China's Revolution in Doctrinal Affairs:

Emerging Trends in the Operational Art of the Chinese People's Liberation Army

Edited by
James Mulvenon and
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David M. Finkelstein

The decade of the 1990s was a period of tremendous change for the Chinese People's Liberation Army (PLA). On nearly every front, this massive defense establishment was engaged in a myriad of reforms aimed at making it a more professional force in a corporate and institutional sense as well as a more operationally capable force. These changes affected every facet of the PLA—force structure, equipment, personnel reform, and yet another rectification of the defense research and development establishment, to name just a few.

Of particular significance, the 1990s was also a decade of tremendous doctrinal ferment. Having just spent the decade of the 1980s refining its approaches to combined arms operations, the PLA, throughout the 1990s, found itself impelled by observing external military events to rethink its own approaches to the operational art and the prosecution of campaign-level operations.

In particular, the performance (both successful and otherwise) of U.S. military forces and coalition partners throughout the 1990s, and the challenges faced by various developing militaries in the face of high-technology warfare helped to crystallize and refine the PLA's conceptualization of what it terms "Local Wars Under Modern High-tech Conditions" (and with the publication of its December 2004 defense white paper, what they now refer to as "Local Wars Under Modern Informationalized Conditions.") So too did the so-called "Revolution in Military Affairs," much written about in the West and subsequently in China, also give PLA operations professionals and theorists cause for pause and self-reflection. Clearly, the emergence of a new type of warfare required a new type of operational doctrine.

At the same time, China's changing assessments of its external security situation provided added impetus to the need for doctrinal change. China's perception of it own changing security landscape during this period was highlighted by the need to enhance its ability to deter Taiwan's drift away from the mainland. It was also influenced by an increasing distrust of U.S. intentions toward China, concerns about India's ambitions as a rising regional power, increasing uncertainty over Japan's evolving role in regional security and military affairs, as well as unresolved competing claims for maritime resources in the South China Sea with various Southeast Asian nations. All of these concerns and uncertainties underscored the need for a reexamination of PLA warfighting concepts in an age of high speed, high lethality, and high technology warfare.

Driven by these aforementioned capabilities-based and contingency-based requirements and assessments, the PLA set about to adjust its approaches to the conduct of operations. In 1999, after nearly a decade of study, research, and presumably experimentation in the field, a new and apparently large corpus of officially promulgated doctrinal guidance was issued under the collective title of "The New Generation Operations Regulations" (*xin yidai zuozhan tiaoling*, 《新一代作战条令》). As a result, it appears that the PLA intends to change how it thinks about the conduct of

campaign-level operations and adjust other supporting activities such as field training regimens, the curricula at institutions of professional military education, force structure organization, and personnel requirements.

In recognition of the ongoing "revolution in Chinese doctrinal affairs," a two-day conference on the PLA's changing approaches to the operational art was co-hosted by The CNA Corporation and The RAND Corporation in December 2002. The timing was right for a conference focused exclusively on changes in PLA doctrine on two accounts. First, by the year 2000, the potential significance of what had transpired doctrinally in the PLA was becoming evident to serious students of Chinese military affairs. Second, for most of the previous decade the PLA itself had generated a tremendous amount of professional literature on the subject, thus providing a more than adequate amount of data to justify serious explorations of the subject. The chapters that follow are the results of the conference.

There is still much that is not understood about the PLA's ongoing doctrinal paradigm shift. However, as a body of scholarship, the papers in this volume offer a rich source of insight into the initial outlines of the PLA's changing approaches to the conduct of operations. All of the authors used a body of professional materials published by the PLA in the original Chinese that represent some (but clearly not all) of the key writings to come out of this period of doctrinal reexamination. The papers likely represent the most current thinking on the PLA's changing operational doctrine as can be found anywhere to this point in the English language.

What is unique about this volume is that it focuses on PLA doctrine at the operational-level of warfare—the very level of conflict at which the PLA itself has put its own emphasis in its new doctrinal literature. It is this level of warfare—the realm of campaigns—that provides the operational linkage between the strategic objectives of a conflict (the desired political-military end state) and the battles and engagements that define the tactical level of combat. It is at this level of conflict at which the operational art is practiced, at which campaign design is paramount, and at which the highest order of generalship is required to take carefully crafted and complex operations plans from the drawing boards to the various battle space dimensions and into contact with the enemy.

Of special note, we were especially fortunate, and honored, to have as our conference's keynote speaker General Donn A. Starry (U.S. Army, Retired), former Commanding General of the U.S. Army Training and Doctrine Command and one of the U.S. Army's most prominent and influential doctrinal experts. As one of the "Founding Fathers" of *AirLand Battle* doctrine, and the driving force behind the Army's watershed 1982 Field Manual, *Operations* (FM 100-5), General Starry provided much appreciated insight into the real world issues associated with what it takes to change a military's doctrine as well as thoughtful commentary on the philosophical and intellectual aspects of thinking through such a complex endeavor.

It is our hope that the readers of this volume will come away with a greater appreciation for the sea changes that are underway in PLA operational thinking, an appreciation for PLA military science researchers and operations specialists as professionals in their own right, and an appreciation for the art of the possible in the field of Chinese military studies in the first years of the 21st Century.

ACKNOWLEDGMENTS

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GLOSSARY, LIST OF SYMBOLS, ETC.

Symbol	Definition
AAM	Air-to-Air Missiles
AMS	Academy of Military Science
ASAT	Anti-Satellite
BMD	Ballistic Missile Defense
C^2	Command and Control
C^3I	Command, Control, Communications, and Inteligence
C^4I	Command, Control, Communications, Computers, and Intelligence
C^4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
CC&D	Camouflage, Concealment, and Deception
CCP	Chinese Communist Party
CMC	Central Military Commission
COSTIND	Commission for Science, Technology, and Industry for National Defense
CTBT	Comprehensive Test Ban Treaty
CWC	Chemical Weapons Convention
DoD	Department of Defense
DPP	Democratic Progressive Party
DSP	Defense Support Program
ECCM	Electronic Countermeasures and Counter-Countermeasures
ECM	Electronic Countermeasures
FBIS	Foreign Broadcast Information Service
FM	Army Field Manual
GED	General Equipment Department
GLD	General Logistics Department

GPD	General Political Department
GPS	Global Positioning System
GSD	General Staff Department
ICBMs	Intercontinental Ballistic Missiles
IDF	Indigenous Defense Fighter
IT	Information Technology
IW	Information Warfare
JTF	Joint Task Force
KMT	Kuomingtang
LOW	Launch-On-Warning
LUA	Launch-Under-Attack
LWUMHTC	Local Wars Under Modern High-Tech Conditions
MAD	Mutually Assured Destruction
MIRVs	Multiple Independently-Targetable Reentry Vehicles
MMB	Ministry of Machine Building
MND	Ministry of National Defense
NCMTB	Northwest Comprehensive Missile Test Base
NCO	Non-Commissioned Officer
NDU	National Defense University
NFU	No-First-Use
NIC	National Intelligence Council
NIE	National Intelligence Estimate
NMD	National Missile Defense
NPC	National People's Congress
NPT	Nuclear Nonproliferation Treaty
NSC	National Security Council
OODA	Observe, Orient, Decide, and Act
PALs	Permissive Action Links

PJO	Principles of Joint Operations
PLA	People's Liberation Army
PLAAF	People's Liberation Army Air Force
PLAN	People's Liberation Army Navy
PME	Professional Military Education
POL	Petroleum, Oils, and Lubricants
PRC	People's Republic of China
R&D	Research and Development
RMA	Revolution In Military Affairs
ROCAF	Republic of China Air Force
SAM	Surface-To-Air Missile
SLBMs	Sea Launched Ballistic Missiles
SLOC	Sea Lanes of Communication
SRBM	Short-Range Ballistic Missile
SSM	Surface-To-Surface Missile
TELs	Transporter Erector Launchers
TMD	Theater Missile Defense
TRA	Taiwan Relations Act
UAV	Unmanned Aerial Vehicles
USAF	United States Air Force
USG	United States Government

1. THINKING ABOUT THE PLA'S "REVOLUTION IN DOCTRINAL AFFAIRS"

— OR —

《论中国人民解放军的战法革命》

By Dr. David M. Finkelstein[1]

INTRODUCTION

Years from now, students of the PLA may well look back at the decade of the 1990s as the period of time during which the PLA began to put into motion an ambitious series of reforms aimed at making the future Chinese armed forces a more professional force and a more operationally competent force. This is particularly true of the years 1996 to 2000—the period of the 9th Five-Year Plan. The PLA's new concepts of operations—its new and evolving war fighting doctrines—are an absolutely critical component of this overall process.

In June 1999, the PLA took a major step toward doctrinal reform. At that time a very substantial body of directives providing new authoritative operational guidance to the PLA at the campaign (*zhanyi*; 战役) and tactical (*zhanshu*; 战术) levels of warfare were issued under the authority of the Central Military Commission (CMC). As a result, the "First Generation Operations Regulations" dating from the mid-1980s were retired, and a large corpus of materials—known collectively as the "New Generation Operations Regulations" (*xin yidai zuozhan tiaoling*; 新一代作战条令)—have been put in place.

At our July 1999 conference, this author provided some initial commentary about the state of understanding in our field about Chinese doctrine. At the time, the article raised more questions than could be answered.[2] Much has transpired in this area of research and study since that conference. This essay will offer some modest new thoughts about the importance of the PLA's new operational guidance, provide some context for where it fits into the larger PLA reform process, and share various other musings about

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[1] The views in this paper are solely those of the author's and do not constitute the views or opinions of The CNA Corporation. Many thanks to CNA Corporation colleagues Ken Allen, Dean Cheng, and Maryanne Kivlehan-Wise for their helpful criticisms and suggestions.

[2] David M. Finkelstein, "Commentary on Doctrine," in James C. Mulvenon and Andrew N.D. Yang, eds. *Seeking Truth From Facts: A Retrospective on Chinese Military Studies in the Post-Mao Era*, Santa Monica, CA: RAND, 2001, pp. 119-130.

the challenges that still persist when attempting to study the operational art as it is evolving in today's PLA.

THINKING ABOUT THE LARGER CONTEXT

Before launching directly into the topic of PLA doctrine, we are well served by reviewing the bigger picture of what has been transpiring in the PLA these past several years, and in so doing place doctrinal reform in a larger context.

Throughout the decade of the 1990s, and continuing today, the PLA began to put into motion a reform and modernization program of profound proportions. Acting upon its own assessments of the rapidly changing nature of modern warfare—including its own analyses of the Gulf War—China's military leadership apparently came to the conclusion that the armed forces of China were ill-equipped to fight and win its most likely future type of military confrontation which they term "Local Wars Under Modern High-Tech Conditions."[3]

The totality of what the PLA leadership hopes to achieve through its reform and modernization program is profound on two accounts: scope and scale.

Scope. The scope of reforms cuts across every conceivable facet of activity within the PLA—the development of new operational concepts and war fighting techniques; the modernization of weapons; the accrual and integration of state-of-the-art technologies; rethinking command-and-control relationships and enabling architectures; the rectification of the armaments R&D and procurement system; personnel recruitment, retention, and management; training; professional military education; administration; force structure adjustments; and logistics, to name just a few of the many areas of focus.

Scale. This latest attempt at wholesale reform is also profound in terms of scale. The PLA is a massive organization. By its own public statements the PLA today has about 2.5 million personnel under arms—even after about a 1.5-million-man reduction since 1985.[4]

But the scale of what China's top military leadership hopes to achieve is not measured just in numbers. It is measured as well in terms of the intellectual, corporate professional, and conceptual "leaps" that this massive defense establishment is being asked to make. The officers and soldiers of the PLA are being told that business as usual will not suffice, that many of the old paradigms are bankrupt, and that entrenched local interests and parochial equities must be cast aside in order to move the PLA into the 21st century.

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[3] More than enough ink has been spilled by PLA officers and Western students of the PLA describing the characteristics of "Local Wars Under Modern High-tech Conditions." There is no need to rehash that discussion in this paper. For those seeking a very concise set of descriptors see my article, "China's National Military Strategy," in James C. Mulvenon and Andrew N.D Yang, eds., *The People's Liberation Army in the Information Age,* Santa Monica, CA: RAND, 1999, pp. 99-145; especially pp. 127-128.

[4] *China's National Defense in 2000*, *Xinhua,* 16 October 2000. A one-million-man reduction was put into motion in 1985. At the 15th Party Congress in 1997, another reduction of 500,000 was announced.

Overall, there is simply no roadmap or precedent in the PLA's past for what China's military leaders are seeking to achieve for its future. Indeed, the PLA itself uses the term "transformation" to describe the processes under way and the desired end state.

To achieve the capability to fight and win the war of the future, the Central Military Commission in 1995 put forth a "new line" (policy) for "army building" (defense modernization) to guide all aspects of PLA reform. Known as the "Two Transformations" (*liangge zhuanbian*; 两个转变), it calls for the Chinese armed forces to undergo a metamorphosis:

- From an army preparing to fight local wars under ordinary conditions to an army preparing to fight and win Local Wars Under Modern High-Tech Conditions, and

- From an army based on quantity to an army based on quality

A corollary that usually accompanies the articulation of the "Two Transformations" is that the PLA must also transform itself from an army that is personnel intensive to an army that is science and technology intensive.[5]

It can be stated with some degree of certainty that the "Two Transformations" line for army building was officially adopted in December 1995 at an enlarged meeting of the CMC chaired by Jiang Zemin.[6] There is also irrefutable evidence of many of the outputs from the program. These deliverables have not just been in the form of new weapons acquisitions, but through the myriad military laws, rules, and especially regulations that were published around the time the 9th Five Plan was coming to a close in 1999, a year I often refer to as "The Year of Regulations." Since 1995, therefore, this overarching program has served to focus all Chinese military reforms.

Deceptively simple in its articulation, the call to enable the "Two Transformations" is intended to cut across just about every aspect of professional activity within the Chinese armed forces.[7] This reform and modernization process should clearly

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[5] The "Two Transformations" is sometimes referred to as the "Two Basic Transformations" (*liangge jiben xing zhuanbian*; 两个基本性转变). See Zhang Qinsheng and Li Bingyan, "Series of Talks on the 'Two Basic Transformations'— Understanding Gained From Studying CMC Strategic Thinking on the 'Two Basic Transformations,'" *Liberation Army Daily*, 14 January 1997 (in Foreign Broadcast Information Service; hereafter, FBIS).

[6] See Xiao Yusheng (Deputy Director of the Military History Research Department of the PLA Academy of Military Science), "Building A Strong People's Army," *Liaowang*, No. 31, 29 July 2002, pp. 7-9 (FBIS).

[7] For a comprehensive overview of the range of particular areas where the PLA leadership had identified need for reform and modernization, see the 1997 essay by Lieutenant General Chen Bingde (at the time Commander of the Nanjing Military Region), "Intensify Study of Military Theory To Ensure Quality Army Building—Learning From Thought and Practice of the Core of the Three Generations of Party Leadership

be recognized as a holistic endeavor—"a complex engineering project," as PLA commentators often put it. Many of the key programs are mutually supportive; progress or lack of progress in one aspect affects all others; uneven progress among the many facets is the norm; it is iterative; all must be integrated; and it is centrally directed.

THINKING ABOUT DOCTRINE AND THE "THREE KEY PILLARS" OF REFORM

Although a holistic endeavor, for the purposes of analytic simplicity, one could parse the PLA's modernization program into "three key pillars" (author's term, not the PLA's) that can be isolated and studied on their own before attempting to reach judgments about progress the larger system is making. These "three key pillars" are:

1. The development, procurement, acquisition, and fielding of new weapons systems, technologies, and combat capabilities. The PLA would refer to this category of modernization as coming under the general heading of *junshi liliang* (军事力量).

2. The development of new operational concepts and war fighting doctrines for their employment. *Junshi sixiang* (军事思想) in the lexicon of PLA military science.

3. The vast array of institutional and systemic reforms that will be necessary to support the first two. Known as *zhengguihua* (正规化) or "regularization" in PLA parlance.

Three words that capture the essence of the "three key pillars" would be: *Weapons*, *Doctrine*, and *Institutions*.

Weapons. The acquisition and fielding of new weapons systems and technologies and other strategic and battlefield assets is a critical (and traditional) measure of the modernization of military establishments. Not surprisingly, therefore, it is this first "pillar" that is the focus of most of the attention of casual as well as full-time students of the PLA. It also attracts the lion's share of media attention.

In the case of studying the PLA, it is also an analytically satisfying undertaking. Once a weapon system is identified there is not a lot of guesswork involved in understanding its inherent capabilities. Moreover, a good deal of data is available in English. China's foreign military acquisitions reach the public domain sooner or later. The Chinese themselves often herald the fielding of new indigenous systems, and international arms and technology shows usually have a Chinese presence showcasing Beijing's latest developments in weapons systems or other military-related technologies. Additionally, for a variety of reasons, the international media consider new Chinese weapons acquisitions inherently newsworthy events—especially the media in Taiwan, Hong Kong, and in some quarters of the US. There is no dearth of articles about new

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in Studying Military Theory," *Zhongguo junshi kexue* [China military science], 20 August 1997, No. 3, pp. 49-56.

Chinese acquisitions, and no shortage of highly qualified experts commenting in those articles about the capabilities or implications of the PLA's new aircraft, destroyers, submarines, enhanced missiles, etcetera. This is not just the case in journals that specialize in international military developments (such as the *Jane's* publications), but in mainstream news weekly's and daily newspapers in the West.[8]

Finally, one does not necessarily have to be a Mandarin reading Sinologist, or a full-time (or long-time) student of the PLA to have significant insights into the importance of new weapons systems. Indeed, a good deal of expert commentary on these issues comes from the technologically savvy in the commercial and R&D sectors, retired military officers, "strategic" and military analysts (generalists) in think tanks, and academics who follow these issues closely.

Without question, tracking this first key pillar is critical and necessary work if one hopes to see where the PLA is headed. However, the systems by themselves do not tell us much about *how* those new capabilities will be employed. When there is some indication of what a new capability might be used for—such as Russian *Sunburn* surface-to-surface missiles against naval assets—the discussion tends to hover at the high end of technological discourse, but doctrinally at the lower end of tactical commentary.

Consequently, the study of weapons systems needs to be kept in perspective. The new systems by themselves do not tell the whole story. There is no straight line from the acquisition of a new weapons system to a new capability. These "hardware" issues are, however, the critical grist of data for the "means" in the "ends, ways, means" equation. But conversely, *not* having certain systems does not necessarily allow one to argue that there are no extent operational capabilities.

Institutions. Research into the elements of the third pillar—the PLA's institutional reforms—comprises a vast set of topics that speak to an increasing number of key systemic adjustments that are changing the way the PLA is organized, how it manages (and leads) its organizations and personnel, and changes in how the Chinese armed forces plans to go about its business in peace as well as in war. It covers such issues as:

- **Reforms to the personnel system**. These issues include officer accession processes; new officer career management procedures; the creation of a new NCO system; changes in conscription, retention, and demobilization policies; and reform of the Professional Military Education (PME) system, to name just a few areas.

- **Organizational reforms**. This category is equally expansive. It includes changes to force structures; administrative procedure reforms; changes to headquarters and staff organization and manning; the consolidation of major commands; new training guidelines; the creation (in one instance)

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[8] For example, see David Lague, "Buying Some Muscle," *Far Eastern Economic Review*, 24 January 2002, pp. 30-34; and Craig S. Smith, "China Reshaping Military to Toughen Its Muscle in Region," *The New York Times*, 16 October 2002.

of a new General Department (the General Armament Department in 1998), etc.

- **Reform of the logistics and defense R & D system**. Included would be such topics as the creation of joint logistics organizations at the Military Region (MR) level; programs to integrate civil and military logistics; and the creation of cross-discipline mobile logistics teams to enhance combat support and combat service support at the tactical level.

These are but a few examples of the myriad institutional changes ("software" reforms) that are being made by the PLA today. And much more so than the acquisition of weapons systems and technologies, the reforms that come under this "pillar" provide the context that will ultimately define the degree of corporate professionalism the PLA will attain in the future.

This pillar receives exponentially less attention from generalists than research and discourse about PLA weapons systems. It receives little to no attention from the foreign media. Serious research into the issues associated with the institutional reforms of the Chinese defense establishment has been nearly exclusively the domain of the community of "PLA experts" in academe, in think tanks, and their counterparts in governments around the world. Indeed, this very conference and others like it has for years been in the vanguard of keeping up with all aspects of PLA modernization and reform—especially institutional reform.

The vast array of institutional reforms the PLA is undergoing constitutes a critical field of research that a new generation of language-capable students ought to be encouraged to pursue. Those who take up the challenge will encounter a remarkably data-rich environment. No PLA reforms have been as public and transparent as have the plethora of institutional changes that have been (and are being) enacted. They are regularly featured by the PLA in its own public (*gongkai*; 公开) periodicals and newspapers—most prominently in *Liberation Army Daily* (*Jiefangjun bao*; 解放军报), the official newspaper of the PLA. The rich trove of data available includes explanations of the reforms; authoritative statements of why the reforms or changes are being enacted; oftentimes interviews with officers from the departments within the PLA with executive oversight for the new changes; as well as the periodic publication of the actual new regulation governing this or that institutional reform in its entirety. And by its own commentaries, the PLA is especially proud of the remarkable progress it has made these past ten years in "regularizing" and standardizing its procedures, organizations, and institutions by developing, adopting, and enforcing new laws and regulations.[9] The PLA understands quite well that reform and modernization is not just about weapons.

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[9] Both of China's recent defense White Papers (1998 and 2000) made a point of highlighting the progress that has been made in standardizing procedures through laws and regulations. See also, "*Jiefangjun bao* Roundup on Achievements in Army Administration by Law," *Jiefangjun bao*, 9 October 2002, p.1.

For those who are interested in delving into the nuts and bolts of how this military does business, the numerous regulations that were announced and published during the 9th Five-Year Plan provide some amazingly granular insights. Over the years, many of the individuals attending this conference and others have published outstanding articles on the PLA's institutional reforms. But more are needed if one ever hopes to understand how the PLA operates as an organization.[10] Moreover, so many systemic changes have occurred over the past decade that the community is still in a catch-up mode. The Chinese books are there. The PLA journal articles are there. A consistent research focus should also continue to be there.

Doctrine. Finally, there is the third key pillar—doctrine. For the sake of simplicity at this point, although discussions about doctrine are never simple, let us define doctrine as the authoritative and fundamental principles that guide commanders and their staffs in planning for the use of, and applying, military force to achieve military objectives.[11] Doctrine guides war fighters in thinking through *how* they will employ their units and weapons, in what sequences, and against which enemy centers of gravity to achieve their military objectives with minimal loss to their own forces and maximum loss to the enemy. Doctrine is the bridge between military theory and military practice. And in most militaries, doctrine exists at three levels—the strategic level of warfare, the operational level, and the tactical level. Doctrine is the "ways" in the "ends, ways, means" equation.

For the most part, like institutional reforms, discussions and research about PLA "doctrine" has generally been the purview of the community of PLA specialists. Of the three key pillars of PLA modernization and reform, doctrine is usually the least studied by generalists. Why? Four reasons are offered.

The first reason is central: the data. Unlike the issue of weapons systems and technological capabilities, authoritative primary source data on PLA doctrinal issues in English is near non-existent. Studying PLA doctrinal issues in primary source materials requires a reading knowledge of Chinese. This immediately makes the study of PLA doctrine a near-impossible task for many (and difficult even for those who do read Chinese). Certainly, there is a body of data available in translation, but it is miniscule and there are many problems with some of the translations that will be discussed later on. Moreover, the secondary source literature in English is equally sparse.

Second, even if there were authoritative data in English, studying doctrine is just plain grueling. Especially for those with little in the way of professional military education studying the doctrine of any military establishment can quickly degenerate

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[10] Among the many examples one could cite are: Thomas Bickford, "Professional Military Education in the Chinese People's Liberation Army: A Preliminary Assessment of Problems and Prospects" in *A Poverty of Riches: New Challenges and Opportunities in PLA Research,* Santa Monica, CA: RAND, 2004, pp. 1-24; Kenneth W. Allen, "PLA Air Force Logistics and Maintenance: What has Changed," and Harlan W. Jencks, "COSTIND is Dead, Love Live COSTIND!—Restructuring China's Defense Scientific, Technical and Industrial Sector," both in Mulvenon and Yang, *The People's Liberation Army in the Information Age*, op. cit.

[11] "Authoritative" means that these fundamental principles are officially endorsed by the military in question.

(understandably) into a mind-numbing exercise in undecipherable professional jargon and seemingly arcane theoretical military discourse. The language of doctrine in any military is the language of its practitioners and its professionals. In the case of studying the PLA there are two "foreign" languages to be mastered: Chinese as well as the subset of professional military terminology in Chinese.

Third, without a firm grounding in one's own military's operational theory and doctrines, either by way of professional military experience and military education—or sustained study in the case of civilians—it is difficult to have a baseline against which to think about PLA doctrine. Judgments about weapons systems are empirically derived from hard facts about technical capabilities. Judgments about doctrine are subjective and comparative. [12]

Finally, unless one has a passion for doctrinal issues in general, studying that of a foreign military's can be extremely tedious. Let's face it, if one does not find reading monographs such as US Army FM 3-0 (*Operations*, formerly FM 100-5) or Joint Pub 3-0 (*Joint Operations*) an engaging and stimulating endeavor, then diving into PLA professional literature (assuming one could access and read it) could prove hazardous to one's mental health due to the Marxist-Leninist intellectual wrapping paper in which a good deal of it comes packaged. And needless to say, media interest in doctrinal issues is next to nil.

How about the community of PLA specialists? Have doctrinal studies fared any better than those among the generalists? The answer is a decidedly mixed "yes" and "no."

There is no question that PLA doctrinal issues have been given serious and sustained attention for many, many years. Let me cite again, as I did in my essay for the 1999 RAND-CAPS conference, the research and publishing record of Dr. Paul Godwin on this issue over a period of at least twenty five years: from his 1977 Air University monograph *Doctrine, Strategy, and Ethic: The Modernization of the Chinese People's Liberation Army* to his 1996 *China Quarterly* article "From Continent to Periphery: PLA Doctrine, Strategy, and Capabilities Toward 2000." Obviously, many other colleagues could be cited as well. The point to be made is simply this: doctrinal issues have not been neglected.

At the same time, as one thinks about the literature and research that has been produced it becomes clear that the doctrinal perspective that has received the most focus has been anchored at the strategic level of warfare.

The history of the sub-field of PLA doctrinal studies (if one can call it that) has mostly been the history of explaining PLA strategic doctrine (strategic level concepts for

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[12] Interestingly, the absence of a viable understanding of PLA doctrine, especially at the operational level of war, rarely deters military generalists from offering assessments of the ability (or inability) of the PLA to conduct major campaign-level operations. One example that comes to mind is an otherwise well thought out and well reasoned article by Michael O'Hanlon, "Can China Conquer Taiwan?" *International Security*, Fall 2000, Vol. 25, No. 2, pp. 51-86. This particular article is a classic case of focusing almost exclusively on individual tactical-level activities and platform-on-platform capabilities with little consideration for the operational art and the complex activities associated with campaign design.

fighting wars writ large), and tracking and discussing the shifts the PLA has made in its strategic approaches to the conduct of war (and all that it has implied politically and sometimes operationally). The literature has followed shifts from "People's War" to "People's War Under Modern Conditions;" from "Local Wars" to "Local Wars Under Modern Conditions," to "Local Wars Under Modern High-Tech Conditions." And in the case of the PLA Navy (PLAN) highlighting the shift from "Coastal Defense" to "Offshore Defense."

A close second among members of the field has been research on doctrinal issues at the higher-end of the tactical level of warfare. The appropriate focus of the field in the latter part of the 1980s on the PLA's decision to enhance its ability to conduct combined arms operations (*hetong zuozhan*; 合同作战) within each of it services, and the changes to force structures and training that ensued, comes to mind.

What has largely been absent has been a focus on the doctrinal perspective that resides at the *operational level of warfare*—between the strategic and tactical.

The operational level of warfare is the domain of campaigns. It is campaigns that link tactical actions (battles) to strategic-level objectives (military and/or political). In the US, the operational level of warfare is the purview of theater commanders or their subordinate Joint Task Force (JTF) commanders. Organizationally, think US Pacific Command and US Central Command. Operationally, think *Operation Desert Storm* and *Operation Enduring Freedom*. For the PLA, the operational level of war takes place within the organizational and operational framework of a War Zone (*zhanqu*; 战区)—single or multiple War Zones—which control single or multiple numbers of *juntuan*-level (*juntuan ji*; 军团级) service formations.[13] And like the US, the PLA thinks in terms of campaigns at this level of conflict. For both the US and the PLA, the operational level of war is where the operational art is practiced.

The Operational Art

"The employment of military forces to attain strategic and/or operational objectives through the design, organization, integration, and conduct of strategies, campaigns, major operations, and battles. Operational art translates the joint force commander's strategy into operational design, and, ultimately, tactical action by integrating the activities at all levels of war."

US Joint Pub 1-02, *Department of Defense Dictionary of Military and Associated Terms* (As Amended through 12 January 1998), p. 314.

The general absence of focus on PLA doctrine at the operational level of war is readily explained. It has certainly *not* been for a lack of desire or a failure to acknowledge the importance of this issue. So why is there this void? Two reasons jump out. First, it has only been in the last decade that the PLA itself has been coming to grips

[13] In the PLA, a *juntuan*-level unit is the lowest scale of unit that can be employed in a campaign-level operation. For the Ground Forces it is a Group Army, *jituan jun*, (near-analogue to a US Army Corps), for the PLAAF it is a Military Region Air Force, for the PLA Navy it is one of the three fleets.

with a need to re-look the importance of the operational level of warfare. It has taken almost a decade—from about 1991 to 1999—for the PLA to think through and revise its own campaign-level guidelines. In essence, then, research into this issue is a relatively new field of study. Second, it has only been since the promulgation of the PLA's new operational-level guidelines in 1999 that data has slowly become available to examine.

We sit, then, at a point in time when research and studies about PLA operational-level doctrine and the operational art are for the first time in a very long time becoming feasible. To a certain extent, the focus of this year's conference is a validation of the new possibilities. The remainder of this essay will address some of the issues and challenges that our group and others will face as it explores this area of research.

THINKING ABOUT THE NEW PLA OPERATIONS REGULATIONS

The first order of business is fixing in our minds just what, exactly, has happened in the realm of PLA doctrinal reform.

The Event

In January 1999, after at least four years of intensive work by the "PLA Operations Regulations Compilation Committee" (in effect, throughout most of the period of the 9th Five-Year Plan), a new and comprehensive set of documented guidelines for the conduct of military operations was issued under the signature of Jiang Zemin in his capacity as Chairman of the Central Military Commission.[14]

Collectively, the new guidelines are referred to by the PLA as the "New Generation Operations Regulations" (*xin yidai zuozhan tiaoling*; 新一代作战条令). They have now replaced the "first generation" operations regulations that were issued in the mid-1980s.

The Format

The "New Generation Operations Regulations" have been issued in a series of capstone publications that are referred to by the PLA as *gangyao* (纲要).[15] Settling on a satisfactory English translation of the term *gangyao* is difficult. One could choose any of the following for a literal translation: "essentials," "guidelines," "outline," or "compendium." I am certainly open to suggestions on this account. What is more important is what a *gangyao* represents in the context of this discussion.

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[14] Ren Xiangdong, "PLA Ground, Navy and Air Units Implement New Generation Combat Regulations," *Liaowang*, No. 23, 7 June 1999, pp. 32-33. Author's note: While this author has not seen the original *Liaowang* article in Chinese, one suspects, based on an broad review of primary source literature on this subject, that the FBIS use of the English word "combat" is probably better translated as "operations." The Chinese word usually used in primary sources is *zuozhan* (作战).

[15] In addition to these "manuals" are a host of "operations regulations" (*zuozhan tiaoling*; 作战条令) that flesh out more details.

For the purposes of this essay, a *gangyao* is best portrayed as the PLA analogue to a US Army Field Manual (FM) or the Joint Pubs on operations issued by the Pentagon's Joint Staff. In fact, when referring to US "FMs" in its own professional literature, the PLA usually uses the term *gangyao* as a point of reference for its own readership. For example, US Army FM 100-5 (*Operations*) is often cited as *Meiguo Lujun* FM 100-5 *Hao* 《*Zuozhan Gangyao*》 [美国陆军 FM 100－5 号《作战纲要》][16] A *gangyao*, then, is a manual-like publication. It is authoritative and provides general guidance to be adhered to and implemented.[17]

At a minimum, to the best that can be determined, the new body of operational guidance consists of at least six *gangyao* (let's choose "essentials" for the purposes of translation) that are listed directly below in order of precedence:[18]

- "The Essentials of Joint Campaigns of the Chinese People's Liberation Army" [*Zhongguo renmin jiefangjun lianhe zhanyi gangyao;* 《中国人民解放军联合战役纲要》]

- "The Essentials of Army Campaigns of the Chinese People's Liberation Army" [*Zhongguo renmin jiefangjun lujun zhanyi gangyao;* 《中国人民解放军陆军战役纲要》]

- "The Essentials of Campaigns of the Chinese People's Liberation Army Navy" [*Zhongguo renmin jiefangjun haijun zhanyi gangyao;* 《中国人民解放军海军战役纲要》]

- "The Essentials of Campaigns of the Chinese People's Liberation Army Air Force" [*Zhongguo renmin jiefangjun kongjun zhanyi gangyao*; 《中国人民解放军空军战役纲要》]

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[16] See for example, citations in Wang Yong (王勇), *Zhongxifang zhanyi bijiao yanjiu* [Comparative research on chinese and western campaigns]**,** Beijing: National Defense University Publishing House, July 1999. Of interest, the NDU Press chose to translate the title of this book into English as *A Comparative Study of the Operational Art of China and the Western Countries,* which indicates that the issue of translation between US and Chinese professional jargon is an issue on both sides of the Pacific. Because of this state of affairs, Chinese materials cited in this essay will be presented in three forms: the Chinese characters followed by the Pinyin, followed by the English translation.

[17] It should also be noted that *gangyao* are not just issued by the PLA. Other PRC state and party entities use the vehicle of *gangyao* to document and disseminate authoritative guidance.

[18] This list from Xue Xinglin (薛兴林), Editor-in-Chief, *Zhanyi lilun xuexi zhinan* [Campaign theory studies guidebook]**,** Beijing: National Defense University Press, February 2002)]. Hereafter, *Zhanyi lilun*.

- "The Essentials of Campaigns of the Chinese People's Liberation Army Second Artillery Corps" [*Zhongguo renmin jiefangjun dier pao bing zhanyi gangyao*; 《中国人民解放军第二炮兵战役纲要》]

- "The Essentials of Campaign Logistics and Safeguards of the Chinese People's Liberation Army"[19] [*Zhongguo renmin jiefangjun zhanyi houqin baozhang gangyao;* 《中国人民解放军战役后勤保障纲要》]

The Reasons

Why did the PLA feel a need to retire an entire set of operations regulations and develop and issue new ones? The answer is rather straightforward. New operational concepts (doctrine), and adjustments to previous operational concepts, were deemed necessary to comport with the PLA's assessment of the most likely type of war it assesses it will face: "Local Wars Under Modern High-tech Conditions" (*gao jishu tiaojian xia jubu zhanzheng*; 高技术条件下局部战争).

Note that the phrase "most likely type of war" is used, not "the most likely specific contingency." Although the PLA surely views a Taiwan campaign as a high priority planning and preparation contingency, the thrust of "army building" for the PLA is not necessarily always about Taiwan.

Even if there were no Taiwan contingency it is highly likely, this student would argue, that the PLA would still be on the same general vector it is on today. This is a function of the iterative analytic process that the legions of PLA and civilian analysts in the Chinese defense and security community (*xitong*; 系统) are constantly cycling through. This iterative process seeks to identify, and constantly reassess, the following issues:[20]

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[19] The term *baozhang* (保障) can be translated literally as "safeguard" or "guarantee." In the parlance of PLA jargon, *baozhang* is a term that refers, generically, to many of the operational support activities that often (but not always) come under the functional categories of *both* Combat Support and Combat Service Support in the US military system; especially the US Army. Some of these would include: communications, intelligence, rear echelon maintenance, electronic countermeasures, and rear area (physical) security to include some aspects of rear echelon (COMMZ in the US) air defense for the PLA.

[20] The identification of these issues is the grist of the incessant debates that go on within the Chinese defense and security analytic community and the subjects of annual conferences and meetings among experts. The gist of this analytic process becomes evident as one reads through Chinese materials. See for example, the chart on page 7 in Wang Wenrong (王文荣), *Zhanlüexue* [The science of strategy], Beijing: National Defense University Press, May 1999. In English, see Yao Yunzhu, "The Evolution of Military Doctrine of the Chinese PLA from 1985 to 1995," *The Korean Journal of Defense Analysis*, Winter 1995, pp. 57-80.

- The state of the international security environment (*guoji huanjing*; 国际环境). As often as not resolving this question is as much a political decision as it is an empirically derived conclusion.[21]

- China's most likely threats. This is the realm of the Chinese military and civilian intelligence community.

- The most likely type of war. For example, total war (*quanmian zhanzheng*; 全面战争), local war (*jubu zhanzheng*；局部战争), and in the case at hand, "Local War Under Modern High-tech Conditions." These assessments are the purview of PLA and civilian military experts.

- And finally the *ways* (doctrine) to best fight that war (*junshi sixiang*; 军事思想 as a generic catch all for military concepts), and the *means* required to fight that war (*junshi liliang*; 军事力量, or hardware, weapons, forces, etc.). This is almost exclusively the responsibility of PLA professionals in the various military science institutes, the operations practitioners in the field, and the defense scientific and technological (S&T) and research and development (R&D) communities

Many of the PLA's military theorists had come to the conclusion that "Local Wars Under Modern High-tech Conditions" were the wave of the future even before 1991. However, not all were convinced. Apparently, and here one is speculating, the detailed post-Gulf War studies conducted by the PLA convinced most others who mattered that something new was afoot in warfare and that adjustments were in fact needed. Some claim that by early 1992 "Local Wars Under Modern High-tech Conditions" had been accepted as the most likely type of future conflict for the PLA.[22] By 1995 there is no question but that the need to fight and win "Local Wars Under Modern High-tech Conditions" was officially blessed, for it became the corner stone of "Two Transformations" program associated with Jiang Zemin.

Having concluded that it had correctly identified the most likely type of future war, the PLA also apparently concluded that its existing operational guidelines were inadequate to the task of guiding its forces in the *ways* to fight such a war. The "first generation" operations regulations, as mentioned earlier, were promulgated in the mid-1980s. The focus of the "first generation" operations regulations on single service (*junzhong*; 军种) combined arms operations (*hetong zuozhan*; 合同作战) between

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[21] For the centrality of this question in the Chinese analytic cycle, and the attendant strategic and political implications, see David M. Finkelstein, *China Reconsiders Its National Security: "The Great Peace and Development Debate of 1999,"* Alexandria, VA: The CNA Corporation, December 2000.

[22] Yao; op. cit.

service branches (*bingzhong*; 兵种) was clearly found wanting in the face of the myriad developments in warfare that had occurred over the course of more than a decade. If it took the PLA almost a decade (1991-1999) to develop its new operational guidelines (bounded by the Gulf War and the publication of the "New Generation Operations Regulations"), then the "first generation" operations regulations in the mid-1980s were probably focused on the warfare of the 1970s and early 1980s. And if in the 1970s and 1980s the PLA was carefully following US and Soviet doctrinal and technological issues—which is probably a safe assumption—then the "first generation" operations guidelines were likely responding to the Arab-Israeli War of 1973, and most assuredly the US doctrinal response to the Soviets in Europe in the early to mid 1980s (*AirLand Battle*). Certainly China's own war with Vietnam in 1979—the last campaign-level operation fought by the PLA—had its own set of lessons for that first-ever batch of operations regulations in the mid-1980s.

In effect, then, to prepare for and to eventually be able to prosecute the new high-tech local wars of the late 20th Century and early 21st Century, new operational concepts and guidelines were deemed necessary by the PLA to account for the lessons they believe they had learned from studying foreign experiences such as the Falklands War and especially the Gulf War.[23] A new approach to the operational art was required to account for such developments as joint operations (*lianhe zuozhan*; 联合作战), increasingly high-technology and high-lethality weapons, the enhanced role on the battlefield of C^4ISR and electronic warfare, as well as the new elements of information warfare that had become so prominent a feature in developed militaries, especially in the US.

The Substance and Focus

In February 1999, former Chief of the General Staff Fu Quanyou heralded the promulgation of the "New Generation Operations Regulations" to the PLA in a wide-ranging interview in *Jiefangjun bao*. Although nearly none of the substance of the new operational guidance was discussed, General Fu did provide some significant commentary on the importance of the new regulations.[24] According to General Fu, the "New Generation Operations Regulations:"

- Are focused on winning future "Local Wars Under Modern High-tech Conditions"
- Support the "Two Transformations" army-building program

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[23] NATO's intervention in Kosovo in 1999 was viewed by the PLA as a validating event for the correctness of the new assessments of the nature of modern warfare. Undoubtedly, US operations in Iraq in 2003 will also be studied carefully for more lessons learned.

[24] "Interview With General Chief of Staff Fu Quanyou by Staff Reporter: 'Earnestly Implement Operation Decrees and Continue to Enhance Capacity to Win Wars,' " *Jiefangjun bao*, 25 February 1999 (FBIS).

- Are intended to "unify the operational thinking of the whole army"
- Adjust previous PLA operational concepts and "assimilates the useful experiences of other countries in the world in recent local wars"
- Provide guidance for "campaigns and battles at all levels and all scales"
- Affect all services, branches, and specialized forces
- Account for the importance of logistics

> *"THE NEW DECREES ARE THE IMPORTANT RULES AND REGULATIONS FOR OUR ARMY; AND ARE A CRITERION THAT THE WHOLE ARMY MUST OBSERVE IN ITS ORGANIZATION OF OPERATIONS, TRAINING, AND TEACHING. THE NEW DECREES HAVE NOT ONLY GIVEN A BASIS FOR COMMANDING OFFICERS AND COMMANDING ORGANS AT ALL LEVELS IN THEIR ORGANIZATION AND COMMAND OF OPERATIONS AND TRAINING, BUT HAVE ALSO PROVIDED A BASIC NORM FOR THE MILITARY ACADEMIES AT ALL LEVELS IN THEIR TEACHING AND SCIENTIFIC RESEARCH. IN ADDITION, THEY WILL ALSO PLAY AN IMPORTANT ROLE IN GUIDING AND PULLING THE STRUCTURAL AND ORGANIZATIONAL REFORM, THE WEAPONRY DEVELOPMENT, AND THE OVERALL BUILDING OF OUR ARMY."*
>
> *GENERAL FU QUANYOU,*
> *CHIEF OF THE GENERAL STAFF*

In addition to the above statements, General Fu offered other commentary that this student views as extremely significant. Specifically, the "New Generation Operations Regulations" will be central in pushing forward the following areas of reform and modernization for the PLA in addition to the actual conduct of operations—

- Training
- Force structure adjustments
- Professional Military Education
- Weapons development

These authoritative comments on the centrality of the new operations regulations for PLA modernization, training, instruction, force structure, and weapon development

are remarkably reminiscent of the central role *AirLand Battle* doctrine played as a forcing function in focusing US Army modernization and reform efforts throughout the 1980s.[25]

Other articles in the Chinese press that heralded the new operations regulations offered almost the same list of attributes.[26] Reportedly, these regulations:

- Conform with the "Two Transformations" army-building program that focuses on fighting "Local Wars Under Modern High-Tech Conditions"
- Reflect operational adjustments to the changing nature of warfare in "combat tasks" and "combat conditions," and are keyed to the Gulf War as well as changes to the military strategies of other major powers since the Gulf War
- Apply to all the services (*junzhong*; 军种) and branches (*bingzhong*; 兵种) of the greater PLA
- Are based on new "combat theories" and recent "new experiences" in training
- Are aimed at "unifying" and "standardizing" operational thinking across the PLA
- Apply to the "various levels" of combat
- Are more detailed than the previous generation regulations "by 45 percent"
- Are divided into three major types: (1) general regulations, (2) regulations for "joint" combat between different services, and (3) combat conducted "jointly" between the various "arms" and "specialties" (probably within a service)
- Provide new campaign and operational principles while at the same time updating previous principles
- Provide for new campaign command-and-control "principles" and "mechanisms" for joint campaigns

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[25] For a remarkable history of the development of US Army doctrine in the 1970s and 1980s that will resonate immediately with students of the PLA, see John L. Romjue, *From Active Defense to AirLand Battle: The Development of Army Doctrine, 1973-1982*, Fort Monroe, VA: Historical Office, US Army Training and Doctrine Command, June 1984. See also Romjue's follow-on volume, *American Army Doctrine for the Post-Cold War*, Fort Monroe, VA: Military History Office, US Army Training and Doctrine Command, 1997.

[26] Ren; and ibid.

- Call for new logistics and maintenance support procedures[27] and address issues related to information warfare and electronic countermeasures, air defense, and other measures "in light of the enemy's high-tech arms"

- Serve as a guide to training within the major services and among them

- Are geared to "future wars"

- Aim to enhance the ability of an army armed with conventional weapons to defeat an army armed with high-technology weapons

All of these descriptors clearly whet the appetite. They provide a sense of the scale of change the new regulations portend. But the specific content remains unknown.

Needless to say, the "New Generation Operations Regulations" and the multiple *gangyao* that define the PLA's new operational guidelines are not, and will not be, available to foreign students of the PLA anytime soon. Unlike scores of US military doctrinal publications that are available to the public in hard copy or online (to include those on basic operational guidelines), it is a safe bet that the PLA has classified its new doctrinal publications and will keep it that way. So right from the start, students of PLA doctrine are going to have a significant data issue with which to contend in coming to grips with ongoing operational change in the PLA. More will be said about the challenge of data later on. In the meantime, there are some basic points that can be made about the general focus, if not the specific content, of the new operational guidelines.

No Change to National Military Strategic Guidelines. First, we should understand that the "New Generation Operations Regulations" have not changed China's overarching military strategy. The official military strategy of the PRC and PLA remains embedded in what is known as the "National Military Strategic Guidelines for the New Period" (*xin shiqi guojia junshi zhanlüe fangzhen*; 新时期国家军事战略方针), which is the closest Chinese analogue to the US's National Military Strategy. This highest-level national military guidance in China has two main components. The first component is operational, and it remains the "Active Defense" (*jiji fangyu*; 积极防御) as adjusted for prosecuting "Local Wars Under Modern High-tech Conditions." The second of the two components concerns the myriad reform and modernization programs in both software and hardware the PLA is undergoing. It is generically referred to by the PLA as "army building" (*jundui jianshe*; 军队建设) or "new period army building" (*xin shiqi jundui jianshe*; 新时期军队建设).[28]

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[27] See also Huang Benhai and Zhang Dongbo, "Chairman Jiang Signs Order To Promulgate and Implement the 'PLA Joint Logistics Regulations,'" *Xinhua,* 30 October 1999 (FBIS).

[28] Although it highly tempting at this point to go into a detailed explanation of the changing nature of the "Active Defense" strategic guideline, that extended discussion is beyond the scope of this essay.

Focus on Campaigns. Second—and this is the critical point—what the "New Generation Operations Regulations" *do* purport to change for the PLA is top-down guidance for the conduct of campaigns. If strategic-level policy is focused on *when* and under what conditions China will employ force to achieve which strategic ends (political or military), then campaign-level guidance is the essence of *how* the PLA will employ military force. The former question is a political-military issue. The latter is strictly an operational issue.

The focus of the "New Generation Operations Regulations" on the campaign-level of warfare is not inconsequential. As one becomes steeped in the available primary source literature it becomes clearer and clearer that the PLA believes that, in "Local War Under Modern High-tech Conditions," campaigns define the war itself. Indeed, the outcomes of some campaigns, such as those categorized by the PLA as "War Zone Strategic Campaigns" (*zhanqu zhanlüe xing zhanyi*; 战区战略性战役), are so critical as to determine the outcome of the entire war. Wars of the future, in the PLA's view, may be defined by a single campaign. (The Gulf War comes to mind.) And from what little one can divine from the Chinese press and other literature surrounding the new operational guidance, there are changes underway in the most critical and fundamental elements of campaign design such as: command and control (relationships, coordination, and architectures), battle space management, force structures, service relationships, sustainment, operational sequencing, and guidance for the optimum circumstances under which to employ various high-end capabilities.[29]

It's About Joint Operations. The third general comment that can be made with some degree of confidence is that the essence of the "New Generation Operations Regulations" is about defining for the PLA what its own style of joint operations is intended to be, and, by fiat, what they *will* be. The answer to the question "What is the nature of Chinese joint operations?" remains open ended at this point. But at the end of the day, the evidence continues to mount that the PLA's new operational guidance is not merely about the high-tech weapons it may possess, now or in the future, but much more about how the PLA plans to accrue the synergies of joint operations, about watershed changes to the Chinese operational art, and about new methodologies for campaign design. Note that all of the new *gangyao* previously listed have "campaign" (*zhanyi*; 战役) in their title. Note as well that the press articles indicate that new campaign principles and new command and control "mechanisms" are part and parcel of the new guidelines.

Overall, it appears that the PLA has reinvigorated its focus on the operational level of warfare just as the Americans and Soviets did in the late 1970s.

THINKING ABOUT OUR DATA

Students of PLA affairs will not have a chance to study and analyze the actual *gangyao*. But neither are they doomed to remain clueless. It should be possible to sketch

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[29] Most of these issues are written about on a regular basis in the publicly available professional journal of the PLA Academy of Military Science, *Zhongguo junshi kexue* [Chinese military science].

out a relatively sound macroscopic picture of the new operational thinking in the PLA if one is creative in seeking out data and, more importantly, judicious in evaluating it.

This very conference underscores a central fact that should give researchers some hope: these last few years the highest levels of PLA military science institutes have engaged in a publications boom on the topics of military strategy, campaign studies, and combined arms tactics. Many of the publications were directed from above as deliverables for military science research under the 9th Five-Year Plan. Many of the texts were designed to update teaching materials for students at higher-level institutes of professional military education.

The PLA National Defense University's "trilogy" is among the best known at this point among the small circle of PLA specialists in the West who follow these issues. They are: *The Science of Strategy* (*Zhanlüexue*; 《战略学》, May 1999); *The Science of Campaigns* (*Zhanyixue*; 《战役学》, May 2000), and *A Course of Study in Combined Arms Tactics* (*Hetong zhanshuxue jiaocheng*; 《合同战术学教程》, August 2000). All three volumes carry the header, "Common Advanced Teaching Product '95' National Level Key Teaching Material" (*Putong gaodeng jiaoyu "jiu wu" guojia ji zhongdian jiao cai*; 普通高等教育"九五"国家级重点教材). In 1997 an updated 11-volume military encyclopedia was published by the PLA Academy of Military Science, *Chinese Military Encyclopedia* (*Zhongguo junshi baike quanshu*; 《中国军事百科全书》), and in 1998, for the first time ever, the PLA Navy published its own 2-volume encyclopedia (*Zhongguo haijun baike quanshu*; 《中国海军百科全书》). There are many, many other volumes one could cite, to include the myriad of excellent articles that continue to be published in PLA professional military journals such as *Chinese Military Science* (*Zhongguo junshi kexue*; 《中国军事科学》). But along with these data opportunities come a daunting number of data challenges.

First, students should not equate teaching materials for authoritative operational guidance. Chinese military science (*junshi kexue*; 军事科学) makes a distinct delineation between "basic theory" (*jichu lilun*; 基础理论) and "applied theory" (*yingyong lilun*; 应用理论).[30] Many of the texts one can read provide solid grounding in the theoretical aspects of the operational art—the "*xue"* (学). But it is uncertain at this point how much the theoretical informs the actual application of the operational art—the "*fa"* (法). Alternately stated, studying such volumes as *Zhanyixue* provide tremendous and much needed insights into the theoretical framework of operational theory at the campaign level of warfare, but it would be analytically dangerous to assume *prima facie* that its contents reflect the specifics of the various newly published series of *gangyao*.

Second, analysts must pay attention to the publication dates of the data they are consulting. If one is hoping to glean any insights into the new operational thinking in the PLA, then, clearly, materials published since the promulgation of the "New Generation

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[30] See Admiral Shi Yunsheng (PLA Navy Commander), "Haijun junshi kexue" [Navy military science], in *Zhongguo haijun baike quan shu* [Chinese navy encyclopedia], Beijing: Haichao Publishing House, December 1998, pp. 1-16.

Operations Regulations" (1999) are of first order interest compared to those published previously. Especially when it comes to the various volumes of teaching materials that are being produced, those published since 2000, *and especially beyond*, should be of great interest. If General Fu Quanyou is to be taken at face value, and we have no reason not to believe so, then military academies will be using the new *gangyao* as the basis for either rewriting course materials or generating new course materials. And, indeed, there has been a flurry of new teaching materials generated since 1999.

But even with those volumes published since 1999 care must be taken in evaluating the content. For example, the textbook *Zhanyixue* was published in May 2000. More than likely it took at least two years to write, perhaps longer. In the course of putting the new text together the new operations regulations were still being formulated and finalized. Because the textbook and the regulations were being produced in parallel we should be careful in making assumptions about how much even *Zhanyixue* reflects the new regulations. Two examples for consideration. First, the last third of the text on joint operations almost appears to have been added as an afterthought by the authors. Why are joint operations at the end of the volume after sections on service campaigns instead of in front of service campaigns as is the case in other volumes published later on? Was there some catch-up ball being played? Second, while *Zhanyixue* does an excellent job of listing and especially explaining the PLA's ten "Campaign Basic Principles" (*zhanyi jiben yuanze*; 战役基本原则), it does not include, or even mention, the newly articulated campaign principles that have been developed specifically for "Local Wars Under Modern High-tech Conditions." Does this detract from the value of *Zhanyixue*? No, of course not. It does suggest that great care should be taken in how these textbooks are used and we should be careful in formulating our assumptions about what they reflect.

Third, students should pay attention to the forwards, afterwards, bibliographies, publishing venue, and writing committee membership of the texts that are chosen for study. Which books or articles are authoritative? Which represent personal opinions? These are probably the two most critical questions that one must confront when considering the evaluation of the data used in forming analytic judgments about new operational thinking in the PLA. The military publishing boom in China appears to be driven as much by the need for military intellectuals to publish, and the need for publishing houses to generate revenue by public sales, as it is to produce authoritative works of military science as research plan targets. Are the new *gangyao* listed in the book's bibliography (some recent volumes are already listing them) or cited by journal article authors? Does the book's forward tie the purpose of the volume to bringing the "greater PLA" up to speed on new operational theories? Are the institutional affiliations (*danwei*; 单位) of the authors listed in the volume, and does the afterward provide any insights into how the book was compiled and how long it took to produce? Which publishing house was used? These are the questions worthy of appropriate attention.

Fourth, let us pay close attention to the debates about the operational art, but not mistake the debates for the end state of new operational guidance. This point relates to paying attention to dates of publication. The process of producing the new operations *gangyao* took at least four years after a formal committee was established and tasked with the mission of developing a consensus body of guidelines. There is little question that prior to their finalization and promulgation the particulars associated with the substance of the new operations regulations were the topic of intense debate among PLA

professionals (the same was true in the US Army when the original versions of FM 100-5 were being vetted[31]). These debates were likely reflected in numerous articles and monographs in venues not available for public consumption. They were also likely reflected in many that are accessible, to include *Jiefangjun bao* and *Zhongguo junshi kexue*. So it should come as no surprise, *but only after the fact and with hindsight*, that the years 1995 to 1999 were witness to a remarkable flurry of writing from Chinese officers that ran the gamut from the incredibly thoughtful articles that discussed the RMA and information operations to monographs such as *Unrestricted Warfare* that even today beg questions about authoritativeness.[32] Should we ignore the debates? Absolutely not! The debates auger the winds of change. At the same time let us reserve judgment about how they factored into the actual guidelines.

Finally, we should not, and cannot, ignore the articles that have been written, and will continue to be written, about the operational art in China subsequent to the new *gangyao*; especially the critiques, debates, and voices of opposition. No doctrine remains static. Even though it is likely that the new *gangyao* will remain in effect for many years to come adjustments, critiques, and revisions may continue. Operations professionals in the PLA will continue to discuss and debate these issues and their articles deserve careful study.[33]

THINKING ABOUT THE ISSUE OF TERMINOLOGY

The new and increasingly available open source texts and journals addressing the operational art in China will not be helpful if we do not understand what we are reading. This community must challenge itself to come to grips with the terminology and jargon of the PLA operations community and rectify and standardize our translations of key operational terms.

Equally important, we must strive to have a common understanding of the meaning of the key operational terms. For example, take the very commonly used PLA term *zhanyi baozhang* (战役保障), which can be alternately translated as "campaign safeguard" or "campaign guarantee." In the case of this important and basic term, the key is not necessarily choosing between "guarantee" and "safeguard" in our translation, but understanding what every newly-commissioned PLA lieutenant likely knows: that this is

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[31] Again, see the two volumes by Romjue, op. cit. See also Keith A. Dunn and William O. Staudenmeir, eds., *Military Strategy in Transition: Defense and Deterrence in the 1980s*, Carlisle, PA: US Army War College, 1983.

[32] For a fascinating indirect rejoinder to *Unrestricted Warfare* and the genre of operational thinking it represents see Si Fu (斯夫), Shu Jun (树军), "Makesi zhuyi zhanzheng guan de jiben guandian bing meiyou guoshi—dui jige suowei 'Zhanzheng Xin Gainian' de zhiyi" [The basic concepts of Marxism on war will not become obsolete—querying some so-called 'new concepts of warfare'],**"** *Zhongguo junshi kexue* [Chinese military science], No. 3, 2000, pp. 148-152.

[33] For example, see Guo Wujun (郭武军), "Chuang xin zhanyi lilun de yuyan [Create new campaign terminology], *Zhongguo junshi kexue*, No. 3, 2000, pp. 153-160.

a catch-all phrase for the following activities that in the US would generally encompass campaign-level combat support and combat service support functions: intelligence, reconnaissance, communications, air defense, electronic counter-measures, rear area physical security, engineer support, etc. All of which, of course, is quite different from logistics (*houqin*; 后勤). The point to be made is that even if one can translate a PLA term the meaning is not always inherently obvious. Like all militaries around the world, the language of the PLA is a language within a language.[34]

If we do not become conversant with the terminology of the Chinese military then we are destined to remain the builders of a "Tower of Babel of PLA-Speak," talking past each other, misinterpreting what we are reading, missing the significance of certain passages in our books and articles, and not moving to the next levels of analysis. Compared to counterparts who studied the Soviet military in the 1960s, 1970s, and 1980s, we are in a lexicological dark age. I am quite prepared to be corrected on this point, but it seems to me that the US Government has not produced an *authoritative* and publicly available dictionary of Chinese military terms since 1985, which barely coincided with the PLA's last doctrinal shift to single-service combined arms operations. So it is no wonder, then, that we are unsure of where even the most basic PLA terms fit in the doctrinal hierarchy. For example, there are some who have labeled the "Active Defense" (*jiji fangyu*; 积极防御) the PLA's doctrine (admittedly, I have been guilty of that mistake); others have called it a strategy. We now know it is not correct to call it either.

My own article for our 1999 conference, "Commentary on Doctrine," did nothing at the time to clear up even the simple lexicological issue of "what is the Active Defense?" My apologies. Permit me make amends right now by starting our terminological "rectification campaign" immediately. Please go back through this paper and strike out the word "doctrine" every time it is used in connection with the term "PLA." Why? Because we now understand that the PLA does not have a word for "doctrine" as used in the West or by the Soviets/Russians (R. doktrina; доктрина) and the PLA does not call its operational guidance "doctrine." Even when referring to Russian or American "doctrine" the PLA has to talk around that particular word and, hence, speaks about "Russian Military Theory" (*Eguo junshi lilun*; 俄国军事理论) and "American Military Operational Theory" (*Meiguo junshi zuozhan lilun*; 美国军事作战理论). We now understand that the PLA's operational hierarchy of combat consists of three major levels: war (*zhanzheng*; 战争); campaigns (*zhanyi*; 战役); and battles (*zhandou*; 战斗), each of which is informed, respectively, by a distinct level and set of operational guidance—namely strategy (*zhanlüe*; 战略); campaign methods (*zhanyi fangfa*; 战役方法, usually contracted as *zhanfa*) and tactics (*zhanshu*; 战术). We therefore also finally come to understand that "Local Wars Under Modern High-tech Conditions" is not a "doctrine" but a contingency.

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[34] Whereas the language of US military jargon is the language of acronyms, that of the PLA's appears the world of character contractions.

At the end of the day, if we are to become serious students of PLA operational thinking, then we are simply going to have to become conversant with the language of Chinese military professionals, be precise, be consistent, stay steeped in the original texts, and be careful about reading translations the quality control over which may be uncertain.

THINKING ABOUT "THE TWO TEMPTATIONS"

After carefully choosing the data, internalizing the PLA's professional terminology, and analyzing the new operational concepts as best one can, the next step in our research efforts will be to explain these ideas to our readership (most likely, ourselves!).

Those who have become steeped in the Chinese literature understand that writing in such a fashion that accurately communicates the essence of PLA campaign-level concepts and the Chinese approach to the operational art will be challenging. In many cases, the operational concepts being developed by the PLA are unique. Consequently, speaking to the balance between operational continuity and operational change will make for a good approach for explaining the state of play. This will come from one's own long years of studying the PLA itself or some very deep research. In these cases, the challenge for writers will be conveying to their readership how the PLA has changed its approaches and why. This will likely require that our papers take written excursions into the PLA's operational past in order to make important and relevant points about the PLA's present and its operational aspirations for the future.[35]

But not all of the PLA's evolving operational concepts will be uniquely Chinese, although seemingly packaged thusly in its professional literature. After a point, there is a certain degree of universality in the operational challenges faced by military professionals and some degree of similarity in their approaches to overcoming those challenges.

The PLA has not built its new operational concepts by relying *exclusively* upon its own traditions, particular "style," or solely upon its recent training experiences and experiments. By its own statements the PLA has also carefully chosen from among the best (or most suitably transferable) recent foreign military experiences, and Chinese military theorists and operations professionals have incorporated some amount of foreign operational thinking into their own concepts. This being the case, writers will have the opportunity to use comparative examples that resonate with their readers' own backgrounds in doctrine and the operational art to explain the PLA's evolving operational concepts.

There will be two major foreign "schools of doctrine" that will be appealing in making comparative points and that can serve as points of reference against which the Chinese approach to warfare can be juxtaposed. The first is the former Soviet experience. The second is the current US experience. But in looking to former Soviet and current US

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[35] There is precious little in the English language in the way of overviews of the operational legacies of the PLA. The CNA Corporation's recent volume is a modest attempt to provide such a survey. See Michael A. McDevitt, David M. Finkelstein, and Mark A. Ryan, editors, *Chinese Warfighting: The PLA Experience Since 1949*, Armonk, NY: ME Sharpe, March 2003.

doctrine as devices to explain what the PLA is currently doing (*remember: this is for the purposes of comparative exposition to our readers*) we must strive to avoid "The Two Temptations."

- **The First Temptation**: We must avoid the temptation to refract everything the PLA is currently doing in the realm of operational theory through the lens of former Soviet doctrine simply because the taxonomies and constructs share many similarities.

- **The Second Temptation**: We must also avoid the temptation to mirror image evolving PLA operational concepts with recent and current US doctrine simply because the advances in the operational art made by the US this past decade and the world class military technologies the US has fielded has been a principle (but not sole) catalyst for changes in PLA operational thinking.

That is, the PLA is not the Soviet Army with Chinese characteristics, nor a Chinese army with some American operational characteristics. Instead, it is a Chinese army with Chinese characteristics that takes what it can from abroad, makes it their own, and adds it to a unique approach to the operational art.

There is no question about the enduring legacy of the Soviet model on both the development of Chinese "military science" (*junshi kexue*; 军事科学) as a field of military academic study and, for many years, the PLA's approach to "military studies" (*junshi xueshu*; 军事学术). This is clearly a result of many decades of PLA exposure to Soviet military affairs, PLA attendance at Soviet institutes of professional military education, the legacies of Soviet military advisers in China (before and after 1949), and a common modern intellectual heritage—Marxism-Leninism.

Indeed, the taxonomy of the field of Chinese military science and that of Soviet "military science" (*voyennaya nauka*; военная наука) is remarkably similar (although decidedly not identical).[36] Examples of the imprints of the Soviets in Chinese military science surely abound. For instance, the Soviet trifurcation of the levels of warfare and the theories that inform each have clearly had an impact on the Chinese schema. Whereas the PLA talks about "strategy," "campaign methods," and "tactics" informing their respective levels of combat (wars, campaigns, battles), the Soviets spoke of "military strategy" (*voyenna strategiya*; военная стратегия), "operational art" (*operativnoye iskusstvo*; оперативное исскуство) and "tactics" (*taktika*; тактика).

At the level of applied military science, there are also a good number of operational terms and operational concepts that are very suggestive of how closely

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[36] See David M.Glantz, *The Voroshilov Lectures: Materials From The Soviet General Staff Academy*, Vol. III, *Issues of Operational Art*, Washington, DC: National Defense University Press, 1992. See also *Soviet Army Operations* (IAG-13-U-78), Washington, DC: Department of the Army, US Army Intelligence and Threat Analysis Center, April, 1978.

intertwined Soviet and Chinese military theory had been at one point. For example, in the realm of force structure it is very tempting to see the parallelism between a former Soviet "Front" (*Front*; фронт)—a large, temporary, task-organized force ranging in scale from armies to multiple divisions—to the current PLA force structure concept "Group of Group Armies" (*jituanjun qun*; 集团军群). And it is natural to look for similarities between the former Soviet operational architecture of the "Theater of Military Operations" (TVD, *Teatr Voennykh Deistvii*; театр военных действий) with the evolving PLA concept of the "War Zone" (*zhanqu*; 战区); especially one in which a PLA "War Zone Strategic Campaign" (*zhanqu zhanlüe xing zhanyi*; 战区战略性战役) is being planned or conducted. If the professional point of reference of one's reader is former Soviet doctrine then there may be creative ways to explain PLA operational concepts by way of comparison. But let us be extremely careful in doing so.

Upon very close examination, we will likely find that there are as many significant differences in substance as there are superficial similarities in form between the former Soviet terms and concepts and current PLA terms and concepts. The substantiated argument on this point is clearly beyond the scope of this particular essay. The important point to be made is that while the packaging of the Chinese operational art is very familiar to those conversant with the Soviet experience the substance may not be.

It is probably quite likely that the Soviet operational theories developed in the 1970s and early 1980s had a significant impact on PLA operational theory in the mid-1980s; especially the development of PLA combined arms ground operations and the shift to Group Armies (*jituanjun*; 集团军) that started to unfold in the early 1980s. But it is equally likely that developments in US operational doctrine at the time had an impact as well.

For one thing, the Chinese and Soviets had little to no official military contacts at that time (this was the height of the Sino-Soviet antagonism). Second, this was the beginning of the heyday of US-China military relations, contacts, and exchanges (the result of the Sino-Soviet split and the US-China *rapprochement*). And third, this was also a period of time in which the US Army was going through a period of doctrinal ferment in response to the Soviets—the PLA was following US doctrinal developments as intensely as those by the Soviets.

Today, it is not entirely clear that the Soviet doctrine and operational concepts that were developed in the 1970s and 1980s are having any substantive impact on the *current* operational theories of the PLA. The evidence is very persuasive that today's PLA is taking its operational cues from developments in the US. As mentioned earlier, American operations in the Persian Gulf in the 1990s served as a wakeup call for PLA trainers, force structure specialists, and operations theorists—especially the US's combination of joint doctrine, information-age command and control architectures, and state-of-the-art high-tech weaponry and equipment.[37]

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[37] While this student cannot claim to have conducted a scientific survey by any stretch of the imagination, the bulk of PLA writing on "foreign military theory" seems to be centered on US developments. This is manifest in the articles one can read in PLA professional journals, on PLA websites, in the topics that seem to be chosen for PLA doctoral dissertations, and in the footnotes of those dissertations.

But let us not ignore the second temptation. While it may be useful and appropriate to use US doctrinal terms and operational concepts as comparative devices to explain the evolving state of the operational art in China, let us not leave our readership with the impression that the PLA is "just trying to be like us," or that PLA operational theory is merely "US joint doctrine with Chinese characteristics."

We are very early on in our study of this latest iteration of the operational art in China, and it is still too early to make conclusive judgments about the nature of the new operational guidance. Indeed, there is always the possibility that the available data (or rather the unavailability of data) will take us just so far. But it seems to me, from what so far has been a cursory survey of the available literature, that there *is* something very indigenous and very (for lack of a better word) "Chinese" about some aspects of the PLA approach to operations. For example, I see two militaries—the US Armed Forces and the PLA—both speaking to a common critical operational question: What does it take to dominate an enemy at the operational level of conflict? But I also see different approaches to the solution. In the West the Clausewitzian concept of "Center of Gravity" (*schwerpunkt*) remains the focus of the solution, even though the definition of what constitutes the center of gravity continues to change and evolve. In China, the discussion revolves about the correct selection of "Vital Targets" (*yaohai mubiao*; 要害目标) and the concepts inherent with the guideline "Key Point Application of Force" (*zhongdian yong bing*; 重点用兵). The two approaches do not easily transfer or inform the other.

So the overarching points of this entire section are thus. First, conveying what has been learned will be difficult. Second, an excellent way to convey the operational changes that are underway is by comparing the PLA to its own recent past. Third, comparisons between the Chinese operational art and those of other militaries can be useful up to a point if used judiciously and the target audience has a base of reference that makes the comparison meaningful. But fourth, we should make no assumptions at this point about whether there is a dominant foreign model that can explain PLA operational thinking. Instead, Chinese operational thinking will have to be conquered on its own terms. At the end of the day the best approach to understanding and conveying operational change in the PLA is by studying the PLA, not by using a Soviet or US doctrinal model as the starting point.

This last assertion takes us full circle back to some of the earlier points in this paper. The key to taking on the PLA's evolving operational art will hinge upon the proper vetting of our data, reading the data in the original Chinese whenever possible, and rectifying and standardizing our use of PLA operational terminology.

CONCLUDING THOUGHTS

It took an act of Congress to institutionally impose "jointness" on the US Armed Forces—the Goldwater-Nichols Department of Defense Reorganization Act of 1986. But the precedents of US joint operations predate it by a decade, going back to the consultations held between the US Army Training and Doctrine Command and the US Air Force's Tactical Air Command in 1976. To a degree, then, one could argue that the joint doctrine that was successfully applied by the US in "Operation Desert Storm" took fifteen years to develop and practice. And needless to say, adjustments continue to this day.

It took a series of new operations regulations signed under the authority of the Chairman of the Central Military Commission to launch the PLA onto its path to a joint future—the "New Generation Operations Regulations" of 1999. Although students have yet to see the actual guidelines, the general essence of what the PLA aspires to achieve is beginning to emerge. But the PLA is today at the very beginning of its joint operational future. Many of the concepts one can read about in the textbooks and journal articles are more likely reflective of aspirations as opposed to current capabilities, but no one can know for sure. We simply do not know at this point in time where the PLA sits on the spectrum of actual operational change where it matters; on the ground, in the air, and on the seas—not just in the textbooks and theoretical journals. The PLA may be further along than any of us can imagine. But it is clear that the process of operational change will be long, hard, and subject to many adjustments.

Can it be said that the PLA is experiencing a "revolution in doctrinal affairs" as is suggested by the title of this paper and volume? Frankly, it is difficult to say. The answer certainly depends on how one defines the term "revolution," which is a semantic debate that the reader will be spared. What can be suggested at this point is that an attempt to impose a profound change in operational culture should be accompanied by significant institutional reforms. It *is* very clear that the PLA recognizes the need to enact the institutional reforms that will enable and support operational change. The scores of new regulations, directives, guidelines, and administrative and systemic changes that are being instituted are testimony to this verity. So if nothing else, the new operational concepts will likely have a "revolutionary impact" on the PLA as an institution over the long haul.

As for us, we seem to be on the cusp of a "revolution in studying PLA doctrinal affairs." More and more primary source information from China on the operational level of war (campaigns) is becoming available. More and more of our circle of specialists are reading these materials in Chinese, not in translation. And, with this conference in particular, we are at the beginning of making the systematic study of the operational art of the PLA a regular feature of the larger field of PLA studies in the US and beyond.

Having the honor of offering the first paper at our conference and in this volume, permit me to set the tone for future research in our new sub-field by closing with the "Four Musts:"

- *We must hold high the banner of studying the operational art!*
- *We must arduously struggle to validate data!*
- *We must unswervingly demand terminological precision!*
- *We must avoid the "Two Temptations!"*

2. JOINT OPERATIONS: DEVELOPING A NEW PARADIGM

By Jianxiang Bi[38]

In January 1999, the Central Military Commission (CMC) of the Chinese People's Liberation Army promulgated the principles of joint operations (PJO)—*Zhongguo renmin jiefangjun lianhe zhanyi gangyao* (中国人解放军联合战役纲要), which marked a decisive move toward jointness, providing and institutionalizing new ways of thinking and fighting shared by all services for future operations.[39]

Enacted both as the "essential form of operations" and as the "unified guiding concepts," the PJO reflects the PLA's assessment of the major shifts of the post Cold-War era in the balance of power, the nature of war, and military technologies, which are profound in their implications and stronger and more multifaceted than generally appreciated. China's desire to catch up with regional military powers and for developing dynamic operational capabilities has been longstanding, but it remains controversial both as an ideal and as a reality. To realize this objective, the PLA is vigorously pushing for far broader and deeper military reforms, which will, if pursued consistently, ensure national security, sovereignty, and dignity and meet anticipated challenges of multiple, complex, and diverse combat missions. In Beijing's mind, paradoxically, military advantage for China equals military advantage for the other regional powers, but not vice versa.

These objectives for military reform, claims the PRC, will be impossible to achieve in the immediate future. Therefore, Beijing argued that it would be a mistake to assume that China seeks expansionism.[40] If valid, this claim calls into question the conceptual foundations that dominate the study of Chinese security. Yet, China's rise as a military power, along with Beijing's scant attention to the underlying interests of the regional powers, has in every case shown that whatever Beijing says, enhanced military capabilities, especially substantially improved strike and power projection, will eventually disrupt the regional security order. It would be a mistake to dismiss as

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[39] "Jiang zhuxi qianshu Zhongguo renmin jiefangjun lianhe zhanyi gangyao" [President Jiang has signed the principles of joint campaigns of the Chinese People's Liberation Army], *Jiefangjun bao,* 8 January 1999, p. 1.

[40] Information Office of the State Council, *National Defense White Paper*, Beijing: Information Office, 2000.

misperceptions.[41] However, China analysts' generic and systematic knowledge about the PJO as well as the PLA's most recent initiatives and mechanisms for implementing the PJO is, at best, limited, thereby falling far short of providing the factual basis for these broader geopolitical conclusions.

Indeed, until recently scholars did not even have many theoretical studies of contemporary operations. This is particularly striking, since the widely accepted approaches to the study of operations mainly derive from pre-second World War European powers, which provide a rational basis for a full account of developments in infantry-centered operations. Operational choices, defensive or offensive, according to structural and functional arguments, suggest, "external environments of the states determine civilian intervention in favor of defensive doctrine," whereas soldiers often support "offensive doctrine for greater resources, fame, prestige, and autonomy."[42] The competing cultural school, on the other hand, claims that changes in military doctrine are "best understood from a cultural perspective," since culture has relatively causal autonomy, rather than merely mirroring functional needs and structural imperatives.[43] In contrast, the Chinese case seems to tell a different story. China has historically demonstrated "a relatively consistent realpolitik strategic culture that persists across different structural contexts."[44] What is worth emphasizing, moreover is, that the PLA, unlike French, British and German counterparts, is given *carte blanche* to adopt, develop and institutionalize new ideas, which serve as the "motivating force" or the "spirit of military modernization" for coping with emerging security and threat issues. This is true despite the fact that its force structure and technology are incompatible with these ideas. In response to uncertainties about regional security, the PLA become has become heavily theory-driven. To discover observable and unobservable connections, it perceives that its ideational and material power has causal weight in explanations of the underlying operational structures and mechanisms at work and of its intention and behavior.

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[41] Edward Timperlake and William Triplett, *Red Dragon Rising: China's Military Threat to America,* New York: Regency Publishing Inc., 1999; Richard Bernstein and Ross Munro, *The Coming Conflict with China,* New York: Alfred A. Knopf, 1997; and Denny Roy, "Hegemon on the Horizon? China's Threat to East Asian Security," *International Security* 19, No. 3, 1994, pp. 149-168.

[42] In contrast to these studies, the US Department of Defense defines military doctrine as "the fundamental principles by which military forces guide their actions in support of national objectives." For the details, see FM 100-5, June 1993.

[43] Barry Posen, *The Sources of Military Doctrine: France, Britain, and Germany between the World Wars*, Ithaca: Cornell University Press, 1984; Jack Snyder, *The Ideology of the Offensive: Military Decision Making and the Disasters of 1914*, Ithaca: Cornell University Press, 1984; Peter Paret, ed. *Makers of Modern Strategy from Machiavelli to the Nuclear Age*, Princeton: Princeton University Press, 1986; and Elizabeth Kier, "Culture and French Military Doctrine before World War II," in Peter J. Katzenstein, ed., *The Culture of National Security: Norms and Identity in World Politics*, New York: Columbia University Press, 1996, pp. 186-215.

[44] Alastair Iain Johnston, "Cultural Realism and Strategy in Maoist China," in Katzenstein, ed., *The Culture of National Security,* p. 220.

However relevant, the studies of European operations are increasingly incapable of explaining newly discovered facts or anomalies involving PLA operations.

For example, given the fact that Chinese joint operations exist side by side with single service operations some have questioned whether science matters for PLA joint operations. In particular, there is some controversy over the issue of whether the PLA can develop the "science of joint operations" (*lianhe zhanyixue*; 联合战役学), as compared to the "science of strategy" (*zhanlüexue*; 战略学) and the "science of tactics" (*zhanshuxue*; 战术学), for justifying its future operations against a powerful neighbor or a distant military power, if war is inevitable. The most critical question is whether the science that the PLA attaches to joint operations helps explain and shape emerging operational issues. Similarly, the trouble with China watchers is that their superb political and strategic calculations are devoid of any thought to the PJO and the "science of joint operations" or say little about them, in spite of their great contribution to the literature on PLA culture, strategy, training, technologies, relations with the Party and the state, and their potential implications for domestic politics and regional security.[45]

This paper sheds some light on the PLA's PJO and its concepts for joint operations other than war. It investigates its connections to and its impact on fighting behavior, by raising the following questions: What is the Chinese paradigm for joint operations? How does the PLA evaluate and measure operational achievements by drawing on Western military scholarship and recent wars? Can the recognized and institutionalized achievements of others provide the PLA with practical examples of how to fight future joint operations around or outside China's borders to defend its national interests? More significantly, to what extent is the PLA committed to joint operations and in what way, if any, is the commitment maintained? To answer these questions, this paper examines heated debates on joint operations through the lens of Chinese active defense strategy. First, it begins with the PLA's zigzagging search for ideas or scientific knowledge of joint operations, which has been a central theme of the PLA's military modernization programs. Second, it maps out self-consciously pursued and committed institutional reforms for implementing the theory of "victory." Third, it explains new ways of fighting, with the primary inspiration determining operational choices, priorities, and agendas.

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[45] James Mulvenon and Andrew Yang, eds., *Seeking Truth from Facts: A Retrospective on Chinese Military*, Santa Monica, CA: RAND, CF-160-CAPP, 2001; David Shlapak, et.al. *Dire Strait? Military Aspects of China-Taiwan Confrontation and Option for US Policy,* Santa Monica, CA: RAND, MR-1217, 2000; Michael O'Hanlon, "Why China Cannot Conquer Taiwan," *International Security*, vol. 25, No. 2, 2000, pp. 51-86; Mark Burles and Abram Shulsky, *Patterns in China's Use of Force: Evidence from History and Doctrinal Writings*, Santa Monica: RAND, MR-1160, 2000; pp. 51-86; James Lilly and David Shambaugh, eds., *China's Military Faces the Future,* New York: M.E. Sharpe, 1999; Michael Pillsbury, *Chinese View of Future Warfare,* Washington D.C.: National Defense University, 1997; David Shambaugh, ed., "China's Military in Transition," *The China Quarterly*, no. 146, 1996; Alastair Iain Johnston, *Cultural Realism: Strategic Culture and Grand Strategy in Chinese History,* Princeton: Princeton University Press, 1995; Ellis Joffe, *The Chinese Army after Mao,* Cambridge: Harvard University Press, 1985; and Paul H.B. Godwin, *Doctrine, Strategy, and Ethic: The Modernization of the People's Liberation Army,* Maxwell Air Force Base: Air University, 1977.

DEFINING JOINT OPERATIONS

With the promulgation of the PJO, conducting joint operations, which were always desired but encountered long delays, is no longer unthinkable for the PLA. This "universally recognized" approach to operations, creating an unprecedented strategic partnership among the services and optimizing their strategic agendas and potential, has systematically broken the logjam of frozen mindsets–"infantry-centered," "linear," and "combined" operations–more quickly and more effectively than economic and political reforms without weakening essential Chinese security needs. The critical shift in operational concepts and use of those ideas over time will have a lasting influence on the PLA and East Asian security. These ideational changes are a reflection of the PLA's positive response to military modernization.

To decode PLA joint operations, this paper employs the term "paradigm" defined by Thomas Kuhn as a set of "ideas, beliefs, and commitments" that the "scientific community" acknowledges over time, to provide a methodological basis for an in-depth analysis of and further research on Chinese operations. This methodological rule enables soldiers to achieve intellectual and scientific advances, displacing one operational paradigm that has become unable to account for emerging facts with a new paradigm that explains the facts in a more satisfactory fashion. To Kuhn, however, the comparative evaluation of competing theories is a formally intractable problem, since any change in the theoretical structure will inevitably produce a change in the meaning of the term. Moreover, there is no common measure for the merits of competing theories and no incontrovertible basis on which to make a rational choice between them, because different people may have different interpretations.[46] Thus, the paradigm does not give soldiers any rules for solving specific combat problems they will face on the battlefield. All it can do is provide an "example of good practice" for future action. It is the soldiers themselves who will determine how the "example" is to be used and what "particular pieces of the example" are to be emphasized. A crucial test of its validity and usefulness is the extent to which the predictions derived from the "example" turn out to be more accurate than those from previous paradigms. This "plastic" nature of the paradigm in fact meets the PLA's psychological, political, and operational needs to build a soft or flexible paradigm for shaping future joint operations.

Concepts

Joint operations is a weather-vane for Chinese military modernization, introducing a new era that renders traditional land operations and military techniques obsolete or unsuitable. However, competing and often conflicting agendas and interests among the services continue to frustrate the PLA in implementing joint operations. As the leading architects of the PJO, scholars and researchers of the Academy of Military Science (AMS) (who are trained to write combat regulations and training manuals and to do research on security issues and force-building) define joint operations as "operations

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[46] Thomas Kuhn, *The Structure of Scientific Revolution,* Chicago: University of Chicago Press, 1970, p.10 and p. 94.

under unified command and executed by two or more services at the level of the corps."[47] This definition, based on foreign military achievements and operational trends, is simple, but it tends to avoid debilitating debates about "definitions," as "other people" in the PLA seek to validate their own interpretations in defense of service interests and priorities. Just like their AMS colleagues, scholars and researchers of the National Defense University (NDU) promote a similar definition, but in a slightly different wording that highlights their teaching mandate. Largely drawing on the PJO and their own scholarship, they define joint operations as "operations undertaken by the corps from two or more services under unified command."[48] Although they define and interpret joint operations narrowly, the definitions show three major characteristics: unified command, two or more services at the level of the corps (group armies, navy bases, air force armies, and second artillery bases) and equal partnership among the services.

These definitions of joint operations have in fact laid a political foundation for breaking through various service or branch conflicts and deadlocks within the PLA and have served as a road map for building a unified, powerful command to achieve the military, political, and diplomatic objectives of the state on the battlefield. An equal partnership for fighting fully integrated operations reinforces an institutional choice of jointness, presenting a new, accepted way of solving the most compelling combat problem that "determines operational size, intensity, and victory."[49] This structural problem may be settled in many ways, but joint operations perhaps offer a unique set of methods and solutions that are formulated and associated with the most recognized military achievements. In the PLA today, this simple definition of joint operations remains widely cited and authoritative.

Despite the complex interplay of often contradictory ideational, institutional, and technological dynamics, the initial introduction of joint operations is linked to the stewardship of the PLA's high command. When China again made its attempts to modernize its armed forces, Deng Xiaoping pushed ahead at the 1977 CMC annual meeting with ideas to study "joint branches and services combat" (*lianhe junbing zhong zuozhan*; 联合军兵中作战), with explicit emphasis on the interdependence of military, political, and societal considerations.[50] Though the PLA, characterized by Deng as "bloated, lax, conceited, extravagant, and inert," was at this stage unable to launch any meaningful initiatives of joint operations, his ideas affected and were in turn affected by

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[47] Gao Yubiao, ed., *Lianhe zhanyi xue jiaocheng* [Textbook of the science of joint campaigns], Beijing: Junshi kexue chubanshe, 2001, p. 26.

[48] Wang Houqing and Zhang Xingye, eds., *Zhanyixue* [On military campaigns],Beijing: Goufang daxue chubanshe, 2000, p. 385.

[49] Gao, ed., *Lianhe zhanyi xue jiaocheng,* pp. 26-27 and pp. 70-71.

[50] Deng Xiaoping, *Deng Xiaoping lun guofang he jundui jianshe* [Deng Xiaoping on national defense and armed forces-building], Beijing: Junshi kexue chubanshe, 1992, pp. 19-25.

operational choices. That is, the PLA must thereafter be prepared to use joint forces in case of war to repel a foreign invasion.

Institutional arrangements are critical to foster ideas and, consequently, intensive studies of joint operations. With potential threats and missions in mind, the PLA organized a variety of workshops, seminars, and special training programs for senior officers, perhaps best evidenced and symbolized by efforts to incorporate the ideas of joint operations into the terms of operational debates and to institutionalize them, though far less so at the beginning of the 1990s than by the end of the decade. At the 1993 seminar of operations held in Guangzhou, Zhang Zhen, Vice Chairman of the CMC, stressed the importance of joint operations, responding to lessons learned from both the protracted Sino-Vietnamese border conflicts and the short Gulf War against Iraq. "In future war," he stated, "our armed forces will face unprecedented joint services and branches operations. We must have a sense of integrated operations and coordinated command in a great effort to make army, navy, air force, second artillery, reservists, and militias fully integrated." Again, in his 1994 address at the NDU, Liu Huaqing, Vice Chairman of the CMC, asked all senior commanders to "study and do research on joint operations for improving their command skills and capabilities."[51] These authoritative quotes clearly show that the PLA high command took joint operations seriously, thereby legitimizing the broadening of the usual focus of research on operations. Political and institutional concern therefore put tremendous pressure on the PLA to develop theories of joint operations, which became the symbol of "desire" and "modernization." The 1996 and 1997 conferences on operations culminated in a PLA-wide consensus that favored a comprehensive definition of joint operations--"integrated operations fought by two or more services at the level of the corps under the unified plan and command in order to achieve strategic or operational objectives by utilizing different combat methods and operational means within coordinated (land, sea, and air) space."[52] This definition was expansive in scope, linking the operational imperatives, which treasured and nurtured operational ideas and determined combat behavior, to strategic objectives, highlighting the strategic decisiveness of contemporary operations. Perhaps there was reason to believe that the PLA was in the process of trying to find a definition as comprehensive as possible in order to break the traditional mindsets that focused on more narrowly defined traditional PLA operations, like "mobile, position, and guerrilla operations," "core positions-centered operations," and "integrated operations, focused strikes," largely practiced within the paradigm of combined operations. Consider, for example, China's vast territory and potential threats. The identified operations, along with various combat environments, strengthened and reflected Beijing's belief that it was impossible for the PLA to have one unified theory, method, or textbook for guiding cross-services training

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[51] Yu Shoushen, eds., *Lun lianhe zhanyi* [On joint campaigns], Beijing: Guofang daxue chubanshe, 1997, p. 2.

[52] Ibid., p. 8; and Cui Changqi, ed. "Dui lianhe zhanyi jige jiben lilun wenti de tantao" [Explorations of several theoretical questions related to joint campaigns], in Guofang daxue kejianbu, ed., *Lianhe zhanyi yu junbingzhong zuozhan* [Joint campaigns and army/service branch operations], pp. 13-16.

and combat missions. Thus, the high command encouraged the services to develop their own combat theories, methods, and textbooks according to their own operational considerations, strength, and targets.[53] The comprehensive definition, as opposed to the simple one, was clearly problematic for the PLA, since promoting a holistic concept would significantly extend the operational mandate and responsibility of the services, with fears that local commanders and commissars would be unable to manage extremely sensitive strategic issues and, more fundamentally, that operational decentralization might contribute to challenging the highly centralized political control system.

The shared definition, therefore, represented a turning point for the PLA in attempting to move beyond the heated debates and to give more attention to training and combat missions.[54] Against the background of definite inferiority in military technology and in the consideration of the continental posture of Chinese forces, the high command was concerned with operational scenarios in which the PLA would likely face a powerful and sophisticated opponent or "nuclear, chemical, and biological threats" in defense of national reunification, territorial integrity, and maritime interests. To meet new operational demands, PLA assertiveness and self-confidence, coupled with its "pockets of excellence" and China's "successful" economic reforms, provided a motivating rationale for integrating and optimizing combat ideas, styles, and methods, regardless of service interest and operating environments.

To the PLA, a paradigm, which it believed has achieved scientific maturity to solve combat puzzles and issues, is always dominant, otherwise it is not a paradigm. The paradigm of joint operations will shape operational concepts, help build political coalitions or support, and, ultimately, enhances the PLA's military status in East Asia. As the tide of the information age rolls on, Beijing insists that joint operations now become the "highest form of political struggle," striking limited civilian and military targets within unlimited space. As the traditional boundaries of tactics, operations, and strategy gradually disappear, the goals of war and operations converge in these "limits." This significant transition leads to dynamic interaction: "strategy constrains operational and even tactical actions, and is affected by operations and tactics."[55] The new paradigm of joint operations enlightens the PLA in forging a strategic partnership to promote new ways of fighting.

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[53] Hu Chengfa, "Zai gaojishu tiaojian xia jubu zhanzheng zhanyi lilun yantiaohui jieshu shi de jianghua" [Closing remarks at the conference on operational theories of limited war under the high-tech conditions], in Guofang daxue keyanbu, ed., *Zhanyi lilun yanjiu* [Campaign theory research], p. 15.

[54] Xiao Lin, "Jiang Zemin zhuxi qianshu minling fabu shixing zhongguo renmin jiefangjun junshi xunlian tiaoli" [President Jiang Zemin ratified the military training regulations of the Chinese People's Liberation Army], *People's Daily,* 12 September 2002, p. 1.

[55] Peng Guangqian and Yao Youth, eds., *Zhanlüexue* [The science of military strategy], Beijing: Junshi kexue chubanshe, 2001, pp. 444-447; Gao, ed. *Lianhe zhanyi xue jiaocheng,* pp. 47-49; and Yu, ed., *Lun lianhe zhanyi,* pp. 31-33.

Basic and Applied Theories

As "science" becomes a national asset of modernization and creates a mood of sanguine expectations, the PLA's attitudes toward it also echo such mentality. Not surprisingly, Chinese soldiers are expected to treat operational activities largely as natural events lending themselves to the same explanatory logic as found in hard science. Though their verbal censoriousness to this scientific venture is never matched by more than a symbolic gesture, they pretend to share this most exciting adventure of modernization as justification for their research by means of systematic observation and experiment. As a primary objective, their scientific explanation and prediction are to explore "observable regularities" and "unobservable entities" that govern war, operations and combat. Contrary to Kuhn's notion of scientific change, however, the PLA's unique approach to paradigm building clearly rests on and favors the notion of assimilating preceding and new achievements. Science is not "revolutionary," but "cumulative."[56] These "inter-paradigmatic scientific progress and growth" are believed to help soldiers develop the paradigm of joint operations, and also understand the importance of human factors that pure science totally ignores. As a result, the PLA's concept of science looks, at best, unscientific.

The science of joint operations (*zhanyixue*; 战役学), according to the PLA, studies enduring laws and regularities and illustrates causal relationships between theory and practice for predicting future joint operations. Heated debates on science have prompted a consensus about combat laws and regularities, with special attention to high-intensity but fully integrated operations, conventional deterrence, and offense, in order to win joint operations. The Chinese science of joint operations includes two essential components: basic theory (*jichu lilun*; 基础理论) and applied theory (*yingyong lilun*; 应用理论) or operational art (*zhanyi fa*; 战役法). Basic theory, in the PLA's parlance, defines operational concepts and research methods devoid of ambiguity in their relations to other sciences. A systematic study of these issues aims to fully explain operational nature, development, and effects of material and psychological factors on joint operations, to predict operational trends, and serve as a guide future military action. Applied theory or operational art, on the other hand, is the method of organizing and executing joint operations, including operational thought, principles, command and control (C^2), space and time, offense and defense, political work, and logistics support.[57] As the core of joint operations, it unifies ways of fighting, promoting integrated operations and rebuilding the PLA along the line of jointness.

Chinese regulations and laws originate from "military tradition" and "operational experience" that provide intellectual justifications for the refinement of basic theory and operational art. In other words, the explanatory power of such empirical relationships, as a whole, does not derive from "purely logical considerations." Meanwhile, the science of

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[56] Zheng Wenhan, eds., *Junshi kexue gailun* [Introduction to military science], Beijing: Junshi kexue chubanshe, 1994, pp. 7-8.

[57] Ibid., p. 2 and p. 16.

joint operations is subject to change. But reconciling changes in force structures and weaponry with new basic theory and new operational art may take time. Again, uncertainties over PLA politics, theory and practice, potential threats, and budgetary issues would likely weaken generalizations about joint operations and developments of the overall combat effectiveness.

Basic theory and operational art can also be affected in different ways by political and cultural considerations and by organizational and technological opportunities and constraints. They may appear inconsistent or incongruent, but indeed express the reigning political and military consensus, which has construed an inviolable link between strategic objectives and operational means to achieve them. To the PLA, regulations and laws must be testable and falsifiable so that commanders can flexibly apply them to win joint operations. The science of joint operations, in the end, becomes soft as a result of human adaptive behavior. This "good science" shows connections between regulations and creativity.

THINKING JOINT OPERATIONS STRATEGICALLY

High-tech limited war, in the view of the PLA, has fundamentally reoriented relationships between strategy and joint operations. In many respects, joint operations are strategically oriented, with the objectives being to devastate the political, economic, and military infrastructures of an opponent state, but not replacing the regime. Lurking behind the linkages of strategy and joint operations is a serious challenge; namely how to shift operational priorities from countering limited attacks or threats through a credible deterrence that would neutralize them before they could reach Chinese borders to preparing for preemptive operations. What is needed to overcome this dilemma is a novel process, a means of making objective vulnerability assessments.

Careful investigation of possible operational scenarios has convinced the PLA that, however overwhelmingly powerful, the U.S. military has some weaknesses. The weakest link of a possible attack on China is the "phase of cross-Pacific power projection," when war looms on the horizon. This "window of vulnerability," in conjunction with limited access to military bases and support provided by host states, questions American defensive formations in the West Pacific and East Asia. A distant battlefield might make it extremely difficult for the U.S. to protect indefensible C^2 systems, so that the collapse, if not the total destruction of the systems, through low-cost hit and run strikes, would disrupt power projection and eventually delay enemy operations. By the same chain of reasoning, the most effective counter-strategy for the PLA is to strike the enemy's "soft center of gravity," because the superior opponent is psychologically unable to bear the "burden of heavy casualties," especially at the opening phase of war. Drawing on expanded data and case studies, such as Vietnam and Somalia, the PLA believes that heavy casualties would erode U.S. domestic support and military cohesion over time.[58] Had the U.S. seen such operations against China as a potential disaster, this powerful opponent would be unwilling to take risk and make sacrifices. Perhaps it is true that the

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[58] Gao, eds. *Lianhe zhanyi xue jiaocheng*, p. 79.

PLA was remarkably insensitive to these "soft" but critical targets, which were out of its reach. Today, increased military modernization efforts, as well as the resulting capacity to absorb technology, give the PLA greater confidence in its ability to manage these issues strategically. The paradigm of combined operations that lost its purpose has finally been set aside.[59]

To meet tomorrow's challenges, the PLA has made concerted efforts to unearth explicable and heretofore inexplicable phenomena of limited war for building a "value-free" paradigm of joint operations that will stand the test of time, such as emerging ideological campaigns, threats, force structures, and weapons systems, without amending core substance or concepts. The grand operational vision and the subsequent development of a full-blown paradigm along these lines encourages the PLA to exploit the human potential of hope more than at any period in its history. Though there are serious discrepancies between the perceived and the actual environment, joint operations become self-validation: they envision a world in which they are true at least for the next two decades. Shifting away from traditional service-specific perspectives, this new paradigm of joint operations will respond to anomalies of the 21st century.

Whatever the reason for the enactment of joint operations, the PLA's ideas have not escaped foreign influence—notably from Russia and the United States. The Russian revolution in military technology and the U.S. system of systems have inspired Chinese soldiers to debate future operations, to cast aside their paradigm of combined operations, and to replace it with joint operations. The term joint operations becomes the latest in a long line of foreign ideas, adopted by the PLA, such as combined operations, deep operations, AirLand Battle, command of the sea and air, and asymmetric strikes. However, despite its clear foreign origins, PLA operational concepts develop independently of and are qualitatively different from the Russian and American ways of thinking. The essential point of studying the Russian and US joint operations by Chinese soldiers is to explain and predict the enduring laws and regularities relevant to, and compatible with, China's strategic environments. An in-depth but comparative analysis of past and current operations has charted future deployment options and presented a model for future joint operations. In other words, the paradigm of joint operations has introduced a rational choice for a PLA that aspires to true regional power capabilities.

Jointness

Perhaps the most significant achievement in implementing the PJO is the PLA's creation of reinforcing "temporary" organizational and normative command structures. The new command design addresses the seamless integration of often deliberately

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[59] For changes in PLA conventional and nuclear strategy and operational art, see Paul H.B. Godwin, "The PLA Faces the Twenty-First Century: Reflections on Technology, Doctrine, Strategy, and Operations," in *China's Military Faces the Future*, eds. Lilley and Shambaugh, pp. 40-42; Alastair Iain Johnston, "Prospects for Chinese Nuclear Force Modernization: Limited Deterrence versus Multilateral Arms Control," *The China Quarterly,* No. 146, 1996, pp. 552-553; and John Wilson Lewis and Xue Litai, *China's Strategic Seapower: the Politics of Force Modernization in the Nuclear Age*, Stanford: Stanford University Press, 1994.

overlapping and competing war zone-level C^2 institutions, such as army-centered war zone headquarters, air force and navy commands, CMC-controlled second artillery units, and provincially-based, autonomous armed police units jointly managed by local governments and Beijing headquarters.[60] The PLA's desire for jointness reflects an awareness of its Achilles' heel: its C^2 perceptions, procedures, and institutions. The PLA now seeks to build "an efficient but flexible command system" for executing joint operations. China's restructuring efforts and initiatives, compared to those of the West, focus on political, economic, and military considerations of the operational leadership, not just simple adjustments to the future battlefield. This leadership remains decisive as the "forgotten logistics, technological, and social dimensions of military success," increasingly play prominent roles in joint operations.[61]

Apart from other uncertainties about waging joint operations, the most critical challenge for the PLA is the extent to which it can establish and, then, fine-tune its war zone unified command by integrating all the services, vertically and horizontally, without neutralizing their combat strength. From this proposed equal partnership for command institution building arises the idea of "centralized command with decentralized execution," in which, the war zone command makes key political and operational decisions. Under such leadership, different battles will be managed by different service commands, demonstrating each service's expertise, or different service commands will be utilized to fight different battles so as to produce more deceptive and more decisive effects. This idea becomes a starting point for the "pre-paradigmatic stage" of joint operations--enhancing partial command reforms while avoiding fundamental changes in the current division of power at the war zone level.

Past as Prologue

The real nerve center of PLA joint operations is the ground force centered war zone command, which has historically been insensitive to both political changes and emerging missions. More precisely, the high profile transition of operational priorities from "luring the enemy deep" to "fighting forward" has not thoroughly changed the mindsets of combined operations, which still favors the use of large numbers of heavy artillery pieces and tanks with extended ranges for rapid outflanking, penetration, or strikes as a means to achieve quick victory on its own soil. To fight in such army-led operations, the navy and the air force in the past served merely as army adjuncts to secure army flanks, and their operational arts mirrored the army missions. For example, the navy deployed more troops on land or islands than on water in support of anti-landing operations, while the air force provided limited reconnaissance and limited close air

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[60] Yang Shihua, *Meijun zhanyi fa yanjiu* [A study of American military doctrine], Beijing: Junshi kexue chubanshe, 2001; and Li Zhiyun, eds., *Meijun lianhe zuozhan lilun yanjiu* [A study of the theory of US joint operations], Beijing: Guofang daxue chubanshe, 1995.

[61] Michael Howard, "The Forgotten Dimensions of Strategy," in *The Causes of Wars and Other Papers,* Cambridge: Harvard University Press, 1983, pp. 101-105.

support or short-range interdiction.[62] Their heavy firepower support functions enabled the army to develop a devastating form of land defense formations for waging operations of annihilation. Put differently, the agreed deployment and targeting tasks for the navy and the air force was to secure land defense, with their distinct commands standing as symbols of institutional independence.

This army leadership-centered C^2 architecture perhaps echoed the Chinese ideas of and approaches to the balance of power--"feuding hierarchies (*tiaotiao*) and territorial units (*kuaikuai*)" aimed at creating a centralized but interdependent command system.[63] To prepare for tomorrow's missions, the introduction of an operationally integrated command system at the war zone level is assumed to maximize combat efficiency, but the resulting nightmare is that the system could also encourage the rise of autonomous power groupings, which might do significant political harm to the command system. While the naval, air, and second artillery commands are hierarchically independent of the army, the PLA continues to study the idea of jointness in an effort to rationalize the war zone command system.

The restructuring dynamics, of course, are not uni-directional. The PLA has a track record of testing new command ideas and of improving C^2 architectures and skills, which, in Mao Zedong's words, is a "permanent revolution." During the 1980s border conflict, for instance, the war zones set up army-dominated "forward command posts" (*qian zhi*) to organize and coordinate combat or support missions conducted by different services, branches, rotating units, and local governments. To achieve a decisive victory at key points, the "forward command posts" often bypassed "group army, division, regiment and battalion command layers" for directly handling company-level and, sometimes, platoon-level assaults. The 1995-1996 military exercises along the Taiwan Strait also saw opening a "joint war zones C^3I system" connecting the Nanjing and Guangzhou war zones and their services. Immediately following these combat missions and war games, incremental command reforms for enhancing integration, with the traditional assignment of war zone services commanders and commissars as deputies of the war zone command and with new mechanisms, such as cross-services rotation and training programs for division and brigade-level officers, achieved levels of jointness that few could imagine.[64] The bond of political control as a functional formula applicable to

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[62] Liu Jingsong, "Dui zhanqu zhujunbingzhong lianhe zuozhan zhihui wenti de tantao" [Explorations of command of joint services/branches operations conducted by war zones], in *Jundui zhihui lilun jiyi* [The collections of military command papers], eds., Jundui zhihui jiaoyanshi, Beijing: Guofang daxue chubanshe, 1992, pp. 1-18.

[63] Jiao Huide, ed. "Guojia xingzheng guanli fashi biange yu jundui guanli jiaoyu moushi chuangxin [The transformation of state administrative methods and the creation of military administrative and educational models]," in *Xinshiqi jundui guanli tedian guilui tantao* [Explorations of military management characteristics and regularities during the new era], eds. Zhongchanmou bu junwubu, Beijing: Junshi kexue chubanshe, 2001, pp. 15-16.

[64] Zhou Tianhong, *Ludi bianjing zuozhan zhanshou yanjiu* [A study of land border combat tactics], Beijing: Junshi kexue chubanshe, 1992, p. 95; Wang Yong, *Zhongxifang zhanyi bijiao yanjiu* [A comparative study of Chinese and western operations], Beijing: Guofang daxue chubanshe, 1999, pp. 93-94; and Li Shunqing,

all the services further reinforces their unity. Though the war zones look more integrated, the core positions are still occupied by army officers. A hard look at structural issues illustrates that jointness is urgently needed to make the army-centered C^2 architecture integrated and congruent with future operations.

With an eye towards operational effectiveness, the war zones and the services are actively developing their distinct ways of thinking, tailored to their expertise and local operational environments. This preference in fact weakens, rather than increases, their adaptability to other services operations within the war zone and to combat environments of other war zones. The poor integration among the services frustrates the army, which is far short of basic knowledge about naval, air, and missile operations. The frustration has produced a never-ending search for more manageable ideas of and approaches to future joint operations.

Fortunately, improved capabilities, in conjunction with the fact that the northern borders are more secure than ever before, provide an opportunity for Beijing to keep attention on possible border conflicts limited. PLA predispositions seem to suggest that the high command is attempting to avoid forcing the state to take on too many security burdens or creating an unfavorable security environment, since its top priority has been set to modernize China economically. Confronted with such new missions, the CMC initially asked the war zones to develop capabilities to execute independent combined operations, absorbing any possible combat impact on Chinese modernization programs.[65] Although foreign threats, real or potential, to national security are insignificant, these threats in nature and in scope still require operational cooperation among war zones and services, such as rotating and concentrating elite units and advanced weapons for fighting swift, decisive operations. However, the PLA quickly realized that the worst-case scenario of any potential conflict would be reunification and separation issues unfolding in Taiwan, inevitably climaxing in an even more grotesque bloodbath involving foreign intervention. The reigning consensus in the PLA now sees jointness as a necessary means to optimize combat effectiveness for deterring the separatists on Taiwan.

The PLA's restructuring of the C^2 system as a whole has been slow and unimpressive. As a result of economic reforms, China has become increasingly decentralized, with the provinces enjoying freedom to push their distinct development agendas and priorities. Despite the constant rotation of provincial leaders to prevent any "local kingdoms," regional economic blocs, however defined, are emerging from the Zhujiang delta, the Changjiang delta and Northwest China, and have won political support from Beijing and provinces. In contrast to the civilian counterparts, the PLA remains an extremely centralized institution, with divided war zones boundaries and services under the firm control of the CMC. With regard to building a war zone-based unified command, the war zones and the services face different, but related problems. To

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"Yanbing changshang de jueshe dakechuan" [Guest commanding officers in war games], *Jiefangjun bao*, 20 November 2001, p. 1.

[65] Zhang Xingyie, eds. *Zhanyi sixiang fazhan shi* [The evolution of operational thought], Beijing: Guofang daxue chubanshe, 1997, pp. 335.

the PLA, the overriding institutional reform issue is to streamline the overlapping command architectures that represent different interests and needs. Such a streamline will be impossible without full support of the CMC and the services. But Beijing at this stage is even more concerned with the extent to which it can maintain the balance between the distribution of power and its potential impact on civil-military relations and service politics. Yet the lack of a meaningful unified command, or the existence of competing C^2 systems, is bound to minimize operational effectiveness.[66]

C^2 Architectures

The PJO and the idea of equal partnership among the services embodies new operational concepts that overturns, in theory, the PLA's C^2 architectures developed during the era of combined operations. Institutionally speaking, the new three-layered command structure for joint operations – war zone, operational direction, and group-army - encourages the services to interact and enhance each other's situational awareness, increasing combat effectiveness, tempo, and synergies. This significant shift toward something approximating jointness is indeed a new tack for the PLA But one need not look far to find other signs that the forces, meant to fight jointly, suffer from conflicting systems and responsibilities. The embedded conflicts over such important issues as under what circumstances one service is leading, when it is playing a supporting role, and the extent to that it can manage the transition of command from bring the leader to being led, remain unsettled. The planned equal partnership has failed to address the real root causes of friction and, to some extent, is counterproductive if the high command is reluctant to enforce institutional reforms.

The trouble with the PLA's C^2 architectures is its distinct integration of operations (combat missions) and management (organizing, training, and equipping the forces). For better or for worse, the high command, war zone, and service commands exercise power and responsibilities through the same chain of command, often giving a top priority to daily management issues. The problems arise from the fact that China's increasingly pluralistic society erodes officers' control over soldiers, so that the PLA is now attempting to regularize C^2 and internal stability through "rule of law," which has received much attention for the last several years. "Rule of law" is an ideal tool to build a powerful war machine, but the laws, without recognized guidelines for the informal operation of power, and paternalistic relations, make officers unwilling invest resources in impersonal arrangements. Driven by growing concerns about strained relations between soldiers and officers, different units have introduced different rules to restore the harmony.[67] The self-made management rules sometimes are contradictory with the laws

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[66] Wang, *Zhongxifang zhanyi bijiao yanjiu*, pp. 93-94.

[67] Wang An, "Kua shiji junshi guanli fanglue" [Strategy for cross-century military management], in *Jundui guanli xin sikao* [Reflections on military management], ed. Zhang Zhiqiang, Beijing: Junshi kexue chubanshe, 1998, pp. 12-27.

and regulations issued by the general departments, the services, and the war zones, and often at the expense of operations.

When coping with straightforward operational issues, on the other hand, the PLA recognizes C^2 skills as "art," not "science."[68] The war zone command is not by any means a hapless organization. Neither, however, is it an organization that is well prepared to defeat a powerful opponent in joint operations. Despite clear disagreement with regard to such issues as restructuring options, operational strength and priorities, and the mechanics of their implementation, pro-restructuring voices are widely heard.[69] At the heart of the issue is the extent to which the PLA can rationalize the relationship between overlapping commands and its system of inseparability of operations and management.

The ideal option for the PLA is, of course, to establish a new joint command that receives strategic instructions from the CMC and the General Staff Department (GSD) and issues orders directly to service combat units both in peace and in war. The clear-cut separation of the dual (operational and administrative) functions at work would solve the C^2 structural issues once and for all. But it seems impossible to achieve in the immediate future, when the PLA's restructuring priority is not to increase command layers and agencies. A second compromise option, resting on the model of the GSD's Operations Department, is to partially reorganize the army-based operations department of the war zones by transferring elite staff of other services to it. As a contingency headquarters, this relatively manageable command arrangement is considered sufficient to increase joint C^2 effectiveness. Yet, it also faces some structural problems. The air force and other service aviation units become a "strategic," not a supporting instrument of joint operations. If true, the war zone command, however professional, is perhaps unable to organize strategic air strikes without cooperation of the service headquarters in Beijing. This handicap raises doubts about the extent to which the war zone can manage relations between its operations department and the services operations departments. The division of power and incompatible C^2 systems, in the end, could undermine cooperation and collaboration across the services. The third option is to set up a "temporary" unified command as the PLA did in the recent war games. Again, different services have different command procedures, terminology, and equipment, which may be incongruent and inconsistent with one another. In spite of growing uncertainties, one thing the services agree upon is that the business as usual approach to structural reforms and the absence of the C^2 systems integration could dangerously degrade the operational effectiveness of the unified command.[70]

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[68] Wang Shenhuai, *Chuantong wenhua yu budui guanli* [Traditional culture and military management], Beijing: Guofang daxue chubanshe, 1996.

[69] Yu, *Lun lianhe zhanyi*, pp. 97-120.

[70] Huang Bin, "Shenhua zhanqiu zhanyi yanjiu de jidian sikao" [Reflections on an in-depth study of war zone operations], in *Zhanyi lilun yanjiu,* eds. Guofang daxue keyanbu, pp. 42-49; Li Xiaojun, "Dui lianhe zhanyi xietong wenti de yanjiu" [A study of coordination in joint operations], in ibid., pp. 65-71.; and Lu Denghua, "Gaojishu tiaojian xia jubu zhanzheng zhanqiu zuozhan zhidao de jige wenti" [Several questions related to combat guidance of the war zone under high-tech limited war], pp. 121-127.

After several years of studies and debates, the options remain open. Yet, institutional concerns have not prevented the PLA from making serious attempts to develop a C^2 architecture for joint operations. There are as yet no firm signs to indicate whether this is a "permanent" or "temporary" command institution, but there are straws in the wind. Technological breakthroughs in long-range, real-time C^2 and imaging/sensoring systems, first tested and used in the border conflict against Vietnam and later war games, and in a new integrated battlefield communication system employing speech signal processing and broadband integrated services digital networks have considerably improved synergies and strengthened service links.[71] The PLA now describes PJO cooperation as heading for what would be a "new" command with clear authority to command all services within the war zone, if joint operations against a foreign invasion are launched. Whatever operational sizes, missions, and objectives, the proposed command consists of a command team supported by small departments.[72] With a mandate from the CMC or the GSD, the war zone commander and political commissar would team up with their regional services commanders and commissars, as well as provincial Party secretaries/governors. The command team is concurrently the forward Party committee that makes important decisions and supervises the execution of operations, signaling a unified Party, government, and military command. This special combination of the civilian and military sectors, according to the PLA, will help the war zones retain a C^2 edge over its technologically advanced opponent.

The greatest problem the PLA faces now is the need to increase the close integration of C^2 architectures for joint operations. To fight seamless operations, the new prescriptions in the PJO almost entirely focus on the building of "intelligence," "decision-making and control," "communications and information warfare," and "firepower coordination" departments, which mirror organizational changes made over the years. The partial transformation of the fragmented and dysfunctional architectures of the past requires the creation of joint services departments. Without them, the war zone command might not organize operations efficiently, so that field units might be unable to prevent a superior opponent from adopting a countering strategy. Taken together, these types of thorough institutional reforms will facilitate removing the C^2 barriers and forming a solid basis for executing joint operations.

Commanding Willpower

With the inheritance of a strong operational tradition, the longstanding principle of the Party leadership continues to shape joint operations. Emerging anomalies within the state and society, however, raise serious doubts almost immediately about the stability of the political leadership, making the PLA less able to react to change and compelling it to

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[71] Zhou, *Ludi bianjing zuozhan zhanshou yanjiu,* pp. 114-115; and Wang, *Zhongxifang zhanyi bijao yanjiu,* p. 94.

[72] Yu, ed., *Lun lianhe zhanyi*, pp. 97-120; Wang and Zhang, eds., *Zhanyixue,* pp. 277-278; and Yang, *Zhanyi lun,* pp. 404-408.

reorient its ideological framework toward a nationalist direction. However, the shift of control priorities would be the ultimate expression of disappointment, undermining of the indoctrination programs which ensure and measure political reliability, morale and cohesion of the forces and which allow the Party to command enough organizational loyalty for enforcing its will. Given the authoritarian nature of the regime, coupled with the hard lessons learned from the former East European states, there is undeniable sensitivity in the PLA to ideological issues. The practice and procedures of control now emphasize national interests and management of technological effects.[73] Yet, the PLA falls victim to the over-management of ideological issues and is deficient in translating military modernization programs or, more precisely, joint operations, into results.

The competing systems of commander and commissar are unfortunate, but complementary. Take ideological pressure that drags the PLA into the sensitive control issues, for example. The most telling complaint of political soldiers is that China's opening up and PLA exchange programs with the West are giving soldiers great opportunities to learn advanced military ideas and technologies. However, awareness of the huge technological gap between the PLA and the regional military powers has devastated moral in the PLA, because this awareness increasingly weakens their confidence in winning a limited war and in safeguarding the political system. The fall of China's central economic planning system and the rise of the market economy – as well as losing the "iron rice bowl"-- has neutralized the PLA's willingness to sacrifice self-interest for national defense.[74] Without innovative management of these emerging issues, some, if not all, units would likely become chaotic in ways that the resulting misjudgments and misperceptions might threaten the effective military arm of the Party. Naturally, the high command is very cautious of those who advocate democracy within its ranks and support building state oriented rather than Party-oriented armed forces. Nonetheless, fighting joint operations needs competent fighters, not political activists. Embarrassed by these "soft" problems, the PLA has tried to regain its firm political control by working on the rational premises that its decisions are the product of self-conscious, calculated, reasonably accurate beliefs and assessments. But it prefers managed and centrist change, with clearly identified targets, detailed steps, and allocated resources to accomplish it.

As a rule, political control of operations is expressed through the Party committee. The exercise of such authority to enforce the decisions often relies on commanding willpower. The central question for the PLA is whether jointness will maximize Party leadership without restricting the creativity of commanders or vice versa.[75] In many

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[73] Fu Quanyou, "Jianchi yifa chongyan zhijun fangzhen, nouli tigao wojun zhengguihua jianshe shuiping" [Insisting on strict management of the army by law, improving the quality of military professionalism], in *Xinshiqi jundui guanli tedian guilui tantao*, eds. Zongcanmou bu junwubu, pp. 1-14.

[74] Wang, "Kua shiji junshi guanli fanglue," in *Jundui guanli xin sikao*, eds., Zhang, pp. 18-20.

[75] Yu Shusheng, ed., *Lun lianhe zhanyi* [On joint operations], Beijing: Guofang daxue chubanshe, 1997, pp. 99-100; and Chen Dan, *Zhongguo renmin jiefangjun minzhu zhidu de lilun yu shijian* [Theory and practice of the PLA's democratic system], Beijing: Junshi kexue chubanshe, 1993, pp. 250-251.

respects, Beijing appears to be concerned about hardware issues —inferiority in technology that provides the raison d'être for military modernization. The Chinese revolution in military affairs (RMA) and the most recent promotion of General Cao Gangchuan to Vice Chairman of the CMC at the 16th Party Congress set an example that the PLA is giving top consideration to exotic technology and operations.[76] The technology and operations that concern the high command cannot substitute for an appreciation of the Party leadership that determines the nature and scope of all military activities.

The reassessment of these technological and operational issues cast doubt on the premises underlying the PLA's convictions about political control. Of course, all the crucial decisions related to operational principles, coordination among the services, and civil-military relations are presented in ways that reflect the Party's absolute leadership. But the dilemma faced by the PLA commands at every level is that the swiftness and decisiveness of joint operations require taking full account of the "internal and external" security environments in the war zone in order to secure military victory. The experience in the Sino-Vietnamese border conflict again presents the contradictory evidence that any attempts to assess such strategic issues on the battlefield are clearly beyond the capability of the war zone or field Party committee. What is available to the Party committee is its own operational plans. When committed to these plans, it likely employs its own operational approaches and procedures to interpret what it is doing and feels strong pressure to win battles. The Party and the state, on the other hand, also strive to understand how an opponent and regional powers see Chinese operations in order to balance costs of fighting and risks of concessions. Fighting joint operations at the political level for Beijing is an act of both punishment and cooperation. Within this context, the war zone or field Party committee is deeply frustrated by the decisions of the high command in ways of managing operations, because it is forced to respond by less than military means to the battlefield in an effort to preserve the policy of the Party and the state.[77]

At the operational level, the Party leadership is problematic as well. Soldiers are psychologically vulnerable during fierce operations and are unable to deal with physical and mental burdens. As anticipated, this fatal weakness, which would be a primary target of the opponent's psychological warfare by way of radio, TV, newspapers, and Internet, compels the PLA to find better ways to reinforce ideological and political control for launching counter psychological warfare.[78] However, the high command acknowledges that cultural and language gaps might not favor such well-designed offensive or defensive missions. Psychological warfare as a means to implement the operational

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[76] *People's Daily*, 16 November 2002, p. 1.

[77] Zhou, *Ludi bianjing zuozhan zhanshou yanjiu,* pp. 94-95.

[78] Chen Keming, eds., *Gao jishu tiaojian xia jubu zhanzheng zuozhan xinli yanjiu* [A study of combat psychology under the conditions of high-tech limited war], Beijing: Guofang daxue chubanshe, 2000, pp. 193-210.

decisions made by the Party becomes the task of persuasion, motivation, and inspiration within the PLA.

The disconnection of psychologically dysfunctional soldiers and operational goals has caused serious problems for the Party leadership in both ensuring political control and strengthening self-confidence of soldiers in their ability to execute missions. The uneven development could further curtail PLA ambitions. Joint operations would create a homeless "political" mission: nowhere are the authority, resources, and accountability brought together in sharp focus, raising questions about the effectiveness of C^2 and especially the relevance of commissar. Command and control through the responsibility system of commander and commissar is, of course, considered an extension of the Party leadership. This system, however, has serious flaws--the bloated political departments are increasingly incapable of commanding willpower, in spite of its operational tradition that gives a top priority to psychological factors in time of war and peace.

There is merit, in any case, in the idea of jointness that is clearly achievable and consistent with future combat missions, but the PLA is institutionally rigid despite its aspirations. Bureaucratic norms and pressure have an almost overwhelming force in the course of any institutional reforms. The army for its own part has been unwilling to explore moving beyond old forms of the leadership, while the navy and the air force show their great enthusiasm for an equal partnership that would probably open the door for further reorganizing the war zone command or for eventually separating daily administration from operations. With respect to the recent developments in jointness, the urgent issue of commanding willpower—the essential definer of PLA operations, at any one time - is not on the top agenda. In other words, the operational C^2 architecture compared to ideological and psychological considerations, has been accorded somewhat greater priority. Perhaps the fatal weakness of jointness, however, is that the PLA has failed to articulate an equal partnership among the services, management and operations, and the responsibility system of commander and commissar or to make them fully compatible. Only when this question is settled can PLA jointness be viable.

PREEMPTION

The most significant shift in Chinese ways of fighting, provided by the PJO, is the clearly strong emphasis on preemptive strikes (*xianji zhidi*; 先机制敌).[79] This operational priority highlights new security policy needs and options. Over the past years, the PLA has been frustrated by the question of how to effectively defend its interests if it absorbs heavy damage in a very short duration high-intensity limited war, especially if events

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[79] For the more detailed discussion of pre-emption, see Guofang daxue keyanbu, eds., *Gaojishu tiaojianxia lianhe zhanyi yu junbingzhong zuozhan* [Joint operations and services/branches combat under high-tech conditions], Beijing: Guofang daxue chubanshe, 1996; *Gaojishu tiaojianxia zhanyi lilun yanjiu* [A study of operational theory under high-tech conditions], Beijing: Guofang daxue chubanshe, 1997; *Gaojishu tiaojianxia zuezhan zhihui yanjiu* [A study of combat command under high-tech conditions], Beijing: Guofang daxue chubanshe, 1997; and Zhang Xingye, eds., *Zhanyi sixiang fazhan shi* [The evolution of operational thought], Beijing: Guofang daxue chubanshe, 1997.

spiral from bad to worse. PLA threat assessments seem to strengthen belief that most wars are manageable. By implication, the appropriate amount of pressure exerted by the high command on the adversary might restrain the latter's reaction or, at least, prevent his overreaction to the Chinese use of force, but not convince him that an all-out war was inevitable. The resulting estimates of potential loss and gain play into the hands of soldiers pursuing high-risk preemptive strikes. These aggressive actions are designed to buy time, to secure battle space initiatives and momentum before enemy threats are assembled, and to cut, if possible, a technologically-advanced opponent force down to a manageable level so that he might feel compelled either to delay his offensives or to take more time to regroup his forces to counter the degradation of his defenses.

The Chinese belief in a potential conflict with a powerful regional power over a clash of interests encourages an aura of fear, that there may be no alternative but a costly war. Though it never underestimates its capabilities, the high command's concern that the PLA might fail to achieve desired objectives at the opening stage of a war propels then to make a risky choice in pursuit of forward engagement. With decades of experience in hostile environments, the PLA no doubt favors preemption that promises rapid operational victory, but the idea of preemptive strikes, as opposed to that of "striking only after the enemy has struck" (*houfa zhiren*; 先发制人), is ambiguous partly because of conscious efforts to keep the opponent guessing about timing, targeting, and forms of attacks and partly because of unwanted tensions that might probably damage China's national interests of ambitious modernization programs.[80]

Of greater significance perhaps is that the PLA understands its previous research on the offense, in many cases, tended to underestimate differences in acceptable risk and real damage inflicted by high-intensity limited war on China's economic infrastructures. Thanks to new technologies, for example, precision bombing could destroy critical industrial bases without killing many innocent civilians or threatening the very survival of the state. The costs of such "total destruction" of the economic infrastructures within unlimited space are low for a powerful opponent, who often launches persistent air and missile strikes to avoid fighting land battles usually associated with heavy casualties. To a weak party, these risks and costs are disproportional, and the PLA cannot afford such losses, politically and economically. If so, then, it would be necessary to falsify offensive operations, a cardinal component of China's active defense strategy. The recognition of a theoretical need for extensive offense leads to the introduction of new ideas of operations fighting. The study and reinterpretation of active defense over the last several years has, to a considerable degree, highlighted inevitable changes in the decades-old strategic or operational principle that Beijing accepts the first blow launched by a superior opponent. That principle is now considered too passive, reactive, and insufficient, since its rationale rests on the gradual transition from defensive operations to follow-on offensive operations and since attempts to inflict limited punitive retaliation following an opponent's attack could not deter attacks. As a whole, the choice of preemptive strikes

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[80] Peng and Yao, eds., *Zhanlüexue*, pp. 452-454; Wang and Zhang, eds., *Zhanyixue,* p. 105; and Zhou, *Ludi bianjing zuozhan zhanshou yanjiu,* pp. 14-17.

might not maximize expected values of deterrence, but in the end, it could reduce political costs.

Preemptive Strikes as a Combat Model

Recent Chinese studies of the first Sino-Japanese naval battles, Operation Desert Storm, and Operation Allied Force have greatly alarmed Beijing. In the first case, misguided by the passive defense strategy, the modernizing Chinese navy was defeated by the Japanese imperial navy—a peer competitor of China. Similarly, the offensive operations of the coalition forces brought the Iraqis and the Serbs to their knees with devastating air and missile strikes. PLA leaders regard these as demonstrations of how wars are fought by technologically superior opponent, and analysts are concerned that a similar dynamic could prevent Beijing from defending its interests in East Asia.[81] Worse, the high command has already started to feel foreign pressure on security issues. In response to the ambiguity in its traditional idea of "seizing battle space initiatives," which, in the eyes of commanders, suggests waiting for the first shot fired by an opponent along well-established defensive lines or positions, the PLA seeks a fundamentally different way to chart future joint operations including fighting on an opponent's territory or on international waters. Pushing for an early victory even before a powerful opponent launches attacks on China has received widespread attention and support and has now become essential to executing joint operations, with the aim shifting its "passive" offense to new "active" preemptive strikes.

The intensive study of the 1894-1895 Sino-Japanese naval battles by the PLA Navy presents a different picture of preemption, and has reshaped PLA perceptions of offense. Given that preemptive strikes are not necessarily an operational characteristic of a strong state, psychological factors and mobile warfare might help set the stage for a weak state to launch surprise attacks in defense of its national interests. This belief is supported by historical evidence that the Chinese navy could have maintained control over the Yellow Sea to defeat the Japanese navy with acceptable costs only if the Chinese navy had possessed the willpower to fight before being forced to fight and only if the fleet enhanced its mobile warfare at sea. But the Chinese rhetoric of "preserving its fleet for deterring the Japanese," together with factional conflicts among generals and politicians, fueled frightening miscalculations that drove the high command to withdraw the fleet from, and later abandon, the Yellow Sea, focusing on coastal defense of key port cities and islands along the Pehai bay.[82] In other words, confronted with an aggressive

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[81] Li Jijun, *Junshi lilun yu zhanzheng shijian* [Military theory and war practice], Beijing: Junshi kexue chubanshe, 1994; Liu Jixian, ed., *Haijun zhanlüe huanjing yu duice yanjiu* [Maritime strategic environments and policy choices], Beijing: Jiefangjun chubanshe, 1996; Liu Yijian, *Zhihaiquan yu haijun zhanlüe* [Command of the sea and navy strategy], Beijing: Guofang daxue chubanshe, 2000; and Ji Guangzhi, ed., *Xin sanda sanfang yanjiu* [A study of new three strikes, three defenses], II vols., Beijing: Junshi kexue chubanshe, 2001.

[82] Chen Weiwen, ed., "Jiawu haizhan zhanyi zhanshu wenti yanjiu" [A study of operations and tactics of the Sino-Japanese naval battles], in *Jiawu haizhan yu Zhongguo haifang* [Sino-Japanese naval battles and

regional power, China had no stomach for command of the sea and for initiating preemptive strikes whenever and wherever possible. This passive defense accelerated the collapse of the Chinese fleet. Conversely, for Japan, the primary objective of its joint task fleet was command of the Yellow Sea, which would pose immediate threats to Beijing, Northeast/North China, and West Korea. Through preemptive strikes, the Japanese navy finally gained effective control over the Yellow Sea.

Under political pressure, the PLA appeared to repeat this strategic mistake by fixating on control of buffer islands and possible invasion routes during the 1970s, when faced with potential Soviet Pacific Fleet surprise attacks on Beijing from the Yellow Sea, in conjunction with a full-fledged ground invasion against the capital from Chinese northern borders. Given the small, ineffective Chinese navy, the only counter strategy available to the PLA was to deploy its best naval assets along the Liaotong and Shangtong peninsulas and on the islands connecting them for conducting anti-landing operations or for blocking the straits by employing mines and artillery firepower. This passive strategy as a symbol of "not past failures" but "flexibility" again delegitimized command of the sea and preemptive strikes for the PLA.

In Desert Storm and Allied Force, the coalition forces launched a preemptive strike against the Iraqis and the Serbs, utilizing naval and air forces as coercive instruments of the state. Before the missiles and bombs began to fall, according to the PLA, Saddam Hussein and Slobodan Milosevic adopted similar, passive defense strategies designed to hide, not to wage active guerilla counterattacks.[83] The coalition attacks, though powerful, were only from a safe distance in order to avoid casualties, as the public was unwilling to shoulder the human costs. If Iraq and Yugoslavia organized some effective missile or air attacks against this center of gravity and the coalition bases during the phase of their power projection, perhaps the coalition forces might not have as easily prevailed.[84] Whatever the counter strategies developed by Baghdad and Belgrade to shatter the coalition forces, to gain international support, and to explore casualty sensitivity as much as possible, they were passive in nature. In sharp contrast, the coalition's preemptive naval/air strikes served as a low-risk, low commitment measure against poor, isolated regional powers to degrade their political, military, and economic capabilities.

To Beijing, these examples illustrate how preemptive strikes work and what patterns the PLA might confront in future conflicts. One important theme, about which the high command knew little, perhaps unintentionally, is that preemptive strikes, rather than inaction and lack of urgency to act, are a powerful tool to reduce political costs. As predicted, a superior opponent would most likely initiate such naval/air preemptive attacks, without waging ground battles, if he went to war against China. Heavy damage to the Chinese economic infrastructures would provoke social unrest, despite the Party's

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Chinese maritime defense], eds., Haijun junshi xueshu yanjiusuo, Beijing: Jiefangjun chubanshe, 1995, pp. 414-423.

[83] Zhang Shaozhong, *Shuinen daying xia yici zhanzheng* [Who can win the next war], Beijing: Zhongguo qingnian chubanshe, 1999.

[84] Wang, *Zhongxi fang zhanyi bijiao yanjiu,* pp.203-204.

firm control over society. Beijing, on the other hand, would be clearly unable to retreat. If the high command were to respond to an opponent's preemption with a more devastating preemption, the full preparation and deployment of Chinese elite units would have to be completed before their opponent's preemptive strikes began. The increased concerns about these potential costs and benefits play a crucial role in considering and taking concrete steps against a superior opponent, thereby strongly affecting the PLA's perceptions of joint operations fighting.

Evidence suggests that momentum is acquiring in the PLA for building limited long distance naval/air reach capabilities, which would allow the PLA to ensure control over strategic straits for executing strategic missions outside the first chain of islands or up to 1,000 nautical miles from the Chinese coast. The hope is that such a new Chinese strategic posture would serve as a deterrent against potential threats. This strategic extension of the naval and air defense battle space or a significant departure from "offshore" defense would represent a gradual shift in the missions of the PLA without an explicit change in China's strategy of active defense. But it would pose a direct (limited) challenge to regional powers, which would have to break through such forward defense lines first before having access to the East China Sea. Beijing believes that its painstaking efforts to develop such maritime defense capabilities do not signify any intention to challenge any great powers around the world; rather it aims to defend its vital interests in the West Pacific and to prevent other powers from seeking hegemony or, more important, from launching preemptive strikes against China around the first chain of islands, if the PLA is involved in a regional conflict.[85]

The PLA's controversial discourse on preemption reflects concerns over maritime insecurity and recent improvements in the PLA's naval/air capabilities. Owing to the Russian and Chinese cooperation programs, a fraction of the navy and the air force now can conduct limited operations in the West Pacific, with the objectives of intercepting incoming missiles or aircraft and waging preemptive strikes against the firepower and support platforms of a superior opponent. There is no doubt that China, at this stage, is not interested in competing with a superior opponent for gaining control of the West Pacific, which would run a significant risk of failure and even war. Nevertheless, Beijing always sees time on its side. The PLA, with gradually modernizing projection capabilities, will eventually become a solid military power in the West Pacific.

Operational Assessments

A pictorial map of China's active defense drawn by the PLA would identify a serious security problem: potential threats to its national security, especially related to the Taiwan issue, are maritime. But Beijing does not represent any meaningful threats to or have any countermeasures against other maritime powers. The threats to the core security concerns of the high command suggest some delicate combat scenarios: a technologically advanced opponent enjoys naval and air superiority around the first chain of islands so

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[85] Qing Tian and Hue Xiaoyong, eds., *Zhonghua haiquan shilun* [History of China's sea power], Beijing: Guofang daxue chubanshe, 2000, pp. 396-407; and Liu, *Zhi haiquan yu haijun zhanlüe*, pp. 230-240.

long as the PLA refrains from seeking limited command of the sea and air. But it is highly unlikely, indeed almost illogical, that China would stay idle in the face of incalculable political and economic costs. To defend its vital interests in the first chain of islands, PLA joint operations would start with active attacks on an opponent's sea-based platforms, closing off as many avenues of naval/air attack as possible. To do so, the PLA needs to field limited but well-trained forces to frustrate any military assault initiated by a superior opponent at sea or in the air. This explains the PLA's interest in preemption that would allow China to use force first, when it believes it has a conventional advantage. With this objective in mind, the PLA aims to develop preemptive strike weapons capable of inflicting limited punishment on an opponent sufficient to deter him. Inspired by the positive considerations, China clearly accepts the idea of provocative preemption, which is viewed as an emerging, affordable alternative, promising insurance against potential threats and the gain of political and operational initiative.

The worst-case analysis addresses how best to cope with preemption--a move toward escalation driven in part by the nationalist mentality. As far as PLA and political leaders perceive, a superior opponent's precision strike, power projection, and C^4ISR capabilities threaten the PLA with defeat. If Chinese preemptive strikes fail to achieve their objectives, any PLA setbacks would reinforce its determination to defend its interests regardless of costs, forcing Beijing to escalate, rather than de-escalate a conflict. The vicious cycle of action and reaction comes perilously close to spiraling out of control, likely provoking a war neither side wants. On the other hand, China's historically rooted sensitivity to international humiliation and its inflamed nationalist passions would put psychological pressure on the leadership and restrain policy options. The accidental U.S. bombing of the Chinese Embassy in Yugoslavia and the EP-3 surveillance plane accident, for instance, sparked anti-US sentiment across China, with society as a whole advocating retaliation. However, these cases suggest popular pressure has the potential to the guide, if not misguide, the political and military leaders. This dangerous, nationalist approach to managing preemptive strikes does not totally blind the decision-makers in Beijing. The high command seems to favor limited assaults with unlimited means to ensure limited victory or, in other words, to save face.

Now, the PLA fully understands that reliance on and manipulation of the nationalist sentiment for decision-making would risk a backlash, blaming the leadership for any operational failure. Internal instability would weaken the regime, economically and politically, as a result of long-term threats posed by a superior opponent's attacks to the Party and the state. Take Chinese strategic environments, for example. Most high-value targets that could absorb the strikes, such as major cities, economic powerhouses, military bases, and C^2 centers, are located along the coast.[86] Some areas, such as the flat terrain of the Changjiang delta, are virtually indefensible to missile and air strikes, thus creating fears that any attack could end in a quick ruin of the Chinese economy, if not the regime. Speedy conventional attacks might also challenge the deterrent effects of Chinese strategic weapons, in that they would become useless to deal with a non-nuclear conflict.

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[86] Zhu Yangming, eds., *Yatai anquan zhanlüe lun* [Asia-Pacific security strategy], Beijing: Junshi kexue chanbanshe, 2000, pp. 243-277.

A perhaps more destabilizing issue is that the destroyed economic infrastructures and the resulting high unemployment rates would neutralize popular support. Of course, any foreign attacks on China are unlikely to contribute to immediate discontent with the Chinese regime, but Beijing is not immune to domestic unrest. The 1989 anti-corruption campaign was unexpectedly transferred into the nation-wide pro-democracy movement and ended up with the bloodshed. These threats remain real. The casual relationship between targeting and desired political and military effects might compel China to "get tough" with a technologically superior opponent.

Historically, the Chinese conviction that "striking only after the enemy has struck" served as a means to gain the moral high ground. However, it has also been a function of the PLA's backwardness. The message sent by this approach to war, as Beijing has long understood it, is that the regional powers often see the Chinese "non-confrontational" approach as a sign of "weaknesses." Lacking an acceptable conflict resolution mechanism other than war, preemptive strikes as the most swift and effective way to crush the opponent could be sold politically at home. The justifications for preemption are persuasive. Any action related to invasions of China's land, airspace, and territorial waters by regional powers or initiation of religious fundamentalism, ethnic separatism, and international terrorism is viewed as the "first shot" fired by an opponent. The consequent preemptive strikes are closely tied to those specific conditions, involving: (1) a separation movement supported by foreign powers that threatens territorial integrity and national sovereignty; (2) border incidents created by foreign powers that destabilize Chinese border areas and threaten border security; and (3) an invasion or occupation of Chinese islands and reefs by foreign powers that damages Chinese maritime rights and interests.[87] The perceived interaction of threats and preemptive strikes paves a way for imminent attacks. Even though the extent to which the high command is certain of the imminence of an opponent's attack before initiating its own attack appears unclear, the PLA claims that China as a victim state has the right of self-defense to launch "defensive" operations. The "defensive" choices include driving the invaders out of the country, striking their overseas military bases or sea/air targets, or perhaps launching attacks against their homeland. The legality and validity of preemption, Beijing holds, will produce a conventional deterrent. This option is compatible with joint operations, maximizing the operational flexibility reserved to a true great power.

Timing

The timing of naval/air preemptive strikes derives from the PLA's consensus on two possible attack scenarios: either before an opponent launches devastating strikes or during the massing and build-up his troops. Striking outside of these phases is insufficient, with a possibility that the PLA might be forced to react to its opponent's way of war fighting and could fail to deter its opponent in a conflict when it is most needed.

Against the background of definite Chinese inferiority in technology, the PLA has no reliable intelligence system to ensure adequate early warning of naval/air attacks and

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[87] Peng and Yao, eds., *Zhanlüexue*, p. 453; and Gao, ed. *Lianhe zhanyi xue jaocheng,* p. 83.

an ability for rapid responses to such attacks from the sea or the air. These technological gaps reshape preemption with emphasis on waging mobile, flexible, and independent (not joint) naval and air operations that "will drag a superior opponent into a passive and reactive position" that he wants to avoid.[88] Together with the reviving and expanding of reach capabilities, the PLA would, the high command hopes, produce a reliable deterrent over time. The crucial issue, related to "getting tough," after all, is the PLA's concerns about possible misjudgments and misinterpretations of the rationale of an opponent's hostile actions leading to overreaction by launching preemptive strikes. Despite rational analyses of the adversary's intentions and capabilities, Beijing has no way to know how he assesses conflict environments and what he is going to do. The opponent might, in turn, feel forced to escalate to retaliation from the belief that the best means of defense is offense. These possibly flawed judgments and estimates are the result of different security ideas and different security terminology. Actions and signals could be misunderstood if they are interpreted according to different rationales. It is apparent that this security dilemma might undermine Chinese ambitions of preemptive strikes or at least prompt Beijing to think twice before use of force.

No doubt, preemptive strikes allow the PLA to give a crushing repulse to potential aggressors. If necessary, operations involve mounting attacks to carry the offense to the opponent's territory as rapidly and decisively as possible, fighting together or in separate army, air force, navy, and second artillery operations. This preemptive strike orientation is largely a reflection of domestic politics and cultural roots. In the post-Cold War era, Beijing is increasingly sensitive to national territorial integrity, sovereignty, and foreign intervention, especially since the most recent regional wars, for instance, have opened the door for humanitarian intervention in domestic affairs of a sovereign state. To discourage such attempts, the PLA is devoting extensive resources to reassessing preemptive strikes that primarily target a powerful regional power in an effort to deter its potential involvement in Chinese joint operations against a third party. But there is no solid evidence that this regional power would wage offensive operations against China regardless of the political, military, and economic costs. Given this operational scenario, the PLA would be unlikely to provoke a conflict and execute preemptive strikes against an enemy's overseas bases.

The Chinese preference for naval/air preemptive strikes is illustrative and matters. An examination of the Chinese security tradition shows continuity along the current path favoring the choice of preemptive strikes, though nonviolent and defensive options remain influential.[89] In many respects, generations of Chinese soldiers view preemptive attacks as the most critical form of military action, making it possible to destroy the opponent and to capture his territory with the objective of war termination on their own terms.[90] Despite the attention long lavished on Mao's famous strategic transition from

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[88] Wang and Zhang, eds. *Zhanyixue,* pp. 104-105; and Yang, *Zhanyi lun,* p. 309.

[89] Johnston, "Cultural Realism and Strategy in Maoist China," in Katzenstein, ed., *The Culture of National Security,* pp. 216-268.

[90] Samuel Griffith, *Sun Tzu the Art of War,* London: Oxford University Press, 1963.

defense to offense, it is clear that offense remains the best option for the PLA to defend the regime. The high command would strive to maintain a decisive advantage at the right place and time, enhancing the efficacy of preemptive strikes.

INFORMATION WARFARE (IW)

A central building block of the PJO is to conduct IW operations, with the estimates that the likely benefits of PLA action would outweigh its probable costs. This trend in Chinese views of IW and in thinking about an unprecedented way of fighting presents a brand new version of preemption for facilitating a quick victory.[91] Beijing's information technology (IT), which has largely benefited from the revolutionary "863" project and from dramatic cost reductions in manufacturing, is the fastest growing sector supplying the PLA with a cheaper, better, and more convenient long-range power projection capability that its soldiers have long desired.[92] This impressive leapfrog has, if taken together, put the PLA on the verge of a major breakthrough that will inevitably help skip several generations of expensive military technologies to challenge the regional powers. The new nonviolent means for the protection, manipulation, degradation, and denial of information, with its devastating effects on an opponent's war machine, economic infrastructures, and society, is transforming military geography. If the PLA's critical technologies and the information programs of the regional powers continue to gain momentum, the ideal of winning without fighting could be realizable.

Chinese IT, compared to that of the regional powers, is underdeveloped, but the PLA is emerging as one of leading IW advocates.[93] The main reason for Beijing's interest in such warfare is simple but convincing: innovative use of IW can be decisive in striking high-value strategic targets, in thwarting a technologically advanced opponent's domestic support, and in deterring a coercing coalition. What really makes it stand out is that bloodless IW mirrors the very essence of the Chinese political jargon —"people's war under high-tech conditions," with limited combat costs to the PLA.

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[91] Wang and Zhang, eds., *Zhanyixue,* pp. 178-179; and Li Jiangzhou, "Xinxi jingong ying queli yiti zuozhan xianji cuihui de zhidao sixiang" [Information attacks must focus on the principle of integrated combat, preemptive strikes], in *Wojun xinxi zhan wenti yanji* [A study of our army's IW]*,* eds., Junshi xueshu bianjibu, Beijing: Guofang daxue chubanshe, 1999, pp. 76-79.

[92] Evan Feigenbaum, "Who's Behind China's High-Technology Revolution," *International Security,* Vol. 24, No. 1, (1999), pp. 95-126; and Tse-kang Leng, "Economic Globalization and IT Talent Flows across the Taiwan Strait: the Taipei/ Shanghai/Silicon Valley Triangle," *Asian Survey,* vol. 42, No. 2, (2002), pp. 230-250.

[93] Shen Weiguang, "Xinxi zhan de jueqi" [Emerging information warfare], *Jiefangjun bao,* 4 April 1987, p. 2; and *Xinxi zhan* [Information warfare]*,* Hangzhou: Zhejiang Daxue Chubanshe, 1990; Zhu Youwen, ed., *Gaojishu tiaojian xia xinxi zhan* [Information warfare under high-tech conditions], Beijing: Junshi Kexue Chubanshe, 1994; and Wang Jinfeng, *Xinxi zhanzheng yu junshi geming* [Information warfare and the revolution in military affairs]*,* Beijing: Junshi Kexue Chubanshe, 1995.

Information Superiority

The PLA has a tradition of exploiting ways to selectively adopt some advanced technologies and then combining them with old ones for developing more effective counter-measures, which make it difficult for a superior opponent to employ its most potent military resources if war suddenly breaks out. Inspired by the positive prospects, it has made serious attempts to integrate technological innovations and organizational adaptation for gathering, processing and moving vast amounts of information quickly. But the extent to which the services fit into IW and how Chinese soldiers can succeed in mastering such technologies and methods remain an open question. Looking at these issues, the high command realizes that information superiority, in the end, means control over real time information that would be captured and processed to support their decision-making process and combat operations, while denying an opponent access to it within a certain space and time, thereby requiring commanders to think more strategically.[94] Given preemptive strikes, developing information superiority will, of course, foster the PLA's synergistic interaction among services or units and, ultimately, assist in ensuring victory. The real value of information superiority depends on whether soldiers can inflict heavy costs on an opponent, but command of IT and IW indeed affects the ways the PLA perceives and calculates.

Even though aspirations of the PLA frequently exceed its capabilities, all the services agree that their IT is far inferior to that of the leading regional powers. This inferiority, in turn, has set the stage for modernizing PLA information systems. The navy, for example, has made institutional efforts to integrate surveillance vessels, aircraft, and land-based units for collecting battlefield data against a would-be opponent. Based on these data, experimentation through war games, simulations, and field exercises aim to enable naval units to identify and solve training problems and, finally, to select striking options compatible with their capabilities and combat environments. Similarly, the air force is looking to introduce a new network of imaging satellite, radar, aviation, and electronic surveillance systems. The significant improvement in this field is the deployment of unmanned aerial vehicles (UAV), designed to maintain frequent surveillance or continuous coverage of certain specific combat sites.[95] The integrated systems are capable of achieving near-real-time surveillance over some areas, not only detecting, locating, identifying, and tracking targets such as tanks, aircraft, missiles, and warships, but also providing the quantity and quality of data for creating a situational awareness across the services. To process and protect such valuable information, the PLA tends to seal off computer systems from the outside world by building advanced fire walls and defenses against computer bugs, virus, and hackers, while developing an

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[94] "Junshi xueshu pinglun yuan, 'Nuli tanshue wojun teshe de xinxi zhan lilun' " [Making great efforts to develop our IW theories], in *Wojun xinxi zhan wenti yanjiu*, eds., Junshi Xueshu Bianji Bu, pp. 1-4.

[95] Me Xinguan, "Gaojishu haishang jubu zhanzheng xinxi zhan chutan" [Preliminary explorations of IW in high tech maritime limited war], in *Wojun xinxi zhan wenti yanjiu,* eds., Junshi Xueshou Bianjibu, pp. 176-182; and Li Shihen, "Kongjun zai bianjing fanji zuozhan zhongde xinxi zhan wenti tantao" [Explorations of IW in border counterattacks fought by the air force], ibid., pp. 172-175.

immune system that produces digital white blood cells or digital antibodies permanently available on line against suspect codes. Through these secured networks, the processed information can be distributed to end users dispersed across the battlefield.[96]

The 1990s witnessed a sharp surge of Chinese interest in and capacity for IW. Among young officers there is talk of victory, claiming that any barriers to fighting this new way of war are not what they once were and that traditional forces might easily get a leg up.[97] Despite orchestrating a massive misinformation campaign to mask their weakness and, later, to exaggerate their strength, this highly anticipated IW suffers the same problem as other forms of PLA warfare. Their poorly designed and poorly functioning information systems spend much of their time being redesigned, retested, or repaired instead of standing ready for combat. No assured or confident defensive and offensive capability emerges. Whatever the optimistic estimates, the resulting operational choices appear limited for Chinese soldiers: either launching preemptive attacks on an opponent's information networks to secure so-called battle space initiatives and information superiority on the PLA's terms or running a risk of the collapse of the whole system under the "heavy information bombardment" of a superior opponent.

The problems inherent in Chinese IW are multifaceted. As far as the PLA is concerned, there are many combat directions, targets, and signals that need to be monitored, but the military is just beginning to move toward information-based warfare and has not yet fully mastered the technology and tactics, and few high-quality devices are available to units. To Beijing, the establishment of multi-layer surveillance platforms guarantees the accuracy of information and reduces misjudgments in overlapping time frames. Unfortunately, the PLA lacks resources to develop these platforms. On the other hand, most, if not all, of the secured information and computer systems are made in foreign countries. The PLA, however, is skeptical and questions the reliability of these foreign products, which might invite fatal attacks by activating viruses, logic bombs, and infectors inserted in software and hardware. Even though the processing systems survive, end users might not receive near-real-time information, because the homemade transmission lines are also unreliable.[98] As a consequence of these technological weaknesses, the protection of Chinese information becomes extremely critical. To have an upper hand in future joint operations, the services endorse a spirited but friendly competition to determine the proper mix of surveillance, information-gathering/processing, and transmission capabilities. This approach seems to indicate that the weakest link over which PLA messages pass is the service-oriented architecture for

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[96] Ma Xianzhang, "Jisuanji bingdu zhan tanzhe" [An analysis of computer virus warfare], ibid., 141-146.

[97] Qiao Liang and Wang Xianghui, *Chaoxian zhan* [War without restrictions], Beijing: Jiefangjun Wenyi Chubanshe, 1999; and Lu Desong, "Xinxi zuozhan: lianhe zuozhan de zhongyao zhizhu" [IW: the core element of joint operations], *Jiefangjun bao*, 11 September 2001, p. 6.

[98] Qin Shiquan, "Guanzhu dueqiu zhi xinxiquan zhanyi" [Paying attention to operations of gaining information superiority], *Jiefangjun bao,* 20 November 2001, p. 6; and Deng Shoulong, "Dueqiu zhi xinxiquan de jiben xilu" [Basic ideas about gaining information superiority], in *Wojun xinxizhan wenti yanjiu,* eds., Junshi xueshou bianji bu, pp. 60-67.

information gathering, processing, and distribution. In other words, the urgent mission for the PLA is to develop secure inter-service communication or relaying systems.

A remarkably consistent pattern of the important information superiority emerges from an assessment of the most recent limited wars. The PLA accepts the need for change and, in particular, pays special attention to preemptive information strikes to disable an opponent's networks. The Chinese assumption is that information networks, however advanced, are virtually indefensible. As long as the networks are running, it will be possible for the PLA to pick up signals and to identify the sources of electromagnetic emissions.[99] This logic reflects the impressive growth in the Chinese understanding of IT and IW, but there is ambiguity in achieving such objectives. It is not surprising at all that preemptive information strikes, if timed correctly, would catch a superior opponent off guard and disrupt his operations, while keeping costs for fighting IW extremely low, compared to conventional land, naval, and air operations. In the final analysis, the PLA can afford sustainable IW.

Maximizing Operational Utilities

The PLA's experience with developing new, cheaper, more effective IT as one of its trump cards has been frustrating. Despite the rapid diffusion of knowledge-based technologies across borders, the PLA's IT appears to remain immature and fails to enable a new way of fighting on a large enough scale to be decisive. Beijing, however, reads the results differently. Paradoxically, innovative use of IT emerges as perhaps the core element of PLA joint operations. The high command has elevated IW to the strategic level, repeatedly contending that a leading edge technology could deliver competitive advantage over an opponent. If successful, joint operations would be bloodless. Yet, the PLA is apprehensive, because it never won any war almost entirely relying on a particular type of weapons. If unsuccessful, the cost of failure associated with the relative autonomy of technology is very high, and then its IW will fall apart. To make the matters worse, the limited defense budget and the shrinking of non-military budget resources further constrain expenditures on and development of IT.

Absent some somber thinking, an uncompromising way to bolster PLA credibility and leverage against a technologically advanced opponent is to magnify rich resources inherent in society, providing soldiers with capable platforms to deliver lethal attacks. Once again, the high command hopes that shifting R&D costs to the civilian sector and a partnership with society would, to some extent, convert the Chinese IT industry into a stronger war machine. Thanks to the technology outflow from leading IT research and manufacturing centers, such as Silicon Valley, the Chinese IT industry is booming and IT-oriented cities are evolving and expanding. The state now designs and builds dual-use information systems, which makes IW become not only a weapon of choice, but also the business of civilian professionals.[100] It is hoped that the dual-use information assets will

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[99] Wang and Zhang, eds., *Zhanyixue*, p. 178; and Gao, ed., *Lianhe zhanyi xue jiaocheng*, p. 83.

[100] Qiao and Wang, *Chaoxian zhan,* p. 44; and Leng, "Economic Globalization and IT Talent Flows across the Taiwan Strait," pp. 230-250.

gradually close the information gap with regional powers without the bother of developing the military IT infrastructure. As a result, cooperation between soldiers and civilians is on the rise. Leading public and private firms are jointly developing digital, fiber-optical, satellite and mobile communication networks across China that offer backup IT platforms and resources for the PLA to launch joint special IW against clearly identified opponents and targets through use of computers, the internet, or jamming devices. The division between the military and the civilians is indistinguishable.

To the PLA, the location for fighting IW matters. As joint operations are designed to defend national sovereignty and territorial integrity, the missions need central bases, such as core coastal cities to secure human and technological support. The conventional wisdom is that the core coastal cities will continue to lead in developing IT. The valuable assets they possess and manage will spread to the PLA, help shift inferiority to superiority, and gain the IT edge. Driven by a desire for greater resources, expertise, and technologies, the high command tends to take advantage of the network of the cities for forming alliances and for feeding strength into the PLA. New kinds of integration programs, by design, keep cropping up.

The state-owned information and telecommunication systems quickly become a target for testing integration. The proposed principles include: (1) in wartime, the telecommunication systems should meet military needs first, but in peacetime, civilian uses are paramount; (2) the joint command makes contingency plans and regulations to ensure military priority during war; and (3) the joint military-civilian networks, though important, will remain inadequate to prevent an opponent from inserting bugs, infectors, and viruses into the systems.[101] These principles imply a mix of signals, but the PLA is increasingly dissatisfied with the potential utility of these assets, since most of the civilian IT products have foreign content, which threatens information security and possible cooperative programs with the military. For example, some security flaws are clearly associated with Pentium III and Win98 that have a wider application in Chinese military and civilian sectors. A recommended solution for solving these potential disasters is a mandatory security test of all imported chips, software, spare parts, and telecommunication systems before using them.[102]

In other words, foreign IT products will have very limited access to the PLA's core C^2 networks. Without these critical products, however, the military-civilian integration programs will eventually focus on two key areas: substitution efforts through reverse engineering for keeping PLA IW units functioning and civilian technical support for maintenance of IW equipment. With these priorities in mind, the war zones and the services will push for needed changes in waging IW. But they have not yet started fixing

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[101] Si Laiyi, "Lun xinxi zuozhan zhihui kongzhi jiben yuanze" [Exploring basic principles of information warfare C^2], in *Wojun xinsizhan wenti yanjiu*, eds., Junshi Xueshou Bianji Bu, pp. 248-249.

[102] Li Qinghua and Liu Xinghua, "Xinxizhan yu Zhongguo anquan hunjing" [Information warfare and China's security environments]; and Wang Yu, "Hulianwang huanjing xia de xinxi anquan" [Information security in the age of the Internet], in *Guoji anquan yu anquan zhanlüe* [International security and security strategy], ed., Xin Ximin, Beijing: Junshi Kexue Chubanshe, 2000, pp. 441-445 and p. 529.

the dysfunctions they inherited and have no resources to carry out their missions, which thus remain unfunded mandates. If the homemade information systems were integrated, the PLA could also reduce costs much further and Chinese IW would sound promising.

Soft and Hard Strikes

Crucial challenges to Chinese IW are how, and the extent to which the PLA can strike the weakest links of an overwhelmingly powerful opponent's information systems by employing its underdeveloped IT capabilities particularly, when a war looms on the horizon. Over time, of course, the PLA will be able to improve its IW capabilities and to make it harder for an opponent to intervene militarily in Chinese "internal affairs" during crises. What is true for the networked society is also true for the civilian and military network, which could substantially enhance the preemption and lethality of the PLA's IW, even if it is by no means assured. Chinese success or failure, in terms of denying or disrupting information flows and of damaging or degrading information and sensor systems depends on its ability to make their inferior information gear effective to strike an opponent's networks. The PLA's belief is that if the information networks of an opponent are severely damaged, the whole system would likely be shut down, thereby triggering a domino effect on its war machine. A somewhat positive prospect does not weaken the high command's sensitivity to the fog of war that is omnipresent in joint operations. This side of the picture is clear to all. If the PLA is unable to degrade an opponent's complicated information systems in the shortest possible time, the costs of such failure will be to turn preemptive information strikes around--the PLA will lose momentum and, ultimately, its ability to conduct joint operations. This is a near term concern for the high command, which is seriously considering military conflict with a technologically advanced power, but trying to avoid it.

Chinese views of IW present the PLA with some worrisome issues.[103] Under some circumstances, IW can, of course, neutralize an opponent's combat effectiveness by taking advantage of "windows of opportunity" to disable his information systems, but it cannot replace other military means to defeat an opponent. Although a superior opponent might not monopolize IT as it once might have, and could become increasingly vulnerable, the "windows of opportunity" for the PLA to launch fatal information assaults are extremely limited. Equally important, IT will function as equalizers for both parties. The Chinese account of the Kosovo Operations strongly supports this possible trend. The US-led coalition forces possessed the most advanced weapons in the world, but they deliberately kept the Yugoslavian telecommunication system intact, with their system waging IW against Belgrade's C^2 gear. The Yugoslavs also turned their eyes to IW counterattacks: misleading coalition forces' radar stations, aircraft, and cruise

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[103] Sha Zhiping, "Lun xinxi zhanzheng de youlie zhuanhun" [Shifting from superiority to inferiority in IW], *Jiefangjun bao*, 29 January 2002, p. 6.

missiles.[104] These events convinced the PLA that it could exploit some knowable holes in the enemy's information systems to confuse an opponent by injecting false massage traffic or creating data errors. But, the PLA is also troubled with the likelihood that an opponent's information systems, just like the Chinese ones, will be sealed off from the civilian networks. The motivated bias that a computer system, however technologically sophisticated, could be broken into makes sense. The contrary point of view is also valid: identifying such linkages and decoding computer-generated messages become almost impossible. What seems to suit the PLA may suit its opponent equally well or better. In the end, "IW is war, but not computer games."[105]

The operational objective of IW, in the Chinese mind, is to maximize damage to an opponent's military and civilian infrastructures through control of computer networks and cyber space. IW will be decisive if it successfully jams and halts GPS navigation satellites and commercial communication systems on which militaries increasingly rely and if it threatens collapsing the enemy's most critical banking, financial, or transportation networks—the central nerve of the home front--without any prospect of killing innocent people. This scenario would be intended to have a hostile opponent think twice about the real costs it faces.[106] Although striking these most sensitive targets is a logical choice, the destruction of the most powerful economy would produce devastating impacts on the international community and force the opponent to escalate, rather than de-escalate the conflict, perhaps by using the weapons of mass destruction. In Desert Storm and Allied Force, the primary targets were not superpowers but weak regional powers, so that the coalition forces could bomb and fight the way they liked. Clearly overestimating the benefits of the information attacks, some radical officers and analysts might perceive incorrectly that Chinese IW is a zero-sum game seeking a total destruction of a regional power's or a superpower's civilian infrastructures. In any event, however, there are no reasonable grounds for believing that these threats will succeed.

For the PLA, IW assumes a role of considerable significance for achieving command of the sea and air. As military planners acknowledge, building a centralized information systems gives the PLA a good opportunity to reorient its operational priorities, timing, and center of gravity for future joint operations. After painstaking efforts, it is the first time in the history of the PLA that Chinese soldiers have possessed meaningful, long-range, nonviolent striking capabilities and enjoyed some freedom in how and where to use these means. But their comparative analyses appear troublesome. At worst, a technologically superior opponent's exclusive reliance on the information systems over time is a high-risk strategy that could bring some disadvantages. In the

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[104] Zhou Yong, "Xinxi hua zhanzheng yu jijie hua zhanzheng bianzheng guanxi de sikao" [Reflections on dialectical relations between IW and mechanized warfare], in *Xiangze xinshiji de chaoyang* [Facing the sun of the new century], ed., Fei Biao, Beijing: Guofang Daxue Chubanshe, 2001, pp. 477-487.

[105] Gong Junjie, "Wangshang duikang bushi jiti youxi" [Computer simulation is not computer games], *Jiefangjun bao,* 29 January 2002, p. 6.

[106] Qiao and Wang, *Chaoxian zhan*, pp. 42-55.

Chinese case, poor geographic conditions might challenge and restrict the utility of his high-tech weapons.[107]

If employed properly, PLA missiles, bombs, artillery shells, or jamming devices could decapitate an opponent's C^2 centers, cut his communications links, and finally disrupt his operations even without totally demolishing them. Though joint operations have become highly transparent, the PLA insists that transparency may not necessarily mean operations are free of deception, designed to create false information for either selecting targets or harassing an opponent's command centers. Of course, successful deception will contribute to achieving unexpected results.[108] The frustration for the opponent, on the other hand, is that IW against the PLA may affect Chinese joint operations less than expected. Though the PLA is increasingly centralized at the war zone level, its units are largely independent of one another. Attacks on the war zone command centers could conceivably release field commanders to seize the initiative in their battle spaces for fighting traditional, decentralized operations.

Despite intentions and resulting efforts to gain and maintain information superiority, the PLA is pessimistic about its IT and its ability to master IW tactics. The services and the war zones have different ideas and options for managing these issues. Keeping units capable of fighting IW will be costly, even with fresh investments from the state. Now, the PLA is promoting dynamic interaction between the civilian and the military sectors, hoping that well-trained IT professionals will play a more important role in sustaining and fighting IW.[109] But a real challenge faced by the PLA is this dilemma: most, if not all, of its super computers and core operating programs are made in the West and the foreign products likely threaten its IW and the effectiveness of its joint operations. Conversely, without the foreign technology content, the PLA's information systems are secured, but with the limited values for executing IW against a superior opponent.

ASYMMETRIC STRIKES

It took remarkably little time for the PLA to introduce, and later press for the formal incorporation of, the idea of asymmetric strikes - a supposedly new way of "not fighting fair" to initiate lethal, preemptive attacks to paralyze high value targets by utilizing its most powerful weapons into the PJO. Asymmetric strikes themselves emerge as a dominant example of operational practice and, by nature, appear to fit exactly into the PLA's combat tradition.[110] At the heart of such attacks is the concept of fighting on

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[107] Qin Shiquan, "Guanzhu dueqiu zhi xinxiquan zhanyi" [Attention to operations of seizing information superiority], *Jiefangjun bao*, 20 November 2001, p. 6.

[108] Sha, "Lun xinxi zhanzheng de youlie zhuanhuan," p. 6.

[109] Li Qinghua, "Xinxi zhan yu Zhongguo anquan huanjing" [Information warfare and chinese security environments]," in *Guoji anquan yu anquan zhanlüe*, ed., Jin, pp. 441-445.

[110] Yu Guohua, *Xiandai jigong zhanyi zhuyao wenti yanjiu* [A study of key issues related to contemporary offensive operations], Beijing: Guofang Daxue Chubanshe, 1998, pp. 180-192.

Chinese terms for inflicting heavy costs by an opponent at the place and time he least expects it. What is "revolutionary" about asymmetric strikes for the PLA is not the advanced conventional and exotic weaponry that might acquire a nuclear-type efficacy without the nuclear weapon's albatross of loss of control and purpose (though they are certainly part of it); rather, the unprecedented ways in which a mix of different technologies is used to overwhelm targets. The deliberately preemptive posture responds to and explains an operational anomaly of attacks on vulnerable but critical targets, certainly illustrating a Chinese taste for seeking a quick, decisive victory.[111] After intensive study and heated debates on potential targets, operational means, and precision strikes in the face of a fairly predictable set of threats to national security, the PLA feels quite confident it can launch effective asymmetric strikes within its operational reach and in the shadow of opponent's deterrence, conventional or nuclear.

According to PLA assessments, technologically advanced powers have coped poorly with low-tech regional powers, which often select and employ less sophisticated weapons and tactics to harass, deny, and even defeat their opponent. In the Chinese case, the PLA's arsenals and technologies, in sharp contrast to those of its primary opponent, are clearly not in the same league in quantitative and qualitative terms, and there is no chance for Beijing to expect their capabilities to improve in the immediate future. Nevertheless, differences in strategic objectives, resources, and willingness to assume risks and accept costs will provide the PLA with an opportunity to design and manipulate asymmetric strikes for military and political purposes. As standard procedure, Chinese combat calculations normally begin with a hypothesis that a superior opponent might try to hide his vulnerabilities, so that the achievement of its operational objectives rests on whether the PLA can succeed in pinpointing and striking them hard by imposing Chinese combat ways and styles on him.[112] In other words, if the enemy's war machine has many strengths, it must have flaws. Correctly identifying them and developing strategic, rather than purely technical, counters help maximize control of operations, which could allow the PLA to decide when, where, and how to fight. Given the geographic asymmetries, the employment of integrated forces and firepower within different space and time against an opponent's high-value targets could create an overwhelming combat effectiveness, force the enemy to follow the Chinese logic of fighting, and end in his quick defeat. Not surprisingly, the high command is very familiar with the counter-argument. A powerful state definitely takes advantage of asymmetric attacks to increase its lethality, to reduce its own casualties, and swiftly to achieve its strategic objectives. Despite its lack of military muscle, the PLA insists, however, that relative military power, not absolute military power, is a meaningful measure of the effectiveness of asymmetric attacks and counterattacks.[113] The central point for a weak state is to avoid fighting symmetric operations.

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[111] Qiao and Wang, *Chaoxian zhan*, pp. 97-105.

[112] Ji, ed., *Xin sanda sanfang yanjiu,* Vol. I, pp. 13-14.

[113] Peng and Yao, eds*., Zhanlüexue*, pp. 441-442.

The Center of Gravity

Central to the concept of asymmetric strikes is the notion of combat costs to an opponent, while preventing him from shifting them to the PLA. This shared priority leads the high command to vigorously pursue the objective of winning war at acceptable costs or without severe damage to China's ongoing economic reforms, but not to returning to the old fighting style of total destruction, which might be counter-productive to its ostensible and original purpose. The operational assessments, conducted by PLA scholars and analysts, offer some guidelines for asymmetric strikes. To lower operational costs, the PLA must be able to maintain unrestrained flexibility to strike limited targets hard enough to erode its opponent's cohesion in unexpected ways and with devastating effects. In the eyes of Beijing, the "imperfections" of an over-muscled military power that tries to win wars through brute strength would be the center of gravity to be destroyed or held hostage in order to influence his decision-making with regard to initiating attacks on China. To PLA planners, the selection of the center of gravity must meet following requirements: the destruction of the clearly identified targets could swiftly destabilize the combat system of the opponent, develop operational environments favorable to the PLA, or facilitate achieving operational objectives.[114] Lethal attack efforts, together with dynamic interactions of the PLA's threats to attack and the opponent's inability to absorb such punishment, would likely neutralize a powerful opponent's offensives.

According to the PLA's assumptions, the most critical center of gravity is a support system located in an opponent's forward-deployed and rear bases, which could not be defended against every attack in every place and at every conceivable time. Today, the military heavily depends on its logistics support system, so that the system itself becomes bloated, extremely visible and vulnerable. If any asymmetric attacks were launched against indefensible support bases, fuel dumps, ammunition depots, and repair centers that are already stretched thin, an opponent's offensive capability would considerably be reduced. Naturally, the opponent's support system is and will remain the center of gravity of asymmetric attacks, whenever the PLA fights.

Cloning the coalition forces' strategy, the PLA further broadens its primary target list to include "highways, railways, bridges, industrial complex, energy centers, power installations, radio/television broadcasting facilities, and livelihoods." Disabling these critical infrastructures are seen as a way to press an opponent by creating suffering among civilian populations and fostering popular discontent within the state, with varying positive implications for Chinese joint operations. No doubt, threats to destroy these targets would force the enemy to rethink the costs of war. The threats are rational, but they seem misplaced, because the PLA has "no global reach capabilities" to strike a distant power.[115] What really counts are the material burdens and human costs produced by the PLA's attacks. As part of its tradition, the PLA usually delivers simultaneous and

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[114] Yu, *A Study of Key Issues related to Contemporary Offensive Operations*, p. 162.

[115] Gao, *Lianhe zhanyi xue jiaocheng,* pp. 147-148.

forceful assaults on the critical targets in different space and time, rather than restricting itself to one or two main directions. The prospects for decisive assaults might be far less promising, since the military and technological balance is always favorable to its potential opponent. In the shadow of nuclear deterrence, the PLA is unlikely launch unlimited assaults on civilian financial and economic centers, which would ruin any regional support or sympathy for its joint operations. The failure to appreciate this strategic imperative will betray little sense of asymmetric strikes.

The final targets, occasioned by increased Chinese concern about psychological impact, are perhaps the opponent's most frightening high-tech firepower platforms--aircraft carrier battle groups, ballistic and cruise missiles, strategic bombers, and long-range artillery batteries, which pose unprecedented threats to Chinese soldiers and its joint operations.[116] The PLA knows precisely what it wants to do and, therefore, there is little ambiguity in achieving these objectives. At the same time, another signal is clearly sent and well read: the immediate focus of the PLA's asymmetric strikes is on survivability of soldiers and equipment, not attacks on these firepower platforms that are very impressive in any side-by-side comparison with the Chinese systems. Any heavy human and material losses that might overwhelm the will of the soldiers and society to fight might also in fact prompt the high command's calling for developing some IT counters, in conjunction with a mix of deception and concealment schemes to blind, if not destroy the satellites and sensors on which smart weapons and situational awareness depend. Of course, the dysfunction of the systems would reduce their effectiveness. Without counter force potentials, however, the high-profile firepower platforms of its opponent would remain effective.

Trump Cards

In the late 1990s there was remarkably widespread and growing agreement in the PLA on the desirability of the push for integrating elite forces and weapon systems in order to produce anticipated combat decisiveness. The impetus was an alarming concern about the PLA's inability to design and build competitive weapon systems. Fearing that it might fall far behind the regional military powers, the high command actively sought a rational way to increase the overall lethality of asymmetric attacks for challenging an opponent's offensive and defensive capabilities.[117] After in-depth calculations, such a course was deemed more desirable. The opportunity appears to exist to make a clear choice to fight efficient joint operations without the acquisition of the most advanced weapon systems. If war occurred today, the PLA's most high-profile trump cards in hand

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[116] Niu Qiwei, "Shiying gaojishu tiaojian xia kongzhong zuezhan xuyao jianshe gongfang jianpai de xiangdai hua qiangda kongzhong liliang" [Meeting air combat demands under high-tech conditions, building a contemporary, powerful force with offensive and defensive capabilities], and Li Gongmin, "Dui tigao wo kongjun zuezhan nengli de jidi xikao" [Reflections on improving our air combat capabilities], in *Xiangzhe xin shiji de zhaoyang*, eds., Fei, pp. 523-527 and pp. 528-532.

[117] Ibid., p. 56; and Peng and Yao, eds. *Zhanlüexue*, pp. 442-443 and pp.460-461.

would undoubtedly include theater ballistic and cruise missiles, naval/air assets, and special forces components.

PLA conventional missile units, though small, are well-trained, highly mobile, and increasingly capable of launching lethal attacks at short notice and under all conditions. Following the example of the navy and air force, the second artillery quickly refashioned its combat priorities and incorporated the conventional missiles into its nuclear-centered missile force in the early 1990s to conduct operations in local, conventional war.[118] A "missile gap" between the services, along with the wider missile utility on the battlefield, also encouraged the army to develop its own missile programs, building missile brigades in war zones and battalions in group armies.[119] The different missile development trends reveal a "missile equilibrium" among all the services. But technical difficulties, C^2 problems, and a spiral of fear and misunderstanding might make the ballistic missiles less than effective. An interesting example is that PLA missile units always complain about lack of access to real-time or near-real-time satellite information and their inability to share information with the other services in a timely fashion. These barriers imply that the Chinese satellites at this stage are not primarily used for military purposes. Yet, the missile units are the most devastating card the PLA can play. In any beyond-the-horizon asymmetric attacks, the army and Second Artillery's DF-11, DF-15, DF-21, and DF-31 could produce more striking effects than these of other conventional means with low costs, while navy C-802s, C-803s, JL-1s and JL-2s could wage attacks on an opponent's naval, air, and land assets, and air force S-300s would improve Chinese air defense systems.[120] With an appropriate cross-service C^2 system, missiles might have significant counter-force potential and deter any unwanted foreign intervention or any possible separation movements in Taiwan. For the strictly military purpose of conventional war fighting, however, their utility vis-à-vis sea-based and land-based theater missile defense (TMD) systems might not be subject to question. Though the PLA has launched a propaganda campaign against any deployment of TMD in East Asia, it seems confident in its capability to overwhelm and them by utilizing decommissioned missiles and sophisticated decoys.

If history is a guide, the coercive use of the air power also becomes one of the PLA's trump cards. China's military leaders now call for substantial offensive air capabilities, with emphasis on developing joint hard-target kill weapons, warning and tracking systems, and real-time (near real-time) C^2.[121] While foreign acquisition programs

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[118] Wang Weixun, "Lianhe zhanyi did changgui daodan budui zuozhan mianlin de wenti ji duice" [Combat problems and solutions for conventional surface-to-surface missile units in joint operations], in *Lianhe zhanyi yu junbingzhong zuozhan,* eds., Guofang Daxue Keyanbu, pp. 246-250.

[119] Gao Wenshu, eds., "Zhou Shuqing: chixin zhu changjian" [Zhou Shuqing: fully devoted to building a powerful sword], *Jiefanjun bao,* 8 December 2001, p. 1.

[120] Gao, *Lianhe zhenyi xue jiaocheng,* pp. 112-113.

[121] Xu Junbao, "Kongjun zai lianhe zhanyi zhong de yunyong" [The employment of the air force in joint operations], in *Lianhe zhanyi yu junbingzhong zuozhan,* eds., Guofang Daxue Keyanbu, pp. 175-179; and

aimed at achieving regional reach and a flexibility of operations and responses remain a top priority of the air force, F-11/Su-27 fighters and indigenous helicopter production is increasing. Within a decade, the air units have already acquired a status of notable importance, allowing the PLA to entertain a far wider operational option spectrum than ever before. In spite of the upgraded capabilities, the Chinese air combat potential is nonetheless severely restricted as a result of inadequate training, C^2, and support systems. The primary concern of the PLAAF is how to manage a superior opponent's attacks and counterattacks, which might threaten its very survival, if its asymmetric attacks fail to reach combat objectives. Evidence detailing the assessments of the PLA's capabilities favors an option of reintroducing a "three strikes, three defenses" (*sanda, sanfang*; 三打三防) program that keeps alive the hope of thwarting enemy retaliation.[122]

Similarly, PLA special forces—marine brigades, an airborne group army, and army special operations detachments—enjoy opportunities to challenge enemy target acquisition systems in ways that missiles, bombers, and warships are unable to achieve. These elite units have the capability to respond to combat missions rapidly, conducting decisive attacks, reconnaissance, surveillance, ambush, sabotage, and rescue missions. As land warfare increases in lethality, the major mission of the special forces is to initiate action against the most critical political, military, and economic targets to paralyze the opponent's operational system. This trump card seems more assured than the others, but the special forces need environments to match their expertise and combat-initiating scenarios. Notably, they are restricted operations to homeland defense or around borders, not to distant battlefields, where C^2, logistics support, and geographical circumstances would weaken their operational effectiveness.

The ideas about use of the trump cards in the Western Pacific or in homeland defense continue to get mixed reviews. So far, the PLA has affirmed in one way or another its commitment to employing them as asymmetric options. In the event of a forward engagement, China's surface ships, submarines, aircraft, and special forces would have limited utility vis-à-vis a powerful opponent's navy and air force in the foreseeable future, whereas ballistic and cruise missiles would perhaps provide a feasible option, in as much as the PLA has deemed itself disadvantaged in terms of the other trump cards.

Focused Attacks

The PLA is exhibiting a renewed interest in optimizing firepower and manpower to increase lethality against key, dispersed, hidden targets, while avoiding collateral damage to infrastructures and personnel. These attacks, by design, follow the PLA's operational tradition of "pitting the strong against the weak," because in the immediate future, the PLA will be inferior in military technology when compared to the other regional powers.

Huang Hengmei, "Kongjun zai gaohan shanqu bianjing lianhe zhanyi zhong de yunyong" [The employment of the air force in joint, cold, mountainous border operations], ibid., pp. 165-174.

[122] Ji, ed., *Xin sanda sanfang yanjiu,* vol. I, pp. 1-5.

These technological deficiencies require the PLA to employ its best weapons and troops for striking carefully selected targets in order to force a swift victory. Indeed, Chinese soldiers always favor launching multifaceted attacks instead of fighting decisive battles, regardless of level of modernization.[123] There is mounting evidence that focused attacks, along with their advantages in numbers, geography, and willingness to risk casualties, would enhance the lethality of PLA operations for achieving strategic objectives in the shortest possible time, and ultimately defeat an opponent.

The Chinese idea of focused strikes is thoughtful and dynamic, but it seems problematic and sometimes laden with contradictions. To the PLA, well-designed attacks normally have one main attack direction or target—the center of gravity—upon which they concentrate superior firepower and manpower and several minor directions devoted to confusing and harassing an opponent for dispersing his attention and forces.[124] In analyzing the most recent foreign wars, Chinese military analysts have made some interesting generalizations about focused attacks. As they observe, air power has superiority over infantry and naval surface ships. Land-based air defense systems, however inefficient, will pose serious threats to and may easily deter an opponent's air attacks, and ballistic and cruise missiles are the most effective means to strike high-value targets located deep in an opponent's rear. The dominant exhortation is to avoid fighting symmetric warfare. If the opponent is interested in long-range attacks, the PLA should fight close combat; if he wages asymmetric strikes, the best counter strategy for the PLA is to launch guerrilla counterattacks.[125] The problem for the PLA, however, is that by using increased operational awareness and strong firepower mobility, the opponent may quickly identify the PLA's attack direction and intention. If the enemy then rapidly shifts the focus of its attacks to block the Chinese main attack, the effectiveness of the PLA's focused strikes become an open question.

Technology now changes the battlefield so rapidly that previous successful practices can no longer guarantee a future technological edge. The changing nature of warfare further impels the PLA to develop some emerging technologies for tomorrow's joint operations. The high degree of accuracy and lethality of high tech munitions suggests that achieving the same results with dumb munitions requires fewer weapons. This would also minimize the cost of logistics that has frustrated the PLA for generations. Despite a lack of technological edge in GPS systems, space reconnaissance networks, high-accurate targeting technologies, and precision-guided munitions, the PLA high command asserts that it has some capability to execute focused attacks. But the effective striking systems might not ensure combat success, while the wrong system clearly guarantees failure. Without adequate technologies, the PLA is pre-determined to

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[123] Yu, *Xiandai jingong zhanyi zhuyao wenti yanjiu,* pp. 180-192.

[124] Zhou, *Ludi bianjing zuozhan zhanshu yanjiu,* p. 45.

[125] Jiang Lei, *Xiandai yilie shenqiang zhanlüe* [Contemporary strategy of pitting the weak against the strong], Beijing: Junshi Kexue Chubanshe, 1997, 182-190; Yu, *Xiandai jingong zhanyi zhuyao wenti yanjiu,* pp. 187-190; and Gao, eds. *Lianhe zhanyixue jiaocheng*, pp. 82-83 and pp. 142-146;

fight asymmetric strikes for neutralizing the opponent's superiority even in a distant battlefield. Given homeland defense missions, the near-term proficiency of the Chinese asymmetric strikes is, of course, unrivaled.

Emerging combat systems will inevitably enhance the decisiveness of the PLA's asymmetric strikes. Pushing for asymmetric strikes largely reflects the PLA's gradually improving operational capabilities and the Chinese tradition of operations. Taking advantage of such momentum would offset the technological superiority of a powerful opponent, force him to accept the Chinese way of fighting, and drag him into operations he prefers to avoid. After all is said and done, a great deal of uncertainty or, more precisely, incalculable disadvantages in weaponry, raises serious questions about the effectiveness of well planned asymmetric strikes. However gratifying they may be intellectually, the PLA at this stage seems only to express its aspirations, but its resources and options for reaching these ambitious goals are insufficient, ignoring the possibility of being compelled to fight its opponent's style of operations. If the PLA is drawn into operations it disfavors, this, more than anything else, will be a real challenge for China.

Sustainability

The PJO formally recognizes that sound logistics is combat power. However, integrating support and weapon systems (*peidao*) or providing logistics support to meet high demands of joint operations is one of the toughest challenges faced by the high command. For the last two decades, the PLA has promoted the idea of "integrated support for peace and war" that reflected then-Chinese leader Deng Xiaoping's long-time advocacy of a pragmatic, balanced approach to logistics-rebuilding, in contrast to Mao's idea that called for building strategic support bases in the deep rear with service-oriented support networks for operations. The traditional linear support system seemed to serve the PLA well in an earlier era, when Beijing primarily restricted to operations inside China, where support units, militias and society could mobilize their unlimited local resources for operations.[126] In the face of new, more demanding missions, Deng's and Mao's support systems have left the PLA well-prepared for military modernization programs to address a massive foreign invasion, and ill-prepared for joint operation along or outside the periphery of Chinese borders. The disconnect between the PLA's support system and emerging new operational scenarios prompted new logistics reform initiatives and mechanisms for implementing "integrated planning, focused support."

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[126] Guofang Daxue Keyanbu, eds., *Gaojishu tiaojian xia jubu zhanzheng zhanyi houqin baozhang yanjiu* [A study of operational logistics support under the conditions of high-tech limited war], Beijing: Guofang Daxue Chubanshe, 1996; Xu Genchu, eds., *Deng Xiaoping houqin jianshe sixiang yanjiu* [A study of Deng Xiaoping's thought on rebuilding logistics support], Beijing: Guofang Daxue Chubanshe, 1997; and Yu Xueting, eds., *Gaige: shexian baozhang youli de biyou zhilu* [Reforms: An only way to ensure effective logistics support], Beijing: Guofang Daxue Chubanshe, 1998.

Digitized Logistics

There was quick consensus in the PLA about the need for logistics reforms, and the high command initiated the building of a digitized support system as part of war zone restructuring. The appetite for digitized support is aimed at strengthening the ground forces interoperability with the other services for fighting joint operations. The quantitative and qualitative innovations, which have signified the end of dependence on nonprofessionals for logistics support, are now plainly evident. The PLA's proposed joint "just-in-time system," connecting the command headquarters with supply, rescue and maintenance units through shared information networks, will negate the previous systems tailored to the particular needs of the services and geographical war zones.[127] The PLA is concerned about local support units under the service or war zone commands squandering resources for building and running their customized systems, and concerned that incompatible systems, data and methods may neutralize their interoperability and response capability. Nevertheless, it should be noted that the military leaders appreciate the benefits of such managed competition, which often serves as a pilot project for additional reforms.

While the PLA's plan for developing a digitized support system remains largely aspirational, the joint support command also remains deficient, not so much in deciding what to do, as in the ability to push for a digitized support system and to get it done. As a whole, building a digitized support system has won political support across the services, since the collaborative relationships will no doubt cut costs through digitized information systems, bulk purchasing, and staff. For better or for worse, the PLA also finds that although there are no serious objections about building such a system, it has failed to address the question of the cost of a system that can sustain truly joint operations. Put another way, the high command should assure the other services that the ground forces-centered digitized support system will not be constructed at the expense of their resources and expertise. The barriers to the integration of programs, which require compromise and putting self-interests at the margins, force the PLA to take one step backward and two steps forward.

A digitized support system is, in fact, designed to promote a proactive, not reactive approach to logistics reforms.[128] Despite early efforts to bring joint operations and support systems into alignment, which will inevitably streamline overlapping agencies, reduce stocks of unnecessary weapons and equipment, and improve support efficiency, bureaucratic norms and pressure have an almost overwhelming resisting force. The services and war zones continue to defend their support programs and perspectives. More importantly, the planned digitized support system seems incompatible with, and does not fully fit into, the force structure, which is more rigid institutionally. The army-controlled joint logistics department, to some extent, also undermines digitized support mechanisms: the army itself has not yet been digitized and retains its hold on policy

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[127] Yuan Zhimin, "Ershiyi shiji shuzihua budui de houqin baozhang" [Logistics support for the 21st century digitized forces], in *Xiangzhe xin shiji de zhaoyang,* ed., Fei, pp. 642-648.

[128] Xu, eds., *Deng Xiaoping houqin jianshe sixiang yanjiu*, pp. 156-158.

influence and implementation decisions, but it has no outstanding command skills, organizational abilities, and expertise for service acquisition and distribution. Absent deeper structural reforms, the joint logistics department will be incapable of providing just-in-time support for joint operations.

As a partial solution, the PLA has introduced a "focused logistics support" project to sustain assaults in a key strategic or operational direction. Having shifted away from just-in-time support, this "just-in-case" support relies on joint support groups, consisting of war zone rapid-response support brigades and services support units. The immediate benefit of building a cross-war zones, cross-services just-in-case support system is obvious: it could augment operational efficiency and sustainability. The rapid response support groups are largely based on newly restructured mobile ammunition, fuel, medical, transportation, repair, and supply depots units, which are commanded by either sub-departments of the war zone joint logistics department or logistics departments of the war zone-based services. On the battlefield, the army's rapid response brigades are responsible for operations conducted by group armies and for supplying interchangeable materials, spare parts and equipment for other services. The navy, the air force, and the second artillery, on the other hand, rely on their special technical support units for operations.

On balance, the readiness of joint logistics support to face operations is progressing. Despite the digitized support initiatives and mechanisms, the basic support pattern is consistent with the old logistics system, partly because the PLA's commitment to building the digitized support system seems a highly political statement with little concrete military impact in the near future and partly because the war zones and services have little hope of accomplishing this mission on their own in the era of rapidly technological change. So far, there has been no joint structure responsible for developing the digitized support system. To the high command, a slow, piecemeal approach is safe and acceptable to avoid organizational and operational disasters, though it will risk lagging far behind combat demands.

Support Priorities

A sensitive issue associated with ongoing logistics reform is how to enhance integrated joint structure support while balancing service support priorities and ending the competition for support. This new "old" problem, long ignored by the high command, has already caused problems for the PLA's aspirations for joint operations. The majority of PLA weapon and support systems were conceived, designed, and developed in the 1960s and 1970s. During this period the PLA "leapfrogged" development stages or shrank the lengthy experimentation stage in cutting the time needed to achieve counter-force capabilities. As a result, the systems often ended up mismatched with no thought about the technologies and resources that would be necessary to integrate them. In the 1990s, the PLA purchased some advanced weapons as a cost-saving and time-saving device and then attempted to incorporate them into the old support system. The consequence of fielding these incompatible systems was to inhibit the PLA's attempts to accrue improved combat effectiveness. The need to consolidate this "Tower of Babel" of

support systems is even more pressing today in the face of potential foreign threats to Chinese security.[129] One positive result, however, is that constant debate on the integration issue is in fact now fostering more cooperation among the services on the issue of developing integrated combat support systems. The need to integrate support is now a fact of life, not a policy choice that can be turned up, down, on, or off in the hands of the PLA. By and large, cooperation is on the rise and is leading to broader structural reforms in an effort to rationalize resource utilitization.

A centralized, digitized support system for interchangeable goods, as proposed, will enhance PLA jointness by tightly linking a decentralized support system for special goods of the navy, the air force, and the Second Artillery.[130] This joint approach will presumably offset the vital weakness—a ruthless competition for resources inherent in the traditional support system. In the past, for example, a service-centered, top-down support system from war zones to group armies to divisions totally neglected horizontal supply relations among group armies, naval bases, air force armies, and Second Artillery bases. The old system was reflective of traditional operations, but increasingly ineffective. The new joint support system is devoted to developing sustainable, efficient, mobile capabilities for operations. It may result in the shrinking, if not abolishing, the division of power and reduce supply depots, hospitals, and stocks of unnecessary equipment and weapons. Though controversial within the PLA, the programs have not yet caused serious strains in service relations and, over time, the services will likely accept the changes in resources, organization, and, of course, power. This kind of restructuring is most likely to be repeated over and over again as the PLA attempts to manage emerging ideational, organizational, and technological changes.

The air force gives support priority to the "core" forward airbases close to the periphery of land and maritime borders, where it will launch preemptive, asymmetric strikes or meet and thwart attacks or counterattacks. In substituting cheap equipment with expensive and complex equipment devoted to improving night-fighting, poor-weather and over water capabilities, the 1990s saw the substantial expansion of support requirements, with emphasis on large transport aircraft parts procurement, stocks of special fuels and munitions, refueling technology, bomb and missile loading, rapid response and communication networks within, to, and from air bases. Thanks to the upgraded logistics support system and consequent efforts to make new weapons systems and support personnel compatible, the air force has shifted its priority to management of

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[129] Ren Jian, "Wojun houqin zhuangbei jianshe kuayueshi fazhan de jidian sikao" [Reflections on the surpassing development of our army's logistics equipment], and Wang Haiyang, "Xiang peitao yaogendue genda de zhandouli" [Asking match to produce more combat effectiveness], in *Xiangze xinshiji de zhaoyang,* ed., Fei, pp. 571-576 and pp. 583-588.

[130] Ouyang Zhaobiao, "Xinshiqi wojun houqing baozhang tizhi gaige de shexiang" [Views on reforms of our logistics support system in the new era], in *Gaige: shixian baozhang youli de biyou zhilou*, ed., Yu, pp. 62-63.

technical support units.[131] Though these improvements conjure up a dramatically exaggerated image of strength, the headquarters are embarrassed by increased flight accidents. The primary causes for such accidents are inadequate training, skill-based errors, and poor management of support staff and technicians. The inability of the support units to conduct proper inspections on or repair new weapon systems, especially in the case of the Su-27, constitutes a real problem: lacking high quality maintenance skills undermines the performance of the weapon systems and though qualified staff and technicians could guarantee a measure of improved combat effectiveness, it will take time to train them at home or abroad. If commanders and commissars can confront key issues, such as the quality of support professionals and a constant turnover of conscript personnel, the efficacy of military education and promotion, and competing with economic development of soldiers' hometowns, the air force will, of course, will overcome operational dilemmas. But as they lack political mechanisms and economic incentives to execute the tasks, the goals seem to far exceed their capability. Fully accounting for such human, systemic, and compatibility factors will strengthen the utility of the air force as a coercive instrument of the PLA.

The logistics priority of the navy is different, but complementary, favoring the development of a long-range, off-shore support capability designed to transform its land-based support networks to sea-based supply networks. This forward support initiative emphasizes the protection of national interests in distant seas through force projection and at-sea sustainability. Following the PLA's advocacy of developing strong logistics support, the navy clearly recognized its fatal weaknesses in some critical areas. First, the inflexible land-based support system had inadequate mobility for projecting forces, for providing any rapid response, and for sustainable support for at-sea operations. But political decisions in response to restructuring the systems always fell short of promises and expectations. Second, PLA Navy logistics support equipment as a whole is far behind the development of its weapon systems. This handicap, together with lack of resources, forces the navy to re-emphasize the quality of soldiers instead of critical structural and financial issues, in the hope of fostering support efficiency. Finally, as a result of their low self-defense capabilities, support units in the navy can not secure their own survival

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[131] Li Guofan, "Zhaoyan kongjun budui tedian jiaqiang hangkong gongcheng jiwu he houqin baozhang renyuan ganli" [Following the nature of the air force, strengthening management of aviation technicians and logistics support staff], in *Xiangze xinshiji de zhaoyang,* ed., Fei, pp. 654-658; Ma Yue, "Dui zuohao xinxingshi xia jiwu zhanshi sixiang gongzuo de sikao" [Reflections on indoctrinate aviation technicians under new environments] in *Xin xingshi xia jundui zhengzhi gongzuo tedian guilu yanjiu* [A study of characteristics and regularities of political work under new environments], ed., Lu Jiashu, Beijing: Guofang Daxue Chubanshe, 1999, pp. 184-189; Chen Weigang, "Guanyu jianli heli gaoxiao de kongjun houqin baozhang tixi de jidian sikao" [Reflections on building a reasonable, high efficient logistics support system of the air force], in *Gaige: sixian baozhang youli de biyu zhilu,* ed., Yu, pp. 127-133; and Zhang Jian, "Qiantan gaojishu tiaojian xia kongzhong jingong zhanyi zhanqiu kongjun houqin baozhang" [Brief discussions of war zone's air force logistics support in offensive air operations of high-tech conditions], in *Gaojishu tiaojianxia jubu zhanzheng zhanyi houqin baozhang yanjiu* [A study of operational logistics support under high-tech conditions of limited war], eds., Guofang Daxue Keyanbu, Beijing: Guofang Daxue Chubanshe, 1996, pp. 625-632.

in the case of any combat missions.[132] Under operational pressure, the navy is turning its eyes to building required offshore and oceangoing support capabilities, including large transport vehicles, multifunction supply vessels, medical ships, airbase support systems suitable for handling different types of deployed aircraft, and in-flight refueling technology, with the goal of providing enhanced service to its nuclear/conventional submarines, Su-27/30 fighters and Sovremenny-class destroyers.

Like the air force, the navy faces the challenging issues of a severe shortage of well-trained professionals and low retention rates. The initial focus on these issues is perhaps a reflection of the PLA's interest in balanced relations between weapons and soldiers. With its deepening personnel reforms, the navy has successfully replaced illiterate or semi-illiterate peasant soldiers with "educated" petty officers, who now occupy roughly "60 percent of the total naval force and 80 percent in surface, submarine, and aviation units." Such transformations are not quick-fix solutions and do not necessarily imply that the navy is more professional than before, either. On the contrary, the navy is simply selecting "the best among the worst." According to the statistics, "70 percent of them have diplomas of junior high school and some only have diplomas of elementary school." [133] At the same time, those well-educated professionals are increasingly dissatisfied with living standards and lifestyles in the barracks, while the poorly educated ones unable to properly handle their new equipment become the backbone of support units.

The PLA has made some notable achievements in enhancing support capabilities. Support units now enjoy strategic importance after decades of neglect. However, the real improvements in priority areas are unimpressive. Some hot topics, for example, such as building multifunction airbases for handling different types of deployed aircraft and multifunction oceangoing support vessels, were raised ten years ago. Since then, the PLA has repeated the need for action in almost all of its conferences on logistics support, but little has been settled, perhaps due to limited budgets. This interesting phenomenon demonstrates that the military leaders need to focus on organizational and financial issues. Without political support, the counter-momentum or the unbalanced development of weapon and support systems would prevail.

Making Reservists Meaningful

As part of Chinese military modernization programs, the PLA is wisely investing its scarce resources in building logistics reserve units in partnership with local governments and the larger society. The most distinct characteristic of this shift is entrepreneurial efforts to adapt to the emerging economic system and the clever use of civilian resources, allowing more military influence over non-military policy

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[132] Pu Ruinan, "Dui haijun houqin jianshe kuayue fazhan de sikao" [Reflections on the surpassing development of the naval logistics], in *Xiangze xinshiji de zhaoyang,* ed., Fei, pp. 659-666.

[133] Haijun Silingbu Junwubu, "Guanyu jiaqiang xinxingshi xia haijun shiguan duiwu guanli jiaoyu de sikao" [Reflections on strengthening management and education of naval sergeants in the new environments], in *Xinshiqi jundui guanli tedian guilun tantao*, eds., Zongcanmoubu Junwubu, pp. 374-384.

considerations and more civilian influence over PLA building. To the PLA, this inexpensive logistics reserve system responds well to the collapse of the planned economy, which seriously challenged the support system upon which the Chinese soldiers used to heavily depend. The match between aspirations and resources will present choices for multifaceted logistics support programs with regard to selecting quality products at competitive prices. Moreover, it helps shift military R&D and investment priorities in the areas of advanced and lethal weapons and makes the leap into the information age.[134] As expected, the logistics reserve units would carry out more missions and perform professional support more efficiently.

The best asset of the naval reserve units is a powerful, modern and specialized Chinese merchant marine, a giant fishing fleet, and well-trained, experienced sailors or fishermen (most of them are decommissioned naval officers and soldiers). The numbers and tonnage of the combined forces for extensive export-import transport capabilities and fishing business clearly generate the foundation for achieving global mobility and sustainability. Together with intensive training programs sponsored by the navy and local governments, the reservist promises to become even more specialized. Yet, under the influence of a decades-old focus on combined operations, this optimized support capability had been oriented toward land missions, especially for coastal defense, culminating in the birth of the navy's first reserve unit of an anti-aircraft artillery division in 1984 under the command of the Lushuen Naval Base. With increased reach capabilities, the navy has shifted its reserve priority to surface warships, aviation support units, and surface-to-ship missile professionals. This transformation, the navy hopes, will help it quickly reconstitute combat and support units capable of executing independent missions in the event of maritime conflict. The main hurdle for the reserve units since the beginning of the program, however, has been with the total failure to register the required number of professional reservists suggested in 1983 and approved by the GSD in 1992.[135] The registration mechanism is still up in the air and has fallen victim to the dynamics of local power politics and government-business relations. But naval prescriptions for reserve functions are surely encouraging.

The future for organizing air reserve units looks promising, with advanced jumbo jet fleets and American/European-trained pilots flying around the world every day. But the air force and the army aviation branch face serious challenges. During the past two decades these units have been received too little attention to achieve the stated professional desires and ambitions. Whatever may be said about declared goals, the reality is that they do not possess any reserve pilots to fulfill future missions. Though air power is now a critical element in warfare, there are no special agencies in the PLA

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[134] Gao, ed., *Lianhe zhanyi xue jiaocheng*, p. 81; and Xu, eds., *Deng Xiaoping houqin jianshe sixiang yanjiu*, pp. 93-106.

[135] Tang Keshen, ed., "Xinshiqi haijun houbei liliang jianshe mianlin de zhuyao renwu" [Major missions faced by building naval reserves in the new era], in *Weile daying mingtian de zhanzheng,* eds., Guofang Bianjibu, pp. 184-188; and Chen Yueqi, "Weilai junshi douzhan zhong de minchuan dongyuan" [Drafting civilian vessels in future operations], in *Xiangze xinshiji de zhaoyang,* eds., Fei, pp. 519-522.

headquarters, the air force, or the provincial commands that are responsible for air force mobilization. It is hard to believe that thoughtful PLA planners would actually neglect these important institutional issues. Yet, it also highlights the air force's and army's inability to manage service politics and civil-military relations: with limited resources, the air command has to cut some air transport units in an effort to maintain quality combat units, while the army aviation branch is unable to purchase long-requested but long-delayed multi-use helicopters. Without reserve pilots and civilian air fleets, there will be no sustainable development. One solution is to regroup civilian pilots for future airlift missions.[136] However effective, the core Chinese airlines are concentrated in three major cities—Beijing, Shanghai, and Guangzhou--so that it is impossible for the air force, as opposed to the navy, to organize reserve divisions and regiments associated with the war zones and provincial commands. The regional air force units, at least, currently have no direct access to local civilian pilots for local missions. In short, the air reserve support potential is severely restricted. It is also important that the air reserve issue has already acquired a status that will enable the air force and the army to entertain a far wider security policy option spectrum than ever before. Time may be on their side.

Like the other services, the Second Artillery understands that its regular forces are operating in increasingly transparent and therefore dangerous battlefields. Its survival from an opponent's first strike or counter-force strikes will depend on the readiness of the reserve brigades and regiments it has built since 1994. Forging an alliance with civilian high-tech sectors, the reserve units start with intensive basic training programs. After having accomplished these training programs, they normally conduct joint training with regular units to improve their skills and to increase the cohesion between them.[137] This ambitious practice requires the organization to maintain high-quality, rapid response reserve units similar to regular units, so that when needed, the second Artillery can easily incorporate them into the regular units. In sharp contrast to the other services, the missile reserve units, by design, are not expected to fight independent battles or execute support missions. Instead, they prepare for being subsumed into the regular combat and support units. This approach to building reserve units has been disappointing. The top-secret status of the Second Artillery has ruled out any chance for the reservists to have access to advanced missiles and support systems. As long as their training programs remain basic, the missile command recognizes their "push-button readiness" will be very limited. The Second Artillery is trying to create a bigger pool of reservists so as to select the most competent civilian professionals, such as engineers, technicians, skilled workers from missile factories, IT experts, and university teachers, for potential combat and support

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[136] Ba Jianmin, "Shiying gaojishu jiubu zhanzheng xuyao jiaqiang kongjun houbei liliang jianshe" [Strengthening the buildup of air reserves for meeting demands of high-tech limited war], in *Weile daying mingtian de zhanzheng,* eds., Guofang Bianjibu, pp. 189-193.

[137] Dierpaobing Silingbu Junwubu, *"*Zhaoyan gaojishu jubu zhanzheng tedian jiaqiang erpao yubeiyi budui zhiliang jianshe" [Paying attention to characteristics of high-tech limited war, strengthening the qualitative building of the second artillery reserve units], in *Weile daying mingtian de zhanzheng,* eds., Guofang Bianjibu, pp. 194-198.

missions. These people become an important adjunct to Chinese strategic and theater missile capabilities.

With the strong partnership among the services and between the military and the civilian sectors, the PLA repeatedly stresses the seamless integration programs central to the rebuilding of its support forces for preemptive, information, asymmetric strikes. The fully integrated support system in the end likely offsets the PLA's inferiority vis-à-vis an opponent's superiority in weapons and technologies and offers a glimmer of hope for winning joint campaigns. Within the context of delicate political and economic reforms, however, they might also portend that the expected integration programs aimed at shrinking the division of power will not be easy to achieve in the immediate future and pose exceptional dangers to the PLA's dysfunctional support systems. Therein, perhaps, the core question remains.

CONCLUSION

The PLA has praised and extolled science as the basis for developing the PJO and it's the paradigm for joint operations. Like a language, the Chinese paradigm is marked by long-periods of steady refinement and serves as a framework for both understanding and perceiving joint operations in shared terms. But it does not provide soldiers with rules or instructions for executing operations; instead, soldiers themselves determine how these scientific achievements are to be used and what particular pieces stand in proper analogy to it. Throughout the slow, discontinuous jumps from one theory to another, the developmental path reflects the PLA's deep ideational, institutional, and operational concerns, and will have potential implications for the ways the PLA will build a more modernized force for initiating lethal strikes against a technologically advanced opponent along and outside the periphery of Chinese maritime and land borders in the foreseeable future.

First, the PLA is increasingly obsessed with new ideas or new ways of thinking. These ideas have become instrumental in defining and justifying the Chinese paradigm of joint operations. To fully understand the new ideas or new ways of thinking, the PLA has closely monitored theoretical and empirical developments in joint operations abroad and has selectively borrowed operational concepts whenever and wherever it is necessary. Meanwhile, it is cautious about importing foreign ideas that might be inconsistent with, if not upset China's situation or contribute to misplacing operational priorities. This dynamic interaction captures the complexities and nuances of the PLA's operational concept development process. The resulting consensus on foreign ideas does more than simply enlighten soldiers and validate the operational charter for the future. The political and cognitive impacts of the new ideas help create coalitions of interests, give intellectual force and inspiration to the PLA, and ultimately change minds for falsifying Chinese concepts and approaches clearly irrelevant to today's, if not tomorrow's operations. To make rational adjustments, the PLA is openly committed to the new ideas for defending the PRC's national interests. The conceptual gap further suggests that the PLA is and will continue to follow the great powers in shaping its operations. Yet lack of creativity and innovation precludes or, at least minimizes, its chance to be a real military power in the near future.

Second, the institutionalized aspects and the resulting institutional reforms, designed to enhance combat capability dominate the politics of joint operations. The PLA

acknowledges that its war zone C^2 structure and staff are increasingly incapable of meeting urgent needs of joint operations and will remain so. In order to make them more joint, the PLA will need to create synergies by assigning well-trained staffs to command centers to execute the joint C^2 mechanisms. To avoid paralyzing the well- established C^2 hierarchy, a compromise, interim solution for unified C^2 in war and service-centered C^2 in peace appears to present a practical means to deal with joint operations, but it does not solve disagreement associated with the possible shrinking of service commands and authority. Driven by bureaucratic resistance to jointness, the services may be tempted to go looking for new ways of maintaining their institutional independence. Though the contradiction between jointness and independence or shift in orientation from jointness to independence has not challenged the idea of equal partnership, the effectiveness of joint operations would be in jeopardy. But the PLA is clearly interested in neither shelving the structural and personnel issues nor solving them once and for all, at least now.

Third, the PLA's threat perceptions, however conceptualized, strongly affect its new ways of fighting, which are undeniably preemption-oriented. The surge of overwhelming support for such shared posture and dynamic has culminated in a search for powerful counter strategies and lethal military assets, since the somewhat more assertive PLA sees its combat potential seriously at risk. When honestly assessing the risks, the PLA quickly identifies systems and technologies and attempts to integrate them as the core for incorporating "pockets of excellence" into old models of hardware and software for improving its overall combat performance. Due to foreign technology transfer and domestic research efforts, the recently achieved momentum of integration is maximizing the utility of available resources. Success will depend on the PLA's ability to translate civilian or dual-use technologies into military muscle. As a result of political and financial barriers, the planned systems and technologies integration programs will more likely take some time. This reality will make PLA preemptive, information, asymmetric strikes less threatening than they first sound.

In the final analysis, "you fight your way, we fight our way" is the core of PLA joint operations. Given the fact that the PLA spent almost ten years developing the sophisticated PJO, the next phase of its mission will be more difficult and more frustrating than before, exclusively focusing on the training and integration programs in order to make the services joint and powerful. With this mission in mind, it appears safe to say that the PLA will need even more time to upgrade operational potential. Fighting fully integrated operations in this decade will, at best, be a dream, not a reality. But the PLA is slowly moving in the right direction for meeting tomorrow's operational challenges.

3. THE EVOLUTION OF CHINA'S MILITARY STRATEGY: COMPARING THE 1987 AND 1999 EDITIONS OF *ZHANLÜEXUE*

By M. Taylor Fravel[138]

Doctrinal reform has been one of the most important elements of the PLA's modernization drive over the past decade. Nowhere is the importance of such reform more apparent than in the transformation of China's approach to military strategy. For China's military thinkers, strategy has always been linked to planning and guiding military operations and the use of force – in general terms, how to wage war. Before 1985, the PLA planned to fight only one type of war with a specific adversary, namely a total war fought to counter a Soviet invasion. In 1985, the Central Military Commission (CMC) shifted from total war to a range of local wars with limited objectives greatly increased the scope and complexity of the planning problem that strategy aims to address. As this chapter will argue, this shift to local war required a dramatic broadening of the China's approach to military strategy to guide the use of force in a much more complicated security environment.

To demonstrate this transformation of China's approach to strategy, this chapter adopts a comparative research methodology. The essence of the analysis is a comparison of two key teaching texts, both entitled *Zhanlüexue* (*Science of Military Strategy*; 战略学), that were published in 1987 and 1999. As reference materials for senior officers, both books are authoritative statements of the PLA's military strategy at two very different periods of doctrinal evolution. The 1987 edition offers a limited approach to strategy based on People's War Under Modern Conditions, using positional and mobile warfare along with combined arms operations to counter a Soviet invasion. The 1999 volume, by contrast, outlines a broader approach to strategy based on preparing to fight a range of local wars under modern high-tech conditions (LWUMHTC) that vary in objectives, intensity and lethality.

Before proceeding several caveats are in order. First, this chapter consciously attempts to avoid 'mirror imaging' by discussing China's approach to strategy in terms of US doctrinal concepts. In US military publications, there is no book that corresponds to *Zhanlüexue*.[139] In this chapter, "strategy" refers to the Chinese word "*zhanlüe"* and its implications as contained in key texts. While it is important to place China's doctrinal concepts in a comparative context, this chapter offers a thorough examination of how the PLA currently defines and understands strategy as part of its military thought. Second,

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[138] Special thanks to Xue Litai, David Finkelstein and Iain Johnston as well as conference participants for helpful discussions on this topic.

[139] The closest document is probably JP 3-0, *Doctrine for Joint Operations*, but in Chinese terms this seems to be a combination of *Zhanlüexue* and *Zhanyixue*.

the discussion in this paper is strictly conceptual, examining the role of strategy in China's evolving military doctrine and the guidance that it offers for military planning. I do not discuss the fit between the requirements of this strategy and the overall operation and organizational capabilities of the PLA, a topic that has been explored previously, especially by Godwin.[140] Finally, this paper focuses only on conventional strategy and excludes nuclear strategy.[141]

This paper proceeds in six parts. The following describes in detail the books that are used for the comparative analysis and demonstrates why they are authoritative reflections of different Chinese approaches to strategy. The second section describes and defines China's basic strategic concepts to outline the Chinese framework of analysis for strategy. The third section reviews briefly the content of China' strategy in the 1987 *Zhanlüexue.* The remaining sections examine in detail the content of China's strategy in the 1999 *Zhanlüexue*, contrasting strategic guidance for general wars, local wars and peacetime military struggles.

BACKGROUND TO THE TEXTS

The heart of the analysis in this paper is a comparison of two key PLA teaching materials on military strategy. The first book, entitled the *Science of Military Strategy* (*Zhanlüexue*; 战略学), was published in 1987 by the Academy of Military Science (AMS).[142] The second book, also entitled the *Science of Military Strategy* (*Zhanlüexue*; 战略学), was published in 1999 by research professors at the PLA's National Defense University (NDU).[143] The chief editor of the 1999 edition was Major General Wang Wenrong (王文荣), who is currently Vice President of NDU. Other members of the editorial board include Major General Ma Bao'an (马保安) and Major General Zhu Chongfeng (朱崇锋), both from the NDU's Strategic Studies Department, and Senior Colonel Ma Ping (马平), director of the NDU's Training and Education Department.

These books can be viewed as authoritative statements of China's military strategy at different points in time for three reasons. Both books have been used extensively as pedagogical teaching materials for the PLA's senior officer corp. The 1987 book, which was *neibu* (内部), was approved for distribution to all officers at the division level and

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[140] Paul H. B. Godwin, "Compensating for Deficiencies: Doctrinal Evolution in the People's Liberation Army, 1978-1999," in James C. Mulvenon and Andrew N. D. Yang, eds., *Seeking Truth from Facts: A Retrospective on Chinese Military Studies in the Post-Mao Era,* Santa Monica: RAND, 2001, pp. 87-114.

[141] The evolution of China's nuclear strategy is covered in the Chase & Medeiros chapter of this volume.

[142] Gao Rui, ed., *Zhanlüexue* [Science of military strategy], Beijing: AMS Press, 1987. Debate revolves around why this book, as a set of teaching materials, was published by the AMS and not NDU. Interviews suggest that this was largely a historical accident, as the NDU had only been established two years earlier, in 1985, and had not yet begun to publish its own texts.

[143] Wang Wenrong, ed., *Zhanlüexue* [Science of military strategy], Beijing: NDU Press, 1999.

above. The 1999 book, in draft form, was used throughout the 1990s as the core teaching text for the NDU's strategy course. In addition, these books were published in response to key changes in China's strategic orientation. The 1987 book captured the changes in China's strategic thinking after an enlarged 1985 CMC meeting, which endorsed Deng's shift from preparing for total war to preparing for local war. Drafting of the 1999 edition began in the aftermath of the 1991 Gulf War and the shift to preparing for Local Wars Under Modern High Tech Conditions. Finally, both books were "chopped" by leading units within the PLA. The 1987 book was approved by the CMC, while members of the General Staff Department (GSD) and all of the service branches participated in the drafting of the 1999 edition.

As "authoritative statements" of strategy, these books serve as representative examples of the PLA's approach to strategy during different periods of doctrinal evolution. However, as teaching texts, they do not necessarily represent the most comprehensive or complete statements of strategic thinking. As the 1987 book was published, Chinese strategists were already thinking and writing about how to fight local, high-tech wars. By 1999, Chinese strategists had already started to assess in great detail the implications of the RMA for future strategy and operations. In the analysis below, these books are viewed as baseline reflections of the PLA's understanding of military strategy as an organization and illustrations of the dominant approaches to strategy in the mid-1980s and the late 1990s, respectively.

The 2001 *Science of Military Strategy* (*Zhanlüexue*; 战略学), compiled by the Strategic Studies Department of AMS, has been excluded from this comparison. The 2001 book has a lower likelihood of representing the current approach to strategy among the PLA leadership because it has not been used as teaching materials in training courses that were designed to communicate doctrine in the organization. In addition, the AMS volume does not appear to have garnered the same high level support from within the PLA that the 1999 NDU book received, including the General Office of the GSD among others. While this volume may offer fruitful insights into future points of contention or debate among China's strategists, it may actually be less authoritative in terms of understanding the PLA's current approach to waging war. Finally, in terms of actual content, the 1999 NDU and 2001 AMS editions are actually quite similar, especially the discussion in the 2001 edition of China's strategy for LWUMHTC. Some sections of the 2001 AMS edition also appear to have been copied directly from the 1999 NDU volume.

An important companion to the 1999 NDU edition is the *Study Guide for Strategic Theory* (*Zhanlüe Lilun Xuexi Zhinan*; 战略理论学习指南), which was compiled by the same team of NDU scholars and published in 2002.[144] This book is apparently the NDU's response to the critique posed by the 2001 AMS edition. Substantively, it clarifies several aspects of China's current strategic thinking, especially in terms of the definition of strategy, the role of active defense and the operational arts. Other important sources on strategy include Zhang Wannian's 1999 book, *Contemporary World Military Affairs and China's National Defense* (*Dangdai Shijie Junshi Yu Zhongguo Guofang*; 当代世界

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[144] Ma Baoan, ed., *Zhanlüe lilun xuexi zhinan* [Strategic theory study guide], Beijing: NDU Press, 2002.

军事与中国国防), which provides a succinct summary of China's military strategy and can be viewed as relatively authoritative given the rank of its editor.[145]

THE VOCABULARY OF STRATEGY

In Chinese doctrinal writings, strategy (*zhanlüe*; 战略) and military strategy (*junshi zhanlüe*; 军事战略) are used interchangeably. In most cases, Chinese writers will only use 'strategy' when they mean "military strategy."[146] In general terms, China's military doctrine can be divided into four levels of analysis.[147] Starting from the highest level of abstraction, these levels are: military thought (*junshi sixiang*; 军事思想), military strategy (*zhanlüe*; 战略), campaigns (*zhanyi*; 战役) and tactics (*zhanshu*; 战术).[148] As will be discussed below, one potentially fruitful way to interpret the PLA's strategic writings is to view strategy as linking military thought and campaigns by providing general guidance for the planning and direction of military operations. The PLA's 'rediscovery' of the operational level of war in the 1990s has increased the importance of studying campaigns in this schema and redefined the position of strategy when compared to previous stages of doctrinal development.[149]

The rest of this section examines the definition of strategy and associated concepts as described by the 1999 NDU edition of *Zhanlüexue*. By offering a detailed discussion of these concepts, this section aims to highlight the varied dimensions of China's current approach to strategy, demonstrate how the concept of strategy has broadened over the past decade and clarify what is meant when Chinese writings refer to "military strategy."

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[145] Zhang Wannian, *Dangdai shijie junshi yu zhongguo guofang* [Contemporary world military affairs and China's national defense], Beijing: AMS Press, 1999.

[146] *Zhongguo junshi baike quanshu* [Encyclopedia of China's military affairs], CD-ROM edition.

[147] As others have noted, China strictly speaking does not have a word for military doctrine. See the Finkelstein chapter in this volume.

[148] For this schema in Chinese military science publications, see Chen Haoliang, *Junshi kexue wenxian xinxi jiansuo zhinan* [Research guide for military science documents and information], Beijing: AMS Press, 2000; Dai Yifang, ed., *Junshi xue yanjiu huigui yu zhanwang* [Review and prospects for military science research], Beijing: AMS Press, 1995 (internal military circulation). Also, see David Shambaugh, *Modernizing China's Military: Progress, Problems, and Prospects*, Berkeley: University of California Press, 2002, pp. 58-59.

[149] As Godwin has demonstrated, the PLA's renewed focus on campaign-level operations began in the late 1970s with planning for countering a Soviet invasion through a combination of positional and mobile warfare. Indeed, in terms of doctrinal evolution, the 2000 *Zhanyixue* stems from these changes that began in the late 1970s. See Paul H. B. Godwin, "Changing Concepts of Doctrine, Strategy and Operations in the Chinese People's Liberation Army, 1978-1987," *The China Quarterly*, No. 112, 1987, pp. 572-590; Godwin, "Compensating for Deficiencies," pp. 87-118.

Basic Strategic Concepts

For the NDU authors of the 1999 book, strategy is defined as "planning and guidance for the overall situation of military struggle, including planning, deploying and guiding the construction and use of military force, to reach the effective achievement of a stated political goal" (1999: 18). The scope of strategy in this definition is quite broad, including threat assessments, overall strategic goals, the main strategic direction, basic principles for conducting military struggle as well as the main means, methods and coordination of military struggle (1999: 22). The NDU authors make clear that the objective of any military struggle is always a political goal and that strategy ultimately serves such a goal. Military strategy is an important part of a nation's overall strategy and must not be viewed as something independent from this overall strategy. Symbolizing a break with past doctrine, military strategy exists to "serve the national interest" (1999: 24).

The NDU's definition is different from those used by previous PLA writings as well as the 2001 AMS volume. Many past Chinese doctrinal writings define strategy as "methods for planning and guiding the overall situation of war," which limits the scope of strategy to the conduct of war and not military struggle more broadly.[150] While the contributors to the 2001 AMS volume offer such a definition, and vehemently stress their differences with the NDU authors, these definitional disputes today are probably more rhetorical than real.[151] Despite its apparently more restrictive definition, the AMS book also covers strategic activities apart from the actual prosecution of war, such as nuclear deterrence, conventional deterrence, arms control and crisis management. To further complicate matters in this debate over the definition of strategy, Zhang Wannian uses the NDU's definition in his 1999 book.[152]

Strategic thoughts (*zhanlüe sixiang*; 战略思想) serve as the foundation for Chinese writings on strategy. Strategic thoughts, which can also be translated as strategic thought or strategic concepts, are "the basic viewpoints for guiding and planning the overall situation of military struggle" (1999: 61).[153] Strategic thoughts refer to foundational principles and concepts of war-fighting and military struggle, but not to any specific guidelines or rules for conducting military operations. This concept of strategic thoughts is linked closely to Mao's own military writings and his central position in modern China's military thought. For the NDU team, two of Mao's most important

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[150] *Zhongguo junshi baike quanshu*, CD-ROM edition.

[151] For an absolutely blistering AMS critique of the NDU definition of strategy, see Yao Youzhi and Zhao Dexi, "The Generalization, Conservation, and Development of 'Strategy,'" *Zhongguo junshi kexue*, 30 September 2001, pp. 120-127 (FBIS: CPP20011126000199). Nevertheless, I believe that this debate represents institutional or personal differences, not substantive ones. In general terms, the content of strategy in the AMS book is quite similar to the NDU one, including the discussion of non-war components of strategy such as deterrence.

[152] Zhang Wannian, *Zhongguo guofang*, p. 177.

[153] Specifically, "指导军事斗争全局的基本观点."

strategic ideas are Active Defense (*jiji fangyu*; 积极防御) and People's War (*renmin zhanzheng*; 人民战争), both of which were originally formulated during the civil war. Mao's other strategic ideas that are less prominent today include protracted war (*chijiuzhan*; 持久战) and guerilla warfare (*youji zhanzheng*; 游击战争) among others (1999: 74). In Western military thought, the analog of strategic ideas are the writings of strategists such as Clausewitz or Liddell Hart, whose concepts to this day remain a part of modern strategic thinking even thought their implications for military operations may have changed.

At the most general level of abstraction, the NDU book describes strategy as a trinity of strategic goals, strategic guidelines and strategic methods. While this trinity parallel ends, ways and means in any generic formulation of strategy, there are some important differences as discussed below. In terms of identifying and defining any particular Chinese strategy, strategic guidelines are most important. Importantly, however, strategic thoughts and concepts strongly influences any particular set of strategic guidelines.

Strategic goals (*zhanlüe mudi*; 战略目的) are the "ultimate result to be achieved through the overall situation of military struggle" (1999: 39).[154] Strategic goals determine the ultimate political objective in any struggle, which is keyed to the national interest. In the 1995/6 Taiwan Straits crisis, for example, the strategic goal of the missile tests and exercises was to attack the forces of Taiwanese independence, an action that was linked to the political goal of maintaining national unity (1999: 40). *Strategic missions* (*zhanlüe renwu*; 战略任务) refer to the operational tasks required for achieving a strategic goal. Strategic goals and missions are the comprehensive reflection of strategic circumstances (*zhanlüe xingshi*; 战略形势), including the main features of the international strategic situation and national security requirements. In wartime, strategic goals focus on operational aspects on the battlefield, such as destroying enemy forces, and maintaining the initiative and the like. In peacetime, strategic goals emphasize safeguarding national interests, namely using military means such as deterrence to create a stable external environment for continued economic development (1999: 38-45).

Strategic guidelines (*zhanlüe fangzhen*; 战略方针) are the "general principles and general programs for guiding the overall situation of military struggle" (1999: 46).[155] Strategic guidelines stipulate how to complete a strategic mission and realize the strategic goal by identifying the key points of struggle, the main strategic directions and related strategic deployments. Strategic guidelines are the "principal part and heart of strategy" (1999: 46). Strategic guidelines perhaps are the closest analog to operational doctrine in Western strategic parlance, though only at the strategic level of war as opposed to the campaign or tactical levels, which are governed by their own guidelines. Past strategic guidelines include People's War and People's War Under Modern Conditions (1978-

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[154] Specifically, "在军事斗争全局上所要达成的最终结果."

[155] Specifically, "**指导军事斗争全局的总纲领, 总原则**"

1985), while as discussed in more detail below the current strategic guideline since 1993 is Local Wars Under Modern High Tech Conditions.[156]

A given strategic guideline generally includes five components. The first is the identification of the strategic opponent, based on the threat to the national interest, and the operational target, based on specific military nature of the threat. The second component of a strategic guideline is the strategic direction, which refers to the focal point of struggle and the center of gravity for the use of force that will decisively shape the overall struggle as well as military deployments and war preparations. The third component is the basic points of preparations for military struggle, which refers to the type of conflict, such as total war vs. local war, nuclear war vs. conventional war. The fourth component of a strategic guideline is the basic methods of military struggle, which refers to the type of struggle such as combat operations versus deterrence, the types of strategic operations such as offense or defense, the main operational forms such as mobile warfare and the main operational types such as blockade. The fifth and final component of a strategic guideline is the guiding thought and principles for the use of military force, which refers to general operational principles to be applied in a conflict, such as whether to gain mastery by striking first or second (*xianfa zhiren*; 先发制人 vs. *houfa zhiren*; 后发制人), or whether to fight a protracted war or a quick decisive war (1999: 136-139). Determination of a strategic guideline thus identifies the organizational and operation requirements for force modernization.

Strategic means (*zhanlüe shouduan*; 战略手段) are "the ways and methods of using military force to achieve an objective, namely what to use to execute military struggle and how to use it" (1999: 51).[157] The NDU book states that both military and non-military means are covered by this definition. Due to rapid changes in military technology since WWII, states can often use non-military means to achieve strategic objectives. The authors identify four types of basic strategic means: actual combat operations, which includes military operations in general war and local war; deterrence operations, which are a primary method of military struggle for achieving strategic goals in peacetime; warning operations, which include strategic early warning, border defense struggles and internal defense; and combat readiness (training) exercises, which include force build-ups, strategic troop transfers, adjustment in deployments, military exercises, war preparedness investigations and weapons tests (1999: 146-167).

All of components of this trinity operate at both general and specific levels. The general level of strategy refers to the strategy for the country as a whole in a given historical moment, while a specific strategy refers to a particular type of conflict or situation that involves the use of force. Most of the NDU edition discusses strategy at the general level, but the definitions and concepts described above operate at both. For example, in addition to the general strategic goal of maintaining territorial integrity,

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[156] As You Ji has argued, China lacked a strategic guideline from 1985 to 1992 because no official '*fangzhen*' had been declared

[157] Specifically, "为了达成战略目的而运用军事力量的方式和方法"

China's specific strategic goal during the 1962 border war with India was to create a period of peace on the Himalayan border (1999: 40). Likewise, the general and specific levels of strategy are manifested in *general strategic guidelines* (*zongzhanlüe fangzhen*; 总战略方针) and *specific strategic guidelines* (*juti zhanlüe fangzhen*; 具体战略方针), such as for a particular war zone or campaign.

CHINA'S CURRENT MILITARY STRATEGY: LOCAL WAR UNDER MODERN HIGH-TECH CONDITIONS

These definitions of strategic concepts clarify descriptions and assessments of China's military strategy. Strategy itself is created through the application of strategic ideas to the prevailing strategic environment and strategic pattern. While strategic ideas endure over time, their implications for military planning and operations depend upon a specific context. China's current strategic guideline, Local Wars Under Modern High Tech Conditions, was developed through the application of the strategic idea of Active Defense to the security requirements of the post-Cold War and post-Gulf War world.[158] As Godwin noted almost 20 years ago, strategic ideas are constant, while guidelines and their implications vary with a given context.[159]

In the Chinese case, People's War and especially Active Defense have been the primary strategic ideas since 1949, informing successive generations of strategic guidelines. As General Zhang Wannian notes, Active Defense is China's "foundational strategic idea" and has served as the basis for China's successive strategic guidelines since 1949.[160] Put simply, Mao defined Active Defense in contrast to passive defense. While a nation may assume a strategically defensive posture, it must nevertheless use offensive means to achieve defensive ends. In the context of resisting Japan, Mao stated that "active defense could be named as offensive defense. It could also be called decisive campaign defense…which was a defense using both counterattack and attack." In

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[158] For descriptions of this strategic guideline, see Shambaugh, *Modernizing China's Military*, pp. 56-94; Alexander Huang, "Transformation and Refinement of Chinese Military Doctrine: Reflection and Critique on the PLA's View," in *Seeking Truth from Facts: A Retrospective on Chinese Military Studies in the Post-Mao Era*, eds., James C. Mulvenon and Andrew N. D. Yang, Santa Monica, CA: RAND, 2001, pp. 131-141; Godwin, "Compensating for Deficiencies," pp. 97-118; David Finkelstein, "Commentary on Doctrine," in *Seeking Truth from Facts: A Retrospective on Chinese Military Studies in the Post-Mao Era*, eds., James C. Mulvenon and Andrew N. D. Yang, Santa Monica: RAND, 2001, pp. 119-130; Nan Li, "The PLA's Evolving Warfighting Doctrine," *The China Quarterly*, No. 146, 1996, pp. 443-463; Paul H. B. Godwin, "From Continent to Periphery: PLA Doctrine, Strategy and Capabilities Towards 2000," *The China Quarterly*, No. 146, 1996, pp. 464-487; Yao Yunzhu, "The Evolution of Military Doctrine of the PLA from 1985 to 1995," *The Korean Journal of Defense Analysis*, Vol. 7, No. 2, 1995, pp. 57-80.

[159] Godwin succinctly made this point almost 20 years ago, but it deservers to be made and emphasized again. See Godwin, "Changing Concepts of Doctrine, Strategy and Operations," pp. 56-57.

[160] Zhang Wannian, *Zhongguo guofang*, p. 177. For more on Active Defense as a strategic idea, see *Zhongguo junshi baike quanshu*, CD-ROM edition. For the relationship between Active Defense and the LWUMHTC strategic guideline, see Dai Yifang, comp., *Junshi xue yanjiu*, pp. 72-73.

strategic terms, Active Defense refers to striking only after the opponent has struck first and a defensive posture. In an operational setting, Active Defense includes seizing the initiative through first-strikes to achieve such defensive goals. Zhang states that Active Defense "organically combines strategic defense with campaign battle offense…to weaken the enemy and realize strategically defensive goals through offensive operations with quickly decisive battles."[161]

China's current strategic guideline applies the insights of Active Defense to the post-Cold War and post-Gulf War security environment. According to the NDU authors, the shift to preparing to win LWUMHTC was "a strategic guideline for the new period" (1999: 276), which was established by Jiang Zemin in 1993. The 2002 defense white paper captures the relationship between the current strategic guideline and Active Defense as a strategic idea:

> China implements a military strategy of active defense. Strategically, China pursues a principle featuring defensive operations, self-defense and attack only after being attacked. In response to the profound changes in the world's military field and the requirements of the national development strategy, China has formulated a military strategic guideline of active defense in the new period…based on winning local wars under modern, especially high-tech conditions.[162]

The details of the current strategic guideline will be discussed in more detail in subsequent sections. In general terms, they are based on the conclusion that China's most likely threats come from small and medium-sized local conflicts, not general or total wars. In the absence of general war, China's strategic goals are based on "protecting state sovereignty, unity, territorial integrity and security" and "a peaceful international and a favorable peripheral environment for China's socialist modernization drive."[163] Moreover, because changes in technology have increased the tempo, intensity of operations in even local wars, the current strategic guideline outlines how China should prepare to deter such conflicts from arising and how to fight them if they do occur.

When describing China's military strategy, it is important to distinguish between Active Defense as a strategic idea and LWUMHTC as a strategic guideline. Since the establishment of the PRC, Active Defense has informed every set of strategic guidelines

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[161] Zhang Wannian, *Zhongguo guofang*, p. 177.

[162] *2002 nian Zhongguo de guofang* [China's national defense in 2002], Beijing: Guowu Yuan Xinwen Banggongting; available on http://www.china.org.cn/ch-book/20021209/index.htm

[163] *2002 nian Zhongguo de guofang*, Section 3.

and strategic orientation, from the first formulation of People's War to the present.[164] Indeed, all of these strategic guidelines are referred to in Chinese sources as a "strategy" of active defense, one of Mao's core tenet of strategy. The content of a strategy at a particular point in time, the key concepts for addressing the main military challenges, are contained in the guidelines that apply Active Defense and other ideas to a particular environment. Active Defense is not a strategic guideline per se. It is only a strategic idea that informs, defines and shapes the strategic guidelines in any given period of time.[165]

Zhanlüexue, 1987

The 1987 *Zhanlüexue* offers a narrow conceptual and operational approach to problems of strategy. The 1987 book defines strategy as "a method for guiding the overall situation of war" (1987: 1).[166] More specifically, strategy is "the art of using the means and force of warfare to achieve the goals of war." In practice, the book focused on addressing only one strategic problem, namely countering a Soviet invasion in the context of fighting a general war. Although this book was published two years after the seminal 1985 enlarged CMC Meeting that codified the strategic transition from total war to local war, China's approach to strategy as described in this book remained strongly influenced by People's War Under Modern Conditions, the strategic guideline before 1985.

Substantively, the principal focus of the 1987 book is how to counter an invasion, in either a general war or a local war context. The main strategic guidance chapters focus on the operational and planning problems linked to this single goal, such as "Our Country's Preparation for Wars of Countering Invasion," "Strategic Air Defense," "Strategic Defense" and "Strategic Offense." In many ways, as Finkelstein has commented, the book reads as if it is a combination of *Zhanlüexue* and a combination of *Zhanyixue*, a blending of the strategic and the operational levels of war. One of the main reasons for the strong operational focus of the 1987 volume was the singular nature of the strategic problem defined by China's leaders, namely countering an invasion. Moreover, the 1987 *Zhanlüexue* focused almost exclusively on ground forces, with little mention of naval operations and only a limited discussion of air operations in the context of strategic

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[164] See, for example, the brief discussion of active defense in Zhang Wannian, *Zhongguo guofang*. and Ch. 8 in Ma Baoan, ed., *Zhanlüe lilun xuexi zhinan*.

[165] That being said, many Chinese sources do create significant confusion on this score by referring to Active Defense as a strategic guideline. Jiang Zemin's recent work speech at the 16th Party Congress states that China's *zhanlüe fangzhen* is active defense. However, I am inclined to believe that this means that China's current strategic guidelines are based on the principles of active defense, not that they represent a strategy of active defense. All of China's post-49 strategic guidelines are usually described in this way and, by itself, the modified of active defense says little about the content of the guidelines. See Zhang Wannian's description of China's successive strategic guidelines post 1949. Zhang Wannian, *Zhongguo guofang*, pp. 176-193.

[166] Specifically, "指导战争全局的方略."

air defense when countering an invasion. In addition, the 1987 volume excludes discussions of conventional deterrence, crisis management or the principles for fighting local wars. Despite the 1985 strategic transformation from total to local war, the PLA's strategic thinking had only just begun to adapt to the new requirements.[167]

In terms of strategic guidance for general war, the book follows the basic elements of active defense in People's War Under Modern Conditions that governed China's military since the late 1970s.[168] The first stage is strategic defense, where the initial surprise attack by an opponent is countered by using a combination of offensive and defensive operations to blunt the force of the attack. Positional warfare was key at this stage. The second stage is strategic counter-attack, where offensive operations are used to counter-attack when the enemy's offensive has been stalled. The third and final stage is a strategic offensive once the enemy has been weakened and conditions have been created for a decisive battle to end the war. While the book includes elements of forward defense, positional warfare and combined arms operations, these were all subordinated to the one strategic problem of countering an invasion.

In sum, the 1987 *Zhanlüexue* presented a narrow approach to strategy because it focused on one type of strategic problem with one adversary. The strong operational orientation of this strategy resulted from the limited scope of the strategic problem and the singular focus on countering invasions. An internally circulated review of military science research by AMS described the 1987 edition of *Zhanlüexue* as based on outmoded assumptions concerning operational experience from World War II, the Soviet threat as it existed at the time and traditional operational tactics linked to People's War.[169] The AMS concluded that the book needed to be revised as part of the ninth Five-Year Plan for military science research to adapt to local wars under high technology conditions.[170]

MOVING STRATEGY BEYOND OPERATIONAL DOCTRINE

In stark contrast to the 1987 *Zhanlüexue*, the 1999 NDU edition offers a much broader approach to military strategy. The NDU authors define strategy as "guiding and planning for the overall situation of military struggle," not just the "overall situation of

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[167] This is not to say, of course, that individual Chinese strategists were not already thinking about the implications of local war and technological changes for China's strategic thinking. However, these writings and ideas were not yet incorporated into strategic thinking.

[168] For detailed discussions of the People's War Under Modern Conditions strategic guideline, see Ellis Joffe, " 'People's War Under Modern Conditions': A Doctrine for Major War," *The China Quarterly*, No. 112 1987, pp. 555-571; Harlan W. Jencks, " 'People's War Under Modern Conditions': Wishful Thinking, National Suicide, or Effective Deterrent?," *The China Quarterly*, No. 98, 1984, pp. 305-319; Godwin, "Changing Concepts of Doctrine, Strategy and Operations," pp. 572-590; Godwin, "Compensating for Deficiencies," pp. 92-96.

[169] Dai Yifang, comp., *Junshi xue yanjiu*, p. 84.

[170] Ibid.

war." In particular, in accordance with the current focus on economic construction in China's national security strategy, the NDU authors identify three different spheres of military strategy: wartime strategy, peacetime strategy and local war strategy. Individual chapters in the 1999 volume discuss how China plans to use force in each strategic sphere. In expanding the scope of strategy, the 1999 volume also includes separate chapters on naval, air and nuclear strategy.

This broadening and deepening of the PLA's approach to military strategy resulted from sustained debate in the early to mid 1990s among China's military strategists and thinkers. According to the mid-1990s AMS review of military science research, a consensus emerged around the expansion of the scope and direction of the concept of strategy.[171] The AMS review concluded that "everybody acknowledges that modern national defense strategy cannot simply consider military problems…but must consider all military and non-military factors related to national defense."[172] The definition, basic content, military guidelines and military guidance of strategy were all hotly debated in the early to mid-1990s. Indeed, strategy appeared to be more contentious than other military science topics such as military thought and campaigns.[173] With the focus on operational concepts at the campaign-level during this same period, strategy as a topic required such debate and clarification.

Wartime strategy (*zhanzheng shiqi de zhanlüe*; 战争时期的战略) refers to periods of time when a state is preparing to fight or fighting a general war. Specifically, 'wartime' is defined as when "society as a whole deals with the condition of war, such as condition of general war" (1999: 203-4). In applied terms, wartime strategy refers to the situation that existed before the 1985 strategic transformation, when society focused on war preparations for an "early, major and nuclear war" with the Soviet Union. In the post-1985 era, wartime strategy refers to situations where China might fight a general war of counter-invasion against a notional opponent, even though the likelihood of such a conflict is viewed as being quite low. In the entire book, the NDU authors devote only one chapter to wartime strategy and they consider countering an invasion as the only type of general war that China might face.

In terms of strategic guidance for fighting general wars, the 1999 volume is quite similar to the strategy contained in the 1987 volume. This strategic guidance divides a general war of countering an invasion into three stages of strategic defense, strategic counter-attack and finally a strategic offensive for a decisive battle. The only real innovation occurs with the discussion of strategic guidance for war termination, but this appears to be a very small refinement (1999: 229-232). The main insight is that war termination should focus not just on ending the war, but also on securing strategic advantages at the same time

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[171] Dai Yifang, comp., *Junshi xue yanjiu*, pp. 65-67.

[172] Ibid.

[173] Dai Yifang, comp., *Junshi xue yanjiu*, pp. 43-120.

Peacetime strategy (*heping shiqi de zhanlüe*; 和平时期的战略), by contrast, refers to periods when the nation is not in a general state of war. The word 'peacetime,' however, should not be confused with the absence of future conflict, but only the low likelihood of a general war. With the 1985 strategic transformation, Chinese strategy and military planning migrated officially from preparing for total war to preparing for local war, from a societal focus on war preparations and to a focus on economic construction. Peacetime strategy includes deterrence operations and crisis management as well as local war.

Local war strategy (*jubu zhanzheng dazhanlüe*; 局部战争大战略) is as a special type of strategic problem that occurs during peacetime. NDU defines a local war as "a war with limited objectives in a part of an area where limited armed force is used" (1999: 271). Local wars have four characteristics: war and politics are closely linked, many aspects of the war (such as the goals and targets of attack) are limited, the outbreak of war is sudden and the operational forms are varied, which places a premium on joint operations as well as command and control. As has been discussed extensively elsewhere in other Chinese writings, high-tech local wars are characterized as being highly intense, mobile and destructive.[174] The NDU volume stresses the increasing role of politics and diplomacy in both complementing the prosecution of local wars and in limiting the scope of military operations of such conflicts. The types of operations in local war include blockades, amphibious assaults, counter-offensive campaigns, and precision strikes.

The broadening of the scope of strategy is only one of the many differences between the 1987 and the 1999 editions of *Zhanlüexue*. Another important difference is that the strategic idea of People's War receives almost no attention in the 1999 *Zhanlüexue* and seems to have been largely removed from the strategic level of analysis. Indeed, given its importance in previous strategic guidelines, especially People's War and People's War Under Modern Conditions, its absence is striking. The NDU authors do discuss People's War in passing as one of Mao's important strategic ideas and later invoke it to describe how to mobilize society in a local war to boost comprehensive national power, primarily by supporting modernization efforts. Even as a one of Mao's key strategic ideas, it is not invoked in any of the strategic guidance for strategy in local wars or in peacetime military struggles.

Likewise, socialist ideology does not play an important role in the 1999 edition. While there are perfunctory references to building socialism and the role of the CCP, none of the future potential conflict scenarios are cast in ideological terms. Class struggle is almost never mentioned. Moreover, in place of ideological terms and references, what permeates the 1999 book is grounding strategic assessments and guidance on the national interest, the correlation of forces and other non-ideological (though still loaded) terms.

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[174] See, for example, Yao Yunzhu, "The Evolution of Military Doctrine;" Nan Li, "The PLA's Evolving Warfighting Doctrine;" Godwin, "Compensating for Deficiencies."

In addition, the importance of first-strikes under a range of circumstances receives much more attention in the 1999 volume than in the 1987 one. While China's military strategy has always maintained an offensive component through active defense, the 1999 book places a stronger emphasis on anticipatory action in both local wars and peacetime military struggles. The 1987 edition only envisioned offensive operations towards the end of a general war.

In terms of similarities, the 'Cult of the Defensive' as described by Scobell is still alive and well.[175] The 1999 volume was published in May 1999, but was presumably copy-edited well before the bombing of the Chinese embassy in Yugoslavia. Nevertheless, the book perpetuates the characterization of aggressive and expansionist actions as hegemonic and defensive acts as peace-loving. Discussion of the strategic offensive or deterrence as key strategic means is always qualified by the statement that China is a peace-loving state and only uses such means in self-defense. Hegemonists, by contrast, use them for expansionist or aggressive ends.

The remaining sections of this chapter examine in detail local war strategy and peacetime strategy.

Strategy in Local War

In contrast to general war, the relationship between strategy and campaigns changes considerably in local wars. The NDU authors stress that the advent of local war has greatly increased the strategic value of campaign operations. In large-scale wars that have a numerous campaigns, each campaign has only a limited or indirect role in the outcome of the overall war. In small and medium local wars, however, the strategic goal can be achieved through only one or two campaigns – or sometimes, one tactical operation with strategic significance. As the NDU book states, "campaigns in locals wars nearly possess even strategic significance" (1999: 281). As a result, strategists must strengthen their control and guidance of campaigns and view them as an important part of strategic planning and guidance (1999: 280-282). The publication of *Zhanyixue* is probably one result of this increased focus on the importance of campaigns.[176]

Local war strategy (*jubu zhanzheng de zhanlüe*; 局部战争的战略) refers to strategic guidance for such conflicts. The NDU authors offer six principles for planning and guiding local wars:

"Prepare in many directions to flexibly respond to contingencies" (*duoshou zhunbei, linghuo yingbian*; 多手准备，灵活应变). The varied objectives and methods of waging local war, along with the speed and intensity of modern warfare, greatly expand the scope of problems that strategy must address in local war. Important variables include the origins of conflict (e.g., border dispute), strength of the adversary, location of combat, and direction of attack (planned vs. unplanned) (1999: 283-284).

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[175] Andrew Scobell, *China and Strategic Culture,* Carlisle: US Army War College monograph, 2002.

[176] For a fascinating discussion of the internal development of campaign doctrine, see Dai Yifang, comp., *Junshi xue yanjiu*, pp. 85-102.

Through this principle, the NDU authors stress the importance of unified planning that considers all of the potential contingencies that the nation might face, not just one type of threat such as invasion. In particular, such planning emphasizes the potential role of great powers that might intervene in a local war and how a conflict should be planned or controlled to avoid their intervention, citing China's 1979 campaign against Vietnam and concerns about Soviet involvement as prime examples (1999: 284).

Moreover, the quick pace of combat in modern warfare and the short duration of many local wars place a premium on a timely and quick reaction to situations that arise, which further emphasizes the importance all-around planning. The notion of "flexible response" underscores the importance of planning and training for different types of conflicts *before* they occur to enable a swift reaction in the actual outbreak of a local war situation.[177] Recent local wars have demonstrated that "whoever can combine peacetime preparations with the flexible management and fast reaction to sudden incidents will quickly control the situation" (1999: 285). To achieve such a capability, the NDU authors discuss the importance of training for different types of contingencies before they occur.

"Combine the offense and defense to seize the initiative" (*fanggong jiehe, zhengqu zhudong*; 防功结合，争取主动). One of the most important conclusions drawn by the NDU team is that the limited battlefield of high-tech local wars increases the strategic importance of offensive operations. In total wars, the decisive battle (*juezhan*; 决战) does not occur until the third stage, when conflict moves from strategic counter-attack to a strategic offensive. In limited conflicts, the war can enter the decisive stage almost as soon as it begins, which "clearly amplifies the proportion of offensive operations in entire operations" of a local war (1999: 287). Moreover, the fluid nature of high-tech war often blurs the once clear distinction between offensive and defensive operations. In addition, in local wars, only offensive operations, the "active offensive" (*jiji de gongshi*; 积极的攻势), can seize and maintain initiative on the battlefield. In particular, the NDU authors state "active offensive operations are the main means for seizing and maintaining the initiative" (1999:287). In a word, "without offense there is no initiative….which makes it harder to control the progress and outcome of war" (1999: 287). To wit, "the strategic significance of offensive operations in seizing the initiative and achieving the goals of the war is even more prominent" in local war than in other types of war (1999: 288). China's campaigns in Korea, India and surprisingly Vietnam are cited as examples of using offensive operations to seize and maintain the initiative (1999: 288).

This call to the offensive is qualified to some degree by the nature of local war. Local wars with a component of invasion should still be met with strategic defense in line with strategic guidance for general wars. For other types of conflicts, however, the NDU authors state simply that it depends on the nature of local war, but imply that offensive operations will play a much larger role in Chinese military planning. In this approach, defense is important only to protect strategic points (*zhanlüe yaodi*; 战略要地) and resist any enemy attack, especially with long-range weapons, when executing offensive

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[177] For more on the idea of "flexible response," see Shambaugh, *Modernizing China's Military*.

operations. Defensive operations alone have little direct strategic value in terms of achieving the strategic objectives in local war. In organizing offensive operations in future high-tech wars, planners must have a firm goal and an intense consciousness of the initiative.

Nevertheless, the emphasis on offensive operations is within the context of fighting local war once the war begins. Whether to join the fight in the first place is a political decision that lies beyond the scope of military strategy. Offensive operations are much more likely to be employed once the political decision to fight has been made and the ability to conduct such operations is one reason why leaders may or may not choose to fight. In addition, the NDU authors stress the importance of offensive operations within a strategic orientation that remains based on 'gaining mastery by striking second'. One subsection, for example, discusses the combination a strategic second strike with campaign and battle-level opportunities to take the offensive and subdue the enemy (1999: 293).

"Integrated operations for key point attacks" (*zhengyi zuozhan, zhongdian daji*; 整体作战，重点打击).[178] In high-tech local wars, victory can only be achieved by attacking the enemy's "war system" with systematized and integrated might. Integrated operations to conduct such campaign battles consist of developing four components of military power. *Operational strength* refers to organizing all of the services and sources of military power, such as reserves and militias, as well as types of weaponry. *Operational space* refers to organizing and integrating all dimensions of the battle space to conduct unified operations, including land, sea, air, space and the electromagnetic sphere. *Operational forms* refers to the combination of different types of operational methods and tactics. *Operational arts* (*zhanfa*; 战法) refers to combining operational strength, space and forms to achieve the greatest effect on the battlefield.

Key point attack refers to two different aspects of fighting a local war. The first is centralizing 'crack troops and sharp weapons' to establish superiority against an opponent. Even though local wars only involve a portion of the nation's armed forces, the best troops should be used to achieve local superiority. The strength of these troops should be centralized and used in the main directions of an engagement. The second aspect of key point attack refers to attacking the opponent's key targets (*zhongdian mubiao*; 重点目标), which is roughly analogous to the center of gravity.

"Strive for quick decisions, but prepare for protracted conflict" (*lizheng sujue, zhunbei chijiu*; 力争速决, 准备持久). In high-tech local wars, a quick resolution of the conflict is essential for achieving the strategic objective. The limited objectives in local war place a premium on surprise, rapid achievement of the objective and the timing of the conflict. Longer conflicts will be more susceptible to international pressure, which can frustrate achievement of the strategic objectives or even create incentives not to fight. Striving for a quick decision reflects the basic characteristics of high-tech war. The importance of speed in local war is often referred as "fighting a quick battle to force a

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[178] This principle is also the key guiding thought for campaign operations. Wang Houqing and Zhang Xingye, eds., *Zhanyixue* [Science of military campaigns], Beijing: NDU Press, 2000, pp. 88-100.

quick resolution" (*suzhan sujue*; 速战速决). The side that starts a local war will fully use the suddenness of the outbreak of conflict to strive for an early victory and in a limited period of time seek to achieve its strategic objectives. The increased firepower, mobility and destructiveness of high-tech war provide the material basis for achieving a quick victory.

When engaged in a local war against a stronger opponent, the NDU book describes four factors that can ensure a quick decision can be achieved. First is a moderate determination of the goal of a local war without any subsequent expansion of the war aims. Second is to stay abreast of changes on the battlefield and strive for a decisive occasion. In particular, in campaign battles, it is important to create decisive opportunities to defeat an opponent by forcing it into engagements when they have not prepared sufficiently or are not in an advantageous situation. Third is to change dynamically the correlation of forces in a specific direction by centralizing ones own forces in one direction to create local superiority and remedy the overall disparity in forces. Fourth is to organize carefully campaigns and battles to control effectively the war situation and war progress (1999:292-293) to minimize risk and maintain the initiative.

"Overall planning to win victory through coordinated efforts" (*quanmian yunchou, heli zhisheng*; 全面运筹, 合理制胜). Overall planning refers to utilizing all aspects of comprehensive national power (CNP), not just military means, to wage local war. The NDU authors specifically state that this mobilization of CNP can enable weaker states to defeat stronger ones and is one of the few instances in which the idea of People's War is invoked. Overall planning is required because while from a military perspective the scope of local wars is limited, from the perspective of political, diplomatic and other forms of struggle the scope of local war is quite broad. In the current international environment, it has become increasingly difficult to rely only on military means to achieve the ultimate goals of local war (1999: 294-296).

In particular, this principle stresses the importance of creating an integrated system that combines the military struggle with the political struggle. Often times, specific military operations can be manipulated to achieve a narrow political goal as well as the general strategic objective. One example in the book is the initiation, pause and resumption of offensive operations in the 1962 border with India, which sought to compel India to open negotiations over the disputed areas. This section also discusses using diplomacy to building sympathy and support for China's military operations to ensure that in local war adversaries are the subject of diplomatic and political attacks as well as military ones (1999: 296-297).

"Unified leadership, centralized command" (*tongyi lingdao, jizhong zhihui*; 统一领导，集中指挥). This principle refers to the importance of centralizing command due to the complex nature and quick pace of high-tech local war.

Strategy in Peacetime

While local war is an important strategic problem in peacetime, the NDU authors also expand the domain of strategy to include other forms of non-war methods of struggle in peacetime. *Peacetime strategy* (*heping shiqi de zhanlüe*; 和平时期的战略) is "the use of strategy in peacetime" and refers to planning and guiding the overall situation of

military struggle other than local wars. (1999: 235). Peacetime military struggles refer to using non-war methods (*feizhanzheng fangshi*; 非战争方式) or local war methods (discussed above) to achieve political or economic goals and complement political, diplomatic or economic forms of struggle. Specific objectives of peacetime strategy are assessments of the general trends of peace and development, determinations of the military threats and other threats of war facing the nation, determinations of the goals and guidelines for peacetime military struggle, planning and preparing army building and preparations for future war (1999: 236-7).

In general terms, the NDU authors stress two main functions of strategy in peacetime, both of which seek to create and maintain a favorable security environment for development. The first is preparing for war, which is similar to wartime war preparations in general but instead focuses on potential war. The second is containing war to promote long-term stability for economic development and modernization. Towards these ends, the NDU authors highlight peacetime strategic guidance in seven areas:

- Preparing for War
- Land, Water and Air Border Defense Struggle
- Deterrence and Counter-Deterrence Struggle
- Military Conflicts and Crisis Situations
- Arms Control & Disarmament Struggle
- Military Diplomacy, Military Aid, Military Trade
- Managing Sudden Internal Incidents

Needless to say, this list represents a broad expansion of the domain of strategy and demonstrates the wide scope of problems that strategy must now address. Moreover, despite the differences in definition, most of these same issues are discussed in the 2001 AMS volume.[179] The overall goal is to use military means to maintain an advantageous position for China, facing either military struggle or other forms of struggle in periods of time when general war is unlikely.

Of the seven, preparing for war is the most important. As discussed above, the suddenness and intensity of high-tech local war greatly increases the importance of

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[179] On arms control, crisis management and conflict control, see Ch. 8. On conventional deterrence, see Ch. 9. Discussion of border conflicts occurs in many chapters.

peacetime preparations. While specific detailed guidance for preparing for war is not offered in the 1999 volume, the authors emphasize the importance of linking such preparations to assessments and judgments of major world trends and the national security environment. A separate chapter focuses on army building activities in peacetime, which is the mainstay of war preparations for high-tech war (1999: 371-393).

Territorial disputes are given special attention and highlighted as a key cause of war to be managed by peacetime strategy. Moreover, these conflicts are viewed as more likely in the future due to the increasing attention that states give to national territory and maritime exploitation. The main goal in any border dispute is to establish and maintain a secure and stable environment for national development. The NDU authors note the importance of striking a balance between the promotion of the Deng's "opening and reform policy" with defense against attempts to 'steal' Chinese territory. When a conflict on the border erupts, the crux of strategic assessment is the character of the opponent, namely whether they are expansionist or peace-loving. Expansionist states must be met with a counter-attack, while conflicts with other states can be settled through negotiations. Unfortunately, the book does not state how to differentiate between expansionist and peace-loving states before a conflict occurs, but it is clear that at the moment none of China's neighbors have been labeled as hegemons, which is a political decision beyond the scope of military strategy. China's strategy for dealing with border disputes remains largely conservative.[180]

In addition, the 1999 volume stresses the importance of unifying land, sea and air defense to create a comprehensive system of border defense, with a special emphasis on maritime resources. Similar themes are repeated in the chapter on naval strategy, which focuses on sovereignty disputes over offshore islands and securing administration control of ocean areas (1999: 302-303), both of which provide additional evidence for the expansion of China's "strategic frontiers" or forward areas to be defended.[181]

Perhaps the most interesting aspect of peacetime strategy concerns the focus on deterrence, military conflicts and crisis management. Taken together, these areas indicate a much larger role for coercion in China's peacetime military strategy. The "deterrence and counter deterrence struggle," (1999: 250) is viewed as one of the most important components of peacetime military strategy. Deterrence itself is defined as "relying on one's own military strength to use methods of military pressure to make an opponent fearful or yield" (1999: 250). Importantly, "counter-deterrence" refers to confrontational actions taken to resist an opponent's deterrent actions, which expands the domain in which deterrence applies. From China's perspective, the 1962 mobilization of troops in coastal provinces and the 1995/6 military exercises were paradigmatic examples of how to conduct deterrent operations. The latter demonstrated the "resolute resolve in

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[180] See Mao Zhenfa, ed., *Bianfang lun* [On frontier defense], Beijing: AMS Press, 1996 (internal military circulation).

[181] For more on strategic frontiers, see Nan Li, "The PLA's Evolving Warfighting Doctrine," p. 450; Shambaugh, *Modernizing China's Military*, pp. 66-69.

protecting unity of the motherland and warned the forces of Taiwan independence" (1999: 252).

For the NDU authors, the art of stratagem is at the heart of successful deterrence or counter-deterrence efforts. The first important component is "creating an image of force," which is achieved by using all means to create an advantageous posture of might against an opponent. The second component is "showing a form," using the image of force to create fear in an opponent so that they abandon their plans. Importantly, "showing a form" can include efforts to create either certainty or uncertainty about how China might respond in a particular situation. Instruments of deterrence include public military exercises, National Day military parades and displays of new weapons in addition to more traditional threats of military action and force mobilization. The NDU authors emphasize the timing of deterrent actions, stating that the best time to use deterrence is "the period between the enemy's strategic choice and strategic probe" (1999: 252). This suggestion is preemptive in the sense of anticipating the actions of an enemy before they occur, especially in a counter-deterrence scenario.

Effective management of military conflicts and crises is another important dimension of peacetime strategy. Military conflicts are "enemy actions of armed confrontation short of war" (1999: 254). Crisis incidents are "tense military confrontations that can create military conflicts" (1999: 254). Both are important because of the potential for escalation, which in peacetime can threaten to upset the external environment that supports economic development. In managing such events, the NDU authors stress three points. The first is correct judgment of the action behind the incident. An attack such as grabbing territory should be resisted through a self-defensive counter-attack, a strategic probe should be met with a deterrent response and accidents should be handled accordingly. The second is the importance of preventive work, including formulation of contingency plans, deployments in sensitive areas and the establishment of warning systems, which will both limit the potential for incidents to arise and aid in the correct judgment of the incident. Again, however, how to assess the character of a crisis incident and differentiate among the different forms of action is not discussed, as this presumably is a political decision. The third aspect of strategic guidance for military conflicts and crises is an emphasis on avoiding escalation and using peaceful means for resolving conflicts with neighbors. Controlling crisis escalation is especially important and underscored. The NDU authors stress that military means should only be used when political and diplomatic means have failed. During the current period of peaceful construction, a "practical and calm attitude must be adopted towards such incidents in order to ensure a secure external environment for economic development" (1999: 257-258).

Finally, the 1999 volume stresses that internal security is an important component of China's peacetime strategy. The NDU volume refers to the "management of sudden internal incidents," a clear reference to the PLA's experience in the Tiananmen crackdown (1999:266). Again demonstrating the broadening of strategy, internal security is not mentioned or discussed in the 1987 volume. Strategic guidance of such events include the importance of quickly suppressing riots and armed rebellions, but emphasizing the use of psychological awe and limiting the actual use of force. The NDU authors stress the importance of limited actions and uniting the people with the government and soldiers (1999:267-270).

CONCLUSION

In Western strategic vocabulary, China's approach to military strategy might be described as a combination of high-level operational doctrine (focused on the general principles for conducting military operations) and a national military strategy (in terms of the types of tools that can be used to counter threats to national security, including non-warfighting means such as deterrence). Whatever the characterization, in substance it is clear that scope of strategy has moved beyond a narrower operational focus on planning to counter a Soviet invasion characterized strategy in the 1980s. Current strategy not only includes how to fight general wars, but also how to fight local wars, how to prevent or contain local war from erupting and how to secure strategic goals through non-violent though risky means, such as deterrence.

In addition to demonstrating the broadening of China's approach to military strategy, this paper identifies two important implications for the future study of the PLA's military doctrine. The first is when describing China's "military strategy," it is essential to remember the difference between strategic ideas (*zhanlüe sixiang*; 战略思想) and strategic guidelines (*zhanlüe fangzhen*; 战略方针). Strategic ideas such as People's War and Active Defense are relatively stable, who's meaning and operational implications vary only when applied in different strategic contexts. Strategic guidelines outline what Western observers and analysts are seeking when trying to identify how China today plans to wage war and use military force. The essence of China's current strategy lies not in the ideas of Active Defense, but their application to Local Wars Under Modern High-Tech Conditions.

The second implication for the future study of the PLA's military doctrine is that the broadening of China's approach to strategy underscores what Finkelstein has referred to as the "rediscovery" of the operational arts and the campaign-level of war. While still "operational doctrine" in the general sense of guiding how force will be used, military strategy in the Chinese context has moved from operational planning, such as how best to repel a Soviet invasion, to operational guidance, such as what types of means and methods should be used for different problems, including war, that require the use of force. As the rest of the chapters in this volume indicate, the publication of *Zhanyixue* symbolizes the flowering of operational concepts that has occurred in planning how to wage local high-tech wars.

4. *ZHANYIXUE* AND JOINT CAMPAIGNS

By Dean Cheng

INTRODUCTION

In *The Science of Campaigns*, hereafter referred to as *Zhanyixue* (战役学), the PLA lays out the importance of the campaign level of war. Not only does *Zhanyixue* discuss the basic concepts, but it also sets forth a typology of campaigns, detailing the basic outlines of the various likely types of campaigns that the PLA might have to undertake.

While the book initially details the various Service campaigns, the final third of the book is focused on joint campaigns. For the PLA, according to *Zhanyixue*, joint campaigns are a primary form of future warfare, representing a major change in how wars will be conducted.

This paper will examine joint campaigns in the context of *Zhanyixue*. It will try to lay out what the authors of *Zhanyixue* considered the foremost aspects of this new, primary form of future PLA warfighting, including identifying its major characteristics. It will briefly explore the major campaign types that are considered "joint." Finally, it will seek to explore some of the salient weaknesses that are likely to confront the PLA as it seeks to translate *Zhanyixue* into reality.

DEFINING JOINT CAMPAIGNS

What does the PLA mean when it uses the term "joint campaigns"? What are the characteristics of a joint campaign? *Zhanyixue* provides a window into what the PLA considers the fundamentals of joint campaigns.

At the strategic level, jointness means the unification of military with political, diplomatic, and economic ends. Thus, operations in one area are expected to complement and support efforts in other areas---all in order to seize the overall initiative and accomplish the overall objective.

At their heart, however, Chinese conceptions of jointness, as laid out in *Zhanyixue*, are at the operational level of war. Joint campaigns are considered a subtype of campaigns, and are subject to many of the principles that apply to campaigns, even as they also have their own unique attributes. *Zhanyixue* defines joint campaigns as those campaigns involving two or more Services, each contributing campaign-level military units (*juntuan*; 军团), i.e., Fleets, Military Region Air Forces, or Group Armies. In a joint campaign, all of these forces operate under a joint command structure, and implement a single, integrated plan for a single campaign.[182]

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[182] *Zhanyixue* does recognize that, under special circumstances, there may be joint campaigns involving force levels that are less than a campaign-level military grouping from each Service, i.e., [*bingtuan*; 兵团]

This definition suggests four distinct characteristics of joint campaigns. In the first place, joint campaigns are marked by *the scope of participation*. That is, a campaign is considered joint based on the number of Services participating and their respective contributions to the campaign, and *not* on the scale of the campaign itself. Indeed, *Zhanyixue* notes that even a very large campaign is still only a Service campaign unless there are more than two Services participating, at the *juntuan* level. Otherwise, the campaign is primarily a combined-arms campaign (i.e., Service-level), with the non-*juntuan* level units providing support to the *juntuan*-level formations.

Second, joint campaigns operate under a *joint campaign command structure*. Joint campaign command structures are hierarchically superior to the local war zone command and Service commands, even though they may be drawn from the various participating Services' and war zones' command structures and personnel. This joint campaign command structure is responsible for planning the campaign and providing command and control once the campaign is begun. This is in contrast to Service campaigns, where the command structure is composed of the lead Service's command personnel, at best augmented by other Services' staff.

Implicit to both the issue of scope of participation and the command structure is the *fundamental equivalence of the participating Services*. Indeed, it is specifically noted that, in a joint campaign, all the Services are considered equal, from a seniority/protocol standpoint, with no Service having preeminence over any other. This is a fundamental and major shift in PLA culture. As one article in *Zhongguo junshi kexue* has specifically noted, the PLA's historical reliance on the ground forces had resulted in an incorrect view that victory required emphasizing only one Service. This perspective, the article notes, was wrong in the context of future joint operations.[183] The primary repository of combat theory and principles lies not solely in the ground forces, but instead among all the Services, as well as among nascent elements of the military charged with space combat and information dominance. Joint campaigns presume that ground forces, naval forces, air forces, and the Second Artillery, as well as the militia and the People's Armed Police (PAP) formations all can and will make essential contributions to attaining victory.

This is not to suggest, however, that all the Services involved in a joint campaign are to be considered equal or interchangeable regardless of circumstances. Under particular conditions or in pursuit of specific missions, one or another Service may be better qualified; it should therefore take precedence in that instance. However, in the course of the entire campaign, each of the Services relies on the other participating Services for support, and therefore, none is more important than the others *in the overall pursuit of the campaign objective*.

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the book emphasizes, however, that there must still be two or more Services contributing, and that the total forces involved should equal a campaign-level military grouping, under such circumstances. National Defense University of the PRC, *Zhanyixue* , Beijing, PRC: NDU Press, 2000, p. 385.

[183] Zhang Xingye, "The Important Aspects of the Conduct of Joint Campaign," *Junshi kexue,* No. 2, 2001, p. 87.

Finally, the organization of the joint campaign is essential. *Zhanyixue* notes that joint campaigns are often the product of a series of Service, or combined arms, campaigns. These subsidiary or component campaigns, which include not only air-landing campaigns, air and counter-air campaigns, ballistic missile campaigns, etc., but also those in outer space, within the electromagnetic spectrum, and in information-space, are systematically joined, through the organization and coordination efforts of the command structure. In so doing, each of the participating forces are able to exploit their strengths synergistically, in order to attain the overall advantage and thereby reach the joint campaign objective. The keystone of The Science of Campaigns, "integrated operations and key point strikes," therefore reaches its apotheosis in joint campaigns, involving the integration, through organization, of various Service and other campaigns. Jointness, in this view, is as much an end product of planning and coordination, as it is a specific form in and of itself.

Examples of joint campaigns, as delineated in *Zhanyixue*, would include:

- Blockade campaigns
- Amphibious or landing campaigns
- Counter-air campaigns (although, interestingly, *air* campaigns are not listed as a joint campaign type)
- Frontier counter-offensive campaigns
- Air-landing campaigns
- Counter-amphibious campaigns

Differences Between Joint and Combined Arms/Service Campaigns

It should be noted that several of these campaigns also have Service equivalents, notably blockade campaigns and counter-air campaigns. In such cases, it is possible to more clearly discern the differences between joint and combined-arms/Service campaigns. This is perhaps most evident when comparing the counter-air campaign (a joint campaign), with the air defense campaign (an Air Force campaign). Counter-air campaigns are evidently more expansive, and include preventive measures, defensive measures, and countering measures. Thus, key counter-air campaign activities include:

- Preventive Measures:
    - Create an effective early warning and intelligence system, issue air defense warnings at the appropriate time

  - Utilize various methods to create an aerial defense (including concealment and deception measures)
  - Organize repair and rescue, to eradicate the effects of aerial attack.

- Defensive Measures:
  - Accurately determine the main defensive axes
  - Combine the use of different defensive methods (including long-range engagement, layered defenses, etc.)
  - Manage the developing situation

- Counter-attack Measures:
  - Pick the right time for counter-attacking
  - Precisely determine the target of the counter-attack
  - Flexibly apply counter-attack tactics

This is a taxonomy that does not occur in air defense campaigns, i.e., at the Service level, and the component activities of each of these measures are not correlated with those seen in air defense campaigns. Instead, defensive air campaigns involve:

- Firmly grasp the enemy's situation, and adjust the campaign elements
- Counter the enemy's electronic suppression, and disrupt their aerial assault
- Accurately grasp opportunities, and counterattack at the right time
- Organize for avoidance, and reduce the losses from enemy attack

This difference in the subsumed activities involved in each type of campaign may be due to the inherently more strategic orientation of the counter-air campaign. Moreover, given the types of activities involved, counter-air campaigns are more likely to require the participation of other Services, such as in the formation of layered defenses.[184] Both of these would fit with the characteristics accorded joint campaigns, i.e., the greater

[184] Details drawn from *Zhanyixue*, pp. 320-324 and pp. 407-420.

strategic impact of joint campaigns, and the greater number of Services (and areas of operation) involved.

A similar differentiation can be seen in comparing Service blockade campaigns, and joint blockade campaigns. A joint blockade campaign's mission is three-fold:

- To intimidate one's opponent
- To weaken the enemy's will and, latent (i.e., industrial) power
- To isolate the enemy

To an even greater extent than with the counter-air campaign, the joint blockade clearly has strategic impact. In contrast, the Service blockade is charged with limiting an opponent's naval and maritime activities, isolating the enemy's forces located on islands or in sea areas, obtaining maritime dominance, and cutting the other side's maritime transportation links. The larger, strategic impact (e.g., to weaken enemy will) is not mentioned as part of the Service campaign's mission.

The joint blockade's special characteristics are also markedly different from those of a Service blockade. In the former case, these include:

- Multiple, varied combat activities, with a strong strategic nature
- Extended combat, with difficult missions
- Multiple participating Services, with difficult command and coordination issues
- Expansive battle-space, with intense combat
- A heavily conditioned battlefield, with major impacts on campaign activities (the conditions refer to the need to understand the scale of operations and the environment)

In a Service campaign, by contrast, the special characteristics are:

- Restrictive legal and policy aspects
- An extended campaign
- A fixed battlefield
- Multiple combat methods

What is especially noticeable is the difference in likely battle-space. A joint blockade evidently will be more expansive in terms of involved battle-area than a Service blockade, even though the latter is, in fact, almost certainly a component campaign of the former.

Finally, in terms of major activities, joint blockade campaigns involve:

- Establishing a blockade system, and assuming a blockade stance
- Implementing blockade barrier combat
- Dominating the blockade combat area, including attacking the enemy's counter-blockade forces and base areas
- Implementing specific, sequential blockade activities

These operate under the special requirements of:

- Establishing the principle of "blockading and fighting are combined, destruction and attrition are both emphasized."
- Preparing for an extended campaign, with quick, specific (*juti*; 具体) combat activities
- Fully developing integrated combat power, emphasizing strengths and avoiding weaknesses
- Accurately determining the key points of the blockade, concentrating and flexibly using force
- Defeating the enemy's counter-blockade combat activities, maintaining the stability of the blockade
- Obeying relevant international laws, so that combat activities are logical, beneficial, and appropriate

It should be noted here that there is no equivalent list of special requirements for Service blockade campaigns. Instead, Service blockade campaigns involve the following main activities:

- Establish a blockade system
- Attack enemy bases and harbors

- Implement military blockade measures, including how to hand off patrols and monitoring, etc.

In comparing joint blockades and service blockades, then, the joint blockade campaign has more strategic overtones. By contrast, the Service campaign appears to be more focused on tactical and operational issues.[185] This would appear to be consistent with the description of joint campaigns as being more strategically salient than campaigns in general.

COMMAND AND COORDINATION FOR JOINT CAMPAIGNS

What is less obvious from the description provided for the various joint campaigns is the role of the command structure and the importance of coordination. What is clear, however, is that the most important element of joint campaigns is the command structure and its coordinating role. If a joint campaign is comprised of orchestrated Service campaigns, each of which is aimed at contributing towards the attainment of the overall campaign goal(s), then the command structure is essential in resolving issues of timing, phasing, and various other aspects of coordination of these Service campaigns. It is this coordination that makes the overall campaign "joint." Not surprisingly, the bulk of the *Zhanyixue* chapter on joint campaigns is therefore focused on the joint campaign command structure and its coordination responsibilities.

Joint Campaign Command Structures

According to *Zhanyixue*, the joint campaign command structure will vary, based on the scale of the joint campaign. Thus, war zone strategic campaigns (*zhanqu zhanlüexing zhanyi*; 战区战略性战役), the largest-scale joint campaign, will be built upon a three-tier campaign command structure. A war zone direction (*zhanqu fangxiang*; 战区方向) campaign, a intermediate joint campaign will have a two-tier campaign command structure, and a group army-scale (*jituan junji*; 集团军级) joint campaign, the smallest, will have a single-tier command structure.

The three-tier joint command structure clearly is the most involved. It will usually include not only war zone and Service command staff, but also, when necessary, senior leadership elements from the central government and the General Staff, in its highest tier. "The joint campaign command section is the highest level command structure for campaigns and receives direction from the senior leadership."[186] Its second tier, depending on the type of command structure that is in place, will either be a war zone direction command section, or a service campaign command section, drawn from the

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[185] Details drawn from *Zhanyixue*, pp. 356-363 and pp. 441-458.

[186] *Zhanyixue*, p. 396.

relevant staff. Finally, the lowest tier of the three-tier joint command structure will be the campaign-level *juntuan* command section, which may be drawn from the leading Service's campaign *juntuan* command section. Thus, a three-tier joint command structure will include high-level command personnel from the central government and the relevant PLA Departments while retaining command personnel, who should be conversant with the unique aspects of the relevant war zones.

A two-tier joint command structure will have a joint campaign command structure that is usually drawn from the war zone and Service command staffs. This structure can directly command army, navy, and air force *juntuan* in the course of the campaign. The remaining Service staffs are subordinate to the joint campaign command staff, being responsible for their individual *juntuan*'s organization and activities, as they implement the overall joint campaign plan.

A single-tier joint command structure will often be centered on the staff of the leading Service of the campaign, while absorbing relevant personnel from other Services. Such a joint command structure appears to be applicable only in very small-scale joint campaigns, where the totality of forces may only amount to a *juntuan*. It would seem that the difference between a single-tier joint command structure and a combined arms campaign's command structure is marginal, which may be as much due to the presumed limited scope of a single-level joint command structure's campaign. It should be noted that the Yijiangshan campaign, the PLA's primary combat experience with joint campaigns, is considered to be a case of either a single-tier or, at most, a two-tier command structure.

What is important to note, however, beyond the details of the various tiers of joint campaign command, is the recognition by the PLA that joint campaign command structures are not "one-size-fits-all." Rather than adopting a "cookie-cutter" approach, it is emphasized that different scales of joint campaigns require different joint campaign command structures.

At the same time, these command structures have similar responsibilities. The joint campaign command staff is charged with mission planning, organization, and direction of the subordinate Service elements. Mission planning involves setting the campaign objective (with due attention to national requirements), determining campaign methods, preparations, and safeguarding, and the myriad planning tasks associated with each of these tasks. Organization involves laying out coordination efforts among the participating Services, preparing the combat support and combat service support forces for their functions ("safeguarding"), including transportation duties, providing specialized training where relevant, and establishing the command centers.

These command centers will actually direct the campaign. It is expected that a joint campaign command will include a combat operations center, an intelligence center, an information center, and a "safeguarding" center, the last being charged with combat support and combat service support-type missions. Other centers that may be established include a combined fire support center, and an information warfare center. What is left unclear, however, is whether there are also Service-specific command centers or mission-oriented command centers.

What ***is*** clear is that the joint campaign command structure is expected to exercise command and control functions in the course of the campaign. These functions involve assessment, ordering, determining consequences, and adjusting.[187] It is almost certainly no accident that these functions mirror the classic elements of the "Boyd decision cycle," i.e., observe, orient, decide, and act (or OODA). At all times, the focus must be on the campaign's objectives, with command activities aimed at achieving the goals by supporting the relevant activities.

Joint Campaign Coordination

The main task of the joint campaign command structure is to implement coordination among the forces over the course of the entire campaign and across the breadth of the involved battle-space. Campaign coordination is essential because the proliferation of new weapons, and the expansion of the joint battlefield to encompass new venues of conflict, make campaign command a much more complex task. The proliferation of campaign combat power means that there are many more imposing tasks in coordinating different combat tactics (e.g., firepower attacks, missile attacks), across multiple potential battlefields (e.g., sea, space), and eliminates the previous "phased" concept of campaign operations (i.e., an initial defensive phase, followed by a shift to offensive activities). Joint campaign command personnel must be conversant with the strengths and weaknesses of each of the services including their attendant weapons, their relative strength in conventional and unconventional approaches to warfare, etc.

Coordination, according to *Zhanyixue*, can therefore be undertaken in three ways: by mission, by phasing, and by involved battle-space.

When undertaking joint campaign coordination by mission, it is essential to first determine the goal of the campaign. Once that is accomplished, missions necessary to achieve those goals can be determined and available forces applied against those missions. In the process of assigning forces, who is supporting whom needs to be determined, as well as which missions need to have priority. The command structure then coordinates the lead and supporting roles of the relevant forces.

When undertaking joint campaign coordination by phasing, it is necessary to first map out the campaign's phases, then determine the missions of each of the participating forces for each phase. The available strength (*liliang*; 力量) is then organized to accomplish these key missions of each phase. It is possible, depending on the phasing, that a given Service or force will go from supporting to dominant role, or vice versa. The most attention must be paid to the transitional period between phases, since this is the most vulnerable period. As the authors note, if the transition between phases is not properly managed, then the previous phases' coordination efforts are likely to complicate subsequent phases, affecting the ultimate outcome of the entire campaign.

Finally, if undertaking joint campaign coordination by battle-space, each participating Service is given specific operational spaces that are its responsibility. It is

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[187] *Zhanyixue*, p. 399.

presumed that such assignments will exploit the relative strengths of each participating Service, while minimizing their respective weaknesses. This is undertaken after due consideration of overall campaign timing, battle-space, and missions. Special effort must be made to insure that the various participating forces don't interfere with each other. Moreover, priority per battle-space must be assigned based on the campaign's ends, rather than Service interests.

This last coordination method is also one of the most likely, since future joint campaigns will almost certainly involve operations across the spectrum of operational spaces. That is, in light of the characteristics of modern, high-tech warfare, joint campaigns are likely to entail operations across a greatly expanded range of environments, including not only the traditional venues of air, land, and sea, but also outer space, information-space, and the electromagnetic spectrum. The campaign command structure must therefore be facile with all of these environments.

In all cases, coordination efforts must focus on the main campaign objectives, and along the main directions and war zones. That is, there must be *overall* coordination, which is to say that the joint command structure must, in its coordination plans, focus on the overall objectives and combat missions, and utilize all the available forces towards that end. *Zhanyixue* repeatedly emphasizes that the command structure's foremost responsibility is the application of the right Service to the right mission. The joint command structure, at least in two- and three-tier cases, therefore, is considered to have precedence over purely Service-based commands, and is to treat all the participating Services as equals, in terms of importance and precedence, and should make coordination decisions solely based on what will benefit the overall campaign.

Thus, all of the Services are on an equal footing with each other. As is noted several times, in the context of the overall joint campaign, there is no "senior Service." Instead, all of the participating forces must be prepared to operate under a single, integrated plan, in pursuit of a common set of objectives. Of course, along a specific direction, or on a specific battlefield, one or another Service is likely to be more appropriate or proficient, and in that specific situation, it is to be the lead Service. But that precedence is likely to change in the course of the overall campaign.

It is also necessary to coordinate across command levels. In larger-scale joint campaigns, each tier of the command structure has several key responsibilities. The various campaign command structures are primarily responsible for their directly reporting campaign units and formations. They are also, however, charged with creating the preconditions for success for the next lower level, and even the next two lower levels, if they are a main direction or otherwise vital combat activity or a key it is transition time. Lower tiers, meanwhile, are expected, in their coordination efforts, to complete their missions so as to enable higher command's objectives. As *Zhanyixue* explicitly states, part of the task of coordination for each command level is to not only direct the activities at their level, but also to understand the missions and responsibilities of the next higher *and* lower levels, and to facilitate the accomplishment of those missions and responsibilities.[188]

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[188] *Zhanyixue*, p. 404.

Such close coordination means extensive planning. But joint campaigns also require flexibility. In particular, it requires recognizing when the plan has failed, or must suffer extreme changes in order to achieve the mission ends. This seemingly contradictory set of requirements is noted by *Zhanyixue*, and the authors attempt to square the circle.

One of the key coordination missions is to lay out a thorough coordination plan that takes into account likely failures. Towards this end, *Zhanyixue* calls for firm, flexible coordination. Firm flexibility refers to the strenuous overcoming of all difficulties and obstacles, and firmly holding to the coordination plan, but, when circumstances change drastically, flexible implementing ad hoc coordination, so as to maintain the stability and continuity of the coordination. Whether or not joint combat commanders will be able, based on the battlefield's development and changes, to implement firm flexible coordination will have an enormous impact on the battle's smooth progress as well as the realization of the preplanned combat goals.

Firmness of coordination primarily refers to firmly following the coordination plan. Joint combat activities' highly complex nature and prevention/security plans determine that following the coordination plan is a primary means of organizing joint combat coordination. It is also a primary technique by which combat commanders and command structures implement coordination in the course of combat. Therefore, it is necessary to overcome all difficulties and obstacles, and not be moved by local sacrifices and friction. It is necessary to constantly seek to revive broken or disrupted coordination, and firmly and thoroughly obey the coordination plan.

Flexibility of coordination refers to being able to flexibly implement ad hoc coordination in response to changes in battlefield conditions. Ad hoc coordination is an essential, important style of joint combat coordination, and an essential supplement to coordination planning. In joint combat under high-tech conditions, when the two sides are undergoing significant changes in combat activities, even the most closely planned pre-battle coordination plan will not be able to predict all the myriad possible changes. When the situation undergoes massive change, then, the original coordination plan may not be appropriate to the new battlefield situation, and may be entirely useless. Therefore, based on the changes in the battlefield situation, flexible implementation of ad hoc coordination may be necessary.

Thus, flexible coordination is mainly expressed in two ways: one is that when battlefield situations locally change, one should promptly make the proper adjustments, corrections, and supplements, based on the foundation of the original coordination plan. Second, when the battlefield situation has undergone a major change, then there must be prompt organization of a new coordinating plan, in order to maintain the various combat strengths' constant coordinated activities, and to ensure that the war proceeds smoothly.

It is in this latter context, however, that the emphasis on coordination across command levels and between Services is most important. *Zhanyixue*'s description of the joint command structure's responsibilities suggest that it is hoped that the new approach will inculcate a new culture of mission-oriented orders and obedience, so that even when the original coordination plans are invalidated by new developments, or otherwise go awry, the PLA will nonetheless continue to focus on achieving its campaign objectives.

THE IMPORTANCE OF JOINT CAMPAIGNS TO THE PLA

Since organizations do not readily undergo change, the question arises, why is the PLA pursuing the transition to a joint campaign-dominated approach to warfare? The answer would seem to involve several levels.

As *Zhanyixue* and other PLA commentators have noted, the likelihood of protracted, all-out war among the superpowers has receded. This is due to the combination of the disintegration of the Soviet Union, the military-technological revolution, and China's domestic political and economic constraints.[189] Consequently, "the total war mentality and worst case planning…had to be replaced by a more explicitly defined war vision" of limited war under high-tech conditions.[190] Since "local" or "limited" wars will be fought without "the whole nation [going] onto a war track and will not require the mobilization of the great masses," the resources available would be limited to what is currently in-hand.[191] Consequently, campaigns assume a strategic nature, a point that is repeatedly raised in *Zhanyixue*.

Joint campaigns in particular, however, "have an even more prominent strategic consequence than campaigns in general."[192] In particular, since joint campaigns impact and influence not only military aspects, but also political, economic, and diplomatic areas, they are enormously influential upon the nation's welfare and the People's safety.[193] The PLA would therefore be derelict not to study and prepare for joint campaigns.

Moreover, joint campaigns are an essential means of creating the synergies that are sought through integrated operations, which are instrumental to local or limited wars under modern, high-tech conditions. Indeed, it is noted that a key prerequisite of joint campaigns is to gather, in advance, the various means of attaining victory into a single, integrated, coordinated whole, and then to apply it against an opponent. The joint campaign, then, is one means of overcoming overall qualitative inferiority by exploiting synergies and individual Service advantages to create local qualitative parity, if not superiority.

Indeed, in the context of "integrated operations, key point strikes," a key aspect of local or limited wars under modern, high-tech conditions, joint campaigns are especially important. "Key point strikes" involve striking at the enemy's most important vulnerabilities with the greatest effect. It also means the application of one's own forces at those key points. It is winning the struggle at the key point that allows the joint

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[189] Yao Yunzhu, "The Evolution of Military Doctrine of the Chinese PLA from 1985 to 1995," *Korea Journal of Defense Analyses*, Winter 1995, pp. 70-71.

[190] Yao Yunzhu, "The Evolution of Military Doctrine," p. 71.

[191] Ibid., p. 72.

[192] *Zhanyixue*, p. 389.

[193] Ibid.

campaign to be decisive. Emphasizing the key points of time, space, and objective, the joint campaign allows the PLA to commit its best available forces, regardless of Service origin, to the most decisive effect. Thus, *Zhanyixue* posits that joint campaigns offer the greatest chance of utilizing synergies among the PLA's Services, including their various operating environments (land, sea, air) and their respective technological strengths (Su-27s, advanced SAMs, Sovremennyys) to mitigate individual weaknesses. The aim is to create a condition of local superiority in both qualitative and, possibly, even quantitative terms, against generally technologically superior opponents. This also allows the PLA to nominally retain its links to Mao and asymmetric strategy, including the ideas of "*nida nide, woda wode,*" and applying PLA strengths against enemy weaknesses.

Moreover, the PLA, looking at recent historical examples of joint warfare (Falklands, Gulf War, etc.) have recognized that the conditions of modern warfare are much more difficult. The proliferation of combat styles and methods has meant that, in addition to traditional land combat (direct fire, indirect fire), air combat, and naval combat (the latter two enhanced by missiles and longer-range strike), there is now fire combat, special operations, missile operations, PSYOPS, etc. Reliance on only one Service or one combat style is more likely to lead to defeat, as an opponent is then better able to pursue asymmetric responses, exploiting different combat spaces and combat methods.

Similarly, just as there are many more combat styles, there are also now more sources of strength (*liliang*; 力量). I.e., the military situation is no longer a ground-forces dominated.[194] The best means of defeating an enemy air attack, for example, may not be through the use of air defense forces, but may involve missile attacks against staging areas, or the exploitation of air defenses arrayed in depth, drawing upon Army and Air Force assets. In order to engage an opponent, especially a technologically more sophisticated opponent, it is therefore necessary to utilize all the available resources at one's disposal. As important, one's opponent is equally likely to do so, making reliance upon a single branch much more dangerous, since it is more vulnerable to "single-point failure."

Coupled with the diverging sources of strength is the increasingly expansive battlefield, which now extends to space, and encompasses all of the sea and the air. This is due, in no small part, to the concomitant increase in modern and, especially, high technology. Precision-guided munitions, it is argued, are now commonplace, as are long-range strike platforms and weapons. Therefore, the physical extent of the actual battlefield is much greater. The Gulf War, for example, spread over some 140,000,000 square kilometers.[195] Joint campaign command structures must be at least cognizant of the interplay among land, sea, and air arenas over extended areas.

As important, though, the PLA, in examining foreign military experiences and the pace of technological change, has concluded that future conflicts will extend beyond the earth-bound realm. Indeed, the authors appear to believe that future warfare necessarily

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[194] Zhang Xingye, "The Important Aspects of the Conduct of Joint Campaign," *Junshi kexue*, p. 88.

[195] *Zhanyixue*, p. 400.

will involve space, which will be as vital a battlefield as any on earth, given the growing reliance on space-based sensors for reconnaissance and surveillance, as well as space platforms for data-relay, meteorology, etc.[196]

These systems represent an increasingly essential role in the command and coordination aspects of joint campaigns. It is partly through the application of space systems that weapons are more accurate and far-flung forces can be coordinated. Therefore, in local wars under high-tech conditions, land, sea, and air battlefields all rely much more on space systems, operating in the space battlefield, for support and safeguarding. In particular, given the key support roles that space-based platforms play, space dominance is one means of seizing the initiative and preventing an opponent from being able to coordinate its forces.

It is therefore to be expected that joint campaigns will involve measures to undertake space-based defense. As with the joint counter-air campaign, this is likely to entail *fang*, *fan*, and *kang*, i.e., the application of various deceptive measures and stealth techniques in order to defend against enemy space-based observation, and utilize various methods in order to prevent enemy space weapons from attacking.

The authors of *Zhanyixue* also note the growing importance of the electromagnetic spectrum in military operations. The references to electronic warfare, it should be noted, almost certainly do not refer solely to jamming and electronic countermeasures (ECM) and counter-countermeasures (ECCM), but instead to the range of electronic operations, including communications, C^2, etc., i.e., the entire C^4ISR array.

Furthermore, another likely future arena is the related conflict in "informational space." While sometimes referred to as information warfare, again, the Chinese terminology does not appear to be fully analogous with the American. Chinese references to information warfare include not only computer viruses and network/Internet warfare, but also the importance of stealth, of deception, of misleading an opponent. A far more accurate term, then, would be "perception management," or "infospace warfare," in either case denoting the much broader parameters involved.

The information battle already affects and permeates the joint campaign's various other battlefields, and is a key factor in seriously determining the outcome and course of the joint campaign. Joint campaign initiative will be determined by the winner of the infospace war. In future combat, there will be no campaigns without information campaigns, and information combat will be part of every other combat and campaign activity; for the PLA, it is a major determinant of the joint campaign battlefield.

In the *Zhanyixue* conception of joint campaigns, all three of these new venues are integral to joint operations. Indeed, it appears that they have become recognized as new arenas for combat primarily in the context of joint operations. Whether this is because bureaucratically they did directly into any specific Service's purview, or whether it is because they have an especially great impact on joint campaigns is unclear. However, there is little question that, based on *Zhanyixue*, they are important parts of any future joint campaign.

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[196] Ibid., p. 394.

POTENTIAL PROBLEMS CONFRONTING "JOINT CAMPAIGNS WITH CHINESE CHARACTERISTICS"

The PLA has clearly devoted significant time and effort towards formulating an approach aimed at developing an approach to joint campaigns suitable for its own requirements. Moreover, as the PLA itself recognizes, it is still in the relatively early stages of jointness. Indeed, one PLA characterization of joint command and control is very interesting. It is suggested that there is a three-egg model:

- There are three eggs in a bowl---preliminary joint training.
- There are three eggs broken into a bowl---limited joint training.
- There are three eggs broken into a bowl, and then mixed together---all-around joint training.[197]

This analogy neatly captures the sense of both where the PLA is now; i.e., it is still in the very early stages of preliminary joint training, and it recognizes that it must eventually aim for more comprehensive joint training.

Yet, there are significant potential problems that are likely to arise, if they have not already, as they seek to implement this vision. One of the most important is whether the PLA can successfully incorporate the concept of jointness into its operations, in the face of an almost complete absence of historical experience. As noted in *Zhanyixue*, the PLA's sole example of undertaking a joint campaign was the 1955 Yijiangshan Campaign. Even that involved a totality of only a *juntuan* (军团), i.e., the participating Services each contributed only *bingtuan* (兵团) level units.[198] All of its other experiences were at most combined arms campaigns, and even many of those involved solely infantry-artillery. In the absence of real-life experience, then, the actual ability of the PLA to implement joint operations remains unknown.

In order to remedy this serious deficiency, the PLA hopes to draw upon the experiences of foreign militaries. The British experience in the Falklands War and the American experience in the Gulf are both often noted as case studies of successful joint operations. But it is not at all clear that foreign experiences can be exploited without porting the attendant cultural and experiential aspects to the PLA. A general reliance on junior officers and NCOs, for example, to bear the brunt of the burden for battlefield

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[197] Yuan Wenxian, "Strengthening Command Training in Joint Operations," *Jiefangjun bao*, 9 April 2002, in FBIS.

[198] It is worth noting that this may be the reason why "joint" operations are consistently considered to involve *juntuan* level units, except in unique circumstances. If this exception were not present, then the PLA could be said to have NEVER operated jointly in a real, wartime context.

decision-making, is essential to much of AirLand Battle. But that, in turn, builds upon a general willingness to decentralize decision-making, not only in the military, but in the culture writ large. Even if the PLA establishes a professional NCO corps (which it is apparently attempting), whether or not the higher level command structure will, in the end, be prepared to allow it to operate is unclear.

Another problem confronting the PLA as it seeks to implement joint campaigns is likely to be institutional resistance. The difficulties in imposing jointness on the American military, despite extensive historical experience with joint operations, are a matter of record, requiring an act of Congress (the 1986 Goldwater-Nichols Defense Reorganization Act) to overcome them. For the PLA to adopt a new approach is likely to engender similar levels of bureaucratic opposition. Indeed, as joint campaigns clearly require a downgrading of the relative importance of the land forces, and a concomitant increase in the importance of air and naval forces, there are likely to be powerful opponents to such a shift. Some aspects of this opposition have already apparently arisen, with some officers still reflecting an emphasis on ground forces to the exclusion of the other Services, while at the same time, officers of other services' **over**-estimate the importance of other services.[199]

These systemic factors are further complicated by the PLA's simultaneous effort to incorporate more advanced technologies and a more expansive sense of battlespace into its campaigns. The introduction of significant new technologies imposes significant strains on any military; the same applies to the expansion of operational purview. In both cases, there are training, logistics, and deployment considerations. In the case of the PLA, however, these problems are exacerbated by several additional considerations.

In the first place, the PLA's starting level of technology is relatively low. As of the 1980s, PLA military technology was described as some of the world's best obsolete equipment. Much of the 1980s, with the emphasis on national economic development, did not improve the PLA's technological sophistication. While the situation has improved throughout the 1990s, with the influx of new equipment, including fourth-generation fighter equipment, new Russian-built destroyers and submarines, etc., it would still be hard to characterize this modernization as affecting all, or even most, of the PLA. If the PLA is to operate in a "modern, high-tech" environment, as envisioned for joint campaigns, it must improve the technological sophistication of at least the formations that are most likely to be involved in its campaigns.

Yet, it is not at all clear whether the PLA can, in fact, accomplish this. The PLA, after all, is still a conscript military, and the PRC as a whole, from which the military is drawn, is hardly uniformly technologically conversant. The growth of the private sector, and the movement of many of the technologically best and brightest to make their fortunes there, almost certainly impacts the ability of the PLA to sustain even its more technologically capable units.

Similarly, the PLA is intent upon expanding its operational environment to space, to information space, and to the electronic sphere. Not only do these arenas tend to

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[199] Zhang Xingye, p. 87.

require more advanced equipment, but they are also *terra incognita* to much of the PLA (although it should be noted that they are hardly familiar even to Western militaries). Thus, even as the PLA is trying to adopt a new method of warfighting, it is also attempting to adjust to new operating areas, with new types of equipment that are significantly in advance of that with which it is most familiar.

Even as the PLA is attempting to incorporate said new technologies, parameters and doctrines, moreover, into its campaign coordination and planning efforts, and is attempting to do so based primarily on foreign experience, it will have to do so, in the event of war, in the face of determined enemy interference. As *Zhanyixue* notes, campaign coordination is very likely to be unstable because an opponent will engage in intense counter-coordination efforts. Both sides will be seeking to paralyze the opponent's coordination capabilities, as that will be the most effective means of disrupting the other side's campaign plans. Clearly, the PLA recognizes that an opponent will engage in counter-coordination efforts. What is less clear is the extent to which the PLA can, in fact, survive such efforts and continue to implement its joint campaign plans successfully in a degraded, hostile environment.

There is also a larger question at work. *Zhanyixue*, and other Chinese writings, argue that single campaigns are likely to be decisive. Future wars, but especially local or limited wars under modern, high-tech conditions, are likely to last for only one campaign. Given these mutually exacerbating shortcomings in the practical ability of the PLA to implement joint campaigns, how many mistakes, failures, or unforeseen circumstances can it accommodate in the event of a future conflict?

5. CHINA'S EVOLVING NUCLEAR CALCULUS: MODERNIZATION AND DOCTRINAL DEBATE

By Michael S. Chase and Evan Medeiros

INTRODUCTION

The nuclear forces of the People's Republic of China (PRC) have been the subject of intense interest and speculation in the United States in recent years. The US debate has centered primarily on questions regarding the pace and scope of Chinese nuclear and missile force modernization, possible Chinese responses to US ballistic missile defense (BMD) plans,[200] Chinese reactions to the new U.S. Nuclear Posture Review,[201] allegations of Chinese espionage of US nuclear secrets[202] and whether the Bush administration's views toward Chinese nuclear force modernization have further amplified the salience of strategic nuclear issues in US-China relations.[203] Of these issues, Chinese strategic

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[200] Robert A. Manning, Ronald Montaperto, and Brad Roberts, *China, Nuclear Weapons, and Arms Control: A Preliminary Assessment*, New York: Council on Foreign Relations, 2000. For recent media reports on the modernization of Chinese nuclear forces, see: Robert Suro, "Study Sees Possible China Nuclear Buildup," *Washington Post*, 10 August 2000; Jane Perlez, "China Likely to Modernize Nuclear Arms, U.S. Believes," *New York Times*, 12 May 2000; James Risen, "New Chinese Missiles Seen as Threat to U.S.," *New York Times*, 10 September 1999; Seth Faison, "China Proclaims It Designed Its Own Neutron Bomb," *New York Times*, 15 June 1999; David E. Sanger and Erik Eckholm, "Will Beijing's Nuclear Arsenal Stay Small, or Will it Mushroom?," *New York Times*, 15 March 1999.

[201] On the Chinese reaction to the NPR, see Evan S. Medeiros and Jing-dong Yuan, "The U.S. Nuclear Posture Review and China's Responses," Center for Nonproliferation Studies, Monterey, CA, 1 April 2002, http://cns.miis.edu/pubs/week/020401/htm.

[202] House, *Report of the Select Committee on U.S. National Security and Military/Commercial Concerns with the People's Republic of China*, 105th Cong., 1999, H. Rept. 105-851. This report is more commonly known as the Cox Committee Report. The complete text of the report is available on the House of Representatives website at http://www.house.gov/coxreport/. For an extensive critique of the Cox Committee Report, see Alastair Iain Johnston, W. K. H. Panofsky, Marco Di Capua, and Lewis R. Franklin, *The Cox Committee Report: An Assessment*, Center for International Security and Arms Control, Stanford University, December 1999.

[203] Recent media reports that focus specifically on U.S. policy and China's nuclear and missile modernization programs include: David E. Sanger, "U.S. Restates its Stand on Missiles in China," *New York Times*, 5 September 2001; and David E. Sanger "U.S. Will Drop Objections to China's Missile Buildup," *New York Times*, 2 September 2001. Regarding Beijing's opposition to U.S. missile defense plans, see: Jane Perlez, "Chinese Unswayed as Powell Pushes U.S. Missile Plan," *New York Times*, 29 July 2001; Erik Eckholm, "Experts Try to Make Missile Shield Plan Palatable to China," *New York Times*, 28 January 2001; Steven Lee Myers, "Study Said to Find U.S. Missile Shield Might Incite China," *New York Times*, 10 August 2000; Erik Eckholm, "China Arms Expert Warns U.S. Shield May Force Buildup," *New York Times*, 11 May 2000; Erik Eckholm, "U.S. Missile Shield Will Set Off a New Arms Race, China

nuclear modernization has received the most analytical attention. In the 1980s, China began for the first time to systematically think about the survivability of its strategic deterrent and launched a determined effort to modernize its nuclear forces.[204] At that time, China was estimated to possess only two or three missiles capable of reaching the US. By the mid-1990s, China fielded approximately 20 CSS-4 (DF-5A) intercontinental ballistic missiles (ICBMs) capable of striking targets in the United States. These large, liquid-fueled missiles are based in silos and Beijing fears they are vulnerable to a nuclear or perhaps even conventional first strike. The PRC also has dozens of CSS-3 (DF-4) long-range missiles capable of reaching targets in Russia and Asia. The U.S. Intelligence Community projects that by 2015 China will have 75 to 100 missiles armed with nuclear warheads, "deployed primarily against the US."[205] China's long-running modernization program is motivated by Beijing's commitment to develop and deploy a more reliable, survivable and, therefore credible strategic missile force.[206] By 2015, when the US projects that China's strategic missile forces will consist primarily of solid-fueled, mobile missiles, China will have gone a long way toward achieving this objective.

Current US Research on Chinese Nuclear Modernization

Despite the increased focus on the new directions in China's nuclear and missile modernization in the post-Cold War era, however, most policymakers and analysts have devoted comparatively little attention to assessing China's nuclear doctrine and thinking among Chinese strategists about nuclear weapons.[207] The preponderant focus on Chinese capabilities provides a particularly limited perspective, especially given that doctrinal issues are closely intertwined with the modernization of Chinese nuclear forces. What many analyses of China's nuclear and missile modernization overlook is that Chinese nuclear analysts are engaged in internal debate and discourse that may redefine Chinese nuclear doctrine in ways that directly affect force structure.

China's evolving nuclear calculus has not gone completely unstudied in the academic and think tank communities, however. In recent years, China watchers in academia and research institutes have produced a number of outstanding analyses of Chinese nuclear doctrine and related strategic issues. Alastair Iain Johnston's initial

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Warns," *New York Times*, 25 November 1999; and John Pomfret, "China Warns of New Arms Race: Official Says U.S. Missile Shield Would Shift Balance of Power," *Washington Post*, 11 November 1999.

[204] This paragraph draws heavily on, *Foreign Missile Developments and the Ballistic Missile Threat Through 2015*, *Unclassified Summary of a National Intelligence Estimate*, Washington D.C: National Intelligence Council, December 2001.

[205] Ibid.

[206] Ibid.

[207] Although some reports have considered the dynamics driving force modernization and Chinese opposition to NMD, many tend to treat developments in each of these areas in isolation. Moreover, few have considered the interrelationship between these issues and nuclear doctrine.

research on Chinese debates about nuclear doctrine and Beijing's arms control policies stands out as among the most influential of these assessments.[208] Drawing on extensive use of numerous Chinese language books and articles, Johnston shows that Chinese nuclear doctrine has been a subject of growing debate in PRC strategic circles since the late 1980s. Chinese analysts have engaged in discussions about shifting away from the traditional Chinese strategic nuclear doctrine of "minimum deterrence" (*zuidi xiandu weishe*; 最低限度威摄) toward the adoption of a nuclear doctrine based on the concept of "limited deterrence" (*youxian weishe*; 有限威摄). Chinese nuclear strategists, Johnston writes, argue that the limited deterrence doctrine "requires sufficient counterforce and counter-value tactical, theater, and strategic nuclear forces to deter the escalation of conventional or nuclear war."[209] This war-fighting doctrine repudiates the notion that mutually assured destruction (MAD) is a stable basis for deterrence. Instead, its proponents argue that for deterrence to be credible it must be based upon capabilities that could actually be used to achieve specific objectives in a nuclear war.

A Chinese shift toward doctrine of limited nuclear deterrence would have important implications in a number of areas. It would increase the number and type of target requirements for Chinese nuclear forces, which in turn would push China's ongoing nuclear force modernization in new and different directions. In addition, shifting to the doctrine of limited deterrence might also make it necessary for the strategic rocket forces or Second Artillery (*dier paobing*; 第二炮兵) to operate at a much higher state of readiness, and perhaps even lead Beijing to drop, conditionalize or clarify its longstanding no-first-use (NFU) commitment as consistent with a policy of launch-on-warning (LOW) or launch-under-attack (LUA).[210]

However, Johnston concludes that "China does not presently have the operational capabilities to implement this vision of limited deterrence."[211] Moreover, he noted it is unclear whether strategists who favor limited deterrence are influencing the resource allocation, research and development, and acquisition decisions that are driving China's current round of nuclear and missile modernization.[212]

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[208] See Alastair Iain Johnston, "China's New 'Old Thinking:' The Concept of Limited Deterrence," *International Security*, Vol. 20, No. 3, Winter 1995/96; and "Prospects for Chinese Nuclear Force Modernization: Limited Deterrence versus Multilateral Arms Control," *China Quarterly*, No. 146, June 1996, pp. 548-576.

[209] Johnston, "China's New 'Old Thinking,' " pp. 5-6. See also Johnston, "Prospects for Chinese Nuclear Force Modernization," p. 555.

[210] Johnston, "Prospects for Chinese Nuclear Force Modernization," pp. 555-558.

[211] Johnston, "China's New 'Old Thinking,' " p. 6.

[212] Johnston, "Prospects for Chinese Nuclear Force Modernization," pp. 549, 558-560. Additional sources that address the "limited deterrence" debate include Paul H.B. Godwin, "China's Nuclear Forces: An Assessment," *Current History*, September 1999, pp. 260-265, and Mark A. Stokes, *China's Strategic Modernization: Implications for the United States*, Carlisle, PA: Strategic Studies Institute, U.S. Army War College September 1999. In an in-depth study of China's strategic modernization that draws on a wealth of

In recent years, the US discourse on Chinese nuclear doctrine has moved beyond the sharp distinction between minimum and limited nuclear deterrence. Recent research by Bates Gill, James Mulvenon, and Mark Stokes moves the US debate forward by examining China's evolving nuclear doctrine by disaggregating it into component parts.[213] Gill, Mulvenon, and Stokes assess Chinese nuclear/missile doctrine at three levels: (1) strategic nuclear forces; (2) theater nuclear and conventional forces; and (3) short-range conventional missile forces. They maintain that at each level, China employs a different doctrinal approach. At the level of strategic nuclear forces, they argue that while China has struggled for nearly four decades to cope with a gap between doctrine and capabilities, the ongoing modernization of Chinese nuclear forces is allowing the PRC "to increasingly achieve a degree of credible minimal deterrence vis-à-vis the continental United States."[214] The modernization of Chinese strategic nuclear forces is intended to increase their survivability, thereby improving the credibility of Chinese nuclear deterrence.[215] At the theater level, China is assuming "a more offensive-oriented posture of limited deterrence," while for its conventional missile forces it is adopting "an offensively-configured, preemptive, counterforce warfighting posture."[216]

This paper aims to update, reconsider and test these findings in light of newly available Chinese language materials on the evolving Chinese debate on nuclear doctrine.[217] Among the most important of these sources are three recently published Chinese volumes: *The Science of Campaigns* (*Zhanyixue*; 战役学), an internal military circulation volume, and two versions (a 1999 National Defense University Press version and 2001 Academy of Military Sciences Press version) of *The Science of Strategy* (*Zhanlüexue*; 战略学). The latter volumes are open publications. *Zhanyixue*, given its focus on campaign operations and its status as a military internal publication, is more specific and may be more authoritative than either edition of *Zhanlüexue*. Although these

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Chinese language sources, Stokes assesses trends in the development of weapons and technology that are critical to understanding Chinese strategic capabilities and doctrine. Emphasizing the high degree of importance that Beijing attaches to China's strategic nuclear forces, Stokes points out that "maintenance of a viable nuclear deterrent has been the highest priority of Chinese defense planners since the mid-to-late 1950s."

[213] Ibid.; "The Chinese Second Artillery Corps: Transition to Credible Deterrence," in *The People's Liberation Army as Organization*, eds., James C. Mulvenon and Andrew N.D. Yang, Santa Monica, CA: RAND, 2002, p. 510-586.

[214] Bates Gill, James Mulvenon, and Mark Stokes, "The Chinese Second Artillery Corps," p. 3-4.

[215] One of the most interesting conclusions reached by Gill, Mulvenon, and Stokes is that deterrence theories developed by Cold War nuclear strategists suggest the modernization of China's nuclear forces will enhance the stability of the deterrence dynamic between China and the United States.

[216] Bates Gill, James Mulvenon, and Mark Stokes, "The Chinese Second Artillery Corps," p. 3-4.

[217] It should be noted that several of the studies discussed above, most notably Iain Johnston's work on "limited deterrence" and the Gill, Mulvenon, and Stokes chapter on the Second Artillery, drew heavily on previously untapped Chinese language sources to further illuminate the debate on Chinese nuclear doctrine.

volumes primarily address issues relevant to conventional operations, all three include sections on nuclear weapons, nuclear deterrence and nuclear operations. Regarding nuclear issues, *Zhanyixue* is far more detailed and specifically discusses conditions under which and how China's Second Artillery would conduct its operations.

Drawing on these sources, this study addresses several key questions. Foremost among them is the question of whether Beijing's nuclear and missile modernization signals a clear move toward the doctrine of limited deterrence or is focused on ensuring the survivability and boosting the credibility of China's current strategic nuclear and missile forces in the face of challenges posed by changes in the international security environment, US missile defense plans and improvements in US conventional precision strike capabilities.

This study's preliminary conclusion is that China has moved to a clearer and more explicit adoption of a doctrine of credible minimum deterrence for its strategic nuclear forces and, thus, its force structure improvements are for now aimed at meeting the requirements of that doctrine. To be sure, regarding some aspects of this conclusion the evidence is mixed and many important questions remain unanswered. Yet, drawing on these two new Chinese language sources highlights several interesting aspects of current Chinese thinking on nuclear doctrine and nuclear operations and opens up fertile ground for additional research. The research in this paper underscores the importance, indeed the imperative, to interact and talk more regularly with Chinese strategists about their thinking about nuclear strategy. Given the curious lack of a formally articulated Chinese nuclear doctrine combined with the growing variety of views in China about nuclear weapons, Western analysts and policymakers need a more consistent and transparent picture of official and widely accepted views on the role of nuclear weapons in China's national security policy. This paper offers several preliminary conclusions based on its analysis of the content of *Zhanyixue* and *Zhanlüexue*:

- Chinese writings on nuclear doctrine clearly and consistently place a high priority on improving the reliability and survivability of Chinese nuclear forces. These are the central concerns of Chinese planners and are consistent with the establishment of a credible minimum deterrent.

- The discussion of nuclear policy in *Zhanyixue* and *Zhanlüexue* reflect both an explicit and implicit acceptance of China's official no-first-use pledge (NFU); some writings specifically view NFU as an explicit constraint on changes in nuclear doctrine and force structure.

- Chinese strategists lack a unified view of the actual composition of China's unconditional NFU commitment. Some writings suggest a narrow interpretation whereas others interpret NFU as consistent with launch-on-warning or launch-under-attack postures. Some Chinese military strategists apply an expansive and offensively oriented definition of NFU.

- Chinese military planners are increasingly focused on the challenges to the viability of China's nuclear deterrent posed by US conventional, long-range precision strike

weapons. Yet, neither *Zhanyixue* nor *Zhanlüexue* explicitly address the implications of such weapons for China's nuclear doctrine and force structure.

- Chinese strategists continue to hold conflicted views about the relative value of minimum deterrence versus adopting a doctrine of limited nuclear deterrence. Some Chinese writings continue to address the operational requirements and strategic virtues of the doctrine of limited deterrence. At a minimum, a continuing interest in a limited deterrent exists in Chinese strategic circles.

- Chinese writings on nuclear weapons and deterrence raise and do not resolve numerous tensions in Chinese thinking about doctrinal issues. These include the conditions under which China's NFU applies; the extent to which Chinese discussions of counter-military targeting are a reflection of technical needs, operational preferences or merely aspirations; and the tension between secrecy and non-transparency on nuclear issues and the ability to communicate the capability and determination to retaliate.

- *Zhanyixue* and *Zhanlüexue* are helpful in refining our understanding of very general aspects of Chinese nuclear doctrine such as the distinction Chinese military analysts draw between offensive and defense nuclear deterrence.

- The relative lack of detail on specific nuclear policies in *Zhanyixue* and *Zhanlüexue* (in contrast to the plethora of data on general conventional military doctrine) suggests three possibilities: that Chinese writings on nuclear issues remain highly classified; that *neibu* (内部) and *junnei* (军内) documents are of limited value in answering nuclear questions; or that there is not much sophisticated thinking and writing about nuclear doctrine to be revealed.

STRUCTURE OF THE STUDY

The central aim of this paper is to assess the key aspects of China's evolving nuclear doctrine in light of new Chinese source materials. These issues include: Chinese views on nuclear deterrence theory, strategic transparency, the relationship between nuclear weapons and great power status, China's no-first-use (NFU) policy, nuclear survivability and nuclear command and control issues. The paper first examines Chinese views on nuclear weapons and nuclear deterrence, and then assesses China's nuclear policies and operational doctrine. The conclusion highlights important gaps in our understanding of Chinese nuclear doctrine and suggests avenues for future research.

Although much work has already been done of these issues, this paper aims to shed further light on them by exploiting new and previously unexamined Chinese sources. This paper draws heavily on three recently published Chinese books: (1) *Zhanyixue,* in particular the discussion of nuclear doctrine contained in the chapter on Second Artillery campaigns, and (2) the examination of nuclear strategy in *Zhanlüexue* – both the 1999

edition published by National Defense University and the 2001 version published by Academy of Military Sciences.[218] In addition, the paper draws on other public and internal Chinese language sources on nuclear doctrine, several English-language articles and monographs on China's nuclear forces and strategy, and interviews and discussions with Chinese and American strategists. The analysis is also informed by a number of classic US writings on nuclear doctrine and deterrence, which have shaped the debate on nuclear strategy from the early years of the Cold War to the present day.[219]

Methodological Challenges

Even though openly published (*gongkai*; 公开), internal distribution (*neibu*; 内部), and military internal distribution (*junnei*; 军内) Chinese writings on nuclear matters have proliferated in recent years.[220] Western analysts of Chinese nuclear doctrine still face problems due to the paucity of quality information. It is reasonable to assume that more detailed and revealing Chinese writings on nuclear doctrine and force modernization exist but that these are considered extremely sensitive and are therefore highly classified.[221] One such document is the *Second Artillery Campaign Theory* (*Dier paobing zhanyixue*; 第二炮兵战役学), which was issued in the mid-1980s according to Chinese sources.[222]

Compounding the problems of access to quality sources, analysts are also faced with difficulties in evaluating the authoritativeness of available Chinese publications.[223] Among the questions confronting analysts are the following: should the views expressed in openly published sources be assessed differently from those advanced in *neibu* or

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[218] Wang Houqing and Zhang Xingye, eds., *Zhanyixue* [The science of campaigns], Beijing, China: Guofang Daxue Chubanshe, May 2000; and Wang Wenrong, ed., *Zhanlüexue* [The science of strategy], Beijing, China: Guofang Daxue Chubanshe, 1999; Peng Guangqran and Yao Youzhi, eds. *Zhanlüexue* [The science of strategy], Beijing, China: Junshi Kexue Chubanshe, 2001.

[219] See for example, Herman Kahn, *On Thermonuclear War,* Princeton, NJ: Princeton University Press, 1960; Herman Kahn, *Thinking about the Unthinkable*, New York: Avon, 1962; Thomas Schelling, Arms and Influence, New Haven, CT: Yale University Press, 1966; Lawrence Freedman, *The Evolution of Nuclear Strategy,* London: Macmillan, 1989.

[220] On this trend, see Evan S. Medeiros, "Undressing the Dragon: Researching the PLA Through Open Source Exploitation," in *A Poverty of Riches: New Challenges and Opportunities in PLA Research*, eds., James Mulvenon and Andrew Yang, Santa Monica, California: RAND, 2004.

[221] In all nuclear countries, many documents on nuclear forces, operations, and even some aspects of doctrine are classified. China is certainly not unique in that it considers many of these matters to be state secrets. It is probably reasonable to assert, however, that China is even more secretive about its nuclear forces and strategic doctrine than are any of the other nuclear countries.

[222] Wang Houqing and Zhang Xingye, eds., *Zhanyixue*, p. 369.

[223] The closed nature of the PRC nuclear policy field and the relative unavailability of nuclear strategists for interviews and dialogue pose additional problems.

junnei materials? Is it possible to discern whether the arguments set forth in a particular volume reflect military and civilian thinking on these topics or are simply the personal views of the author? When different published sources put forward divergent views on a topic, does that reflect an active debate on the subject? If so, how can one know which views are representative of the mainstream and which are in the minority? How much can be inferred from available sources about high-level debates on these issues? How closely related are these debates to actual operational planning?[224]

These questions raise serious methodological challenges for analyzing available Chinese writings on nuclear doctrine. Although a full exploration of these problems lies beyond the scope of this paper, it is worth noting that many Chinese publications - even restricted distribution volumes like *Zhanyixue* - are not necessarily authoritative on all issues.[225] All research on nuclear doctrine, given its relative sensitivity in China and relative newness of the topic for Chinese strategists, should be evaluated in the context of these caveats.

CHINESE VIEWS ON NUCLEAR WEAPONS AND NUCLEAR DETERRENCE

This section examines Chinese writings on nuclear weapons and nuclear deterrence. It focuses on China's views on nuclear weapons and great power status, the nature of nuclear deterrence, the costs and benefits of strategic transparency, and the Chinese concept of "counter-deterrence."

Nuclear Weapons and Great Power Status

Chinese strategists have traditionally viewed nuclear weapons as possessing a symbolic value and thus confirming and validating China's status as a great power. This was one of the primary reasons (in addition to preventing further superpower coercion and "blackmail" of China) that Beijing decided to devote substantial resources to the development of nuclear weapons in the first place. Recent Chinese publications confirm that strategic thinkers in China continue to view nuclear weapons as an important component of China's standing as a great power. In *Zhanlüexue*, for example, nuclear weapons are described as a crucial factor in establishing a nation's international status (*guoji diwei*; 国家地位).[226] The editors of *Zhanlüexue* suggest that nuclear weapons are "a type of political weapon" (*yizhong zhengzhi wuqi*; 一种政治武器) and are valuable

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[224] It is certainly worth noting that there are often gaps between declaratory doctrine and actual operational planning. In the United States during the Cold War, for instance, there was at times a substantial divergence between public and even closed-door debates on nuclear doctrine and the options that were actually available to the President.

[225] This paper's appendix contains a comparison of the openly published *Zhanlüexue* and the internal volume *Zhanyixue* that illustrates the scope of these methodological problems.

[226] Wang Wenrong, ed., *Zhanlüexue*, p. 348.

primarily for political reasons.[227] Nuclear weapons are seen in this regard as particularly important not only for China, but also for the other small and medium nuclear powers. In some cases, the possession of nuclear weapons even confers great power status upon countries that would otherwise be regarded as no more than middle-ranking powers. In pursuing this theme further, the editors of *Zhanlüexue* suggest that Britain and France sought membership in the "nuclear club" (*he julebu*; 核俱乐部) not only to protect their national interests, but also to enhance their political status.[228] These views of the role of nuclear weapons have influenced Chinese perceptions of India's 1998 nuclear tests and Indian motivations to confirm publicly their nuclear weapon status.[229]

Nuclear weapons, however, are viewed as more than mere symbols of international political status in *Zhanlüexue*. According to the editors, nuclear weapons have "great influence in international politics and diplomacy"[230] and have become "important chips (*chouma*; 筹码) in the international political struggle."[231] This interpretation is consistent with China's longstanding assertion that it developed nuclear weapons to counter the nuclear threats of the superpowers. Turning to China's decision to develop nuclear weapons, the editors of *Zhanlüexue* echo the statement China released in October 1964 after successfully conducting its first nuclear test. "It was under the nuclear blackmail (*he ezha*; 核讹诈) and nuclear threats (*he weixie*; 核威胁) of the superpowers that China was compelled (*beipo*; 被迫) to develop nuclear weapons." For China, the development of a nuclear capability struck a heavy blow against the "arrogant bluster" (*xiaozhang qiyan*; 嚣张气焰) of the superpowers.[232]

While some Chinese strategists have downplayed the military utility of nuclear weapons, parts of *Zhanyixue* - as well writings by Second Artillery strategists - have underscored the military relevance of nuclear forces. According to *Zhanlüexue,* the importance of nuclear weapons is not limited to their impact on international politics; their influence has also been felt in military affairs. "The production of nuclear weapons was an epochal event in the history of weapons development, and its influence in the field of military affairs was revolutionary, widespread, and profound."[233] Moreover, the editors assert, "the emergence of nuclear weapons produced major changes in the theory

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[227] Ibid.

[228] Ibid.

[229] Jing-dong Yuan, "India's Rise After Pokhran-II: Chinese Analyses and Assessments," *Asian Survey*, November/December 2001, p.978-1001.

[230] Wang, Wenrong, ed., *Zhanlüexue*, p. 347.

[231] Ibid., p. 348.

[232] Ibid.

[233] Ibid. p. 349.

and practice of military affairs," and "traditional strategic and tactical concepts couldn't help but be deeply changed under nuclear conditions."[234]

CHINESE VIEWS ON THE NATURE OF NUCLEAR DETERRENCE

Beyond the role of nuclear weapons as symbols of great power status, Chinese strategists in recent years have developed a set of Chinese views about the nature of deterrence and how it functions between and among nuclear nations. The Chinese writings examined in this study confirm these views are evolving. The main Chinese term for deterrence, *weishe* (威摄), has traditionally had a distinctly pejorative connotation, which suggests an explicit effort to coerce and terrify an adversary with the threat of force. Some Chinese analysts have dealt with this problem by asserting that deterrence was something inflicted upon China by hegemonists and imperialists of various stripes, not something that China itself practiced. In addition, due to this negative connotation, for decades China's official position was that it opposed a policy of nuclear deterrence. Yet in the late 1990s Chinese strategists began to distinguish for the first time between defensive (acceptable) and offensive (unacceptable) nuclear deterrence. This critical distinction is elucidated for the first time in *Zhanlüexue*.

Zhanlüexue notes that nuclear deterrence is not only a means of achieving military objectives but political ones as well.[235] In contrast to past Chinese views, *Zhanlüexue* explains that deterrence is not an evil in and of itself. To the contrary, its political quality depends on how it is employed and, of course, which country is using it. "Because political goals differ," the editors explain, "the nature of nuclear deterrence also varies." "There is the offensive nuclear deterrence of hegemonism, and then there is defensive nuclear deterrence used for self-protection." Unsurprisingly, they continue by asserting that during the Cold War the superpowers used nuclear deterrence to threaten and blackmail less powerful countries, and in general to strive for hegemony and promote "power politics."[236] This formulation conveniently solves the problem of how to criticize the nuclear superpowers for their use of deterrence while at the same time justifying China's nuclear deterrence policy. In the words of the editors, "China is a country that possesses nuclear weapons, and its limited nuclear forces have a deterrence function (*weishe de gongneng*; 威慑的功能)." According to *Zhanlüexue*, China's nuclear weapons, however, are for the purposes of self-defense, prevention of nuclear war, and

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[234] Ibid., p. 350.

[235] Ibid., p. 357. It is worth noting that the term deterrence is in some ways treated more neutrally in this volume. It does not always carry the decidedly negative connotations often associated with the term in some Chinese writings and statements. The editors rather dispassionately state that deterrence is as an "important form of military struggle" and that nuclear deterrence has "especially great significance" because of the tremendous destructive power of nuclear weapons. The editors appear to confuse deterrence and coercion at some points, but for the most part they present a fairly straightforward, politically neutral definition of deterrence.

[236] Ibid., p. 358.

protection of national security and world peace. Consequently, this allows the editors to claim that there are "fundamental differences" between the "nuclear deterrence of hegemonistic countries" and the nuclear deterrence practiced by China.[237]

Having solved this thorny terminological problem, the editors then discuss the theory and practice of nuclear deterrence. According to the editors of *Zhanlüexue,* there are three essential requirements for effective deterrence: the first is possession of sufficient and reliable nuclear forces (*zugou, kekao de he liliang*; 足够可靠的核力量); the second is the resolve (*juexin*; 决心) to use nuclear weapons if necessary; and the third is ensuring that the adversary clearly understands the above two conditions have been fulfilled, thus enabling the "deter-er" to influence the adversary's decisions and actions. If effective nuclear forces are lacking or if the resolve and will to use nuclear weapons is absent, nuclear forces cannot play an effective role in deterrence. Even if the side that attempts to deter has resolve, if it fails to communicate its resolve to the party that it seeks to deter, or that party does not understand the message correctly, it is unlikely that nuclear deterrence will be effective. For these reasons, according to the editors of *Zhanlüexue*, "all three of these factors are necessary conditions (*biyao tiaojian*; 必要条件) for nuclear deterrence to be effective; if even one is lacking it would be unacceptable (*que yi buke*; 缺一不可)."[238]

According to the editors of *Zhanlüexue*, among the most important factors that determine the success or failure of nuclear deterrence are resolution (*juexin*; 决心) and will (*yizhi*; 意志*)*.[239] After a brief examination of the Cuban Missile Crisis, the editors conclude that Moscow backed down because of a lack of resolve. It is implied that Moscow agreed to withdraw its missiles without seeking sufficient concessions from Washington. Interestingly, in this analysis the Chinese did not address the relative (im)balance of interests between the US and Soviet Union during the Cuban Missiles crisis; such an assessment of US and Soviet interests and their respective will and determination to escalate the crisis would be applicable to Chinese analysis of a conflict over Taiwan. From the Chinese perspective, a more interesting argument, and one that would have much greater relevance to the Taiwan situation, would be that the United States prevailed in the crisis because it had more important interests at stake than did the USSR and therefore had greater resolve and determination that enhanced the credibility of its threats. These insights could have implications for a scenario in which the U.S. and China come into conflict over Taiwan if Beijing believes that in such a showdown the

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[237] Ibid., p. 358-359.

[238] Ibid., p. 358. Interestingly, these are the exact same three requirements identified by Liu Huaqiu in his Stimson Center paper on China's NFU policy, and the wording of the paragraph is quite similar to that of the section on deterrence in Liu's essay. It is unclear whether this is because they have drawn on the same official guidance, or whether the editors of *Zhanlüexue* simply borrowed the passage from Liu without attribution. It is of course also possible that both the former and the latter copied the passage from a third, presumably non-authoritative source, such as an article written by another Chinese analyst.

[239] Ibid., p. 362.

asymmetry of the interests at stake would favor China by enhancing the credibility of Chinese threats.

Nuclear Deterrence and Transparency

Another issue that further elucidates Chinese views on nuclear weapons is the relationship between transparency and the credibility of deterrence. Several key questions arise in the context of this issue. They include: do Chinese strategists believe that some transparency is beneficial or that secrecy and ambiguity are more effective at enhancing security? If secrecy is preferred, is it intended to hide China's capabilities or perhaps to divert attention from a lack of capability in certain areas? Is China's goal to make sure that a potential adversary is uncertain about China's capabilities? What accounts for China's lack of transparency on doctrinal issues? In Chinese thinking, to what extent are the possession of a credible deterrent and transparency mutually reinforcing or inconsistent?

Western strategic analysts tend to view transparency as a measure that can bolster strategic stability. While a certain degree of non-transparency and ambiguity regarding either intentions or capabilities can be useful, Western strategists generally recognize that some transparency, especially with weaker countries, can promote strategic stability by reducing suspicion and uncertainty. This, in turn, reduces the possibility of misperceptions and miscalculation that could result in armed conflict. Chinese strategists are not nearly as predisposed to accept the value of transparency as their Western counterparts. However, China in past years has viewed transparency as a monolithic notion and has been unwilling to share much information about its policies, its intentions and its force capabilities on security and military issues. The Chinese have been very unwilling to share any data about China's military modernization efforts, citing its weak military capabilities relative to the US. These sensitivities are especially acute on all nuclear issues, both those related to doctrine as well as capabilities.[240]

Yet, Chinese views on transparency appear to be evolving. Beijing has made some notable strides regarding military transparency in recent years, such as its publication of white papers on arms control (1995) and national defense (1998, 2000 and 2002). At the same time, however, China has remained reluctant to increase transparency in specific areas. In particular, China has resisted enhancing transparency in the areas of nuclear forces and doctrine. This reluctance is a function of two possible factors. The first is the existence of a deeply entrenched culture of military secrecy in China; Chinese strategic

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[240] For a discussion of Chinese attitudes toward military transparency in general and as it relates to arms transfers and arms control in particular, see Bates Gill and Evan Medeiros, "The Foreign and Domestic Influences on China's Arms Control and Nonproliferation Policies," *China Quarterly*, March 2000, p. 66-94. Gill and Medeiros argue that a combination of external pressure, Beijing's desire to improve China's international image, and the evolution of the policy-making process in China have shaped the PRC's attitude toward arms control and nonproliferation issues, including transparency and confidence building measures, during the era of reform.

thinkers have traditionally placed a great deal of emphasis on secrecy and deception.[241] In addition to a strategic culture that places a high degree of emphasis on secrecy as a pillar of security, another important explanation is that Chinese decision-makers fear greater transparency would expose China's vulnerabilities and weaknesses, potentially undermining deterrence.[242]

Chinese analysts thus calculate that secrecy and ambiguity enhance the potency of nuclear deterrence, whereas transparency might undermine its credibility. In particular, they view transparency as inherently disadvantageous for comparatively weak powers, such as China when compared to the US. As one Chinese interlocutor succinctly put it, "Transparency is a tool of the strong to be used against the weak."[243] For these reasons, when it comes to nuclear weapons and many aspects of nuclear doctrine, China has clearly preferred secrecy and ambiguity to transparency. China's attitude is summarized by Liu Huaqiu, a longtime Chinese arms control strategist:

> China, as a medium nuclear power, will not make a show of force as the two superpowers did, nor will it make clear exactly how it would use its nuclear weapons. It could be disadvantageous to China to let its adversaries know too many details about its capabilities. It would be better to leave some uncertainties for its adversaries to ascertain. This ambiguity seems to be a factor in China's doctrine of minimum nuclear deterrence.[244]

Liu's focus on these issues confirms China's concerns that enhanced transparency would undermine the credibility of China's nuclear deterrent.

Li Bin, a national security specialist at Qinghua University, is even more explicit about the connection between secrecy and possessing a credible deterrent. According to Li, China's "deterrence is based on the quantitative ambiguity of its nuclear arsenal."[245]

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[241] Sun-Tzu, *The Art of Warfare*, Roger Ames, trans. New York: Balantine Books, 1993, esp. pp. 104-105. "Warfare is the art of deceit," Sun-Tzu wrote. "Therefore," he advised, "when able, seem to be unable; when ready, seem unready; when nearby, seem far away; and when far away, seem near." It must be noted that the influence of classical Chinese military thought on contemporary Chinese views of security issues is unclear. Moreover, the interpretation of the writings of Sun-Tzu and others is the subject of spirited debate. But these statements definitely do not constitute a ringing endorsement of the concept of transparency. Indeed, classical Chinese military writers generally place a great deal more emphasis on the potential effectiveness of secrecy and deception than Western military thinkers such as Clausewitz.

[242] A third possibility is that there may not be much thinking about such nuclear issues in China. Yet, this third modality seems to be rather unlikely given the numerous topics raised in the two Chinese volumes that are the focus of this article.

[243] Interviews with Chinese military officials, Beijing, January 2000.

[244] Liu Huaqiu, "No-First-Use and China's Security," Eliminating Weapons of Mass Destruction: Electronic Essays, Stimson Center, October 1998, p. 3. The full text of Liu's essay is posted on the Stimson Center web site: http://www.stimson.org/pubs/zeronuke/liu3.htm.

[245] Li Bin, "The Impact of U.S. NMD on Chinese Nuclear Modernization," p. 2.

Li explains the contribution of ambiguity to the maintenance of strategic deterrence in greater detail:

> The two dozen land-based ICBMs that have been detected and located by the U.S. intelligence agencies would have very little chance of surviving a U.S. preemptive nuclear strike. However, because China has neither confirmed nor denied any outside estimates about the size of its long-range nuclear force, it is difficult for the U.S. to rule out some errors in its estimate. If the U.S. considers launching a preemptive nuclear strike against China, the Americans would understand that they may not know the exact number of the Chinese ICBMs. They may have some confidence that they could destroy all the two dozen detected Chinese ICBMs in a preemptive strike, but they would have to worry about a Chinese nuclear retaliation with a few undetected ICBMs. Such a worry would discourage and deter the U.S. from attempting a nuclear strike against China.[246]

In other words, it is not the capabilities of China's ICBM force that counts, but the uncertainty surrounding the U.S. estimate of that number. In Li's words, "the scope of this uncertainty or error is directly relevant to the credibility of Chinese deterrence."[247] Liu Huaqiu similarly underscores the importance of potential adversary's uncertainty of Chinese capabilities and resolve:

> The role of nuclear weapons lies mainly in deterrence, but the effectiveness of deterrence not only depends on strength and the determination to use this strength, but also on a rival's perception of capability and intentions. None of these three factors is dispensable, and without any one of them the effect of deterrence is nil. In other words, deterrence is not a sum of the three factors above, but a product of them.[248]

Thus the release of data about the size, composition or capabilities of China's nuclear force structure would severely degrade its potency as a deterrent. These statements suggest that Chinese analysts consider secrecy and ambiguity of Chinese nuclear and missile capabilities to be essential components of deterrence. They accordingly reject transparency, even about overall numbers of ICBMs and perhaps other nuclear capabilities, on the grounds that such transparency would undermine the credibility of China's deterrent. Indeed, during an interview with the New York Times, China's then-President Jiang Zemin vaguely responded to questions about China's

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[246] Ibid.

[247] Ibid.

[248] "No First-Use and China's Security," Liu Huaqiu, p. 4.

nuclear capabilities and possible Chinese responses to US missile defense plans. His responses were so ambiguous that it prompted some commentators to question the depth of his knowledge of this critical aspect of Chinese national security.[249]

CHINA'S THEORY OF COUNTER DETERRENCE

One of the most interesting and intriguing ideas to emerge from Chinese literature on deterrence is the Chinese concept of counter nuclear deterrence (*fan he weishe*; 反核威慑). Sections of *Zhanyixue* discuss counter deterrence as an operation used to demonstrate China's resolve and will to use nuclear weapons in response to efforts by adversaries to coerce China with nuclear threats. In this sense, counter-deterrence appears to only be a wartime type of operation. According to sections from *Zhanyixue*:

> We conduct it [counter deterrence combat] to counter enemy nuclear deterrence and to contain and foil some of the enemy's important strategic intentions or risky operations and to support national political and diplomatic struggle. We should pay attention to the following when conducting counter-nuclear deterrence combat: number one, we should closely combine anti-nuclear deterrence operation with political and diplomatic struggle. Counter-nuclear deterrence operation is actually a contest of psychological will…. Number two, we should fully prepare for nuclear retaliation. In counter-nuclear deterrence combat, the campaign commander of the Second Artillery has to firmly establish the principle of "being ready to fight while deterring." We should have the troops fully prepared for nuclear retaliation. Comprehensive and firm combat readiness is itself an important means and firm backing to show a strong resolve and will.

Chinese writings and theorizing about counter-deterrence raise two issues relevant to Chinese doctrine. First, this concept suggests that some in China continue to adhere to the view that deterrence is a negative term implying coercion and blackmail of China, and therefore that it requires countering. Unlike in Western theory, deterrence for some Chinese strategists is not simply a description of a relationship or state of affairs between nations but rather seems to be a policy or operation directed against another nations for the purposes of coercion or blackmail. For many Chinese, the term deterrence has carried a distinctly pejorative connotation. Second, Chinese views of the role and function counter-deterrence combat are, in Western theory, simply one of the central pillars of basic deterrence. For a credible deterrent to be obtained, a nation needs to possess not only a capability to inflict unacceptable damage but also must communicate the will and resolve to use it. For China, counter-deterrence is an effort to communicate its willingness to respond to a nuclear first strike or perhaps just an attack on Chinese strategic facilities. In this sense, counter-deterrence for China is a form of nuclear

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[249] "In Jiang's Words: 'I Hope The Western World Can Understand China Better' " *New York Times*, 10 August 2001.

signaling to an adversary. Yet, in discussing counter deterrence, neither *Zhanyixue* nor *Zhanlüexue* further explain what types of signals China might send or how it might communicate them during a crisis. For example, neither volume addresses the possibility that would China withdraw or conditionalize its NFU commitment as a signal to the US. This is a critical issue for US and Chinese strategists to explore further as it is directly relevant to ensuring crisis stability.

FROM THEORY TO PRACTICE: ASSESSING CHINESE NUCLEAR POLICIES AND OPERATIONAL DOCTRINE

Understanding and evaluating China's nuclear doctrine has long been one of the key analytical hobgoblins of Western research on Chinese security issues. To this day (and in contrast to smaller nuclear powers like India), China has never publicly articulated a nuclear doctrine or its system of nuclear command and control.[250] For decades leading up the mid-1990s, Chinese officials and public documents seldom addressed issues related to nuclear strategy or capabilities. In the 1960s and 1970s, there was little, if any, systematic, theoretical thinking in China about nuclear doctrinal issues. By the 1980s Chinese military planners began to pay more attention to these issues and research on nuclear theory and doctrine became more institutionalized. The Second Artillery for example initiated several research programs to examine nuclear theory issues. As mentioned above, in the mid-1980s the Second Artillery for the first time issued an internal document on their campaign theory. Yet, at that time, nuclear doctrine issues were viewed as too sensitive and secretive to discuss openly. There were simply no public statements about the conditions under which China would use nuclear weapons. Chinese officials for years repeated the same litany of statements that China had a policy of NFU and supported complete nuclear disarmament. Chinese support for NFU was the closest that China came to articulating publicly a nuclear doctrine. The paucity of official and academic writings in Chinese on nuclear issues has seriously handicapped an effort to understand Chinese nuclear doctrine. Indeed for many years (until recently), China's official position was that it opposed a policy of nuclear deterrence; a position which is in clearly inconsistent with China's nuclear weapon status. By the late 1990s, Chinese officials began to state publicly that China had dropped its categorical objection to "the policy of nuclear deterrence." China modified its policy to opposing nuclear deterrence *based on the first use of nuclear weapons*. These statements aside, the extent to which Chinese strategists will continue to support a minimum deterrence doctrine in the face of growing challenges to the effectiveness of China's deterrent is an open question. This section examines this issue by looking at the discussion of doctrine in *Zhanyixue* and *Zhanlüexue*. An analysis of these seminal works indicates that Chinese strategists continue to hold mixed views on the relative value of minimum and limited deterrence. Even though Chinese writings (both public and internal) suggest a rough consensus around the importance of establishing and

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[250] In 2003, India publicly released an eight-point document describing its official nuclear doctrine and specifying the national command authority for the release of nuclear weapons.

maintaining a credible minimum deterrent, there continues to be much discussion of limited deterrence. These themes are addressed below.

China's 2000 Defense White Paper summarized for the first time publicly, officially and in a single document the main elements of China's position on nuclear weapons. This characterization suggests the adoption of a minimum deterrent posture.

> China possesses a small number of nuclear weapons entirely for self-defense . . . China maintains a small but effective nuclear counterattacking force in order to deter possible nuclear attacks by other countries. Any such attack will inevitably result in a retaliatory nuclear counterstrike by China. China has always kept the number of its nuclear weapons at a low level.[251]

Qinghua professor Li Bin explains the political and strategic calculus underlying the minimum deterrence doctrine:

> China worries that the superpowers would feel free to offend China's vital security interests without apprehension if China did not have nuclear weapons. It expects that its nuclear arsenal would discourage the use of nuclear weapons or the threat of using nuclear weapons against China. The Chinese leaders believed that (1) a modest nuclear force would be able to neutralize nuclear blackmail made by the superpowers and deter their nuclear attacks; and (2) nuclear weapons are not militarily usable and therefore the Chinese nuclear weapons are not for war-fighting.[252]

Consequently, Li writes, "a Chinese retaliatory strike with a few nuclear warheads should be able to deter a first nuclear attack from the U.S."[253]

These relatively clear (though narrow and limited) public statements about China's nuclear doctrine stand in contrast to the discussions of nuclear deterrence in *Zhanlüexue* and *Zhanyixue*. The editors of *Zhanlüexue* assert that there are two types of nuclear war: all-out nuclear war (*quanmian he zhanzheng*; 全面核战争) and limited nuclear war (*youxian he zhanzheng*; 有限核战争).[254] They argue that the limited nuclear war theories (*youxian hezhanzheng lilun*; 有限核战争理论) that were advanced by superpower strategists during the Cold War have "major limitations" (*hen da de juxianxing*; 很大的

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[251] *China's National Defense in 2000*, Beijing, China: State Council Introduction Office, October 2000, p. 6.

[252] Li Bin, "The Impact of U.S. NMD on Chinese Nuclear Modernization," p. 1.

[253] Ibid., p. 2.

[254] Wang Wenrong, ed., *Zhanlüexue*, p. 352.

局限性).[255] The editors cast doubt on these limited war theories because they believe that if the use of nuclear weapons were initiated in a conflict between two nuclear-armed adversaries, escalation control would become extremely difficult. "Once nuclear war breaks out," they argue, "it would be very difficult to control the scale and scope of the use of nuclear weapons; under certain conditions there would be danger of escalation to the level of all-out nuclear war."[256] Quite apart from the problems of escalation control, the editors acknowledge that the requirements for a credible counter-force capability are exacting, and such a posture is thus a feasible option only for the nuclear superpowers. Targeting cities, on the other hand, is seen as the "main option" for countries with relatively limited nuclear strike capabilities.[257] The editors of *Zhanlüexue* do not explicitly assess the implications of this argument for China, nor do they state that limited deterrence is an unrealistic option for China. Their analysis implies, however, that limited deterrence or any other doctrine that calls for inflicting damage at each level of nuclear conflict (as opposed to escalation dominance at each level) is not a credible strategy for a country that faces quantitative and qualitative limits on its nuclear forces, its delivery systems, and its C^4ISR architecture.

Yet, there is also a discussion in *Zhanlüexue* of the requirements of a limited deterrent posture. *Zhanlüexue* lists the objectives of a nuclear strike or counterstrike as destroying the enemy's military forces—especially its nuclear retaliatory forces, paralyzing its command and control network, and damaging its war potential. The nuclear strike is aimed at "directly achieving the political and military objectives of the war" (*zhijie dacheng zhanzheng de zhengzhi mudi he junshi mudi*; 直接达成战争的政治目的和军事目的) or creating "decisive conditions" (*juedingxing tiaojian*; 决定性条件) under which those aims can be more readily attained.[258] These statements are more in accordance with a war-fighting and war-winning doctrine than with minimal deterrence. Thus, the text of *Zhanlüexue* is not consistent in its support of one doctrine or the other. Overall, it is difficult to say that *Zhanlüexue* clearly favors either limited deterrence or minimal deterrence. Indeed, some of the editors' analysis suggests a preference for a limited deterrence doctrine, but much of it is more in line with a purely retaliatory, credible minimal deterrence strategy.

To further complicate matters, no specific mention is made in *Zhanlüexue* of the capability of Chinese nuclear forces to support either minimum deterrence or limited deterrence doctrines. The editors do outline several steps China should take to improve the capabilities of its nuclear forces, however, such as "strengthening nuclear force

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[255] Ibid., p. 353.

[256] Ibid., p. 353.

[257] Ibid., p. 354.

[258] Ibid.

building," enhancing readiness, rapid retaliation capabilities, survivability, and accuracy, and improving the command and control system.[259]

A Chinese Typology of Nuclear Deterrence

In *Zhanlüexue*, three different types of nuclear deterrence are identified: "maximum nuclear deterrence" (*zuida xiandu he weishe*; 最大限度核威慑); "minimum nuclear deterrence" (*zuidi xiandu he weishe*; 最低限度核威慑); and "limited nuclear deterrence" (*youxian heweishe*; 有限核威慑).[260] The 2001 AMS version of *Zhanlüexue* adds a fourth term called "medium strength nuclear deterrence" (*zhongdeng qiangdu he weishe*; 中等强度核威慑).[261] There is some terminological confusion evident here, particularly with regard to the description of limited deterrence, but it is nonetheless useful to discuss briefly the definitions of each type of deterrence as they are used in *Zhanlüexue*. Maximum deterrence, the editors write, is the strategy of countries that enjoy nuclear superiority over their adversaries and use the threat of a massive nuclear attack to "contain their adversaries." This strategy relies upon the threat of a nuclear first strike and requires numerical and technological superiority, as well as the capability to destroy hard targets (*ying mubiao*; 硬目标). The editors identify this strategy with the U.S. "massive retaliation" doctrine of the 1950s. They assert that it is also compatible with the doctrine of Mutual Assured Destruction (MAD) and other variants of U.S. nuclear strategy that "emphasized maintaining nuclear forces sufficient to ensure the reliability of deterrence and flexibility of options," and with the nuclear doctrine of the former Soviet Union. In what appears to be a reference to contemporary U.S. nuclear strategy, they note that maximum deterrence may also rely upon a "perfect strategic defense system" (*wanshan de zhanlüe fangyu xitong*; 完善的战略防御系统). Finally, the editors assert that maximum deterrence strategies give rise to arms races and "constitute a serious threat to world peace."[262]

In contrast to maximum deterrence, *Zhanlüexue* says minimum deterrence is based on the assumption that an adversary is unlikely to be willing to risk facing the consequences of even the most limited nuclear retaliation. According to this viewpoint, a very small number of nuclear weapons capable of striking an enemy's cities and holding its population hostage is enough to constitute an effective deterrent force and thus to guarantee the security of the practitioner of a minimum deterrence doctrine.[263] The editors identify this strategy with England, noting that a British official once stated a single

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[259] Ibid., p. 355-356.

[260] Ibid., p. 359-361.

[261] Peng Guangqian and Yao Youzhi, eds. p. 235.

[262] Wang Wenrong, ed., p. 360.

[263] Ibid., p. 360.

ballistic missile submarine was enough to inflict unbearable damage on any potential enemy and thus to deter a first strike against the United Kingdom. They question this assertion, however, and assess that because of the US-UK alliance British nuclear forces were ultimately a supplement to American "maximum deterrence."

Limited deterrence, according to *Zhanlüexue*, occupies a place in between the extremes of maximum and minimum deterrence on the nuclear deterrent continuum. The concept of limited deterrence, the editors write, does not require that a country achieve nuclear parity with its adversary. To the contrary, to be successful the doctrine of limited deterrence demands only that the country maintain retaliatory forces sufficient to inflict unacceptable damage (*wufa chengshou de pohuai*; 无法承受的破坏) on its adversary.[264] This characterization of the concept of limited deterrence appears to depart from the standard Western definition of limited deterrence. *Zhanlüexue's* characterization of the concept of limited deterrence is seemingly more consistent with what Gill et. al. term "credible minimum deterrence." In any case, the editors do not say which of these doctrines is presently employed by China, nor do they make any recommendations about which doctrine they believe will be most appropriate for China in the future given its present or projected nuclear capabilities, its political-military objectives, and changes in its external security environment.

Turning to the *practice* of nuclear deterrence, the editors write that the most important objective is using deterrence to avoid nuclear war. Importantly, it is also suggested that nuclear weapons can be used to deter an enemy from undertaking actions short of a nuclear attack. The editors suggest that the threat of nuclear retaliation can be used, for example, to prevent the loss of territory or forestall the escalation of a conventional conflict. The importance of clearly communicating to an adversary what actions it must not take is highlighted as a critical element of successful deterrence, no matter what its specific objective. It is not enough to have firm resolve, "it is also necessary to communicate this resolve to the adversary."[265] The adversary must understand that crossing a certain line will result in nuclear retaliation.[266] Interestingly, this requirement for communication and clarity is never linked to China's traditional emphasis on secrecy in nuclear affairs and Beijing's lack of articulation of a nuclear doctrine for many years.

Zhanyixue and Nuclear Deterrence

The discussion of nuclear strategy and doctrine in *Zhanyixue* is even less consistent in some respects than that found in *Zhanlüexue*. However, there is by far a greater

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[264] Ibid., p. 360. The editors aver that this is enough to deter the adversary and prevent nuclear war. They cite French nuclear strategy as a representative example of limited deterrence.

[265] Ibid., p. 362.

[266] Ibid., p. 361. The editors cite as an example the Gulf War, claiming that U.S. warnings that it might use tactical nuclear weapons to respond to the employment of WMD by Iraq successfully deterred Baghdad from using chemical weapons.

discussion of the requirements and value of possessing a limited nuclear deterrent. The text notes that the use of nuclear weapons has a "decisive influence" (*juedingxing yingxiang*; 决定性影响) on the outcome of a war.[267] According to *Zhanyixue*, the objectives of a retaliatory nuclear strike are to paralyze the enemy command system (*tanhuan...zhihui xitong*; 瘫痪...指挥系统), cripple enemy war potential (*xueruo...zhanzheng qianli*; 削弱...战争潜力), frustrate the enemy's strategic intentions (*cuobai...zhanlüe yitu*; 挫败...战略意图), shake the enemy's determination (*dongyao...zhangzheng yizhi*; 动摇...战争意志), and contain the escalation of the nuclear exchange (*ezhi hezhanzheng shengji*; 遏止核战争升级).[268] Some of these objectives, particularly disrupting adversary command and control and achieving escalation dominance, are more consistent with a limited warfighting doctrine than with one that focuses purely on retaliation against counter-value targets, or in other words, the cities that house the enemy's population and industry.

Zhanyixue continues that the Second Artillery must be prepared to engage in protracted operations (*chijiu zuozhan*; 持久作战).[269] This is a considerably more demanding mission than launching a single retaliatory strike, suggesting that it is not enough for the PLA to be able to survive a first strike and simply launch a second strike. *Zhanyixue* notes that China's strategic missile forces must also be able to continue to operate for a prolonged period of time in a nuclear environment. As the editors observe, conducting protracted operations requires hardening of targets, "various types of camouflage measures," (*duozhong weizhuang shouduan*; 多种伪装手段) and a reliable command, control, and communications system (*ke'kao de zhihui kongzhi tongxin xitong*; 可靠的指挥控制系统).[270] To be sure, China's current nuclear, missile, and C^3I capabilities fall far short of what would be needed to carry out the missions envisioned by advocates of a counter-force, limited deterrence doctrine. Yet, there is no discussion in *Zhanyixue* of such a doctrine-capabilities gap in Chinese nuclear operations.

China's No-First-Use (NFU) Policy

China's NFU commitment is central to any discussion of Chinese nuclear doctrine. It is one of the few aspects of Chinese doctrine that is well known and publicized. Since China tested its first nuclear weapon, Beijing has persistently and consistently reaffirmed a no-first-use commitment and called for an international NFU treaty among the nuclear

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[267] Wang Houqing and Zhang Xiqye, *Zhanyixue*, p. 370.

[268] Ibid., p. 369.

[269] Ibid., p. 372.

[270] Ibid., p. 372.

powers.[271] China has since reaffirmed its commitment to NFU in official statements on several occasions over the past 30 years. In 1995, in China went beyond the NFU pledge but clarifying its policy negative security assurances to non-nuclear weapon states; Chinese officials stated that China will never to use or threaten to use nuclear weapons against states that do not possess nuclear weapons.[272] This position and the NFU were reaffirmed in official documents in recent years such as in the 2000 and 2002 National Defense White Papers.[273]

The importance of China's NFU pledge lies in its centrality to Chinese doctrine. Since 1964, NFU has become one of centerpieces of Chinese nuclear doctrine; for Chinese strategists, NFU is not simply a policy statement (as it was for the Soviet Union during the Cold War) but rather is considered a guiding principle (*zhidao yuanze*) of nuclear doctrine. The extent to which Western analysts see NFU as a policy statement and the Chinese think of it as a guiding principle serves as a source of confusion and friction in understanding the current composition and future evolution of Chinese nuclear doctrine.

These themes are repeated in *Zhanyixue*, which may suggest more than a cursory Chinese adherence to a NFU policy. The text notes, "In accordance with our country's principle (*yuanze lichang*; 原则立场) that it will not be the first to use nuclear weapons (*bu shouxian shiyong hewuqi*; 不首先使用核武器), the Second Artillery's nuclear counterattack campaign will occur under circumstances in which the enemy has first launched a nuclear attack against us."[274] The PRC's no-first-use pledge, negative security assurances, and rhetorical position on disarmament are also dutifully noted in *Zhanlüexue*:

> Ever since the first day that it possessed nuclear weapons, China has taken the lead in proclaiming that at no time and under no circumstances will it be the first to use or threaten to use nuclear weapons, nor will it use nuclear weapons against non-nuclear countries or non-nuclear regions; China advocates the complete prohibition and thorough destruction of nuclear weapons.[275]

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[271] 'Statement of the Government of the People's Republic of China," 16 October 1964, in Lewis and Xue, *China Builds the Bomb*, pp. 241-243.

[272] Shen Dingli, "China's Negative Security Assurances," Eliminating Weapons of Mass Destruction: Electronic Essays, Stimson Center, October 1998, http://www.stimson.org/pubs/zeronuke/shenfin.htm.

[273] *China's National Defense in 2000*, Beijing, China: State Council Information Office, October 2000, p. 6

[274] Wang Houqing and Zhang Xingye, eds., p. 370.

[275] Wang Wenrong, ed., p. 349.

In addition, the editors of *Zhanlüexue* assert that China adheres to "a nuclear strategy that is defensive in nature" (*fangyuxing de he zhanlüe*; 防御性的核战略).[276]

Interestingly, neither *Zhanyixue* nor *Zhanlüexue* indicates the existence of a debate about the nature and scope of China's NFU policy. This is in contrast to reports by US and Western scholars that US missile defense plans in recent years have sparked such a discourse in China.[277] For example, following the release of the 2000 National Defense White Paper, some Chinese privately indicated that during the drafting process there were internal discussions about whether to conditionalize China's NFU commitment.[278] In addition, Gill et. al. argued that the modernization of Chinese missile and nuclear forces and changes in the strategic environment, such as the apparent vulnerability of China's aging liquid-fueled, silo-based missiles to attack by conventional precision-guided munitions are generating "pressures to possibly alter and refine" the PRC's traditional NFU pledge and NSAs to make them "consistent with new strategic realities."[279]

In spite of the internal debate about China's NFU commitment, it is hard to conceive of circumstances in which the first use of nuclear weapons would result in anything but unmitigated disaster for China. This inescapable fact has been recognized by Chinese analysts. Liu Huaqiu wrote: "China has developed a very small nuclear arsenal, and this is a reflection of China's no-first-use policy. If China should use nuclear weapons first, the adversaries would retaliate with many more nuclear weapons, which could in effect be self-destruction for China."[280]

SURVIVABILITY

Closely linked to the NFU policy is the issue of survivability. The survivability of nuclear forces and their associated command, control, and communications infrastructure is an essential pillar of a credible nuclear deterrence posture. For Chinese nuclear planners and strategists, survivability is their *central* concern and preoccupation. This section begins with a brief review of core Western thinking about survivability and credibility and then links it to the discussion of this issue in *Zhanlüexue* and *Zhanyixue*. This approach allows for a comparison of Western writings on the requirements of survivability and credibility and Chinese writings.

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[276] Ibid., p. 349.

[277] See Pan Zhenqiang, "On China's No First Use of Nuclear Weapons," Pugwash Online, from Pugwash Meeting No. 279, London UK, 15-17 November 2002, http://www.pugwash.org/reports/nw/zhenqiang.htm.

[278] Discussions with Chinese and US experts, Beijing and Washington, 2000-2002.

[279] Gill, Mulvenon, and Stokes, "The Chinese Second Artillery Corps," p. 10.

[280] Liu, "No-First-Use and China's Security," p. 6

After more than four decades after its publication, Albert Wohlstetter's "Delicate Balance of Terror" remains among the most persuasive and insightful presentations of the argument that deterrence is far more difficult to achieve than is usually assumed.[281] Much of Wohlstetter's classic essay centers on two key questions: First, what are the key requirements to make deterrence credible? Second, is it easy or difficult to maintain the credibility of nuclear deterrent forces? Wohlstetter's analysis has important implications for understanding the dynamics behind nuclear modernization and the accompanying doctrinal debate in China. Although the article was published years before China's first nuclear test, contrasting Wohlstetter's argument with the underlying assumptions of the traditional Chinese doctrine of minimal deterrence yields striking results. The key premise of minimal deterrence is that a handful of nuclear weapons are sufficient to deter a first strike by any would-be aggressor, even one that possesses technologically and numerically superior nuclear forces. Wohlstetter's arguments that the balance of terror is "precarious" and the requirements for deterrence are "stringent," however, call into question the viability of that assumption. "Deterrence...is not automatic," Wohlstetter warns, and that to assume it is a given is to court disaster.

Strategists who believe deterrence is relatively easy to achieve because even a handful of nuclear weapons are sufficient to deter any rational, risk-minimizing aggressor, fundamentally misunderstand the nature of deterrence, Wohlstetter contends. "To deter an attack," he writes, "means being able to strike back in spite of it. It means in other words a capability to strike second."[282] The argument that a handful of bombs are all that is needed to deter an adversary who enjoys vast numerical superiority, and even technological superiority in nuclear forces, is thus dangerously flawed under some conditions. Wohlstetter cautions that this argument will hold only if it is certain that the few bombs in the inventory of a state seeking to deter an attack could survive the attack and reach their intended targets. In other words, deterrence can be achieved only if a state has an invulnerable retaliatory capability. To be secure, according to Wohlstetter, a second strike force must meet six requirements:

- It must have safeguards to ensure safety and security during peacetime operations.

- It must have the capability to survive an enemy first strike. This requires some degree of warning capability, mobility, or concealment. (Weighing the costs and benefits of dispersal with regard to these first two requirements presents a variety of challenges.)

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[281] Wohlstetter, *The Delicate Balance of Terror*, P-1472, 1958. Available online at: http://www.rand.org/publications/classics/wohlstetter/P1472/P1472.html.

[282] Ibid. p. 5-6.

- It must have survivable command and control capabilities to ensure that a decision to retaliate can be made and implemented. This command and control system must be invulnerable to a perfectly executed decapitation strike or attacks aimed at critical communications nodes.

- It must be able to reach enemy targets. (This concern no doubt seemed more pressing when the U.S. relied primarily on manned bombers.)

- It must be able to penetrate enemy air defenses, or to bring this condition up to date, it must be able to penetrate a potential adversary's missile defenses.

- It must have the capability to destroy the selected target despite passive measures that the adversary may have taken to protect the target.

But even if a country's strategic nuclear forces lacked some of these attributes, could credibility be maintained at lower levels? Wouldn't the possibility of enormous losses, however slight, be enough to ensure deterrence, as Waltz argues? Wohlstetter rejects these arguments that uncertainty is sufficient to guarantee effective deterrence. "Prizes for a retaliatory capability are not distributed for getting over one of these jumps," he cautions. "A system must get over all six."[283]

Implications for China

Wohlstetter's emphasis on the difficulty of guaranteeing the invulnerability of retaliatory forces leads to several conclusions that raise several worrisome implications for Chinese nuclear strategists. A retaliatory force that is vulnerable to a disarming first strike invites preemptive attack and undermines strategic stability between nations, especially in a crisis when nuclear forces might be placed on a higher state of alert. In addition to the problems identified by Wohlstetter, Chinese nuclear planners must now contend with two further challenges that have emerged in subsequent decades. These are the possible US deployment of missile defense systems and advances in ISR and long-range precision strike capabilities that raise troubling questions for Chinese planners about whether China's silo-based missiles are vulnerable to a conventional first strike.

The issues of survivability and credibility are addressed at some length in the internally published *Zhanyixue*. The editors of *Zhanyixue* acknowledge that survivability is critical: "Whether the missile force can survive (*shengcun xia lai*; 生存下来) and whether it can maintain its nuclear retaliation capabilities (*baochi hefanji nengli*; 保持核反击能力) is an important strategic issue that is directly related to the success or failure of a nuclear counterattack campaign."[284] The protection of the strategic missile force is

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[283] Ibid., p. 7-8.

[284] Wang Houqing and Zhang Xingye, eds., p. 370.

thus of the utmost importance. As the editors of *Zhanyixue* write, the protection (*fanghu*; 防护) of China's strategic missile force is an "important prerequisite" for guaranteeing its survivability and its capability to launch a retaliatory strike against the enemy.[285]

Furthermore, *Zhanyixue* indicates that Second Artillery planners have become increasingly concerned about the vulnerability of the strategic missile forces to attack by conventional precision-guided munitions. The book notes that in addition to guarding against nuclear, chemical, or biological attacks, the Second Artillery's strategic missile forces must also be prepared to defend against conventional attacks using long-range precision guided munitions (*yuancheng jingque zhidao wuqi*; 远程精确指导武器).[286] This leads the editors of *Zhanyixue* to conclude that, in order to ensure the survivability of the strategic missile force, China must improve the Second Artillery's mobile combat (*jidong zuozhan nengli*; 机动作战能力) and rapid response capabilities (*kuaisu fanying nengli*; 快速反应能力).[287]

Zhanyixue continues that to increase the probability that at least some portion of the strategic nuclear missile force would survive a first strike, the forces of the Second Artillery are deployed in a "highly dispersed" (*gaodu fensan*; 高度分散) manner.[288] The combat positions (*zuozhan zhendi*; 作战阵地) of China's strategic nuclear forces are "widely scattered in the strategic deep areas of the country" (*guangfan fenbuyu guojia zhanlüe zongshen*; 广泛分布于国家战略纵深). They are highly dispersed and deployed in many places over a wide area. The reason for this type of deployment is that it enhances the concealment (*yinbi*; 隐蔽) and survivability of China's strategic missile force. The book acknowledges some of the vulnerability issues that arise from such dispersal, but does not address the relevant trade-offs in great depth.

Moreover, the text of the section on Second Artillery operations implicitly confirms China's adherence to its NFU pledge. This suggests that China's repeated public adherence to NFU may be more than a propaganda exercise. The clearest indication of this is that the text of *Zhanyixue* assumes that the Second Artillery would carry out its strategic nuclear campaign only *after the enemy had used nuclear weapons against China*. The text notes that campaign would take place in a "grim nuclear environment" (*yanku de he huanjing*; 严酷的核环境).[289] Moreover, since the strategic missile forces of the Second Artillery would likely be the "focal point" (*zhongdian mubiao*; 重点目标) of the enemy's nuclear attack, the Second Artillery must be prepared to operate under "exceedingly harsh nuclear conditions" (*jiqi yanku de he tiaojian*; 极其

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[285] Ibid., p. 370.

[286] Ibid., p. 371.

[287] Ibid., p. 372.

[288] Ibid., p. 370.

[289] Ibid.

严酷的核条件).[290] The Second Artillery would suffer heavy damage as the result of an enemy first strike. The casualties among Second Artillery personnel would be heavy, weapons, equipment, roads, and bridges would be destroyed, and the command, control, and communications system (*zhihui tongxin xitong*; 指挥通信系统) would be damaged.[291]

NUCLEAR RETALIATION: IMMEDIATE VS. DELAYED RESPONSES

Another key doctrinal issue addressed in *Zhanlüexue* and *Zhanyixue* is China's policy on when and how to retaliate to a nuclear first strike. After absorbing a nuclear first strike, the country on the receiving end of the blow might launch a counterattack immediately or it might elect to delay the retaliatory strike until a time of its own choosing. Mao Zedong once intimated that after suffering a nuclear attack, China might wait weeks, or even months, before launching a retaliatory strike. This raises a key question: does China's evolving nuclear doctrine favor rapid response or delayed retaliation?

Examination of the passages that address this issue in *Zhanyixue* suggests that Chinese strategists currently believe it is necessary to retaliate rapidly or even immediately after a first strike is launched against the PRC. The Second Artillery, according to *Zhanyixue*, must "respond rapidly" (*kuaisu fanying*; 快速反应) because modern wars are characterized by "suddenness" (*turanxing*; 突然性) and "intensity" (*canliexing*; 惨烈性). This is especially so in a nuclear conflict. "Rapid response has already become one of the fundamental requirements for modern campaign operations."[292] "In case nuclear deterrence fails," the Second Artillery must "immediately (*like*; 立刻) carry out the nuclear counterattack in accordance with the nuclear retaliation order of the supreme command."[293] These passages appear to reflect a calculation that China must retaliate swiftly, before it looses the capacity to strike back. Moreover, the use of the word "immediately" suggests some interest on the part of Chinese strategists in moving toward a policy of LOW or LUA.

Zhanlüexue and Retaliation

The editors of *Zhanlüexue* define a nuclear counterattack or second strike as a retaliatory nuclear attack (*baofuxing he daji*; 报复性核打击) that is launched after suffering the enemy's initial nuclear strike.[294] The editors state that the retaliatory strike

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[290] Ibid.

[291] Ibid.

[292] Ibid., p. 371.

[293] Ibid., p. 373.

[294] Wang Wenrong, ed., p. 355.

is "usually" (*tongchang*; 通常) carried out under the direction of the supreme command, perhaps suggesting that the authority to launch a retaliatory strike could be delegated to lower levels under certain unspecified circumstances.[295] It should be noted that throughout much of this section the editors never state explicitly whether they are discussing China in particular or simply writing about all of the nuclear powers more generally. Apparently turning specifically to the Chinese case, the editors assert that the Strategic Missile Forces (*zhanlüe daodan budui*; 战略导弹部队) can carry out such a strike independently, or in coordination with (*xietong;* 协同) the navy's ballistic missile submarine forces (*haijun zhanlüe daodan qianting budui*; 海军战略导弹潜艇部队) and the strategic bombers of the air force (*kongjun zhanlüe hongzhaji budui*; 空军战略轰炸机部队). The targets of a nuclear counterstrike would include "important political, economic, and military targets in strategic deep areas." The objectives of nuclear retaliation are to "cripple enemy war potential and strategic strike forces, retard its strategic operations, sabotage its strategic intentions, and cause psychological shock."[296]

The editors of *Zhanlüexue* also comment on the timing of a counterstrike. The first retaliatory blow, they write, should be launched as quickly as possible. If possible, LOW or LUA is the preferred method. "Do all that is possible (*lizheng*; 力争) to retaliate immediately," recommend the editors. "When it has been judged reliably that the enemy nuclear weapons are already on the way, but have not yet exploded, respond swiftly by launching a nuclear counterstrike against the enemy."[297] As for those countries that lack the surveillance and early warning capabilities to implement a LOW or LUA strategy, they should launch their first nuclear counterstrike after the first enemy nuclear weapons explode on their territory, but before the enemy has time to carry out additional nuclear attacks. The editors of *Zhanlüexue* apparently envision a protracted nuclear conflict in which further retaliatory strikes can be launched against the enemy to "prevent the escalation of the nuclear war" (*fangzhi he zhanzheng shengji*; 防止核战争升级).[298] The editors again note that China supports the principle of no-first-use of nuclear weapons and would carry out retaliatory operations only after the enemy first launched a nuclear strike.[299] The issue is not addressed directly, but it is seemingly implied that LOW or LUA would be consistent with China's NFU policy. In addition, there is no discussion in either volume of the trade-offs between a LOW/LUA posture and the increased chances of accidental and unauthorized missile launches. The heavy Chinese emphasis, especially in public documents, on the centralized control of nuclear weapons suggests that a

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[295] Ibid.

[296] Ibid.

[297] Ibid.

[298] Ibid.

[299] Ibid., p. 356.

LOW/LUA posture would require a change in China's nuclear command and control policies and/or capabilities. Such a change would potentially serve as a critical indicator of a shift in China's launch posture.

COMMAND AND CONTROL OF NUCLEAR FORCES

Another key issue relevant to Chinese nuclear doctrine and capabilities is the command and control (C^2) of Chinese nuclear forces. Changes in command and control operations and capabilities can serve as a critical indicator of broader shifts in nuclear doctrine. Yet, little information concerning the command and control of Chinese nuclear forces is available from open sources. Public information suggests that China's strategic nuclear C^2 system is highly centralized. In a rare comment on such a highly secretive issue, China's 2000 Defense White Paper states that Chinese nuclear forces are under the "direct command" of the Chinese Communist Party's powerful Central Military Commission (CMC).[300]

The discussion of nuclear command and control issues in *Zhanyixue* adds to the limited data on this issue. First, much of the text emphasizes the necessity of ensuring that, whether in peacetime or in the event of war, the supreme national leadership retains extraordinarily strict command and control of nuclear operations. In the space of only a few pages, the editors reiterate this point *six* times:

- "The command of the campaign is highly centralized" (*zhanyi zhihui gaodu jizhong*; 战役指挥高度集中).[301]

- "The important combat operations of a nuclear retaliation campaign must be carried out under the direct command and control of the supreme decision-making stratum of the nation." (*bixu shou guojia zuigao juececeng de zhijie zhihui he kongzhi*; 必须受国家最高决策层的直接指挥和控制).[302]

- One of the defining characteristics of a strategic nuclear campaign is that it must be carried out under a "highly centralized and unified" (*gaodu jizhong tongyi*; 高度集中统一) command structure.[303]

- The Second Artillery must operate under a "highly centralized unified command" and "strictly carry out the orders of the supreme command." [304]

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[300] *China's National Defense in 2000*, p. 6.

[301] Wang Houqing and Zhang Xingye, eds., p. 369.

[302] Ibid., p. 370.

[303] Ibid.

- "The supreme command (*tongshuaibu*; 统帅部) must make the decisions regarding all of the important campaign issues, such as the guiding principles of the campaign (*zhanyi fangzhen*; 战役方针), the objectives of the campaign (*zhanyi mubiao*; 战役目标), campaign deployments (*zhanyi bushu*; 战役部署), targets (*daji mubiao*; 打击目标), and the timing of the nuclear retaliation."[305]

- The Second Artillery must "extremely strictly and extremely correctly" (*jiduan yange*, *jiduan zhengque*; 极端严格极端正确) follow the orders of the supreme command.[306]

Similarly, *Zhanlüexue* strongly emphasized that only the supreme national leadership (*guojia zuigao lingdaoceng*; 国家最高领导层) and supreme command (*zuigao tongshuaibu*; 最高统帅部) have the authority to order the use of nuclear weapons.[307] Other sources tend to confirm that the authority to issue orders to Chinese strategic forces is tightly held at the very apex of the Chinese political and military systems. It is believed, for example, that during a crisis situation nuclear missile brigades would "likely report directly to the national command center in the Western Hills (*Xishan*; 西山) in Beijing."[308]

Though available information suggests that the institutional and procedural structure of the Chinese nuclear command and control system is highly centralized, much remains unknown. For instance, no mention is made in any Chinese sources of plans that the senior civilian and military leadership in Beijing may have to pre-delegate the authority to use nuclear weapons to lower levels in the event of a war, though Chinese strategists are undoubtedly aware of the concerns about the survivability of nuclear forces and wartime command that preoccupied many western nuclear strategists during the Cold War.[309]

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[304] Ibid., p. 371.

[305] Ibid.

[306] Ibid.

[307] Wang Wenrong, ed., p. 354.

[308] Gill, Mulvenon, and Stokes, "The Second Artillery Corps," p. 29.

[309] Chinese analysts are presumably familiar with the arguments of American nuclear strategists who feared that Washington was vulnerable to a Soviet surprise attack aimed at decapitating the U.S. leadership and paralyzing American nuclear forces. Some argued that in order to preserve the credibility of U.S. nuclear deterrence, the authority to launch a retaliatory nuclear strike in the even that the president and his potential successors were killed or left unable to communicate should be delegated to senior military officers. Operating from a network of highly dispersed command posts, the proponents of delegation argued, these senior officers would constitute a highly survivable command and control structure.

Beyond the issues of peacetime and wartime command, even less is known about the specific technical and procedural safeguards China employs to prevent unauthorized or accidental use of its strategic nuclear weapons. For example, does China use permissive action links (PALs) on its nuclear weapons? It is only on extremely rare occasions that Beijing makes any public statements concerning the precautions it has taken to prevent accidental or unauthorized release of nuclear weapons, and these statements are as general as they are infrequent. For instance, China's 2000 Defense White Paper states: "China is extremely cautious and responsible in the management of its nuclear weapons, and has established strict rules and regulations and taken effective measures to ensure the safety and security of its nuclear weapons."[310] The U.S. Intelligence Community made public its assessment of the possibility of accidental or unauthorized launch of a nuclear-armed Chinese missile in an unclassified estimate released in September 1999. The National Intelligence Council judged it "highly unlikely" that a Chinese strategic missile would be launched without authorization.[311] The December 2001 unclassified summary of the most recent National Intelligence Estimate on foreign ballistic missile threats, however, provides no assessment of the chances of an unauthorized or accidental launch of a PRC strategic nuclear missile.[312]

In addition to the requirements for strict command and control over China's nuclear stockpile (warheads, gravity bombs and artillery), the need to modernize the nuclear command and control system is another topic that is mentioned in restricted circulation Chinese publications. According to the editors of *Zhanyixue*: "The Second Artillery must establish a secure, reliable, and efficient command and control system; it must ensure that command is smooth, timely, accurate, and secret."[313] The use of the word "establish" suggests that the technical infrastructure of the command and control system currently in place does not fully satisfy the stated requirements. Since survivable command, control, and communications are every bit as essential as survivable nuclear forces to the maintenance of credible deterrence, this modernization effort is surely a high priority. Indeed, Gill, Mulvenon, and Stokes assess that China's efforts to modernize its nuclear C^4I system serve as one of the clearest indications that China is in the process of enhancing the credibility of its nuclear deterrent forces.[314]

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[310] *China's National Defense in 2000*, p. 6.

[311] National Intelligence Council, *Foreign Missile Developments and the Ballistic Missile Threat Through 2015*, *Unclassified Summary of a National Intelligence Estimate, September 1999*, p. 11.

[312] National Intelligence Council, *Foreign Missile Developments and the Ballistic Missile Threat Through 2015*, *Unclassified Summary of a National Intelligence Estimate, December 2001*. The report states that an accidental or unauthorized launch of a strategic nuclear missile in Russia is "highly unlikely" because of "procedural and technical safeguards" employed by Russia's Strategic Rocket Forces. For the assessment of Russia, see page 5. (http://www.cia.gov/nic/pubs/other_products/Unclassifiedballisticmissilefinal.htm)

[313] Wang Houqing and Zhang Xingye, eds., p. 371.

[314] Gill, Mulvenon, and Stokes, "The Second Artillery Corps," p. 59.

As China modernizes its nuclear forces and its nuclear C^4I capabilities, it will face a series of tradeoffs between the objectives of enhancing survivability of the nuclear missile force and ensuring effective command and control, especially under combat conditions. *Zhanyixue* recognizes the complexity of this issue. It notes that dispersed deployment modes are beneficial but make "combat command and coordination" (*zuozhan zhihui yu xietiao*; 作战指挥与协调) in an environment where communications would be highly vulnerable to disruption "extremely difficult and complicated" (*shifen fuza kunnan*; 十分复杂困难).[315] Yet, there is no mention in *Zhanyixue* of China's preferences. China could attempt to turn to low-tech or no-tech options as C^2 backups. Indeed, the Chinese nuclear C^2 system reportedly deliberately avoids reliance on high-tech communications mechanisms for the transmission of particularly sensitive information, in part, perhaps, for this reason, though communications security concerns are likely the main factor.[316]

Tensions in the Evolution of Chinese Nuclear Doctrine

One of the inevitable conclusions of the preceding analysis is that several internal tensions and potential inconsistencies inhabit Chinese writings on nuclear weapons and Chinese discussions of the PRC's official nuclear doctrine. As Chinese thinking on these issues evolves in the coming years, the way in which Chinese writings address these ambiguities and tensions will serve as an important indicator of the internal debates and overall direction of Chinese thinking about nuclear weapons and nuclear deterrence in the 21st century. Three major tensions emerge from the preceding analysis of *Zhanyixue* and the two most recent editions of *Zhanlüexue*.

First, there appear to be tensions between China's long-declared NFU policy and the conditions under which the NFU policy applies; this suggests that China's NFU pledge may not be as pure and robust as indicated by Chinese official statements. Chinese writings on NFU are usually addressed in the context of the core Chinese operational concept of *hou fazhi ren* (后发制人) or "striking after the enemy has struck." This concept, which dates back to the original 1987 *neibu* (internal circulation) version of *Zhanlüexue*, is part of a broader set of core concepts which the Chinese use to characterize their overall military doctrine.[317] Yet, Chinese military writings about *hou fazhi ren* (in either a conventional or a nuclear scenario) suggest that some strategists interpret it as allowing a response before the enemy has actually attacked. The 2001

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[315] Wang Houqing and Zhang Xingye, eds., p. 370.

[316] For example, the most sensitive documents concerning nuclear forces reportedly are hand-carried by armed military couriers.

[317] The entire formulation is "*hou fazhi ren, yanmi fanghu, zhongdian daji, fahui weishe, and baofu zuoyong* [后发制人，严密防护，重点打击，发挥威慑，报复作用]." These are core operational concepts for Chinese military planners. The authors are grateful to Iain Johnston for pointing out these concepts.

version of *Zhanlüexue* published by the Academy of Military Sciences includes just such an interpretation. It states, "Second strike upholds the principle of not firing the first shot, but by no means is equivalent to abandoning the advantage of first opportunity (*xianji*; 先机) in campaigns or tactics." Thus, pre-emption in some circumstances can be consistent with a second strike posture. To be sure, this section of text was not specifically discussing nuclear operations and was more oriented toward conventional warfare. But it raises questions about the scope of China's NFU.

A related tension in China's thinking about NFU is the extent to which it applies to circumstances in which an adversary strikes with *advanced precision conventional weapons* Chinese counter-military targets including nuclear forces, defenses against nuclear attacks, chemical/biological weapon facilities, conventional forces, war-supporting industries or military command and control facilities. Would China consider a conventional attack on one or a combination of those facilities to be equivalent to a nuclear first strike and respond with nuclear weapons? Similarly, how would China respond to a conventional attack that produced an effect similar to the use of weapons of mass destruction; for example, if an adversary used conventional weapons to destroy the Three Gorges Dam. There are some indications that the Chinese are beginning to consider these ideas but no indication of their linkage to China's broader NFU pledge.[318]

A second tension in Chinese thinking on nuclear doctrine is related to the issue of targeting. A core operational concept for Chinese military planners is *zhongdian daji* (重点打击) or "key point attacks." It is not readily clear in the nuclear context if this encompasses just counter-society targets (which would be consistent with a minimum deterrent posture) or whether it also includes counter-military targets as well. Chinese discussions of this topic suggest that Chinese planners are interested in both counter-society and counter-military targets. The text of *Zhanyixue* notes that the task of the Second Artillery includes "a nuclear sudden attack on the enemy's major strategic and campaign targets (*zhanyi mubiao*; 战役目标)." *Zhanyixue* then defines a campaign as "an operational military action comprised of several battles under unified command, carried out by an army group in order to achieve partial or total goals of a war".[319] This definition suggests that campaign targets presumably are ones that assist the adversary's armies in engaging in operational actions including combat operations. In addition, neither *Zhanyixue* nor *Zhanlüexue* (AMS and NDU versions) explicitly argue that minimum deterrence based on counter value targeting is sufficient. This suggests that as China's capabilities improve that its target sets might expand beyond counter-value targets to include soft counter-military targets as well. In this sense, China's apparent adherence to minimum deterrence may for some Chinese strategists be more of a technical necessity than an operation preference. Another possibility is that many of these concepts, like

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[318] Wu Peng and Si Shilei, "Study of Consequences of Attacks on Nuclear and Chemical Facilities," *Guofang* [National defense], 15 September 2002, p. 19-20 (FBIS).

[319] Wang Houqing and Zhang Xingye, eds., p. 9.

"key point attacks" or *zhongdian daji*, may have been conceived in the context of conventional military operations and have minimal relevance to nuclear operations.[320]

A third important tension in Chinese writings on nuclear doctrine is the relationship between maintaining secrecy about capabilities and doctrine while at the same time revealing their "will" and determination to use nuclear weapons in a crisis. The Chinese, as noted above, discuss the importance of signaling determination to retaliate as embodied in the concept of counter deterrence; but it is not clear how they will do this and how such signaling may trade-off with secrecy issues. On the one hand, by revealing its capabilities or "displaying form" (*shi xing;* 示形), the Chinese potentially limit their ways of signaling in a crisis and create opportunities for an adversary to develop countermeasures to its capabilities. On the other hand, not revealing capabilities creates the conditions under which misperceptions form and miscalculations can occur.[321] The existence of this and other tensions in Chinese nuclear thinking serves as an indicator of the depth of thinking, at least as it is reflected in publications available to Western researchers, in China on nuclear issues. Whether and how China resolves these tensions will serve as an important indicator of the future direction of Chinese doctrine as Chinese capabilities nuclear capabilities inevitably improve in the coming years.

CONCLUSION

Based on the preceding analysis of *Zhanyixue* and the two editions of *Zhanlüexue*, Chinese views on nuclear doctrine and nuclear operations are clearly mixed and continue to evolve. From the perspective of Western analysts, internal Chinese debates on nuclear issues are a moving target and bear continued watching. There is a real lack of concrete and consistent thinking in these books about nuclear doctrine and operations. As Iain Johnston has argued, Chinese thinking on nuclear issues is clearly not as "elaborate, complex or game theoretic as US discourse on nuclear theory."[322] In some instances, Chinese research appears to be essentially replicating past Western debates on nuclear deterrence and nuclear warfighting. In other instances Chinese research reflects an effort to apply *Chinese understandings* of this work to *China's evolving circumstances*. These differing stages of Chinese understanding and application of Western deterrence theories are reflected in the texts of *Zhanlüexue* (AMS and NDU) and *Zhanyixue*. These trends are most manifest in the fact that some Chinese strategists continue to possess a great deal of interest in limited deterrence. Yet, it is not clear that their discussions of limited deterrence equate with Western notions of the term; terminological confusion in China on nuclear issues is a major problem in interpreting Chinese writings on nuclear doctrine. What is far more clear is that most Chinese discussions of limited deterrence are

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[320] The authors are grateful to Iain Johnston for highlighting this point.

[321] The authors are grateful to Iain Johnston for highlighting this point.

[322]This is taken from A.I. Johnston, "Some Thoughts on Chinese Nuclear Deterrence," Talking Points Prepared for Workshop on Chinese Military Doctrine, CNA Corporation, 2 February 2000.

aspirational. Adoption a limited deterrence posture is not a realistic option given the vast asymmetry between the nuclear forces of the United States and China that exists today and will continue to exist well into the future even as the number of Chinese weapons rises and the number of U.S. weapons declines.

On balance, it seems that Beijing is not ready to jettison the minimum deterrence doctrine, at least at the level of strategic nuclear relations with the US and the Soviet Union. To be sure, China's evolving nuclear deterrent relationship with India is an interesting test case for such beliefs. The available evidence suggests strongly that China's modernization of its nuclear weapons and missile forces is aimed primarily at ensuring the survivability of Chinese strategic missile forces, and thus maintaining the credibility of China's deterrent. Recently published Chinese sources, including *Zhanyixue*, support the argument that Chinese nuclear forces and doctrine are evolving toward "credible minimal deterrence," at least in the area of the PRC's strategic nuclear posture vis-à-vis Russia and the United States. Yet, Chinese debates suggest that strategists continue to leave open the option of moving toward a limited deterrent in the future. In any case, based on recent projections of increases in PRC capabilities over the next 10-15 years, Beijing is unlikely to have the numbers or types of weapons or command and control infrastructure needed to support a limited deterrence doctrine at the strategic level.

In this regard, this paper raises a number of important questions that are not addressed in *Zhanlüexue* and *Zhanyixue*. These questions will have a direct bearing on the future of strategic stability in US-China relations. Key questions for future work include: what are Chinese strategic nuclear forces expected to deter: conventional attack on strategic nuclear missile forces or conventional attacks on the mainland during a Taiwan conflict? Do Chinese strategists view their nuclear forces as a credible deterrent against a conventional attack aimed at destroying China's nuclear capability? Would China's NFU policy hold in such a circumstance? China's NFU policy and the writings of some Chinese analysts imply that Beijing doubts nuclear weapons deter conventional attack, but it is unclear that these have taken into account the advent of highly effective precision conventional weapon capabilities. Moreover, the demonstration of the impressive advances the United States has made in intelligence, surveillance, reconnaissance, and precision-guided munitions in recent conflicts, such as Operation Enduring Freedom and Operation Iraqi Freedom, has probably further intensified concerns about the vulnerability of China's strategic forces to a disarming conventional first strike. Further research is needed to determine if Chinese strategists are ready to just modify or to reject wholesale traditional Chinese doctrines (such as NFU) in order to deter conventional attack and possibly to bear the international political costs of altering the longstanding NFU policy.

Perhaps the first step to understanding these complicated analytical issues is to begin with structure and process by first identifying the key organizations, institutions, and individuals involved in the formulation of China's nuclear strategy and doctrine. Very little is known about the organizations involved in research, debates and decision-making on nuclear doctrine and capabilities issues. Such an effort must therefore address several questions: Who are China's nuclear strategists? Is nuclear doctrine an exclusively military preserve, or do civilian experts also play an influential role in nuclear policy debates? Which organizations, institutions, and individuals are important participants in

the formulation of Chinese nuclear doctrine? Which publications and periodicals should analysts read to try to gain insights into the views of Chinese nuclear strategists? Such an organizational map will help scholars begin to understand the bureaucratic interests involved in decisions about nuclear modernization as another window into strategic nuclear debates in China.

APPENDIX A: COMPARING INTERNALLY PUBLISHED AND OPEN SOURCES

Comparing the openly published *Zhanlüexue* and the restricted volume *Zhanyixue* illustrates the challenges faced by analysts in their attempts to assess Chinese publications on military affairs. In the Chinese system, publications and documents can be divided into three categories based upon the sensitivity of their content and scope of readership. These categories are *classified materials*, *internal documents*, and *openly published documents*. Classified materials are ones directly bearing on Chinese national security interests and if leaked could cause material harm to Chinese national security. Such documents, in contrast to internal ones, are not even available on a restricted basis in Chinese bookstores or libraries.

Internal documents are formally defined by a Party work dictionary as follows: "documents that do not touch upon important secrets, but are not released to the outside; (these publications) are restricted to a certain body or organization for internal reading and use."[323] By all accounts, the internal (*neibu*; 内部) category is incredibly broad and nebulous. There are no clear standards for determining what material is considered internal or why it is considered internal, so it is a very broad category in terms of content. Similarly, there are no clear guidelines that govern the distribution of "internal" material. Sometimes internal documents or books are intended only for those working on the relevant issue, or only for employees of a particular office or organization. Other internal publications, however, are theoretically available to all Chinese, but are not to be seen by foreigners. Yet whether the intended audience of an internal publication is a small handful of bureaucrats or the entire population of the world's most populous nation, the publication is simply marked as *neibu faxing* (内部发行) and typically carries no specific instructions regarding distribution. In sum, there are no clear, standardized guidelines for marking materials as internal or restricted, and there are no guidelines that stipulate the scope of access for a given internal publication. A military publication provides something that approximates guidance for marking materials as internal: "Documents, materials, books, periodicals, films, videotapes, and audiotapes that are not considered to fall within the scope of military secrets, but are not suitable for public release outside of the army…are ordinarily referred to as internal (*neibu*) documents and materials."[324]

As if the situation described above was not already sufficiently muddled, there is another separate category of "internal military distribution" (*junnei*; 军内) publications that differs in some respects from the rest of the internal (*neibu*) publications system. One interlocutor asserts that the "military internal" marking indicates a book was written by a

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[323] See Li Tian and Sun Jingxun, eds., *Jianming dangwu gongzuo cidian* [Concise dictionary of party affairs work], Beijing: Zhongguo Zhanwang Chubeushe, 1990.

[324] *Junshi mishuxue*, [Military mishu studies], Beijing: Haichao Chubanshe, 1992, p. 300.

military author and is intended primarily for a military audience.[325] This is confirmed by a handbook for military secretaries, which states that newspapers, books, magazines, and other materials that carry the *junnei* marking may not be distributed outside the military.[326] In addition, only military personnel with identification cards are permitted to purchase books marked with the military internal designation, according to a former Chinese official.[327]

The differences between open and internal publication are reflected in the preceding analysis. The openly published *Zhanlüexue* treats the subject of nuclear weapons and nuclear doctrine much more generally than the internally published *Zhanyixue*. In *Zhanyixue*, it is clear that the editors are discussing Chinese nuclear forces and doctrine. In contrast, the coverage of these topics in *Zhanlüexue* is much more general. It is presented in such a way in some sections that the comments could apply to any nuclear country; the editors seldom state explicitly that they are describing or analyzing Chinese nuclear forces and doctrine.

The beginning of the chapter on nuclear weapons in *Zhanlüexue*, for example, is devoted to a somewhat cursory history of the development of atomic weapons (the editors briefly mention Einstein and the Manhattan Project), the role of nuclear weapons in US-Soviet relations in the early Cold War period, and the decisions of the UK and France to acquire independent nuclear capabilities. The editors also discuss in very broad terms the destructive power of nuclear weapons.[328] The editors do not even mention China at all until they reach the third page of the section. To be sure, *Zhanlüexue* provides some useful insights into Chinese thinking on the subject of nuclear weapons, but much of the chapter on nuclear weapons consists of boilerplate rhetoric and a general history of the nuclear arms race. There is also commentary on U.S. nuclear research and development efforts during the Second World War and the Cold War and the economic costs of these efforts, and a general discussion of deterrence and the influence of nuclear weapons on strategic thought. Much of this section appears to be largely derivative of Western writings on these subjects. For example, the chapter contains a cursory review of the debate between advocates of pure counter-value strategies and analysts who favored the limited use of theater tactical weapons,[329] and an equally general summary of the debate on counter-city and counter-force targeting that

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[325] Interview, former Chinese official, 2001.

[326] See *Junshi mishuxue*.

[327] Interview, 2001.

[328] Wang Wenrong, ed., pp. 347-349.

[329] Ibid., p. 352. For more in depth analysis of U.S. nuclear strategy and deterrence theory from a Chinese viewpoint, see: Yao Yunzhu, *Zhanhou Meiguo weishe lilun yu zhengce* [Post-war American deterrence theory and policy], Beijing: Guofang Daxue Chubanshe, 1998; and Wang Zhongchun and Xia Liping, *Meiguo he liliang yu he zhanlüe* [America's nuclear forces and nuclear strategy], Beijing: Guofang Daxue Chubanshe, 1996.

preoccupied many strategic thinkers during the Cold War.[330] Interestingly, the text of *Zhanlüexue* is in some places so similar to that of other Chinese writings on nuclear weapons and doctrine that it seems there are only two plausible explanations. The first is that multiple authors have been drawing upon the same official guidance. The second possibility is that some of the authors have copied almost word-for-word from each other's published work.

There are also a few pages devoted to a rather superficial review of the topics of early warning and civil defense. The editors assert in this section that 48% of Americans could be protected underground in the event of a nuclear attack on the United States; in Sweden, they write, the number that could be protected in this manner is no less than 91 percent of the population. The editors make no specific references to Chinese efforts during the Cold War to relocate industrial assets and construct an elaborate civil defense network, but—apparently unaware of the difficulties the United States and other countries encountered in attempting to put such ideas into practice during the darkest days of the Cold War—they suggest that it would be relatively easy to disperse the population or evacuate major cities ahead of a nuclear attack.[331] In addition, it is interesting to note that, perhaps because *Zhanlüexue* is an openly published volume, the editors choose to quote Western strategists like B.H. Liddell Hart and Charles de Gaulle rather than their Chinese counterparts.

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[330] Ibid., p. 354-355.

[331] Ibid., p. 356-357.

6. IMPLEMENTING PLA SECOND ARTILLERY DOCTRINAL REFORMS

By Kenneth Allen and Maryanne Kivlehan-Wise[332]

Second Artillery conventional missile campaign operations are restricted by many factors…only by combining combat factors such as personnel, equipment, launch sites, combat command, and various safeguarding into an organic whole can we form an overall combat capability.

Zhanyixue [*The science of campaigns*; 战役学][333]

INTRODUCTION

Within recent years a great deal of attention has been given to studying the modernization of China's People's Liberation Army (PLA) in general, and the modernization of China's missile force, the Second Artillery Corps, in particular.[334] Although there is disagreement on the pace at which Second Artillery is pursuing its program of reform and the operational significance of the accomplishments they have made thus far, the basic direction of the modernization program is fairly well understood. There seems to be a general consensus that the PLA is moving:[335]

- Toward increasing the overall number of missiles in its arsenal.
- Away from liquid-fueled missiles and toward the use of solid fuel.
- Away from fixed-site launchers and toward the use of mobile launchers.

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[332] Kenneth Allen and Maryanne Kivlehan-Wise are senior analysts at the CNA Corporation, a non-profit research and analysis organization. The opinions expressed in this paper are those of the authors.

[333] Wang Houqing, Zhang Xingye, ed., *Zhanyixue* [The science of campaigns], Beijing: National Defense University Press, May 2000, Chapter 14, 376.

[334] For purposes of this paper, the Second Artillery Corps (*dier paobing*; 第二炮兵) will be identified simply as Second Artillery (*erpao*; 二炮). There is no accepted English acronym such as PLAAF for the PLA Air Force or PLAN for the PLA Navy.

[335] For a discussion of PLA strategic and conventional missile modernization see the July 2002 DoD *Annual Report on the Military Power of the People's Republic of China* . (The transporter erector launchers (TELs) for DF-11/CSS-7/M-11 and DF-15/CSS-6/M-9 SRBMs can be re-loaded within 45 minutes. The missiles can be served by a crew of fewer than 10. USNI Military Database (www.periscope.ucg.com/ weapons/missrock/landatk/w0000606.htm).

- Away from single-use launchers and toward the use of re-loadable launchers.
- Away from a purely nuclear missile force and toward a mixed nuclear and conventional force.
- Toward building a reliable short-range ballistic missile force capable of being used in local wars.

When examining the evolution of this independent branch of the PLA, much of the discussion has focused on two specific issues: strategic level nuclear doctrine and the ballistic missile order of battle. As others point out, these issues are important and logical starting points for understanding Second Artillery's modernization because they help in identifying their aspirations and the general direction of reform. Several authors, including Iain Johnston, Bates Gill, James Mulvenon, John Lewis, Hua Di, Stan Morris, Brad Roberts, Shirley Kan, and Mark Stokes, have written extensively on these issues.[336] At the same time, however, regardless of its doctrine, weapons acquisition alone cannot tell the complete story of the Second Artillery's capabilities. To more fully understand this process and gauge the PLA's progress toward modernization, one needs to pay attention to institutional and software issues—what Finkelstein refers to in the introductory chapter as the third pillar of PLA reform.[337]

This paper focuses on the understudied institutional aspects of Second Artillery that will either enable or hinder the implementation of PLA operational doctrine. Where possible, this paper also examines the reforms currently taking place within Second Artillery and the challenges to transformation that this branch of the PLA is facing on its journey toward modernization. The term "institutional reforms" as used in this paper is

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[336] Bates Gill and James Mulvenon, "The Chinese Strategic Rocket Forces: Transition to a Credible Deterrence," *China and Weapons of Mass Destruction: Implications for the United States, National Intelligence Council*, Conference Report, 5 November 1999; Alastair Iain Johnston, "Prospects for Chinese Nuclear Force Modernization: Limited Deterrence Versus Multilateral Arms Control," *China Quarterly*, June 1996; John Wilson Lewis and Hua Di, "China's Ballistic Missile Programs: Technologies, Strategies, Goals," *International Security*, Vol. 17, No. 2, Fall 1992; Alastair Iain Johnston, "China's New 'Old Thinking': The Concept of Limited Deterrence," *International Security*, Winter 1995/96, Vol 20, No 3; Mark Stokes, "Weapons of Precise Destruction: PLA Space and Theater Missile Development," *China and Weapons of Mass Destruction: Implications for the United States*, Conference Report, 5 November 1999; Mark Stokes, "Chinese Ballistic Missile Forces in the Age of Global Missile Defense: Challenges and Responses," in *China's Growing Military Power: Perspectives on Security, Ballistic Missiles, and Conventional Capabilities*, eds., Andrew Scobell and Larry M. Wortzel, Carlisle, PA: Strategic Studies Institute, September 2002, p. 107-168; Mark Stokes, "The People's Liberation Army and China's Space and Missile Development," paper presented at the Conference on The People's Liberation Army at 75: Lessons Learned," 14-15 September 2002, U.S. Army War College, Carlisle Barracks, PA; Robert S. Norris, Andrew S. Burrows, and Richard W. Fieldhouse, *Nuclear Weapons Databook, Volume V: British, French, and Chinese Nuclear Weapons*, 1994; Shirley A. Kan, *China: Ballistic and Cruise Missiles*, Washington, DC: Congressional Research Service, 10 August 2000.

[337] See Chapter One of this volume.

meant to capture a wide range of organizational reforms, management reforms, and systemic reforms—often referred to as "software" issues—that the PLA will need to implement in order to fight with its new operational concepts, employ and maintain new weapons and technologies, and fill its ranks with a new breed of officers. In short, it refers to the people, processes, and institutions that will either enable or limit the PLA's capability to fight and win Local Wars Under Modern High-Tech Conditions.[338]

This paper consists of several sections. It begins discussing Second Artillery's doctrine by examining its basic missions, the types of campaigns assigned to Second Artillery, and the requirements needed to prosecute these campaigns as described in *Zhanyixue*. It looks at the historic development of Chinese missile doctrine and points to a shift in focus away from a purely nuclear missile force and toward a mixed nuclear and conventional missile force. It then takes a detailed look at Second Artillery's organizational structure, examining the extent to which this structure supports and limits the implementation of modernization reforms. Finally, it shifts focus again to examine Second Artillery's personnel, education, and training policies and programs currently in place to support the PLA's move from a labor intensive to an expertise intensive force. Four appendices are provided with detailed reference material on Second Artillery's history, organizational structure, leadership, and foreign relations.

SECOND ARTILLERY CAMPAIGN DOCTRINE

The evolution of Second Artillery and its campaign doctrine is firmly rooted in the PRC's desire to develop nuclear weapons capabilities (See Appendix A for a brief history). It remained an all nuclear force until the early 1990s and it is only within the last decade that the PLA has given the development of conventional missile doctrine any serious attention.

Current Campaign Theory

As will be discussed below, the authors recognize that nuclear and conventional campaigns have many similar requirements. Both types of campaigns are highly complex in terms of technology and organization. For this reason, fully formulated operational concepts, a high level of coordination, a central unified command, a comprehensible organizational structure, and thorough peacetime planning and preparation are basic requirements of any Second Artillery campaign.

According to *Zhanyixue*, the basic missions of a Second Artillery campaign are: (1) to conduct nuclear retaliation campaigns using strategic nuclear missiles to attack key enemy strategic targets and achieve strategic goals, (2) to conduct conventional missile attack campaigns, using conventional missiles to attack key enemy strategic and campaign targets in order to achieve the planned campaign goals, (3) to help the combat operations of the army, air force, and navy campaign *juntuan*, or (4) to accomplish other

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[338] For a more detailed discussion of Institutional Reforms throughout the PLA, see *Institutional Reforms of the Chinese People's Liberation Army, Overview and Challenges*, by Kenneth Allen, Dean Cheng, David Finkelstein, and Maryanne Kivlehan, Alexandria, VA: The CNA Corporation, 2002.

combat missions assigned by a higher authority.[339] These missions can be accomplished in one of two types of campaigns:

- Nuclear retaliation campaigns (*he fanji zhanyi*; 核反击战役)
- Conventional missile attack campaigns (*changgui daodan tuji zhanyi*; 常规导弹突击战役)

NUCLEAR RETALIATION CAMPAIGNS

As defined in *Zhanyixue,* a nuclear retaliation campaign can be either an independent campaign or part of a combined nuclear retaliation campaign.[340] The objective is to launch a nuclear attack on key enemy targets. The desired effect of this campaign is to paralyze the enemy command system, weaken the enemy's capability to prosecute a war, sabotage the enemy's strategic plans, shake the enemy's will to fight, and stop the escalation of nuclear war.[341]

Some of the basic operations *Zhanyixue* attributes to this type of campaign include: (1) to conduct "counter-nuclear deterrence combat" (*fan he weishe*; 反核威慑) by displaying nuclear power and will in order to deter the enemy's nuclear deterrence in support of the national political and diplomatic struggle,[342] (2) guarding against an enemy surprise attack (nuclear and conventional) through careful preparation, air defense planning, concealment and camouflage of potential targets, and intelligence and reconnaissance, and (3) conducting nuclear missile attacks.[343]

Central Control. Central control of combat operations and the strict adherence to central-level guidance is one of the most prominent characteristics of a Second Artillery nuclear retaliation campaign. (This is neither unique nor surprising.) The authors of *Zhanyixue* give careful consideration to the strategic importance of all decisions related to the prosecution of a nuclear retaliation campaign. They point out that such a campaign

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[339] Basically, a *juntuan* refers to the group armies for the ground forces, the seven military region air forces (MRAF) for the air force, and the three fleets (North Sea Fleet, East Sea Fleet, and South Sea Fleet) for the navy.

[340] Throughout this section, unless otherwise noted, statements describing Second Artillery campaigns, missions, requirements, etc. are listed as described in Chapter 14 of *Zhanyixue*.

[341] *Zhanyixue,* pg. 368. Literally: *Tanhuan qi zhihui xitong, xiaoruo qi zhanzheng qianli,cuobai qi zhanlüe qitu, dangyao qi zhanzheng yizhi, ezhi hezhanzheng shangji*; 瘫痪其指挥系统，削弱其战争潜力，挫败其战略企图，动摇其战争意志，遏制核战争升级。

[342] Some scholars have described the concept of "counter-nuclear deterrence combat" as establishing and maintaining second-strike capability.

[343] *Zhanyixue,* pg. 372-374.

will have decisive influence over the process and results of the war and, more importantly, that such a campaign will have a great effect on the "overall situation" of the national political, economic, diplomatic, and military struggle. Because the campaign carries out a strategic-level mission, it is under the direct command of the "supreme leader," which in this case means the Chairman of the Military Commission of the Communist Party's Central Committee, commonly known as the CMC.

Absorbing a First Strike. A second characteristic of a nuclear retaliation campaign is that, at least on paper, China has a "no first use" policy and implies that it will absorb the first strike of a nuclear conflict, and that any nuclear retaliation campaign will be fought only after China has absorbed such an attack.[344] The grim circumstances under which such a campaign would be fought are given no small amount of attention. The authors of *Zhanyixue* write that Second Artillery's strategic missile force will be a key target and will likely suffer from an enemy nuclear attack and assume that they will be operating after suffering serious losses of personnel, equipment, and infrastructure. For this reason, the importance of protecting their strategic nuclear missile force while absorbing this first blow and maintaining a strategic force reserve in order to carry out a retaliation campaign is given particular emphasis. Not surprisingly, they consider it to be one of the most important tasks of, and a precondition for, a nuclear retaliation campaign.[345]

Dispersed Deployment. In order to aid in protecting Second Artillery's strategic nuclear missile force, deployment for this type of campaign should be highly dispersed. This, in turn, is recognized as making command and control more difficult and heavily dependent on survivable telecommunications systems. In addition, these types of campaigns are technically complex and require a high level of integration. Therefore, equipment and personnel used for support (*baozhang*; 保障) are also crucial to the successful prosecution of nuclear retaliation campaigns—and thus key targets for enemy attack.

Critical Needs. The authors of *Zhanyixue* identify the following as critical for successfully prosecuting this type of campaign: (1) establishing a highly centralized and unified command where issues such as campaign guidance, campaign goals, deployment, targets, and timing are decided by the "supreme commander,"[346] (2) maintaining an ability to operate in close coordination with other parts of Second Artillery and with the PLA as a whole, (3) ensuring a rapid response capability through the preparation of personnel, weapons and equipment, combat positions, command systems, and a variety of combat support measures, (4) preparing careful plans on the details of protecting the strategic nuclear missile force from nuclear, chemical, biological, and missile attacks, (5)

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[344] For a detailed discussion of China's no first use policy, see "The Chinese Second Artillery Transition to Credible Deterrence" by Bates Gill, James Mulvenon, and Mark Stokes, in *The People's Liberation Army as Organization*, eds., James Mulvenon and Andrew Yang, Santa Monica, CA: RAND, 2002.

[345] *Zhanyixue,* pg. 370.

[346] T*ongshuai* or 统帅 in original text, *Zhanyixue,* pg. 371.

maintaining an ability to work in extremely hostile environments and under very difficult circumstances, and (6) maintaining the necessary reserve force for a nuclear retaliation campaign.

The Rise of Conventional Missiles

PLA thinking on the importance and relevance of conventional missiles has been an area of great change over the past decade. Since the founding of Second Artillery, and throughout the duration of the Cold War, China's strategic thinkers understood that the possession of nuclear missiles was a critical aspect of China's military strength and a key to attaining at least some of its strategic aims. However, according to *Zhanyixue*, after the Cold War, the utility and importance of nuclear missiles were seen to have decreased. At the same time, especially with the development of precision-guided munitions, the utility and strategic importance of conventional missiles has increased greatly. The authors of *Zhanyixue* explain that it was only with the end of the Cold War that conventional missile attack campaigns became one of the key types of modern warfare. Although it had previously been given less attention, it became *the* main type of campaign involving surface-to-surface missile attacks.[347] For this reason, it is worthwhile to examine the development of Second Artillery's conventional missile doctrine.

Second Artillery's conventional missile force was not established until the early 1990s. According to *Zhanyixue*, it was not until 1998 that Second Artillery developed the concepts referred to in this paper as the "conventional missile attack campaign" and compiled its first instructional textbook, entitled *Second Artillery Conventional Missile Attack Campaign* [*Dierpaobing Changgui Daodan Tuji Zhanyi*; 第二炮兵常规导弹突击战役]. Shortly thereafter, the PLA published *The Essentials of Campaigns of the People's Liberation Army Second Artillery* [*Zhonghua Renmin Jiefangjun Dierpaobing Gangyao*; 中华人民解放军第二炮兵纲要]. Beyond what is written in Chapter 14 in *Zhanyixue*, little is known about the contents of these documents. Scholarly articles from the mid-1990s address some of the key issues, but, as has been pointed out earlier in this volume, examining such materials sensitizes us to the range of views, but does not necessarily inform on the outcome of this process of experimentation and debate.

One source that does provide some authoritative insights into PLA thinking on conventional weapons strategy as a whole, however, is the Academy of Military Science's (AMS's) 2001 publication entitled *The Science of Strategy [Zhanlüexue*; 战略学].[348] The authors of this book divide PLA thinking on conventional weapons strategy into two broad categories: (1) conventional weapons strategy pertaining to periods in which there is no nuclear threat, and (2) conventional strategies that pertain to operating under the existence of a nuclear threat.[349] They discuss the implications of the nuclear

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[347] *Zhanyixue*, Chapter 14.

[348] In 1999 the National Defense University published a book by this same title.

[349] *Zhanlüexue* [The science of strategy], AMS publishing house, 2001, pp 17-26.

threat on conventional operations, and examine how the strategic importance of conventional weapons has changed with the end of the Cold War. For example:

> High-tech conventional war strategy was born out of the development of a series of non-nuclear high-tech and new military technologies such as electronic computer technology, precision guidance technology, laser technology, remote attack technology and space technology in the new revolution of military development after the 1970s of the 20th Century. The application of these non-nuclear high and new technologies has a strategic effect similar to nuclear weapons while avoiding the huge political risk of stepping over the nuclear threshold. Therefore, its importance and position rises day by day, becoming a new and more popular strategic model for countries. [350]

Given the relative youth of Second Artillery's conventional missile force and the operational concepts which it will utilize in training to prosecute its campaigns, and the critical role this force will play in the PLA's larger vision of jointness and integrated operations and key point strikes, operational concepts for the Second Artillery will most likely continue to evolve over the coming years. Tracking these developments, and separating authoritative writings from scholarly debate will be a challenge for PLA watchers in the years to come.

CONVENTIONAL MISSILE ATTACK CAMPAIGNS

Zhanyixue describes a conventional missile attack campaign as consisting of (1) a conventional missile attack and (2) all related combat operations conducted by a conventional missile campaign *juntuan* (军团) for the purpose of achieving the overall or local goals of war. Unlike a nuclear retaliation campaign, which is usually an independent campaign, a conventional missile attack campaign is usually an important part of a joint campaign (*lianhe zhanyi*; 联合战役) and only under special circumstances would it be conducted independently.

The basic operations of this type of campaign as defined in *Zhanyixue* are: (1) to use conventional missiles to deter enemy strategic intentions and discourage military adventurism, (2) to conduct conventional missile attacks, (3) to conduct "missile firepower blockades" (low-intensity missile attacks on the key targets upon which the enemy relies for land, air, and sea mobility that are intended to block or inhibit the mobility of enemy troops and supplies), (4) to conduct "missile firepower disturbance" (random and small scale conventional missile attacks to disturb the enemy and disrupt daily life in order to increase psychological pressure),[351] (5) to conduct "missile force

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[350] *Zhanlüexue*, p 20-21.

[351] Note: this is apparently very similar to what the US referred to as harassment and interdiction fire (H&I) during the Vietnam War.

mobile combat" (troop movement and missile attack conducted to enhance survivability of the missile force), and (6) to conduct "missile firepower mobile combat" (adjusting the attack missions of parts of the missile force without changing the force deployment).

The authors of *Zhanyixue* characterize conventional missile attack campaigns as highly effective, complex in terms of organization, command and control, and support, and vulnerable to enemy disruption.

Highly Effective. These campaigns are seen to be effective because conventional missiles have long-range capabilities, and can make possible a sudden, accurate, powerful, and distant strike on key enemy targets.

Complex. Conventional missile attack campaigns are considered complex because the operations involved are technologically advanced and highly integrated. The authors of *Zhanyixue* rightly point out that a small error in any of the tactical or technical variables that play into a command decision can have a large and direct effect on the results of the campaign. Personnel, equipment, organization, and logistics play a major role in determining the success or failure of this type of campaign. Furthermore, since Second Artillery most often carries out a conventional missile attack campaign as part of a larger joint campaign, this complex coordination needs to take place not only internally, but also between Second Artillery and the campaign forces of other services. Because the weapons used in a conventional missile attack campaign are technically sophisticated and the battlefield is wide and dispersed, maintaining coordination with other services with regard to organization, command, and safeguarding and support is especially important.

Unified, Central Command. Like nuclear retaliation campaigns, conventional missile attack campaigns are also seen to possess the potential to affect profound changes on the "overall political, diplomatic, and military struggle." For this reason, the maintenance of a unified central command is believed to be extremely important. It should be noted, however, that unlike the case of nuclear retaliation campaigns, in which the campaign commander was identified to be none other than the "supreme commander," in the case of a conventional missile attack campaign, the identity of those who possess launch authority is less clear-cut. The authors of *Zhanyixue* write that during this type of campaign, the combat methods, intensity, and time of execution should be centrally controlled "by the campaign commander, or even the supreme commander."[352]

Difficult to Protect. PLA strategic thinkers characterize conventional missile attack campaigns as vulnerable to enemy disruption and comment on the need to pay great attention to defense for two reasons. First, the missile force is widely dispersed, creating a large area to manage and many separate targets to protect. Second, because Second Artillery's conventional missile force is technically advanced and this type of campaign requires such a high degree of coordination, attacks on the missiles themselves, as well as on the campaign personnel, equipment, and critical infrastructure have the possibility of disrupting the campaign. This is particularly true in cases where the enemy possesses advanced reconnaissance systems and precision guided munitions.

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[352] *Zhanyixue,* pg. 379-380.

Limited Size of Force. The authors of *Zhanyixue* also recognize that Second Artillery's conventional missile force is limited in number and size. Therefore, they emphasize the need to concentrate firepower on the most critical (e.g. those that paralyze the enemy) or threatening enemy targets.

While Second Artillery continues to develop its campaign theory, a rational organizational structure and highly skilled personnel are required to maintain and operate the high-tech weaponry involved, manage operations, and to perform all of the specialized logistics and support of both nuclear and conventional missile campaigns. This organization and its personnel must be trained and prepared to work under the assumed difficult conditions they would be assumed to face in an actual campaign—manning weapon systems that the enemy would consider to be key and primary targets. Assignment to these units carries with it the risk of high casualties, and the likelihood of working in the midst of a missile assault, and at worst, in the aftermath of a nuclear, chemical, or biological attack. For this reason, the remainder of this paper will focus on the institutional enablers that Second Artillery currently has in place to support these campaigns.

ORGANIZATIONAL STRUCTURE

Of course, any reform that occurs within Second Artillery will be instituted through an administrative and organizational structure. This structure can either support or limit the PLA's efforts at modernization.

China's Armed Forces Components

One cannot examine Second Artillery's organizational structure without first understanding how it fits into the PLA as a whole. PLA writings generally describe the armed forces as consisting of leadership and command organizations (*lingdao zhihui jiguan*; 领导指挥机关), services (*junzhong*; 军种), branches (*bingzhong*; 兵种), logistics support (*houqin baozhang*; 后勤保障) organizations, academies and schools (*yuanxiao*; 院校), training (*xunlian*; 训练) units, and research institutes (*junshi yanjiusuo*; 军事研究所). The three services are the army (ground forces), navy (PLAN), and air force (PLAAF). Second Artillery is described as an independent branch that is considered equal to the three services (*xiangdang yu junzhong de duli bingzhong*; 相当与军种的独立兵种).[353] The PLA describes its leadership and command structure as follows:[354]

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[353] Qian Haihao, ed., *Jundui zuzhi bianzhixue jiaocheng* [Course material for the study of military organizational structures], Beijing, Academy of Military Science Press, March 2001, 75; *Zhongguo junshi baike quanshu* [Chinese military encyclopedia], Beijing, Academy of Military Science Publishers, July 1997, Volume 2-348. According to interviews with PLA officials, the PLA has debated for several years whether or not to make Second Artillery a service.

[354] *Junshi zuzhi tizhi yanjiu* [Military organization system research], Beijing: NDU Publishers, June 1997, 372. The PLA uses the term *lingdao* (领导) for leadership, *zhihui* (指挥) for command, *kongzhi* (控制)

- The CCP Central Committee and its subordinate Military Commission implement leadership and command for the ground forces, PLAN, PLAAF, and Second Artillery through the four general departments (General Staff, Political, Logistics, and Equipment).

- Ground force troops residing within the military regions (MR/*junqu*; 军区) are part of the MR organizational structure and come under the MR's leadership and command.

- PLAN and PLAAF units deployed within the military regions are organizationally part of their services but come under the dual leadership of the service headquarters and the MR leadership authorities. During peacetime, the PLAN and PLAAF headquarters are responsible for operational command, military training, equipment management, organization development, political work, logistics work, and administrative management of their respective forces. During wartime, the war zone (*zhanqu*; 战区) leadership authority takes operational command of PLAN and PLAAF units within the war zone.

- The command structure for Second Artillery is somewhat different than that of the three services. Although Second Artillery troops are located within the MRs, Second Artillery implements what has been referred to as vertical command (*chuizhi zhihui*; 垂直指挥).[355]

Second Artillery Structure

Because Second Artillery is one of the least transparent entities within the PLA, gathering information on its organizational structure has been a challenge. Mark Stokes' writings in 1999 on China's strategic modernization provided the first good list of bases

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for control, and *lingdao zhihui* (领导指挥) for leadership and command. The PLA makes a clear distinction when to use each word separately and together.

[355] *Junshi zuzhi tizhi yanjiu*, p. 372. The term vertical command is not further defined but appears consistently in conjunction with Second Artillery. In civilian party and government units, chuizhi leadership means that the entire system , from the center to the lowest levels, is lead by a vertical chain of command of the professional or technical unit, rather than the local geographical party and government units. State Security units, for example, reportedly are led primarily by higher level state security offices rather than local party committees. In the case of the Second Artillery, this suggests that they may be more strictly under the leadership of higher level Second Artillery, rather than MR leadership, than most other PLA units.

and brigades.[356] Scholarly articles and various websites on the subject produced since then, however, have used Stokes' material without updating the data.[357]

Second Artillery, with an estimated 100,000 personnel, has an administrative structure and an operational structure consisting of Headquarters Second Artillery and six army-level launch bases.[358] It also has one test and training base, two command academies, one engineering design academy, four research institutes, and possibly an early warning unit.

Administrative Structure

Prior to 1998, Second Artillery had four first-level departments—Headquarters (*silingbu*; 司令部), Political (*zhengzhibu*; 政治部), Logistics (*houqinbu*; 后勤部), and Technical Equipment (*jishu zhuangbeibu*; 技术装备部).[359] The first three were a mirror image of the General Staff Department (GSD), General Political Department (GPD), and General Logistics Department (GLD). The Technical Equipment Department did not have an equivalent general department level organization, but worked closely with the GSD and GLD for their respective functions. Its primary responsibilities included equipment R&D, maintenance, repair, and procurement. Following the creation of the General Equipment Department (GED) in 1998, the Technical Equipment Department was reorganized and changed its name to Equipment Department (*zhuangbeibu*; 装备部)

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[356] Mark Stokes, "Weapons of Precise Destruction: PLA Space and Theater Missile Development," *China and Weapons of Mass Destruction: Implications for the United States*, Conference Report, 5 November 1999, 203-205; Mark A. Stokes, "China's Strategic Modernization: Implications for the United States," U.S. Army Strategic Studies Institute, September 1999, 93.

[357] Examples of various websites using Stokes' data include the following: John Pike's GlobalSecurity.org (http://www.globalsecurity.org/wmd/world/china/missile-facility.htm), China Software of unknown affiliation (http://www.softwar.net/dongfeng.html), the Federation of American Scientists (http://www.fas.org/nuke/guide/china/agency/2-corps.htm), Ted Turner and Senator Sam Nunn's the Nuclear Threat Initiative/NTI organization (http://www.nti.org/db/china/sac.htm), and the Wisconsin Project (http://www.wisconsinproject.org/countries/china/missile-miles.htm). Bill Gertz from the *Washington Times* and various news reporters in Taiwan provide bits and pieces of information from the U.S. and Taiwan intelligence communities, which is further disseminated and incorporated into the website information.

[358] Figures for Second Artillery's strength varies from 90,000 to 128,000. In 2002, Ellis Melvin calculated the present strength at 100,000 based on the number of deputies in the 9th National People's Congress and the increase of units. A rough estimate can be made by taking the total number of PLA delegates representing the total PLA strength and calculating the 2nd Artillery's portion of that strength by its number of deputies. The figure 90,000 comes from Mark Stokes, "Weapons of Precise Destruction: PLA Space and Theater Missile Development," *China and Weapons of Mass Destruction: Implications for the United States*, Conference Report, 5 November 1999, 203-205. The Republic of China's *2002 National Defense Report* states Second Artillery has 128,000 personnel. 2002 National Defense Report, Taipei, Taiwan, www.mnd.gov.tw/report, July 2002, Part 1, Chapter 4.

[359] *Shijie junshi nianjian* [World military yearbook], PLA Press, Beijing, 1987-2001.

to match the PLAN and PLAAF structure.[360] It also took over some of the functions previously under the headquarters and logistics departments.

Like Second Artillery Headquarters, missile bases have a Headquarters Department, a Political Department, Logistics Department, and an Equipment Department. Missile brigades and support regiments have a Headquarters Department, Political Division (*chu*; 处), Logistics Division, and Equipment Division.[361] The Second Artillery logistics director most likely serves as the base commander at the brigade level and below much like the logistics directors at PLAAF and PLAN division-level operational organizations and below (aviation airfields and naval bases).

It is not clear what the administrative structure for a launch battalion is, but it is probably similar to other PLA battalions that include a Headquarters Department, Political Division, logistics organization, and equipment organization**.** While regiments and above have political commissars (*zhengwei*; 政委), battalions and companies have political instructors (*jiaodaoyuan*; 教导员 for battalions and *zhidaoyuan*; 指导员 for companies). The logistics administrative organization probably has subordinate offices (*ke*; 科), branches (*gu*; 股), or sections (*zu*; 组) for materiel, quartermaster, finance, transportation, and housing, etc. and their support companies and elements (*baozhang liandui he fendui*; 保障连队和分队). The equipment organization, which probably consists of the appropriate administrative offices, branches, or sections and support companies and elements, is primarily responsible for maintenance and repair.

Similar to the GSD and the Headquarters Department within the military regions, PLAN, and PLAAF, the second level organizations within the Second Artillery Headquarters Department and the bases most likely include operations, intelligence, communications, military affairs, training, and mobilization departments.[362]

Operational Structure

According to PLA writings, Second Artillery consists of nuclear strategic and nuclear and conventional tactical missile brigades equipped with short-range (*jincheng*; 近程), medium/intermediate-range (*zhongcheng*; 中程), long-range (*yuancheng*; 远程), and intercontinental (*zhouji*; 洲际) ballistic missiles,[363] as well as all types of support

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[360] The PLA Navy had as many as five first level departments, the PLA Air Force had four first level departments, and the military regions only had three. After the General Equipment Department was established, all of the services, branches, and military regions realigned their administrative structures to be in conformity with the four general departments.

[361] Qian Haihao, ed., *Jundui zuzhi bianzhixue jiaocheng* [Course material for the study of military organizational structures], Beijing, Academy of Military Science Press, March 2001, 207, 220.

[362] Ibid., p. 82.

[363] Almost every PLA article on the Second Artillery, including all of the PLA yearbooks, has this basic description. Chinese dictionaries translate *zhongcheng daodan* as both medium and intermediate-range missiles. According to *Zhongguo junshi baike quanshu* [Chinese military encyclopedia], Beijing: Academy

(*baozhang*; 保障), engineering (*gongcheng*; 工程), and specialized (*zhuanye*; 专业) troops.

Second Artillery has six organizational levels—Second Artillery Headquarters (*erpao*; 二炮), army-level (*junji*; 军级) missile bases (*daodan jidi*; 导弹基地), missile brigades (*daodan lü*; 导弹旅), launch battalions (*fashe ying*; 发射营), launch companies (*fashe lian*; 发射连) and launch platoons (*fashe pai*; 发射排).[364] Company and platoon launch entities are sometimes referred to as launch elements (*fashe fendui*; 发射分队).[365] To facilitate command and logistics, these key operational strike organizations are likely assigned only one type of missile (See Appendix B for detailed information on each of the six levels).

The structure differs below the launch battalion level for the strategic nuclear force (*zhanlüe hedaodan budui*; 战略核导弹部队) and the conventional missile force (*changgui daodan budui*; 常规导弹部队).[366] For the strategic nuclear force, each launch battalion has several subordinate launch companies, which are the smallest nuclear force launch organizations.

A typical conventional missile brigade includes a mobile command post, a central depot, a transfer point, and an assigned set of pre-surveyed launch sites, as well as a set of reserve launch sites.[367] Conventional missile brigades have at least three launch

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of Military Science Publishers, July 1997, Volume 2-51, *jincheng* refers to less than 1000 km, *zhongcheng* to 1000-3000 km, *yuancheng* to 3000-8000 km, and *zhouji daodan* covers ranges greater than 8000 km.

[364] Qian Haihao, ed., *Jundui zuzhi bianzhixue jiaocheng* [Course material for the study of military organizational structures], Beijing: Academy of Military Science Press, March 2001, p. 40. The term *erpao* or *dierpaobing* means Second Artillery as a whole. When *erpao* is used alone it also means Second Artillery Headquarters. When seen in a newspaper or book, the exact meaning is usually clear. The PLA does not use the term *erpao zongsilingbu* for Second Artillery Headquarters. When *erpao silingbu* or *ersi* is used, it refers to the Headquarters Department within Second Artillery Headquarters. Some Western organizations translate launch elements as launch batteries.

[365] *Zhongguo junshi baike quanshu* [Chinese military encyclopedia], Beijing, Academy of Military Science Publishers, July 1997, Volume 2-41-42. According to the AMS Encyclopedia, *daodan fashe fendui* (missile launch *fendui*) is the common term for elements below the battalion level (*ying yixia*; 营以下) that are responsible for launching missiles. In the PLA's context, this means a company or platoon. The photo accompanying the definition shows a DF-21/CSS-5 missile TEL.

[366] Qian Haihao, ed., *Jundui zuzhi bianzhixue jiaocheng* [Course material for the study of military organizational structures], Beijing: Academy of Military Science Press, March 2001, 207-210; *Junshi zuzhi tizhi yanjiu* [Military organization system research], Beijing: NDU Publishers, June 1997, 396.

[367] This paragraph comes from Mark Stokes, "Weapons of Precise Destruction: PLA Space and Theater Missile Development," *China and Weapons of Mass Destruction: Implications for the United States*, Conference Report, 5 November 1999, pp. 215-217. Stoke's material came from the following sources: For reference to a fourth battalion within a Second Artillery brigade structure, see "Guangrong bang" [Glorious honor roll], *Flying Eagle*, 2 Nov 1993, p. 10; Senior Colonel Wang Benzhi, "Didi changui daodan huoli yunyong de jige wenti [Some questions related to the use of conventional surface-to-surface missile firepower]," in *Lianhe zhanyi yu junbingzhong zuozhan* [Joint theater and service operations], Beijing: National Defense University Press, 1998, pp. 236-241. SrCol Wang is the Chief of Staff of the Second

battalions, with each battalion assigned at least three launch companies. Depending on the type of missile system, each launch company may have at least three subordinate launch platoons. Each launch company or platoon would likely be assigned at least one launcher, an electric power generation vehicle, a surveying vehicle, a communications command vehicle, and a missile transport vehicle. Battalions and companies would be assigned a zone within which to operate.

The basic firepower unit (*jiben huoli danwei*; 基本活力单位) for Second Artillery's nuclear and conventional forces are different. The launch battalion is the basic firepower unit for the nuclear force. Although the conventional force has launch companies and launch platoons, the launch platoon is the conventional force's basic firepower unit.

Although the exact personnel structure for launch platoons, companies, and battalions, as well as for the various support *fendui* (分队) is not available, the question arises as to the challenges posed by the differences in operational experience of the conscripts, non-commissioned officers (NCOs), and officers at each level. As will be discussed later, one-half of the two-year conscript force turns over every year and it was not until quite recently that the PLA began to take serious steps to develop a professional NCO corps. Furthermore, the experience level of a platoon, which is normally commanded by a second lieutenant, is not going to be as high as that of a company (commanded by a captain) or a battalion (commanded by a major or lieutenant colonel). It is not clear how all of this has affected Second Artillery's training and readiness, especially at the lowest levels.

SECOND ARTILLERY MISSILE ORDER OF BATTLE

As stated in the introduction of this paper, one aspect of Second Artillery's reform program is an increase in the total number of ballistic missiles. There are varying estimates as to the current size of the force and of how quickly the number of missiles will increase over the next several years. It is not the purpose of this paper to attempt to estimate the total number of missiles in Second Artillery's inventory. There are several reasons for this. First, the Chinese do not provide public information on their missile systems, size of the missile force, or the deployment status. For example, China's 1998 National Defense White Paper did not even mention China's ballistic missiles and the 2000 report merely stated, "Second Artillery is composed of strategic missile, conventional missile, and other specialized units."[368] The 2002 White Paper stated, "The

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Artillery Huaihua Base (80305 Unit). One source states that an operational zone could be 20-40 square kilometers. It is unclear what echelon would operate in this size zone. See Lu Xiaohong, "Daodan jidong fashe zhuangbei ji dimian shebei weizhuang yu yinshen jishu fenxi [Analysis of mobile missile launch and ground equipment camouflage and stealth technology]," in Xu Dazhe, *Guowai dandao daodan jishu yanjiu yu fazhan* [Study and development of foreign ballistic missile technology], Beijing: Astronautics Press, October 1998, pp. 193-202.

[368] *China's National Defense*, Beijing: Information Office of the State Council of the People's Republic of China, July 1998. "China's National Defense in 2000," *Xinhua*, 16 October 2000.

strategic nuclear missile force, under the direct command of the CMC, constitutes the main part of China's limited nuclear counterattack capability. It is equipped with land-based strategic nuclear missile systems. The conventional campaign and tactical missile force has conventional missiles."[369]

Second, any discussion of China's overall missile force gets bogged down in debates over issues such as (1) the number of missiles of each type currently in the inventory, (2) China's development and possible use of multiple reentry vehicles (MRVs) and/or multiple independently targetable reentry vehicles (MIRVs) to compensate for the lack of a large number of missiles, (3) the number of reserve missiles that are, and will be, available for per launcher, and (4) the size and type of force China will deploy against any type of missile defense system.

Inconsistent Data. One of the most often used public sources of data on the size of China's ballistic missile force is the *Nuclear Weapons Databook, Volume V: British, French, and Chinese Nuclear Weapons*, which was published in 1994.[370] Many non-government reports and websites use this report as a starting point for their own data. Unfortunately, the *Databook* has not been updated.[371] Since the late 1990s, various U.S. government (USG) agencies, including the Department of Defense (DoD) and National Intelligence Council (NIC), have released reports covering China's ballistic missiles, but these reports have not helped clarify the situation.

Several non-government analysts and research organizations have also tried to reconcile the available numbers. It has been difficult, however, to track the actual growth of China's ballistic missile force based on the lack of historical data available in the public realm. Furthermore, the USG has not used consistent formats for its annual reports, nor have the reports provided specific data on the types, numbers, deployment status, and reload capabilities of missiles as was done in the annual report on *Soviet Military Power* during the 1980s.

Normally, the USG reports provide estimates of missiles rounded off to the nearest five in each class or the total number of warheads, which includes those for the PLA Navy's sea launched ballistic missiles (SLBMs). For example, a 2002 National Intelligence Estimate (NIE) states, "The Intelligence Community has differing projections of the overall size of Chinese strategic ballistic missile forces over the next 15 years, ranging from about 75 to 100 warheads deployed primarily against the United States."[372] The 2002 DoD report to Congress states that China has "approximately 20

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[369] "White Paper on China's National Defense in 2002," *Xinhua*, 9 December 2002.

[370] Robert S. Norris, Andrew S. Burrows, Richard W. Fieldhouse, *Nuclear Weapons Databook, Volume V: British, French, and Chinese Nuclear Weapons*, Westview Press, 1994.

[371] Discussion with one of the authors reveals that much of the data in the report itself was speculative and was difficult to gather in the first place.

[372] "Foreign Missile Developments and the Ballistic Missile Threat Through 2015," National Intelligence Officer for Strategic and Nuclear Programs, January 2002. There is a debate within the U.S. whether China will use maneuverable reentry vehicles (MRVs) and/or multiple independently targetable reentry vehicles (MIRVs) to compensate for the lack of missile numbers.

CSS-4s" and "the number of ICBMs capable of targeting the United States will increase to around 30 by 2005 and may reach 60 by 2010."[373] Occasionally, the reports provide more exact figures. For example, DoD's 2000 report to Congress on China's military states, "China reportedly has built 18 CSS-4 silos."[374] In the case of silo-based ICBMs, the number of missiles appears to equal the number of launchers.

As noted, these reports discuss numbers of missiles and warheads, but do not provide an organizational breakout in terms of bases, brigades, and launch elements (battalions, companies, and platoons) and number of launchers for each entity. For example, since China launched several missiles near Taiwan in 1995 and 1996, a great deal of attention has been paid to the growing number of SRBMs opposite Taiwan. Since 1999, various reports have indicated China began with a modest force of 30-50 CSS-6 SRBMs in 1995, is increasing its force by about 50 missiles per year, and will eventually deploy about 650 missiles in seven brigades opposite Taiwan by 2005.[375] Some news

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[373] Secretary of Defense, "Annual Report on the Military Power of the People's Republic of China," Report to Congress Pursuant to the FY2000 National Defense Authorization Act, July 2002.

[374] Secretary of Defense, "Report on the Current and Future Military Strategy of the People's Republic of China," Report to Congress Pursuant to the FY2000 National Defense Authorization Act, 23 June 2000.

[375] The 1999 NIC report emphasizes that China is significantly improving its theater missile capabilities and is increasing the size of its SRBM force deployed opposite Taiwan. The current trend indicates an increase of about 50 missiles per year that began with a modest force of 30-50 M-9/11 SRBMs in 1995. The primary factors that will influence the eventual size and composition of this force include the political situation (domestic, regional, and international), doctrinal considerations, strategic and tactical requirements, technology developments, production capacity, and the PLA's organizational structure. Any or all of these factors could cause adjustments up or down in the size and deployment rate of the force over the next ten to fifteen years. Beginning in 1999, media reports in the U.S. and Taiwan cited an unpublished DoD report that stated China may have 650 SRBMs deployed opposite Taiwan by 2005. In December 2000, the *Taipei Times* reported that "An intelligence official notes that China had one theater missile brigade in 1995 and the number has since grown to three. China is expected to have seven theater missile brigades by between 2005 and 2010." The 2002 DoD report to Congress states, "China has approximately 350 SRBMs already in its deployed inventory, increasing at about 50 missiles per year. The number of missiles will increase substantially over the next several years." Sources: National Intelligence Council, *Foreign Missile Developments and the Ballistic Missile Threat to the United States through 2015*, September 1999; "US calls in China's ambassador over Taiwan," *Agence France Presse*, 16 March 2000 (a full copy of his speech given at the Carnegie Endowment for International Peace can be found at http://www.pacom.mil/ref/2000/sst/CARNEG.htm); Tony Walker and Stephen Fidler, "China builds up missile threat: Deployment against Taiwan poses policy headache as Clinton prepares to meet premier Zhu," *Financial Times*, 10 February 1999; Bill Gertz, "China strengthens position near Taiwan," *Washington Times*, 26 February 1999. These articles cited unnamed US intelligence sources who said Beijing plans to increase the number of SRBMs opposite Taiwan to 650 missiles by 2005. Prepared Testimony of Vice Admiral Thomas R. Wilson Director, Defense Intelligence Agency Before the Senate Intelligence Committee, *Federal News Service*, 2 February 2000. Vice Admiral Wilson told the Senate Intelligence Committee that by 2015, Chinese forces will be much better equipped, possessing more than a thousand theater-range missiles. This figure most likely includes MRBMs as well as SRBMs. For example, see Howard Diamond, "China Warns U.S. on East Asian Missile Defense Cooperation," in *Arms Control Today*, January/February 1999, http://www.armscontrol.org/act/1999_01-02/chjf99.asp; Nadia Tsao, "Delegation Pressing for Aegis Sale," *Taipei Times*, 18 December 2000, http://www.taipeitimes.com/News/archives/2000/12/18/0000065969; *Annual Report on the Military Power*

reports indicate the SRBM brigades have 16 launchers and 96 missiles per brigade.[376] By examining the numbers reported over the past few years, it appears that 650 missiles would equate to seven brigades with a total of 112 launchers and six missiles per launcher.

To further confuse the issue in terms of the number of possible SRBMs in the region, the ground forces within the Nanjing MR began to convert at least one of its tube artillery brigades into an SRBM brigade in 1997.[377] Available media and government reports do not make it clear yet whether this brigade is directly subordinate to the Nanjing MR Headquarters or one of the group armies based in the Nanjing MR.

Current Operational Structure

When trying to decipher these reports, it is useful to understand how ballistic missile brigades are organized and structured, and more important, to understand some of the possible ways in which this increase in the number of missiles would affect the Second Artillery's organizational structure.

Based on existing open source material, Second Artillery currently has at least 16, and probably 19, missile brigades subordinate to the six missile bases as shown in Figure 6.1 below.[378] But public data is insufficient and the Second Artillery may have additional brigades not shown on the chart.[379]

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of the People's Republic of China, Department of Defense Report to Congress Pursuant to the FY2000 National Defense Authorization Bill, July 2002.

[376] http://www.taiwandc.org/washt9905.htm.

[377] *Jiefangjun bao*, 29 March 1999.

[378] The information in this chart is compiled from various "Directories of PRC Military Personalities." Thanks also go to Harlan Jencks and Ellis Melvin for their input and analysis. According to a review of various PLA writings, the 814th Launch Brigade was located in at a branch of the Second Artillery Command Academy in Qingzhou, Shandong. The branch was transformed into the Second Artillery NCO Academy in the 1990s. The current status of the 814th Launch Brigade is not certain, but it may have been incorporated into the academy or possibly deactivated. Various new reports have noted the 818th and 820th brigades are being formed under Base 52. Brian Hsu, "China Modifying Its Medium-Range Ballistic Missiles," *Taipei Times*, 15 July 2002. The reports of an eventual seven SRBMs brigades indicate there is also an 819th Brigade under Base 52 as well.

[379] Note that the six bases are located in six different military regions, but this appears to be by chance and geographical necessity rather than by design.

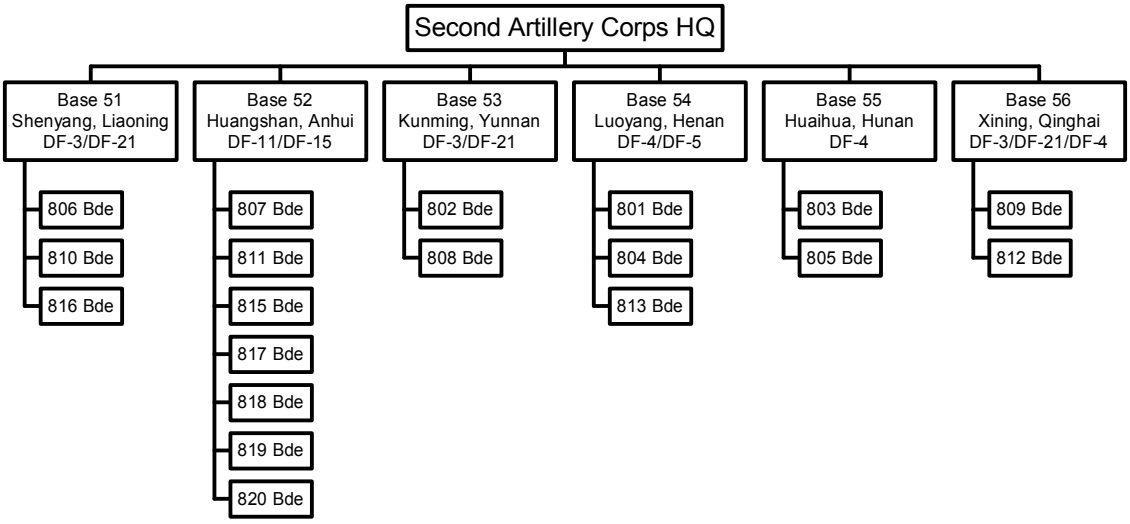

Figure 6.1 Second Artillery Bases and Brigades

Examining the organizational structure of the PLA as a whole from an historical perspective provides an analytical tool for understanding Second Artillery's current structure and to help predict its potential growth over the next decade.

The 3-3 and 4-4 Systems. Beginning in the 1920s, the Red Army tried to structure its forces systematically using what is known as the 3-3 system (*sansanzhi*; 三三制). As a general rule, the 3-3 system means that each entity in the chain of command has three subordinate entities.[380] For example, an army has three divisions or brigades, which in turn have three subordinate regiments each, on down the chain of command. In 1930, the Red Army Congress formalized this structure when it decided that the entire military would be organized into *juntuan*, armies, divisions, regiments, battalions, companies, platoons, and squads.[381] In November 1948, the PLA underwent a major reorganization and used the 3-3 system as a basis.[382] Although major organizational changes have taken place in the ground forces' group armies since 1985, the legacy of the 3-3 system is still

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[380] Yao Yanjing, Lai Mingchuan, Wang Yamin, *Junshi zuzhi tizhi yanjiu* [Military organization system research], Beijing: NDU Press, June 1997, p. 377; *Zhongguo renmin jiefang jun da shiji 1927-1982*, p. 284; Yuan Wei, ed., *Zhongguo renmin jiefang jun wu da yezhan budui fazhan shi lue* [History of the People's Liberation Army's five field armies], Beijing: PLA Press, 1987, 29.

[381] *Zhongguo junshi baike quanshu* [Chinese military encyclopedia], Beijing: Academy of Military Science Publishers, July 1997, Volume 7-401.

[382] *Zhongguo junshi baike quanshu* [Chinese military encyclopedia], Beijing: Academy of Military Science Publishers, July 1997, Volume 2-330.

in effect throughout much of the PLA today.[383] In some cases, however, the PLA uses a 4-4 system or possibly some combination of the 3-3 and 4-4 structure. In either event, the PLA has tried to maintain a consistent structural logic.

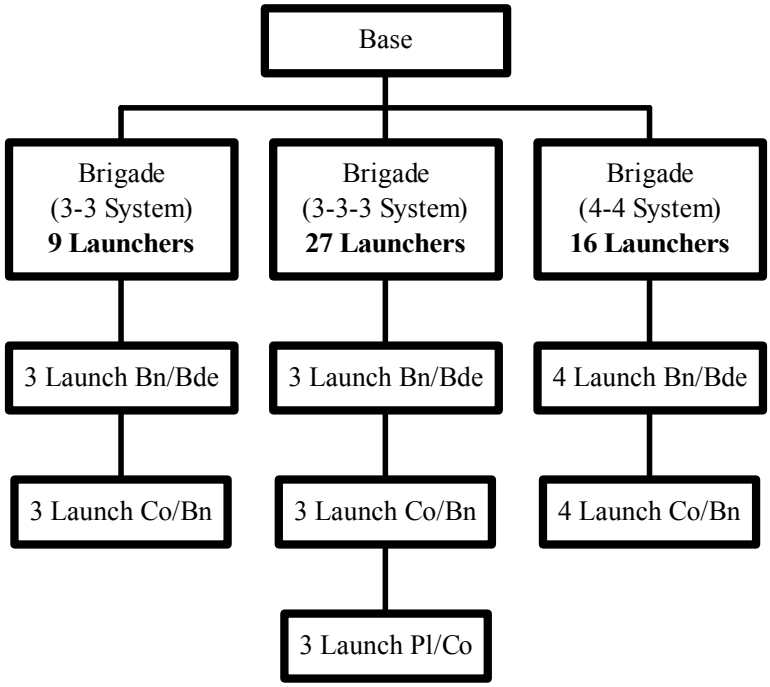

Figure 6.2 Nominal Second Artillery 3-3 and 4-4 System

Second Artillery apparently uses the 3-3 system for some bases and the 4-4 system for others. Basically, a 3-3 system means a missile brigade has three subordinate launch battalions, each of which has three subordinate launch companies or equivalent launch *fendui* for a total of nine launchers per brigade. Some brigades may have three launch platoons per launch company/*fendui* for a total of 27 launchers per brigade. A 4-4 system means each missile brigade has four subordinate launch battalions, each of which has four subordinate launch companies/*fendui* for a total of 16 launchers per brigade. This concept is shown in Figure 6.2 above.

ORGANIZATIONAL ISSUES AND MOBILE LOGISTICS

Over the past few years, Second Artillery has upgraded its mobile logistics capabilities by creating various mobile *fendui* and integrating them into the peacetime

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[383] Based on discussions with John Corbett.

and wartime command post system.[384] When missile troops conduct joint mobile operations, the base logistics organization establishes a main command post. The base logistics command post establishes communication links to the base operations command post, each missile unit logistics command post, and the war zone logistics command post. In addition, the base logistics command post creates a link to the front by establishing a forward command post at the unloading stations. The base logistics organization also deploys emergency support *fendui* to some of the logistics command posts, including the war zone command post.

Each base is classified as a rear area support entity, which normally has two types of support groups (*baozhang qun*; 保障群)—one main support group and one field mobile support group. The main support group is composed of troops from the base hospital, vehicle battalion, warehouse *fendui*, and base repair depot. Its responsibilities during peacetime are to: (1) establish medical, repair, and material storage areas and (2) fuel tanks. In areas where the threat of enemy attack is high, these facilities can be placed underground.

The field mobile support group has emergency mobile composite support *fendui* composed of troops from the base hospital, repair depot, vehicle battalion, and warehouse *fendui*. These troops are further organized into a field medical aid station, a field repair shop, a vehicle transportation *fendui*, and a materiel supply *fendui*.

Within the predetermined operations areas, the base's field mobile support group's emergency mobile composite support *fendui* work closely with the missile units' logistics *fendui*. If necessary, they can create roving support teams composed of medical, repair, transportation, and supply personnel to support the various launch *fendui*.

When equipment problems occur in the field, personnel from the base and missile unit repair shops try to fix the problem on site. If they cannot achieve this, then general-purpose equipment is sent back to the nearest war zone logistics repair organization or the closest local repair factory. Special-purpose equipment is returned to the base repair depot to be fixed.

Missile brigades are the primary organization responsible for providing supplies to their subordinate launch *fendui*. Missile units receive their special-purpose supplies from the missile base logistics depot and use the closest war zone logistics depot as the primary source for general-purpose supplies.

Looking to the Future

By understanding the basic brigade organizational structure for the different types of missile systems, it should be easier to predict the incremental changes in China's future missile force. For example, Table 6.1 shows the number of launchers China could deploy using the 3-3 and 4-4 system.

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[384] Information on Second Artillery mobile logistics comes from Wen Guangchun, ed., *Jidong zuozhan houqin baozhang* [Logistics support for mobile operations], PLA General Logistics Department Headquarters Department, PLA Press, January 1997, 280-295.

Brigades	1	2	3	4	5	6	7	8	9	10
Launchers (3-3 System)	9	18	27	36	45	54	63	72	81	90
Launchers (3-3-3 System)	27	54	81	108	135	162	189	216	243	270
Launchers (4-4 System)	16	32	48	64	80	96	112	128	144	160

Table 6.1 Estimated Number of Launchers per Brigade

Too often, large numbers are thrown out without basing them on an organizational methodology to predict the increase in missiles. For example, an August 2000 AFP report cited a secret USG report that stated, "China is already modernizing and modestly expanding its arsenal of around 20 intercontinental ballistic missiles, but in response to National Missile Defense (NMD) it would probably expand its force to as many as 200 missiles to overwhelm the U.S. shield's capabilities." [385] From an organizational perspective, an increase from the current 18-20 ICBMs to 200 would mean increasing the number of brigades from the existing two to about twenty brigades. If this were the case, the PLA would most likely have to create several new bases with multiple brigades per base, acquire all of the requisite equipment, and train the necessary enlisted and officer force. The question remains whether this is realistic.

Besides the number of launch entities, analysts should also look at whether the silos, transporter erector launchers (TELs), and erectors are single use or re-loadable. If the they are re-loadable, analysts should look at how many missiles are available for each silo and TEL. Based on available information, Table 6.2 provides information on the existing systems, type of fuel, launch mode, reusability, and number of missiles per launcher.[386]

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[385] http://www.spacedaily.com/news/bmdo-00zzv.html.

[386] The information in this chart is a compilation of information from multiple websites, including the Monterey Institute of International Studies Center for Nonproliferation Studies (MIIS/CNS), the Carnegie Endowment for International Peace (CEIP), the Nuclear Threat Initiative (NTI), the USNI Military Database, and the Institute for International Strategic Studies (IISS), among others.

System	Fuel	Launch mode	Reusable launcher	Missiles per launcher
DF-3/CSS-2	Liquid	Road mobile erector	?	?
DF-4/CSS-3	Liquid	Silo elevate-to-launch; cave-based roll-out to launch TEL	No?	1?
DF-5/CSS-4	Liquid	Silo elevate-to-launch; cave-based roll-out to launch TEL	No?	1?
DF-15/CSS-6/M-9	Solid	Road mobile TEL	Yes	6
DF-11/CSS-7/M-11	Solid	Road mobile TEL	Yes	6
DF-21/CSS-5	Solid	Road mobile TEL	Yes	?
DF-31/CSS-9	Solid	Road mobile TEL	Yes?	?

Table 6.2 Chinese Missile Systems and Launchers

Regardless of what type of missile China chooses to deploy, any increase in the size of Second Artillery's missile inventory leads to several organizational, training, and possible political questions. As shown in Figure 6.1, the PLA could add a small number of new brigades to bases 51, 53, 54, 55, and 56 without much difficulty. However, if Second Artillery were to add several new brigades to any of the bases, it would most likely have to create new army-level bases to provide the proper span of control (Base 52, which is thought to have seven brigades, may already be too unwieldy to manage). Where would any new bases be located? What will Second Artillery have to do to train the troops to man the new units? Will Second Artillery's size have to increase at a time when the rest of the PLA is downsizing? What would the political ramifications in the region be if China began building entire new bases? Although beyond the scope of this paper, these questions are important, and worthy of further research.

PERSONNEL & EDUCATION

Ultimately, it is people, in this case Second Artillery's personnel, who will be responsible for instituting change. As Second Artillery's Military Training Department has aptly written, "People are the core or soul of all the essential elements of combat capability and a decisive factor in the outcome of war."[387] As with the PLA as a whole, Second Artillery has undergone tremendous changes in recent years. As its technology and operational doctrine evolve, the methods Second Artillery employs to recruit, train, educate, and retain its needed personnel will play a large role in determining how close it will come to attaining its vision.

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[387] Military Training Department of the Second Artillery Command "New Expansion of Military Training Task," *Jiefangjun bao*, 8 October 2002.

OFFICER ACCESSION

As the PLA adjusts to the demands of developing a military prepared to fight and win local wars under modern high-tech conditions, the need to move from a labor-intensive force to an expertise-intensive force has become clearer. One of the great challenges facing the PLA as a whole, and Second Artillery in particular, is identifying and recruiting quality officer candidates.

The PLA as a whole has addressed these issues through a series of programs designed to select officers from a larger, more diverse pool of candidates who are knowledgeable and skilled in a wide variety of areas, including advanced technologies, engineering, and social sciences. Some examples include the development of a more formal, widespread officer recruitment program at civilian universities, the establishment of on-campus officer recruitment offices at civilian institutions of higher education, and the creation of a national defense scholarship program to recruit young, potential PLA officers before they begin their civilian college studies.[388]

Although part of a larger trend, it should be noted that, on paper at least, there appears to be some room for variation of officer accession reform programs among the various services, branches, and MRs. For example, the 1999 *Circular on Developing Military Cadres* charges "the various MRs, services, branches, GSD, GLD, and GED, and the People's Armed Police" to each select and broker agreements with one or two institutions of higher learning. It then charges them to set up selection and training organizations to select and develop officers in various manners.[389] Therefore, it is useful when looking at Second Artillery's reforms in this area, to bear in mind that its progress might not always be a reflection of progress within the greater PLA.

Compared with the PLA as a whole, Second Artillery has been fairly successful at recruiting civilian college graduates. It has signed agreements with several civilian colleges and universities, including the Northwest Polytech University in Xian and the Hefei Industrial University.[390] In terms of raw numbers, Second Artillery ranks second in the number of actual civilian college graduates recruited each year, and it has the highest number of civilian college gradates in proportion to the size of its population.[391] Among

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[388] As of November 2001, Second Artillery was reported to have approximately 430 students participating in the national defense scholarship program. Chen Xinping and Zhang Xuanjie, "Strategic Missile Units Attract Large Numbers of Local University Students," *Xinhua*, 26 November 2001. For a more detailed discussion of these efforts, see *Institutional Reforms of the Chinese People's Liberation Army: Overview and Challenges* by Kenneth Allen, Dean Cheng, David Finkelstein, and Maryanne Kivlehan., Alexandria, VA: The CNA Corporation.

[389] "Military Issues Circular on Developing Military Cadres," *Xinhua*, 3 August 1999.

[390] Wu Xudong and Zhang Xuanjie, "About 20 Percent of Officers Serving in China's Strategic Missile Units Come from Colleges and Universities Across the Country," *Xinhua*, 29 April 2002.

[391] Li Xuehong, "Continued Education Gives Rise to Greater Room for Development and Stronger Development Potential for Second Artillery," *Zhongguo qingnian bao*, 25 November 2001.

the college students it has recruited, 89 percent of them are reported to have a four-year college degree.[392]

Orientation. Managing the in-processing and basic training of relatively high numbers of civilian college graduates has also been an area ripe for Second Artillery's innovation. Second Artillery is reported to have invested more than 10 million RMB (more than USD 1.2 million) to establish two training camps where these recruits can receive "pre-job" training.[393] Each of these two training camps has established a weaponry lab, an electronic survey lab, a special environment lab, an engineering protection lab, and a simulation lab. These new officers are also given opportunities to train in military institutions, study in industrial plants, and participate in major military maneuvers and missile launches.[394] Upon completion of these programs, they can go on to a variety of jobs. It should be noted that, in a break from past practices, there have been reports that at least some of these civilian college graduates are being assigned to operational positions at the company level.[395]

Creating an NCO Corps

One noteworthy benchmark of the PLA's march to higher levels of professional competence is its decision to create an enlarged professional corps of noncommissioned officers. The PLA has articulated an overarching goal of increasing the number of noncommissioned officers while reducing the total number of conscripts. China revised its *Military Service Law* in December 1998; the PLA subsequently revised its *Regulations on Military Service of Active-Duty Soldiers* in July 1999. Together these documents put into motion the creation of an enlarged professional corps of NCOs.[396] This NCO Corps was designed, in part, to provide a more professional and stable backbone enlisted force to replace a shrinking conscription force (discussed below).

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[392] Wu Xudong and Zhang Xuanjie, "About 20 Percent of Officers Serving in China's Strategic Missile Units Come from Colleges and Universities Across the Country," *Xinhua*, 29 April 2002.

[393] Ibid.

[394] Ibid.

[395] "According to statistics, of the military officers Second Artillery has recruited from local institutions of higher learning in recent years, several hundred have taken up the post of principal operational company officers. . . " Chen Xinping and Zhang Xuanjie, "Strategic Missile Units Attract Large Numbers of Local University Students" *Xinhua*, 26 November 2001.

[396] As with many personnel reforms, the creation of a PLA NCO corps had been attempted before. The decision to adopt a system of noncommissioned officers was made by the Central Military Commission in 1978. Prior to the promulgation of these two documents, the PLA had an NCO corps, but it was limited both in terms of numbers and in terms of types of duties performed. "Major Reform in Our Army's Service System—Yang Zhiqi, Director of the Military Affairs Department of the General Staff Headquarters Answers Reporters' Questions on Military Service Regulations," *Jiefangjun bao*, 13 July 1999 (FBIS).

There is little evidence that the challenges Second Artillery experienced as a result of this restructuring of their enlisted corps were more severe than those experienced by the PLA as a whole. However, there have been reports that the primary institute for the training of Second Artillery NCOs, Qingzhou Noncommissioned Officers Academy in Shandong Province, was, at least initially not providing NCOs with useful and appropriate training. Units are reported to have complained that the NCOs were being given too much theory and not receiving enough practical instruction. "They (the new NCO graduates) were only versed in lecturing theories, but not capable of operating equipment."[397] The Academy has since reported a change in curriculum.

Another challenge Second Artillery appears to be struggling with in regards to NCOs is the difficulty of shortening the orientation period for new NCOs once they have joined their units. The Second Artillery's Qingzhou NCO Academy is reported to be currently involved in revising its curriculum to allow more time for training for an NCOs post-graduation assignment and to allow for some preparation for field conditions. The objective of this revised training is to complete the orientation process at the Academy, so that new NCOs will be fully prepared for duty when they report for their new positions.[398]

Enlisted Conscription

Accompanying changes in officer accession policies and the creation of an enlarged NCO Corps, recent PLA personnel reforms have also affected the conscript force. The most significant of which is a change in the length of mandatory service, which was codified in the 1998 *Service Law* and the 1999 *Regulations on Active-Duty* noted above.

Previously, the length of mandatory service for soldiers in the ground forces was three years, and for those assigned to the Navy and Air Force—the PLA's technical services—was four years.[399] However, pursuant to the promulgation of these new policies, the length of mandatory service for conscripts in all services and branches is now two years.

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[397] Gao Qiang, and Zhou Guojun, "The Qingzhou Noncommissioned Officer Academy of the PLA Second Artillery Enhances the Teaching of Special Skills," *Jiefangjun bao*, 26 August 2002. It is not clear at what point in their career soldiers attend the NCO Academy. It could be immediately after they complete their two-year conscription period, or it could be later in their NCO career. Since 1999, the PLA's NCOs can serve for a total of 30 years, which is divided into six periods of 3, 3, 4, 4, 5, and 9 years. Although the system is present on paper and in the new regulations, it will take several years to completely transition from the old system.

[398] Ibid.

[399] It seems logical to surmise that, prior to the change, the mandatory service period for Second Artillery conscripts would have been 4 years—the same as it was for the two technical services (Navy and Air Force). However, the authors cannot find this stated in any published reports. Either a 3 or 4-year conscription period would have been possible. Regardless, the period of mandatory service is now the same throughout the PLA.

There is little in the way of official PLA explanation for this seemingly counterproductive change. Anecdotal evidence suggests that the change was in response to domestic political pressures. Specifically, some suggest that because of the state's "one child policy" (which was instituted in 1982) and the breakdown of the centralized social safety net (a result of a more free market economy), many rural families were resisting the requirement to give up an only son to military service for more than two years. If true, this is a telling explanation. What is clear, however, is that a change in the term of service had a potentially significant impact on the PLA's ability to retain expertise.

By curtailing and standardizing the period of compulsory service from three or four years to two years throughout all services and branches, and eliminating the option of voluntarily extending the period of enlisted service, the 1998 *Military Service Law* radically altered the PLA recruitment and retention plans for enlisted personnel and created a short-term experience gap.

The exact effect this development will have on Second Artillery is difficult to determine. At first glance, Second Artillery appears to have a smaller proportion of conscripts within its ranks than the PLA as a whole.[400] However, the challenge posed by a 50-percent annual attrition rate among conscripts is one Second Artillery will face for as long as it maintains the two-year conscription period. Therefore, the mechanisms it develops to cope with this challenge in the coming years are worthy of some observation. Conscripts appear to be on a path of decreasing responsibility and professionalism, with NCOs taking on a new and more significant role. For this reason, progress in recruiting and retaining NCOs is a critical measure of Second Artillery's progress in developing a more professionalized force. When examining its progress, one must look at not only its success in meeting its initial recruitment goals, but also its NCO retention rates and changes in the average number of years experience.

DEVELOPING TALENT

As in the PLA as a whole, Second Artillery is coming to terms with new challenges for retaining talented individuals. Like the militaries in many countries undergoing a period of rapid economic growth, the PLA faces competition from its own private sector to recruit and retain the most talented personnel. As the most high-tech arm of the PLA, Second Artillery has in many ways been forced to take the lead in developing innovative means of retaining talented officers.

In an attempt to address this issue, in early 2000, the PLA released its "10th Five-Year Plan for the Development of Talented People" that included specific goals for Second Artillery.[401] According to reports, this plan identified 30 specific measures for improving the way in which Second Artillery develops its talented personnel and realize its goal of "developing a large number competent and talented commanders, expert

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[400] Data derived from Periscope Country Report on China, <http://www.periscope.ucg.com/nations/asia/china/organzn/index.html>.

[401] Dong Jushan, and Wu Xudong, "Second Artillery to Have More Than 300 experts at State and Armed Forces Levels in 10th Five-Year Plan," *Jiefangjun bao* , 20 August 2000.

technical personnel, think-tank staff officers, and modern managers."[402] These measures are broad sweeping and range from improving the ideological and political quality of talented personnel to improving the management and structure of training and development.

Professional Military Education

In order to successfully prosecute the types of campaigns described in PLA doctrinal writings, Second Artillery must ensure that it is developing officers with an appropriate range of educational experiences. For Second Artillery, this has translated into ensuring that there is enough current and specialized expertise to use advanced equipment, operate under difficult conditions, and coordinate with other entities both within Second Artillery and with the PLA as a whole.

Enabling Integrated Operations: Career Broadening. As has been demonstrated in PLA doctrinal writings on Second Artillery campaigns, the PLA sees an ability to establish and maintain close coordination essential to successfully instituting its operational doctrine for Second Artillery campaigns. Second Artillery recognized that its current method of officer training was not developing the type of soldier it needed to prosecute the types of campaigns Second Artillery would be called upon to wage. Second Artillery also acknowledges that it could sustain severe combat losses during a conflict, so its troops must be prepared to perform multiple tasks. As a result, we have seen reports of changes to some of the most basic assumptions behind professional military education (PME) within Second Artillery.

The 2nd Artillery Engineering Academy (*erpao gongcheng xueyuan*; 二炮工程学院) is Second Artillery's basic training academy (*erpao chuji peixun yuanxiao*; 二炮初级培训院校). During the course of an officer's study, command training and technical training are integrated. All students must become proficient in basic military and technical issues before going on to specialized training. Although little can be said about their progress in this area, it is reported that one goal of this training is to ensure that upon completion of this program, all participants would be prepared to work both as military commanders and as engineers, and that all would possess a solid foundation that would allow them to more quickly master the various high-tech equipment they would encounter.[403]

The Second Artillery Command Academy (*erpao zhihui xueyuan*; 二炮指挥学院) is the main academy responsible for intermediate training for officers in Second Artillery. This academy is reported to have undergone a dramatic shift in its training procedures and polices in recent years. According to one article, prior to 1997, the Second Artillery Command Academy followed a training model in which separate and specialized training was offered to officers for military work, political work, logistics, equipment, etc. As a

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[402] Ibid.

[403] Li Xuehong, "Continued Education Gives Rise to Greater Room for Development and Stronger Development Potential for Second Artillery," *Zhongguo qingnian bao*, 25 November 2001.

result, each group of officers did not understand the intricacies of the other group's work.[404] An expression was used to describe this situation: "You don't understand my work's special characteristics and I don't understand the nature of your work" (*ni bu liaojie wode gongzuo tedian, wo ye bu liaojie nide gongzuo xingzhi*; 你不了解我的工作特点，我也不了解你的工作性质). Such a situation was seen to be unsuitable for tasks that require a high degree of cooperation. As one officer stated:

> While scientific research becomes more specialized, there is an increasing demand for coordinated actions in future wars. Therefore, simply separating the training of talents into technical and command training is unscientific and unsuitable in view of the integrated demands of future wars.[405]

To combat this problem, the Second Artillery Command Academy adopted a new approach to training known as "combine, separate, combine" (*he fen he*; 合分合). According to this article, under this new training regime, all officers receiving intermediate-level training at the academy, including those specializing in military issues, political works, logistics, equipment, etc., will combine and spend the first six months of a one year training program as an integrated group. During this time, all officers receive training on topics such as missile weaponry, political work, equipment management, and logistic support. During the second phase, also lasting six months, officers will separate into groups and receive specialized training in their specific areas of expertise. Upon graduation from the course, the officers will go back to work in their specialized fields and combine the knowledge they have received in order to more efficiently conduct integrated exercises.[406]

Maintaining Current Expertise, the Rise of Continuing Education. Second Artillery is also challenged by the rapid pace at which highly technical knowledge and training can become obsolete. For this reason, continuing education has become more of a priority within Second Artillery. In an effort to address this need, Second Artillery has created a special fund to be used to develop talents and provide special training at all levels of service. The current level of funding for this initiative, however, 4 million RMB

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[404] Ibid.

[405] Ibid.

[406] There also appears to be a direct relationship between Second Artillery and the Langfang Army Missile Academy (*Langfang lujun daodan xueyuan*; 廊坊陆军导弹学院). The academy, which was established as a training regiment in 1978, trains the ground force's antitank missile troops, surface-to-air missile troops, and *fendui*-level officers in campaign and tactical surface-to-surface missile command. The officers train for three to four years before they are assigned to battalion-level and below ballistic missile units as commanders, technical officers, and political instructors. A review of *Jiefangjun bao* articles indicates that missile officers can move back and forth between the academy, the Nanjing MR's new missile units, and Second Artillery.

(approximately USD 500,000) each year, may not be up to the task of maintaining technical currency throughout this elite corps.[407]

Another Second Artillery initiative to promote continuing education was the establishment of a continuing education department (*jixu jiaoyu xi*; 继续教育系) in Second Artillery's Engineering Academy in 1999. It is reported to be the first such facility set up in any Chinese military academy. At this facility, the faculty conducts courses for commanders of missile battalions and companies, members of the headquarters staff, and engineers. It is also reported to hold ad hoc courses for senior engineers in order to help keep them abreast in the latest technologies and scientific breakthroughs.[408]

New Techniques and Approaches. Second Artillery has taken some interesting steps at experimenting with education and training techniques. For example, in addition to numerous reports about the introduction of computer technology and multimedia training techniques that come up when looking at any branch of the PLA, for Second Artillery, areas such as political education have been the grounds for innovation. A November 2001 report describes one brigade's attempts to rationalize political education by taking a multi-layer approach.[409] According to this report, the brigade was experimenting with the concept of designing a political education plan in which people of different ranks and levels of responsibility were given different types of lessons. Under this new plan, rather than continuing with the existing practice of gathering the entire brigade to receive the same training, political education would be designed for four different target groups: (1) leaders and government officials, (2) front-line officers (regiment and below) and grade 2 or higher NCOs, (3) grade 1 NCOs, and (4) conscripts. Some might suggest that the very fact that this seemingly useful and innocuous innovation is still an experimental policy tells more about the PLA's past approaches toward training than their current willingness to change, but it is, nonetheless, an indication of a willingness to break away from the past and seek new solutions.

The same report also listed a new approach to managing political instructors. According to this experimental plan, political instructors would compete for the honor of teaching a class. Several political instructors would be given a topic and tasked to come up with lesson plans. The instructors would then each teach a sample class to a review committee. The best instructor would then be chosen to teach the course throughout the brigade.[410]

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[407] Dong Jushan, and Wu Xudong, "Second Artillery to Have More Than 300 experts at State and Armed Forces Levels in 10th Five-Year Plan," *Jiefangjun bao* , 20 August 2000.

[408] Li Xuehong, "Continued Education Gives Rise to Greater Room for Development and Stronger Development Potential for Second Artillery," *Zhongguo qingnian bao*, 25 November 2001.

[409] Wang Cai and Bi Yongjun, "Second Artillery Brigade Explores New Multi-layers Approach to Political Education" *Jiefangjun bao*, 4 November 2001 (FBIS).

[410] Ibid.

Modernizing Human Resource Management: Retaining and Evaluating Talent

Perhaps more than other branches of the PLA, China's decade-long economic boom has created special challenges for the high-tech Second Artillery. When faced with competition from higher-paying private sector companies, it is simply more difficult to attract and retain the expertise that Second Artillery requires. One of the primary ways it has addressed this is by providing material incentives for what one can surmise must be the most elusive groups: civilian college graduates, scientific and technical officers, and military academy and research institute faculty. At the same time, as the officer corps diversifies and faces new tasks and challenges, Second Artillery must ensure that the methods it uses to evaluate and promote its personnel meet its current and future needs.

Preferential Treatment. Second Artillery has polices in place to encourage students with higher education to join and remain in Second Artillery, including material benefits such as preferential working conditions and remuneration.[411] The motto often associated with such programs is "respect for knowledge and regard for talent."

Second Artillery also appears to be making special efforts to increase opportunities for career development within their military academies and research institutes. For example, the Second Artillery Engineering Academy is said to have implemented a policy of the "four priorities" to attract and retain the interest of young scientists. According to this policy, young scientists are encouraged to remain in Second Artillery and become involved with teaching by being offered preferential treatment in four areas: (1) priority selection for going on for further study, (2) priority selection for overseas visits and participation in academic exchanges, (3) priority in the organization of research projects in and teaching of their main research interests and areas of expertise, and (4) priority consideration for promotions, meritorious service awards, etc.[412]

Another Second Artillery research institute is engaged in a similar program to attract and retain scientific and technical officers. To do this, they have instituted a policy known as the "six priorities" for dealing with scientific and technical cadres: (1) giving preferential treatment with regards to the allocation of their office facilities; (2) housing arrangements; (3) guaranteeing their use of cars; (4) granting them special consideration for awards; (5) giving them priority consideration for promotions to a new post or a higher grade; and (6) providing special procedures for examining and approving their work.

Evaluation and Career Development. Second Artillery appears to have given some thought to items other than material compensation that would entice young talent not only to join, but also to remain and develop within the PLA. In particular, Second Artillery has begun to give greater attention to the concept of career development. Young

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[411] "PRC Strategic Missile Forces Enlisting More College Graduates," *Xinhua*, 29 November 2001. Also see: Chen Xinping and Zhang Xuanji, "Large Number of University Students Attracted to Join Strategic Missiles Unit – Student Cadres, All-Round Students, Party (Cadet) Members and Students with Special Skills Make Up 96 Percent of Recruit," *Renmin ribao*, 29 November 2001.

[412] Liu Mingsong and Zhao Fengyu, "Engineering Institute of Second Artillery Devotes Efforts to Foster Scientific and Technological Leaders," *Jiefangjun bao*, 4 October 2002.

officers are reportedly given more opportunities to receive advanced training early in their careers. This is said to often entail giving civilian college graduates an opportunity for some amount of further college training within the first three years of their careers.[413]

In a move to address concerns about career development, and to ensure that the military leaders of the future rise through the ranks, Second Artillery is moving toward a more open and objective process of assessing and evaluating the performance of its officers. In recent years, the PLA as a whole has made efforts to standardize and make more objective and transparent its process of evaluating and promoting officers. These subjects have been addressed in the December 2000 *Active-Service Officers Law* and the January 2002 *Regulations on the Appointment and Removal of Military Officers on Active Service*.[414] Among other things, these laws have encouraged a standardization of the officer evaluation process and allowed for new avenues of feedback, such as opinion polls among an officer's peers. Unit Party Committees have actually been instructed not to promote officers who are disliked or disapproved of among "the masses,"[415] and, although political reliability is still a factor in officer evaluation, other criteria are also listed as being relevant.[416]

Second Artillery is also making special efforts to reform the academy instructor evaluation system. For example, the Engineering Academy claims to have done away with the more traditional seniority-based promotion system. Instead, they are reported to have laid out new criteria for evaluating instructors and selecting professors based on scientific achievements. Without a more thorough understanding of past promotion rates, it is difficult to gauge the pace of this reform. Since 2000, the academy is reported to

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[413] Li Xuehong, "Continued Education Gives Rise to Greater Room for Development and Stronger Development Potential for Second Artillery," *Zhongguo qingnian bao* , 25 November 2001.

[414] In some reports, the *Active-Service Officers* Law is listed as decreed in January 2001 rather than December 2000. For a detailed discussion of this law and all of its ramifications, see an exceptionally dense and granular article issued by the PLA General Political Department. "Explanations on the *Active-Service Officers Law of the People's Republic of China*," *Jiefangjun bao,* 18 January 2001 (FBIS). For information on the Regulations on the Appointment and Removal of Military Officers on Active Service, see "CMC Chairman Jiang Zemin Signs Decree on Promulgation of *Regulations on Appointments and Removals of Military Officers on Active Service*," *Jiefangjun bao*, 14 January 2002 (FBIS); and "Leader of Cadres Department under the PLA General Political Department Answers This Reporter's Questions on Regulations on the Appointment and Removal of Military Officers," *Jiefangjun bao,* 1 February 2002 (FBIS).

[415] "CMC Chairman Jiang Zemin Signs Decree on Promulgation of Regulations on Appointments and Removals of Military Officers on Active Service," *Jiefangjun bao*, 14 January 2002 (FBIS).

[416] In the *2000 Active-Service Officers Law*, "loyalty to the Communist Party" and "having firmly held revolutionary ideals" are requirements for all officers. "Explanations on the *Active-Service Officers Law of the People's Republic of China*," *Jiefangjun bao,* 18 January 2001 (FBIS).

have broken with tradition and selected younger scientists with less seniority as professors eight times.[417]

Interestingly, according to some reports, one purpose for this effort is to improve the PLA's ability to manage what they see as inevitable personnel shortages during times of crisis, or to better their ability to "pick the taller from among the short people" when the situation demands it.[418] Given their assumption of high casualties resulting from any attack on its missile force, this idea could have special relevance for Second Artillery.

In a broad-based effort to improve its assessment and evaluation procedures, Second Artillery is reported to have initiated a series of studies on how to better manage and assess its scientific and technical officers.[419] After two and a half years of study and discussion, in early March 2002, Second Artillery is reported to have issued its *Criteria for the Quality Assessment of Scientific and Technical Cadres in Conventional Missile Brigades*. The purpose of issuing the *Criteria* was to standardize the methods by which Second Artillery scientists, engineers, and technical officers are evaluated. The *Criteria* identifies specific areas of competency and force evaluators to give a quantifiable measure (a number grade) of each officer's performance in each of the specified areas. These areas cover several broad categories, including: political quality, professional expertise, and management capability.[420]

As with many PLA personnel innovations, what is most remarkable about this system is that it is reported to be an innovation, a new policy introduced for the first time in March 2002! It does appear however, that the *Criteria* themselves are not the sole product of two and a half years of careful study and investigation. They are described to be the first of several steps away from a system of "rough estimate" and toward a more modern Second Artillery approach to human resource management. If this is true, in upcoming years, we should see the implementation of other policies and procedures that might address some of the other human resource management challenges that Second Artillery has identified, such as a disproportionate distribution of expertise in certain scientific fields and an overall shortage of "high-level" experts.[421]

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[417] Liu Mingsong and Zhao Fengyu, "Engineering Institute of Second Artillery Devotes Efforts to Foster Scientific and Technological Leaders," *Jiefangjun bao*, 4 October 2002.

[418] Wang Jinxiang, "Carry Out Personnel Training According to the Line of Thought Advocating Leaping--To Achieve Leaping in Armed Force Construction, It Is Necessary to Achieve Leaping in Personnel. Break Away from the Gradualist Mode of Personnel Training and Discard the Approach of Following Established Practices, on the Basis of Focusing on the General Trend in Military Revolution of the World and Seizing the Favorable Historical Opportunity," *Jiefangjun bao*, 29 May 2001 (FBIS).

[419] The PLA uses officer and cadre interchangeably, especially since there was no rank system before 1955 and between 1965 to 1988.

[420] Li Guangrong and Bi Yongjun. "Second Artillery Issues Criteria for the Quality Assessment of Its Scientific and Technological Cadres," *Jiefangjun bao*, 18 March 2002 (FBIS).

[421] Ibid.

New Areas of Study. One striking element in doctrinal writings on Second Artillery campaign operations is the ready acceptance of the fact that, in the event of an actual conflict, these units would be asked to perform their duties in just about the worst environment imaginable. Although there are no real solutions to that problem, Second Artillery does appear to be giving some amount of consideration to the mental and emotional strain this will place on personnel. Reports of psychological studies and the use of psychological evaluations are becoming more prevalent. One example is an article appearing in *Jiefangjun Bao* in August 2002 in which a missile brigade was experimenting with the use of psychological evaluations to determine the combat readiness of individual personnel—especially technical personnel and "key hands" (*zhongyao haoshou*; 重要好手). According to this article, the brigade set up psychological assessment files for all of its technical personnel and "key hands." An assessment was made every quarter and just prior to the execution of any important launch mission. If an individual was found to be in a less than ideal psychological state, the person was replaced.[422]

SECOND ARTILLERY FOREIGN RELATIONS: A TOOL FOR RETENTION AND EDUCATION

One under-studied tool that Second Artillery may use to address retention issues and to improve the overall professional education of its force is its foreign relations program. It can be used both to entice young officers to remain in Second Artillery and to expand the educational experiences of the Second Artillery's rising stars by exposing them to other militaries and introducing them to new approaches to common challenges.

Since reform began in 1978, senior PLA officers have led over 1,600 delegations to more than 80 countries (See Appendix C).[423] Each of the senior PLA leaders in the CMC have averaged one trip abroad per year. When they travel, their delegations usually include senior members of the different services and military regions, including deputy commanders, deputy political commissars, and chiefs of staffs.[424] In addition, the Navy and Air Force commanders and political commissars, deputy chiefs of the general staff, and military region commanders have averaged one trip abroad per year. Where does Second Artillery fit into this program?

It was not until the mid-1990s that Second Artillery's commander and political commissar became active participants in the PLA's foreign relations program (See Appendix D for leadership biographies). Unlike the PLAN and PLAAF commanders and

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[422] Wang Xiaojun and Xia Hongqing, "Second Artillery Brigade Brings Psychological Evaluation into Sphere of Training," *Jiefangjun bao*, 21 August 2002 (FBIS).

[423] Huang Cailong, "Moving Toward the World and Peace: Roundup of Five Decades of PLA Foreign Military Interaction," *Xinhua*, 14 September 1999 (FBIS: FTS19991005000721); "China's Military Diplomacy Forging New Ties," *Xinhua*, 28 October 2002; Kenneth W. Allen and Eric A. McVadon, *China's Foreign Military Relations*, The Henry L. Stimson Center, October 1999.

[424] A typical delegation consists of 7-10 members.

political commissars, Second Artillery's leaders have hardly traveled abroad. Yang Guoliang, who was the commander from 1992 to 2003, became the first commander to travel abroad when he accompanied Defense Minister Chi Haotian to France, Spain, Portugal, and Finland in September 1995.[425] In November 1996, Yang led a Second Artillery Delegation to Saudi Arabia, and in August 2000, he led another delegation to Russia and Finland.[426]

Second Artillery's political commissars visited abroad in 1996, 1998, and 2000 as members of senior PLA officer-led delegations. In May 1996, Sui Yongju accompanied Defense Minister Chi Haotian to Egypt, the United Arab Emirates, Saudi Arabia, and Kuwait.[427] In May 1998, Sui Mingtai accompanied Yu Yongbo, Director of the General Political Department, to Cuba and Mexico.[428] In January 2000, Sui Mingtai was a member of Chi Haotian's delegation to South Korea, Russia, Britain, and Mongolia.[429] So far, no political commissars have apparently led delegations abroad.

Three Second Artillery deputy commanders have been members of senior PLA member delegations. In August 1991, Qian Gui accompanied Chi Haotian, who was then chief of the general staff, to Russia.[430] In December 1996, Zhao Xijun was a member of Defense Minister Chi Haotian's delegation to the United States.[431] Zhao also traveled

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[425] "Chi Haotian Arrives in Spain for Visit," *Xinhua*, 7 September 1995 (FBIS FTS19950907000501); "Chinese Defense Minister Visits Finland," *Xinhua*, 15 September 1995.

[426] "Saudi Arabia, China Discuss Military Cooperation," *Agence France Presse*, 27 November 1996; "PLA Delegation Leaves for Russia, Finland," *Xinhua*, 10 August 2000; "Defence Minister Receives Commander Of Chinese Strategic Missile Forces," *BBC*, 28 November 1996 (from SPA news agency, Riyadh, in Arabic, 26 November 1996). Beside LTG Sui, the only other senior PLA officer reported in the entourage was Deputy Chief of the General Staff LTG Xiong Guangkai.

[427] "Chinese Defense Minister Chi Leaves for Middle East," *Kyodo News Service*, 25 May 1996.

[428] "PLA Political Director Returns From Cuba, Mexico," *Xinhua*, 18 May 1998. Besides Sui, Yu's entourage included Lieutenant General Zheng Shenxia, Commander of the Shenyang Military Region Air Force and concurrently Shenyang Military Region Deputy Commander.

[429] "Chinese Military Delegation Anxious Not To 'Provoke' North," *BBC*, 24 January 2000 (from *Yonhap News Agency*, Seoul, in English, 21 January 2000). Besides Sui, other member of the delegation included Major General Zang Wenqing, Beijing Military Region Deputy Commander; Major General Luo Bin, Director of the Foreign Affairs Office of the Defence Ministry; and Major General Wang Jianmin, Chief of Staff of the Shenyang Military Region.

[430] "PLA Chief of General Staff Makes Historic Soviet Visit," *Xinhua*, 5 August 1991. Besides Qian, other members of the delegation included Lieutenant General Wang Chengbin, Commander of the Beijing Military Region; Vice Admiral Wei Jinshan, Political Commissar of the Navy; and Senior Colonel Luo Bin, Deputy Director of the Foreign Affairs Bureau of the Defense Ministry.

[431] Yang Guojun and Wang Xiaodong, "Chi Haotian Leaves for U.S. on 10-Day Official Visit," *Xinhua*, 2 December 1996. Besides Zhao, other member of the delegation included Lieutenant General Xiong Guang Kai, Deputy Chief of the General Staff; Lieutenant General Liu Shunyao, Air Force Commander; Lieutenant General Tao Bojun, Guangzhou Military Region Commander; Lieutenant General Wang Tailan,

with CMC Vice-Chairman Zhang Wannian to Spain, Italy, and Portugal in May 2000.[432] In April 2000, Huang Cisheng accompanied Chief of the General Staff Fu Quanyou to Japan, Nepal, and Germany.[433]

It is important to note, however, that much of what Second Artillery does in terms of its foreign relations, especially its functional exchanges, is hidden from outside view. For example, a 1996 *Xinhua* report stated, "Second Artillery has arranged for nearly 1000 experts, scholars, and promising science and technology personnel to study abroad, to visit foreign countries, to engage in advanced studies abroad and to participate in international academic activities, in order to keep track of the world's newest technology of the current time."[434] Unfortunately, there is virtually no reporting on these activities. A good example is the lack of reporting by *Xinhua* and *Jiefangjun Bao* on commander Yang Guoliang's visit noted above to Saudi Arabia in November 1996. Available information on Yang's visit came from the *British Broadcasting Corporation's* translation of Saudi Arabia's *SPA News Agency* reporting in Arabic.

Based on the information available, no discernible pattern appears to exist for visits to specific countries other than to Russia to discuss possible acquisition of weapon systems and technology and to Saudi Arabia concerning the Saudi's 1988 acquisition of 30-35 DF-3/CSS-2 SRBMs.[435]

Although it is difficult to draw any generalizations from so little data, Second Artillery's officer participation as members of senior PLA delegations abroad meets the PLA's requirement of "having China's military leaders and younger officers acquire modern military knowledge, especially from the developed world, in doctrine, operations,

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General Logistics Department Deputy Director; Lieutenant General He Pengfei, Navy Deputy Commander; and Major General Zhan Maohai, Defense Ministry Foreign Affairs Office Deputy Director.

[432] "China's Zhang Wannian Leaves for European Tour," *Xinhua*, 23 May 2000. In addition to Zhao, Zhang's entourage included Lieutenant General Xiong Guangkai, Deputy Chief of General Staff; Lieutenant General Tao Bojun, Commander of Guangzhou Military Region; Lieutenant General Wang Liangwang, Air Force Deputy Commander; Vice Admiral Zhang Dingfa, Commander of the North Sea Fleet and concurrently Deputy Commander of Jinan Military Region.

[433] "Chinese Army Chief Fu Quanyou Arrives," *BBC*, 8 April 2000 (from *Xinhua*, 6 April 2000). Other members on the entourage included Vice Admiral Shen Binyi, Deputy Commander of the Navy; Lieutenant General Guo Yuxiang, Commander of the Jinan Military Region Air Force and concurrently Deputy Commander of the Jinan Military Region; and Major General Zhan Maohai, Deputy Director of the Foreign Affairs Office of the Ministry of National Defence.

[434] "Strategic missile units hone technological skills,"*BBC* (from *Xinhua* ,in Chinese, 9 December 1996).

[435] For the origins of the DF-3 sale see Lu Ning, *The Dynamics of Foreign-Policy Decision-making in China*, Boulder, CO: Westview Press, 1997, p. 113-117; John W. Lewis, Hua Di, and Xue Litai, "Beijing's Defense Establishment: Solving the Arms-Export Enigma," *International Security*, Spring 1991. In October 2000, Saudi Defense Minister Prince Sultan Bin Abd-al-Aziz visited China as a guest of Minister of Defense Chi Haotian. "Saudi Defence Minister Says No New Military Deals With China,"*BBC*, 14 October 2000 (from *SPA News Agency*, 12 October 2000).

training, military medicine, administration, and a host of non-combat related areas."[436] Based on discussions with PLA officials, these visits help expose the PLA officers throughout the chain of command to foreign militaries, in hopes they will develop a perspective of warfare that is broader than they read in PLA journals. Most of these PLA officers have never traveled abroad or even traveled extensively within China. Second, these visits are used to help groom certain officers for future positions. Third, it makes it easier for the general departments to implement reforms when senior officers within the various general department, service, and military region headquarters have had firsthand experience that allows them to see changes in the PLA as necessary.

TRAINING REFORMS

One of the great challenges for Second Artillery to enable its new operational concepts is maintaining a sufficiently trained force that can adapt to changes brought about by new technologies and ongoing reforms and modernization. Second Artillery has made several reforms in this area, including improving the process by which it introduces new technologies, improving the way in which it utilizes technology in training methods, and revising its training cycle to allow for more time to be spent on advanced training.

NEW APPROACHES TO INTRODUCING NEW TECHNOLOGIES

Over the past decade, Second Artillery has added several mobile nuclear and conventional brigades equipped with new or modified missiles to its arsenal. During the early 1990s, it took about two to three years from the time a brigade received its new missiles until it was prepared to launch the first test missile.[437] As more brigades were established, however, Second Artillery established procedures to reduce this time frame for new and modified missiles. These procedures were issued as the "Second Artillery Training Plan" in late 1999 and were apparently a major focus of Second Artillery's annual training conference in November 1999.[438]

Based on a review of Chinese source material on Second Artillery, it appears that many of these procedures have been devised by individual units, blessed by higher authorities, and then passed on to other units, possibly during the annual Second Artillery training conference held in November. For example, after three years of studying combat methods and principles of strategic missile units with emphasis on technical and tactical issues, one Second Artillery base introduced significant military training reforms that

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[436] Interviews with PLA officials.

[437] "Second Artillery Quickens Combat Power Generation," *Jiefangjun bao*, 27 August 1999.

[438] "Brigade Starts Training with New Subjects," *Jiefangjun bao*, 9 January 2000. The "Zhongguo renmin jiefangjun dier paobing xunlian dagang" [Second artillery training plan] has been referenced in various PLA publications and National Defense University dissertations, but no specifics have been given.

were approved at the November 1995 Second Artillery Training Work Conference.[439] The base's study resulted in a large number of new tactical training methods for Second Artillery as a whole.

When the first mobile brigades were created, the units waited until they received their new missiles before they began training. This process was reported to have changed during the late 1990s as the operational brigades organized three separate groups to begin training well before the missiles arrived. One group became involved in the entire process of weapon's development, testing, design finalization, and production.[440] Under the new procedures, while the new weapon is at the design and development stage, a small number of cadre are sent to the factory and research institute to learn the design and the structural and operating theory. During the testing stage, testing and training teams are sent to the test grounds to watch, study, collect and process data, and learn to operate and service the new equipment At the stage of design finalization, the unit forms a complete operating group to learn its operation. A second group deployed to another unit that already had the new type of missile and trained with them.[441] A third group deployed to test launch sites to learn launch skills. Using the new training procedures, brigades are able to launch their first missiles in about one year instead of three. After employing this training method, one unit was described as being capable of launching a missile within a year of receiving the missile, becoming a "fist unit" in the second year, and being fully combat effective in the third year.

USING TECHNOLOGY TO IMPROVE TRAINING METHODS

One of the key factors that has allowed Second Artillery to upgrade its training and operational readiness is its digital microwave communications system, which was the first such system to be established in the PLA.[442] As a result of communications upgrades, Second Artillery bases and brigades have increased their use of computers to conduct individual and unit training. Various bases have equipped their subordinate units with modern missile launch simulators, equipment simulators, training laboratories, multi-function training fields, and simulated opposition force training centers.[443] One unit invested more than one million RMB (USD 125,000) in computers, multimedia, and

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[439] Zhang Jiajun and Liu Shengdong, "Tactical Study Promotes Training Methods Reform--Second Artillery Base Military Training Enters Benign Circle after Three Years of Hard Work," *Jiefangjun bao*, 10 December 1995.

[440] "Second Artillery Quickens Combat Power Generation," *Jiefangjun bao*, 27 August 2000.

[441] "New-Type Guided Missile Launched By Newly-Formed Brigade," *Huojian bao*, 7 June 2001.

[442] "New Digital Communications Network In Full Operation," *Jiefangjun bao*, 8 September 1999.

[443] "Brigade Explores S&T Troop Training," *Jiefangjun bao*, 15 November 1999. *Jiefangjun bao*, 13 September 2000.

other high-tech equipment.[444] While focusing on its campaign and tactical command training simulation system and network construction, the unit developed 200 multimedia software systems covering theory, equipment operation, common training subjects, and integrated support. Overall, the computers have cut down the training time for some jobs by 25-60 percent. Some training items that previously required operation of real equipment can now be mastered in the barracks.

REVISED TRAINING CYCLE

In the past, Second Artillery moved from basic technical training at home during the winter to progressively more difficult mobile tactical training in the fall. This one-year cycle was based on the annual conscription period of 1 November through 31 October. Even though the conscription period was reduced to only two years in 1999, it appears Second Artillery has adjusted its training cycle, making it possible for advanced training to begin earlier and be conducted year round. For example, according to *Jiefangjun Bao*, one particular brigade conducts an emergency deployment exercise against a tactical background about once a month."[445] In addition, Second Artillery communications regiments are said to routinely train for emergency mobile support by testing their microwave, carrier wave, optical terminal, satellite, and program-controlled equipment during different weather conditions.[446]

Generally, battalion training begins with a single piece of equipment and single training subject during the first couple months of training, which also coincides with the winter months.[447] Following Spring Festival, which usually occurs in February, battalions and brigades move to combined arms training with all equipment. The training also progresses from fixed position to mobile position training, and from daytime training to training spanning day and night. Of note, Second Artillery combined arms training consists of "organic training for the entire brigade under simulated war conditions."[448]

SECOND ARTILLERY NOTIONAL EXERCISE

In order to implement its campaign theory, Second Artillery training places a great deal of emphasis on mobility and operating under reduced manning due to expected heavy casualties. They also emphasize camouflage, concealment, and deception (CC&D).

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[444] "Online Troop Training Proves Effective," *Huojian bao*, 20 August 1999.

[445] *Jiefangjun bao*, unidentified date in September 2000.

[446] "Communications Regiment Trains for Emergency Mobile Support," *Huojian bao*, 21 March 1999.

[447] "Brigade Upgrades Military Training," *Huojian bao*, 26 May 2001.

[448] "Brigade Commander on Combined Arms Training," *Huojian bao*, 6 October 2001. Generally, the PLA defines combined arms training as training by two or more branches within the same service. However, Second Artillery is a branch, not a service. Therefore, Second Artillery uses this term liberally to refer to training by all of its troops.

Based on a compilation of PLA writings, the next few paragraphs provide a notional mobile exercise by a brigade involving several hundred vehicles and over 1,000 troops in four echelons moving a total of 5,000 kilometers by rail and road for several days.[449]

During the first day, the brigade received a third-degree war readiness order, at which time mobilization orders were issued.[450] At 1500 hours, the brigade's equipment inspection regiment received orders to conduct a complete inspection of all equipment.[451] At midnight, battle orders and documents were transmitted to the combat *fendui* via the local area network linked to equipment inspection stations. The launch *fendui* and their support forces composed of several hundred vehicles departed immediately via rail and road for their launch positions. Regardless of the terrain and weather conditions, the convoy that traveled by road periodically operated without lights at night in order to avoid detection.[452]

As part of its CC&D mission, false launch-related vehicles capable of traveling at 40 kilometers per hour were built in about 30 minutes by assembling boards on vehicle chassis. These and other false vehicles disguised as special equipment and communications vehicles give off the same radar, infrared, and thermal imaging coefficients as real trucks. Meanwhile, the main fleet of vehicles moved along another route. When the trucks stopped, they had different types of netting to conceal them in wooded and open areas.

Throughout the exercise, the launch *fendui* carried out various types of training, including electronic interference, concealment, camouflage, emergency evacuation, tunnel survival, simulated launches, anti-airborne force, anti-air raid, anti-nuclear, and chemical defense.[453] The *fendui* also practiced field survival training and equipment tests at various temperatures. While en route, the logistics *fendui* conducted decontamination training against nuclear, biological, and chemical attacks, as well as water purification and cooking in a contaminated environment.[454] Vehicle refueling also took place under these conditions.

Once the battalions reached their launch positions, they were informed that an enemy satellite would soon be overhead and to implement various CC&D measures for all the vehicles. Some of the equipment vehicles became a "small hill covered with

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[449] The notional exercise is based on multiple articles from 1999-2002 from *Jiefangjun bao* and *Huojian bao*. The information in this particular sentence describing the scenario comes from "Unidentified Second Artillery Base Conducts Long-Range Mobile Operations Training," *Huojian bao*, 28 June 2001.

[450] *Huojian bao*, 29 November 1999. There is no explanation of the different war readiness degrees.

[451] "Equipment Inspection Regiment Holds Online Drill," *Huojian bao*, 6 July 1999.

[452] "Brigade Commander Discusses Guerilla-Type Operations," *Huojian bao*, 7 June 2001.

[453] This is a composite of numerous articles from *Jiefangjun bao* and *Huojian bao*.

[454] "Anhui Missile Base Logistics Unit Holds Drill," *Huojian bao*, 25 April 1999.

bushes," while other vehicles disguised their appearance as "civilian houses with chimneys emitting smoke."

Once the first-degree combat order was received, the vehicles moved to their launch positions and waited for the launch command to be given.[455] As the launchers moved to their positions, further CC&D measures were implemented, including releasing a smoke screen, setting out triangular and square angle reflectors to defeat enemy radar waves, and employing chaff launchers.[456] The *fendui* also built a false launch position to attract enemy satellite, electronic, and aerial surveillance. When the launch command was received, the missiles were launched in a sequence, resulting in "multi-wave precision strikes."[457]

Although this was a notional exercise compiled by the authors from information on multiple Second Artillery exercises, the goal was to show Second Artillery is clearly trying to implement its campaign doctrine.

CONCLUSION

Second Artillery has historically been the least transparent part of the PLA, but more information is slowly becoming available to the public from Chinese open source material, from the Congressionally-mandated annual DoD reports on China's military posture, and from the unclassified version of various U.S. National Intelligence Estimates. Western PLA watchers have tended to focus on Second Artillery's missiles, support equipment, and associated hardware reforms, as well as China's nuclear doctrine. As more information becomes available, however, it is now possible to begin examining Second Artillery's software reforms, including the organizational structure, personnel issues, professional military education, training, and foreign relations program.

PLA doctrinal writings identify two main types of Second Artillery campaigns: nuclear retaliation campaigns and conventional missile attack campaigns. Both are described as highly complex in terms of technology and organization, and in both cases, Second Artillery appears to infer that, in order to achieve success, they must be prepared to absorb high losses of personnel and equipment if attacked by enemy missiles. The importance of peacetime preparations, coordination, and adherence to a strict chain of command—in most cases reporting directly to the chairman of the CMC—are thus given heavy emphasis.

Second Artillery appears to recognize that in order to successfully prosecute the types of campaigns it envisions, highly skilled personnel will be required to maintain and

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[455] *Huojian bao*, 29 November 1999. The article, of which the authors only have the English translation, appears to make a difference between a "war readiness order" and a "combat order." Based on other PLA writings, *yiji zhandou zhiling* (一级战斗指令) has been noted for first-degree combat order.

[456] *Huojian bao*, 26 November 1999; see also "Camouflage Improves Base Survivability In Wartime," *Huojian bao*, 22 March 2001.

[457] "Progress in Conventional Missile Training," *Jiefangjun bao*, 15 March 1999. The Chinese term for multi-wave launch is *boci fashe* (波次发射).

operate the high-tech weaponry involved, and to perform all of the specialized logistics and support of both nuclear and conventional missile campaigns. These personnel need to be prepared to work under the assumed difficult conditions they would face in an actual campaign—manning weapons systems that the enemy would consider to be key and primary targets.

To ensure that the needed manpower is available, Second Artillery has begun to re-examine the methods through which it recruits, develops, and retains the talent it will need to achieve its vision. As with the PLA as a whole, Second Artillery has become active in civilian colleges and universities. To aid in its recruitment efforts, it has established recruitment offices in several schools and selected a growing number of civilian college students to participate in China's new national defense scholarship program.

Perhaps more than other branches of the PLA, China's decade long economic boom has created special challenges for a high-tech Second Artillery. When faced with competition from higher-paying private sector companies, it is simply more difficult to attract and retain the expertise that Second Artillery requires. One of the primary ways it has addressed this is by providing material incentives for what one can surmise must be the most elusive groups: civilian college graduates, scientific and technical officers, and military academy and research institute faculty. How effective these programs will be at addressing retention issues remains to be seen, but it should be noted that such polices do leave open the possibility of creating resentment and tensions between the Second Artillery "haves" and "have nots."

For Second Artillery, the challenges of coping with rapidly evolving technologies and the challenges associated with integrated operations has led to the development of some new approaches to professional military education. This has mainly entailed increasing emphasis and allotting funds and facilities to promote continuing education and instituting a less specialized approach to military academy education. Officers of different specializations are now forced to spend more time training together on areas outside their normal duties in order to gain a boarder understanding of Second Artillery as a whole.

Other efforts to develop the talents and broaden the experience of Second Artillery officers include participation in its foreign military relations. Although traditionally very insular, Second Artillery participation in foreign military relations is increasing.

From an organizational perspective, one of the biggest changes in the past decade has been the creation of several new Second Artillery SRBM brigades opposite Taiwan, plus at least one brigade belonging to the Nanjing MR ground forces. Changes in the organizational structure have also occurred with the transition to mobile DF-21s from DF-3s with both a conventional and nuclear capability against regional targets. The increase in deployed missiles has taken place at a time when the rest of the PLA has been reducing its overall manpower, the number and size of its units, and the number of older weapon systems and equipment. However, by understanding the basic brigade organizational structure for the different types of missile systems, it should be easier to predict the incremental changes in China's future missile force. Too often, large numbers are thrown out without basing them on an organizational methodology to predict the increase in missiles.

Second Artillery's nuclear force is directly subordinate to the CMC through the GSD. Therefore, one of the most important questions concerning the inclusion of conventional theater missiles in Second Artillery's inventory and their use in joint service war zone campaigns is how the PLA is handling command and control issues. Under which circumstances, if any, will the authority to employ these missiles be chopped to the war zone commander? This question becomes even more problematic when considering the existence of conventional missile brigades within the PLA ground forces as well as Second Artillery. Although beyond the scope of this paper, further research on this topic is needed to fill some important gaps.

Second Artillery has used technology to make several advancements in the field of training. For example, the introduction of its digital microwave communication system has allowed Second Artillery to upgrade its training and operational readiness, and the increasing use of computers has greatly shorten the amount of time required for several types of training.

Despite the reduced period of mandatory service for conscripts, Second Artillery apparently has improved its ability to assimilate new and modified missiles into the inventory and to add new units in a shorter period of time than was required ten years ago. It also appears that the training cycle is not as dependent on the annual conscription cycle as it was in the past. It is not clear, however, whether the new NCO system has been a decisive factor in the development of this capability.

As Second Artillery continues down its path of reform, these institutional aspects and "software" issues will play a large role in implementing the PLA's vision. At some times, they will hinder change, and at other times, they will enable transformation. They are worthy of observation as the PLA strives to bridge the gap between aspirational doctrine and operational capabilities.

APPENDIX A: HISTORY OF THE DEVELOPMENT OF SECOND ARTILLERY

In early 1955, the CCP Central Committee decided to develop nuclear energy and manufacture nuclear weapons. Based on the "Report on Developing and Producing Rocket Weapons" Premier Zhou Enlai made the decision in May 1956 to develop missiles with Soviet assistance.

In September 1956, the Soviets provided China with two R-1 missile samples for teaching purposes, accepted 50 Chinese students to study rocket technology, and sent five Soviet professors to China to teach Chinese students.

In November 1956, the National People's Congress (NPC) created the 3rd Ministry of Machine Building (MMB/*jixie gongyebu*; 机械工业部) to manage the nuclear weapons development program and construction of the nuclear industry.[458] The 3rd MMB was renamed the 2nd MMB in February 1958 when the existing 2nd MMB was merged into the 1st MMB.

In May 1958, the CMC established the 5th Department under the Ministry of National Defense (MND/*guofangbu*; 国防部), which was responsible for PLA special weapons R&D and equipment development. In October 1958, the Party Central Committee approved a CMC report on "Reorganizing the Commission of Aviation Industry into the Commission of Science and Technology for National Defense (NDSTC)" with Nie Rongzhen as the director. In April 1959, the 5th Department was merged with NDSTC.

Missile Development and Testing

In 1958, the CMC authorized construction of the Northwest Comprehensive Missile Test Base (NCMTB) at Shuangchengzi, Gansu Province, to conduct testing of surface-to-surface (SSM), surface-to-air (SAM), and air-to-air missiles (AAM). NDSTC was the controlling authority. When construction was completed in 1960, NCMTB apparently consisted of four basic entities—the base with control organizations for SSMs, SAMs, and AAMs, and three separate test ranges. In March 1962, China's first domestically-produced missile was tested, but failed its first flight.

In June 1964, China successfully test-fired the indigenously-designed Dongfeng-1 (DF-1) short-range missile from NCMTB. In October 1964, China conducted the first atomic bomb test and started developing short, long, and intercontinental range ballistic missiles. Between the mid-1960s and summer of 1970, a new launch site was constructed

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[458] In August 1952 the 1st MMB was created to manage all civilian production, including shipbuilding, and the 2nd MMB was created to manage all defense industries, with subordinate bureaus for ordnance, tanks, and aviation. In November 1956, the 3rd MMB was established for the nuclear industry and nuclear weapons. In February 1958, the 1st and 2nd MMBs were merged into the 1st MMB and the 3rd MMB was renamed the 2nd MMB. The MMBs are also referred to as MMIs (Ministry of Machine Building Industries).

for the preliminary stage tests of medium and intermediate range SSMs and launch tests for intercontinental ballistic missiles.

Establishing the First Missile Units

In December 1957, the CMC decided to establish an SSM training unit near Beijing. In 1958, "the Special Artillery Corps" was established under the CMC. The initial training possibly took place at the special weapons school (*tezhong wuqi xuexiao*; 特种武器学校), also known as the PLAAF 15th Aviation School (*hangkong xuexiao*; 航空学校), which was established in September 1958 in Baoding, Hebei Province. The school was responsible for training all services on surface-to-surface, surface-to-air, and shore-to-ship missile maintenance. Over 600 officers and soldiers assembled from various units across the PLA conducted the first six-month training period, using 30 sets of rudimentary technical teaching materials hastily put together over three months. In June 1959, the CMC dissolved the training unit and set up two missile launch battalions, one of which was at an unidentified artillery school in northwest China in March 1960. It is not clear where the second battalion was stationed.

Second Artillery Established in 1966

In June 1966, the CMC combined staff members from a public security unit and an artillery troop staff element that had been managing strategic missiles within the CMC. On 1 July 1966, Second Artillery was officially founded under the CMC with its headquarters in Beijing.

In July 1967, Xiang Shouzhi (向守志), who was a deputy commander of a ground force artillery corps, was appointed Second Artillery's first commander, and Li Tianhuan (李天焕) was appointed as the political commissar.[459] At that time, the relevant missile troops and schools belonging to the artillery troops were transferred to Second Artillery.

Early Campaign Training

According to one *Xinhua* report, by the mid-1970s, Second Artillery had organized a massive long-range firing practice with live warheads, involving moving operations, camouflaging, and launching.[460] The report also stated that in August 1983, Second Artillery conducted its first large-scale combined-arms campaign training exercise (*hecheng xunlian zhanyi yanxi;* 合成训练战役演习) to examine the units' overall fighting capability.

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[459] *Zhongguo renmin jiefangjun de 70 nian* [70 years of the PLA], edited by the Academy of Military Science History Research Department, published by Military Science Publishers, July 1997, p. 575.

[460] Zhang Jiajun and Zao Zhi, "The Strong Contingent of Secret Rockets: The Historical Course of Development of China's Strategic Guided Missile Units," *Xinhua*, 7 July 1996.

In August 1983, Second Artillery conducted its first nuclear counterstrike exercise, which involved three levels—corps (*bingzhong*; 兵种), base (*jidi*; 基地), and detachments (*zhidui*; 支队).[461] In 1984, Second Artillery officially began alert duty.[462] On 1 October 1984, at a ceremony in Beijing to mark the 35th anniversary of the founding of the PRC, Second Artillery made its first public appearance in Tiananmen, with a display of strategic missiles.

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[461] *Zhongguo renmin jiefangjun de 70 nian* [70 years of the PLA], edited by the Academy of Military Science History Research Department, published by Military Science Publishers, July 1997, p. 637.

[462] *Zhongguo junshi baike quanshu* [Chinese military encyclopedia], Beijing: Academy of Military Science Publishers, July 1997, Volume 9, p. 1567. The terms used for starting alert duty are *kaishi danfu zhanbei zhiban renwu*（开始担负战备值班任务).

APPENDIX B: SECOND ARTILLERY ORGANIZATIONAL STRUCTURE

The following bullets provide information from various sources about the leadership, administrative, and operational structure of Second Artillery's six levels.[463]

- Second Artillery Headquarters (*erpao*; 二炮)
  - The headquarters is a military region-level organization
  - The commander and political commissar are grade33 officers (military region *dajunqu zhengzhi*; 大军区正职) with the primary rank of general and secondary rank of lieutenant general
  - First level administrative departments include the:
    - Headquarters Department (*silingbu*; 司令部)
    - Political Department (*zhengzhibu*; 政治部)
    - Logistics Department (*houqinbu*; 后勤部)
    - Equipment Department (*zhuangbeibu*; 装备部)[464]

- Missile base (*daodan jidi*; 导弹基地)
  - A missile base is an army-level (*jun*; 军) organization
  - The commander and political commissar are grade-5 officers (*zhengjun zhi*; 正军职) with the primary rank of major general and secondary rank of lieutenant general

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[463] Qian Haihao, ed., *Jundui zuzhi bianzhixue jiaocheng* [Course material for the study of military organizational structures], Beijing: Academy of Military Science Press, March 2001, p. 75; *Zhongguo junshi baike quanshu* [Chinese military encyclopedia], Beijing: Academy of Military Science Publishers, July 1997, Volume 2, p. 348; *Junshi zuzhi tizhi yanjiu* [Military organization system research], Beijing: NDU Publishers, June 1997; Mark A. Stokes, *China's Strategic Modernization: Implications for the United States*, U.S. Army Strategic Studies Institute, September 1999; *Shijie junshi nianjian* [World military yearbook], Beijing: PLA Press, 1987-2001. Multiple articles from *Jiefangjun bao*.

[464] There is no consensus in Western writings whether *zhuangbeibu* is translated as Equipment Department of Armament Department, but we have chosen the literal translation of Equipment Department.

- First-level administrative departments include the:
  - Headquarters Department (*silingbu*; 司令部)
  - Political Department (*zhengzhibu*; 政治部)
  - Logistics Department (*houqinbu*; 后勤部)
  - Equipment Department (*zhuangbeibu*; 装备部)
- Missile bases have the following subordinate battle, technical, and logistics support units (*zhandou jishu houqin danwei*; 战斗技术后勤单位)
  - Missile brigades (*daodan lü*; 导弹旅)
  - Training regiment (*xunlian tuan*; 训练团)
  - Vehicle battalion (*qiche ying*; 汽车营)
  - Equipment inspection regiment (*zhuangjian tuan*; 装检团)[465]
  - Transportation station (*zhuanyun zhan*; 转运站)
  - Communications regiment (*tongxin tuan*; 通信团)
  - Repair depot (*xiupei chang* ; 修配厂)
  - Hospital (*yiyuan*; 医院)
  - Command office (*zhihui shi*; 指挥室)
  - Weather office (*qixiang shi*; 气象室)
  - Chemical defense elements (*fanghua fendui*; 防化分队)
  - Engineering elements (*gongcheng fendui*; 工程分队)
  - Survey and mapping elements (*cehui fendui*; 测绘分队)
  - Computer elements (*zhuyuan jisuan fendui*; 诸元计算分队)

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[465] For the nuclear force, each base has a nuclear warhead equipment inspection unit (*he dantou zhuangjian budui*; 核弹头装检部队), which implies it is a regiment-level organization.

- Control elements (*kongzhi fendui*; 控制分队)
- Camouflage elements (*weizhuang fendui*; 伪装分队)
- Reconnaissance elements (*zhencha fendui*; 侦察分队)
- Technical testing elements (*jishu ceshi fendui*; 技术测试分队)
- Electronic countermeasures elements (*dianzi duikang fendui*; 电子对抗分队)

- Missile brigade (*daodan lü;* 导弹旅)
  - The commander and political commissar are grade-8 officers (*zhenglü zhi*; 正旅职) with the primary rank of colonel and secondary rank of senior colonel
  - First-level administrative departments include the
    - Headquarters Department (*silingbu*; 司令部)
    - Political Division (*zhengzhichu*; 政治处)
    - Logistics Division (*houqinchu*; 后勤处)
    - Equipment Division (*zhuangbeichu*; 装备处)
  - Missile brigades are the Second Artillery's basic operational unit (*jiben zuozhan danwei*; 基本作战单位)
  - Missile brigades for both the nuclear and conventional forces have the following subordinate operational and support organizations
    - Launch battalions (*fashe ying*; 发射营)
    - Communication elements (*tongxin fendui*; 通信分队)
    - Launch position management elements (*zhendi guanli fendui*; 阵地管理分队)
  - For the conventional missile force, each launch brigade also consists of the following subordinate battalions
    - Technical battalions (*jishu ying*; 技术营)

- Communication battalions (*tongxin ying*; 通信营).

- Launch battalion (*fashe ying*; 发射营)
  - The commander and political instructor are grade-11 officers (*zhengying zhi*; 正营职) with the primary rank of major and secondary rank of lieutenant colonel
  - For the nuclear force
    - The launch battalion is the basic firepower unit
    - Launch battalions with liquid propellant missiles have the following subordinate organizations
      - Launch companies (*fashe lian*; 发射连) or company-equivalent launch elements (*fashe fendui*; 发射分队), which are the smallest launch organizations
      - Testing elements (*ceshi fendui*; 测试分队)
      - Control elements (*kongzhi fendui*; 控制分队)
      - Refueling elements (*jiazhu fendui*; 加注分队)
  - For the conventional force
    - Launch battalions have several subordinate company-level and/or platoon-level launch elements (*fashe fendui*; 发射分队)
      - Launch companies may have several subordinate launch platoons, which are the smallest possible launch organizations
        - The commander and political instructor are grade-13 officers (*zhenglian zhi*; 正连职) with the primary rank of captain and secondary rank of first lieutenant
      - The launch platoon is the conventional force's basic firepower unit
        - The commander and political instructor are grade-15 officers (*zhengpai zhi*; 正排职) with the primary rank of second lieutenant and secondary rank of first lieutenant

APPENDIX C: THE PLA'S FOREIGN RELATIONS PROGRAM

The desire for countries to maintain a cordial relationship with China is reflected in the number of military exchanges the PLA has been involved in over the past twenty years. The number of delegations during the 1990s nearly doubled the number from the previous decade. When the PLA celebrated its 50th anniversary in October 1999 and when the PLA celebrated its 75th anniversary in August 2002, *Xinhua* carried various articles reviewing fifty years of PLA diplomacy. Highlights from those reports are as follows:[466]

> Since reform began in 1978, senior PLA officers have led over 1,600 delegations to more than eighty countries. The PLA has welcomed over 2,500 military delegations from five continents, involving tens of thousands of people, of which more than half of the delegations were led by defense ministers, joint service commanders, chiefs of the general staff, and service commanders. China has formed military diplomatic ties with 146 foreign countries and sent military attachés to 103 countries, while 74 foreign countries have stationed military attachés in China. During the 1990s, the Academy of Military Science interacted with counterparts in 27 countries. Since the National Defense University was founded in 1985, it has received 749 military delegations from 79 countries, involving 6,407 foreign military personnel. Since 1991, the PLA has sent over 20,000 people in more than 800 specialized technical delegations overseas to investigate, cooperate in research, and participate in studies.

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[466] Huang Cailong, "Moving Toward the World and Peace: Roundup of Five Decades of PLA Foreign Military Interaction," *Xinhua*, 14 September 1999 (FBIS-FTS19991005000721); "China's Military Diplomacy Forging New Ties," *Xinhua*, 28 October 2002.

Name	Position	Date	Delegation Leader	Country Visited
LTG Qian Gui	Deputy Commander	Aug 1991	Chi Haotian, Chief of General Staff	Russia
LTG Yang Guoliang	Commander	Sep 1995	Chi Haotian, Minister of Defense	France, Spain, Portugal, Finland
LTG Sui Yongju	Political Commissar	May 1996	Chi Haotian, Minister of Defense	Egypt, UAE, Saudi Arabia, Kuwait
LTG Yang Guoliang	Commander	Nov 1996	Yang Guoliang, Second Artillery	Saudi Arabia
LTG Zhao Xijun	Deputy Commander	Dec 1996	Chi Haotian, Minister of Defense	United States
LTG Sui Mingtai	Political Commissar	May 1998	Yu Yongbo, Director, General Political Department	Cuba, Mexico
LTG Sui Mingtai	Political Commissar	Jan 2000	Chi Haotian, Minister of Defense	South Korea, Russia, Britain, Mongolia
LTG Huang Cisheng	Deputy Commander	Apr 2000	Fu Quanyou, Chief of General Staff	Japan, Nepal, Germany
LTG Zhao Xijun	Deputy Commander	May 2000	Zhang Wannian, CMC Vice Chairman	Spain, Italy, Portugal
Gen Yang Guoliang	Commander	Aug 2000	Yang Guoliang, Second Artillery	Russia, Finland

Table 6.3 Second Artillery Delegation Members on PLA Visits Abroad

ARMS CONTROL

As part of its foreign relations program, the PLA is an important participant in China's arms control process, including policymaking and negotiations at home and abroad.[467] According to Chinese officials, every year the Ministry of Foreign Affairs coordinates a research plan for the next year's program at the Conference on

[467] Unless stated otherwise, the information in this portion on arms control negotiations was obtained from interviews with Chinese academics involved in arms control issues.

Disarmament in Geneva, concerning matters such as the Nuclear Nonproliferation Treaty (NPT), Comprehensive Test Ban Treaty (CTBT), Chemical Weapons Convention (CWC), fissile material cutoff, and land mines. The appropriate military and civilian offices work together on the research plan and on formulating arms control policy.

Depending upon the issue involved, different PLA entities have specific responsibilities for making or coordinating arms control policy. Second Artillery is the most secretive of the PLA organizations involved in arms control, and reportedly is directly involved in all issues involving nuclear weapons. Specifically, Second Artillery is involved in CTBT and NPT issues. Second Artillery reportedly has its own arms control group, but they rarely coordinate with other arms control organizations, especially with non-military organizations.

APPENDIX D: SECOND ARTILLERY COMMANDERS AND POLITICAL COMMISSARS

Primary Source: *Zhongguo Junshi Baike Quanshu* [China Military Encyclopedia], Academy of Military Science Publishers, July 1997, vol. 9, p. 1568, for list of commanders and political commissars.

COMMANDERS

Xiang Shouzhi (向守志): 1966-?

Yang Junsheng (杨俊生): ? - ?

Zhang Yixiang (张翼翔): ? – 1975

Li Shuiqing (李水清): Sep 1977 – Nov 1982

He Jinheng (贺进恒): Nov 1982 – Aug 1985

Li Xuge (李旭阁): Aug 1985 – Nov 1992

Yang Guoliang (杨国梁): Nov 1992 – Jan 2003

Jing Zhiyuan (靖志远): Jan 2003 - Present

POLITICAL COMMISSARS

Li Tianhuan (李天焕): 1966-?

Wu Lie (吴烈): ?-?

Chen Fahong (陈发洪): ?- May 1975

Chen Heqiao (陈鹤桥): May 1975 – Nov 1982

Liu Lifeng (刘立封): Nov 1982 – Apr 1990

Liu Anyuan (刘安元): Apr 1990 – Nov 1992

Sui Yongju (隋永举): Nov 1992 – Dec 1997

Sui Mingtai (隋明太): Dec 1997 – Present

COMMANDER BIOGRAPHIES

Xiang Shouzhi (向守志): Born November 1917 in Sichuan. Joined the Red Army in 1934. Served in 9th Corps; participated in the Long March; entered infantry school in 1936; 8th Route Army 129th Division as deputy company commander, company commander, battalion commander, deputy regiment commander, regiment commander. During civil war, served in 1st *zhidui* as deputy *zhidui* commander, 2nd brigade commander, 9th *zongdui* 26th brigade commander, 2nd Field Army 15th corps 44th division commander and concurrently political commissar. After 1949, served in Korean War as division commander and as 15th corps chief of staff. After returning to China in 1954, he served as the 15th corps deputy commander and commander. In 1960, graduated from senior officer military academy. Served as Artillery Technical Academy president, PLA artillery corps deputy commander, Second Artillery commander (1966-?)[468], and Nanjing Military Region deputy commander and then commander (1982-1990). In 1955, received rank of major general. In 1988, received rank of general. Member of 12th Communist Party Central Committee.[469]

Yang Junsheng (杨俊生): No bio. Yang was the Beijing Garrison Command's political commissar in 1980.[470]

Zhang Yixiang (张翼翔): Born June 1914 in Hunan. Died in April 1990. 1929 joined Red Army. Served in 1st front army as platoon commander, company commander, and battalion commander; participated in Long March; after arriving at Yan'an, served in Red 6th Juntuan 52nd regiment as chief of staff; after anti-Japanese war began, studied at Anti-Japanese Military-Political University; 1938 served as 4th Route Army 4th *zhidui* instructor (political/*jiaodao*) *dadui* as commander; 14th regiment commander, 2nd division 6th brigade deputy commander, 5th brigade deputy brigade commander, 2nd *zongdui* in Jiangsu-Zhejiang military region deputy commander; during civil war, served as Shandong field army 1st *zongdui* 3rd brigade commander, Huadong field army 1st *zongdui* chief of staff and deputy commander, 3rd Field Army 20th corps commander; in 1950 fought in Korean War as 9th *bingtuan* commander and concurrently political commissar; returned to China in 1952, served as Huadong Military Region deputy chief of staff; 1957 graduated from military academy, then served as Fuzhou Military Region deputy commander, PLA railway corps commander, Second Artillery commander; 1975-1985,

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[468] *Zhongguo Renmin Jiefangjun da shiji 1927-1982* [People's Liberation Army chronicle 1927-1982], Beijing: PLA Academy of Military Science, November 1983, p. 379.

[469] *Zhongguo junshi baike quanshu* [China military encyclopedia], Academy of Military Science Publishers, July 1997, Vol. 9, p. 1281.

[470] BBC Summary of World Broadcasts, 14 February 1980, Part 3 The Far East; B. Internal Affairs; China II; FE/6345/BII/15, from 'Peking Daily' 1 February 1980.

served as Academy of Military Science vice president. 1955 received rank of lieutenant general. Member of 9th and 10th Party Central Committee.[471]

Li Shuiqing (李水清): Born November 1917 in Jiangxi. Joined the Red Army in 1930. Served in the Red 1st juntuan political department, the 1st division political department propaganda team chief, the 13th regiment as a company political instructor; participated in the Long March; during the Anti-Japanese War, served in the 8th Route Army 115th division 343rd brigade as a battalion political instructor; the 33rd regiment as political division director, the jin-cha-yi (Shanxi-Hebei) military region 7th regiment political commissar, 11th *fenqu* deputy political commissar and concurrently director of the political department; during the civil war, served in the Shanxi-Hebei field army 3rd zongdui 7th brigade as the deputy political commissar, in the Huabei military region 2nd zongdui 5th brigade as the political commissar, in the 67th corps 199th division as the commander. In 1951, joined the Korean War as the 67th corps deputy commander. In 1952, returned to China and studied at a military academy. Beginning in 1955, he served as a corps commander, Jinan Military Region deputy commander, minister of the 1st Ministry of Machine Building, and Nanjing Military Region deputy commander. From September 1977 to November 1982, he was commander of Second Artillery. 1955 received the rank of major general. Member of the 9th, 10th, 11th Party Central Committee and the 6th and 7th National Political Consultative Standing Committee.[472]

He Jinheng (贺进恒): Born February 1919 in Shanxi. Joined 8th Route Army in 1938. Served in various political instructor and commissar positions in infantry and artillery units. Following the Anti-Japanese War, he served as an artillery battalion political instructor, Shandong *bingtuan* artillery regiment chief of staff, 3rd Field Army 25th corps artillery *bingtuan* regiment commander. Beginning in 1952 during the Korean War, he served as the 7th Artillery Division commander. After returning to China in 1953, he studied at the senior artillery school, then stayed as the director of the tactics department. In 1956, he served as the artillery corps' training division director, deputy director of the artillery military scientific research department, commandant of the Zhengzhou artillery school, second artillery base deputy commander and commander; Second Artillery chief of staff, and then concurrently deputy commander, and commander (November 1982 – August 1985). Member of 12th Party Central Committee and 7th National People's Congress Standing Committee.[473]

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[471] *Zhongguo junshi baike quanshu* [China military encyclopedia], Academy of Military Science Publishers, July 1997, Vol. 9, p. 1466.

[472] *Zhongguo junshi baike quanshu* [China military encyclopedia], Academy of Military Science Publishers, July 1997, Vol. 8, p. 685.

[473] *Zhongguo junshi baike quanshu* [China military encyclopedia], Academy of Military Science Publishers, July 1997, Vol. 7, p. 425.

Li Xuge (李旭阁): Born January 1927 in Hebei. Joined the 8th Route Army in December 1943. Served as a cadet in the East Hebei Military Region 13th *fenqu* military political cadre school, company cultural instructor, supply officer in the Hebei Jehol Liaoning military region special affairs regiment; during the civil war, he served as the East Hebei military region headquarters department staff officer, 15th *fenqu* headquarters department branch director, independent 5th division headquarters department deputy section director, Huabei Military Region 8th *zongdui* 23rd brigade 69th regiment deputy chief of staff, and 65th corps 194th division 582nd regiment chief of staff; in February 1951, served in Korea as a corps headquarters department section director and deputy division director; he returned to China in 1953; in 1954 he served in the General Staff Department's operations department as a staff officer and deputy division director; in 1969 he served as a division commander; in 1975 he was the General Staff Department operations department deputy director; in 1982 he became Second Artillery deputy commander; from July 1985 to November 1992, he was commander of Second Artillery. He was a member of the 13th Party Central Committee and 8th National People's Congress Standing Committee. In 1988 he received the rank of lieutenant general.[474]

Yang Guoliang (杨国梁): Born in 1938 in Hebei. After graduating from the Beijing Institute of Aeronautics and Astronautics (Beijing Hangkong Xueyuan), he joined the PLA. He served in the Commission for Science, Technology, and Industry for National Defense (COSTIND) as a base staff officer, deputy section director, deputy regiment commander, deputy division (*chu*) director, division director, base deputy commander, and base commander. He then served as Second Artillery deputy commander (September 1985 to November 1992) and commander (November 1992 to December 2002). In March 1998, he was promoted to general.[475]

Jing Zhiyuan (靖志远): Birthdate unknown. Jing became the Second Artillery commander in January 2003, following the 16th Party Congress, where he was selected as a full member of the central committee. Previously, he served as the Second Artillery chief of staff from April 1999 to December 2002. Prior to that, he was the commander of Base 52 at Huangshan, Anhui Province.[476]

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[474] *Zhongguo junshi baike quanshu* [China military encyclopedia], Academy of Military Science Publishers, July 1997, Vol. 8, p. 691.

[475] *Zhongguo junshi baike quanshu* [China military encyclopedia], Academy of Military Science Publishers, July 1997, Vol. 9, p. 1348.

[476] "Jing Appointed New Commander of the PLA Second Artillery," *China Times* (Taipei), 17 January 2003.

POLITICAL COMMISSAR BIOGRAPHIES

Li Tianhuan (李天焕): Born 1912. Died May 1986. Public Security Force (PAP predecessor) deputy political commissar in 1955, also received rank of major general. Second Artillery political commissar from Jul 1966-?.[477]

Wu Lie (吴烈): No bio. In 1980 and 1981, he was the Deputy Political Commissar of the Peking units and second political commissar of the Peking garrison command.[478]

Chen Fahong (陈发洪): Born 1916. Died June 1980. Was the Second Artillery political commissar from unknown date until May 1975. Last position when he died in 1980 was Wuhan Military Region deputy political commissar.[479]

Chen Heqiao (陈鹤桥): Born in August 1914 in Anhui. Joined Red Army in 1932. Served as Red 28th corps 82nd division political department propaganda team director, Red 25th corps political department publishing (*wen yin*) section director. Participated in Long March. After arriving at Yan'an, served as Red 15th *juntuan* political department publishing section director. In September 1937, studied at Anti-Japanese Military Political University. After graduation, served as a school political department party affairs section director, senior cadre section political division director, and Taihang Army Middle School political commissar. In September 1943, served as Party Central Committee Beifang Bureau secretariat division director, then as Hebei-Shandong-Henan Military Region political department organization department director. During the civil war, he served as Zhongyuan Military Region and Zhongyuan field army 2nd field army political department organization department director. After 1949, he served in the Xinan Military Region political department organization department director and concurrently cadre management department director, the 14th corps political commissar. In 1958, graduated from the PLA political academy. In May 1960, served as the Kunming Military Region deputy political commissar, then the PLA Signal Corps political commissar.

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[477] *Zhongguo Renmin Jiefangjun da shiji 1927-1982* [People's Liberation Army chronicle 1927-1982], Beijing: PLA Academy of Military Science, November 1983, p. 379; Liu Hsiao-hua, "People's Armed Police Ties to PLA," *Kuang chiao ching*, No. 307, 16 April 1998, pp. 42-47; "Death: Former Political Commissar of Second Artillery," BBC Summary of World Broadcasts, 3 June 1986, Part 3 The Far East; B. Internal Affairs, China II; FE/8275/BII/1 (from *Xinhua* in Chinese, 29 May 1986).

[478] "Other Reports on PLA Affairs; Peking Units Political Commissar at Awards Ceremony," BBC Summary of World Broadcasts, 1 March 1980, Part 3 The Far East; B. Internal Affairs; China II; FE/6359/BII/3; from *Xinhua*, 27 February 1980.

[479] "PLA Affairs; Memorial service for Wuhan deputy commissar," BBC Summary of World Broadcasts, 19 June 1980, Part 3 The Far East; A. International Affairs; China II; FE/6449/BII/6, from *New China News Agency*, 13 June 1980.

From May 1975 to November 1982, served as Second Artillery political commissar. In 1955 received rank of major general. Member of the 6th National People's Congress Standing Committee. [480]

Liu Lifeng (刘立封): Born May 1918 in Shandong. Died in February 1996. 1939 joined Red Army 8th Route Army Shandong *zongdui* political department organization department as a staff officer and served in various Shandong area units as a political instructor. After the Anti-Japanese war, served in the Central Shandong Military Region 9th Division political department as a section director, Huadong Field Army 8th *zongdui* health department as the political commissar, the 3rd field army 26th corps logistics department as the deputy political commissar and political commissar. Beginning in November 1950, he served in the Korean War in the 9th *bingtuan* as a division deputy political commissar, the *bingtuan* political department directly subordinate work (*zhi gong*) department deputy director, and the *bingtuan* headquarters department management division political commissar. He returned to China in 1953, and thereafter served as Shandong Military Region political department organization department director, the Jinan Military Region political department organization department director, General Logistics Department political department director, Second Artillery political department director and concurrently deputy political commissar. From Nov 1982 to April 1990, served as Second Artillery political commissar. In 1998 received rank of lieutenant general.[481]

Liu Anyuan (刘安元): Born December 1927 in Shandong. Joined Communist Party in November 1943. Joined 8th Route Army in August 1945 and served in the Northwest. In March 1947 he served as a political instructor in the Dongbei Democratic United Army's 6th *zongdui*. In 1949, he served in the 4th Field Army 43rd Corps battalion political instructor, regiment political commissar, and artillery regiment commander. In 1961 entered an artillery school as a student. In 1965 became a division deputy political commissar and political commissar, then a corps deputy political commissar. In 1973 he became the General Political Department organization department deputy director, cadre department deputy director, and then Guangzhou Military Region deputy political commissar. In 1987 he became the General Logistics Department political commissar. In April 1990 he became Second Artillery political commissar. From November 1992 to December 1993, he served as the Nanjing Military Region as the political commissar. In 1988 he received the rank of lieutenant general. He was a member of the 13th and 14th Party central committee.[482]

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[480] *Zhongguo junshi baike quanshu* [China military encyclopedia], Academy of Military Science Publishers, July 1997, Vol. 7, pp. 144-145.

[481] *Zhongguo junshi baike quanshu* [China military encyclopedia], Academy of Military Science Publishers, July 1997, Vol. 8, p. 736.

[482] *Zhongguo junshi baike quanshu* [China military encyclopedia], Academy of Military Science Publishers, July 1997, Vol. 8, pp. 725-726.

Sui Yongju (隋永举): Born in 1932 in Dalian, Liaoning. Joined the PLA in April 1950. He first served in the Public Security Service in various positions in Luda. He then served in a Second Artillery's construction and engineering regiment as a political division organization branch director and regiment political division director, Second Artillery base political department organization division deputy director and director, regiment political commissar, base political department deputy director, base political commissar, Second Artillery political department director and deputy political commissar. In November 1992 he became the Second Artillery political commissar. In 1988 he received the rank of major general and was promoted to lieutenant general in July 1990, then promoted to general in January 1996. In October 1992 he became a member of the Party Central Committee Discipline Inspection Commission.[483]

Sui Mingtai (隋明太): Dec 1997 – Present. Previously Sui served as the political commissar at Base 52 in Huangshan, Anhui Province (1989-1991), the deputy director of the political department at Second Artillery Headquarters (1991—1995), director of the political department at Second artillery Headquarters (1995-1997), and moved to the political commissar position in 1997.[484]

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[483] *Zhongguo junshi baike quanshu* [China military encyclopedia], Academy of Military Science Publishers, July 1997, Vol. 8, p. 1092.

[484] *Directory of PRC Military Personalities*, no publisher given, October 1999.

7. THE CHINESE JOINT AEROSPACE CAMPAIGN: STRATEGY, DOCTRINE, AND FORCE MODERNIZATION

By Mark A. Stokes

INTRODUCTION

Aerospace power is emerging as a key instrument of Chinese statecraft. Heavily influenced by U.S. air campaign theorists and by the U.S. performance in the Gulf War and ALLIED FORCE, the People's Republic of China (PRC) understands the role airpower, theater missiles, and information dominance can play in getting others to do their bidding. Driven largely by the desire to stem further steps toward Taiwan autonomy, Beijing is prioritizing aerospace power as its primary tool of choice.[485] PRC use of force in the Taiwan Strait would most likely involve infliction of sufficient pain and destruction of things of value in order to coerce Taiwan's leadership to agree to talks, a timetable for unification, or political integration with the PRC.[486]

Since the Gulf War, the PLA has made significant advances in developing a force capable of applying aerospace power in a joint environment. Investment priorities include increasingly accurate and lethal theater ballistic and land attack cruise missiles; development of multi-role fighters; and ground force assets including special operations forces. Advances in hardware are in large part being driven by the development of a theoretical foundation to drive modernization; increases in defense spending; innovation in joint command structures; investment in advanced command, control, communications, and intelligence systems; acquisition of new hardware; and increased emphasis on training. PLA joint aerospace campaign theory envisions mutual cooperation between information assets and long range firepower, including those of the PLA Air Force and the Second Artillery. This study attempts to determine how aerospace power would contribute to successful PLA coercion, and under what circumstances would its contributions be most successful.

Coercive aerospace power is the integrated application of information operations and weapon systems that use the medium of air against strategic and operational-level targets to make an adversary choose to act in a manner that it otherwise might not act. Strikes are mounted or threatened not just to destroy things, but are intended to cause a policy change by the target entity. Aerospace power involves projection of information

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[485] The author would like to thank Professor Paul Godwin and LTC (ret.) Dennis Blasko for their very useful comments on an earlier draft of this paper.

[486] See, for example, "Any Chinese Attempt to Take Taiwan Unlikely to Succeed: US Admiral," *AFP*, 16 May 2000; "U.S. Experts Say China Too Weak To Invade Taiwan," *Reuters*, 13 May 2000; and Michael O'Hanlon, "Can China Invade Taiwan?," *International Security*, Summer 2001. For a superb commentary on alternative analytical approaches, see Thomas J. Christensen, "Posing Problems Without Catching Up," *International Security*, Vol. 25, No. 4, Spring 2001, pp. 5-40.

or firepower within the total expanse beyond the earth's surface. Aerospace power is generally broader than airpower, which is "that form of military power generated by platforms capable of sustained, maneuvering, powered flight." A bullet, an artillery shell, and most guided weapons directed along their paths by the laws of ballistics do not constitute air power. On the other hand, most would consider ballistic missiles of ranges greater than 150 kilometers to be a form of air power.[487] From the PRC's perspective, however, "aerospace power" and "airpower" are synonymous. Airpower or air combat (*kongzhong junshi douzheng*) is "intended to achieve specific political and economic objectives through the medium of air and space, using air and space systems and ground-based air defenses."[488] For the purposes of this study "airpower" are "aerospace power" are used interchangeably.

Aerospace power will become an increasingly powerful tool of PRC coercion as the range and payload of PLA aircraft improve, land attack cruise missiles are fielded, and lethality and accuracy of PLA theater ballistic missiles increase. PLA force modernization increases the number of coercive options that could be available to PRC policymakers. Aerospace power can raise concerns within an adversary regime over internal stability by striking economic targets and population centers. Aerospace power can be used to neutralize an adversary's strategy for victory by attacking its fielded forces and the logistics upon which they depend. Airpower can bolster the credibility of other threats, such as a ground invasion, and prevent an adversary from inflicting costs back on the coercive power by undermining domestic support.

Adoption of coercive strategies and PLA advances in aerospace power may present new and complex challenges for U.S. policymakers. Most challenging will be meeting legal requirements under the Taiwan Relations Act. The TRA states that it is the policy of the United States "to maintain the capacity of the United States to resist any resort to force or other forms of coercion that would jeopardize the security, or the social or economic system, of the people on Taiwan." Use of force in a coercive context introduces a high degree of complexity requiring acute political judgment and the ability to respond rapidly in a crisis situation.[489]

This paper, drawing heavily from internal PLA journals (*neibu* and *junnei faxing*), writings from China's defense-industrial complex, publications from the Taiwan's PLA

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[487] See Eliot A. Cohen, "The Meaning and Future of Air Power," *Orbis*, Spring 1995, pp. 189-118; also see Air Force Doctrine Document 2, *Organization and Employment of Aerospace Power*, 17 February 2000, p. 133.

[488] Wang Wenrong, ed., *Zhanlüexue* [Strategic studies], Beijing: National Defense University Press, 2000, p. 322. *Zhanlüexue*, together with *Zhanyixue* [Campaign studies], are two of the most significant pieces of literature to be published by the National Defense University in several years. The last edition of *Zhanlüexue* was published in 1987. Co-editors of the 2000 edition are Ma Bao'an, Zhu Chongfeng, and Ma Ping.

[489] Some have questioned the ability of the U.S. to effectively respond to a concerted PRC attack on Taiwan. See, for example, Daniel L. Davis, "Could the US Win Against China," *Taipei Times*, 7 May 2000.

watching community, as well as U.S. and other Western publications, focuses on the application of coercive airpower within the context of the Taiwan Strait. The potential for conflict in the Taiwan Strait has emerged as the primary scenario driving PRC doctrinal development and force modernization. Coercion, rather than brute force attempts by the PRC to physically occupy the island, likely will characterize future conflict in the Taiwan Strait. At a minimum, the struggle for air superiority likely will determine the ultimate outcome.

In addressing the growing role that aerospace power is playing in PRC political and military coercion, the initial section outlines universal theory on coercive strategies in order to provide the basis upon which to compare and contrast PRC views on deterrence and coercion. The paper will then examine PLA theory on the conduct of joint campaigns, including a discussion on critical joint command and control concepts that would guide the conduct of a joint air campaign. Subsequent sections address theoretical issues associated with three essential components of aerospace power – information, conventional air, and theater missile operations. Each of these sections contains a discussion of PLA force modernization programs that are intended to close the gap between aspirational doctrine and operational theory, and capability. The final section outlines the potential application of a coercive air campaign in the Taiwan Strait context.

COERCIVE AEROSPACE POWER AND THE SECURITY SITUATION IN THE TAIWAN STRAIT

The objective of most military conflict is to change an opposing government's behavior through means of coercion. As Carl Von Clausewitz noted, "war is thus an act of force to compel our enemy to do our will." Political considerations are bringing increased pressure on military leaders to achieve national goals at minimal cost. In combat, coercion is used to obtain favorable conditions to end the fight without a total military victory over the adversary. Coercion succeeds when an adversary still has the power to resist. Diplomatic coercion, before initiation of hostilities, may enable concessions from an adversary without the high cost usually associated with conventional military action. Therefore, successful coercion is usually less costly than total military victory.[490]

Coercion is a complex concept. Any assessment of utility of coercion must take into account the perceived costs in the adversary's mind, as well as the ability of an adversary to neutralize those costs. Successful coercion requires not only effective

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[490] The most prominent works on coercion theory include Thomas Schelling, *Arms and Influence,* New Haven, CT: Yale University Press; Alexander L. George and William E. Simons, ed., *The Limits of Coercive Diplomacy*, Boulder: Westview Press, 1994; Robert A. Pape, *Bombing to Win: Air Power and Coercion in War*, Ithaca: Cornell University Press, 1996; Daniel L. Byman, Matthew C. Waxman, Eric Larsen, *Air Power as a Coercive Instrument*, Santa Monica, CA: RAND Corporation, MR-1061, 1999; Stephen J. Cimbala, *Coercive Military Strategy*, College Station, TX: Texas A&M University Press, 1998; and Daniel Byman and Matthew Waxman, *The Dynamics of Coercion: American Foreign Policy and the Limits of Military Might*, Cambridge, United Kingdom: Cambridge University Press, 2002.

threats, but also neutralization of adversary responses. In fact, one of the dangers of coercion is that it can backfire, prompting the coerced entity to increase adverse behavior rather than the desired behavior.[491] Most coercion theory assumes a rational actor model of expected utility, and assumes that a rational actor will concede to a coercer's demands when the costs exceed the expected benefits of a particular course of action. However, most decision-makers are part rational and part irrational, driven at times by reason and logic, and sometimes by passion. Some leaders may endure punishment much longer than expected.

This section examines types of coercion, distinguishing coercive strategies from concepts of annihilation and attrition. At risk of oversimplification, coercion can be examined from three perspectives that differ in the level of violence and nature of political objectives that are being pursued: (1) deterrence, (2) coercive diplomacy, and (3) military coercion.[492] Coercion is separate and distinct from brute force or annihilative approaches to use of force. Deterrence attempts to dissuade an adversary from taking an action not yet initiated. Diplomatic and military coercion, like deterrence, seeks to influence the behavior of an adversary by manipulating the costs of benefits of a particular course of action. Coercion attempts to convince an enemy to stop an ongoing initiative or start a new course of action by manipulating its calculation of costs and benefits. Both coercive diplomacy and military coercion force another government to choose between making concessions or suffering the consequences.[493] However, the two are distinguished by the degree of emphasis. Coercive diplomacy stresses the use of threats rather than the use of force to achieve political objectives. Military coercion generally involves the actual use of force to attain limited political objectives.

Deterrence. Deterrence attempts to dissuade an adversary from taking an action not yet initiated by demonstrating that the costs or risks of that action outweigh the benefits. Deterrence discourages implementation of a particular policy through fear of consequences. It involves communicating national interests and resolve, then waiting, in a reactive mode. To be effective, a deterrent force must be credible.[494]

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[491] See Daniel L. Byman and Matthew C. Waxman, "Kosovo and the Great Air Power Debate," *International Security*, Vol. 24, No.4, Spring 2000, pp. 13-15.

[492] Prominent works on coercion differ on the relationship between deterrence and coercion. For example, George and Simons (*The Limits of Coercive Diplomacy*) and Robert Pape (*Bombing to Win*) assert that deterrence is separate and distinct from coercion. A recent RAND study on coercive airpower (*Airpower As a Coercive Instrument*) adopts a broader definition of coercion that describes the two components as two sides of the same coin: compellence and deterrence. This study adopts the RAND approach. In this construct, coercive diplomacy and military coercion are both forms of compellence. Pape distinguishes coercion and deterrence by explaining that both focus on affecting the decision making process of an adversary. Deterrence seeks to maintain the status quo by discouraging another government from changing its behavior. Coercion seeks to force another government to *alter* its behavior.

[493] Daniel L. Byman et.al., *Air Power as a Coercive Instrument*, pp. 10-15.

[494] Robert Jervis, "Deterrence and Perception," *International Security*, Winter 1982/1983, Vol. 7, No. 3, pp. 3-54; also see Patrick Morgan, *Deterrence: A Conceptual Analysis*, Beverly Hills, CA: Sage Publications, 1983.

Deterrence is distinguished from defense. Deterrence discourages an enemy from taking military action by posing for him a prospect of cost and risk outweighing his prospective gain, while defense involves reducing one's own prospective costs and risks in the event that deterrence fails. Deterrence focuses on an enemy's intentions in that the intended effect is to reduce the likelihood that an enemy will use force. Defense reduces an enemy's capability to use force or to mitigate the adverse consequences of an enemy attack. Deterrence is primarily a peacetime objective involving political psychology to affect the cost-benefit calculus of an opposing leadership. However, deterrence also functions after initiation of hostilities in that eventually one side is deterred from continuing a conflict by the realization that continued fighting can only generate additional costs without the prospect of any gain.[495]

Coercive Diplomacy. Coercive diplomacy places a demand on an adversary, backed by threat of military force for noncompliance that will be credible and violent enough to persuade him that it is in his interest to comply with the demand. Coercive diplomacy, which generally involves use of an ultimatum, is essentially a diplomatic strategy that relies on the threat of force rather than the use of force to achieve that objective. Coercive diplomacy seeks to persuade an opponent to stop short of a particular goal, or compel an adversary to undo an action that has already been taken. Coercive diplomacy generally involves an explicit demand or ultimatum, the creation of some sense of urgency, and the threat of punishment. At the upper end of coercive diplomacy, very limited use of force can be used to demonstrate resolve and willingness to escalate to higher levels of violence if necessary. Coercive diplomacy, however, seeks to avoid use of force rather than to bludgeon him into submission. If limited demonstrations of force are used, it is carried out as a flexible, refined psychological instrument involving a degree of signaling or bargaining.[496]

Military Coercion. Military coercion is the use of limited force to induce an adversary to behave differently than it would have otherwise. Military coercion succeeds when the adversary gives in while it still has the power to resist and is different from brute force, an action that involves annihilation and total destruction. Coercion is convincing an adversary to take action short of annihilation and/or occupation. The adversary must still have the capacity for organized violence but choose not to exercise it.[497] Military coercion attempts to exploit vulnerabilities in a victim's strategy either through targeting or punishing his population or by undermining or denying him his

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[495] Glenn H. Snyder, *Deterrence and Defense: Toward a Theory of National Security*, Princeton: Princeton University Press, 1961, pp. 3-109.

[496] George and Simons, pp. 2-3. The distinctions between limited use of violence at the upper extremes of coercive diplomacy and limited use of force in the lower end of military coercion tend to blur.

[497] Schelling, *Arms and Influence*, pp. 2-18; George and Simons, pp. 2-3; Byman, et.al, *Air Power as a Coercive Instrument*, pp. 10-15; and Byman and Waxman, "Kosovo and the Great Air Power Debate," pp. 5-38. Also see Pape, p. 12.

ability to conduct military operations. Such an approach requires knowledge not only of military vulnerabilities of an opponent, but also of the decision making process.[498]

Military coercion, either through punishment or denial, is distinguished from the imposition of demands that follow victory through annihilation or exhaustion through attrition. Both approaches may pursue the same goals, but how they attain them are different. Brute force means of warfare, espoused by influential German theorists such as Delbruek and Clausewitz, advocate first annihilating or exhausting the opposing force and then imposing political demands on a defenseless victim. The defeated government and its military are neutralized or brought to a point where organized forces are no longer capable of impeding the victor's operations.[499] By contrast, coercive solutions seek to change the behavior of the target government that still has capable forces under its command.

Coercive Airpower. Airpower has emerged as a preferred tool of military coercion among modern states. Airpower seeks to achieve effects at the strategic, theater, or tactical level. Unlike surface warfare, airpower is usually concentrated to directly achieve objectives with theater-wide significance, bypassing tactical objectives. Airpower, if used properly, can serve political as well as military objectives. A single airstrike may have strategic significance, in that it can produce a political outcome. In measuring the effectiveness of a coercive air campaign, one relies more on judgments of strategic, rather than on tactical effectiveness, i.e. how well bombs, missiles, and electronic attack effects targets. Strategic effectiveness describes how the destruction of target sets attains political goals.

Aerospace power is an important tool that can be used along the entire continuum from deterrence through coercion to annihilation. However, recent history has demonstrated that aerospace power is especially important in the context of military coercion. The 1967 Arab-Israeli conflict, the 1991 Gulf War, and the Allied Force campaign of 1999 are examples of military coercive campaigns in which aerospace power was decisive in influencing the ultimate outcomes. The success of coercive airpower depends upon strategic effectiveness, which in turn depends on assumptions about how military force translates into political outcomes. Determining the strategic effectiveness of a coercive air campaign requires identifying the causal mechanism or strategy by which destruction of a specific target set would change the enemy's political calculation, and then examining whether the sequence of events in a specific case matches this causal claim.

Deterrence, Coercion and Annihilation in PRC Strategy. Chinese views of deterrence and coercion differ slightly from Western perspectives. Chinese authors associate deterrence and coercion with the concept of stratagem (*moulüe*; 某略) the art of winning political or military contests through clever or superior strategic ploys, operational art, or tactics. Heavily reliant on deception and attacks on an opponent's cognitive processes, stratagem requires accurate assessments of the friendly and enemy

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[498] Ibid.

[499] See Carl Von Clausewitz, *On War*, Princeton: Princeton University Press, 1984, pp. 75-80.

situations, and specific calculations of where pressure or manipulation can be applied to achieve political or military objectives.[500]

According to PLA General Staff Department-affiliated scholars, coercion is a form of deterrence (*weishe*; 威慑), which, in turn, is a practical application of stratagem. Deterrence has varying degrees of intensity, ranging from demonstrations of force and intimidating propaganda to the actual use of limited force. The essence of stratagem and deterrence lies in Sunzi's strategic theory of "subduing the enemy without fighting" (*buzhan ersheng*; 不战而胜). Backed by the threat of or actual application of force, deterrence is an expression of one's determination and to ensure an opponent understands the consequences of his actions. Deterrence is intended to restrain an enemy, force him to stop an activity, and to believe that he has no choice but to accept Beijing's will. Effective deterrence requires the credible capability to exercise force, the will to use force, an ability to exploit circumstances or incidents, and the existence of effective information channels. Deterrent strategies are distinguished from "actual warfighting strategies" (*shizhan*; 实战) in the Chinese literature.[501]

To deter an adversary, a number of methodologies can be adopted. From the PLA's perspective, demonstrations of power can be a low risk, effective means to achieve limited objectives by instilling fear in an adversary and affecting his national will. One can forward deploy forces, demonstrate the PLA's top of the line weaponry or showcase key units. Large-scale exercises can be the most effective means of deterrence. One can also intimidate through propaganda (*xuanchuan donghe*; 宣传恫吓). Another measure is attacking an enemy's "cognitive blind zone" (*siwei mangqu*; 思维盲区), or areas in which an enemy is not paying attention or exploiting an adversary's "disbelief" or underestimation of capability.[502]

Coercive (*gaoya bipo*; 高压逼迫 or *yapo*; 压迫) measures are forms of deterrence intended to directly affect an opponent's interests in order to compel him to submit to Beijing's will. Coercion is viewed as a more intense form of deterrence, a "hard" measure as opposed to "soft" deterrent measures, such as power demonstrations or propaganda. Coercive means include diplomatically isolating an opponent or carrying out an economic blockade. Coercive measures also include military strikes of a certain intensity that are intended to achieve specific objectives. PLA authors view the Gulf War as an example of a coercive campaign that succeeded in its limited objectives.[503]

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[500] Wang Qiming and Chen Feng, ed., *Daying gaojishu jubu zhanzheng* [Winning high tech local war], Beijing: Junshi Yiwen Chubanshe, 1997, pp. 331-334 (internal military circulation). Wang Qiming, Sr. Col Chen Fang, and associate editors Li Qinggong, Zhang Changtai, Chen Baozhong, Wang Xianyun, and Qiu Yi are from the China Institute for International Strategic Studies, an organization closely associated with the General Staff Department. This volume is advertised on the cover as "mandatory reading for military officers."

[501] Wang Qiming and Chen Feng, ed., *Daying gaojishu jubu zhanzheng*, p. 334-335.

[502] Ibid.

[503] Ibid. *Gaoya bipo* can be roughly translated as "high pressure compellence."

In the Taiwan Strait context, PLA leaders may understand that a brute force war of annihilation which necessitates the occupation of the Taiwan may sow a quagmire of problems, including long term occupation, insurgencies, and a hostile international community, to include economic sanctions and the probable formation of an alliance explicitly directed against Beijing. As one prominent PLA-affiliated journal noted in 1997:

> Because of the increased effect of high-tech weapons and equipment on local war, the battle of annihilation in the traditional sense--that is, direct annihilation of the enemy--will be replaced by battles aimed mainly at destroying the enemy's weapon system, especially high-tech weapon systems, paralyzing its combat structure, and collapsing its fighting will.[504]

PRC Coercion and Taiwan

Prominent PLA political analysts believe coercive approaches offer the optimal solution to minimize negative international repercussions in the wake of using force against Taiwan to achieve limited political objectives.[505] Brute force attempts at physical occupation to achieve unification, at least according to one PLA observer, "will entail a very high mid- to long-term price and therefore is not advisable." At least one deterrent is that "the largest scale and most violent military operation that hopes to achieve unification in one stroke will be the most likely operation to cause the most serious U.S. military intervention." While confident China could prevail in a determined attempt to occupy the island, even in the face of limited U.S. military intervention, observers believe that the likelihood of a new Cold War in the Asia-Pacific region would be the costly consequence of a brute force solution. Such a situation would imperil China's goal of becoming a world power.[506]

Shortly after the Taiwan elections in March 2000, the Central Military Commission directed the drafting of a range of military options that could be used against Taiwan. Hong Kong sources indicate that while physical occupation of the island can not be ruled out, the PRC leadership is inclined more toward coercive solutions involving the use of airpower. A survey of PRC literature indicates that the particular coercive strategy is still

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[504] Among numerous sources on the move away from annihilative strategies, see Wang Yong "Development and Change in Concept of Campaigns," *Hsien-tai chun-shih* (Hong Kong), 11 March 1997, No. 242, pp 36-37 (FBIS: FTS19970731000825); Su Size, "Kosovo War and New Military Theory," *Jiefangjun bao*, 1 June 1999, p. 6 (FBIS: FTS19990701000148); and General Fu Quanyou, "Deepen the Study of the Characteristics and Laws of High-Technology Local War and Raise the Standard of Guidance for Winning High-Technology Local War of the Future," *Zhongguo junshi kexue*, 20 February 99, pp. 6-14 (FBIS: FTS19990701001913).

[505] Shi Yinhong, "Several Grand Strategy Issues Concerning Taiwan Require Facing Up To," *Zhanlüe yu guanli* [Strategy and management], 30 April 2000, pp. 27-32 (FBIS: CPP20000517000170). Shi Yinhong is Director of the Institute of International Strategic Studies of the PLA's Nanjing Institute of International Relations.

[506] Ibid.

under debate. PRC leaders may believe that Taiwan has a low threshold for pain and would acquiesce shortly after initial strikes. There was also a belief that the U.S. would limit intervention in the event the PRC adopted a coercive strategy involving the use of force short of physical occupation of the island.[507]

Based on lessons from the Gulf War, the PLA reviewed basic operational theory and has begun to transition toward coercive strategies. Chinese history is replete with examples of use of limited force as a means to coerce an adversary to heed its will. Chinese strategic culture has emphasized surprise, deception, and stratagem. Surprise not only derives military advantages, but has additional psychological effects that may in themselves prove critical in achieving political objectives. This shock effect is especially important in militaries that have limited ability to sustain operations. An adversary may become disheartened or defeatist as a result of sudden violent action.[508]

A number of factors have been pressing the PLA to move away from attrition and annihilation strategies. There is the natural desire for efficiency, which involves achieving political goals at minimal cost. The PLA may not be able to carry on a long-term conflict due to logistical and technological shortcomings. Having said that, technical advances in key areas may be propelling the PLA to adopt a more sophisticated approach to compelling an adversary such as Taiwan. Advances in technology are creating opportunities. Beijing's investment into the development and acquisition of precision guided munitions permits the application of force against a broad array of targets within a relatively short period to create systemic effects. In particular, the advent of increasingly accurate and lethal ballistic and land attack cruise missiles over the next five years or so may create a more permissive environment for air operations in the airspace over Taiwan. There also may be organizational explanations for the PLA shift toward an offensive strategy, as the PLA Air Force and Second Artillery naturally seek greater influence, prestige, and autonomy, and larger share of resources.

UNIVERSAL COERCIVE MILITARY STRATEGIES

To begin a deeper understanding of PRC coercive airpower, it may be useful to examine universal coercive military strategies. Such a discussion may provide the context within which to analyze alternative PLA coercive air strategies in the Taiwan Strait. In contemplating the direct linkage between airpower and policy outcomes, USAF

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[507] Willy Wo-Lap Lam, "PRC Thinking On Military Force Against Taiwan Viewed," *South China Morning Post,* 29 March 2000 p 17 (FBIS: CPP20000330000012).

[508] The emphasis on shock and surprise have been an important aspect of Chinese military thinking in most conflicts in the 21st century. During the Korean War, Mao Zedong sought to inflict a large and demoralizing defeat on U.S. forces in the initial encounters so as to maximize the possibility that the political shock would lead to a U.S. decision to withdraw from the Korean peninsula altogether. A similar approach was used in Chinese military action in India in 1962 when the magnitude and unexpectedness of the Chinese victories had an advantageous effect on Indian policy. See Mark Burles and Abram N. Shulsky, *Patterns in China's Use of Force: Evidence From History and Doctrinal Writings*, Santa Monica, CA: RAND, 2000, pp. 11-12.

School of Advanced Airpower Studies developed an analytical framework that examines the use of airpower to pursue political objectives. A useful framework divides airpower strategies into three elements: (1) the desired outcome, or change in behavior, (2) the mechanism by which the attack will produce a change in the enemy's behavior, and (3) air or information operations, including targets that will be destroyed by air attack and the timing of their destruction.[509]

Political Outcome

Political outcomes reflect the desired end state of the coercing power. The outcome in coercive airpower is a change in the nature or behavior of an actor's political system generated by military action. Even a single air or missile strike may have strategic significance and produce a political outcome. The outcome normally manifests itself as either explicit policy changes, shifts in public opinion, or changes in the economy. The "target" in this sense is the opposing regime, or adversary against which or for whom the airpower action is taken. The opposing leadership is normally the psychological focus of a particular strategy but could be the physical focus as well.

Mechanism

The mechanism is the means with which aerospace power achieves a political outcome.[510] Scarce resources demand a focused effort, so a coercing power searches for key places that will stimulate the policy process to achieve the greatest effect with the least effort. Because most countries have limited air and missile assets, they must be focused on a particular strategy or mechanism. The mechanism contains the most important assumptions about how decisions are made within the opposing leadership. Analysis of the mechanism involves an understanding of policy processes, to include the *threshold*. The threshold is the required magnitude of destruction or manipulation of centers of gravity needed to achieve the desired effects. The threshold concept attempts to determine how much force is enough. Simply put, if an action does not reach a threshold in the political process, nothing happens. Precise judgment about where the threshold may lie is difficult, perhaps even impossible. Therefore, strategists can only speculate about or assume the threshold.

There are three general types of mechanisms or strategies: (1) punishment strategies (2) denial strategies, and (3) strategic paralysis. *Punishment* mechanisms or strategies, influenced in large part by Guilio Douhet, focus on the adversary's population. In theory, offensive aerospace operations can lead to either popular revolt or the leadership's fear of it, which in turn forces a change in government and ultimately a change in policy. Punishment was the first coercive strategy to be put into practice

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[509] This discussion draws largely from Robert A. Pape, pp. 55-86.

[510] The mechanism is similar to Liddell Hart's definition of strategy: "the art of distributing and applying military means to fulfill the ends of policy." See B.H. Liddell Hart, *Strategy*, New York: Signet, 1967, p. 321.

during the early days of manned flight when airpower was first developed. A coercer can increase costs by threatening to attack the civilian populace directly, or threaten to destroy the economic infrastructure that indirectly leads to civilian suffering. The objective is to destroy the will of a government by targeting the general population and the economy.[511]

A variant of punishment strategies is *graduated escalation*. Graduated escalation increases the risk of continued resistance, instilling in an enemy a fear of future loss by slowly raising the risk of civilian damage. The idea is to compel an opponent to concede to avoid suffering future costs. Like punishment strategies, graduated escalation generally targets the general population and the economy. The opponent risks further pain if compliance is not forthcoming. Coercive leverage comes from the anticipation of further damage after initial punitive actions. Risk strategies, influenced in large part by the writings of Thomas Shelling, hold ultimate ruin in abeyance. The Douhet model calls for inflicting the greatest degree of pain in the shortest possible time. The Shelling model holds that the coercer will destroy targets in a sequence from demonstrations of force, to destruction of military forces, to strikes against economic targets, to attacks against the general population. Under this strategy, air strikes, beginning with demonstrations of force, would gradually escalate in intensity and in geography.[512]

Denial strategies seek to undermine the enemy's capacity for military operations in the hope that the opposing regime would give in to demands to avoid further loss or to avoid futile expenditure of resources. While punishment strategies exploit civilian vulnerabilities, denial strategies are focused on undermining an enemy's military strategy. Denial seeks to degrade enemy capabilities to such an extent that success looks impossible, defeat looks inevitable, resistance appears futile, and the costs of continued resistance outweigh the costs of surrendering. Denial strategies seek to make resistance to the coercer look futile instead of prohibitively painful.

Denial can focus on the operational level of warfare, seeking to complicate or thwart an enemy's military strategy. Denial can be characterized by destruction of defense industries, interdiction of logistical supplies, disruption of movement and military communications, and attrition of fielded forces. Theater air operations can provide direct support of a combined ground force assault, to include an amphibious invasion. Strategic interdiction can involve destruction of national power grids, transportation networks, or strategic POL (petroleum, oils, and lubricants) as a means to complicate enemy operations. Another form that a denial strategy can take is operational interdiction. Operational interdiction encompasses the use of airpower to strike rear area combat support functions, including tactical supply networks, reinforcements, and command and control facilities at and below the theater level. The end game is

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[511] Pape, pp. 58-66.

[512] Ibid, pp. 66-69. The best example of a graduated escalation strategy is the Rolling Thunder bombing campaign against North Vietnam.

operational paralysis that reduces an enemy's ability to move and coordinate forces in the theater.[513]

A *strategic paralysis* strategy seeks to break an opponent's national will through attacking national-level targets that are most closely associated with governing or defending a country or territory. This strategy contains elements of both denial and punishment, but is unique in its focus on the leadership element as the exclusive target of operations. These strategies attempt to cause strategic paralysis by undercutting a regime's ability to effectively govern. Strategic paralysis calls for attacking national-level targets that most directly support the enemy's war making efforts and will to continue the conflict. According to some theorists, this strategy holds promise for changing the enemy's behavior at a relatively low cost to both sides.[514] Those who seek a quick victory at a relatively low cost favor strategic paralysis, an approach that gained prominence in the Gulf War.[515]

Strategic paralysis normally involves decapitation, or targeting an entity's leadership and national-level telecommunications facilities. Strategic paralysis is based on the assumption that if the leadership is neutralized or isolated from fielded military forces, then the resistance likely will crumble. In theory, targeting the national communications infrastructure through the combined use of firepower and information operations, including strategic psychological operations, could facilitate or prompt mobilization of domestic political opposition, or coup, against the regime. Attacks on security forces can further reduce a regime's hold on power and facilitate an overthrow of government by a group sympathetic to the coercing party's objectives.[516] Strategic paralysis also involves producing fear, to including endangering the loss of sovereign control.

There are at least three ways that a coercing power could pursue strategic paralysis or decapitation. First, the coercing power could attempt to neutralize the opposing regime. Leadership decapitation targets specific political-military leaders on the assumption that they are the driving force behind the conflict. In theory, successors will adopt policies more favorable to the coercing power for fear that they in turn would be the next target. Such a strategy can be risky since finding and then neutralizing a

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[513] Ibid., pp. 262-264. One should note that destruction of defense industries is most effective in protracted wars of attrition when the effects of strikes against military production can be seen on the battlefield.

[514] Jason B. Barlow, "Strategic Paralysis: An Air Power Strategy for the Present," in *The Future of Air Power in the Aftermath of the Gulf War*, eds., Richard H. Schultz, Jr., and Robert L. Pfaltzgraff, Jr., Maxwell AFB: Air University Press, 1992, pp. 57-83.

[515] One should note though that airpower theorists, such as Billy Mitchell, Guilio Douhet, the Air Corps Tactical School, and the Luftwaffe all discussed paralysis as one potential effect of air power. Sir Basil H. Liddell Hart articulated a more detailed paralysis strategy in the 1950s, asserting that "it is thus more potent, as well as more economical, to disarm the enemy than to attempt his destruction by hard fighting…a strategist should think in terms of paralysis, not killing."

[516] John A. Warden, "Success in Modern War: A Response To Robert Pape's *Bombing To Win*," *Security Studies*, Winter 1997/1998, pp. 180-182.

nation's leadership is a daunting task. Secondly, airpower may also be used to spark or support the overthrow of a regime or create the circumstances in which an opposition group would overcome the government and replace it with one more amenable to concessions. At least one aspect of this strategy is targeting security forces, their headquarters, or even files. Finally, airpower could focus on national command and control and communications nodes in order to isolate fielded forces from the national leadership so that orders can no longer be disseminated. Deprived of centralized control, enemy forces might collapse even under moderate pressure.[517]

Punishment, denial, and strategic paralysis all share a common objective – compelling an adversary to adjust his policy in accordance with the coercing state's will. As a general rule, air superiority often is perceived as a necessary pre-condition for coercive air strategies. Most coercive air strategies require command of the air since aircraft cannot systematically place bombs on any target set if air operations encounter strong opposition from enemy forces. Therefore, the key question for air campaign planners is what to attack once air superiority has been achieved. However, some airpower theorists assert that air superiority in itself can be coercive if the enemy's strategy hinges on the control of the air.[518] In addition, the advent of new forms of coercive airpower, including theater ballistic missiles and information operations, are able to achieve strategic effects without air superiority.

Force Application

An aerospace strategy involves the application of force, whether it is missile strikes, bombing, the acquisition and deployment of ballistic missiles, or information attack. A critical part of the policy model is where, in broad terms, the strategist thinks force should be applied to achieve the desired effects most economically. Intelligent application of power mandates that the strategist be efficient, and where leverage should be applied. The effectiveness of the application of force depends upon capabilities, doctrine, tactics, and the vulnerabilities of specific target sets. In general, more capable militaries can pursue a broader range of strategies. Doctrine outlines fundamental assumptions of airpower that should be applied. Targets are the physical, tactical objective of air action. The number of targets in a campaign varies from conflict to conflict, and do not necessarily have to be destroyed to be affected. Use of aerospace power is seen as particularly convenient for this purpose because of their ability to strike any point within the belligerent nation. The application of airpower seeks to achieve effects in the most efficient and effective manner possible. The air campaign strategy or mechanism will drive identification of target sets, which could include fielded military

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[517] See Timothy F. Lindemann, *Decapitation: Contemporary Countercontrol Strategies*, Maxwell AFB, AL: Air University Press, 1998.

[518] See Pape, p. 58. Karl Mueller, a RAND analyst, is the leading proponent of air superiority as an end in itself. For example, during the Battle of Britain, the defenders successfully coerced Germany into abandoning its campaign to physically occupy the island through an air superiority campaign that relied mainly on air combat.

forces, civilian and/or military leadership, financial centers, electrical power plants, industry, or population centers.[519]

CHINESE DEBATE OVER COERCIVE MECHANISMS

A broad survey of the Chinese literature indicates that the PLA is evaluating and debating coercive strategies. Some favor a maritime and air blockade while others advocate a "Kosovo model" involving a comprehensive air campaign. Since spring 2000, sources indicate that the senior PRC leadership is favoring a coercive air strategy. In addition to military targets, Hong Kong sources indicate critical infrastructure targets, including oil depots, power plants, and transportation networks, would be included in the master attack plan. After a 48-hour campaign, PRC observers believe that Taipei will not only agree to initiate unification talks, but acquiesce to PRC terms. An added benefit is that the coercive air campaign would be over before the international community has time to react. PRC economic specialists are assessing how to counter anticipated economic sanctions in the wake of an air campaign.[520]

Chinese writings indicate that there is no consensus over what is the optimal coercive mechanism to achieve their political objectives. As PLA Academy of Military Science observers note, political objectives drive the degree of force that is necessary. Modest objectives require only a modest level of force. By extension, the degree of change that is sought in an opponent's policy will drive the degree of force required. The greater value that an opponent attaches to an issue or policy, the greater degree of force that will be required to change that policy.[521]

The three coercive air strategies—punishment, denial, and strategic paralysis—have been addressed in the Chinese literature. Some prominent PLA strategists, such as Lieutenant General Mi Zhenyu, advocate a punishment strategy, specifically the targeting of Taiwan's economy as the primary means to bring the island to its knees.[522] Some National Defense University analysts believe a blockade will deprive Taiwan of "basic conditions for fighting a protracted war."[523] Another observer asserted that southern

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[519] For example, Operation El Dorado Canyon involved only four target sets.

[520] Willy Wo-Lap Lam, "PRC Timetable for Taiwan 'Liberation' Talks Viewed," *South China Morning Post*, 1 March 2000, p. 17 (FBIS: CPP20000301000048).

[521] Senior Colonel Chen Zhou, *Xiandai jubu zhanzheng lilun yanjiu* [A study of modern local war theory], Beijing: National Defense University Press, 1997, p. 136 (internal military circulation). Sr. Col Chen is an officer within the AMS' Strategic Studies Department. He allegedly was one of the principle authors of China's Defense White Paper published in 1999.

[522] "General Says Massive Forces Are Not Necessary for Attacking Taiwan," *Ming pao* (Hong Kong), 12 March 2000, p. B7 (FBIS: CPP20000313000028).

[523] Qing Zhi, Xiao Chun, Qu Kai, "First Option for Military Offensive Against Taiwan: Armed Blockade," *Ta kung pao*, 10 September 1999, p. A6 (FBIS: FTS19990910000280).

Taiwan should bear the brunt of punishment since that region has traditionally been pro-independence.[524]

Other observers believe that graduated escalation could permit Beijing to achieve its political objectives. According to one media source with sources inside the PLA, initial strikes in a coercive campaign likely would be focused on military targets. If this does not succeed in attaining its objectives, follow-on strikes would be carried out against civilian targets, such as oil depots, electric power plants, and transportation networks. PRC leaders may believe that Taiwan's central leadership has a low threshold for pain and would acquiesce shortly after initial strikes.[525] An author from Shanghai believes that coercive measures such as a blockade or occupation of a few off-shore islands leaves too much to "luck" since the Taiwan leadership's threshold is difficult to calculate.[526]

Most PLA writings focus on denial. Beijing appears guided by a strategy of denial, that is, forcing Taiwan's political leadership to lose confidence in their military's ability to defend the island, thus compelling a shift in policy in line with Beijing's desires. A punishment strategy, which could involve a blockade or strikes against civilian targets, seeks to inflict sufficient pain on the population to spark a political movement to either remove the regime from power or at least force them to give in to Beijing's demands. A blockade would be necessary should the PRC want to carry out an amphibious invasion. While Beijing certainly could opt for a punishment strategy that involves a blockade, the literature indicates that the PLA thinks more in terms of denial.

While denial strategies dominate PLA strategic literature, there is an increasingly vocal faction that favors strategic paralysis. PLA publications indicate that Western airpower theorists such as John Warden have had a significant effect on Chinese airpower strategy. For example, the "Five Circles" and concepts of systemic paralysis are prominent in several publications.[527] Senior PLA generals ostensibly have directly threatened Taiwan's senior political leadership. For example, Li Laizhu asserted that PLA land attack cruise missiles, when fielded, will be capable of hitting the Taiwan president's desk.[528]

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[524] "PRC 'Expert' On China's Use of Force Against Taiwan," *Ming Pao*, 2 April 2000 (FBIS: CPP20000403000010). The 'expert' is Xin Qi from the Peace and Development Research Center.

[525] Willy Wo-Lap Lam, "PRC Thinking On Military Force Against Taiwan Viewed," *South China Morning Post,* 29 March 2000 p 17 (FBIS: CPP20000330000012).

[526] Zhang Zuqian, "National Defense Modernization and the Taiwan Problem," *Zhanlüe yu guanli,* 30 December 1999, pp. 45-49 (FBIS: CPP20000215000116).

[527] For example, see Li Qingshan, ed., *Xinjunshi geming yu gaojishu zhanzheng* [The new military revolution and high technology warfare], Beijing: Academy of Military Sciences Press, 1995, pp. 90-91.

[528] "General Li Laizhu Says the Mainland's Cruise Missiles are Capable of Hitting Taiwan's Presidential Palace," *Tai yang pao*, 7 March 2000, p. A17 (FBIS: CPP20000307000021).

In sum, potential use of force in the Taiwan Strait is best analyzed within a coercive context involving limited use of force to achieve limited political objectives. Among the tools of military coercion, modern leaders tend to view airpower as the most effective and efficient means of compelling an adversary to adjust his policy in accordance with the coercing power's will. Effective use of coercive airpower generally requires a clearly defined objective or end state, an understanding of how airpower could attain those political objectives, and a credible ability to apply airpower. Chinese strategic culture lends itself to coercive solutions with airpower gaining greater prominence as a tool of Chinese statecraft. As will be seen in subsequent sections, the PLA is establishing a theoretical foundation for the integrated application of airpower and information operations.

GENERAL JOINT CAMPAIGN THEORY

The PLA has a well-established theoretical framework for the application of aerospace power in a joint environment. Airpower, supported by information operations, creates the conditions necessary for attainment of theater and strategic objectives. PLA analysts view an air campaign as an integral component of "firepower warfare" (*huolizhan*; 火力战) involving the coordinated use of PLA Air Force strike aviation assets and Second Artillery conventional theater missiles. Although the military leadership in Beijing appears to be developing a range of options at all levels of conflict, the PLA is most disposed toward a denial strategy with a particular focus on achieving operational paralysis as a means to compel an adversary to heed Beijing's will. This section addresses general campaign theory to include basic warfighting principles, the process of disseminating strategic direction from the central leadership to subordinate commands; joint command and control, and firepower warfare.

Joint Campaign Theory

A campaign (*zhanyi*; 战役) is an organized military endeavor that seeks to achieve either total or partial war objectives, in accordance with the strategic intent of the political leadership, under a unified command. A campaign is the middle of three levels of armed conflict, which also include war (*zhanzheng*; 战争) at the highest level, and combat operations (*douzheng*; 斗争) at the lowest. A campaign includes several elements, including assigned forces, objectives, planning, and command.[529] Under the concept of "active defense" (*jiji fangyu*; 积极防御), the PLA defends China's sovereignty and territory with an emphasis on taking the initiative (*jiji zhudong*; 积极主

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[529] Wang Houying and Zhang Xingye, *Zhanyixue* [Campaign studies], Beijing: NDU Press, 2000. Wang is Deputy Commandant of the National Defense University. Zhang Xingye is the NDU Deputy Dean of Studies. Huang Bin and Zhan Xuexi served as assistant editors. NDU's *Zhanyixue* was developed based on inputs from 29 military doctrine specialists. Also see Huang Bin, "Shenhua zhanqu zhanyi yanjiu de jidian sikao, [A few considerations for deepening war zone campaign studies]," in *Zhanyi lilun yanjiu*, pp. 42-49.

动) and annihilation of the enemy on Chinese territory, only after the enemy has struck. However, campaign-level strategy requires taking the initiative through striking the enemy outside Chinese territory. Only through taking the initiative through striking (*jiji zhudong jingong*; 积极主动进攻) can the guiding strategy of active defense be achieved.

A modern campaign can be waged as either a combined or joint effort. A combined campaign (*hetong zhanyi*; 合同战役) involves a single service, such as the PLA Air Force, or a corps-level operation in which other services support one single service. A joint campaign (*lianhe zhanyi*; 联合战役) involves two or more corps-level entities, pursuing a common objective under a joint command. Joint campaign is considered to be the basic form of future warfare that consists of a series of combined campaigns.[530]

The basic guiding thought (*jiben zhidao sixiang*; 基本指导思想) of a campaign is encompassed in the eight character slogan "comprehensive operations, striking key points" (*zhengti zuozhan, zhongdian daji*; 整体作战，重点打击). Comprehensive operations stress the supremacy of people's warfare, the inseparability of military action and political objectives, and the application of all elements of national power – military diplomatic, economic, and political. Comprehensive operations involve the destruction or paralysis of the enemy's overall operational system. A concentration of the PLA's most capable forces must target critical nodes within an enemy's operational system at the most propitious moment. Effective concentration of power requires a comprehensive understanding of the enemy as a system. Gaining the initiative at the outset of a conflict is best achieved through preemption.[531]

Strategic Guidance

Preparations for a campaign begin with issuance of strategic direction in the form of a strategic policy development process called the *juece* (决策; literally translated as "policy decision"). The *juece* first establishes a general gameplan (*mouhua*; 谋划 or *chouhua*; 筹划) for military action that explores all possible outcomes, develops stratagems (*jimou*; 机谋), and analyzes centers of gravity. The *juece* process normally is divided into two parts: (1) theater guiding principles (*zhanyi fangzhen*; 战役方针), and (2) the campaign resolution (*juexin*; 决心).[532]

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[530] Wang and Zhang, *Zhanyixue*, p. xx.

[531] This operational principle is known as "controlling the enemy by striking first" (*xianji zhidi*). See Liu Jingsong, "Zhanqu kangdi jubu ruqin lianhe zhanyi zhanfa yaoze [Joint campaign operational methodologies for opposing limited enemy invasion in a war zone]," *Guofang daxue xuebao* [NDU journal], May 1997, pp. 36-41.

[532] This section on strategic guidance is drawn largely from Wang and Zhang, *Zhanyixue*, pp. 136-141; and Zhan Xuexi, ed., *Zhanyixue yanjiu* [Campaign research], Beijing: National Defense University Press, 1997, pp. 139-147 (internal military circulation). Assistant editors of this volume are Zhai Dongjing and Yang Guochuan. *ZhanyixueYyanjiu* appears to be a precursor to *Zhanyixue*, published in 2000. For example, the

Theater Principles. The framework for the conduct of campaign is contained in a document known as the "theater principles" (*zhanyi fangzhen*; 战役方针). The principles contain a general statement regarding the campaign's guiding thought (*zhidao sixiang*; 指导思想), a discussion of strategic and operational adversaries, and a discussion of the enemy's intent and capabilities. The theater principles also will include a discussion of the desired end state or goal of the campaign (*zhanyi mudi*; 战役目的) and operational methodologies (*zhanfa*; 战法 or *jiben fangfa*; 基本方法) for meeting those objectives.[533] The principles will also outline the geographical scope of the operation, to include delineation of the direction or front (*zuozhan fangxiang*; 作战方向). The campaign command has the responsibility for raising objections if the principles exceed their capabilities. This portion of the *juece* process outlines how much force is required to achieve political objectives, with an emphasis on using the minimum amount of force to achieve the greatest operational effect.[534]

Campaign Resolution. The campaign resolution (*juexin*; 决心) is guidance issued by the joint campaign command outlining how to meet the high command's objectives. This document, which in effect serves as an operational net assessment, outlines the probable enemy courses of action as well as an analysis of enemy operational plans, strengths and weaknesses, command and control structure, and relevant weapons systems. The campaign resolution also provides an overview of the friendly situation, including state of readiness, forces available, and logistical situation. The resolution defines campaign objectives, courses of action, operational methodologies (*zhanfa*; 战法), and publishes a logistics plan and a general targeting plan. The campaign resolution also apportions forces to the joint command and control structure, defines the campaign phases, delineates responsibilities, and establishes timelines for achievement of objectives.[535]

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editor of *Zhanyixue Yanjiu*, Zhan Xuexi, served as associate editor of *Zhanyixue*. Sometimes the guiding principles and the resolution can be integrated into a single document. Also see Wang Wenrong, *Zhanlüexue*, [Strategic studies], Beijing: National Defense University Press, 1999, pp. 134-143. Associate editors include Ma Bao'an, Zhu Chongfeng, and Ma Ping. As of October 2000, Major General Wang Wenrong was Dean of NDU's Graduate School. For details on the *mouhua* process, see Liu Leibo ed., *Silingbu gongzuo jianlun* [Brief on headquarters work], NDU Press, July 1999, pp. 99-131 (internal military circulation).

[533] Basic methodologies include: (1) basic forms (*jiben fangshi*), such as lethal or non-lethal means, or real war as opposed to deterrence, (2) operational forms (*zuozhan xingshi*), such as mobile warfare, positional warfare, guerilla warfare, and (3) operational styles (*zuozhan yangshi*), such as air strikes, blockade, amphibious invasion, airborne operations, air defense, and/or urban warfare.

[534] Ibid.

[535] Senior Colonel Yuan Wenxian, "Guanyu lianhe zhanyi juexin jianyi de tantao" [A discussion concerning joint campaign resolution proposals], in *Gaojishu tiaojianxia zuozhan zhihui yanjiu* [Research on operational command under high technology conditions], Beijing: National Defense University Press, 1997, pp. Senior Colonel Yuan is from the PLA National Defense University Command Instruction Department. The *juexin* appears to be similar in nature to the campaign plan concept outlined in DoD Pub

Dissemination of the *juexin* ensures all assigned forces understand the high command's intent, strategic principles, operational principles, and the campaign command's scheme. The *juexin*, developed after receiving the campaign policy, is drafted based on the high command's stated mission and net assessment of the enemy situation, friendly situation, geographical and weather-related factors that must be taken into account. The *juexin,* which is approved by the high command, will formally establish a command center, including its organization and locations. If time is a factor, the campaign command has the authority to act based on guidance contained in the *juece*, but must transmit the *juexin* later.

Specifically, the *juexin* contains six parts, including operational objectives (*zhanyi qitu*; 战役启土) that support the high command's intent. The *juexin* will outline the fronts and geographical scope (*zhuyao zuozhan fangxiang he diqu*; 主要作战方向和地区) of the campaign, to include routes of attack and key areas to be defended. The *juexin* will also outline the theater distribution of forces *(zhanyi bushu*; 战役布署) that allocates assets the theater commander; basic measures (*jiben shouduan*; 基本手段); and unit missions (*budui renwu*; 部队任务).

Joint Command and Control Structure

The Joint Theater Command (*lianhe zhanyi zhihuibu*; 联合战役指挥部 or *lianzhi*; 联指) in most circumstances would be the leading authority for a joint air campaign.[536] According to authoritative sources, this organization normally would consist of representatives from the Central Military Commission, the four general departments, service headquarters, and the Chinese Communist Party. The Joint Theater Command Post itself would be staffed by officers from the general four departments: (1) Headquarters Department (*silingbu*; 司令部), (2) Political Department (*zhengzhibu*; 政治部), (3) Logistics Department (*houqinbu*; 后勤部), and (4) Mobilization Committee (*dongyuan weiyuanhui*; 动员委员会). The primary mission of the Command would be

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5-01, *Doctrine for Planning Joint Operations*, Section II-19; also see Zhang Shiping, "Lianhe zhanyi zhihui ruogan wenti chuyi" [Proposals on the backbone of joint campaign command], in *Zuozhan zhihui yanjiu*, pp. 61-67. Zhang is from AMS Campaign Tactics Department.

[536] One should note that in the PLA, there are differences between a joint campaign and a combined campaign. A combined campaign can include different Services or only carried out by various ground force branches. Ground forces are the core, and other Services support. The Army command and control center is assigned Service coordination cells. In a joint campaign, a joint theater command is established in which each Service has equal status. Such an arrangement presents options for independent Service operations. See Min Zengfu, Tian Tongxun, and Zheng Youtai, "Qiantan lianhe yu hetong zhanyi de qubie" [Discussion of the difference between joint and combined operations], in *Gaojishu tiaojianxia lianhe zhanyi yu junbingzhong zuozhan* [Joint and service operations under high technology conditions], Beijing: National Defense University Press, 1997, pp. 30-33. The authors are from the PLAAF Command College.

to plan and prepare for joint operations and exercise authority over each corps-level Service branch (*juntuan*; 军团) assigned to the Joint Theater Command.[537]

The Joint Theater Command would be responsible for establishing a primary command post (*jiben zhihuisuo*; 基本指挥所), a reserve command post (*yubei zhihuisuo*; 预备指挥所), and rear command post (*houfang zhihuisuo*; 后方指挥所), and if necessary, a forward command post (*qianjin zhihuisuo*; 前进指挥所). Generally, a GSD team, led by a Deputy Chief of General Staff, would determine the location of the posts as part of the *juexin* process.[538] The forward command post and the rear command post, which is responsible for logistical support, reports to the primary command post. The reserve post would assume duties as the primary command post if the latter is neutralized. Supporting the primary command post would be a communications center (*tongxin zhongxin*; 通信中心), a firepower coordination center (*huoli xietiao zhongxin*; 火力协调中心), intelligence information center (*qingbao xinxi zhongxin*; 情报信息中心), electronic countermeasures command center (*dianzi duikang zhihui zhongxin*; 电子对抗

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[537] Zhang Youming and Zhang Qingchun, "Qiantan wojun lianhe zhanyi de jiben yuance he zhihui wenti" [Discussion on PLA fundamental joint campaign principles and command issues], in *Lianhe zhanyi yu junbing junzhong zuozhan*, Beijing: National Defense University Press, 1997, pp. 80-86. The authors are from the Academy of Military Sciences Campaign Tactics Department. Also see Wang Jianghuai, "Dui jianli wojun lianhe zhanyi zhihui tizhi wenti de tansuo" [Discussion on issues with establishment of a PLA joint campaign command system], in *Zhanyi lilun zhihui*, pp. 128-133. As the senior representative assigned to the Joint Theater Command, a CMC member likely would in effect serve as the Joint Forces Commander, especially if the Joint Theater Command oversees forces in more than one military region. One Hong Kong newspaper (*Hsin pao*, 22 December 1995) reported that a joint theater command structure was stood up in October 1995 to oversee a series of exercises in the southeast China. The headquarters was commanded by CMC Vice-Chairman General Zhang Wannian. Another Hong Kong newspaper (*Sing tao jih pao*) reported that the Joint Campaign Command also stood up after Chinese Lunar New Year on 11 February 2000. The CMC representative and Joint Forces Commander was Gen Guo Boxiong. The NMR Commander and Guangzhou MR Commander, and Second Artillery Commander Yang Guoliang served as Deputy Commanders. Deputy Commanders of PLAAF, PLA(N), and Second Artillery were assigned senior positions within the Command Headquarters. See Jen Hui-Wen, "CPC Specially Sets Up Headquarters to Plan Military Exercises Targeting Taiwan," *Hsin pao*, 22 December 1995 (FBIS: FTS19951222000005); and "CMC Sets Up Operational Headquarters in Fujian," *Sing tao jih pao*, 17 February 2000, p. A29 (FBIS: CPP20000217000018). Also see Li Xinjian and Xu Youze, "Zhu junbingzhong lianhe zhanyi zhihui wenti tantao" [Exploration of command problems of army/service branch joint campaigns], *Lianhe zhanyi yu junbing junzhong zuozhan*, Beijing: National Defense University Press, 1997, pp. 87-91. The authors are from the Guangzhou Military Region Headquarters. Also see Xue Xinglin and Yu Shusheng, "Dui jianli wojun lianhe zhanyi zhihui guanxi de gouxiang" [The concept of constructing our army's joint campaign command relationships], in *Lianhe zhanyi yu junbing junzhong zuozhan*, Beijing: National Defense University Press, 1997, pp. 92-97; and Zhang Shiping, "Lianhe zhanyi zhihui ruogan wenti chuyi" [Proposals on the backbone of joint campaign command], in *Zuozhan zhihui yanjiu*, pp. 61-67. Zhang is from AMS Campaign Tactics Department.

[538] See Liu Leibo, ed., *Silingbu gongzuo jianlun* [Brief on Headquarters Work], NDU Press, July 1999, pp.54-55 (internal military circulation).

指挥中心), and a weather center (*qixiang zhongxin*; 气象中心).[539] The primary command post, usually manned by the senior war zone leadership, carries out operational planning, firepower coordination, and political work. The primary command post has skip echelon authority and includes representatives from each service for coordination. In fact, service component generally would serve as deputy commanders of the Joint Theater Command. Establishment of command and control coordinating mechanisms is the responsibility of the Joint Theater Command Chief of Staff who implements the *juexin*.[540]

Corps-Level Command and Control. At least two corps-level service branches would make up the second echelon in a theater command and control structure. At least one corps-level headquarters would be formed to oversee subordinate ground forces. One corps-level air force command (*kongjun zhanyi juntuan zhihuibu*; 空军战役军团指挥部) would serve as the air component command and additional corps-level command would oversee the Second Artillery. The special operations command (*tezhong zuozhan budui zhihuibu*; 特种作战部队指挥部) would reside at the unit level. If a war zone were to be established on the coast, a corps-level naval component command (*haijun zhanyi juntuan zhihuibu*; 海军战役军团指挥部) would be established.[541]

Each corps-level command would establish a command post that would include representatives from the other services. Formal mechanisms would be established for coordination between the various units, such as between the Air Force command post and Naval Aviation command and ground force air defense units. Electronic warfare units of the air, ground, and naval, Second Artillery, and special forces would establish a formal coordination mechanism. The Air Force command post would include an aviation operations command, ground-based air defense operations command, an airborne

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[539] Ibid. One article asserts that a special operations center would be formed as well. See Wang Jianghuai, "Dui jianli wojun lianhe zhanyi zhihui tizhi wenti de tansuo" [Discussion on issues with establishment of a PLA joint campaign command system], in *Zhanyi lilun zhihui*, pp. 128-133. Also see Liu Qingguo, *Dianzi duikang zuozhan zhihui xitong yanjiu* [A study on the electronic warfare operational system], Beijing: NDU Press, 2000, pp. 158-159. *Zhanyixue*, p. 125 notes that another organization that would be subordinate to the command center would include a planning coordination center (*jihua xietiao zhongxin*).

[540] Fu Bingzhong, "Tigao lianhe zuozhan zhihui xiaoneng wenti chutan" [A first exploration of problems related to strengthening the efficiency of joint operations command], in *Lianhe zhanyi yu junbing junzhong zuozhan*, Beijing: National Defense University Press, 1997, pp. 98-102; also see Tang Xuqi, "Qiantan lianhe zhanyi de xietong" [Discussion of coordination in joint operations], *Zhanyi lilun yanjiu*, pp. 78-85. Tang is from the NDU Campaign Instruction Department. In fact, one article asserts that PLAAF, PLA Navy, and/or Second Artillery Commanders would serve as deputy commanders of the Joint Campaign Command. See Wang Jianghuai, "Dui jianli wojun lianhe zhanyi zhihui tizhi wenti de tansuo" [Discussion on issues with establishment of a PLA joint campaign command system], in *Zhanyi lilun zhihui*, pp. 128-133. One source indicates that the forward command center in located in the vicinity of Fuzhou.

[541] Ibid.

operations command, and a radar intelligence operations command.[542] The Air Force command post would also house the Joint Campaign Command's Air Defense command post, which normally would be overseen by a deputy commander of the Joint Campaign Command.[543] There are some indications that the second echelon air command post is located in the vicinity of Fuzhou. The underground facility is slated for a 24 million RMB (U.S. $3 million) upgrade.[544]

PLA writings indicate concern over the survivability of their command and control structure. Authors such as Major General Wang Liangjun, Deputy Chief of Staff of the Beijing Military Region, perceive that precision guided munitions, electronic warfare, and special operations pose serious challenges to sustainment of command and control. Dispersing and reducing the scope of command centers enhances survivability. Underground command centers can deny enemy optical, infrared, and radar sensors from identifying their locations. Mobile command centers at the *juntuan* level can increase survivability rates. One PLA study indicates that mobility can increase survivability rates from 50-60 percent to 70-80 percent.[545]

Theater communications authorities are responsible for establishing a joint operational command communications network to support the command structure outlined in the campaign resolution. Senior military region communications note that command posts are communications hubs that must be protected. The communications centers will include representatives from the services and general headquarters as well as provincial telecommunications offices. Links between theater elements normally will need to be established. PLA officials stress the importance of security and are explicit in their preference for buried and semi-buried cable. Provisions for skip echelon command and control (*yueji zhihui*; 月季指挥) must be established.[546]

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[542] Also see Li Xinjian and Xu Youze, "Zhu junbingzhong lianhe zhanyi zhihui wenti tantao" [Exploration of problems related to army/service branchs joint campaign command], in *Lianhe zhanyi yu junbing junzhong zuozhan*, Beijing: National Defense University Press, 1997, pp. 87-91 (internal military circulation). The authors are from the Guangzhou Military Region.

[543] Zhang Lihua and Qiu Daxiong, *Zhanyi fankongxi zhanfa yanjiu* [Study on theater air defense operational methodologies], Beijing: NDU Press, 1994, p. 104.

[544] "Fuzhou extends underground military facilities," *Ming pao*, 7 April 2000, p. B15 (FBIS: CPP20000407000049).

[545] Wang Liangjun, "Lianhe zuozhan baochi zhihui wending mianlin de weixie ji duice," in *Zuozhan zhihui yanjiu*, pp. 39-43. MGen Wang was formerly associated with the 51361 Unit, a ground force unit with the Beijing Military Region.

[546] Senior Colonel Zhang Liangfu, "Lianhe zuozhan zhihui tongxin wenti yanjiu" [Research on joint operational command communications issues], in *Zuozhan zhihui yanjiu.* Zhang was formerly assigned to the Nanjing Military Region Communications Department and is now Deputy Director of the Nanjing Military Region Armaments Department. As of 1996, an integrated theater wide communications network had not been established. Interoperability between the corps-level service entities was limited due to incompatible communications systems. Communications normally would be carried out via radio. In

Firepower Warfare

The Joint Theater Command structure manages one of the most significant conceptual frameworks related to aerospace operations and joint campaign theory -- "firepower warfare" (*huolizhan*; 火力战). Within the PLA operational lexicon, air and missile operations are viewed within the context of an integrated joint firepower campaign that consists of strike aviation, theater missiles, and/or long range artillery. At the operational level, firepower warfare inflicts a striking defeat that sharply alters the military situation and potentially determines the outcome of the conflict. Management of integrated firepower warfare resides at the theater level. Joint theater-level firepower, supported by information operations, is intended to "destroy the enemy's warfighting capability and basic infrastructure, destroy or paralyze the enemy's operational system, and create conditions for decisive achievement of strategic and theater-level objectives."[547] Firepower warfare would dominate the preliminary phase of a campaign and, under certain conditions, could *independently* achieve strategic objectives of the PRC.[548]

The mission of firepower warfare is three-fold. First and most important, air strikes and theater missile operations, supported by information operations, are intended to create the conditions necessary for a decisive attainment of strategic and theater objectives. These conditions include the achievement of the "Three Superiorities" (*sanquan*): information dominance, air superiority, and sea superiority. Achievement of the three superiorities could, in and of itself, create the necessary conditions for termination of conflict on the PRC's terms.[549] The second mission of firepower warfare is to support large-scale ground force operations through annihilation of or paralyzing the enemy's effective strength. The final function involves independent firepower operations in direct support of strategic and theater objectives. Independent missions involve demonstrations of force or resolve, "strategic deterrence" missions, punishment through long-range air strikes, or a series of Second Artillery strikes that are intended to achieve limited strategic or operational objectives.[550]

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addition, service cells with communications links would be established in others headquarters for liaison purposes.

[547] *Zhanyixue*, p. 182. Also see Yu Guohua, *Xiandai jingong zhanyi zhuyao wenti yanjiu* [Study on issues in a modern offensive campaign], Beijing: National Defense University Press, 1998, p. 81 (internal military circulation). Yu Guohua, who in 1997 became the first NDU PhD in operational theory, is one of the PLA's most influential figures on development of operational methodologies. He is the principle drafter of this chapter of *Zhanyixue*.

[548] Ibid. Also see Li Yanta, "Shilun lianhe zhanyizhong de huolizhan" [Discussion of firepower warfare in joint operations], in *Lianhe zhanyi yu junbing junzhong zuozhan,* pp. 126-131. As of 1998, Li was a NDU PhD candidate.

[549] Yu Guohua, *Xiandai jingong zhanyi*, p. 83.

[550] Ibid.

The Firepower Coordination Center would coordinate an air and theater missile campaign against key targets in order to achieve strategic and theater objectives. Limited firepower assets must only be used against targets whose destruction or suppression can achieve the greatest effects. Primary targets for the application of firepower include command and control system and associated communications; strategic infrastructure; the most technologically advanced fielded forces, including the air defense system; defense industries; and airfields and ports. From the PLA's perspective, air and conventional theater missile strikes are the most important means of firepower against deep targets.[551] Some prominent PLA strategists, such as Yu Guohua, believe that the central focus of firepower must be on the information system. From this perspective, firepower warfare becomes synonymous with the physical destruction aspect of information operations.[552]

Firepower Command and Control. Application of firepower would be centrally managed at the theater level within the Joint Theater Command.[553] The Firepower Coordination Center (*huoli xietiao zhongxin*; 火力协调中心) plays a crucial role for application of joint air power. Normally directed by a Joint Theater Command deputy chief of staff, the Firepower Coordination Center consists of a handful of firepower coordination cells (*huoli xietiaozu*; 火力协调阻). These are made up by the Air Force, Second Artillery, special operations, and ground force elements that would carry out necessary liaison with their respective corps-level service headquarters. The Firepower Control Center will also be assigned Navy representatives who coordinate maritime strike missions against coastal targets through fixed wing assets and land attack cruise missiles.[554] Within the Joint Theater Command, the Firepower Coordination Center would work closely with the ECM and Intelligence Centers, as well as psychological warfare elements in developing the general firepower plan. Similar in function to the U.S. Joint Target Coordination Board, the center's most important role is development of the master targeting plan.[555]

In addition to Service cells, the Firepower Coordination Center consists of three functional elements: 1) the operational planning cell; 2) the targeting intelligence cell; and 3) the airspace coordination cell. The operational planning cell (*zuozhan jihuazu*) develops and coordinates firepower plan, establishes channels for communications with

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[551] *Zhanyixue*, p. 182.

[552] Yu Guohua, *Xiandai jingong zhanyi*, p. 82-85.

[553] *Zhanyixue*, p. 130.

[554] See Min Zengfu, Tian Tongxun, and Zheng Youtai, "Qiantan lianhe yu hetong zhanyi de qubie" [Discussion of the difference between joint and combined operations], in *Gaojishu tiaojianxia lianhe zhanyi yu junbingzhong zuozhan* [Joint and service operations under high technology conditions], Beijing: National Defense University Press, 1997, p. 31 (internal military circulation). There are clear indications of PLA intent to conduct surface strike missions from the maritime platforms.

[555] Li Yanta, "Shilun lianhe zhanyizhong de huolizhan" [Discussion of firepower warfare in joint operations], in *Lianhe zhanyi yu junbing junzhong zuozhan,* pp. 126-131.

subordinate firepower assets, receives status reports, coordinates air strike packages and coordinates fire support for suppression of enemy air defenses, and transmits the *juexin*. The targeting intelligence cell (*mubiao qingbaozu*; 目标情报组) is responsible for coordinating with the Joint Campaign Command's Intelligence Information Center, maintaining targeting folders, developing the concept for battle damage assessment, and providing the "target sequence schedule" (*mubiao paixubiao*; 目标排序表) to the operational planning cell. Finally, the airspace coordination cell (*kongyu xietiaozu*; 空域协调组), normally overseen by a senior PLAAF officer, coordinates with the operational planning cell on airspace management issues and prevents conflicts in air operations with the Second Artillery and other service operations.[556]

In sum, joint campaign theory provides the foundation for a coercive air campaign. Moving away from a philosophy to seize and control territory, PRC strategists view future conflict in a coercive context. The senior PRC leadership outlines and provides political direction for a campaign through a clear and institutionalized process. Direct Central Military Commission oversight of and integration with the Joint Theater Command ensures an orchestrated political-military strategy. With air and missile assets controlled at the theater level, a coercive air or "firepower warfare" campaign would seek to achieve systemic paralysis at the operational level through use of elite forces, deep strikes, surprise, and shock. "No-contact warfare" would seek to avoid ground force engagements that could lead to a costly, protracted conflict. In theory, an effective air campaign would degrade an adversary's capabilities to such an extent that success looks impossible, defeat looks inevitable, further resistance appears futile, and the costs of continuing to resist outweigh the costs of surrendering.

AIR FORCE CAMPAIGN STRATEGY AND OPERATIONAL METHODOLOGIES

The PLA Air Force (PLAAF) is a core component of the PLA's integrated approach to firepower warfare. Since its establishment in 1949, the PLAAF's primary responsibility has been territorial air defense for China's major cities. The limited size and poor performance of its ground attack force limited the effectiveness of its interdiction and close air support missions in support of ground force operations. The lack of an integrated air defense system has called into question the PLAAF's ability even to conduct its primary mission of air defense. The PLAAF's ability to conduct close air support has been limited by the lack of any coordinating mechanism and little capability to deliver air-to-ground munitions.[557]

However, after absorbing lessons from the Gulf War and seeking less costly coercive military options that could stem Taiwan's perceived drift toward independence,

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[556] Senior Colonel Lang Shoulin, "Lianhe zhanyi huoli xietiao qiantan" [Discussion of joint firepower coordination], in *Lianhe zhanyi yu junbingzhong zuozhan*, pp. 306-314.

[557] Kenneth W. Allen, Glenn Krumel, and Jonathon Pollack, *China's Air Force Enters the 21st Century*, Santa Monica, CA: RAND, 1995, p. xv.

the PRC leadership has supported enhancing the PLA's ability for strategic and theater strike missions. The PLAAF has therefore become a top priority for force modernization. It also is diversifying its roles and missions, moving away from a force that was almost exclusively responsible for air defense and interdiction and close air support for ground forces toward a service whose primary mission is deterrence and strategic attack. The PLAAF's diversification is grounded in a body of theory that stipulates a potential firepower warfare campaign that independently could support national objectives.

PLAAF interest in independent air campaigns began shortly after the Gulf War. In 1993, a special committee of 60 air power specialists was formed to study air power theory, strategy, and development. A primary theme of several studies was the requirement for an independent air campaign as a cornerstone of theater operations. Also outlined was the concept of integrating an offensive and defensive operations (*gongfang jianbei*; 攻防兼备), rapid reaction, and elite "fist" units (*quantou budui*; 拳头部队) that could forward deploy on a moment's notice. At the same time, the PLAAF increased emphasis on foreign relations in order to gain a better understanding of airpower strategy, operational concepts, and technology.[558] In a *Xinhua* news interview in April 1997, PLAAF Commander Liu Shunyao emphasized improving their ability to launch strikes and imposing "air blockades" or no-fly-zones. In addition, to strike aircraft, Liu pointed out the importance of procuring airborne early warning and electronic warfare assets.[559]

The PLA Air Force could operate independently or in conjunction with the Second Artillery and other assets for a deterrence or coercive campaign. A group of specialists from the PLAAF, Second Artillery, and other services completed the drafting of operational guidelines for conducting joint strike operations in 1996, to include an agenda for joint exercises to validate the guidelines.[560]

The predominant strategic focus of the PLA Air Force is on denial – paralyzing an adversary's capabilities to such an extent that further resistance appears futile and the costs of continuing to resist outweigh the costs of surrendering. Perhaps the most influential senior PLAAF officer responsible for the adapting concepts associated with Western air theory is PLAAF Chief of Staff Lieutenant General Zheng Shenxia. As commandant of the PLAAF Command College, Lieutenant General Zheng oversaw analytical efforts to absorb lessons from the Gulf War, and is in a position to implement many of the theoretical concepts that he developing.

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[558] Chang Qing, Zhang Yike, and Zhao Xianfeng, "China's Air Force Moving Toward 2000," *Junshi zhanwang* [Military prospect], December 1999, pp. 6-14. For an excellent discussion on PLAAF foreign relations, see Kenneth W. Allen and Eric A. McVadon, *China's Foreign Military Relations*, Washington DC: Henry L. Stimson Center, October 1999, pp. 53-55.

[559] "Air Force Chief on Plans To Buy High Tech Arms," *Hong Kong AFP*, 15 April 1997 (FBIS FTS19970415000187). Gen Liu reiterated the principle of "*gongfang jiehe*" in another interview in November 1999.

[560] John Wilson Lewis and Xue Litai, "China's Search for a Modern Air Force," *International Security*, Summer 1999, p. 93.

Key Missions of the PLA Air Force

Over the last several years, the PLA Air Force has placed emphasis on the development of offensive air strikes in support of deterrence and coercive strategies. Among the various PLAAF missions, most important are: (1) air deterrence, (2) air strikes, (3) air blockade, and (4) support for ground force operations.

Air Deterrence. According to Deputy Commander General Qiao Qingchen, the PLAAF's most important mission is "air deterrence."[561] Air deterrence (*kongzhong weishe*; 空中威慑) is the use of airpower as a means to coerce or deter an adversary short of large scale military operations. As a general rule, the Central Military Commission exercises direct oversight over air deterrence operations.[562] Air deterrence missions can take various forms. First, air deterrence can be in the form an airpower demonstration. Airpower demonstrations may include deployments and exercises, weapons tests, or overflights. Demonstrations of airpower are intended to induce fear in an adversary in order to achieve a specific strategic objective. Secondly, air deterrence missions can warn or punish an adversary through limited strikes against carefully selected targets, particularly those bases or facilities that pose the greatest threat to the PRC. In addition, air deterrence missions can be carried out in conjunction with other services as a means to demonstrate joint power.[563]

Air Strikes. Central to air deterrence is the ability to conduct wage an offensive air campaign. Air strikes (*kongzhong jingong*; 空中进攻) are the most effective means of warfare and can launched as an independent campaign to rapidly gain air superiority, reduce an adversary's capacity for military operations, and establish the conditions necessary for victory. According to responsible figures in PLAAF Headquarters Operations Department, the key priority in strike operations is suppression or destruction of enemy air defense, in all weather conditions, day and night, for a very short period of

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[561] PLAAF Deputy Commander Qiao Qingchen outlined these basic missions in a 1997 article for internal distribution. See Lieutenant General Qiao Qingchen, "Kongjjun zai lianhe zhanyizhong de yunyong" [Use of air forces in joint campaigns], in *Zhanyi lilun yanjiu* [Research on campaign theory], pp. 109-114. Instead of missions, the actual term used in the article is *jiben fangshi* or "basic forms." Qiao, who was born in 1939, has had an especially interesting career, having moved back and forth between operational and political positions. As of 2000, he is the PLAAF Political Commissar after serving as Deputy Commander for more than a year. He was formerly Beijing Military Region Air Force Commander since 1996, and then formerly Jinan Military Region Air Force Deputy Political Commissar. Qiao has two sons in PLAAF, both logistics officers. He accompanied Zhang Wannian during his September 1998 visit to the United States and Yu Yongbo during his November 1999 visit to New Zealand.

[562] Lieutenant General Qiao Qingchen, "Kongjjun zai lianhe zhanyizhong de yunyong" [Use of air forces in joint campaigns], in *Zhanyi lilun yanjiu*, pp. 109-114; also see Senior Colonel Dong Wenxian, "Lianhe zhanyizhong de kongjun yunyong" [Use of air forces in joint campaigns], in *Gaojishu tiaojianxia lianhe zhanyi yu junbing junzhong zuozhan*, Beijing: National Defense University Press, 185-191.

[563] Ibid. Also see *Zhanlüexue*, pp. 343-344.

time. In targeting enemy centers of gravity, PLAAF officers note the importance of avoiding collateral damage.[564]

PRC sources indicate the PLA relies heavily upon extensive, well-planned pre-emptive strikes as a means to shock an opponent, paralyze his ability to conduct operations, and to force a political solution soon after initiation of hostilities. The first strike consists of multiple waves and seeks to suppress enemy airpower. This includes preventing key enemy aviation assets from taking off, effectively preventing ground based air defenses from organizing resistance along specific corridors, and eliminating enemy early warning assets. Achieving air superiority will facilitate follow-on air activity or landing operations.[565]

PLA observers tend to divide an offensive air campaign into two general phases: first strikes and follow-on strikes (*erhou tuji*; 而后突击). PLA first strike operations would involve the concentration of the PLAAF's best assets, as well aviation assets from other services. Force should be concentrated against those targets whose destruction or suppression would have the greatest strategic and operational effects. However, planning should take into consideration neutralization of targets that would permit a more permissive environment for follow-on strikes. Follow-on strikes should capitalize on the success of first strike operations. Flexibility is important, requiring a capable and timely reconnaissance network that can evaluate results of the first strike. In general, fewer aircraft are needed for follow-on strike operations.[566]

PLA observers note the problem of penetrating increasingly sophisticated air defense systems around their periphery. However, successfully defeating an enemy's air defense network usually is crucial to achieving strategic and operational objectives. A prominent NDU publication notes multiple approaches to countering air defenses, including development of low observable aircraft or use of conventional ballistic and land attack cruise missiles to strike key targets within the air defense system, particularly early warning and command and control systems.[567] Escort fighters can counter enemy air defense interceptors. Electronic attack missions can complicate air defense operations, while deception can desensitize or force the enemy to scatter his early warning assets. Night-time operations or operations in bad weather are also a standard approach. The PLA could also opt to limit their operations to opening only a single corridor (*zoulang*; 走廊).

Air Blockade. In many circumstances, an offensive air campaign would be the precursor to establishment of a coercive "air blockade" (*kongzhong fengsuo*; 空中封锁).

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[564] Xu Xingde, "Prospects for China's Air Force Theory Development in the New Century," *Jiefangjun bao*, 18 April 2000, p. 6 (FBIS: CPP20000419000049).

[565] Cao Kuofa, "Denglu zhanyizhong kongjun zuozhan yunyong de jige wenti" [Issues concerning the application of air power in landing operations], *Research on Campaign Theory,* pp. 115-120.

[566] *Zhanyixue*, p. 356.

[567] *Zhanyixue*, p. 355.

As a relatively new mission, authoritative PRC sources view air blockades as an effective means to compel an adversary to accede to Beijing's demands. A blockade would be intended to "create internal struggles and societal collapse." Air blockades involve strikes against ports and navigation routes to shut down air and maritime traffic and cut off contact with the international community as a means to achieve specific political or military objectives. Operations also include efforts to counter an enemy's attempt to break the blockade. An air blockade can weaken an enemy's capacity for operations, or compel him to accede to Beijing's demands short of war. An air blockade can take many forms, including suppressing air and naval bases, halting land transportation, or cutting off traffic in the Taiwan Strait. An air blockade can be carried out in conjunction with a maritime blockade or quarantine.

PLA authorities note that air superiority is a necessary condition of an air blockade, generally first requiring neutralization of airbases and ground based air defenses. Airpower can also effectively enforce a no-fly-zone (*tingfeiqu*; 停飞区), an effective a form of air blockade. PLAAF officers note that in carrying out this type of operation, the PLA must work closely with policymakers.[568] PLA representatives note that airpower can support blockade or area denial operations. For example, air patrols can provide cover along submarine transit routes and provide targeting data for countering "large ship formations" or enemy ASW operations.[569]

Because drawing down of an enemy's strategic reserves takes time, senior PLA officers view sustainment of an air blockade as a significant challenge. An air blockade requires sensors to detect aircraft, the ability to intercept and aircraft flying in violation of the blockade. Forced landings may be required as well. PLAAF air assets must remain on alert at bases close to the blockade zone or conduct patrol in the zone itself. Strikes against enemy bases conducting operations will be necessary. Air operations in support of other forms of blockade may require a aerial mine laying capability.[570]

Support for Ground Operations. While stressing use of airpower to directly achieve strategic objectives, PRC analysts acknowledge a continuing requirement for battlefield air interdiction and close air support. PLA writings often discuss an air

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[568] Lieutenant General Qiao Qingchen, "Kongjjun zai lianhe zhanyizhong de yunyong" [Use of air forces in joint campaigns], in *Zhanyi lilun yanjiu*, pp. 109-114; also see Senior Colonel Dong Wenxian, "Lianhe zhanyizhong de kongjun yunyong" [Use of air forces in joint campaigns], in *Gaojishu tiaojianxia lianhe zhanyi yu junbing junzhong zuozhan*, Beijing: National Defense University Press, 185-191. Also see Hong Zebo and Tao Qian, "Yao chongfen renshi dui daxing daoyu fengsuo zhanyi de diwei he zuoyong" [The need to fully recognize the position and utility of large island blockade campaigns], in *Lianhe fengsuo zuozhan yanjiu* [Study on joint blockade operations], ed. Hu Wenlong, An Weiping, and Wu Yafei, Beijing: NDU Press, 1999, pp. 1-5 (internal military circulation). Also see *Zhanlüexue*, pp. 334-335; and *Zhanyixue*, p. 362-363.

[569] Wu Lianqing, "Hangkongbing xietong qianshui da daxing jianting biandui de jige wenti" [Some issues regarding coordination between aviation and submarines in attacking large ship formations], in Hu Wenlong, et al, *Lianhe fengsuo zuozhan yanjiu,* pp. 60-63.

[570] *Zhanyixue*, pp. 364-366.

campaign in the context of supporting a landing campaign which is divided into four phases: (1) operational preparations phase (*zuozhan zhunbei jieduan*; 作战准备阶段), (2) preliminary operations phase (*xianqi zuozhan jieduan*; 先期作战阶段), (3) landing operations phase (*denglu zuozhan jieduan*; 登陆作战阶段), and (4) the ground operations phase (*lushang zuozhan jieduan*; 陆上作战阶段). The air campaign would be integral to the preliminary operations phase. The PLAAF intends to carry out strategic and theater airlift in support of joint theater operations. The PLA intends to exploit civil aviation assets to augment its transport fleet.[571]

In a landing campaign, PLA air assets would target logistics facilities, since mechanized warfare is highly dependent upon logistics and communications networks, ammunition, and fuel. A strategy can break down when the flow of needed supplies is interrupted. Primary targets during a Taiwan Strait crossing would include hardened coastal defenses. PLA observers note that Taiwan Strait crossing operations will be extremely difficult unless Taiwan strike assets are eliminated. After landing, air power would primarily be applied against reinforcements and key chokepoints such as bridges. Airborne units would focus on command headquarters. PLA operational planners note the importance of air defenses in support of a landing campaign. Extended range ground based air defenses would be deployed to cover ports and embarkation points.[572] PLA writings indicate that during the initial phase of a joint landing campaign, 35 to 40 percent of forward deployed assets would be dedicated to strike operations, while 10 to 15 percent would be dedicated toward close air support and interdiction during while ground forces cross the Strait. During the landing phase, at least 50 percent would be dedicated to landing operations.[573]

Operational Principles of the PLAAF

The PLAAF operates under a set of operational principles that guide its thinking about the use of airpower. These include surprise and first strikes, concentration of force, offensive action as an important element of defense, and close coordination.

Surprise and First Strikes. One of the most fundamental principles of the PLA Air Force is achieving strategic and tactical surprise in its initial strikes to cripple an opponent and gain the initiative early in a conflict. The objective is to complicate enemy air operations, render ground based air defense assets difficult to organize effective resistance, neutralize ground based early warning radar systems, and facilitate future strike operations. This is particularly important in situations in which the PLA is at a disadvantage in weapons systems. The first strike (*shouci tuji*; 首次突击) must be

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[571] Ibid.

[572] Ibid. The PLA views logistics as a key operational center of gravity. Perhaps the most promising link is fuels since a modern military cannot operate without fuel.

[573] For an outstanding discussion, see You Ji, "Adding Offensive Teeth to the PLA Air Force," *Issues & Studies*, Vol. 35, No. 2, March/April 1999.

decisive (*shouzhan juesheng*; 首战决胜).[574] Under the principle, "seek surprise based on the offensive" (*lizheng qixi, lizu qianggong*), the PLA intends to take advantage of favorable conditions and rely heavily on concealment and deception. Early victory will be sought at the lowest possible cost. Strikes will be carried out continuously after the initial attacks to ensure an enemy does not have time to recover and organize large scale counterattacks. Flexibility is important to take advantage of opportunities and to shift the operational focus after transitioning to a new phase in the overall campaign. The PLA must adopt innovation operational methodologies, including the use of existing weapon systems in ways never seen before. Strikes must be carried out at an unexpected time and location.[575]

Surprise requires thorough deliberate planning in peacetime, to include development of target sets, route planning, and weaponeering that requires precise calculations. Training must support planning. In wartime, sufficient force must be concentrated at the proper time and place to achieve the desired strategic and operational effects.[576] Doctrinal publications indicate PLA intent to conduct campaign preparations in secret; and they must use stratagem (*moulüe*; 谋略), diplomacy, propaganda, psychology, intelligence channels, and electronic warfare to desensitize and deceive the enemy. Analysts believe they must select the most propitious time for attack while diverting the attention of the adversary (this stratagem is known as "*guci shibi"*; 顾此失彼). The primary target set of first strike operations must be the enemy's air defense system, including the enemy air command and control structure, key airbases, and SAM sites. PLAAF strategists expect first strike operations to be conducted together with conventional missile forces, naval missile forces, and other assets.[577]

As PLAAF Lieutenant General Xie Decai noted in 1997, different types of targets would be apportioned to different Services. Second Artillery strikes normally would precede air strikes. The conventional Second Artillery and PLAAF bombers would focus on airfields, ports, and communications hubs. PLAAF strike and multi-role fighters

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[574] Cao Kuofa, "Denglu zhanyizhong kongjun zuozhan yunyong de jige wenti" [Issues concerning the application of air power in landing operations], in *Zhanyi lilun yanjiu,* pp. 115-120; also see Lieutenant General Zheng Baolin, "Lukong lianhe zhanyi yuance qiantan" [A brief talk about principles for ground-air joint campaigns], in *Zhanyi lilun yanjiu*, pp. 86-92. Zheng is from the Lanzhou Military Region Air Force.

[575] *Zhanyixue*, p. 352.

[576] *Zhanyixue*, p. 352.

[577] Senior Colonel Dong Wenxian, "Lianhe zhanyizhong de kongjun yunyong" [Use of air forces in joint campaigns], in *Gaojishu tiaojianxia lianhe zhanyi yu junbing junzhong zuozhan*, Beijing: National Defense University Press, 185-191. Dong oversees a special research unit under PLAAF Headquarters Department. The concept of *guci shibi* is literally, "attend to one thing while losing sight of another." Also Major General Gao, "Lianhe zhanyi kongjun zuozhan shiyong wenti qiantan" [Discussion of problems in joint campaign air force operations], in *Lianhe zhanyi yu junbingzhong zuozhan*, pp. 180-184. Major General Gao was Deputy Commander of the 8th Air Army in 1997. He is currently commander of the 10th Air Army, under the Beijing Military Region Air Force headquarters, located in Datong, Shanxi Province.

would strike the enemy command structure and missile bases. While other services, such as the Navy and ground forces would be involved, coordination between the Second Artillery and the PLAAF regarding specific targets and timing is crucial.[578]

PLA planners note three requisites for an effective first strike. First is the need for effective targeting. PLAAF planners assert that airpower assets must be concentrated on critical nodes that will have the most direct effect on the enemy's ability to conduct air operations. The three most important target sets include intelligence centers and key radar sites, ground based air defenses; and key air bases. AMS planners have a broader view of how theater airpower assets should be applied, citing the need to strike targets that will have the greatest psychological effect. Campaign planners must organize the most powerful strike force possible. PLAAF operational planners assume at least 80 percent of forces apportioned to the theater commander would be used for initial strikes. After careful coordination, Second Artillery, Navy, and Army aviation must provide support. Electronic countermeasures must be concentrated against key targets. Finally, concealment and surprise are critical. The key tools for concealment and surprise include the active use of electronic warfare, as well as political, diplomatic, and military measures to conceal true campaign designs and movements. The PLA intends to use of pre-prepared sites and initiate rapid initiation of hostilities. Units must use geographic conditions, fly low, and attack from multiple directions.[579]

There are occasional reports that if all else fails, a strategy of attrition may still be required. According to Hong Kong reporting, at least some assume that a five-to-one ratio over Taiwan aircraft may be required.[580] By the PLAAF's calculations, a four-to-one advantage is needed to ensure victory in an air campaign. According to a Western source with access to Chinese internal writings, PLAAF planners use a notional figure of 400 enemy fighter assets, indicating a requirement of approx 1600 PLAAF fighters. During a wartime situation, the PLAAF's best aircraft would be assembled among forward bases in the Nanjing and Guangzhou Military Regions.[581] Since at least the mid-1990s, the PLAAF has increased emphasis on adapting air superiority fighters in a strike

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[578] Lieutenant General Xie Decai, "Zhanqu denglu zhanyi kongjun de zhihui yu xietong" [Air force command and coordination in theater landing operations], in *Gaojishu tiaojianxia de zhanyi lilun yanjiu* [Campaign theory research under high tech condition], Beijing: National Defense University Press, 1997, pp. 207-213.

[579] Cao Kuofa, "Denglu zhanyizhong kongjun zuozhan yunyong de jige wenti" [Issues concerning the application of air power in landing operations], in *Zhanyi lilun yanjiu,* pp. 115-120; and Zhang Shiping, "Lianhe zhanyi zhihui ruogan wenti chuyi" [Proposals on the backbone of joint campaign command], *Zuozhan zhihui yanjiu*, pp. 61-67. Zhang is from AMS Campaign Tactics Department.

[580] Tsao Kuo-chung, "Mainland Fighter Planes to Gain Air Supremacy with Five-to-One Depletion Tactic," *Tai yang pao*, 5 August 1999, p. A17 (FBIS FTS19990805000249).

[581] You Ji, "Adding Offensive Teeth to the PLA Air Force," *Issues & Studies*, Vol. 35, No. 2, March/April 1999.

role (*yijian daiqiang*; 以箭代强). From the PLA's perspective, at least 40 percent of their fighter assets should be competent in carrying out strike operations.[582]

Concentration of Best Assets. Surprise requires concentration of the limited number advanced strike fighters in order to achieve a rapid resolution of the conflict (*suzhan sujue*; 速战速决).[583] According to the principle of "using best assets for first strike" (*jingbing shangzhen, quanli shoutu*; 精兵上阵，全力守土), the PLA must be able to concentrate its best assets across military region boundaries to "hammer" the opponent. In accordance with the developmental concept of "fighters replacing strike aircraft" (*yijian daiqiang*; 以箭代强), a portion of PLAAF air superiority fighter assets will be used in pre-emptive strikes in the opening stage of an air campaign.[584]

Under principle of "active suppression and destruction of key nodes" (*jiji yazhi, zhongdian cuihui*; 积极压制，重点摧毁), the PLAAF intends to dedicate the majority of its most advanced air power assets and focus on targets that have the most influence on a campaign. Priority targets will include command and control centers, radar sites, and primary airfields. Air strikes would seek to inflict varying degrees of damage on the enemy: suppression (*yazhi*; 压制), paralysis (*tanhuan*; 瘫痪), or destruction (*xiaomie*; 消灭).[585]

In accordance with "using the best assets for the first strike," the PLAAF has designated many of its most advanced elements as "fist units" (*quantou budui*; 拳头部队) that can reaction rapidly in a crisis situation and deploy in a matter of hours. These units likely are regimental-level, have been equipped with the best foreign assets (e.g. Su-27s, Su-30s, SA-10s, etc), and domestically produced multi-role fighters and bombers (e.g. F-10, F-8IIIF/8IIM, FB-7s, etc).[586]

Offensive Action as a Component of Air Defense. The PLA views offensive counter air missions as an integral aspect of air defense. In accordance with the PLAAF

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[582] Ibid.

[583] Lieutenant General Zheng Baolin, "Lukong lianhe zhanyi yuance qiantan" [A brief talk on principles for ground-air joint campaigns], *Zhanyi lilun yanjiu*, pp. 86-92. Zheng is from the Lanzhou Military Region Air Force.

[584] Concentration of the most advanced assets and units from around the country is associated with a PLA strategic concept known as *jingbing zhisheng*, or "victory through elite troops."

[585] Lieutenant General Zheng Shenxia, "Lianhe zhanyi kongjun yunyong yingzhe bawo de jige wenti" [Few issues concerning the application of air forces in a joint campaign], in *Zhanyi lilun yanjiu*, pp. 101-108. The exclusion of ground based air defense sites as a target set leads one to believe that the Second Artillery would focus on this aspect of a suppression of enemy air defense (SEAD) campaign. Also see Senior Colonel Dong Wenxian, "Lianhe zhanyizhong de kongjun yunyong" [Use of air forces in joint campaigns], in *Lianhe zhanyi yu junbing junzhong zuozhan*, pp. 185-191.

[586] "Zhonggong kongjun hangkongbing diyishi" [The PLAAF 1st air division], unpublished article, August 2000; and "Zhonggong kongjun diyi wangpai kongsanshi zhanli qiantan" [Discussion of the PLAAF's premier 3rd air division capabilities], unpublished paper, July 2000.

principle of "strike in support of defense, integrate the offense and defense" (*yifang zhugong, gongfang jiehe*; 依防主攻，攻防结合), air strikes must be considered as an integral aspect of air defense through attacks against enemy assets that pose the greatest threat. At the same time, capable air defenses are required to protect strike assets. While there is an emphasis on integrating offensive and defensive operations, offensive operations take priority over the defense (*gongfang jianbei, yigong weizhu*; 攻防兼备，以攻为主). Consistent with the principle of *gongfang jianbei*, preemption is vital to reduce an enemy's ability to launch strikes against the mainland. Under conditions in which available forces are limited, protracted warfare (*chijiuzhan*; 持久战) is to be avoided. Rapid resolution of the conflict is critical.[587]

Close Coordination. Close coordination (*miqie xietong*; 密切协同) of air operations is vital for success. The PLA has several options for coordination of air assets of all services, including those of the ground forces, Navy, and Second Artillery missile assets. Strike packages must involve the best assets that the PLA has to offer.[588] PLA strategists acknowledge the political and technical challenges of the targeting process. Relative value of potential targets must be assessed as well as capabilities of enemy air defenses. The deployment of the strike would be consistent with the guidelines outlined in the *juexin*. The strike force must be carried out under a unified command and in multiple, layered, and small packages.[589] Operations must be carried out under unified command structure of two layers (*shuang cengci*; 双层次), the first layer consisting of the joint theater command and the second of the Air Force component command. PLAAF assets based along the coast but within the boundaries of two different military regions will be placed under the same command.[590]

Force Modernization

To close the gap between doctrinal aspiration and capabilities, the PLA Air Force is transitioning its force from an almost exclusive focus on defensive counter air to one that stresses suppression of enemy air defenses and offensive counter air operations. The PLA is investing in a growing fleet of multi-role fighters that can conduct extended range operations against Taiwan from further inland; or, alternatively, carry out operations further from China's shores when forward-deployed. The PLAAF understands its current limitations. In the short term, they are attempting to develop the operational concepts

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[587] *Zhanyixue*, p. 352-353.

[588] Ibid.

[589] Ibid., p. 354.

[590] Senior Colonel Dong Wenxian, "Lianhe zhanyizhong de kongjun yunyong [Use of air forces in joint campaigns], in *Lianhe zhanyi yu junbing junzhong zuozhan*, pp. 185-191.

necessary to make the best use of existing resources.[591] The PLAAF also is improving its training and the ability of its air battle managers to command and control its forces. PLAAF modernization also includes procurement of precision air-to-ground munitions. Due to shortcomings in its indigenous research and development, and to accelerate development of a viable coercive air force, the PLA relies heavily upon of the former Soviet Union.

In sum, the PLA Air Force (PLAAF) has become a top priority for force modernization. The PLAAF is diversifying its role and missions, moving away from a force that has been almost exclusively responsible for air defense, battlefield air interdiction and close air support for ground forces, toward a service whose primary missions are deterrence and strategic attack. The PLAAF's diversification is grounded in a body of theory that highlights its role in a firepower warfare campaign that could, under certain conditions, independently achieve national objectives. The PLAAF also figures prominently in a blockade scenario, both in support of a maritime blockade or in enforcing an air blockade or "no-fly-zone" to compel an adversary such as Taiwan. PLAAF doctrine stresses rapid mobility, concentration of its best assets, surprise, and pre-emption. To close the gap between its doctrinal aspirations and capabilities, the PLAAF is acquiring a new generation of multi-role fighters and associated air-to-ground munitions from Russia, fielding a new multi-role fighter, and converting a number of existing air superiority fighters to multi-role platforms. At the same time, ground-based air defenses are improving their ability to defend against air and missile strikes. In pursuit of national objectives, the PLAAF could operate independently or in conjunction with other firepower elements, such as the Second Artillery.

CONVENTIONAL THEATER MISSILES AND THE PLA AIR CAMPAIGN

Like the PLA Air Force, the Second Artillery plans a crucial role in the overall firepower plan. One of the PRC's most effective tools of aerospace coercion is its growing arsenal of increasingly accurate and lethal theater ballistic missiles. Conventionally-equipped ballistic missiles are effective up the entire scale of violence, ranging from deterrence to supporting an annihilation campaign. Successful conduct of a joint air campaign would rely heavily on China's growing inventory of theater missiles. The PLA's reliance on conventional ballistic missile reflects shortcomings in the PLA Air Force, offsetting its lack of suppression of enemy air defense assets. As they increase in accuracy and lethality, ballistic missiles could be critical in a campaign for air superiority.

The predominant guiding ideology of the Second Artillery, known as a "strategic fist" (*zhanlüe quantou budui*; 战略拳头部队), is controlling the enemy through first strikes against key targets (*xianji zhidi, zhongdian tuji*; 先击制敌，重点突击). The limited number of available missiles requires assets to be to be used sparingly against

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[591] Cui Wenge, "Accomplish the Sacred Missions for Modern Aircraft Pilots," *Jiefangjun bao*, 6 June 2000, p. 6 (FBIS: CPP20000609000055).

only the most important of targets to achieve strategic and operational objectives. Surprise is crucial to success.[592]

The PRC views conventional ballistic missile inventory in any of three ways: (1) independent operation, (2) essential component of a blockade, or (3) component of a joint firepower strike group. First and foremost, conventional missiles are for deterrence, tools for coercing or intimidating an opposing leadership. They can "weaken enemy arrogance and shake enemy resolution." In the PLA lexicon, deterrence operations (*weishe zuozhan*; 威慑作战) could include exercises, actual firepower demonstrations, (similar to those conducted off the coast of Taiwan in 1995-1996), or the actual use of ballistic missiles against a limited target set.[593] PRC sources also note an important role for ballistic missiles in a coercive blockade campaign.[594]

Conventional missiles also can be used in surprise attacks in order to achieve air superiority. In attempting to achieve air superiority, theater missiles would be used against runways, airbase command centers, early warning facilities, and ground based air defenses. Ballistic missiles could support a campaign for sea superiority. Missiles would be used against naval bases, ground based anti-ship missile facilities, and maritime command centers. They could also be used to blockade and control enemy ports. The final mission is to support amphibious operations, targeting command centers, transportation nodes, second echelon formations, and armored formations.[595]

Preemptive theater missile strikes, carried out in conjunction with air strikes and special operations, are intended to create favorable conditions for dominance in all dimensions of theater warfare. A theater missile campaign would be an essential component of a broader denial campaign to achieve the "three superiorities" (*sanquan*; 三权) -- information dominance (*zhixinxiquan*; 制信息权); air superiority (*zhikongquan*; 制空权); and sea superiority (*zhihaiquan*; 制海权).[596] To achieve air superiority, the PLA would target key air defense sites and airfields. The PLA would seek to damage Taiwan Air Force runways, taxiways, weapons storage facilities, airfield command posts, and fuel depots to complicate generation of sorties. Strikes against airbase runways and taxiways are referred to as an "airbase blockade" (*fengsuo jichang*; 封锁机场). The objective would be to shock and paralyze air defense systems to allow a window of opportunity for follow-on PLAAF strikes and rapid achievement of air superiority. Air

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[592] Zhang Erwang, "Lianhe zhanyizhong changgui daodan budui zuozhan yunyong de jige wenti" [Questions on conventional missile operations], in *Zhanyi lilun yanjiu*, pp. 228-231.

[593] Ibid.

[594] Ren Qiuke and Gao Jihu, "Zhanyi zhanshu daodan zai haishang fengsuo zuozhanzhong de yunyong" [Application of theater missiles during maritime blockade operations], in Hu Wenlong, ed., *Lianhe fengsuo zuozhan yanjiu*, pp. 122-125.

[595] Zhang, "Lianhe zhanyizhong changgui daodan budui zuozhan yunyong de jige wenti," pp. 228-231.

[596] *Lianhe zhanyi di erpaobing zuozhan*, p. 17.

superiority is key to establishing a no-fly-zone, enabling freedom of action on the ocean for a blockade, or to permit greater freedom of action for physical occupation of the island if necessary. The PLA intends to carry out synchronized launches from a wide range of azimuths in order to stress active missile defenses and associated battle management systems.[597]

Strikes supporting the quest for information dominance would target the civilian and military leadership, semi-hardened command and control centers, weak links in Taiwan's defense information infrastructure, key intelligence collection facilities, and electronic warfare facilities. PLA conventional ballistic and land attack cruise missiles would attempt to paralyze Taiwan's command and control system by to cutting off fielded military forces from the civilian and military leadership in Taipei. Anti-radiation missiles would be employed against key radar installations. [598]

To achieve sea superiority, PLA writings indicate prioritization of strikes against naval ports. The key objective would be to strike naval facilities in the opening phases of conflict as a means to prevent projection of naval power and resupply of strategic resources by sea. "Strike opportunities" exist when ships are concentrated in port or when they are moving along known transit routes en route to the theater of operations.[599]

Like the PLA Air Force, the Second Artillery premises its operational ideology on a series of fundamental principles (*jiben yuanze*; 基本原则). The first basic principle is "close coordination through a unified command" (*tongyi zhihui, miqie xietong*; 统一指挥，密切协同). Conventional Second Artillery assets would be subordinated to a single unified commander who is best positioned to use assets in an efficient and effective manner possible. Secondly, under the principle of "flexible and rapid reaction" (*zhudong linghuo, kuaisu fanying*; 主动灵活，快速反应), conventional ballistic missile forces would quickly deploy to launch sites and disperse to alternate locations depending upon the circumstances. The Second Artillery also stresses surprise and a first strike capability (*yinshen turan, xiandi tuji*). Such an approach uses deception to achieve surprise, both in terms of timing and targets, to achieve maximum effects and catch the enemy

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[597] Ibid.

[598]Ibid, p. 10; and Guan Lin'gen, "Brief Analysis of Combined Fire Assault," *Jiefangjun bao*, 21 April 1998, p.6 (FBIS: FTS19980529000519). Some Western observers have asserted the initial phase would include strikes against the general population and infrastructural targets, such as power plants, fuel, industry, and transportation hubs as a means to weaken overall national resolve. However, the effects from these targets would take a while to materialize. The PRC objective would be to achieve military dominance over Taiwan within two weeks to a month, before negative international economic and political developments can occur. For comments on the importance of strikes against enemy intelligence and electronic attack facilities in support of information dominance, see Yang Zhiguo, "Didi changgui daodan budui zhanfa chutan" [Initial discussion of surface-to-surface missile unit doctrine], in *Lianhe zhanyi yu junbingzhong zuozhan*, [Joint theater and service operations], Beijing: National Defense University Press, 1998, pp. 242-245. Senior Colonel Yang is Chief of Staff of the Second Artillery's Luoyang Base (80304 Unit).

[599] Senior Colonel Wang Benzhi, pp. 236-241.

unprepared. Another key approach is the use of multiple launch points, azimuths, and simultaneous impacts (*duodian duofangxiang, tongshi tuji*; 多点多方向，同时突击). Under the principle of "concentrated application and continuous strikes" (*jizhong shiyong, lianxu daji*; 集中使用，连续打击), PLA planners focus on critical nodes that will achieve the greatest strategic and operational effects; create shock and confusion; and destruction in the shortest period of time. Finally, under the principle of "integrate attack and defense with the emphasis on the attack" (*dafang jiehe, yigong weizhu*; 打防结合，以攻为主), the Second Artillery includes in its target folder enemy counterforce assets.[600]

The Joint Theater Command's Firepower Coordination Center would direct a ballistic missile campaign as one component of a broader joint strike effort that also could include air forces and electronic attack assets.[601] Coordination with other strike assets will be carried out via the Firepower Coordination Cell (*huoli xietiaozu*; 火力协调阻) within the Second Artillery corps-level command center.[602] Most important mission of this cell is deconfliction of targeting between the PLAAF and the Second Artillery, which is required to report positions and firepower plans to the PLAAF Corps-level command center. Generally, as senior Second Artillery officers point out, missile units carry out the initial surprise attacks, followed closely by aviation assets.[603] Responsibilities of the Second Artillery's *juntuan* command include distribution of the *juexin*, developing a mobility plan, planning for first strike and counter-denial (*kang fanzhi*) operations, and development of post-strike dispersal plans.[604]

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[600] *Lianhe zhanyi di erpaobing zuozhan;* and *Zhanyixue*.

[601] Guan Lin'gen, "Brief Analysis of Combined Fire Assault," *Jiefangjun bao*, 21 April 1998, p.6 (FBIS: FTS19980529000519).

[602] See Sun Xiaohe, "Jiaqiang huoli xietiao, fahui zhengti weili" [Strengthen firepower coordination, give play to comprehensive power], in *Lianhe zhanyi yu junbingzhong zuozhan* [Joint theater and service operations], Beijing: National Defense University Press, 1998, pp. 281-285. Senior Colonel Sun is Deputy Director of the Guangzhou Military Region Service Arms Department.

[603] Zhang Erwang, "Lianhe zhanyizhong changgui daodan budui zuozhan yunyong de jige wenti" [Questions on conventional missile operations], in *Zhanyi lilun yanjiu*, pp. 228-231.

[604] Lieutenant General Zhao Xijun, "Lianhe zhanyizhong changgui daodan budui jidong zuozhan zhihui yu xietong de jige wenti" [Problems in conventional missile mobile operational command and coordination in joint campaigns], in *Lianhe zhanyi lilun*, p. 227. Zhao is Deputy Commander of the Second Artillery. The term "fanzhi" is used by the Taiwan Air Force to describe counterstrike operations.

The Four Phase Second Artillery Campaign

Unsubstantiated reports indicate that a phased campaign could require at least 400 theater missiles distributed in as many as seven conventional missile brigades.[605] To maximize firepower for the most likely scenario, most probably would be based in the Nanjing Military Region or chopped to the Taiwan theater of operations joint command during a crisis. PLA writings indicate that approximately 50 percent of its total theater missile inventory would be used in the initial strike phase. Western sources believe the PLA may deploy as many as 650 SRBMs opposite Taiwan over the next several years.[606] In the event of a major coercive air campaign, PLA officers envision the Second Artillery would implement a four phase operational plan: (1) operational preparations phase (*zuozhan zhunbei jieduan*; 作战准备阶段), (2) campaign mobility phase (*zhanyi jidong jieduan*; 战役机动阶段), (3) missile strike phase (*daodan tuji jieduan*; 导弹突击阶段), and (4) enemy counterattack phase (*kangdi fanji jieduan*; 抗敌反击阶段). The four phased campaign under most circumstances would be in support of the PLAAF.[607]

Operational Preparation Phase. The operational preparation phase begins with dissemination of the campaign resolution (*juexin*). The phase likely would include development or review of a mobility plan, increased security, and closer monitoring of foreign satellites and air/naval activity in the Western Pacific. Working in conjunction with the theater command, missile reconnaissance officers and planners would review or develop targeting folders. General Staff Department and theater intelligence staff would exploit existing intelligence and/or task space-based imaging assets for updates to support targeting. The Firepower Coordination Center within the Joint Theater

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[605] *Lianhe zhanyi di erpaobing zuozhan*, p. 10. One source indicates that during annual meetings at Beidaihe in August 1999, China's senior leadership decided to accelerate the production and deployment of enough ballistic missiles to outfit four SRBM brigades by 2002. As of January 2000, four batches of DF-15 SRBMs had been completed. Each production batch (*piliang shengchan*) consists of 60 missiles, indicating that 240 DF-15 missiles had been produced. See Will Young, "Shenmi de zhongguo daodan budui" [The development of the chinese second artillery], *Shijie junshi luntan* [World military forum], January 2000 [internet edition in Chinese (http//:www.wforum.com)]. The rapid growth in the Second Artillery's conventional force has prompted the outsourcing of training. In 1999, the Northwest China Engineering University and the Second Artillery agreed to jointly foster more high quality personnel for China's missile forces.

[606]Guan Lin'gen, "Brief Analysis of Combined Fire Assault," *Jiefangjun bao*, 21 April 1998, p.6 (FBIS: FTS19980529000519). In comparison, allied forces in the Gulf War used 137 theater missiles (TLAMs/CALCMs) during the first 24 hours of the conflict. Each wave consisted of around 50 missiles. Western reporting indicates the PLA currently has only one brigade consisting of 150-200 SRBMs. See Tony Walker and Stephen Fidler, "China Builds Up Missile Threat," *Financial Times*, 10 February 1999, p. 1.

[607] *Lianhe zhanyi di erpaobing zuozhan*, p. 10. Also see Wang Xuejin and Zhang Huaibi, "Didi changgui daodan budui zuozhan zhidao sixiang fenxi" [Analysis of conventional surface-to-surface missile operations guiding thought], in *Lianhe zhanyi yu junbingzhong zuozhan* [Joint theater and service operations], Beijing: National Defense University Press, 1998, pp. 223-227. Wang and Zhang call the strike phase the "operations implementation phase" (*zuozhan shishi jieduan*).

Command would prioritize targets in keeping with the guidance of higher command for the conduct of the theater campaign and determine the most effective method of dealing with those targets. The Joint Theater Command would de-conflict strikes so that limited assets are not wasted. Theater commanders also would modify preplanned targeting of targets that have changed over time.[608]

Mobility Phase. During the campaign mobility phase, brigade elements would deploy to the area of operations in a well-disguised fashion. Rail is the normal way of moving launchers and missiles from brigade garrison to a staging area or transfer assembly point (*zhuanzai changping*).[609] The individual launchers would then disperse to pre-surveyed launch sites (*zhendi*) within the battalion's assigned area of operations, not far from rail lines or highways.[610] A mobile command and control center would coordinate launches. Rapid reaction (*kuaisu fanying*; 快速反应) is essential, requiring a quick calculation of position, orienting the missile, inputting targeting data, and scattering in a very short period of time. Chinese writings indicate that units intend to launch within 40 minutes after arrival to the pre-surveyed launch sites. Units can not arrive at the launch site too early in order to avoid detection.[611] To reduce reliance on pre-surveyed launch sites, the PLA appears to be integrating GPS onto their mobile launchers.[612]

Missile Strike Phase. During the missile strike phase, Second Artillery units would support the Joint Theater Commander by striking strategic and operational centers of gravity. Missile firings would be coordinated with other strike assets and directed against critical nodes (*yaohai*; 要害) within an enemy's infrastructure. Strikes normally would be carried out at night or in inclement weather. After an initial salvo, launchers could move to new pre-surveyed launch sites within that brigade's assigned area of

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[608] Ibid. Also see Wang Xiaodong and Wang Xiangwei, "Daodan budui zai jingong zhanyizhong de junyong wenti" [Military problems in a missile strike campaign], in *Zhanyi lilun yanjiu*, pp. 232-235.

[609] See "Fujian Seeks Foreign Funds for Railroad Construction," *Xinhua*, 12 February 1996 (FBIS: FTS19960212000035); and "Fujian Governor Announces Plans For Six New Railways," *Xinhua*, 1 August 1997 (FBIS: FTS19970801000893). For comments on Leping garrison, Yong'an launch site, and use of rails, see "Defense Ministry Analyzes 4th Missile Launch," *China Broadcasting Corporation News Network* (Taiwan), 13 March 1996 (FBIS: FTS19960313000064).

[610] *Lianhe zhanyi di erpaobing zuozhan*, p. 17. Theater command authorities would determine a deployment pattern that would be centered on the brigade's mobile command center. Also see Richard D. Fisher, "China's Missiles Over the Taiwan Strait: A Political and Military Assessment," paper presented at September 1996 Coolfont Conference on the PLA, pp. 1-30. For reference to a unit having an assigned operating area, see Senior Colonel Wang Benzhi, pp. 236-241.

[611] Zhu Bao, pp. 9-19; and Wang Xiaodong and Wang Xiangwei, "Daodan budui zai jingong zhanyizhong de junyong wenti" [Military problems in a missile strike campaign], in *Zhanyi lilun yanjiu*, pp. 232-235.

[612]Zhang Hu, "Application of GPS in Missile Maneuvering Positioning," *Zhongguo yuhang xuehui fashe gongcheng yu dimian shebei wenzhai* [China astronautics society launch engineering and ground equipment abstracts], November 1993.

operations.[613] At least three raids are feasible if one assumes availability of 400 theater missiles for the phased campaign.[614]

The PLA intends to carry out synchronized launches from a wide range of azimuths in order to stress active missile defenses and associated battle management systems. The concept of synchronized, multi-axis strikes is a fundamental principle of Second Artillery conventional doctrine (*duodian, duofangxiang, tongshi tuji*). Other important operational concepts include "*xushi bingyong, shengdong xiji*" (literally "use reality, make a noise in the east, but strike to the west"), and "*xiaojiange, duoboci tuji*" (literally "cut time and strike in multiple waves"). The first calls for integration of simultaneous launches from different launch azimuths and use of infrared radiation "disruption" to confuse enemy satellite early warning systems and complicate enemy attack operations. The second includes use of two strike waves, the first "screening" the second by exploiting "time lags" (*shijiancha*;时间差) in missile defenses.[615] A range of space-based, airborne, and battlefield intelligence systems are needed to adjust firepower.[616]

Counterstrike Phase. For the counterstrike phase, PLA planners rely on survivability as a critical aspect of their theater missile force. In ensuring their survivability, designers believe three systems in particular pose the greatest challenges to the survivability of China's theater missile force: the F-117A, J-STARS, and AWACS. The most important step to ensure survivability is counter-reconnaissance (*fanzhencha*; 反侦察), that is, denying foreign air and space assets the ability to detect missile garrisons, storage facilities, and units in the field. Counter-reconnaissance measures include decoy launchers and missiles that must match the optical, infrared, and radar characteristics of real systems. The Second Artillery also intends to use natural masking, radiation reflectors, deception, and communications security. Chinese camouflage is explicitly intended to counter U.S. air and space-based reconnaissance platforms.[617]

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[613] See Wang Jixiang and Chang Lan, pp. 96-108. Also see Wang Xiaodong and Wang Xiangwei, "Daodan budui zai jingong zhanyizhong de junyong wenti" [Military problems in a missile strike campaign], in *Zhanyi lilun yanjiu*, pp. 232-235.

[614] See Senior Colonel Wang Benzhi, pp. 236-241.

[615] *Lianhe zhanyi di erpaobing zuozhan*, p. 17. See Senior Colonel Wang's "Didi changgui daodan huoli yunyong de jige wenti."

[616] Ibid.

[617]For a good summary of Second Artillery CCD practices, see Ge, et.al., "Xinxizhan zhong daodan budui mianlin de wenti yu duice," p. 189-192. Also see Wang Jixiang and Chang Lan, pp. 96-108. Wang and Chang are from the Beijing Institute of Astronautical Systems Engineering and Lu Xiaohong, "Camouflage and Concealment Technology for Mobile Launchers and Ground Equipment of Strategic and Tactical Missiles," Aerospace Industry Press, HQ-96034, 1996. The key institute for camouflage, concealment, and deception (CCD) technology related to missile launchers is the Beijing Institute of Special Machinery (CALT 15th Research Institute).

In sum, the Second Artillery would be a key player in a joint PLA air campaign. The PRC's ballistic missile forces could operate independently in support of a deterrent or coercive campaign or in support of air, maritime, or information operations. The Second Artillery's most important mission likely would be for suppression of enemy air defenses in order to facilitate air superiority and follow-on air strikes. Centrally commanded and controlled at the theater level, the Second Artillery's basic principles stress surprise and pre-emption, concentration of resources, and rapid reaction. The Second Artillery's force modernization program requires a significant increase in accuracy and increased numbers of ballistic missiles. At the same time, they are developing sophisticated warheads that could increase the destructiveness of their ballistic missile force.

INFORMATION OPERATIONS AND THE PLA AIR CAMPAIGN

A PRC coercive air and missile campaign would be intimately related to information operations. As PLAAF Chief of Staff General Xu Xinde remarked during Spring 2000, "the air force is a technology-intensive force with the greatest sources of information and the greatest dependence on the information environment."[618] Coercive military operations ultimately are intended to affect the decision calculus and morale of opposing civilian and military leaders. Perceptions and decisions of an opposing leadership are shaped the quality and amount of information in which they possess. Effective military operations rely upon the ability to defend one's sources of information while exploiting and assaulting an opponent's information structure.

Over the last several years, the PLA has demonstrated significant interest in information operations. Since 1999, PLA writings indicate that concepts on information operations suitable for the PRC's unique situation have solidified. A basic PLA National Defense University text on theater warfare asserts: "Seizing information dominance, and denying the enemy of his information capabilities, has become the most important task of modern theater operations."[619] Any campaign must begin with an assault against the enemy's system of information collection, transmission, and management.

The focus of information operations is the enemy's command system. The command system, known as the "vital point" (*yaoxue*; 要穴) of the enemy's entire operational system, consists of policymakers at the strategic level, the operational military command, and supporting command, control, and communications systems. Colonel Yu Guohua, a prominent strategist at the PLA National Defense University, notes that the focus of all operations must be directed against this center of gravity. According to Colonel Yu, an enemy's theater system of operations can be viewed as a structure of four concentric circles. In the middle is the enemy's command system. The next ring is the command's theater support (*zhanyi baozhang*; 战役保障) network, which

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[618] Xu Xinde, "Prospects for China's Air Force Theory Development in the New Century," *Jiefangjun bao*, 18 April 2000, p. 6 (FBIS: CPP20000419000049).

[619] *Zhanyixue*, pp. 168-170.

include basic infrastructure, such as airbases, ports, rail lines, and highways. Moving outwards, the next ring consists of operational support (*zuozhan zhiyuan*; 作战支援), including artillery, aviation, and other assets. The outermost ring includes individual combat units. According to Colonel Yu, information and firepower assets that are dedicated toward a first strike operations must concentrate on the innermost ring.[620]

General information operations involve information attack (*xinxi jingong*) and information protection (*xinxi fanghu*; 信息防户). From the PLA's perspective, there are at least four approaches to information attack. First, electromagnetic attack involves exploitation of the frequency spectrum to suppress, jam, or deceive enemy information systems or to prompt mistakes in enemy decision making. Logic attacks (*luoji jingong*; 逻辑进攻) comprise the second approach to information attack. These use computers and computer software to exploit or deny the enemy use of his computer networks. Another approach is to attack an adversary's psychology, including cognitive processes (*renshi*; 认识) and beliefs or convictions (*xinnian*; 信念). The final approach is physical destruction (*shiti cuihui*; 实体摧毁) of the enemy's command structure and C^4ISR systems. Information protect measures include defenses against enemy electronic or logic attacks, psychological operations, and physical destruction.[621]

Forms Of PLA Information Operations

At least four forms (*fangshi*; 方式) of information operations dominate PLA theoretical thinking: (1) intelligence warfare, (2) electronic warfare, (3) psychological warfare, and (4) firepower warfare. Information operations are most effective if all four forms are applied against an adversary's national leadership in an integrated fashion under a unified information operations command subordinate to the Joint Theater Command.

Intelligence warfare is "the use of every type of sensor and other capabilities to attain the necessary level of intelligence while destroying or degrading the enemy of his sensors in order to deny him his needed sources of intelligence."[622] Building upon a rich tradition of Chinese strategic culture, intelligence warfare involves intelligence reconnaissance, intelligence defense, and intelligence deception and counter-deception. PLA theory approaches reconnaissance from an integrated perspective involving traditional spy tradecraft and technical reconnaissance (*jishu zhencha*; 技术侦察 or *jizhen*; 技侦 for short), a euphemism for signals intelligence. The PLA relies

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[620] Yu Guohua, *Xiandai jingong zhanyi zhuyao wenti yanjiu* [A study on modern offensive campaigns], Beijing: NDU Press, 1999, pp. 69-72.

[621] *Zhanyixue*, pp. 173-177; the quote is from Wang Baocun, "Subduing Enemy Force Without Battle' and Informationized Warfare," *Zhongguo junshi kexue,* 4 May 1999, pp. 60-63 (FBIS: FTS19990823000602).

[622] Zhu Wenquan and Chen Taiyi, *Xinxi zuozhan* [Information operations], Beijing: NDU Press, 1999, p. 75.

increasingly upon air- and space-based reconnaissance assets. Intelligence defense depends upon concealment and camouflage and upon proper training of network operators. Deception operations are perhaps most important during the preparatory phase of a campaign to desensitize an opponent or force errors in judgment. Counter-deception operations rely heavily upon intelligence collection and proper analysis.[623]

Electronic attack (*dianzi gongji*; 电子攻击) and electronic defense (*dianzi fangyu*; 电子防御) are integral aspects of a PLA joint air campaign. The PLA's senior leadership understands that electronic warfare can powerfully affect the results of a military campaign and theater offensives, and perhaps help determine the outcome of a war. PLA literature indicates that electronic warfare is central to an offensive air campaign. Since the Gulf War, the PRC's senior military leadership has stressed electronic warfare, as a component of information warfare. In 1995, Admiral Liu Huaqing, Vice Chairman of the Central Military Commission asserted:

> Information warfare and electronic warfare are of key importance, while fighting on the ground can only serve to exploit the victory. Hence, China is more convinced (than ever) that as far as the PLA is concerned, a military revolution with information warfare as the core has reached the stage where efforts must be made to *catch up with and overtake rivals* (emphasis added).

PLA operational concepts highlight the importance of centralized command and control over electronic attack assets and view electronic warfare as crucial to successful deception and surprise.

Command and Control

Peacetime management of electronic warfare is carried out by the General Staff Department Electronic Countermeasures and Radar Department (*dianzi duikang yu leida bu*; 电子对抗与雷达部), also known as the GSD Fourth Department (*zongcan sibu*; 总参四部). In addition to strategy and force planning, the Fourth Department oversees electronic intelligence collection and analysis, and the maintenance of signal data bases. The Department, which also develops stratagem involving electromagnetic deception, oversees at least four bureaus and one research institute: [624]

- Science & Technology Bureau (*kejiju*; 科技局)

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[623] Ibid., pp. 83-84.

[624] "Kongjun yu haihang wuqi zhuangbei fazhan" [Development of the air force and naval aviation equipment], in *Zhonggong junshi xiandaihua* [PRC military modernization], Taipei: Freedom Publishing, June 2000.

- Equipment Bureau (*zhuangbeiju*; 装备局)
- Intelligence Bureau (*qingbaoju*; 情报局)
- Training Bureau (*xunlianju*; 训练局)
- 54th Research Institute

In a crisis situation, joint electronic countermeasures operations would be coordinated within the Joint Campaign Command in the Joint ECM Center (*lianhe dianzi duikang zhongxin*; 联合电子对抗中心). The Joint ECM Center consists of representatives from the General Staff Department, military region headquarters, and service representatives. Joint ECM Center responsibilities include directing the collection and analysis of electronic reconnaissance, development of ECM concept of operations (*juexin*) and electronic attack plan; assignment of responsibilities and targets, transmission of orders to service ECM organizations; and coordination with the Joint Theater Command leadership and other centers. The Joint ECM Center oversees second echelon ECM cells (*dianzi duikang zu*; 电子对抗阻) at each Service component – Air Force, Navy, Second Artillery, Special Forces, and ground forces. The service component ECM cells exercise command authority over ECM unit command centers.[625]

There is some indication that the ECM Center eventually may be subsumed into a broader Information Operations Center (*xinxi zuozhan zhongxin*; 信息作战中心). According to one internal PLA publication, the information operations center consists of three sub-centers: an ECM sub-center, a network warfare (*wangluozhan*; 网络战) sub-center, and a physical destruction (*yingcuihui*; 硬摧毁) sub-center. The ECM Center would be comprised of a joint intelligence group (*qingbaozu*; 情报组), an electronic attack group (*dianzi jingongzu*), and an electronic defense group (*dianzi fangyuzu*; 电子防御组).[626] The ECM Sub-Center would be responsible for managing the flow of

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[625] Zhang Youcai, "Denglu zhanyi dianzi duikang zuozhan zhidao de jige wenti" [Some questions surrounding ECM operational principles during a landing campaign], in *Zuozhan zhihui yanjiu* [Research on operational command and control], Beijing: NDU Press, January 1997, pp. 327-333. As of 1997, Major General Zhang Youcai was director of the GSD Fourth Department; also see Zhang Chenhui and Cai Shichuan, "Jianli denglu zhanyi dianzi duikang zhihui xitong de tantao" [Discussion on establishing an ECM command system during landing campaign], in *Zuozhan zhihui yanjiu*, pp. 342-347. Zhang and Cai are from the PLA Electronic Engineering Academy, the Fourth Department's primary entity responsible for ECM training and doctrine development. The Academy is located in Hefei, Anhui province.

[626] At least three sources give one the impression that the concept for an Information Operations Center has already been established. One source indicates that the ECM Center concept was codified in 1999, and calls for codification in the next revision. See Liu Qingguo, *Dianzi duikang zuozhan zhihui xitong yanjiu* [A study on the electronic warfare operational system], Beijing: NDU Press, 2000, pp. 175-178. Liu is an instructor at the PLA Electronic Engineering Academy and is one of the PLA's leading authorities on electronic warfare strategy, doctrine, and command and control. Wang Houqing, "Evaluating Introduction

electronic intelligence information, planning for an ECM campaign, commanding and controlling those ECM assets directly under the Joint Campaign Command, and guiding the operations of all ECM units in the theater.

In addition to providing direction to service electronic warfare units, the Joint Campaign Command would oversee at least one organic ECM regiment.[627] PLA sources indicate that a typical ECM regiment will include a headquarters department, a political department, a logistics department, and a technology department. The regimental headquarters will oversee an electronic reconnaissance battalion that uses sophisticated receivers and processing equipment to scan the electromagnetic spectrum for voice communications, and to monitor and record the operating parameters of radar emissions and guidance systems. During a wartime situation, the PLA would use fixed sites and mobile electronic reconnaissance units (*jidong zhenchazhan*; 机动侦察战), as well as electronic reconnaissance aircraft and ships. Internal PLA sources indicate that reliance on electronic reconnaissance satellites will increase in the future.[628]

The regiment has one communications jamming battalion that targets both theater and tactical level radio networks operating in the high to ultrahigh frequency portions of the electromagnetic spectrum. A theater level radar jamming battalion would include companies responsible for jamming of ground based radars, as well as airborne fire control radars. The regiment also has a training unit.

Operational Principles and Concepts

Senior General Staff Department officers responsible for electronic warfare have articulated a number of operational concepts associated with electronic combat. Most important is the principle of unified command (*tongyi zhihui*; 统一指挥) which asserts that all electronic warfare activities will be centrally directed in the Joint ECM Center at the theater-level headquarters. Related to unified command are the principles of concentration of assets (*heli zhidi*) and stressing key points (*tuchu zhongdian*; 突出重点), focusing combined naval, air, and ground-based electronic attack assets against specific target sets during each phase of a campaign. Another important principle is rapid flexibility (*kuaisu linghuo*; 快速灵活), which requires ECM units to quickly detect and react to new emitters that are discovered after the initiation of hostilities. GSD leaders also stress that electronic attack and electronic defense be granted equal priority

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to Information Warfare," *Jiefangjun bao,* 7 December 1999 p. 6 (FBIS: FTS20000105000705). Wang Houqing, editor in chief of *Zhanyixue*, refers to a major text on information warfare written by Dai Qingmin of the PLA Electronic Engineering Academy. Fu Quanyou ostensibly approved the book.

[627] During peacetime, each Military Region has a subordinate ECM regiment. For example, the 56106 Unit is an electronic warfare regiment that supports the Chengdu Military Region.

[628] This discussion is drawn from Wang Jianghuai and Zhu Guolin, *Gaojishu tiaojianxia hetong zhanyi hong/lan liangjun shouzhang jiguan duikang yanxi jiaocheng* [Lecture on combined red/blue campaign command organization countermeasures exercise], Beijing: NDU Press, 1997, pp. 104-110.

(*gongfang bingzhong*;攻防并重). Finally, a primary purpose of electronic warfare is to enhance stealth and surprise (*yinshen turan*; 隐身突然).[629]

Chinese electronic warfare operational concepts emphasize concealing the activities and disposition of PLA forces and to mislead the enemy. In addition to supporting air defense, ground based electronic warfare units generally are to focus on battalion-level targets and below to include radio networks. Airborne stand off jammers generally target theater level command and air defense networks to cover PLAAF and ground force aviation assets. Authoritative PLA sources emphasize high power broadband jamming as a means to counter frequency agile radar and communication systems. Sea-based electronic warfare units generally focus on early warning units, satellite communications, and support blockade activities. In addition, in a cross-Strait scenario, the PLA intends to intrude upon Taiwan television networks and broadcast their own false information and propaganda. Anti-radiation missiles and precision guided munitions will be targeted against radars and satellite control stations.[630]

Phased Electronic Combat Support Campaign

PLA writings indicate that an electronic attack campaign will precede air strikes. Basic objectives of electronic attack campaign are to: conceal PLA operational designs; weaken enemy air defense early warning; carry out electromagnetic deterrence; and to paralyze or disrupt enemy integrated air defense systems. Most important is multidirectional jamming from airborne, ground-based, and sea-based platforms, combined with decoys. Primary targets should include early warning radars and communications. Electronic warfare operations would be integrated with physical destruction of command and control centers and early warning sites to reduce the effectiveness of an enemy's communications system and to effect systemic paralysis. Senior PLAAF officials responsible for formulating electronic combat policy and strategy have outlined a three phased approach for electronic combat support for air operations. These include: (1) take off and assembly phase, (2) overwater crossing phase, (3) strike phase.[631]

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[629] See Zhang Youcai, "Denglu zhanyi dianzi duikang zuozhan zhidao de jige wenti" [A few problems in directing electronic countermeasure operations in an island landing campaign], in *Zuozhan zhihui yanjiu*, Beijing: NDU Press, 1997, pp. 327-333. Zhang is from the GSD Fourth Department. Also see Zheng Baolin, "Lukong lianhe zhanyi yuance qiantan" [Discussion of joint air-land campaign principles], *Zhanyi lianhe yanjiu*, pp. 86-92.

[630] Zhang Ming, "Dui binhai chengshi jingong zhanyi dianzi duikang yunyong de tantao," *Zuozhan zhihui kongzhi yanjiu*, pp. 374-377; also see Wang Jianghuai and Zhu Guolin, *Gaojishu tiaojianxia hetong zhanyi hong/lan liangjun shouzhang jiguan duikang yanxi jiaocheng* [Lecture on combined red/blue campaign command organization countermeasures exercise], Beijing: NDU Press, 1997, pp. 104-110. The latter is an internal guide for senior PLA commanders to use during exercises. The Blue Force is the United States.

[631] Zhang Youcai, pp. 327-333; Wang Yongsheng, "Denglu zuozhan kongzhong jingong zhanyi de dianzi jingong xingdong" [Electronic attack activity during the air attack campaign of a landing operation], in *Gaojishu tiaojianxia zuozhan zhihui yanjiu*, February 1996, pp. 361-365; and Cui Yansong, "Kongjun

Take Off and Assembly Phase (*qifei chuhang jieduan*; 起飞出航阶段). During the initial phase, the PLA intends to integrate airborne, ship-borne, and ground-based, electronic attack assets to conceal the take off and assembly of strike packages and deceive enemy air defense commanders. In accordance with a "feint, bait, and deceive" (*yangdong, erdi, qipian*; 佯动，饵敌，欺骗) strategy, the objective would be to cover and conceal PLAAF activities, confuse enemy air defense commanders, force errors in judgment, and expose/exploit gaps in air defense coverage. Prior to conflict all units must cease use of radio traffic. Deception jamming is expected to begin approximately four to five hours before commencements of strikes. Just prior to strikes, airborne and sea-based jammers will concentrate on air defense and early warning networks. Satellite communications will also be a priority target. Transmissions simulating command networks and force movements are intended to bait and deceive the opposition. PLA ECM units would create multiple jamming screens but intentionally permit the detection of decoys, create false alarms (*xujing*; 虚惊) to confuse enemy air defense commanders and force the Taiwan air defense system to spread coverage to 360 degrees. Deception jamming would create false aircraft returns and wake up radars in order to launch ARMs. In short, the PLA would attempt to saturate the enemy early warning systems and delay and complicate real time management of the air picture.[632]

Overwater Flight Phase (*haishang feixing jieduan*; 海上飞行阶段) and **Attack Phase**. During these phases, PLA planners indicate that ECM assets would target leadership communications, Taiwan's integrated air defense system, and any fight assets that the Taiwan Air Force is able to get off the ground. Objective of an electronic warfare campaign would be to reduce Taiwan's warning time through covering the take-off, formation into strike packages (*biandui*; 编队), and transit.[633] Jamming would focus on air- and ground-based early warning and command and control systems, as well as medium range fire control radars. PLAAF assets, flying within pre-designated corridors with specified altitudes, widths, and densities, would be equipped with countermeasures against the guidance systems of medium and short range air-to-air missiles. Strike packages would include "escort coverage" (*suidui yanhu*; 随队掩护) electronic combat support assets. Airborne COMJAM packages would jam early warning broadcasts and leadership communication networks. Target ground-to-air and air-to-air communications. At the same time, PLA computer network attack specialists would target enemy automated command systems through the use of insiders who have penetrated internal networks and/or through pre-planted viruses into automated air

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zuozhanzhong de xinxizhan qianshen" [Survey of information warfare in air force operations], in *Wojun xinxizhan wenti yanjiu* [Research on problems in PLA information warfare], Beijing: Guofang Daxue Chubanshe, 166-171. Senior Colonel Cui is Director, PLAAF HQ ECM Department.

[632] Ibid.

[633] Wang Yongsheng, "Denglu zuozhan kongzhong jingong zhanyi de dianzi jingong xingdong" [Electronic attack activity during the air attack campaign of a landing operation], in *Gaojishu tiaojianxia zuozhan zhihui yanjiu*, February 1996, pp. 361-365.

defense networks. [634] PLA plans also include escort coverage (*suidui yanhu*) electronic warfare aircraft. [635]

At least three types of airborne jammers would be employed. One airborne jammer would carry equipment that operates that the microwave part of frequency spectrum to counter surface to air radar sites. Another jammer should be placed between the strike package and enemy airborne early warning systems. To enhance effects, ship-based jammers should be used to augment the airborne jammers. During the attack phase, fixed wing assets, combined with theater ballistic missiles, anti-radiation missiles, UAVs, and land attack cruise missiles would destroy key points in an enemy's air defense system. [636] In addition, the PLA is said to have heli-borne ECM assets subordinate to army aviation units.[637] Ground-based jammers are usually organized into battalion-level entities at the group army-level and above. Key targets include enemy three-dimensional and air defense fire control radars. Must be prepared to use frequency hopping and spread spectrum jammers.[638]

Guiding Principles for Communications Countermeasures

The PLA places a high priority on communications jamming as a subset of electronic combat. Communications countermeasures are driven by a set of fundamental principles that shape the PLA's thinking in this area. First, the PLA believes it must prepare now for future contingencies that could arise with little warning. Preparation must include development of basic concepts, organization, technology, and operational methodologies. A solid base of intelligence should be established for the most likely theaters of conflict. Training programs must be rigorous.[639]

The PLA leadership stresses a unified command over jamming operations. Based on the supreme command's *juexin*, deliberate plans must be developed for both attack operations and defense. Because attack and defense operations involve separate organizations, a coordinating mechanism between the two must be established. Plans

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[634] Cui, "Kongjun zuozhanzhong de xinxizhan qianshen" [Modest information war during air operations], p. 170.

[635] Ibid. Also see Wang Yongsheng, "Denglu zuozhan kongzhong jingong zhanyi de dianzi jingong xingdong" [Electronic attack activity during the air attack campaign of a landing operation], in *Gaojishu tiaojianxia zuozhan zhihui yanjiu*, February 1996, pp. 361-365.

[636] Ibid.

[637] "PLA Plans to Develop Army Aviation Units," *Sing tao jih pao*, 22 October 1999, p. A17 (FBIS: FTS19991028000246).

[638] Wang Yongsheng, pp. 361-365.

[639] This discussion of communications countermeasures is drawn from Zhu Wenquan and Chen Taiyi, *Xinxi zuozhan* [Information operations], Beijing: Junshi yiwen Press (internal circulation), 1999.

should cover camouflage and deception. Centralized control of attack and defensive operations, to include dedicated communications networks for each, is required.

Under the principle of "catching the enemy unprepared through concealment and surprise" (*yinbi turan, chudi buyi*; 隐蔽突然，出敌不意), the PLA believes it must exceed the expectations of the enemy in terms of technology, doctrine, and tactics. Achieving surprise in communications countermeasures is fundamental. At the same time, though, the PLA expects to operate at a disadvantage in terms of technology and numbers of attack systems. To offset shortcomings, concealment, feints, and desensitization are crucial to achieving surprise. Weaknesses in an enemy's tactics, equipment, and technology must be exploited, requiring a significant degree of knowledge of an adversary's strengths and weaknesses.

Another principle is "equal weight to offense and defense, giving prominence to critical nodes" (*gongfang bingzhong, tuchu zhongdian*). Limited communications jamming must be distributed to defend against air attack as well as to support an information offensive. Furthermore, one must focus on critical nodes within both the PLA's and the enemy's communications systems. PLA analysts believe that since they will be operating at a technological disadvantage, they must fight smarter, requiring superior operational methodologies. At least three strike methodologies can be adopted: acupuncture (*dianxuefa*; 点穴法), paralysis (*tanhuanfa*; 瘫痪法), and obstruction (*zheduanfa*; 遮断法).

PLA strategists also stress the need to pre-coordinate operations under a unified command structure. The complexity of coordination requires dedicated communications networks for management of both communications and electronic countermeasure units. Communications and electronic countermeasure plans must be fully vetted with subordinate units in advance of any conflict. Prior planning should also be carry out with firepower assets, including the PLAAF, for purposes of targeting systems posing the greatest threat to friendly communications units.

Under the concept of "break through conventionality and apply the extraordinary" (*dapo changgui, chaochang shiyong*; 打破常规，超常使用), the PLA intends to concentrate its best trained and most technologically advanced assets and exploit China's rich tradition of stratagem (*jimou*; 机谋). Stratagems, which are generally associated with strategic and operational-level surprise and deception, include "dominate the enemy through stealth and surprise" (*yinshen turan, chuqi zhisheng*) and "concealing the real and showing the false" (*yinzhen shijia*; **隐真示假**) to confuse and desensitize the enemy (*mihuo mabi*).

Basic Operational Methodologies. The most fundamental operational methodology associated with counter-communications operations is associated with concealment and deception ("conceal form to create power, counter the enemy's reconnaissance," or *yinxing zaoshi, fandi zhencha*; 隐形造势，反敌侦察). PLA officers involved in doctrine development believe information dominance relies on an ability to control information and deceive an adversary. Operational intentions must be concealed and an adversary must be lulled into a state of unpreparedness through intentional disclosure of false information and concealing real dispositions and intentions (a stratagem known as *yinzhen shijia*). Concealment may be practiced by radio silence, camouflaged deployments, highly directional antennae, and through emission control

measures. Camouflage measures can include physical measures such as netting or frequency or signal masking. Deception measures include establishment of a decoy network to cover the direction of attack and misdirect an enemy's collection assets. [640]

Specific measures include luring enemy collection assets toward false networks. After exposure of a false network, one can bring that network up as the real network and then make the formerly real network the false one. Such measures could force an enemy to spread his collection assets thin. One can intentionally plant deceptive information on a real network (*neirong shijia*; 内容示假). Another key deception measure includes the sudden initiation of communications networks that would force an enemy to initiate defensive measures. Through selective activation of various networks and measuring responses, one can identify the enemy's collection focus.

Enhancing the PLA's ability to counter an adversary's attempt to disrupt communications networks requires a range of technical and doctrinal countermeasures. Technical countermeasures include redundancy, highly directional antennae, increased signal strength, spread spectrum and frequency hopping radios, and widespread utilization of fiber optic cable. Doctrinal concepts to enhance counter-jamming include creation of deception networks and other measures discussed above.

Survivability of PLA communications networks is critical to sustaining air operations. To enhance survivability, careful attention must be paid to communications engineering, particularly the establishment of fiber optic networks and placement of physical decoys and decoy networks. PLA observers stress the need for mobile relay systems, including maritime and airborne relay assets. Arrangements will be made with civilian regional networks to exploit their capabilities if necessary. The PLA's principle means of communications is through wireless forms (e.g. high frequency, UHF/VHF, microwave, SATCOM) with HF being the most important. They believe that additional emphasis must be placed on tactical SATCOM networks. To avoid electronic fratricide, unified command of electronic countermeasure operations is crucial.

Psychological Warfare

Psychological warfare (*xinlizhan*; 心理战) is a basic form of PRC warfare that not only serves national defense, but also international and economic competitions. Rooted in ancient Chinese strategy, psychological operations target the mind of the enemy and his will to resist. Normally geared toward morale (*shiqi*; 士气), psychological operations use television, radio broadcasts, and other methodologies rather than physical destruction to convince the enemy to do something. When properly employed, psychological operations can lower the morale and reduce the efficiency of enemy forces and could create dissidence and disaffection within their ranks.

The Chinese have utilized psychological operations throughout history as a means to influence perceptions of foreign groups and leaders. In Chinese strategic thought, psychological operations are intimately associated with deterrence, deception, and

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[640] Ibid.

moulue (stratagem) intended to compel an enemy to concede without fighting. Psychological operations can be applied in both peace and wartime. During times of peace, PRC psychological operations seek to reveal and exploit divisions within an enemy's political establishment. They also are intended to ensure that PRC policies and military operations are cast in the proper light. Psychological operations also are targeted against the enemy's value concepts (*jiazhi gainian*; 价值概念). Psychological operations seek to force divisions in alliances and coalitions and reduce confidence in an enemy's economy.[641]

Modern psychological operations are enhanced by the expansion of mass communication capabilities. Countries like China may multiply the effects of their military capabilities by communicating promises of threats of force or retaliation, conditions of surrender, safe passage for defectors, invitations to sabotage, support to resistance groups, and other messages directly to their intended targets. Their effectiveness depends heavily on their credibility and capability to carry out promises or threatened actions. Based on traditional strategic thought, Chinese forces want to face an adversary who is both unsure about its cause and capabilities and certain about its impending defeat -- an enemy who, even if unwilling to surrender, has little will to engage in combat.

The PLA's propaganda apparatus, managed by the General Political Department, is well equipped to carry out psychological operations. Chinese missile exercises off the coast of Taiwan in March 1996 serve as the best example of a show of force intended to send a strong psychological message. More recently, journal articles have played up PLA strengths, especially their missile force, in the hope of destroying Taiwan morale.[642] Success of psychological operations through propaganda is dependent upon credibility. The PRC must ensure a potential adversary is uncertain about true intentions and capabilities. Psychological operations are highly dependent upon accurate intelligence information concerning the target identity, location, vulnerabilities, susceptibilities, and the political, economic, social or cultural, and historic conditions within the target area. PLA observers stress the integration of psychological warfare into campaign planning. As NDU strategist Yu Guohua notes:

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[641] Zhu Wenquan and Chen Taiyi, *Xinxi zuozhan* [Information operation*s*], Beijing: NDU Press, 1999, pp. 349-350.

[642] Development of ballistic missiles is discussed later. Among numerous Chinese references to the hopelessness of Taiwan's defense, see Yuan Lin, "The Taiwan Strait is No Longer a Barrier -- PLA Strategies for Attacking Taiwan," *Kuang chiao ching* [Wide angle], 16 April 1996, No. 283, pp. 14-19. *Wide Angle* is a Hong Kong based publication with close links to the PLA. Li Xinyi, "On the Air Supremacy and Air Defense of Taiwan and China: Is Taiwan an 'Unsinkable Aircraft Carrier'?," *Taiwan de junbei* [Taiwan military preparations], 1 July 1996, pp. 11-18 (FBIS: FTS19971113000383). Li brags that the Taiwan Air Force would be brought to its knees in about 45 minutes. For a pitch against the U.S. invincibility, see Ying Nan, "Hangmu de biduan ji fanhangmu zuozhan" [Shortcomings of aircraft carriers and anti-carrier operations], *Xiandai junshi*, January 1998, pp. 13-15; in addition, see "U.S. Military Intervention in Cross-Strait Conflict Seen As Unlikely," *Taiwan de junbei*, 1 July 1996, pp. 76-79, (FBIS: FTS19971025000253) -CHI-97-302; and Su Qi, "Intervention in Taiwan Question Seen As Harmful to U.S. Interests," *Taiwan de junbei*, 1 July 1996, pp. 72-75 (FBIS: FTS19971025000252).

> We should fully utilize the enemy's fatal weakness of fighting an unjust war and combine military attack with deterrence of psychological warfare, sap the military's morale, disintegrate their will to fight, ignite the anti-war sentiment, among their citizens at home, heighten international and domestic conflict, weaken and sway the will to fight among its high level decision makers, and in turn lessen their superiority in military strength.[643]

Since the mid-1990s, the PLA has stepped up its psychological operations campaign against the Taiwan political and military leadership, and armed forces.[644] For example, the GSD and GPD in 1997 reportedly formed a special unit to examine methodologies to spark a "soldier's movement" (*bingyun*; 兵运) to gradually sap the morale of its armed forces and reduce confidence of the Taiwan people in its military. Beijing theoretically can encourage disputes within the military and damage its reputation. In theory, a fractious Taiwan military that is mistrusted by the people and civilian authorities would crumble after an initial shock.[645] PLA observers advocate forming a national-level psychological operations agency to develop and coordinate strategy, as well as a psychological warfare command directly subordinate to the Central Military Commission.[646]

According to sources in Taiwan, an important component of the PRC information operations campaign is intensified use of the PRC, Hong Kong, and Taiwan media to deceive and influence Taiwan's population. To assess the effectiveness of its information operations campaign, the PRC established a 24-hour "Taiwan Media Monitoring Center" in Spring 2002. The intent of this "media warfare" (*meiti zhan*; 媒体战) is to demoralize Taiwan's general population, the armed forces, and divide the island's domestic polity.[647]

In sum, the PRC views information operations as integral to a successful joint air campaign. Intelligence warfare, electronic warfare, and psychological operations are force multipliers that can enhance the effectiveness of air and missile operations. In

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[643] Yu Guohua, "NDU Officer on Weaker Force Achieving Victory in Local War," *Zhongguo junshi kexue* [China military science], 20 May 1996 (FBIS: FTS19960520000593).

[644] See for example, Yu Bo, "Taiwan No Match for Mainland," *Kuang chiao jing*, 16 December 1995, pp. 20-25 (FBIS: FTS19951216000024).

[645] "Official on PRC Plan To Incite Anti-Forces Movement," *Tzu-li wan pao*, 25 October 1997, p. 2 (FBIS: FTS19971027000258).

[646] Xu Hezhen, "Focus On Psychological War Under the Background of A Larger Military Strategy," *Zhongguo junshi kexue*, 20 October 2000, pp. 67-76 (FBIS: CPP20001211000122).

[647] Wu Ming-chieh: "Chinese Communists Use Taiwan Media To Manipulate Comments in Favor of China," *Tzu-yu shih-pao* (Taiwan) [Liberty times], 6 April 2002, p. 1 (FBIS: CPP20020408000020). Also see "Facing China's Fifth Column," *Taipei Times*, 1 December 2002 (internet version).

some cases, information operations by itself could, under certain circumstances, permit the successful attainment of limited political objectives. These capabilities are intended to confuse an adversary and increase the chances of strategic or operational surprise. From a psychological perspective, information operations can magnify the effects of air strikes with detrimental effects on an enemy leadership's morale and national will. To close the gap between aspirational doctrine and capabilities, the PRC is investing heavily into command automation, tactical data links, electronic attack, and space-based reconnaissance and communications systems.

COMPETITIVE AIR STRATEGIES IN THE TAIWAN STRAIT

Potential conflict in the Taiwan Strait has emerged as the primary scenario driving PLA doctrinal development and force modernization. This paper posits that future use of force in the Taiwan Strait likely would involve an effort to coerce, not to seize, and that airpower would be the principle tool of PRC coercion. The ultimate objective of any military action would be force Taiwan to the negotiating table on unification, or at least to deter further steps toward greater international autonomy.[648] Airpower likely would be the centerpiece of such a coercive campaign, with the struggle for air superiority potentially determining its ultimate outcome. Judgments about the chances for PRC political success are dependent upon a number of factors, including Taiwan's ability to deny the PLA the successful attainment of their campaign objectives. Some sources claim that the PRC leadership hopes to begin formal cross-Strait unification talks with Taiwan authorities within three years.[649]

Most analyses tend to examine prospects for an air war over the Taiwan Strait as one of attrition, with Taiwan denying the PLA air superiority for as long as two weeks. Taiwan pilots, equipped with more modern fighter aircraft and better training, are expected to engage the PLA in prolonged air-to-air combat. Assumptions upon which analyses are made include continuous source of tactical early warning, uninterrupted command and control, and unimpeded airbase operations. These assumptions, linked with PLA shortcomings in the areas of training, joint command and control, and logistics, and aging aircraft, lead analysts to conclude that the PLA is unlikely to win an air war over the Taiwan Strait.[650]

In reality, Taiwan may share with the PRC an intention to avoid fighting a war of attrition. The island's proximity to the mainland and lack of strategic depth, its relatively meager manpower and material resources, and inability to secure reliable allies besides

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[648] "PLA Making Preparations for War Against United States," *Ming pao*, 18 May 2000, p. A17 (FBIS: CPP20000518000041).

[649] "PRC Leaders Said To Want Talks With Taiwan in Three Years," *Ming pao*, 10 Mar 2000, p. B14 (FBIS: CPP20000310000037).

[650] Among the most detailed studies include David A. Shlapak, David T. Orletski, and Barry A. Wilson, *Dire Strait? Military Aspects of the China-Taiwan Confrontation and Options for U.S. Policy*, Santa Monica, CA: RAND, 2000.

the United States who would come to its aid in its hour of need are fundamental constraints on its military thinking. Taiwan can not permit itself to become involved in a draining war of attrition nor allow heavy fighting to take place on its territory. Either could spell the end of the Republic of China's political existence or, at a minimum, severely damage its economy, social fabric, and well-being of the entire population. Therefore, Taiwan's civilian leadership appears to have determined that any future conflict must be quick, and fought in the Taiwan Strait or on the mainland.

This section examines the potential PRC use of force in the Taiwan Strait, with airpower playing the central role, to achieve limited political objectives. The political basis for a potential conflict is outlined, as well as notional triggers and political end states. Following is a discussion of Taiwan's strategic centers of gravity that the PRC most likely would exploit to achieve its political objectives. The last section then outlines Taiwan's strategies to counter PRC coercion, including a shift in air strategy to expand the battlespace into Southeast China.

Political Basis for Conflict: Perceptions of "One China"

The "One-China" debate, a legacy from the Chinese Civil War from 1945 to 1949, has become the primary source of cross-Strait tension over the last 10 years. Before 1990, Taipei and Beijing adhered to the "One China" principle, but disagreed about which side had *de jure* sovereignty over that China. Beijing and Taipei rejected the notion of "two Chinas" and Taiwan independence. Taipei asserted that the Republic of China (ROC) had authority over all of China even though it was temporarily governing from Taiwan. Beijing claimed that the ROC's sovereignty over China was transferred to Beijing after the KMT lost the war and evacuated to Taiwan. From Beijing's perspective, the "one country, two systems" concept proposed by Deng Xiaoping in 1984 provides a fair and workable way for the two sides to institutionalize their relationship, requiring Taiwan only to acknowledge its status as a special administrative region of the PRC.

The 1988 election of the first Taiwanese president demonstrated the growing influence of the Taiwanese people and a break in the monopoly of power that ethnic Chinese held over the island since the late 1940s. Lee's election sparked a debate about the KMT's claim to sovereignty over the whole of China and Taiwan's status as a province of "One China." In 1991, Taiwan's National Unification Council, formed in part to address the "One China" issue, modified Taiwan's definition of "One China." The Council asserted that while "One China" meant that while the ROC had sovereign authority over all of China, Taipei had jurisdiction only over Taiwan, Penghu, Jinmen, and Matsu. The Council asserted that "both sides of the Strait agree there is only one China." However, the Council asserted for the first time that "China has been temporarily divided, and each side of the Strait is administered by a separate political entity."

Lee's assertion of "one divided China" sparked concerns in Beijing that he was taking Taiwan toward a position of "two Chinas," or "One China" and "One Taiwan." In November 1992, representatives from Taipei and Beijing met in Hong Kong to establish a framework for a meeting of the two sides' senior negotiators. Both sides also reached a consensus that there was "One China," but that each side would retain its own definition of what "One China" meant.

Throughout the 1990s, both sides refined their definition of "One China" in response to various events. After the 1993 meeting between senior negotiators from Beijing and Taipei, Taipei became concerned that Beijing's insistence that the PRC is "the sole legal government of China, enjoying and exercising sovereignty over the whole of China including Taiwan," denied the existence of the ROC and the reality of China's division. Jiang Zemin's 1995 "Eight Point" proposal involved an interim deal that would in effect freeze the status quo pending final agreement on terms for unification. However, Beijing's failure to allay Taipei's concerns over Beijing's insistence to assert PRC authority over Taiwan led Lee Teng-hui to underscore ROC "sovereignty and independence" by asserting in July 1999 that the two sides had "special state-to-state" relations and that Taipei's understanding of "One China" was that of a future democratic one China. Lee's remarks hardened Beijing's demand. In its February 2000 White Paper on Taiwan, Beijing asserted that Chinese sovereignty could not be divided or shared.

Since the election of President Chen Shui-bian in March 2000, both sides have harkened back to the 1992 consensus since it was the basis for the initial cross-Strait dialogue. However, both sides have altered their interpretation of that consensus in the intervening eight years. Taipei claims that both sides agreed in 1992 to separate interpretations of "One China." Beijing denies it ever agreed to the separate interpretation formula. Chen Shui-bian has called for the two sides to resume dialogue on the basis of the 1992 formulation, agreeing to disagree, with the meaning of "One China" being the subject of future discussion. Beijing has rejected this offer, but has moderated its response by publicly telling Taiwan and U.S. interlocutors that "Taiwan and the mainland are part of one China," but not mentioning the PRC.

Nevertheless, Beijing's assertion that the PRC maintains sovereignty over the whole of China, including Taiwan, and that Taiwan is a province of China, undercuts its efforts to persuade Taipei that it will treat it as an equal in negotiations. Chen's assertions in 2000 that "unification is not the only option" for Taiwan struck at Beijing's notion of "One China" and elevated Beijing's level of mistrust of the new President. The result has been continued stalemate. Taiwan does not rule out discussion of "one China." However, it does believe that acceptance of "one China" can not be a pre-condition for dialogue. Due to the perception that Taiwan is intentionally stonewalling on talks leading to unification, a number of sources indicate that an increasingly impatient segment of the PRC government desire to set a timetable for unification. The timeframe most often discussed is 2007.[651]

One should note that from Taiwan's perspective, there is no need to formally declare independence since Taiwan is already a sovereign entity. As Lee Teng-hui stated in July 1999, "Since we made our constitutional reforms in 1991, we have redefined cross Strait relations as nation-to-nation, or at least as special nation-to-nation relations. Under such special nation-to-nation relations, there is no longer any need to declare Taiwanese independence." Taiwan prefers to begin negotiations on more mundane

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[651]"Beijing Works Out Timetable for Resolving Taiwan Issue in Seven Years," *Ming pao*, 22 May 2000 (FBIS: CPP20000522000013).

issues such as fishing disputes to help build trust needed for political talks at a later stage.[652]

Triggers For Conflict and the Political End State

With the foregoing in mind, PRC use of force against Taiwan should be analyzed within the context of what it the desired end state or outcome. As National Defense University's Senior Colonel Wang Qingrong stated, "political considerations will define the nature of conflict in the Taiwan Strait."[653] The dispute over the definition of "One China," and Beijing's mistrust of Taipei's longer term intentions with regard to sovereignty issues and independence most likely would be at the root of any PRC use of force in the Taiwan Strait. Military action would be intended to deter steps toward greater autonomy or compel Taiwan's leadership to reverse a shift policy that has already taken place.

The PRC may seek a number of political outcomes in a conflict with Taiwan, each potentially requiring greater levels of violence. Among these, the PRC may seek to deter Taiwan from moving closer toward *de jure* independence or from taking any other action that the PRC perceives inimical to its interests. Limited use of force would be intended to demonstrate the consequences of a particular course of action. Should Taiwan overstep some ill-defined red line, the PRC may seek to coerce Taiwan into stepping back or reversing a particular policy. Today, every day, Beijing threatens the use of force against Taiwan as a means to deter the Taiwan leadership against further steps toward *de jure* independence. At some point in time, triggered by the crossing of some ill-defined red line or by some incident, Beijing may believe that it must compel Taipei into accepting Beijing's definition of "One China, negotiating a timetable for unification, or immediate political integration into the PRC. As prominent NDU scholar Senior Colonel Peng Guangqian asserted, PRC use of force may seek to "force Taiwan to accept talks on peaceful reunification."[654]

On the other hand, the political and military leadership in Beijing may have doubts about the viability of a coercive campaign and could seek the annihilation of Taiwan's political regime and physical occupation of island. An invasion would be the most difficult and costly option for the PRC, and there is significant debate regarding Beijing's ability to physically occupy the island. The Department of Defense asserted in 1999 that the PRC, if willing to accept high costs, would eventually prevail barring third party intervention. Other U.S. military authorities and think tank observers believe that the PLA does not have the ability to occupy the island due to geographical considerations.

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[652] "Taiwan Redefines China Relations," *Associated Press*, 10 July 1999.

[653] "PRC Military Scholars on Cross-Strait War, U.S. Intervention," *Sing tao jih pao*, 4 May 2000, p. A33 (FBIS: CPP20000504000024).

[654] "PRC Military Scholars on Cross-Strait War, U.S. Intervention," *Sing tao jih pao*, 4 May 2000, p. A33 (FBIS: CPP20000504000024).

PRC propaganda boasts that the PLA could physically occupy Taipei after only four or five days of armed conflict.[655]

Ambiguity surrounds the condition that would trigger the use of force. The February 2000 Taiwan White Paper outlined three conditions that could precipitate use of force include prolonged refusal to negotiate, foreign "invasion," and a declaration "in any name:"

> …if a grave turn of events occurs leading to the separation of Taiwan from China in any name, or if Taiwan is invaded and occupied by foreign countries, or if the Taiwan authorities refuse, *sine die*, the peaceful settlement of cross-Straits reunification through negotiations, then the Chinese Government will only be forced to adopt all drastic measures possible, including the use of force, to safeguard China's sovereignty and territorial integrity and fulfill the great cause of reunification.

Other sources of unknown reliability have speculated that more specific triggers include an explicit announcement establishing Taiwan as a sovereign state, amending the constitution to institutionalize the "Two State Theory," a national referendum on unification or Taiwan independence, establishing a formal defense alliance with a foreign country, attempts to institutionalize "One China, One Taiwan, or "Two Chinas" in international for a, formalizing "Taiwan independence" in culture, history, or ideology; prolonged refusal to enter into peaceful negotiations, importing "modern offensive weapons from Western countries," researching and developing weapons of mass destruction, or any action that turns Taiwan into a "strategic base of the West for containing China."[656]

Some sources indicate that the PRC has intensified planning for military action against Taiwan since at least 1993-1994 when a series of CMC documents allegedly concluded that Taiwan authorities had made a conscious decision to move gradually toward independence. Three key offices involved in developing military strategies directed against Taiwan include the General Staff Department, the Central Military Commission's General Office's Research Office, and the National Defense University's Military Strategy Research Office.[657] A number of sources indicate that Beijing has set

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[655] Ye Bian, "Beijing Press Article Says Taiwan Can Resist Only 5 Days in the Event of PLA Attack," *Guangzhou ribao*, 13 August 1999 (FBIS: FTS19990813000014).

[656] Wen Jen, "Zhang Wannian Expounds Eight Forms of Taiwan Independence," *Tai yang pao*, 29 April 2000 (in FBIS: 29 April 2000).

[657] Tseng Hui-yen, "Beijing Regards U.S. as Obstacle To Reunification," *Lienho pao*, 21 October 1994 (FBIS). The CMC General Office is perhaps the most important entity involved in the development of national military strategy and policy, including strategic deception. The General Office is directed by Lieutenant General Dong Liangju. A large number of the General Office's key strategists, including SrCol Hu Hanlin (CMC Research Office Director), Senior Colonel Wang Guanzhong (CMC Research Office Deputy Director), Colonel Li Jiang, Colonel Zhang Haiyan, Colonel Gan Qianjin, have cycled through the United States on private exchange programs. The GSD General Office, directed by Major General Li Yu, likely has a similar strategy function.

an internal timetable for unification, generally set in the 2005-2007 timeframe.[658] In late May 2000, Hong Kong sources indicate that the CMC held an operational planning meeting in Xishan in late May 2000 to examine options for a coercive strike campaign that includes multi-wave attacks using Second Artillery, PLAAF, and Navy assets. According to one Hong Kong journal of unknown reliability, more than 200 targets have been proposed, including military facilities, command centers, ports, airports, highways and other transportation lines, communications and power facilities.[659] In addition to stemming Taiwan's drift toward greater autonomy, there may be some who believe that a coercive air campaign could appeal to domestic audiences as well. Prominent Taiwan analysts believe that tensions within the PRC leadership could prompt a crisis as a means to divert attention from internal problems, including state enterprise reform, inflation, the rising consumer index, the Falun Gong sect, unemployment, and demonstrations.[660]

Taiwan's Strategic Centers Of Gravity

PRC use of force against Taiwan likely would be concentrated to achieve maximum results at the lowest possible cost. Defense establishments around the world generally establish targeting priorities through an analysis of enemy centers of gravity, a methodology useful for economizing the use of force. At the operational level, the PLA analyzes centers of gravity in terms of critical nodes (*guanjie*; 关节) or single points of failure that could paralyze an entire system. Key features of a center of gravity are its importance to the enemy's ability to wage war, its importance to the enemy's motivation and willingness to wage war, its importance to the enemy political body, population, and armed forces, and the enemy's consciousness of these factors.

PRC military action would be directed against the Taiwan leadership as a means to affect policymakers. The primary strategic center of gravity in a coercive campaign is the opposing leadership. Coercive force is used to affect the amorphous and unquantifiable variable of national will, morale, and resolve, or through manipulating a leadership's decision calculus by ensuring he understands that the costs of continuing a particular course of action outweigh the benefits. The challenge is to shatter the will and morale of an opponent or affect his decision calculus.[661]

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[658] Kuang Tung-chou, "Keep Initiative in One's Own Hands and Compel Taiwan To Submit; Beijing Sets Timetable for Cross-Strait Reunification," *Sing tao jih pao* (Hong Kong), 15 November 1999, p. A1 (FBIS: FTS19991115000215).

[659] Wen Jen, "PLA Deliberates Military Tactics Against Taiwan," *Tai yang pao*, 5 June 2000 (FBIS: CPP20000605000009).

[660] "Divisions in China Cast Uncertainty over Taiwan Policy," *China Times*, 8 May 2000.

[661] This analytical framework for strategic centers of gravity is a modification of a concept outline by Phillip Meilinger's "Air Strategy: Targeting for Effect," *Airpower Journal*, Winter 1999 (electronic version).

Morale is a fuzzy term, but generally it refers to individual or collective attitude. Morale at the strategic level refers to the leadership's will to resist. Morale, and thus the will of the leadership, could be affected by focusing on specific target sets. Unity of purpose and maintenance of discipline within the leadership, when faced with extreme challenges, is important in resisting coercion. After people have lost confidence in their leadership's ability to govern, in their own abilities, and in their ability to contribute to the war effort, they may cease supporting the leadership's efforts. Direct targeting of national will is difficult. However, national will could be affected by undermining secondary centers of gravity.[662]

One of the Taiwan leadership's greatest concerns is maintenance of national will and psychological security.[663] Taiwan's national resolve could be affected in a number of ways, including targeting its international support, undercutting or denying its military capabilities, sparking a severe downturn in economic health, sowing dissent within the domestic polity, or physical neutralization of Taiwan's political leadership. These actions would be intended to raise the costs to Taiwan's political and military leadership of continuing a particular course of action. Such measures could directly prompt Taiwan's leadership to accede to Beijing's demands or reduce civilian morale sufficient to foment a political movement to remove the regime or force concessions.

The leadership can be targeted directly, both physically and psychologically, through airpower or other means. However, more often than not, compelling a shift in national policy requires manipulating secondary centers of gravity to effect a second order change. In Taiwan's case, there are at least four secondary centers of gravity that could be manipulated to affect the decision making of the leadership: (1) international support, (2) the economy, (3) the domestic political opposition, and (4) its national security apparatus, including the armed forces and internal security organs. All four are interrelated in that the PLA use of force to manipulate one can have a positive or negative effect on another. For example, PRC manipulation of Taiwan's economy may strengthen political opposition to the Taiwan's ruling regime or diminish international support. Demonstrating the inability of Taiwan's military to defend the island could directly affect the national policymakers' decision calculus, have negative repercussions on Taiwan's economy or strengthen anti-regime sentiment that could force a change in policy.

There are multiple means to affect each secondary center of gravity, including military force, economic and political means, and informational measures.[664] A

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[662] See Eric Ash, "Terror Targeting: The Morale of the Story," *Airpower Journal* (internet version), Winter 1999.

[663] "PLA Making Preparations for War Against United States," *Ming pao*, 18 May 2000, p. A17 (FBIS: CPP20000518000041); "Editor's Comments: Where is the Psychological TMD?," *Chien tuan k'o chi* [Defense technology monthly], 1 March 1999, p. 3 (FBIS: FTS19990326000918).

[664] Informational measures include propaganda that could influence the economy, belief the in viability of Taiwan's deterrent capabilities, or degree of international support. Taiwan is subjected to PRC propaganda on almost a daily basis. Informational measures could also include deception intended to undermine regime support.

diminishment of international support may influence the economy, spark greater political opposition, or affect military capabilities. A domestic political struggle could reduce or complicate international support. There is a range of means the PRC could use to influence Taiwan national policymakers and manipulate Taiwan's secondary centers of gravity. However, this paper focuses on one specific aspect: aerospace power, specifically and air and missile and/or information operations campaign, as a means to directly affect primary and secondary centers of gravity.

Targeting International Support

International support perhaps is Taiwan's most important secondary strategic center of gravity. International support has long been one of Taiwan's strategic centers of gravity and the target of PRC foreign policy through political coercion, intimidation, and creation of economic incentives. Taipei and Beijing both understand the intimate relationship between international support and Taiwan's national policymaking. Fundamental to PRC national strategy, Beijing uses informational and diplomatic means to reduce international support for Taipei. As demonstrated in the 1996 Taiwan Strait crisis, international support in deterring and defeating PRC use of force is crucial. International support shores up morale and national will, and strengthens other secondary centers of gravity. Foreign support could restore investor confidence in the economy, reduce domestic political opposition by a clear demonstration of support to the leadership, and provide the armed forces with weapon systems, training, and intelligence needed to counter a PRC military operation. The United States in particular has been the focus of PRC efforts. As a prominent Hong Kong journal notes:

> CPC leaders have repeatedly stressed that the key to the Taiwan issue is the United States, and that once China finds a trump card against the United States, the Taiwan issue can be readily resolved, and the resolution will not be far off.[665]

For a range of reasons, Taiwan may seek to decrease its dependence on external sources of support by enhancing its ability to conduct a counter-coercion campaign. The perceived U.S. drift since 1997 toward the establishment of a "constructive strategic partnership" with the PRC resulted in a significant reduction in Taiwan confidence in the United States as the ultimate arbiter of its fate. Arms sales not only enhance Taiwan's military capabilities, but also serve as a visible manifestation of U.S. support for peaceful resolution of differences between the two sides of the Taiwan Strait.

Targeting the Economy

The economy is another critical secondary center of gravity. Taiwan's economic power represents the vitality of the leadership and has earned Taiwan the respect of the

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[665] "PLA Making Preparations for War Against United States," *Ming pao*, 18 May 2000, A17 (FBIS: CPP20000518000041).

international community. Disrupting Taiwan's economic institutions – banks, stock exchange, trading houses, and commodity exchange—could reduce the overall economic power of the island and influence policies of the regime. Disruptions could weaken the political base of a leader and force him or her to be more responsive to external influence.[666]

Aerospace power could affect Taiwan's economy through electronic attack or physical destruction. Air or missile strikes could be used for manipulation of the stock market, to target critical industries and infrastructure, or to support an air or maritime blockade. Targeting of the economy can influence domestic political opposition, international support, or Taiwan's military readiness. Attacks against economic targets could affect Taiwan's ability to support defense modernization and spark political opposition to the ruling elite. Isolating Taiwan or creating a more threatening environment through deterrence operations may make it a less attractive home for foreign investment. Other means to affect economy besides airpower including freezing of assets on mainland or establishment of a maritime blockade.

Some PLA analysts have included economic centers on their target lists. However, striking economic targets, particularly integrated circuit production facilities in Xinzhu, carries a significant degree of economic and political risk. Chinese attempts to damage the factories or supply lines of Taiwan companies like Acer, Quanta Computer and Taiwan Semiconductor Manufacturing would be an indirect but potentially lethal hit against giant U.S. firms, including IBM, Dell Computer, Hewlett-Packard and Cisco Systems, that rely on Taiwan for manufacturing services and components.[667] Due to the increasing interdependency of cross-Strait economies, direct strikes that result in physical damage to may have long lasting effects on the PRC economy.

Targeting Political Opposition

Targeting of political opposition as a means to force a change in policy is another approach. Manipulation of opposing political groups can target unity of purpose and collective confidence in the leadership. At a minimum, there are indications that Taipei is concerned that some domestic groups could resort to violence to force the government to submit to Beijing's demands after initial air strikes. Such a scenario was part of a drill

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[666] For an excellent overview on the targeting economies as a means of coercion, see Dr. H. David Arnold, "Economic Warfare: Targeting Financial Systems As Centers of Gravity," in Dr. Karl P. Magyar, *Challenge and Response: Anticipating US Military Concerns*, Maxwell AFB: Air University Press, 1994, pp. 345-362.

[667] See Craig Addison, "A 'Silicon Shield' Protects Taiwan from China," *International Herald Tribune*, 29 September 2000. While officers in the Chinese armed forces may not realize that taking out a Taiwan semiconductor wafer fabrication plant would soon undermine the global computer supply chain, President Jiang Zemin of China must know that it will. Trained as an engineer, he served as minister of electronics during the early 1980s. His son, Jiang Mianheng, is a partner in a wafer fabrication project in Shanghai with Winston Wang of Taiwan's Grace T.H.W. Group.

held in Xinzhu in August 2000.[668] However, a coup is of sufficient concern that a disgruntled stock investor reportedly was arrested in December 2000 for spreading rumors in April 2000 of a military takeover in order to drive the stock market down.[669]

PRC-affiliated spokesmen cast doubt on the Taiwan military's loyalty to the current regime and on their willingness to support any move toward *de jure* independence. Noting the military's dominance by mainlanders and long affiliation with the KMT, PRC observers note DPP anxiety over the military that will constrain on any latent tendency toward a Taiwanese state.[670] PRC affiliated writings generally assess Taiwan military morale to be low, questioning their loyalty and motives. PRC observers believe that the primary source of morale in the Taiwan Armed Forces is foreign support in the form of arms sales. Citing the armed forces' traditional opposition to Taiwanese separatist policies, one PLA-affiliated journal notes:

> Officers and men are in ideological chaos, shaken in their faith. Faced with the Taiwan authorities separating China and pandering to "Taiwan independence," and the infiltration into the military of Taiwan social phenomena such as rampant corruption and syndicate money politics, the officers and men in the Taiwan armed forces are generally confused about "just who and what they are fighting for."[671]

Manipulation of opposing political elites in Taiwan through airpower could be carried through physical punishment of general or selected portions of population, an information operations campaign in support of opposition, or through direct support of opposing political/military elements. At least one media report indicated that prolonged refusal to accept the "one-China" principle will precipitate the use of force with southern Taiwan bearing the brunt of destruction since it has traditionally been pro-independence.[672]

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[668] Fang Wen-hung, "Military Holds Air Defense Drill in Northern Taiwan," *Central News Agency*, 15 August 2000 (FBIS: CPP20000815000072).

[669] "Taiwan Man Accused Of Spreading Coup Rumors To Rattle Stock Market," *China Post*, 20 December 2000.

[670] Long Shui, "Chen Shui-bian's Real Purpose in 'Reviewing Troops," *Wen wei po*, 17 June 2000 (FBIS: CPP20000617000009).

[671] Yueh Ming: "In a Cross-Strait War, How Long Could the Taiwan Military Hold Out?," *Kuang chiao ching*, 16 September 1999, No. 324, pp. 39-41 (FBIS: FTS19991102000252). Eighty percent of Taiwan's population are Taiwanese whose ancestors migrated from the mainland during the Ming and Qing dynasties. Mainlanders, who make up an estimated 20 percent of the Taiwan population, sought refuge on the island during the closing months of the Chinese Civil War. Naturally, mainlanders tend to be more supportive of "One China," while Taiwanese tend to feel less affiliation with the mainland. Eighty percent of Taiwan's military officers were either born on the mainland or were born to mainland parents.

[672] "PRC 'Expert' On China's Use of Force Against Taiwan," *Ming pao*, 2 April 2000 (FBIS: CPP20000403000010). The 'expert' is Xin Qi from the Peace and Development Research Center.

Targeting the Armed Forces and Security Apparatus

The most relevant secondary center of gravity for the purposes of this study is the role of airpower in undercutting Taiwan's military strategy for defense of the island. PLA writings indicate a prominent role for airpower in suppressing enemy air defenses, counter command and control, information dominance, and strategic and operational interdiction. Most PLA writings point toward almost exclusive targeting of armed forces. Occasional anecdotal references emerge regarding targeting of economic facilities or political centers. Taiwan military observers believe the shock effects of a sudden military campaign can be significant. As Pan Jiayu, an instructor at Taiwan's National Defense University notes:

> If the cross-strait deadlock is not resolved and results in Chinese communists' use of force against Taiwan, the Chinese communists would resort to "no-contact warfare" (*bujiechu zhan*; 不接触战), using guided missiles, long-range rockets, electronic interference, special operations, armed fishing boats, advance infiltration and espionage activities, and other means to launch sudden attacks on our airports, harbors, radar stations, and missile bases and paralyze our air defense system in order to gain air control. They would then use their powerful groups of planes to attack the Taiwan island and destroy our command, control, communications, and information facilities, the remaining sea and air combat force, and air warning systems, and would continue their air attacks to force our side to surrender, thus achieving their political and military purposes.[673]

PLA target sets would be identified in the campaign determination (*juexin*). Targets are important to analyze since they in large part determine strategies intended to achieve political and military objectives. According to the Nanjing Military Region Headquarters Department:

> Determination of target sets must be in accordance with requirements stemming from the political struggle, must realize campaign objectives, and must achieve decisive effects. In terms of military considerations, most important is to shock the enemy economic and political infrastructure to create a comprehensive and devastating effect.[674]

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[673] "US Said Powerless To Rescue Taiwan If PRC Attacks," *Tzu-li wan-pao*, 8 December 1999, p. 2 (FBIS: FTS19991215000245).

[674] "Denglu zhanyi de tedian yu yaoqiu" [Special characteristics and demands of landing operations], *Zhanyi lilun yanjiu*, pp. 151-157. The article was authored by the Nanjing Military Region Headquarters Department.

Based on a broad survey of PRC literature, PLA air, missile, and electronic attack assets during the initial phase of a campaign appear to be focused on six key target sets: (1) military command and control centers, (2) early warning facilities, (3) communications facilities, (4) ground based air defense, (5) air bases, and (6) surface-to-surface missile sites. Important but lesser priorities appear to include naval bases, electrical power grids, and logistics centers, particularly POL facilities. In subsequent phases of a campaign, other targets, including maritime reconnaissance and missile sites and transportation nodes, assume a greater importance. Some PRC planners outline different classes of targets: (1) command and control systems, including command centers, communications nodes, and radar/intelligence sites, (2) transport facilities, including rail lines, airfields, and ports, (3) support systems such as power generation, petroleum, foodstuffs, and logistics centers, (4) personnel, including the general population, and (5) weak spots within deployed forces.[675] Taiwan media sources expect that key targets in a PLA air campaign would include the following, in order of priority:[676]

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[675] Zhang Shiping, "Lianhe zhanyi zhihui ruogan wenti chuyi" [Proposals on the backbone of joint campaign command], *Zuozhan zhihui yanjiu*, pp. 61-67. Zhang is from AMS Campaign Tactics Department.

[676] Zhang Lide, "Woguo goujian feidan fangyu yu yuanju gongji feidan xitong de pinggu" [Analysis of Taiwan's missile defense and long range attack missile systems], in *Jianduan keji* [Defense technology], March 2000, pp. 54-67.

Priority	Target Set	Specifics
1	Governmental Nodes	Presidential Palace; Executive Yuan
2	Critical Military Nodes	Ministry of National Defense; Armed Services General Departments; Hengshan and other command centers
3	Radar Sites and Key Communication Centers	Approx 10 key air and maritime radar sites, including Songshan, Leshan, and Dahanshan.
4	Military Airbases	Airbases with 2nd-generation fighters, including Xinzhu, Qingquangang (CCK), Jiayi, Tainan, Hualian, and Jiashan Airbases will take priority. Songshan and Pingdong Airbases would also be included in first strike.
5	Ground-Based Air Defenses	Most important will be the six Tiangong sites, and any future missile defense assets
6	Key Military Ports	Zuoying, Penghu, Jilong, and Su'ao
7	POL Facilities	Gaoxiong, Dalin, Taoyuan, and Jiayi oil refineries; and military fuel storage sites
8	National Electrical Power Grid	Various
9	National Communications Switching Centers	Various
10	Large Reservoirs	Feizui Reservoir; Shimen Reservoir; Zengwen Reservoir

Table 7.1 Key Targets in a PLA Air Campaign

Command and Control. Command is the most fundamental requirement of military operations. Without effective command, a military organization is nothing more than a rabble. Destruction or paralysis of any level of command can have serious or fatal effect on its subordinate elements. Obviously, command, along with its associated intelligence and communications functions, is a standard operational center of gravity, and has been so since ancient times. The key challenge is locating the key command facilities that contain not only the commander, but also perhaps more importantly, the staff supporting the conduct of military operations.

As a modern democratic society, Taiwan's critical command facilities have become of topic of widespread media coverage. Taiwan and PRC media sources have highlighted Hengshan Underground Command Center as Taiwan's perhaps most prominent command facility. In addition to the national political leadership, including the President, Premier, and Minister of Defense, press reports note that Hengshan houses the Tri-Service Command, and the Hengshan Command and Control System, which includes the Navy's Dacheng sub-system, the Air Force's Qiangwang sub-system, and the Army's Lu'zi sub-system. Under the Brotherhood Project, initiated in 1993, there are allegedly plans to establish a Dazhi Strategic District that will house the Ministry of National Defense and a staff of 5000-6000 individuals in the vicinity of the Hengshan Command Center. The Taiwan media notes that the program is slated for completion in 2003.[677]

Early Warning and Intelligence Facilities. The PRC intends to suppress, confuse, or destroy the sources of information upon which command elements would depend. Early warning is crucial to assess the nature of impending attack, alert the national leadership to enable them to make a decision on the course of action, alert air defense forces, adjust rules of engagement, alert air bases so aircraft can be flushed, and warn the civilian population. Negation of Taiwan's early warning capability likely would be considered critical to the success of an air campaign. Signals intelligence facilities are a particularly important source of early warning information on PRC military activity in Southeast China. According to Desmond Ball, a prominent Australian defense analyst, Taiwan's largest SIGINT facility is located at Linkou, some 20 kilometers northwest of Taipei. Electronic intelligence activities are focused on production and maintenance of a comprehensive and detailed catalog of electronic order of battle, including the technical characteristics of radar systems, navigational beacons, fire control systems, and electronic warfare equipment.[678]

Communications Facilities. Attacks on government communications systems can accelerate a breakdown of political and military efficiency and reduce the high level of communication that is normally needed to direct operations from the strategic (civilian) and theater level. Disruption of strategic communications would impede the ability of the Taiwan's national political leadership to reassure the population or to orchestrate civil support to military operations. Strikes against the military communications system can force airbases and other tactical units to operate autonomously. The implication is that a

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[677] Xu Hong, "Taijun dasuan taiwanban dixia 'Wujiao dasha' " [Taiwan's military plans to establish underground 'Pentagon'], *Quanqiu shibao* [World news], 15 September 2000. Also see Lou Chao-lung, "The Hengshan Command Post: A Key Position From Which To Defeat The Enemy," *Chung-kuo shih-pao*, 8 September 2000 (FBIS: FTS19990923001655); and Brian Hsu, "Air Force Shows Off Command Centers," *Taipei Times*, 8 September 2000. According to *Janes Defense Weekly*, the Qiangwang, or Strong Net air defense network, includes four Control and Reporting Centers, and is controlled by the Taiwan Air Force's Kungkuan Anti-Aircraft Operations Center in Taipei. Over the next 5-10 years, the Qiangwang system will be supplemented by long range UHF early warning radars. See Wendell Minnick, "Taiwan Targets $30 Million for Radar Upgrades," *Jane's Defense Weekly*, 6 November 2000.

[678] Desmond Ball, "Signals Intelligence in Taiwan," *Jane's Intelligence Review*, 1 November 1995.

base would have to deal with a national threat with only local information. Pilots would take off without the benefit from the national air defense system. In addition, management of defensive operations at the theater level requires significant coordination to ensure that logistics, firepower, communications, electronic warfare, intelligence, and deception comes together at the right time and place.[679]

Ground-Based Air Defenses. PLA writings clearly indicate that they believe that Taiwan air defenses are significant and must be neutralized. PLA writings indicate at four key methodologies to suppress enemy air defenses, including theater ballistic and land attack cruise missiles, electronic attack, anti-radiation missiles, and special forces. Ballistic missiles, equipped with submunition payloads, are viewed as perhaps the most important means to neutralize ground based air defenses. Taiwan's overall air defense architecture consists of three PATRIOT fire units positioned around Taipei, and six Tiangong I and Tiangong II fire units to counter medium- and high-altitude targets.[680] Taiwan is also said to be equipped with 20 Improved HAWK fire units.[681]

Airbases. Because destroying aircraft in the air is the least efficient means of gaining air superiority, attacks against airbases traditionally have been among the most important targets for an offensive air campaign. Airbases are attractive targets, combining high strategic and monetary value with a large number of vulnerabilities. Airfields are said to be easy to attack and damage, but keeping them closed requires repeated and continual attacks, assuming the defender has a strong airfield recovery capability. Light, one time attacks probably will not eliminate an airfield, but may, for a limited period, keep its aircraft on the ground. Because their supply is limited and fragile, pilots or highly skilled maintenance technicians can be as valuable of a target as the aircraft themselves. Runways are another key target, although they generally will have only temporary effects. Striking runways may be necessary to shut down an airfield or fix an adversary in place for a short period of time.[682]

According to media reporting, Taiwan's ability to sustain operations after initial strikes depends on two underground complexes on the west coast. The first is an underground aircraft storage facility at Jiashan, in eastern Taiwan adjacent to Hualian Airbase. The Jiashan base, which took roughly eight years and more than NT$27 billion

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[679] For a discussion of the implications of strikes against the national telecommunications infrastructure, see Warden, pp. 150-161.

[680] The six TK fire units are located at Gaoxiong, Linyuan, Penghu, Sanzhi, Taizhong, and Dongyin. "ROC Completes Missile Deployment On Outlying Islands," *Taiwan Central News Agency*, 11 August 1999.

[681] Zhang Lide, "Woguo goujian feidan fangyu yu yuanju gongji feidan xitong de pinggu" [Analysis of Taiwan's missile defense and long range attack missile systems]," in *Jianduan keji* [Defense technology], March 2000, pp. 54-67.

[682] Under ideal circumstances, airfield attacks can be dramatic. For example, Germany destroyed more than 4000 Russian aircraft on the ground between 22-30 June 1941 with less than 1400 fighters and bombers. During the 1967 Arab-Israeli war, the Israeli Air Force destroyed the almost 400 Arab aircraft on the ground in less than two days.

to build, was one of the military's largest engineering projects in recent decades. Its construction spanned from 1985 to 1993. The base reportedly is able to accommodate roughly 200 fighter planes. It was designed to preserve the combat strength of the air force in the event of a first strike by the enemy.[683] A second underground aircraft shelter is located in a hollowed out mountain near Taidong on Taiwan's southeastern coast. The underground facility, which began operations in 1993, supports operations at Chihhang airbase.[684]

Surface-to-Surface Missile Sites. Writings from China's defense industrial complex have expressed concern regarding the existence in Taiwan of theater ballistic, and in the future, land attack cruise missiles. However, there is little evidence that Taiwan possesses ballistic missiles at the current time.

National Electric Power. Some PRC sources stress the targeting of Taiwan's national electric power. Strikes against electric power generally are intended to affect national morale or military operations. Influencing an opposing political leadership by depriving it of electricity is usually associated with coercive strategies, specifically denial if the intent is to force military units to back up power supplies, punishment if the intent is to create hardship for the general populace, or strategic paralysis if the intent is to undercut the effective functioning of the government. Striking power facilities may create temporary confusion. Attacking national electric power systems requires a significant degree of intelligence information, which the PRC presumably possesses. Strikes can be directed against various subsystems, including the turbines or generators that produce electricity, the fuel upon which the generators rely; the transmission system that carries the power from one part of the island to the next, or the control systems that manage the distribution of power. Strikes against nuclear or hydro-electrical plants are accompanied by significant political baggage.[685]

Some sources assert that the PRC most likely would avoid physical destruction of Taiwan's national electric system, and would opt for computer network attack, since loss of power could have negative repercussions for the economy. Taiwan's national electric power system has demonstrated vulnerability to disruption at least twice in the last three years. In early October 2000, Zhang Wannian was alleged to have stated that airpower was to play a central role in first paralyzing power generation. Taiwan's nuclear power facilities would be avoided.[686]

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[683] Chong-Pin Lin, "The Military Balance in the Taiwan Strait," *The China Quarterly*, 1996, p. 579; Brian Hsu, "Chen Visits Mountain Air Force Base," *Taipei Times*, 15 December 2000 (internet version).

[684] Brian Hsu, "Air Force Shows Off Top Secret Base," *Taipei Times*, 11 January 2001.

[685] Thomas Griffith, Jr., "Strategic Attack of National Electric Systems," thesis presented to the faculty of the School of Advanced Airpower Studies, Air University Press, Maxwell AFB, Alabama, October 1994.

[686] "Zhang Wannian Says There Will Be War in Taiwan Strait in 5 Years," *Tung fang jih pao,* 19 November 2000, p. A7 (FBIS: CPP20001120000091).

POL Facilities. PLA-affiliated writings note that POL is a critical vulnerability of Taiwan's.[687] Taiwan's oil reserves are relatively limited. Governmental regulations require that the China Petroleum Corporation maintain a 60-day reserve. However, only 36 days of crude oil reserves are held due to low-turn over of available storage tanks. Taiwan relies on external sources for 95 percent of its fuel supply, with only two ports, Gaoxiong and Jilong, accounting for 95 percent of the flow. Strikes against the storage facilities themselves or against the pipelines that transfer the POL to other parts of the island could be targets for PLA air, missile, or special operations attacks. Oil could also be cut off as a result of a blockade.[688] Airfields generally maintain their own fuel storage facilities, often enough to sustain 30 days of operations. Because fuel storage tanks are normally hardened, air or missile strikes can target other vulnerable parts of the fuel chain, including the pump house, computerized control facilities, or the electric power supply that support fuel pumps.[689]

Reservoirs. Targeting of reservoirs can increase pressure on the general population and thus the central government. The Feizui Reservoir is the primary source of drinking water for the greater Taipei area. Robbing Taipei, or others parts of Taiwan, of potable water can increase stress on the general population and add pressure on the central government to meet the people's general need for basic essentials.

THE TAIWAN COUNTER-COERCIVE CAMPAIGN

Academic]observers in Taiwan understand the PRC is moving increasingly toward a coercive strategy involving a minimal use of force to achieve their political objectives. Analysts assert that Taiwan's populace, and more importantly the national leadership, is vulnerable to coercive military operations. Casting doubt on the PLA's ability to sustain a war of attrition, some believe that the PLA is adopting a force capable of rapid victory but at minimum cost. Taiwan military observers have noted PRC inclinations toward minimalist solutions, with a basic precept being "military operations without bloodshed; if bloodshed is necessary, it should be limited to combatants; and if civilian casualties are inevitable, they should be kept to a minimum." "Blood-free" options include a long-range blockade of Taiwan's SLOCs and a high altitude electromagnetic pulse burst

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[687] See, for example, "Taiwan Lacks Resources for War," *Taiwan de junbei*, 1 July 1996, pp. 30-31 (FBIS: FTS19980103000112).

[688] See Chien Cheng, "High Tech War Preparations of the PLA: Taking Taiwan Without Bloodshed," *Taiwan Defense Affairs,* Vol. 1, pp. 156-157. Chien is a security specialist at the National Tsing Hua University; also see "Taiwan No Match for Mainland in War," *Zhongguo xinwenshe*, 2 September 99 (FBIS: FTS19990903000014).

[689] Scott E. Wuesthoff, *The Utility Of Targeting The Petroleum-Based Sector Of A Nation's Economic Infrastructure*, Maxwell AFB: Air University Press, 1994.

several tens of kilometers above Taiwan.[690] Former NSC Advisor and current Vice Minister of Defense Lin Chong-pin notes:

> Beijing will reject the use of nuclear weapons, avoid city-destroying attacks with indiscriminate conventional weapons and use harassment tactics or unorthodox measures that are psychologically overbearing yet physically non-damaging.[691]

In the face of PRC use of force, ultimately Taiwan's President, in consultation with key advisors, would determine what change in policy, if any, would be required. Current President Chen Shui-bian is a member of the Democratic Progressive Party. Early in his career, Chen advocated Taiwan independence, but has adopted a more moderate policy since assuming a position of responsibility. He has been toughened by time in prison and the maiming of his wife, allegedly by radical elements within the KMT. Since becoming President, Chen has established a solid working relationship with the defense establishment, an organization that previously had been dominated by the KMT.

Chen's key advisors include personal staff in the Office of the President, members of the National Security Council, National Security Bureau, the Mainland Affairs Council, the Ministry of National Defense, and other key members of the Cabinet. How the President would organize a crisis response team is an unknown variable. Groups that make key decisions in a crisis situation are usually limited in size – between 12-20 people. Theoretical studies have indicated that members of a small group of decision makers often share an illusion of invulnerability that may encourage extreme risk taking behavior.[692]

The susceptibility of Taiwan's leadership to coercion is dependent upon a number of factors. Perhaps most important is Taiwan's ability to survive initial strikes, reconstitute an operational capability, deny or reduce the PLA's capacity for offensive operations, and increase the PRC's willingness to negotiate on terms more favorable to Taipei. This would include undercutting PLA's ability to project force through passive means, striking directly at PLA power projection at its source, and/or raising the costs of PLA action through attrition. Such an effort, combined with other instruments of national power, would be intended to raise the costs of PLA military action and force a negotiated settlement on favorable terms as soon as possible, and before escalation of the conflict. The PLA guiding strategy of "rapid war, rapid resolution" increases Taiwan's requirement to conduct operations without the help of the international community.

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[690] Chung Chien, "High Tech War Preparation of the PLA: Taking Taiwan Without Bloodshed," *Taiwan Defense Affairs*, October 2000, pp. 141-163.

[691] Chong-Pin Lin, "The Military Balance in the Taiwan Strait," *The China Quarterly*, 1996.

[692] Irving Janis, *Victims of Groupthink*, Boston: Houghton Mifflin, 1972, pp. 197-199.

Taiwan's Evolving Strategy

The PRC's growing arsenal of theater ballistic and land attack cruise missiles, conventional airpower, and information operations as its principle tool of military coercion naturally is prompting Taiwan to develop countermeasures. Over the last few years, a growing number of observers have called for a more active approach to defense to complicate PRC objectives. Many in Taiwan have realized that exclusive reliance on defensive counter air operations forces Taiwan toward an attrition strategy in which the chances of success are slim, barring third party intervention. Some sources indicate that Taiwan has long been prepared to retaliate for any attack on Taiwan and the off-shore islands. For example, during the March 1996 crisis, Taiwan's leadership communicated to U.S. interlocutors their intent to strike a range of air bases, missile bases, radar installations, and supply depots with indigenous fighters and tactical missiles.[693]

Taiwan's strategy to defend against PRC military action has evolved over the last forty years. From the early 1950s to the mid-1960s, Taiwan's primary strategic objective was recovery of the mainland, and was therefore strategically offensive in nature. From the mid-1960s, Taiwan shifted toward a defensive strategy, but retained a strong strategic offensive component that could return to the mainland should there be a popular uprising that required Taiwan forces for a final decisive blow to rid China of the communist regime. By the early 1980s, after dissolution of the Mutual Defense Treaty with the United States, Taiwan was forced to adopt an exclusively defensive posture that did not assume U.S. intervention. Through a policy of strategic endurance (*zhanlüe chijiu*; 战略持久), Taiwan has sought to hold out as long as possible, attriting PLA forces to the maximum degree possible to delay their advance. Such a strategy requires gradual attrition of air and naval assets to slow cross-Strait amphibious invasion forces. Once the PLA disembarks at landing zones, the Taiwan Army, supported by air and naval assets, would crush opposing forces. [694]

The civilian and military leadership in Taipei understands that engaging in a war of attrition with the PLA through an exclusively defensive counter air campaign is a losing proposition. Such an approach ensures loss of air superiority – the only question would be how long Taiwan could deny the PLAAF command of the skies. After loss of air superiority, the Taiwan political leadership would be faced with a limited number of choices, including acceding to PRC demands, negotiating a settlement more favorable to Taiwan's interests, or continuing to resist in the hope of defeating a PRC amphibious invasion, or, if necessary, third party intervention.

A number of trends are forcing Taiwan toward a defensive strategy that contains a limited offensive element to deter PRC use of force and, if necessary, deny or at least complicate execution of a PRC coercive air campaign. The Taiwan Air Force has studied

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[693] Patrick Tyler, *A Great Wall: An Investigative History*, New York: Century Foundation Books, 1999, p. 23.

[694] Lung Hsiang, "There Are Many Blind Areas in Taiwan's Security Strategy," *Ta kung pao*, 28 December 1998, p. A2 (FBIS: FTS20000113000873). Also see *The Republic of China Yearbook*, Taipei: Government Information Office, 1999, p. 128.

Western airpower concepts. In classical land warfare, the defense generally has the advantage. In air warfare, the opposite is true, particularly given trends in the accuracy and lethal of conventional ballistic missiles. As John Warden noted in his landmark 1988 book *The Air Campaign*, if one adopts a purely defensive strategy, the key to not losing is to inflict enough damage on the enemy that he becomes unwilling or unable to pay the price. The goal then is to impose heavy losses on an attacking enemy in as short as time as possible, done through concentration of forces in a particular sector to meet the enemy force with superior strength. Exclusively defensive counter air operations, normally requiring a greater ratio of interceptors to attacking aircraft, passes the initiative to the enemy, making concentration of forces difficult unless early warning is sufficient to permit time to amass defensive fighters. A defending air force must devise means to get aircraft off the ground quickly. Under some circumstances, a successful defensive counter air campaign could lead the enemy to determine that further offensive operations are too costly. Before committing to such a strategy, Warden notes that one must read the opponent's political and military will and have the strength necessary to take a sufficient toll before the enemy does too much damage.[695]

Generally, air forces adopt an exclusively defensive posture if it is assumed that foreign forces will intervene and/or take on the offensive counter air mission, or if defensive posture will permit the buildup of a reserve for counteroffensive operations. Both situations can be risky. Generally, military leaders are advised to make contingency plans for what he will do if a foreign power does not intervene, new aircraft do not arrive, or if a reserve force is neutralized.[696]

Facing a growing threat posed by a growing arsenal of increasingly accurate and lethal conventional ballistic missiles, the introduction of land attack cruise missiles, and a more lethal conventional air strike capability, Taiwan is placing greater emphasis on developing its own counterstrike capability. Taiwan's answer to the PLA's "*gongfang jianbei*" strategy was outlined in the November 1999 Defense Policy White Paper sponsored by the Democratic Progressive Party (DPP) and promulgated in a speech delivered by Taiwan President Chen Shui-bian in June 2000. Media reporting of unknown reliability claims that the Executive Yuan approved Taiwan's new strategy on 27 December 2000, in conjunction with approval of the MND's mid-term five-year plan. The plan, which ostensibly replaces "attrition warfare" with "paralysis warfare," allegedly reduces the relative priority of counter-landing operations and increases investment into systems that can paralyze the enemy's ability to conduct a military campaign at its source. The Taiwan Air Force stands to benefit most.[697] Taiwan media reports indicate that the Executive Yuan has devoted an increased proportion of the 2001-

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[695] John Warden III, *The Air Campaign: Planning for Combat*, Lincoln: Excel Publishers, 2000.

[696] Ibid., pp. 21-24.

[697] Lin Shu-ling and Wu Min-ching, "Taiwan Strait Military Affairs: Taiwan Proposes War of Paralysis to Replace War of Attrition," *Chung-Kuo Shih-Pao* (Taiwan), 28 December 2000, p. 4 (FBIS: CPP20001228000021).

2005 defense budget toward joint strike capabilities. Included is a survivable new generation fighter that would have a reduced radar cross section and short-take off and landing capability.[698]

To counter PRC coercion, Taiwan stresses maintenance of the necessary military strength, the ability to survive a first-strike, and an ability to carry out a second-strike in retaliation. Taiwan policymakers recognize the need to establish clearly defined strategic objectives at the outset of a crisis. As the November 1999 DPP Defense White Paper points out:

> If deterrence proves ineffective and armed confrontation or even war should erupt, the government should promptly hand down its decision and empower the nation's armed forces to take any necessary military measure and take decisive action to drive back the enemy. Decisive action refers to, at the political decision-making level, the formulation of clear political goals. At the operational level, it means taking into account the size of the enemy force to gather a superior force of our own to engage in quick, synchronized, and centralized joint combat and make a decisive strike against the enemy we confront, and if necessary, go wide and deep to strike at the enemy's rear echelon to destroy their combat capability.

The ruling party has indicated that it does not rule out pre-emption given unambiguous warning:

> Based on the defense concept of protecting national safety and maintaining peace, prior to the enemy's attack, the ROC will not take the initiative to start any offensive military action, but once the potential source of threat takes confrontational military action or threat, and if large-scale military conflict is no longer avoidable, Taiwan will take decisive action, use military force, and adopt quick and vigorous military action to destroy any enemy force before it enters our territory. We will destroy the enemy deep in its own rear base and paralyze the military targets on its soil. This is a legal and even essential form of national defense.

The Democratic Progressive Party's defense policy platform called for an adjustment in defense strategy to include greater stress on airpower as a means to counter PLA operations at their source:

> Taiwan is an island nation surrounded by the sea, and any threat from outside enemies will primarily be in the form of naval and air assault. Therefore, our military strategy should be adjusted to gear away from

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[698] Brian Hsu, "Air Force Says it Will Introduce New Strategies," *Taipei Times*, 27 December 2000.

> passive to active defense. We should abandon the idea of beachhead operations and replace attrition warfare with operations to paralyze the enemy. We need to acquire the ability to disable the enemy from starting a war against us, so as to avoid fighting a war on our own soil and avoid endangering the people's life and property.

With this in mind, and depending on the circumstances, Taiwan's political leadership may opt to counter a future PRC coercive air campaign through a denial strategy focused against theater-level targets. Such a campaign would be limited in scope and, from a political perspective, would have three audiences in mind – Beijing's political and military leadership, Taiwan's domestic polity, and foreign audiences, particularly the United States. A theater air campaign would attempt to deny, or at least complicate, the PLA's ability to conduct offensive operations against Taiwan in hope of influencing the PRC leadership to halt its campaign against the island on the most favorable political terms possible. As one prominent advisor to the Taiwan Air Force, British air strategist Vice Marshal Tony Mason, remarked in January 2001 to a group of Taiwan strategists:

> Any attack from the mainland, regardless of its timescale, would depend upon tight coordination to achieve its political objectives. Consequently, any delay, disruption or dislocation inflicted by even small-scale ROCAF attacks could have a disproportionate strategic and ultimately political impact.[699]

By definition, military actions initiated by the PRC to coerce Taipei, regardless of the political trigger, are strategically offensive. By extension, actions and associated weapon systems that are intended to counter PRC coercion are defensive, even if those actions necessitate expansion of the battlespace into Southeast China. Effective self-defense, particularly against the growing air and missile threat, may *require* strikes against PRC offensive forces, and the command and control and logistics infrastructure upon which they depend. With the foregoing in mind, conventional weapons that facilitate expansion of the battlespace are of a defensive character.

Taiwan's capabilities are limited at the current time. PRC and Taiwan media reporting claims that the *jingwai juezhan* strategy is driving a number of programs that were slated for funding beginning in January 2001. Press reporting from Taiwan asserts that the Ministry of National Defense is considering the procurement of new fighters in the 2005-2010 timeframe, but candidate systems have not been identified. A seven year program to develop "joint air defense and denial weapons" allegedly is centered on transforming the Indigenous Defense Fighter (IDF) into a "joint denial platform." Another plan involves the development of submunitions. As an alternative to the IDF upgrade program, Western reporting has noted Taiwan's interest in the Joint Strike

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[699] RAF Vice Marshal (ret) Dr. Tony Mason, "Air Power and Taiwan Security," Conference Paper 107, *Future Vision of Taiwan's Defense Policy and Military Strategy*, January 2001, p. 38.

Fighter or F-22, successors to the F-16 and F-15, or a vertical short take-off and landing aircraft similar to the Harrier.[700] PRC sources also indicate that Taipei is also developing a land attack variant of the Hsiung-feng II anti-ship cruise missile. The system is expected to have a range of greater than 500 kilometers and will be fielded by 2004.[701]

Taiwan is also focused on information operations. Media reports indicate the Ministry of National Defense was slated to stand up their first dedicated information warfare unit in 2001. Taiwan media sources note that the battalion-sized unit will be directly subordinate to the office of the Chief of General Staff. According to one media source, beginning in 2001, Taiwan's Ministry of National Defense will be investing almost one fourth of their procurement budget into C^4ISR, electronic warfare, and information warfare. Taiwan's Ministry of National Defense reportedly is investing approximately US $100 million (NT 3 billion) into defensive and offensive information warfare technology over the next four years. In reaction to Beijing's advances in electronic warfare capabilities, Taiwan also is said to be upgrading its radar network.[702]

Taiwan defense authorities believe their highest chances for success involve absorbing initial strikes, reconstituting an operational capability, thwarting the PLA's attempt to quickly resolve the conflict through adoption of a denial strategy, and raising the political, military, and economic costs to a point that is unacceptable to the PRC leadership. Raising the costs of continued fighting may force the PRC to lower its political demands to an extent that may be more palatable to Taiwan's political leadership. Some Taiwan observers understand that foregoing tactically offensive operations forces them into a battle of attrition, one in which they are sure to lose, barring third party intervention shortly after initiation of hostilities. Taiwan's Defense Minister pointed out in a July 2000 interview, "the armed forces will not adopt any offensive military action unless the Chinese communists launch an attack. That means we will continue to stick to the policy, under which we would not fire the first shot and would rather take the first strike (from the mainland)." In discussing the need for retaliatory operations, the Minister claimed, "with such a deterrent, the enemy would be aware that they have to pay dearly if they dare to attack us."[703]

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[700] Craig S. Smith, "Taiwan's Leader Considers Purchase of Updated Jet Fighters," *New York Times*, 4 August 2000.

[701] "Taiwan de daodan zhuangbei qingkuang" [Taiwan's missile equipment situation], *Zhongguo hangtian*, July 2000 (internet version). The same sources point to development of an SRBM based on the TK-2 has been underway since 1997. There is little evidence, however, to support this assertion. Also see "Taiwan to Develop New Fighter: Report," *Agence France Presse*, 31 July 2000.

[702] See Brian Hsu, "Military Sets Aside NT$3B For E-Warfare," *Taipei Times*, 15 October 2000 (internet version). The Chihan project will enhance Taiwan's resistance to PLA computer network attack, while the Maihu Plan is intended to defend against electromagnetic pulse weapons. The Anyu Program addresses radar modernization.

[703] "Taiwan Will Not Fire First In Any Clash with China: Defense Minister," *Agence France Presse*, 2 July 2000.

Little information is available that outlines Taiwan's thinking on targeting. However, according to the DPP White Paper, an air and missile campaign would focus on political and military targets that pose the most significant threats to Taiwan. These are likely to include key PLA command and control, communications, and intelligence facilities, static infrastructure supporting theater missile operations, aircraft and naval bases and assets that would be involved in a PLA air campaign, and staging sites for any amphibious invasion. The objective would be to "suppress and interfere" with the PLA command and control system, and paralyze their air and missile systems as a means to gain information dominance and air and sea superiority. According to PRC sources, primary targets of Taiwan denial operations would be PLA radar sites, command and control centers, airfields, fuel depots, munitions storage facilities, and amphibious ship concentrations.[704]

There is no indication that Taiwan intends to pursue an extended strategic air campaign. An air campaign seeking to achieve strategic paralysis would focus on things highly valued by the PRC leadership, including not only the lives and prosperity of the Chinese people but the military, industrial, and political sources of the regime itself. A strategic air campaign, for example, could target the PLA, internal security forces, and the Communist Party in order to spark independence movements in other parts of the PRC, including Xinjiang or Tibet. However, Taiwan's ability to pursue such a campaign through airpower is limited at best. Taiwan's need for international support in a crisis situation would temper its political and military options. Punishment strategies against population centers likely would negatively affect Taiwan's international support, one of its most important secondary centers of gravity, and would unlikely be able to achieve much political effect.

PLA theoretical writings reveal a number of vulnerabilities that, if properly exploited, could present opportunities to slow the PLA's tempo of operations. From Taiwan's perspective, centralized command and control, reliance on highly scripted operations, and the massing of forces during the cross-Strait phase of an amphibious invasion could present opportunities to at least complicate PLA operations. In a future conflict, putting the PLA on the defensive could force its multi-role aircraft into the defensive, vice offensive mode. Blunting the PLA's "rapid war, rapid resolution"

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[704] See "Taiwan yanzhi yinshen zhanji" [Taiwan develops stealth fighter], *Keji yaowen* [China S&T news], 15 September 2000 (internet version); "Taiwan yanzhi 'lianhe fanzhi zaitai' " [Taiwan develops 'joint denial platform'], *Keji yaowen*, 13 September 2000 (internet version); "Taiwan jiang yanzhi xinxing daodan" [Taiwan to develop new missile], *Keji yaowen*, 14 September 2000 (internet version); for Taiwan reporting, see "Taiwan Masters Technology for Producing Stealth Jets," *Ping kuo jih pao*, 21 Dec 1997, p. A13; Sofia Wu, "Taiwan President Chen Calls For Planning New-Generation of Warplanes," *Central News Agency*, 3 August 2000 (FBIS: CPP20000803000073); and Sophia Wu, "Taiwan Defense Ministry To Set Aside NT$32.26 Million for Upgrading IDFs," *Central News Agency*, 11 August 2000 (FBIS: CPP20000811000111). Other R&D projects reported in the Taiwan and PRC press, ostensibly slated to commence in 2001 include the Tianpin Plan, the Huangfeng (Yellow Bee) Plan, the Qianghan Plan, the Yelei (Brilliant Thunder) Plan, the Cengxi (Layered System) Plan for the TK-2A upgrade, the Pin'guan Plan, the Maihu (Artery Guardian) Plan, and the Zi'an (Capital Defense) Plan for defensive IW. The IDF combat radius increase plan is known as the Xiangsheng Plan. The RCS reduction plan is the Lushan Plan and the submunition program is the Wanjian Plan.

(*suzhan, sujue*) strategy could prompt the PLA to seek a more accommodating negotiating position before a full fledged and costly land campaign. Even if of limited military value, strikes against mainland could boost the morale of the Taiwan people and armed forces.

Success of a Taiwan denial campaign would be dependent upon a number of factors. First, and most important, would be sufficient intelligence that would identify vulnerabilities or critical nodes within the Joint Theater Command, or Second Artillery or PLA Air Force *juntuan*-level command structure. Neutralization of even a few critical nodes could have significant political and operational effects. A second requirement would be to survive initial strikes and reconstitute an operational capability. Preferably, Taiwan's armed forces would be equipped with sufficient warning to disperse assets and implement concealment or deception measures. Taiwan may seek to brunt the severity of the initial PRC attacks, with a special focus on attriting the PLA's most prized assets that, in accordance with the *jingbing zhisheng* principle, would play a prominent role in the initial phase of an offensive air campaign. Taiwan also would require an effective means to suppress the PLA's increasingly sophisticated air defense system deployed opposite Taiwan. It also would need the means to deliver munitions against the critical nodes that had been identified and to assess the damage to the intended targets.

From Taiwan's perspective, a number of outcomes of an air campaign are possible. Taiwan may hope to inflict damage on attacking PRC forces sufficient for a cessation of hostilities and return to *status quo ante bellum.* This may or may not include a negotiated settlement acceptable to both parties. Having threatened to do so in the event the PRC uses force, Taiwan's political leadership may seek *de jure* independence. On the other hand, depending on the initial successes of a PRC air campaign and the level of international support, Taiwan's leadership may agree to full terms mandated by Beijing, particularly if PRC demands are limited. Finally, depending upon the costs in which Beijing is willing to bear and the level of international support, Taiwan's political leadership may lose physical control of the island. However, Taiwan observers believe a protracted PRC campaign against Taiwan would be fraught with significant risks for Beijing. These include the possibility of PRC inability to seize Taiwan rapidly, possible US intervention, regression of its economic development, decline in national tax revenues, sharp increase in unemployment, and possible downfall of the current mainland leadership.[705]

Judging the political effectiveness of military action is difficult and strikes against selected targets on the mainland may escalate the conflict. However, Taipei may desire to demonstrate the failure of Beijing's coercive strategy by undermining the political and military effectiveness of *shashoujian* weapons. Air strikes may demonstrate to Taiwan's domestic audiences its resolve as a means to shore up national will. Concerns over loss of international support likely would moderate the scope of Taiwan's offensive action. The political leadership may understand that the potential loss of support if strikes against civilian targets are carried out or if weapons of mass destruction are used.

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[705] Sofia Wu, "MAC Official: Invading Taiwan Could Topple PRC Leaders," *Central News Agency,* 26 April 2000 (FBIS: CPP20000426000121).

Taiwan's Strategy and the Potential for Escalation

A key challenge for Taiwan in any counter-coercion campaign would be to affect these centers of gravity while controlling escalation. Because most decisions to escalate are conscious and calculated, escalation can be controlled. The key is to avoid an open ended action-reaction cycle. Both sides of the Taiwan Strait may desire to establish stable limits as early as possible in the conflict. Understanding sensitivities is an important aspect of controlling escalation. Normally, the failure of decision makers in one country to assess how the world looks to the adversary decision maker can lead to conceptual failures and loss of escalation control. The decision maker that escalates hopes that new limits will stick, but an element of uncertainty is involved, since the escalation might spark an open ended action-reaction cycle. [706]

There are a number of factors affecting escalation. Herman Kahn in 1965 noted at least three ways that a nation could intentionally escalate a conflict: increasing intensity; widening the area of conflict through use of longer range weapons systems based out of theater; and compounding escalation involving strikes against non-contiguous allies. Other factors exist as well. For example, the pace of conflict may affect the probability of unintended escalation. Slower paced conflicts generally provide more time for adequate assessment. If a crisis emerges slowly, then there is a higher probability that each side will understand the other's political objectives in a military confrontation. Escalation tends to develop when a crisis emerges with little or no warning. Intended escalation also can occur when adversaries misperceive the intent of each other's military operations. This is especially so when the doctrine of both sides in the conflict places central importance on offensive operations designed to achieve battlespace dominance early in the conflict. There will be a strong tendency to escalate in order to overcome the debilitating effects of the initial strikes.

Target selection can have a direct influence on unintended escalation. In a war with limited objectives, striking targets of high strategic value will be viewed as potentially indicating the political objectives have changed. Targets that are most sensitive include national leadership and C^2, strategic forces, and space-based ISR assets supporting national command centers. Others include industrial centers, communication centers, and urban areas not in the theater of operations. Acceptable targets include general purpose forces, military headquarters and command and control centers, conventional missiles, air defenses, and infrastructure directly related to the theater of operations.[707]

As a final note, Taiwan understands that PRC use of force would be met with serious international rebuke, perhaps destruction of infrastructure in Southeast China, and/or economic sanctions. Use of force likely would halt or reverse the PRC's economic development that relies on international markets and foreign direct investment. There is some PRC concern about the costs of a conflict, including the effects it would

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[706] Richard Smoke, *War: Controlling Escalation*, Cambridge: Harvard University Press, 1977.

[707] Herman Kahn, *On Escalation: Metaphors and Scenarios*, Greenwood Press, 1965.

have on commodity prices and the stock market. After rapid accomplishment of their objectives, Chinese planners are examining ways to reduce the economic sanctions that they expect.[708] Beijing also runs the risk that if they use force, Taipei may take political measures even more inimical to Beijing's interests. During his 20 May 2000 inaugural address, Chen clearly stated this intention:

> Therefore, ***as long as the CCP regime has no intention to use military force against Taiwan***, I pledge that during my term in office, I will not declare independence, I will not change the national title, I will not push forth the inclusion of the so-called "state-to-state" description in the Constitution, and I will not promote a referendum to change the status quo in regards to the question of independence or unification. Furthermore, the abolition of the National Unification Council or the National Unification Guidelines will not be an issue.

From Beijing's perspective, failure of its Taiwan policy, that is to ensure the island remains an integral part of the China, could be viewed as a loss of the CCP's mandate to rule. Taiwan is considered to be a regime survival issue.

In sum, the nature, form, and degree of PRC force against Taiwan would be shaped by political circumstances. PRC use of force in the Taiwan Strait may seek to coerce Taiwan's leadership to agree to talks leading to unification, a timetable for unification, or immediate political integration with the PRC. In most cases, airpower would play a substantial if not predominant role in a coercive military action. Taiwan's strategic center of gravity is its leadership. A PRC coercive air campaign would seek to affect the will, morale, and decision calculus of Taiwan's leadership by inflicting punishment upon the general populace, denying its military forces of the ability to effectively conduct operations, or affecting the leadership's ability to govern or direct military operations. Taiwan is gradually adopting a strategy intended attempt to undercut the PRC's coercive strategy through adoption of a denial campaign to slow or complicate PRC military operations. In order to accomplish its political and operational objectives with regard to Taiwan, the PRC has demonstrated its intent to deny U.S. forces access to, or at least complicate U.S. operations in the theater of operations

CONCLUSION

The Taiwan Strait is an aerospace theater. Influenced by Western air campaign theory and seeking to enforce its interests at minimal cost, the PRC understands the role airpower can play to resolve conflicts around its periphery. Since the Gulf War, the PLA has made significant advances in developing a force capable of applying aerospace power in a joint environment. The PRC's growing aerospace power – the synergy created by integrated theater missile, space, conventional air operations, and information operations

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[708] "PRC Military Scholars on Cross-Strait War, U.S. Intervention," *Sing tao jih pao*, 4 May 2000, p. A33 (FBIS: CPP20000504000024.

– will facilitate PLA achievement of the desired effects. This study has attempted to determine how aerospace power would contribute to successful PLA coercion, and under what circumstances would its contributions be most successful. Coercive aerospace power is the integrated application of information operations and weapon systems that use the medium of air against strategic and operational-level targets to make an adversary choose to act in a manner that it otherwise might not act. Strikes are mounted or threatened not just to destroy things, but are intended to cause a policy change by the target entity.

The PRC's "rapid war, rapid resolution" strategic doctrine is intended to break Taiwan's will such that its leadership sees no alternative but to accept Beijing's strategic aims and military objectives. Aerospace power makes it possible to compress the fury of the initial stages of conflict into a few hours. The hope is for termination of hostilities before a period of even greater conflict.

Guided by a strategy of denial, most PRC analysts have determined that it is necessary to defeat, disarm, or neutralize Taiwan's capacity for military operations. In theory, PLA strategists note that physical occupation may not be necessary or even desired. To affect the will of Taipei, PLA writings and exercises indicate that Beijing intends to strike strategic and military targets on Taiwan to achieve the psychological and physical effects needed for Taipei to submit.

There are numerous explanations for the PRC's almost exclusive focus on denial. First, Beijing may understand that targeting economy and civilians has been ineffective throughout history. Secondly, military authors go for what they know best – operations directed against other military forces. In addition, the PRC may understand that economic targeting could have an effect on its own economy. Having said that, there is a faction within the PLA, led by authors such as Yu Guohua, who focus on strategic paralysis, and believe that the focus of all action should be upon the political and military leadership and its means of command and control.

However, some within the PLA may believe that they must be prepared to carry out a landing campaign as a hedge in case the objectives of an air campaign fail. All within the PLA may not be on board with limited coercive strategies. Military establishments around the world generally are proud, resistant to the political interference in military operations that coercive strategies generally entail, and are more comfortable with total victory.

The PLA has been heavily influenced by Western thinking on airpower, especially the 1988 book authored by Col John Warden, *The Air Campaign*. The book argued war could be won from the air, using a strategy that would disable enemy "centers of gravity" and facilitate a more decisive and less destructive victory. Like Warden's theory of air power, PLA operational theory focuses on the "heart" of an opponent. The objective is "paralysis, " either operational paralysis through targeting of air defense networks and command and control facilities, or strategic paralysis through targeting civil telecommunications, electrical power plants, oil plants, production facilities and transportation links.

Authoritative PLA sources provide little evidence of political decapitation, strategic interdiction, punishment, or risk strategies. There are at least four explanations. First, senior authorities in Beijing may understand that civilian decapitation strategies that involve neutralization of the political leadership generally have failed. Beijing may

desire to minimize international censure and win hearts and minds of the populace on Taiwan. PRC propaganda has expressed its intent to target the government apparatus and foreign invaders, not Chinese people. In addition, Beijing's desire for a quick resolution may preclude a strategic interdiction campaign since effects are not immediate. Finally, Beijing may desire to limit economic disruption.

PROSPECTS FOR SUCCESSFUL PRC COERCION

Success or failure of a PRC coercive campaign will depend upon several factors. First is the salience of the contested issue. Whether or not Taiwan would accept an ultimatum depends on the demands that Beijing imposes. If the demands are limited, then the threshold at which the Taiwan would be willing to negotiate may be lower. Much also depends upon Taiwan's military capabilities and vulnerabilities, the PLA's ability to apply force successfully, and the ability of political leaderships in Beijing and Taipei to forge consensus within their respective governments and among the general populace. Taiwan's ability to inflict political, economic, and/or military costs back on the PRC government through a counter-coercive campaign may enhance its bargaining position or reduce PRC demands. At the same time, successful coercion may depend largely upon Beijing's ability to credibly escalate the conflict and inflict a greater price of defiance. The PRC must be able to increase the costs of continued resistance while denying Taiwan any opportunity to neutralize those costs or counter-escalate. Finally, perhaps the most important factor that will determine the success or failure of a coercive campaign is the degree of international support that Taiwan enjoys.

Ultimately, Taiwan may not fold without a credible threat to physically seize the island. Because of the inherent uncertainties with the threshold, PLA planners may assume a requirement to conduct a full-scale invasion. Therefore, most joint campaign theory is conceived in the context of a ground force operation, such as an amphibious invasion. This, in and of itself, leads the PRC toward a denial strategy to achieve the desired political end state. Successful attainment of the "Three Superiorities" (information, air, and maritime) may be sufficient to bring Taipei to concede before an invasion is attempted. However, many observers do not assume a coercive air campaign will be successful. In the end, a brute force attempt at physical occupation may be necessary and should serve as the basis for planning.

Deterrence and Defense in the Taiwan Strait

Unless some *modus vivendi* can be reached, conflict in the Taiwan Strait appears likely over the next five to 10 years. Such a conflict is less likely to be a contest of military strength, but one involving a competition of national will, endurance, obstinacy, and willingness to absorb costs. It is for this reason that discussion of "military balance" in the Taiwan Strait is interesting, but of limited utility. Balance of deterrence or intentions in some ways is more important, albeit subjective, than an objective calculation of military capabilities. Competition in the Taiwan Strait involves a balance of resolve and deterrence, rather than an equilibrium of forces.

A competition of deterrence occurs in the Taiwan Strait almost every day. The PRC places a premium on convincing Taiwan and the world that defense of the island is hopeless. Since at least 1992, a PRC information operations campaign has targeted the

Taiwan population with a number of themes, including (1) defense of the island is hopeless; (2) the United States will not support Taiwan; and (3) any military action will not be directed against the people of Taiwan. PRC-affiliated articles argue that Taiwan has limited resources, its military weaponry is substandard, and the people do not have the will to resist. Articles also assail the morale of Taiwan's armed forces, asserting that factionalism, low pay, and irregular promotion rates seriously affect Taiwan's ability to carry out military operations.[709] Some PRC officials believe that the US would pressure Taiwan to negotiate once a conflict breaks out.[710]

The United States figures significantly in this competition. Taiwan understands that an explicit commitment to its defense does not give it a blank check. The damage to Taiwan stemming from any cross-Strait military confrontation would be significant. In fact, some may believe that while a more explicit U.S. commitment is useful for deterrence purposes, actual U.S. intervention in a crisis may escalate the conflict. Such views require the United States to carefully gauge its reaction.

Vulnerability to Strategic and Tactical Surprise

Due to the PRC's heavy reliance on deception and stratagem, U.S. and Taiwan may become increasingly vulnerable to strategic and operational surprise. The PLA believes that surprise is crucial for the success of any future campaign, and would likely not be willing to initiate any military action unless assured of a significant degree of strategic surprise. The side that strikes first against an unready opponent will have a substantive advantage. In fact, even an enemy possessing considerable advantages and means to counter an attack may be unable to employ them if caught unaware.[711] With no apparent political prohibitions against preemption, the PLA *requires* surprise as a force multiplier, to catch Taiwan or another potential adversary such as the United States, standing down.

Surprise can also involve new or unexpected operational methodologies that exploit strategic and/or operational vulnerabilities. A surprise attack is intended to inflict a striking defeat that sharply alters the military situation and determines the outcome of a conflict by delivering a shock to Taiwan from which it may not be able to recover. The direction of PLA modernization contributes facilities to its ability to achieve the types of surprise they are seeking. PLA writings indicate a number of methodologies that could

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[709] Among numerous articles, see Lung Hsiang, "There Are Many Blind Areas in Taiwan's Security Strategy," *Ta kung pao*, 28 December 1998, p. A2 (FBIS: FTS20000113000873); also see "The Real Combat Effectiveness of Taiwan's Imported Weapons Is Only 60 Percent," *Ming pao* (Hong Kong), 30 November 1999, p. B16 (FBIS: FTS19991229000414).

[710] "PRC Military Scholars on Cross-Strait War, U.S. Intervention," *Sing tao jih pao*, 4 May 2000, p. A33 (FBIS: CPP20000504000024).

[711] For discussions of strategic surprise, see Klaus Knorr and Patrick Morgan, ed., *Strategic Military Surprise: Incentives and Opportunities*, New Brunswick: Transaction Books, 1983.

enhance the success of surprise, including strategic and operational deception, electronic warfare, and wearing down or desensitizing Taiwan's political and military leadership.[712]

Another factor that could contribute to strategic surprise is the tendency, particularly in U.S. academic circles and some segments of Taiwan society, to misjudge PLA capabilities. Underestimating another state's military can contribute to a strategic surprise either by increasing confidence that an attack will not occur or by instilling the belief that any attack will be effectively resisted. Intelligence community analysts may be vulnerable to strategic surprise if they overestimate capabilities for detecting it in advance.[713]

Even if warning of an attack is available, there are powerful psychological and political incentives to misinterpret warning or to delay a necessary response. The launching of an air campaign, or other military action against Taiwan is considered unlikely because the risks would be astronomical. However, history has demonstrated that those launching surprise campaigns occasionally have resorted to seemingly suicidal risks because of miscalculation or desperation. Taiwan requires adequate warning of impending PRC military action, and using that warning to alert air defense and naval units and increase the readiness state of its forces.

In many ways, the dangers of surprise are greater than any asymmetries in the balance of forces. The PLA draws upon a rich tradition of strategy, deception, and doctrinal concepts that could, under certain circumstances, compensate for their technological shortcomings. One must calculate the effects of surprise, deception, detailed planning, intelligence preparation of the battlefield, and doctrine development on the PLA's ability to prevail in a Taiwan scenario, even with U.S. intervention.

Implications for the United States

PRC coercive strategies that rely on surprise and pre-emption present challenges to the United States' ability to fulfill its legal obligations under the Taiwan Relations Act (TRA). The TRA states that it is the policy of the United States "to maintain the capacity of the United States to resist any resort to force or other forms of coercion that would jeopardize the security, or the social or economic system, of the people on Taiwan." A PRC campaign of annihilation or attrition against Taiwan – an amphibious invasion – in many ways would be easier to counter than a coercive air campaign. Concentration of ground forces is more likely to be detected in advance, thus providing greater lead-time to prepare a response. A surface campaign also would be at a relatively slow tempo of operations, rendering these forces vulnerable to interdiction and close air support.

In a coercive campaign that stresses surprise and shock, the U.S. and other regional actors must act swiftly to counter PRC aggression and shore up the national will of

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[712] As Albert Wohlstetter once noted, "an excess of warnings which turn out to be false alarms always induce a kind of fatigue, a lessening of sensitivity."

[713] See Richard K. Betts, "Surprise Attack: NATO's Political Vulnerability," *International Security*, Spring 1981, Vol. 5, No. 4, pp. 117-149; also Knorr and Morgan.

Taiwan's leadership. It is difficult to judge the threshold at which Taiwan's leadership would accede to Beijing's demands after the initial use of force. However, the nature of and degree of U.S. support that Taiwan enjoys would be a critical variable in Taipei's ability to resist coercion.

The opening salvo of a PRC air campaign would require an immediate and visible U.S. response. Political and physical constraints, as well as the PRC's increasingly sophisticated ballistic missiles, information operations, and submarine modernization programs, may complicate U.S. military operations in region. The slow response time of surface forces and the PRC's focus on countering aircraft battle group operations places a premium on the ability of the U.S. to conduct extended range operations, using the medium of air and space, in order to deny Beijing the successful attainment of its strategic and operational objectives. The September 2001 Quadrennial Defense Review highlights the need to project and sustain U.S. forces in distant anti-access or area-denial environments and defeating anti-access and area denial threats. In the face of the PRC's growing ability to apply force in a coercive context, a U.S. military response must be measured in terms of hours, not days or even weeks. In this context, the rapid deployment of expeditionary aerospace forces, global strike task forces, and use of existing assets in the region will be critical to the defense of Taiwan.[714]

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[714]A global strike task force is intended to rapidly establish air dominance and subsequently guarantee that joint aerospace, land, and sea forces will enjoy freedom from attack and freedom to attack. It combines stealth and advanced weapons with a horizontally integrated command, control, intelligence, surveillance, and reconnaissance (C^2ISR) constellation that provides lethal joint battlespace capability. The C^2ISR constellation will team space assets, UAVs, and a consolidated wide-body platform that transforms data into decision-quality data for a CINC and the engaged component commanders.

8. COERCIVE CONTRADICTIONS: *ZHANYIXUE*, PLA DOCTRINE, AND TAIWAN SCENARIOS

By Thomas J. Christensen

The recent PLA doctrinal textbook, *Zhanyixue,* is a very important document for those interested in understanding the prospects for successful deterrence of conflict across the Taiwan Strait and for control of escalation if such a conflict were to occur.[715] Like so much of the relationship between Taiwan and the mainland, *Zhanyixue* is a study in contradictions. For instance, one of the most striking things about this text is that it rarely if ever mentions Taiwan, yet it is arguably largely about Taiwan scenarios. Particularly in certain coercion scenarios it is fairly clear who the immediate enemy is and what potential "third country" interlopers might complicate PRC strategic planning by entering the fray. The constant references to fighting militarily and technologically superior foes are quite clearly references to the United States and its regional allies and friends: Japan and Taiwan. The infrequent but meaningful references to experiences of American adversaries in Kosovo, the Gulf War, etc. put some flesh on what the authors mean by "advanced country," and "materially superior enemy."

In analyzing what the book means for maintaining peace or fighting wars across the Taiwan Strait and the Pacific, this essay will review and analyze some of the important contradictory messages in *Zhanyixue*:

1. *Deterrence through Military Superiority vs. The Weak Defeating the Strong:* The book offers both real hope that China can be deterred from attacking Taiwan under many circumstances and real cautionary notes to those who would argue that Taiwan, the United States, and Japan can achieve successful deterrence quite easily simply by demonstrating overall military superiority over the PLA. On the one hand, the authors recognize the difficulty in taking on foes protected by water, especially those who, along with their "third country" protectors, will often have superior technology and firepower. On the other hand, the book is all about how China can and must find ways to defeat those superior adversaries by timing their attacks well, concentrating firepower on key enemy targets, and destroying enemy morale and political will.

2. *Escalation Control vs. The Need to Strike Hard and Early*: At times the book discusses the use of military force for coercive goals, suggesting the ability to control escalation in a careful manner, even to the degree of obeying international

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[715] Lieutenant General Wang Houqing, and Maj. General Zhang Xingye, chief eds., *Zhanyixue* [The science of campaigns] Beijing: National Defense University Press, May 2000. The book is available at China studies centers outside of the PRC, including the Harvard University Fairbank Center Library.

laws regarding freedom of the seas, etc. At other times it suggests that a high degree of escalation is quite likely even in what might appear to be more limited military campaigns, such as maritime blockades or information warfare. Precisely because China is weak and vulnerable, in certain scenarios, it must attack early and try hard to avoid ceding the initiative to the enemy.

3. *Coercive Deterrence vs. Robust Warfighting*:[716] On the one hand the book discusses the "deterrent capability" of the PLA's conventional and nuclear missile forces, on the other hand it emphasizes the accuracy of those missiles and the use of those missiles, including nuclear missiles, against primarily military targets in warfighting. This is hardly the stuff of sloppy terror weapons and minimal deterrence and blurs the line between coercion and military defeat of the enemy as a PLA goal.

Most of these contradictions flow from the nature of mutual deterrence across the Taiwan Strait (and across the Pacific). On the one hand, neither side wants armed conflict and neither side has the capabilities nor the desire to invade and occupy the other, at least not with ease. On the other hand, both sides have the capability to raise the costs of conflict to very high levels and neither is certain that the other might not use that capability for the purpose of changing the political status quo across the Taiwan Strait.

None of these contradictions are fundamentally new to students of deterrence theory and the history of coercive diplomacy.[717] *Zhanyixue* is an important text because it presents in a systematic and authoritative fashion some of these contradictory strands in contemporary PLA thought, not just in political science theory. In the process, it reveals important findings about the potential difficulties in deterring a PRC attack on Taiwan and the difficulties in avoiding escalation of any such conflict, should it occur. It also reveals some important findings about PLA thinking on issues like the use of missiles in warfare and the importance of coercive strategies, such as maritime blockades.

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[716] The reader should note that I use the term coercion in this paper somewhat differently than my colleague Mark Stokes does in his chapter. Here I refer to coercion as the act of threatening future punishment or threatening to continue current punishment for the purpose of achieving political results by altering the incentive structure and policies of one's enemy. A coercive strategy is aimed at the enemy's psychology and is thereby distinct from "brute force," which is aimed at destroying, defeating, and dominating the enemy militarily. Coercion has two sub-categories: deterrence and compellence. In deterrence the coercer is attempting to prevent enemy action and preserve the status quo. In compellence, the coercer is attempting to change existing enemy behavior and alter the status quo. For these theoretical distinctions, see Glenn H. Snyder, "Deterrence and Defense," in Robert J. Art and Kenneth N. Waltz, eds., third edition, *The Use of Force: Military Power and International Politics*, New York: University Press of America, 1988, pp. 25-44.

[717] Most of these can be found in books such as Thomas C. Schelling, *Arms and Influence,* New Haven: Yale University Press, 1966; Richard K. Betts, *Nuclear Blackmail and Nuclear Balance,* Washington, DC: Brookings Institution Press, 1987; and Robert Jervis, *The Meaning of the Nuclear Revolution: Statecraft and the Prospect of Armageddon,* Ithaca, NY: Cornell University Press, 1989.

Taiwan: The Phantom Enemy

Taiwan is not discussed at any length in the book, if at all. But the United States is discussed frequently in terms of its successes, its military strengths, and remaining potential shortcomings in the military arena. A main focus of the book is how to overcome Chinese deficiencies in firepower, communications, and technology and how the "weaker can defeat the stronger" through well-timed, well-executed, and precise use of firepower. It seems hard to believe that these sections of the book are focused primarily on any potential adversary other than the United States and its regional friends and allies. Since it is difficult to imagine U.S.-China conflict over issues other than Taiwan for the foreseeable future, it seems that the authors certainly have Taiwan scenarios in mind, even when discussing warfare with superior "advanced countries."

Taiwan scenarios seem especially salient when one considers the extensive discussions of the powerful deterrent power of accurate, conventionally tipped ballistic missiles. Most of these in fact are arrayed against Taiwan and/or U.S. bases in Japan. Finally, the extensive sections of the book on maritime blockades of islands near China are obviously about Taiwan. If there were any doubt about this, one major section on blockades discusses the primary purpose of the campaigns as follows:

> "Carrying out blockades, demonstrates one's own side's military strength and resolve in protecting national sovereignty, causing the side under blockade to not dare to take rash actions…."[718]

It is hard to imagine just how, outside of Taiwan scenarios, the PLA would adopt offensive blockade methods in order to "protect national sovereignty."

Mixed Messages on the Ability to Deter China: The PLA Seeks to Find a Way Despite Weakness

From the point of view of deterring the PRC there are two very heartening aspects of *Zhanyixue*. First, it is quite clear that PLA leaders understand just how far China is behind the leading militaries of the world. Second, with the exception of the use of accurate ballistic missiles, there is fairly consistent recognition of the difficulties that the PRC would face in adopting several different types of campaigns.

On China's general backwardness, the text recognizes that China is not in the same military league as the "advanced countries" of the world (*fada de guojia*; 发达的国家). Moreover, unlike in the heady early days of the Great Leap Forward, PLA strategists do not envision China closing that overall gap anytime soon. There is no stated expectation of short-cuts or leapfrogging to great power military status. In other words, China will have to accept that its relative technological backwardness and weakness in power projection will persist for a long time. As one section of the text reads:

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[718] *Zhanyixue*, p. 409.

> "Our military equipment has gone through major upgrading (*hen da tigao*; 很大提高) in comparison with the past, but in comparison to advanced countries, whether it be now or even a relatively long period from now, there will still be a relatively large gap (*reng you jiao da de chaju*; 仍有较大的差距)."[719]

Another part of the text assumes that future enemies will be more powerful than the PLA. It states: "The most prominent objective reality that the PLA will face in fighting future campaigns is that in [the area of] military equipment, the enemy will be superior and we will be inferior." Currently, even though our military equipment has improved a lot, for a relatively long period of time our military equipment will still be in an inferior position in comparison to global military great powers."[720]

Equally heartening for those trying to deter China from attacking Taiwan is the serious and sober way in which most types of military campaigns relevant to Taiwan are viewed, at least at an abstract level. Amphibious invasion is portrayed as being almost so difficult as to be nearly impossible. PLA officers recognize three huge obstacles to a successful amphibious invasion against a resolute adversary. First, amphibious invasion against an enemy requires the "three masteries" or *san quan* (simultaneous information superiority, control of the sea, and air superiority). Second, the authors also recognize that given modern enemy surveillance and firepower and the need for the invader to concentrate large amounts of shipping and forces, "campaign preparation and concealment activities are very problematic (*shifen kunnan*; 十分困难)."[721] Since stealth, deception, and early strike are all key aspects of PLA attempts to overcome overall military weakness, these problems are all the more important from China's perspective. Third, in addition to the complexity of planning, the need for massive preparations, and the difficulty of successful invasion, planners must consider the possibility that "third countries" will intervene.[722]

One commonly discussed alternative to amphibious assault - maritime and air blockades - is also considered quite difficult: "Owing to the facts that the sustainment period for a blockade is long, that achieving the goals of a blockade are difficult, and that the expenditure of weapons and every form of [logistical] support is great, fulfilling the tasks of a blockade is very arduous (*shifen jianju*; 十分艰巨)."[723] In considering

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[719] Ibid., p. 28.

[720] Ibid., p. 91.

[721] Ibid., p. 421.

[722] Ibid., p. 423.

[723] Ibid., p. 408.

maritime blockades the author's recognize various problems, from the potential violation of international law in a way that will undercut Beijing's political and diplomatic strategy, to the necessarily slow nature of blockades designed to cut off all trade and military logistics. Such requirements would generally preclude the possibility of a quick, decisive battle (*suzhan sujue*; 速战速决). This is a problem not only because fighting any single opponent for an extended period is dangerous, but also because "third countries" could decide to give military and economic support and would have time to do so.[724]

Unfortunately, the signs of hope for actors attempting to deter China stop there. The authors of *Zhanyixue* do not simply recognize the aforementioned problems and therefore admit defeat, giving up on the notion of fighting superior foes. Instead they make the requisite call for the PRC to reduce the overall military power gap to the degree possible in the future, and then focus most of the book on the need for the PLA to use initiative (*nengdongxing*; 能动性) to secure victory through the art of "the lesser equipped countering the better equipped (*yi lieshi zhuangbei duifu youshi zhuangbei*; 以劣势装备对付优势装备) under high tech conditions."[725] This theme of the "weak overcoming the strong" is a staple in Chinese strategic writings and there seems to be a constant search for weaknesses among the forces of the United States and its allies that can be exploited by a well-trained and thoughtful opponent who fights in a holistic (*zhengti*; 整体) fashion and who strikes at vital enemy targets (*zhongdian daji*; 重点打击).[726]

This theme is consistent with other CCP strategic writings. In discussions of the Gulf War for example, some Chinese strategists blame Saddam's passive strategy for his inability to coerce the United States and its allies into a more favorable outcome. In wars like Kosovo, the United States is seen as a bully, willing to intervene in the internal affairs of other countries, but it is seen as a weak bully, only willing to attack the weak from a safe distance. Yugoslav forces are pitied on the one hand, for lacking the type of weapons that China has, from ballistic missiles to nuclear weapons. On the other hand, aspects of the Yugoslav strategy are lauded for tricking the superior forces into missing targets.[727] In *Zhanyixue*, the authors point out that the Yugoslav military prevented the

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[724] Ibid., p. 321, p. 407, and p. 410. As an aside the use of the term "third countries" (*di san guo*) in this context, though generic, is interesting, as in Taiwan scenarios, Taiwan would never be called a second country or enemy country in PLA parlance.

[725] Ibid., p. 28

[726] For versions of the concept of *Yilie shengyou*, see *Zhanyixue*, ch. 3, esp. pp. 91-92, and 96-101. For other Chinese strategic writings emphasizing this concept, see Michael Pillsbury, *China Debates the Future Security Environment,* Washington, DC: National Defense University Press, 2000.

[727] See the views of General Li Jijun as reported in Pillsbury, *China Debates the Future Security Environment,* p. 76; also see Dr. James J. Perry, "Operation Allied Force: The View From Beijing,"

destruction of high-value targets, such as SAM launchers, by mobility and deception, which are apparently major components of China's air defense doctrine. *Zhanyixue* calls for the use of water screens, smoke screens, fake targets, and mobility, among other countermeasures against high-tech surveillance and precision guided weapons.[728] Other PRC authors have lauded the Yugoslav forces for successfully engaging and downing a stealthy USAF F-117A.[729]

From the point of view of Taiwan scenarios, one important historical analogy might be the Falklands War, where a technologically superior foe projected power over great distances to protect a distant island situated near a hostile developing country that was employing largely imported coercive military tools. From the point of view of deterring the PRC, it is a bit disturbing that one PLA analysis suggests that more than anything else, British commanders simply outsmarted the Argentinian forces near the Falklands. This suggests that the Argentinians could have prevailed with the military tools they had if only they had adopted a better strategy and had shown more "initiative".[730]

In addition to the abstract notion that China can successfully strike at a superior enemy's vital points, there are two real and developing capabilities in the PLA arsenal that give PLA analysts some hope of doing disproportionate damage with a weaker overall force. The first is concentrated attacks on key enemy targets with accurate, conventionally tipped ballistic missiles. In a truly excellent 1999 study that cites numerous open-source Chinese publications, Lieutenant Colonel Mark Stokes of the United States Air Force first raised the hypothesis that China was working hard to move beyond the use of missiles as terror weapons and to obtain such a militarily useful, accurate missile force.[731] *Zhanyixue* strongly confirms Stokes's pioneering and, at the time, controversial study. Stokes's account accurately reflects high-level PLA thinking about missile strikes as military tools to reduce the fighting capacity of the enemy in

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Aerospace Power Journal, Summer 2000, pp. 79-91. On Iraq, see Zhou Shijun, "Try as Far as Possible to Move Battlefields Toward Enemy Side," *Jiefangjun bao* (in Chinese), 14 September 1999, p. 6 (FBIS: FTS1999092701808); and General Li Jijun, cited in Michael Pillsbury, *China Debates the Future Security Environment,* p. 76. On Kosovo, see Yan Xuetong, *Meiguo baquan he Zhongguo anquan* [American hegemony and Chinese security], pp. 33-35.

[728] *Zhanyixue*, ch. 17, esp. p. 450.

[729] See Fang Fenghui, "Stealth Does Not Mean Invisible--On Striking at Stealth Planes," *Jiefangjun bao* (in Chinese) 16 November 1999, p. 6 (FBIS: FTS19991216001946). Senior Colonels Huang Xing and Zuo Quandian, "Holding the Initiative in Our Hands in Conducting Operations, Giving Full Play to Our Advantages to Defeat Our Enemy--A Study of the Core Idea of the Operational Doctrine of the People's Liberation Army," in *Junshi kexue* [Chinese military science], 20 November 1996, No. 4, pp. 49-56 (FBIS: FTS19970619001611), 19 June 1997. On PLA anti-stealth and anti-satellite writings and programs, see Stokes, *China's Strategic Modernization*, ch. 5.

[730] *Jiefangjun bao* [PLA daily], 8 May, 2002, p. 12.

[731] Mark Stokes (USAF), *China's Strategic Modernization: Implications for the United States,* Carlisle, PA: Strategic Studies Institute, September 1999, ch. 4.

addition to, or as part of, an overall military coercion campaign. In almost every type of future warfighting scenario from blockade to invasion, the authors of *Zhanyixue* view as essential concentrated attacks on enemy military assets with accurate missiles launched by the PLA's missile forces, the Second Artillery. Moreover, the current conventional missile force, though of limited size, is portrayed as already having sufficient range and accuracy for such attacks on critically important enemy assets as regional naval bases, air strips, and command and control centers, if the targets are well selected and the missile firings are sufficiently concentrated.[732] The text argues that a concerted deep strike attack on important enemy assets, can "seize battlefield initiative (*zhanyi zhudongquan*; 战役主动权) and establish the conditions for victory; moreover in politics it can frighten his [the enemy's] psychology, shaking his will to fight a war *(dongyao zhanzheng yizhi*; 动摇战争毅志), and accelerating the progress of the battle (*jiasu zhanyi jincheng*; 加速战役进程)."[733] Since China's conventional missile force continues to grow both in size and in accuracy and will likely soon be supplemented by a land attack cruise missile capability, potential adversaries should take the threat of an accurate PLA missile attack very seriously.

Another way that China might attempt to overcome weakness is through effective use of information and electronic warfare, a topic that has received significant attention in *Zhanyixue* and elsewhere. Endeavors in this field are perhaps the clearest example of how Chinese military elites accept the PLA's inferior overall capabilities but try to create problems for others with more advanced command and control systems and surveillance assets. In an earlier article, Richard Betts and I called this the "counter-revolution in military affairs" aimed at responding to enemy superiority rather than launching a Chinese revolution in military affairs designed to leapfrog existing technology leaders, placing China in the lead.[734] Two Chinese senior colonels at the Academy of Military

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[732] In April 1998, the Second Artillery formally raised to the PLA its concept for surprise conventional attack. *Zhanyixue*, p. 369, and pp. 375-378, 411-412, 430-433.

[733] *Zhanyixue*, p. 376; for similar discussions of concentrated missile strikes to cause strategic paralysis against Taiwan, see mainland military commentator, Zhu Xianlong "Destroying 100 Targets on Taiwan within One Hour," *Wen wei pao*, 5 August 2002 (FBIS: CPP20020805000038).

[734] See Richard Betts, and Thomas Christensen, "China: Getting the Questions Right," *The National Interest*, Winter 2000-2001. For an authoritative Chinese military author's take on the RMA, see Wang Baocun, *Shijie xin junshi geming* [The world's new revolution in military affairs], Beijing: PLA Publishers, April 1999. For two excellent studies of these "RMA" themes in Chinese open-source writings, see Stokes, *China's Military Modernization*, section II, and Michael Pillsbury, *China Debates the Future Security Environment*, Washington, DC: National Defense University Press, 2000, ch. 6, entitled forecasting future wars. Many aspects of Stokes's work are confirmed by *Zhanyixue*, ch, 6 and passim. As with missiles, there is no military activity that does not call for some information war activities in the campaign, from blinding enemies during all-out invasions, to incapacitating the enemy's ability to track mine-laying submarines or to clear mines in blockade scenarios.

Science point out that the most sophisticated systems might be the most vulnerable, writing that "striking evidence of this is the case of the US Defense Department network being paralyzed by a physically weak high-school student."[735]

Zhanyixue argues that, in order to fight more advanced foes, China needs to develop the following capabilities and tactics, all of which fit well with the notion of a counter-revolution in military affairs: special forces operations against enemy command and control; precision guided missiles, including anti-radiation missiles (*fan fushe daodan*; 反辐射导弹); electromagnetic pulse weapons (*dianci maichong wuqi*; 电磁脉冲武器); lasers (*jiguang*; 激光); and computer viruses and computer hackers (*heike*; 黑客) to attack information networks.[736] The foremost U.S. analyst of these questions, James Mulvenon, argues in an excellent study: "behind all the rhetoric hype and, IW presents the Chinese with a potentially potent, if circumscribed, asymmetric weapon. Defined carefully, it could give the PLA a longer-range power projection capability against U.S. forces that its conventional forces cannot currently hope to match."[737] It is very difficult to assess from Chinese writings how developed the Chinese information warfare and electronic warfare capability really is. Unlike those relating to missile warfare, the Chinese writings on information warfare do not betray a high degree of confidence in China's current capabilities. But the writings are quite voluminous, demonstrating the importance of this issue to Chinese military thinkers.[738] Even if China currently lacks key capabilities to render such attacks, Beijing might develop more impressive capabilities over the next several years.

It is also clear from *Zhanyixue* that Chinese military strategists are thinking of tactical ways to overcome the vulnerabilities and weaknesses of some of their systems. In addition to using mobility and deception to reduce damage from enemy attack on China, as discussed above, there is also an emphasis on timing offensive attacks properly so as to maximize surprise and effectiveness against superior foes. The authors place some emphasis on the peculiarly nasty weather patterns around the southern coast, in particular, as providing an opportunity to prepare effective surprise submarine attacks

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[735] See Senior Colonels Huang Xing and Zuo Quandian, "Holding the Initiative in Our Hands in Conducting Operations, Giving Full Play to Our Advantages to Defeat Our Enemy--A Study of the Core Idea of the Operational Doctrine of the People's Liberation Army," in *Junshi kexue* [Chinese military science], 20 November 1996, No. 4, pp. 49-56 (FBIS: FTS19970619001611).

[736] *Zhanyixue*, pp. 174-175; and Stokes, *China's Military Modernization*, ch. 3.

[737] James Mulvenon, "The PLA and Information Warfare," in James C. Mulvenon and Richard H. Yang, *The People's Liberation Army in the Information Age,* Santa Monica CA: The RAND Corporation, 1999, pp. 175-176. Mulvenon's article offers an excellent review of the current literature and thinking in China on information war.

[738] In addition to Mulvenon's "PLA and Information Warfare," see Vincent Wei-cheng Wang, "Information Technology, Asymmetric Warfare, and Cross-Strait Security," a paper prepared for the 2002 Annual Meeting of the American Political Science Association, 29 August-1 September 2002. Boston, MA.

against ships congregated and berthed in or near enemy harbors.[739] These need not be direct attacks but could include the laying of mines outside of ports where the ships are congregated.[740] The goal is to catch enemy ships while they are concentrated in port and before enemy ASW assets in the air and on the surface have been effectively deployed. Other PLA works similarly argue that submarines should pre-position themselves for attack on military assets, ports, and supplies, and should attack them early in a blockade scenario.[741]

The *Zhanyixue* authors envision heavy reliance on sea mines in blockade scenarios, delivered by multiple methods from submarines, surface navy ships, airplanes, and, if necessary, assembled civilian maritime craft. The laying of sea mines is considered "the main mission" (*zhuyao renwu*; 主要任务) of a blockade force.[742] Sea mines are notoriously difficult to clear under the best of conditions and mine-clearing is a recognized weakness of the US Navy, particularly when one consider the "organic" capabilities of forward-deployed battle groups rather than those stationed in ports on the east coast of Texas, far from Taiwan.[743] The *Zhanyixue* authors explain the relative primacy given the laying of sea mines in blockade scenarios: "…the stealthiness of

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[739] For the first mention of this in the book, see *Zhanyixue*, p. 64.

[740] *Zhanyixue*, pp. 415-416.

[741] Ji Mingliang, *Fengsuo yu fanfengsuo zuozhan* [Blockade and counter blockade warfare], Beijing: Academy of Military Sciences Publishers, December 2001, pp. 189-198; also see Ching Tung, "Beijing's Submarine Forces and Taiwan's Antisubmarine Capabilities," *Kuang chiao ching*, 2 August 2002, pp. 40-43 (FBIS: CPP20020816000067).

[742] *Zhanyixue*, p. 322, p. 411.

[743] For pioneering discussions of a scenario involving a PLA blockade of Taiwan, see Paul H.B. Godwin, "The Use of Military Force Against Taiwan: Potential PRC Scenarios," in Parris H. Chang and Martin L. Lasater, eds., *If China Crosses the Taiwan Straits: The International Response*, New York: University Press of America 1993, pp. 15-34; and Eric McVadon, "PRC Exercises, Doctrine, and Tactics Tiward Taiwan: The Naval Dimension," in *Crisis in the Taiwan Strait,* eds., James R. Lilley and Chuck Downs, Washington, DC: National Defense University Press, 1997, pp. 249-278. Admiral McVadon's work is notable as one of the early warnings about the use of submarine-laid mines in PLA doctrine. For PLA writings on blockade scenarios of unnamed foes, see *Zhanyixue*, pp. 320-324, and ch. 16. America's general weakness in minesweeping is widely recognized. Although the United States recently has developed new minesweeping and minehunting equipment, much of this new equipment is kept in bases in the United States and would require a significant amount of time to be sent to the theater. A new naval plan, "the fleet engagement strategy," backed by former Secretary of Defense William Cohen, calls for increased "organic" minehunting and minesweeping capabilities within battle groups that would involve airborne (helicopters), surface, and submarine-based capabilities. It is unclear how effective these initiatives will be in providing American forces in East Asia with readily available capability in a crisis. See Captain Buzz Broughton and Commander Jay Burton, "The (R)evolution of Mine Countermeasures," *Naval Institute Proceedings,* May 1998, pp. 55-58; "Cohen Expected to Respond This Week to Navy Brief on Mine Warfare," *Inside the Navy*, 17 August 1998, p. 3; and "Cohen Directs Navy to Add $53 Million to Develop Minehunting System," *Inside the Navy*, 31 August 1998, p. 1.

maritime mines is good, they function for a relatively long time (*zuoyong shijian chang*; 作用时间长), are inexpensive and durable, are easy to lay, and are hard to sweep." The authors also report that all countries pay careful attention to sea mines and that there have been important recent improvements in sea mine technology, that make mines even harder to detect and counter.[744]

Judging from my discussions with military experts outside of China, there are big potential problems with the tactics described above. For example, in the scenario of a surprise blockade during a stormy period, it is not clear whether the authors envision such an attack just after the weather clears or during the storm.[745] The authors might be suggesting that the PLA Navy lay mines or use torpedoes just after a significant storm clears, before ships leave port, and just before ASW assets are deployed, but scheduling such an attack would be difficult at best, particularly with submarines that must snorkel intermittently thus moving to an unstable surface and/or exposing themselves to enemy ASW assets.

From the point of view of deterring the PRC, what is more important than these external critiques of PLA doctrine is what PLA authors are thinking and writing. The important issue for our purposes here is that the military elites of the country Taiwan and the United States are trying to deter, the PRC, are thinking about these issues and writing about them often, including in internally circulated military texts not normally designed for foreign consumption. Moreover, they are doing so without the apparent degree of skepticism that I offer above. For example, another recent military text focuses entirely on blockade and counter-blockade strategies, viewing them as a major military aspect of China's overall strategy in protecting national sovereignty and achieving national unification despite the efforts of U.S.-led "anti-China forces."[746] Other PLA strategic thinkers also seem to be placing increased emphasis on the importance of maritime blockades, in particular the use of submarines and mines in Taiwan blockade scenarios.[747]

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[744] *Zhanyixue*, p. 415-416. Sea mines are also featured in another important and more recently published military book, which will be discussed further below. Ji Mingliang, *Fengsuo yu fanfengsuo zuozhan,* p. 191.

[745] It is likely the former because submarines generally would have trouble functioning near the surface in inclement weather and it would be particularly difficult and dangerous to lay mines in such weather. I base that conclusion on discussions with knowledgeable active and retired US naval officers.

[746] Ji Mingliang, *Fengsuo yu fanfengsuo zuozhan*, p. 5. Ji emphasizes that, given global interdependence and the importance of sea transport, blockades are an excellent way to achieve victory at relatively low levels of violence and relatively little cost. He predicts that blockade campaigns will become more prominent in future military affairs. Ibid., ch. 4. For another recent book dedicated to blockade warfare, see Hu Wenlong, ed., *Lianhe fengsuo zuozhan yanjiu* [Research on joint blockade warfare], Beijing: National Defense University Press, March 1999. I am grateful to Andrew Yang for calling this book to my attention.

[747] See Article by Qing Zhi, Xiao Chun, and Qu Kai from PLA National Defense University, "First Option for Military Offensive against Taiwan: Armed Blockade," *Takung pao*, 10 September 1999 (FBIS:

A final, less prominent sign of a new emphasis on blockade and undersea warfare in PLA thinking is the first printing of the expansive *English-Chinese Dictionary of Underwater Weapons* by the National Defense University Press in late 1998.[748]

The next two sections of this paper examine why coercive campaigns, including blockades, might still seem attractive to PLA strategists, despite the many difficulties outside experts associate with them.

Coercion as the Main Goal and Psychology and Morale as the Main Target

One way that the PRC can convince itself that it can overcome its military inferiority in a conflict and prevail against its adversaries is if it believes it need not defeat its enemy entirely on the military battlefield, but rather simply raise costs and concerns to such a degree that the PRC can achieve its political goals through a more limited use of force. This notion is often missed by non-Chinese analysts studying the deterrent situation across the Taiwan Strait, who too often believe deterrence is robust because of the difficulties inherent in crossing water under fire and the clear military superiority of the United States and Taiwan, particularly the former, over the PRC.[749]

If coercion is the goal of an attack, not domination, then enemy resolve and morale must be an important part of the attacker's calculation. There is a running debate in China about the staying power of US forces in a Taiwan conflict. Though many now believe that the United States would certainly intervene in a Taiwan conflict following the deployment of two US aircraft carrier battle groups to the area in March 1996, there is remaining doubt over how actively and for what duration the United States would enter the fight, particularly if the United States were simultaneously tied down fighting a war in another theater. There is much more consensus among CCP strategists regarding Taiwan itself: an enemy that is widely considered to be weak-willed and easily coerced, especially if speedy and robust U.S. intervention is in doubt. In this light it is worthwhile to pay attention to the themes of coercion and psychology in books like *Zhanyixue*.[750]

It is fairly clear that deterrence, coercion, enemy psychology, and morale are key targets of many of the operations discussed in *Zhanyixue*. The authors write that early infowar attacks can harm "the enemy's psychological conviction" (*xinnian xinli*; 信念心

OW1009084999); and Ching Tung, "Beijing's Submarine Forces and Taiwan's Antisubmarine Capabilities," *Kuang chiao ching*, 2 August 2002, pp. 40-43 (FBIS: CPP20020816000067).

[748] Ying Han, *Shuizhong bingqi cidian* , Beijing: National Defense University Press, October 1998.

[749] It is perhaps ironic that the great Clausewitz's classic dictum that "war is politics by other means," seems more accepted in "Eastern" China than in the "Western" United States, where military operations are more likely to be viewed as a "last resort" that can only be implemented if they are seen as being able to "solve" a problem once and for all.

[750] I base these conclusions on many years of interview research on these topics in Beijing and Shanghai. For review of some Chinese literature on these issues, see my "Posing Problems without Catching Up: China's Rise and Challenges for American U.S. Security Policy," *International Security*, Vol. 25, No. 4, Spring 2001, pp. 5-40.

里), and can achieve the goal of breaking the enemy military's willingness to fight (*douzhi*; 斗志) and [its] ambition *(zhiqi*; 志气) and of reducing its combat effectiveness (*zhandouli*; 战斗力)."[751] The target is as much the enemy's resolve as it is its military might. Similarly, missiles are so useful for the "seizure of battlefield initiative (*zhanyi zhudongquan*; 战役主动权)" in large part because "in politics it [a large scale and concentrated ballistic missile strike] can frighten its [the enemy's] psychology, shaking its will to fight a war *(dongyao zhanzheng yizhi*; 动摇战争毅志)."[752] So, whereas the specific targets of the missiles are not traditional "terror" targets, but military, communication, and leadership targets (airstrips, ports, communication nodes, etc), as Stokes first argued, the goals may be still largely psychological and political. Moreover, the perceived threshold for success might be much lower than if total destruction of enemy assets followed by military occupation were the goal of the operation. For example, the goal may be to use many accurate ballistic missiles and land attack cruise missiles to attack Taiwan's air strips and degrade Taiwan's much touted air superiority long enough to make psychologically damaging fighter and bomber attacks on key targets in Taiwan or, perhaps, to land or airdrop a limited number of forces on the island for the shock value that might provide.

What is critical for deterrence is not how we view the wisdom of such tactics, but how PRC civilian and military elites perceive the necessary costs that must be raised against its potential enemies as weighed against the likelihood that those enemies will accept China's terms for peace. Beijing's calculation on that score may be the most important determinant of whether or not China is successfully deterred from using force against Taiwan in a given political crisis.

In no section of *Zhanyixue* is this distinction more important than in the discussion of blockades. As discussed above, the authors writing from a military point of view initially seem quite sober about the difficulty of launching and sustaining successful blockades against determined and technologically superior foes, especially if "third countries" were to intervene. But when one reads further and more carefully, one sees that the goals of blockades need not be so grandiose that sustained military domination is necessarily required. In chapter 16 on blockades, the section describing the task or mission of a blockade is most revealing and is worth translating at length:

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[751] *Zhanyixue*, pp. 174-175. Another PLA text makes a similar argument. The authors state, "The soul of the thinking behind information warfare is to wreck the enemy's decision-making and to cause the enemy's will to break down." See Wang Jianghuai and Lin Dong "Viewing Our Army's Quality Building from the Perspective of What Information Warfare Demands," *Jiefangjun bao*, 3 March 1998 (FBIS: FTS199803130058).

[752] *Zhanyixue*, p. 376.

Although blockade campaigns are a form of offensive battle activity, the main point (*zhuoyandian*; 着眼点) is not in wiping out the opponent's effective strength (*yousheng liliang*; 有生力量), it is rather to obstruct (*zujue*; 阻绝) and isolate (*guli*; 孤立) the blockaded side.

The important missions are:

1. *Shocking* (*deterring*) and *cowing* the opponent (*Zhen (wei) she*; 震威慑): Instituting of blockade activities demonstrates one's own side's military strength and determination to defend national sovereignty, causing the blockaded side not to dare to take rash actions (*bugan qingju wangdong*; 不敢轻举妄动), and thereby achieving (*zhengqu*; 争取) a relatively long lasting peaceful environment, and reaping (*huode*; 获得) favorable conditions for politics, diplomacy, and military struggle.

2. *Weakening enemy morale* (*douzhi*; 斗志) and fighting potential: Implementing blockades creates psychological pressure on the enemy, breaking its morale (*shiqi*; 士气). At the same time, it makes it impossible for the enemy to carry out normal industrial and agricultural production, thus reducing its ability to support warfare, breaking its societal and domestic stability (*pohuai qi shehui he jingji de wending*; 破坏起社会和经济的稳定).

3. *Creating a Situation of Isolation for the Enemy*: Instituting a blockade is a military activity that obstructs the enemies maritime, air, and electromagnetic fields (*dianci lingyu*; 电磁领域), etc., isolates and cuts off the enemy, depriving (*boduo*; 剥夺) it of freedom of action (*xingdong ziyouquan*; 行动自由权), thus creating the conditions for one's own side to capture and hold the military initiative (*junshi xingdong de zhudongquan*; 军事行动的主动权).[753]

Especially when we consider the first two goals of a blockade, one can see the heavy emphasis placed on coercion and psychological and political targeting. This is consistent with other writings on blockades. One study states: "In future maritime and

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[753] *Zhanyixue*, p. 409. Italics added.

air blockade combat, the goal is not how much of the adversary's shipping you sink or how many of the adversary's planes you knock down, but rather to coerce [or terrorize] with military force (*yi wuli xiang weishe*; 以武力向威慑), and to produce the effect of shock in the society's psychology (*chansheng zhenhanxing de shehui xinli xiaoying*; 产生震撼性的社会心里效应)."[754] In this context, the author offers a strange and, in this context, a potentially dangerous historical interpretation of WWII, labeling as relatively successful one of the classic cases of a failed military blockade, Germany's naval encirclement of Great Britain in WWII.[755]

In a tightly interdependent world, one can disrupt "normal economic activities" without the slightest pretense of dominating the military situation for an extended period of time. And if one's political goal is merely to preserve sovereignty over the long run by frightening those who would threaten that sovereignty via "rash actions," then the military threshold of success might be much lower than if one was trying to get internationally recognized foreign leaders to cede control of their own nation (or, for that matter, than if one is trying to get a breakaway section of the nation to do more than simply recognize national unity at some abstract level). Making matters worse, what the PRC considers a "rash action," might be considered legitimate and normal behavior by Taipei elites and their international supporters. On the flip side of the same coin, certain political demands that the mainland makes of Taiwan may seem moderate in Beijing, but may appear to be anathema to Taiwan citizens. In a coercive context, such political differences and misperceptions are fuel for escalation.

Although we as outsiders might think of military activities as the worst possible way for China to influence the enemy's psychology in the desired way, for deterrence purposes what matters most is what PRC elites believe, not what we believe. It is fine to conclude from *Zhanyixue* that a relatively weak China would not be eager to get involved in many of the campaigns discussed, but it would be wrong to conclude that U.S. overall superiority and Taiwan's geography necessarily means deterrence is very robust under the full range of political conditions in cross-Strait relations and in U.S.-Taiwan relations.

Although one might be reassured by Beijing's apparently accommodating positions on cross-Strait issues (e.g. the three links, the promise of Taiwan's autonomy under the "one country, two systems" formula, and statements that a unified China need not equate with the PRC), from the perspective of deterrence, that moderation could prove quite troubling if Beijing were to grow frustrated with the lack of progress toward eventual unification flowing from those overtures. The limited nature of their political goals might convince Beijing elites that a coercion campaign far short of amphibious invasion would

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[754] Ji Mingliang, *Fengsuo yu fanfengsuo zuozhan*, p. 154.

[755] Ji Mingliang, *Fengsuo yu fanfengsuo zuozhan*, p. 152. Ji says that the German blockade made the British people's will unsteady (*renxin fudong*) and only failed after the United States intervened and gradually restored calm and security to Britain. Again, for deterrence purposes, it is important to know how PLA analysts, not Western analysts, view these cases, however bizarre the interpretation might appear to an objective observer.

likely succeed in convincing a weak-willed Taiwan and its potential international supporters that fighting a prolonged battle to avoid such an outcome simply is not worth it. That strategy in Beijing might prove terribly wrong, but at that point deterrence already would have failed and we might have started down the road to a cross-Strait and Sino-American war.

Procurement

Not only is China building its military at a relatively fast pace for peacetime (at current rates the official defense budget will double every four years in real terms), the PLA is procuring weapons systems consistent with the coercion strategies discussed above. Judging from both the April 2001 arms sales package of the Bush Administration and the July 2002 DoD report to Congress on Chinese military power, it seems that Washington is aware of these trends in PRC doctrinal thinking and is responding accordingly.[756] While much public attention was paid to the Bush Administration's refusal to sell Aegis systems and the controversial decision in principle to transfer eight diesel submarines, for our purposes more significant still was the agreement to transfer P-3 Orion airplanes (good for hunting submarines and breaking surface blockades), Kidd destroyers with sophisticated radars and weapons suites, and mine clearing helicopters. The chart below presents a comparison of some key trends in PLA acquisitions of coercive systems and in Taiwan's capabilities to counter those coercive techniques. (I intentionally include systems like PLA air defense systems because they will assist China in reducing the military costs of conflict, with implications for deterrence across the Taiwan Strait. As stated above, *Zhanyixue* emphasizes the importance of defensive measures against aerial attack, concealment of targets, and repair and recovery of targets that have been hit by technologically superior foes.)[757]

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[756] Department of Defense, "Report on the Military Power of the People's Republic of China," 12 July 2002, available at http://www.defenselink.mil/news/Jul2002/d20020712china.pdf.

[757] *Zhanyixue*, ch. 18.

P.R.C.	Taiwan
Strategic Missiles & Missile Defenses **Offensive Systems** 300-500 SRBMs (M-9 and M-11) Likely to grow by 50-100 per year 50-60 IRBMs (DF-21A) Reports of DF-31 attaining operational status Land Attack Cruise Missiles Will be acquired soon in unknown numbers	**Missile Defenses** **Anti-Ballistic Systems** Lower Tier: A number of Patriot-variant BMD systems, including PACII plus, likely to grow over next decade. Interest in obtaining PAC-III capability Inclusion in future Upper Tier systems: ?? **Anti-Cruise Missile Systems** Kidd-class DDGs (SM-2 SAMs—due to arrive in 2005) Several Patriot-variant systems, including PAC II plus
PLA AIR FORCE **Tactical Airpower** 80-120 Fourth-Generation fighters (SU-30, SU-27) Rapid increases possible, contingent on continued Russian support Small, but unknown numbers of Soviet AA-12 (Beyond Visual Range) 200 J-8s To be followed with the J-10 which is currently in prototype Hundreds of older J-6/J-7 **SAMs** ~20 SA-10 variant SAM systems (each w/ several launchers) Numerous indigenously produced systems **Force Multipliers** Perhaps 2-4 A-50E (Russian AWACS variant) in the future Significantly less capable than US/Israeli systems 3-4 Patrol/reconnaissance planes (TU-154M, Y-8) **May have some limited early warning capabilities**	**TAIWAN AIR FORCE** **Tactical Airpower** 210 Fourth-Generation Fighters (F-16, Mirage-2000-5) Small, but unknown quantities of AMRAAMs (BVR) Reports of sales of small quantities of HARMs 325 Third-Generation Fighters (IDF, F-5E) **Airbases** Hardening of infrastructure still sorely needed **SAMs** Substantial numbers of tactical systems **Force Multipliers** 4 E-2C Hawkeye AWACS Capable of controlling 40 intercepts, monitoring 2000 targets, at range of 300+ nmi Up to 4 more may be purchased Also seeking long-range early warning radars

PLA NAVY	TAIWAN NAVY
Surface Fleet	**Surface Fleet**
2 modern Sovremenny-class destroyers	22 modern frigates (Perry, La Fayette, Knox)
At least 2 more should be imported soon	10 older warships (Improved Gearing)
60 other surface warfare ships with severe vulnerabilities to air and sub attacks	4 Kidd-class destroyers to arrive about 2005
Submarine Fleet	**Submarine Fleet**
4 quality kilo-class (2 standard export variant, 2 enhanced)	4 SSKs (2 WWII-era, 2 more-modern Dutch model)
Beijing reportedly interested in importing 8 more from Russia.	8 newer SSKs could arrive around 2010, depending on U.S. ability to procure
5 SSNs of questionable reliability (Han)	
May be supplemented by two newer subs in latter half of decade	Key ASW Assets (other than surface fleet)
2-4 indigenous relatively modern Song-class	20-30 S-2T patrol aircraft
40-60 older, noisier SSKs (Ming, Romeo)	Possibly to be supplemented with 12 P-3 Orions if purchase approved by Taiwan legislature.
Anti-ship Cruise Missiles	**Counter-Mine Capabilities**
Some advanced systems deployed	4 relatively modern Minehunter ships
More capable systems likely under purchase contract with Russia or under development with Russian support	Modern Minesweeping helicopters, to be imported (MH-53E)
	8 older Minesweeper ships
Mine Warfare Assets	
Some evidence of advanced mines	
A large inventory of backward mines	

Sources: International Institute for Strategic Studies, *The Military Balance, 2001-2002* (New York: Oxford University Press, 2001); A.D. Baker III, *Combat Fleets of the World, 2000-2001: Their Ships, Aircraft, and Systems* (Annapolis, Maryland: Naval Institute Press, 2000); Paul Jackson, et al, eds., *Jane's All the World's Aircraft, 2001-2002* (Alexandria, Virginia: Jane's Information Group, 2001); Tony Cullen and Christopher Foss, eds., *Jane's Land Based Air Defense, 2001-2002* (Alexandria, Virginia: Jane's Information Group, 2001); Duncan Lennox, *Jane's Strategic Weapon Systems, 2001-2002* (Alexandria, Virginia: Jane's Information Group, 2001); Mark A. Stokes, *China's Strategic Modernization: Implications for the United States* (Carlisle Barracks: Strategic Studies Institute, US Army War College, 1999). On future transfer of Kilo submarines and anti-ship cruise missiles, see "Report on Functions, Armament of Russian-Made 'Kilo'-Class Submarines," *Hong Kong Sing tao jih pao,* June 10, 2002, p. A18 (in FBIS: CPP20020910000043).

Figure 8.1 Selected Relevant Military Systems for PRC Coercive Strategies[758]

[758] This chart is originally from Thomas J. Christensen, "China," in Richard Ellings and Aaron Friedberg, eds. *Strategic Asia, 2002-2003*, Seattle, WA: National Bureau for Asian Research, 2002.

Zhanyixue and Escalation

One last concerning aspect of *Zhanyixue* is the tendency to place emphasis on surprise and early concerted strikes to offset China's relative military weaknesses and the apparent ease with which even limited coercive scenarios can escalate to include much more robust warfighting. As with other lessons from the book regarding Taiwan scenarios, the lessons here are somewhat contradictory. On the one hand, from a deterrence perspective the risk of escalation *might* be a good situation. A PRC leadership who saw all forms of warfighting as potentially escalatory might be more likely to avoid using military force altogether than would a leadership who believed there were clear firebreaks at lower levels of violence.[759] On the other hand, given the proximity of Taiwan to the mainland and the time it would take the United States to get forces into the area, particularly if Washington should find itself fighting elsewhere, the emphasis on surprise, robust offensive attacks on enemy defenses, and the need to get in the first blow may make escalation more dangerous and crisis management much more difficult.

Zhanyixue reports that in April 1998, the Second Artillery formally raised its concept for "sudden conventional missile attack campaigns" (*di er paobing changgui daodan tuji zhanyi*; 第二炮兵常规导弹突击战役). The book is not always so explicit about the need to strike first with conventionally tipped missiles. However, the generally expressed fear of enemy firepower (including enemy aircraft and cruise missiles), the fear of leaving time for effective "third country" intervention, the overall emphasis on surprise and stealth in the book, and the emphasis on concentrated early blows against vital points (*zhongdian*; 重点), all suggest an offensive doctrine of early use of large numbers of ballistic missiles, rather than demonstration strikes with just one and two. Since the targets of concentrated attacks are select, critically important enemy military assets such as regional naval bases, air strips, and command and control centers, it only makes sense that one would want to attack them hard and early in any conflict.[760]

Even when discussing limited coercive strategies, the need to attack enemy defensive capabilities early is usually mentioned as a critical part of the campaign. For example the *Zhanyixue* authors sometimes discuss the early phases of a maritime blockade in a fashion that does not bode well either for crisis stability or controlling wartime escalation. The authors' suggested solution to PLA vulnerability to enemy counter-blockade capabilities is early, large-scale attack using missile strikes and submarines at the high end, and, if necessary, large numbers of civilian ships for mine-laying at the low end to achieve battlefield superiority relatively quickly.[761] This is consistent with other writings on blockades, which at times call for early attacks on enemy ports, airstrips, and missile sites as part of a blockade. One military officer rather

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[759] This would be the conventional equivalent of "the threat that leaves something to chance" in nuclear worlds as discussed by Jervis, *The Meaning of the Nuclear Revolution*.

[760] *Zhanyixue*, p. 369, and pp. 375-378, 411-412, 430-433.

[761] *Zhanyixue*, p. 411.

frankly labels these attacks in the early phases of blockades as the "prelude to escalation" (*shengji qianzou*; 升级前奏).[762] *Zhanyixue* at one point discusses in a similar light how the combat between blockade and counter-blockade forces can quickly spiral upward and become intense (*jilie*; 激烈).[763]

Nowhere does crisis stability seem more threatened than in information warfare. PLA authors place a premium on attacking the enemy's information net before the enemy attacks one's own. The authors of *Zhanyixue* write that, while offense and defense in information war are both indispensable, "offense is dominant" (*jingong zhanyou zhudao diwei*; 进攻占有主导地位). Without an effective offense, China will be unable to defend its own information networks efficiently from attack by enemies, who, the authors imply, will be more technologically advanced and powerful than China.[764] More recent PLA writings on information warfare reiterate these points about the advantage of the offensive.[765] These writings on information war provide a classic example of how China's perceived or actual military weakness can prove a destabilizing factor, rather than a stabilizing one, in cross-Strait coercive diplomacy.

One final concern involves escalation to include parties other than the United States and Taiwan. Most important among these would be Japan, from whose naval bases and airstrips the United State would project power. Separating enemies from "third countries" who might lend support is a logical strategy given the concerns expressed in *Zhanyixue.* Such tactics have been a traditional concern of PRC strategists.[766] *Zhanyixue* itself does not concentrate on this issue explicitly, but it is hard to imagine that when the authors write of concentrated attacks with conventionally tipped missiles and stealthy use of submarines, that they have only Taiwan in mind. Moreover, the book's discussion of nuclear warfighting (albeit always as a "second strike) and the targeting of specific, militarily important targets, not just vague counter-value targets, underscores the importance of Japan in the Second Artillery's targeting. Chinese ICBMs aimed at the United States simply lack the accuracy to carry out the missions discussed in those sections of the book and Taiwan is an extremely unlikely target for Chinese nuclear

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[762] Ji Mingliang, *Fengsuo yu fanfengsuo,* p. 198.

[763] *Zhanyixue*, p. 408.

[764] *Zhanyixue*, p. 172.

[765] Tang Chaojing, "Information Plays a Decisive Role in Military Struggles," *Jiefangjun bao* (Internet Version), 17 July 2002, cited in Wang, "Information Technology, Asymmetric Warfare, and Cross-Strait Security."

[766] For example, one military strategy book from the early 1990s emphasizes the political means to separate attackers from their alliances. See Huang Yuzhang, chief editor, *Junshi zhanlüe gailun* [Introduction to military strategy], Beijing: National Defense University Press, December 1991, pp. 264-265.

weapons, so it seems that U.S. bases in Japan and perhaps Hawaii and Guam are the unnamed targets in those discussions.[767]

CONCLUSION

From the point of view of coercive diplomacy, *Zhanyixue* is a mixed bag of contradictory lessons. On the one hand, some factors point in the direction of robust deterrence by the United States and Taiwan. There is a general recognition in the book that the PLA lags behind the advanced militaries of the world in terms of its technology and overall fighting power. Moreover, with the possible exception of ballistic missile strikes and, to a lesser degree, information warfare capabilities, nearly all types of military campaigns are viewed as difficult, complex, and problematic, especially against superior foes with potential outside assistance. On the other hand, there are various sections of the book that make deterrence seem much more fragile, especially those referring to the psychological aspects of warfare, rather than the brute force aspects. The same analysis holds for the potentially exaggerated estimations of specific capabilities, like the ability of submarines to lay mines or torpedo enemy ships near harbors during or just after foul weather, or the ability to coordinate submarine, air, and missile strikes in complex "joint operations" against enemy counter-blockade capabilities.

One key lesson of the book is that China sees coercive operations as preferable to more dominating operations like amphibious assault and occupation of enemy territory, perhaps because they see the latter as simply unworkable, especially against superior foes. The book emphasizes that the PRC must be prepared to fight superior foes for missions such as "preserving sovereignty" and must find ways to prevail in those struggles despite China's military weaknesses. Therefore, states deterring the PRC will need to do two things simultaneously. First, they must demonstrate not only that they can defeat the PRC in a long drawn out toe-to-toe war, but also that they can limit the economic, human, and psychological costs of warfare to themselves by maintaining a very high degree of superiority. Second, on the political side of the equation, they need to reassure China that this superiority will not be used to attack core Chinese security interests by, for example, suggesting current or eventual future support for Taiwan independence. If reassurance is left out of the equation, Beijing elites are more likely to come to the conclusion that they have no choice but to use force, despite perceived weaknesses. They might convince themselves through a series of motivated biases that they can back their enemies down through some combination of their own clever strategies and the weak-willed nature of their opponents.

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[767] The rather stunning discussion of nuclear warfighting can be found in *Zhanyixue*, pp. 369-382. What is perhaps most concerning from the point of view of escalation to bases in Japan and, perhaps escalation to the nuclear level, is that, unlike short range ballistic missiles like the M-11 and DF-15, medium range ballistic missiles, such as the DF-21, can reach both Taiwan and Japan from Northeast China and can carry both conventional and nuclear warheads. Early attacks against DF-21s deep in China by U.S. forces could provoke a dangerous escalatory process. They would be very tempting targets for the United States to attack, however, so foregoing those attacks would take great restraint.

Finding the balance between credible threats of effective response to CCP coercion on the one hand, and reassurance that the combined superiority of Taiwan and the United States will not be used in the future to push for Taiwan independence on the other, might prove increasingly difficult as the decade progresses. As the CCP builds more coercive capacity against Taiwan, the United States will likely transfer more sophisticated weapons to and increase defense coordination with Taiwan's military. The problem is that the same PLA forces that can deter Taiwan independence can be used to compel unification on the PRC's terms, and the same forces that can protect Taiwan from such a compellent strategy, by Beijing can also protect Taiwan from the PLA forces that might deter Taiwan independence. This means that short of a series of credible political reassurances on all sides, and arms race and spiral of tensions across the Strait is quite possible. Deterrence is quite possible, but it is not simple. [768]

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[768] For further elaboration on the need for combined military superiority and political reassurance, see Thomas J. Christensen, "The Contemporary Security Dilemma: Deterring a Taiwan Conflict," *Washington Quarterly* (Autumn 2002), pp. 7-21.

9. THE CHINESE VISION OF SPACE MILITARY OPERATIONS

By Kevin Pollpeter[769]

The U.S. military is increasingly integrating the use of space-based assets into military operations. Operation Desert Storm, for example, is referred to as the first "space war" because of the scale of the use of space assets. Global Positioning System (GPS) satellites guided troops in a featureless desert; reconnaissance satellites provided imaging data; Defense Support Program (DSP) satellites provided early warning of Scud missile launches; and communication satellites provided critical communication links. In Operation Enduring Freedom, the use of space became even more integral to military operations. GPS guided bombs increased the effectiveness of air strikes and reduced civilian casualties. Satellite communications provided communication links between the U.S. government and anti-Taliban agents as well as providing control and video links between unmanned aerial vehicles (UAV) and their operators.

China has noticed the increasing emphasis on the use of space by the U.S. Defense Department both in practice, during Operations Desert Storm, Allied Force and Enduring Freedom, and in theory in such publications as United States Space Command's *Vision For 2020*. The increasingly important role space is playing in U.S. military operations has caused concern that such capabilities could be used against China in a war over Taiwan. Consequently, China's contemplation of the military use of space has focused on two broad areas: (1) How to use space in military operations to increase its offensive capability, and (2) How to use space in military operations to deny space capabilities to adversaries.

This report describes Chinese thinking on military space operations, including the importance of space in fighting wars, the concept of space war and its characteristics, the platforms and weapons used in space war and their applications. Unfortunately, due to the paucity of authoritative information on the military use of space in Chinese writings, this report will only explore the Chinese characterization of space war and will not offer a definitive determination on whether or how the Chinese will use space in an armed conflict, though it will conjecture based on the evidence provided. In addition, this paper will refrain from detailing China's space technology and instead focus on how space in general may be used by the PLA.

Sources: The Authoritativeness of Chinese Writings on Space Warfare

It is difficult to assess the authoritativeness of Chinese writings without discussions with Chinese experts. It is possible that Chinese writers of military space publications may actually not represent the views of the majority in the PLA or the views of the top

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[769] The author would like to thank Dennis Blasko, John Baker, Bob Preston and Eric Valko for their comments.

PLA leadershipand may actually represent a small core of PLA "space cadets" who for bureaucratic or professional reasons or genuine belief feel compelled to espouse these views.

Despite this, it is possible to make some comments about the authoritativeness of Chinese writings used in this paper. In the PLA, military doctrine is developed by military researchers and academics and not by warfighters as in the U.S. military. The results of their research are then provided to military education institutes and to PLA warfighters. Of these institutes, the PLA's Academy of Military Science (AMS) and National Defense University (NDU) are the most reputable. Of these two institutes, AMS is considered the center of research on military doctrine. NDU does conduct research, but its main responsibility is teaching. Thus, generally speaking, publications by individual researchers at AMS will be more authoritative than publications by researchers from other organizations.

A second measure of authoritativeness is whether a source is openly published or is for internal distribution only. Internally distributed publications fall into two categories: internal publications that can have various degrees of distribution, including organization and citizenship, and internal PLA sources that are only available to members of the PLA. These internal sources are considered to be more authoritative than sources published for open distribution.

The main source used for this paper, *Space Warfare*, is an openly distributed book written by a professor at the PLA's NDU who received a bachelor's degree in engineering from the PLA Zhengzhou Mapping Institute in 1983 and a master's degree in strategic studies from NDU in 1998. He teaches courses on military technology and equipment. No direct evidence supports this author having an expertise in space issues. Based on his education, however, it is possible that he has worked on space issues involving remote sensing and his affiliation with NDU may indicate higher-quality research skills.

This paper also draws heavily on articles that appear in *China Military Science*, a highly regarded, openly distributed military journal published by AMS as well as a number of articles that appeared in *Liberation Army Daily*, the official newspaper of the PLA. Other sources include *China Aerospace*, an authoritative journal published by the China Aerospace Science and Technology Corporation, and *The Journal of the Academy of Equipment Command & Technology*, an internally distributed journal published by the Institute of Equipment Command and Technology.

Writings on Chinese strategy are mainly taken from *The Science* of *Campaigns*, an internal PLA textbook on campaign strategy used by the PLA. In addition to this, several sources on information warfare were used to supplement the discussion of information operations. One book, *Information Operations*, is an internally distributed book regarded as the synthesis of Chinese thinking of information warfare while another book, *Research On Our Army's Information Warfare Issues*, is a compilation of articles that appear in the authoritative internal PLA journal *Military Art* (军事学术). A third book is the internally distributed *An Introduction to Information Operations* by Dai Qingmin, a major general and director of the PLA Fourth Department (electronic warfare and radar) of the General Staff Headquarters and noted author on Chinese information warfare.

In writing this paper an attempt has been made to use the most authoritative publications possible. While sources of varying authoritativeness have been used, no

publications were found that differed with two main conclusions: space warfare is inevitable and China must prepare for space war by integrating space into military operations and by developing its own space weapons.

WHAT IS SPACE WAR?

Definitions of Space

At first blush a definition of space seems easy -- it is the void beyond the Earth's atmosphere. At closer examination this definition becomes more difficult to refine. There is no clear distinction between where space begins and the atmosphere ends. Carol Laymance has done a good job in delineating the definitions of space:

> If trying to define where space begins for biological reasons, one might choose nine miles above the Earth since above this point a pressure suit is required. If concerned with propulsion, 28 miles is important since this is the limit of air-breathing engines. For administrative purposes, one might find it important that US astronaut wings may be earned above 50 miles. An aeronautical engineer might define space as starting at 62 miles above the Earth's surface since this is where aerodynamic controls become ineffective. Conventional and customary law defines the lower boundary of space as the lowest perigee of orbiting space vehicles, about 93 miles.[770]

There are two different definitions of space used by Chinese writers. *The Science* of *Campaigns* defines space as beginning at 120 km (72 miles) above the earth because "aeronautical maneuvering and jet propelling are of little effect" and because "vehicles can maintain an orbit around the Earth for a certain period of time."[771] Another author uses 100 km (62 miles) as the boundary between space and the atmosphere without explanation, but presumably this is also based on the ineffectiveness of aerodynamic control.[772]

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[770] Carol Laymance, "Science of Space," in the *Space and Missile Orientation Course* (Vandenberg Air Force Base California: 30th Operations Support Squadron, 1993), in Judson J. Jusell, "Space Power Theory: A Rising Star," Air Command and Staff College, April 1998, p. 25.

[771] Wang Houqing and Zhang Xingye et al., *The Science of Campaigns* (战役学), Beijing: National Defense University Press, 2000, p. 69.

[772] Li Daguang, *Space Warfare* (太空战), Beijing: Military Science Press, 2001, p. 115. The author is a professor at the PLA's National Defense University.

Definitions of Space Warfare

The U.S. military does not have a definition of space war, but Chinese scholars have defined space war in several different ways. Space war, known as *taikong zhan* or *kongjian zhan*, is defined by *Chinese PLA Military Terminology* as:

> Military confrontations mainly conducted in outer space between two rival parties. It includes offensive and defensive operations between the two parties in outer space as well as offensive and defensive operations between the two parties from outer space to air space or to the ground and vice versa.[773]

The *Chinese Military Encyclopedia*, on the other hand, has the following definition:

> Military confrontations conducted in outer space between rival countries. It is also known as space warfare (*kongjian* or *taikong* warfare). It includes military offensive and defensive operations in outer space, operations conducted to engage targets in air space or on the ground from outer space, as well as operations conducted from the ground or in air space aimed at destroying or incapacitating space systems.[774]

The author of *Space Warfare* defines space warfare as:

> Operational activities for which establishment and retention of space control are its main mission objectives. Outer space is its main operational area and military space forces are its main operational forces. It consists of the engagement of both parties' space-based operational systems and interception of strategic ballistic missiles by space-based operational platforms, as well as surprise attacks to targets on Earth by space weapons and attacks from ground, sea and air to enemy launch ranges and command and control structure.[775]

A more comprehensive definition of space warfare is given by the authors of a *China Military Science* article:

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[773] Hong Bing and Liang Xiaoqiu, "The Basics of Space Strategic Theory" (关于空间战略理论的几个基本问题), *China Military Science* (中国军事科学), 2002, Vol. 1, p. 23. Hong Bing is the head of the Third Research Office of the Military Science Institute's Strategy Research Department. Liang Xiaoqu is an associate researcher at the Military Science Institute's Strategy Research Department.

[774] Ibid, p. 24.

[775] *Space* Warfare, p. 60.

> We believe that space warfare refers to offensive and defensive operations employed or aimed at military space forces. There are two main types of operations: one, operations conducted to gain space dominance. The objectives are to damage enemy space systems and constrain its freedom of action in space in order to protect one's own space systems and freedom of action in space. Operations include confrontations between military space forces of the two parties at war, as well as operations conducted by one party that sets to attack rival military space targets, using non-space military forces. Two, actions meant to achieve the goal of joint military operations by means of military space forces. Both sides will use space forces to provide their own war systems with surveillance, navigation, communications, command, and control support, among others, as well as engage ground targets via space-based weapons system. Space warfare directly serves one geographical part or an entire area of a war and its success or failure has an immediate impact on the course and result of the war.[776]

It should be noted that nearly every Chinese source on space warfare includes force enhancement missions as an element of space warfare, but that these are curiously left out of most definitions of space warfare.

Elements of Space Warfare[777]

Though it is important to note that Chinese writers do not use U.S. Air Force (USAF) terminology, their characterizations of space warfare include all four aspects of military space operations described by the USAF:[778]

1. Force Enhancement. Focuses on providing capabilities to enable or support air, land, sea and military space operations. The six sub-missions are: space-based navigation, satellite communications, environmental monitoring, surveillance and threat warning, command and control, and information operations.

2. Space Support. Advocates for and provides the capabilities to launch assets to space; reposition, recover and service assets on-orbit; and operate the space assets as required. Space Support consists of two sub-mission areas: launch operations and satellite operations.

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[776] "The Basics of Space Strategic Theory," p. 24.

[777] This section draws from *Space Warfare*, pp. 175-272 unless otherwise noted.

[778] Air Force Space Command, *Strategic Master Plan For FY02 And Beyond*, 9 February 2000 accessed at http://www.spacecom.af.mil/hqafspc/library/AFSPCPAOffice/table_of_contents.htm.

3. Space Control. Ensures the freedom of operations within and through the space medium, while denying its to adversaries. Space Control is thus essential to achieving the force multiplying effect of all space and missile capabilities. It includes three sub-missions: space surveillance, counterspace and NMD.

4. Force Applications. To conduct global operations by the direct and prompt application of force from and through space against terrestrial targets. The primary goal is to provide precise, prompt, global strike capability with selective lethality thus deterring aggression or achieving military objectives when use of force is directed.

Chinese writers organize their thinking around three main elements, which encompasses the characterization of space operations by the USAF.

1. Space Safeguard Operations (太空保障作战). This mission area is roughly equivalent to USAF space support operations but only includes the launching and recovery of space vehicles and does not include operations involving satellite control.

2. Space Support Operations (太空支援作战). This mission area exactly corresponds to the USAF force enhancement mission area.

3. Attack Operations (对抗作战或攻击作战). This mission area is very expansive and includes all elements of the USAF mission areas of space control and force application. It includes the use of space-based weapons against terrestrial targets, the use of terrestrial weapons against space-based targets, and the use of space-based weapons against other space-based assets.

Space Weapons[779]

Space weapons refer to the variety of systems used in military space operations. The Chinese list of space weapons includes technology that is associated with space support operations, such as reconnaissance and navigation, as well as technology that shoots at targets. Some of these technologies can be used both in anti-satellite (ASAT)/anti-spacecraft roles as well as attacks on terrestrial targets and include platforms that can be armed with weapons. They can be divided into four categories according to their utility in operations:

1. Platforms that can be used to attack space-based or terrestrial-based targets or conduct support operations. These include “aerospace planes” such as the space

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[779] This section draws on *Space Warfare*, pp. 175-272 unless otherwise noted.

shuttle; "space planes" that are powered craft that operate in space and the atmosphere; spacecraft such as the Shenzhou space capsule; "spacecraft carriers" that other spacecraft are able to dock with to resupply, refuel and repair; and "space stations," which house crews for scientific experiments or weapons use but differ from "spacecraft carriers" in that they are not designed for the docking and maintenance of other spacecraft.

2. Support technology such as communication, navigation and reconnaissance satellites.

3. Space safeguard systems such as launch and recovery technology as well as transportation equipment used in space warfare.

4. Counter space and space defense technologies mainly made up of ballistic missile defense systems and anti-spacecraft weapons, but can also include terrestrial attack weapons and computer network attack[780] as well as manipulation in which a spacecraft can use a mechanical arm to grab another spacecraft.[781] They can also include passive measures such as cover and concealment and denial and deception. They may also include missiles, air and special forces operations against ground-based segments of space operations.

Examples of technology used in space warfare are:

<u>Platforms</u>

- Aerospace plane (航天飞机), e.g., space shuttle
- Space plane (空天飞机)
- Spacecraft (载人航天器), e.g., Shenzhou space capsule
- Spacecraft carrier (航天母船)
- Space station (空间站)

<u>Support Technology</u>

- Communication satellites

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[780] Liu Zengliang and Liu Wei, "Research on Issues in Computer Network Attack and Defense" (计算机网络战攻防问题研究), in Military Studies Editorial Department（军事学术编辑部), *Research On Our Army's Information Warfare Issues* (我军信息战问题研究*)*, Beijing: NDU Press, 1999, p. 137.

[781] "The Basics of Space Strategic Theory," p. 29. Simple descriptions of using manipulation to capture satellites ignore the complex and precise methods needed to perform such an operation.

- Navigation satellites
- Reconnaissance satellites
- Early Warning satellites
- Meteorological satellites

Safeguard Technology

- Launch vehicles
- Recovery vehicles

Weapons

- Anti-satellite satellites
- Lasers
- Microwave weapons
- Kinetic energy weapons
- Missiles (nuclear and nonnuclear)
- Orbital bombs (nuclear and nonnuclear)
- Manipulation
- Computer network attack
- Passive measures

THE GUIDING CONCEPTS OF SPACE WAR (太空战的指导思想)[782]

This section discusses the Chinese views of the concepts of space war. *The Science of Campaigns* defines campaign concepts as "the basis for gaining understanding of the basic issues in military campaigns and of the ways to achieve victory in military campaigns."[783] The three concepts of space war--space mobility, full spectrum jointness, and full coverage strike--describe a vision of space warfare as consisting of operations that can strike any target on short notice with a variety of weapons.

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[782] This section draws from *Space Warfare,* pp.114-124.

[783] *The Science of Campaigns*, p. 88.

Space Mobility (空间机动)

Space mobility refers to the ability of high speed and maneuverable spacecraft to operate at high altitudes in a boundless environment that is not subject to the limitations of territorial boundaries, weather or the time of day.[784] The ability of spacecraft to operate at high altitudes is described as especially useful in observation and communications. Within limits, the higher the altitude the more area of the earth one can observe or communicate with. For example, in geostationary orbits just three communication satellites can cover the entire earth while at low earth orbits constellations of satellites must be used to cover the entire earth. This ability enables spacecraft to cover the entire earth without regard to sovereignty issues and permits them to overcome some of the limitations imposed on aircraft. In addition, because of the absence of many restrictions that terrestrial-based weapons face, all types of weapon can be used from space with great affect.[785]

Full Spectrum Jointness (全维联合)

Full spectrum jointness refers to connecting land, sea and air information systems through the use of space assets. In this way, space assets can act as force multipliers for terrestrial weapon systems. Moreover, space assets will not only contribute to joint operations by providing support functions, they will also provide their own offensive and defensive strike capabilities. Specifically, space will be especially important in battlefield awareness, precision strikes, missile defense, information warfare and air operations.

Full Coverage Strike (全域攻击)

Full coverage strike refers to using space assets throughout the complete strike process, from planning to execution to evaluation. It refers to the ability of space assets to provide reconnaissance, navigation, communication, and command and control support and to the use of space-based weapons to strike terrestrial and space-based targets. Because of the variety of targets, different types of weapons will be required, including ground-based laser weapons, air-based microwave weapons, and spacecraft.

Full coverage strike is acknowledged to not yet be possible, but if the evolution of air operations can be used as a guide, then military space operations can be assumed to eventually take on all of these roles in a three-step evolutionary process. Air operations initially concentrated on conducting reconnaissance and then evolved into conducting air superiority and strategic bombing missions. While space is still in the first stage of development, it can be expected at some point in the future to conduct all of these

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[784] In actuality, spacecraft do travel at high speeds, but have only a limited ability to maneuver.

[785] In reality, space-based weapons do have significant limitations. For a discussion of the possibility, utility, legalities and limitations of using space weapons, see Bob Preston, et al., *Space Weapons, Earth Wars*, Santa Monica: RAND, 2002.

missions. The second stage in the development of space operations will involve operations to disrupt and destroy space systems while the third stage of development will be the use of space forces to strike terrestrial targets.

SPACE WAR OPERATIONAL THEORY (太空战的作战理论)[786]

The elements of space war operational theory –- space control and the integration of air and space operations –- places space as the premier battlefield for insuring victory. Space and air operations will become mutually supporting and because of technology will actually become one battlefield. This section discusses the Chinese view of space operations theory.

Space Control (制天权)

Space control refers to having freedom of movement and freedom to the use of space and the ability to limit the freedom of movement and the use of space by the enemy. Achieving space control has now joined achieving air, sea and electromagnetic control as a fundamental condition for achieving victory. Moreover, achieving space control is a fundamental condition for achieving air, sea and electromagnetic control. Thus, space control will be more important than sea, air, and electromagnetic control.

Integration of Air and Space (空天一体)

The integration of air and space is partly due to the fact that there is no clear distinction between the end of the earth's atmosphere and the beginning of space and the fact that what is launched into space must first pass through the atmosphere. In addition, the development of space planes will make it possible for craft to takeoff from earth, transit through space and reenter the atmosphere. Thus, to conduct space operations both air and space have to be considered when conducting mission planning.

A second reason for the integration of air and space forces is that the operational application of all space weaponry cannot be divorced from achieving the goal of terrestrial-based operations. Modern war is a high technology operation that integrates forces of all dimensions. Air and space battlefields are linked by information, are mutually supporting, and are part of a component of an entirety of military application.

The third reason for the integration of air and space is the coordination provided by C^4I systems. It is now possible to have real-time communications between surveillance and early warning aircraft, satellites and their customers. Synchronization and coordination of the space and air battlefields has thus become possible and air and space forces have entered a new stage in which they become mutually dependent, affecting and conditioning.

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[786] This section draws on *Space Warfare*, pp. 124-134.

THE BASIC PRINCIPLES OF SPACE WARFARE (太空战的基本原则)[787]

The Science of Campaigns defines the basic principles of military campaigns as "a concrete expression of basic guiding concepts of military campaigns from different perspectives. They are the basic rules governing the preparation and execution of military campaigns."[788] Thus, the principles of space warfare are the basic rules governing the preparation and execution of military space operations. This section discusses the Chinese views of the principles of space warfare.

Unified Command, Dispersed Implementation (统一指挥，分散实施).

Unified Command

One source refers to unified command as establishing a space warfare command center directly under the highest state leader or the highest military decision-making organization that will be fully in charge of the development and application of military space forces. Military space forces must be controlled and commanded in a centralized manner in order to secure the coordination and unity of military operations.

Another source, however, also calls for a unified command, not so much to conduct better military operations, but to take charge of the country's space development effort.

> Our country is a developing country. Its national economic strength, science and technology level and industrial base are all relatively weak. Therefore, we must establish a strong leadership organization based on the needs of future space operations to meet every service's operational requirements (mainly referring to information requirements) and carry out unified leadership of organizations, units, schools and scientific research units and systems in order to excel in comprehensive design and planning, determine the development path, clearly direct principles and construct a unified systems of technology standards and regulations.[789]

Perhaps in recognition of the difficulties in establishing some sort of space command, one author notes that the establishment of armed forces is subject to the needs of a country's national security and military strategies and that once forces of a certain scale have been formed their reorganization becomes difficult. It is also recognized that

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[787] This section draws on *Space Warfare*, pp. 134-145 unless otherwise noted.

[788] *The Science of Campaigns*, p. 101.

[789] Chang Xianqi, "Space Power and National Security" (空间力量与国家安全), *Journal of the Academy of Equipment Command and Technology* (装备指挥技术学院学报), December 2002, p. 4. The author is the president of the Equipment and Command Technology Institute.

establishment of a space command will also depend on the development of space weapon systems.

Dispersed Implementation

The space battlefield is described as unusually vast and space warfare operational platforms as ultra fast. These factors require that space operations must be dispersed in order to bring the advantages of space systems into play, achieve effective control and to conduct flexible campaigns and tactics.

Dispersed implementation stresses the utilization of independent operational units that can actively take the initiative. Active operations are described as an effective way of seizing the initiative and only with active operations can large numbers of the enemy be killed, the military balance changed, and operational freedom and initiative won. Therefore, the high-speed mobility, long range, and destructive power of space forces should be brought fully into play.

The strategies of active offense and gaining mastery by striking first are particularly emphasized in space operations. When carrying out offensive military operations it is necessary to organize a powerful military space assault corps that employs a variety of offensive operations and continuously attacks the enemy. Moreover, when carrying out defensive operations it is imperative to emphasize a comprehensive and tight defense. At the same time, it is important to use offensive counterattacks that closely integrate force enhancement operations with weapon systems. Finally, it is important to avoid fighting a blind battle or to fight any battle that is energy consuming.

Complete Application and Joint Operations (全程使用，联合作战)

Complete Application. Complete application refers to the maximum use of space forces during the entirety of a battle, including all phases of joint campaigns or any period of time during an operation. In future battles space warfare will be decisive in gaining space and electromagnetic superiority. This requires the application of space forces during the whole course of the war. It is pointed out that the USAF believes air and space supremacy is a precondition to conducting mobile engagement, full dimensional protection and precision attack and that the United States has always considered outer space the vantage point of the entire battle which allows it to conduct asymmetrical operations with those countries that do not have or have few operational space forces.

The complete application of space forces in future battles includes force enhancement and direct strike operations. Force enhancement operations will take place during the whole course of a battle, including during the preparation, prosecution, and assessment stages of a battle. Direct attacks will also be used to engage enemy forces on the ground, sea, air, space and electromagnetic battlefields through hard and soft kills against all enemy weapon systems. In addition, it will also deny an enemy's freedom to use space resources by interfering with and destroying an enemy's space weapon systems and prevent enemy intervention and destruction of the PLA's own space systems.

Joint Operations. Space forces have become an indispensable component of modern joint operations and without the support of space satellite systems it is impossible

to establish a C^4I system of significance. In fact, centralized command, close coordination in a multi-dimensional battlefield, and rapid mobility cannot be accomplished without the use of space. At the same time, however, space supremacy can only play a significant role with the help of ground, naval, and air forces. Close integration between space operations and operations on the ground, sea, air and electromagnetic space is needed to maximize the effect of integrated operations. Specifically, *The Science of Campaigns* notes that "space reconnaissance directly guides ground, sea and air operations and anti-satellite and anti-missile warfare can directly cover and protect important targets on various battlefields from being located and destroyed."[790]

Tight Defense, Careful Use of Force (严密防护，慎重用兵)

Tight Defense. Space weapons systems are extremely susceptible to both hard and soft attack and require "crucial measures" to enhance their survivability. If any one segment of a space operation is damaged or destroyed, whether it is the ground support, space weaponry or space transportation segment, then the space force may not be able to accomplish its mission. For this reason, planning for a tight defense not only concerns the security of important bases, it also concerns the stability of operational systems and maintaining operational capabilities. In addition, it is necessary to prevent space information systems from becoming the "Achilles' heel" of an operation and it is imperative to maintain space control at all costs during the entire course of a war by eliminating enemy threats to one's space information systems and securing their ability to effectively provide information support.[791]

The Careful Use of Force. The careful use of force refers to the careful analysis of data, weighing of consequences, and prudent use of military space technology. Space weapons and equipment are extremely expensive, limited in number, and operate in inhospitable environments. They are not easy to replace. In addition, space operations can be affected by other military operations, international restrictions, C^4I system developments, the quality of staff and technology, and weather. If any link is subject to damage or destruction it can reduce the effectiveness of space operations. Therefore, before space forces are used, the highest decision-making bodies must judge the risks and benefits so as not to act rashly and to act only when victory is certain.

Rapid Response To Bring To A Rapid Conclusion (快速反应，速战速决)

Space operation systems must have the ability to respond quickly to changing battlefield conditions. Military space assets are quick and have long-range strike and

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[790] *The Science of Campaigns*, pp. 72-73.

[791] Xu Wei, "Space Power and Space Operations" (试析制天权与空间作战), *China Military Science* (中国军事科学), 2002, Vol. 1, pp. 41-42. The author is a major in the PLA and a doctoral candidate at the PLA's National Defense University studying operational command.

rapid response attack capabilities. It is important to deliver destructive strikes to the enemy using maximum power in order to fight rapidly, conclude the operation rapidly and to withdraw from the confrontation. Thus, minimizing the time spent carrying out operations is important while the size of sovereign territory no longer constitutes an important factor. Consequently, to seize space by means of time will be a new strategic choice.

Focus on Real Operations and Emphasize Deterrence (力主力足实战，注重威慑)

Space operations should focus on real capabilities as much as deterrence. Deterrence, however, can only be effective when one possesses real capabilities. Therefore, even having a limited military space capability is of tremendous importance and as long as one has a capability, important strategic objectives can be achieved.

The principle of space deterrence seems to focus on four aspects. The first is integrating space with other military forces in order to form the most effective military possible. By having a strong military a nation can deter other nations from attacking it. The second aspect is having a credible counter space capability to threaten another nation's space assets in order to deter the opponent from using its counter space capabilities. In this way, both sides would be reluctant to attack the other's space assets lest they also come under attack. The third aspect is having an effective space support system that can identify potential aggressors and provide enough time for their actions to be halted. In this case, intelligence gathered from space systems can be used to provide backing for a country's policies or to prove actions denied by another country. The fourth aspect is having an effective missile defense system that would make nuclear attack with ballistic missiles useless and permit freedom of action in regards to nuclear operations. According to two authors, "The party that enjoys superiority in space will secure its survival by weakening the enemy's nuclear deterrent capabilities, thereby increasing tremendously one's nuclear deterrent power. Space forces constitute both a 'space shield' and a 'space sword.'"[792] This last point may be more to stress China's vulnerability than a path to follow for China's space development efforts.

Interestingly, one author has a less optimistic view of the power of space deterrence:

> Military space power is similar to nuclear power in that it can be used for deterrence, but the difference is that the threshold of use for space strategic power is much lower than that of nuclear weapons. This means that space strategic power must not only have a deterrent effect but also real war fighting potential. This relationship must be handled well, for the

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[792] See Li Jinjun and Shan Yuchuan, "The Strategy of Space Deterrence" (空间威慑战略刍议), *China Military Science* (中国军事科学), 2002 Vol. 1, pp. 18-22. Li Jinjun is a senior colonel in the PLA and is the head of the Equipment Command Technology Institute's Research Science Department. Shan Yuchuan is an assistant professor at the Equipment Command Technology Institute and heads its Military Science and Technology Strategic Development Office.

> relationship of the "possession" of deterrence and the "use" of real war fighting must be paid attention to. Like nuclear weapons, some space weapons have a strategic deterrent effect and thus cannot be used casually. Despite their small probability of use in real war fighting, these space weapons have considerable strategic deterrent value. If the deterrent effects are well managed, they can achieve the goal of "winning without fighting." However, deterrence is not empty threats. To generate credible deterrent effects, one must back them up with real war fighting capabilities and be serious about preparations for real war fighting. When employed, space strategic forces will have significant consequences; therefore, decisions to use them must be made with great caution. Before the war breaks out, necessary space strategic forces can be used to demonstrate strength to deter in order to prevent the outbreak of war. In the initial stage of war, deterrent space actions can be taken to prevent the escalation of war and bring the confrontation to a conclusion by resolving the crisis under conditions that are favorable to one's side. As the war progresses, if necessary, swift decisions must be made to use space strategic forces to gain mastery by striking first with attacks on the enemy's vital targets, in order to create conditions favorable to one's side. The strategic commander should also consider the combined power of deterrence and real war fighting so as to maximize the strategic effects.[793]

Unfortunately, the author does not explain why he equates space weapons with nuclear weapons but does go on to explain that because nations will only have a small number of space weapons their use will be limited.

CONCLUSIONS OF CHINESE AUTHORS ABOUT THE DIRECTION AND CONDUCT OF SPACE WAR[794]

This section will examine the conclusions of Chinese authors on the direction and conduct of space war. It relies heavily on *Space Warfare*, whose conclusions do not differ significantly from the conclusions of other Chinese authors writing on military space issues.

Air and Space Control Is Essential for Victory and Military Space Confrontation Is an Inevitable Result of Scientific and Technological Development.

The development of space technology will inevitably lead to the militarization of space and space militarization will lead to confrontation in space. As the struggle over air and space control is becoming the new focal point of war, space will become the main battlefield of future wars. According to Chinese writings, recent high-technology local

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[793] "The Basics of Space Strategic Theory," p. 30.

[794] This section draws from *Space Warfare*, pp. 408-420 unless otherwise noted.

wars are evidence that whoever gains air and space control will seize the initiative. Consequently, air and space control will play an increasingly important role in modern war and dominating space will be the one and only principle of winning future wars. Therefore, air and space control will be the new focal point of struggle in future wars.[795]

Chinese writers also point out three aspects of air control theory that can be logically extended to space control theory. First, modern air superiority theory concerns military operations and military deterrent activities in peacetime. It also emphasizes the accomplishment of strategic campaign objectives through air attacks. Second, air superiority theory expands the missions of air operations from supporting ground and sea operations to conducting air operations directly aimed at winning the battle by emphasizing strategic air assaults against vital enemy targets. Third, it expands the emphasis of air operations to include air operations outside tactical battlefields. It emphasizes the maximum use of rapid and flexible air power with a global reach and advocates destroying and damaging air defense weapons that are not currently in use but might have an effect on the outcome of the battle.

Space control is seen as the further development of air control as the development of space technology allows space vehicles to transit through space as well as to strike terrestrial targets from space. It maximizes one's own space forces and limits, weakens, damages, and denies the application of enemy space forces. Space control theory also emphasizes the support and safeguarding of ground, sea, and air operations through the control and utilization of space. To gain space control has become one of the essential conditions to gain air, sea, land and electromagnetic control.[796]

HOW TO PREPARE THE PLA FOR SPACE WAR

Based on the view that space will become the premier battlefield in future wars and that the control of space is a prerequisite for victory, PLA writers call on the military to prepare for space war through four ways: developing space war theory, developing technology, centralizing control over space organizations, and developing human resources. One author writes:

> In the face of the intensified outer space struggle and the militarization of space in an effort to secure our country's national security and national interests particularly the security and interests of outer space in the 21st century, we must attach great importance to space warfare. We must establish and strengthen the concept of dominating air and space to win in future operations. We also have to pay close attention to the development and trends of contemporary major space powers in the space warfare domain and we must devote more effort on developing a space theory with

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[795] *Space Warfare,* pp. 375-376.

[796] Ibid, pp. 377-378.

> our characteristics and to develop our space warfare weaponry with focus.[797]

The PLA is also urged to begin thinking about how to dominate air and space:

> We must correctly appreciate the role of the air and space domains in future wars, consolidating and establishing the notion of dominating air and space to win. This has especially important practical significance in developing the right military strategy and tactics and to win future battles and to win cross-Strait military armed struggles.[798]

However, according to author accounts, the PLA appears to be unable to establish air and space control and must begin to change its mindset.

> Since its establishment 50 years ago, our Air Force has gained tremendous achievement in its modernization process. However, our Air Force modernization drive and development lags behind the world military trend. It is important to acknowledge this. We need to establish in the Air Force the notion of controlling air and space. The current situation of Air Force modernization strongly calls for the notion of controlling air and space to win. Only by establishing such a notion can we realize the important practical significance of building a people's Air Force with both offensive and defensive capability and at the same time explore the patterns and characteristics of modern wars. We also have to conduct in depth analysis of high technology local wars in order to maximize our advantages and minimize our shortcomings and increasing our confidence in beating enemies of superior weaponry using our current weapons.[799]

Meeting the challenges of space warfare not only requires a change in mindset but also requires the development of technology. The author continues:

> Because space technology development requires large investments and long development cycles, it is important to coordinate and plan the development of military space systems and to design scientific and reasonable plans for developing space weapons. Based on the needs of national security and our nation's space development, the planning of space weapons development can be divided into two stages with the first stage covering from now until 2010 and the second stage from 2010 to

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[797] Ibid, p. 408.

[798] Ibid.

[799] Ibid, pp. 409-410.

> 2025. In the first stage we must strive to make our space weapon systems possess support and safeguard capabilities as well as basic space combat capability. In addition, they can complement our operations on the ground, sea and air and at the same time provide effective surveillance, monitoring, early warning, communications, navigation, and positioning support to our combat units. They should also have a certain combat capability in space, particularly in regards to defensive capability. In the second stage, we should build on the foundation of the first stage by further improving our offensive and defensive capability of space weapon systems. In particular, the offense capability in space should, if necessary, be capable of destroying or temporarily incapacitating all enemy space vehicles that fly in space above our sovereign territory.[800]

The author then gives a five-step plan for developing the nation's space warfare ability. First, it is important to consider the capacity of the national economy and R&D efforts and avoid being spread too thin and setting goals too high. The plan should narrowly seek the advancement of technology and quantitative superiority to improve combat capabilities while avoiding a negative impact on the country's economic development.[801]

Second, the focus of space warfare technology must be based on operational requirements. The PLA must accurately predict future space operational models so as to identify the position of space weapon systems development. It must correctly analyze and judge Taiwan's and the United States' space weapons development and evolution as well as their space operational measures and characteristics in order to determine their strengths and weaknesses so as to develop space weapon systems that effectively attack their weak points and nodes. Moreover, the PLA must identify its own weaknesses and urgently develop information collection, transmission, processing and application technologies as well as combat and advanced navigation and positioning capabilities that support long range operations as well as strategic deterrent capabilities that can effectively deal with enemy space forces. In response to these conditions, and based on feasibility, the PLA must underline the focal points that are the combination of needs and possibilities and selectively choose those space weapon systems that have broad coverage, strong penetration capability, and can act as force multipliers.[802]

Third, integration must be stressed. Winning high-technology local wars depends on using space systems as the core of an integrated operational system supported by C^4ISR systems, with the participation of all military services. Therefore, space weapon systems development must emphasize integration by fitting space weapon systems development into the big picture of weapon systems development. This requires

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[800] Ibid, pp. 413-414.

[801] Ibid, p. 414.

[802] Ibid, p. 415.

standardizing and sequencing the development and production of space weapon systems with uniform technical requirements in order to increase the compatibility of space systems.[803]

Fourth, conduct long term planning and adopt a global view and consider thoroughly issues related to development strategy. Space technology development should be based on the future needs of a high-technology war, main long-term threats and the trends of military space weapons. Continuous development and leapfrog development must be combined.[804]

Fifth, combine military and civilian technology and integrate peacetime and wartime facilities. As space equipment is costly to develop and maintain, it is important to have civil-use technology that can also be used in military applications.[805] The dual-use nature of space technology allows space development to adapt to the military-civilian compatible model of development. Therefore, the development of space technology must serve military missions as well as national economic development.

The author then assigns priorities to developing military space technologies. The first priority should be given to military satellites that will provide direct support to terrestrial military applications such as surveillance, early warning, communications, navigation, and terrain mapping. Second, space-based weapon systems that are mainly used to attack enemy anti-satellites systems, such as anti-satellite satellites, anti-satellite missiles, and space-based directed energy weapons should be developed. Finally, manned space vehicles such as space ships, space shuttles and space stations should be developed. In the short run, the key developments should be anti-satellites weapons including land-based anti-satellite weapons and anti-satellite satellites.[806]

Another author suggests concentrating on three principles of development: point breakthroughs, system development and international cooperation. Since no one country can excel at developing every type of space technology and since space technology requires heavy investment, development efforts should focus on key technologies. The second principle, system development, not only concerns insuring the compatibility of components within a space-based system but also insuring the compatibility of a space-based system with other operational systems such as weapon systems and ground support systems. The third principle is international cooperation. The increasing development costs of space systems necessitate even the United States to seek international partners. International cooperation is described as the fastest means of developing China's space program.[807]

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[803] Ibid.

[804] Ibid, pp. 415-416.

[805] Ibid, p. 416.

[806] Ibid, p. 417.

[807] "Space Power and National Security," p. 4.

In addition to technology development, the PLA must change its internal structure to better meet the challenges of space warfare. A space testing unit and a national research and command center must be established.[808] These will be the organizational and leading bodies of China's future space operations that will be responsible for the uniform coordination of command and control of all forces related to the building of space forces. Its main mission should consist of three aspects. First, to guide the strategy for developing space operations by planning and coordinating the development of space technology and to organize and guide the research and study of space warfare theories as well as top level design and system building.

Second, these organizations will lead and organize the development of space weapon systems. They will also study how to adapt current space technology to military applications and plan and coordinate the preparations for building a future space unit.

Third, they will be in charge of studying the military application of China's current military space forces and its training and management, which includes the uniform management and maintenance of current space weapon systems. When needed this center could be turned into a military space operational command center or the highest command headquarters.

Specifically, these organizations should focus on countering the United States' missile defense systems as well as countermeasures related to the integration of Taiwan into these systems.[809] In addition, to meet the requirements of defeating the United States in a war over Taiwan, the PLA is urged to possess weapons that can act as "trump cards" (*shashoujian*) with space attack capability. Therefore, China must construct a small, yet elite space operational testing unit as soon as possible. The goal and purpose of forming this unit is to explore, assess and implement space warfare concepts and to accumulate experience to implement space deterrent and operational capabilities. This will also act as the foundation of a future space unit and create advantageous conditions for such a construction.[810]

But the development of a space force must be done in a way that reconciles China's stated policy against the weaponization of space with the trends it sees in the way wars are fought. The author goes on to write:

> On the one hand we must adhere to the non-weaponization of space as national defense policy, on the other we have to take precautions and increase our defense capability of space assault in real terms. We have to use our current outer space technology to develop all kinds of civilian communication, navigation, exploration, meteorological satellites and spacecraft in order to defend against attacks from space…Only when we

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[808] *Space Warfare,* pp. 417-418.

[809] Ibid, p. 418.

[810] Ibid, pp. 418-419.

> have a presence in space can we guarantee an invincible position in future high-tech local wars.[811]

The author also writes that considering international opposition to the weaponization of space, the construction of a space force should be carried out secretly:

> Military space force development and application is a complex project involving a multitude of units inside and outside the military that has a high degree of difficulty and a long development span with the necessity for a high degree of command and control as well as a high degree of sensitivity. Considering certain constraints from the international society, the construction of such a unit should be carried out secretly by keeping a low profile. We should also use our military's current space equipment and institutions and avoid large-scale institutional change to maximize the effect by using the least investment.[812]

Finally, the PLA must improve its talent pool. It is noted that the major military space powers have schools to teach space technology and operations and the students of these schools "must have an advanced military mentality, relatively high level of strategic thinking, and expertise in space weapon systems" as well as a interest in science and technology, wide-knowledge base, multi-disciplinary training and a progressive mindset. Finally, emphasis should be placed on training these students in operations command and engineering.[813] But education should not be restricted to lower-level officers and those directly responsible for space operations. One author recommends that "middle and high-level commanding officers should also receive training on space operations."[814]

OBSERVATIONS ON THE CHINESE VISION OF SPACE WARFARE

China Is Learning From the United States

The Chinese vision of space warfare is heavily drawn from U.S. writings on space warfare. In fact, many Chinese publications frequently reference U.S. military writings on space and future warfare, such as the United States Space Command's *Vision For 2020*, and *Joint Vision 2010* and *Joint Vision 2020* and books such as *Space Power*

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[811] Ibid, p. 409.

[812] Ibid, p. 419.

[813] Chang Xianqi, "Space Strategy and National Security" (空间战略与国家安全), *China Military Science* (中国军事科学) 2002, vol. 1, p. 17.

[814] "Space Power and National Security," p. 5.

Theory by James Oberg. Just a few examples will serve to illustrate this point. In regards to the evolution of the military use of space, the United Space Command writes:

> Over the past several decades, space power has primarily supported land, sea, and air operations—-strategically and operationally. During the early portion of the 21st Century, space power will also evolve into a separate and equal medium of warfare. Likewise, space forces will emerge to protect military and commercial national interests and investment in the space medium due to their increasing importance.[815]

The U.S. Space Command also believes that space superiority will be critical to future military operations:

> Just as land dominance, sea control, and air superiority have become critical elements of current military strategy, space superiority is emerging as an essential element of battlefield success and future warfare.[816]

In addition, the USAF viewed air and space as seamless operational environments in a 2000 publication:

> Our service views the flight domains of air and space as a seamless operational medium. The environmental differences between air and space do not separate the employment of aerospace power within them.[817]

It also views space as essential for accomplishing both terrestrial and non-terrestrial operational goals:

> Control of the entire aerospace continuum is increasingly a prerequisite for effective joint operations.[818]

The similarity of the Chinese and U.S. visions of the military use of space suggests that at the same time that the U.S. Defense Department makes very public statements about threats to the U.S. space infrastructure, the need to control space, and the inevitability of

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[815] United States Space Command, *Vision For 2020*, February 1997.

[816] Ibid.

[817] U.S. Air Force, *The Aerospace Force: Defending America in the 21st Century,* 2000. p. i. The USAF view of air and space as seamless mediums was an attempt by USAF bureaucracy to improve coordination between air forces and space forces and not a doctrinal issue. The USAF has now returned to the view that air and space are separate mediums.

[818] Ibid, p. 5.

space weaponization,[819] these statements are then used by the Chinese to justify the militarization and weaponization of their own space program. In a 7 February 2001 *Liberation Army Daily* article, one author writes that the United States "maintains that a space war is inevitable" and that through the use of space the "United States can occupy a commanding height in issuing a threatening signal to opponents to make them stop their threat of armed force, and thus reach its goal of 'forcing the enemy to surrender without a fight.'" The author concludes:

> Space fighting is not far off. National security has already exceeded territory and territorial waters and airspace and territorial space should also be added. The modes of defense will no longer be to fight on our own territory and fight for marine rights and interests. We must also engage in space defense as well as air defense.[820]

Consequently, the U.S. Defense Department may unwittingly be producing a security dilemma where its own efforts to protect its systems may be driving others to develop systems to counter U.S. space efforts. This may suggest, at the least, that Defense Department pronouncements about its vision for the use of space should not be made so public and, at the most, may require the U.S. Defense Department to examine how its actions may affect U.S. security.

Ironically, the use of U.S. writings by Chinese authors does not necessarily mean they are accurately characterizing space operations or drawing correct conclusions. For example, spacecraft are described as able to travel very fast and highly maneuverable. While spacecraft do travel very fast, they are, in fact, quite limited in their ability to maneuver. In another example, a discussion of grappling a satellite in order to send it out of orbit ignores the fact that such a maneuver requires very exact control methods. Similarly, the statement that "every type of weapon can be used from space with great affect" ignores the very real limitations of space-based weapons.

Erroneous or incomplete descriptions of the military use of space may be leading Chinese space theorists to exaggerate the potential of space in armed conflicts. For example, describing space as becoming fundamental to insuring air, land and sea control

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[819] For examples of U.S. government statements on the weaponization of space see Jeremy Singer, "Pentagon In No Rush To Deploy Space-Based Weapons," *Space News*, 22 December 2002, p. 22. According to USAF General Lance Lord, commander of Air Force Space Command, the USAF "is trying to mature the necessary technology for space-based weapons, and lay a foundation for space programs in general." Also, Bill Sweetman, 'USAF Plots Return to Space," *Jane's International Defense Review*, May 2002, p. 45. "Eberhart (General Ralph Eberhart, Commander of U.S. Space Command) likens the use of space assets in 'Desert Storm' to the use of airpower in the First World War. 'The lessons were important. We learned a lot. But the most important message was that we recognized the great promise that air power held for the future.'"

[820] Teng Jianqun, "Thoughts Arising From The U.S. Military's Space War Exercise," *Liberation Army Daily* (online), 29 October 2002 (in FBIS as "*Jiefangjun bao* Views U.S. Preparations for Space Warfare," 7 February 2001).

ignores the inability of the USAF in Operation Allied Force to locate much of the Serbian army. Achieving space control also does not address the threat from ground-based air defenses that can force aircraft in many operations to stay above altitudes of 10,000 feet. Such mischaracterizations may further feed the belief that control of space is vital to the success of operations on the ground.

China Has a Nascent Military Space Program

Chinese writings are mainly aspirational and do not necessarily state how they will use space to fight wars either now or in the near future. Clearly, the use of spacecraft carriers and other types of nonexistent or nascent technology are at best many years away from being put into operation by any country. China does have the ability to carry out some of this vision as it applies to force enhancement missions. It has communication and earth observation satellites that have military utility. Carrying out space control and force applications missions, however, pose significant technological hurdles. Still, this is not to say that all of this technology is new. The Soviet Union in 1968 tested an anti-satellite satellite[821] and in 1982 the United States tested an anti-satellite missile fired from an F-15.[822]

Chinese authors admit that while China's space program is more developed than most countries', it is still behind the United States and Russia and that this poses challenges for Chinese national security. The authors of a June 2002 *China Aerospace* article write that although China's space industry has built a solid foundation "it is still far from meeting the requirements for winning a local war under high technology conditions."[823] China's deficiencies lie in two main areas:

> One is the application range still awaits expansion. At present, most of China's military space technology remains on an operational support level. Moreover, the projects are incomplete and still await further improvement as well as technological and system development in the areas of space attacks (jamming and destruction) and space defense. Two is that the technological level still awaits improvement. Taking China's remote sensing satellite technology as an example, it has deficiencies in areas such as image resolution, time resolution, operating life, and information transfer ability. Not only are the benefits of using satellites low, they are also only able to undertake partial general survey work, and the information requirements under detailed survey and emergency situations are obviously

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[821] Paul B. Stares, *The Militarization of Space: U.S. Space Policy, 1945-1984*, Ithaca: Cornell University Press, 1987, p. 137.

[822] Raymond L. Puffer, "The Death of a Satellite," Edwards Air Force Base Air Flight Test Center, website accessed at http://www.edwards.af.mil/moments/docs_html/85-09-13.html.

[823] Xie Yonggao, Qin Zizeng and Huang Haibing, "Looking at the Past and Future of Military Space Technology" (军事航天技术的回顾与展望), *China Aerospace* (中国航天) (online), No. 6, 2002.

> unable to be satisfied. Generally speaking, there still exists outstanding contradictions between the requirements of China's military satellite systems and realities which urgently await resolution.[824]

This 1998 article may, in fact, already be outdated. A report on a meeting entitled "The Conference On Satellites and Their Use During the Iraq War" revealed that Chinese satellite imagery was able to reveal craters in Iraqi runways, which would suggest advanced imaging technology of around 1 meter.[825] Preparing for space war, however, not only entails improving systems, it also requires developing space power theory. Several Chinese writings call on theorists to continue exploring questions central to the conduct of space warfare such as the affect of space operations on future wars, the methods of integrating space into future joint operations and the general conduct of space war.[826] Chinese recommendations for its military space program address the need for improving every aspect of development. Much work needs to be done to develop organizations, human resources, doctrine, and technology to meet the requirements of space warfare.

However, the preliminary nature of China's thinking on military space operations can only be partly attributed to the fact that China is a developing country with a military that is coming to grips with fighting high technology wars. Space warfare is new to military science and it is surprising how little thinking has been done to develop space power theory, even in the United States. For example, there is no official Defense Department definition of "space war" or "space weapon" and its definition of "space" appears to do more to lay the groundwork for the weaponization of space rather than really define it: "A medium like the land, sea, and air within which military activities shall be conducted to achieve U.S. national security objectives."[827]

Regardless of how developed China's military space program is, there is general agreement that China does need to develop space for military uses. A frequent quote in Chinese writings is that whoever controls space controls the earth. A *Guang jiao jing* article is representative of many Chinese publications in stating:

> China must make a choice quite unlike that of any development strategy of military strategy in the past, abandoning the traditional passive "pressure-response" development mode with regard to China's military power,

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[824] Zhao Dexi, "It Is Necessary To Give Serious Attention To Building A Military Aerospace System To Strengthen National Defense," *China Aerospace*, November 1998, pp. 6-9 (in FBIS as "Aerospace Said Key To National Defense," 14 January 1999).

[825] "Experts View The Iraq War: Using Satellites in the Service of National Defense" (专家感言伊战: 利用卫星服务国防), *China Space News* (中国航天报) (online), 9 April 2003.

[826] "Space Power and National Security," p. 5.

[827] Joint Chiefs of Staff, *Department of Defense Dictionary of Military and Related Terms,* 25 September 2002 accessed at www.defenselink.mil.

> national security, and science and technology and working day and night to develop its own space power. . . [828]

China's plans for the military use of space raise important questions about the sincerity of its arms control statements. But China's position as expressed in its defense white papers has changed subtlety from opposing the militarization of space to opposing the weaponization of space. In *China's National Defense in 2000*, Beijing states in regards to the military use of space:

> Such activities as the testing, deployment or use of weapons, weapon systems or their *components* should be banned in outer space, in order to prevent the militarization of and an arms race in outer space. At present, there are intentions, plans and actions to pursue unilateral military and strategic superiority in, and control of, outer space. They are not only real but also growing. Therefore, it is realistic and urgent that the international community takes effective measures to stop such negative developments.[829] (emphasis added)

However, in its 2002 defense white paper, China states:

> At present, outer space is faced with the danger of weaponization, and protection of outer space from weaponization and an arms race has become a very urgent and realistic issue. The international community should negotiate and conclude the necessary legal instrument as soon as possible to prohibit the deployment of weapons in outer space and the use or threat of use of force against objects in outer space, so as to ensure peace and tranquility therein.[830]

The change in China's rhetorical stance would no longer put it in opposition to the use of space for such applications as reconnaissance or navigation and positioning for military purposes. It would, however, still put China in opposition to the weaponization of space. Considering this, China's space program may be at odds with its official position. Such a situation would not be unprecedented within the context of space and arms control. The United States during the Carter administration followed a two-track policy of developing ASATs at the same time that it was supporting their prohibition on the grounds that an

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[828] Gao Yan, "China Must Become a Space A Power," *Guang jiao jing*, 16 July 2002, pp. 10-13 (in FBIS as "China: Need To Become Space Power May Lead To Confrontation With US," 19 July 2002).

[829] PRC Government Information Office, *China's National Defense in 2000* accessed at www.china.org.cn.

[830] PRC Government Information Office, *China's National Defense in 2002* accessed at www.china.org.cn.

ASAT program would support the U.S. bargaining position and act as a hedge against the failure of the negotiations.[831]

China's Use of Space in an Armed Conflict

There is little information on China's space program and even less on how China is considering using space for military purposes. Information on how China will actually use space in an armed conflict is virtually nonexistent. One place to start is *The Science of Campaigns*. *The Science of Campaigns* does recognize that the modern battlefield has expanded and that space will play an increasingly important role in future operations.[832] In addition, there is a recognition of the ability of space technology to foster better integration by providing better C^4ISR capabilities and of its ability to destroy enemy space assets. But there is no detailed discussion of the use of space forces as there is of ground, naval, air and missiles forces. Still, Chinese strategic planning may give us insight into how the PLA may *potentially* use space in an armed conflict.

According to PLA authors, in contrast to wars in the past, modern wars have become increasingly short and are often decided by just one campaign.[833] Thus, winning the campaign may mean winning the war. The main guiding concept of PLA thinking on how to win campaigns is "integrated operations and concentrated strikes." *The Science of Campaigns* describes this concept as:

> . . . to combine all crucial campaign elements including strength, space, timing and material means in order to form an all-round operational synergy, starting by damaging and paralyzing the general structure of the enemy's operations system, and focusing spearhead forces in the campaign's main direction, and on crucial moments and important activities, keeping an eye on the vital targets that integrate and support the enemy's overall operations system; to adopt flexible and mobile campaign methods and exercise proactive and focused compound strikes to push forward and resolve the general campaign situation. In other words, striving to paralyze first and annihilate later, and to conduct an operation of annihilation so as to seek a rapid conclusion through quick operations in order to promptly accomplish campaign objectives.[834]

According to this concept, even a highly efficient military will have vital weaknesses, which, if damaged, could paralyze the whole system. Vital targets are defined as:

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[831] *The Militarization of Space: U.S. Space Policy, 1945-1984*, pp. 180-181.

[832] *The Science of Campaigns*, pp. 24-25.

[833] Ibid, p. 12.

[834] Ibid, p. 89.

> . . . those targets that could have a direct impact on the overall situation of the campaign or produce an overall effect. They include systems, parts and links vital to the sustaining of the campaign, as well as important force groupings and important battlefield facilities.[835]

Commanders should actively take the initiative to strike at an enemy's vital targets because "only through active offensive operations and counter-attacks can one seize and maintain the initiative."[836] Specifically, vital targets include information, command and support systems. Hitting these vital targets through concentrated strikes is especially recommended in cases where the PLA faces a "powerful enemy equipped with high-technology weapons and equipment" rather than conduct wars of annihilation.[837]

Increasingly, the PLA views information operations as being critical to winning future wars. Primarily due to the U.S. performance in recent operations, the PLA has come to realize the important role of information in the conduct of modern wars. According to *The Science of Campaigns*, the goal of information warfare is:

> . . . to cut off the enemy's observation, decision-making, and troop command and control capabilities at critical times and in areas related to overall campaign operations, while maintaining our own command and control ability, thus allowing us to seize information superiority, to establish strategic and campaign superiority, and to create conditions to win the decisive battle.[838]

In addition,

> . . . whoever receives, transmits, and uses information more frequently in real-time, more accurately, and more effectively has more chances to win the war. Moreover, the one who has the control over collecting information generally usually can achieve better cost-effectiveness in war. Therefore, the primary task of modern campaigns has become seizing information superiority and taking away the enemy's capability of acquiring information.[839]

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[835] Ibid, p. 96.

[836] Ibid, p. 98.

[837] Ibid, p. 97.

[838] Ibid, p. 169.

[839] Ibid, p. 170.

Because of the primacy of information warfare,

> . . . the first targets of a campaign are no longer the enemy's heavy forces and artillery positions. Instead, they are detection, command and telecommunications information systems, whose degradation or destruction will negate or reduce the enemy's ability to control information and create conditions for later combat.[840]

Indeed, *The Science of Campaigns* concludes "to cripple or destroy the enemy's information system would drastically degrade the enemy's combat capabilities by making it blind, deaf or paralyzed."[841] A list in *The Science of Campaigns* may prioritize command and information systems as the first and second of five target types to be struck.[842]

Another aspect of the concept of integrated operations and concentrated strike is the principle of taking the enemy by surprise. Taking the enemy by surprise catches the enemy unprepared "and causes confusion in and huge psychological pressure on the enemy, and would help one win relatively large victories at relatively small costs."[843] The authors of *The Science of Campaigns* write that information warfare both necessitates and facilitates "gaining mastery by striking first." Launching an information offensive through a sudden attack is easier with information operations because it can be carried out remotely and covertly. Secondly, information operations consume fewer resources than other types of operations and can be conducted for longer periods of time. Thirdly, information systems use the electromagnetic spectrum, which leaves them vulnerable to attack. Finally, information systems that are destroyed may not be able to be restored for long periods of time. These factors determine that "whoever takes the early advantage is more likely to seize control over information on the battlefield and get better combat effect."[844]

Information superiority, however, does not have to be achieved throughout the entire course of a war and does not need to be achieved in totality, rather information superiority can be seized during specific time periods needed to conduct attacks on vital targets. One source states:

> For any strong army, establishing information control is a relative concept and absolute information control does not exist. For our army it is even more so. The process of establishing information control is relative with

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[840] Ibid, pp. 169-170.

[841] Ibid, p. 95.

[842] Ibid, pp. 95-96.

[843] Ibid, p. 108.

[844] Ibid, p. 178.

> the scope of control being localized and the gains and losses dynamic. The importance of the value of information operations is determined by the needs of the timing and scope of joint operations. By being relative, the effectiveness of localized information control is increased.[845]

Thus, Chinese writings on the general conduct of campaigns and the specific prosecution of information operations may suggest the manner in which China conducts military space operations. First, the recognized benefits that space provides to military operations as well as their vulnerabilities may make them a vital target irresistible to PLA campaign planners. Second, because achieving information dominance may necessitate "gaining mastery by striking first" and because, according to PLA space warfare theorists, achieving space superiority will become necessary for seizing the initiative and establishing battlefield dominance, an enemy's space assets may be the first targets struck, possibly even through sneak attack.

If the Chinese vision of space warfare is to be believed, then the benefits that space gives to a military campaign will play an increasingly important role. Thus, to deny an enemy the use of space will be an important factor in future wars. One author writes:

> From the perspective of cross-Strait armed conflict the improvement of our space operational capability not only can effectively inhibit the intervention of a strong enemy, it will also play an important role in weakening Taiwan's offensive and defensive capability. At present Taiwan possesses a certain low-tier ballistic missile defense capability. It is also enthusiastically developing theater ballistic missiles and its Zhonghua satellites can obviously be used in military activities. Therefore, military space forces will certainly become an important military measure that we must consider using in conflict with the other party.[846]

He continues:

> We must understand the situation of our space force construction and focus on the possible space operational issues when resolving the Taiwan problem. Studying and developing operational models and campaign methods of real operational significance with a special focus on those that can effectively contain Air Force support for Taiwan by the United States. Judging from our country's current space technology level and situation, we should focus on studying future space-terrestrial confrontation models and anti-satellite warfare campaign methods.

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[845] Dai Qingmin, ed., *Introduction to Information Operations* (信息作战概论), Beijing: Liberation Army Press, 1999, p. 277.

[846] *Space Warfare*, p. 411.

> This constitutes the operational models and campaign methods of real operational significance to our country in the coming decade.[847]

Other writers echo these recommendations by stating:

> . . . a war may break out on our periphery that directly uses military space systems, including space support, attack and defense spacecraft. To meet this threat, we must intensify research into ground-based and space-based (concentrating on ground-based) anti-satellite systems and as soon as possible develop one or two anti-satellite weapons that can threaten enemy space systems and allow the initiative to be taken in space.[848]

In addition, China has recognized the vulnerability of space assets and U.S. dependence on them. One source notes that during the Gulf War, 90% of strategic communications was handled by satellites, including commercial satellites.[849] A *People's Daily* article states that "modern militaries rely to an unprecedented degree on satellites"[850] while an article in the *Liberation Army Daily*, states:

> Currently, space systems have increasingly become systems in which countries' key interests lie. If an anti-satellite weapon destroys a space system in a future war, the destruction will have dealt a blow to the side that owns and uses the space system, stripped it of space supremacy, and weakened its supremacy in conducting information warfare and even its supremacy in the war at large. Anti-satellite weapons that can be developed at low cost and that can strike at the enemy's enormously expensive yet vulnerable space system will become an important option for the majority of medium-sized and small countries with fragile space technology to deter their powerful enemies and protect themselves.[851]

A Xinhua article states, "For countries that can never win a war with the United States by using the method of tanks and planes, attacking the U.S. space system may be

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[847] Ibid, p. 143.

[848] "Looking at the Past and Future of Military Space Technology."

[849] *Introduction to Information* Operations, p. 350.

[850] Ye Qinqin, "Humanity's Call: Do Not Militarize Space" (人类的共同呼声 太空不能军事化), *People's Daily* (online), 25 May 2001.

[851] Li Hechun and Chen Yourong, "Sky War – A New form of War That Might Erupt in the Future," *Liberation Army Daily* (online), 17 January 2001, p. 17 (in FBIS as "PLA Article Says Space War May Be Future Form of Warfare," 17 January 2001).

an irresistible and most tempting choice."[852] The author of a *China Military Science* article writes:

> Only by launching an attack on an enemy's C^4ISR system in all-dimensional space at the same time or one after another will it be possible for an inferior belligerent to effectively raise overall effectiveness of information operations and seize local information control. For this reason, we should own arms and equipment for fighting an all-around information war so as to contend with an enemy for information superiority in all-dimensional space. Information operations will certainly focus on contentions for information superiority in the air or space so that quite a few countries are expected to focus on developing synthesized arms and equipment for information operations in the air or space.[853]

Such thinking would fall in line with official PLA thinking of how to conduct campaigns. As stated above, PLA writings frequently cite command and control systems as the main targets in warfare and have identified satellites as the "nerve center" of U.S. C^3I systems.[854] Such attacks would slow down U.S. information collection and transmission and would better enable the PLA to control the pace of the campaign or at least slow down U.S. operations to make them comparable to the speed of PLA operations.[855]

As stated before, space operations are required to deliver destructive strikes to the enemy using maximum space engagement power in order to fight rapidly, conclude the operation rapidly and to withdraw from the confrontation in order to avoid wasting energy and time and to drag on without engagement and conclusion.[856] Moreover, one Chinese writer on space states that striking targets that can directly influence the battle rather than strikes that cause large numbers of enemy casualties is called "superior mobility," by some and "strategically gaining mastery by striking first" or "strategic

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[852] Wang Hucheng, "The U.S. Military's Soft Ribs and Strategic Weaknesses," *Xinhua*, 5 July 2000 (in FBIS as "Liaowang On US Military's 'Strategic Weaknesses,'" 5 July 2000).

[853] Dai Qingmin, "Innovating and Developing Views On Information Operations," *China Military Science*, 20 August 2000, pp. 72-77 (in FBIS as "PRC Military Science Journal on Information Operations," 11 September 2000).

[854] Yao Ji and Sun Zhiqiang, "Military Satellites Change With Each Passing Day" (军用卫星日心月异), *Liberation Army Daily* (解放军报)(online), 13 November 2002.

[855] Thanks to Dean Cheng for this point.

[856] *Space Warfare*, p. 142.

control" by others.[857] This further suggests that the Chinese vision of space warfare includes striking first in space.

Writings in Chinese literature on how to conduct space war reflect the concepts and principles of campaign warfare stated above, though there is still little direct evidence as to what types of space targets the PLA may consider the most important and how they would attack them. Chinese authors writing on space do not assign a relative value to satellites and instead lump all satellites as potential targets. Chinese sources on strategy and information warfare, however, provide some clues as to what types of targets are most valuable. As mentioned earlier, *The Science of Campaigns* lists five types of targets. The first target is the enemy's command system, which is described as the "nerve center" of campaign operations. The second target is an enemy's information systems. These include surveillance and reconnaissance devices, computer equipment, communication facilities, command and control facilities as well as information processing and display equipment. The third target is enemy weapons systems. The fourth target is support systems, such as logistics. The fifth target is the links between command, operations, weapons and support systems whose crippling can result in the enemy carrying out isolated instead of concerted campaign operations.[858]

Assuming that this list is also a prioritization, Chinese strategy would seem to value the destruction of intelligence gathering satellites, which would belong to the second-tier targets of information systems over other types of satellites, such as communication and GPS satellites that provide links between various campaign systems, that fall into the fifth-tier, or least valuable target set. This prioritization is also supported by various writings on information warfare. In these writings, information collection is regarded as the basis of information warfare. One source states, "First, the direct goal and basis of operations to achieve campaign information control is the collection of information and the maintaining of information superiority."[859] In fact, one source describes "intelligence warfare" as the primary operational method and asserts that whoever achieves intelligence superiority will then be able to achieve a high degree of battlefield transparency which can then lead to seizing operational initiative and winning the war.[860] Another source goes further by describing intelligence warfare as holding a "special position" in the realm of information countermeasures:

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[857] *Space Warfare*, p. 117.

[858] *The Science of Campaigns*, pp. 95-96.

[859] Zhang Jianhong, "Operations To Achieve Campaign Information Control" (夺取战役制信息权作战探要)," in Military Studies Editorial Department (军事学术编辑部), *Research On Our Army's Information Warfare Issues* (我军信息战问题研究), Beijing: NDU Press, 1999, p. 68.

[860] Lu Daohai, *Information Operations: Exploring The Seizure of Information Control* (信息作战：夺取制信息权的探索), Beijing: Military Yiwen Press, 1999, p. 74.

> Under information warfare conditions, only by having clear intelligence on the enemy and the operational area and even the enemy's country and by strictly controlling our intelligence, can correct judgments of the battlefield be made, correct operational guidance given, and information attacks and firepower attacks correctly organized to paralyze enemy operational systems and maintain the concealment of operational movement in order to accomplish campaign goals.[861]

Perhaps because intelligence collection forms the basis of information superiority, one source states, "before an operation or in the opening stages of an operation enemy reconnaissance and early warning systems must be struck."[862] This statement is echoed in another source which states, "When a campaign starts, the main tasks of an information operation is to attack enemy reconnaissance systems and implement campaign information deception to conceal our operational intent and protect the start of our campaign force."[863]

Other types of satellites, however, have also been discussed as targets. Considering the PLA's emphasis on attacking command and control targets, it is not surprising that attacking communication satellites has been discussed. One source states:

> Jamming satellite communications can block the main channel of information flow. The enemy's naval force and its national military command authorities, naval command centers and other force links mainly rely on high frequency satellite communications and microwave communications and all other satellite communications, including commercial and military satellite communications, all of which are easily susceptible to electronic interference and deception. In regards to this point, we can use ground-based high-powered satellite communication jammers or vessels installed with high frequency satellite communication jammers against the transmitters of high frequency satellites used by large naval forces in order to enter into an advantageous position within the wave shape coverage of the communication satellite transmitter. We can then jam the satellite's transmitter at its source, destroying its normal operation and interrupting satellite communication with the outside. We can also deploy electronic interference aircraft to conduct

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[861] Xu Yuanxian, "Future Basic Methods of Our Army's Information Warfare" (试论未来我军信息战的基本样式), in Military Studies Editorial Department (军事学术编辑部), *Research On Our Army's Information Warfare Issues* (我军信息战问题研究), Beijing: NDU Press, 1999, p. 29.

[862] Wang Huying, "The Basic Principles and Campaign Methods of Information Attacks" (信息进攻的基本原则激战法), in Military Studies Editorial Department (军事学术编辑部), *Research On Our Army's Information Warfare Issues* (我军信息战问题研究), Beijing: NDU Press, 1999, p. 82.

[863] *Introduction to Information* Operations, p. 313.

> suppression or deception at the source against ship-borne WSC-3 high frequency communication satellite receivers and SSR-1 satellite signal receivers.[864]

In addition, because of the U.S. reliance on satellite positioning for targeting, the U.S. GPS system may also be a target. A *Liberation Army Daily* article outlines three vulnerabilities of the GPS system. First, the GPS signal can be easily jammed by signals produced by commercial television stations, satellite communications and mobile satellite terminals.[865] Another method is to use space-based jammers to disrupt the GPS signal at its source.[866] Second, altering the signal to avoid jamming is difficult and would have negative consequences for global transportation. Finally, GPS satellites are vulnerable to direct attack.[867] Another *Liberation Army Daily* article states that "the optimal method for dealing with coordinate warfare is to destroy the opposition's NAVSTAR satellites or to use the same coordinate warfare methods to counter attack the opposition's vital targets."[868] But jamming the GPS signal does not need to be complex. It is reportedly inexpensive and can be purchased with off the shelf technology for less than $400.[869] China may also be less inclined to discriminate in its GPS jamming. According to one article:

> To low-tech rivals such as countries that do not rely heavily on GPS, in particular, it is not necessary to worry about the consequences of one's jamming, nor is it necessary to select the frequency and scope of interference, which do not have simple counter measures. In contrast, for countries highly reliant on GPS, it is necessary to limit their jamming

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[864] Nie Yubao, "Electronic Warfare Methods To Attack Large Enemy Ships" (打击海上敌大船艇编队的电子战战法), in Military Studies Editorial Department (军事学术编辑部), *Research On Our Army's Information Warfare Issues* (我军信息战问题研究), Beijing: NDU Press, 1999, p. 185.

[865] Shi Chunmin, "War Is Aimed at the Soft Rib of GPS" (战争瞄向 GPS '软肋'), *Liberation Army Daily* (解放军报) (online), 15 January 2003.

[866] Zhu Rinzhong, "The Theory of GPS and Methods of Countering It," *Junshi xueshu*, May 1999, pp. 58-59, in Dean Cheng, "The Chinese Space Program: A 21st Century Fleet In Being," in James Mulvenon and Andrew Yang, *A Poverty of Riches: New Challenges and Opportunities in PLA Research*, Santa Monica: RAND, 2003, p. 46. Interfering with a GPS signal involves jamming the GPS receivers, not transmitters. In this case the author is advocating an ill-advised tactic.

[867] "War Is Aimed at the Soft Rib of GPS."

[868] Liu Sunshan, "Military Experts Believe That Coordinate War Is Coming Onto The Warfare Stage," *Liberation Army Daily*, 13 June 2001 (in FBIS as "Jiefangjun Bao Article on Accurate All-Weather Attacks Using Satellite Data", 13 June 2001).

[869] Liu Weiguo, "The Soft Rib Of The High Technology Battlefield: GPS" (现代高技术战场软肋: GPS), *Liberation Army Daily* (online), 18 July 2001.

> power to a narrow, specific scope of frequency from a long distance, but the control and focus of this kind of jamming power is relatively difficult.[870]

In addition, China may also consider attacking space-based segments of a missile defense system. China fears that a U.S. national missile defense system could negate China's nuclear deterrent, which could subject it to nuclear blackmail by the United States.[871]

As mentioned before, there is no specific information on the types of attacks China would conduct against space assets, though "soft" attacks appear to hold priority over "hard" attacks. Most writings, however, call for a combination of soft and hard attacks. For example:

> Soft kill has the following advantages: broad application, strong operational effect, and does not create pollution in the outer space environment. Still, it cannot cause direct casualties or the destruction of enemy hardware and facilities such as ground launch platforms, space weapons and operation personnel. Using hard destruction can make up for the shortcomings of soft kill methods, containing enemy space capabilities in the long term. Also, hard destruction methods can achieve optimal effect only when complemented with soft kill. Therefore, only by applying in an integrated manner measures of soft kill and hard kill destruction methods can an enemy's space capabilities be weakened or deprived.[872]

But anti-satellite operations do have their constraints and limitations. One article states:

> The most noticeable difference between space strategic forces and ground, sea and air strategic forces on the battlefield lies in the limited scale and high cost of the former. Even for the rich and arrogant major space power, space forces cannot be employed at will. Therefore, the application of space forces should be focused on crucial moments and important targets to conduct focused engagements. As for other space countries, investments in space are limited and so is the scale of their military space forces, which limits a large-scale employment. Operational guidance must

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[870] Ibid.

[871] Philip Saunders, Jing-Dong Yuan, Stephanie Lieggi, and Angela Deters, "China's Space Capabilities and the Strategic Logic of Anti-Satellite Weapons," Center For Nonproliferation Studies website accessed at http://cns.miis.edu/pubs/week/020722.htm.

[872] "Space Power and Space Operations," pp. 43-44.

> emphasize limited goals. Major space powers such as the United States might set as its space strategic goal gaining complete supremacy of space, and consequently might use its space forces to achieve this goal. Other space countries, however, can only seek to "gain a foothold" in certain areas that have decisive implications for their security and operations. In their war fighting efforts, they should not seek to destroy completely the enemy's space operational systems, but to conduct nodal warfare, breaking the enemy's space information chain and undermining the support given to the ground operation by the enemy's space operational systems at crucial moments, which will cause the enemy to lose partially its space dominance in a certain time span. When it comes to attacking targets, full engagement is not to be emphasized. "To break one finger is more effective than hurting all ten fingers." An enemy's vulnerable and fatal targets are to be focused on.[873]

In addition, anti-satellite attacks cannot be conducted indiscriminately. With the increasing internationalization of space commerce, an aggressor may use third party satellites. During the Gulf War and the Kosovo conflict, the United States used European satellites. Consequently, any action taken against the satellite in question will be viewed as an act of aggression by the country that owns it and will unnecessarily draw international criticism. In addition, China and a potential adversary may also share the services of a third party's satellite, the destruction of which may also impair China's access to space technology. As a result, operations against third party satellites must not be carried out casually. In some cases when it is necessary to act against third party satellites, temporary "soft" kills should be used instead of "hard" kills. Conducting soft kills will also have the added result of not creating space debris, which could damage Chinese satellites.[874]

Space warfare can also include passive means and is not limited to wartime. PLA members have been warned that "above our heads are an innumerable number of eyes and ears staring at and listening to us every minute of the day."[875] This creates a need for the PLA to both actively and passively counter such efforts through interference, deception, concealment and camouflage.[876] Specifically, the PLA may utilize terrain or

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[873] "The Basics of Space Strategic Theory," p. 23.

[874] "Space Power and Space Operations," p. 41.

[875] Zhang Xiaoqing, "Guarding Against the Outer Space Eye" (谨防太空谍眼), *Liberation Army Daily* (解放军报) (online), 30 May 2001.

[876] See, for example, Chao Chunjiu, "Construct The Solid Shield of Information Warfare" (构筑信息监实盾牌), *Liberation Army Daily* (解放军报)(online), 7 November 2001.

take into account the timing of satellite overflights to conceal intentions.[877] The PLA has also banned the use of mobile phones by most of its members.[878] One interviewee explained that this was due in part because the U.S. "Echelon" signals intelligence program uses a network of satellites to gather information.[879]

While China's counter space strategy may cause the most concern in some circles, developing force enhancement functions is its first priority.[880] Communication, reconnaissance, weather and positioning satellites would enable the PLA to better conduct "integrated operations and concentrated strikes." This concept requires the integration of the "participating arms and services…into an organic whole to form a campaign force structure of a combined operational force."[881] Three authors writing on naval combat state:

> Satellite Technology will be fully emphasized by all countries, with systems such as the satellite-based C^3I and C^4I systems, the GPS (global positioning system) navigation positioning system, remote sensing technology, space-based attack systems, and space-based, large-scale monitoring and warning systems being used by most maritime countries. Satellite technology can, in future space development, ensure better command and control of naval operations.[882]

At the same time, China must continually monitor potential adversaries in order to gain an information advantage in war. "This is to create the condition of 'winning before fighting,' laying down a solid foundation for winning peace, containing war and gaining

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[877] Sun Zheng and Zhang Yingwu, "Opinions on Anti-C^4I Operations," *Liberation Army Daily*, 23 July 2002, p. 6 (in FBIS as "PRC: JFJB Article Discusses Operations Against C^4I System," 23 July 2002).

[878] Xu Zhuangzhi and Wang Dongming, "Small Mobile Phones and National Defense Information Security," *Qingnian bao*, 13 April 2002 (in FBIS as Military Expert Interviewed on PLA's Ban on Use of Mobile Phones By Soliders," 13 April 2002).

[879] Ren Qiuling, "Building An Intelligence Network At High Cost, The U.S. From All Aspects Listens To China" (部戏巨资打造情报网 美国全方监听中国), *People's Daily* (人民日报) (online), 17 April 2002.

[880] Ping Fan and Li Qi, "A Theoretical Discussion of Several Matters Involved In The Development of Military Space Forces," *China Military Science*, 20 May 1997 pp. 127-131 (in FBIS as "Military Officers Discuss Space Forces, 25 October 1997). Senior Colonel Ping Fan is a vice president of the Defense Science Work Commission, Command Technology Academy. Captain Li Qi is an instructor at the Defense Science Work Commission, Command Technology Academy, Command Teaching and Research Section.

[881] *The Science of Campaigns*, p.93.

[882] Shen Zhongchang, Zhang Haiying, and Zhou Xinsheng, "21st Century Naval Warfare," in Michael Pillsbury, *Chinese Views Of Future* Warfare, Washington, DC: National Defense University Press, 1998, p. 265.

victory in future armed struggles."[883] One author has outlined eight information requirements of a high technology war that can all be performed through the use of space.[884]

1. Determine the position of political, military, economic, and communication infrastructure of certain countries and assess the posture and capabilities of adversaries.

2. Monitor weapons and troop deployments and verification of treaty compliance.

3. Monitor military actions and discover signs of war.

4. Conduct battlefield reconnaissance and battle damage assessments and provide intelligence for combat commands and the use of strategic weapons.

5. Transmit real-time of near real-time tactical information.

6. Expose enemy concealment and camouflage and verify one's own concealment and camouflage efforts.

7. Conduct accurate weather forecasting.

8. Conduct signals intelligence.

The ability of satellites to provide information on enemy forces has also been recognized as "improving a stratagem's probability of success."[885] The ability to locate enemy forces would enable the PLA to position forces to conduct ambushes and to concentrate forces at identified weak points or vital targets. Moreover, the Chinese offer to invest in the European Galileo satellite positioning system would provide its weapon systems with precision guidance and hinder U.S. efforts to deny such benefits because of European allies' ownership of the system.

One part of the vision that may be incorrect, however, is the extent China needs to rely on space in an armed conflict with the United States over Taiwan. In this situation, the U.S. military would be required to operate hundreds, if not thousands, of miles from any base and China would be able to conduct operations relatively close to its bases.

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[883] "Space Power and Space Operations," p. 42.

[884] Zhao Dexi, "It Is Necessary To Give Serious Attention To Building A Military Aerospace System To Strengthen National Defense," *China Aerospace*, November 1998, pp. 6-9 (in FBIS as "Aerospace Said Key To National Defense," 14 January 1999).

[885] Wang Jianghuai and Yang Genyuan, "The Characteristics of Military Stratagems In A High Technology War" (高技术战争中的军事谋略特征), *Liberation Army Daily* (解放军报) (online), 18 December 2001.

This creates a situation in which the U.S. military would rely on space to conduct military operations and the PLA would not be required to rely as much on space, with the exception being satellite navigation and positioning support and early warning. For example, the extensive laying of fiber optic lines in China would negate the need for a heavy military reliance on satellite communications. In addition, airborne platforms or agents on the ground could provide imagery of Taiwan. So as not to take this point too far, not relying on space systems also has its weaknesses. Fiber optic terminals are not mobile and if discovered could be easily attacked. In addition, conducting airborne reconnaissance of Taiwan assumes that the PLA could achieve air superiority at least for the duration of the reconnaissance flight. But a situation in which China was not as reliant on space systems as the United States could provide China with an asymmetry that would be difficult for the United States to overcome and may cause them to emphasize offensive operations over support operations. According to one article, "the party with inferior military space forces will be unable to organize a comprehensive and effective defense, it should therefore concentrate its limited military space forces on the offensive."[886]

CONCLUDING REMARKS

While this paper has focused on the military aspects of China's space program, what cannot be forgotten is that China is engaging in a comprehensive effort to develop its space program. It has a robust civil satellite program, is developing a commercial satellite presence, and is planning to send a manned mission into space in late 2003. These efforts accentuate the seriousness with which China is contemplating space. It is little wonder then that many Chinese writers describe space systems as important to the conduct of war and assert that in future wars China must first gain mastery of space before it can hope for victory on earth.

China is in a certain sense already conducting space war. Regardless of the commercial or civil aspects of their satellites, all of them can be, and most certainly are, being used for military purposes. China is also aware of the information gathering capability of U.S. satellites and is conducting passive measures to deny information gathering. While these measures are certainly valuable, the bulk of Chinese writings on space address the issue of the need to conduct offensive space warfare missions. Despite an exhaustive review of Chinese writings on space, no articles were discovered rebutting the view that China needs to develop counter space technology and its use as inevitable. It is true that articles against the weaponization of space have been written, but these are mainly in the context of railing against U.S. efforts to weaponize space. Thus, these writings do not represent a debate within the PLA about whether to develop space weapons, rather, they are a concerted effort to convince the PLA to develop space weapons and prepare for their use.

The Chinese vision of space warfare presents some troubling challenges to the United States. If, as Defense Secretary Donald Rumsfeld fears, the U.S. military is too

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[886] "The Basics of Space Strategic Theory," p. 31.

dependent on space, then it is possible that China could conduct a "Space Pearl Harbor" against the United States in order to gain mastery in space.[887] Such an attack would seem to conform with Chinese doctrinal teachings which emphasize "gaining mastery by striking first," the need to strike first in information operations, and the primacy of gaining the initiative in space to insure the success of other operations. The focus of such an attack would be to deny or delay information to the U.S. military. Some Chinese writings suggest that the first types of satellites to be attacked would be intelligence satellites. Intelligence information forms the basis of information warfare and denying the United States, which according to Chinese sources relies on satellites for 90% of its intelligence collection, the main source of its strategic intelligence would impair the U.S. ability to monitor the position of PLA forces and create the conditions, possibly through the use of stratagems, that could then lead to a decisive victory.

Whether the U.S. military is overly reliant on space systems may be inconsequential. The perception that space warfare is inevitable and that the U.S. military is highly vulnerable to strikes against its space systems may not only be one factor that leads China to attack U.S. space assets, but it also may lead them to believe that they can conduct a successful military campaign against the United States.[888] It has been noted by some Chinese writers that the United States does consider attacks against its space assets as an act of war, but this has not dissuaded them from advocating developing space for military uses.[889] Consequently, China's increasing interest in the military use of space poses serious challenges to the U.S. military. The U.S. military cannot assume that in a potential armed conflict China will adopt the types of passive defenses that the U.S. military has faced in the past. This requires the U.S. government to better understand China's space program in order to identify how China will use space in armed conflict and requires the U.S. government to begin meeting the threats that China may pose to the U.S. space architecture, either through diplomacy or technology.

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[887] "Rumsfeld Asks If Pentagon Is Over-Reliant On Space System," *Space News*, 13 May 2002, p. 4.

[888] For a discussion of how Chinese perceptions may lead to war, see Thomas J. Christensen, "Posing Problems Without Catching Up: China's Rise and Challenges for U.S. Security Policy," *International Security*, Vol. 25, No. 4 (Spring 2001), pp. 5-40.

[889] See Wei Qiyong, Qin Zhijin, and Liu Erxun, "Analysis of the Change of U.S. Military Strategy Before 2020," *Missile and Space Vehicles*, 2002, No. 4, pp. 1-4 (in FBIS as "PRC S&T: Analysis of Changing Emphasis In US Military Strategy.") The authors are from the China Academy of Launch Vehicle Technology.

10. KEYNOTE SPEAKER GENERAL DONN A. STARRY REMARKS

First we need a disclaimer, then one definition, and we can proceed.

The disclaimer is that I know virtually nothing about the ongoing Chinese revolution in the affairs of the PLA. Indeed, I have read a lot about it, but have not studied it in detail. Your names and credentials in a list provided me by David Finklestein were, to me, awesome if not frightening, and on that basis I demurred. David, however, overrode my demurral, stipulating that what he wanted from me was my perspective description of how change has been effected in times past in U.S. armed forces, especially in our air-land forces. So, on that basis, I agreed. For, unlike so many who speak in public in today's confusing circumstances, I do not speak in public on matters about which I know little or nothing. Novel concept I know – but it avoids adding more confusion to the babble-on so characteristic of official as well as media coverage of events of our time.

That said, we need at least one definition in order to begin. It is of the word "DOCTRINE." The word appears in the title of this conference. In his lead paper for this conference David Finklestein identifies doctrine as a fundamental element of the PLA reforms now underway. So what is it, this DOCTRINE? And why is it important?

Doctrine, is what is written; what is taught. Set forth in principle in authoritative instructions or directives, taught in schools and educational institutions. It is found in several venues; there is religious doctrine, military doctrine, political doctrine, organizational doctrine, and other doctrine. Military doctrine, which we consider here, provides the basis for establishment of performance requirements for equipment (weapons systems in particular), for structure and organization (size and shape of forces), for training of soldiers and units, and for the training and education of leaders (noncommissioned and commissioned). Please note DOCTRINE is the first and great commandment. Other commandments are like unto it, but may or may not be relevant without. Relevant doctrine describes what is to be done, how and with what resources and organization it might best be accomplished. But doctrine is first, not necessarily first among equals either – just FIRST. For without carefully thought out, clear, coherent doctrine it is dangerous to proceed further, lest it be on the wrong azimuth, leading to non-relevant outcomes, and at great expense. Doctrine can change. In the military context several fundamentals drive doctrine development: national security strategy and derivative national military strategy; what resources the nation is willing to spend on its' armed forces; threat or threats to vital national interests which might require employment of military force to achieve political aims; appropriate countermeasures, or technical opportunities which, appropriately fielded would provide U.S. and/or Allied forces a measurable delta in performance over an expected threat.

These are not new ideas. Early on in a letter to his friend Timothy, the Apostle Paul wrote as follows:

> "I solemnly urge you: proclaim the message; be persistent whether the time is favorable or unfavorable; convince, rebuke and encourage, with the utmost patience in teaching. For the time is coming when people will not put up

> with sound doctrine, but having itching ears, they will accumulate for themselves teachers to suit their own desires, and will turn away from the truth and wander away to myths."

It is instructive to pursue the idea of doctrine and itching ears in an historical context. We live in a world of change; indeed the only constant in our world is change itself. For change is all about us, it is self-generating, persistent, always in motion. If we fail to seize the reins of ongoing change and give it some direction, it will wander afield, too often in aggression. So it frequently happens that if you are not directing change it will likely come up behind you and bite a big chunk out of your south end whilst you are heading northbound. Characteristic of large organizations is the fact that, absent consistent direction - leadership, institutional as well as managerial, they tend to regress on themselves. To the point that frequently one awakens to find things back close to where they were, even before the onset of change.

Changing an institution as large as an army, any army, is problematic under the best of circumstances. In the two centuries plus of its existence the United States Army has undergone dramatic change perhaps no more than five times. The significant milestone changes have been related in the main to success or non-success in the nation's wars. So let us briefly seek informed judgment from that history.

Very early reforms were instituted by Secretary of War John C. Calhoun, who in 1818, laid down an early national security strategy in the wake of the nation's defeat and the ignominious burning of Washington in the War of 1812. Secretary Calhoun's strategy saw the Navy as the first line of defense. Behind the shield of the Navy there would be a very small regular army, which would be expanded by volunteer militia in time of crisis. It was in fact called the "expansible army." All was consistent with frequent reference to the "militia" in the Constitution. But at the time, that army hand no doctrine; no performance criteria with regard to tactics, techniques and procedures, organization, training and education, planning for war, or for forces deployed to and fighting battles, most of which were anticipated to be in the mode today styled as "homeland defense." The War of 1812 was the paradigm; Secretary Calhoun would prepare the nation to fight again, only better, the war just finished; a practice that would be iterated several-fold well into the next century. So mark one of the Secretary of War – the first "transformer."

The expansible army failed the test of the Civil War. The militia system could in no way provide the manpower and related resources for large operations. But we won; whatever other goals President Lincoln may have had, the Union had been preserved. At war's end, without much serious intellectual investigation, the Army set out to define what it might be required to do next. These matters underway, General Grant, newly appointed Commander in Chief, sent other Congress a request for an Army of 65 thousand soldiers. Let by General Grant the "War Lords," the Bureau Chiefs, descended on the Congress explaining that by no stretch of the imagination could they field the armies, corps and divisions needed with only 25 thousand men. To which the Congress responded that there was no need for armies, corps and divisions, and that since the Army seemed unable to decide, the Congress would authorized fifteen regiments of Infantry, ten regiments of Cavalry and five regiments of Artillery. And by the way there would be no bases closed because of potential adverse impact on local economies. With but

modest revisions, that Army lasted the United States until 1898 and the Spanish-American War. It was the Army of the Frontier, the Indian fighting Army. Transformer score: Secretary of War 1, Congress 1.

The Indian fighting Army failed the test of the Spanish American War. We did win, but it was one of those "near run things" as Wellington described the Allied victory at Waterloo. For within a scant few weeks following the Spanish surrender, virtually the entire deployed force was immobilized with Yellow Fever. Not just medical, but logistical support, war planning, deployment and redeployment, and a host of other bedeviling problems prompted Secretary of War Elihu Root to react. Hence the Dick Bill of 1902 was introduced into the Congress; it eliminated the Bureaus, created a General Staff with a Chief of Staff presiding, established an officer education system, and provided for a War College Division of the General Staff which would quite soon design a mobilization system to replace the militia system, and develop national strategy and appropriate war plans. In due course mobilization would be enabled by a National Guard and a U.S. Army Reserve, replacing Secretary Calhoun's (and the Constitution's) militia.

Mobilization for World War I was surpassed only by the demobilization frenzy at war's end. Nonetheless it worked; with some dysfunctionalities smoothed out by changes made necessary in that war, post-War I the Army set about to correct observed shortcomings of the new system, thus get ready to fight over again, only better, the war just finished – an idea from Secretary Calhoun's doctrinal revolution a century removed. Transformer score: Secretary of War 2; Congress 1.

Despite improved mobilization schemes and a war planning capability provided by the Root reforms, the Army between the World Wars pretty much regressed on itself. Notable exception to the intellectual vacuum: the mechanized force experiments at Fort Knox as the horse cavalry was overtaken by products of the Industrial Revolution, and cavalrymen sought new and useful employments. Mobilization for World War II was very much the creation of Chief of Staff George C. Marshall. While we might score it that the Army transformed itself, truth is that the urgency of the situation forced the transformation, as opposed to the development of enlightened doctrine, especially with regard to effects of the Industrial Revolution on military affairs. Newly formed armor units very much wrote their own doctrine, experimented, changed it, then post-War II returned to the school system to record what they had done during the war. Post War II it is fair to say that, since we had won big time, it was considered only necessary to patch things up here and there in order to get ready to do again, only better, what we had just done so well. The mindset virtually ignored the probable impact of nuclear weapons on warfare, and the urgent need to consider wars that were less than total with outcomes less unconditional surrender. Lessons hard learned, if at all, in Korea and Vietnam. Transformation score: Secretary of War 2; Congress 1; Army a conditional 1.

The fifth transformation was the work of the Army itself, following the Vietnam War; it was in fact, arguably, the only time in two hundred years that the Army took the initiative and "transformed" itself. And, albeit after the fact, it recognized the advent of thermo-nuclear war and the improbability of the total war/unconditional surrender venue that characterized World War II. It raised the ultimate question – what does it mean to win, absent nuclear weapons an total war. Change was se in direction by the genius of one great soldier, Creighton Abrams the elder, Chief of Staff from 1972 until his untimely death in office in 1974. General Abrams' initiatives were faithfully pursued by

his immediate successor in office, General Fred Weyand. Doctrine, equipment requirements, structure and organizational design, training for soldiers and training and education for noncommissioned and commissioned officers were designed by Training and Doctrine Command (TRADOC) as the "user surrogate," coordinated with the whole Army, the Combatant Commands, and most especially with the SACEUR. After seventeen years of directing and steering the process and progress of change, the Army demonstrated its' impressive capabilities in a strikingly successful field trial in the Hundred Hour War of 1991. It all worked! Some of it better than hoped, some not quite so well, but it all worked, largely because it was in the hands of well trained soldiers and units, let by well trained leaders, noncommissioned and commissioned.

How was that accomplished?

Every transformation begins from its own unique baseline. Of the five transformations just sketched, only one, post Civil War, had been generated in the wake of unqualified military success; three were generated in the wake of unqualified military success; three were generated in response to defeat or dear defeat; to include Vietnam, from which many of us returned more than once, never having lost a battle, only to find that whilst we were away the nation had lost the war.

The 1972-73 Army was in deep trouble; understanding the circumstances a the time provides the unique baseline for what happened next. President Lyndon Johnson's rejection of large scale mobilization for Vietnam resulted in the use of the entire Army as a rotation base for forces deployed to Vietnam. This decision resulted in an intolerable turbulence rate in the non-Vietnam Army. By 1972-73 morale and discipline were at an all-time low, the drug culture had pervaded the Army, military jails were full to overflowing, and the non-commissioned officer corps had been rendered virtually non-effective by frequent repetitive rotations. There was a crisis in confidence in leadership from the lowest levels right up to the Commander in Chief. Units deployed to NATO Europe considered themselves no more than speed bumps for Soviet forces en route to the Rhine and beyond. As General Abrams waited for confirmation in 1972, one observer close to him reported that the Army, whose Chief of Staff he was about to become, was "out on its ass."

Once confirmed as Chief of Staff, General Abrams directed a study of Army organization at the top. Called Steadfast 1973, its implementation resulted in significant reductions in headquarters echelons, both in the TO&E army and especially in the non-TO&E Army – the administrative Army. Most importantly Steadfast reordered Major Army Command responsibilities, dividing the Continental Army Command into a Forces Command, responsible for unit training and deployment of Army units based in the U.S., and a Training and Doctrine Command into which were consolidated the combat developments functions of the Army; developing war fighting doctrine, defining requirements for equipment capabilities needed to fight the next war and providing user oversight of equipment development, organizing the Army for war, training of soldiers, training and education of noncommissioned and commissioned officers. All designed to meet the needs of the next, not the last war.

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Curriculum Vitae

Donn A. Starry is a retired General, United States Army, and a retired business executive. He is a lecturer and advisor to government and industry on military doctrine, equipment, force structure and organization, training and education of soldiers, non-commissioned officers and commissioned officers; on command-control of military operations and of manned and unmanned space operations; and on leadership and management in government and industry.

General Starry enlisted in the United States Army in 1943, won an appointment and was commissioned from West Point in 1948. Subsequently he commanded armor and armored cavalry units from platoon through Corps. During the last dozen years o his military service General Starry commanded, in succession, the Army's Armor Center at Fort Knox (1973-1976). V US Corps in US Army Europe (1976-1977), the US Army Training and Doctrine Command (1977-1981), and from 1981-1983 the United States Readiness Command, whose forces included what became US Central Command, the US force that fought Operation Desert Storm 1991. During the war in Vietnam he served twice in that country, leading his Regiment, the famous 11th Armored Cavalry, into Cambodia in May of 1970. He was principal staff designer of the post-Vietnam Army force structure, then in a succession of commands, principal architect of Air Land Battle—Army and Joint Force doctrine, equipment, structure and organization, training and education of all ranks, so dramatically successful in Desert Storm 1991.

Following military retirement in 1983, General Starry joined Ford Aerospace Corporation, serving first as Vice President and General Manager of Ford's highly successful Space Missions Group, developing an operation major command-control systems for manned and unmanned space operations for NASA and the Defense Department, and later as Executive Vice President of Ford Aerospace and Special Assistant to the Chief Executive Officer of BDM International, at the time a wholly owned Ford subsidiary. He served as a member of the Board of Maxwell Laboratories 1988-1993, and from 1996-1998 was Chairman of the Board as Maxwell became Maxwell Technologies and began transition from government to commercial markets. He presently serves as Chairman of the Board of Universal Voltronics, Brookfield, CT., producer of high voltage direct current power supply systems for government and commercial markets.

A graduate of the US Army Command and General Staff College, the Armed Force Staff College, and the US Army War College, he holds a Master's Degree in International Affairs from the George Washington University, and several honorary Doctoral degrees. A two term member of the Defense Science Board, he chaired that Board's landmark study on Armor-Antiarmor (1985) and was co-chair of the 1992 study on Countering Weapons of Mass Destruction in Contingency Operations. He is author of a book, *Mounted Combat in Vietnam* (USGPO 1977), co-editor and co-author of a book *Camp Cold to Desert Storm, The History of US Armored Forces* (The University Press of Kentucky 1999) and of more than a hundred articles for professional journals and encyclopedia. Since 1991 he has served as a Senior Fellow on the faculty of the Joint and Combined Warfighting School at the Joint Forces Staff College, Norfolk, Virginia.

A member of the Board of the Eisenhower Foundation, Abilene, Kansas, General Starry also serves as Chairman of the Board of the US Cavalry Memorial Foundation and the Historical Foundation and a member of the Board of the Washington Institute of Foreign Affairs. He is a member of the US Army's Fort Leavenworth Command and General Friends of the Fifth of May, an honorary Life Member of Battery "C", the Artillery Company of Newport, and holder of the Gold Medal of the Armor Association's Order of Knight Commander's Cross of the Order of Merit—the famous Grosseverdienskreuz, and include the Defense Distinguished Service Medal, two awards of the Army Distinguished Service Medal, the Silver Star, the Bronze Star—one award of gallantry and one for service, the Soldier's Medal, the Purple Heart, the Legion of Merit with two Oak Leaf Clusters, the Distinguished Flying Cross, and the Air Medal with nine Oak Leaf Clusters. The 41st Colonel Commanding during the Vietnam War, he continues to serve his Regiment, the 11th Armored Cavalry, now the Opposing Force (OPFOR) at the National Training Center, Fort Irwin, as its Honorary Colonel.

He is married to the former Leatrice (Letty) Gibbs of Kansas City, Kansas. Mrs. Starry is the organizer of a number of highly successful Community Life Programs designed to promote community involvement in every aspect of the life and well being of Army families in her husband's several commands. The Starrys have four children and seven grandchildren.

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Dean Cheng is a specialist of Chinese security affairs—especially technology issues—with over a decade of continuous experience in government, academe, and research institutes. He is widely recognized as one of the few specialists in the U.S. on the Chinese space program. He received his undergraduate degree in politics from Princeton University and did graduate work at the Massachusetts Institute of Technology. Formerly a senior analyst at SAIC, he supported the U.S. Army's Quadrennial Defense Review process by developing database and analytic models. As a senior analyst of China at the U.S. Congress's (former) Office of Technology Assessment, Mr. Cheng developed deep expertise about the Chinese defense industrial complex. Fluent in Mandarin and conversant with high-end technologies as well as political-military issues, he is widely published in various professional journals and edited volumes on Chinese security affairs.

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