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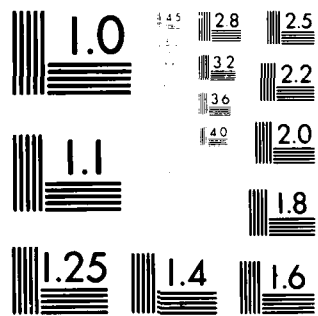
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⑥ **The Chinese Tactical Air Forces
and
Strategic Weapons Program:
Development, Doctrine, and Strategy.**

⑩ Paul H. B. Godwin

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To Colonel Henry L. Baulch, USAF,
whose original questions were the
primary motivation for this monograph

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INTRODUCTION

The armed forces of the People's Republic of China (PRC) emerged from twenty-two years of civil and international war with a complex doctrine of people's war but ill-equipped and organized to fight a contemporary conventional war and, of course, with no doctrine or capability to fight a nuclear war. In less than thirty years, however, the Chinese People's Liberation Army (PLA) has been transformed from a sprawling semi-guerrilla force composed almost entirely of ground troops to a centralized, modernized (within the limits of China's technological and economic capability) combined arms structure that will almost certainly deploy the first ICBM force of any lower developed country. Although a decision was made prior to the Korean conflict to centralize and modernize the PLA, the Korean war was the first major catalyst in the modernization of the armed forces. The first war fought by the PLA outside China's borders brought it into contact with the lethality of a fighting force that was a product of the world's greatest industrial power. The Chinese, with Soviet assistance, moved quickly to modernize their armed forces, and with the termination of the Korean war the pace of modernization may even have quickened. Faced with the threat of "massive retaliation" from the United States and encirclement by United States' sponsored defense treaties, China began to build its defense industries, paying special attention to the development of a combat aircraft industry and a nuclear weapons program.

→ The purpose of this analysis is to present a description and analysis of the growth of the People's Liberation Army Air Force, the Chinese nuclear weapons program and the associated doctrinal and strategic thought. It is designed to bring together the results of considerable research (mostly completed by analysts other than this author) into a single essay to serve the interests of the students attending the various schools associated with the Air University. A second purpose of this essay is to review the current debate over the modernization of the Chinese armed forces within a specific focus on the People's Liberation Army Air Force and the strategic weapons program. This essay, therefore, is a specialized companion piece to my earlier essay, *Doctrine, Strategy, and Ethic: The Modernization of the Chinese People's Liberation Army*, published in 1977. Although this paper is designed to stand alone, some of the basic issues discussed in the 1977 monograph are not reviewed at length here, thus the reader would find it useful to review the earlier essay in order to grasp the relationship between overall problems and the specialized topics analyzed in the following pages.

Finally, I wish to express my gratitude to Lt Col Thomas A. Fabyanic of the USAF Air War College for his assistance in working out many of the problems that emerged as the monograph developed.

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April 1978

THE SOVIET CONNECTION: 1945-1960

As part of the overall modernization program of the Chinese People's Liberation Army (PLA), the People's Liberation Army Air Force (PLAAF) was created in 1949 and its leadership separated from the ground forces. The air force that emerged in the Korean War was almost entirely the creation of the USSR, for although the Chinese had utilized Japanese equipment turned over by the USSR to the PLA in 1945 and had expanded this force by adding captured Kuomintang [Chinese Nationalist] (KMT) crews and equipment in the later stages of the civil war, the reequipment of the PLAAF did not begin in earnest until the Korean War. The emergence of the PLAAF was a function of probably the "most comprehensive technology transfer in modern industrial history."¹ Similarly, the nuclear weapons program emerged from the massive technology transfer that began after Stalin's death in March 1953.

Soviet military assistance programs began in Moscow with the signing of the Treaty of Friendship, Alliance, Mutual Assistance on February 14, 1950, but only with the demoralizing defeat of the Korean People's Army in the fall of 1950 did the USSR begin large-scale defense transfers to China. This assistance was not designed, at least initially, to create an independent defense industry for China, but had the effect of keeping Peking dependent upon Moscow by supplying weapons systems but not production facilities. The

actual intent of the USSR will not be known, because Stalin died in March 1953, the Korean armistice came on July 27, 1953, and the first major technology transfer agreement occurred on September 15, 1953, with the signing in Moscow of the Sino-Soviet Accord for Technical and Scientific Cooperation. Combat had used up equipment at a very high rate (the Chinese lost 2,000 aircraft during the war), and resupply was perhaps more important than a domestic production capability. Nonetheless, with the war terminated and Stalin dead, the USSR agreed to supply China with its own production capabilities. Succeeding agreements in October 1954, April 1956, August 1958, and February 1959 expanded on the original agreement. While both the civil and defense sectors of the economy as well as research and development programs were included, transfer of military technology was a critical aspect of the agreements.

Both conventional and nuclear weapons development programs were included in the accords. Conventional weapons programs consisted primarily of agreements that would permit China to produce Soviet designed weapon systems ranging from pistols through tanks and artillery, to aircraft and submarines. The agreements reached that were to lead ultimately to a Chinese ballistic missile capability were initially designed to create a nuclear research capability in China. An agreement signed in October 1957 was specifically negotiated, according to the Chinese, to transfer nuclear weapons technology to China both through a sample bomb and technical assistance in its² manufacture. Thus the collaboration between China and the USSR

from 1953 until the final break in July-August 1960 appears to have been consciously designed to grant China the capability to produce advanced weapons in both the conventional and nuclear range. The initial defense transfers were conventional weapons, thus we shall first review the creation of the Chinese combat aircraft industry.

The Tactical Air Force

The PLAAF was a primary benefactor of the defense technology transfer. The Soviets rebuilt the production plants of the Japanese Manchu Aircraft Manufacturing Co., in Shenyang and Harbin, factories that had produced combat aircraft in the 1930's and 1940's, but which had been stripped by the USSR in 1945. They reequipped them with the most up-to-date Soviet equipment available for airframe and power plant manufacturing, including metal fabricating and metal forming plants, and component and avionics manufacturing equipment. At the same time, the Soviet Ministry of Aviation Industry provided Chinese industry with production licenses, engineering drawings, assembly tools, and production tooling all designed to enable the Chinese to shift from the assembly of Soviet built components to full production.³ Chinese aircraft production capabilities were complemented in 1956 by the establishment of an Institute of Mechanics within the Chinese Academy of Sciences led by Dr. Ch'ien Hsueh-shen, an MIT aerodynamicist who had left the United States in 1955 after years of harassment.

In 1956 China began assembling the MiG-15 and MiG-17 in the

Shenyang factories with power plants produced entirely in China. By 1958, assembly of the Mil Mi-4 helicopter was begun in Shenyang. These developments were accompanied by agreements in October 1957 and January 1958 for the licensed production of the twin-jet MiG-19,⁴ and in 1959 examples of this aircraft arrived in China.

The aircraft industry was generally shielded from the excesses of the anti-foreign technology campaign that marked the Great Leap Forward (GLF). This was a policy decision, for the last two accords signed by the USSR and China (August 1958 and February 1959) were extremely important in China's development of an independent capability to produce combat aircraft. If anything, the interaction between the aircraft industry and the USSR became even closer during the GLF. The agreements of 1958 and 1959 not only permitted the assembly, and ultimately the production, of the Mi-4 helicopter and the MiG-19, they also provided for massive Soviet assistance in the expansion and dispersal of the aircraft industry into China's interior provinces. The years 1959 and 1960 saw work begin on the creation of two large production complexes in Sian and Chengtu. These two plant facilities were ultimately to produce the Tu-16 medium bomber (Sian) and the MiG-21 (Chengtu). Even later, in 1976, Sian was to become the planned⁵ production center for the Rolls-Royce *Spey* 202 military jet engine.

The Nuclear Weapons Program

The decision to develop an independent nuclear capability was made early in 1956 by Mao Tse-tung, and was to be implemented within

the Twelve Year Science Plan presented to the Eighth Congress of the Communist Party of China (CPC) in September 1956. A September 1977 report by the National Defense Scientific and Technological Commission (NDSTC) states that the twelve-year program placed "emphasis on the rapid development of atomic energy and rocket techniques."⁶ There can be no doubt that the decision to enter into a nuclear weapons and delivery systems development program was in large part a function of technology transfer agreements with the USSR.

Chinese attitudes toward nuclear weapons between 1945 and 1954⁷ were generally disparaging, but in October 1951, an NCNA statement indicated that China was indeed concerned about the need to develop its own nuclear weapons:

Now we understand more clearly that only when we ourselves have the atomic weapon, and are fully prepared, is it possible for the frenzied warmongers to listen to our just and reasonable proposals.⁸

Sino-Soviet cooperation in the development of nuclear research facilities began in 1953, although this agreement was preceded in March 1950 by the formation of the Sino-Soviet Non-Ferrous and Rare Metals Company, which was to collaborate on the location and extraction of radioactive minerals in Sinkiang. In February 1953, a delegation of scientists, led by Ch'ien San-ch'iang, Director of the Institute of Physics of the Chinese Academy of Science, went to the USSR to discuss collaboration in atomic research, and in March 1953 the Soviet Union provided China with an atom smasher and

assisted in the organization of a number of nuclear research laboratories. Thus, when the First Five-Year Plan of 1953-1957 listed the development of peaceful uses of atomic energy as the first of its ten tasks, it is reasonable to assume that the USSR was expected to supply the technology necessary to support this goal. This assumption is supported by Soviet actions and agreements in which the USSR supplied China with technical equipment and material necessary for the research and development of nuclear energy. In August 1954, the Chinese and Soviets reported that they were establishing a joint nuclear research organization to study the military applications of nuclear research. Agreements for scientific and technical cooperation signed in January and April of 1955 provided for the supply to China of isotopes for nuclear research, the construction of a 6,500-kilowatt heavy-water-type atomic reactor in Peking, a 2,500-electron-volt cyclotron and betatrons. In July of that year, the USSR agreed to the construction of atomic reactors at Lanchow and Paot'ou to be completed in 1960. In March 1956, Peking sent scientists to Dubna in the USSR to participate in the Joint Institute of Nuclear Research. In the final year of the First Five-Year Plan, 1957, the Institute of Atomic Energy was established within the Chinese Academy of Sciences, and in September of 1957 the Academy recommended the creation of a Northwest Center for Scientific Research at Lanchow, where the first nuclear bomb was to be constructed. It was then that the Chinese say the Soviets agreed to supply them with a sample bomb and technical assistance in the

manufacture of nuclear bombs. In December of 1957, the Academies of Science of both countries signed agreements for the construction of additional nuclear reactors in Chungking, Shenyang, Sian, and Peking.⁹

It is clear that collaboration between China and the USSR for both the peaceful and military uses of nuclear energy was extensive, and that by June 1959, when the Chinese claim that the USSR unilaterally abrogated their agreement to assist in the construction of nuclear weapons, the Chinese were well on their way to the establishment of a nuclear R & D program capable of independent growth.

Military Research and Development

The structure of the Chinese R & D management is only vaguely¹⁰ known, and the military sector is even less understood. In part, much of the confusion over the structure and management of scientific research in China is a function of the fairly frequent reorganizations that have occurred over time. The development of a specialized management structure for national defense R & D may have begun as early as 1958 when the Scientific Planning Commission and the State Technological Commission were combined to form the Scientific and Technological Commission (STC). The director of the STC until his dismissal in 1967-68 was Marshal Nieh Jung-chen, one of China's more prominent soldiers. It is his appointment as Director that has led some to believe that the National Defense Scientific and Technological Commission (NDSTC) was established in 1958. It does

appear, however, that the NDSTC may not have been established until 1965-66. However, the Military Science Academy was established in 1958 to direct all military R & D.¹¹ Given Nieh's military profession and prestige, it is quite plausible that one of his major functions was to coordinate military and civil research and development programs.¹² The establishment of the National Defense Scientific and Technological Commission in 1965-66¹³ appears to have formalized the separation of civil and military R & D, and Marshal Nieh Jung-chen was appointed Chairman of the new NDSTC while he retained his chairmanship of the State Technological Commission. Nieh's positions in the supervision of China's R & D structure were complemented by a vice-chairmanship in the party's military policy committee, the Military Commission (MC), in 1961, and his appointment to the Politburo in 1966 (Nieh was dismissed from the Politburo in 1969 and reappointed once again in 1977).

The nuclear research program, then, came under the general control of the Scientific and Technological Commission until 1965-66, when, presumably, it came under the sphere of control of the National Defense Scientific and Technological Commission. The main research institutions involved are the Atomic Energy Institute and the Weapons Department of the University of Science and Technology.¹⁴ Responsibility for delivery systems research, especially missiles, appears to include the Institute of Upper Atmosphere Physics in Wuhan, the Institute of Automation and Remote Control in Peking, and the Institute of Mechanics and Electronics, also located in

Peking. These three institutions were established in 1959 to intensify the research in the rocket program. Evidence that the Chinese were expanding their scientific and technical manpower base in this field was indicated by the establishment in 1963 of the China Aeronautical Engineering Society.

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The Impact of Soviet Withdrawal

The abrupt, but not entirely unexpected, withdrawal of Soviet assistance in July and August of 1960 hit both the aeronautical and nuclear weapons program especially hard. Even though the USSR unilaterally cancelled its agreement to assist China in the construction of a nuclear bomb in 1959, collaboration in nuclear research had continued. In the aeronautical industries, Sino-Soviet cooperation had become even more intense during the Great Leap Forward (GLF), contrary to most other Soviet assisted programs, because the industry was involved in an ambitious expansion program that could be begun and successfully completed on schedule only with Soviet assistance. By 1960, the Chinese had just begun to master series production of the MiG-17 and its Klimov centrifugal flow turbo-jet power plant. Soviet designed industrial centers were underway at Chengtu and Sian which were critical if Peking was to expand its combat aircraft manufacturing capability. Equally important, domestic assembly of the MiG-19 from Soviet parts was underway, and the Chinese were just beginning to learn the production techniques necessary for its Klimov axial flow RD-9B engines. Equally critical to the

development of the PLAAF was the Tu-16 bomber, and in early 1960 the USSR had supplied two examples of this aircraft with its 21,000 lbs. thrust Mikulin RD-3M engines. Soviet withdrawal in 1960 was a major disaster for the Chinese air force,¹⁶ for it had relied upon Soviet assistance for the development of a complex of industries related to strategic and tactical airpower to maintain its capability at a level compatible with that of its major adversary--the United States Air Force.

It cannot be determined whether or not resource allocation to the air force was the product of a particular PLAAF lobby in the Chinese military establishment, or among the civil leadership and the industries involved, or in any particular combination of such factors. In 1958, however, Liu Ya-lou, the Commander of the PLAAF from 1949 until his death in 1965, defined the conflict that emerged in China over the Soviet assisted force modernization program in a manner that may indicate that the air force was participating in a general program and not one in which the PLAAF gained any particular advantage over the other branches of the armed forces:

Upon the founding of the People's Republic of China, the Chinese People's Liberation Army was confronted with a new historical task: not only to develop rapidly the infantry into a multi-arm army but also to build a powerful air-force and navy. The new objective situation presented us with this question: what are the direction and principle for building these new modernized arms. Meanwhile, it also gives rise to a question of how to study the advanced experience of the Soviet Union: the following question also arose: how to deal with the rich experience and glorious tradition of our army, whether to adhere to the principles of the class line, mass line, military democracy, unity of army and people and unity of officers and

men, whether the system of party committees is applicable to the modernized army and whether political work is important or not. In essence it is a question of how to apply Mao Tse-tung's military thinking to the process of building a modernized army.¹⁷

With the withdrawal of Soviet assistance, the fortunes of the air force began to decline as a result of the severe economic crisis that impacted China in the years 1960 to 1963. Resource allocation became critical, and the prior decision to give priority to an independent strategic weapons program, also a function of the Sino-Soviet dispute, had a major impact on the tactical air forces of the PLAAF.¹⁸ In fact, it is my judgement that the strategic weapons program should not be viewed as an air force related program, as it is in the United States (recognizing, of course, the navy's SLBM program), but as a program independent of, and therefore competing with, the PLAAF for resource allocation. The 2nd Artillery Corps, which commands the Chinese missile force, is a branch of the PLA independent of the PLAAF headquarters in the same manner as the Strategic Rocket Forces in the USSR.

SELF-RELIANCE: 1960-1970

The allocation of resources within the PLA after Soviet withdrawal remained the same as in previous years, with the lion's share going to nuclear weaponry--both warheads and launchers--to the neglect of the general purpose forces. While Soviet assistance had been in force, the PLAAF had gained from the expansion of the aviation and electronics industries and the USSR's willingness to assist China in the production of combat aircraft. Without Soviet assistance, the PLAAF suffered from the primary allocation to strategic weapons systems. Between 1961 and 1964, the air force declined in operational strength, aviation fuel was in short supply with the resultant drastic drop in pilot training sorties, and operational aircraft had to be cannibalized for parts. Even though withdrawal of Soviet assistance supplies a partial explanation, it should have been possible to resume MiG-17 production by 1962, but output did not begin again until 1964. Further complicating the analytical problem is the fact that although Soviet assistance was withdrawn for production facilities, the USSR continued to supply some critical spare parts and materials to permit normal overhaul and replacement of the equipment it had supplied to China. Further, in 1962, the USSR supplied China with around thirty MiG-21f (NATO designation "Fishbed C") day fighters with their Tumanskii R-37 after-burner power plants. If lack of materials necessary to produce the power

plants is presented as an explanation, this is not fully satisfactory, for Sweden, which is not a member of COCOM, did supply Peking with specialized alloys necessary for turbine engine production.¹⁹

The poor performance of the aircraft industry is in stark contrast to the development of plants related to the nuclear weapons program. In 1961-62, the Chinese established a 25 million electron volt cyclotron in Peking, a small research reactor in Shanghai, a 600 megawatt plutonium production reactor in Yumen, and a gaseous diffusion plant in Lanchow. The apparent poverty of the air force in comparison to the growth of programs related to nuclear research indicates that a deliberate policy choice was made to concentrate resources on the creation of the S&T and production facilities necessary for the development of nuclear weapons and their ballistic missile delivery systems, and to neglect the general purpose forces.²⁰ Such a decision would have considerable impact on the technology-heavy PLAAF, but it appears likely that China had neither the resources nor desire to continue to develop two sets of weapons systems which were individually a heavy drain on its scientific, technological, and financial resources during an economic slump of considerable proportion. Assuming that the PLAAF would be unwilling to accept the reduction of its force capability willingly, it appears that the air force lost in competition with the strategic weapons program and the needs of the civil sector of the economy.

Although the nuclear weapons program was dealt a severe blow

in 1959 when the USSR refused to honor its commitment to assist China in the development of a nuclear bomb, all the evidence indicates that China had committed itself to the creation of an independent nuclear capability some years earlier. China continued on the course initially set in collaboration with the USSR, and it is reported that early in 1960 a laboratory had been completed to test nuclear explosions. Sometime in 1962, all the prominent physicists in China were brought together under the direction of Ch'ien Hsueh-shen²¹ and sent to northwest China, presumably to develop a nuclear bomb, and on October 16, 1964, China detonated its first nuclear device-- a 20KT implosion device tower mounted in Lop Nor, Sinkiang.

The Vietnam Crisis and the PLAAF

In November-December 1965, Marshal Lo Jui-ching, Chief of Staff of the PLA and Secretary General of the party's Military Commission was relieved of all his military and party positions. His purge was in large part a function of an internal debate over the appropriate strategy to pursue in view of what was seen by some members²² of the Chinese High Command as an increasing US threat to China. The difficulty in analyzing this strategic debate is a function not only of the linkage of non-military domestic issues to the various military options available to China, but also by the fact that US escalation in Indochina coincided with the rise of domestic political issues that led ultimately to the Cultural Revolution. Since, in spite of considerable fascinating exposition, the strategic options

perceived and debated within China remain obscure, it is useful²³
to review China's overt military behavior in the years 1964-1966.

As Allen S. Whiting has observed, "This will not identify which
alternatives were rejected, much less for what reasons, but it
does indicate within relatively fixed parameters of operational
requirements what policies were adopted with their attendant commit-
ments and constraints."²⁴

On August 5, 1964, President Johnson authorized air strikes on
six Democratic Republic of Vietnam (DRV) naval facilities. This
action was taken in response to a purported second attack by the
DRV on US naval vessels in the Gulf of Tonkin--the first having²⁵
taken place on 2 August. China responded with a series of speeches,
editorials, and mass rallies in an attempt to convince US authorities
of the seriousness with which Peking viewed such an escalation of
the war. Peking also undertook a series of military actions. On
August 10, the United States reported that China had supplied the
DRV with MiG-15 and MiG-17 fighters--an action anticipated because
of the preparations undertaken which included the lengthening of
runways on airfields in the vicinity of Hanoi. The delivery of
these aircraft was accompanied by the training of DRV pilots in
China.

These actions were supported by the reinforcement of Chinese
air defense capabilities in an area approximately 300 miles north
of the Sino-Vietnamese border. Peking increased the number of

combat aircraft in the area, including concentrating the few Mig-19's available to the PLAAF, and began the construction of three new airfields immediately above Indochina. The Mig-19 redeployment was particularly noteworthy because previously they had been rotated only between east and northeast China,²⁶ and their relocation was clearly an attempt to bring China's most potent fighter close to Vietnam. The three new airfields under construction were also significant.

Only one of the airfields appeared to be designed to cover a possible attack route entering China; the other two appeared to be located to assist the DRV air force and to permit base facilities for air action over the northern part of Vietnam. In October 1964, an airfield was discovered at Ning-ming, only twelve miles from Ping-hsiang railroad junction where supplies were shipped across the Sino-Vietnamese border. The second airfield was located approximately one hundred miles west of Ning-ming at Pei-tun Yunnani, directly adjacent to a pre-existing facility. This factor seemed to indicate that it would, or could, be used by the DRV air force as a safe haven against American fighters which would observe, in Peking's judgement at that time, Chinese sanctuaries as they had²⁷ during the Korean War.

Construction of air bases and the training of Vietnamese pilots was complemented in January 1965 by joint air exercises in an area extending some twelve miles into the northern part of Vietnam. These exercises suggested that the PLAAF and DRV air forces were contemplating

joint action in the air defense of the Hanoi-Haiphong complex,
the Red River Delta, and the defense of supply routes from China.²⁸
This possibility was reinforced later by the redesign of DRV grid
patterns to coincide with the Chinese grid. An agreement on grids
would permit the coordination of air defense radars and contribute
substantially to a joint air defense capability.²⁹

Chinese ground force deployment to the northern part of the DRV
in September-December 1965 supported previous indicators of a Sino-
Vietnamese coordinated air defense capability. Approximately 35,000
PLA personnel crossed the border, and by the early spring of 1966
this number had expanded to 50,000. The troops were primarily
engineering and railroad construction units, but they included two
AAA divisions. These forces, primarily concerned with the maintenance
and protection of supply routes from China, were also involved in
the construction of a large Chinese military facility at Yen Bai,
approximately one hundred miles northwest of Hanoi. This base
complex grew to more than two hundred buildings and a long runway
protected by Chinese AAA units.³⁰

All of these air defense, logistic, and support facility prepara-
tions were in distinct contrast to the lack of preparation prior
to the Chinese forces crossing the Yalu River in 1950. In the
years 1964-1966, the Chinese were building roads, strengthening
bridges, constructing support facilities, and making preparations
for a coordinated air defense effort. As Whiting states, these

actions were taken overtly and appeared to form, at least in part, a pattern of deterrence behavior designed to communicate to the United States a military commitment that supported the warning behavior signalled in the press, radio broadcasts, and mass rallies that coincided with the military preparations. But, this behavior also coincided with increased activity in the production of Chinese combat aircraft.

As US behavior in the Vietnam war grew more threatening, a series of events took place in the aviation industry which significantly improved China's capability to produce combat aircraft--a capability that had stagnated since the withdrawal of Soviet assistance. Early in 1964 a new Ministry of Machine Building (MMB), the 7th, was created to conduct the planning, management, and production of aircraft. The new MMB was under the direction of Wang Ping-chang, the then Deputy Commander of the PLAAF.³¹

In the same year, MiG-19 production resumed in the Shenyang complex, but in contrast to prior models, those produced in 1964 and after were of wholly Chinese manufacture and were given the designation "F-6." Serious efforts to back-engineer the Tu-16 also began in 1964 from the two samples provided to China in 1960. They can only be classified as *samples* because, as with the MiG-21's delivered in 1962, they were supplied without blueprints, tooling or co-production licenses.³² Back-engineering of the MiG-21 also began in 1964. The power plants of both these aircraft are complex,

making it an extremely difficult task to create a production capability without tooling and production plans supplied by the original manufacturer, and this almost certainly explains why pre-production proto-types of the Tu-16 did not appear until 1967, and trial production of the MiG-21³³ did not begin until 1966. The efforts to back-engineer the Tu-16 may have been influenced by the anticipated first test of a nuclear device in October 1964; thus this bomber may reflect the strategic weapons program rather than the air superiority and close air support concerns of the tactical air force that are clearly involved in the efforts to produce the MiG-19 and MiG-21.

There are obviously two possible explanations for the efforts to up-grade China's combat aircraft production capability in 1964-65. One is that the efforts observed were simply the overt signs of a long-range policy decision made when the USSR terminated its assistance in 1960, or that production plans were set back and could not be resumed until the middle 1960's. This latter argument, however, is somewhat weakened by the fact that although F-6 production began again in 1964, back-engineering of the Tu-16 and the MiG-21 was also delayed until 1964, with trial production runs still some years into the future. It was certainly possible to begin back-engineering long before 1964 in preparation for much earlier series production. The Tu-16's were provided in 1960 and the MiG-21's in 1962. Further indication that priorities set in 1960 were what effected aircraft production rather than simple inability or shortage

of personnel is the fact that work on engineering the Chinese variant of the MiG-19 known as the F-9 probably did not begin until 1964, for it went into series production in 1969 at about the same time as the MiG-21. Thus there is some reason to believe that the air force benefited from the Vietnam crisis through an increase in resource allocation to the design and production of combat aircraft. The strategic debate over the appropriate response to the American threat supplies little additional information.

The Strategic Debate of 1965

The escalation of United States military involvement in Indochina, especially the increasing use of air power in 1964-1965 raised a basic issue within the Chinese High Command: Was the threat to Chinese security interests from the United States increasing, and were Chinese preparations for a US incursion into the DRV or even strikes in China adequate? This "strategic debate" has been adequately analyzed elsewhere,³⁴ so it is unnecessary to do more than sketch the issues in this analysis. The leading figure advocating the necessity of improving China's defense posture in the face of what he saw as an increasing threat from the United States was Marshal Lo Jui-ch'ing, Chief of Staff of the PLA and Secretary General of the Military Commission of the Central Committee. In opposition was Marshal Lin Piao and his supporters, who evidently believed that China's defenses were adequate.

The debate between Lo and Lin was one of emphasis rather than

complete disagreement. Both agreed that the threat was controllable without the introduction of ground combat forces into Vietnam. Both also apparently agreed that it was unnecessary to substantially increase the amount of material assistance the DRV was receiving from China. Lin, however, insisted that the then current defense posture with its emphasis on protracted war was sufficient to deter the United States, believing the Americans to be unwilling to get bogged down in a long, drawn out war with China. Lo, it appears, was concerned about a much wider range of options available to the United States than was Lin.

Lo was concerned about possible US air strikes on Chinese installations in south China that functioned in part to support the DRV's warfighting capabilities. He also sought to preposition Chinese forces and equipment to deter the United States from any possible limited incursion. Lo's strategic interpretation of China's defensive doctrine was somewhat different from Lin's, for whereas Lin was advocating the classic Maoist strategy of people's war and "luring the enemy deep," Lo was evidently contemplating a heavier reliance on the Main Forces and their ability to defend critical cities and defensive positions, and their capability to move into a counter-³⁵offensive. It may have been Lo's belief that Lin's strategy called for an indefinite retreat into China's interior--a strategic withdrawal that would be costly and could possibly be avoided by the prepositioning of ground forces and a strong air defense and ground attack

capability. Not that Lo intended to fight from a fixed line of defense, but that he wished to reduce the amount of territory to be initially surrendered in a strategy of active defense. For such a force deployment to be successful, a reallocation of resources within the military budget may have been required in order to support the defense preparations. Not wishing to expand the allocation to the armed forces, the strategic weapons program may have been required to pay the cost if Peking had selected such an option.

There is some inconclusive evidence that such a reallocation may have occurred even prior to the purge of Marshal Lo. Unfortunately, the time frame for the shift corresponds with the events leading up to the Cultural Revolution and the Cultural Revolution itself, so no definite conclusions can be drawn. The nuclear testing program dropped from three tests in 1966, which included the test-firing of an SS-4 with a 20-30KT warhead, two tests in 1967, to only one test in 1968.³⁶ The reduction in the number of tests could well have been a function of Cultural Revolution disruptions, so resource allocation may not have been the cause. Disruptions did occur in the aircraft industry, and there were fairly frequent reports of political turmoil in the 7th MMB.³⁷ But, series production of the MiG-19, its Chinese variant the F-9, and the MiG-21 all began in 1969, while series production of the Tu-16 began in 1967. The evidence is inconclusive, yet it appears reasonable to assume that the decline in the combat effectiveness of the PLAAF was reversed

in 1964-65 when the threat to Chinese security interests from the United States was perceived to be increasing, with consensus on³⁸ the threat established by September 1965.

THE EMERGENCE OF A NUCLEAR WEAPONS DOCTRINE:
1945-1977

Analysis of China's basic military doctrine for the development and use of nuclear weapons is complicated. Development of the weapon systems began when the primary threat to China was the United States with its much publicized doctrine of massive retaliation, but the threat shifted to the USSR as China began to deploy its nuclear weapons. Thus a technology developed initially to counter a threat from an enemy whose home territory was some 7,000 miles away had to be shifted to counter an adversary whose forces were directly on China's border. In one sense, the shift of adversaries may not have caused Chinese planners too much difficulty in adjustment. The alliance structure established by the United States brought US-forward-deployed forces to the edge of China, thus the initial developmental model would be required to counter this immediate threat. Logically, the primary impact of the shift in adversaries would have been on the development of ICBM technology, required to directly threaten the territory of the United States but not so immediately necessary to threaten the USSR. Thus the technology necessary to deter the USSR was less demanding than that required to deter the United States.

Doctrine Emerges

Because China had no nuclear weapons of its own and was dependent

upon the USSR for its defense against the US threat of massive retaliation, announced by Secretary of State John Foster Dulles in 1954, any public discussions of nuclear doctrine and strategy were tied to Soviet concepts. The USSR, however, was going through its own doctrinal debate. With the death of Stalin in 1953, Malenkov advocated a doctrine of essentially "pure" deterrence in which he argued that the mere possession of nuclear weapons was sufficient to deter an American attack. Other members of the Soviet leadership, most notably Nikita Khrushchev, contended that total reliance on nuclear weapons was an error; that it was not true that nuclear war would mean the end of civilization. Toward the end of 1954, the debate was clearly moving in favor of Khrushchev when the USSR declared publicly that a nuclear war would not mean the end of civilization, but would result in the destruction of capitalism and the survival of communism. China's position was pegged to that of the USSR, therefore it was unlikely that Peking would enunciate a doctrine prior to an understanding within Moscow on what Soviet doctrine should be.

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By the summer of 1955, it became evident that China had reassessed its past position and that an internal debate was underway on the significance of nuclear warfare. Sudden attack, an issue aired earlier, was being discussed within the context of a nuclear strike. It was agreed that nuclear weaponry had raised a new problem for military thought and analysis. Marshal Yeh Chien-ying in a speech delivered

in July 1955 to the First National People's Congress referred specifically to the growing capabilities of the United States Air Force and, by implication, to the integration of battlefield nuclear weapons into US ground forces. Earlier, in 1954, Peking had raised the spectre of US base agreements and alliances resulting in an encirclement of China and the USSR by a global US Air Force. The inclusion of an indirect reference to tactical nuclear weapons being placed in the US ground force inventory raised the spectre of a nuclear war against China that would be both strategic and tactical.⁴⁰

The first public discussion of the implication of nuclear weapons for warfare came at a time when the intensive modernization of the Chinese armed forces was underway under the direction of the USSR, and when the first collaboration with the USSR on a Chinese nuclear R & D capability was beginning. It was evident that China was becoming more and more dependent upon the USSR both for its emerging defense industry and its nuclear program. The modernization of the Chinese armed forces was creating both doctrinal and economic problems for the Chinese leadership, and the role of the USSR in China's military and economic systems was becoming increasingly controversial. Then, in August 1957, the USSR tested an ICBM. By the end of 1957 and in early 1958, the Chinese were publicly analyzing the Soviet breakthrough. The Chinese argument, in essence, was that Soviet ballistic missiles had nullified Strategic Air Command (SAC) and US-forward-positions by making them vulnerable to Soviet nuclear strikes.⁴¹

Within the Chinese debate, however, it became evident that two further questions were being asked: Was the Soviet Union willing and able to deter the United States from attacking China, and was the USSR willing and able to deter the United States' use of nuclear weapons in response to aggressive Chinese military action that directly impinged on what the United States would interpret as its interests in the Western Pacific.⁴² These questions were of direct importance to Peking, for in 1955, when the Chinese had probed the off-shore islands retained by the Chinese Nationalists after their retreat from the mainland in 1949, the United States had threatened to use tactical nuclear weapons in their defense, and the Chinese had backed away.

Khrushchev's visit to Peking between July 31 and August 3, 1958, becomes an interesting problem when viewed in this context, for the shelling of Quemoy on August 23 announced the beginning of the Second Taiwan Strait crisis. Khrushchev's talks with the Chinese leaders were probably designed to alleviate Chinese concern over the USSR's failure to prevent US and British intervention in the Middle East crisis of that summer. But, assuming the Chinese discussed with Khrushchev their objectives toward the off-shore islands, it is likely that he recommended caution. In any event, once it became evident that the United States would support the Republic of China in the defense of the islands, Chou En-lai indicated that Peking was willing to enter into ambassadorial-level discussions

with the United States. It was not until the Chinese clearly signalled their intention to limit the level of military commitments in the Straits that the USSR made an unambiguous deterrent threat to the United States in Khrushchev's letter to Eisenhower in which he stated that an attack on China would be viewed as an attack on the USSR. On October 5, Khrushchev reiterated his previous position in an interview with a TASS reporter, and on October 6, Marshal P'eng Teh-huai, China's Minister of National Defense, offered to negotiate a peaceful settlement with the Republic of China and announced that the People's Republic would suspend the bombardment⁴³ of Quemoy for one week.

China had deliberately kept the military confrontation to a low level, thereby avoiding the risk of a strong US response, but had gleaned two messages from the crisis. One was that the USSR could be relied upon to deter the US from an unprovoked attack on the mainland, but that it could not be used as a nuclear shield for the expansion of the People's Republic of China from within its current political borders if the expansion involved a conflict with the United States. China became aware, therefore, if it had not been prior to this time, that as long as Peking relied upon the Soviet nuclear umbrella, then the USSR could limit Chinese actions⁴⁴ to those which suited Soviet goals and objectives. Such a condition of reliance would be a strong basis for arguing that China needed its own independent nuclear force.

Chinese awareness of the outer limit of the Soviet Union's commitment was heightened by the conclusion of the Second Taiwan Crisis. According to the Chinese, though, there were even further problems emerging from their defense relationship with the USSR. The Chinese have stated that in 1958 the USSR "put forward unreasonable demands to bring China under military control." ⁴⁵ It appears that the USSR was demanding that Chinese nuclear weapons, to be built with Soviet assistance, were to be placed within a dual Sino-Soviet control system. Chinese refusal to accommodate Soviet demands, and their criticism of Khrushchev's "peaceful coexistence" policy toward the United States, when combined with Soviet uncertainty over Peking's future courses of action toward the Republic of China, which was now clearly under the protective umbrella of the United States, led to the USSR's unilateral abrogation on June 20, 1959 of the October 15, 1957 agreement to supply China with a nuclear bomb and technical assistance in the production of nuclear weapons. The Chinese leadership, even if it had not decided to do so prior to this date, was forced to develop its nuclear weapons program without direct Soviet assistance. Indirect assistance, however, continued as Chinese scientists remained at the nuclear research facility in Dubna, and in fact remained there until 1965--some five years after the break of August 1960. The 1959 abrogation of the weapons agreement evidently came after the USSR had shipped rockets to China, for on June 23, 1959, Khrushchev allegedly told Averill Harriman that the USSR had already shipped a number of rockets to the People's Republic. Thus, by August 1960, when the

USSR severed its economic and technical assistance programs, China had established the essential infrastructure of a nuclear weapons program, including samples of Soviet rocketry upon which to base its own missile delivery system development.

Once the break with the USSR had occurred, Chinese analysis of the impact of nuclear weapons on warfare had to face the assumption that Peking could not be confident of Soviet support in a conflict with the United States. The only major source of Chinese doctrinal thought in 1960-1961 are the twenty-nine issues of the secret military journal *Kung-tso T'ung-hsun* (*Bulletin of Activities--henceforth Bulletin*) published during the period January 1 through August 26, 1961, and released by the United States Department of State on August 5, 1963. The *Bulletin* was published by the General Political Department of the PLA and issued to party cadres at the regimental level and above. It served to send the instructions of the Military Commission to ranking cadres in the field. This document, classified "secret" by the Chinese, contains a few appraisals of the impact of nuclear weapons on warfare and some analysis of the Chinese armed forces' doctrine and strategy when faced with nuclear weapons.

In 1960-61, China was concerned about two levels of nuclear warfare, a sudden strategic attack followed by a conventional ground assault, and a conventional assault in which nuclear weapons were used on the battlefield. The perception of the Chinese High Command, as expressed in the *Bulletin*, was that surprise, or sudden, nuclear attack was likely, but that the adversary could not succeed in

victory without launching a conventional ground attack. Further, that the effect of tactical nuclear weapons used on the battlefield could be significantly reduced if the ground forces utilized night attacks and close combat. The overriding impression left by the discussions in the *Bulletin* is that China appreciated the devastation that would result from a strategic nuclear strike; that ICBMS would form a major part of the offensive force; and that the problem was how to survive in order to defeat the conventional/tactical nuclear battle that would follow the strategic strike. Further, that China, while developing its own nuclear weapons, must see to it that the Military Science Academy develop the doctrinal and strategic principles for using nuclear weapons in the future. The only hint of an offensive doctrine is found in the statement that the armed forces must "utilize skillfully the effect of an atomic surprise attack, . . ."

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In the latter part of 1961, Marshal Yeh Chien-ying addressed a meeting on military training held by the Military Commission in which he discussed the future role of nuclear weapons. In making his presentation, Yeh indicated that he was familiar with the debate in the United States over the proper balance between nuclear forces and conventional forces. He observed: "At present, some foreign military theoreticians, including, some American military theoreticians, maintain that in future war the final solution will still lie in conventional weapons." Yeh may well have been referring to Maxwell Taylor's *The Uncertain Trumpet*, first published in 1959, in which he argued that the doctrine and force structure of the United

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States was wedded to the uncertain doctrine of massive retaliation, and that the basic military doctrine of the United States should be changed to one of deterrence and a "flexible response" with the required concomitant increase in the capability of the general purpose forces.⁴⁸ No doubt, the judgements of Marshal Yeh also reflected Mao's views on "man over weapons," for he presents the case that China has a vast territory with varied terrain, and thus even after a strategic strike has destroyed China's political and economic centers, to conquer China requires the defeat of its armies. But he also observed that China will develop its own nuclear weapons in the future, and that even though of necessity the army must fight with the weapons it has on hand, the future PLA will have nuclear weapons⁴⁹ to fight the enemy.

Since 1964, however, when China tested its first nuclear device, Chinese discussions of the use of nuclear weapons have been cautious, emphasizing their defensive purpose and pledging "no first use." Unfortunately, there have been no systematic and definitive statements of Chinese doctrine and strategy for nuclear weapons, therefore all judgements have to be inferential. Public statements lead to the conclusion that China is concerned primarily with deterrence and only secondarily with warfighting capabilities. Nonetheless China's nuclear capability emerged within a series of national security crises. First the 1964-66 United States escalation in Vietnam, then the build-up of Soviet forces along the Sino-Soviet border, culminating in the border flareup with the USSR in the spring and summer of

1969. During this time, China's public perception of its major national security threat shifted from the United States to the USSR.

Chinese attitudes toward nuclear weapons were influenced by
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three major sets of constraints: 1) Recognition that the US and the USSR were superior in both their conventional and nuclear weaponry; 2) recognition that if a major change in Chinese foreign policy occurred that could be directly linked to a nuclear weapons capability, then the perceptions of China by Peking's neighboring states would be affected; and 3) recognition that such a weapons-linked change could significantly affect the perceptions of both the communist and nonaligned nations on China's periphery. China's statements about nuclear weapons once China had a nuclear capability were, therefore, constrained by a need to avoid raising the hostility of the US, of the USSR, and to reduce the possibility that neighboring states would become more fearful of China because of Peking's emergence as a military nuclear power.

During the initial period of development and deployment (1964-1969) there is no evidence that China believed itself to be gaining any further security from its nuclear weapons. With the American escalation in Vietnam, the emerging theme from China was that the United States was shifting its emphasis from Europe to Asia. From 1967 to 1969, as the Soviet build-up along the Sino-Soviet frontier escalated, there emerged an additional theme of Soviet-American "collusion" against China. After 1969 this theme persisted, but
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greater emphasis was placed upon the growing threat from the USSR.

During these periods when the Chinese demonstrated a public fear of imminent war, they stressed the threat of "sudden" or "surprise" attack; publicized the need to prepare for war; and in 1969 began a program of civil defense that continues today, but at no time did they threaten to use nuclear weapons. Nonetheless, the discussions in the *Bulletin* of 1961 indicate a clear awareness that nuclear weapons do have a significant impact on warfare, and that even before the first Chinese test in 1964 the military hierarchy was concerned with, and analyzing the problems of, fighting a war in which nuclear weapons were used. The constraints listed above primarily influenced China's public statements, not its internal evaluations and doctrinal developments. Such doctrinal and associated strategic and tactical planning would be hastened both by the deployment of China's own MRBM's in 1967-1970 and the introduction of tactical nuclear weapons into the Soviet order of battle in Central Asia and the Soviet Far East no later than 1971-1972.

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Current Doctrine

The current constraints upon Chinese doctrinal thought are evident. Peking's primary threat is from the USSR. The USSR is vastly superior to China in both conventional and nuclear weapons, and there is almost no possibility that China will be able to match the capabilities of the USSR within the next twenty years, if ever in nuclear weapons. The technological gap is too wide, and the cost of closing this gap would be prohibitive, even if China did choose to reverse its current

priorities and place primary emphasis on upgrading its weapons systems.

There is no evidence that since 1961 China has ever sought to *match*
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the weapons of the superpowers. China has consistently sought to deter a sudden attack upon China, hence its doctrine had been one of deterrence even prior to the development of nuclear weapons, and there is no evidence that this basic military doctrine has been changed. The threat of a people's war was the basic strategy for deterrence prior to the development of nuclear weapons. The question to be asked, then, is what is the strategy once nuclear weapons have been deployed?

The difficulty the Chinese faced, and will continue to face, is that China's adversaries are both numerically and technically superior in nuclear weapons. If an adversary should launch a massive strategic strike, it is reasonable to assume that China would respond with whatever weapons systems were left. But, if an adversary chose to use a limited nuclear option striking only selected targets and leaving most potential targets untouched, China would face a difficult dilemma. Peking would not have the escalatory capability of either of its adversaries, and to respond in kind would open China to precisely the threat implied by the initial limited strike. Simply stated, China's nuclear force is vulnerable. Its very existence creates much of the vulnerability, and the force will remain vulnerable until China has an assured second-strike capability. Deterrence under these ambiguous conditions becomes quite problematic. Public statements of "no first use" and other statements designed to emphasize the defensive nature

of the Chinese weapons development and deployment program do not resolve the dilemma. Nor is this dilemma one-sided, for if China's nuclear force is vulnerable, then, from the adversaries' view, there is some probability that China would have an incentive to use them before they are struck.

The imponderables in this calculus are obvious. Prior to an evaluation of their problems it will be advantageous to look at China's nuclear force as it developed, and its capabilities in 1977.

The Force

The Chinese nuclear weapons program is almost twenty-three years old, and over the years it has become more and more sophisticated both in the weapons deployed and in the processes of development and testing. There can be two points of view in looking at the process as a whole. One is that:

The PRC has a relatively small, but carefully conceived, strategic program.⁵⁴

Additionally, however, it is also plausible to see the Chinese program as erratic and constrained by 1) cost; by 2) a shortage of personnel trained in the required scientific and technological skills (S & T); and by 3) political problems such as those that emerged in the Cultural Revolution and the alleged coup plot of Marshal Lin Biao and its aftermath. Policy disagreements over the extent to which China should be committed to a nuclear weapons program may also have contributed to the slow and erratic deployment of the missile force. Official US government sources publicly stress the "carefully conceived" analysis,

but evidence for that position is not available publicly.

Nonetheless, it is true that Chinese *deployment* practices since the late 1960s when MRBM's were first deployed have recognized the need for survivability by using dispersal, terrain features, mobility, and lately hardened silos. Thus, even though the missile force development may be restrained by problems related to resource allocation, limited S & T capabilities, and political factors, its deployment follows the practices required by a minor nuclear power facing an overwhelming nuclear capability.

Currently China has deployed some 30-40 medium range ballistic missiles (MRBM) with an estimated range of approximately 600 nautical miles (nm), and 30-40 intermediate range ballistic missiles (IRBM) with an estimated range of 1500 nm.⁵⁵ An unknown number of short range ballistic missiles (SRBM) with an estimated range of 350 nm may also have been deployed.⁵⁶ In addition, China may have deployed two or more multiple-stage IRBM with an estimated range of some 3,000 to 3,500 nm.⁵⁷ Warhead yields for these systems range from 20 kilotons (KT) in the MRBM to 2-3 megatons (MT) in the IRBM.⁵⁸ The warhead for the multiple-stage IRBM is not known, but it is probably in the 2-3 MT range.

The delivery system for a Chinese warhead capable of striking the United States does exist, but it has not been tested at long or full-range. It is anticipated that this missile will be similar to the US *Titan* and the Soviet Union's SS-9,⁵⁹ and the activities of a Chinese scientific research vessel in the south Pacific during

the summer of 1977 raised the question of whether or not China was planning a long-range, if not a full-range, test.⁶⁰ The first test of this missile, known to the US government as the CSS-X-4, was in 1971 when it was tested within China's borders. Since that time it has been used to launch the most recent Chinese experimental space satellites.⁶¹

Fuel for the rocket motors of all Chinese missiles is liquid, with the IRBM propellant known to be storable.⁶² China has, however, put considerable emphasis on research, development, and production facilities for solid fuels.⁶³

In addition to landbased missiles, China is believed to be developing a submarine-launched missile with a range of about 1,500 miles--approximately the same performance as the first generation of the US *Polaris*-type.⁶⁴ The only known missile launching submarine in the Chinese inventory is one Soviet G-class built in Dairen in 1964. It has three verticle missile tubes in the enlarged conning tower, but it is not capable of firing a *Polaris*-type missile. The missile for this *Golf* class submarine is an SRBM, probably *Serb*-type. It is not known whether or not the vessel is armed, nor have there been any reports that the Chinese have ever tested its missile launching capability, therefore the vessel may well be unarmed.⁶⁵

Although not known to be a strategic submarine, the Chinese are testing an attack version of a nuclear powered submarine, known as the *Han* class.⁶⁶ The boat evidently has an *Albacore* hull and was probably laid down in 1971-72.⁶⁷ This combination of a missile

launching submarine and a nuclear powered attack boat has led to the general conclusion that China is aiming at developing an SSBN in the future, thereby laying the ground work for a potential triadic approach to its nuclear force. The development of a solid fuel capability supports this notion, for solid fuel is more appropriate for storing missiles in submarines.

The third leg of this emerging triad is formed by China's bomber force, based upon the Tu-16 and Il-28. Again, as with the missiles,⁶⁸ this bomber capability is limited by range to a regional force. About 80 Tu-16s with a combat radius of some 1,600 nm are believed to be nuclear-capable. The number of nuclear-capable Il-28s is not known, but with a total of around 400 in the air force, and a combat radius of some 550 nm, the combination of Tu-16s and Il-28s have the potential for significant bomber force. Nonetheless, it must also be recognized that the penetration capabilities of these 1950's-design bombers within the Soviet air defense environment⁶⁹ is extremely limited.

The Strategy

Although China's nuclear capability emerged during the period when Peking's major adversary was the United States, deployment of the force occurred as China's threat perception began to focus on the USSR. The MRBM achieved initial operational capability (IOC)⁷⁰ in 1966. In the intervening years, the Chenpao/Damansky border conflict of March 1969, and its expansion along the border into Central Asia, raised the prospect of a Soviet strike into China to an

extremely high level; an image supported by a widespread rumor that the Soviet Union was considering a "surgical strike" on Chinese nuclear testing facilities in Sinkiang.⁷¹ These rumors were augmented by the appointment of Colonel General Tolubko, Deputy Commander of the Strategic Rocket Forces, to command the Far East Military District. Soviet deployment and realignment of its military districts all added to Chinese perceptions of a growing Soviet threat. By the end of 1969 the USSR had increased its deployment along the border from around 13 divisions in 1965-66 to 21 divisions. This number increased to 30 in 1970 and 44 in 1971. These forces, including 2-3 divisions in the Mongolian People's Republic (MPR), were supported by some 1,000 combat aircraft controlled by a coordinated air defense system⁷² established in the MPR sometime in 1970.

By the time Henry Kissinger visited China in the summer of 1971, Mao Tse-tung was convinced that China was faced with a potentially more dangerous and immediate adversary than the United States. This shift in primary adversaries made possible the Sino-American rapprochement confirmed by President Nixon's visit to China in February 1972. But, the initial deployment of China's nuclear deterrent was to have a profound effect on China's basic military doctrine and the strategy devised to implement the doctrine. The dilemma was that China's total nuclear force was miniscule when compared to that of the USSR, and that Soviet forces deployed in the Trans-Baikal and Far East Military Districts, and Mongolia, exposed the industrially important area of Manchuria and North China (the Shenyang and Peking Military

Regions) to Soviet attack.

Although Peking had moved diplomatically to reduce the threat to China by entering into a revised relationship with the United States, from the point of view of a military planner China was still faced with obvious strategic disadvantages. China had a long land frontier with one of the international system's two superpowers, and, even though Peking was entering into a deterrent relationship with the Soviet Union, the USSR's military capability far outweighed that of China. The only strategic advantage held by Peking was that the impact of a strategic nuclear strike on China would be less disrupting than it would be to a highly centralized and industrialized society. There were, and are, concentrations of targets in specific regions that would be lucrative if the objective of strategic targeting was to significantly erode China's industrial capability and its ability to recover industrially from a nuclear war. But, China was yet a developing society with 80 per cent of the population involved in agriculture and small-scale industry in rural towns. The consequences of a strategic strike would not be as devastating for China as they would be for an industrialized society dependent upon a highly centralized political and communications systems--a condition noted by Marshal Yeh Chien-ying a decade earlier. China's socio-political system was centralized, but the regional military and political structure had the capability to function successfully within a relatively autonomous process. The "worst plausible case" for China, then, remained as it had in the past as a strategic strike followed

by a conventional ground assault. If this was true, then China's doctrinal problem was how to deter such a choice by the adversary while Peking was deploying its own nuclear deterrent, and how to defeat the adversary should deterrence fail. It was possible that China's emerging strategic weapons deployment would contribute to deterrence, but at the same time it could create a dangerous instability in the military relationship with the USSR.

First, for the emerging Chinese missile force to be considered a deterrent, it had to be survivable, and survivability can be enhanced through hardened silos, concealment, mobility, and dispersal. Thus far China has utilized all four techniques, but primarily concealment and dispersal. Equally significant to deterrent value are reliability, accuracy, and quick-reaction time. These are technical problems, and are certainly being attacked by China's strategic weapons R & D program. China's development of a solid propellant capability will, of course, contribute to the quick reaction requirement. Nonetheless, Chinese planners are faced with the reality that it is virtually impossible for its strategic forces to catch up with the USSR in either qualitative or quantitative factors as long as the Soviet Union maintains its current development program. China's strategic force planners, therefore, must operate within a permanent condition of weapons inferiority in all three legs of China's emerging triad.

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Chinese planners, however, will view the entire strategic environment of the USSR as part of Peking's deterrence strategy. The confrontation between the Warsaw Pact and NATO, and the strategic

relationship between the United States and the USSR have formed a major facet of China's discussion of its strategic environment. The principal components of deterrence are capability and credibility; that is, deterrence is a product of these two components. To deter means to reduce the incentive to attack. With the USSR "threatened" both by the nuclear strike (first or second) capability of the United States and by the NATO confrontation with the Pact, Chinese calculations will include the western threat to the USSR. Indeed, for some years, China has been an avid supporter of NATO, warning that the primary "threat" of the USSR is not to China but to Europe. Soviet deployments in the east, Peking editorials argue, are only a feint⁷⁴ and, in fact, are more threatening to Japan than China. Such statements, however, have to be combined with provincial broadcasts, from Manchuria especially, in which preparation for war is a major⁷⁵ topic. The Chinese purpose behind these efforts is obviously designed to raise the risk to the Soviet Union of a strike on China by supporting a strong threat to the USSR's western flank. Nonetheless, assuming that the Soviet fear of China's ability to cut the USSR's lines of communication to the Far East is as strong as that reported by General Wilson, the Director of the Defense Intelligence⁷⁶ Agency, in 1976, then the USSR will have prepared to fight a two-front war against both its adversaries. It is evident that in their deterrence calculation, Chinese decision-makers have included an estimate of the total strategic environment of the USSR. This environment, they hope, will effect the Soviet estimate of the costs of

striking China, in that the western "threat" from NATO and the United States will provide a disincentive to strike.

The second major facet of a deterrence strategy, in addition to reducing the adversary's incentive to attack, is to effect the adversary's perception of the risk of *not striking*.⁷⁷ If the risk involved in not striking is high, then the incentive to attack is correspondingly higher. Since China does not have the capability for a disarming first strike against the USSR, then the only reason for a Soviet first strike against Chinese missiles would be to protect Soviet Central Asia and the Soviet Far East from a Chinese strike. Possibly the deployment of two 3500nm IRBMs, which gives China a limited capability against the western USSR, raises the Soviet concern over China's ability to strike European USSR, but Chinese deployment remains quite limited. A Soviet first strike under these conditions would appear implausible except under extreme provocation. Given the wide gap between Chinese and Soviet nuclear capabilities, there seems to be no great risk for the USSR inherent in not striking first. This condition could change in the future when, and if, China deploys its ICBMs.

At this juncture it is plausible for a destabilizing interaction to occur between Chinese deployments and the Soviet perception of the level of risk involved in not striking China. Chinese public strategy, therefore, places major emphasis on the first facet of deterrence--reducing the adversary's incentive to strike. China's frequent and almost laudatory references to France's independent nuclear capability

are important here. In one sense, China may be using France to justify its own nuclear program, but it is also equally probable that Peking's public praise of France is being used to highlight the complex nuclear world faced by the USSR. The complexities of the Soviet Union's strategic relationship to the United States and NATO, including France, are emphasized by the Chinese as part of its strategy to deter the Soviet Union from an attack. Thus the implausibility of a Soviet first strike against China is a function not only of China's limited capabilities, but also of the total strategic environment of the USSR; an environment constantly referred to in China's public statements.

Reviewing China's nuclear deterrence posture, its current deployment is directed primarily against the USSR, but its missiles could also be targeted against Japan, Taiwan, the Philippines, mainland Southeast Asia, and South Asia. When the newly deployed multiple-stage IREB is included, Australia and the Marianas fall into the target capability. Currently, however, deterring the USSR is China's primary objective. This objective is sought by demonstrating a capability to target all of the major cities along the Trans-Siberian railroad system--Vladivostok, Khabarovsk, Irkutsk, Krasnoyarsk, Novo Kuznetsk, Novosibirsk, Omsk, etc. The number of cities capable of being targeted would be a function of the location of China's MREB and IREB force, and the ability of the Tu-16 and Il-28 to penetrate Soviet air defense networks. It is feasible, however, for China to target all of the USSR's major cities and military installations

within the Tran-Siberian and Far Eastern Military Districts, and to a limited extent European Russia short of Moscow. Because of the presumed inaccuracy of Chinese missiles, the targeting would be counter-value, aimed at creating the greatest level of destruction possible.

The deployment of the missile force has been determined both by the availability of targets and the problem of survivability, resulting in an extremely wide dispersal of sites. This deployment is designed to assure a second-strike capability against the USSR. The erection of a very large phased-array radar system in west China indicates that China has taken the first step in establishing a ballistic missile early warning system (BMEWS).⁷⁹ The initial steps have therefore been taken to prepare for a launch-on-warning capability. China's concern, demonstrated by its deployment pattern and early warning program, is to make its missile and air force less susceptible to a Soviet pre-emptive attack. Since China cannot realistically contemplate a force with a capability for a disarming first strike, the logic is to inflict the maximum damage on accessible targets. For China this means population centers, industrial complexes and military targets.

The problem for Chinese decision-makers to ascertain is what level or threshold of deployment can they achieve without creating a Soviet incentive to strike first? It is obvious that the observer cannot answer this question. It is this author's judgement, however, that the Chinese believe they have passed the critical level, and will

continue current deployments, to include its modernization by replacing the initial SS-4-type MRBM with a more sophisticated IRBM with storable liquid fuel, and an ICBM. When the USSR-PRC strategic relationship is viewed in isolation, the imbalance is very acute, but when the total strategic environment is taken into account, the Chinese condition seems more balanced. Nonetheless, it is difficult, if not impossible, for the external observer to determine what the precise strategic values are used to calculate the force level decision. The Chinese capability against the Soviet Far East appears to be sufficient to deter the USSR from launching a nuclear strike against China when the Soviet Union is faced with a complex strategic relationship with the United States. But, the observer cannot determine what the USSR considers to be an unacceptable level of indiscriminate retaliatory capability from China. Nor can the observer determine with any known accuracy what the USSR's long range goals for China are, therefore the logic for a preemptive or disarming first strike by the USSR against China cannot be known. Chinese decision-makers are faced with the same dilemma. Thus, whether or not the Soviet Union launches a nuclear strike against China *may* have less to do with the balance of military power than with long term Soviet objectives, one of which may well be to avoid a strategic exchange with China for as long as possible.

General Wilson's discussions with three star generals and above in the Army, Navy, and Air Force of the USSR between 1971 and 1973 led him to conclude that the question of China was a highly emotional

issue for them, and that they viewed China as the number one threat. But, General Wilson judged that the option to disarm the Chinese force was no longer considered feasible by Soviet decision-makers.⁸¹ It was General Wilson's view, as a result of his discussion with Soviet officers, that they also take a very "pragmatic" view of Chinese military capabilities. It was his judgement that the Soviets saw China not as a direct military threat, but "as some sort of parasitic organism that is going to ebb onto Soviet territory, . . . as opposed to an all-out military thrust after cities and rail junctions and bridge lines, and that kind of thing."⁸² It was difficult, for the Director of the Defense Intelligence Agency, despite his intelligence sources and personal discussions with senior Soviet military officials over a two or three year period, to define precisely the Soviet perception of the Chinese "threat." Nonetheless, there seems to have been nothing that led him to conclude that the USSR had any strong desire to implement a first strike strategy against China, and it is difficult to determine logically what incentive there is for a Soviet first strike.

THE MODERNIZATION DEBATE

The Tactical Air Forces Since 1969

When the break with the USSR occurred in 1960, Chinese engineers and designers were faced with the task of producing an aircraft capable of meeting the demands of the 1960s. Isolated from the West, China was forced to design its own combat aircraft for the first time, based upon an industry that was production oriented and with only extremely limited experience in the design of combat aircraft. The first Chinese combat aircraft, therefore leaned heavily on the Chinese MiG-19SF (Farmer - C) and PF (Farmer D), known as the F-6. This was, and is, primarily a clear-air day fighter equipped with an SRD-IM *Scan Fix* radar permitting only a range-to-target measurement with no search or tracking capability. The Chinese clearly desired an all-weather capability, but with a design that could attain series production without major changes in the F-6 (MiG-19) production line. The result was a Chinese variant of the MiG-19 known as the Fantan-A F-9 (the Chinese produced MiG-21 being the F-8). This aircraft went into series production in 1969, as did the F-8.

Visually, the F-9 differs from the F-6 in that it has a pointed radome and utilizes lateral air intakes, whereas the F-6 uses a divided air intake in the nose. The F-9 also has a somewhat wider wing span and a longer fuselage than the F-6, although sources vary on these dimensions. Wing span differences may be as much as three

feet, and over-all length differences may be as much as two feet. The maximum speeds of the two aircraft are also believed to differ, with Chinese improvements on the RD-9B-811 increasing the thrust by 20 per cent. The F-9 may also be fitted with a copy of the *Spin Scan B* radar, which would give it a capability to search for air targets at a range of 20 km and a tracking range of approximately 13 km. This radar could have been obtained from the MiG-21 PFs shipped to Vietnam through China.⁸³ As many as 400 of these multiple role combat aircraft (MRCA)⁸⁴ may have entered service.

The follow-on MRCA to the F-9 has been dubbed the Hsian (or Sian) -A by western sources. It is reported to be a delta-wing aircraft and, again, because the MiG-21 is a delta-wing design, it may well be that China is modifying its F-8 to produce the Hsian-A.⁸⁵ Perhaps not incidental to the development of the Hsian-A was the contract signed with Rolls-Royce in December 13, 1975, for the licensed production of the *Spey* 202 and a supply of completed engines and equipment.⁸⁶ This is a purely military version of the engine that powers the Hawker-Siddeley *Trident* now in China's civil air fleet. The *Spey* engine may well be used to power the *Hsian-A* in future.

The purchase of the *Spey* tends to confirm speculations that there are production problems associated with both the F-8 and the F-9 that relate to their power plants. And, in fact, power plant design and manufacture is the most complex and difficult phase of high-performance combat aircraft production.

Chinese concern over their airpower capability is obvious from

the purchase of the *Spey*, and such evidence as there is indicates that if the PLAAF is to develop a combat capability based upon middle 1960s technology, then the aviation and avionics industries are in dire need of foreign assistance. Current Chinese design and production technology is no less than twenty years behind the United States and the USSR, and there is considerable evidence that the Chinese are going to turn to foreign technology for assistance. Chinese interest in foreign combat aircraft has been widely reported, with special interest shown in the Hawker-Siddeley *Harrier* since July 1972 when Sir Anthony Royle, then Under-Secretary at the British Foreign Office, opened discussions with the Chinese. Negotiations continued on and off over the years, then in the fall of 1977, Vice Premier Wang Chen told a visiting British trade delegation that the Chinese government was considering purchase of the *Harrier*.⁸⁷ British industry sources say that China is now interested in buying 100 of the aircraft, whereas in 1976 reports were suggesting around 200.⁸⁸ Chinese interest in foreign combat aircraft, although it may now be settling on the *Harrier*, has also included the Swedish *Viggen* and French *Mirage*, with a team reportedly visiting Daussault in 1975 to broach purchasing negotiations, although the particular model the Chinese were interested in was never reported.⁸⁹

Chinese interest in foreign weapons technology is, of course, wider than simply the aircraft market. A Japanese newspaper reported that Teng Hsiao-p'ing on October 7 told visiting retired Japanese military officers that China was planning to purchase both technology

and weapons from foreign nations in order to support its military
modernization plans.⁹⁰ These observations corresponded in time with
the visit to France on September 12-25, of a fifteen member military
delegation, led by the First Deputy Chief of Staff Yang Ch'eng-wu.
The delegation was officially responding to the visit of General
Guy Mery, Chief of Staff of the French forces, to China in July 1976.⁹¹
This "French connection" appears to be a growing one, for in June 1977,
at the invitation of the French Minister of Defense, Yvon Bourges,
Hsing Yung-ning, Deputy Chief of Staff of the PLAAF, led a small
delegation to attend the 32nd Paris International Air Show.⁹²

The PLAAF is the world's third largest combat air arm. Behind
this statement, however, stands an air force supported by a stagnating
industry which does not appear to be capable of doing much more than
reproduce Soviet designs of the 1950s.⁹³ Perhaps even more important,
there is strong evidence that more sophisticated designs and power
plants may be beyond the industry's series production capability.
The great mass of the air force consists of clear-air day fighters
and fighter-bombers, with only a very few aircraft capable of limited
all-weather combat. These aircraft are armed primarily with cannons.
Only a few are armed with air-to-air missiles--some with *Atoll*-type
heat-seeking missiles and possibly some *Alkali*-type beam-riding missiles.
The bomber force is equally obsolete, especially when faced with an
air defense system as sophisticated as that of the USSR. The PLAAF
is clearly in need of a new MRCA, and the *Spey*-202 may well be the
power plant around which a new multiple-role combat aircraft will be

built. This aircraft, however, will need sophisticated navigation and weapons-aiming systems if it is to enter into the all-weather category. Such systems are not presently being designed and produced in China, which means they too have to be obtained from the West.

The Origins of the Debate

The need for Western arms technology was a major basis for the dispute over military modernization that emerged in 1976 and continues today. The origins of the current policy debate may go back as far as 1971, when China's estimated military budget reached an all-time high, but which was followed in 1972 by a noticeable drop in military procurement, down to the level of 1969—a drop of some 25 per cent.⁹⁴ An adequate explanation for this drop in military procurement is difficult to provide because a number of events impinge on the decision area. The alleged discovery of a coup plot led by Lin Piao and the subsequent purge of the high command may well have led to a decision to reduce military spending because of a lack of confidence in the loyalty of the armed forces. In 1971, however, rapprochement with the United States was in the final stages of negotiation, and its completion in early 1972 may have led the leadership to conclude that this diplomatic coup reduced the probability of war with the USSR. It may well have been though, that the drop in the supply of new military equipment was a function of the civil sector of the economy receiving priority over the military sector, a choice made feasible⁹⁵ by the general economic slump China entered in the 1970s. An

additional factor complicating analysis is the basis of the estimate-- aircraft production. Since much of the estimated decline in procurement was a function of US intelligence estimates of China's combat aircraft production, it could well be that Peking was waiting for more advanced weapons systems to go into series production before it would increase procurement. Finally, a decision may have been made to reallocate funds to more intensive RDT&E of strategic missile systems and their associated space and communication programs, a choice that may be supported by the flurry of strategic weapons systems activity in the latter part of 1975 and early 1976. Whatever the reason, or combination of reasons, for this drop in procurement, 1975 reversed this process and also gave evidence that China was moving ahead in its space and strategic weapons programs. Three space satellites were launched in 1975, the first launches since 1971, with an additional launch in the summer of 1976. In October 1975 three nuclear devices were tested, while four more were tested in 1976.

The modernization debate thus emerged at a time when China was engaged in the testing and evaluation of nuclear weapons, delivery systems, and space satellites, while at the same time it continued its exploration of the European arms market. . Since the debate entered the press in 1976, two facets have emerged. One reflects a classical allocation of resources dispute, while the other reflects the internal politics of the succession struggle that became evident after the death of Chou En-lai in January 1976.

The Internal Politics of the Debate

As Chinese press reports currently define the early stages of the debate, it was a function of attempts by the so-called "Gang of Four" (Wang Hung-wen, Chang Ch'un-ch'iao, Chiang Ch'ing-Mao's wife, and Yao Wen-yuan) to undermine the modernization decisions made at an enlarged meeting of the Central Committee's Military Commission (MC) held in June and July of 1975. It was this foursome, all members of the Politburo and supporters of the more radical policies of Mao Tse-tung that were the core of the Cultural Revolution, who were arrested on the night of October 6, 1976, less than one month⁹⁷ after Mao's death. Their arrest ended the most critical stage of the succession struggle in which the radical wing of the Politburo had attempted to unseat the moderates led by the acting-Chairman of the party, Hua Kuo-feng. The move against the "Gang of Four" was supported by senior members of the PLA, and, in the days after the arrests, it appeared very much as if the more moderate members of the Politburo had formed an alliance with the PLA High Command to rid themselves of the radical wing of the party. Since it is the victors in the succession struggle who are now reporting the origins of the dispute over the modernization of the armed forces, it is almost certain that their description is distorted; nonetheless, the current reporting needs to be analyzed. This analysis is necessary because even though the "Four" were arrested early in October 1976, the debate continued through 1977 and is still underway in February 1978.

Chinese press and radio broadcasts now report that an enlarged

Military Commission meeting held in the summer of 1975 made a "number of important decisions on consolidating the army, intensifying military training, preparing for war and improving weapons and equipment." ⁹⁸ Both Yeh Chien-ying and Teng Hsiao-p'ing made speeches at this meeting outlining future policy. Even though Mao supported the decisions, which were made in response to his directives, the press now reports that "the Gang of Four" attacked both the meeting and the decisions it made. They argued that the meeting was dominated by the "theory ⁹⁹ that weapons decide everything," and an "atom bomb fetish." In particular, the "Four" are charged with distorting Teng's speech in which he stated the necessity of increasing steel production and said that this task was similar to a "tough battle fought by the army," by ¹⁰⁰ arguing that Teng's position was that "weapons decide everything."

The current *apologia* is particularly careful to stress that Teng's position at this meeting was misrepresented by the "Four," and this careful treatment is a function of Teng Hsiao-p'ing's political history. He was purged during the Cultural Revolution along with Liu Shao-ch'i as one of the two senior party officials most responsible for distorting Mao's policies and leading China down the road to revisionism. He was restored in 1973, and under the protection of Chou En-lai quickly returned to a position of prominence. When Chou En-lai became seriously ill in 1975 and was confined to a hospital, Teng took Chou's place as China's senior administrator. Also in 1975, as part of the general policy of ensuring party control of the armed forces, Teng was appointed Chief of Staff of the PLA--the first time this post had gone to a career

civil party official. When Chou En-lai died in January 1976, it was widely assumed that Teng Hsiao-p'ing would be selected to succeed him. But, Teng's position in the hierarchy was shaken by the appointment of Hua Kuo-feng, a relative newcomer to the central leadership, to the positions of acting First Vice Chairman of the party and Premier of the State Council. These appointments confirmed that the policy debates occurring in the press were aimed at Teng Hsiao-p'ing and, indirectly, Chou En-lai, for Teng had been implementing policies designed by Chou.

The attacks on Teng culminated on April 3-4, 1976, when thousands of Chinese in Peking rioted to protest the untimely removal of wreaths placed in T'ien An-men Square in memory of Chou En-lai during the *Ch'ing Ming* festival. On 7 April, the Politburo announced that Teng Hsiao-p'ing had been dismissed from all his party and governmental posts, and that Hua Kuo-feng had been confirmed as the First Vice Chairman of the CPC and Premier of the State Council. This decision, the Politburo announced, was sponsored by Mao Tse-tung, and was in response to the rioting engineered by Teng's supporters.

Once Teng had been removed, a campaign to discredit him got underway, and one of its major foci became Teng's military modernization policies. This campaign has now been described as being the work of the "Gang Four" who were able to utilize the press through Yao Wen-yuan's control of the Propaganda Department and, by implication, Chang Ch'un-Ch'iao's control of the organ of the PLA's General Political Department--the *Liberation Army Daily*. The campaign to undermine

the decisions of the 1975 Military Commission, current articles say, began in the winter of 1975 and ended in October 1976 when the "Four"

¹⁰¹
were arrested. Even though the specific charges against Teng are no longer issues, the public debate in the press and radio broadcasts has continued, clearly indicating that not all the issues raised can be defined as "distortions" created by the "Gang of Four."

¹⁰²
The Modernization Debate in 1976

As the campaign to discredit Teng Hsiao-p'ing gathered speed, it began to concentrate on his military modernization policies. Using the now time-honoured theme of military debates in China, it focussed on the Maoist issue of "man over weapons." Teng was charged with placing more emphasis on the material and technological factors of war than the ideological strength¹⁰³ of the individual soldier fighting a protracted people's war.

As the criticism of Teng's policies continued, he was compared with the nineteenth century modernizers of the Chinese armed forces, Li Hung-chang and Tseng Kuo-fan. They had instituted a policy of importing western military technology, but as Teng's critics pointed out, this had led not to China's independence but to its submission to the West. Further, it was argued that Teng's emphasis on technology would lead to China becoming a "colony" of the West, exporting raw materials to pay for the technology imports--a direct refutation¹⁰⁴ of Mao's principle of self-reliance.

What was at stake, evidently, was the extent to which China's

resources could be allocated to support the technological enhancement of the PLA's military capabilities. The attack on Teng, it must be noted, came at a time when China was intensely involved in exploring the Western arms market, and shortly after China had signed the contract with Rolls-Royce for the licensed production of the *Spey* 202.

The Modernization Debate in 1977

With the purge of the "Gang of Four" in October 1976, the modernization debate intensified, and representative individuals and institutions of the armed forces began to define their positions in the debate. The criticism directed at Teng Hsiao-p'ing in 1976 was placed at the feet of the "Gang of Four" and turned against them, but the issues raised by the "Four" continued to be raised in opposition to the hard-line modernizers. At issue was not only the allocation of scarce resources between the civil and defense sectors of the economy, but also the strategy of the armed forces when faced with the Soviet threat.

In January 1977, an article in the prestigious Peking newspaper, *Kuang Ming Jih-pao* observed that "Armed with Mao Tse-tung thought and possessing technically advanced weapons and equipment the people's army will be like a tiger with wings and will be invincible." ¹⁰⁵ This view was stated by the organization responsible for coordinating the Chinese defense industries--the National Defense Industries Organization (NDIO). As the debate continued, it became evident that the Chinese equivalent of a military-industrial complex composed of the

defense industries, the centers of professional military education (PME), and the defense research centers represented by the National Defense Scientific and Technological Commission (NDSTC), was pushing hard for an intensive military modernization program and that they were expressing their views in clear and certain terms. In addition, General Su Yu, who was associated with the "modernizers" in the late 1950s and may have been removed from his position as Chief of Staff in 1958 when the modernization dispute of 1955-59 was reaching its high point, contributed to the debate with an extremely specific discussion of the relationship between technology and strategy. It seems clear that in 1977 and early 1978 the military-industrial complex was pressing hard to have the 1975 Military Commission decisions implemented, especially those related to improving the warfighting capabilities of the armed forces.

General Su Yu's article, published in the *People's Daily* on August 6 as part of the celebration of the fiftieth anniversary of the founding of the PLA, put the argument into an historical perspective. The major pattern of his analysis was designed to put the concept of a people's war into historical perspective and to demonstrate the progression of the PLA from an ill-armed but highly dedicated institution fighting a revolutionary people's war to an equally dedicated institution fighting a people's war "under modern conditions." He argued:

We are paying full attention to developing the role of the weapons we have. In the meantime, we are determined to constantly improve our weapons and equipment through self-reliance. We will acquire what our enemies have and also

what they do not have. The future war against aggression will be a people's war under modern conditions. . . . If any enemy dares to invade us, he will certainly be buried completely by a people's war waged on an unprecedented scale.¹⁰⁶

General Su then proceeds to analyze the role of nuclear weapons, discussing the advantage China has in a nuclear exchange with either the United States or the USSR. He argues that both the United States and the USSR have heavy concentrations of industry and population whereas China's industry and population centers are relatively less concentrated. His argument is that China is less susceptible to total disruption from a nuclear strike than either of its two adversaries because its population centers are not as concentrated as those of the USSR and the United States. General Su's assessment of the "threat" is that China is threatened primarily by a "surprise attack by Soviet social-imperialism."¹⁰⁷

Su Yu's concern with nuclear war and modernization was also reflected in an article originating in the Academy of Military Science and published in the party theoretical journal *Red Flag* on August 8, 1977. The Academy took an extremely hard line on modernization, arguing:

We must have a war concept, be prepared to cope with any emergency. We must be prepared to fight an early and large-scale war, and we must plan and arrange our work in terms of the worst possibilities.¹⁰⁸

The article stresses the need for speed in modernizing the armed forces, adding that rebuilding the army is "not merely a question of time, but a political question bearing on the fate of the country and the future of the proletarian dictatorship."¹⁰⁹

These demands to build up the warfighting capabilities of the Chinese armed forces, with considerable emphasis on the role of nuclear weapons, were not necessarily reflected in all sectors of the government and party. The joint editorial published by the *People's Daily*, *Red Flag*, and the *Liberation Army Daily* on August 10, although arguing ostensibly for the modernization of the armed forces, put greater emphasis on building up the civil sector of the economy prior to placing emphasis on the defense sector.¹¹⁰ Similar lack of enthusiasm for a high investment in the nuclear weapons program may be reflected in a June 21 article in the *People's Daily* which downplayed the significance of nuclear weapons. The author downgraded the role of nuclear weapons in warfare, but stated that "we have to build some nuclear weapons entirely for the purpose of defense and of smashing the nuclear monopoly of the two superpowers--the Soviet Union and the United States."¹¹¹ This essay supported the idea that China must prepare for both conventional and nuclear war, but adds that ultimately China will draw the invader into a people's war. There was a distinct lack of support for the idea that China should invest quickly and heavily into an accelerated program to build up China's conventional and nuclear warfighting capability.

Throughout 1977, there was a seesaw debate in which the military-

industrial complex stressed the need for new and sophisticated weapons technologies while the civil sector, although agreeing on the need to modernize the armed forces, sought to delay the investment until the civil sector of the economy had achieved higher levels of development. The early months of 1978 saw the debate continue.

The Modernization Debate in 1978

The most hard-line argument for weapons modernization in early 1978 was voiced by the National Defense Scientific and Technological Commission (NDSTC). In a phrase certain to make the classic people's war advocates shudder, the NDSTC observed, "'Millet plus rifles' is an heirloom with which our country's army and people have overcome the enemy and won victory under the leadership of the party and Chairman Mao." Stressing that the decision made in the summer of 1975 by the Military Commission must be pursued, the article stated that anyone who believed that he could use "broadwords against guided missiles and other nuclear weapons" has "a foolish or even criminal attitude. . . ." Then, in a clear and unmistakable statement of opinion, the NDSTC representatives stated:

In waging war we have relied and will continue to rely on people's war. However, we must realize that any future war against aggression will be a people's war under modern conditions. The suddenness of an outbreak of modern war, the complexity of coordinating ground, naval and air operations, the extreme flexibility of combat units, and the highly centralized, unified, planned and flexible command structure--all these factors make it necessary for our army to have appropriate modern equipment.¹¹²

Pressing this argument, the NDSTC analyzed the quick-reaction time

necessary to respond effectively to a nuclear salvo and concluded that "for this reason our armed forces must have an automatic, computerized countdown, communications and command system, and rapid, motorized, modernized transportation facilities." ¹¹³ After calling for advances in weapons and communications technology, the essayists note that for the future, certainly over the next five to ten years, China's weapons systems will remain inferior to those of its adversaries, therefore that the dilemma of defeating an adversary armed with superior weapons systems remains.

Again, however, the internal debate over resource allocation continued, with an article by "Commentator" in *Red Flag* presenting a contrary view. ¹¹⁴ This essay argued in favor of primary emphasis on the domestic sector of the economy and, while recognizing that it was necessary to modernize national defense, stated that in order to do this "it is necessary to achieve rapid development of the national economy, which is also the aspiration of the people of China and the earnest hope of the people of the world." ¹¹⁵

By the convening of the Fifth National People's Congress in late February and early March 1978, no clear indication of resource allocation had been stated. It is extremely unlikely that the armed forces will be able to rearrange the investment priorities of China to the extent that their allocation will be much more than the current ten to eleven per cent of the GNP being invested in national defense. At this juncture, the issue may well be one of resource allocation between the various service arms. Thus far the PLAAF is the only service to have benefitted directly from investment

in foreign weapons technology with the purchase and licensed production rights to the Rolls Royce *Spey* 202. This investment was reinforced in February through a \$20 million contract with the British Vickers Engineering Group for aerospace testing equipment. Some of this equipment will be used to test components of the *Spey*, with Rolls Royce engineers working with Vickers on the design of the equipment, which will be delivered in 1980.¹¹⁶

The 2nd Artillery Corps, believed to command China's missile force, may also benefit from an increased allocation of resources, but thus far there is no direct evidence to support this supposition. There has, however, been considerable emphasis in the arguments originating in the NDSTC and the Military Science Academy to upgrade China's nuclear weapons and support systems technology. In this respect it is interesting to note that Canton television in February 1978 broadcast a program explaining the principles of the neutron bomb. In this program, footage of the detonation of both fission and fusion bombs was used to illustrate the presentation.¹¹⁷ This kind of television elaboration on nuclear warfare would serve to make the Chinese public far more sensitive to the implications of nuclear weapons than newspaper articles, and may well be an initial indicator of a decision to increase the resource allocation to the strategic weapons program.

It must be recognized, however, that the aerospace component of the Chinese armed forces will be facing stiff competition from the Navy and the ground forces, which can present equally strong

arguments for increased resources. Thus it is by no means certain that the tactical air force and strategic weapons program will be able to gain at the expense of the other elements of the armed forces. It is clear, nonetheless, that the military establishment as a whole will gain from recent decisions to improve China's independent research capabilities both by improving facilities and redirecting the educational system to produce scientifically and technologically trained personnel in great numbers. The Ministry of Education over the past six months has announced a series of decisions designed to improve the quality of students entering the university system and those going into post-graduate research programs. A critical aspect of this program is to create 88 "key" universities, sixty of which were defined as such prior to the Cultural Revolution, which will function in a "pilot" role in raising the quality of education. These universities will recruit students with a "superior educational level" and will have more competent faculties with better teaching facilities, all created with additional financial assistance from the central government. ¹¹⁸ Perhaps the greatest single indicator of change in the government's view of higher education is that all students are no longer required to spend time working in factories or on the communes prior to entering the university. ¹¹⁹ Some twenty to thirty per cent of the students who pass their entrance exams this year will enter the university system directly from high school.

China's research capability will also be affected by a series of reform measures announced over the past six months. Recognizing that considerable time was spent in political meetings, it is now policy that research personnel will spend no less than five sixths of their time in research, and that all unnecessary political meetings will be ended. It has also been declared that the organization and management of research will be improved and support for research centers will be increased.¹²⁰ In preparation for a conference to be held in the spring of 1978, a Central Committee Circular of September 18, 1977 declared that all research units must evaluate their programs and report the policies they have established for their research programs for the coming three-year period, eight-year period, and a prospectus for the coming twenty-three-year period. Such an analysis and prospectus is designed to fit the current policy of modernization in agriculture, industry, national defense, and science and technology (the "four modernization"), which is being designed to conclude its second stage of development in the year 2000.¹²¹ With-
in the several reports on the policy programs for improving China's research capabilities, the research facilities under the direction of the Military commission have received special attendees, having been described by Professor Ch'ien Hsueh-shen, Director of the Mechanics Institute of the Chinese Academy Sciences, as one of the major bases upon which China can develop its new, accelerated program.¹²²

The *Liberation Army Daily* in one of its commentaries on the accelerated program to improve China's scientific and technological

capabilities, discussed the relationship of military modernization to this program. The editorial stated that there are basically two components in the process of military modernization: One is the procurement of sophisticated nuclear and conventional weapons, while the other consists of training personnel to use them and the technology and tactics for their utilization. In both components, the editorial argued, scientific and technological development precedes both procurement and battlefield deployment.¹²³ Given the level of military technology demanded in the modernization debate, it is clear that the armed forces recognize the linkage between battlefield technology and the development of compatible strategy and tactics, and the problems of maintenance associated with these technologies. To successfully integrate the new technologies, the armed forces will require increasing levels of trained, competent maintenance personnel, which in turn places a heavy demand on the armed forces training programs. Within this anticipated introduction of sophisticated weapons and command, control, and communications (C³) technology, the PLAAF and the 2nd Artillery Corps face a particularly heavy burden, thus it can be foreseen that their demands for S&T support will be high.

Within this problem, the leadership of the aerospace component of the Chinese armed forces requires special attention. Although not enough is known of the background of individual senior officers who compose the leadership of the PLAAF and the 2nd Artillery Corps, certain assumptions can be assumed to be valid by reviewing the

history of the two organizations. The leadership of the PLAAF was separated from the ground forces in 1949-50 to build the new air force with Soviet assistance. The Korean conflict produced the first generation of pilot-rated leaders with extensive combat experience, and between 1953 and 1969 they assumed command positions in the PLAAF air divisions and air armies. These commanders were significantly younger than their ground force counterparts, but were probably similar in age to the equally new naval commanders.¹²⁴ The same characteristic is probably also true of the 2nd Artillery Corps. The mission requirements of these two leadership structures also tend to give them distinct characteristics. They are less involved in non-military tasks than the ground forces, and their strategic and tactical focus is more "outward" than "inward" looking. Their concern with air defense, close ground support, air superiority, strategic bombing and strategic nuclear warfare creates a focus on weapons systems that are technology-heavy. Thus the leadership of China's aerospace forces moved away from the "millet and rifles" tradition that was the mainstream of PLA thought for so many years and developed its own cadre of leaders based upon a "mission which required modern technology, equipment, readiness, and training expertise in every sense."¹²⁵ The mission requirements of the air force and the missile force create a built-in bias toward technology, and a similar bias toward recognizing the strengths and weaknesses of individual weapon systems that may not be present in the ground forces. As the 2nd Artillery Corps leadership reviews the requirements of a stable

deterrent capability, the technological limitations of China's weapons will be glaring. Similarly, the PLAAF leadership reviewing the capabilities of the USSR's combat aircraft and air defense systems will be painfully aware of its limitations. These requirements to measure the adversaries capabilities, combined with an aerospace leadership which long ago broke from the "millet and rifles" tradition, would create a cadre of officers to whom technology was not simply a contributing factor for mission success, but was the single most critical factor. This is not to say that the ground forces and the navy are not without technological needs and requirements that they do not recognize, but that combat aircraft and ballistic missiles are considerably more dependent upon technology to fulfill their mission than the tanks of the army and surface combatants of the navy. If the Chinese leadership should decide to concentrate on the sea-borne leg of a strategic triad, then, of course, the navy would be faced with similar problems.

Thus the current resource allocation debate, although being fought by the armed forces as a whole, could well be led by those in the PLAAF and the 2nd Artillery Corps who see the weaknesses in China's military research, development, and production capabilities and, in the short run, its weapons systems, as a critical issue for the future.

CONCLUSIONS

The armed forces of the People's Republic of China are currently involved in a watershed debate, the outcome of which will affect their capabilities in the 1980's and 1990's. Whatever the decision, it is unlikely that it will affect their basic military doctrine of deterrence. No matter what the allocation between the civil and military sectors of the economy should finally be, the two primary adversaries of the PRC--the Soviet Union and the United States--have little to gain, if anything, from an attack on China, given both the political and military costs involved. China's military capabilities, when combined with the current military balance extant between the United States and the USSR, make any improvement in China's national security through the modernization of its weapons and equipment minimal. It is equally evident, however, that the hard-liners in the debate representing China's military-industrial complex are as much concerned with warfighting as they are with deterrence. Their emphasis on the "worst possible case" scenario is familiar to anyone who observes the arguments presented for the upgrading of weapons and equipment. The conflict between a deterrence-based doctrine and a strategy to win if deterrence should fail is common to military institutions involved in a military confrontation. The problem for the Chinese air force and the missile forces is that their weapons are either outdated or lacking in technological sophistication. The question

then becomes one of the extent to which the Chinese leadership will commit itself to investing in the modernization of the armed forces, and within the focus of this analysis, in the air forces and missile force.

To some extent the answer to this question is already known. The "turn-key" contract for the *Spey* 202 was the largest single contract of 1975 or 1976, even though it amounted to only US\$200 million. The recent contract with Vickers Engineering for US\$20 million in aerospace testing equipment was an additional significant indicator of an aerospace modernization program. Similarly, the existence of the Hsian-A combat aircraft demonstrates that China is seeking to upgrade its air force. In the missile program, the move toward solid fuels is an indicator of continuing progress, and it is generally recognized that the space program is linked to military concerns through its implication for reconnaissance satellites and launcher reliability and performance.

It is also plausible, if not extremely likely, that China's computer orders to Control Data Corporation in the United States and Hitachi, Ltd., of Japan have military applications. The two Control Data Cyber 172 computers are to be used, according to the Chinese, for off-shore oil deposits and earthquake prediction, while the Hitachi Hitac M170 and the M160 II are to be used for weather forecasting and the international exchange of weather information. Sophisticated computers such as these, however, can have direct military application in such areas as avionics, communications, missile

guidance, and anti-submarine warfare. It was because of the potential military application of the Cyber 72 that China agreed to give Control Data Corporation the right to monitor the use of their computers for three years.

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At the root of the problem is not only cost, but also what appears to be China's limited ability to integrate sophisticated military technologies into both its armed forces and the industries that support them. China is clearly not contemplating a "quick-fix" solution, but is preparing for an expansion of its scientific and technological capabilities in both the civil and military spheres. The educational reforms combined with the programs designed to make China's research facilities more effective will, if they are effectively carried out, increase China's ability to integrate Western technology into its own research and production capabilities. The design of the current reforms would appear to be leading toward a greater facility to absorb sophisticated technologies rather than prepare for immediate changes.

The modernization of the air force and missile force are, then, part of a general program of improvement in national defense capabilities which does not appear to include any plans for a short-term "quick fix" solution. Given China's basic military doctrine of deterrence, no "quick fix" is required. The concern of the PLAAF and the 2nd Artillery Corps for a warfighting capability is understandable, but it is unlikely that the current leadership will reorient its investment priorities to a quick response to these concerns. There

are ongoing projects which will improve warfighting capabilities of the air force and missile force, and these may well receive additional support, but it is evident that the expansion of the civil sector of the economy will receive priority.

The final question has to focus on the over-all objectives of the Chinese leadership toward the nuclear weapons program. Even though official Chinese statements constantly argue that China is a member of the "Third World" and will never become a superpower, it is also known that China is in the testing and evaluation stage of ICBM development. The political consequences of an ICBM deployment far outweigh the warfighting capabilities the initial deployment will represent. Such a deployment will symbolize China's desire to enter "superpower" status, as that term is currently understood by the international community. Assuming that the initial deployment will occur within the next five years, Peking will still lack the economic base and capability to project military force that is associated with "superpower" status. Such weaknesses will limit China's ability to compete with the USSR and the US on a world-wide basis. Nonetheless, the symbolism involved in deploying ICBMs, and their contribution to a doctrine of general rather than limited deterrence, will move Peking one major step up the ladder beyond regional influence to an emerging world power whose aspirations for superpower status will become obvious.

APPENDIX A

PLAAF: Organization and Deployment (see chart 1)

The operational units of the PLAAF are deployed into 11 Air Districts which appear to have boundaries conterminous with those of the ground force's Military Regions (see map below). The Military Regions (MR) and, presumably, the Air Districts (AD) are named after the city where the regional/district headquarters are located. Command of the air force units in an Air District comes directly from the PLAAF headquarters, with no intervening level of command. The MR and AD headquarters will coordinate activities, but with the exception of air force units directly attached to the MR command, the PLAAF is independent of the ground forces.¹²⁷

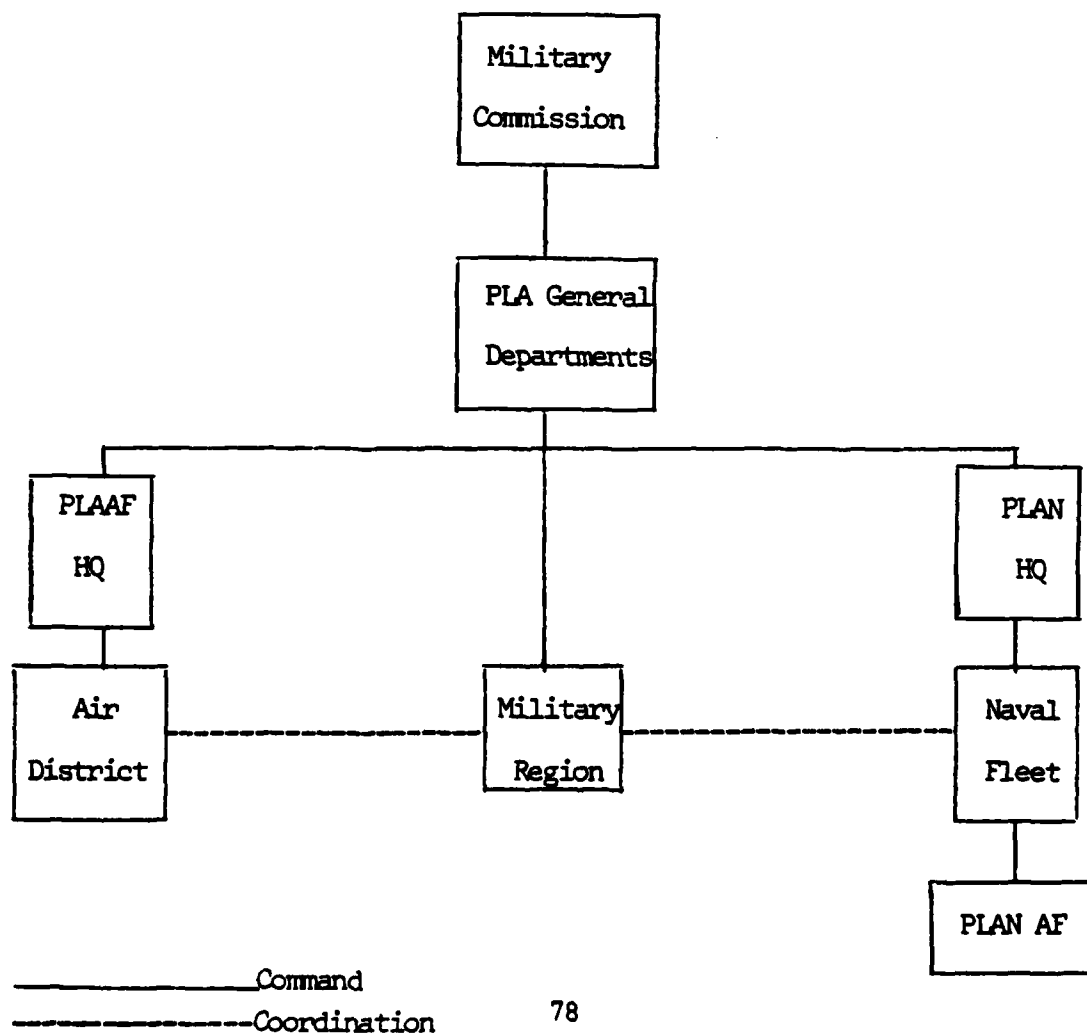
The current deployment of air armies and air divisions is not known to this author, but the total deployment very probably reflects China's current threat perception, with some 50 per cent deployed to face the Soviet threat.¹²⁸ Since the Soviet deployment around Manchuria in the Trans-Baikal and Far Eastern Military Districts and in the Mongolian People's Republic is perceived by Peking as the greatest threat to China's security, deployed strength will be greatest in the Shenyang, Peking, and Lanchou Air Districts.¹²⁹

It should also be noted that the PLAAF is not the only air force component of the PLA. The PLA Navy (PLAN) has an air arm dedicated to the defense of naval shore installations and components of the surface fleet within range. The units assigned to air defense missions are

almost certainly under the operational command of the PLAAF.¹³⁰

Appendix B lists estimates of PLAAF and PLAN combat aircraft strength.

Chart 1



[illegible]

 Military region boundary Internal administrative boundary
 Lao-chow Military region capital Internal administrative capital
 Railroad

APPENDIX B*

TACTICAL AIR FORCES (all numbers approximate)

Chinese People's Liberation Army Air Force (PLAAF)

Personnel (includes 120,000 Air Defense personnel): 400,000

Combat Aircraft:

<u>Medium Bombers:</u>	Tu-16	80
	Tu-4	(a few)
<u>Light Bombers:</u>	Il-28	400
	Tu-2	100
<u>Fighter Bombers:</u>	MiG-15/F-9	600
<u>Air Defense/Air Superiority:</u>	MiG-17/-19	4,000
	MiG-21	120
	F-9	<u>(some)</u>
		<u>5,300+</u>

Chinese People's Liberation Army Navy Air Force (PLANAF)

Personnel: 30,000

Combat Aircraft:

<u>Torpedo Bombers:</u>	Il-28	130
<u>Medium Bombers:</u>	Tu-16	(a few)
<u>Light Bombers:</u>	Tu-2	(a few)
<u>Air Defense/Air Superiority:</u>	MiG-17/-19/F-9	<u>500</u>
		<u>630+</u>

*Source, The Military Balance 1977-1978, IISS, 1977.

APPENDIX C*

STRATEGIC FORCES (all numbers approximate)

Second Artillery Corps

<u>System</u>	<u>Characteristics</u>		<u>No. Deployed</u>
MRBM	IOC	1966	30-40
	Range	600 nm	
	Yield	About 20KT	
	Configuration	Single Stage	
	Propellant	Liquid	
IRBM	IOC	1972	30-40
	Range	1500 nm	
	Yield	2-3 MT	
	Configuration	Single Stage	
	Propellant	Storable Liquid	
IRBM	IOC	mid-1970's	2+
	Range	3000 nm	
	Yield	2-3 MT	
	Configuration	Multiple-Stage	
	Propellant	(Storable?) Liquid	
ICBM	IOC	?	None
	Range	7000 nm	
	Yield	?	
	Configuration	?	
	Propellant	?	

* Sources, *The Military Balance 1977-1978*, 11SS, 1977, for numbers deployed. Defense Intelligence Agency, *Handbook on the Chinese Armed Forces*, DDI-2680-32-76, July 1976, for characteristics.

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