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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

NATIONAL SECURITY AND
INTERNATIONAL AFFAIRS DIVISION

B-216037

AUG 17 1984

General Richard Thompson
Commander
U.S. Army Materiel Command
Department of the Army



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Dear General Thompson:

Subject: GAO Concerns Relating to Additional EQUATE Pro-
curements and Improvements (GAO/NSIAD-84-152)

While we have not completed our survey of the Army's Test Measurement and Diagnostic Equipment Program, we have identified several concerns that should be considered before awarding contracts for additional Electronic Quality Assurance Test Equipment (EQUATE) procurements and improvements.

EQUATE is the Army's standard automatic test equipment at the general support and higher maintenance levels. Currently, the Army has 131 EQUATES on hand or under contract and plans to procure 57 more units through fiscal year 1988. Expenditures for several EQUATE improvements also are planned. While these procurements and improvements will occur over several years, the next contract awards are scheduled for September 21, 1984, and September 30, 1984. In total, the procurements and improvements will cost about \$84 million and \$133 million, respectively.

We believe that the additional EQUATE procurements and planned improvements need to be reassessed because:

- New generation automatic test equipment, called Intermediate Forward Test Equipment (IFTE), will replace about 35 forward-support EQUATES; this should eliminate the need for some planned EQUATE procurements.
- EQUATES currently used to develop Test Program Sets, or software, could be made available for other uses; this would reduce the need for some EQUATE procurements.
- IFTE or other alternatives could replace EQUATE at other maintenance levels; this could eliminate the need for most if not all planned improvements.

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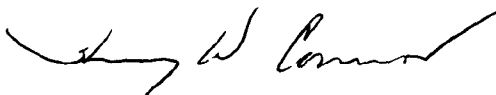
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--Some weapon system developers and test equipment users are not satisfied with EQUATE; consequently, several developers have requested to use nonstandard equipment, and one user has requested that fielding of EQUATE in Europe be halted.

The enclosure to this letter describes these concerns and includes our observations which we believe should be considered before future EQUATE procurement or improvement contracts are awarded. We are reporting our observations to you now, even though our work is not completed, because of the planned September contract awards. We plan to pursue these concerns further.

We are available to discuss these concerns in more detail with you or your staff and would like to be informed of any actions you decide to take on future EQUATE procurements and improvements. We are sending copies of this report to the Secretaries of Defense and Army.

Sincerely yours,



Henry W. Connor
Senior Associate Director

Enclosure

GAO CONCERNS RELATING TO ADDITIONAL
EQUATE PROCUREMENTS AND IMPROVEMENTS

NEW GENERATION EQUIPMENT
WILL REPLACE SOME EQUATES

Intermediate Forward Test Equipment (IFTE) has been designated the standard automatic test equipment for intermediate direct support or forward, maintenance. Accordingly, it will replace all Electronic Quality Assurance Test Equipment (EQUATE) deployed at this level. Yet, the Army has not revised its EQUATE procurements to reflect this change. Additionally, some Army officials believe IFTE should replace EQUATE as the standard automatic test equipment at all levels of maintenance.

Army guidance ^{1/} directs that the IFTE be used for intermediate direct support electronic testing of all systems fielded after 1988. This means that IFTE will replace at least 35 EQUATES. However, the guidance does not mention where these EQUATES will be used nor how this will affect overall EQUATE requirements. Also, the guidance lends support to IFTE as a potential EQUATE replacement at all maintenance levels. For example, the guidance states that

" . . . one of the foundations of the IFTE program is the direct application, with minor adjustment, of Test Program Sets written on the EQUATE . . . "

The Test Measurement and Diagnostic Equipment (TMDE) Program Manager believes that IFTE should be considered as the EQUATE replacement. He told us that he planned to propose an assessment of the advantages and disadvantages of making such a change. He also told us that such a change would require Army Materiel Command approval. While he has not considered alternatives, the program manager maintains that EQUATE procurements scheduled for 1984 and 1985 are justified because they, unlike later procurements, are dedicated to the support of specific systems. We believe, that other alternatives may be available such as contractor support, leased or purchased commercial test equipment, and increased utilization of current EQUATE assets until IFTE is available.

^{1/} U.S. Army Materiel Development and Readiness Command Message (1591200Z) dated June 1984., Subject: General Purpose Automatic Test Equipment Policy.

GAO observations

Using IFTE to replace EQUATES deployed at forward maintenance levels could free assets for use at other levels. This should reduce overall EQUATE requirements and eliminate the need for some planned procurements. Also, in our opinion, IFTE appears to be a candidate for replacing EQUATE, Army-wide.

Therefore, before contracting for additional EQUATES, we believe the Army needs to (1) determine when and how IFTE will replace EQUATES, (2) decide how the replaced EQUATES will be used, and (3) determine how this will affect overall EQUATE requirements and reduce planned procurements. We also believe that if the Army made a detailed assessment of the costs, risks, and benefits of continuing with EQUATE versus converting to IFTE it could better decide whether IFTE can and should replace EQUATE at other maintenance levels. In addition, the assessment should consider interim options such as contractor support, leased or purchased commercial test equipment, and increased utilization of current EQUATE assets to fulfill automatic test equipment requirements until IFTE is available.

EQUATE USED IN DEVELOPING
TEST PROGRAM SETS COULD BE
MADE AVAILABLE FOR OTHER USES

Several government-owned EQUATES are being used by contractors to develop Test Program Sets. The Army guidance specified that contractors would develop IFTE Test Program Sets using contractors' equipment and government-furnished software that emulates IFTE. This same approach should be used to develop EQUATE Test Program Sets, according to the TMDE Program Manager, because it would be cost-effective and it would free several EQUATES now being used by contractors for other uses.

GAO observations

The Program Manager's idea appears to have merit and we believe the Army should consider developing software that would enable contractors to use their equipment to develop EQUATE Test Program Sets for as long as they are still needed. This may be a cost-effective alternative, and it would free several EQUATES for other uses, thereby eliminating the need for some planned procurements.

PLANNED IMPROVEMENTS
MAY NOT BE NEEDED

About \$133 million in EQUATE improvements are planned. However, considering the recent Army guidance and questions raised by some Army officials, these improvements may no longer be needed.

Recent Army guidance directed that all EQUATEs used at the intermediate direct support level be replaced by IFTE; and some Army officials view IFTE as the likely replacement for EQUATE, Army-wide. Yet, plans to improve EQUATE continue unchanged.

Army Missile Command officials are questioning whether EQUATE Engineering Change Proposal 185 should proceed. This \$37 million improvement is the first of several major EQUATE product improvement programs. Essentially, this improvement will replace the EQUATE computer, video terminal, and other components that are becoming obsolete and unsupportable. It is intended to make the EQUATE supportable through the years 1995 to 2000. The initial design contract for this improvement will cost about \$3 million, and it is scheduled to be awarded on September 30, 1984.

Missile Command concerns about this improvement are exemplified by the following questions raised in a message dated June 27, 1984, from the Missile Command to individual project offices.

- Should Engineering Change Proposal 185 be implemented?
- Should existing EQUATE capability be maintained and reliability improved?
- Should existing EQUATEs just be maintained until the IFTE is fielded and then be replaced by attrition with the IFTE?

The Missile Command had not received responses to these questions at the time we completed this phase of our work.

GAO observations

Planned EQUATE improvements may not be justified, particularly if IFTE is chosen as the EQUATE replacement. EQUATE, based on 1970s technology, is becoming obsolete. The Army has decided to replace all EQUATEs at forward support levels with

IFTEs, and other EQUATE replacements are being considered. These changes could eliminate the need for most, if not all, of the planned improvements. Accordingly, we think the Army needs to reassess its plans to improve EQUATE and to delay awarding improvement contracts until the assessment is completed.

SOME DEVELOPERS AND USERS
ARE NOT SATISFIED WITH EQUATE

Although EQUATE is the Army's standard automatic test equipment at intermediate general support and higher levels of maintenance, some system developers and users are not satisfied with EQUATE and have requested authorization to use alternative test equipment.

At least 14 developers and users have requested permission to use other automatic test equipment for such reasons as cost savings and technical performance. A request by the Program Manager of the Patriot Missile System, for example, identified savings of about \$8 million over 10 years if an alternative automatic tester were used to satisfy Patriot requirements instead of EQUATE. The request was approved.

In a December 1983 message to the U.S. Army Materiel Development and Readiness Command (now the Army Materiel Command) the European Logistics Assistance Office stated that the AN/MSM-105s (field version of EQUATE) in Europe were seldom used because Test Program Sets were unreliable, incomplete, or not available. They concluded that

" . . . further fielding of the EQUATE (AN/MSM-105) within the U.S. Army Europe will offer no improved readiness or any increased ability to go to war."

The European office requested that fielding of EQUATE (AN/MSM-105) be halted and that a concept of leasing state-of-the-art automatic test equipment be pursued. The requests were denied.

GAO observations

Because of dissatisfaction with EQUATE, some weapon system developers and users have identified possible cost-effective alternatives. This, coupled with our other concerns, leads us to believe that the Army should consider replacing EQUATE with IFTE or some other alternative. Until that assessment is completed, the Army should limit its investment in EQUATE procurements and improvements.