TECHNICAL MANUAL

# METEOROLOGICAL EQUIPMENT DATA SHEETS

HEADQUARTERS, DEPARTMENT OF THE ARMY

30 APRIL 1973

TECHNICAL MANUAL

No. 750–5–3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *30 April 1973*

# METEOROLOGICAL EQUIPMENT DATA SHEETS



★ This manual supersedes TM 750–5–3, 25 January 1967.

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

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

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

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

*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, sec SG). |
| OA | Operating assemblies | Assembly of operating units not otherwise covered, used with or part of one set or set series. |
| OC | Oceanographic devices | Bathythernlograplls, etc. |
| OS | Oscilloscope, test | Test oscilloscopes for general test purposes. |
| PD | Prime drivers | Gasoline engines, electric motors, diesel motors, etc. |
| PF | 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). |
| RD | 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. |
| R O _ _ _ _ _ | Recorders | Sound, graphic, tape, wire, film, disc, facsimile, magnetic, mechanical, etc. |
| R P _ _ _ _ _ | Reproducers | Sound, graphic, tape, wire, film, disc, facsimile, magnetic, mechanical, etc. |
| R R _ _ _ _ _ | Reflectors | Target, confusion, etc. Except antenna reflectors (see AT). |
| R T _ _ _ _ _ | 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). |
| S M _ _ _ _ _ | Simulators | Flight, aircraft, target, signal, etc. |
| S N _ _ _ _ _ | Synchronizers | Equipment to coordinate two or more functions, |
| S T _ _ _ _ _ | Straps | Harness, straps, etc. |
| SU_ _ _ _ _ | Optical device | Telescopes, periscopes, projectors, and boresighting scopes. |
| T_ _ _ _ _ | Transmitters | Transmitters, all types, except telephone. |
| T A _ _ _ _ _ | Telephone apparatus | Miscellaneous telephone equipment. |
| T B _ _ _ _ _ | 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. |
| T F _ _ _ _ _ | 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. |
| T L _ _ _ _ _ | Tools | All types except line construction (see LC). |
| TN_ _ _ _ | Tuning units | Receiver, transmitter, antenna, tuning units, etc. |
| T R _ _ _ _ | Transducers | Magnetic heads, phonopickups, sonar transducers, vibration pickups, etc. (see H, LS, and M). |
| T S _ _ _ _ | Test items | Test and measuring equipment not otherwise included; boresighting and alignment equipment. |
| T T _ _ _ _ | Teletypewriter and facsimile apparatus | Miscellaneous tape, teletype, facsimile equipment, etc. |
| T V _ _ _ _ | 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. |
| W D _ _ _ _ | 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.

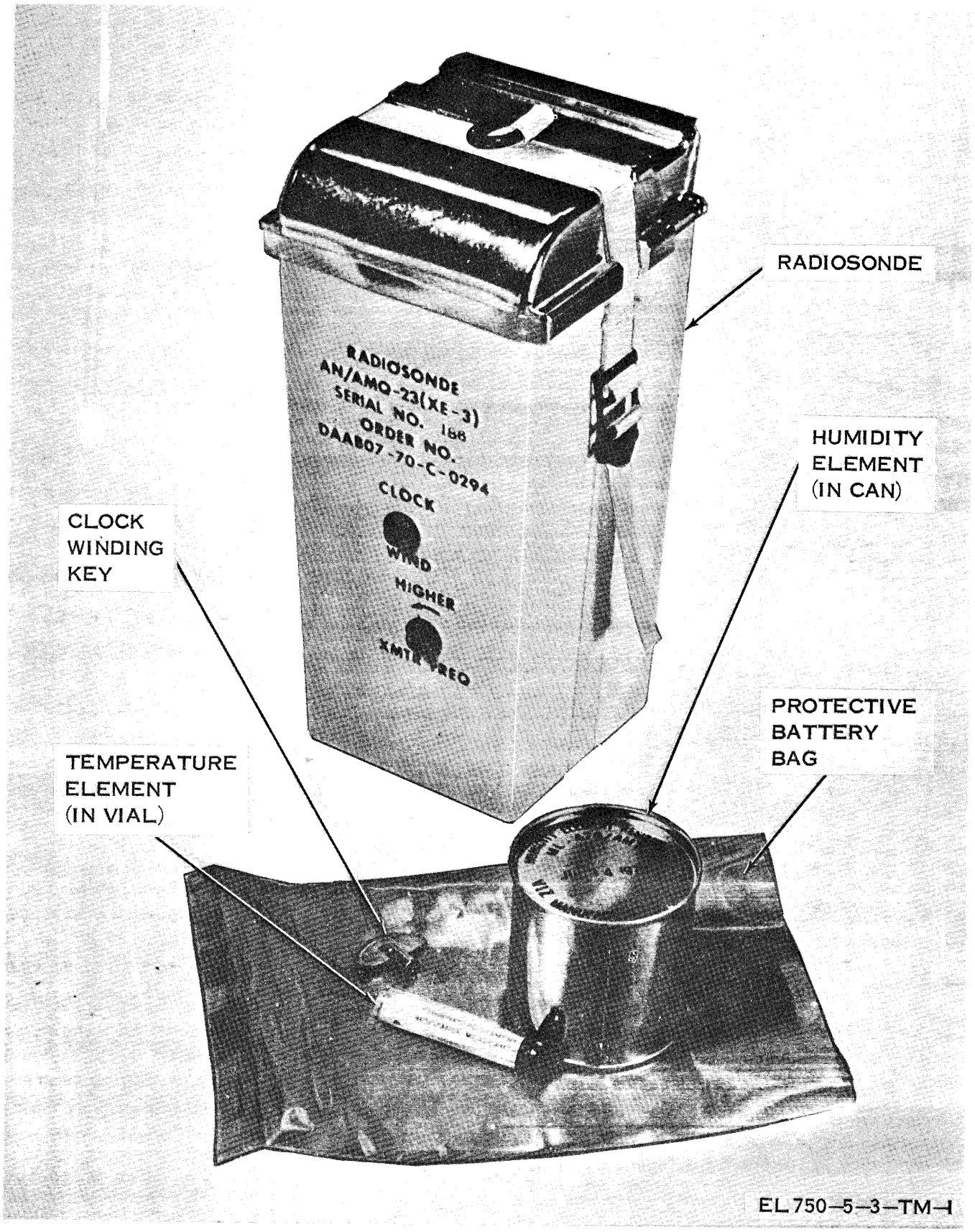


*Figure 1. Atmospheric Meteorological Probe AN/AMQ-23( ).*

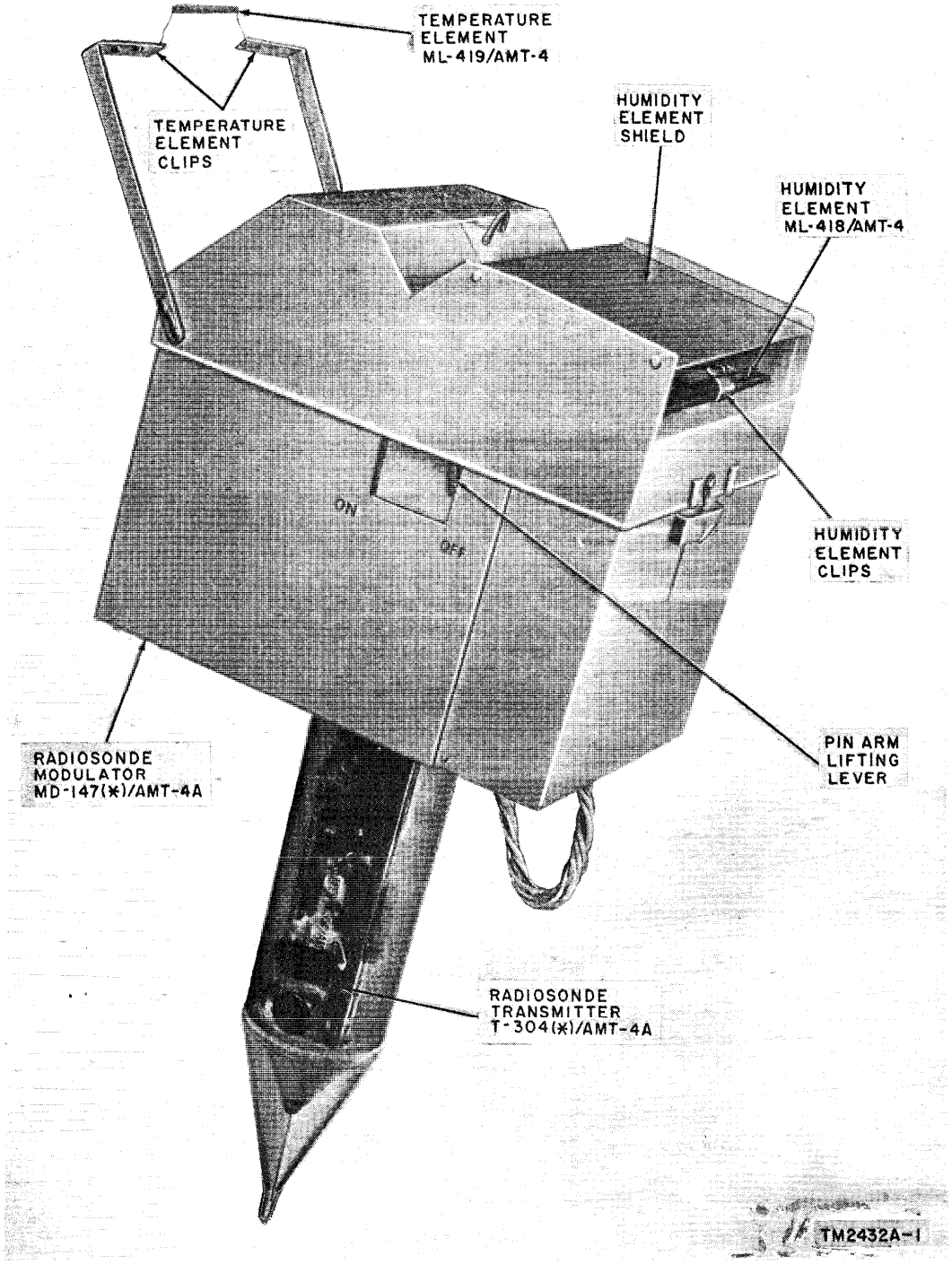


*Figure 2. Radiosonde Set AN/AMT–4( ).*

# AN/AMT-4( )

**1. NOMENCLATURE:** Radiosonde Set AN/AMT–4 ( ).

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

**3. SECURITY REQUIREMENTS:** Unclassified.

**4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:** Furnishes data on temperature, humidity, and pressure of the upper air.

**5. BRIEF FUNCTIONAL DESCRIPTION:** Radiosonde Set AN/AMT–4( ) is a balloon-borne, battery-powered meteorological instrument which transmits signals relating to the pressure, temperature, and humidity of the air-to-ground receiving equipment. The AN/AMT–4( ) transmits signals to a rawin set which is connected to a radiosonde recorder. The recorder prepares a flight record on calibrated graph paper which is used to evaluate the information received from the radiosonde set. Information for computation of wind direction and speed is obtained from Control Recorder C–577 IGMD–1 of Rawin Set AN/GMD–1( ), from the rise and horizontal drift of the radiosonde set. Meteorological data provided by the AN/AMT–4( ) are used for analyzing and forecasting weather conditions, guiding aircraft, planning missions for aircraft, and preparing ballistic correction data for the effect of the atmosphere on the trajectory of artillery projectiles, missiles, and rockets.

**6. TECHNICAL CHARACTERISTICS:**

| | |
|---|---|
| Range of measurements: | |
| Atmospheric pressure | 1,060 to 5 mb. |
| Temperature | +60° C. to -90° C. |
| Relative humidity | 10% to 100%. |
| Accuracy: | |
| Atmospheric pressure | ± 4 mb. |
| Temperature | ±1° C. |
| Relative humidity | ±10%. |
| Distance range: | |
| Altitude | 100,000 ft (30,480 meters) max. |
| Horizontal | 125 mi (201,125 meters) max. |
| Radiosonde Modulator: | |
| MD–147 ( ) /AMT–4A. | |
| MD–210A/AMT–4B. | |
| Radiosonde Transmitter: | |
| T–304 ( )/A MT–4A. | |
| T435A/AMT–4B. | |
| T–436 A/AMT–4B. | |
| Power requirements | 115, 6, and 1.5 vdc (Battery Pack BA-259/AM). |
| Frequency range: | |
| T–304()/AMT–4A | 1,668 to 1,692 MHz. |
| T–435A/AMT–4B | 1,660 to 1,700 MHz. |
| Preset frequency | 1,680 ±4 MHz. |
| Type of signal | Am. |
| Antenna | Dipole, current fed. |
| Approximate weight including battery | 1,105 g. |

**7. MAJOR COMPONENTS:**

Radiosonde Modulator MD–147( )/AMT–4A.
Radiosonde Transmitter T–304( )/AMT–4A.
Temperature Element ML–419/AMT–4A.
Humidity Element ML–418 /AMT–4A.
Radiosonde Modulator MD–210A/AMT–4B.
Radiosonde Transmitter T–435 A/AMT–4B.
Humidity Element ML–476/AMT/4B.
Resistor, 47,000 ohms ±20% AN/AMT–4B.
Pressure calibration chart.

**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.*

Battery Pack BA–259/AM.
Meteorological balloon, inflating and launching accessories, and parachute.
Radiosonde Baseline Check Set AN/GMM–1.
Rawin Set AN/GMD–1( ).
Radiosonde Recorder AN/TMQ–5C, AN/TMQ–5A, AN/TMQ–5B, or AN/TMQ–5C.
Test Set T–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 11–2432A | AN/AMT–4(A,B) |
| TM 11–6660–228–10 | AN/AMT–4C, D |
| TM 11–6660–219–12, –20P, –35P. | AN/GMM–1, –1A |
| TM 11–6660–204–10, 25, 25P, ESC. | AN/TMQ–5( ) |
| TM 11–6625–213–12, –20P, –35, –35P. | TS–538/U |

**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* |
|---|---|
| M2WOH8AA | 1 |

**15. PRICE DATA:**

*a.* Major item $17.60.

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

**16. ITEM REPLACED:** None.

**17. REMARKS:**

Issued as a unit replacement.

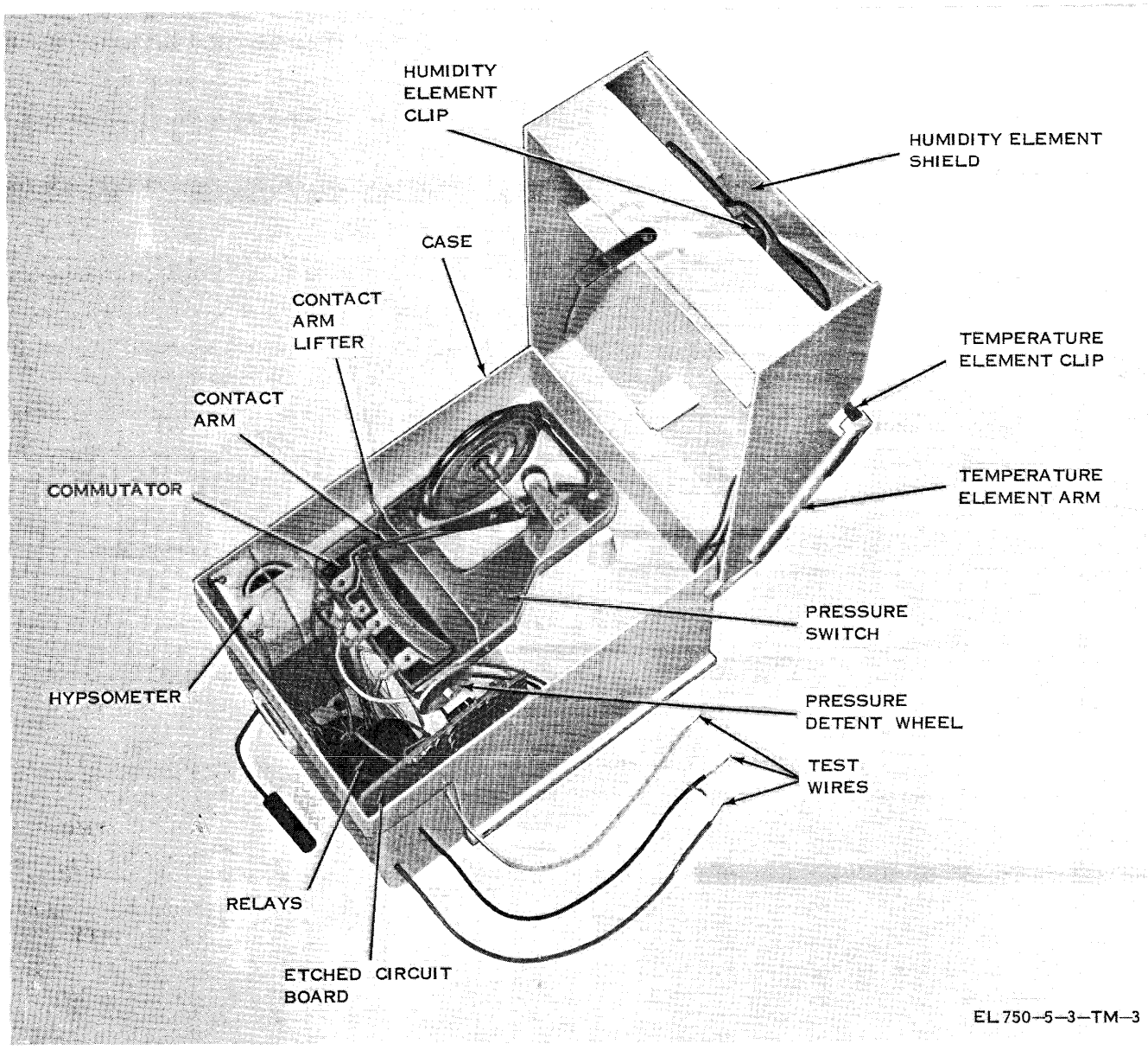


*Figure 3. Radiosonde Set AN/AMT–12.*

**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 automaticlly 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 (thermistor changes resistances with changing boiling-point temperature of carbon disulfide due to pressure variations).
  - Temperature sensor _ _ _ _ Temperature Element ML–419/AMT–4 (resistance varies inversely with temperature).
  - Humidity sensor _ _ _ _ _ _ Humidity Element, Resistance 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 accessories, 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. Auziliary 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 density.

**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 based on 100 equipments). Expendable, nonrepairable.

**16. ITEM REPLACED:** None.

**17. REMARKS:** Issue as a unit replacement.

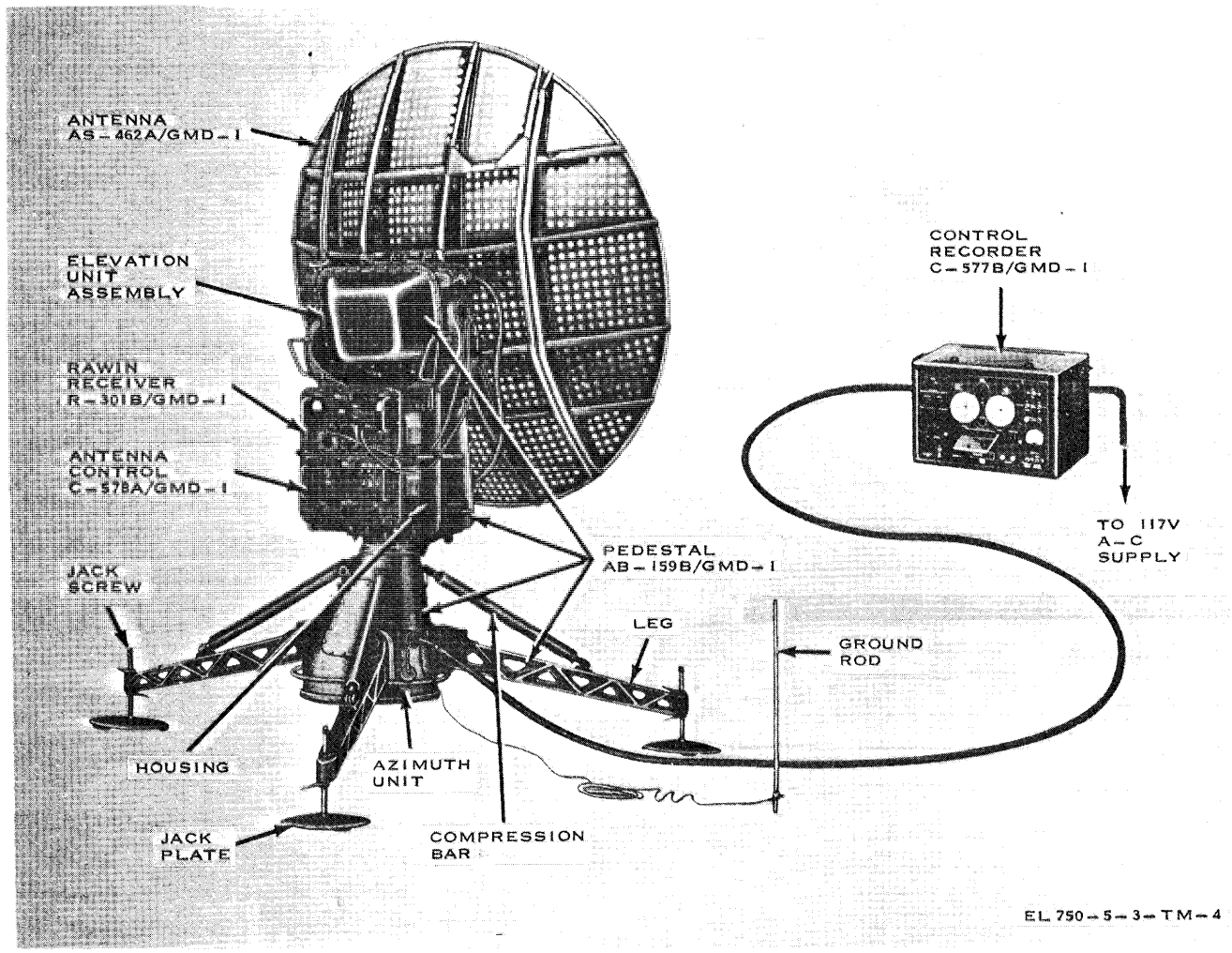


*Figure 4. Rawin Set AN/GMD–1 ( ).*

**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 | Conieal. |
| 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. |

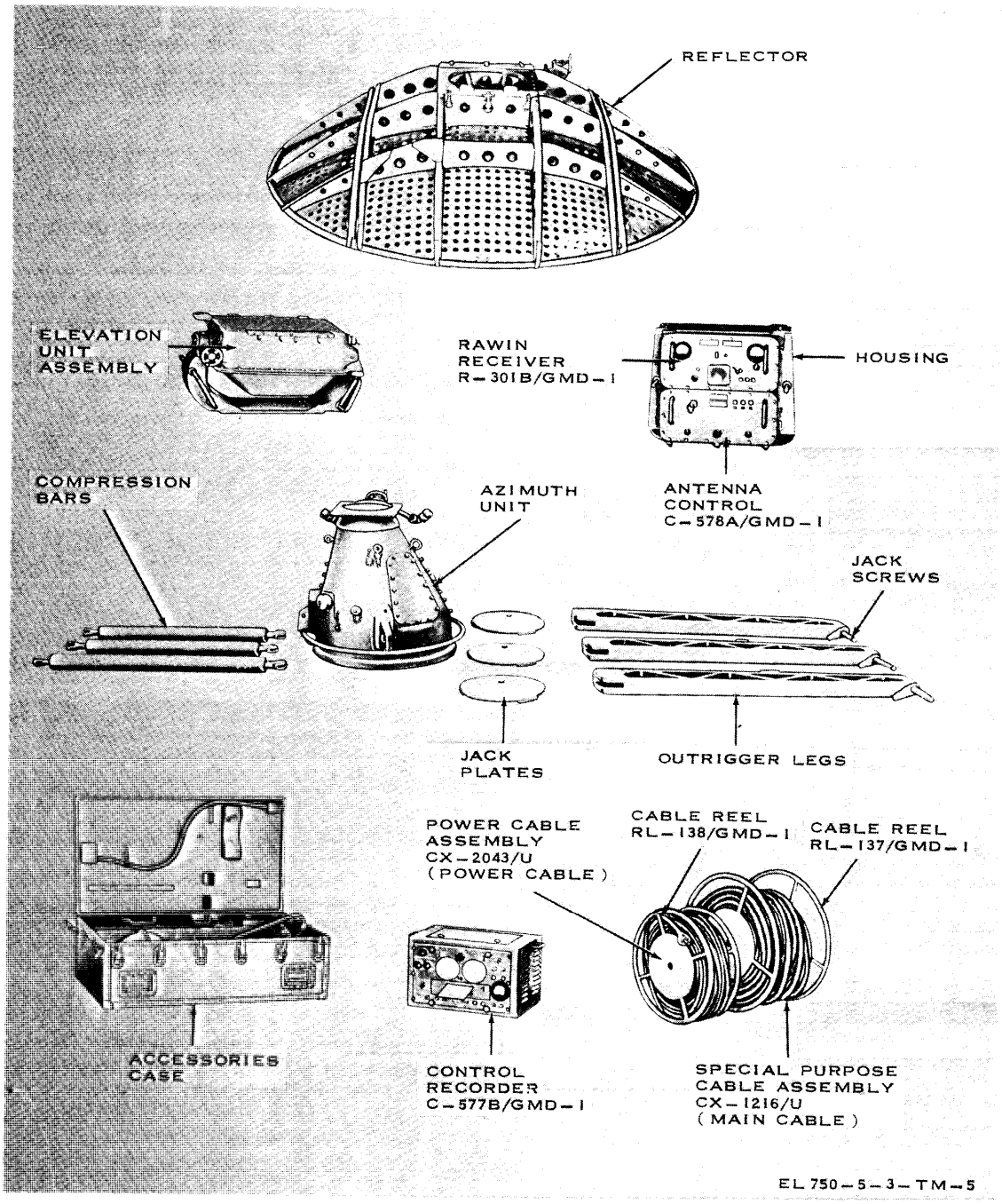


*Figure 5. Rawin Set AN/GMD–1( ).*

| | |
|---|---|
| Tracking accuracy _____ | 0.05° max error, between 10° and 60° elevation. |
| Antenna positioning system: | |
| Tracking _____ | Automatic, local manual, and remote manual. |
| Drive motors (elevation and azimuth). | 60vdc (nominal), 1.4-amp splitstator, reversible, 1/20 hp at 5,000 rpm. |
| Antihunt generators (elevation and azimuth). | 2.1vdc (nominal /100 rpm, self-excited, permanent magnet. |
| Positioning, indicating, and recording systems: | |
| 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 ½ in. long; weight 300 lb. |
| Cy–898/GMD–1 | 20 in. high, 21 in. deep, 25 in. long; weight 48 lb. |
| Cable assembly, power | ¾ 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 ¾ in. high, 25 15/16 in. deep, 32 1/16 in. long; weight 366 lb. |
| Case CY–737A/GMD–1 | 17¼ in. high, 19 5/16 in. deep, 26 15/16 in. long; weight 159 lb. |
| Case, Components CY–1157/ GMD–1A | 17½ 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 | 13½ 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, 22¾ 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 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:**

| *TOE* | *Allowance* |
|---|---|
| 6–201G | 1 |
| 6–302H | 1 |
| 6–576G | 2 |
| 6–701H | 1 |
| 6–716H | 1 |
| 7–100H | 1 |
| 17–100G | 1 |
| 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.

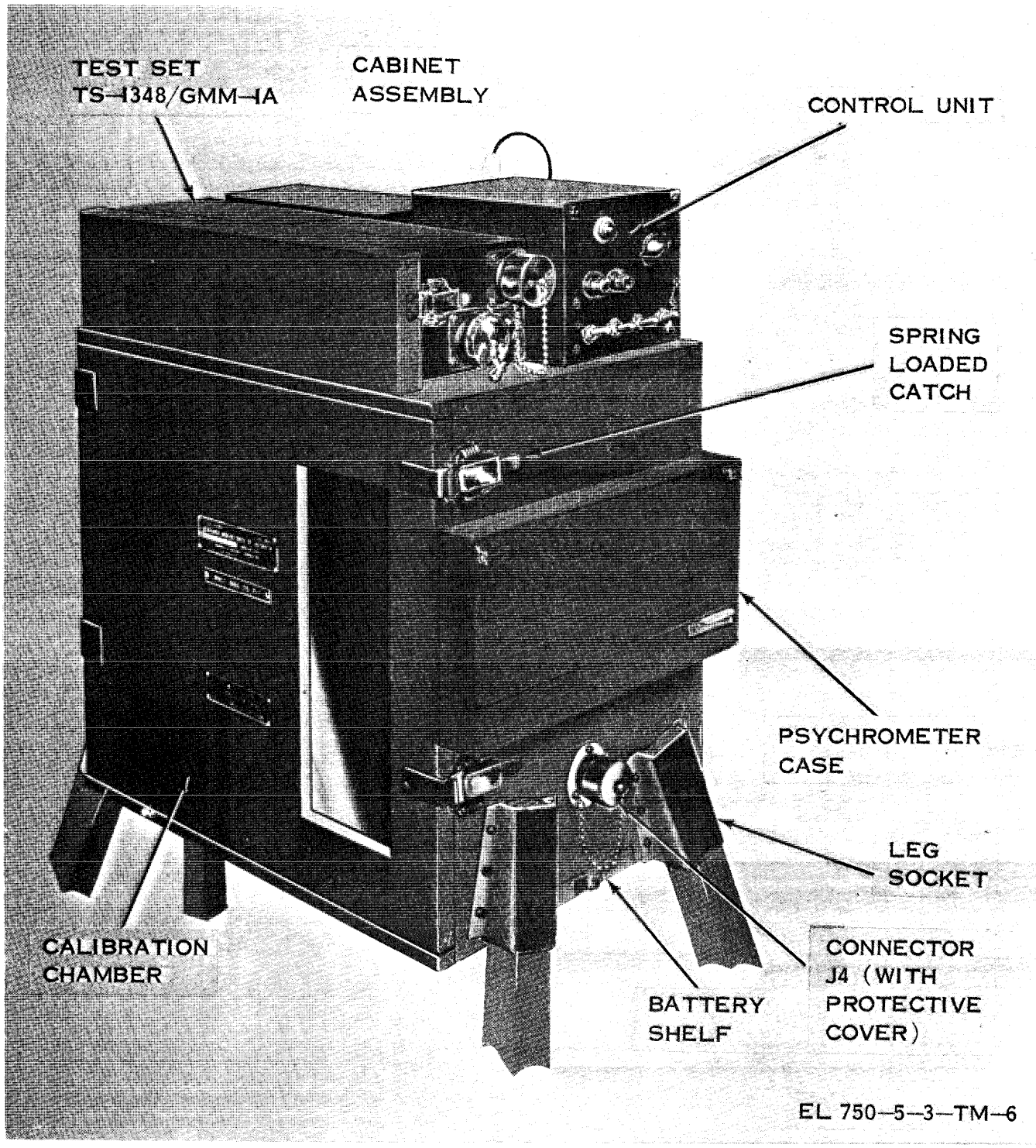


*Figure 6. Radiosonde Baseline Check Set AN/GMM–1.*

# 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, 26¼ in. deep, 35¾ 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, mercury thermal element. |
| Temperature range | –37° C to +46° C. |
| Thermometer scales | ½ °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, –35 P,–34 | AN/GMM–1, –1A |
| 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:**

| *TOE* | *Allowance* |
|---|---|
| 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.

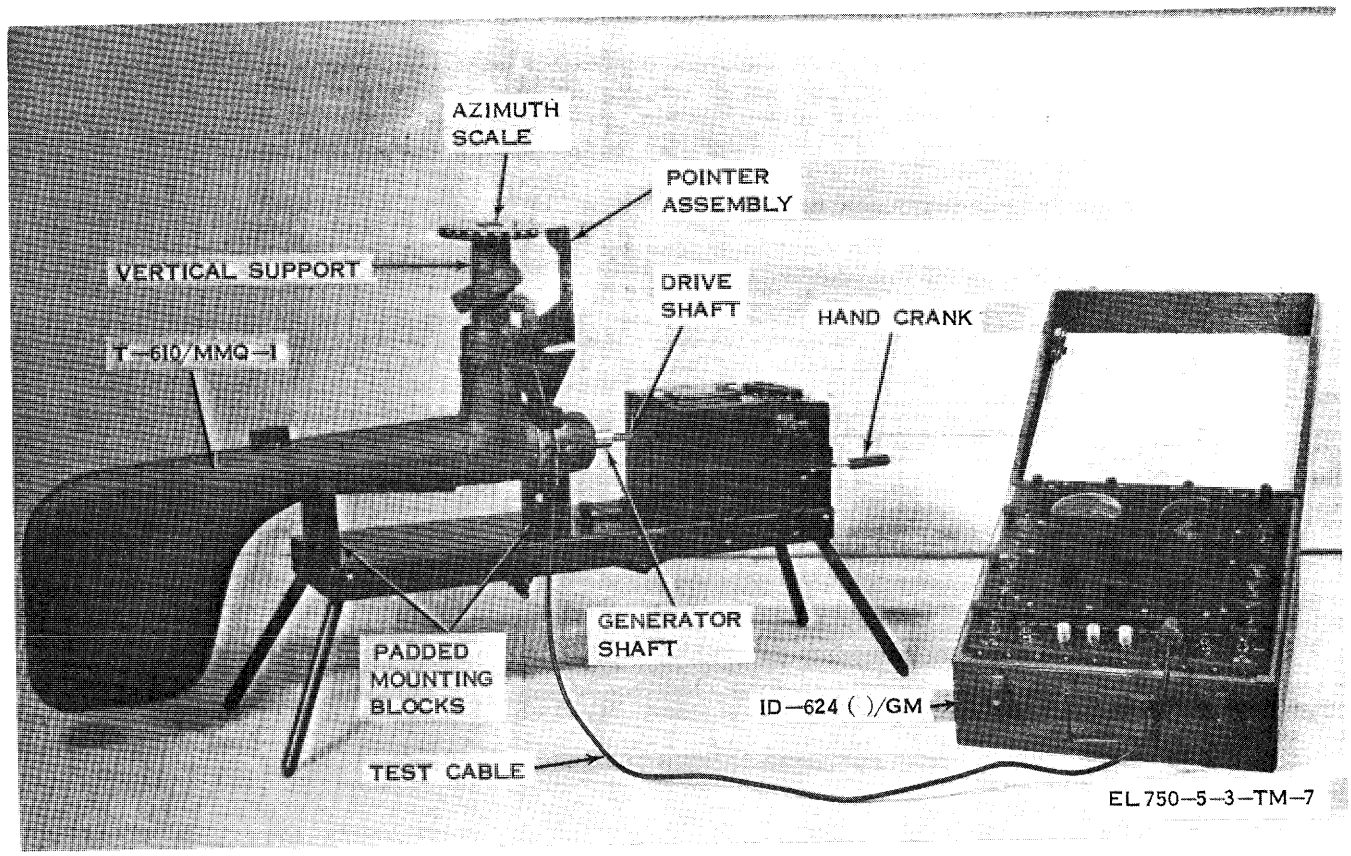


*Figure 7. Wind Speed Simulator AN/GMM–7( ).*

**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 windspeeds | ±1mph for temp ranges of 120° F to 32° F. |
| Operation | Hand operated through a gear train and flywheel. |
| 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

**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.**

| *Toe* | *Allowance* |
|---|---|
| 6–100H | 1 |
| 6–175H | 1 |
| 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.

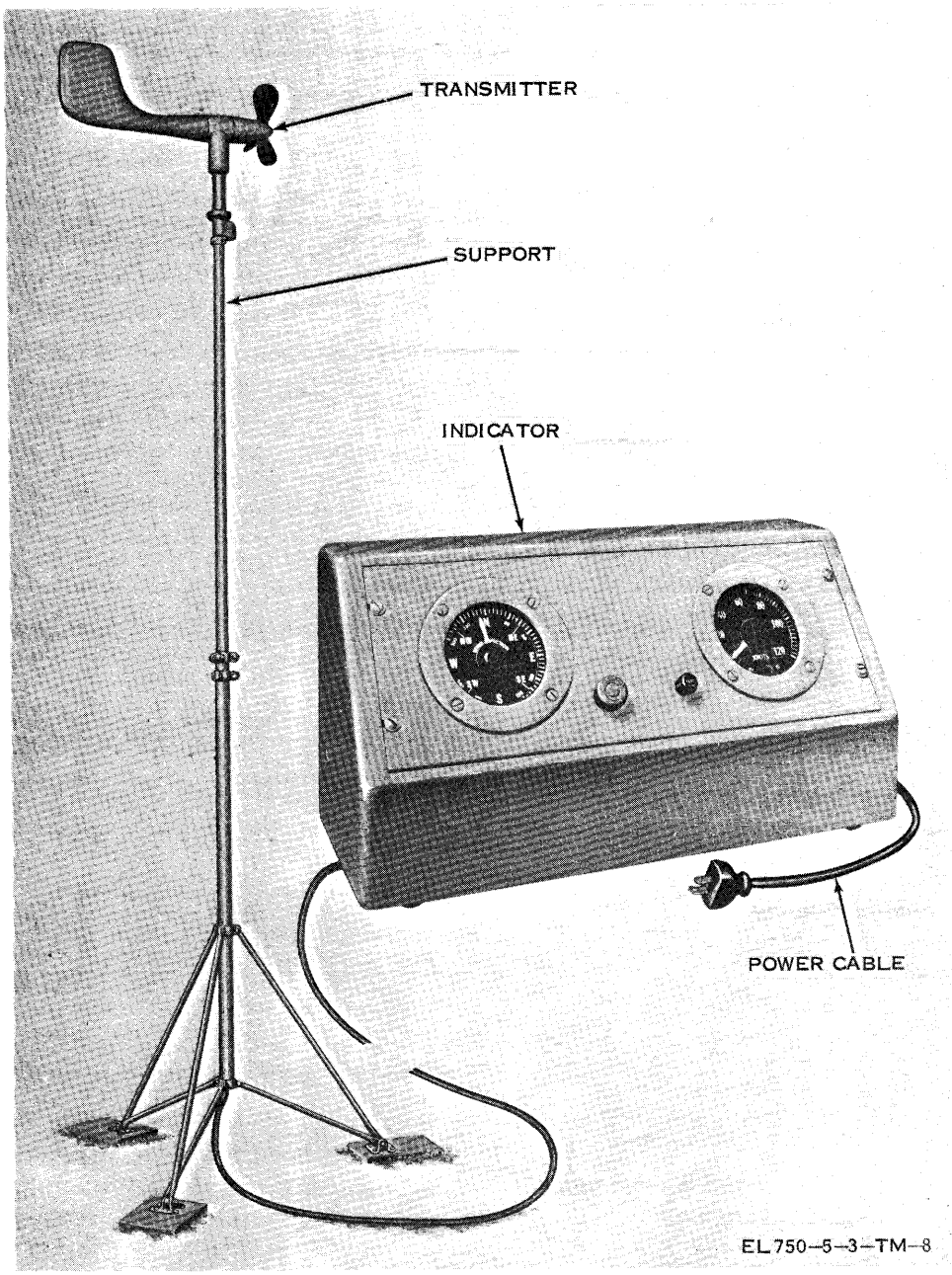


*Figure 8. Wind Measuring Set AN/GMQ–11.*

**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. |

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 to10,000 ft above mean sea level.
Temperature _____ 40 °F. to +150° F.
Relative humidity _____ 0 to 100%
Dimensions:
Indicator _____ 10 7/8in. high, 21 in. wide, 8 1/16 in. deep.
Transmitter _____ 30 in. high, 33 in. wide, 15½ 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:**

| *TOE* | *Allowance* |
|---|---|
| 1–207H | 1 |
| 3–266G | 1 |
| 29–500G | 1 |
| 39–51G | 1 |
| 30–52G | 1 |
| 57–102H | 1 |
| *TA* | |
| 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.

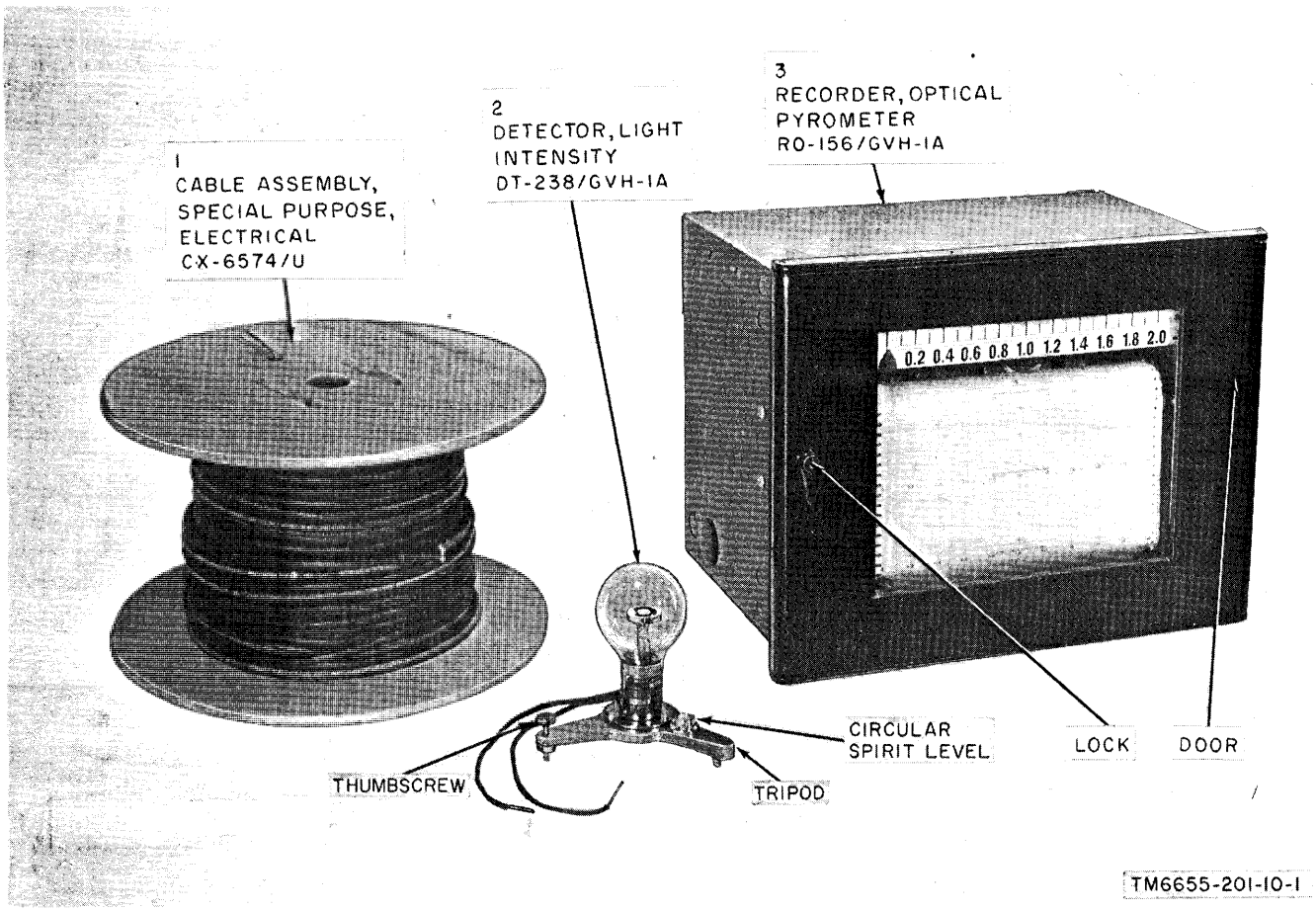


*Figure 9. Solar Radiation Measuring Set AN/GVH-1A.*

**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. |

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:**

| *TOE* | *Allowance* |
|---|---|
| 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 |
| *TA* | |
| 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.

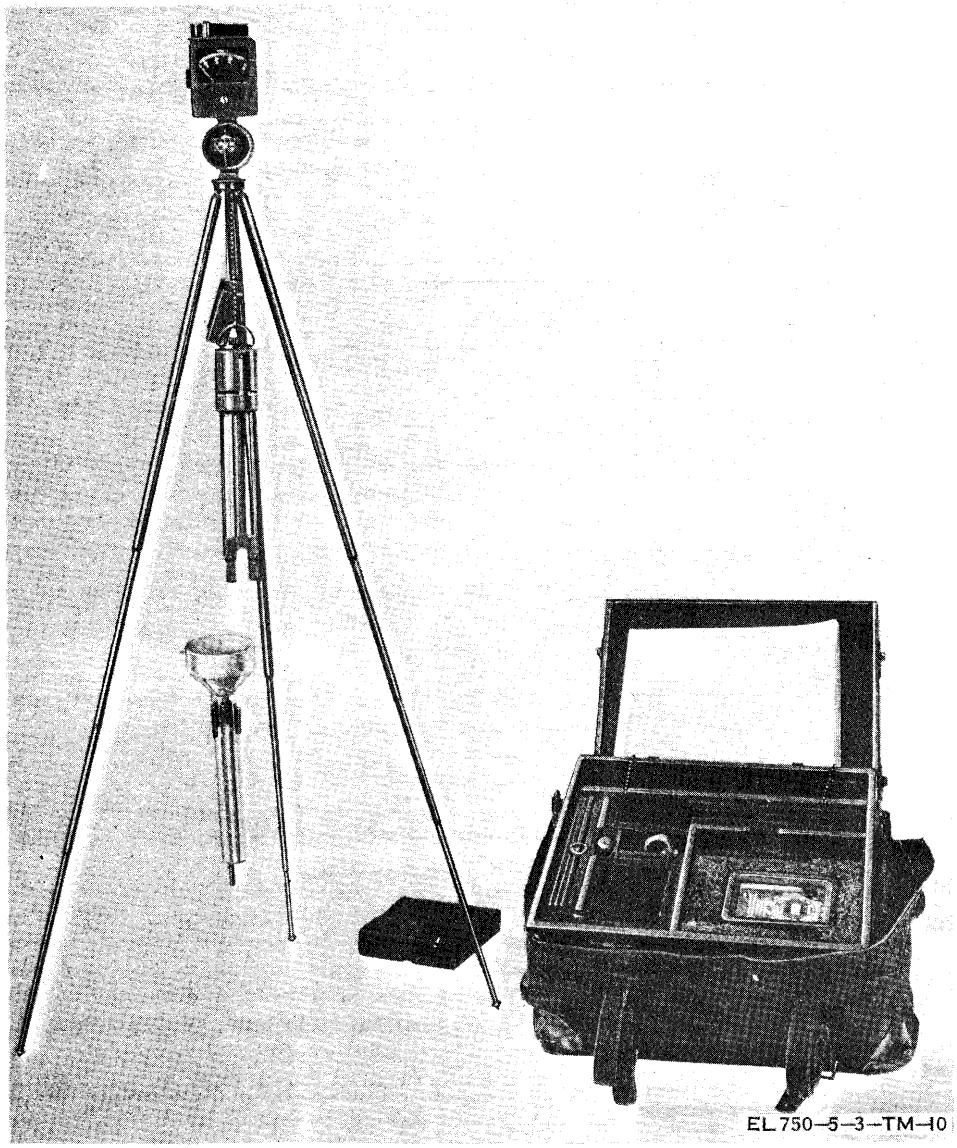


*Figure 10. Meteorological Station, Manual AN/PMQ–1A.*

**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 precripitation 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° ±11.25°.

Aneroid Barometer ML–459/PMQ–1:
- PMQ–1:
  - Range _____ 750 t0 900 mb; 900 to 1,050 mb ±0.5 mb.

Psychrometer Calculator ML–429/UM:
- Range:
  - Low _____ –60 ° to + 32° F.
  - High _____ 10° to + 85° F.

Gage, Precipitation ML–435/PMQ–1:
- Range _ _ _ _ _ _ _ __ 0 to 1 in.
- Graduation _ _ _ _ _ _ _ _ 2°.

Thermometer, Self-Indicating, Liquid-in-Glass ML–488/PM–1:
- Range _ _ _ _ _ _ _ _ _ –50° to + 150° F. ±2° F.
- Scale length _ _ _ _ _ _ _ _ _ _ 4¼ in.
- Scale _ _ _ _ _ _ _ _ _ _ _ _ _ 2°.
- ML–437/PMQ–1:
  - Range _ _ _ _ _ _ _ _ _ _ _ –40° F. to + 120° F.
  - Scale length _ _ _ _ 4¼ in.
  - Graduation _ _ _ _ _ _ _ 2°
- ML–438/PMQ–1:
  - Range _ _ _ _ _ _ _ _ –75° F to –25° F.
  - Scale length _ _ _ _ 6 in.
  - Graduation _ _ _ _ _ _ _ 0.5°.
- ML–439/PMQ–1:
  - Range _ _ _ _ _ _ _ _ _ _ _ _ +40° F. to + 140° F. ±2° F.
  - Scale length _ _ _ _ _ _ _ _ 6 in.
  - Graduation _ _ _ _ _ _ _ _ 0.5°.
- ML-440/PMQ-1:
  - Range _ _ _ _ _ _ _ _ –35° F to +60°F ±4° F. below 0° F. ±2° F. above 0° F.
  - Scale length _ _ _ _ _ _ _ 0.5°.
  - Graduation _ _ _ _ _ _ _ 0.5°.

Dimensions of Meteorological Equipment Case CY-952/PMQ–1. 17¼ in. high; 9 in. deep, 16 in. wide.

Approx weight of case and components _ _ _ _ _ _ _ _ _ 25 lb.

**7. MAJOR COMPONENTS:**

Anemometer ML–433A/PM.
Anemometer Tripod MT–869/PMQ–1.
Aneroid Barometer ML–459/PMQ–1.
Case CY–952/PMQ–1.
Conversion Scale ML–431/UM.
Gage, Precipitation ML–435/PMQ–1.
Psychrometer Calculator ML–429/UM.
Thermometer, Self-Indicating, Liquid-in-Glass ML–437 /PMQ–1.
Thermometer, Self-Indicating, Liquid-in-Glass ML–438/PMQ–1.
Thermometer, Self-Indicating, Liquid-in-Glass ML–440/PMQ–1.
Thermometer, Self-Indicating, Liquid-in-Glass ML–488/PM.
Psychrometer ML–436A/PMQ–1.

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

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

**10. TOOLS AND TEST EQUIPMENT:**

a. *Tools.*
Screwdriver sets, jeweler's.
Pointer remover.

*b. Test Equipment.*
Pressure chamber.
Precision mercurial barometer.

**11. REFERENCE DATA AND LITERATURE:**

TM 11–422 _ _ _ _ _ _ _ _ _ _ AN/PMQ–1A
TM 11–6660–201–12P, –35P_ _ _ _ _ _ _ _ _ _ _ _ _ AN/PMQ–1A
TM 11–6660–205–15P_ _ _ _ ML–433A/PM
TM 11–6660–212–50P _ _ _ ML–434B/PM
TM 422 _ _ _ _ _ _ _ _ _ _ _ ML–435 /PMQ–1
TM 422 _ _ _ _ _ _ _ _ _ _ _ ML–436A/PMQ–1

**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.**

**15. PRICE DATA:**

*a.* Major item _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ $1,370.00
*b.* Repair parts (1-year cost based on 100 equipments)_ _ _ _ _ _ _ $20,550.00

**16. ITEM REPLACED:** None.

**17. REMARKS:** None.

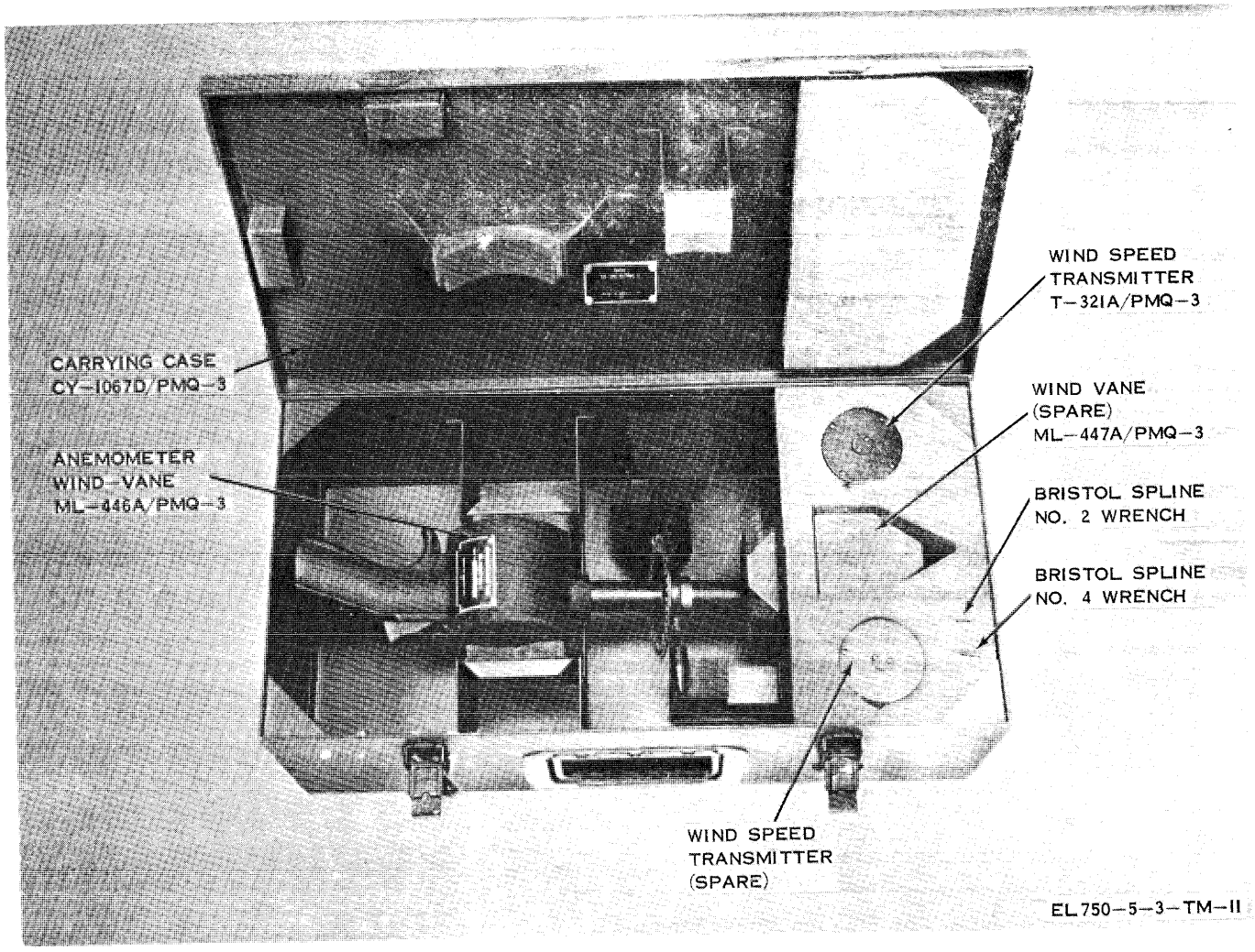


*Figure 11. Wind Measuring Set AN/PMQ–3A.*

**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.

**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 to1975.

**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 | $ 850.00 |
| *b.* Repair Parts (1-year cost based on 100 equipments) | $18,500.00 |

**16. ITEM REPLACED:** None.

**17. REMARKS:** None.

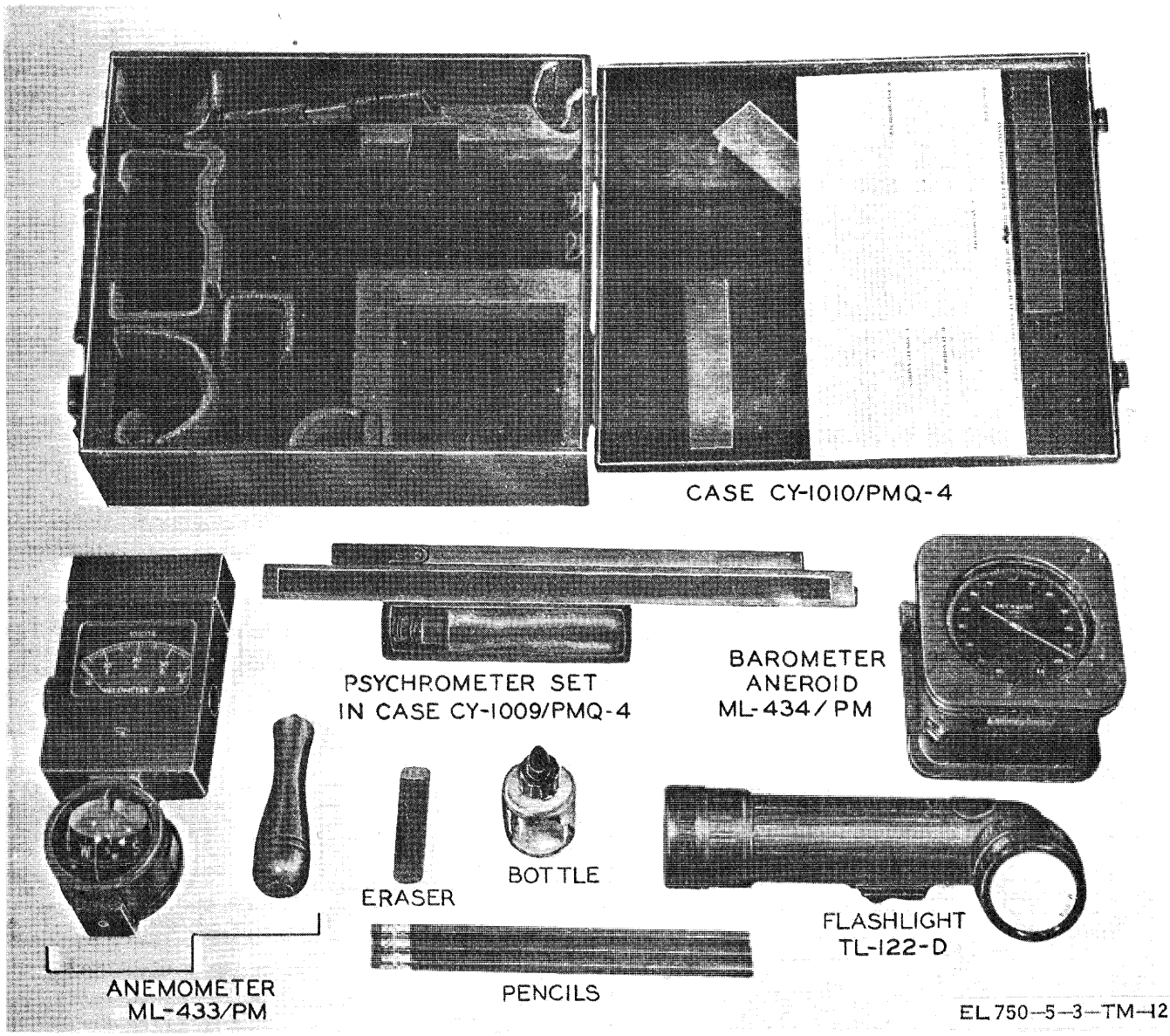


*Figure 12. Meteorological Station, Manual AN/PMQ-4.*

**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 dewpoint 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. |

Psychrometer ML–24:
Type _ _ _ _ _ _ _ _ _ _ _ Wet-bulb and dry-bulb thermometer; mercury.
Thermometer range _ _ _ –380° F, to +110° F.
Flashlight TL–122–D:
Power _ _ _ _ _ _ _ _ _ _ _ 2 Batteries BA–30.
Lamp _ _ _ _ _ _ _ _ _ _ _ _ GE–PR9.
Filters _ _ _ _ _ _ _ _ _ _ 2 M–384.
Case CY–1010/PMQ–4:
Dimensions _ _ _ _ _ _ _ _ _ 3 7/8 in. high, 9 3/8 in. wide, 10 5/8 in. long.

**7. MAJOR COMPONENTS:**
Anemometer ML–433/PM.
Psychrometer ML–24.
Aneroid Barometer ML–434/PM.
Flashlight TL–122–D.

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

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

**10. TOOLS AND TEST EQUIPMENT:**
a. *Tools.*
Tool Equipment TK–21/G.
*b. Test Equipment.* None.

**11. REFERENCE DATA AND LITERATURE:**
TM 11–2412 _ _ _ _ _ _ _ AN/PMQ–4
TM 11–6660–201–12P, –35P AN/PMQ–1, 1A
TM 6660–205–15P _ _ _ _ _ _ ML–433/PM
TM 11–6660–218–12, –25P _ _ _ _ _ AN/TMQ–4
TM 11–6660–222–12 _ _ _ _ _ _ ML–224
TM 11–6660–212–50P _ _ _ _ _ ML–334/PM

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

**13. TRAINING REQUIREMENTS:**
Operator MOS 93–E–20, 93–F–20.
Maintenance MOS 35–D–20.

**14. TYPICAL BASIS OF ISSUE:**

| *TA* | *Allowance* |
|---|---|
| 8–12 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 1 |

**15. PRICE DATA:**
*a.* Major item _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ $ 855.00
*b.* Repair parts (1-year cost based on 100 equipments) _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ $12,825.00

**16. ITEM REPLACED:** None.

**17. REMARKS:** None.

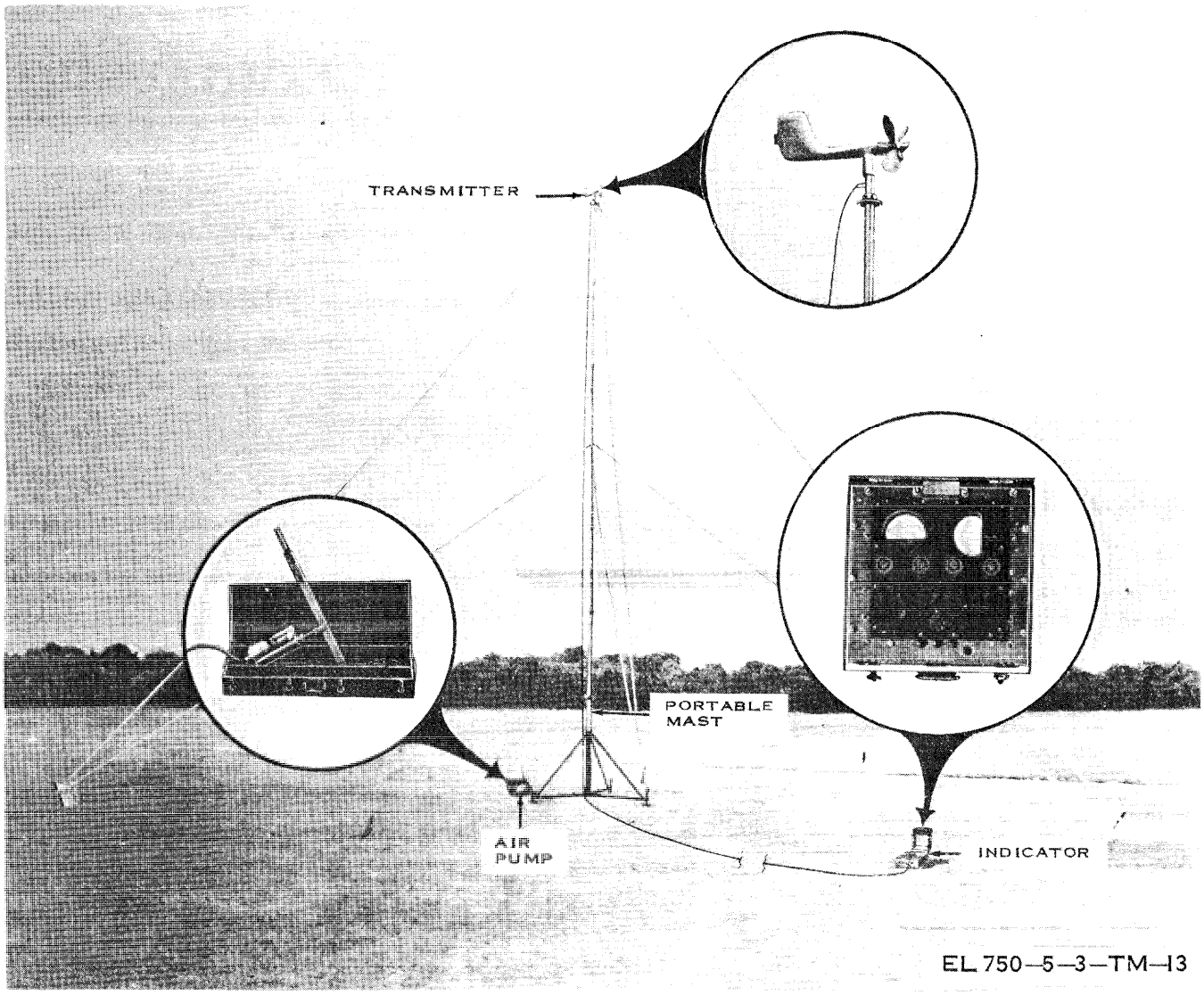


*Figure 13. Extended Wind Measuring Set AN/PMQ–6.*

**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 ¾-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.

| | |
|---|---|
| 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–l.
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:**

| *TOE* | *Allowance* |
|---|---|
| 6–177H | 2 |
| 6–300H | 4 |
| 6–717H | 4 |
| *TA* | |
| 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.

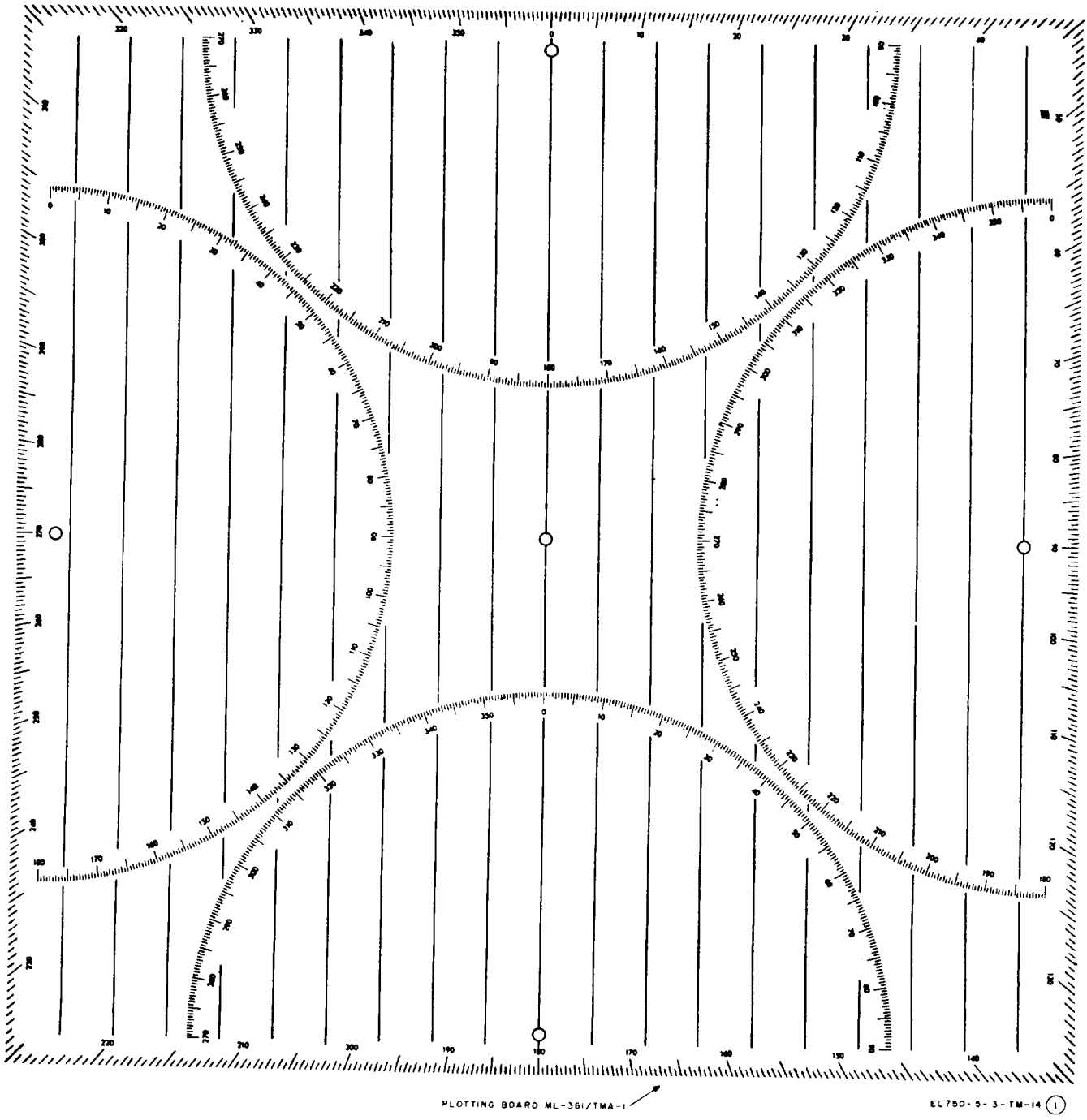


*Figure 14 ① . Plotting Set AN/TMA–1 (sheet 1 of 2).*

**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.

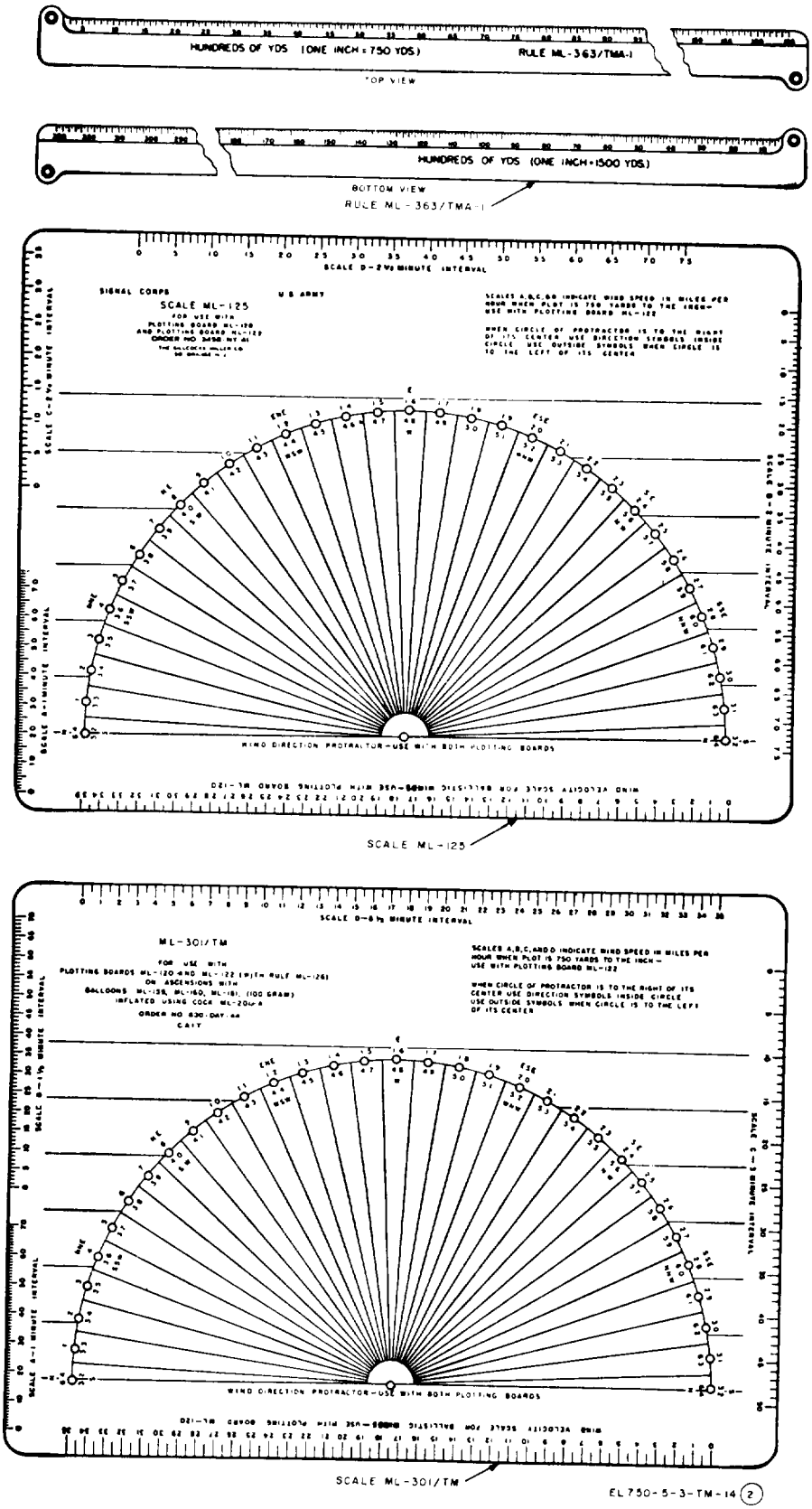


*Figure14 ② . Plotitng Set AN/TMA–1 (sheet 2 of 2).*

Rule _____ 22 by 1¼ in.
Scales _____ 10¼ by 7¾ in.
Slide rule _____ 20 by 1 3/8 in.

Weight:
Plotting boards ___ 4 lbs. ea.
Slide rule _____ 1½ 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:**

| *TA* | *Allowance* |
|---|---|
| M2–WIN2AA _____ | 4 |

**15. PRICE DATA:**
*a*. Major item _____ $ 653.00
*b*. Repair parts _____ $9,790.00

**16. ITEM REPLACED:** None.

**17. REMARKS:** None.

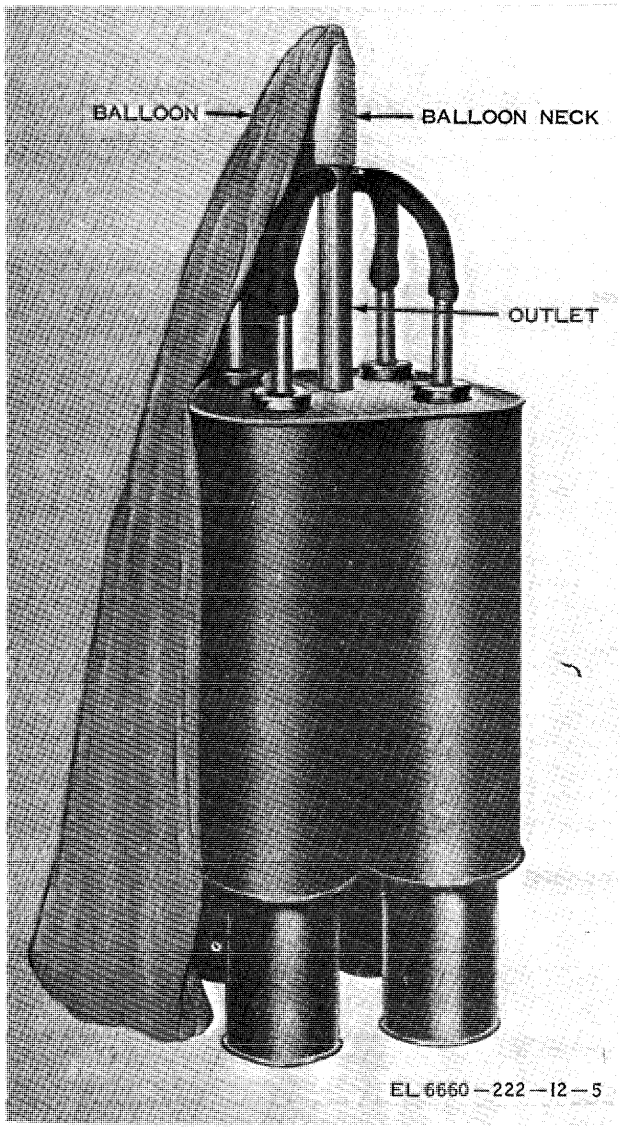


*Figure 15. Hydrogen Generator Set AN/TMQ–3.*

**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 _ _ _ _ _ _ _ ¾ 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.

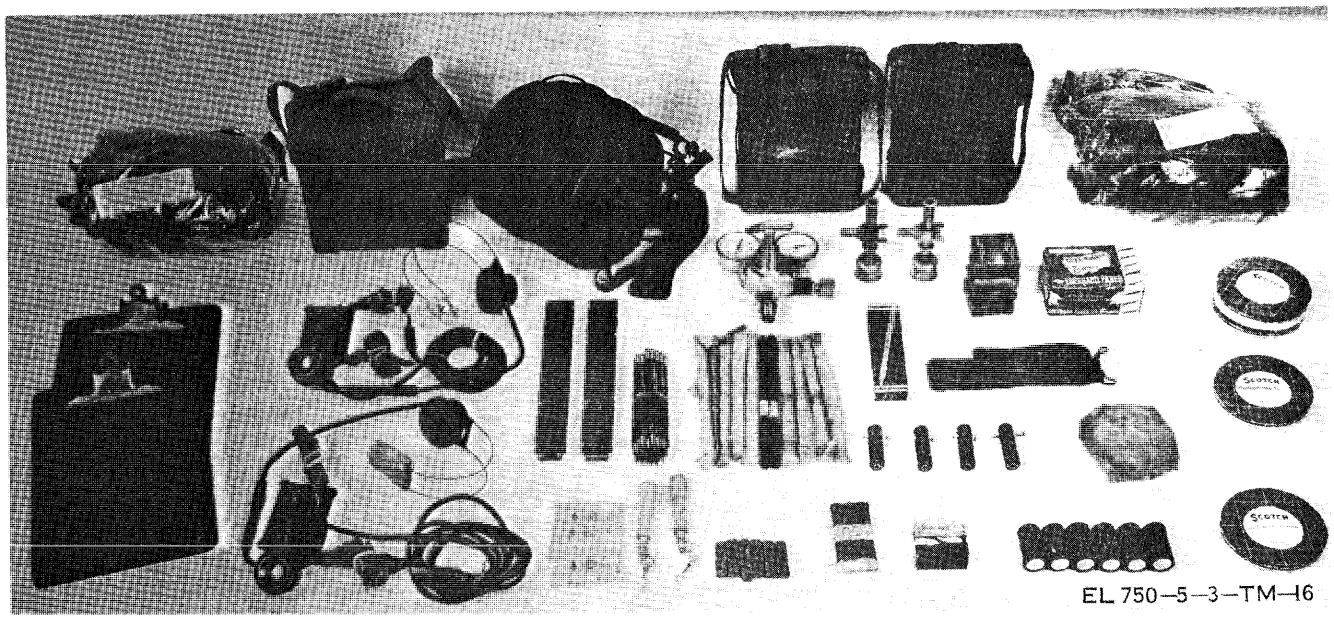


*Figure 16. Components Meteorological Station AN/TMQ–4.*

**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.

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 dia¾ 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, 3½ in. long.
Barometer ML–102( ) 3 7/8 in, high, 6¼ in. deep, 6¼ in. long, 4½ 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; 9½ lb.
Theodolite, Double Center ML–247, ML–247–A, or ML–474/GM _ _ _ _ _ _ _ _ _ 15¼ in. high, 12¾ in. deep, 11 in. long.
Timer, Stop FM–103(1) 7¾ in. high, 2¾ 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.

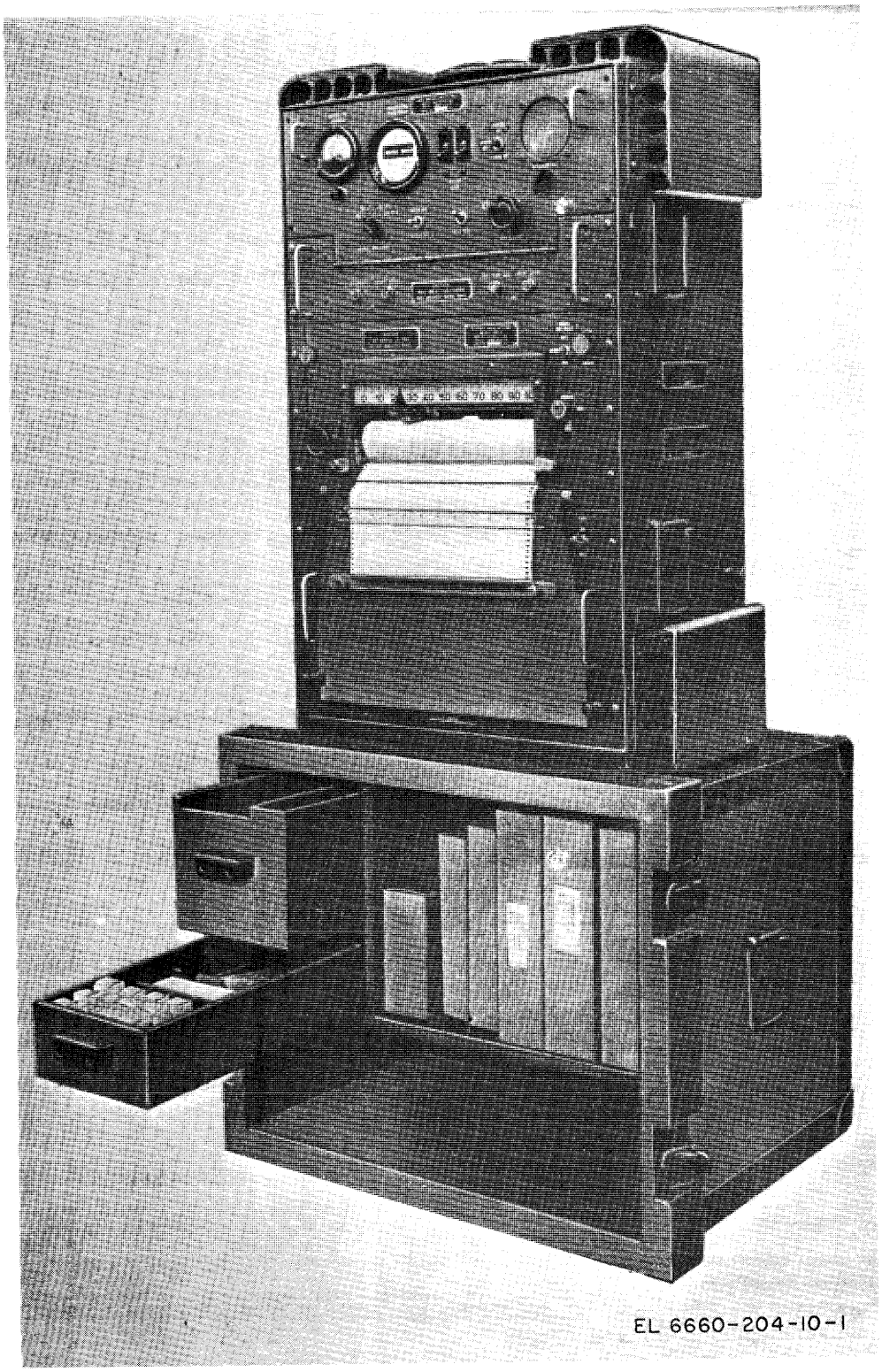


*Figure 17. Recorder, Radiosonde AN/TMQ–5( ).*

# 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 μs 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 _____ ½ in. interval.

Horizontal axis _____ 100 equal divisions.

Speed _____ ½-in.1min for Radiosonde Recorder AN/TMQ–5; ½- or 1-in./min for Radiosonde Recorder AN/TMQ–5A; ½-, 1-, or 2-in./min for Radiosonde Recorder AN/TMQ–5C.

Speed of response ..... 2½-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:**

| *TOE* | *Allowance* |
|---|---|
| 6–186H | 1 |
| 6–201G | 1 |
| 6–302H | 1 |
| 6–526G | 1 |
| 6–576G | 2 |
| 6–701H | 1 |
| 6–716H | 1 |
| 7–100H | 1 |

| *TOE* | *Allowance* |
|---|---|
| 17-100H | 1 |
| 37-100H | 1 |
| 39-51G | 1 |
| *TA* | |
| 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.

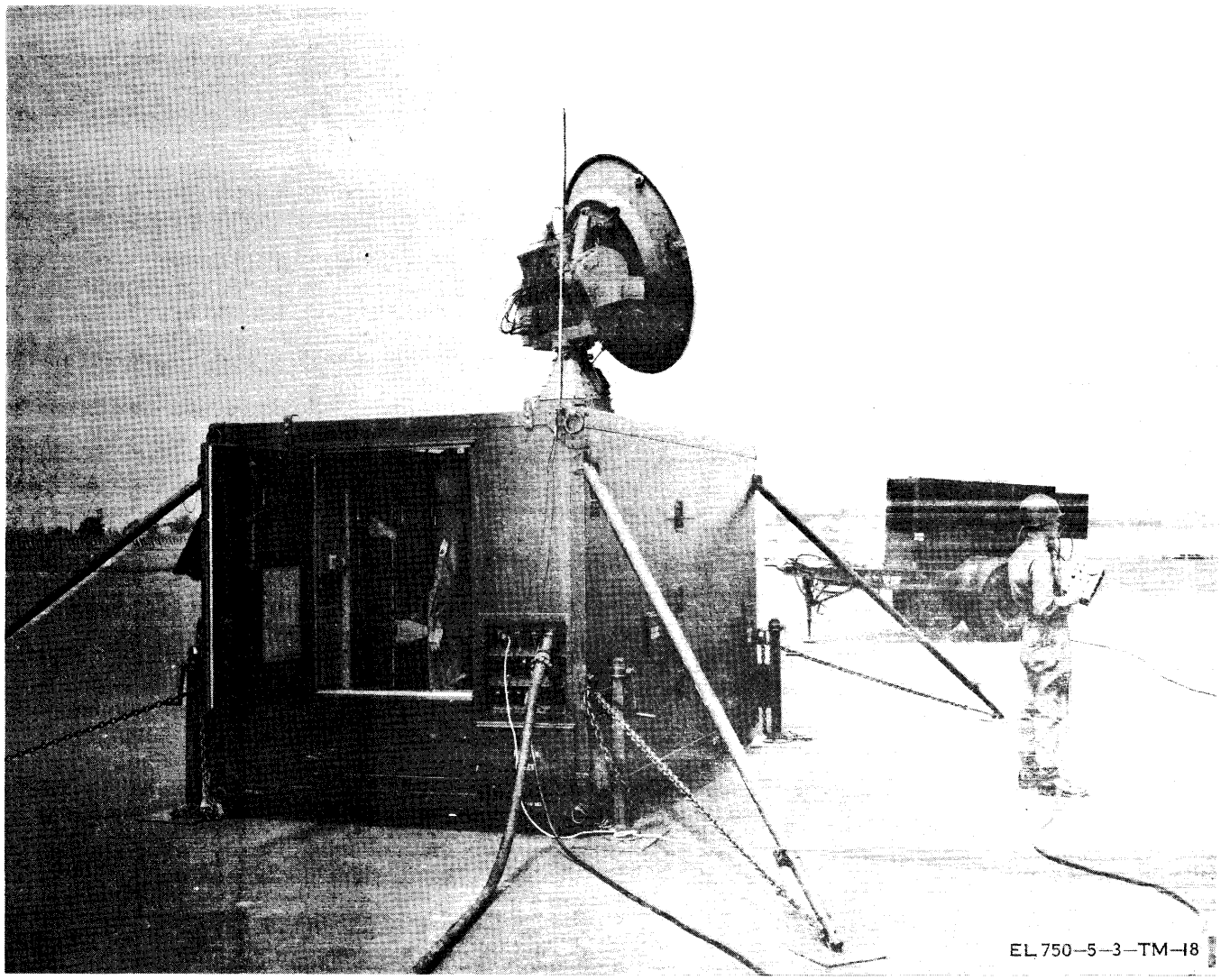


*Figure 18. Automatic Atmospheric Sounding Set AN/TMQ–19(XE–2).*

**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. |

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 cornputer message. fallout 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.

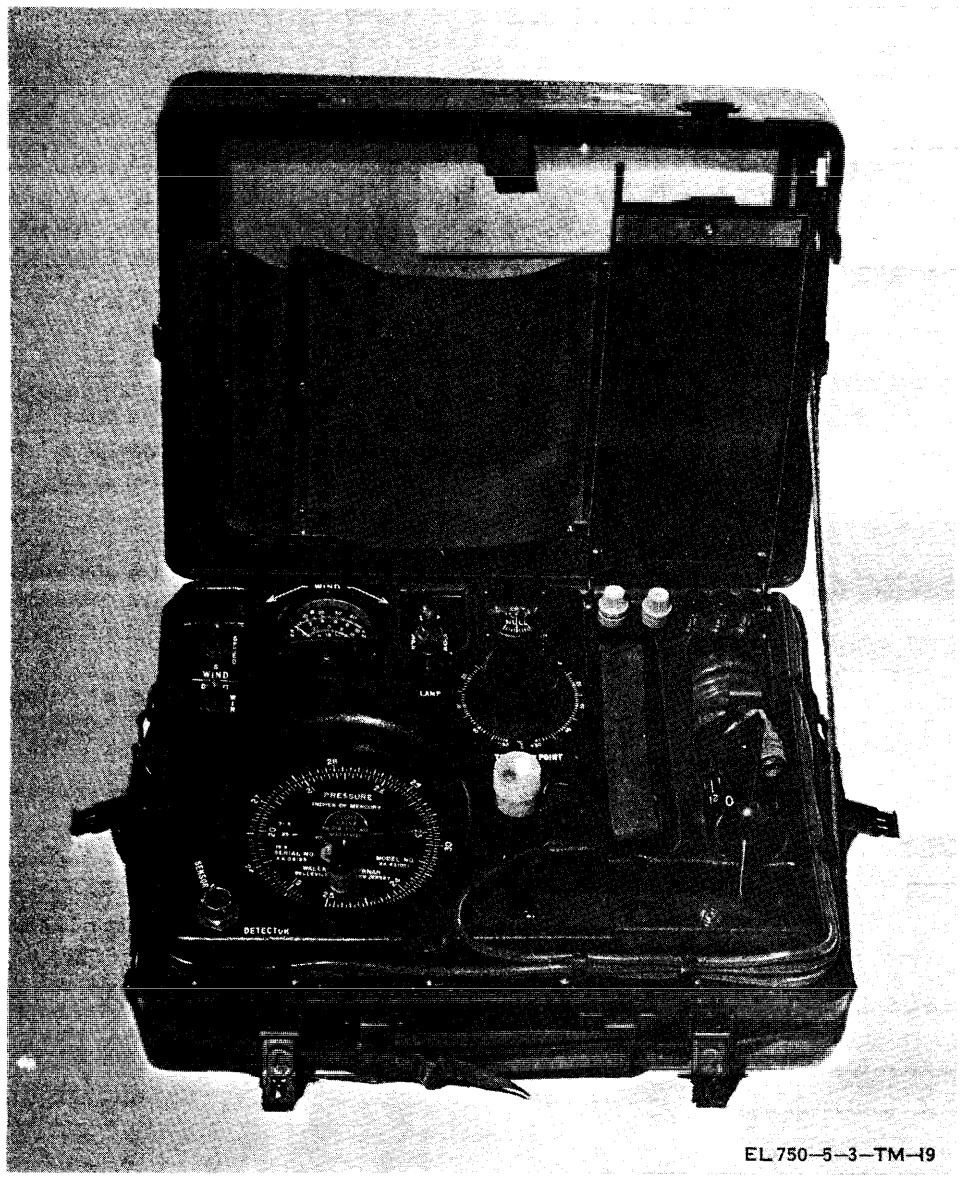


*Figure 19. Meterological Measuring Set AN/TMQ–22.*

**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 requires 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. |

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:**

| *TA* | *Allowance* |
|---|---|
| 4AW2NTAA _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 98 |
| 6AW0V13C _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 18 |
| 6AW04FAA _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 188 |
| *TOE* | |
| 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.

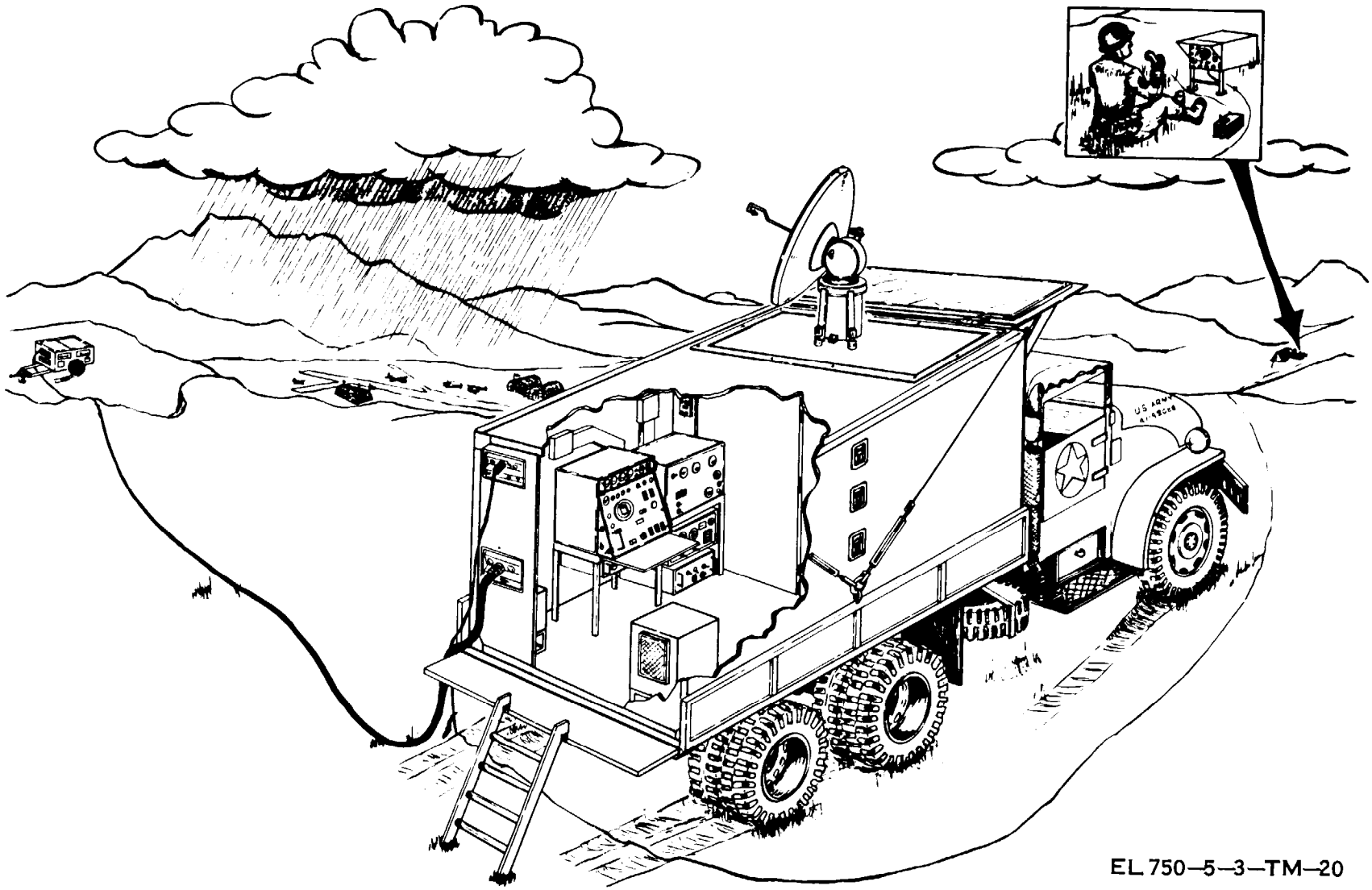


*Figure 20. Radar Set AN/TPS-41( ).*

# 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 ethos 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 maint 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. |
| Reflecter | 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 circulator. |

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 Balanced 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. |
| Range Markers | 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 generators). |
| Output | 10 Kw. |
| Fuel Consumption | 2 gal /hr. per generator. |

**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:**

| *TOE* | *Allowance* |
|---|---|
| 7–4H | 18 |
| 17–4H | 18 |
| 37–4H | 18 |
| 57–4G | 18 |

**15. PRICE DATA :**

**16. ITEM REPLACED:** None.

**17. REMARKS:** None.

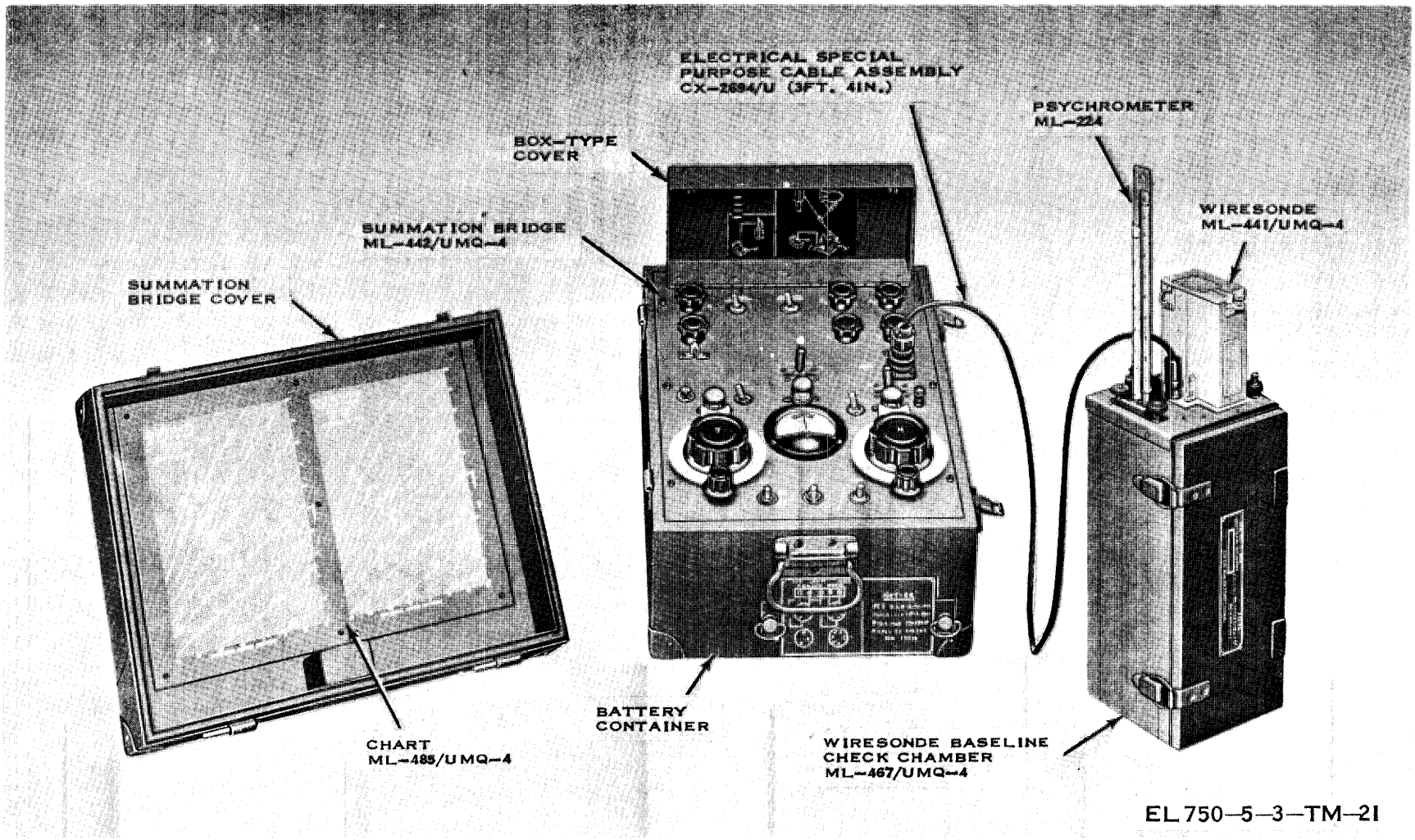


*Figure 21. Wiresonde Set AN/UMQ-4.*

# 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 transmission-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 .* | *Allowance* |
|---|---|
| 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.

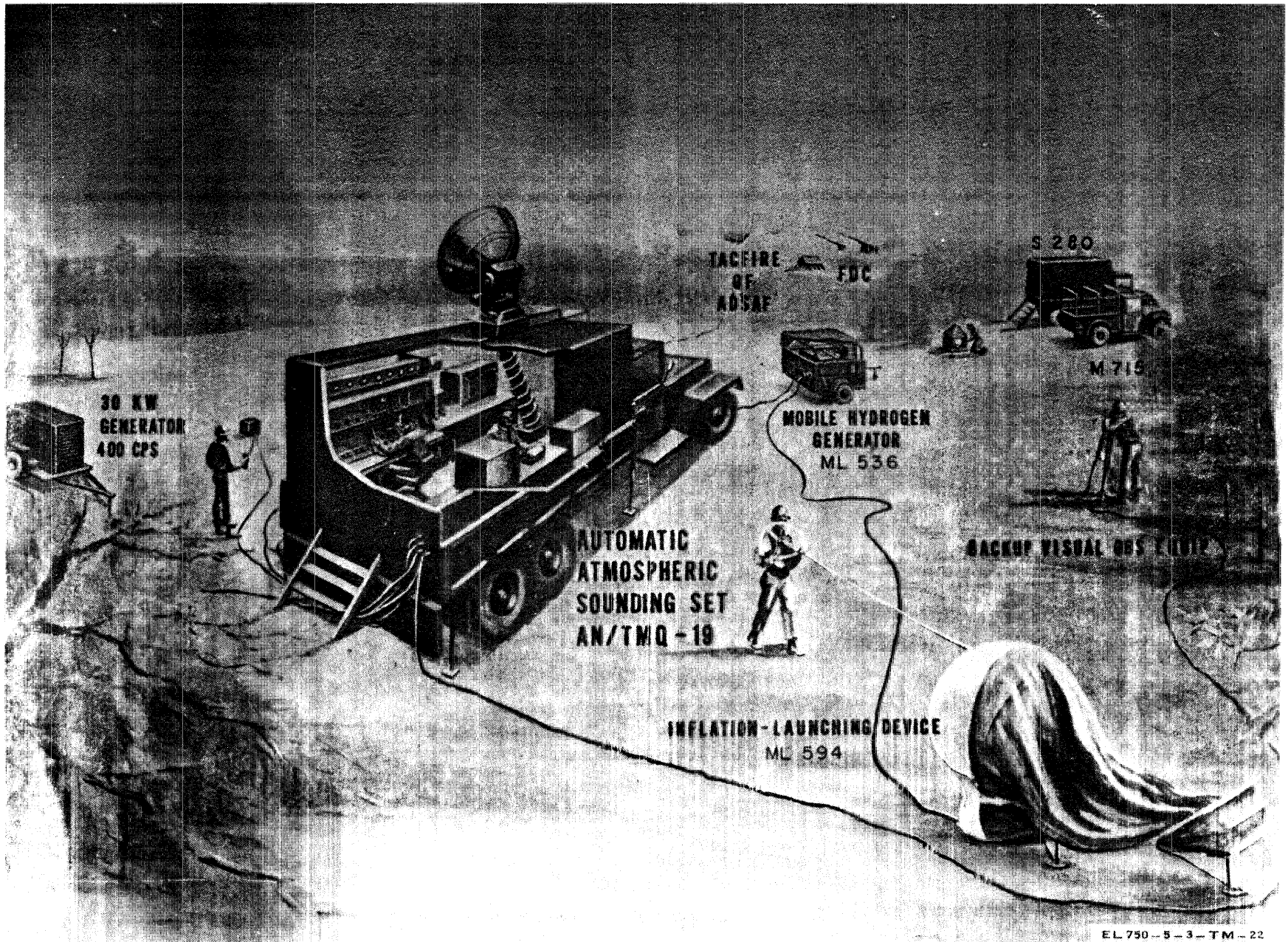


*Figure 22. Meterological Data Sounding System AN/UMQ–7.*

# 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.

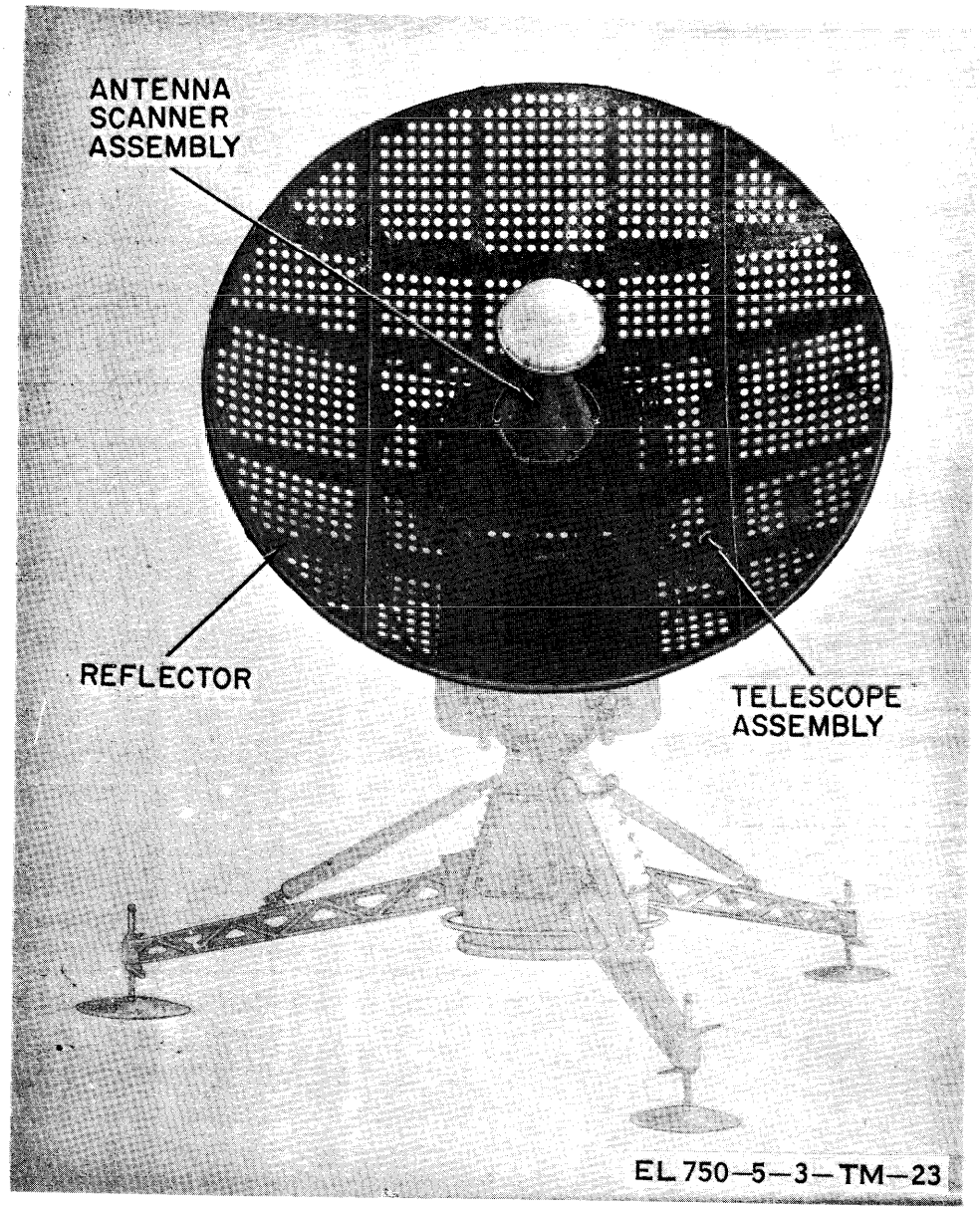


*Figure 23. Antenna AS–462/GMD–1.*

**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 ±10%, 60 Hz ±5–10, 1,760 rpm.

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 1b.

**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:**

| *TOE* | *Allowance* |
|---|---|
| 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 |
| *TA* | |
| 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( ).

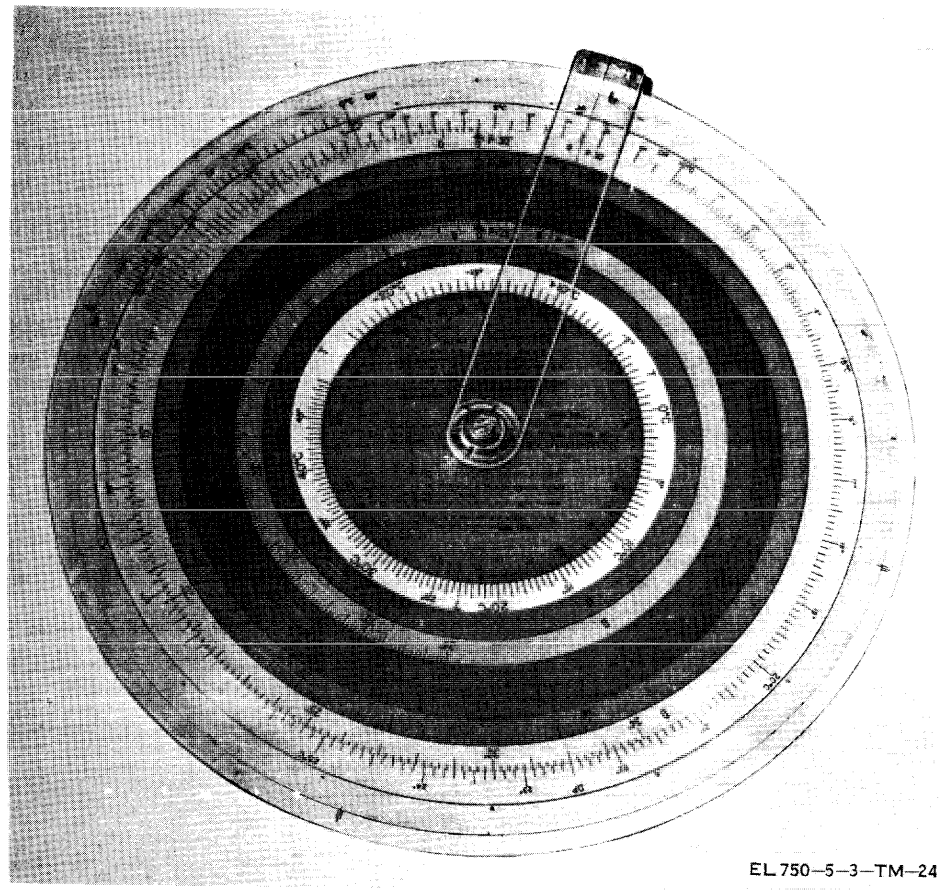


*Figure 24. Computer, Psychometric CP–164/UM.*

**1. NOMENCLATURE:** Computer, Psychometric 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, Psychometric 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, Psychometric CP–164/UM is designed for use with Celsius psychometric 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. atmospheric pressure, and for relative humidity.
Diameter _____ 11¼ in.
Material _____ Plastic.

**7. MAJOR COMPONENT:** Computer, Psychometric CP–164/UM.

**8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:** This equipment is used with Celsius psychometric 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:**

| *TA* | *Allowance* |
|---|---|
| 50–322 _____ | 32 |
| 50–366 _____ | 24 |

**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.

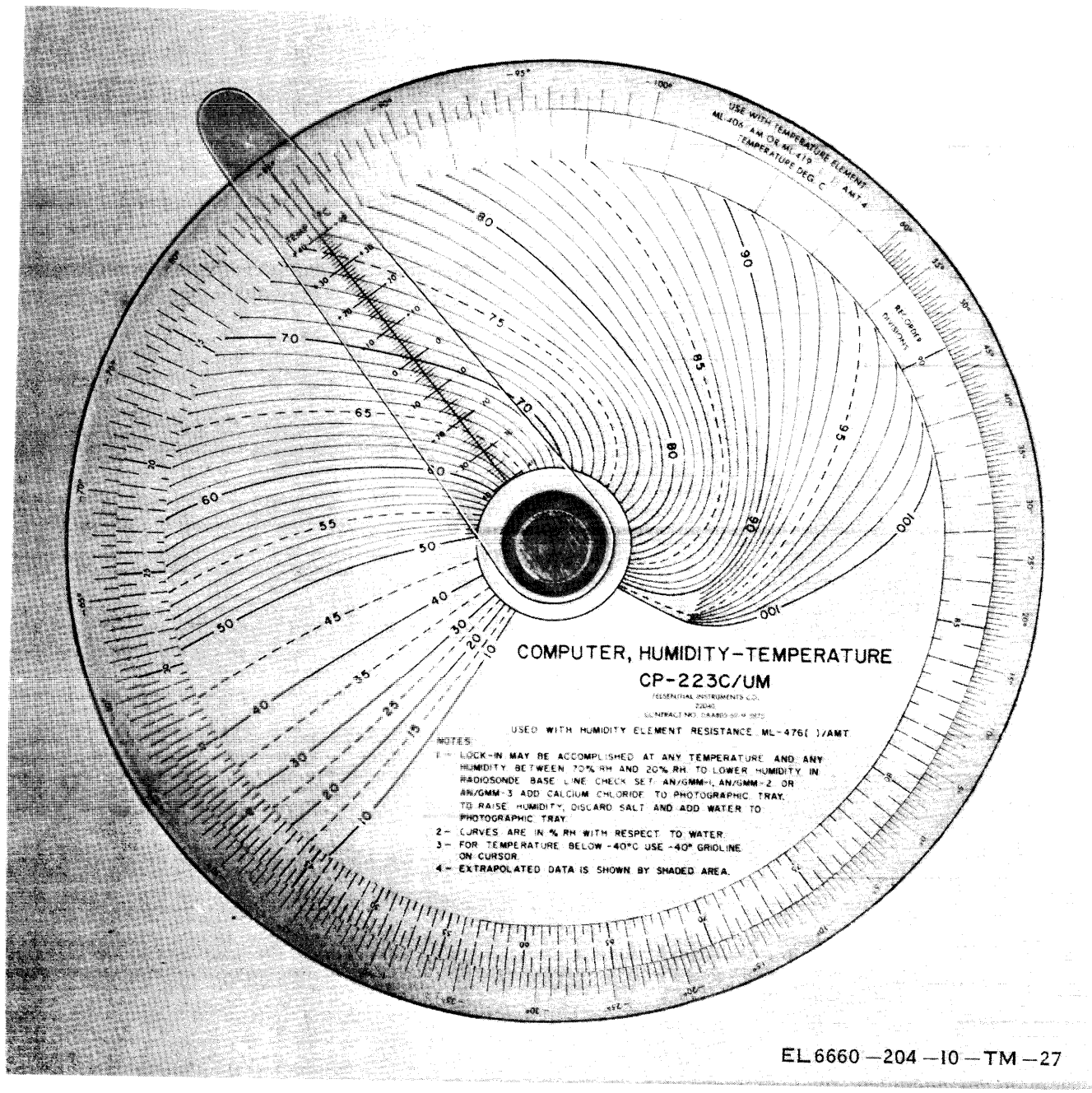


*Figure 25. Computer, Humidity-Temperature CP–223C/UM.*

**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. graduations; 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, humidity 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/TM Q–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* | | *Allowance* |
|---|---|---|
| 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( ).

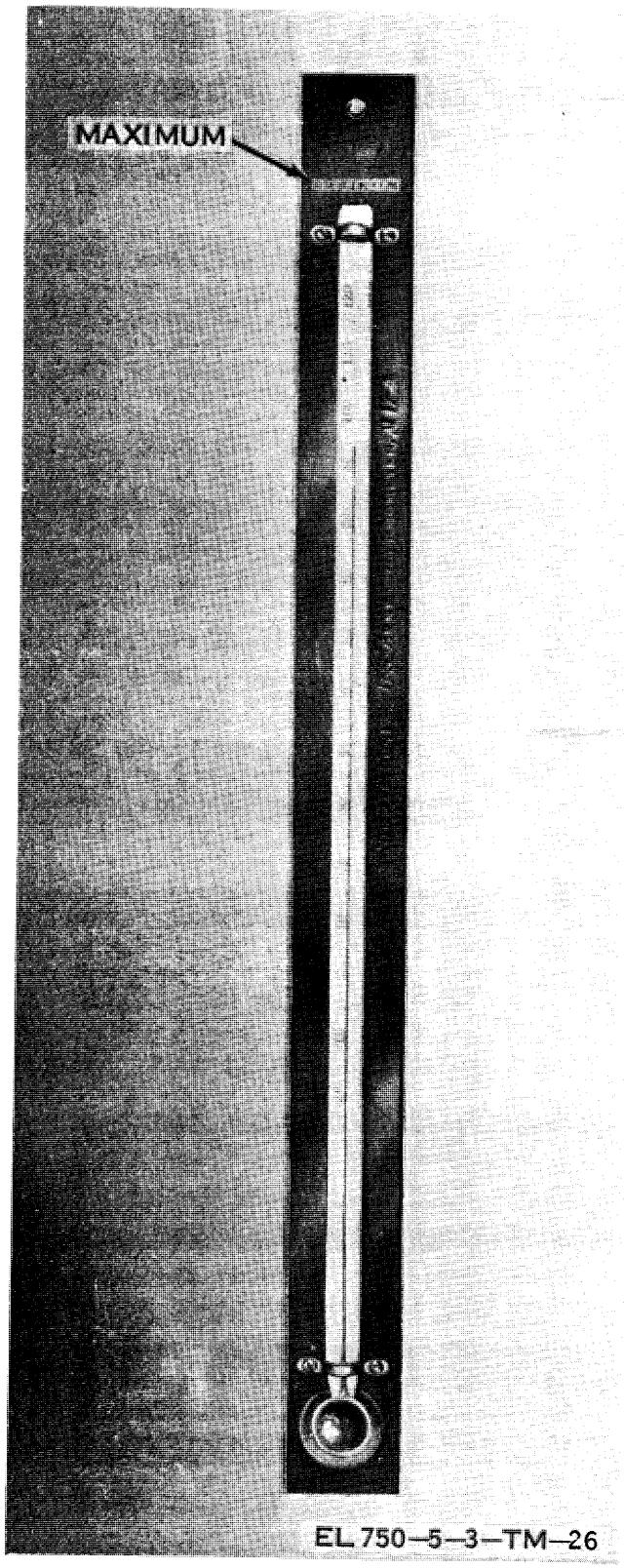


*Figure 26. Maximum Thermometer ML–4.*

**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:**

| *TA* | *Allowance* |
|---|---|
| 10–4 | 2 |
| 20–30 | 9 |

**15. PRICE DATA:**
*a.* Major item _____ $4.00
*b.* Repair parts (1-year cost based on 100 equipments). Expendable item, nonrepairable.

**16. ITEM REPLACED:** None.

**17. REMARKS:**
Issued as a unit replacement.

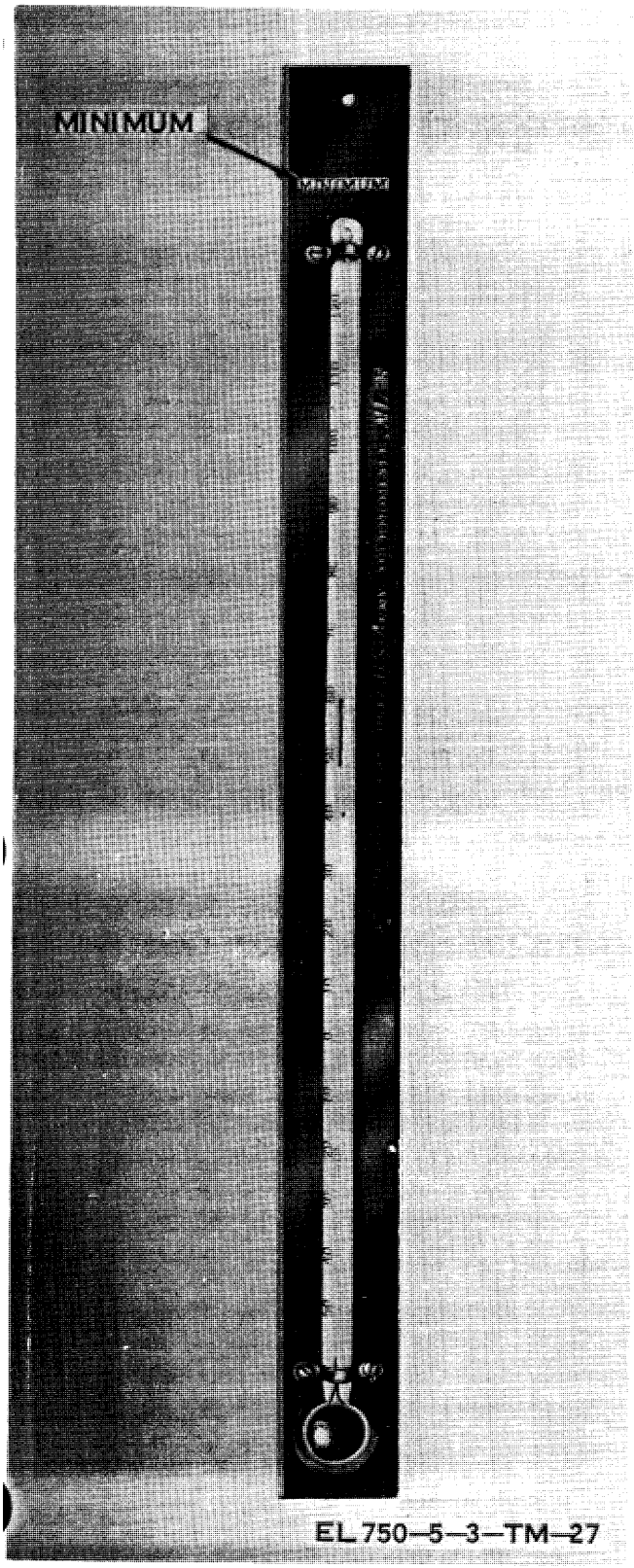


*Figure 27. Minimum Themometer ML–5.*

**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 ½ 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, ½ 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:**

| *TA* | *Allowance* |
|---|---|
| 20–30 | 8 |
| 50–774 | 2 |

**15. PRICE DATA:**
*a.* Major item $2.70
*b.* Repair parts (1-year cost based on 100 equipments) Expendable, nonrepairable.

**16. ITEM REPLACED:** None.

**17. REMARKS:**
Issued as a unit replacement.


*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 |
| *TA* | |
| 50–256 | 3 |
| 77–7 | 3 |

**15. PRICE DATA:**
*a.* Major item $3.54
*b.* Repair parts (1-year cost based on 100 equipments) Expendable, nonrepairable.

**16. ITEM REPLACED:** None.

**17. REMARKS:**
Issued as a unit replacement.

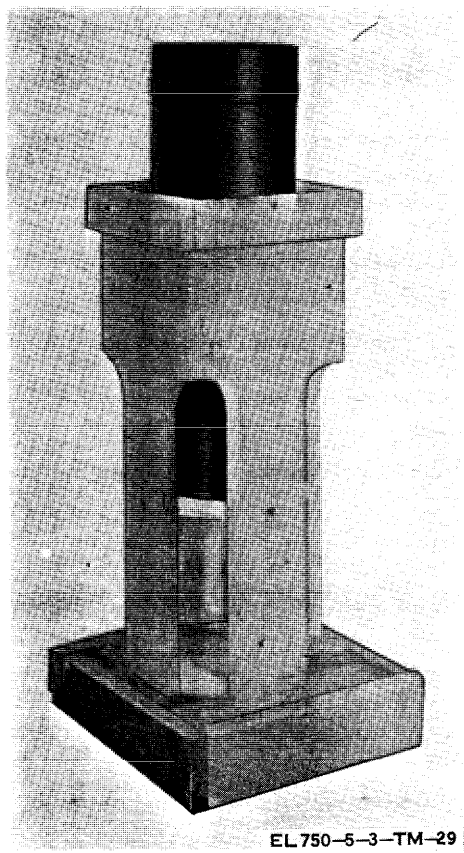


*Figure 29. Gage, Precipitation ML–17( ).*

**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.

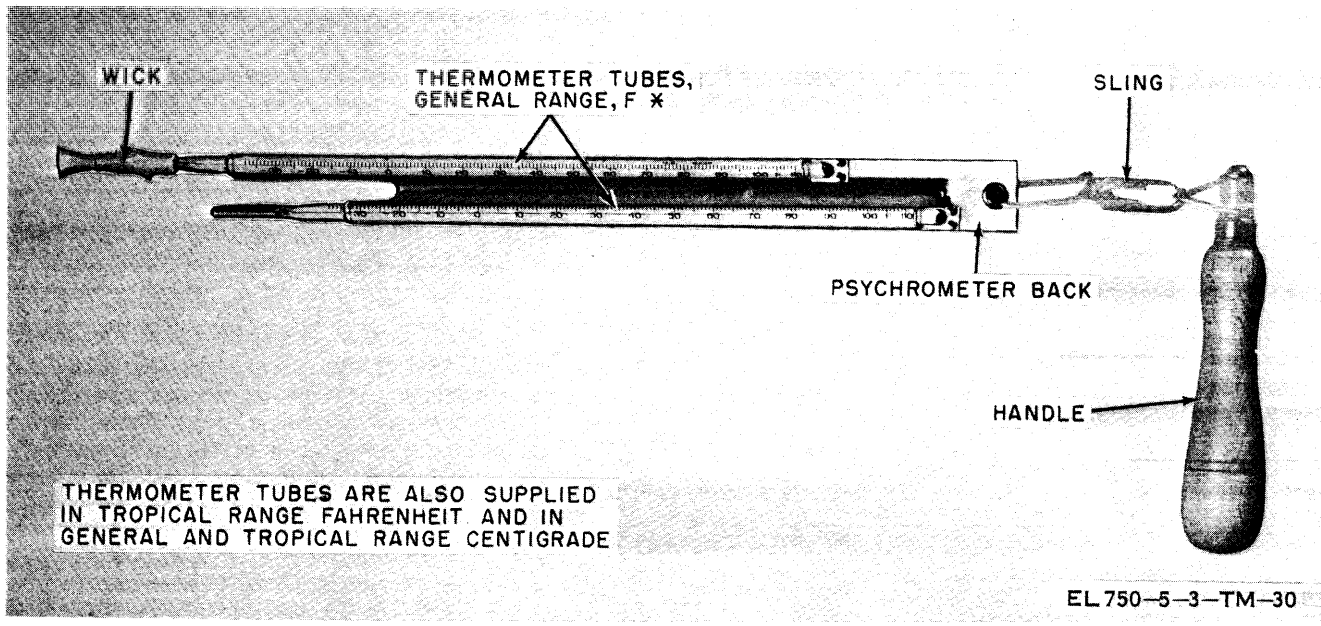


*Figure 30. Fahrenheit Psychrometer ML–24.*

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

| *TA* | *Allowance* |
|---|---|
| 55–2 | 1 |
| 77–7 | 10 |
| 80–12 | 1 |

**15. PRICE DATA:**

*a.* Major item $4.66

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

**16. ITEM REPLACED:** None.

**17. REMARKS:**

Issued as a unit replacement.

## ML–48( )

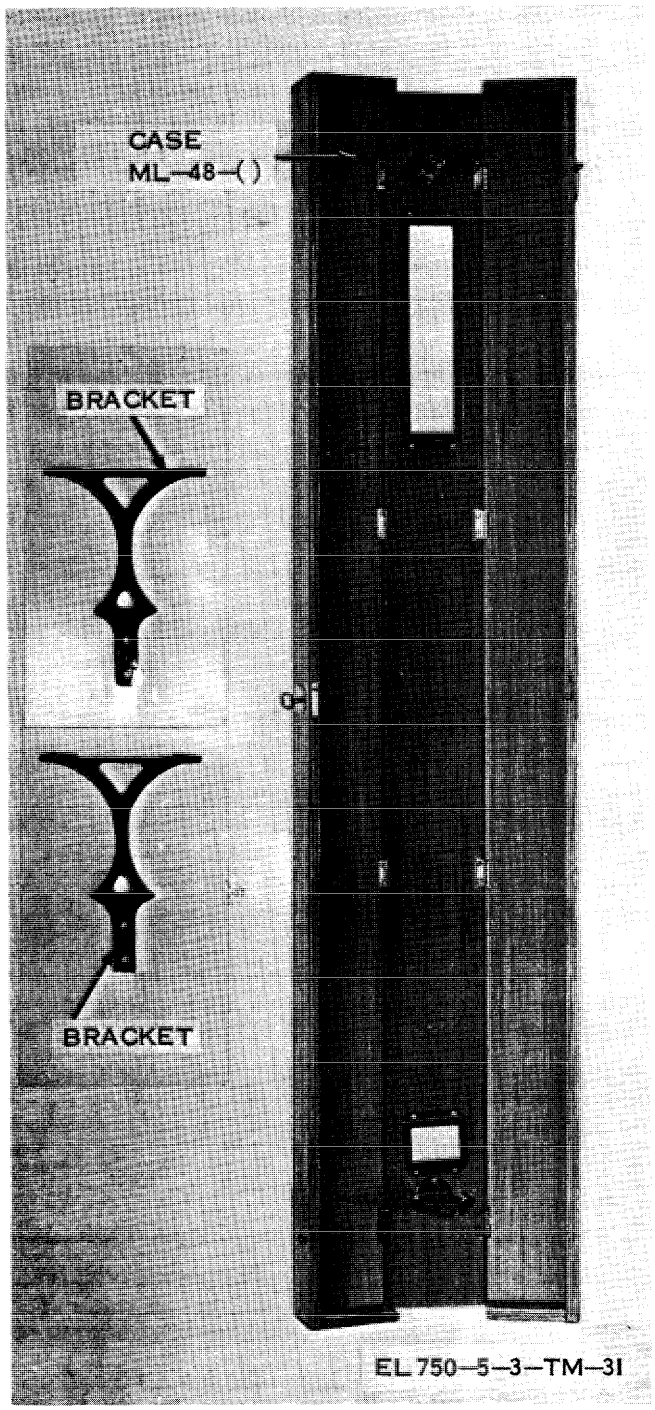


*Figure 31. Case, Barometer ML–48( ).*

**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:**

| *TA* | *Allowance* |
|---|---|
| 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 |
| *TOE* | |
| 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.

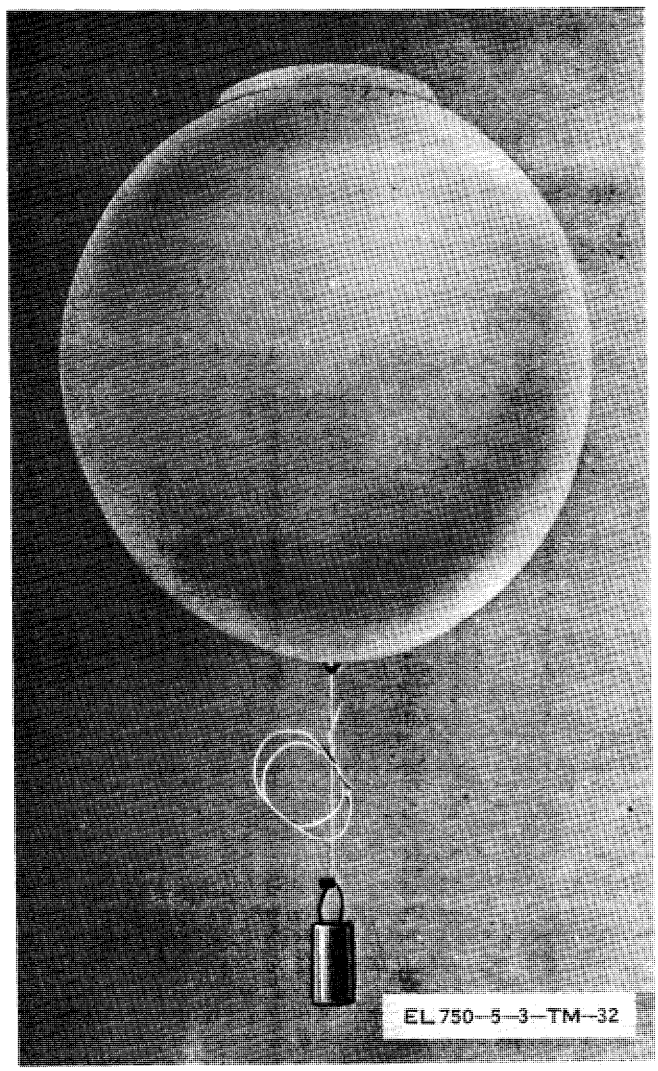


*Figure 32. Pilot Balloon ML–51 ( ).*

**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.

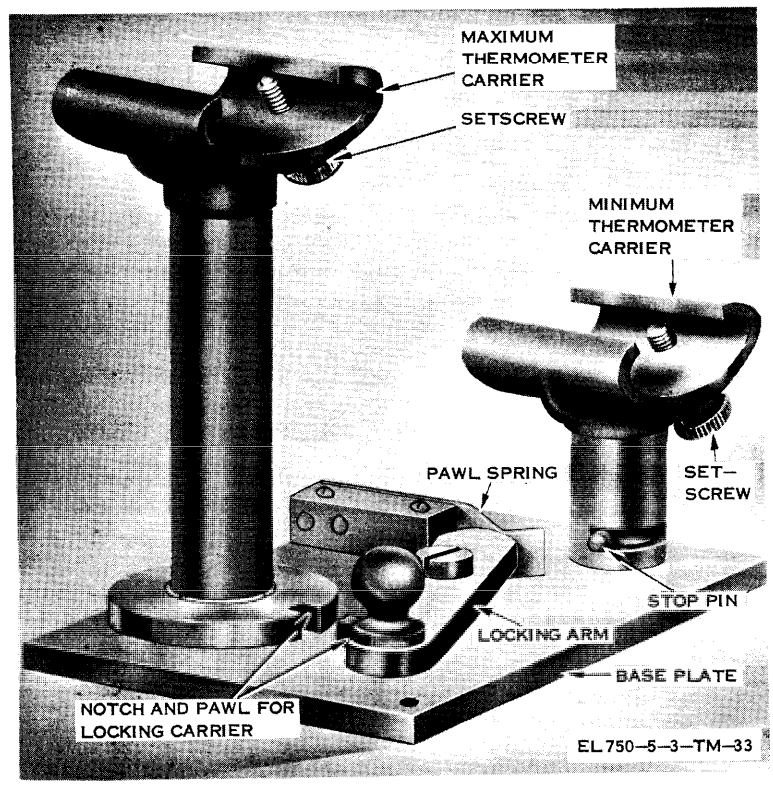


*Figure 33. Support ML–54( ).*

**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 on 100 equipments). Expendable, nonrepairable.

**16. ITEM REPLACED:** None.

**17. REMARKS:** Issued as a unit replacement.

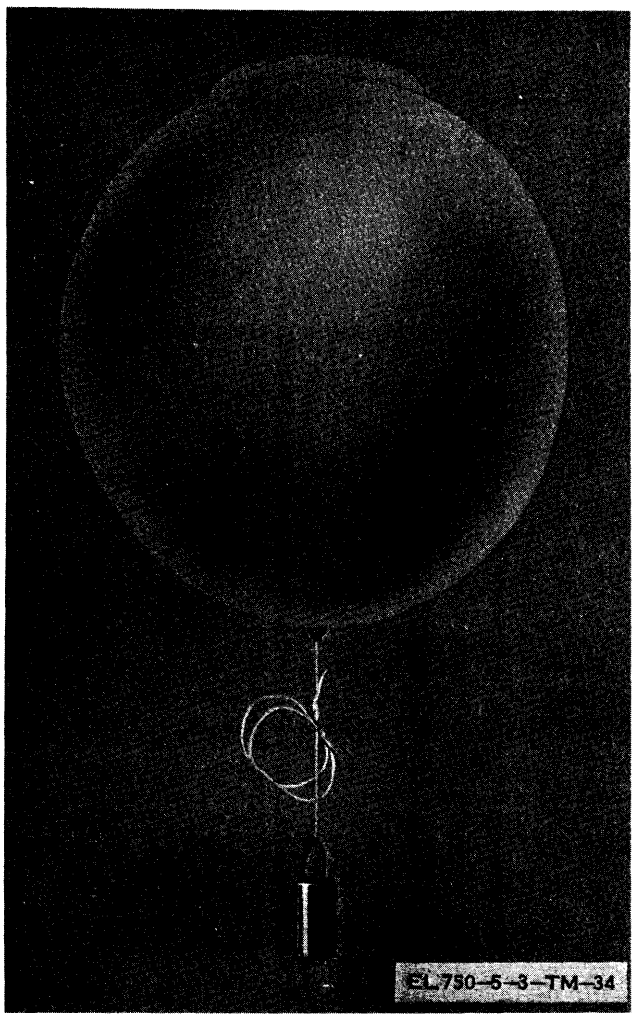


*Figure 34. 30-Grain Pilot Balloon ML–64A.*

**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 windspeed 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, nonrepairable. |

**16. ITEM REPLACED:** None.

**17. REMARKS:**
Issued as expendable item with Manual Meteorological Station AN/TMQ–4.

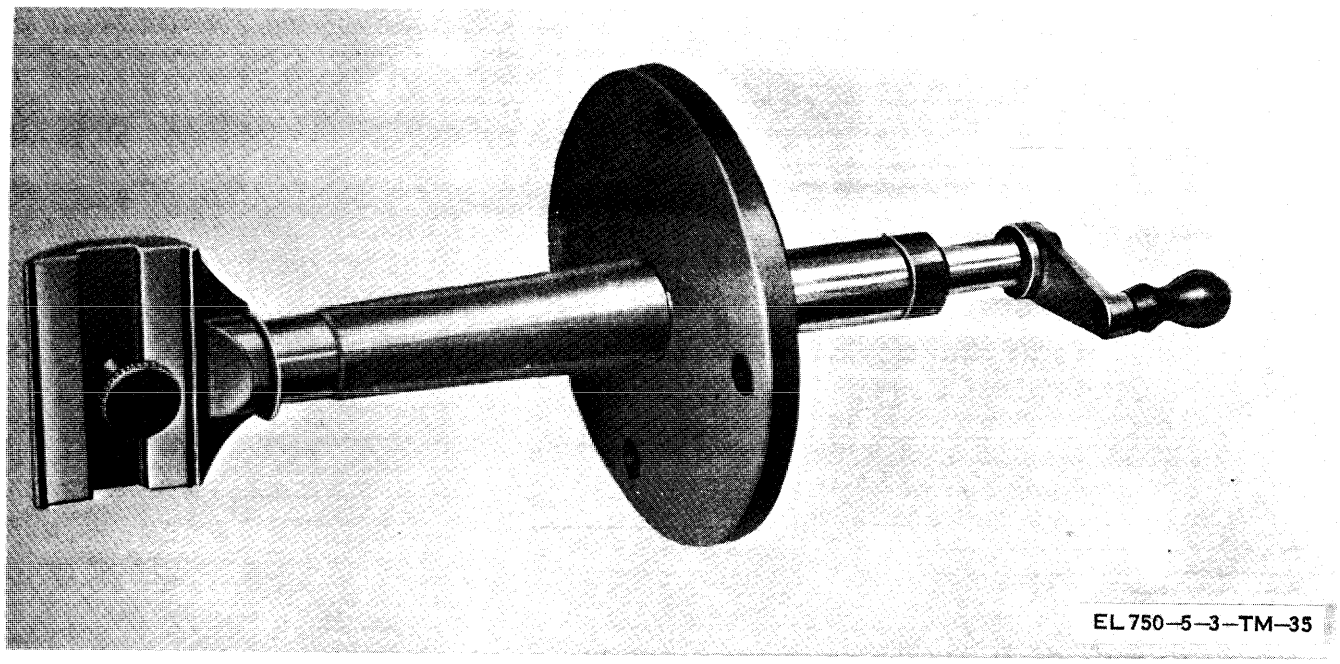


*Figure 35. Rotor ML–74A.*

**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–Fu1l 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.

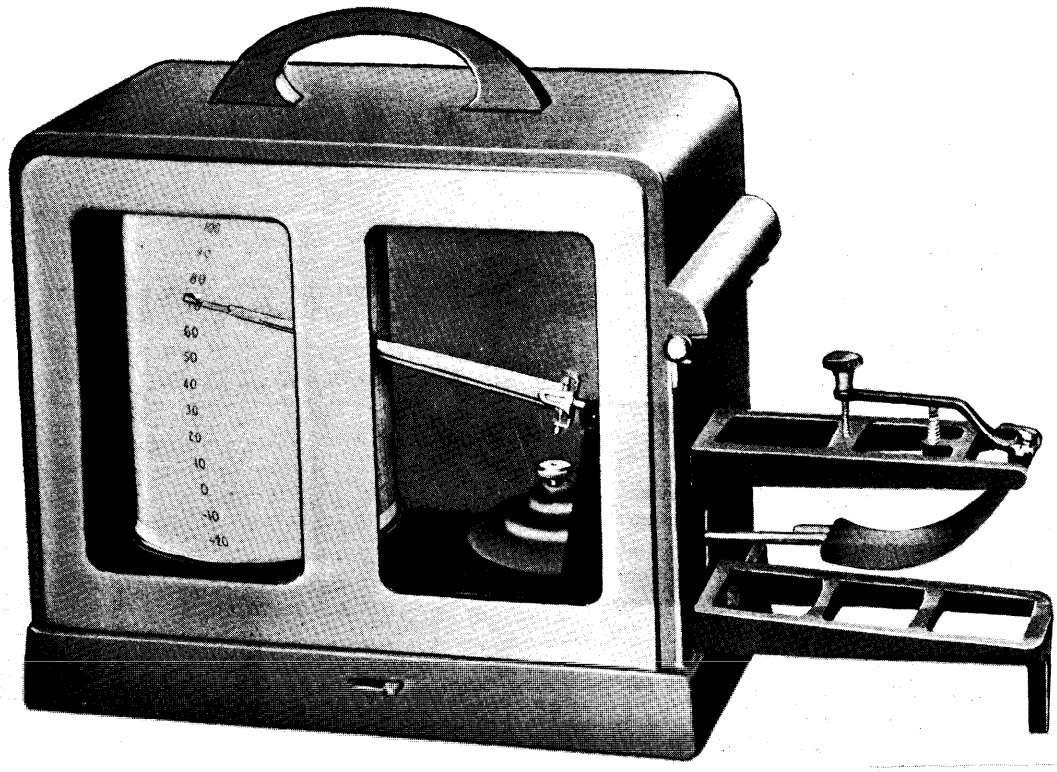


*Figure 36. Thermograph ML-77.*

**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 divisions.

Clock, running time _ _ _ _ _ 8 days (each winding).

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:**

| *TA* | *Allowance* |
|---|---|
| 5–1101 | 1 |
| 8–7 | 7 |
| 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.

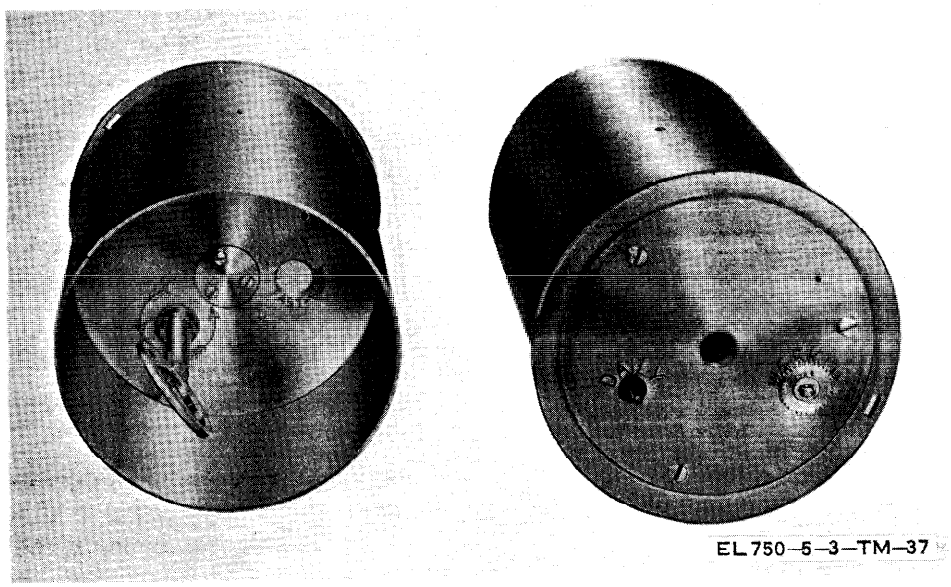


*Figure 37. Clock ML–79.*

**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 Thermo–graphs 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 cylin-der, 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 adjust-ments 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 AUX-ILIARY 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.

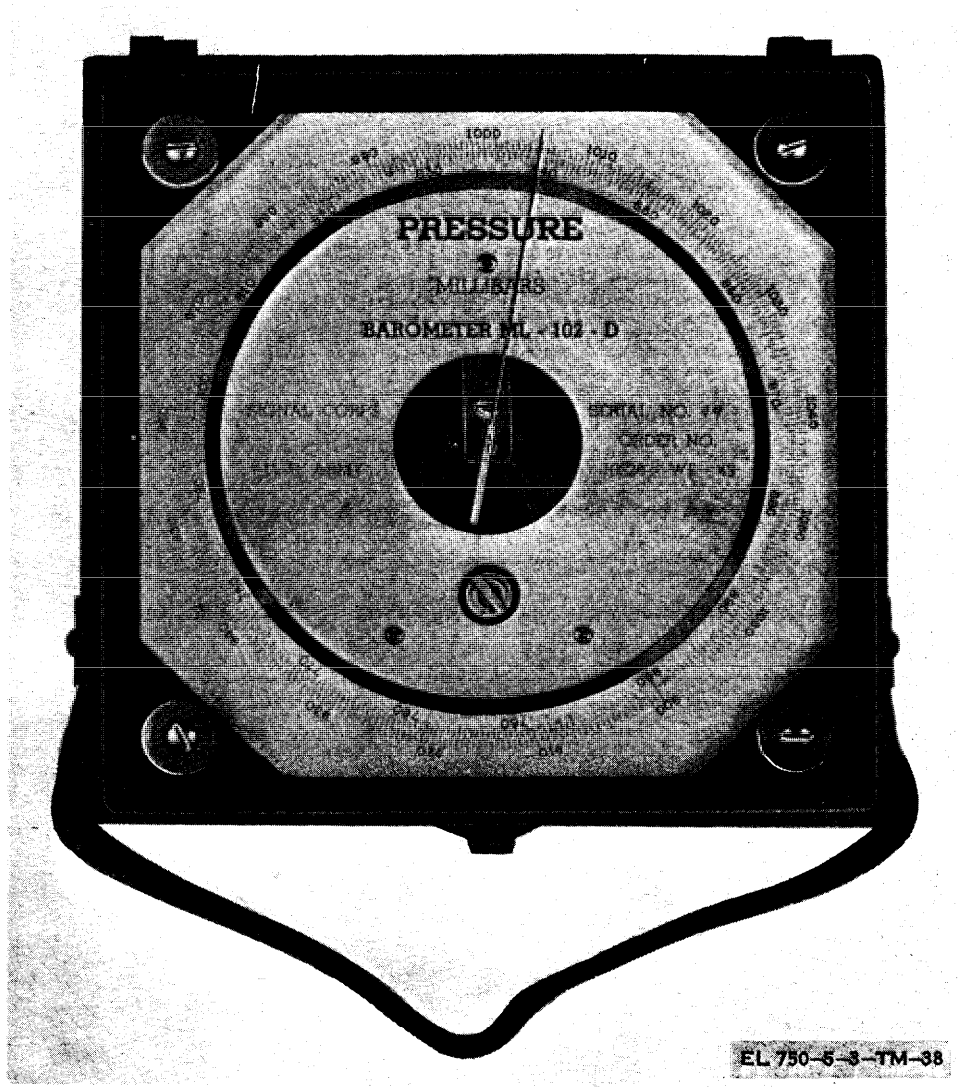


*Figure 38. Aneroid Barometer ML–102( ).*

**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.

Dimensions _ _ _ _ _ _ 6 1/4 in. long, 6 1/4 in, wide, 3 7/8 in. high.
Weight _ _ _ _ _ _ _ _ _ 4½ lb net.

**7. MAJOR COMPONENT:**
Barometer ML–102( ).

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

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

**10. TOOLS AND TEST EQUIPMENT:**
*a. Tools*
Tool Equipment TE–33.
*b. Test Equipment.* None.

**11. REFERENCE DATA AND LITERATURE:**
TM11–427 _ _ _ _ _ _ _ _ _ _ _ _ _ _ ML–102( )
TM 11–6685–202–15,–35P _ _ _ _ _ _ _ _ ML–102( )

**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:**

| *TA* | *Allowance* |
|---|---|
| 6A W0QXAA | 1 |
| 6AW0YMAA | 2 |
| 6A W2QTAA | 1 |
| *TOE* | |
| 55–128G | 1 |
| 57G | 1 |

**15. PRICE DATA:**
a. Major item _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ $221.00
b. Repair parts (1-year cost based on 100 equipments) _ _ _ _ _ _ _ _ _ _ _ $3,315.00

**16. ITEM REPLACED:**
Replaces ML–9.

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

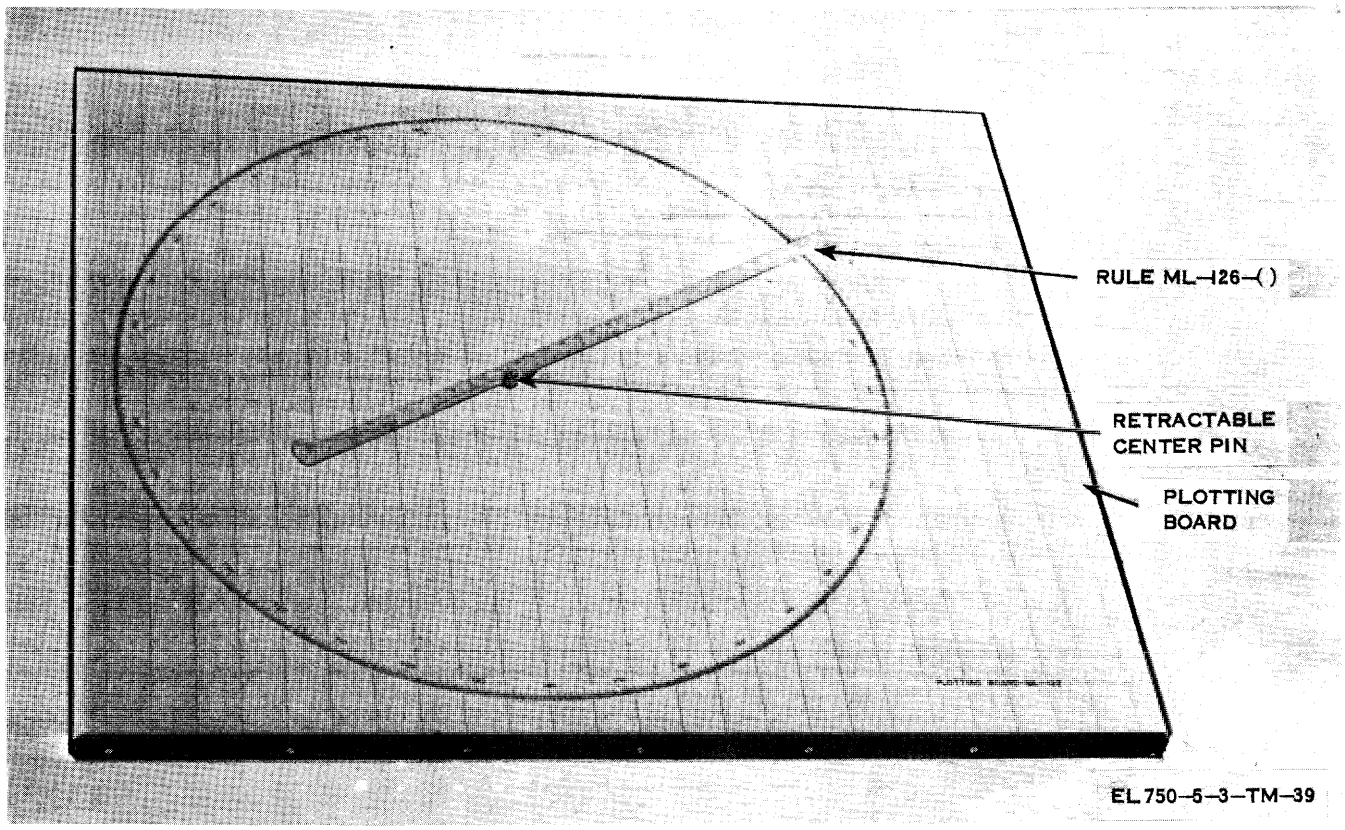


*Figure 39. Plotting Board ML–122.*

**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 _ _ _ _ _ ½ 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

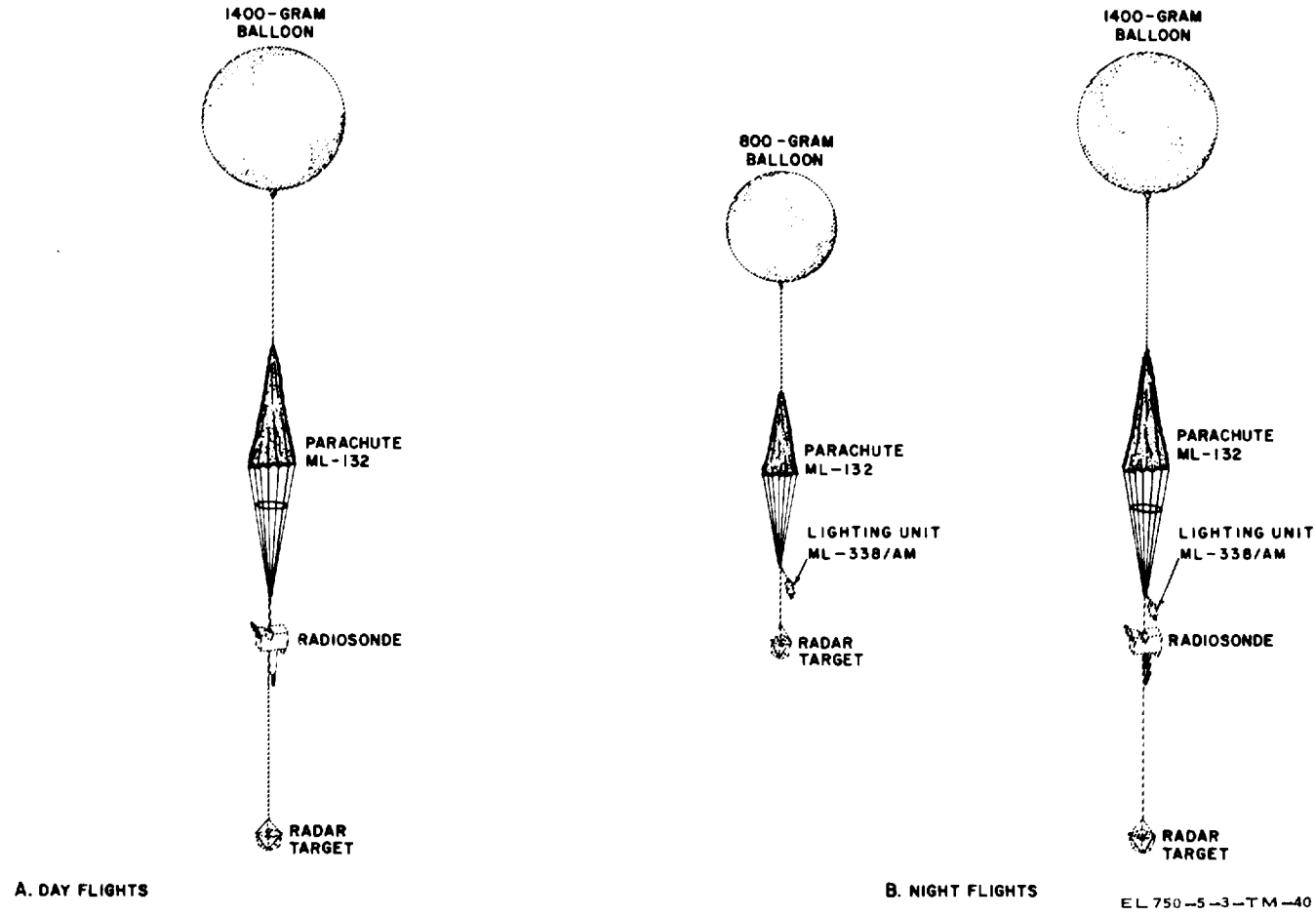


*Figure 40. Parachute ML–132.*

**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, nonrepairable.

**16. ITEM REPLACED:** None.

**17. REMARKS:**

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

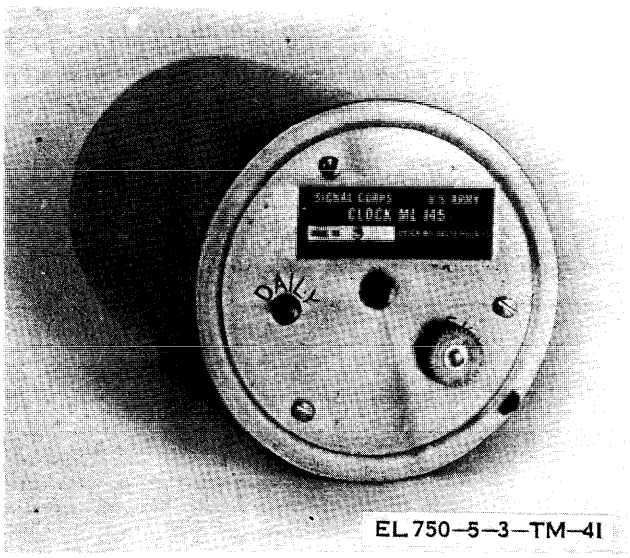


*Figure 41. Clock ML–145.*

**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 50–818 QTY 1

**15. PRICE DATA.**

**16. ITEM REPLACED:** None.

**17. REMARKS:** None.

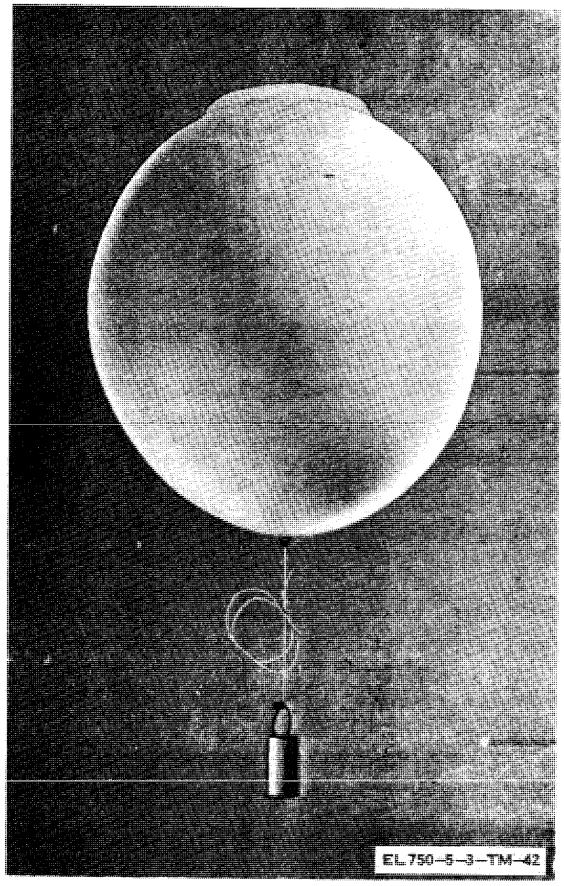


*Figure 42.30-Gram Pilot Balloon ML–155A.*

**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 estimating 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.* Maior 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.

# ML-156A

(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.

## ML–157

(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.

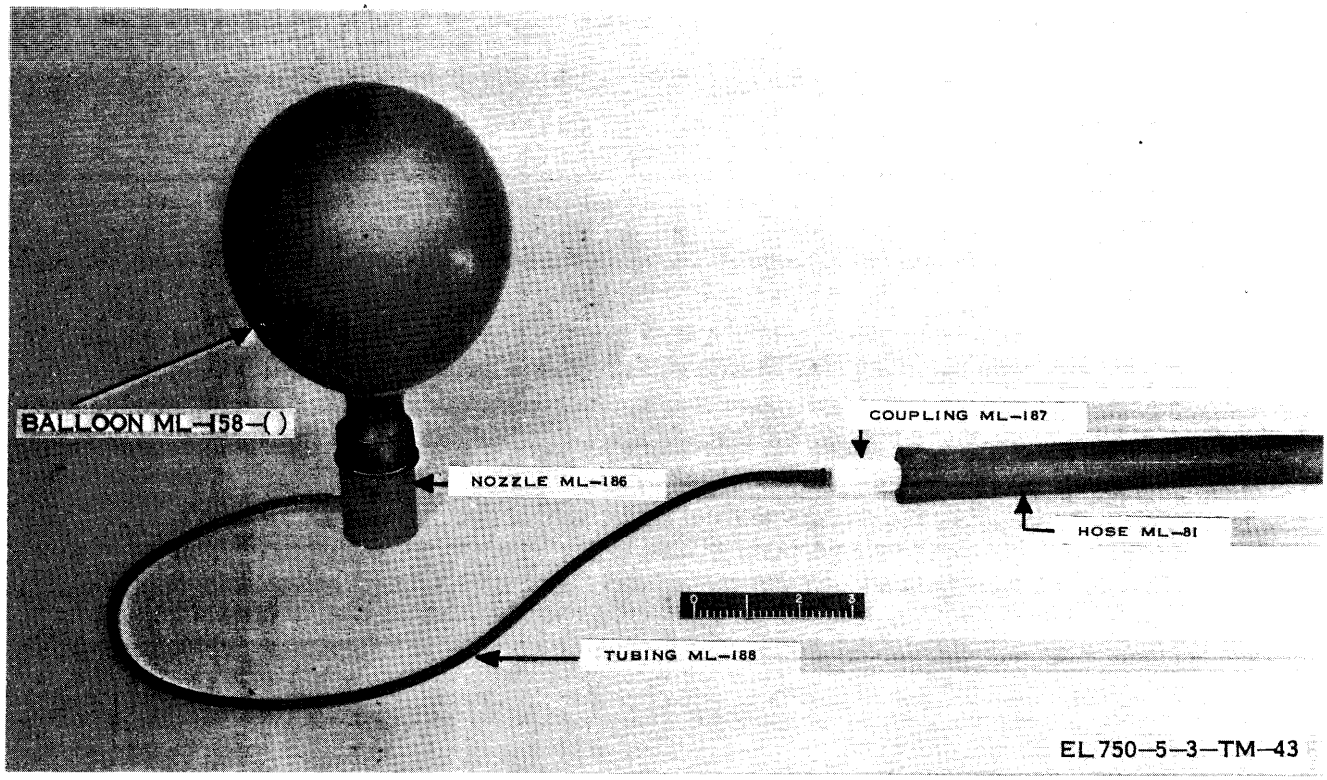


*Figure 43. Ceiling Balloon ML–158.*

**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 on 100 equipments). Expendable, nonrepairable.

**16. ITEM REPLACED:** None.

**17. REMARKS:**
Issued as a unit replacement.

## ML—159

(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, 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 | 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, nonrepairable.

**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.

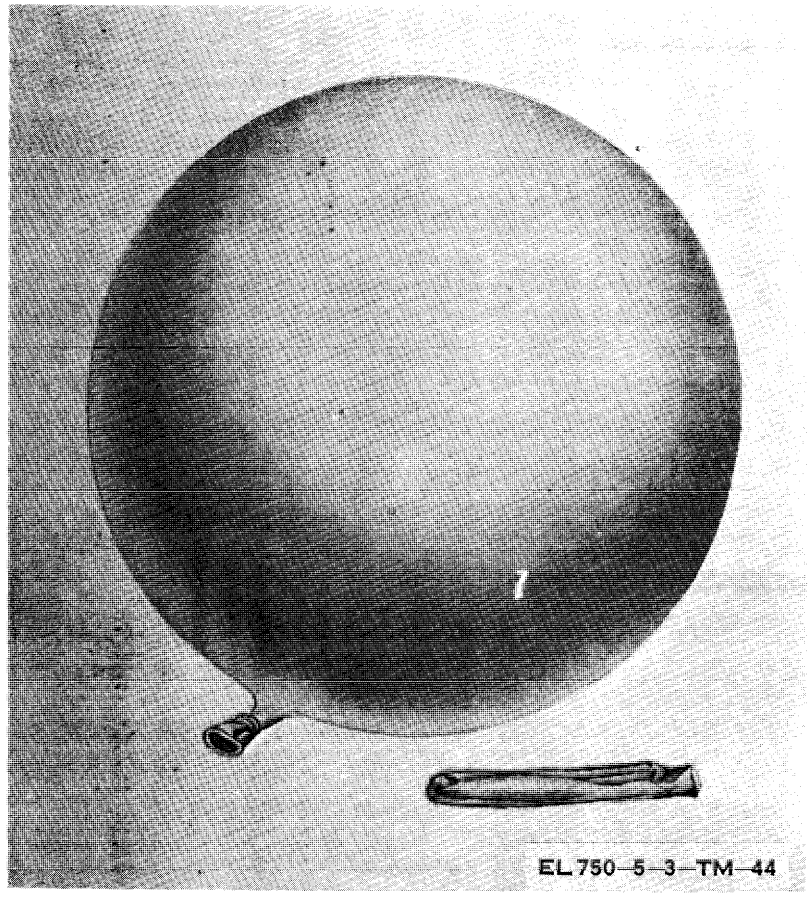


*Figure 44.Balloon ML–161A.*

**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

**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 on 100 equipments). | Expendable, nonrepairable. |

**16. ITEM REPLACED:** None.

**17. REMARKS:**
Issued as a unit replacement.

# ML–162

(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, nonrepairable. |

**16. ITEM REPLACED:** None.

**17. REMARKS:**
Issued as a unit replacement.

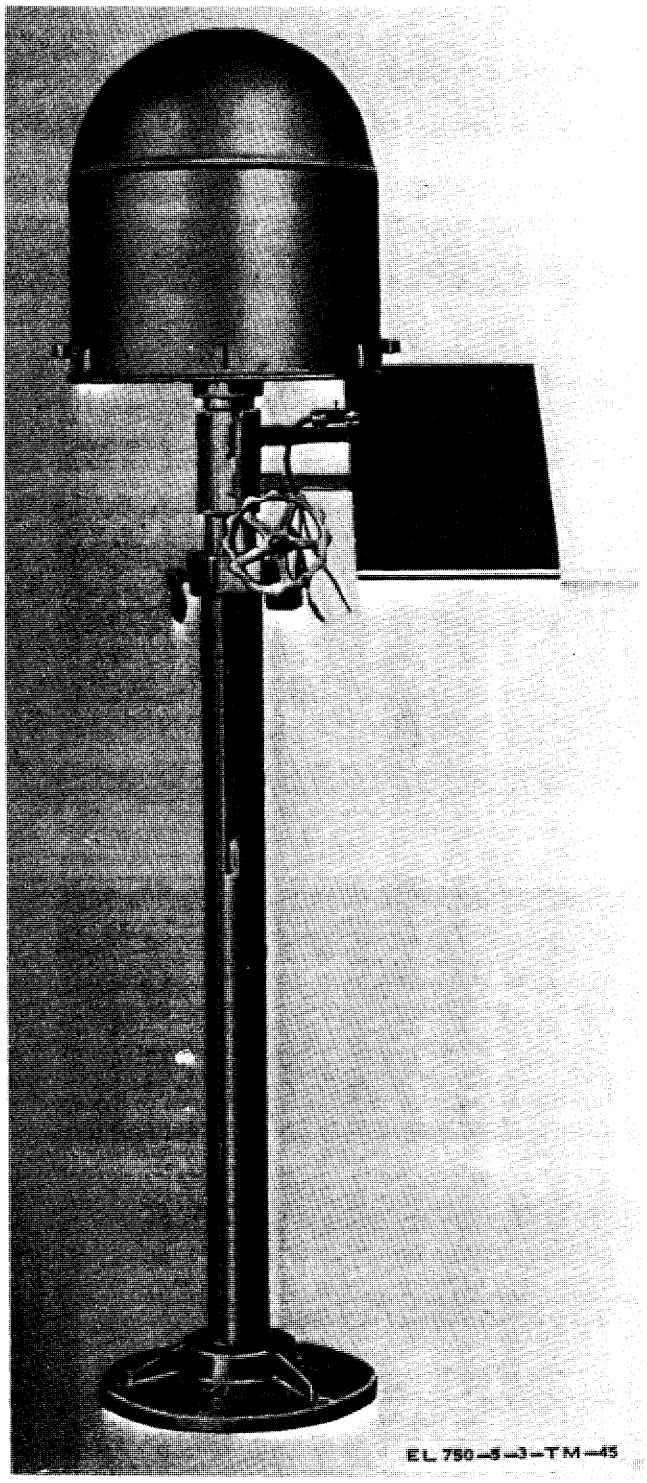


*Figure 45. Theodolite Mount ML–180.*

**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.

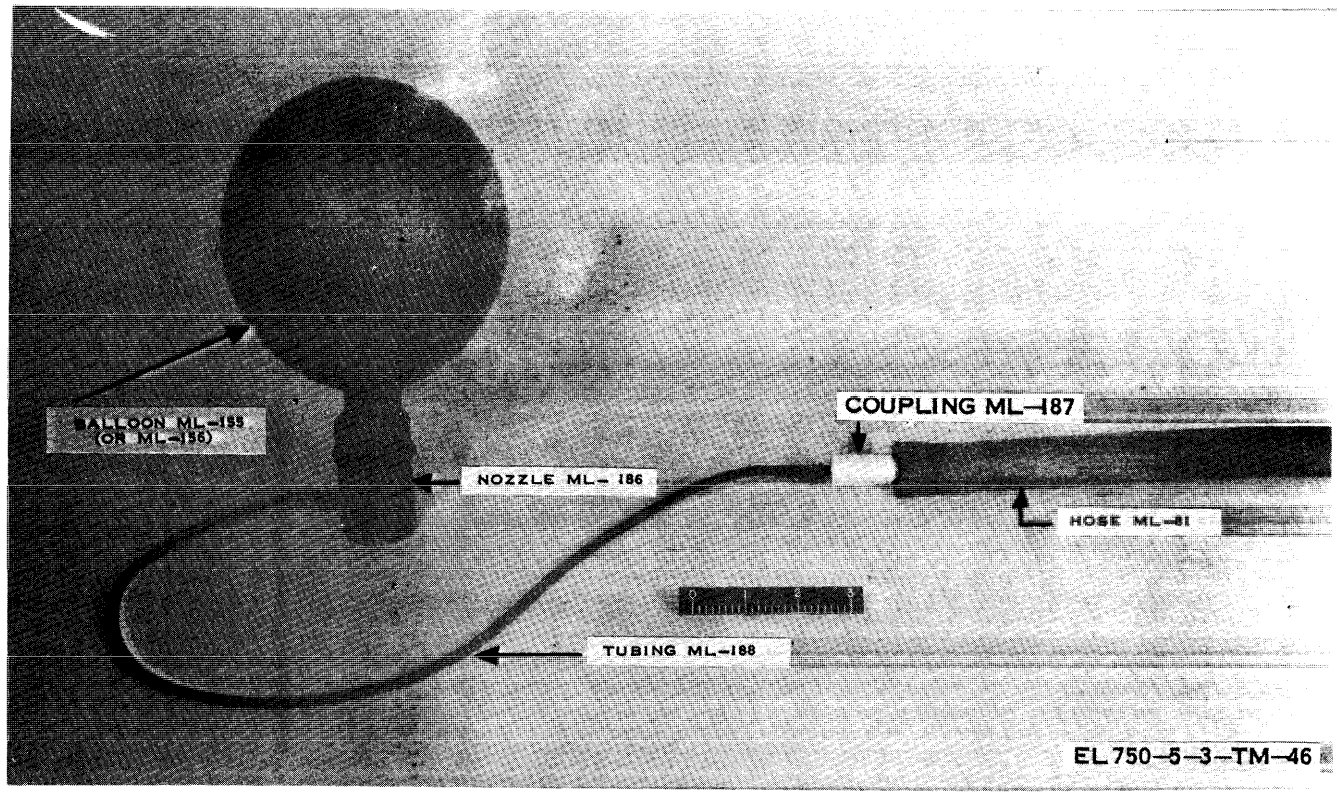


*Figure 46. Coupling ML–187.*

**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 on 100 equipments). Expendable, nonrepairable.

**16. ITEM REPLACED:** None.

**17. REMARKS:**
Issued as a unit replacement.

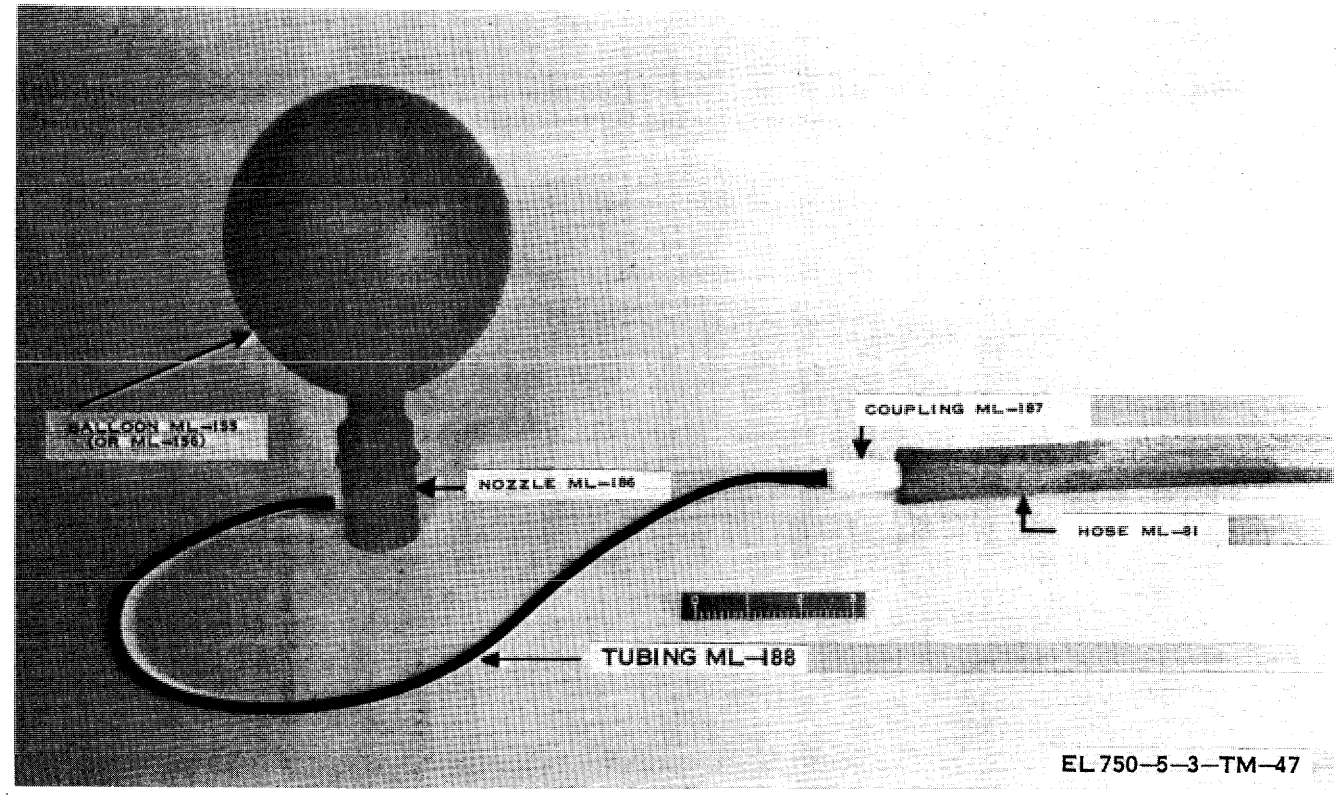


*Figure 47. Tubing ML–188.*

**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 ceiling 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.

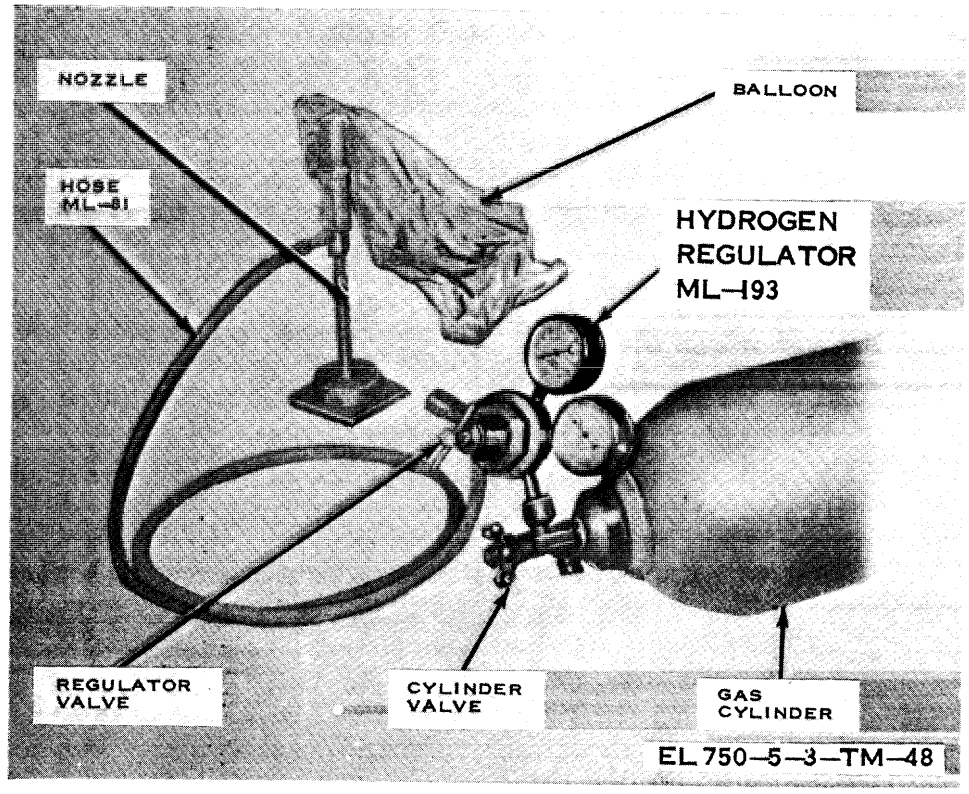


*Figure 48. Regulator, Hydrogen ML–193.*

**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 1ow-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, |
| Valve | 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

**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 co t based on 100 equipments). Expendable item, nonrepairable.

**16. ITEM REPLACED:** None.

**17. REMARKS:**
Issued as a unit replacement.

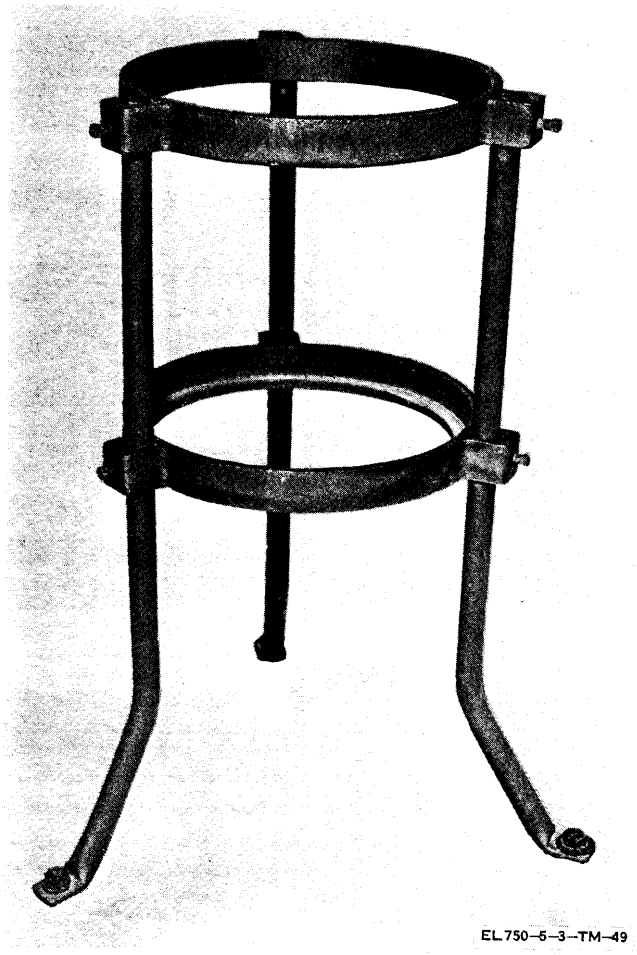


*Figure 49.Support ML–214.*

**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.

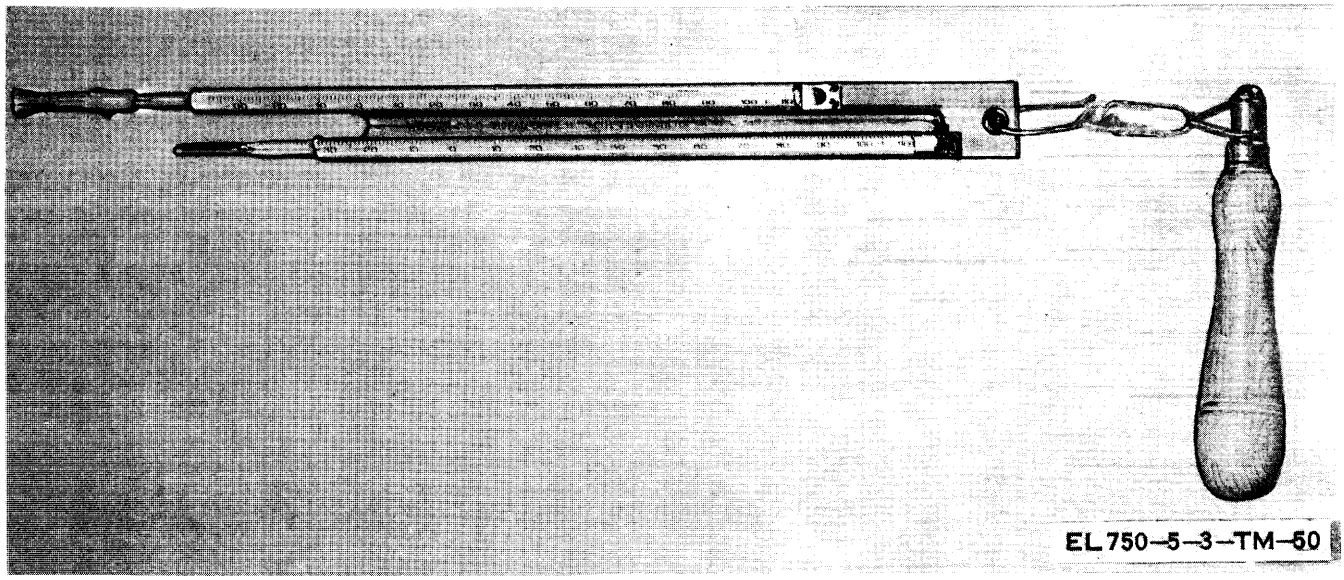


*Figure 50. Centigrade Psychrometer ML–224.*

**1. NOMENCLATURE:** Psychrometer ML–224.

**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–224 consists of two identical mercury-in-glass thermometers mounted on a metal frame which is attached to a sling. The psychrometer is rotated rapidly about one axis at a right angle to its length. One thermometer (the dry bulb) measures the temperature of the free air and the other (the wet bulb) provides measurement of the water vapor content of the air. From these readings the dewpoint, relative humidity, and vapor pressure of the atmosphere can be calculated.

**6. TECHNICAL CHARACTERISTICS:**

Thermal element _ _ _ _ _ Mercury-in-glass.
Temperature range:
General _ _ _ _ _ _ _ _ –37° C. to +46° C.
Tropical _ _ _ _ _ _ _ _ –12 °C. to 63° C.
Graduation _ _ _ _ _ _ _ _ _ Intervals of 1° C.; each multiple of 10° C. is numbered.
Accuracy:
Below –18° C _ _ _ _ _ _ ±0.4° C.
From 18° to 0°C _ _ _ _ _ _ ±0.3° C.
Above 0° C _ _ _ _ _ _ _ ±0.2° C.
Mounting _ _ _ _ _ _ _ _ Metal frame.
Ventilation _ _ _ _ _ _ _ _ Hand sling or Rotor ML–74( ).
Dimensions (thermometer tube):
Length _ _ _ _ _ _ _ _ 9 3/8 in.
Outside diameter _ _ _ _ 7/32 in.

**7. MAJOR COMPONENT:**
Psychrometer ML–224.

**8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This equipment is used as a 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 11–6660–222–12 _ _ _ _ _ ML–224
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* |
|---|---|
| 6–577G _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 2 |
| *TA* | |
| 5–1101 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 1 |
| 10–4 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 18 |
| 20–30 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 8 |
| 50–731 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 2 |
| 50–807 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 1 |
| 50–813 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 1 |
| 60–4 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 1 |
| 82–5 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 1 |

**15. PRICE DATA:**
*a.* Major item _ _ _ _ _ _ _ _ $4.50
*b.* Repair parts (1-year cost based on 100 equipments). Expendable, nonrepairable.

**16. ITEM REPLACED:** None.

**17. REMARKS:**
Issued as a replacement unit.

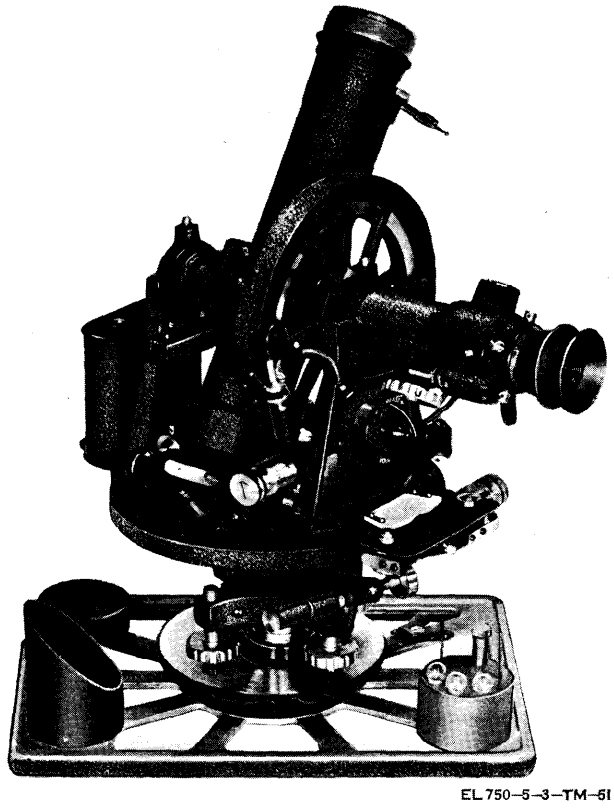


*Figure 51. Theodolite ML–247( ).* EL 7509–5–3–TM–51

**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) |

Dimensions (carrying case) _ _ _ 17x 4¾ x 11¾ in.
Weight (components and carry- 41¼ lb.
ing case).

**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.

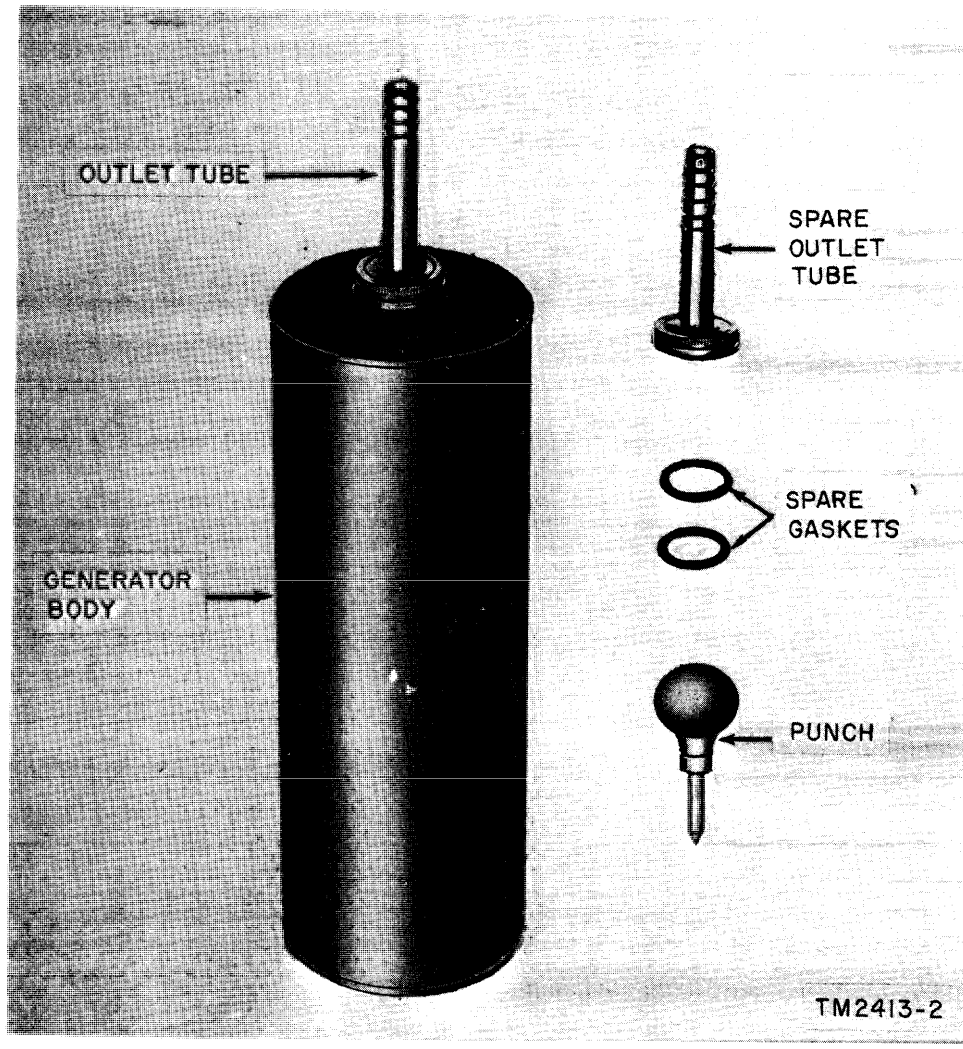


*Figure 52. Hydrogen Generator ML–303/TM.*

**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.

**14. TYPICAL BASIS OF ISSUE:**

| *TA* | *Allowance* |
|---|---|
| 6–575E | 3 |

**15. PRICE DATA:**

*a.* Major item _ _ _ _ _ _ _ _ _ $69.55

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

**16. ITEM REPLACED:** None.

**17. REMARKS:** None.

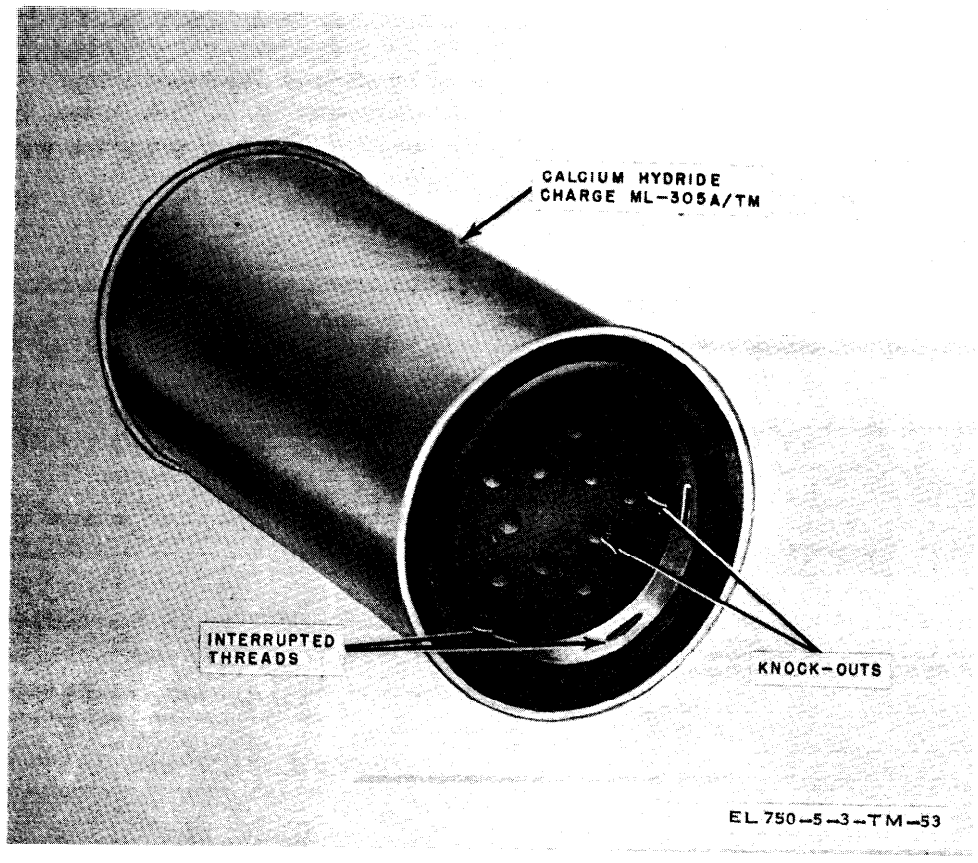


*Figure 53. Calcium Hydride Charge ML–305A/TM.*

**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 purse 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 |

| *TOE* | *Allowance* |
|---|---|
| 6-716H | 1 |
| 6-100H | 1 |
| 37-100H | 1 |
| 39-51G | 1 |
| *TA* | |
| 6–2 | 18 |
| 50–734 | 2 |
| 74–5 | 1 |

**15. PRICE DATA:**

*a.* Major item $3.50

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

**16. ITEM REPLACED:** None.

**17. REMARKS:**

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

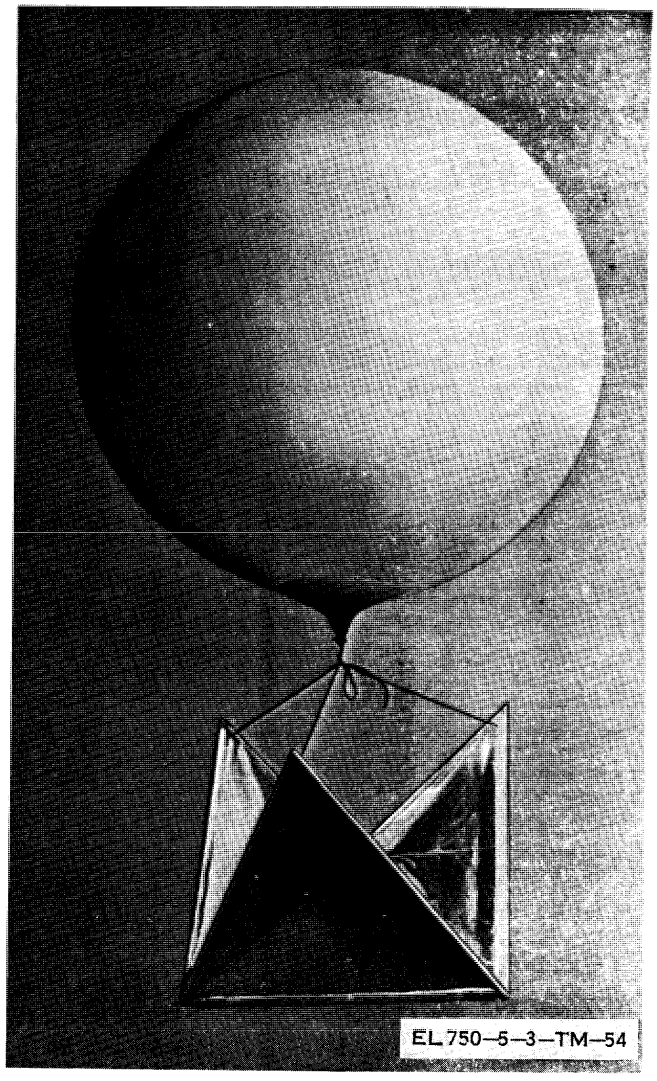


*Figure 54. Pilot Balloon Target ML–307/AP.*

**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, nonrepairable.

**16. ITEM REPLACED:** None.

**17. REMARKS:**
Issued as a replacement unit.

(No illustration available)

**1. NOMENCLATURE:** Graphing Board ML–312( ) /TM.

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

**3. SECURITY REQUIREMENTS:** Unclassified.

**4. PRIMARY USE OR CONCEPT OF EMPLOYMENT:**
Used to plot winds aloft observations.

**5. BRIEF FUNCTIONAL DESCRIPTION:**
Graphing Board ML–312( )/TM is used to evaluate graphically winds aloft and to compute ballistic winds.

**6. TECHNICAL CHARACTERISTICS:**

Plotting board dimensions _ _ _ _ _ 18 by 22 5/16 in.
ML–312/TM wind scale calibrated _ _ _ Mph.
ML–312(A, B) /TM wind scales
calibrated _ _ _ _ _ _ _ _ _ _ Knots.

**7. MAJOR COMPONENTS:**
Plotting board
Wind scale.

**8. SET, SYSTEM, FACILITY, AND CONFIGURATION APPLICATIONS:**
This graphing board is used with various meteorological equipments.

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

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

**11. REFERENCE DATA AND LITERATURE:**
TM 11–6660–221–15P _ _ _ _ _ AN/PDR–60

**12. REPAIR PARTS SUPPORT CAPABILITY:** None.

**13. TRAINING REQUIREMENTS:**
Operator MOS 93–F–20.

**14. TYPICAL BASIS OF ISSUE:**

| *TA* | *Allowance* |
|---|---|
| M2–WIN2AA _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 4 |

**15. PRICE DATA:** None available.

**16. ITEM REPLACED:** None.

**17. REMARKS:** None.

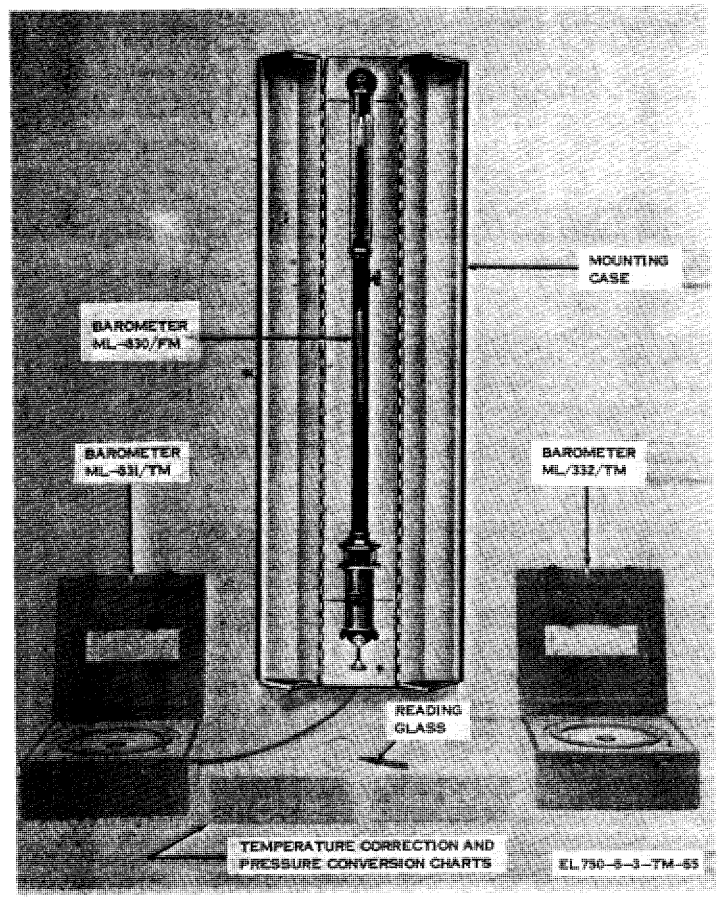


*Figure 55. Barometer ML–330/FM.*

**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 numbered. |
| 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:**

| *TA* | *Allowance* |
|---|---|
| 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 |

**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.

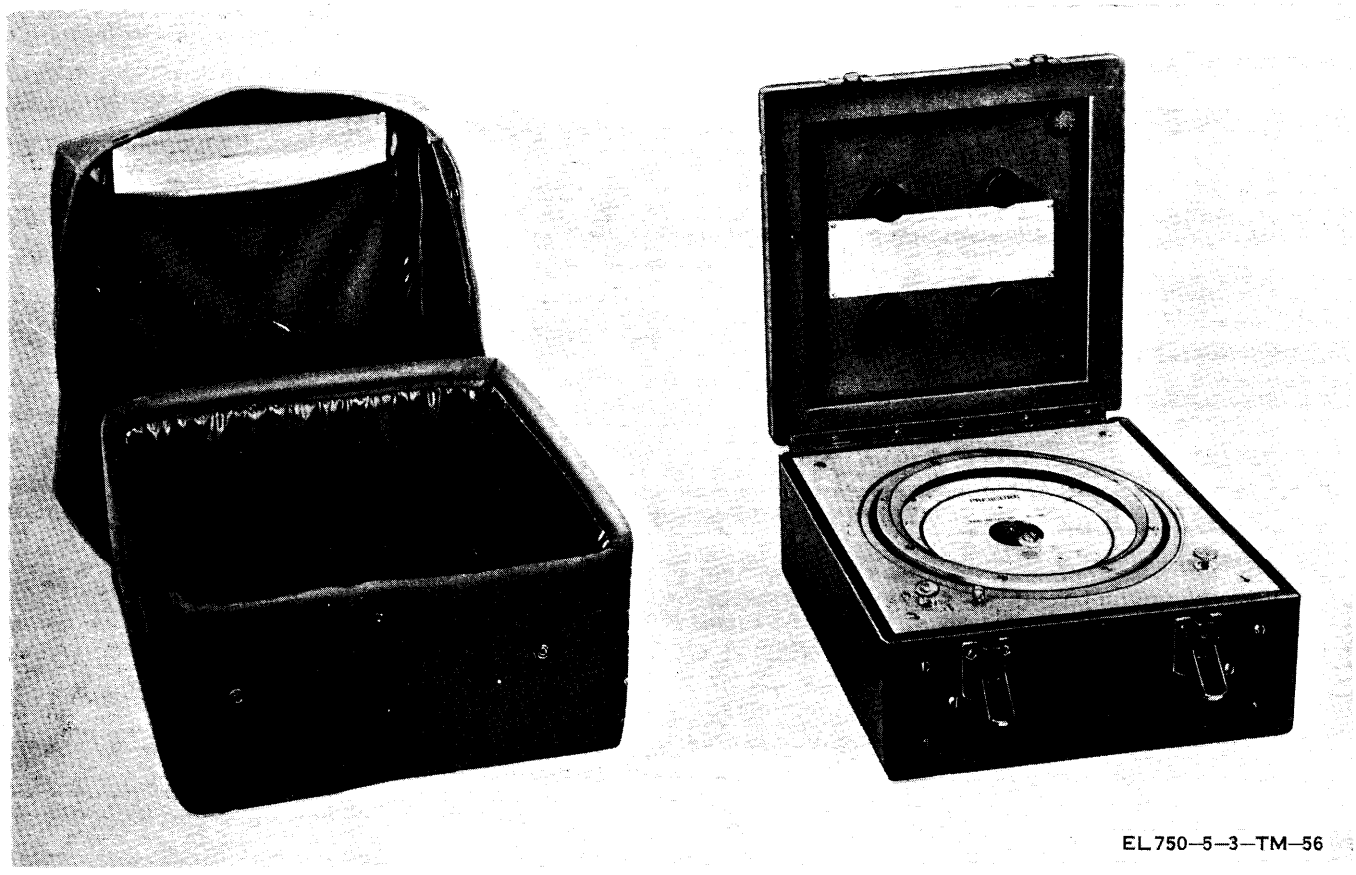


*Figure 56. Barometer ML–331/TM.*

**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 ½ 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:**

| *TA* | *Allowance* |
|---|---|
| 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.

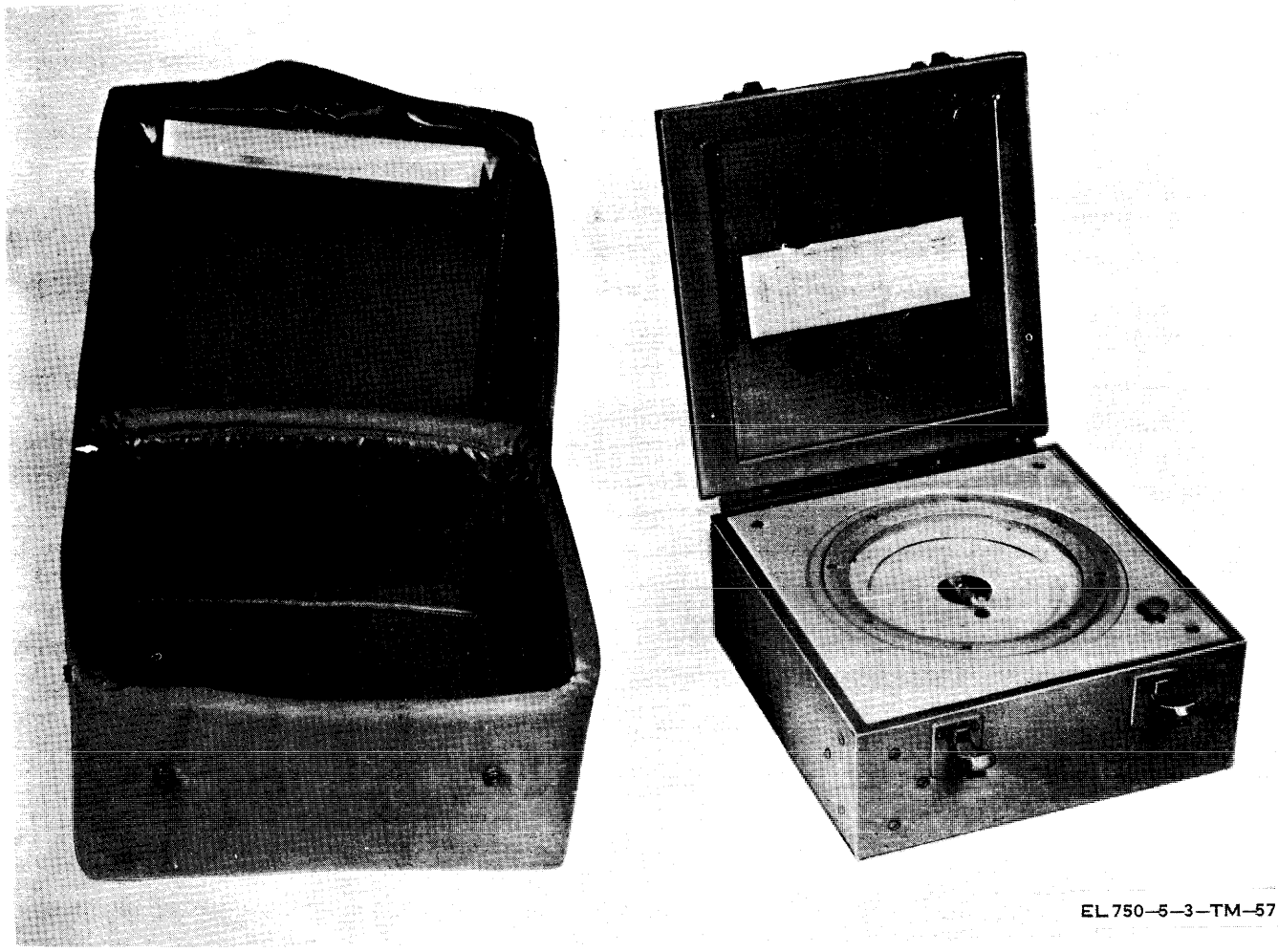


*Figure 57. Barometer ML–322/TM.*

**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 ½ 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:**

| *TOE* | *Allowance* |
|---|---|
| 6–201G | 1 |
| 6–576G | 2 |
| 6–701H | 1 |
| 6–716H | 1 |
| 55–27G | 1 |
| *TA* | |
| 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.

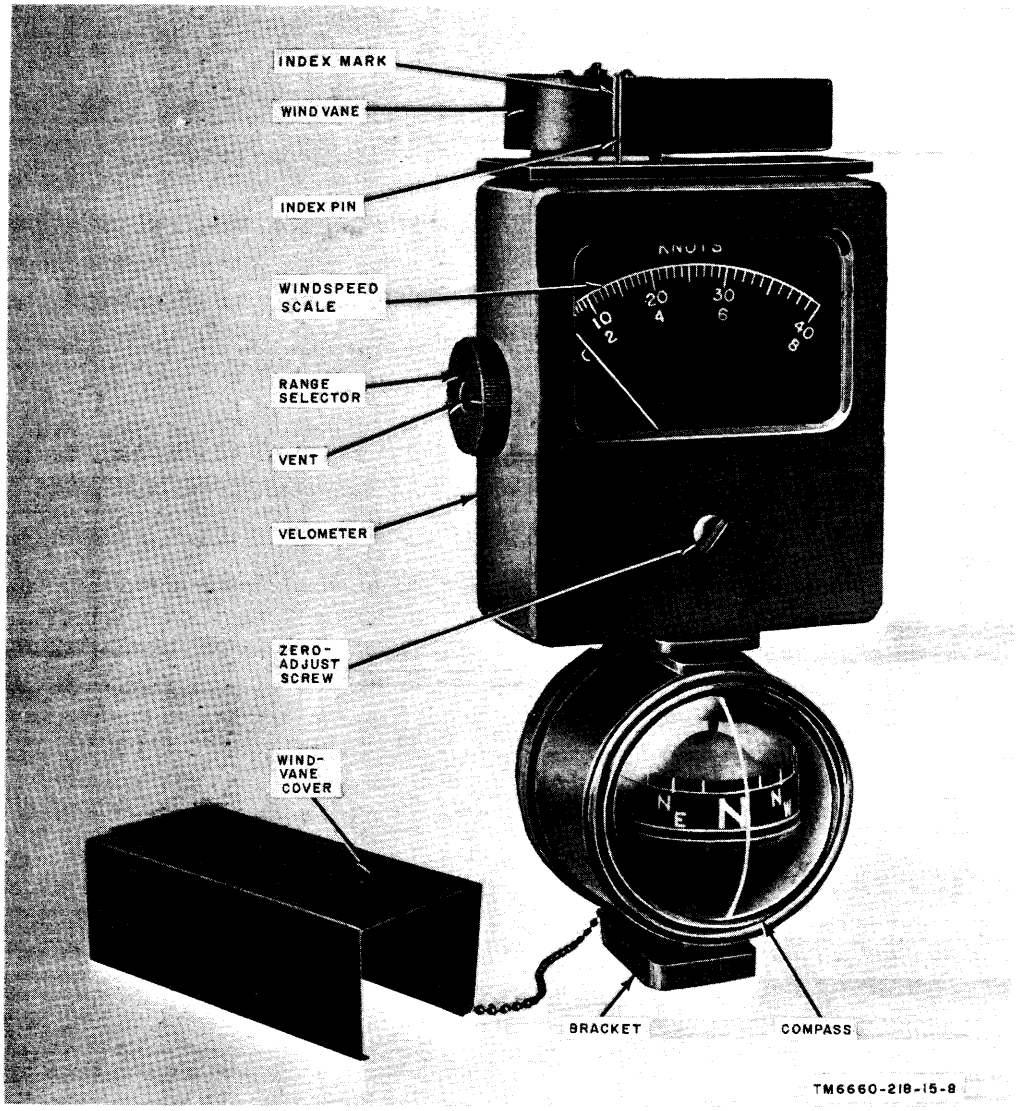


*Figure 58. Anemometer ML–433( )/PM.*

**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.

**13. TRAINING REQUIREMENTS:**
Operator MOS 93–F–20.
Repairman MOS 35–D–20.

**14. TYPICAL BASIS OF ISSUE:**

| *TA* | *Allowance* |
|---|---|
| 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.

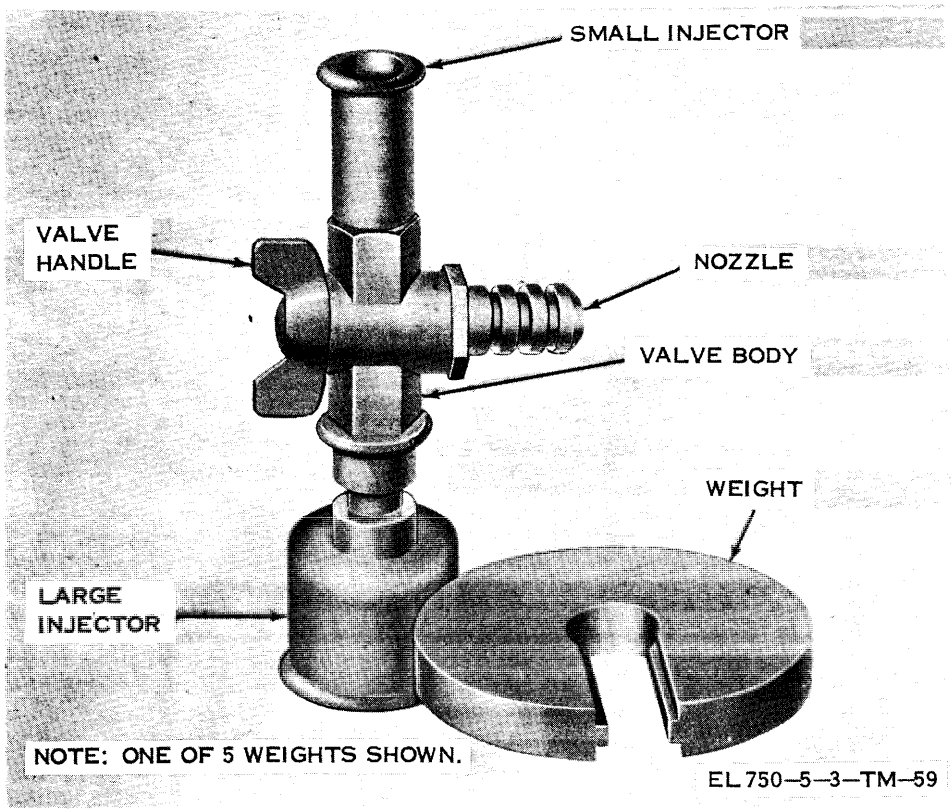


*Figure 59. Nozzle ML–462( )/UM.*

**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.

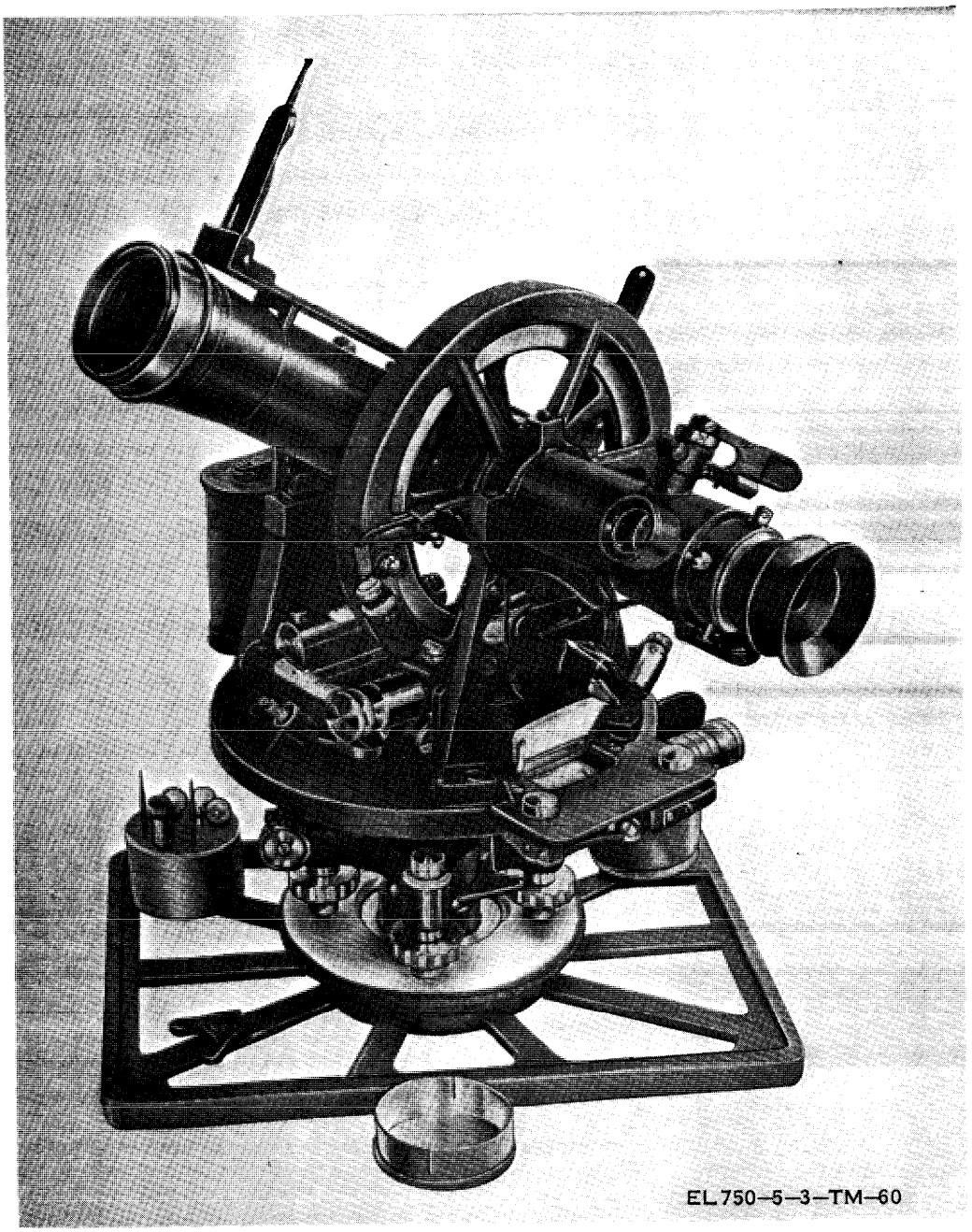


*Figure 60. Theodolite ML–474/GM.*

**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 particularly 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.

| | |
|---|---|
| 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 combination with eyepiece 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 assemblies; current supplied by 2 Batteries 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:**

| *TA* | *Allowance* |
|---|---|
| E2W0CEAA | 2 |
| M2W0H8AA | 1 |
| M2W1N2AA | 66 |
| M7W0WRAA | 3 |
| M7W04WAA | 3 |
| M7W04YAA | 1 |
| M8W1NKAA | 1 |
| SDW21GAA | 16 |
| 5AW2NTAA | 55 |
| *TOE* | |
| 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.

# ML–475( )/GM

(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. |
| Outdocr 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:**

| *TA* | *Allowance* |
|---|---|
| 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 intervals. | ½0 in. numbered each 1 in.; 1 mb numbered each 10 mb. |
| Vernier scale | Readings to 1/500 (0.002) in.; readings to ½0 (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, 2⅛-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) ——— $1,935.00

**16. ITEM REPLACED:** None.

**17. REMARKS:**

Formerly nomenclatured ML2-( ).

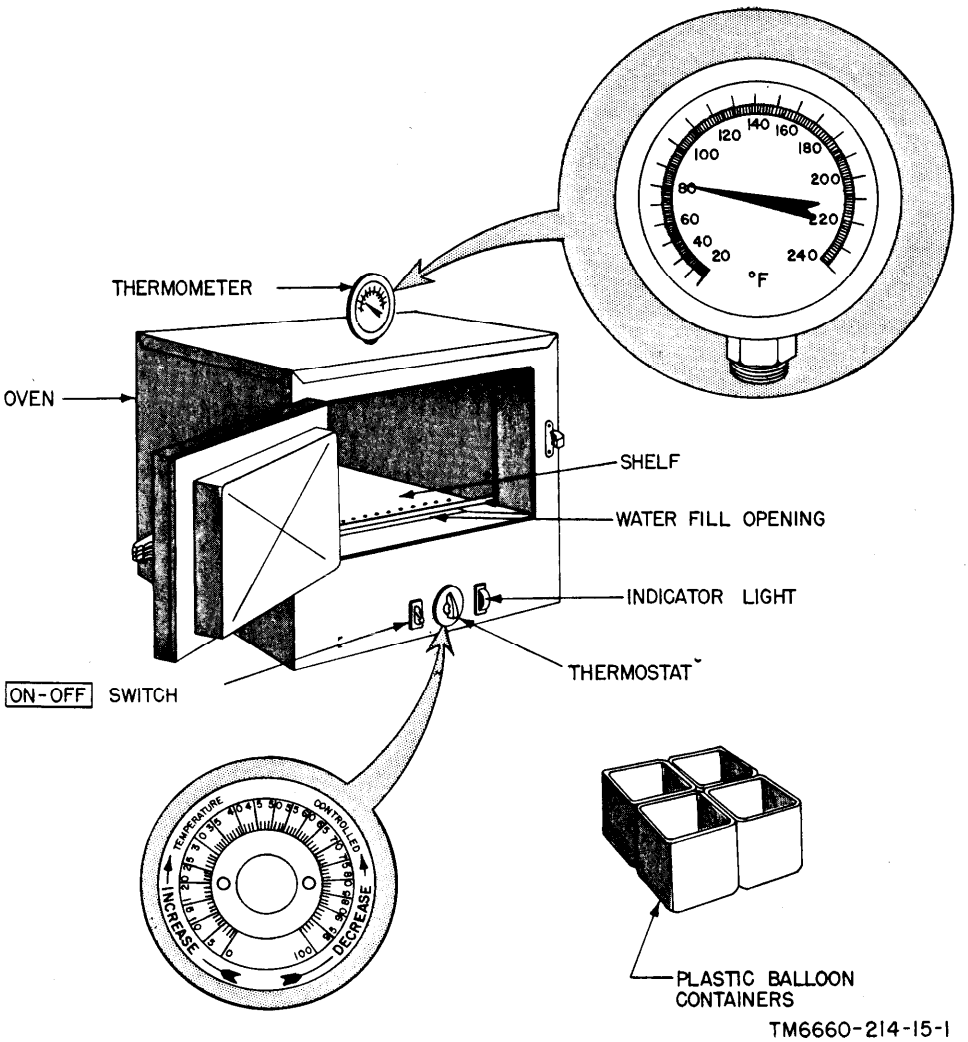


*Figure 61. Balloon Conditioner, Meteorological ML–513/GM.*

**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 chamber. | 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.

## 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:**

| *TA* | *Allowance* |
|---|---|
| 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, ¾ 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.

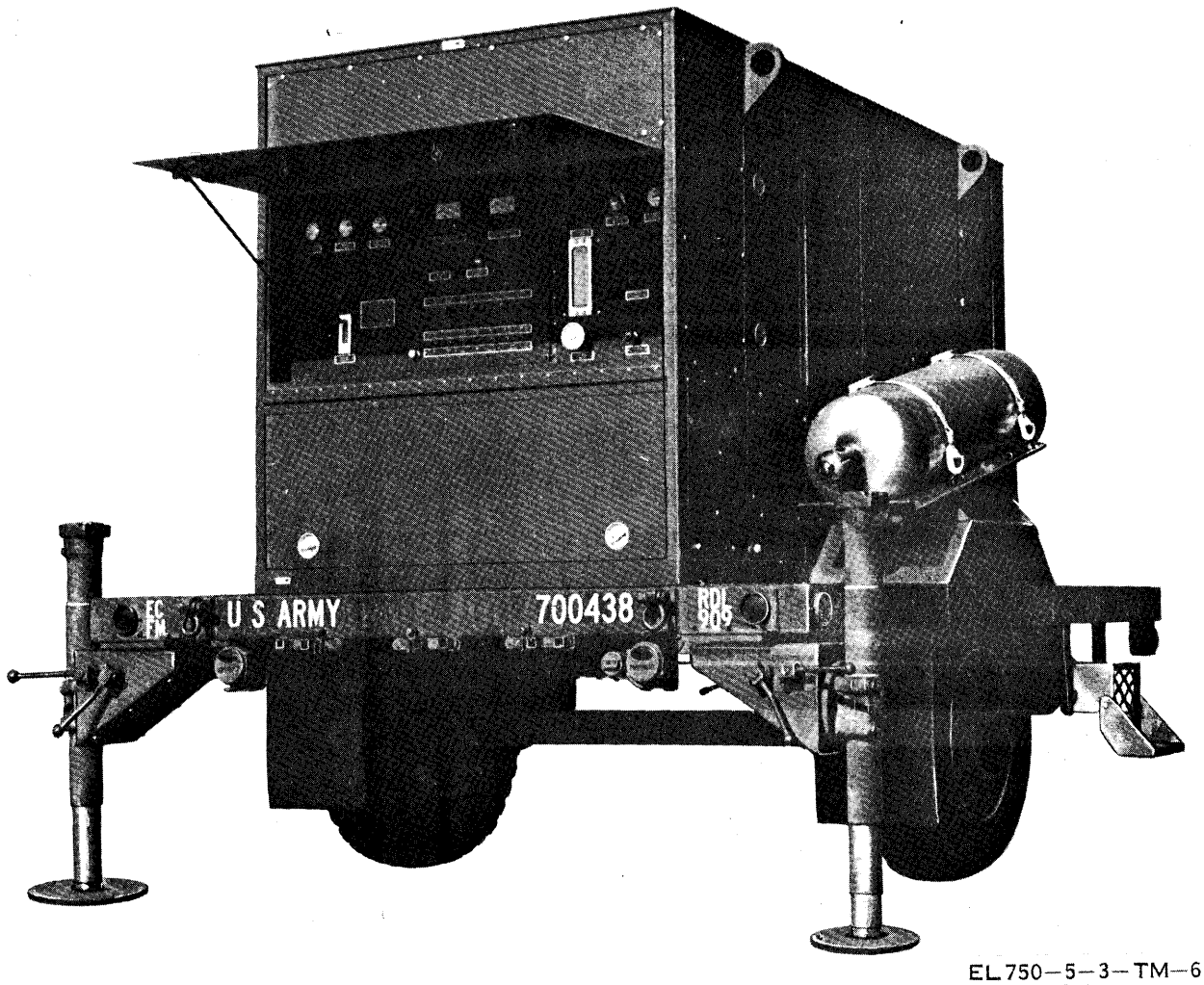


*Figure 62. Hydrogen Generator ML–536/UM.*

**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. |

Nonoperating tempera- +160° F to –80° F.
ture range.
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; l,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 | $6.00 |
| *b.* Repair parts (1-year cost based on 100 equipments). | Expendable, nonrepairable. |

**16. ITEM REPLACED:**
ML–391( )/AM.

**17. REMARKS:**
Issued as a unit replacement.

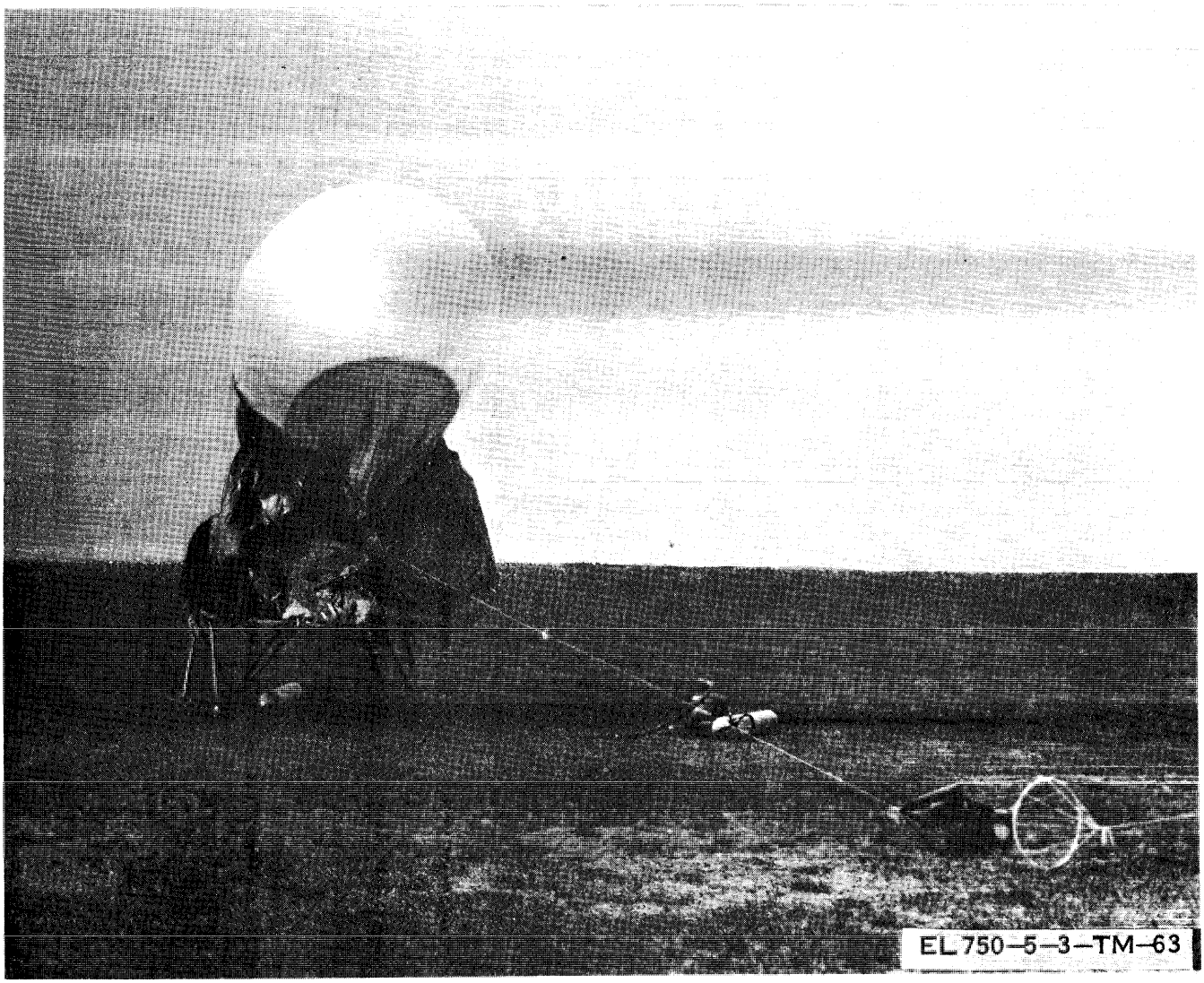


*Figure 63. Balloon, Meteorological ML–541/AM.*

**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.

## 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 on 100 equipments). Expendable, non-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:**

| *TOE* | 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, nonrepairable. |

**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 Eqiupment.*
Barometer, Mercurial ML–512/GM.
Barometer, Mercurial ML–330/FM.

**11. REFERENCE DATA AND LITERATURE:**
TM 11–425, TM 11–6660–217–20P, –35 P } ML–563/UM

**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:**

| *T A* | *Allowance* |
|---|---|
| 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.

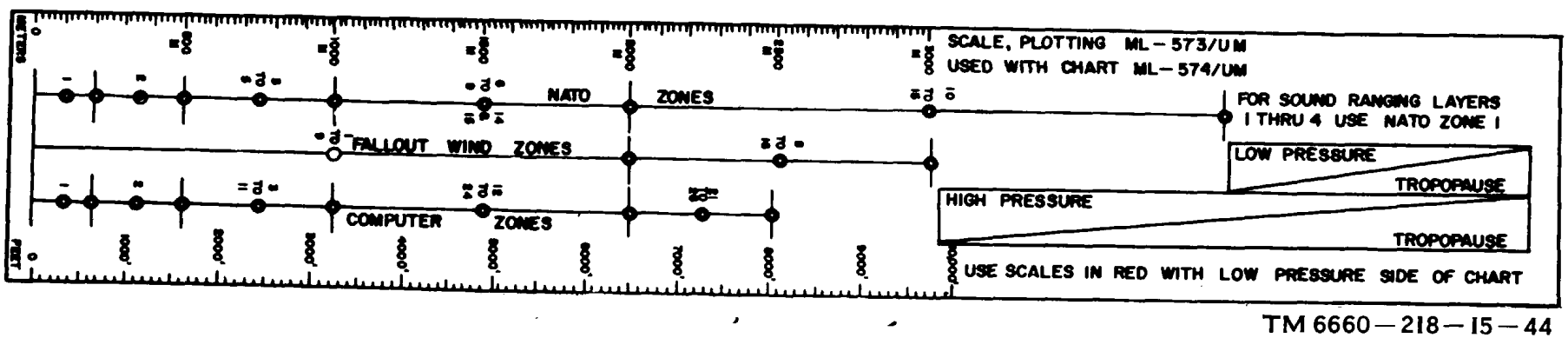


*Figure 64. Scale, Conversion, Pressure-Temperature-Altitude ML–573.*

# 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.

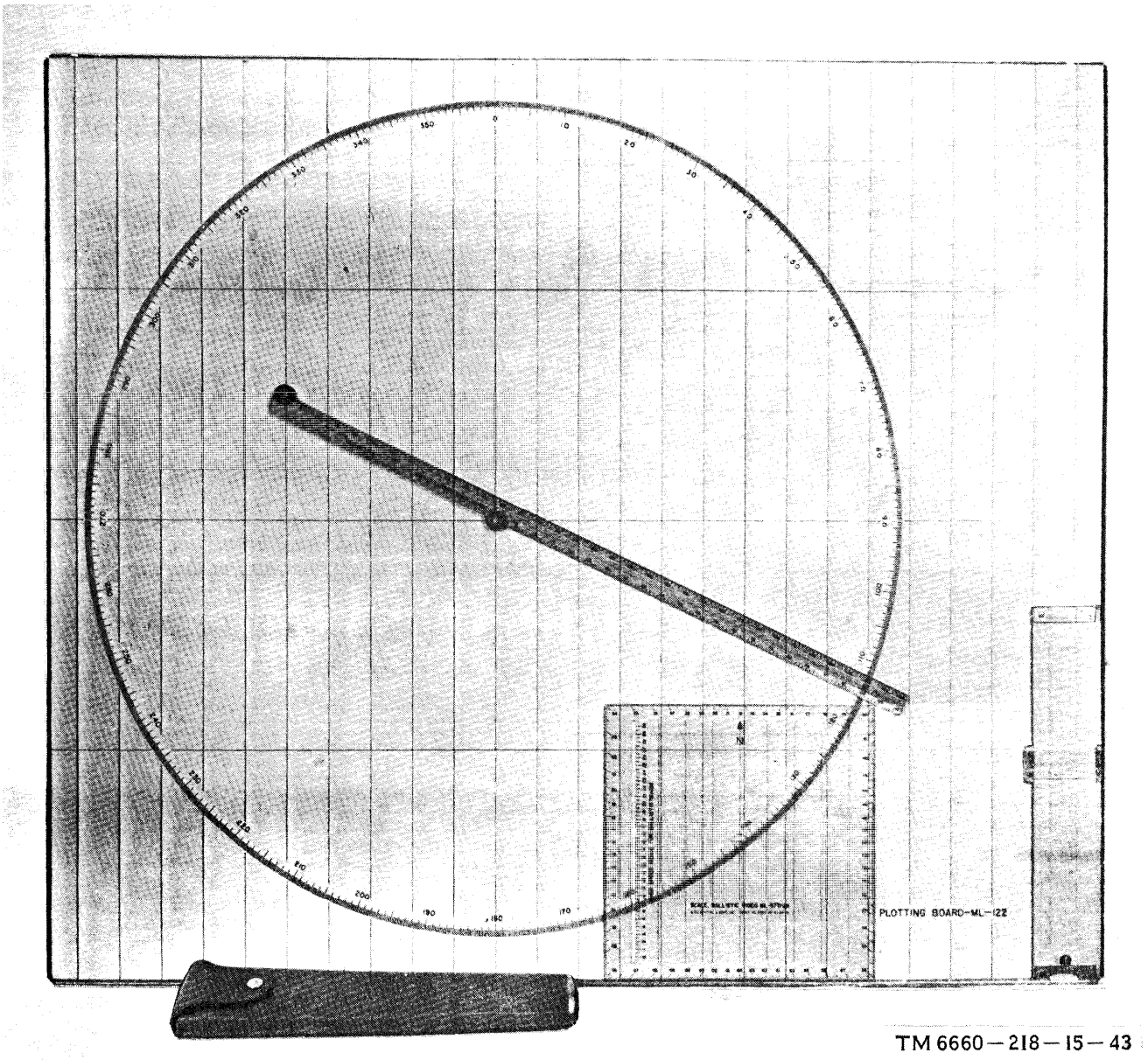


*Figure 65. Scale, Plotting ML–577/UM.*

**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; 7¾-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 on 100 equipments). Expendable, non-repairable.

**16. ITEM REPLACED:** None.

**17. REMARKS:**
Used with Chart ML–574/UM; issued as a replacement unit.

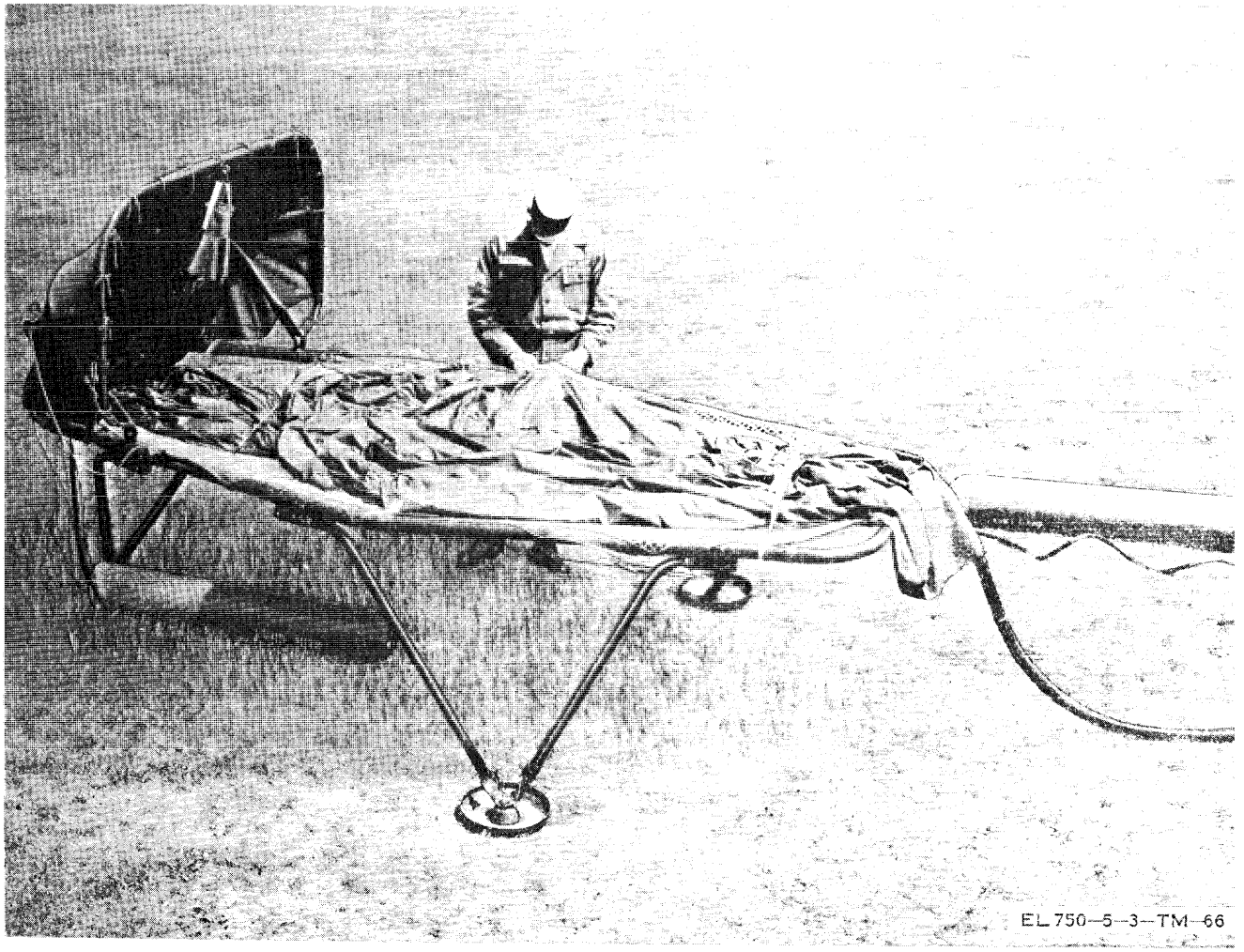


*Figure 66. Balloon Launcher ML–594/U.*

**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.

**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:**

| *TA* | *Allowance* |
|---|---|
| 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.

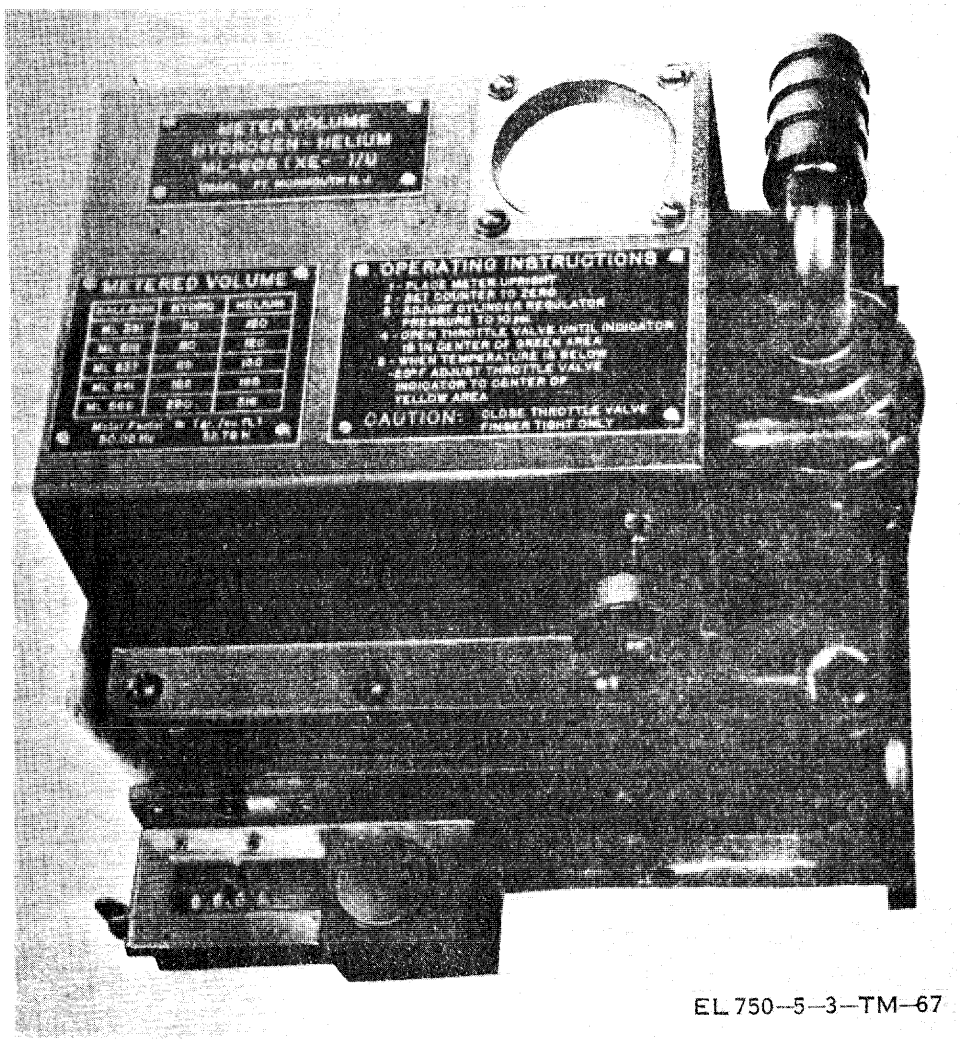


*Figure 67. Volume Meter Hydrogen-Helium ML–605/U.*

**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. |

| | |
|---|---|
| Inflation nomograph | Inflation volume graph, can be interpreted within ½ cu ft. |
| Recording device | Registers balloon volumes 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 ¾ 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, 2¼ 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:**

| *TA* | *Allowance* |
|---|---|
| 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 | l,200 g (approx). |
| Rate of rise | 1,000- to 1,500-fpm with load of 1,300 g and inflated with a free lift of 1,600 g. |
| Environmental limitation: | |
| Ambient temperature. | —90° C to +60° C. |
| 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.**

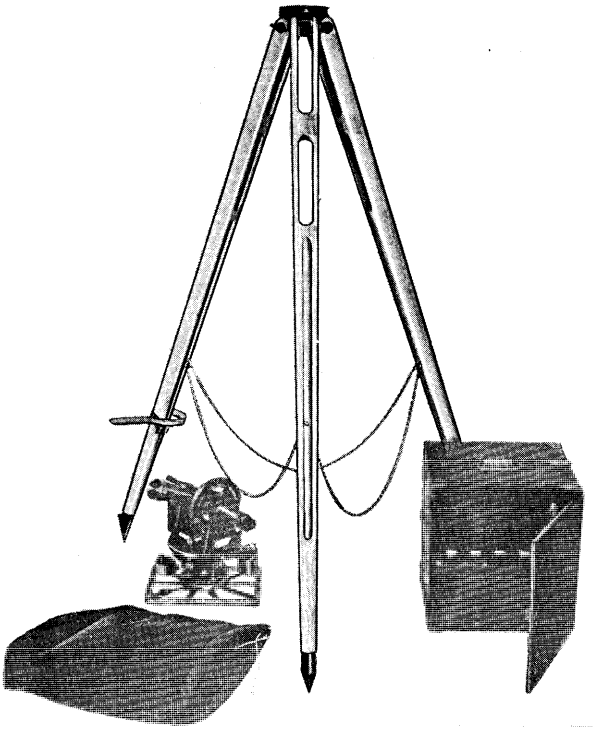


*Figure 68. Tripod MT–1309/TM.*

**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:**

| *TA* | *Allowance* |
|---|---|
| 6–2 | 35 |

## MT–1309/TM

| *TA* | *Allowance* |
|---|---|
| 50–772 | 1 |
| 77–4 | 1 |
| *TOE* | |
| 6–577G | 1 |

**15. PRICE DATA:**

a. Major item $35.40

*b.* Repair parts (1-year cost based on 100 equipments) $531.00

**16. ITEM REPLACED:**

Replaces ML–78.

**17. REMARKS:**

Part of Manual Meteorological Station AN/TMQ–4 (same as ML–78).

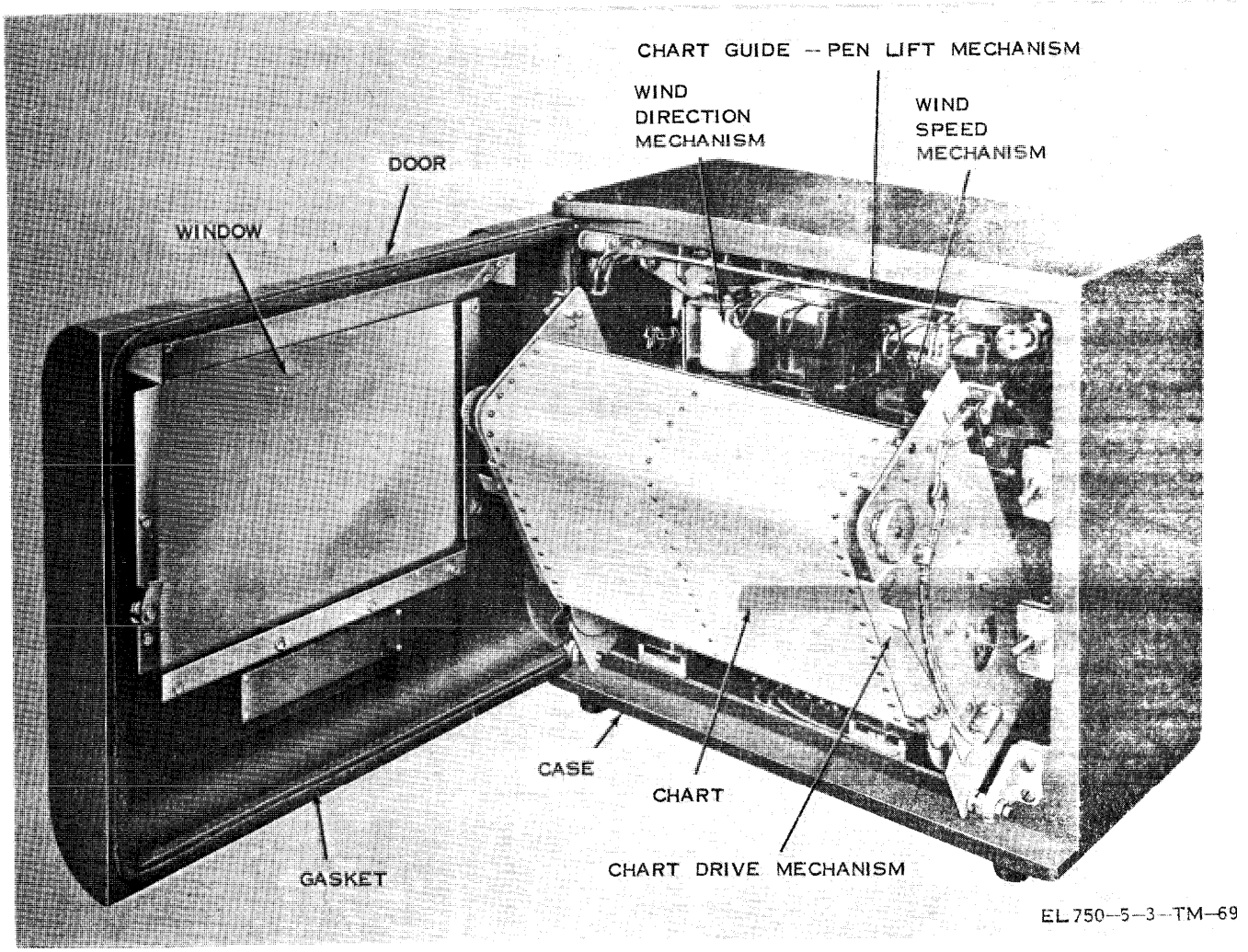


*Figure 69. Recorder, Wind Direction and Speed RO–2( )/GMQ.*

**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 _ _ _ _ _ _ _ _ _ _ | ±l% 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. ADDITIONAI, 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:**

| *TA* | *Allowance* |
|---|---|
| 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.

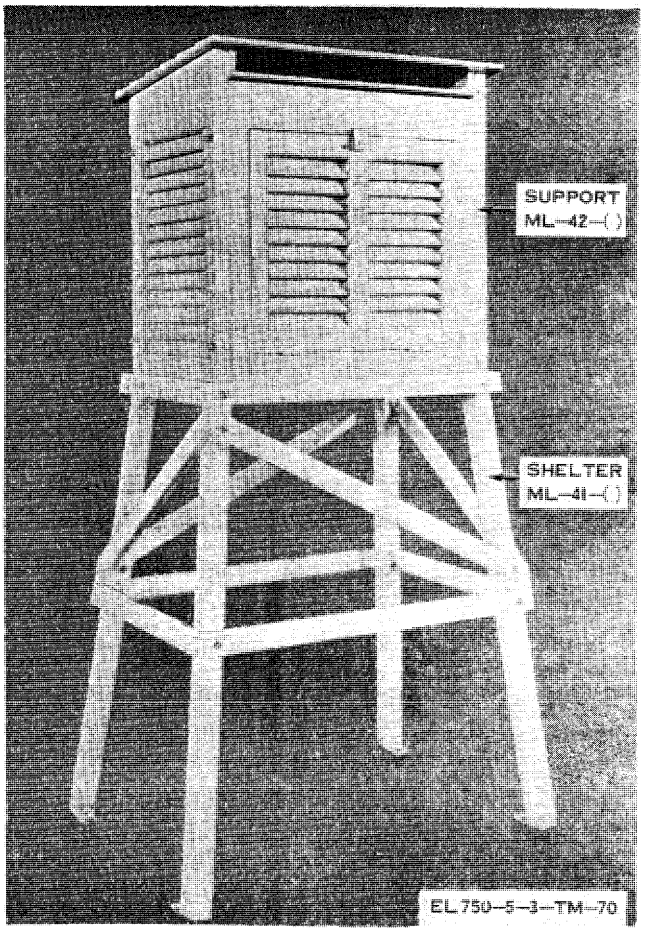


*Figure 70. Instrument Shelter S--101/ UM.*

**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 (approx). | 33 in. long, 24 in. wide, 33 in. 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:**

| *TA* | *Allowance* |
|---|---|
| 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( ).

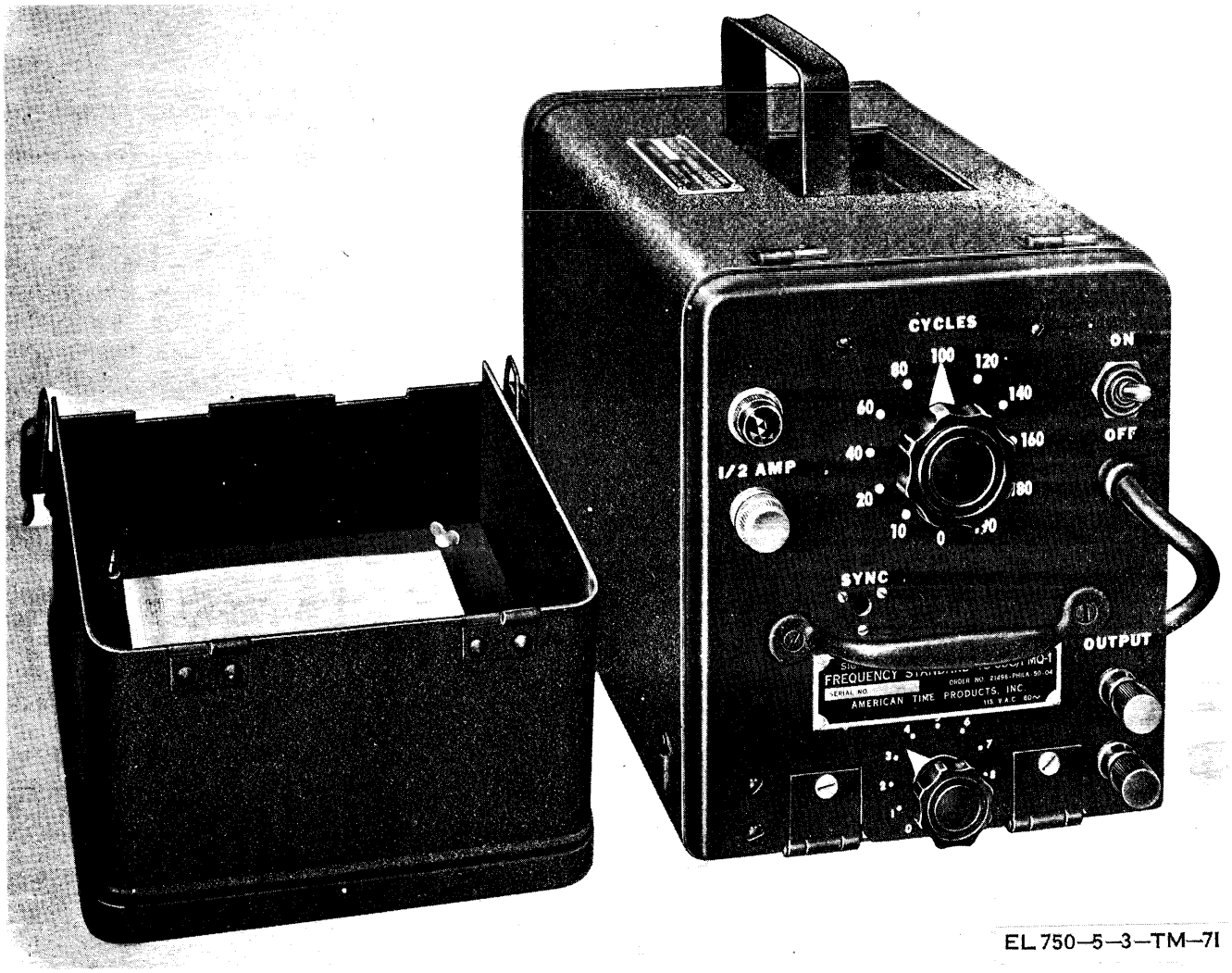


*Figure 71. Test Set TS–65C/FMQ–1.*

**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.

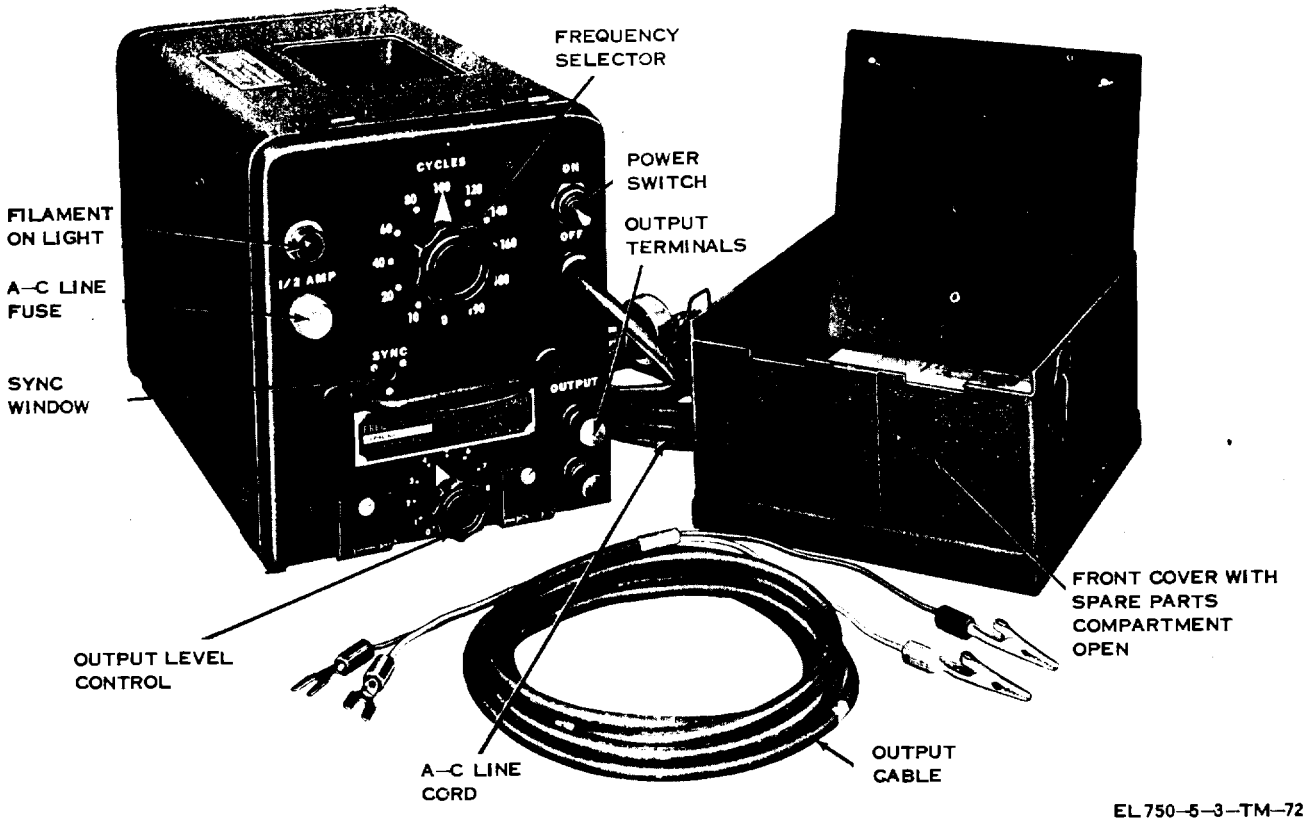


*Figure 72. Test Set Components TS–65C/FMQ–1.*

**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:**

| *TOE* | *Allowance* |
|---|---|
| 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 |
| *TA* | |
| 6–2 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 2 |
| 20–30 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 1 |
| 50–734 _ _ _ _ _ _ _ _ _ __ _ _ _ __ _ | 1 |
| 50–811 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 2 |
| 77–5 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ | 1 |

| *TA* | *Allowance* |
|---|---|
| 80–10 | 3 |
| 130–4 | 59 |

**15. PRICE DATA:**

a. Major item $858.00

*b.* Repair parts (1-year cost based on 100 equipment) $12,870.00

**16. ITEM REPLACED:** None.

**17. REMARKS:** None.

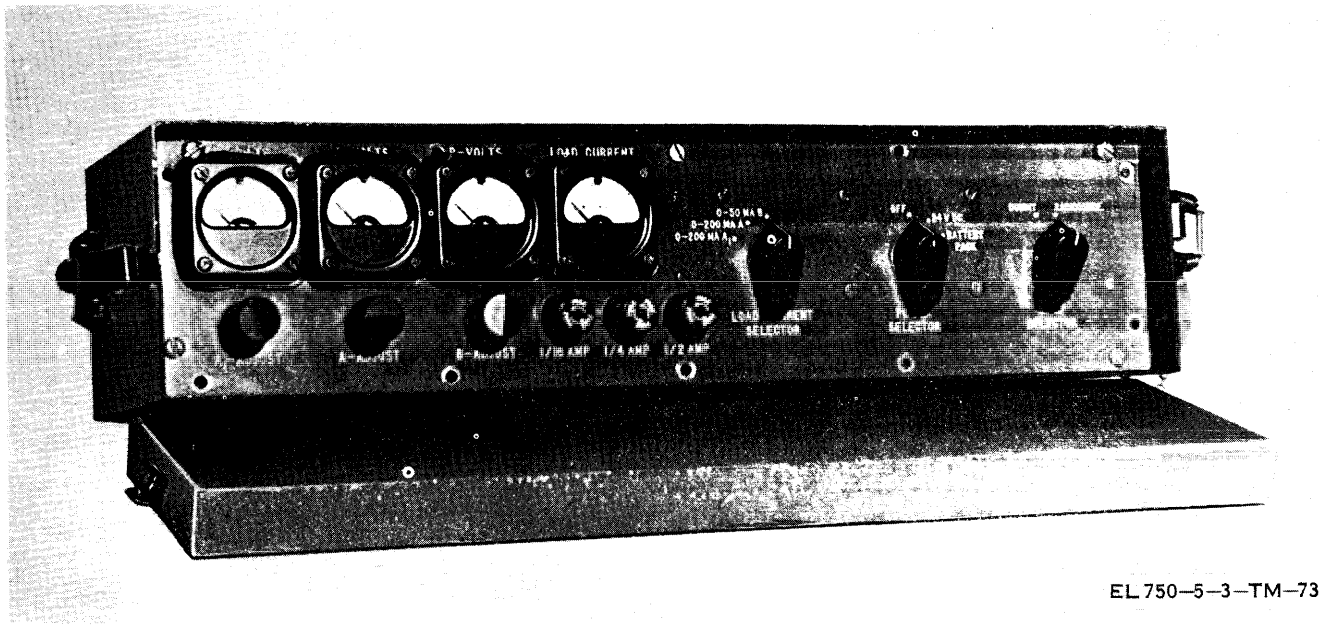


*Figure 73. Radiosonde Test Set TS–1348( )/GMM–1A.*

**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 |

## TS–1348( )/GMM–1A

| *TOE* | *Allowance* |
|---|---|
| 6-701H | 1 |
| 6-716H | 1 |
| 7–100G | 1 |
| 17–100G | 1 |
| 37–100G | 1 |
| 39–51G | 1 |
| *TA* | |
| 6–2 | 18 |
| 50–366 | 12 |
| 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.

# INDEX OF ITEMS BY GROUPS

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.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1979—714-591/319

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

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

## SOMETHING WRONG WITH PUBLICATION

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

| PUBLICATION NUMBER | PUBLICATION DATE | PUBLICATION TITLE |
|---|---|---|
| | | |

BE EXACT PIN-POINT WHERE IT IS

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

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

| PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER | SIGN HERE |
|---|---|
| | |

TEAR ALONG PERFORATED LINE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

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

REVERSE OF DA FORM 2028-2 AMSMC OP 103-85

TEAR ALONG PERFORATED LINE

FILL IN YOUR UNIT'S ADDRESS

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS

NO POSTAGE NECESSSARY IF MAILED IN THE UNITED STATES

# BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 82 ROCK ISLAND IL

POSTAGE WILL BE PAID BY ROCK ISLAND ARSENAL

COMMANDER
U.S. ARMY ARMAMENT, MUNITIONS
AND CHEMICAL COMMAND
ATTN AMSMC-MAS
ROCK ISLAND IL 61201-9948

# 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 decigram = .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**

# This fine document...

Was brought to you by me:

## Liberated Manuals -- free army and government manuals

Why do I do it? I am tired of sleazy CD-ROM sellers, who take publicly available information, slap “watermarks” and other junk on it, and sell it. Those masters of search engine manipulation make sure that their sites that sell free information, come up first in search engines. They did not create it... They did not even scan it... Why should they get your money? Why are not letting you give those free manuals to your friends?

I am setting this document FREE. This document was made by the US Government and is NOT protected by Copyright. Feel free to share, republish, sell and so on.

I am not asking you for donations, fees or handouts. If you can, please provide a link to liberatedmanuals.com, so that free manuals come up first in search engines:

<A HREF=http://www.liberatedmanuals.com/>Free Military and Government Manuals</A>

– Sincerely
  Igor Chudov
  http://igor.chudov.com/