

**BY ORDER OF THE COMMANDER  
445TH AIRLIFT WING**

**445TH AIRLIFT WING INSTRUCTION  
21-104**



**8 NOVEMBER 2012**

**Maintenance**

**CONSOLIDATED TOOL KIT (CTK)  
PROGRAM**

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This instruction implements Air Force Policy Directive (AFPD) 21-1, *Air and Space Maintenance*. It establishes positive procedures for tool control and assigns responsibility for maintaining an effective consolidated tool program. This directive is applicable to 445<sup>th</sup> Airlift Wing (445 AW) personnel subject to performing tasks on the flight line and all Maintenance Group (445 MXG) maintenance shops. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the Air Force Form (AF Form) 847, *Recommendation for Change of Publication*; route AF Form's 847 from the field through the appropriate functional chain of command. 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 the Air Force Records Disposition Schedule (RDS) located at <https://afrims.amc.af.mil/>.

**SUMMARY OF CHANGES**

This document has been substantially revised and must be completely reviewed.

**1. General.** This instruction provides positive tool controls and accountability procedures and is an integral part of the Foreign Object Damage (FOD) prevention program. Adhering to this instruction aids in reducing/deterring FOD to aircraft, engines, aircrew training devices, and support equipment; it furthermore helps in maintaining safe and reliable tools for employee use.

**2. Responsibilities.**

2.1. The Squadron Operations Officer/Maintenance Superintendent is responsible for the overall management of the Consolidated Tool Kit (CTK) program within their squadron.

Individual shop supervisors are responsible for the management of the CTK program within their functional areas. Each user of a CTK is responsible for the care, cleanliness, proper use, and security of CTKs in their possession. Flight Chiefs are responsible for designating in writing primary and alternate CTK Custodians. These procedures will also apply to life support, operations, and crash recovery personnel that may be dispatched to the flight line with tools.

2.2. Commanders will designate personnel authorized to procure/purchase tools.

### 3. Procedures.

3.1. Each tool in a CTK will have an assigned location, a “show” (e.g., a shadow of the tool) and “know” (knowledge of tool or kit location) concept will be utilized for inventory control.

3.2. FOD Control. FOD bags will be attached to each dispatchable CTK. Non-dispatchable CTKs that remain in a shop environment, where permanent FOD containers are available, do not require a FOD bag. If not permanently attached, the FOD bag will be listed on the Master Inventory List (MIL).

3.3. Personal Equipment (e.g., headsets, hard hats, ear defenders, reflective belts and respirators) will, at a minimum, be marked with a TCMax number (and their initial issue recorded in TCMax); personal equipment items may be kept in personal lockers.

3.4. Personally-purchased tools are not authorized. Personal tools, (e.g., mini-mag flashlights, multi-tools, buck knives, etc.) not controlled through CTK procedures are NOT authorized on the flightline or in any maintenance area.

### 4. Marking/Security.

4.1. CTK/Tool identification numbering will comply with the TCMax directives as outlined in AFI 21-101, Chapter 10 and this instruction.

4.2. Tool room equipment, stock items and CTKs will be permanently marked/etched with identification designators listed in Attachment 2.

4.3. As a general rule, smooth uninterrupted surfaces of .125” (1/8th inch) or greater may be legibly marked using standard engraving equipment. Items without an uninterrupted surface of this size may be physically impossible to legibly etch. Small tools or items such as APEX bits, drill bits, etc., need not be etched if placed in a container that is shadowed. The container is counted as one of the items (e.g. 9 allen wrenches + container for a total of 10). Screwdriver handles/apex drivers (sockets) will not be used to permanently store apexes.

4.4. Workcenters must place the 9-digit EID on all CTKs, tools not assigned to a box, and dispatch-able equipment that is of sufficient size. Custodians may affix non-metallic bar code labels on tools to prevent re-etching as long as the use of the tool and its work environment does not normally result in excessive damage to the label making it unreadable.

4.5. CTKs may be etched in an abbreviated format. All CTKs will be numbered with a unique numeric identifier, within a given tool room, beginning with number one, through the number of CTKs assigned. This unique numeric identifier cannot be duplicated within a given tool room. See **Figure 1**.

**Figure 1. Abbreviated Etching Examples.**

CTK ID	CTK Etching Required
W9AFCTK01	W9AF01
W9AFTOW21	W9AF21
<b>NOTE:</b> All nine digits, if elected to do so, can always be etched on all items within a CTK.	

4.6. A secure area will be designated to store CTKs when not in use. This area will be capable of being locked and provide protective measures, such as monitoring or controlled key access, to prevent unauthorized removal of tools or CTKs. Locks are not required on individually-issued tools and equipment located within tool rooms or work centers. Combination locks are not to be used on CTKs. For adequate security, if possible, CTKs will be lockable containers and the keys will be controlled, to include a beginning and end of shift inventory. If not lockable, CTKs will be kept in an area that is lockable. Dispatched CTKs will be locked and secured to an immobile object when left unattended. The only exception to this requirement is CTKs locked and located within the restricted area access on the aircraft-parking ramp.

## 5. TCMax Tool Control Software.

5.1. Required personnel will have access to the TCMax system. TCMax data will be loaded and maintained using the TCMax User Manual as reference. This information may be printed out in lieu of a computer backup. All transaction and inspection histories will be maintained for a minimum of two years. The database will be backed up to a removable media at least once every month. Tool rooms will develop a TCMax Disaster Plan, approved by the shop supervisor, for tool control in the event of the TCMax system becoming inoperative. Tool rooms will maintain a supply of required forms, designated in the approved TCMax Disaster Plan, in the event of a power failure or computer malfunction.

5.2. All Precision Measurement Equipment Laboratory (PMEL) items to be dispatched, will be loaded and the associated Test Measurement and Diagnostic Equipment (TMDE) inspection interval tracked and documented in TCMax. The inspection interval will be derived from the TMDE tag (e.g. Air Force Technical Order (AFTO) Form 398, *Limited TMDE Certification*, AFTO Form 99, *Limited/Special TMDE Certification*, etc).

5.3. Each work-center will load its complete operational Technical Order (TO) library. The associated annual inspection shall be tracked and documented In Accordance With (IAW) TO 00-5-1 *AF Technical Order System*.

5.4. Aircraft TO libraries will not be loaded in TCMax.

5.5. CTK annual inspections will be tracked and documented in TCMax.

5.6. Any other inspection criteria, directed by AFI 21-101, *Aircraft and Equipment Maintenance Management*, Chapter 10 or this instruction, (daily shift inventory, annual comprehensive inventory), will be tracked and documented in TCMax.

## 6. Tool Accountability and Control.

6.1. CTKs, mini-kits, and special tools will be issued by means of TCMax. A separate Air Force Reserve Command (AFRC) Form 177, *Consolidated Tool Kit Inventory and Control Log*, is maintained for each CTK. **NOTE:** For CTKs that do not leave the tool room or work center, a separate AFRC Form 177 is not required. Chit systems are not authorized.

6.2. A visual inventory, looking for missing/broken tools will be accomplished for each CTK/mini-kit whenever responsibility for that item changes (e.g., shift change, turn-in, or at time of issue). An additional visual inventory for missing tools will be conducted upon job completion at the worksite. For aircraft/vehicle/trailer-mounted CTKs, the AF Form 177 will be annotated by the person that performed the tool inventory before leaving one job site for another. Upon turning in the CTK, it will be inventoried by someone other than the person who signed it out.

6.3. One-person shops/shifts must, as a minimum, have a second party or on-duty supervisor perform the turn-in inspection of all tools. The same individual that signs out a CTK cannot sign it back in.

6.4. Spare tools and consumable items in CTKs may be kept on hand, but will be stored in a secure area. CTK identified consumables procured through bench stock must be sub-located to the secure area. Supervisors or the CTK Custodian will control the issue and replacement of items on a one-for-one basis. Replacement tools are not issued without receipt of the unserviceable tool or documentation indicating the tool is lost and reported according to the lost tool procedures outlined in this instruction ([Para 4](#)).

6.5. Tool rooms/work centers may elect to distribute CTKs or peculiar support/test equipment to decentralized locations. The owning tool room will maintain ownership, insuring accountability and control. Upon arrival at the decentralized location a complete inventory of the CTK/test equipment will be performed.

6.6. Tools that are damaged, worn or broken will be reported to the shop supervisor or CTK Custodian and removed from the CTK. The removal will be documented on an AFRC Form 175, *Missing/Removed Tools and Equipment*, and in TCMax. Tools and equipment in CTKs that are removed for PMEL will also be documented on the AFRC Form 175 and in TCMax. An AFRC Form 175 will be maintained in each dispatchable CTK.

6.7. Each CTK will have a MIL of contents signed by the shop chief or flight chief. The MIL resides in TCMax, but a hard copy of the MIL must reside with each dispatchable CTK.

6.8. Rag control applies to all organizations and personnel performing aircraft, munitions, and equipment maintenance. Products used in a FOD potential environment must be controlled. The rags will be placed in a suitable container or pouch, which will be assigned an item number and the number of rags contained. Rags will be signed in/out. Lost or missing rags will be treated as a lost tool and documented on AFRC Form 175. Rags taken cross-country will be signed out by quantity and signed in when aircraft returns to home station. All rags utilized for aircraft, on-equipment, and off-equipment maintenance, will be approved by the Environmental Program Manager and disposed of in accordance with the 88th Air Base Wing Hazardous Waste Management Plan.

6.9. Absorbent (diaper) material will be controlled through tool room procedures when used during maintenance processes in a FOD potential environment, using the same guidelines as rags described in Paragraph 6.8. Each squadron will ensure processes are in place for control of these products within their maintained areas.

6.10. Hazardous Material (HAZMAT) Spill Kits will contain an inventory. Inventoried kits, awaiting spill response, will be sealed with a tamper seal. When the seal is broken, during spill response, the kit will be re-inventoried and replenished, as required, and subsequently resealed. Superintendents will ensure the management and control of HAZMAT Spill Kits.

6.11. An annual comprehensive inventory will be performed of all tools and equipment to ensure proper content and serviceability according to TO 32-1-101, *Maintenance and Care of Hand Tools*. Personnel performing the inventory will document the completion in TCMMax.

6.12. Contract Field Teams (CFT) and Depot Teams. CFT and Depot Teams will ensure a process is in place for tool inventory and control at the beginning and end of each shift. If a tool is discovered missing on or near an aircraft, a Red X will be placed in the aircraft forms with a discrepancy. The team chief will immediately notify the Maintenance Operations Center (MOC) and Quality Assurance (QA). Upon notification MOC will initiate the Lost Tool Checklist. The team chief will direct efforts to find the missing tool.

6.13. Flashlights, lanterns, and portable lighting devices identified in TO 35F5-1-2, *Operation and Maintenance Instruction - Explosion-Proof Lanterns and Extension Light Assembly*, will be inspected annually. The Maintenance Squadron (MXS) Electro/Environmental Shop is designated as the qualified inspection agency. The inspection will be documented/tracked in TCMMax.

6.14. Expendable hand tools such as blades, apexes, files, and file cleaners may be kept on hand, but will be stored in a secure area. CTK identified expendables procured through bench stock must be sub-located to the secure area. Supervisors or the CTK custodian will control the issue and replacement of items on a one-for-one basis. Replacement tools are not issued without receipt of the unserviceable tool or documentation indicating the tool is lost and reported according to the lost tool procedures stated in Paragraph 11 of this instruction.

6.15. Electronic Tools (E-Tools) will be controlled and accounted for IAW 33 series AFI's. The Technical Order Distribution Officer (TODO) will maintain the Automated Data Processing Equipment (ADPE) account for E-tools issued for viewing technical data. E-Tool computers will be issued to maintenance tool custodians using AF Form 1297. Tool room custodians will control and issue E-tool systems using the same procedures used for other support equipment. The Maintenance Group TODO and TODA's shall work with the Group Computer Systems Administrator (CSA) to ensure E-Tools are configured with current software to support TO and maintenance documentation.

## **7. Operation.**

7.1. Tool rooms, cages, and shops that store tools and equipment must complete inventories at the beginning and end of each shift. This inventory will be entered in TCMMax or documented on AFRC Form 177 when TCMMax is not available.

7.2. Individuals will sign out tools and CTKs utilizing TCMMax or an AFRC Form 177 when TCMMax is not available.

7.3. Procedures for transfer of tools/CTKs at the job site (on-site transfers). CTKs are not normally passed from one individual to another at the job site; however, mission needs occasionally require this action to occur (this shall be “by exception only” and not become common practice). To ensure tool accountability and control is maintained, an AFRC Form 177 will be maintained in each CTK (including aircraft/vehicle/trailer-mounted CTKs) and is used to record CTK/tool transactions at the job site. The person signing out/assuming responsibility for the CTK/equipment/tool annotates the “out” time/signature block. The “in” block is annotated when the user returns the CTK/equipment. The person annotating the “out” block is not the same person annotating the “in” block. The tool room will be notified and reassigned possession (shift change transfer) to the gaining individual in TCMMax.

7.4. All items that are not turned in at the end of a given shift must be in a Long Term Issue (LTI) status.

## **8. Locally Manufactured Tools & Equipment.**

8.1. Locally manufactured tools will be tracked IAW AFI 21-101.

8.2. All work-center tool monitors will contact the QA Office for review and approval by engineering as required on all locally designed tools and equipment. 445 Maintenance Group Commander (MXG/CC) must sign the approval for the use of all locally designed tools or equipment that carry loads, change torque, or present a potential to damage government resources.

8.3. A Modified Tools Log with pictures and descriptions of the tools or equipment will be maintained in the QA office with duplicate copies kept by the work-center tool room monitors and the Master CTK listing. Items and requirements will be reviewed biennially for applicability and current configuration.

8.4. Acquisition of a new modified tool or equipment, upon approval, will be reported and documented by QA and the affected work-center in their respective logs.

## **9. Damaged Tools.**

9.1. Work center supervisors will ensure all damaged tools are, if under warranty, exchanged on a one-for-one basis through the manufacturer or supplier. Account for damaged or broken warranted tools until replaced by the contractor, if not under warranty turn in to Defense Reutilization Marketing Office (DRMO). Identification numbers will be removed when it is determined that the tool is unserviceable. The supervisor or CTK Custodian will assure that damaged tools are stored in a secured area until processed for disposal.

## **10. Aircrew and Life Support Tool Control.**

10.1. Aircrew will use the manual CTK identification numbers identified in Attachment 3. Control will be documented using the AFRC Form 177.

10.2. Life Support will use the manual CTK identification numbers identified in Attachment 3. Control will be documented using the AFRC Form 177.

## **11. Lost Item/Tool Procedures.**

11.1. In-shop, report missing tools to supervisor and the CTK Custodian as soon as loss is known. The supervisor will determine if other work centers or staff agencies should be notified and will direct efforts to find tools.

11.2. On-aircraft, report missing tools to the appropriate supervisor, MOC, and QA as soon as the loss is known. MOC will then accomplish the Lost Tool Check Sheet 3-8. The supervisor will direct efforts to find the missing tool.

11.2.1. When an item/tool is reported missing on or near an aircraft, the individual discovering the missing item/tool will place a Red X in the aircraft forms with a discrepancy giving the type of tool, CTK number, and if possible, the general area of the aircraft where the tool was lost. This individual will ensure that the lost tool is documented on AFRC Form 175, if applicable. Individual's supervisor will also ensure an AFRC Form 174, *Lost Tool/Object Report*, is initiated and completed. The CTK Custodian maintains it on file for one year or until the missing tool is found. QA will get a copy of the completed AFRC Form 174 for input into the Quality Assurance Tracking and Trend Analysis System (QANTTAS) database. The CTK Custodian will notify QA of any lost tool found after a completed AFRC Form 174 has been turned in.

11.2.2. Loose equipment items on aircraft, or such items discovered missing upon the return to home station of a cross country aircraft, will be treated as a lost item. The individual discovering the missing item will place a Red X in the aircraft forms, stating the nomenclature of the item. An AFRC Form 174 will be initiated and completed. When it is unknown where the item was used, a general search of the aircraft will be accomplished prior to clearing the Red X entry per paragraph 11.2.1. QA will get a copy of the completed AFRC Form 174 for input into the QANTTAS database. QA will be notified if an item is found after the completed AFRC Form 174 has been turned in.

11.2.3. When it is suspected that the tool has fallen into an inaccessible or unobservable aircraft location the suspect area will be x-rayed to locate the lost tool. If the tool is in an inaccessible area that poses no FOD threat, can only be retrieved by major disassembly and higher headquarters assistance is required. QA confers with the responsible Air Logistics Center (ALC) on appropriate action. If action is to leave the tool in place, the x-ray, with identification of the exact tool location and copies of all messages concerning the lost tool, is maintained in the aircraft historical file until the tool is recovered. If the aircraft Mission Design Series (MDS) is one that has programmed depot maintenance or is scheduled for depot modification, the lost tool and location is listed in the AFTO Form 345, *Aerospace Vehicle Transfer Inspection Checklist and Certification*, and the AFTO Form 103, *Aircraft/Missile Condition Data*, for removal by the depot.

11.2.4. When, after a thorough search, the tool cannot be found, the Red X discrepancy may be cleared. Authorization to clear Red Xs when a tool/item cannot be located will be limited to no lower than Operations Officer/Maintenance Superintendent. Additionally, individuals will be identified on the Special Certification Roster (SCR) using the appropriate G081 course code.

11.3. Post taxi/take-off. If a tool is discovered lost after taxiing or take-off of aircraft, supervision will notify MOC, who in-turn will notify the Command Post and QA. Upon notification to MOC, supervisor will also provide information (e.g. tool lost, where, etc.) for the placement of a write-up in the aircraft forms. The recommendation will also provide the aircrew with the severity of the situation. Command Post will notify applicable aircraft commander of lost tool incident and aircraft commander will evaluate the recommendation and determine whether to continue the mission or abort.

STEPHEN D GOEMAN, Colonel, USAFR  
Commander

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

AFPD 21-1, *Air and Space Maintenance*, 25 Feb 2003

AFI 21-101, *Aircraft and Equipment Maintenance Management*, 26 Jul 2010

TO 32-1-101, *Maintenance and Care of Hand Tools*, 1 Dec 2004

TO 35F5-1-2, *Operation and Maintenance Instruction – Explosion Proof Lanterns and Extension Light Assemblies*, 15 Jul 1988

AFMAN 33-363, *Management of Records*, 1 March 2008

***Forms Adopted***

AFTO Form 99, *Limited/Special TMDE Certification*

AFRC Form 174, *Lost Tool/Object Report*

AFRC Form 175, *Missing/Removed Tools and Equipment*

AFRC Form 177, *Consolidated Tool Kit Inventory and Control Log*

AFTO Form 103, *Aircraft/Missile Condition Data*

AFTO Form 345, *Aerospace Vehicle Transfer Inspection Checklist and Certification*

AFTO Form 398, *Limited TMDE Certification*

***Terms***

**Chit**—A round piece of metal with a number on it.

**G081 (Core Automated Maintenance System for Airlift)**—Mainframe database for all AMC aircraft to track maintenance, flying time and all other pertinent information.

**Mission Design Series (MDS)**—Aircraft make and model.

**TCMax**—Tool Control Software by Soaring Software Solution, Inc.

**Attachment 2**

**CTK OR STOCK ITEM NUMBER**

1. No CTK or Stock Item number can be longer than nine characters.
2. The 1<sup>st</sup> and 2<sup>nd</sup> characters, **W9**, will be the designators for 445 AW, Wright-Patterson AFB, OH.
3. The 3<sup>rd</sup> character will be derived from the squadron/group:
  - A** 445th Aircraft Maintenance Squadron
  - M** 445th Maintenance Squadron
  - L** 445th Maintenance Group/Maintenance Operations Squadron
  - O** 445th Operations Group/Operations Support Squadron
4. The 4th character is the shop designator. The following tables apply:

445 OG

S – Life Support	A – Aircrew (Pilots/Co-pilots, Engineers, Loadmasters)		
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445 MXG

Q – Quality Assurance			
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445 MXS

A - AGE Shop	G - Munitions	N – NDI Shop	E - Electro/Environmental Shop
F - Fuel Shop	H - Pneudraulic Shop	P – Survival	J - Jet Shop
S - Structural Repair Shop	R - HSC Inspection Section	M – MTEC Shop	

445 AMXS

F - AMXS Flight line			
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5. Technical Data will be labeled with the following characters:
  - A. Small Binder T.O.s will have the 5<sup>th</sup> and 6<sup>th</sup> characters of JG.
  - B. Large Binder T.O.s will have the 5<sup>th</sup> and 6<sup>th</sup> characters of TD.

6. Except where noted above, the 5<sup>th</sup> through 9<sup>th</sup> characters are for individual shops' numbering decisions, e.g. W9MJ01A01 for item located in Cabinet 01, Drawer A, Item 01.

**Attachment 3**

**MANUAL CTK NUMBER ASSIGNMENT**

**OPERATIONS GROUP**

FLIGHT ENGINEERS      FE-01 through FE-50

**OPERATIONS SUPPORT SQUADRON**

LIFE SUPPORT              LS-10 through LS-30