



CHINA'S PURCHASE OF RUSSIAN FIGHTERS: A CHALLENGE TO THE U.S.

INTRODUCTION

U.S. military strength in Asia underpins deterrence and U.S. leadership in Asia. If the two Koreas were to reunify, American ground troops would likely be reduced, and American air power in Asia would become much more important in maintaining deterrence. China's recent purchase from Russia of co-production rights for the Sukhoi SU-27 *Flanker* jet fighter represents a significant step in Beijing's ambition to build a world-class air force. Currently, the People's Liberation Army Air Force (PLAAF) is saddled with thousands of obsolete Soviet-era combat aircraft and is deficient in advanced munitions, electronic warfare systems, logistics, and training. The SU-27 will be China's first jet fighter with capabilities roughly equivalent to current U.S. Air Force, Navy, and Marine fighters. U.S. intelligence reportedly estimates that China may obtain up to 300 SU-27s. If successful in absorbing the Sukhoi's technology and production know-how, China eventually could challenge American air superiority in Asia.

To sustain deterrence in Asia, the U.S. must proceed with programs to build advanced fighter aircraft and munitions that will guarantee American air superiority in Asia. Specifically, the U.S. should:

- ✓ **Sustain funding for the F-22A jet fighter.** This is the only U.S. jet fighter currently in development that promises a clear level of superiority to the SU-27.
- ✓ **Maintain 12 Navy aircraft carrier battle groups.** The Clinton defense budget puts at risk the Navy's ability to project power in Asia. Should budget pressures force a reduction in carrier battle groups, the Navy may be required to deploy its Seventh Fleet carrier, now homeported in Japan, to non-Asian trouble spots for increasing periods of time, thereby reducing the U.S. deterrent in Asia.

- ✓ **Develop an air-superiority fighter for the Navy.** With the Navy's F-14 *Tomcat* to be phased out by 2010, the Navy will need a fighter that is clearly superior to the Russian SU-27.
- ✓ **Accelerate development of a helmet-sighted missile and make advanced U.S. air-to-air missiles available to U.S. allies.** The U.S. and its allies should have such a system to counter current Russian helmet-sighted missiles sold to China.
- ✓ **Develop advanced versions of the F-16 and F-18 for allied and friendly Asian air forces.** The danger is that the U.S. could lose sales to future European or Russian aircraft.
- ✓ **Ask Russia and Israel to curtail sales of advanced combat aircraft and related technology to China.** Russia and Israel should be told that they are helping to accelerate a military modernization program that could destabilize Asia.

CHINA'S SU-27 DEAL

In February, it was reported that Moscow and Beijing had reached agreement on a \$2.2 billion deal for China to begin co-producing the Sukhoi SU-27.¹ The Chinese designation for this aircraft will be the J-11. China had purchased an initial batch of 24 SU-27s in 1991 for about \$1 billion. These aircraft were reported to have been delivered by the end of 1992 and are based at Wuhu Air Base, about 150 miles east of Shanghai.² In May of last year, it was reported that China had purchased a second batch of 22 aircraft as a prelude to the larger co-production deal.³ Former Russian Defense Minister Pavel Grachev said the second batch of SU-27s was delivered in April.⁴ These aircraft will be based at Suixi Air Base in Southern China.

Estimates vary as to the final number of SU-27s that China may purchase or co-produce. According to one report, the first co-production contract would enable the Chinese to produce 40 to 60 aircraft from Russian-made components over the next three years.⁵ According to another source, China may obtain a total of 72 to 78 SU-27s from this deal, enough to equip three regiments of the PLAFAF, followed by co-production after five years.⁶ Yet another source states that China will purchase 120 sets of prefabricated components for assembly in China, with indigenous production phased in later.⁷ Finally, a

-
- 1 Co-production means in this instance that China intends to build the Russian aircraft in China. Patrick E. Tyler, "China to Buy Advanced Fighter Planes From Russia," *The New York Times*, February 7, 1996, p. A3; Steven Mufson, "Bridging a Frosty Frontier," *The Washington Post*, February 11, 1996, p. A25; David A. Fulghum, "China Buys SU-27 Rights from Russia," *Aviation Week and Space Technology*, February 12, 1996, p. 60.
 - 2 Hsio Yu-sheng, "New Developments in the Chinese Air Force," *Kuang Chiao Ching* (Hong Kong), January 16, 1996, pp. 78-81, in *FBIS-CHI-050*, March 13, 1996, p. 41; "Airscene," *Air International*, April, 1996, p. 196.
 - 3 "'Made in China' deal is forged for Su-27s," *Jane's Defence Weekly*, May 6, 1995, p. 3.
 - 4 AFP, "Moscow Delivers 22 Sukhoi-27 Fighters to China," *The Korea Times*, April 27, 1996, p. 1.
 - 5 Graham Hutchings, "China to build SU-27 in \$2bn deal with Moscow," *The Daily Telegraph*, February 5, 1996, p. 12.
 - 6 Fulghum, "China Buys SU-27 Rights from Russia."
 - 7 Hsio, "New Developments in the Chinese Air Force," p. 43.

Pentagon intelligence assessment concludes that China eventually may obtain as many as 300 SU-27s.⁸ In any event, it is reasonable to assume that the total could exceed 100; and if China masters full co-production, the total (to include Chinese-designed variants) could exceed several hundred.

COMPARING THE SU-27 WITH CURRENT U.S. FIGHTERS

Because the SU-27 will play a significant role in modernizing the PLAAF, it is useful to compare it to existing U.S. fighter aircraft. Some key performance parameters are listed in Table 1. Since entering service in 1986, the SU-27 has been the best fourth-generation air-superiority fighter in service with the Russian Air Force.⁹

The SU-27 is roughly comparable to the F-15C, the best U.S. Air Force fighter. The F-15C is the only U.S. fighter used almost exclusively for air-superiority missions. Over 400 F-15Cs have been purchased by the United States Air Force, and 108 are deployed in U.S. Pacific Command.¹⁰ This aircraft accounted for 36 of the 39 USAF air-to-air victories in the Gulf War. The F-15C will remain the principal U.S. Air Force air-superiority fighter until replaced by the Lockheed-Martin F-22 later in the next decade.

The F-15C and the SU-27 have comparable ranges, though the SU-27 can carry ten missiles while the F-15C can carry eight. The F-15's ability to maneuver is about the same as the SU-27's.¹¹ Both are capable of difficult maneuvers that stress the airframe to nine times the weight of the aircraft. The F-15C uses the AN/ANG-70 radar, which can detect targets about 100 miles away and can track and engage multiple targets. The SU-27's Phazatron N001 radar has a search range of over 62 miles with the ability to track 10 targets and engage two. However, unlike the F-15, the SU-27 is equipped with an infrared search and tracking (IRST) system with a range of from 15 to 31 miles that directs gun and missile systems.¹² This system allows the *Flanker* to track and engage targets while turning off its radar, decreasing the chances of detection by opposing aircraft.

The Grumman F-14, the U.S. Navy's primary air-superiority fighter, is a better all-around combat interception system than the SU-27. Were it not for the F-14's swing-wing, the SU-27 might be much more maneuverable than the F-14. The F-14 can carry six long-range or medium-range and two short-range air-to-air missiles (AAMs), but its

8 Bill Gertz, "Chinese arms buildup increases attack range," *The Washington Times*, March 12, 1996, p. A12.

9 First generation: F-86 *Saber* and Mig-15 *Fagot*; second generation: F-100 *Super Saber* and Mig-19 *Farmer*; third generation: F-4 *Phantom* and Mig-23 *Flogger*; fourth generation: F-15 *Eagle* and SU-27 *Flanker*.










10 This number includes: Alaska, 36; Japan, 54; Hawaii, 18 (the last are early model F-15As with an Air Force Reserve squadron).

11 The F-15 has slightly better thrust-to-weight ratio, though wing-loadings are even at combat weights. A greater thrust-to-weight ratio and a lower wing-loading confers better combat potential. These variables help determine acceleration and turn rate in combat, and improve as aircraft weight decreases through fuel consumption. The SU-27 is said to have an instantaneous turn rate of 20 to 22 degrees per second and a sustained turn rate of 14 to 16 degrees per second. Comparable figures for the F-15 are 14 degrees and 12 degrees; see Dennis R. Jenkins and Jay Miller, *Sukhoi Su-27*, Aerofax Extra 3, 1991, and Mike Spick, *F-15 Eagle*, Osprey Combat Aircraft Series (London: Osprey Publishing, 1986), p. 48.

12 High range estimate from *Jane's All the World's Aircraft, 1995-1996*, p. 375; low range estimate from Anthony Thornborough, *Modern Fighter Aircraft, Technology and Tactics* (Somerset: Haynes Publishing, 1995), p. 94.

Table 1

China's SU-27: Challenging U.S. Air Superiority in Asia

	FCS Level	MTE Capable	Armament Number x Type	T/W (lb st/lb)	W/S (lb/sq ft)	Max Mach Speed	Combat Radius With Max External Fuel (Miles)	Number Deployed in Asia/ on Order
SU-27J-11 	2	yes	1 x Gun 4 x Short R. AAM 4 x Medium R. AAM 2 x Long R. AAM	0.94	62	2.35	930 (internal fuel)	China: 48/250? Vietnam: 3/3
Current and Planned U.S. Combat Aircraft								
F-15 C 	2	yes	1 x Gun 4 x Short R. AAM or up to 8 x Medium R. AAM	1.32	62	2.5+	800+	U.S.: 108 in Japan, Alaska, and Hawaii Japan: 180
F-14 B 	2	yes	1 x Gun 4 x Short R. AAM 6 x Medium R. AAM or 6 x Long R. AAM	0.83	89	2.34	725	U.S.: 24 F-14A in Japan
F/A-18 C/D 	2	yes	1 x Gun 2 x Short R. AAM or up to 10 x Medium R. AAM	0.96	83	1.8+	349	U.S.: 24 in Japan Australia: 70 Malaysia: 8 Thailand: 0/8
F/A-18E/F 	1	yes	1 x Gun 2 Short R.AAM up to 10 Medium R. AAM	1	84	1.8	472	U.S.: 0/1,000
F-16 A 	4	no	1 x Gun 4 x Short R. AAM	1	73	2.0+	575+	Thailand: 36 Singapore: 17 Indonesia: 11/9 Taiwan: 0/150
F-16 C 	3	yes	1 x Gun up to 6 Short R.AAM or up to 6 Medium R.AAM	1+	90	2.0+	800+	U.S.: 138 in S. Korea, Japan, and Alaska S. Korea: 60/120
F-5 E/F 	6	no	2 x Gun 2 x Short R. AAM	0.79	68	1.64	656	Taiwan: 275 S. Korea: 195 Singapore: 45 Thailand: 45 Malaysia: 11 Indonesia: 12
F-22 A 	1	yes	1 x Gun up to 10 x Short R. AAM or up to 10 Medium R. AAM	1.13	NA	1.7	800 (internal fuel)	U.S.: 0/442

Note: Performance figures are estimates for purposes of comparison.

FCS: Fire Control System level estimation for Air-to-Air: Level 1 is estimated best, level 6 is the simplest.

MTE: Multiple Target Engagement Capability.

Short/Medium/Long R. AAM: Short/Medium/Long Range Air-to-Air Missile.

T/W: Thrust/Weight Ratio at take-off with full internal fuel and AAMs; number greater at lower combat weights.

W/S: Wing/Surface Loading, same conditions as for T/W.

Sources: *Military Technology*, February 1994; *Jane's All the World's Aircraft*; *Aviation Week and Space Technology*.

unrefueled range is less than the SU-27's. With the added flexibility of a two-man crew, the F-14A's AN/AWG-9 weapons control system can detect targets out to 190 miles, track 24, and engage six at long range with its 100-mile-range AIM-54 *Phoenix* missiles.

Fourteen Navy squadrons are now equipped with F-14As, including two deployed with the Japan-based Seventh Fleet. The F-14A's principal weakness has been its Pratt and Whitney TF-30 turbofan engines, which are prone to stalling during hard maneuvers. This has led to engine failures and many crashes. Consequently, certain combat maneuvers are now restricted until these aircraft are modified with updated control systems. All F-14As are due to be retired from service by 2004. Over 90 F-14Bs, which now equip five Navy squadrons, have been fitted with more powerful and responsive General Electric F110 engines. The Navy also has acquired 56 F-14Ds with the F110 engines and more powerful radar combat systems. Three squadrons are outfitted with the F-14D. The F-14B and D are expected to serve through the next decade. A program to build a successor to the F-14, the A/F-X, was canceled by the Clinton Administration in 1993.

Later in the next decade, as the F-14 is being retired from U.S. Navy inventory, the numerically most important U.S. Navy fighter will be the F/A-18E/F. The Navy expects to purchase over 1,000 of these aircraft by 2015. They are designed to replace the current C/D version of the F/A-18, the F-14, and the long-range ground-attack Grumman A-6 *Intruder*.¹³ Compared to both versions of the F/A-18, however, the SU-27 has an advantage in unrefueled range and may be more maneuverable due to its more powerful engines and larger wing. The F/A-18E/F is about 25 percent larger than the C/D; has more powerful engines and a longer range because of larger external fuel tanks; and is to be equipped presently with an AN/AGP-73 multi-mode radar, which also equips the most current production model of the F/A-18C. More advanced radar upgrades already are planned for the F/A-18E.¹⁴ In terms of offensive and defensive electronic systems, the F-18E/F will be superior to the SU-27.

The F-16 also is a multi-role fighter designed for ground-attack as well as air-defense missions. It is the most numerous combat aircraft in the U.S. Air Force, currently numbering over 1,200 aircraft. Forces with the U.S. Pacific Command possess 138 F-16Cs, the major combat aircraft for South Korea. An earlier version, the F-16A, is the most capable combat aircraft in the air forces of Indonesia, Singapore, and Thailand, and soon of Taiwan. Shorter in unrefueled range than the SU-27, the F-16C carries only six medium-range or short-range AAMs. The F-16 is a single-engine aircraft, while the SU-27, F-15, F-14, and F/A-18 are twin-engine aircraft with greater survivability in combat. The F-16 is roughly comparable to the SU-27 in maneuverability; both airframes can be stressed to nine times their weight.

13 The demise of the Navy's A-12 stealth attack bomber in 1991 ended Navy attempts to build a dedicated A-6 replacement. Critics argue that the F/A-18E/F cannot carry as much ordnance as far as the A-6. See RADM Ned Hogan (ret.), "The F/A-18E/F Is 'Catch-22'," *U.S. Naval Institute Proceedings*, July 1993, p. 10; "Comment and Discussion," *U.S. Naval Institute Proceedings*, August and November 1993; and James P. Stevenson, "A Better Hornet, Promises, Promises....," *U.S. Naval Institute Proceedings*, October 1993, p. 104.

14 "The New Hornet Is Coming, Interview with Jerry Daniels," *U.S. Naval Institute Proceedings*, June 1995, p. 49.

The Northrop F-5E *Tiger II* currently is the most numerous combat aircraft for Taiwan, South Korea, Thailand, Malaysia, and Indonesia. The F-5E is no match for the SU-27 in maneuverability, range, or weapons load. Several companies offer upgrades for the F-5's radar and combat systems. These upgrades can ease pilot workload and increase search and detection capability, but they cannot alter the F-5's inferior aerodynamic performance. As a consequence, prosperous Asian countries are acquiring new, more capable aircraft like the F-16 and F-18.

The U.S. Technology Advantage. Compared to the SU-27, all current U.S. combat aircraft benefit from better cockpit design and better avionics. For example, the U.S. practice of placing most combat relevant information on a large Head-Up Display (HUD) which combines the functions of a monitor and a weapons sight, or on large, easy-to-read flat-panel displays on the instrument panel, increases combat potential by allowing pilots to spend more time watching for opposing aircraft than tending instruments. Better U.S. aircraft computers and cockpit displays enable U.S. pilots to evaluate information more quickly and accurately. By contrast, similar Russian systems used in early models of the SU-27 are less advanced. American aircraft also are equipped with better countermeasures against radar and missile threats. These include electronic jamming systems and decoys that use several methods to confuse attacking missiles.

U.S. Air Force, Navy, and Marine fighters have long benefited from a well-developed system of in-air refueling which extends range or combat patrol time. The U.S. also benefits from advanced airborne warning and control (AWACS) aircraft, such as the E-2C *Hawkeye* and E-3 *Sentry*. In addition, the three services employ a range of electronic intelligence aircraft that warn fighters of enemy radar and missile defenses. The Navy's EA-6B is designed to jam enemy radars, while the F-16 HTS, F/A-18, and EA-6B can use anti-radar missiles to destroy enemy air defenses.

THE CHINESE AIR FORCE AND THE CHALLENGE OF THE SU-27

The acquisition of the SU-27 and its production rights marks a major turn for the Chinese Air Force. Nevertheless, this service is beset with major weaknesses. The foremost is that the PLAAF currently is saddled with over 2,000 aircraft (including MiG-19s, MiG-21s, and TU-16s) of 1950s-era Soviet design comparable to outdated U.S. fighters like the F-100, F-8, and B-47. These aircraft are no match for current U.S. jet fighters. In addition, the Chinese Air Force lacks the capability to refuel its combat aircraft during flight, and this shortens their range. It also is bereft of AWACS aircraft that manage air battles, fire-and-forget long-range air-to-air missiles, anti-radar missiles to attack enemy air defenses, and precision-guided munitions (PGMs) like laser-guided bombs. These systems were critical to U.S. air superiority during the Persian Gulf War.

The PLAAF compares poorly to the USAF and some Asian air forces in areas of training and maintenance. A RAND Corporation study issued last year concludes that Chinese Air Force pilots do not fly as often as their U.S. counterparts.¹⁵ Chinese pilots typi-

15 Kenneth W. Allen, Glenn Krumel, and Jonathan D. Pollack, *China's Air Force Enters the 21st Century* (Santa Monica, Cal.: RAND Corporation, 1995), p. 130.

cally fly 100 hours a year, while U.S. pilots train more than 200 hours per year. Chinese air combat tactics resemble old Soviet-style tactics that stress tight ground control of aircraft.¹⁶ PLAAF commanders place a high priority on flight safety, and this reduces pilots' initiative and inhibits the utilization of aircraft to their fullest capabilities. While the PLAAF is beginning to utilize "Aggressor" squadrons which specialize in adversarial combat tactics in an attempt to raise tactical skills proficiency, it remains to be seen whether these new training squadrons will be effective. The PLAAF also faces another severe problem: a lack of spare parts. One of the reasons for this is that production standards vary between differing aircraft and engine manufacturers, inhibiting interchangeability of parts between aircraft and engines of the same type.¹⁷

RAND questioned whether China can afford the SU-27 as well as indigenous aircraft programs, pointing to recent reforms that have devalued China's currency, thereby reducing PLA purchasing power.¹⁸ However, the actual size of China's defense budget is unknown. Official figures typically fail to include all military-related expenditures and earnings from PLA-controlled businesses. For example, while the official 1994 PLA defense budget figure was \$6 billion, the Washington-based Defense Budget Project estimates that it could range between \$92 billion and \$143 billion.¹⁹ A higher budget such as this increases the possibility that the PLA could afford multiple new aircraft programs.

The RAND study estimated that China would have only 70 SU-27s in the year 2005.²⁰ The SU-27 co-production agreement suggests that China has placed a greater emphasis on acquiring higher numbers of this aircraft in addition to its production technology. The PLA appears to want a phased transition to full co-production, preceded by domestic assembly of a large number of aircraft from major components fabricated in Russia. Co-production of the SU-27 will be difficult for the Chinese because this aircraft incorporates technologies the Chinese cannot yet produce. But PLA aircraft manufacturers will benefit from advanced Russian production techniques and from the presence of Russian technicians, who will assist SU-27 assembly and eventual production.

Chinese Air Force Difficulties with the SU-27. Integrating the SU-27 into its inventory will not be easy for the PLAAF. The Chinese Air Force has had difficulty maintaining the SU-27 and was not prepared for its additional cost. Moreover, some runways are not capable of handling this heavier fighter aircraft.²¹ However, the SU-27 is being used in exercises. In August 1995, Chinese SU-27s approached the Senkaku Islands north of Taiwan, which are claimed by China, Japan, and Taiwan. And in March 1996, the SU-27 flew in major military exercises intended to intimidate Taiwan on the eve of its presidential election. The SU-27 possibly will be seen more frequently over the South China Sea, flying from Suixi Air Base in South China. From Wuhu and Suixi Bases, the SU-27 can reach Taiwan, many disputed areas in the South China Sea, and U.S. forces based on Oki-

16 *Ibid.*, p. 131.

17 *Ibid.*, p. 177.

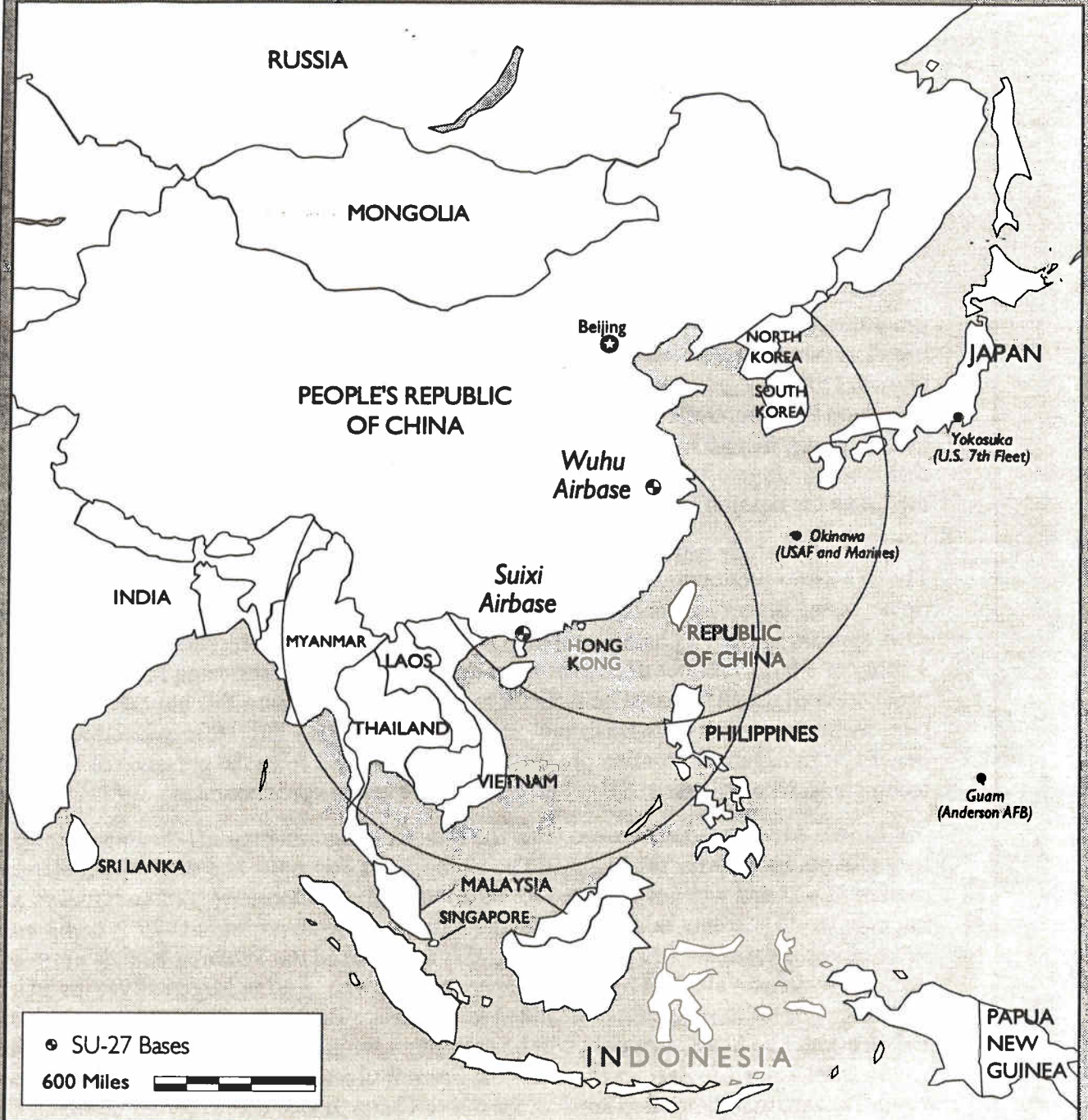
18 *Ibid.*, pp. 138, 186.

19 Richard A. Bitzinger, "China Defense Budget," *International Defense Review*, February 1995, p. 37.

20 Allen *et al.*, *China's Air Force Enters the 21st Century*, p. 163.

21 *Ibid.*, p. 157; "Taiwan: 'Officer' Assesses PRC's Su-27 Fighter Production," *Chung-Kuo Shih-Pao* (Taipei), February 4, 1996, p. 3, in *FBIS-CHI-027*, February 8, 1996, p. 75.

Map 1



China's SU-27: New Long Reach for the PLAAF

Source: Based on 900 mile radius from the two known SU-27 bases.

nawa (see map). Despite early difficulties in tactics and training, as well as enduring PLAAF institutional constraints, it is entirely possible that as more SU-27s enter service, the PLAAF will learn how to exploit this system to its fullest capabilities some time in the next decade.

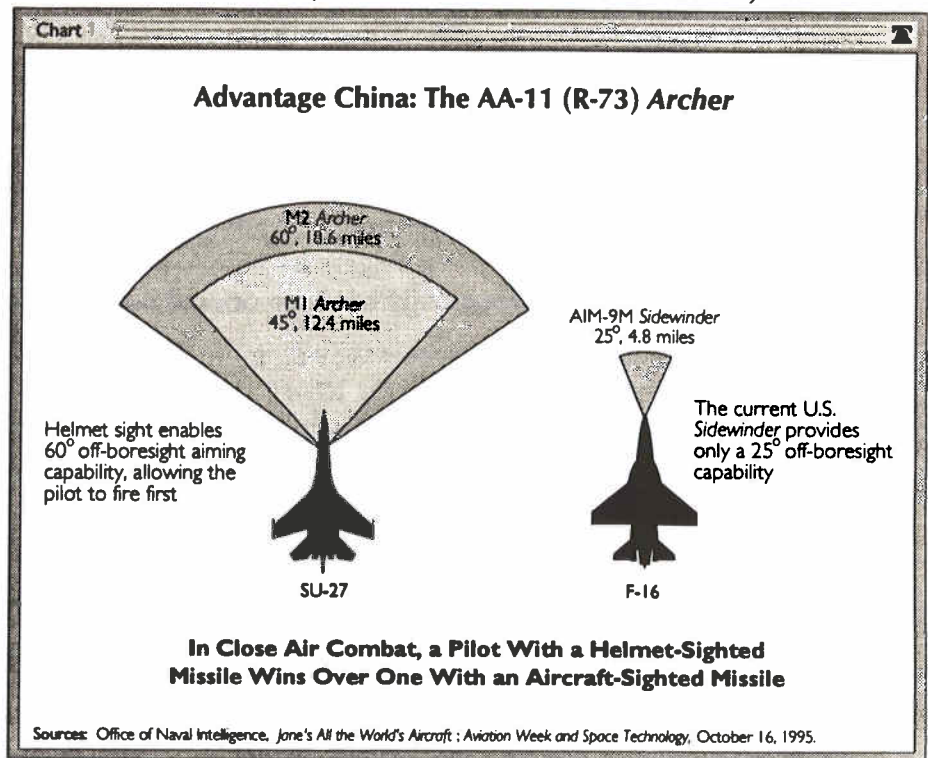
OTHER TECHNOLOGIES THAT MAY ASSIST CHINA'S AIR FORCE MODERNIZATION

Advanced military technology from Russia and Israel plays a major role in China's effort to modernize its military forces. This is especially true for the PLAAF. Russia in particular is viewed by China as a potential source for many systems and technologies that comprise a modern, all-weather, multi-mission air force. Advanced air-to-air missiles, precision-guided munitions, radar aircraft, and electronic countermeasures are all on China's shopping list. For now, Russia appears to be more interested in profit than in any potential threat to its interests arising from sales to China.

Advantage Archer. The SU-27 is equipped with a series of advanced Russian missiles that in some cases exceed or equal U.S. missile capabilities. The PLAAF is the only air force in Asia to possess the Russian R-73 (NATO codename: AA-11 Archer) air-to-air

missile. China is believed to have an early version of the Archer (M1) and is known to have used it against parachute flares during March 1996 exercises near Taiwan. The AA-11 is the first effective "helmet-sighted" air-to-air missile to be employed anywhere. With this missile, a pilot can aim his weapon by turning his head, and does not have to

line up his plane with the target, which has been the main practice in aerial combat since World War I. The M1 version can be fired 45 degrees off the aircraft's forward line-of-direction, or off-boresight, to a range of 12.4 miles (see chart).²² The M2 version of the AA-11 can be fired up to 60 degrees off-boresight and has a range of 18.6 miles.²³ In targeting aircraft beyond visual range, the AA-11 can be cued by the *Flanker's* infrared tracking system.



²² *Air Force Magazine*, March 1996, p. 77.

²³ David Hughes, "Russians Offer AA-11s to McDonnell Douglas," *Aviation Week and Space Technology*, September 4, 1995, p. 25; Russia is developing a new version of the Archer with a 90 degree off-boresight capability.

In the hands of a capable pilot, the *Archer* conveys a decisive margin for victory. During 1994 air combat exercises between German and U.S. aircraft, MiG-29s of the German Air Force armed with the less capable version of the *Archer* had a clear advantage over U.S. F-16s armed with *Sidewinder*.²⁴ Even though the F-16 was able to outmaneuver the MiG in 60 percent of the exercise engagements, the MiG already had "fired" its *Archer*, meaning the F-16 most likely was defeated.²⁵

The U.S. is not expected to field a helmet-sighted thrust-vectoring AAM for at least six years. The AIM-9M *Sidewinder*, the most modern U.S. short-range air-to-air missile—which lacks a helmet sight—can acquire targets only 27.5 degrees off the forward line-of-sight and has a range of only 4.8 miles. American defense officials assert that the lack of a helmet-sighted missile is compensated for by the 32-mile-range Advanced Medium-Range Air to Air Missile (AMRAAM). This missile, called the AIM-120, is guided by its own radar, allowing the pilot to break aircraft radar contact with the target and begin evasion. This was not the case with earlier U.S. radar-guided missiles. U.S. officials argue that the AIM-120 confers much of the same tactical flexibility as the *Archer*.²⁶ However, the U.S. still has some difficulty in exploiting the long range of the AIM-120. For one thing, it has problems with identifying targets.²⁷ Moreover, this missile cannot be used by the F-16A or the F-5E. While U.S. fighters in Asia have the AIM-120, so far only South Korea and Thailand are approved to buy it. Equipped with AIM-120, the F-15, F-14, F-16, and F/A-18 all have a fighting chance against the SU-27. But the Russians also have their AIM-120 equivalent in the AA-12. This missile could be marketed to China in the future, and apparently has been offered for sale to the U.S.²⁸

China also could acquire newer, more advanced Russian missiles and precision-guided munitions. For example, the Kh-17 (NATO codename: AS-17 *Krypton*) missile has multiple versions that are designed to attack ships and AWACS radar aircraft at long range. The U.S. Navy is evaluating this missile for possible use as a target to simulate future threats for naval missile defense systems. One version of this missile is credited with a 125-mile range, and all versions are capable of flying at almost three times the speed of sound.²⁹ U.S. Naval Intelligence also is concerned about a new 200-mile-range AAM designed to attack AWACS and other long-range radar aircraft.³⁰ Russia also produces a series of laser-guided and television-guided bombs that could arm future variants of the SU-27 produced by China.

24 Germany acquired the Russian fighters and missiles following East-West unification.

25 David Hughes, "Luftwaffe Mig Pilots Effective with Archer," *Aviation Week and Space Technology*, October 16, 1995, p. 39.

26 "Turning IR Missile May Be Overrated," *Aviation Week and Space Technology*, October 16, 1995, p. 38.

27 Michael A. Dornheim and David Hughes, "U.S. Intensifies Efforts to Meet Missile Threat," *Aviation Week and Space Technology*, October 16, 1995, p. 36; the necessity for U.S. F-15 pilots to close in on targets due to identification requirements during the Gulf War is illustrated in Paul Crickmore, "Star of the Storm," *Air International*, January 1992, p. 17.

28 Hughes, "Russians Offer AA-11s to McDonnell Douglas."

29 Steven Zaloga, "Harpoonski," *U.S. Naval Institute Proceedings*, February 1994, p. 38.

30 Office of Naval Intelligence, *Worldwide Challenges to Naval Strike Warfare* (Washington, D.C.: U.S. Department of Defense, 1996), p. 20.

Russian Technology and China's SU-27s. Russia now plans to market advanced versions of the SU-27 to China, as it already has to India. There are reports that a deal for China to purchase the more advanced SU-30 broke down over financing disagreements.³¹ The SU-30 is a two-seat dedicated attack variant of the SU-27 with more advanced attack systems that allow for delivery of precision-guided munitions.³² Moscow and Beijing also may have discussed Chinese co-production of the SU-35.³³ The SU-35 features a better cockpit display, better missile fire-control systems, and forward horizontal control surfaces that boost maneuverability. According to Lt. General George Mueller, Principal Deputy to the Air Force Assistant Secretary, the SU-35's "missile fire control system is as good or better than the F-15."³⁴ Sukhoi unveiled last year a variant of the SU-35 with thrust-vectoring engines, called the SU-37, which Russian pilots claim will be "10-times" better in close-in dogfights than unmodified fighters.³⁵

AWACS and Aerial Refueling. A number of reports indicate China also is seeking other "force-multipliers" the U.S. has long utilized, like AWACS and air-refueling capabilities. Russian AWACS aircraft and Israel's *Phalcon* early-warning aircraft appear to be on Beijing's shopping list.³⁶ In a reported \$250 million deal with China, Israel will put its *Phalcon* 200-mile-range airborne early warning radar on a Russian Il-76 transport aircraft.³⁷ This aircraft may also carry advanced Israeli electronic sensing and intelligence systems. China is reported to have modified up to five of its H-6 bombers to refuel J-8II *Finback* fighters—the most advanced fighter China currently produces. This extends the range of the J-8II from 430 to over 630 miles. U.S. intelligence reportedly estimates China may convert up to 20 H-6 bombers into air-to-air refueling aircraft.³⁸ China's SU-27s are not modified for air-to-air refueling, but this capability could be acquired later.

China is using Russian technology to upgrade the J-8II with modern radar and engines which give the aircraft greater combat capability.³⁹ An upgraded version of this aircraft, the J-8II M, was test-flown at the end of March.⁴⁰ There are about 200 J-8s in the Chinese Naval Air Force and Air Force.

China is co-developing the FC-1 lightweight fighter with Pakistan which also may use a Russian engine radar and avionics, or a European radar.⁴¹ This aircraft may be slightly

31 Bates Gill, "Russia, Israel Help Force Modernization," *Jane's Defence Weekly*, January 31, 1996, p. 54.

32 "China secures deal to build 'Flanker' fighters," *Jane's Defence Weekly*, February 14, 1996, p. 12.

33 Nicolay Novichkov, "Sukhoi Upgrades Geared to South Asian Market," *Aviation Week and Space Technology*, May 27, 1996, p. 57; Hsio, "New Developments in the Chinese Air Force," p. 43; Hutchings, "China to build SU-27 in \$2bn deal with Moscow," p. 12.

34 David A. Fulghum, "'97 Bottom-Up Review to Spotlight Operations," *Aviation Week and Space Technology*, September 11, 1995, p. 25.

35 Thrust vectoring involves deflecting engine exhaust with vanes or nozzles to enable far greater maneuverability; "Su-37 dogfights will be '10 times as effective,'" *Jane's Defence Weekly*, July 10, 1996, p. 11.

36 "Phalcon may fly over China," *Flight International*, November 1-7, 1995, p. 6.

37 Ari Egozi, "Israel presses Russia in bid to clear way for China AEW deal," *Flight International*, July 17-23, 1996, p. 13.

38 Gertz, "Chinese arms buildup increases attack range"; Fulghum, "China Buys SU-27 Rights from Russia."

39 "Russia helps China upgrade F-8," *Flight International*, October 18-24, 1995, p. 25.

40 "PRC: First Successful Flight of Jian-8 II Model-M Fighter Reported," *Hangkong Zhishi (Aerospace China)*, May 1996, p. 2, in *FBIS-CHI-96-136*, July 15, 1996, p. 24.

less maneuverable than the F-16, and China initially may buy 100 copies. The FC-1 also could be marketed as a low-cost successor to aircraft such as the F-5E and Mig-21, which continue to be used widely in less-developed countries.

Israeli Assistance and China's J-10 Advanced Fighter Program. Israel maintains a quiet but significant military technology relationship with China. Its largest military program with China involves the development of the J-10 advanced fighter aircraft, modeled on Israel's *Lavi* fighter that was canceled in 1987.⁴² Russian radar and engines also may feature prominently in the J-10 program.⁴³ Last year, RAND Corporation analyst Mark Lorell concluded that the J-10 will benefit from the *Lavi*'s "advanced airframe technology, [and] superior avionics...."⁴⁴ China revealed in April a model of the J-10 that was similar to the *Lavi*. The model also showed the J-10 armed with the PL-10 short-range air-to-air missile, a copy of the Israeli *Python 3* missile. The U.S. Office of Naval Intelligence estimates the J-10 may be more maneuverable than the F/A-18E/F but will carry less sophisticated radar and countermeasures.⁴⁵ The first prototype may fly this year, and China eventually may produce 300 J-10s.⁴⁶ Washington is concerned that U.S.-originated technology from the *Lavi* has been transferred to China.⁴⁷ Israel is reported to have rebuffed Clinton Administration attempts to end this program.⁴⁸

Could China's SU-27 Go to Sea? Central Military Commission (CMC) Vice President Liu Haqing, a former top PLA Navy commander, believes China needs the ability to dominate the Pacific from Japan down to the Philippines and should be able to fight as far away as Guam.⁴⁹ Acquiring an aircraft carrier to help fulfill this goal appears to be a high PLA priority, and there are reports that at a December meeting of the CMC, President Jiang Zemin endorsed construction of an aircraft carrier as part of the next five-year plan.⁵⁰ However, the cost of a carrier and its attendant defensive and logistic support ships may prove prohibitive for the Chinese Navy. But should China acquire its first aircraft carrier, perhaps in the next decade, the U.S. could face a Chinese sea-borne version of the SU-27. China could follow the example of Russia, which now uses a version of the SU-27 (called the SU-33) as the principal combat aircraft for its sole aircraft carrier, the *Admiral Kuznetsov*. Unlike the basic version of the SU-27, the SU-33 is equipped for air-to-air refueling, both to receive fuel and to carry a modified fuel tank that can per-

-
- 41 "Paris Airscene," *Air International*, July 1995, p. 8; Paul Lewis, "China ignores FC-1 doubts," *Flight International*, July 3-9, 1996, p. 17.
- 42 The U.S. had subsidized about 90 percent of the \$1.5 billion spent on the *Lavi* to 1987. Donald E. Fink, "Lavi: a tough decision," *Aviation Week and Space Technology*, September 7, 1987, p. 15.
- 43 Charles Bickers and Nick Cook, "Russia, Israel helping China build new fighter," *Jane's Defence Weekly*, November 25, 1995, p. 4.
- 44 Reuters, December 7, 1995.
- 45 ONI, *Worldwide Challenges to Naval Strike Warfare*, p. 34.
- 46 "Chinese F-10 details revealed," *Flight International*, November 15-21, 1995, p. 4.
- 47 Bill Gertz, "Israelis face query on sales to China," *The Washington Times*, June 19, 1996, p. A4; Israel, however, denies that it has sold U.S. technology to China.
- 48 *Ibid.*
- 49 Lt. Commander Jeffrey B. Goldman, "China's Mahan," *U.S. Naval Institute Proceedings*, March 1996, p. 45; Alexander Chieh-cheng Huang, "The Chinese Navy's Offshore Active Defense Strategy," *Naval War College Review*, Summer 1994, p. 18.
- 50 Willy Wo-Lap Lam, "PLA prepares arsenal 'to take Taiwan,'" *South China Morning Post Weekly*, January 13, 1996, p. 7.

form in-flight refueling. The SU-33's engines generate enough thrust to allow the use of a ski-jump to get airborne, eliminating the need for complex steam-driven catapults used on U.S. Navy carriers.

MEETING THE CHALLENGE OF CHINA'S SU-27

American leadership in Asia rests upon several factors, including a willingness to maintain sufficient military force to deter potential adversaries. In the event Korea is reunified, the U.S. very likely will withdraw ground troops stationed there, leaving the Air Force and the Navy to function as the dominant elements of the U.S. military presence in Asia. The U.S. Pacific Command now relies on about 350 Air Force, Navy, and Marine fighter and attack aircraft deployed in South Korea, Japan, Alaska, and Hawaii. One aircraft carrier, the *USS Independence*, provides the most flexible component of American airpower in Asia. In March 1996, two carrier battle groups, led by the *Independence* and the *USS Nimitz*, were ordered to locations near Taiwan in response to China's threatening military exercises. The U.S. reportedly has decided to halt regular Middle East deployments by the *Independence* in order to respond to possible scenarios involving North Korea or China.⁵¹ Such is the importance of U.S. naval power to peace and stability in Asia.

Were it to occur, China's acquisition of large numbers of SU-27s would pose a serious challenge to U.S. air superiority. Since World War II, American military commanders have aimed to establish air superiority in order to win battles on the sea and ground. Although China may not today be able to utilize the SU-27 to its fullest extent, it cannot be assumed that this will continue indefinitely. To sustain deterrence, the U.S. needs to maintain its all-around edge in strategy, tactics, and weapons systems.

In particular, aircraft that are "good enough" or slightly superior to the SU-27 do not provide a sufficient margin of superiority to guarantee U.S. dominance in the air. The U.S. must proceed with plans to field advanced combat aircraft superior to the SU-27. Current and future aircraft must be equipped with an effective helmet-sighted missile to counter the *Archer*. Failure to do so risks allowing the Asian balance of power to shift dangerously in favor of China. To prevent this from happening, Washington should:

✓ **Sustain funding for the F-22A jet fighter.**

To ensure U.S. air superiority in Asia, the U.S. should proceed with full funding for the Lockheed-Martin F-22A. This aircraft promises better uses of radar-evading stealth technology, engines that can achieve supersonic speeds without using fuel-guzzling afterburners, thrust vectoring that enhances maneuverability at high speeds, and advanced radar and electronic combat systems. It can carry four short-range air-to-air missiles and up to ten AMRAAM missiles and has a combat range comparable to the F-15C. There are suggestions from Pentagon officials that the planned purchase of 442 F-22As may be cut in half due to funding constraints.⁵² This would be a mistake because it would likely reduce the number of F-22As, which are needed to deter potential adversaries. The Air Force is requesting \$2 billion for FY 1997 for re-

51 Brian Williams, "U.S. carrier to remain in waters of East Asia," *The Washington Times*, June 17, 1996, p. A13.

52 Fulghum, "'97 Bottom-Up Review to Spotlight Operations."

search and development as part of an expected \$70 billion program. This is indeed expensive, but the F-22A is the only U.S. fighter in development that can offer decisive air superiority for U.S. forces.

✓ **Maintain 12 Navy aircraft carrier battle groups.**

The U.S. Navy needs at least 12 aircraft carrier battle groups in order to sustain peacetime security commitments. These commitments include the maintenance of one carrier battle group with the Seventh Fleet in Japan. However, the Clinton defense budget could force a reduction to eight carrier battle groups by the year 2002. If this occurs, the U.S. may have to deploy its Seventh Fleet carrier to potential crisis areas outside of Asia,⁵³ in which case carriers would not be available to respond sufficiently to some future Chinese provocation against Taiwan. This would be regarded by Washington's friends and potential adversaries in Asia as a significant reduction in the traditional U.S. commitment to preserve peace in Asia. To deter future potential conflicts in Asia that could damage U.S. economic and military security, the U.S. must have 12 carrier battle groups to sustain deterrence.

✓ **Develop an air-superiority fighter for the Navy.**

The Clinton Administration should review its 1993 decision to forgo development of a dedicated successor to the Navy's F-14 fighter aircraft. The A/F-X program, canceled in 1993, had attracted proposals from Lockheed to develop a naval variant of the F-22. If U.S. naval task forces are to be superior to all opponents, the Navy will need a fighter with at least the capability of the F-22. While the F/A-18E/F is an impressive aircraft that incorporates advances in air combat and ground-attack systems, it does not present a decisive advance in capability over the SU-27/35 family. The Navy needs the F/A-18E/F to fulfill fighter and ground attack missions. But the Navy also needs an aircraft that will guarantee naval air superiority against the SU-27 and its advanced variants. In the meantime, as the F-14A is cycled out of Navy inventory early in the next decade, it is essential that the Asia-deployed Seventh Fleet receive priority in retaining F-14B/Ds.

The only other major combat aircraft program in the Navy's future is the Joint Strike Fighter (JSF), which is scheduled to enter service after 2010. But this aircraft also is the next major aircraft program for the Marines and the Air Force. In all, the JSF is intended to replace such diverse aircraft as the A-6, the AV-8 *Harrier*, Britain's *Sea Harrier*, the F-14, the F-16, and the F-18. The Air Force wants an F-16 replacement that is inexpensive, while the Navy seeks stealthy long-range strike aircraft. The JSF is not expected to be much larger or much more maneuverable than an F-16, but it will incorporate stealth and advanced combat systems. According to General Muellner, for the Air Force, the JSF would "not be on the leading edge of air supremacy," but would compliment the F-22.⁵⁴ The Navy version of the JSF should pay greater attention to the air-superiority mission, meaning increased range and in-

53 Baker Spring, "Will Clinton Pay the Price for America to Remain a Global Power?," Heritage Foundation *Backgrounders* No. 1083, May 16, 1996, p. 4.

54 Barbara Starr, "USA and Norway set for joint strike fighter talks," *Jane's Defence Weekly*, June 12, 1996, p. 6; Graham Warwick, "Joint endeavor," *Flight International*, July 3-9, 1996, p. 28.

creased internal air-to-air missile carriage; if it cannot approach the air superiority capabilities of the F-22, the Navy should be directed to begin development of a fighter that provides a dedicated replacement for the F-14.

✓ **Accelerate development of a helmet-sighted missile and make advanced U.S. air-to-air missiles available to U.S. allies.**

It is critical that the Pentagon be directed to accelerate the development of a helmet-sighted and highly maneuverable short-range AAM. Israel, for example, was able to field its 90-degree off-boresight-capable, helmet-sighted *Python 4* short-range AAM in about half the time it is expected to take the U.S. to field its helmet-sighted AAM.⁵⁵ A former senior Joint Chiefs of Staff officer was quoted recently as saying that "For the Air Force and Navy not to have a helmet-mounted sight and off-boresight missile is absolutely criminal."⁵⁶ U.S. aircraft and those of Asian allies armed only with *Sidewinder* AAMs are at a distinct disadvantage when compared with Chinese SU-27s armed with the Russian *Archer* AAM. When a helmet-sighted missile enters U.S. service, it also should be made available for sale to Asian allies and friends. In the meantime, the U.S. should sell the AIM-120 to allies and friends with compatible aircraft. Specifically, the AIM-120 should be offered to the Republic of China as its F-16s enter service next year.

✓ **Develop advanced versions of the F-15, F-16, and F-18 for allied and friendly Asian air forces.**

Most countries in Asia, except possibly Japan, will not be able to afford the F-22. The JSF also may prove to be too expensive. Therefore, the U.S. should develop advanced, more affordable versions of the F-16 and the F/A-18E/F for Asian friends and allies. The danger is that unmodified U.S. types could lose markets to newer and very capable European combat aircraft like the French *Rafale* and the *Eurofighter-2000*.⁵⁷ Maintaining commonality between U.S. and Asian air forces is an important U.S. interest.

✓ **Ask Russia and Israel to curtail advanced weapons sales to China.**

Sales of advanced military technology to China do more than strengthen China's military capabilities: They also constitute a potential threat to regional peace and stability. To Russia, the U.S. should stress that a well-armed China could be less benign and more inclined, for example, to press old territorial claims. To Israel, the U.S. should stress that China might sell advanced aircraft to rogue states like Iran which pose a threat to Israel. Last June, for example, China was suspected of having shipped missile components or technology to Syria.⁵⁸ The U.S. also should enlist its

55 Dornheim and Hughes, "U.S. Intensifies Efforts to Meet Missile Threat."

56 *Ibid.*

57 According to RAND analysts, only the F-22A may exceed the combat capabilities of newer European models like the *Eurofighter* and *Rafale*; see Mark Lorell, Daniel P. Raymer, Michael Kennedy, and Hugh Levaux, "The Grey Threat," *Air Force Magazine*, February 1996, p. 64.

58 Bill Gertz, "CIA suspects Chinese firm of Syria missile aid," *The Washington Times*, July 23, 1996, p. A1.

allies and friends in Asia to warn Russia and Israel that by arming China, they are creating a potential threat to peace.

CONCLUSION

For over 50 years, the United States has enjoyed air superiority in Asia. American industry has produced combat aircraft that have been proven superior over Korea, the Taiwan Strait, Vietnam, the Middle East, and the Persian Gulf. With the demise of the Soviet Union, delay in building a fifth-generation fighter to succeed the F-15 and F-14 was justifiable. But should it occur, China's acquisition of a large inventory of SU-27 aircraft would present a major challenge to American air superiority in Asia. This poses the first major post-Cold War challenge to U.S. strategy in Asia, as America's ability to deter conflict in Asia will rely increasingly on air power.

To preserve U.S. air superiority and sustain deterrence in Asia in the next century, the U.S. should produce the F-22A jet fighter, field a helmet-sighted air to air missile, and make the AIM-120 advanced air to air missile available to allies and friends like the Republic of China. Equally important, it also is time to re-examine whether an F-14 follow-on must be built if U.S. naval air power is to retain the superiority critical to sustaining the credibility of U.S. naval forces in Asia. Finally, the U.S. should tell Russia and Israel that their sale to China of advanced weapons and technology is helping to create a potential threat to the peace and stability of the Asia region.

Richard D. Fisher
Senior Policy Analyst

HERITAGE STUDIES ON LINE

Heritage Foundation studies are available electronically at several on-line locations. On the Internet, The Heritage Foundation's world wide web home page address is www.heritage.org. Bookmark it for new information daily.

Heritage studies also are available on CompuServe as part of the Town Hall forum. A joint project of The Heritage Foundation and National Review, Town Hall is a meeting place for conservatives to exchange information and opinions on a wide variety of subjects. For more information on line, type GO TOWNHALL or call 1-800-441-4142.