Army Regulation 750–43

Maintenance of Supplies and Equipment

Army Test, Measurement, and Diagnostic Equipment

Headquarters
Department of the Army
Washington, DC
14 December 2004

UNCLASSIFIED

SUMMARY of CHANGE

AR 750–43
Army Test, Measurement, and Diagnostic Equipment

This major revision, dated 14 December 2004--

- Formalizes policy for development and maintenance of calibration standards to provide direct measurement traceability to the National Institute of Standards and Technology.

- Realigns responsibilities to the correct staff agency, command, and activity (chap 2).

- Revises the test, measurement, and diagnostic equipment management structure (chap 3).

- Streamlines test, measurement, and diagnostic equipment acquisition considerations and waiver process to complement Department of Defense acquisition policy (chap 4).

- Updates test program set policy and management procedures (chap 5).

- Updates Army test, measurement, and diagnostic equipment calibration and repair support program (chap 6).

- Establishes policy on embedded diagnostics, prognostics, interactive electronic technical manuals, and associated information (chap 7).

- Begins implementation of Department of Defense policy on condition-based maintenance-plus through establishment of policy on embedded diagnostics, embedded prognostics, and interactive electronic technical manuals (chap 7).

- Revises DA Form 4062.

Headquarters
Department of the Army
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14 December 2004

*Army Regulation 750–43

Effective 14 January 2005

Maintenance of Supplies and Equipment

Army Test, Measurement, and Diagnostic Equipment

By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

Official:

SANDRA R. RILEY
Administrative Assistant to the Secretary of the Army

History. This publication is a major revision.

Summary. This regulation establishes policy for embedded diagnostics and prognostics, formalizes direct measurement traceability requirement, and documents changes in responsibilities and authorities.

Applicability. This regulation applies to the Active Army, the Army National Guard of the United States/Army National Guard, and the U.S. Army Reserve. Specifically, it applies to all U.S. Army elements that own/use, select, acquire, support, or supply diagnostic equipment in support of Army missions. This publication is applicable during mobilization.

Proponent and exception authority. The proponent of this regulation is the Deputy Chief of Staff, G–4. The Deputy Chief of Staff, G–4 has the authority to approve exceptions or waivers to this regulation that are consistent with controlling law and regulations. The Deputy Chief of Staff, G–4 may delegate this approval authority, in writing, to a division chief within the proponent agency or a direct reporting unit or field operating agency of the proponent agency in the grade of colonel or the civilian equivalent. Activities may request a waiver to this regulation by providing justification that includes a full analysis of the expected benefits and must include formal review by the activity's senior legal officer. All waiver requests will be endorsed by the commander or senior leader of the requesting activity and forwarded through higher headquarters to the policy proponent. Refer to AR 25–30 for specific guidance.

Army management control process. This regulation contains management control provisions, identifies key management controls, and provides a checklist for conducting management control reviews in accordance with Army Regulation 11–2.

Supplementation. Supplementation of this regulation and establishment of forms other than Department of the Army (DA) forms are prohibited without prior approval from the Deputy Chief of Staff, G–4, ATTN: DALO–SMM, 500 Army Pentagon, Washington, DC 20310–0500.

Suggested improvements. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Deputy Chief of Staff, G–4, ATTN: DALO–SMM, 500 Army Pentagon, Washington, DC 20310–500.

Distribution. This publication is available in electronic media only and is intended for command levels A, B, C, D, and E for the Active Army, the Army National Guard of the United States, and the U.S. Army Reserve.

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*This regulation supersedes AR 750–43, dated 28 November 1997.

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Chapter 1
Introduction

1–1. Purpose
This regulation—

a. Prescribes policies and procedures, assigns responsibilities, and establishes goals and objectives applicable to the development, selection, acquisition, management, sustainment, and support of Army test, measurement, and diagnostic equipment (TMDE), associated test program sets (TPSs), embedded diagnostics and prognostics, and interactive electronic technical manuals (IETMs).

b. Assigns responsibilities for planning, directing, managing, and executing the Army TMDE program.

c. Establishes policy for the development, acquisition, and maintenance of calibration standards to provide direct measurement traceability to the National Institute of Standards and Technology (NIST).

1–2. References
Required and related publications and prescribed and referenced forms are listed in appendix A.

1–3. Explanation of abbreviations and terms
Abbreviations and terms used in this regulation are explained in the glossary.

1–4. Responsibilities
Responsibilities are listed in chapter 2.

Chapter 2
Responsibilities

2–1. The Assistant Secretary of the Army for Acquisition, Logistics and Technology
The Assistant Secretary of the Army for Acquisition, Logistics and Technology (ASA(ALT)) is responsible for overall TMDE procurement and Army acquisition policy and will—

a. Integrate TMDE considerations, including Army standard automatic test equipment (ATE) and test program set (TPS) requirements, embedded diagnostics and prognostics (ED and EP) and TMDE support concepts into supported end item acquisition strategies.

b. Investigate new test, measurement, and diagnostic technology through an Army-wide program of research and development.

c. Ensure that TMDE requirements, plans and issues are addressed in the Army Systems Acquisition Review Council (ASARC) process when applicable.

d. Ensure TMDE policy and requirements are addressed in regulatory documents for which ASA(ALT) is the proponent agency.

e. Ensure that TMDE requirements, plans and issues are agenda items at all in-process reviews (IPRs) where the Department of Army (DA) is the approving authority.

f. Coordinate acquisition and support strategies requiring TMDE with the Deputy Chief of Staff, Army G–4 (DCS, G–4), the Deputy Chief of Staff, Army G–3 (DCS, G–3) and The Deputy Chief of Staff, Army G–8 (DCS, G–8).

g. Ensure that planning and integration of Manpower and Personnel Integration (MANPRINT) is performed in accordance with Army Regulation (AR) 602–2.

h. Ensure that integrated logistics support (ILS) is implemented per AR 700–127.

i. Conduct an annual program review to ensure program executive officers (PEOs), program, project, and product managers follow this policy guidance in the design, development, acquisition and integration of TMDE.

j. Ensure participation with other services concerning activities relative to Department of Defense (DOD) standard ATE mission.

2–2. The Deputy Chief of Staff, G–4
The DCS, G–4 will—

a. Approve and publish Army policy that applies to TMDE and the Army TMDE program.

b. Serve as the Army Staff focal point for establishment and coordination of TMDE policies and matters within Headquarters, Department of the Army (HQDA).

c. Integrate and coordinate Army efforts to increase effectiveness of overall TMDE life-cycle management.

d. Participate in ASARC meetings to ensure that TMDE requirements, plans and issues are addressed.

e. Ensure TMDE policy and requirements are addressed in regulatory documents for which the DCS, G–4 is the proponent agency.

f. Provide information to the Joint Logistics Commanders on Army TMDE and initiatives.

g. Ensure that MANPRINT analysis for TMDE is integrated and considered throughout the ILS development in accordance with AR 602–2.

2–3. The Deputy Chief of Staff, G–3

The DCS, G–3 will—

a. Direct implementation and maintenance of approved DOD automatic test language standards and related actions.

b. Coordinate TMDE requirements and authorization strategy with DCS, G–4 and DCS, G–8.

c. Ensure TMDE policy and requirements are addressed in regulatory documents for which DCS, G–3 is the proponent agency.

d. Take action to remove obsolete TMDE from authorization documents.

e. Review, prioritize, and validate requirements.

f. Validate the prioritization of test equipment modernization (TEMOD) as established by the TEMOD Working Group (WG) annually.

2–4. The Deputy Chief of Staff, G–8

The DCS, G–8 will—

a. Coordinate TMDE requirements and authorization strategy with DCS, G–3 and DCS, G–4.

b. Ensure that MANPRINT analysis for TMDE is considered in the user testing programs and in estimating requirements for training programs according to AR 602–2.

c. Ensure an active program is implemented to modernize the Army's inventory of TMDE and calibration equipment.

d. Resource TMDE, ED/EP, calibration and repair support (C&RS), and IETM requirements.

2–5. The Director, Army National Guard and the Chief, Army Reserve

The Director, Army National Guard (DANG) and the Chief, Army Reserve (CAR) will—

a. Establish and maintain a command TMDE management program that provides for the support and control of TMDE in accordance with this regulation and Technical Bulletin (TB) 750–25. The DANG and the CAR are responsible for overall TMDE equipment policy and guidance that applies to the Army National Guard of the United States/Army National Guard (ARNG) and/or the U.S. Army Reserve (USAR).

b. The DANG will ensure that ARNG elements that provide C&RS are restricted to the support of the ARNG, the USAR, and the Active Army. Support capability beyond T-level will not be instituted without coordination with the USATA and subsequent approval of the Commanding General (CG), U.S. Army Materiel Command (AMC), who is the national sustainment maintenance manager.

2–6. The Commanding General, U.S. Army Materiel Command

The CG, AMC, as the national sustainment maintenance manager for the Army, will—

a. Lead the Army TMDE program.

b. Manage the DA TMDE C&RS program as specified in this regulation.

c. Develop organizational concepts to support national sustainment maintenance operations.

d. Provide for the development and publication of TMDE calibration procedures to support the DA TMDE C&RS program.

e. Plan, program, and budget for TMDE C&RS, and TPS.

f. Plan, manage and program funds to sustain ED/EP and IETM specifications and standards.

g. Plan, manage and program funds to verify and maintain the Army website for electronic technical manuals (ETMs) and IETMs.

h. Maintain and staff the Army Primary Standards Laboratory (APSL) to provide direct measurement traceability to the NIST, calibrate and repair any TMDE necessary to support the worldwide C&RS laboratory mission, and maintain a metrology technology base program dedicated to developing and testing new measurement technologies.

i. Maintain and staff AMC worldwide organizational elements responsible for secondary transfer level and secondary reference level TMDE C&RS missions.

j. Provide nucleonics, radiation dosimetry, and health physics services, to include—

(1) Dosimetry service worldwide and maintenance of an Army dosimetry records repository.

(2) Radioactive source leak test analysis services, specialized radiation monitoring equipment, and support services and quality assurance program for dosimetry and counting laboratories through radiation, detection, identification, and computation (RADIAC) instrumentation and counting standards traceability to NIST.

(3) Emergency health physics assistance, radiation facility design review, and technical assistance and technical interface while ensuring National Regulatory Commission compliance.

k. Review and coordinate maintenance support plans and integrated logistics support plans and participate in

preacquisition reviews and evaluation and verification of hardware and associated publications required for operation, calibration, and maintenance of system unique to ATE within the major subordinate command (MSC).

l. Establish, manage, and execute the Army TMDE C&RS quality assurance program.

m. Develop, establish, and maintain a central TMDE C&RS data collection and management information system that will provide performance reliability, maintenance management, and program administration information for the Army.

n. Provide information to the TEMOD WG concerning TMDE that is no longer supportable.

o. Manage Army data standards for IETMs.

p. Through delegation to commanders of AMC (MSCs)—

(1) Establish and maintain a TPS center for coordination of TPS development, acquisition, fielding, requisition, and support.

(2) Maintain organic capability for development, maintenance, and support of commodity-managed TPSs.

q. Through the MSC ATE/TPS center managers—

(1) Provide TPS technical and management support to materiel developers/managers.

(2) Assist materiel developers in preparation of the TPS management plans (TPSMPs) and all updates and revisions to TPSMPs.

(3) Serve as the principal reviewing agency of TPSMPs.

(4) Maintain a TPS database for commodity-oriented TPSs.

(5) Provide TPS postdeployment support to include: assistance in the field to accomplish onsite definition, identification of TPS problems, TPS installation, and participation in TPS certification.

2–7. The Commanding General, U.S. Army Training and Doctrine Command

The CG, U.S. Army Training and Doctrine Command (TRADOC), as combat and training developer, will—

a. Develop doctrine and organizational concepts for field Army operations and application of TMDE to include maintenance support.

b. Ensure new Army concepts, doctrine, and organizations affecting TMDE and calibration are coordinated with the DCS, G–4, DCS, G–3, DCS, G–8, AMC, and the TMDE program manager.

c. Designate a school as the training proponent for each item of TMDE and provide training on TMDE use, calibration, and maintenance.

d. Review supported end item requirements documents to ensure that they are consistent with Army TMDE and calibration policy.

e. Prepare and staff TMDE and calibration requirements documents.

f. Review and comment on TMDE and calibration adequacy in materiel system acquisition documents, equipment publications, and test and evaluation master plans (TEMP).

g. Verify that—

(1) TMDE and military occupational specialty (MOS) development are satisfactorily addressed in basis-of-issue plans (BOIPs).

(2) TMDE and calibration program requirements are documented during preparation and submission of the BOIP.

h. Prepare TMDE and calibration test issues and criteria and provide them to the user tester for integration into the TEMP.

i. Ensure that training, including calibration training, is addressed during the TMDE acquisition process.

j. Establish and chair the TEMOD WG to establish a modern TMDE inventory for the Army.

k. Periodically review maintenance programs of instruction to determine that TMDE and calibration are adequately addressed.

l. Ensure that MANPRINT analysis is considered and applied to each TMDE system or separate items of equipment in accordance with AR 602–2.

m. Coordinate doctrinal changes that impact TMDE and calibration sustainment support with Headquarters (HQ) AMC.

2–8. Materiel developers/program executive officers, and program, project, and product managers

Army materiel developers, including PEOs and program, project, and product managers assigned logistics support/materiel acquisition missions and the U.S. Army materiel developers listed in AR 70–1, chapter 2, will—

a. Ensure that the TMDE and calibration requirements of the acquisition programs that they manage are addressed in accordance with this regulation. These requirements will be considered during all phases of assigned acquisition programs.

b. Coordinate TMDE and calibration requirements with the TMDE program manager and U.S. Army TMDE activity (USATA) to leverage horizontal solutions where appropriate.

c. Use existing TMDE, including Army standard ATE and the preferred item list (PIL) in DA Pamphlet (PAM) 700–21–1, items for nonembedded solutions prior to developing any new TMDE solutions.

d. Provide USATA with appropriate engineering and logistics data required to develop calibration supportability and to certify support ability of TMDE prior to fielding.

e. Coordinate and perform TMDE life-cycle planning, management, and execution consistent with this regulation. This includes managing an assigned TMDE acquisition, deployment, support, and disposal missions, and provision for the accomplishment of related actions.

f. Identify to the combat developer those materiel developments that have an impact on Army TMDE and also recommend elimination of TMDE items no longer needed in the Army inventory.

g. Ensure that TMDE requirements are addressed early in materiel systems or equipment life cycle and provide for TMDE consideration during IPRs and type classification and reclassification. For systems or equipment that require ATE, this includes the designation of the current Army standard ATE in appropriate program and contractual documents.

h. Provide for logistics support of TMDE. This includes coordinating training requirements with TRADOC, performing ILS requirements, and determining calibration requirements.

i. Participate in the Army-wide TMDE technology base program.

j. Ensure that ED, TMDE, TPSs, and IETMs are on the agenda at all program reviews.

k. Ensure that the TMDE program manager and USATA are extended participant status in the review of program documents from program initiation and at all program meetings on proponent materiel system or equipment.

l. Ensure the initial identification of TMDE C&RS requirements is made to the USATA by the materiel developer and the command responsible for TMDE materiel management.

m. Ensure that program requirements are in place, such that the operational requirements document reliability and maintainability performance and system readiness objective requirements will be achieved.

n. Provide appropriate engineering and logistic data required by USATA to develop support capability and certify supportability of TMDE before fielding.

o. In coordination with USATA, develop, evaluate, and publish calibration procedures for special purpose TMDE (TMDE–SP).

p. Through coordination with USATA, ensure that calibration procedures and maintenance manuals for C&RS are available before or concurrent with the initial issue of the TMDE.

q. Ensure that foreign military sales (FMS) involving TMDE are coordinated with USATA for C&RS requirements.

r. Ensure that MANPRINT analysis is performed according to AR 602–2 on each item of equipment covered by this regulation.

s. Prepare a TPSMP for each system that will, or is expected to, require automatic testing in accordance with this regulation and coordinate TPS development and fielding actions with the supporting MSC ATE/TPS center.

t. Acquire TPS support for the supported system in accordance with requirements in this regulation.

u. Establish a Memorandum of Understanding with an AMC MSC for the purpose of identifying principal ATE/TPS center support.

v. Coordinate TPS development and fielding actions with the assigned TRADOC combat developer and training developer.

2–9. The Commander, U.S. Army Test and Evaluation Command

The Commander, U.S. Army Test and Evaluation Command will execute TMDE operational test and evaluation functions identified in the TEMP. This includes consideration of TMDE issues in test reports and independent evaluation reports.

2–10. Commanders at all levels

Commanders at all levels will—

a. Designate in writing a calibration coordinator.

b. Coordinate war, emergency, and contingency plans with USATA when TMDE calibration and repair support is a requirement.

c. Coordinate major changes that impact C&RS requirements provided by AMC elements with the USATA.

d. Identify their TMDE support requirements to the USATA supporting organizations.

e. Compare their property books, or TMDE inventory, with TB 43–180 to initially determine the C&RS requirements for their instruments. Upon request, the supporting TMDE support activity (TSA) can provide technical assistance to the TMDE owners/users in their identification of TMDE requiring support.

f. Ensure all TMDE is identified to include TMDE that may be embedded in sets, kits, outfits, or other assemblages. Initial identification of TMDE requiring C&RS will be coordinated with the TSA or the field/sustainment unit for proper documentation. Additions, changes, and deletions in TMDE inventories that require C&RS shall be identified to the supporting activity calibration coordinator.

g. Turn in TMDE, to include all operator documentation and basic issue items that are in excess of authorizations, through appropriate channels, for redistribution.

h. Develop and execute training programs that will attain and maintain the highest level of proficiency among personnel in the use, maintenance, and calibration of TMDE. These programs should supplement the TRADOC TMDE program-training base.

i. Ensure that TMDE acquisition requests are submitted according to this regulation.

j. Use TMDE pools, where feasible, at installation-type activities to get the best use of TMDE assets and to control use of high-demand and low-density TMDE.

k. Report TMDE problems that affect unit readiness.

l. Ensure that subordinate installations and activities identify to the USATA their need for support services from the U.S. Army Primary Standards Laboratory (USAPSL) and the NIST.

m. Identify required C&RS services to HQ, USATA, or the appropriate USATA support activity.

n. Coordinate precise time and time interval (PTTI) requirements with the Army PTTI coordinators at the USATA.

o. Take appropriate actions to remove unnecessary and/or outdated TMDE from their requirements and authorizations documents.

p. Participate in the TEMOD WG that is held annually (major Army command (MACOM) level requirement only)

Chapter 3
Army TMDE Administration and Policy

Section I
Administration

3–1. Army TMDE basics

a. TMDE encompasses—

(1) Equipment and instruments capable of performing one or more-functional capabilities involving testing, measurement, and diagnostics.

(2) ATE.

(3) Physical/dimensional, radiological and electrical/electronic type instruments and equipment.

b. TPSs encompass—

(1) Test program (TP)

(2) Test program hardware (TPH)

(3) Applicable documentation

c. Embedded diagnostics and prognostics encompass—

(1) Sensors including microelectrical mechanical systems.

(2) Data buses and data storage devices.

(3) Platform/equipment central processing units.

(4) Smart wiring technologies.

(5) Compatible automatic identification technologies.

(6) Diagnostic functionality of health monitoring systems and IETMs.

(7) Prognostics functionality as it relates to equipment/platform health.

d. Diagnostic and prognostic information associated with embedded or separate platform software and IETMs encompasses—

(1) Data standards.

(2) Handling and archiving of technical data including diagnostic specific data.

(3) Fault isolation and diagnostic trees, wiring diagrams and related tools.

(4) Standards for repair procedures.

(5) Embedded training for component replacement, system repair and related maintenance checks and services.

3–2. Army-wide use of TMDE and the role of calibration

a. TMDE is essential to Army maintenance because of its distinctive ability to test, adjust, synchronize, repair, and verify accuracy, safety, readiness, and information assurance of weapon platforms and equipment using highly precise measurements across the physical/dimensional, radiological, electrical, electronic and electro-optical spectrums. Because of this, TMDE is recognized as a unique commodity of equipment that requires centralized acquisition and support considerations.

b. Calibrated TMDE used in Army maintenance replicates the precision, performance, and safety that are built into equipment during the manufacturing process. The capability of Army weapon platform mechanical systems, radios and

communication devices, radar systems, targeting devices and fire control systems, missiles, and aviation platforms to operate accurately and effectively depend on the synchronization of these precise measurements against known standards.

c. The Army uses calibration sets as the transfer mechanism to reflect national and international standards in our TMDE and ultimately weapon platforms, and to ensure standards are consistently maintained.

d. The Army chain of custody (traceability, reference MIL-STD 1839)) for these standards begins at NIST and the APSL at USATA. Because of this critical requirement, materiel acquisition will not be accomplished without carefully reviewing existing capability and coordinating with the AMC for calibration and repair support C&RS requirements early in the acquisition life cycle.

3–3. Management structure

a. The DA focal point for TMDE policy is the DCS, G–4. To aid in the effective development, distribution, calibration repair, funding, and modernization of all TMDE, a total Army centralized management structure under HQDA has been established.

b. The CG, USAMC, as the national sustainment maintenance manager for the Army, will lead the TMDE program.

c. The CG, USAMC and the Army Acquisition Executive (AAE) are the principal agents for executing Army TMDE policy and program. In this specified management structure (fig 3–1), each agent is designated authority to recommend TMDE policy to HQDA and to plan, program, budget, acquire, deploy, sustain, and otherwise manage DA TMDE functions within their assigned areas of responsibility.

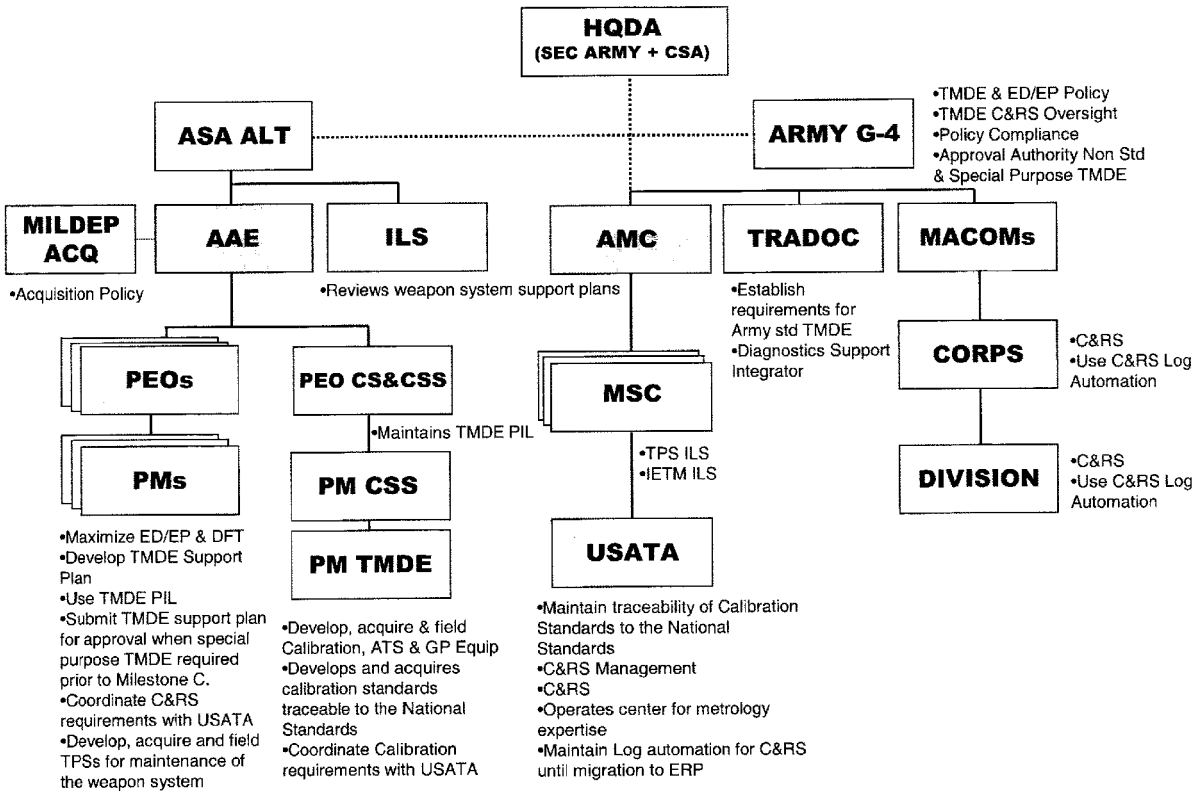

Figure 3–1. TMDE management structure

d. To facilitate effective execution of the Army TMDE mission, the Army designates the following organizations as key for executing Army TMDE policy:

(1) TRADOC.

(2) PEOs, program and project managers, and product managers.

(3) USATA.

(4) The TMDE program manager.

(5) AMC MSCs.

e. The MACOMs and subordinates are the users of the TMDE.

3–4. Automatic test system program

The TMDE program manager, under the direction of the AAE, will maintain an automatic test system (ATS) program to—

a. Manage the Army standard ATE family and acquisition of standard ATE.

b. As part of the standard ATE family, develop and maintain at-platform ATE to enhance readiness and support Army IETMs requirements.

c. As part of the standard ATE family, develop and maintain a standard off-platform tester to enhance readiness and reduce the logistics footprint.

d. Maintain an active research and development program to promote an open ATE system architecture and incorporate commercial standards into the Army ATE environment as needed.

e. Provide assistance to Army materiel developers in their efforts to employ the Army standard ATE in support of their systems.

f. Interface with the other services in a continuous effort to achieve maximum beneficial interservice standardization.

3–5. Test equipment modernization program

a. The TMDE program manager, under the direction of the AAE, will maintain a TEMOD program to—

(1) Introduce a minimum ensemble of different types and models of commercial standard TMDE into the Army inventory to support the requirements of numerous weapon platforms and equipment end items.

(2) Replace multiple generic types of TMDE with a single new item of Army standard TMDE where feasible, practical, and cost effective.

(3) Provide direction to the Army for disposition of items being displaced by a TEMOD fielding.

(4) Assess the Army inventory to identify TMDE or families of TMDE that require replacement or acquisition.

b. The Combined Arms Support Command (CASCOM) will conduct an annual TEMOD WG, which will include representatives from the TMDE program manager, materiel developers, Army Materiel Systems Analysis Activity, and USATA to ensure requirements for the modernization of Army TMDE inventory are identified and properly prioritized. The TEMOD WG will prioritize the resulting requirements and submit their recommendation to the DCS, G–3 for approval.

3–6. Calibration sets and standards program

a. The TMDE program manager, under the direction of the AAE, will maintain a calibration sets modernization program to—

(1) Develop, in coordination with AMC, USATA, and the combat developer, the required calibration standards and associated equipment to perform the total Army TMDE calibration and repair support mission.

(2) Continually assess the TMDE inventory to ensure its adequacy and to ensure that the accuracy of calibration standards is traceable from the user to NIST.

b. The TMDE program manager will provide Army calibration standards and repair equipment for all Army (table(s) of organization and equipment/table of distribution and allowances) calibration and repair support missions.

3–7. Management assessment

a. Product managers will include the TMDE program manager and USATA in materiel system or equipment meetings or reviews (for example, command and program reviews, supportability strategy, integrated logistics support management team, IPRs, and test integration working groups where TMDE is an agenda item). Product managers will provide one copy of each materiel system, equipment, or TMDE program management document to USATA for review and coordination before fielding and publication.

b. The TMDE program manager and USATA will conduct or participate in assessments of developmental, non-developmental, product improvement, and fielded TMDE and supported end item programs. These assessments will

verify TMDE performance, program status, logistic supportability, and conformance to DA TMDE program requirements and objectives. This regulation contains management control provisions, identifies key management controls, and provides a checklist for conducting management control revisions (app C) in accordance with AR 11–2.

c. MACOMs will conduct staff assistance visits to field units using equipment readiness assessments and provide unit status reports (AR 220–1) to identify TMDE shortcomings to assess their TMDE programs. Field commanders are encouraged to use maintenance assistance and instruction teams, logistic assistance offices, and direct contact with AMC in resolving TMDE mission issues.

d. Adequacy of TMDE, availability, support, utility, and related issues will be topics of special interest for all field visits conducted under AR 11–1, AR 50–6, and AR 750–1.

Section II
Acquisition Guidelines, Considerations, and Policy

3–8. Requirements identification

a. The combat developer and the supported end item materiel manager will begin TMDE requirement planning early in the supported end item acquisition program.

(1) Design-for-testability (DFT) will be a TMDE and supported end item consideration before milestone A. All DFT will be designed in and validated before the milestone C decision for the supported end item acquisition program and any subsequent product improvement, with emphasis on reducing requirements for system-peculiar TMDE.

(2) The equipment design and the logistic support analysis will take into consideration alternative approaches such as—

(a) ED/EP.

(b) Built-in test (BIT) and/or built-in test equipment (BITE).

(c) Automatic or manual TMDE.

(d) Existing, augmented, or new TMDE.

(e) General purpose or special purpose TMDE.

(f) Various combinations of such approaches to optimize the selection of ED/EP, BIT/BITE, GP and SP, manual TMDE, and ATE. The same TMDE multiple levels of maintenance will be considered to achieve vertical TMDE standardization. These efforts and related tradeoffs involving life-cycle cost and operational readiness should result in a supported end-item maintenance concept that identifies all TMDE requirements at the time of entry into engineering and manufacturing development (milestone B).

b. During development of new materiel/weapon systems, the initial identification of TMDE C&RS and ATE requirements will be provided to the USATA and the TMDE program manager by the appropriate materiel developer. Command agencies with selected TMDE from the U.S. Army inventory will identify to the USATA TMDE C&RS requirements as they apply in support of their systems. Initial calibration intervals may be established either by selecting the interval of a like item from TB 43–180, the manufacturer's recommendation, or sound engineering advice. Calibration intervals will be reduced, or extended as required, to maintain established levels of instrument reliability. Items such as gages, meters, and valves contained in utility systems, firefighting systems, other similar systems, and instrumentation not used to make quantitative measurements will not be considered appropriate for periodic calibration unless the owner/user requests such service on the basis of critical application involving security, health, safety, and damage to property.

c. Each TMDE item selected for use in or in support of an end item will be identified to USATA. The materiel developer will use DA Form 3758–R (Calibration and Repair Requirement worksheet) in accordance with TB 750–25 to accomplish the identification.

(1) USATA will validate the need for use of other than general-purpose TMDE (TMDE–GP) and will determine the level of support concept. The level of support decision will be based on the premise that USATA will provide C&RS for all Army TMDE.

(2) The designation of TMDE–SP to be supported by maintenance units (or sources other than USATA) will be on an exception basis approved by the combat developer and USATA.

(3) The decision to designate other than USATA for C&RS will be based on the need for skills or training not available or provided to the appropriate military or DA civilian technicians.

(4) To designate an item of TMDE–SP as F-level in TB 43–180—that is, to be supported by field/sustainment units—the support units must be authorized appropriate equipment and trained personnel to perform the F-level support function.

3–9. Determining TMDE need

The end-item requirement for TMDE will consider—

a. Optimum use of ED and EP on a weapon system or equipment end item.

b. Optimum level of BIT/BITE for on-system line replaceable unit (LRU) failure identification or isolation as justified by cost effectiveness, mission requirements, and technical feasibility.

c. ED/EP/BIT/BITE design will consider—

(1) Reliability, maintainability and operational readiness goals.

(2) Operations and support costs.

(3) Design for testability of equipment end items, and line replaceable units or modules.

(4) Use of modular construction

(5) Mission requirements and operator constraints

(6) Interface requirements with TMDE to fault isolate subassemblies when removed from an end item.

(7) Impact on MOS and DA civilian technical skills.

d. Alternatives to satisfy the end item TMDE need when the use of a TMDE PIL has proven to be inappropriate, such as—

(1) Modification, augmentation, adaptation, or product improvement of existing TMDE.

(2) Acquisition of existing nondevelopmental item or other viable alternatives.

e. Development of new TMDE will be considered only when all other viable alternatives are proven not to be acceptable.

3–10. TMDE design requirement

a. New TMDE will be designed to conform to the design criteria, parameters, and test requirements specified in approved requirements documents. TMDE design will incorporate modular design and open architecture and support Army maintenance policy outlined in AR 750–1, chapter 3, section I. Emphasis will be placed on TMDE design that promotes general-purpose use, optimizes equipment-operator interface, and minimizes reliance on contractor or depot level support.

b. Design for testability of the TMDE and supported end item will be emphasized to promote interface compatibility and ease of testing.

3–11. Acquisition strategy

a. TRADOC, in coordination with USATA and the TMDE program manager will establish requirements for the modernization and development of Army standard TMDE.

b. ASA(ALT), in coordination with the TMDE program manager and USATA, will review and approve all weapons systems support plans requiring the acquisition of TMDE.

c. ASA(ALT), (PEO, Combat Support/Combat Service Support) will maintain a TMDE PIL.

d. The TMDE program manager will develop, acquire, and field Army standard TMDE (for example, calibration, ATS, and general-purpose test equipment.)

e. The TMDE program manager will develop and acquire all calibration standards (primary, secondary, and transfer laboratory) traceable to the National Standards.

f. Program managers will develop and incorporate ED/EP capabilities in coordination with TRADOC on all new and retrofit equipment.

g. Program managers will maximize DFT early in the acquisition process.

h. Program managers and other purchasers of TMDE will document the use of the TMDE decision tree to determine their TMDE support plan.

i. Program managers will obtain TMDE program manager review and, if necessary, the approval of the TMDE support plan prior to milestone C.

j. Program managers will make maximum use of TMDE from the PIL.

k. Program managers will coordinate C&RS TMDE requirements with USATA.

l. Program managers will develop acquire and field TPSs and IETMs for Army standard ATS for the maintenance of the weapon system.

(1) TPSs will conform to Military Performance Specifications (MIL–PRF) 32070 and 49503B.

(2) IETMs will conform to Military Standard (MIL–STD) 2361B and 40051B.

3–12. End item and TMDE interface

a. Acquisition strategy for TMDE and scheduling will be compatible with the end item acquisition strategy and scheduling.

b. Evaluation of TMDE requirements, performance, and adequacy in relation to the end item will occur continuously during the developmental testing (DT) and operational testing (OT) process.

(1) The DT/OT process for new or product improved TMDE will verify the achievement of TMDE performance, durability, environmental resistance, and reliability, availability, and maintainability goals. Use of the TMDE, on an as-required basis, to support the end item DT/OT will not be accepted as having satisfied the TMDE DT/OT test requirements.

(2) Test criteria and issues (both critical and noncritical) for TMDE will be identified in applicable test documents.

(3) Support for TMDE and related support will be made available for the end item DT/OT as part of the system support package (AR 700–127) to assure complete TMDE evaluation.

c. TMDE acquired for depot type use or government-furnished TMDE for contractor depot maintenance will be specified in the end item depot maintenance support plan and depot maintenance work requirements or contractual equivalents. For ATE, the Army standard will be specified in accordance with the ATE policy. Evaluation of depot TMDE adequacy will occur during end item pilot overhaul or contractual equivalent.

d. TMDE will be type classified consistent with AR 70–1. The end item materiel manager will develop and implement a milestone plan to resolve any TMDE issues remaining at the time of type classification of the supported end item.

e. Required TMDE and related TMDE logistic support for all levels of maintenance will be made available to the field before or will be concurrent with release of the end items (AR 70–1 and AR 700–127).

3–13. Reduction of TMDE inventory

USATA, in coordination with the TMDE program manager and TRADOC, will ensure that procedures are developed and implemented to optimize the capability of TMDE and reduce the inventory at all levels of maintenance. Procedures will include—

a. Identification of marginally effective or nonutility TMDE through a process of requirements validation.

b. Recommend replacement of marginally effective TMDE or TMDE with significant support or operational deficiencies.

3–14. Department of the Army TMDE preferred items list

The DA TMDE PIL will be maintained by the TMDE program manager for the ASA(ALT) and will be used as the preferred acquisition guideline for procurement or reprocurement of Army TMDE. The TMDE PIL objectives and policy are outlined in chapter 4.

3–15. Hot mockups

Use of hot mockups or the substitution of known good subcomponents, in lieu of suitable TMDE, is not authorized. Request for an exception to policy will be submitted to the TMDE program manager, who may approve the request or recommend disapproval. Final disapproval authority will reside with HQDA, DCS, G–4 (DALO–SMM). Request for exceptions will be supported with validated economic and technical analysis that verify the recommended maintenance procedure to be the most cost-effective and responsive alternative.

Section III
TMDE Logistics Support Guidelines, Considerations, and Policy

3–16. Integrated logistics support strategy

a. AMC will maintain traceability of calibration standards to the National Standards.

b. AMC will provide and manage C&RS for the Army.

c. AMC will provide TPS and IETM ILS.

d. AMC will develop and maintain logistics automation to manage Army C&RS requirements until migration to enterprise resource planning (ERP).

e. Army units will maintain traceability of weapons platforms and equipment to the National Standard by ensuring all required TMDE is properly enrolled and calibrated in accordance with this policy.

f. Army Units will use TMDE logistics automation to manage C&RS requirements until migration to ERP.

3–17. TMDE readiness

TMDE system readiness will be correlated to weapon system readiness and will be considered for inclusion in AR 700–138.

3–18. TMDE calibration and repair support

a. To ensure that the objectives of the materiel release process (AR 700–142) are met, USATA will issue a TMDE supportability statement for each system prior to its release to the user. Provide a TMDE statement of nonapplicability if TMDE is not required. The supportability statement will address the adequacy of—

(1) Calibration and repair procedures.

(2) Supply support.

(3) Maintenance and training.

(4) TMDE calibration equipment specified to accomplish the repair and calibration mission.

(5) Technical data.

b. The TMDE supportability statement will be an integral part of the documentation package prepared to support a

type-classification, production, or fielding decision. Release of TMDE to the user will not occur without a favorable supportability statement. Chapter 6 contains additional guidance concerning C&RS.

3–19. TMDE management information systems

a. The USATA will maintain a comprehensive TMDE management information system (TEMIS) to assist the DA in effective planning and execution of the TMDE program.

b. USATA and HQ AMC will transition TEMIS functionality and information requirements to ERP application of the logistics enterprise.

c. The management information system will—

(1) Provide users and managers with comprehensive data related to the planning, budgeting, development, acquisition, testing, use, and disposition of Army TMDE.

(2) Provide an automated means to collect and maintain TMDE management information.

(3) Provide an interface capability between TMDE integrated materiel management system (TIMMS) and the Army's standard supply system.

3–20. Test program sets

TPSs needed to support a specific end item will be planned, funded, acquired, tested, evaluated, deployed, and modified in accordance with chapter 5 of this regulation and DA Pam 750–43. TPSs will be type classified as part of the weapon system that they support. A TPSMP will be developed during the development prove out phase of system acquisition, and will serve as the central document to guide planning, development, acquisition, and maintenance of the TPSs. The TPSMP will be included as part of the supportability strategy.

3–21. Safety considerations

Army TMDE will be acquired, operated, supported, and disposed of in accordance with applicable safety requirements in accordance with AR 385–16.

3–22. Security considerations

a. All TMDE will be acquired and fielded consistent with AR 380–5 security provisions. Protection of classified information handled by automatic TMDE will be accomplished in accordance with AR 380–40.

b. Classified TPSs will not be released to the field unless a validated requirement exists and the TMDE user has satisfied regulatory security provisions. The user's capability and costs associated with the operation and storage of classified TPSs will be addressed when deciding to develop and field classified TPSs.

3–23. Manpower requirements criteria

Manpower requirements criteria will be developed for each TMDE item that requires maintenance support, including calibration and repair. The combat developer in coordination with USATA will generate, process, update, and use the data consistent with AR 71–32.

3–24. Logistics control code

All TMDE that are type classified as standard will be assigned a logistics control code of "A" and a reportable item control code of 2 in accordance with AR 708–1. The logistics control code must change whenever a TMDE item is being replaced with new TMDE.

3–25. Equipment improvement report and maintenance digest

The USATA will publish, as required, an equipment improvement report and digest of technical information, maintenance instructions, and administrative and management guidance of interest to the TMDE developer, materiel manager, user, and maintainer.

Chapter 4
TMDE Acquisition

Section I
Acquisition Process

4–1. General

a. This chapter applies to all types of TMDE. Weapon system developers and system managers requiring TMDE will obtain acquisition approval as documented in this regulation for all TMDE procured for Army use (fig 4–1) unless exempted by paragraph 4–2.

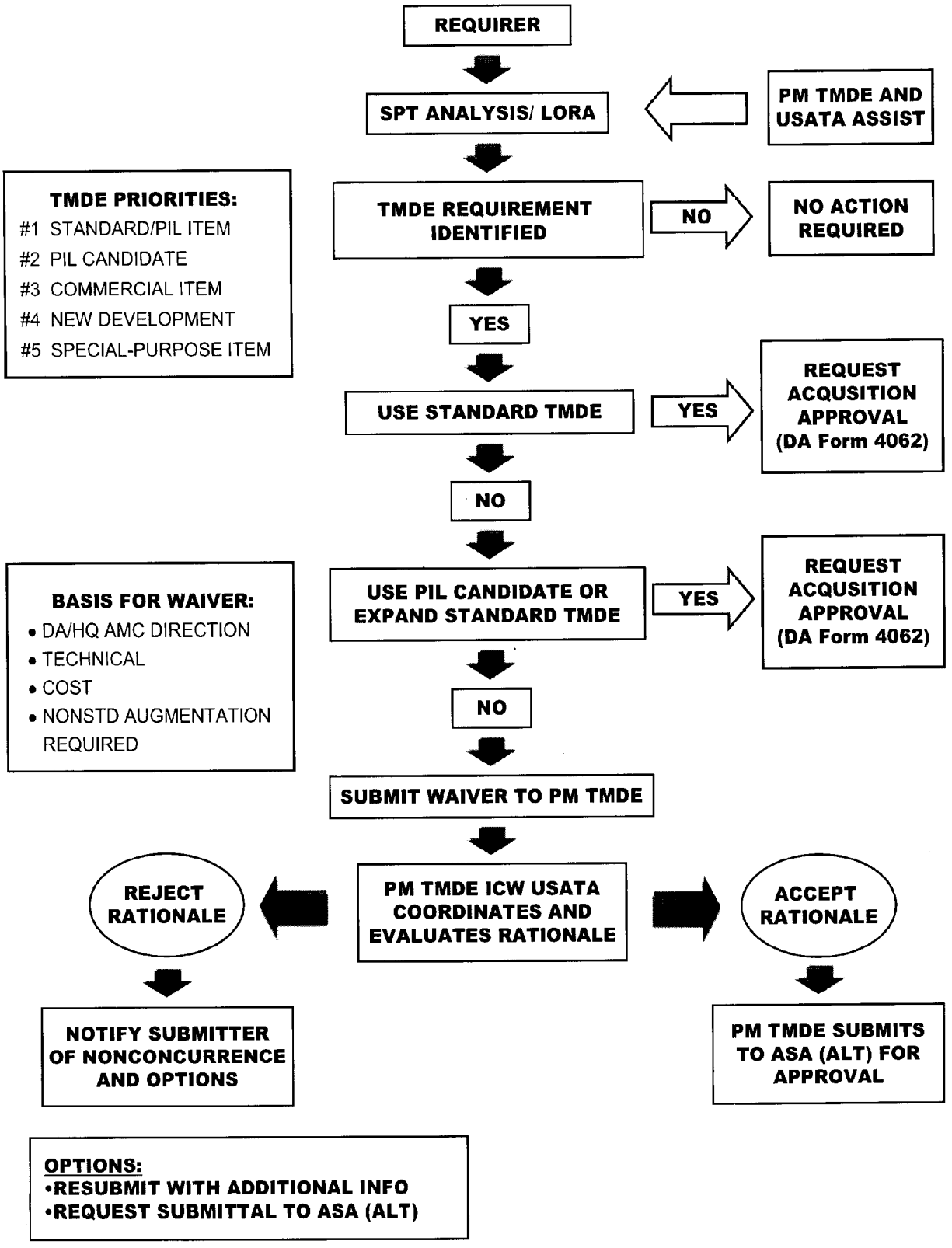

Figure 4–1. TMDE selection process

b. Weapon system developers and system managers will complete requests for TMDE acquisition approval according to this chapter and send the requests to the TMDE Program Manager, SFAE–CSS–CS–T, Redstone Arsenal, AL 35898–5400.

c. TMDE acquisition requests approved under the provisions of this regulation are subject to all provisions of the applicable procurement regulations.

d. To optimize cost effectiveness and supportability, the TMDE program manager will procure all general-purpose TMDE required by Army elements except for items exempted by paragraph 4–2.

4–2. Equipment exempt from acquisition approval requirement

The following items are exempt from the acquisition approval requirement unless the materiel developer requires C&RS:

a. Items procured for FMS or other services.

b. Items procured for research, development, test, and evaluation (RDTE) applications and that will not be deployed to the Army in the field.

c. Accessory equipment, to include shipping and storage containers.

d. Breakout boxes and devices (for example, dividers, probes, samplers, sensors, and similar devices).

e. Class IX repair parts (for example, panel meters, gages, indicators, liquid crystal displays, and light emitting diodes).

f. Dummy loads.

g. Electrical counting devices (does not include frequency counters, thermoluminescent dosimetry reader devices, and nuclear radiation counting equipment such as liquid scintillation and alpha-beta-gamma counting systems).

h. Electrical coupling, matching, interconnection, and distribution devices.

i. Electrical and electronic filters and mixers.

j. Mounting devices.

k. Attenuators.

l. Physical measuring devices (such as weighing scales, and tensiometers).

m. Test chambers.

n. Torque wrenches, screwdrivers, and torque drivers.

o. Variable and fixed capacitors, inductors, and resisters (including decade boxes).

p. Power supplies and converting devices (programmable, intelligent power supplies are not exempt).

q. Medical equipment used for patient diagnosis/prognosis.

4–3. TMDE research, development, test, and evaluation controls

Managers will send all requests for conduct of metrology research and exploratory development and for development of special-purpose TMDE to the TMDE Program Manager, SFAE–CSS–ME–T, Redstone Arsenal, AL 35898–5400 for review prior to initiation of the project. The review requirement is applicable for all programs and activities that address testability, advanced BIT/BITE concepts, improved digital and automatic testing methods, and other RDTE-funded programs involving test, measurement, and diagnostic functions and equipment.

Section II
TMDE Selection Process

4–4. General

Once the materiel developer identifies the need for TMDE, in accordance with chapter 3, section II, the materiel developer, in coordination with the TMDE program manager, will use the process outlined in figure 4–1 to select the TMDE. Throughout the selection process, cost effectiveness and supportability will be prime considerations.

4–5. Selection process

a. The selection process defined in figure 4–1 has been established to encourage—

(1) TMDE standardization.

(2) Elimination of duplicate TMDE development efforts.

(3) Prevention of TMDE makes and model proliferation.

b. The most modern and proven TMDE available within the Army inventory and the one requiring the least amount of justification and approval will be the preferred selection. The DA TMDE PIL items and PIL candidates include TMDE and ATE designated as Army standards.

c. The Army standard is the required selection unless a waiver is approved in accordance with paragraph 4–7.

Section III
TMDE Acquisition Process

4–6. TMDE acquisition process

a. TMDE acquisition approval constitutes an agreement that the specified configuration and quantity of TMDE will be acquired for the purpose intended. Weapon system developers/system managers will request and receive acquisition approval for TMDE—

(1) Prior to notifying the TMDE program manager of the need for procurement.

(2) For all TMDE purchased for Army use, including TMDE to be used in contractor facilities or by other government organizations, unless exempted by paragraph 4–2.

(3) For leased TMDE.

b. Acquisition approval signifies Army approval to procure a TMDE item that—

(1) Satisfies the application requirement as identified in the acquisition request.

(2) Satisfies the technical and cost constants and specifications of the TMDE item identified in the acquisition request.

c. Acquisition requests for TMDE will be submitted on DA Form 4062 (TMDE Acquisition Approval Analysis Data). Instructions for completing DA Form 4062 are contained in appendix B.

d. Weapon system developers/system managers will forward requests to the TMDE program manager at least 90 days (120 days for ATE) prior to anticipated contractual or in-house commitment to procure the TMDE.

e. The TMDE program manager will approve requests for items complying with the established selection process (fig 4–1). Requests that deviate from the established selection process will be forwarded to the responsible official for sustainment within ASA(ALT) for a final decision.

f. Results of each acquisition request reviewed will be provided to the originator and the TMDE materiel manager. An alternative with supporting rationale will be recommended where the requested TMDE is not deemed appropriate.

g. For TMDE not type classified standard, the materiel manager will follow the applicable type classification guidance in AR 70–1 and provide to the TMDE program manager a type classification milestone schedule with the DA Form 4062.

h. Product managers and TMDE materiel managers will ensure that a DA Form 4062 is submitted for all conceptual and developmental TMDE. An updated form will be submitted annually, at a minimum, or when major characteristics change, until the conceptual and developmental item is approved for full-rate production.

4–7. TMDE waiver procedures

On determination that TMDE is required and the designated standard TMDE/ATE hardware/software cannot be used or expanded in capability or that it is not cost effective to accommodate the test requirements, the system developer will prepare a request for waiver.

a. The developer or requiring activity will determine the basis for a waiver and will identify alternate or candidate TMDE systems based on the priorities established in figure 4–1 and schedule.

b. The developer or requiring activity will submit a formal request for waiver to the TMDE Program Manager, SFAE–CSS–CS–T, Redstone Arsenal, AL 35898–5400. The waiver request will include a completed copy of DA Form 4062 and schematic drawings/block diagrams that depict the proposed TMDE alternative. The waiver documentation requirements are explained in detail in appendix B.

c. On receipt of the request for waiver, the TMDE program manager will confirm the basis for the waiver request and coordinate the request with other agencies (for example, HQ TRADOC, appropriate program/project managers) to establish waiver validity. The TMDE program manager and USATA will complete a technical evaluation of the waiver request.

d. After completion of the technical evaluation, if the request for waiver is judged acceptable it will be forwarded to the responsible official for sustainment within ASA(ALT) for approval. If the waiver is not endorsed, the TMDE program manager will advise the originator of the rationale for nonconcurrence. The originator may withdraw the request, submit an updated waiver request, or recommend the request be submitted to the responsible official for sustainment within ASA(ALT) for a final decision.

4–8. TMDE funding and procurement

a. The TMDE program manager will be funded for and will procure Army standard TMDE that is designated as part of the IFTE and TEMOD programs.

b. Weapon system developers, system managers, and other activities receiving approval for acquisition of general-purpose TMDE will provide funding to the TMDE program manager for procurement. The TMDE program manager will procure and provide items in accordance with the approved acquisition request.

Section IV
Automatic Test Equipment Policy and Management

4–9. General
All ATE procured by the Army for use in the field, a depot, or a contractor's production facility must be acquired in accordance with this regulation and current Army policy directives.

4–10. Automatic test equipment policy
The Integrated Family of Test Equipment (IFTE) program was established to provide a suite of at-system and off-system automatic testers to satisfy test and diagnostic requirements for Army weapon systems. IFTE is the Army standard ATE and is designated as a DOD standard. The Army will use the Army standard ATE to satisfy Army automatic test and diagnostic requirements unless ASA(ALT) approves a deviation waiver.

4–11. Determination of automatic test equipment requirements
a. System developers, in coordination with TRADOC and the TMDE program manager, will determine ATE requirements. A system level of repair analysis (LORA) will be performed. The system LORA will identify, as well as justify, ATE requirements at the various levels of maintenance.

b. The AMC MSCs and their respective ATE/TPS centers will assist system developers in preparation of the system LORA which will address the following areas:

(1) BIT/BITE requirements.

(2) TMDE requirements and alternatives, system test envelope, workload distribution, and estimated failure frequency.

(3) System maintenance plan and personnel requirements.

(4) System interface and TPS requirements.

(5) Force structure requirements.

(6) Life-cycle costs.

(7) Risk assessment.

(8) System or subsystem calibration requirements.

c. Once the ATE requirements have been identified for a system, the system developer will—

(1) Determine if use of the Army standard ATE will fulfill the ATE technical and operational requirements of the system.

(2) Determine, in coordination with the TMDE program manager, the feasibility of expanding the basic capabilities of the Army standard ATE, if the Army standard ATE does not satisfy the ATE requirements.

(3) If neither (1) nor (2) above is feasible, submit a waiver request in accordance with paragraph 4–7.

4–12. Automatic test equipment system software
a. The proponent ATE materiel manager will manage software embedded in the ATE consistent with Army policy. The materiel manager will decide how the software will be accessed, modified, and maintained. Changes to general purpose ATE system software will be coordinated with—

(1) Product managers and commands having equipment supported by the ATE.

(2) The combat developer for the supported equipment.

(3) The TMDE program manager.

(4) USATA.

(5) AMC MSCs and their respective ATE/TPS centers.

b. The ATE system software developed for and issued with the ATE is considered to be part of the ATE. The ATE system software will—

(1) Use an approved DOD high order language, be based on commercial, open systems architecture, and be NxTest compliant, as required by DOD Joint Technical Architecture policies.

(2) Be planned, acquired, verified, and deployed as outlined in the ATE acquisition strategy. System software will be a specified variable in design and logistics tradeoff analyses.

(3) Be documented in accordance with established criteria to the extent that fielded software can be used without contractor support. Necessary ATE software support items will be specified as contractually deliverable with unlimited rights for DOD.

(4) Be identified as a separate contract line item where practicable.

c. Modularity, ease of change, and transferability will be specifically addressed in software design and development plans.

d. A disciplined approach that minimizes life-cycle cost will be employed in the ATE system software design, development, programming, configuration management, and maintenance.

e. The proponent ATE materiel manager will ensure ATE system software changes and updates are tested and verified prior to release.

4–13. Automatic test equipment interface

The supported end item will have integrated into the design the necessary diagnostic connector assemblies and data buses that provide the minimum number of test connection points necessary to satisfy end item testability constraints. The design objective will be to minimize the development of TPS interconnection devices and cables necessary to diagnose and fault isolate quickly and easily a failed LRU at the location of the failed replaceable item.

4–14. Automatic test equipment selection criteria for joint programs

Each service has its own unique ATE standardization policies necessitated by basic mission differences and operational scenarios. On joint programs to minimize duplicate costs for technical publications, training, test programs sets, and other logistics factors, the following guidelines will be used:

a. BIT/BITE will be used in the design of the system to minimize reliance on off-system ATE, especially at organizational and intermediate levels.

b. Depot-level maintenance technical publications, training, TPSs, and other logistics items will be procured only for the service depots designated to perform depot-level maintenance for the joint system. Designation of the performing depots will be required early in the acquisition cycle.

Section V
Department of the Army TMDE preferred items list, DA Pam 700–21–1

4–15. General

The TMDE program manager will maintain a TMDE PIL for the ASA(ALT), to include TMDE designated as Army standard and other items sponsored by the managing commands.

4–16. Objectives of the preferred items list

The objectives of the PIL are to—

a. Provide TMDE users with a catalog of general-purpose instruments that are acceptable for Army use and that are logistically supportable and available.

b. Identify candidate instruments that are not yet qualified for the PIL but that have planned dates for type classification and system supportability.

c. Provide a listing of ATE for selection in applications for which the Army single ATE policy designated items may not be appropriate.

4–17. Preferred items list qualifications and policy

a. An item of TMDE will be added to the DA TMDE PIL when—

(1) It is Army standard general-purpose TMDE or a member of the IFTE.

(2) It is not Army standard general-purpose TMDE or IFTE, but it has been determined by the DA TMDE PIL in-process review panel to be suitable for Army use.

b. A PIL item must be type classified standard. A PIL candidate item may be type classified generic.

c. All items added to the DA TMDE PIL will have complete technical specifications.

d. An item of TMDE will be deleted from the PIL when it is no longer considered the most technically acceptable, available, or supportable Army-adopted item.

4–18. Review and update of the preferred items list

a. This regulation establishes the DA TMDE PIL in-process review panel to be chaired by the TMDE program manager and to include representatives from USATA, U.S. Army Aviation and Missile Command, the Integrated Materiel Management Center, the Ordnance Munitions and Electronics Maintenance School, the CASCOM Director of Combat Developments, and others designated by the TMDE program manager. This panel will meet annually to update the PIL.

b. The TMDE program manager will—

(1) Solicit proposed changes to the PIL and prepare a coordinating draft 90 days prior to the scheduled in-process review panel meeting.

(2) Staff the coordinating draft with panel members for review and comment.

(3) Resolve issues on PIL changes when panel consensus is not reached.

(4) Update and provide access to the PIL.

Chapter 5
Test Program Set Policy and Management

Section I
Test Program Set Policy Requirements

5–1. General

a. A TP contains the coded sequence that, when executed by an ATE, will provide—

(1) A TP, which is a coded sequence, when executed by an ATE, that causes—

(a) Unit under test (UUT) stimuli.

(b) Measurements of UUT responses.

(c) Detection of UUT faults to required levels.

(d) Isolation of UUT faults to required levels.

(e) Alignment procedures for faults correction.

(2) TPH, which are various hardware items required by a TPS to function. These may include an interface device, or a combination of an interface device, cable assembly (set), test fixture(s), holding fixture(s), accessories, and ancillary equipment.

(3) Applicable documentation, which is used for testing, fault detection and isolation, maintenance, and any other evaluations of components and equipment.

b. All TPSs procured by the Army for use in the field, at a depot, or in the system developer's production facility must be acquired in accordance with this regulation and current DOD and Army policy directives.

c. The UUT can range from the entire system or an element of the system, for example, system, LRU, line replaceable module, shop replaceable unit, or circuit card assembly. The complexity of the UUT, availability of ATE resources, and location of testing (such as at-system versus off-system) will determine the complexity and cost factors of the TPS.

5–2. Determination of test program set requirements

a. The materiel developer, in coordination with the appropriate MSC ATE/TPS center and TRADOC, will determine their TPS requirements. A system-level supportability analysis will be performed early in the acquisition life cycle to determine the level, economy, and functionality of TPS implementation at each level of maintenance. Supportability will be given equal consideration with performance, schedule, and life cycle cost. See figure 5–1 for cause and effect diagram depicting the TPS process. The MSC ATE/TPS centers will assist system developers in the preparation/ analysis of the system supportability analysis summaries that address the following areas:

(1) ED and BIT/BITE requirements.

(2) DFT and system test envelope, workload distribution, and estimated failure frequency. DFT features and the ability to design organic test and repair will be given a high level of importance when conducting trade studies. For guidance see Military Handbook (MIL–HDBK) 2165.

(3) System maintenance plan and personnel requirements.

(4) System interface and TPS requirements.

(5) Force structure requirements.

(6) Life-cycle costs.

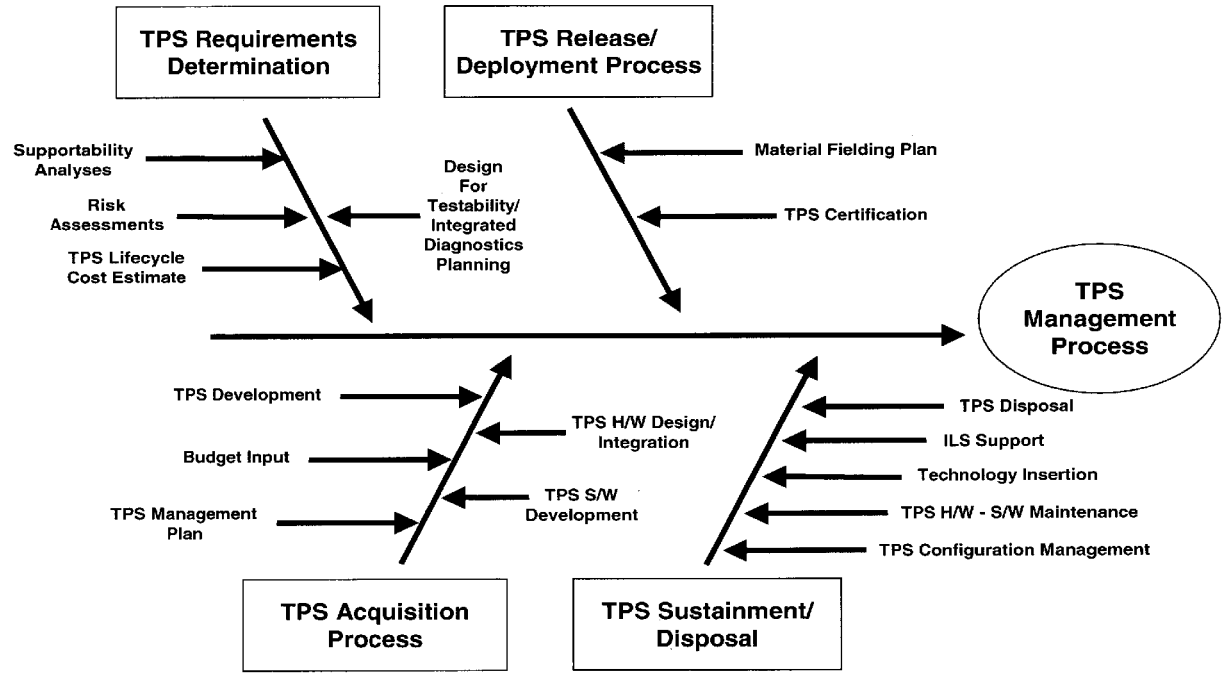

Figure 5–1. TPS process

b. In determining the life-cycle maintenance planning and risk management for the weapon system, the materiel developer, in conjunction with the appropriate MSC ATE/TPS Center and TRADOC, is responsible for conducting a risk assessment to include:

(1) Determination of risk associated with various maintenance concepts.

(a) Organic support.

(b) Warranty and after warranty expires.

(c) Contractor logistics support or no contractor logistics support.

(d) Combination of approaches.

(2) Risks associated with technology maturity and systems integration.

(3) Obsolescence risks and mitigation.

(4) System readiness and sustainment risks.

(5) Continuity of support and economic risks.

(6) Data risks and data rights to permit organic diagnostic support without recourse to any contractor assistance.

(7) Supportability risks associated with commercial items, for example, commercial off-the-shelf, and ability to organically sustain test and repair programs.

c. The TPS life-cycle cost estimation will—

(1) Determine phased cost estimate for acquisition, production, deployment, sustainment, and disposal of TPSs.

(2) Perform sensitivity analyses associated with identified risks.

5–3. Test program set acquisition

a. The materiel developer will coordinate acquisition, development, sustainment and disposal requirements for TPSs with the appropriate MSC ATE/TPS Center.

b. The materiel developer will program and budget for TPS life-cycle acquisition and support of required TPSs.

c. The MSC ATE/TPS centers will maintain an organic capability to acquire, develop, and sustain TPSs.

d. Materiel developers will utilize acquisition management services of the commodity-oriented MSC ATE/TPS centers.

e. The materiel developer will require contractors who have a requirement for TPS development/validation or special acceptance and inspection equipment (SAIE) to document those requirements for—

(1) Performance specifications allocating test requirements for production and tactical environments.

(2) Technical testability requirements in both hardware and embedded software design.

(3) Consideration to use Army standard ATE for production line testing of electronic assemblies and subassemblies to reduce life-cycle costs.

5–4. Test program set development

TPS development is possible during any stage of the material system acquisition framework (fig 5–2). Funding for TPS development will be programmed according to the materiel system life-cycle phase. TPS development for any UUT will proceed only when the design of the target UUT has begun to stabilize to reduce risk and cost. An evolutionary development program is the preferred method for TPS development as the UUT matures and risk is reduced. The materiel Developer must closely monitor and control UUT design stability consistent with TPS support requirements and the TPS schedule. The items below are necessary to initiate a TPS development program, either by contractor or organic MSC ATE/TPS Center. The following items will be supplied by the materiel developer to the TPS developer and coordinated with the TRADOC combat developer and training developer to reduce the risks associated with TPS development schedule and costs due to inadequate data or resources to support the development process:

a. UUT requirements.

(1) Current configuration of the UUT, for example, system, line replaceable unit, line replaceable module, shop replaceable unit, and circuit card assembly.

(2) Performance and product specifications.

(3) Theory of operation and/or maintenance manuals.

(4) Failure modes, effect, and criticality analysis data.

(5) Testability requirements data for production and tactical certification.

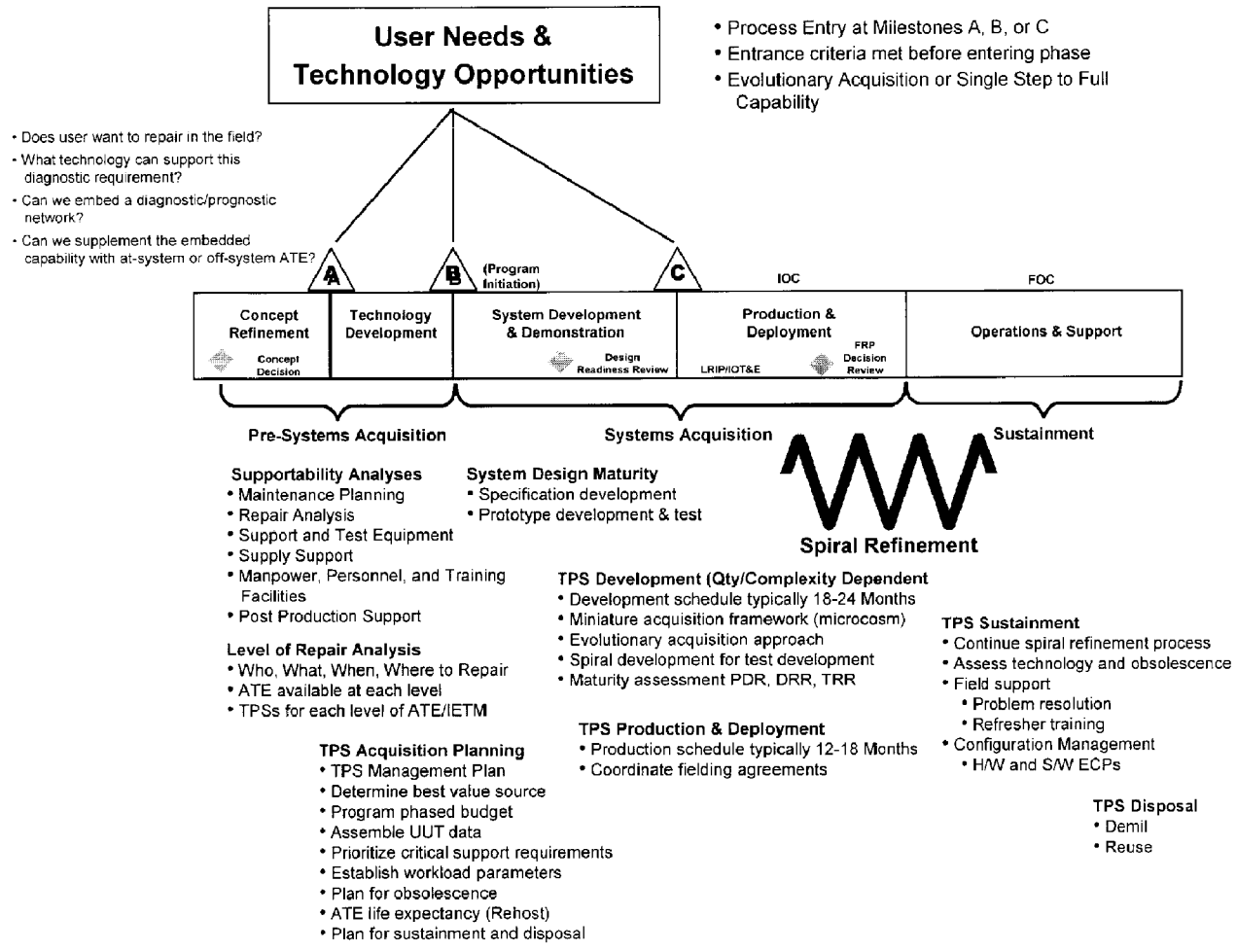

Figure 5–2. Materiel system acquisition framework—TPS considerations

b. ATE requirements.

(1) Target ATE or negotiate access to MSC ATE/TPS center resources.

(2) Performance and product specifications.

c. Statement of objectives considerations. The TPS statement of objectives considerations will state the objectives of the automatic test program in enough detail so that the TPS will be evaluated against it at the various design reviews and audits.

d. Data and data rights. These will include, but not be limited to, maintenance and repair procedures, source files required to regenerate the TP executable, test software embedded or downloaded to UUTs, and code and software development station configuration information.

Section II
Test Program Set Management

5–5. General

The materiel developer will address TPS requirements as a major element in all phases of the supported system life cycle. See figure 5–2 for material system TPS management timeline. The TPS life-cycle management will be a separate and distinct action in the supported system's life cycle. DA Pam 750–43 addresses specific TPS management requirements.

a. All TPS planning will be initiated as early in the supported system's life cycle as is practical. All TPS management responsibilities will be included in the prime system acquisition strategy.

b. The central document for planning, monitoring, and controlling TPS development, acquisition, and maintenance throughout the system life cycle is the TPSMP.

(1) The materiel developer is responsible for developing a TPSMP. The TPSMP will be coordinated with the appropriate MSC ATE/TPS Center and TMDE program manager.

(2) The MSC ATE/TPS Center manager will act as the principal staff advisor to the materiel developer and will actively assist in the development of the TPSMP.

c. The MSC ATE/TPS centers will support management of TPSs. Materiel developers under Total Life-Cycle System Management or AMC must program funding for matrix support from the appropriate MSC ATE/TPS center to provide logistics supply support service and management.

d. A formal configuration management and quality program will be established to identify, control, account for, and audit the functional and physical characteristics of each TPS. The MSC ATE/TPS center will act as the repository for TPSs and can assist in providing configuration management for TPSs.

(1) Certification and release. The MSC product assurance organization will certify the TPS against development contract requirements and mission requirements. DT/OT will not be required. Acceptance testing by the MSCs quality assurance organization will be sufficient to show acceptable field use. User representatives may participate in the acceptance testing.

(2) TPS suitability for release will be addressed during the materiel release process for the materiel system.

e. The materiel developer will address fielding of TPS in the program's material fielding plan in coordination with the MSC ATE/TPS center. On-site acceptance by the gaining unit will be accomplished when the TPH passes a self-test. Additionally, performance verification tests on UUTs may be performed, but will not automatically be required.

f. TPS developed in accordance with MIL–PRF–32070 and MIL–PRF–49503 have no special training requirements for TPS. Materiel developers will not be required to provide TPS training assets, for example, TPH and UUTs, except under very special circumstances. Support will be tailored based upon the complexity of the system.

5–6. Test program set program hardware

TPH will be designed to reduce the total logistics footprint and minimize cost. TPSs typically are noncomplex, low-density items of support equipment. Complexity is driven by UUT complexity, interfaces, and availability of ATE resources. It is not cost effective to apply the same level of materiel end item life cycle management and support as that applied to complex, high-density weapon systems. TPH will be developed, tested, fielded, and supported with these considerations in mind.

a. Performance requirements. TPH design will comply with MIL–PRF–32070.

b. Commercial parts. TPH will be designed utilizing commercial components to the maximum extent possible. No proprietary components or processes will be utilized.

c. Drawings. TPH drawings will be prepared in contractor or MSC ATE/TPS Center format using best commercial practices and be maintained in the commodity MSC ATE/TPS repository. If required, a source control drawing will be prepared to be included in the weapon system TDP that shows that the source of TPH is the commodity MSC ATE/TPS center.

d. Storage. TPH and associated storage containers will be kept to a minimum size to reduce the physical footprint required for storage. The TPH will be designed to test the maximum number of UUTs with the least amount of hardware.

e. Ruggedization. TPH will be ruggedized only to the extent consistent with use in an environmentally controlled shelter and storage in transit cases.

f. Supply support. TPH will be identified by part number or national stock numbers.

g. Maintenance manuals. The TPH developer may prepare manuals not designated by The Adjutant General for the testing, troubleshooting, and repair of TPH. The Adjutant General technical manuals will not be required.

h. Authorization. The TPH will be authorized as a special tool in the UUT technical manual. Line item numbers are not required to authorize the TPH.

i. Environmental testing. Environmental testing will not be required.

j. Type classification. TPSs will have the same level of type classfication (TC) as the supported weapon system. No separate TC action is required for the TPH.

k. Production hardware. TPH is accepted when it passes a TPH self-test and successful completion of a UUT performance verification tests.

5–7. Test program software

a. TPSs for all Army standard ATE will use the appropriate test programming language(s) approved for that particular standard ATE. Other ATE TPS programming languages used for new TPS development will comply with a framework that enables transportability from test station to test station with a minimum of rehosting effort as defined by the materiel developer in coordination with the MSC ATE/TPS center. This language requirement will apply to TPS language for new Army standard ATE and to TPS languages used by contractors including subcontractors. These languages must adhere to the following requirements:

(1) The *VXI plug&play (VPP) Systems Alliance System Frameworks Specification (VPP–2)* addresses the application development environment.

(2) The *VXI plug&play Systems Alliance Instrument Drivers Specification (VPP–3–X)* identifies the requirements for various aspects of instrument control.

(3) The *VXI plug&play Systems Alliance Virtual Instrument Software Architecture Specification (VPP–4–X)* defines the low-level communications interface between an instrument driver and the instrument(s) it controls.

b. TPs will be formatted to comply with MIL–PRF–49503B and use the TP requirements in MIL–PRF–32070 as a guide.

c. All TP code will be self-documenting, meaning there will be sufficient embedded comments to understand the program functionality. The commented code must be sufficient for the MSC ATE/TPS centers to be able to maintain the TP.

5–8. Test program set sustainment

TPS sustainment requirements will be addressed throughout the supported system life cycle and documented in the TPSMP. The commodity MSC ATE/TPS center will provide centralized configuration management support and control of assigned TPSs. The focal point for TPS technical service support throughout the sustainment period will be the MSC ATE/TPS centers, which will be tapped to support sustainment of TPSs.

a. Materiel developers under total life-cycle system management or AMC will program funding to resource the MSC ATE/TPS centers adequately to support the following areas:

(1) Personnel to provide technical and logistics service and management.

(2) Repair of ATE/TPS center resources, for example, ATE and UUTs, as part of the repository.

(3) Travel to support investigation and resolution of TPS customer problems.

(4) Peculiar ATE augmentation equipment required to support material system.

(5) UUTs to assist in troubleshooting procedures reported from TPS customer base.

b. Materiel developers will coordinate with the MSC ATE/TPS Centers during product improvements for TPS impact or new TPS development requirements.

c. The MSC ATE/TPS centers will maintain process control over configuration changes and distribution of TPS hardware and software.

d. The MSC ATE/TPS centers will use their local processes to maintain configuration of technical data and configuration status accounting for changes to TPS hardware and software throughout the life cycle of the TPS.

Chapter 6
Army TMDE Calibration and Repair Support Program

Section I
Program Objectives and Administration

6–1. Program objectives

The objectives are to provide the U.S. Army with TMDE calibration and repair support and ensure that the measurements made with calibrated TMDE are traceable to national, international, or intrinsic standards of measurement; that Army TMDE complies with specifications; and that a high percentage of the Army TMDE inventory is available for use. The following goals are established to achieve the program objectives:

a. On average, 90 percent of items will be in tolerance over the calibration interval, and 81 percent in tolerance at the end of the interval.

b. That 95 percent or above of the TMDE inventory identified in the owner/user's Instrument Master Record File (IMRF) is available to the user in a calibrated and repaired condition. Items placed in calibrate before use (CBU) status will be subtracted from the owner/user's IMRF when calculating availability.

c. The TMDE owner/user's delinquency rate (failure to submit for required support) is 2 percent or below. Items placed in CBU and calibration not required (CNR) status should be subtracted from the owner/user's IMRF when calculating delinquency.

d. Methods for computing availability and delinquency rates are outlined in figure 6–1.

Availability Rate.

$$\% \text{ Available} = 100 - \left[\frac{\text{items in shop + delinquent items}}{\text{total items in IMRF – CBU items}} \right] \text{X } 100$$

Delinquency Rate.

$$\% \text{ Delinquent} = \left[\frac{\text{delinquent items}}{\text{total items in IMRF – CBU items – CNR items}} \right] \text{X } 100$$

Figure 6–1. Methods for computing availability and delinquency rates

6–2. Program administration

a. The CG, AMC, as the national sustainment maintenance manager, will manage, direct, and control the Army TMDE C&RS program.

b. The primary organization responsible for execution of the Army TMDE C&RS program is the U.S. Army TMDE activity (USATA). Program execution entails—

(1) Providing C&RS for TMDE–GP and selected TMDE–SP as identified in TB 43–180.

(2) Maintaining a centrally managed structure that provides measurements traceable to NIST or fundamental physical constants to meet Army maintenance and operational requirements.

(3) Maintaining the USAPSL to provide the Army's highest level of measurement accuracies.

(4) Exercising command and control of all USATA support elements in the execution of the Army-wide TMDE support mission.

(5) Locating Army TMDE support activities at strategic locations in the continental United States (CONUS) and outside the continental United States (OCONUS) in order to provide optimum regional support. In no case will more than one nondeployable Army TMDE support activity exist on an installation.

(6) Maintaining technical management and control processes for the Army-wide TMDE C&RS program.

(7) Providing metrology-engineering support for all Army calibration standards.

(8) Evaluating the reliability of TMDE through assessment of maintenance data.

(9) Ensuring and maintaining necessary control of radioactive calibration devices and materiel, personnel safeguards, and all corresponding licenses, authorizations, permits, and related radiation records that apply to TMDE C&RS operations (AR 11–9).

(10) Coordination of all Army PTTI requirements with the DOD PTTI manager and providing or arranging for PTTI support for Army commands.

(11) Providing technical assistance for C&RS standards and equipment and assisting materiel developers in determining TMDE C&RS requirements.

(12) Providing TMDE owners with a quarterly master listing of all TMDE belonging to the unit, a monthly projection of TMDE scheduled for calibration, and a listing of TMDE where the calibration due date has expired.

(13) Performing reconciliation actions on TMDE in repair or evacuation status. For items that have been evacuated for more than 60 days, the supporting activity will contact the performing activity, or contractor, to determine the status of those items. Owners that have TMDE awaiting repair or TMDE that has been evacuated (for example, awaiting repair parts, in-shop repair, evacuated to another activity/contractor) over 60 days will be notified of the status of those items. Thereafter, status updates on repair or evacuated items will be provided to the owner at 30-day intervals.

(14) Monitoring training and career development of military and civilian TMDE C&RS personnel and coordinate with TRADOC proponent schools on training requirements and program needs.

(15) Coordinating Army TMDE C&RS requirements with the other military services to identify common requirements that are operationally acceptable and cost effective,

Section II
TMDE Calibration and Repair Support Concept

6–3. Support concept

The C&RS of TMDE is based on the general concept of one-stop service for the supported customer. The one-stop service allows the customer to deliver and pick up the supported TMDE at a designated TSA location. The concept also subscribes to the levels of support designated in TB 43–180 and designates that TMDE not listed in TB 43–180 will be coordinated with the local TSA for help in determining the appropriate support requirement. Additional concept requirements are—

a. All TMDE owners or users will perform field maintenance on organic TMDE.

b. Support may be provided in a fixed or mobile configuration.

c. Normally, calibration of TMDE will be provided on a first-come, first-served basis unless extenuating circumstance dictate that support be provided according to the priorities established under paragraph 6–11.

d. All field/sustainment maintenance units will provide support service for organic and supported units' TMDE–SP as designated in TB 43–180. Certain TMDE–SP may require a combination of maintenance support by both a TSA and a field/sustainment maintenance unit. For example: A TMDE–SP console may include TMDE–GP that is normally serviced by a TSA, and also contain components or subunits that are TMDE–SP requiring system peculiar training to perform the repair work. In such cases TSA and field/sustainment unit personnel will coordinate the work efforts in order to reduce the equipment turn-around time back to the customer.

e. When TMDE repair parts are no longer available or repair cost would exceed maintenance expenditure limits, the instrument will be condition coded and returned to the owner/user for disposition.

f. When the capability to repair an item of TMDE is not available at the TSA that normally calibrates the item, the item will be evacuated directly to the manufacturer or appropriate commercial repair facility. To reduce equipment turn around time, items evacuated by a TSA for repair should avoid routing such items through higher levels of support unless absolutely necessary.

6–4. Support coordinator

Each command, installation, and unit that uses TMDE will designate a TMDE C&RS coordinator in writing. The coordinator will act as the central point of contact for TMDE C&RS matters. The TMDE coordinator will be responsible and have authority for monitoring the command, installation, or unit TMDE management program. This program will be consistent with this regulation and AR 750–1. Should conflict between this regulation and AR 750–1 arise regarding TMDE C&RS, this regulation takes precedence.

6–5. Levels of support

The following TMDE C&RS levels are key to sustaining accurate and traceable measurements. They should not be confused with Army standard maintenance levels.

a. F-level support. All field/sustainment maintenance, facilities, owners, and users of TMDE provide F-level support as indicated in TB 43–180 and appropriate maintenance manuals.

b. T-level support. Area TMDE support teams (ATSTs) provide C&RS for TMDE requiring secondary transfer level support within the assigned mission area. Where F-level support capability for general purpose TMDE does not exist T-level will provide that support. T-level support is typically provided by military, DA civilian, or contractor personnel operating from a mobile or fixed facility. All military ATSTs providing T-level support will be organized under a mobile equipment configuration for deployment purposes.

c. S-level. Area calibration laboratories (ACL) provide C&RS for TMDE measurement standards and designated items of TMDE within their assigned mission area that require secondary reference level support in accordance with TB 43–180. The ACLs are the principal support providers for T-level transfer standards.

d. P-level. The Army's highest support level for calibration and measurement accuracies provides support for measurement standards and selected items of TMDE requiring P-level support in accordance with TB 43–180. The APSL, located at Redstone Arsenal, is the Army's only complete P-level support laboratory.

e. Levels of TMDE calibration and repair support. This support provided by the Army may vary from one location to another because of the density, type of TMDE supported, and the criticality of the support mission. Some designated laboratories may have S- and very limited P-level capabilities. Other TSA locations may have T- and S-level capabilities and comprise both military and civilian support elements.

6–6. Interservice support

C&RS services that are provided to reimbursable customers (for example, select Army, DOD military services, Federal and State Government departments and agencies) will be accomplished through interservice support agreements or intergovernmental support agreements.

6–7. Commercial contractor support

All C&RS for Army materiel will normally be accomplished utilizing Army resources, or support agreements with other DOD departments or agencies, in order to optimize the use of existing workload capacity. Commercial contracts may be used to provide C&RS when the required support is not available from the above organizations.

a. When considering contracting out Army TMDE calibration and repair support functions the command responsible for developing such contract will coordinate with the receiving command of such support and the USATA prior to contract development and prior to request for proposals (RFP). Army TMDE support will not be included in contracts with other services or functions without prior coordination with the USATA.

b. All contracts with a commercial laboratory for calibration services will specify that the commercial laboratory adhere to International Organization for Standardization (ISO)/IEC 17025:1999 or American National Standards Institute (ANSI)/NCSL Z540–1–1994 for all measurement parameters required for the calibration(s). Commercial calibration laboratories that are accredited and recognized as such by the International Laboratory Accreditation Cooperation are not subject to paragraph 6–17 of this regulation.

c. All commercial contracts or Interservice Support Agreements that provide calibration and repair support to Army TMDE will stipulate the requirement to report TMDE C&RS management data and properly identify the current status of TMDE supported in accordance with this regulation.

Section III
TMDE Calibration and Repair Support

6–8. Identification of TMDE requiring calibration and repair support

a. TMDE calibration requirements will be established when TMDE accuracy must be maintained and when an out-of-tolerance condition could adversely affect system operations, product evaluation, end item performance, or safety.

b. TB 43–180 will be used by all U.S. Army units, organizations, installations, activities, and commands to include schools and training centers, ARNG, and USAR units that are responsible for the maintenance of Army materiel for determining TMDE C&RS requirements.

c. As an exception to 6–8*b*, the TMDE owner will establish C&RS requirements for TMDE used in the following applications: APSL functions, depot maintenance, Directorate of Public Works, Corps of Engineers, research development test and evaluation facilities, and specialized disposal facilities. These C&RS requirements will not be listed in the published version of TB 43–180 but will be included in the USATA data base and be accessible to the appropriate supporting/supported activities.

d. The TMDE owner/user will ensure that the supporting organization is continuously provided accurate, complete, and up-to-date information on their TMDE. When any of the following occur: activation, inactivation, or relocation of the unit(s); receipt of new types or additional quantities of TMDE; or turn-in or placement of TMDE in storage and

when errors are detected on any listing provided by the TSA, the TMDE owner/user must identify such to the supporting TSA.

6–9. Identification of TMDE calibration and repair support for new Army materiel

a. The test and measurement requirements of new Army materiel and associated maintenance support TMDE will be identified and analyzed early in system development and demonstration phase of the materiel development process to facilitate early consideration and development of the required C&RS capability. This is to ensure that the required logistics support and measurements standards will be available when the new materiel is issued for use.

b. The materiel developer will identify all TMDE support requirements for materiel developed and procured under the ILS management concept. All C&RS requirements for TMDE selected by the materiel developer will be submitted to the USATA using DA Form 3758–R, Calibration and Repair Requirements Worksheet, in accordance with TB 750–25, appendix B. The logistics support analysis process will be used for determining TMDE support requirements where applicable. Any C&RS requirements evolving from acquisition of TMDE through other than ILS procedures (for example, local procurement) will be submitted to the USATA in accordance with TB 750–25, appendix B. USATA will initially be notified of materiel acquisition by letter of requirement or through operational and organizational planning. Thereafter, USATA will participate in TMDE requirement planning actions, including—

(1) Logistic support analysis and planning.
(2) IPRs.
(3) BOIPs.
(4) New equipment training.
(5) TMs.
(6) Support list allowance cards.
(7) Type classification actions.
(8) Other life-cycle management actions deemed necessary to ensure that the required skills, measurement system, measurement standards, and technical procedures will be available for TMDE C&RS when the new materiel is fielded.

6–10. Submitting TMDE for calibration and repair support

a. TMDE requiring C&RS will be submitted to the supporting TSA in accordance with the calibration recall schedule and TB 750–25 on or before the calibration void date listed on DA Label 80 (U.S. Army Calibrated Instrument).

b. The TMDE owner/user will perform field maintenance (AR 750–1) on their TMDE in accordance with the maintenance allocation chart and designated maintenance manual prior to submitting to their TSA.

c. The TMDE owner/user is responsible for the delivery and pickup of TMDE. The TMDE that is too heavy, bulky, or sensitive to be transported will be serviced on-site as agreed upon between the owner/user and the supporting TSA. TMDE must be transported in a manner that provides protection from inclement weather, vibration, and shock. It must be complete with all unique or special purpose adapters, cables, and accessory items required by the supporting organization to accomplish the calibration or repair.

d. When requested, the TMDE owner/user will provide authorized maintenance and manufacturer's manuals. If the owner/user or the TSA does not have the appropriate manufacturer's manuals, the supporting TSA will contact USATA for assistance (para 6–20).

6–11. Calibration and repair support priorities

Under normal operating conditions TMDE C&RS will be provided on a first-come, first-served cyclic basis using an automatic recall system. Extenuating circumstances may preclude C&RS from being provided to all units as scheduled and may necessitate providing support on a priority basis for a unit or mission essential TMDE. Priorities will be set as follows:

a. The USATA C&RS standards required to perform the mission will receive support prior to customer equipment.

b. The OCONUS host theater Army command will establish C&RS priorities for subordinate commands or units, and all tenant commands or units in the theater of operation if deemed necessary. The commander will also identify those priorities to the AMC activity responsible for theater C&RS.

c. The CONUS installation commanders will establish C&RS priorities for subordinate and tenant units on the basis of mission requirements, and identify those priorities to the TSA responsible for C&RS at that installation if deemed necessary.

6–12. Calibration intervals

Instruments requiring calibration will be calibrated at regularly prescribed intervals. Calibration intervals will be established and changed by USATA in coordination with the responsible materiel developer or materiel manager.

a. The calibration interval specified in TB 43–180 is the maximum number of days that an instrument may be used before recalibration is required. Calibration intervals for instruments not listed in TB 43–180 will be established by reviewing similar items listed in TB 43–180, manufacturer's recommendations, sound engineering judgment, or

statistical analysis. Instruments should not be used beyond the calibration void date identified on the appropriate label; however, deviation from the calibration void date may be permissible under the following conditions:

(1) Calibration of an instrument may be requested by the TMDE owner/user anytime the user suspects the TMDE is not functioning properly, or suspect an out-of-calibration condition.

(2) The TMDE owner/user may request, in writing, an extension beyond the calibration void date for a limited period of time (a maximum of 10 percent of the established interval) under certain specific conditions—for example, an item being used on an in process test. The owner/user will submit, in writing, to the supporting organization a request for the deviation. The activity that grants the deviation must be the activity that schedules calibration of the instrument. All TMDE used in areas for personnel safety will not be allowed deviation from prescribed calibration intervals.

(3) USAR and ARNG assigned TMDE specified in TB 43–180 as requiring calibration at intervals less than 1 year may be extended to a 360–day interval if the TMDE is used solely during weekends and/or annual training periods and are identified in writing to the scheduling TSA. This extended interval authority does not apply to the TMDE used in support of aircraft, watercraft, and safety of operations. DA labels affixed to TMDE with extended intervals will be overprinted with "EI" as specified in TB 750–25.

b. Changes to intervals will be generated based on analysis of TMDE calibration performance reliability data. USATA will establish a program to review TMDE performance reliability. Based on the results of the review, USATA will adjust calibration intervals to achieve the DA established TMDE reliability goals as identified in paragraph 6–1*a*.

Section IV
TMDE Calibration Support Laboratories and Teams

6–13. The Army Primary Standards Laboratory

The APSL is the Army's principal laboratory for measurement development and calibration technology in support of the Army's current and future weapon systems. The APSL provides the highest level of metrology and the most accurate level (P-level) of calibration services within the Army and is dedicated to advancing state of the art metrology in this unique mission area, and to ensuring effective management of the related technical programs. As part of this highly technical support mission, the APSL—

a. Provides the most accurate source of physical, mechanical, electrical and electromagnetic measurements and standards with direct traceability to legal United States measurement standards at the NIST, to fundamental physical phenomena, or to standards maintained at the U.S. Naval Observatory.

b. Provides expert calibration and technical support for Army laboratories, field units, DOD, and other Federal agencies. The APSL represents the Army in triservice metrology research and development and assigns professional scientists and engineers to participate actively on all subcommittees of the Joint Service Metrology Engineering Working Group.

c. Provides scientists and engineering subject matter experts to serve on the National Conference of Standards Laboratories executive committees and other DA, DOD, and national technical committees and provides liaison between the Army and NIST and other measurement technology developers.

d. Supports the DA Radiation Safety community by providing program specific services such as personnel dosimetry support and DA personnel radiation exposure database archive records update and maintenance (para 6–14).

6–14. Radiation Standards and Dosimetry Laboratory

This laboratory manages and operates the nucleonic, radiation dosimetry, and health physics programs as central components of Army health physics and radiation metrology support. The laboratory also provides DA-wide personnel dosimetry support and the highest measurement capability for photonics and ionizing radiation standards with measurement traceability to the U.S. legal measurement standards at NIST or to fundamental physical constants. The program also encompasses—

a. Planning, directing, controlling, training, and performing basic research development and engineering efforts related to radiation measurement standards, health physics theory, and techniques required to provide the Army with adequate personnel dosimetry, calibration, and radioactive waste/nuclear contamination spectrum analysis.

b. Providing special measurement services for the assigned parameters of the electromagnetic spectrum from far infrared wavelengths through gamma radiation, to advance the metrology state of the art in this unique mission area and to ensure effective management of the related technical programs.

c. Managing a support program that provides special nuclear services to various governmental agencies such as Federal Emergency Management Agency and the White House Military Office pursuant to an appropriate interagency agreement.

d. Providing a centralized radiological control program and Radioactive Material Control Point for the USATA.

e. Coordinating the DA OCONUS Radioactive Waste Disposal Program and the worldwide DA RADIAC Calibration and Repair Support Program and providing technical support and policy guidance relative to these programs.

6–15. Area calibration laboratories

Area calibration laboratories (ACLs) are strategically located throughout CONUS and selected OCONUS locations providing TMDE secondary reference (S-level) support for supported transfer reference standards, TMDE–GP, and selected TMDE–SP as specified in TB 43–180. The ACL core laboratory configuration is quite often a major component of a more extensive laboratory capability supporting a regional area. Such support capabilities may include not only an ACL but also other laboratory elements to include T-level support and support that are unique to an installation.

6–16. Area TMDE support team

Area TMDE support teams (ATSTs) provide T-level C&RS. These teams are generally the first TMDE support element that a field Army customer encounters. Depending on the support mission, an ATST may be established in a mobile or fixed facility configuration and manned by military or civilian personnel located throughout CONUS and selected OCONUS locations. As such, the ATST accounts for the majority of T-level TMDE C&RS. The military configuration will be established as a mobile capability because of deployment requirements. Civilian operated ATSTs may be established in a mobile or fixed configuration or a combination thereof dependent on the support mission. The civilian ATST operation is quite often a subelement of a more extensive laboratory capability tailored to installation or peculiar support requirements. Regardless of the configuration the ATST provides, at a minimum, a C&RS capability comprises calibration standards (transfer standards), ancillary TMDE, production control facilities, and workspace for repair functions. The ATST is the principal TMDE support element on the ground during war, contingencies, and operations other than war, to include peacetime support missions. The doctrinal ATST mission requirements are found in Field Manual (FM) 4–30.3 and FM 63–11.

Section V
TMDE Calibration and Repair Support Programs

6–17. Quality assurance and inspection program

USATA will establish a total Army TMDE C&RS periodic technical and management inspection program to ensure Army organizations that provide C&RS are providing such support in accordance with technical specifications and program directives. Organizations under this program also include Government-owned contractor-operated (GOCO) TMDE support organizations and activities. Results of the periodic inspection will be reported directly to the HQDA Inspector Generals office, in accordance with this regulation, AR 20–1, and AR 702–11. Other aspects of the quality assurance and inspection program will include the following:

a. At a minimum, inspections will be conducted at 24-month intervals and will also include a review of the TMDE management program with the TMDE coordinators of the supported commands, installations, or activities, and an assessment of customer satisfaction. All inspected activities will be notified through formal memorandum at least 10 days prior to the inspection. GOCO sites will be notified as above unless stipulated differently in the GOCO contract requirements.

b. Quality assurance reviews of other DOD TMDE support activities or contractor support operations that provide C&RS for Army TMDE will be conducted by USATA according to USATA quality assurance program and any specific provisions specified in support agreement or contract.

c. All activities inspected will be rated. Specific pass or fail criteria will be established for various functional areas. At the discretion of the inspection team chief, a failed rating can result in the suspension of calibration support by the inspected activity. Critical findings that can cause an organization to fail overall or in a specific functional area are—

(1) Failure of end items to meet specifications.

(2) Loss of measurement traceability.

(3) Significant safety or health hazard.

(4) A deficiency that has adverse impact on combat effectiveness of a supported weapon system or organization.

(5) General lack of program discipline.

(6) Consistent failure to meet program performance goals and objectives.

d. A technical measurement audit and analysis program, as part of the overall QA and inspection program, is designed to evaluate the accuracy and integrity of measurements performed by TSAs in relation to national or international standards.

e. The Director, USATA will arbitrate unresolved issues or disagreements between the inspector and inspected activities. Results of all inspections and reviews will be provided to The Department of The Army Inspector General, ATTN: SAIG–TI. Inspections and review results pertaining to the Army National Guard will also be provided to the Chief, National Guard Bureau. Inspection and review results of GOCO C&RS operations will also be provided to the contracting officer's representative and the appropriate installation commander.

6–18. Cross checks, intercomparisons, and visual inspections program

The TSA will perform actions specified in TB 9–4931–537–35. When Army calibration standards are found to be out

of tolerance and determined to have a potential negative impact on items supported, the activity performing the calibration will inform the TMDE owning activity of the out-of-tolerance condition and actions to be taken.

6–19. Metrology engineering and research, development, test, and evaluation program

The metrology engineering and RDTE program is designed to advance state of the art in metrology and the science of measurement and to maintain pace with advancements in Army materiel and equipment technology and processes. The program is instrumental in providing for the development of calibration standards, the investigation and testing of new and unique measurement systems, and techniques.

Section VI
TMDE Management Information

6–20. TMDE technical assistance program

USATA will establish and maintain a TMDE technical assistance program is designed to provide a central point of information relative to TMDE C&RS logistics, engineering, calibration procedures, acquisition of equipment, and the configuration of calibration sets. The program provides Army units USATA and TMDE program manager expertise through direct phone access or the Internet.

6–21. TMDE management information system

TEMIS is an information system designed, managed, and maintained by USATA and dedicated to the total Army's TMDE calibration and repair support data collection, storage, and analysis. The system also provides the software programming needs for production control processes, financial management, and management data information requirements in support of the Army's TMDE C&RS program.

6–22. TMDE integrated material management system

As an integral part of the TEMIS, the USATA-managed TIMMS provides the TSAs with site-specific software to identify TMDE for recall, provide customer notification of equipment readiness, process equipment through the C&RS shops, account for customer equipment while in the shop, and identify repair parts and associated cost.

6–23. Instrument Master Record File

Each activity providing TMDE C&RS will establish and maintain an IMRF. The IMRF will include all TMDE–GP and TMDE–SP, to include dosimeters and RADIAC meters. The TMDE owners or users will ensure that their TMDE is identified in the supporting activity's IMRF and that any changes to their TMDE assets are reported to their supporting activity. The IMRF for TMDE–SP, supported by the field/sustainment maintenance units, will be maintained by the TSA supporting those units. A TMDE owner may be supported by more than one TSA that reports C&RS data under a "performing" unit identification code (PUIC), but will have only one designated TSA that reports data under a "scheduling" unit identification code (SUIC). It is noted that the TSA that schedules (SUIC) may also be the PUIC.

6–24. National instrument historical database

The USATA will establish and maintain a national instrument historical database (NIHD) for collecting Army-wide TMDE C&RS data. The National Instrument Historical Database will support establishment and analysis of calibration intervals, identify marginally effective TMDE, and provide management information required for effective program administration.

6–25. Instruments used in Army schools

Instruments required by Army schools curricula used in providing individual training will not require cyclic calibration unless training efficiency or safety is adversely affected. When cyclic calibration is required the appropriate interval, as specified in TB 43–180, will be used. TMDE used for maintenance support of school equipment will be calibrated at intervals specified in TB 43–180.

Section VII
Specialized Calibration and Repair Support Requirements

6–26. Medical equipment

The Office of the Surgeon General will determine C&RS in accordance with AR 40–61, chapter 6, for any item of equipment or system that is used for diagnosing and treating patients in the Army Medical Department health care program. All TMDE–GP used for maintenance of medical materiel will be calibrated and repaired by the supporting TSA. All TMDE, to include general and special purpose, used for maintenance of medical materiel will be listed in TB 43–180.

6–27. Small arms and ammunition gages

The owner/user will contact their local TSA for certification of ammunition and small arms gages. The owner/user is required to maintain the DA Form 3023 (Gage Record) that comes with each ammunition and small arms gage that requires certification (see TB 750–25, app E). The owner/user will provide the respective DA Form 3023 with the ammunition and small arms gage when the item is presented for inspection and certification.

6–28. Nuclear weapons support

The U.S. Army Joint Munitions Command and USATA jointly determine C&RS requirements based on nuclear weapons reliability.

6–29. Foreign military sales

All proposals, letters of offer, or letters of acceptance that offer Army materiel to foreign customers through the security assistance program will include TMDE required for maintenance support and will identify the need for C&RS. The following apply:

a. In those cases where TMDE and/or calibration services are included, the activity responsible for letter of acceptance preparation will coordinate requirements with the TMDE program manager Foreign Military Sales and Support Office (SFAE–CSS–ME–T–FMS), Redstone Arsenal, AL 35898–5400. The U.S. Army cannot provide assurance of complete supportability unless the TMDE program manager Foreign Military Sales and Support Office has identified the C&RS required or verified that an organic capability has been evaluated satisfactorily.

b. Periodic calibration of applicable TMDE is required to ensure conformity with maintenance specification and safety requirements and to improve serviceability throughout the end items life cycle. Calibrations must be traceable to NIST and/or international standards. The purchaser of TMDE could have organic C&RS facilities and capabilities that can provide required calibration and repair services. The TMDE program manager, Foreign Military Sales and Support Office, can consider, through normal FMS channels, a request for technical evaluation of TMDE and training required to ensure that these critical items do not cause a degradation of the equipment's operational readiness.

Section VIII
TMDE Publications, Forms, and Records

6–30. TMDE calibration and repair support publications

Equipment publications will be developed and published for each maintenance significant instrument introduced into the Army inventory. The use of ETM or IETMs is mandatory for all TMDE. Specific considerations toward TMDE maintenance and calibration procedural publications include—

a. field/sustainment maintenance manuals for TMDE–GP will be developed by the TMDE–GP materiel manager. Calibration procedures for TMDE–GP will be developed by the USATA.

b. Field/sustainment maintenance manuals and calibration procedures for TMDE–SP will be developed by the TMDE–SP materiel manager. They will include the use of TMDE authorized at the supporting field/sustainment maintenance unit, or units/activities that provide T-level C&RS.

c. Contracts that contain the requirement to prepare maintenance manuals or calibration procedures for TMDE–GP or TMDE–SP calibration procedures will ensure the publications are coordinated with the USATA and use Army-fielded TMDE and calibration standards. This may occur when no DA publication (maintenance or calibration) is available and when contractor preparation is more feasible than in-house preparation. These publications will be distributed to the appropriate TSAs concurrent with or before issuing TMDE.

d. Drafts of proposed maintenance manuals and calibration procedures for TMDE will be prepared as a part of a system's or major item's test package. All draft calibration procedures will be coordinated with USATA prior to initiating final test. The manuals will be evaluated as part of the materiel-testing program before being prepared in final form for publication and general use.

e. USATA will review all draft TMDE calibration publications.

f. Calibration procedures will be prepared as stated in MIL–PRF–3879B.

g. Verified commercial service manuals that provide C&RS may be used to accomplish TMDE maintenance incident to achieving first unit equipped status.

6–31. Calibration labels and forms

DA Label 80, DA Label 163 (U.S. Army Limited or Special Calibration), DA Form 2417 (U.S. Army Calibration System Rejected Instrument), and DA Form 7372 (TMDE Calibration and Repair Data) will be used by all activities providing C&RS, in accordance with this regulation and TB 750–25. These labels and forms document the current status of TMDE.

a. Unserviceable TMDE normally falls into two categories: TMDE that becomes inoperative during use, or TMDE that is determined to require repair during the calibration process. Unserviceable TMDE must have a DA Form 2417 affixed to it, as specified in TB 750–25. For instruments that become inoperative during use, the owner/user will

submit that TMDE to their supporting TSA for repair. When condition-coding TMDE for turn-in the owner/user submits a DA Form 2407 with the item of TMDE to the supporting TSA for proper coding. Instructions for completing DA Form 2407 are contained in DA Pam 750–8.

b. It is the responsibility of the owner/user to ensure TMDE (all equipment listed in TB–43–180) is in an operating condition and affixed with the appropriate label indicating its calibration status.

(1) A current DA Label 80 or 163 must be affixed to each item of TMDE that requires calibration. If an instrument becomes unserviceable during use, the TMDE owner/user will void the DA label.

(2) TMDE that has exceeded its calibration void date will have the DA label overprinted with the word "VOID," in order to identify an uncalibrated instrument to a potential user.

(3) A DA Label 80 overprinted with the letters CNR (calibration not required) will be affixed to all TMDE designated as such.

Chapter 7
Embedded Diagnostics, Embedded Prognostics, Interactive Electronic Technical Manuals, and Related Data Considerations and Policy

7–1. General

a. ED consist of capabilities that—

(1) Accomplish self-diagnosis using on-board resources as an integrated system (for example, sensors, analytical software and embedded devices).

(2) Collect, correlate, synthesize and report systems performance data to provide a system level health assessment via on-board processing of existing condition.

(3) Enable conditioned-based maintenance (CBM), prognosis, and anticipatory logistics.

(4) Interface with the future Army logistics system (maintenance module), share information with other information users, identify imminent or existing failures/condition-based services, and provide actionable logistics support direction.

b. EP (capabilities are a further refinement of ED) consist of capabilities that—

(1) Support CBM, physical and functional failure prediction, and anticipatory logistics enabled by the use of software algorithms.

(2) Identify impending failures prior to failure and provide appropriate actionable logistics support direction.

(3) Combined with ED, provide the ED/EP system for the collection, correlation, and synthesizing of performance data to enable weapon system level and other platform health assessments.

c. IETMs are screen-based tools comprising platform/equipment technical data, including drawings, schematics, operating procedures troubleshooting procedures, repair procedures, safety warnings, repair parts/ and special tools list and maintenance allocation charts that provide user interfaces to the equipment, databases that manage user or equipment information, parts, operational states and modes or performance information through hardware and software. IETMS should be resident on the weapon platform/equipment items where feasible. When IETMs are not on board, they will be used with the Army standard at-systems tester, the maintenance support device. IETMs must meet requirements of AR 25–30 and to the extent possible incorporate—

(1) Platform/equipment technical data used to operate, service, troubleshoot, isolate faults of, and identify the scheduled and unscheduled maintenance processes to repair weapon systems and other support equipment.

(2) Software that manages weapon platform/equipment technical data, equipment interfaces, diagnostics functionality, and embedded training.

(3) Diagnostic capabilities that can be an integral or interfaced component of the IETM and occur on complex weapon systems through communication and interaction with selected sensored components or the weapon system central data base. IETM diagnostic functionality will provide the information necessary to identify faults, perform repairs, verify fault correction, and identify the necessary services and parts required to return a system to an operational status and restore end items to full operational condition. Less sophisticated IETMs may communicate information to the user to effect troubleshooting and traditional fault isolation.

(4) Interface with the existing maintenance Standard Army Management Information System and future ERP and support for other logistics information systems.

(5) Embedded training to enhance operator and maintainer skills in support of weapon system operation and sustainment.

(6) TPS as defined in chapter 5 or as modified to work in an embedded mode or any combination therein.

7–2. Determination of embedded diagnostic/embedded prognostics and interactive electronic technical manuals requirements

a. The materiel developer, in coordination with the appropriate MSC, TMDE program manager, and TRADOC, will determine the ED/EP/IETM requirements. A system-level supportability analysis will be performed early in the

acquisition life cycle to determine the level, economy, and functionality of ED/EP and IETM implementation at each level of maintenance. Supportability will be given equal consideration with performance, schedule, and life-cycle cost.

b. In determining the life-cycle maintenance planning and risk management for the weapon system, the materiel developer, in conjunction with the appropriate MSC and TRADOC, is responsible to conduct a risk assessment, to include—

(1) Determination of risk associated with various maintenance concepts such as—

(a) Organic support.

(b) Period of warranty.

(c) Contractor logistics support or no contractor logistics support.

(d) Performance-based logistics support.

(e) Combination of approaches.

(2) Risks associated with technology maturity and systems integration such as—

(a) Obsolescence risks and mitigation.

(b) System readiness and sustainment risks.

(c) Continuity of support and economic risks.

(d) Data risks and data rights to permit organic diagnostic support without recourse to any contractor assistance.

(e) Supportability risks associated with commercial items, for example, COTS, and ability to organically sustain test and repair programs.

(3) ED/EP/IETM life-cycle cost estimation, used to—

(a) Determine phased cost estimate for acquisition, production, deployment, sustainment, and disposal of components of ED/EP and IETMs.

(b) Perform sensitivity analyses associated with identified risks.

7–3. Embedded diagnostics/embedded prognostics and interactive electronic technical manuals acquisition

a. The materiel developer will coordinate acquisition, development, sustainment and disposal requirements for ED/EP and IETMs with the appropriate MSC.

b. The materiel developer will program and budget for ED/EP and IETM life-cycle acquisition and associated support.

c. Materiel developers will utilize acquisition management services of the commodity-oriented MSCs.

d. The materiel developer will require contractors who have a requirement for ED/EP and IETM development/validation or special acceptance and inspection equipment to document those requirements in terms of—

(1) Performance specifications allocating test requirements for production and tactical environments.

(2) Technical testability requirements in both hardware and embedded software design.

(3) Consideration to use Army standard ATE to host IETMs that are not embedded.

7–4. Embedded diagnostics/embedded prognostics development

ED/EP development is possible during any stage of the Materiel system acquisition framework. Funding for ED/EP development will be programmed according to the materiel system life cycle phase.

7–5. Interactive electronic technical manuals development

a. IETM development is possible during any stage of the materiel system acquisition framework. Funding for IETM development will be programmed according to the materiel system life cycle phase.

b. IETMSs will—

(1) Use extensible mark-up language (XML) tagging.

(2) Use data structure and data type definition outlined in MIL–STD–2361C and MIL–STD–40051C.

(3) Provide common look and feel to user by integrating Aerospace Industries Association and TRADOC-approved style sheets and formats.

c. Data and data rights will include, but not be limited to platform/equipment technical data used to operate, service, troubleshoot, isolate faults of, and identify the scheduled and unscheduled maintenance processes to repair weapon systems and other support equipment.

7–6. Embedded diagnostics/embedded prognostics and interactive electronic technical manuals sustainment

a. ED/EP/IETM sustainment requirements will be addressed throughout the supported system life cycle. Materiel developers will document, plan, and program funds according to the materiel life-cycle phase.

b. Commercial specifications and standards will be used when feasible, appropriate, and cost effective. Specifications and standards will foster interoperability and reuse of data.

Appendix A
References

Section I
Required Publications

AR 11–1
Command Logistics Review Program (CLRP). (Cited in para 3–5.)

AR 11–2
Management Control. (Cited in para 3–5.)

AR 11–9
The Army Radiation Safety Program. (Cited in para 6–2.)

AR 20–1
Inspector General Activities and Procedures. (Cited in para 6–17.)

AR 40–61
Medical Logistics Policies and Procedures. (Cited in para 6–26.)

AR 50–6
Chemical Surety. (Cited in para 3–5.)

AR 70–1
Army Acquisition Policy. (Cited in paras 2–8, 3–10, 4–6.)

AR 71–32
Force Development and Documentation—Consolidated policies. (Cited in para 3–21.)

AR 220–1
Unit Status Reporting. (Cited in para 3–5.)

AR 380–5
Department of the Army Information Security Program. (Cited in para 3–20.)

AR 380–40
Policy for Safeguard and Controlling Communication Security—(COMSEC) Materiel. (Cited in para 3–20.) (Available from Army Knowledge Online, www.us.army.mil/suite/login/welcome.html.)

AR 385–16
Systems Safety, Engineering and Management. (Cited in para 3–19.)

AR 602–2
Manpower and Personnel Integration (MANPRINT) in the System Acquisition Process. (Cited in para 2–1, 2–2, 2–4, 2–7.)

AR 700–127
Integrated Logistics Support. (Cited in paras 2–1, 3–10.)

AR 700–138
Army Logistics Readiness and Sustainability. (Cited in para 3–15.)

AR 700–142
Materiel Release, Fielding and Transfer. (Cited in para 3–16.)

AR 702–11
Army Quality Program. (Cited in para 6–17.)

AR 708–1
Logistics Management Data and Cataloging of Supplies and Equipment. (Cited in para 3–22.)

AR 750–1
Army Materiel Maintenance Policy. (Cited in paras 3–5, 3–8, 6–4, 6–10.)

DA Pam 700–21–1
Department of the Army Test, Measurement and Diagnostic Equipment Preferred Items List (DA TMDE PIL). (Cited in paras 2–8, 4–16.)

DA Pam 750–8
The Army Maintenance Management System (TAMMS) User's Manual. (Cited in para 6–31.)

DA Pam 750–43
Army Test Program Set Procedures. (Cited in para 3–18.) (Available on EM 0001, Army Electronic Library (DA Pam 25–30).)

FM 4–30.3
Maintenance Operations and Procedures. (Cited in para 6–16.) (Available from http://atiam.train.army.mil.)

FM 63–11
Logistics Support Element Tactics, Techniques and Procedures. (Cited in para 6–16.) (Available from http://atiam.train.army.mil.)

MIL–PRF–38793B
Technical Manuals: Calibration Procedures—Preparation. (Cited in para 6–30.) (Available at http://dodssp.daps.mil/assist.htm.)

MIL–STD–1839
Department of Defense Standard Practice for Calibration and Measurement Requirements. (Cited in para 3–2.) (Available at http://dodssp.daps.mil/assist.htm.)

TB 9–4931–537–35
Calibration Procedures for Cross-checks, Intercomparisons, and Visual Inspections. (Cited in para 6–18.) (Available at www.logsa.army.mil.)

TB 750–25
Maintenance of Supplies and Equipment: Army Test, Measurement, and Diagnostic Equipment (TMDE) Calibration and Repair Support (C&RS) Program. (Cited in paras 2–5, 3–6, 6–9, 6–10, 6–12, 6–27, 6–31.) (Available on EM 0001, Army Electronic Library (DA Pam 25–30).)

TM–43–TMDE
TMDE Technical Data Catalog. (Cited in paras 2–10, 3–6, 6–2, 6–3, 6–5, 6–8, 6–12, 6–15, 6–25, 6–26, 6–30, 6–31.) (Available on EM 0001, Army Electronic Library (DA Pam 25–30).)

Section II
Related Publications
A related publication is a source of additional information. The user does not have to read it to understand this regulation.

AR 750–10
Army Modification Program

DA Pam 700–21–2
Department of Defense Consolidated Electronic Test Equipment

MIL–HDBK–2165
Testability Program for Systems and Equipments. (Available at http://dodssp.daps.mil/assist.htm.)

MIL–PRF–32070
Test Program Sets. (Available at http://dodssp.daps.mil/assist.htm.)

MIL–PRF–49503B
General Style and Format, test Program Sets for Automatic test Equipment. (Available at http://dodssp.daps.mil/assist.htm.)

MIL–PRF–28800F
General Specifications for Test Equipment for use with Electrical and Electronic Equipment. (Available at http://dodssp.daps.mil/assist.htm.)

MIL–HDBK–1839A
Calibration and Measurement Requirements. (Available at http://dodssp.daps.mil/assist.htm.)

MIL–STD–2361C
Digital Publications Development. (Available at http://dodssp.daps.mil/assist.htm.)

MIL–STD–40051C
Preparation of Digital Technical Publications Information for Multi-Output Presentation of Technical Manuals. (Available at http://dodssp.daps.mil/assist.htm.)

TB 11–6625–3263–25
Test Equipment Modernization (TEMOD) Program Guide and Replacement Lists. (Available at www.logsa.army.mil.)

TB 43–0001–53–1
Equipment Improvement Report and Maintenance Digest Patriot Air Defense Guided Missible System (1st Quarter, CY 2000). (Available at www.logsa.army.mil.)

TB 43–0001–62–03–2
Equipment Improvement Report and Maintenance Digest for Tank, Automotive, and Armament Equipment (April thru June–2nd QTR CY 03). (Available at www.logsa.army.mil.)

TB 43–0001–62–03–3
Equipment Improvement Report and Maintenance Digest for Tank, Automotive, and Armament Equipment. (Available at www.logsa.army.mil.)

ANSI Z540.1994
Calibration Laboratories and Measuring and Test Equipment—General Requirements. (Available from National Conference of Standards Laboratories, 1800 30th Street, Suite 305B, Boulder, CO 80301.)

ISO 10012–1–92
Metrological Confirmation System for Measuring Equipment. (Available from International Organization for Standardization, 1 Rue de Varembe, Case Postale 56 CH–1211 Geneva 20, Switzerland.)

ISO/IEC 17025:1999
General requirements for the competence of testing and calibration laboratories. (Available from www.iso.org/iso/en/isoonline.frontpage.)

Section III
Prescribed Forms

The following forms are available on the APD Web site (www.apd.army.mil) unless otherwise stated.

DA Form 4062–R
TMDE Acquisition Approval Analysis Data. (Prescribed in paras 4–6, 4–7.)

Section IV
Referenced Forms

DA Form 11–2–R
Management Control Evaluation Certification Statement

DA Form 2407
Maintenance Request

DA Form 2417
U.S. Army Calibration System Rejected Instrument

DA Form 3023
Gage Record card

DA Form 3758–R
Calibration and Repair Requirements Worksheet

DA Form 7372
TMDE Calibration and Repair Data

DA Label 80
U.S. Army Calibrated Instrument

DA Label 163
U.S. Army Limited or Special Calibration

Appendix B
DA Form 4062

B–1. Purpose
To provide use, disposition, and preparation instructions for DA Form 4062 (figure B–1)

B–2. Use
DA Form 4062 is used to provide the TMDE program manager with logistical, technical, and supportability data for making an acquisition decision for TMDE not identified in the DA TMDE PIL or in the DOD Consolidated Equipment List or that is not designated Army or DOD standard equipment. The form will also address Army capability to provide calibration and repair support for the item of TMDE. When additional space or explanation is required, attachments to the form are authorized. Such attachments should be referenced ("see attachment") in the appropriate block of DA Form 4062. If any data on the form are classified, then the completed form will be classified no lower than the highest level of classified data used.

B–3. Disposition
The TMDE program manager will retain completed DA Forms 4062 on file for a minimum of 1 year after a final decision on the request.

TMDE ACQUISITION APPROVAL ANALYSIS DATA

For use of this form, see AR 750-43; the proponent agency is DCS, G-4.

1a. THRU	1b. TO	2. FROM
COMMANDER US ARMY AVIATION AND MISSILE COMMAND REDSTONE ARSENAL, AL 35898-5000 AMSAM-TMD-LI	PM TMDE ATTN: SFAE-CSS-ME-T REDSTONE ARSENAL, AL 35898-5400	COMMANDER TOBYHANNA ARMY DEPOT ATTN: AMSEL-LC-ME-N, N.S. SMITH 11 HAP ARNOLD BLVD, PA 18466-5075

3. TMDE NOMENCLATURE	4. MODEL / PART NUMBER	5. UNIT COST
SIGNAL GENERATOR	MDL: 2030 w/opt 001 & 006	$18,000.00

6. NSN	7. LIN	8. MANUFACTURER'S NAME	9. CAGE CODE
N/A	N/A	IFR	0GKL4

10. SYSTEM APPLICATION	11. RDD	12. AUTHORIZATION DOCUMENT
AIR NAVIGATION	30 NOV 2004	APPROVED DA 4610R TO TDA (SEE ATTACHED)

USER SUPPORTABILITY DATA

13. END ITEM MEASUREMENT REQUIREMENTS / TMDE SPECIFICATIONS

Frequency 20Khz to 1.0 Ghz
Resolution 0.1 Hz

TMDE Manufacturer specifications (attached)
critical parameters: Frequency 10Khz to 1.35GHz
Resolution 0.1Hz

14. PUBLICATIONS

IFR operating and maintenance manual.

15. USER MOS OR SKILL	16. LEVEL OF USE	17. MAINT MOS OR SKILL	18. LEVEL OF MAINT
WG-2610	D	WG-2610	D

19. DISTRIBUTION / QUANTITY	20. REMARKS
Air Navigation Division/ QTY 1	Avionics options needed

21a. TYPED NAME AND TITLE	21b. PHONE NUMBER / E-MAIL
Nathan S, Smith, Equipment Specialist	DSN 795-9999/ Nathan.smith@tobyhanna.army.mil

21c. SIGNATURE	21d. DATE *(YYYYMMDD)*
Nathan S. Smith	20040915

USATA SUPPORTABILITY ANALYSIS

22. CALIBRATION AND REPAIR SUPPORTABILITY *(C&RS)*

ITEM ☐ IS ☒ IS NOT SUPPORTABLE BY THE ARMY'S C&RS PROGRAM

23. REMARKS

Compliance with AR 700-127 is required to assure supportability issues are addressed

24a. TYPED NAME AND TITLE	24b. PHONE NUMBER / E-MAIL
Joseph Jones	DSN 645-9987/ Joe.Jones@redstone.army.mil

24c. SIGNATURE	24d. DATE *(YYYYMMDD)*
Joseph Jones	20041018

DA FORM 4062, OCT 2004 PREVIOUS EDITIONS ARE OBSOLETE APD V1.00

Legend for Figure B–1;
completion instructions are below.

Figure B–1. Sample of a completed DA Form 4062

1a. THRU. Commander, U.S. Army Aviation and Missile Command (AMSAM–TMD–LI), Redstone Arsenal, AL 35898–5000. USATA review is required for supportability analysis.

1b. TO. TMDE Program Manager, SFAE–CSS–ME–T, Redstone Arsenal, AL 35898–5400.

2. FROM. Enter submitting activity's address.

3. TMDE NOMENCLATURE. If available, enter the nomenclature assigned per Supply Bulletin 700–20. If not assigned, enter the manufacturer's nomenclature.

4. MODEL/PART NUMBER. If available, use the Joint Electronics Type Designation System (JETDS) number, for example, AN/PSM–45A. Use the manufacturer's model number or part number if a JETDS number is not available.

5. UNIT COST. Enter estimated unit cost of TMDE item proposed.

6. NSN. Enter the national stock number for the TMDE item if assigned; otherwise, enter "NA."

7. LIN. Enter the TMDE line item number if assigned; otherwise, enter "NA."

8. MANUFACTURER'S NAME. Enter the item manufacturer's name.

9. CAGE CODE. Enter the commericial activity/Government entiry (CAGE) code to correspond with the name in block 8.

10. SYSTEM APPLICATION. Enter the system nomenclature and model number the requested item of TMDE will be used to support.

11. RDD. Enter the required delivery date in order to support system in field.

12. AUTHORIZATION DOCUMENT. Enter the authorization document for the TMDE including information, such as document number, paragraph, and UIC of obtaining units.

USER SUPPORTABILITY DATA

13. END ITEM MEASUREMENT REQUIREMENTS/TMDE SPECIFICATIONS. Enter the end item measurement requirements and critical specifications or required measurement parameters for the TMDE item. A copy of the manufacturer's specifications sheet, or other such document, may be sent as an enclosure to simplify the form. Identify if the item is PIL, PIL candidate, Department of Defense Consolidated Electronic Test Equipment Listing (DODCEL), TEMOD, or IFTE.

14. PUBLICATIONS. Enter the name and number of any commercial and/or military manuals. As a minimum, an operator's manual and a maintenance manual should be listed. When applicable, also list the calibration procedure.

15. USER MOS OR SKILL. Enter the military occupational specialty or civilian skill code of the TMDE user/operator.

16. LEVEL OF USE. Enter the level of maintenance where the TMDE item will be used (for example, D, depot; L, special repair activity; H, general support; F, direct support; O, unit maintenance; C, unit/operator maintenance). If none of the codes applies, enter a brief description in this block or use block 20 (Remarks) to describe how the TMDE will be used.

17. MAINT MOS OR SKILL. Enter the military occupational skill or civilian skill code of the TMDE maintainer.

18. LEVEL OF MAINT. Enter the level of maintenance at which the TMDE will be maintained (for example, D, depot; L, special repair activity; H, general support; F, direct support; O, unit maintenance; C, unit/operator maintenance). If another level of maintenance applies, enter a brief description in this block or in block 20 (Remarks).

19. DISTRIBUTION/QUANTITY. Enter all known geographic locations and quantities where the TMDE will be deployed to include estimated delivery dates. An excerpt from the materiel fielding plan or other document may be added as an enclosure to simplify this entry.

20. REMARKS. Enter any pertinent information not covered elsewhere on the form.

21a. TYPED NAME AND TITLE. Enter the name and title of the responsible official (for example, TMDE item manager, maintenance engineer, program/project/product manager).

21b. PHONE NUMBER/E-MAIL. Commercial or DSN telephone number and e-mail of the responsible official.

21c. SIGNATURE. Signature of the person named in block 21a.

21d. DATE *(YYYYMMDD)*. Enter the date of the request.

USER SUPPORTABILITY ANALYSIS

22. CALIBRATION AND REPAIR SUPPORTABILITY *(C&RS)*. This block attests to the supportability of the item by the Army's TMDE C&RS program.

23. REMARKS. Enter any pertinent information to clarify or expand on C&RS issues. An entry in this block is required if item is marked not supportable in block 22.

24a. TYPED NAME AND TITLE. Enter the name and title of the responsible USATA official performing the analysis.

24b. PHONE NUMBER/E-MAIL. Enter the commercial or DSN telephone number and email of the responsible official.

24c. SIGNATURE. Signature of the person named in block 24a.

24d. DATE *(YYYYMMDD)*. Enter the date of the analysis.

Figure B–1. Sample of a completed DA Form 4062—Continued

Appendix C
Management Control Evaluation Checklist

C–1. Function
The functions covered by this checklist is the Army TMDE program.

C–2. Purpose
To assist commanders within the TMDE program in evaluating key management controls. The following checklist is not intended to cover all controls but does cover those controls considered to be the most importance in evaluating the overall effectiveness of the TMDE program.

C–3. Instructions
Answers to the below evaluation must be based on the actual testing of controls (for example, document analysis, direct observation, interviewing, sampling, simulation, evaluation reports, and so forth). Those answers that indicate deficiencies must be explained, to include corrective action taken, with supporting documentation. These controls must be evaluated at least once every year. Certification that the evaluation has been conducted must be accomplished in accordance with AR 11–2 on DA Form 11–2 (Management Control Evaluation Certification Statement).

C–4. Test questions
a. Is there Army doctrine and organizational structures in place to support the TMDE calibration and repair support program? (FM 63–11, FM 4–30.3, TRADOC)

b. Are materiel developers, including ED/EP and IETM requirements, in their system-level supportability analysis early in the acquisition lifecycle to determine the level, economy, and functionality of ED/EP and IETM for their system or equipment item? (Materiel system developers/ASA(ALT))

c. Are materiel developers programming for life-cycle support of ED/EP and IETMs when the supportability analysis supports implementing some level of ED/EP and IETM? (Materiel system developers/ASA(ALT))

d. Are IETMs being developed in extensible markup language in accordance with MIL–STD–2361C and MIL–STD–40051C (Materiel system developers/ASA(ALT))

e. Are calibration measurements traceable to NIST, or an accredited national/international holder of standards? (AMC/USATA/DCS, G–4)

f. Is the overall TMDE program adequately funded to ensure execution of the program? (HQ AMC/DCS, G–4/DCS, G–8)

g. Are adequate numbers of calibration and repair support personnel, military and civilian, trained and available within the total Army force structure? (TRADOC/AMC)

h. Are TMDE requirements addressed in the emerging material systems acquisition programs? (Material system developers/ASA(ALT))

i. Are materiel developers complying with the policy to use Army standard ATE/PIL items to meet TMDE requirements?

j. Does the materiel developer use the waiver process when a TMDE requirement cannot be addressed using the Army standard ATE or preferred item listing? (Materiel system developers/ASA(ALT))

k. Does the ASA(ALT) enforce the Army standard ATE, PIL, and associated waiver process?

l. Are quality assurance inspections carried out in accordance with this regulation and appropriate technical documents, with the results of such provided to the Army Inspector General's office? (AMC/USATA)

m. Is there a functional TMDE management information system(s) available to collect and provide performance data reports relative to the Army TMDE programs effectiveness? (AMC/USATA)

n. Are unit/installation TMDE support coordinators monitoring the TMDE inventory availability and delinquency rates to ensure the unit/installation meets the established goals in this regulation? (Unit/installation commanders)

C–5. Supersession
This checklist replaced the checklist for the Army TMDE program previously published in AR 750–43, dated 28 November 1997.

C–6. Comments

Help make this a better tool for evaluating management controls. Please submit comments to: Deputy Chief of Staff, G–4 (DALO–SMM), 500 Army Pentagon, Washington, DC 20310–0500.

Glossary

Section I
Abbreviations

ACL
area calibration laboratory

AAE
Army Acquisition Executive

AMC
U.S. Army Materiel Command

ANSI
American National Standards Institute

APSL
U.S. Army Primary Standards Laboratory

AR
Army regulation

ARNG
Army National Guard

ASA
Assistant Secretary of the Army

ASARC
Army Systems Acquisition Review Council

ASA(ALT)
Assistant Secretary of the Army for Acquisition, Logistics and Technology

ATE
automatic test equipment

ATS
Automatic Test System

ATST
Area TMDE Support Team

BIT
built-in test

BITE
built-in test equipment

BOIP
basis-of-issue plan

C&RS
calibration and repair support

CAR
Chief, Army Reserve

CASCOM
Combined Arms Support Command

CBM
condition-based maintenance

CBU
calibrate before use

CG
commanding general

CNR
calibration not required

CONUS
continental United States

DA
Department of the Army

DANG
Director, Army National Guard

DCS, G–3
Deputy Chief of Staff, G–3

DCS, G–4
Deputy Chief of Staff, G–4

DCS, G–8
Deputy Chief of Staff, G–8

DFT
design-for-testability

DOD
Department of Defense

DODCEL
Department of Defense Consolidated Electronic Test Equipment Listing

DT
developmental testing

ED
embedded diagnostics

EIR
equipment improvement report

EP
embedded prognostics

ERP
enterprise resource planning

ETM
electronic technical manual

FIELD
field maintenance

FM
field manual

FMS
foreign military sales

GOCO
Government-owned, contractor-operated

HQDA
Headquarters, Department of the Army

IETM
interactive electronic technical manual

IFTE
integrated family of test equipment

ILS
integrated logistics support

IMRF
Instrument Master Record File

IPR
in-process review

ISO
International Organization for Standardization

JETDS
Joint Electronics Type Designation System

LORA
level of repair analysis

LRU
line replaceable unit

MACOM
major Army command

MANPRINT
manpower and personnel integration

MARC
manpower requirements criteria

MIL–HNBK
military handbook

MIL–PRF
military performance specifications

MIL–STD
military standard

MOS
military occupational specialty

MSC
major subordinate command

NIHD
national instrument historical database

NIST
National Institute of Standards and Technology

OCONUS
outside continental United States

OT
operational testing

PAM
pamphlet

PIL
preferred items list

PTTI
precise time and time interval

PUIC
performing unit identification code

RADIAC
radiation, detection, identification, and computation

RDTE
research, development, test, and evaluation

SUIC
scheduling unit identification code

SUSTAINMENT
sustainment maintenance

TB
technical bulletin

TC
type classification

TEMIS
TMDE management information system

TEMOD
test equipment modernization

TEMP
test and evaluation master plan

TIMMS
TMDE integrated material management system

TMDE
test, measurement, and diagnostic equipment

TMDE–GP
TMDE—general purpose

TMDE–SP
TMDE—special purpose

TP
test program

TPH
test program hardware

TPS
test program set

TPSMP
test program set management plan

TRADOC
U.S. Army Training and Doctrine Command

TSA
TMDE support activity

TSC
TMDE support center

USAPSL
U.S. Army Primary Standards Laboratory

USAR
U.S. Army Reserve

USATA
U.S. Army TMDE Activity

UUT
unit under test

Section II
Terms

area TMDE support team
An organizational element of a TSA/TMDE support center (TSC) or Army Maintenance support company. The ATST provides T–Level TMDE calibration and repair support in a mobile or fixed configuration staffed by military or civilian support personnel.

area calibration laboratory
An organizational element of a TSC that provides support for secondary transfer measurement standards and/or TMDE designated as requiring S–Level support. The ACL consists of measurement standards, TMDE C&RS equipment, and is staffed by civilian personnel.

Army Primary Standards Laboratory (APSL)
An organizational element of USATA that provides the Army's highest level of measurement capability. The USAPSL maintains the Army's most precise and accurate measurement standards and provides C&RS service for selected Army materiel.

ATE/TPS center
The central point of focus at the MSC level for ATE and TPS automatic test issues.

automatic/automated test equipment
TMDE that performs a predetermined program to test functional or static parameters, to evaluate the degree of performance degradation, or to perform fault isolation of unit malfunctions. As a minimum, ATE must be able to sequentially perform testing/measurements, compare the measurements to predetermined values or ranges, and based on the result of this comparison, branch to other tests without manual intervention.

automatic test system (ATS)
ATE, associated system software, all items required for support, and those supported end items TPSs that may be stored with the ATE.

built-in-test (BIT)
Hardware and software that are designed into the end item to test all or part of that end item.

built-in-test-equipment (BITE)
Any identifiable device that is a part of the supported end item and is used for testing that supported end item.

calibration
The comparison of a measurement system or device of unverified accuracy to a measurement system or standard of known greater accuracy to detect and correct any variation from the required performance specifications of the unverified measurement system or device.

calibration equipment
Measurement standards and test, measurement, and diagnostic equipment and accessories used in performance of calibration.

calibration interval
The period of time that a calibrated instrument can be expected to retain its specified accuracy within a predetermined confidence level before it must be recalibrated.

calibration procedure
The document that identifies the technical specifications of an instrument to be calibrated, the required measurement standards, and the detailed technical procedure to be used to perform a calibration.

calibration requirement
The identification of an instrument that requires calibration, a statement of the instrument's specifications that must be verified (accuracies, ranges, frequencies, and so forth), and the support application of the instrument.

certification
Endorsement of reliability.

diagnostic equipment
Equipment used to analyze and identify electronic and physical characteristics.

embedded diagnostics (ED)
A capability that accomplishes self-diagnosis using on-board resources as an integrated system (i.e., sensors, analytical software and embedded devices); collects, correlates and synthesizes systems performance data to provide a system level health assessment via on-board processing.

embedded prognostics (EP)
A further refinement of embedded diagnostics to address system condition, support failure prediction and enable anticipatory logistics by use of software algorithms. Prognostic capabilities identify impending failures and provide appropriate actionable logistics support direction.

field maintenance
Field maintenance is the first operation of the Army maintenance system. Field maintenance is characterized by the performance of maintenance tasks "on system" in a tactical environment using trained personnel, tools, and TMDE. Field maintenance is typically operator/crew maintenance and repair and return to user maintenance operations.

hot mockup
Any assemblage of repair parts, components, modules, or similar items configured to simulate an end item or subsystem for the purpose of testing or checking individual or collective parts, component, modules, or similar items.

instrument
The term used to denote both TMDE and measurement standards.

Instrument Master Record File (IMRF)
The data file that contains identifying information about instruments that require cyclic calibration and repair. It also contains identifying information about instruments that require repair but do not require calibration.

interservice support agreement
Calibration and maintenance service performed by the organic capability of one military service (or element thereof), contractor, and other Government agencies in support of another military service (or element thereof). Such action can be recurring or nonrecurring in character.

levels of support
As related to TMDE C&RS, there are four distinct levels of support.

a. F-level support. TMDE support provided by field/sustainment maintenance units, facilities, owners and users of TMDE as identified in TB 43–180 and appropriate maintenance manuals.

b. T-level support. TMDE support provided by an Area TMDE Support Team (ATST) with secondary transfer standards. Items requiring such support are identified in TB 43–180.

c. S-level support. TMDE support provided by an Area Calibration Laboratory (ACL) or by the closest TMDE support activity that has the appropriate secondary reference support capability. Items requiring such support are identified in TB 43–180.

d. P-level support. The highest level of calibration support. The Army's Primary Standards Laboratory (APSL) provides p-level support. Items requiring such support are identified in TB 43–180.

line replaceable unit
A unit designated to be removed upon failure from a larger entity (equipment or system) in the operational environment.

manual test
Test performed using manual equipment.

measurement equipment
Equipment used to observe a quantitative value or dimension.

measurement standard
An instrument, natural physical constant, or materiel with known performance characteristics used as a reference to establish the value and maintain accuracy of a measurement system or instrument.

National Institute of Standards and Technology (NIST)
Founded in 1901, NIST is a Federal agency within the U.S. Commerce Department's Technology Administration (http://www.nist.gov). NIST's mission is to develop and promote measurement, standards, and technology to enhance productivity, facilitate trade, and improve the quality of life. NIST carries out its mission in four cooperative programs:

a. NIST Laboratories, conducting research that advances the nation's technology infrastructure and is needed by U. S. industry to continually improve products and services.

b. Baldrige National Quality Program, which promotes performance excellence among U.S. manufacturers, service companies, educational institutions, and health care providers; conducts outreach programs and manages the annual Malcolm Baldrige National Quality Award which recognizes performance excellence and quality achievement.

c. Manufacturing Extension Partnership, a nationwide network of local centers offering technical and business assistance to smaller manufacturers.

d. Advanced Technology Program, which accelerates the development of innovative technologies for broad national benefit by co-funding R&D partnerships with the private sector

national instrument historical database (NIHD)
A database maintained by HQ, USATA that contains Army-wide information about C&RS actions on each instrument of TMDE.

national standard
A measurement standard maintained by National Institute of Standards and Technology (NIST), the US Naval observatory for time and time interval, constituting the highest level of accuracy and legal basis for measurement in the United States.

nondevelopmental item
Those items available for procurement to satisfy an approved materiel requirement from existing sources (such as commercial items and items developed by other Government agencies, U.S. military services, or countries) requiring little or no additional development.

precise time
A time requirement accurate to within 10 milliseconds. Time signifies epoch, that is the designation of an instant on a selected time scale, astronomical or atomic. It is used in the sense of time of day.

preferred items list (PIL)
Those TMDE identified that are considered the most advanced and acceptable in their respective families for military use. The TMDE are supportable and procurable in adequate quantities, capable of meeting specific requirements in military environments, and type classified "standard."

primary reference standard
Measurement standards representing the highest level of measurement capability within the Army TMDE calibration and repair program that are normally used and maintained by the U.S. Army Primary Standards Laboratory (USAPSL) and Army Primary Nucleonic Laboratories.

RADIAC (radiation, detection, identification, and computation) meter
A portable TMDE, such as Geiger counter or ionization chamber, used to detect nuclear radiation and dose rate. RADIAC meters may be used to detect or measure alpha, beta, gamma, x-ray, or neutron radiation.

secondary reference standards
A set of measurement standards and accessories that are normally used in a fixed facility laboratory environment and maintained by ACLs providing S-level calibration support.

secondary transfer standards
A set of measurement standards and accessories that are used in a mobile or fixed configuration by ATSTs and TSA/TSCs providing T-level calibration support.

sustainment maintenance
Sustainment maintenance is the second operation of the Army maintenance system. Sustainment maintenance is characterized by the performance of maintenance tasks, "off system" in a secure environment using trained personnel, tools, and TMDE. Sustainment maintenance is typically repair and return to stock and depot maintenance operations.

test accessories
The items required to interface an ATE with TPS.

test equipment
Equipment used to determine characteristics or values using specific procedures and/or methods to make a reference measurement.

test, measurement, and diagnostic equipment (TMDE)
Any system or device used to evaluate the operational condition of an end item or subsystem thereof to identify and/or isolate any actual or potential malfunction. This TMDE includes diagnostic and prognostic equipment; semiautomatic and automatic test equipment, to include TPSs (with issued software); and calibration test or measurement equipment. *Note:* When the term TMDE is used, it refers to both TMDE–GP and TMDE–SP.

test program set (TPS)
The combination of interface devices, software test programs (such as those residing in logic storage media or in permanent digital memory), and documentation (for example, technical manuals and technical data packages) that together allows the ATE operator to perform the testing/diagnostic action on the unit under test (UUT).

test program set (TPS) center
An organization for management of TPS development, acquisition, fielding, requisition, and support. The centers are

normally located within AMC major subordinate commands and provide technical and management support to materiel developers.

TMDE-general purpose (GP)
Any TMDE that can be used without modification for support operations of more than one end item or system. Addition of external special accessories, plug-in assemblies, logic probes, attenuators (or TPSs for ATE) are not considered modifications.

TMDE-special purpose (SP)
Any TMDE designed specifically for support of and functionally restricted to, one end item or system. To use this TMDE for support of another end item or system would necessitate modifications) to the TMDE. Addition of external special accessories, plug-in assemblies, logic probes, attenuators (or TPS for ATE) are not considered modifications.

TMDE support activity (TSA)
A functional organization (personnel and equipment) specifically established to provide single source C&RS for TMDE.

TMDE support center (TSC)
A center for TMDE calibration and repair support established at strategic geographic locations. The TSCs typically operate an ACL and provide ATSTs as required within the assigned area of support. TSCs are typically civilian operated support activities.

Section III
Special Abbreviations and Terms
This section contains no entries.

Index

This index is organized alphabetically by topic and subtopic. Topics and subtopics are identified by paragraph number.

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