
TECHNICAL MANUAL

METEOROLOGICAL
EQUIPMENT
DATA SHEETS

HEADQUARTERS, DEPARTMENT OF THE ARMY

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TECHNICAL MANUAL

No. 750-5-3

HEADQUARTERS
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METEOROLOGICAL EQUIPMENT DATA SHEETS

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SECTION I

INTRODUCTION

1. Scope

a. This publication contains information and data on US Army Electronics Command meteorological equipment. Additional publications of this series will be listed in DA Pam 310-4 (Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, and Lubrication Orders).

b. The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to Publications) and forwarded direct to Commander, US Army Electronics Command, ATTN: AMSEL-MA-S, Fort Monmouth, N.J. 07703.

2. Purpose

This manual is intended primarily for use by personnel in US Army activities who are responsible for selecting (or recommending selection of) electronic equipments for application and use in all types of military missions, in the field and in design, development, procurement, maintenance engineering, and other related activities. It is not intended to give complete design, operating, maintenance, and procurement information or technical data. It includes only such of this information as will enable personnel concerned to determine which of the equipments listed (if any) will be most likely to meet the requirements of the mission. Details beyond the source of this manual may be found in the applicable technical manuals.

3. Organization of Content

a. All data on any one equipment appears on one or more pages comprising a data sheet for that equipment. The type number appears in the upper outside corner of each page for that equipment. The data sheets themselves are arranged throughout this manual in alphabetical order by Joint Electronic Type designations (MIL-STD-196). Type designations are

derived from a coded system of designations. Charts I and II explain these designated codes. Official nomenclature followed by () is used to indicate all models of the equipment covered in this manual.

b. The contents pages list the type numbers of the data sheets in this manual. With each change published that adds or deletes one or more data sheets to the manual, new contents pages are also published to reflect the added or deleted items. Users of this manual should make sure that all new contents pages are inserted as well as data sheets and that superseded pages are removed. Users should also check the latest edition of DA Pam 310-4 (with its latest changes) to be sure they have the latest changes to this meteorological manual.

c. For the reader's convenience an index has been provided, listing numbers alphanumerically under functional groups. New updated data index pages are also provided with each change and should be inserted.

4. US Army Type Classifications

a. The type classification of an equipment is highly significant in the selection of an equipment for any mission and should be given appropriate consideration,

b. The status-type classifications of items of equipment covered in this manual are defined below. However, items which have not been assigned formal or official type classifications, but which, nevertheless, have been issued and are available for, or are in, current use are included.

(1) *Standard A (STD A).* A combat acceptable item which will fill an operational requirement and which is being produced in quantity or could be produced to fill shortages.

(2) *Standard B (STD B).* A satisfactory item to fill an operational requirement but which is being, or has been replaced by a newer generation or series of items.

(3) *Contingency and Training (C & T).* Items which are not acceptable for US

Army operational requirements and will not therefore be counted as assets.

Items in this category will be limited to—

- (a) Those items which are not acceptable to meet an operational requirement but which may be used in training.
- (b) Those which are not acceptable to meet an operational requirement of the U.S. Army but which are being retained to meet interim contingency requirements pending availability of a Standard A or Standard B item

(4) *Limited Production Type (LP)*. These are items under development, commercially available, or available from other Government agencies, for which an urgent operational requirement exists and for which no other existing items are adequate, which appear to fulfill an approved qualitative material requirement

or other DA approved requirements, and to be promising enough operationally to warrant initiating procurement and/or production for troop issue prior to completion of development and/or test or adoption as standard items.

(5) *Development Type (DP)*. These are items of material being developed or tested to meet approved qualitative material requirements or small development requirements.

5. Currency of Information

Information and data in this manual are current as of the date of basic manual and/or changes.

6. Omitted data

Where headings are included without data, data anticipated was not available and will appear in a subsequent revision.

Chart I. Table of Set or Equipment Indicator Letters

1 1st letter (designed installation class)	2 2d letter (type of equipment)	3 3d letter (purpose)
<i>Installation</i>	<i>Type of Equipment</i>	<i>Purpose</i>
A—Airborne (installed and operated in aircraft). B—Underwater mobile, submarine. C—Air transportable (inactivated, do not use). D—Pilotless carrier. F—Fixed. G— Ground, general ground use (include two or more ground-type installations). K—Amphibious. M—Ground, mobile (installed as operating unit in a vehicle which has no function other than transporting the equipment). P—Pack or portable (animal or man). S—Water surface craft. T—Ground, transportable.	A—Invisible light, heat radiation. B—Pigeon. C—Carrier. D—Radiac. E—Nupac. F—Photographic. ¹ G—Telegraph or teletype. I—Interphone and public address. J—Electromechanical or Inertial wire covered. K—Telemetry. L—Countermeasures. M—Meteorological. N—Sound in air. P— Radar. Q—Sonar and underwater sound. R—Radio. S—Special types, magnetic, etc., or combinations of types.	A—Auxiliary assemblies (not complete operating sets used with or part of two or more sets or sets series). B—Bombing. C—Communications (receiving and transmitting). D—Direction finder, reconnaissance, and/or surveillance. E—Ejection and/or release. G—Fire control or searchlight directing. H—Recording and/or reproducing (graphic meteorological and sound). K—Computing. L—Searchlight control (inactivated, use G). M—Maintenance and test assemblies (including tools). N—Navigational aids (including altimeters, beacons, compasses, racons, depth sounding, approach, and landing).

¹Not for U.S. use except for assigning suffix letters to previously nomenclature items.

Chart I. Table of Set or Equipment Indicator Letters—Continued

1 1st letter (designed installation classes)	2 2d letter (type of equipment)	3 3d letter (purpose)
<p style="text-align: center;"><i>Installation</i></p> <p>U—General utility (includes two or more general installation classes, airborne, shipboard, and ground). V—Ground, vehicular (installed in vehicle designed for functions other than carrying electronic equipment, etc., such as tanks). W—Water surface and underwater.</p>	<p style="text-align: center;"><i>Type of Equipment</i></p> <p>T—Telephone (wire). V—Visual and visible light. W—Armament (peculiar to armament, not otherwise covered). X—Facsimile or television. Y—Data processing.</p>	<p style="text-align: center;"><i>Purpose</i></p> <p>P—Reproducing (inactivated, do not use). Q—Special, or combination of purposes. R—Receiving, passive detecting. S—Detecting and/or range and bearing, search. T—Transmitting. W—Automatic flight or remote control. X—Identification and recognition.</p>

Chart II. Table of component indicators

Component indicators	Family name	Examples of use (not to be construed as limiting the application of the component indicator)
AB	Supports, antenna	Antenna mounts, mast bases, mast sections, towers, etc.
AM	Amplifiers	Power, audio, interphone, radio frequency, video, electronic control, etc.
AS	Antennae, complex	Arrays, parabolic type, masthead, etc.
AT	Antennae, simple	Whip or telescopic loop, dipole, reflector, etc.
BA	Battery, primary type	B batteries, battery packs, etc.
BB	Battery, secondary type	Storage batteries, battery packs, etc.
BZ	Signal devices, audible	Buzzers, gongs, horns, etc.
C	Controls	Control box, remote tuning control, etc.
CA	Commutator assemblies, sonar	Peculiar to sonar equipment.
CB	Capacitor bank	Used as a power supply.
CG	Cable, assemblies, RF	RF cables, waveguides, transmission lines; etc., with terminals.
CK	Crystal kits	A kit of crystals with holders.
CM	Comparators	Compares two or more input signals.
CN	Compensators	Electrical and/or mechanical compensating regulating or attenuating apparatus.
CP	Computers	A mechanical and/or electronic mathematical calculating device.
CR	Crystals	Crystal in crystal holder.
CU	Couplers	Impedance coupling devices, directional couplers, etc.
CV	Converters (electronic)	Electronic apparatus for changing the phase, frequency, or from "one" medium to "another."
CW	Covers	Cover, bag, roll, cap, radome, nacelle, etc.
CX	Cable assemblies, non-RF	Non-RF cables with terminals, test leads, also composite cables of RF and non-RF conductors.
CY	Cases and cabinets	Rigid and semirigid structure for inclosing or carrying equipment.
D	Dispensers	Chaff dispensers.
DA	Load, dummy	RF and non-RF test loads.
DT	Detecting heads	Magnetic pickup device, search coil, hydrophore, etc. (see RF).
DY	Dynamotors	Dynamotor power supply.
E	Hoists	Sonar hoist assembly, etc.
F	Filters	Band-pass, noise, telephone, wave traps, etc.
FN	Furniture	Chairs, desks, tables, etc.
FR	Frequency measuring devices	Frequency meters, tuned cavity, etc.

Chart II. Table of component indicators—Continued

Component indicators	Family name	Examples of use (not to be construed as limiting the application of the component indicator)
G	Generators, power	Electrical power generators without prime movers (see PU & PD).
GO	Goniometers	Goniometers of all types.
GP	Ground rods	Ground rods, stakes, etc.
H	Head, hand, and chest sets	Includes earphone.
HC	Crystal holder	Crystal holder less crystal.
HD	Air-conditioning apparatus	Heating, cooling, dehumidifying, pressure, vacuum devices, etc.
ID	Indicators, noncathode ray tube	Calibrated dials and meters, indicating lights, etc. (see IP).
IL	Insulators	Strain, standoff, feed-through, etc.
IM	Intensity measuring devices	Includes SWR gear, field intensity and noise meters, slotted lines, etc.
IP	Indicators, cathode ray tube	Azimuth, elevation, panoramic, etc.
J	Junction devices	Junction, jack and terminal boxes, etc.
KY	Keying devices	Mechanical electrical and electronic keyers, coders, interrupters, etc.
LC	Tools line constriction	Includes special apparatus such as cable plows, etc.
LS	Loudspeaker	Separately housed loudspeakers, intercommunication station.
M	Microphones	Radio, telephone, throat, hand, etc.
MA	Magazines	Magnetic tape or wire, etc.
MD	Modulators	Device for varying amplitude, frequency or phase.
ME	Meters	Multimeters, volt-ohm-milliammeters, vacuum tube voltmeters, power meters, etc.
MF	Magnets or magnetic field generator	Magnetic tape or wire eraser, electromagnet, permanent magnet, etc.
MK	Miscellaneous kits	Maintenance, modification, etc. except tool and crystal (see CK. TK).
ML	Meteorological devices	Barometer, hygrometer, thermometer, scales, etc.
MT	Mountings	Mountings, racks, frames, stands, etc.
MX	Miscellaneous	Equipment not otherwise classified, includes subassemblies. Do not use if better indicator is available.
MU	Memory units	Memory units.
O	Oscillators	Master frequency, blocking, multivibrators, etc. (for test oscillators, see SG).
OA	Operating assemblies	Assembly of operating units not otherwise covered, used with or part of one set or set series.
OC	Oceanographic devices	Bathythermographs, etc.
OS	Oscilloscope, test	Test oscilloscopes for general test purposes.
PD	Prime drivers	Gasoline engines, electric motors, diesel motors, etc.
P F	Fittings, pole	Cable hanger, clamp, protectors, etc.
PG	Pigeon articles	Container, loft, vest, etc.
*PH	Photographic articles	Camera, projector, sensitometer, etc.
PP	Power supplies	Nonrotating machine type such as vibrator pack, rectifier, thermoelectric, etc.
PT	Plotting equipments	Except meteorological. Boards, maps, plotting table, etc.
PU	Power equipments	Rotating power equipment except dynamotors, motor-generator, etc.
R	Receivers	Receivers, all types except telephone.
RC	Reels	Reel cable (see RI).
R D	Recorder-reproducers	Sound, graphic, tape, wire, film, disc, facsimile, magnetic, mechanical, etc.
RE	Relay assemblies	Electrical, electronic, etc.
RF	Radiofrequency component	Composite component of RF circuits. Do not use if better indicator is available.

Chart II Table component indicators—Continued

Component indicators	Family name	Examples of use (not to be construed as limiting the application of the component indicator)
RG	Cables, RF, bulk	RF cable, waveguides, transmission lines, etc., without terminals.
RL	Reeling machines	Mechanisms for dispensing and rewinding antenna or field wire, recording wire, or tape, etc.
RO	Recorders	Sound, graphic, tape, wire, film, disc, facsimile, magnetic, mechanical, etc.
RP	Reproducers	Sound, graphic, tape, wire, film, disc, facsimile, magnetic, mechanical, etc.
RR	Reflectors	Target, confusion, etc. Except antenna reflectors (see AT).
RT	Receiver and transmitter	Radio and radar transceivers, composite transmitter and receiver, etc.
S	Shelters	House, tent, protective shelter, etc.
SA	Switching devices	Manual, impact, motor driven, pressure operated, etc.
SB	Switchboards	Telephone, fire control, power, panel, etc.
SG	Generators signal	Test oscillators, noise generators, etc. (see O).
SM	Simulators	Flight, aircraft, target, signal, etc.
SN	Synchronizers	Equipment to coordinate two or more functions,
ST	Straps	Harness, straps, etc.
SU	Optical device	Telescopes, periscopes, projectors, and boresighting scopes.
T	Transmitters	Transmitters, all types, except telephone.
TA	Telephone apparatus	Miscellaneous telephone equipment.
TB	Towed body	Towed underwater body or fish, paravane, etc.
TC	Towed cable	Articulated towing strut, faired cable, etc.
TF	Timing devices	Mechanical and electronic timing devices, range device, multiplexers, electronic gates, etc.
TF	Transformers	Transformers when used as separate items.
TG	Positioning devices	Tilt and/or train assemblies.
TH	Telegraph apparatus	Miscellaneous telegraph apparatus.
TK	Tool kits	Miscellaneous tool assemblies.
TL	Tools	All types except line construction (see LC).
TN	Tuning units	Receiver, transmitter, antenna, tuning units, etc.
TR	Transducers	Magnetic heads, phonopickups, sonar transducers, vibration pickups, etc. (see H, LS, and M).
TS	Test items	Test and measuring equipment not otherwise included; boresighting and alignment equipment.
TT	Teletypewriter and facsimile apparatus	Miscellaneous tape, teletype, facsimile equipment, etc.
TV	Tester, tube	Electronic tube tester.
TW	Tapes and recording wires	Recording tape and wire, splicing, electrical insulating tape, etc.
U	Connectors, audio and power	Unions, plugs, sockets, adapters, etc.
UG	Connectors, RF	Unions, plugs, sockets, choke couplings, adapters, elbows, flanges, etc.
V	Vehicles	Carts, dollies, trucks, trailers, etc.
VS	Signaling equipment, visual	Flag sets serial panels, signal lamp equipment, etc.
WD	Cables, two conductor	Non-RF wire, cable and cordage in bulk (see RG).
WF	Cables, four conductor	Non-RF wire, cable and cordage in bulk (see RG).
WM	Cables, multiple conductor	Non-RF wire, cable and cordage in bulk (see RG).
WS	Cables, single conductor	Non-RF wire, cable and cordage in bulk (see RG).
WT	Cables, three conductor	Non-RF wire, cable and cordage in bulk (see RG).
ZM	Impedance measuring devices	Used for measuring Q, G, L, R, or PF, etc.

SECTION II
EQUIPMENTS

1. NOMENCLATURE: Atmospheric Meteorological Probe AN/AMQ-23().

2. TYPE CLASSIFICATION. Development.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT.

Furnishes temperature and humidity data of the upper air.

5. BRIEF FUNCTIONAL DESCRIPTION: Atmospheric Meteorological Probe AN/AMQ-23() (radiosonde) is a balloon-borne, battery-operated meteorological instrument. The probe automatically measures temperature and relative humidity and transmits the data to ground receiving equipment.

6. TECHNICAL CHARACTERISTICS:

Range of measurements:

Temperature _____ +60° C. to -90° C.
Relative humidity _____ 0 to 100%.

Accuracy:

Temperature _____ ±1° C.
Relative humidity _____ ±10%.

Distance range:

Altitude _____ 105,000 ft max.
Horizontal _____ 100 mi max.

Radiosonde Set AN/AMT-20:

Power requirements _ _ _ 20 to 30 vdc (Battery MAP-2047).

Frequency range _____ 1,660 to 1,700 MHz.

Preset frequency _____ 1,680 ±2 MHz.

Type of signal _____ Pulse.

Antenna _____ Discone.

Weight (including battery) 680g approx.

7. MAJOR COMPONENTS:

Radiosonde Set AN/AMT-20.

Radar Reflector.

Temperature Element ML-419/AMT-4A.

Humidity Element ML-418/AMT-4A.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATION:

This set is used in a system with Automatic Atmospheric Sounding Set AN/TMQ-19().

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

a. Additional Equipment.

Battery MAP-2047.

Meteorological balloon, inflating and launching accessories, and parachute.

Atmospheric Sounding Set AN/TMQ-19().

Meteorological Data Sounding System AN/UMQ-7().

b. Auxiliary Equipment. None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-261-10 _____ AN/AMQ-23 () (To be published)

TM 11-6660-241-12, -34 _ _ AN/TMQ-19() (To be published)

12. REPAIR PARTS SUPPORT CAPABILITY: No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20.

14. TYPICAL BASIS OF ISSUE: No density.

15. PRICE DATA:

a. Major item _____ \$24.50.

b. Repair parts _____ Expendable, nonrepairable.

16. ITEM REPLACED: None.

17. REMARKS: Issued as a unit replacement.

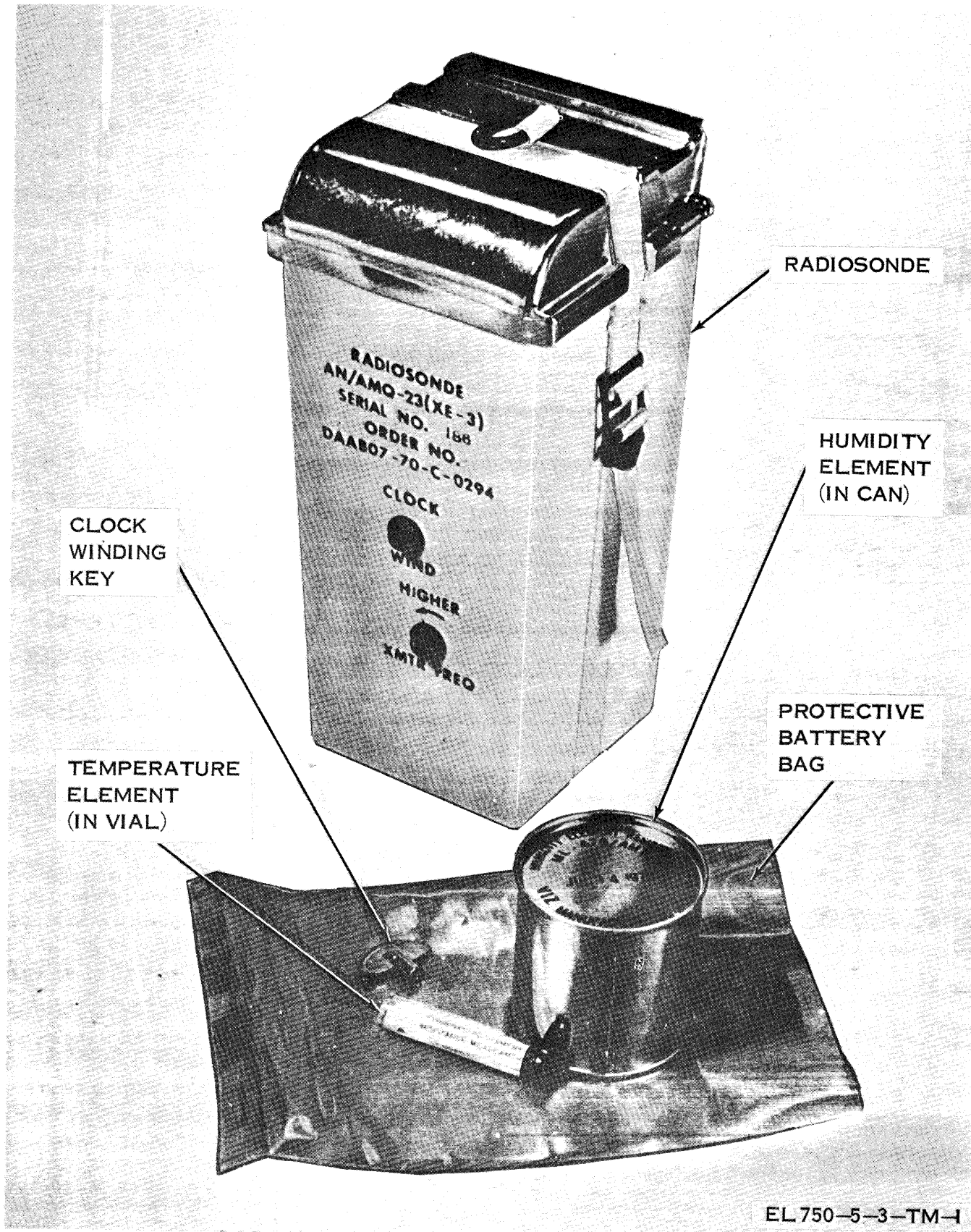


Figure 1. Atmospheric Meteorological Probe AN/AMQ-23().

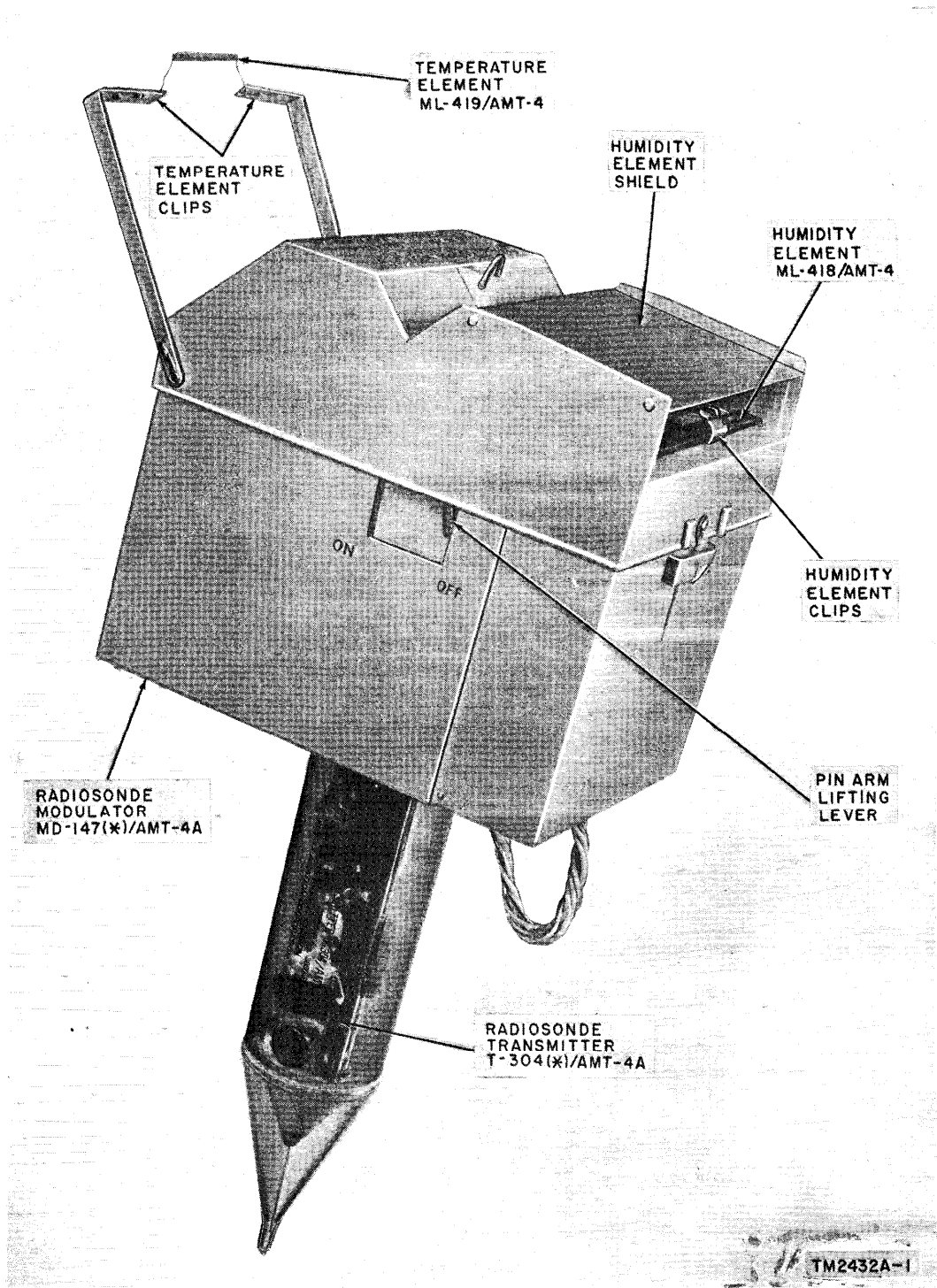
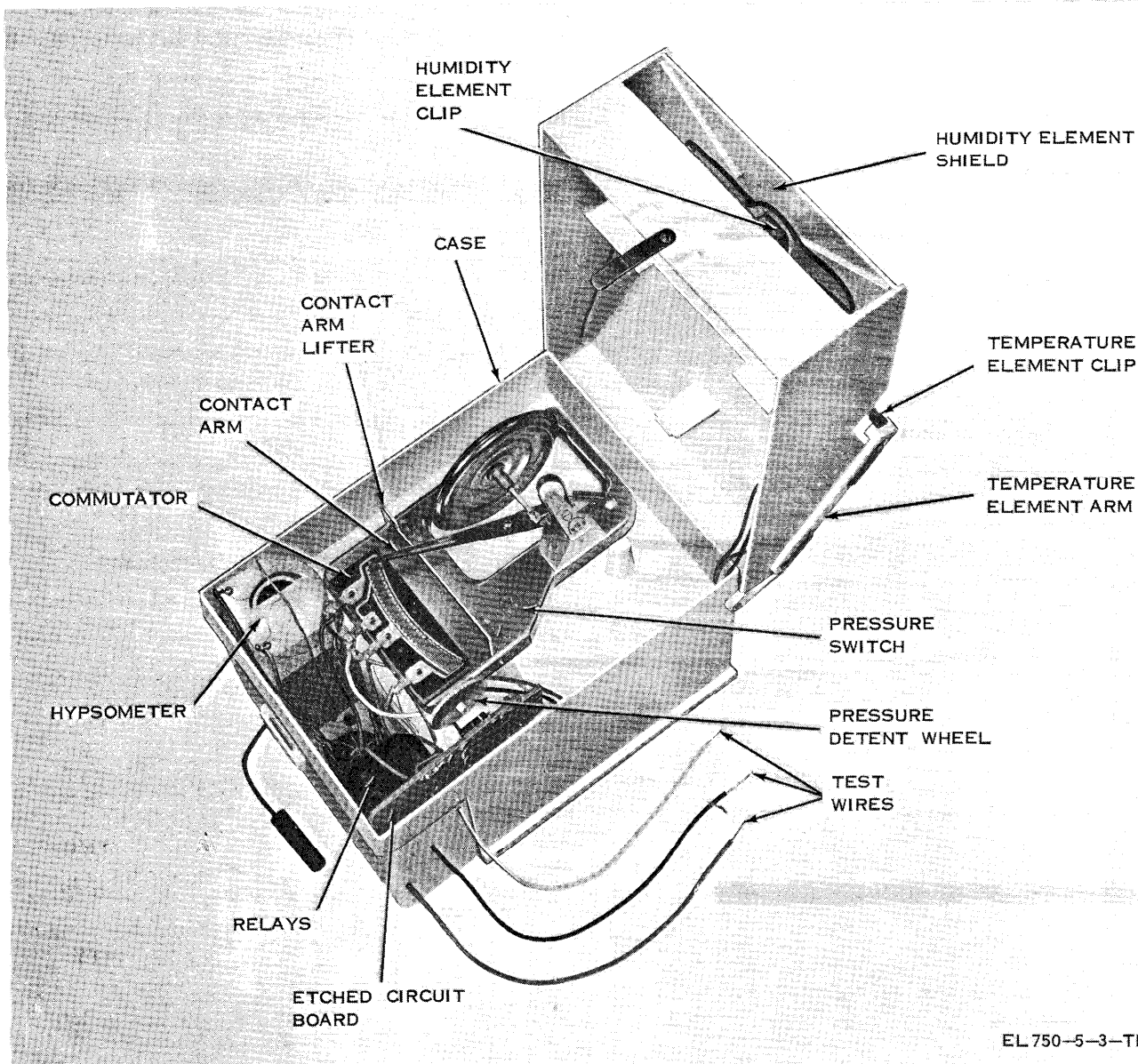


Figure 2. Radiosonde Set AN/AMT-4().



EL 750-5-3-TM-3

Figure 3. Radiosonde Set AN/AMT-12.

1. **NOMENCLATURE:** Radiosonde Set AN/AMT-12.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:** Furnishes data on temperature, pressure, and humidity of the upper air.
5. **BRIEF FUNCTIONAL DESCRIPTION:** Radiosonde Set AN/AMT-12 is a balloon-borne, battery-powered meteorological instrument which automatically transmits radio signals relating to the pressure, temperature, and humidity of the upper air-to-ground receiving equipment.

Signals transmitted by Radiosonde Set AN/AMT-12 are received by a rawin set which is connected to Radiosonde Recorder AN/TMQ-5 (). The recorder prepares a flight record on graph paper which is used to evaluate the information received from the radiosonde set. Information for the computation of wind direction and speed is obtained from Control Recorder C-577/GMD-1 of Rawin Set AN/GMD-1 (), from the rise and drift of the radiosonde set.

Meteorological data provided by Radiosonde Set AN/AMT-12 are used for analyzing and forecasting weather conditions, guidance of aircraft, planning missions for aircraft, and correction on trajectory of artillery projectiles, missiles, and rockets.

6. TECHNICAL CHARACTERISTICS:

Radiosonde Set AN/AMT-12:

Range of measurements:

Atmospheric pressure _ _ 1,060 to 2 mb.
Temperature _ _ _ _ _ +60° C. to -90° C.
Relative humidity _ _ _ _ 15% to 100%.

Accuracy:

Atmospheric pressure 1,060 to 50 ±4 mb, 50
to 20 ±0.5 mb, 20 to
2 ±0.25 mb.

Temperature _ _ _ _ _ ±0.5° C.

Relative humidity _ _ _ _ Within ±5%.

Distance Range:

Altitude _ _ _ _ _ 141,275 ft max or 43,-
061 meters.

Horizontal _ _ _ _ _ 125 mi max.

Power supply 115, 6, and 1.5 vdc
(Battery Pack BA-
259/AM).

Output power _ _ _ _ _ 180 mw min.

Weight (less battery) _ _ _ _ 392g.

Modulator, Radiosonde MD-317/AMT-12:

Pressure sensors:

1,060 to 50 mb _ _ _ _ _ Aneroid capsule.

50 to 2 mb _ _ _ _ _ Hypsometer (thermis-
tor changes resist-
ances with changing
boiling-point temper-
ature of carbon di-
sulfide due to pres-
sure variations).

Temperature sensor _ _ _ Temperature Element
ML-419/AMT-4 (re-
sistance varies in-
versely with temper-
ature).

Humidity sensor _ _ _ _ Humidity Element, Re-
sistance ML-476/
AMT-4 (resistance
varies directly with
humidity).

Transmitter, Radiosonde T-652/AMT-12:

Frequency range _ _ _ _ 1,660 to 1,700 MHz.

Preset frequency _ _ _ _ 1,680 ±4 MHz.

Type of output _ _ _ _ Pulse.

Pulse repetition rate _ _ _ 5 to 200 pps.

Antenna _ _ _ _ _ Dipole, current fed.

7. MAJOR COMPONENTS:

Modulator, Radiosonde MD-317/AMT-12.

Transmitter, Radiosonde T-652/AMT-12.

Temperature Element ML-419/AMT-4.

Humidity Element, Resistance ML-476/AMT-4.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This set is used in a system with Rawin Set AN/GMD-1(), Radiosonde Recorder AN/TMQ-5(), and Baseline Check Set AN/GMM-1.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

a. Additional Equipment.

Battery Pack BA-259/AM.

Meteorological balloon, inflating and launching acces-
sories, parachute.

Carbon disulfide.

Radiosonde Baseline Check Set AN/GMM-1 or AN/
GMM-1A.

Rawin Set AN/GMD-1A or AN/GMD-1B.

Radiosonde Recorder AN/TMQ-5, AN/TMQ-5A, AN/
TMQ-5B, or AN/TMQ-5C.

Test Set TS-538/U, TS-538A/U, TS-538B/U, or
TS-538C/U.

b. Auxiliary Equipment. None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-220-10 _ _ _ _ AN/AMT-12

TM 11-6660-219-12, -20P,
-34,-35P _ _ _ _ AN/GMM-1()

TM 11-6660-204-10, -25,
-25P _ _ _ _ AN/TMQ-5()

TM 11-6660-206-12, -20P,
-35 _ _ _ _ AN/GMD-1()

TM 11-6625-213-12, -20P,
-35,-35P _ _ _ _ TS-538/U()

TM 11-6660-222-12. Balloons, Launchers

12. REPAIR PARTS SUPPORT CAPABILITY: No den-
sity.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE: No density.

15. PRICE DATA:

a. Major item _ _ _ _ \$28.60.

b. Repair parts (1-year cost Expendable, nonrepair-
based on 100 equipments). able.

16. ITEM REPLACED: None.

17. REMARKS: Issue as a unit replacement.

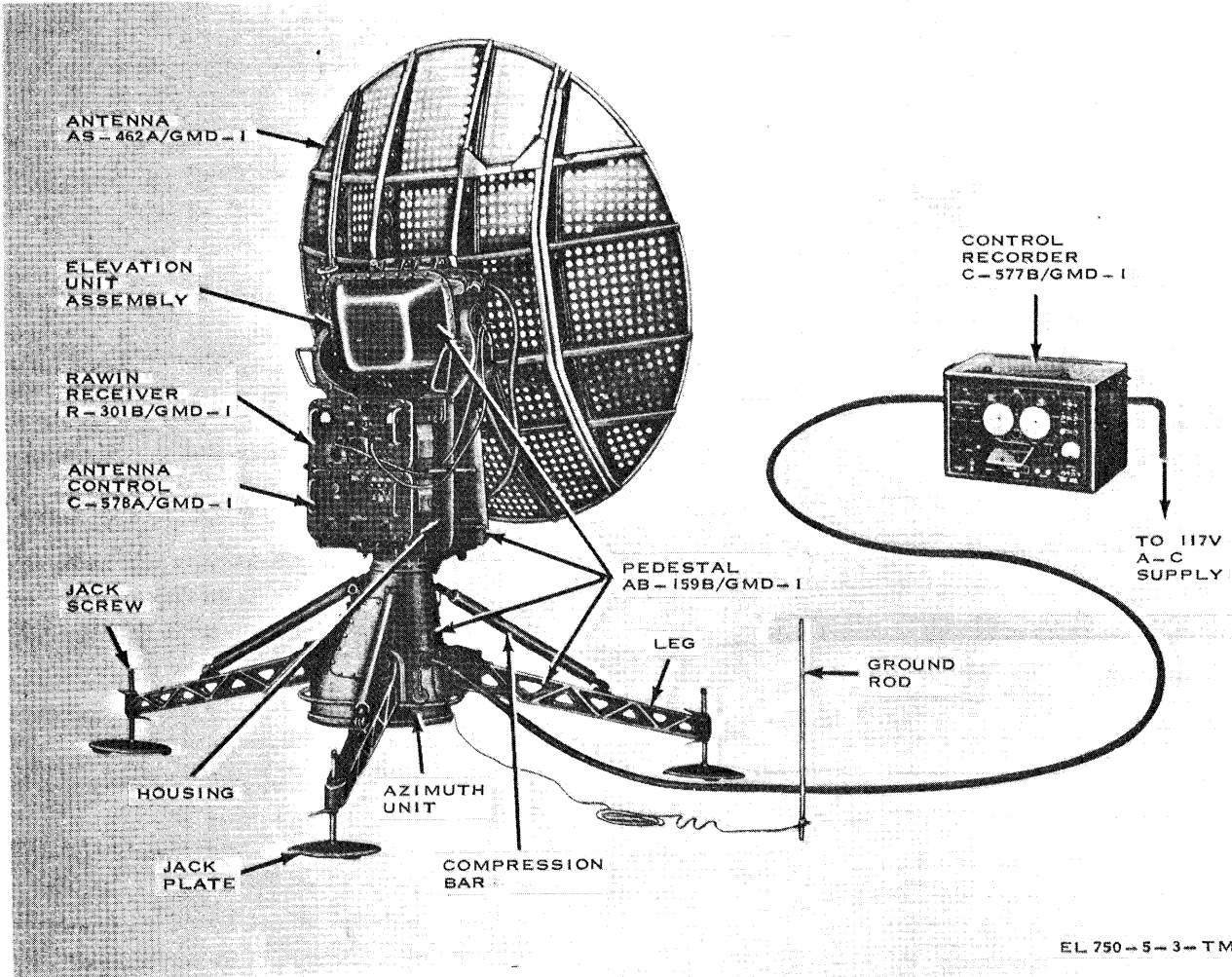
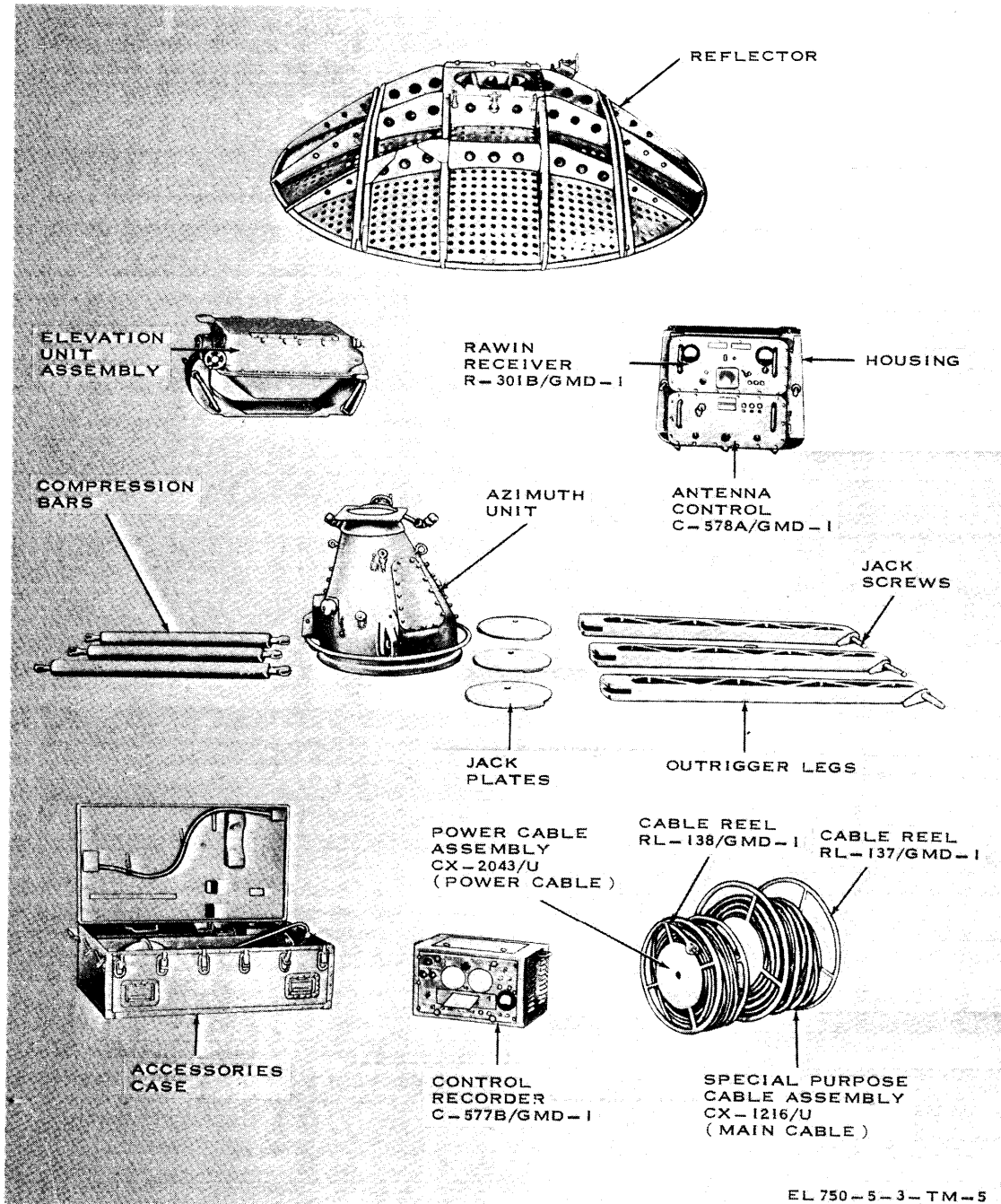


Figure 4. Rawin Set AN/GMD-1 ().

1. **NOMENCLATURE:** Rawin Set AN/GMD-1().
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:** Used to track a balloon-borne radiosonde transmitter.
5. **BRIEF FUNCTIONAL DESCRIPTION:** Rawin Set AN/GMD-1(), a transportable radio direction finder, automatically tracks a balloon-borne radiosonde transmitter. Signals representing meteorological data, transmitted by the balloon-borne radiosonde transmitter, are received, amplified, and detected by Rawin Set AN/GMD-1(). Wind data is evaluated by using the print-out information from equipment Control Recorder C-577/GMD-1 of Rawin Set AN/GMD-1() and meteorological information for values of temperature, pressure and humidity from Radiosonde Recorder AN/TMQ-5(). These measurements are used to analyze and forecast weather conditions, guide and plan for the navigation of aircraft, and prepare ballistic corrections for the effect of the atmosphere on the trajectory of projectiles, missiles, and rockets.

6. TECHNICAL CHARACTERISTICS:

Power input	105 to 129 vac, 50 to 65 Hz, 1,000 w.
Frequency	1,660 to 1,700 mHz.
Type of reception	Am or fm.
Altitude	100,000 ft or 30,480 meters.
Horizontal distance	125 mi.
RF system:	
Scanning type	Conical.
Antenna type	Single dipole.
Reflector type	Parabolic.
Receiving system:	
Type receiver	Superheterodyne.
Normal frequency	1,680 MHz.
Intermediate frequency	30 MHz.
Frequency control	Automatic and manual.
Input impedance	50 ohms nominal.
Bandwidth	Sharp, 0.75 ±0.15 MHz; broad 1.5 ±0.3 MHz.



EL 750-5-3-TM-5

Figure 5. Rawin Set AN/GMD-1().

Tracking accuracy _____	0.05° max error, between 10° and 60° elevation.	Antihunt generators (elevation and azimuth).	2.1vdc (nominal /100 rpm, self-excited, permanent magnet.
Antenna positioning system: Tracking _____	Automatic, local manual, and remote manual.	Positioning, indicating, and recording systems:	
Drive motors (elevation and azimuth).	60vdc (nominal), 1.4-amp splitstator, reversible, 1/20 hp at 5,000 rpm.	Synchrotransmitters (elevation and equipment).	Single-phase, self-synchronous, energizing voltage 115 vac ±10%, 60 Hz +5 -10.

Tape recording _ _ _ _ _	Time, elevation angle, and azimuth angle. printed on tape.
Print-cycle motor _ _ _ _ _	20-30vdc, chronometer movement
Dimensions and weight:	
Case CY-734/GMD-1 _ _ _	37 1/8 in. high, 22 3/8 in. deep, 20 1/2 in. long; weight 300 lb.
Cy-898/GMD-1 _ _ _ _ _	20 in. high, 21 in. deep, 25 in. long; weight 48 lb.
Cable assembly, power	3/4 in. dia, 150 ft, weight 61 lb with cable reel.
Case CY-735/GMD-1 _ _ _	20 3/8 in. high, 24 in. deep, 25 in. long; weight 198 lb.
Case CY-736/GMD-1 _ _ _	26 3/4 in. high, 25 15/16 in. deep, 32 1/16 in. long; weight 366 lb.
Case CY-737A/GMD-1 _ _	17 1/4 in. high, 19 5/16 in. deep, 26 15/16 in. long; weight 159 lb.
Case, Components CY-1157/GMD-1A _ _ _ _ _	17 1/2 in. high, 19 15/16 in. deep, 26 15/16 in. long; weight 219 lb.
Outrigger _ _ _ _ assembly	3 3/8 in. high, 3 3/8 in. deep, 32 in. long; weight 321 lb.
Elevation Unit assembly	13 1/2 in. high, 18 5/8 in. deep, 32% in. long; weight 196 lb.
Cable Assembly, Special Purpose, Electrical CX-1216/U.	205 ft long; weight 205 lb with cable reel.
Reflect _ _ _ _ _	84 in. high, 22 3/4 in. deep, 84 in. long; weight 126 lb.
Total weight _ _ _ _ _	2,199 lb.

7. MAJOR COMPONENTS:

- Accessories case.
- Antenna AS-462/GMD-1.
- Antenna Control G-578/GMD-1.
- Azimuth unit.
- Cable Reel RL-137/GMD-1.
- Cable Reel RL-138/GMD-1.
- Compression bars.
- Control-Recorder C-577/GMD-1.
- Elevation unit assembly.
- Housing.
- Jack plates.
- Jackscrews.
- Outrigger legs.
- Pedestal AB-159/GMD-1.
- Rawin Receiver R-301/GMD-1.
- Reflector.
- Cable Assembly, Power CX-2043/U.
- Special Purpose Cable Assembly CX-1216/U.
- Special Purpose Cable Assembly CX-1285/U.
- Power Cable Assembly CX-1218/U.
- Special Purpose Cable Assembly CX-1217/U.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This set is used in a system with Radiosonde AN/AMT-4(), or Radiosonde AN/AMT-12 and Radiosonde Recorder AN/TMQ-5(), or Radiosonde Receptor AN/FMQ-2, and Baseline Check Set AN/GMM-1.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

- a. *Additional Equipment.*
Radiosonde AN/AMT-4, Radiosonde AN/AMT-12, and Radiosonde Recorder AN/TMQ-5.
Power source of 106 to 129 vac, 50 to 60 Hz.
- b. *Auxiliary Equipment.* None.

10. TOOLS AND TEST EQUIPMENT:

- a. *Tools.*
Tool Equipment TE-113.
Screwdriver Phasing SC-B-93534.
Wrench (5/16 in. socket).
- b. *Test Equipment.*
Audio Oscillator TS-382/U.
Bridge, Summation TS-779/U.
Test Set, Crystal Rectifier TS-268/U.
Electronic Multimeter TS-505/U.
Frequency Meter AN/URM-32.
Multimeter AN/URM-105.
Oscilloscope AN/USM-140.
Power Supply PP-1243/U.
Shunt, Instrument, Multirange MX-1471/U.
Test Set, Electron Tube TV-2/U.
Test Set, Electron Tube TV-7/U.
Voltmeter. Meter ME-30A/U.
Wavemeter FR-91/U.
Test Set TS-538()/U.
Oscilloscope AN/USM-32.

11. REFERENCE DATA AND LITERATURE:

- TM 11-6660-206-12, -20P,
-35, -35P AN/GMD-1()
- TM 11-2432-A AN/AMT-4()
- TM 11-6660-223-10 AN/AMT-4()
- TM 11-2436 AN/TMQ-5()
- TM 11-2436-ESC AN/TMQ-5()
- TM 11-6660-204-10, -25,
-25P AN/TMQ-5()
- TM 11-6625-261-12, -20P,
-35, -35P TS-382()/U
- TM 11-2142 TS-268/U, AN/TCC-3
- TM 11-5511 TS-505/U
- TM 11-6625-203-12, -20P,
-35, -45P AN/URM-105
- TM 11-6625-535-15 AN/USM-140A
- TM 11-5120 PP-1243/U
- TM 11-6625-316-12, -20P,
-35, -35P TV-2/U
- TB 11-6625-316-12/1 TV-2/U
- TB 11-6625-274-12/1 TV-7/U
- TM 11-6625-274-12, -25P,
-35 TV-7/U
- TM 11-6625-320-12, -25P,
-35 ME-30A/U
- TM 11-6625-213-12, -20P,
-35, -35P TS-538/U

TM 750-5-3

AN/GMD-1()

TM 11-5123 ----- AN/USM-32
 TM 11-2602B ----- TS-65C/FMQ-1

12. REPAIR PARTS SUPPORT CAPABILITY: To 1974—
 Full support.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.
 Maintenance MOS 35-B-20, 35-D-20.

14. TYPICAL BASIS OF ISSUE:

<i>TOE</i>	<i>Allowance</i>
6-201G -----	1
6-302H -----	1
6-576G -----	2
6-701H -----	1
6-716H -----	1
7-100H -----	1
17-100G -----	1

<i>TOE</i>	<i>Allowance</i>
37-100G -----	1
39-51G -----	1
TA	
6-2 -----	18
50-366 -----	12
50-771 -----	2
50-774 -----	1
80-10 -----	1

15. PRICE DATA:

a. Major item -----	\$17,500.00
b. Repair parts (1-year cost based on 100 equipments) -----	\$262,500.00

16. ITEM REPLACED: None.

17. REMARKS: None.

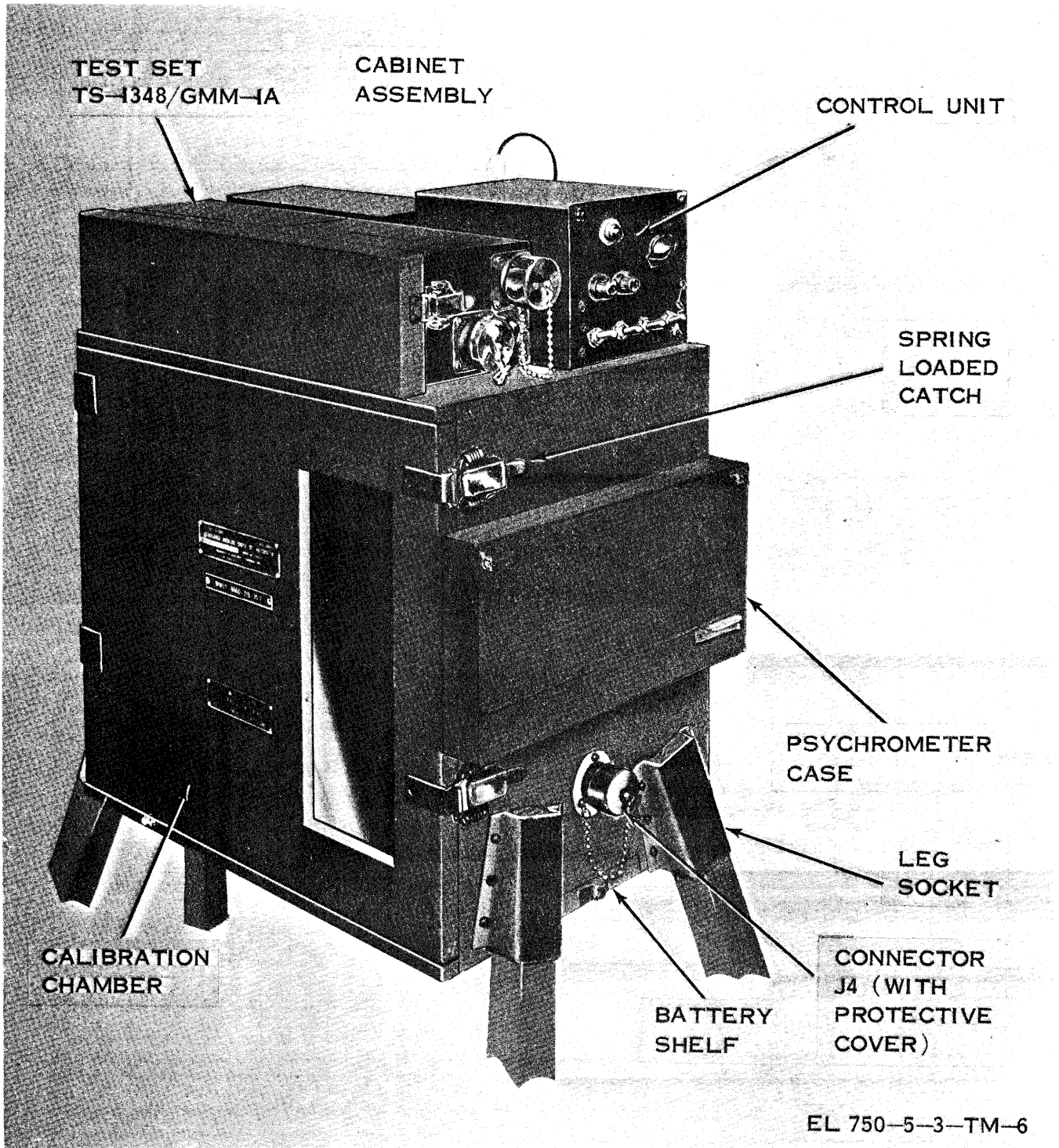


Figure 6. Radiosonde Baseline Check Set AN/GMM-1.

TM 750-5-3
AN/GMM-1()

1. NOMENCLATURE: Radiosonde Baseline Check Set AN/ GMM-1 ().

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT: Used for preflight testing of radiosonde sets.

5. BRIEF FUNCTIONAL DESCRIPTION: Radiosonde Baseline Check Set AN/GMM-1() consists of a temperature-humidity calibration chamber and a control unit for the regulation of the humidity and temperature under controlled conditions for preflight testing of radiosondes. The set provides a complete baseline check of the temperature and humidity elements of Radiosonde Set AN/AMT-4() and Radiosonde Set AN/AMT-12 before their release for atmospheric measurements. Radiosonde Baseline Check Set AN/GMM-1() indicates whether or not the radiosonde being tested is operating properly in all respects. The check is made in conjunction with Rawin Set AN/GMD-1() and Radiosonde Recorder AN/TMQ-5().

6. TECHNICAL CHARACTERISTICS:

Power requirements	110 to 115 vac, 60 Hz single phase.
Fan, centrifugal:	
Motor type	Capacitor induction.
Horsepower	1/50.
Speed	3,300 rpm.
Power requirements	115 vac, 60 Hz single phase.
Heater:	
Type	Resistance element strip.
Resistance	66.1 ohms.
Power	200 w.
Control power supply motor:	
Type	Synchronous.
Speed	240 rpm.
Power input requirements	115 vac, 60 Hz, single- phase.
Dimensions:	
Carrying case	17 1/8 in. high, 26 1/4 in. deep, 35 3/4 in. long.
Temperature-humidity chamber	22 in. high, 14 in. deep, 19 in. long.
Control power supply	5 1/8 in. high, 6 in. deep, 7 in. long.
Weight:	
Carrying case	65 lb.
Temperature-humidity chamber	20 lb.
Control power supply	61 lb.
Psychrometer:	
Type	Hand sling.
Thermometer (2)	Self-indicating, mer- cury thermal element.
Temperature range	-37° C to +46° C.
Thermometer scales	1/2 °C subdivision.
Dimensions	11 15/16 in. long, 1 15/16 in. deep.

7. MAJOR COMPONENTS:
 Chamber, temperature-humidity.

Control power supply.
 Psychrometer ML-224.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS: This set is used in a system with Rawin Set AN/GMD-1() and Radiosonde Recorder AN/TMQ-5().

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

- a. Additional Equipment.
 Radiosonde Set AN/AMT-4() or Radiosonde Set AN/AMT-12.
 Recorder, Radiosonde AN/TMQ-5().
 Rawin Set AN/GMD-1().
 Power source of 110 to 115 vac, 60 Hz, single-phase.
- b. Auxiliary Equipment.
 TS-1348/GMM-1A.

10. TOOLS AND TEST EQUIPMENT:

- a. Tools.
 Tool Equipment TE-113.
- b. Test Equipment.
 Multimeter TS-352/U.

11. REFERENCE DATA AND LITERATURE:

- TM 11-6660-219-12, -20P, AN/GMM-1, -1A
-35 P,-34
- TM 11-6625-366-15 TS-352/U
- TM 11-6660-228-10 AN/AMT-4()
- TM 11-6660-220-10 AN/AMT-12()
- TM 11-6660-206-12, -20P,
-35, -35P AN/GMD-1()
- TM 11-6660-222-12 ML-224

12. REPAIR PARTS SUPPORT CAPABILITY: To 1974-
 Full support.

13. TRAINING REQUIREMENTS :

- Operator MOS 93-E-20, 93-F-20.
- Maintenance MOS 35-B-20, 35-D-20.

14. TYPICAL BASIS OF ISSUE:

<i>TOE</i>	<i>Allowance</i>
6-186G	1
6-201G	1
6-302H	1
6-626G	1
6-676G	2
6-701H	1
6-716H	1
7-100H	1
17-100H	1
37-100H	1
39-61G	1
TA	
6-2	18
50-366	12
50-771	2
80-10	1

15. PRICE DATA:

- a. Major item \$1,960.00
- b. Repair parts (1-year cost based on
 100 equipments) \$29,400.00

16. ITEM REPLACED: None.

17. REMARKS: None.

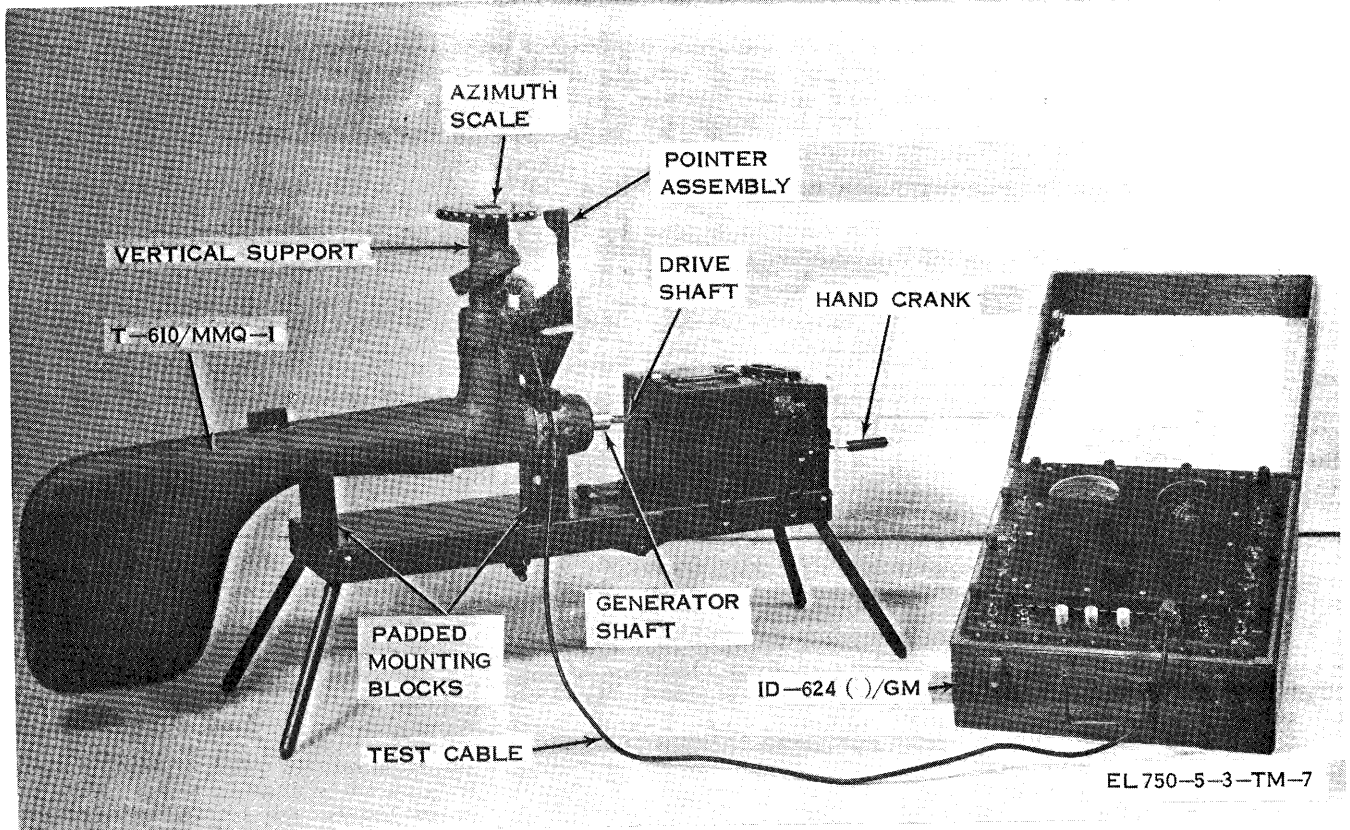


Figure 7. Wind Speed Simulator AN/GMM-7().

1. **NOMENCLATURE:** Wind Speed Simulator AN/GMM-7().

2. **TYPE CLASSIFICATION:** Standard A.

3. **SECURITY REQUIREMENTS:** Unclassified.

4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:** Checks output of the transmitters of Wind Measuring Sets AN/MMQ-1() and AN/PMQ-6().

5. **BRIEF FUNCTIONAL DESCRIPTION:** Wind Speed Simulator AN/GMM-7() monitors the output drive shaft speed of the transmitters of Wind Measuring Sets AN/MMQ-1() and AN/PMQ-6(). By driving the generator shaft of these transmitters at known speeds, Wind Speed Simulator AN/GMM-7() provides a field check of the accuracy of the transmitter outputs. Wind Speed Simulator AN/GMM-7() provides a go-no-go indication to the operator as to whether or not the wind measuring set being tested is functioning within acceptable tolerance.

6. **TECHNICAL CHARACTERISTICS:**

Power requirements ----- 8.4 vdc, Battery BA-1090/U.
Simulated windspeed ----- 10, 15, 20, 25, and 30 mph.
Accuracy of simulated wind-speeds ----- ±1mph for temp ranges of 120° F to 32° F.

Operation ----- Hand operated through a gear train and fly-wheel.
output ----- Mechanical shaft connection.

7. **MAJOR COMPONENTS:**

case. Simulator. Wind Speed CY-4996/GMM-7().
Simulator, Wind Speed AN/GMM-7().
Meter, Simulator, Wind Velocity ME-326/GMM-7().

8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:** This unit is used with Wind Measuring Sets AN/MMQ-1() and AN/PMQ-6.

9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:** None.

10. **TOOLS AND TEST EQUIPMENT:**

a. *Tools.*

Tool Kit TK-100/G.
Key Set Socket HD 1/16 in., 1/8 in., and 5/32 in.

b. *Test Equipments.*

Audio Oscillator TS-382()/U.
Oscilloscope OS-8.
Frequency Meter AN/USM-26.
Multimeter TS-352/U.

11. **REFERENCE DATA AND LITERATURE:**

TM 11-6625-261-12, -20P,
-35,-35P ----- TS-382()/U
TM 11-6660-235-12 ----- AN/GMM-7

TM 750-5-3
AN/GMM-7()

12. REPAIR PARTS SUPPORT CAPABILITY : Full support through FY 1975.

13. TRAINING REQUIREMENTS:
 Operator MOS 35-C-2.
 Maintenance MOS 35-D-20.

14. TYPICAL BASIS OF ISSUE.

<i>Toe</i>	<i>Allowance</i>
6-100H _____	1
6-175H _____	1

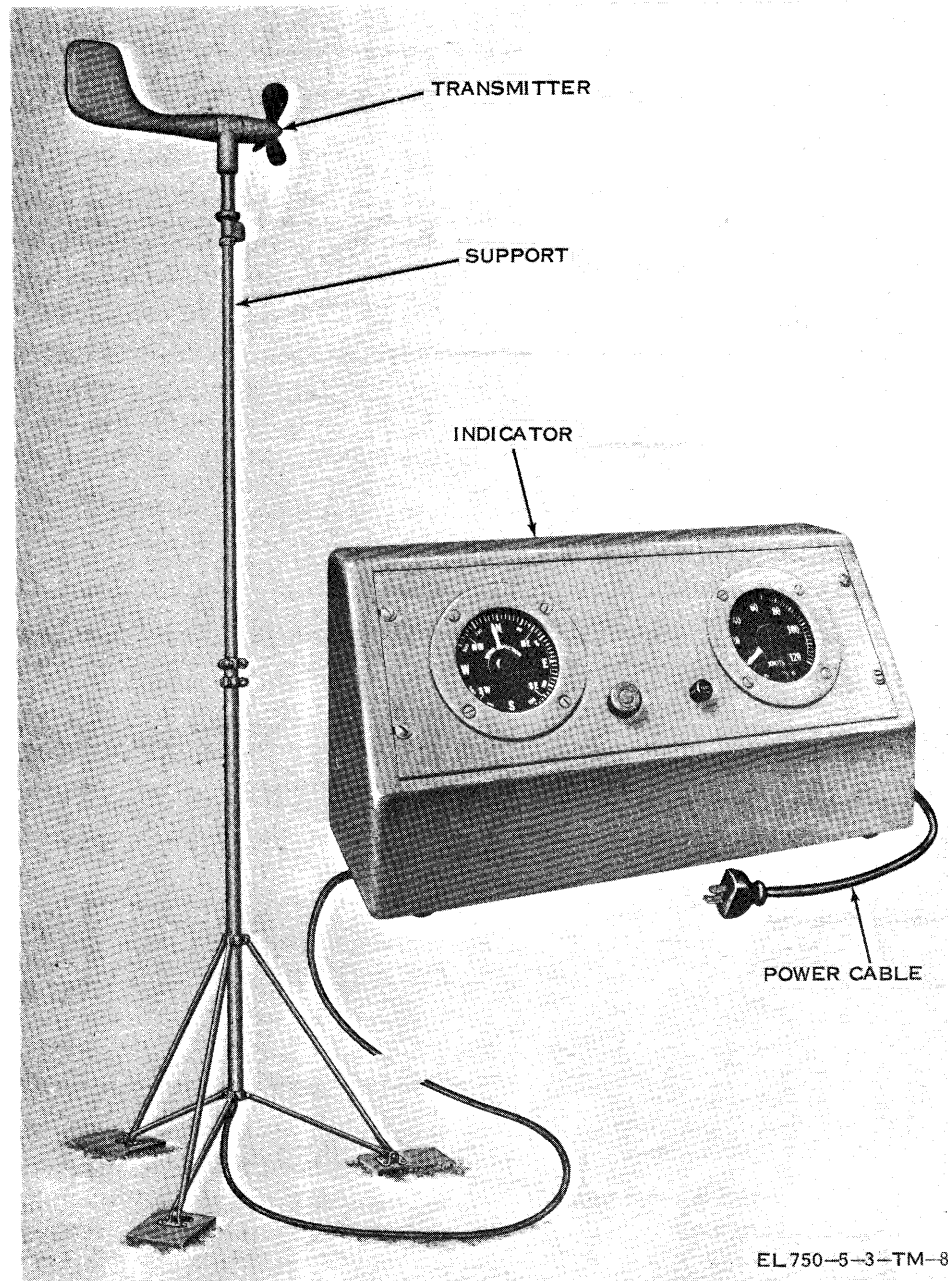
<i>Toe</i>	<i>Allowance</i>
6-300H _____	1
6-525G _____	1

15. PRICE DATA :

a. Major item _____	\$1,200.00
b. Repair parts (1-yr cost based on 100 equipments) _____	\$18,000.00

16. ITEM REPLACED: None.

17. REMARKS: None.



EL 750-5-3-TM-8

Figure 8. Wind Measuring Set AN/GMQ-11.

1. **NOMENCLATURE:** Wind Measuring Set AN/GMQ-11.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:** Indicates wind direction and measures windspeed.
5. **BRIEF FUNCTIONAL DESCRIPTION:** Wind Measuring Set AN/GMQ-11 is a fixed unit designed to provide visual indication of windspeed and wind direction values. Wind Measuring Set AN/GMQ-11 is used independently when an observer is present to read and record the meter indications, but also may be used with Wind Direction and

Speed Recorder RO-2()/GMQ when a permanent, automatically recorded, continuous record of windspeed and wind direction is required.

6. TECHNICAL CHARACTERISTICS:

Power consumption ----- 60 w, 0.5 amp.
Voltage requirements ----- 105 to 125 vac, 60 Hz,
single-phase.

Indicator range:
Windspeed ----- Either 0 to 120 kn
or 0 to 121 mph as
determined by
installation option
selected.

TM 750-5-3
AN/GMQ-11

Wind direction _____ 360°.
 Accuracy:
 Wind direction _____ ±2°.
 Windspeed
 0 to 60 mph or kn. _____ ±2 mph or ± 2 kn.
 61 to 120 mph or kn _____ -2 mph or +3, or
 -2 kn

Operating range:
 Altitude _____ 0 to 10,000 ft above
 mean sea level.
 Temperature _____ 40 °F. to +150° F.
 Relative humidity _____ 0 to 100%

Dimensions:
 Indicator _____ 10 7/8 in. high, 21 in.
 wide, 8 1/16 in. deep.
 Transmitter _____ 30 in. high, 33 in. wide,
 15 1/2 in. deep.
 Support _____ 13 ft high, 4 ft wide,
 4 ft deep (extended).

Weight:
 Indicator _____ 17 lb.
 Transmitter _____ 10 lb.
 Support _____ 30 lb.

7. MAJOR COMPONENTS:

Indicator, Wind Direction and Speed ID-373()/
 GMQ-11.
 Transmitter, Wind Direction and Speed T-420()1
 GMQ-11.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This set is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

a. *Additional Equipment.*
 Power source 105- to 125-vac, 60 HZ, single-phase.
 b. *Auxiliary Equipment.*
 Recorder, Wind Direction and Speed RO-2()/GMQ.

10. TOOLS AND TEST EQUIPMENT:

a. *Tools.*
 Tool Equipment TK-17/FMQ-1.
 Wrench TL-477/U.
 Screwdriver TL-358/U.
 b. *Test Equipment.*
 Electronic Multimeter TS-505/U.
 Frequency Meter AN/USM-26.
 Multimeter AN/URM-105.
 Tachometer TS-806/U.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-200-10, -20,
 -20P, -35, -35P _____ AN/TMQ-11
 TM 11-6625-239-12, -20P,
 -35, -35P _____ TS-505()/U

TM 11-6625-203-12, -20P,
 -35, -45P _____ AN/URM-105
 TB 11-6680-200-12/1 _____ TS-806/U
 TM 11-6660-231-12P, -35P RO-2()/GMD
 TM 11-2444 _____ RO-2()/GMD

12. REPAIR PARTS SUPPORT CAPABILITY:

To 1974-Full support.

Operator MOS 93-E-20, 93-F-20.
 Maintenance MOS 35-C-20, 35-B-20.

14. TYPICAL BASIS OF ISSUE:

<i>TOE</i>	<i>Allowance</i>
1-207H _____	1
3-266G _____	1
29-500G _____	1
39-51G _____	1
30-52G _____	1
57-102H _____	1
<i>TA</i>	
3-2 _____	2
7-2 _____	2
10-4 _____	8
32-13 _____	1
32-82 _____	25
44-7 _____	28
50-147 _____	5
50-156 _____	3
50-477 _____	1
50-772 _____	14
50-774 _____	8
50-818 _____	1
55-60 _____	1
60-26 _____	95
77-7 _____	1
77-11 _____	54
77-26 _____	178
80-5 _____	1
80-10 _____	7
80-12 _____	1
80-26 _____	17
80-54 _____	1
82-5 _____	2
83-5 _____	2
145-20 _____	8

15. PRICE DATA:

a. Major item _____ \$1,770.00
 b. Repair parts (1-year cost based on
 100 equipments) _____ \$26,550.00

16. ITEM REPLACED:

Replaced AN/TMQ-1.

17. REMARKS: None.

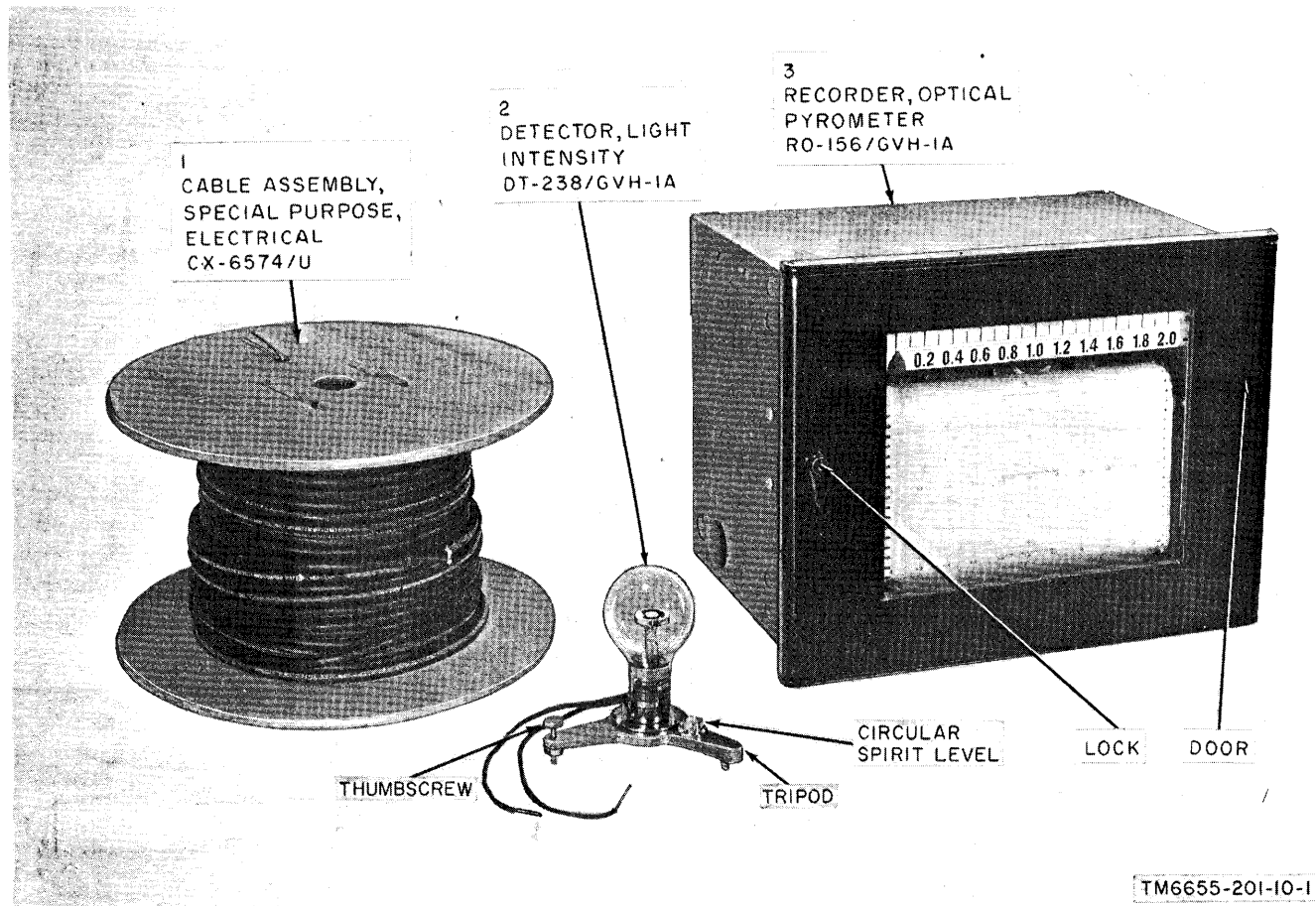


Figure 9. Solar Radiation Measuring Set AN/GVH-1A.

1. NOMENCLATURE: Solar Radiation Measuring Set AN/GVH-1A.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT: Measure and continuously record solar radiation falling on the horizontal surface of the detector.

5. BRIEF FUNCTIONAL DESCRIPTION: The solar radiation set is designed to measure the intensity of radiation received by the detector. The computation of solar radiation is determined by averaging the radiation intensity between the time lines multiplied by the time interval, which is expressed in gram calories per square centimeter.

6. TECHNICAL CHARACTERISTICS:

Recorder, Optical Pyrometer:

- Voltage requirements _____ 105 to 125 volts ac, 60 Hz, single phase.
- Measuring range _____ 0 to 2 gram calories per square centimeter per minute.
- Input _____ 0 to 20 millivolts dc.

- Type _____ Strip chart.
- Chart speed _____ 2, 4, 6, or 8 in. per hour.
- Chart Dimensions:
 - Length _____ 120 ft.
 - Width _____ 12 in.
- Speed of response _____ 12 seconds for full-scale pen motion.
- Number of tubes _____ 4.
- Operating temperature range _____ 40° to 140° F.
- Detector, light intensity:
 - Spectrum range _____ Approximately 0.28 to 4.2 microns.
 - Sensitivity _____ Approximately 7.50 millivolts per gram calorie per square centimeter.
 - Output signal _____ 0-20 millivolts dc; maximum output as low as 12 millivolts dc.
 - Response time _____ 98 percent of output signal in approximately 30 seconds.

**TM 750-5-3
AN/GVH-1A**

Radiation intensity versus
emf ----- Linear to within ± 1
percent.
Temperature effect on
Output ----- +0.05 to +0.10 percent
of full scale.

7. MAJOR COMPONENTS:

Detector, Light Intensity DT-238/GVH-1A.
Recorder, Optical Pyrometer RO-166/GVH-1A.
Cable Assembly, Special Purpose, Electrical CX-6574/
U on Cable Reel.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATION: This set is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

Power cable two-conductor No. 18 AWG.
Lead electrical, ground cable (FSN 5995-682-3325).
Cable clamp electrical (FSN 5935-223-0574).
Connector plug electrical (FSN 5935-518-9653).
Grounding rod, 5 feet long (FSN 5975-240-3864).
Clamp electrical, brass (FSN 5975-248-5814).

10. TOOLS AND TEST EQUIPMENT:

a. Tools.

Screwdriver TL-360/U.
Wrench set, Spintite.
Allen wrench set.
Bristol wrench set.
Tool Kit TK-17/FMQ-1.

b. Test Equipment.

Multimeter TS-352/U.
Electron Tube Test Set TV-7/U.

11. REFERENCE DATA AND LITERATURE:

TM 11-6655-201-10, -20
and -35 ----- AN/GVH-1A
TM 11-6625-274-12 ----- TV-7A/U

12. REPAIR PARTS SUPPORT CAPABILITY: Full support to 1975.

13. TRAINING REQUIREMENTS:

Operator MOS 93 E-20, 93-F-20.
Maintenance MOS 35-C-20, 35-B-20.

14. TYPICAL BASIS OF ISSUE:

<i>TOE</i>	<i>Allowance</i>
6-186G -----	1
6-201G -----	1
6-302H -----	1
6-526G -----	1
6-576G -----	1
6-701H -----	1
6-716H -----	1
7-100G -----	1
17-100H -----	1
37-100H -----	1
39-51G -----	1
<i>TA</i>	
6-2 -----	18
50-734 -----	2
74-5 -----	1

15. PRICE DATA:

a. Major item ----- \$3,300.00
b. Repair parts (1-year cost based on
100 equipments) ----- \$51,000.00

16. ITEM REPLACED: None.

17. REMARKS: None.

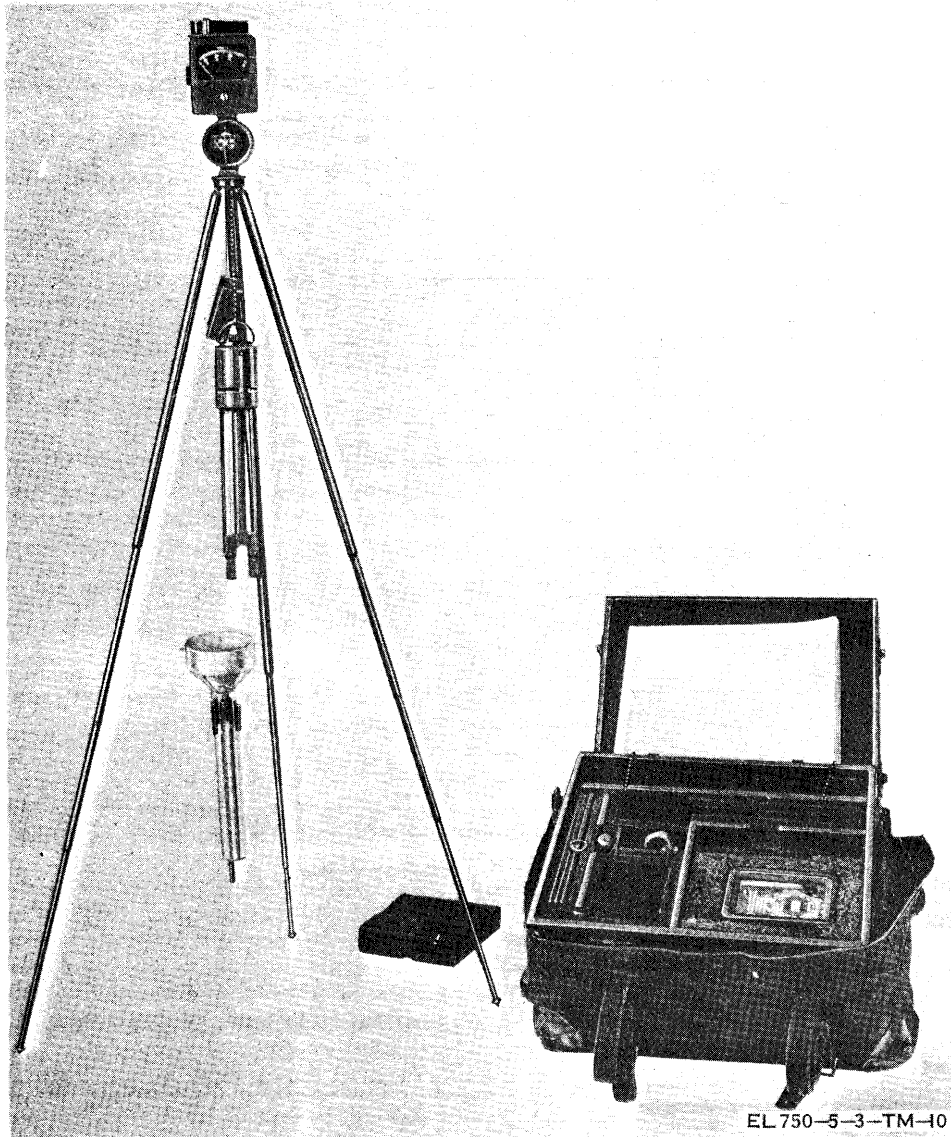


Figure 10. Meteorological Station, Manual AN/PMQ-1A.

1. NOMENCLATURE: Meteorological Station, Manual AN/PMQ-1A.

2. TYPE CLASSIFICATION: Standard B.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT: Portable meteorological station for use in the field.

5. BRIEF FUNCTIONAL DESCRIPTION: Meteorological Station, Manual AN/PMQ-1A is a portable group of meteorological equipment, designed to make surface measurements of atmospheric pressure; ambient, ground, and wet-bulb temperatures; wind direction; windspeed; and precipitation. Meteorological Station, Manual AN/PMQ-1A is designed for field use and can be operated by one person. The AN/PMQ-1A consists basically of an anemometer, a barometer, a psychrometer, a precipitation gage, 10 thermometers, a thermometer support and a tripod,

6. TECHNICAL CHARACTERISTICS:

Anemometer ML-433A/PM:

Range:

Velometer ----- 0 to 8 ± 1.5 kn, 0 to 40 ± 2.0 kn,

Wind vane and

compass ----- 0° to $360^\circ \pm 11.25^\circ$.

Aneroid Barometer ML-459/

PMQ-1:

PMQ-1:

Range ----- 750 to 900 mb; 900 to 1,050 mb ± 0.5 mb.

Psychrometer Calculator

ML-429/UM:

Range:

Low ----- -60° to $+32^\circ$ F.

High ----- 10° to $+85^\circ$ F.

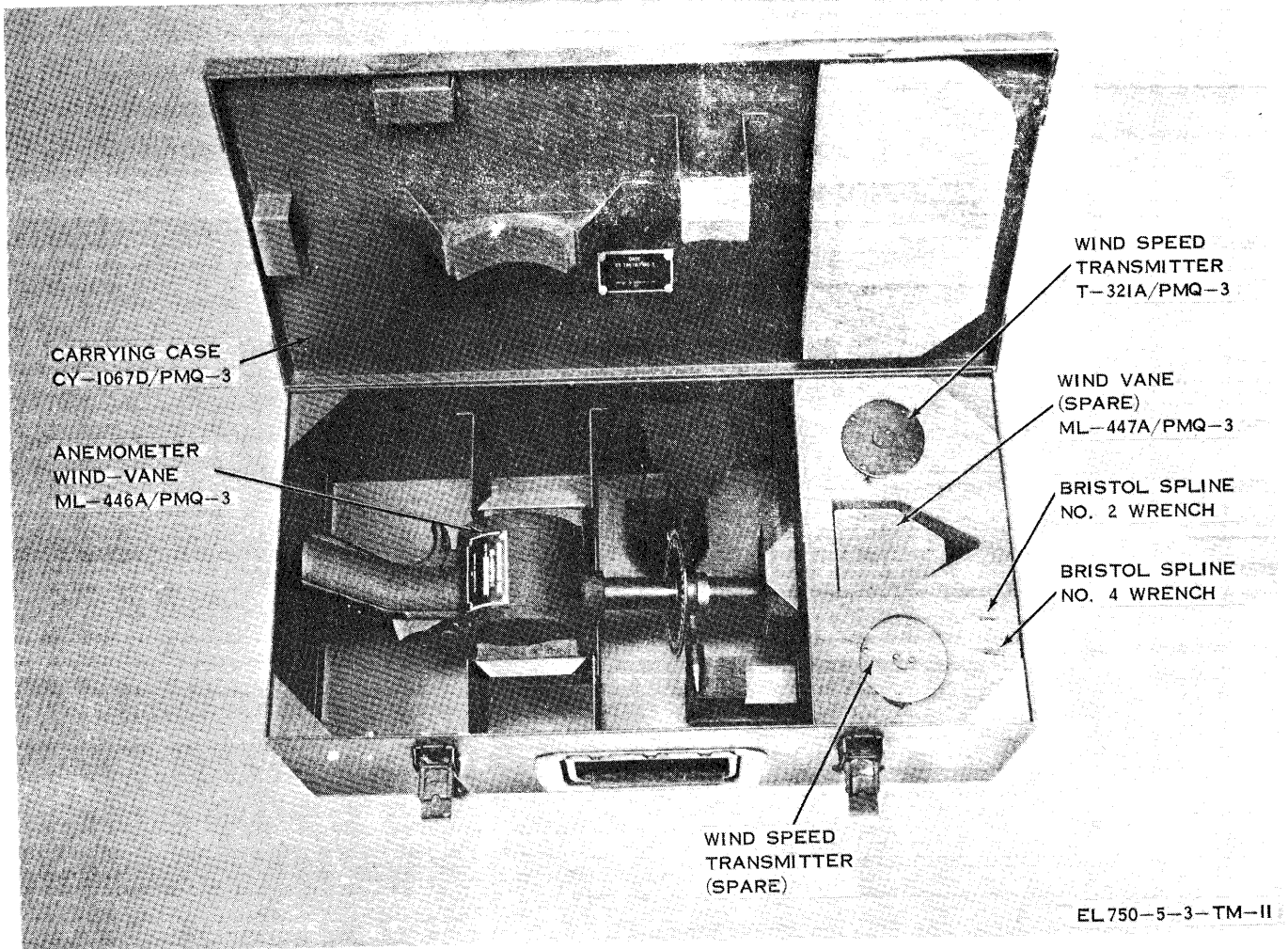


Figure 11. Wind Measuring Set AN/PMQ-3A.

1. **NOMENCLATURE:** Wind Measuring Set AN/PMQ-3A.

2. **TYPE CLASSIFICATION:** Standard A.

3. **SECURITY REQUIREMENTS:** Unclassified.

4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:** Gives visual wind direction and windspeed readings in support of artillery fire and meteorological forecasts.

5. **BRIEF FUNCTIONAL DESCRIPTION:** A complete portable hand-held wind measuring set which will give visual indications of wind direction from 0 to 860° and windspeeds from 0 to 60 knots.

6. **TECHNICAL CHARACTERISTICS:**

General:

Windspeed _____ 60 knots maximum.
Wind direction _____ 0-360° in azimuth.

Transmitter:

Turbine generator _____ Rotor generator with voltage output proportional to windspeed.

Generator output _____ 4.46 vac ±0.06 at rotor speed of 120 Hz (40 knots).

Indicator, Windspeed:

Inner scale _____ 0-15 knots.
Outer scale _____ 0-60 knots.
Range toggle switch normal. 0-60 scale.
Accuracy _____ ±½ knot from 0-7; ±1 knot from 10-40; ±2 knots from 41-60 knots.

Wind Direction:

Trigger switch engaged _____ Free movement from 0-360°.
Trigger switch released _____ Locking brake for wind vane pointer direction reading.
Accuracy _____ ±2° in a 5 knot wind.

7. **MAJOR COMPONENTS:**

Case Carrying CY-1067D/PMQ-3A.
Anemometer, Wind Vane ML-446A/PMQ-3.
Wind Speed Transmitter ML-T-321A/PMQ-3.
Wind Vane ML-447A/PMQ-3.

TM 750-5-3
AN/PMQ-3A

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATION: This set is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT:

a. Tools.

Tool Kit TK-101.

b. Test Equipment.

Multimeter TS-352 B/U.

Voltmeter ME-202/U.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-232-15 _ _ _ _ _ AN/PMQ-3A

12. REPAIR PARTS CAPABILITY: Full support to 1975.

13. TRAINING REQUIREMENTS:

Operator MOS 93 E-20, 93 F-20.

Maintenance MOS 35C.

14. TYPICAL BASIS OF ISSUE:

<i>TOE</i>	<i>Allowance</i>
44-547G _ _ _ _ _	1
44-548G _ _ _ _ _	1
57G _ _ _ _ _	1

15. PRICE DATA:

a. Major Item _ _ _ _ _ \$ 850.00

b. Repair Parts (1-year cost based on 100 equipments) _ _ _ _ _ \$18,500.00

16. ITEM REPLACED: None.

17. REMARKS: None.

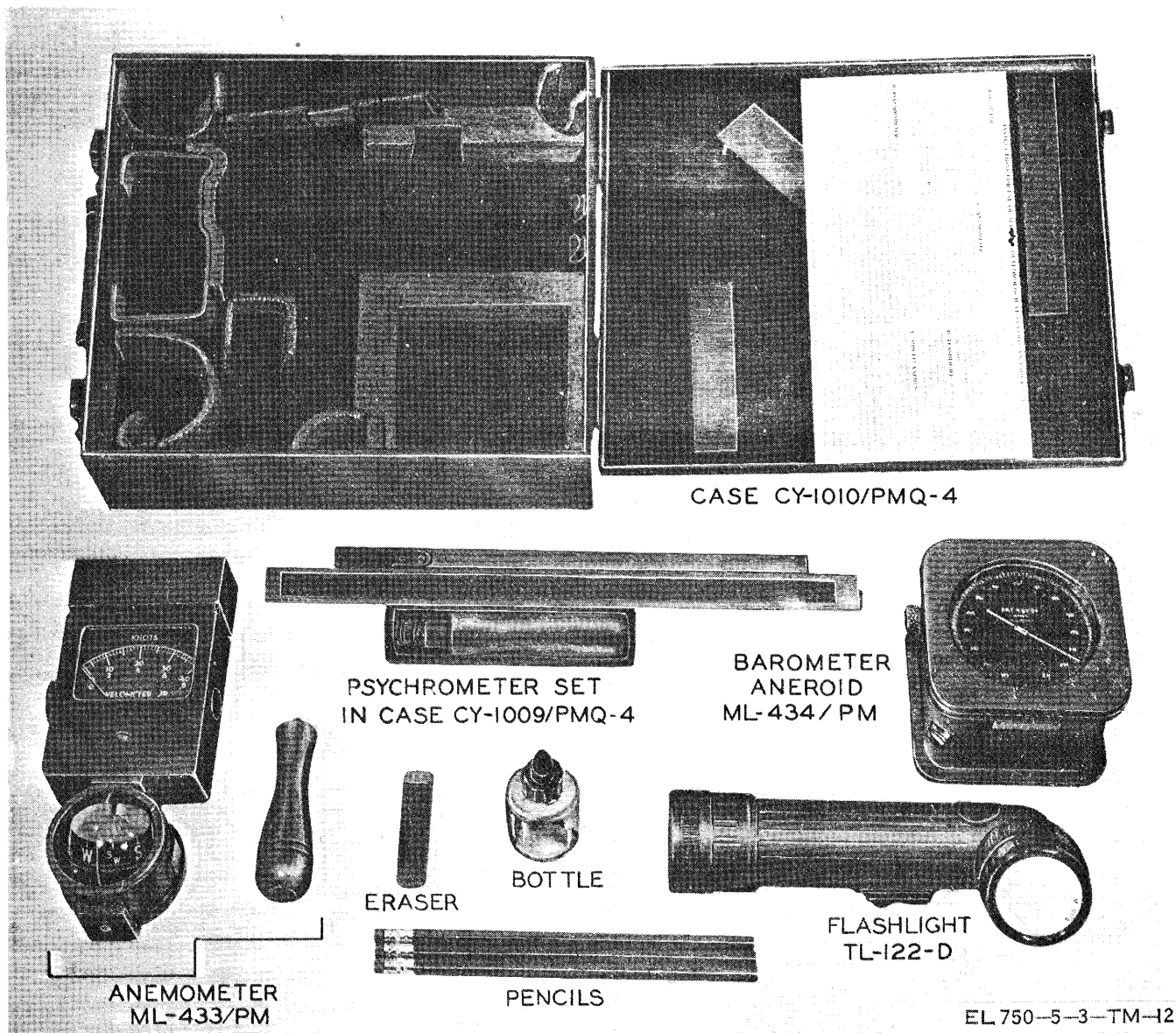


Figure 12. Meteorological Station, Manual AN/PMQ-4.

1. NOMENCLATURE: Meteorological Station, Manual AN/PMQ-4.

2. TYPE CLASSIFICATION: Standard B.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Portable meteorological station for field use.

5. BRIEF FUNCTIONAL DESCRIPTION: Meteorological Station, Manual AN/PMQ-4 is a portable group of meteorological equipments designed for field use. The station consists basically of a barometer to determine surface pressure, an anemometer to visually observe wind direction and speed, and a psychrometer to measure the air

temperature and determine the relative humidity or dew-point temperature.

6. TECHNICAL CHARACTERISTICS :

Aneroid Barometer ML-434/PM:

Type _____ Aneroid.
Range _____ 750 to 1,050 mb.
Max working altitude _____ 8,000 ft ±100 ft.

Anemometer ML-433/PM:

Type _____ Wind vane, velometer, and compass.
Velometer ranges _____ 0 to 8kn; 0 to 40kn.
Compass _____ Magnetic; 90° out of phase.

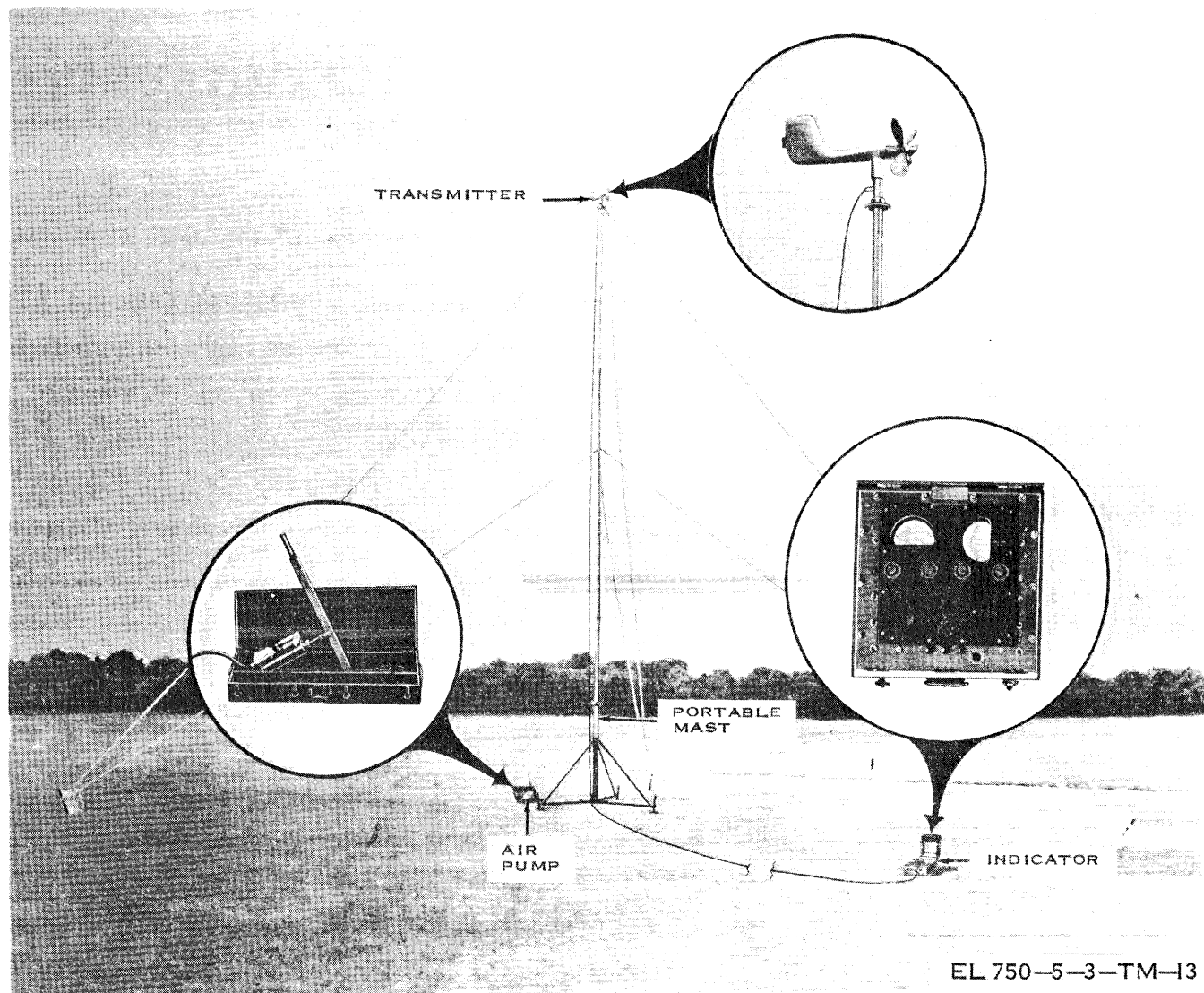


Figure 13. Extended Wind Measuring Set AN/PMQ-6.

1. NOMENCLATURE: Wind Measuring Set AN/PMQ-6.

2. TYPE CLASSIFICATION: Standard A.

2. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT: Provides rangewind and crosswind readings in support of missile or rocket launchings.

5. BRIEF FUNCTIONAL DESCRIPTION: Wind Measuring Set AN/PMQ-6 provides crosswind and rangewind readings from 0 to 60 miles per hour. The AN/PMQ-6 senses, transmits, indicates, and resolves windspeed and wind direction. The equipment is used to correct trajectory data pertaining to azimuth (crosswind) and elevation (rangewind). Wind Measuring Set AN/PMQ-6 which can be mounted on a jeep or 3/4-ton truck includes a transmitter, an indicator, and a mast which can be extended

to 50 feet using a hand-operated air pump. The mast raises the transmitter to a position where the wind speed and wind direction can be accurately measured with little or no interference from ground obstacles. The transmitter converts the windspeed and wind direction to electrical energy to operate the indicator which interprets the signals from the transmitter as measurement of crosswind and rangewinds.

6. TECHNICAL CHARACTERISTICS:

General:

Windspeed _____ 50 mph max.
Range for remote operation. 1 mi max between transmitter and indicator.

Portable mast:

Extended length _____ 50 ft, 1 in.

TM 750-5-3
AN/PMQ-4

Retracted length _____ 9 ft.
 Extension _____ Manual (air pump,
 double-action).

Transmitter:
 output _____ 6 vdc (no load) at 1,000
 rpm.
 Wind vane rotation _____ 0° to 360°.
 Internal resistance _____ 200 ohms.

Indicator:
 Crosswind (mph):
 Outer Scale _____ 50-0-50.
 Inner Scale _____ 25-0-25.
 Rangewind (mph):
 Outer scale _____ 50-0-50.
 Inner scale _____ 25-0-25.
 Voltage requirements One 22.5v battery; six
 1.5v batteries; and
 two 135v batteries.

7. MAJOR COMPONENTS:

Transmitter, Wind Speed T-610/MMQ-1.
 Indicator, Wind Speed ID-624 B/GM.
 Portable mast.
 Air pump.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This set is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

a. Additional Equipment.

Batteries BA-416/U.
 Batteries BA-404/U.
 Battery BA-261/U.
 Gasoline.
 Oil, SAE 10.
 Power source, 105-129 vac, 50 to 60 Hz.

b. Auxiliary Equipment. None.

10. TOOLS AND TEST EQUIPMENT:

a. Tools

Tool Equipment TE-33.
 Tool Alignment 6R5003-2.
 Hammer 6Q50200-8H.
 Screwdriver TL-359/U.
 Pliers 6R4721-6.
 Wrench 6R55520-24.

Wrench 6R56610.
 Wrench 6R55010.
 Spudger 6R25351-1.
 Screwdriver TL-456/U.
 Tool Equipment TK-17/FMQ-1.
 General mechanics tool set, FSN 5180-357-7738.

b. Test Equipment.

Multimeter AN/URM-105.
 Tachometer, Electronics TS-806/U.
 Meter, Frequency FR-67/U.
 Multimeter TS-505/U.
 Test Set, Electron Tube TV-7/U.
 Test Set, Electron Tube TV-2/U.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-255-12, -35 _____ AN/PMQ-6
 TM 11-6625-203-12, -35, -20P, -45P _____ AN/URM-105
 TB 11-6680-200-12/1 _____ TS-806/U
 TM 11-6625-239-20P, -35, -35P, -12 _____ TS-505 ()/U
 TB 11-6625-316-12/1 _____ TV-2/U
 TM 11-6625-316-12, -20P, -35, -35P _____ TV-2/U
 TB 11-6625-274-12/1 _____ TV-7/U
 TM 11-6625-274-12, -25P, -35 _____ TV-7/U

12. REPAIR PARTS SUPPORT CAPABILITY: To 1974-
 Full support.

13. TRAINING REQUIREMENTS:

Operator MOS 93-F-20.
 Maintenance MOS 35-D-20.

14. TYPICAL BASIS OF ISSUE:

<i>TOE</i>	<i>Allowance</i>
6-177H _____	2
6-300H _____	4
6-717H _____	4
<i>TA</i>	
50-447 _____	5
50-771 _____	3
80-12 _____	4

15. PRICE DATA:

a. Major item _____ \$ 7,427.00
b. Repair parts (1-year cost based on 100
 equipments) _____ \$111,405.00

16. ITEM REPLACED: None.

17. REMARKS: None.

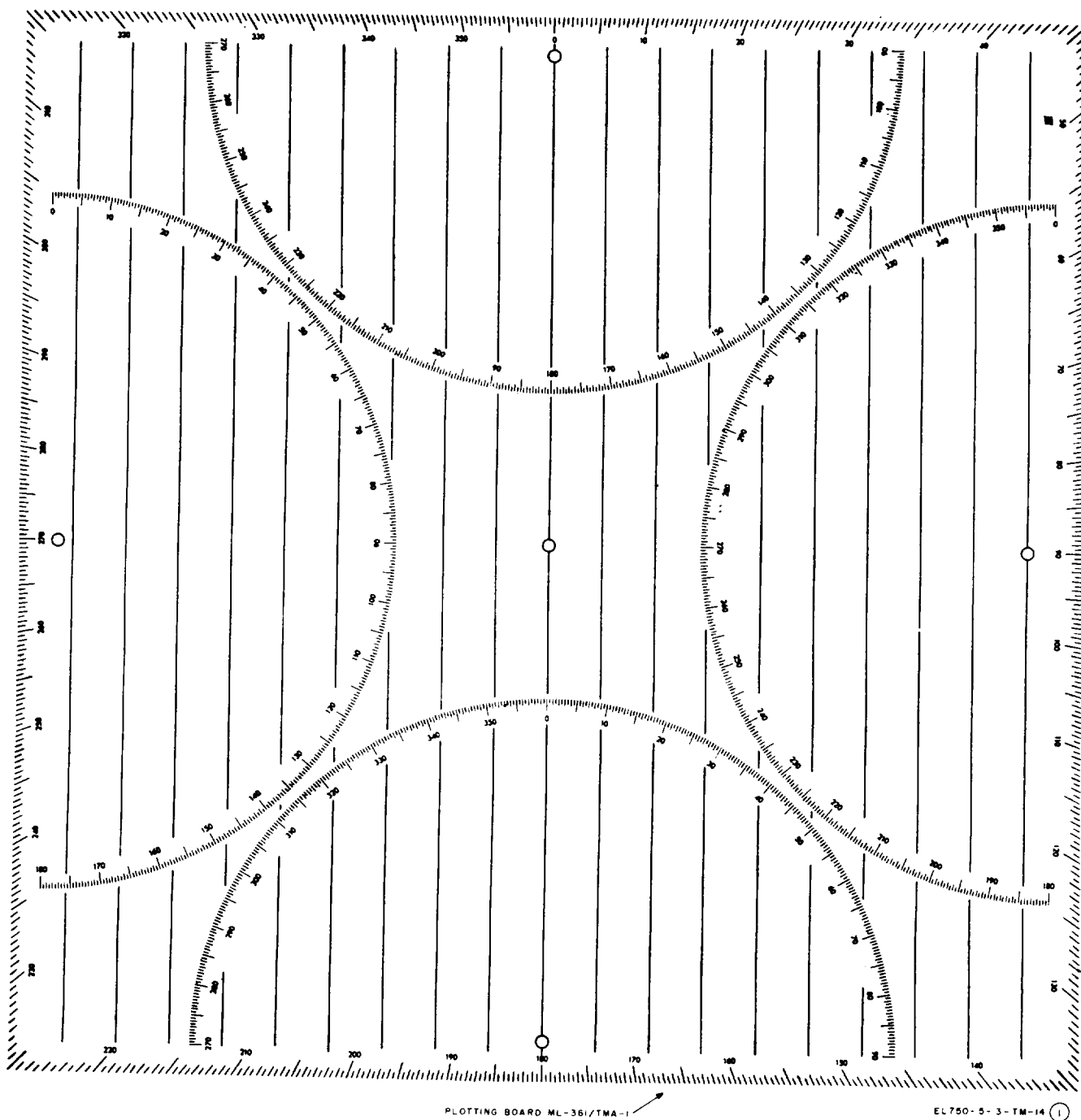


Figure 14 ① . Plotting Set AN/TMA-1 (sheet 1 of 2).

1. **NOMENCLATURE:** Plotting Set AN/TMA-1.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:** Used to plot and graphically compute meteorological data.

5. **BRIEF FUNCTIONAL DESCRIPTION:** Plotting Set AN/TMA-1 contains equipment to evaluate graphically winds aloft and to compute ballistic winds.

6. **TECHNICAL CHARACTERISTICS:**

Dimensions:

Plotting boards ----- 20 by 20 in.

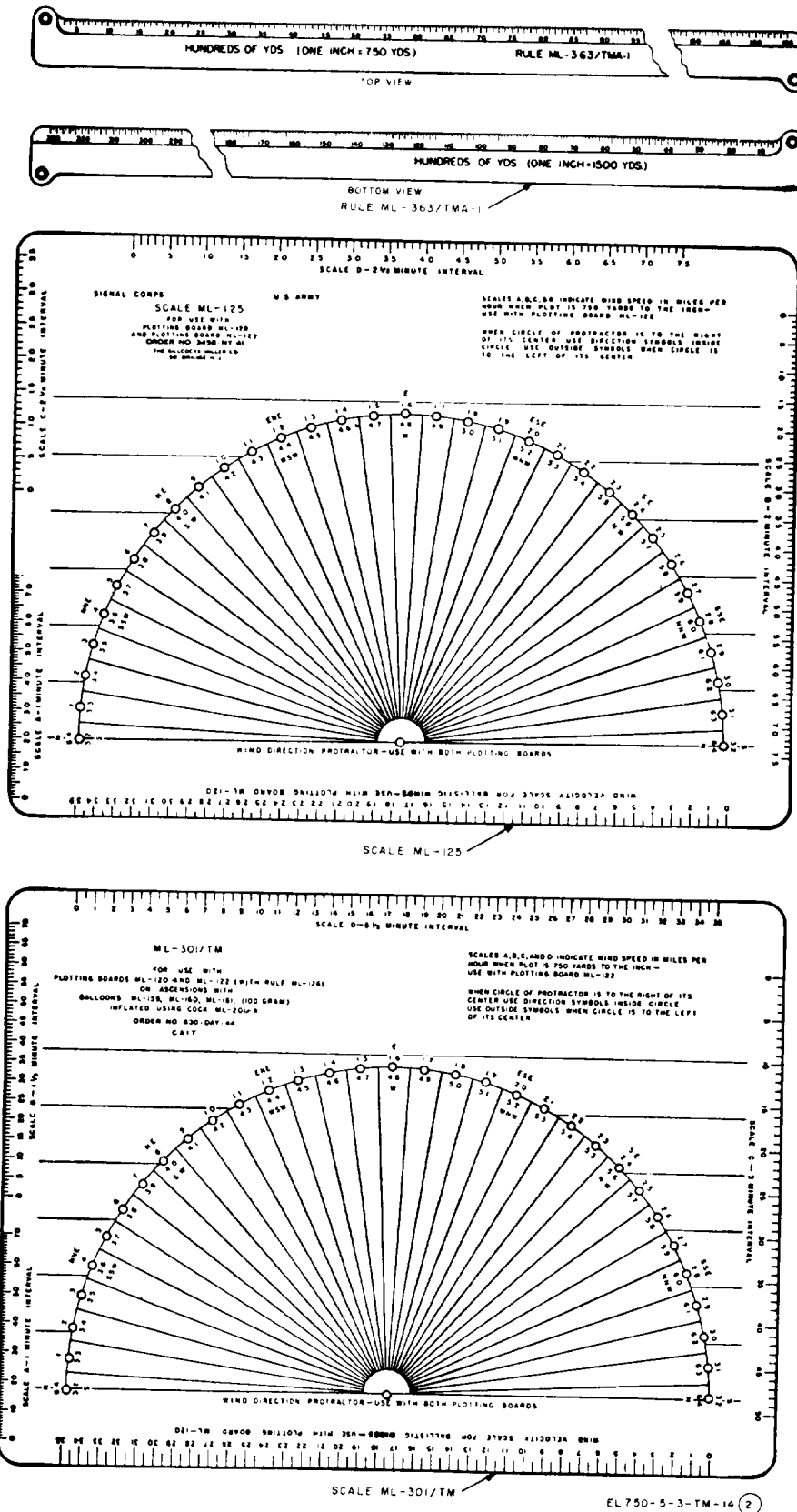


Figure 14 (2). Plotting Set AN/TMA-1 (sheet 2 of 2).

Rule ----- 22 by 1 ¼ in.
Scales ----- 10 ¼ by 7 ¾ in.
Slide rule ----- 20 by 1 3/8 in.

Weight:

Plotting boards --- 4 lbs. ea.
Slide rule ----- 1 ½ lbs.

7. MAJOR COMPONENTS:

Plotting Boards ML361/TMA-1 and ML-362/TMA-1.
Rule ML-363/TMA-1.
Scales ML-125 and ML-301/TM.
Slide rule ML-59.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION

APPLICATIONS: This equipment is used in a meteorological system.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TB SIG 174.

12. REPAIR PARTS SUPPORT CAPABILITY: None.

19. TRAINING REQUIREMENTS: Operator MOS 93-F-20.

14. TYPICAL BASIS OF ISSUE:

<i>TA</i>	<i>Allowance</i>
M 2 - W I N 2 A A -----	4

15. PRICE DATA:

a. Major item -----	\$ 653.00
b. Repair parts -----	\$9,790.00

16. ITEM REPLACED: None.

17. REMARKS: None.

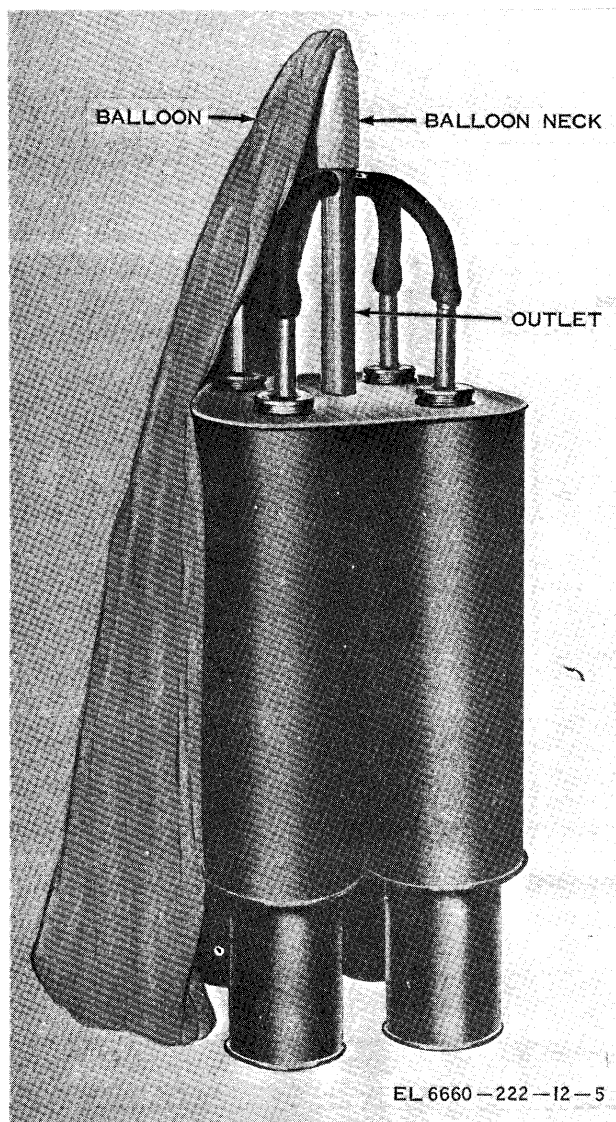


Figure 15. Hydrogen Generator Set AN/TMQ-3.

1. **NOMENCLATURE:** Hydrogen Generator Set AN/TMQ-3.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY CLASSIFICATION:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:** Used to generate hydrogen in the field for inflation of meteorological balloons.
5. **BRIEF FUNCTIONAL DESCRIPTION:** A transportable field generator used with calcium hydride charges to manufacture hydrogen gas for inflation of meteorological

balloons. When using four calcium hydride charges the generator will produce 96 cubic feet of hydrogen gas in 15 to 25 minutes.

6. TECHNICAL CHARACTERISTICS:

Hose ML-81 dimensions:
 Inside ----- 1/8 in.
 Outside ----- 3/4 in.
 Lengths ----- 5, 6, 10, and 15 ft.
 Hydrogen Generator ML-303/TM:
 Height ----- 15 in.
 Diameter ----- 5 1/8 in.

Manifold ML-344 /TMQ-3:
 Plate length ----- 10 9/16 in.
 Plate width ----- 10 9/16 in.
 Plate thickness ----- 1 1/16 in.
 Hole diameters ----- 1 25/32 in.

7. MAJOR COMPONENTS:

Case CY 219/TMQ-3.
 Hose ML-81.
 Hydrogen Generator ML-303/TM.
 Manifold ML-344/TMQ-3.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATION: This set is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

Chemical Hydride Charges ML-305/TM for a 100-gram balloon.
 Chemical Charge ML-304A/TM for a 30-gram balloon.
 Chemical Charge ML-587/TM for sounding balloons.

10. TOOLS AND TEST EQUIPMENT: Knife TL-29 (or equivalent) only tool and test equipment required.

11. REFERENCE DATA AND LITERATURE:

TM11-2413 ----- AN/TMQ-3

12. REPAIR PARTS SUPPORT CAPABILITY : To 1975—Full Support.

13. TRAINING REQUIREMENTS :

Operator MOS 93 E-20, 93 F-20.
 Maintenance MOS 35C.

14. TYPICAL BASIS OF ISSUE:

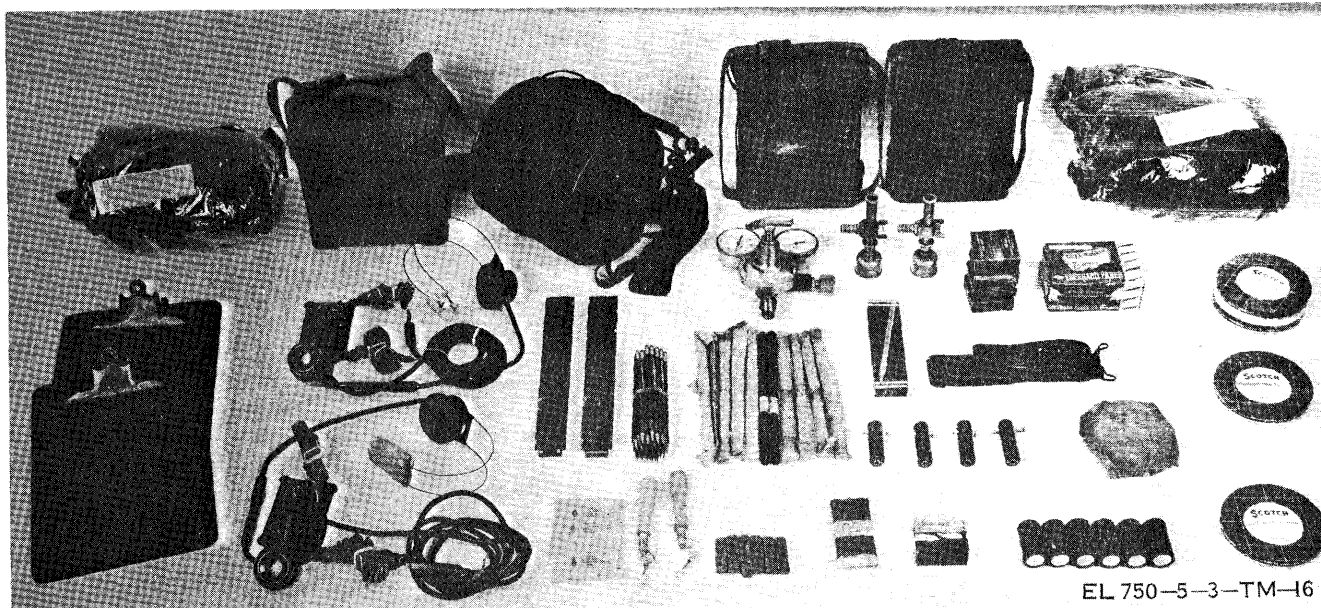
TOE	Allowance
44-547G -----	1
44-548G -----	1
57G -----	1

15. PRICE DATA:

a. Major Item ----- \$ 250.00
 b. Repair parts (1-year based on 100 equipments) ----- \$1,500.00

16. ITEM REPLACED. None.

17. REMARKS: Hydrogen Set AN/TMQ-3 consists of four ML-303/TM Hydrogen Generators mounted in tandem on a manifold.



EL 750-5-3-TM-16

Figure 16. Components Meteorological Station AN/TMQ-4.

1. NOMENCLATURE: Meteorological Station, Manual AN/TMQ-4.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT: Transportable manual meteorological equipment set used primarily by field artillery units.

5. BRIEF FUNCTIONAL DESCRIPTION: Meteorological Station, Manual AN/TMQ-4 is a transportable meteorological equipment set for use by field artillery units when taking visual, electronic and radar observations of the atmosphere and when performing sound ranging techniques. The AN/TMQ-4 includes equipment for taking surface observations of temperature, relative humidity, dewpoint, atmospheric pressure and wind direction and velocity. This set also includes equipment for taking pilot balloon observations to determine ballistic winds. The information obtained by these observations can be used to make corrections for atmospheric effects on the trajectory of artillery projectiles and to locate positions of enemy fire.

6. TECHNICAL CHARACTERISTICS:

Anemometer ML-433A/PM:

Velometer _____ 0-8 ±1.5 kn; 0-40 ±2.0 kn.

Wind vane and compass _____ 0 ±360° + 11.25°.

Mounting _____ Handle.

Anemometer ML-497/PM:

Velometer _____ 0-8 ±1.5 mph; 0-40 ±2.0 mph.

Wind vane and compass _____ 0-360° ±11.25°.

Mounting _____ Handle.

Barometer ML-102 ():

Type _____ Aneroid, portable, precision.

In. of mercury _____ 22-31.5 (ML-102-B, -E, -F).

Millibar range _____ 745-1,085 (ML-102-B, -E, -F) ; 745-1,065 (ML-102-D, -G).

Graduation intervals:

In. scale _____ 0.02 from 22 to 31, numbered each 0.1 in. (ML-102-B, -E, -F).

Millibar scale _____ 1 mb numbered each 5 mb (ML-102-B, -E, -F); 0.5 mb numbered each 10 mb (ML-102-D, -G).

Reading position _____ Vertical (models B, E, and F); Horizontal (models D and G).

Battery Pack BA-259/AM:

Voltage _____ 1.5 and 6v A-SUPPIY 115v B-supply.

Operating life _____ 2-3 hr.

Type _____ Water activated.

Calcium Hydride Charge ML-304A/TM and ML-305A/TM:

ML-304A/TM _____ Generates enough hydrogen to inflate a 30 g balloon to produce a free life of 155 g. min.

ML-305A/TM _____ Generates enough hydrogen to inflate a 100 g balloon to produce a free lift of 650 g min.

TM 750-5-3
AN/TMQ-4

Hydrogen Generator Charge ML-587/TM: Generates enough hydrogen from calcium hydride to produce a total life of 1,360 g.

Head and Chest Set HS-25-C:

Impedance _____ 900 ohms.
 Operating power _____ Sound-powered.
 Operating range _____ Approx 3 mi.

Lighting Unit ML-338/AM:

Power source _____ 6 vdc water-activated Battery BA-253/U.
 Bulb base _____ Bayonet.

Nozzle ML-196:

Material _____ Steel.
 Weighing-off range _____ 1,500 to 3,700 in 100 g increments.
 Separate weights _____ 100, 200, 400, 500, and 1,000 g.

Parachute ML-132:

Material _____ Paper.
 Size _____ 6 ft dia.

Parachute ML-430/U:

Material _____ Paper.
 Size _____ 16¼ in. dia.

Plotting Board ML-122:

Type _____ Portable.
 Material _____ Plywood with phenolic surface.

Inscriptions _____ 3 horizontal lines, 25 vertical lines, and a degree-azimuth scale consisting of a 360° circle marked in 1/5° divisions.

Psychrometer ML-224:

Type _____ General observation.
 Thermal element _____ Mercury.
 Temperature range:
 General _____ -37° C. to +46° C.
 Tropical _____ -12° C. to +63° C.
 Graduations _____ 1° intervals with every tenth degree numbered.

Accuracy:
 Below -18° C. _____ ±0.4°.
 From -18° C. to 0° C. _____ ±0.3°.
 Above 0° C. _____ ±0.2°.

Mounting _____ Metal frame.
 Method of ventilation _____ Hand sling.

Radiosonde Set AN/AMT-4():

Meteorological measurements:
 Atmospheric pressure _____ 5 to 1,060 mb ±4.
 Temperature _____ +60° C. to 90° C. ±1C.
 Relative humidity _____ 10% to 100% ±10%.
 Distance range:
 Altitude _____ 10,000 ft max, 30,480 meters.
 Horizontal _____ 125 mi max.
 Power source _____ Battery Pack BA-259/AM.
 Output power _____ 3 w (approx).

Reel RL-39():

Capacity _____ ½ mi of Wire W-130-A or equivalent.

Reel, Launching ML-367/AM:

Material _____ Aluminum.

Length of cord _____ 60 ft.
 Regulator, Pressure, Compressed Gas ML-528/GM:
 Material _____ Brass.
 Gage, high pressure _____ Indicates pressure from 0 to 3,000 psi.
 Gage, low pressure _____ Indicates pressure from 0 to 50 psi.
 Valve _____ Diaphragm-type reducing.
 Fittings _____ For attachment to a gas cylinder valve.

Balloon Launcher ML-594/U

Telephone TA-43/PT:
 Transmission frequency _____ 300 to 3,200 Hz range.
 Altitude limit _____ 10,000 ft.
 Temperature limits _____ -40° F. to +113° F.
 Power source:
 Local battery _____ Two batteries (BA-30) located within the battery compartment of the telephone.
 Common battery _____ Battery supplied by switchboard.

Transmission range using
 Wire WD-1/TT _____ Wet, 14 mi; Dry, 22 mi.

Theodolite, Double Center ML-474/GM, ML-247, and ML-247A.

Tracking telescope:

Magnification _____ 19 to 24 power.
 Angle of view _____ 1.7° to 2.1°.
 Optical system _____ Right angle, using prism.

Finder telescope:

Magnification _____ 3.75 to 5 power.
 Angle of view _____ 3.2° to 4.3°.
 Optical system _____ Right angle, using mirror.

Azimuth scale:

Range _____ 360°.
 Marking degrees _____ 0.1°.

Elevation scale:

Range _____ 240°.
 Marking degrees _____ 0.1°.

Power source _____ Two Batteries BA-30.

Thermometer ML-352/UM:

Temperature range _____ -70° F. to +35° F.
 Graduation intervals _____ Each 0.5°, numbered every 5°.
 Readability _____ ±0.1°.
 Accuracy _____ ±0.3°.
 Thermal liquid _____ Thallium amalgam.

Timer, Stop FM-103(1):

Type _____ Mechanical.
 Range _____ ½ sec to 60 min.
 Fast hand _____ One revolution every 1 min.
 Slow hand _____ One revolution every 60 min.

Tropical thermometer:

Temperature range _____ +5° F. to +150° F.
 Graduation intervals _____ Each 1° numbered every 10°.
 Readability _____ ±0.5°.

Accuracy _____ ±0.5°.
Thermal liquid _____ Mercury.
Hydrogen Generator Set AN/TMQ-3:
Hose ML-81:
Material _____ Heavy gun tubing.
Dimensions _____ 1/8 in. inside dia 3/4 in.
outside dia; 5-10 ft.
long.
Hydrogen Generator ML-303/TM:
Chemical charge _____ Calcium hydride.
Type _____ 1 shot.
Manifold ML-344/TMQ-3:
Number of input tubes __ 4.
Number of output tubes __ 1.
Dimensions and weight:
Anemometer ML-433A/PM
or ML-497/PM _____ 7 5/8 in. high, 1 3/8 in.
deep, 3 1/2 in. long.
Barometer ML-102() 3 7/8 in. high, 6 1/4 in.
deep, 6 1/4 in. long,
4 1/2 lb.
Battery Pack BA-259/AM 2 3/8 in. high, 4 in. deep,
4 5/8 in. long.
Case, Theodolite CY-787/U 17 in. high, 14 3/4 in.
deep, 11 3/4 in. long;
19 lb.
Hydrogen Generator ML-
303/TM _____ 19 in. high, 5 1/8 in.
deep; 1.6 lb.
Manifold ML-344/TMQ-3 __ 11 in. high, 11 in. deep,
11 in. long; 2.3 lb.
Plotting Board ML-122 __ 7/8 in. high, 36 in. deep,
42 in. long.
Psychrometer ML-224 __ __ in. deep, 11 15/16 in.
long.
Telephone TA-43/PT __ __ 4 in. high, 7 in. deep,
11 in. long; 9 1/2 lb.
Theodolite, Double Center ML-
247, ML-247-A, or ML-
474/GM _____ 15 1/4 in. high, 12 3/4 in.
deep, 11 in. long.
Timer, Stop FM-103(1) 7 3/4 in. high, 2 3/4 in.
deep, 6 in. long.
Tripod, Surveying MT-1309/TM 60 in. high.

7. MAJOR COMPONENTS:

Anemometer ML-433A/PM.
Anemometer ML-497/PM.
Hydrogen Generator Set AN/TMQ-3.
Head and Chest Set HS-25-C.
Psychrometer ML-224.
Plotting Board ML-122 and Rule ML-126-A.
Radiosonde Set AN/AMT-4().
Telephone TA-43/PT.
Theodolite, Double Center ML-247, ML-247A, or
ML-474/GM.
Thermometer ML-352/UM and Thermometer FSN
6660-535-4539.
Timer, Stop FM-103(1).

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS: This facility is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

a. *Additional Equipment.*
Radiosonde Recorder AN/TMQ-5().
Rawin Set AN/GMD-1().
Baseline Check Set AN/GMM-1.
Power Unit PE-75.
Cylinder of helium gas.
Radar Set AN/GMD-2 or Radar Set AN/CPS-9.
b. *Auxiliary Equipment.* None.

10. TOOLS AND TEST EQUIPMENT:

a. *Tools.*
Tools Equipment TE-33.
Wrench TL-112.
Hammer HM-3.
b. *Test Equipment.* None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-218-12, -25P ___ AN/TMQ-4
TM 11-2413 _____ AN/TMQ-3
TM 11-6660-222-12 _____ ML-224
TM 11-6660-228-10 _____ AN/AMT-4C, -4D
TM 11-337 _____ TA-43/PT
TM 11-5805-256-12P, -36P ___ TA-43/PT
TM 11-6675-200-10, -20, -35 ___ ML-247, ML-247A,
ML-474
TM 11-6660-204-10, -25 _____ AN/TMQ-S()
TM 11-6660-219-12, -20P,
-35P, -34 _____ AN/GMM-1()
TM 11-6660-206-ESC _____ AN/GMD-1()
TM 11-6660-206-12, -20P,
-35, -35P _____ AN/GMD-1()
TM 11-6115-206-20P, -35P ___ PE-75-series
TM 11-6660-220-10 _____ AN/AMT-12()

12. REPAIR PARTS SUPPORT CAPABILITY: To 1974-
Full support.

13. TRAINING REQUIREMENTS:

Operator MOS 93-F-20.
Maintenance MOS 35-C-20.

14. TYPICAL BASIS OF ISSUE:

TOE	Allowance
6-186H _____	1
6-201G _____	1
6-302H _____	1
6-526G _____	1
6-576G _____	2
6-701H _____	1
6-716H _____	1
6-100H _____	1
37-100G _____	1
39-51G _____	1
TA	
6-2 _____	18
50-734 _____	2
74-5 _____	1

15. PRICE DATA:

a. Major item _____ \$13,100.00
b. Repair parts (1-year cost based on 100
equipments) _____ \$196,500.00

16. ITEM REPLACED: None.

17. REMARKS: None.

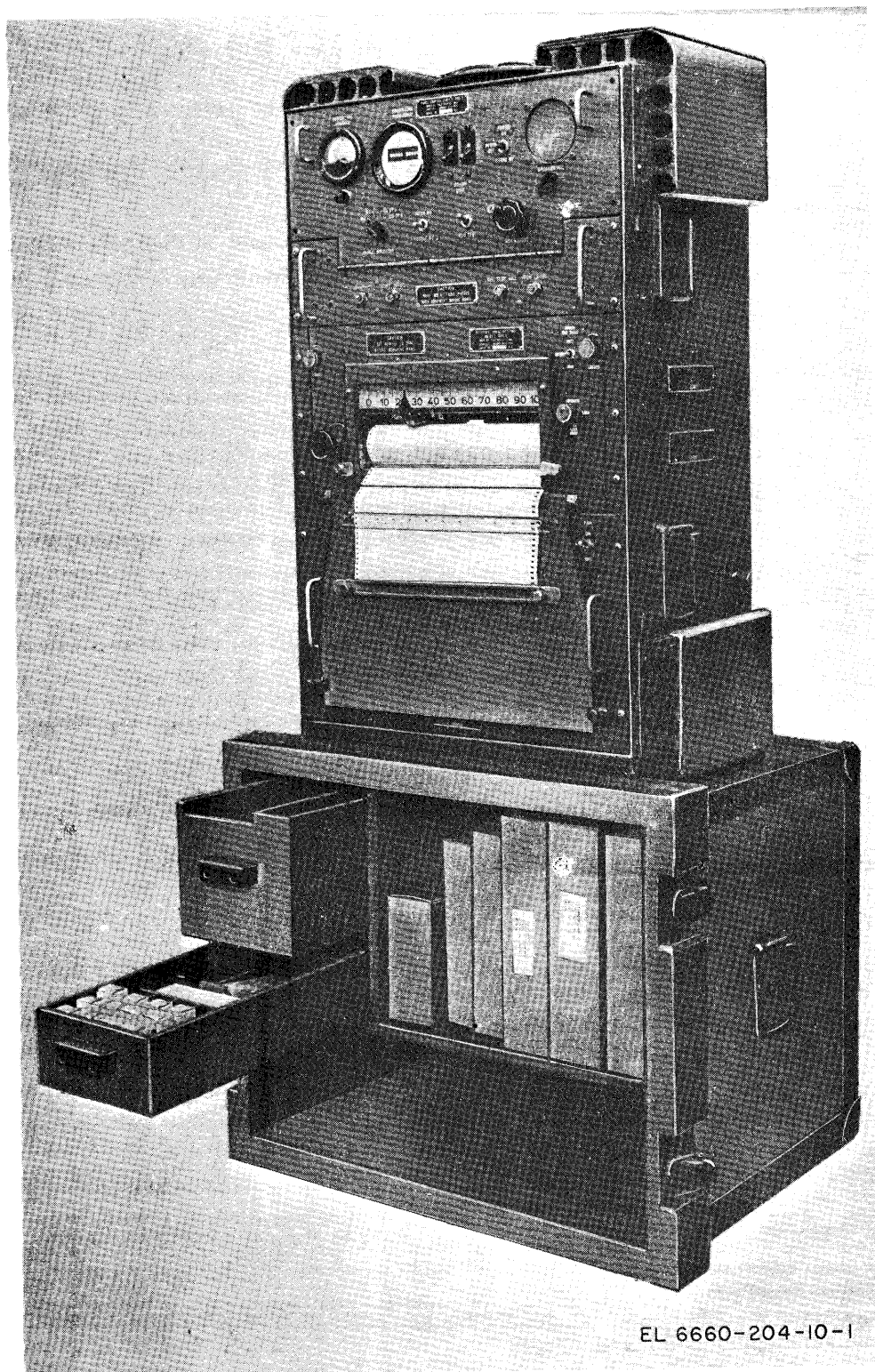


Figure 17. Recorder, Radiosonde AN/TMQ-5().

AN/TMQ-5()

1. NOMENCLATURE: Recorder, Radiosonde AN/TMQ-5, AN/TMQ-5A, AN/TMQ-5B, AN/TMQ-5C.

2. TYPE CLASSIFICATION: C & T.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT: Converts audiofrequency signals representing meteorological data into graphic form.

5. BRIEF FUNCTIONAL DESCRIPTION: Recorder, Radiosonde AN/TMQ-5() is an electronic meteorological instrument which records, in printed form, weather information transmitted by a balloon-borne radiosonde. Signals radiated from the radiosonde are received by a Rawin receiver which converts these signals to audiofrequency, which are then fed into the recorder and converted to direct current (dc) voltages. The dc voltages excite a servo system which positions a pen in the recorder to draw a graph on calibrated paper. The graph on the calibrated paper is then evaluated in terms of meteorological data, including temperature, pressure, and humidity.

6. TECHNICAL CHARACTERISTICS:

Power requirements _____ 105 to 125 vac, to 65
 _____ Hz, single-phase,
 _____ 225 to 275 w.

Test signal:
 Sine wave _____ 10 to 220 Hz, 10 v
 _____ peak-to-peak min.

Input signal:
 Negative-going pulse or
 sawtooth _____ 10 to 220 Hz, 10 to 100v
 _____ peak-to-peak, 1,000
 _____ to 2,500 μ s wide.

Power supply:
 Positive _____ Self-contained, full-
 _____ wave, regulated,
 _____ + 300 v.

Negative _____ Self-contained, full-
 _____ wave, regulated,
 _____ -175 v.

Signal data converter _____ Nominally 30 mv dc for
 _____ full-scale deflection
 _____ of pen.

REF ADJUST frequency
 range _____ 163 to 242 Hz.

Chart:
 Length _____ 120 ft.
 Width _____ 10 11/16 in. overall.

Vertical axis _____ 1/2 in. interval.

Horizontal axis _____ 100 equal divisions.

Speed _____ 1/2-in. 1min for Radio-
 _____ sonde Recorder AN/
 _____ TMQ-5; 1/2- or 1-in./
 _____ min for Radiosonde
 _____ Recorder AN/TMQ-
 _____ 5A; 1/2-, 1-, or 2-in./
 _____ min for Radiosonde
 _____ Recorder AN/TMQ-
 _____ 5C.

Speed of response 2 1/2-sec max including
 _____ penlifting operation.

Weight 240 lb.

Dimensions _____ 33 7/8in. high, 22 7/8 in.
 _____ wide, 17 3/8 in. deep.
 Ambient temperature range _____ -40° F. to + 125° F.

7. MAJOR COMPONENTS:

Control Panel C-834/TMQ-5.
 Signal Data Converter CV-146/TMQ-5.
 Power Supply PP-968/TMQ-5.
 Frequency-Time Recorder RD-88, -88A, -88C/TMQ-5.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATION:

This set is used in a system with Radiosonde Sets AN/AMT-4() or AN/AMT-12; Rawin Set AN/GMD-1(); and Baseline Check Set AN/GMM-1().

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

a. *Additional Equipment.*
 Power supply required to provide 105 to 125 v; 50 to 60 Hz; single-phase, 225 to 275 w.

b. *Auziliary Equipment.*
 Baseline Check Set AN/GMM-1().
 TS-1348/GMM-1A.

10. TOOLS AND TEST EQUIPMENT:

a. *Tools.*
 Tool Kit, Radar and Radio Repairman TK-87/U.
 Tool Kit, Radar and Radio Repairman TK-88/U.
 Tool Kit, Radar Repairman TK-115/U.
 Tube Puller TL-201.

b. *Test Equipment.*
 Frequency Standard TS-65C/FMQ-1.
 Multimeter TS-352/U.
 Oscilloscope AN/USM-140A.
 Test Set, Electron Tube TV-7.
 Test Set, Electron Tube TV-2.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-204-10,
 -25, -25P _____ AN/TMQ-5()

TM 11-2602B _____ TS-65C/FMQ-1

SB 11-647 _____ TK-88/U

TM 11-6625-316-12,
 -20P, -35, -35P _____ TV-2/U

TB 11-6625-316-12/1 _____ TV-2/U

TB 11-6625-274-12/1 _____ TV-7/U

TM 11-6625-274-12,
 -25P, -35 _____ TV-7/U

12. REPAIR PARTS SUPPORT CAPABILITY: To 1974-
 Full support.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.
 Maintenance MOS 35-B-20, 35-D-20.

14. TYPICAL BASIS OF ISSUE:

<i>TOE</i>	<i>Allowance</i>
6-186H _____	1
6-201G _____	1
6-302H _____	1
6-526G _____	1
6-576G _____	2
6-701H _____	1
6-716H _____	1
7-100H _____	1

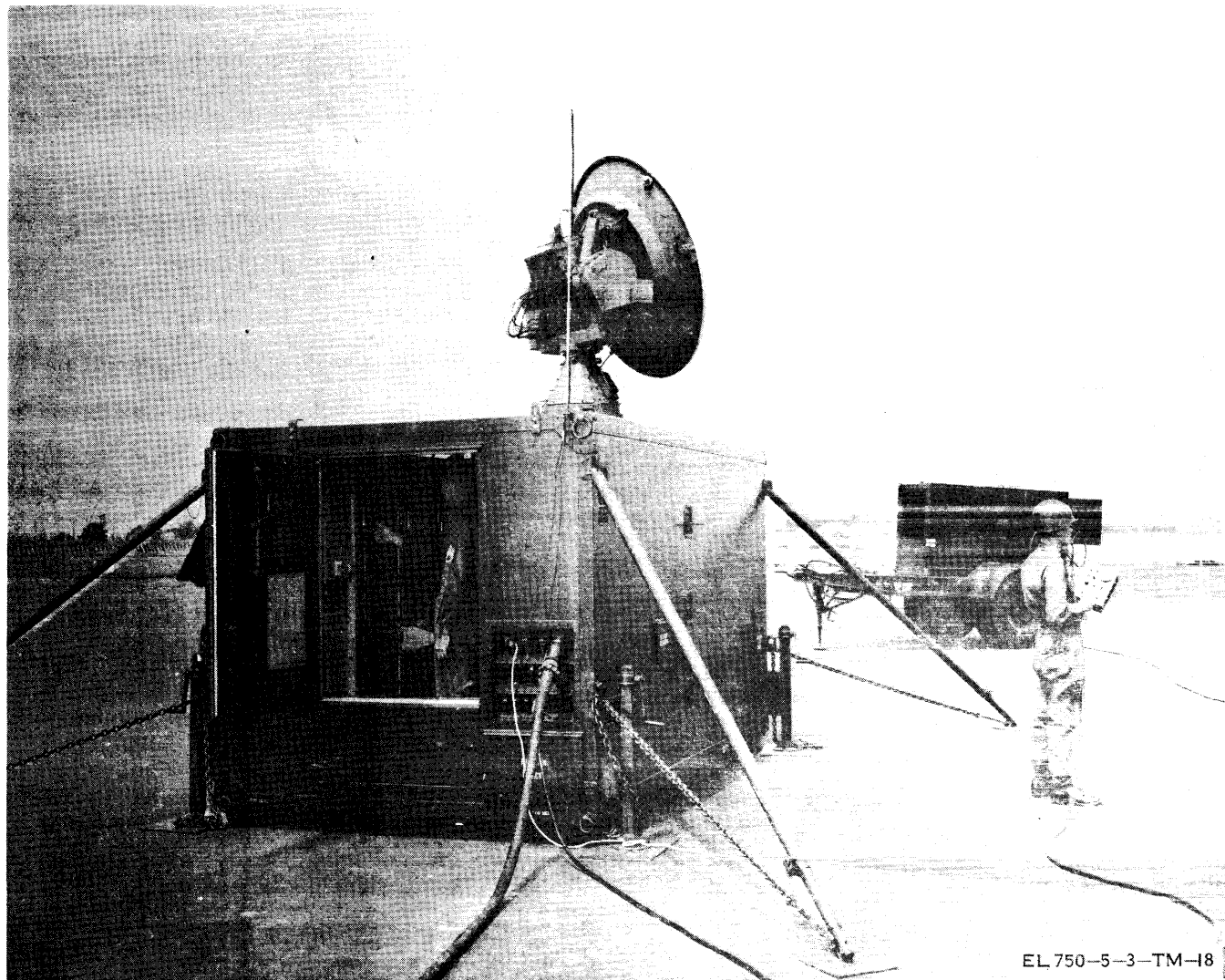
<i>TOE</i>	<i>Allowance</i>
17-100H -----	1
37-100H -----	1
39-51G -----	1
<i>TA</i>	
6-2 -----	18
50-734 -----	2
74-5 -----	1

15. PRICE DATA:

- a. Major item ----- \$4,570.00
- b. Repair parts (1-year cost based on
100 equipments) ----- \$53,550.00

16. ITEM REPLACED: Replaces AN/TMQ-2() when used with SCR-658() or AN/GMD-1().

17. REMARKS: None.



EL 750-5-3-TM-18

Figure 18. Automatic Atmospheric Sounding Set AN/TMQ-19(XE-2).

1. NOMENCLATURE: Automatic Atmospheric Sounding Set AN/TMQ-19(XE-2).

2. TYPE CLASSIFICATION: Development.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT: None.

5. BRIEF FUNCTIONAL DESCRIPTION: Automatic Atmospheric Sounding Set A.N/TMQ-19 is a lightweight transportable system, which has the capability to track and receive data transmitted from airborne balloons and rocket Atmospheric Meteorological Probes AN/AMQ-23 and AN/AMQ-22. The sounding system will provide automatic computation and analysis of meteorological data for Army artillery. The system is housed in a mobile-type shelter for field operation and has the ability to provide

reliable, rapid data processing with high accuracy under all types of weather conditions.

6. TECHNICAL CHARACTERISTICS:

X-band and S-band combined antenna:

Size	5 ft paraboloid.
Feed	Dual (8,500-9,300 MHz) , (1,670-1,700 MHz).
Beamwidths	1.5° (9,300 MHz), 7° (1,680 MHz).
Gain	40 db (9,300 MHz), 26 db (1,680 MHz).
Track accuracy	±0.05° (conical scan).
Search	360° continuous; azimuth 0-90° manual; elevation any 50° sector scan in each.

TM 750-5-3
AN/TMQ-19

S-band receiving and tracking characteristics:

Frequency ----- 1,670-1,700 MHz.
 Frequency control ----- Manual or crystal.
 Noise figure ----- 2 db.
 Bandwidth ----- 100 kHz.
 Modulation type ----- Am. (0.950 Hz).
 Tracking accuracy ----- 0.05°.
 Tracking speed ----- 60°/sec.

X-band ranging characteristics:

Frequency ----- 8,500-9,600 MHz.
 Output peak power ----- 150 kw.
 Pulse wide ----- 0.8 and 1µs.
 Receiver noise figure ----- 5 db.
 Range ----- 30 m to at least 160 km.
 Accuracy ----- ±16 m.
 A- and R-scope sweep ranges ----- A-scope-10,40,80,160 km; R-scope-32 m.

Radiosonde data processor characteristics.

Serial mode data handling capability; parallel mode data handling capability; conversion, display and recording of eight parameters: range azimuth angle, elevation angle, roll angle, temperature humidity, elapse time; compatible with FADAC, BASIC-PAG, and MOBIDAC computers. Produces eight messages with any of above computers: nato No. 1 or 2 messages, nato No. 1, 2, or 3 messages artillery computer message. fall-out message, air weather service message, refractivity message.

7. MAJOR COMPONENTS:

Shelter (modified S-280).
 Antenna assembly.
 S-band components.
 X-band components.
 Radiosonde data processor.
 Data display.
 Input-output paper tape set.
 Fadac computer
 Programs.
 Diagnostic analyzer and simulator.
 Baseline check set.
 Communication equipment.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This set is used in a system with Meteorological Data Sounding System AN/UMQ-7().

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

Power supply required to provide three-phase, 400-Hz, AN/AMQ-23 (XE-3).

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-666W241-12, -34 _ _ _ AN/TMQ-19 (XE-2)
 (To be published)
 TM 11-6660-241-14 _ _ _ _ _ AN/UMQ-7()
 (To be published)
 TM 11-6660-261-10 _ _ _ _ _ AN/AMQ-23 (XE-3)
 (To be published)

12. REPAIR PARTS SUPPORT CAPABILITY: No density.

13. TRAINING REQUIREMENTS:

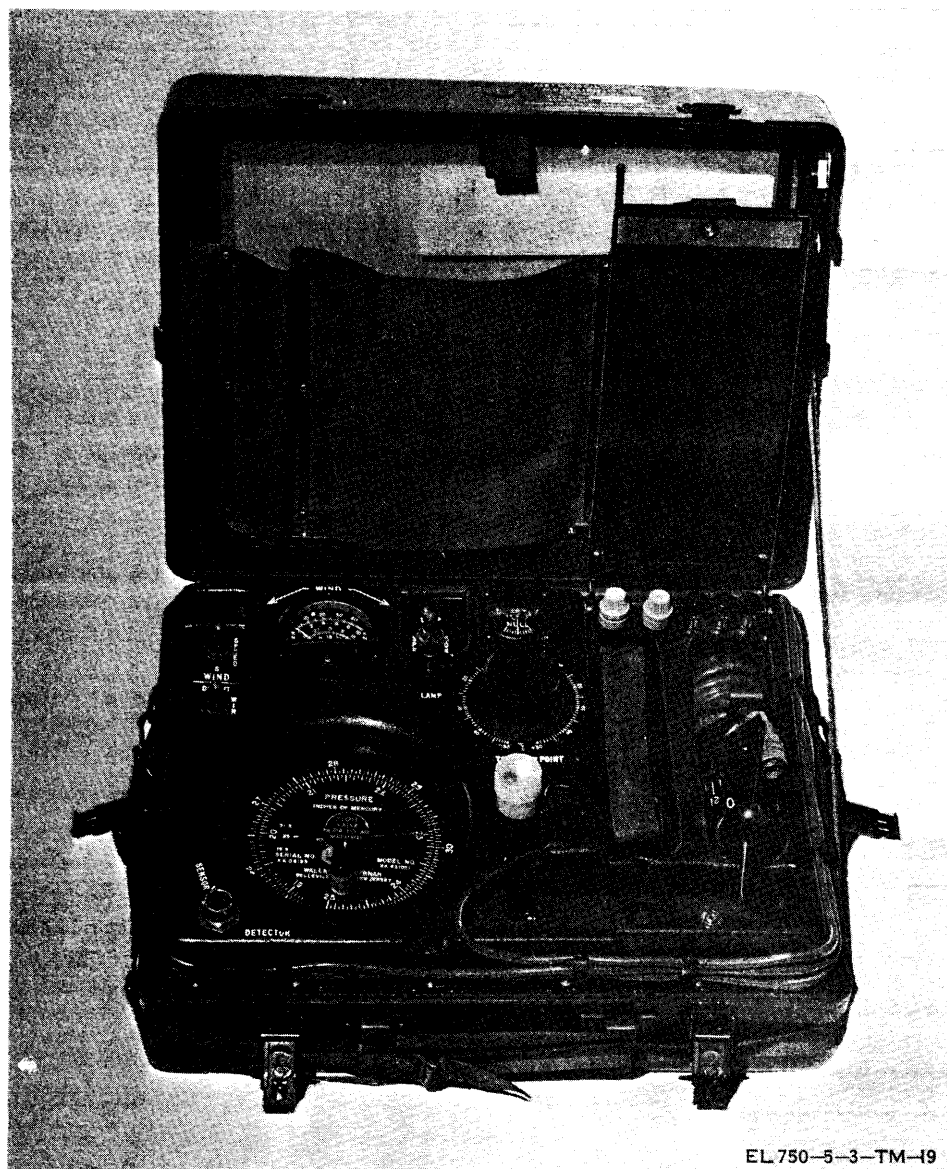
Operator MOS 93-E-20, 93-F-20.
 Maintenance MOS 35-D-20, 35-B-20.

14. TYPICAL BASIS OF ISSUE: No density.

15. PRICE DATA: None.

16. ITEM REPLACED: None.

17. REMARKS: None.



EL 750-5-3-TM-19

Figure 19. Meteorological Measuring Set AN/TMQ-22.

1. NOMENCLATURE: Meteorological Measuring Set AN/TMQ-22.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT: Renders instantaneous and accurate surface measurements of ambient conditions.

5. BRIEF FUNCTIONAL DESCRIPTION: Meteorological Measuring Set AN/TMQ-22 is a battery-operated field instrument designed to measure windspeed and wind direction, barometric pressure, air temperature, dewpoint temperature, humidity, snow depth, and rainfall. The AN/TMQ-22 can be operated as a portable weather station or as a semipermanent weather station. The set re-

quires minimum setup time and renders and accurate measurements of ambient conditions.

6. TECHNICAL CHARACTERISTICS:

Power requirements	1.5 vdc (2 BA-30 type batteries); 3.0 vdc (2 BA-80 type batteries).
Windspeed	0-50±2 knots.
Wind direction	360°± 5°.
Barometric pressure	18.90 to 31.30 in of mercury, ±0.015 in of mercury.
Air temperature	-50° c. to +50° C., ±0.5° C.
DewPoint temperature	-50° C. to +50° C., ± 1.0° C.

TM 750-5-3

AN/TMQ-22

Precipitation gage _____ 0-2.0 in, ±0.02 in.
Snow depth gage _____ 0-36.0 in, ±0.5 in.
Dimensions (including external hardware) _____ 6 in high, 12 1/16in. wide, 16 3/16 in. long.

Weight of case (including components) _____ 16.60 lb.

7. MAJOR COMPONENTS:

- Main case.
- Sensor.
- Detector.
- Snow depth gage.
- Precipitation gage.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS: This set is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: Battery (four) BA-30.

10. TOOLS AND TEST EQUIPMENT:

a. Tools

- Screwdriver.
- Allen wrench, 5/64 in.
- Tool Kit, Electronic TK-100/U.
- Tool Kit, Electronic TK-101/U.

b. Test Equipment

- Barometer ML-512().
- Psychrometer ML-224.
- Precision decode box.
- Resistance Bridge ZM-1614/U.
- Multimeter TS-352/U.
- Multimeter AN/URM-105.
- Multimeter ME-26A/U.

Oscilloscope OS--46/U.
Test Set TS-1836/U.

11. REFERENCE DATA AND LITERATURE:

TM 11-6625-366-15 _____ TS-352/U
TM 11-2417 _____ ML-224
TM11-427 _____ ML-102
TM 11-6625-203-12-20P,
-35, -45P _____ AN/URM-105
TM 11-6660-236-12, -35 __ AN/TMQ-22
(To be published)

12. REPAIR PARTS SUPPORT CAPABILITY: To 1975-Full support.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.
Maintenance MOS 35-D-20, 35-B-20.

14. TYPICAL BASIS OF ISSUE:

	<i>Allowance</i>
<i>TA</i>	
4AW2NTAA _____	98
6AW0V13C _____	18
6AW04FAA _____	188
<i>TOE</i>	
31-125H _____	28

15. PRICE DATA:

- a.* Major item _____ \$4,500.00
- b.* Repair parts (1-year cost based on 100 equipments) _____ \$67,500.00

16. ITEM REPLACED: Manual Meteorological Sets AN/PMQ-1, AN/PMQ-4.

17. REMARKS: None.

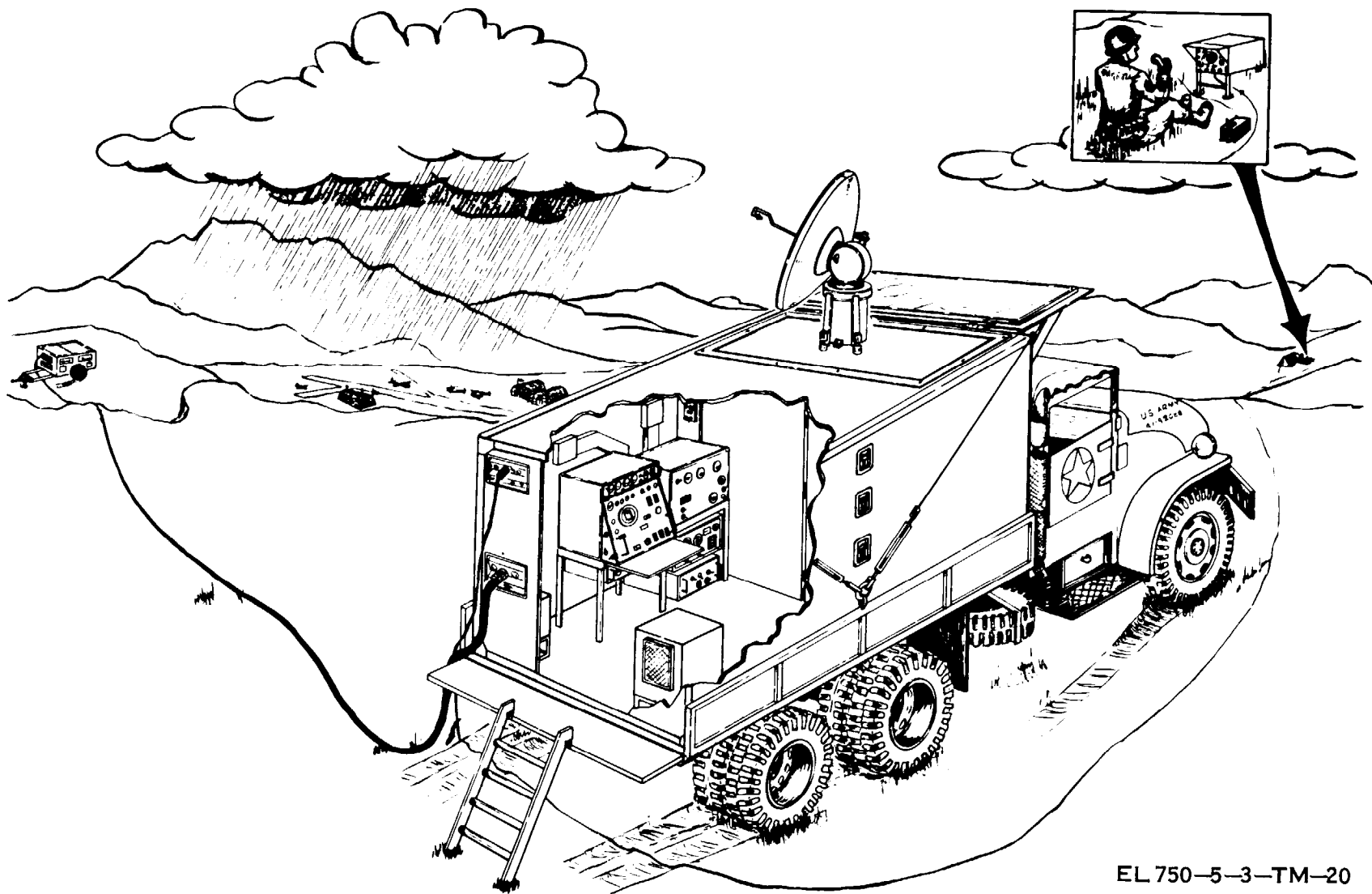


Figure 20. Radar Set AN/TPS-41().

EL 750-5-3-TM-20

TM 750-5-3
AN/TPS-41()

TM 750-5-3
AN/TPS-41()

- 1. NOMENCLATURE:** Radar Set AN/TPS-41().
- 2. TYPE CLASSIFICATION:** Development.
- 3. SECURITY REQUIREMENTS:** Unclassified.
- 4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:** Used as a search device for locating precipitating areas in early weather forecasts and nuclear detonation activity.

5. BRIEF FUNCTIONAL DESCRIPTION: The set is a mobile weather radar set providing real time and three dimensional data on precipitation areas and nuclear detonation activity. The radar set can operate in a modified S-280(B)/G shelter on a 2½-ton truck, or on the ground. Transportation to the operating site can be made by truck, helicopter, or as loose cargo.

The radar set detects and displays radar echoes on the plan position indicator (PPI), range height indicator (PHI) and A/R Scope indicator. Iso-echo contouring of the target area is also available for analysis.

Three remote indicator units are provided and can be operated up to one mile from the control console. Display on these units can duplicate the main RHI/PPI display and can be individually adjusted for displays independent from the RHI/PPI display.

6. TECHNICAL CHARACTERISTICS:

General:

Power input	115 vac, 30, 4 wire, 400 Hz, 10 kw.
Maximum range	240 km.
Minimum range	250 meters.
Range accuracy	± 100 meters.
Range determination	By use of range marks and movable strobe.
Azimuth coverage	360° continuous clock wise and counter- clockwise, sector scan 10° to 50° and manual positioning.
Azimuth accuracy	±0.6°.
Azimuth determination	By synchronizing PPI Sweep with antenna rotation and Nixie readout.
Elevation accuracy	±0.5°.
Elevation Angle	Nixie readout.
Height determination	By reading scribe marks on RHY/PPI scope.
Shelter	Modified S-280(B)/G.
Assembly time	30 minutes-3 men.

Transmitting:

Frequency	8.5-9.6 Hz.
Peak power	250 w at antenna.
Average power	250, 200, 100.
Pulse repetition rate	490 Hz, 380 Hz, 760 Hz.
Pulse width	1.0 sec, 5.0 sec.
Duty cycle	.001, .0008, .0004.
Source of rf power	Magnetron.

RF:

Transmission Line	RG 51/U Aluminum Waveguide.
Radiating element	Horn, Buttonhook.

Reflector	5-foot fiber glass, parabola truncated.
Horizontal beam width	1.6° max.
Vertical beam width	1.7° max.
Attenuation of side lobes	22 db.
Rotation speeds	5 rpm cw, ccw.
Duplexer	4-port ferrite circula- tor.

Receiving:

Type	Microwave.
Operating frequency	8.5 Hz to 9.6 Hz.
Local oscillator tube type	Klystron.
Local oscillator	8.5 Hz to 9.6 Hz.
Mixers	60 MHz, AFC Bal- anced Mixer, image reject ion balanced signal mixer.

Intermediate:

Frequency	60 MHz.
Bandwidth	750 kHz or 1.4 MHz.
Sensitivity	- 104 dbm wideband pulse, 1µs pw, - 107 dbm narrow band pulse, 5 µs pw,
Gain	128 db.

Synchronizing:

Oscillator	5.999552 MHz Crystal.
Ranger Markers	6.66 µs (1KM), 66µs (10 KM), 26.6 µs (40 KM).
System triggers	187.5, 375, 750 Hz.

Indicating:

Presentation	RHI/PPI, A/R scope displays.
Cathode-ray tube	7AQP7, SC2751.
Sweep ranges	10, 40, 80, 160, 240 km.
R a n g e M a r k e r s	1, 10, 40 km.
Elevation scale	-5° to -90°.
Azimuth scale	0° to 360°.

Antenna:

Azimuth	
Positioning:	
Drive system	dc motor.
Types of operation	Manual, sector scan, continuous (cw & ccw).
Continuous rotation speed	5 rpm.

Elevation:	
Drive system	dc motor.
Type of operation	Manual, sector scan.

Power Unit:

Type	PU 656/G (2 genera- tors).
Output	10 Kw.
Fuel Consumption	2 gal /hr. per genera- tor.

7. MAJOR COMPONENTS:

Console, Radar Set OJ-146 ().
 Modulator, Radar MD-813().
 Receiver-Transmitter, Radar RT-958().

Interconnecting Box J-2873().
Control, Antenna C-1890().
Pedestal, Antenna AB-1122().
Indicator, Radar Data IP-975().
Shelter, Assembly.
Lift Mechanism.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATION: This set is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: 3-phase 400-Hz power supply.

10. TOOLS AND TEST EQUIPMENT:

- a. *Tools.*
 - TK-101/G.
 - 9/64 hex socket capscrew.
 - Adjustable wrench.
- b. *Test Equipment.*
 - Multimeter AN/PSM-6.
 - Oscilloscope 545.
 - DC Power Supply 6215A.
 - RF Test Set 624C.
 - VHF Signal Generator 608C.
 - Spectrum Analyzer AN/UPM-17.

Pulse Generator.
Voltmeter 410C.
Timer S-1.

11. REFERENCE DATA AND LITERATURE:
TM 11-6660-242-10, -24 ____ AN/TPS-41()
(To be published)

12. REPAIR PARTS SUPPORT CAPABILITY.

13. TRAINING REQUIREMENTS:
Operator MOS 93-E-20, 93-F-20.
Maintenance MOS 35-D-20, 35-B-20.

14. TYPICAL BASIS OF ISSUE:

<i>TOE</i>	<i>Allowance</i>
7-4H -----	18
17-4H -----	18
37-4H -----	18
57-4G -----	18

15. PRICE DATA :

16. ITEM REPLACED: None.

17. REMARKS: None.

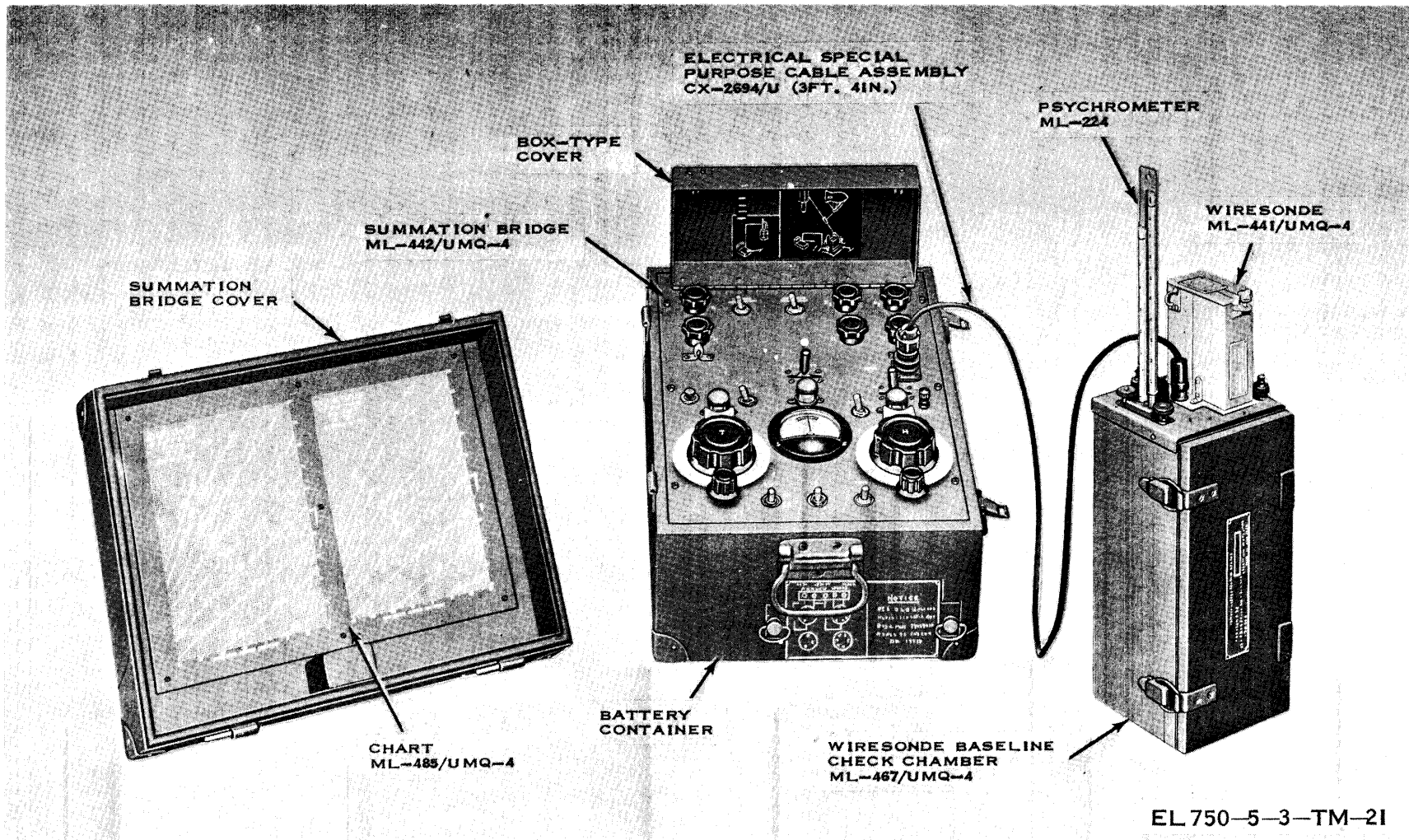


Figure 21. Wiresonde Set AN/UMQ-4.

TM 750-5-3
AN/UMQ-4

1. **NOMENCLATURE:** Wiresonde Set AN/UMQ-4.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used to measure atmospheric temperature and humidity at low altitudes.
5. **BRIEF FUNCTIONAL DESCRIPTION:** Wiresonde Set AN/UMQ-4 is a transportable equipment designed to measure atmospheric temperature and humidity at low altitudes. The AN/UMQ-4 provides data on conditions of the lower atmosphere for use in weather forecasting, wave propagation, correction of artillery fire, chemical warfare, and other similar applications, Temperature-sensitive and humidity-sensitive elements, carried aloft by a kytoon, are connected to a summation bridge on the ground through a transmission-mooring cable. Temperature and humidity variation affecting the elements carried aloft are thus detected on the summation bridge.

6. TECHNICAL CHARACTERISTICS:

Range of measurements:	
Temperature	+40 C.
Humidity	10% to 100% above 0°C., 20% to 100% below 0° C.
Altitude	0 to about 1,500 ft.
Data transmission --	Three wire conductors in transmission- mooring cable.
Summation bridge:	
Circuit	Wheatstone bridge.
Power	12 vdc (Two Batteries BA-409/U).
Wiresonde:	
Temperature sensitive element	Dry-bulb thermistor.
Humidity sensitive element	Wet-bulb thermistor or lithium chloride strip.
Power for blower motor	6 vdc (One Battery BA-2531/U).
Cable reeling machine:	
Capacity -----	2,000 ft of transmis- sion-mooring cable.
Operation -----	Hand operated.
Dimensions:	
Hand Cable Reeling Machine RL-156/ UMQ-4 -----	21¾ in. high, 12 5/16 in. deep, 20¼ in. wide.
Accessories Case CY-1000/ UMQ-4 -----	21½ in. high, 24½ in. deep, 38 3/8 in. wide.
Wiresonde Set Case CY- 999/UMQ-4 -----	23 in. high, 23 in. deep, 34 in. wide.
Weight:	
Hand Cable Reeling Machine RL-166/ UMQ-4 -----	40 lb.

Accessories Case CY- 1000/UMQ-4 -----	106.5 lb (empty).
Wiresonde Set Case CY- 999/UMQ-4 -----	117.75 lb (empty).
Summation Bridge ML- 442/UMQ-4 -----	32.5 lb.
Overall weight -----	3401b (approx).

7. MAJOR COMPONENTS:

- Summation Bridge ML-442/UMQ-4.
- Wiresonde Baseline Check Chamber ML-467/UMQ-4.
- Wiresonde ML-441/UMQ-4.
- Meteorological Resistance Temperature Element ML-484/UMQ-4.
- Hydrography Humidity Element ML-379/AM.
- Hand Cable Reeling Machine RL-156/UMQ4.
- Clinometer ML-110().
- Psychrometer ML-224.
- Kite Balloon ML-483/UM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATION: This set is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

- a. *Additional Equipment.*
Battery (two) BA-409/U.
Battery BA-253/U.
Helium or hydrogen supply.
Distilled water.
- b. *Auxiliary Equipment.* None.

10. TOOLS AND TEST EQUIPMENT:

- a. *Tools.*
Tool Equipment TE-113.
Tool Equipment TK-17/FMQ-1.
- b. *Test Equipment.*
Decade Resistor TS-679/U.
Decade Resistor TS-894/U.
Multimeter AN/URM-105.

11. REFERENCE DATA AND LITERATURE:

- TM 11-2438-10,-20,
-35 ----- AN/UMQ-4
- TM 11-6660-222-12 ----- ML-224
- TM 11-6625-203-12,
-20P, -35, -45P ----- AN/URM-105

12. REPAIR PORTS SUPPORT CAPABILITY: To 1974-
Full support.

13. TRAINING EQUIPMENTS:

- Operator MOS 93-E-20, 93-F-20.
- Maintenance MOS 35-C-20.

14. TYPICAL BASIS OF ISSUE:

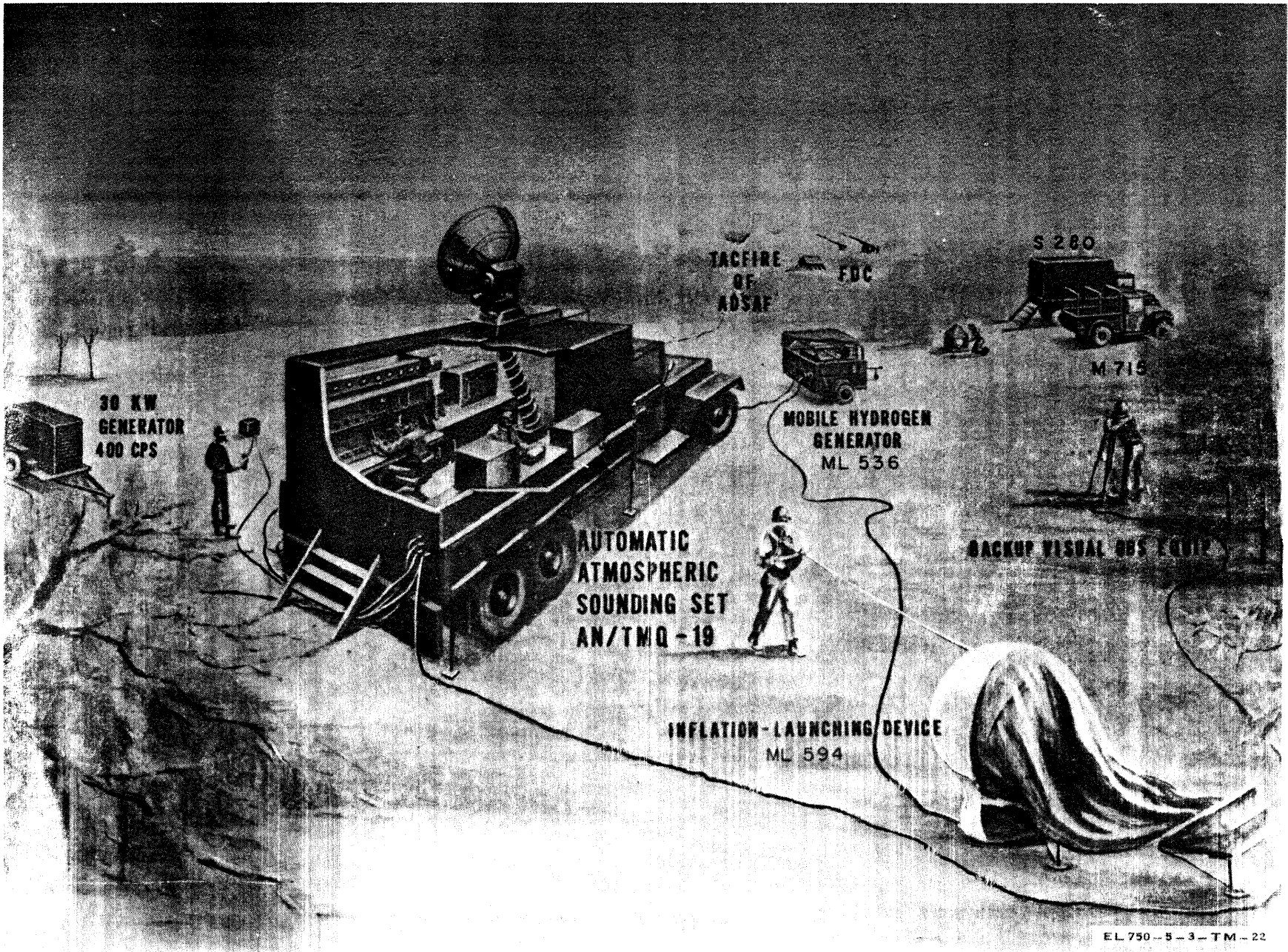
TA .	<i>Allowance</i>
50-447 -----	2
50-772 -----	1

15. PRICE DATA:

- a. Major item ----- \$4,300.00
- b. Repair parts (1-year cost based on
100 equipments) ----- \$64,500.00

16. ITEM REPLACED: None.

17. REMARKS: None.



EL 750-5-3-TM-22

Figure 22. Meteorological Data Sounding System AN/UMQ-7.

TM 750-5-3
AN/UMQ-7

1. NOMENCLATURE: Meteorological Data Sounding System AN/UMQ-7.

2. TYPE CLASSIFICATION: Development.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT: Furnishes upper atmospheric data primarily for meteorological ballistic corrections and for fallout prediction information to altitudes of 20km and 30km, respectively.

5. BRIEF FUNCTIONAL DESCRIPTION: Meteorological Data Sounding System AN/UMQ-7 (sounding system) is a mobile system that processes and computes automatically upper atmospheric data and makes available to field commanders various meteorological messages within minutes after the completion of a sounding.

6. TECHNICAL CHARACTERISTICS:

Tracks at 60 degrees per second.
Angular accuracy of ± 0.05 degrees.
Tracking range of 160km ± 16 meters.
Fully transportable.
Operational within 40 minutes after employment.
Design goal of 1000 hours MTBF.

7. MAJOR COMPONENTS:

Atmospheric Meteorological Probes AN/AMQ-22(), AN/AMQ-23().
Hydrogen Generator ML-536()/UM.
Automatic Atmospheric Sounding Set AN/TMQ-19().
Balloon Inflation and Launching Device ML-594()/U.
Power generator.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS: This system is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT:

Tool Kits, Radar and Radio Repairman TK-87/U and TK-88/U.
Tool Kit, Radar Repairman TK-115/U.
Multimeter TS-352/U.
Oscilloscope AN/ USM-281.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-261-10 _ _ _ _ _ AN/AMQ-23
(To be published)
TM 11-6660-241-12, -34 _ _ _ AN/TMQ-19
(To be published)
TM 11-6660-261-14 _ _ _ _ _ AN/UMQ-7
(To be published)

12. REPAIR PARTS SUPPORT CAPABILITY: No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.
Maintenance MOS 35-D-20, 35-B-20.

14. TYPICAL BASIS OF ISSUE: None.

15. PRICE DATA:

16. ITEM REPLACED : AN/GMM-1.

17. REMARKS: None.

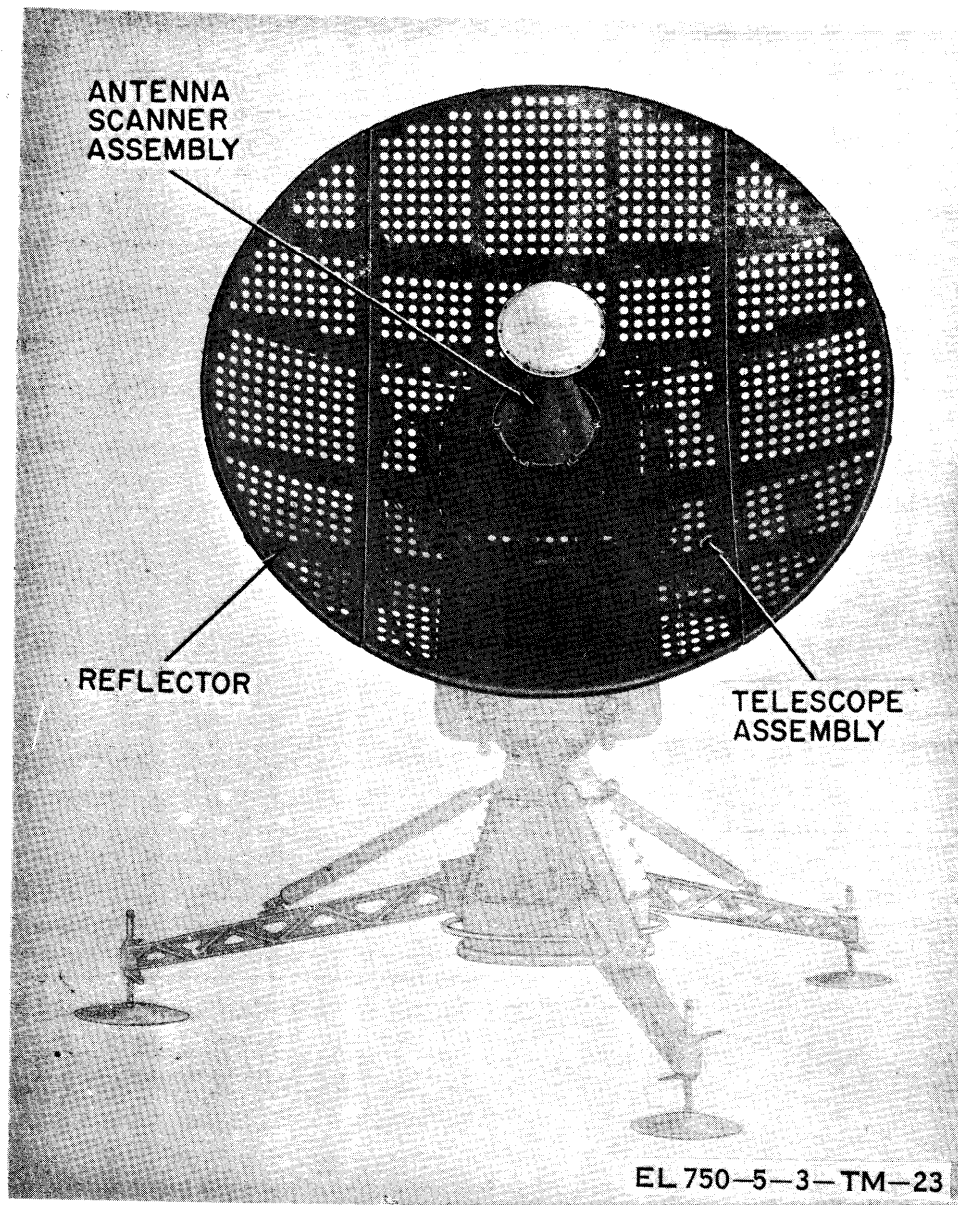


Figure 23. Antenna AS-462/GMD-1.

1. NOMENCLATURE: Antenna AS-462/GMD-1.
2. TYPE CLASSIFICATION: Standard A.
3. SECURITY REQUIREMENTS: Unclassified.
4. PRIMARY USE OR CONCEPT OF EMPLOYMENT: Receives radiosonde signals and provides conical scanning for Rawin Set AN/GMD-1().

BRIEF FUNCTIONAL DESCRIPTION :

a. Antenna AS-462/GMD-1, consisting of a reflector and an antenna scanner assembly, receives signals generated by an airborne radiosonde and provides conical scanning.

b. Antenna AS-462/GMD-1 is used as part of Rawin Set AN/GMD-1() in a rawinsonde system. The radio-

frequency (RF) energy radiated by a radiosonde transmitter is received by the AS-462/GMD-1 and is sinusoidally modulated by conical scanning. This sinusoidal modulation of the RF energy is introduced by the rawin set to permit automatic tracking of the radiosonde.

6. TECHNICAL CHARACTERISTICS:

Scanning type	-----	Conical.
Antenna type	-----	Single dipole.
Reflector type	-----	Parabolic.
Antenna scanner assembly		
drive motor	-----	Induction, split-phase
		capacitor start,
		115-vac $\pm 10\%$, 60 Hz
		$\pm 5-10$, 1,760 rpm.

TM 750-5-3
AS462/GMD-I

Reference voltage generator _ _ 2,040 rpm; 15-vac, 34-
 cps (nominal), two-
 phase, self-excited.

Lobe Width _ _ _ _ _ 6.5° nominal, 3 db
 down, 1,680 Hz.

Power requirements _ _ _ _ _ 115 vac, 60 Hz.

Reflector:

Dimensions _ _ _ _ _ 84 in. high, 22¾ in.
 deep, 84 in. long.

Weight _ _ _ _ _ 126 lb.

7. MAJOR COMPONENTS:

Reflector.
 Antenna scanner assembly.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS: This equipment is used in a system with Rawin Set AN/GMD-1(), Radiosonde Set AN/AMT-4(), and Radiosonde Recorder AN/TMQ-5().

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

- a. *Additional Equipment.*
 Power source, 115 vac, 60 Hz.
 Rawin Set AN/GMD-1().
- b. *Auxiliary Equipment.*
 Radiosonde Set AN/AMT-4().
 Radiosonde Recorder AN/TMQ-5().

10. TOOLS AND TEST EQUIPMENT:

- a. *Tools.*
 Tool Equipment TE-113.
- b. *Test Equipment.*
 Multimeter TS-352/U.
 Test Set TS-538/U.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-206-10, -20,
 -20P, -35 _ _ _ _ _ AS-462/GMD-1
 TM 11-2432A _ _ _ _ _ AN/AMT-4()
 TM 11-6660-228-10 _ _ _ AN/AMT-4()

TM 11-6660-204-10, -25,
 -25P _ _ _ _ _ AN/TMQ-5()
 TM 11-6625-203-12, -20P,
 -35, -45 _ _ _ _ _ AN/URM-105
 TM 11-6625-213-12, -20P,
 -35, -35P _ _ _ _ _ TS-538/U

12. REPAIR PARTS SUPPORT CAPABILITY: To 1974-
 Full support.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.
 Maintenance MOS 35-B-20, 35-D-20.

14. TYPICAL BASIS OF ISSUE:

<i>TOE</i>	<i>Allowance</i>
6-201G _ _ _ _ _	1
6-302H _ _ _ _ _	1
6-576G _ _ _ _ _	2
6-701H _ _ _ _ _	1
6-716H _ _ _ _ _	1
7-100G _ _ _ _ _	1
17-100H _ _ _ _ _	1
37-100H _ _ _ _ _	1
39-51G _ _ _ _ _	1
<i>TA</i>	
6-2 _ _ _ _ _	18
50-366 _ _ _ _ _	12
50-771 _ _ _ _ _	2
50-774 _ _ _ _ _	1
80-10 _ _ _ _ _	1

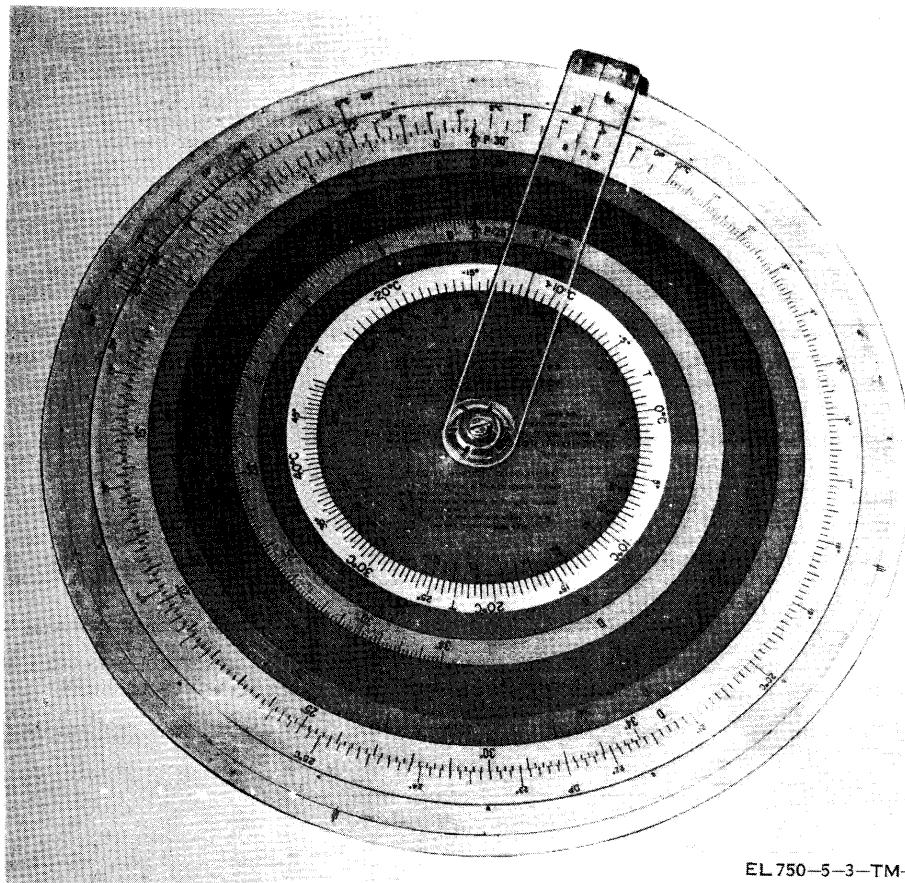
15. PRICE DATA:

- a. Major item _ _ _ _ _ \$1,500.00
- b. Repair parts (1-year cost based on
 100 equipments) _ _ _ _ _ \$22,500.00

16. ITEM REPLACED: None.

17. REMARKS:

Part of Rawin Set AN/GMD-1().



EL 750-5-3-TM-24

Figure 24. Computer, Psychrometric CP-164/UM.

1. NOMENCLATURE: Computer, Psychrometric CP-164/UM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT: Used to compute dewpoint temperature and relative humidity.

5. BRIEF FUNCTIONAL DESCRIPTION: Computer, Psychrometric CP-164/UM is a circular slide rule which is used to compute Celsius dewpoint temperature and percentages of relative humidity from observed values of dry- and wet-bulb Celsius temperatures and atmospheric pressure. All data are read directly from the scales. Computer, Psychrometric CP-164/UM is designed for use with Celsius psychrometric measuring instruments.

6. TECHNICAL CHARACTERISTICS:

Temperature scale _____ In degrees Centigrade.

Temperature range:

Low _____ -50 °C. to 0 ° C.

High _____ -23° C. to +29.4° C.

Wet-bulb depression scales _____ Wet-bulb depression at

23,25,27,28,29,
and 30 in. atmos-
pheric pressure, and
for relative humidity.

Diameter _____ 1 1/4 in.

Material _____ Plastic.

7. MAJOR COMPONENT: Computer, Psychrometric CP-164/UM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS: This equipment is used with Celsius psychrometric measuring instruments.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-204-10, -25,

-25P _____ AN/TMQ-5

12. REPAIR PARTS SUPPORT CAPABILITY : To 1974— Full support.

13. TRAINING REQUIREMENTS: Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

	Allowance
TA	
50-322 _____	32
50-366 _____	24

TM 750-5-3
CP-164/UM

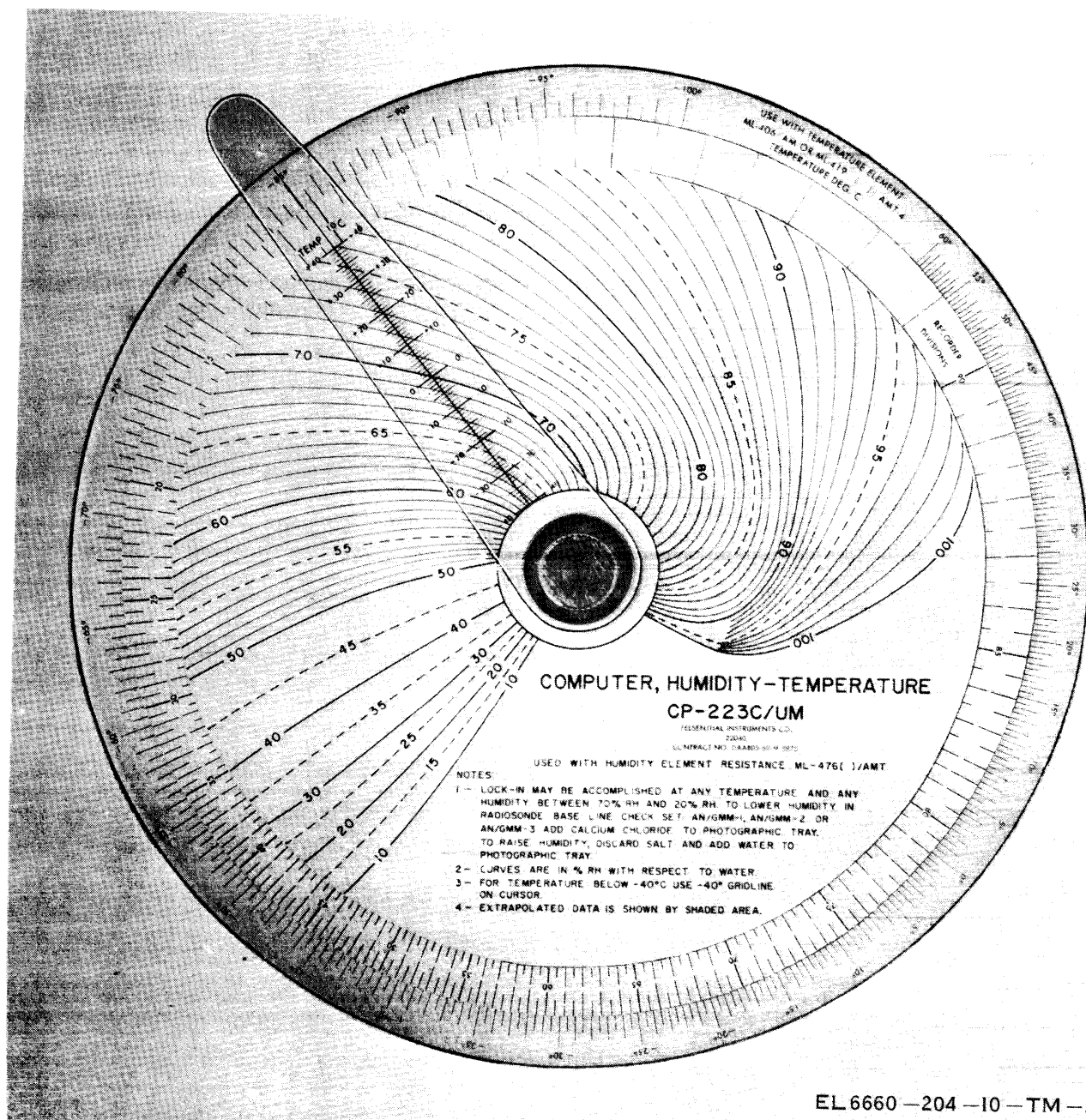
15. PRICE DATA:

a. Major item -----	\$43.40
b. Repair parts (1 year cost based on 100 equipment) -----	\$651.00

16. ITEM REPLACED:

ML-322/UM.

17. REMARKS: None.



EL 6660-204-10-TM-27

Figure 25. Computer, Humidity-Temperature
CP-223C/UM.

1. NOMENCLATURE: Computer, Humidity-Temperature CP-223C/UM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT: Used in evaluating temperature and humidity from radiosonde flights.

5. BRIEF FUNCTIONAL DESCRIPTION: Computer Humidity-Temperature CP-223C/UM is used to evaluate temperature and relative humidity information being received from a balloon-borne radiosonde. The CP-223C/UM is a circular slide rule which consists of three concentric plastic disks mounted together at their common center so that each one is free to rotate. Also located on the center is a transparent cursor arm with a hairline. The hairline radially aligns the graduations of one disk with

those of another. Meteorological data transmitted by a radiosonde set and recorded by the Radiosonde Recorder AN/TMQ-5() is evaluated by translating the graphic representations of the recordings into actual temperature and humidity readings.

6. TECHNICAL CHARACTERISTICS:

Type ----- Plastic, one-cursor,
three-disk.

Scales:

Temperature ----- Two temperature
scales: one scale
+60° C. to -100°
C., 5° C. gradua-
tions; other scale
-40° C. to +40° C.,
1° C. graduations.

Humidity ----- 10% to 100% range,
6% graduation.

Recorder division ----- 1 to 90, one-half units
of graduation.

Dimensions ----- Base disk 10 in. dia,
recorder division
disk 9 in. dia, hu-
midity disk 8 in. dia,
cursor 6 7/16 11 in. long,
1¼ in. tapering to
5/8 in. wide.

7. MAJOR COMPONENTS:

Computer, Humidity-Temperature CP-223C/UM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS: This equipment is used in a system with

Rawin Set AN/GMD-1(), Radiosonde Recorder AN/TMQ-5(), and Baseline Check Set AN/GMM-1().

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM- 11-6660-204-10, -25,
-25P ----- AN/TMQ-5()

12. REPAIR PARTS SUPPORT CAPABILITY: No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

TA	<i>Allowance</i>
50-366 -----	34

15. PRICE DATA :

- a. Major item ----- \$5.13
- b. Repair parts (1-year cost
based 100 equipments) --- Expendable, non-
repairable.

16. ITEM REPLACED:

Temperature Humidity Evaluator ML-420A/AMT-4.

17. REMARKS:

Expendable unit furnished with Radiosonde Recorder AN/TMQ-5().

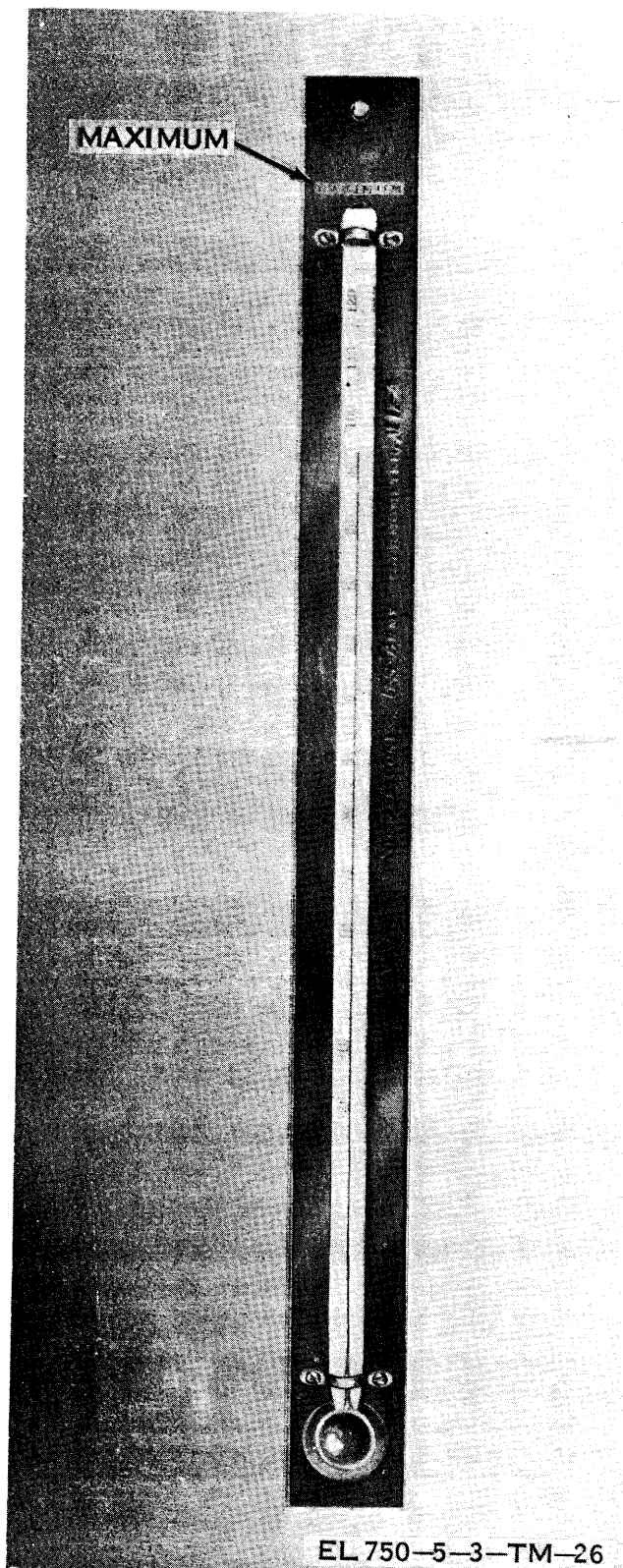


Figure 26. Maximum Thermometer ML-4.

1. **NOMENCLATURE:** Thermometer ML-4.

2. **TYPE CLASSIFICATION:** Standard A.

3. **SECURITY REQUIREMENTS:** Unclassified.

4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Registers maximum temperature to which it has been exposed.

5. **BRIEF FUNCTIONAL DESCRIPTION:**

Thermometer ML-4 is a mercury-in-glass thermometer which indicates the highest temperature to which it has been exposed after being set. Unlike ordinary mercurial thermometers, the bore of the stem is constricted near the bulb so that when the mercury is forced above the constriction by a rise in temperature, it cannot readily return to the bulb. Thermometer ML-4 is graduated in degrees Fahrenheit, and is available in general, tropical, and arctic temperature ranges.

6. **TECHNICAL CHARACTERISTICS:**

Type	Max registering.
Thermal element	Mercury.
Temperature range:	
General	-10° F to +125° F.
Tropical	+10° F to +145° F.
Arctic	-35° F to +105° F.
Accuracy	±0.8° F from -35° F to 0° F ; 0.6° F from 0° F to +32° F, ; ±0.4° F from +32° F to +125° F.
Graduations	Intervals of 1°, each multiple of 10° is numbered.
Mounting	Metal frame.
Operating position	Bulb approx 5° above the horizontal.
Weight	0.8 lb.

7. **MAJOR COMPONENT:**

Thermometer ML-4.

8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**

Thermometer ML-4 is used independently.

9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:**

Support ML-54.

10. **TOOLS AND TEST EQUIPMENT:** None.

11. **REFERENCE DATA AND LITERATURE:**

TM11-6660-222-12 - - - - - ML-4

ML-4

12. REPAIR PARTS SUPPORT CAPABILITY :

No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

<i>TA</i>	<u>Allowance</u>
10-4 -----	2
20-30 -----	9

15. PRICE DATA:

- a. Major item ----- \$4.00
- b. Repair parts (1-year cost Expendable item,
based on 100 equipments). nonrepairable.

16. ITEM REPLACED: None.

17. REMARKS:

Issued as a unit replacement.

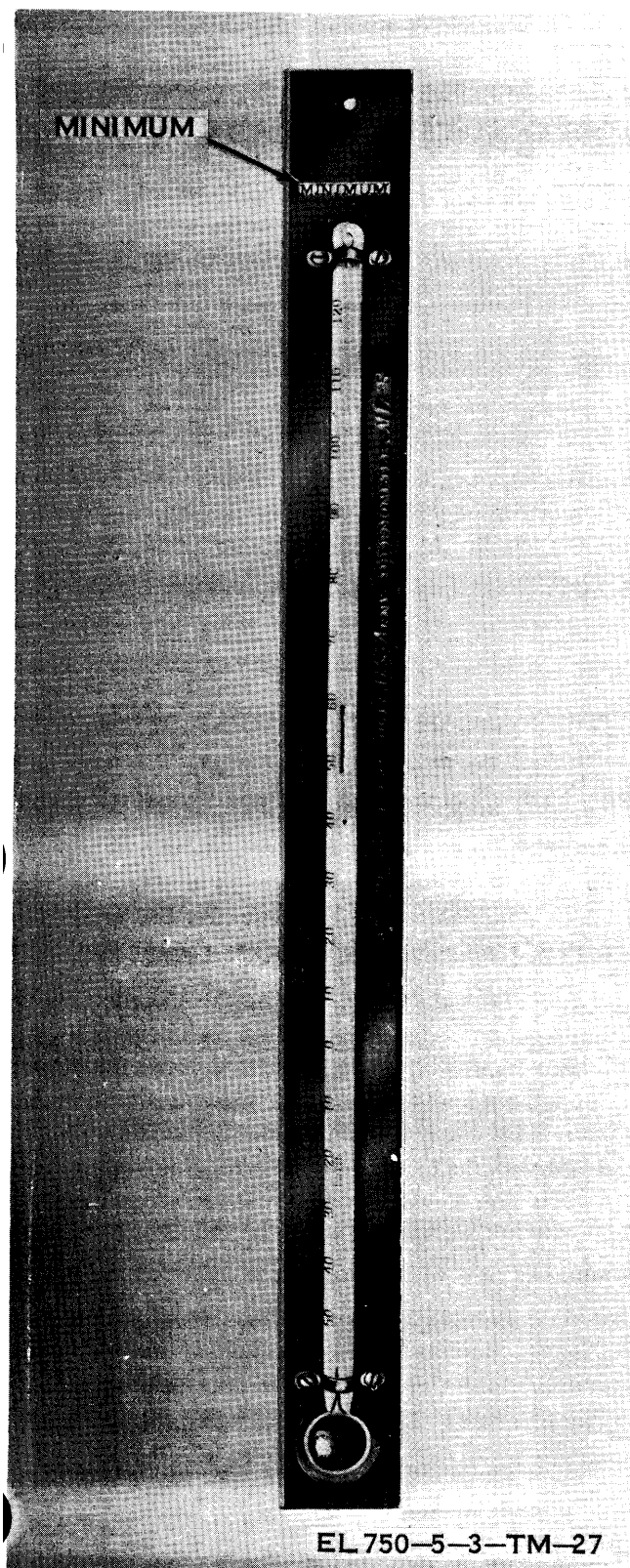


Figure 27. Minimum Thermometer ML-5.

1. **NOMENCLATURE:** Thermometer ML-5.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Indicates the lowest temperature to which it is exposed.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Thermometer ML-5 is an alcohol-in-glass thermometer which indicates the minimum (lowest) temperature to which it has been exposed after being set. An index, about 1/2 inch long, is fitted loosely within the bore of the stem of Thermometer ML-5. The lowest temperature to which the thermometer has been exposed after being set is indicated at the end of the index nearest the top of the stem. Thermometer ML-5 is graduated in degrees Fahrenheit and is available in general, tropical, and arctic temperature ranges. In use, the thermometer must be mounted on Support ML-54.
6. **TECHNICAL CHARACTERISTICS:**

Type	-----	Min registering.
Thermal element	-----	Alcohol.
Temperature range:		
General	-----	-60° F. to + 100° F.
Tropical	-----	-40° F. to + 120° F.
Arctic	-----	-90° F. to +80° F.
Accuracy:		
Below -50° F	-----	+1.8° F.
From -50° F. to -30° F	---	±1.6° F.
From -30° F. to 0° F	---	±1.2° F.
From 0° F. to +32° F	---	± 0.8° F.
Above +32° F	-----	± 0.4° F.
Graduation	-----	Intervals of 1°, each multiple of 10° is numbered.
Overall dimensions	-----	12 in. long, 15/16 in. wide, 1/2 in. deep.
Total weight	-----	0.3 lb (export packed).
7. **MAJOR COMPONENT:**
Thermometer ML-5.
8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
Thermometer ML-5 is used independently.
9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:**
Support ML-54.
10. **TOOLS AND TEST EQUIPMENT:** None.
11. **REFERENCE DATA AND LITERATURE :**
TM 11-6660-222-12 ----- ML-5

ML-5

12. REPAIR PARTS SUPPORT CAPABILITY:

No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

<i>TA</i>	<i>Allowance</i>
20-30 -----	8
50-774 -----	2

15. PRICE DATA:

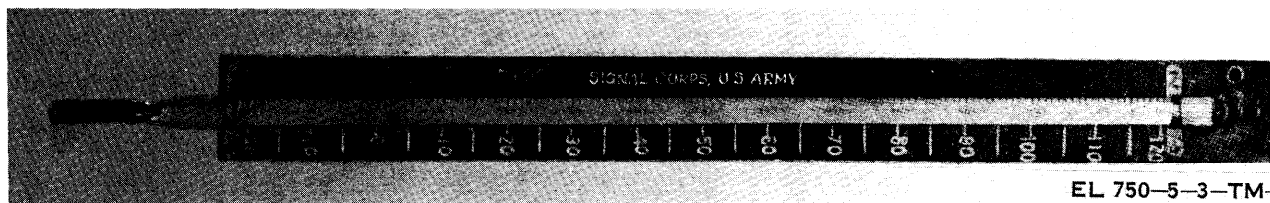
a. Major item ----- \$2.70

b. Repair parts (1-year cost based Expendable, nonre-
on 100 equipments). pairable.

16. ITEM REPLACED: None.

17. REMARKS:

Issued as a unit replacement.



EL 750-5-3-TM-28

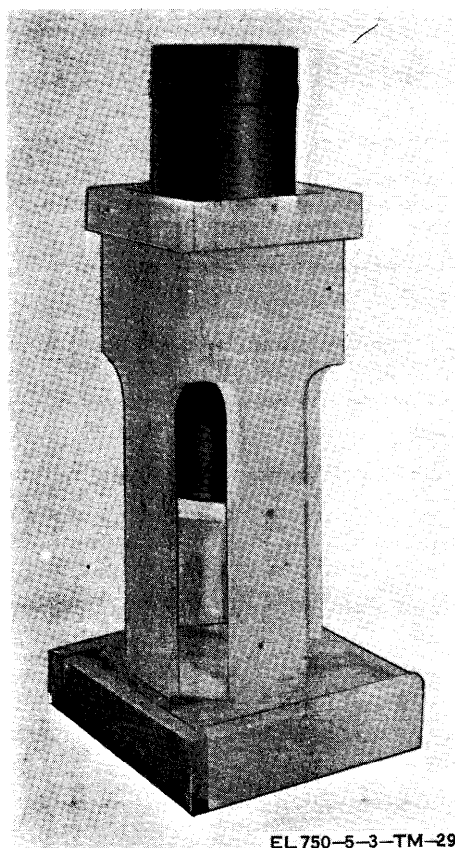
Figure 28. General Thermometer ML-7().

1. **NOMENCLATURE:** Thermometer ML-7().
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used by field troops to take air temperature readings.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Thermometer ML-7(), used in the field to measure and indicate air temperature, is available in general, tropical, and arctic ranges. The general and tropical range models are a mercury-in-glass type, while the arctic range model is an alcohol-in-glass type thermometer. Thermometer ML-7() has a cylindrical bulb and is calibrated in degrees Fahrenheit.
6. **TECHNICAL CHARACTERISTICS:**
Thermal element _____ Mercury, alcohol.
Temperature range:
General _____ -35° ±3° F. to 125°F.
Tropical _____ ±5° F. +10° ±5 °F. to
+145° ±5° F.
Arctic _____ -90° ±5° F. to +90°
±5° F.
Accuracy:
General _____ ±0.4° above 32° F.;
±0.6°, +32° F. to 0°
F.; ±0.8° below 0° F.
Tropical _____ ±0.4° above 32° F.;
±0.6°, +32° F. to 0°
F.; ±0.8° below 0° F.
Arctic _____ ±0.4° above 32° F.;
±0.8°, +32° F. to 0°
F.; ±1.2°, 0° F. to
-30° F.; ±1.6°,
-30° F. to -50° F.;
±1.8° below -50° F.
Graduation _____ Intervals of 1°, each
multiple of 10° is
numbered.

Dimensions _____ 12 in. long, 15/16 in. wide,
5/16 in. dia.
Weight _____ 0.5 lb net, 0.8 lb packed.

7. **MAJOR COMPONENT:**
Thermometer ML-7().
8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This thermometer is used independently.
9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:**
Psychrometer ML-24.
10. **TOOLS AND TEST EQUIPMENT:** None.
11. **REFERENCE DATA AND LITERATURE:**
TM 11-6660-222-12 _____ ML-41()
12. **REPAIR PARTS SUPPORT CAPABILITY:**
No density.
13. **TRAINING REQUIREMENTS:**
Operator MOS 93-E-20, 93-F-20.
14. **TYPICAL BASIS OF ISSUE:**

TOE	Allowance
1-258G _____	1
3-266G _____	3
8-137G _____	1
55-407H _____	1
<i>TA</i>	
50-256 _____	3
77-7 _____	3
15. **PRICE DATA:**
 - a. Major item _____ \$3.54
 - b. Repair parts (1-year cost based Expendable, non-repairable. on 100 equipments).
16. **ITEM REPLACED:** None.
17. **REMARKS:**
Issued as a unit replacement.



EL 750-5-3-TM-29

Figure 29. Gage, Precipitation ML-17().

- 1. **NOMENCLATURE:** Gage, Precipitation ML-17().
- 2. **TYPE CLASSIFICATION:** Standard A.
- 3. **SECURITY REQUIREMENTS:** Unclassified.
- 4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used to measure the quantity of precipitation.
- 5. **BRIEF FUNCTIONAL DESCRIPTION:**

Gage ML-17() is an instrument used to measure the amount of precipitation of rain. The ML-17() consists of a graduated measuring stick and a funnel-shaped, galvanized sheet iron, outer case. Scale ML-75 and Support ML-214 are used with the ML-17() to measure rain data, but the ML-75 and ML-214 are not supplied with the ML-17().

6. TECHNICAL CHARACTERISTICS:

Collector:	
Material	Outer case, galvanized sheet iron semiglass enamel finish.
Design	Funnel-shaped.
Diameter	8 in.
Measuring stick graduation.	10 to 1 depth magnification.
Dimensions	27 in. long, 8¼-in. outside dia.
Weight	20 lb.

7. MAJOR COMPONENTS:

- Collector.
- Measuring stick.
- Overflow can.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This unit is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

Scale ML-75, Support ML-214.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE.

12. REPAIR PARTS SUPPORT CAPABILITY:

To 1974 -Full support,

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

TA	Allowance
3-2	1
10-4	5
20-30	2
50-815	1
50-827	1

15. PRICE DATA:

a. Major item	\$23.10
b. Repair parts (1-year cost based on 100 equipments)	\$846. 50

16. ITEM REPLACED: None.

17. REMARKS: None.

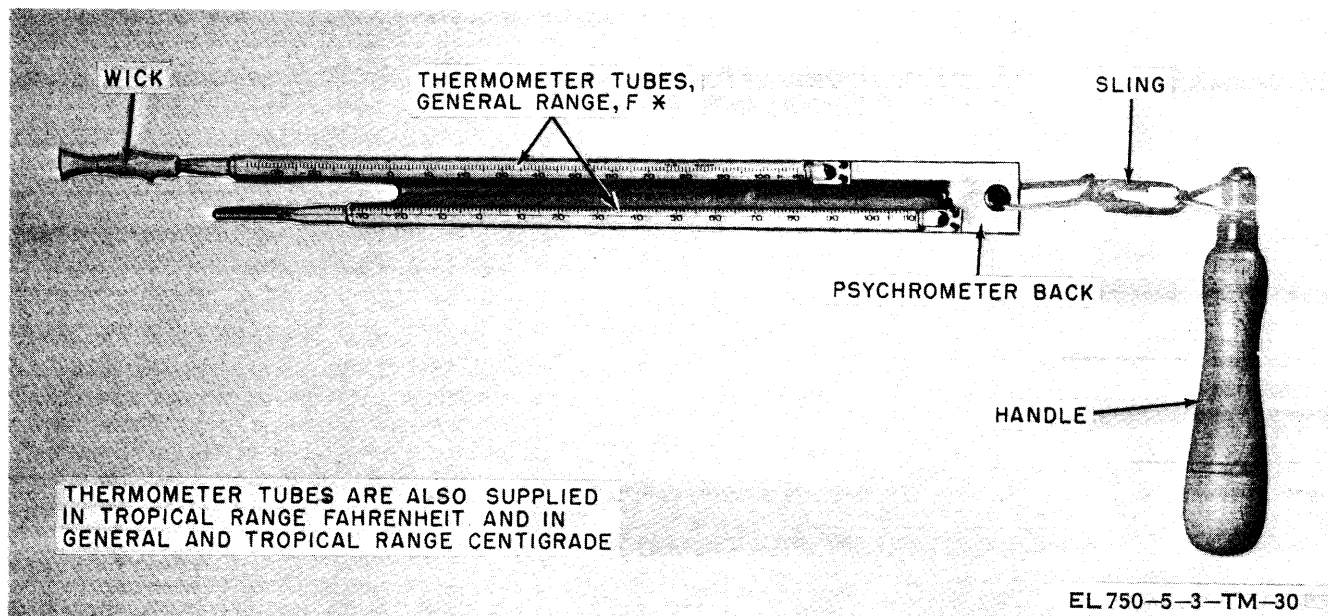


Figure 30. Fahrenheit Psychrometer ML-24.

- 1. **NOMENCLATURE:** Psychrometer ML-24.
- 2. **TYPE CLASSIFICATION:** Standard A.
- 3. **SECURITY REQUIREMENTS:** Unclassified.
- 4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used to measure temperature and water vapor content of the air.

- 5. **BRIEF FUNCTIONAL DESCRIPTION:**
Psychrometer ML-24 consists of two identical mercury-in-glass thermometers mounted on a metal frame which is attached to a sling. One of the thermometers (the dry bulb) is used to measure the temperature of the free air, and the other (the wet bulb) is used to provide a measurement of the water vapor content of the air. From the wet-bulb and dry-bulb readings, the dewpoint, relative humidity, and vapor pressure of the atmosphere can be calculated. In use, the psychrometer is rotated rapidly about an axis at right angles to its length, using a hand sling or Rotor ML-74().

6. TECHNICAL CHARACTERISTICS:

Thermal element	Mercury.
Temperature range:	
General	-35° F. to +115° F.
Tropical	+10° F. to +145° F.
Accuracy	±0.4° above 32° F., ± 0.6° from 0° F. to 32° F., ±8° below 0° F.
Graduations	Intervals of 1°, each multiple of 10° is numbered.
Ventilation	Hand sling or Rotor ML-74().

Dimensions (thermometer tube) 9 3/8 in. long, 7/32 in. outside dia.
Weight 1 lb net, 3 lb packed.

- 7. **MAJOR COMPONENT:**
Psychrometer ML-24.
- 8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This unit is used independently.
- 9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:** None.
- 10. **TOOLS AND TEST EQUIPMENT:** None.
- 11. **REFERENCE DATA AND LITERATURE:**
TM 11-6660-222-12 ML-24
- 12. **REPAIR PARTS SUPPORT CAPABILITY:**
No density.
- 13. **TRAINING REQUIREMENTS:**
Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

	TOE	TA	Allowance
6-525G	-----		2
6-677G	-----		2
11-500G	-----		1
6-1	-----		14
32-13	-----		1
50-322	-----		2
50-510	-----		1
50-815	-----		1
50-816	-----		4
50-826	-----		2
50-914	-----		62

TM 750-5-3

ML-24

<i>TA</i>	<i>Allowance</i>
55-2 -----	1
77-7 -----	10
80-12 -----	1

15. PRICE DATA:

a. Major item ----- \$4.66

b. Repair parts (1-year cost based Expendable, non-repairable, on 100 equipments).

16. ITEM REPLACED: None.

17. REMARKS:

Issued as a unit replacement.

ML-48()

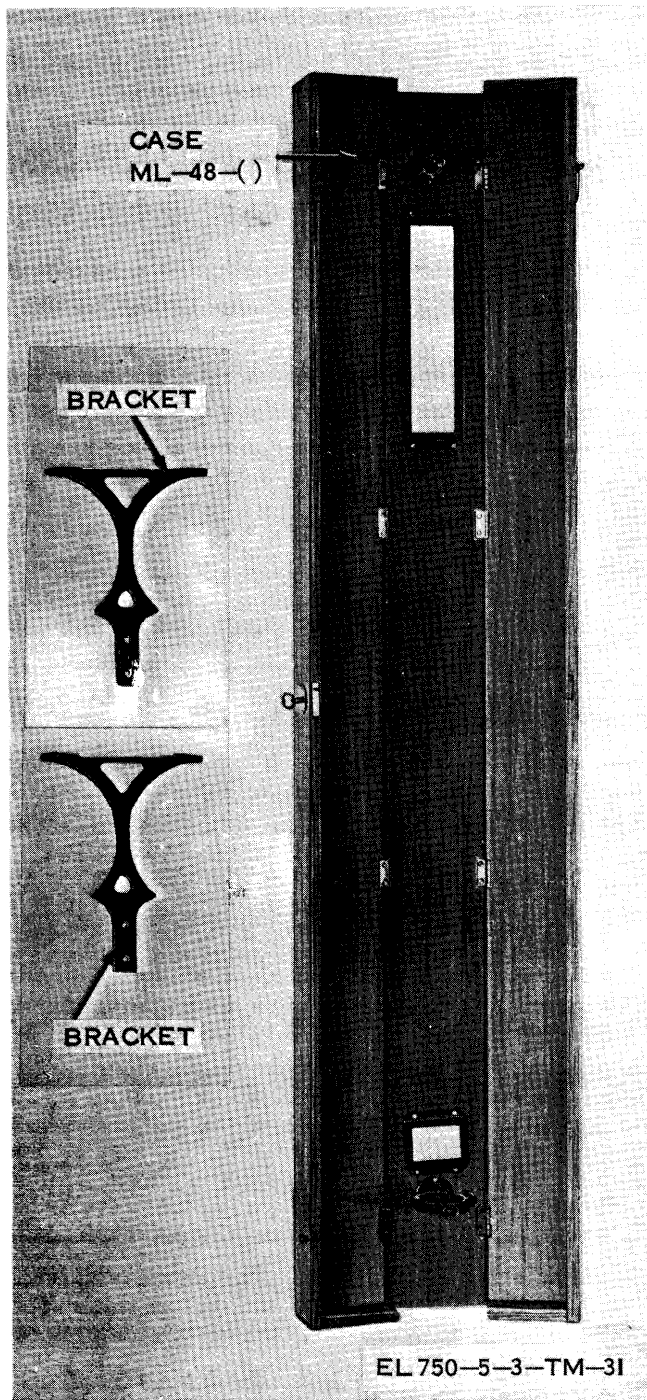


Figure 31. Case, Barometer ML-48().

1. **NOMENCLATURE:** Case, Barometer ML-48().
2. **TYPE CLASSIFICATION:** Standard A.

3. **SECURITY REQUIREMENTS:** Unclassified.

4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Provides a means of suspending Mercurial Barometers ML-2 through ML-2H and ML-512/GM.

5. **BRIEF FUNCTIONAL DESCRIPTION:**
Case, Barometer ML-48() is designed to provide a safe and convenient means of suspending and steadying Mercurial Barometers ML-2 through ML-2H and ML-512/GM.

6. **TECHNICAL CHARACTERISTICS :**
Material _____ Mahogany.
Approx dimensions ___ 44 in. long, 3 3/4 in. wide,
3 5/8 in. high.
Weight _____ 8 lb net, 20 lb packed.

7. **MAJOR COMPONENT:**
Case, Barometer ML-48().

8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This barometer case is used independently.

9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:** None.

10. **TOOLS AND TEST EQUIPMENT:** None.

11. **REFERENCE DATA AND LITERATURE :**
TM 11-428 _____ ML-48()

12. **REPAIR PARTS SUPPORT CAPABILITY :**
No density.

13. **TRAINING REQUIREMENTS:**
Operator MOS 93-E-20.

14. **TYPICAL BASIS OF ISSUE:**

<u>TA</u>	<u>Allowance</u>
8-16 - - - - -	1
8-18 - - - - -	1
8-20 - - - - -	1
8-33 - - - - -	1
10-4 - - - - -	1
20-30 - - - - -	2
50-774 - - - - -	2
62-22 - - - - -	1
63-30 - - - - -	1
77-11 - - - - -	6
 <u>TOE</u>	
8-650G - - - - -	1

15. **PRICE DATA:**
a. Major item _____ \$36.00
b. Repair parts (1-year cost based on 100 equipments) _____ \$540. 00

16. **ITEM REPLACED :** None.

17. **REMARKS:** None.

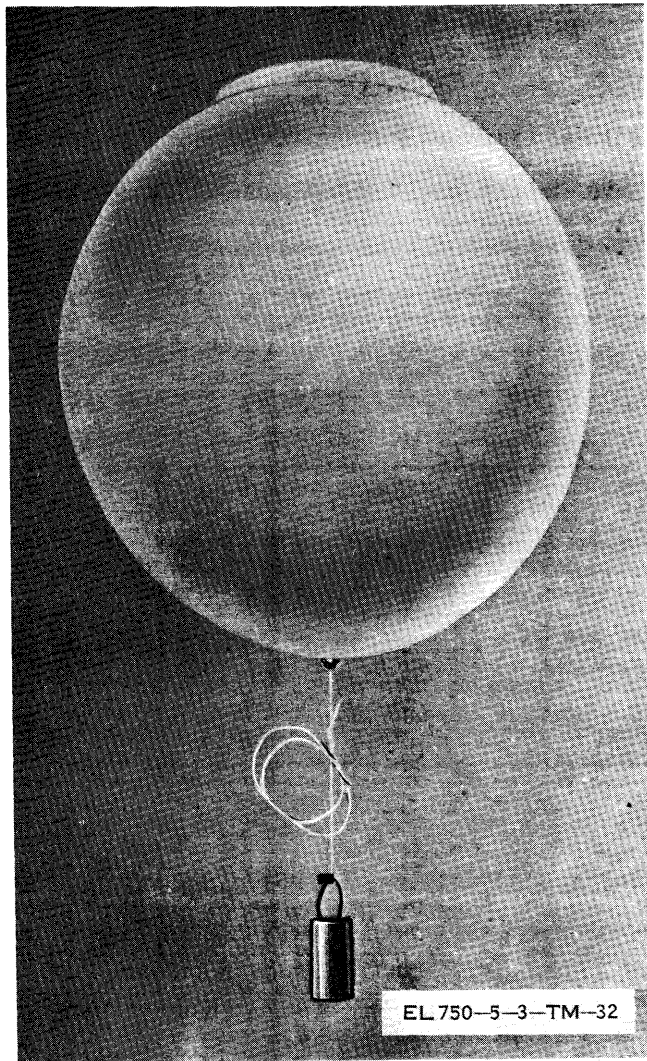


Figure 32. Pilot Balloon ML-51 ().

1. **NOMENCLATURE:** Balloon ML-51 ().
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used as an aid to determine the direction and speed of winds aloft.

5. BRIEF FUNCTIONAL DESCRIPTION:

Balloon ML-51 () is a small (black) pilot balloon which is used to determine the direction and speed of winds aloft. The ML-51 () may be used in early morning, at sunrise, in late evening at sunset when the sky is overcast with thick or thin clouds, or when there is a dense haze aloft. The ML-51 () also may be used at night to determine the height of clouds. Tracking of the balloon may be done visually or with the aid of a theodolite to heights of 30,000 feet.

6. TECHNICAL CHARACTERISTICS:

Type	-----	Pilot.
Material	-----	Neoprene.
Color	-----	Black.
Weight	-----	30 g.
Free lift	-----	132 g.
Average rate of rise	-----	600 fpm, 183 meters-per-minute.
Dimensions	-----	1 7/8 in. long, 9/16 in. dia.
Bursting altitude	-----	30,000 ft.

7. MAJOR COMPONENT:

Balloon ML-51().

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used in a system with Meteorological Station, Manual AN/TMQ-4.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-218-12, -25P ----- AN/TMQ-4

12. REPAIR PARTS SUPPORT CAPABILITY:

No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

15. PRICE DATA:

- a. Major item ----- \$0.21
- b. Repair parts (1-year cost based on 100 equipments). Expendable, non-repairable.

16. ITEM REPLACED: None.

17. REMARKS:

Issued as expendable item with Manual Meteorological Station AN/TMQ-4.

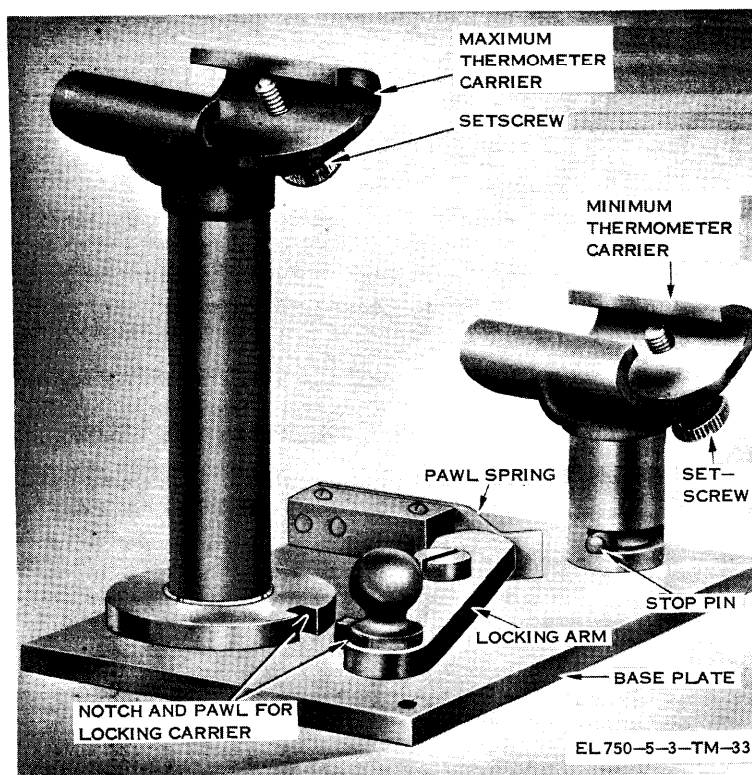


Figure 33. Support ML-54().

1. **NOMENCLATURE:** Support ML-54().
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Provides support for a maximum and a minimum thermometer.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Support ML-54() is a small metal device for holding two thermometers, one maximum and one minimum, in proper exposed position. The ML-54() consists of two pivoted thermometer carriers on a baseplate which is mounted to the interior of Instrument Shelter, Meteorological S-101/UM or Shelter ML-41.
6. **TECHNICAL CHARACTERISTICS:**
Dimensions _____ 2-in. by 3-in. base, 2¾ in. height (approx).
Weight _____ 0.4 lb net, 0.5 lb packed.
7. **MAJOR COMPONENT:**
Support ML-54().
8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATION:**
This unit is used independently.

9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:** None.
10. **TOOLS AND TEST EQUIPMENT:** None.
11. **REFERENCE DATA AND LITERATURE:**
TM 11-6660-222-12 _ _ S-101/UM, ML-41()
12. **REPAIR PART SUPPORT CAPABILITY:**
No density.
13. **TRAINING REQUIREMENTS:**
Operator MOS 93-E-20, 93-F-20.
14. **TYPICAL BASIS OF ISSUE:**

TA	Allowance
20-30	9
15. **PRICE DATA :**
 - a. Major item _____ \$10.00
 - b. Repair parts (1-year cost based Expendable, nonreparable on 100 equipments).
16. **ITEM REPLACED:** None.
17. **REMARKS:** Issued as a unit replacement.

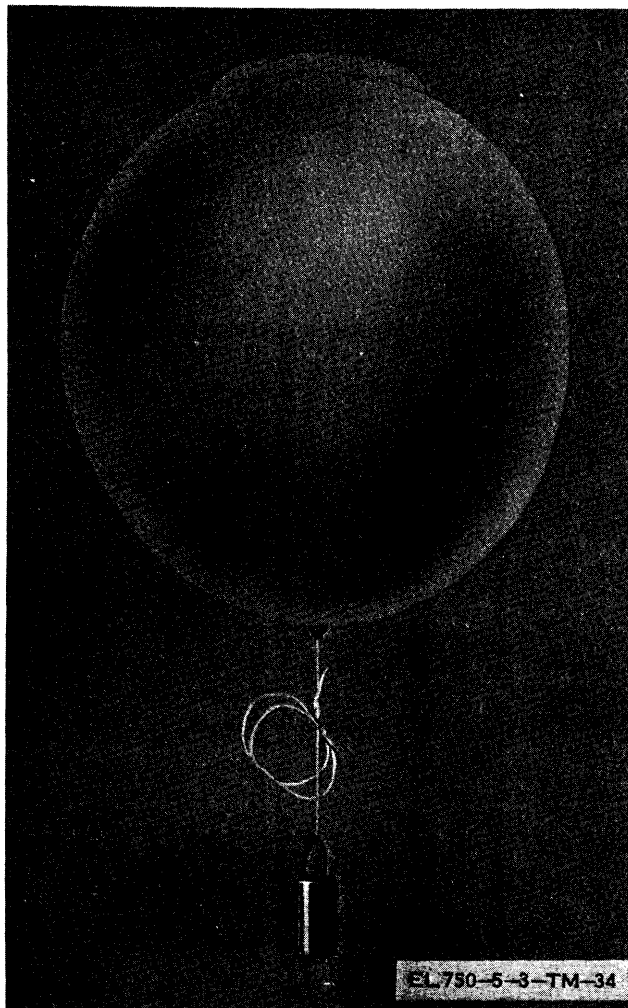


Figure 34. 30-Grain Pilot Balloon ML-64A.

1. **NOMENCLATURE:** Balloon ML-64A.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used as an aid to determine wind direction and wind-speed aloft.

5. BRIEF FUNCTIONAL DESCRIPTION:

Balloon ML-64A, a small red pilot balloon, is used to determine the direction and speed of winds aloft and the height of clouds up to 30,000 feet at night. The balloon may be used when the sky is partly cloudy with either a blue or cloudy background or when conditions are indefinite or changeable. Windspeed and wind direction are determined by following the movement of the balloon visually or with the aid of a theodolite and computing the angular data received.

6. TECHNICAL CHARACTERISTICS:

Type	-----	Pilot.
Material	-----	Neoprene.
Weight	-----	30g.
Color	-----	Red.
Free lift	-----	132 g.
Average rate of rise	-----	600 fpm, 183 mpm.
Dimensions (neck)	-----	1 7/8 in. long, 9/16-in. dia.
Bursting altitude	-----	30,000 ft.
Volume	-----	0.003 cu ft.

7. MAJOR COMPONENT:

Balloon ML-64A.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used as part of Meteorological Station, Manual AN/TMQ-4.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

Theodolite ML-247() or -474/GM.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-660-222-12	-----	ML-64A
TM 11-6660-218-12,-25P	-----	ML-64A

12. REPAIR PARTS SUPPORT CAPABILITY:

No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

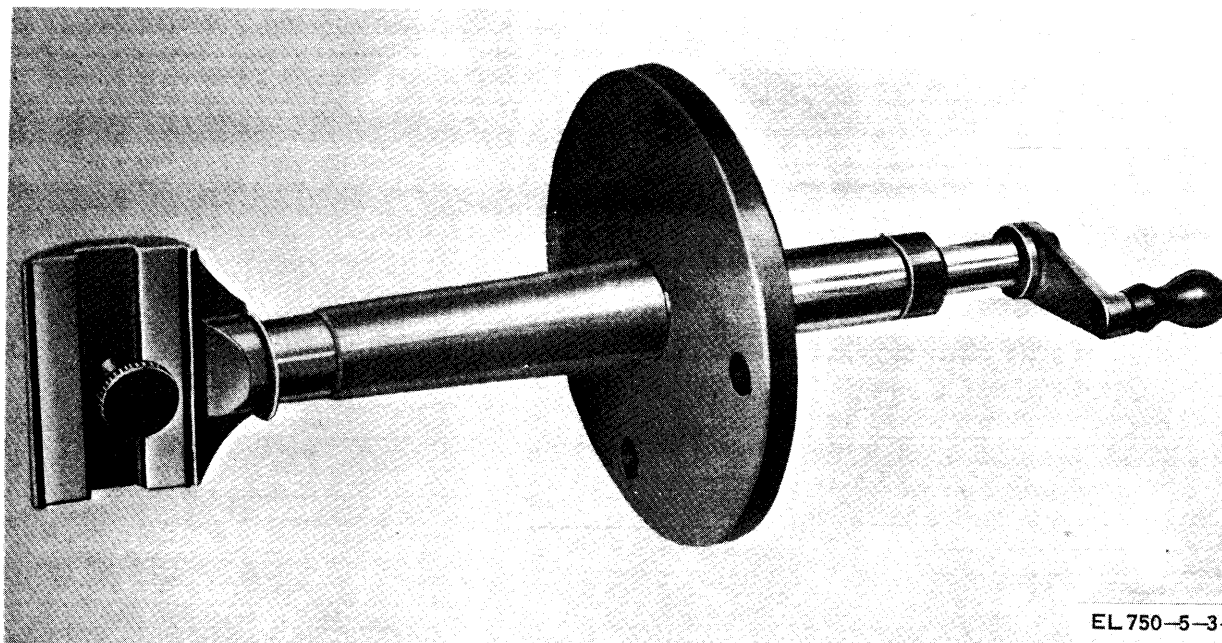
15. PRICE DATA:

a. Major item	-----	\$0.19
b. Repair parts (1-year cost based on 100 equipments).	-----	Expendable, non-repairable.

16. ITEM REPLACED: None.

17. REMARKS:

Issued as expendable item with Manual Meteorological Station AN/TMQ-4.



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Figure 35. Rotor ML-74A.

1. **NOMENCLATURE:** Rotor ML-74A.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used for ventilating Psychrometer ML-24 or ML-224.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Rotor ML-74A is a mechanical device for ventilating Psychrometer ML-24 or Psychrometer ML-224. This equipment consists of a rotatable steel shaft in a metal housing with a handle in one end for turning and a fixture on the other end for mounting the psychrometer. The ML-74A, when installed in Shelter ML-42 or S-101/UM, permits cranking of the rotor from outside the shelter.
6. **TECHNICAL CHARACTERISTICS:**
Shaft ----- Rotating; handle in one
end and clamp in other.
Weight ----- 2.16 net, 4 lb packed.
7. **MAJOR COMPONENT:**
Rotor ML-74A.
8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This equipment is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

Shelter S-101 or ML-41B.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-222-12 ----- ML-74A
TM 11-6660-218-12, -25P --- S-101/UM

12. REPAIR PARTS SUPPORT CAPABILITY:

To 1974-Full support.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

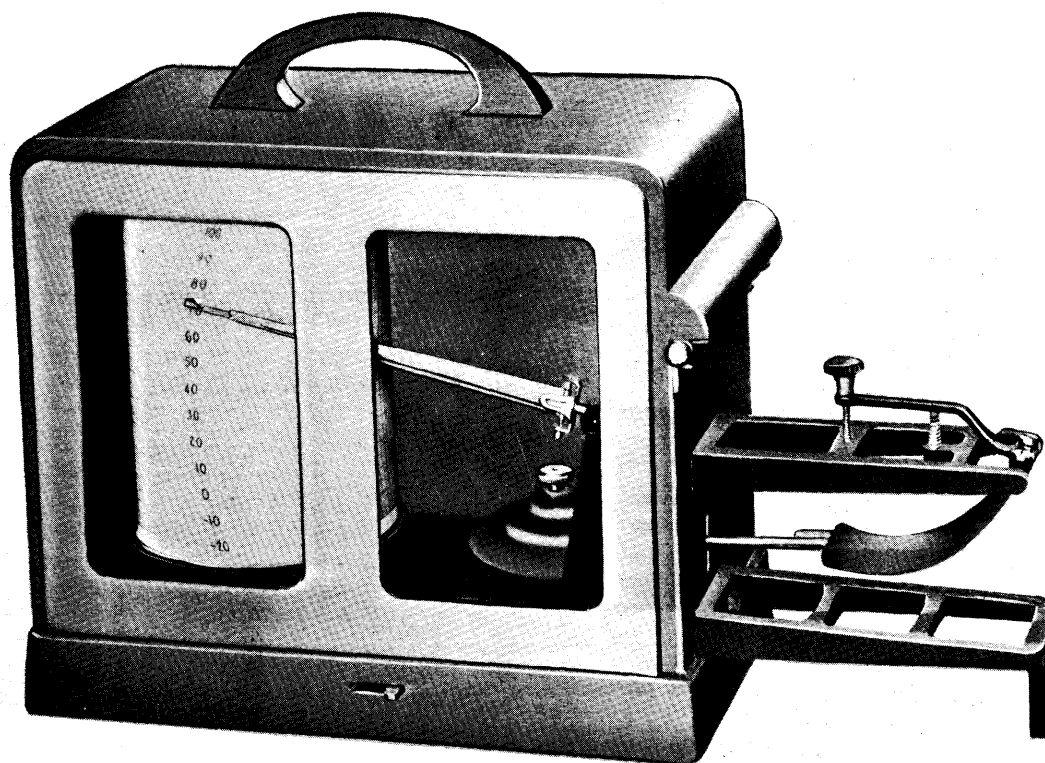
TA	Allowance
20-30 -----	3
32-13 -----	1

15. PRICE DATA:

- a. Major item ----- \$83.35
- b. Repair parts (1-year cost based on 100 equipments) ----- \$1,250.25

16. ITEM REPLACED: None.

17. REMARKS: None.



EL7504-3-TM-36

Figure 36. Thermograph ML-77.

1. **NOMENCLATURE:** Thermograph ML-77.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used to continuously record ambient temperature.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Thermograph ML-77 is a portable instrument which provides a means for automatically and continuously sensing and recording of surface atmospheric temperature over a period of either 1 day or 1 week. The LML-77 records on a chart ambient temperatures within the ranges of - 50° F. to + 80° F. and -20° F. to +110° F. depending on the adjustment and the chart used.

6. TECHNICAL CHARACTERISTICS:

Charts:

Range:

Thermograph Chart - 50° to + 80° F.
ML-234.

Thermograph Chart - 20° to + 110° F.
ML-235.

Graduations:

Temperature _ _ _ _ 1° F, division labeled
at 10° intervals.

Time _ _ _ _ _ 2-hr interval divi-
sions.

Clock, running time _ _ _ _ _ 8 days (each wind-
ing).

Speed of recording cylinder _ _ 1 revolution/day or
1 revolution/week.

Dimensions _ _ _ _ _ 14 in. long, 5 5/8 in.
wide, 9 9/16 in. high.

7. MAJOR COMPONENTS:

Clock ML-79.

Pen.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This unit is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

ML-77

10. TOOLS AND TEST EQUIPMENT:

a. Tools.

- Screwdriver TL-456/U.
- Screwdriver TL-458/U.

b. Test Equipment.

- Thermometer ML-7.
- Electric office clock.

11. REFERENCE DATA AND LITERATURE:

- TM 11-426-50 _____ } ML-77
- TM 11-6660-225-10-50P _____ }

12. REPAIR PARTS SUPPORT CAPABILITY:

To 1974-Full support.

13. TRAINING REQUIREMENTS:

- Operator MOS 93-E-20.
- Maintenance MOS 35-C-20.

14. TYPICAL BASIS OF ISSUE:

<u>TA</u>	<u>Allowance</u>
5-1101 _____	1
8-7 _____	7

<u>TA</u>	<u>Allowance</u>
8-29 _____	2
10-4 _____	25
32-82 _____	5
20-30 _____	2
32-13 _____	1
50-147 _____	2
50-156 _____	13
50-256 _____	12
50-456 _____	1
50-610 _____	1
50-811 _____	2
50-731 _____	4
77-4 _____	1

15. PRICE DATA:

- a. Major item _____ \$204.00
- b. Repair parts (1-year cost based on 100 equipments) _____ \$3, 060.00

16. ITEM REPLACED: None.

17. REMARKS: None.

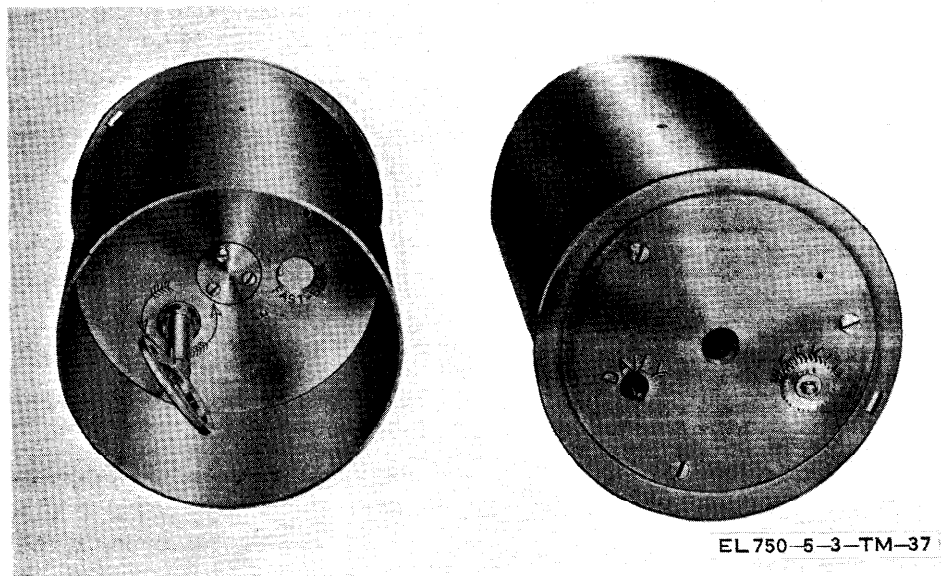


Figure 37. Clock ML-79.

1. NOMENCLATURE: Clock ML-79.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:

Used to rotate chart recording cylinder of Thermographs ML-77 () and ML-277().

5. BRIEF FUNCTIONAL DESCRIPTION:

Clock ML-79 is used with Thermographs ML-77, ML-77A, ML-277, and ML-277A to aid in the continuous recording of ambient temperature over a period of 1 or 7 days. The ML-79 rotates itself and a recording cylinder, which is mounted over it, around a main shaft fastened to the base of the thermograph. A chart is pinned on the cylinder and as the clock rotates with the recording cylinder, variations in temperature cause a pen to mark the chart; thus, the chart furnishes a record of changes in temperature compared with time. The ML-79 is provided with two gear shafts; one completes a rotation in 1 day and the other in 1 week. This permits recording of ambient temperature for 1 day or 1 week.

6. TECHNICAL CHARACTERISTICS:

Type _ _ _ _ _ Spring driven.
 Clock, running time _ _ _ 8 days each winding.
 Cylinder:
 Revolutions _ _ _ _ _ 1 in 7 days or 1 in 1 day.
 Dimensions _ _ _ _ _ 130-mm long, 93-mm dia.
 Weight _ _ _ _ _ 2 lb net.
 Special feature _ _ _ _ _ Fast and slow adjustments provided.

7. MAJOR COMPONENT:

Clock ML-79.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This clock is used in a facility with Thermographs ML-277, ML-277A, or Thermographs ML-77, ML-77A

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-225-10, -50P _ _ _ _ _ ML-79

ML-79

12. REPAIR PARTS SUPPORT CAPABILITY:

No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.
Maintenance MOS 35-C-20.

14. TYPICAL BASIS OF ISSUE.

15. PRICE DATA:

a. Major item _ _ _ _ _ \$75.00
b. Repair parts (1-year cost based on 100
equipments) _ _ _ _ _ \$1,125.00

16. ITEM REPLACED: None.

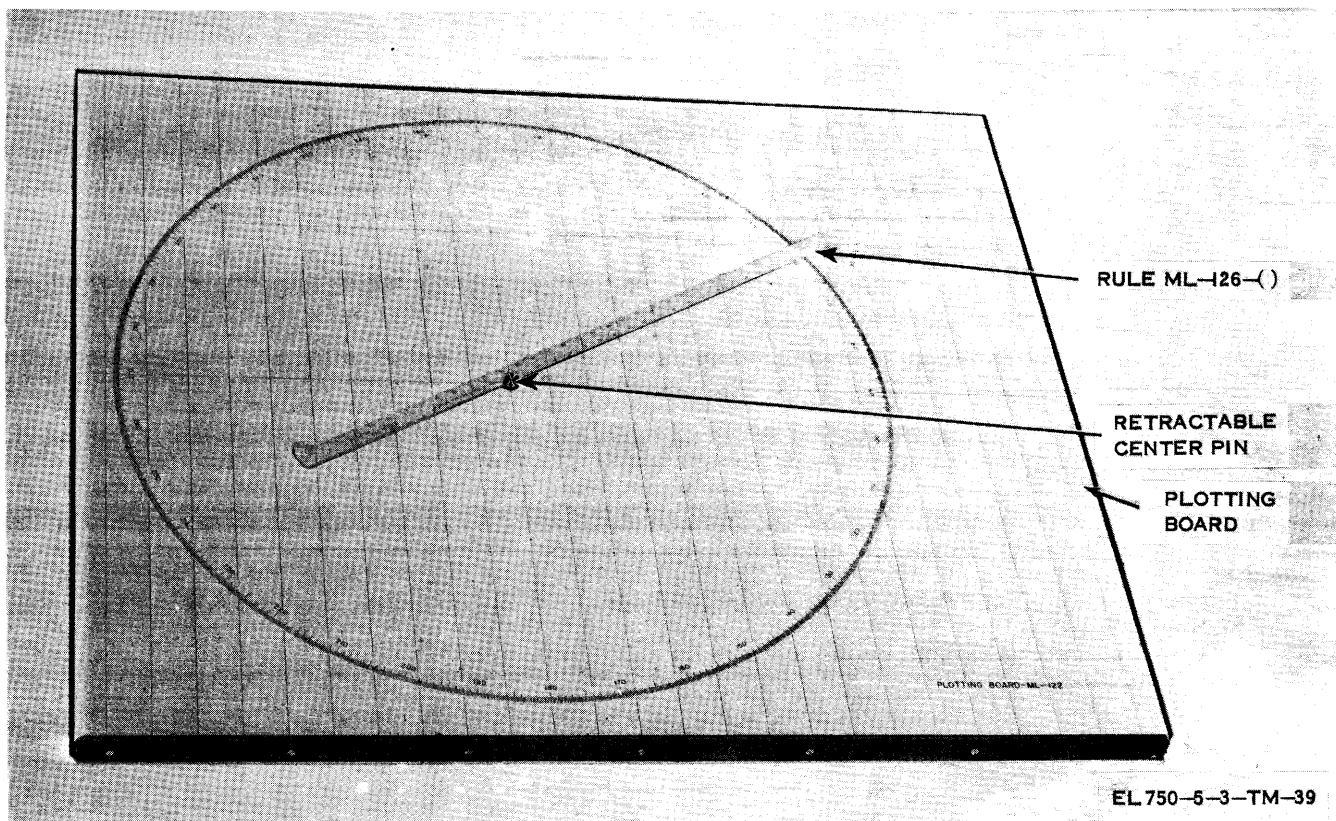
17. REMARKS: None.



Figure 38. Aneroid Barometer ML-102().

1. **NOMENCLATURE:** Aneroid Barometer ML 102().
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used to measure atmospheric pressure.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Aneroid Barometer ML-102() is designed for use in fixed or mobile stations and for transport by hand or in vehicles. Apart from the measurement of atmospheric pressure, the ML-102() can be used in determining height above sea level or above the ground, and in determining differences in elevation between two points.
6. **TECHNICAL CHARACTERISTICS:**
Type ----- Aneroid, portable, precision.

- Range:
In. of mercury ----- 22 to 31.5 (ML-102-B, -E, -F).
- Millibar:
ML-102-B, -E, -F --- 745 to 1,085.
ML-102-D, -G --- 745 to 1,065.
- Graduation intervals:
In. scale ----- 0.02 from 22 to 31, numbered each 0.1 in. (ML-102-B, -E, -F).
- Millibar scale, ML-102-B, -E, -F. 1 mb, numbered each 5 mb.
- Reading position ----- Vertical (ML-102-B, -E, -F), horizontal (ML-102-D, -G).
- Case:
Type ----- Weatherproofed plywood.



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Figure 39. Plotting Board ML-122.

1. NOMENCLATURE: Plotting Board ML-122.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Used to plot and graphically compute meteorological data.

5. BRIEF FUNCTIONAL DESCRIPTION:

Plotting Board ML-122 consisting of Rule ML126-A and a wooden drawing (plotting) board, is used to plot and graphically compute meteorological data. Plotting Board ML-122 is used to compute the horizontal projection of the trajectory of a balloon, using data obtained from rawin or radar observations. The projection and trajectory of the balloon is plotted as a means of determining the windspeed and wind direction of the upper air.

6. TECHNICAL CHARACTERISTICS:

Dimensions:

Rule ML-126-A 23 1/16 x 1 1/16 x 5/32 in.
Plotting board 35 x 30 7/8 in.

Weight:

Rule ML-126-A 1/2 lb.
Plotting board 30 lb.

7. MAJOR COMPONENTS:

Plotting board.
Rule ML-126-A.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS :

This equipment is used as part of Meteorological Station, Manual AN/TMQ-4.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-2442 ML-122
TM 11-6660-218-12, -25P AN/TMQ-4

12. REPAIR PARTS SUPPORT CAPABILITY:

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

TA	Allowance
50-322	16
50-366	12
50-734	2
50-774	2

15. PRICE DATA:

a. Major item \$70.00
b. Repair parts (1-year cost based on 100 equipments) \$1,050.00

16. ITEM REPLACED:

Replaces ML-55.

17. REMARKS:

Part of Meteorological Station, Manual AN/TMQ-4().

ML-132

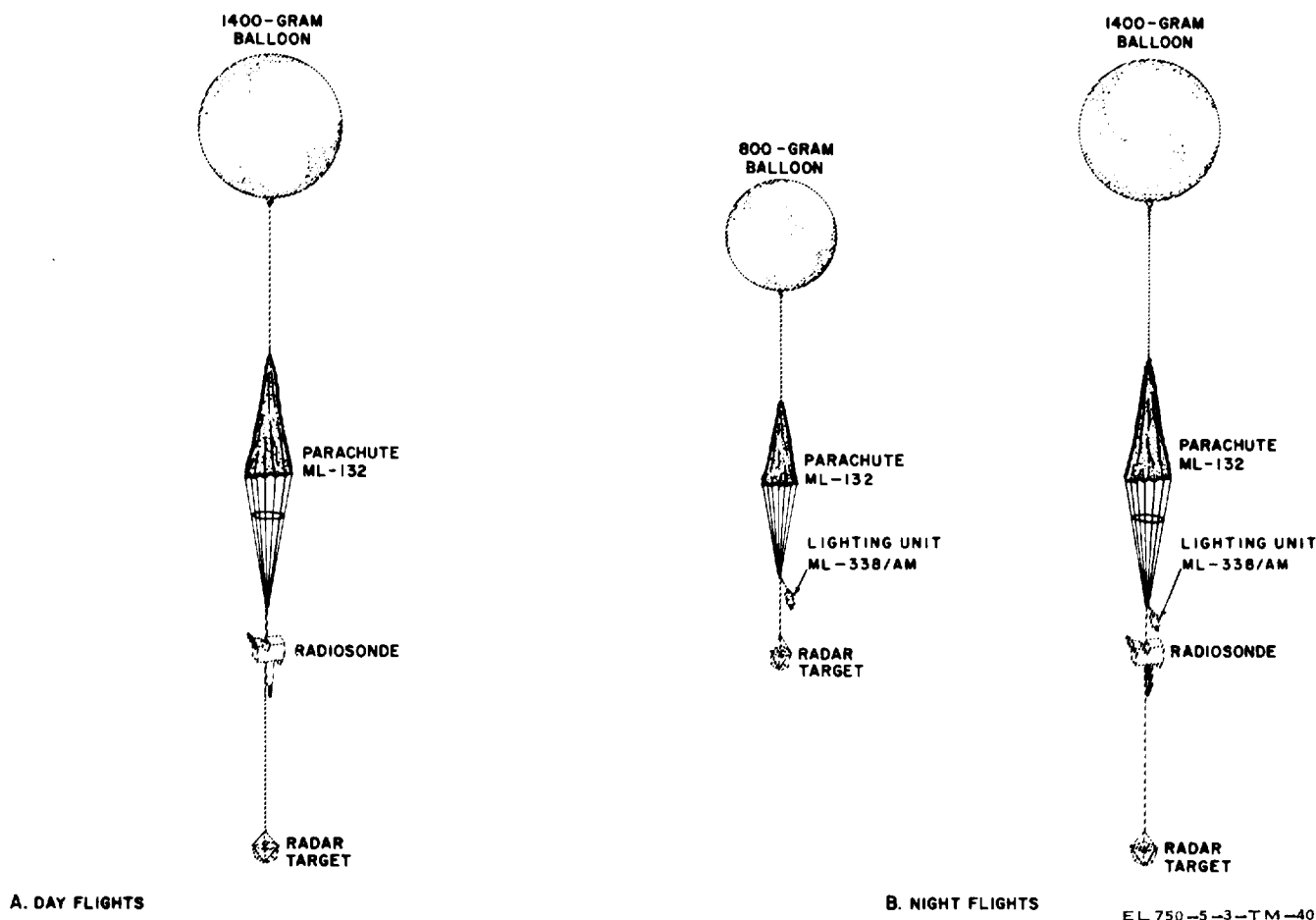


Figure 40. Parachute ML-132.

1. **NOMENCLATURE:** Parachute ML-132.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE ON CONCEPT OF EMPLOYMENT:**
Used to retard the descent of radiosonde equipment.
5. **BRIEF FUNCTIONAL DESCRIPTION.**
Parachute ML-132 is a paper parachute which is used to retard the descent of radiosonde equipment AN/AMT-4() or AN/AMT-12 following the bursting of the balloon that took the equipment aloft. The ML-132 parachute slows the descent of the balloon train and prevents injury to persons or property by the falling radiosonde equipment.
6. **TECHNICAL CHARACTERISTICS:**

Material:	
ML-132	Paper.
ML-132-A	Cloth.
Diameter	6 ft.
Weight	100 g.

7. **MAJOR COMPONENT:**
Parachute ML-132.
8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This equipment is used in a system with Balloon ML-537/UM and Radiosonde AN/AMT-4(), or Radiosonde AN/AMT-12.
9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:** None.
10. **TOOLS AND TEST EQUIPMENT:** None.
11. **REFERENCE DATA AND LITERATURE:**
TM 11-6660-218-12,-25P ML-132
TM 11-6660-222-12
12. **REPAIR PARTS SUPPORT CAPABILITY:**
No density.
13. **TRAINING REQUIREMENTS:**
Operator MOS-93-E-20, 93-F-20.
14. **TYPICAL BASIS OF ISSUE.**

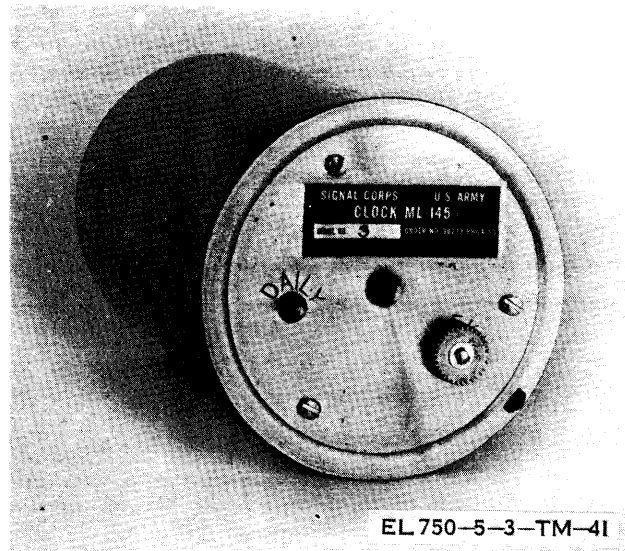
15. PRICE DATA:

- a. Major item _ _ _ _ _ \$1.32.
- b. Repair parts (1-year cost based on 100 equipments). Expendable, non-repairable.

16. ITEM REPLACED: None.

17. REMARKS:

Part of Meteorological Station, Manual AN/TMQ-4() issued as a unit replacement.



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Figure 41. Clock ML-145.

1. **NOMENCLATURE:** Clock ML-145.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used to rotate chart cylinders of Barograph ML-3() and Barograph ML-563/UM.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Clock ML-145 is an 8-day, spring-driven, integrally propelled mechanism used in Barograph ML-3() and Barograph ML-563/UM to aid in the recording of variations in atmospheric pressure. The ML-145 rotates itself and a chart cylinder, in which it is mounted, around on a main shaft fastened to the base of the barograph. Chart ML-236 is mounted on the chart cylinder. As the ML-145 rotates with the chart cylinder and the chart, a pen makes marks on the chart representing variations in atmospheric pressure. The chart furnishes a record of changes in air pressure with respect to time. Clock ML-145 which completes 1 revolution in 4½ days measures the time.
6. **TECHNICAL CHARACTERISTICS:**

Type	Spring driven, integral propulsion, 8-day clock.
Revolution	1 complete revolution in 4½ days.
Special features	Fast and slow adjustment.
Height	175 mm.

Diameter _____ 93 mm.
Weight _____ 2½ lb net.

7. **MAJOR COMPONENT:**
Clock ML-145.
8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This equipment is used with Barograph ML-3 or ML-563/UM.
9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:** None.
10. **TOOLS AND TEST EQUIPMENT:**
Screwdriver Set, Jeweler.
Barometer, Aneroid, or Barometer Mercurial.
11. **REFERENCE DATA AND LITERATURE:**
TM 11-425 _____ ML-145
12. **REPAIR PARTS SUPPORT CAPABILITY:**
No density.
13. **TRAINING REQUIREMENTS:**
Operator MOS 93-E-20, 93-F-20.
Maintenance MOS 35-C-20.
14. **TYPICAL BASIS OF ISSUE:**

TA	QTY
50-818	1
15. **PRICE DATA.**
16. **ITEM REPLACED:** None.
17. **REMARKS:** None.

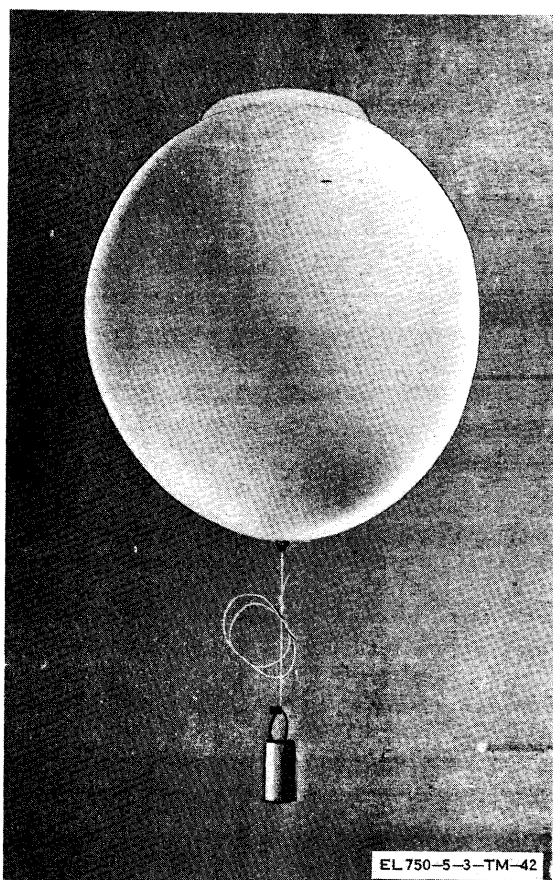


Figure 42.30-Gram Pilot Balloon ML-155A.

1. **NOMENCLATURE:** Balloon ML-155A.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used to determine the direction and speed of winds aloft.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Balloon ML-155A, a small orange pilot balloon, assists in the determination of wind direction and windspeed aloft using Theodolite ML-247() or ML-474/6M and esti-

mating the height of clouds up to 30,000 feet at night. The ML-155A may be used when there are very thin cirrus clouds or when a haze partially covers the sky. Windspeed and wind direction may be computed by tracking the balloon visually and computing the angular data received.

6. TECHNICAL CHARACTERISTICS:

Type	-----	Pilot.
Material	-----	Neoprene.
Color	-----	Orange.
Weight (inflated)	-----	30 g.
Free lift	-----	132 g.
Average rate of rise	-----	600 fpm/183 meters per min.
Bursting altitude	-----	30,000 ft/9144 meters.
Dimensions (neck)	-----	1 7/8in. long, 9/16-in dia.
Volume	-----	0.003 cu ft.

7. MAJOR COMPONENT:

'Balloon ML-155A.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used in a meteorological system.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE :
TM 11-6660-222-12 ----- ML-155A

12. REPAIR PARTS SUPPORT CAPABILITY :
No density.

13. TRAINING REQUIREMENTS:
Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE.

15. PRICE DATA:

a. Major item	-----	\$0.25
b. Repair parts (1-year cost based on 100 equipments).	-----	Expendable item, nonrepairable.

16. ITEM REPLACED: None.

17. REMARKS:
Issued as a unit replacement.

(No illustration available)

- 1. NOMENCLATURE:** Balloon ML-156A.
- 2. TYPE CLASSIFICATION:** Standard A.
- 3. SECURITY REQUIREMENTS:** Unclassified.
- 4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used to and in the determination of wind direction and speed aloft.
- 5. BRIEF FUNCTIONAL DESCRIPTION:**
Balloon ML-156A, a small yellow pilot balloon, is used to determine the direction and speed of winds aloft. The ML-156A may be used when there are very thin cirrus clouds or when a haze partially covers the sky. The ML-156A also may be used to determine the height of clouds. Tracking of the ML-156A can be done visually with theodolite equipment. Movement of the balloon in the atmosphere supplies angular data from which the wind direction and speed are computed. Balloon ML-156A has a limiting operating range of 30,000 feet or 9,144 meters.
- 6. TECHNICAL CHARACTERISTICS:**

Type	-----	Pilot.
Material	-----	Neoprene.
Color	-----	Yellow.
Weight (inflation)	-----	30 g.
Free lift	-----	132 g.
Average rate of rise	---	600 fpm/183 meters per min.
Bursting altitude	----	30,000 ft/9, 144 meters.
Dimensions (neck)	----	1 7/8 in. long, 9/16-in. dia.

- 7. MAJOR COMPONENT:**
Balloon ML-156A.
- 8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This equipment is used in a meteorological system.
- 9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:** None.
- 10. TOOLS AND TEST EQUIPMENT:** None.
- 11. REFERENCE DATA AND LITERATURE:**
TM 11-6660-222-12 ----- ML-156A
- 12. REPAIR PARTS SUPPORT CAPABILITY:**
No density.
- 13. TRAINING REQUIREMENTS:**
Operator MOS 93-E-20, 93-F-20.
- 14. TYPICAL BASIS OF ISSUE.**
- 15. PRICE DATA:**

a. Major item	-----	\$0.19
b. Repair parts (1-year cost based on 100 equipments).		Expendable, non-repairable.
- 16 ITEM REPLACED:** None.
- 17. REMARKS:**
Issued as a unit replacement.

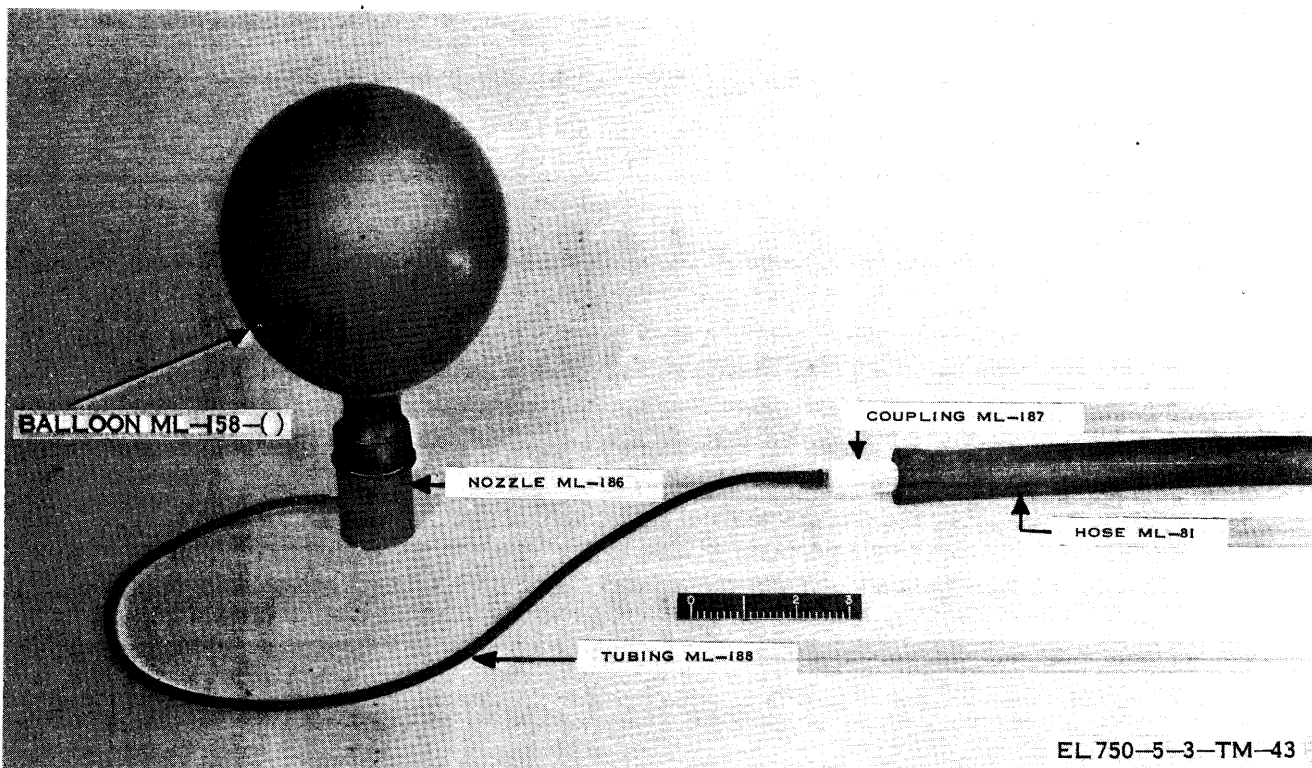
(No illustration available)

- 1. **NOMENCLATURE:** Balloon ML-157.
- 2. **TYPE CLASSIFICATION:** Standard A.
- 3. **SECURITY REQUIREMENTS:** Unclassified.
- 4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used during the day to determine ceiling height of clouds.
- 5. **BRIEF FUNCTIONAL DESCRIPTION:**
Balloon ML-157 is a black ceiling balloon used during the day to determine the height of clouds when the ceiling is approximately 2,500 feet/762 meters or less. The ceiling may be computed when the ascent rate of the balloon and the time interval between the balloon's release and its disappearance into a cloud deck are known.
- 6. **TECHNICAL CHARACTERISTICS:**

Type _____	Ceiling.
Material _____	Neoprene.
Color _____	Black.
Weight _____	10 g.
Free lift _____	40 g.
Average rate of rise _____	During first 1¼ rein, the balloon ascends 580 ft or 152 meters after which ascent is at a rate of 360 fpm or 110 meters per min.
Bursting altitude, ML-157.	10,000 ft /3,048 meters.
Dimensions (neck) _____	2 in. long, 7/8-in. dia.

- 7. **MAJOR COMPONENT:**
Balloon ML-157.
- 8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This equipment is used in a meteorological system.
- 9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:** None.
- 10. **TOOLS AND TEST EQUIPMENT:** None.
- 11. **REFERENCE DATA AND LITERATURE:**

TM 11-6660-222-12 •••••Ž ML-157
 TM 11-6660-218-12, -25P •• AN/TMQ-4
- 12. **REPAIR PARTS SUPPORT CAPABILITY:**
No density.
- 13. **TRAINING REQUIREMENTS:**
Operator MOS 93-E-20, 93-F-20.
- 14. **TYPICAL BASIS OF ISSUE.**
- 15. **PRICE DATA:**
 - a. Major item _ _ _ _ _ \$0.21
 - b. Repair parts (1-year cost based on 100 equipments). Expendable, non-repairable.
- 16. **ITEM REPLACED:** None.
- 17. **REMARKS:**
Issued as a unit replacement.



EL 750-5-3-TM-43

Figure 43. Ceiling Balloon ML-158.

1. **NOMENCLATURE:** Balloon ML-158.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used during the day to determine ceiling height.

5. BRIEF FUNCTIONAL DESCRIPTION :

Balloon ML-158 is a red ceiling balloon used during the day to determine the height of clouds when the ceiling is approximately 2,500 feet/762 meters or less. The ceiling may be computed when the ascent rate of the balloon and the time interval between the balloon's release and its disappearance into a cloud deck are known.

6. TECHNICAL CHARACTERISTICS:

Type	-----	Ceiling.
Material	-----	Neoprene.
Color	-----	Red.
Weight	-----	10 g.
Free lift	-----	40 g.
Volume	-----	1.6 cu ft.
Average rate of rise	-----	During the first 1¼ rein, the balloon ascends 580 ft or 152 meters, after which ascent is at a rate of 360 fpm or 110 mpm.
Bursting altitude	-----	10,000 ft/3048 meters.
Dimensions (neck)	-----	2 in. long, 7/8-in. dia.

7. MAJOR COMPONENT:

Balloon ML-158.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used in a meteorological system.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-222-12 ----- ML-158
TM 11-6660-218-12, -25P ----- AN/TMQ-4

12. REPAIR PARTS SUPPORT CAPABILITY:

No Density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE.

15. PRICE DATA:

- a. Major item ----- \$0.11
- b. Repair parts (1-year cost based Expendable, non-repairable).

16. ITEM REPLACED: None.

17. REMARKS:

Issued as a unit replacement.

(No illustration available)

- 1. NOMENCLATURE:** Balloon ML-159.
- 2. TYPE CLASSIFICATION:** Standard A.
- 3. SECURITY REQUIREMENTS:** Unclassified.
- 4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used to determine wind direction and speed of winds aloft.
- 5. BRIEF FUNCTIONAL DESCRIPTION:**
Balloon ML-159, a large white pilot balloon, is used to determine the wind direction and windspeed of the winds aloft to a maximum altitude of 45,000 feet/13,716 meters. The ML-159 can be used when the sky cover is scattered with a blue background. The ML-159 may also be used to aid in the estimation of cloud heights at night, Wind-speed and direction may be determined by tracking the balloon visually and computing the angular data received,
- 6. TECHNICAL CHARACTERISTICS:**

Type	Pilot.
Material	Neoprene.
Color	White.
Weight (inflation)	100 g.
Free lift	575 g.
Average rate of rise	900 fpm or 275 mpm.
Bursting altitude	45,000 feet or 13,760 meters.
Dimensions	1 7/8 in. long, 9/16-in. dia.

- 7. MAJOR COMPONENT:**
Balloon ML-159.
- 8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This equipment is used as part of the AN/TMQ-4 system,
- 9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:** None.
- 10. TOOLS AND TEST EQUIPMENT:** None.
- 11. REFERENCE DATA AND LITERATURE:**
TM 11-6660-222-12 ----- ML-159
- 12. REPAIR PARTS SUPPORT CAPABILITY:**
No density.
- 13. TRAINING REQUIREMENTS:**
Operator MOS 93-E-20, 93-F-20.
- 14. TYPICAL BASIS OF ISSUES.**
- 15. PRICE DATA:**
 - a. Major item ----- \$0.42
 - b. Repair parts (1-year cost based on 100 equipments). Expendable, non-repairable.
- 16. ITEM REPLACED:** None.
- 17. REMARKS:**
Issued as a unit replacement.

(No illustration available)

1. **NOMENCLATURE:** Balloon ML-160A.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used to determine wind direction and windspeeds aloft.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Balloon ML-160A, a large black pilot balloon, is used to determine the wind direction and windspeeds of the winds aloft to a maximum altitude of 45,000 feet/13,760 meters. The ML-160A can be used when sky conditions are overcast against a dark background. The ML-160A may also be used to aid in the estimation of cloud heights at night. Windspeed and direction may be determined by tracking the balloon visually and computing the angular data received.
6. **TECHNICAL CHARACTERISTICS:**

Type	_____	Pilot.
Material	_____	Neoprene.
Color	_____	Black.
Weight (inflation)	_____	100 g.
Free lift	_____	575 g.
Average rate of rise	_____	900 fpm or 275 mpm.
Bursting altitude	_____	45,000 feet or 13,760 meters.
Dimensions	_____	1 7/8 in. long, 9/16-in. dia.

7. **MAJOR COMPONENT:**
Balloon ML-160A.
8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This equipment is used as part of the AN/TMQ-4 system.
9. **ADDITIONAL EQUIPMENTS REQUIRED AND AUXILIARY EQUIPMENT:** None.
10. **TOOL AND TEST EQUIPMENT:** None.
11. **REFERENCE DATA AND LITERATURE:**
TM 11-6660-222-12 _____ ML-160A
12. **REPAIR PARTS SUPPORT CAPABILITY:**
No density.
13. **TRAINING REQUIREMENTS:**
Operator MOS 93-E-20, 93-F-20.
14. **TYPICAL BASIS OF ISSUE.**
15. **PRICE DATA:**

a. Major item	_____	\$0.49
b. Repair parts (1-year cost based on 100 equipments).		Expendable, non-repairable.
16. **ITEM REPLACED:** None.
17. **REMARKS:**
Issued as a unit replacement.

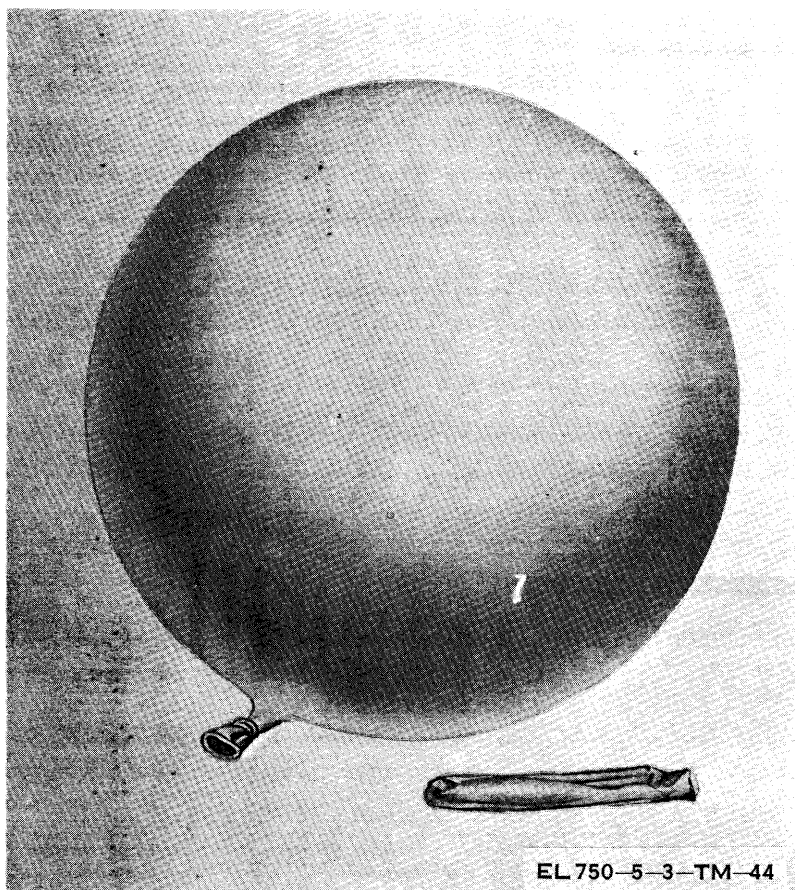


Figure 44. Balloon ML-161A.

1. NOMENCLATURE: Balloon ML-161A.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:

Used to determine wind direction and speed of winds aloft.

5. BRIEF FUNCTIONAL DESCRIPTION:

Balloon ML-161A, a large red pilot balloon, is used to determine wind direction and windspeeds of the winds aloft to a maximum altitude of 45,000 feet/13,760 meters. The ML-161 A can be used when the sky is partly cloudy with either a blue or cloudy background and when conditions are indefinite or changeable. The ML-161 A also may be used to aid in the estimation of cloud heights at night. Windspeed and direction may be determined, tracking the balloon visually and computing the angular data received.

6. TECHNICAL CHARACTERISTICS:

Type	_____	Pilot.
Material	_____	Neoprene.
Color	_____	Red.

Weight	_____	100 g.
Freelift	_____	575 g.
Average rate of rise	_____	900 fpm.
Bursting altitude	_____	45,000 ft/13,760 meters.
Dimensions (neck)	_____	1 7/8 in. long, 9/16-in dia.

7. MAJOR COMPONENT:

Balloon ML-161A.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used as part of the AN/TMQ-4 system.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE :

TM 11-6660-222-12. - - - - ML-161A

ML-161A

12. REPAIR PARTS SUPPORT CAPABILITY:

No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE.

15. PRICE DATA:

a. Major item _ _ _ _ _ \$0.42

b. Repair parts (1-year cost based Expendable, nonre-
on 100 equipments). pairable.

16. ITEM REPLACED: None.

17. REMARKS:

Issued as a unit replacement.

(No illustration available)

1. NOMENCLATURE: Balloon ML-162.

2. TYPE CLASSIFICATION: Standard C & T.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Used to carry meteorological equipment aloft.

5. BRIEF FUNCTIONAL DESCRIPTION:
Balloon ML-162 is a sounding balloon which is used to carry aloft equipment which furnishes data on the temperature, humidity, and pressure of the upper air. The ML-162 also may be used to carry radar targets aloft when radar equipment is used to determine the direction and speed of winds.

6. TECHNICAL CHARACTERISTICS:

Type	-----	Sounding.
Material	-----	Rubber.
Color	-----	Uncolored.
Weight (inflation)	-----	700 g (not less than 650, not more than 750 g).
Dimensions (neck)	-----	5 in. long, 1-in. dia, inflated to 18-ft dia before bursting.

7. MAJOR COMPONENT:
Balloon ML-162.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used in a system with Radiosondes AN/AMT-2, AN/AMT-2A, and AN/AMT-4.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:
TM 11-6660-218-12, 25P ----- ML-162

12. REPAIR PARTS SUPPORT CAPABILITY.

13. TRAINING REQUIREMENT :
Operator MOS 93-E-20, 93-F-20.

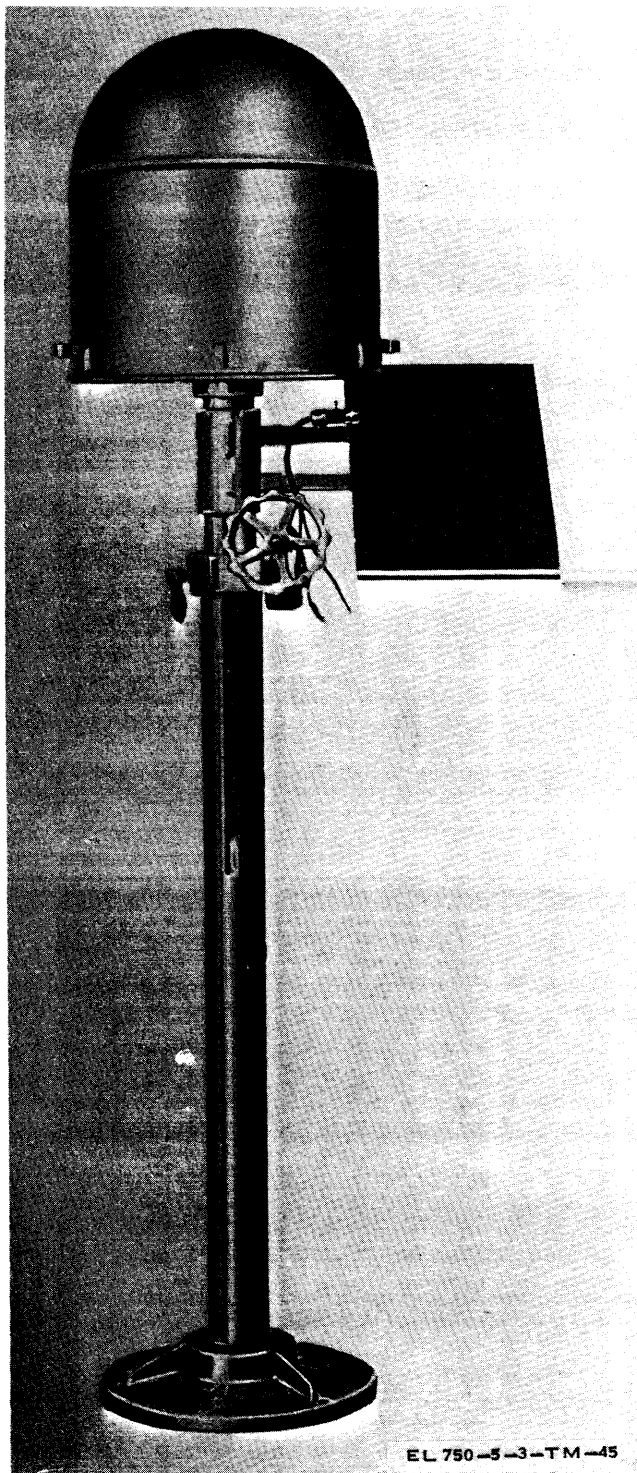
14. TYPICAL BASIS OF ISSUE.

15. PRICE DATA:

a. Major item	-----	\$1.44
b. Repair parts (1-year cost based on 100 equipments).		Expendable, non-repairable.

16. ITEM REPLACED: None.

17. REMARKS:
Issued as a unit replacement.



EL 750-5-3-TM-45

Figure 45. Theodolite Mount ML-180.

1. **NOMENCLATURE:** Theodolite Mount ML-180.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used as a support for theodolites.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Theodolite Mount ML-180 is a metal support of adjustable height for Theodolites ML-247 and ML-474/GM. The ML-180 is designed for permanent installation on an observation platform.
6. **TECHNICAL CHARACTERISTICS:**
Pipes, vertical Two, one telescoped within the other.
Hood Metal; protects theodolite.
Shelf Data sheet, with lamp.
7. **MAJOR COMPONENT:**
Theodolite Mount ML-180.
8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This unit is used in a system with Theodolite ML-247() or ML-474/GM.
9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:** None.
10. **TOOLS AND TEST EQUIPMENT:** None.
11. **REFERENCE DATA AND LITERATURE:**
TM 11-6660-210-15P ML-180
12. **REPAIR PARTS SUPPORT CAPABILITY:**
No density.
13. **TRAINING REQUIREMENTS:**
Operator MOS 93-E-20, 93-F-20.
14. **TYPICAL BASIS OF ISSUE:**

TA	Allowance
M2W1N2AA - - - - -	48
M7W0WRAA - - - - -	8
15. **PRICE DATA:**
 - a. Major item \$193.00
 - b. Repair parts (1-year cost based on 100 equipments) \$2,895.00
16. **ITEM REPLACED:** None.
17. **REMARKS:** None.

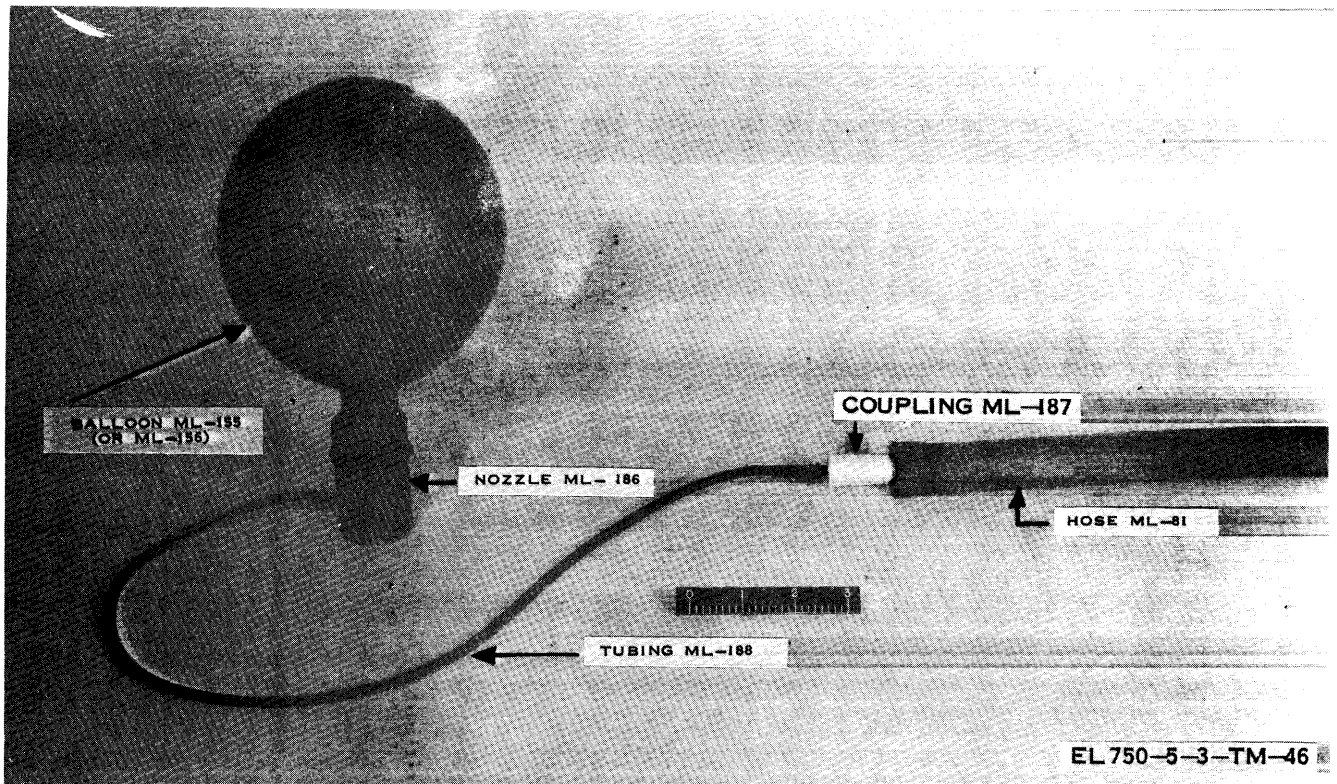


Figure 46. Coupling ML-187.

1. **NOMENCLATURE:** Coupling ML-187.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used to connect Hose ML-81 to Tubing ML-188.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Coupling ML-187 is a metal reducing fitting used to connect Hose ML-81 to Tubing ML-188 in the inflation of 10-gram ceiling balloons. The free end of Hose ML-81 connects to a hydrogen source and the other end of Tubing ML-188 connects to Nozzle ML-186.
6. **TECHNICAL CHARACTERISTICS:**

Material	-----	Metal.	
Weight	-----	0.1 lb	net.
7. **MAJOR COMPONENT:**
Coupling ML-187.
8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This equipment is used independently.
9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT.**
10. **TOOLS AND TEST EQUIPMENT:** None.
11. **REFERENCE DATA AND LITERATURE:**
TM 11-6660-222-12 ----- ML-187
12. **REPAIR PARTS SUPPORT CAPABILITY:**
No density.
13. **TRAINING REQUIREMENTS:**
Operator MOS 93-E-20, 93-F-20.
14. **TYPICAL BASIS OF ISSUE.**
15. **PRICE DATA:**
 - a. Major item ----- \$0.42
 - b. Repair parts (1-year cost based Expendable, non-repairable on 100 equipments).
16. **ITEM REPLACED:** None.
17. **REMARKS:**
Issued as a unit replacement.

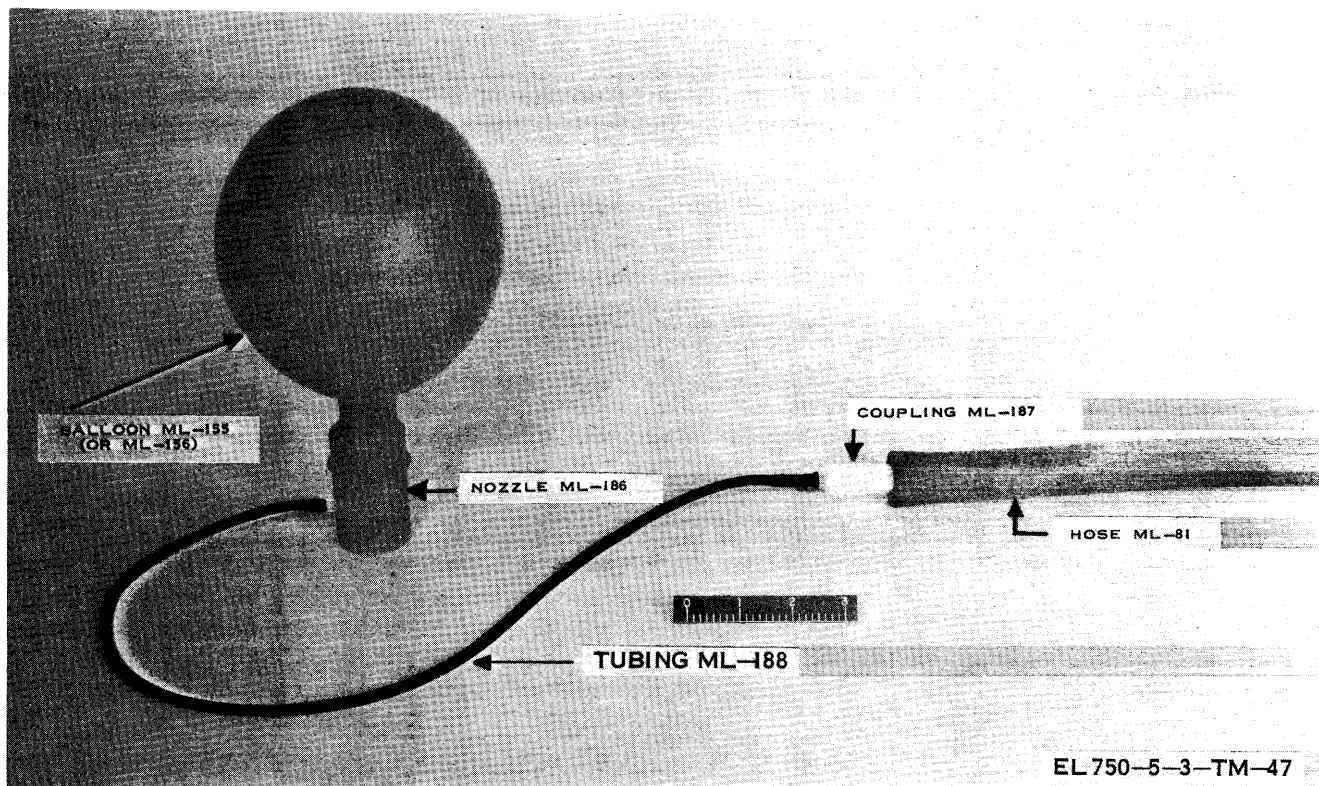


Figure 47. Tubing ML-188.

1. NOMENCLATURE: Tubing ML-188.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Used in the inflation of 10-gram balloons.

5. BRIEF FUNCTIONAL DESCRIPTION:

Tubing ML-188 is used in the inflation of 10-gram ceiling balloons. One end of the ML-188 fits in the inlet tube of Nozzle ML-186 and the other end fits onto Coupling ML-187 used with Hose ML-81, which leads from the gas source.

6. TECHNICAL CHARACTERISTICS:

Material	-----	Pure gum rubber.
Weight	-----	6 g.
Dimensions	-----	24 in. long, 1/8in. inside dia., 3/16-in. outside dia.

7. MAJOR COMPONENT:

Tubing ML-188.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

Used with Coupling ML-187, Hose ML-81, and Nozzle ML-186 in a balloon inflation facility

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-222-12	---	---	ML-188
TM 11-6660-218-12, -25P	---	---	AN/TMQ-4

12. REPAIR PARTS SUPPORT CAPABILITY:

No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE.

15. PRICE DATA:

Expendable, nonrepairable.

16. ITEM REPLACED: None.

17. REMARKS:

Issued as a replacement unit.

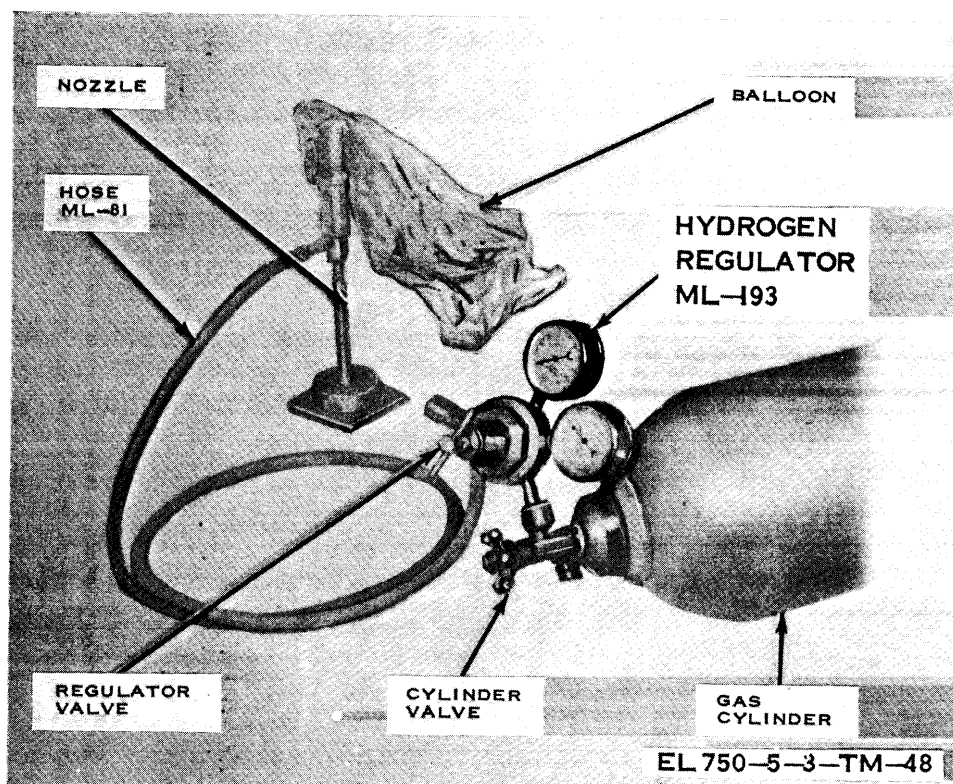


Figure 48. Regulator, Hydrogen ML-193.

1. NOMENCLATURE: Regulator, Hydrogen ML-193.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Indicates pressure and controls flow of gas during balloon inflation.

5. BRIEF FUNCTIONAL DESCRIPTION:

Hydrogen Regulator ML-193 provides a means of indicating pressure and cubic content of a standard hydrogen cylinder and throttling the rate of discharge to a low-pressure outlet. The unit is equipped with fittings for attachment of the regulator to the hydrogen cylinder valve and for attachment of ML-81 and Coupling ML-49 to the outlet valve. The ML-193 is not used with hydrogen generators.

6. TECHNICAL CHARACTERISTICS:

Material _ _ _ _ _ Brass.

Gage, high pressure _ _ _ Indicates pressure from 0 to 3,000 psi.

Gage, low pressure _ _ _ _ _ Indicates pressure from 0 to 50 psi,

V a l v e _ _ _ _ _ Diaphragm-type reducing.

Fittings _ _ _ _ _ For detachment to hydrogen cylinder valve.

Weight _ _ _ _ _ 6 lb net.

7. MAJOR COMPONENT:

Regulator, Hydrogen ML-193.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

Used with meteorological balloons, Hose ML-81, and a hydrogen cylinder.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-218-12, -25P _ _ AN/TMQ-4

TM 750-5-3
ML-193

12. REPAIR PARTS SUPPORT CAPABILITY:

No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

TA Allowance
50-734 ----- 2

15. PRICE DATA:

a. Major item ----- \$25.00

b. Repair parts (1-year cost based Expendable item,
on 100 equipments). nonrepairable.

16. ITEM REPLACED: None.

17. REMARKS:

Issued as a unit replacement.

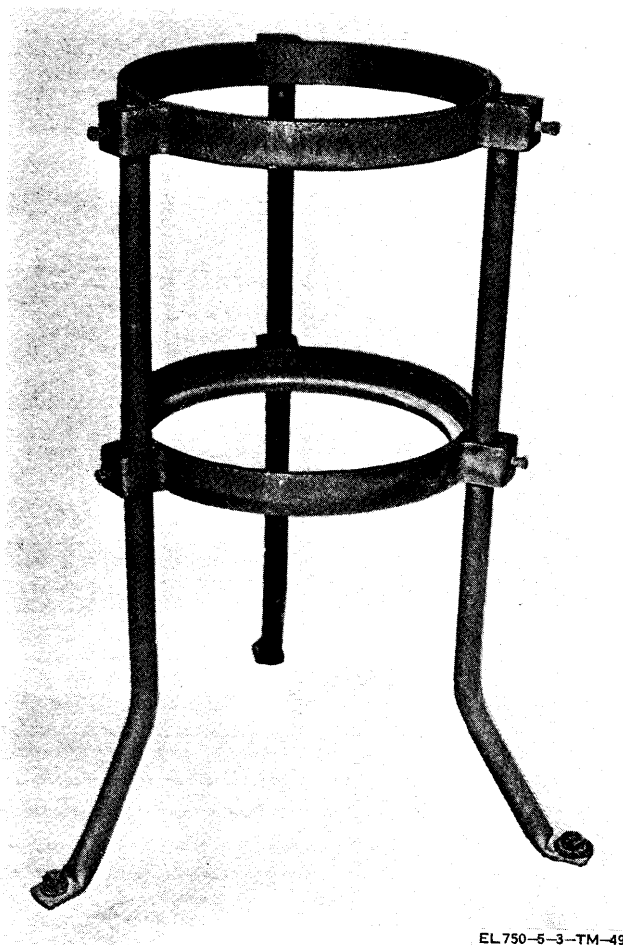


Figure 49. Support ML-214.

1. **NOMENCLATURE:** Support ML-214.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used as a support for Gage ML-17.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Support ML-214, a metal support for Gage ML-17, exposes the top of the gage at about 30 inches above the

ground or roof. Support ML-214 is similar in function to Support ML-199. However, the ML-199 is wooden; therefore Support ML-214 is procured for use at stations where wooden supports would not be satisfactory.

6. TECHNICAL CHARACTERISTICS:

Type ----- Tripod.
 Construction ----- Sectionalized.
 Material ----- Iron.
 Finish ----- Olive drab enamel.
 Features ----- Adjustable rings near top and bottom for supporting gage at correct distance above ground or roof.
 Dimensions (approx) -- 20 in. high, 15-in. dia.

7. MAJOR COMPONENT:

Support ML-214.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This support is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE.

12. REPAIR PARTS SUPPORT CAPABILITY:

No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

TA	Allowance
10-4 -----	1
20-30 -----	2
32-13 -----	1

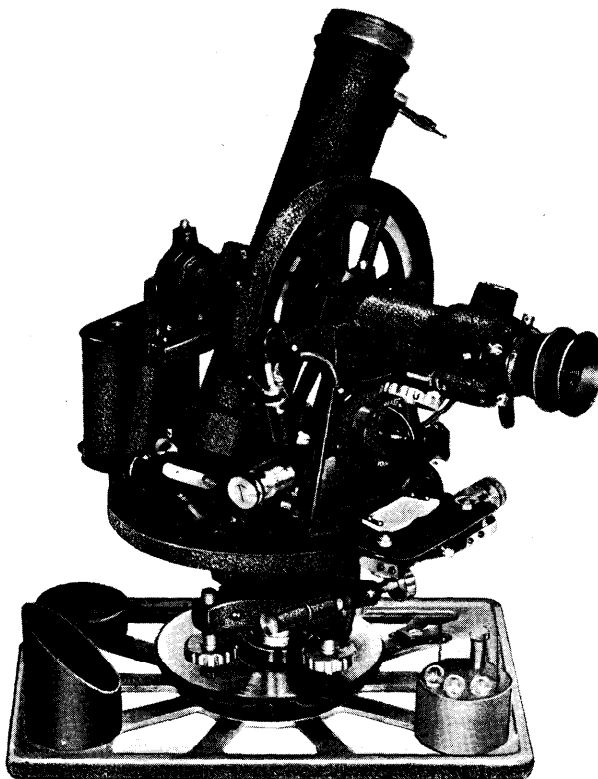
15. PRICE DATA:

a. Major item ----- \$11.90
 b. Repair parts (1-year cost based on 100 equipments) ----- &178.50

16. ITEM REPLACED:

Replaces ML-199.

17. REMARKS: None.



EL 750-5-3-TM-51

Figure 51. Theodolite ML-247().

EL 7509-5-3-TM-51

1. NOMENCLATURE: Theodolite ML-247().

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:

Used to follow and measure the movement of pilot balloons.

5. BRIEF FUNCTIONAL DESCRIPTION:

Theodolite ML-247() is a portable, right-angle, telescope-type surveying instrument particularly adaptable for the observation of balloons. The ML-247() is used to visually track a weather balloon in flight. The instrument follows and measures the movement of a pilot balloon as it is carried through the atmosphere by the airflow. The azimuth and elevation of the balloon are read from the scales on Theodolite ML-247() at regular intervals from which computations are made to determine the speed and direction of the wind at various heights. Theodolite ML-247() consists mainly of the theodolite, base plate, and carrying case, and is usually mounted on Tripod ML-78 or MT-1309/GM.

6. TECHNICAL CHARACTERISTICS:

Tracking telescope:

Type	Right angle, with prism.
Magnification	19-24 power (approx).
Field of view	2° (approx).
Eyepiece	Inverting, adjustable with crosshairs.
Focus	Adjustable.

Finder telescope:

Magnification	3.75 to 5 power.
Field of view	10° (approx), in combination with eyepiece of main telescope.

Azimuth scale _____ 360° range, calibration 0.1.

Elevation scale _____ 240° range, calibration 0.1.

Sights:

Extension	For sighting vertical angles to 85°.
Fixed	For sighting vertical angles 45°.

Illumination _____ 3 incandescent lamp assemblies.

Power requirements. - 3 vdc (two 1½-v batteries)

TM 750-5-3

ML-247()

Dimensions (carrying case) _ _ _ 17x 4¼ x 11¼ in.
Weight (components and carrying case) 41¼ lb.

7. MAJOR COMPONENTS:

Compass ML-197.
Telescope ML-146.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This unit is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

a. Additional Equipment.

Surveying Tripod Mount MT-1309/GM or Tripod ML-78().
Timing and Telephone Set ML-110
Plumb-bob.
Batteries (four) BA-30.

b. Auxiliary Equipment. None.

10. TOOLS AND TEST EQUIPMENT:

a. Tools.

Tool Equipment TK-17/FMQ-1.
Tool Equipment TE-113.

Tool set, special, FSN 6660-353-5236.
Lens, magnifying, FSN 6760-353-5585.
Wrench, strap, Signal Corps stock No. 6R59349.
Dividers, ordnance stock No. 41-D-1365.

b. Test Equipment. None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6675-200-10, -20, -35 _ _ _ _ ML-247A

12. REPAIR PARTS SUPPORT CAPABILITY:

To 1974 - Full support.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.
Maintenance MOS 35-C-20, 35-D-20.

14. TYPICAL BASIS OF ISSUE.

15. PRICE DATA:

a. Major item	_____	\$785.00
b. Repair parts (1-year cost based on 100 equipments)	_____	\$ 11,775.00

16. ITEM REPLACED: None.

17. REMARKS: None.

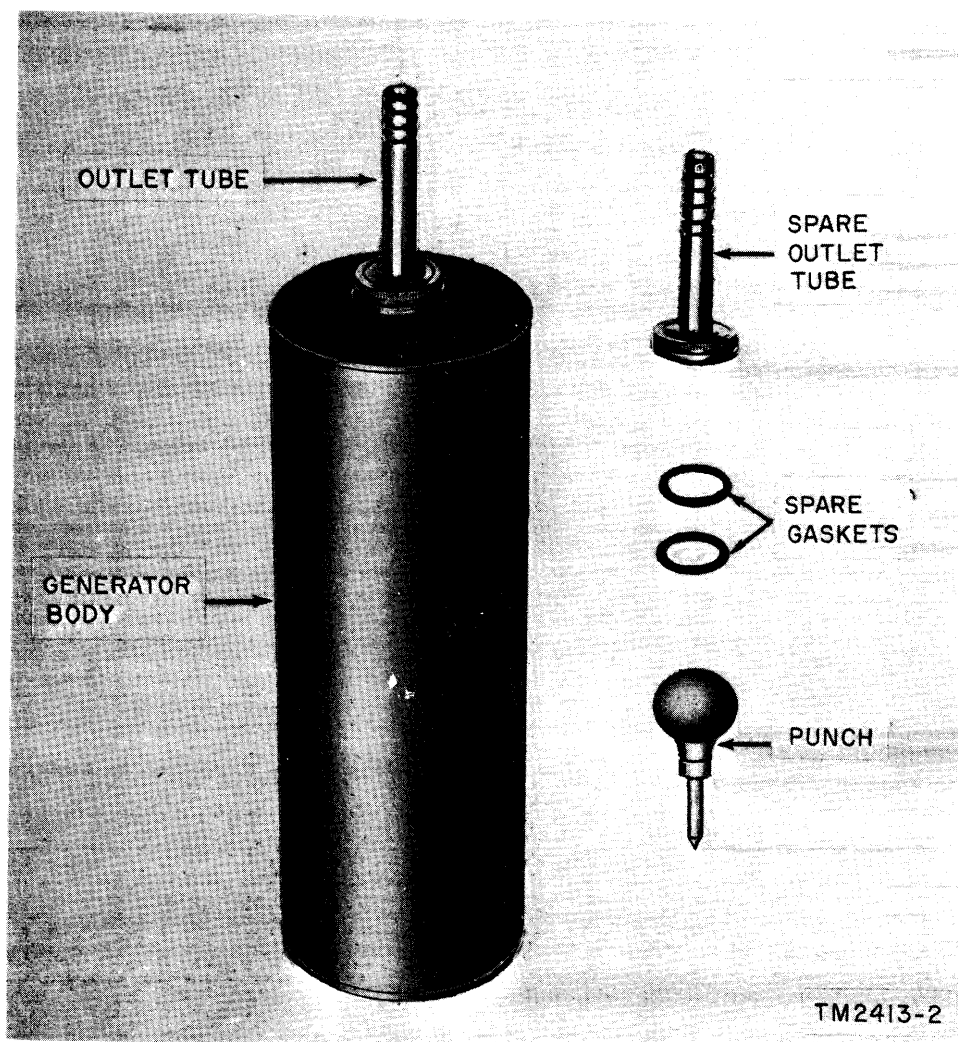


Figure 52. Hydrogen Generator ML-303/TM.

1. **NOMENCLATURE:** Hydrogen Generator ML-303/TM.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Furnishes hydrogen for inflating meteorological balloons.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Hydrogen Generator ML-303/TM is a transportable cylindrical steel can with a screw cap and corrugated stem for attaching a hose to inflate meteorological balloons.
6. **TECHNICAL CHARACTERISTICS:**
Size in inches: 19 high; 5 1/8 diameter.
Weight: 1.6 lb.
Volume: 2.3 cu ft.
Generating capacity: 24 cu ft in 15 minutes.
7. **MAJOR COMPONENTS:**
Generator body.
Outlet tube.
8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This hydrogen generator is part of and used with Hydrogen Generator Set AN/TMQ-3.
9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:**
Manifold ML-334/TMQ-3.
Calcium Hydride Charge ML-304A/TM.
Calcium Hydride Charge ML-305A/TM.
10. **TOOLS AND TEST EQUIPMENT:** Punch.
11. **REFERENCE DATA AND LITERATURE:**
TM 11-2413 - - - - - ML-303/TM
12. **REPAIR PARTS SUPPORT CAPABILITY:** None.
13. **TRAINING REQUIREMENTS:**
Operator MOS 93-F-20.
Repairman MOS 35-D-20.

TM 750-5-3
ML-303/TM

14. TYPICAL BASIS OF ISSUE:

TA
6-575E -----

Allowance
3

15. PRICE DATA:

a. Major item ----- \$69.55

b. Repair parts ----- Expendable, non-repairable.

16. ITEM REPLACED: None.

17. REMARKS: None.

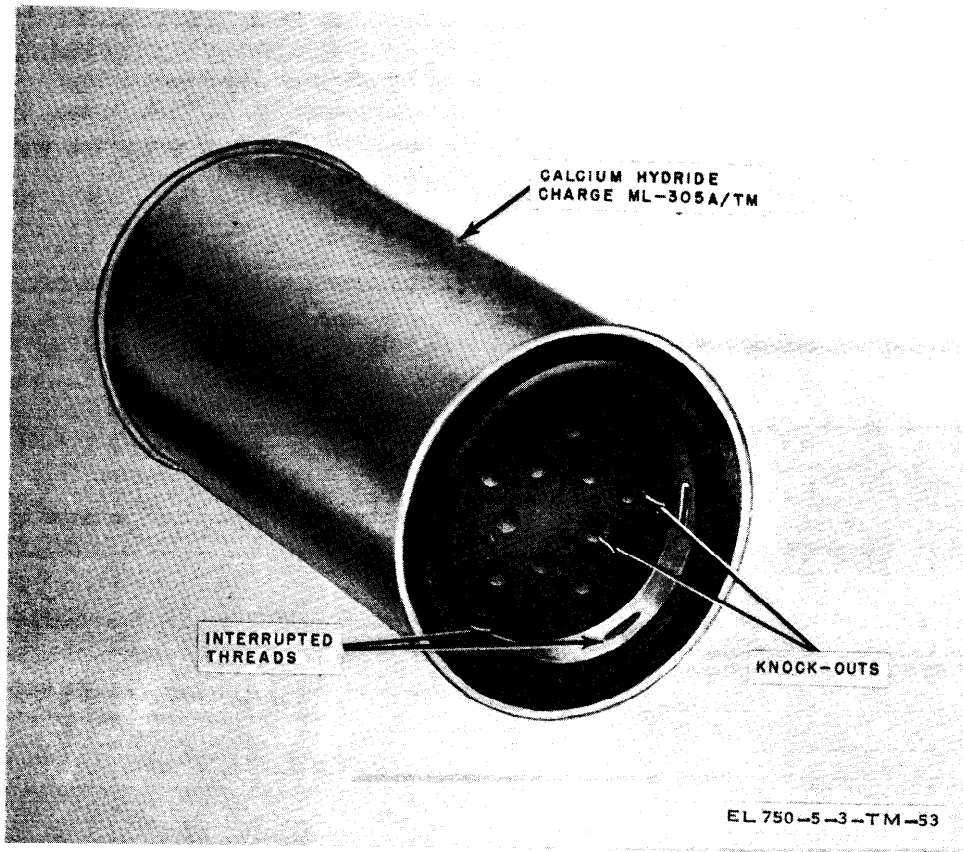


Figure 53. Calcium Hydride Charge ML-305A/TM.

1. NOMENCLATURE: Calcium Hydride Charge ML-305A/TM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Used to generate hydrogen gas for meteorological balloon inflation.

5. BRIEF FUNCTIONAL DESCRIPTION:

Calcium Hydride Charge ML-305A/TM, an airtight metal can containing pure calcium hydride, is used to generate enough hydrogen to inflate a 100-gram balloon to produce a free lift of 650 grams minimum. Calcium Hydride Charge ML-305A/TM is used with Hydrogen Generator ML-303/TM or AN/TMQ-3.

6. TECHNICAL CHARACTERISTICS:

Type	Can, top scored with holes.
Material	Sheet metal.
Contents	1½ lb of 90° pure calcium hydride.
Hydrogen produced	Approx 24 cu ft.
Dimensions	6¼ in. high, 3¾-in. dia.
Time required	15 min.

7. MAJOR COMPONENTS:

Calcium Hydride Charge ML-305A/TM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used as part of the AN/TMQ-4 system.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-222-12	ML-303A/TM
TM 11-6660-218-12, -25P	AN/TMQ-4

12. REPAIR PARTS SUPPORT CAPABILITY:

No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

TOE	Allowance
6-186G	1
6-201G	1
6-302H	1
6-526G	1
6-576G	2
6-701H	1

TM 750-5-3
ML-305A/TM

<i>TOE</i>	<i>Allowance</i>
6-716H -----	1
6-100H -----	1
37-100H -----	1
39-51G -----	1
<i>TA</i>	
6-2 -----	18
50-734 -----	2
74-5 -----	1

15. PRICE DATA:

- a. Major item ----- \$3.50
- b. Repair parts (1-year cost based Expendable, non-repairable on 100 equipments).

16. ITEM REPLACED: None.

17. REMARKS:

Part of Manual Meteorological Station AN/TMQ-4; issued as replacement unit.

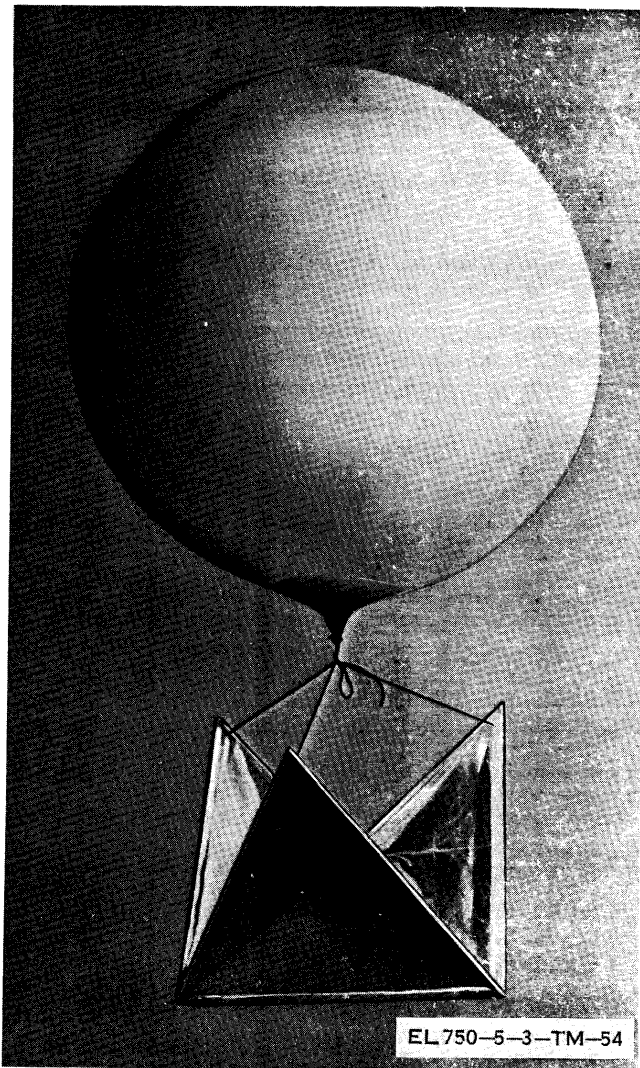


Figure 54. Pilot Balloon Target ML-307/AP.

1. **NOMENCLATURE:** Pilot Balloon Target ML-307/AP.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used to assist in radar tracking of pilot balloons.

5. BRIEF FUNCTIONAL DESCRIPTION:

Pilot Balloon Target ML-307/AP is a collapsible radar reflector which is attached to a pilot balloon to assist in tracking the balloon. The ML-307/AP is used with available radar equipment to determine upper wind direction and upper wind velocity. Pilot Balloon Target ML-307/AP is made of aluminum foil with wooden reinforcements to prevent collapse aloft and consists of a square plane with fins mounted on top.

6. TECHNICAL CHARACTERISTICS:

Construction _ _ _ _ _ Triangular shaped, aluminum foil backed on balsa frame.
Dimensions _ _ _ _ _ 50 in. long, 50 in. wide, 37 in. high.
Approximate weight _ _ 100 g.

7. MAJOR COMPONENT:

Pilot Balloon Target ML-307/AP.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This unit is used in a system with available radar equipment and pilot balloons.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

- a. *Additional Equipment.*
Radar equipment.
Pilot Balloon ML-159, ML-160, ML-161, and Pilot Balloon Target ML-306/AP.
- b. *Auxiliary Equipment.* None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-218-12, -25P _ _ AN/TMQ-4

12. REPAIR PARTS SUPPORT CAPABILITY:

No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-F-20.

14. TYPICAL BASIS OF ISSUE.

15. PRICE DATA:

- a. Major item _ _ _ _ _ \$0.24
- b. Repair parts (1-year cost based on 100 equipments). Expendable, non-repairable.

16. ITEM REPLACED: None.

17. REMARKS:

Issued as a replacement unit.

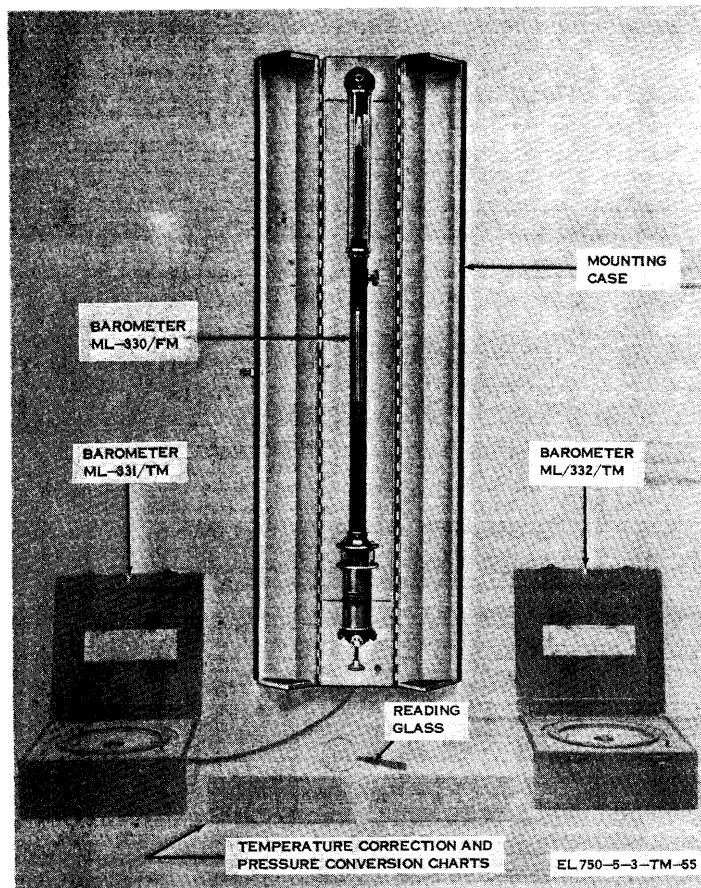


Figure 55. Barometer ML-330/FM.

1. NOMENCLATURE: Barometer ML-330/FM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Used as a reference standard for checking barometers.

5. BRIEF FUNCTIONAL DESCRIPTION:

Barometer ML-330/FM is a precision mercurial barometer which is used with two precision aneroid barometers as a set of reference standard barometers for weather region control offices of the Army Air Forces. All barometric instruments in the region are to be compared with two aneroid barometers for the purpose of bringing field station instruments into agreement with the standard. Barometer ML-330/FM is of such precision that each one is individually calibrated with the U.S. Army primary-standard barometers at the U.S. Army Signal Research and Development Laboratory. The ML-330/FM is available in two ranges: for general use and for high altitude use. Barometer ML-330/FM remains in the regional control office as the standard for the region.

6. TECHNICAL CHARACTERISTICS:

Range of scale:

Actual:

In. of mercury --- 23.5 to 32.8 (9.3 in.);
21.2 to 32.8 (11.6 in.).

Millibar - - - - 800 to 1,110 (310 mb);
717 to 1,110 (393 mb).

Effective:

In. of mercury --- 23.7 to 31.3 (7.6 in.);
21.5 to 31.3 (9.8 in.).

Millibar - - - - 805 to 1,060 (225 mb);
725 to 1,060 (335 mb).

Graduation:

In. scale - - - - - In 20th of an in. each
integral-in. is num-
bered.

Millibar scale - - - In whole mb.

Vernier, Measurement _ Permits reading to 0.002
(1/500) in.

Permits reading to 0.05
(1/20) mb.

ML-330/FM

Thermometer:
 Fahrenheit ----- -30° to +130°; scale graduated in ½° intervals.
 Centigrade ----- 0° to 55°; scale graduated in 2° intervals.
 Dimensions, carrying case - 51 in. long, 8 in. wide, 8 in. deep.
 Weight (packed for hand transportation) 40 lb.

7. MAJOR COMPONENT:

Barometer ML-330/FM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

Barometer ML-330/FM is used with Barometer ML-331/TM and ML-332/TM or ML-333/TM to form a set.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-2421 ----- ML-330/FM, ML-331/TM
 ML-332/TM, ML-333/TM

12. REPAIR PARTS SUPPORT CAPABILITY:

Controlled by Anniston Army Depot, Anniston, Al. 36201 ATTN: AMXAN-QC.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.
 Maintenance MOS 35-C-20.

14. TYPICAL BASIS OF ISSUE:

<i>TA</i>	<i>Allowance</i>
8-7 -----	2
10-4 -----	1
20-30 -----	15
50-147 -----	1
50-156 -----	4
50-247 -----	2
50-811 -----	3
50-818 -----	1
77-5 -----	1
80-5 -----	1
82-5 -----	1

TOE

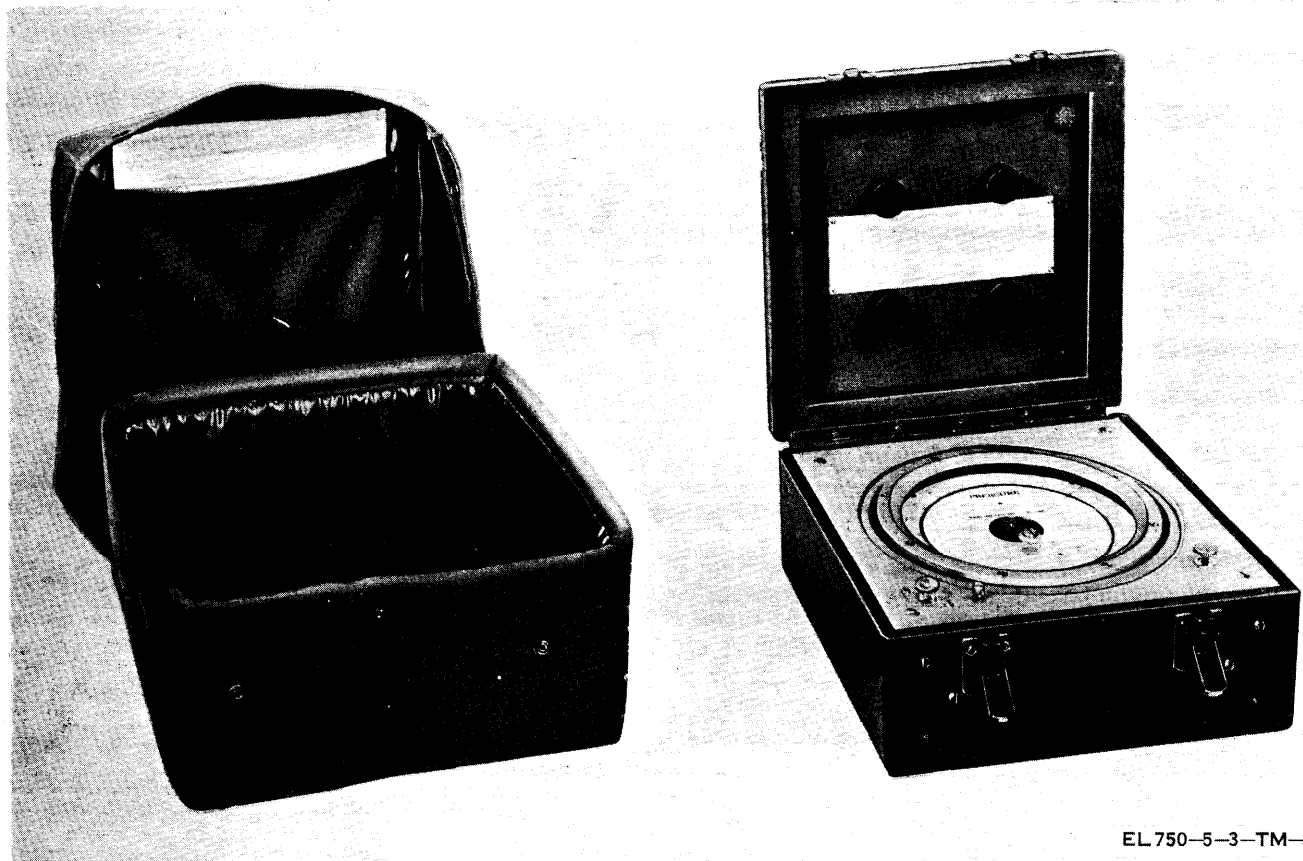
11-500G -----	1
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16. PRICE DATA:

- a. Major item ----- \$225.00
- b. Repair parts (1-year cost based on 100 equipments) ----- \$3,375.00

16. ITEM REPLACED: None.

17. REMARKS: None.



EL 750-5-3-TM-56

Figure 56. Barometer ML-331/TM.

1. **NOMENCLATURE:** Barometer ML-331/TM.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used as a reference standard for checking the accuracy of barometers.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Barometer ML-331/TM is a precision aneroid barometer which is used with another precision aneroid barometer and a precision mercurial barometer as a set of reference standard barometers for weather station region control offices of the Air Force. Barometer ML-331/TM is used with Barometer ML-332/TM or ML-333/TM in the field for checking both aneroid and mercury station barometers. Barometer ML-331/TM is constantly checked against one of the other aneroid barometers and against the mercury standard in the regional office at specified intervals.
6. **TECHNICAL CHARACTERISTICS:**
Type ----- Aneroid; beryllium-copper, corrugated cell without spring.

- | | |
|----------------------|---|
| Range: | |
| Extent of scale | 840 to 1,040 mb. |
| Millibar | 200. |
| Scale | Mb only; graduated in 1/2 mb; full numerical designation every 10 mb. |
| Max usable elevation | 5,000 ft (approx). |
| Dimensions | 11 in. long, 11 in. wide, 5 in. deep. |
| Weight | 3 lb net, 14 lb packed (for hand transportation). |

7. **MAJOR COMPONENT:**
Barometer ML-331/TM.
8. **SET, SYSTEM, FACILITY, AND CONFIGURATION , APPLICATIONS:**
Barometer ML-331/TM is used with Barometers ML-330/FM and ML-332/TM or ML-333/TM to form a set of reference standard barometers.
9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:** None.
10. **TOOLS AND TEST EQUIPMENT:** None.

ML-331/TM

11. REFERENCE DATA AND LITERATURE:
TM 11-2421 - - - - ML-331/TM, ML-330/FM,
ML-332/TM, ML-333/TM

12. REPAIR PARTS SUPPORT CAPABILITY:
Controlled by Anniston Army Depot,
Anniston, Al. 36201, ATTN: AMXAN-QC.

13. TRAINING REQUIREMENTS:
Operator MOS 93-E-20, 93-F-20.
Maintenance MOS 35-C-20.

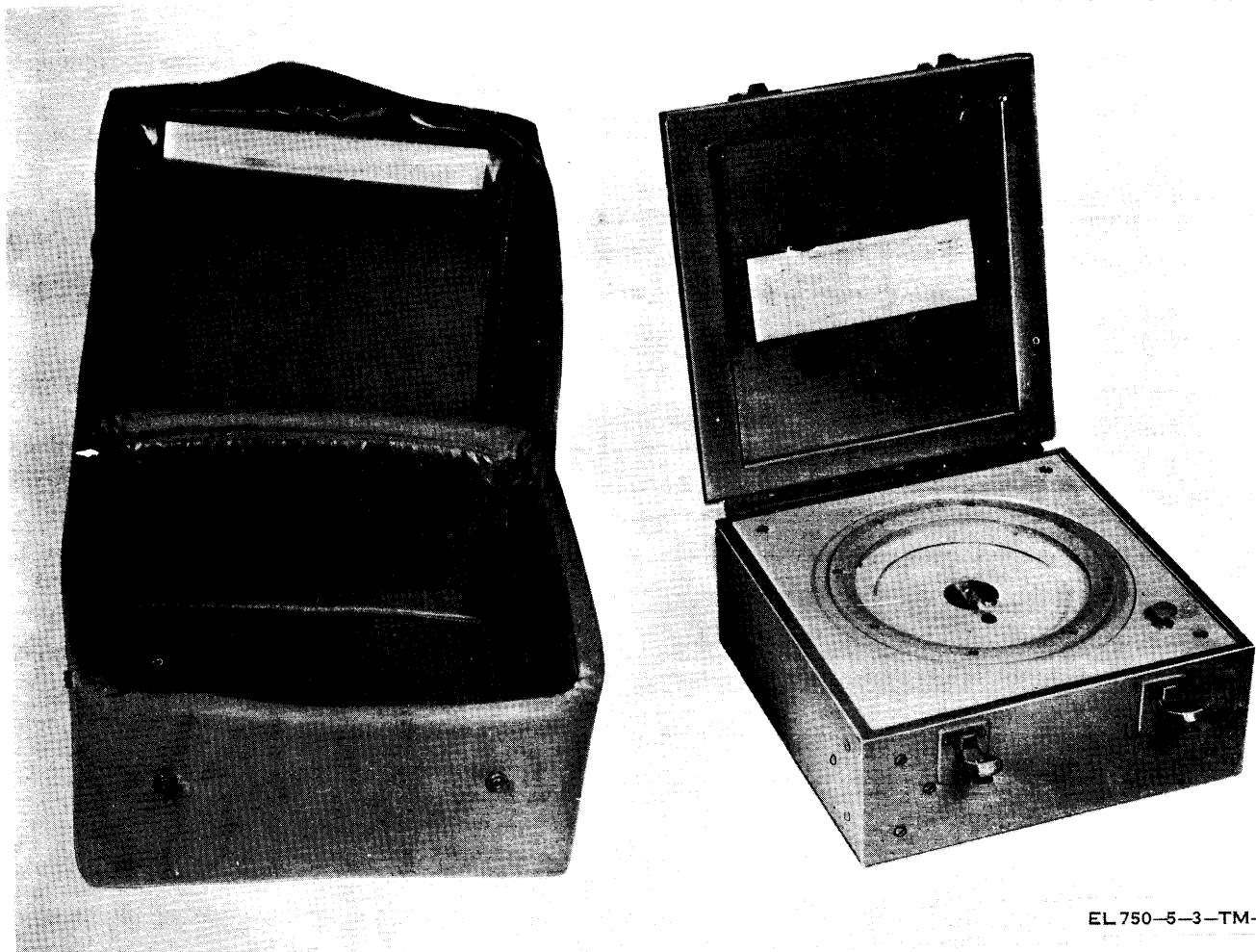
14. TYPICAL BASIS OF ISSUE:

<i>TA</i>	<i>Allowance</i>
5-10 - - - - -	1
50-156 - - - - -	1
50-807 - - - - -	1
50-818 - - - - -	2

15. PRICE DATA:
a. Major item - - - - - \$200.00
b. Repair parts (1-year cost based on 100
equipments) - - - - - \$3,000. 00

16. ITEM REPLACED: None.

17. REMARKS: None.



EL 750-5-3-TM-57

Figure 57. Barometer ML-332/TM.

1. NOMENCLATURE: Barometer ML-332/TM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:

Used as a reference standard for checking the accuracy of barometers.

5. BRIEF FUNCTIONAL DESCRIPTION:

Barometer ML-332/TM is a precision aneroid barometer which is used with another precision aneroid barometer and a precision mercurial barometer as a set of reference standard barometers for weather region control offices of the Army Air Forces. Barometer ML-332/TM is used with Barometer ML-333/TM or ML-331/TM in the field for checking the accuracy of aneroid and mercury station barometers.

6. TECHNICAL CHARACTERISTICS:

Type ----- Aneroid; beryllium-copper
corrugated cell without
spring.

Range:

Extent of scale ----- 745 to 1,040 mb.
Millibar ----- 295.

Scale ----- Mb only; graduated in 1/2
mb; full numerical designation every 10 mb.

Max usable elevation ----- 5,000 ft (approx).

Dimensions ----- 11 in. long, 11 in. wide, 5
in. deep.

Weight ----- 3 lb net, 14 lb packed (for
hand transportation).

7. MAJOR COMPONENT:

Barometer ML-332/TM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

Barometer ML-332/TM is used with Barometers ML-330/FM, and ML-331/TM or ML-333/TM to form a set.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM11-2421 ----- ML-332/TM, ML-333/TM,
ML-331/TM, ML-330/FM

12. REPAIR PARTS SUPPORT CAPABILITY:

Controlled by Anniston Army Depot, Anniston, Al.
36201. ATTN: AMXAN-QC.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.
Maintenance MDS 35-C-20.

14. TYPICAL BASIS OF ISSUE:

<i>TOE</i>	<i>Allowance</i>
6-201G -----	1
6-576G -----	2

<i>TOE</i>	<i>Allowance</i>
6-701H -----	1
6-716H -----	1
55-27G -----	1
<i>TA</i>	
5-10 -----	1
50-811 -----	3
79-51 -----	2

15. PRICE DATA:

a. Major item -----	\$200.00
b. Repair parts (1-year cost based on 100 equipment) -----	\$3,000.00

16. ITEM REPLACED: None.

17. REMARKS: None.

(No illustration available)

1. NOMENCLATURE: Barometer ML-333/TM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:

Used as a reference standard for checking the accuracy of barometers.

5. BRIEF FUNCTIONAL DESCRIPTION:

Barometer ML-333 /TM is a precision aneroid barometer which is used with another precision aneroid barometer and a precision mercurial barometer as a set of reference standard barometers for weather region control offices of the Army Air Forces. Barometer ML-333/TM is used with Barometer ML-332/TM or Barometer ML-331/TM in the field for checking the accuracy of aneroid and mercury station barometers.

6. TECHNICAL CHARACTERISTICS:

Type	Aneroid; beryllium-copper corrugated cell without spring.
Range:	
Extent of scale	540 to 1,030 mb.
Millibar	490.
Scale	Mb only; graduated in ½ mb; full numerical designation every 10 mb.
Max usable elevation	16,000 ft (approx).
Dimensions	11 in. long, 11 in. wide, 6 in. deep.
Weight	3 lb net, 14 lb packed (for hand transportation).

7. MAJOR COMPONENT:

Barometer ML-333/TM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

Barometer ML-333/TM is used with Barometers ML-333/FM, and ML-331/TM or ML-332/TM to form a set.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-2421 _____ ML-333/TM, ML-330/FM,
ML-331/TM, ML-332/TM

12. REPAIR PARTS SUPPORT CAPABILITY:

Controlled by Anniston Army Depot, Anniston, Al. 37201, ATTN: AMXAN-QC.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.
Maintenance MOS 35-C-20.

14. TYPICAL BASIS OF ISSUE:

TA	Allowance
5-10	50
11-44	1
20-30	1
50-147	1
50-546	4
TOE	
6-526G	1
6-576G	2

15. PRICE DATA:

a. Major item	\$200.00
b. Repair parts (1-year cost based on 100 equipments)	\$3,000.00

16. ITEM REPLACED: None.

17. REMARKS: None.

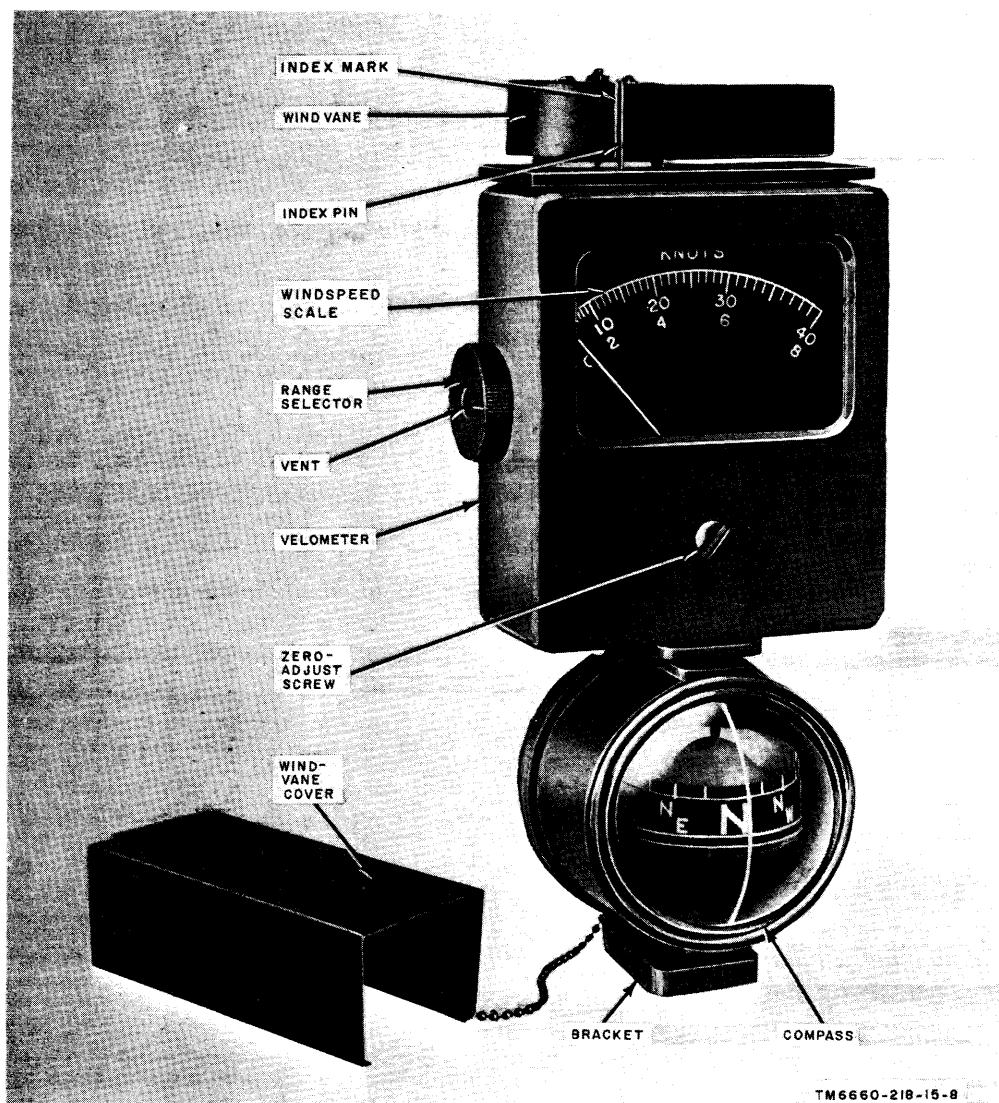


Figure 58. Anemometer ML-433()/PM.

1. NOMENCLATURE: Anemometer ML-433()/PM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:

The anemometer measures wind velocity in knots.

5. BRIEF FUNCTIONAL DESCRIPTION:

Anemometer ML-433()/PM is a wind vane with a removable cover, a velometer to measure wind speed, and a compass to measure wind direction.

6. TECHNICAL CHARACTERISTICS:

Velometer: 0-8, ± 1.5 kn; 0-40 ± 2.0 kn.

Wind vane and compass: 0-360 ± 11.25 degrees.

7. MAJOR COMPONENTS:

Velometer.

Wind vane and compass.
Handle.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This anemometer is used with the following systems: AN/PMQ-1(), AN/PMQ-1, AN/PMQ-4, and AN/TMQ-4.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-205-15P _____ ML-433/PM

TM 11-6660-218-12, -25P _____ AN/TMQ-4

12. REPAIR PARTS SUPPORT CAPABILITY: Full support.

TM 750-5-3

ML-433()/PM

13. TRAINING REQUIREMENTS:

Operator MOS 93-F-20.
Repairman MOS 35-D-20.

14. TYPICAL BASIS OF ISSUE:

<i>TA</i>	<i>Allowance</i>
A1-Y0AXAA -----	1
E1-W077AA -----	1
M2-W1N2AA -----	20
P2-W0ASAA -----	1

15. PRICE DATA:

a. Major item ----- \$195.00
b. Repair parts (1-year cost based on 100
equipment) - - - - - \$3,000.00

16. ITEM REPLACED: None.

17. REMARKS: None.

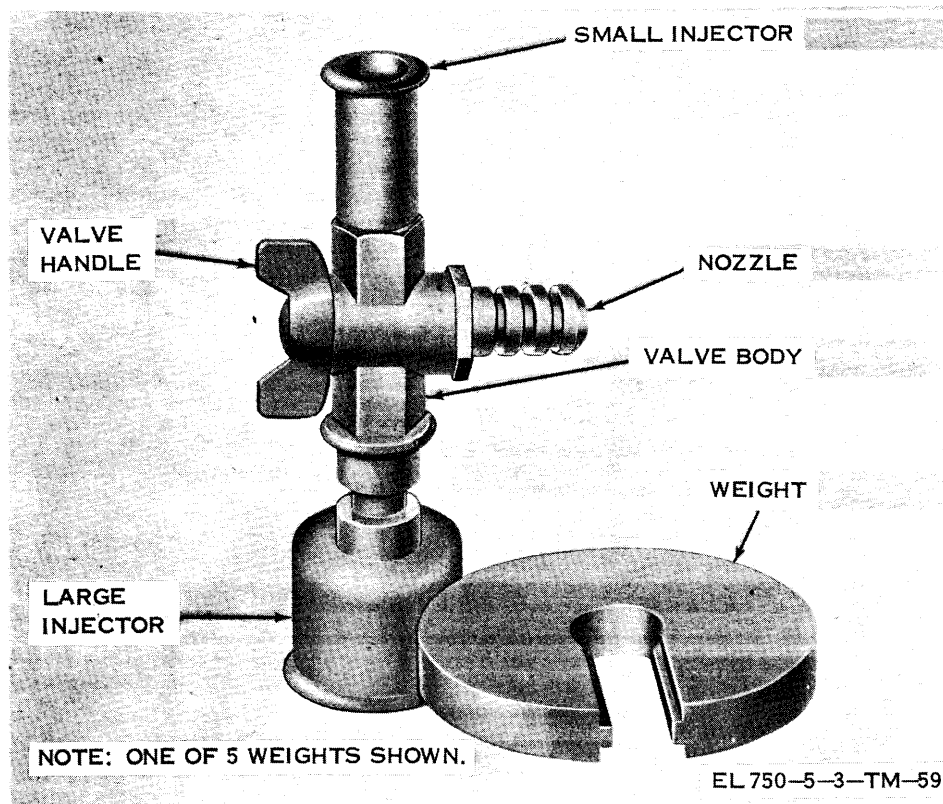


Figure 59. Nozzle ML-462()/UM.

1. NOMENCLATURE: Nozzle, Meteorological Balloon Inflation ML-462()/UM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Used for inflation and weighing off of meteorological pilot balloons.

5. BRIEF FUNCTIONAL DESCRIPTION:
Nozzle, Meteorological Balloon Inflation ML-462 ()/UM is used for inflation and weighing off of 30- and 100-gram meteorological pilot balloons.

6. TECHNICAL CHARACTERISTICS:

Nozzle weight	-----	125 g.
Auxiliary weights	-----	14, 175, 240, 324, and 376 g.
Small injector	-----	11/16 -in. outside dia, balloon connection.
Large injector	-----	7/8 -in. outside dia, balloon connection.
Nozzle	-----	5/8 -in. outside dia, hose connection.

7. MAJOR COMPONENT:

Nozzle, Meteorological Balloon Inflation ML-462()/UM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used in a system with meteorological balloons.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-218-12, -25P ----- AN/TMQ-4
TM 11-6660-222-12 ----- ML-462()/UM

12. REPAIR PARTS SUPPORT CAPABILITY:

No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

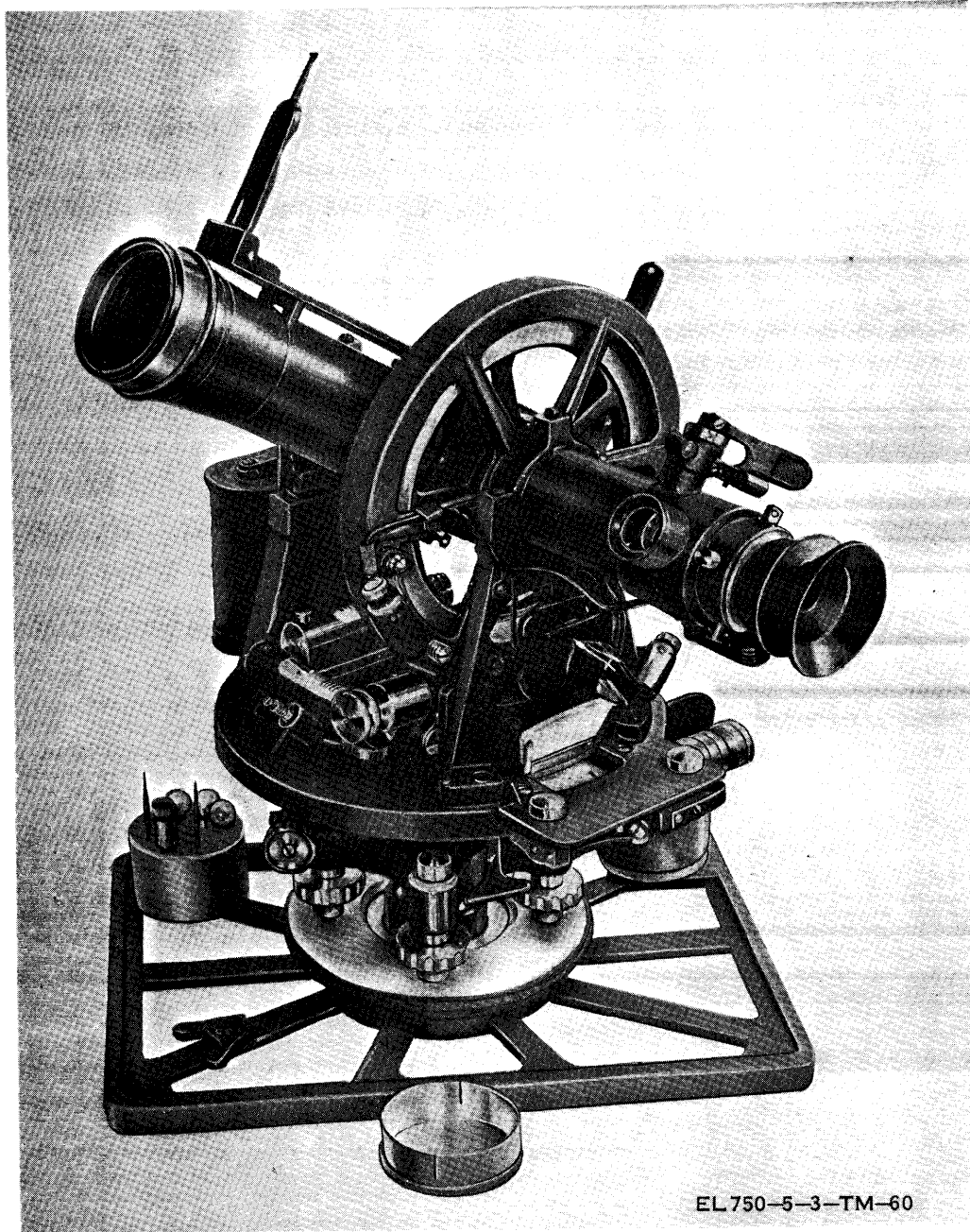
TA	-----	Allowance
5AW2NTAA	-----	2

15. PRICE DATA:

a. Major item	-----	\$12.60
b. Repair parts (1-year cost based on 100 equipments)	-----	\$189.00

16. ITEM REPLACED: None

17. REMARKS: None.



EL 750-5-3-TM-60

Figure 60. Theodolite ML-474/GM.

1. **NOMENCLATURE:** Theodolite, Double-Center ML-474/GM.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:** Used for the observation of meteorological balloons.
5. **BRIEF FUNCTIONAL DESCRIPTION:** Theodolite, Double-Center ML-474/GM is a portable, right-angle, telescope-type surveying instrument particu-

larly adaptable for balloon observation work. The ML-474/GM is used to follow the movement of a pilot balloon while it is being carried horizontally through the atmosphere by the airflow. Readings of the elevation and the azimuth of the balloon are made at regular intervals to determine the speed and direction of the winds aloft at various heights.

6. TECHNICAL CHARACTERISTICS:

Tracking telescope:

Type Right angle, with
 prism.

TM 750-5-3
ML-474/GM

Power ----- 20 dia (approx).
 Field of view ----- 2° (approx).
 Eyepiece ----- Inverting, adjustable
 with crosshairs.
 Focus ----- Adjustable.
 Finder telescope:
 Power ----- 4 dia.
 Field of view ----- 10° (approx); in com-
 bination with eye-
 piece of tracking
 telescope.

Sales:
 Azimuth:
 Range ----- 360°.
 Graduations ----- In whole degrees.
 Vernier reading ----- To 0.1°.
 Elevation:
 Graduation ----- In whole degrees.
 Vernier reading ----- To 0.1°.

Sights:
 Extension ----- For sighting vertical
 angles to 86°.
 Fixed ----- For sighting vertical
 angles to 450.

Illumination ----- 3 incandescent lamp as-
 ssemblies; current
 supplied by 2 Bat-
 teries BA-30.

7. MAJOR COMPONENTS:

Case CY-787/U.
 Compass ML-197.
 Lamp LM-19.
 Telescope ML-146.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used as part of the AN/TMQ-4 system.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

Tool Equipment TK-87/U.
 Tool Equipment TK-113.
 Tool Set Special FSN 6660-353-5236.
 Lens Magnifying, Dividers.
 Wrench Strap.

11. REFERENCE DATA AND LITERATURE:

TM 11-6675-200-10, -20, -35 ___ ML-474/GM

12. REPAIR PARTS SUPPORT CAPABILITY:

To 1974-Full support.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.
 Maintenance MOS 36-C-20, 35-D-20.

14. TYPICAL BASIS OF ISSUE:

<i>TA</i>	<i>Allowance</i>
E2W0CEAA -----	2
M2W0H8AA -----	1
M2W1N2AA -----	66
M7W0WRAA -----	3
M7W04WAA -----	3
M7W04YAA -----	1
M8W1NKAA -----	1
SDW21GAA -----	16
5AW2NTAA -----	55
<i>TOE</i>	
6-575G -----	3
6-577G -----	1

15. PRICE DATA:

a. Major item -----	\$785.00
b. Repair parts (1-year cost based on 100 equipments) -----	\$11,775.00

16. ITEM REPLACED: Replaces ML-47().

17. REMARKS: Part of Meteorological Station, Manual AN/TMQ-4.

(No illustration available)

1. NOMENCLATURE: Thermometer, Indicating, Capillary Tube and Bulb ML-475()/GM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Used to measure indoor and outdoor temperatures simultaneously.

5. BRIEF FUNCTIONAL DESCRIPTION:
Thermometer, Indicating, Capillary Tube and Bulb ML-475()/GM is an instrument which measure indoor and outdoor temperature simultaneously. The ML-475()/GM has two indicators mounted on the same panel. A radiation shield for the outdoor sensing element and an 8-foot tubular mount for the capillary tube are supplied with the ML-475()/GM.

6. TECHNICAL CHARACTERISTICS:

Thermal element:
 Indoor ----- Alcohol-in-glare type.
 Outdoor ----- Mercury, capillary and bulb type.

Temperature range:
 Indoor ----- +30° F. to + 120° F.
 Outdoor ----- -40° F. to +140° F.

Graduation intervals ___ 2° F., numbered each 10° F.

Accuracy ----- +2° F.

Outdoor sensing element:
 Type ----- Liquid-filled capsule.
 Dimensions-- ----- 2¼ in. long, 5/16-in. dia.

7. MAJOR COMPONENTS:
Thermometer, Indicating, Capillary Tube and Bulb ML-475()/GM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:
This unit is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE.

12. REPAIR PARTS SUPPORT CAPABILITY:
No density.

13. TRAINING REQUIREMENTS:
Operator MOS 93-E-20, 93-E-2, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

<i>TA</i>	<u><i>Allowance</i></u>
50-811 -----	1
60-26 -----	82
77-11 -----	54
77-26 -----	93
80-10 -----	1
80-13 -----	7
80-26 -----	14
82-5 -----	1

15. PRICE DATA:
 a. Major item ----- \$48.00
 b. Repair parts (1-year cost based on 100 equipments) ----- \$720.00

16. ITEM REPLACED: None.

17. REMARKS: None.

(No illustration available)

1. NOMENCLATURE: Barometer, Mercurial ML-512/GM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Used to measure atmospheric pressure.

5. BRIEF FUNCTIONAL DESCRIPTION:
Barometer, Mercurial ML-512/GM is an instrument which utilizes a column of mercury to measure atmospheric pressure. The ML-512/GM is a Fortin-type (adjustable cistern) mercurial barometer intended for permanent indoor installation.

6. TECHNICAL CHARACTERISTICS:
Barometer:
Type ----- Mercury, Fortin-type.
Indicator ----- Mercury column in glass tube.
Range ----- From 22 to 32 in. of mercury from 735 to 1,110 mb.
Scale graduation in $\frac{1}{2}$ in. numbered each 1 in.;
tervals. 1 mb numbered each 10 mb.
Vernier scale ----- Readings to $\frac{1}{500}$ (0.002) in.; readings to $\frac{1}{20}$ (0.05) mb.

Thermometer:
Type ----- Nonregistering.
Thermal element ___ Mercury.
Range:
Fahrenheit ___ - 10° F. to + 100° F.
Centigrade ___ -23° C. to +38° C.
Dimensions ----- 39 in. long, $2\frac{1}{8}$ in. dia.

7. MAJOR COMPONENTS:
Barometer, Mercurial ML-512/G M.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:
This barometer is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:
TM 11-428 ----- ML-512/GM

12. REPAIR PARTS SUPPORT CAPABILITY :
To 1974 - Full support.

13. TRAINING REQUIREMENTS :
Operator MOS 93-E-20.
Maintenance MOS 35-D-20.

14. TYPICAL BASIS OF ISSUE:

TA	Allowance
3-2	2
8-2	2
8-14	1
8-16	1
8-18	1
8-20	1
8-29	1
8-33	2
8-34	46
1 & 4	1
2 & 30	2
50-147	2
50-411	1
50-774	2
50-805	1
5 & 810	1
50-811	3
50-818	1
50-825	1
50-938	8
50-939	412
50-940	95
50-941	89
50-942	42
55-2	2
77-5	1

15. PRICE DATA:
a. Major item ----- \$129.00
b. Repair parts (1-year cost based on 100 equipments) ----- \$, 935.00

16. ITEM REPLACED: None.

17. REMARKS:
Formerly nomenclatured ML2-().

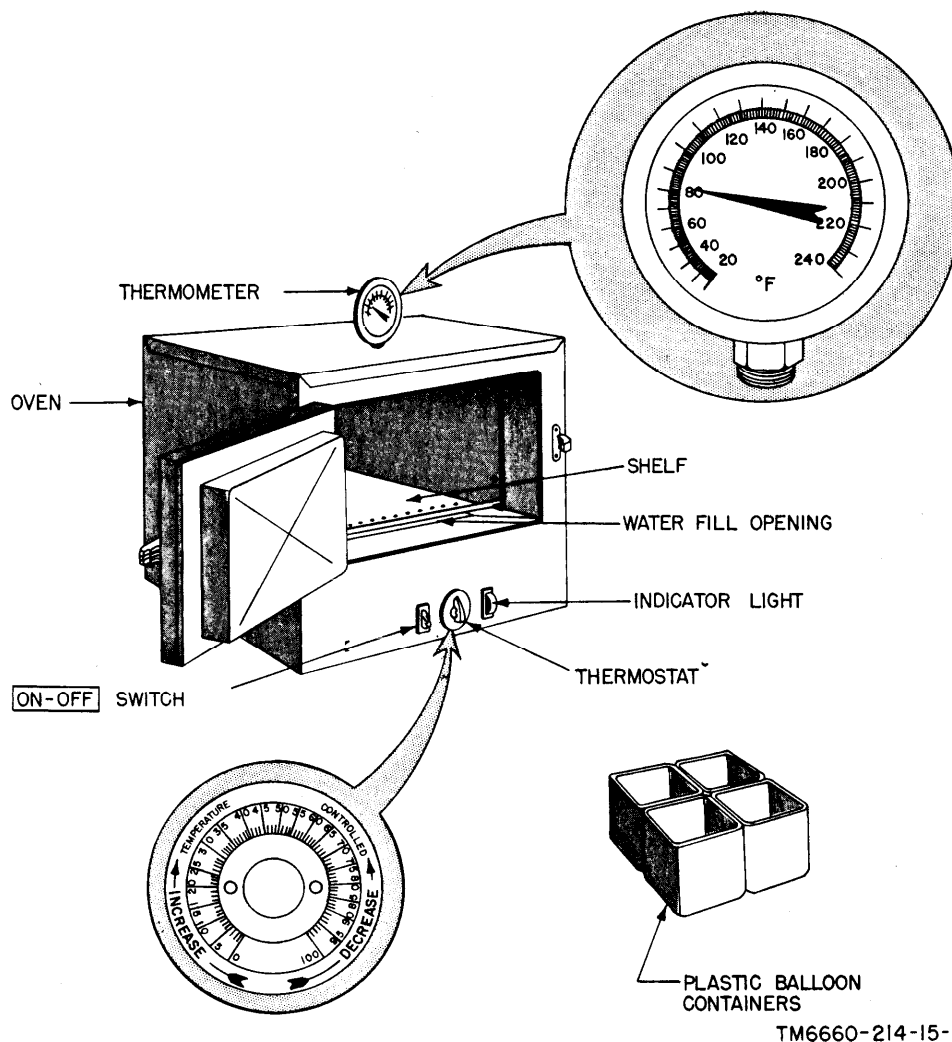


Figure 61. Balloon Conditioner, Meteorological ML-513/GM.

1. NOMENCLATURE: Balloon Conditioner, Meteorological ML-513/GM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:

Provides controlled heat and humidity for balloon conditioning.

5. BRIEF FUNCTIONAL DESCRIPTION:

Balloon Meteorological Conditioner, ML-513/GM is an oven that provides the necessary heating and humidity values to condition meteorological balloons prior to flight to reach the altitudes for which the balloons were designed. Balloons in storage for periods of more than 1 year from the date of manufacture or stored at temperatures below 50° F., for any extended period of time require conditioning.

6. TECHNICAL CHARACTERISTICS:

Power requirements ----- 115 vac, 60 Hz, single phase 5.8 amp max.

Maximum heat range ----- To 194° F. (90° C.).

Power consumption ----- 670 watts max.

Capacity of conditioning chain- 4 plastic balloon containers.

7. MAJOR COMPONENTS:

- Oven.
- Thermometer.
- Shelf.
- Plastic balloon container.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This set is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

Power supply required to provide 115 vac, 60 Hz, single phase 5.8 amp max.

TM 750-5-3
ML-513/GM

10. TOOLS AND TEST EQUIPMENT:

a. Tools.

Tool equipment TE-33.

Tool equipment TK-17/FMQ-1.

b. Test Equipment.

Multimeter AN/URM-105.

11. REFERENCE DATA AND LITERATURE:

TM 6660-214-15, -25P _____ ML-513/GM

TM 11-6625-203-12, -20P, -35,
-45P _____ AN/URM-105

12. REPAIR PARTS SUPPORT CAPABILITY:

To 1974-Full support.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

Maintenance 35-C-20.

14. TYPICAL BASIS OF ISSUE:

<i>TA</i>	<i>Allowance</i>
50-322 -----	35
50-366 -----	23
83-5 -----	2

15. PRICE DATA:

a. Major item ----- \$390.00

b. Repair parts (1-year cost based on 100
equipments) ----- \$5,415.00

16. ITEM REPLACED: None.

17. REMARKS: None.

(No illustration available)

1. NOMENCLATURE: Plotting Board, Winds Aloft ML-514/TM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Used to plot time-height curve and winds aloft data.

5. BRIEF FUNCTIONAL DESCRIPTION:
Plotting Board, Winds Aloft ML-514/TM is a plywood plotting board with laminated plastic inclosing a paper chart and scaled to the surface of the board. The ML-514/TM is used at all air weather service rawin stations for plotting time-height curve; and winds aloft data from both rawin and pibal ascensions to provide standard level wind data for transmission.

6. TECHNICAL CHARACTERISTICS:
 Type _____ Plywood, with laminated plastic inclosing a paper chart on the surface of the board.
 Chart _____ 5 vertical lines representing heights in ft and km, 1 horizontal reference line.
 Graduations _____ Meter and kn/sec and also for time in min.
 Dimensions _____ 30 in. long, 30 in. wide, 3/4 in. thick.

Special features _____ Has plastic parallel arms which move vertically, collapsible tilting device to raise board 3 in.

7. MAJOR COMPONENT:
Plotting Board, Winds Aloft ML-514/TM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:
This equipment is used in a system with Plotting Board ML-122 and Rawin Set/GMD-1().

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE.

12. REPAIR PARTS SUPPORT CAPABILITY:
No density.

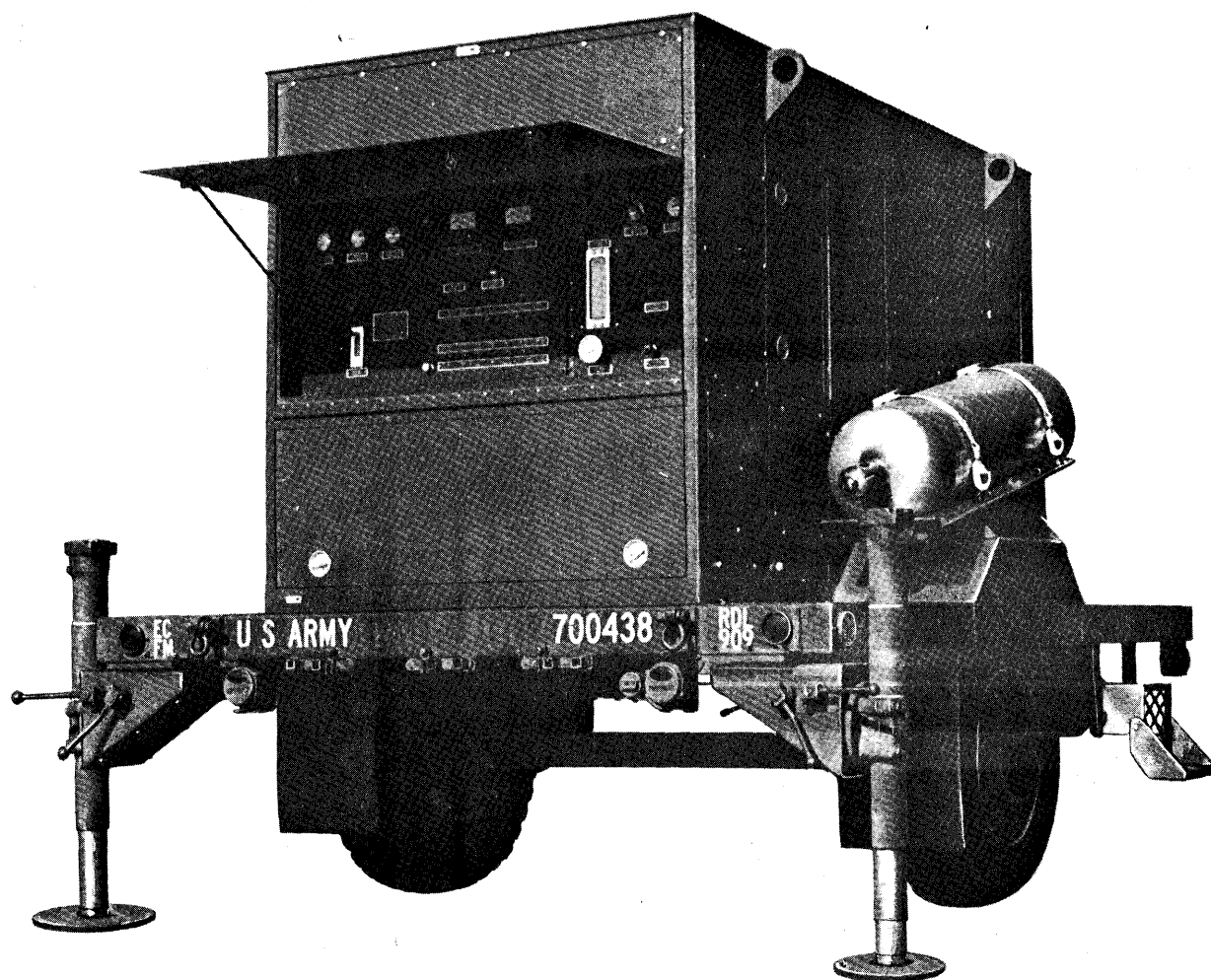
13. TRAINING REQUIREMENTS:
Operator MOS 93-F-20.

14. TYPICAL BASIS OF ISSUE.

15. PRICE DATA.

16. ITEM REPLACED: None.

17. REMARKS: None.



EL 750-5-3-TM-62

Figure 62. Hydrogen Generator ML-536/UM.

1. NOMENCLATURE: Hydrogen Generator Set ML-536/UM.

2. TYPE CLASSIFICATION: Development.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Produces pure hydrogen for the inflation of meteorological balloons.

5. BRIEF FUNCTIONAL DESCRIPTION:
Hydrogen Generator Set ML-536/UM is a mobile hydrogen generator which is designed to produce pure hydrogen from liquid hydrocarbon fuels and water. The ML-536/UM is used to inflate meteorological balloons

under tactical field conditions. The unit may be mounted, transported, and operated on a 1½-ton cargo trailer, type M-105. Material is provided to produce 3,600 cubic feet of hydrogen.

6. TECHNICAL CHARACTERISTICS:

Capacity	900 standard cu ft per hr.
Power requirements	115±5 vac, 400±10 Hz, single-phase.
Startup time	40 min.
Fuel	Liquid hydrocarbon.
Operating temperature range.	Ambient temperature in the range of + 140° F to -40° F.

TM 750-5-3

ML-536/UM

Nonoperating temperature range +160° F to -80° F.

Relative humidity _ _ _ 0% to 97%.

Elevation:

Operating range _ _ _ Up to 10,000 ft above sea level.

Nonoperating range _ _ Up to 25,000 ft above sea level.

Weight _ _ _ _ _ 3,000 lb.

Installation _ _ _ _ _ 1½-ton Trailer M-105

7. MAJOR COMPONENT:

Hydrogen Generator Set ML-536/UM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE.

12. REPAIR PARTS SUPPORT CAPABILITY:

To 1975 - Full support.

13. TRAINING REQUIREMENTS:

Operator MOS 93-F-20.

Maintenance MOS 35-B-20, 35-D-20.

14. TYPICAL BASIS OF ISSUE.

15. PRICE DATA.

16. ITEM REPLACED: AN/TMQ-3

17. REMARKS: None.

(No illustration available)

1. **NOMENCLATURE:** Balloon ML-537/UM.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Dual-purpose sounding balloon used to carry aloft meteorological equipment.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Balloon ML-537/UM is a dual-purpose sounding balloon used to carry aloft meteorological equipment at an ascent rate of approximately 1,000-feet-per-minute or 330-meters-per-minute for the purpose of obtaining upper air measurements, to include pressure, temperature, relative humidity, windspeed and wind direction, up to an altitude of 100,000 feet or 33,528 meters during day or night operations.
6. **TECHNICAL CHARACTERISTICS:**
Type _ _ _ _ _ Sounding, uncolored.
Weight (nominal) _ _ _ _ _ 1,100 g.
Material _ _ _ _ _ Neoprene latex.
Lifting force _ _ _ _ _ 1,500 g night; 1,200 g day.
Rate of rise (average) _ _ 1,000 fpm or 330 meters-per-minute.
Bursting altitude _ 110,000 feet/33,528 meters.
Dimensions (uninflated) -- Body dia 5½ ft, neck 4½ in. lg and 1 in. dia.

7. **MAJOR COMPONENT:**
Balloon ML-537/UM.
8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This equipment is used independently.
9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT.**
10. **TOOLS AND TEST EQUIPMENT:** None.
11. **REFERENCE DATA AND LITERATURE:**
TM 11-6660-218-12, -25P.. AN/TMQ-4
12. **REPAIR PARTS SUPPORT CAPABILITY:**
No density.
13. **TRAINING REQUIREMENTS:**
Operator MOS 93-E-20, 93-F-20.
14. **TYPICAL BASIS OF ISSUE.**
15. **PRICE DATA:**
a. Major item _ _ _ _ _ \$ 6 . 0 0
b. Repair parts (1-year cost based on 100 equipments). Expendable, non-repairable.
16. **ITEM REPLACED:**
ML-391()/AM.
17. **REMARKS:**
Issued as a unit replacement.

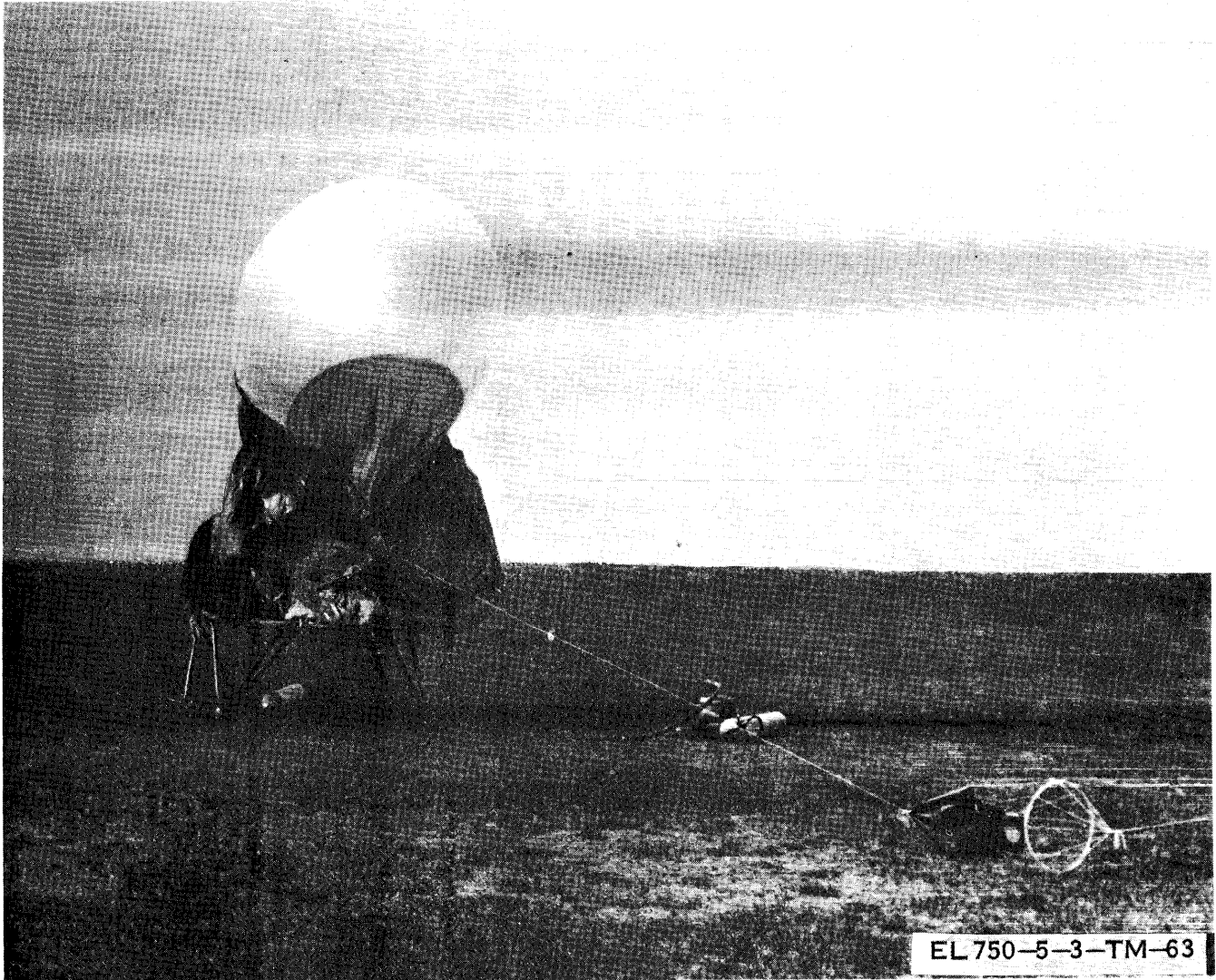


Figure 63. Balloon, Meteorological ML-541/AM.

1. NOMENCLATURE: Balloon, Meteorological ML-541/AM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Used to carry meteorological equipment aloft.

5. BRIEF FUNCTIONAL DESCRIPTION:

Balloon, Meteorological ML-541 /AM is a sounding balloon which is used to carry aloft meteorological equipment which furnishes data on temperature, humidity, and pressure of the upper air during daytime hours. The ML-541/AM also may be used to carry aloft radar targets when radar equipment is used to determine the direction and speed of winds aloft.

6. TECHNICAL CHARACTERISTICS:

Type _____ Sounding, uncolored.
Weight (nominal) _____ 2,000 g.

Material _____ Neoprene.

Lifting force _____ 2,600 g.

Total lift _____ 5,950 g.

Rate of rise (average) _____ 1,700 fpm or 520 meters-per-minute.

Bursting altitude _____ 75,000 ft/22,860 met.

Dimensions (uninflated) _____ Body dia 80 in, neck 4½ in. long and 1 in. dia.

7. MAJOR COMPONENT:

Balloon ML-541/AM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

10. TOOLS AND TEST EQUIPMENT: None.

TM 750-5-3
ML-541/AM

11. REFERENCE DATA AND LITERATURE:
TM 11-6660-218-12, -25P ____ AN/TMQ-4, ML-
541/AM

12. REPAIR PARTS SUPPORT CAPABILITY:
No density.

13. TRAINING REQUIREMENTS:
Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

15. PRICE DATA:

- a. Major item _____ \$14.00
- b. Repair parts (1-year cost based Expendable, non-
on 100 equipments). _____ repairable.

16. ITEM REPLACED:
ML-391() /AM.

17. REMARKS:
Issued as a unit replacement.

(No illustration available)

1. NOMENCLATURE: Fallout-Prediction Plotting Scale ML-556/UM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:

Plots a wind sounding for the purpose of forecasting radioactive fallout.

5. BRIEF FUNCTIONAL DESCRIPTION:

Fallout-Prediction Plotting Scale ML-556/UM is a flat, rectangular-type, plastic plotting scale which is used to plot wind soundings in a head-to-tail manner for the purpose of forecasting radioactive fallout. The ML-556/UM includes 12 parallel slotted lines, scaled in miles per hour to indicate windspeed, and an azimuth circle to indicate wind direction.

6. TECHNICAL CHARACTERISTICS:

Type _____ Plastic, flat, rectangular shaped.

Graduation data (mph on map scale) _____ 1 to 1,00,000; 1 to 250,000; 1 to 500,000.

Dimensions _____ 7.5 by 16.5 in. (approx).

7. MAJOR COMPONENT:

Fallout-Prediction Plotting Scale ML-556/UM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

Used with Manual Meteorological Station AN/TMQ-4.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-218-12, -25P _____ AN/TMQ-4

12. REPAIR PARTS SUPPORT CAPABILITY:

No density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-F-20.

14. TYPICAL BASIS OF ISSUE:

<i>TOE</i>	Allowance
5-101G _____	2
29-102G _____	1
54-12G _____	2
54-22G _____	2
54-422G _____	2

15. PRICE DATA:

a. Major item _____ \$2.05

b. Repair parts (1-year cost based on 100 equipments) _____ Expendable, non-repairable.

16. ITEM REPLACED: None.

17. REMARKS:

Issued as a replacement unit.

(No illustration available)

1. **NOMENCLATURE:** Barograph ML-563/UM.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used to produce a continuous record of atmospheric pressure.
5. **BRIEF FUNCTIONAL DESCRIPTION:**
Barograph ML-563/UM is a portable precision instrument which measures and records atmospheric pressure. The ML-563/UM supplies a continuous visible record on a chart for a period of 4 days. Variation in atmospheric pressure actuates mechanisms in the ML-563/UM, causing a pen to mark on a rotating chart. The chart is pinned on to a cylinder which is mounted on Clock ML-145. Clock ML-145 completes a rotation in 4 days. Thus, the chart furnishes a record of changes in atmosphere with respect to time.
6. **TECHNICAL CHARACTERISTICS:**
 Type _____ Aneroid.
 Pressure-sensitive unit _ Spring-loaded aneroid bellow.
 Recording system. ___ Pen actuated by lever system bearing against paper chart mounted on a rotating cylinder.

 Range _____ 2½ in. of mercury adjustable between 8 and 32 in.
 Chart _____ 2½ in. of chart width to 1 in. of mercury.
 Recording time _____ 4 days.
 Dimensions _____ 13¼ in. long, 5 7/8 in. wide, 10¼ in high.
7. **MAJOR COMPONENTS:**
 Clock ML-145.
 Pen.
 Pressure-measuring and registering mechanism mounted in case.

8. **SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This equipment is used independently.
9. **ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:**
a. Additional Equipment.
 Ink.
 Chart ML-236.
b. Auxiliary Equipment. None.
10. **TOOLS AND TEST EQUIPMENT:**
a. Tools.
 Tool Equipment TK-17/FMQ.
 Tool Equipment TK-22/G.
b. Test Equipment.
 Barometer, Mercurial ML-512/GM.
 Barometer, Mercurial ML-330/FM.
11. **REFERENCE DATA AND LITERATURE:**
 TM 11-425 _____ } ML-563/UM
 TM 11-6660-217-20P, -35 P _____ }
12. **REPAIR PARTS SUPPORT CAPABILITY:**
T o 1 9 7 4 - Full support.
13. **TRAINING REQUIREMENTS:**
 Operator MOS 93-E-20, 93-F-20.
 Maintenance MOS 35-C-20.
14. **TYPICAL BASIS OF ISSUE:**

T A	<u>Allowance</u>
50-818 _____	1
15. **PRICE DATA:**
 a. Major item _____ \$365.00
 b. Repair parts (1-year cost based on 100 equipments) _____ \$5,475.00
16. **ITEM REPLACED:** None.
17. **REMARKS:**
Formerly nomenclature ML-3().

(No illustration available)

1. NOMENCLATURE: Dual Purpose, Fast Rising Balloon ML-566()/AM.

2. TYPE CLASSIFICATION: Development.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:

Used to carry meteorological equipment aloft during day or night.

5. BRIEF FUNCTIONAL DESCRIPTION:

Dual Purpose, Fast Rising Balloon ML-566()/AM is a combination-type weather balloon consisting of an inner high altitude spherical balloon and an outer streamlined balloon. The ML-566()/AM is used during daytime or nighttime hours, in any climate or weather conditions, to carry aloft equipment which furnishes data on the temperature, humidity, and pressure of the upper air.

6. TECHNICAL CHARACTERISTICS:

Type _____ Dual-purpose, sounding.
Ascent rate _____ 1,700 fpm during day,
1,600 fpm at night
when carrying a load
of 1,300 g.

Bursting altitude 100,000 ft or 33,528
meters.

Environment limitation:

Temperature -115° F. to +140° F.
Pressure 31 in. mercury to 0.1 in.
mercury.

Relative humidity _____ To 100%.

Inflation _____ Hydrogen from cylinder
or generator.

Dimensions (neck) ___ 4.5 in. long, 1-in. dia.

Weight _____ 4,000 g.

Total lift _____ 9,500g.

7. MAJOR COMPONENT:

Dual Purpose, Fast Rising Balloon ML-566/AM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

Nozzle ML-196.

Balloon shroud or Launching Device ML-594 /UM.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE: None.

12. REPAIR PARTS SUPPORT CAPABILITY: Development.

13. TRAINING REQUIREMENTS:

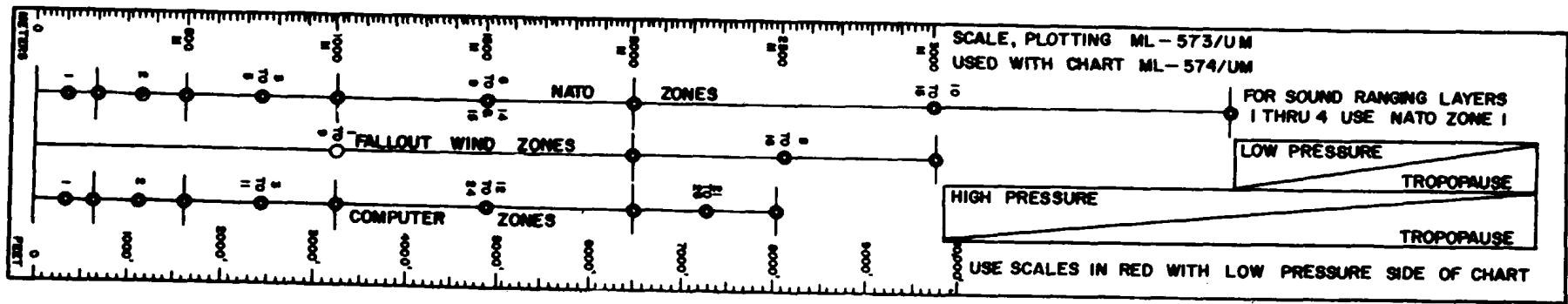
Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

15. PRICE DATA.

16. ITEM REPLACED: None.

17. REMARKS: None.



TM 6660-218-15-44

Figure 64. Scale, Conversion, Pressure-Temperature-Altitude ML-573.

1. NOMENCLATURE: Scale, Conversion, Pressure-Temperature-Altitude ML-573.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Used for the determination of ballistic data in artillery calculations.

5. BRIEF FUNCTIONAL DESCRIPTION:
Scale, Conversion, Pressure-Temperature-Altitude ML-573 is used in conjunction with Chart ML-574/UM for the determination of ballistic data in artillery calculations. Mean virtual temperature, pressure, and altitude given on Chart ML-574/UM are converted to ballistic data by the use of the ML-573. The ML-573 is a part of Manual Meteorological Station AN/TMQ-4.

6. TECHNICAL CHARACTERISTICS:
Type ----- Plastic, flat, rectangular shaped.
Graduation data ----- Meters, 0 to 3,000; sound ranging layers: nato zones 1 to 15; fallout wind zones 1 to 6; computer zones 1 to 26; ft, 0 to 10,000.
Dimensions ----- 15.171 in. long.

7. MAJOR COMPONENT:
Scale, Conversion, Pressure-Temperature-Altitude ML-573/UM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:
This equipment is used in Manual Meteorological Station AN/TMQ-4.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:
TM 11-6660-218-12, -25P ----- ML-573

12. REPAIR PARTS SUPPORT CAPABILITY:
No density.

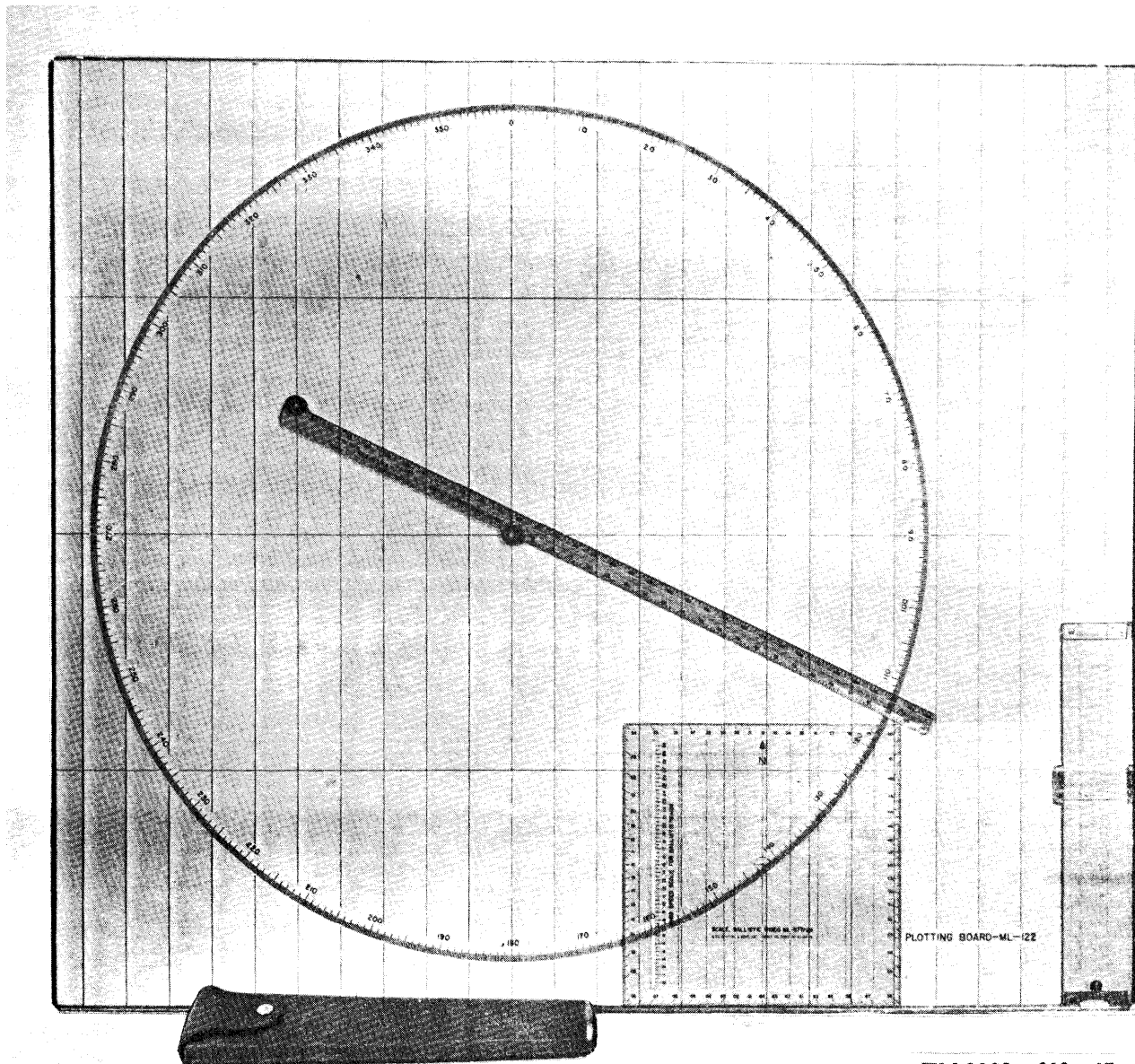
13. TRAINING REQUIREMENTS:
Operator MOS 93-F-20.

14. TYPICAL BASIS OF ISSUE:

15. PRICE DATA:
Expendable, nonrepairable.

16. ITEM REPLACED: None.

17. REMARKS:
Issued as replacement unit.



TM 6660-218-15-43

Figure 65. Scale, Plotting ML-577/UM.

1. NOMENCLATURE: Scale, Plotting ML-177/UM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Used in plotting and computing windspeed and wind rection.

5. BRIEF FUNCTIONAL DESCRIPTION:

Scale, Plotting ML-577/UM is used as an aid in determining windspeed and wind direction, The ML-577/UM is used with Plotting Board ML-122 in the plotting and computation of vectored zone winds and ballistic winds from meteorological data obtained by pilot balloons or radiosonde balloon tracking.

6. TECHNICAL CHARACTERISTICS:

Type ----- Plastic, fluted cross section, square shaped.

Graduations ----- Outer edges 10 mil units of circular measure, numbered 1 to 64, slit in face of scale graduated in knots of windspeed numbered 1 to 30; 7 $\frac{3}{4}$ -in. by 1/8-in. slit graduated in knots of windspeed numbered 1 to 30; 8 each 9-in. parallel lines spaced 9/10 in. apart for orienta-

tion of scale with plotting
board.

Overall dimensions ----- 9 by 9 in.

7. MAJOR COMPONENT:

Scale, Plotting ML-577/UM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used with Manual Meteorological Station AN/TMQ-4.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

Plotting Board ML-122.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-218-12, -25P ----- AN/TMQ-4

12. REPAIR PARTS SUPPORT CAPABILITY:

No Density.

13. TRAINING REQUIREMENTS:

Operator MOS 93-F-20.

14. TYPICAL BASIS OF ISSUE.

15. PRICE DATA:

a. Major item ----- \$2.00

b. Repair parts (1-year cost based Expendable, non-repairable.
on 100 equipments).

16. ITEM REPLACED: None.

17. REMARKS:

Used with Chart ML-574/UM; issued as a replacement unit.

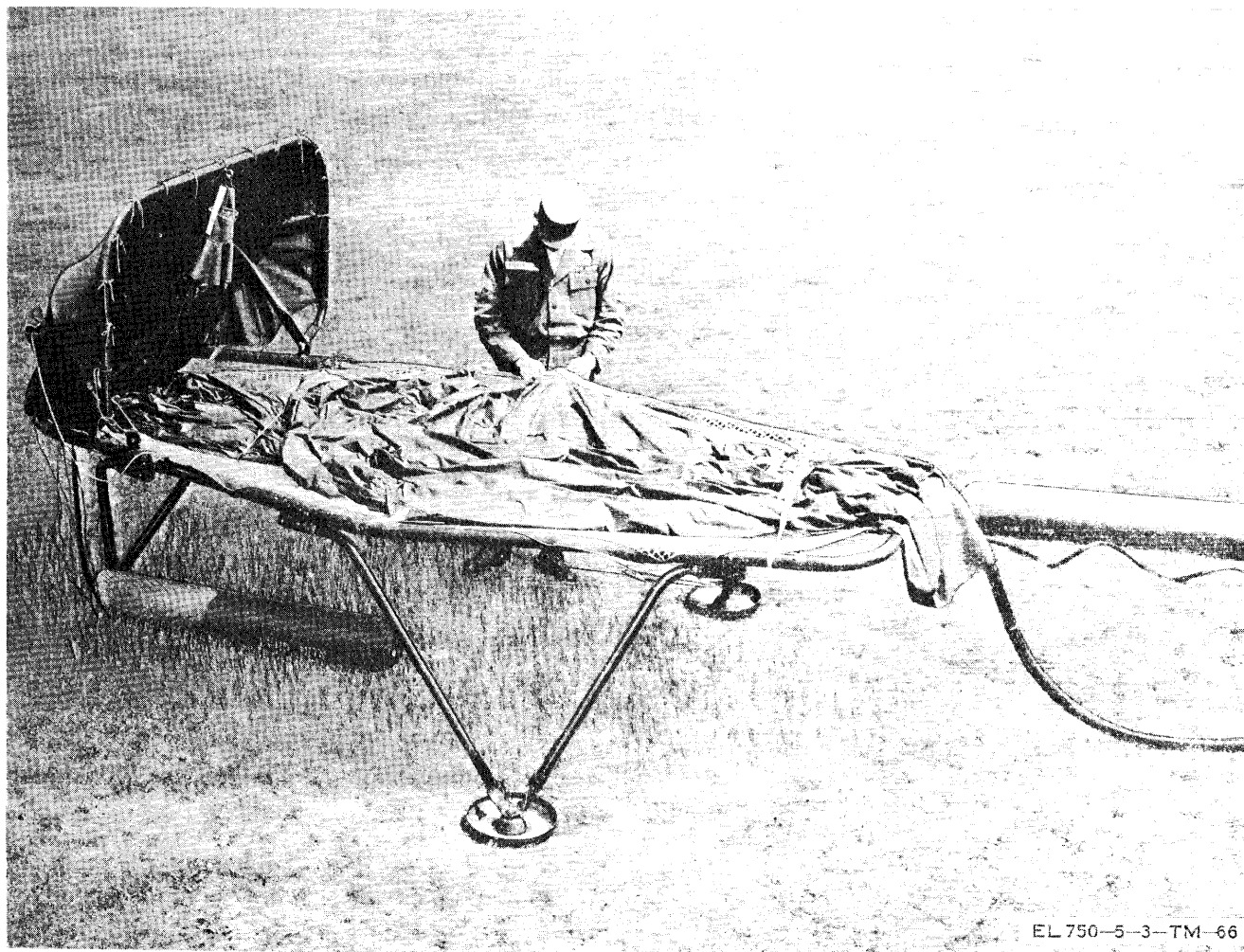


Figure 66. Balloon Launcher ML-594/U.

1. NOMENCLATURE: Balloon Inflation and Launching Device ML-594/U.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:

Designed to facilitate meteorological balloon launching under adverse field conditions.

5. BRIEF FUNCTIONAL DESCRIPTION:

Balloon Inflation and Launching Device ML-594/U is a portable device designed primarily to facilitate meteorological balloon launching under adverse field conditions. The device is used to secure the balloons during inflation and protect them from extremes of weather. The equipment design provides a portable launching platform which is adaptable to a variety of terrain conditions. Design features and the material used in fabrication of the

equipment reduces the explosion hazard when using hydrogen.

6. TECHNICAL CHARACTERISTICS:

Unpacking and assembly time _ Approx 15 min by 2 men.

Ambient conditions:

Surface winds _ _ _ _ _ Operates satisfactorily in winds up to 50 mph.

Temperature _ _ _ _ _ -40° F. to +140° F.

Ice thickness _ _ _ _ _ Up to 1/16 in. on surface of device.

Operating range _ _ _ _ _ Up to 10,000 ft above mean sea level.

Dimensions of transit case _ _ _ 9¾ in. high, 48 in wide, 66¾ in. long.

Weight of transit case with components _ _ _ _ _ 140.40 lb.

TM 750-5-3

ML-594/U

7. MAJOR COMPONENTS:

- Canopy.
- Canopy support.
- Case, transit windbreak frame assembly.
- Nozzle assembly.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This device is used with Volume Meter, Hydrogen-Helium ML-605/U in a fast-riser balloon system.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

a. Additional Equipment.

- Shovel.
- Mallet.
- Ring to release the canopy master loop release strap.

b. Auxiliary Equipment. None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

- TM 11-6660-238-15, -25P ML-594/U
- TM 11-6660-245-15, -25P ML-605/U

12. REPAIR PARTS SUPPORT CAPABILITY:

To 1975—Full support.

13. TRAINING REQUIREMENTS:

- Operator MOS 93-E-20, 93-F-20.
- Maintenance MOS 35-D-20.

14. TYPICAL BASIS OF ISSUE:

<i>TA</i>	<i>Allowance</i>
M7W04SAA - - - - -	_ 1
M7W04WAA - - - - -	_ 2
M7W04ZAA - - - - -	_ 1
5AW2NTAA - - - - -	_ 6

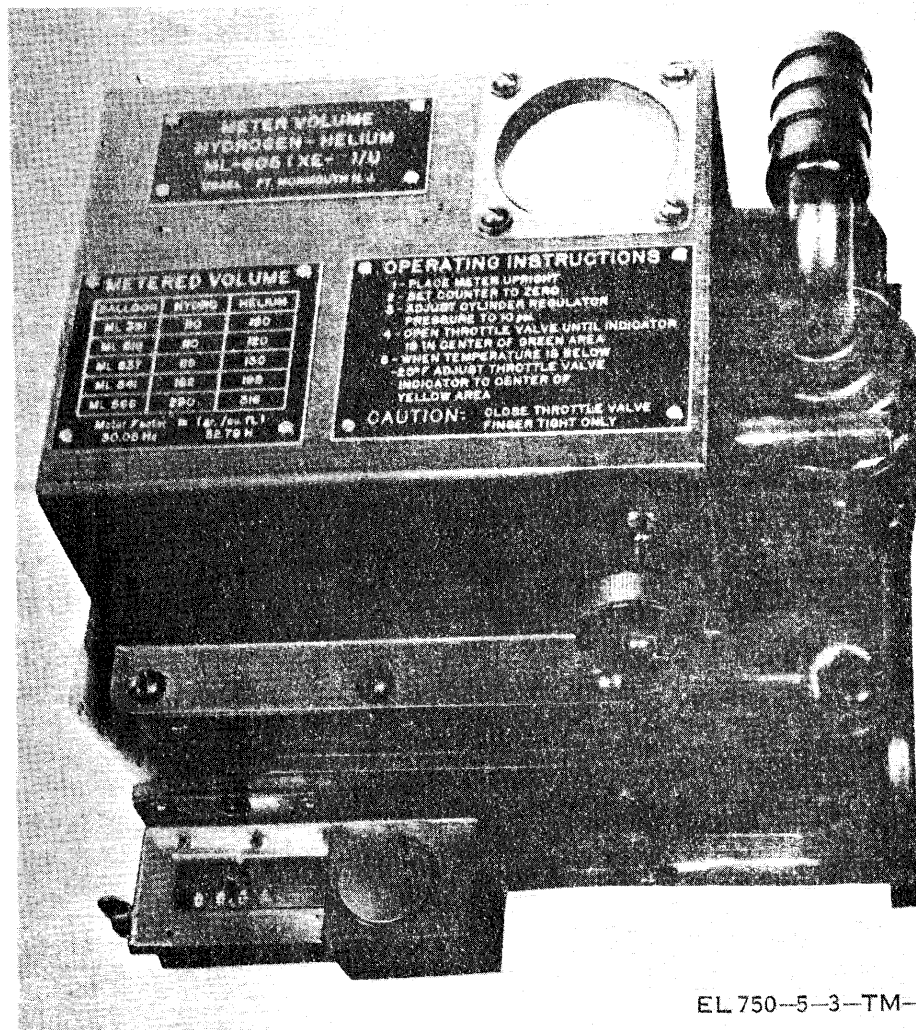
15. PRICE DATA:

- a.* Major item _____ \$2,602.00
- b.* Repair parts (1-year cost based on 100 equipments) _____ \$39,030.00

16. ITEM REPLACED:

Balloon Shroud ML-424/U and Inflation Tent ML-1957.

17. REMARKS: None.



EL 750-5-3-TM-67

Figure 67. Volume Meter Hydrogen-Helium ML-605/U.

1. **NOMENCLATURE:** Volume Meter, Hydrogen-Helium ML-605/U.

2. **TYPE CLASSIFICATION:** Standard A.

3. **SECURITY REQUIREMENTS:** Unclassified.

4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Measures volume of gas required to properly lift meteorological sounding balloons.

5. **BRIEF FUNCTIONAL DESCRIPTION:**
Volume, Meter, Hydrogen-Helium ML-605/U (volume meter) is designed to measure the correct volume of gas in cubic feet required to obtain the proper lift for meteorological sounding balloons when inflated with helium or hydrogen cylinder gas, Volume Meter, Hydrogen-Helium ML-605/U can be assembled in an inflation and launching system consisting of a cylinder gas supply, Volume Meter, Hydrogen-Helium ML-605/U, and Balloon Inflation and Launching Device ML-594/U. The volume meter delivers helium gas at a rate of 420 cubic-feet-an-hour minimum

and hydrogen gas at a rate of 600 cubic-feet-an-hour minimum.

6. **TECHNICAL CHARACTERISTICS:**

Rate of gas delivery:

Helium ----- 420 cu-ft-per-hr, min.
Hydrogen ----- 600 cu-ft-per-hr, min.

Method of metering gas delivery:

Gas volume indicator at 60°
F. and 1,013 millibars pressure.
Temperature compensating
bimetal element-correct for
temperature changes between +140° F. and - 40°
F.

Inflation data place ----- Indicates the proper
meter volume for
each balloon series.

TM 750-5-3
ML-605/U

Inflation nomograph ----- Inflation volume graph,
 can be interpreted
 Recording device ----- Registers balloon vol-
 umes 1-9999.9 cu. ft.
 Dimensions of case ----- 36 in. high, 36 in. deep,
 36 in. wide.
 Weight of case and components _ 57 lb.

7. MAJOR COMPONENT:

Volume Meter, Hydrogen-Helium ML-605/U.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This unit is used with Balloon Inflation and Launching Device ML-594/U in a fast-riser balloon system.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

a. Additional Equipment.

Helium or hydrogen gas cylinder.
 Hydrogen Regulator ML-193.
 Coupling ML-49.
 Hose ML-81.
 Balloon Inflation and Launching Device ML-594/U.
 Meteorological balloon.

b. Auxiliary Equipment. None.

10. TOOLS AND TEST EQUIPMENT:

a. Tools.

Screwdriver (spcl).

Wrench, open end, 5/16 and 3/8 in.
 Wrench, open end, 11/16 and 3/4 in.
 Wrench, plier, 7 in. nom size.
 Screwdriver 1/8 in. wide, 5 in. long.
 Screwdriver 3/16 in. wide, 5 in. long.
 Key, sockethead screw 0.050 in.
 Punch, drive pin, 1/16 in. dia.
 Wrench, octagonal, 2 1/4 in. open.

b. Test Equipment. None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-245-15, -25P ML-605/U
 TM 11-6660-238-15, -25P ML-594/U
 TM 11-6660-218-12, -25P AN/TMQ-4

12. REPAIR PARTS SUPPORT CAPABILITY:

To 1974—Full support.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.
 Maintenance MOS-35-C-20.

14. TYPICAL BASIS OF ISSUE:

<i>TA</i>	<i>Allowance</i>
M7W04SAA -----	1
5AW2NTAA -----	6

15. PRICE DATA.

16. ITEM REPLACED: None.

17. REMARKS: None.

(No illustration available)

1. NOMENCLATURE: Balloon, Fast Riser ML-607()/AM.

2. TYPE CLASSIFICATION: Development.

3. SECURITY REQUIREMENT: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Used to carry meteorological equipment aloft.

5. BRIEF FUNCTIONAL DESCRIPTION:

Balloon, Fast Riser ML-607()/AM is a sounding balloon which is used to carry aloft meteorological equipment which furnishes data on the temperature, humidity, and pressure of the upper air. The ML-607()/AM can be used to carry aloft targets when radar equipment is used to determine the direction and speed of winds. The ML-607()/AM provides satisfactory service in any climate or weather conditions, and is capable of rising to an altitude of at least 110,000 feet in all climatic regions, including arctic and tropic regions where extremely low temperatures aloft are found at night.

6. TECHNICAL CHARACTERISTICS:

Type _____ Sounding, all zones.
Material _____ Neoprene.
Bursting altitude _____ 110,000 ft.
Weight _____ 1,200 g (approx).
Rate of rise _____ 1,000- to 1,500-fpm with
load of 1,300 g and in-
flated with a free lift of
1,600 g.

Environmental limitation:

Ambient tempera- —90° C to +60° C.
ture.

Pressure _____ 1,050 to 5 mb.

Inflation _____ Hydrogen from a cylinder
or generator; helium
from a cylinder.

Dimensions (neck) _____ 4.5 in. long, 1 in. in dia.

7. MAJOR COMPONENT:

Balloon, Fast Riser ML-607 ()/AM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

Inflation nozzle and weights.

Balloon launcher.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE.

12. REPAIR PARTS SUPPORT CAPABILITY:

Development.

13. TRAINING REQUIREMENT:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE.

15. PRICE DATA.

16. ITEM REPLACED.

17. REMARKS.

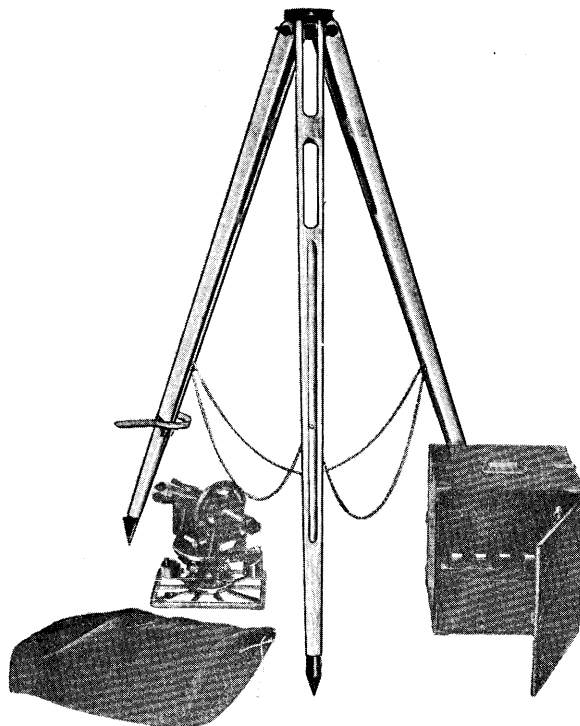


Figure 68. Tripod MT-1309/TM.

1. NOMENCLATURE: Tripod, Surveying MT-1309/TM.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:

Used as a support for Theodolites, Double Center ML-474/GM and ML-247().

5. BRIEF FUNCTIONAL DESCRIPTION:

Tripod, Surveying MT-1309/TM, consisting of three wooden legs and a threaded mount, is used in Meteorological Station, Manual AN/TMQ-4 to support and keep steady Theodolite ML-247() and ML-474/GM.

6. TECHNICAL CHARACTERISTICS:

Material	-----	Wood.
Mount	-----	Threaded, protected by a protector cap when not in use.
Legs	-----	Metal-tipped, strap holds legs together when tripod is transported.
Dimensions	-----	60 in. high.

7. MAJOR COMPONENT:

Tripod, Surveying MT-1309/TM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

Theodolite ML-47(), ML-247(), or ML-474/GM.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

TM 11-6660-218-12, -25P AN/TMQ-4

12. REPAIR PARTS SUPPORT CAPABILITY:

No density.

13. TRAINING REQUIREMENTS:

Operators MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

<u>TA</u>		<u>Allowance</u>
6-2	-----	3 5

TM 750-5-3

MT-1309/TM

<i>TA</i>	<u>Allowance</u>
50-772 -----	1
77-4 -----	1
<i>TOE</i>	
6-577G -----	1

b. Repair parts (1-year cost based on 100 equipments) ----- \$531.00

15. PRICE DATA:

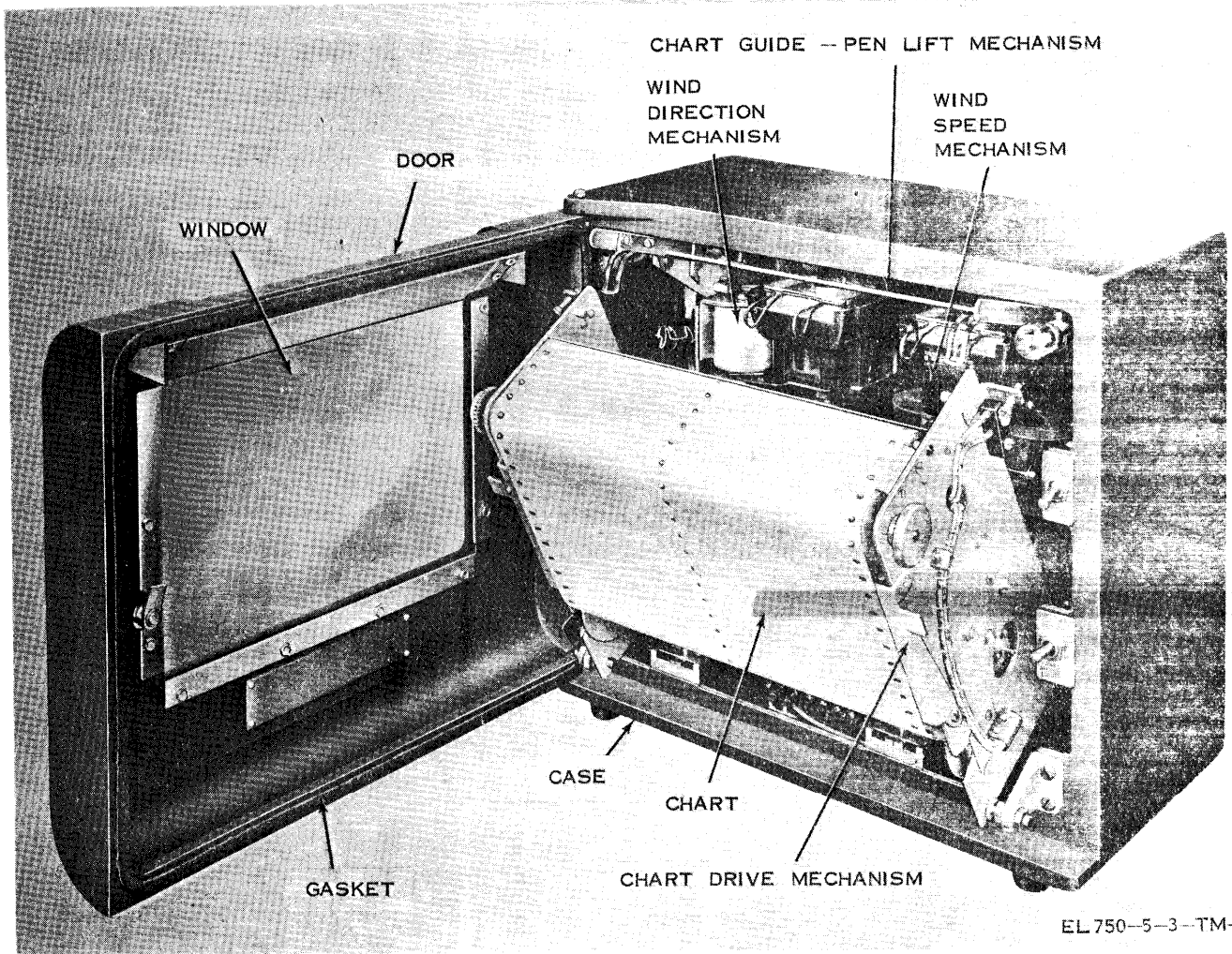
a. Major item ----- \$35.40

16. ITEM REPLACED:

Replaces ML-78.

17. REMARKS:

Part of Manual Meteorological Station AN/TMQ-4 (same as ML-78).



EL 750-5-3-TM-69

Figure 69. Recorder, Wind Direction and Speed RO-2()/GMQ.

1. NOMENCLATURE: Recorder, Wind Direction and Speed RO-2/GMQ, RO-2A/GMQ, RO-2B/GMQ, RO-2C/GMQ.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
Provides a continuous record of wind direction and windspeed.

5. BRIEF FUNCTIONAL DESCRIPTION:

Recorder, Wind Direction and Speed RO-2()/GMQ is a two-element recorder which provides a continuous record of wind direction and windspeed value with respect to time. Electrical values, representing wind direction and windspeed, supplied by Wind Measuring Set AN/GMQ-11, activate mechanisms in the RO-2()/GMQ, causing a pen to make ink traces of the wind direction and windspeed values on a continuous-strip paper chart. Wind Measuring Set AN/GMQ-11 is not supplied as part of the RO-2()/GMQ but is required for operation.

6. TECHNICAL CHARACTERISTICS:

Power supply:
RO-2/GMQ and RO-2C/GMQ. 105- to 125-vac, 60-Hz, single-phase, 80-w.
RO-2A/GMQ and RO-2B/GMQ. 101- to 125-vac, 50- to 65-Hz, single-phase, 80-w.

Range of recorder measurement:
Wind direction ----- 360°.
Windspeed ----- 0 to 120 kn or 0 to 240 kn; RO-2B/GMQ and RO-2C /GMQ also have 0 to 140 mph or 0 to 280 mph windspeed.

Recorder accuracy:
Wind direction ----- ±4° (pen follows transmitter within ± 4°).
Windspeed ----- ±1% of full scale on 0 to 120 and 0 to 240 kn; 0 to 140 mph or 0 to 280 mph on

the RO-2B/GMQ and RO-2C/GMQ.

Atmospheric conditions:

Temperature ----- -10° F. to 125° F.
 Relative humidity ----- 0% to 95%.
 Operating range ----- 0 to 10,000 ft above mean sea level.

Running time ----- 15 days (chart speed 3 in. per hr) or 7½ days (chart speed of 6 in. per hr).

Signal input:

Wind direction ----- Input from remote synchro (transmitter) representing a wind direction.

Windspeed ----- 0 to 14.6 ±0.01 vdc represents 0 to 120 kn windspeed; 0 to 29.2±0.02 vdc represents 0 to 250 kn wind speed; on the RO-2B/GMQ and RO-2C/GMQ, 0 to 14.78 ± 0.01 vdc represents 0 to 140 mph, and 0 to 29.57±0.02 vdc represents 0 to 280 mph.

Dimensions ----- 13 15/16in. high, 10 1/16 in. deep, 15 5/8 in. wide.

Weight ----- 44 lb.

7. MAJOR COMPONENT:

Recorder, Wind Direction and Speed RO-2 ()/GMQ.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS :

This set is used in a system with Wind Measuring Set AN/GMQ-11.

9. ADDITIONAL, EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

a. Additional Equipment.

Power source 105 to 125 vac, 50 to 65 Hz, single-phase, 80 w.

b. Auxiliary Equipment. None.

10. TOOLS AND TEST EQUIPMENT:

a. Tools.

Tool Kit TK-115/G.
 Tool Kit TK-87/U.

b. Test Equipment.

Multimeter AN/URM-105.
 Multimeter TS-352/U.

11. REFERENCE DATA AND LITERATURE:

TM 11-2444 ----- RO-2()/GMQ
 TM 11-6625-203-12, -35 _ AN/URM-105
 TM 11-6625-366-15 ----- TS-352/U
 TM 11-6660-200-10, -20, -35 ----- AN/GMQ-11

12. REPAIR PARTS SUPPORT CAPABILITY:

To 1974—Full support

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.
 Maintenance MOS 35-B-20, 35-C-20.

14. TYPICAL BASIS OF ISSUE:

<i>TA</i>	<i>Allowance</i>
10-4 -----	8
32-13 -----	1
50-147 -----	1
50-156 -----	3
50-447 -----	5
50-774 -----	2
50-819 -----	2 5
60-26 -----	1 1 1
77-26 -----	8
80-26 -----	20

15. PRICE DATA:

a. Major item ----- \$865.00
b. Repair parts (1-year cost based on 100 equipments) ----- \$12,975.00

16. ITEM REPLACED: None.

17. REMARKS: None.

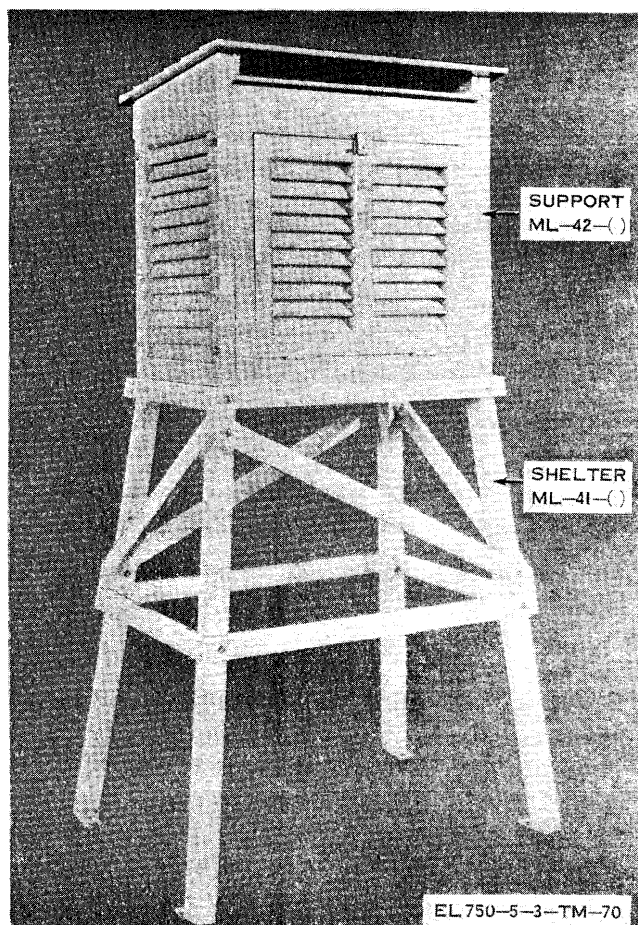


Figure 70. Instrument Shelter S-101/UM.

1. **NOMENCLATURE:** Instrument Shelter, Meteorological S-101/UM.
2. **TYPE CLASSIFICATION:** Standard A.
3. **SECURITY REQUIREMENTS:** Unclassified.
4. **PRIMARY USE OR CONCEPT OF EMPLOYMENT:** Used as a housing for meteorological instruments.

5. BRIEF FUNCTIONAL DESCRIPTION:

Shelter, Meteorological Instrument S-101/UM, a housing for meteorological instruments, is used in conjunction with Instrument Shelter Support MT-1426/UM.

6. TECHNICAL CHARACTERISTICS:

Material ----- Wood.
 Ventilation ----- Rainproof louvered sides.
 Roof ----- Slanting, double thick.
 Front door ----- Hinged.
 Overall dimensions 33 in. long, 24 in. wide, 33 in. (approx). high.
 Weight (approx) ----- 65 lb net, 100 lb packed.

7. MAJOR COMPONENT:

Instrument Shelter, Meteorological S-101/UM.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This equipment is used independently.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT: None.

11. REFERENCE DATA AND LITERATURE:

12. REPAIR PARTS SUPPORT CAPABILITY:

To 1974--Full support.

13. TRAINING REQUIREMENTS:

Operator MOS 93-E-20, 93-F-20.

14. TYPICAL BASIS OF ISSUE:

<u>TA</u>	<u>Allowance</u>
10-4 -----	4
32-13 -----	1
50-156 -----	19
50-734 -----	1

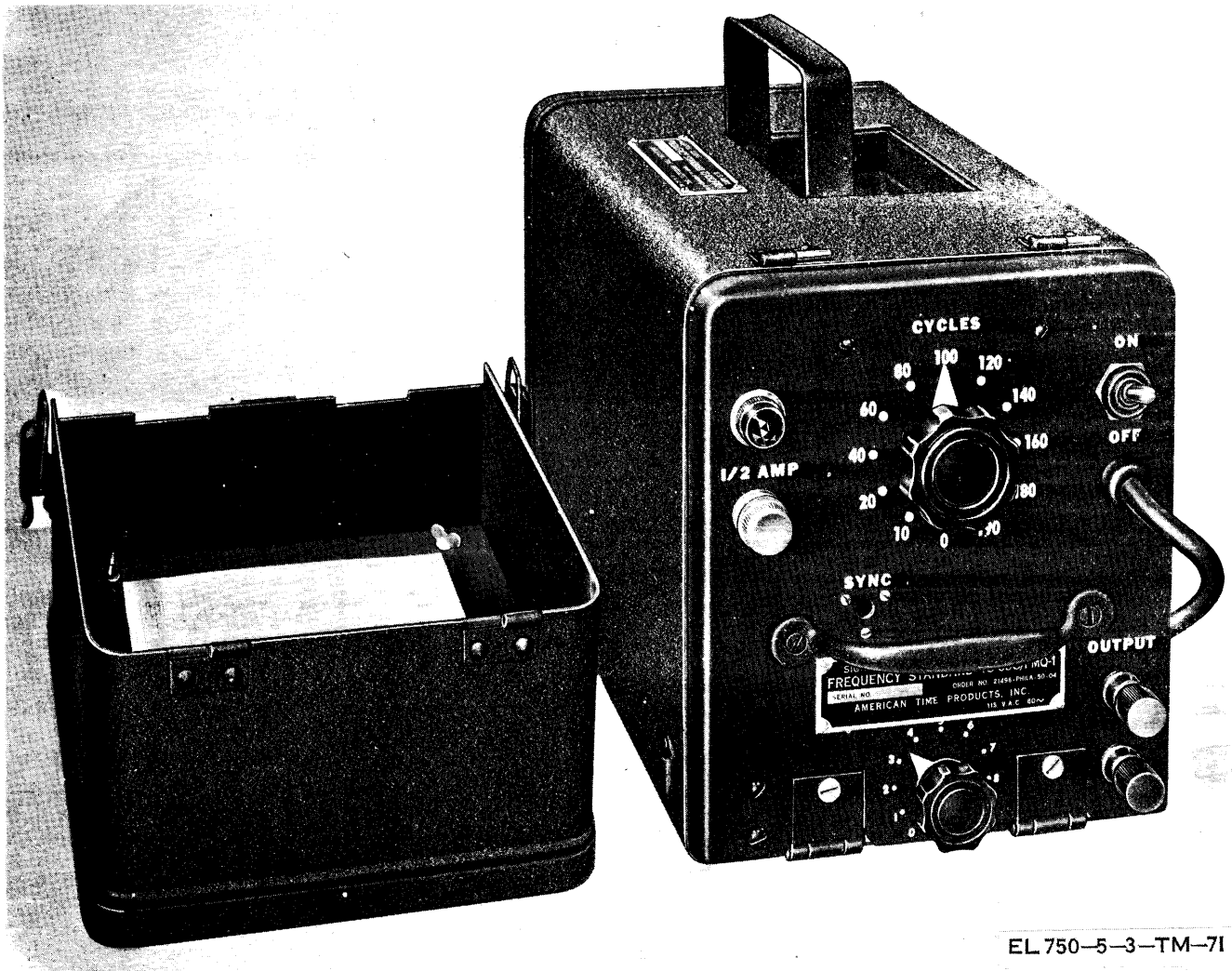
15. PRICE DATA:

a. Major item ----- \$92.90
 b. Repair parts (1-year cost based on 100 equipments) ----- \$1,393.50

16. ITEM REPLACED: None.

17. REMARKS:

Formerly nomenclatured ML-41().



EL 750-5-3-TM-71

Figure 71. Test Set TS-65C/FMQ-1.

1. NOMENCLATURE: Audio Frequency Generator TS-65C/FMQ-1.

2. TYPE CLASSIFICATION : Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:

Used to calibrate and align Radiosonde Recorder AN/TMQ-5().

5. BRIEF FUNCTIONAL DESCRIPTION:

Audio Frequency Generator TS-65C/FMQ-1 is a low audiofrequency generator used to provide a means for linear calibration of the Radiosonde Recorder AN/TMQ-5(). Audio Frequency Generator TS-65C/FMQ-1 incorporates electronic, electromechanical, and photoelectric devices to provide accurate electrical signals of frequencies between 10 and 190 hertz. The frequencies are selected by a manually-controlled CYCLES knob on the front panel. The equipment is complete in a single metal case.

6. TECHNICAL CHARACTERISTICS:

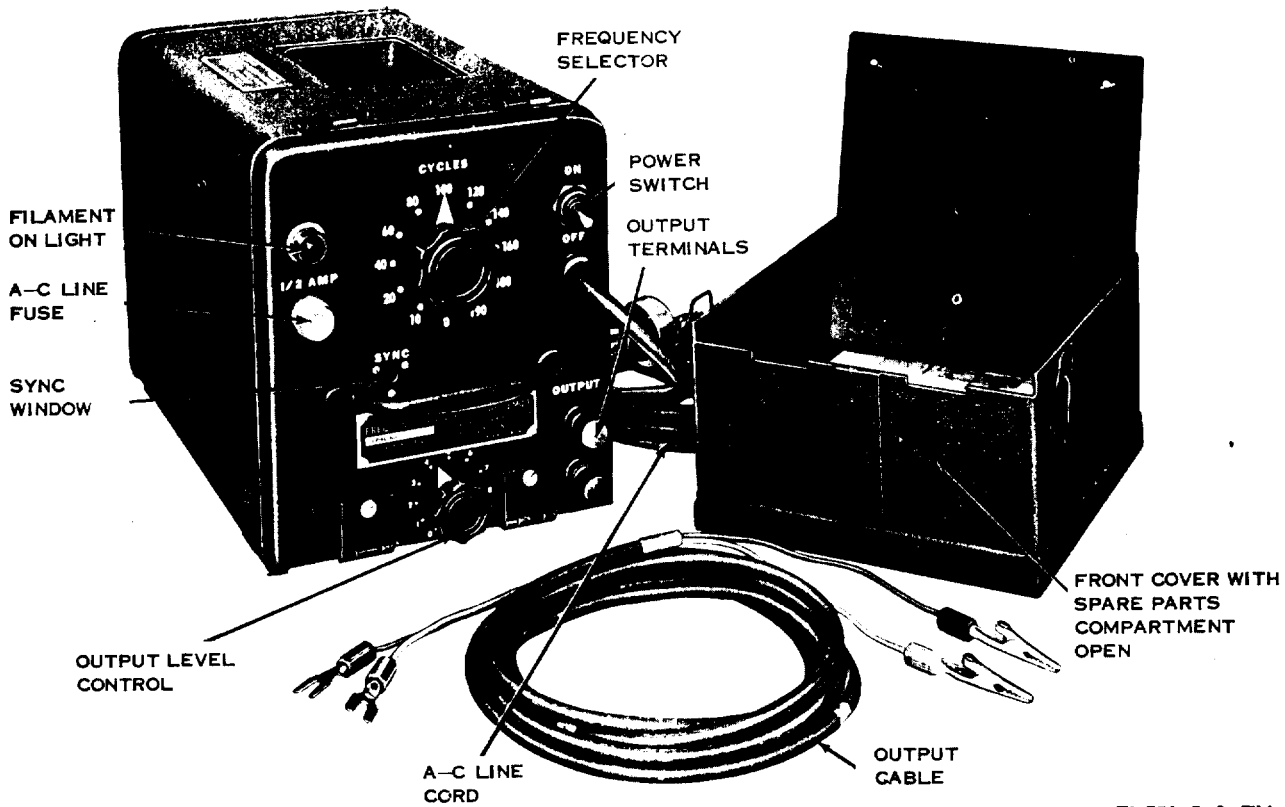
Input voltage	-----	110 to 135 vac.
Input frequency	-----	50 to 60 Hz.
Input power	-----	35 w.
Output frequencies	-----	10, 20, 40, 60, 80, 100, 120, 140, 160, 180, and 190 Hz.
Output voltage	-----	Variable, max equals 45±15 volts peak.
Output wave shape	-----	Negative-going pulse.
Output impedance	-----	50,000 ohms (max).
Output loading	-----	250,000 or more ohms.
Weight	-----	25 lb.
Dimensions	-----	15½ in. long, 7¼ in. wide, 8¼ in. high.

7. MAJOR COMPONENT:

Audio Frequency Generator TS-65C/FMQ-1.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:

This set is used independently.



EL 750-5-3-TM-72

Figure 72. Test Set Components TS-65C/FMQ-1.

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT:

Power Supply, 110 vac, 50-60 Hz.

10. TOOLS AND TEST EQUIPMENT:

a. Tools.

- Tool Kit TK-87/U.
- Tool Kit TK-88/U.

b. Test Equipment.

- Audio Oscillator TS-382/U.
- Frequency Meter AN /USM-26.
- Multimeter TS-352/U.
- Oscilloscope OS-8/U.
- Test Set, Electron Tube TV-2/U.
- Test Set, Electron Tube TV-7/U.

11. REFERENCE DATA AND LITERATURE:

- TM 11-2602B _____ TS-65C/FMQ-1.
- TM 11-6625-261-12, -20P,
-35 _____ TS-382/U.
- TM 11-6625-366-15 _____ TS-352.
- TM 11-6625-316-12, -35 _____ TV-2 /U.
- TB 11-6625-274-12/, -25P
-35 _____ TV-7/U.

12. REPAIR PARTS SUPPORT CAPABILITY:

To 1974—Full support.

13. TRAINING REQUIREMENTS:

- Operator MOS 35-C-20, 35-O-20.
- Maintenance MOS 35-C-20, 35-B-20, 35-D-20.

14. TYPICAL BASIS OF ISSUE:

	<i>TOE</i>	<i>Allowance</i>
6-186G	-----	1
6-201G	-----	1
6-302H	-----	1
6-526G	-----	1
6-576G	-----	2
6-701H	-----	1
6-716H	-----	1
6-100H	-----	1
11-500G	-----	1
17-100G	-----	1
29-16H	-----	1
29-26H	-----	1
37-100H	-----	1
39-51G	-----	1
<i>TA</i>		
6-2	-----	2
20-30	-----	1
50-734	-----	1
50-811	-----	2
77-5	-----	1

TA
80-10 -----
130-4 -----

Allowance
3
59

b. Repair parts (1-year cost based on
100 equipment) ----- \$12,870.00

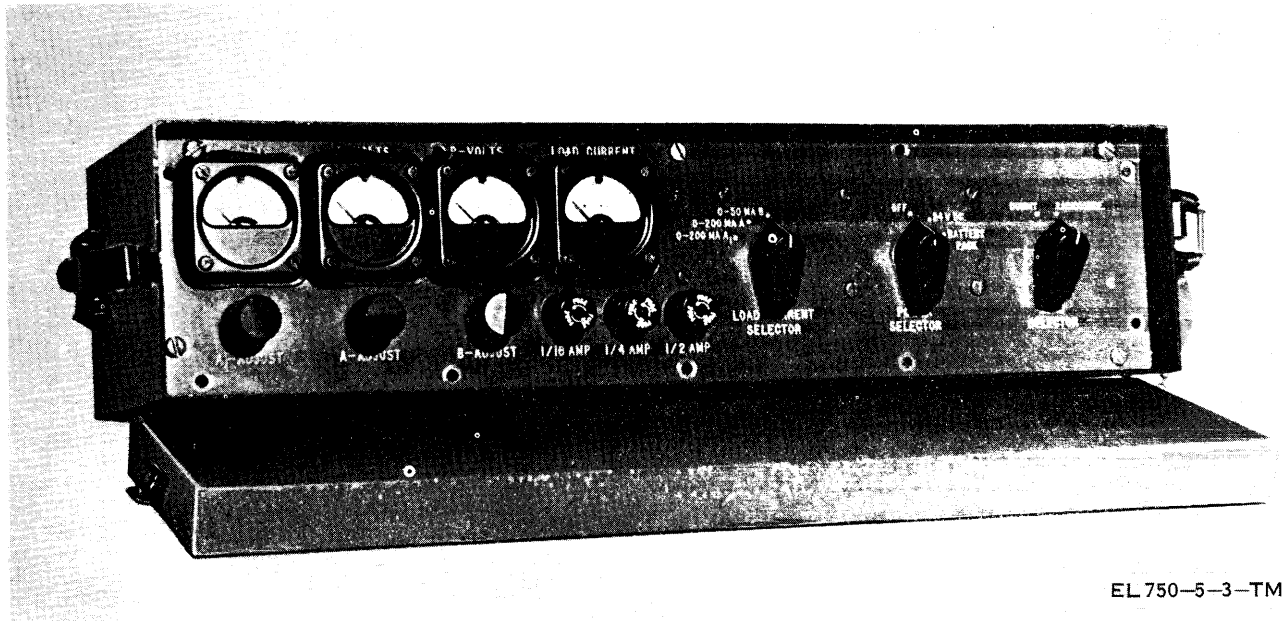
15. PRICE DATA:

a. Major item -----

\$858.00

16. ITEM REPLACED: None.

17. REMARKS: None.



EL 750-5-3-TM-73

Figure 73. Radiosonde Test Set TS-1348()/GMM-1A.

1. NOMENCLATURE: Radiosonde Test Set TS-1348 ()/GMM-1A.

2. TYPE CLASSIFICATION: Standard A.

3. SECURITY REQUIREMENTS: Unclassified.

4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:
 For preflight testing of Battery Pack BA-259/AM, Radiosonde Set AN/AMT-4(), and Radiosonde, Set AN/AMT-12.

5. BRIEF FUNCTIONAL DESCRIPTION:
 Radiosonde Test Set TS-1348()/GMM-1A provides a dummy load to measure the output voltage of Battery Pack BA-259/AM. In addition, Radiosonde Test Set TS-1348()/GMM-1A measures the operational current of Radiosonde Set AN/AMT-4 and Radiosonde Set AN/AMT-12 when these equipments are powered either by Battery Pack BA-259/AM or by a 24-volt vehicular battery. These measurements help prevent incomplete radiosonde flights by testing the battery and the radiosonde under known conditions.

6. TECHNICAL CHARACTERISTICS:

Input voltage:

Battery pack ----- 1.4 vdc at 110 ma, 6.6 vdc at 180 ma, 115 vdc at 34 ma.

Vehicular battery ----- 24 vdc, 750 ma.

Output voltages:

Battery pack ----- 1.4 vdc at 110 ma, 6.6 vdc at 180 ma, 115 vdc at 34 ma.

Vehicular battery ----- 1.4 vdc at 110 ma, 6.4 vdc at 180 ma, 115 vdc at 34 ma.

Meter ranges:

A1 VOLTS meter ----- 0 to 30 vdc ±2%.

A VOLTS meter ----- 0 to 10 vdc ±2%.

B VOLTS meter ----- 0 to 150 vdc ±2%.

Load current meter ----- 0 to 250 ma.

7. MAJOR COMPONENTS:
 Radiosonde Test Set TS-1348()/GMM-1A.

8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:
 This unit will be used with Radiosonde Baseline Check Set AN/GMM-1().

9. ADDITIONAL EQUIPMENT REQUIRED AND AUXILIARY EQUIPMENT: None.

10. TOOLS AND TEST EQUIPMENT:

a. Tools.
 Tool Equipment TE-113.

b. Test Equipment.
 Multimeter TS-325/U.

11. REFERENCE DATA AND LITERATURE:
 TM 11-6660-219-12, -34, -20P

12. REPAIR PARTS SUPPORT CAPABILITY:
 To 1975—Full support.

13. TRAINING REQUIREMENTS:
 Operator MCS 93-E-20, 93-F-20.
 Maintenance MOS--35-D-20.

14. TYPICAL BASIS OF ISSUE:

TOE	Allowance
6-186G -----	1
6-201G -----	1
6-302H -----	1
6-526G -----	1
6-576G -----	2

TM 750-5-3

TS-1348()/GMM-1A

<i>TOE</i>	<i>Allowance</i>
6-701H -----	1
6-716H -----	1
7-100G -----	1
17-100G -----	1
37-100G -----	1
39-51G -----	1
<i>TA</i>	
6-2 -----	18
50-366 -----	12

<i>TA</i>	<i>Allowance</i>
50-771 -----	2
80-10 -----	1

15. PRICE DATA:

a. Major item -----	\$200.00
b. Repair parts (1-year cost based 100 equipments) -----	\$3,000.00

16. ITEM REPLACED: None.

17. REMARKS: None.

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By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
The Adjutant General

Distribution:

Active Army:

USASA (2)
CNGB (1)
ACSC-E (2)
Dir of Trans (1)
COE (1)
TSG (1)
DCSLOG (1)
USAARENBD (2)
USAMB (10)
USACDC (2)
USACDC Agcy (1)
AMC (5)
CONARC (5)
ARADCOM (2)
ARADCOM Rgn (2)
OS Maj Cored (4)
LOGCOMDS (5)
MICOM (5)
TECOM (5)
MECOM (5)
MUCOM (5)
WECOM (5)
USASTRATCOM (4)
USAESC (70)
MDW (1)
Armies (2)
Corps (2)
Svc Colleges (2)
USASESS (10)
USAADS (2)
USAFAS (2)
USAARMS (2)
USAIS (2)
USAES (2)
USAINTS (3)
Div (3)

WRAMC (1)
USACDCEC (10)
USMA (2)
Instl (2) except
Fort Gordon (10)
Fort Huachuca (10)
Fort Carson (10)
Ft Richardson (ECOM Ofc) (2)
WSMR (3)
Army Dep (2) except
LBAD (14)
SAAD (30)
LEAD (7)
TOAD (14)
NAAD (5)
SVAD (5)
ATAD (10)
USA Dep (2)
Sig Sec USA Dep (5)
Sig Dep (5)
Sig FLDMS (2)
ATS (1)
USAERDAA (2)
USAERDAW (5)
USACRREL (2)
MAAG (1)
USARMIS (1)
Procurement Distr (2)
PG (2)
Laboratories (2)
Units org under fol TOE
(2 copies each unit):
11-95
11-168
29-134
29-136

NG: None

USAR: None

For explanation of abbreviations used, see AR 310-50.

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



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The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
 1 decimeter = 10 centimeters = 3.94 inches
 1 meter = 10 decimeters = 39.37 inches
 1 dekameter = 10 meters = 32.8 feet
 1 hectometer = 10 dekameters = 328.08 feet
 1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
 1 decigram = 10 centigrams = 1.54 grains
 1 gram = 10 decigrams = .035 ounce
 1 dekagram = 10 grams = .35 ounce
 1 hectogram = 10 dekagrams = 3.52 ounces
 1 kilogram = 10 hectograms = 2.2 pounds
 1 quintal = 100 kilograms = 220.46 pounds
 1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
 1 deciliter = 10 centiliters = 3.38 fl. ounces
 1 liter = 10 deciliters = 33.81 fl. ounces
 1 dekaliter = 10 liters = 2.64 gallons
 1 hectoliter = 10 dekaliters = 26.42 gallons
 1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
 1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
 1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
 1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
 1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
 1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
 1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
 1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	To	Multiply by	To change	To	Multiply by
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

°F Fahrenheit temperature 5/9 (after subtracting 32) Celsius temperature °C

PIN: 012691-000