

UNCLASSIFIED

093913



U. S. GENERAL ACCOUNTING OFFICE

STAFF STUDY

{ F-5E INTERNATIONAL FIGHTER AIRCRAFT }

DEPARTMENT OF THE AIR FORCE

BEST DOCUMENT AVAILABLE

FEBRUARY 1973

71-3069

093813

UNCLASSIFIED

C o n t e n t s

	<u>Page</u>
SYSTEM DESCRIPTION AND STATUS	1
COMING EVENTS	2
COST	2
CONTRACT DATA	6
PERFORMANCE	7
PROGRAM MILESTONES	9
RELATIONSHIP TO OTHER SYSTEMS	10
SELECTED ACQUISITION REPORTING	10
MATTERS FOR CONSIDERATION	11
AGENCY REVIEW	11
PICTURE OF F-5E	12

BEST DOCUMENT AVAILABLE

ABBREVIATIONS

APPRO	Air Force Plant Representative Office
DOD	Department of Defense
DODI	Department of Defense Instruction
FMS	Foreign Military Sales
MAP	Military Assistance Program
MASF	Military Assistance Service Funded
MTBF	Mean Time Between Failure
SAR	Selected Acquisition Report
SPO	System Program Office

STATUS OF MAJOR WEAPON SYSTEM
F-5E AIRCRAFT (INTERNATIONAL FIGHTER)

We reviewed the June 30, 1972 F-5E Selected Acquisition Report (SAR) for significant changes which have occurred since our previous review and to determine if it complies with the spirit and intent of Department of Defense Instruction (DODI) 7000.3 dated September 13, 1971, and DODI 7000.3, Change 1 dated April 12, 1972. Information on this program was obtained by reviewing correspondence, reports, and other records and by interviewing officials at the System Program Office (SPO), Aeronautical Systems Division, Air Force Systems Command. We evaluated management procedures and controls related to the decision-making process, but we did not make detailed analyses or audit the basic data supporting program documents. The following sections present the cost, schedule, and performance status of the F-5E program as of June 30, 1972, and other pertinent program information.

SYSTEM DESCRIPTION AND STATUS

The F-5E aircraft is a single place, fixed wing, supersonic aircraft armed with two 20mm guns and two sidewinder AIM-9 air-to-air missiles. The aircraft is to be an improved model of an existing system and is essentially an off-the-shelf procurement. It was designed for use by our allies primarily as an air superiority fighter for local air defense

BEST DOCUMENT AVAILABLE

with a secondary air-to-ground capability. The F-5E program is now in the latter stage of full-scale development with its engine officially qualified and first flight completed.

COMING EVENTS

Future program milestones are Category II Flight Test scheduled to start May 1973 and First Operational Aircraft to be delivered in September 1973. Accomplishment of the above milestones is contingent upon the operational suitability of the radar and solution of recent engine problems.

BEST DOCUMENT AVAILABLE

COST

The current estimate on the SAR at June 30, 1972, was \$297.4 million. This estimate covers only the Military Assistance Service Funded (MASF) portion of the program--83 aircraft--a major portion of which is scheduled for delivery to the Vietnamese Air Force. In compliance with DOD Instruction 7000.3, which states that if the DOD component is acting as a procurement agent for other bases, domestic or foreign, the additional quantities will be shown in a footnote, the 242 aircraft being procured for the Military Assistance Program (MAP), and Foreign Military Sales (FMS), are not included in the Program Acquisition Cost estimates on the SAR but are shown as a footnote.

SPO records show a June 30, 1972, estimate for the total 325 aircraft program to be \$705.6 million. This is an increase of \$8.3 million over the total program estimate (MASF, MAP, FMS--325 aircraft) as of June 30, 1971. These changes in development and production estimates resulted from added

munitions certifications, additional Air Traffic Control Radar Beacon Identification Friend or Foe for Mark XII system (AIMS) requirement, and other engineering and schedule changes.

The Air Force advised us that the current estimate for the MASF portion of the program as shown in the Fiscal Year 1974 President's Budget and to be reflected in the December 31, 1972, SAR is \$416.8 million. The reason for the increase of approximately \$120 million from the June 30, 1972, estimate is primarily due to the increase in MASF aircraft from 83 to 154.

Logistic Support/Additional
Procurement Cost

In a letter dated May 25, 1972, the Assistant Secretary of Defense (Comptroller) issued new reporting requirements for the Logistic Support/Additional Procurement Cost section of the SAR. The letter stated, in part, that in the interest of uniformity, and clarification and simplification of the reporting requirement, only modification and component improvement costs will be reported. The instructions also stated that the period covered by these costs will be from program inception through either the last year of the Five Year Defense Program or the last year of procurement of the basic system, whichever is later.

Our review of the F-5E program showed a decrease of \$70.9 million in reported logistic support/additional procurement costs in fiscal year 1972. This reduction in reported costs is attributed to (1) a decrease of \$25.4 million as a result of implementing the new reporting instructions issued

by OSI), and (2) a decrease of \$45.5 million primarily due to the Air Force reporting costs for only 83 aircraft at June 30, 1972. These changes in Logistic Support/Additional Procurement Costs are shown below.

<u>CURRENT ESTIMATE</u> (in millions)			
<u>Cost Category</u>	<u>June 30, 1971</u>	<u>June 30, 1972</u>	<u>Net Change</u>
Modifications	\$29.6	\$ 1.6	-\$28.0
Component Improvement	<u>20.5</u>	<u>3.0</u>	<u>- 17.5</u>
Subtotal	\$50.1	\$ 4.6	-\$45.5
Mod Spares	\$ 3.6	not reported	-\$ 3.6
Replenishment Spares	15.8	not reported	- 15.8
Common AGE	5.7	not reported	- 5.7
Common AGE Spares	<u>.3</u>	not reported	<u>- .3</u>
Subtotal	\$25.4	not reported	-\$25.4
Total	<u>\$75.5</u>	<u>\$ 4.6</u>	<u>-\$70.9</u>

The Office of the Secretary of Defense is planning to meet with the House Appropriations Committee in early 1973 regarding the Committee needs for data in the SAR as cited in their report 92-1389, dated September 11, 1972. The Committee stated that considerable improvement was needed to the additional procurement cost section, including the need for firm base-lines and the categories of costs to be reported. DOD Instruction 7000.3 will be revised to incorporate the results of this meeting.

Economic Escalation

The SPO's estimate for economic escalation in the June 30, 1972, Current Estimate is as follows:

<u>Program</u>	<u>Current Estimate of Total Cost</u>	<u>Portion of Current Estimate for Escalation</u>
	(\$ in millions)	
Research, Development, Test and Evaluation (RDT&E)	\$101.5	\$ 3.5
Production	546.5	48.6
Spares	<u>57.6</u>	<u>5.2</u>
Total	<u>\$705.6</u>	<u>\$57.3</u>

The above \$57.3 million was included in the Current Estimate to cover inflation during the development and production phase of the F-5E program. Even though the total Current Estimate is greater than reported in the June 30, 1971 SAR, the amount identified for economic escalation was reduced by \$1 million. This resulted from a refinement in calculation and acceleration of the procurement schedule.

Shown below is the allowance for price escalation in program cost estimates as of June 30, 1972.

	<u>Development Estimate Nov. 1970</u>	<u>Current Estimate June 1972</u>
	(\$ in millions)	
Total Cost Estimate	\$698.6	\$705.6
Portion of Estimate that is Escalation	\$ 59.7	\$ 57.3

The estimate includes economic price escalation for RDT&E, production, and spares. Three different sets of escalation rates which vary by fiscal

year were used by the Air Force to calculate the allowance for economic escalation. One set used for pricing purposes was developed by Northrop, the airframe contractor, and another set was developed by General Electric, the engine contractor. A third set prescribed in a DOD memorandum dated June 30, 1970, was used for Government-furnished aerospace equipment.

Funding

As of June 30, 1972, the Congress had appropriated \$173.0 million for the F-5E program, of which \$158.6 million had been obligated and \$95.7 million had been expended.

During the September 1972 Program Assessment Review, the SPO Director assessed the adequacy of the financial position of the program to be marginal because of engine and radar problems.

CONTRACT DATA

On December 8, 1970, Northrop was awarded a fixed-price incentive contract for engineering development and production of the F-5E airframe. The contract award price was \$415.6 million, if all five fiscal year options are exercised for 325 aircraft. The current contract target price had increased by \$1 million as of June 30, 1972, from definitized, and authorized but undefinitized changes. As of September 30, 1972, definitized changes had increased the contract by another \$2.023 million and at the same time, there were undefinitized change orders which will increase the contract target price by an amount not to exceed \$6.341 million, if remaining 3 options are exercised.

Northrop's management control system was validated on July 14, 1971, as meeting the objectives of DODI 7000.2, Performance Measurement for Selected Acquisitions. The Air Force Plant Representative's Office (AFPRO) monitors and evaluates the effectiveness of the system and provides a monthly report to the SPO Director. This report is a detailed analysis of cost and schedule variances reported by the contractor. Additionally, SPO personnel participate in monthly AFPRO/contractor on-site reviews of the system.

The General Electric Company was awarded a cost-plus-incentive-fee contract on March 1, 1971, for engine development. On May 20, 1971, a letter contract was executed by the Air Force to preserve the engine procurement schedule. This letter contract was definitized as a fixed-price redeterminable contract on September 17, 1971. The aggregate initial development and production contracts was \$9.086 million. As of June 30, 1972, the aggregate of these contracts was \$53.287 million resulting from quantity increase to meet schedule requirements.

General Electric's management control system was validated on May 22, 1972, as meeting the objectives of DODI 7000.2, Performance Measurement of Selected Acquisitions.

PERFORMANCE

The technical section of the June 30, 1972 SAR shows the following minor variances which occurred in performance during fiscal year 1972.

7
BEST DOCUMENT AVAILABLE

<u>Operational/Technical Characteristics</u>	<u>June 30, 1971 Current Estimate</u>	<u>June 30, 1972 Current Estimate</u>	<u>Variance</u>
<u>Operational</u>			
Design Mission Radius Counter Air (Nautical Miles)	155	145	-10
Max Mach No. @ 36,000 feet (with 2 AIM-9 missiles)	1.49	1.51	+0.02
Energy-Maneuverability Requirements (50% fuel, clean)			
a. Mach 0.6, 10,000 feet 1G ft/sec	290	302	+12
b. Mach 0.9, 10,000 feet 1G ft/sec	390	423	+33
c. Mach 0.9, 30,000 feet 1G ft/sec	220	235	+15
<u>Technical</u>			
Design, mission takeoff wt (lbs)	15,660	15,745	+85

The above operational items were redefined to reflect wind tunnel data results. The technical item pertaining to weight was redefined during the Source Selection Evaluation Board study, which resulted in a new design for the landing gear (70 pounds) and an additional item of Government Furnished Aircraft Equipment, Standby Attitude Indicator (15 pounds).

The Current Estimate for reliability is 14.03 hours Mean Time Between Failure (MTBF) compared to the system specification requirements of a

BEST DOCUMENT AVAILABLE

MTBF of 16.98 hours. The Current Estimate for maintainability is 14.2 maintenance hours per flying hour compared to the system specification requirements of 15.6 hours. The Current Estimate data for reliability and maintainability was derived from experience with the F-5 family of aircraft and data which is peculiar to the F-5E aircraft.

Two performance problems, requiring special management emphasis were discussed at the September 1972 Program Assessment Review. These were: engine compressor blade failure and a report that the F-5E radar was "not operationally suitable". The engine problem is under joint study by the SPO and the contractor. An engineering change has been implemented to correct the radar low altitude clutter problem.

PROGRAM MILESTONES

Milestone variances which occurred in 1972 were a one-month improvement (from September 1972 to August 1972) in First Flight and Category I Flight Test Start (Contractor Development Test and Evaluation) and a one-month slippage (from August 1973 to September 1973) in the First Operational Aircraft delivery date. The former resulted when Northrop's internal schedule was compressed to allow advancement of the milestone schedule while the latter resulted from expanded MASF training requirements which necessitated an allocation of six additional aircraft for use by the Tactical Fighter Training Squadron rather than being delivered to operating units.

BEST DOCUMENT AVAILABLE

RELATIONSHIP TO OTHER SYSTEMS

The F-5E has a place in the spectrum of tactical aircraft as a local air defense fighter with a secondary role in air-to-ground weapons delivery. The F-5E is a low cost aircraft with limited avionics especially designed for use by those allied nations which do not require large range/payload capability or all weather weapons delivery from a tactical fighter aircraft.

SELECTED ACQUISITION REPORTING

The first SAR was prepared on the F-5E program as of March 31, 1971, and addressed the entire MASF, MAP and FMS--325 aircraft--program. Beginning with the December 31, 1971, SAR the cost section was revised to reflect only the MASF portion of the program which is funded from Air Force appropriations, and the MAP and FMS aircraft, which are bought through other funding arrangements, were identified separately by footnotes. This change in SAR presentation is in compliance with DOD Instruction 7000.3, which states that if the DOD component is acting as a procurement agent for other bases, domestic or foreign, the additional quantities will be shown in a footnote. In addition the Air Force rationale cited for this change was to align the F-5E program cost section with that of other weapon system reports and permit more visibility for monitoring Air Force program and budget progress.

The June 30, 1972 SAR appears to comply with the spirit and intent of DOD Instruction 7000.3.

MATTERS FOR CONSIDERATION

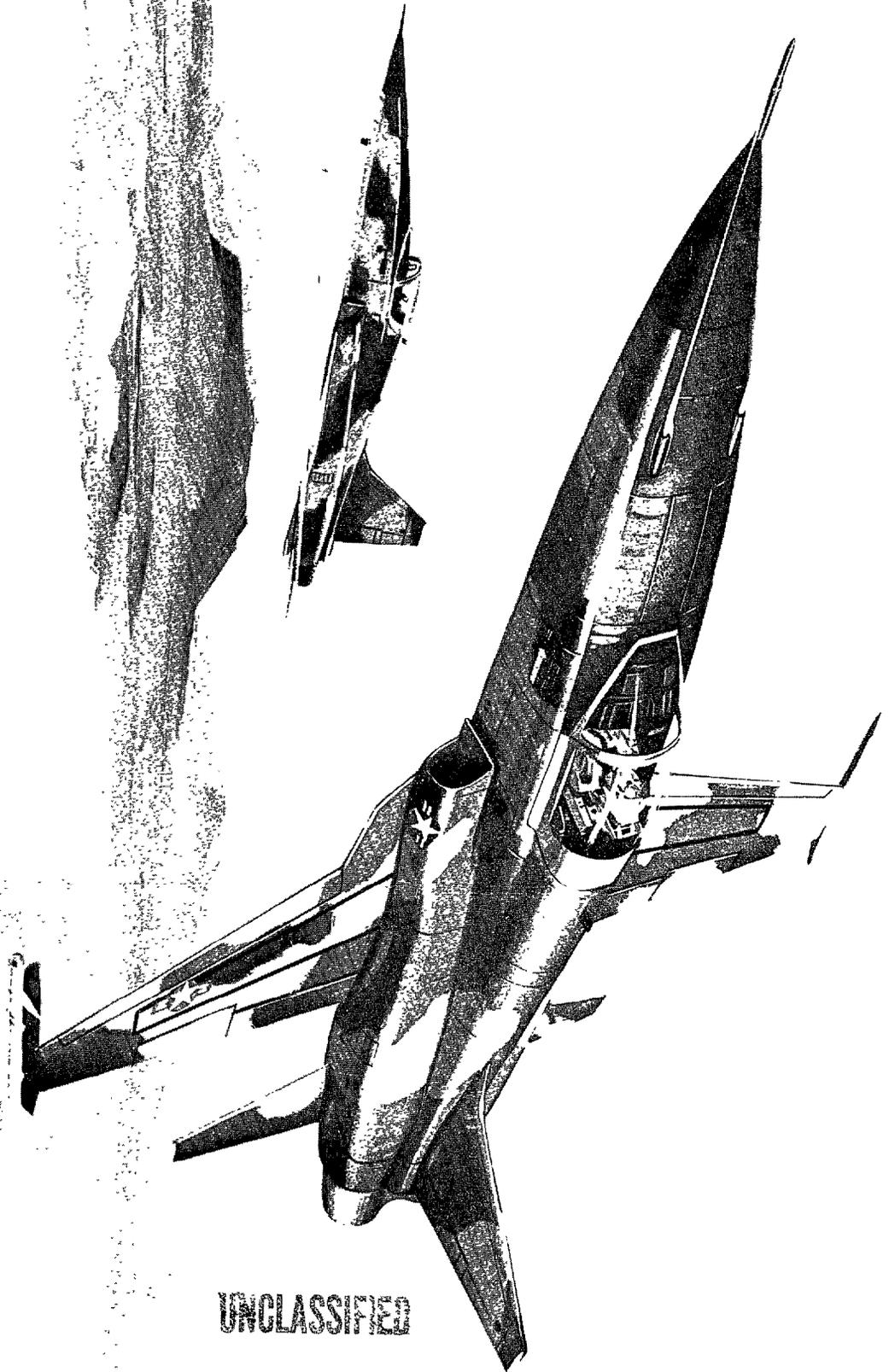
This report is being furnished to the Congress to inform them of the status of the F-5E program.

AGENCY REVIEW

A draft of this staff study was reviewed informally by selected Air Force officials associated with the management of this program and their comments are incorporated in the report as we believe appropriate. We know of no residual differences with respect to the factual material presented herein.

BEST DOCUMENT AVAILABLE

UNCLASSIFIED



UNCLASSIFIED