

## *Beyond the Unipolar Moment*

# Beijing's Reach in the South China Sea

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by Felix K. Chang

Since the early 1980s, China has consistently sought to accelerate the modernization of its conventional forces. The essence of that new policy was captured by Chinese strategists in a “set of eight Chinese characters: *zongti fanqwei, zhongdian fazhan* (strengthen overall national power for defending security, emphasize the main points of defense science and technology).”<sup>1</sup> The policy was designed to give Chinese forces the strategic framework to “coordinate with each other in combat, react quickly, counter electronic surveillance, ensure logistical supply, and survive in the field.”<sup>2</sup> By relying on the wealth generated from the country’s economic expansion to acquire foreign military equipment and technology, particularly from Russia, China’s modernization program has benefited significantly. Now, as Chinese leaders become more assertive in East Asia, China’s neighbors naturally monitor with growing unease the Chinese military, increasingly geared for power-projection.<sup>3</sup>

Although Taiwan has so far been this year’s focus of concern, Chinese military planners have not abandoned their aim of asserting sovereignty over the Spratly (Nansha) Islands in the South China Sea. China and several Southeast Asian countries—including Vietnam, Malaysia, the Philippines, Taiwan, and Brunei—vie for control over these islands and the rights to the sea and seabed

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<sup>1</sup> John Wilson Lewis and Xue Litai, *China’s Strategic Seapower: The Politics of Force Modernization in the Nuclear Age* (Stanford, Calif.: Stanford University Press, 1994), p. 218.

<sup>2</sup> “The Beginning of a New Phase for the Modern Construction of the PLA,” *Renmin Ribao*, July 31, 1984, quoted in Lewis and Xue, *China’s Strategic Seapower*, pp. 213–14.

<sup>3</sup> See Nayan Chanda, “Fear of the Dragon,” *Far Eastern Economic Review* (hereafter *FEER*), Apr. 13, 1995, pp. 24–28; Nayan Chanda, Rigoberto Tiglao, and John McBeth, “Territorial Imperative,” *FEER*, Feb. 23, 1995, pp. 14–16; Patrick E. Tyler, “China Revamps Forces With Eye to Sea Claims,” *New York Times*, Jan. 2, 1995; Denny Roy, “Hegemon on the Horizon?” *International Security*, Summer 1994, pp. 149–68; Michael G. Gallagher, “China’s Illusory Threat to the South China Sea,” *International Security*, Summer 1994, pp. 169–94; and Nicholas D. Kristof, “The Rise of China,” *Foreign Affairs*, Nov./Dec. 1993, pp. 59–74.

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resources around them. (See Maps 1 and 2.) China's position is clear. The Spratly Islands "are within Chinese territory and other countries are definitely not allowed to invade and occupy them," and the National People's Congress passed a maritime law in February 1992 affirming China's "indisputable sovereignty" over the islands.<sup>4</sup> Those countries that defy China in such situations as the South China Sea will be ejected in a conflict that, the Chinese say, would be "characterized by sudden outbreaks, a quick conclusion, a broad theater of war, long distances from the land, and much greater requirements for the capabilities to stage combined operations by the three armed services."<sup>5</sup> Even countries that are not directly involved in the Spratly Islands dispute, such as Indonesia and Singapore, have become concerned with China's rhetoric.

While observers of Southeast Asia have thoroughly examined the economic, political, and legal aspects of this dispute, few have made a holistic attempt to determine whether China's forces can make good their government's threats. It is to these considerations that we now turn.

### The Correlation of Forces

Assuming that China's political objective in the South China Sea is the Spratly Islands and the natural resources that may surround them, the military objective for the People's Liberation Army (PLA) is evident—to secure the disputed islands and gain control over all means of access to the area. With the abiding memory of the Chinese navy's successful armed clash with Vietnamese forces on March 14, 1988, and the Chinese navy's clear superiority in naval tonnage, it is easy to imagine Chinese warships surging en masse into the South China Sea and overwhelming their adversaries in decisive battle. That image is further reinforced by the fact that "since the late 1980s, [Chinese] naval planners have called for changing from a coastal defense (*jinbai fangyu*) strategy to an offshore defense (*jinyang fangyu*) strategy . . . [extending] the defense perimeter to between 200 nm and 400 nm from the coast, and even more in the case of the South China Sea islands."<sup>6</sup>

Moreover, many Chinese warships are now outfitted with ship-launched cruise missiles like the HY-2 (C-201), a derivative of the Soviet SS-N-2a Styx, that has a range of 80–95 km. Most newer Chinese naval ships field the more accurate JY-1 (C-801), which can strike targets out to a distance of 32–40 km. Improving on the JY-1, the JY-2, which will soon be operational, incorporates

<sup>4</sup> See John Garver, "China's Push Through the South China Sea: The Interaction of Bureaucratic and National Interests," *The China Quarterly*, Dec. 1992, p. 1019. See also Bonnie S. Glaser, "China's Security Perceptions," *Asian Survey*, Mar. 1993, pp. 264–67.

<sup>5</sup> Jia Wenxian et al., "On the Specific Laws Concerning Future Local Conflicts That Will Involve Our Country," *Guofan Dazue Xuebao*, No. 11, 1987, p. 9, quoted in Lewis and Xue, *China's Strategic Seapower*, p. 226.

<sup>6</sup> *Ibid.*, p. 229.



Navy (PLAN) will soon be able to conduct the sustained large-scale operations necessary for a campaign in the South China Sea.<sup>7</sup>

Unfortunately for China, its potential adversaries in the Spratlys dispute, particularly Malaysia and Singapore, have matched or even surpassed China in several technical areas with weapons like the American-built anti-ship RGM-84D Harpoon and the French-built MM 38 Exocet. The Harpoon, with a range approaching 125 km, outdistances even the Chinese HY-2. Combined with advanced fire-control and guidance systems aboard their warships, Malaysian and Singaporean Harpoons and Exocets are much more lethal than their Chinese counterparts.

Singapore's navy, arguably one of the most technologically advanced in the region, can now deploy six Fearless-class and six Sea Wolf-class guided-missile patrol boats, as well as six Victory-class corvettes, all armed with Harpoons. Some are also equipped with Israeli-built Gabriel II anti-ship missiles, French-built Mistral infrared homing anti-air missiles, the Sadral point-defense system, and modern radar and communications systems. Moreover, Singapore commissioned four Swedish-designed Bedok-class (Landsort) mine hunters and organized them into the 194th Mine Countermeasures Squadron in October 1995. By 1997, Singapore will add six more Fearless-class patrol boats and at least one Swedish-built Sjöormen-class diesel submarine.<sup>8</sup>

Malaysia recently added two new British-built frigates to its two Kasturi-class corvettes, all armed with Harpoons and Exocets. Having excellent anti-air capabilities, the new frigate *Lekiu*, 30, was commissioned in December 1995 with a sixteen-cell Seawolf SAM vertical-launch group, and her sister *Jebat*, 29, will follow in August 1996. Surprisingly, Malaysia "agreed to purchase two of the four Iraqi Assad-class guided missile combatants from Italy," despite their small size and equipment incompatibility with other Malaysian navy vessels. However, that appears to be only an interim solution. Malaysia plans to build "as many as 27 1,200-ton new generation patrol vessels (NGPVs) . . . over the next fifteen years, at either Penang Shipbuilding Corporation or the ex-Navy Lumut Dockyard, or possibly both" in "what will undoubtedly be the largest

<sup>7</sup> Jane's reports that the HY-2 and JY-1 have ranges of 80 km and 40 km, respectively. Richard Sharpe, ed., *Jane's Fighting Ships 1995-96* (Surrey, England: Jane's Information Group Limited, 1995), pp. 114-41. The U.S. Naval Institute reports that the HY-2 and JY-1 have ranges of 95 km and 32 km, respectively. The HY-2 has a land-based variant, the Silk Worm. Bernard Prézelin and A.D. Baker III, eds., *The Naval Institute Guide to Combat Fleets of the World 1993* (Annapolis, Md.: Naval Institute Press, 1993), p. 87.

<sup>8</sup> See Sharpe, ed., *Jane's Fighting Ships 1995-96*, pp. 636-42; International Institute for Strategic Studies, *The Military Balance 1995/96* (Oxford: Oxford University Press, 1995), pp. 172, 187-88; Prézelin and Baker III, eds., *The Naval Institute Guide to Combat Fleets of the World 1993*, pp. 382-83, 630-31; Timothy M. Laur and Steven L. Llanos, *Encyclopedia of Modern U.S. Military Weapons* (New York: Berkeley Publishing Group, 1995), pp. 261-63; "World Navies in Review," U.S. Naval Institute *Proceedings* (hereafter *Proceedings*), Mar. 1996, pp. 111-12; "Combat Fleets," *Proceedings*, Nov. 1995, p. 93; "Combat Fleets," *Proceedings*, Oct. 1995, p. 125; "Combat Fleets," *Proceedings*, Aug. 1995, p. 93; and "World Navies in Review," *Proceedings*, Mar. 1995, p. 114.

naval construction program in Southeast Asian history." These ships are anticipated to be fitted out with modern anti-ship and anti-air missiles.<sup>9</sup>

Furthermore, both Malaysia and Singapore have augmented their air forces with modern combat aircraft. Malaysia has taken delivery of eighteen Russian-built MiG-29s, eight American-built F/A-18Ds, and the first eighteen of a total order of twenty-eight British-built Hawk 108/208s. Singapore can deploy up to eighteen F-16A/Bs and will soon have an additional eighteen F-16C/Ds. For reconnaissance, Singapore fields four E-2C Hawkeye airborne early-warning (AEW) aircraft that can not only detect and track multiple targets but also provide integrated over-the-horizon targeting data for the Harpoon missiles aboard its naval units. Lastly, Southeast Asian operations in the waters adjoining the Spratly Islands would be facilitated by Malaysia's completion of its second-largest naval base, which can accommodate as many as 2,500 personnel, at Kota Kinabalu on Borneo, just 310 km from Swallow Reef.<sup>10</sup>

Nevertheless, Southeast Asian forces' operational advantage in geography and weapons technology may be offset by their inability to cope with mass. Without automatic reloading mechanisms, Southeast Asian warships must retire to rearm once their missiles are expended. Chinese commanders could then exploit their mass to absorb losses, bring up follow-on forces, and close with their adversaries. However, for Chinese warships to reach that point, the People's Liberation Army Air Force (PLAAF) and Naval Air Force (PLANAF) must keep the skies above their naval ships free of enemy tactical aircraft. As stated in one official Chinese article, "Without control of the air, there will be no mastery of the sea."<sup>11</sup>

### Chinese Air and Naval Air Forces

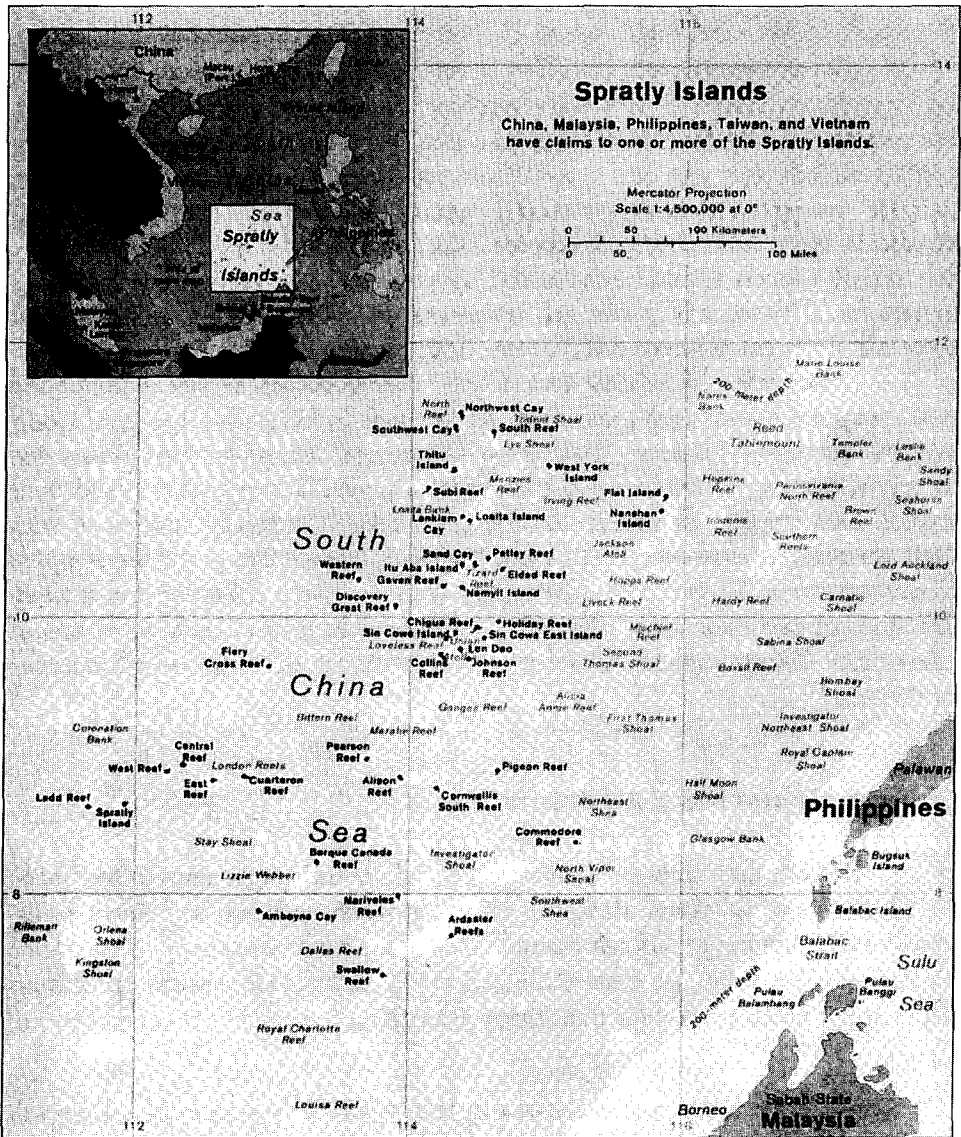
Despite their imposing collection of fighter and attack aircraft (see Table 1), Chinese air and naval air forces must still resolve several significant problems—including range, aircraft maintenance, training, and number of advanced aircraft—before they can ensure air superiority or provide reliable tactical air support for naval units near the Spratly Islands.

<sup>9</sup> The program "was to have been announced at the LIMA '95 show at Langkawi last December, but the decision has been deferred until the spring. Many international companies are bidding for prime contractorship in this prestigious program, worth up to \$2.2 billion. A prerequisite is maximum technology-transfer and participation by local industries." "World Navies in Review," *Proceedings*, Mar. 1996, pp. 111–12. See also Sharpe, ed., *Jane's Fighting Ships 1995–96*, pp. 425–34; International Institute for Strategic Studies, *The Military Balance 1995/96*, pp. 187–88; and Prézelin and Baker III, eds., *The Naval Institute Guide to Combat Fleets of the World 1993*, pp. 630–31.

<sup>10</sup> "Senator Deplores Planned Base," *Manila Chronicle*, Nov. 29, 1989; "Malaysia's 2nd Largest Naval Base Planned," *Philippine Daily Inquirer*, Nov. 28, 1989.

<sup>11</sup> Zhang Ze'nan, "New Developments in the Modern Construction of the Chinese Navy," *Jianchuan Zhishi*, No. 8, 1987, p. 2, quoted in Lewis and Xue, *China's Strategic Seapower*, p. 227.

**Map 2**  
**South China Sea**  
 (detail from previous map)



Source: Central Intelligence Agency, Washington, D.C.

*Range.* China's range problem is, at least in part, derived from Mao Zedong's strategic principle of an "active defense" (*jiji fangyu*), in which he envisioned that China would be defended in depth with mobile forces and prepared battlefields far to the rear. Although Chinese strategists tinkered with the idea of positional warfare after the Korean armistice in 1953, the Sino-Soviet

**Table 1**  
**Principal Chinese Combat Aircraft**

Aircraft	PLAAF	PLANAF	Standard Combat Load (kg)	Range (km)	
				low-low-low	high-low-high
J-5 (MiG-17F)	400	600	500		560
J-6 (MiG-19)	3000		1000		550
J-7 (MiG-21)	500		4 AAM	370	600
J-8	100		7 AAM		800
Q-5	400+	100	2000	400	600
Su-27	26		6 AAM		1500

Source: International Institute for Strategic Studies, *The Military Balance 1995/96* (Oxford: Oxford University Press, 1995), pp. 308–11. J-6 high-low-high range is the author's estimate.

Low-low-low and high-low-high refer to the altitude of a fighter's approach, attack, and egress, respectively. Flying at a lower altitude, where the air is denser, results in a higher drag and lower fuel economy.

border clashes in the late 1960s moved the PLA back to the concept of “active defense and luring the enemy deep” (*jiji fangyu, youdi shengru*) by 1977.<sup>12</sup> Thus, many of China's outlying airbases were constructed only as a first line of defense and, as a result, were not equipped to service the advanced aircraft now entering the Chinese air forces. More important, their runways were not designed to bear the type of punishment that the weight of modern fighters like the Su-27 can inflict. Given the PLAAF's current “strategy of ‘light front, heavy rear’ [*qian qing hon zhong*], it is unlikely the air force can justify building new airfields near the country's borders.”<sup>13</sup> Consequently, Chinese air operations in the South China Sea would have to be conducted from better-constructed and better-equipped air bases in rear areas much farther from the Spratly Islands.

Even from China's forward air bases, most Chinese fighter and attack aircraft still cannot reach the disputed islands. (See Table 2.) Carrying a standard combat load, even the PLAAF's newest fighter, the Su-27, would have a loiter time over the Spratly Islands of less than thirty minutes.<sup>14</sup> Although China is rumored to be negotiating for the purchase of up to seventy-nine MiG-31 fighters to be assembled in Guizhou Province under a cooperative agreement with Moscow, the MiG-31 would not solve the range problem because its range is no greater than that of the Su-27.<sup>15</sup> Until recently, only the H-6D, China's main

<sup>12</sup> *Ibid.*, pp. 211–19.

<sup>13</sup> Kenneth Allen, Glenn Krumel, and Jonathan D. Pollack, *China's Air Force Enters the 21st Century* (Santa Monica, Calif.: RAND, 1995), p. 124.

<sup>14</sup> Nayan Chanda, Rigoberto Tiglao, and John McBeth, “Territorial Imperative,” p. 16.

<sup>15</sup> Kristof, “The Rise of China,” p. 66.

**Table 2**  
**Estimated Flight Distances (km)**

	Nanshan Island	Spratly Island	Swallow Reef
<b>Chinese air bases</b>			
Woody Island	790	920	1080
Yujin	1100	1125	1325
Zhanjiang	1300	1400	1590
<b>Southeast Asian air bases</b>			
Ho Chi Minh City	975	625	880
Lauban	610	525	290
Kota Kinabalu	535	560	315
Kudat	435	575	350
Phan Rang	760	465	710
Puerto Princesa	330	750	610
Sandakan	600	760	520
Thitu Island	190	360	415

Source: The author's estimates

bomber, could reach the Spratly Islands from its air base at Zhanjiang and return. As a result, Chinese planners have been diligently attempting to develop methods that will extend the range of their aircraft.

The two most direct solutions to China's range problem would be to require Chinese aircraft to carry external fuel tanks or to reduce their standard combat load. Both solutions, however, would decrease their ability. External fuel tanks would increase the aircraft's total mass and thus restrict its speed and maneuverability. On the other hand, a reduced combat load would diminish the firepower that each Chinese pilot could command in an engagement, placing him and his aircraft at greater risk. Since China will probably neither acquire nor construct a fully operational aircraft carrier along with a trained air crew before the end of the next decade, there are only two ways China can maintain a strong and constant air cover over the Spratly group: aerial refueling or the development of an intermediate air base between southern China and the Spratly Islands.

Although never officially acknowledged, China likely purchased aerial refueling technology from Iran and "equipped four of its combat aircraft with air refueling . . . 'bolt on' probes provided [originally] by the United States for

Iranian F-5 aircraft." In addition, a Chinese Y-8 transport and possibly an H-6D bomber were reported to have been converted into test tanker platforms.<sup>16</sup>

As is often remarked, Chinese air forces now possess the Su-27, which can utilize aerial refueling to extend its range. However, it is uncertain whether the Su-27s China purchased have that capability or are compatible with the aerial refueling technology acquired from Iran. Moreover, aerial refueling is an arduous task demanding a level of proficiency and precision that Chinese air forces, with their basic air-to-air and air-to-ground communications, do not currently possess. Aircraft and tankers engaged in refueling must act in concert to rendezvous at specified coordinates, altitude, bearing, and velocity. They then must maneuver delicately at close distances to effect a link-up. All that requires rigorous practice and flight time that China, so far, has not provided its pilots.

Lastly, the whole process must take place over the South China Sea for it to be of any use. But since the PLAAF pilots who operate China's Su-27s never train over open ocean, it would be a challenge for them to navigate reliably over such a large, featureless expanse to a set of distant coordinates. Moreover, Chinese tankers operating over the South China Sea would need to be defended from Southeast Asian interceptors, effectively drawing away a number of China's precious Su-27s from their real missions of air superiority and tactical air support.

The development of an intermediate air base between southern China and the Spratly Islands appeared to have become a reality when Chinese engineers constructed a 2,700-meter airstrip on Woody Island, the largest member of the Paracel (Xisha) Islands. While the airstrip, 345 km from Yulin—China's southernmost mainland air base—and 920 km from Spratly Island, is long enough to support all types of Chinese combat aircraft, there is little space on the tiny (1.88 km<sup>2</sup>) island for dedicated aircraft shelters, like hangars or even revetments. Unless kept in a protected environment, sophisticated aircraft like the Su-27 can deteriorate rapidly, particularly in the humid, briny climate of the South China Sea.

Shortage of space also restricts the volume of munitions and jet fuel—vital for extended air operations—that can be stored on the island. Even if a regular flow of supplies could be established from the mainland, Woody Island's inadequate docking facilities, consisting currently of a single jetty supplemented by small ferries, would limit the rate at which these supplies could be unloaded.

Like the runways of other forward Chinese air bases, the Woody Island airstrip was not designed for the Su-27. Unremitting use by the Su-27 or heavier aircraft would erode the airstrip's surface and could render it inoperable. Maintenance and repair facilities on the island are minimal even though "modern high performance aircraft require elaborate supporting structures to make them

<sup>16</sup> Allen, Krumel, and Pollack, *China's Air Force Enters the 21st Century*, pp. 170–71. See also Nicholas D. Kristof and Sheryl WuDunn, *China Wakes: The Struggle for the Soul of a Rising Power* (New York: Times Books, 1994), p. 382.

functional.”<sup>17</sup> In fact, one of the principal reasons cited to explain why the first batch of Su-27s was not assigned to air bases in southern China was that the PLAAF met with so many unanticipated infrastructure and logistical problems that the cost of deploying the aircraft to the region far outweighed the benefit of doing so. Therefore, while certainly an asset to Chinese forces in the South China Sea, Woody Island remains far from being a primary base of operations.<sup>18</sup>

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**Most Chinese fighter and attack aircraft cannot reach the Spratly Islands.**

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*Aircraft maintenance.* One of the typically overlooked, but important, aspects of military readiness is proper maintenance, particularly for sophisticated combat aircraft. Many Chinese units “purport to have an operational ready rate of 95 percent,” high even for Western air forces. However, these claims do not “reflect that each aircraft only logs about 100 hours annually (barely three hours a week) and that most of this is navigation.”<sup>19</sup> Complex maneuvering takes a much greater toll on aircraft and lowers their overall performance.

The most serious aircraft maintenance problem is often the engine. Engine wear is caused by prolonged exposure to the high temperatures created by flying at high velocities or for extended periods of time. Of no minor concern to Chinese air forces, “the PLAAF’s fighter engines [such as the Chengdu WP7B (BM), Liyang WP13A II, and Klimov RD-93] require a major overhaul after 300 to 350 hours [of flying time], a second overhaul after an additional 200 to 250 hours, and a third after an additional 150 hours. After that, the engines are scrapped.”<sup>20</sup> (Not surprisingly, these overhaul rates are comparable to those for other Soviet-designed engines in Warsaw Pact air forces during the cold war.) These rates are far greater than even those of the complex F100-PW-220 and F100-PW-229 engines that power Singapore’s F-16s, which have been criticized for requiring substantial overhaul every 1300 hours.<sup>21</sup>

The extreme fragility of China’s Soviet-designed engines is directly related to the decreasing range of a growing number of its fighter and attack aircraft. These aircraft will invariably demand more support personnel and spare parts at frontline air bases to keep their sortie rates high. Unfortunately for the Chinese, the PLAAF’s “light front, heavy rear” strategy denies frontline air bases, like those on Hainan Island and Woody Island, good maintenance and repair facilities. To make matters worse, “not all spare parts [among Chinese combat aircraft] are interchangeable. For example, because the rivets in each aircraft

<sup>17</sup> Eliot A. Cohen, “The Meaning and Future of Air Power,” *Orbis*, Spring 1995, pp. 191–92.

<sup>18</sup> Chien Chung, “Economic Development of the Islets in the South China Sea” (paper presented at the American Enterprise Institute Conference, Sept. 7–9, 1994). To peruse good aerial photographs of Woody Island, see Pan Shiyang, “The Nansha Islands: A Chinese Point of View,” *Window*, Sept. 3, 1993, pp. 23–37.

<sup>19</sup> Allen, Krumel, and Pollack, *China’s Air Force Enters the 21st Century*, p. 123.

<sup>20</sup> *Ibid.*, p. 178. See also Paul Jackson, Kenneth Munson, and John W.R. Taylor, eds., *Jane’s All the World’s Aircraft 1995–96* (Surrey, England: Jane’s Information Group Limited, 1995), pp. 48–68, 781.

<sup>21</sup> Author’s conversation with a former Pratt and Whitney engineer. The F100-PW-220 engine requires overhaul after every four thousand cycles of use. Above average use of the engine is approximately three cycles/hour. Andrew Cockburn, *The Threat: Inside the Soviet Military Machine* (New York: Random House, 1983), pp. 238–39.

are hand drilled, the holes are not all in the same place. Therefore, when a subsystem, such as the radio, is pulled out to be repaired, the aircraft does not fly until that radio is replaced." Thus, "each base has a one-year supply of spare parts for each aircraft," greatly limiting the PLAAF's mobility in case of a crisis.<sup>22</sup>

Securing a reliable source of spare parts is an essential part of maintenance. The Indian Air Force, which operates thirty-six squadrons of MiG fighters, was reported to have been scrambling for spare parts in 1994. Fortunately for China, its December 1995 agreement with Russia includes the licensed production of the Su-27, which will eventually ameliorate many of its most serious problems with spare parts.<sup>23</sup> Until then, however, China will have to rely on Russian sources.

Despite Chinese claims that the PLAAF achieved a 97.5 percent readiness rate and a 99.7 percent takeoff rate for its aircraft during the Sino-Vietnamese conflict in 1979, it was in reality "not a difficult feat with such a low sortie rate."<sup>24</sup> The PLAAF launched some 8,500 sorties—including "area familiarization, flights during the 30-day conflict, and postconflict sorties"—during a period of two to three months. Inasmuch as 700 aircraft were deployed to the Vietnamese border, that suggests only a dozen sorties per aircraft over sixty-plus days. (By contrast, USAF aircraft in a European war were expected to fly up to three sorties per day.)<sup>25</sup> What is more, aerial combat over the Spratlys could be much more intense than in China's expedition into Vietnam. Unless Chinese air and naval air forces can maintain a high readiness rate throughout a South China Sea campaign, they face the prospect of losing air superiority. The fact that the Chinese air force has flown twenty-six Su-27s since 1992 and still has major maintenance concerns is a worrisome indicator.

*Training.* Although the new doctrinal rigor infused into China's pilot training program has improved the general abilities of the PLAAF and PLANAF, Chinese pilots still average only between 80 and 150 hours of flying time each year, in contrast with the more than 200 hours that their Malaysian and Singaporean counterparts receive.<sup>26</sup> In fact, even after lengthy training in Russia, the pilots assigned to fly the initial batch of twenty-six Su-27s remained "so unskilled that Russian pilots had to deliver the planes to Chinese bases."<sup>27</sup> Even now, Chinese commanders, fearful of damaging their new aircraft, have husbanded their use, restricting Chinese pilots to little more than navigation flights and basic maneuvers. Meanwhile, Singaporean pilots have cut their teeth by training at Luke Air Force Base with the U.S. 58th Tactical Fighter Wing.

<sup>22</sup> Allen, Krumeel, and Pollack, *China's Air Force Enters the 21st Century*, p. 178.

<sup>23</sup> Patrick E. Tyler, "China to Buy 72 Advanced Fighter Planes From Russia," *New York Times*, Feb. 7, 1996. See also International Institute for Strategic Studies, *The Military Balance 1994-1995* (Oxford: Oxford University Press, 1994), p. 155.

<sup>24</sup> Allen, Krumeel, and Pollack, *China's Air Force Enters the 21st Century*, p. 93.

<sup>25</sup> *Ibid.*

<sup>26</sup> *Ibid.*, p. 130.

<sup>27</sup> Kristof and WuDunn, *China Wakes*, p. 382.

Moreover, the instruction Chinese pilots receive remains circumscribed. Because the training of each service, whether air force or naval air force, tends to be built rigidly around service-specific missions, Chinese pilots from the two services are often incompatible. PLAAF pilots, for instance, are never trained to operate over open ocean or provide tactical air support for naval units—a particularly problematic situation for Chinese commanders since all twenty-six Su-27s currently in Chinese service have been assigned to the PLAAF.<sup>28</sup> Its officers' handbook specifically states that

flying over water and over land is completely different. When flying over the ocean, there are no ground markers as reference points; it is difficult to estimate altitude and distance; weather changes quickly, visibility is low, and the horizon is difficult to discern; there is no navigation equipment on the ocean, and it is difficult to deal with special situations when they appear. Pilots encounter control problems over the water every day, which greatly complicates training. Therefore, the farther one flies from the coastline, the more problems there are and the more difficult it becomes.<sup>29</sup>

Nor are PLANAF pilots routinely trained in air-superiority roles. Even within the services there are substantial training barriers. Whatever capability is resident in the J-8 fighter for tactical air support, for instance, may never be exhibited if its Chinese pilot has been trained only in air-superiority maneuvers. Consequently, Chinese air forces, if called into action, might fail to accomplish the most elemental coordination between air and naval forces. Significant technical and doctrinal differences also exist between the PLAAF and PLANAF in terms of command, control, and communications architecture.<sup>30</sup>

While Chinese air forces performed adequately in the 1995 and 1996 naval and air demonstrations and exercises off the northern and southwestern coasts of Taiwan, the PLAAF and PLANAF have not resolved many of their worst training deficiencies.

*Advanced aircraft.* The successful December 1995 conclusion of China's acquisition of the final forty-six Su-27s of a total order of seventy-two aircraft from Russia has many observers proclaiming another leap in Chinese air capability. The Chinese air force currently operates the initial twenty-six Su-27s (twenty-two Su-27s and four Su-27UBs) from this order. These aircraft were assigned to the PLAAF's 3rd Air Division based at Wuhu, 270 km west of Shanghai and far removed from the South China Sea. The second batch of twenty-four Su-27s is reported to be earmarked for deployment with the PLANAF on Hainan Island.<sup>31</sup>

On the whole, however, seventy-two Su-27s still represent a relatively small number of fighters, particularly for a country like China that faces potential conflict all along its borders. It is unlikely that Chinese leaders—many of whom remain concerned with the long-range threats of Russia and Japan—would be

<sup>28</sup> Allen, Krumel, and Pollack, *China's Air Force Enters the 21st Century*, p. 206.

<sup>29</sup> *Ibid.*

<sup>30</sup> *Ibid.*, p. 125.

<sup>31</sup> Tyler, "China to Buy 72 Advanced Fighter Planes From Russia."

willing to stake all their new and expensive aircraft in a single venture in a discretionary conflict in the South China Sea.<sup>32</sup> As Eliot Cohen pointedly remarked, the expensive aircraft of today are no longer the "easily expendable commodities" they were in World War II.<sup>33</sup>

Only after China is able to exploit fully its \$2 billion Su-27 production license can it significantly alter the correlation of forces in the South China Sea. However, building on license is still a difficult process. Chinese engineers needed six years to bring the relatively simple MiG-21 into limited production as the J-7, and "if the Su-27 is chosen to be the next standard fighter, a lengthy development cycle could again result in China building its air force around an aircraft that is old by the time it sees service in large numbers."<sup>34</sup> Everything from metal alloys to solid state electronics must be carefully reproduced. That is not to diminish in any way the impact that Chinese production of Su-27s will have. Indeed, unless Southeast Asian countries are able to maintain a credible conventional deterrent to China's new Su-27s, they will find themselves in increasing danger. But China's stalled J-10 "new fighter" project, created from the abandoned Israeli Lavi design, continues to cast doubt on China's ability to overcome its persistent engineering deficiencies.<sup>35</sup>

China is interested in developing an airborne early-warning capability and has converted a Tu-4 bomber and possibly a Y-8 transport into preliminary platforms for such a role. However, China currently has no known operational AEW aircraft, despite a fleeting November 1993 BBC report that China may have installed British-built Nimrod radar systems on three of its ten Il-76 transports, assigned to the 13th Air Division based near Wuhu, in order to create A-50 AEW platforms.<sup>36</sup> It is, however, much more likely that the Il-76s will be used to support Chinese airborne brigades.

## Chinese Naval Forces

With Chinese air superiority in some question, the importance of capable Chinese ship-based air defenses becomes paramount. Currently, the most capable Chinese anti-air warfare ship is the Luh-class destroyer. The Rice Screen three-dimensional air-search radar aboard the Luh class can detect and track airborne contacts out to a range of 185.3 km. Once these contacts come within 13 km of the ship, the destroyer can then engage them with its eight French-built Crotale missiles. In addition to relatively good communications, seakeeping

<sup>32</sup> On Chinese threat perceptions, see Shulong Chu, "The PRC Girds for Limited, High-Tech War," *Orbis*, Spring 1994, pp. 180-83.

<sup>33</sup> Cohen, "The Meaning and Future of Air Power," p. 193.

<sup>34</sup> Allen, Krumel, and Pollack, *China's Air Force Enters the 21st Century*, pp. 223-24.

<sup>35</sup> *Ibid.*, pp. 144-46.

<sup>36</sup> Bernard Blake, ed., *Jane's Radar and Electronic Warfare Systems 1995-96* (Surrey, England: Jane's Information Group Limited, 1995), p. 258. The British Broadcasting Corporation report stated that China may have purchased sixteen British-built Nimrod radar systems in 1990-91. Allen, Krumel, and Pollack, *China's Air Force Enters the 21st Century*, p. 172.

qualities, and chaff defenses, the Luhuhu class houses the Chinese navy's first electronic combat information suite, the French-built TAVITAC combat data system.

The Crotale SAM and TAVITAC combat data system can also be found aboard at least three of China's sixteen Luda-class destroyers and will probably be fitted out on additional Luda-class ships as they become available. The *Kaifeng*, 109, in the North Sea Fleet and *Zhubai*, 168, in the South Sea Fleet were modernized in 1990–91 with French assistance, and a third Luda class was reported to have been similarly modernized in 1995.<sup>37</sup> These ship upgrades are particularly important for Chinese naval operations in the South China Sea since the Luda class would most likely be called upon to fill any Chinese task force's air defense requirements until enough Luhuhu-class destroyers are constructed. Two Chinese frigate classes also mount SAM defenses. Both the newer Jiangwei class and older Jiangdong class are equipped with Chinese-built HQ-61 launchers and PL-9 missiles, which have an effective range of 8.5–10 km and can reach an altitude of 5,000 meters. However, this SAM system, under development since the 1960s and first deployed in the 1980s, has had a "long history of problems."<sup>38</sup> Each Jiangwei class is armed with one sextuple HQ-61 launcher, and each Jiangdong class fields two.

To further aid their operations, Chinese naval commanders would seek to organize their ships into tactical formations that would minimize their exposure to air attack while maximizing their air defense resources. On the operational level, two fundamental types of organization exist: concentration and dispersal. Concentration could mitigate Chinese deficiencies in command and control and give local commanders direct access to a maximum of air defense assets, but it could also make the main body vulnerable by making its detection more likely. In contrast, dispersal makes detection of the main body less likely by physically separating its parts but raises the specter that the various task forces could be engaged piecemeal and defeated in detail. In considering the South China Sea operational environment, however, Chinese commanders are likely to choose dispersal over concentration. Dispersal in this environment holds the possibility of dividing Southeast Asia's small air forces—making them vulnerable to interception and destruction by a locally superior Chinese force.

Ultimately, the number of task forces that the PLAN can form will be strongly influenced by its small number of capable anti-air warfare ships, since each task force must contain some warships able to manage the task force's

<sup>37</sup> Since the first of its class was completed in 1971, the Luda class has undergone several upgrades, and as a result, the armament and electronic equipment aboard the sixteen operational ships of the class vary. "World Navies in Review," *Proceedings*, Mar. 1995, p. 114. See also International Institute for Strategic Studies, *The Military Balance 1995/96*, p. 177; Sharpe, ed., *Jane's Fighting Ships 1995–96*, pp. 120–21; and Prézelin and Baker III, eds., *The Naval Institute Guide to Combat Fleets of the World 1993*, p. 90.

<sup>38</sup> Richard Sharpe, ed., *Jane's Fighting Ships 1994–95* (Surrey, England: Jane's Information Group Limited, 1994), p. 122; Tony Cullen and Christopher F. Foss, eds., *Jane's Land-based Air Defense 1995–96* (Surrey, England: Jane's Information Group Limited, 1995), pp. 112–13. The HQ-61 launcher is derived from a land-based variant that has proven to be unreliable.

integrated air defenses. Currently, the Chinese navy possesses only two Luh-class and three Croale-armed Luda-class destroyers, and six Jiangwei-class and two Jiangdong-class frigates. Further production of the Luh class has been recently stymied by a shortage of LM 2500 propulsion gas turbines. Ukraine may supply "gas turbines for the third and subsequent [Luh-class] ships."<sup>39</sup>

However, the consequences of such a small number of ships capable of effective air defense go far beyond task-force building. Because of China's long coastline, the PLAN's anti-air warfare ships are dispersed among its three fleets, each defending a section of that coastline. Only the Chinese navy's South Sea Fleet, operating from Zhanjiang, covers the South China Sea.<sup>40</sup> In case of a crisis near the Spratly Islands, the time required to redeploy the anti-air warfare ships from the other two fleets would effectively slow Chinese operations and allow Southeast Asian forces to gather strength and gain a temporary tactical advantage.

More important, the small number of air defense ships could rob China of the advantage of strategic or operational surprise. Any salient shifting of these warships to the South China Sea prior to a crisis would certainly alert Southeast Asian countries to the possibility of a surprise Chinese action in the Spratly Islands. That is particularly true because most of China's most advanced anti-air ships, including its two Luh-class destroyers, are assigned to the North Sea Fleet—defending the historic seaward approaches to Beijing. In fact, the South Sea Fleet is the least modern of all three Chinese fleets. Aside from the *Zhubai*, the Luda-class destroyers in the South Sea Fleet are among the Chinese navy's least capable. While all are equipped for underway replenishment, few have Rice Screen air-search radars, and none has SAM air defenses. Some other ships assigned to the South Sea Fleet, like the Chengdu-class and Jiangnan-class frigates, are nearing retirement.<sup>41</sup> Thus, until China can build enough anti-air warfare ships to make such shifting unnecessary, any sudden movement of these easily tracked ships will give observers a hint to Chinese intentions.

Similarly, Chinese intentions may be revealed by an increase in the number of Chinese familiarization cruises in the waters adjoining the Spratly Islands, which may expand from one or two frigate patrols to coordinated destroyer-frigate maneuvers. Since treacherous reefs and rocks abound in these shallow waters, Chinese navy captains would understandably want to undertake some sort of training in the area before being deployed there in a combat situation. In addition, because the PLAAF does not have, nor will it acquire "in

<sup>39</sup> Sharpe, ed., *Jane's Fighting Ships 1995-96*, p. 119.

<sup>40</sup> The East Sea Fleet, operating from Shanghai, covers Taiwan. The North Sea Fleet, operating from Qingdao, covers Japan and the Korean Peninsula.

<sup>41</sup> These ships include the *Changsha*, 161; *Nanning*, 162; *Nanchang*, 163; *Guilin*, 164; *Zhanjiang*, 165; and *Zhubai*, 168. Sharpe, ed., *Jane's Fighting Ships 1995-96*, pp. 120-21; "World Navies in Review," *Proceedings*, Mar. 1996, pp. 111-12; and Prézelin and Baker III, eds., *The Naval Institute Guide to Combat Fleets of the World 1993*, pp. 90-92. *Zhubai* changed hull numbers from 166 to 168. Jeffery B. Goldman, "China's Mahan," *Proceedings*, Mar. 1996, p. 46. The last four Jiangnan-class frigates may have been retired in 1995. International Institute for Strategic Studies, *The Military Balance 1995/96*, p. 177.

the near to mid term,” good airborne photographic capabilities, China’s ability to conduct any “strategic [or] tactical planning for attacks on [Southeast Asian] forces and airfields” would be seriously constrained.<sup>42</sup>

Without reliable all-weather communications or surveillance equipment, China’s small military outposts and weather-monitoring stations in the Spratly Islands are of dubious utility. Even a third-phase Chinese installation, complete with reinforced concrete merlons, can be bypassed by controlling the air and sea around it. Furthermore, suggestions that the conventionally armed DF-25 missile was designed for operations in the Spratly Islands are unpersuasive. While the DF-25 can reach the islands, its accuracy is suspect, and its threat to a mobile naval force can be discounted.

### The Scenario

How would all the preceding influences blend together in a combat environment? To suggest an answer to this question, let us posit a scenario in which Malaysia and Singapore alone cooperate to halt a Chinese thrust into the South China Sea. This takes into account both the difficulty in creating and sustaining a large wartime coalition and the fact that these two countries have a history of intelligence exchange and military cooperation in the Five Power Defense Arrangement—under whose framework they conduct regular annual exercises in their Integrated Air Defense System.<sup>43</sup>

From the onset of the crisis, forces from these Southeast Asian countries, as well as additional stores of munitions and jet fuel, would be mobilized and deployed to Malaysian air bases at Kudat, Kota Kinabalu, Lauban, and Sandakan on the northwestern coast of Borneo. Malaysian and Singaporean Starburst, Rapier, Mistral, and Improved Hawk SAM batteries would follow aboard Malaysia’s newly acquired Newport-class tank landing ship, the *Sri Inderapura*.

Throughout the deployment, at least one of Singapore’s four E-2Cs would be constantly patrolling above the southern end of the Spratly group, where it would be outside the effective combat range of most Chinese fighters and protected by friendly forces. Using its APS-139 air-and-surface-search radar, the E-2C can detect and track more than two thousand different contacts out to a range of 463 km. The relative absence of land in the South China Sea and the fact that the APS-139 incorporates an improved ECCM system would prevent any appreciable image degradation caused by either background clutter or Chinese electronic jamming. The E-2C patrols could be supplemented by Singapore’s four Fokker 50 Mk. 2 maritime reconnaissance aircraft, which possess

<sup>42</sup> Allen, Krumel, and Pollack, *China’s Air Force Enters the 21st Century*, p. 125.

<sup>43</sup> “Five Power Defence Arrangement (FPDA) Marks 20th Year of Existence,” *Asia Defence Journal*, June 1990, pp. 82–83.

a multimode APS-134 radar and a chin-mounted infrared detection system for all-weather operations. A skilled APS-134 operator, by selecting various scan rates, pulse frequencies, and pulse widths, could search for surface targets as small as submarine periscopes and antennas.

Once a Chinese task force was located and assessed, Southeast Asian F/A-18Ds and F-16C/Ds, armed with AGM-65A/B Maverick missiles, could be assembled into their strike elements and assigned targets. When the task force was believed to be beyond Chinese air cover, the strike would be sent aloft. If Chinese fighters, refueling at Woody Island, returned to threaten the strike, MiG-29s, F-16A/Bs, and F-5Es would be deployed to intercept them. Because these Chinese fighters would still be operating near the edge of their combat radii, Southeast Asian interceptors orchestrated by an E-2C could easily defeat them or, at the very least, deflect their attention from the strike below.

Approaching the Chinese task force at a very low altitude and in close formation, the strike elements could use the earth's curvature to shield themselves from Chinese air-search radars, as Argentine Mirage IIIs and A-4s did against British air defenses in the South Atlantic in 1982. The strike aircraft could further cloak their radar signatures by restricting their electronic emissions. Real-time information regarding the Chinese task force could be downloaded to the strike elements by the orbiting E-2C. The longer the strike elements could delay detection, the more likely it is that they would survive Chinese air defenses to mount a successful attack.

Once the strike elements converged on the task force and closed within the range of their AGM-65A/B Mavericks, they would surge to a higher altitude, activate their targeting radars, and launch their missiles. From an altitude of 914 meters, the Maverick can be released 16.8 km from its target. From an altitude of 3,048 meters, the Maverick can be released as far as 22.2 km from its target. The F/A-18D, sweeping forward at an altitude of 20 meters, can reach a launch altitude of 914 meters and 3,048 meters in 3.9 seconds and 13.2 seconds, respectively. F-16C/Ds have comparable climb rates. Once launched, the AGM-65A/B has a demonstrated 85 percent probability of a successful hit.<sup>44</sup>

Although the strike aircraft are sure to be compromised from the moment they begin their ascent, Chinese warships, even those equipped with the Rice Screen air-search radar and Crotale SAM, would be sorely pressed to shoot down any of their attackers because the strike aircraft would likely release their munitions outside or just inside the 13 km range of the Crotale. Moreover, Chinese commanders with "no AEW capability" and "only rudimentary airborne reconnaissance capability" would be virtually blind to the precise direction of the air attack until the attack was already underway.<sup>45</sup> What aerial reconnaissance

<sup>44</sup> Laur and Llanso, *Encyclopedia of Modern U.S. Military Weapons*, pp. 272–74. "Maverick success rate (successful launch and guidance to the target) was approximately 80 to 90 percent for the more than 5,100 AGM-65s fired [in the Persian Gulf conflict]." U.S. Department of Defense, *Conduct of the Persian Gulf War* (Washington, D.C.: Government Printing Office, 1992), p. 778.

<sup>45</sup> Allen, Krumel, and Pollack, *China's Air Force Enters the 21st Century*, p. 125.

the Chinese could muster would probably be limited and based on the Su-27's look-down Doppler radar platform. However, Su-27s used in this manner would presumably be intercepted by Malaysian and Singaporean F-5Es.

In planning the strike, Southeast Asian commanders would first target those warships most likely to control the task force's integrated air defenses and central communications. Suppression of Chinese air defenses would pave the way for follow-on air attacks. Without central communications, command and control would deteriorate, and the ships of the task force would be compelled to operate separately, making them more vulnerable to air attacks by less capable but more numerous strike aircraft like the Hawk 108/208, A-4PTM, and A-4S. Since none of their SAM systems can be automatically reloaded, Chinese warships would be forced to rely on locally directed anti-aircraft gunfire. Consequently, Malaysia's and Singapore's eighteen Hawk 108/208s, thirty A-4PTMs, and sixty-four A-4Ss would likely penetrate what was left of Chinese air defenses and ravage the remnants of the Chinese task force.

To this point, the scope of the battle has been circumscribed by political actors—not military commanders. Cognizant that the Malaysian air bases on the northwestern coast of Borneo are the operational key to any Southeast Asian defense, Chinese commanders would naturally want to neutralize them with a meticulously planned tactical strike at the outset of hostilities. However, an attack of this sort on the well-recognized sovereign territory of Malaysia—a defense ally of the United Kingdom, Australia, New Zealand, and Singapore, as well as a friend of the United States—certainly carries weighty political and military implications. While the ultimate decision is a political one, in light of the Chinese military's new policies, the possibility of a Chinese air strike against these bases can no longer be discounted completely.

### **The Model**

To secure the Spratly Islands against all challengers, China could be forced into a battle of attrition. The model presented here pits Malaysia's and Singapore's combined twenty-six F/A-18Ds and F-16C/Ds against three distinct Chinese task forces. (See Table 3.) This model is derived from one that was used to describe an air-ground battle between NATO and Warsaw Pact forces in Central Europe in the 1980s. Success in the latter model was achieved once NATO strike aircraft suppressed Pact air defenses, since NATO air forces could then interdict Pact military concentrations deep into the enemy's rear areas and thereby influence the forward ground battle. Similarly, in the South China Sea scenario, once Southeast Asian strike aircraft suppressed Chinese air defenses, they could then turn their full attention to engaging Chinese naval ships. Because many Southeast Asian pilots, like those of Malaysia and Singapore, fly American-built aircraft and are trained with American tactics, and Chinese naval crews

**Table 3**  
**The South China Sea Model**

Sortie	Total Aircraft	Ready Aircraft	Penetration	Cumulative Penetration	Shots on Target	Cumulative Shots	Kills	Cumulative Kills	Radars Destroyed	New Attrition Rate
1	26	20	18	18	72	72	15	15	0.375	0.1
2	24	19	17	35	68	140	14	29	0.725	0.07
3	22	17	16	51	64	204	13	42	1	0.042
4	21	16	14	14	56	56	11	11	0.275	0.1
5	19	15	13	27	52	108	11	22	0.55	0.078
6	17	13	12	39	48	156	10	32	0.8	0.056
7	16	12	11	50	44	200	9	41	1	0.036
8	15	12	10	10	40	40	8	8	0.2	0.1
9	13	10	9	19	36	76	7	15	0.375	0.084
10	12	9	8	27	32	108	6	21	0.525	0.07
11	11	8	7	34	38	136	5	26	0.65	0.058
12	10	8	7	41	28	164	5	31	0.775	0.048
13	9	7	6	47	24	188	5	36	0.9	0.038
14	8	6	5	52	20	208	4	40	1	0.028
A	B	C	D	E	F	G	H	I	J	K

Input values: Initial aircraft = 26; Initial radars/task force = 40; Readiness rate = 0.8; Shots/aircraft = 4; Hit rate = 0.425; Kills/hit = 0.5; Probability of kill = 0.2125; Attrition rate = 0.1; Minimum attrition rate = 0.02.

Equations for Row 2: Sortie = 2; Aircraft =  $B1 - (C1 - D1)$ ; Ready =  $INT(B2 \cdot 0.8)$ ; Penetrate =  $INT(C2 \cdot (1 - K2))$ ; Cum. penetrate =  $E1 + D2$ ; Shots =  $D2 \cdot 4$ ; Cum. shots =  $G1 + F2$ ; Kills =  $INT(F2 \cdot 0.2125)$ ; Cum. kills =  $I1 + H2$ ; Radars destroyed =  $IF(I2/40 > 1, 1, I2/40)$ ; New attrition =  $(1 - J1) \cdot (0.1 - 0.02) + 0.02$ .

(INT is a rounding function. The IF function prevents the percentage of radars destroyed from exceeding 1.)

use Soviet-designed technical systems and tactical guidelines, one can assume that the combat effectiveness of the contending forces in the South China Sea would be approximately the same as that of forces in Central Europe.<sup>46</sup>

To compensate fully for the lack of practiced command-and-control direction among Southeast Asian forces, however, the model was designed with several assumptions favoring the Chinese. First, assume that each Southeast Asian strike aircraft will carry only four AGM-65A/Bs—even though the F/A-18D and F-16C/D can carry up to eight missiles—compensating for the possibility that some aircraft may not be solely dedicated to a strike role and, therefore, may carry air-to-air missiles or external fuel tanks. Secondly, assume that each Chinese task force is equipped with forty air-search radars or SAM guidance systems—exaggerating reality. Each task force would consist most likely of no more than ten destroyers and frigates, each with fewer than four air-search radars or SAM guidance systems. Thirdly, assume an attrition rate for Southeast Asian strike aircraft of 10 percent, twice that expected to be inflicted on NATO aircraft operating over Central Europe, but close to the attrition rate experienced by Argentine air forces during the most intense combat in the South Atlantic. (British warships were better equipped than their current Chinese counterparts, while Southeast Asian strike aircraft are more advanced and better armed than their Argentine counterparts. Moreover, Argentine A-4s needed to close within the range of all British air defense weapons before dropping their munitions, placing themselves at great risk. Still, Argentine Mirage IIIs and A-4s were able to sink five British ships and damage eleven others.) Fourthly, assume that the AGM-65A/B has a hit probability of .4025, even though the Maverick has a demonstrated hit probability of .85. And fifthly, assume a .5 probability of a hit successfully disabling its target.

Lastly, because of China's potential to field seventy-two Su-27s, let us assign all eighteen Singaporean F-16A/Bs to air-superiority roles rather than strike roles alongside Malaysia's eighteen MiG-29s. Although outnumbered two to one, the Southeast Asians can use their aircraft much more efficiently by relying on their E-2C reconnaissance capability. During the early 1980s, NATO aircraft would have encountered similar ratios over Central Europe.

The results of the model suggest that a combined Malaysian and Singaporean strike, consisting of a mixed force of eight F/A-18Ds and eighteen F-16C/Ds, could defeat three successive Chinese task forces in fourteen sorties. After the fourteenth sortie, all the air-search radars and SAM guidance systems aboard all three task forces would be destroyed. The surviving ships would then be vulnerable to follow-on air attacks. Unlike damaged Southeast Asian warships that can retire to the nearby Malaysian naval base at Kota Kinabalu, damaged Chinese warships must sail or be towed back to repair facilities at Yulin.

<sup>46</sup> Barry R. Posen, *Inadvertent Escalation: Conventional War and Nuclear Risks* (Ithaca, N.Y.: Cornell University Press, 1983), pp. 219–34.

## Conclusions

To be sure, the fundamental assumption of the model above is the strength of the Malaysia-Singapore coalition. While Malaysia's imperative in the Spratly Islands is clear—to defend what it considers to be its sovereign territory—Singapore's imperative is less evident. Although Singapore does not want to see China dominating the region or the sea lanes through the South China Sea, its interests are not directly at stake. Nevertheless, Singapore does strongly support forward defense, greater military cooperation with Malaysia, and enhanced regional security cooperation against external threats.<sup>47</sup> Whatever its stand, Singapore's involvement is critical because its E-2Cs, Fokker 50 Mk. 2s, F-16A/B/C/Ds, and AGM-65A/B Maverick missiles would be the cornerstone of any effective Southeast Asian resistance.

Despite China's rapid economic growth in the 1980s and early 1990s, indicators now point to a "long, hard road" for China's future growth.<sup>48</sup> Less new revenue will be available to fuel China's accelerated acquisitions. Moreover,

there are also constraints inhibiting extensive Russian military technology transfers to the PRC, such as a chronic shortage of hard currency in Beijing and a pervading apprehension in the Kremlin that a too well armed PLA on Russia's southern border is not in Moscow's interests. Similarly, given Russia's intent to expand its trade and commercial ties in Asia, it would not want to be seen as China's armorer in the manner that it was from 1950 to 1960. This would be especially so in Southeast Asia, where advanced long-range aircraft would be significant for PRC military operations in the South China Sea.<sup>49</sup>

For the PLA to overcome its current problems and prevail, Chinese strategists and planners must develop the operational maneuvers and deception skills necessary to create a favorable correlation of forces at a point of its choosing.

In January or February 1995, China tested the United States's commitment to its mutual defense treaty with the Philippines with regard to the Spratly Islands by descending on the Philippine-claimed Mischief Reef. The American response was subdued. The U.S. Department of State reissued its 1994 statement of neutrality in the Spratly Islands dispute and hoped that the "conflicting claims

<sup>47</sup> See Michael Vatikiotis, "The First Step," *FEER*, June 3, 1993, p. 18; Michael Vatikiotis, "Forging Stronger Links," *FEER*, Apr. 29, 1993, p. 26; Richard Stubbs, "Subregional Security Cooperation in ASEAN," *Asian Survey*, May 1992, pp. 397–410; Sheldon W. Simon, "The Regionalization of Defense in Southeast Asia," *The National Bureau of Asian Research*, June 1992; and Amitav Acharya, "Regional Military-Security Cooperation in the Third World: A Conceptual Analysis of the Relevance and Limitations of ASEAN (Association of Southeast Asian Nations)," *Journal of Peace Research*, 1992, pp. 7–21. Singapore's prime minister, Goh Chok Tong, has spoken with Beijing leaders about the Spratly Islands. See Rigoberto Tiglaio, "Remote Control," *FEER*, June 1, 1995, p. 20.

<sup>48</sup> See "Keeping China Off the Rocks," *The Economist*, Feb. 10, 1996, pp. 35–36; and "A Survey of China," *The Economist*, Mar. 18, 1996, pp. 3–22.

<sup>49</sup> Parris H. Chang and Martin L. Lasater, *If China Crosses the Taiwan Strait* (Lanham, Md.: University Press of America, 1993), p. 29. See also Bin Yu, "Sino-Russian Military Relations," *Asian Survey*, Mar. 1993, pp. 302–16.

[would] be resolved peacefully.”<sup>50</sup> By contrast, although the Philippines did not challenge the seizure militarily, in late March its navy removed or destroyed Chinese markers on five atolls, reefs, and shoals, and the Philippine air force arrayed its entire fighter complement, five F-5Es of its 6th Tactical Fighter Squadron, to Thitu Island in the western portion of the Spratly group.<sup>51</sup>

Despite American neutrality, the United States does have a limited interest in the delimitation of sea lanes through the South China Sea, and since only China claims not only the Spratly group but also all of the South China Sea, the United States should oppose a unilateral Chinese resolution of the dispute. Excepting the possibility of a resurgent Russia drawing Chinese attention to the north, a conventional deterrent needs to be maintained as China continues to build its forces. However, limited objectives should be met with limited means. Therefore, from a military standpoint, the United States should: (1) export modern fighter aircraft (like the F-16C/D and F/A-18D), E-2C/D AEW aircraft, and particularly the typically overshadowed AGM-65A/B/C/D Maverick to closely aligned Southeast Asian countries—including Malaysia, the Philippines, and Singapore; and (2) share timely American satellite and signals intelligence regarding Chinese naval ship movements with Southeast Asian intelligence agencies.<sup>52</sup>

The Spratly Islands are a long-term Chinese objective. Until Chinese leaders are convinced that either their forces are strong enough to prevail or their adversaries' forces are too weak to resist, they will continue to refrain from committing their forces to a full-fledged assault.



<sup>50</sup> Deputy Assistant Secretary of State Peter Tomsen, letter included in packet of material concerning the South China Sea, U.S. Department of State, 1994.

<sup>51</sup> See Reginald Chua, “Chinese, Filipinos Stage a Stare-Down at Sea in Disputed Pacific Reef Area,” *Wall Street Journal*, May 17, 1995; Rodney Tasker, “A Line in the Sand,” *FEER*, Apr. 6, 1995, pp. 14–16; and International Institute for Strategic Studies, *The Military Balance 1995/96*, p. 168.

<sup>52</sup> See Robert S. Ross, *Negotiating Cooperation: The United States and China, 1969–1989* (Stanford, Calif.: Stanford University Press, 1995); Kenneth Lieberthal, “The China Challenge,” *Foreign Affairs*, Nov./Dec. 1995, pp. 35–49; Karl W. Eikenberry, “Does China Threaten Asia-Pacific Regional Stability?” *Parameters*, Spring 1995, pp. 82–103; Wayne Bert, “Chinese Policies and U.S. Interests in Southeast Asia,” *Asian Survey*, Mar. 1993, pp. 317–32; and James A. Winnefeld et al., *A New Strategy and Fewer Forces: The Pacific Dimension* (Santa Monica, Calif.: RAND, 1992).