



USAF's Indispensable "Failures"

By Peter Grier

The F-15, AWACS, and C-17 were derided as boondoggles early on. Things changed.

"Congress Is in Doubt Over Cost and Need in Air Force Buildup," blares the headline in the *New York Times*.

Among the charges under this headline: The Air Force is buying needlessly complex and expensive fighters, and it is asking for more warplanes than it needs.

Critics were particularly incensed about USAF's fighter recapitalization plan. Why does the Air Force feel it has to have new models when the Navy has already developed a perfectly good modern fighter both services could use?

"This is a dubious purchase costing billions," the *Times* quotes Sen. Carl Levin (D) of Michigan as saying. "Why not use a less expensive plane?"

This article sounds like an assault on the Air Force's F-22 and F-35 fighter programs, but it isn't new at all. Rather, it is from April 8, 1982. Levin was not chairman of the Senate Armed Services Committee, as he is today, but a low-ranking member.

The aircraft purchase he was objecting to was the F-15, which in decades to



Top: The F-15 prototype during testing. Above: An E-3 AWACS performs a mission over Iraq. Both aircraft types were the subject of caustic and derisive criticism, and both types have proved invaluable.



come would prove to be one of the most successful combat aircraft in history.

To be fair, Congressional critics at the time were complaining about Air Force plans to purchase large numbers of F-15s for defense of the continental US, while many felt the Navy F-14 could do that job at a lower price.

But this news piece from the past points out a basic fact of warplane development. For 30 years, most new models have been the subject of caustic criticism. Technical setbacks are treated as surprises which threaten a system's viability—or its very existence. Airframes always seem to be too complicated, too high-tech, too expensive, and not what the US really needs. That's the criticism, at least.

Lost in the volume is recognition of the fact that modern warplanes are among the most complex machines ever designed. It takes patience and hard work to make them deployment-ready. Many of today's Air Force legacy systems came out of "a long, arduous, and turbulent process," notes a RAND Corp. monograph on fighter acquisition. "Nonetheless, these often vitriolic debates ended in the design and development of several of the world's most capable fighters."

The F-15 Eagle, E-3 AWACS, and the C-17 Globemaster III, to pick three, all had significant teething problems, and all developed into aircraft the Pentagon can't do without today.

A look at the history of some current USAF systems puts the criticisms of today's development efforts in perspective. The F-15, from its very conception, was

the target of a group of mostly retired officers and midlevel Pentagon systems analysts whom the press eventually named the "military reformers."

In the mid-1960s, a consensus developed in the Air Force on the need for a specialized air superiority fighter. Service leaders were dissatisfied with the progress and prospects of the joint Navy and Air Force TFX (Tactical Fighter Experimental) program, which would eventually produce the F-111. Their concern was partly motivated by the escalation of the air war over Vietnam, where aging but maneuverable MiGs were shockingly effective at shooting down F-4 Phantoms and other large, multimission US aircraft.

Persistent Criticism

Agreement on needs was one thing—getting the Air Force and the Defense Department to rally around an approach was another. Some groups wanted a large, complex multi-engine aircraft. Others pushed a light, single-engine dogfighter. Among the latter were John R. Boyd, a former Air Force colonel and Pentagon consultant, and Pierre M. Sprey, an engineer and OSD systems analyst. These two—later joined by a former Air Force captain, Franklin C. "Chuck" Spinney—were at the center of what became the military reformers group.

Boyd pushed the F-X project (the future F-15) away from a heavy design with variable-sweep wings. The new F-15, as it emerged from the design process, thus was lighter and more agile. But it

F-16s, such as these shown at Nellis AFB, Nev., were the preferred aircraft of military reformers, who largely were skeptical of the F-15's usefulness.

was not as light and agile as Boyd and his allies wanted. They thought the Air Force would be better off buying more of a smaller and cheaper aircraft design, such as the F-5.

Their criticisms eventually helped lead the way to the lightweight fighter program, which morphed into the F-16. Even the F-16, however, had elements the reformers did not approve of, such as ground-mapping radar and multimission capability.

The criticism was nothing if not persistent. F-15 and F-16 aircraft, which still serve as the backbone of American tactical airpower, suffered early on from defective engines and something approaching all-around bad karma during development. They were "America's Jinxed Warplanes," according to an April 7, 1980 *US News & World Report* article.

The reformers continued to pick at the Eagle as the years rolled by. In 1981, Sprey wrote an airpower section in a book issued by the Heritage Foundation which questioned the F-15's effectiveness.

The F-15 was larger and more visible than its predecessor the F-4, wrote Sprey, making it vulnerable in daylight close-in dogfighting. He claimed the Eagle was too dependent on radar guided missiles, which "are not likely to be more effective than those used in Vietnam."

Since 1960, Sprey wrote in the 1981 piece, too much of the Air Force tacti-



cal aviation budget had been devoted to complex night/all-weather systems “of highly questionable capability.” Sprey urged the Air Force to emphasize the F-16 over the F-15 because “in visual combat, the F-16 has been demonstrated to be the superior aircraft.”

This was the point where the military reformers misfired.

Future air combat would not, as they assumed, take place largely in daytime, close-in engagements. The F-15 would go on to become the dominant air-to-air force in the skies precisely because of its radar missiles and long reach.

In the first Gulf War, the F-15 accounted for 36 of 40 Air Force aerial victories. Of those, 28 involved radar guided missiles. Worldwide, the Eagle has racked up an unprecedented kill ratio of 104-to-zero.

Writing in 2004, David R. Mets of Air University summed it up this way: “The Korea-style dogfight seems to have all but disappeared from the air-to-air battle. The agility of both [the F-15 and F-16] remains highly useful in dodging surface-to-air missiles, but that is not what Boyd and the [military reform] acolytes had in mind.”

The F-15 was not the only Air Force system hit in its early years as overly dependent on high technology.

Today, the E-3 Airborne Warning and Control System seems beyond criticism, an obvious force multiplier without whose radar Air Force operations might be blind. AWACS can track enemy aircraft and guide friendly forces straight to them, making it an invaluable asset for both offensive and defensive air operations. But during development, AWACS

was derided as a boondoggle: unnecessary, unworkable, and vulnerable.

On April 13, 1974, *The New Republic* ran an article on the ungainly airborne radar system. Titled “AWACS: The Plane That Would Not Die,” it called the airborne warning and control mission “a complete phony.” It described the aircraft simply as a means to keep money flowing to contractors. The article even took a shot at the airplane’s appearance, describing it as a “mushroom with elephantiasis.”

The author appeared to have little understanding of the mission of airborne command and control which the AWACS was designed to fulfill, and less understanding of the technology involved. But the story, and similar criticism in other media, helped fuel opposition to the system in Congress. Serious criticisms of the AWACS, leveled by the General Accounting Office and others, included worry that the slow E-3 airframe would be highly vulnerable to Soviet fighters and thus unable to get close enough to contested airspace to be of any use in a European conflict.

The Pre-eminent Symbol

“It was claimed that electronic countermeasures (ECM) would render the [AWACS] radar useless. The large number of targets in [Europe] would saturate the tracker,” said Robert E. Cowdery and William A. Skillman, engineers who helped develop the radar for Westinghouse, in a history of the system published in a professional engineering journal in 1995.

Worried about these allegations, the Senate Armed Services Committee in

The C-17 was mocked as a \$340 million ugly duckling, but it has proved its worth in worldwide operations.

1974 requested the Secretary of Defense to certify that AWACS could perform in the cluttered environment of Central Europe. The Pentagon’s Research and Engineering branch set up an ad hoc committee of experts to study the problem and allow lawmakers’ concerns. Members conducted “ground-flooder” ECM tests, among other things, and by the end of 1974 had established to their own satisfaction that the AWACS performed just fine. “As a result, the Secretary of Defense certified to Congress that the performance of AWACS in ECM was adequate to meet the projected threat,” wrote Cowdery and Skillman.

Since then, the “mushroom with elephantiasis” has become a symbol—perhaps the pre-eminent symbol—of an Air Force operational presence. It has directed traffic in conflicts from Grenada, to the Persian Gulf, to the Balkans, and recently over Iraq and Afghanistan. AWACS flew more than 7,000 combat hours in the first Gulf War, alone.

NATO has its own AWACS fleet, as do France and Great Britain. Saudi Arabia operates five. Japan also has four, based on a Boeing 767 airframe. After Sept. 11, 2001, seven NATO AWACS deployed to the United States to monitor commercial air traffic. It was “a mission never foreseen by any planner, but one which captures the uncertainty of weapon system planning,” wrote Walter J. Boyne.

Mobility aircraft have not been immune to similar sorts of criticism, and more recently the C-17 has survived



The F-22 (shown here) and the F-35 have faced harsh Congressional criticism and media wire-brush attention, just like the AWACS, F-15, and C-17.

intense turbulence on its way to airlift pre-eminence.

“The C-17 program encountered political opposition and limited funding, plus technical development and program management difficulties, which affected the program’s cost, production, and delivery schedule,” wrote Betty Raab Kennedy, an Air Mobility Command historian, in a 1999 analysis of C-17 acquisition. At its onset in the late 1970s, the C-17 had a difficult time winning support in Congress. Lawmakers felt DOD had not clearly demonstrated the need for additional strategic airlift capacity. Thus, development funding was not approved until 1981.

Then, in 1982, DOD decided its airlift shortfall was so urgent it could not wait for development of a whole new aircraft. It asked for 50 new C-5s to make up part of the airlift gap. Congress approved the money, but asked for an airlift master plan to guide the way forward. This assessment concluded the C-17 was the most cost-effective solution to the airlift problem, but the study was not completed until the end of 1983, adding further delay.

“By the mid-1980s, the C-17 program appeared to be on track, if somewhat behind schedule,” wrote Christopher Bolkcom of the Congressional Research Service in a 2007 report. But the C-17 had taken so long to get going that key personnel had drifted away from prime contractor McDonnell Douglas and production difficulties followed. These hiccups delayed the program even further and increased development costs.

In April 1990, then-Secretary of Defense Dick Cheney cut the production program from 210 to 120 aircraft, due to both the collapse of the Soviet Union and domestic budget constraints. Cuts

of this sort have an inevitable effect: They increase the aircraft’s unit price, fueling a new round of criticism.

In 1993, Defense Secretary Les Aspin disciplined four senior Air Force officials for their handling of the program. Among other things, they had improperly channeled cash to McDonnell Douglas at a time when the company was having financial problems.

Finally, in December 1993, the C-17 program reached its darkest hour. DOD announced the C-17 program would be killed by 1995 if McDonnell Douglas did not improve performance.

Political Gamesmanship

In fall 1995, as the deadline loomed, *The Bulletin of the Atomic Scientists* dubbed the C-17 a “\$340 Million Ugly Duckling.” The airlifter’s unit cost had skyrocketed, according to the article, while technical glitches such as airflow problems around the cargo doors persisted. Quoting the GAO, the *Bulletin* piece said the C-17’s specialized and expensive short-landing abilities had little use in any foreseeable conflict.

Convening at the end of 1995, a crucial Defense Acquisition Board decided to proceed with the full 120 C-17 program. The airlifter’s combination of long reach with relatively short takeoff and landing requirements was not duplicated by other alternatives. “The DAB regarded the C-17 as best providing the greatest amount of flexibility in meeting the strategic airlift requirements,” wrote Kennedy.

Since then, C-17s have become the backbone of the US air transport fleet,

lauded for their versatility and high reliability. Globemaster IIIs have delivered military goods and humanitarian aid all around the world, neatly bridged the gap between the tactical C-130 and the massive C-5, and allowed USAF to fully retire its old C-141s.

In its first operational use, an October 1994 delivery to the Persian Gulf, the aircraft moved a five-ton “rolling command post,” five vehicles, and other supplies. In a 1995 deployment of peacekeepers and cargo to Bosnia for Operation Joint Endeavor, the C-17 flew 26 percent of airlift missions while delivering 44 percent of cargo. Today, C-17s are routinely flying the 26-hour round-trips from Germany to Afghanistan, while dropping supplies directly at forward US operating bases.

The C-17 goes wherever the President goes, as it is the airlifter of choice for the armored limousines of the executive branch.

Weapons systems today still receive the same media wire-brush attention accorded past development efforts. The F-22, the F-35, and other programs all must achieve their technological advances under constant scrutiny. Developmental testing, which is designed to identify problems so that they can be corrected, is often regarded as if it were a program’s final grade. A single flop in testing generates headlines and has the potential to send a system to the scrap heap.

Many members of Congress, meanwhile, love a show and must vote to continue system funding every year.

This means service leaders have a doubly demanding task, wrote Boyne in *Beyond the Wild Blue: A History of the US Air Force*. “They must have a vision of what will be required for the defense of the nation for many years into the future. At the same time, they must be proficient in the political gamesmanship necessary to shepherd the ideas of their predecessors through all the hazards into operational use.”

Developing an advanced military aircraft is no easy feat, but the Air Force—and the nation—are better off when systems make it into service with problems identified and corrected. The past 30 years of military operations might have been very different if the military leadership had given up on the F-15, AWACS, or C-17 early on. ■

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