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28 July 1970

Materiel Test Procedure 6-4-004
U. S. Army Arctic Test Center

U. S. ARMY TEST AND EVALUATION COMMAND
ENVIRONMENTAL TEST PROCEDURE

ARCTIC ENVIRONMENTAL TEST OF TACTICAL RADIO COMMUNICATIONS EQUIPMENT

1. OBJECTIVE

The objective of the procedures outlined in this MTP is to provide a means of evaluating the performance, safety, human factors engineering, maintainability and reliability aspects of Tactical Radio Communications Equipment under arctic winter environmental conditions.

2. BACKGROUND

Tactical Radio Communications Equipment supply a vital communications link between operational field units and command headquarters. This equipment may be man carried or vehicle mounted during combat operations depending on the communication needs and the availability of equipment. Because of its military importance Tactical Radio Communications Equipment must perform reliably under all environmental conditions including those of the arctic winter.

Testing in a natural arctic winter environment is used to substantiate the simulated environmental test data acquired during engineering or service testing. Natural environmental testing is generally not authorized until data from simulated environmental tests provides reasonable assurance that the test item will function satisfactorily when subjected to the conditions that would be encountered in the arctic.

3. REQUIRED EQUIPMENT

- a. Arctic Winter Uniform as specified in MTP 10-4-500.
- b. 180 Day Maintenance Package to support test items plus additional parts of known vulnerability in Arctic Conditions, such as Rubber and Soft Plastic, Electrolytic Capacitors, etc.
- c. Maintenance Support Facility.
- d. Support Vehicles, with Drivers (wrecker on call).
- e. Voltmeters.
- f. Field Strength Meters.
- g. Lightmeter.
- h. Ohmmeter.
- i. Ammeter.
- j. RF Power Meter.
- k. Noise Measuring Sets.
- l. Other Instrumentation (peculiar to the item being tested).
- m. Weighing Scales.
- n. Still and Motion Picture Cameras with Associated Photographic Equipment (black and white or color).
- o. Meteorological Support Instrumentation.
- p. Standard Type Radio-Wire Integration Equipment.
- q. Standard Remote Control Equipment.
- r. Maintenance Capabilities (organizational, direct, and general

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support with qualified personnel).

s. General and Special Tools and Ancillary Items required for repairs or maintenance on the test item.

t. Skis and Snowshoes.

4. REFERENCES

- A. AR 70-8, Human Factors and Social Sciences Research.
- B. AR 70-10, Test and Evaluation During Research and Development of Materiel.
- C. AR 70-38, Research, Development, Test and Evaluation of Materiel for Extreme Climatic Conditions.
- D. AR 705-5, Army Research and Development.
- E. AR 750-6, Maintenance Support Planning.
- F. USATECOM Regulation 350-6, Training in New or Modified Equipment and Training Devices.
- G. USATECOM Regulation 385-6, Verification of Safety of Materiel During Testing.
- H. USATECOM Regulation 700-4, Reliability Program for USAMC Materiel.
- I. USATECOM Regulation 750-15, Maintenance of Supplies and Equipment - Maintenance Portion of the Service Test.
- J. USAMC Regulation 700-38, Correction of Defects Found During Materiel Life Cycle Testing.
- K. USAMC 385-224, AMC Safety Manual.
- L. USAMC Regulation 385-12, Verification of Safety of Materiel from Development through Testing and Supply to Disposition.
- M. MTP 3-2-503, Safety Evaluation of Electrical and Electronic Equipment.
- N. MTP 6-1-001, Testing Communication, Surveillance and Avionic Elec. Equip.
- O. MTP 6-2-110, Handset, Telephone.
- P. MTP 6-2-115, Handset, (Earphones).
- Q. MTP 6-2-242, Receiver - Transmitter, General.
- R. MTP 6-2-250, Relays, Radio.
- S. MTP 6-2-288, Terminals, Radio.
- T. MTP 6-2-326, Wire and Cable.
- U. MTP 6-2-327, Cable and Wire Dispensers.
- V. MTP 6-2-329, Reeling Machines.
- W. MTP 6-2-502, Human Factors Engineering.
- X. MTP 6-2-503, Reliability.
- Y. MTP 6-2-504, Maintenance/Reliability.
- Z. MTP 6-2-507, Safety.
- AA. MTP 6-3-170, Loudspeakers.
- AB. MTP 6-3-329, Reeling Machines.
- AC. MTP 6-3-502, Personnel Training Requirements.
- AD. MTP 6-3-523, Safety.
- AE. MTP 6-3-524, Maintenance Evaluation.
- AF. MTP 6-3-525, Human Factors.
- AG. MTP 7-3-085, Helmets (Aviation).
- AH. MTP 10-3-206, Helmets, Combat Vehicle Crewmans.

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AI. MTP 10-4-500, Arctic Environmental Testing, Preoperational Inspection, Physical Characteristics, Human Factors, Safety and Maintenance Evaluation.

5. SCOPE

5.1 SUMMARY

The procedures outlined in this MTP provide general guidance for the conduct of arctic environmental testing of selected Tactical Radio Communications Equipment, and are applicable in some degree to all materiel subjected to such tests. Specific procedures and testing requirements will be determined by the discrete characteristics and performance requirements of the individual item under test.

The specific subtests to be performed and their intended objectives are listed below:

a. Preoperational Inspection and Physical Characteristics - The objective of this subtest is to determine:

- 1) If the test items are in proper condition for testing.
- 2) If the test item's physical characteristics conform to applicable criteria.
- 3) If the maintenance package (spare parts, special tools, test gear, manuals) is complete.

b. Arctic Mounting - The objective of this subtest is to determine if the test item and its auxiliary equipment, modified with appropriate arctic winterization kit will permit installation and efficient operation from its intended vehicle.

c. Vehicle Winterization Kits - The objective of this subtest is to determine if the winterization kits, designed to operate under intermediate environmental conditions, enable the test item to operate properly under arctic winter conditions.

d. Short Range Communications - The objective of this subtest is to determine if the test item will transmit and receive voice and teletype traffic (if applicable) satisfactorily from a specified minimum to a specified maximum range under arctic winter conditions.

e. Frequency Stability - The objective of this subtest is to determine if the frequency circuits and controls of the test item will provide frequency stability when employed at specified communications ranges under arctic winter conditions.

f. Continuous Operation - The objective of this subtest is to determine the suitability of the test item for continuous operation in an arctic winter environment.

g. Compatibility - The object of this subtest is to determine if the test item can transmit to and receive from another test item when turned to the same frequency and the operational compatibility with standard items and their components.

h. Remote Operation - The objective of this subtest is to determine

the suitability of the test item for remote operation with remote control equipment.

i. Mobile Operations - The objective of this subtest is to determine whether the test item will transmit and receive voice and teletype (if applicable) traffic satisfactorily while in motion over various types of terrain.

j. Manpack Operation (if applicable) - The objective of this subtest is to determine if the test item will provide communications by ground wave at all ranges up to its specified range using portable omni-directional antenna without special siting.

k. Reaction Time - The objective of this subtest is to determine the reaction time of the test item under arctic winter conditions.

l. Accessories - The objective of this subtest is to determine whether the operating accessories furnished with the test item are suitable and adequate for arctic winter conditions.

m. Battery Power Supplies - The objective of this subtest is to determine the length of time the power supply for the test item can provide continuous operation under arctic winter conditions.

n. Human Factors - The objective of this subtest is to determine the human factors of the test items under arctic winter environmental conditions.

o. Safety - The objective of this subtest is to determine the safety aspects of the test items under arctic winter environmental conditions.

p. Maintenance Evaluation - The objective of this subtest is to determine if the test items meet the maintenance requirements as defined by Qualitative Material Requirements (QMR), Small Development Requirements (SDR), and Technical Characteristics (TC), and/or other established criteria under arctic winter environmental conditions.

q. Reliability - The objective of this subtest is to determine the reliability of the test items under arctic winter environmental conditions.

5.2 LIMITATIONS

Because of the scope and complexity of the equipment, it is not possible to include all of the details. The reader should consult the references listed in this MTP and the individual requirement specifications in the MTP for additional data that will aid in conducting tests. Procedures are intentionally made general to provide tests that are applicable to a variety of systems and test conditions. Not all of the subtests presented are applicable to all test items. The test officer must select, adapt and even combine tests as appropriate to the discrete characteristics of the test item. This procedure is applicable only to test items in the ground mode and not as a part of an aircraft system.

6. PROCEDURES

6.1 PREPARATION FOR TEST

a. Since arctic winter environmental tests are normally scheduled from October through March (6 months), ensure that the test items are delivered to the Arctic Test Center prior to 1 October. Any delay in the test schedule will be reported to TECOM headquarters and a revised schedule requested. The test schedule will reflect an estimate of net testing time required for each

subtest.

b. When necessary to augment assigned personnel, ensure the availability of TDY personnel and their training to the degree that they are as proficient on the individual test items as the troops who will use the equipment in the field. Assigned personnel shall prepare the plan of test, supervise and conduct the test, gather test data, and report the results of the test.

c. Ensure that all test personnel are familiar with required technical and operational characteristics of the test item under test, such as stipulated in Qualitative Materiel Requirements (QMR's), Small Development Requirements (SDR's), and Technical Characteristics (TC's) and record the criteria in the test plan. A familiarization class shall be given to all test personnel by the test officer.

d. Ensure that all personnel receive New Equipment Training (NET) as referenced in paragraph 4F.

e. Review all instructional material issued with the test item(s) by manufacturer, contractor, or government agencies, as well as reports of previous tests conducted on the same type of equipment and familiarize all test personnel with such documents.

f. Select test equipment ideally having an accuracy 10 times greater than that of the specified tolerances of the function(s) to be measured.

g. Prepare record forms for systematic entry of data, chronology of tests, and analysis in final evaluation.

h. Prepare adequate safety precautions to provide safety for personnel and equipment (refer to MTP 3-2-503). Ensure that all safety SOP's are observed throughout the test. Ensure that a safety release has been obtained prior to test conduct.

i. Outfit all personnel in appropriate arctic uniform as described in MTP 10-4-500.

j. Record the prevailing meteorological conditions during test conduct, to include:

- 1) Temperature
- 2) Humidity, relative or absolute
- 3) Temperature gradient
- 4) Atmospheric pressure
- 5) Precipitation
- 6) Solar radiation
- 7) Wind speed and direction
- 8) Frequency of Readings
- 9) Source of data

k. Upon notice of arrival of the test item(s) or the estimated time of arrival, select and schedule the use of testing sites, facilities and equipment as required by the applicable subtest and/or corresponding MTP.

6.2 TEST CONDUCT

6.2.1 Preoperational Inspection and Physical Characteristics

a. Upon receipt, carefully inspect all test and comparison items and their shipping or packaging containers for completeness, damage, and general

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condition, in accordance with the applicable reference MTP's.

- b. Note the physical characteristics of the test item and/or any components thereof in all obtainable configurations.
- c. Record the nomenclature and manufacturer's name of the test items.
- d. Take photographs of the test item, if required.
- e. Note all discrepancies, corrective action necessary, and other information pertinent to the discrepancies.
- f. Ensure test item is properly assembled, secured, cleared, and correctly adjusted. Record any necessary corrective action.

6.2.2 Arctic Mounting

- a. Mount the test item (and place the components) in their respective vehicles, modified with the appropriate arctic winterization kits.
- b. Record the following data:
 - 1) Any damage to equipment attributed to the mounting and placement of the test items.
 - 2) Any difficulties encountered by the operating personnel.

6.2.3 Vehicle Winterization Kits

- a. Cold-soak the test items installed or stored on a suitable vehicle as appropriate.
- b. Measure the initial internal and outside temperatures of the test item(s) after cold-soak.

NOTE: The initial internal temperatures of the test item after cold-soak shall match the outside ambient temperatures.

c. Prepare and operate the vehicle winterization kits in accordance with applicable instructions.

d. Warmup the test item until the internal temperature of the test item(s) reaches its maximum possible value or it reaches at least the test items minimum operating temperature.

NOTE: The recorded warmup time shall indicate the total time required for the internal temperature to reach its maximum possible value or to reach the test item's minimum operating temperature, whichever occurs first.

e. Direct soldiers to operate the test item(s) in accordance with the applicable instructions.

f. Record the following data:

- 1) Any difficulty of failure of the winterization kits that affect efficient operation of the test item.
- 2) Initial and final warmup temperatures; both inside and outside.
- 3) Warmup time in minutes.

6.2.4 Short Range Communications

- a. Cold-soak the test items a minimum of 24 hours at ambient air temperatures below 0°F prior to being tested.
- b. Establish a two station net using one test item as a base station and the other test item as an out station.
- c. Locate the out station at various distances (separation distances) from the base station.
- d. Operate the test items during daylight and darkness using all modes of operation.
- e. Separation distances and length of operation shall be as follows:
 - 1) Five mile increments from 20 to 50 miles with 5 to 10 minute operation time, during prescribed temperature conditions.
 - 2) Ten mile increments from 50 miles to greater distances with 10 to 15 minute operation time, during prescribed temperature conditions.
- f. Use frequencies as appropriate for time of day, separation distances, terrain features, ground conductivity and propagation conditions.
- g. Use all applicable antenna configurations as appropriate.
- h. Record the following data:
 - 1) Data required in operator's log sheet and frequencies used (Appendix A).
 - 2) Separation distances between stations.
 - 3) Location of each station.

6.2.5 Frequency Stability

NOTE: Throughout the conduct of all subtests, particular attention shall be given to the frequency stability of the test items during mobile and stationary operations.

- a. Use four frequencies from the high, middle and low portion of the test items frequency range during this subtest.
- b. Utilizing two test sets direct soldiers to warmup the test items from a cold start at prevailing ambient temperatures.
- c. Employ one test item as the test set while the other as the control set.
- d. Warmup period for the test sets shall include:
 - 1) Cold start from equipment temperatures that match ambient external temperatures.
 - 2) Cold start from equipment temperatures that have achieved maximum or comfortable level as rendered by the winterization kit.
- e. Make frequency changes after operational readiness has been established, as applicable.
- f. Utilizing the appropriate test equipment, record the following data:

- 1) Any evidence of frequency drift or instability.
- 2) Frequencies utilized.
- 3) Warmup period required for frequency stability in minutes.
- 4) Initial and final warmup temperatures, both internal and external.
- 5) Record of ambient temperatures.
- 6) Time required to obtain prelogged frequency changes in minutes.
- 7) Time required to establish operational readiness after a frequency change is made.

6.2.6 Continuous Operation

- a. Operate the test items for three 24 hour periods.
- b. If applicable, each of the operating periods listed in step a, above shall include a minimum of 20 percent of the operation time with the test item in its respective vehicle, in motion on hard surface and secondary roads.

NOTE: Preventive maintenance of the test items shall not be performed during these 24 hour periods.

- c. Turn the test items off only if a failure occurs.
- d. Record the following data:
 - 1) Difficulties encountered and interrupted operation.
 - 2) Total cumulative hours of operation of the components of the test items (Appendix A).

6.2.7 Compatibility

- a. Using two or one test item and a standard item and their components with which the test item is to be compatible, whichever is applicable, set up a two station network.
- b. During daylight and darkness attempts shall be made to establish communications using four different frequencies representative of the low, middle and upper portion of the test items frequency range.
- c. Utilize all appropriate antenna configurations.
- d. Determine the operational compatibility of the test item with standard items and their components, if applicable.
- e. Record the following data:

- 1) Any evidence of weak signal reception in the test net. Weak signal reception will be defined as any reception which cannot be completely understood by the receiver operator.
- 2) Difficulties encountered.
- 3) Instances of incompatibility between test items and between test items and standard items.

6.2.8 Remote Operation

- a. Establish a two station net using two test items or one test item and a standard item with a specified separation distance between stations.
- b. Transmit test messages between stations in a voice mode.
- c. Use the appropriate Receiver-Transmitter Control Group to remote the test item.
- d. Connect the local control unit of the control group to the appropriate remote connector of the test item and to the remote control unit over various lengths of field wire.
- e. Repeat steps a. through d. for an appropriate Radio Set Control to allow control of the test item in a radio/wire integrated circuit.
- f. Connect the Radio Set Control Group to a switchboard and extended to a telephone.
- g. Record the following data:
 - 1) Distances over which voice, CW, and teletypewriter modes operated using the Receiver-Transmitter Control Group and the Radio Set Control without noticeable degradation of the receive or transmit signals.
 - 2) Any difficulties encountered.

6.2.9 Mobile Operation

- a. Use the test item acting as an out station to transmit and receive voice and radio-teletype signals, if applicable, while operating in a moving vehicle.
- b. Transport the test item in an appropriate vehicle over flat and rolling terrain for a minimum of 10 miles on hard surface roads and 10 miles on secondary roads.
- c. Repeat step b. four times during specified temperature ranges using frequencies representative of the low, middle and high portion of the test item's frequency range.
- d. Record the following data:
 - 1) Any difficulty or failure encountered during mobile operation and whether it was on the outgoing or incoming leg of the course.
 - 2) Frequency utilized in each phase of testing.
 - 3) Distance and average speed traveled over each type terrain.

6.2.10 Manpack Operations (If Applicable)

- a. Cold-soak the test items a minimum of 12 hours at temperatures below 0°F before start of testing.
- b. Establish a two station net using an out station and a base station.

NOTE: Both stations shall be in manpack configuration.

- c. Locate the out station at various separation distances from the base station over terrain representative of flat open, flat dense woods, moderate hills and ravines.

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d. If appropriate, the out station shall transmit and receive in the standing, kneeling and prone positions.

e. If appropriate, repeat steps a. through d. using different representative frequencies of the test item.

f. Record the following data:

- 1) Separation distances between stations.
- 2) Type of terrain.
- 3) Clarity and volume of received messages (clear, unclear, weak, normal, strong).
- 4) Frequency utilized during each test.
- 5) If applicable, the transmitting and receiving position (standing, kneeling, prone).

6.2.11 Reaction Time

a. Conduct this subtest in temperatures of 0°F to -40°F and in -40°F and below.

b. Cold-soak two test items a minimum of 24 hours, in temperatures below 0°F before the start of testing.

c. Turn-on one of the test items and operate it for a minimum of 5 minutes.

d. Turn-on the other test item and allow it to warm-up until its signal is received by the receiver listed in step c. above.

e. Repeat step d. above, using different frequencies, if appropriate.

f. Using the appropriate test equipment measure and record the following data:

- 1) Reaction time
- 2) Length of cold soak period
- 3) Frequencies utilized

6.2.12 Accessories

a. Observe the suitability and adequacy of accessories such as antennas, handsets, microphones, earphones and loudspeakers through the conduct of all testing.

b. Record the following data:

- 1) List of accessories.
- 2) Observations, identified by subtest, accessory and indications of unsuitability.

6.2.13 Battery Power Supplies

a. Use new batteries to power the test item.

b. Cold-soak the test items a minimum of 12 hours in temperatures below 0°F before the start of any testing.

c. Conduct this subtest using cold-soaked or warm-soaked batteries or both as appropriate.

NOTE: If warm-soaked batteries are used they shall be warm-soaked for a minimum of 8 hours at room temperature or as specified by the developer.

d. Measure the initial battery output voltages, also measure the voltages before and after each test period.

e. Measure the initial transmitter RF power output, measure the power before and after each test period.

f. Utilizing the manpack configuration operate two test items continuously using a separation distance representative of its specified maximum range for three periods of 1-minute transmit/10-minutes standby receive until the batteries will no longer effectively power the sets (when transmitter power output has been decreased 50 percent, or when frequency instability occurs, or upon any other evidence of unsatisfactory power).

g. Using the appropriate test equipment record the following data:

- 1) Length of cold-soak of test item prior to operation.
- 2) Length of warm-soak.
- 3) Separation distance.
- 4) Battery voltage at beginning and end of each test cycle.
- 5) Length of effective battery life.
- 6) Measured RF output at beginning and end of each test period.
- 7) Intermittent or broken reception at radio receivers while operating in the squelch position, or a weak signal while operating in the unsquelched position.

6.2.14 Human Factors

a. Conduct all Human Factors Tests in accordance with applicable sections of MTP 10-4-500, AR 70-8, MTP 6-2-502, and MTP 6-3-525.

b. Conduct this subtest concurrently with operational subtests in the MTP.

c. Determine if the test item is compatible with the skills, aptitudes, and limitations of the personnel who will operate and maintain this equipment under arctic winter environmental conditions.

d. Determine if all accessories and components of the test item and the test item as a whole, enable or allow easy operation by test personnel wearing the appropriate arctic winter uniform.

e. Observe and record any and all major or minor tasks that are difficult or impossible to accomplish on or with the test item under arctic winter environmental conditions.

6.2.15 Safety

a. Conduct all Safety Tests in accordance with applicable sections of MTP 10-4-500, USATECOM Regulation 385-6, USAMC Regulation 385-12, MTP 3-2-503, MTP 6-2-507, MTP 6-3-523, and USAMC 385-224.

b. Conduct this subtest concurrently with operational subtest in this MTP.

c. Determine if the test item is safe for United States Army use under arctic winter environmental conditions.

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d. Prepare adequate safety precautions to provide safety for personnel and equipment, and ensure that all safety SOP's are observed throughout the test. Ensure that a Safety Release has been obtained prior to test conduct.

e. Determine if all accessories and components of the test item and the test item as a whole, can be operated safely by test personnel wearing the appropriate arctic winter uniforms.

f. Observe and record any and all major or minor tasks that are difficult or impossible to accomplish safely on or with the test item under arctic winter environmental conditions.

6.2.16 Maintenance Evaluation

NOTE: Classifications and definitions of malfunctions shall be as approved and commonly defined by all USATECOM testing agencies.

a. Conduct all maintenance evaluation tests in accordance with applicable sections of MTP 10-4-500, AR 750-6, USATECOM Regulation 750-15, MTP 6-2-504, and MTP 6-3-524.

b. Conduct this substest concurrently with operational substests in this MTP.

c. Throughout the conduct of all testing as outlined in this MTP, maintain a record of performance of all scheduled and unscheduled maintenance as prescribed in the appropriate draft publications.

NOTE: Whenever possible, maintenance shall be performed under prevailing arctic environmental conditions. Reasons why this is not possible shall be recorded.

d. Continuously monitor all maintenance operations for human factors, safety implications, and to determine if ease of maintenance has been included in design of the equipment.

e. Compare all replacement parts and components, provided with the test item, with anticipated and actual requirements, evaluating spare parts requirements under arctic environmental conditioning.

f. Record the following information:

- 1) Scheduled and unscheduled maintenance performed, to include lubrication, adjustments, repairs, and replacement of parts.
- 2) Favorable and unfavorable aspects of maintenance.
- 3) Unsafe and inadequate aspects of maintenance operations.
- 4) Mean time between failures (MTBF) and the mean time to repair (MTTR) the test weapons and associated equipment.
- 5) Repair parts usage.
- 6) Human factors implications.

g. During performance of maintenance, utilize all common and special tools and test equipment furnished with the items under test, and record the following data:

- 1) Maintenance operations for which special tools are required.

- 2) Common and special tools and test equipment required, but not furnished in the maintenance package.
- 3) Tools and test equipment furnished but not required.

h. Thoroughly analyze all publications provided with the test items for clarity and simplicity of maintenance instructions, and completeness of preventative maintenance procedures.

i. Monitor all maintenance operations to determine if instructions and the sequence of operations are adequate for the level of training possessed by appropriate maintenance personnel, or if added or special training is required.

j. Record the following data:

- 1) Accuracy and adequacy of maintenance publications.
- 2) Requirements for special training and maintenance category requiring special training.
- 3) Errors and omissions in nomenclature and parts numbers on repair parts lists.
- 4) Unclear and inadequate maintenance instructions.
- 5) Inadequate safety instructions for personnel and equipment, including environmental protection during operation and maintenance.
- 6) Desirable changes and comments.

6.2.17 Reliability

a. Conduct all reliability tests in accordance with applicable sections of USATECOM Regulation 700-4, and MTP 6-2-503.

b. Conduct this subtest concurrently with operational subtests in this MTP.

6.3 TEST DATA

All test data to be recorded shall be as specified in the individual subtests of this MTP.

6.4 DATA REDUCTION AND PRESENTATION

Processing of raw test data shall, in general, consist of organizing, marking for identification and correlation, and grouping the test data according to test title.

Specific instructions for the reduction and presentation of individual test data are outlined in the succeeding paragraphs.

6.4.1 Preoperational Inspection and Physical Characteristics

Preoperational inspection and physical characteristics data shall be reduced and presented in accordance with MTP 10-4-500.

6.4.2 Arctic Mounting

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Evaluate recorded data and relate results of evaluation for efficient winter mounted operations of the test item and its ancillary equipment from its intended vehicle.

6.4.3 Vehicle Winterization Kits

Evaluate recorded data and relate results of evaluation to determine if the vehicle winterization kits (designed to operate under environmental conditions) enable the test items to operate properly under arctic winter conditions.

6.4.4 Short Range Communications

Evaluate recorded data and relate results of evaluation to determine if two test items can communicate with each other from a specified minimum range to a specified maximum range under arctic winter conditions.

6.4.5 Frequency Stability

Evaluate recorded data and relate results of evaluation to the frequency stability of the test items during mobile and stationary operations under arctic winter conditions.

6.4.6 Continuous Operation

Data recorded in paragraph 6.2.6 continuous operation shall be reviewed and the ease of operation shall be evaluated.

6.4.7 Compatibility

Evaluate recorded data and relate results of evaluation to determine the operational compatibility of the test item with standard items and their components.

6.4.8 Remote Operation

Evaluate recorded data and relate results of evaluation to distances at which reliable communications is achieved.

6.4.9 Mobile Operation

Evaluate recorded data and relate results of evaluation to determine whether the test item will operate while in motion over various types of terrain.

6.4.10 Manpack Operation (if applicable)

Evaluate recorded data and relate results of evaluation to determine if the test item will provide communications by ground wave at all ranges up to its specified range using portable omni-directional antenna without special siting.

6.4.11 Reaction Time

Examine the recorded data and evaluate the reaction time of the test item under arctic winter conditions.

6.4.12 Accessories

Evaluate recorded data and relate results of evaluation to determine whether the operating accessories furnished with the test item are suitable for arctic winter conditions.

6.4.13 Battery Power Supplies

Evaluate recorded data and relate results of evaluation to determine the length of time the power supply for the test item can provide continuous operation under arctic winter conditions.

6.4.14 Human Factors

Human factors shall be reduced and presented in accordance with MTP 10-4-500.

6.4.15 Safety

Safety data shall be reduced and presented in accordance with MTP 10-4-500.

6.4.16 Maintenance Evaluation

Maintenance data shall be reduced and presented in accordance with MTP 10-4-500.

6.4.17 Reliability

Reliability data shall be reduced and presented in accordance with MTP 10-4-500.

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APPENDIX A

TABLE 1 -- Radio Operator's Log

DATE/TIME _____

OPR 's NAME: _____

<p>STRENGTH</p> <p>(1) Scarcely perceptible</p> <p>(2) Weak</p> <p>(3) Fairly good</p> <p>(4) Good</p> <p>(5) Very good</p>	<p>READABILITY</p> <p>(1) Unreadable</p> <p>(2) Readable now and then</p> <p>(3) Readable w/difficulty</p> <p>(4) Readable</p> <p>(5) Perfectly readable</p>
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TRANSMITTING STATION			RECEIVING STATION	
Mode	SxR*	Xmt Msg. No.	ANTENNA: CW or Voice Message received or remarks (use back of page, if required).	LOCATION AND TEMPERATURE FREQUENCY

NOTE 1: Date time group, teletype mode and base or out station will be indicated on all received teletype messages and messages will be stapled to this log. Operators must account for all messages during each shift.

NOTE 2: All information regarding operation and performance of the test or control items is important and any observations will be recorded on the log under remarks.

* Indicate SxR (Strength and Readability) rating by selecting number appropriate to signal being tested. Example: maximum rating 5 x 5.

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TABLE 2 -- Daily Operating Time Log Sheet

Instructions: Indicate total hours of operation per day per component in space provided.

COMPONENTS	DATE	CUMULATIVE TOTALS

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