TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL

FOR

DATA ANALYSIS CENTRAL

AN/TYK-11

NSN 5895-00-988-0342

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HEADQUARTERS, DEPARTMENT OF THE ARMY

5 DECEMBER 1979

WARNING

SHOCK HAZARD

This equipment contains dangerous voltages which can cause injury or death by severe electrical shock. Be extremely careful when making voltage measurements or other checks with the equipment connected to the power source during troubleshooting. Always disconnect the power source before making any continuity tests.

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FOR

DATA ANALYSIS CENTRAL AN/TYK-11 NSN 5895-00-988-0342

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: US Army Electronics Materiel Readiness Activity, ATTN: SELEM-ME-E, Vint Hill Farms Station, Warrenton, Virginia 22186. A reply will be furnished to you.

*This technical manual supersedes TM 32-5895-220-14&P, 31 January 1977.

LIST OF ILLUSTRATIONS

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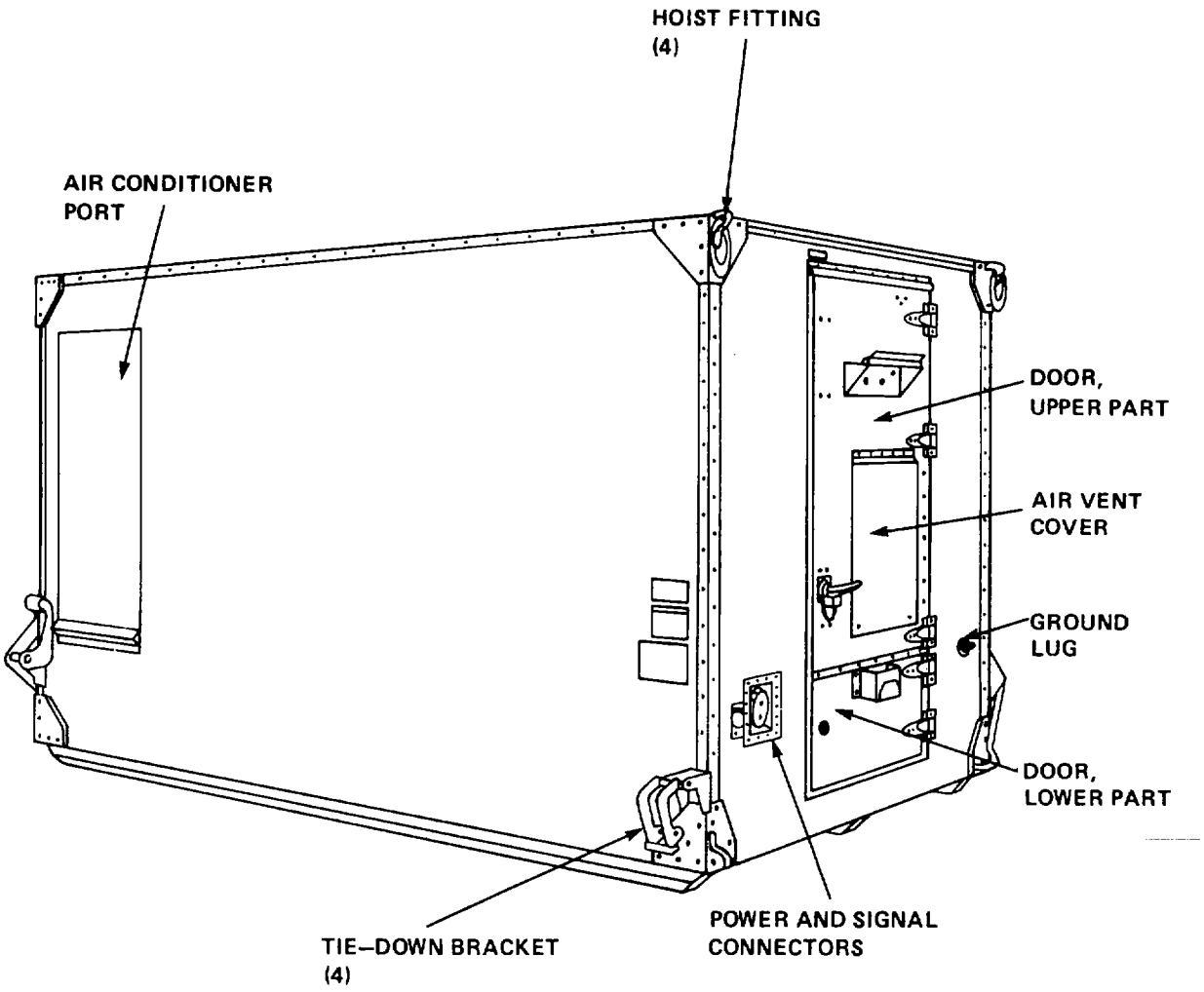


Figure 1-1. Data Analysis Central AN/TYK-11, Exterior View

CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1 SCOPE. This manual provides operator/crew, organizational, direct support, and general support instructions for the installation and maintenance of the Data Analysis Central AN/TYK-II (figure 1-1). A repair parts and special tools list is also included.

1-2 MAINTENANCE FORMS AND RECORDS. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (TAMMS).

1-3 DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE. The AN/TYK-1 I shall be destroyed to prevent enemy use in accordance with instructions provided in TM 750-244-2.

1-4 ADMINISTRATIVE STORAGE. Administrative storage shall be in accordance with instructions provided in TM 740-90-1.

1-5 CALIBRATION. No calibration of the equipment in this group is required.

1-6 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR's). If your AN/TYK-11 needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to perform. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at US Army Electronics Materiel Readiness Activity, ATTN: SELEM-ME-I, Vint Hill Farms Station, Warrenton, Virginia 22186. We'll send you a reply.

Section II. DESCRIPTION AND DATA

1-7 PURPOSE AND USE. The Data Analysis Central AN/TYKI I is a transportable center designed for recording and transcribing radio telephone transmissions.

1-8 DESCRIPTION.

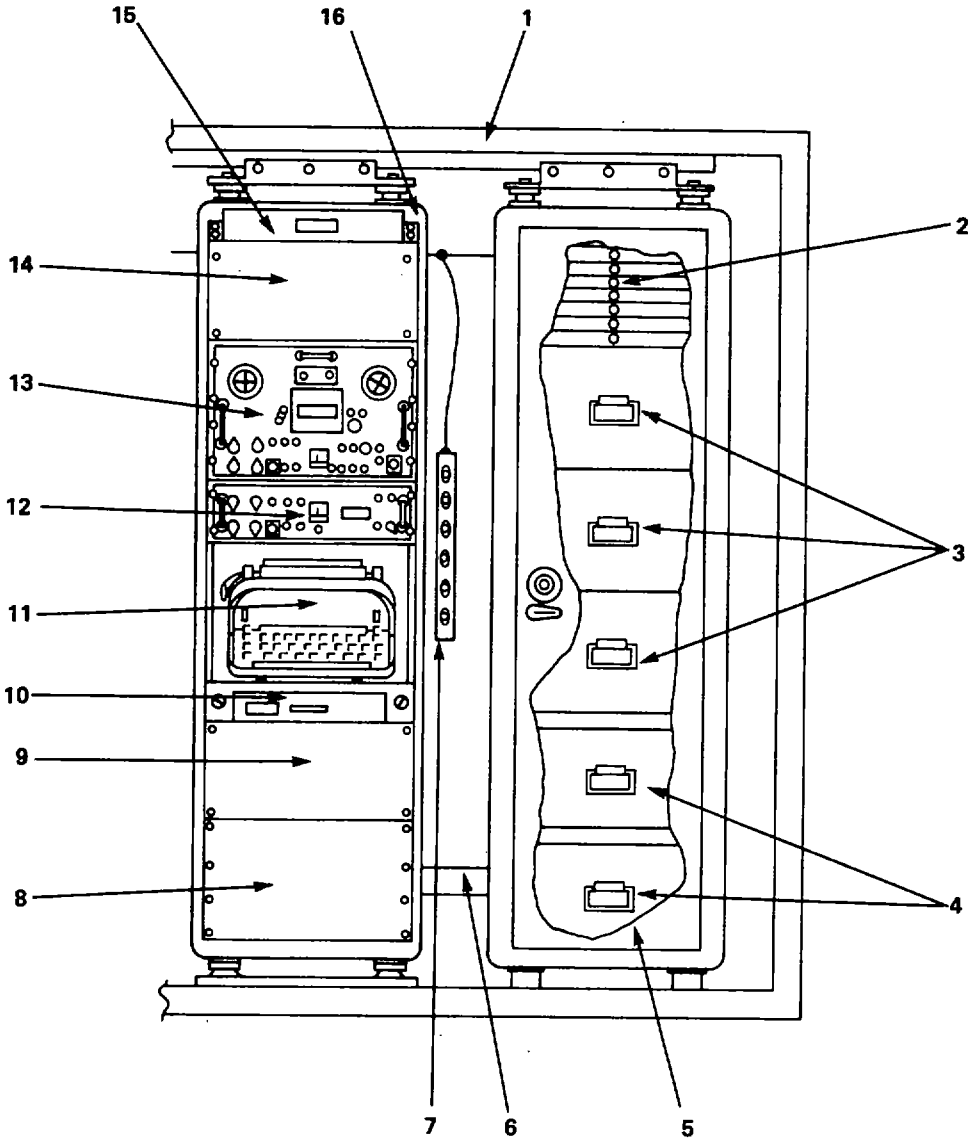
a. General. The Data Analysis Central AN/TYK-II consists of four monitoring stations and a safe/cabinet housed in a modified Electronic Equipment Shelter S-281/G. Components for each station are rack-mounted. Figure 1-2 shows a typical rack and components, which occupy positions 1, 2, 3, and 4. Also shown is the safe/ cabinet, which occupies the fifth position. Each rack contains a recorder-reproducer, an amplifier/power supply, a typewriter and shelf, and three panels that are used to cover-empty positions. The safe/cabinet contains one file card storage drawer, three document storage drawers, and two storage drawers. Other items used by the operator are shown in figure 1-3. An external power supply of 115 to 200 Vac, 50 to 60 Hz, 3-phase, 4-wire, 5.5 kW is required for the AN/TYK-II. Refer to table 1-1 for the list of items comprising an operable AN/TYK-II and to table 1-2 for other items needed but not furnished as part of the Central.

b. Recorder-Reproducer AN/TNH-11(V). The AN/TNH1 I(V) records monitored radio telephone communications for playback and transcription. Input is provided by an external radio set.

c. Amplifier/Power Supply OA-3978(V)/TNH-11. This unit, when coupled with the AN/TNHI(V), permits two-track recording. Where it is turned off, the AN/TNHI I(V) can still function independently in a one-track mode.

d. Standard Typewriter. This item is used to transcribe recorded radio transmissions. It is shelf mounted and conveniently positioned for the operator.

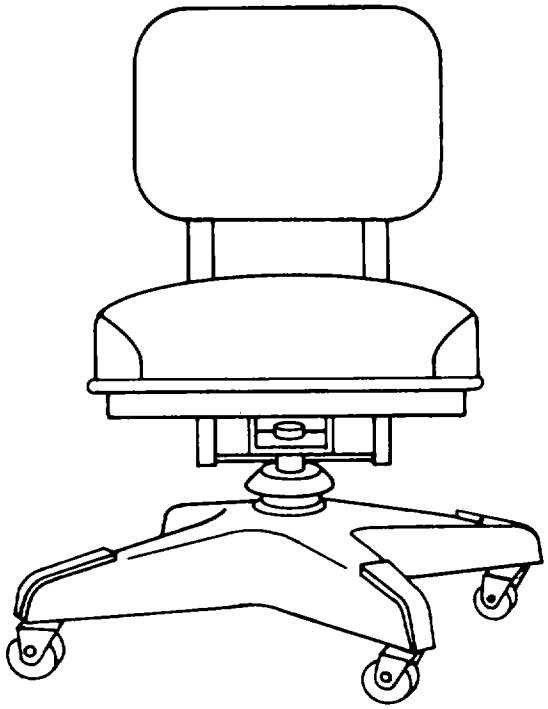
1-9 TABULATED DATA. Refer to the technical manual of the individual items for tabulated data applicable to the equipment.



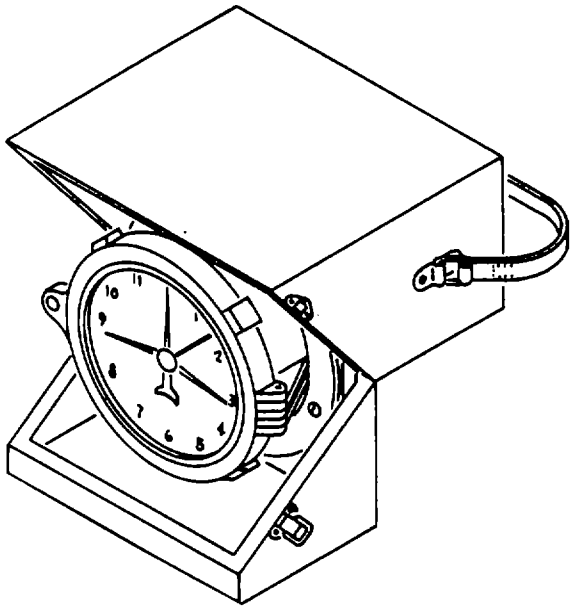
LEGEND

1. SHELTER WALL
2. DRAWER MX7196 (1)
3. DRAWER MX7197 (3)
4. DRAWER MX204 (2)
5. SAFE/CABINET CY4842 (1)
6. POWER OUTLET CHANNEL
7. POWER BOARD (4)
8. COVER PANEL (4)
9. COVER PANEL (4)
10. SHELF FN-87 (4)
11. TYPEWRITER (4)
12. AMPLIFIER OA-3978(V) (4)
13. RECORDER-REPRODUCER AN/TNH-11 (4)
14. COVER PANEL (4)
15. LAMP, INCANDESCENT (4)
16. RACK, ELECTRONIC EQUIPMENT

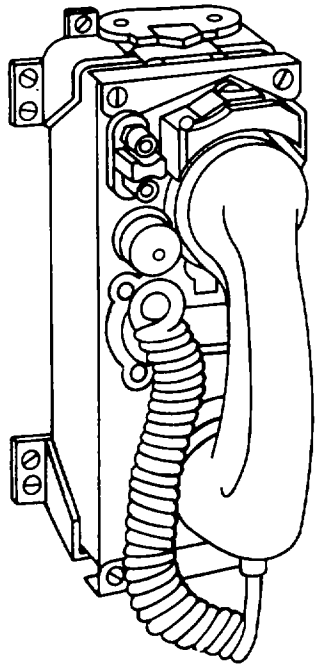
Figure 1-2. Typical Monitoring Station (Rack Position 1, 2, 3, or 4) and Safe/Cabinet



A – CHAIR, ROTARY



B – CLOCK



C – TELEPHONE SET TA-312/PT

D – HEADSET H-216 U

Figure 1-3. Chair, Clock, Telephone, and Headset

Table 1-1. Items Comprising an Operable AN/TYK-11

NSN	Description	Common name	Qty
5410-00-070-7936	Shelter, Electrical Equipment S-281/G	Shelter	1
	Rack, Electrical Equipment MT-1 579	Rack	4
5835-00-892-3507	Recorder-Reproducer, Sound AN/TNH-1 l(V)	Recorder	4
5835-00-064-6836	Amplifier/Power Supply OA-3978(V)/TNH-11	Amplifier	4
7430-00-663-1241	Typewriter, Standard	Typewriter	4
5830-00-327-5031	Shelf, Typewriter FN-87	Shelf	4
7125-00-998-2796	Safe, Modified CY4842/G, consisting of:	Safe	1
7125-00-952-9285	Drawer, File Card Storage MX-7196/G	Card File Drawer	1
7125-00-952-9091	Drawer, Document Storage MX-7197/G	Document Drawer	3
	Drawer, Storage MX-204	Storage Drawer	2
5965-00-892-3353	Headset H-216/U	Headset	12
7110-00-273-8791	Chair, Rotary	Chair	4
6445-00-936-8120	Clock, Mechanical M2	Clock	1
5805-00-543-0012	Telephone Set TA-312/PT	Telephone	1

Table 1-2. Items Required for an Operational AN/TYK-11 but not Furnished as Part Thereof

Quantity	Description	Function
1	Generator Set (10 kW)	Power source when other ac power source is not available.
1	Radio	Supplies data input.
1	Grounding Kit	Connects shelter to earth ground.
1	Power Cable Kit	Connects generator to shelter.

CHAPTER 2

SERVICE UPON RECEIPT AND INSTALLATION

Section I. SITE AND SHELTER REQUIREMENTS

2-1 GENERAL. The Data Analysis Central AN/TYK-11 is normally mounted on a 2-1/2-ton truck chassis or installed on the ground.

2-2 SITE SELECTION. Site selection for AN/TYK-11 installation is determined primarily by application. The selected area must be large enough to permit unhindered access to, and the proper placement and servicing of, the AN/TYK-11 (or a multiple of centrals) and the associated equipment required to perform the mission. For ground installation, a single unit requires a level area with natural drainage of approximately 10 X 15 feet. Swampy or spongy areas and areas with close-in high ground should be avoided.

Section II. SERVICE UPON RECEIPT OF MATERIEL

2-3 UNPACKING. The AN/TYK-11 is shipped fully assembled. Unpacking is limited to removing waterproof tape from doors, panels, and electrical entrances and to opening the shelter to air it out.

2-4 CHECKING UNPACKED EQUIPMENT.

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6.

b. Check the equipment against the component listing in table 1-1 and the packing slip to see if the shipment is complete. Report all discrepancies in accordance with standard procedures. The equipment should be placed in service even though a minor assembly or part that does not affect proper functioning is missing.

c. Check to see whether the equipment has been modified. (Equipment which has been modified will have the MWO number on the front panel near the nomenclature plate.) Check also to see whether all currently applicable MWO's have been applied. (Current MWO's applicable to the equipment are listed in USASA PAM 310-6 or DA PAM 310-7, as applicable.)

d. For dimensions, weights, and volume of packaged items, see SB 700-20.

Section III. INSTALLATION INSTRUCTIONS

2-5 TOOLS, TEST EQUIPMENT, AND MATERIALS REQUIRED FOR INSTALLATION. No installation equipment or tools are required. All operational equipment and cables in the AN/TYK-11 have been previously installed or secured in the storage cabinet, in the miscellaneous items package, or by mobility tiedowns.

2-6 EXTERNAL POWER CONNECTION. External 208 Vac, 60 Hz, 3-phase power is connected to the AN/TYK-11 through the external, waterproof male connector at the back of the S-281/G shelter. Refer to TM 32-5410-22114&P for specific instructions covering power cable connections and grounding.

2-7 MOBILITY TIEDOWN RELEASES. The chairs, typewriter, and writing shelves are secured for movement by mobility tiedowns and must be released prior to operation.

a. Chairs. Tiedowns for each chair consist of two C-type clamps hooked into retainers in the shelter floor. To release the clamps, loosen the winged, threaded screws far enough so that the hooked ends can be moved clear of the retainer pins in the shelter floor. Unhook the retainers from the legs of the chairs and stow them in the safe. Chair height can be adjusted by turning the seat adjusting screw clockwise or counterclockwise.

b. Typewriter and Writing Shelf: The typewriter and writing shelf are secured in the rack during mobility lock down by captive screws in the shelf panel face. In the operating position, they are secured by a spring-loaded, button-operated linkage lock. Release the shelf as follows:

(1) Loosen the large captive screw on each side of the panel face until the shelf is free to slide forward.

(2) Depress the button on each slide and pull the shelf to maximum extension. Release the buttons and adjust the shelf in slightly to latch the linkage.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. CONTROLS AND INSTRUMENTS

3-1 OPERATOR/CREW CONTROLS. Operator /crew controls and indicators for the recorder-reproducer, telephone set, and shelter are described in the applicable technical manuals listed in table 3-1. Refer to Appendix A of this manual for additional documentation affecting the AN/ TYK-11.

Table 3-1. Components with Controls and Indicators

Component	Reference manual
Recorder-Reproducer Set, Sound AN/TNH-1 l(V) including Amplifier/Power Supply OA-3978(V)/TNH-II 1	TEMO 036-0118
Telephone Set TA-312/PT	TM 11-5805-201-12
Shelter, Electronic Equipment S-281/G	TM 32-5410-221-14&P

Section II. OPERATION UNDER USUAL CONDITIONS

3-2 PRELIMINARY STARTING PROCEDURE. Prior to placing the AN/TYK-11 into operation, perform the following:

a. Check the earth grounding terminals to make sure they are tight.

b. Make sure that all circuit breakers are in the off position before connecting the external power source.

3-3 OPERATING PROCEDURE.

a. Refer to appropriate technical manuals for connecting power source to shelter and installed equipment.

b. Switch main power circuit breaker to on.

c. Set light circuit breaker to on.

d. Turn shelter lights on.

e. Make sure all switches on components are placed in the off position.

f: Switch convenience circuit breakers to on.

g. Turn rack lights on.

h. Operate the installed equipment as instructed by the appropriate technical manuals.

3-4 SHUTDOWN PROCEDURE.

a. Refer to the appropriate technical manuals and shut down all installed equipment.

b. Switch convenience circuit breakers to off.

c. Switch shelter lights off.

d. Switch light circuit breaker to off.

e. Switch main power circuit breaker to off.

f. Refer to appropriate technical manuals for disconnecting power source from the shelter and storing peripheral equipment.

Section III. OPERATION UNDER UNUSUAL CONDITIONS

3-5 GENERAL. The AN/TYK-11 is fully insulated and weatherproofed for operation in hot, cold, wet, or dry climates, and is capable of providing operating personnel and equipment complete protection from the elements in temperatures ranging from minus 30°F to plus 120°F. Internal temperature control is maintained by a combined heater/air conditioner installed as part of the shelter.

3-6 OPERATION IN EXTREME COLD. Special precautions must be taken to protect equipment and materials when operations are conducted in frigid climates or during intense cold. Use care in handling cables and wire insulation. These items become hard and brittle in extreme cold and are easily damaged. Avoid sharp bends and unnecessary loops in wires. Keep all other equipment as warm and dry as possible. Keep equipment running, if necessary, to maintain warmth. For protection against cold drafts, and as an aid to reducing overall interior shelter heat loss, a barrier, such as a blanket, can be placed between the shelter doorway and the equipment.

3-7 OPERATION IN EXTREME HEAT AND DUST. In hot, dry climates, connectors, receptacles, and binding posts are subject to damage from dust and dirt. Open doors only when necessary, and be sure that door and panel gaskets seal properly. Hang wet sacking over doors to cut down on entry of dirt and sand when doors are opened. Do not remove panel and chassis assemblies unless absolutely necessary, and then clean thoroughly before replacing. Make frequent preventive maintenance checks. Excessive dirt, sand, or dust that comes in contact with oil and grease forms an abrasive grit that can damage moving parts. Clean and dust the shelter daily.

3-8 OPERATION UNDER HOT, HUMID CONDITIONS. The AN/TYK-11 is weatherproofed and capable of providing complete protection from the elements; however, it is susceptible to damage from moisture and fungi. Heat and humidity can cause rapid deterioration of equipment. Moisture and fungi accumulation should be wiped away as soon as they appear.

Section IV. PREPARATION FOR MOVEMENT

3-9 PROCEDURE. Refer to the appropriate technical manuals for instructions detailing preparations for movement of the various components of the AN/TYK-11. Preparations shall include the following:

a. Make sure that all electrical equipment is turned off.

b. Press the locking buttons on the shelf slides in and slide the typewriters and shelves into the racks. Tighten the two captive screws on each shelf panel face into the racks to lock the shelves in place.

c. Set each chair over a pair of retainers in the floor and secure them with the holddown braces removed at the time of unpacking.

d. Close and lock the safe.

e. Turn off all lights.

f. Switch all electrical circuit breakers in the power panel off.

g. Refer to TM 32-5410-221-14&P for procedures on removing the ground rod, disconnecting the external power and phone cables, stowing the cables, and preparing the S-281/G shelter for movement.

CHAPTER 4

OPERATOR/CREW MAINTENANCE INSTRUCTIONS

Section I. TOOLS AND TEST EQUIPMENT

4-1 GENERAL. No special tools or equipment are authorized or required for operator/crew maintenance of the Data Analysis Central AN/TYK-11.

Section II. LUBRICATION INSTRUCTIONS

4-2 LUBRICATION. For detailed lubrication instructions of the operational equipment in the central, refer to the appropriate technical manuals for each component. Other lubrication is limited to applying a light film of general purpose lubricating oil, Appendix E, to the parts listed below.

a. Seat adjusting screw and seat back tensioner.
b. Typewriter shelf slides.
c. Safe hinges and drawer slides.

Section III. OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-3 GENERAL. To ensure that the AN/TYK-11 is always ready for operation, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure. The necessary preventive maintenance checks and services (PMCS) to be performed are listed and described in table 4-1. The item numbers indicate the sequence of minimum inspection requirements. Defects discovered during operation of the central will be noted for future correction as soon as operation has ceased. Record all deficiencies, together with corrective action taken, on the appropriate maintenance form listed in TM 38-750.

CAUTION

Stop operation immediately if a deficiency is noted during operation which would damage the equipment.

Section IV. TROUBLESHOOTING

4-4 GENERAL. This section provides instructions that will enable the operator/crew to isolate sources of certain malfunctions. When a malfunction is noted, look for the malfunction in the troubleshooting chart (table 4-2). Check each of the probable causes listed to determine the actual cause, and perform the appropriate corrective action.

4-5 MAJOR EQUIPMENT. For detailed troubleshooting of the major components of the AN/TYK-11 central, refer to the appropriate technical manual covering the specific item of equipment. (See Appendix A, References.) Any trouble that is beyond the scope of the operator/crew shall be referred to organizational maintenance.

Table 4-1. Operator/Crew Preventive Maintenance Checks and Services

NOTE

If the equipment must be kept in continuous operation, check and service only those items that can be checked and serviced without disturbing operation. Make complete checks and services when the equipment can be shut down.

Within designated interval, these checks are to be performed in the order listed.

B - Before **A - After** **M - Monthly**
D - During **W - Weekly** **C - Combat Operability Check**

Item No.	Interval						Item to be Inspected	Procedures	Equipment will be reported Not Ready (Red) if:
	B	D	A	W	M	C			
1				•			CLOCK	Rewind clock with supplied key.	Clock fails to keep time.
2	•						LAMPS	Check for burned out bulbs.	Bulb(s) burned out.
3				•			BLACKOUT LIGHTS	Open door to see if white lights go out and blue lights come on.	White lights stay on or blue lights fail to come on.
4				•			SWITCHES, CIRCUIT BREAKERS, AND CIRCUITRY	Check for proper functioning, worn insulation, bends and kinks.	Any abnormal condition is observed.
5	•						TYPEWRITER	Check function of all keys; check paper and replace as needed.	Typewriter does not work properly.
6				•			CLEANING	Use a clean, lint-free cloth to remove dust, oil, and moisture from exterior surfaces of equipment.	

Table 4-2. Operator/Crew Troubleshooting

WARNING

Be extremely careful when performing troubleshooting procedures on electrical equipment; dangerous voltages are present which could cause serious injury or death.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

1. NO POWER TO CENTRAL.

Step 1. Check main power circuit breaker.

Reset to ON.

Step 2. Trace power cable from central to power source.

Reconnect, repair, or replace cable if damaged.

Step 3. Check output of power source.

If output is incorrect, switch to auxiliary power source.

2. PARTIAL LOSS OF POWER.

Step 1. Check for one or more power circuit breakers tripped.

Reset to ON.

Step 2. Check for loose or damaged power cable.

Tighten all connections; repair or replace cable if damaged.

3. NO SHELTER LIGHTS.

Check light circuit breaker.

Reset circuit breaker to on.

4. SINGLE LIGHT INOPERATIVE.

Check light switch for good contact.

Turn switch off, then on again.

5. ALL ELECTRONIC COMPONENTS INOPERATIVE.

Check convenience outlet circuit breaker.

Reset to ON.

Table 4-2. Operator/Crew Troubleshooting - Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

6. ONE ELECTRONIC COMPONENT INOPERATIVE.

Step 1. Check power cord for good connection.

Unplug and replug power cord.

Step 2. Check component fuse(s).

Replace blown fuse(s). If fuse(s) blow immediately, disconnect power supply and refer to higher maintenance.

7. NO INPUT TO RECORDER.

Step 1. Check input cabling for looseness or damage.

Reconnect loose cables; repair damaged cabling.

Step 2. Radio malfunction.

Refer to proper manual to troubleshoot radio.

8. NO INPUT TO HEADSET.

Step 1. Check jack for good connection.

Unplug and replug jack, twisting it slightly.

Step 2. Plug in another headset to see if problem is in headset or recorder.

Refer defective component to next higher level of maintenance for repair.

9. TYPEWRITER LETTERS NOT PRINTING.

Step 1. Check to see if ribbon is feeding through ribbon guides.

Thread ribbon through guides.

Step 2. Check color lever position.

Set lever to blue.

10. TYPEWRITER TYPES PALE.

Check ribbon for wear.

Replace ribbon.

11. TYPEWRITER CHARACTERS FILLED IN.

Check for dirty type.

Clean type.

CHAPTER 5

ORGANIZATIONAL MAINTENANCE INSTRUCTIONS

Section I. TOOLS AND EQUIPMENT

WARNING

This equipment contains dangerous voltages which can cause injury or death by severe electrical shock. Be extremely careful when making voltage measurements or other checks with the equipment connected to the power source during troubleshooting. Always disconnect the power source before making any continuity tests.

5-1 GENERAL. Special tools issued with or authorized for use on the Data Analysis Central AN/TYK-11 are listed in Section III of the Maintenance Allocation Chart, Appendix D of this manual. The only special tool called for is the Multimeter AN/URM-105, which is used to detect circuit interruptions between components at this level of maintenance. Special tools, test equipment, and accessories which may be required for work on individual components are listed in the appropriate manual for each item.

Section II. REPAINTING AND REFINISHING INSTRUCTIONS

5-2 GENERAL. Repainting and refinishing shall be done in accordance with TB 746-10, Field Instructions for Painting and Preserving Electronics Command Equipment. Paints and finishes shall be of the types listed in SB 11-573, Painting and Preservation Supplies Available for Field Use for Electronics Command Equipment. Refer to TM 43-0139, Painting Instructions for Field Use, for instructions on the care of painting equipment. Refer to the individual component technical manuals for specific directions on what surfaces are not to be painted.

5-3 REPAINTING AND REFINISHING. Refer to the -applicable technical manuals for repainting instructions of the separate components. For those items not covered by separate manuals, refer to the technical bulletins in the preceding paragraph.

Section III. LUBRICATION INSTRUCTIONS

(There are no lubrication functions to be performed at this level.)

Section IV. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

5-4 GENERAL. The preventive maintenance checks and services to be performed on the major components are contained in the respective technical manuals covering each item, along with pertinent warnings, cautions, and notes. PMCS's not covered in other manuals are listed in table 5-1.

Table 5-1. Organizational Preventive Maintenance Checks and Services

Legend

W- Weekly
M --Monthly
Q Quarterly
S -Semiannually
A-Annually
B-Biennially
H-Hours
Ml-Miles

Item No.	Interval								Item To Be Inspected	Procedures	Equipment will be reported Not Ready (Red) if:
	W	M	Q	D	A	B	H	MI			
1			•						PUBLICATIONS	Check to see that all publications are complete, serviceable, and current (including all current publication changes). Refer to the latest issue of DA Pam 310-4.	
2			•						COMPONENT PMCS	Refer to all applicable component technical manuals and perform organizational PMCS as required.	
3			•						MODIFICATION WORK ORDERS (MWO's)	Check DA Pam 310-7 for applicable MWO's. Check equipment to see that all MWO's have been applied.	One or more URGENT MWO's have not been applied.
4			•						SPARE PARTS	Check all repair parts authorized for the performance of maintenance at organizational level.	
5			•						CABLES AND WIRES	Tighten loose connections; repair cracked or cut insulation; remove kinks or strains.	
6			•						EQUIPMENT INVENTORY	Inventory each operating equipment; requisition missing or broken parts.	

Table 5-1. Organizational Preventive Maintenance Checks and Services - Continued

Item No.	Interval								Item To Be Inspected	Procedures	Equipment will be reported Not Ready (Red) if:
	W	M	Q	D	A	B	H	MI			
7			•						EQUIPMENT OPERATION	Check all equipment for proper operation.	
8			•						EQUIPMENT MOUNTING	Tighten all loose hardware which secures racks and equipment to shelter floor and wall. Tighten all loose hardware on rack mounted equipment. Inspect shock mounts for damage. Inspect all ground straps across shock mounts for damage and correct installation.	

Section V. TROUBLESHOOTING

5-5 TROUBLESHOOTING PROCEDURE.

WARNING

Be extremely careful when performing troubleshooting procedures on electrical equipment; dangerous voltages are present which could cause serious injury or death.

Troubleshooting of the major components at this level is limited to verifying that the component is inoperative, and then referring the component to direct support/general support maintenance. Nonmajor component troubleshooting consists of determining the symptom and referring to table 5-2, Organizational Troubleshooting Chart, for corrective procedures. Refer any trouble that is beyond the scope of organizational maintenance to a higher level of maintenance as specified in the MAC, Appendix D.

Table 5-2. Organizational Troubleshooting Chart

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

1. NO POWER IN SHELTER WHEN POWER CABLE IS CONNECTED.

Step 1. Check for defective power cable.

Repair or replace power cable.

Step 2. Check for defective power receptacle.

Repair or replæce receptacle.

Step 3. Check for defective main circuit breaker.

Replace circuit breaker.

Step 4. Check for defective wiring from power entrance to circuit breaker.

Repair or replace wiring.

2. NO SHELTER LIGHTS WHEN SWITCHED TO ON.

Step 1. Check for defective circuit breaker.

Replace defective breaker.

Step 2. Check for current at lights.

Repair or replace defective wiring from breaker to lights.

Table 5-2. Organizational Troubleshooting Chart - Continued

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

3. SINGLE LIGHT INOPERATIVE.

Step 1. Check for defective switch.

Replace defective switch.

Step 2. Check for defective lamp socket.

Repair or replace lamp socket.

Step 3. Check for defective wiring.

Repair or replace defective wiring.

4. BLACKOUT LIGHTS FAIL TO COME ON WHEN DOOR IS OPENED.

Step 1. Check for defective interlock switch.

Replace interlock switch.

Step 2. Check for defective wiring.

Repair or replace defective wiring.

5. CEILING LIGHTS DO NOT GO OUT WHEN BLACKOUT SWITCH IS ON AND DOOR IS OPENED.

Step 1. Check for defective interlock switch.

Replace interlock switch.

Step 2. Check for defective blackout switch.

Replace defective blackout switch.

Step 3. Check for defective wiring.

Repair or replace defective wiring.

6. NO POWER TO RECEPTACLES.

Step 1. Check for defective circuit breaker.

Replace circuit breaker.

Step 2. Check for defective wiring.

Repair or replace defective wiring.

Section VI. MAINTENANCE OF DATA ANALYSIS CENTRAL AN/TYK-11

5-6 GENERAL. Maintenance of the Data Analysis Central AN/TYK-11 is confined to removing and replacing defective installed equipment. Maintenance instructions for the separate components should be referenced from the individual technical manuals as listed in Appendix A.

5-7 REMOVAL AND REPLACEMENT OF RACKMOUNTED EQUIPMENT.

WARNING

Turn off power to equipment and disconnect power cable plugs before removing powered equipment. Dangerous voltages are present which could cause injury or death on contact.

a. Remove each item of equipment from the rack as follows:

(1) Disconnect the power cable plug from rack receptacle.

(2) Remove mounting screws and washers from front panel.

(3) Pull equipment forward to allow cable connectors to be reached.

(4) Disconnect cables from equipment, tagging all unmarked cables.

(5) Remove equipment by pulling forward and out of the rack.

b. Install equipment into racks as follows:

(1) Insert the equipment into the rack, leaving it out far enough to allow access to the cables and connectors at the back of the component.

(2) Connect the cables to the connectors.

(3) Push the equipment into the rack, making sure that cables do not bind or get pinched.

(4) Secure the equipment in the rack with the mounting screws and washers on the front panel.

(5) Connect the power cable plug to the rack receptacle.

c. Remove storage drawers from the safe as follows:

(1) Slide the drawer out until it hits the stops.

(2) Lift front of drawer up over stops and remove drawer from cabinet.

(3) Remove the four assembly hardware sets holding one half of the slide assembly set to one safe wall and remove it.

(4) Remove the four assembly hardware sets holding the other half of the slide assembly to the other safe wall and remove it.

d. Install storage drawers into the safe as follows:

(1) Secure half of the slide assembly set to one wall of the safe using four assembly hardware sets.

(2) Secure the other half of the slide assembly to the other wall of the cabinet using four assembly hardware sets.

(3) Align slides on safe walls with the slides and rollers of the drawer.

(4) Insert the drawer slides and rollers over the stops on the slides of the safe.

(5) Slide drawer into cabinet.

e. Remove the typewriter from the shelf as follows:

(1) Slide the typewriter shelf out until it hits the stops.

(2) Remove the four assembly hardware sets on the underside of the shelf securing the typewriter.

(3) Lift typewriter from shelf.

f. Install the typewriter on the shelf as follows:

(1) Align the feet of the typewriter with the correct holes in the typewriter shelf.

(2) Secure the typewriter to the shelf with the four assembly hardware sets removed previously.

(3) Slide the shelf back into the rack.

CHAPTER 6

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Section I. GENERAL

6-1 SCOPE. The following sections provide direct support and general support maintenance instructions for the Data Analysis Central ANITYK-11 in conformance with the Maintenance Allocation Chart (MAC), Appendix D.

Maintenance instructions for individual components comprising the AN/TYK-11 are contained in technical manuals covering the specific equipment. (See Appendix A.)

Section II. TOOLS AND EQUIPMENT

6-2 GENERAL. Special tools authorized for repair of the AN/TYK-11 central are listed in Section III of the MAC, Appendix D. Refer to the individual technical manuals

for special tools and equipment required for specific components of the central.

Section III. TROUBLESHOOTING

6-3 GENERAL. No special troubleshooting procedure is required at the direct support and general support maintenance levels. Refer to the individual technical manuals for

special troubleshooting procedures for specific items of equipment comprising the AN/TYK1.

Section IV. MAINTENANCE

6-4 GENERAL. Maintenance instructions for direct support and general support personnel are provided in the

technical manuals applicable to the individual items of equipment as listed in Appendix A.

APPENDIX A

REFERENCES

Reference	Title
TEMO 036-011B	Recorder-Reproducer Set, Sound, AN/TNH-II(V), (Including Depot Maintenance Repair Parts and Special Tools Kit)
TM 5-4120-222-14	Operator's, Organizational, Direct Support, and General Support Maintenance Manual: Air Conditioner: Compact, Vertical, 208 V, 3 Phase, 18,000 BTU/H Cooling, 12,000 BTU/H Heating (Trane Models), 56/60 Hz Model CE20VAL6 (NSN 4120-00-973-4589) 400 Hz Model (CE20VAL4) and (4120-00-858-5795).
TM 9-2320-209-10	Operator's Manual for 2½-Ton 6x6 W/W, M44 Series Chassis, Truck: M44, M44A1, M44A2, M45, M45A1, M45A2, M45A2G, M45C, M45G, M46, M46A1, M46AIC, M46A2C, M46C, M57, M58. Instrument Repair Shop, Truck Mounted: M185, M185AI, M185A2, M185A3; Truck, Cargo: M34, M35, M35A1, M35A2, M35A2C, M36, M36A2, M36C; Truck, Dump: M47, M59, M342, M342A2. Truck, Maintenance, Earth Boring Machine and Pole Setter: V18A/MTQ, M764; Truck, Maintenance, Telephone Construction and Maintenance: V17/MTQ; Truck, Pipeline Construction: M756A2. Truck, Tank, Fuel Servicing: 1200 Gal., M49, M49A1C, M49A2C, M49C; Truck, Tank, Water: 1,000 Gal., M50, M50AI, M50A2; Truck, Tractor: M48, M275, M275A1, M275A2; Truck, Van, Electronic: M5675; Truck, Van, Expansible: M292, M292A1, M292A2, M292A5; Truck, Van, Shop: M109, M109A1, M109A2, M109A3; Truck, Wrecker, Crane: M 108 and Truck, Wrecker, Light: M60.
TM 11-5805-201-12	Operator and Organizational Maintenance Manual, Including Repair Parts and Special Tools Lists: Telephone Set TA-312/PT (NSN 5805-00-543-0012) [TO 31W1-2PT-291]
TM 11-5805-201-35	Direct Support, General Support, and Depot Maintenance Manual, Including Repair Parts and Special Tools Lists: Telephone Set TA-312/PT (NSN 5805-00-543-0012) [TO 31WI-2PT-2923
TM 11-6625-203-12	Operator and Organizational Maintenance Manual: Multimeter AN/URM-105 and AN/URM-105C, Including Multimeter ME-77/U (NSN 6625-00-284-0854) and ME-77C/U (NSN-6625-00-999-6625).
TM 32-5410-221-14&P	Operator's, Organizational, Direct Support and General Support Maintenance Manual, Including Repair Parts and Special Tools Lists, Electrical Equipment Shelter, S-281/G, (NSN 5410-00-070-7936).
TM 38-750	The Army Maintenance Management System (TAMMS)
TM 43-0139	Painting Instructions for Field Use
TM 740-90-1	Administrative Storage of Equipment
AR 700-58	Report of Packaging and Handling Deficiencies
CTA 50-970	Expendable Items (Except Medical, Class V, Repair Parts and Heraldic Items)
DA Pam 3104	Index of Technical Publications
DA Pam 310-7	U.S. Army Equipment Index of Modification Work Orders

Reference	Title
SB 11-30	FSC Class 6135; Dry Battery Management Data
SB 11-573	Painting and Preservation Supplies Available for Field Use for Electronics Command Equipment
SB 38-100	Preservation, Packaging, Packing and Marking Materials, Supplies and Equipment Used by the Army
TB43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters

APPENDIX B

COMPONENTS OF END ITEM LIST

Section I. INTRODUCTION

B-1. SCOPE. This appendix lists integral components of and Basic Issue Items (BII) for the Data Analysis Central AN/TYK-I1 (central) to help you inventory items required for safe and efficient operation.

B-2. GENERAL. This Components of End Item List is divided into the following sections:

a. Section II. Integral Components of the End Item. These items, when assembled, comprise the central AN/TYK-II and must accompany it whenever it is transferred or turned in. The illustrations will help you identify these items.

b. Section III. Basic Issue Items (BII). These are the minimum essential items required to place the central AN/TYK-II in operation, to operate it, and to perform emergency repairs. Although shipped separately packed they must accompany the central AN/TYK-11 during operation and whenever it is transferred between accountable officers. The illustrations will assist you with hard-to-identify items. This manual is your authority to requisition replacement BII, based on TOE/ MTOE authorization of the end item.

B-3. EXPLANATION OF COLUMNS.

a. Illustration. This column is divided as follows:

(1) *Figure Number*. Indicates the figure number of the illustration on which the item is shown.

(2) *Item Number*. The number used to identify item called out in the illustration.

b. National Stock Number. Indicates the National stock number assigned to the item and which will be used for requisitioning.

c. Part Number. Indicates the primary number used by the manufacturer, which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items.

d. Description. Indicates the Federal item name and, if required, a minimum description to identify the item.

e. Location. The physical location of each item listed is given in this column. The lists are designed to inventory all items in one area of the major item before moving on to an adjacent area.

f. Usable on Code. "USABLE ON" codes are included to help you identify which component items are used on the different models. Identification of the codes used in these lists are: None.

g. Quantity Required ({Qty Req'd). This column lists the quantity of each item required for a complete major item.

h. Quantity. This column is left blank for use during an inventory. Under the Rcv'd column, list the quantity you actually receive on your major item. The Date columns are for your use when you inventory the major item at a later date; such as for shipment to another site.

Section II. INTEGRAL COMPONENTS OF END ITEM

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)	(8) Quantity			
(a) Figure No.	(b) Item No.	National Stock Number	Part No. & FSCM	Description	Location	Usable On Code	Qty Reqd	Rev'd	Date	Date	Date
1-1		5410-00-070-7963	S-281/G	SHELTER, ELECTRICAL EQUIP-MENT			1				
1-2	2	7125-00-952-9285	MX-7196/G	DRAWER, FILE CARD STORAGE			1				
1-2	3	7125-00-952-9091	MX-7197/G	DRAWER, DOCUMENT STORAGE			3				
1-2	4		MX-204	DRAWER, STORAGE			2				
1-2	5	7125-00-998-2796	CY4842	SAFE/CABINET			1				
1-2	10	5830-00-327-5031	FN-87	SHELF, TYPEWRITER			4				
1-2	11	7430-00-663-1241	24-D	TYPEWRITER, REMINGTON STANDARD			4				
1-2	12	5835-00-064-68 36	OA-3978/TNH-11	AMPLIFIER/POWER SUPPLY			4				
1-2	13	583500-892-3507	AN/TNH-I I(V)	RECORDER-REPRODUCER SET, SOUND			4				
1-2	16	5830-00-327-5066	MT-1579/G	RACK, ELECTRONIC EQUIPMENT			4				

BASIC ISSUE ITEMS

(1) Illustration		(2)	(3)	(4)	(5)	(6)	(7)	(8) Quantity			
(a) Figure No.	(b) Item No.	National Stock Number	Part No. & FSCM	Description	Location	Usable On Code	Qty Reqd	Rev'd	Date	Date	Date
1-3		6445-00-936-8120	CLOCK, 8-DAY				1				
1-3		5965-00-892-3353	ANH-216	HEADSET			12				
1-3		5805-00-543-0012	TA-312/PT	TELEPHONE			1				
1-3		7110-00-273-8791	NOREF (33333)	CHAIR, ROTARY			4				
		6145-00-226-8812	WD-1	CABLE, SIGNAL			A/R				
		5995-00-842-0255	X-8110-82	CABLE ASSEMBLY			1				
		3895-00498-8343	RL-39	REEL MACHINE			1				

APPENDIX C

ADDITIONAL AUTHORIZATION LIST

(NOT APPLICABLE)

C-1/(C-2 blank)

APPENDIX D

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

D-1. GENERAL.

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall responsibility for the performance of maintenance functions on the identified end item or component. The implementation of the maintenance functions upon the end item or component will be consistent with the assigned maintenance functions.

c. Section III lists the special tools and test equipment required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

D-2. MAINTENANCE FUNCTIONS.

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Replace. The act of substituting a serviceable like type part, subassembly, or module for an unserviceable counterpart.

d. Repair. The application of maintenance services or other maintenance actions to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), and item, or system.

e. Overhaul. That maintenance effort (services/actions) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards; i.e., Depot Maintenance Work Requirement in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

f. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipments/components.

D-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II.

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in column 2. (For detailed explanation of these functions, see para. D-2.)

d. Column 4, Maintenance Level. Column 4 specifies, by the listing of a "work time" figure in the appropriate subcolumn(s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform the maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate "work time" figures will be shown for each level. The number of man-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

C .....Operator or crew
O .....Organizational maintenance
F .....Direct support maintenance
H .....General support maintenance
D .....Depot maintenance

e. Column 5, Tools and Equipment. Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, Test, Measurement, and Diagnostic Equipment (TMDE), and support equipment required to perform the designated function.

f. Column 6, Remarks. This column shall, when applicable, contain a letter code, in alphabetical order, which shall be keyed to the remarks contained in Section IV.

D-4 EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III.

a. Column 1, Reference Code. The tool and TMDE reference code correlates with a code used in the MAC, Section II, column 5.

b. Column 2, Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

c. Column 3, Nomenclature. Name or identification of the tool or test equipment.

d. Column 4, National/NATO Stock Number. The National Stock Number (NSN) of the tool or TMDE.

e. Column 5, Tool Part Number. The manufacturer's part number.

D-5 EXPLANATION OF COLUMNS IN REMARKS, SECTION IV.

a. Reference Code. The code recorded in Section II, column 6.

b. Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level C	O	F	H	D	(5) Tools and Equipment	(6) Remarks
00	Central, Data Analysis AN/TYK-11	Inspect	0.5						
		Test		0.6	1.0			1, 2, 3	
		Repair		1.0	2.2			1,2, 3	
		Overhaul					40.0	1,2, 3	
		Rebuild					120.0	1,2, 3	
01	Shelter, Electrical Equipment S-281/G	Inspect	0.4						A
		Test		0.4				1, 2	
		Repair		0.4				1, 2	
		Overhaul					40.0	1, 2, 3	
		Rebuild					120.0	1,2, 3	
02	Rack, Position No. 1								
0201	Rack, Electronic Equipment	Inspect	0.1						
		Test		0.2				1	
		Replace		1.1				1,2	B
0202	Lamp Unit	Inspect	0.1						
		Test	0.1	0.3				1,2	
		Repair		0.3				1,2	
		Replace		0.3				1,2	
0203	Recorder-Reproducer AN/TNH-1 I(V)	Inspect	0.1	A					
		Test		0.3				1, 2	
		Repair			1.5			1,2	
		Replace		0.3				1, 2	
		Overhaul					3.5	1,2, 3	
0204	Amplifier/Power Supply	Inspect	1.0						A
		Test		0.3				1, 2	
		Repair				1.5		1,2	
		Replace		0.3				1, 2	
		Overhaul					3.5	1, 2, 3	
0205	Typewriter	Inspect	0.1	C					
		Replace		0.3				2	
0206	Typewriter Shelf FN-87	Inspect	0.1						
		Replace		0.5				2	
0207	Panel, Cover	Inspect	0.6						
		Replace		0.1				2	
03	Rack, Position No. 2								
0301	Rack, Electronic Equipment	(Same as 0301)							
0302	Lamp Unit	(Same as 0302)							
0303	Recorder-Reproducer	(Same as 0303)							
0304	Amplifier/Power Supply	(Same as 0304)							

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level C	O	F	H	D	(5) Tools and Equipment	(6) Remarks
0305	Typewriter	(Same as 0305)							
0306	Typewriter Shelf	(Same as 0306)							
0307	Panel, Cover	(Same as 0307)							
04	Rack, Position No. 3								
0401	Rack, Electronic Equipment	(Same as 0301)							
0402	Lamp Unit	(Same as 0302)							
0403	Recorder-Reproducer	(Same as 0303)							
0404	Amplifier/Power Supply	(Same as 0304)							
0405	Typewriter	(Same as 0305)							
0406	Typewriter Shelf	(Same as 0306)							
0407	Panel, Cover	(Same as 0307)							
05	Rack, Position No. 4								
0501	Rack, Electronic Equipment	(Same as 0301)							
0502	Lamp Unit	(Same as 0302)							
0503	Recorder-Reproducer	(Same as 0303)							
0504	Amplifier/Power Supply	(Same as 0304)							
0505	Typewriter	(Same as 0305)							
0506	Typewriter Shelf	(Same as 0306)							
0507	Panel, Cover	(Same as 0307)							
06	Safe/Cabinet	Inspect	0.1						
		Repair			1.0			2	
		Replace		1.0				2	
		Overhaul					2.0	2, 3	
0601	Lock, Combination	Inspect	0.1						
		Repair			1.0			2	
		Replace		1.0				2	
0602	Drawer MX 7196	Inspect	0.1						
		Replace		0.1					
0603	Drawer MX 7197	Inspect	0.1						
		Replace		0.1					

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Level C	O	F	H	D	(5) Tools and Equipment	(6) Remarks
0604	Drawer MX 204	Inspect	0.1						
		Replace		0.1					
07	Chair Rotary	Inspect	0.1						
		Replace		0.1					
08	Headset	Inspect	0.1						
		Test		0.2				1,2	
		Repair		0.4				1,2	
		Replace		0.1					
		Overhaul					1.0	1,2	
09	Telephone Set TA-312/PT	Inspect	0.1						A
		Test		0.2				1	
		Repair			1.0			1,2	
		Replace		0.3				1,2	
		Overhaul					1.8	1,2	

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) Reference Code	(2) Maintenance Level	(3) Nomenclature	(4) National/NATO Stock Number	(5) Tool Number
1	O	Multimeter AN/URM-105C	6625-00-999-6282	AN/URM-105C
2	O	Tool Kit, Electronic Equipment TK-105/G	5180-00-610-8177	TK-105/G
3	F	Tool Kit, Electronic Equipment TK-I01 /G	5180-004064-5178	TK-101/G

Section IV. REMARKS

Reference Code	Remarks
A	For maintenance of this item, refer to the applicable technical manual as listed in Appendix A, References.
B	Maintenance on this item is limited to replacement of defective components.
C	Commercial supply. No repair is authorized for this item. Return to depot for replacement.

APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. SCOPE. This appendix lists expendable supplies and materials you will need to operate and maintain the Data Analysis Central AN/TYK-1 1. These items are authorized to you by CTA 50-970, Expendable Items (except Medical, Class V, Repair Parts, and Heraldic Items).

E-2. EXPLANATION OF COLUMNS.

a. Column 1, Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., ". . . applying a light film of a general purpose lubricating oil, Appendix E").

b. Column 2, Level. This column identifies the lowest level of maintenance that requires the listed item.
C ..... Operator/Crew

c. Column 3, National Stock Number (NSN). This is the NSN assigned to the item; use it to request or requisition the item.

d. Column 4, Description. Indicates the Federal Item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. Column 5, Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the U/M differs from the unit of issue, requisition the lowest unit that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
C	9150	00-231-6639	OIL, LUBRICATING, GENERAL PURPOSE, P/N P1208, FSCM 29700	CN
ALL OTHER EXPENDABLE MATERIALS ARE LISTED IN APPLICABLE MANUALS FOR EACH PIECE OF EQUIPMENT.				

☆U.S. GOVERNMENT PRINTING OFFICE: 1984-461-065/23504

By Order of the Secretary of the Army:

E. C. MEYER
General United States Army
Chief of Staff

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN...JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL.

SOMETHING WRONG WITH PUBLICATION

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE

BE EXACT PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.

IN THIS SPACE, TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT.

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER	SIGN HERE

TEAR ALONG PERFORATED LINE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

THE METRIC SYSTEM AND EQUIVALENTS

'NEAR MEASURE

. Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

'VEIGHTS

Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

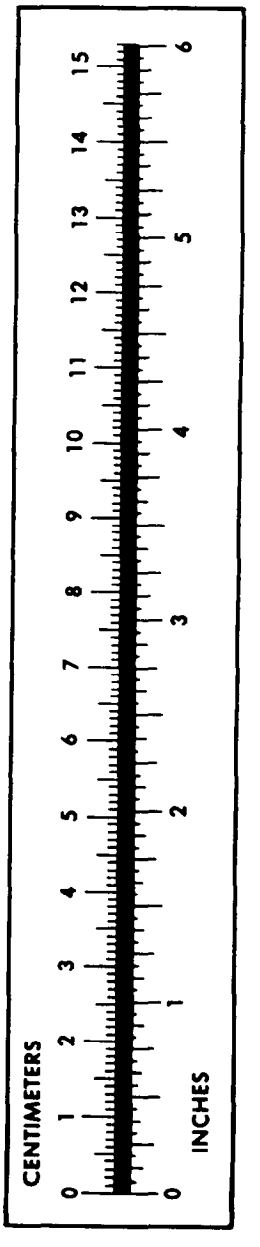
TEMPERATURE

5/9(°F - 32) = °C
212° Fahrenheit is evuivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5C° + 32 =°F

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
ıts	Liters	0.473
arts	Liters	0.946
allons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
ers	Gallons	0.264
ms	Ounces	0.035
ograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
lometers per Liter	Miles per Gallon	2.354
meters per Hour	Miles per Hour	0.621



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