TM 11-6625-3018-14

TECHNICAL MANUAL

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

FOR

WATTMETER ME-497/U

(BIRD ELECTRONIC MODEL 6104)

(NSN 6625-01-064-3555)

HEADQUARTERS, DEPARTMENT OF THE ARMY
13 MAY 1982

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1. DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL
2. IF POSSIBLE , TURN OFF THE ELECTRICAL POWER
3. IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL
4. SEND FOR HELP AS SOON AS POSSIBLE
5. AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

WARNING

Under continuous operation at maximum rated power the radiator assembly may become heated. Avoid contact with radiator assembly during prolonged operation of wattmeter.

When using the wattmeter, observe all safety precautions which apply to the equipment being tested.

Do not exceed the power rating of the wattmeter.

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

CAUTION

Carefully check the condition of all cables and connectors before using the wattmeter.

If transmitter output is not known, make certain the semiconductor device diode is plugged into the X 10 range and the switch is on the red scale.

TECHNICAL MANUAL
No. 11-6625-3018-14

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 13 May 1982

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

FOR

WATTMETER ME-497/U
(BIRD ELECTRONIC MODEL 6104)
(NSN 6625-01-064-3555)

REPORTING 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: Commander, US Army Communications-Electronics Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, New Jersey 07703.

In either case, a reply will be furnished direct to you.

This manual is an authentication of the manufacturer's commercial literature which, through usage, has been found to cover the data required to operate and maintain this equipment. Since the manual was not prepared in accordance with military specifications, the format has not been structured to consider levels of maintenance.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

CHAPTER 0
INTRODUCTION

0-1. SCOPE. This manual describes Wattmeter ME-497/U and provides instructions for operation and maintenance. The ME-497/U is a Termaline Model 6104 Radio Frequency Wattmeter manufactured by Bird Electronic Corporation.

0-2. INDEXES OF PUBLICATIONS.

a. *DA Pam 310-4.* Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. *DA Pam 310-7.* Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO'S) pertaining to the equipment.

0-3. MAINTENANCE FORMS, RECORDS, AND REPORTS.

a. *Reports of Maintenance and Unsatisfactory Equipment.* Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (Army).

b. *Report of Item and Packaging Discrepancies.* Fill out and forward SF 364. [Report of Discrepancy (ROD)] as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73/AFR 400-54/MCO 4430.3E.

c. *Discrepancy in Shipment Report (DISREP) (SF 361).* Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-36/ NAVSUPINST 4610.33B/AFR75-18/MCOP4610.19C and DLAR 4500.15.

0-4. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR). If your ME-497/U 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 Commander, US Army Communications — Electronics Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, New Jersey 07703. We'll send you a reply.

0-5. ADMINISTRATIVE STORAGE. To prepare the equipment for administrative storage, ascertain its operability and reliability. In addition, use the proper packing materials.

0-6. DESTRUCTION OF ARMY ELECTRONICS MATERIEL. Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

0-7. PURPOSE AND FUNCTION. Wattmeter ME-497/U (see figure 0-1) is designed to measure radio frequency (RF) power under non-radiating conditions, and has the following specific uses:

a. Troubleshooting and routine maintenance.

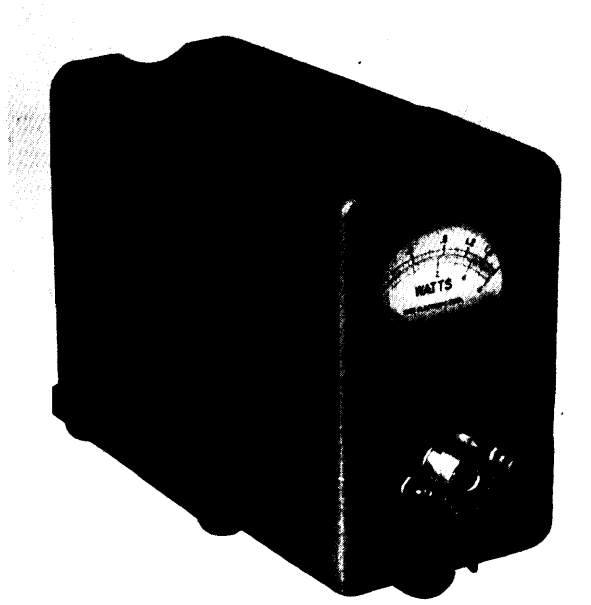
b. Transmitting tests.

c. Transmission line loss measurements.

d. Testing of coaxial line insertion devices such as connectors, switches, relays, filters, tuning stubs, patch cords, etc.

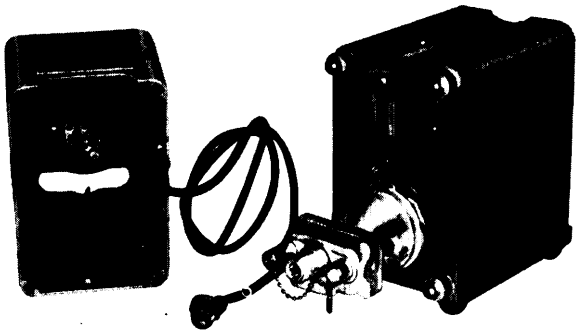
e. As an RF load resistor.

f. As a modulation monitor (audio frequency AM may be monitored by connecting phones, amplifiers, or audio voltmeters to the DC meter circuits).



EL8AP001

Figure 0-1. Wattmeter ME-497/U



EL8AP002

Figure 0-2. Meter Housing Detached

0-8. DESCRIPTION. Wattmeter ME-497/U consists of a coaxial RF load (radiator assembly), DC cable, and meter housing (see figure 0-2), The load portion is comprised of the coaxial load resistor encased in a finned radiator on which the voltmeter block assembly is mounted. A 3-1/2-foot coaxial cable connects the voltmeter block assembly to the meter housing. The meter is sealed and shock mounted in its housing. Two semiconductor device diodes (one working and one spare) are furnished with the wattmeter. The diodes are interchangeable and may be used to cross check the instrument's accuracy. The working diode is located in the voltmeter block assembly. The spare is located on the upper left face of the radiator assembly.

0-9. SPECIFICATIONS. Specifications for the wattmeter are listed in table 0-1.

Table 0-1. Specifications

Type	ME-497/U
Frequency range	25 to 512 MHz
VSWR	1.1:1 DC to 512 MHz
Input impedance	50 ohms nominal
Input connector	Female N
Load power rating	80 watts continuous
Power scales	
Low scale (black)	0-2 and 0-20 watts
High scale (red)	0-6 and 0-60 watts
Accuracy	±5% of full scale 25 to 512 MHz
Weight	7 pounds (3.2 kg)
Overall dimensions	9-5/8 x 3-61/64 x 6-3/8 inches (244.5 x 100.4 x 161.9 mm)
Operating position	Load upright
Power supply	None required
Coolant	G.E. 10C Transformer Oil

CHAPTER 1
INSTALLATION

1-1. GENERAL. This wattmeter is essentially a portable test instrument and should be placed as close as possible to the equipment whose power is being measured. Use this wattmeter in an upright position only. No power supply is required.

1-2. UNPACKING. Open the shipping container and remove the wattmeter which consists of the following components: coaxial RF load (radiator assembly), power cable, and meter housing. Check that all components are present. Visually inspect these components for any damage that may have occurred during shipment.

1-3. LOCATION. When selecting a suitable location for the wattmeter make certain that there is at least a 4-inch clearance on all sides of the wattmeter. Free air circulation around the wattmeter is essential for proper operation. Do not place the wattmeter near heated surfaces. Keep the space above it unobstructed to permit good heat transfer.

1-4. MOUNTING. The wattmeter may be fastened to a work bench or testing bench. To mount the wattmeter, unscrew and remove the four rubber bumpers located on the bottom of the radiator assembly. Using No. 8-32 screws, attach the wattmeter to the bench. The threaded holes form a 3 x 4-1/2-inch (76.2 x 114.3 mm) rectangle.

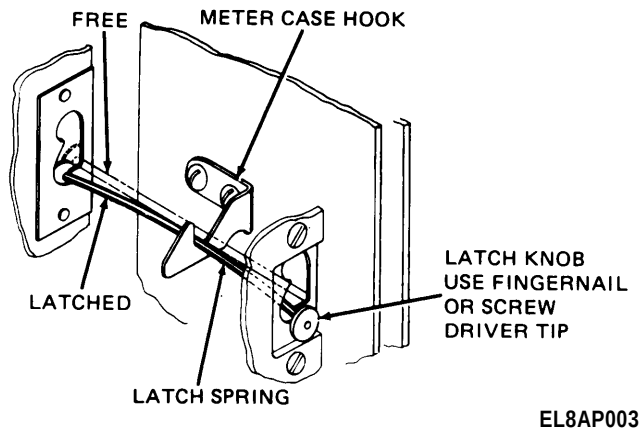


Figure 1-1. Latch Operation

1-5. REMOTE USE. The wattmeter may be separated for remote use. The wattmeter case is retained on the radiator assembly by the bow-spring action of the latch spring. To remove the meter case, raise the latch knobs at the side of the case, one at a time, until the latch is above the notch in the meter case hook (see figure 1-1). When reassembling the wattmeter and case, be certain to coil the power cable in such a manner that it will allow the meter case to be replaced properly on the load.

CHAPTER 2
THEORY OF OPERATION

2-1. BASIC PRINCIPLES OF OPERATION. The method of power determination used in Watt meter ME-497/U can be expressed by $W = E^2/R$, whereby

E is the voltage across the resistor R
W is the power expressed in watts

RF energy flows from the transmitter through the resistor R producing a voltage drop across the resistor (see figure 2-1). The RF voltage is rectified by a semiconductor device diode. A voltmeter is used to measure the rectified voltage.

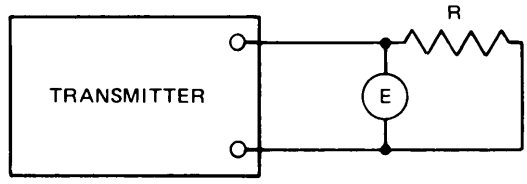
NOTE

It is important that the output impedance of the wattmeter be equal to the resistance and that the voltmeter is accurate at the operating frequency.

2-2. RF LOAD RESISTOR.

a. The RF load resistor consists essentially of a cylindrical film type resistor immersed in a dielectric coolant. The resistor is enclosed in a specially tapered housing which provides a linear reduction in surge impedance directly proportional to the distance along the resistor.

b. The coolant is chosen for its dielectric properties and thermal characteristics. The load is cooled by natural fluid and air convection. The coolant carries the electrically generated heat from the resistor to the walls of the cylindrical cooling tank, which is encased by metal radiating fins. The heat from the coolant is transferred to the surrounding air by the radiating fins.



EL8AP004

Figure 2-1. E^2/R Method of Power Measurement

c. A synthetic rubber diaphragm located in the rear dome on the load allows the coolant to expand as the temperature rises.

2-3. VOLTMETER CIRCUIT. The voltmeter consists of two separate filtered half-wave rectifier circuits. Select the active circuit by inserting the semiconductor device diode into the desired socket. A toggle switch provides for selection of the desired scale.

CHAPTER 3
OPERATING INSTRUCTIONS

3-1. OPERATING PRECAUTIONS. Carefully check the condition of the RF cable and connectors used in the RF circuitry. Interconnecting cable length and the use of adapters and connectors should be kept to a minimum. Use only Type N or other constant-impedance 50-ohm connectors and adapters. Use a male N connector (UG-21/U) to connect the input cable to the wattmeter. If other than 50-ohm connectors are used, make certain they are used at the transmitter jack only. This will keep the RF cable free from standing waves.

3-2. ACCURACY TEST. Operating checks should consist mainly of comparisons between this wattmeter and others of the same type. This check should indicate an accuracy of ±10% fuII scale. A cross check may also be made between the working semiconductor device diode and the spare. Semiconductor device diode should be accurate within 3% of full scale.

3-3. FREQUENCY RESPONSE. Wattmeter ME-497/U is a broad band instrument, therefore misreadings can occur in the presence of harmonics or spurious frequencies. To prevent misreadings due to harmonics, connect a low pass filter between the transmitter and wattmeter.

NOTE

Do not continue operation of the wattmeter when large spurious responses are present.

3-4. MEASURING TRANSMITTER POWER. Wattmeter ME-497/U can be used to measure transmitter power output.

WARNING

Do not exceed the power rating of the wattmeter.

CAUTION

If transmitter output is not known, make certain the semiconductor device diode is plugged into the X10 range and the switch is on the red scale.

a. Position the wattmeter so that the meter can be read while the transmitter is being adjusted. The meter pointer should be at zero under no load conditions. If necessary, turn the zero adjust screw, located below the meter face, until the meter reads exactly zero.

b. Using a short piece of 50-ohm cable (preferably under 5 feet in length), connect the wattmeter to the transmitter.

c. The meter will now measure the power dissipated in the load portion of the instrument. Losses introduced by the interconnecting cable between the transmitter and the wattmeter, if significant, must be added to the power indicated by the meter.

NOTE

During the process of switching from the wattmeter back to the antenna, it may become necessary to retune the transmitter slightly due to the difference in VSWR between the wattmeter and the transmitter's antenna.

3-5. USING AS A DUMMY LOAD. The wattmeter may be used without the meter and semiconductor device diode as a 50-ohm coaxial termination for transmitters with a power output up to 80 watts from DC to 4000 MHz. To protect the meter and semiconductor device diode when using the equipment as a dummy load, remove the semiconductor device diode from the voltmeter block assembly and disconnect the DC cable.

CHAPTER 4
MAINTENANCE INSTRUCTIONS

4-1. PREVENTIVE MAINTENANCE. This wattmeter requires only simple and routine maintenance.

a. Avoid subjecting the meter and semiconductor device diodes to rough treatment.

b. Keep the DC plug connected to the voltmeter block assembly and the semiconductor device diodes in their sockets at all times. This will prevent dust and dirt from accumulating in the sockets.

c. Wipe off dust and dirt regularly.

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flames; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with the skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

d. Clean contacts with a cotton swab stick dampened with TRICHLOROTRIFLUOROETHANE.

e. If any portions of the radiator or meter housing are scratched, clean area with a fine flint sandpaper and touch up with gray enamel.

4-2. TROUBLESHOOTING. Refer to table 4-1 for a listing of troubles that might occur during operation of the wattmeter. Possible causes and remedies are also listed.

4-3. PERIODIC INSPECTION. This wattmeter is ruggedly constructed and will normally provide trouble-free service. Periodic inspections should be performed at six-month intervals.

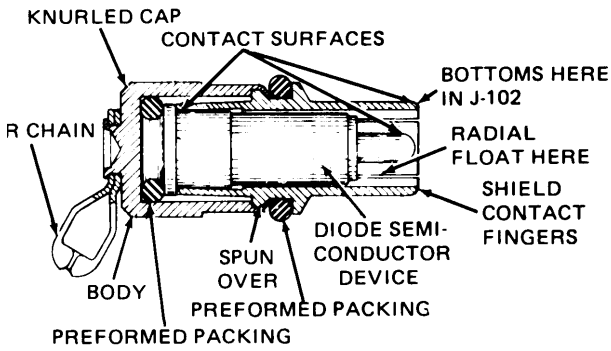
a. *Leakage.* Routinely check the front and rear clamp bands for any signs of coolant seepage. To check coolant level, remove the filler plug located on the reservoir. (Position radiator assembly with plug in UP position before removal.) Coolant level should be within 1/4 inch of the inside thread of the socket.

NOTE

If coolant is removed, it must be replaced with new coolant. Radiator capacity for coolant is 0.1 gallon (378.5 ml).

Table 4-1. Troubleshooting

Trouble	Possible cause	Remedy
No meter indication	No radio frequency power	Check transmitter, switch on, and refer to operating instructions for equipment used.
	Burned out semiconductor device diode	Replace semiconductor device diode.
	Meter damaged or burned out	Replace meter.
	Fault in DC circuit	Check DC circuit for continuity and repair.
	Load resistor burned out or faulty	Replace load resistor.
Intermittent or inconsistent meter readings	Sticky or defective meter	Test meter and replace if defective.
	Faulty semiconductor device diode	Replace semiconductor device diode.
	Faulty load resistor unit	Replace load resistor unit.
	High VSWR on load	Test load resistor with slotted line or with a termination wattmeter or equivalent.



EL8AP005

Figure 4-1. Semiconductor Device Diode

b. *Semiconductor Device Diodes.* Occasionally lubricate the preformed packing on the semiconductor device diode (see figure 4-1) with a non-metallic compound such as Dow Corning No. 4. Check the contact fingers of the shield for proper contact with the crystal socket. Bend slightly if necessary, making sure not to damage the locating pin of the semiconductor device diode.

4-4. DIAPHRAGM SERVICE. If coolant is leaking, it may be necessary to inspect and service the diaphragm.

a. Position the radiator assembly vertically with the diaphragm end up.

b. Loosen the clamp screw and release the clamp band.

c. Remove the diaphragm cover and carefully lift the diaphragm from the back end of the radiator tank.

d. Inspect the diaphragm and replace if leaks or signs of deterioration are detected.

e. Reinstall the diaphragm cover and secure the clamp band. Invert the wattmeter and check for leakage.

4-5. POWER CABLE AND DC PLUG SERVICE.

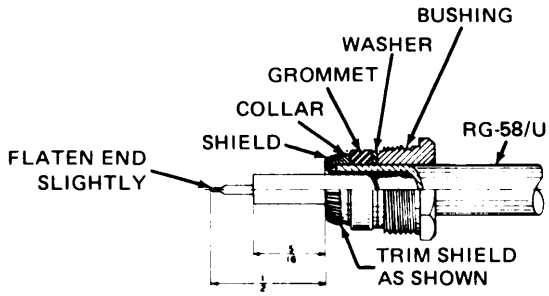
a. To remove the power cable from the DC plug, unscrew the bushing and pull out on the cable.

b. Assemble the cable to the DC plug as follows:

(1) Slip the bushing, washer, and grommet over the end of the cable.

(2) Remove the outer insulation 9/16 inch from the end of the cable.

(3) Slip the collar over the shielding (unbraided).



EL8AP006

Figure 4-2. Assembly of Power Cable and DC Plug

(4) Fold back the braids, and trim as shown in figure 4-2. Remove insulation to the dimension shown.

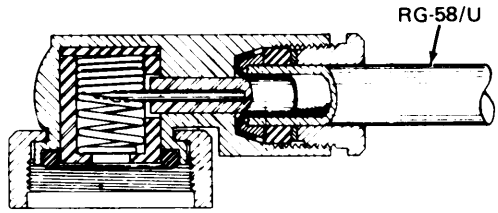
(5) Form the end of the center conductor to a sharp chisel edge. Insert the cable into the DC plug, making sure the edge of the center conductor is aligned with the turns of the coil spring.

(6) Push in the grommet and washer, and screw in the bushing snugly. When the power cable and DC plug are assembled, the center conductor of the cable makes snug contact between the turns of coil springs in the DC plug (see figure 4-3).

4-6. WATTMETER DISASSEMBLY. Disassemble wattmeter and inspect internal parts only when troubles are evident.

a. Disengage the latch spring securing the meter housing to the load and separate the assemblies.

b. Remove the filler plug and drain approximately 2 ounces of coolant.



EL8AP007

Figure 4-3. Power Cable and DC Plug Assembly

c. Disconnect the DC plug from the voltmeter block assembly, and place the radiator assembly vertically with the voltmeter block assembly end up.

d. Loosen the clamp screw from the clamp band and remove the band.

e. Lift out the voltmeter block assembly from the radiator assembly, allowing the remaining coolant to drain before removing the voltmeter block assembly from over the cylinder.

f. Inspect the preformed packing. Replace it if it is worn or deteriorated.

g. Fill with new coolant. Radiator coolant capacity is 0.1 gallon (378.5 ml).

NOTE

Use G.E. 10C Transformer Oil, or equivalent.

4-7. SWITCH REPLACEMENT. Do not repair a defective switch assembly. Replace defective switch as follows:

a. Loosen the hex nuts securing the power cable and terminal strip to the meter.

b. Carefully unsolder the switch leads from the terminal board, making certain not to overheat the shunt resistor.

c. Remove the face nut securing the switch assembly to the meter case and remove the switch assembly.

4-8. METER REPLACEMENT. The meter is a rugged instrument which is shock mounted in its housing. When properly used and not abused or overloaded, this meter should not break down. Do not repair a defective meter. Replace the meter as follows:

a. Place the wattmeter assembly face down on a smooth, clean surface.

b. While pressing down on the meter retaining ring, remove the two flat head machine screws securing the meter to the meter housing.

c. Carefully remove the meter, retaining ring, and shock strips as an assembly.

4-9. WATTMETER REASSEMBLY.

a. If meter requires replacement, install new meter, retaining ring, and shock strips as an assembly. While depressing the retaining ring, install the two flat head machine screws securing the meter to the meter housing.

b. If switch assembly requires replacement, install new switch into the meter housing and secure with beveled face nut. Carefully solder the switch leads to the terminal strip, making certain not to overheat the shunt resistor.

c. Replace the preformed packing if necessary and secure the voltmeter block assembly to the radiator assembly using the clamp band.

d. Reconnect the power plug and check coolant level.

e. Reassemble meter housing to the load and test for accuracy as described in paragraph 3-2.

4-10. PREPARATION FOR RESHIPMENT. Before packing the wattmeter for shipment, inspect the semiconductor device diodes to be sure they are installed tightly in their sockets. Check that all latches, clamps, and connectors are tight. Tape the handle securely to the housing.

4-11. STORAGE INSTRUCTIONS. Store the wattmeter in a cool, dry location. Keep the wattmeter free of dust and dirt, and protect it from rough handling.

APPENDIX A
REFERENCES

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
TB 43-0118	Field instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 11-6625-3018-24P	Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) Wattmeter ME-497/U. (To be published.)
TM 38-750	The Army Maintenance Management System (TAMMS).
TM-750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).

APPENDIX D
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

D-1. General

This appendix provides a summary of the maintenance operations for ME-497/U. It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

D-2. Maintenance Function

Maintenance functions will be limited to and defined as follows:

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 to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. *Service.* Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, align, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e., DMWR) 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.

k. 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. Column Entries

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 noun names of components, assemblies, subassemblies, and modu!es for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 Iists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4 speci - fies, by the listing of a “worktime” 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 that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the

listed maintenance function vary at different maintenance categories, appropriate "worktime" figures will be shown for each category. The number of task-hours specified by the "worktime" 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 allocation chart. Subcolumns of column 4 areas follows:

C-Operator/Crew
O-Organizational
F-Direct Support
H-General Support
D-Depot

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

f. Column 6, Remarks. Not applicable.

D-4. Tool and Test Equipment Requirements (Section Ill)

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b. Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturer's part number of the tool followed by the Federal Supply Code for manufacturers (5-digit) in parentheses.

D-5. Remarks (Section IV)

Not applicable.

SECTION II MAINTENANCE ALLOCATION CHART FOR

WATTMETER ME-497/U

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQPT.	(6) REMARKS
			C	O	F	H	D		
00	Wattmeter ME-497/U	Inspect		0.1					
		Test				1.0		1,3	
		Service				1.0		1,2,3	
		Repair				1.0		1,2,3	
01	Meter Housing	Test				0.3		1	
		Repair				1.0		2	
0101	Switch Assembly	Test				0.2		3	
		Repair				0.3		1,2,3	
		Replace				0.3		2	
02	Radiator Assembly	Service				0.5		2	
		Repair				0.5		2	
		Replace				0.5		2	
03	Block Assembly, Voltmeter	Test				0.2		1,3	
		Repair				0.3		1,2,3	
		Replace				0.3		2	

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
WATTMETER ME-497/U

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	H	Multimeter, AN/USM-451	6625-01-060-6804	
2	H	Tool Kit TK-105/G	5180-00-610-8177	
3	H	Wattmeter AN/URM-120	6625-00-813-8430	

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 wattmeter. 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. Not used.

b. Column 2, Level. This column identifies the lowest level of maintenance that requires the listed item. (Enter as applicable.)

C-Operator/Crew
O-Organizational Maintenance
F-Direct Support
H-General Support Maintenance

c. Column 3, National Stock Number. This is the National stock number 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 Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

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 unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II. EXPENDABLE SUPPLIES AND MATERIALS

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
	0	8020-00-721-9657	Brush, paint	ea
	0	7920-00-862-6710	Cloth, lint-free	yd
	0		Paint	oz
	0		Sandpaper	sh
	0	6850-00-105-3084	Trichlorotrifluoroethane	qt
	0	2990-00-398-0774	Coolant	qt

☆ U.S. GOVERNMENT PRINTING OFFICE: 1982–564-029/1146

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL MANUALS

SOMETHING WRONG WITH THIS MANUAL?

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

FROM: (YOUR UNIT'S COMPLETE ADDRESS)
Commander
Stateside Army Depot
ATTN: AMSTA-US
Stateside, N.J. 07703

DATE 10 July 1975

PUBLICATION NUMBER	DATE	TITLE
TM 11-5840-340-12	23 Jan 74	Radar Set AN/MPQ-76

BE EXACT. . .PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.	
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°. REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 20 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.
3-10	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		F03		Zone C 3. On J1-2, change "+24 VDC to "+5 VDC." REASON: This is the output line of the 5 VDC power supply. + 24 VDC is the input voltage.

TYPED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE:
SSG I. M. DeSpiritof 999-1776	SSG I. M. DeSpiritof

DA FORM 1 AUG 74 2028-2

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

TEAR ALONG DOTTED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-6625-3018-14	13 May '82	Wattmeter ME-497/U

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	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:

DA, FORM 1 JUL 70 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

TEAR ALONG PERFORATED LINE

REVERSE OF DA FORM 2028-2

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

FOLD BACK

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-6625-3018-14	13 May '82	Wattmeter ME-497/U

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	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:

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.

TEAR ALONG PERFORATED LINE

REVERSE OF DA FORM 2028-2

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-6625-3018-14	13 May '82	Wattmeter ME-497/U

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:

DA, FORM 1 JUL 70 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.

TEAR ALONG PERFORATED LINE

REVERSE OF DA FORM 2028-2

FILL IN YOUR UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

U.S. MAIL

TEAR ALONG PERFORATED LINE

By Order of the Secretary of the Army:

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

Official:

ROBERT M. JOYCE
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:

To be distributed in accordance with Special List.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1982—564-029/1146

DEPARTMENT OF THE ARMY
US ARMY AG PUBLICATIONS CENTER
1655 WOODSON ROAD
ST. LOUIS, MISSOURI 63114

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
SPECIAL FOURTH
CLASS RATE

CDR MC457
LSA DARCOM MAT READ SPT
ACTV ATTN DRXMC-MF
LEXINGTON KY 40511

DA PUBLICATION/FORM NUMBER				CHG OR DATE
TM 11-6625-3018-14				
LOCATION	QUANTITY	UNIT OF ISSUE	ACTION	RCN DATE
F4192	1	EA		3116
PKG SIZE	ITEM NO	BULK RQPT DATE	SC AGPC CONTROL NO	
	355059	NB3116	3117 C5646	

TAGO FORM 4-26s, 1 SEP 75 PREVIOUS EDITION OF THIS FORM IS OBSOLETE

PIN: 051080-000