

Adding Offensive Teeth to a Defensive Air Force: The New Thinking of the PLAAF*

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The best lesson China has learned from the Gulf War and Kosovo is the value of air power in high-technology warfare. This lesson has significantly influenced the debate within the People's Liberation Army Air Force (PLAAF) regarding the role of the service in modern warfare. As discussed in this paper, a consensus has emerged that emphasizes the strategic function of air power in the new age. The Air Force's traditional role of supporting the Army has not been discarded, but the force is being given more independent missions to perform, such as establishing air superiority, launching long-distance strikes, and conducting surgical operations for political purposes.

The new thinking concerning the functions of the Air Force in the future has paved the way for a number of key reforms. First, the PLAAF is being restructured from a fundamentally defensive force to a force with both defensive and offensive capabilities. Second, this force restructuring has affected the whole weapons programs for the Air Force, which gives top priority to the development of strategic airlift, aerial refueling, and ground-attack capabilities. Third, air and missile defence has been identified as the weakest point in the PLA's modernization and thus has received new emphasis. All these reforms are designed to help the PLAAF catch up with the international trend of the revolution in military affairs.

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Modern technology has fundamentally altered the way modern warfare is conducted. The most visible of all changes is the changing function of air power. This new development has speeded up the PLA Air Force's (PLAAF's) transition from its traditional subordinate role in China's armed forces. Now the PLAAF is entrusted with a wider range of missions, from supporting ground force units in their tactical actions to launching independent air campaigns and to projecting power from home.¹ These new demands have motivated the PLAAF to achieve the status of an independent strategic force in the coming decades. However, China's Air Force is the weakest service in the PLA. Most of its aircraft are two generations behind the technological level of the major powers. Therefore, the PLAAF has been given developmental priority over the other services.² One direct outcome of this special treatment can be seen in the acquisition of air force hardware, which has made up the lion's share of China's arms purchases from the international market. In other words, the PLAAF is the major beneficiary of the PLA's shift toward a high technology-oriented defence strategy. This paper is an attempt to identify and analyze the PLAAF's modernization efforts.

The PLA Air Force's New War Fighting Doctrine

Since the 1980s the PLAAF has undergone considerable reforms in terms of its combat doctrine, force structure, and weapons programs. Under the revised doctrine the PLAAF is being urged, at the strategic level, to transform its traditionally defensive orientation and apply new principles of

¹Teng Liangfu and Jiang Fusheng, *Kongjun zuozhan yanjiu* (The study of air force operations) (Beijing: Guofang daxue chubanshe, 1990), 149.

²Deng Xiaoping, *Guanyu xinshiqi jundui jianshe lunshu xuanbian* (Deng Xiaoping on the building of the armed forces in the new era) (Beijing: Bayi chubanshe, 1993), 57.

exercising air power in a pro-offensive manner. At the operational level, the PLAAF is required to develop better offensive capabilities in air control, air strike, and air defence. At the tactical level, proper use of specific weapons systems has been highlighted in order to accomplish specific tasks. Never before has the PLAAF's role been formulated with such a level of clarity. For instance, air campaigns are now viewed as a key link in fulfilling the Central Military Commission's strategic goal of joint operations at the theater level. For a tactical operation, standard procedures are prescribed for a given unit, i.e., a regiment, to conduct a formation strike against a pre-determined target or to conduct ground support missions for the Army.

Transforming itself into an offensive force is requiring the PLAAF to put forward a series of new air power concepts. These concepts have absorbed the main features of the American air-land doctrine and other Western military ideas. Prominent among these borrowed ideas is the concept of air deterrence, which is now deemed as even more practical and applicable in contemporary warfare than the concept of nuclear deterrence.³ Another Western concept that has greatly influenced the PLAAF's long-term development plan is that of beyond-vision air combat which is regarded as a key form of future air wars. After a comprehensive review of the international armed conflicts in the 1980s, the PLA high command has realized that any future warfare would have to be multidimensional: land, sea, air, and space. As a result, air superiority is so crucial that the PLA cannot achieve any of its strategic objectives in future operations without it.⁴

The New Thinking:

The Air Force Assuming Independent Missions

Given the backwardness of the Chinese Air Force, the PLA identifies

³Min Zengfu, "A Quick Analysis of Air Warfare in the Twenty-first Century," *Zhongguo junshi kexue* (Chinese Military Science), 1995, no. 1:31-40.

⁴Command Academy of the PLAAF, "On the Campaign of Air Attack in Regional Warfare," in *Tongxiang shengli de tansuo* (Exploring the ways toward victory), ed. Editorial Group (Beijing: Jiefangjun chubanshe, 1987), 14.

enemy air attack as the gravest future threat in both total and limited high-tech wars. Wang Hai, a former commander of the PLAAF, has identified three aspects of new technology development which has changed the role of the air force in modern warfare: firepower, maneuverability, and electronic superiority. In terms of firepower, he pointed out that the traditional role of the air force underwent qualitative change as early as the Vietnam War in the 1970s. The U.S. Air Force inflicted as much as 70 percent of the total casualties suffered by the communist Vietnamese army. As a result of this demonstration of air power effectiveness, the air forces of the major powers have become an independent strategic force assuming independent combat missions. Such new responsibilities include multiple payload delivery, pinpoint targeting, and long-distance bombing of the enemy's air base. This has forced the PLA to undertake a serious revision of the role of its air force. The PLAAF's inadequacy in conducting strategic missions serves as the biggest obstacle to the PLA's organization of large-scale joint operations.⁵

Again the PLAAF's new conceptualization of its role in modern warfare originated from its enhanced understanding of how the superpowers use their own air forces. Rapid troop mobility, for instance, is made possible primarily by strategic airlift capability.⁶ In another example, the air force is now regarded as the best in electronic warfare measures, which gives the air force a unique position in joint operations. According to PLA researchers, contemporary warfare is first of all an electronic warfare to win control over information. Aircraft platforms for information and intelligence gathering can help expose the enemy's strategic intentions and troop deployments and movements. The ability of enemy's electronic aircraft to easily find targets at night has posed a serious challenge to the PLA's traditional tactic of hiding movement in the darkness. Therefore the PLAAF has to acquire sophisticated means to conduct independent anti-electronic warfare, or must assume a key role in such warfare with other services.⁷

⁵Wang Hai, "The Role of Air Force in Contemporary Warfare," *ibid.*, 927-39.

⁶*Ibid.*

⁷Dai Jingyu, "The Challenge of High-Tech Conventional Limited Wars," *Guofang daxue xuebao* (Journal of National Defence University), 1991, no. 1:50-51.

Wang Hai was among the first of the PLA top brass to recognize in the second half of the 1980s that the application of information technology has revolutionized contemporary warfare. Now it has become a popular view among the entire armed forces that an air war may be an independent process without involvement of the other services, and that the outcome of the entire war may hinge on the war in the air.⁸ This has led the PLAAF to acquire independent combat status more quickly and has helped it translate the conceptual change into practical change (as demonstrated by modifications in war plans, force restructuring, and deployment).⁹ For instance, in the 1980s, the role of the Air Force in the PLA's defence strategy was still that of weakening the enemy's effectiveness in an air offensive campaign, a role generally regarded as no more than supplementary. Now the air force has been elevated to the position of a strategic force capable of assuming independent missions. Although Jiang Zemin realizes that it will take a long transitional period for the PLAAF to actually become a true independent fighting force, he instructed the PLAAF to dare wage independent air strike campaigns as a means to secure the victory of a war.¹⁰

The Theory of Offensive Air Campaigns

The requirement for the PLA Air Force to assume independent combat missions has paved the way for a number of innovative concepts to emerge in the Air Force's campaign theories. These new developments are also politically important because they have shifted the PLA's traditional emphasis from being focused on men to being directed toward weapons. In a way, PLA generals have agreed that in a major war, ground battles are not winnable without support from other specialized services.

⁸Dong Wenxian and Hu Siyuan, "Our Air Force Must Establish New Ideas for Its Strategic Operations," *ibid.*, 1994, no. 5:25.

⁹Liu Yicang, *Gaojishu zhanzheng lun* (The study of high-tech warfare) (Beijing: Junshi kexueyuan chubanshe, 1993), 22-26.

¹⁰Jing Xueqin, "Deepening the Efforts of Implementing the New Military Strategy, Working Hard to Advance the Air Force's Modernization," *Guofang daxue xuebao*, 1997, no. 8-9:41.

Traditionally, the PLAAF's chief mission was defensive, largely confined to territorial defence. This was due mainly to the low level of its technology, which restricted its aircraft to: a short flight radius (200-500 kilometers), aerial dog-of-war combat (close engagement), and reliance on interceptors (passive defence). With the application of high technology in aircraft development, the offensive aspect of air power has been greatly highlighted. As a result, there has emerged a general consensus among China's top air force commanders that the PLAAF's strategy and tactics must be primarily offensive.¹¹

This indicates that as the PLA currently focuses on cross-Straits scenarios, it has underscored the idea of air/missile strikes directed at the enemy's defence as its primary mission. This is a visible departure from the PLAAF's traditional practice of engaging enemy aircraft at the front lines. In other words, the PLAAF is learning to conduct major air battles away from home. Therefore, it has substantially enlarged the size of air war zones to the extent that the distinction between the air defence front line and the in-depth strike zone has become less clear. Seeing itself as an offensive service, the PLAAF has required its troops to prepare simultaneously for attack on strategic targets in the enemy's rear and for defence against the opponent's aircraft or long-distance missile strikes. Accordingly, medium- to long-range air attack and defence have been emphasized in recent years as operations decisive to establishing air superiority. Moreover, the traditional focus on high-altitude interception has now been at least paralleled by low-altitude strike missions, and control over medium-altitude combat is seen as linking the two.

Since future air war is understood as high technology and information warfare, the result of the offensive campaigns will largely depend on the quality of the offensive aircraft and supporting aircraft. In contrast, the number of aircraft will relatively decrease in importance. The combined application of AWACs and medium- to long-range missiles can conveniently destroy a large number of aircraft of the weaker side beyond pilot-vision range. Precision and guided missiles and smart bombs reduce the

¹¹Ouyang Wei, "On the Question of Troop Deployment," *ibid.*, 1995, no. 6:20.

need for large bomber formations. Aircraft battle wings, both offensive and defensive, will thus become smaller. Additionally the PLA's future offensive air operations will particularly depend on effective electronic warfare measures and countermeasures, as these are crucial for the survivability of its aircraft and for achieving air superiority over its opponents.¹²

To cater to the development of an offensive air force, the PLAAF has revised its campaign theories and combat principles. The Air Force has also established its own rapid response strategies, particularly for limited regional high-tech wars under different circumstances.¹³ No longer satisfactory is the simple recognition that without control of the air nothing can be achieved in modern warfare. The PLAAF finds achieving a minimum level of deterrence in the high-tech era difficult without a long-range strike capability. This is especially essential for safeguarding the country's maritime security.¹⁴

According to the PLAAF, the development of its offensive air force will proceed through several stages. Being unable to expect to introduce enough third-generation aircraft in the near future, the PLAAF can expect its offensive capability to remain limited. Its campaign objective during the next decade will also remain limited, being basically defensive in nature and confined to the task of weakening the enemy's offensive air capability. Most operations will be conducted within China's land borders. This self-imposed limit is necessary because without sufficient support from home bases, any large-scale air operations would result in heavy losses. This limit also reflects the fact that the PLAAF is unable to secure air superiority over its potential adversaries for a fairly long time to come.¹⁵ In the early decades of the twenty-first century, however, after deploying more third- or fourth-generation aircraft and receiving more sophisticated C³I and early

¹²Fang Lin, "On the Factors That Are Decisive to Victories of Air Attack Campaigns," *ibid.*, 1995, no. 10:40-42.

¹³Teng and Jiang, *Kongjun zuozhan yanjiu*, chap. 5.

¹⁴Zhang Cangzhi, "On the Reorientation of the PLAAF from a Defence Force to One Combining Defensive and Offensive Components," in *Jundui xiandaihua jianshe de sikao* (The study of the PLA's modernization programs) (Beijing: Guofang daxue chubanshe, 1988), 239-354.

¹⁵*Tongxiang shengli de tansuo*, 942.

warning support, the PLAAF will be able to project air power much more effectively. The PLAAF is well aware that only hardware modernization will bridge the gap between doctrinal design and application. The following are some of the new features of the PLAAF's operational and tactical concepts.

Preemptive and Surgical Strike

The need for the PLA to conduct preemptive strikes lies in the fact that as the inferior side, it is difficult for the PLA to recover and reposition itself to take the offensive once the initiative is lost. Therefore the PLA should not be prevented from making plans for predeclared actions.¹⁶ These actions include bombing the enemy's key political and military targets, i.e., nuclear missile sites, defence headquarters, telecommunications hubs, and air bases—especially those for strategic bombers. As soon as a political decision is reached, the Air Force should, according to Shenyang Military Region Air Force commander Lt. Gen. Zheng Shenxia, attack first; otherwise the PLA will be left in a no-win situation.¹⁷ One thing the PLA learned from the Gulf War was that Iraq would not have lost in such a shameful manner if its military had started to attack before the majority of Allied troops were in combat readiness. The opportunity for preemptive strike is always available, since the enemy inevitably requires time to deploy to a forward position. Yet the opportunity is brief, given the awesome airlift capability of some potential opponents. In the final analysis, as argued by PLA strategists, the PLAAF must accept the principle of preemptive and decisive use of its forces. Under this principle the Air Force should keep its front- and second-line units in a constant state of readiness so as to lay a solid foundation for a joint operation with the Army and the Navy.¹⁸

¹⁶Zhang Xusan, "On the Guiding Principle of Our Campaign Tactics in Future Wars," *ibid.*, 967-77.

¹⁷Zheng Shenxia, "Several Key Questions on the Use of the Air Force in Joint Operations," *Guofang daxue xuebao*, 1997, no. 1:45.

¹⁸Wang Qunbo, "Guidelines for Air Force Mobile Campaigns," *Junshi xueshu* (Study of Military Science), 1994, no. 12:27.

Securing Air Control in Selected Battle Directions

Given the large gap in airpower between China and its potential opponents, it is not possible for the PLAAF to obtain absolute air control in a major air war with a regional opponent if the war is conducted beyond a certain range. The PLAAF believes, however, that if it concentrates enough of its advanced aircraft and air defence weapons in a selected battle direction, it may achieve temporary tactical air superiority against even a major power, and in doing so, it would be able to win limited offensive air operations. This is possible because post-Cold War international politics will not involve China in multiple war directions at the same time. Therefore, this allows the PLA to deploy its main attack capabilities in the war zone where actions are most likely to take place. Quoted below is one case analysis by a PLAAF officer:

In future wars the air force must concentrate enough strength to neutralize airports or aircraft carriers in its front. For instance, an aircraft carrier battle group has strong defences that can be extended over five hundred kilometers in five layers. To tackle this target the PLAAF should mobilize, even at high cost, enough aircraft to launch a continuous strike. It should also be supported by land-based, airborne, and shipborne tactical missiles. In one battle direction the PLA will be able to achieve limited air superiority if it makes coordinated efforts.¹⁹

Here the number of aircraft is a significant factor. For instance, by the PLAAF's calculation, if the enemy has four hundred aircraft, the PLA will have to concentrate enough aircraft to outnumber the enemy's four to one. This should be done through regrouping the PLAAF's best aircraft located in different air force regional commands.²⁰ It is interesting to note that this figure of four hundred aircraft is the current force strength of Taiwan. And the idea of concentrating the PLAAF's best aircraft from its different regional commands is also important. At present the number of the PLA's first-line aircraft across the Taiwan Strait is small due to the small number of military airports.²¹ This scenario, therefore, also dictates a major re-

¹⁹Yang Zhenggang, "The Employment of Air Strike Power in Air Strike Campaigns," *ibid.*, 1995, no. 3:37.

²⁰Liu Zuoxin, "Initial Research on the Force Structure and Command for Offensive Air Campaigns," *Guofang daxue xuebao*, 1995, no. 10:40.

²¹The number of the PLA's first-line airports across the Taiwan Strait now stands at thirteen.

deployment of the PLAAF's best units.

Yet concentration in strength may be difficult to execute. Take Taiwan's case as an example. Each of the PLAAF's thirteen first-line airports—located within four hundred kilometers of Taiwan—can normally deploy one regiment which has about thirty to thirty-five aircraft in its battle array. Therefore, there are only about four to five hundred aircraft available for a first-wave attack. This number is too small to handle the advanced jet-fighters in Taiwan. The offensive cannot be sustained over a given period of time. Even if more than one regiment is stationed at these airports (at the risk of overcrowding), there is yet another problem: According to estimates by Taiwan air force generals, air space limitations restrict combat activities to 168 aircraft at any given time. Therefore, even if the PLAAF can concentrate a large number of aircraft, these cannot be employed in the way it theoretically designs.²²

Another key factor is how to deploy enough strength for a credible first-strike capability. Traditionally, the PLAAF's defensive nature prescribed a "light front, heavy rear" principle to guide its deployment. This is now impeding the PLAAF's switch toward an offensive-oriented posture in some anticipated contingencies. Yet the PLAAF also opposes positioning too much strength in the front line, as its capabilities of early warning and air defence are weak. To overcome this contradiction the PLAAF has proposed new deployment plans. Under the precondition of no substantial rise in the number of front-line air bases, the PLA will have to readjust the types of its aircraft in the first ring, making it more offensive-capable. This means more attack aircraft will be deployed in the front than before, supported by some interceptors and specialized aircraft. The main aim is to preemptively destroy the enemy's jet-fighter, early warning aircraft, and air defence hubs in the ground. At the second line there should be sufficient bomber and jet-bomber units. Their deployment is decided by their specific missions in an offensive action. Coordination by fixed deployment on the ground and mobile deployment in the air is necessary, due to the lack of air bases. The

²²Fan Li, "Some Analysis of the Structure of Air Control Power in Taiwan," *Guoce* (National Policy), no. 104 (January 24, 1995): 7.

overall posture serves the ultimate objective of active air strike.

In a Joint Operation with the Army and Navy

The PLAAF has been designated to play a key role in a joint operation with the Army and Navy in any future wars. Specifically, it assumes the missions of air reconnaissance, air control, bombing before and during the charge by the ground forces, transporting troops and supplies, and the air-lifting of casualties. Recently the PLAAF has particularly studied its role in a theater (war zone) campaign participated in by a number of army groups and navy sub-fleets. The PLAAF has also formulated detailed campaign designs for likely border wars and conflicts with different landscapes (countries). Moreover, it has planned for various kinds of smaller-scale actions. Such actions include how to employ the air force in a maritime operation one thousand miles away from home, the air force's role in a surgical strike against a terrorist state that damages China's vital interests, and air force procedures in a tactical nuclear war.

One of the Air Force's planned missions is a major landing operation involving 100,000 personnel or more. This is a strategic campaign of several army groups. At least one air force corps and a number of air defence divisions would be deployed. If required, a few airborne divisions would also join the campaign. The forces involved are organized into three formations. The first is the strike formation, intended to destroy prescribed enemy targets. It is composed mainly of bombers and ground strike divisions, plus some jet-fighter regiments. The Strategic Missile Force's tactical missile units should be an important additional component of this formation. The second and third formations are deployed for the purpose of protection of the first. The second comprises jet-fighter divisions and surface-to-air missile (SAM) divisions. They provide not only a shield for the strike formation in the air, but also air defence for the major political and military targets on the mainland. The third formation is made up of specialized aircraft with duties such as electronic warfare, early warning and surveillance, and transportation.²³ Throughout the whole process they

²³See note 19 above.

should keep close contact with the landing forces, as they assume specific tasks such as providing air cover for land force boarding ships, navigation, landing, and consolidation of landing platforms.²⁴

In such a large-scale joint operation, the formation of the air wing should give more emphasis to attack aircraft. In the stage of establishing air control prior to landing operations, while 10-15 percent of the aircraft should be used for providing air cover for shipping the troops, only 35-40 percent of all aircraft should be employed in paralyzing the enemy's air power by attacking its airfields and C³I centers. In the stage of landing and consolidating landing platforms, at least 50 percent of the sorties should be devoted to protecting the ground force landing units. During this stage, the Air Force provides crucial support for the PLA Navy to secure sea control, a precondition for landing troops. Bombing operations should be carried on throughout, although jet-fighters play the decisive role of intercepting the enemy's aircraft, which is essential for the ground forces to create and consolidate landing platforms at the third stage.²⁵

Restructuring for an Offensive Air Force

Since 1990 the PLAAF's preparation for action has been characterized by three parallel initiatives: restructuring, enhanced training, and hardware upgrading, each of which is seen as critical to the PLAAF's modernization and readiness. As far as training is concerned, a three-stage pilot education system was established in the 1980s (flying academy, training base, and operational units), all the pilots in the PLAAF have acquired university qualifications, and all the aviation unit commanders including the Air Force commander can pilot aircraft.²⁶ Moreover, since the PLA's comprehensive training reform was carried out in 1993, the Air Force has tailored its training program to the scenarios of a high-tech war: the PLAAF

²⁴Dai Jingyu et al., "The Challenge of High-Tech Conventional Limited Wars," *Guofang daxue xuebao*, 1993, no. 1:291-308.

²⁵Ibid.

²⁶*Jiefangjun bao* (Liberation Army Daily), November 10, 1994.

is more target-specific, close to combat situations, and integrated into joint exercises with other services. More concretely, training for strike and very low altitude flying has increased substantially and night exercises have become a must for all PLAAF units. According to PLA sources, most aviation units have overfulfilled the annual flying requirement of 122.25 hours.²⁷ Some "elite flying regiments" (*jialeituan*) in certain war zones have approached a record high of 200 hours in implementing *The PLAAF's Training Guidelines for Joint Operations*. Even the cadets in the flying academies have to increase their hours in the air. A cadet now normally flies 200 to 300 hours in his three years of training. This is in sharp contrast with the 1980s, when a cadet could only fly a few dozen hours.²⁸ The traditional pattern of "closed-door training" (single service training) has been remedied through joint training with the Army, the Navy, and the Strategic Missile Force.²⁹ One particular theme in the training reform has been the change in emphasis from defensive to offensive missions. This was the central design of the largest live ammunition exercise the PLAAF ever staged—an exercise held in northwest China in September 1996, which was a follow-up of the war games conducted close to the Taiwan Strait in March of the same year.³⁰ By the mid-1990s the PLAAF had achieved some improvement in "software" development, even though it was still far behind the other major powers in terms of "hardware modernization."

As far as the force restructuring is concerned, no desired progress has been made in meeting the demand of a high-tech air war, largely due to the fact that the PLAAF cannot provide enough advanced aircraft to make the transition from a defensive to an offensive force. The long-term guideline for the task is that the PLA should create an air force capable of both conducting a high-tech air warfare and exerting credible deterrence against potential threats from the air; it should be powerful enough not only to win

²⁷Yu Hao et al., *Dangdai Zhongguo: Zhongguo renmin jiefangjun* (Contemporary China: The PLA) (Beijing: Renmin chubanshe, 1994), 78.

²⁸Yin Changzhi, "Study Deng Xiaoping's Inscription and Do a Good Job in Training Qualified Personnel," *Haijun* (The Navy), 1994, no. 1:21.

²⁹Mao Huangli et al., "Several Questions Concerning the Tightening Up of the PLAAF's Campaign Training," *Junshi xueshu*, 1993, no. 3:31.

³⁰*Jiefangjun bao*, September 16, 1996.

a limited regional conflict but also an all-out war. Moreover, it should be effective both in its supporting role in a joint operation organized by a military regional command and in an independent operation initiated directly by PLA headquarters.³¹

The PLAAF went through a deep restructuring in the mid-1980s in an effort to make it leaner. By 1988 its total personnel had been cut back by one-fourth.³² The ongoing restructuring efforts of the PLAAF have been guided by one fundamental objective: remolding it into a multirole air force capable of assuming independent missions, in order to serve as a strategic arm of the PLA central command. The key to the multirole force is to create an air force that should, according to its deputy commander, Lt. Gen. Jing Xueqin (formerly commander of the naval air force), transform its force structure from one that is mainly defensive to one that is a combination of credible defensive and offensive capabilities.³³ As an offensive force, it should perform not only its traditional missions of air attack and defence but also of space attack and defence. It should also develop nuclear and missile defence capabilities. To be more concrete, the following restructuring measures are being implemented.

First, the Air Force should be divided into two parts: strategic and regional units. The former are placed directly under the control of the Central Military Commission (through the air force central command in Beijing) and should primarily be offensive-oriented, while the latter should be under the control of the seven military regions, assuming tactical missions. The priority in force development is accorded to the former, including funding, training, equipment, and personnel allocations.³⁴

The defensive nature of the PLAAF is reflected in the fact that it has disproportionably too many fighter divisions in the overall force structure. PLA analysts have noticed that in the last decade the Soviet Union reduced

³¹Dong Wenxian, "First of All, We Must Have a Powerful Air Force," *Zhongguo junshi kexue*, 1995, no. 1:77-82.

³²Wang Hai, *Dangdai Zhongguo kongjun* (The contemporary Chinese air force) (Beijing: Zhongguo shehui kexue chubanshe, 1989), 675.

³³See note 10 above.

³⁴Dong Wenxian, "The Size and Structure of the PLAAF in the New Era," in *Jundui xian-daihua jianshe de sikao*, 394-410.

its jet-fighters by 55 percent, and the United States, by 24 percent. They concluded that under high-tech conditions simple-function fighters could establish neither air superiority nor a level of deterrence. Therefore, the ongoing restructuring aims at cuts in the number of fighters and the enhancement of the bomber/attack units, as new model attack aircraft are to be produced. In December 1998, China's new generation fighter-bomber (nick-named Flying Panther or FBC-1) entered into production, although there is no way to know how many of the type will be produced. What is certain is the fact that the number of the PLAAF's attack aircraft will be significantly boosted within a period of time, thus improving the ratio of attack aircraft and jet-fighters in its force structure.³⁵ In contrast, according to *The Chinese Defence White Paper*, the PLA had already scrapped over 6,000 aging aircraft by the 1980s, most of which have been J-5s and J-6s.³⁶ And there is a further room for scrapping jet-fighters in the PLAAF. As a result, according to a 1998 U.S. Department of Defence Report on the Cross-Strait Military Balance, the PLAAF will possess 2,200 tactical jet-fighters, 500 ground attack aircraft, and 400 bombers.³⁷ The ratio between jet-fighters and attack aircraft/bombers will by then have declined to nearly two to one, a much more healthy proportion.

Now the biggest challenge to the PLAAF is how to get rid of the remaining J-6s, which comprise over 50 percent of the Air Force's jet-fighters; and how soon. The PLAAF has proposed that the number of J-6s should be at least halved by the end of the decade, and gradually they should be phased out altogether in the first decades of the new century. This will profoundly affect the PLAAF's overall size and strength, cutting its entire inventory from 4,297 in 1994 to about 2,344 in the year 2005 (see figure 1).

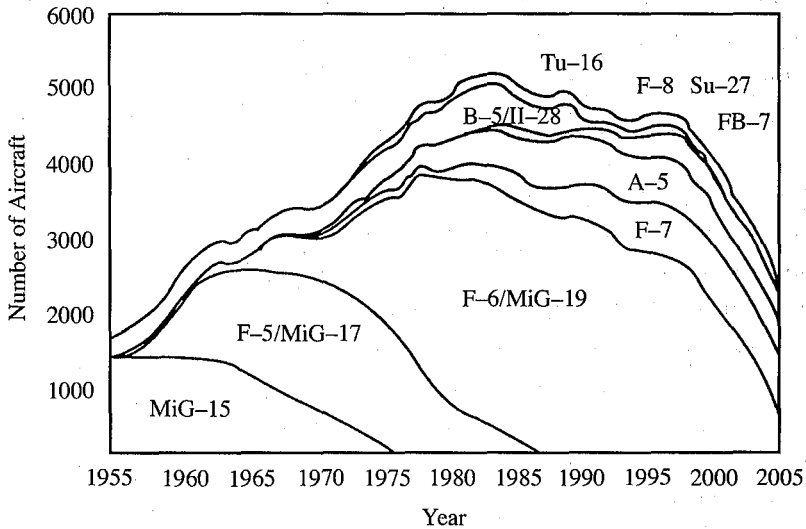
The number in 2005 may be even smaller, as China may stop producing J-7s at the turn of the century. It is likely that the PLAAF will acquire

³⁵Men Xian and Zheng Shaozhong, "The Coming into Being of Our Domestically Developed Fighter-Bomber," New China News Agency, December 22, 1998.

³⁶*Renmin ribao* (People's Daily), November 19, 1995.

³⁷I thank Mr. Ken Allen of The Henry L. Stimson Center for sharing this piece of information with me.

Figure 1
PLAAF Fighter Force Projection



Source: Ken Allen, Glen Krumel, and Jonathan Pollack, *China's Air Force Enters the 21st Century* (Santa Monica, Calif.: RAND, 1995), 140.

more Su-27s than the seventy listed in figure 1 through domestic production of the aircraft. Yet this will be unlikely to compensate for the loss of the J-7s. As the J-8II is only a transitional aircraft and no new follow-up to it has been planned to enter into service in fairly large numbers, the pace of decommissioning the J-6s has to be slowed down to allow the PLAAF to maintain a force level of at least twenty jet-fighter divisions.

As an alternative to removing the J-6s substantially in the short run, the PLAAF put forward a restructuring plan of establishing combined divisions composed of jet-fighters and attack aircraft in order to enhance the strike capability of the Air Force.³⁸ The restructuring resulted in mergers of a number of fighter and ground attack/bomber divisions. Therefore, some of the first-rate fighter divisions now have regiments of bombers and

³⁸Teng and Jiang, *Kongjun zuozhan yanjiu*, 174.

attack aircraft. For instance, some elite jet-fighter divisions have two interceptor regiments and one ground strike aircraft regiment. Each of the interceptor regiments is equipped with thirty-two jet-fighters, mainly J-7s and J-8IIs but with a small number of Su-27s and J-6s. The attack aircraft regiment is equipped with about twenty-five A-5s. In some cases a ground attack division can also be injected into a jet-fighter regiment. The PLAAF's elite divisions have already begun this experiment.³⁹ This mixed structure is aimed at creating an all-altitude defence/strike capability. Here the J-6s assume the strike mission in relatively large formations, utilizing their low-altitude and close-range combat capabilities.⁴⁰ In what is defined by the PLAAF as the "*yijian daiqian*" (using interceptors as attack aircraft) program, the J-6s and J-7s can enjoy some extended life. Although having a limited radius in air combat, both are still regarded as suitable for large-scale air war above the Taiwan Strait because of the short distance the aircraft have to cover. In recent years these two types of aircraft have been engaged in ground attack training.⁴¹ This experimental effort has been designed to strengthen the offensive function of the jet-fighter divisions at the tactical level. It is prescribed that following the principle of the "*yijian daiqian*" program strike capability should make up at least 40 percent of the force structure's overall strength.⁴²

Second, the establishment of rapid response units has been listed as a top priority in the new round of restructuring. These units include a few air force corps as the national strategic reserve force (*zhanlue yubeidui*); the elite rapid response units (*zhanlue zhiban budui* or those units on 24-hour strategic duties); air defence corps that are entrusted with defence of sensitive areas; airborne corps; strategic transportation corps (to appear perhaps in a decade or so); and other special units such as electronic warfare and early warning aircraft.⁴³ The need for these rapid response units can be

³⁹ *Jiefangjun bao*, May 6, 1998, 2.

⁴⁰ Ji Rongren, "In Organizing Offensive Air Campaigns There Should Be Five Good Coordinations," *Guofang daxue xuebao*, 1995, no. 10:46.

⁴¹ *Renmin ribao*, December 2, 1995.

⁴² Liu Zuoxin, "Initial Research on the Force Structure and Command for Offensive Air Campaigns," *Guofang daxue xuebao*, 1995, no. 10:40.

⁴³ Dong, "The Size and Structure of the PLAAF in the New Era," 398.

seen from the fact that until the second decade of the new century no regional air force, except for Beijing, will be able to organize independent air campaigns. In such an event it would need reinforcement by the centrally-controlled national strategic reserve force. Therefore, all elite air force units in military regions may take the mission of supporting other regional air force commands in an emergency situation.⁴⁴ This endeavor of forging rapid response units is now being pursued in the following three fronts:

1. *Concentration of the troops which are responsible for strategic missions but are currently under separate regional commands.* They are to be reorganized into an independent force. For instance, the PLAAF's Hong-6s (Tu-16s) are designated as carriers of nuclear weapons, although they represent the weakest link in China's nuclear triad. The H-6s are, nevertheless, the only strategic aircraft available to the PLAAF for supporting joint operations with the PLA's ground forces and the Navy. H-6 units are now dispersed in several military regions, but the restructuring will see them concentrated within a single command and control system, imitating the functions of the already disbanded U.S. Strategic Air Command.⁴⁵

2. *Direct central command of the elite jet-fighter units.* These are highly mobile "fist" units equipped with the PLA's best aircraft. They are to be deployed reasonably close to "flashpoint" areas in order to assume the functions of deterrence and containment. They should exercise, however, in all potential major battle directions.⁴⁶ These units are centrally-controlled but may be placed under the normal daily management of a war zone command. For the time being, there are no air defence units directly under the control of the regional air force commands. The most urgent restructuring task in this regard is, therefore, to create rapid response air defence units at the war zone level, as suggested by senior PLA officers. Each war zone should organize at least one rapid response air defence division vis-à-vis air defence brigades in the normal force structure, and each division should have regiments responsible for high-, medium-, and low-

⁴⁴Liu, "Initial Research on the Force Structure and Command," 41.

⁴⁵Dong, "The Size and Structure of the PLAAF in the New Era," 399.

⁴⁶See note 14 above.

altitude defence. Rapid response units should be highly mobile and equipped mainly with most advanced SAMs in the PLA's arsenal.⁴⁷ Rapid response units should also be capable of getting airborne and arriving at any potential battlefield on short notice.

3. *Strengthening the PLAAF with sufficient aircraft with specialized functions such as early warning and control, aerial refueling, electronic warfare, large transport, surveillance, and reconnaissance.* One proposed ratio is that jet-fighters consist of no more than 55 percent of total PLAAF aircraft (down from the current over 70 percent), bomber/attack aircraft 35 percent, and others 10 percent.⁴⁸ This proposal was tabled in the late 1980s. It is likely that the percentage of the simple-function interceptors is to be further reduced as a long-term developmental trend, while the specialized aircraft units strengthened. Many PLA reports on the Gulf War noted that the percentage of supporting aircraft was larger than that of aircraft directly involved in the attack. This is understood as a key feature of modern high-tech warfare.⁴⁹ Moreover, preparations have been made for the establishment of "arms of specialized functions" in the PLAAF, e.g., a space force to deal with the increasingly intense threat from space and an independent anti-electronic warfare command in the PLAAF.⁵⁰ This need has been highlighted by the fact that two Chinese meteorological satellites suddenly became dysfunctional in early 1998. Although the real causes have not been made known, some sources say that the satellites encountered a great deal of abnormal "pressure" from space.

As briefly mentioned earlier, restructuring and redeployment for future air wars require modification of the PLAAF's traditional "light front, heavy rear" principle, which is meant to prevent unnecessary losses of planes if the enemy launches a surprise strike at the PLAAF's airfields. Under this guiding principle the PLAAF divides the battle area into three

⁴⁷Cui Longzhu, "Establishing War Zone Air Defence Troops," *Junshi xueshu*, 1994, no. 11: 53.

⁴⁸Dong, "The Size and Structure of the PLAAF in the New Era," 398.

⁴⁹Zhang Zhen and Su Qingyi, *Guojishu yu xiandai kongjun* (High technology and the modern air force) (Beijing: Junshi kexue chubanshe, 1993), chap. 2.

⁵⁰Jing, "Deepening the Efforts of Implementing the New Military Strategy," 42.

tiers, using the front line of enemy airfields as the baseline. The first tier extends to a radius of five hundred kilometers from the baseline, the second another five hundred kilometers, and the third extends beyond one thousand kilometers. This, however, creates a major problem for air force deployment, as most of China's military aircraft are deployed at least two hundred kilometers away from national borders. As a result, the majority of China's aircraft do not have the capability to fly to the border from their home bases, loiter for any length of time, conduct an interception, and return home again.⁵¹ This is a serious problem that the PLAAF has to resolve soon.

Air Defence: A Top Priority for Development

China's air defence system comprises five subsystems: the C³I system (the headquarters at various levels), the early warning system (the radar and communications units), the interceptive system (the aviation wings), the logistical supply system, and the civil defence system. Generally speaking, air defence is the most backward arm in the PLAAF. According to one PLA air defence expert, qualitatively speaking China's air defence weaponry is two generations behind that of the major powers and the gap is now widening. In terms of the numbers of aircraft and anti-aircraft weaponry the PLAAF has deployed, China's territorial air defence is at least five times sparser than that of the former Soviet Union, leaving large numbers of key political and military targets inadequately protected.⁵² The lessons of the Gulf and Kosovo wars also demonstrated the importance of air defence in the overall national defence. Gravely worried, Central Military Commission leaders have in recent years allocated much fund for up-

⁵¹Ken Allen, Glen Krumel, and Jonathan Pollack, *China's Air Force Enters the 21st Century* (Santa Monica, Calif.: RAND, 1995), 115.

⁵²Min Zengfu, "On the Establishment of the Command System of National Air Defence," in *Jundui zhihui lilun jijin* (A collection on the command theories of the army), ed. PLA National Defense University (Beijing: Guofang daxue chubanshe, 1992), 579.

grading the air defence system, as seen from purchases of foreign hardware. High on the agenda is the R&D of a sophisticated missile defence system.⁵³ The eventual goal is to create an integrated air defence system that can withhold air/missile/electronic attack of the Kosovo intensity.

Operational Air Defence Concepts

The guiding principle of China's air defence has traditionally been that of point defence, a form of passive defence that requires positioning of air defence weapons around sites in need of protection. Air defence weapons are separately deployed for defending their specific targets and do not function as an integrated system. Now the PLAAF has proposed a new kind of air defence theory, which can be termed "large area defence" (*quyu yanhu*).⁵⁴ According to this concept, defence should be effectively extended to the whole area within which those points are located. Each point is just part of a whole network, and the weapons around it can be employed to support the defence of other points. Sometimes this enlarged area covers a region large enough for a theater campaign. The PLAAF's early warning system is thus required to extend well into the enemy's territories. From there the multilayered defence is divided into three lines: outer ring, medium ring, and inner ring. The outer ring is mainly the responsibility of the jet-fighters, which should stop a major proportion of intruders. The medium ring includes both aircraft and SAMs. The inner ring, composed of short-range SAMs and anti-aircraft guns, is the last defence line for the key targets and must wipe out the remaining invaders.⁵⁵ This in-depth area defence dictates improvements in early warning, multilayered interception, and four-dimensional defence (underground, land, air, and space), and therefore represents a kind of integrated defence with combined combat units from different services.⁵⁶

⁵³Chen Hongyou, *Xiandai fangkong lun* (On modern air defence) (Beijing: Jiefangjun chubanshe, 1992), 61-69.

⁵⁴*Jiefangjun bao*, April 30, 1993.

⁵⁵Hu Wenlong and Cha Jinlu, *Xiandai junbingzhong zhanshu* (The contemporary tactics of service arms and branches) (Beijing: Junshi kexueyuan chubanshe, 1993), 445.

⁵⁶Guo Yongjun, "Air Defence Should Be Guided by the Theory of Area and Integrated Defence," *Junshi xueshu*, 1995, no. 11:47-49.

Transforming air defence from passive to active defence is another new trend in the PLAAF's operational strategy. The PLAAF has recognized that with the greatly improved penetrating capability of the fourth-generation aircraft, passive defence can no longer protect targets effectively. In a high-tech era, comprehensive measures are needed which combine defence systems: interceptors, SAMs, anti-aircraft artillery, and construction to augment the survivability of Chinese installations.⁵⁷ Among these, the first is most preferred. Therefore, large-area air defence is closely linked to preemptive strike and long-range interception. Nothing would bolster air defence more than neutralization of the enemy's air bases or aircraft carriers.⁵⁸

An effective, modern air defence must proceed from developing countermeasures to "soft kill" of electronic warfare which can paralyze the opponent's C³I systems. The PLAAF has raised the issue of anti-electronic warfare as the key link in a successful air defence. It believes a modern air defence system is based on high technology-intensive electronic equipment. Air defence is the first line of all anti-electronic warfare. Without the means to deal with electronic bombardment, 80 percent or more of military hardware can be rendered ineffective, and many vital facilities paralyzed. The PLAAF has therefore broadened the concept of air defence from defending against the enemy's aircraft and missiles to include electronic warfare in the air. It believes that only when the PLA can defend itself against electronic warfare, which is the prelude to offensive air campaigns, can China win the real air war.⁵⁹

The Three Missions in Air Defence

As mentioned earlier, the air defence force of the PLAAF is entrusted with three major missions: territorial air defence (*guotu fangkong*); defence for key political, economic, and military targets (*zhongdian fangkong*); and

⁵⁷Chen, *Xiandai fangkong lun*, 64.

⁵⁸Zhan Fangyou, *Haijun zhanyixue jiaocheng* (The textbook for naval campaign theory) (Beijing: Guofang daxue chubanshe, 1991), 134.

⁵⁹Fang Lin, "On the Factors That Are Decisive to Victories of Air Attack Campaigns," *Guofang daxue xuebao*, 1995, no. 10:42.

battlefield defence (*yezhan fangkong*). Therefore, the components of the PLAAF's air defence systems are structured accordingly. For territorial air defence, the main force is a combination of regular air force defence units and civil air defence networks. The regular air defence system is largely equipped with anti-aircraft artillery and surface-to-air missile batteries. The civil air defence system involves millions of militia personnel. The backbone of the system is the air force reserve anti-aircraft units, which are organized into a division-regiment structure and commanded by active and reserve air force officers. These divisions are normally positioned around the major civil targets.

The key-point and battlefield air defence systems are now undergoing a transition from relying on anti-aircraft artillery to SAM systems. For the key-point air defence, a national missile defence command center has been set up at the headquarters of the PLAAF. It is linked to a national surveillance system composed of large numbers of early warning radars of all ranges.⁶⁰ On the eve of the celebration of PLA Founding Day in 1997, PLAAF Commander Liu Shun Yao announced that China now has a complete air defence network composed of all types of SAMs, including long-range missiles.⁶¹ As the network is still at its initial stage of construction, however, it suffers from, among other things, slow reaction time, as it normally takes a few hours to become fully operational nationwide. The most heavily-guarded city is the country's capital, Beijing. The first few SAM units were deployed around Beijing in the 1960s. In 1996-97 a special air defence missile division was established in the Beijing Military Region and was equipped with China's latest types of SAMs. Its regiment-division force structure indicates that it is an enhanced unit and assumes both strategic and tactical air defence missions. Soon after the division's new equipment became operational, General Zhang Zhen visited the division and watched its live ammunition exercises. He spoke highly of the division's readiness for action.⁶²

Battlefield air defence is mainly the responsibility of the army anti-air

⁶⁰*Jiefangjun bao*, November 11, 1994.

⁶¹*Ta Kung Pao* (Hong Kong), June 23, 1997.

⁶²*Ibid.*, July 9, 1997.

defence brigades at the group army level, and battalions at the division-regiment level. One chief task of these ground force air defence units is to defend the infantry and tank troops against enemy helicopters. Normally, however, the group army's air defence is strengthened by the PLAAF's air defence units in the major combat directions. These units are mobile and equipped with SAM batteries, most of which are short- and medium-altitude missiles. And they are better trained as well, specializing in battle-field air defence missions, for instance, in dealing with different types of aircraft. In recent years air force units and army anti-air attack troops have started joint exercises, although there is a long way for them to go in order to achieve smooth combat operations.

Currently battlefield air defence is based mainly on anti-aircraft artillery guns and SAMs, which are combined within air defence units in the Army. This mixture is designed to meet the needs of providing an air defence shield for the army units against enemy aircraft flying at both high and low altitudes. In their division of labor the SAM systems mainly cope with fixed-wing medium-to-high-altitude aircraft, and the anti-aircraft artillery is still considered effective against low-altitude aircraft, especially paratrooper transports and attack helicopters. This is the reason why a fairly large number of anti-aircraft artilleries still remain in service in the PLA and are mixed with SAMs.⁶³ The most advanced type of these artilleries has been equipped with an effective fire control system which has substantially raised rapid response capability. The PLA reportedly copied this system from a similar one used by the Israeli armed forces. The system aims to reduce human losses through separation of personnel from the guns, relying on its computerized automation procedures. On the other hand, however, the pace of transition toward missile systems is accelerating. This will lead to the decommission of a large number of anti-aircraft artilleries currently in service. At the same time, more and more short-range air defence missile systems have been introduced, mainly for the purpose of dealing with tank-killer helicopters.

The territorial and key-point air defence systems will increasingly

⁶³Hu and Cha, *Xiandai junbingzhong zhanshu*, 552.

move toward missile systems as well. The PLAAF began to build up SAM units in the early 1960s and now possesses over two dozen missile divisions/brigades. However, the quantity in personnel is compromised by the lack of quality in hardware. The bulk of the missiles are updated versions of Soviet prototypes of the 1960s. Their reliability is questionable in the high-tech era. Even though the number of air defence units is large, the density of air defence coverage is still limited. The big "holes" in air defence have made strategic cities and military facilities vulnerable to a "Desert Storm" type air attack. This may be the major reason why the PLA included the purchase of S300 SAMs in the first Sino-Russian military deal. S300PMU-1, the version the Chinese have bought, is said to be the world's most advanced surface-to-air interceptive missile system.

For the time being, the aspect of air defence most worrying to the PLA high command is battlefield air defence. The threat to PLA ground force units comes from two sources—attack aircraft and tactical missiles—but the former poses a more serious danger. One senior PLA army officer calculated a battalion of forty-four Apache helicopters could fly five times a day and each helicopter could destroy one or two tanks on each sortie. This could wipe out one PLA tank division within a day. Furthermore, the air defence capability of the PLA's tank divisions is weak. All its air defence weapons put together could only cover one-tenth of the area into which its tanks are deployed. The protection is even weaker when the division is on the move. In addition to its low speed, divisions have anti-aircraft guns and a small number of infantry SAMs that can only cope with a limited number of sorties flown by low-altitude aircraft.⁶⁴

At the group army level the situation is even worse. According to Lt. Gen. Huang Xinsheng, former commander of the 27th Group Army, when the Army is positioning for an offensive campaign, its troops cover an area of forty to sixty kilometers in width and over one hundred kilometers in length, a total of five thousand square kilometers.⁶⁵ The current anti-air

⁶⁴Zhao Ji, "On the Air Defense Problems of Tank Divisions in a Defensive Campaign," *Junshi xueshu*, 1992, no. 6:31-32.

⁶⁵Huang Xinsheng, "The Question of Organizing and Commanding Long-Distance Troop Movement under the High-Tech Conditions," in *Jundui zhihui lilun jijin*, 104.

equipment available to a group army is grossly inadequate to provide protection for this large area. Lt. Gen. Li Jijun, deputy president of the PLA Academy of Military Sciences, estimates that if a group army cannot destroy 24 percent of the enemy's attacking aircraft, it cannot get through the battle zones. Even if able to get through, the group army is likely to have suffered unbearable losses.⁶⁶ The PLA is trying to address this fatal weakness, as it constitutes a matter of life and death in any high-tech war. Among other things, more anti-air attack weaponry will be introduced to the ground force's anti-aircraft units and basic-level companies in the coming years. Moreover, when a group army is in forward movement, measures will be taken to make the unit sparsely deployed. The objective is to prevent the situations wherein any given enemy air strike wing can simultaneously threaten more than one division/regiment, or an enemy missile or bomb can damage more than one company.⁶⁷

Conclusions

The best lesson China has learned from the Gulf and Kosovo wars is the importance of the employment of air power in high-tech wars. This lesson has significantly influenced the debate within the PLA Air Force regarding the role of the service in modern warfare. As discussed in this paper, a consensus has emerged that has emphasized the strategic function of air power in the new age. The Air Force's traditional role of supporting the Army has not been discarded, but the PLA Air Force is given more independent missions to perform, such as establishing air superiority, launching long-distance strikes, and conducting surgical operations for political purposes. The new thinking concerning the functions of air force in the future has paved the way for a number of key reforms.

First, the PLA Air Force is being restructured from a fundamentally defensive force to a force with both defensive and offensive capabilities. In

⁶⁶Li Jijun, "Some Reflection on the Development of Campaign Theory," in *Tongxiang shengli de tansuo*, 882.

⁶⁷*Junshi xueshu*, 1994, no. 11:51.

this combination, however, offence represents the main function of the service. As a result, the number of jet-fighter divisions has been reduced, while space is being created for the introduction of more multifunctional aircraft to take the leading role in the years to come.

Second, this force restructuring has affected the whole weapons programs for the PLA Air Force. Among the top priority projects are strategic airlift, aerial refueling, and ground-attack capabilities. A new generation of air superiority fighters is being developed.

Third, air defence and missile defence have been listed as the weakest point in the PLA's modernization and thus received new emphasis for remedy. All this is designed to catch the PLA Air Force up with international trends in the revolution in military affairs.