

# Audit

# Report



OFFICE OF THE INSPECTOR GENERAL

QUICK-REACTION REPORT ON THE ACQUISITION OF  
THE F-15 DOWNSIZED TESTER

Report No. 93-138

June 30, 1993

Department of Defense

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## **Acronyms**

**ACAT**  
**AIS**  
**CASS**  
**IFTE**  
**METS**

**Acquisition Category**  
**Avionics Intermediate Shop**  
**Consolidated Automated Support System**  
**Integrated Family of Test Equipment**  
**Mobile Electronic Test Set**



INSPECTOR GENERAL  
DEPARTMENT OF DEFENSE  
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ARLINGTON, VIRGINIA 22202

June 30, 1993

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE (ACQUISITION AND  
TECHNOLOGY)  
ASSISTANT SECRETARY OF THE AIR FORCE  
(FINANCIAL MANAGEMENT AND COMPTROLLER)

SUBJECT: Quick-Reaction Report on the Acquisition of the F-15 Downsized Tester  
(Report No. 93-138)

We are providing this final quick-reaction report for your information and use. It addresses the planned acquisition of the F-15 Downsized Tester to be used to test a portion of the electronic equipment on the F-15 aircraft at the intermediate maintenance level. Comments from the Principal Deputy Assistant Secretary of Defense (Production and Logistics) and the Deputy Assistant Secretary of the Air Force (Acquisition) were considered in preparing this final report.

Recommendations are subject to resolution in accordance with DoD Directive 7650.3 in the event of nonconcurrence or failure to comment. Therefore, you must provide final comments on the unresolved recommendations by July 15, 1993. We also ask that your comments indicate concurrence or nonconcurrence with the material internal control weaknesses highlighted in Part I. Potential monetary benefits were undeterminable.

The cooperation and courtesies extended to the audit staff are appreciated. Please contact Mr. Christian Hendricks, Program Director, at (703) 692-3414 (DSN 222-3414) or Mr. Tilghman Schraden, Project Manager, at (703) 692-3413 (DSN 222-3413), if you have any questions concerning this final quick-reaction report. Copies of the final quick-reaction report will be distributed to the activities listed in Appendix E.

A handwritten signature in cursive script, reading "Robert J. Lieberman", is positioned above the typed name.

Robert J. Lieberman  
Assistant Inspector General  
for Auditing

Office of the Inspector General, DoD

Report No. 93-138  
Project No. 3LB-5014

June 30, 1993

**ACQUISITION OF THE F-15 DOWNSIZED TESTER**

**EXECUTIVE SUMMARY**

**Introduction.** The Air Force is procuring an F-15 Downsized Tester (the Tester) to replace existing automatic test equipment for the F-15 aircraft. The Tester will be a portable automatic test equipment system for testing a portion of the electronic equipment on the F-15 aircraft at the intermediate maintenance level. The Tester will initially replace the F-15 Avionics Intermediate Shop test equipment that has been in operation since 1974. Later the Tester will replace the F-15E Mobile Electronic Test Set used on the F-15E model aircraft since 1986.

The audit was requested by the Director, Weapon Support Improvement Group, Office of the Assistant Secretary of Defense (Production and Logistics). The Air Force plans to award a contract for \$167 million for 55 units of automatic test equipment over the 6-year Future Years Defense Program (FY 1992 through FY 1997).

**Objective.** The primary objective of the audit was to evaluate Air Force's acquisition of unique test equipment to replace existing F-15 avionics test equipment.

**Audit Results.** The Air Force was planning to develop and procure unique automatic test equipment that is not cost-effective. As a result, the Air Force could spend \$167 million for automatic test equipment with capabilities limited to testing portions of the F-15 avionics systems.

**Internal Controls.** Internal controls were not effective to ensure that automatic test equipment being acquired for the F-15 aircraft was properly justified and cost-effective. The internal control weaknesses are discussed in detail in the report.

**Potential Benefits of Audit.** Undeterminable savings will be achieved through standardization of equipment and support. Appendix C summarizes the potential benefits resulting from audit.

**Summary of Recommendations.** We recommended that the Air Force discontinue its full and open competitive acquisition of the Tester. We also recommended that thorough analyses of costs and technical requirements be properly prepared and approved for standardized automatic test equipment. Additionally, we recommended that the Under Secretary of Defense (Acquisition and Technology) and the Air Force implement policies and procedures for standardizing automatic test equipment.

**Management Comments.** The Air Force nonconcurred with the recommendations to discontinue the Tester acquisition and to prepare thorough analyses of costs and technical requirements, stating that discontinuing the full and open competition would result in monetary losses, that the operational requirements document was approved

by the Air Force Vice Chief of Staff on May 11, 1993, and that a cost and operational effectiveness analysis was not required. The Principal Deputy Assistant Secretary of Defense (Production and Logistics) and the Air Force concurred with recommendations to implement policies and procedures for standardizing automatic test equipment. The Principal Deputy also advised that corrective action by the Under Secretary of Defense (Acquisition and Technology) would be more appropriate. The complete text of management comments is in Part IV of this report.

**Audit Response.** Benefits from developing and acquiring standardized automatic test equipment should exceed any monetary losses incurred by the Air Force. The operational requirements document and cost benefit analyses that the Air Force prepared were based on unsupported and incomplete information. Consequently, we believe more thorough analyses are necessary to ensure that the Air Force acquires the most cost-effective standardized automatic test equipment. Audit responses to specific Air Force comments are in Appendix B. We request that the Under Secretary of Defense (Acquisition and Technology) respond to the revised recommendation and the Assistant Secretary of the Air Force (Acquisition) provide comments on the final report by July 15, 1993.

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This report was prepared by the Logistics Support Directorate, Office of the Inspector General for Auditing, DoD. Copies of the report can be obtained from the Secondary Reports Distribution Unit, Audit Planning and Technical Support Directorate at (703) 614-6303 (DSN 224-6303).

## **Part I - Introduction**

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## Background

Maintenance and diagnostic automatic test equipment is used to support the electronic maintenance testing requirements of weapons systems at the organizational, intermediate, and depot levels of maintenance. The automatic test equipment includes test program sets (primarily computer software and hardware interfaces) used to adapt automatic test equipment systems to the individual testing requirements of specific weapon systems. The F-15 Downsized Tester (the Tester) will be a portable automatic test equipment system for testing a portion of the electronic equipment on the F-15 aircraft at the intermediate level. The Tester would initially replace the F-15 Avionics Intermediate Shop (AIS) that has been in operation since 1974. The Tester would later replace the F-15E Mobile Electronic Test Set (METS) used on the F-15E model aircraft since 1986.

In 1990, the Air Force attempted to procure a Radio Frequency METS (a larger modified model of the F-15E METS) to replace the F-15 AIS test equipment and to provide new test equipment for the Special Operations Forces' AC-130 Gunship. During the acquisition, Allied Signal, Inc., filed a protest in U.S. District Court of Delaware because the Air Force was planning a sole-source procurement with McDonnell Douglas Corporation. The U.S. District Court issued a stipulation of dismissal requiring that the Air Force notify Allied Signal, Inc., within 24 hours of a decision to acquire automatic test equipment through other than full and open competition.

In April 1992, the Air Force issued to contractors a request for cost and technical proposals for the Tester. The Air Force began its source selection process for the development of the Tester in June 1992.

During the budgetary process, the House Appropriations Committee issued Report 102-627 on June 29, 1992, directing the Secretary of the Air Force to establish procedures and programs to standardize test equipment. Ultimately, conferees from the House and Senate Appropriations Committees concluded in the House of Representatives Conference Report 102-1015, October 5, 1992, that the Air Force could not afford to develop test equipment unique to the Air Force or to weapon systems. As an interim measure to DoD-wide policy on automatic test equipment commonality, Report 102-1015 required the Military Departments to submit a cost benefit analysis comparing newly recommended systems acquisitions to the Army Integrated Family of Test Equipment (IFTE) and the Navy Consolidated Automated Support System (CASS). A description of the IFTE and CASS programs is in Appendix A. The restrictions were applicable to all weapons systems being developed or modified, except for the Tester contract, which was to be awarded in the near future.

The Principal Deputy Assistant Secretary of Defense (Production and Logistics) sent a memorandum to the Assistant Secretary of the Air Force (Acquisition) on January 26, 1993, stating, "The Air Force should redirect the DST [F-15 Downsized Tester] acquisition to use the IFTE or another inventory DoD

standard ATE [automatic test equipment-Navy's CASS], or revise its acquisition approach to address known and projected DoD-wide requirements for a downsized tester." The Principal Deputy did not endorse the acquisition of the Tester because the acquisition did not comply with standardization policy for automatic test equipment. The Principal Deputy stated that the Air Force initiated the acquisition without a current analysis of the existing standard automatic test equipment, without a review of other upcoming "downsized" test requirements, and without an approved operational requirements document.

In response to the Principal Deputy's January 26, 1993, memorandum, the Deputy Assistant Secretary of the Air Force (Acquisition) issued a memorandum on February 12, 1993, that provided a history of the Tester acquisition program with analyses to show that Air Force could not justify the redirection of the acquisition. The memorandum concluded by stating, "Unless specifically directed to the contrary by the DoD Acquisition Executive, it is our intent to proceed with our acquisition strategy to acquire the F-15 DST [F-15 Downsized Tester] through full and open competition."

The Deputy Assistant Inspector General for Auditing, Office of the Inspector General, DoD, sent a memorandum on March 22, 1993, to the Assistant Secretary of the Air Force (Financial Management and Comptroller) requesting that the Air Force suspend the source selection for a Government contractor to develop the Tester until after the audit of the Tester was completed, reviewed by the Air Force, and any disagreements with our conclusions were resolved. Preliminary results indicated that the Air Force issued the solicitation to Government contractors without adequate justification or approval of the requirement specifications for the Tester by the Air Force Air Combat Command and without adequate evaluations of existing DoD families of standard automatic test equipment.

In response to the March 22, 1993, Deputy Assistant Inspector General for Auditing memorandum, the Deputy Assistant Secretary of the Air Force (Acquisition) stated on April 5, 1993, that the Air Force did not agree with suspending the source selection until the completion of the audit. The Deputy Assistant Secretary stated that although the draft operational requirements document was not approved by the Air Force Chief of Staff, the Air Force Air Combat Command agreed with the requirement for the Tester. Additionally, the Deputy Assistant Secretary stated that the Air Force adequately evaluated the DoD families of standard automatic test equipment. However, the Air Force did agree to delay the award of the contract for the Tester until after the audit analysis was completed and the Air Force had reviewed the final report.

## Objectives

The primary objective of the audit was to evaluate the Air Force's acquisition of unique test equipment to replace existing F-15 avionics test equipment. Specifically, we determined if the Air Force complied with DoD policies and procedures for acquiring automatic test equipment, and if the Air Force justified

## **Introduction**

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the acquisition of the F-15 Downsized Tester by fully documenting requirements and evaluating alternative test equipment in the Army and Navy. Additionally, we evaluated the effectiveness of the applicable internal controls.

## **Scope of Audit**

We evaluated requirements documents, contractual records, cost benefit analyses, system studies, and other program documentation covering the period from June 1988 through March 1993 that pertained to the acquisition of the Tester. Additionally, we evaluated the Air Force's compliance with DoD general policies and procedures for standardizing automatic test equipment. We also reviewed the adequacy of program budgeting for the proposed Tester.

We discussed the reasonableness of the acquisition strategy for the Tester with senior management officials in the Office of the Assistant Secretary of Defense (Production and Logistics); the Office of the Assistant Secretary of the Air Force (Acquisition); the Air Force Commander, San Antonio Air Logistics Center; and the Air Force Program Manager and Procurement Contracting Officer for the Tester. This economy and efficiency audit was made from February through May 1993, in accordance with auditing standards issued by the Comptroller General of the United States, as implemented by the Inspector General, DoD, and accordingly included such tests of internal controls as were considered necessary. Organizations visited or contacted during the audit are listed in Appendix D.

## **Internal Controls**

The audit identified material internal control weaknesses as defined by Public Law 97-255, Office of Management and Budget Circular A-123, and DoD Directive 5010.38. Controls were not effective to ensure that automatic test equipment being acquired for the F-15 aircraft was properly justified and cost-effective. Internal control weaknesses are discussed in detail in the Finding and controls assessed are discussed in Part I. Recommendations 1. and 2., if implemented, will assist in correcting the weaknesses. Undeterminable savings will be achieved through standardization of equipment and support from implementing the recommendations. A copy of this final report will be provided to the internal control officers within the Office of the Secretary of Defense (OSD) and the Air Force.

## Prior Audits

We issued two audit reports in 1992 addressing deficiencies in OSD and Air Force policies and procedures on standardizing automatic test equipment. Inspector General (IG), DoD, Report No. 92-037, "Effectiveness of the Air Force's Internal Controls over the Development and Acquisition of Maintenance and Diagnostic Systems," January 23, 1992, stated that Air Force commands were not complying with Air Force guidance for acquiring standardized automatic test equipment. We recommended that the Air Force approve developments of new automatic test equipment only when it can be demonstrated that it would not be cost-effective to acquire the standard automatic test equipment developed under the Army's IFTE and the Navy's CASS programs. The Air Force did not specifically address the recommendation in its comments to the audit report. In a June 17, 1992, memorandum to the Deputy Assistant Inspector General (Inspection, General Accounting Office, and Audit Followup), the Assistant Secretary of the Air Force agreed that the Air Force would promulgate policy requiring that selection of automated test equipment would be based on a cost benefit analysis of equipment or system alternatives (including software) available in the DoD inventory.

IG, DoD, Report No. 92-095, "Acquisition and Management of Maintenance and Diagnostic Automatic Test Equipment," May 21, 1992, reported that management deficiencies by the Military Departments and the lack of uniform and comprehensive DoD-wide policy and guidance contributed to the continued proliferation of maintenance and diagnostic automatic test equipment and seriously affected the cost-effectiveness of acquisitions. We recommended that comprehensive and uniform DoD-wide policy and guidance on the acquisition and management of maintenance and diagnostic automatic test equipment be developed and implemented. The Assistant Secretary of Defense (Production and Logistics) agreed in principle with our recommendation and performed a DoD-wide automatic test systems investment strategy study that was presented to Congress on May 20, 1993. The study will provide a basis for DoD automatic test systems policy guidelines and assignment of management responsibilities.

## Other Matters of Interest

During our discussions with the Air Force management officials, the Air Force raised concerns about congressional, legal, and cost implications caused by any changes in the acquisition strategy for the Tester. The Air Force's concerns are unwarranted.

The Air Force asserted that Congress made clear its intention in House Conference Report 102-1015 that the Tester program was to proceed in accordance with the Air Force's competitive acquisition strategy. Although

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the House Conference Report excused the Air Force from submitting a cost benefit analysis for the Tester to the congressional defense committees, we believe the Report did not preclude the Air Force from preparing a cost benefit analysis for the Secretary of Defense.

In House Conference Report 102-1015, the conferees concluded that the Air Force could not afford to develop test equipment unique to the Military Departments or weapon systems. As an interim measure to DoD-wide policy on automatic test equipment commonality, the House Conference Report required the Military Departments to submit a cost benefit analysis comparing newly recommended systems acquisitions to the Army's IFTE and the Navy's CASS. The House Conference Report states that restrictions are applicable to all weapons systems being developed or modified, except the Tester. Taken in context, the congressional language does not appear to restrict the Secretary of Defense's authority to redirect the program if defense acquisition management policies and procedures were not followed.

In its February 12, 1993, response to the Principal Deputy Assistant Secretary of Defense (Production and Logistics), the Air Force stated that purchasing the Army's IFTE would reverse the Air Force's present acquisition strategy for full and open competition. Through our discussions with Air Force officials in the contracting, competition advocate, and general counsel offices, we were unable to determine any obstacle to purchasing the Army test equipment if thorough analysis justified such a decision to proceed with other than full and open competition.

First, the request for proposal in the full and open competition for the Tester was not based on acquiring standardized automatic test equipment, but was prepared for the unique testing requirements of some of the avionics subsystems on the F-15 aircraft. Requirements and contract specifications for standardized automatic test equipment would be broader in scope and include additional Air Force avionics subsystems and other aircraft, as well as the potential for other DoD weapon systems. As a result of identifying additional requirements, the basis for determining full and open competition would be different. Therefore, sole-source procurement of the Army and Navy's test equipment could be justifiable partially on the basis that theirs is the only standardized test systems in production in the current DoD inventory.

Second, the Army is planning to have a full and open competition for the follow-on purchase of the IFTE after FY 1995. If sole sourcing presents a significant obstacle, the Air Force could delay its acquisition until FY 1996. During the interim period, the Air Force could continue to use existing equipment and complete thorough cost and requirements analyses and provide new contract specifications for the Army's follow-on purchase.

Finally, awarding a sole-source contract in light of the U.S. District Court of Delaware stipulation for dismissal does have a precedent. Although the Air Force's acquisition of a downsized tester for the AC-130 Gunship was affected by the Delaware Court ruling, the Special Operations Forces later processed a justification and approval for a sole-source procurement of new automatic test

equipment for the AC-130 Gunship. When Allied Signal, Inc., filed another protest, the General Accounting Office ruled in favor of the Air Force and the Special Operations Forces.

Air Force officials stated that the procurement process for the Tester needed to be accelerated to avoid undue schedule slippage and costs for acquiring new test equipment. The Air Force program management office contracted with ARINC Research Corporation to prepare a study, "F-15 AIS Supportability Study," that compared the cost of buying new automatic test equipment to the cost of upgrading and modifying the F-15 AIS test equipment. According to the ARINC study, over 91 percent of the \$458 million needed for the F-15 AIS tester was for modernizing, upgrading, and purchasing repair parts for the test equipment and F-15 aircraft through the year 2010. After discussions with ARINC and the San Antonio Program Management Office representatives, we concluded that prior to the discontinuance of the upgrade the Air Force had already bought the repair parts for the test equipment. We also concluded that the annual cost for repairing the test equipment is about \$75,000. If the purchase of new test equipment was delayed for 2 years (the amount of time estimated by the Air Force to perform sufficient analyses and prepare contract specifications, if necessary), it would cost the Air Force \$150,000 to repair existing automatic test equipment. The Tester action officer at the Air Force Air Combat Command stated that Bendix Corporation was committed to supporting the F-15 AIS equipment as long as necessary.

If the Air Force does not defer the replacement of the F-15 AIS tester, it would not get the full utility of the investment made for modernizing the primary test equipment and upgrading the test stations, including the cost for repair parts that were stocked. Although the Air Force made an investment in the F-15 AIS tester by modernizing, upgrading, and purchasing repair parts that extended the usefulness of the computer test sets through the year 2010, the Air Force did not consider this investment during the preparation of the contract specifications for the Tester. As a result, the Tester may be replacing more components of the F-15 AIS tester than is necessary.

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## **Part II - Finding and Recommendations**

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## **Acquisition of F-15 Downsized Tester**

The Air Force was planning to develop and procure unique automatic test equipment that is not cost-effective. The condition occurred because the Air Force did not comply with defense acquisition management guidance and perform sufficient cost, technical, and requirements analyses to determine if standard DoD families of test equipment or other automatic test equipment could satisfy Air Force and other DoD test equipment requirements. Additionally, OSD and the Air Force had not developed and implemented effective policy and guidance on standardized automatic test equipment. As a result, the Air Force could spend \$167 million for 55 units of the F-15 Downsized Tester over the 6-year Future Years Defense Program (FY 1992 through FY 1997) with capabilities limited to testing portions of the F-15 avionics systems.

### **Background**

The Air Force initiated the acquisition of unique automatic test equipment for the F-15 aircraft in 1990 that would test portions of the aircraft's avionics systems. Standard automatic test equipment, such as the Army's IFTE and the Navy's CASS, were entering the DoD inventory during this same period. The standard automatic test equipment programs are more cost-effective because they have capabilities for testing multiple electronic or avionics systems and can be used to support several weapons systems. The Air Force pursued the acquisition of the Tester without thoroughly evaluating the Army's IFTE and the Navy's CASS as potentially more cost-effective alternatives. We attributed the Air Force's inadequate evaluations to noncompliance with defense acquisition management guidance and the lack of OSD and Air Force standardization policy.

### **Defense Acquisition Management**

The Air Force did not comply with defense acquisition management policies and procedures for the acquisition of the Tester. DoD Directive 5000.1, "Defense Acquisition," and DoD Instruction 5000.2, "Defense Acquisition Management Policies and Procedures," both dated February 23, 1991, established a disciplined management approach for acquiring major and nonmajor systems and materiel that satisfy the operational users' needs. The guidance identifies core activities that must be accomplished for every acquisition program, such as a documented operational requirement and a cost and operational effectiveness analysis. One management principle in the guidance is that a full range of alternatives must be considered before deciding to initiate a new acquisition program. The preferred or first alternative, in an order of precedence, is that a DoD Component use or modify an existing U.S. military system to satisfy an

operational requirement. Although the Army's IFTE or the Navy's CASS were viable alternatives, the Air Force did not evaluate the Army or Navy's programs before initiating the acquisition of the Tester in April 1992.

**Analysis of Army and Navy's Automatic Test Equipment.** The Air Force did not implement recommendations in Report No. 92-037 to approve developments of new automatic test equipment only when it could be demonstrated that it would not be cost-effective to acquire the standard automatic test equipment developed under the Army's IFTE and the Navy's CASS. In June 1992, 5 months after our final report was issued, the Air Force agreed that it would promulgate policy requiring that selection of automated test equipment would be based on a cost benefit analysis of equipment or system alternatives (including software) available in the DoD inventory. However, before the June 1992 agreement, the Air Force disregarded our recommendation and in April 1992 it issued a request for technical and cost proposals for the Tester without evaluating the Army or Navy's systems. In July 1992, the Air Force initiated a review of the Army and Navy's systems only after the House Appropriations Committee directed the Secretary of the Air Force to establish procedures and programs to standardize test equipment for Air Force systems.

**Air Force Review of Automatic Test Equipment.** The Air Force's review of automatic test equipment was conducted in two phases. Phase 1 was to survey all Air Force programs to identify current or evolving automatic test equipment requirements at the intermediate, depot, and factory levels of maintenance and to determine the status of automatic test equipment efforts. Phase 2 was to be a detailed cost and technical assessment of appropriate Air Force programs identified in Phase 1 compared to the Army's IFTE and the Navy's CASS. The Air Force accelerated the Phase 2 cost assessment for the Tester and included preliminary results of the assessment in the Phase 1 report. The Air Force issued a final report for Phase 1 on September 11, 1992, and a final report on Phase 2 on March 31, 1993. The final report on Phase 1 did not adequately address the cost and technical comparisons needed to assess standardization of automatic test equipment for the Tester.

**Cost Assessment.** The Air Force cost assessments for the Tester cannot be relied upon for significant acquisition decisions because the assessments were incomplete and were not properly prepared and validated. Two cost assessments that the Air Force completed, the ARINC Research Corporation cost study and the cost assessment reported in the Phase 1 final report, did not satisfy the requirement for a cost and operational effectiveness analysis.

DoD Instruction 5000.2 states that a cost and operational effectiveness analysis should be prepared early in the acquisition process for systems acquisitions and approved by the Air Force Acquisition Executive. The cost and operational effectiveness analysis is intended to illuminate the advantages and disadvantages of alternative systems being considered for acquisition and the sensitivity of each alternative to possible changes in assumptions or variables such as selected performance capabilities. A cost and operational effectiveness analysis will

## Acquisition of F-15 Downsized Tester

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draw on several subanalyses, including analyses of mission needs, the threat and U.S. capabilities, the interrelationship of systems, the contribution of multi-role systems, measures of effectiveness, costs, and cost-effectiveness comparisons.

Instead of a cost and operational effectiveness analysis, the Air Force program office at the San Antonio Air Logistics Center initially contracted with ARINC Research Corporation for a study that identified cost savings that would be realized from purchasing new automatic test equipment versus extending the life of the F-15 AIS tester. The ARINC cost study was completed in June 1991 and was the only cost study initially used to justify the acquisition of the Tester.

After receiving the congressional direction and after starting the source selection process in its full and open competition, the Air Force accelerated its Phase 2 analysis of the Tester and included a cost assessment of the Tester in its Phase 1 survey of automatic test equipment. The Air Force Aeronautical Systems Center at Wright-Patterson Air Force Base, Ohio, completed a cost assessment on September 11, 1992. The assessment consisted of composite estimates of contractor proposals for the Tester compared to estimated costs for Army's IFTE and Navy's CASS. It also included technical data on the performance of the Army IFTE and Navy CASS compared to the performance requirements in the draft operational requirements document for the Tester. Air Force officials stated that the assessment relied on cost and technical data solicited from the Army IFTE and Navy CASS program offices as well as the Air Force program office for the Tester. However, the Air Force officials were unable to provide adequate evidence to show that the Army and Navy program offices verified the cost and technical data used in the Air Force's cost assessment. Additionally, officials at the Air Force Materiel Command did not approve the cost assessment as prescribed by Air Force Logistics Command Supplement 1 to Air Force Regulation 173-1, "The Air Force Cost Analysis Program," June 15, 1989. Although the Aeronautical Systems Center had not completed the process of updating and approving the cost assessment for the Tester, the San Antonio program office was concurrently evaluating the best and final offers from contractors in its full and open competition for the Tester. The Air Force's actions imply that the Air Force had little or no intention of changing its acquisition strategy regardless of the outcome of the cost assessment of the Tester compared to the Army and Navy's test equipment.

The Air Force's cost study and cost assessment were not adequate substitutes for the cost and operational effectiveness analysis required by defense acquisition management guidance and Air Force implementing guidance, Air Force Regulation 57-1, "Air Force Mission Needs and Operational Requirements Process," August 1, 1992. The cost study and cost assessment were inadequate because they did not include evaluations of cost, performance, and schedule tradeoffs for differences in the alternative Army and Navy standardized automatic test equipment, as required by DoD guidance. For example, the Air Force's technical assessment, discussed later in this report, showed variances in performance characteristics for the Army's IFTE. Although the variances were the bases for disqualifying the Army test equipment as a viable alternative, the Air Force did not evaluate tradeoffs that could be made in the cost, performance, or schedule of the test equipment and the ultimate impact, if any, on the mission success of the F-15 aircraft as a result of the variances.

The Air Force's cost assessment and comparison of the Army's IFTE and the Navy's CASS also did not evaluate the benefits resulting from standardizing test equipment. The essence of standardizing, as in the Army and Navy's automated test systems, is that cost benefits are derived from having one piece of test equipment to test electronic subsystems, modules, or components from several different avionics subsystems, such as electronic warfare, communications, and radar equipment, from several different weapon systems, such as F-15, F-16, and F-111 aircraft in a composite Air Force wing. Cost savings accrue from having to purchase and provide maintenance support for only one test system instead of several different test systems. A draft OSD investment strategy report on automatic test systems stated that an average cost savings of 25 to 35 percent could result from reductions in development costs, economies of scale, and workload efficiencies through standardization of equipment. The Tester that the Air Force is competing among several contractors will have projected life cycle costs of \$269 million and will test only some subsystems, electronic modules, and components from the F-15 aircraft. The Army and Navy test systems can be modified to test electronic modules from several avionics subsystems and several different aircraft to include the F-15 aircraft.

The Air Force's cost assessment did not adequately compare and evaluate the operating and support costs of the alternative Army and Navy standard automatic test equipment. Results from OSD's yearlong investment strategy study, which was provided to Congress on May 20, 1993, support our conclusion that the Air Force had insufficient cost data to compare and evaluate the Tester with the Army and Navy's systems. The OSD study concluded that costs of automatic test equipment gathered and maintained by the Military Departments consisted primarily of hardware development and procurement costs. According to the OSD study, there were insufficient data available in the Military Departments to assess operating and support costs including software, which can be a dominant cost factor. Insufficient operating and support costs data are evident in the Air Force Aeronautical Systems Center's cost assessment because the development, production, operating, and support costs for the test program sets were shown as the same for each system. Without complete data, Air Force system developers cannot compare and evaluate life cycle costs for each alternative automatic test equipment.

**Technical Assessment.** The Air Force performed insufficient analyses of performance data and requirements for new automatic test equipment to support its technical assessment. The Air Force program management office at San Antonio, Texas, completed a technical assessment on December 22, 1992, that compared the technical parameters of the Army's IFTE with the technical requirements for the Tester. Based on the December 22, 1992, technical assessment, the Air Force concluded that the Army's IFTE could not satisfy the performance and deployment requirements for testing electronic equipment on the F-15 aircraft. Specifically, the Army test equipment's mean time between failure in hours was too low, the Army's test equipment could not be carried on two pallets and setup by four maintenance technicians, and the Army's test equipment had technical operating deficiencies, such as the inability to detect faults in electronic modules within specified parameters.

## Acquisition of F-15 Downsized Tester

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The Air Force did not perform sufficient analyses to support the mean time between failure technical requirements in the draft operational requirements document for the Tester. The draft operational requirements document stated that the new test equipment was required to have a mean time between failure of 1,000 hours. Officials at the Air Force Air Combat Command coordinating the draft operational requirements document could not provide any documentation or other analyses to show the need for the specific performance criterion, as required by Air Force Pamphlet 57-1. Operations personnel indicated that performance data on the mean time between failure were not being collected and analyzed because the data collecting capability for the maintenance of test equipment was unreliable. Therefore, the performance of existing and future test equipment could not be measured and evaluated accurately.

The 1,000-hour mean time between failure criterion had doubled over the criterion cited in a previous requirements document approved in 1988, which was referred to in the draft operational requirements document as the source document. Officials at the Air Force Air Combat Command did not have an audit trail between the two documents, as required by Air Force Pamphlet 57-1, and could not explain why the mean time between failure for the new test equipment increased from 500 hours in 1988 to 1,000 hours in 1993. The Air Force disqualified the Army's IFTE in its December 22, 1992, technical assessment on the technical basis that the Army's test equipment could not meet the 1,000-hour mean time between failure requirement for the test equipment. However, the mean time between failure performance specification for the Army test equipment of 590 hours would have met the 1988 Air Force performance requirement of 500 hours.

We noted similar discrepancies in the Air Force's analyses supporting other performance requirements in its draft operational requirements document; including the need for two pallet transportability, four-man setup and operation, 95-percent system availability, and requirements to isolate faults in shop repairable electronic units ranging from 95 to 100 percent. According to Air Force Pamphlet 57-1, the operational requirements document should contain a requirements correlation matrix that cites system operational characteristics and capabilities that are realistic, meaningful, and germane to the mission need. Values for each threshold and objective must be described based on their relationship to mission success and how the initial values were selected. The Army program manager for the IFTE implied that the Air Force systems' parameters were unrealistic, in his conclusion; and that the Air Force system mean time between failure was significantly higher than the mean time between failure experienced for similar test equipment in the Army. Additionally, the Air Force Air Combat Command could not provide data analyses showing how the values or parameters were selected, the cost effect of the increased values, and their relationship to mission success.

Regarding technical values and parameters, the Air Force had inconsistencies in its evaluations of cost and technical data as performed by personnel at the San Antonio Air Logistics Center and the Aeronautical Systems Center. For example, the program manager at San Antonio found that the 70-percent system availability and 98-percent fault detection parameters for the Army's IFTE were unacceptable in comparison to the respective 95 and 100 percent parameters

specified in the draft operational requirements document. However, personnel at the Aeronautical Systems Center performing the cost and technical analyses reported that the Army test equipment performance criteria were acceptable. Without adequate data analysis, a complete audit trail for the Air Force's performance requirements in its draft operational requirements document, and with inconsistent evaluations of technical parameters, the Air Force's disqualification of the Army test equipment on a technical basis was unjustified.

**Operational Requirements Document Approval.** The Air Force had no official basis for establishing the technical criteria for evaluating alternatives to the Tester or for preparing contract specifications for a full and open competition. Defense acquisition management guidance states that the operational user prepares an operational requirements document to provide a basis for system-specific performance requirements written in the contract specifications. The Air Force began processing its draft operational requirements document for the Tester in October 1991. The program manager for the Tester developed and issued a draft request for proposal to Government contractors in January 1992 and issued a final request for proposal in April 1992. Although the Air Force had not coordinated the draft operational requirements document for final approval until a year later on March 31, 1993, it had planned to award a contract for the development and procurement of the Testers as early as March 1, 1993. The developing, processing, and approving of an operational requirements document is out of sequence with sound acquisition management procedures. The operational requirements document should have been prepared and approved before request for proposals were issued in January 1992.

## Policy on Standardized Automatic Test Equipment

Neither OSD nor the Air Force had developed and implemented effective policy and guidance on the standardization of automatic test equipment. The Assistant Secretary of Defense (Production and Logistics) chartered a study on February 7, 1992, to develop a DoD investment strategy for automatic test equipment. A study team of OSD and Military Department officials conducted an extensive review from February through August 1992 of automatic test equipment acquisition costs, policies, processes, organizations, and technical needs and capabilities. Although completed in August 1992, OSD had not officially finalized the results of the study.

In the October 5, 1992, House Conference Report 102-1015, Congress directed the Secretary of Defense to develop a DoD-wide policy requiring automatic test equipment commonality in standards among the Military Departments along with an oversight system to ensure compliance. As of June 1, 1993, OSD had not issued specific, comprehensive policy on the acquisition and oversight of automatic test equipment in DoD. OSD did include general guidance in the revised DoD Directive 4151.18, "Maintenance of Military Materiel,"

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August 12, 1992, that test measurement and diagnostic equipment, including automatic test systems and their associated software programs, shall be standardized among DoD Components.

Congress also directed the Secretary of Defense to ensure that the Air Force establish a Secretarial mandate and control procedures for standardized test equipment. As of June 1, 1993, the Air Force had no specific, comprehensive policy on the acquisition of automatic test equipment. However, the Air Force was establishing an organization at the San Antonio Air Logistics Center to establish policies and procedures on standardized automatic test equipment.

In summary, the Air Force did not have the organization, guidance, and data bases necessary to evaluate and monitor the acquisition of automatic test equipment to ensure that equipment would satisfy multiple requirements of electronic subsystems and weapon systems. The acquisition of the Tester evolved in the absence of adequate OSD and Air Force policy and guidance on standardized automatic test equipment.

## Summary

The primary concern of the Director, Weapon Support Improvement Group, is that the Air Force is not developing a family of standardized automatic test equipment, or using existing families in DoD, that meet multiple weapon system and cross Military Department test requirements. We agree with the intent of the Principal Deputy Assistant Secretary of Defense (Production and Logistics) to standardize automatic test equipment in DoD when he advised the Air Force to redirect its acquisition of the Tester. The Principal Deputy had legitimate concerns about the requirements and the cost benefits of the Tester because the Air Force did not comply with procedures and practices for ensuring the cost-effective acquisition of automatic test equipment. Additionally, the Air Force's uncertainties concerning the effects of congressional, legal, cost, schedule, and policy issues, as discussed in Other Matters of Interest, do not preclude the Air Force from deferring the acquisition of the Tester pending sufficient cost, technical, and requirements analyses. Therefore, the Air Force could avoid spending \$167 million for unique automatic test equipment for the F-15 aircraft by redirecting its acquisition strategy to procure standardized automatic test equipment.

## Recommendations, Management Comments, and Audit Response

1. We recommend that the Under Secretary of Defense (Acquisition and Technology) develop and implement uniform and comprehensive DoD-wide policy and guidance on the acquisition and management of standardized automatic test equipment.

**Management Comments.** The Principal Deputy Assistant Secretary of Defense (Production and Logistics) concurred with Recommendation 1., stating that draft DoD automatic test systems acquisition policy and guidance was being prepared and coordinated with the Services. The Principal Deputy Assistant Secretary also stated that the corrective action would be more appropriate for the Under Secretary of Defense (Acquisition).

**Audit Response.** We revised Recommendation 1. by addressing the recommendation to the Under Secretary of Defense (Acquisition and Technology). We request that the Under Secretary comment on the revised Recommendation 1. in responding to the final report. The comments should include an estimated completion date for implementing DoD-wide policy and guidance.

2. We recommend that the Assistant Secretary of the Air Force (Acquisition):

a. Discontinue the full and open competition acquisition of the F-15 Downsized Tester.

**Management Comments.** The Deputy Assistant Secretary of the Air Force (Acquisition) nonconcurred with Recommendation 2.a., and the potential monetary benefits associated with the recommendation, stating that discontinuing the full and open competition of the Tester would result in monetary losses. The monetary losses would include costs for the maintenance and repair of the F-15 AIS tester and increased market prices for a replacement tester, or increased costs for the Army's IFTE and costs to reimburse contractors for preparing their bids on the Tester if a contract is not awarded.

Regarding the potential monetary benefits, the Deputy Assistant Secretary stated that the 2-year delay in the acquisition of the Tester could cost the Air Force over \$245 million in continued support of the aging F-15 AIS tester and the eventual acquisition of a replacement test system at FY 1996 and FY 1997 market prices. Potential lawsuits by the Tester bidders could result in additional monetary losses. Procurement of the IFTE would cost the Air Force approximately \$215 million, as opposed to the \$167 million for the Tester. The complete text of the Air Force comments are included in Part IV. Air Force comments to the finding and our response to those comments are in Appendix B.

**Audit Response.** The potential monetary losses that the Air Force cited from discontinuing the acquisition of the Tester are a product of the Air Force's improper planning and imprudent management decisions. Had the Air Force followed defense acquisition management guidance it could have avoided delays in the acquisition, and the delays' associated costs, by performing adequate cost, technical, and requirements analyses before the Air Force issued the requests for proposals to Government contractors. We believe the Air Force could have exercised better management judgment when the Principal Assistant Secretary of Defense (Production and Logistics) requested the Air Force to redirect its acquisition strategy. After the Principal Deputy Secretary's request and after we began our requested audit, the Air Force released its request for best and final offers from the Government contractors, although there was no apparent

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urgency and management differences on the acquisition strategy were unresolved. With this action, the Air Force not only increased the prospective costs to Government contractors for preparing potentially unnecessary bids but the risks for liability to the Government to pay the costs were also increased. If the Air Force should incur some monetary losses by redirecting its acquisition strategy, we believe benefits from developing and acquiring standardized automatic test equipment would still exceed any monetary losses incurred because of the Air Force's improper planning. Therefore, we request that the Assistant Secretary of the Air Force (Acquisition) reconsider its position in response to the final report.

Concerning the potential monetary benefits, the Air Force did not provide documentation to support its claim that \$245 million was needed for the maintenance of the F-15 AIS tester for 2 years and the cost of its replacement. The only analysis the Air Force provided to us was the ARINC Research Corporation study, which showed that the maintenance and repair costs for the F-15 AIS would be \$150,000 for 2 years. We continue to believe that the Air Force needs to perform new analyses for acquisition of standardized automatic test equipment that includes the complete F-15 AIS, additional requirements for other aircraft beyond the F-15, and potential test capabilities for other DoD weapon systems. Until new analyses are prepared and properly approved, the \$167 million programmed for a new Tester is unjustified and should not be spent on the current acquisition. We have modified the report to indicate that net potential monetary benefits are currently undeterminable. We request that the Assistant Secretary of the Air Force (Acquisition) reconsider its position on the estimated monetary benefits in the response to the final report.

b. Prepare a revised operational requirements document prescribed by Air Force Pamphlet 57-1 that is based on a thorough and supportable analysis of realistic and cost-effective user performance requirements. The operational requirements document should be expanded in scope to include performance requirements for standardized automatic test equipment. It should also be approved by the Air Force Chief of Staff.

**Management Comments.** The Deputy Assistant Secretary of the Air Force (Acquisition) nonconcurred with Recommendation 2.b., stating that the operational requirements document for the Tester was approved by the Air Force Chief of Staff on May 11, 1993. The Deputy Assistant Secretary also stated that the need for replacing the F-15 AIS tester was identified years ago and support for the F-15 weapon system cannot be delayed indefinitely while requirements are continually reevaluated.

**Audit Response.** Although the operational requirements document was approved, we were not provided a copy of the approved document and all supporting analyses for our review. Therefore, we continue to believe that the requirements (such as the 1,000 hour mean time between failure requirement) cited in the document were not adequately justified with complete and thorough analyses that should have been done when the need to replace the F-15 AIS tester was first identified. We also believe that, in this case, a delay is appropriate for identifying realistic requirements to avoid purchasing expensive automatic test equipment with limited testing capabilities. The Air Force should

evaluate additional automatic test equipment requirements for other weapon systems in its inventory and develop new performance criteria for acquiring standardized automatic test equipment such as the Army's IFTE or Navy's CASS. We request that the Assistant Secretary of the Air Force (Acquisition) reconsider its position in response to the final report.

c. Prepare a cost and operational effectiveness analysis that compares the Army's Integrated Family of Test Equipment and the Navy's Consolidated Automated Support System to the new requirements developed for standardized automatic test equipment. The cost and operational effectiveness should also include an evaluation of the improvements that have been made to existing automatic test equipment in determining the incremental need for new test equipment and test program sets.

**Management Comments.** The Deputy Assistant Secretary of the Air Force (Acquisition) nonconcurred with Recommendation 2.c., stating that a cost and operational effectiveness analysis is required for acquisition category (ACAT) I programs only and that authority for the designation of ACAT II, III, and IV programs is delegated to the Service Acquisition Executive. The Air Force decided that it would not be cost-effective to accomplish a full cost and operational effectiveness analysis for this program when several cost analyses have already been accomplished.

**Audit Response.** Although the cost and operational effectiveness analysis is mandatory only for ACAT I programs, the underlying principles and analytical concepts are to be tailored and implemented in support of ACAT II, III, and IV programs. As stated in DoD Instruction 5000.2, the cost and operational effectiveness analysis is one of the required core activities that must be accomplished for every acquisition. The Air Force did not tailor and implement the principles of a cost and operational effectiveness analysis in the cost analyses discussed in the report. A cost and operational effectiveness analysis is still needed to evaluate the potential tradeoffs in cost, performance, and schedule among the alternative programs, and fully evaluate the benefits of standardization of automatic test equipment. We request that the Air Force provide us the newly referenced documentation and reconsider its position in response to the final report.

d. Develop and implement comprehensive Air Force policy and procedures on the standardization of automatic test equipment.

**Management Comments.** The Deputy Assistant Secretary of the Air Force (Acquisition) concurred with Recommendation 2.d., stating that policy for the acquisition of automatic test equipment would be issued by June 30, 1993.

**Audit Response.** The Air Force's action is responsive. As part of the follow-up process, we request a copy of the policy when the Air Force provides comments to the final report.

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## **Part III - Additional Information**

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## **Appendix A. Description of the Army's Integrated Family of Test Equipment and the Navy's Consolidated Automated Support System**

The Army's IFTE is composed of five subsystems of automatic test equipment. The primary intermediate maintenance level subsystem is the Base Shop Test Facility (the Test Facility) which is installed in an S-280 shelter and mounted on a 5-ton truck for Army use. The Test Facility is general purpose, multi-functional automatic test equipment that uses several configurations of tests to diagnose electronic faults or failures in weapon systems. The Test Facility entered low rate initial production in February 1989 and full scale production in March 1992. The Army has authorized the acquisition of 121 Test Facilities to support 26 weapon systems by FY 1998. The Army is ordering 57 Test Facilities for Army weapon systems, including the AVENGER and HAWK missile systems; the All Source Analysis System; and the Multiple Launch Rocket System, that will be put into operation throughout FY 1993.

The Navy's CASS is automatic test equipment composed of six electronic configurations: the Hybrid Station; Electro-Optical Station; Radar Station; Electronic Warfare Station; Communication, Navigation, and Identification Station; and Digital Display Station. The CASS is general purpose, multi-functional automatic test equipment for diagnosing electronic faults or failures in weapon systems that is used at the intermediate maintenance levels, primarily aboard aircraft carriers, and depot maintenance levels. The CASS entered the engineering and manufacturing development phase in December 1986 and full scale engineering in 1987. The CASS is currently in the second low rate initial production phase and full rate production is expected in the second quarter of FY 1994. The Navy is planning to use the CASS in support of 60 weapon systems at 119 different sites.

## Appendix B: Audit Responses to Specific Air Force Comments

The following paragraphs provide audit responses to specific Air Force comments.

### Prior Audit Coverage

**Air Force Comments.** Page 2, para 2: The Air Force stated that our history was incomplete regarding IG, DoD, Audit Report No. 92-037 and the resolution process. The Air Force provided additional details. 5

**Audit Response.** The prior audit coverage comments in the draft audit report were not meant to be comprehensive but were a synopsis of salient points pertinent to the audit finding.

### Internal Controls

**Air Force Comments.** Page 3, para 2: The Air Force did not agree with our statement that controls were not effective to ensure that automatic test equipment being acquired for the F-15 aircraft was properly justified and cost-effective, stating that the acquisition is justified and is the most cost-effective solution for this requirement. 4

**Audit Response.** In other comments to the draft report the Air Force agreed that it did not comply with defense acquisition management policies and procedures, that it did not have data analyses available to support the operational requirements document, and that it did not implement specific, comprehensive policy on automatic test equipment. The above are some of the internal controls needed to ensure that automatic test equipment is properly justified and cost-effective. Therefore, we still believe that our statement is applicable.

### Background

**Air Force Comments.** Page 4, para 3: The Air Force disagreed with our statement that the House Appropriations Committee Report 102-1015 required a cost benefit analysis comparing newly recommended systems acquisitions to the 2

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Army IFTE and the Navy CASS. The Air Force stated that the cost benefit analysis was to include a comparison of the recommended systems with existing systems within the DoD, the IFTE or CASS system, a modified IFTE or CASS system, and modular components of existing systems. Report 102-1015 also stated that the restrictions on automatic test equipment apply to all weapons systems being developed and to modifications for upgrading existing avionics systems, except the Tester contract, which is to be awarded in the near future.

Regarding the statement on page 5, para 2, the Air Force noted that the February 12, 1993, Assistant Secretary of the Air Force (Acquisition) memorandum replying to Assistant Secretary of Defense (Production and Logistics) provided a history of this acquisition program that included analyses of the Army's IFTE and Federal District Court litigation over a sole-source attempt to procure automatic test equipment in the DoD inventory. The Air Force could not justify redirection of the acquisition to a sole-source contract program, such as the Army's IFTE because adequate competition existed.

3

**Audit Response.** We agree that the scope of the congressional language was broader. We paraphrased the information we believed to be relevant to this report. Concerning Air Force comments on its response to the Principal Deputy Assistant Secretary of Defense (Production and Logistics), we revised the background for clarity.

## Discussion

**Air Force Comments.** Page 6, para 1: Although the Air Force concurred with our statement, "The Air Force did not comply with defense acquisition management policies and procedures for the acquisition of the tester...a full range of alternatives must be considered before deciding to initiate a new acquisition program," the Air Force stated that a range of alternative automatic test systems were, in fact, considered and the Air Force originally attempted to procure an inventoried system, the METS.

10

**Audit Response.** We disagree that the Air Force adequately considered a full range of automatic test equipment. The Air Force provided no documentation to support that any automatic test equipment, such as the IFTE was fully evaluated before it issued the requests for proposals. Air Force acquisition officials stated that no additional analyses were necessary because the F-15 METS performed well in Operation Desert Shield and Desert Storm and the Air Force users wanted that equipment. The Air Force ignored the suggestion in the 1988 High Mobility Tester Statement of Need to evaluate the Army's IFTE and Navy's CASS as viable alternatives. Instead, the Air Force attempted to make a sole-source procurement of an F-15 Radio Frequency METS. When the Air Force could no longer pursue the acquisition of a radio frequency METS, officials stated that requirements were prepared for the Tester request for proposal that were based on the METS performance characteristics. We do not believe the actions by the Air Force were consistent with sound acquisition management policy.

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**Air Force Comments.** Page 6, para 2: The Air Force disagreed with our statement, "The Air Force disregarded our recommendation and in April 1992 it issued a request for technical and cost proposals for the Tester without evaluating the Army or Navy systems," stating that the solicitation process had already begun when audit Report No. 92-037 was issued. The draft solicitation was released for industry comments in early February 1992, prior to receipt of audit Report No. 92-037. Further, the Air Force was neither directed nor requested to hold any of its automatic test equipment acquisition programs in abeyance pending the mediation of this report.

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**Audit Response.** Air Force acquisition officials were made aware of the viability of alternative Army and Navy automatic test equipment before the source selection process began for the Tester. Report No. 92-037 merely reinforced what the Air Force's 1988 High Mobility Tester Statement of Need suggested - that the Army IFTE and the Navy CASS were viable alternative automatic test equipment to replace the F-15 AIS tester. We believe that evaluating these alternatives before it issued the requests for proposals in April 1992 (potentially committing the Government to pay bid and proposal costs) would have been the prudent or responsible management decision for the Air Force to make, without being directed or requested to hold or stop any specific acquisition.

**Air Force Comments.** Page 7, para 1: The Air Force nonconcurred with the draft report statement, "The Air Force cost assessments for the Tester cannot be relied upon for significant acquisition decisions because the assessments were incomplete and were not properly prepared and validated. . . a COEA [cost and operational effectiveness analysis] should be prepared early in the acquisition process. . . and approved by the Air Force Acquisition Executive." The Air Force stated that defense acquisition management guidance establishes a firm requirement for a cost and operational effectiveness analysis for ACAT I programs only. The Tester was an ACAT IV program that did not require a cost and operational effectiveness analysis. The Air Force further stated that it recognized that a cost analysis should be performed and noted five studies that were completed prior to the release of the request for proposals for the Tester. The Air Force concluded that, collectively, the five studies provided management with the tools necessary to make informed decisions and a selection of alternatives.

11

**Audit Response.** Although the cost and operational effectiveness analysis is mandatory only for acquisition category I programs, the underlying principles and analytical concepts are to be tailored and implemented in support of acquisition category II, III, and IV programs. DoD Instruction 5000.2 states that there are core activities that must be accomplished for every acquisition program. "These core activities establish and document the threat and operational requirements, affordability, the acquisition strategy and program baseline, cost and operational effectiveness, production readiness and supportability, and developmental and operational testing. . . Tailoring shall focus on how these activities are conducted, the formality of reviews and documentation, and the need for other supporting activities." The Air Force did not accomplish the cost and operational effectiveness of the Tester and did not tailor its acquisition strategy. The program management office representatives

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stated that instructions they received in managing the acquisition were oral and evolutionary. The Air Force did not provide four of the five studies mentioned in its comments, but, the cost assessments that the Air Force provided the audit staff did not satisfy the requirements of a cost and operational effectiveness analysis for reasons discussed in the report. We still believe a cost and operational effectiveness analysis is the appropriate cost analysis as required in defense acquisition management guidance.

**Air Force Comments.** Page 8, para 1: The Air Force nonconcurred with our statement, "Air Force officials were unable to provide adequate evidence to show that the Army and Navy program offices verified the cost and technical data used in the Air Force's cost assessment," stating that at the time of the IG, DoD, visit to Aeronautical Systems Center, the cost assessment was not complete and formal Army and Navy coordination was not yet appropriate. The Army and Navy had assigned members to the assessment team, who provided Army and Navy cost figures. The Air Force has coordinated the final report in writing with the Army on the IFTE and verbally with the Navy on the CASS.

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**Audit Response.** Our comments were based on the Phase I cost assessment completed on September 11, 1992. The Army and Navy did participate in the cost assessment by providing cost data; however, our contacts with the Army representatives did not result in an agreement with the conclusions reached by the Air Force officials using the cost data. In March 1993, the Army responded to an Air Force special request for the Army to review the Air Force's comparative studies of the Tester and Army's IFTE. The Army responded that the IFTE was a potentially attractive alternative to the Tester and that requirements, cost, and legal concerns about the acquisition appeared to be caused by inconsistencies in Air Force strategies and not by operational shortfalls of the equipment. The Army implied that the Air Force cost assessment was incomplete because the cost assessment did not compare the IFTE to the total inventory of Air Force intermediate maintenance level testers to capture the significant cost and operational benefits of the multi-functional systems.

**Air Force Comments.** Page 8, para 1: The Air Force disagreed with our statement, "The Air Force's actions imply that the Air Force had little or no intention of changing its acquisition strategy regardless of the outcome of the cost assessment of the tester compared to the Army and Navy's test equipment," stating that the Air Force was in source selection at the time of the review and had neither been directed nor requested to stop the process. The program was not even questioned by OSD until October 28, 1992, in a request for a briefing.

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**Audit Response.** See our comments under Air Force comments, page 6, para 2.

**Air Force Comments.** Page 8, para 2: The Air Force nonconcurred with our statement, "The Air Force's cost study and cost assessment were not adequate substitutes for the cost and operational effectiveness analysis...The cost assessment was inadequate because it did not include evaluations of cost, performance, and schedule tradeoffs for differences in the alternative Army and Navy standardized automatic test equipment, as required by DoD guidance,"

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stating that the cost assessment accomplished by Aeronautical Systems Center was not intended to be a substitute for a cost and operational effectiveness analysis, but a comparative cost analysis of the Tester versus adapting the Army's IFTE and Navy's CASS. The analysis was part of a comprehensive Air Force review that examined all automatic test equipment acquisition programs to determine the technical and programmatic impacts of acquiring IFTE or CASS. The analysis process was validated by the Air Force Audit Agency on March 5, 1993. The Air Force further stated that the analysis included benefits of standardization such as economies of scale, reductions in support equipment, and training courses and software tools that have been purchased already. Other potential standardization savings were not evaluated because Air Force did not have a requirement for an intermediate maintenance level tester at a composite wing.

**Audit Response.** For reasons stated in other sections of this report, we believe that Air Force cost analyses were inadequate and the cost and operational effectiveness analysis is appropriate for the Tester acquisition.

The Air Force Audit Agency validated that the economic analysis model prescribed in Air Force regulations was appropriately applied for the cost analysis of an avionics subsystem for an unspecified aircraft. The Audit Agency's review did not determine if the appropriate model was chosen for the Tester, did not verify any cost data for the Tester or Army and Navy test equipment, and did not consider the effects of standardization.

The benefits of standardization that the Air Force may have included in the F-15 cost assessment did not address the much larger savings that can be achieved through standardization. For example, the operating system software will not have to be developed for seven different testers if a standardized tester is developed. Likewise, training courses, calibration equipment, and maintenance programs will not have to be developed and procured for seven different programs. The OSD automatic test equipment investment strategy study concluded that an average cost savings of 30 percent could result from standardization, which amounts to over \$178 million for the seven programs included in the Air Force's Phase II cost assessment.

**Air Force Comments.** Page 9, para 1: The Air Force nonconcurred with our statement, "The tester that the Air Force is competing among several contractors will have projected life cycle costs of \$269 million and will test only some subsystems, electronic modules, and components from the F-15 aircraft," stating that while the Air Force agrees that the IFTE and CASS can be modified to test line replaceable units from the F-15, the proposed Tester can be modified to test systems other than the F-15. Unlike the man-portable Tester, IFTE and CASS should require further modifications to meet the F-15's deployment requirements. It should be noted that, although the Aeronautical Systems Center assessment projects a life cycle cost of \$269 million for the proposed Tester, it also projects \$351 million for CASS and \$302 million for IFTE for the F-15 requirement, assuming no slippages to the current program's schedule. Slippage to the current program schedule to accommodate IFTE would cost an additional amount of approximately \$13.5 million per year in maintenance costs for continued support of the F-15 AIS.

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**Audit Response.** The Air Force was unable to provide any documented support to show that systems other than the F-15 systems specified in the request for proposal could be tested by the Tester.

Based on our analysis of the ARINC supportability study, only \$75,000 is needed annually for the maintenance of the F-15 AIS tester. The life cycle cost of the Tester is not comparable to the life cycle cost of the IFTE or the CASS because standardization was not considered in the one-on-one comparisons. The IFTE and CASS have many more potential weapon system applications than the Air Force Tester. Also, the life cycle costs of the IFTE and CASS are more realistic because these systems are becoming operational and the Tester has not been developed. See our audit response under Air Force comments, page 8, para 2, for potential average cost savings that could result from standardization.

**Air Force Comments.** Page 9, para 2: The Air Force nonconcurred with our statement, "The Air Force's cost assessment did not adequately compare and evaluate the operating and support costs of the alternative Army and Navy test equipment." It stated that the operating and support cost area was thoroughly examined by the Automatic Test Equipment Acquisition Review team and changes continued to be made after the auditors' visit to Aeronautical System Center. Operating and support costs for the testers and test program sets were also considered. Both the Army and Navy provided tester operating and support cost estimates based on projections for organic repair costs for their automatic test equipment. The assessment team used an average of the Army and Navy cost estimates, which was applied to the Tester as a percentage of the automatic test equipment's production costs to account for differences in complexity of the testers. Because there was very little cost data available on the test program sets operating and support costs, the assessment team used an average of Navy and Air Force cost data, which was applied as a fixed percentage of test program set acquisition costs for all alternatives. Test program set development and production costs were also estimated as the same for all alternatives because these costs vary little among testers with the same capabilities.

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**Audit Response.** The Air Force did not provide the audit staff a complete copy of the final Phase II cost assessment. However, we determined from segments of a draft of the Phase II cost assessment that the methodology for comparing the Tester operating and support costs changed from Phase I to Phase II. For example, the operating and support costs for the Tester in Phase I were computed as five percent of the Tester production costs. The Air Force provided no supporting rationale or source data for determining the five percent except that the percentage was purportedly from the OSD Investment Strategy Study. In the draft results of Phase II, the Air Force used the average operating and support costs of the Army's IFTE and the Navy's CASS to determine the percentage. We could not corroborate any of the cost estimates the Air Force made to the source cost data used to develop the percentages for the estimates. We do not believe that using the average of the competing Army and Navy general purpose test equipment costs is appropriate. We believe the Air Force should have evaluated the costs of similar Air Force system specific testers, such as METS, for applicability to the Tester. Instead it used arbitrary estimates applied equally for all the test equipment evaluated.

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**Air Force Comments.** Page 10, para 1: The Air Force nonconcurred with the statement, "The Air Force performed insufficient analyses of performance data and requirements for new automatic test equipment to support its requirements assessment," stating that the San Antonio Air Logistics Center Technical Assessment, December 22, 1992, compared the F-15 line replaceable units performance requirements to the available stimuli, measurement, and power capacities of the IFTE system. IFTE operational shortfalls pertaining to mean time between failure, transport configuration, and portability were noted. Additionally, fault isolation shortfalls, human factors limitations, operational deficiencies, and necessary modifications for the IFTE system were identified.

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**Audit Response.** Our report refers to the lack of analyses that the Air Force Air Combat Command performed to support the requirements or performance data stated in the draft operational requirements document. The performance data were used as the basis for the technical assessment. We believe the conclusions of the technical assessment were based on unsupported requirements such as the need for a 1,000-hour mean time between failure and two man transportability.

Our report also noted deficiencies in the San Antonio Air Logistics Center technical assessment of the Army's test equipment. The technical assessment:

- o did not attempt to evaluate the impact of identified variances between the Army's IFTE performance statistics and the Air Force's operational requirements document,

- o did not attempt to evaluate the impact of the schedule delay associated with the modifications of Army test equipment,

- o did not consider the completed upgrades to the F-15 AIS tester,

- o was not reviewed by the Army test equipment engineers, who later disagreed with the conclusions of the assessment, and

- o was inconsistent with some of the Aeronautical Systems Center engineers' technical assessments.

**Air Force Comments.** Page 10, para 2: The Air Force nonconcurred with our statement, "The Air Force did not perform sufficient analyses to support mean time between failure technical requirements in the draft operational requirements document," stating that experience with the F-15 METS during System Performance Demonstration produced an 831-hour mean time between failure for a similar device. The 1,000 hour mean time between failure requirement grew out of the Air Force's Reliability and Maintenance 2000 initiative.

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**Audit Response.** The Air Force provided no information or documentation on the F-15 METS System Performance Demonstration or the Air Force's Reliability and Maintainability 2000 initiative during the audit. The data provided to the audit staff from the F-15 System Program Office showed that METS specifications were 500 hours for the mean time between failure and that METS demonstrated a performance of 588 hours. We believe this actual data

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of an operational tester could be considered realistic and meaningful, which is consistent with the guidelines of Air Force Pamphlet 57-1. However, the data do not indicate whether the characteristics are germane to the mission need. Air Force system developers should take full advantage of the technology in the market place whenever that technology is practical and cost-effective. However, the presumed availability of the technology should not be the sole basis for the requirement. We still believe that the Air Force did not demonstrate that the 1,000-hour mean time between failure was realistic, meaningful, and critical to the mission success of the F-15 aircraft.

**Air Force Comments.** Page 10, para 2: The Air Force disagreed with our statement that, "Officials at Air Force Air Combat Command. . . could not provide any documentation or other analysis to show the need for specific performance criterion... personnel indicated that such performance data were not being collected and analyzed.... Therefore, the performance of... automatic test equipment could not be measured and evaluated accurately." It stated that the ability to collect and track automatic test equipment data is available and is in use. The Automated Test Equipment Reporting Subsystem module of the Core Automated Maintenance System provides units with the capability to show the specific relationships between automatic test system shop and tester replaceable units and aircraft system line replaceable unit testability.

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**Audit Response.** At the Air Force Air Combat Command we specifically requested performance data on the F-15 AIS from the Tester action officer, the officer in charge of the F-15 AIS, several of the operational noncommissioned officers, and the noncommissioned officer dedicated to the Automated Test Equipment Reporting Subsystem of the Core Automated Maintenance System. The Tester action officer told us that F-15 AIS performance data were not reliable. The noncommissioned officers agreed that the data collection system was unreliable because it reported inaccurate data and was difficult to use. Additionally, the METS action officer in the F-15 System Program Office indicated that there was no ready source to provide accurate failure data on the METS. Documents from ARINC Research Corporation further supported the nonavailability of data on the failure rates of automatic test equipment.

**Air Force Comments.** Page 10, para 3: The Air Force nonconcurred with our statement, "The 1,000 hour mean time between failure criterion had doubled over the criterion cited in a previous requirements document approved in 1988." It stated that comparing the High Mobility Tester Statement of Need to the Tester operational requirements document was unreasonable because the two acquisition programs were distinctly different. The High Mobility Tester was not envisioned as an F-15 AIS replacement as is the Tester.

14

**Audit Response.** The Tester operational requirements document clearly states that the High Mobility Tester Statement of Need is the basis for the requirement. The Tester action officer stated that the High Mobility Tester Statement of Need was originally for a standardized automatic tester for several weapon systems including the F-16, F-111, and A-7 aircraft. The action officer explained that the F-16 acquired unique automatic test equipment and the F-111 and A-7 programs no longer supported a requirement for the acquisition of standardized automatic test equipment. Consequently, the requirement for the

## Appendix B. Audit Responses to Specific Air Force Comments

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Tester had to be tailored to fit revised requirements in the High Mobility Tester Statement of Need. In the tailoring process, the Air Force took advantage of the possibility that manufacturers could produce a more reliable tester; and at the urging of the program management at the San Antonio Air Logistics Center, an increased mean time between failure of 1,000 hours was incorporated into the requirement. The action officer stated that he had no basis for the performance characteristics in the Tester's operational requirements document other than the High Mobility Tester Statement of Need.

**Air Force Comments.** Page 11, para 2: The Air Force disagreed with our statement, "We noted similar discrepancies in the Air Force's analyses supporting other performance requirements in its draft operational requirements document, including 2 pallet transportability, 4 man set up and operations, 95 percent system availability and 95-100 percent reliability." It stated that when the Air Force initially attempted to procure the METS it anticipated a tester that would fit on a single pallet and be 2 man portable. A prime reason behind redirecting the procurement from a sole-source attempt was that vendors claimed they had the capability to fill Air Force requirements by packaging off-the-shelf components with little new development. The requirements are directly in concert with Air Force guidelines to enhance each unit's deployability.

14

Many of the specific requirements that are at issue resulted from the Air Force policy decisions made under the Reliability and Maintainability 2000 program. The 1,000 hour mean time between failure for the Tester responded to direction from the Air Force Vice Chief of Staff stating that, "requirements documents for system acquisitions shall specify quantitative R&M [Reliability and Maintainability] levels which are at least double the system level operational measures of reliability." The Reliability and Maintainability 2000 study showed that "Double R/Half M" is achievable for most systems. While the specific requirements were sometimes difficult to support analytically, implementation of this policy has resulted in many significant gains in terms of increased capability and reduced operating and support costs.

**Audit Response.** We continue to believe that system operators should determine and develop requirements that are realistic, germane, and relevant to the mission success of the F-15 aircraft. As we stated in an earlier response, Air Force officials were unable to provide any rationale for the performance characteristics in the Tester operational requirements document. Therefore, the performance characteristics could be considered arbitrary and unjustified. For example, the Air Force criterion for system availability was 99.8 percent in the High Mobility Tester Statement of Need. The Air Force subsequently reduced the requirement to 95 percent, without sufficient mission-related analysis or rationale. Although we noted that the Air Force relaxed technical requirements when competing contractors could not achieve the performance criterion, the Air Force would not relax the technical requirements for the IFTE. In another example, the Air Force established a performance requirement that the Tester had to isolate an electronic fault to one shop replaceable unit 95 percent of the time. The IFTE requirement was 90 percent of the time. Consequently, the San Antonio program management office disqualified the IFTE on this technical basis.

## Appendix B. Audit Responses to Specific Air Force Comments

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**Air Force Comments.** Page 11, para 2: The Air Force agreed with our statement, "The Air Force Air Combat Center could not provide data analyses showing how the values or parameters were selected, the cost effect of the increased values, and their relationship to mission success." It stated that the values and parameters evolved from an October 1991 conference of Air Force Command representatives. Based on their experience, the Air Force officials combined the functionality of five previous individual testers in determining that the Tester required a large jump in reliability and testing parameters over the current F-15 AIS tester. Contractors' proposals, based on the latest technology, gave the Air Force a high degree of confidence that the 1,000 hour mean time between failure would be met.

14

**Audit Response.** The process and analysis in determining requirements should be systematic and documented to provide internal controls and to comply with defense acquisition management guidance. The requirement for a "long jump in the reliability and testing parameters" should be fully documented and its relationship to mission success. The acquisition of the Tester has an estimated \$269 million life cycle cost. Correspondingly, the requirements for this significant investment should be supported with thorough analyses.

**Air Force Comments.** Page 11, para 3: The Air Force nonconcurred with the statement, "Air Force had inconsistencies in its evaluations of cost and technical data as performed by personnel at the San Antonio Air Logistics Center and Aeronautical Systems Center," stating that reports by the two organizations were not contradictory. The Aeronautical System Center review compared CASS and IFTE to the proposed Tester, identified impacts to cost and schedule, and modifications to CASS or IFTE for support of the requirement. The San Antonio study was a more detailed parametric analysis of the Army IFTE system in meeting the F-15 requirements, and its findings included more than the availability and fault detection capability of IFTE. The Air Force officials at the Aeronautical System Center and San Antonio talked to different people at different times on various IFTE capabilities and a few minor inconsistencies resulted. However, the two independent reports came to the same conclusion, that parametric capabilities of the IFTE must be modified or upgraded to fulfill the requirements at a cost greater than the proposed Tester.

14

**Audit Response.** We do not believe that our statement infers that the two Air Force reports were contradictory. We continue to believe, however, that the conclusions pertaining to the acceptance of certain parametric data were inconsistent in the two reports.

**Air Force Comments.** Page 11, para 3: The Air Force disagreed with our statement, "The Air Force's disqualification of the Army test equipment on a technical basis was unjustified," based on the data in the studies the Air Force cited, and the fact that the requirements in the operational requirements document have not changed. Even with modification for test requirements, IFTE would not meet transportability and portability requirements specified in the operational requirements document.

15

**Audit Response.** We continue to believe that the disqualification of the Army test equipment was unjustified because the performance criteria in the

## Appendix B. Audit Responses to Specific Air Force Comments

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operational requirements document were not adequately supported. We noted from the Air Force's comments that transportability and portability requirements were changed to accommodate "off-the-shelf" technology, but not for the Army's IFTE which is also "off-the-shelf."

**Air Force Comments.** Page 12, para 1: The Air Force nonconcurred with our statement, "The Air Force had no official basis for establishing the technical criteria for evaluating alternatives to the tester or for preparing contract specifications for a full and open competition." It stated that the operational requirements document was in the coordination cycle and an approved acquisition plan existed. Likewise, the congressional language and the U.S. Federal District Court Stipulation for Dismissal firmly establish an official basis for a full and open competition acquisition.

15

**Audit Response.** The Air Force did not have an approved operational requirements document based on a thorough analysis of performance characteristics, in accordance with defense acquisition management guidance. Therefore, we continue to believe the Air Force did not have a basis for establishing the technical criteria for determining contract specifications and evaluating alternative proposals. The congressional language and court decisions are discussed in Other Matters of Interest in the report.

**Air Force Comments.** Page 13, para 2: The Air Force nonconcurred with our statement, "The Air Force did not have the organization, guidance, and data bases necessary to evaluate and monitor the acquisition of automatic test equipment to ensure that equipment would satisfy multiple requirements." It stated that the Air Force has established the Automatic Test Systems Product Group Management office at San Antonio. Although the concept of operations for centralizing the Air Force automatic test systems management and acquisition was approved and Initial Operational Capability was declared on March 31, 1993, the office has functioned in a leadership role since 1991. The Automatic Test System Product Group Manager is charged with formulating, coordinating and executing policy and guidance that will achieve Air Force standardization objectives.

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**Audit Response.** We concluded from our discussions with the Director for the Automatic Test System Product Group Management office that controls were not yet in place for effectively monitoring the acquisition of standardized automatic test equipment in the Air Force. The Director stated that the organization, guidance, and data bases necessary to evaluate and monitor the acquisition of automatic test equipment were all in the planning stages.

**Air Force Comments.** Page 13, para 3: The Air Force nonconcurred with our statement, "Air Force. . .concerns about congressional, legal, and cost implications caused by any changes in the acquisition strategy. . .are unwarranted." It stated that awarding a sole-source contract for the Army's IFTE or the Navy's CASS would be contrary to the Competition in Contracting Act. When the Air Force issued a solicitation for the Tester, numerous contractors submitted proposals for the Tester. Conceivably, Army and Navy

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## Appendix B. Audit Responses to Specific Air Force Comments

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could construct a Justification and Approval for the sole-source procurement of standardized automatic test equipment, but, Air Force believes there would be a low probability of success against the potential protests and litigation.

**Audit Response.** We still believe that the Air Force's concerns are unwarranted, as stated in Other Matters of Interest.

**Air Force Comments.** Page 13, para 4: The Air Force nonconcurred with our statement, "The Air Force asserted that Congress made clear its intention. . .that the tester program was to proceed in accordance with the Air Force's competitive acquisition strategy. We believe that the direction only made an exception for the Air Force to provide a cost benefit analysis to the congressional defense committees." The Air Force quoted from House Appropriations Committee Report 102-627, ". . .the Committee expects the Air Force to conduct a full, fair and open competition for the acquisition of the F-15 downsized METS." The Air Force further quoted from Senate Appropriations Committee Report 102-408, regarding the Tester, ". . .the committee believes that the Air Force should continue its ongoing competitive development and procurement for this capability."

5

**Audit Response.** The comments by the House Appropriations Committee and Senate Appropriations Committee were made in the process of determining the appropriations for FY 1993 and were relevant at the time. However, we do not believe the congressional language precludes the Air Force from evaluating other alternative automatic test equipment for the F-15 to determine their cost-effectiveness.

**Air Force Comments.** Page 14, para 2: The Air Force disagreed with our statement, "Through our discussions with Air Force. . .competition advocate. . .we were unable to determine any obstacle to purchasing the Army test equipment. . . ." It stated that the Air Force Competition Advocate at San Antonio believed that cancellation of the current competition and acquiring Army's IFTE would cause protests and litigation by the contractors in the competition. Additionally, the Air Force believes that a new Justification and Approval may be required to procure IFTE for Air Force requirements and a sole-source justification would be against public law, knowing that other contractors want to bid on the requirement.

6

The Air Force also stated that our discussion on page 14, para 5 was misleading. The Air Force stated that the acquisition was for the METS, which was already the standard automatic test equipment for the Special Operating Forces. Originally, the Air Force Competition Advocate had planned to direct a competition, but approved the Justification and Approval when it was demonstrated that, unless the Air Force wanted to discard \$12 million worth of Government equipment, it could not have a fair competition.

6

**Audit Response.** The Air Force's comments provide a general summary of the discussion with the San Antonio Air Logistics Center competition advocate. However, in addition to the inconclusiveness of the Air Force representative's opinion during our audit, he was unable to provide any documents on the

## Appendix B. Audit Responses to Specific Air Force Comments

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subject because he was not involved in the acquisition. Therefore, we considered the competition advocate's conclusions to be speculation and not based on the full facts of the acquisition.

We believe our statement about the legal circumstances of the acquisition of the Special Operations Forces automatic test equipment was accurate. The General Accounting Office denied the protest of Allied-Signal, Inc., because the Air Force was able to show that the Government would lose significant funds if it changed to a competitive acquisition. We further believe that the Air Force should be able to justify buying standardized automatic test equipment if it were to lose significant funds by following the competition strategy of buying unique automatic test equipment.

**Air Force Comments.** Page 15, para 3: The Air Force nonconcurred with our statement, "The Air Force's acquisition of new automatic test equipment may not be critical or cost effective. . . Consequently, mission urgency and cost avoidance do not appear to be adequate justifications for accelerating the acquisition." It stated that the audit report's quote of a \$75,000 annual cost for repairing the test equipment is inaccurate, and apparently based on estimates from the ARINC study for repair of certain stations only. This does not equate to the actual costs incurred for AIS repair. The actual AIS repair costs in FY 1992 were \$13.73 million (\$10.05 million for contract repair and \$3.68 million for organic repair). It is anticipated that AIS support will become increasingly expensive due to increasing labor rates and cost of repair parts.

7

The Air Force also offered up to \$81.9 million of offsets to help procure the Tester. All the spares and stock funding offsets (\$65 million) came from the termination of spares for the old AIS, based on the schedule replacement. Remaining funds were taken from the AIS modernization program. If the source selection is terminated, additional funding will be required for station upgrade and maintenance.

A delay in the program would also impact the F-15 mission supportability. Because of the F-15's low avionics reliability, the AIS deploys as part of the aviation package and is required to be operational in theater by day seven. The Air Force experienced the problem of not being able to properly deploy the AIS during Desert Storm because of airlift constraints. Conversely, the METS was easily deployable, since it only required a single pallet position. The Tester will require only two pallets, compared to the 14 pallets currently needed for the five AIS stations replaced by the Tester, reducing airlift requirements by an entire C-141 per AIS.

The audit report does not indicate the basis for the claim of up to \$287 million in estimated expenditures for modernization and repair parts for the AIS. This may well have included costs for technical changes to the aircraft, which would not be affected by replacing the AIS with the Tester. The San Antonio Air Logistics Center spent \$14.2 million not \$287 million on the AIS modernization program. This modernization effort was driven by aircraft line replaceable unit modification, not to upgrade AIS reliability.

## Appendix B. Audit Responses to Specific Air Force Comments

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**Audit Response.** The \$75,000 annual cost for repairing the test equipment was derived from the ARINC Research Corporation study. The ARINC study was the only documentation provided during the audit on the repair costs of the F-15 AIS tester. Consequently, we were unable to determine the applicability of the \$13.73 million that the Air Force claimed was the actual repair costs for FY 1992. However, we noted that the \$75,000 in the ARINC study applied to three F-15 AIS stations that would be replaced during a 2-year delay. Therefore, only the three stations should be considered in the annual maintenance costs. We also concluded from the ARINC study that significant costs were already incurred to stock F-15 aircraft and AIS spare parts and to upgrade the test stations. After several attempts at reconciling the cost data with ARINC representatives and Air Force officials, we were unable to determine if the funding for spare and repair parts and the modernization was accurate, and in which years, if any, the program funds were spent. We cannot address the \$81.9 million in offsets for the Tester, which the Air Force mentioned, because this is new information that was not provided during the audit; however, as stated above, we believe sufficient assets are on hand to support the F-15 AIS for the 2-year delay.

To assess the deployability of the Air Force's current and future test equipment, the full complement of test equipment should have been evaluated. The total complement of F-15 AIS test equipment requires 22 pallets for airlifting. If the Tester is acquired, the total complement of test equipment will be reduced to two pallets for the Tester and eight pallets for the balance of the F-15 AIS test equipment that will not be man portable. The balance of test equipment on eight pallets will have to be transported and operated in shelters similar to the Army's IFTE. Our conclusions are that the Army IFTE better satisfies the mission urgency for deployability because it could be modified to test the full complement of requirements of the F-15 AIS tester. Such modification would reduce the total pallets required to 2 1/2 pallets compared to the 10 pallets needed for the Tester and the balance of the F-15 AIS tester.

Our \$287 million estimate was derived from the ARINC study, and discussions with ARINC representatives and representatives of the automatic test equipment program management office at the San Antonio Air Logistics Center. We made several attempts at verifying the costs but we were not provided complete and accurate information from Air Force and ARINC representatives.

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## Appendix C. Summary of Potential Benefits Resulting from Audit

Recommendation Reference	Description of Benefit	Amount and/or Type of Benefit
1.	Internal Control. DoD-wide policy and guidance on standardized automatic test equipment will be developed.	Nonmonetary.
2.a.	Economy and Efficiency. The Air Force will avoid purchasing automatic test equipment that is not standardized or properly justified with cost, technical, and requirements analyses.	Funds Put to Better Use. Undeterminable.
2.b.	Economy and Efficiency. Ensures acquisition of new automatic test equipment will be standardized and will be based on realistic performance specifications.	Nonmonetary.
2.c.	Economy and Efficiency. Ensures adequate cost analyses and comparisons of alternative standardized automatic test equipment are performed.	Nonmonetary.
2.d.	Internal Control. Air Force policy and guidance on standardized automatic test equipment will be developed.	Nonmonetary

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## **Appendix D. Organizations Visited or Contacted**

### **Office of the Secretary of Defense**

Office of the Assistant Secretary of Defense (Production and Logistics), Washington DC

### **Department of the Air Force**

Office of the Deputy Assistant Secretary of the Air Force (Communications, Computers, and Logistics), Washington, DC

Headquarters, Air Force Materiel Command, Wright-Patterson Air Force Base, OH

San Antonio Air Logistics Center, San Antonio, TX

Air Force Air Combat Command, Langley Air Force Base, VA

Aeronautical Systems Center, Wright-Patterson Air Force Base, OH

### **Non-Government Organizations**

Institute for Defense Analysis, Arlington, VA

ARINC Research Corporation, Annapolis, MD

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## **Appendix E. Report Distribution**

### **Office of the Secretary of Defense**

Under Secretary of Defense (Acquisition and Technology)  
Assistant to the Secretary of Defense for Public Affairs  
Assistant Secretary of Defense (Production and Logistics)  
Comptroller of the Department of Defense

### **Department of the Army**

Secretary of the Army  
Inspector General

### **Department of the Navy**

Auditor General, Naval Audit Service

### **Department of the Air Force**

Secretary of the Air Force  
Assistant Secretary of the Air Force (Acquisition)  
Assistant Secretary of the Air Force (Financial Management and Comptroller)  
Air Force Audit Agency

### **Defense Agencies**

Director, Defense Contract Audit Agency  
Director, Defense Logistics Agency  
Director, Defense Logistics Studies Information Exchange  
Inspector General, Defense Intelligence Agency  
Inspector General, National Security Agency

### **Non-DoD Federal Organizations**

Office of Management and Budget  
U.S. General Accounting Office  
National Security and International Affairs Division, Technical Information Center  
National Security and International Affairs Division, Defense and National Aeronautics  
and Space Administration Management Issues

**Appendix E. Report Distribution (cont'd)**

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**Non-DoD Federal Organizations (cont'd)**

National Security and International Affairs Division, Military Operations and Capabilities Issues

Chairman and Ranking Minority Member of Each of the Following Congressional Committees and Subcommittees:

Senate Committee on Appropriations  
Senate Subcommittee on Defense, Committee on Appropriations  
Senate Committee on Armed Services  
Senate Committee on Governmental Affairs  
House Committee on Appropriations  
House Subcommittee on Defense, Committee on Appropriations  
House Committee on Armed Services  
House Committee on Government Operations  
House Subcommittee on Legislation and National Security, Committee on Government Operations

## **Part IV - Management Comments**

# Principal Deputy Assistant Secretary of Defense (Production and Logistics) Comments



ASSISTANT SECRETARY OF DEFENSE  
WASHINGTON, DC 20301-8000

MAY 17 1993

MEMORANDUM FOR DEPARTMENT OF DEFENSE INSPECTOR GENERAL


SUBJECT: Draft Quick-Reaction Audit Report on the Acquisition of the  
F-15 Downsized Tester (Project No.3LB-5014), April 27, 1993

I agree with your audit findings and recommendations. The following comments are provided to clarify some specific points.

While your recommendations suggested that DoD ATS acquisition policy and guidance should be issued by ASD(P&L), it is more appropriate that this action be taken by the Under Secretary of Defense (Acquisition). We have prepared draft policy and guidance and are in the process of coordinating it with other appropriate organizations, including the Services.

Your draft audit report states that "about \$167M in potential monetary benefits can be realized from implementing the recommendations". I suggest that this be modified to reflect that this full cost avoidance can be realized only if it is determined that no new test equipment is needed. However, I agree that cost avoidance would be realized over time if the F-15 were to use a DoD standard ATS family in lieu of new, weapon-peculiar ATS. The OSD ATS study reported, in the individual cases examined, that sizable ATS acquisition savings would be possible over the life of the weapon system when ATS standard families are used. On this point, your draft audit report stated that the OSD ATS study found "an average cost savings of 25 to 35 percent could result" through standardization. Please note that these average savings were projected for the case study systems examined; this was not projected as an across-the-board savings percentage.

Thank you for your consideration of these comments. Please let us know if any further information or clarification of our comments is needed.

  
David J. Berteau  
Principal Deputy

# Deputy Assistant Secretary of the Air Force (Acquisition) Comments



DEPARTMENT OF THE AIR FORCE  
WASHINGTON DC



OFFICE OF THE ASSISTANT SECRETARY

12 MAY 1993

MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING  
OFFICE OF THE INSPECTOR GENERAL  
DEPARTMENT OF DEFENSE

SUBJECT: Draft Quick-Reaction Audit Report on the Acquisition of the F-15 Downsized Tester (Project No. 3LB-5014)

This is in reply to your memorandum requesting the Assistant Secretary of the Air Force (Financial Management and Comptroller) provide Air Force comments on the subject report.

The Air Force supports using DoD inventoried Automatic Test Systems (ATS) and Equipment (ATE) whenever practical. It was our original intent to satisfy the F-15 requirement with a fielded system, the F-15 Mobile Electronic Test Set (METS). Having since been directed toward a competitive acquisition strategy, we have found that reliable, cost effective alternatives exist within the commercial marketplace. Our analyses indicate that the proposed Downsized Tester (DST) will be less expensive, will meet the program schedule, and will be better suited to the requirement than alternative test systems. The following discussion of findings in your audit report is provided for your use in reevaluating your conclusions and recommendations for this program.

#### Prior Audit Coverage

P 2., Para 2. Your history is incomplete. In April 1992, DoD IG Audit Report No. 92-037, Effectiveness of the Air Force's Internal Controls over the Development and Acquisition of Maintenance and Diagnostic Systems, January 23, 1992, was referred to the Deputy Assistant IG for Audit Followup for mediation because it was believed that the Air Force's comments to the audit did not specifically concur/nonconcur with recommendation 2. In an April 30, 1992 memorandum, the DoD IG asked the Air Force to negotiate a mutually acceptable course of action in meeting the intent of the recommendations.

The resultant agreement was contained in a DoD IG Memorandum for the Record, June 30, 1992 that an organization would be created that would centrally manage acquisition and distribution of ATE. The Air Force agreed to promulgate policy that would require cost benefit analysis of existing systems in the DoD inventory for use as ATE/ATS. The Air Force also agreed that exemption of this requirement or from implementation of the results of the analysis would be granted only upon acceptance of written justification.

## Deputy Assistant Secretary of the Air Force (Acquisition) Comments

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### Internal Controls

P. 3., Para 2: "Controls were not effective to ensure that ATE being acquired for the F-15 aircraft was properly justified and cost effective."

Nonconcur. The acquisition is justified and is the most cost effective solution for this requirement. Internal control discrepancies discussed in detail throughout the report are addressed individually.

P.3., Para 2: "About \$167 million in potential monetary benefits can be realized from implementing the recommendations."

Nonconcur. A delay of the program for two years could cost the Air Force over \$245M in continued support of the aging A-15 AIS and the eventual acquisition of a replacement test system at FY96-97 market prices. In addition, potential lawsuits by DST bidders, who could rightfully expect reimbursement for costs incurred in the bidding process could result in additional monetary losses. Procurement of an IFTE under the Army's current contract would cost the Air Force approximately \$215M, according to the IFTE Program Management Office, as opposed to the \$167M budgeted for the DST.

### Background

P 4., Para 3: "As an interim measure (House Appropriations Committee) Report 102-1015 required a cost benefit analysis comparing newly recommended systems acquisitions to the Army (Integrated Family of Test Equipment) IFTE and the Navy (Consolidated Automated Support System) CASS."

Nonconcur. The cost benefit analysis is to "include a comparison of the recommended systems with existing systems within the Department of Defense, the IFTE or CASS system, a modified IFTE or CASS system, and modular components of existing systems." Report 102-1015 also states that "These restrictions on ATE apply to all new weapons systems being developed and to modifications for upgrading existing avionics systems, except for the F-15 downsize tester contract which is to be awarded in the near future."

Regarding the statement on P.5., Para 2, it should be noted that the referenced February 12, 1993 SAF/AQ memorandum replying to ASD (P&L) provided a history of this acquisition program that included analyses of the Army's IFTE and Federal District Court litigation over a sole source attempt to procure DoD inventoried ATE. Recognizing that adequate competition does exist, the Air Force could not justify redirection of this acquisition to a sole source contract program, such as the Army's IFTE.

Discussion

P.6., Para 1: "The Air Force did not comply with defense acquisition management policies and procedures for the acquisition of the tester...a full range of alternatives must be considered before deciding to initiate a new acquisition program."

Concur. Although the Operational Requirements Document (ORD) has since been approved, the Solicitation and Source Selection proceeded, based on a draft ORD. A range of alternative ATS were, in fact, considered and the Air Force originally attempted to procure an inventoried system, the METS, for this requirement. However, in April 1991 Allied-Signal Inc. filed a lawsuit against the Air Force in the United States District Court for the District of Delaware, challenging the sole-source acquisition strategy. The lawsuit was resolved after the Air Force agreed to compete the acquisition or advise the contractor within 24 hours if a Justification and Approval (J&A) for other than full and open competition was approved.

P.6., Para 2: "The Air Force did not implement recommendations in audit report No. 92-037 to approve developments of new ATE only when...it would not be cost effective to acquire the.. Army's IFTE and Navy's CASS...The Air Force disregarded our recommendation and in April 1992 it issued a request for technical and cost proposals for the Tester without evaluating the Army or Navy systems."

Nonconcur. The solicitation process had already begun when the Report was issued. The draft solicitation was released for industry comments in early February 1992, prior to receipt of audit Report No. 92-037. The Request For Proposals (RFP) was released in April 1992, in response to the user's requirements, just prior to the timeframe in which the DoD IG first requested mediation of the report's recommendations. The Air Force was neither directed nor requested to hold any of its ATE acquisition programs in abeyance pending the mediation of this report.

P.7, Para 1. "The final report on (Air Force ATE Acquisition Review) Phase I did not adequately address the cost and technical comparisons needed to assess standardization of ATE...Air Force cost assessments for the Tester cannot be relied upon for significant acquisition decisions because the assessments were incomplete and were not properly prepared and validated ...a cost and operational effectiveness analysis (COEA) should be prepared early in the acquisition process ..and approved by the Air Force Acquisition Executive...Instead of a COEA, the Air Force. initially contracted with ARINC Research Corporation for a study that identified cost savings that would be realized from purchasing new ATE versus extending the life of the F-15 AIS."

Nonconcur. Part 4E of DoDI 5000 2, Paras 2.a-b, state: "Cost and operational effectiveness analysis shall be prepared and considered at milestone decision reviews of acquisition category I programs. The underlying principles and analytical concepts of this section shall be tailored and implemented in support of acquisition category II, III, and IV programs as deemed appropriate by the DoD Component Acquisition Executive."

## Deputy Assistant Secretary of the Air Force (Acquisition) Comments

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Similarly, AFR 57-1, August 1992, Para 2.b. states: "COEAs are required for ACAT I (waivers may be granted), or as directed by the applicable Acquisition Executive."

DoDI 5000.2, Air Force Sup to DoDI 5000.2, and AFR 57-1 establish a firm requirement for a COEA for ACAT I programs only. In DoDI 5000.2, the DAE delegates management responsibility for ACAT II, III, and IV programs to the Service Acquisition Executive (SAE). The F-15 DST is an ACAT IV program, and did not require a COEA under the OSD acquisition guidance contained in the 5000 series DoDD/DoDIs.

Recognizing that a decision not to accomplish a COEA does not negate the requirement to accomplish a cost analysis, it should be noted that, prior to the release of the RFP, five supportability/cost/capability studies were performed:

- a. SA-ALC/MMT study (14 February 1988): This study identified problem elements within the F-15 AIS at the time.
- b. McAir study (10 February 1988): Feasibility and cost of expanding the METS to replace five AIS test stations for the F-15 A-D and three for the F-15E, thus standardizing test equipment for the entire F-15 fleet.
- c. HIMOT: A 27 March 1989 study to determine if an existing tester possessed the capability to test specific Line Replaceable Units (LRUs) with minimal modification and risk. Cost estimates were determined as part of the study.
- d. SA-ALC/ACC (now FM) Study (June 1989): A comprehensive analysis and cost study assessed the overall economy (including manpower and training costs) of using the METS to replace all or portions of the existing F-15 AIS.
- e. ARINC Supportability Study (June 1991): A contractor performed study analyzed the supportability of three AIS test stations.

Collectively, these studies provided Air Force management with the tools necessary to make informed decisions and selection of alternatives. While the ARINC study is the only one referenced in your report, we note that your auditors do not indicate disagreement with the findings of the studies referenced above. As such, we assume agreement with the cost savings of approximately \$25.13M per year that would be realized from replacing the AIS with a system similar to the METS.

P.8., Para 1: "Air Force officials were unable to provide adequate evidence to show that the Army and Navy program offices verified the cost and technical data used in the Air Force's cost assessment."

Nonconcur. At the time of the DoD IG visit to ASC, the cost assessment was not complete and formal Army and Navy coordination was not yet appropriate. ASC/ENE officials explained to the auditors that the Army and Navy had assigned members to the

assessment team and that the team members were providing Army and Navy cost figures. ASC officials understood that the auditors phoned the Army and Navy to verify their participation. We now have a letter of coordination on the final report from Mr. Joseph Rivamonte, Deputy IFTE Program Manager for the Army (attached) and verbal coordination from Capt Ed Holder (USMC), Navy CASS Program Management Office, NAVAIR 55223, 23 March 1993, whose written coordination is expected by 28 May 1993.

P.8., Para 1: "The Air Force's actions imply that the Air Force had little or no intention of changing its acquisition strategy regardless of the outcome of the cost assessment of the tester compared to the Army and Navy's test equipment."

Nonconcur. The Air Force was in Source Selection at the time of the Review and had neither been directed nor requested to stop the process. The program was not even questioned by ASD (P&L) until October 28, 1992 in a request for a briefing.

P.8., Para 2: "The Air Force's cost study and cost assessment were not adequate substitutes for the COEA...The cost assessment was inadequate because it did not include evaluations of cost, performance, and schedule tradeoffs for differences in the alternative Army and Navy standardized ATE, as required by DoD guidance."

Nonconcur. The cost assessment accomplished by ASC was not intended to be a substitute for a COEA, but was a comparative cost analysis of SA-ALC's F-15 DST approach versus adapting the Army and Navy ATE for the same purpose. The assessment process was designed to provide enough scope and precision for management decisions and selection of alternatives. The analysis was part of a comprehensive Air Force ATE Acquisition Review that examined all ATE acquisition programs to determine the technical and programmatic impacts of acquiring IFTE or CASS instead of the programs' original ATE selections. The Review's analysis process was validated by the Air Force Audit Agency in a letter dated 5 March 1993. This endorsement was communicated to the auditors.

Several benefits of standardization were part of the F-15 DST assessment. Economies of scale, when Air Force buys were combined with Army/Navy buys were included. Support equipment for the testers (calibration equipment, self test software, etc.) was shared when multiple testers were needed at a single site. The assessment took advantage of savings because development of IFTE and CASS, and associated items (training courses, software tools, etc.) have already been paid for.

Other potential standardization savings, such as multiple weapon system support in a composite wing and workload efficiencies were not identified for F-15 DST. The Air Force does not presently have a requirement for an Intermediate Level composite wing tester.

## Deputy Assistant Secretary of the Air Force (Acquisition) Comments

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P. 9., Para 1: "The tester that the Air Force is competing among several contractors will have projected life cycle costs of \$269 million and will test only some subsystems, electronic modules, and components from the F-15 aircraft. The Army and Navy test systems can be modified to test the electronic modules from several avionics subsystems and several different aircraft to include the F-15."

Nonconcur. While the Air Force agrees that the IFTE and CASS can be modified to test LRUs from the F-15, it is also a fact that the proposed DST can be modified to test systems other than the F-15. Unlike the man-portable DST, IFTE and CASS would require further modifications to meet the F-15's deployment requirements. It should be noted that, although the ASC assessment projects a life cycle cost of \$269M for the proposed DST, it also projects \$351M for CASS and \$302M for IFTE for the F-15 requirement, assuming no slippages to the current program schedule. Slippage to the current program schedule to accommodate IFTE would cost an additional amount of approximately \$13.5M per year in maintenance costs for continued support of the F-15 AIS.

P. 9., Para 2: "The Air Force's cost assessment did not adequately compare and evaluate the operating and support costs of the alternative Army and Navy test equipment...the Air Force had insufficient cost data to compare and evaluate the Tester with the Army and Navy's systems...Without complete data, Air Force system developers cannot compare and evaluate life cycle costs for each alternative ATE."

Nonconcur. The O&S cost area was thoroughly examined by the ATE Acquisition Review team and changes continued to be made after the auditors' visit to ASC. O&S costs for the testers and test program sets (TPS) were also considered.

Tester O&S - Both the Army and Navy provided tester O&S estimates based on projections for organic repair costs for their ATE. Since organic repair for the testers has not started, neither has actual cost data. The team dissected these O&S estimates to be sure the same or equivalent factors were used in each and that the factors used were relevant to Air Force scenarios. These Army and Navy estimates were then used for all CASS/IFTE assessments. Some Air Force programs, such as the F-15 DST, did not yet have O&S estimates. In these cases, the assessment team used an average of the Army and Navy costs. This was applied as a percentage of ATE production costs to account for differences in complexity of the testers

TPS O&S - The assessment team definition of TPS includes test software, adapters, and tech manuals. There is very little cost data available in the TPS O&S area. Here, the team used an average of Navy and Air Force data in the 1992 DoD ATS Investment Strategy Study. The team used a fixed percentage of 2.6% of TPS acquisition costs as the estimate for all alternatives. The percentage approach accounts for any differences in TPS complexity. In the DST case, the team also estimated TPS development and production costs to be the same for all alternatives. It is our experience that TPS costs vary little

across testers with similar capabilities. This is the case in our F-15 DST assessment, where we included modifications of CASS and IFTE to provide DST equivalent test capabilities.

P. 10., Para 1: (Technical Assessment) "The Air Force performed insufficient analyses of performance data and requirements for new ATE to support its requirements assessment."

Nonconcur. The SA-ALC Technical Assessment, 22 December 1992, compared the F-15 LRU performance requirements to the available stimuli, measurement, and power capacities of the IFTE system. IFTE operational short falls pertaining to Mean Time Between Failure (MTBF), transport configuration, and portability were noted. In addition, fault isolation shortfalls, human factors limitations, operational deficiencies, and necessary modifications for the IFTE system were identified, to include:

Additional Instruments Required.

- a. LRU Cooling Air Supply
- b. Pneumatic Measurement Device
- c. Oscilloscope
- d. Electro-Optics / Display Testing Devices
- e. AM / FM Phase Noise Measurement Device

Modifications / Enhancements Required:

- a. DC Power Supply accuracy and current capacity upgrades
- b. Frequency / Time Interval Counter range extension
- c. RF Synthesizer power range increase
- d. Additional Bussing (H009 and 1553) devices
- e. Digital pin-out number increases

P.10 , Para 2: "The Air Force did not perform sufficient analyses to support MTBF technical requirements in the draft ORD"

Nonconcur. Experience with the F-15 METS during System Performance Demonstration produced an 831 hour MTBF for a similar device. The 1,000 hr MTBF requirement grew out of the Air Force's R&M 2000 initiative. discussed at greater length in response to P 11 , Para 2.

P 10, Para 2. "Officials at ACC could not provide any documentation or other analyses to show the need for specific performance criterion.. personnel indicated that such performance data were not being collected and analyzed ..Therefore, the performance of ...ATE could not be measured and evaluated accurately."

Nonconcur. The ability to collect and track ATE data is available and is in use. The Automated Test Equipment Reporting Subsystem (ATERS) module of the Core Automated Maintenance System (CAMS) provides units with the capability to show the

## Deputy Assistant Secretary of the Air Force (Acquisition) Comments

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specific relationships between ATS Shop/Tester Replaceable Units and aircraft system LRU testability.

P. 10, Para 3: "The 1,000 hour MTBF criterion had doubled over the criterion cited in previous requirements document approved in 1988. Officials at the ACC...could not explain why the MTBF for the new test equipment increased from 500 hours in 1988 to 1,000 hours in 1993."

Nonconcur. Citing discrepancies in the jump from 500 hours to 1,000 hrs in the MTBF requirements from the HIMOT SON to the DST ORD is unreasonable, since the two acquisition programs are distinctly different with separate objectives. The HIMOT effort sought the purchase of a flight line tester which would test only certain "high burner" LRUs from various weapon systems. It was not envisioned as an AIS replacement as is the DST. ACC referenced the HIMOT SON in the DST ORD because it was pertinent to the program and the downsized, highly-mobile concept was still valid. However, it is important to note that the two were distinctly separate programs. The requirement stated in the approved ORD is for the DST to "achieve a minimum observed configuration MTBF of 1,000 hours under worst case environmental conditions."

P. 11., Para 2: "We noted similar discrepancies in the Air Force's analyses supporting other performance requirements in its draft ORD, including 2 pallet transportability, 4 man set up and operation, 95% system availability and 95-100% reliability."

Nonconcur. When the Air Force initially attempted to procure the METS we anticipated a tester that would fit on a single pallet and be two man portable. A prime reason behind redirecting the procurement from a sole source attempt was that vendors claimed they had the capability to fill Air Force requirements by packaging off-the-shelf components with little new development. As a result, the initial draft ORD and the draft RFP stated requirements for a single pallet and 2 man portability. Following receipt of industry comments to the draft RFP, requirements were modified slightly, since an "off-the-shelf" solution is solicited. The requirements are directly in concert with Air Force guidelines to enhance each unit's deployability.

Many of the specific requirements that are at issue resulted from the Air Force policy decisions made under the Reliability and Maintainability (R&M) 2000 program, outlined in AFP 800 7. The 1,000 hour MTBF for the DST responded to direction from the Air Force Vice Chief of Staff stating that, "requirements documents for system acquisitions shall specify quantitative R&M levels which are at least double the system level operational measures of reliability." The R&M 2000 study showed that "Double R/Half M" is achievable for most systems. While the specific requirements were sometimes difficult to support analytically, implementation of this policy has resulted in many significant gains in terms of increased capability and reduced O&S costs. In recognizing the limitations to such broad approaches to R&M, the Air Combat Command (ACC) has restructured its staff to better address R&M requirements analysis.

P. 11., Para 2: "The Air Force ACC could not provide data analyses showing how the values or parameters were selected, the cost effect of the increased values, and their relationship to mission success."

Concur. Representatives from the using commands, HQ USAF, and AFMC met in October 1991 to develop the draft ORD. The values and parameters outlined in the ORD grew from this initial conference. Drawing upon their knowledge and experience with ATE, those involved in the development of the DST requirements defined the requirement for a highly reliable and accurate tester. The DST combines the functionality of 5 previously individual testers. This required a large jump in the reliability and testing parameters of the current AIS. Additionally, the DST is deployed as a single unit. Failure during operations would pose a high risk to maintenance. The values and parameters are consistent in the draft and final RFP and the ORD. Contractors' proposals, based on the latest technology, give us a high degree of confidence that the 1,000 MTBF will be met.

P. 11., Para 3: "Regarding technical values and parameters, the Air Force had inconsistencies in its evaluations of cost and technical data as performed by personnel at the SA-ALC and ASC."

Nonconcur. This statement infers the two reports are contradictory. Such is not the case. The ASC Review compared CASS and IFTE to the proposed DST, identified impacts to cost and schedule, and modifications to CASS or IFTE for support of the requirement. The Army and Navy provided CASS and IFTE performance information in a survey format with specific definitions of the performance parameters. This information was reverified with Army and Navy program offices and is correct. The SA-ALC study was a more detailed parametric analysis of the Army IFTE system in meeting the F-15 requirements, and its findings included more than the availability and fault detection capability of IFTE. ASC and SA-ALC talked to different people at different times on various IFTE capabilities, and a few minor inconsistencies resulted. However, the two independent reports come to the same conclusions: that parametric capabilities of the IFTE must be modified or upgraded to fulfill the requirements at a cost greater than the proposed DST.

P. 11., Para 3: "The Air Force's disqualification of the Army test equipment on a technical basis was unjustified."

Nonconcur, based on the data in the studies cited, and the fact that the requirements in the ORD have not changed. Even with modification for test requirements, IFTE would not meet transportability and portability requirements specified in the ORD.

P. 12., Para 1: Operational Requirements Document Approval. "The Air Force had no official basis for establishing the technical criteria for evaluating alternatives to the tester or for preparing contract specifications for a full and open competition."

## Deputy Assistant Secretary of the Air Force (Acquisition) Comments

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Nonconcur. Official basis for technical criteria and contract specifications did exist. The ORD was in the coordination cycle and an approved acquisition plan existed. Likewise, House Appropriations Committee (HAC) language in HR 102-627, Senate Appropriations Committee (SAC) language in SR 102-408, and U.S. Federal District Court Stipulation for Dismissal firmly establish an official basis for a full and open competition acquisition.

P. 12., Para 1: "The development, processing and approving of an ORD is out of sequence with sound acquisition management procedures. The ORD should have been prepared and approved before RFP was issued in January 1992."

Concur. However, attempts were made in good faith by the Air Force to follow proper acquisition management procedures. The F-15 DST Program Office held several meetings with ACC, HQ USAF, AFMC, ALC, and F-15 SPD representatives to validate the user's requirements identified within the ORD. As a result of these conferences, an ORD was sent out for coordination on 31 October 1991. However, a format change was mandated by AFR 57-1 (1 August 1992) and AFP 57-2 (1 October 1992). Caught in the midst of a lengthy coordination process, the ORD was pulled back for reformatting and the coordination cycle began anew. Realizing the forced format change was causing the DST acquisition to proceed simultaneously with ORD coordination activities, SA-ALC interfaced with ACC representatives on a daily basis to ensure the solicitation being used to procure the DST was an accurate representation of the user's requirements as reflected in the ACC prepared ORD. The basic requirements of the ORD have not changed since release of the formal RFP. ACC personnel have functioned as team members of the F-15 DST program office throughout the process and have reviewed all solicitation documents to ensure the ORD and solicitation were in harmony. The ORD received final approval by the Air Force on 11 May 1993.

P. 13., Para 2: "As of March 1993 the Air Force had no specific, comprehensive policy on the acquisition of ATE."

Concur. ATS acquisition policy has not yet been released. However, an Air Force Policy Directive (AFPD 63-2) has been drafted, and is currently in the final coordination cycle for approval by the Air Force Chief of Staff. NOTE: In response to audit Report 92-037, the Deputy Assistant Secretary of the Air Force for Acquisition issued interim ATS acquisition policy to AFMC, in a memorandum, 30 July 1992.

P. 13., Para 2: "The Air Force did not have the organization, guidance, and data bases necessary to evaluate and monitor the acquisition of ATE to ensure that equipment would satisfy multiple requirements."

Nonconcur. The Air Force has established the ATS Product Group Management office at SA-ALC. Although the Integrated Weapon System Management (IWSM) Concept of Operations (CONOPs) for centralizing the Air Force ATS management / acquisition was approved and Initial Operational Capability (IOC) was declared on 31

March 1993, the office has functioned in an ATS leadership role since the IWSM process began in 1991. The ATS PGM is charged with formulating, coordinating and executing policy and guidance that will achieve Air Force standardization objectives. Controls are being implemented to ensure all requirements are considered and meet the criteria laid out in DoDD 5000.1 and DoDI 5000 2.

P. 13., Para 3: "Air Force...concerns about congressional, legal, and cost implications caused by any changes in the acquisition strategy...are unwarranted."

Nonconcur. Reversing our current acquisition strategy of full and open competition and attempting to award a sole source contract would be contrary to the Competition In Contracting Act Statute. In 1991 the USAF attempted to sole source the F-15 METS and the United States District Court for the District of Delaware challenged the sole source. The ensuing lawsuit was only resolved when the USAF agreed it would advise Allied-Signal if a Justification and Approval (J&A) for other than full and open competition was approved. Because the USAF could not prove that only one source could satisfy our needs, a solicitation for the DST was issued in April 1992, for full and open competition. As a result, numerous sources submitted proposals for the DST. To reverse this strategy and claim that only the Army's IFTE or Navy's CASS systems (sole source) can satisfy the USAF requirements would be inconsistent with the competitive facts. Conceivably, a J&A based on "standardization" could be constructed. However, the Army or Navy would be required to synopsise the sole source requirement which, in our opinion, would be subject to protest and litigation and is a low probability of success strategy as there is little to support a DoD standardization program.

The Acquisition Law Division, SA-ALC/JAN, reviewed the Allied Signal stipulation of Dismissal and has provided a legal opinion on its applicability. Attorney-Advisor 30 April 1993 opinion is attached.

P. 13., Para 4: "The Air Force asserted that Congress made clear its intention...that the tester program was to proceed in accordance with the Air Force's competitive acquisition strategy. We believe that the direction only made an exception for the Air Force to provide a cost benefit analysis to the congressional defense committees."

Nonconcur. HAC Report 102-627 at 133, states "The Air Force also tried to award a sole source contract for the downsized F-15 mobile electronic test sets. This action was rejected by procurement officials. It is the Committee's view that a more open and competitive process should have been used for the SOF METS acquisition. In addition, the Committee expects the Air Force to conduct a full, fair and open competition for the acquisition of the F-15 downsized METS "

Similarly, SAC Report 102-408 at 283, states that, in regard to the F-15 DST, " the committee believes that the Air Force should continue its ongoing competitive development and procurement for this capability "

## Deputy Assistant Secretary of the Air Force (Acquisition) Comments

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P. 14., Para 2: "Through our discussions with Air Force ... competition advocate ... we were unable to determine any obstacle to purchasing the Army test equipment..."

This assertion is incorrect. A memo dated 19 Feb 1993, by the SA-ALC competition advocate indicates a different interpretation of the meeting with the auditors. It states:

"All of the general discussion revolved around the question, "Is it against public law, in this case the Competition in Contracting Act, to cancel the competitive acquisition of the F-15 DST and initiate a Military Interdepartmental Purchase Request (MIPR) to the Army to buy AF requirements under their sole source IFTE contract" The general response was that this action could be construed as circumventing competition, especially since we know that other contractors can supply the Government requirements. Cancellation would definitely bring about litigation/protest. Also, the type/extent of modification to the IFTE to meet AF requirements would also determine whether or not a new J&A would be required. We believe a sole source justification would be against public law, knowing that other sources want to bid on the requirement."

Similarly, the discussion on Page 14, Para 5 is misleading. That acquisition was for the METS which was already the standard ATE for the SOF. Originally, the Air Force Competition Advocate had planned to direct a competition, but approved the J&A when it was demonstrated that, unless the Air Force wanted to discard \$12M worth of Government equipment, we could not have a fair competition. The total acquisition cost for the METS was estimated at \$20M, with a cost of \$12M already incurred. The Air Force would have had to achieve a savings from competition of 60% just to break even.

P.15., Para 3 The Air Force's acquisition of new ATE may not be critical or cost effective... Consequently, mission urgency and cost avoidance do not appear to be adequate justifications for accelerating the acquisition

Nonconcur. The audit Report's quote of \$75,000 annual cost for repairing the test equipment is inaccurate, and is apparently based on estimates from the ARINC study for repair of certain stations only. This does not equate to the actual costs incurred for AIS repair. The actual AIS repair costs in FY92 were \$13.73M (\$10.05M for contract repair and \$3.68M for organic repair). It is anticipated that AIS support will become increasingly expensive due to increasing labor rates and cost of repair parts.

In addition, the Air Force offered up to \$81.9M in offsets to help procure the DST. All of the spares/stock funding offsets (\$65M) came from the termination of spares for the old AIS, based on the scheduled replacement. Remaining funds were taken from the AIS modernization program. If the source selection is terminated, additional funding will be required for station upgrade and maintenance.

A delay in the program would also impact the F-15 mission supportability. Because of the F-15's low avionics reliability, the AIS deploys as part of the aviation package and is required to be operational in theater by day seven. The Air Force experienced the problem

of not being able to properly deploy the AIS during Desert Storm because of airlift constraints. Conversely, the METS was easily deployable, since it only required a single pallet position. The DST will only require two pallets, compared to the 14 pallets currently needed for the five AIS stations replaced by the DST, reducing airlift requirements by an entire C-141 per AIS.

The audit report does not indicate the basis for the claim of up to \$287M in estimated expenditures for modernization and repair parts for the AIS. This may well have included costs for technical changes to the aircraft which would not be effected by replacing the AIS with the DST. SA-ALC spent \$14.2M not \$287M on the AIS modernization program. This modernization effort was driven by aircraft LRU modification and was not to upgrade AIS reliability.

### P. 16: Summary

The Air Force supports using DoD inventoried ATS rather than developing unique test systems, whenever practical. This is borne out by our initial attempt to procure the METS for the F-15A-D. We have found, however, that there are reliable and cost effective alternatives within the commercial marketplace that can be readily adapted to our requirements. Experience with this program has shown that to be the case. It should be noted that there is presently no official OSD or Joint Service document identifying either the criteria or nomenclature of what constitutes a DoD "standard family of ATS." There are several test systems within the Air Force and DoD inventories that may be termed ATS "families." For example, the F-16 AIS supports multiple weapon systems and has developed a downsized capability. As stated earlier, inventoried ATS were reviewed but were found not to be the most cost effective solutions for this particular requirement. Since August 1991 our acquisition strategy has been to satisfy the requirement through full and open competition.

Additionally, we are concerned by the late OSD involvement in this effort. The Air Force's full and open competition has engendered a lot of contractor interest and allowed the best approach for acquiring a commercial-off-the-shelf tester for our use. Contractors have spent a considerable amount of bid and proposal money. These costs may indirectly be borne by the government if the source selection is canceled.

In conclusion, the Air Force's post cold-war requirements call for rapidly deployed air power, often to areas with limited infrastructure and support. We can no longer rely on forward based forces for support. To meet these new demands, the Air Force is taking deliberate steps to reduce the large support requirements which tether our forces to vulnerable combat support bases. The F-15 is the Air Force's premier air superiority aircraft, and the DST is the most effective ATE solution to sustain its combat capability in forward operating locations.

### Recommendations for Corrective Action

## Deputy Assistant Secretary of the Air Force (Acquisition) Comments

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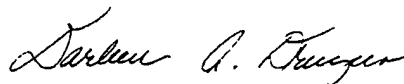
1. Concur with recommendation 1

2. Non concur with recommendation 2.a. Discontinuance of the full and open competition would result in monetary losses through prolonged support of the AIS, procurement of a replacement at FY96-97 market rates, or, if sole source for IFTE, a higher current year cost, and payment of bidders costs if litigation ensues from the canceled source selection. As addressed in the discussion above, commercial capability already exists for satisfying this requirement.

3. Non concur with recommendation 2.b. The ORD for this requirement was approved by the Air Force Vice Chief of Staff on 11 May 1993. The need for AIS replacement was first identified years ago. Support of the F-15 weapon system cannot be delayed indefinitely while requirements are continually reevaluated. Rationale for nonconcurrency is elaborated in the discussion above

4. Non concur with recommendation 2 c. As stated above, a COEA is required for ACAT I programs only. Authority for the designation of this requirement for ACAT II, III, and IV programs is delegated to the SAE. The Air Force has decided that it would not be cost effective to accomplish a full COEA for this program. Several Cost analyses have already been accomplished for this acquisition

5. Concur with recommendation 2 d The Air Force intends to issue policy for the acquisition of ATS/ATE by 30 June 1993



DARLEEN A DRUYUN  
Deputy Assistant Secretary  
(Acquisition)

### 2 Attachments

- AMCPM-TMDE Letter, Air Force ATE Acquisition Review, 12 May 1993
- SA-ALC/JAN Letter, Applicability of Stipulation of Dismissal, 30 April 1993

Deputy Assistant Secretary of the Air Force (Acquisition) Comments


FROM: SA-ALC/JAN

30 April, 1993

SUBJECT: Applicability of the Stipulation of Dismissal in Allied-Signal Inc. v. United States, No. 91-189-FLI (D. Del.)

TO: LDA-2

1. You have requested our opinion on the effect of the stipulation of dismissal signed in May 1991 on a potential decision to acquire the Army's Integrated Family of Test Equipment (IFTE) in lieu of the Downsized Tester.
2. The stipulation requires us to notify Allied-Signal's counsel within one work day of your being notified that a justification and approval for non-competitive contracting had been approved, noncompetitive negotiations had occurred, or a noncompetitive contract had been awarded. We are not prevented by the stipulation from taking any specific actions.
3. You have advised that an IFTE acquisition would be noncompetitive in nature. We therefore do not believe that we could achieve a contract for IFTE without taking an act that would require us to notify Allied-Signal. They would then be able to decide whether they wished to take legal action.

  
PAUL S. DAVISON  
Attorney-Advisor  
Acquisition Law Division

ATTORNEY'S WORK PRODUCT PREPARED IN DIRECT  
OR INDIRECT ANTICIPATION OF LITIGATION.  
NOT FOR RELEASE OR TRANSFER OUTSIDE OF THE  
AIR FORCE WITHOUT THE SPECIFIC APPROVAL  
OF THE ORIGINATOR OR HIS/HER AUTHORITY. NOT  
SUBJECT TO DISCOVERY OR RELEASE UNDER  
FOIA 5 U.S.C. 552(b)(5)

Deputy Assistant Secretary of the Air Force (Acquisition) Comments



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
UNITED STATES ARMY TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT ACTIVITY  
REDSTONE ARSENAL, ALABAMA 35888-5400

12 MAY 1993

AMCPM-TMDE (70-1x)

MEMORANDUM FOR Commanding Officer, Wright Patterson Air  
Force Base, ATTN: APC/ENEM (Craig Wall),  
Wright Patterson Air Force Base, Ohio

SUBJECT: Air Force (AF) Automatic Test Equipment (ATE)  
Acquisition Review, Wright-Patterson Air Force Base, Ohio,  
23-24 Mar 93

1. References:

- a. Air Force ATE Acquisition Review Final Report,  
draft, 25 Mar 93.
- b. Revised Cost Comparison tables from ASC/ENECA, dated  
2 Apr 93.
2. The draft final report as modified by the revised cost  
comparison tables has been reviewed.
3. The IFTE data as defined in the report is considered an  
accurate characterization of the Army's ability to support  
potential AF programs.

  
JOSEPH M. RIVAMONTE  
Deputy Program Manager

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## **Audit Team Members**

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## INTERNET DOCUMENT INFORMATION FORM

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Downsized Tester**

**B. DATE Report Downloaded From the Internet: 04/24/99**

**C. Report's Point of Contact: (Name, Organization, Address, Office  
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