

**BY ORDER OF THE COMMANDER
301ST FIGHTER WING**

**301ST FIGHTER WING INSTRUCTION
21-161**



16 OCTOBER 2014

Maintenance

**COMPOSITE TOOL KIT AND TEST
EQUIPMENT MANAGEMENT PROGRAM**

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements procedures for the Composite Tool Kit (CTK) program as directed in Air Force Instruction (AFI) 21-101, AFRC Supplement 1, *Aircraft and Equipment Maintenance Management*. It fulfills the AFI 21-101 requirement to provide guidance for control and management of tools and equipment. It applies to all personnel in the 301st Maintenance Group (301 MXG), 457th Fighter Squadron (457 FS) and 301st Operations Support Flight (301 OSF). Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the Air Force (AF) Form 847, Recommendation for Change of Publication; route AF Form 847s from the recommending office thru the 301st Fighter Wing (301FW) Publications/Forms Managers (301 CF/SCOKP) to Higher Headquarters if necessary. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with AFMAN 33-363, Management of Records, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located at <https://afirms.amc.af.mil/>. 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.

1. When Two or More Work Centers Operate a Single Tool Room/Support Section.

1.1. Procedures: The Non-Commissioned Officer in Charge (NCOIC) of the Tool Room/Support Section (+ Office Symbol) will provide a secure area to store dispatchable Consolidated Tool Kits (CTK), tools, equipment and Technical Orders, Personal Protective

Equipment (PPE), bench and operating stock, consumables and chemicals needed to support flight line maintenance and generation activities. The Flight/Section Chiefs will coordinate with the Tool Room/Support Section NCOIC on the CTKs, tools, equipment and Technical Orders, PPE, bench and operating stock, consumables and chemicals they need to have supplied in the tool room. Aircrew Flight Equipment (AFE) will be responsible for AFE in-shop and dispatchable CTKs.

1.2. Responsibilities:

1.2.1. Flight/Section Chiefs are responsible to:

1.2.1.1. Manage CTKs, tools and equipment that the work center has stored in the tool room.

1.2.1.2. Ensure the Master Inventory List (MIL) is accurate for each CTK and test equipment item requiring an MIL.

1.2.1.3. Conduct periodic and scheduled inspections of CTKs and equipment to include forms documentation.

1.2.1.4. Inform Tool Room/Support Section of needed PPE, consumables, chemicals, bench and operating stock.

1.2.1.5. Ensure the turn-in inventory is thorough so as to be sure there are no broken/missing tools and no Foreign Object Damage (FOD) in the CTK and equipment.

1.2.2. Tool Room/Support Section is responsible to:

1.2.2.1. Maintain a secure and limited access entry into the tool room.

1.2.2.2. Maintain established PPE, consumables, chemicals, bench and operating stock.

1.2.2.3. Insure that a thorough visual turn-in inventory of CTKs and equipment is complied with.

1.2.2.4. Notify owning work centers when inspections are due or equipment damage is noted.

2. Controlling Access to Tool Rooms. Tool Rooms are locked when unattended. When no tool room personnel are available, only the Flight/Section Chiefs or shift supervisor are authorized entry.

3. CTK Security, Control, and Accountability.

3.1. Security:

3.1.1. Dispatched CTKs are inventoried and locked when left unattended. Dispatched CTKs are secured to an immobile object when left unattended, except when located within the restricted access areas on the aircraft-parking ramp, Hangar 1643, Hangar 1656, Bldg 1650 Aircrew Flight Equipment (AFE) and Bldg 1630 (AFE). Tools will be maintained in an orderly manner in the work area. Tools will be placed back in the appropriate inlays when unattended or when the job is complete.

3.1.2. In-shop CTKs must remain locked when not in use unless they are stored in a place that is constantly manned or secured. When a work center is not large enough to facilitate a manned tool room, the shop supervisor is responsible for an itemized inventory of all tools and equipment at the beginning and end of each shift. All CTKs will be locked at the close of the normal business day.

3.2. Control: Store CTKs, tools, and equipment in a designated location for positive control and ease of inventory. Personnel are responsible for control of the CTK and equipment they sign out.

3.3. Accountability:

3.3.1. All 301 MXG maintenance areas that use CTKs or maintain aircraft related parts/equipment will use the Tool Accountability System (TC-MAX) to account for CTKs and equipment as directed by AFI 21-101, AFRC Sup 1, *Aircraft and Equipment Maintenance Management*, Chapter 10, Tool and Equipment Management. Personnel are accountable for the CTK and equipment they sign out.

3.3.2. CTKs will be marked with nine-digit Equipment Identification Designators as identified in [Attachment 2](#). The 9-digit Equipment Identification Designators (EID) must be placed on the outside of dispatchable CTKs. Tools located inside the tool box may be marked with less than 9-digits but must contain the 4-digit World Wide Identification (WWID) and identifying characters that tie the tool back to the CTK.

3.3.2.1. Electronic devices Land Mobil Radio (LMR)'s, e-tools, etc.) will be assigned an EID and controlled through TC-MAX.

3.3.2.2. Radio/Laptop Batteries are considered consumable. Batteries not tracked in TC-MAX must be marked with the owning unit, section, or workcenter id.

3.3.3. Tool and Equipment Identification: maintenance will be identified with an EID for accountability purposes.

3.3.3.1. EIDs marked on tools must be clear, legible and easy to read.

3.3.3.2. If security devices (i.e., cables, locking bar, etc.) are not permanently attached to the CTK, mark the items with the EID and add them to the MIL.

3.3.3.3. Tools marked with two different CTK numbers are considered double etched and are not authorized. Double etched is considered as any part of a previous EID number that may be legible. Tools that have laser etched CTK numbers for enhanced legibility may have the non-applicable or old EID numbers removed by etching or lasering a continuous line through the old CTK number, (S4QA00001). It is not considered double etched if marked with the correct EID more than once.

3.3.3.4. Locks (if applicable) and keys will be listed as separate items on the MIL and count toward the MIL total. Locks that are not permanently attached will be etched with CTK EID. Keys will be always be etched with CTK EID.

3.3.3.5. Toolbox foam will not be listed on the MIL or count toward the MIL total.

3.3.3.6. Removable tool trays will be etched with the CTK EID, listed on the MIL and count toward MIL total.

3.3.3.7. FOD Bags will be etched with the CTK EID, listed on the MIL and count toward MIL total.

3.3.4. Only CTK custodians are allowed to make pen/pencil changes on a MIL.

4. Control of Personal Equipment (ear defenders, headsets, etc.). Personal equipment such as ear defenders/headsets which are issued to an individual will be controlled by one of the two procedures listed below:

4.1. Items will be marked with a CTK identification number and kept within a CTK. These items will be controlled as a tool.

4.2. Items may be kept, maintained, and controlled by the person issued the item. As a minimum, these items will be marked with an EID. The EID will contain 9 characters, numbers and letters. The first four characters will be the world wide identification (WWID) code; ex, "S4AT". The last five characters will be the individual's employee number.

5. Inventory.

5.1. Annual. All tools and Support Equipment (SE) containing accessories are completely inventoried annually or when CTK custodian changes. The purpose of this inventory is to perform a comprehensive inspection of all tools and SE and is more extensive than the daily beginning and end of shift inventory. The CTK custodian/alternate performs the inventory. When CTK custodians change, the outgoing and incoming CTK custodians perform the inventory together. CTK custodians will maintain a MIL for each type of kit assigned to the work center. MILs will be updated annually and when the CTK custodian changes to ensure accuracy. The listings will be signed by the applicable flight Office in Charge (OIC), NCOIC, Flight, or Section Chief. The annual inventory will consist of:

5.1.1. Ensure the MIL in the CTK matches the MIL in TC-MAX (also applies to SE with accessories)

5.1.2. Ensure the MIL matches the contents of the CTK or SE

5.1.3. Ensure all tools, to include local manufactured tools and consumables, are identified on the MIL with, at minimum, name and size.

5.1.4. Ensure all equipment identification designators (EID) are correct and readable

5.1.5. Inspect all tools and equipment in accordance with (IAW) applicable tech data or manufacturer's manual. Replace or remove unserviceable tools and document in TC-MAX, (if used), Major Command (MAJCOM) form, or hard copy MIL.

5.1.6. Tools are clean and rust free.

5.1.7. Ensure the CTK is free of Foreign Object (FO).

5.1.8. Ensure all required forms are present and documentation is current and correct.

5.2. Daily. Perform a visual CTK and SE inventory prior to operation of aircraft or equipment, when leaving the work area, at the completion of a job or task, and when signed in and out of the tool storage facility. This inventory will consist of:

5.2.1. Ensure all tools are in the CTK and are serviceable.

5.2.2. Ensure all SE accessories are accounted for and inside the container.

5.2.3. Ensure the CTK is free of FO.

5.2.4. Ensure AFRC Forms 177, *Consolidated Tool Kit Inventory and Control Log*, AFRC Form 175, *Missing/Removed Tools and Equipment* documentation is complete and current.

6. Warranted Tool Management.

6.1. The purpose of the Warranted/Quality Tool Program is to ensure that high quality, industrial strength warranted tools are available for use in aircraft maintenance activities.

6.2. Warranted tools can be obtained:

6.2.1. Through General Services Administration (GSA).

6.2.2. Local contract with a warranty tool vender.

6.3. Warranted tools are exchanged on a one-for-one basis in accordance with the Warranted/Quality Tool Program contract. Do not throw away broken tools. Broken tools will be documented on the AFRC Form 175, removed from the CTK and given to the CTK monitor for replacement. Once a new tool is received, it will be etched and replaced in the CTK.

6.4. Owning section supervisor or tool room facility will retain tool/equipment warranty documents.

6.5. Warranted tools and equipment will not be modified if such modification voids the warranty.

7. Management of Replacement, Consumable Hand Tools, and Other Consumable Items Contained in CTKs.

7.1. All consumables located in a CTK will be identified on the MIL (examples are, but are not limited to: safety wire, adhesive, wire bundle-lacing, solder, etc.).

7.1.1. All consumables that are on bench stock and are included in a CTK will be maintained in a secure environment and will only be issued by the CTK monitor or alternate or tool room personnel.

7.2. The CTK EID will be etched on larger items such as spools of safety wire. Smaller items such as pin hole plugs, splices, split pins, etc., will be placed in a container or holder with the CTK number and quantity marked on the outside of the container by etching, or by use of marking tape.

7.3. The container shall be inventoried after each job completion, when transferred to another person, during sign-in and during sign-out.

7.4. Upon return to the tool room, each container will be refilled to the specified quantity. If adequate consumables are not available for replacement, the quantity missing will be annotated on the AFRC Form 175 as "Removed/Not Replaced."

7.5. The individual that signs the CTK out is responsible for full accountability of all consumables.

7.6. Expendable hand tools, (apexes, blades, grinding wheels etc) that are included in a CTK will be maintained in a secure location and shall only be issued by the tool room personnel or the supervisor.

7.7. Replacement/Spare/Expendable Tool Control: All replacement/spare/expendable tools shall be inventoried and documented quarterly in TC-MAX.

7.8. Tools, equipment, or consumables permanently deleted, or replaced with an item of a different size, will have their inlay, shadowed layout, and/or silhouette filled in or adjusted to match the new item.

7.9. Replacement tools will not be issued without receipt of the unserviceable tool or documentation indicating the tool is lost and reported IAW the lost tool procedures outlined in AFI 21-101 and paragraph 9 of this instruction. Replacement tools will be marked with an EID prior to issue.

8. Transfer of CTKs/Equipment at the Job Site.

8.1. When transferring CTKs, Tools, TOs, and equipment at the job site:

8.1.1. Both incoming and outgoing individuals will inventory all items.

8.1.2. List all items to be transferred on an AF IMT 1297. For each item, put the EID in the "Stock Number" block and nomenclature in the "Description of Item" block.

8.1.3. The incoming individual will print and sign in the "Issued To" blocks.

8.1.4. The inventory will also be verified by one of the following: support section representative, WS-8 or higher, or Senior Non-Commissioned Officer in Charge (SNCO).

8.1.5. The individual verifying the inventory will sign in the "Issued By" block of the AF Form 1297.

8.1.6. The outgoing individual will take the AF IMT 1297 to the support section that issued the items. The support section representative will transfer accountability of the items listed on the AF IMT 1297 to the incoming individual in TC-MAX.

8.1.7. The outgoing individual will verify all accountable items have been transferred in TC-MAX before departing.

8.2. If tools are found missing, lost tool procedures will be implemented.

9. Lost Item/Tool Procedures. In addition to procedures outlined in Chapter 10 of AFI 21-101, *Aircraft and Equipment Maintenance Management* and 301FWI21-110, *Foreign Object Damage and Dropped Object Prevention Program* lost tool procedures are as follows:

9.1. If a tool or item is lost by an individual and is recovered by the same individual within 15 minutes no further action is required.

9.2. If the individual leaves the immediate area prior to the tool/item being found or if it is not found within 15 minutes, notify the Expediter or Production Superintendent.

9.3. For lost tools/items used on an aircraft that has operating engines, taxied or airborne, notify the Pro-Super/Expeditor immediately.

9.3.1. If the lost item/tool was used on an aircraft that has taxied, the Pro-Super will have Maintenance Operations Center (MOC) notify the Supervisor of Flying (SOF) and

request the aircraft be held pending the results of the investigation for the lost tool/item. If the affected aircraft is not airborne, it will be aborted until the tool is accounted for. If the aircraft is airborne, MOC will notify the SOF who will take the appropriate action.

9.3.2. If the aircraft has not taxied, the expediter or Pro-Super will notify the Aircrew at the aircraft.

9.4. A thorough search will be conducted for the missing item. When it is decided the tool/item cannot be found, Squadron Supervision will determine inspection actions to be taken and determine when the search should be terminated. If tool is not located, initiate and complete an AFRC Form 174, *Lost Tool/Object Report*.

10. Series/Block of CTK Identification Numbers. All CTK identification numbers will be assigned by QA. See Attachment 1 for assigned CTK identification numbers.

11. Rag Control Procedures.

11.1. Use uniform size rags to facilitate control procedures.

11.2. Secure all clean and dirty rag containers to ensure no unauthorized access.

11.3. Rags will be issued in bundles of 5.

11.4. Sign-out bundled rags in TC-MAX to all users.

11.5. Count all rags returned by the user, verify the quantity in the TC-MAX, and then sign-in.

11.6. Follow lost tool procedures if a rag is lost.

11.7. Hydrazine Response trailers will have rags bundled in quantities that will allow expeditious accountability without hindering emergency actions. All rags must be accounted for prior to replenishing trailers.

12. Personnel Authorized to Procure Tools. Squadron Commanders will identify, by letter, personnel authorized to procure tools. No other personnel will be authorized to procure tools.

13. Local Manufactured Tools and Equipment Controls. See 301 MXGI 21-301, *Aircraft and Equipment Maintenance Management* Local Manufacture Processing for local manufacture of tools and equipment. Local Manufactured Tools and equipment will be controlled as a tool/equipment IAW AFI 21-101, AFRC Supplement 1, *Aircraft and Equipment Maintenance Management* and this instruction. AFE will follow the procedures in **paragraph 17**.

13.1. Section supervisors will file and retain the Local Manufacture Request Form of all local manufactured tools and equipment that have been approved. This form provides the section supervisor the technical reference, justification and proof of local manufacture approval.

13.2. All local manufactured tools and equipment will be reviewed by the Quality Assurance (QA) office prior to being manufactured or modified.

13.3. The biennial (every two years) review of all locally manufactured or developed tools and equipment will be documented in TC-MAX.

14. Depot Teams. Factory Representatives, and Contract Field Teams.

14.1. Depot Teams, Factory Representatives, and Contract Field Teams performing maintenance on 301 FW aircraft will ensure strict compliance with AFI 21-101, *Aircraft and Equipment Maintenance Management*, Chapter 10. Additionally, all units performing maintenance on 301 FW aircraft must coordinate lost tools, dropped objects and FO damage with the 301 FW FOD Prevention Office and IAW 301FWI21-110, *Foreign Object Damage and Dropped Object Prevention Program*. QA will brief factory representatives and depot/contract field teams on local tool control procedures before allowing them to perform maintenance on aircraft or equipment.

14.2. Depot Teams, Factory Representatives, and Contract Field Teams will show full accountability for tools in accordance with the applicable portion of the contract or will comply with this publication. A listing of CTK numbers or other means of tool identification will be coordinated with QA. A listing of CTKs, tools, and equipment, their means of accounting / controlling their tools and equipment will be validated by QA.

15. Single Person Sign-in and Sign-out Procedures.

15.1. Under no circumstances will the person who signs for a CTK, equipment, or shop be the one to sign it back in (this includes CTKs affixed inside vehicles).

15.2. When only one individual is available in a work center:

15.2.1. Flight/Section Chief will verify the inventory was properly accomplished and document TC-MAX.

15.2.2. If the Flight/Section Chief has no access to TC-MAX, they will sign the AFRC Form 177 in the sign-in block as inventoried and secure the CTK/equipment in the tool room or a secure shop. The individual will then notify his supervisor by e-mail that the CTK/equipment needs to be signed-in, (in TC-MAX) prior to CTK/equipment use. AFE will follow the procedures in [paragraph 17.4](#)

16. Control of Crash Recovery and Hydrazine Response Equipment.

16.1. Crash recovery/Crash Damaged or Disabled Aircraft Recovery equipment/tools in emergency response vehicles/trailers will be maintained as a CTK.

16.2. The CTK MIL will be maintained in the workcenter and a copy will be kept in each affected emergency response vehicle/trailer.

16.3. When sorties are scheduled to be flown, emergency response vehicle CTKs will be inventoried during the vehicle operator pre-use inspection, and will be documented on an AFRC Form 177 or TC-MAX.

16.4. Emergency response trailers will be inventoried prior to use and will be documented on an AFRC Form 177 or TC-MAX.

16.5. Hydrazine Response CTKs:

16.5.1. Hydrazine response equipment/tools contained within response vehicles/trailers will be maintained as a CTK.

16.5.2. When sorties are scheduled to be flown, hydrazine response vehicle/trailer CTKs will be inventoried and documented at the start and end of each shift.

16.5.3. Hydrazine response vehicle/trailer CTKs will be inventoried upon beginning and completion of each hydrazine response and aircraft maintenance action.

17. Aircrew Flight Equipment (AFE):

17.1. Aircrew Flight Equipment shall follow all procedures outlined in AFI 11-301V1 *Aircrew Flight Equipment Program*, for all tools and equipment brought and used on 301 FW aircraft. Use of TC-MAX is not required.

17.2. Personal tools are not authorized in any AFE area or on the flightline (e.g. flashlights, multi-tools, knives, etc). Only tools authorized in the CTKs will be utilized.

17.3. Local Manufactured Tools. All local manufactured or developed tools and equipment will be reviewed by the AFE QA office, and approved by the AFE Superintendent, prior to being manufactured or modified.

17.3.1. Section supervisors will file and retain the Local Manufacture Request Form for all local manufactured or developed tools and equipment that was approved. This form provides the section supervisor the technical reference, justification and proof of local manufacture approval. Approved forms will be filed in the Master CTK Book with its respective CTK Master Inventory Listing.

17.4. Single Person Sign Out Procedures. When only one individual is available due to leave, Temporary Duty (TDY), or any other circumstance, the individual will contact the AFES/Section Supervisor who will verify the inventory was properly accomplished. If no other person is available, the individual will perform the required inventory, sign the AFRC Form 177 and notify the AFES/Section Supervisor the next duty day. Another inventory will be accomplished at the earliest availability of another person.

17.5. The AFE Superintendent will ensure positive control of Night Vision Device (NVD) items. These items include, but are not limited to: Night Vision goggles, storage/transportation containers, lens covers, batteries, flashlights and finger lights. AFE will follow the NVD sign out/in procedures outlined in AFI 11-301 VI, *Aircrew Flight Equipment Program*.

JOHN M. BREAZEALE, Colonel, USAFR
Commander

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

AFI 21-101, AFRC Supplement 1, *Aircraft and Equipment Maintenance Management*, 13 January 2011

AFI 11-301V1, *Aircrew Flight Equipment (AFE) Program*, 25 February 2009

301FWI21-110, *Foreign Object Damage and Dropped Object Prevention Program*, 16 July 2012

301 MXGI 21-301, *Aircraft and Equipment Maintenance Management*, 28 August 2014

Adopted Forms

Air Force Form 847, *Recommendation for Change of Publication*

AF Form 1297, *Temporary Issue Receipt*

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

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

Abbreviations and Acronyms

AFE—Aircrew Flight Equipment

AFRC—Air Force Reserve Command

CTK—Consolidated Tool Kit

EID—Equipment Identification Designators

FO—Foreign Object

FOD—Foreign Object Damage

IAW—In Accordance With

GSA—General Services Administration

LMR—Land Mobile Radio

MIL—Master Inventory List

MOC—Maintenance Operations Center

NCOIC—Non-Commissioned Officer in Charge

NVIS—Night Vision Imaging System

OIC—Officer in Charge

PPE—Personal Protective Equipment

QA—Quality Assurance

SE—Support Equipment

SOF—Supervisor of Flying

TC—MAX – Tool Accountability System

TDY—Temporary Duty

Attachment 2

CTK EQUIPMENT IDENTIFICATION DESIGNATORS

Table A2.1. 301st Maintenance Squadron (301 MXS).

Electrical Environmental Section	S4AE XXXXX
Fuels Section	S4AF XXXXX
Egress Section	S4AY XXXXX
Pneudraulics Sections	S4AH XXXXX
Age Flight	S4AG XXXXX
Armament Flight	S4AR XXXXX
Electronics Warfare (ECM)	S4AC XXXXX
Avionics Intermediate Station (AIS)	S4AI XXXXX
TMDE	S4AX XXXXX
Structural Section	S4AU XXXXX
Metal Technologies Section	S4AM XXXXX
Nondestructive Inspection (NDI)	S4AN XXXXX
Survival Equipment Section	S4AS XXXXX
Maintenance Inspection Flight	S4AZ XXXXX
Propulsion Flight	S4AP XXXXX
Munitions Storage Section	S4MS XXXXX
Munitions Inspection Section	S4MI XXXXX
Munitions Equipment Section	S4ME XXXXX
Munitions Training	S4MT XXXXX
Conventional Maintenance Section	S4MC XXXXX
Line Delivery Section	S4MD XXXXX
PGM Section	S4MP XXXXX

Table A2.2. 301st Aircraft Maintenance Squadron (301 AMXS).

Support Section Tool Room	S4ATT XXXX
A and B Flights	S4ATFL XXX
Specialist Flight (Flight Line Avionics)	S4ATAV XXX
Specialist Flight (Electrics)	S4ATEE XXX
Specialist Flight (AFREP)	S4ATRP XXX
Weapons Flight	S4ATWL XXX

Table A2.3. 301st Maintenance Group Quality Assurance Office (301 MXG/MXGQ).

301 MXG/MXGQ	S4QA XXXXX
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Table A2.4. 301st Operational Support Flight Aircrew Flight Equipment (301 OSF/OSL).

301 OSF/OSL	S4AT0 XXXX
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