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20 February 1985
SUPERSEDING
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18 January 1979

MILITARY SPECIFICATION

BATHYTHERMOGRAPH TRANSMITTING SET AN/SSQ-36

This specification is approved for use by the 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 design, performance, and acceptance requirements for the Bathythermograph Transmitting Set AN/SSQ-36 herein referred to as the BTS. The BTS relays, by FM VHF radio transmission, temperature information in the range of -2°C to +35°C as detected by a cable attached temperature sensing device. The BTS is an aircraft launched, expendable, floating device used for detecting thermal gradients in sea water to depths of 305 meters (M).

2. APPLICABLE DOCUMENTS.

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks 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.

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, NJ 08733, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

SPECIFICATIONS

Military

MIL-T-18303	Test Procedures, Preproduction and Inspection for Aircraft Electronic Equipment, Format for

STANDARDS

Military

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-454	Electronic Equipment, General Requirements for
DoD-STD-480	Configuration Control - Engineering Changes, Deviations and Waivers
MIL-STD-785	Requirements for Reliability Program
MIL-STD-1385	Preclusion of Ordnance Hazards in Electromagnetic Fields; General Requirements for

HANDBOOKS

Military

H107	Inspection and Quality Control Single-Level Continuous Sampling Procedures and Tables for Inspection by Attributes (Handbook H-107)

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

PUBLICATIONS

3054-ETP-1924	Environmental Test for Sonobuoys
STF-TP-101	Manual of Sonobuoy Test Procedures
STF-3062-1-1	Operator's Handbook for Sonobuoy Antenna Range Test
SPD-10	Requirements for Performance Verification and Safety Certification of Sonobuoys Containing Lithium Batteries
SPD-13	Sonobuoy Decelerator Effective Drag Area, Ballistic Coefficient and Parachute Construction Requirements

SPD-14	Sonobuoy Air Descent Control System Safety Certification
SPD-15	Production Sonobuoy Program Marking Requirements
49CFR	Combined Federal Register, Title 49

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

2.3 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 First article. When specified in the contract, a sample shall be subjected to first article inspection (see 4.4, 6.2.1 and 6.3).

3.2 Product configuration identification (PCI). The equipment covered by this specification is designated as a configuration item, which requires PCI in the form of technical documentation (see 6.2.2). The documentation shall be used as the basis for configuration control in accordance with DoD-STD-480. The technical documentation shall consist of specifications and detailed production drawings under the custody and control of the contractor. All changes to the approved equipment PCI shall be made in accordance with the contract. The approved equipment PCI shall be determined as follows:

a. The contractor shall establish a preliminary PCI upon submission of first article samples. The approved PCI shall be the documented configuration of the approved first article samples.

b. When first article is not required, the approved PCI shall be the documented configuration of the last acceptable lot produced on the previous contract.

c. The approved PCI for the air descent mechanism shall be the documented configuration, safety certified in accordance with SPD-14.

d. The approved PCI for lithium based power supply, if used, shall be the documented configuration, safety certified in accordance with SPD-10.

3.3 Reliability.

3.3.1 Reliability program. When specified in the contract, the contractor shall conduct a reliability program in accordance with MIL-STD-785 and the contract (see 6.2.1).

3.3.2 Quantitative requirements. The reliability of the BTS is specified as the probability of operation in accordance with the requirements of this specification and the contract and shall be 0.90. The minimum acceptable reliability will be demonstrated during quality conformance testing by successful completion of the aircraft drop tests of 4.5.3.

3.3.3 Performance maintenance program. Sample units from each lot will be tested to evaluate specification compliance for parameters not normally tested during aircraft drop tests. Results of these tests shall become a part of the contractor's reliability program.

3.3.4 Failure reporting and corrective action. The contractor shall maintain a system for initiating failure reports, analyzing failures, and implementing corrective actions in accordance with MIL-STD-785 and the contract (see 6.2.1). Failure analysis reports for any BTS which fails during aircraft drop tests or performance maintenance tests shall be prepared and submitted to the procuring activity (see 6.2.2).

3.4 Environmental requirements.

3.4.1 Standard conditions. The following conditions represent laboratory bench test conditions:

a.	Ambient Air Temperature	25 ± 10°C
b.	Water Temperature	25 + 10°C - 15°C
c.	Altitude	Normal Ground
d.	Humidity	Room Ambient up to 90 percent Relative Humidity (RH)
e.	Input Power	External power source that is equivalent to the impedance voltage-time-characteristics of the sonobuoy's internal battery power supply in its operating environment.

3.4.2 Service conditions.

3.4.2.1 Non-operating. The BTS shall operate as specified after exposure to any combination or sequence of the non-operating service conditions specified in 3.4.2.1.1 through 3.4.2.1.11.

3.4.2.1.1 Vibration. Random vibration with the power spectral density levels identified in figure 1 and a duration of one hour in each of three mutually perpendicular axis in accordance with the requirements of 3054-ETP-1924.

3.4.2.1.2 Shock. Three 100 g half-sine impacts to the bottom end of the unit and seven 50 g half-sine impacts in the five other axes in accordance with the requirements specified in 3054-ETP-1924 for shock testing.

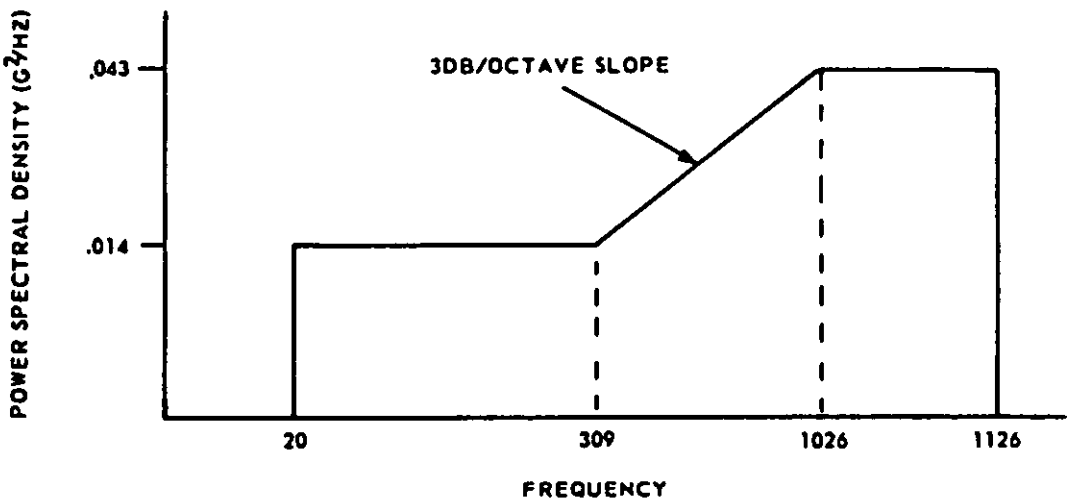


FIGURE 1. Random vibration with power spectral density levels

3.4.2.1.3 Salt atmosphere. A salt fog atmosphere prepared from a five percent salt solution at 35°C for 48 hours in accordance with the requirements specified in 3054-ETP-1924 for salt spray testing.

3.4.2.1.4 Humidity/temperature. Ten-day cycling envelope of figure 2 in accordance with the procedure specified in 3054-ETP-1924 for humidity/temperature testing.

3.4.2.1.5 Temperature/altitude. Range of -60°C to +70°C at sea level atmospheric pressure to -60°C to +35°C at 12,200 meters altitude atmospheric pressure in accordance with the procedures specified in 3054-ETP-1924 for temperature and altitude testing.

3.4.2.1.6 Fungus. Fungus cultures at 29°C combined with 95 percent relative humidity for 14 days in accordance with the requirements specified in 3054-ETP-1924 for fungus testing.

3.4.2.1.7 Thermal shock. Sudden temperature changes within the range of +70°C to -60°C in accordance with the requirements specified in 3054-ETP-1924 for temperature shock testing.

3.4.2.1.8 Storage life. The BTS in sealed packaging as specified in 5.1 and exposed to the temperature and humidity conditions specified in figure 2 for five years. The BTS, outside all packaging shall be exposed to a temperature of +35°C and 90 percent relative humidity for 90 days.

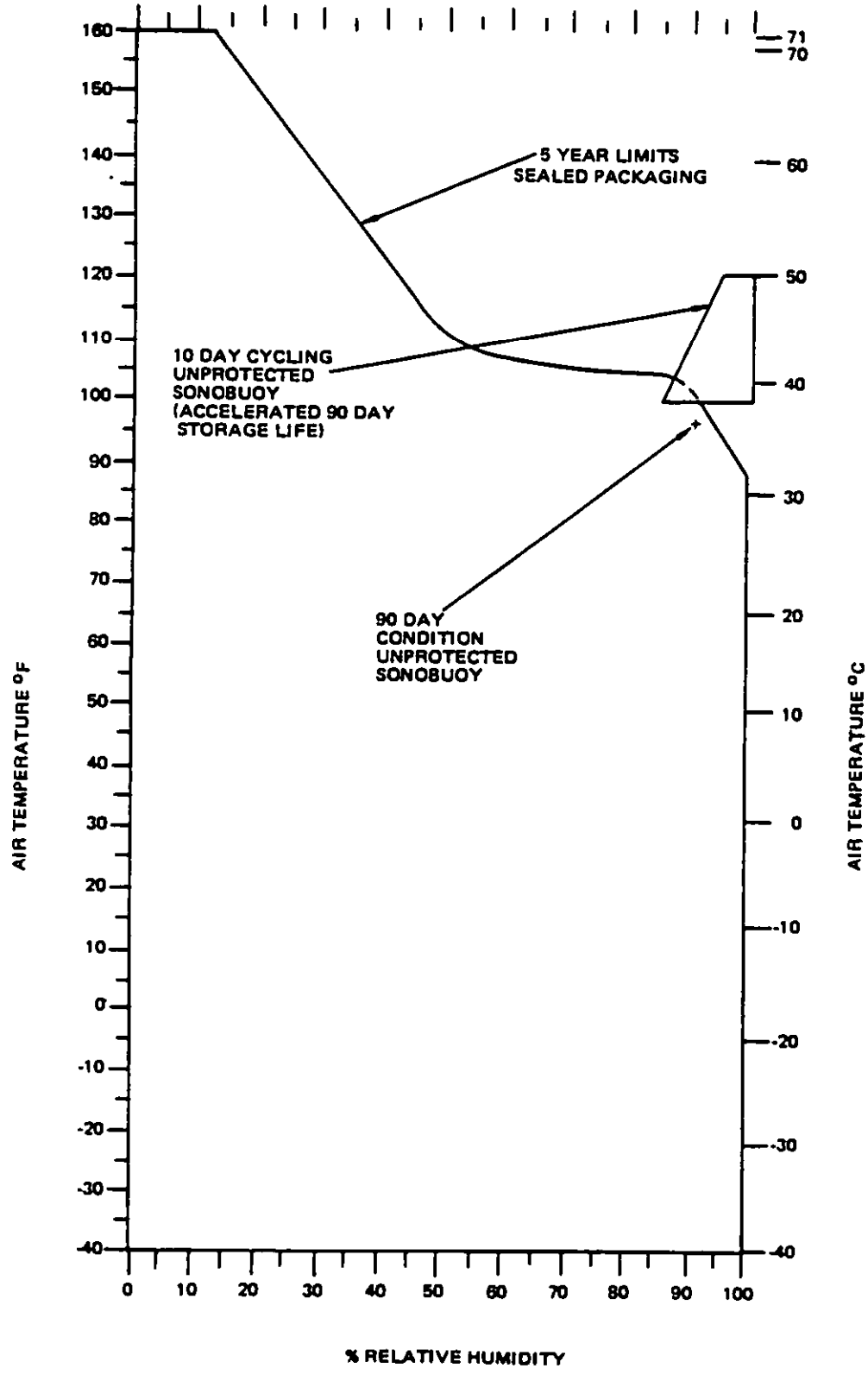


FIGURE 2. Humidity/temperature envelope

3.4.2.1.9 Packaging interface testing. Packaging interface testing required by packaging and palletization requirements of 5.1 and 5.2

3.4.2.1.10 Electromagnetic radiation. The electromagnetic radiation shall be as specified in MIL-STD-1385.

3.4.2.1.11 Launch envelope. Launching at any combination of altitude and airspeed within the launch envelope described in figure 3. The BTS shall be capable of being loaded, unloaded, and launched from P-3, S-3, SH-2, SH-3 and SH-60B type aircraft launcher system without damaging the aircraft or the BTS.

3.4.2.2 Operating. The BTS shall operate as specified during exposure to the operating service conditions specified in 3.4.2.2.1 and 3.4.2.2.2.

3.4.2.2.1 Sea environment. Sea water having a salinity of 1.5 to 3.6 percent by weight and over a temperature range of 0° to +35°C at the surface. Sea water having a salinity of 2.3 to 3.6 percent by weight and over a temperature range of 3° to 30°C 15 meters or more below the surface. Sea state conditions of 0 through 5 (international scale) with a constant surface wind velocity of 56 kilometers per hour (km/h) maximum and surface wind gusts of 74 km/h maximum. The differential current between any two points along the deployed BTS shall be equal or less than that depicted by the two dimensional current profile of figure 4.

3.4.2.2.2 Activation temperature shock. The BTS stabilized at -20°C to +55°C and entering 0° to +35°C sea water in accordance with the requirements specified in 3054-ETP-1924 for cold and hot activation testing.

3.5 Mechanical requirements.

3.5.1 Nomenclature. Nomenclature shall be as specified in the contract (see 6.2.1).

3.5.2 Form factor. The BTS shall have a maximum outside diameter of 123.82 + 0.00 - 3.18 millimeters (mm) and an overall length of 914.39 + 3.18 -4.74 mm. The BTS shall pass through a right circular test cylinder having an inside diameter of 125.400 +0.400 -0.000 mm and length of 1.2 meters. No force other than gravity shall be required to cause passage of the BTS through the test cylinder when placed in a vertical position. Any irregularities on the external surface shall not damage the aircraft launcher. External dimensions of the BTS shall either conform to the above or shall be the same as previously approved during first article testing. All contractor initiated changes to the external dimensions as previously first article qualified and not in compliance with the above dimensions shall be prepared and be available as Class I ECPs for approval by the procuring activity in accordance with the contract (see 6.2.2).

3.5.3 Weight. The maximum weight of the BTS shall not be greater than 9.0 kilograms (kg).

3.5.4 Finish. Parts shall not evidence corrosion which results in the failure of the BTS to meet any specification requirements after any combination of environmental conditions specified in this specification.

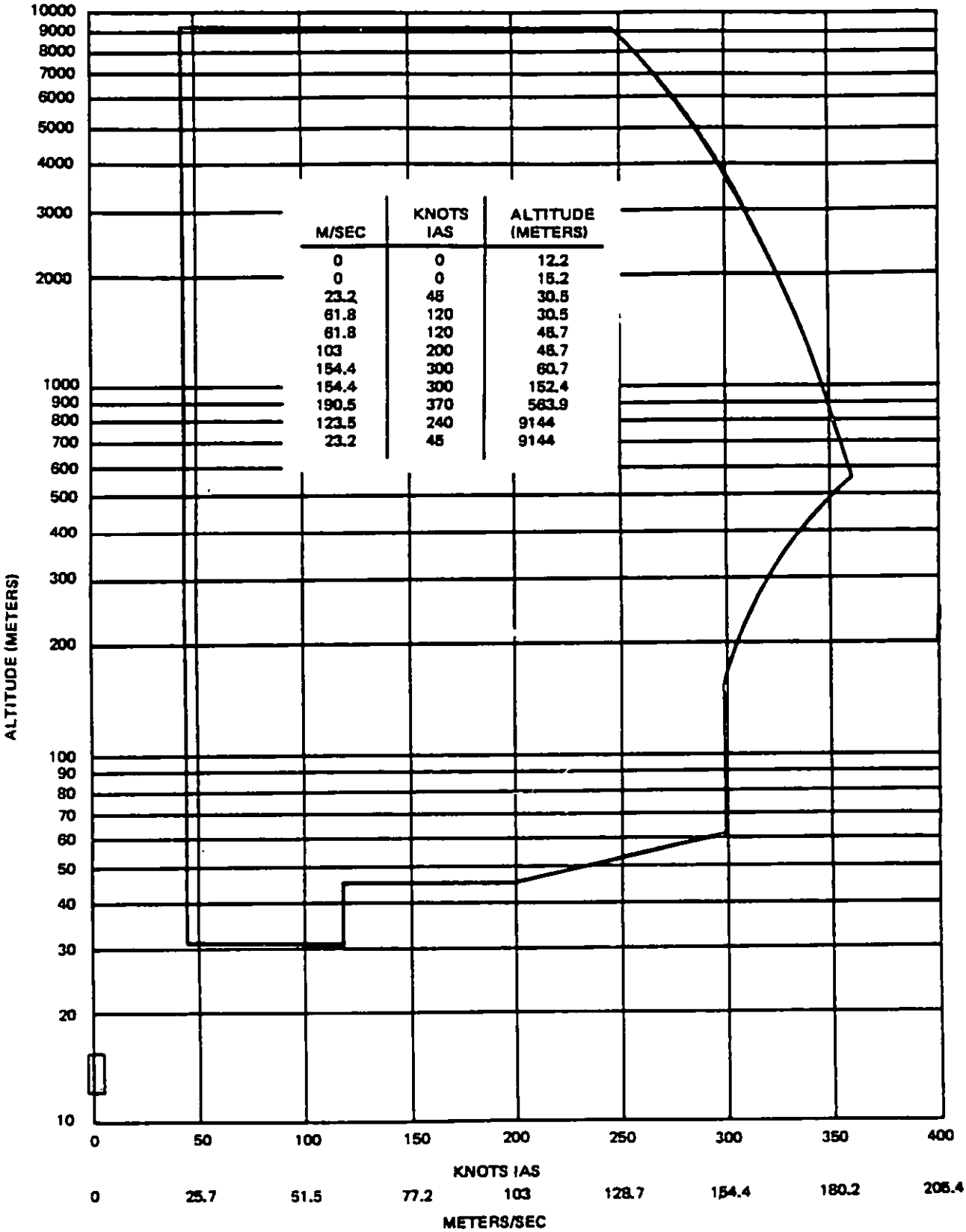
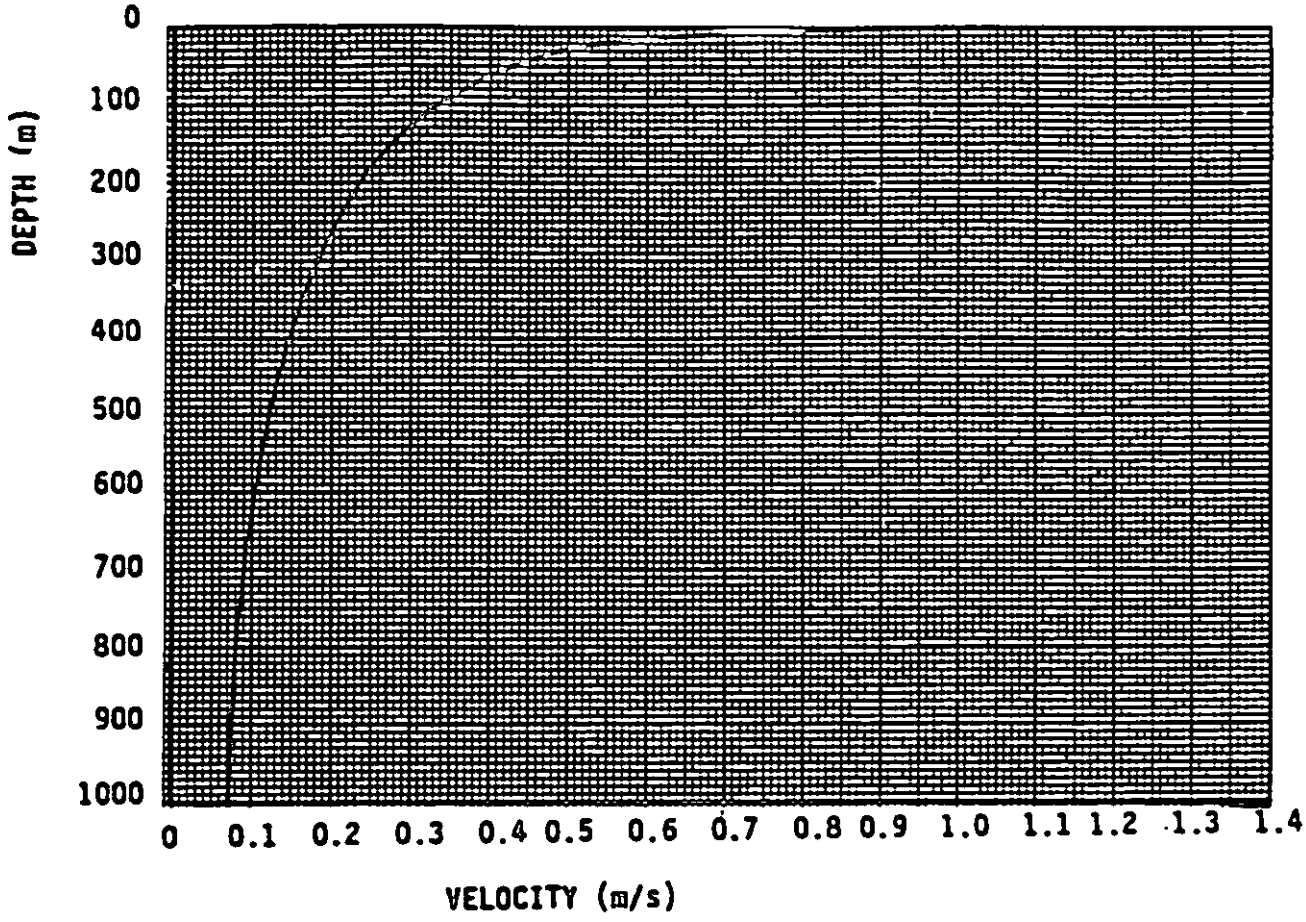


FIGURE 3. Altitude/speed launch envelope



VELOCITY (m/s)	DEPTH (m)
$V = \frac{77}{130 + d} + 0.036 \ln \left[\frac{45.6}{d + 0.002} \right]$	$d \leq 45.6$
$V = \frac{77}{130 + d}$	$45.6 < d < 1000$
$V = 0.068$	$d \geq 1000$

FIGURE 4. Sonobuoy current profile

3.5.5 Marking. The BTS shall be marked with the information specified in 3.5.5.1 through 3.5.5.7.

3.5.5.1 BTS identification, housing. The BTS housing, approximately midway between the BTS ends, shall be marked with the nomenclature, Naval Ammunition Logistics Code (NALC), contract number, lot number, contractor's Federal Supply Code for Manufacturers (FSCM), and BTS gross weight in accordance with SPD-15.

3.5.5.2 Transmitter channel number. The BTS housing, approximately midway between BTS ends, shall be marked with the transmitter channel number (see 3.6.4.1) in accordance with SPD-15.

3.5.5.3 BTS identification, end. The ends of the BTS shall be marked with the BTS abbreviated nomenclature, transmitter channel number and the NALC number in accordance with SPD-15.

3.5.5.4 BTS hazardous material marking. When a BTS contains hazardous material as specified by paragraph 171.8 of Title 49 of the Code of Federal Regulations (49CFR), the BTS shall be marked in accordance with Department of the Navy requirements.

3.5.5.5 BTS non-explosive ammunition marking. The BTS housing shall be marked with a warning in accordance with SPD-15 when the BTS contains a Class C explosive electric squib in accordance with 49CFR paragraph 173.100 (j) and the BTS (packaged in the container to be used in shipment) has successfully completed non-explosive ammunition testing in accordance with 49CFR paragraph 173.55.

3.5.5.6 Air descent control system instructions. The activator shall be marked with a warning in accordance with SPD-15 when the activator is spring loaded. The retainer or surface in the immediate area shall be marked with actuation instructions in accordance with SPD-15.

3.5.5.7 Bar code marking. The BTS housing, adjacent to the BTS identification marking, shall be marked with two bar codes in accordance with SPD-15. The information contained in one bar code shall include the National Item Identification Number (NIIN), U.S. Navy ownership code and material condition code. The information contained in the other bar code shall include a modified ammunition lot number (manufacturer, date, configuration, and lot information), a shelf life date, and the quantity of BTS units.

3.5.6 Test receptacles. Test connections shall be provided for electrical bench testing of the assembled BTS. Access to the test connections shall be possible without deformation of mechanical parts or major disassembly of the BTS; however, the air descent control device may be removed and the watertight integrity may be violated for this testing. If the watertight integrity is broken, it shall be restored using simple hand tools after testing is complete. The test connections shall provide the capability for:

a. Applying necessary external electrical power for testing.

b. Performing quality conformance inspection specified in 4.5.

3.5.7 Downloading tool access. The BTS bottom plate shall be provided with a 12 mm minimum diameter hole. The shape, depth, and location of the hole shall allow the BTS to be hooked and lifted from a top-loaded aircraft launcher using the tool shown in figure 5.

3.5.8 Compatibility with packaging. The BTS shall be compatible with the packaging and palletization specified in 5.1.

3.5.9 Air descent control system. A system shall be provided to control the air descent of the BTS when the BTS is launched at any point within the launch envelope specified in figure 3. The system shall not interfere with BTS performance as otherwise specified herein. The system shall be compatible with and certified safe, in accordance with SPD-14, for all sonobuoy launch tube systems in the P-3A/B/C, S-3A, SH-2F, SH-3H, and SH-60B aircraft. The system shall include the hardware and physical properties as specified in 3.5.9.1 through 3.5.9.2.1.

3.5.9.1 Hardware. The air descent control system hardware shall include the decelerator, activator, captivator, retainer, outer housing, and all intermediate parts required to interconnect the above hardware ultimately to the outer housing.

3.5.9.1.1 Decelerator. The decelerator shall have a known effective drag area as determined by wind tunnel testing. The overall length of the decelerator, assembled to the BTS and extended in the maximum possible condition, shall not be greater than 0.92 meters. The decelerator shall have a redundant attachment feature to prevent separation of the decelerator from the BTS should a single attachment point fail. The decelerator shall be located at the end of the BTS that exits the SLC first during launching. The decelerator shall fully deploy within 0.8 seconds after the sonobuoy clears the aircraft launch tube at airspeeds greater than 150 knots IAS. Effective drag areas, ballistic coefficient calculation, and construction requirements for parachute decelerators shall be in accordance with SPD-13.

3.5.9.1.2 Activator. The activator shall initiate decelerator deployment during launching regardless of the BTS's orientation with respect to the air stream. The activator shall not inadvertently deploy while the BTS is carried in a SH-3H launch tube with the decelerator end up. The activator shall not inadvertently deploy while the BTS is loaded, carried, or downloaded in a P-3A/B pneumatic launch tube with the decelerator end down and the captivator removed. Special marking on the BTS is required when the activator is spring loaded (see 3.5.5.6).

3.5.9.1.3 Captivator. The captivator shall secure the activator, thereby preventing initiation of decelerator deployment, until the BTS has cleared the SLC regardless of the BTS's orientation with respect to the air stream at airspeeds up to and including 150 knots IAS. The captivator shall perform as specified for up to one hour as might happen if a BTS was only partially launched from a helicopter horizontal launch tube. The captivator shall be removable by hand and without tools to facilitate BTS use in P-3A/B and SH-3H aircraft launch tubes. The captivator shall not interfere with the operation of the activator.

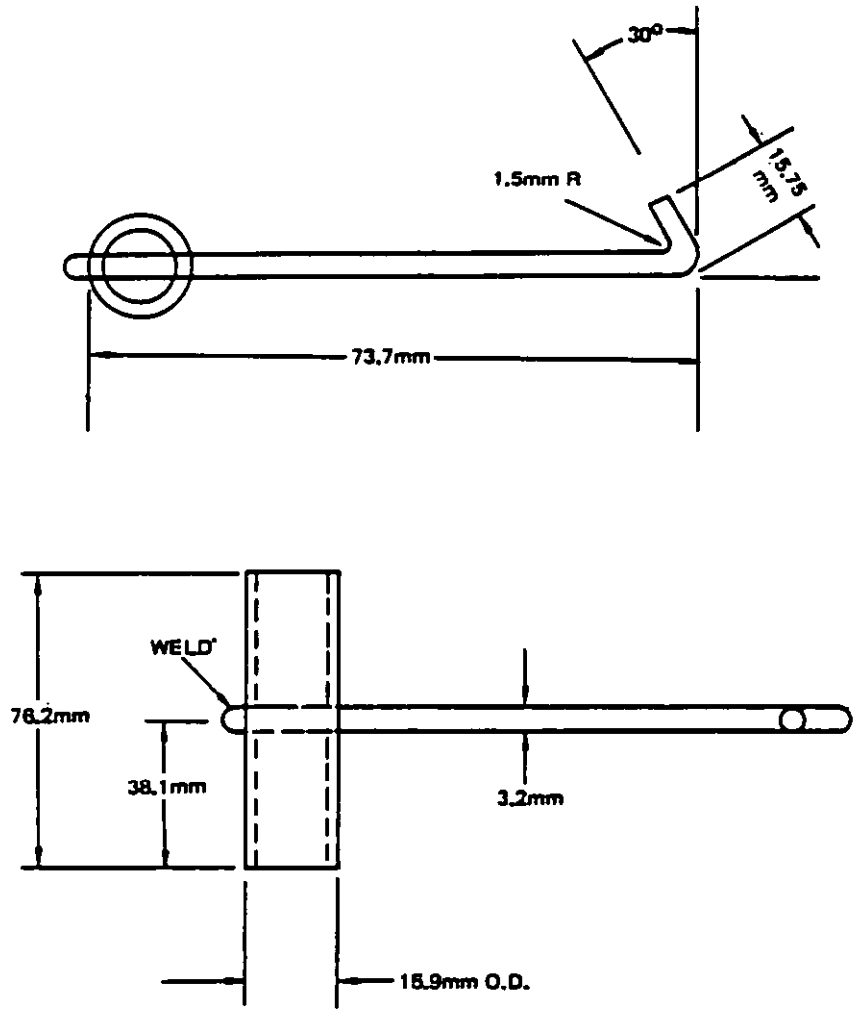


FIGURE 5. Downloading tool.

3.5.9.1.4 Retainer. The retainer shall secure the activator, thereby preventing initiation of decelerator deployment, when handling the BTS outside of the SLC. The retainer shall be capable of engagement or disengagement by hand and without tools. Special marking on the BTS is required when the retainer must be engaged or disengaged (see 3.5.5.6). The retainer shall not interfere with the operation of the activator when the retainer is positioned for launch as directed by special marking and as shipped in the SLC.

3.5.9.2 Physical properties. The air descent control system physical properties shall include the BTS weight, center of gravity in the major axis, and the ballistic coefficient.

3.5.9.2.1 Ballistic coefficient. The ballistic coefficient is defined as the weight of the BTS divided by the BTS effective drag area. The BTS effective drag area is the combination of deployed decelerator and BTS canister effective drag areas. The ballistic coefficient for the BTS with a deployed decelerator shall be 60.0 ± 4.9 Kg per squared meter.

3.5.10 Flotation system. The BTS shall have a flotation system which maintains positive buoyancy in the deployed configuration for the operating life.

3.5.11 Scuttling system. The BTS shall have a scuttling system which automatically scuttles the BTS, by means of a positive acting device, within 30 hours following water entry but not during the BTS operating life. The BTS shall include a means to prevent the collapse of BTS Housings due to hydrostatic pressure after the BTS has scuttled.

3.5.12 Watertight integrity. The electronic sections and flotation system shall be watertight, through out the operating life of the BTS.

3.5.13 Subsurface assembly system. The subsurface assembly system shall consist of a temperature sensing device, preamplifier, and connecting cable.

3.5.13.1 Temperature sensing device and suspension cable. A suspension cable and temperature sensing device shall be provided.

3.5.13.2 Subsurface operating depth. The subsurface operating depth shall be defined as the progressive vertical distance from the free floating BTS waterline to the temperature sensing device, which commences at a depth not to exceed 1.5 meters and continues to a terminal depth of at least 305 meters when the the subsurface assembly is subjected to a current profile up to and including that shown in figure 4.

3.5.13.3 Release sequence. The temperature sensing probe shall be released from the surface assembly in the following sequence:

a. Prior to modulation of the VHF Carrier, the temperature sensing device shall be retained within 1.5 meters of the water surface.

b. Following commencement of 0.25 watt VHF carrier and within ± .25 seconds of commencement of modulation the temperature sensing device shall be released and begin to descend.

3.5.13.4 Descent characteristics. Under the condition of zero relative current shear, the temperature sensing device shall descend to a depth of 305 meters at the rate of 1.524 meters per second ± five percent. Terminal velocity shall be reached within three seconds after the release of the device.

3.5.13.5 Color. The exterior of the temperature sensing device shall be substantially black.

3.6 Electrical requirements.

3.6.1 Power supply. All power shall be supplied by self-contained power supplies. If lithium batteries are used, the batteries shall comply with the requirements of 49CFR paragraph 173.206(F) to allow unrestricted transportation, storage and disposal of the lithium battery/sonobuoy assembly. Lithium battery assemblies shall be certified safe when tested in accordance with SPD-10.

3.6.2 Operating life. The BTS shall operate with specified performance during operating life. The BTS shall have a continuous operating life from water entry until the temperature sensing device has reached a depth of 305 meters at the nominal descent rate.

3.6.3 Antenna system. An antenna system shall be provided and shall operate as specified for all VHF carrier frequencies listed in 3.6.4.1. The antenna system shall fully erect within 30 seconds following water entry and prior to release of the temperature sensing device. Beam pattern requirements shall be laboratory evaluated in accordance with STP-3062-1-1.

3.6.3.1 Vertical beam pattern. The vertical beam pattern of the antenna system at the assigned VHF channel frequency, shall have a single major lobe between the angles of 0° to 90° of elevation measured relative to a reference plane normal to the major axis of The BTS. The pattern shall have a null at 90° from the reference plane which is at least 20 decibels (dB) below the maximum amplitude of the major lobe. The beam width of the pattern shall be defined by the -3 dB points which shall occur at elevation angles of less than 3° and greater than 15° with respect to the reference plane. In addition, variations in the pattern with respect to the maximum of the major lobe shall be not greater than 16 dB between 0.5° and 3° elevation and 12 dB between 15° and 60° elevation.

3.6.3.2 Horizontal beam pattern. The horizontal beam pattern of the antenna system at the assigned VHF channel frequency, shall be omnidirectional within ± 1 dB for all elevation angles within the vertical beam pattern defined by the -3 dB points of 3.6.3.1.

3.6.4 VHF transmitter.

3.6.4.1 VHF frequency. The VHF transmitter shall operate on one of three VHF channels spaced 1,500 kilohertz (kHz) apart in the frequency range of 170.50 to 173.50 megahertz (MHz). Each individual BTS shall be preset at the time of manufacture to one of these channel frequencies as specified in the contract (see 6.2.1). The channel number and frequency assignments shall be as shown

in table I. In the absence of modulation the VHF transmitter carrier frequency shall be within ± 25 kHz of the assigned channel frequency.

TABLE I. BTS channel frequencies.

VHF Channel	VHF Carrier Frequency (MHz)
12	170.50
14	172.00
16	173.50

3.6.4.2 VHF power output. The VHF transmitter shall deliver a power output of at least 0.25 watt RMS on the assigned channel frequency to the antenna system. For test purposes, power may be measured into a test load that is electrically equivalent to the antenna and its transmission line.

3.6.4.3 VHF commencement and cessation. VHF transmission of 0.25 watt minimum shall commence within 30 seconds following water entry. VHF transmission shall cease within 12 minutes following water entry, but not during the BTS operating life.

3.6.4.4 VHF drop out. VHF carrier drop out shall be permissible a maximum of five percent of the time. In addition, for elevation angles greater than three degrees, as specified in 3.6.3.1, the duration of the drop out shall be not greater than three seconds. For the purpose of this specification, a VHF drop out is specified as a six dB or greater reduction in VHF power from the levels specified in 3.6.4.5.

3.6.4.5 Radiated signal power density. The BTS shall radiate a VHF signal on the assigned channel frequency having a power density of at least 21 milliwatts per square meter when measured at the maximum amplitude of the major lobe of the radiation pattern specified in 3.6.3.1 at a test distance of one meter. The far field power density shall be in accordance with the power levels specified in table I of STF-TP-101, Vol II.

3.6.4.6 Spurious radiation. No components of the spurious radiation spectrum shall be greater than a level of -40 dB relative to the major lobe power density of the signal radiated on the VHF carrier frequency.

3.6.4.7 VHF carrier frequency modulation. The VHF carrier frequency shall be frequency modulated by the temperature signal in the frequency band of 1,360 to 2,700 Hz. The VHF carrier frequency deviation shall be 75, +10-25 kHz (75 kHz deviation represents 100 percent modulation). Total distortion of the modulated carrier frequency shall be not greater than 10 percent with external sinusoidal modulation.

3.6.4.8 Modulation commencement and cessation. Modulation of the VHF carrier shall commence no later than one minute after water entry. Modulation shall cease within 12 minutes following water entry but not during the BTS operating life.

3.6.4.9 Residual VHF carrier deviation. No continuous sinusoidal signal in the RF transmission prior to temperature probe release in the frequency range from 1,200 - 2,800 Hz shall be greater than level of -60dB relative to the signal after probe release.

3.6.4.10 Symmetry. Frequency modulation of the VHF carrier shall be symmetrical within ± 20 percent, when a modulating signal with amplitude sufficient to produce ± 75 kHz peak frequency deviation is applied to the transmitter modulator. The modulating signal shall be in the frequency range of 1,360 - 2,700 Hz inclusive.

3.7 Thermographic system. The thermographic system shall be specified as all the elements that pass temperature measurement information from the ocean through the BTS VHF transmitter antenna.

3.7.1 Distortion. The maximum total harmonic distortion in the thermographic system appearing at the output of the VHF transmitter shall be not greater than 30 percent with a nominal FM carrier deviation of 75 kHz and an input frequency range of 1,360 - 2,700 Hz.

3.7.2 Temperature/frequency relationship. The thermographic system shall provide for modulating the VHF carrier with a temperature signal whose frequency is related to the sea water temperature in accordance with the formula:

$$f = 1440 + 36T$$

Where f is expressed in Hertz and T is expressed in degrees Celsius.

3.7.3 Accuracy. The thermographic system shall provide for modulating the VHF carrier with a temperature signal that is within ± 20 Hz of the frequency specified in 3.7.2 for all sea water temperatures from -2° to +35°C. Additionally, the thermographic system shall provide temperature gradient information that is within ± 20 percent of the true gradient.

3.7.4 Time constant. The time response of the thermographic system shall be not greater than one second for a 63 percent change in steady state output signal between an initial sea water temperature and a final sea water temperature.

3.7.5 Stabilization. Prior to the commencement of modulation of the VHF carrier, the thermographic system shall sufficiently stabilize to conform with the accuracy requirements of 3.7.3.

3.8 Safety. The BTS design shall provide for safety in the categories specified in 3.8.1 through 3.8.4. Changes to the BTS which affect safety shall be in accordance with the contract (see 6.2.2).

3.8.1 Personnel. The BTS shall be so constructed that personnel cannot be cut by screws or sharp edges. Parts which store energy or that are acted on by stored energy shall not release energy inadvertently or shall be of small mass and shaped such that they do not constitute a hazard.

3.8.2 Shipping. All parts and products of the BTS shall be restrained within the confines of the packaging specified in the contract (see 5.1 and 6.2.1) under shipping and storage conditions.

3.8.3 Launching. The BTS shall not be a hazard to the aircraft or crew when launched.

3.8.4 Potentially hazardous material or devices. The BTS may utilize potentially hazardous material and devices; however, the application of these materials and devices shall conform to specific guidelines established by the government. The BTS may not utilize electric squibs or other class explosives unless the BTS, packaged in the container to be used in shipment, has successfully completed non-explosive ammunition testing in accordance with 49CFR paragraph 173.55. The procuring activity will provide these guidelines as requested by the contractor. Any BTS containing lithium battery assemblies shall be certified safe when tested in accordance with the procedures of SPD-10.

3.9 Quality and workmanship.

3.9.1 Quality program. When specified in the contract, the contractor shall conduct a quality program in accordance with the specification referenced in the contract (see 6.2.1). If specified in the contract, the contractor shall prepare a Product Assurance Program Plan (PAPP) for review and acceptance by the procuring activity (see 6.2.2).

3.9.2 Workmanship. Workmanship shall be in accordance with the contractor developed standards based on MIL-STD-454, Requirement 9.

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 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.

4.1.1 Test equipment and inspection facilities. The contractor shall insure that test and inspection facilities of sufficient accuracy, quality and quantity are established and maintained to permit performance of required inspections.

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

a. Contractor demonstration (see 4.3)

b. First article inspection (see 4.4)

c. Quality conformance inspection (see 4.5)

(1) Individual inspection (see 4.5.1)

(2) Sampling inspection (see 4.5.2)

(3) Aircraft drop tests (see 4.5.3)

d. Performance maintenance inspection (see 4.6)

4.3 Contractor demonstration. When specified in the contract, contractor demonstration tests shall be conducted by the contractor. Tests shall be conducted under the approved test procedures of 4.8. Data obtained by the contractor in conducting these tests shall be included with the BTS submitted for first article tests. Contractors not having adequate facilities to conduct all required tests shall obtain the services of a commercial testing laboratory acceptable to the procuring activity (see 6.2.1).

4.4 First article inspections. When specified in the contract, first article inspection shall be conducted at the first article test activity designated by the procuring activity (see 6.2.1). These inspections shall also include aircraft drop tests and any other tests necessary to assure compliance with this specification. Whenever possible, the first article BTS shall be manufactured using the methods, procedures, parts, and materials intended for use on production equipments. Otherwise, the methods, procedures, parts, and materials used shall be functionally representative of the configuration identified as the product baseline. The number of BTSs' required shall be as specified in the contract. These tests may be conducted in increments. Deficiencies disclosed in any increment shall be corrected prior to submission of subsequent increments. Whole BTSs' or specific parts of BTSs' may be returned to the contractor for his use in failure analysis. Production of BTSs' prior to completion of first article tests and granting of first article approval shall be done at the contractor's own risk.

4.4.1 Accessory material. In addition to the equipments submitted for first article tests, the contractor shall also have available accessory material such as connectors, cables, and include data (excluding avionics equipment) necessary to perform first article tests.

4.5 Quality Conformance Inspections. Acceptance of the production equipments shall be on a lot basis after satisfactory completion of the tests specified in 4.5.1 through 4.5.1.2. The contractor shall furnish all equipments and shall be responsible for accomplishing individual and sampling tests. The procuring activity will conduct aircraft drop tests. All inspection and testing at the contractor's plant shall be monitored by the cognizant government representative. When specified in the contract, the contractor shall prepare and have available test reports showing results for all individual and sampling tests required by this specification and signed by an authorized representative of the contractor or laboratory, as applicable (see 6.2.2). Acceptance or approval of material during the course of manufacture

shall in no case be considered a guarantee of the acceptance of the finished product.

4.5.1 Individual Inspection. Each BTS shall be subjected to the individual tests. These tests shall be adequate to determine compliance with the requirements of material, workmanship, and operational adequacy. As a minimum, each equipment shall be subjected to the following:

a. Examination of Product (see 4.5.1.1)

b. Operational Test (see 4.5.1.2)

4.5.1.1 Examination of product. Each BTS shall be carefuly examined to determine that the requirements for material and workmanship have been met.

4.5.1.2 Operational test. Each BTS shall be operated for such time as may be necessary to permit the measured parameter to stabilize and shall then be tested for compliance with the requirements specified in table II under the standard conditions. These tests shall be conducted at the highest assembly level which precludes disassembly in order to accomplish the test.

TABLE II. Operational tests requirements.

Test	Applicable Paragraph
VHF Transmitter Frequency	3.6.4.1
VHF Transmitter Power Output	3.6.4.2
Residual VHF Carrier Deviation	3.6.4.9
Temperature/Frequency Relationship and Accuracy at a minimum of the following temperatures; 0°C, 25°C, and 35°C.	3.7.2, 3.7.3

4.5.2 Sampling Inspection. Sampling inspections shall be conducted on a sublot consisting of 151 BTS's or more. Sampling inspection may be conducted without the air descent mechanism in place. Assembled BTS's, shall be selected for test in accordance with MIL-STD-105, Normal Inspection, Level II, Single Sampling Plan, and shall be accepted or rejected in accordance with the procedures of MIL-STD-105, Acceptable Quality Level (AQL) 1.5 percent defective. In lieu of sublot sampling, continuous sampling in accordance with CSP-1 Sampling Plan, Option (b) of H-107 may be used with Inspection Level II and AQL of 1.5 percent. The production interval shall not exceed two months. The sampling frequency code letters E, F, G, H and I are the only code letters which may be used. The rules and procedures for administration shall be as specified in H-107. A break in the homogeneity requirement of H-107 is specified as follows:

a. Any interruptions to the production process that may affect the measured characteristic(s) of the specified sampling tests is considered a break in homogeneity, other than interruptions due to the end of shift, day or workweek.

b. Any engineering change (Class II, preliminary Class I, or Class I) that may affect the measured characteristic(s) of the specified sampling tests is considered a break in homogeneity.

c. Each BTS tested shall be operated for such time as may be necessary to permit its termperature to stabilize and shall then be tested for compliance with the requirements specified in table III under standard conditions. In lieu of the Inspection Level II specified, 100 percent or any other increased level of inspection is allowable.

TABLE III. Sampling tests.

Test 1/	Applicable Paragraph
Watertight Integrity (Subassembly Level)	3.5.12
Transmitter Power Output (Actual power measurement not required if test identified in test procedure is made for indication of specified power output)	3.6.4.2
Residual VHF Carrier Deviation	3.6.4.9
Temperature/Frequency Relationship and Accuracy at Ambient Temperature	3.7.2, 3.7.3

1/ BTS's which have successfully passed the sampling tests shall be returned to the sublot from which they were selected.

4.5.3 Aircraft drop tests. Aircraft drop tests will be conducted on a production lot sample of equipments as specified in the contract. The completely assembled BTS will be randomly selected from a production lot by the cognizant government representative in accordance with MIL-STD-105, Inspection Level I and the contract. The sample will be submitted to the test activity designated by the procuring activity (see 6.2.1). The samples will be evaluated to the performance requirements of this specification in accordance with STF-TP-101 and the contract. Defects will be classified as Critical, Major, or Minor in accordance with MIL-STD-105 and as specified in STF-TP-101 Vol II and the contract.

4.5.3.1 Lot acceptance. The cognizant government representative will be notified of the acceptability of each production lot when its representative sample has completed the aircraft drop tests. Upon receiving such notification, the cognizant government representative will accept or reject the entire lot. Lot acceptance is conditional on delivery as specified in packaging. In the event the cognizant government representative is not notified of the test results and the action to be taken, within the time specified in the contract, the entire lot will be accepted. The date of submission is defined as the date of shipment of the sample from the contractor's plant. Notification of shipment will be as specified in the contract (see 6.2.1).

4.5.3.2 Lot rejection. A production lot represented by the sample under test shall be rejected if the number of defective BTS's observed for that sample exceeds the contractual limit.

4.5.3.3 Production lot samples. Production lot samples representing satisfactory production lots shall be accepted as fulfilling part of the contractual quantity requirements. Samples representing unsatisfactory production lots shall not be accepted.

4.6 Performance maintenance inspection. Performance maintenance inspections will be conducted by the first article test activity on production equipments not expended in aircraft drop tests. These inspections may duplicate any tests previously conducted during first article tests. Defective units will be returned to the contractor providing 90 days has not elapsed since acceptance of the last lot of the contract. The contractor shall perform a failure analysis of all returned units and shall identify corrective action. The failure analysis reports shall be provided to the procuring activity (see 6.2.2).

4.7 Inspection of packaging. The sampling and inspection of the preservation, packing, and container marking shall be in accordance with section 5 and the contract.

4.8 Inspection procedures. The procedures used for conducting contractor demonstration, individual and sample inspection shall be prepared and submitted for acceptance by the procuring activity (see 6.2.1). MIL-T-18303 shall be used to the extent specified in the contract for preparation of the procedures.

5. PACKAGING.

5.1 Preservation and packaging. The requirements of the contract shall apply (see 6.2.1).

5.2 Marking. The packaging shall be marked in accordance with SPD-15. Government identification numbers shall be as specified in the contract (see 6.2.1).

6. NOTES.

6.1 Intended use. The BTS covered by this specification is used to determine temperature information in the range of -2° to +35°C from sea surface to a depth of 305 meters.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification

b. First article inspection requirements (see 3.1 and 4.4)

c. Requirements for the reliability program (see 3.3.1)

d. Requirements for failure analysis reports (see 3.3.4)

e. Nomenclature assignment for BTS (see 3.5.1)

f. Distribution of channel frequencies (see 3.6.4.1)

g. Requirements for the quality program (see 3.9.1)

h. Contractor demonstration requirements (see 4.3)

i. Designation of the first article and aircraft drop test facilities (see 4.4, 4.5.3)

j. Instructions for submitting notification of shipment of aircraft drop test samples and the maximum time allowed for the Government to test lot samples (see 4.5.3.1)

k. Instructions for submittal of contractor demonstration, individual and sampling test procedures (see 4.8)

l. Requirements for packaging including marking and assignment of government identification numbers (see 5.1 and 5.2)

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 approved Data Item Description (DD Form 1664) and delivered in accordance with the approved CDRL incorporated into the contract. When the provisions of FAR 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 requirements title	Applicable DID no.	Option
3.2	Data, Design	UDI-E-21338	
3.3.4	Report, Corrective Action	UDI-T-23719	
3.3.4, 4.6	Report, Failure	DI-R-7039	
3.5.2 3.8	Engineering Change Proposal (ECP) and Request for Deviations and Waivers	DI-E-2037	
3.9.1	Plan, Product Assurance Program (PAPP)	DI-R-1700	
4.5	Procedure, Quality Conformance Tests	UDI-T-21347	

(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.)

6.3 First article. The first article sample should consist of the number of unit(s) specified in the contract. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations and approval of the first article documents.

6.4 Associated equipment. The BTS is used with the following equipment:

a. Radio Receiving Set, AN/ARR-72, AN/ARR-75, and AN/ARR-76

b. Recorder, Bathythermograph Data, RO-308/SSQ-36

c. Aircraft Data Processor AN/AQA-7, AN/AQA-7(V), OL-82/AYS

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

Preparing activity
Navy-AS
Project 5845-N082)

INSTRUCTIONS: In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge *(DO NOT STAPLE)*, and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER	2. DOCUMENT TITLE
MIL-B-22356F(AS)	Bathythermograph Transmitting Set AN/SS-36, Specification For

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)*

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