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Northrop's F-20: A Case of Mistaken Identity?

A Case Study by Ray F. Bessette

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NORTHROP'S F-20 TIGERSHARK:
A CASE OF MISTAKEN IDENTITY?

by

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SUMMARY
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In the mid-1970s, the Northrop Corporation began studying the problem of building a successor to its highly successful F-5E export fighter aircraft. The new aircraft, which would become the F-20, was developed under the auspices of the so-called F-X (for Fighter-Export) policy exception to Presidential Decision 13, which governed conventional arms transfers under the Carter administration. The F-X policy, announced in 1980, excepted development of a new export fighter from PD-13's prohibition on developing significant military equipment solely for export. It also mandated that contractors would have to build the aircraft with their own funds. Northrop accepted this condition, and launched its program immediately. There have been no sales of the F-20, however, and its success now hinges on a purchase by the U.S. Air Force. Moreover, it has grown in sophistication from a simple improvement of the F-5E to the point of exceeding some of the capabilities of the most advanced U.S. fighters.

How the results of the F-X policy could have been so different from those expected by both Northrop and the government is the subject of this paper. One principal cause seems to be that Northrop misread both the size of the market and the reluctance of potential customers to buy an aircraft which was perceived to be not "good enough" for the U.S. Air Force's own use. A second is that the wording of the F-X policy consigned the F-20 to "intermediate" or second-class status from the outset, severely damaging its market appeal. Third, the Reagan administration has not kept the F-16 and other "advanced" fighters off the market, a precondition to any F-X sales. Nevertheless, it continues to adhere to the F-X policy.

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INTRODUCTION

This paper discusses the development of the Northrop Corporation's latest export fighter aircraft, the F-20 Tigershark. The F-20 is one of the very few major pieces of military equipment developed for export by the United States in this century, and the only such fighter since World War II. It has been built solely with Northrop's own funds, which makes the F-20 the only fighter developed privately since World War II. The government's role has been unique. The aircraft was built under an exception to the Carter administration's prohibition of arms development solely for export, and with no guarantee of sales or government help of any kind. The exception was granted in 1980, and, six years and almost one billion dollars of Northrop's money later, there have been no sales of the F-20. Something obviously went wrong, and this paper deals with some of the factors which may have led to the current impasse. Did Northrop miscalculate the government's intentions, and/or the size and nature of the potential market for fighters? Were there any implied commitments by the government to restrict sales of the F-16 fighter, which have severely damaged the F-20's prospects? Should Northrop have abandoned the F-20 at an early stage when F-16 sales began to proliferate? What was the impact of the change of administration from Carter to Reagan? What has been the role of Congress, especially now that the F-20 must be sold to the U.S. Air Force if it is to be a financial success?

It is the interaction of the interests of private industry and national security policy which makes the case of the F-20 worth investigating. This is especially so given the emphasis the Reagan administration has placed both on the virtues of free enterprise and on creating a more robust security policy. The end result has not been a happy one for Northrop.

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CHAPTER I
GENESIS: THE F-5 PROGRAM

"I believe it was Adam ("The Money Game") Smith who advised, "When there is no game, don't play!" He was writing, of course, of the stock market, but he might just as well have been referring to fighter design.... Now it may be that some young designer reading this will feel that he, too, should get down to where the rubber meets the road, find out what the knuckleheads will be calling for in the next round, and plan a project accordingly. As it happens, there is no need for him to spend years risking getting trampled to death by Korean masseuses, hepatitis in the Persian Gulf, gin-poisoning in India, half-drowned in Nigeria, beaten to a pulp in Tijuana, or any of the other fun-things in the programme. To save him the trouble, I will reveal the fruits of my own excruciatingly painstaking research: Design anything you like, as long as it is fast and cheap!...Excellent in-flight performance sells. Low price sells. Advanced technology only sells when it results in excellent in-flight performance or low price. Nothing else sells aeroplanes."

Background: The F-5. The U.S. got involved in the export of fighters in the post-World War II period as a means of implementing the mutual security aspects of its national security policy. The NATO nations were the first beneficiaries, followed in due course by members of CENTO and SEATO, and eventually other friendly nations. Until the advent of the Northrop F-5 in the early 1960s, however, the aircraft involved were usually second-hand U.S. Air Force fighters which were being replaced. There was a large number of U.S. fighter programs in the fifties, turnover in Air Force squadrons was high, and the aircraft were not nearly as expensive as they are today. Moreover, in most cases the fighters were supplied gratis by the U.S. under the Military Assistance Program (MAP). Consequently, a large number of the world's air forces used to fly American fighters, especially since competent foreign competition was almost nonexistent.

These fighters were not easy to fly and maintain, however, and frequently placed a large support burden on the recipient air force. Availability rates of many American fighters of the period were low in U.S. service -- in the third world, with lower maintenance standards, they were abysmal. These facts were not lost on the U.S. government or on Northrop, which in the mid-1950s had fallen on hard times and was actively looking for an aircraft market. Accordingly, with government funding support it began development of a light, simple fighter which would feature good performance, be inexpensive to acquire and operate, and (perhaps most significantly) be simple to maintain. Northrop used state of the art technology in exactly the way called for in the introductory quote: to enhance performance and reduce price. The result was the N-156 Freedom Fighter, which first flew in 1958.

U.S. AIR FORCE

The N-156 met all design goals, but the government took four years to decide what to do with it. Finally, in April, 1962, it was selected as the "counter air" fighter to be offered under the MAP and re-designated the F-5 by the Department of Defense. It was the first jet fighter for many recipients, and for most it was the only alternative to used U.S. Air Force aircraft, which were becoming even more complex and difficult to maintain. Foreign competition was still minimal, and the F-5 compared well to the MiG-15s, -17s and -19s the Soviets were offering their clients. As a result, the F-5 was quite a success, and it was very unusual for other U.S. fighter aircraft to be offered for export in its stead. It became the official, and widely-accepted, U.S. export fighter.

By the late 1960s, however, the picture was changing. The Soviets were offering their MiG-21 routinely for export, and more advanced versions of that aircraft were considerably more effective than the F-5. Accordingly, the administration requested, and Congress approved, the development of an improved export fighter in 1969. The following year the Air Force announced that Northrop had won a competition to produce the "International Fighter Aircraft," intended from the outset to be a MiG-21 competitor. This aircraft became the F-5E (the "E" suffix indicating that it was the fifth major modification of the basic F-5). Interestingly enough, the competition attracted three other manufacturers, indicating that the export fighter market would in the future no longer be a Northrop preserve. On technical grounds, the Air Force favored one of the other aircraft, but the Northrop offering won out because of its lower cost. It is important to repeat that the F-5E, like earlier versions of the F-5, was developed and procured at government expense.

The F-5E fulfilled its promise, just as its predecessor did. Deliveries began in the early 1970s, and the production line did not close until 1985. Over 2,300 F-5s of all types have been exported, about 900 under MAP, and the remainder sold commercially as the MAP was phased out in the 1970s. Thus, though the F-5 got its start by being given away to very poor, unsophisticated air forces with few if any alternatives, it did very well for many years being sold on a more or less commercial basis via the Foreign Military Sales (FMS) program. (FMS guarantees credits on sales, but in most cases the customer is expected to pay a commercial price.) Of great importance later in the story is the fact that the U.S. Air Force bought 36 F-5s for test purposes, since it was administering foreign sales of the aircraft and was responsible for support, testing and training under both the MAP and FMS programs. In addition, the Air Force and Navy acquired 69 F-5Es intended for Vietnam, which became available following the North Vietnamese takeover. These aircraft are still being used as "aggressors" in training exercises, simulating the very MiGs they were designed to compete with. The criticism of the F-20 -- however tenuous -- that the F-5 was "good enough" to be bought and operated by the U.S. services, and that the F-20 is not, is one of the key contributors to the F-20's failure to garner any sales thus far. The fact that the F-5 was bought only for administrative and training purposes, and not operational ones, has no impact. This point will be discussed in more detail below.

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The Next Step: Development of the F-5G. Just as the mid-1950s saw the development of the F-5 concept, and the mid-1960s the evolution of what would become the F-5E, so the mid-1970s saw Northrop begin to work on the F-5E's successor. This aircraft would begin life as the F-5G, which, with substantial modification, has become the F-20. As with the F-5E, the perceived need was to be able to offer a fighter able to counter a modern Soviet fighter, beginning to appear in the export market, this time the MiG-23. By now, however, the environment had changed in several important ways. First, the era of fighters being supplied free to a captive market under the Military Assistance Program was over, and it was clear that Northrop's next export fighter would have to be able to compete on a commercial basis from the outset. Second, the U.S. Air Force was fully committed to buying large numbers of the new F-15 and F-16 for its future needs, so there was little hope for a domestic order if the new aircraft failed to sell internationally. Third, there was no guarantee of what the government's policy concerning arms exports would be. The Carter administration had just placed severe restrictions on arms deals, including a prohibition on developing weapons for export only. It seemed intent on restricting the sale of advanced fighters to the third world, but policy could change. Fourth, the competition from foreign fighters, particularly French, had become intense.

Northrop began to study its F-5E follow-on in 1974, and eventually decided on a very conservative approach. The new aircraft, to be called the F-5G, would use as much of the F-5E's structure and systems as possible, but employ a single new-generation engine instead of the F-5 series' pair of small turbojets. This new engine would provide 60 percent more thrust but consume less fuel than the original installation. The result would be sufficient to raise the new aircraft's maximum speed to over Mach 2 (twice the speed of sound), as compared to the F-5E's Mach 1.6, a valuable selling point. The increased energy available also promised to improve the F-5G's maneuverability over that of its predecessors. Air-to-air armament would remain the same: two Sidewinder missiles and two cannon, but the increased thrust available would enable more air-to-ground ordnance to be carried if required.

Northrop's decision to adapt the F-5E design with minimal modification rather than design a completely new aircraft was a calculated risk. The benefit was much reduced development costs (especially important because it had to use company funds), and high commonality with the F-5E fleets already in service with a large number of air forces. Northrop's initial plan was that the new plane would cost only about one million dollars more than the F-5E, which would be very inexpensive for the prestigious Mach 2 capability. The risk was that the new aircraft would not be able to take advantage of advances in the state of the art in aircraft design and manufacture, or fully apply lessons learned in air combat since the F-5E had been designed. A further risk was that the new aircraft would be perceived simply as a re-tread of a 20-year old design, and would not show up well at all against the new Soviet and French fighters being offered. The best way to counter these risk factors is to sell the aircraft for such an attractive price that they don't matter. This may have been Northrop's initial calculation, but, as described below, events would conspire to make the current F-20 not nearly as inexpensive relative to the competition as Northrop would have hoped.

A complicating factor was the Taiwan market. The F-5E was being co-produced in Taiwan, and Northrop reportedly had strong ties there through some of its senior personnel. In any event, Taiwan was an obvious customer because the number of aircraft it required (as many as 150) might have been sufficient in itself to justify putting the new fighter on the market. Few other potential third world customers offered a market that large. The Carter administration also sent a signal that it was interested in providing at least some additional fighter capability to Taiwan. In mid-1978, Taiwan requested that the U.S. sell it the first-line F-4 fighter with Sparrow radar-guided missiles so that it could replace its older fighters. The administration turned down the request on the grounds that such an advanced capability was not warranted by Taiwan's situation. However, it asked Northrop to study configuring the F-5E with the Sparrow to appear at least partially responsive to Taiwan's request. Northrop did the testing, but found that fitting the missile degraded the F-5E's performance unacceptably. By late 1978, the U.S. and PRC had established diplomatic relations, and prospects for significant arms sales to Taiwan dwindled. The administration rejected a Taiwanese request for the F-5G, too, and imposed a one-year moratorium on all arms sales in January 1979.

For whatever reason, though, the Taiwan link to the launch of the new fighter was forged. In order to sell to Taiwan, it was clear that the aircraft would have to be marketed as a simple modification of the basic F-5 in order to minimize political opposition to the sale from those leery of antagonizing the PRC. This may have been another reason why Northrop decided early on that it would simply re-engine the F-5E rather than develop a more sophisticated, higher-performance aircraft. What to call the new plane predictably became an issue in itself. Some within the company reportedly believed that to tie it too closely with the F-5 would jeopardize its attractiveness in a world market looking for something new, while others were fearful of losing the possibility of selling to Taiwan if the aircraft were to appear too formidable. In the end, the importance of a substantial launch order outweighed other considerations, and eventually the company and the Department of Defense decided to call the aircraft the F-5G, suggesting only an evolutionary development of the basic F-5. This decision was an important cause of the "second-rate" image problem the new fighter has suffered ever since.

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CHAPTER VI
FIGHTER EXPORT POLICY UNDER PRESIDENT CARTER

Presidential Decision 13. Government policy was also pushing Northrop toward the conclusion that a low-profile design approach was preferable. Upon taking office, President Carter suspended all arms sales temporarily, and ordered a comprehensive review of U.S. conventional arms transfer policy. The absence of a comprehensive policy, and a plethora of often mutually contradictory procedures, had been the subject of congressional concern for some years and was a significant issue in the 1976 presidential election campaign. The expressed concern was that the arms transfer process was out of control and could not be relied upon to serve the best interests of the country. The new administration believed that to be true, but went one better by declaring in Presidential Decision (PD) 13 (May, 1977) that the "spiraling arms traffic" was a "threat to world peace"² and that restraint was required. Since the U.S. was the largest arms seller, it would have to take the lead. A set of specific controls was listed, which included:

- a dollar ceiling on FMS sales (services and commercial sales excepted)
- the U.S. would not be the first to introduce advanced weaponry into a given geographical region, and would not do so in any case until such weapons had been introduced into U.S. service first
- development of advanced weapons solely for export was prohibited
- co-production was restricted
- re-transfers were further limited
- policy-level State Department authorization was required for arms sale promotion activities overseas by government employees and private citizens
- human rights and economic development would be factors in arms sales decisions.

PD-13 was followed in August by the so-called "leprosy letter" to State Department posts and arms contractors spelling out the prohibition on government assistance to arms merchants overseas even if they were equipped with export licenses.

There was substantial leeway in the policy for presidential discretion, and it did not apply to NATO partners, Japan, Australia, and New Zealand. Israel was also given special status. Under these circumstances, the effect on defense contractors was mixed. Most did not depend very heavily on the export market to countries other than those excepted. Northrop, however, did. It was not as diversified a company as it is today, and did a large portion of its business in the third world. It was particularly upset by the policy, and lobbied long and hard against it.

According to Lucy Benson, Under Secretary of State for Security Assistance, Science and Technology during most of the Carter years, the case of fighter aircraft was viewed as a particular problem for PD-13 from the very beginning. Fighters are very high prestige items of military equipment, and their availability (or unavailability) for sale can have significant political impact.

Further, Northrop already had a significant market share of the international fighter market and was disproportionately affected by the policy. The requirement for an F-5 successor to serve U.S. foreign policy goals was recognized by many in the administration. But, she argues, there was considerable ideological energy behind a strict interpretation of PD-13 (at least early on) and many hoped that the requirement would simply go away. The success of foreign competitors at the expense of U.S. companies limited by PD-13 was not to be a consideration.³

Enter the F-16. Over time, industry lobbying and administration recognition that the fighter problem was a special case because of the international political implications would lead to an exception for fighter exports, which will be described later. But first, administration policy on F-16 exports must be introduced because it is F-16 sales by both the Carter and Reagan administrations which has probably done the most harm to the F-5G/F-20's prospects by undercutting its natural markets.

The F-16 was developed in the mid-1970s by General Dynamics as one of two new fighters which were to equip the Air Force during the 1980s and 1990s. It is a single-seat, single-engine airplane which set new standards for fighter design and performance. While somewhat larger and more expensive than the Northrop fighter, it is sufficiently comparable to compete for much of the same market. In Israeli hands, it has won an unparalleled combat reputation. Since the second of the two fighters, the larger and heavier F-15, is too expensive to be attractive for export (only Japan, Israel and Saudi Arabia have it), the F-16 has become the most prestigious fighter in the world to buy. It is recognized as a special sign of American favor to possess it.

The F-16 was marketed overseas before it had even reached squadron service in the U.S. A NATO consortium based in Norway, Denmark, Belgium and the Netherlands has been co-producing the F-16 since the mid-seventies for the air forces of those countries, and gets a portion of all business to other countries as well. In addition, the F-16 was supplied to Israel by the Carter administration at an early stage. But NATO and Israel were both excepted under PD-13, and there was reportedly quite strong feeling in the administration that the F-16 should not be sold elsewhere.⁴ The administration's first significant test on that score was Korea, which applied to buy 60 F-16s in 1978. The decision was delayed by President Carter in the last months of that year because of the policy debate about the proposed unilateral U.S. troop withdrawal from Korea. The resulting reassessment of the North Korean threat, plus the planned presence of U.S. Air Force F-16s in Korea, evidently convinced the President to approve the sale. Also, the Korean F-16s would augment a continuing U.S. military presence.

Pakistan became an issue since the administration placed high priority on improving relations (especially in view of the deteriorating situation in Afghanistan). Further, the Pakistanis refused to accept anything but F-16s as part of the military and economic aid package being offered by the U.S.

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Thus, while Northrop was designing the F-5G and lobbying hard to secure changes in PD-13, the F-16 was already flying, being exported, and acquiring an outstanding combat record. Perhaps just as significant, General Dynamics was developing expertise and interest in the international marketing of fighters -- qualities among American manufacturers previously found chiefly at Northrop.

The F-X Exception. Controversy within the administration, concerns of congressional arms control advocates, unrestricted sales of foreign advanced fighters, and pressures from domestic manufacturers led to a debate about whether an exception to PD-13 for fighter export sales should be granted. The Arms Control and Disarmament Agency strongly disagreed with the proposed exception on the grounds that there was an insufficient market for advanced fighters. However, the President believed that a policy change was warranted and approved it in late 1979. It was promulgated in the Munitions Control Newsletter No. 77, of January 1980, from which the following quotes are drawn. The new policy provided that:

"...in certain cases the sale to foreign countries of an intermediate fighter aircraft developed or modified for export (F-X) would be in the national interest and would be consistent with the objectives of the US arms control policy. An intermediate fighter is defined as one whose cost and performance characteristics would generally lie between our current export fighter, the F-5E, and fighter aircraft now in production for US forces, such as the F-16."

The policy foresaw an arms control advantage in that the availability of an intermediate fighter would forestall demands by foreign countries for advanced fighters like the F-16. The F-X was to have "...capabilities tailored largely toward a defensive role..." Further, the US Government "...will not provide funding for the development of the aircraft, and aircraft companies will assume all financial and market risks." It was explicit that the exception to PD-13 was only to that provision dealing with the development or significant modification of weapons for export. The remainder of PD-13, which mandated (among other things) consideration of the regional force balance and prohibited introducing advanced weaponry into a given region, remained in full effect. Thus, the PD-13/F-X combination implied that advanced fighters would be sold on a very restrictive basis, clearing the way for sales of "intermediate" F-X fighters instead.

The conclusion of the Newsletter provided some general considerations:

"The US Government has not developed detailed characteristics for an intermediate export fighter; it does, however, believe such an aircraft should meet several general criteria. The aircraft should be a multirole fighter with strong air defense characteristics and somewhat restricted ground attack capabilities. It should:

- Have a primary mission of defending the recipient country from projected air threats in the 1980s and 1990s.
- Have a secondary air-to-ground capability on close air support of ground forces; be sufficiently limited in an offensive range-payload capability to categorize it clearly as not in the class of more advanced aircraft.

- Have lower cost and easier maintainability than first-line US aircraft.
- Not require either an implicit or explicit USG minimum guaranteed market.
- Not easily be substantially upgraded without USG approval." (Emphasis supplied)

Now the administration found itself in a classic bureaucratic trap. The F-X policy clearly called for an aircraft with less than first-class performance. This is what previous F-5s had always been, with the big difference that there had never been an official U.S. government policy document that said so: no tender foreign governmental egos were at stake when buying F-5s. But here the administration was forced to try to codify an implicit policy which had existed for many years -- that the most advanced fighter aircraft were unsuitable for most third world air forces, and a less expensive, lower performance alternative was needed. There had been no real need to spell this out (to the embarrassment of both the recipient and the aircraft manufacturer) until the need arose to revise PD-13's explicit prohibition of development of major weapons systems for export. There was then no choice but to publicly explain the revision, its justification, and what the outcome was expected to be. Thus the F-X aircraft became officially branded as second-rate in a way that the F-5 series never had. Northrop won the battle to secure permission to develop its new fighter, but it paid the price of having it stigmatized from birth.

In the first weeks of 1980, an interagency group comprised of representatives from the Department of State, Office of the Secretary of Defense, U.S. Air Force, Arms Control and Disarmament Agency and the Defense Security Assistance Agency met to determine what the F-X candidate fighters would be. There were only two serious contenders: the F-5G and the F-16/79 from General Dynamics. In March, the Secretary of Defense designated the Air Force the executive agent for the development of the F-X.

The F-16/79 was so designated because it was an F-16 in every way except for substitution of an older-generation J-79 engine. The replacement imposed certain performance penalties, especially in range and low altitude maneuverability. On the other hand, some performance characteristics at higher altitudes were enhanced. The intent was to degrade the more "aggressive" ground attack capabilities of the aircraft, and emphasize its "defensive" air defense qualities. The re-engining job was a minor one, and the F-16/79 flew for the first time in October 1980. General Dynamic's investment was about \$50 million. Four years later, Otto Glasser, General Dynamic's Vice President, International was to describe his company's decision to enter an F-X candidate:

"In line with this (F-X) policy, our Fort Worth Division developed its "F-X," the F-16/79, believing that the market for this type aircraft would be limited at best. We did not believe that the competitive world any longer resembled the marketplace of the 1960s and 1970s when the previous U.S. export fighter (i.e., the F-5) was so effective. However, since the F-16/79 could be seen as a closely related adjunct to our successful F-16A program, the rather modest business risk appeared acceptable."⁵

In view of the fact that there have been no sales of either F-X competitor, General Dynamics may have had a better appreciation of the market than Northrop (granted a certain allowance for hindsight). Whatever its actual reasoning in 1980, with an investment of only \$50 million versus Northrop's now nearly \$1 billion, it obviously hasn't taken the F-X program nearly as seriously. The F-16 program was thriving, had already enjoyed export success, and was in great demand worldwide. General Dynamics probably calculated that the administration would be unable to resist for long the pressure to sell F-16s more widely. General Dynamics did attempt to sell the F-16/79. It secured licenses to market it to some 40 countries, and flew over 100 demonstration flights. If nothing else, this activity served to expose many air forces which never would have seen an F-16A to something very much like it. Development of the F-16/79, therefore, probably has had a direct positive impact on the increased popularity of the F-16A as an export fighter.

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CHAPTER III

THE REAGAN YEARS

Shifts in Security Assistance Policy. The Reagan administration's philosophical approach to security assistance could hardly be more different from its predecessor's. In its "Conventional Arms Transfer Policy" issued in July 1981 it began with a consideration of the threat (as did PD-13), but this time the chief problem was threats to U.S. security by our adversaries, not to world peace as a result of the spiralling arms trade. The Reagan policy stressed the need for flexibility in order to be able to respond to requests for security assistance promptly and adequately, and there were few specific guidelines. The favored approach was a case by case evaluation, with the final determinant being a proposed program's "...net contribution to enhanced deterrence and defense."⁶ In addition, the "leprosy letter" forbidding embassy assistance to arms contractors was rescinded and replaced with instructions for posts to help them as they would any other business representatives. The new administration assigned a high priority to security assistance as an element of its national security policy, and the early Reagan years saw an upsurge in arms marketing and sales.

For Northrop, the mood when the new administration took office must have been euphoric. Not only were restrictions on arms transfers to be reduced, judging from campaign policy pronouncements, but there was much vocal support for Taiwan as well. The latter gave Northrop hope that the Carter administration's restrictions on arms transfers to Taiwan would be eased, and that it could go forward with marketing the F-5G. The company was in for a rude shock. In its first month in office, the administration rejected Taiwan's renewed request for the F-X. Moreover, by summer it had implemented a new policy stating that Taiwan would not be supplied with weapons more advanced than it already had, and rescinded Northrop's technical data license to market the F-5G there. Like its predecessor, the new administration decided that the fledgling relationship with the People's Republic was important enough to warrant restraint in supplying arms to Taiwan.

Not only was Northrop frustrated by these developments concerning Taiwan (which took place even before the Conventional Arms Transfer Policy was implemented), the administration also determined that the F-X policy would be retained -- the only remnant of the Carter arms transfer policy to survive intact. This meant that Northrop would still be stigmatized by the F-5G's categorization as "intermediate," and still could expect no government financial help. Northrop's initial unsuccessful marketing attempts were making it clear to them that the F-X categorization of their aircraft was going to be a serious problem. The company was faced with a crucial decision. It had lost an opportunity to sell to Taiwan, and had found no other takers. It probably also suspected that the new administration was going to be less reluctant to sell the F-16, which certainly proved to be the case. Therefore, the choice seemed to be to cancel the F-5G at an early stage (it had not even flown yet) or to upgrade it sufficiently to be able to compete with the F-16.

THE REAGAN YEARS

Northrop did not hesitate long. In October 1980 it requested permission of the State Department's Office of Munitions Control for a comprehensive upgrade of the F-5G's avionics systems, which until then had simply been those of the F-5E. These improvements, and those which would follow, would bring the F-5G to a level of sophistication and performance in many respects equal to or greater than the latest versions of the F-16. Northrop's decision to go forward at this point meant that the F-5G program would be far more expensive and slower developing than it had foreseen. Essentially, the company had decided to build a new airplane rather than cut its losses.

The F-16 Decisions. Wasting no time, the Reagan administration decided in 1981 to sell the first-line F-16 to three potential F-X customers: South Korea, Pakistan and Venezuela. The Korea sale had already been approved by the Carter administration, but the package was reduced in size to 36 aircraft in the March 1981 announcement. This sale, coming as it did in the wake of the reassessment of the North Korean threat and the decision to base U.S. Air Force F-16s in South Korea, generated relatively little opposition either within the administration or from Congress. Further, the South Korean Air Force was successfully operating F-4 fighters, which indicated that it could handle the F-16 from a maintenance standpoint.

The Pakistan sale, announced the following October, was more controversial. There was little doubt about the Pakistani Air Force's ability to operate the F-16 -- the concern was more about the balance of forces in the region, the cost to an impoverished country, and Pakistan's intentions regarding the development of nuclear weapons. The Pakistanis were offered the F-5G, but rejected it because it had not yet been built or tested. They wanted immediate help, and they got it. Six F-16s of a total of 40 were delivered within a year (remarkably quickly, as these things go), with the remainder experiencing the more normal delays of up to three years. This early delivery complicated the delivery schedules to established customers, including the U.S. Air Force, and caused those six aircraft to be sent to Pakistan without full maintenance support. The case for this sale was weak to many, but it was approved nevertheless by a Congress exhausted by the divisive Saudi AWACS debate, and without the energy to give full attention to another controversial arms sale.⁷ The most telling arguments in favor seemed to be relating the sale to resisting the Soviet invasion of Afghanistan, and the fact that it was a part of a comprehensive aid package involving substantial economic help as well.

The sale that caused the most controversy, and arguably did the most damage to the F-5G, was to Venezuela. The military threat to Venezuela used as justification for the sale (MiG-23s in Cuba) was pretty unconvincing, and the Venezuelan Air Force's ability to handle the F-16 uncertain at best. The real justification for the sale was political, with the administration very concerned about Central America and Grenada, and looking for opportunities to reward its friends in the region. This sale led to considerable opposition in Congress, and serious questions were raised, not only about the merits of the sale itself, but about the status of the F-X policy. These concerns were aired in a Senate Foreign Relations Committee hearing in February, 1982. James L. Buckley, Under Secretary of State for Security Assistance, Science and Technology was the administration's lead witness. At that time, at least officially, the administration was not concerned that there had not yet been any sales of either F-X candidate:

"Senator Percy: ...Many observers do believe that the potential for the F-X aircraft is now markedly reduced, the F-X meaning the F-16/79 and the F-5G. Do you agree that the potential for that plane is now somewhat reduced as a result of the F-16's (sales)?"

Mr. Buckley: "No, I would not, Mr. Chairman. One of the problems, at least with the F-5G, has been the fact that it has not been in existence, that people, if you will, have not been in a position to kick its tires. That has been a significant drawback. But we expect by the end of the year to have some flying models. Second, we are receiving some very real expressions of interest from several quarters. Third, you have the factor of the sheer discrepancy in cost. Countries are increasingly sensitive to interest rates, to the burden of a significant arms sale, and in the case of the F-5G, they can buy very competent aircraft for significantly fewer dollars."⁹

The Department of Defense Steps In. Other administration actions, however, indicated that it was attempting to boost the F-X even as it opened the door to F-16 sales wider. In the fall of 1981 it prohibited the release of F-16 material to any nation not already approved for an F-16 sale should that nation request it. This considerably cut down on General Dynamics' ability to market their fighter, whereas the administration placed few restrictions on F-X license applications. In March 1982, the Secretary of Defense directed the Secretaries of the Air Force and Navy to choose between the F-5G and F-16/79 as the preferred F-X candidate and to order 20 aircraft under the new Special Defense Acquisition Fund. (The Fund was set up to build stocks of weapons in advance of requests to reduce delivery time to recipient nations.) This would have provided U.S. government endorsement of one of the aircraft, if not actually starting production. However, the House Foreign Affairs Committee in April prohibited using Fund monies for F-X since neither candidate was in production.

In late July, the Deputy Secretary of Defense rescinded the March memorandum, but directed the Navy and Air Force secretaries to "...actively encourage the foreign procurement of the F-X, not leaving the marketing effort just to the manufacturers."⁸ He also listed 39 "target nations" where marketing by the manufacturers had been approved, but only eleven in which the Department was initially permitted to help: Turkey, Egypt, Jordan, Malaysia, Philippines, Thailand, Indonesia, Bahrain, United Arab Emirates, Oman, and Saudi Arabia. DoD promotional activities in the remaining countries would require prior approval through DoD and State channels. Thus, five years after the "leprosy letter," policy had come full circle. From outright prohibition of contact with arms manufacturers, government representatives overseas were now directed to cooperate to the extent of marketing on their own. Administration policy continued to hold (as it does to this day) that export sales of the F-16 are all exceptions to the F-X policy and must be justified as such.

In addition, the Defense Security Assistance Agency, which manages arms transfers for the government, set up very strict controls over the marketing procedure to ensure that the F-X got a fair hearing. All contractor cost and performance claims were verified by the Agency, and conflicts resolved before the material was presented to the foreign customer.

Briefings were written and delivered by Agency representatives, who answered all questions. Since the F-16 was in widespread U.S. service, and the testing of the two F-X candidates had been supervised by the Air Force as executive agent, the Agency had first-hand knowledge of each of the export fighters and could deliver an objective view. The only aspect of a proposed sale under the Foreign Military Sales program (and all but two recent fighter sales have been FMS) that is not covered is the contractor's proposal for offsets and/or co-production. Any co-production arrangements do, however, have to get government approval elsewhere. But these administrative advantages provided to the F-X contestants and burdens imposed on the F-16 have at most only slowed the proliferation of F-16 sales and contributed nothing to the success of the F-X.

On August 30, 1982 the F-5G flew for the first time, not quite two years after the F-16/79. It was the original, modified F-5E without the advanced avionics systems upgrade which was intended to turn it into an F-16 competitor. In addition, it was a single-seater, which meant that marketing via demonstration rides was difficult to arrange. Prospective customers who wished to ride in the aircraft all had to be very good pilots, and in any case were not flying a representative aircraft of the one for sale. (The sole F-16/79 is a two-seater.) The first true F-20 would not fly until August 1983.

In November 1982, Northrop got something else from DoD that it really wanted: a designation change from F-5G to F-20. This removed the aircraft, officially at least, from a direct association with the F-5 line, and partially made up for the "second class" stigma. William Schneider, Jr., William Buckley's successor as Under Secretary of State for Security Assistance, Science and Technology, described the change as being "...in recognition of the changing nature of the F-5G program from one of modification to the development of a new aircraft..."¹⁰ A change of designation of this type is unprecedented since at least World War II. DoD designations are reserved for aircraft in production for one of the military services, and granting Northrop a change for cosmetic reasons in contrast to policy indicates a considerable commitment from DoD to helping the program.¹¹

In late 1982, hopes ran high in both the administration and Northrop that sales of the F-20 to Egypt and Jordan might be forthcoming. Egypt had a potential requirement for 180 aircraft, which would have gotten the F-20 off to an excellent start. However, the Egyptians were already recipients of the F-16 as part of the Camp David accords, desired more, and wanted additional FMS credits to use on a F-20 purchase. They also were reluctant because the aircraft was not in production, and negotiations foundered. A much smaller opportunity (36-40 aircraft) was presented by Jordan. F-20 supporters hoped that agreement could be reached and an announcement made during a state visit by King Hussein in late December. However, this potential sale, too, came to grief, this time over threats of congressional opposition.

"The New Aircraft": The F-20. Encouraged by the designation change and by the growing realization that the F-20 was going to be a very good fighter, Northrop pressed ahead with development in 1982 and 1983, even though there continued to be no marketing success. For its part, the administration imposed no objections to Northrop's creating a very different aircraft than had been approved by the original interagency F-X group in 1981.

Proposed improvements were routinely granted, and the question of the group's meeting again has never been considered. This appeared to be an attempt by the administration to compensate Northrop for the liberalization of F-16 sales. When Northrop's strategy became apparent, General Dynamics protested to the administration, arguing that the original F-16A model should be qualified as an F-X fighter because, in fact, it had become the standard U.S. export fighter; because Northrop was building an equivalent fighter to the F-16 which had fewer marketing restrictions under the F-X rubric; and because the advent of the improved F-16C made the F-16A no longer a "first-line" fighter. Regardless of the strength of these arguments (and the third is certainly dubious) the administration has retained the F-X policy and the policy distinction between the F-20 and the F-16 series.

Northrop did not shirk from the expense involved in applying high technology to its original F-5G to make it into an F-16 competitor. Its primary goal was to make the aircraft simple and easy to operate. Engines and radars are the modern fighter's weak points in terms of equipment breakdown. Because of the very high levels of electrical power pushed through a fighter's relatively small radar, and the extreme operating temperatures of the engines (to get maximum thrust) these systems fail at greater rates than most others. They are also crucial to the fighter's function. The original F-5G had an excellent engine -- the General Electric F404 -- also in use in a Navy fighter. The engine was designed for the Navy with maintenance requirements a primary concern. It is of modular construction, with a fraction of the parts of earlier engines of similar thrust. Failure rates are low because the engine was built with less than the maximum potential thrust. This means that the engine runs easier, with less strain, and that the dynamic components last much longer. Northrop was not satisfied with any radar it found on the market, and so ordered an entirely new one, which couples excellent performance with double the reliability of previous units. Northrop also adopted an inertial navigation system used in the latest commercial airliners. This new system has an estimated failure-free operating time measured in thousands of hours, and provides the F-20 with an ability to be airborne in seconds from a cold start because the system can align itself so quickly. The cockpit is among the most modern anywhere and the mission computer has more capacity than any now flying in a fighter. The end result is an aircraft that Northrop estimates will have reliability about half again better than the F-16. This remains to be seen, since the F-20 data is all based on test conditions while the F-16 has years of squadron service behind it. But Air Force data so far does confirm that Northrop's philosophy of designing for ease of maintenance will lead to a fighter with significantly better operational readiness than any in service today. Northrop also made some configuration changes to improve maneuverability and increased the fuel storage to improve range.

The company then put together an innovative package of warranties based on commercial aviation practice. It offered to guarantee a fixed price per flying hour for each customer, based on that customer's ability to maintain the aircraft, and on the aircraft configuration. This price would include spares, depot repairs, base maintenance supplies, and safety and other improvements. Spare support, a real sore point for many operators of export fighters, would be provided by the Air Force Logistics Command, just as with the F-5. At the time it was made, an offer of this type for a fighter was unprecedented.

So Northrop had designed an exceptional aircraft, but still had political and policy problems to wrestle with. Its attitude on the F-X appellation has varied. Earlier on, it argued in defense of its upgrade program that the F-20 still fit within the F-X standards because in some respects (mainly range and payload) it was inferior to the F-16, the top end of the F-X spectrum. As time has worn on, though, it began to perceive the F-X designation as a hindrance. Thomas Jones, Northrop's Chief Executive Officer, in 1984 called F-X "...misleading labeling by our own bureaucracy..."¹² and further stated that "...no sovereign nation could be expected to react warmly to defending itself with an airplane that, in direct contradiction to its true capability, the U.S. chooses to smother in the label 'F-X Intermediate.'"¹³ He also took the government to task for its perceived lack of support: "...without government endorsement, without the government taking the initiative to disclose the quality of the F-20 as a first-line American complement to other first-line fighters in our own inventory, the Tigershark (F-20) lacks the credibility needed for political acceptance abroad. In the absence of official U.S. information, foreign countries simply ask for the same fighter the U.S. flies."¹⁴ As we have seen, the F-20 is still stuck with the F-X policy, though Mr. Jones' complaints in the final quote would seem to have been addressed by DSAA procedures.

As its marketing failures mounted, Northrop has turned increasingly to the possibility of an F-20 purchase by the U.S. Air Force or Navy as a way to get the program started. Northrop began to try to market the then F-5G to the services in 1981, as a replacement for the F-5Es operated by both as "aggressor" aircraft in specialized training units, but there was no interest. In March of 1982 the National Guard issued a report called Vista 1999, which called for procurement of several hundred "austere" F-16s or F-5Gs for the Air National Guard for the continental air defense mission. The release of this report led to considerable publicity at the time, and its echos, as we shall see, are still being heard. Vista 1999 marked the first expression of interest by the government (though the report itself could best be described as semi-official) in procurement of the F-5G for its own use. There was some congressional interest, but nothing came of the report's recommendations at that moment.

In June 1982, Jones was forced to announce that the pace of the F-20 development program would have to be slowed: "The F-5G development program is on schedule and continuing. As a consequence of delays in government commitments, however, we will not continue production expenditures at their current levels ahead of orders."¹⁵

Re-enter the F-16. The Reagan administration continued to have its conceptual difficulties with the F-X policy, on the one hand refusing to give it up, and on the other granting the F-16 sufficient F-X exceptions to expand its marketing territory ever further. Administration decisions in 1983 and 1984 opened up the Persian Gulf and the Association of South-East Asian Nations (ASEAN) as potential sales areas for the F-16. This was a crushing blow to the F-20's already poor sales prospects and left only Latin America as F-X "territory" where the F-16 could not be marketed without securing an exception. The F-X policy was by now dead in all but name.

However, that name alone was enough to damage the F-20's sales prospects, and the way the policy was being applied did virtually nothing to promote sales of the aircraft. It was the worst of both worlds for Northrop.

The proposed sales to ASEAN sparked congressional interest, and led to a House Foreign Affairs Committee hearing in March 1984.¹⁶ The chief administration witness was again William Schneider, Under Secretary of State for Security Assistance, Science and Technology. He began by summing up the results of the F-X policy to that point: no F-X sales, but over 1,100 fighters of other types sold since the policy was announced in 1980. This despite the fact that requests for sales of advanced fighters had been turned down in several cases, and the F-X offered instead. (Of the six rejections, four have since been cleared for the F-16. One of these, Singapore, has bought some.) Secretary Schneider's statement concluded with a summary of the policy dilemma faced by the administration:

"In conclusion, Mr. Chairman, we are faced with some very difficult choices. The continuation of our present policy may not result in future F-X sales, while it may adversely impact (sic) our bilateral relations with countries in areas of strategic importance to the US, in addition to leaving the market open to foreign competitors with the attendant implications for US economic interests. On the other hand, if we were to remove the restraints from our present policy, we might spur a greater demand for front-line U.S. fighter aircraft and be confronted with a series of difficult political decisions regarding the approval or disapproval of requests for force structure aircraft. The trends in aircraft development are toward a more highly sophisticated aircraft. In addition, the cost of such aircraft and the complexity of maintenance will be more than many countries can handle. Notwithstanding the general lack of foreign interest in either F-X aircraft, we need lower cost, more easily maintainable aircraft which can compete in the international market place."¹⁷

With the exception of the concern expressed about foreign competitors and the potential adverse economic impact on the U.S., Secretary Schneider's statement could have been written by the Carter administration in 1980 when the F-X policy was new. This despite the fact that there was practically nothing left of it because of erosion of the market by the F-16.

The root of the administration's problem was acknowledged by Richard L. Armitage, Assistant Secretary of Defense for International Security Affairs: "In essence, we can implement the policy in a negative way by discouraging the export of advanced fighter aircraft to ASEAN, but we cannot force these countries to buy the F-X and thus ensure the policy's success."¹⁸ The administration did discourage the ASEAN nations, and many others as well. But in the end, it was not able to make its position stick. It had approved the F-16 too many times.

Fighter export policy toward the Persian Gulf had been modified already. Secretary Schneider's description of the shift reveals how convoluted implementing the F-X policy had become:

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"However, due to special security requirements and relationships, the policy was modified for the Persian Gulf region in June 1983. The current Gulf policy offers F-X aircraft to Kuwait, the United Arab Emirates, and Qatar, and provides assurances that we would be prepared to sell them an advanced fighter once they absorb the F-X. Because the air forces of Saudi Arabia and Oman have demonstrated the ability to integrate modern fighter aircraft, they were exempted from this policy. A special exception that was made for Bahrain permitted them to purchase an advanced U.S. fighter after absorbing the F-5E."¹⁹

Thus, the Persian Gulf policy has three levels for a total of only six countries: advanced fighter (read F-16) after F-X, advanced fighter after F-5E, and advanced fighter immediately. When asked whether the administration had made recommendations to countries that they would be better off buying one aircraft than another, Secretary Schneider replied for the record:

"We have suggested to most of the Gulf States and ASEAN nations that, with less expense in terms of maintenance and support, they could acquire the capabilities of an air interceptor they are seeking to meet the threat by buying the F-X rather than an advanced U.S. fighter."²⁰

The Committee also asked questions about why the F-X hadn't sold. Secretary Schneider responded:

"The marketing efforts for the F-X aircraft by both contractors, with the active support of U.S. government officials, have met stiff resistance from potential customers. Most importantly, many countries reject the aircraft because they have not been included in the current U.S. Air Force inventory. Some countries also reject the aircraft because F-X is perceived as something less than first class by virtue of the promulgated design limits. In addition, sales of foreign produced aircraft (such as the Tornado, Mirage F-1 and 2000, and the MiG-23) compete for the same market and, in some cases, carry substantially more concessionary financial conditions. This contrasts sharply with the U.S. Government's relatively restrictive financial terms."²¹

This is as good a summary of the problems encountered in trying to sell the F-X candidates as any. It applies particularly to the F-20 because, in the case of the F-16/79, General Dynamics could at least maintain that it was a very simple modification of an aircraft in widespread U.S. Air Force service. Secretary Schneider identified four marketing problems: the F-X aircraft were not in the U.S. inventory, they had been identified as less than first class because of the policy limitations, foreign competition was available, and better financing could be found for foreign fighters. Yet he offered no solutions to these problems, and argued elsewhere that the F-X policy should be maintained as written. Moreover, while the administration was willing to recommend F-X buys in lieu of advanced fighters, it was unwilling to insist -- in the end, requesting countries have gotten pretty much what they wanted.

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The Persian Gulf has been a special case for security assistance for several years now, and perhaps it was too much to expect for the administration to stick to a policy as abused as the F-X. For very long in that case. But, once giving in there, it lost credibility in the next round, ASEAN, where the F-X makes very good sense. First, it gave in to Thailand on the grounds of the Vietnamese threat, and then to Singapore, then to the rest. The case of Singapore is interesting because it had actually ordered a small batch of F-16/79s. However, once the Thailand exception was granted, it insisted upon an exception of its own, and got its F-16s.

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CHAPTER IV
END GAME: SELL TO THE GOVERNMENT

Northrop had run out of options. With its potential markets fast eroding to the F-16 and foreign fighters, there was no prospect of putting together a package big enough (300 to 400 aircraft) to warrant starting production of the F-20. It concluded that there was only one way to get around the stigma of being "intermediate" and at the same time assuage foreign concerns that parts support and technical assistance would be lacking: sell the F-20 to the Air Force.

As we have seen, this effort began with less urgency in 1981 with an offer to provide new "aggressor" aircraft, and it surfaced again in 1984. Congress then combined the Navy and Air Force funding for aggressor aircraft and ordered them to report on the feasibility of a single replacement. This represented a new opportunity for Northrop because it had not bid on the Navy's order due to the small numbers involved. Combining the programs, however, made the potential order larger and more attractive. Congress' action also had the effect of cancelling the bids already received for the Navy's program and making it start over again. In the end, the services argued that their programs were different enough, especially concerning when the replacements were needed (the Navy very soon, the Air Force several years off) that separate approaches were justified. Congress agreed. The Navy ultimately bought a version of the F-16 for what was alleged to be an exceedingly low price.

Some members of Congress had long been sympathetic to Northrop's plight because of the company's activities within their districts, and others because they truly did believe that an intermediate fighter was required and that the administration had been too easy in releasing the F-16. But support of this kind wasn't broad enough to help Northrop. The turning point came as a result of the Air Force's increasing use of competition between major contractors to lower costs and increase performance. The Air Force had opened up competition for the engine powering the F-16 and F-15 in the early 1980s, and discovered that General Electric was prepared to build an engine which met its needs better than the original Pratt and Whitney design, and for less money. The engine orders have been split between the two contractors ever since, the proportion of business won depending on the attractiveness of the bid. Bringing in the F-20 to compete with the F-16 for Air Force orders seemed to represent another good test case, and support in Congress for the idea grew. The congressional interest was a mixed blessing for Northrop, however, since it drew statements from both Secretary of Defense Casper Weinberger and Air Force Secretary Verne Orr that the F-20 was not designed to meet Air Force requirements. Northrop did not need yet another indication from the government that the F-20 was unacceptable to the Air Force.

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By the March 1985 hearings on the FY 1986 budget, Air Force Secretary Orr was able to agree with the principle of a competition, but offered some cautions:

"...but there is a potential competition to the F-16 or at least the F-16A, which would be the F-20. We have been thinking about that. As a matter of fact, I suspect there is not a topic that General Gabriel (Air Force Chief of Staff) and I have talked more about in the last 6 or 7 months than how we could bring the F-20 in as competition to the F-16 the way we brought Pratt & Whitney and General Electric together in head to head competition...I think there is no question that there is merit to it. There is a fundamental difference, Mr. Chairman. When I had two engines to compete, they were very close to identical. You could fit an F-16 with one engine or the other and it is essentially the same plane. The two airplanes are not that close. They have different ranges, different scramble times, many different features. It is hard just to say: "We'll have one or the other." If I had my druthers, and I think the Committee probably would agree it would be nice to be able to say I will make the mix 180 or 120, and 60 or however it goes, between the two based on their price. It would be very beneficial if we could find a way to do that."²²

Northrop didn't need to be told twice. The following month it made an unsolicited proposal to the Air Force for 396 F-20s in a four-year program at a fixed acquisition price, and a guaranteed cost per flying hour which included certain spares and depot maintenance items. These aircraft would replace only a portion of the programmed F-16 buy. Given the lower cost of the F-20, argued Northrop, the Air Force could buy more fighters with its programmed funds and thereby reach its otherwise unattainable force structure goals. In a late April point paper, Northrop also argued that Air Force acceptance of the offer would open the door to the elusive foreign sales. Indeed, the company all but acknowledged that Air Force procurement was essential if there were to be any export successes.²⁴

In June, General Dynamics (as if to make the point about competition) responded with an unsolicited proposal of its own for a stripped-down version of their latest F-16 which would cost about the same as the F-20, with a guaranteed cost per flight hour a little higher. The aircraft had several significant F-16C systems downgraded or eliminated, but General Dynamics believes that its capabilities will be sufficient for the continental air defense mission. Northrop responded in the same month that it would begin production of the F-20 with a firm commitment for only 180 of the 396-aircraft offer, and a guaranteed right to compete for future orders. Northrop evidently believed that an order for 180 would generate sufficient foreign orders to warrant starting production.

Congress responded by directing a competition, to be run by the Air Force, to select suitable fighters for the active and reserve forces. The competition is open to all suitable aircraft, and there has been some interest by other manufacturers. However, the main event will be the F-20 versus the new, cheaper variant of the F-16C. The study is experiencing delays, and will probably not be finished until the end of the calendar year, which will make it difficult to assess and include in the FY 1987 budget, which has already been sent to Congress.

CHAPTER V
CONCLUSIONS

So by the middle of 1985 Northrop had come full circle with the F-20. The program began as a low-cost, low-risk replacement for the F-5E, intended for export only. There was no question of selling the original aircraft to the Air Force because it didn't have nearly enough performance to offer, and the Air Force had already made its fighter plans. But five years after the project really got going, it had become a true competitor to the top-of-the-line F-16 with its success or failure riding on an Air Force order. What happened?

There were several contributing factors, some related to Northrop's market assessment and approach, some to the government's policies, and yet others having to do with the international environment which neither Northrop nor the government could control. However, the story of the F-20 is principally one of Northrop's misreading of the export fighter market and the government's pursuit of a policy which hamstrung marketing of the F-20 from the very beginning.

Northrop's Approach. Northrop was working from a formula in the late 1970s when the F-5G was being designed. That formula was to progressively improve an existing design to keep it competitive in the international marketplace. It had upgraded the 1960-vintage F-5A with the F-5E, and both aircraft had sold extremely well. The company's reputation for building serviceable aircraft with high readiness rates, and for prompt technical support, was unsurpassed. In addition, it had a wealth of international marketing experience. There was, thus, a corporate tendency to approach the problem of building a successor to the F-5E in a way that had brought success in the past, and corporate confidence that it would work.

Other factors discussed earlier in the paper also influenced Northrop toward a conservative approach. These included the fact that the aircraft would have to be developed with company funds, and that it would have to be a minimum modification if it were to be sold to Taiwan. Northrop planned from the beginning an upgraded version of the F-5G, but believed that the original version would first have market success in its own right. This commercial success would in turn provide the revenue and momentum to fund the advanced version at some time in the future. But the failure of the F-5G pushed Northrop into development of the more advanced version, the F-20, sooner than it would have wished, and without benefit of income from F-5G sales. Moreover, the longer development times involved with fielding the F-20 meant that the program would be far more expensive and later into the market than originally anticipated.

Northrop also failed to predict the fatal mix which would result from its attempting to market yet another F-5 variant (perceived by many as a dated concept), the F-20's lack of association with the Air Force, and its classification as "intermediate" by the government.

These factors were all very significant in the rejection of the F-20 internationally, but they were far more potent in an emotional than an objective sense. Nevertheless, buying fighters (as the opening quote suggested) has a very high degree of emotional content. In fact, while the F-20 was clearly similar to the F-5 series in appearance and general configuration, it was in every sense a modern fighter and was being offered at a very competitive price with unmatched performance guarantees. Its lack of association with the Air Force is perceived as a drawback because foreign customers like being able to draw on the Air Force's logistics system. In fact, the F-20 is fully supported by the Air Force system, regardless of whether the Air Force buys it for its own use. The "intermediate" classification has proven deadly, but in fact the F-20 is a much more formidable fighter than the F-5G which was the original F-X candidate. It is a match in many respects for the latest versions of the F-16 at a much lower price, and more than a match for foreign fighters in its price range.

But the customers' perception that they want something that is "good enough for the Air Force" has been impossible to shake. It stems from a variety of factors, but the principal one probably is that the U.S. has supplied its best friends with its latest fighters, and other customers want the same treatment. Some special consideration for traditional allies can be expected, but Northrop could not have anticipated that the latest versions of the F-16 would be approved for sale to the extent they have been. Paradoxically, Northrop also has to overcome opposition to the fighter on the grounds that it is American. The U.S. imposes strict restrictions on further transfers of military aircraft, and, more importantly, limits what weapons will be supplied. The U.S. typically will not transfer its best missiles to foreign customers, while its foreign competitors have no such scruples. In combat, the best missiles on a mediocre aircraft can be a better combination than mediocre missiles on the best aircraft. Many customers are well aware of these factors, and are reluctant to buy American.

Northrop's assessment of the size of the export fighter market was far too optimistic. In October 1981, it estimated a market of 3,000 fighters in the F-5G's class through the 1990s, with the F-5G selling about 1,800. In April 1983 the estimate was a total market of 2,000 to 2,500, with the F-5G selling about half. So while the estimate was coming down, it has not come down nearly far enough. For example, sales of the F-16 (which have done so much to compromise the F-20's prospects) total only slightly more than 200 outside of NATO and Israel. Sales of foreign competitors have been of similar scale, except for the Soviet programs in India, where Soviet fighters are manufactured under license. As for the future, the Defense Security Assistance Agency estimates the fighter market for the next five years at only about 200 aircraft. Northrop was not alone in its optimistic estimates of the early 1980s, and cannot be faulted for missing some of the principal reasons why the market didn't develop. Chief among these was the financial pressures experienced by many of the oil producing countries, which had been among Northrop's best customers. Other countries were in the midst of a severe recession in the early 1980s, and many still are. The result was fewer customers than had been expected. Other factors were perhaps more predictable.

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A flourishing market in rebuilt fighters has been developing for some years, which has also taken away sales. Potential customers are having their current fleets modernized or buying used aircraft to save money. Finally, many nations are buying small two-seater jets which can be used as trainers or in combat. They are not nearly as effective in combat as the F-20 or other pure fighter, but they can be used for other purposes, a compelling argument when money is tight. Northrop anticipated a bull market, but it simply hasn't worked out that way.

The Government's Policies. It was Northrop's ill luck to have had to deal with two administrations with such different philosophies of security assistance. The F-5G was a little too "hot" for the Carter administration, with its restrictive approach to arms transactions, and it took almost the entire presidential term to get permission to build the fighter. But to the Reagan administration, it didn't offer enough, even in its upgraded F-20 configuration.

Further, the F-X policy had the ironic effect of making possible the development of the F-20, but contributing strongly to making it almost impossible to sell. Even if the Reagan administration (which has been in office for all but the first year of the policy's existence) had administered it more strictly, there still would have been problems for Northrop. The Carter administration drafters, in their attempt to define an important exception to existing PD-13 policy, used language in the F-X policy that has haunted the F-20 ever since. The negative connotations of the F-20's classification as "intermediate" and the policy limitations on its capabilities will simply not go away, even though the current F-20 is far more potent than any aircraft contemplated in the policy. Whether there is a way they could have modified the policy in a responsible manner without doing permanent damage to the prospects of the F-X candidates is a moot point. In fact, the policy could only work if there were no suitable alternatives to the F-X for recipient countries. Northrop almost certainly did not intend in 1979 to build a competitor to the F-16, especially since it had to use its own money. The F-16 was far too strong a challenge: it was already in service, was successful operationally, and was already the subject of very large orders. As we have seen, however, the new administration permitted extensive marketing of the F-16, and there were also very attractive foreign options.

The problem was (and is) that the F-X policy is not compatible with the administration's Conventional Arms Transfer Policy (which governs all other conventional transfers). That Policy has a far more positive approach toward arms transfers than did President Carter's PD-13, the context for the F-X policy. The restrictive F-X policy simply doesn't fit well in the looser framework of the Reagan policy, which would tend to favor F-16 sales unless there were compelling reasons not to. The administration has predictably followed its natural tendencies as expressed in the overall Conventional Arms Transfer Policy. Unfortunately for the F-20, in so doing it has made the F-X policy -- which depends upon keeping more advanced aircraft off the market -- unworkable.

Although the administration does not put a very high priority on keeping advanced aircraft off the market, it has at the same time supported the F-X policy in other ways.

F-16 marketing and sales have always been considered exceptions to the policy, and General Dynamics has had an increased paperwork burden and associated delays as a result. The F-5G was granted a change of designation to F-20 in contravention to long-standing policy. It permitted F-5G upgrades which eventually turned it into a new airplane. DoD instructions to actively promote the F-X contenders were issued to overseas personnel. DoD representatives verify present comparative cost and performance data of "advanced" and F-X fighters to potential customers. Administration spokesmen publicly support the concept of an intermediate fighter as being more manageable for many air forces and reducing the demand for "advanced" fighters which may upset regional force balances.

However, no consideration has weighed as heavily on the administration as have the political benefits of selling the F-16. Each time it has provided an F-X exception to F-16 marketing or sale, the administration has made it that much harder to deny the F-16 to the next claimant. Now only Latin America is left as a region where General Dynamics does not already have permission to market the aircraft. Venezuela has already purchased it, and the number of other potential customers in the region with suitable political and financial characteristics is low. The administration has even decided to provide vital financial and technical support to the development of the Israeli Lavi fighter, a potential export competitor. The administration has proceeded on an ad hoc, case-by-case basis, and has behaved consistently with the Conventional Arms Transfer Policy. In so doing, it sold no F-X aircraft, and has left Northrop dependent on a U.S. government order. In the cold light of Gramm-Rudman-Hollings, that is a very slender reed. A political decision made in the Congress will decide the F-20's fate.

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1. Roy M. Braybrook, "The Military Aircraft Marketplace" (Air International, June 1976, pp. 15-21).
2. "Statement by the President on Conventional Arms Transfer Policy" (Office of the White House Press Secretary, May 19, 1977)
3. Interview with Lucy Benson, former Under Secretary of State for Security Assistance, Science and Technology, February 11, 1986.
4. Ibid.
5. Statement of Otto J. Glasser, Vice President, International, General Dynamics Corporation in a hearing before the Subcommittees on International Security and Scientific Affairs and on Asian and Pacific Affairs of the Committee on Foreign Affairs, U.S. House of Representatives, March 28, 1984.
6. White House Release, July 9, 1981 as contained in Munitions Control Newsletter No. 90, 8/81, p. 2.
7. Interview with Hans Bennendijk, former Staff Director, Senate Foreign Relations Committee, February 18, 1986.
8. Statement of Hon. James L. Buckley, Under Secretary of State for Security Assistance, Science and Technology in a hearing before the Committee on Foreign Relations, U.S. Senate, February 5, 1982.
9. Deputy Secretary of Defense Memorandum of July 29, 1982, referenced in "F-5G Tigershark in for a Testing-Time" by Charles Gilson (International Defense Review Vol. 15, No. 9/82, pp. 1281-1284).
10. Statement of Hon. William Schneider, Under Secretary of State for Security Assistance, Science and Technology in a hearing before the Subcommittees on International Security and Scientific Affairs and on Asian and Pacific Affairs of the Committee on Foreign Affairs, U.S. House of Representatives, March 18, 1984.
11. The change must have been especially difficult for the military services to stomach because the assignment of the F-20 number makes obvious the question of what the F-19 could be, as the highest fighter number before the F-20 was the F-18. Since attention has been focused on the F-19, it has been reported in the press to be a highly secret "stealth" aircraft.
12. Quoted in: Robert R. Ropelewski, "Northrop F-20 Achieving Flight Test Program Goals" (Aviation Week and Space Technology, June 11, 1984, p. 56)
13. Ibid.

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14. Ibid.
15. Quoted in: Bruce Smith, "Northrop Cutting Costs on the F-5G Line" (Aviation Week and Space Technology, July 5, 1982, p. 24)
16. Hearing Before the Subcommittees on International Security and Scientific Affairs and on Asian and Pacific Affairs of the Committee on Foreign Affairs, U.S. House of Representatives, March 18, 1984.
17. Ibid., p. 15.
18. Ibid., p. 18.
19. Ibid., p. 4.
20. Ibid., p. 40
21. Ibid., p. 11
22. U.S. Congress. House. Committee on Appropriations. Subcommittee on Defense. DoD Appropriations for 1986. Hearings, 99th Congress, 1st Session. Washington, U.S. Printing Office, 1985. Part 2: p. 335.
23. "The Impact of the USAF F-20 Proposal on Foreign Sales Prospects" (Northrop Corporation point paper, April 23, 1985)

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