

INCH-POUND

MIL-A-49204A(CR)

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SUPERSEDING

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MILITARY SPECIFICATION

ANTENNA GROUP OE-254/GRC

This specification is approved for use by the Communications-Electronics Command, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 This specification covers production engineering, test and production of a broadband omni-directional VHF antenna system to be designated Antenna Group OE-254/GRC. The OE-254 is also referenced herein as: the antenna system.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standard, and handbooks. The following specifications, standards, and handbooks from a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Communications-Electronics Command, ATTN: AMSEL-ED-TM, Fort Monmouth, New Jersey 07703 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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MIL-A-49204A

SPECIFICATIONS

MILITARY

MIL-P-11268	Parts, Materials and Processes Used in Electronic Equipment
MIL-M-12320	Mast Base, Section and Adapter Kit
MIL-C-39012	Connectors Coaxial, Radio Frequency, General Specification for

STANDARDS

MILITARY

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts
MIL-STD-252	Wired Equipment, Classification of Visual and Mechanical Defects
MIL-STD-454	Standard General Requirements for Electronic Equipment
MIL-STD-810	Environmental Test Methods
MIL-STD-1472	Human Engineering Design Criteria for Military Systems, Equipment and Facilities

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from: Standardization Documents Order Desk, Bldg 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents, drawings and publications. The following other Government documents, drawings and publications form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

DRAWINGS

SC-D-17226	Bend Test Jig For Mast Sections MS-116A, MS-117A, MS-118A, AB-21/GR, AB-22/GR, AB-23/GR and AB-24/GR, Assembly
SC-D-17227	Bend Test Jig For Mast Sections MS-116A, MS-117A, MS-118A, AB-21/GR, AB-22/GR, AB-23/GR and AB-24/GR, Details

MIL-A-49204A

SC-D-17228	Bend Test Jig For Mast Sections MS-116A, MS-117A, MS-118A, AB-21/GR, AB-22/GR, AB-23/GR and AB-24/GR,
SC-GL-57620	Gages for Mast Section MS-117()
GL-SM-A-57621	Gages for Mast Section MS-116()
SC-GL-57626	Gages for Mast Section AB-24()/GR
SC-GL-323064	Gages for Mast Base AB-652()/GR
SM-B-659290	Guy Plate
SM-C-659375	Stake Assembly
SM-D-659410	Guy Assembly
DL-SM-B-944750	Antenna Group OE-254/GRC
DL-A3003195	Cable Assembly, Radio Frequency CG-1889C/U

(Copies of drawings, publications, and other Government documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.1.2 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

Electronic Industries Association Standard

RS-329	Minimum Standards for Land-Mobile Communication Antennas, Part I - Base or Fixed Station Antennas, Dec. 1966
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(Applications for copies should be addressed to the Electronic Industries Association, 2001 Eye Street NW, Washington, DC 20006).

2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First Article. Unless otherwise specified by the contract or purchase order, the contractor shall furnish First Article units in accordance with 4.3.

MIL-A-49204A

3.2 Construction. The equipment shall be constructed in accordance with the requirements of this specification and of Drawing and Data List DL-SM-B-944750 including the requirements for parts, materials, and processes thereon. In case of conflict between the requirements of the specification and the requirements of the drawings, the drawings shall govern.

3.3 Parts, Material, and Processes; General. In addition to the requirements of this specification, the requirement of MIL-P-11268, including selection requirement therein shall apply.

3.4 Configuration. The configuration of every Antenna Group OE-254/GRC on order shall include the following: (See 4.19.5)

<u>ITEM</u>	<u>QUANTITY</u>
Antenna AS-3166()/GRC	1 each
Transmission Line	1 each
Mast AB-1244 ()/GRC	1 each
Accessory Items	1 of each
Bag	1 each
Running Spares	1 set

3.4.1 Transmission Line. The Transmission line shall be Cable Assembly, Radio Frequency CG-1889 C/U (80 ft. 0 in.) in accordance with Data List A3003195. The cable assembly shall consist of RG-213/U Cable terminated at each end with RF Coaxial Connector M-39012/01-0007 per specification MIL-C-39012/1. (See 4.19.2)

3.5 Basic Antenna. The basic antenna shall be a radial biconical design having three equally spaced elements angled upward and three equally spaced elements angled downward from a feedcone structure. A field mast assembled from mating sections shall elevate the antenna and the antenna feed arrangement. The system shall be capable of continuous duty.

3.6 Electrical Requirements. The following electrical requirements apply to the completely assembled Antenna System, including the transmission line, unless otherwise stated.

3.6.1 Bandwidth. The assembled antenna system shall comply with all the following electrical characteristics, at all frequencies within the specified range of frequency coverage, without electrical tuning, switching, or physical adjustment.

3.6.2 Frequency Range. The frequency range of the antenna system shall be at least from 30 to 88 MHz.

MIL-A-49204A

3.6.3 Impedance. The reference load impedance for all measurements, at the end of the transmission line opposite the antenna, shall be 50 ohms, unbalanced to ground.

3.6.4 Free Space VSWR. Free space voltage standing wave ratio for the complete antenna system, including the transmission line, shall not exceed 3.0 to 1 in the frequency range of 30 to 88 MHz. (See 4.22.1)

3.6.5 Antenna Gain. Antenna Gain over the required frequency range shall be no less than 3 dB below the gain of the reference dipole antenna of 4.16. (See 4.21.4)

3.6.6 Radiation Pattern. In accordance with 2.5.2 of Electronic Industries Assoc Standard RS-329 over the frequency range of 30 to 84 MHz. Over the frequency range of 84 to 88 MHz, the relative gain in any azimuth direction shall not vary from the mean value by more +3 dB for 360 degrees of rotation. (See 4.18.5)

3.6.7 RF Power Level. Continuous duty RF power capability of the complete antenna system shall be 350 watts. (See 4.22.3)

3.6.8 Dielectric Withstanding Voltage. Insulation material in the feedcone structure and the insulating extension shall show no visible effects or evidence of dielectric breakdown due to an applied voltage of 10,000 volts after the system has been subjected to environmental stresses of the service conditions specified herein. (See 4.22.5)

3.6.9 Balun.

3.6.9.1 Power Rating. The balun shall be capable of continuous duty operation with a continuous wave input power of 350 watts, over the frequency range specified herein. (See 4.22.4)

3.6.9.2 Coupling Loss. Coupling loss through the balun shall not exceed 0.5 dB. (See 4.20.3 and 4.22.4)

3.6.9.3 Balun VSWR. VSWR at the input of the balun connector shall not exceed 2.0 : 1 in the frequency range 30 to 88 MHz to be consistent with the free space VSWR requirements of paragraph 3.6.4 for the complete system, when tested in accordance with paragraph 4.19.3. (See 4.22.4)

3.7. Mechanical Requirements. The following mechanical requirements shall apply.

3.7.1 Gages, Jigs and Fixtures. (See 4.20.4)

MIL-A-49204A

3.7.1.1 Gages. The contractor shall employ the following government furnished gages to test mechanical dimensions of the applicable threaded items.

GAGE LISTAPPLICABLE ITEM

SC-GL-3232064
SC-GS-57620
GL-SM-A-57621
SC-GL-57626

Feedcone Structure Sockets
MS-117/A
MS-116/A
AB-24/GR

3.7.1.2 Fixtures. The contractor shall furnish fixtures for measuring cone angle of the feedcone structure and for performing the structural integrity test of the feedcone.

3.7.2 Height. Height for the assembled antenna system from the mast base plate to the vertical center of the feedcone structure shall be no less than 30 feet and no greater than 32 feet.

3.7.3 Weight. Weight of the complete antenna system, with all parts and the technical manual stowed in the bag, shall not exceed 45 pounds, 8 ounces. Weight of the feedcone structure, including the balun, shall not exceed 3 pounds, 6 ounces. (See 4.20.1)

3.7.4 Transport Size. The outside dimensions of the closed bag, with all items properly stowed, shall not exceed 42 inches in length and 40 inches in perimeter. (See 4.20.2)

3.7.5 Interchangeability. The system shall provide for two-way interchangeability of parts. Selection of tolerances as shown on the drawings shall permit any part selected from one system, to be substituted into any other system of those on order without any problem of function or fit. Like units, assemblies and replaceable parts shall conform to Requirement 7 of MIL-STD-454. (See 4.20.4)

3.7.6 Uniformity. All units manufactured according to this specification shall be constructed from the same drawings, fabricated from the same tools, and assembled to the same procedures. (See 4.19.1 and 4.20.4)

3.7.7 Feedcone Structural Integrity. The feedcone structure shall be capable of withstanding, without damage or indication of separation, a tensile force of 2000 pounds applied in a manner to separate the two cones. This 2000 pound force shall be reduced to 1500 pounds for all Group "C" environmental post-tests. The feedcone structure shall also be capable of withstanding a tensile force of 250 pounds applied at the balun unbalanced connector and to the two cones in a manner tending to separate the balun from the feedcone structure. (See 4.20.5)

3.7.8 Air Pressure. The feedcone assembly shall be capable of maintaining an air pressure, applied at the air pressure test vent to test the balun seal points, to within 0.01 psi. (See 4.19.4)

MIL-A-49204A

3.8 Service Conditions. As a result of being subjected to the following environmental conditions, according to the methods set forth in the test schedules, the antenna system shall not exhibit any effect which would be harmful to performance or reliability. The parts of the system shall not be deformed, defaced, frayed in any manner or exhibit evidence of corrosion. Corrosion is any visible degradation that can be attributed to flaky, pitted, blistered or otherwise loosened finish or metal surface. Harmful electrical performance is performance below the test limits stated herein. (See 4.22.2)

3.8.1 Temperature.

3.8.1.1 High Temperature. (See 4.21.1)

3.8.1.1.1 Operating. The antenna system shall be operable without degradation in specified performance and shall sustain no physical deterioration, at ambient air temperature as high as 71 degrees, C (+160 F). This includes effects of solar radiation at a rate of 360 BTU/ft x ft/hr.

3.8.1.1.2 Storage and Transportation. The antenna system shall withstand exposure to ambient temperatures as high as 71 degrees, C (+160 F).

3.8.1.2 Low Temperature. (See 4.21.2)

3.8.1.2.1 Operating. The antenna system shall be operable without degradation in specified performance and shall sustain no physical deterioration at ambient air temperatures as low as -45.6 degrees, C (-50 F).

3.8.1.2.2 Storage and Transportation. The antenna system shall withstand exposure to ambient temperatures as low as 57 degrees, C (-70 F).

3.8.2 Humidity. The antenna system shall be operable without degradation in specified performance and shall sustain no harmful physical deterioration, during and after prolonged exposure to extreme high humidity levels encountered in tropical areas. (See 4.21.3)

3.8.3 Fungus. The antenna system shall show no evidence of viable fungus or corrosion when subjected to environmental conditions which would be favorable to their development, namely high humidity, warm atmosphere, and presence of inorganic salts. (See 4.18.2)

3.8.4 Salt Fog. The antenna system shall be capable of operation for extended periods in the saline atmosphere of a seacoast environment without harmful structural deterioration, without degradation in specified performance, without insulator breakdown and without electrical flashover. (See 4.18.3)

3.8.5 Dust. The antenna system shall be capable of operating for extended periods in a dry, windy (17 knots), sandy environment without harmful structural deterioration, without degradation in specified performance, without insulator breakdown and without electrical flashover. (See 4.18.4)

MIL-A-49204A

3.8.6 Bounce, Loose Cargo. The antenna system, disassembled and stowed in its bag, shall be capable of withstanding shocks and exposure to wear induced during field transport as loose cargo. Some wear to the bag is expected as a result of the test of 4.18.6. However, the bag shall not be frayed or torn to the extent that it ceases to perform its function of containing and protecting its contents.

3.8.7 Drop. The antenna system, disassembled and stowed in its bag, shall be capable of being repeatedly dropped a distance of 30 inches onto any surface or edge without harmful damage to any component or to the bag. (See 4.21.5)

3.8.8 Wind/ice Load. The antenna system, when erected for field operation according to the instructions, shall be capable of withstanding 90 mile per hour winds without ice load and 60 mile per hour winds with 1/2 inch of radial ice and remain erected, without harmful damage to the feedcone structure, to the balun, or to the mast including the guy system. (Note that the test specified herein is for 90 mph winds only since this is easier to implement and performs essentially the same purpose as a combined wind/ice load test). (See 4.21.6)

3.8.9 Immersion. The antenna system, stowed in its bag (less Technical Manual and Cable Assembly CG-1889 C/U), shall be capable of being immersed to a covering of 3 feet of fresh water for a period of 2 hours. The immersion shall not result in any form of physical deterioration, loss of fit, or reduction in electrical performance below specified limits. (See 4.21.7)

3.9 Running Spares. A set of running spares shall be furnished consisting of the following:

2 ea Mast Section MS-116A	per MIL-M-12320
1 ea Mast Section MS-117A	per MIL-M-12320
1 ea Mast Section AB-24	per MIL-M-12320
1 ea Guy Assembly	per SM-D-659410-Gp1
1 ea Guy Assembly	per SM-D-659410-Gp2
1 ea Stake Assembly	per SM-C-659375
1 ea Guy Plate	per SM-B-659290-1
1 ea Guy Plate	per SM-B-659290-2
1 ea Antenna Tip Assy	per SC-C-446046
1 ea Connector Adapter, right angle ENC(M)-N(F), P/N TRU-2064	as supplied by TRU-Connector Corp., Peabody, Mass., or equal.

3.10 Systems Safety Engineering.

3.10.1 Personnel Hazards. Personnel hazards shall be kept to a minimum. The criteria of MIL-STD-454, Requirement 1 and 8 shall be made applicable for tasks and efforts such as selection of parts, the complete manufacturing and assembly process, and any product baseline configuration changes that may be implemented during the course of the contract. Verification that compliance with this requirement has been achieved shall be verified through visual inspection (see 4.18.1).

MIL-A-49204A

3.10.2 Corona. The feedcone structure shall be free of sharp edges and points.

3.10.3 Radioactive Materials. Radioactive materials shall not be used (e.g. luminous dials/markings, electron tubes, surge arrestors and lenses).

3.10.4 Edge Rounding Exposed. Exposed edges shall be rounded to a minimum radius of 0.04 inch (1 mm), and exposed corners to a minimum of 0.5 inch (13 mm).

3.11 Standards of Workmanship. Workmanship shall be in accordance with requirement 9, MIL-STD-454 (see 4.3.1). Classification of defects shall be in accordance with MIL-STD 252. The specified camouflage paint has a flat, dull finish which is easily polished (marked) when parts are rubbed together. Occasional small marks are expected and can be tolerated. Excessive polishing is considered to exist when greater than ten percent of the surface area of a given part is marked. Such a condition may be induced by certain mechanical tests. When excessive polishing exists the finish shall be given a paint touch-up prior to final acceptance. (See 4.19.1)

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for performance of inspection requirements specified herein unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure that supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.2 Classification of inspection. Inspection shall be classified as follows:

- a. First article inspection (see 4.3).
- b. Inspection covered by subsidiary documents (see 4.4).
- c. Quality conformance inspection of equipment before packaging (see 4.5).

MIL-A-49204A

4.3 First article inspection. This inspection shall consist of the inspection specified in Table I and shall include, as referenced on inspection data sheets, inspection specified in subsidiary documents and the supplementary tests. Order and quantity of equipments to be subjected to First Article Testing shall be as specified in Table I.

4.3.1 Standard of workmanship. Standard of workmanship, 3.11, shall be established during the Visual Inspections of 4.18.1.

TABLE I. First article test schedule

TITLE	RQT PARA	INSP PARA	SEQUENCE				
			UNIT 1	UNIT 2	UNIT 3	UNIT 4	UNIT 5
Visual Inspection	3.7.6, 3.11	4.19.1	1	1	1	1	
Transmission Line	3.4.1	4.19.2	2	2	2	2	2
Balun VSWR	3.6.9.3	4.19.3	3	3	3	3	3
Air Pressure	3.7.8	4.19.4	4	4	4	4	4
Item Count	3.4, 3.9	4.19.5	5	5	5	5	5
Weight	3.7.3	4.20.1	6	6	6	6	6
Transport Size	3.7.4	4.20.2	7	7	7	7	7
Coupling Loss	3.6.9.2	4.20.3	8	8	8	8	8
Interchangeability	3.7.5	4.20.4	9	9	9	9	9
High Temperature	3.8.1a	4.21.1		10			
Low Temperature	3.8.1b	4.21.2		11			
Humidity	3.8.2	4.21.3				10	
Antenna Gain	3.6.5	4.21.4	11	13		11	10
Drop	3.8.7	4.21.5				12	
Wind Load	3.8.8	4.21.6		15		13	
Immersion	3.8.9	4.21.7	14	17			
Initial Visual Inspection		4.18.1					1
Salt Fog	3.8.4	4.18.3	10				
Dust	3.8.5	4.18.4		12			
Radiation Pattern	3.6.6	4.18.5	12				
Bounce Loose Cargo	3.8.6	4.18.6		14			
Fungus	3.8.3	4.18.2			10		
Feedcone	3.7.7	4.20.5	13	16	11	14	11
Structural Integrity							

MIL-A-49204A

4.3.2 Procedure in the Event of Failure During First Article Inspection. In the event of failure to pass First Article Inspection, the unit shall be corrected as necessary and then resubmitted to First Article Inspection. After successful retest, the same corrections shall be applied to all other systems on order.

4.3.3 First Article Sample. Following acceptance of the First Article samples, the units shall remain in the custody of the Government Quality Assurance Representative for his use as a reference. Following completion of production on order, the unit, or units shall be reconditioned to whatever extent necessary and then shipped according to the contract.

4.4 Inspection Covered by Subsidiary Documents. The following shall be inspected under the applicable subsidiary documents as part of the inspection of equipment before preparation for delivery.

ITEM

Parts, Materials and Processes Used In
Electronic Equipment

PARAGRAPH

3.3

4.5 Quality Conformance Inspection of Equipment Before Packaging. The contractor shall perform the inspection specified in 4.4 and 4.6 through 4.9. This does not relieve the contractor of his responsibility for performing any additional inspection which is necessary to control the quality of the product and to assure compliance with all specification requirements. The Government will review and evaluate the contractor's inspection procedures and examine the contractor's inspection records. In addition, the Government, at its discretion, may perform all or any part of the specified inspection, to verify the contractor's compliance with specified requirements. Test equipment for Government verification inspection shall be made available by the contractor. Further, all facilities and services necessary for the placement, operation and maintenance of these test equipments shall be provided by the contractor.

4.6 Group A Inspection. Each unit on contract or purchase order shall be inspected for conformance to inspections specified in Table II. Discrete lots shall be formed from units that pass this inspection. Factors of lot composition not defined herein, or in the contract or purchase order, shall be in accordance with MIL-STD-105. Each lot shall be subjected to sampling inspection in accordance with Table II-1.

MIL-A-49204A

TABLE II. Group A inspection

TITLE	RQT PARA	INSP PARA
Visual Inspection	3.7.6	4.19.1
	3.11	
Transmission Line	3.4.1	4.19.2
Balun VSWR	3.6.9.3	4.19.3
Air Pressure	3.7.8	4.19.4
Item Count	3.4	4.19.5

TABLE II-1. Sampling plan for Group A inspection

<u>Lot Size</u>	<u>Sample Size</u>
2 to 8	*
9 to 15	13
16 to 25	13
26 to 50	13
51 to 90	13
91 to 150	13
151 to 280	20
281 to 500	29
501 to 1200	34
1201 to 3200	42
3201 to 10,000	50
10,001 to 35,000	60
35,001 to 150,000	74
150,001 to 500,000	90
500,000 and over	102

* Indicates that the entire lot must be inspected.

NOTE: The Acceptance Number in all cases is ZERO.

4.6.1 Procedure in the event of failure during Group A inspection. In the event of failure to pass any Group A inspection item, the unit shall be corrected as necessary and then resubmitted to Group A inspection.

4.7 Group B inspection. This inspection (including sampling) shall conform to Table III. Group B inspection shall normally be performed on inspection lots that have passed Group A inspection and on samples selected from units that have been subjected to and met Group A inspection. Each lot shall be subjected to sampling inspection in accordance with Tables III-1 and III-2.

4.7.1 Order of inspection within Group B. Group B inspection shall be performed in any order which is satisfactory to the Government.

MIL-A-49204A

TABLE III. Group B inspection

TITLE	RQT PARA.	INSP PARA
Weight	3.7.3	4.20.1
Transport Size	3.7.4	4.20.2
Coupling Loss	3.6.9.2	4.20.3
Interchangeability	3.7.1, 3.7.5	4.20.4
	3.7.6	
Feedcone Structural Integrity	3.7.7	4.20.5

TABLE III-1. Sampling plan for Group B inspection

<u>Lot Size</u>	<u>Sample Size</u>
2 to 8	3
9 to 15	3
16 to 25	3
26 to 50	5
51 to 90	6
91 to 150	7
151 to 280	10
281 to 500	11
500 to 1200	15
1201 to 3200	18
3201 to 10,000	22
10,001 to 35,000	29
35,001 to 150,000	29
150,001 to 500,000	29
500,000 and over	29

NOTE: The Acceptance Number in all cases is ZERO.

MIL-A-49204A

TABLE III-2. Sampling plans for Group B inspection
(for Interchangeability inspection only)

<u>Lot Size</u>	<u>Sample Size</u>
2 to 8	2
9 to 15	2
16 to 25	3
26 to 50	5
51 to 90	5
91 to 150	6
151 to 280	7
281 to 500	9
501 to 1200	11
1201 to 3200	13
3201 to 10,000	15
10,001 to 35,000	15
35,001 to 150,000	15
150,001 to 500,000	15
500,000 and over	15

NOTE: The Acceptance Number in all cases is ZERO.

4.7.2 Procedure in the event of failure during Group B inspection. In the event of failure to pass any Group B inspection item, the unit shall be corrected as necessary and then resubmitted to Group B inspection. After successful retest, the same corrections shall be applied to all other uncovered systems on order.

4.8 Group C Inspection. This inspection shall be as specified in Table IV and shall be performed on units that met Group A and Group B inspection.

TABLE IV. Group C inspection

<u>TITLE</u>	<u>RQT PARA.</u>	<u>INSP PARA</u>	<u>SUB GROUP</u>
Immersion	3.8.9	4.21.7	II
High Temperature	3.8.1.a	4.21.1	II
Low Temperature	3.8.1.b	4.21.2	II
Humidity	3.8.2	4.21.3	III
Antenna Gain	3.6.5	4.21.4	IV
Drop	3.8.7	4.21.5	IV
Wind Load	3.8.8	4.21.6	IV
Salt Fog	3.8.4	4.18.3	IV
Dust	3.8.5	4.18.4	IV
Bounce Loose Cargo	3.8.6	4.18.6	IV
Fungus	3.8.3	4.18.2	IV

MIL-A-49204A

4.8.1 Sampling for inspection of equipment. Units selected for each Group C inspection shall be selected without regard to their quality in accordance with the following:

Subgroup II. For this subgroup, two units from the first 50 production units shall be selected for this Group C inspection. For subsequent Group C inspections, two units from each successive 500, or two every two months, if less than 500 are produced during a two month period.

Subgroup III. For this subgroup, two units from the first 50 production units shall be selected for the first Group C inspection. For subsequent Group C inspections, two units shall be selected from each successive 600, or two every three months, if less than 600 are produced during this three month period.

Subgroup IV. For this subgroup, two units from the first 50 production units only shall be selected. Subsequently, two units shall be tested every six (6) months until completion of production.

4.8.2 Procedure in the event of failure during Group C inspection. The contractor shall immediately report in writing each Group C failure occurrence, including details of the failure and characteristics affected. The contractor shall immediately investigate the cause of failure and further report the results of investigation and details of the proposed corrective action on (1) the process and materials, as applicable, and (2) all units of product which were manufactured under the same conditions and which the Government considers subject to the same failure. Reports shall be forwarded to the responsible technical activity designated in the contract through the Quality Assurance Representative for evaluation. After corrective action has been taken, additional sample units shall be subjected to Group C inspection (all inspections, or the inspections which the sample failed, at the option of the Government) and Groups A and B inspection may be reinstituted; however, final acceptance and shipment will be withheld until the Group C reinspection results have shown that the corrective action was effective.

4.8.3 Reinspection of conforming Group C sample units. Unless otherwise specified, sample units which have been subjected and passed Group C inspection may be accepted on the contract or order provided all damage is repaired and the sample units are resubjected to and pass Groups A and B inspection.

4.9 Supplementary tests. Supplementary tests are defined as those tests herein which are only conducted as a pretest and/or post test to a first article or Group C test.

4.10 Government witness to inspection. The contractor shall permit all inspections to be witnessed by a representative or representatives of the contracting officer.

4.11 Recycling of inspection schedule. When corrective action has been applied as a result of failure and the nature of the corrective action may influence other specified requirements, testing shall be recycled to the extent

MIL-A-49204A

necessary to insure that the end design represents full compliance with the specifications.

4.12 Failure reports. Failure reports shall be prepared for each instance where the antenna system fails to comply with a test requirement. The failure report shall contain a failure analysis statement and a corrective action statement. The test data sheet recording the initial failure and the failure report shall be attached to the data sheet recording compliance after corrective action. The failure report shall be signed by the contractor's quality assurance representative who conducted the investigation and by the contractor's chief of Quality Assurance.

4.13 Standard test conditions. Unless otherwise specified, the following standard test conditions shall prevail during testing.

<u>Condition</u>	<u>Value/Tolerance</u>
Temperature	Prevailing Ambient
Altitude	Ground Level

4.14 Test equipment. All electrical test equipment employed, except for the 350 watt RF power source, shall be commercially available items for which calibration service, referencing back to primary standards, is available. The 350 watt RF power source for balun testing may be any unmodulated generator capable of adjustment to the required power level, capable of adjustment to the designated test frequency, and having a harmonic content of less than 10%. All test equipment shall be supplied by the contractor.

4.15 Reference dipole antenna. The reference dipole antenna for gain measurements shall be vertically polarized balanced dipole. Length of the dipole shall be continuously adjustable. At each test frequency, length shall be adjusted to half-wave length resonance, considering end effects (usually 95% to 97% of one half wave length). When so adjusted, free space VSWR shall be less than 2.0 to 1. The coupling balun shall have a 1 to 1 impedance ratio. Balun coupling loss shall be less than 1 dB. The transmission line shall be the same line or an identical line to that of the antenna under test. Free space VSWR of the antenna and coupling loss of the balun shall be measured over the frequency range of the antenna under test. Maximum VSWR and maximum coupling loss shall be recorded in the space provided for on the test data sheet for gain measurements. A typical antenna for this purpose is shown in Figure 1.

MIL-A-49204A

4.18 First Article Inspection

4.18.1 Initial Visual Inspection. The equipment shall be visually inspected for compliance with the requirements of Drawing DL-SM-B-944750 and this specification to include: radiating elements, feedcone structure, corona, notice, balun, repairability, air pressure test vent, protective cap, insulating extension, transmission line, Mast AB-1244()/GRC, connector adapter, anti-corrosion compound, electrical tape, construction, straps, compartmentation, materials and methods, instructions, height, ground area, galvanic corrosion, castings, impregnation of aluminum castings, uniformity, resistance to precipitation, parts, materials & processes, finishes, marking, systems safety engineering, human engineering, workmanship.

4.18.2 Fungus. As a pretest, the antenna system shall be subjected to the Free space VSWR test, 4.22.1. After pretest, the antenna system shall be subjected to the test of Method 508.1, Procedure 1 of MIL-STD-810. The system shall be installed in the chamber but with radiating elements and support mast sections removed to the extent required to accommodate the chamber size. Other parts and the bag shall be arranged in the chamber so that the other parts are unprotected by the bag. After exposure, the following shall be conducted: RF power capability, 4.22.3, Dielectric withstanding voltage, 4.22.5, Air pressure, 4.19.4, Free space VSWR, 4.22.1, and Inspection for physical condition, 4.22.2. During Inspection for physical condition the items of the system shall be examined for evidence of fungus growth or damage. (3.8.3)

4.18.3 Salt fog. As a pretest, the antenna system shall be subjected to the Free space VSWR test, 4.22.1. After pretest, the antenna system shall be subjected to the test of Method 509.1, Procedure 1 of MIL-STD-810. The system shall be installed in the chamber but with radiating elements and support mast sections removed to the extent required to accommodate the chamber size. Other parts and the bag shall be arranged in the chamber so that the other parts are unprotected by the bag. After exposure, the following shall be conducted: RF power capability, 4.22.3; Dielectric withstanding voltage, 4.22.5; Air pressure, 4.19.4, Inspection for physical condition, 4.22.2 and Free space VSWR, 4.22.1. (3.8.4)

4.18.4 Dust. As a pretest, the antenna system shall be subjected to the Free space VSWR test, 4.22.1. After pretest, the antenna system shall be subjected to the test of Method 510.1, Procedure 1 of MIL-STD-810. Step 3 shall be performed immediately after temperature has stabilized during Step 2. After exposure, the following shall be conducted without cleaning other than due to necessary handling of equipment: RF power capability, 4.22.3; Dielectric withstanding voltage, 4.22.5; Air pressure, 4.19.4, Inspection for physical condition, 4.22.2 and Free space VSWR, 4.22.1. (3.8.5)

4.18.5 Radiation Pattern. Method is in accordance with paragraph 2.5.3 of Electronic Industries Association Standard RS-239 except the antenna under test shall be full scale size. (3.6.6)

4.18.6 Bounce, Loose Cargo. The antenna system, with all components stowed in the bag, and without any additional container, shall be subjected to the test of Method 514.2, Procedure XI of MIL-STD-810. As a pretest, the antenna shall

MIL-A-49204A

be subjected to the Free space VSWR test, 4.22.1. After bounce, the following tests shall be conducted: RF power capability, 4.22.3; Free space VSWR, 4.22.1; Air Pressure, 4.19.4; and Inspection for physical condition, 4.22.2. (3.8.6)

4.19 GROUP A Inspection

4.19.1 Visual Inspection. (Note: The first article visual inspection of 4.18.1 must be completed before the following test can be conducted.) Visual inspection is performed, item by item. The First Article Test unit subjected to visual inspection of 4.18.1, shall serve as a reference. In-process inspection records shall be checked. (3.7.6 and 3.11)

4.19.2 Transmission Line. A reflectometer shall be used to test for correct impedance and continuity. (3.4.1)

4.19.3 Balun VSWR. A 200 OHM dummy load* shall be placed across the balanced terminals of the balun. VSWR shall be measured at the balun unbalanced connector using commercially available equipment having a load impedance of 50 ohms and having the capability of displaying VSWR over the complete required frequency range. VSWR shall be observed over the complete range and recorded at the frequency having the largest VSWR. (3.6.9.3)

*DUMMY LOAD - Resistive

$R_p = 200 \text{ ohms } (\pm 10\%)$

$CP = \pm 0.2 \text{ Picofarads (when measured with a Boonton 250A RX meter or equivalent)}$

4.19.4 Air Pressure. An air pressure of $1 \frac{1}{2}$ pounds per square inch $\pm 1/4$ psi shall be applied at the air pressure test vent so as to test balun seal points. Pressure shall be applied for 1 minute during which time there shall be no more than 0.01 psi change in pressure. (3.7.8)

4.19.5 Item Count. Each item required to complete the antenna system shall be inventoried as it is placed in its assigned position in the bag. (3.4)

4.20 GROUP B Inspection

4.20.1 Weight.

Step I The bag shall be weighed with all items of the system contained therein. (3.7.3)

Step II The feedcone structure, with balun attached, shall be weighed. (3.7.3)

4.20.2 Transport Size. The bag shall be closed and fastened with all system items in place. Length and perimeter shall be measured. (3.7.4)

4.20.3 Coupling Loss. For convenience of test instrumentation, two baluns are employed in the test with the balanced sides joined together by the shortest

MIL-A-49204A

possible connections. Test results are adjusted to account for the doubling of effects of the test. Power from a radio frequency source having a 50 ohm output impedance shall be fed to the unbalanced side of one balun through an in-line RF wattmeter. The unbalanced side of the second balun shall be connected to an RF wattmeter having a 50 ohm load impedance. The signal source shall be adjusted to supply a fixed forward power at the in-line wattmeter. Power at the load wattmeter shall be measured and loss computed. (3.6.9.2)

4.20.4 Interchangeability.

a. Method when conducted as part of First Article testing. (3.7.1, 3.7.5, and 3.7.6)

Step 1. Contractor gages shall be employed to test threads of the feedcone structure and Mast Sections MS-116A, MS-117A and AB-24/GR. The cone angled of the feedcone structure shall also be measured with the appropriate fixture.

Step 2. Within each system all parts not included in Step 1, and required by the design to be fitted together, shall be assembled or fitted together. Observation for correctness of fit shall be conducted. These parts shall then be interchanged among other first article samples and assembled or fitted together. Observation of correctness of fit shall be repeated.

b. Method when conducted as part of Group B Acceptance Tests. (3.7.1, 3.7.5, and 3.7.6)

Step 1. Same as Step 1 above.

Step 2. Within each antenna system under Group B test, parts not included in Step 1 shall be designated by the Government Quality Assurance Representative for interchangeability test. These parts shall be interchanged two ways with like parts in the accepted First Article sample in the custody of the Government QAR. Observation of correctness of fit in both systems shall be observed.

4.20.5 Feedcone Structural Integrity. (3.7.7)

Step 1. A manufacturer's fixture shall be arranged which is capable of attaching individually to each cone and then applying a tensile force tending to separate the cones from the joining insulator. A force of 2000 pounds shall be applied for 1 minute. This force shall be reduced to 1500 pounds for all Group C environmental post tests.

Step 2. A manufacturer's fixture shall be arranged which is capable of attaching to the two cones and to the balun unbalanced connector and then applying a tensile force tending to separate the balun from the feedcone structure. A force of 250 pounds shall be applied for 1 minute.

Pretest/post test. Pretest and post test shall be visual inspection. Any indication of damage or indication of separation of the assembly shall constitute failure.

MIL-A-49204A

4.21 GROUP C Inspection

4.21.1 High temperature. The antenna system shall be subjected to the test of Method 501.1, Procedure II of MIL-STD-810. As a pretest, the antenna shall be subjected to the Free Space VSWR Test, 4.22.1. At Step 4 the chamber temperature shall be 71 degrees, C (160 F). At Step 7 the chamber temperature shall be 71 degrees, C (160 F). During Step 8 the balun shall be subject to the Balun Power Test, 4.22.4, for 2 minutes. During the test all items of the antenna system shall be stowed in the bag except for the balun. After exposure the following tests shall be conducted: Free space VSWR, 4.22.1; Air pressure, 4.19.4; Feedcone Structural Integrity, 4.20.5; and Inspection for Physical Condition, 4.22.2. (3.8.1.1)

4.21.2 Low Temperature. The antenna system shall be subjected to the test of Method 502.1, Procedure I of MIL-STD-810. As a pretest, the antenna shall be subjected to the Free Space VSWR test, 4.22.1. During Step 2, the chamber temperature shall be maintained at -57 degrees C (-70 degrees F) for not less than 2 hours after stabilization of the test items. Delete Step 3. During Step 4, the chamber temperature shall be maintained at -45.6 degrees C (-50 degrees F) for not less than 4 hours after stabilization of the test items. During Step 5, the balun shall be subjected to the Balun power test, 4.22.4, for 2 minutes. During the test all items of the antenna system shall be stowed in the bag, except for the balun. After exposure, the following tests shall be conducted: Free Space VSWR, 4.22.1; Air pressure, 4.19.4; Feedcone Structural Integrity, 4.20.5; and Inspection for Physical Condition, 4.22.2. (3.8.1.2)

4.21.3 Humidity. The antenna system shall be subjected to the test of Method 507.1, Procedure II of MIL-STD-810. The equipment shall be arranged in the test chamber with the balun, feedcone structure and the six innermost radiating elements assembled together. Other radiating elements shall be assembled in pairs as in use. Other parts and the bag shall be arranged in the chamber so that the parts are unprotected by the bag. As a pretest, at Step 4, the antenna shall be removed from the chamber and subjected to the Free Space VSWR test of 4.22.1. Following the VSWR test the equipment shall be returned to the chamber. At Step 8 the equipment shall be removed from the chamber and the following tests shall be conducted: RF power capability, 4.22.3; Dielectric withstanding voltage, 4.22.5; Air pressure, 4.19.4 and Free Space VSWR, 4.22.1. During Step 9 the equipment shall be subjected to Feedcone structural integrity, 4.20.5; and to the Inspection for Physical condition, 4.22.2. Particular attention shall be given to the effectiveness of anti-corrosion compound used on mast section threaded joints and to the effectiveness of corrosion resistant design at the joint between the mast sections and the feedcone structure. (3.8.2)

4.21.4 Antenna Gain. The gain of the antenna is the ratio of the radiation intensity of the antenna in a given direction, usually on the horizon, to the maximum radiation intensity of a lossless reference antenna, usually a half-wave dipole, with same input power. Method is in accordance with paragraph 2.11.3 of Electronic Industries Association Standards RS-239 except that the standard antenna shall conform to 4.16 and the antenna under test shall be full scale size. Test frequencies shall be at least every 2 MHz over the required

MIL-A-49204A

frequency range and shall be sufficient so that a plot of gain vs. frequency will faithfully include maximum and minimum points within that range. (3.6.5)

4.21.5 Drop. The antenna system, with all components stowed in the bag, shall be subjected to the test of Method 516.2, Procedure II of MIL-STD-810. As a pretest the antenna shall be subjected to the Free Space VSWR Test, 4.22.1. After drop, the following tests shall be conducted: RF power capability, 4.22.3; Free Space VSWR, 4.22.1; Air pressure, 4.19.4; Feedcone structural integrity, 4.20.5; and Inspection for Physical Condition, 4.22.2. (3.8.7)

4.21.6 Wind Load. The antenna system shall be subjected to the load test of Figure 2. Inspection for physical condition, 4.22.2, shall be conducted as pretest and post test. (3.8.8)

4.21.7 Immersion. See 3.1.2, Method 512.1, Procedure I of MIL-STD-810. Remove technical manual, cable assembly CG-1889C/U, electrical tape, and anti-corrosion compound. As a pretest the antenna system shall be subjected to the Free Space VSWR Test, 4.22.1. After pretest the antenna system shall be stowed in its bag and immersed in water so that the uppermost point of the bag is at least 36 inches below the surface of the water. Immersion shall continue for at least 2 hours. On removal from the water, the antenna system shall be subjected to post test procedures without being dried in any manner other than induced by necessary handling. Post tests shall be completed within 4 hours after removal. Post tests, to be done in the following sequence, shall be RF Power Capability, 4.22.3; Test 4.22.5; inspection 4.22.2; test 4.19.4; and Free Space VSWR, 4.22.1. During Inspection for physical condition the balun shall be checked for leakage of moisture by opening the air pressure test vent and orienting the balun to allow drainage. Presence of moisture shall constitute a failure. (3.8.9)

4.22 Supplementary Tests.

4.22.1 Free Space VSWR. This test is to be conducted where otherwise specified as part of service condition tests. Method of measurement is in accordance with paragraph 2.3.3 of Electronic Industries Association Standard RS-239 except that the measurement shall be performed with a vector impedance meter or other instrument of equivalent accuracy. (3.6.4)

4.22.2 Inspection for Physical Condition. Inspection is to be conducted where otherwise specified as part of service condition tests by visual inspection. Method is by visual inspection. (3.8)

4.22.3 RF power capability. This test is to be conducted where otherwise specified as part of service condition tests. The feedcone structure, balun, insulating extension and uppermost support mast section shall be connected together. A load impedance shall be connected across the two sections of the feedcone structure. The load shall be such that VSWR, referenced to 50 ohms, is less than 3 to 1 at the balun unbalanced connection. Since the manner of the test set-up may introduce stray inductance or capacitance, load reactance may be tuned out. To electrically include the insulating extension in the test, a ground connection shall be completed between the support mast section and the ground side of the unbalanced balun connector. Three hundred fifty watts of power shall be applied to the assembly at the balun unbalanced connector. The power source shall be a continuous wave, radio frequency source having a nominal output impedance of 50 ohms. The test frequency shall be at the high end of the specified frequency range. Power shall be applied for a

MIL-A-49204A

period of 2 minutes. During the period when power is applied, the insulation material shall be observed for evidence of RF flashover or leakage. After power is removed the insulation material shall be inspected for evidence of RF flashover or leakage. Evidence of RF flashover or leakage shall constitute a failure. The test shall be completed within 1 hour of the time of completion of exposure to the environmental condition tests of 4.21.3, 4.21.5, 4.18.6, 4.18.2, 4.18.3 and 4.18.4. (3.6.7)

4.22.4 Balun Power. This test is to be conducted where otherwise specified as part of service condition tests. For convenience of test instrumentation, two baluns are employed in the test with the balanced sides joined together by the shortest possible connections. Both baluns are subjected to the service condition tests of 4.18.2, 4.18.3, 4.18.4, 4.18.6, 4.21.1, 4.21.2, 4.21.3, 4.21.5, 4.21.6 and the results are adjusted to account for the doubling of effects of the test. Power from a radio frequency source having a 50 ohm output impedance shall be fed to the unbalanced side of one balun through an in-line RF Wattmeter capable of measuring forward and reverse power. The unbalanced side of the second balun shall be connected to an RF Wattmeter having a 50 ohm load impedance. The signal source shall be adjusted to supply 350 watts forward power at the in-line wattmeter. VSWR shall be measured at the in-line wattmeter and coupling efficiency shall be observed by measuring power at the load wattmeter. (3.6.9.1, 3.6.9.2, 3.6.9.3)

4.22.5 Dielectric Withstanding Voltage. To be conducted where otherwise specified as part of service condition tests. The test shall be performed in accordance with MIL-STD-202, Method 301. (3.6.8)

5. PACKAGING

5.1 Packaging Requirements. The packaging requirements for the desired level(s) of protection shall be as specified by the acquisition activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Antenna Group OE-254()/GRC is intended for use with Radio Sets AN/VRC-12, AN/VRC-43 through AN/VRC-49, AN/VRC-53, AN/VRC-64, AN/GRC-125, AN/GRC-160, and SINOGARS.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, date of this specification and any amendment thereto.
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1).
- c. Place of final inspection.

6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Descriptions (DID's) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DID's are tailored to reflect the requirements of the

MIL-A-49204A

specific acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

<u>Reference Paragraph</u>	<u>DID Number</u>	<u>DID Title</u>	<u>Suggested Tailoring</u>
4.3, 4.6, 4.7, 4.8	DI-R-1701	Product Assurance Test, Demonstration & Evaluation Plan	

The above DID was those cleared as of the date of this specification. The current issue of DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423.

6.4 First Article. When first article inspection is required, the contracting officer should provide specific guidance to offerors whether the item(s) should be a preproduction sample, a first article sample, a first production item, a sample selected from the first production items, a standard production item from the contractor's current inventory (see 3.2), the number of items to be tested as specified in 4.3. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first article. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract. Bidder should not submit alternate bids unless specifically requested to do so in the solicitation.

6.5 Group C inspection. Approval to ship may be withheld, at the discretion of the Government, pending the decision from the Contracting Officer on the adequacy of corrective action (see 4.8.2).

6.6 Government-furnished property. The contracting officer should arrange to furnish the property listed in 3.7.1.1.

6.7 Subject term (key word) listing.

cable assembly
gages
mast assembly
mast section

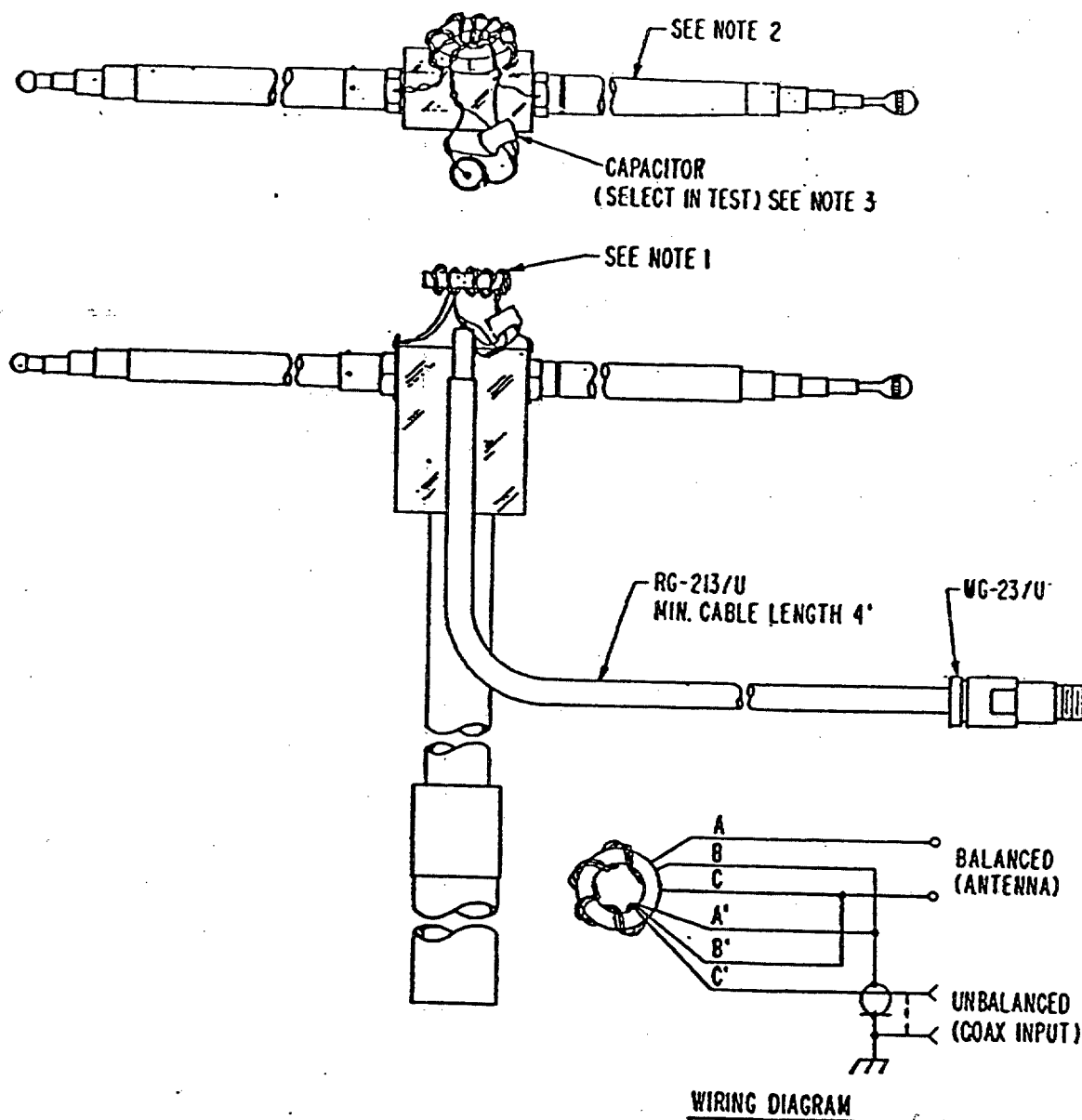
6.8 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodian
Army - CR

Preparing Activity
Army - CR

Project No. 5985-A610-02

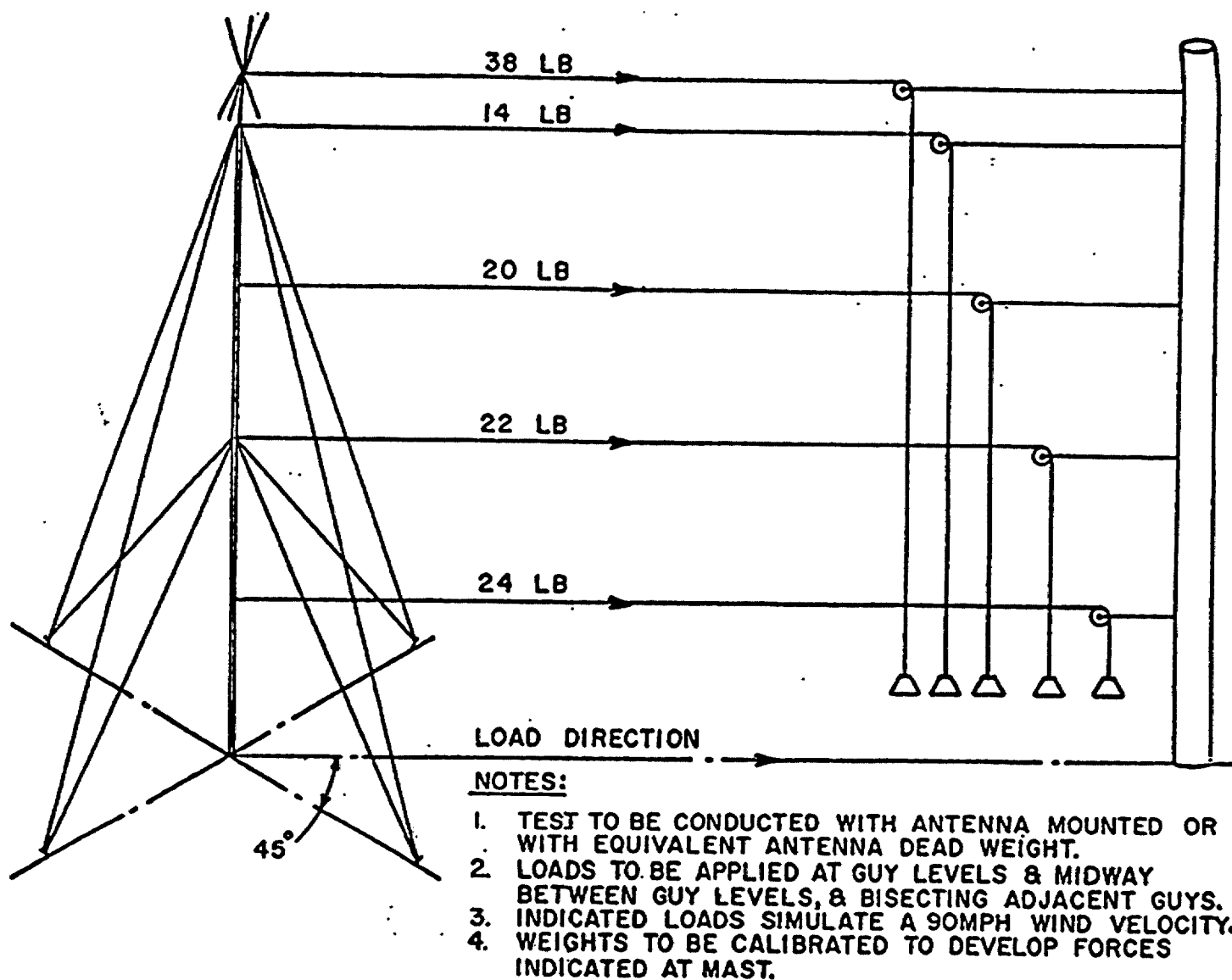
MIL-A-49204A

**NOTES:**

- 1- INDIANA GENERAL PART # F624-19,02, FERRAMIC TOROID OR EQUAL WITH 10 TURNS #18 ENAMELED WIRE, TRIFILAR WINDING.
- 2- WHIP SECTIONS MUST EXTEND ANYWHERE FROM 25 FEET TO 85 FEET TO ADJUST TO FREQUENCY OF MEASUREMENT.
- 3- VALUE OF CAPACITOR TO BE SELECTED SO AS VSWR OF THE BALUN IS ≤ 1 ACROSS THE FREQUENCY RANGE OF THE BALUN.

Figure 1. Reference Dipole Antenna

MIL-A-49204A

Figure 2. Antenna Group OE-254()/GRC Wind Load Test

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:		1. DOCUMENT NUMBER MIL-A-49204A (R)	2. DOCUMENT DATE (YYMMDD) ; 5 Oct 92
3. DOCUMENT TITLE ANTENNA GROUP OE-254/GRC			
4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)			
5. REASON FOR RECOMMENDATION			
6. SUBMITTER			
a. NAME (Last, First, Middle Initial)		b. ORGANIZATION	
c. ADDRESS (Include Zip Code)		d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (If applicable)	7. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY			
a. NAME Cdr, U.S. Army Communications-Electronics Command		b. TELEPHONE (Include Area Code) (1) Commercial 908-532-5851 (2) AUTOVON 992-5851	
c. ADDRESS (Include Zip Code) ATTN: AMSEL-ED-TM Fort Monmouth, NJ 07703-5023		IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	