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METEOROLOGICAL EQUIPMENTS FOR ARMY TACTICAL OPERATIONS.(U)
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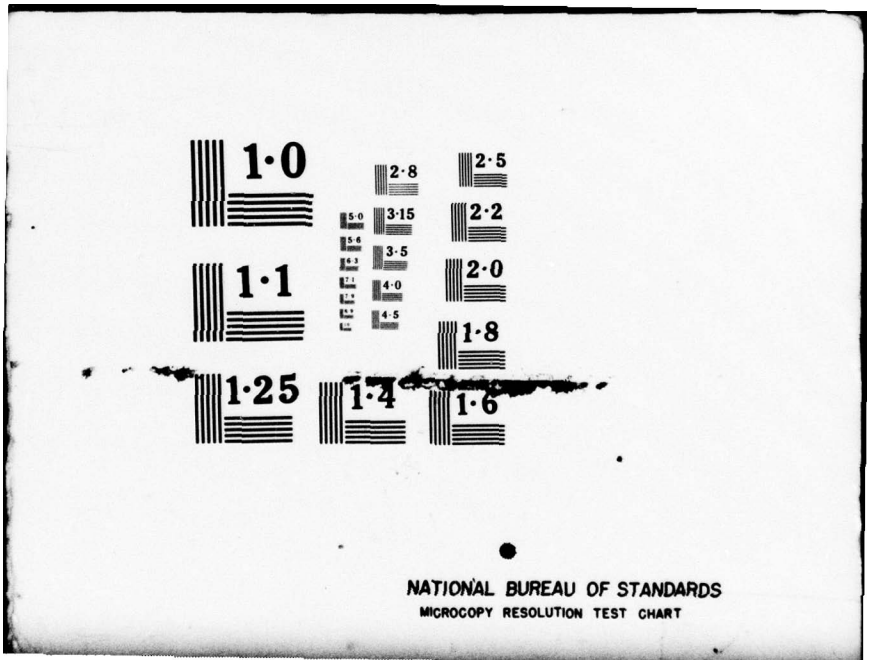
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N.H.

USACECDA 5-62, Final Report, "Meteorological Equipments for Army Tactical Operations" (formerly identified as USAEPG 6-52-62, USAEPG Subtask Number METCD-1/1), is published for the information of all concerned. Distribution of this publication has been approved under the provisions of paragraph 9i, AR 310-1, by the Adjutant General acting for the Secretary of the Army. Comments relative to this publication are invited; such comments, as well as information of changes in address or desired attention lines, should be directed to Commanding Officer, US Army Communications-Electronics Combat Developments Agency, ATTN: CAGCE-CM.

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The views expressed in this report are those of the Commanding Officer, US Army Communications-Electronics Combat Developments Agency and the Commander, 2d Weather Group (MATS), and are not necessarily those of the Department of the Army, the Department of the Air Force, and Commanding General, US Army Combat Developments Command, or the Commander, Air Weather Service (MATS).

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SUMMARY

The purpose of this study is to determine the suitability and availability of surface weather observing equipment in Federal and commercial sources which will fulfill field army weather data requirements, and to determine the quantitative mobilization requirements for equipments found suitable for army tactical operations.

This combat development study was conducted pursuant to a request by Hq USCONARC in February 1961. Personnel of the 2d Weather Group (MATS) and the U. S. Army Signal Corps participated in the investigation which was begun in July 1961 when the Meteorology Department, USAEPG, was assigned primary responsibility under Subtask Number METCD-1/1.

An interim report, describing the status of meteorological equipments in Federal supply channels, received limited distribution on 29 December 1961. Joint effort culminated in the preparation of a final report designated as USAEPG 6-52-62, "Meteorological Equipments for Army Tactical Operations" in March 1962.

Action was initiated by the Meteorology Department, USAEPG, on 4 May 1962 for review, approval and preliminary coordination of the report. Draft copies were sent to the Office of the Chief Signal Officer (OCSigO), Hq 2d Weather Group and the U. S. Army Signal Research and Development Laboratory (USASRDL) for review and comment.

Responsibility for final coordination and publication of this combat development study was assumed by the U. S. Army Communications-Electronics Combat Developments Agency in July 1962. Accordingly, this report has been redesignated as USACECDA 5-62, Final Report, "Meteorological Equipments for Army Tactical Operations."

Comments received from OCSigO, 2d Weather Group and USASRDL have been incorporated in the study, where appropriate.

This report contains a tabulation of surface weather observing equipment and accessories available within supply channels of the Army and Air Force, and the quantities available from Army supply depots. Meteorological equipments currently used by the Naval Weather Service and the Weather Bureau have been listed and are considered whenever comparison is appropriate. A survey of commercially available "off-the-shelf" items of meteorological equipment is also included.

Recommendations are made pertaining to the suitability of equipments for Army tactical use, revisions in packaging, changes of equipment in TOE's, determination and maintenance of combined Army and Air Force stock levels, and testing of selected commercially available equipment.

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METEOROLOGICAL EQUIPMENTS FOR ARMY TACTICAL OPERATIONS

1. OBJECTIVE

The objective of this study is to determine the suitability and availability of surface weather observing equipment in Federal and commercial sources which will fulfill field army weather data requirements, and to determine the quantitative mobilization requirements for equipments found suitable for Army tactical operations.

2. SCOPE

a. The scope of this investigation has been defined in OCSigO correspondence and in conferences of joint Air Force-Army working groups. Consequently, the surface weather observing equipment considered includes devices for obtaining measurements to 1,500 feet above the surface, but excludes rawinsonde and aerograph equipment and components. More than 3,900 items listed by the U. S. Army Signal Supply Agency and approximately 100 additional Air Force, Navy, and Weather Bureau items provided source material.

b. The surface weather observing equipments considered in the investigation are those needed to fulfill the requirements specified in the USCONARC doctrinal statement "Meteorological Requirements of the U. S. Army," ATINT 413.6/61, dated 2 June 1959 and in the classified combat development concept study "Meteorological Data Requirements for the Field Army 1965-1970 (U)," (USAEPG-SIG 970-28 and 970-34).

3. BACKGROUND

a. The adequacy of surface weather observing equipment in Army and Air Force supply channels to meet Army mobilization requirements is questionable. Certain items of meteorological equipment are approaching obsolescence and are no longer in production. No adequate substitutes are known to be available in supply channels.

b. In recognition of this weak link in tactical meteorological support plans, Hq USCONARC requested that the Signal Corps and the USAF Air Weather Service (AWS) conduct a joint investigation of currently available surface weather observing equipment to determine the present status of meteorological equipment suitable for Army tactical operations.

c. A conference was held at Hq USCONARC on 16-17 May 1961 to plan the conduct of the joint investigation. The conferees developed a Detail Working Plan and assigned responsibility for the investigation, conducted during the 9 months beginning 1 July 1961, to the USAEPG and the 2d Weather Group, AWS. Conclusions of the conferees, the Detail Working Plan and correspondence between Hq USCONARC, Hq AWS, and OCSigO initiating the joint investigation are contained in letter ATINT-D and D 337, Hq USCONARC, 20 June 1961, subject, "Report of Conference - Meteorological Equipment for Army Tactical Operations" and inclosures.

d. Assignment of primary responsibility to USAEPG was made 20 July 1961 by OCSigO in 1st Ind, SIGRD-8a (28 June 1961), subject, "Meteorological Equipment Survey Study."

e. On 29 December 1961 an interim report was prepared describing the status of meteorological equipments in Federal supply channels. Stocks on hand were compared to mobilization requirements in a classified annex. The interim report received limited distribution, but the essential information contained therein is included in this final report.

4. DISCUSSION

a. During the period July 1961 to March 1962 a joint Air Force-Army working group held three meetings at USAEPG to consolidate and consider factual material developed pursuant to the Detail Working Plan, and to resolve equipment problems related to organizational structure.

b. Army stock level data provided the basis for partially determining the status of surface weather observing equipment in depots. Apparently some shortages exist, but the adequacy of combined Army and Air Force stock levels could not be determined by the working group, since Air Force stock data was not made available.

c. The Manual Meteorological Station AN/TMQ-1, as presently packaged, contains certain items no longer considered necessary by the Air Weather Service for meteorological support at army airfields, and lacks components to support analysis, forecasting, and briefing capabilities.

d. The joint working group reviewed the meteorological requirements for a field army and evaluated surface weather observing equipment currently used by the Army, Navy, Air Force, and Weather Bureau. Current TOE equipments were also reviewed. A list of the equipment most suitable for Army tactical operations was compiled, but some of the items were not considered to be fully satisfactory. Substitutes were selected, where practical, but some requirements remained unfulfilled.

e. A survey of commercially available equipment revealed that much of the equipment was equivalent to that in Federal supply channels. Electronic Test Agency, Fort Huachuca, is evaluating, by field test, several of the commercial equipments which appear to possess potential capabilities for improving weather support to Army tactical operations.

f. Annex A comprises a list of items selected by the joint working group as suitable for use in taking surface weather observations during Army tactical operations. A revised packing list for the AN/TMQ-1 to provide separate surface observing and pibal equipment packages is included.

g. In August 1962 comments on the review draft of this study were received from the US Army Signal Research and Development Laboratory (USASRDL), indicating that the Inflation Shelter S-13/TM is excessively large for pibal balloon inflation and recommending that the meteorological tent S-249/T (recently developed by USASRDL) be standardized and included in the revised AN/TMQ-1. The joint working group concurred in the recommendation.

h. Although this study deals principally with standardized equipments available in Federal supply channels, two weather observing equipments currently in advanced states of development are worthy of special consideration. Comments received from the 2d Weather Group on the review draft disclose that the Manual Meteorological Station AN/TMQ-16 is undergoing operational suitability tests. The equipment is designed to replace the Manual Meteorological Stations AN/PMQ-1 and AN/PMQ-4. Another compact station which appears suitable for Army tactical use is the Navy's Portable Aerological Set AN/PMQ-5 mentioned in comments from USASRDL.

i. Annex B includes a summary of the meteorological observational requirements of a field army and an evaluation of major equipments available to satisfy these requirements. Items in annex B which have been prefixed with an asterisk represent the most suitable equipments now available in supply channels. This does not imply that they are entirely satisfactory for use during Army tactical operations, nor that all stated requirements are satisfied. The remainder of the items in annex B represent meteorological equipments which the joint working group considered to be conditionally acceptable or unsuitable, as indicated by brief comments on each item. None of the Weather Bureau equipment was considered more suitable than comparable items in military supply channels.

j. Annex C is a list, by services, of individual items of standardized meteorological equipment and components used by the Army, Air Force, Navy, and Weather Bureau.

k. Annex D is a tabulation of surface weather observing equipments in Signal Corps supply channels as of December 1961. The data tabulated includes the quantities of each type available, the depot locations and the condition of the equipment.

l. Annex E describes commercially available equipment which may be of potential value for weather support in tactical situations. Other commercially available "off-the-shelf" items considered in the equipment survey are also listed.

m. Annex F describes the conduct of the equipment survey and summarizes the activities of the joint Air Force-Army working group.

n. Annex G (classified SECRET, furnished separately) is a tabulation of surface weather observing equipments required for Army mobilization units and Air Weather Service support to these units. This annex also includes recommended TOE changes and a comparison of total mobilization requirements with available stocks. In determining the types of meteorological stations to be used at each echelon and the total mobilization requirements, it was necessary to consider the overall weather support (observing, analysis, forecasting, and briefing) required at each echelon.

5. CONCLUSIONS

It is concluded that:

a. The adequacy of combined Army and Air Force stocks of surface weather observing equipments cannot be determined until Air Force stock data is available.

b. Unless the Air Force has sufficient quantities of equipment to supplement the Army depot stocks tabulated in annex D, some of the equipment requirements stated in Annex G cannot presently be fulfilled.

c. Manual Meteorological Station AN/TMQ-1 requires revision and repackaging.

d. The items selected by the joint Air Force-Army working group and listed in annex A represent the most suitable surface weather observing equipments available in Army and Air Force supply channels; however, not all of these items are fully satisfactory for use during Army tactical operations.

e. Inflation Shelter S-13/TM is excessively large for use during the inflation of pibal balloons. The tent S-249/T, developed by USASRDL, is a suitable substitute for the S-13/TM in pibal balloon inflation.

f. Manual Meteorological Station AN/TMQ-16, being developed by the Air Force, and Portable Aerological Set AN/PMQ-5, being developed by the Navy, appear to be potentially suitable for Army tactical use.

g. Some items of surface weather observing equipment currently authorized in TOE's were determined as not being the most suitable by the working group.

h. Equipments are not available in Federal supply channels for measuring all of the meteorological parameters required for Army tactical operations, but several commercially available equipments appear to be potentially suitable for field army use. (See annex E)

6. RECOMMENDATIONS

It is recommended that:

a. Combat Developments Command consider requesting an inventory position from Air Force Logistics Command to determine the adequacy of combined Army and Air Force stock levels for surface weather observing equipment.

b. Army Materiel Command consider initiating action to maintain adequate stock levels for surface weather observing equipments which will be required to provide weather support for Army tactical operations, as indicated in annex G.

c. Manual Meteorological Station AN/TMQ-1 packaging be revised in accordance with annex A and necessary action be taken to field test the revised AN/TMQ-1.

d. Equipments listed in annex A be accepted for use in a field army until such time as improved equipments are available.

e. Meteorological Tent S-249/T be standardized and included, in lieu of Inflation Shelter S-13/TM, in the revised Manual Meteorological Station AN/TMQ-1.

f. Manual Meteorological Station AN/TMQ-16 and Portable Aerological Set AN/PMQ-5, if standardized, be considered for use in lieu of the Manual Meteorological Stations AN/PMQ-1 and AN/PMQ-4.

g. Substitutions, additions, and deletions of equipments in TOE's listed in annex G be implemented.

h. Electronic Test Agency of U. S. Army Test and Evaluation Command at Fort Huachuca obtain and field test selected commercially available meteorological equipments (described in annex E) which are potentially suitable for Army tactical operations, and, where advantageous, perform minor modifications.

ANNEX A

SELECTED LIST OF METEOROLOGICAL EQUIPMENT ITEMS SUITABLE FOR USE BY FIELD ARMY

AN/TMQ-2	Cloud Height Set
ML-50	Balloon, Pilot, Clear, 30 gram
ML-51	Balloon, Pilot, Black, 30 gram
ML-81	Hose
ML-303/TM	Generator, Hydrogen
ML-304A/TM	Charge, Calcium Hydride
ML-338/AM	Lighting Unit
ML-373/GM	Nozzle, Meteorological Balloon Inflation
S-13/TM	Inflation Shelter
ML-24	Psychrometer (^{o}F)
ML-224	Psychrometer (^{o}C)
ML-429/UM	Calculator, Psychrometric
ML-17	Gage, Precipitation
ML-75	Scale (Measuring Stick)
ML-209	Support, Precipitation Gage
ML-217	Gage, Precipitation
ML-102-G	Barometer, Aneroid
ML-330/FM	Barometer, Mercurial
ML-331/TM	Barometer, Aneroid
ML-332/TM	Barometer, Aneroid
ML-333/TM	Barometer, Aneroid
ML-7	Thermometer, General (or Tropical)
ML-352/UM	Thermometer, Arctic
AN/GMQ-1	Wind Measuring Set
AN/GMQ-11	Wind Measuring Set
AN/MMQ-1	Wind Measuring Set
AN/PMQ-3	Wind Measuring Set
AN/PMQ-6	Wind Measuring Set
ML-110	Timing and Telephone Set
ML-122	Plotting Board, Winds Aloft
ML-125	Scale
ML-126	Rule
ML-474/GM	Theodolite, Double Center
MT-1309/GM	Tripod, Surveying
ML-488/PM	Thermometer, Ground Surface Temperature

AN/PMQ-1	Meteorological Station, Manual
AN/TMQ-1	Meteorological Station, Manual (Revised)
AN/TMQ-4	Meteorological Station, Manual
SCM-12	Meteorological Observation Set

RECOMMENDED REVISION OF MET STATION, AN/TMQ-1

1. AWS met teams providing support to the headquarters and major airfields at each echelon must make surface observations, analyze maps and charts, prepare or modify forecast information, and provide briefing services. Certain equipments and supplies are necessary for accomplishing these operations. Of the equipments in supply channels, the Meteorological Station AN/TMQ-1 provides most of the equipment needed, but requires repackaging and some modification of contents.

2. The AN/TMQ-1 as presently packaged includes equipment for making observations and obtaining data on surface wind direction and speed, winds aloft direction and speed, atmospheric pressure, air temperature, relative humidity, precipitation and ceiling height. With the addition of communication facilities, supplies, and weather maps furnished separately to fit local conditions, the station may be operated in the field to plot weather maps, to make weather forecasts, and provide briefing services.

3. However, the AN/TMQ-1 as presently packaged has many disadvantages. The station includes pibal equipment for making winds aloft observations and computations. Since the artillery Met sections and sound ranging platoons will be making low level wind observations, these should be sufficient to satisfy the users' requirements for low level wind information. Low level wind observations, where required, by the AWS Met teams can be accomplished with the re-packaged pibal set recommended. The inclusion of the pibal equipment in the AN/TMQ-1 adds unnecessary weight and volume to the station. In addition, some items are no longer essential and the inclusion of some new items is desirable.

4. Repackaging the Meteorological Station AN/TMQ-1 into an airfield surface observing/forecasting set and a separate pibal observing set with some modifications will provide equipments more suitable for

use by AWS Met teams in support of Army tactical operations. The following repackaging lists are recommended as preliminary estimates and should be field tested to determine adequacy. The test should also consider such factors as communications and shelters for working area.

5. Recommended airfield surface observing/forecasting set.

Shelter, S-13/TM, w/rope, plate, poles, stakes, supports	1	
Balloon, 30 gram, black, ML-51-A	100	
Hydrogen Generator ML-303/TM	1	
Lighting Unit ML-338/AM	50	
Nozzle, Balloon inflation ML-373/GM	1	
Hose (10 ft length) ML-81	1	
Calcium Hydride Charge ML-304A/TM	120	
Barometer, Aneroid ML-102-G	1	
Precipitation Gage ML-217	1	
Support, Precipitation Gage ML-209	1	
Psychrometer ML-24	2	
Thermometers, General, Tropical or Arctic as required, ML-7 (Spares for ML-24)	6	
Wicks (for ML-24)	25	
Psychrometric Calculator ML 429/UM	2	
Wind Measuring Set AN/GMQ-1A (w/running spares)	1	
Wire WD-1/TT (for AN/GMQ-1A)	1	
Wind Measuring Set AN/PMQ-3	1	
Cloud Height Set AN/TMQ-2 (w/running spares)	1	
Voltage Regulator, MX-140/TMQ-2	1	
Chart, HO-1706 (Mag Dec) (US Navy type)	1	
WBAN 10A and 10B	5	pads
USAF SKEWT Log P Chart (WPC-9-16A)	750	
Clipboard	2	
Eraser, Pencil	6	
Ink, 4 oz. bottle	4	
Pen Points	24	
Penholders	2	
Pencil, black, thin lead	3	doz
Pencil, green	1	doz
Pencil, red-blue combination	2	doz
Rubber Bands	1	box
Slide Rule, ML-59 with case	1	

Tent, M-1948	1
Straight Edge, 12-inch	1
Straight Edge, 18-inch	1
Weather Forecaster Kit MA-1 (USAF)	1
Test Set Soil (FSN 6635-542-1284)	1
Compass, Magnetic	1
Stopwatch (FSN 6645-679-8217)	1
Heater	1
Lantern, 6-volt	2
Battery, 6-volt	6
Flashlight TL-122	2
Battery BA-30	24
Telephone Set TA-312	2
Tool Equipment TE-33	1 set
Hammer HM-3	1
Tape, Friction TL-83	1 roll
Twine RP-15	2 rolls
Tape, Measuring, Steel, 100-foot (FSN 5210-221-1882)	1
Psychrometric Tables	1 book
Smithsonian Meteorological Tables	1 book
Code Tables	1 book
AWS Manual 105-24 Aero Met Codes	1 book
AWS Manual of Barometry	1 book
WBAN Manual of Synoptic Codes	1 book
WBAN Circular "N" Manual of Surface Observations	1 book
WMO International Cloud Atlas	1 book
Technical Manuals for Operations of Equipments	1 ea

6. Recommended pibal set.

Balloon ML-50-A, 30 Gm, Clear	120
Balloon ML-51-A, 30 Gm, Black	120
Calcium Hydride Charge ML-304A/TM for 30 gm	216
Chart WBAN 20	250
Clipboard	1
Pibal Graphing Board ML-514/TM	1
Pibal Plotting Board ML-122	1
Paper, Tissue	3
Rubber Bands	1 box
Pibal Rule ML-126-A	1
Pibal Scale ML-511/GM	2
Slide Rule ML-59	1
Code Tables	1

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Hammer HM-3	1
Case CY-787/U (Theodolite Supplies)	1
Theodolite Tripod MT-1309/GM	1
Theodolite ML-474/GM	1
Head and Chest Set HS-25-A	1
Wire WD-1/TT (for HS-25-A)	1
Jack JK-39 (for HS-25-A)	2
Plug PL-57 (for HS-25-A)	2
Hydrogen Generator ML-303/TM	1
Nozzle, Meteorological Balloon Inflation ML-462/UM	1
Lighting Unit ML-338/AM	150
Theodolite Lamp LM-19	11
Tape TL-83 Friction	1
Twine RP-15	2
Time Interval Unit ML-138 (for HS-25-A)	1
S-13/TM Shelter, w/rope, plate, poles, stakes, supports	2
Heater	1
Lantern, 6-volt	2
Battery, 6-volt	6
Compass, magnetic	1
Tent, M-1948	1
Telephone Set TA-312	2
Eraser, art gun, drafting	12
Batteries BA-30	24
Flashlight TL-122	2
Scale AWS WPC 9-23	1
WBAN Manual, Upper Wind Code	1
WBAN Manual, Winds Aloft Observations	1
AWSTR 105-116 Tables for 30 gm balloons	1
Pencil, Black, 2H	3
Hose ML-81, 10 ft length	1

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ANNEX B

SUMMARY OF METEOROLOGICAL REQUIREMENTS OF A FIELD ARMY AND RELATED EQUIPMENTS

1. CLOUDS

a. Requirement.

(1) General (friendly and enemy)

(a) Sky condition -- clear, scattered, broken, or overcast.

(b) Heights of bases -- low (less than 1,000 ft), middle (1,000 to 5,000 ft), and high (above 5,000 ft) - above ground.

(2) Special (friendly and enemy) (Artillery, Air Defense, Aviation, Atomic, Weapons, Airborne and Drone).

(a) Amounts by layers -- clear, scattered, broken and overcast,

(b) Heights of bases -- to nearest 50 ft up to 200 ft, 100 ft up to 1,500 ft, 500 ft up to 5,000 ft, 500 ft up to 5,000 ft, and 1,000 ft up to 10,000 ft

(c) Location and direction of movement of breaks in overcast.

b. Equipments Evaluated. The requirements for obtaining cloud base measurements in friendly areas are the only requirements above which can be (partially) fulfilled by equipment in supply channels.

(1) *Balloon, Pilot ML-51 (Black, 30 gm) and
*Hose ML-81 (10 ft length)
*Hydrogen Generator ML-303/TM
*Calcium Hydride Charge ML-304A/TM
*Lighting Unit ML-338/AM
*Nozzle, Met Balloon Inflation ML-373/GM
*Inflation Shelter S-13/TM
*Stopwatch (FSN 6645-679-8217)

(2) *Cloud Height Set AN/TMQ-2. Includes hand-cranked generator, or operates from external power source.

*Denotes suitable item.

(3) Ceilometer Equipment AN/GMQ-2, Fixed installation. Will be phased out of supply system by FY-63.

(4) Cloud Height Set AN/GMQ-13. Fixed installation only.

(5) Projector, Cloud Height ML-121 thru ML-121-H. Requires external power.

Note: Current TOE's list the ML-121 cloud height projector for use at airfields. It is recommended that the AN/TMQ-2 be substituted for ML-121.

2. HUMIDITY

a. Requirement.

General (friendly and enemy). Dewpoint - to nearest 1°F at surface.

b. Equipments Evaluated.

(1) *Psychrometer ML-24 (Fahrenheit scale)

(2) *Psychrometer ML-224 (Centigrade scale)

(3) *Calculator, Psychrometric ML-429/UM

(4) Psychrometer Set ML-313/AM. For installation on aircraft.

(5) Calculator, Psychrometric ML-322/UM. Part of ML-313/AM.

(6) Calculator, Pressure ML-323/UM. Part of ML-313/AM.

(7) Calculator, Air Speed ML-324/UM. Part of ML-313/AM.

(8) Psychrometer ML-436/PMQ-1 (spring-powered). For use with thermometers ML-438, ML-439, ML-440. Acceptable as component of set where so packaged. New MC for set is pending.

(9) Psychrometer, Electric ML-450/UM (Navy) fragile, requires batteries.

(10) Hygrothermograph ML-499/G. Uses mercury bulb. For fixed installation only.

(11) Measuring Set, Humidity-Temperature AN/TMQ-11. For fixed (Air Force) installation only. Consumes 300W at 115V.

3. PRECIPITATION

a. Requirement.

(1) General (friendly and enemy).

(a) Type -- rain, snow, etc
(b) Time of beginning and ending
(c) Intensity as light, moderate, or heavy
(d) Location
(e) Amount
(f) Snow depth -- to nearest inch

(2) Special (friendly and enemy).

(a) (Engineers) General, plus amount to .01 inch of rainfall and snow accumulation to 1. inch.

(b) (Chemical -- enemy only) General, plus amount to nearest 0.1 inch water equivalent.

(c) (Atomic weapons) General, plus snow cover as none, partly covered, completely covered.

b. Equipments Evaluated.

(1) *Gage, Precipitation ML-217 and
*Support, Precipitation Gage ML-209 (which serves as shipping container).

(2) *Gage, Precipitation ML-17. Heavy, but acceptable as substitute for ML-217.

(3) *Scale ML-75(Measuring stick required for ML-17).

(4) Gage, Precipitation ML-435/PMQ-1. Acceptable as component of set where so packaged. New MC for set is pending.

4. PRESSURE

a. Requirement.

(1) General (friendly and enemy). Sea level pressure to nearest 0.3 millibar (mb).

(2) Special.

(a) (Aviation and drone - friendly) -- altimeter setting to nearest 0.01 inch.

(b) Aviation, drone, and airborne - enemy) -- altimeter setting to nearest 0.02 inch.

(c) (Psychological warfare - enemy) -- pressure at 100 ft levels to 500 ft to nearest millibar.

b. Equipments Evaluated.

(1) *Barometer, Aneroid ML-102-G.

(2) *Barometer, Mercurial ML-330/FM. For use in field maintenance.

(3) *Barometer, Aneroid ML-331/TM. For use in field maintenance.

(4) *Barometer, Aneroid ML-332/TM. For use in field maintenance.

(5) *Barometer, Aneroid ML-333/TM. For use in field maintenance.

(6) Barometer, Mercurial ML-512/GM. Aneroids are more easily transported.

(7) Barometer, Mercurial ML-2. Aneroids are more easily transported.

(8) Barometer, Mercurial ML-222. For high altitude (540-880 mb) only.

(9) Barometer, Aneroid ML-102-B thru ML-102-F. ML-102-G is more accurate.

(10) Barometer, Aneroid ML-434. Acceptable as component of set where so packaged.

(11) Barometer, Precision Aneroid ML-448/UM (Navy) Limited Range (910-1,060 mb).

(12) Barometer, Aneroid ML-459/PMQ-1. Acceptable as component of set where so packaged.

(13) Barograph ML-3-D. Fragile. Recorded trace not required.

(14) Barograph ML-563/UM. Fragile. Recorded trace not required. Same stock number as ML-3-D.

5. TEMPERATURE

a. Requirement.

(1) General (friendly and enemy). Surface air temperature to nearest 1°F.

(2) Special (chemical - enemy). Air stability measured by temperature difference between two heights such as 0.3 and 2 m reported to 1/2°C. Also, to nearest 1°C from surface to 1,000 ft in 100-ft increments.

b. Equipments Evaluated.

(1) *Thermometer ML-7 (General, Tropical, Arctic).

(2) *Thermometer ML-352/UM (Arctic).

(3) Thermometer ML-4 (Maximum). Not required.

(4) Thermometer ML-5 (Minimum). Not required.

(5) Thermometer ML-438/PMQ-1 (Arctic).
(6) Thermometer ML-439/PMQ-1 (Tropical).
(7) Thermometer ML-440/PMQ-1 (General).

} Acceptable as components of set where so packaged. New MC for set is pending.

(8) Thermometer, Indicating, Resistance ML-471/AMQ-8. Part of Navy aerograph.

(9) Thermometer, Indicating, Capillary Tube (12 ft) and Bulb ML-475/GM. Remote indicating, for control towers.

(10) Thermograph ML-77 (General). Not required.

(11) Thermograph ML-277 (Arctic). Not required.

6. VISIBILITY

a. Requirement.

(1) General (friendly and enemy).

(a) Type of obstruction
(b) Time of beginning and ending
(c) Location
(d) Visual range - to nearest 25 m to 100 m, 100 m to 2 km, and 1 km to 5 km

(2) Special (Aviation).

(a) General with slant range to nearest 300 ft to 1,000 ft, and 1000 ft to 1 mile at major airfield.

(b) (Friendly and enemy) - Lower 500 ft layer above the surface, visual range to nearest 1,000 ft up to 1 mile. Levels 500 ft to 10,000 ft to nearest 1 mile.

b. Equipment Evaluated.

AN/GMQ-10 Transmissometer Set. Fixed (Air Force) installation only.

NOTE: No equipment suitable for measuring visibility during Army tactical operations was found in supply channels.

7. WIND

a. Requirement.

(1) General (friendly and enemy).

(a) Wind direction to nearest 10^{o}
(b) Wind speed to nearest 1 knot

(2) Special

(a) (Sound ranging - friendly). Wind direction to nearest 100 mils and wind speed to nearest 1 kt from surface to 2,700 ft

(b) (Chemical - enemy). Wind direction to nearest 15^{o} and wind speed to nearest 5 knots from surface to 1,000 ft

(c) (Drone - friendly). Wind direction to nearest 5^{o} and wind speed to nearest 1 kt from surface to 2,000 ft

(d) (Aviation - friendly and enemy). Nearest 10^{o} and 5 kts for 500-ft levels to 5,000 ft, and 1,000-ft levels to 10,000 ft

(e) (Airborne - enemy). Nearest 10^{o} and 1 kt from surface to drop altitude (1500')

(f) (Psychological warfare - enemy). Direction to 8 points and speed to 5 kts from surface to 500 ft

b. Equipments Evaluated.

(1) *Wind Measuring Set AN/GMQ-1. Does not require external power.

(2) *Wind Measuring Set AN/GMQ-11. For rear area, fixed station use.

(3) *Wind Measuring Set AN/MMQ-1. For mobile missile battalion.

(4) *Wind Measuring Set AN/PMQ-3. Appears to be best hand-held set now available.

(5) *Wind Measuring Set AN/PMQ-6. For use by missile units. Transportable by helicopter.

(6) *Balloon, Pilot ML-51 (Black, 30 gm). For wind to 1,500 ft, and
*Hose ML-81 (10-ft length)
*Hydrogen Generator ML-303/TM
*Calcium Hydride Charge ML-304A/TM
*Lighting Unit ML-338/AM
*Nozzle, Met Balloon Inflation ML-373/GM
*Inflation Shelter S-13/TM.

(7) *Timing and Telephone Set ML-110.

(8) *Plotting Board, Winds Aloft ML-122.

(9) *Scale ML-125.

(10) *Rule ML-126.

(11) *Theodolite, Double Center ML-474/GM.

(12) *Tripod, Surveying MT-1309/GM.

(13) Theodolite ML-47. Std "C" replaced by ML-474.

(14) Theodolite ML-247. Std "C" replaced by ML-474.

(15) Theodolite Mount ML-180. For fixed installation only.

(16) Transmitter, Wind Speed ML-151-A. For fixed installation only.

(17) Transmitter, Wind Direction ML-152. For fixed installation only.

(18) Anemometer ML-433/PM. Acceptable as component of set where so packaged. New MC for set is pending.

(19) Anemometer ML-497/PM. Replaced by AN/PMQ-3.

(20) Anemometer ML-62. Replaced by AN/PMQ-3.

(21) Wind Vane ML-73. Replaced by AN/PMQ-3.

(22) Wind Measuring Set AN/GMQ-12. Lacks ruggedness, has limited range; suitable for research.

(23) Wind Measuring Set AN/UMQ-5. (Navy). Comparable to AN/GMQ-11.

(24) Generator, Hydrogen ML-486/UM. For fixed installations.

(25) Generator, Hydrogen ML-490/GM. High pressure; not required.

(26) Hydrogen Generator Set AN/TMQ-3. Component ML-303/GM adequate. Set is not required, except as part of meteorological station AN/TMQ-4 where so packaged.

(27) Plotting Board, Winds Aloft ML-312/TM. Not required.

(28) Scale, Plotting ML-511/GM. Reads in meters per second.

(29) Plotting Board, Winds Aloft ML-514/TM. Same as ML-312/TM.

(30) Plotting Table, Meteorological Data ML-533/U. (Navy). Not required.

(31) Plotting Set AN/GMQ-3. Reads in mils.

(32) Plotting Board, Winds Aloft AN/TMA-1. Acceptable as part of meteorological station AN/TMQ-4 where so packaged.

8. AIR DENSITY

a. Requirements.

(1) General. None.

(2) Special.

(a) (Aviation and drone - friendly). Density altitude to nearest 500 ft.

(b) (Aviation - enemy). Density altitude to nearest 1,000 ft.

(c) (Airborne - enemy). Density altitude to nearest 100 ft.

b. Equipments Evaluated. None.

NOTE: Air density can be computed from pressure, temperature, and humidity data, but no single equipment to meet the above requirement is known to be in supply channels.

9. THUNDERSTORMS

a. Requirement.

(1) General.

(a) Period of occurrence
(b) Intensity - light, moderate, and heavy
(c) Location
(d) Direction of movement

(2) Special. None.

b. Equipments Evaluated. None.

NOTE: Fulfillment of above requirements is still being investigated.

10. SURFACE CONDITIONS

a. Requirement.

(1) General.

(a) Snow depth to nearest 1 inch
(b) Trafficability as reported by Corps of Engineers

(2) Special.

(a) (Aviation - friendly). Water depth on a irfield
(b) (Airborne - enemy). Ground frozen or not
(c) (Engineers - friendly). Cone penetrometer reading of soil at weather observation points.

b. Equipments Evaluated.

(1) *Scale ML-75 (Measuring Stick).

(2) *Test Set, Soil (FSN 6635-542-1284). For determination of soils trafficability as recommended by Corps of Engineers.

11. SOIL MOISTURE AND TEMPERATURE

a. Requirement.

(1) General. None.

(2) Special (C of E - friendly and enemy, where weather observations are taken):

(a) Soil moisture -- to nearest 1% saturation at surface, 6 inches, and 12 inches.

(b) Soil temperature -- to nearest 1°F at surface, 6 inches, and 12 inches.

b. Equipments Evaluated.

(1) *Thermometer ML 488/PM (liquid-in-glass).

(2) Thermometer ML-437/PMQ-1 (liquid-in-glass). Acceptable as component of set where so packaged. New MC for set is pending.

NOTE: Both thermometers indicate ground surface temperature, not subsurface temperature.

12. FROST OR DEW

a. Requirement.

(1) General. None.

(2) Special (aviation and surveillance - friendly and enemy). Occurrence or nonoccurrence of frost or dew.

b. Equipments Evaluated. None.

NOTE: No equipment to meet the above requirement is known to be in supply channels.

13. EVAPOTRANSPIRATION

a. Requirement.

(1) General. None.

(2) Special (C of E - friendly and enemy where weather observations are taken). Soil moisture depletion to nearest 0.1 mm per 1 cm^2 area.

b. Equipments Evaluated. None.

NOTE: No equipment to meet the above requirement is known to be in supply channels.

14. SEA AND SURF CONDITIONS

a. Requirement.

(1) General. None.

(2) Special (Engineer, Marine and Amphibious - friendly and enemy):

(a) Direction of waves to 8 points
(b) Period of waves in seconds
(c) Height of waves to nearest foot
(d) Occurrence of breakers
(e) Direction of swell to 8 points
(f) Height of brakers to nearest foot
(g) Height of tide to nearest foot
(h) Time of high and low tides and slackwater
(i) Water temperature to nearest 1°F

b. Equipments Evaluated. None.

NOTE: No equipment to meet the above requirements is known to be in supply channels.

15. WIND CHILL

a. Requirement.

General (friendly and enemy). In general terms of cold, very cold, etc.

b. Equipments evaluated. None.

NOTE: No equipment to meet the above requirements is known to be in supply channels.

16. MULTIPARAMETER EQUIPMENTS

a. *Meteorological Station, Manual AN/PMQ-1

b. *Meteorological Station, Manual AN/TMQ-1 (Revised)

c. *Meteorological Station, Manual AN/TMQ-4

d. *Meteorological Observation Set SCM-12

e. Meteorological Station, Manual AN/PMQ-4. Lacks precipitation measurement capability.

ANNEX C

METEOROLOGICAL EQUIPMENT ITEMS OF THE ARMY, AIR FORCE, NAVY, AND WEATHER BUREAU

(Listed in type number order.)

ARMY

TYPE NR	NAME	FSN
AB-159/CMD-1	Pedestal, Antenna	6660-256-3328
AB-328/M	Mast	6660-519-6021
AB-329/G	Mast	6660-545-7175
AB-329A/G	Mast	6660-523-7725
AB-503/U	Mast	6660-708-2943
AN-107A/GRD-1A	Amplifier	6660-752-0591
AN-1618/GMQ-12	Amplifier, Power Supply	6660-519-9299
AN/AMQ-7	Humidity-Temperature Measuring Set	6660-663-7911
AN/AMQ-12	CLASSIFIED	
AN/AMR-1	Radiosonde Receptor	6660-324-9430
AN/AMT-3E	Radiosonde	6660-533-5979
AN/AMT-3G	Radiosonde	6660-543-6004
AN/AMT-4	Radiosonde	6660-164-7135
AN/AMT-4D	Radiosonde	6660-542-1964
AN/AMT-6	Radiosonde	6660-521-1449
AN/AMT-6B	Radiosonde	6660-542-1377
AN/AMT-6C	Radiosonde	6660-682-4740
AN/AMT-6D	Radiosonde	6660-682-4813
AN/AMT-12	Radiosonde Set	6660-585-3553
* AN/CPS-9	Radar Set	5840-503-1088
AN/GMD-1A	Rawin Set	6660-224-6137
AN/GMD-1B	Rawin Set	6660-510-4815
AN/GMD-2	Rawin Set	6660-753-1862
AN/GMM-1A	Radiosonde Baseline Check Set	6660-356-5059

TYPE NR	NAME	FSN
AN/GMM-2	Radiosonde Baseline Check Set	6660-580-9736
*AN/GMQ-1	Wind Measuring Set	6660-243-8767
*AN/GMQ-2	Ceilometer Equipment	6660-531-2839
AN/GMQ-3	Plotting Set	6660-408-4724
*AN/GMQ-11	Wind Measuring Set	6660-663-8084
AN/GMQ-12	Wind Measuring Set	6660-567-0422
AN/GMQ-12A	Wind Measuring Set	6660-752-8697
AN/GVH-1A	Solar Radiation Measuring Set	6655-476-1200
AN/GVQ-2	Solar Radiation Measuring Set	6655-606-8870
AN/MMQ-1	Wind Measuring Set	6660-663-8085
AN/MMQ-1A	Wind Measuring Set	6660-527-9676
AN/MMQ-1B	Wind Measuring Set	6660-608-0113
*AN/PMQ-1	Meteorological Station Manual	6660-663-8121
*AN/PMQ-1A	Meteorological Station, Manual	6660-663-8121
*AN/PMQ-3C	Wind Measuring Set	6660-592-9002
*AN/PMQ-4	Meteorological Station, Manual	6660-526-7800
*AN/PMQ-4A	Meteorological Station, Manual	6660-752-7768
AN/PMQ-6	Wind Measuring Set	6660-682-4459
AN/TMA-1	Plotting Set	6660-408-4727
*AN/TMQ-1	Meteorological Station, Manual	6660-537-9194
*AN/TMQ-2	Cloud Height Set	6660-408-4592
AN/TMQ-3	Hydrogen Generator Set	6660-408-4683
AN/TMQ-4	Meteorological Station, Manual	6660-537-9195
AN/TMQ-5	Recorder, Radiosonde	6660-324-9426
AN/TMQ-5A	Recorder, Radiosonde	6660-393-2234
AN/TMQ-5C	Recorder, Radiosonde	6660-682-4500

TYPE NR	NAME	FSN
AN/UMQ-3	Wiresonde Set	6660-408-4900
AN/UMQ-4	Wiresonde Set	6660-663-8087
AN/UPM-38	Target Set, Radar	5840-392-6138
AS-462/GMD-1	Antenna	6660-497-8501
AS-462A/GMD-1	Antenna	6660-774-8432
AS-1117/GMD-2	Antenna	6660-752-5794
AT-114/GRD-1A	Antenna	6660-243-0427
AT-716/GRD	Antenna	6660-752-0599
C-513/CPS-9	Indicator Control	6660-505-0900
C-577B/GMD-1	Control, Recorder	6660-498-9650
C-578/GMD-2	Control, Antenna	6660-537-3765
C-578A/GMD-2	Control, Antenna	6660-244-8572
C-834/TMQ-5	Panel, Control	6660-569-0403
C-1406/GMD-2	Control-Recorder, Rawin Set	6660-752-8549
CD-1258	Cable Assembly, Power, Electrical	6660-160-1350
CG-409/U	Cable Assembly, RF (p/o AN/GMD-2)	6660-504-2437
CM-63/GMD-2	Comparator, Signal	6660-752-5796
CP-164/UM	Computer, Psychrometric	6685-663-4751
CP-223A/UM	Computer, Humidity-Temperature	6660-752-7794
CV-146/TMQ-5	Converter, Signal Data	6660-503-0669
CW-113/TMA-1	Case, Plotting Set	6660-498-9596
CX-269/U	Cable Assembly	6660-502-1189
CX-794/GRD-1A	Cable Assembly, Power Electrical	6660-504-0382
CX-798/GRD-1A	Cable Assembly, Power, Electrical	6660-170-6888
CX-800/U	Cable Assembly, Power, Electrical	6660-160-5774 6660-577-3447

TYPE NR.	NAME	FSN
CX-1216/U	Cable Assembly (p/o AN/GMD-1A)	6660-191-9773
CX-1217/U	Cable Assembly (p/o AN/GMD-2)	6660-160-5889
CX-1284/U	Cable Assembly (p/o AN/GMD-1)	6660-708-2965
CX-1285/U	Cable Assembly (p/o AB-159/GMD-1)	6660-170-4499
CX-2043/U	Cable Assembly (p/o AN/GMD-2)	6660-255-2059
CX-2268/GRD-1	Cable Assembly	6660-752-2013
CX-2337/TMQ-5	Cable Assembly, Special Purpose, Elec.	6660-306-2126
CX-2340/U	Cable Assembly (p/o AM/TMQ-5)	6660-503-0670
CX-2694/V	Cable Assembly (p/o AN/UMQ-4	6660-502-1194
CX-4552/U	Cable Assembly (p/o AN/PMQ-6)	6660-682-3377
CX-4553/U	Cable Assembly (p/o AN/PMQ-6)	6660-682-3376
CX-4585/GMD-2	Cable Assembly	6660-440-6323
CX-4586/GMD-2	Cable Assembly	6660-440-6324
CX-6491/U	Cable Assembly (p/o AN/GMD-2)	6660-752-2522
CX-6492/U	Cable Assembly (p/o AN/GMD-2)	6660-752-2523
CX-6493/U	Cable Assembly (p/o AN/GMD-2)	6660-752-2524
CX-6571/U	Cable Assembly (p/o AN/GMD-2)	6660-827-0712
CX-6665/U	Cable Assembly (p/o AN/GMD-2)	None
CX-6666/U	Cable Assembly (p/o AN/GMD-2)	None
CX-6667/U	Cable Assembly (p/o AN/GMD-2)	None
CY-42A/GRD-1A	Case, Maintenance Equipment	6660-404-9564
CY-97/TMQ-2	Case	6660-408-4567
CY-101A/PMQ-4	Case	6660-752-7747
CY-178/TMQ-1	Case, Plotting Board	6660-322-4633
CY-179/TMQ-1	Case	6660-498-9629

TYPE NR	NAME	FSN
CY-180/TMQ-1	Case, Accessories	6660-498-9630
CY-181/TMQ-1	Case, Meteorological Equipment	6660-498-9631
CY-206/TMQ-2	Case	6660-408-4568
CY-280/TMQ-4	Case	6660-408-4570
CY-295/UM	Case (p/o ML-313)	6660-408-4571
CY-734/GMD-1	Case	6660-497-9770
CY-735/GMD-1	Case, Rawin Set	6660-545-7368
CY-736/GMD-1	Case	6660-038-0847
CY-737/GMD-1	Case	6660-497-9773
CY-787/U	Case, Theodolite (u/w ML-247)	6675-547-5319
CY-952/PMQ-1	Case, Meteorological Equipment	6660-030-3081
CY-953/PMQ-1	Case, Thermometer	6685-290-4035
CY-999/UMQ-4	Case, Miresonde	6660-393-2028
CY-1000/UMQ-4	Case, Miresonde	6660-393-2029
CY-1009/PMQ-4	Case, Meteorological Equipment	6660-537-7903
CY-1010/PMQ-4	Case, Meteorological Equipment	6660-537-7904
CY-1157/GMD-1	Case, Standardized Components, Elec.	6660-356-3912
CY-1285/PMQ-1	Carrying Case	6660-537-7913
CY-1320/UM	Case, Barometer (u/w ML-512)	6660-663-4768
CY-1390/TMQ-5	Cabinet, Electrical Equipment	6660-343-0370
CY-1397/PM	Case, Anemometer (u/w ML-433)	6660-663-4629

TYPE NR	NAME	FSN
CY-1558/UMQ-4	Case, Accessories	6660-396-3419
CY-1623/U	Case, Cable Assembly (p/o AN/AMT-4)	6660-631-5702
CY-1805/MMQ-1	Case, Meteorological Equipment	6660-527-8891
CY-1806/MMQ-1	Case, Indicator	6660-527-9678
CY-1895/GMD-1	Case, Standardized Components, Electrical	6660-333-2688
CY-2181/GMD-2	Case	6660-799-3198
CY-2498/PMQ-6	Case	6660-710-1787
CY-2499/PMQ-6	Case	6660-681-9859
CY-2507/U	Case(p/o AB-503/U)	6660-710-1788
CY-2508/U	Case(p/o AB-503/U)	6660-710-1789
CY-3005/GMD-2	Case, Rawin Set	6660-799-3200
CY-3081/GMD-2	Case, Rawin Set	6660-708-2160
ID-159/GRD-1A	Indicator	6660-775-2436
ID-334/AMQ-7	Indicator, Humidity, Elec. Resistance	6660-527-7198
ID-373C/GMQ-11	Indicator, Wind Direction & Speed	6660-752-7793
ID-415/MMQ-1	Indicator, Azimuth & Elevation Correction Data	6660-521-9062
ID-415A/MMQ-1	Meter, Arbitrary Scale	6660-542-6112
ID-421/U	Indicator, Humidity, Electrical Resistance (u/w ML-487)	6685-542-1762
ID-624/GM	Indicator, Wind Speed (p/o AN/MMQ-1)	6660-608-0115
ID-751/GMQ-11	Indicator, Wind Direction & Speed	6660-663-8081
IP-28/CPS-9	Indicator	6660-376-1643
J-1005/PMQ-6	Terminal Box	6660-682-0450
*M-1948	Tent, w/Accessories	8340-247-4408
*M-1953	Tent, Balloon Inflation	8340-267-3130

TYPE NR	NAME	FSN
NC-573	Shroud, Balloon	6660-408-4533
MD-147A/AMT-4	Modulator, Radiosonde	6660-663-8133
MD-147C/AMT-4A	Modulator, Radiosonde	6660-248-8980
MD-317/AMT-12	Modulator	6660-752-7552
MK-558/PMQ-6	Modification Kit	6660-752-6072
*ML-2	Barometer, Mercurial	6660-521-1436
*ML-3	Barograph	6660-223-5104
*ML-4	Thermometer, Maximum - Arctic	6660-239-4014
	Tropical	6660-253-2551
	General	6660-253-2553
*ML-5	Thermometer, Minimum - Arctic	6660-239-4016
	Tropical	6660-253-2552
	General	6660-239-4015
*ML-7	Thermometer - Arctic	6660-239-4012
	Tropical	6660-663-4736
	General	6660-239-4010
*ML-17	Gage, Precipitation	6660-223-5094
*ML-24	Psychrometer - Tropical	6660-448-8244
	General	6660-223-5083
*ML-41	Shelter, Meteorological Instrument	5450-222-0507
ML-42	Support, Instrument Shelter	5410-408-4807
ML-47	Theodolite	6660-408-4819

TYPE NR	NAME	FSN
ML-48	Case, Barometer	6685-356-5039
ML-49	Coupling Assembly	4730-408-4628
ML-50	Balloon, Pilot	6660-663-8158
ML-51	Balloon, Pilot	6660-526-6041
*ML-54	Support, Thermometer	6660-246-8732
ML-59	Slide Rule	7520-634-1632
ML-61	Clock	6645-408-4610
ML-62	Anemometer	6660-223-5092
ML-64	Balloon, Pilot	6660-663-8159
ML-73	Wind Vane	6660-408-4898
*ML-74-A	Rotor	6685-223-6819
ML-75	Scale	6660-774-8379
*ML-77	Thermograph	6660-223-5101
ML-78	Tripod	6675-408-4846
ML-79-A	Clock	6685-498-9643
ML-81	Hose	4720-221-2470
*ML-102-G	Barometer, Aneroid	6660-223-5073
ML-106	Chart (Rossby)	6660-408-4596
*ML-110	Timing & Telephone Set	6660-408-4839
*ML-119	Clinometer	6650-570-6112
ML-121	Projector, Cloud Height (See 6660-531-6038 ML-121-H)	6660-149-8536
ML-121-A	Projector, Cloud Height (See 6660-531-6038 ML-121-H)	6660-243-0991

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TYPE NR	NAME	FSN
*ML-121-H	Projector, Cloud Height	6660-531-6083
*ML-122	Plotting Board, Winds Aloft	6660-663-4748
ML-125	Scale (Wind Speed & Direction)	6610-408-4775
ML-126	Rule (Plotting Balloon Position)	6675-663-4707
ML-126-A	Rule (Plotting Balloon Position)	6675-663-4706
ML-129	Bearing (Used on Wind Vane)	6660-408-4551
ML-131	Balloon (350 gm)	6660-224-7040
ML-132	Parachute	6660-408-4718
ML-138	Time Interval Unit	6645-498-9774
ML-143	Weather Panel	6660-238-7116
ML-144	Wind Recorder	6660-223-5935
ML-145	Clock	6685-498-9645
ML-146	Telescope (u/w ML-47 or ML-247)	6650-537-9222
ML-151-A	Transmitter, Wind Speed	6660-224-6383
ML-152	Transmitter, Wind Direction	6660-223-5814
ML-155	Balloon, Pilot	6660-537-9163
ML-156	Balloon, Pilot	6660-663-8156
ML-157	Balloon, Ceiling	6660-237-8139
ML-157-A	Balloon, Ceiling	6660-663-7933
ML-158	Balloon, Ceiling	6660-663-8153
ML-159	Balloon, Pilot	6660-663-8154
ML-160	Balloon, Pilot	6660-663-8155
ML-161-A	Balloon, Pilot	6660-151-7772

TYPE NR	NAME	FSN
ML-162	Balloon (700 gm)	6660-224-7040
ML-169	Junction Box (u/w ML-151 & ML-152)	5940-242-4654
ML-170	Panel Board, Control (u/w ML-151 & ML-152)	6110-308-5726
ML-171A	Terminal Box (u/w ML-143, -144, -173, -174, -183)	5930-636-0521
ML-172	Chart Roll (u/w ML-144)	6660-385-6350
ML-173	Weather Panel (u/w ML-151, -152)	6660-408-4850
ML-178	Mounting, Barograph	6685-408-4709
ML-180	Theodolite Mount	6675-217-2567
ML-182	Chart, Recording (u/w AN/FMQ-2)	6660-408-4598
ML-183	Weather Panel (u/w ML-143, -144)	6660-243-1021
ML-186	Nozzle, Meteorological Balloon Inflation	6660-213-5182
ML-187	Coupling (u/w 10 gm balloons)	4730-408-4629
ML-188	Tubing (u/w 10 gm balloons)	None
ML-193	Regulator, Hydrogen	6685-408-4766
ML-196	Nozzle, Meteorological Balloon Inflation	6660-663-7924
ML-197	Compass (u/w ML-47, -247)	6605-498-9649
ML-199	Support, Ring	6660-408-4808
*ML-203	Transmitter, Wind (p/o AN/GMQ-1)	6660-265-6765
*ML-204	Wind Panel (p/o AN/GMQ-1)	6660-223-5682
ML-206	Support (AN/GMQ-1)	6660-223-7337
ML-207	Carrying Case (p/o AN/GMQ-1)	6660-408-4572

TYPE NR	NAME	FSN
ML-208	Carrying Case (p/o AN/GMQ-1)	6660-408-4573
ML-209	Support, Precipitation Gage (u/w ML-217)	6660-526-7860
ML-211	Calibrator (u/w ML-151)	6660-408-4561
ML-212	Control Set (u/w ML-121)	6660-408-4622
ML-214	Support (u/w ML-17)	6660-223-7338
ML-216	Hose	4720-408-4678
*ML-217	Gage, Precipitation	6660-241-2593
ML-222	Barometer, Mercurial	None
*ML-224	Psychrometer -	
	Tropical	6660-640-9162
	General	6660-223-5084
ML-233	Chart, Thermograph	6685-408-4907
ML-234	Chart, Thermograph	6685-408-4908
ML-235	Chart, Thermograph	6685-408-4909
ML-236	Chart, Barograph	6685-408-4910
*ML-247	Theodolite	6660-498-9773
ML-277	Thermograph	6660-223-5102
ML-301	Scale (p/o AN/TMA-1)	6660-545-8579
*ML-303/TM	Generator, Hydrogen	3655-408-4669
ML-304A/TM	Charge, Calcium Hydride	6660-408-4559
ML-305A/TM	Charge, Calcium Hydride	6660-408-4560
ML-307/AP	Pilot Balloon Target	6660-356-5133
ML-312/TM	Plotting Board, Winds Aloft (also see ML-514 same FSN)	6660-663-4749

TYPE NR	NAME	FSN
ML-313/AM	Psychrometer Set	6660-620-7968
ML-318/TMQ-2	Projector, Cloud Height	6660-221-1192
ML-322/UM	Calculator, Psychrometric (p/o ML-313)	6660-242-5972
ML-322A/UM	Calculator, Psychrometric (p/o ML-313)	6660-240-6142
ML-323/UM	Calculator, Pressure (p/o ML-313)	6660-238-8298
ML-324/UM	Calculator, Air Speed (p/o ML-313)	None
ML-325/AMQ-2	Chart Roll	6660-408-4906
ML-326/UM	Calculator, Mixing Ratio	None
*ML-330/FM	Barometer, Mercurial	6660-542-0526 6685-244-1775
*ML-331/TM	Barometer, Aneroid	6660-223-5072
*ML-332/TM	Barometer, Aneroid	6660-223-5074
*ML-333/TM	Barometer, Aneroid	6660-408-4548
ML-335/GMQ-2	Ceilometer Projector	6660-223-5760
ML-336/GMQ-2	Ceilometer Recorder	6660-408-4594
ML-337/GMQ-2	Ceilometer Detector	6660-527-7201 6660-223-5759
ML-338/AM	Lighting Unit	6660-408-4698
ML-344/TMQ-3	Manifold	3655-408-4699
ML-346/TM	Chart, Baroswitch Evaluation	6660-356-5261
ML-347/GMQ-3	Plotting Surface	6660-223-7465
ML-348/GMQ-3	Rule	6675-408-4773

TYPE NR	NAME	FSN
ML-349/GMQ-3	Scale	6675-408-4778
ML-351/AM	Ventilation Duct	6660-408-4848
ML-352/UM	Thermometer (Arctic)	6660-239-4019
ML-356/GMQ-3	Scale	6675-408-4779
ML-357/GM	Straight Edge	6675-250-0503
ML-358/GM	Straight Edge	None
ML-361/TMA-1	Plotting Board	6660-223-7464
ML-362/TMA-1	Plotting Board	6660-223-7466
ML-363/TMA-1	Rule	6675-498-9740
ML-366/UM	Scale	6675-408-4777
ML-367/AM	Launching Reel	6660-408-4696
ML-373/GM	Nozzle, Meteorological Balloon Inflation	6660-238-3044
ML-376/AM	Temperature Element	None
ML-377/AM	Temperature Element, Resistance	6660-223-7322
ML-378/AM	Temperature Element, Resistance	6660-223-7323
ML-379/AM	Humidity Element	6660-663-7922
ML-380/AM	Humidity Element	None
ML-381/AM	Humidity Element	None
ML-388/UM	Charge, Caustic Soda	None
ML-389/UM	Charge, Aluminum	None
ML-418/AMT-4	Humidity Element	6685-663-4799
ML-419/AMT-4	Temperature Element, Resistance	6660-243-9173

TYPE NR	NAME	FSN
ML-420/AMT-4	Temperature-humidity Evaluator	6660-223-7345
ML-422/U	Chart (Winds Aloft WBAN 20A)	6660-249-6143
ML-424/U	Shroud, Balloon	6660-356-5196
ML-425/UM	Chart (Adiabatic)	6660-408-4600
ML-426/U	Chart (Adiabatic)	6660-527-0822
ML-427/U	Chart (Adiabatic)	6660-692-3062
*ML-428	Humidity Chamber	None
ML-429/UM	Calculator, Psychrometric	6660-399-7998
ML-430/U	Parachute	6660-408-4717
ML-431/U	Scale, Conversion, Pressure-Speed-Temperature	6660-356-5186
*ML-433/PM	Anemometer	6660-663-8090
*ML-433A/PM	Anemometer	6660-663-8091
*ML-434/PM	Barometer, Aneroid	6660-663-8117
*ML-435/PMQ-1	Gage, Precipitation	6660-663-8088
*ML-436/PMQ-1	Psychrometer	6660-537-9084
*ML-437/PMQ-1	Thermometer	6660-663-4732
*ML-438/PMQ-1	Thermometer	6660-663-4739
*ML-439/PMQ-1	Thermometer	6660-663-4738
*ML-440/PMQ-1	Thermometer	6660-663-4740
ML-441/UMQ-4	Wiresonde	6660-663-8086
*ML-446/PMQ-3	Anemometer - Wind Vane	None
*ML-447/PMQ-3	Wind Vane	None

TYPE NR	NAME	FSN
ML-458/UM	Chart (p/o AN/PMQ-4)	6660-570-6110
*ML-459/PMQ-1	Barometer, Aneroid	6660-663-8118
ML-462/UM	Nozzle, Meteorological Balloon Inflation	None
ML-467/UMQ-4	Calibration Chamber, Wiresonde	6660-521-1438
ML-468/UM	Scale, Plotting	6675-560-5784
ML-469/U	Shroud, Balloon	6660-346-4931
*ML-474/GM	Theodolite, Double Center	6660-496-9773
ML-475/GM	Thermometer, Indicating, Capillary Tube & Bulb	6685-663-4671
*ML-486/UM	Generator, Hydrogen	None
*ML-488/PM	Thermometer	6660-663-4732
ML-490/GM	Generator, Hydrogen	3655-408-4658
ML-491/UM	Aluminum Chips	None
ML-492/UM	Sodium Hydroxide	None
ML-497/PM	Anemometer	6660-892-2314
ML-499/G	Hygrothermograph	6685-557-5713
ML-511/GM	Scale, Plotting	None
ML-512/GM	Barometer, Mercurial	6660-521-1436
ML-513/GM	Conditioner, Balloon, Meteorological	6660-520-8276
*ML-514/TM	Plotting Board, Winds Aloft (same FSN as ML-312)	6660-663-4749
ML-528/GM	Regulator, Pressure, Compressed Gas	None

TYPE NR'	NAME	FSN
ML-537/UM	Balloon, Meteorological	6660-892-1718
ML-541/UM	Balloon, Meteorological	6660-892-2342
ML-551/GMQ	Chart (u/w RO-2/GMQ)	6660-566-7987
ML-552/GMQ	Chart	6660-566-7988
ML-553/GMQ-12	Chart	None
ML-554/GMQ-12	Chart	None
ML-556/UM	Scale, Plotting (Fallout Winds)	None
ML-557/UM	Scale, Plotting	None
ML-559/UD	Scale, Plotting	None
ML-563/UM	Barograph	6660-223-5104
ML-573/UM	Scale, Conversion, Pressure-Temperature-Altitude	6660-606-5834
ML-574/UM	Chart (u/w ML-573/UM)	6660-606-8648
ML-577/UM	Scale, Plotting (u/w ML-574/UM)	6660-606-5835
MR-558/PMQ-6	Modification Kit	6660-529-5866
MT-436/GRD-1A	Mounting	6660-392-8721
ML-869/PMQ-1	Tripod, Anemometer	6660-356-5238
MT-1246/GMQ-11	Support, Wind Direction & Speed Transmitter	6660-663-4764
MT-1309/GM	Tripod, Surveying (u/w ML-247 & ML-474)	6675-408-4846
MT-1355/TMQ-5	Support, Radiosonde Recorder	6660-392-9737
MT-1421/U	Holder, Cable Reel (p/o AN/GMD-2)	6660-510-4761
MT-1426/UM	Support, Shelter	5410-408-4807
MT-1825/GMQ-12	Tripod, Meteorological	6660-570-7616
MX-249/GMQ-1	Modification Kit, Electronic Equipment	6660-356-5123
MX-1265/AP	Kit, Pilot Balloon Target	6660-474-8107

TYPE NR	NAME	FSN
MX-1482/TMQ-5	Cabinet, Sub-assembly	None
PP-179/GRD-1A	Power Supply	6660-752-1877
PP-968/TMQ-5	Power Supply	None
PT-12/TSA-1	Plotting Kit	6660-498-9397
R-301A/GMD-1	Rawin Receiver	6660-519-3809
R-333/GRD-1A	Receiver, Radio	6660-519-3810
RC-120	Facsimile Equipment	6660-543-1498
RD-88/TMQ-5	Recorder, Frequency-Time	6660-503-0715
RD-88A/TMQ-5	Recorder, Frequency-Time	6660-503-0713
RD-88C/TMQ-5	Recorder, Frequency-Time	6660-708-2944
RL-137/GMD-1	Reel, Cable	8130-498-8366
RL-138/GMD-1	Reel, Cable	8130-498-8367
RL-156A/UMQ-4	Reeling Machine, Cable, Hand	6660-292-0069
*RO-2/GMQ	Recorder, Wind Direction & Speed	6660-663-8075
RO-64/GMQ-12	Recorder, Wind Direction & Speed	6660-567-0425
RO-156/GVH-1A	Recorder	6685-475-9555
RO-157/GMQ-12A	Recorder	6660-752-8696
*S-13/TM	Inflation Shelter	8340-408-4784
S-101-UM	Shelter	5410-222-0507
SCM-12	Meteorological Observation Set	6660-641-8367
*T-321/PMQ-3	Transmitter, Wind Speed	None
T-420/GMQ-11	Transmitter, Wind Direction & Speed	6660-545-8580
T-449/MMQ-1	Detector, Wind Direction & Speed	6660-640-9004
T-610/MMQ-1A	Detector	6660-521-9063
T-627/GMQ-12	Detector, Wind Speed	6660-543-6598
T-628/GMQ-12	Detector, Wind Direction	6660-567-0421

TYPE NR	NAME	FSN
T-652/AMT-12	Transmitter	6660-752-7551
TK-21/G	Tool Equipment	5180-408-2391
TK-22/G	Tool Equipment	5180-408-2392
TK-87/U	Tool Kit, Radar & Radio Repairman	5180-690-4452
TS-65C	Frequency Standard	6625-256-3874
TS-555	Ceilometer Test Set	6625-498-3691
TS-643	Aerograph Calibration Set	6660-678-5835
**CY-1067/PMQ-3	Case	None

NOTES: * Also used by Air Force and/or Navy.
** Late addition.
u/w - used with.

p/o - Part of.
None - No FSN available at present.

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ITEMS IN ARMY SUPPLY CHANNELS NOT CLASSIFIED BY TYPE NUMBER

NAME	FSN
Accessory Kit (p/o AN/GMQ-11)	6660-092-1546
Altimeter-Barometer, Aneroid	6660-551-3998
Amplifier (p/o AN/GMD-1)	6660-351-3207
Antenna Assembly (p/o AN/GMD-1)	6660-264-7539
Barometer, Aneroid	6665-537-9173
Barometer, Aneroid	6660-664-4675
Cable Assembly, Special Purpose, Electrical (u/w B&W Wind Set Model #170-430)	6660-567-0400
Case, Radiosonde Baseline Check Set (p/o AN/GMM-1)	6660-351-8201
Chart, Recording (p/o AN/AMR-1A)	6660-555-3035
Chart Recording (u/w AN/GMQ-12)	6660-566-4902
Chart, Recording (u/w AN/GMQ-12)	6660-566-4903
Chart, Wind Speed Correction (p/o AN/PMQ-4)	6660-392-9690
Detector, Wind Direction & Speed	6660-592-3319
Detector, Subassembly, Windspeed (p/o ML-203-A & B)	6660-333-2974
Drive, Chart (p/o ML-144)	6660-448-2560
Elevator (p/o AN/GMD-1)	6660-404-2390
Indicator, Wind Speed (u/w AN/PMQ-4)	6660-663-8163
Mast Section (p/o ML-206-A)	6660-224-5108
Mast Section (p/o ML-206-A)	6660-224-5115
Mast, Telescopic (50 ft)	6660-500-5798
Modification Kit (p/o RO-2/GMQ)	6660-099-0725

NAME	FSN
Modification Kit (p/o AN/GMD-1)	6660-219-6273
Modification Kit (p/o C-577/GMD-1)	6660-392-5857
Modification Kit (p/o AN/GMD-1A)	6660-396-3190
Modification Kit (u/w AN/GMD-1A)	6660-399-7395
Modification Kit (p/o R-301/GMD-1)	6660-543-1352
Modification Kit (u/w AN/GMD-1A)	6660-543-1386
Modification Kit (p/o C-578A/GMD-1)	6660-606-8744
Psychrometer, Aspirated	6685-526-9167
Psychrometer Subassembly (p/o ML-24)	6660-322-5849
Reflector (p/o AN/GMD-1)	6660-253-1605
Scale, Altitude	6660-408-4789
Subassembly (p/o AB-159B/GMD-1)	6660-774-8410
Subassembly (p/o AB-159B/GMD-1)	6660-774-8411
Support, Theodolite (p/o ML-47 & ML-247)	6660-356-5216
Support, Wood (u/w AN/GMD-1 when transported in trailer)	6660-025-3908
Temperature Element, Bimetallic, Meteorological	6660-663-8168
Thermometer, Self-indicating, Liquid in Glass	6660-239-4011
Thermometer, Self-indicating, Liquid in Glass	6660-239-4018
Transmitter Group, Humidity-Temperature	6685-602-5196
Transmitter Group, Humidity-Temperature	6685-602-5197
Transmitter, Wind Speed (p/o ML-151)	6660-252-9527

NOTES: p/o - Part of.
u/w - Used with.

AIR FORCE

TYPE NR	NAME	FSN
*AN/AMQ-9	Radiosonde Set	6660-892-2459
AN/AMR-3	Radiosonde Receptor	None
AN/APQ-13A	Radar Set	1280-538-0365
*AN/CPS-9	Radar Set	6660-505-2039
*AN/GMQ-1 & 1A	Wind Equipment	6660-531-2236
*AN/GMQ-2	Ceilometer Equipment	6660-531-2839
AN/GMQ-10B	Transmissometer Set (USAF Stock Nr 2600-034600000)	
*AN/GMQ-11	Wind Measuring Set (USAF Stock Nr 2600-703856500)	
AN/GMQ-13A	Cloud Height Set	None
AN/GRD-1A	Static Direction Finder	6660-519-3785
*AN/PMQ-1	Manual Meteorological Station	6660-526-7845
*AN/PMQ-4	Manual Meteorological Station	6660-526-7800
*AN/TMQ-1	Meteorological Station	6660-537-9194
*AN/TMQ-4	Ceiling Light Set	6660-408-4592
AN/TMQ-11(V)	Humidity-Temperature Measuring Set (USAF Stock Nr 2600-032706000)	
*M-1948	Tent, w/Accessories	None
*M-1953	Balloon Inflation Tent	8340-267-3130
MA-1	Weather Forecaster Kit	6660-547-2765
*ML-2 & -2-H	Barometer	6660-224-6350
*ML-3-D	Barograph	6660-224-6360

TYPE NR	NAME	FSN
*ML-4	Thermometer	
	General	6660-526-8255
	Tropical	6660-526-8264
	Arctic	6660-526-8263
*ML-5	Thermometer	
	General	6660-526-8262
	Tropical	6660-526-8258
	Arctic	6660-526-8259
*ML-7	Thermometer	
	General	6660-526-8259
	Arctic	6660-526-8256
*ML-17	Gage, Precipitation	6660-223-5095
*ML-24	Psychrometer	
	General	6660-523-5083
	Tropical	6660-523-5083
*ML-41	Instrument Shelter	5450-224-6356
*ML-54	Support (Townsend)	6660-526-7861
*ML-74-A	Rotor	6660-329-1448
*ML-77A	Thermograph	6660-223-5101
*ML-102-B thru -G	Barometer	6685-223-5073
*ML-110	Telephone Set	6660-408-4839
*ML-119-F	Clinometer	6675-567-9934
*ML-121-H	Ceiling Light Projector	6660-526-5369
*ML-122	Plotting Board	6660-223-7462
*ML-203	Wind Transmitter	6660-265-6765
*ML-204	Wind Panel	6660-223-5682
*ML-217	Gage, Precipitation (USAF Stock Nr 2600-701949450)	

TYPE NR	NAME	FSN
*ML-224	Psychrometer	
	General	6685-546-1457
	Tropical	6685-546-1457
*ML-247	Theodolite	6675-498-9773
*ML-303	Hydrogen Generator	3655-408-4669
*ML-330/FM	Barometer	6660-224-6349
*ML-331/TM	Barometer	6660-223-5071
*ML-332/TM	Barometer	6660-223-5070
*ML-333/TM	Barometer	6660-224-6348
*ML-433/PM	Anemometer	6660-526-7797
*ML-434/PM	Barometer, Aneroid	6660-526-5983
*ML-435/PMQ-1	Precipitation Gage	6660-526-7838
*ML-436/PMQ-1	Psychrometer	6660-527-8910
*ML-437/PMQ-1	Thermometer	6660-515-4821
*ML-438/PMQ-1	Thermometer	6685-515-4793
*ML-439/PMQ-1	Thermometer	6660-515-4807
*ML-440/PMQ-1	Thermometer	6660-515-4808
ML-443/UM	Balloon	6660-663-8157
*ML-459	Barometer, Aneroid	6660-526-5983
ML-480	Psychrometer Aspirator	6685-047-3812
*ML-486	Hydrogen Generator	3655-521-0631
*ML-488/PMQ-1	Thermometer	6660-551-3813
ML-504/GM	Straight Edge	None
ML-506/GMQ-13	Projector, Cloud Height	6660-557-5839

TYPE NR	NAME	FSN
ML-507/GMQ-13	Detector, Cloud Height	6660-581-2000
ML-508/AMT-6	Parachute	None
*ML-514/TM	Plotting Board, Winds Aloft	6660-663-4749
ML-518/AM	Balloon (800 gm)	6660-551-2549
ML-525/GMQ-13A	Detector, Cloud Height	None
ML-526/GMQ-13A	Projector, Cloud Height	None
ML-543/UM	Computer, Wind, Geostrophic & Gradient	6660-609-7522
ML-544/UM	Computer, Wind, Geostrophic & Gradient	6660-609-7523
ML-545/UM	Computer, Wind, Geostrophic & Gradient	6660-609-7524
ML-555/UM	Protractor, Rectangular	None
*RO-2/GMQ-11	Wind Direction & Speed Recorder	6660-527-7388
*S-13/TM	Shelter	8340-408-4784
SCM-1	Mobile Meteorological Station	6660-408-4175

NOTE: Under FSN column where the word "none" appears no FSN is available at present.

NAVY

TYPE NR	NAME	FSN
AN/AMQ-8	Aerograph Set	VH6660-563-0443
*AN/AMQ-9	Radiosonde Set	6660-892-2459
AN/AMQ-11	Aerograph Set	VH6660-515-4215
AN/AMT-11A	Radiosonde	R6660-530-0799-H035
AN/GMQ-14	Meteorological Station, Semi-Automatic	VH6660-557-5637
AN/GMQ-14A	Meteorological Station, Semi-Automatic	VH6660-621-2049
AN/PMQ-3	Wind Measuring Set	RH6660-223-5099-H035
AN/PMQ-3A	Wind Measuring Set	RH6660-515-4339-H035
AN/PMQ-3B	Wind Measuring Set	RH6660-574-4179-H035
*AN/PMQ-3C	Wind Measuring Set	RH6660-592-9002-H035
AN/UMQ-5C & -5D	Wind Measuring Set	None
*CY-787/U	Case, Theodolite	6675-547-5319
*CY-1067/PMQ-3	Case	None
*ML-428/UM	Humidity Chamber	RH6660-602-7204-H035
*ML-446/PMQ-3	Anemometer, Wind Vane	None
*ML-447/PMQ-3	Wind Vane	R6660-547-9436-H035
ML-447A/PMQ-3	Wind Vane	R6660-323-2262-H035
ML-447B/PMQ-3	Wind Vane	R6660-587-0594-H035
ML-447C/PMQ-3	Wind Vane	R6660-592-8987-H035
ML-448/UM	Barometer, Precision Aneroid	RH6685-600-3777-H035
ML-450A/AM	Psychrometer, Electric	R6685-590-8759-H035

TYPE NR	NAME	FSN
ML-471/AM	Thermometer, Vortex	VH6685-545-8988
*ML-474	Theodolite (Shore Type)	RH6675-588-0518-H035
ML-505/AMQ-11	Wiresonde (Helicopter)	None
ML-515/UM	Scale, Plotting	R6660-339-4320-H035
ML-516/UM	Scale, Plotting	R6675-614-8655-H300
ML-517/AMQ-11	Humidity Element, Resistance	R6685-671-4961-H035
ML-519/UM	Balloon, Meteorological	R6660-515-4214-H035
ML-521/U	Shroud, Balloon	R6660-564-6312-H035
ML-527/UD	Scale, Plotting	R6675-614-8654-H300
ML-529/U	Display Board, Meteorological Data	None
ML-530/U	Display Board, Meteorological Data	None
ML-531/U	Table, Observer, Meteorological Data	None
ML-532/U	Table, Forecaster, Meteorological Data	None
ML-533/U	Plotting Table, Meteorological Data	None
ML-534/AM	Balloon, Meteorological	None
ML-558/GMQ-14A	Gage, Precipitation	None
*T-321A/PMQ-3	Transmitter, Wind Speed	R6660-515-4342-H035
*T-321B/PMQ-3	Transmitter, Wind Speed	R6660-558-0088-H035
*T-321C/PMQ-3	Transmitter, Wind Speed	R6660-592-8986-H035

NOTE: None - No FSN available at present.

NAVY ITEMS NOT CLASSIFIED BY TYPE NUMBER

NAME	FSN
Barograph	RH6685-551-3661-H035
Barometer, Mercurial (Model 751-B) (Aero-1927-USN)	RH6685-145-0579-H035
Barometer, Precision Aneroid (Aero-1936-USN)	RH6685-149-1970-H035
Hygrothermograph (Model 594)	RH6685-602-6867-H035
Thermometer, Maximum	R6685-530-4051-H035
Thermometer, Minimum	R6685-556-1884-H035
Thermometer	R6685-515-4220-H035

LIST OF APPLICABLE ITEMS SUBMITTED BY U. S. WEATHER BUREAU

STOCK NR	NOMENCLATURE	USWB SPEC. NO.
A081	Photoelectric Sunshine Switch	--------
A100	Pyrheliometer, 10-Junction	--------
A101	Pyrheliometer, 50-Junction	--------
A110	Normal Incidence Pyrheliometer (Receiver, Radiation)	470.6113
A310	Solar Radiation Recorder, Strip Chart	451.8305
A311	Solar Radiation Recorder, Strip Chart	451.8305
A312	Solar Radiation Recorder, Circular Chart with Integrator	451.8305
C102-1	Thermometer, Maximum	450.1016
C102-2	Thermometer, Maximum	450.1016
C102-3	Thermometer, Maximum	450.1016
C122-1	Thermometer, Minimum	450.1016
C122-2	Thermometer, Minimum	450.1016
C122-3	Thermometer, Minimum	450.1016
C122-4	Thermometer, Minimum	450.1016
C611	Thermograph (Vertical Drum Type)	450.1201
C622	Distance Thermograph	--------
C630	Telethermometer	--------
C640	Temperature Telemetering System	--------
C821	Support, Thermometer	--------
D100	8-Inch Precipitation Gage	450.2301
D101	Rain Gage, Reporters, Visual	450.2112

STOCK NR	NOMENCLATURE	USWB SPEC. NO.
D110	Universal Type Weighing & Recording Precipitation Gage	450.2201
F311	Gust Recorder	--------
F312	Gust Recorder	--------
F313	Dual Wind Recorder	
	F313 Recorder	--------
	F605 Speed Retransmitter	--------
	F606 Direction Retransmitter	--------
F315	Operation Recorder	451.4164
F420	Wind System	450.6150
F540	Winds Aloft Plotting Board	450.6651
F545	Winds Aloft Graphing Board	450.6652
G110	Altimeter Setting Indicator	450.7205
G122	Precision Aneroid Barometer	450.7203
G130	Barometer, Aneroid, Precision, Portable	450.7202
G131	Barometer, Aneroid, Precision, Portable	450.7202
G210	Barograph (Vertical Drum Type)	450.7221
H021-1	Sling Psychrometer	450.1016
H055	Psychrometer, Portable, Electric	450.8113
H060	Hygrothermometer System (Resistance Type) Temperature, Ambient & Dew Point System (Resistance Element Type)	450.1318
H061	Hygrothermometer System (Liquid Filled Type) Temperature, Ambient & Dew Point System	
	(Time Impulse & Telemetric Type)	450.1319
	(Capillary Type)	450.1317

STOCK NR	NOMENCLATURE	USWB SPEC. NO.
H110	Hygrothermograph (Vertical Drum Type)	450.8202
H700	Psychrometric Calculator	450.8190
J600	Optical Theodolite	450.6602
J611	Pibal Timer	450.6643
K100	Ceiling Light Projector	451.2101
K110	Clinometer	451.2131
K210	Rotating Beam Ceilometer	
	Ceilometer Detector	451.2322
	Ceilometer Projector	451.2323
	Mirror, Searchlight, Glass Plate, Parabolic	451.2323/1
	Transformer, Constant Voltage	451.2323/2
	Ceilometer Indicator	451.2324
P300	Medium Instrument Shelter	--------
P300-2	Support, Instrument Shelter	--------
----	Aerological Balloons	458.300
	10 gram Black-Red-White	
	30 gram Black-Red-White-Orange-Yellow	
	100 gram Black-Red-White	
	300 gram Uncolored	
	600 gram Uncolored	
	800 gram Uncolored	
	1200 gram Uncolored	
----	Transmissometer	451.9161

ANNEX D

QUANTITIES, LOCATION AND CONDITION OF SURFACE WEATHER OBSERVING EQUIPMENTS IN SIGNAL SUPPLY CHANNELS - DECEMBER 1961

(See Legend at end of table)

Type Nr	Nomenclature	Account Code	Condition Reservation Code	Available Stock & Location TO	LX	LW	SC	LA	Total	Quantity Due In and Approximate Delivery Date
1. Major items required for mobilization purposes.										
ML-121-H	Projector Cloud Height	11	1				2		2	
		11	3				1		1	
		11	6	2					2	
		38	1		2				2	
							Total		7	21 Aug 1962
AN/TMQ-2	Cloud Height Set	11	1		9				9	
		11	6				1		1	
		55	1		11				11	
							Total		21	None
ML-303-T/M	Generator, Hydrogen	11	0	53			20		73	
		11	1		6	3	2		11	
		11	3				1		1	
		11	6	1					1	
		11	7	1	6	9	2		18	
		57	1		1				1	
							Total		105	65 Apr 1962
ML-373/GM	Nozzle, Balloon Inflation	11	0				20		20	
		11	1	43	46		114	4	207	
		11	3		5				5	
		55	0		74				74	
		55	1		20				20	
							Total		326	None
ML-224	Psychrometer (General)	11	1	9	225				234	
		57	1		4				4	
							Total		238	None

Type Nr	Nomenclature	Account Code	Condition Reservation Code	Available Stock & Location TO	LX	LW	SC	LA	Total	Quantity Due 1. and Approximate Delivery Date
ML-224	Psychrometer (Tropical)	11	1	33	65		12		110	
		57	1		3				3	
									113	None
ML-102-G	Barometer, Aneroid	11	1		2				2	
		11	0				10		10	
		11	4		5				5	
		11	6	16	1		9		26	
		11	7		7				7	
		55	0		30				30	
		55	6		1				1	
									81	114 Jul 1962

ML-330/FM Barometer, Mercurial

This equipment is stocked, repaired, calibrated and issued by USASRDL, Fort Monmouth, N. J.

Stock Status as follows

Ready for issue:	1
Need calibration:	39
Need repair:	1
	41

ML-331/TM Barometer, Precision Aneroid

This equipment is stocked, repaired, calibrated and issued by USASRDL, Fort Monmouth, N. J.

Stock Status as follows

Ready for issue:	40
Need calibration:	0
Need repair:	1
	41

ML-332/TM Barometer, Precision Aneroid

This equipment is stocked, repaired, calibrated and issued by USASRDL, Fort Monmouth, N. J.

Stock Status as follows

Ready for issue:	32
Need calibration:	0
Need repair:	1
	33

Type Nr	Nomenclature	Account Code	Condition Reservation Code	Available Stock & Location TO	LX	LW	SC	LA	Total	Quantity Due In and Approximate Delivery Date	
ML-333/TM	Barometer, Precision Aneroid										
	This equipment is stocked, repaired, calibrated and issued by USASRDL, Fort Monmouth, N. J.										
	Stock Status as follows:										
	Ready for issue: 37										
	Need calibration: 0										
	Need repair: 1										
	38										
ML-7	Thermometer (Arctic)	11	1	16	20		128		164		
									164	570	Aug 1962
ML-7	Thermometer (General)	11	1	19	85	11	101	26	242		
		32	1		1				1		
									243	None	
ML-7	Thermometer (Tropical)	11	1	32			10		42		
									42	130	Aug 1962
ML-352/UM	Thermometer (Arctic)	11	1		304		93	4	401		
		38	1	2					2		
		55	0		74				74		
									477	None	
AN/PMQ-3	Wind Measuring Set								None	693	Jul 1963
ML-497/PM	Anemometer	27	1	30	26		13		69		
									69	None	
ML-125	Scale (Quantity Unknown - Ordnance Corps responsibility)										
AN/GMQ-8	Plotting Set								None	None	
	(Lexington Inventory Control Office Remarks: "No known Army requirements."										
AN/GMQ-11	Wind Measuring Set	17	6	3					3		
									3	252	Jan 1962

Type Nr	Nomenclature	Account Code	Condition Reservation Code	Available Stock & Location TO	LX	LW	SC	LA	Total	Quantity Due I and Approximate Delivery Date
AN/MMQ-1	Wind Measuring Set	17	6	13	3	1			17	
		17	7	1					1	
									18	None
AN/MMQ-1A	Wind Measuring Set	17	1		4				4	
		17	3	2	5				7	
		17	6	7					7	
									18	None
AN/MMQ-1B	Wind Measuring Set	17	1		4		5		9	56 due in currently and to be completed by March 1962.
		17	3	4	1				5	
		17	6	2					2	
									16	
AN/TMQ-4	Meteorological Station, Manual								None	31 on set assembly schedule at Lexington. Due by June 1962.
AN/TMQ-1	Meteorological Station, Manual	11	1		4				4	
									4	None
MA-1	Weather Forecaster Kit (Unknown - USAF Item)									
Unk	Test Set, Soil (Quantity unknown - QMC Item - FSN 6635-542-1284)									
2. Other items suitable for field army use.										
ML-81	Hose (Quantity unknown, Corps of Engineer responsibility)									
ML-17	Gage, Precipitation								None	30 Aug 1962
ML-217	Gage, Precipitation	11	1		110		3		113	
		55	1		11				11	
									124	None

Type Nr	Nomenclature	Account Code	Condition Reservation Code	Available Stock & Location TO	LX	LW	SC	LA	Total	Quantity Due In and Approximate Delivery Date
AN/GMC-1	Wind Measuring Set	11	6	3			1		4	
		98	6				1		1	
									5	None
ML-209	Support, Precipitation Gage	11	1		46				46	
		55	1		11				11	
									57	None
ML-304A/TM	Charge, Calcium Hydride	11	1	4485	1102	2209	8949		16745	
		55	0		8208				8208	
									24953	None
ML-75	Scale	11	1	40			24		64	
									64	None
ML-110	Timing & Telephone Set	11	1	12	11		8		31	
		11	6			1			1	
		55	1		11				11	
									43	None
ML-51	Balloon, Pilot	11	0		140				140	
		11	1	40	4064				4104	
									4244	12195 Apr 1962
SCM-12	Meteorological Observation Set								None	14 ea on Set Assembly Schedule at Lexington. Due for completion by June 1962.

Type Nr	Nomenclature	Account Code	Condition Reservation Code	Available Stock & Location TO	LX	LW	SC	LA	Total	Quantity Due and Approximate Delivery Date
ML-122	Plotting Board, Winds Aloft	11	0		53				53	
		11	1	19	39				58	
		11	3				1		1	
		55	0		13				13	
									125	109 March 1962
AN/PMQ-1	Meteorological Station,	11	1		1				1	
	Manual	11	6		4				4	
		11	7		4				4	
									9	None
AN/PMQ-6	Wind Measuring Set	17	1		33		1		34	
		17	6	4	1				5	
									39	21 Jan 1962
MT-1309/GM	Tripod, Surveying (Quantity unknown Corps of Engineers responsibility)									
ML-474/GM	Theodolite, Double Center								None	119 Jan 1963
ML-126-A	Rule (Quantity unknown - Corps of Engineers responsibility)									
ML-126	Rule (Quantity unknown - Corps of Engineers responsibility)									
ML-24	Psychrometer (General)	11	0		39		20	3	62	
		11	1	45	87				132	
									194	220 Jul 1962
ML-429/UM	Calculator, Psychrometric	11	1		4		20		24	
		55	1		6				6	
		57	1		1				1	
									31	70 Dec 1961
ML-24	Psychrometer (Tropical)	11	1	109	40		19		168	
									168	None
ML-488/PM	Thermometer, Ground	11	1	37	86	42	140		305	
	Surface Temperature	29	1				1		1	
									306	None
S-13/TM	Inflation Shelter (Quantity unknown - GMC responsibility)									

Type Nr	Nomenclature	Account Code	Condition Reservation Code	Available Stock & Location TO	LX	LM	SC	LA	Total	Quantity Due In and Approximate Delivery Date
3. Items considered unsuitable (acceptable where packaged as component of a set)										
ML-436/PMQ-1	**Psychrometer**								None	18 Aug 1962
ML-435/PMQ-1	**Gage, Precipitation**	11	1		5		1		6	
		57	1		1				1	
									7	10 Mar 1962
ML-434/PM	**Barometer, Aneroid**	11	1		1				1	
		11	6		2				2	
									3	16 Jan 1962
ML-459/PMQ-1	**Barometer, Aneroid**	11	1		8		8		16	
									16	None
ML-438/PMQ-1	**Thermometer**	11	1		38		21		59	
									59	None
ML-439/PMQ-1	**Thermometer**	11	1		39		82		121	
									121	None
ML-440/PMQ-1	**Thermometer**	11	1		18		23		41	
									41	None
ML-47	**Theodolite (Replaced by ML 474/GM)**								None	None
ML-247	**Theodolite (Same FSN as ML-474/GM)**								See ML-474/GM	
ML-433/PM	**Anemometer**	11	0		4				4	
		11	1		2		1		3	
		11	3		1				1	
		11	4		2				2	
		11	6	1	1				2	
		11	7	1	7				8	
									20	296 Mar-Apr 1962

Type Nr	Nomenclature	Account Code	Condition Reservation Code	Available Stock & Location TO	LX	LW	SC	LA	Total	Quantity Due In and Approximate Delivery Date
ML-433A/PM	Anemometer	11	1		10		4		14	
									14	None
ML-62	Anemometer	11	1	7	55		5		67	
		11	6	33	79	1	17		130	
									197	None
ML-73	Wind Vane	11	1		14		2		16	
		11	6	3	3		1		7	
									23	None
AN/TMQ-3	Hydrogen Generator Set	11	0		72				72	
		11	1		29	2	1		32	
		11	3	33		7			40	
		11	6	2	7	5	22		36	
									180	None
AN/TMA-1	Plotting Set	11	0				10		10	
									10	None
ML-437/PMQ-1	Thermometer	11	1	37	86	42	140		305	
		29	2				1		1	
									306	775 Jul 1962
AN/PMQ-4	Meteorological Station, Manual	11	3		3				3	
		11	6		6				6	
		11	7		3				3	
									12	None
AN/PMQ-4A	Meteorological Station, Manual								None	None

Legend

Account Codes	Condition Reservation Codes	Depots
11 - General Issue Stock	0 - Serviceable - Reserved for Set Assy	LX - Lexington
17 - Regulated Item (PEMA)	1 - Serviceable	TO - Tobyhanna
25 - Regulated Item (USASCEA)	2 - Serviceable - Reserved for Government Furnished Property	LW - Fort Worth
27 - Stock Reserved by USASSA	3 - Serviceable - Incomplete End Equipment	SC - Sacramento
29 - Special or Emergency Requirements and USASEA Programs	4 - Serviceable - Reserved for End Items Undergoing Set Assy	LA - Atlanta
32 - Army Mobilization Reserve Nr 3	6 - Unserviceable - Economically Repairable	
38 - Reserve Stock	7 - Unserviceable - Scheduled for Repair	
55 - Government Furnished Property & Government Furnished Avionics Equipment	8 - Serviceable - Stock requiring application of modification work order	
57 - Reserved for Completion of Incomplete Equipment Other than scheduled Set Assembly	9 - Accepted Property, Unsuitable for issue	
98 - Excess Property		

ANNEX E

COMMERCIAL EQUIPMENT SURVEY

1. Equipments potentially suitable for field army use and not presently available in supply channels.

a. Soil Thermometers.

(1) Science Associates

(a) Wooden frame, mercury-in-glass
(b) Stainless steel bourdon tube, dial type

(2) Weksler Instrument Corp., Freeport, N.Y.

(a) Mercury-in-glass, encased in a stainless steel frame
(b) Mercury-in-glass, wooden frame

(3) Henry J. Green Co., Westbury, N. Y.

Mercury-in-glass, wooden frame

b. Recording Balloon Theodolite. Georgi model PM8V distributed by Kahl Scientific Instrument Corp., El Cajon, California. Angles are recorded on paper tape and theodolite can be operated by single observer with gloved hands.

c. Tactical Cloud Height Set, Type TNS. Cosmic Technological Corp., Washington, D. C. This is a pulsed light radar with a range of 1,300 feet. The unit weighs 350 lbs and operates near the U. V. region of the spectrum by discharging a capacitor across an air gap at 60 cps. Reports indicate that the beam is almost invisible at night. Distance measurement is accomplished by timing the reflected pulses on a radar "A" scope display.

d. Wilcox Weather Radar, Wilcox Electric Co., Kansas City, Mo. This is a light, transistorized, X-band radar weighing less than 250 pounds,

including the radome, a 15-ft mast and other components. Power input is 300VA. Power output is 15KW. Range scales can be varied from 50 to 150 nautical miles, and data is displayed on a PPI scope. Iso-echo contouring capability is included.

2. Other equipments comparable to those in supply channels, or which do not fully meet the requirements for tactical operations.

a. Cloud Height Measuring Equipment.

Crouse Hinds Co., Syracuse, N. Y. (Rotating Beam Ceilometer)

b. Humidity Measuring Equipment.

(1) Abbeon Inc., Jamaica 32, N. Y., (hygrometers)

(2) Belfort Instrument Co., Baltimore, Md., (hygrothermographs, psychrometers)

(3) Bendix Friez, Baltimore, Md., (hygrometers)

(4) Cambridge Systems Inc., Waltham, Mass., (Electronic Dew Point Hygrometer)

(5) Cargocaire Engineering Co., N. Y., N. Y., (hygrothermographs)

(6) Emil Greiner Co., N. Y. 13, N. Y., (hygrometers, hygrothermographs)

(7) H. B. Instrument Co., Philadelphia, Pa., (psychrometers)

(8) Kahl Scientific Instr. Corp., El Cajon, Calif. (hygrothermographs, psychrometers)

(9) A. Leitz Co., San Francisco, Calif., (hygrothermographs)

(10) Moeller Instrument Co., N. Y., N. Y., (hygrometers)

(11) Physical Chemical Research Co., N. Y. 3, N. Y., (hygrocon - relative humidity readout)

(12) Precision Thermometer and Instrument Co., Philadelphia, Pa., (hygrometers, psychrometers)

(13) Science Associates, Princeton, N. J.., (hygrometers, psychrometers)

(14) Serdex Inc., Boston 14, Mass., (hygrometers, hygrothermographs)

(15) Taylor Instr. Co., Rochester 1, N. Y., (psychrometers)

(16) Weksler Instr Corp., Freeport, N.Y., (hygrometers, psychrometers)

c. Precipitation Gages

(1) Belfort Instrument Co., Baltimore, Md.

(2) Bendix Friez, Baltimore, Md.

(3) Henry J. Green Co., Westbury, N. Y.

(4) Kahl Scientific Instr. Corp, El Cajon, Calif.

(5) Leupold and Stevens Instr. Inc., Portland, Oregon

(6) Science Associates, Princeton, N. J.

(7) M. C. Stewart, Ashburnham, Mass.

(8) Precision Thermometer and Instr. Co., Phila., Pa.

d. Pressure Measuring Equipment

(1) Abbeon Inc., Jamaica 23, N. Y., (aneroid barometers)

(2) Americal Paulin System, Los Angeles 15, Calif., (altimeter barometer)

(3) Belfort Instr. Co., Balt., Md., (microbarographs)

(4) Bendix Friez, Balt 4, Md., (barographs)

(5) Central Scientific Co., Chicago 13, Ill., (mercurial and aneroid barometers)

(6) Henry J. Green Co., Westbury, N. Y., (mercurial and aneroid barometers)

(7) Emil Greiner Co., N. Y. 13, N. Y., (mercurial and aneroid barometers)

(8) Kahl Scientific Instr. Corp., El Cajon, Calif., (barographs)

(9) A. Leitz Co., San Francisco, Calif., (barographs and microbarographs)

(10) Moeller Instr. Co., N. Y., N.Y., (mercurial barometers)

(11) Olympic Radio and TV Division, Long Island City, 1, N. Y., (digital force balance barometers)

(12) Precision Thermometer and Instr. Co., Phila, Pa., (mercurial barometers)

(13) Wiancko Engr. Co., Pasadena, Calif., (Type Q 3003 automatic microbarograph system)

e. Storm Detection and Tracking Equipment

General Mills Inc., Minn. 14, Minn., (Tripartite Sferics System)

f. Temperature Measuring Equipment

(1) Abbeon Inc., Jamaica 23, N. Y., (thermometers)

(2) Aero Research, Chicago 7, Ill., (thermocouples)

(3) Alnor Research, Chicago 10, Ill., (thermocouples)

(4) Bendix Friez, Balt., Md., (thermometers)

(5) Central Scientific, Chicago 13, Ill., (thermometers, thermographs)

(6) Gelman Instr. Co., Chelsea, Mich., (thermometers)

(7) Henry J. Green Co., Westbury, N. Y., (thermometers)

(8) H. B. Instr. Co., Phila. 40, Pa., (thermometers)

(9) Kahl Scientific Instr. Corp, El Cajon, Calif., (thermometers)

(10) Leeds and Northrup Co., Phila, 44, Pa., (resistance thermometers)

(11) Moeller Instr. Co., N. Y. 18, N. Y., (thermometers)

(12) Precision Thermometer and Instr. Co., Phila., Pa., (thermometers)

(13) Rosemount Engr. Co., Minneapolis 20, Minn., (resistance thermometers)

(14) Taylor Instr. Co. Rochester 1, N. Y., (thermometers)

(15) Weksler Instr Co., Freeport, N. Y., (thermometers)

(16) Yellow Springs Instr Co., Yellow Springs, Ohio (thermistors)

g. Wind Measuring Equipment

(1) Aero Research, Chicago 7, Ill., (pitot tubes)

(2) Alnor Instr Co., Chicago 10, Ill., (velometers)

(3) Beckman Whitley, San Carlos 3, Calif., (anemometers)

(4) Belfort Instr Co., Baltimore, Md., (anemometers)

(5) Bendix Friez, Baltimore 4, Md., (anemometers)

(6) Cambridge Systems Inc., Waltham 54, Mass., (sonic anemometers)

(7) Gelman Instr Co., Chelsea, Mich., (hot wire anemometers)

(8) Henry Green Co., Westbury, N. Y., (anemometers)

(9) W and L. E, Gurley, Troy, N. Y., (anemometers)

(10) Hastings-Raydist, Hampton, Va., (hot wire anemometers)

(11) Kahl Scientific, El Cajon, Calif., (anemometers)

(12) Rosemount Engr Co., Minneapolis 20, Minn., (pitot tubes)

(13) Science Assoc., Princeton, N. J. (anemometers)

(14) Simerl Co., Alexandria, Va., (anemometers)

(15) M. C. Stewart, Ashburnham, Mass., (anemometers)

j. Evaporation Gages

(1) M. C. Stewart, Ashburnham, Mass.

(2) Kahl Scientific Instr. Corp, El Cajon, Calif.

k. Transmissometers

(1) Crouse-Hinds Co., Syracuse 1, N. Y.

(2) Kahl Scientific Instr. Corp, El Cajon, Calif.

ANNEX F

CONDUCT OF THE EQUIPMENT SURVEY and ACTIVITIES OF THE JOINT WORKING GROUP

1. In anticipation of the study effort, personnel of Meteorology Department, USAEPG, visited U. S. Army Signal Supply Agency (USASSA) at Philadelphia and Lexington Inventory Control Office (LICO) of USASSA at Lexington, Kentucky, during June 1961 to obtain lists of meteorological equipment and supporting information pertinent to stocks in Army supply channels. Personnel of 2d Weather Group began the collection of data on meteorological equipment used by the Air Force and the Navy.

2. A joint Air Force-Army working group met at USAEPG on 10-14 July 1961. The requirements specified in the 1959 USCONARC doctrinal statement and USAEPG-SIG 970-28 were reviewed to firmly establish the surface parameters to be considered for meteorological support to a field army. Detailed methods for the accomplishment of the task were agreed upon, and the phasing of operations was revised.

3. During July 1961, computer listings of items in Army supply channels were received from USASSA and LICO. The screening of approximately 3,900 items in Federal Supply Classes 6660 and 6685 was begun by USAEPG. End items of meteorological equipment and their major components were identified and catalogued on cards showing name, type number, Federal Stock Number (FSN), type classification and line item (EAM) number, where available. As cross-checks, the data from the computer listings was correlated with information obtained from TM 11-487G, SB 11-253, SB 11-474, and other available references. Technical characteristics, weight, volume and cost figures, applicable technical manual numbers and military specification numbers, where available, were also noted on the cards.

4. During August, September, and October 1961 the reconciliation of data and compilation of information prerequisite to the evaluation of meteorological equipment continued. The 2d Weather Group compiled

information on Air Force and Navy equipments and forwarded data cards to USAEPG on approximately 80 equipments and/or components. Information on observational equipment of the U. S. Weather Bureau was obtained by USAEPG.

5. On 31 October 1961, USAEPG sent an inquiry letter to suppliers to obtain information related to "off-the-shelf" items of commercially available meteorological equipment. Replies were received from 85 of the addressees.

6. A meeting of the joint Air Force-Army working group was held 13-16 November 1961 at USAEPG, with a representative from OCSigO participating in the evaluation of the surface weather observing equipment currently stocked by the Army, Air Force, Navy and Weather Bureau. The group developed a list of the most suitable equipment available to meet present field army meteorological observational requirements and considered the choice of substitutes for selected items. Latest available Tables of Organization and Equipment (TOE's) were reviewed to determine types and quantities of meteorological equipment needed for adequate support. The type field army selected for purposes of this study was taken from U. S. Army Signal Board Case 679. Several inconsistencies involving meteorological equipment were detected in the TOE's and were subsequently resolved by visit of USAEPG personnel to appropriate headquarters. Preliminary estimates, based upon replies received, indicated that the commercial survey would not be completed by 1 January 1962. Therefore, the working group decided to submit an interim report in which the quantities of suitable meteorological items in Army and Air Force stocks, depot locations, and estimated mobilization requirements would be listed.

7. Requests for latest available quantities in stock, depot locations, and condition of equipment were sent to USASSA and 2d Weather Group on 4 December 1961 to complete the information required for the interim report. Information submitted by USASSA, in compliance with the request, provided the basis for partially determining the status of surface weather observing equipment necessary to meet mobilization requirements. Data on Air Force depot stocks was not available to 2d Weather Group and the request was referred to Hq AWS for action.

8. Replies to the commercial survey letter were reviewed during January and February 1962 by personnel of the Meteorology Department, USAEPG. Descriptive literature received from suppliers of "off-the-shelf" equipment was examined to find new types which might better fulfill the meteorological requirements of a field army than equipments currently stocked by the Army and Air Force. A very large portion of commercially available equipment is equivalent to that currently in supply channels. However, several of the items (described in Annex E) appear to possess characteristics which make them potentially capable of improving the weather support to Army tactical operations. In March 1962 the Meteorology Department, USAEPG, initiated the procurement of these items for field test evaluation.

9. A meeting of the joint Air Force-Army working group was held 7 - 9 March 1962 at USAEPG to draft the final report and resolve problems related to equipment needed to meet mobilization requirements. Since there is no official document that defines the weather support requirements for the various type units, some of the problems inherent in annex C could not be resolved satisfactorily at the working group level.

10. On 4 May 1962, draft copies of the final report were sent to the Office of the Chief Signal Officer (OCSigO) for review and comment. In July the Communications-Electronics Combat Developments Agency of the U. S. Army Combat Developments Command at Fort Huachuca assumed responsibility for the completion of the study. During August 1962 the comments of OCSigO, 2d Weather Group and the U. S. Army Electronic Research and Development Laboratory (formerly USASRDL) were resolved and, where appropriate, have been incorporated in the study.

ANNEX G

MOBILIZATION REQUIREMENTS AND AVAILABILITY (U)

(Note:
This annex is classified and has been printed separately as Supplement Nr I to this report.)

ANNEX H

STUDY DIRECTIVE AND SUPPORTING CORRESPONDENCE

SIGRD-8a (28 June 61) 1st Ind 20 JUL 1961
SUBJECT: Meteorological Equipment Survey Study

Hq, DA, OCSigO, Washington 25, D. C.

TO: Commanding General, U. S. Army Electronic Proving Ground, Fort Huachuca, Arizona

1. Reference, letter, ATIET-D&D 337, Hqs, USCONARC, 20 June 1961, subject, Report of Conference - Meteorological Equipment for Army Tactical Operations, inclosure 1.

2. Primary responsibility for the conduct of survey of meteorological equipment for tactical army operations is assigned to your headquarters as requested in basic letter.

3. The survey should be accomplished in accordance with the agreement outlined in the reference cited above. The survey report will be submitted to this office ATTN: SIGRD-8a for review and approval prior to effecting distribution.

4. Authority is granted to accomplish the survey from programmed resource previously made available to your headquarters by last item (Integrated Meteorological System for the Field Army 1965-1970, 1970-1975) page 2, Incl 1, to reference 1c, basic letter.

FOR THE CHIEF SIGNAL OFFICER:

Arthur W. Keene

1 Incl
a/s

ARTHUR W. KEENE
Colonel, Signal Corps
Chief, Combat Development Branch
Research & Development Division

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HEADQUARTERS

U.S. ARMY ELECTRONIC PROVING GROUND

Fort Huachuca, Arizona

SIGPG-DMO 28 JUN 1961

SUBJECT: Meteorological Equipment Survey Study

TO: Chief Signal Officer
ATTN: SIGRD-8a
Department of the Army
Washington 25, D. C.

1. Reference is made to:

a. Message, Unclas SIG 39754 from SIGRD-4c to USAEPG dated 3 May 1961.

b. 1st Ind SIGRD-8a (23 Jan 61) dated 6 April 1961 to letter SIGPG-DMC, USAEPG to OCSigO, dated 23 Jan 1961, subject: "Interim Phase of Integrated Meteorological System for the Army."

c. Letter, SIGRD-8, OCSigO, dated 31 May 1961, subject: "FY-62 USAEPG Technical Program Guidance (U)".

d. Study, SIGPG-C, USAEPG, dated 15 April 1961, subject: "Manpower Requirements".

2. Reference 1a called a joint meeting on 16-17 May 1961 at Hq, USCONARC to discuss and initiate USCONARC meteorological equipment survey study. During this meeting it was agreed that responsibility for conduct of the survey rests jointly with the Meteorology Department of USAEPG and the 2nd Weather Group, Air Weather Service, U. S. Air Force, Langley Field, Virginia.

3. Reference 1b informs this headquarters of the Chief Signal Officer's qualified acceptance of the study and intent to assign the study to USAEPG.

4. As a result of the meeting, discussed in para 2 above, it was recommended that this survey be limited in scope to surface observing equipment and that subsequent surveys be made on equipments for other meteorological operational areas. The limited scope in the initial survey can be accomplished within programmed resources of last item (Integrated Meteorological System for the Field Army 1965-1970, 1970-1975), page 2, Incl 1, to reference 1c. Subsequent surveys will necessitate one additional civilian meteorologist in FY-62 as indicated in "Meteorology Department Additional Planned Requirements" in reference 1d.

H - page 3

28 JUN 1961

SIGPG-DMO
SUBJECT: Meteorological Equipment Survey Study

5. Request that an official directive be issued assigning USAEPG primary responsibility for conduct of the study in accordance with agreements reached in joint meeting at Headquarters, CONARC.

FOR THE COMMANDER:

E. H. KOREMAN
COL, AGC
Adjutant General

Copy Furnished:
OCSigO USAEPG LnO

H - page 4

HEADQUARTERS
UNITED STATES CONTINENTAL ARMY COMMAND
FORT MONROE, VIRGINIA

ATINT-D&D 337

20 June 1961

SUBJECT: Report of Conference - Meteorological Equipment for Army Tactical Operations

TO: See distribution

1. References:

a. Letter, ATINT-D&D 000.9, HQ USCONARC, 18 February 1961, subject: "Meteorological Equipment for Army Tactical Operations," with 1st Indorsement, SIGRD-4c2(360601B)(18 Feb 61), CSigO, DA, 29 March 1961. (Inclosure 1)

b. Letter, ATINT-D&D 000.9, HQ USCONARC, 10 April 1961, subject: "Meteorological Equipment for Army Tactical Operations," with 1st Indorsement, HQ AWS, 5 May 1961. (Inclosure 2)

2. A conference was held at Fort Monroe, Virginia, 16-17 May 1961 to plan the conduct of the subject equipment investigation. Participants were as shown in Inclosure 3.

3. Conclusions of the conference were as follows:

a. Purpose: The purpose of this investigation is to determine the qualitative and quantitative requirements for surface observing equipment to support the Army in the field and the availability of this equipment from military and civilian sources.

b. Duration: The duration of the investigation will be for six months beginning 1 July 1961.

c. Participation: The primary responsibility for conduct of the survey will be with the Meteorology Department of the U. S. Army Electronic Proving Ground and with the 2d Weather Group. Major agencies who have interest in this survey and the personnel to be contacted will be as follows:

Headquarters 2d Weather Group Langley AFB, Virginia	Maj Cleveland E. Autry) CWO Eugene W. Wiggins)	Langley PA 2-7911 Ext 29157 or 25177
Headquarters U. S. Army Electronic Proving Ground Fort Huachuca, Arizona	Mr. L. A. Jay) Mr. E. C. Rengers)	Gladstone 8-3311 Ext 2413 or 5260

Headquarters Air Weather Service Scott AFB, Illinois	Lt Col R. F. Durbin, AWSOP) Mr. J. F. Snow, AWSMtS) Mr. V. S. Hardin, AWS/SS)	Adams 4-4000 Ext 36247 Ext 34225 or 34226 Ext 4134 or 4135
R&D Division Office Chief Signal Officer Department of the Army Washington 25, D. C.	Maj G. D. Dean) Mr. Copeland)	Oxford 62932 or 62957
16th Weather Squadron Fort Monroe, Virginia	Lt Col Thomas W. Lane) CWO M. L. Crowder)	Ft Monroe 727-3752 727-3712
Headquarters USCONARC G2 Weather Branch	Lt Col J. Chrietzberg, Jr.) Mr. D. A. Lawson, Jr.)	Ft Monroe 727-3454

d. Distribution: The U. S. Army Electronic Proving Ground and the 2d Weather Group will prepare a joint final report on the investigation and distribute it as follows:

HQ USCONARC, Fort Monroe, Virginia	5 copies
HQ AWS, Scott AFB, Illinois	5 copies
OCSigO, DA, Washington 25, D. C.	4 copies
HQ 2d Weather Group, Langley AFB, Virginia	3 copies
HQ USAEPG, Fort Huachuca, Arizona	3 copies

e. Phasing: Phasing of the investigation will be as follows:

PHASE 1.

(1) A meeting of the working group to develop a detailed plan.

(2) Identify units to be supported: (a) type; (b) number.

(3) Identify data needed to provide service required.

(4) Determine general categories of equipment necessary to satisfy data or service requirement.

PHASE 2.

(1) Identify specific equipments in supply depots and in inventories that could be made available to the problem.

(2) Identify off-the-shelf commercial items that appear to fill gaps or would improve on available resources.

PHASE 3.

Optimize choice and selection of items by consolidation of requirements and testing where necessary.

PHASE 4.

Determine who will own various equipments or see if this is really determined and firm.

PHASE 5.

Recommend procurement plans and supply transfer procedures to satisfy Army requirements.

f. Working Plan: The detailed working plan for conduct of the survey, as prepared by representatives of USAEPG and 2d Weather Group and approved by the participants in the conference is at Inclosure 4.

g. Miscellaneous Guidance: In addition to the above the USAEPG and 2d Weather Group were provided with the following guidance:

(1) The investigation will not consider equipment that requires research and development but only that equipment in its present state or with minor modification.

(2) The investigation should not instigate a major testing program; however, it may be necessary to test some individual items of equipment to determine their suitability.

(3) The investigation will consider items of surface observing equipment used by both the Army and the Air Weather Service in support of the Army in the field.

(4) It was pointed out to the Working Group by Mr. Snow that items of equipment found in Air Force supply channels at the present time might not be available at some later date unless appropriate action is taken to hold such equipment for a specific purpose.

4. Request any corrections to the above report be forwarded to Commanding General, USCONARC, Fort Monroe, Virginia, attention: Deputy Chief of Staff for Intelligence, by 1 July 1961. (Exempt report, subpara. 17x, AR 335-15.)

FOR THE COMMANDER:

T. J. MARNANE
Colonel, AGC
Adjutant General

4 Incl
(Over)

4 Incl (Cont'd)
as

DISTRIBUTION:
CSigO, DA (SIGRD 4-c)
CG, AWS, Scott AFB, Ill.
CG, USAEPG, Ft Huachuca, Ariz.
Comdr, 2d Wea Gp, LAFB, Va.
Comdr, 16th Weather Squadron,
Ft Monroe, Va.
Lt Col R. F. Durbin, HQ AWS
Mr. J. F. Snow, HQ AWS
Mr. V. S. Hardin, HQ AWS
Maj G. D. Dean, OCSigO, DA
Mr. L. A. Jay, HQ USAEPG
Mr. E. C. Rengers, HQ USAEPG
Lt Col L. M. Grisham, HQ 2d Wea Gp
Maj C. E. Autry, HQ 2d Wea Gp
CWO E. W. Wiggins, HQ 2d Wea Gp
Lt Col J. Chrietzberg, Jr., HQ USCONARC
Lt Col W. L. Hogan, Sr., HQ USCONARC
Lt Col T. W. Lane, HQ USCONARC
CWO M. L. Crowder, HQ USCONARC
Mr. David A. Lawson, Jr., HQ USCONARC

SIGRD-4c2(360601B)(18 February 61) 1st Ind
SUBJECT: Meteorological Equipment for Army Tactical Operations

HQS DA, OCSigO, Washington 25, D. C., [illegible] 1961

TO: Commanding General, U. S. Continental Army Command, Fort Monroe, Virginia

1. The investigation requested in basic letter has been reviewed and is accepted for action subject to the following clarification. The request is interpreted as consisting essentially of a meteorological equipment inventory of Service items and commercial equipment to identify and list all available equipment applicable for use as tactical weather equipment. In determining the suitability of individual commercial items of equipment, extensive investigation and test is not envisaged since a major effort would be required to determine service life, ease of maintenance, acceptability insofar as ruggedness, human engineering factors, portability, etc., are concerned. Only a general evaluation of suitability will be made in the investigation; the detailed determination of equipment suitability required for standardisation action is considered to be beyond the scope of this investigation.

2. It is estimated that the investigation will require six months to complete. Signal Corps participation will be by U. S. Army Electronic Proving Ground personnel. It is recommended that the investigation be initiated by a meeting of CONARC, AWS and Signal Corps personnel to insure proper orientation of the investigation to achieve the desired objective. Administrative procedures for preparation and submission of the results of the investigation could also be arranged in this meeting. A meeting date within the period 17-28 April 1961 is recommended.

3. The above comments are based on the assumption that the above program can be accomplished within the resources included in the presently approved FY-62 RDT&E program. A more positive indication in this regard can be given after the meeting proposed in paragraph 2.

FOR THE CHIEF SIGNAL OFFICER:

2 Incl
w/d

JOHN C. MONAHAN
Brigadier General, USA
Chief, Research & Development Division

A. W. ROGERS
Technical Director
Research & Development Division

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INCLOSURE 1

HEADQUARTERS
UNITED STATES CONTINENTAL ARMY COMMAND
FORT MONROE, VIRGINIA

ATINT-D&D 000.9

18 FEB 1961

SUBJECT: Meteorological Equipment for Army Tactical Operations

TO: Chief Signal Officer
Department of the Army
ATTN: SIGRD-4c
Washington 25, D. C.

1. References:

a. "Joint US Army - US Air Force Doctrine for the Provision of Weather Support to the US Army," HQ USCONARC, HQ 2d Weather Group, 5 January 1960, Inclosure 1.

b. "Equipment and Supplies for Air Weather Service Tactical Weather Stations Supporting the US Army," HQ USCONARC, HQ 2d Weather Group, 15 June 1960, Inclosure 2.

c. Letter, ATINT-D&D 000.9, HQ USCONARC to CSigO, 27 January 1961, subject: "Integrated Meteorological System."

2. The organization of Air Weather Service (AWS) units for tactical Army support, as proposed in Annex A of document, reference 1a above, was used to prepare mobilization plans for such AWS units. These plans were approved by both Department of the Army and Department of the Air Force.

3. In recognition that a weak link in the tactical meteorological support plans is the equipment for surface weather observations, document, reference 1b above, was prepared for joint Department of the Army/Department of the Air Force consideration. It was realized that certain items of the listed equipment are approaching obsolescence and not still in production, yet nothing else was known to be available in Army or Air Force supply channels.

4. Modernized meteorological equipment for Army tactical operations eventually will be available in the Integrated Meteorological System. For the present, however, it is questionable to what extent available meteorological equipment will meet Army mobilization requirements. The manner in which the present supply of equipment is scattered between Army and Air Force supply channels and even within several of the Army technical services, adds to the complexity of the problem.

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ATINT-D&D 000.9
SUBJECT: Meteorological Equipment for Army Tactical Operations

5. As discussed in letter, reference 1c above, meteorological observations of surface conditions are made by both Army and AWS personnel during Army tactical operations. In view of these joint responsibilities, and in order to more accurately determine the present status of the meteorological equipment that is suitable for Army tactical operations, it is requested that the Signal Corps in conjunction with the Air Weather Service conduct an investigation of currently available surface weather observing equipment.

6. The investigation should include:

a. A determination of the surface weather observing equipment now available within Army and Air Force supply channels. It should investigate the suitability of each type of equipment for Army tactical use; and, if suitable, then determine the quantities of each type available, where available, and the condition of the equipment. It may be necessary to actually conduct a short field test of some of the equipment in order to determine its condition and suitability for tactical use.

b. A consideration of equipment that is currently in use by the other weather services and "off the shelf" commercial items, and a determination whether these items are suitable for use in support of Army tactical operations.

7. The final report should include, but not necessarily be limited to the items enumerated in the preceding paragraph. Within the recommendations there should be complete lists of equipment required for use in support of Army tactical operations by both organic Army elements and AWS units, using: (a) only equipment of a type available in Army and Air Force channels; and (b) where desirable, adding items that could be obtained by purchase from other sources, paragraph 6 above, to include those requiring modification for Army tactical use. Items requiring modification should be so indicated.

8. Recommended investigation is needed at as early a date as possible. Upon receipt of OCSigO comments, including suggested date of completion, this headquarters will write the AWS requesting participation in the joint project.

FOR THE COMMANDER:

ALBERT ABRAHAM, III
1st Lt, AGC
Assistant Adjutant General

2 Incl
as

Ltr, Hq USCONARC (ATINT-DSD 000.9), 10 Apr 61, Meteorological Equipment for Army Tactical Operations

1st Ind (AWSOP)

5 MAY 1961

Hq AWS, Scott AFB, Ill

TO: Hq USCONARC, Ft Monroe, Va

1. We intend that the 2d Weather Group will be the primary coordinator and point of contact for our participation in this proposed investigation. This procedure should expedite the actions necessary to a successful completion of the program. This headquarters will furnish representation to the orientation meeting at Ft Monroe to insure an understanding of your objectives, the background of the problem and determining an approach for its resolution.

2. We are limited functionally in directly supporting all facets of your investigation but are willing to act as an intermediary with other Air Force agencies as may be necessary. This is because we are not assigned overall responsibilities for the full area of discussion. Responsibility for AF systems and equipment development now lies with the Air Force Systems Command, thus any determination of suitability of off-the-shelf items rests with that command. Equipment available in the USAF inventory primarily will be the depot stocks available within the Air Logistic Command system. Equipments available within the Air Weather Service are normally fully committed against known requirements. A portion of these commitments is allocated to support of stated Army requirements.

3. We consider it appropriate for this initial meeting to be held with representatives of the 2d Weather Group and our headquarters as planned. As specific requirements for surveys or determinations of suitability of specific equipments arise during the course of the investigation that require the assistance of other than the 2d Weather Group or this headquarters, the required actions will be initiated within USAF channels.

4. Request you confirm the date and location for your meeting and provide instructions for submission of security clearance information.

FOR THE COMMANDER

C E ROACHE
Colonel, USAF
DCS/Operations

3 Atch
w/d

Copy to:
2 Wea Gp

INCLOSURE 2

HEADQUARTERS
UNITED STATES CONTINENTAL ARMY COMMAND
FORT MONROE, VIRGINIA

ATINT-D&D 000.9 10 APR 1961

SUBJECT: Meteorological Equipment for Army Tactical Operations

TO: Commanding General
Headquarters, Air Weather Service
Scott Air Force Base, Illinois

1. References:

a. "Joint US Army - US Air Force Doctrine for the Provision of Weather Support to the US Army," HQ USCONARC, HQ 2d Weather Group, 5 January 1960, Inclosure 1.

b. "Equipment and Supplies for Air Weather Service Tactical Weather Stations Supporting the US Army," HQ USCONARC, HQ 2d Weather Group, 15 June 1960, Inclosure 2.

c. Letter, ATINT-D&D 000.9, HQ USCONARC to CSigO, 27 January 1961, subject: "Integrated Meteorological System," Inclosure 3.

2. The organization of Air Weather Service (AWS) units for tactical Army support, as proposed in Annex A of document, Inclosure 1, was used to prepare mobilization requirements of the Army for such AWS units. These requirements were approved by both Department of the Army and Department of the Air Force.

3. In recognition that a weak link in the tactical meteorological support plans is the equipment for surface weather observations, document, Inclosure 2, was prepared for joint Department of the Army/Department of the Air Force consideration. It was realized that certain items of the listed equipment are approaching obsolescence and not still in production, yet nothing else was known to be available in Army or Air Force supply channels.

4. Modernized meteorological equipment for Army tactical operations eventually will be available in the Integrated Meteorological System. For the present, however, it is questionable to what extent available meteorological equipment will meet Army mobilization requirements. The manner in which the present supply of equipment is scattered between Army and Air Force supply channels and even within several of the Army technical services, adds to the complexity of the problem.

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ATINT-D&D 000.9
SUBJECT: Meteorological Equipment for Army Tactical Operations

5. As discussed in letter, Inclosure 3, meteorological observations of surface conditions are made by both Army and AWS personnel during Army tactical operations. In view of these joint responsibilities, and in order to more accurately determine the present status of the meteorological equipment that is suitable for support of Army tactical operations, it is requested that the Air Weather Service participate with the US Army Signal Corps in an investigation of currently available surface weather observing equipment. It is estimated that such an investigation will require six months to complete.

6. The investigation should include:

a. A determination of the surface weather observing equipment now available within Army and Air Force supply channels. It should investigate the suitability of each type of equipment for Army or AWS tactical use; and, if suitable, then determine the quantities of each type available, where available, and the condition of the equipment. It may be necessary to actually conduct a short field test of some of the equipment in order to determine its condition and suitability for tactical use.

b. A consideration of equipment that is currently in use by the other weather services and "off the shelf" commercial items, and a determination whether these items are suitable for use in support of Army (or Air Force) tactical operations.

7. The final report should include, but not necessarily be limited to the items enumerated in the preceding paragraph. Within the recommendations there should be complete lists of equipment required for use in support of Army tactical operations by both organic Army elements and AWS units, using: (a) only equipment of a type available in Army and Air Force channels; and (b) where desirable, adding items that could be obtained by purchase from other sources, paragraph 6, above, to include those requiring modification for Army tactical use. Items requiring modification should be so indicated.

8. If Headquarters, Air Weather Service agrees to participate in this investigation, it is recommended that a meeting, to insure proper orientation of the personnel conducting the project, be held at Fort Monroe, Virginia, on 16-17 May 1961, with representatives from Headquarters, AWS, the US Army Signal Corps, Headquarters, USCONARC, and Headquarters, 2d Weather Group participating.

ATINT-D&D 000.9
SUBJECT: Meteorological Equipment for Army Tactical Operations.

9. This correspondence is marked FOR OFFICIAL USE ONLY solely because of the addition of Inclosure 3. When this inclosure is removed protective marking will be cancelled.

FOR THE COMMANDER:

LEE L. STEWART
Lt Col, AGC
Asst Adj Gen

w/d 3 Incl
as

Copies furnished: (w/o incl)
CSigO, DA
Comdr, 2d Wea Gp

CONFERENCE
METEOROLOGICAL EQUIPMENT
FOR
ARMY TACTICAL OPERATIONS
16-17 MAY 1961

ROSTER OF CONFEREES

Lt Col R. F. Durbin	HQ AWS, Scott AFB, Ill.
Mr. J. F. Snow	HQ AWS, Scott AFB, Ill.
Mr. V. S. Hardin	HQ AWS, Scott AFB, Ill.
Maj G. D. Dean	OCSigO, DA, Washington 25, D.C.
Mr. L. A. Jay	USAEPG, Ft Huachuca, Arizona
Mr. E. C. Rengers	USAEPG, Ft Huachuca, Arizona
Lt Col L. M. Grisham	HQ 2d Weather Group, LAFB, Va.
Maj C. E. Autry	HQ 2d Weather Group, LAFB, Va.
CWO E. W. Wiggins	HQ 2d Weather Group, LAFB, Va.
Lt Col J. Chrietzberg, Jr.	HQ USCONARC, Ft Monroe, Va.
Lt Col W. L. Hogan, Sr.	HQ USCONARC, Ft Monroe, Va.
Lt Col T. W. Lane	HQ USCONARC, Ft Monroe, Va.
CWO M. L. Crowder	HQ USCONARC, Ft Monroe, Va.
Mr. D. A. Lawson, Jr.	HQ USCONARC, Ft Monroe, Va.

DETAIL WORKING PLAN

1. Review of field army meteorological observing requirements.

a. Use USCONARC's 1959 requirements and USAEPG's Phase I report as guidance.

b. Determine the type and number of units requiring meteorological equipment (observing).

c. List all the meteorological information within specified limits required.

(1) The following list includes parameters for consideration and may not be necessarily complete.

(a) Amount of clouds.

(b) Height of cloud bases.

(c) Height of cloud tops.

(d) Dewpoint.

(e) Relative humidity.

(f) Precipitation (type, intensity, amount).

(g) Pressure (and at surface; altimeter).

(h) Temperature (ambient, max & min).

(i) Visibility (horizontal, slant; visual range).

(j) Wind velocity (and at surface).

(k) Wind velocity (surface to 1500').

(l) Air density and density altitude.

(m) Thunderstorms (intensity, location, movement).

(n) Surface conditions (water and snow depths).

(o) Sea Water temperature.

(p) Wind chill.