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Defense Modernization in China

An Intelligence Assessment

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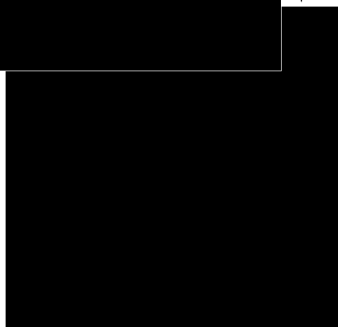
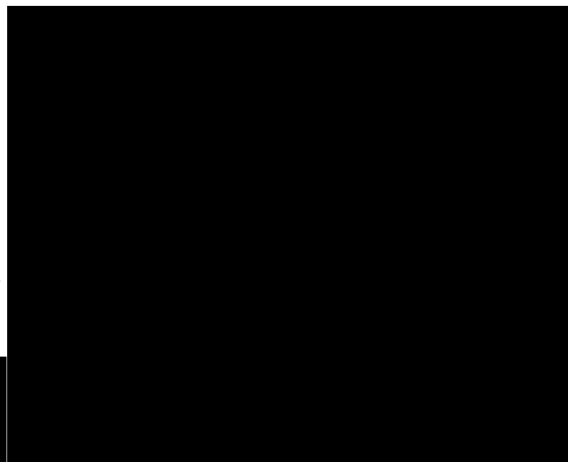
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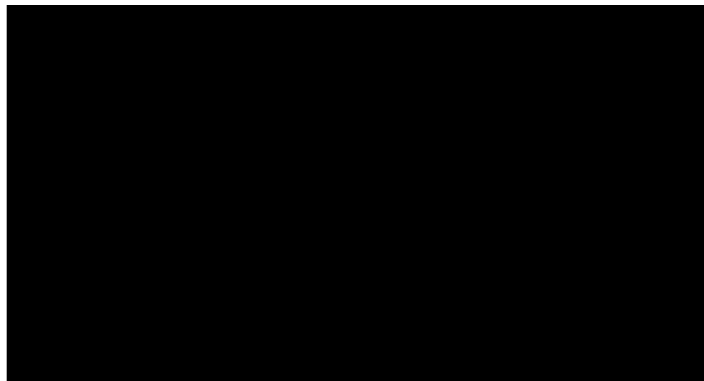
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Defense Modernization in China ([REDACTED])

An Intelligence Assessment

*Information available as of 31 August 1980
has been used in the preparation of this report.*



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[REDACTED]
October 1980

Defense Modernization in China

Overview

China's defense modernization program, a two-decade effort aimed at improving the People's Liberation Army (PLA) and the defense industries, is off to a good start but has far to go. The effort arises from deep-rooted apprehension over Soviet military capabilities and from the leadership's desire to "move China into the front rank of nations" by the year 2000. It will be successful only if the nation enjoys prolonged political stability, retains access to foreign capital and technology, avoids costly foreign military campaigns, and moves forward in science, education, and industry.

China's prospects for military modernization are influenced by strengths and weaknesses in its political, economic, and technical bases. The country suffers from serious shortages of trained technicians, deficiencies in key technologies and defense industries, and inadequate foreign exchange. The principal factors favoring success of the modernization drive include the leadership's stability and dedication to modernization and the willingness of foreign governments to provide technical and financial assistance.

The defense modernization program has two distinct aspects: (1) improving PLA capabilities at low cost through 1985 while (2) simultaneously reorganizing defense industries and selectively investing in new tooling and technology. Low-cost improvements include such measures as providing realistic combat training, encouraging younger leadership at all echelons, promoting officers on the basis of merit, and reducing military involvement in local political and economic matters. Upgrading the defense industries will involve training more engineers, technicians, and design specialists and modernizing plant layout and management. In some cases, China must arrange technology licensing agreements and purchase new equipment.

A key factor in creating a professional military force is the PLA's emphasis on realistic combat training. This effort is designed to get more out of the weaponry and equipment now on hand and to prepare troops and commanders for new equipment in the mid-1980s. The training program encourages competition between units and individuals and presents awards for outstanding performance. PLA officers and soldiers are receiving more and better technical education and practical experience.

In 1977 the defense industries began a lengthy process of reorganizing plants, retraining workers, and assimilating foreign technology that ultimately will provide the PLA with modern weapons and equipment. China

seeks to acquire design and production technologies in key areas such as the aircraft industry, military electronics, advanced metallurgy, and shipbuilding. It will pursue long-term technology transfer by three main methods—arranging technology purchases and coproduction agreements, exploiting military equipment obtained from friendly governments, and collecting information from study groups and “technical exchanges.” Purchasing technology may be China’s only viable option for modernizing its aircraft industry, but other defense industries, such as those supporting the ground forces, require less outside assistance. China is especially interested in dual-use technologies that both benefit the civil economy and enhance military capabilities. [REDACTED]

Despite its technological deficiencies, China has produced and deployed a number of strategic and conventional weapon systems since 1970. These systems include nuclear-powered submarines, strategic missile systems, and the experimental Xian-A fighter. In recent years, China’s production has included an air-to-air missile, a new multiple rocket launcher, a light antitank guided missile, and ships for open-ocean naval operations. Before 1985, we expect to see deployment of a new main battle tank, a better antitank guided missile, a new surface-to-air missile, a new interceptor, and perhaps a nuclear-powered ballistic missile submarine. [REDACTED]

Although serious gaps in China’s defenses will remain well past 1985 as a result of inadequate military industrial output, technology licenses and coproduction arrangements in the electronics and aircraft industries probably will help resolve major problems in military production. By the early 1990s industry will be able to design and produce new weapons and to provide a wide variety of equipment to the forces. [REDACTED]

China’s defensive capabilities will be significantly improved by 1995 if political stability, economic growth, and scientific and industrial modernization continue unobstructed. Even with steady improvement in forces and defense industries over the next 15 years, however, China will not develop a significant offensive capability against the USSR, largely because of that country’s vastly superior industrial base. With a population that is expected to reach 1.3 billion by 1995, China is unlikely to develop forces based on technology rather than manpower or to abandon its defensive doctrine of “People’s War Under Modern Conditions.” This doctrine posits defeat of a technically superior enemy by exploiting China’s overwhelming manpower and vast terrain. [REDACTED]

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Defense Modernization in China

Background

The Chinese consistently describe modernization of the PLA as a process of gradual force improvement, based upon self-reliance, that will require many years to accomplish. In China the term "force modernization" implies making fundamental institutional changes in the PLA and the military industrial base, instilling new thought patterns and skills in PLA commanders and troops, and—eventually—introducing new weapons and equipment.

China can achieve its goal of significantly modernizing its defense forces by the year 2000 only if:

- It remains politically stable.
- It receives sufficient foreign capital and technology.
- It avoids military attack upon its industrial base in Manchuria and a large-scale war with Vietnam.
- It succeeds in higher priority efforts to modernize agriculture, industry, and science and technology.

The genesis of the present military modernization drive was Premier Zhou Enlai's economic program set forth in 1972. Zhou proposed to modernize agriculture and industry and to "move China into the front rank of nations" by the year 2000. This program provided the core of what later became the "Four Modernizations."

Defense modernization emerged as an issue in 1973, when China made its first inquiries about the Harrier V/STOL ground attack aircraft and resumed negotiations for the transfer of Spey turbofan engine technology. In 1974, Deng Xiaoping, rehabilitated from his Cultural Revolution disgrace, assumed a prominent role in promoting military modernization.

The watershed year for defense modernization was 1975, the rehabilitation of former Chief of Staff and modernization advocate Lo Ruiqing, and the signing of an agree-

ment to transfer Spey engine technology.

The Spey transfer signaled China's willingness to seek foreign technology that would fill military needs.

The death of Zhou Enlai in January 1976 triggered a series of political upheavals that led to the second ouster of Deng Xiaoping and the subsequent reign of the Gang of Four.¹ The Gang reversed or slowed many of the military programs.

The death of Chairman Mao Zedong in September, however, ended the Gang's activities, and the four were arrested in October. A new leadership centered around Hua Guofeng and Ye Jianying began to take shape in late 1976.

The new leaders resumed the interrupted military modernization drive in 1977, dispatched numerous delegations to Europe and Japan to study foreign military technology, and began to reorganize selected defense plants. The leadership also accelerated the drive for military professionalism and more realistic training begun two years earlier. In August 1977 the PLA announced a new doctrine of "People's War Under Modern Conditions,"² and Deng Xiaoping again returned to power.

¹ The Gang of Four consisted of radical leaders Jiang Qing (Madame Mao), Zhang Chunqiao, Wang Hongwen, and Yao Wenyuan, all of whom gained prominence during the Cultural Revolution.

² "People's War Under Modern Conditions" posits defeat of technologically superior invaders by use of China's geographical advantages and immense manpower. Modern weaponry is recognized as complementing and improving the defensive potential of manpower and terrain. Resistance could include all forms of armed struggle ranging from guerrilla warfare to nuclear strikes.

Impetus for Defense Modernization

China's pursuit of military modernization—in its present context—springs from deep-rooted apprehension over Soviet military intentions in Asia. The Chinese have viewed with increasing anxiety the marked growth over the last decade in the USSR's strategic and conventional military power, particularly the strengthening of Soviet forces along the Sino-Soviet frontier. Senior Chinese officials have expressed concern that the PLA might fall so far behind the Soviet military that it could no longer function as an effective deterrent. ■

Despite such concerns, China evidently views the Soviet Union as a long-term threat rather than as an immediate danger, and defense modernization probably will continue to hold the lowest priority among the Four Modernizations. Civilian "modernizers" in the leadership make a strong case that defense modernization cannot proceed far without broad progress in agricultural, industrial, and scientific affairs. Accordingly, the Chinese themselves expect early results to be few and unspectacular, and they prefer to stress over the next 20 years the building of an industrial base that only eventually will enable China to produce a wide range of modern weapons. ■

China's appraisal of Soviet intentions and capabilities largely shapes the direction of the defense modernization effort. The Chinese leadership evidently believes that the Soviet Union's most likely attack would involve heavy armored thrusts, supported by airpower, into Manchuria and possibly Inner Mongolia. The Chinese appear to believe that the Soviets could not effectively employ their naval power against China and that they would refrain from using strategic nuclear weapons because of China's limited but credible retaliatory capability. ■

Strengths and Weaknesses of the Forces

The centerpiece of China's defense posture is its 3.5-million-man ground forces, of which nearly three-quarters are infantry. The ground forces are organized

according to the "Three-in-One" principle,⁴ which calls for a defense in depth to contain a conventional attack by a militarily superior enemy. Most main-force units and some regional forces are adequately equipped with tanks, field artillery, antiaircraft artillery, anti-tank guns, and other equipment, much of it based upon Soviet technology and designs of the late 1950s. Although some equipment is obsolete by US and Soviet standards, most pieces are rugged, reliable, and still effective on the battlefield. ■

Though the ground forces have much of the equipment needed for wartime operations, several key deficiencies—chiefly in equipment for antitank and air defense operations—would notably increase the PLA's losses in a conventional war. The PLA has little antitank capability at ranges beyond 1,500 meters.⁵ Antiaircraft artillery defenses feature cannon and machineguns of old Soviet designs and a Chinese copy of an early model SA-2 surface-to-air missile. ■ Weaknesses in radar tracking of targets, and the limited range and accuracy of the weapons, render Chinese ground forces vulnerable to attack by fast, low-flying aircraft. ■

The ground forces also suffer from serious deficiencies in logistics and tactical communications. Inadequate roads and motor transport slow the movement of troops to the battlefield, hamper their redeployment to counter breakthroughs, and limit the movement of ammunition and other supplies and the evacuation of casualties. Tactical radios are neither numerous nor good enough to support command and control effectively and to ensure that units react quickly to changing situations. ■

⁴ The "Three-in-One" principle specifies that Chinese forces will be organized into main forces (maneuver units), regional forces (units that usually man fixed defensive positions), and militia (armed civilians trained to augment the other forces and defend local areas). Regional forces would attempt to slow an enemy's advance and channel his movements into terrain favoring defense. Maneuver units would seek to mount major defensive operations at times and places of advantage and—when possible—to counterattack. The militia would provide intelligence, logistical support, and replacement personnel to main and regional forces. ■

⁵ The Chinese ground forces of the 1970s were equipped with the ATGM ■

[REDACTED]

Beijing regards the ground forces as absolutely essential for defending against a Soviet conventional attack, and their modernization is receiving strong attention. Development of weapons to counter armor and aircraft is of immediate concern, and the Chinese evidently are concentrating resources on producing a new main battle tank, increased numbers of antitank guided missiles and antitank mines, improved antiaircraft artillery, and a new surface-to-air missile [REDACTED]. Other important concerns are the provision of reliable tactical radios and the production of heavy trucks and some tracked vehicles. As the major gaps are filled, attention will turn to improvement of tank and artillery ammunition and production of improved artillery pieces, mobile bridging equipment, and a broader range of infantry weapons. [REDACTED]

China's 6,000-plane Air Force is the service least capable of successfully performing its mission. The Air Force lacks advanced avionics, air-to-air missiles, and electronic countermeasure equipment. Moreover, it is the most difficult service to modernize because needed technologies currently are beyond China's grasp and are extremely expensive. [REDACTED]

[REDACTED] Until recently, China's most advanced jet engine was that in the MIG-21, [REDACTED]. The inability of Chinese engineers to design and build turbine aircraft engines with performance better than that of older, Soviet-designed models spurred the Spey engine negotiations and the continuing exchanges with Western aircraft manufacturers. [REDACTED]

Along with engines, the Chinese want to develop better avionics equipment and aircraft weaponry. [REDACTED]

[REDACTED] China also hopes eventually to build helicopters, wide-body transport aircraft, and improved combat aircraft. [REDACTED]

The PLA Navy has some deficiencies but could effectively perform its primary mission of defending China's coast. A sizable force of diesel attack submarines serves as a first line of defense against approaching hostile fleets. This is backed up by a small but growing force of major surface combatants, numerous missile and torpedo boats, and finally naval shore defense sites. The Navy is deficient in air defense and antisubmarine warfare, but these weaknesses apply mainly to open-ocean operations beyond the continental shelf and the range of land-based aircraft. With an air arm of some 800 aircraft, the Navy can provide near-shore air cover to the fleet, maritime surveillance, and supporting attacks. However, the Navy cannot perform major amphibious operations, because it lacks the resources for transporting tanks and for providing fire support for large assaults. [REDACTED]

missile submarines and a [redacted] number of new land-based, solid-propellant ICBMs, IRBMs, and SRBMs. We also expect that China gradually will improve the reliability and targeting flexibility of its missile forces. [redacted]

Problems and Prospects for Defense Modernization

Restraints to Modernization

China's military modernization is constrained by numerous fiscal, organizational, and technical factors. [redacted]

Human. The defense industries—and the broader industrial base—face the prospect of a rapidly dwindling supply of trained researchers and engineers. Many were educated in France, Germany, or the United States during the 1930s and 1940s and returned to build a "new China" in the 1950s. They now are in their seventies and eighties and are having difficulty carrying the burden of research. A pool of 40,000 to 50,000 Soviet-trained engineers exists, most of them trained between 1950 and 1960. This group, however, is not as skilled as China's Western-educated engineers and is too small to fill Beijing's requirements for technically trained manpower. The Cultural Revolution period from 1966 to 1976 virtually destroyed the system of higher education, and few trained engineers or technicians emerged during this "Lost Decade." [redacted]

The government is fully aware of the crisis it faces in training large numbers of new technicians. Until China has sufficient engineers and technicians trained in modern methods and conversant with modern technology, staffing for most major weapons programs will include older engineers lacking needed design and production skills. Still, China can mobilize enough technical talent for selected, high-priority projects in the strategic weapons, aircraft, and naval programs. Growing numbers of young students will begin to enter the defense industries in the mid-to-late 1980s and replace the older technicians. Some 900,000 students—more than two-thirds in science and technology—are now enrolled in colleges and universities throughout China, and the government plans to expand the number of university students to 3 million by

1985. Additionally, several thousand graduate students trained in engineering and technical subjects before the Cultural Revolution are abroad for advanced training. [redacted]

Financial. Defense modernization is constrained by China's deep poverty and the leadership's relegation of defense to fourth priority behind agriculture, industry, and science and technology. Although the 1979 defense budget was increased, the entire increase probably was needed to pay for the conflict with Vietnam and subsequent improvements in border defenses. The 1980 budget presented to the recent National People's Congress (NPC) calls for a 13-percent cut in defense expenditures. Military leaders accepted this decision, [redacted]

The financial key to defense modernization, however, is found less in the explicit defense budget than in allocations to science and technology and to industry. [redacted]

[redacted] Investments in research and development in such nonmilitary areas as metallurgy, electronics, and civil aircraft will ultimately benefit the military modernization program. The NPC approved increases in expenditures [redacted] in 1980 for a portion of the budget that includes science and technology. [redacted]

Materials and Electronics. Manufacturing modern weapons requires sophisticated metals and alloys, advanced electronics, and special materials. In none of these areas can the Chinese now produce the desired quantities of high-quality products. China does produce about 30 million tons of steel annually, sufficient to sustain its current, low-technology arms industry. However China is unable to produce enough high-grade or specialty steel—especially heat-resistant steel—to meet military needs. [redacted]

[redacted] Nearly all superalloys and related materials must be imported at high cost from Japan or Western Europe. Virtually all nickel

alloys are imported from the USSR.⁷ The Chinese do possess large supplies of aluminum ore and produce enough aluminum to meet military demands. A similar abundance of titanium ore will permit China to meet demand for this metal when sufficient refining capacity has been built. China will have to make a major effort, however, in advanced metallurgy.

[REDACTED]

Most Chinese-produced radars, sonars, and communications systems are technically deficient because China's electronics sector lacks essential manufacturing technologies to move advanced components from the laboratory into production. China produces a broad range of electronic equipment and components.

[REDACTED]

Manufacture of special materials such as composites, plastics, ceramics, and synthetic fibers is in its infancy.

[REDACTED]

One exception may be development of a Kevlar-like⁸ fiber used to produce lightweight, high-strength components for aircraft and space vehicles. This material can be used in relatively small quantities to manufacture missile casings, aircraft components, and parts for shoulder-launched antitank and air defense weapons.

Military Industry. Despite excess plant capacity that resulted from the large building program between 1969 and 1974, much of China's defense industry cannot yet support the modernization drive.

[REDACTED]

⁷ China's drive to lessen dependence on foreign sources of steel is noted in an article on tank production in the March 1980 issue of *Liberation Army Pictorial*: "China's successful development of armor plate and structural steel to replace various lines of chrome-nickel steel from abroad has been an important contribution and has resulted in the granting of first-class awards in national science and technology."

⁸ Kevlar is a US-developed and patented polyamide fiber used in place of fiberglass or composite materials.

[REDACTED] An unpredictable supply of raw materials, components, and electric power also slows production.

[REDACTED]

Outmoded machinery or equipment of local manufacture presents a lesser problem. Though such equipment may be less efficient than comparable Western or Japanese equipment, it generally is adequate for producing parts and components needed for weapons. Poor management practices, including excessive politics in plant management and confused chains of command, persist into 1980.

[REDACTED]

[REDACTED]

[REDACTED]

Still, despite extensive reorganization, China's major effort in jet engine development remains hampered by inadequate test facilities. To improve their testing capabilities, the Chinese are actively seeking advanced wind tunnels and computers for engine testing and component research. (S)

Institutional. Deficiencies in the People's Liberation Army itself constitute another major constraint to military modernization. The forces are not well organized, trained, or equipped to receive new weapons. The absence of a modern logistics organization calls into question the PLA's ability to obtain spare parts when needed or to maintain and repair advanced weapon systems.

[REDACTED]

The top PLA leadership has gained an appreciation of these problems from its contacts, since 1976, with Western armies and military leaders. [REDACTED]

[REDACTED] The leadership recognizes that the PLA cannot and should not become a Western-style military force but that it can adapt selected practices to Chinese needs. [REDACTED]

Assets to Modernization

Despite the many restraints to military modernization, several noteworthy factors favor the program: the leadership is generally stable and committed to modernization, foreign assistance is available, the PLA is willing to modernize, and Beijing has avoided expensive military entanglements since the Vietnam incursion. If China maintains these advantages over the next decade, it may well develop the foundation needed for eventually introducing large quantities of modern equipment and armament into the PLA. [REDACTED]

Leadership Continuity and Cohesion

Since early 1977 the party leadership has been increasingly cohesive and committed to the twin policies of economic modernization and diplomatic opening to the West. Leadership reformers under Deng Xiaoping have carefully but persistently removed or weakened leaders opposed to these policies and have successfully eliminated much opposition. The modernization program now appears to be popularly accepted as providing individual economic opportunities and relief from the confusion and uncertainty of past leadership struggles. Serious economic and political problems remain, however, and newly appointed government and party leaders will be under considerable pressure to show results and sustain the momentum of the modernization program. [REDACTED]

Availability of Foreign Assistance

China has an excellent credit rating, and many foreign governments are eager to sell to Beijing or to provide hard-currency loans. Foreign industrial firms have launched intensive efforts to sell large quantities of finished goods and whole plants. Despite strong Soviet pressure, the French and British Governments have

announced their readiness to sell arms to Beijing, and Chinese arms delegations have found generally receptive audiences among arms manufacturers in Western Europe, Japan, and the United States. To avoid dependence on foreign suppliers, however, the Chinese prefer to obtain technology rather than end items and are cautious when approaching negotiations. To the extent that China can maintain political stability and social order, foreign governments will continue to provide Beijing with much-needed development funds and critical technology and equipment. [REDACTED]

The willingness of the United States and Europe to accept students for language and technical training is another important aspect of China's relationship with the West. In an effort to develop a pool of trained manpower for research and development within the defense industries and throughout the general economy, Beijing has sent to Western universities more than 3,000 students, virtually all with technical training and industrial or research experience. Plans call for their return to China to teach others, translate foreign scientific and technical publications and papers, and conduct advanced research. [REDACTED]

The PLA's Attitude Toward Modernization

The PLA has displayed eagerness to get on with defense modernization. Large numbers of officers who possessed few military skills and who advanced to the upper levels of the PLA during the Cultural Revolution have been removed since 1975. Although promotions are still dominated by patronage and the old-boy network, the idea of making promotions dependent upon demonstrated skills and readiness to implement modernization programs is gaining acceptance. [REDACTED]

Further evidence of the PLA's willingness to modernize is the General Staff Department's [REDACTED] program to study foreign military doctrine and strategy. [REDACTED] the GSD has acquired foreign training manuals

* The Chinese leadership, however, is wary of undue dependence on foreign banks and other creditors in view of China's experience with Western loans in the 1920s and 1930s. During 1979, China's negotiations for arms technology, conducted with several West European governments, slowed considerably. The slowdowns probably were caused by China's reassessment of its economic needs rather than European reluctance to sell. [REDACTED]

and films, invited European defense attaches to lecture to PLA audiences, and exchanged senior military academy groups with the United States, Canada, Great Britain, and France. [REDACTED]

[REDACTED] the [REDACTED] The Chinese clearly gain [REDACTED] at least a basic familiarity with the doctrine and strategies of many Western forces—and probably a better understanding of Soviet forces as well. [REDACTED]

Indigenous Weapons Development Program

For all their weaknesses, China's military industries already represent far more than a zero base for future progress. Despite the disruptions of the Great Leap Forward, the cutoff of Soviet aid, and the Cultural Revolution, China succeeded in developing nuclear weapons, strategic missiles, and a prototype nuclear submarine in the decade before the fall of Lin Biao. The Chinese have added a number of conventional weapons since 1974. For the ground forces, they have deployed a new 130-mm multiple rocket launcher, copies of the AT-3 Sagger antitank guided missile, rocket-scattered antitank mines, tank laser rangefinders and night-vision devices, and limited numbers of the SA-7 low-altitude surface-to-air missile. The Navy has received [REDACTED]

[REDACTED] In late 1978 the Chinese unveiled an air-to-air missile that is now deployed with a number of Air Force units. These achievements suggest that some development and production of new weapons and equipment will take place well before completion of the defense industry reorganization program. [REDACTED]

How the Modernization Program Will Work

The Chinese realize that military modernization requires improvement of both the PLA and the defense industries that support it. China's industry cannot produce modern weapons and equipment in quantity, and the PLA is ill prepared to use and support new armament. The leadership has therefore devised a dual-track program: the track for the forces em-

phasizes military professionalism and better training, and the track for the defense industries stresses methodical reorganization and acquisition of technology. At present the key to military modernization lies in learning how to get more out of current military equipment and industrial plants. China's military capabilities probably will improve significantly sometime after 1985, as the defense industries produce more advanced weaponry and the PLA is increasingly able to use it. [REDACTED]

Professionalism ¹⁰

The first step toward modernizing the PLA was the decision made following Lin Biao's fall in 1971 to remove the Army from civilian matters and direct its attention toward national defense. Professionalism was a major point of disagreement between the Leftists and the group of modernizers around Zhou Enlai. The Leftists saw the PLA as an ideological tool for spreading the correct political line throughout the country. As a result of Cultural Revolution violence, the PLA had assumed a greatly increased responsibility for internal security. Collapse of civil authority in many areas led the PLA into widespread involvement in civil government, factories, railroads, and communes. Under former Defense Minister Lin Biao, many officers were promoted solely on the basis of political credentials or personal loyalty. By the early 1970s, the very concept of "professionalism" was looked upon with suspicion by civilian Party members and career PLA officers alike. [REDACTED]



¹⁰ As applied to China, "professionalism" connotes separation of the forces from local politics, administration, and internal security and the promotion or assignment of individuals on the basis of merit rather than personal or political relationships. [REDACTED]

by an order for the PLA to withdraw from civilian involvement and to reduce political study and propaganda. [REDACTED]

[REDACTED] the PLA continued withdrawing to the barracks and began retiring incompetents or political appointees. [REDACTED]

[REDACTED] Since [REDACTED] 1977 the PLA has yielded virtually all of its former positions in the civil administration and economy and returned to military concerns. The number of Internal Defense units—formed to deal with Red Guard mobs—has been reduced and will continue to decline as the PLA's internal security role declines. The PLA also has adopted higher standards for its personnel and has directed that division, regiment, and battalion commanders be younger and better prepared professionally. The General Staff Department recently announced the following goals in its campaign to seek younger leadership:

Unit	Commander's Age	
	Present	Planned
Platoon	25-26	22
Company	32-33	25-26
Battalion	40+	30+
Regiment	50+	40-45
Division	55+	45+

The drive for professionalism may bring about the reintroduction of military rank in the PLA. A Soviet-style rank system existed in China between 1955 and 1965, but it was abolished on the eve of the Cultural Revolution. Ideological considerations prevented restoration of that system in the early 1970s, but combat experience in the Sino-Vietnamese war has provoked serious study of the issue. Restoration of military rank would reduce dependence upon personal relationships at all levels and would facilitate the transfer of officers. [REDACTED]

Military Training

Though training was not entirely abandoned by the PLA even during the worst part of the Cultural Revolution, it received low priority and was of uneven quality. This resulted partly from Cultural Revolution

exigencies that required PLA units to provide internal security under difficult conditions of factional strife and partly from the policy approach of the Leftists, which stressed political training. Before 1975, most training involved small-unit tactics and basic infantry skills. [REDACTED]

[REDACTED] Each PLA soldier normally spent about four hours per day in military training and another three hours in political and cultural study. [REDACTED]

[REDACTED] Since 1977 the PLA's annual cycle of field training—which begins with individual training and concludes with divisional and joint-service exercises—has become increasingly sophisticated. Major improvements

[REDACTED] The General Staff Department also is conducting [REDACTED] exercises with increasing frequency and intensity in all military regions. Finally, the PLA is spending considerably more time on military training and less on political study. [REDACTED]

Air Force training stresses development of pilot skills and improvement of air tactics. [REDACTED]

" In the ground forces, political training accounts for eight hours per week—about 20 percent of all training—and is limited to readings from Mao's works. In the Air Force, political training now absorbs about 15 percent of the total training time. [REDACTED]

[REDACTED]

The new emphasis upon quality of training is a key aspect of the military modernization program. Competition between units and individuals is now encouraged, with awards for outstanding performance. The military school system, largely shut down during the Cultural Revolution, has been reopened, [REDACTED]

[REDACTED]

Greater attention is also being given to technical education for PLA officers and possibly for selected soldiers. [REDACTED]

Reorganization of Industry and Assimilation of Technology

After several false starts prior to the fall of the Gang of Four, China began in 1977 a program to reorganize industry and to import technology and equipment—an effort intended eventually to broadly transform the defense industry. Reorganization will permit the Chinese to make better use of existing plants and technology and in some cases will prepare the way for absorption of foreign technology. China currently seeks key foreign technologies [REDACTED]

[REDACTED] and it intends to assimilate and improve on foreign technology." [REDACTED]

To justify this important policy shift—bitterly attacked by the Gang of Four—the modernizers extensively quote Mao Zedong, Lenin, and even Karl Marx as favoring the importation of foreign technology. The leadership, however, carefully recognizes and appropriately rewards domestic inventiveness and publicizes [REDACTED]

[REDACTED]

"China's policy was well summarized in the Beijing *Xinhua* of 22 April 1979 by one Zhang Dehua, described as a worker-engineer in the Capital Iron and Steel Works: "We do not import things for the sake of importing. Our purpose is to assimilate the advanced technology and equipment of other countries by importing them. We should not remain satisfied with the ability to use or copy them, though. We should digest, transform, and overtake them." [REDACTED]

instances in which Chinese workers improve upon foreign technology. In this way, the leadership easily represents its policy of importing technology as "making foreign things serve China." [REDACTED]

[REDACTED]

For the present, the main avenue for technology transfer will continue to be the exchange of technical groups and delegations, which will attempt to obtain as much free technology as possible. Licensing arrangements will be few and chiefly in areas of technology that support broad sectors of industry. [REDACTED]

[REDACTED]

Rumors and reports of China's interest in equipment purchases and technology-transfer agreements have excited unwarranted hopes among Western businessmen. The Chinese did sign the \$200 million Spey engine agreement in December 1975 after four years of negotiation. [REDACTED]

[REDACTED]

To date, however, no further contracts have been signed. The Chinese probably will eventually consummate several major weapons technology licensing agreements, but only after exhaustive study and careful preparation. [REDACTED]

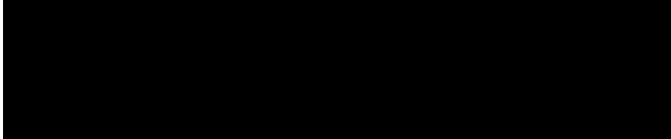
Technology purchases offer the advantages of (1) direct foreign assistance in the form of equipment and prototypes, materials, blueprints, and specialized industrial training, and (2) eventual independence from foreign suppliers. Coproduction arrangements may even provide Western management expertise, on-site technical representatives, and Western design and production technology on a "partnership" basis. The disadvantages, however, include high and sometimes [REDACTED]

prohibitive costs, implicit pressure for political concessions, and—most important—China's lack of trained engineers and technicians to assimilate the new technology.¹⁴ [REDACTED]

Individual pieces of military equipment are obtained as gifts or barter items from friendly foreign governments. In this way China [REDACTED] has acquired over the years US equipment captured in Vietnam, [REDACTED] MIG-23 fighters [REDACTED] and a Soviet T-72 [REDACTED]. China has also obtained examples of the USSR's AT-3 Sagger ATGM, SA-6 Gainful SAM, and SA-7 Grail hand-held SAM. This equipment provides China with cheap access to improved military technology, but thorough exploitation requires extensive and difficult reverse engineering. Such exploitation probably yields valuable data on the characteristics of each weapon but cannot ensure reproduction—especially of higher technology equipment. [REDACTED]

Dispatching technical delegations and study groups and conducting technical "exchanges" are now China's best means of acquiring general military technology. Over 5,000 Chinese have visited Japan, Europe, and the United States since 1977 seeking technology with military applications. [REDACTED]

¹⁴ The Chinese are well aware of the disadvantages of importing manufacturing capabilities without also acquiring design and production technology. The following observation on 2 December 1978 by the leading PRC science-oriented newspaper, *Guangming Ribao*, may reflect Chinese experiences with the Soviets in the 1950s and possibly with the British regarding the Spey transfer: "However, there are many drawbacks to importing complete sets of equipment, not the least being the great expense incurred, and it is not likely to help raise the levels of domestic research and production. Although in this process some technology may be brought in, such technology is mainly confined to data concerning production capabilities and not related to the technological processes essential to manufacture. This is because the vendors alone have access to basic designs and vital aspects of production technology, whereas the buyers have no way to acquire technological and production know-how beyond certain engineering particulars on the manufacture of required components and accessories for replacement purposes. This is an important reason why for a long time China was unable to manufacture sets of equipment identical to those it had imported in the past." [REDACTED]



Though the number of such "exchanges" has declined since its peak in late 1978, large numbers of Chinese military technology specialists and defense industry technicians continue to travel abroad. [REDACTED]

Many Western experts believe that China's only option for achieving industrial modernization lies in purchasing technology or arranging coproduction deals. For some defense industries—notably the aircraft industry—this may indeed be the only recourse, and it probably will require heavy outlays of foreign exchange over a number of years.¹⁵ Other industries, such as those supporting the ground forces, probably need less outside assistance. Plants producing land armaments sometimes need only to resolve specific technical problems related to a particular weapon. The answers often are obtainable at little cost by consulting Western firms or technical personnel and by purchasing limited amounts of equipment or end items. [REDACTED]

Chinese attention has increasingly focused upon a wide variety of "dual-use" technologies as the key to meeting civilian industrial requirements while satisfying military needs. Since 1978 the Chinese have opened most defense industries to civilian production, probably to use excess capacity, gain technical skills, reduce waste, and acquire management expertise. With the "civilianization" of the defense industries, acquisition of technologies with both military and civilian applications has become politically more acceptable than purchase of purely military technology. Examples include heavy trucks and tracked vehicles that may be used in mining or construction but are equally useful as military transport or as tracked weapons carriers. Certain computer and electronics technologies are intended for scientific research or commercial purposes [REDACTED]

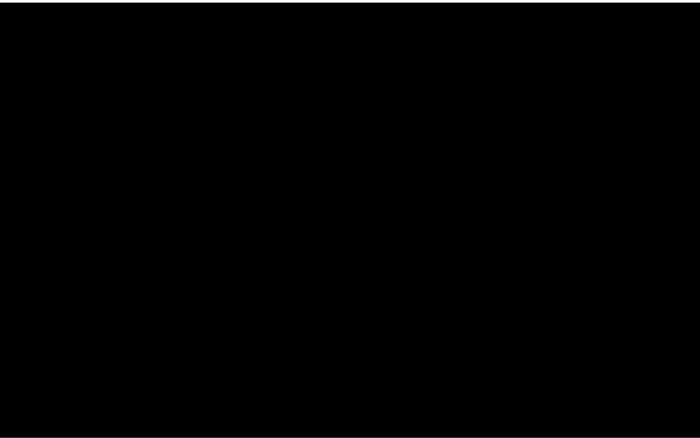


but may enable China to improve radars, sonars, electronic warfare equipment, and military communications. Beijing is purchasing wide-body aircraft for use by the Civil Aviation Administration, but such aircraft can be quickly converted to military transport use. [REDACTED]

The PLA of the Future

Although China's defense modernization is still in an early stage and undoubtedly faces severe tests, the program is off to a good start. Many aspects of the program—such as developing military professionalism—are already bearing fruit, and others—the education of technicians and the acquisition of technical literature—are well under way. If China remains politically stable and systematically assimilates foreign technology, it can achieve and maintain a steady pace of military modernization. For the near term, the PLA will continue to emphasize better classroom instruction and will conduct field training that involves regimental and divisional units and combined arms. Meanwhile, the defense industries will acquire the tools, technicians, and technology needed to provide improved weapons and equipment. After 1985, a combination of improved PLA training and increased defense output probably will begin to accelerate improvements in military capabilities. [REDACTED]

Over the next five years Beijing will emphasize low-cost measures designed to get more out of existing forces and equipment and introduce only a few new weapons into the inventory:



- Commanders will become more familiar with Soviet tactical doctrine and strategy.

- Limited numbers of weapons new to the PLA will enter the inventory— [REDACTED]

Despite notable gains by 1985, the PLA will still suffer from serious material deficiencies resulting from weaknesses in military industry:

- Problems in the aviation industry will continue to hamper improvements in the Air Force, though a few multirole fighters with twin Spey engines may enter the force by 1985.



- Tactical mobility and logistical support will be hampered by shortages of vehicles and by limited capacity for repair and maintenance.



Technology licenses and coproduction arrangements in the electronics and aircraft industries probably will be concluded in the early-to-middle 1980s and begin to help China resolve major problems in military production.

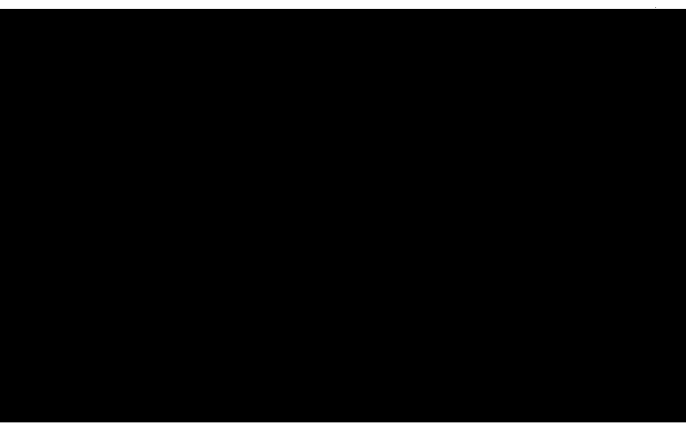


More and better tactical radios and telephones will appear as electronics technology acquired [REDACTED] is used to resolve technical and production problems. Increased heavy truck production—probably using Japanese technical assistance—will begin to improve tactical mobility [REDACTED]

After 1985, marked improvements in force capabilities probably will occur as the defense industries become able to meet PLA requirements for weapons and equipment. Emphasis on antitank and air defense weaponry will continue, and the numbers of these weapons in the PLA inventory will increase substantially. Mobility

will be improved through greater numbers of wheeled vehicles and some tracked armored vehicles. China's inventory of transport aircraft will grow, and resolution of engine problems may permit deployment of greater numbers of fighter aircraft. The Chinese will deploy improved radars and more electronic equipment and provide commanders with reliable tactical radios. An improved logistics system—spawned by likely advances in computer technology—probably will begin appearing by the late 1980s. [REDACTED]

China's defensive capabilities will be significantly improved by 1995 if political stability, economic growth, and scientific and industrial modernization continue unobstructed. Even with steady improvement in forces and defense industries over the next 15 years, however, China will not develop an offensive capability against the USSR, largely because of that country's vastly superior industrial base. With a population that is expected to reach 1.3 billion by 1995, China is unlikely to develop forces based on technology rather than manpower or to abandon its defensive doctrine "People's War Under Modern Conditions," which posits defeat of a technologically superior enemy by overwhelming manpower and vast terrain. [REDACTED]



Appendix A:

Role of Military Trading Companies in Modernization

The Chinese have established a number of trading companies to systematically acquire arms, technology, and military equipment from Europe, Japan, and the United States. The best known firm, the Northern Industrial Corporation, appeared in 1975 and has been followed by at least seven others. [REDACTED]

[REDACTED] Most were originally chartered to study foreign technology and report to the parent ministry, which then would place orders through MACHIMPEX or TECHIMPORT—arms of the Ministry of Foreign Trade (MFT). [REDACTED]

Since mid-1979 the companies have become more aggressive in their pursuit of foreign technology and increasingly independent of the MFT. [REDACTED]

[REDACTED] Military trading companies now are empowered to conduct direct negotiations with foreign firms, offer licensing or coproduction arrangements on behalf of the Chinese Government, and engage in arms sales. [REDACTED]

Northern Industrial Corporation. NORINCO was chartered in 1975 [REDACTED] to study foreign military technology on behalf of the Fifth Ministry (Land Armaments). Over the years the firm has exhibited broad interest in advanced metallurgy, electronics, shipbuilding, aircraft, and land armaments. [REDACTED]

[REDACTED] NORINCO's latest effort has been to offer for sale Chinese-produced tanks, artillery, SAMs, and other weapons to earn foreign exchange for the defense modernization drive. [REDACTED]

Great Wall Industrial Corporation. GWIC was chartered sometime before 1978 and serves as an extension

of the Seventh Ministry (Missiles and Space). Its representatives participated in the negotiations with German and US firms for communications satellites and with the Japanese for launch technology. [REDACTED]

China National Aero-Technology Import and Export Corporation. CATIEC, chartered in 1979, acknowledges the Third Ministry (Aviation) as its parent and has taken charge of several key negotiations with US aircraft and engine manufacturers that had been begun by MACHIMPEX. The firm may conclude coproduction deals for wide-body aircraft, helicopters, and jet engines. [REDACTED]

China Shipbuilding Industrial Corporation. CSIC appeared in 1978 and has held talks with Japanese and European firms regarding modernization of Chinese shipyards. The Corporation is headed by the Minister of the Sixth Ministry (Shipbuilding). [REDACTED]

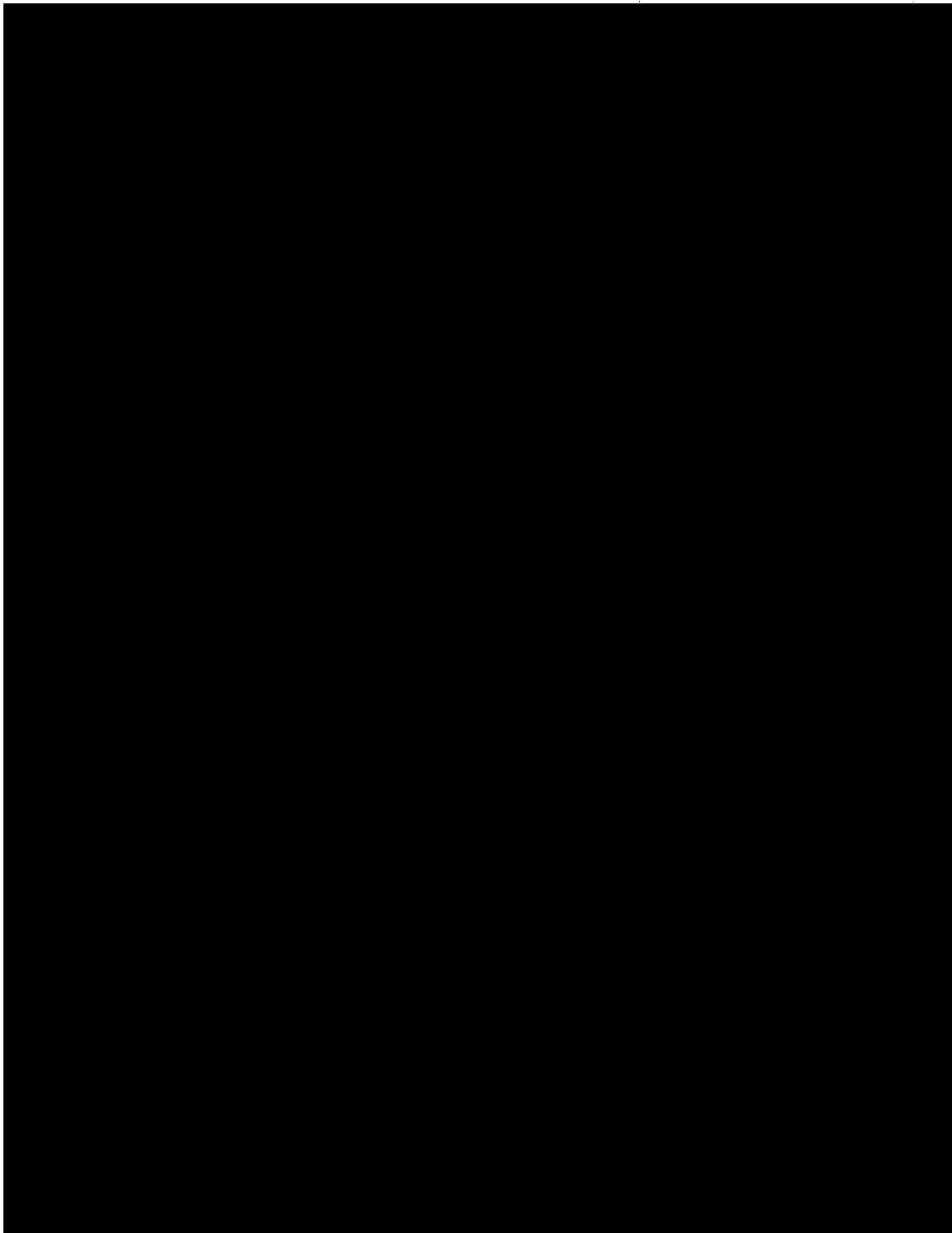
[REDACTED] CSIC representatives have attempted to buy ASW detection equipment and weapons and have studied advanced steel forging technology. [REDACTED]

China Precision Machinery Import and Export Corporation. CPMIEC was chartered in July 1980 for the purpose of studying Western military electronics technology applicable to flight controls. Recent information suggests that CPMIEC is subordinate to the Eighth Ministry, which was formed—or at least publicly announced—in late 1979. According to *Xinhua*, CPMIEC will seek precision navigation instruments for aircraft, spacecraft, and ships, and advanced electronic and optical products. [REDACTED]

Eastern Special Equipment Corporation. ESEC [redacted]
[redacted] has continued some early negotiations begun by NORINCO. Active primarily in Europe, ESEC currently is negotiating for ground forces equipment, mobile bridging, nonmetallic mine detectors, and night-vision devices. [redacted]
[redacted]

China Nuclear Equipment Corporation. CNEC was chartered in 1979 and probably serves as an arm of the Second Ministry (Nuclear). [redacted]
[redacted]

China Electronic Technology Import-Export Corporation. CETIEC appears to be the successor to the China Radio Equipment Corporation. [redacted]
[redacted] It is publicly acknowledged as an extension of the Fourth Ministry (Military Electronics). CETIEC will presumably continue the efforts of its predecessor to acquire electronic component assembly plants from Japan and microelectronics technology from the United States. [redacted]
[redacted]
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