

The enthusiastic claims of some aircraft carrier proponents frequently defy reality.

The Carrier

IN the 1990s, American aircraft carriers have been busier than ever, engaging mostly in “presence” operations and responses to local crises and flare-ups. “If you don’t have that forward deployed presence, you have less of a voice, less of an influence,” observed Defense Secretary William S. Cohen.

From an operational perspective, the big-deck aircraft carrier no longer functions mainly as guardian of the high seas. Rather, observed British defense analyst Lawrence Freedman, the carrier has become “most valuable” as a “mobile air base.” Since Operation Desert Storm in 1991, the Navy has put its air wings through a major transformation, retiring older, hard-to-maintain aircraft such as the A-6 Intruder and modernizing its F-14 Tomcats and F/A-18C Hornets to carry precision munitions.

The carriers have proven their value, but the claims of some carrier proponents frequently defy reality. Carrier effectiveness, though significant, has been inflated to mythic proportions.

Dramatic film footage of carrier-based aircraft being catapulted into the skies frequently dominates televised coverage of periodic US crises with Iraq, even though that image does not reflect actual composition of the joint US force in the region. In early 1998, Rear Adm. John B. Nathman, commander of Task Force 50 aboard USS *Nimitz* in the Gulf, actually declared, “I attribute the cessation of Iraqi no-fly zone violations to our presence” in the area.

By Rebecca Grant

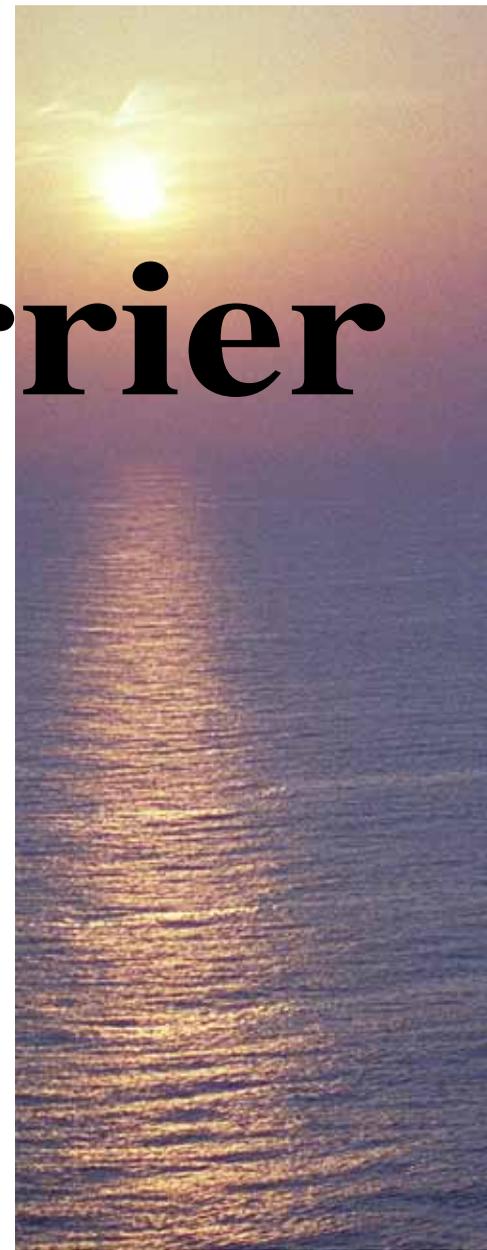
In official statements, the Navy claims that “the carrier battle group, operating in international waters, does not need the permission of host countries for landing or overflight rights.” They can operate independently and present “a unique range of options” to the President, the service adds.

Going to Extremes

In its most extreme form, the myth contains a declaration that aircraft carriers can operate effectively without access to land bases, carry out sustained strikes against targets several hundred miles inland, and

generate up to four sorties per strike aircraft *per day* if the warship and its air wing shift into a surge mode. This claim gives rise to the notion that advanced stealth aircraft might not be necessary, because the carriers manage to get by without them.

The carrier myth has flourished in budget-conscious Washington. Senior officers are guarded in their remarks, but the defense press often picks up and amplifies backstage debates on issues such as the relative effectiveness of carriers and bombers, forward presence, life cycle costs, and the relative merits of new fighter aircraft. Carrier



Myth



proponents sometimes trash Air Force airpower.

In the past decade, carrier air wings have become more capable, fueling higher demand for carriers in joint operations. Even so, the 1990s have shown that the big-deck carrier is a specialized airpower asset, not a self-sufficient substitute for land-based airpower. Getting to the heart of what carriers can actually do requires an honest assessment of their strengths and weaknesses as airpower assets in joint operations.

The Navy's Maritime Strategy, formally introduced in the early 1980s,

called for carriers to strike an assertive, forward-based stance in key waters around the globe, where they would be poised to go immediately on the offensive against Soviet targets and attack Soviet warships. The idea was that, in a war, the Soviet fleet would be pinned down defending its own shores and sea approaches and thus unable to make trouble for US warships in the open ocean, the control of which would be vital to the resupply of allies in Europe and East Asia.

The new strategy caused an increase, from 12 to 15, of the number of deployable groups built around big-deck

carriers. Moreover, because the carriers were expected to face attack from waves of Soviet Backfire bombers and cruise missiles, the Navy embarked on a buildup of Ticonderoga-class Aegis air defense cruisers and Arleigh Burke-class destroyers to handle airborne threats. This multibillion dollar expansion was deemed necessary in the face of a massive challenge from Soviet naval forces. Navy officials said the 15-carrier force was the minimum required to meet demands of forward positioning and independent offensive operations in the Pacific, Atlantic, and Mediterranean.

Then, however, came the collapse of the Soviet Union and, with it, the rapid demise of the once fearsome Soviet fleet. The decline has continued in the era of the Russian Federation.

Doctrinal Disaster

Of equal significance was Operation Desert Storm—a doctrinal disaster for the Navy. One who makes that point is Adm. William A. Owens, the now-retired former vice chairman of the Joint Chiefs of Staff. Owens stated: “Little in Desert Storm supported the Maritime Strategy’s assumptions and implications. No opposing naval forces challenged us. No waves of enemy aircraft ever attacked the carriers. No submarines threatened the flow of men and materiel across the oceans. The fleet was never forced to fight the open-ocean battles the Navy had been preparing for during the preceding 20 years.”

For carrier advocates, Desert Storm constituted a wake-up call. For example, they realized that no naval aircraft was able to drop autonomously designated laser-guided bombs. In addition, a report by the Center for Naval Analyses in Alexandria, Va., pointed out that carrier aircraft flew just 6,297 sorties over land to drop bombs, working out to only about 24 sorties per day per carrier.

The experiences of USS *Theodore Roosevelt*, CVN-71, were representative. CVN-71 arrived on station near Qatar with 20 F/A-18 multirole fighters, 18 A-6 medium bombers, and 18 F-14 fleet defense interceptors. Over 43 days of the war, the F/A-18s averaged only 1.28 sorties per aircraft per day. *Roosevelt* “surged” during a brief ground war in late February 1991. The result: an average of 2.03 sorties per aircraft per day.

After Desert Storm, the Navy quickly recognized that it was time for new thinking. The chief of naval operations, Adm. Frank B. Kelso II, put Navy analysts to work blending the lessons of Desert Storm with an even older Navy tradition of expeditionary warfare. The result was that, in September 1992, the Navy published “... From the Sea,” a concise vision of the new roles for naval forces operating forward “in the littoral or ‘near land’ areas of the world.”

The Navy immediately began procurement of precision guided weapons. By the time that USS *Theodore Roosevelt* participated in Operation Delib-

erate Force in Bosnia in 1995, nearly all of its strike sorties were carried out by precision-weapon-capable F/A-18s. The deck mix had changed, too. The A-6s were gone, leaving 14 F-14s and 37 F/A-18s in the wing.

Along the way, forward presence requirements replaced warfighting requirements as the major factor in the sizing of the carrier force. Former Secretary of Defense Les Aspin in 1993 said, “If we base our carrier needs solely on the regional threats, we could end up with fewer than we need to maintain a strong carrier battle group presence around the world.”

Aspin’s Bottom-Up Review of 1993 authorized 11 active and one reserve training carrier, but Cohen’s Quadrennial Defense Review returned to a requirement for 12 active carriers. Even with the increase, then-Vice Adm. Donald L. Pilling claimed, “With 12 carriers, we can barely meet our overseas commitments.”

He maintained 12 carriers couldn’t provide 100 percent coverage of the Mediterranean, Persian Gulf, and western Pacific. Covering all three regions full-time “takes 14 or 15 carriers,” according to Pilling.

To compensate, the Navy began to “gap” (that is, leave carrier-less) the Med for a few months each year, with occasional gaps in the Persian Gulf. Maintaining two carriers on station at any hub—for example, during a crisis with Iraq—strained the entire fleet, disrupting everything from deployment cycles to ammunition allotments.

Starring Role

By the mid-1990s, carriers had the starring role in a new littoral strategy. The air wings could generate more firepower, and the “requirement” for presence was firmly embedded in Pentagon planning documents.

In early 1997, the chief of naval operations, Adm. Jay L. Johnson, released a new Navy Operational Concept summing up the Navy’s capabilities. He said, “Our ability to deliver a wide range of naval firepower and generate very high aircraft sortie rates can have a major impact on the course and outcome of a conflict, especially during the critical early period of a joint campaign, when continental US-based forces are just starting to arrive in theater.”

Carrier capabilities had indeed im-

proved, and carriers undeniably have been busy meeting on-station requirements in the Med and Gulf and showing force in events like the Taiwan Strait crisis of 1996. Yet claims of sustainable carrier firepower and high sortie rates were unproven. A carrier’s ability to project sustained firepower depended on generating numerous sorties, and claims for high sortie rates are key to the carrier myth.

Several mid-1990s operations in the Balkans provided real-world tests of carrier striking power in a littoral environment. Beginning in April 1993, US naval aviators joined with Air Force and NATO allies to enforce a UN-mandated no-fly zone over Bosnia. Six carrier battle groups eventually took a turn on station in the Adriatic from early 1993 through December 1995.

Bosnian airspace was only about 100 miles from the typical carrier launch site. Even with a benign environment from which to launch, the Navy generated only 8,290 sorties, about 10 percent of the NATO total. The total was exceeded by both the French air force (12,502 sorties) and the Royal Air Force (10,300 sorties) during the same period. For its part, USAF flew 24,153 sorties, 31 percent of NATO’s total production.

The limits on littoral operations were again evident in NATO’s first actual use of military power—Operation Deliberate Force. Over two weeks in August and September 1995, NATO aircraft conducted a campaign to defend safe areas and degrade Bosnian Serb military effectiveness by striking targets around Sarajevo and throughout Serb-controlled territory in northwest Bosnia.

US naval aviators now had precision guided weapons, a coordination cell in the Combined Air Operations Center, and much improved abilities to receive the CAOC daily air tasking message. Carrier-based aircraft flew 583 attack sorties “feet dry” over Bosnia and another 165 support sorties. Land-based USAF aircraft flew 774 feet dry sorties and 392 support sorties. In addition to USAF’s land-based operations, land-based Marine Corps aircraft flew 142 sorties (100 percent of the USMC contribution). The Navy flew a large share of its suppression of enemy air defenses sorties from USAF’s Aviano AB, Italy.

The Navy's carrier-based airplanes used precision guided munitions for virtually all missions, far more than had been the case in the Gulf War. The Institute for Defense Analyses, in a study, noted, "PGMs made up less than 2 percent of the air-to-ground ordnance delivered by naval aircraft during the Gulf War," but "they comprised more than 90 percent of the ordnance these services dropped in Bosnia."

One-Quarter Share

Still, land-based forces surpassed naval contributions in delivery of PGMs. US forces expended 618 PGMs, scoring 374 hits. Of this number USAF aircraft accounted for 249 hits (66.6 percent of the total), the Navy 98 (26.2 percent), and land-based Marine Corps aircraft 27 (7.2 percent). Thus, strikes launched from sea tallied about a quarter of the hits with PGMs.

Deliberate Force comprised 11 days of actual operations. During this period, Navy sea-based strikers flew 583 sorties, meaning that the output of sea-based aviation averaged 53 sorties per day. Because there were a total of 58 strike aircraft on board (36 F/A-18s, 14 F-14s, and eight EA-6Bs), the carrier air wing produced firepower at a rate of 0.9 sorties per aircraft per day.

During that same period, 46 land-based USAF aircraft flew 777 total strike sorties. The Air Force contribution works out to an average of 70 sorties per day or a daily per aircraft sortie rate of 1.5.



US Navy photo by PH2 Michael W. Pendergrass

Bombs sit ready to be loaded onto aircraft deployed aboard USS Enterprise during Operation Desert Fox. The best estimate is that Enterprise generated about 50 strike sorties per day.

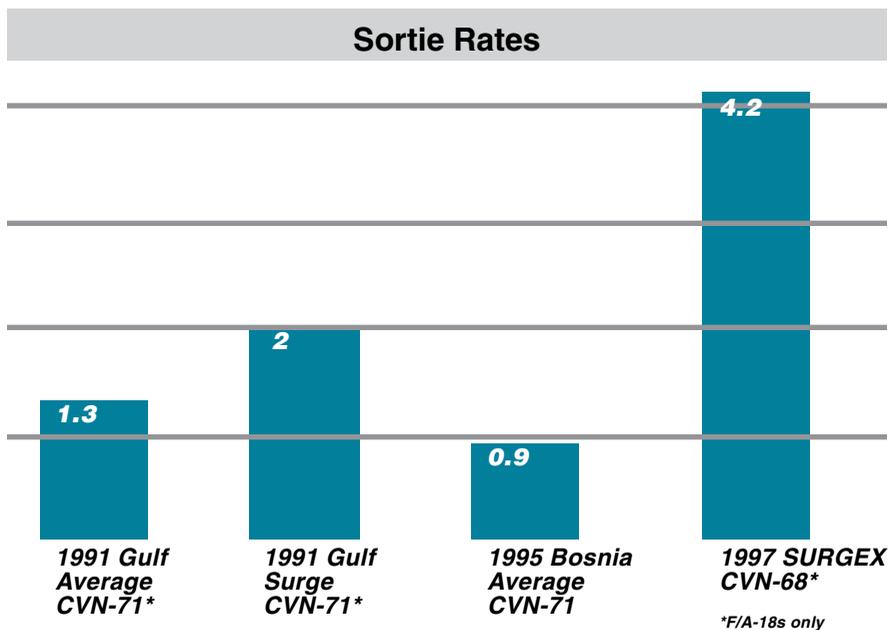
The Navy in early 1997 began planning a demonstration of a single carrier's ability to surge sortie production. The clear expectation was that the carrier would make a good showing. Said then-Rear Adm. Dennis V. McGinn, director of the Navy's Air Warfare Division at that time, "A carrier air wing can hold at risk far more aim points than ever before because we can generate more sorties, and each of those sorties is more productive because of the precision joint weapons that they carry."

The Navy opened the exercise, called SURGEX, on July 20, 1997. Over 98

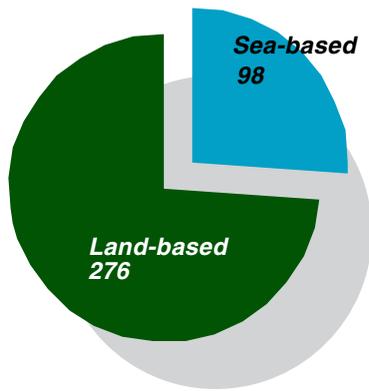
hours, carrier *Nimitz* and its air wing, CVW-9, generated 975 fixed-wing sorties. Of this total, 771 were strike sorties, which led to delivery of 1,336 "bombs"—mostly practice BDU-45s—on targets within 200 nautical miles of *Nimitz*. F/A-18 strike fighters flew 79 percent of the strike sorties, posting what on the surface seemed to be a phenomenal sortie rate of 4.2 sorties per aircraft per day.

As the Navy told it, this was not just an exercise but also a valid indicator of real-world capabilities. Nathman, commander of the *Nimitz* battle group, claimed as much to a reporter on Oct. 15, 1997, during a Persian Gulf rotation. "If we had to do that again, we could," said Nathman. "We certainly have an excess capacity if [CENTCOM] wanted us to" increase the number of strike sorties.

The SURGEX results, however, depended on several unusual factors, as noted in a study conducted by Dr. Angelyn L. Jewell and Maureen Wigge, experts with the Center for Naval Analyses. When operations began, the aircrews were ready, the aircraft were groomed, and the ordnance was staged, they pointed out. For the pilots, the routine of fly, fly, fly was made possible by the addition of 25 extra pilots to the air wing's normal complement. This augmentation of the aircrews was essential to generation of almost 200 strike sorties per day. Augmentees also formed a strike planning cell, whose



Precision Guided Munitions Hits



work helped reduce the amount of time each aircrew had to spend in mission preparation.

Nimitz also took on a full load of ordnance and replenished its aviation fuel stores while under way. Not all the strike sorties required refueling, but when they did, USAF KC-135s and USMC KC-130s provided land-based tanking support. S-3s did duty as recovery tankers—topping off jets as they returned to the carrier for landing.

Out of Gas

The exceptional steps weren't lost on the CNA analysts. Even with special preparations and maximum effort, "a carrier and her air wing can maintain high-tempo operations for just so long," reported Jewell and Wigge. The analysts concluded that *Nimitz's* ordnance magazines and aviation fuel would have been depleted after one more day of operations.

The *Nimitz* SURGEX demonstrated the result of a maximum effort from a single carrier under optimum conditions. Placed in context, however, SURGEX results indicate a capability that would fit only a narrow band of potential real-world joint operations. If surging an air wing is America's only strike response in a future crisis, then it means that a theater commander's options are severely limited.

The problems boil down to time and range if a carrier operates by itself. The high sortie rate demonstrated in SURGEX relied on nonstandard conditions such as access to extra pilots and short sortie durations that would

be hard to repeat under contingency conditions.

Ironically, the short sortie cycles that SURGEX worked so hard to achieve would pose a major challenge in time of war. According to Jewell and Wigge, the F/A-18C optimum "cycle" from launch to recovery fell between one hour, 15 minutes, and one hour, 20 minutes (without land-based tankers). One-hour cycles pushed the deck crews too hard. But short cycles would limit the combat radius of carrier aircraft, especially those in a heavy bomb-dropping or close air support configuration.

Few Targets

The SURGEX concept postulated carrier aircraft flying one-hour to 1.5-hour sorties and ringing up 200 sorties every 24 hours. With such time requirements, targets more than 200 miles from the carrier would prove to be out of reach. The short sorties reflected a blue-water, ocean-control legacy, not a realistic littoral scenario. In SURGEX, none of *Nimitz's* 771 strike sorties exceeded a 200-mile combat radius. Some critical targets may be that close

to a coastline, but the majority probably would not.

Carrier strike aircraft may be free to operate from a deck in international waters, but they depend on land-based support to reach maximum combat effectiveness. As land-based tankers extend the combat radius of strike aircraft, the overall number of sorties and the per-airplane-per-day rates would drop. In the 1990s, no carrier combat strike operations have been launched without the support of USAF land-based tankers.

In joint combat operations, the Joint Force Air Component Commander would need to integrate *Nimitz's* sorties with those of other carriers or of land-based wings. Here, the carrier's heritage of independent operations remains a stumbling block. In the Cold War, Navy tactics called for each carrier to be able to survive and operate on its own. In contingency operations, two carriers that could coordinate their flight operations to sustain longer sorties could well be a better asset for the joint force. The Navy is still working on the communications, doctrine, and procedures for linking carriers.

Today's Carrier Fleet

| Ship Name | No. | Commissioned | Status |
|-----------------------------|-----|----------------|--------|
| <i>Kitty Hawk</i> | 63 | April 1961 | Active |
| <i>Constellation</i> | 64 | October 1961 | Active |
| <i>Enterprise</i> | 65 | November 1961 | Active |
| <i>John F. Kennedy</i> | 67 | September 1968 | Active |
| <i>Nimitz</i> | 68 | May 1975 | Active |
| <i>Dwight D. Eisenhower</i> | 69 | October 1977 | Active |
| <i>Carl Vinson</i> | 70 | March 1982 | Active |
| <i>Theodore Roosevelt</i> | 71 | October 1986 | Active |
| <i>Abraham Lincoln</i> | 72 | November 1989 | Active |
| <i>George Washington</i> | 73 | July 1992 | Active |
| <i>John C. Stennis</i> | 74 | December 1995 | Active |
| <i>Harry S. Truman</i> | 75 | July 1998 | Active |

Recent Departures

| Ship Name | No. | Commissioned | Decommissioned | Status |
|---------------------|-----|----------------|----------------|--------------------|
| <i>Midway</i> | 41 | September 1945 | April 1992 | stricken from list |
| <i>Coral Sea</i> | 43 | October 1947 | April 1990 | sold for scrap |
| <i>Forrestal</i> | 59 | October 1955 | September 1993 | stricken from list |
| <i>Saratoga</i> | 60 | April 1956 | August 1994 | stricken from list |
| <i>Ranger</i> | 61 | August 1957 | July 1993 | inactive reserve |
| <i>Independence</i> | 62 | January 1959 | September 1998 | inactive reserve |
| <i>America</i> | 66 | January 1965 | August 1996 | inactive reserve |

The carrier myth came to the fore in February 1998 as the USS *George Washington* and USS *Independence* battle groups waited on station to mount strikes against Iraq. With a combined 102 strike aircraft, they looked set to dominate the action once some of Washington's regional allies put limits on the use of local bases by land-based American fighters.

A diplomatic agreement ended that crisis before hostilities could commence, but later experience showed the constraints that limit the effectiveness of expeditionary naval air operations. In December 1998, Operation Desert Fox was launched against targets in Iraq. It was mostly a Navy show based on the combined power of two big carriers in the Gulf, USS *Enterprise* and, later, USS *Carl Vinson*. However, the attacks focused on a comparatively small set of only about 100 targets. Even at that, the US had to use more than 320 Tomahawk land attack missiles and land-based US and British airpower to meet the CINC's goals.

For *Enterprise*, Operation Desert Fox presented a scenario very different from that which was obtained in SURGEX. Air Wing 3 embarked with about 36 F/A-18s, 10 F-14s, and six EA-6Bs to form the core of its strike capability. Far from operating around the clock, however, strikes came only at night. Targets ranged from an oil refinery near Basra to southern Iraq air defenses and weapons plants near Baghdad. For the carrier, Desert Fox no doubt required sorties much longer than one hour. The best estimate is that CVW-3 logged about 50 strike sorties per day, for a sortie rate of 1.0.

The myth of the carrier conducting independent, high tempo operations masks the real contributions of carriers to joint airpower. Against small target sets like that of Desert Fox, the carrier air wing can conduct defense suppression and generate useful striking power. Still, in the Persian Gulf, carrier aircraft had to fly extended missions, get refueling support, and operate at night only. Moreover, operational-level planning was done by the JFACC on land.



The F/A-18E/F, the "cornerstone of 21st century Navy TACAIR," has front-aspect-only signature reduction. Lack of all-aspect stealth will confine carrier air to the low end of the threat spectrum.

Heavily defended targets like Al Taqqadum and airfields around Baghdad, all well-known Gulf War targets, would probably overtax the range and self-protection capabilities of carrier aircraft. The myth that the carrier can provide effective firepower against all targets without land-based aircraft on scene has no basis in reality.

Still No Stealth

One reason is that the Navy has no operational stealth aircraft in the fleet. Moreover, the Navy seems likely to depend heavily on non-stealthy aircraft for years to come. The Navy will buy a minimum of 548 F/A-18E/F Super Hornets and keep them in the fleet air wings even when the Joint Strike Fighter becomes available. "The Super Hornet is the cornerstone of 21st century Navy TACAIR," said the CNO, Johnson, adding, "My vision for Navy tactical aircraft for power projection on aircraft carriers in the 21st century is a flight deck full of Super Hornets and JSFs."

The Joint Strike Fighter will be a stealthy platform, but the Navy won't start taking delivery until 2010. The long wait for the JSF relegates the Navy to another decade or more without a true all-aspect stealth aircraft.

Stealth is a topic that rarely finds its way into public discussions of naval aviation, and for good reason. The Super Hornet is advertised as being survivable because of front-aspect signature reduction, more room for chaff and flares, and a towed decoy, but none claim it can achieve vital all-aspect signature reduction. The lack of all-aspect stealth means carrier strikes will continue to be confined to the lower end of the threat spectrum.

Navy carriers are a valuable tool, but their warfighting contribution must be judged against an airpower standard, not just against a sea-control standard. World War II's fast carrier task forces won their place in history because they conducted sustained operations, and their commanders, like Adms. Raymond A. Spruance and Marc A. Mitscher, were masters of air warfare. Until carriers have an all-aspect stealth aircraft, naval aviators will be unable to perform many critical wartime missions. Navy aircraft are not expected to match the penetration and survivability of the F-117, much less the payload of the B-2. The nation will call on aircraft carriers to take the lead in smaller-scale contingencies, to provide presence in locations like the Taiwan Strait, and to add their capabilities to joint operations. For many of the most critical tasks, however, only land-based aircraft from in-theater bases will do. ■

Rebecca Grant is president of IRIS, a research organization in Arlington, Va. She has worked for RAND Corp., in the Office of Secretary of the Air Force, and for the Chief of Staff of the Air Force. Her most recent article for Air Force Magazine was "The Radar Game," which appeared in the February 1999 issue.