

**BY ORDER OF THE COMMANDER  
ARNOLD ENGINEERING  
DEVELOPMENT COMPLEX**



**ARNOLD ENGINEERING  
DEVELOPMENT COMPLEX  
INSTRUCTION 21-113**

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**TOOL CONTROL**

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This publication implements the Tool Control Program requirements of Air Force Instruction 21-101, Air Force Materiel Command Supplement, Air Force Material Command Addendum A, *Non-Standard Organization (NSO) Logistics Maintenance Management*. This instruction provides the minimum essential guidance and procedures to manage and implement the Tool Control Program. It applies to all Government, contractor, and test customer personnel working in, around, or traveling through Foreign Object (FO) Critical Areas and FO Awareness Areas at all locations of the Arnold Engineering Development Complex including the Geographically Separated Units (GSUs). This publication may be supplemented at any level, but all supplements must be routed to the Office of Primary Responsibility (OPR) listed above for coordination prior to certification and approval. Refer recommended changes and questions about this publication to the OPR listed above using the AF Form 847, *Recommendation for Change of Publication*; route AF Forms 847 from the field through the appropriate chain of command. Requests for waivers must be submitted to the OPR listed above for consideration and approval. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS). The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

## ***SUMMARY OF CHANGES***

This document has been substantially revised and must be completely reviewed. Major changes include the use of 2 new AEDC forms to include how and when to use them. Item 3. Specific Actions contains new actions that apply to all Tool Kits and Tool Cribs located in FO Awareness Areas.

**1. Overview.** The primary objective of the tool control program is to prevent foreign object damage (FOD) to aircraft, test articles, and test support equipment from ineffective tool management. Secondary objectives are to reduce the cost of tool replacement and provide efficient access to tools.

### **2. Responsibilities.**

2.1. The AEDC Commander (AEDC/CC) shall ensure assets and resources are allocated to implement and execute this instruction.

2.2. Chief, Test Systems Sustainment Division (AEDC/TSS) shall ensure compliance with this instruction.

2.3. Maintenance Superintendent (AEDC/TSS) shall serve as the Tool Control Program administrator.

2.4. TSS Functional Specialists shall:

2.4.1. Perform monthly spot inspections IAW this instruction and document finding on AEDC form 881 and 882.

2.4.2. In addition to this guidance, perform housekeeping and safety inspections.

2.4.3. Document findings in database for reporting and trend analysis. Provide training and feedback on failed items to work center.

2.4.4. Provide training or education to work centers when requested.

2.4.5. Maintain all findings in local database.

2.5. AEDC/TST test managers/test engineers shall ensure that test customers comply with the tool control requirements stated in Attachment 2 if customers are required to use tools in FO Critical and Awareness Areas.

2.6. AEDC personnel shall ensure all contracts include the tool control requirements of Attachment 2 as a minimum if contracted work may be in FO Critical and Awareness Areas.

### **3. Specific Actions.**

3.1. The following actions apply to all tools, tool kits (TK) and tool cribs (TC) permanently located in FO Awareness Areas as identified in AEDCI 21-111, *FOD Prevention Program*. The FO Awareness Areas primarily consist of test cell, test plant, utilities, and the AEDC airfield areas. Tool control requirements for non-permanent tools used in FO Critical and Awareness Areas are defined in Attachment 2. The AEDC/TSS Maintenance Superintendent is the approval authority for application of this instruction to other AEDC areas.

3.2. Tools

3.2.1. Tools are defined as: hand tools (wrenches, pliers, hammers, screwdrivers, sockets, ratchets, flashlights, continuity testers, tape measures, mirrors, etc.) and portable power tools (electric tools such as drills and saws and pneumatic tools such as impact wrenches).

3.2.2. Locally manufactured/modified tools (LMT) are tools that have been manufactured at AEDC for a specific purpose or tools that have been modified at AEDC by grinding, welding, cutting, etc.

3.2.3. A subset of tools are expendable tools. These items are typically an attachment to a tool and wear as a result of use such as bits, grinding wheels, and saw blades. Expendable tools shall be treated as tools except where specifically directed otherwise in this instruction.

3.2.4. Consumables are defined as: safety wire, solder, tape, string, chalk, adhesives, wire bundle lacing, sanding paper, steel wool, welding rod, batteries, bulbs, razor blades, etc. Consumables must be accounted for in FO Critical and Awareness Areas to prevent FOD as part of good housekeeping; however, consumables do not require marking and inventory unless they are contained in a tool kit.

3.2.4.1. Industrial shop machinery accessories/attachments are defined as blades, bits, etc. that are used in non-portable shop machinery such as lathes, band saws, drill presses, etc. Industrial shop machinery accessories/attachments need not be controlled as tools. However, these items shall be maintained in designated storage locations for accountability and inventory purposes in a neat, clean, orderly fashion. Accessories/attachments either will be in use on the designated piece of equipment or properly stored in the designated location.

3.2.5. Test meter leads/circuit jumpers and jumper adapters are permitted outside the scope of tool control if and only if they meet the following criteria:

3.2.5.1. Must NOT be taken into FO Critical or FO Awareness Areas.

3.2.5.2. Must be stored in a designated area.

3.2.5.3. The storage area must be kept neat, clean, and orderly.

### 3.3. Tool Kit and Tool Crib General Requirements

3.3.1. TK shall be designated single-user (Individual Tool Kit (ITK) or multi-user (Consolidated Tool Kit (CTK) or dispatchable (Dispatchable Tool Kit (DCTK).

3.3.2. Each organization shall determine the type, size, and number of ITK, CTK, and TC required for their work centers; however, all new ITK, CTK, and TC and proposed changes to existing ITK, CTK, and TC shall be approved by the AEDC/TSS Maintenance Superintendent before implementation.

3.3.3. ITK, CTK, and TC shall be designed to provide a quick inventory and accountability of tools. Develop a simple inventory method, using a “show” (e.g., a shadow of the tool) and “know” (knowledge of tool or kit location) concept.

3.3.4. All ITK and CTK (to include any storage containers designated to be affixed to the TK) and all TC shall be marked with a locally assigned identification number, and all contents shall be subject to the guidelines of this instruction.

3.3.5. A Master Inventory List (MIL) shall be developed for each ITK, CTK, and TC. A copy of the MIL shall be kept in the tool kit or crib and a master MIL shall be maintained by the TIC at all times for inventory purposes. The master MIL may be electronic.

3.3.5.1. MILs must be standardized across the Complex to ensure proper documentation and the following minimum criteria must be met: contents must be identified on the MIL by drawer/section indicating the number and type of items in each drawer/section; the type of items listed must be sufficiently detailed to ensure the item can be identified for search and/or replacement purposes; the TIC shall maintain a template which is to be used for all MILs.

3.3.5.2. If chits/dog tags/identification tags or similar tags or dust caps are attached to tools/equipment, they shall be listed on the MIL.

3.3.5.3. The MIL remains valid until the contents in the ITK, CTK, or TC change. Pen and ink changes are permissible but require the change originator's initials and date of the change. MILs do not require replacement solely to update signature and/or pen and ink changes.

3.3.5.4. The MIL shall state the identification number(s) of assigned TMDE items.

3.3.6. No more than one item shall be stored in a cutout, shadow, or silhouette except for tools issued in sets such as drill bits, allen wrenches, apexes, or paired items (e.g., gloves, booties). As much as practicable, sets should be placed in a container.

3.3.7. All individually shadowed/silhouetted items in a tool kit or crib shall be etched, stamped or marked with the locally assigned identification number.

3.3.7.1. Small tools or items that cannot be marked with the identification number (such as drill bits, Allen wrenches, apexes, etc.) are to be maintained in a container marked with the tool kit or crib number and the number of tools contained. The container and the MIL shall be marked "XX pieces plus case" and an asterisk shall be placed on the MIL denoting the items are too small to mark.

3.3.7.2. Tools that consist primarily of a shank such as rotary files need not be etched but shall be stored in an etched container.

3.3.7.3. Drill bits maintained in drill bit indexes do not require individual etching, but the index shall be etched.

3.3.7.4. Fiberglass-handled hammers shall be mechanically etched on the metal head only (not on handle) in a non-impact area. A permanent marker may be used to mark on the handle but the marking must remain legible at all times.

3.3.7.5. Marking Test, Measurement, and Diagnostic Equipment (TMDE) assets with the TK number is not required. Utilize the existing bar code number on the Air Force Technical Order (AFTO) Form 65 (metallic), TMDE (Bar Code Label, Aluminum), or AFTO Form 66 (non-metallic), TMDE (Bar Code Label, Polyester), attached by (Precision Measurement Equipment Laboratory (PMEL).

3.3.7.6. Items that are assembled and are not intended to be disassembled during use, require only one mark/etch/stamp and one entry on the MIL (scribes, flashlights, etc.).

3.3.8. Remove pocket clips from tools when possible (flashlights, continuity testers, small screwdrivers, tape measures, mirrors, etc.) prior to placement. These items must be annotated “with clip” or “without clip” on the MIL.

3.3.9. Any tool normally used with a blade, such as a utility knife or hacksaw, shall be stored with the blade installed and the MIL shall be annotated “with blade.” If a blade is temporarily unavailable, annotate the mission blade on the AFMC Form 309, AFMC Tool Control Inventory Record.

3.3.10. Remove internal components such as spare bits, blades and light bulbs from tools such as utility knives and flashlights. If spare items are not removed, the MIL shall be annotated “with # blades/bits stored internally” and these spare components shall be subject to inventory.

3.3.11. Hazardous or flammable materials such as hand grease guns, dispensing cans, spray bottles, pump oilers, and similar containers will be stored in approved storage units and be marked with the type of grease, fluid, or other liquid and the military specification (MILSPEC) of the contents, if available.

3.3.12. Document all actions concerning the tool kit or crib on AFMC Form 309. This includes documenting removed/broken/replaced items, TMDE items being calibrated, and other items requiring special inspections.

3.3.13. Maintain record of lost, broken, or damaged tools. Track each transaction to identify the following data:

- 3.3.13.1. Date of transaction
- 3.3.13.2. Kit number of transaction
- 3.3.13.3. Type replacement (lost, broken, or damaged)
- 3.3.13.4. Item description
- 3.3.13.5. Kit Custodian
- 3.3.13.6. Kit Custodian Org
- 3.3.13.7. Value of lost/broken/damaged tools
- 3.3.13.8. USAF Property Tag number, if applicable

3.3.14. Deliver broken/damaged tools or un-needed tools to the Tool Issue Center.

3.3.15. Each TK and TC shall have a custodian assigned.

3.3.16. All tools, equipment, TK, and TC must be secured, if practical, when left unattended. The term unattended means when not in use by local personnel such as at the end of a shift.

3.3.16.1. Tool kit and crib locks shall be used to provide a physical barrier to opening the container or door and prevent the unauthorized removal of tools.

3.3.16.2. Access to keys for all kits and cribs must be available at all times to permit DoD audits and ensure access to tools can be achieved without regard to specific employee availability.

3.3.17. Consumables should not be placed in a TK. If a consumable item must be placed in a TK, it shall be treated as a tool and shall meet all the requirements of this instruction related to tools placed in a TK.

3.3.18. Notify the Tool Issue Center of a Custodian reassignment or location change of a tool kit or crib. If change involves an item with a USAF Property Tag, update property records as appropriate.

3.3.19. Control Consumable and Personal Accountable items that are not configured in TK or cribs as follows:

3.3.19.1. Provide security of supply storage

3.3.19.2. Maintain a neat and organized supply storage

3.3.19.3. Provide managed dispensing of supply items

3.3.20. Each work center/craft supervisor shall devise a system that works best for the area to ensure positive control of rechargeable power tools and batteries.

3.3.21. Torque wrenches will be stored at the lowest scale setting.

#### 3.4. ITK/CTK Specific Requirements

3.4.1. Each tool contained in an ITK/CTK shall have an assigned location in a drawer identified either by inlay cuts in the shape of the item, shadowed layout, label, or silhouette. The 2-colored inlay cut is preferred. Silhouettes should only be used when logistics prevent inlay cuts.

3.4.2. Perform and document a visual inventory using AEDC 1771 of all CTKs and ITKs when issued for use, when transferred to another person, after last use during a shift, and prior to operation of any major system, test article, or equipment when maintenance actions were performed (engine run, system checkout, before closing a confined space, etc.)

3.4.3. If tools/tool kits are required to be transferred from one employee to another at a job site, the individuals involved in the transfer shall conduct a joint inventory and document accordingly.

#### 3.5. Tool Issue Center and Tool Accountability

3.5.1. The TIC is the primary source of replacement tools and contact point for maintenance and control of all lost tool reports.

3.5.2. The TIC is the area designed to issue and accept return of TK and perform inventory changes with configuration control of documentation for all kits and cribs within the tool control program.

3.5.3. The TIC shall remove the identification number from unserviceable and excess tools when they are no longer assigned to a TK.

3.5.4. An engineering design review and evaluation is required on all requests for approval and use of LMT or equipment that carry loads, change torque, or present potential to injure personnel or damage government resources. A copy of the approval and certification letter shall be maintained by the TIC for each locally

manufactured/modified item assigned to a TK or TC. A copy of the certification letter shall also be maintained in the affected CTK, ITK, or crib. NOTE: This procedure does not apply to local manufacture, modification or design of tools authorized in specific technical data.

3.5.5. Account for all TK, tools, and dispatchable equipment at the beginning and end of each shift.

3.5.5.1. Document shift inventories on the AFMC Form 309 maintained in each tool kit/crib.

3.5.5.2. TK and TC not used on a particular day need not be opened simply for the purpose of inventory.

3.5.6. When a person signs for a tool or piece of equipment, they are accountable for it until it is returned to its assigned location and accountability is transferred.

3.5.7. Chit systems, AF Form 1297, Temporary Issue Receipt shall be used for accountability and control of TK, equipment, and tools.

3.5.7.1. When using a chit system, chits are issued by the TIC to individuals in sets. The number of chits in the set shall be determined by the supervisor and coordinated with the TIC. The TIC shall maintain records of issuance. Each chit shall be marked with a positive identifier, such as an employee number. Upon issuance, the chit set(s) becomes the responsibility of the owner and must be available for inspection upon request.

3.5.7.2. Chits are used when checking out tools for temporary use (limited to one shift) and only if the tool will be used outside the immediate area (defined as within sight and/or sound); when checking out tools for more than one shift use AF Form 1297. Tools checked out on AF Form 1297 for long-term use must be physically verified at least every 30 days and a new AF Form 1297 must be issued.

3.5.7.3. Chits will be accounted for at the beginning and end of each shift to ensure none were lost while performing work. If Chits are lost while performing work in an FO Critical or Awareness Area follow lost tool procedures as listed in para. 3.6.

### 3.6. Lost Tools

3.6.1. All personnel using tools in FO Awareness and FO Critical Areas shall be trained in lost tool procedures.

3.6.2. The person identifying the missing item/tool shall search the immediate work area for the item/tool.

3.6.3. If the lost item/tool is not found after completing an initial search, the individual shall notify appropriate personnel as directed by work area policy/procedure.

3.6.4. If after completing a thorough search the item/tool is not found within one hour, notify the Operations Center, FOD Monitor, TSS Functional Specialist and appropriate leadership as directed by work area policy/procedure.

3.6.5. Perform an operational risk assessment

3.6.6. If item is lost in a FO Critical Area, notify the Impound Authority per AEDCI 21-112 *Impoundment*.

3.6.7. If item is not found in one hour after the initiation of the search start the lost tool report documentation process using AEDC Form 145.

3.6.7.1. After all items including headers and checklist items one through five are complete on the AEDC Form 145, submit to TSS/Maintenance Superintendent/Functional Specialist for review and filing.

3.6.7.2. Functional Specialist will bring a completed copy of the AEDC Form 145 and take to TK/Crib Custodian for their records.

3.6.8. Discontinued operations may only resume when the item is found or the area(s) is cleared for return to service by concurrence of the Government.

RODNEY F. TODARO, Colonel, USAF  
Commander



**Attachment 1****GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

TO 32-1-101, *Maintenance & Care of Hand Tools*, 19 Sep 2014

AFI 21-101, *AFMC Sup Addendum A, Non-Standard Organization (NSO) Logistics Maintenance Management*, 2 June 2014

***Prescribed Forms***

AEDC 881, Tool Stewardship Observations, 06 Oct 2004

AEDC 882, Tool Stewardship Observations, 29 Oct 2008

AEDC 1771, Tool Control Inventory Record, 04 Apr 2016

AEDC 145, Lost Tool Procedures, 12 Apr 2016

***Adopted Forms***

AFTO Form 65, TMDE Bar Codes (Metallic)

AFTO Form 66, TMDE Bar Codes (Non-Metallic/Polyester Film)

AF847, Recommendation for Change of Publication

AF Form 1297, Temporary Issue Receipt

AFMC Form 309, AFMC Tool Control Inventory Record

***Abbreviations and Acronyms***

**AFTO**— Air Force Technical Order

**CMMS**— Computerized Maintenance Management System

**CTK**— Consolidated Tool Kit

**DCTK**—Dispatchable Consolidated Tool Kit

**DOD**—Department of Defense

**FO**—Foreign Object

**FOD**— Foreign Object Damage

**IAW**—In Accordance With

**ITK**— Individual Tool Kit

**LMT – Locally**—Manufactured/Modified Tool

**MIL**— Master Inventory List

**NFAC - National Full**—Scale Aerodynamics Complex

**OPR**— Office of Primary Responsibility

**Ops Center**— AEDC Operations Center

**PMEL**— Precision Measurement Equipment Laboratory

**TC**—Tool Crib

**TIC**—Tool Issue Center

**TMDE**— Test, Measurement, and Diagnostic Equipment

**TSS**—Test System Sustainment Division

### *Terms*

**Chit Set**— Numbered tags, manufactured of metal, plastic or some material not easily damaged, used to identify a person who borrows a tool from a tool kit or shadow board.

**Consolidated Tool Kit (CTK)**— A multi-user container used to store tools or equipment, enabling effective/efficient control of tools and ease of inventory.

**Consumables**— Items that after limited usage, do not maintain their original configuration and are considered used up. Examples are safety wire, solder, tape, string, chalk, etc.

**Daily Tool Kit Inventory**— A documented verification that all items are in place and missing items are documented and reported.

**Dispatchable Consolidated Tool Kit (DCTK)** — any tool kit that is not permanent to an FO Awareness or FO Critical Area that will be used by personnel to perform work in or near an FO Critical Area.

**Expendable Tools**—Items used in conjunction with tools that wear as a result of use such as bits, files, saw blades, sanding disks, and grinding wheels.

**FO Awareness Areas**—Locations where there is the potential for damage to aircraft, test articles, test equipment, or test facilities from FO. AEDC FO Awareness Areas are all active test cells, test plants, test utilities industrial areas and airfields.

**FO Critical Areas**—Areas designated in AEDCI 21-1 where there is significant potential for damage due to foreign objects.

**Individual Tool Kit (ITK)**— A single-user tool kit used to store tools or equipment, enabling effective/efficient control of tools and ease of inventory.

**Locally Manufactured/Modified Tool (LMT)**—A tool or equipment that is designed, developed, built, or modified locally.

**Master Inventory List (MIL)**—A list of all the items in a tool kit or tool crib.

**Shop machinery accessories/attachments**— Tool type items such as dies, fixtures, tool holders, chucks, machine tool wrenches, and special valve wrenches that are designed for use exclusively with a specific asset. Common tool items such as screwdrivers, Allen wrenches, sockets, pliers, and wrenches are not normally considered accessories or attachments.

**Supervisor's Inspection**— A comprehensive inspection/inventory of all tool kits conducted at least every 180 days. The purpose of this inventory is to perform an extensive inspection of all tools, to include condition, identification markings, and accuracy of the MIL. Inspect all tools for serviceability and review lost tool reports. Document these inspections and maintain the

most current inventory documentation on file. This inspection also verifies that each kit contains the required type and quantity of tools and eliminates excess and duplicate tools.

**Tool**— Any instrument or object used to perform work on components, equipment, and facility systems.

**Tool Crib (TC)**—Multi-user selection of tools normally secured in a cage or room that are available for routine checkout and issued by a custodian.

**Tool Issue Center (TIC)**— The area designed to issue and accept return of tool kits and perform inventory changes with configuration control of documentation for all kits within the tool control program. Primary source of replacement tools and contact point for maintenance and control of all lost tool reports.

**Tool Kit (TK)**— Any tool kit that may be used in a test cell, plant, machine shop area, and/or FO Awareness Area.

**Tool Serviceability**— The physical condition of a tool item that renders it safe and capable of use for its intended purpose. Conditions that render a tool unserviceable include dullness of cutting surfaces, structural damage due to loose or cracked handles, corrosion, nicks, cracks, mushrooming of striking surfaces, or critical dimensional changes that would cause the tool to cause personal injury or damage to the equipment being serviced. Reference: TO 32-1-101.

**Unauthorized Tool**— Any tool in an FO Awareness Area not controlled through the tool control program to include personal tools.

**Attachment 2****TOOL CONTROL REQUIREMENTS FOR DISPATCHABLE CONSOLIDATED TOOL KITS TO BE USED IN FO CRITICAL AND AWARENESS AREAS****Figure A2.1. Tool Control Requirements for Dispatchable Consolidated Tool Kits To Be Used In FO Critical And Awareness Areas**

1. A dispatchable consolidated tool kit (DCTK) is any tool kit that is not permanent to an FO Awareness or FO Critical Area that will be used by personnel to perform work in an FO Critical or Awareness Area. A DCTK may include tools owned by the Government, AEDC contractors, and non-AEDC contractors including test customers. A DCTK shall be utilized for the shortest period necessary to perform the work.
2. A DCTK may be created by checking out a selection of tool items from CTK, TK, TIC, or other source for use at remote job sites.
3. Each DCTK shall have a custodian assigned.
4. All tools, expendable tools, and consumables must be marked to identify the custodian and/or tool kit.
5. Each DCTK shall have a temporary Master Inventory List (MIL) of all tools, expendable tools, and consumables; and identifies the custodian.
6. Inspect DCTK daily, record inventory on AFMC Form 309, and report inspection results as required by Area Supervisor or Master Permit Issuer. Inventories must be accomplished and documented upon the first opening and last closing of every shift.
7. Lost tools must be immediately reported to the work permit issuing official or other work area responsible person.
8. If unmanned storage of DCTK is required, provide the following:
  - a. Lockable storage security protection (gang box, job box, cabinet, room, vehicle compartment, etc.).
  - b. Protection from weather or other potential physical harm.
  - c. Marking outside of storage units with name of Custodian and work crew organization.
9. At the end of work assignment: perform a final inventory, remove the DCTK from the FO Awareness or FO Critical Area, break down the DCTK and return tools.