Report to Congress
Pursuant to the FY2000 National Defense Authorization Act

ANNUAL REPORT ON THE MILITARY POWER OF THE PEOPLE'S REPUBLIC OF CHINA

Section 1202 of the National Defense Authorization Act for Fiscal Year 2000, Public Law 106-65, provides that the Secretary of Defense shall submit a report "on the current and future military strategy of the People's Republic of China. The report shall address the current and probable future course of military-technological development on the People's Liberation Army and the tenets and probable development of Chinese grand strategy, security strategy, and military strategy, and of the military organizations and operational concepts, through the next 20 years."

This annual report addresses (1) gaps in knowledge of China's military power; (2) China's grand strategy, security strategy, and military strategy; (3) developments in China's military doctrine and force structure, to include developments in advanced technologies that would enhance China's military capabilities; (4) China's relations with the former Soviet Union; and, (5) the security situation in the Taiwan Strait.

I. INTRODUCTION: GAPS AND UNCERTAINTIES

The report addresses the current and probable future course of military-technological development on the People's Liberation Army (PLA) and the tenets and probable development of Chinese grand strategy, security strategy, and military strategy, and of the military organizations and operational concepts, through the next 20 years. This report to Congress addresses specific questions in four sections on Chinese strategy, Chinese military forces, China's arms sales from the former Soviet Union, and the security situation in the Taiwan Strait.

This report begins with a cautionary note that was first outlined in the Office of the Secretary of Defense, Net Assessment's *Report to Congress on Implementation of the Taiwan Relations Act* in 2000. The Net Assessment report surveys how little is known about the most significant aspects of Chinese military power. Chinese secrecy is extensive. China reveals little in its Defense White Paper about the quantity or quality of its military forces. China's defense spending may be some four times larger than its public announcement in March 2002 of a defense budget of about $20 billion. Since the 1980s, U.S. military exchange delegations to China have been shown only "showcase" units, never any advanced units or any operational training or realistic exercises.

A. Knowledge Gaps

The Department of Defense (DoD) has identified three gaps in U.S. knowledge about Chinese military power. First is PRC military power juxtaposed to that of Taiwan. There is much more the United States can learn about both sides' ideas of statecraft, their approaches to the use of force, their perceived vulnerabilities, and their preferred operational methods, as well as about the political and military organizations that produce military assessments and plans. Second are intangible PRC capabilities -- training, logistics, doctrine, command and control, special operations, and mine warfare. Finally, although DoD has identified emerging methods of warfare that appear likely to be increasingly important in the future – particularly missiles and information warfare – it is difficult to assess confidently how these developments will affect the overall military competition.

B. Key Developments

Over the last few years, DoD has identified improvements in China's military capabilities in a significant number of areas. Recent developments in China's military power include:

- Doctrine of Preemption and Surprise. Chinese doctrine is moving toward the goal of surprise, deception, and shock effect in the opening phase of a campaign. China is exploring coercive strategies designed to bring Taipei to terms quickly.

- Military Budget. In March 2002, China announced a 17.6 percent or $3 billion increase in spending, bringing the publicly reported total to $20 billion. Total spending is closer to $65 billion, and annual spending could increase in real terms over three- to four-fold by 2020.

- Improvements in Training and Joint Operations. Beijing's military training exercises increasingly focus on the United States as an adversary.
  - The PLA's "Three Attacks and Three Defenses" air defense training concentrates on attacking stealth aircraft, cruise missiles, and helicopters, while defending against precision strikes, electronic warfare, and enemy reconnaissance.
  - In 2001, PLA training emphasized maritime and amphibious operations, integrating conventional ground units with marines, airborne, and special operations forces. Exercises included more combat units improving the PLA's abilities to deploy and sustain its forces.

- Missile Development
  - China has approximately 350 short range ballistic missiles (SRBMs) already in its deployed inventory, increasing at about 50 missiles per year. The accuracy and lethality of this force also are increasing. The PLA is developing variants of the CSS-6 that enable attacks against Okinawa when forward-deployed or against Taiwan when deployed further inland.
  - All of China's known SRBM assets are believed to be based in the Nanjing Military

Region (MR). The number of conventional ballistic missiles deployed opposite Taiwan is expected to increase substantially over the next several years.

- China is replacing the CSS-4 Mod 1 intercontinental ballistic missile (ICBM) with the longer range CSS-4 Mod 2. China also is replacing all of its approximately 20 CSS-4 Mod 1 missiles and developing two follow-on, extended-range versions of the DF-31: a solid propellant, mobile ICBM and a solid propellant submarine-launched ballistic missile.

- Air Power
  - China has acquired Su-30MKK fighter aircraft from Russia. China also is producing Su-27 front-line fighter aircraft. Over the past two years, the Su-27s and Su-30s have been more rapidly integrated into operational units.
  - To bolster strike capabilities further, China reportedly is developing an improved version of the FB-7 supersonic fighter-bomber.
  - PLA Air Force (PLAAF) and PLA Naval Air Force (PLANAF) tactical forces also are developing and acquiring precision guided munitions (PGMs). The Su-30 is equipped to use anti-radiation missiles (ARMs).
  - China reportedly has developed electronic warfare variants of several of its larger aircraft, and may have several programs underway to deploy new standoff and escort jammers on bombers, transports, tactical aircraft, and unmanned aerial vehicle (UAV) platforms.
  - In 1999, China introduced an airborne early warning (AEW) aircraft, the Y-8AEW. China is also looking to acquire the A-50 MAINSTAY AWACS aircraft from Russia.
  - China has been upgrading its air facilities along the Taiwan Strait.
  - Air combat tactics continue to evolve and training is becoming more advanced. PLANAF fighters and tanker aircraft successfully transferred fuel during aerial operations over the South China Sea in April 2000.

- Naval Forces. Naval enhancements included greater familiarization and crew proficiency on recently acquired platforms and associated weapon systems, as well an increase in the PLA Navy's (PLAN) maritime surveillance capability.
  - PLAN is making efforts to improve its force-projection options by improving the capability to deploy submarines on extended patrols, and outfitting surface ships with more capable air defense assets and more lethal anti-ship cruise missiles.
  - China has replaced its World War II-vintage landing ships with newer ships produced in China. In addition, China has a large fleet of about 600 military and civilian landing craft, which could be used for ship-to-shore operations. China also has a large civilian merchant fleet that could be pressed into service to support amphibious operations.
  - The PLAN's first Russian-made SOVREMENNYY-class guided missile destroyer arrived in China in February 2000. China has signed a contract for two additional SOVREMENNYY destroyers and could acquire additional Russian-made major surface combatants.
  - China has produced the diesel-electric SONG submarine, the first Chinese submarine to have a skewed propeller. The SONG also is the first Chinese submarine designed to

carry the developmental YJ-82, China's first encapsulated anti-ship cruise missile (ASCM) capable of launching from a submerged submarine.

- China has purchased from Russia the KILO SS, one of the quietest diesel-electric submarines in the world. Armed with such weapons as the wire-guided Test-71ME heavyweight torpedo and the 53-65KE wake-homing torpedo, the KILO provides Beijing with access to previously unavailable quieting and weapons technology.
- China will acquire a new nuclear-powered attack submarine class, the Type 093 Class SSN, which will carry wire-guided and wake-homing torpedoes and cruise missiles.

- Air Defense and Detection
  - The SA-N-7, provided by Russia, provides the most capable short-range surface-to-air defense system for the PLAN in the near term. Technology from the SA-N-7 probably could assist with the development of an indigenous naval SAM system. Over the next ten years, the PLAN likely will develop a naval missile roughly equivalent to the shore-based SA-10s purchased from Russia.
  - The land-based version of the long-range HQ-9 surface-to-air missile is in development and probably will incorporate technology from the Russian SA-10 medium-range surface-to-air missile. Based on precedents, China will probably produce a naval variant of the HQ-9 incorporating Western technology.

- Land Forces and Armor. During the past year, the PLA ground force revealed incremental improvements, evidenced by an increase in training tempo and equipment upgrades.
  - The PLA has begun a program to upgrade the main gun on its mainstay Type 59 main battle tanks, as well as maintain over 1,000 tanks already equipped with the 105-mm gun.
  - Several new or updated armor assets are gradually making their way into the PLA ground force inventory, to include a light tank, an amphibious tank, and an amphibious armored personnel carrier (APC).
  - Production of the Type 96 tank continues, with 1,800 expected to be deployed by 2005.
  - Since the mid-1990s, the army has shrunk from about 100 divisions to approximately 50, with many of the units downsizing to brigades, freeing more resources for modernization.
  - The PLA has improved its amphibious attack capabilities in recent years and is steadily expanding its ability to transport ground forces by air.

- Command, Control, Communications, Computers, and Intelligence (C4I). China has steadily improved its C4I capabilities and may be negotiating with the Belarusian firm Agat to produce C4I software and equipment capable of performing joint battle management.

- Intelligence, Surveillance, and Reconnaissance. China’s procurement of new space systems, airborne early warning aircraft and long-range UAV, and over-the-horizon radar will enhance its ability to detect, monitor, and target naval activity in the Western Pacific Ocean.

- China may have as many as three over-the-horizon (OTH) sky-wave radar systems, which China aspires to use against aircraft carriers.

- Information Warfare. To improve its skill base, the PLA has been recruiting specialists via its reserve officer selection program in order to design, comprehend, and execute a full-spectrum information operations/information warfare (IO/IW) campaign.

- Electronic Warfare. China's electronic warfare efforts are focused on technology and design development, accomplished mainly through cooperation with Western companies and by reverse engineering. China's newer designs show significant improvements over older systems.
  - China is procuring state-of-the-art technology to improve its intercept, direction finding, and jamming capabilities. It also may be developing jammers, which could be used against Global Positioning System (GPS) receivers.

- Laser Weapons. China is pursuing a robust research and development program for laser weapons. In 1999 the Chinese displayed a probable laser-based, anti-tank guided missile (ATGM) countermeasure on its Type 90-II tanks.

- Radiofrequency Weapons. Chinese scientists have written about, and China probably has in place, a program to develop explosively driven RF weapons technology that potentially could be used in missile warheads or aircraft bombs.

- Space Warfare
  - Beijing may have acquired high-energy laser equipment that could be used in the development of ground-based anti-satellite (ASAT) weapons.
  - In July 2001, Moscow and Beijing signed a five-year space cooperation agreement pursuant to which: China and Russia will establish special departments on joint development of a regional missile defense system; China and Russia will set up cooperation organs to develop a new generation of high-tech weapons and equipment with funding up to $500 million.

II. GOALS AND TRENDS IN CHINESE STRATEGY

A. Grand Strategy

Goals of Grand Strategy

China has not publicly articulated an authoritative, official statement of its "grand strategy." Chinese military strategists define grand strategy as the "overall strategy of a nation or an alliance of nations in which they use overall national strength" to achieve national political goals, especially those related to national security and development.

China's grand strategy attempts to balance two often competing objectives: one is developing what it calls the nation's "comprehensive national power" (CNP). The other is exploiting to maximum advantage the existing "strategic configuration of power" or "*shi*," to preserve

national independence and enable China to build "momentum" in its effort to increase national power.[1] The relative priority that the national leadership places on these two objectives is subject to adjustment and change, depending on how China assesses the opportunities and challenges in the "strategic configuration of power."

"Comprehensive national power" (CNP) is the concept by which China's strategic planners evaluate and measure national standing in relation to other nations. The concept of CNP first appeared in conjunction with former paramount leader Deng Xiaoping's national development strategy in the early 1980s. It represents an adaptation of Western methodologies for monitoring and assessing national power, fused with traditional Chinese concepts of statecraft and strategy, which placed a heavy emphasis on calculations and estimates of relative power among nations. The current approach applies quantitative and qualitative evaluations of politics, economics, military, science and technology, and foreign affairs to determine relative CNP.[2]

While China's national leadership is focused primarily on national development, it is constantly assessing the broader "strategic configuration of power" for potential challenges or threats that might prompt it to adjust or change its grand strategy, as well as for opportunities to advance national interests. In particular, China's leaders believe that three essential "conditions" – national unity, stability, and sovereignty – must exist if China is to survive and develop as a nation. Among these conditions, Beijing judges that national unity is the most important. Beijing's preoccupation with maintaining unity is driven by China's internal and external security environment and national condition, historical experience, national goals, and, perhaps most importantly, challenges to the Chinese Communist Party's (CCP's) legitimacy.

Ensuring domestic stability and a secure international environment is crucial to Beijing's national development strategy. Senior leaders currently are focused on the short-term task of ensuring regime stability by maintaining domestic order and leadership control while dealing with several sources of internal unrest and instability. Chinese leaders also believe they must maintain conditions of state sovereignty and territorial integrity. This is reflected in China's response to a range of international issues, including human rights and democracy, and territorial and resource disputes with its neighbors.

Should China become involved in a major war, the relative priority it places on its national goals is likely to change. Deng Xiaoping and current CCP General Secretary and State President Jiang Zemin have indicated publicly that the goal of reestablishing a favorable "strategic configuration of power" would override the goal of developing national power if

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[1] There is no Western equivalent to the concept of "*shi*." Chinese linguists explain it as "the alignment of forces," the "propensity of things," or the "potential born of disposition," that only a skilled strategist can exploit to ensure victory over a superior force. Similarly, only a sophisticated assessment by an adversary can recognize the potential exploitation of "*shi*."

[2] This definition of Comprehensive National Power is used primarily by the PLA Academy of Military Science (AMS). However, the China Academy of Social Sciences (CASS) uses a slightly different set of measures: politics, economics, science and technology, and foreign affairs. See Chapter 5 of *China Debates the Future Security Environment*, (National Defense University Press, 2000).

China faced a fundamental threat to its national unity, internal stability, or sovereignty. Such circumstances were defined as situations in which China faced the credible prospect of a military invasion of the mainland, or the nation was involved in a large-scale war, such as a major war between China and Taiwan that included direct U.S. military intervention. While Deng and Jiang indicated that ensuring a favorable strategic "configuration of power" would be the primary national goal in such situations, they also clearly emphasized that one of China's war aims would be to end the war on favorable terms as soon as possible so that Beijing could refocus on the goal of developing national power.

Sources of Grand Strategy

China's grand strategy has been influenced primarily by a combination of the ancient tenets of Chinese statecraft as well as more modern national development theory. While ancient Chinese statecraft and national development theories are dominant, other factors also shape China's grand strategy. China has had a longstanding geopolitical challenge in maintaining control over the heartland of China and major elements of "Inner Asia," and in securing a vast periphery of coastal and land boundaries as well as maritime territory in a region populated by traditional rivals and enemies. These challenges shape how China approaches grand strategy, especially its emphasis on maintaining a favorable domestic and international "strategic configuration of power." Moreover, Maoist and Marxist ideology, as well as lessons from the Sino-Japanese war and the civil war, are prevalent in China's approach to grand strategy. Finally, the Chinese study how other nations approach international security affairs, to include grand strategy, in an effort to enhance their own approach to the issues of strategy, security, and development.

Beijing has sought to describe its long-term political goals of developing CNP and ensuring a favorable strategic configuration of power in positive, passive, cooperative, benign, and peaceful themes. These themes include China's emphasis on "peace and development," the non-use of force in settling international disputes, non-intervention in the internal affairs of other countries, the defensive nature of China's military strategy, its "no-first-use of nuclear weapons" declaration, its support for nuclear-free weapons zones, and claims that China would never deploy its military forces on foreign soil.

These principled themes should not, however, obscure the ambitious nature of China's national development program and the nature of China's approach to the use of force, which is contingent, rather than inherently passive or defensive, as Chinese commentators often vigorously assert. In particular, Beijing probably calculates that ambiguity in international discourse helps to buy China time in developing its national power.

One of Deng Xiaoping's key directives to China's security and development establishment was the so-called "24 character strategy:" "keep cool-headed to observe, be composed to make reactions, stand firmly, *hide our capabilities and bide our time*, never try to take the lead, and be able to accomplish something" (emphasis added). This often-quoted maxim not only suggests a desire to downplay China's ambitions; it also affirms a long-term strategy to build up China's CNP with a view to maximizing China's options in the future.

From Beijing's perspective, strategic ambiguity, including strategic denial and deception, is a mechanism to influence the policies of foreign governments and the opinions of the general public and elites in other countries. China's leaders believe that ambiguity and stressing the "just nature" of PRC actions have the effect of "drawing out" those who oppose and those who support China's interests abroad. Once China's leaders make the distinction between friends and adversaries, they can develop and tailor themes to counter opposition and advance their overall agenda. Moreover, such distinctions position China to reward "friends" abroad, or alternatively, punish "enemies" to enhance its own position in the balance of power.

B. Security Strategy

Security Assessment

As with its "grand strategy," China has not publicly articulated a "national security strategy" in a format similar to that used by the United States. China's efforts to accomplish its security goals involve an integrative strategy that applies diplomatic, informational, military, and economic instruments of national power. China's national security leadership structure is based on a traditional Leninist model in which the party apparatus mirrors the state system and plays the dominant role in strategy and policy formulation and oversight. The party function is facilitated by "cross leadership" — the practice of "dual hatting" party cadres with government positions. For example, Communist Party General Secretary Jiang Zemin also serves as the State President.

While seeing opportunity and benefit in interactions with the United States – primarily in terms of trade and technology – Beijing apparently believes that the United States poses a significant long-term challenge. China's leaders have asserted that the United States seeks to maintain a dominant geostrategic position by containing the growth of Chinese power, ultimately "dividing" and "Westernizing" China, and preventing a resurgence of Russian power. Beijing has interpreted the strengthened U.S.-Japan security alliance, increased U.S. presence in the Asia-Pacific region, and efforts to expand NATO as manifestations of Washington's strategy. Most importantly, China has adopted an ambivalent if not skeptical attitude toward the U.S. presence in the Asia-Pacific region. As China's 2000 Defense White Paper states:

> *There are new negative developments in the security of the Asia-Pacific region. The United States is further strengthening its military presence and bilateral alliances in this region advocating the development of the TMD system and planning to deploy it in East Asia. Japan has passed a bill relating to measures in the event of a situation in the areas surrounding Japan. All this goes against the tide of the times. Joint military exercises have increased in the region to detriment of trust between countries…Encroachments on China's sovereignty and interest in the South China Sea are not infrequent, and some extra-regional countries are attempting to interfere in this issue…*

Beijing apparently calculates that U.S. efforts to develop missile defenses will challenge the credibility of China's nuclear deterrent and eventually be extended to protect Taiwan, degrading the coercive value of its growing conventional theater ballistic missile capability opposite the island.

Chinese analyses indicate a concern that Beijing would have difficulty in managing potential U.S. military intervention in crises in the Taiwan Strait or the South China Sea. There are even indications of a concern that the United States might intervene in China's internal disputes with ethnic Tibetan or Muslim minorities. Chinese concerns about U.S. intervention likely have been reinforced by their perceptions of the U.S. response to the 1995-1996 Taiwan Strait crises, Operation ALLIED FORCE in Kosovo, and more recent U.S.-led military operations to combat international terrorism. Over the longer term, China often expresses concern over the prospects for the expansion of Japanese military power in the region.

Beyond these more traditional security concerns, China's strategic planners are beginning to recognize global and transnational threats such as HIV/AIDS, international crime and narcotics trafficking, terrorism, and the proliferation of weapons of mass destruction. In addition, in part stemming from over two decades of "reform and opening up," China's leaders increasingly perceive threats to "economic security," "information security," and the erosion of national independence as a consequence of globalization. These concerns will only grow in future years with China's entry into the World Trade Organization (WTO).

While assuming the primacy of economic power, China's leaders view the military as necessary to ensure that China's economic power will rise; to protect important national interests; and, to support China's eventual emergence as a great power and the preeminent power in Asia. Nevertheless, Chinese leaders since Deng have placed military modernization behind other priorities such as development in agriculture, industry, and science and technology. This placement is based on a calculation that broad-based modernization will raise overall levels of industry, technology, and human resources to sustain long-term military modernization.

Debate over the proper ordering of China's national priorities has surfaced periodically – particularly in the face of external challenges to China's security interests. For example, following Operation ALLIED FORCE in 1999, Beijing seriously considered upgrading the priority attached to military modernization. While the senior leadership has since reaffirmed its stress on economic growth and development, it nevertheless agreed to provide significant additional resources and funding to support accelerated military modernization.

A key variable in assessing long-term trends in the PRC's security strategy is Taiwan. One of Beijing's priority security interests is to prevent further steps by Taiwan toward permanent separation from the mainland and to secure the eventual resolution of the Taiwan issue on the PRC's terms. Taiwan's integration under mainland authority is considered to be an essential step toward completion of "national reunification." China's leaders will remain determined to secure unification on Beijing's terms.

Beijing assesses that the permanent separation of Taiwan from the mainland could serve as a strategic foothold for the United States. At the same time, securing control over Taiwan would allow the PRC to move its defensive perimeter further seaward. The PRC's Taiwan strategy will continue to emphasize a coercive approach toward Taipei, and Beijing's decision-makers have affirmed that they will resort to force if Taiwan's present *de facto* separation becomes official, either through a declaration or international recognition as such. Moreover, China's leaders have threatened force if they fail to make progress toward "reunification" objectives.

In addition to preventing Taipei's moves toward *de jure* independence, Beijing seeks to counter what it perceives to be Japan's growing military cooperation with the United States and to prevent a rebirth of Japanese militarism. At the same time, it will continue to value the economic benefits it derives from access to Japanese technology, trade, and foreign investment. Beijing's other important security goals in East Asia include preventing the development and implementation of a regional theater missile defense system, particularly one involving Taiwan; coping with challenges to its claims in the East and South China Seas; and supporting its economic interests through bilateral and multilateral mechanisms, such as the Association of Southeast Asian Nations (ASEAN), the Asia-Pacific Economic Cooperation (APEC) process, and the ASEAN Regional Forum (ARF).

The United States will remain central to these regional priorities. Consequently, China's actions in the region will be shaped by its assessment of U.S. policies, particularly our regional alliance and defense relationships. While seeking a stable relationship with Washington, Beijing will continue to seek opportunities to diminish U.S. regional influence.

Key Trends in Security Strategy

Three key factors likely will remain fundamental in shaping Chinese security policy over the long term, regardless of the outcome of a Taiwan conflict or the change in the nature of the Chinese regime.

First, China's leaders will be unlikely to maintain a monolithic state. Future leaders probably will continue to pursue economic growth and technology, which, combined with the information revolution and bureaucratic professionalization, will reinforce this trend. Second, globalization and China's linkage to the outside world will continue and expand. Third, there will be pressure for political change. China will continue to face economic and internal challenges; the demands on the regime from both internal and external sources will persist. Consequently, China will continue to perceive challenges from the West. Beijing will continue to seek technology, wealth, and power associated with the Western system, but will maintain that Western political concepts and culture are antithetical to its interests.

C. Military Strategy

China's leaders believe that the control and use of the armed forces and other coercive instruments of power are essential components of their security strategy. China does not have

a document directly equivalent to the U.S. "National Military Strategy." The closest approximation is a document referred to as the "National Military Strategic Guidelines for the New Period."

PLA strategists are beginning to discuss in professional journals issues such as the efficiency accrued through limited applications of force to accomplish political goals. Moreover, advances in military technologies will provide China's leaders over the long term with an expanded set of options. These enhanced capabilities have given rise to and will sustain a trend in which China's warfighting strategies increasingly favor coercive over annihilative approaches.

Trends in Military Strategy

The principal area where China appears to be making advances in coercive military capabilities involves airpower, to include missiles and information operations. Military coercion also can be effected through the use of blockades or quarantines. Further, the use of ground forces may provide the "shock value" necessary to weaken the adversary's will. Finally, China's leaders also may employ economic coercion through the manipulation of stock and currency exchanges and banking, as well as political and psychological intimidation.

III. PRC MILITARY MODERNIZATION

Preparing for a potential conflict in the Taiwan Strait is the primary driver for China's military modernization. Beijing is pursuing the ability to force Taiwan to negotiate on Beijing's terms regarding unification with the mainland. It also seeks to deter, deny, or complicate the ability of foreign forces to intervene on Taiwan's behalf. Beijing has been influenced by the emerging revolution in military affairs and is seeking the means to counter advances the United States could make in this area. PRC doctrine stresses surprise, deception, and preemption as a means to offset weaknesses in equipment and other areas. Currently, China's conventional short-range ballistic missile force is its most credible and immediate threat to Taiwan.

A. PRC Operational Doctrine

Evolution of PRC Operational Doctrine

The evolution of PLA operational doctrine has mirrored changes that have taken place in PRC security and military strategy since the mid-1980s.

Impact of the Revolution in Military Affairs. China's more forward-looking strategists note the Persian Gulf War's role in bringing the emerging revolution in military affairs (RMA) into sharp focus for the PLA. In particular, PLA observers witnessed how quickly the force, equipped with high-tech weapons systems, defeated the Iraqi force that resembled the PLA in many ways. The force and capability displayed by the coalition during that conflict prompted

PLA theorists to alter their perceptions of the character of future wars, highlighting the role of air and air defense operations, electronic and information warfare, and long-range precision strikes.

At the same time, the PLA observers judged that the technological advances surrounding the RMA also increased the demands on military forces in other areas, to include greater emphasis on command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR), joint service and combined arms operations, the need for professional, technically qualified personnel to operate and maintain advanced equipment, and the need, especially, for a professional corps of non-commissioned officers.

U.S. observations of the RMA also have migrated into PLA thinking on the impact of the RMA on future warfare. As an example, Zhou Fangyin, of the China Institute of Contemporary International Relations, appeared to pull from U.S. academic writing when he indicated that "war in the information age will be manifested not as 'platform-centered warfare,' but rather as 'network-centered warfare.'" The internalization of RMA concepts, over time, is manifest in actual changes in doctrine, strategy, tactics, and equipment.

China's military planners are working to incorporate the concepts of modern warfare attributed to the "revolution in military affairs" and have placed a priority on developing the technologies and tactics necessary to conduct rapid tempo, high-technology warfare in Asia.

On balance, PLA authors assess that the current RMA holds the potential for producing radical new forms of warfare, enhanced information warfare, networks of systems, and "digitized" combat forces. At the same time, however, based on observations and lessons learned from the Gulf War and, later, Operation ALLIED FORCE, Beijing perceives certain weaknesses in the U.S. over-reliance on the advances offered by the RMA. Consequently, revised PLA doctrine, rather than seeking to capture and pursue RMA advances, emphasizes measures to target and exploit its weaknesses.

Evolution Since the Persian Gulf War. Operation ALLIED FORCE in 1999 appears to have had at least as much impact on PLA thinking as the Persian Gulf War, although more as a validation of earlier assessments of the trends of modern warfare than as a catalyst for change. PLA commentary on NATO's Kosovo air operation concluded that a superior enemy's situational awareness and precision-strike systems could be stymied through effective, and often low-tech, counter-reconnaissance measures such as camouflage and concealment, simple decoys, dispersion, and frequent movement of forces. NATO air operations reinforced the PLA's focus on the use of underground facilities, landline communications, and well-concealed supply depots.

The Serbs' survival in a modern battlefield against a superior force reportedly impressed PLA observers. These observers, however, also noted that the Serbs suffered from inferior equipment, inadequate defense of civilian installations, and poor logistics.

The PLA implemented lessons from Operation ALLIED FORCE in the restructured "Three

Attacks, Three Defenses" air defense training regime. "Three Attacks, Three Defenses" concentrates on attacking stealth aircraft, cruise missiles, and helicopters, while defending against precision strikes, electronic warfare, and enemy reconnaissance. Many PLA training events also now incorporate this new training regime.

Current PLA Operational Doctrine

Doctrinal literature is developed by the PLA Academy of Military Science (AMS) under the authority of the CMC and in close coordination, probably, with the PLA General Staff Department (GSD)**.** The AMS is responsible for the development of theoretical and applied military strategy, operational theory and methodology, and combat tactics for China's armed forces. Service-specific tactics, techniques, and procedures are developed variously by the PLA Navy, Air Force, and Second Artillery; however, each service must adhere to the greater context and guidance for military strategy and operations at the theater level of war and above promulgated by the AMS. Officers from the AMS Campaign and Tactics Department had a major role in developing the new operational regulations. This department also is responsible for drafting and writing documents and manuals that are the functional equivalents of U.S. Joint Publications and Field Manuals. Very little is known about the actual substance of the new operational directives that emerged in 1999.

The Role of Surprise and Pre-Emption in Local Conflicts

PLA operational theory reflects the transition undertaken during the 1990s to shift from predominately annihilative to coercive war-fighting strategies. Shock and surprise are considered by PLA strategists as crucial to successful coercion. Accordingly, PLA operational theory emphasizes achieving surprise and accruing "shock power" during the opening phase of a campaign. The pre-eminent role that surprise and pre-emption have in potential conflicts is best illustrated in the fundamental principles of "Actively Taking the Initiative" and "Catching the Enemy Unprepared" in PLA operational doctrine.

- "Actively Taking the Initiative" stresses the necessity of attack at the optimal point and time to catch the enemy unprepared.
- "Catching the Enemy Unprepared" emphasizes the role of concealment of intentions and capabilities through camouflage, deception, feints, and the use of stratagem to allow a relatively small amount of force to dominate the enemy through surprise.

Throughout the 1990s, PLA writers have highlighted pre-emptive strikes as a means to offset advantages that a technologically superior power brings to the fight. Lessons from Kosovo added impetus to developing a capacity for offensive operations against targets at the operational and strategic levels of warfare. PLA writers have asserted that offensive strike assets, which are more cost effective than defensive assets, must focus on an opponent's ability to carry out strikes and/or conduct counterattack operations. The measure of effectiveness, in this context, is not the capture of territory but the effects the strikes have on an enemy's ability to resist. The defender is thrown into a state of passivity due to his inability to conduct operations.

The PLA believes that surprise is crucial for the success of any future campaign, and it likely would not be willing to initiate any military action unless assured of a significant degree of strategic surprise. With no apparent political prohibitions against pre-emption, the PLA requires shock as a force multiplier, to catch Taiwan or another potential adversary such as the United States, unprepared. Observers such as PLAAF Chief of Staff LTG Zheng Shenxia have noted that without adopting a pre-emptive doctrine, the chances of a PLA victory are limited.

PLA writings indicate a number of methodologies that could enhance the success of surprise, including strategic and operational deception, electronic warfare, and wearing down or desensitizing an opponent's political and military leadership. At least one objective would be to reduce indications and warning of military action.

Operational Considerations Against Technologically Superior Adversaries

The relative technological inferiority of the PLA and the overarching primacy of economic development have led to the exploration of asymmetric methods enabling "the inferior to defeat the superior."

PLA writings suggest that China's armed forces remain relatively confident of their ability to defeat a regional military force of comparable technological development with traditional battles of annihilation, or operations that rely on mass and attrition to attack the enemy forces, formations, and troops directly. The PLA also is convinced that this traditional approach to campaigns will *not* suffice against an enemy with advanced technologies. Consequently, there is an emphasis on conducting operations that will paralyze the high-tech enemy's ability to conduct its campaign, including operations to disrupt and delay the enemy campaign at its inception, and operations that are highly focused on identifying the types and locations of enemy high-tech weapons that pose the greatest threat. After identifying those weapons, the PLA must then attempt to neutralize them, either through hard-kill methods (e.g., firepower, special operations, etc.) or soft-kill methods also termed technological interdictions. Degrading a high-tech adversary's ability to process or gather information is viewed as an absolutely essential task if the weak is to defeat the strong, especially if that high-tech adversary is perceived to be overly dependent upon information systems to enable its own operations.

Captain Shen Zhongchang from the Chinese Navy Research Institute, for example, envisions a weaker military defeating a superior one by attacking its spaced-based communications and surveillance systems. "The mastery of outer space will be a requisite for military victory, with outer space becoming the new commanding heights for combat." He also noted that "lightning attacks and powerful first strikes will be more widely used in the future." In future wars, Shen highlights radar, radio stations, communications facilities, and command ships as priority targets vulnerable to smart weapons, electronic attack, and electromagnetic pulse

(EMP) weapons.[3]

Ultimately, the PLA seeks to level the technological playing field at the outset of a campaign in order to enhance its chances of operational success. Consequently, PLA operational theory calls for operations aimed at:

- Destroying the enemy command system;
- Crippling the enemy information systems;
- Destroying the enemy's most advanced weapons systems;
- Crippling the enemy support (logistic) systems; and
- Disrupting the critical links in the enemy's campaign systems (i.e., denying the enemy the synergies that accrue from its technological superiority).

B. PRC Conventional Military Modernization and Training

China retains the world's largest military, yet it lacks the technology and logistical support to project and sustain conventional forces much beyond its borders. Military modernization is directed towards training and equipping the services to be capable of fighting short-duration, high-intensity conflicts. Recognizing that comprehensive modernization will take many years, the PLA is pursuing force multipliers.

Air. Although the PLA has approximately 3,400 aircraft, only about 100 are considered modern, 4th-generation fighters. Development and acquisition efforts have been aimed primarily at defeating the regional air forces, defending against aircraft at long ranges from China's coast, defeating high-value air assets, denying U.S. naval operations, and striking other targets such as airbases and air defense sites. A force-wide modernization focused on the acquisition of advanced systems, improved training realism, new tactics to complement modern technology, and technically proficient personnel is intended to improve combat capability over the next decade and help to extend operations farther beyond land and sea borders. By the end of the decade, China is expected to have a more robust fleet of 4th-generation fighters augmented by modern missiles, electronic countermeasures, and several AWACS-type aircraft. Although PRC pilot capabilities will remain poor by Western standards, improvements across the board will increase their potential.

Navy. The PLA Navy (PLAN) is making efforts to improve its regional force projection options by improving the capability to deploy submarines on extended patrols, and outfitting surface ships with more capable air defense assets and more lethal anti-ship cruise missiles. In addition, the Navy is attempting to address weaknesses in anti-submarine warfare. Despite incremental gains, the PLAN still lacks fleet air defense, over-the-horizon targeting, and sufficient sea/air lift for major amphibious operations. The PLA is addressing these deficiencies, but does not appear likely to make significant gains in those areas until at least

[3] See *Chinese Views of Future Warfare* (National Defense University Press, 1998).

2005. Regardless, the PLAN will remain a large force that could pose a threat to regional navies.

Ground. Force reductions and selective new equipment acquisitions are creating a more mobile, combat-ready core within the larger ground force. Since the mid-1990s, the army has shrunk from about 100 divisions to approximately 50, with many of the units downsizing to brigades. The PLA also has three Airborne divisions and two Marine brigades. However, the army's ability to project force much beyond China's land borders remains limited due to a shortage of amphibious ships, heavy cargo carrying aircraft, long-range transports, and other logistical shortcomings. Although the PLA has improved its amphibious attack capabilities in recent years, there are no signs that Beijing is serious about increasing its heavy lift capacity or conducting sustained ground operations.

Conventional Missile Forces. Modernization and training developments in recent years highlight China's continuing effort quantitatively and qualitatively to improve the capabilities of its conventionally-armed SRBM force. There are approximately 350 SRBMs already in the deployed inventory; this number is increasing at about 50 missiles per year. The accuracy and lethality of this force is expected to increase through the use of satellite-aided guidance systems.

Air Forces Modernization

The PLA Air Force (PLAAF) and PLA Naval Air Force (PLANAF) are equipped with approximately 3,400 fighters of mostly obsolete Soviet design. Modernization efforts through the 1990's were highlighted by the purchase of Su-27 and Su-30 FLANKER fighters from Russia and a license agreement to produce additional Su-27s in China. Beijing also has continued to pursue domestic aircraft programs, including the FB-7, and upgrades to the F-7 and F-8 fighters.

Combat aircraft. The PLA has used some of its increased modernization funding to purchase modern arms from Russia, to include Su-27 air defense fighters and Su-30 multi-mission fighters. Domestic production of the Su-27 is proceeding, albeit very slowly. China also continues to upgrade fighters already in the inventory. The primary focus is on improving sensors, weapons, electronic warfare capabilities, and information connectivity on aircraft in order to increase the lethality of the otherwise outdated airframes. To bolster strike capabilities, China reportedly is developing an improved version of the FB-7. The twin-engine FB-7 is an all-weather, supersonic, medium-range fighter-bomber with an anti-ship mission. Improvements to the FB-7 likely will include a better radar, night attack avionics, and weapons. Over the next 20 years, production efforts for the air forces are expected to focus on an indigenous 4th generation-type aircraft, the improved FB-7 fighter-bomber, and possible upgrades to the Su-27/Su-30.

Special Mission Aircraft. Since the Gulf War, China has sought to improve the capabilities of its special-mission aircraft, with a focus on electronic warfare aircraft, C4ISR platforms and tankers. China reportedly has developed jamming versions of several of its larger aircraft, and may have several programs underway to deploy new standoff and escort jammers using bombers, transports, tactical aircraft, and UAV platforms.



The PLA Air Force is building up its multi-role fighter force. The most powerful strike-fighter deployed in the Taiwan theater is the PLAAF's Russian-built Sukhoi Su-30MKK, which can deliver precision-guided missiles in all weather conditions.

China has been actively pursuing an advanced airborne surveillance and control aircraft since the early 1990's. In 1999, it introduced an airborne early warning (AEW) aircraft, the Y-8AEW. The cancellation last year of the more capable PHALCON program forced Beijing to pursue other alternatives, to include the possible acquisition of A-50 MAINSTAY AWACS aircraft from Russia.

Air-to-Air Refueling. China began developing its air-to-air refueling capability in the mid-1980s using a converted B-6/BADGER bomber as an aerial tanker. PLANAF fighters and tanker aircraft successfully transferred fuel during aerial operations over the South China Sea in April 2000, suggesting that the PLANAF has achieved a very limited, clear weather, daytime aerial refueling capability. Training, however, remains rudimentary and it will be

several years before either the PLAAF or the PLANAF incorporate aerial refueling into routine operations.

Unmanned Aerial Vehicles (UAVs). China is investing considerably in the development of UAVs. China already has a number of short-range and longer-range UAVs in its inventory for reconnaissance, surveillance, and electronic warfare (EW) roles. Research efforts also are underway across a range of UAV technologies with several developmental UAV programs underway related to reconnaissance, surveillance, communications, and EW.

Munitions. China's approach to the development of conventional munitions for its air forces has been altered irrevocably since the Gulf War, where precision-guided munitions (PGMs) were introduced on a large and effective scale. Ensuing campaigns such as Operations ALLIED FORCE and ENDURING FREEDOM have demonstrated an increasing use of PGMs that has reinforced Beijing's desire to develop its own cruise missiles. The PLANAF has operated the B-6/BADGER as a weapons platform for the C-601/KRAKEN anti-ship cruise missile for over ten years. Another variant of the B-6/BADGER is being developed to carry land-attack cruise missiles (LACMs) in the future. PLAAF and PLANAF tactical forces also are developing and acquiring PGMs. The Su-30 is equipped to use anti-radiation missiles (ARMs), and eventually could carry laser, TV, and radar-guided missiles and munitions. Future aircraft also are expected to employ a variety of both indigenously produced and Russian-made LACM, ASCM, and ARM PGMs.

Evolving Capabilities. Since China received its first 4th-generation fighter, the Su-27, in 1992, training, tactics and operational concepts progressed slowly as China integrated the new technologies and capabilities into the force structure. This protracted learning phase has allowed China to prepare for the introduction of larger numbers of 4th-generation aircraft into its inventories. Over the past two years, new Su-27s and Su-30s have been more rapidly integrated into operational units. Meanwhile, air combat tactics continue to evolve and training is becoming more advanced. By 2010, the PLA will have all the elements of a modern air force and should have developed the operational concepts and the training needed to fight as an integrated force. Although not all the PLAAF and PLANAF will be equipped with modern weapons by that time, a core of units will be in place to allow the PLA to execute the type of regional combat operations envisioned by its current military doctrine.

Maritime Forces Modernization

The PLA Navy (PLAN) numbers 290,000 personnel, with approximately 60 destroyers and frigates, about 50 diesel and six nuclear submarines, and some 40 amphibious landing ships. Approximately 350 auxiliary and smaller patrol vessels, as well as a naval air arm of over 500 fixed-wing aircraft and 50 helicopters, complement this force. Over the last decade, the Navy has streamlined and modernized its forces by eliminating large numbers of older ships and replacing them with fewer, more modern units. The number of submarines has declined by about one-half. The Navy's entire inventory of U.S.-built, World War II-vintage landing ships has been replaced by newer ships produced in China. In addition, there is a large fleet of about 600 landing craft, both military and civilian, that could be used for ship-to-shore

operations, as well as a handful of air cushion vehicles. The PLAN also has hundreds of smaller landing craft, barges, and troop transports, all of which could be used together with fishing boats, trawlers, and civilian merchant ships to augment the naval amphibious fleet. The size of the major surface combatant fleet has been relatively stable, with older ships slowly being replaced by newer Chinese-built destroyers and frigates.

The PLAN seeks to push its maritime defense perimeter further seaward. This change in operations will require newer, more modern warships and submarines capable of operating out to the Ryukyu Islands and into the South China Sea. At these extended ranges, the platforms will have to be better armed to enable defense from all methods of attack. The Navy has been conducting research and acquiring foreign technology in an effort to improve the broad range of naval warfare capabilities; it also is acquiring new classes of ships that will be better suited for operations out to the limits of the East and South China Seas.



A *PLA Navy Russian-built Sovremennyy-class destroyer leads a line of warships during exercises last year. China's navy now has two Russian Sovremennyy-class destroyers that fire a supersonic anti-ship missile that cannot be shot down by any Asian navy.*

Major Surface Combatants. The acquisition of two Russian-built SOVREMENNYY Class destroyers has improved China's surface fleet capabilities. These ships are equipped with SS-N-22/SUNBURN ASCMs and the SA-N-7 SAM system. The SOVREMENNYYs also are fitted with the AK-630M 30-mm Gatling gun and 130-mm dual-purpose gun.

China's best domestically constructed surface combatant, the 6,000-ton LUHAI Class destroyer, is equipped with C-802 ASCMs. It also is equipped with a naval variant of the HQ-7 SAM system.

China has signed a contract for two additional SOVREMENNYY destroyers and could acquire additional Russian-made major surface combatants. Not only would these foreign acquisitions provide China with immediate improvement to its warfighting capabilities; they also would provide the PLAN with the opportunity to reverse-engineer more modern weapons

and associated systems

By 2010, another new destroyer class probably will begin to enter the fleet, as could a new frigate. By 2020, China is expected to have its new destroyer classes in full production, with several in service or on the way. The new frigate likely will experience a similar rate of production. As they go into service, these platforms will replace the older JIANGHU I/II Class frigates. By 2020, China probably will have phased out most of the LUDA Class DD.

Aircraft Carrier. While continuing to research and discuss possibilities, China appears to have set aside indefinitely plans to acquire an aircraft carrier.

Air Defense. The PLAN continues to have longstanding concerns about its capability to engage enemy aircraft, cruise missiles and precision-guided munitions. This problem is becoming more significant as the Navy strives to operate away from the protection of land-based air defenses. PLAN surface combatants have a limited, and primarily self-defense, anti-air warfare (AAW) capability. Only about twelve of its destroyers and frigates are outfitted with SAM systems; the others are armed only with AAA and possibly man-portable air defense systems. In addition, PLAN warships lack the modern air surveillance systems and data links required for area air defense missions. The combination of short-range weapons and lack of modern surveillance systems limits the PLAN to self-defense and point-defense anti-air warfare only. Consequently, except in unusual circumstances, no PLAN ship is capable of conducting air defense of another ship. Additionally, the PLAN could not reliably defend against either current or projected anti-ship cruise missiles (ASCM). China has recognized the importance of countering low-observable aircraft and cruise missiles. Engineering efforts to develop air defense systems capable of detecting and eventually engaging these systems are underway.

Air defense improvements include the development of SAMs to provide area defense. This effort has led to continuing exchanges with Russia on air defense-related radars and missiles. The SA-N-7 provides the most capable system in the near term. Technology from the SA-N-7 probably could assist with the development of an indigenous naval SAM system. Over the next ten years, the PLAN could develop a naval missile roughly equivalent to the shore-based SA-10s purchased from Russia. While indigenous SAM development is preferred, it is uncertain if China will be able to build its own equivalent within an acceptable period of time, and purchase of additional, more advanced Russian weapons may be required.

The land-based version of the long-range HQ-9 is in development and probably will incorporate technology from the Russian SA-10. Based on precedents, China will probably produce a naval variant of the HQ-9. HQ-9 is designed to be a long-range SAM to counter high-performance aircraft, cruise missiles, air-to-surface missiles (ASMs), and tactical ballistic missiles (TBMs). Technology from advanced Western systems may also be incorporated into the HQ-9.

Submarines. The PLA Navy likely intends to maintain a large submarine force. China is producing more modern submarines and is acquiring Russian technology to improve future units, with likely upgrades to the current fleet accomplished during overhauls. Although the force is oriented principally toward interdicting surface ships using torpedoes and mines, development of the YJ-82 ASCM for the SONG submarines eventually will give the Navy a submerged-launch cruise missile. A second major improvement likely will entail the use of advanced mobile mines to augment the Navy's large inventory of submarine-laid mines. While the primary mission of China's submarine force remains anti-surface warfare, China's ASW capabilities also will continue to improve in light of the acquisition of Russian-built KILO Class submarines.



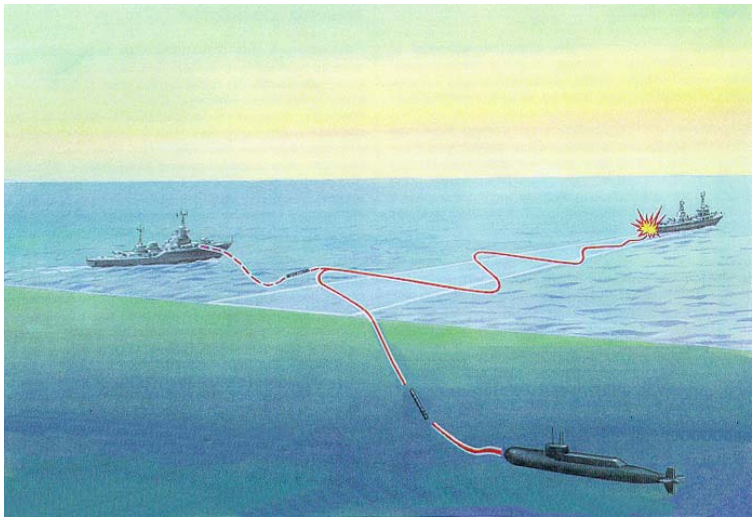
A new advanced version of the SONG-class conventional submarine is expected to incorporate advanced air-independent propulsion. SONG-class submarines, equipped with submerged launched cruise missiles, could play a significant role in countering U.S. aircraft craft battle groups operating in the Western Pacific Ocean.

Diesel Electric Submarines. In addition to the roughly 30 obsolete Soviet-designed ROMEO Class submarines remaining in the force, China has produced two domestically designed diesel-electric attack submarine classes: the MING and the SONG Class SS. China has launched 21 MINGs and three SONGs. The MING essentially is an improved version of the ROMEO. The SONG, on the other hand, is China's first new-design, conventionally powered submarine.

The SONG is a blend of Chinese and Western technology and has several key features that point to a major shift in diesel submarine design philosophy. It is the first Chinese submarine to have a skewed propeller. The SONG also is the first Chinese submarine designed to carry the developmental YJ-82, China's first encapsulated ASCM capable of launching from a submerged submarine. SONGs are probably fitted with flank-array sonars of French design. Chinese diesel submarines are fitted with German MTU diesel engines.

The PLAN has taken delivery of four Russian-built KILO Class SS. Two are standard export version Project 877 EKM KILO SS and two are Project 636 KILO SS (the improved KILO design). In purchasing the KILO SS, the PLAN has acquired one of the quietest diesel-electric submarines in the world. Armed with such weapons as the wire-guided Test-71ME heavyweight torpedo and the 53-65KE wake-homing torpedo, the KILO provides Beijing with access to previously unavailable quieting and weapons technology. China most likely will try to incorporate aspects of this submarine into its domestic programs, although it will take several years before these technologies could be used effectively.

By 2010, China will have withdrawn the ROMEO Class submarines from service. By 2020, China's non-nuclear submarine inventory probably will include MING, SONG, and KILO SS. China will continue using Russian technology to improve quieting, propulsion, and submarine design; it also is incorporating foreign technology into its existing submarines. China also will benefit from the maturation of its domestic submarine research and development (R&D) infrastructure to achieve a capability to design and manufacture modern submarines domestically.



Wake homing torpedoes are a "fire-and-forget" weapon that can sense and follow a vessel's wake. Even crews with minimal proficiency can deploy this weapon effectively. China's acquisition of wake homing torpedoes makes its submarines potent anti-ship platforms.

Nuclear-Powered Submarines. The PLAN has five HAN nuclear attack submarines (SSNs) in its inventory, all launched between 1970 and 1990. China's sole nuclear-powered ballistic missile submarine (SSBN) – the XIA Class – was overhauled in 1995-1998 and most likely will be extended through at least 2011. Next-generation nuclear submarine programs will reflect Russian influence and technology. China will acquire a new nuclear-powered attack submarine class, the Type 093 Class SSN, which will have technology similar in quality to the Russian VICTOR III SSN. The Type 093 Class will carry wire-guided and wake-homing torpedoes and cruise missiles. The first Type 093 Class SSN probably will be operational soon after 2005. It eventually will replace the HAN Class SSNs, all of which China will withdraw from service by 2020. The Type 094 SSBN is expected to carry an advanced submarine-launched ballistic missile (SLBM).

Mines. China likely has enough mine warfare assets to lay a good defensive and a modest offensive minefield using a wide variety of launch platforms. China is believed to have a variety of mine types available including bottom and moored influence, mobile mines, remotely controlled mines, and propelled-warhead mines. China recently has begun advertising some advanced mines, indicating it may have even more sophisticated mines in its inventory.

Torpedoes. China's modernization efforts likely are focused on developing torpedoes with state-of-the-art homing and propulsion systems capable of operating in acoustically challenging shallow-water environments. China also may seek advanced torpedo countermeasures like mobile decoys and hard-kill anti-torpedo torpedoes to increase the survivability of its surface ships and submarines.

Submarine Sonars**.** Most PLAN submarines are believed to have obsolete sonar systems based on older analog designs. A limited number of Chinese submarines have more modern digital sonar systems based probably on 1980s Western technology. The Chinese have an extensive research and development infrastructure in shallow-water acoustics and have experience using modern commercial off-the-shelf (COTS) computer processing technology. It is likely that current Chinese sonar designs are similar to commercially available Western submarine sonar systems and feature modern COTS processors and displays.

Submarine Quieting. PLAN submarines are assessed to incorporate a wide range of quieting technologies, most of which are imported. China nonetheless desires to develop the capability to produce indigenously quiet submarines. The main submarine quieting technologies are machinery mounts, hull coatings, and propellers. Future PLA Navy submarine designs are expected to incorporate lower propeller rotational rates and more advanced propeller designs, machinery mounts, and hull coatings. China's apparent goal is to design and construct quiet submarines independently of other countries. This effort is evident in China's large investment in research, development and manufacturing.

Ground Forces Modernization

China's ground forces are divided among approximately 20 group armies, more than 40 maneuver divisions, and some 40 maneuver brigades. More than a dozen of these divisions and several of these brigades are designated "rapid reaction" units. China completed a 500,000-man force reduction in 2000 in an effort to streamline the force further and free up funding for modernization. This reduction was achieved primarily through the deactivation of several group army headquarters; the transfer of personnel to the People's Armed Police; and the downsizing of approximately 30 combat divisions to brigades. Recent improvements also have focused on increasing the capability of reserve and militia units. The size of the PLA ground forces suggests that continued modernization will remain slow, deliberate, and limited through at least 2010. By 2020, infantry, airborne, armor and army aviation units will comprise a much larger percentage of the force.

Armor Modernization. The PLA has begun a program to upgrade the main gun on its mainstay Type 59 main battle tanks, as well as maintain over 1,000 tanks already equipped with the 105-mm gun. In addition, several new or updated armor assets are gradually making their way into the PLA ground force inventory, to include a light tank, an amphibious tank, and an amphibious APC. Production of the Type 96 tank continues, with 1,800 expected to be deployed by 2005, according to open sources.

Fire Support Modernization**.** Artillery research, development and production have continued to emphasize qualitative improvements to the PLA's artillery forces over quantitative production. Progress on an advanced multiple rocket launcher and a self-propelled amphibious howitzer continues.

Special Operations Forces. In addition to conventional warfare modernization, the PLA has devoted considerable resources to the development of Special Operations Forces (SOF). SOF units are an integral element of ground force modernization. They are expected to play an important role in achieving objectives in which limited goals, scale of force and time would be crucial to victory. SOF missions likely include conducting surveillance and battle damage assessment; locating or destroying C4I assets, transport nodes, and logistics depots; capturing or destroying airfields and ports; supporting invasion forces; destroying air defense assets; and, conducting denial and deception and information operations.

Army Aviation**.** China's Army Aviation forces can provide only minimal support to ground or amphibious operations despite a slowly growing inventory of helicopters, which currently numbers about 300 aircraft. Army Aviation has been acquiring small numbers of attack and medium lift helicopters over the last several years, but still lacks a dedicated attack helicopter.

While PLA ground forces continue to make advances in several areas, they remain faced with several key challenges, including:

- Downsizing and Restructuring. China's leadership still considers its ground forces as too "infantry-heavy." Beijing probably believes that further troop reductions accompanied by additional restructuring are required in order to make the force a more appropriately balanced combined arms force with increased mobility, lethality, and survivability.

- The Pace of Modernization. Recent fielding of new equipment has thus far been in limited numbers and, therefore, has not improved appreciably the capabilities of most of the PLA's ground forces. Even with the consolidation of ground force assets into progressively fewer units, the army remains so large as to impede rapid equipment modernization throughout its force structure. However, new equipment, while not being deployed throughout the whole of China, is being deployed to the PLA's strategically important areas, especially the southeast.

Conventional Second Artillery Missile Modernization

Beijing's growing conventionally armed missile force provides China with a military capability that avoids the political and practical constraints associated with the use of nuclear-armed missiles. The CSS-6 and CSS-7 SRBMs provide China with a survivable and effective conventional strike force, as will future conventionally armed CSS-5s and LACMs.



China maintains various types of conventional ballistic missiles.

Ground-Based Air and Missile Defense Modernization

China currently lacks a coherent, national, strategic-level integrated air defense system (IADS). It has a variety of major defensive weapon systems; however, the bulk of China's air defense system is based on obsolete weapon systems, which, when combined with an antiquated and inefficient C3 system, allow for routine operations, such as providing point air defense for major cities and other high-value assets, but does not allow for an in-depth or flexible air defense throughout the country.

China's air defenses consist of strategic assets operated by the PLAAF and tactical assets operated by the PLA's ground forces. Historically, Beijing relied upon its large inventory of interceptors along with PLA anti-aircraft artillery units to defend the country. However, the acquisition of modern SAMs may be precipitating a change to the historical strategy in which SAMs had not been the primary choice of engagement. Modern SAMs are primary weapons against cruise missiles, SRBMs and tactical aircraft at close range. PLAAF aircraft would be primary weapons for engaging tactical aircraft at a greater distance. Until additional SAM units become operational, China will only be able to defend effectively against isolated intrusions and small-scale attacks.

Much of China's more recent air defense modernization efforts extend from Beijing's observation of Western military campaigns beginning with the Gulf War in early 1991 and Operation ALLIED FORCE in mid-1999. During the Gulf War, the employment of precision-guided munitions, stealth aircraft, and airborne C4I apparently awakened Beijing to the limitations of its air defense capabilities. The design of the HQ-9 SAM reportedly was influenced by these observations, and plans were made to upgrade China's C4I system. Late model Russian SAMs such as the SA-10 and the SA-15 were purchased to provide a stop-gap measure against a perceived cruise missile threat, and external assistance was sought to develop a robust air defense system.

Anti-Radiation Missile Development. Reports of a Chinese anti-radiation SAM, the FT-2000, first surfaced in sales brochures at the September 1998 Farnborough Air Show. The FT-2000 is a mobile system based on the HQ-9/SA-10 with a maximum advertised range in excess of 100 km. It has been described as an "AWACS killer." There also are indications that China is promoting the development of another anti-radiation SAM, the FT-2000A, which is an update of the antiquated CSA-1; it is a fixed-based SAM system with a range of under 100 km. The intended targets for anti-radiation SAM systems would be AWACS aircraft or any airborne asset emitting radio signals. There is no information indicating that any country, including China, has expressed an interest in acquiring either system or that either system has progressed beyond the conceptual phase.

Training and Exercises

PLA combined-arms training in 2001 reportedly emphasized amphibious warfare with limited multiservice participation. Several major exercises were conducted, some of which focused on aspects of amphibious warfare. The PLAN, Air Force, and Second Artillery all conducted service-specific training.

Ground Forces Training and Exercises. PLA ground forces training and exercises since the mid-1990s have focused on various themes, although without a predictable pattern or sequence from year to year. Training activity in 2001 reportedly emphasized maritime and amphibious training, and integration of conventional ground units with Marines, Airborne, and SOF. It built on previous years and included more combat units, which incrementally improved the PLA's abilities to deploy and sustain the force, and to conduct amphibious operations in a multi-service environment.

PLA Navy Training and Exercises. PLAN training and exercise activity in 2001 was limited, with the Navy reportedly participating in only a handful of exercises. Moreover, the normal end-of-year multifleet exercise apparently was cancelled.

PLA Air Training and Exercises. The PLAAF and PLANAF fighter pilot tactical training continues, albeit slowly. During 2001, some of the PLAAF's more advanced aircraft reportedly conducted advanced tactical training involving fighters of dissimilar types. Advanced tactics training is part of the PLA's push to modernize combat tactics against

regional air forces. The tactics being practiced are a significant departure from traditional PLA training. PLAAF/PLANAF exercise activity during 2001 reportedly concentrated on mobility, air defense, and support to amphibious assault forces. Air defense exercises, apparently smaller in number than last year, were said to be highly scripted and the scenarios lacked realism, limiting the benefit PLA pilots could have gained from the exercises.

C. Strategic Force Modernization

China is in the midst of a ballistic missile modernization program that is improving its force, both qualitatively and quantitatively, in all classes of missiles. This modernization program will improve both China's nuclear deterrence by increasing the number of warheads that can target the United States as well as improving its operational capabilities for contingencies in East Asia.

Intercontinental Ballistic Missiles (ICBM)

China is replacing CSS-4 Mod 1 ICBMs with longer range CSS-4 Mod 2s. The replacement of all the approximately 20 CSS-4 Mod 1s will be completed by mid-decade. In addition, China is developing three solid propellant ICBMs. Development of the DF-31 is progressing and deployment should begin before mid-decade. China also is developing two follow-on extended range versions of the DF-31: a solid-propellant, mobile ICBM and a solid-propellant submarine launched ballistic missile (SLBM). Deployment of these two DF-31 follow-ons should begin by mid-to-late-decade. China also will retain the dozen CSS-3 ICBMs through the end of the decade.

Intermediate and Medium Range Ballistic Missiles (IRBM and MRBM)

The Second Artillery is continuing the replacement of the liquid propellant CSS-2 IRBM with the solid-propellant, mobile CSS-5 MRBM.

Submarine-launched Ballistic Missiles (SLBM)

China is expected to deploy a medium-range SLBM aboard the XIA SSBN before the end of the year. The DF-31 follow-on SLBM will be deployed on a new, more capable submarine by the end of the decade.

Missile Deployment Trends

China currently has around 20 ICBMs capable of targeting the United States. This number will increase to around 30 by 2005 and may reach 60 by 2010.

Likely Countermeasures to U.S. Missile Defense Deployments

China's ballistic missile modernization began before it assessed that the United States would deploy a missile defense, but China likely will take measures to improve its ability to defeat

the defense system in order to preserve its strategic deterrent. The measures likely will include improved penetration packages for its ICBMs, an increase in the number of deployed ICBMs, and perhaps development of a multiple warhead system for an ICBM, most likely for the CSS-4.



China is developing a longer range version of the DF-31 that can reach much of the U.S.

D. Intelligence, Surveillance, and Reconnaissance (ISR)

China is enhancing its battlespace awareness for a Taiwan Strait conflict. The acquisition of modern intelligence, surveillance, and reconnaissance (ISR) systems remains a critical aspect of Beijing's military modernization. China is developing its ISR capabilities based upon indigenous developments, supplemented by foreign technology acquisition, and procurement of complete foreign systems. Its procurement of new space systems, airborne early warning aircraft, long range unmanned aerial vehicles, and over-the-horizon radar will enhance its ability to detect, monitor, and target naval activity in the Western Pacific Ocean.

Space-based ISR Development

Exploitation of space and acquisition of related technologies remain high priorities in Beijing. China is placing major emphasis on improving space-based reconnaissance and surveillance, including electro-optical, synthetic aperture radar, and other satellite reconnaissance systems. These systems, when fully deployed, are expected to provide regional and potentially a hemispheric, continuous surveillance capability. China has begun to embrace new satellite architecture emphasizing common satellite buses. This approach to satellite construction is

based on the use of a standard, versatile satellite bus module, with minor modifications to accommodate various payloads. In addition to indigenous development, China will probably continue to use commercial satellite imagery and may seek to join an international consortium-owned constellation. China is cooperating with a number of countries, including Russia, Ukraine, Brazil, Great Britain, France, Germany, and Italy, in order to advance its objectives in space.

Airborne ISR Development

Unmanned Aerial Vehicles. China's armed forces have operated the Chang Hong (CH-1) long-range, air-launched autonomous reconnaissance drone since the 1980s. China developed the CH-1 by reverse-engineering U.S. Firebee reconnaissance drones recovered during the Vietnam War. An upgraded version of the system was displayed at the 2000 Zhuhai air show and is being offered for export. A PRC aviation periodical reported the CH-1 can carry either a daylight still, TV or infrared camera. It is likely not equipped with a data-link, which would allow remote control operation, nor is it capable of providing real-time payload feedback to the remote operator. China's armed forces also operate other UAVs, primarily for battlefield reconnaissance or electronic warfare.

Manned Aircraft. In addition to the Y-8 AEW and efforts to procure and produce an AWACS capability, China has several other aircraft that can perform ISR missions such as the Tu-154 multi-role special mission aircraft equipped for ELINT collection missions and possibly electronic warfare. The PLAAF reportedly also has several aircraft – both fighters and bombers – capable of performing an imagery reconnaissance function.

Ground-based ISR Development

Over-the-Horizon Radar (OTHR). China may have as many as three OTH sky-wave radar systems that China aspires to use to target aircraft carriers. These systems could be used in an early warning capacity. China also may have deployed at least one surface-wave OTHR.

Sea-Based ISR Development

China may have developed passive acoustic sensors for use in coastal waters. China also may have at least one underwater acoustic range. This range could be used to track torpedoes during training exercises. Because of China's interest in ASW, development and deployment of additional underwater sensors is probable in the next 5-10 years and will expand through 2020. Some of these future systems may be installed as far offshore as the edge of the continental shelf. Passive sensors would provide only a few miles of coverage against quiet submarines**,** but could detect merchant shipping and noisy combatants at greater distances.

E. Battle Management/Command, Control and Communications

Theater-level Weapons Management

Currently, the PLA conducts joint battle and weapon management functions manually at the theater level. The theater-level commander determines which weapons will accomplish the task and communicates these decisions to subordinate weapon controllers. The weapon controllers provide feedback, enabling the theater-level commanders to determine the next course of action. China is developing a battle management system that will be used by the entire PLA for strategic, campaign, and tactical planning and operations.

China's on-going development of a common, joint C4ISR system recognizes the importance of accurate sensors. China also aims to improve the characteristics of its sensors in terms of all-weather capability, miniaturization, artificial intelligence, survivability, and integration with other sensors.

Over the next 10 years, China is projected to have several functioning AWACS-type platforms. The technical ability could exist for these aircraft to display a coordinated air picture, with the capability to command and control airborne assets. With the enhancement of an air refueling capability, this air capability could extend into the South China Sea and beyond. In the interim, China reportedly has leased several A-50 aircraft from Russia, with first delivery expected this year. China may be negotiating with the Belarusian firm Agat to produce C4I software and equipment capable of performing joint battle management. Analysis of brochures for Agat's PANORAMA C2 system suggests it is capable of performing joint battle management. Although a purchase has yet to be confirmed, acquisition of the PANORAMA C2 system would be one way China could make progress in developing a joint C4ISR architecture.

Communications Networks

China has an extensive network of hardened, underground shelters and command and control facilities for both its military and civilian leadership. Fear of a possible war with the former Soviet Union in the 1960s and 1970s prompted Beijing to expend considerable resources constructing national-level command posts, civil defense facilities and associated communications. These facilities are intended to ensure survival of China's leadership and provide a refuge from which it can maintain control over the country's military forces.

China's national command and control (C2) facilities are supported by both civilian and military communications networks. The military communications network is separate from the civilian telecommunications network. It supports all levels of the military and civilian leadership. The military communications network provides the backbone support to China's national military command and data network. PLA national level C3 is carried over multiple transmission systems to include coaxial and fiber optic cable, satellite communications, microwave radio relay, and long-range high frequency (HF) radio. China's communications

networks, both civil and military, would be capable of supporting a wide range of military operations.

Information Operations

China views information operations/information warfare (IO/IW) as a strategic weapon for use outside of traditional operational boundaries. China is particularly sensitive to the potential asymmetric applications IO/IW can have in any future conflict with a technologically superior adversary.

Both the Academy of Military Science and the National Defense University have published several books devoted, in part or completely, to this subject. These writings indicate a growing sophistication in the PLA's understanding of all aspects of IO. In addition to developing wartime applications for its robust information control and perception management capability, China is pursuing IO/IW development as part of its overall military modernization. Combining information warfare--such as computer hacking--with irregular special and guerilla operations, would allow China to mount destructive attacks within the enemy's own operations systems, while avoiding a major head-on confrontation.

The PLA has increased the amount and complexity of IO/IW components in several recent exercises. Efforts have focused on increasing the PLA's proficiency in defensive measures, most notably against the threat of computer viruses. This concern apparently is driving anti-viral and network security research and development within the PLA and military-supported academia. The research is facilitated by the dual-use nature of Information Technology (IT) and the growth in China's technology base. Increases in network defense likely will enhance China's understanding of virus propagation and behavior, creating a solid knowledge base not only for computer network defense (CND), but potentially also for computer network attack (CNA) through malicious software development.

In an effort to improve its skill base in the IT field, the PLA has been recruiting specialists via its reserve officer selection program. The program involves sponsoring students, particularly those in high technology fields, through college or offering to repay loans after graduation in return for a military service commitment. This program is intended to help provide China with a more technically skilled officer corps that would improve, among other things, the PLA's ability to design, comprehend, and execute a full-spectrum IO/IW campaign.

China has the capability to penetrate poorly protected U.S. computer systems and potentially could use CNA to attack specific U.S. civilian and military infrastructures. This anti-access strategy is centered on targeting operational centers of gravity, including C41 centers, airbases, and aircraft carrier battle groups located around the periphery of China.

Role of Nationalistic Hacking

In the near term, nationalistic hacking is likely to occur during periods of tension or crises. Chinese hacking activities likely would involve extensive web page defacements with themes

sympathetic to China. Although the extent of Chinese government involvement would be difficult to ascertain, official statements concerning the leveraging of China's growing presence on the Internet, and the application of the principles of "Peoples War" in "net warfare," suggest the government will have a stronger role in future nationalistic hacking.

G. Electronic Warfare

China's electronic warfare (EW) efforts are focused on technology and design development, accomplished mainly through cooperation with Western companies, through reverse engineering efforts, and through the procurement of foreign systems. The inventory of Chinese EW equipment includes a combination of 1950s-1980s technologies, with only a few select military units receiving the most modern components. China's newer designs, offered for sale at air and trade shows, show significant improvements over older systems.

China is procuring state-of-the-art technology to improve its intercept, direction finding, and jamming capabilities. In addition to providing extended imagery reconnaissance and surveillance and electronic intelligence (ELINT) collection, Beijing's unmanned aerial vehicle programs probably will yield platforms for improved radio and radar jammers. Additionally, existing earth stations can be modified to interfere with satellite communications. The PLA also is developing an electronic countermeasures (ECM) doctrine and has performed structured training in an ECM environment.

H. Counterspace Development

Publicly, China opposes the militarization of space, and seeks to prevent or slow the development of anti-satellite (ASAT) systems and space-based missile defenses. Privately, however, China's leaders probably view ASATs – and offensive counterspace systems, in general – as well as space-based missile defenses as inevitabilities. In addition to passive counterspace measures – such as denial and deception – China is said to be acquiring a variety of foreign technologies, which could be used to develop an active ASAT capability.

China probably has a thorough knowledge of U.S. and foreign space operations, based, in part, on access to open-source information on U.S. space systems and space operations. Beijing already may have acquired technical assistance that could be applied to the development of laser radars used to track and image satellites and may be seeking an advanced radar system with the capability to track satellites in low earth orbit. It also may be developing jammers that could be used against Global Positioning System (GPS) receivers. In addition, China already may possess the capability to damage, under specific conditions, optical sensors on satellites that are very vulnerable to damage by lasers. Beijing also may have acquired high-energy laser equipment and technical assistance, which probably could be used in the development of ground-based ASAT weapons. Given China's current level of interest in laser technology, Beijing probably could develop a weapon that could destroy satellites in the future. Although specific Chinese programs for laser ASAT have not been identified, press articles indicate an interest in developing this capability and Beijing may be working on appropriate technologies. For example, a Hong Kong newspaper article in January 2001

reported that China had developed and tested an ASAT system described as a "parasitic microsatellite." This claim is being evaluated. Nonetheless, a number of countries, including China, are developing and proliferating microsatellite (10- to 100-kg mass) and nanosatellite (1- to 10-kg mass) technologies.

I. Space Launch Capabilities

Since 1998, China and the United States have signed three intergovernmental agreements on launching services. Several U.S. satellite-manufacturing companies have signed contacts on commercial satellite launching services, involving a total of some 30 satellites.

Beijing is developing a new modular family/class of heavy-lift space launch vehicles (SLVs), which reportedly will use ecologically clean propellants. China's objective is a capability to launch 25 tons to low earth orbit and 14 tons to geosynchronous orbit by 2007. Beijing also has begun to develop a new small, solid-propellant SLV.

China continues to make progress with its manned space program. The first unmanned test launch occurred in November 1999. A second unmanned test flight occurred in January 2001. There is some concern that at least the recovery portion of the second mission experienced some difficulty, since Beijing has not released any photography of the recovery capsule (it did release pictures of the capsule used in the November 1999 mission shortly after recovery). While one of the strongest immediate motivations for this program appears to be political prestige, China's manned space efforts almost certainly will contribute to improved military space systems in the 2010-2020 time frame.

China may launch its first manned space mission by 2003 or 2004. It also has long-term plans to launch its own space station, and possibly a reusable space plane as well.

J. "New Concept" Weapon Systems

China is pursuing research and development programs to introduce so-called "new concept" weapon systems into the PLA inventory. Key weapon systems in this category include laser and radio frequency weapons.

Laser Weapons

China is pursuing a robust research and development program for laser weapons. The Chinese have openly stated that their scientists have "laid a firm technical foundation" in laser technology and are capable of developing laser weapons. China reportedly is focusing its laser weapon development on anti-personnel, counter-precision guided munitions air defense, and ASAT roles.

China's research into laser weapon technologies already has resulted in the development and fielding of several systems. In 1995, China North Industries Corporation (NORINCO), a military trading company, introduced the ZM-87 laser weapon at defense exhibitions in

Manila and Abu Dhabi. Since that time, Chinese writings indicate a continuing effort to develop additional laser systems. A second system was unveiled at the 50th Anniversary Military parade in 1999, when the Chinese displayed a probable laser-based ATGM countermeasure on its Type 90-II tanks. Additional Chinese ground combat systems include laser pointers, laser range finders, and laser target designators. These devices are routinely marketed at defense exhibitions. In the future, China can be expected to continue to develop and field military weapon and non-weapon laser systems. Using a combination of indigenous capabilities and foreign assistance, China could emerge as a leading producer and exporter of military lasers by 2020.

Radiofrequency Weapons

China reportedly has placed a priority on the development of radiofrequency (RF) weapons. PRC officials have indicated publicly that the PLA will need RF weapons that would defeat enemy electronics in the 21st century. Although the PLA most likely does not have an RF weapon at this time, it is believed to have a program to develop the high-power RF technologies that could form the basis for some types of RF weapons. In addition to indigenous research, China is working closely with foreign scientists and is seeking foreign technology associated with high-power RF generation. Chinese scientists have published on efforts to develop explosively driven RF weapons technology that potentially could be used in missile warheads or aircraft bombs, and are studying the effects of RF pulses on electronics and the propagation of RF energy through the atmosphere.

Within the next decade, China may be able to develop and field air defense RF weapons intended to defeat missiles or aircraft by targeting the electronics in guidance, altimeter, fire-control, communications, navigation or other critical subsystems. While the PRC has discussed the use of high-power RF technology for air defense, there is little evidence that a program to produce an RF weapon for this mission has been initiated. Nevertheless, China may consider working with Russia to support research and development on a high-powered microwave system (HPM), referred to as Ranets-E, which would target the electronics onboard precision-guided weapons. If the Russians succeed in developing the system – and China purchases it – the PLA could have a number of these systems available before 2020.

China is known to be conducting research on explosively driven RF weapons; however, there are questions regarding the technological feasibility and military utility of RF warheads. Even if China could produce significant amounts of RF energy by means of an explosive driver, it is still not clear whether it is possible to build an RF warhead that will negate electronics at a significantly greater range than a conventional warhead of the same size would cause blast/fragmentation damage. China is unlikely to possess effective RF warheads until after the year 2010 even if such weapons do prove to be feasible.

Finally, China may consider RF weapons with an ASAT capability. An ASAT mission is undoubtedly one of the most stressing RF weapon applications. For a ground-based system beaming RF energy into space, HPM sources operating at very high power levels as well as large transmitting antennas having high gain would be required. For an RF weapon delivered

via a direct-ascent missile or deployed as an orbital system, there are severe constraints on system size and mass and the question of competitiveness with other ASAT systems that also must approach the target. Even if the Chinese commit resources to a major ASAT RF development program, they likely will be unable to deploy such a weapon for at least fifteen years.

Low Observable Technologies

China reportedly embarked on an extensive national effort to understand and develop low observable (LO) technology in the 1980s. Indigenous efforts likely have grown in maturity and understanding so as to allow analysis of foreign capabilities and attempt to duplicate past research. Chinese scientists are said to have an excellent theoretical understanding of LO technology, but apparently lack practical experience that comes with decades of applied research. China appears to have begun multiple programs to apply basic signature reduction technologies to its fighter aircraft programs and reportedly is developing new fighter aircraft that will incorporate LO technology.

K. Technology Acquisition

The PRC's efforts to develop, acquire and gain access to advanced technologies that would enhance military capabilities are multi-faceted and include the use of traditional military actors, commercial entities and individuals involved in basic scientific research. The production of advanced weapon systems requires not only the transfer or development of the technology, but also the transfer or development of associated knowledge, including training, education, technical skills and manufacturing know-how.

In 1979, China began modernizing its weapons facilities through a policy emphasizing production of both military and civilian goods throughout its defense industrial base. This policy shift reflects China's aspiration to attain long-term self-sufficiency through the acquisition of key foreign dual-use technologies and knowledge. Once such technology is obtained, defense-affiliated institutes and factories may apply them to the design and production of commercial and/or military end-items. Moreover, design and production of commercial goods by the defense industrial base can generate revenue and foreign exchange to finance the acquisition of advanced technology. Since 1979, thousands of PRC business entities have been established in the United States. The bulk of the business conducted by these entities is probably legitimate, but an undetermined number may target dual-use commodities and controlled technologies restricted from sale to the PRC.

Recently, two authoritative PRC journals recommended an increase in the use of overseas ethnic-Chinese scientists to transfer foreign technology. The journals endorsed building databases of such overseas scientists, tasking them with research of interest to Beijing, and maintaining secrecy through the use of intermediaries and third countries. Recruitment through intermediaries was recommended to avoid complications due to policies and sensitivities of the targeted nation. One journal suggested private sector intermediary organizations and international talent exchange associations be used for recruiting. The

journals also suggested setting up an "Overseas Chinese Experts Data Center" operated by the Ministry of Science, fed by multiple sources, and organized by region, country, and profession. This data would be collected through privately owned service organizations supported by the State, over Internet websites hosted in China and the target country, by the private sector's foreign offices, and by science attaches in PRC embassies and consulates abroad.

Using academic exchange as a medium to train scientists and to develop ties between scientists, China appears to be building an informal S&T network around the world that could not only contribute to basic research but also to the development of commercial and military technologies. The close relationships between the personnel and organizations involved often makes it difficult to separate the research, funding and cooperation triangle among Chinese universities, government institutes and businesses.

Collection of Technical Information

In 1991, the China Defense Science and Technology Information Center (CDSTIC) – then the information arm for the Commission on Science, Technology and Industry for National Defense – published a science and technology (S&T) collection manual titled "Sources and Techniques of Obtaining National Defense Science and Technology Intelligence." The manual suggested that 80% of China's defense S&T needs are met through open and gray source (purchase/subscription) materials. This manual provided detailed information on foreign open sources on defense technology and noted that there are roughly 4,000 individual intelligence organizations operating in China (as of 1991). Many of these organizations are associated with state-owned enterprises, research institutes and academies affiliated with China's defense industrial base.

The collection of technical information probably continues to be orchestrated by CDSTIC – now under the PLA General Equipment Department (GED). The GED reportedly oversees a complex web of factories, institutes, and academies that are subordinate to China's nuclear, aeronautics, electronics, ordnance, shipbuilding, and astronautics industries. Each of these institutions has an import/export corporation to facilitate the import of technology and knowledge.

China's Defense Industrial Base

National Defense Science, Technology and Industry. China's defense industrial base – also known as National Defense Science, Technology and Industry (NDST&I) – is a well-organized and redundant structure, consisting of the factories, institutes, and academies subordinate to the organizations that represent the nuclear, aeronautics, electronics, ordnance, shipbuilding, and astronautics industries.

Prior to the reforms of 1998, five corporations and one ministry represented China's defense industrial base:

- Ministry of Electronics Industry

- China National Nuclear Corporation (CNNC)
- Aviation Industries of China (AVIC)
- China North Industries Corporation (CNIC)
- China State Shipbuilding Corporation (CSSC)
- China Aerospace Corporation (CASC)

In 1998, each of the five corporations split into two competing corporations in the shipbuilding, aviation, nuclear, ordnance and missile/aerospace arenas. The Ministry of Electronics Industry merged with the Ministry of Posts and Telecommunications to become the Ministry of Information Technology and Telecom Industry. The current organization of China's defense industrial base is:

- Ministry of Information Technology and Telecom Industry (MTTI)
- China State Shipbuilding Corporation (CSSC)
- China State Shipbuilding Industry Corporation (CSIC)
- China Aviation Industry Corporation I (AVIC I)
- China Aviation Industry Corporation II (AVIC II)
- China National Nuclear Corporation (CNNC)
- China National Engineering Construction Corporation (CNEC)
- China North Industries Group Corporation (CNIGC)
- China South Industries Group Corporation (CSIGC)
- China Aerospace Science and Industry Corporation (CASIC)
- China Aerospace Science and Technology Corporation (CASC)

Each of these corporations and MTTI have subordinate import/export corporations. These sub-corporations facilitate the import of technology and the export of commercial and military goods for profit. All of these import/export corporations have at least one branch office operating in the United States.

The import/export corporations are:

- China Nuclear Energy Industry Corporation
- China Aero-Technology Import/Export Corporation
- China North Industries Corporation
- China National Electronics Import/Export Corporation
- China Shipbuilding Trading Corporation
- China Great Wall Industries Corporation
- China Precision Machinery Import/Export Corporation

Chinese Academy of Sciences. The Chinese Academy of Sciences (CAS), directly subordinate to the State Council, is China's highest academic institution for comprehensive research in the natural and applied sciences. Research is conducted in the basic sciences, such as

mathematics, physics, chemistry, astronomy, and geology, as well as in newer scientific fields, such as systems engineering, remote sensing, computers, automation, robotics, semiconductors and lasers. CAS has branches with subordinate institutes in Shanghai, Nanjing, Hefei, Guangzhou, Wuhan, Changchun, Shenyang, Chengdu, Kunming, Xian, Lanzhou, and Xinjian – cities also strongly associated with China's defense industrial base. As a consequence, these organizations often work closely with the military in applied research, with products funded or developed for use by the military.

L. Military Budget Trends

In March 2002, Chinese finance minister Xiang Huaicheng announced that China is increasing military spending in 2002 by 17.6 percent, or $3 billion, bringing the publicly reported total to $20 billion. The publicly disclosed figures do not include major spending for weapons research and for the purchase of foreign weapons like two Russian-built destroyers China bought last year. Actual military spending, including the large but difficult-to-assess off-budget financing portion, could total $65 billion, making China the second largest defense spender in the world after the United States and the largest defense spender in Asia.

Additional double-digit defense budget growth is likely, at least through the 10th Five-Year Plan (2001-05). These increases will be used to offset losses from divested PLA commercial enterprises, underwrite escalating personnel costs, and fund PLA modernization. Beijing's 2000 White Paper on National Defense and its predecessor editions detail the official PLA budget, but only by poorly defined resource categories and not by service or mission. The release of the white papers may be an attempt by China to appear to be increasing its military transparency to the West while in reality keeping much secret.

Although Xiang cited modernization as one reason for the budget increase, most defense modernization spending occurs outside the PLA budget. Imported weapon systems are financed by separate hard-currency allocations from the State Council and are not charged against the PLA budget. The PLA pays for domestically produced Chinese equipment, which makes up about half of the modernization effort, but it pays only the incremental cost of manufacturing one system and none of the substantial R&D or startup costs. Such costs appear in the budget of the state-owned industry that produces the equipment, including substantial hard-currency costs for foreign technology and assistance.

The PLA receives funding from numerous, extra-budgetary sources. These sources include special allocations for procurement, at least partially derived from arms sales profits; sales of military unit services (e.g., construction) and products (e.g., farm produce) and other traditional PLA self-sufficiency activities; earnings from PLA enterprises remaining after divestment, which still produce civilian services and products; and, defense-related allocations in other ministries (e.g., state science and technology budgets and agencies at the provincial and local levels). In addition, China's proliferation of weapons of mass destruction (WMD)-associated technology and conventional munitions may help subsidize certain force modernization programs. Tracking these sources complicates the process of identifying and assessing defense budgetary trends.

Projecting Chinese defense spending over a long period of time is problematic, especially given that even total defense spending is not adequately defined or reported. However, anticipated economic growth would define somewhat the boundaries of future defense expenditures. Using this method, annual defense spending could increase in real terms over threefold to fourfold between now and 2020.

IV. COOPERATION BETWEEN THE FORMER SOVIET UNION AND CHINA

China's force modernization program is heavily reliant upon assistance from Russia and other states of the former Soviet Union (FSU). China hopes to fill short-term gaps in capabilities by significantly expanding its procurement of Russian weapon systems and technical assisstance over the next several years. Beijing's purchase of Russian weapon systems includes advanced fighters, such as the Su-30MKK, modern air defense systems such as the SA-10/20 and SA-15 SAMs, KILO-class submarines, and SOVREMENNYY-class destroyers. Sales of these systems are, or likely will be, accompanied by the transfer of precision guided air-to-surface munitions, active, BVR air-to-air missiles, and sophisticated anti-ship cruise missiles. Russia's assistance to China's space program is extensive. Russian arms sales and technical assistance to China accelerate Beijing's force modernization, and likely will have a significant impact on its ability to use military force.



Chinese President Jiang Zemin and Russian President Vladimir Putin.

A. FSU Policies Governing Military Sales to and Cooperation With China

China maintains defense and security cooperation relationships with some, but not all, of the states from the FSU. Beijing's primary objectives in establishing and fostering ties with FSU

nations are to develop political and economic influence and gain access to the advanced military technologies and weapon systems necessary to pursue military modernization. With the exceptions of Russia and Ukraine, most countries of the FSU do not have the capability to manufacture and sell complete, fully integrated weapon systems. Consequently, FSU governments tend to sell the parts or components of a larger system that were originally manufactured in their part of the FSU and stand now as no-cost inventory. Moreover, because these nations often do not have a valid requirement for these systems or sub-systems, they are viewed as potential sources of export revenue.

Russia. China and Russia maintain a robust defense and security relationship, including bilateral policy consultations and professional military exchanges. The sale of arms and military technology to China is a major component of Russia's foreign and security policy. Military-technical cooperation with Beijing acts as a source of revenue to fill state coffers, support defense industries and enrich influential Russian individuals and groups. It also provides Moscow with a vehicle to bolster relations with an emerging power and provides a primary source of funding for continued Russian military research and development (R&D) efforts.

Beijing reportedly purchased approximately $1.0 billion worth of Russian weaponry a year on average during the 1990s, accounting for about one-quarter of total Russian arms sales. Since 1999, however, China's purchases from Russia have averaged approximately twice that amount annually. These sales have increased in the late-1990s. Russian leaders are not expected to reduce significantly their sales effort in China even under pressure. Similarly, improved U.S.-Russian relations after the September 11 terrorist attacks are unlikely to cause Moscow to scale down arms transfers to Beijing.

Arms and technology sales also fortify Russia's relationship with China. Access to Russian weaponry gives Beijing a strong stake in cooperation with Moscow. Russian leaders probably view China's commitment to good relations as particularly important given the length of their common border, demographic trends in Russia's eastern regions, Beijing's growing power, and mutual concern over certain U.S. policies. Nevertheless, based on persistent concerns over the direction of China's foreign and security policies, Russia's leadership has placed some limits on the types and sophistication of weapons transferred to China.

Ukraine. Kiev is a moderate supplier in the world arms market and has active military cooperation agreements with dozens of nations, including China; however, Kiev's arms sales to China comprise only a very small percentage of its total world sales. Since Ukraine has no political sanctions against China, there are no diplomatic barriers to prevent growth in either military cooperation agreements with China or arms sales. Ukraine likely would resist international pressure to limit cooperation with China, or it would declare its cooperation but move some of its sales into the gray market to obscure direct governmental links.

Belarus. The Belarusian arms trade is closely tied to that of Russia. Belarus uses arms sales to generate hard currency and to keep its struggling arms industry afloat. China represents a lucrative target for arms sales, and since there are no internationally recognized sanctions

against China, Minsk does not perceive a need to limit its sales or military cooperation with Beijing. While Belarus is a signatory to major international agreements regarding the proliferation of WMD, it does not believe it should be subject to any constraints on the transfer of conventional technologies and systems.

Uzbekistan. Uzbekistan recently joined the Shanghai Cooperation Organization (SCO), in which China is a leading member. Despite some concerns over Beijing's intentions in Central Asia, its bilateral military cooperation with Beijing has increased in recent years, primarily through professional military exchanges and military assistance. Available evidence indicates that arms-related sales and technology transfers from Uzbekistan to China are limited.

Kazakhstan. Kazakhstan apparently pursues defense and security contacts with Beijing primarily as a mechanism to promote economic cooperation and address shared regional security issues such as Islamic extremism, border delimitation, and demilitarization. Available information does not support a significant Kazakh-Chinese military arms relationship. Any growth in bilateral military cooperation, including arms sales or professional military exchanges, likely would reflect a balance of Kazakhstan's interests to support economic and security cooperation with the Russian-led Commonwealth of Independent States (CIS) while pursuing closer economic ties and continuing dialogue through the SCO framework with China.

Kyrgyzstan. Although Kyrgyz military contacts with China have increased in recent years, there is no information suggestive of significant Kyrgyz arms transfers to China. Kyrgyzstan has agreed to headquarter the SCO Counter-Terrorism Center in Bishkek, indicating that closer defense and security relations with Beijing likely will include cooperative measures to combat Islamic extremism.

Tajikistan. Like Kyrgyzstan, Tajikistan is a member of the CIS Collective Security Pact and the SCO. While Tajikistan faces practical political restraints on military cooperation with China, it reportedly has begun a program of military-to-military exchanges with Beijing. However, there is no evidence of arms or technology transfers from Tajikistan to China.

Others. The remaining FSU states – Armenia, Azerbaijan, Estonia, Georgia, Latvia, Lithuania, Moldova, and Turkmenistan – are not believed to have a significant defense, security, or military-technical component to their bilateral relations with China.

B. FSU Laws and Regulations Governing Military Cooperation with the PRC

All fifteen FSU states have current or pending laws, decrees, or regulations controlling the transfer of dual-use or conventional weapon technologies and commodities. However, these measures act more to control than prohibit the transfer of military hardware, expertise or technology to the PRC.

In general, export control laws within the FSU serve an important purpose by providing a domestic legal framework that may one day enable FSU nations to satisfy fully international

commitments. While the FSU has made some progress in developing export controls, many FSU nations still lack the capability to control effectively the transfer of commodities and technologies relevant to military hardware including WMD.

Both Russia and Ukraine have extensive export control regulations. Russia has made multiple additions to its export laws in recent years. After almost three years of U.S. technical assistance, on July 18, 1999, former Russian President Boris Yeltsin signed legislation controlling the transfer of goods, technologies, and raw materials related to weapons of mass destruction, their delivery systems, and other types of weapons and military hardware. Conventional weapon exports are regulated by the "Law on Military-Technical Cooperation of the Russian Federation with Foreign States," enacted on July 9, 1998.

Russian law has extensive provisions for export licensing of nuclear-related and dual-use technologies. In 1998, Russian legislators also added a "catch-all clause" to the existing body of export control legislation to prevent exporters from transferring weapons-related technologies to sensitive end-users. This clause empowers authorities to hold an export that is under suspicion while they investigate the conditions for its ultimate end-use, even if the export has no other legal restriction. In addition, Russian exporters are required to obtain preliminary license approval from a group of government experts authorized to take into account the end-user and the technology to be exported. Russian licenses issued for weapons-related goods and technologies also are issued for one-time use only, requiring parties to reapply each time the transfer of sensitive technologies would occur.

In addition, Russian export control authorities maintain provisions to issue administrative sanctions on exporters who violate control regulations. Under this type of administrative penalty, export authorities could suspend export operations, annual export licenses, or impose fines if they find violations of Russian law. Russia's Criminal Code articles 78.1 and 189 provide criminal penalties for those violating WMD export control regulations, including up to five years of imprisonment with seizure of property, or a fine of up to five monthly wages for illegal exports of raw materials, equipment, technologies, scientific and technical information, and services that can be used in developing armaments and military hardware.

Ukraine does not have active comprehensive export control legislation. Such legislation is, however, awaiting parliamentary approval. In the meantime, Kiev's export control regime consists of a variety of presidential decrees and cabinet resolutions. In February 1998, Ukraine issued "Presidential Decree No. 117/98" determining specific procedures for state control over the international transfer of arms, military materiel, raw materials, hardware, and technologies that can be used for weapons development.

Ukraine's licensing process is primarily limited to nuclear, chemical, missile, and conventional arms. It also covers 36 kinds of industrial activity mainly related to nuclear, chemical, missile, and conventional arms trade. The process requires a license and must be submitted complete with an international import certificate, an end-user certificate, a copy of the contract, and specifications of the trade.

The Ukrainian penal code also has specific penalties for WMD-related export control violations. Section 228.6 of the Penal Code states that the violation of established procedures for export of missile, nuclear, and chemical armament goods and technologies—including special military equipment, services related to creation of arms, and any related spare parts and ammunition—is punishable by up to eight years' imprisonment and confiscation of property.

Kazakhstan is an example of an FSU nation with moderate export control regulations. In June 1997, Kazakhstan enacted "Presidential Decree #1037," which covers import and export licensing for its export control system. An anomaly in the Kazakh system is that many specifics are not written into law, but rather are regulated through a Cabinet of Ministers of Energy, Industry, Trade, Defense, Finance, Atomic Energy, and Science.

Kazakhstan has an extensive criminal code for dealing with violations of export control law, with penalties, including confiscation of goods, fines, and possible criminal liability, for the illegal export of WMD-related arms and technologies.

Azerbaijan is representative of FSU nations with limited export control laws. In June 1997, Azerbaijan issued "Rules Regulating Foreign Trade in the Azerbaijan Republic," requiring explicit permission from the Cabinet of Ministers to export specified military related goods and technology, including spare parts, nuclear materials technology and equipment, special non-nuclear materials, narcotics, psychotropic substances, chemical poisons, scientific-technical information and certain kinds of technology, materials, and equipment that could be used in the creation of military technology or arms.

Azerbaijan does not have a well-defined licensing system, and there are no particular limitations regarding company-specific export of WMD-related or sensitive goods. Moreover, Azerbaijan does not appear to have a criminal code addressing export control violations.

C. FSU Arms Sales and Technology Transfers to China Since 1990

There are no unclassified figures that accurately depict the extent of arms sales and technology transfers from FSU states to China since 1990. Depending upon the source, figures for signed arms agreements range from $10 billion to $20 billion, with actual deliveries to date ranging from $7 billion to $10 billion. Russia, Ukraine, and Belarus appear to be China's chief sources of weapons and materiel, reportedly providing in excess of 90 percent of all PRC arms imports since 1990. Among FSU nations, Russia clearly is China's largest arms supplier, accounting for over 90 percent of all FSU arms sold to China over the last decade.

Russia. The Sino-Russian military trade relationship has been extensive with China purchasing advanced Russian weapon systems for its military forces, weapon components for its indigenous production programs, and military technology for its weapon development programs. Beijing's purchase of advanced Russian weapon systems available for export has included Su-27 and Su-30 fighter aircraft, A-50 AWACS-type aircraft, SA-10 and SA-15 SAMs, KILO Class submarines, SOVREMENNYY class destroyers, and associated weapon

systems. China also relies on key Russian components for several of its weapon production programs and, in some cases, has purchased the production rights to Russian weapon systems. For example, China assembles Su-27 fighters from Russian kits and eventually is expected to fabricate major components for the aircraft. In addition to weapon components, Russian military technology and technical assistance has played an important role in many of China's key weapons development programs.

Ukraine. While Ukraine ranks as the second largest FSU arms supplier to China, signed arms contracts with Beijing total approximately $250 million, accounting for less than 2 percent of China's arms purchases during this period. Ukraine's arms sales to China reportedly have consisted primarily of weapon system components and equipment to support China's aircraft and missile programs. For example, Ukraine is said to have sold aircraft engines for use on China's K-8 jet trainer.

Belarus. Belarus is not a major PRC arms supplier. Since the break up of the Soviet Union, Minsk reportedly has signed contracts with Beijing valued at just over $200 million. Most of Minsk's arms contracts with Beijing reportedly have focused on providing equipment, technical assistance and technology that have supported China's development of various missile systems.

Uzbekistan. Uzbekistan is a minor Chinese arms supplier. Since 1990, Tashkent has signed arms agreements with Beijing valued at approximately $100 million, accounting for less than one percent of China's arms agreements, reportedly involving primarily the sale of the IL-76/CANDID transport aircraft.

D. FSU Arms Sales and Technology Transfers to China Under Negotiation

From 1999-2001, Beijing conducted major weapons negotiations with Moscow, suggesting that China will continue to rely on Russia as its primary source of modern military weapons systems. China also will continue to look to Russia and the other FSU states as potential suppliers for modern electronics, communications, and other technologies for incorporation into existing or new weapon systems under development in China.

China pursues a two-track weapon acquisition strategy to satisfy both long- and short-term military requirements. Russia figures prominently in both tracks. In the first track, China's preference is to develop and produce a weapon system domestically to satisfy long-term military requirements. To accomplish this goal, China uses technologies and commodities acquired from both domestic and foreign sources. The second track involves the acquisition of advanced foreign weapon systems and technologies in order to satisfy immediate military requirements, often together with related manufacturing technologies. This demand for technology transfer as part of an end-item sale is known as an "offset." Since at least 1993, China reportedly has acquired advanced Russian weapon system technologies for the development of PLA air, ground, and naval weapon systems, as well as advanced materials and manufacturing technologies associated with missiles, lasers, and space systems.

Beijing has expressed interest in or is currently negotiating the purchase of additional Russian weapon systems and military technology. For example, China publicly has expressed interest in acquiring additional KILO Class diesel submarines, anti-submarine helicopters and various aircraft engines. China's interest in assembling or producing Russian weapons apparently remains strong.

E. FSU Cooperation With PRC Defense Industries

Scientists and technicians from FSU nations reportedly have worked within China's defense industrial base since at least the early 1990s. According to reporting from 1993, there were about 300 Russian scientists in China on long-term defense-related programs. By 2000, that figure has risen to approximately 1,500. However, the exact numbers and locations of those workers cannot be confirmed. Nevertheless, defense industrial cooperation between China and Russia is extensive and affects most sectors of the PRC defense industrial base. FSU specialists also apparently interact with their PRC counterparts through facility-to-facility visits and lectures from visiting scientists or industry experts. FSU industry officials also are probably present in China as a result of services purchased with equipment, such as technicians for maintenance and training.

Interaction in Russia/FSU. PRC industry-related contact in Russia also takes place at multiple levels. PRC technicians visit Russian industries for a variety of purposes to receive technology demonstrations, attend lectures and briefings, negotiate contracts, tour industries, or discuss joint projects. China also reportedly has explored, and may have developed, ties with other former Soviet states. However, these ties likely are less extensive than China's ties to Russia.

F. FSU Assistance to China's Space Programs

China and Russia have been cooperating on space programs since the early 1990s. Most recently, in July 2001, Moscow and Beijing signed a five-year Sino-Russian space cooperation agreement. In line with this agreement, China and Russia allegedly will jointly launch experimental satellites. In addition, Russia will provide China with manned spacecraft technologies and train Chinese astronauts in Russia. China and Russia also are said to have a program for the co-development of remote sensing satellites.

G. Role of Cooperation with China in Funding FSU Research and Development

Funding for military R&D is a cost borne by a nation or business before an experimental weapon system is brought to the market. This business reality is significant in view of a world defense market that over the last decade has been generally characterized by shrinking national defense budgets and highly competitive industrial alliances and consolidation. R&D costs for advanced conventional weapon systems from FSU nations have had a significant impact upon operating budgets as the market for FSU weapons systems shrank and became less competitive with Western nations. The burden of R&D with respect to development of

new advanced conventional weapons systems has become most apparent in the trading relationship between Russia and China as well as between Russia and India.

H. Military Effects of Sino-FSU Cooperation

Russian arms sales are expected to have a significant impact on China's ability to use force against potential adversaries such as Taiwan. However, the full impact of these sales will not be apparent until China fully integrates its new hardware and technology. China probably will require many years of training and doctrinal development to reap the full benefit of the equipment purchased thus far. Nevertheless, Russian assistance has provided China better fighter aircraft, quieter submarines and more sophisticated missiles of various types. While PLA training and readiness do not enable full exploitation of most of these systems, their inherent lethality poses an enhanced threat to any potential adversary. Russian sales to China increase regional anxieties about emerging PRC power. Most Russian systems improve Beijing's military options against Taiwan and help extend the range of the PLA's ability to project force beyond China's littoral areas, including the South China Sea.

V. SECURITY SITUATION IN THE TAIWAN STRAIT

A. Beijing's Strategy Towards Taiwan

Beijing's longstanding approach to Taiwan is multi-faceted, integrating political, economic, cultural, and military strategies. Both Beijing and Taipei have stated that they seek a peaceful resolution to the unification issue. However, the PRC's ambitious military modernization casts a cloud over its declared preference for resolving differences with Taiwan through peaceful means. Beijing has refused to renounce the use of force against Taiwan and has listed several circumstances under which it would take up arms against the island. These include: a formal declaration of independence by Taipei, foreign intervention in Taiwan's internal affairs, indefinite delays in the resumption of cross-Strait dialogue, Taiwan's acquisition of nuclear weapons, and internal unrest on Taiwan. These statements, and the PRC's ambitious military modernization program, may reflect an increasing willingness to consider the use of force to achieve unification. Beijing's primary political objective in any Taiwan-related crisis, however, likely would be to compel Taiwan authorities to enter into negotiations on Beijing's terms and to undertake operations with enough rapidity to preclude third-party intervention.

Although President Chen Shui-bian has stated that his administration will not seek independence for Taiwan, Beijing perceives many political trends on the island as leading in that direction. The increase in strength of Chen's Democratic Progressive Party (DPP) following December 2001's local and parliamentary election and a possible 2004 re-election of President Chen Shui-bian, coupled with an increase in strength of his DPP may strengthen the position of those on the mainland who favor a more aggressive policy toward Taiwan. Signals from Beijing, however, have been mixed.

The internal debate over how to respond to Taiwan has ebbed and flowed over the past ten years. Beijing took military measures prior to the 1995 and 1996 Taiwan elections to seek to intimidate the Taiwan populace from voting for independence-leaning candidates. Following then-Taiwan President Lee Teng-hui's "state-to-state" comments in 1999, Beijing sparked propaganda and military activity in and around the Taiwan Strait. Beijing apparently opted not to apply direct military pressure in the run-up to the March 2000 Taiwan presidential election. Following Chen's election, Beijing has pursued a low-key approach of expanding contacts with political and economic elites on Taiwan who traditionally have favored unification. This approach is intended to isolate Chen, both domestically and internationally, by ignoring him and dealing with his political opponents. Despite this policy, China's leadership was caught off-guard when the mainland-favored Kuomintang (KMT) did worse—and Chen's DPP did better—than expected in the December 2001 legislative elections. Debate in Beijing over resorting to more coercive options may intensify in the run-up to Chen's anticipated reelection bid in 2004. Meanwhile, the PLA is continuing to develop military capabilities that could expand its options for an armed conflict against Taiwan.

Beijing's Political and Economic Options for Coercion

Beijing has developed a range of non-lethal coercive options, including political/diplomatic, economic, and military measures. PRC coercive strategies would seek to influence Taiwan policymakers whose actions are driven, at least in part, by public opinion. Presently, the population on Taiwan overwhelmingly supports the status quo, through which it enjoys economic prosperity, democracy, and *de facto* autonomy. Any coercive measures that threatened the island's livelihood likely would subject Taiwan's leadership to substantial internal pressure. China's leaders also recognize the sensitivity of Taiwan's economy to changing cross-Strait dynamics and could directly or indirectly manipulate Taiwan's stock exchange and investor confidence during periods of tension.

Beijing's Military Options

The PLA's offensive capabilities improve as each year passes, providing Beijing with an increasing number of credible options to intimidate or actually attack Taiwan. Should China use force, its primary goal likely would be to compel a negotiated solution on terms favorable to Beijing. Such an approach would necessitate a rapid collapse of Taiwan's national will, precluding the United States from intervening. The specific coercive military strategy that Beijing would adopt is unclear, and perhaps is the subject of extensive internal debate. A coercive campaign may seek to deter or punish Taiwan through the sudden application of violence. China may choose gradually to escalate the level of military pressure in order to compel Taiwan's political leadership to adopt policies favorable to Beijing's interests. On the other hand, Beijing may seek to deny Taiwan's military its ability to resist, thereby convincing the leadership that further resistance is futile. The PLA also could adopt a decapitation strategy, seeking to neutralize Taiwan's political and military leadership on the assumption that their successors would adopt policies more favorable to Beijing.

Coercive options include, but are not limited to, information operations, an air and missile campaign, or a naval blockade. With little warning, Beijing may choose to seize quickly a limited number of key facilities on Taiwan using amphibious or airborne forces as means to compel political capitulation. In the future, the PLA should be able to conduct military operations with increasing confidence of both success and minimal casualties. The PRC's ability to exercise coercive military options presents challenges not only to Taiwan, but also to other potential adversaries, such as the Philippines and Japan.

Should coercive measures fail, Beijing might attempt to occupy the entire island of Taiwan. Such an operation would require a major commitment of civilian air and maritime transport assets and would not be guaranteed to succeed. The PLA's success in a D-Day style invasion of Taiwan would rest on a number of variables, some tangible – principally the lack of amphibious lift as well as a number of intangibles, including personnel and equipment attrition rates on both sides of the Strait; the interoperability of PLA forces; and the ability of China's logistical system to support a high tempo of operations. In order for an invasion to succeed, Beijing would have to possess the capability to conduct a multi-faceted campaign, involving air assault, airborne insertion, special operations raids, amphibious landings, maritime area denial operations, air superiority operations and conventional missile strikes. The PLA likely would encounter great difficulty conducting such a sophisticated campaign throughout the remainder of the decade. Nevertheless, the campaign likely would succeed – barring third-party intervention – if Beijing were willing to accept the political, economic, diplomatic, and military costs that such a course of action would produce.



Should coercive measures fail, Beijing might attempt to occupy the entire island of Taiwan. Pictured above is a PLA amphibious training exercise.

Taiwan's Susceptibility to Coercion

Taiwan's susceptibility to coercion depends upon several factors. Perhaps the most important factor is the nature of the demands that Beijing imposes. If Beijing's demands are limited, then the threshold at which Taiwan would be willing to negotiate may be lower. Other factors

include 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 and maintain a 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. Successful coercion also may depend largely upon Beijing's ability credibly to escalate the conflict and inflict a greater price on defiance. A final, and perhaps most important, factor that will determine the success or failure of a PRC coercive campaign is the degree of international and especially U.S. support that Taiwan enjoys.

Factors Constraining PRC Use of Force Against Taiwan

The PRC's decision-making on the use of force against Taiwan will continue to entail an evaluation of a number of internal and external constraints. The principal factor is likely to be a leadership assessment of PLA capabilities to execute a desired coercive option to attain the desired political objective. Beijing most likely would not only consider its military capabilities relative to Taiwan, but also the PLA's capability to deter or deny any external intervention on Taiwan's behalf. China's leaders reportedly believe that failure in any military venture against Taiwan would pose a threat to the survival of Communist Party rule.

China apparently also is sensitive to the potential political and economic costs that it could incur from war with Taiwan, and recognizes that the use of force against Taiwan could damage China's regional and global interests. In the present period, China is pursuing economic reform and development. To that end, Beijing has avoided activities that might threaten its economic growth and access to foreign markets, investment, and technology. To a lesser extent, during the decision-making process in considering use of force against Taiwan the Beijing leadership also would consider the state of the overall security environment, especially in the Asia-Pacific region.

Dealing with External Intervention

If Beijing perceived war with Taiwan was inevitable, it most likely would adopt a war-fighting strategy to contain and limit the geographic scope of the conflict. Moreover, China's leaders would seek to execute its military operations with sufficient force and speed to achieve a military solution before outside powers could intervene on Taiwan's behalf and before its own vital trade and foreign investment were disrupted. This strategy would entail a propaganda campaign against Taiwan threatening the use of force, while concurrently building a case that hostilities were an internal issue and therefore not subject to international mediation or intervention. In response to external intervention in a regional conflict involving China, the PLA would attempt to weaken the third party's resolve by demonstrating the capability to hold at risk – or actually striking – high-value assets. The PLA would leverage emerging asymmetric capabilities to counter or negate an adversary's superiorities. Chinese journals provide some evidence of the PLA's intent to use asymmetrical means to complicate U.S. aircraft carrier battle group operations in support of Taiwan.

B. Force Posture

Taiwan remains the focus of China's military modernization. Earlier this year, Beijing announced a significant increase in defense spending. Should this trend continue, China could double its announced defense spending between 2000-2005. Over the past year, Beijing's military training exercises have taken on an increasingly real-world focus emphasing rigorous practice and operational capabilities, and improving the military's actual ability to use force. This is aimed not only at Taiwan, but also at increasing the risk to U.S. forces and to the United States itself in any future Taiwan contingency.

PLA Ground Force Posture

PLA ground forces have a considerable numerical advantage over Taiwan's Army and Marine forces. Three Group Armies are based in Nanjing MR opposite Taiwan, and several others likely would be included as part of the primary attack force in the event of an all-out invasion of the island. These Group Armies most likely would be supported by airborne, special operations forces (SOF) and marine units. Despite its numerical advantage, China's main ground forces are limited by shortcomings in such areas as sea-lift and logistics. However, China is steadily expanding its ability to transport ground forces by air.

PLA Naval Force Posture

Over the last decade, the PLA Navy has streamlined and modernized its fleet by eliminating some older ships and replacing them with fewer, more modern vessels. However, the PLA Navy still has a large fleet that includes approximately 60 surface combatants, some 60 attack submarines, about 40 medium and heavy amphibious lift ships, and approximately 50 coastal missile patrol craft. Two-thirds of those assets are located in the East and South Sea Fleets. Mission critical assets from the North Sea Fleet could augment these forces. In addition, Beijing reportedly is stepping up efforts to refit merchant ships to make up for the shortage in naval landing vessels.

PLA Air and Naval Air Force Posture

The PLAAF and PLANAF have a combined total of approximately 3,400 aircraft consisting of air defense and multirole fighters, ground attack fighter-bombers, and bombers. In addition, there are over 90 reconnaissance aircraft and some 500 transports. The majority of PLAAF and PLANAF aircraft are based in the eastern part of the country.

PLA Conventional Ballistic Missile Force Posture

All of China's known short-range ballistic missile (SRBM) assets are believed to be based in Nanjing MR. Any additional SRBM deployments most likely will take place in Nanjing MR. The number of conventional ballistic missiles deployed opposite Taiwan is expected to increase substantially over the next several years.

Forces Likely to be Involved in a Taiwan Campaign

During a major military campaign against Taiwan, the Nanjing MR would become part of the so-called "Nanjing War Zone," which probably would include, at a minimum, the three Group Armies in the Nanjing MR, elements from Group Armies based in adjacent military regions (e.g., Guangzhou and Jinan MRs), as well as China's airborne and marine forces. Air assets would come primarily from the Nanjing MR augmented by mission-critical aircraft from other parts of China. The Navy would commit assets from both the East and South Sea Fleets, as well as mission-critical assets from the North Sea Fleet. Finally, all deployed SRBMs most likely would be available to the "war zone" commander.

Effects of Strategic and Operational Surprise on Taiwan's Military Operations

The PLA believes that surprise and deception are crucial for the success of a military campaign. China likely would not be willing to initiate any military action unless assured of a significant degree of strategic surprise. A surprise missile and air strike on Taiwan most likely would damage severely most of Taiwan's combat aircraft and degrade both its air defense and C4ISR systems. Concurrently, the PLA Navy also could attack major Taiwan surface combatants with little or no warning. If successful, these attacks could enable the PLA to protect a large cross-Strait sea and air fleet and land troops in sufficient strength to achieve a foothold on the island. If the PRC effectively incorporates these concepts into its doctrine, Taiwan could become increasingly vulnerable to PRC strategic and operational-level surprise.

Military Imbalances in the Taiwan Strait

Missiles. China has an arsenal of over 300 SRBMs that can strike Taiwan. This number will grow substantially over the next few years. Taiwan's ability to defend against ballistic missiles is negligible.

Naval Forces. Although the Taiwan Navy maintains a qualitative edge over the PLA Navy, China has a much larger number of submarines that could pose a considerable torpedo and mine threat. Commercial merchant and fishing ships also could pose a potential threat to block ports with mines. In addition, anti-ship cruise missiles on patrol boats and major surface combatants could strike Taiwan vessels.

Air Campaign Forces. The Taiwan Air Force has enjoyed dominance of the airspace over the Taiwan Strait for many years. Today, Taiwan maintains a qualitative edge over and possesses three times as many 4th-generation fighters as China. The PLAAF does not appear to have been putting large numbers of aircraft in the air simultaneously, controlling large numbers of engagements, or sustaining high sortie rates for extended periods of operations. Pilot proficiency is improving, but China's best pilots lag behind their Taiwan counterparts in terms of capabilities.



Taiwan currently has only two submarines that are capable of operations, while the PLA has scores of submarines to impose a naval blockade.

However, China's force modernization, weaponry, pilot training, tactics, and command and control are beginning to erode Taiwan's qualitiative edge. The number of Chinese 4th-generation fighters is expected to move closer to Taiwan's. China will have improved situational awareness. Beijing's SRBM force also could be used to soften Taiwan's air defenses and disrupt airbase operations, supporting any air campaign designed to cripple the Taiwan Air Force and damage or destroy Taiwan military facilities. Over the next several years, given current trends, China likely will be able to to cause significant damage to all of Taiwan's airfields and quickly degrade Taiwan's ground based air defenses and associated command and control through a combination of SRBMs, LACMs, special operations forces, and other assets.

Ground Forces. China's sole ground force advantage is its overwhelming size – provided these forces could be delivered to the battleground. Taiwan's ground forces will maintain an edge for combat on the main island unless China expands significantly its fleet of medium and heavy lift amphibious ships and develops a robust amphibious logistics infrastructure. There is little discussion in the available Chinese literature of any need to develop such capabilities.



To bolster strike capabilities, China reportedly is developing an improved version of the FB-7/JH-7, which will carry cruise missiles, anti-radar missiles, and laser-guided bombs.

Shortcomings in Conducting Extended Campaigns in the Region

Success in a military operation directed against Taiwan will depend upon Beijing's ability to overcome a number of obstacles. The PRC faces roadblocks and challenges in implementing doctrinal changes; fielding new equipment and operating it to its full potential; executing combined or joint operations; and assimilating technology. China's main weaknesses today in sustaining extended campaigns beyond its coastal waters include an inability to protect air and sea lines of communication against superior naval and air forces; poor ASW capabilities; limited ground force amphibious lift assets; a limited number of missiles; significant logistical and training weaknesses; an economy largely dependent on exports to the United States and Japan; and a lack of real-time intelligence. China also is challenged by difficulties in absorption of technology. Its Navy is highly vulnerable to air attack.

China is taking steps to remedy at least some of these weaknesses by improving its air and naval combat capabilities; increasing its conventional ballistic missile forces; consolidating its logistics force structure; attempting to diversify exports, with a strong emphasis on Europe; and, pursuing a wide variety of real-time, intelligence-capable platforms such as reconnaissance satellites and AWACS-type aircraft.

C. Assessment of Challenges During 2000-2001 to Taiwan's Deterrence Posture

During the past year, the PLA ground force revealed incremental improvements, evidenced by an increase in the training tempo and equipment upgrades. Naval enhancements included greater familiarization and crew proficiency on recently acquired platforms and associated

weapon systems, as well an increase in the PLAN's maritime surveillance capability. The most significant change in the PLAAF's force posture was the acquisition and deployment of new Su-30 fighter aircraft and the reported upgrade of air facilities along the Taiwan Strait.

Taiwan Defense Reform

Since the mid-1990s, driven by Taiwan's expanding democratization and economic prosperity, the Taiwan military has been attempting to address several deficiencies. These deficiencies include an opaque military policymaking system; a ground force-centric orientation; and a conservative military leadership culture. As part of this process, in January 2000, the Legislative Yuan passed two major defense reform laws, which are to be implemented by 2003.

The National Defense Law (NDL) formally designates the Defense Minister as the island's principal defense official and subordinates the General Staff to the Ministry of National Defense, which assumes responsibility for defense policy and military research and development. Another piece of legislation adds a second vice minister and establishes or resubordinates from the General Staff ten offices and five bureaus responsible for strategic planning, integrated assessments, procurement, budgeting, military schools, and military law. The Chief of the General Staff will report directly to the Defense Minister and supervise a smaller General Staff focused exclusively on directing military operations.

If implemented successfully, these reform laws would strengthen civilian oversight and reduce inter-service rivalry, especially with respect to the island's strategic direction and force planning. They also would promote a joint service environment needed to meet the growing challenge from the PLA's modernizing air, naval, and missile forces. Despite the reform, the defense budget's steady decline as a percentage of total government spending will challenge Taiwan's force modernization.

Ground Forces. In the mid-1990s the Taiwan Army (TA) was a force of roughly 250,000, with a strategic focus on counter-landing operations. From 1997-2001, the *ching shih* reform initiative down-sized the entire military from approximately 450,000 to around 385,000 personnel, with the Taiwan Army taking a disproportionate reduction. Following the down-sizing, the TA was left with about 200,000 personnel organized into combined arms brigades. The counter-landing focus, however, remains unchanged. While significant strides have been made over the past half-decade, the TA still has major shortcomings as a fighting force, particularly in the areas of joint war-fighting and development of a professional NCO corps.

Naval Forces. As a result of the *ching shih* reforms, the Taiwan Navy (TN) has shrunk from approximately 55,000 to 45,000 personnel, while preserving its basic organizational structure, fleet size, and mission focus on counter-blockade/defense of sea lines of communication. The TN is organizationally well-run, its equipment generally well-maintained, and its leadership apparently aware of its own strengths, weaknesses, and the nature of the threat it faces. The TN has benefited from several important hardware acquisitions from abroad; as a result, its fleet contains a number of relatively new platforms with enhanced combat potential. Despite

these improvements, Navy operations are not well-integrated with those of either the army or air force, and joint training is infrequent and rudimentary. Perhaps a more significant shortcoming is the Navy's inability to conduct multiple missions simultaneously.



China's force modernization, weaponry, pilot training, tactics, and command and control are beginning to erode Taiwan's qualitative edge.

Air Forces. In many respects, the Taiwan Air Force's (TAF) fate over the past decade closely resembles the TN's. The TAF has shrunk from roughly 55,000 to 45,000 personnel during the *ching shih* reforms, while preserving its basic organizational structure, aircraft fleet size, and defensive counter-air mission focus. TAF officers are highly professional and hard-working. The TAF exhibits ingenuity in its use and maintenance of older hardware. The TAF senior leadership is moving to rectify highly publicized pilot shortages by extending minimum terms of service, offering large bonuses, and enlarging the pool of prospective pilot applicants. Although outnumbered by the PLAAF and PLANAF, TAF weapons systems and training qualitatively surpass those of their cross-Strait peers. However, TAF personnel – especially its fighter pilot corps – reportedly are overworked. Pilot training continues to focus on the defensive counter-air mission. However, dissimilar air combat training is rarely practiced.

VI. CONCLUSION

Beijing is pursuing its long-term political goals of developing its comprehensive national power and ensuring a favorable "strategic configuration of power." China's efforts to accomplish its security goals involve an integrative strategy that applies diplomatic, informational, military, and economic instruments of national power. China's leaders believe that national unity and stability are critical if China is to survive and develop as a nation. Chinese leaders also believe they must maintain conditions of state sovereignty and territorial integrity. While seeing opportunity and benefit in interactions with the United States – primarily in terms of trade and technology – Beijing apparently believes that the United States poses a significant long-term challenge.

In support of its overall national security objectives, China has embarked upon a force modernization program intended to diversify its options for use of force against potential targets such as Taiwan and to complicate United States intervention in a Taiwan Strait

conflict. Preparing for a potential conflict in the Taiwan Strait is the primary driver for China's military modernization. While it professes a preference for resolving the Taiwan issue peacefully, Beijing is also seeking credible military options. Should China use force against Taiwan, its primary goal likely would be to compel a quick negotiated solution on terms favorable to Beijing.

China is developing advanced information technology and long-range precision strike capabilities, and looking for ways to target and exploit the perceived weaknesses of technologically superior adversaries. In particular, Beijing has greatly expanded its arsenal of increasingly accurate and lethal ballistic missiles that are ready for immediate application should the PLA be called upon to conduct war before its modernization aspirations are fully realized.

China's force modernization program is heavily reliant upon assistance from Russia and other states of the former Soviet Union (FSU). China hopes to fill short-term gaps in capabilities by significantly expanding its procurement of Russian weapon systems and technical assistance over the next several years. The success of China's force modernization will also depend upon its ability to overcome a number of technical, logistical, and training obstacles.