

Rediscovering Air Superiority: Vietnam, the F-X, and the 'Fighter Mafia'

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On May 4, 1967, Col. Robin Olds was robbed of ace status. On that day he fought two fighter engagements over North Vietnam. In the first he fired all of his missiles and downed a Mig-21. In the second he displayed his superb flying skills, engaging highly-agile Mig-17s in his lumbering F-4C and obtained firing solutions on three or four enemy aircraft from as close as 20 feet. His proficiency was for naught that day for the simple reason that his fighter was not equipped with a gun. Olds had nothing to shoot with from close range.¹ "A fighter without a gun," he said later, "is like an airplane without a wing."² The USAF and the American military establishment had forgotten the lessons of air warfare's brief history and were ill-equipped to fight anything other than a strategic nuclear war. For the USAF fighter community, this meant that their fighters were not designed for old-fashioned dogfights.

The Road To Vietnam

At the end of World War II, the ideas and doctrines of the American government and military were preoccupied with an over-emphasis on nuclear warfare. For the USAF's Tactical Air Command (TAC), this meant playing second-fiddle to the "Bomber Mafia" of the Strategic Air Command (SAC). Fighter design priorities emphasized the nuclear delivery and interceptor missions. While this was understandable and even acceptable, the fact that this emphasis was given at the expense of nearly all other potential missions was not.³

The underlying assumption was that nuclear weapons would make conventional wars obsolete and that as a result Air Combat Maneuver (ACM) was dead, taken over by the interception mission which required supersonic speed, high-technology sensors, and missile weaponry. Safety considerations of practicing ACM at high speeds also played a part.⁴

The short history of air warfare was ignored and/or deemed inapplicable to the new nuclear-dominated world. In previous wars that involved air combat, the business of obtaining and holding the air superiority was the domain of the fighter. Fighters carried out this mission chiefly by destroying the enemy in ACM engagements. The belief in the 1950s that the dogfight was dead was not original. Between the world wars many thought that the higher speeds and G-loading of the higher-performance aircraft that were appearing made ACM impossible. In 1940 during the Battle of Britain the British rediscovered the art of ACM after realizing the inferiority of their fixed vic formations vis a vis the German fighter escorts that had already re-learned the art of air combat.⁵ The lessons of the 1950-1953 war in Korea were also ignored by the USAF. In that conflict fighters demonstrated that ACM was still important and that not all future wars would be nuclear in nature. Instead, the military proclaimed Korea an exception to the rule and sufficiently unlikely to reoccur to the degree that nothing was done to prepare for a war of similar character and scope.⁶

Vietnam: The Truth Comes Out

With the enlarged American commitment in Vietnam the fighter community began to realize just how far off target the fixation on interception and nuclear weapons delivery had put them. The large, heavy, unmaneuverable and purely missile-armed fighters were forced to engage older but more agile Migs. The matter was made worse by the fact that ACM training left the curriculum soon after the Korean War.⁷ Political-based limitations on Rules of Engagement (ROE) further hampered fighter pilots. Incidents in which damaged American aircraft returned to base with *American* missiles lodged in them as well as fears that foreign non-combatant aircraft might be downed generated the policy requiring an aircraft had to be identified *visually* before it could be fired upon.⁸ This ROE negated many of the intended advantages of the missile-armed fighters of the period with their emphasis on Beyond Visual Range (BVR) capability. The resulting engagements frequently devolved into lower, slower endgame battles American fighters without guns could not fight well.⁹

The USAF needed solutions to these problems. For the short term gun pods were added to the service's single respectable ACM fighter, the F-4 Phantom. These pods, however, adversely impacted the aircraft's performance.¹⁰ An internal gun was added to the F-4E variant then in development.¹¹ The wisdom of this decision was born out in the aircraft's final combat record. Of the 21 kills made by F-4Es seven, or one-third, were made with the aiplanes' gun.¹² These and other modifications made to American fighters of the period were largely cosmetic, however--the designs were never intended for ACM and could not be remade into dogfighters. What was needed was a new series of fighters that would live up to the old doctrines and ideas of air combat handed down from every major air campaign since those of the First World War. Such aircraft were already in the works.

Post-Vietnam Fighters: Getting it Right

Even as the mistaken fighter design priorities were discovered in the skies over Vietnam, matters were in hand to put things right. In 1965, as the errors of the USAF were just beginning to be appreciated, a small group of authoritative individuals, later to be known as the "Fighter Mafia," oversaw the creation of a report that called for new fighter designs that harked back to pre-nuclear fighter characteristics-- agile with good pilot visibility and armament for close engagements as well as BVR combat.¹³ These men were not alone-- there were others who felt that the role of the fighter had lost its focus in the post-Korean War years. Meanwhile much of the American military machine was continuing to plod along with blinders on, caught up in its own didactic processes.

Work on what would become post-Vietnam fighters began at roughly the same time the Fighter Mafia drafted their report. The Air Force Systems Command, overlooking the events in Southeast Asia, began their "Preliminary F-X Concept Formulation Package" in 1965 and presented it a year later.¹⁴ The design stuck with the ideas and doctrines that dominated the fighter field since the 1950s and called for a vehicle which was clearly just another evolution of the Century Series fighters. The F-X was to weigh in at approximately 60,000 pounds, have a top speed of approximately Mach 2.7 and a low Thrust-to-Weight (TW) ratio of .75.¹⁵

It was at this point that the military establishment, the Fighter Mafia, fighter pilots from the pre-1950s schools of thought now in positions of authority, and the war in Vietnam all collided and made the post-Vietnam War fighters revolutionary instead of merely evolutionary.

F-X Under Attack: The Fighter Mafia Strikes Back

In late 1966 Major John Boyd, one of the Fighter Mafia, worked for the USAF's Tactical Division of the Air Staff Directorate of Requirements. Boyd was an engineer and ACM tactician who rediscovered energy maneuvering and many other air combat techniques that were nearly as old as air combat itself but which had been discarded by the "atomic" USAF. Unsurprisingly, Boyd rejected the F-X proposal.¹⁶ In 1967 a second Request for Proposal (RFP) was made for a very different F-X, one that incorporated the design characteristics the Fighter Mafia advocated. The changes underway in USAF thinking at this point are best demonstrated by the fact that where the original F-X RFP was for a "Tactical Support Aircraft," the 1967 version was for a "Fighter."¹⁷ The McDonnell Douglas design eventually won the competition in December of 1969 after a series of revised cost proposals from the three finalist contractors earlier in that year.¹⁸ The resulting F-15 design was everything the Fighter Mafia advocated, with a TW at combat load of 1.4:1, good cockpit visibility, and other ACM features, including a gun.¹⁹

The Fighter Mafia: Over-Rated in the Verdict of History

There is no question that the Fighter Mafia was instrumental in correcting the USAF's short-sightedness that premiated air combat ideas and doctrine and made life difficult for fighter pilots in the Vietnam War. In many ways, however, the group's achievements are overrated. Their case was not as difficult to make as history suggests; furthermore their more radical ideas were potentially as damaging as the doctrines they debunked.

One of the few authors who presents a more balanced account of the Fighter Mafia is USAF historian Richard Hallion. Hallion notes that the position of the Fighter Mafia ranged from the logical conclusions and judgments described above to more extreme stances on the other side of the scale. Even as the F-15 was taking shape in 1968, the more radical members of the Fighter Mafia did not feel that the design went far enough away from the interceptor mentality. They argued that the USAF should instead build a highly-agile single-engine fighter, the F-XX, that was dedicated purely to air superiority. The Air Staff was not convinced and the F-X/F-15 program was not further modified, though the F-XX was reborn in a *modified* form in 1971 and ultimately evolved into the highly-successful F-16.²⁰ The Fighter Mafia's arguments, taken to their extreme, would have been nearly as damaging as the design priorities of the 1950s-- the versions of the F-15 and F-16 the group had in mind were not intended for any type of ground attack role. "Not a pound for air-to-ground" was a rallying cry in parts of the F-15 program, though at the prototype rollout in 1972 USAF General Benjamin Bellis who headed up the aircraft's System Project Office clearly had a more realistic view, commenting that "It shows a tremendous air-to-ground capability."²¹ The utility of having a fleet of F-XX-type fighters with only two Sidewinders and a gun for armament is at best questionable and at worst a serious drain on resources.

On a more fundamental level, how hard did the Fighter Mafia have to press against those who were clamoring for a Century Series type of interceptor concept for the F-X? The final RFP summary required the winning entry to have a maximum speed of Mach 2.5.²² This compares very favorably with the Mach 2.7 capability of the original F-X concept described above (though admittedly this comparison does not take into account endurance, which could impact the significance of the pure maximum speed). Certainly the speed compared favorably with the interceptors of the day such as the F-106's Mach 2.3.²³

Speed is certainly desirable for an interceptor, and it is arguable that the USAF had an over-fixation with speed with many of the aircraft of the Century Series, but referring once again to the original F-X RFP's Mach 2.7 speed it becomes apparent that the interceptor community recognized the inevitable based on experiences with hypersonic designs such as the F-103, YF-12, and F-108 (only one of which proceeded to flight status of any kind). It didn't make sense to argue for a hypersonic interceptor because Mach 2.5 is a plateau for speed-- aircraft designed to operate at above this velocity run into problems with diminishing returns of size and expense.²⁴ Even a brief examination of the "paper" airplanes mentioned above reveals that the designs are increasingly flying fuel tanks.

The final F-X RFP summary also specified a high TW ratio, mainly for ACM, but such a characteristic would also be useful in fast acceleration for the interceptor role as well. Advances in radar such as look-down capability were useful in either the interceptor role or ACM, so there could not have been much conflict between the fighter schools of thought on that particular issue.

Taken in total, then, the final F-X RFP favored anything that the interceptor-oriented fighter advocates could have wanted-- they sacrificed nothing of significance. The second F-X design was both a dogfighter and an interceptor if need be, and to argue for a pure interceptor would have been foolhardy given the reports coming in from Vietnam and a Soviet threat that was increasingly based on ICBMs and SLBMs rather than manned bombers.

In addition, the Fighter Mafia did not learn all of the lessons of Vietnam, or or at least chose to ignore some of them. A frequent criticism of the early fighters of the Vietnam era was their lack of any Radar Warning Receiver (RWR) for either Surface-to-Air-Missiles (SAMs) or other aircraft as well as no onboard Electronic Counter-Measures (ECM) gear. This is especially troublesome in view of the demonstrated capability of Soviet-built SAMs from the U-2 downing years before.²⁵ A study by the 7th Air Force in Vietnam demonstrated that an F-4 had a 33% greater chance of survival carrying an ECM pod than without.²⁶ The F-15 did carry a RWR from day one, but no ECM gear. The failure of integrating ECM equipment was felt in the Persian Gulf War where fighters were forced once again to carry ECM pods and were all but forced to abort their missions if the equipment failed. ECM gear is no longer optional, this was known during the F-X design phase and yet such equipment was not mandated on the aircraft.

Finally, some historians erroneously charge that the Fighter Mafia extremists were more on target than the moderates whose design actually prevailed. Critics argued that the Century Series and other fighters of the 50s and early 60s were the result of the USAF's over-fixation on technology, technology that proved unreliable in Vietnam.²⁷ Yet it was the incorporation of this very same state-of-the-art technology that made the F-15 and F-16 a success. The advanced

engines, avionics, and other features of those aircraft are what enabled them to be interceptor, dogfighter, and later, tactical bomber. Only a few years after the conclusion of the F-X program, the fixation on technology produced a genuine revolution: stealth. The Fighter Mafia extremists' simplistic vision was shortsighted in several key respects.

Conclusion

The domination of the nuclear mission and bomber interception clearly took the USAF down the wrong path in fighter design priorities in the 1950s and mid-1960s. Fighters were not designed to perform ACM and other functions that they would be called upon for in limited wars that were thought unlikely during the immediate post-WWII years. This was, of course, closely intertwined with armament development, doctrine, and training as well as foreign and domestic political policy. Clearly the generation of fighters that followed Vietnam would have to address the realities of non-nuclear warfare, but individuals considered the saviors of the dogfighter pushed too far and, had they been allowed to adopt the more extreme design philosophies and priorities proffered, the USAF would have nearly as bad off as it had been in Vietnam, only this time it would have been off base at the opposite end of the spectrum, armed with a fleet of fighters equipped with short-ranged weaponry unable to take advantages of developments such as AWACS and unable to perform any useful function other than air-to-air combat.

Works Cited

Coggins, Edward V. Wings That Stay On. Ft. Worth: By the Author, 1995.

Cooling, Benjamin Franklin, ed. Case Studies in Air Superiority. Washington, D.C.: Center for Air Force History, 1994.

Donald, David. "F-15E Strike Eagle." World Air Power Journal. 21 (Summer 1995): 38-83.

Door, Robert F., and Chris Bishop. Vietnam Air War Debrief. Westport: AIRtime Publishing, Inc., 1996.

Drendel, Lou. And Kill Migs. Carrollton: Squadron-Signal Publications, 1974.

Francillon, Rene J. Vietnam: The War in the Air. New York: Arch Cape Press, 1987.

Gunston, Bill. F-4 Phantom. New York: Charles Scribner's Sons, 1977.

Hallion, Richard. Storm Over Iraq: Air Power and the Gulf War. Washington, D.C.: Smithsonian Institution Press, 1992.

Hallion, Richard. "A Troubling Past: Air Force Fighter Acquisition Since 1945." Airpower Journal, 9, no.4 (1990): 4-23.

Knaack, Marcelle Size. Encyclopedia of US Air Force Aircraft and Missile Systems Volume I: Post-World War II Fighters 1945-1973. Washington, D.C.: Office of Air Force History, 1978.

Stevenson, James Perry. McDonnell Douglas F-15 Eagle. Fallbrook: Aero Publishers, 1978.

Sweetman, Bill. Aurora: The Pentagon's Secret Hypersonic Spyplane. Osceola: Motorbooks International, 1993.

Sweetman, Bill, and others, The Great Book of Modern Warplanes. New York: Portland House, 1987.

Sweetman, Bill. YF-22 and YF-23: Advanced Tactical Fighters. Osceola: Motorbooks International, 1991.

Tilford, Earl H. Crosswinds: The Air Force's Setup in Vietnam. College Station: Texas A&M University Press, 1993.

Notes

1. Lou Drendel. And Kill Migs (Carrollton: Squadron-Signal Publications, 1974), 11.
2. Bill Gunston. F-4 Phantom (New York: Charles Scribner's Sons, 1977), 66.
3. Richard Hallion. "A Troubling Past: Air Force Fighter Acquisition Since 1945," Airpower Journal, 9, no.4 (1990): 9.
4. Bill Sweetman and others, The Great Book of Modern Warplanes (New York: Portland House, 1987), 140.
5. Edward V. Coggins. Wings That Stay On (Ft. Worth: By the Author, 1995), 40.
6. Richard Hallion. Storm Over Iraq: Air Power and the Gulf War (Washington, D.C.: Smithsonian Institution Press, 1992), 15.
7. Hallion. "A Troubling Past," 15.
8. Benjamin Franklin Cooling, ed. Case Studies in Air Superiority (Washington, D.C.: Center for Air Force History, 1994), 528.
9. Bill Sweetman. YF-22 and YF-23: Advanced Tactical Fighters (Osceola: Motorbooks International, 1991), 8.
10. Hallion. Storm Over Iraq, 537.
11. Gunston, 40.
12. Rene J. Francillon. Vietnam: The War in the Air (New York: Arch Cape Press, 1987), 59.
13. Hallion. "A Troubling Past," 16.
14. Hallion. Storm Over Iraq, 40.
15. Hallion. "A Troubling Past," 17.
16. Ibid.
17. James Perry Stevenson. McDonnell Douglas F-15 Eagle (Fallbrook: Aero Publishers, 1978), 10.
18. Marcelle Size Knaack. Encyclopedia of US Air Force Aircraft and Missile Systems Volume I: Post-World War II Fighters 1945-1973 (Washington, D.C.: Office of Air Force History, 1978), 334.
19. Stevenson, 60.
20. Hallion. "A Troubling Past," 19.
21. David Donald. "F-15E Strike Eagle," World Air Power Journal, 21 (Summer 1995): 40.
22. Stevenson, 15.

23. Knaack, 221.
 24. Bill Sweetman. Aurora: The Pentagon's Secret Hypersonic Spyplane (Osceola: Motorbooks International, 1993), 49.
 25. Hallion. Storm Over Iraq, 20.
 26. Robert F. Dorr and Chris Bishop. Vietnam Air War Debrief (Westport: AIRtime Publishing, Inc., 1996), 77.
 27. Earl H. Tilford. Crosswinds: The Air Force's Setup in Vietnam (College Station: Texas A&M University Press, 1993), 184.
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