

Defining tomorrow's

The Air Force is looking at various concepts for both its next-generation and interim bombers

The Air Force has set out to design and build its next-generation, globe-spanning bomber much sooner than originally intended. The service is also laying the groundwork for development of an interim "regional" bomber to augment its fleet of B-52s, B-1Bs, and B-2s in the near future.

By all accounts, U.S. air operations over Iraq underscored the capabilities and advantages of these long-range, large-payload bombers

armed with precision-guided munitions (PGMs). The air campaign also reaffirmed the value of shorter range ground-attack fighters such as F-16s and F-117s, but also raised questions about their future logistical limitations.

Gen. T. Michael Moseley, Air Force vice chief of staff, told Congress earlier this year that Air Force attack fighters were able to reach all their targets in Iraq because they operated from bases in friendly nations nearby. But this may not happen again, he pointed out.

"We are unlikely to encounter such a luxury in subsequent conflicts," declared Moseley, who was in command of the Iraq air campaign. "In the future, we will require deep-strike capabilities to penetrate and engage high-value targets during the first minutes of hostilities anywhere in the battlespace."

Questions of range and age

An Air Force study of deep-strike requirements, issued last year, noted that by 2015 the new F/A-22 Raptor air-combat and attack fighter and the coming F-35 joint strike fighter, both stealthy, may not have enough range to attack critical ground targets far inside enemy territory, repeatedly, and under all circumstances.

Titled "Long-Range Global Precision En-

bomber



The Air Force has set out to develop a bomber to follow the B-52, B-1B, and B-2.

gagement," the study made it clear that the Air Force must develop new global- and theater-range systems capable of striking moving and fixed targets quickly and persistently anywhere on the globe, with particular attention to theaters of operation. It concluded that global-strike platforms should be able to take off on very short notice, fly at least 3,400 miles without refueling, and carry an impressive load of long-distance standoff weapons.

The Air Force seemed in no hurry to develop such platforms, however. It had decided that a fleet of 157 bombers—76 B-52s, 60 B-1Bs, and 21 B-2s, all capable of carrying highly accurate joint direct attack munitions (JDAMs) with GPS/inertial guidance systems—would suffice for many years to come.

This meant that a heavy investment in bomber modernization could be deferred until the mid to late 2020s, Air Force leaders concluded. They have contended all along that the service will not have enough money to modernize its fighter force with F/A-22s and F-35s while also modernizing its bomber force, and that fighter modernization must come first.

Although the air campaigns in Afghanistan and Iraq were widely interpreted as proof of the prowess and staying power of existing heavy

bombers, those operations also called attention to the advancing age and limited numbers of the fleet, and made its modernization all the more urgent, in the minds of big-bomber partisans at the Pentagon and on Capitol Hill.

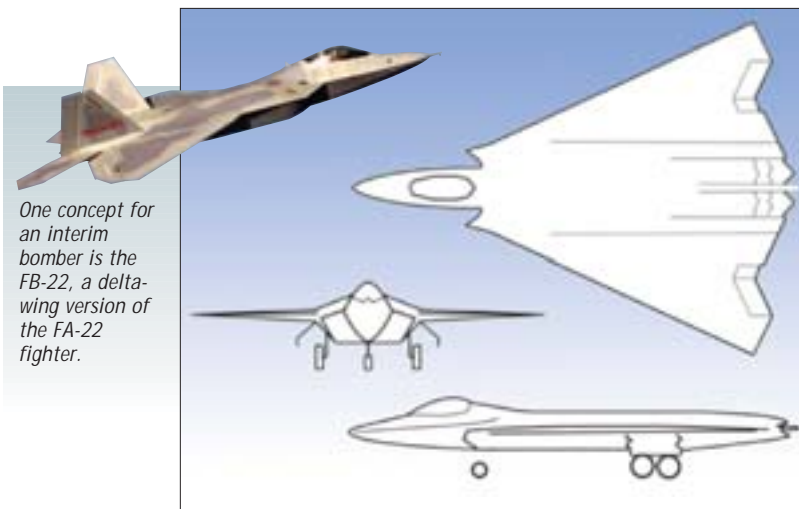
Last year, Congress came up with \$100 million for the Air Force to get cracking on bomber modernization. The House-Senate conference report on the FY04 defense authorization bill noted that "the bulk of the Air Force bomber fleet consists of...B-52s, which will be 50 years old by the year 2012," and declared that "the conferees believe this is insufficient to meet ongoing requirements."

Enter the interim bomber

The Air Force, which had not requested the funding, took it from there. Moseley told Congress that the USAF now plans to have its next-generation bomber ready for operational service between 2025 and 2030—seven to 12 years earlier than the previous operational target date of 2037. Development of the interim bomber is expected to begin in a few years, and it could be in operation around 2015, he said.

He explained that the interim bomber will be adapted from an existing aircraft, and that a leading candidate is the FB-22, a larger, recon-

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One concept for an interim bomber is the FB-22, a delta-wing version of the FA-22 fighter.

figured variant of the Lockheed Martin F/A-22. Officials emphasize that the interim bomber has yet to be determined, but point out that the FB-22 would make a lot of sense. For one thing, they note, much or all of the industrial base to be needed for the FB-22 is already in place.

At a symposium early this year, Gen. John Jumper, the Air Force chief of staff, described the would-be FB-22 as a "regional bomber," one that "would evolve from the F/A-22" and "would carry some 30-plus small-diameter bombs, have a range of about 1,600 miles, and be able to persist behind enemy lines."

The expectation in Air Force and industry circles is that the FB-22 will be a delta-winged aircraft with several of the fighter-like characteristics of the clipped-delta-wing F/A-22, such as maneuverability, supercruise (supersonic speed without afterburners), and enough maneuverability and defensive capability to serve it well in air-to-air combat.

Long-range strike possibilities

The next-generation bomber, which the Air Force prefers to call the long-range strike (LRS) system, will be much more advanced and may well be a hypersonic aircraft/spacecraft, planners point out.

Jumper told his audience that the Air Force and its industry partners have conducted and are collating some 35 studies of what the system should look like and be able to do.

"We need to resolve...those studies to understand whether we're going to go with a manned or an unmanned platform, whether this is a replacement bomber, or whether it goes through or from space, and these are all dependent on how and when we think these technologies can mature," Jumper explained.

The job of evaluating those technologies and identifying which will be required for the advanced bomber falls to the LRS office at Air Materiel Command's Air Force Research Laboratory and to the Air Combat Command's integrated planning team, which is in charge of operational analysis. Both were established early this year and are operating in concert.

"We are making exceptionally good progress" in selecting and marshaling technologies and requirements for the next-generation long-range-strike system, declares Maj. Gen. Stephen Goldfein, the USAF's director of operational requirements. Planners are concentrating on identifying "the capabilities and the [combat] effects" to be required of the LRS platform, and on the enabling technologies that will be the basis of the platform's design, he explains.

At this point, says Goldfein, "our leader-

ship has a wide open mind about what we need to do. We will go about getting this done however we can and with whatever it takes."

Many of the future LRS platform's attributes are all but certain, officials say. These include stealth combined with high speed, robust reliability and maintainability, diverse precision-guided munitions, aerial refueling capability, global range, long loiter time, secure, long-distance voice communications, and a built-in capacity for network-centric operations and targeting, featuring fully automated, machine-to-machine data links to command centers and to weapons and sensor platforms in air and space and on land.

The LRS system could turn out to be a manned or unmanned vehicle, or both. It could be an air-breathing aircraft, a suborbital flying machine, or an orbital spacecraft, or all three, officials note. It may be armed with directed-energy weapons, such as lasers. Its propulsion is anybody's guess at this point, although scramjet engines capable of generating hypersonic speeds are said to be attracting considerable attention.

Long-range strike requirements and future LRS systems are discussed at length in the "U.S. Air Force Transformation Flight Plan" issued early this year. The document describes the next-generation bomber as "a key enabler of the global response conops [concept of operations] mission," which will involve "holding terrorist-related targets at risk anywhere" in the world and "allow[ing] the United States to project power almost immediately in areas with no forward-deployed forces or easy access."

The flight plan listed the "B-X [interim] bomber," a "new long-range platform," and the "hypersonic cruise vehicle [HCV]" as system concepts that should enable the Air Force to attain "transformational capability for rapid and precise attack of any target on the globe with persistent effects."

The HCV is depicted in the document as a manned or unmanned spaceplane capable of deploying satellites and launching weapons. The Air Force and the Defense Advanced Research Projects Agency began receiving industry proposals for the HCV late last year.

Long before the HCV comes into being, the Air Force intends to build and deploy, by 2015, the "common aero vehicle" (CAV), described in the flight plan as a rapidly responsive, highly maneuverable, hypersonic glide vehicle that would be rocket-launched into space. The CAV, reportedly in early development, will be capable of carrying a variety of sensors and of launching weapons through and from space against fixed and moving targets on land.



Maintaining the fleet

While proceeding with plans and programs for deep-strike platforms, the Air Force is under pressure from Congress not to shrink its existing bomber fleet.

Last year, the USAF retired 23 B-1Bs. The Congress, spurred by its bomber advocates, opposed the move and pressed for its reversal. The Air Force compromised, agreeing to restore seven of the 23 B-1Bs to operational service.

That will do it, officials say. "We have no present plans to ask for more [restored B-1Bs]," Goldfein declares.

Introduced 20 years ago, the B-1B has experienced a number of nagging problems, beginning with defensive avionics that were deemed deficient from the start, and that proved chronically difficult to fix. Even so, the B-1B has performed handsomely when called upon in combat, officials claim.

"If there's a story about someone kissing a frog and turning it into a princess, it ought to be called the B-1 story," Gen. Hal Hornburg, commander of Air Combat Command, told a symposium audience early this year. "From something that we absolutely wanted to divest ourselves of, to one of the most capable airplanes in the Air Force inventory, right now it's the B-1," he continued.



After flying a fully upgraded, Block 5 B-1B last January at Dyess AFB, Texas, Jumper declared that the Air Force had "done some amazing things with that airplane," including "integrating the GPS capabilities with the ground moving-target indicator radar," and "improving the situation awareness inside the airplane."

"But we have a long way to go," the Air Force chief of staff continued. "There are other things we still need to do to that airplane for it to realize its full potential."

Jumper noted that all Air Force bombers are capable of penetrating deep inside enemy territory once fighters have established air superiority, and that the B-52 also has considerable standoff capability. The B-2 is reserved "for those most difficult missions where penetration is required," he explained.

"We tested a bomb rack on a B-2 just a few months ago that dropped 80 individually guided 500-lb bombs from a single [bomber].

That capability...will help us deal even better with the fixed-target sets,"

Jumper asserted.

B-2 production began in the 1980s. The

Air Force took delivery of its 21st and final

B-2 in 2000. Citing the bomber's high cost, the

Force, which originally planned to produce 132 B-2s, has repeatedly rejected requests from lawmakers and others to reopen the production line.

B-52s went into production in the early 1960s. Despite their age, they have held up amazingly well, by all accounts. Congress keeps funding the retention of 18 B-52s in reserve status at Minot AFB, N.D., even though the Air Force has not asked for the money.

Focusing on fighters

In recent years, the Air Force has concentrated on modernizing fighters, upgrading its F-15s

The B-1 (top) went into production about 20 years ago; the B-2 came along in the 1980s. Production of the venerable B-52 (left) began in the 1960s.



and F-16s and advancing its top-priority, expensive F-22 air-superiority fighter from development into production. F-15E, F-16C/D, and F-117 fighters have proven highly capable in the ground-attack role. The attack variant of the F/A-22 is expected to be the best of all, Air Force officials claim.

Attack fighters are said to be especially good at quickly hunting down and targeting moving targets, including mobile missile launchers, on land. But their range leaves something to be desired. Aerial refueling has greatly increased the reach of fighter aircraft, but even so, ground-attack fighters cannot match heavy bombers in range and payload, pro-bomber partisans note.

Utilizing air-to-air refueling, ground-attack fighters struck targets over long distances on many occasions in Afghanistan and Iraq, but those missions often proved stressful to cockpit-cramped air crews and were difficult to carry out, sources claim.

In order to support ground forces “such as the new Army brigade combat team” deep behind enemy lines, the Air Force must have attack aircraft “in position close... within one time of flight of the problem areas,” Jumper said. This, he explained, may not be possible in the future, which is why the Air Force decided to build the regional bomber as “a bridging capability” between current and next-generation bombers, and to fill the need “to penetrate with a significant bomb load in those situations.”

Nothing beats a bomber

Fighter capability notwithstanding, nothing beats a big long-range bomber like the B-52, B2

or B-1B in its ability to strike deep, powerfully, and precisely, heavy-bomber partisans maintain. They point out that B-2s flew nonstop from Whiteman AFB, Mo., to bomb targets in Iraq, and cite numerous other examples of big-bomber exploits over great distances.

In the Afghanistan and Iraq campaigns, B-52s out of faraway bases repeatedly bombed Taliban positions with JDAMs. An oft-cited, classic example of big-bomber responsiveness and accuracy over Iraq is that of the B-1B that struck a high-value target of opportunity in Baghdad with four JDAMs only 12 min after being assigned to the target. In another instance, a B-2 en route to one target was redirected—and its JDAMs reprogrammed—to attack another target, an Iraqi Republican Guard position, based on fresh intelligence from a Global Hawk unmanned aerial vehicle.

Bomber proponents point out that heavy bombers armed with PGMs, such as JDAMs, are now capable of delivering ordnance so accurately and discriminately that they can be, and have been, used on missions previously reserved for fighters, including close air support of ground troops, a mission that was out of the question for bombers until satellite-guided PGMs came along.

“Close air support is not just the [aircraft] that’s down there close to the ground,” Jumper declared. “It’s not just the A-10 or the fighter forces. It is now the B-52 from 39,000 ft with a...GPS [guided] bomb. It’s the sergeant on the ground with the laser designator that can get those precise coordinates up to that bomber in a timely manner.” ▲