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MILITARY SPECIFICATION

COUNTERMEASURES SET, B-Band

This specification is approved for use by Naval Air Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification establishes the requirements for the manufacture and acceptance of the Countermeasures Set, B-Band referred to herein as the set.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications and standards of the issue listed in that issue of the Department of Defense index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification to the extent specified herein.

SPECIFICATIONS

MILITARY

MIL-P-116	Methods of Preservation.
MIL-E-5400	Electronic Equipment, Aerospace, General Specification for.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer, Naval Air Engineering Center, Engineering Specifications and Standards Department (ESSD) Code 93, Lakehurst, New Jersey 08733, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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MIL-T-5422	Testing, Environmental, Airborne Electronic and Associated Equipment.
MIL-M-7793	Meter, Time Totalizing.
MIL-E-17555	Electronic and Electrical Equipment Accessories and Repair Parts; Packaging and Packing of.
MIL-T-18303	Test Procedures, Preproduction, Acceptance, and Life for Aircraft Electronic Equipment; Format for.
MIL-N-18307	Nomenclature and Identification for Electronic, Aeronautical, and Aeronautical Support Equipment, Including Ground Support Equipment.

STANDARDS

MILITARY

MIL-STD-129	Marking for Shipment and Storage.
MIL-STD-130	Identification Marking of U.S. Military Property.
MIL-STD-454	Standard General Requirements for Electronic Equipment.
MIL-STD-461	Electromagnetic Interference Characteristics, Requirements for Equipment.
MIL-STD-462	Electromagnetic Interference Characteristics, Measurement of.
MIL-STD-704	Aircraft Electric Power Characteristics.
MIL-STD-781	Reliability Design Qualification and Production Acceptance Tests; Exponential Distribution.
MIL-STD-794	Parts and Equipment, Procedures for Packaging and Packing of.
MIL-STD-831	Test Reports, Preparation of.
MIL-STD-45662	Calibration System Requirements.
MS3102	Connector, Receptacle, Electric Box Mounting, Solder Contacts, AN Type.
MS17321	Meter, Time Totalizing, Miniature, Digital 28 Volt DC.

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2.1.2 Other Government documents, drawings, and publications. The following drawings form a part of this specification to the extent specified herein.

DRAWINGS

NAVAL AIR SYSTEMS COMMAND
(Code Ident 30003)

1356AS302	Countermeasures Set, B-Band.
1356AS307	GFE Interconnection, B-Band.

(Copies of specifications, standards, handbooks, drawings and publications required by manufacturers in connection with specific acquisition functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.1.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.

3. REQUIREMENTS

3.1 Set description. The set shall be a single module capable of generating medium-power, B-band countermeasures signals with both frequency and amplitude modulation. The set shall be remotely commandable and shall provide adjustments of countermeasure signal parameters.

3.1.1 Major components. The set shall consist of the following major components:

a. Solid-State Amplifier, A-B Linear.
b. Mode Generator.
c. 32 decibel (dB) Output Sampling Directional Coupler.

3.1.2 Government furnished equipment. The set shall utilize the following associated equipment which shall be Government furnished (see 6.4):

	Component	Card No.	Part No.	Quantity
a.	Command Logic Card:	(1)	1356AS218	1
b.	Component Assy AM Board:	(2)	1356AS202	1
c.	Component Assy Noise Board:	(3)	1356AS183	1

3.2 First article. When specified, a sample shall be subjected to first article inspection (see 4.4 and 6.3).

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3.3 Interface.

3.3.1 External electrical and RF. The external electrical interface for the set shall be provided as specified in Drawing 1356AS307. Interface type and function shall be as specified in Table I.

TABLE I. Electrical and RF interface types and functions.

Reference Designation	Connector Type	Function	Pin Number
J1 Input Power	MS3102E20-8P	+28V Standby Indicator Gnd, +28V Return Operate Indicate Gnd	A C D E F
J2 Control/Monitor	MS3120E-19S	Cmd A Cmd B Cmd C Cmd D Gnd AM Waveform SAM Sweep Swept Noise Sweep	A, N, V B, M, U C, S D G H F E
J3 RF Output	Type N Female	RF Output	
J4 Output Sample	SMA Female	RF Output Sample	
TP1 AM	---	AM Waveform	---
TP2 SS	---	SAM Sweep Waveform	---
TP3 SF	---	Swept Noise Sweep Frequency Waveform	---

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3.3.2 External mechanical. The external mechanical interface dimensions shall be as specified in Drawing 1356AS302. The mechanical interface shall enable direct installation into Government selected electronic platforms using existing mounting holes.

3.3.3 Internal interface with Government furnished equipment (GFE). The physical and functional interface requirements between the GFE and the contractor's design shall be as specified in Drawing 1356AS307.

3.4 Controls. The set shall incorporate the controls and functions specified in Table II, which are included on the Government furnished equipment, except for the RF TUNE, which shall be developed by the contractor. All controls shall be readily accessible.

TABLE II. Controls and functions.

Control	Function
RF TUNE	Developed by the contractor. Adjusts the set's frequency
100 SAT	Controls noise amplitude into output amplifier
SPT BW	Adjusts RF bandwidth of spot and instantaneous noise bandwidth for barrage and swept noise
BAR BW	Adjusts bandwidth of barrage noise
SWP BW	Adjusts swept noise bandwidth
SWP FRQ	Adjusts swept noise frequency
SWP MULT/LO/HI	Switches swept noise frequency between low and high range
BLNK MULT/LO/HI	Switches blink frequency between low and high range
BLNK FRQ	Adjusts blink frequency
BLNK DTY	Adjusts duty cycle of blink waveform
SAM FRQ	Adjusts low end of SAM frequency range
SAM RATIO	Adjusts high end of SAM frequency range
SAM SWP	Adjusts sweep time from low frequency to high frequency
SAM DTY	Adjusts duty cycle of SAM waveform
SPT SAT	Adjusts spot noise frequency linearity

3.5 Time meter. The set shall be provided with a time-totalizing meter as specified in MIL-M-7793, Type MS17321-10.

3.6 Materials, processes, and parts. In the selection of materials, processes, and parts, fulfillment of major design objectives for the intended application specified herein shall be the prime consideration. In so doing, the following shall govern:

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a. Microwave technology shall be considered and microwave items shall be as specified herein.

b. Other materials, processes, and parts requirements shall be as specified in MIL-E-5400.

c. Contractor-designed (peculiar) microwave items shall meet the general intent as specified in MIL-E-5400.

d. Approval for the use of nonstandard materials, processes, and parts shall be obtained as specified in MIL-E-5400.

3.7 Characteristics.

3.7.1 Performance. The set shall meet the conditions of the performance requirements as specified herein at the conditions of 3.8.

3.7.1.1 Input power. The set shall operate as specified when supplied a power source in accordance with MIL-STD-704, Table II and Figures 9 and 10, except as follows:

a. 28.0 ±3.0 Volts direct current (Vdc)

b. Not greater than 25.0 amperes.

3.7.1.2 Under-voltage, fault protection, and reverse polarity.

3.7.1.2.1 Under-voltage protection. The set shall not be damaged by primary power voltages less than 25 Vdc, although specified performance is not required during low-voltage periods. The set shall automatically resume specified operation when the voltage returns within the specified limits.

3.7.1.2.2 Fault protection. The set shall contain electronic overload and thermal cut-out circuits. The protective functions shall automatically reset upon clearance of the fault.

3.7.1.2.3 Reverse polarity protection. Reverse polarity protection shall be provided.

3.7.1.3 Warm-up time. Within three minutes after application of primary power, the set shall achieve specified output power and all other performance requirements.

3.7.1.4 Frequency range. The operating frequency range shall be 425 to 445 MHz.

3.7.1.5 Frequency stability. The frequency of the set shall be stable within ±3 MHz from 425 to 445 MHz, from -35°C to +54°C.

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3.7.1.6 Termination mismatch. The set shall meet specified frequency stability and RF output across the frequency range with an output voltage standing wave ratio (VSWR) of 1.5:1 nominal. The set shall not be damaged when operating into an infinite VSWR over the specified frequency range and at any phase angle.

3.7.1.7 RF output power. Using solid state devices, the set shall provide an RF power output of not less than 100 watts between 425 and 445 MHz into a 50-ohm load with a VSWR of 1.5:1 ±10 percent varied through all phase angles. The output power variation shall be less than ±1.5 dB from 425 to 445 MHz.

3.7.1.7.1 RF output sample. When the output of the set is 100 watts, the power at the RF sample, J-4, shall be +18 dBm ±2.0 dBm.

3.7.1.8 Noise figure. The set's noise figure shall be not greater than 32 dB.

3.7.1.9 Electromagnetic interference. The set shall meet the CE01 and RE02 requirements for electromagnetic interference as specified in MIL-STD-461.

3.7.1.10 Modes of operation. The set shall provide noise jamming of pulse or CW radars. The equipment shall transmit, with or without amplitude modulation, an internally generated radio frequency. The set shall include remote control functions to command the following modes:

a. Spot Noise
b. Blink Spot
c. Swept AM and Spot
d. Barrage Noise
e. Blink Barrage
f. Swept AM and Barrage
g. Swept Noise
h. Spare
i. Spare
j. Spare
k. Standby

3.7.1.10.1 Spot noise.

a. FM noise bandwidth: Adjustable from 2 to 20 MHz in the frequency band of 425 to 445 MHz.

b. FM noise deviation frequency components: 100 Hz to 10.0 MHz

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3.7.1.10.2 Barrage noise.

a. FM noise bandwidth: Adjustable from 2 to 30 MHz (with no sweep) in the frequency band of 425 to 445 MHz.

b. FM noise deviation frequency components: 100 Hz to 10.0 MHz (with no sweep).

c. Sweep waveform: Not less than 100 kHz sawtooth.

d. Sweep bandwidth: Adjustable from 10 to 30 MHz in the frequency band of 425 to 445 MHz.

3.7.1.10.3 Swept noise.

a. FM noise bandwidth: Adjustable between 2 to 30 MHz (with no sweep) in the frequency band of 425 to 445 MHz.

b. FM noise deviation frequency components: 100 Hz to 10.0 MHz (with no sweep).

c. Sweep waveform: Adjustable from 1 Hz to 9 kHz sawtooth.

d. Sweep bandwidth: Adjustable from 10 to 30 MHz in the frequency band from 425 to 445 MHz.

3.7.1.10.4 Swept AM.

a.	Sweep range:	Adjustable from 10 Hz to 1.0 kHz.
b.	Minimum frequency:	Adjustable from 10 Hz to 1.0 kHz.
c.	Sweep ratio:	Adjustable from 2:1 to 10:1.
d.	Sweep period:	Adjustable from 0.4 to 15.0 secs
e.	Duty cycle:	Not less than 5 percent nor greater than 95 percent adjustable.
f.	Depth of RF modulation:	Not less than 40 dB.

3.7.1.10.5 Blink AM.

a.	Frequency range:	Adjustable from 0.1 to 100 Hz
b.	Duty cycle:	Not less than 5 percent nor greater than 95 percent adjustable.
c.	Depth of RF modulation:	Not less than 40 dB.

3.7.1.11 Spectral purity. All harmonic and spurious emissions in-band (425 to 445 MHz) shall be suppressed more than 25 dB from the carrier level. All emissions above 450 MHz and below 420 MHz shall be suppressed more than 40 dB from the carrier.

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3.7.1.12 Video-frequency tolerance. All video frequencies, when set, shall be stable within ±10 percent over the -35°C to +54°C temperature range.

3.7.1.13 Programming. The set shall be programmed as follows:

a. The equipment shall be fully energized by the external application of the +28.0 ±3.0 Vdc power.

b. Remote control of ECM modes during flight:

(1) An ECM mode, as specified in Table III, shall be selected when ground is removed from the applicable command signal and all other command signals grounded.

(2) Output function conditions shall be as specified in Table IV.

3.8 Environmental conditions.

3.8.1 Operational. The set shall meet all requirements specified in 3.7.1 and attendent subparagraphs prior to, during, and after the following environmental conditions, separately or any combination thereof. The set shall not exhibit any temporary or permanent degradation as the result of exposure to any of the following environments:

a.	Reduced pressure:	50,000 feet (equivalent pressure)
b.	High temperature:	+54°C
c.	Low temperature:	-35°C
d.	Vibration:	±10.0 gravity units (g) 5-2000 Hz bandwidth
e.	Shock:	25 g, 11 ms pulse
f.	Explosion:	Air/fuel atmosphere ratio 13:1, sea-level 50,000 feet

3.8.2 Nonoperational. The set shall meet all requirements specified in 3.7.1 and attendent subparagraphs after the following environmental conditions, separately or any combination thereof. The set shall not exhibit any temporary or permanent degradation as the result of exposure to any of the following environments:

a.	Thermal shock:	-54°C to +71°C
b.	Humidity:	95 percent relative humidity

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TABLE III. ECM mode and command signal.

ECM Mode	Command Signal
Spot Noise	A
Blink Spot	B
Swept AM and Spot	AB
Barrage Noise	C
Blink Barrage	AC
Swept AM and Barrage	BC
Swept Noise	ABC
Spare	D
Spare	AD
Spare	BD
Standby	STANDBY/CLEAR

TABLE IV. Output function conditions.

Output Function	Output
Swept waveform	0.0 ±0.2 Vdc to +4.5 ±0.5 Vdc
AM waveform	0.0 ±0.2 Vdc to +4.5 ±0.5 Vdc
Swept AM sweep waveform	0.0 ±0.2 Vdc to +4.5 ±0.5 Vdc

3.9 Physical characteristics.

3.9.1 Dimensions. The length, width, and height of the set shall be as specified in Drawing 1356AS302.

3.9.2 Weight. The weight of the set shall be not greater than 30 pounds.

3.10 Reliability. The reliability of the set shall be not less than 100 hours mean-time-between-failure (MTBF).

3.11 Maintainability. The mean-time-to-repair (MTTR) of the set shall be not greater than 0.5 hour when replacing major assemblies or shop replaceable units.

3.12 Storage life. The storage life of the set shall be such that the set can be stored for five years and then meet the requirements specified herein.

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3.13 Nameplate and marking. The nameplate shall be as specified in Drawing 1356AS302. Interchangeable parts and assemblies shall be legibly marked. All markings shall be as specified in MIL-STD-130.

3.13.1 Nomenclature and serial numbers. The contractor shall prepare requests for nomenclature and serial number assignments as specified in MIL-N-18307 (see 6.2.2).

3.14 Interchangeability. All assembly and subassembly level items of hardware that are subject to replacement and have the same part number shall be electrically, physically, and functionally interchangeable. The set shall meet the interchangeability requirements as specified in MIL-STD-454, Requirement 7, and the electrical and mechanical interface requirements specified in 3.3.

3.15 Safety. The set shall meet the safety requirements as specified in MIL-STD-454, Requirement 1.

3.16 Human performance/human engineering. Unless otherwise specified herein, all controls and adjustments shall be set during production and initial testing. Components and assemblies that have to be replaced to meet maintainability requirements as specified herein shall be clearly identified in the set. Removal and substitution of these items shall not be impeded by their position within the set assembly or by other components or structures. No special equipment, tools, or fixtures shall be required to effect a removal and replacement action.

3.17 Workmanship. Fabrication and assembly practices shall be as specified in MIL-STD-454, Requirement 9.

3.17.1 Soldering practices. Soldering practices shall be as specified in MIL-STD-454, Requirement 5.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order (see 6.2.1), 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 the performance of the 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 supplies and services conform to prescribed requirements.

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4.1.1 Inspection system. The contractor shall assure product conformance to the requirements, inspections, and tests specified herein. The contractor's quality assurance program shall be planned and used in a manner to achieve levels of quality and reliability commensurate with the intended application specified herein. The contractor's inspection system shall be subject to review by the procuring activity (see 6.2.2).

4.1.2 Test plans. Unless otherwise specified in the contract or purchase order (see 6.2.1), detailed test plans as specified in MIL-T-18303 shall be prepared by the contractor prior to the commencement of testing (see 6.2.2).

4.1.3 Test data. Unless otherwise specified in the contract or purchase order (see 6.2.1), the detailed test data from both the first article tests and acceptance tests shall be prepared by the contractor (see 6.2.2). Test data for each set offered for acceptance shall be as specified in MIL-STD-831. This data shall identify all rejections from acceptance tests and corrective actions taken.

4.1.4 Failure records. Unless otherwise specified in the contract or purchase order (see 6.2.1), failure analysis and proposed corrective action shall be prepared by the contractor (see 6.2.2).

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. First article inspection (see 4.5).
b. Quality conformance inspection (see 4.6).

(1) Acceptance tests (see 4.6.1).
(2) Reliability tests (see 4.6.2).

4.3 Inspection conditions. Unless otherwise specified in the applicable test procedure, all tests and inspections shall be conducted under the following conditions:

a.	Temperature (ambient):	+23° ±10°C
b.	Atmospheric Pressure:	725 +50/-115 mm of mercury (28.5 +2.0/ -4.5 inches of mercury)
c.	Humidity:	10 to 90 percent

4.3.1 External power. The external power shall be +28.0 ±3.0 Vdc applied to J1 and shall simulate airborne vehicle power transfer, when specified in the applicable test procedure.

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4.3.2 RF output termination. Unless otherwise specified herein, the set's RF output shall be connected to a separate 50 ohm RF load termination when power is applied to the set.

4.3.3 Test equipment accuracy. Unless otherwise specified herein, all test equipment used shall have an accuracy within 20 percent of the tolerance for the variable to be measured. In some cases where an open-ended minimum or maximum requirement is given, the test equipment used shall be accurate to within five percent of that requirement.

4.3.3.1 Maintenance and calibration. All test equipment shall be maintained and calibrated as specified in MIL-STD-45662. Certification to this effect prior to all inspections and tests shall be prepared by the contractor (see 6.2.2).

4.4 First article sample. Unless otherwise specified in the contract or purchase order (see 6.2.1), the first article sample shall consist of two sets and shall be subjected to the first article tests specified herein. The first article sample shall be manufactured using the same materials, processes, and procedures proposed for production.

4.4.1 First article approval. Approval of the first article sample shall be by the procuring activity upon satisfactory completion of all tests. The procuring activity reserves the right to require an additional sample and test if any set fails to meet any requirement specified herein (see 6.2.1). Any production by the contractor before acceptance of the first article sample will be at the contractor's risk. Subsequent to first article approval, the contractor shall not change materials, processes, or procedures without prior approval of the procuring activity by an engineering change proposal (see 6.2.2).

4.5 First article inspection. The first article sample shall be subjected to the inspections and tests specified in Table V and shall be performed in the sequence specified therein. The contractor shall prepare and include test reports (see 6.2.2).

4.5.1 First article failure analysis and corrective action. When specified in the contract or purchase order (see 6.2.1), the procuring activity shall be notified within one working day of a first article test failure and its probable cause. Procuring activity approval is required before implementation of any corrective action in first article products (6.2.2).

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TABLE V. First article and quality conformance tests.

Examination or Test	Method Paragraph		
	Requirement Paragraph	First Article	Acceptance
1. Visual examinations			
a. Dimensions	3.9.1	4.7.1.1	4.7.1.1
b. Weight	3.9.2	4.7.1.1	4.7.1.1
c. Nameplate and markings	3.13	4.7.1.3	4.7.1.3
d. Interchangeability	3.14	4.7.1.4	4.7.1.4
e. Workmanship	3.17	4.7.1.5	4.7.1.5
2. Manufacturing burn-in test		4.6.3	4.6.3
3. Performance			
a. Warm-up and operational stability	3.7.1.3	4.7.2.1	4.7.2.1
b. Primary power voltage variation (25.0 +0.1 - 0.0 Vdc)	3.7.1.1	4.7.2.6	
c. Primary power voltage variation (31.0 +0.0 - 0.1 Vdc)	3.7.1.1	4.7.2.7	
d. Termination mismatch	3.7.1.6	4.7.2.2	
e. Undervoltage fault protection and reverse polarity	3.7.1.2	4.7.2.3	
f. Controls	3.4	4.7.2.4	4.7.2.4
g. Time meter	3.5	4.7.2.5	4.7.2.5
h. Electromagnetic interference	3.7.1.9	4.7.2.8	
i. Spot noise FM noise bandwidth	3.7.1.10.1a	4.7.3.1	4.7.3.1
j. Spot noise FM noise deviation frequency components	3.7.1.10.1b	4.7.3.2	4.7.3.2
k. Barrage noise FM noise bandwidth and sweep bandwidth	3.7.1.10.2a	4.7.3.3	4.7.3.3
l. Barrage noise FM noise deviation frequency components and sweep waveform	3.7.1.10.2b, 3.7.1.10.2c, 3.7.1.10.2d	4.7.3.4	4.7.3.4
m. Swept noise FM noise bandwidth and sweep bandwidth	3.7.1.10.3a, 3.7.1.10.3d	4.7.3.5	4.7.3.5
n. Swept noise FM noise deviation frequency components and sweep waveform	3.7.1.10.3b, 3.7.1.10.3c	4.7.3.6	4.7.3.6
o. Swept AM	3.7.1.10.4	4.7.3.7	4.7.3.7
p. Blink AM	3.7.1.10.5	4.7.3.8	4.7.3.8
q. Spectral purity	3.7.1.11	4.7.3.9	4.7.3.9
r. Video frequency tolerance	3.7.1.12	4.7.3.10	4.7.3.10
4. Environmental			
a. Operational	3.8.1	4.7.4.1	
b. Nonoperational	3.8.2	4.7.4.2	
5. Reliability 1/	3.10	4.6.2	4.6.2 1/

1/Reliability tests shall be performed on first article sample units and, when specified in the contract or purchase order (see 6.2.1), other selected units which have passed all other acceptance testing (see 4.6.2).

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4.6 Quality conformance inspection.

4.6.1 Acceptance tests. Acceptance tests shall be conducted on each set offered for acceptance and shall consist of the tests specified in Table V. Unless otherwise specified by the contract or purchase order (see 6.2.1), sets shall be randomly selected from those which have passed acceptance testing and then be subjected to the reliability tests specified in 4.6.2.

4.6.1.1 Acceptance test data. The contractor shall prepare acceptance test data sheets (see 6.2.2) for each set offered for acceptance.

4.6.2 Reliability tests. Reliability tests shall be conducted on the first article sample and on randomly selected sets which have passed acceptance testing to ensure compliance specified in 3.10 (see 6.2.1). The reliability tests shall be in accordance with the Probability Ratio Sequential Test (PRST) Plan VIIIC, Figure C-8, Appendix C as specified in MIL-STD-781. If during reliability testing the total test hours and test failures plotted on the PRST Acceptance/Reject criteria for Test Plan VIIIC as specified in MIL-STD-781 shows a reject situation, the procuring activity reserves the right to stop acceptance of sets any time reject situation exists pending a review of the contractor's efforts to improve the set, the set's components and parts, and the set's workmanship (see 6.2.1).

4.6.2.1 Reliability failure criteria. In addition to the failure criteria as specified in MIL-STD-781, a set shall be considered to have failed when any of the monitored characteristics perform outside the specified limits for that characteristic. Preventive maintenance measures or adjustments shall not be performed upon the sets during the period of the test.

4.6.2.2 Reliability data and test reports. Unless otherwise specified in the contract or purchase order (see 6.2.1), the contractor shall prepare reliability test data and reports, including failure records, for each set subjected to reliability testing (see 6.2.2). The data and reports shall be as specified in MIL-STD-781 and shall be prepared for review not later than 10 working days after completion of reliability testing.

4.6.3 Manufacturing burn-in test. Each set shall be operated under the conditions specified herein for a period of ten hours without failure. A failure shall be anything which causes malfunctioning of the equipment. Only those adjustments will be permitted which can be made by using such controls and adjustments that are accessible to the operator during the normal use of the set. This test shall be deleted if the reliability test includes a test on each set which requires at least ten hours of set on time. The test shall be run at ambient temperature and humidity conditions. Vibration shall be at any nonresonant frequency between 20 and 30 Hz at a level of ± 3 gs. The set shall be vibrated (without vibration oscillators)

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for a period of ten minutes prior to the beginning of the ten hour period of operation. Where feasible, the set shall be operated during this vibration period for the purpose of detecting flaws and imperfect workmanship. Operation within the specified limits of satisfactory performance is not necessarily required during the vibration period. The direction of vibration shall be vertical to the normal mounting plane for five minutes and lateral to the plane for five minutes. Where it is not feasible to vibrate the set in two directions, the vertical direction shall be used. During the ten hour period of operation following the ten minute vibration period, the set shall be mechanically cycled periodically through its various phases of operation. Should a failure occur, it shall be repaired and the test started over, except that the ten minute vibration period need not be repeated when it is certain the failure was not a result of the vibration. Should repetitive failures occur, corrective action shall be taken to eliminate this defect from future sets. A record shall be kept of all failures. The ten hour period specified above may be composed of two five-hour periods to conform with standard working hours.

4.7 Inspection and test methods. Details of methods and procedures shall be as specified in the approved test plan (see 4.1.1).

4.7.1 Visual examinations.

4.7.1.1 Physical characteristics. The set shall be inspected to determine conformance to 3.9

4.7.1.2 Materials, processes, and parts. The set shall be inspected to determine conformance to 3.6.

4.7.1.3 Nameplate and marking. The set shall be inspected to determine conformance to 3.13.

4.7.1.4 Interchangeability. The set shall be examined to determine conformance to 3.14.

4.7.1.5 Workmanship. The set shall be examined to determine conformance to 3.17.

4.7.2 Performance tests. Unless otherwise specified in the contract (see 6.2.1), performance tests shall be performed to ensure that the set shall operate for conformance as specified in 3.7.1. Input power shall be as specified in 3.7.1.1 and the performance shall be continuously monitored during the conduct of tests.

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4.7.2.1 Warm-up and operational stability test. The set shall be operated under the provisions and conditions specified in 4.3. The set shall be operated for a period of 30 minutes and the following shall be observed:

a. Input power (see 3.7.1.1).
b. Warm-up time (see 3.7.1.3).
c. Programming (see 3.7.1.13).
d. Frequency range (see 3.7.1.4).
e. Frequency stability (see 3.7.1.5).
f. RF output power (see 3.7.1.7).
g. RF output sample (see 3.7.1.7.1).
h. Noise figure (see 3.7.1.8).

4.7.2.2 Termination mismatch. The set shall be connected to a mismatched load having a VSWR of 2:1 with phase angle between the resistive and the reactive load components varied between zero and 360 degrees. Input power shall be 28.0 ±3.0 Vdc and the RF TUNE shall be adjusted to 435 MHz and the following observed to determine if the set meets the requirements specified in 3.7.1.6:

a. Input power (see 3.7.1.1).
b. Warm-up time (see 3.7.1.3).
c. Frequency range (see 3.7.1.4).
d. RF output power (see 3.7.1.7).

4.7.2.3 Under-voltage and fault protection. The set shall be tested for under-voltage and fault protection by application of 20 Vdc and non-damaging simulated faults. The operation of under-voltage and fault protection functions shall meet the requirements specified in 3.7.1.2.

4.7.2.4 Controls test. The set's controls shall be tested under simulated operational conditions to ensure they meet the requirements specified in 3.4.

4.7.2.5 Time meter test. The set's time meter shall be tested under simulated operational conditions with running time observed and meet the requirements specified in 3.5.

4.7.2.6 Primary power voltage variation (+25.0 +0.1 -0.0 Vdc) test. The primary power voltage shall be adjusted to +25.0 +0.1 -0.0 Vdc and the following observed:

a. Input power (see in 3.7.1.1).
b. Warm-up time (see in 3.7.1.3).
c. Frequency range (see in 3.7.1.4).
d. RF output power (see in 3.7.1.7).

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4.7.2.7 Primary power voltage variation (+31.0 +0.0 -0.1 Vdc) test. The primary power shall be adjusted to +31.0 +0.0 -0.1 Vdc and the following observed:

a. Input power (see 3.7.1.1).
b. Warm-up time (see 3.7.1.3).
c. Frequency range (see in 3.7.1.4).
d. RF output power (see in 3.7.1.7).

4.7.2.8 Electromagnetic interference test. The power lead conducted emission test CE01 and the radiated emission electric field test RE02 as specified in MIL-STD-462 shall be performed to ensure that the set meets the requirements specified in 3.7.1.9.

4.7.3 Modes of operation test. The following modes of operation shall be tested to verify conformance to 3.7.1.10.

4.7.3.1 Spot noise FM noise bandwidth test. The spot noise FM noise bandwidth shall be tested to verify conformance to 3.7.1.10.1a at 435 MHz.

4.7.3.2 Spot noise FM noise deviation frequency component test. The spot noise FM noise deviation frequency components shall be tested to verify conformance to 3.7.1.10.1b.

4.7.3.3 Barrage noise FM noise bandwidth and sweep bandwidth test. The barrage noise FM noise bandwidth and sweep bandwidth shall be tested to verify conformance to 3.7.1.10.2a and 3.7.1.10.2d.

4.7.3.4 Barrage noise FM noise deviation frequency components and sweep waveform test. The barrage noise FM noise deviation frequency components and sweep waveform shall be tested to verify conformance to 3.7.1.10.2b and 3.7.1.10.2d.

4.7.3.5 Swept noise FM noise bandwidth and sweep bandwidth test. The swept noise FM noise bandwidth and sweep bandwidth shall be tested to verify conformance to 3.7.1.10.3a and 3.7.1.10.3d.

4.7.3.6 Swept noise FM noise deviation frequency components and sweep waveform test. The swept noise FM noise deviation frequency components and sweep waveform shall be tested to verify conformance to 3.7.1.10.3b and 3.7.1.10.3d.

4.7.3.7 Swept AM test. The swept AM shall be tested to verify conformance to 3.7.1.10.4.

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4.7.3.8 Blink AM test. The blink AM shall be tested to verify conformance to 3.7.1.10.5.

4.7.3.9 Spectral purity test. The spectral purity of the set shall be tested to verify conformance to 3.7.1.11 in 5 MHz steps from 420 to 450 MHz.

4.7.3.10 Video frequency tolerance test. The video frequency tolerance of the set shall be tested to verify conformance to 3.7.1.12.

4.7.4 Environmental tests. The environmental tests of Table VI shall be performed as specified in MIL-T-5422, except as modified herein. The right is reserved by the procuring activity (see 6.2.1) to modify the tests or require any additional tests deemed necessary to determine compliance with the requirements specified herein. The test specimens shall be allowed to stabilize at room ambient conditions prior to performance of measurements and inspections.

4.7.4.1 Operational environmental tests. The set's performance shall be tested and meet the requirements specified in 3.7.1 during and after exposure to the following environments to verify conformance to 3.8.

TABLE VI. Modification of test chamber conditions for temperature-altitude tests.

Table II of MIL-T-5422 step	Temperature (degree C)	Altitude (feet)	Time (hours)	Input Voltage	Operating/ Nonoperating
1	-35	ATM 1/	2	---	Nonoperating
2	-35	ATM	---	25.0	Operating
3	-35	50,000	---	31.0	Operating
4	-10	ATM	---	31.0	Nonoperating
5	+54	ATM	16	---	Operating
6	+54	ATM	4	31.0	---
7	Omit	---	---	---	---
8	Omit	---	---	---	---
9	0	50,000	1.25	31.0	Operating
9A	AMB 2/	AMB	2	---	Nonoperating
9C	0	50,000	1.25	31.0	Operating
10	+30	35,000	2	31.0	Operating
11	Omit	---	---	---	---
12	Omit	---	---	---	---
13	Omit	---	---	---	---

1/ ATM equals 1 atmosphere
2/ AMB equals ambient

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4.7.3.4.1 Temperature and altitude test. The set shall be tested in accordance with the temperature-altitude test as specified in MIL-T-5422 Table II, as modified herein by Table VI.

4.7.4.1.2 Vibration test. The set shall be tested in accordance with the vibration test as specififed in MIL-T-5422, Curve I and Curve II.

4.7.4.1.3 Shock test. The set shall be tested in accordance with the shock test as specified in MIL-T-5422, except as modified herein to no greater than 25 g.

4.7.4.1.4 Explosion test. The set shall be tested in accordance with the explosion test as specified in MIL-T-5422.

4.7.4.2 Nonoperational environmental tests. The set performance shall be tested and meet the requirements specified in 3.8.2 after exposure to the following environments.

4.7.4.2.1 Thermal shock test. The set shall be tested in accordance with the thermal shock test as specified in MIL-T-5422.

4.7.4.2.2 Humidity test. The set shall be tested in accordance with the humidity test as specified in MIL-T-5422, except that two continuous cycles shall be used instead of 10.

4.8 Preshipment inspection. Prior to shipment, inspection shall ensure that preservation, packaging, packing, and marking for shipment are in accordance with the requirements specified in Section 5.

5. PACKAGING

5.1 Preservation-packaging, and packing. Unless otherwise specified in the contract or purchase order (see 6.2.1), the level of preservation-packaging, and packing shall be as specified in MIL-E-17555 and MIL-STD-794, Level C. The method of preservation for level C shall be determined in accordance with the selection chart in Appendix D as specified in MIL-STD-794 and the method of packaging shall be as specified in MIL-P-116.

5.2 Marking.

5.2.1 Special marking. Special marking shall be as specified in the contract or purchase order (see 6.2.1).

5.2.2 Normal marking. Unit packages and shipping containers shall be marked in accordance with the requirements as specified in MIL-STD-129.

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5.3 Spare parts. Unless otherwise specified in the contract or purchase order (see 6.2.1), spare parts shall be preserved and packaged to the same specification as a complete set except that weight of spare parts will determine selection of style of the box container.

6. NOTES

6.1 Intended use. The Countermeasures Set, B-Band is intended for use in electronic warfare test and evaluation programs. The set will be utilized as a modular unit, easily combined with other target vehicles, to provide electronic warfare configurations.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

a. Number, title and date of this specification.
b. Responsibility for inspection (see 4.1).
c. Detail test plans if other than specified in 4.1.2.
d. Detail test data if other than specified in 4.1.3.
e. Requirements for failure records (see 4.1.4).
f. Requirements for first article sample if other than specified in 4.4.
g. Additional tests and samples, if required (see 4.4.1).
h. First article failure analysis and corrective action (see 4.5.1).
i. Sets to be selected for reliability test (see 4.6.2 and Table V).
j. Option to stop acceptance of set during reliability testing (see 4.6.2).
k. Requirement for reliability data and test reports (see 4.6.2.2).
l. Requirement for performance tests (see 4.7.2).
m. Environmental tests, if other than specified (see 4.7.4).
n. Level of preservation-packaging and packing (see 5.1).
o. Special marking (see 5.2.1).
p. Level of packing for spare parts if different than the set (see 5.3).

6.2.2 Data requirements. When this specification is used in an acquisition which incorporates a DD Form 1423, Contract Data Requirements List (CDRL), the data requirements identified below shall be developed as specified by an appproved Data Item Description (DD Form 1664) and delivered in accordance with the approved CDRL incorporated into the contract. When the

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provisions of DAR-7-104.9(n) (2) are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification is cited in the following paragraphs:

Paragraph No.	Data requirement title	Applicable DID No.	Option
3.13.1	Nomenclature Request for (DD Form 61), Preparation of	UDI-E-23090B	
4.1.1	Inspection System Program Plan	DI-R-4803	
4.1.2	Test Procedures	UDI-T-21347	
4.1.3, 4.6.1.1	Records, Inspection and Test	UDI-T-22706A	
4.1.4, 4.5.1	Failure Analysis and Corrective Action Report	DI-R-5299C	
4.3.3.1	Equipment Calibration Procedures	DI-R-7065	
4.4.1	Engineering Change Proposal (ECPs), Requests for Waivers and Deviations (Long Form)	DI-E-2037	
4.5	Report, First Article (Preproduction) Test	UDI-T-21349	
4.6.2.2	Plan, Reliability Test	DI-R-7033	
4.6.2.2	Reports, Reliability Test, and Demonstration	DI-R-7034	
4.6.2.2	Procedures, Reliability Test	DI-R-7035	
4.6.2.2	Failure Summary and Analysis Report	DI-R-7041	

(Data item descriptions related to this specification, and identified in section 6 will be approved and listed as such in DoD 5000.19L., Vol. II, AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

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6.3 First article. When a first article inspection is required, the item will be tested and should be a first article sample. The first article should consist of 2 sets. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, test approval of the documents first article.

6.4 Government furnished equipment. The contracting officer should arrange to furnish the property listed in 3.1.2.

Preparing activity:

Navy - AS

(Project 5865-N035)

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-C-85579(AS)	COUNTERMEASURES SET, B-BAND

3a. NAME OF SUBMITTING ORGANIZATION	4. TYPE OF ORGANIZATION *(Mark one)*
	☐ VENDOR
b. ADDRESS *(Street, City, State, ZIP Code)*	☐ USER
	☐ MANUFACTURER
	☐ OTHER *(Specify)*: _____

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional	b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional
c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional	8. DATE OF SUBMISSION *(YYMMDD)*

DD FORM 82 MAR 1426

PREVIOUS EDITION IS OBSOLETE.