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Land-Based Tactical Aviation

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CURRENT TAC AIR PROBLEMS

Force Size

We are currently spending more for fighter (both land and sea-based) investment than in any previous peacetime period: about \$12 billion per year as compared to \$6 billion in the mid-fifties in constant FY 80 dollars. Despite this, we are buying only one-seventh as many fighters as in the mid-fifties—400 per year today versus 3,000 then. U.S. fighter forces¹ have shrunk from 18,000 to 7,000 over the same period and would have shrunk far more if the Services had not grossly underfunded operating expenses and stretched the operational life of their fighters to 20+ years.

Readiness

Our first line land-based fighter, the Air Force's F-15, is currently ready (fully mission capable) about 35 percent of the time. Deploying a squadron of them usually requires stripping 2 or 3 other squadrons of their spares and test equipment. In fact, in a 1980 inspection, the USAF's prestigious 1st Fighter Wing (F-15s) was found incapable of deploying with *3 weeks of prior notice*.

The radar early warning aircraft which is intended to control these fighters, the E-3 AWACS, shows only about 15 percent readiness. And our tactical all-weather bomber, the F-111 is only slightly more ready. The only Air Force tactical aircraft in current inventory which approaches 70 percent readiness is the A-10, our least complex attack jet.

In the even more important area of personnel readiness, our pilots are averaging about one-third as many flights per month as Israeli pilots average. It is widely known that both pilots and maintenance crews in the air reserves and Air National Guard are noticeably superior to those in the regular forces. Retention of active fighter pilots has dropped to an all-time low, primarily because of inadequate flying time and lack of confidence in Service leadership and only secondarily because of low pay.² The retention of skilled maintenance NCOs, though less publicized, is in an even more critical state.

Force Effectiveness: Air-to-Air

Judging by the lessons of the Vietnam and the Yom Kippur Wars—as opposed to the promises of computer analysis—our tactical air forces have never been less effective. In Korea, against an Oriental air force with little combat experience, our first line F-86 fighters achieved a 10:1 exchange ratio against the MIG-15. In Vietnam, against a much smaller Oriental air force with no combat experience, our first line F-4 could achieve little better than a 2:1 edge over the MIG-21. Why did we do so much worse in Vietnam? There are three principal reasons: inadequate pilot training; the ease with which MIGs could find and surprise the large, highly visible F-4; and the less than 10 percent kill rate of the Sparrow radar missile around which the F-4 had been designed.

Have these deficiencies been cured? Today, our pilots receive almost half the flying training time they had before and during Vietnam. The F-15 is even larger and more visible than the F-4. It is so large because it was designed to be dependent on radar missiles which are not likely to be more effective than those used in Vietnam. And, of course, since the F-15 costs 3 to 4 times more to buy than the F-4—and can fly only one-half to two-thirds as often—there will be far fewer of them in the air to oppose the enemy.

Force Effectiveness: Air-to-Ground

The U.S. and its NATO allies spend \$85 billion per year on procurement and operation of land-based tactical air forces. It is reasonable to ask what the resulting air forces can contribute to stopping 75 or more Warsaw Pact divisions in a Central European onslaught. The answer is that NATO's \$85 billion buys two main air capabilities:

- 3000 multi-purpose, high-speed jets suited mainly for bombing Poland and Czechoslovakia in much the same way that we bombed North Vietnam—a capability that would have little effect, and certainly no immediate one, on Red armored spearheads thrusting deep into West Germany.
- 300 deployed attack aircraft maneuverable enough to find tanks and carrying a weapon lethal enough to kill tanks (i.e., A-10s with the 30mm cannon)—a force much too small to affect the outcome of the land battle.

The same lack of effectiveness against hard-to-find, fleeting ground force targets can be expected if we attempt to use USN and USAF tactical air in the Middle East or elsewhere in the Third World.

WHAT HAS LED TO THE CURRENT TAC AIR PREDICAMENT?

To shape a course of action that will lead to practical improvements, it is first necessary to understand the underlying causes of the present state of affairs. Among the many candidates, five factors appear to have played a crucial role in the last 20 years of deterioration in tactical air effectiveness:

- The absence of new concepts of air power (in either the USAF or the USN) to replace the attrition warfare, interdiction bombing approach that failed in Korea and Vietnam.
- Twenty years of overemphasis on RND and procurement at the expense of training, readiness and combat-oriented leadership.
- Since 1960, diversion of a large fraction of the tac air budgets to complex night/all-weather electronic systems of highly questionable capability.
- Increasing centralization via proliferating management systems, computerized C³ and intelligence, and automated "battle management" radar systems, resulting in slower response, rigid and predictable tactics, decay of tactical innovation, and rapid decline in morale of combat-oriented pilots and crews.
- An unwillingness to foster *independent* testing and to use it to cancel ineffective programs.

More money will not alone cure our tac air problems. Indeed, unless the ways in which we spend money change, more spending will merely exacerbate current problems. More funding is, however, required in some areas, especially operations and maintenance.

The basic causes of current tac air deficiencies, which have strong institutional roots, must be dealt with. Independent testing organizations must be established within the Department of Defense. New concepts for employing tac air in other than an attrition deep interdiction mode must be developed. All new fighter and attack aircraft programs should incorporate a competitive fly-off shoot-off. In addition, the five-year programming and zero-based budgeting systems, along with ONIB directive A-109, should be re-evaluated and possibly eliminated.

However, while the necessary institutional changes are underway, concrete steps must be taken to improve tac air capabilities.

In terms of available systems:

- Procurement of the F-16 should be emphasized over the F-15. In visual combat, the F-16 has been demonstrated to be the superior aircraft. The poor performance of the Sparrow missile and lack of solution to the IFF (Identification Friend or Foe) problem render the beyond-visual-range mission highly questionable. The F-16 should be continued in production until the "super-cruise" fighter (discussed below) has been developed.

- The A-10 should be continued in production until the combined arms fighter (discussed below) is ready to replace it.

A number of new R&D programs should be initiated to make the more fundamental changes needed in the air.

WHAT SHOULD BE DONE?

The following programs are intended to foster major increases in tactical air effectiveness at sharply reduced unit cost (in both dollars and manpower).

Aircraft

- *Combined arms fighter*—to form the backbone of a new and badly needed tactical air capability—that can be thought of as a highly lethal, aerial anti-tank cannon. A minimum of 2000 of these aircraft (U.S. plus Allied) would operate as a major combat arm combined integrally with blitzkrieg ground tactics. The aircraft should be the smallest, most maneuverable fighter possible, wrapped around the four-barrel 30mm cannon. Speed should be no more than 400 knots; acceleration should be double that of the A-10, together with a 50 percent maximum *g* advantage. Cost should be under \$2 million in FY 81 dollars, weight under 7500 pounds.

- *Supercruise fighter*—a single purpose air-to-air fighter designed to maximize surprise, the decisive factor in 80 percent of air kills. It would be intended to cruise at Mach 1.3 to 1.6, instead of the Mach .8 to .9 of every current tactical fighter. To enhance the surprise achieved by superior cruise speed, basic avionics and weapons would be non-emitting and the aircraft's size would be held to less than that of the F-5. Such a fighter would render every existing fighter obsolete in much the same way that the ME 262 jet made all prop fighters obsolete in 1945. The cost would be under \$5 million in FY 81 dollars. The weight would be less than 10,000 pounds.

Weapons

- *Air-to-air gun*—the current U.S. F-14/F-15/F-16 gun uses a 1942 round that is the least effective 20mm round in the world. A new gun and round could increase the effective gun firing envelope by at least 50 percent while increasing individual round lethality and cutting gun and ammo weight and cost by a factor of three.

- *Air-to-air anti-radiation missile* (ARM)—because a fighter radar is a perfect, self-identifying beacon for a missile to home on, the deployment of an air-to-air ARM, would eliminate the use of radars in air combat. Because the enemy's radar solves the IFF problem, this missile would be the only true BVR (beyond visual range) missile available. The missile would be Sidewinder-sized with only earphones (for lock-on tone) needed as fire control. The cost, via competitive development and competitive, two-source procurement, could be held to under \$20,000 in view of inherent simplicity of radar-homing guidance.

- *Snipshoot passive air-to-air missile*—possibly a Sidewinder variant, intended to permit locking on and firing in equal or less time than required by a gun. Other major emphases would be on look-down ability (i.e., ability to discriminate against ground and sky IR (Infra Red) clutter) and resistance to *combined flare/*maneuver countermeasures. The emphasis on look-down ability conflicts with the sensitivity required for head-on capability. Since look-down is more important, the head-on requirement is eliminated. Cost should be under \$15,000.

- *Improved air-to-ground cannon*—although the GAU-8 30mm has unprecedented anti-tank lethality, it would be prudent to start work on a new cannon of larger caliber and/or higher velocity in order to be prepared if the side and rear armor of Soviet tanks increase. If this cannon shows much improved effects against infantry targets, machine gun nests and other field fortifications, it would be well-justified even without an increased thickness in Soviet armor. The NATO 35mm round appears to be a logical candidate to start with.

Components

- *Supercruise engine*—a competitive engine program is needed immediately to permit supercruise aircraft prototype initiation in 2 years. Because optimization for supersonic cruise fortunately requires more ramjet-like engines, the supercruise engine would be much simpler and a lower risk than the high cost, trouble-ridden TF-30, F-100, F-101 or F-404.

Selected Bibliography

- *Simple air-to-air radar warning receiver*—this is needed as the single most important avionics item on the supercruise (or any) air-to-air fighter. Key characteristics are: a) reliable discrimination between enemy fighter radars and all other friendly and enemy emitters and b) reliable indication of which aircraft in a formation has been locked onto.
- *Short-squint radar with passive angle-tracking*—it would be useful to have a simple radar to do wide-band passive angle-tracking on an enemy fighter radar located by the above-mentioned warning receiver and occasionally to take a short-burst range reading on the target in order to decide whether to launch an air-to-air ARM or other missile. The short burst minimizes the chance of alerting the enemy's radar warning receiver and thereby sacrificing the all-important surprise attack. DoD lags behind the nation's police in this obvious radar ECCM technique; the police are already using short burst radars to foil "fuzzbusters."
- *Reinforced composite materials aircraft*—despite the hundreds of millions DoD has poured into boron and graphite composite structure research and fabrication, we have yet to build our first all composite man-rated airplane. In the meanwhile, the "backyard" aircraft builders (such as Bert Rutan, the noted kit designer) have built dozens of successful aircraft entirely of fiberglass-over-foam construction. We need some DoD prototypes using this innovative, extraordinarily low cost approach—which provides "stealth" (passive ECM qualities) without the weight and heavy aerodynamic penalties of our recently advertised high technology approach to "stealth."

Footnotes

1. Inventory of fighters, attack and recon for USAF, USN and all reserve components; official DoD inventory counts used.
2. Note that complaints about pay increase sharply as job satisfaction and confidence in leadership deteriorate.
3. The M6mm cannon has already demonstrated unprecedented accuracy and destructive effects on tanks. Its lethality against a wide spectrum of targets from trucks and artillery to landing craft and missile fast boats should be even more impressive.

- Boyd, John. "Patterns of Conflict." February 1979 (and updated regularly), unpublished.
- Canby, Steven L. *A Comparative Assessment of the NATO Corps Battle*. C&L Associates, November 1978.
- "General Purpose Forces." *International Security Review*, 5 (Fall 1980).
- "*Military Manpower Procurement: A Policy Analysis*." Lexington, Mass.: D.C. Heath, 1972.
- "U.S. Defense Policy: The Problem Is Not More Money." *AEI Foreign Policy and Defense Review*, 1 (No. 3), and Butler, Robert A. "The Military Manpower Question." In (National Strategy Information Center, Inc.) *Arms, Men And Military Budgets: Issues for Fiscal Year 1977*. Edited by William Schneider, Jr. and Francis P. Hoerber. New York: Crane, Russak & Company, Inc., 1976.
- Fallows, James. "Muscle-Bound Supperpower: The State of America's Defense." *The Atlantic Monthly*, October 1979.
- "The Civilianization Of The Army." *The Atlantic Monthly*, April 1981.
- Hart, Gary. "Statement By Senator Gary Hart, D-Colo. FY81 Defense Authorization." July 1, 1980.
- "The Case for Military Reform." *The Wall Street Journal*, January 23, 1981.
- Kondracke, Morton. "Defense Without Mirrors." *The New Republic*, January 24, 1981.
- Lind, William S. "Bureaucratic Tactics." *Air University Review*, January-February 1980.
- "Defining Maneuver Warfare for the Marine Corps." *Marine Corps Gazette*, 64 (March 1980).
- "Military Doctrine, Force Structure, And The Defense Decision-Making Process." *Air University Review*, May-June 1979.
- and Record, Jeffrey. "I will fight for the Corps?" *United States Naval Institute Proceedings*, 104 (July 1978).
- Luttwak, Edward N. "A critical view of the U.S. military establishment." *Forbes*, May 26, 1980.
- "A New Arms Race?" *Commentary*, September 1980.