

MIL-1-17301B(SHIPS)
7 April 1965

~~SUPERSEDING~~
MIL-1-17301A(SHIPS)
5 July 1957
(See 6.5)

MILITARY SPECIFICATION
INDICATOR, SHIP'S DISTANCE-SPEED

1. SCOPE

1.1 Scope. - This specification covers speed indicators and distance indicators for use with underwater log systems on Naval ships.

1.2 Classification. - Indicators shall be of the following types as specified (see 6.2):

- Type I - Speed 0 - 40 knot.
- Type II - Speed 0 - 25 knot.
- Type III - Distance 360 revolutions per nautical mile input.
- Type IV - Distance 60 revolutions per nautical mile input.

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal form a part of the specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

QQ-A-501 - Aluminum-Alloy Sand Castings

MILITARY

- MIL-T-27 - Transformers and Inductors (Audio, Power, and High Power Pulse) General Specification for
- MIL-I-983 - Interior Communication Equipment, Naval Shipboard, Basic Design Requirements for
- MIL-M-15071 - Manuals, Equipment and Systems
- MIL-P-15137 - Provisioning Technical Documentation for Repair Parts for Electrical and Mechanical Equipment (Naval Shipboard Use)
- MIL-E-17362 - Electronic Repair Parts Requirements, Procedures for Provisioning Technical Documentation and Stock Numbering

STANDARDS

MILITARY

- MIL-STD-167 - Mechanical Vibrations of Shipboard Equipment
- MIL-STD-202 - Test Methods for Electronic and Electrical Component Parts
- MIL-STD-740 - Airborne and Structureborne Noise Measurements and Acceptance Criteria of Shipboard Equipment

FSC 6320

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DRAWINGS

BUREAU OF SHIPS

9000-56504-73687 - Dial Markings for IC Order and Indicating Systems

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

2.2 Other publications. - The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

U.S. NAVAL ENGINEERING EXPERIMENT STATION

Report No. 060025 - Proposed Specifications for the Illumination of Interior Communication Instruments and Other Visual Display Systems.

(Application for copies should be addressed to the U.S. Navy Marine Engineering Laboratory, Annapolis, Md. 21402.)

OFFICIAL CLASSIFICATION COMMITTEE

Uniform Freight Classification Rules

(Application for copies should be addressed to the Official Classification Committee, 1 Park Avenue at 33rd Street, New York 16, N. Y.)

AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM)

B26 - Aluminum-Base Alloy Sand Castings

(Application for copies should be addressed to the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pa.)

AMERICAN STANDARDS ASSOCIATION (ASA)

- B5.20 - Machine Pins
- B171 - Woodruff, Keys, Keyslots, and Cutters
- B18.1 - Small Solid Rivets
- B18.2 - Square and Hexagon Bolts and Nuts
- B18.3 - Socket Cap, Shoulder and Set Screws
- B18.6 - Slotted and Recessed Head Screws, Machine and Tapping Types
- B18.6.2 - Hexagon Head Cap Screws, Slotted Head Cap Screws, Square Head Set Screws and Slotted Headless Set Screws
- B18.6.4 - Slotted and Recessed Head Tapping Screws and Metallic Drive Screws
- B27.1 - Lock Washers
- B27.2 - Plain Washers

(Application for copies should be addressed to the American Standards Association, 10 East 40th Street, New York, N. Y., 10016.)

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

3. REQUIREMENTS

3.1 Qualification. - The speed and distance indicating equipment furnished under this specification shall be products which have been tested and passed the qualification tests specified herein and have been listed on or approved for listing on the applicable qualified products list.

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3.2 Description.

3.2.1 Speed indicators shall indicate by means of a single dial and single pointer positioned by a type 23TR6a synchro the speed being transmitted by the underwater log system over the range designated in T. 2.

3.2.2 Distance indicators shall indicate by means of a 6 digit counter driven by a type 23TR6a synchro the distance being transmitted by the underwater log system from 0000.00 to 9999.99 nautical miles in accordance with the input for the type designated in 1. 2.

3.2.3 The equipment shall be sturdily constructed of a grade of material adequate for each specific application consistent with the requirements noted herein.

3.2.4 The design, layout, and assembly of the unit and their parts shall be such as to facilitate quantity production. Jigs shall be used to position parts during welding and assembly operation.

3.3 **General Features:** The equipment shall be in accordance with the following paragraphs of MIL-I-983 in addition to the requirements specified herein. (Whenever a requirement of MIL-I-983 conflicts with a requirement of this specification, the requirements of this specification shall govern.)

General requirements
 Definitions
 Materials, general
 Substitution of (equal or superior) materials or parts
 Fungus-inert materials
 Unacceptable materials
 Acceptable materials
 Flammable materials
 Arc-resistant materials
 Toxic materials
 Wood
 Metals
 Aluminum
 Magnesium
 Iron and steel
 Nonferrous material (except aluminum)
 Zinc
 Springs (material)
 Other metals
 Plastics
 Ceramics
 Impregnating, embedding and encapsulating compounds
 Glass
 Lubricants and lubrication
 Painting
 Protection against corrosion
 Bolts, machine screws, studs and nuts
 Parts - mechanical
 Gaskets
 Dials and pointers
 Dial sizes
 Locking devices
 Washers
 Ball bearings
 Parts - electrical - general
 Use of nonstandard parts
 Variable resistors
 Transformers
 Synchros
 Synchro electrical zero and equipment mechanical zero
 Electrical tapes
 Dial illumination lamps
 Switches

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- Indicator lights and lampholders
- Enclosures - general
- Enclosure - accessibility
- Enclosure - degree of
- Enclosure - mounting
- Stiffening grooves
- Minimum sheet metal thicknesses
- Through bolting
- Cable entrance
- Ventilation
- Size (for submarines and surface ships)
- Threaded devices
- Rounded corners and edges
- Internal subassembly protection
- Drilled and tapped holes
- Welding
- Temperature and humidity
- Extreme temperature for exposed location
- Accelerated life
- Salt spray
- Shock, vibration and inclination (3.7)
- Features-electrical
- Primary power supply circuits
- Power supply tolerances
- Personnel protection
- Shielding and radio frequency noise reduction
- Ground potential and grounding
- Soldering
- Electrical parts mounting
- Internal subassembly connection (Test cable required)
- Terminal boards connectors and terminals
- Synchro connections and markings
- Wiring
- Color coding
- Dial illumination
- Electrical insulation
- Dielectric strength and insulation resistance clearances
- Drawings - general
- Drawings - preliminary
- Drawings - working
- Schematic diagrams
- Wiring diagram
- Drawing list
- Assembly drawings
- Drawings - manufacturing
- Bill of materials
- Interchangeability and standardization
- Manuals
- Repair parts
- Designation and marking (Serial numbers are required)
- Reports
- Item names and nomenclature
- Workmanship and general examination

3.4 Detail features. -

3.4.1 Speed indicators (types I and II). -

3.4.1.1 The indicator shall receive synchro signals at the rate of 9 degrees per knot for type I indicators or 14.4 degrees per knot for type II indicators and convert these signals to indications of speed by means of a type 23TR6a synchro directly coupled to the hub of the pointer.

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3.4.1.2 Location of dial markings and numerals shall be in accordance with figures 16 and 17 and Sheet 7 of Drawing 9000-S6504-73687. All markings shall be white on a dull black background except as noted herein.

3.4.1.3 The dial shall be 4 inches in diameter and shall have "Duo-Panel" type internal red and white illumination in general accordance with U. S. Naval Engineering Experiment Station Report No. 080025 of 24 July 1953. Provisions shall be made to prevent the escape of white light. The dial shall be readily removable in order to permit interchangeability.

3.4.1.4 Variation of illumination intensity. - A dimmer rheostat shall be provided which shall vary the voltage on the lamps from 0 to full voltage. The rheostat shall vary the illuminations from approximately a luminance of 0.05 to 02.5 foot-lamberts. Maximum voltage applied to the lamps (8.3 v. from a transformer incorporated in the equipment) shall be less than the voltage rating of the lamp.

3.4.1.5 Enclosure. - The enclosure shall be watertight (3-foot head) and shall be fabricated of 356 T-6 cast aluminum alloy conforming to Publication ASTM B26 or Class 3M, T-6 cast aluminum in accordance with QQ-A-601. The enclosure shall have universal type (panel or bulkhead) mounting with overall dimensions no greater than 8-3/4 inches high by 7 inches wide by 6-3/4 inches deep. An "O" ring seal shall be provided between the case and the cover with the "O" ring groove so designed that the "O" ring cannot be removed from the groove without force. The weight of the indicator shall not exceed 15 pounds.

3.4.2 Distance indicators (types III and IV). -

3.4.2.1 Indicators shall receive synchro signals at the rate of 360 revolutions per nautical mile for type III or 60 revolutions per nautical mile for type IV indicators and convert these signals to indications of distance by means of a type 23TR6a synchro directly geared to a 6 digit counter.

3.4.2.2 The counter shall have at least 1/4 inch numerals. Numerals to the left of the decimal point shall be white on a dull black background; numerals to the right shall be black on a dull white background.

3.4.2.3 The numerals shall have red and white illumination by means of "across the face" illumination which shall be obtained by means of white sources with and without red filters. Provisions shall be made to prevent white light from escaping.

3.4.2.4 Illumination intensity and enclosure. - Illumination intensity and enclosure shall be in accordance with 3.4.1.4 and 3.4.1.5.

3.5 Manual inserts. - Manual inserts shall be suitable for insertion in interior communication technical manuals, shall contain the information required by MIL-M-15071 and shall be of the same format and size; however, no binding is required.

3.6 Accelerated life. - The units shall satisfactorily withstand the accelerated life test (endurance) specified in 4.5.3.

3.7 Shock, vibration and inclination. - The units shall satisfactorily withstand without mechanical or electrical damage which would cause malfunctioning or inoperation method 207 shock in accordance with MIL-STD-202, vibration tests (vital), type I in accordance with MIL-STD-167, and inclination tests of 60 degrees from vertical in any direction, that is, forward, backward, left or right.

3.8 Corrosion-resisting steel hardware items. - External hardware items such as nuts, screws, bolts and lockwashers shall be of nickel-copper alloy.

3.9 Screws, bolts, nuts, washers, pins and other hardware items. - All screws, bolts, nuts, washers, pins and other hardware items shall be in accordance with Publications ASA B5.20, B177, B18.1, B18.2, B18.3, B18.6, B18.6.2, B18.6.4, B27.1 and B27.2, as applicable.

3.10 Magnetic permeability of components. - Except for those applications where the function of the component requires the use of magnetic material, all components shall use non-magnetic materials.

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3.11 Tools. - No special tools shall be necessary for assembly, disassembly or maintenance of the equipment referenced herein. Special tools are defined as those tools not listed in the Federal Supply Catalog. (Copies of this catalog may be consulted in the office of the Government Inspector.)

3.12 Transformers. - Transformers shall be in accordance with grade 5, class S of MIL-T-27, and shall have a life expectancy X.

3.12.1 Insulating electrical windings. - Electrical windings shall be thoroughly treated or impregnated by a method which will ensure the evacuation of all air and water from, and the filling in of all interstices within such windings. The liquid insulation used shall have such characteristics and be so applied as to ensure thorough drying, solidification, or curing throughout the innermost recesses of the windings.

3.13 Electrical tapes. - Electrical tapes of the best commercial grade of acetate film; glassfiber or polyethylene only shall be used. Fabric or textile pressure-sensitive (adhesive or friction) tape shall not be used.

3.14 Painting. - Case enclosures shall be completely painted as specified in 3.14.1 through 3.14.4.

3.14.1 Cleaning. - After all machinery, welding and brazing operations are completed, the interior and exterior surface of all metal enclosures shall have all rust or other visible corrosion products removed, and shall be thoroughly cleaned of all grease, oil, and dirt by solvent wiping, vapor degreasing, or caustic washing and rinsing.

3.14.2 Undercoat and finish. - One coat of zinc chromate primer followed by two coats of high grade semi-gloss light gray equipment enamel shall be applied. The anodizing, primer, and enamel coats shall be applied in accordance with the best commercial practice.

3.14.3 Protection against corrosion. - All metal parts shall be of suitable corrosion-resisting materials or other materials treated in a satisfactory manner.

3.14.4 Corrosion-resisting treatments. - The corrosion-resisting treatments shall be in accordance with those specified herein. In each case the treatment shall be accomplished in accordance with the best commercial practices.

- (a) Zinc coating (hot dip galvanizing) for parts other than threaded fasteners, unless otherwise specified herein.
- (b) Electroplating of zinc for surfaces not to be painted and for externally threaded parts.
- (c) Electroplating cadmium for surfaces not to be painted and for externally threaded parts.
- (d) Electroplating of chromium for general application.
- (e) Anodic treatment of aluminum.
- (f) Lubricant and lubrication. With the exception of the synchro bearings and main shaft bearings, all other bearings in the equipment shall be lubricated with light oil such as Navy 2110. Gear-teeth shall be lubricated with a 600 W oil or Navy type 5190 oil.

3.15 Airborne and structureborne noise. - Indicators shall conform to the requirements of MIL-STD-740, grade C, type 3 for airborne and structureborne noise. Speed indicators shall conform at all speed readings between zero and full scale. Distance indicators shall conform at all distance inputs corresponding to speeds from zero to 40 knots.

3.16 Counters. - All revolution counters shall be of the odometer, nonreset, ball bearing, revolving drum type with six figure wheels. The numerals on the figure wheels shall be at least 1/4 inch high by 3/16 inch wide.

3.16.1 Accuracy. - When the equipment is operated on designed voltage and frequency at any ambient temperature over the range 40° to 149°F., the accuracy shall be as specified in 3.16.2 and 3.16.3.

3.16.2 Permissible error, distance. - Maximum permissible error of distance indication in the distance indicator shall be less than 0.01 mile per mile.

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3.16.3 Permissible error, speed. - Maximum permissible error of speed indication in the speed indicator shall be less than 0.1 knot when compared with the indicator-transmitter.

3.17 Parts such as gears, pointers and levers shall be secured to their associated shafts by positive locking devices such as pins or keys. Set screws shall not be used as the principal method of securing these parts.

3.18. Drawings. -

3.18.1 Drawing requirements. - The drawings and features applicable to each type shall consist of a schematic diagram, a wiring diagram, and assembly drawings.

3.18.1.1 Appropriate notes shall be added to the drawings giving the information specified in (a) and (b).

- (a) Power requirements
- (b) Heat dissipation

3.18.1.2 Wiring diagrams shall include the information specified in (a) through (d).

- (a) All parts in correct relation as to physical location with terminals clearly shown and marked and all wiring between parts.
- (b) The coding of all wires.
- (c) Appropriate notes shall designate wire size and type.
- (d) Designation of parts shall correspond to those assigned in the diagrams.

3.18.2 Commencement of work by manufacturer. - Upon receipt of drawing approval letter and prior to validation of tracings, and, if the manufacturer has no objections to any changes or modifications requested in the drawing approval letter, manufacture may be started in accordance with the drawings as revised in anticipation of validation of drawings.

3.18.3 Approval of drawings by the bureau or agency concerned does not relieve the manufacturer of the responsibility for meeting all the provisions of the contract.

3.18.4 Drawings for provisioning. - Drawings required solely for identification and cataloging purposes shall be submitted in accordance with MIL-P-15137 or MIL-E-17362 as applicable.

3.19 Onboard repair parts. - One type 23TR6a synchro shall be available in the ships integrated spare parts for each 4 speed or distance indicators installed.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. - Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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.

4.2 Qualification tests^{1/}. - Qualification tests shall be conducted at a laboratory satisfactory to the Bureau of Ships. Qualification tests shall consist of the tests specified in table 1. One speed indicator of either type and one distance indicator of either type covered in this specification shall be subjected to the qualification tests listed in table 1. Approval obtained on the type submitted will include qualification of both types of speed and distance indicators.

^{1/} Application for qualification tests shall be made in accordance with "Provisions Governing Qualification" (see 6.3 and 6.4).

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Table I - Qualification tests.

Tests	Requirement paragraph	Test reference
General examination	3.3	MIL-I-983
Operating	3.3, 3.4	4.5.4
Accuracy	3.16.1	4.5.4.1, 4.5.4.2
Supply line voltage and frequency variation	3.3	MIL-I-983
Radio frequency noise	3.3	MIL-I-983
Airborne noise	3.15	4.5.6
Structureborne noise	3.15	4.5.6
Temperature and humidity	3.3	MIL-I-983 and 4.5.3.3
Inclination	3.3, 3.7	MIL-I-983 and 4.5.3
Accelerated life	3.3, 3.6	MIL-I-983 and 4.5.3
Dielectric strength	3.3	MIL-I-983
Insulation resistance	3.3	MIL-I-983
Enclosure	3.3, 3.4.1.5	MIL-I-983 and 4.5.5
Salt spray	3.3	MIL-I-983
Vibration	3.3, 3.7	MIL-I-983 and 4.5.7
Shock	3.3, 3.7	MIL-I-983 and 4.5.7
Illumination	3.4.1.3, 3.4.1.4	4.5.2

4.3 Sampling for quality conformance inspection. -

4.3.1 Inspection lot. - All equipment presented for delivery at one time shall be considered a lot. The lot may include the entire contract quantity or it may be the production of any convenient time period.

4.3.2 Group A examination and tests. - All equipment covered on the contract or order shall be subjected to the group A examination and tests listed in table II. The results of each test shall be compared with specification requirements. In the event of failure to conform to this specification for any examination or test, the contractor shall correct the cause of failure on future production units and repair the deficiency in all equipments produced on the contract or order.

4.3.3 Group B tests. - Group B tests will be required by the bureau or agency concerned when the basic design of the equipment or the material of a vital part has been changed. One complete equipment shall be selected and subjected to each of the group B tests listed in table II. The results of each test shall be compared with specification requirements. In the event of failure to conform to this specification for any group B test, the contractor shall correct the cause of failure on future production units and repair the deficiency in all equipments produced on the contract or order.

4.4 Quality conformance inspection. - The sample equipments selected in accordance with 4.3 shall be subjected to the tests listed in table II. Tests shall be performed, in general, in the order listed.

4.5 Test procedures. -

4.5.1 General examination. - The general examination shall be conducted in accordance with MIL-I-983.

4.5.2 Illumination test. - The illumination test shall be conducted in accordance with standard commercial practices to determine conformance with 3.4.1.3 and 3.4.1.4.

4.5.3 Accelerated life test. - The accelerated life test shall be in accordance with Specification MIL-I-983 with the following speeds of operation.

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Table II - Quality conformance inspection.

Inspection	Requirement paragraph	Test reference
<u>Group A</u>		
General examination	3.3	MIL-I-983
Operating	3.3, 3.4	4.5.4
Dielectric strength	3.3	MIL-I-983
Insulation resistance	3.3	MIL-I-983
Accuracy	3.16.1	4.5.4.1, 4.5.4.2
<u>Group B</u>		
Supply line voltage and frequency variation	3.3	MIL-I-983
Airborne noise	3.15	4.5.6
Structureborne noise	3.15	4.5.6
Shielding and radio frequency noise	3.3	MIL-I-983
Temperature and humidity	3.3	MIL-I-983 and 4.5.3.3
Inclination	3.3, 3.7	MIL-I-983 and 4.5.7
Accelerated life	3.3, 3.6	MIL-I-983 and 4.5.3
Enclosure	3.3, 3.4.1.5	MIL-I-983 and 4.5.5
Salt spray	3.3	MIL-I-983
Vibration	3.3, 3.7	MIL-I-983 and 4.5.7
Shock	3.3, 3.7	MIL-I-983 and 4.5.7
Illumination	3.4.1.3, 3.4.1.4	4.5.2

4.5.3.1 Speed indicators (types I and II). - During the accelerated life test, the speed indicator shall be continuously oscillated at the rate of 2 cycles per minute from 0 to full scale.

4.5.3.2 Distance indicators (types III and IV). - During the accelerated life test, the distance indicator shall be continuously rotated in the additive direction for 1/4 of the total 500 hours at each of the following rates:

- 10 nautical miles indication for each 1 hour of operation.
- 20 nautical miles indication for each 1 hour of operation.
- 30 nautical miles indication for each 1 hour of operation.
- 40 nautical miles indication for each 1 hour of operation.

4.5.3.3 The temperature during the hours 175 to 300 shall be 149°F. (65°C.) in lieu of 131°F. (55°C.) as specified in MIL-I-983.

4.5.4 Operating test. - The operating test shall consist of a one hour operating test for each production equipment with a transmitter driving one or more speed indicators or distance indicators.

4.5.4.1 Accuracy test, speed. - During the operating test of the speed indicator the accuracy shall be checked at zero and at 10 knot intervals to full scale for compliance with 3.16.3.

4.5.4.2 Accuracy test, distance. - During the operating test of the distance indicator the accuracy shall be checked at at least four speed rates between 5 knots and full scale over a distance indication of at least one mile for compliance with 3.16.3.

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4.5.5 Enclosure test. - A thorough inspection shall be made of the enclosure to determine conformance with the requirements of 3.4.1.5. There shall be no leakage of water into the enclosure or leakage of air from the enclosure under test when the enclosure is subjected to the submergence test shown on figure 1.

4.5.6 Airborne and structureborne noise test. - Compliance with the airborne and structureborne noise requirements shall be determined in accordance with 3.15.

4.5.7 Shock, vibration and inclination tests. - The speed indicators and distance indicators shall operate within tolerances specified herein after being subjected to the shock and vibration tests and while inclined as specified in 3.7.

5. PREPARATION FOR DELIVERY

5.1 Domestic shipment and early equipment installation and for storage of onboard repair parts. -

5.1.1 Basic equipment or item. -

5.1.1.1 Preservation and packaging. - Preservation and packaging shall be sufficient to afford adequate protection against corrosion, deterioration and physical damage during shipment from the supply source to the using activity and until early installation and may conform to the suppliers commercial practice when such meets these requirements.

5.1.1.2 Packing. - Packing shall be accomplished in a manner which will insure acceptance by common carrier at the lowest rate and will afford protection against physical or mechanical damage during direct shipment from the supply source to the using activity for early installation. The shipping containers or method of packing shall conform to the *Uniform Freight Classification Rules and Regulations* or other carrier regulations as applicable to the mode of transportation and may conform to the suppliers commercial practice when such meets these requirements.

5.1.1.3 Marking. - Shipment marking information shall be provided on interior packages and exterior shipping containers in accordance with the contractor's commercial practice. The information shall include nomenclature, Federal stock number or manufacturer's part number, contract or order number, contractor's name and destination.

5.1.2 Onboard repair parts. - The onboard repair parts shall be preserved and packaged level A; packed level C and marked levels A and C respectively in accordance with MIL-E-17555.

5.2 Domestic shipment and storage or overseas shipment. - The requirements and levels of preservation, packaging, packing and marking for shipment shall be specified by the procuring activity (see 6.2).

(5.2.1 The following provides various levels of protection during domestic shipment and storage or overseas shipment, which may be required when procurement is made.

5.2.1.1 Preservation, packaging, packing and marking: The equipment and accessories, repair parts and technical publications shall be preserved and packaged levels A or C; packed level A or B as specified and marked in accordance with MIL-E-17555.)

6. NOTES

6.1 Intended use. - The speed indicators and distance indicators will be installed in locations in which ship's speed or distance traveled through the water is required continuously.

6.2 Ordering data. - Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Type of equipment required (see 1.2).
- (c) Quantity of items required.
- (d) Quantity of manuals required.

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- (e) Inventory control point for stock repair parts.
- (f) Whether unit stock number is to be entered on the identification plate.
- (g) Preservation and packaging, packing, and marking if other than as specified in 5.1 (see 5.2).

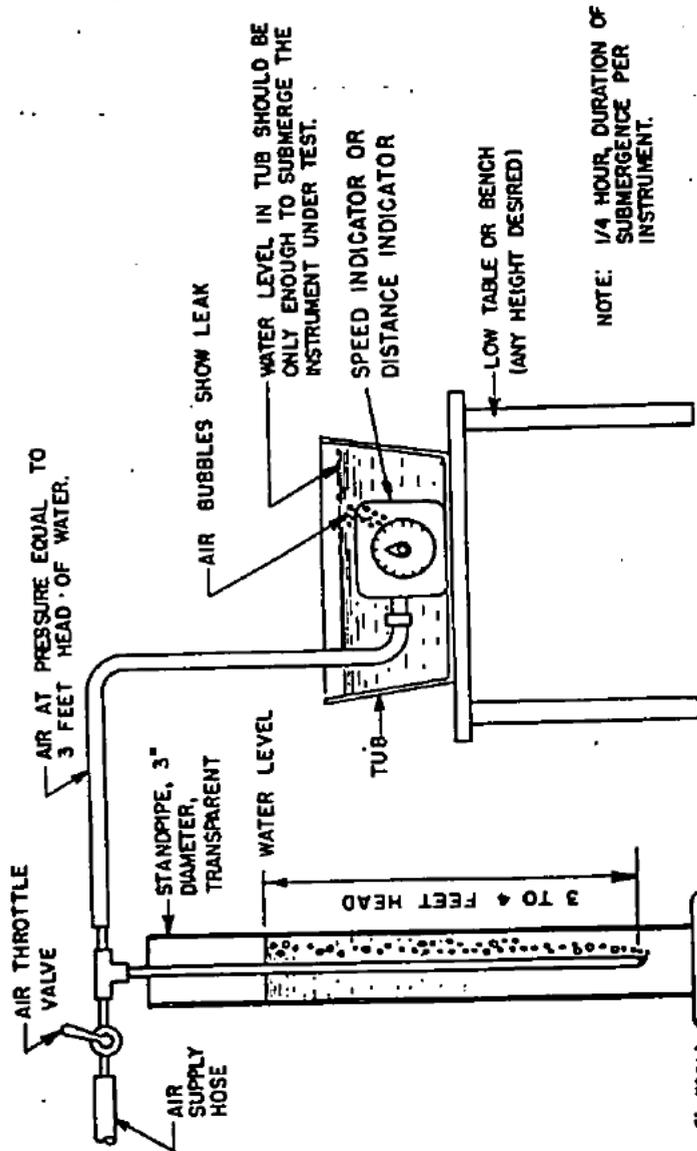
6.3 With respect to products requiring qualification, awards will be made only for such products as have, prior to the time set for opening of bids, been tested and approved for inclusion in Qualified Products List QPL 17301, whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification, in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the qualified products list is the Bureau of Ships, Department of the Navy, Washington 25, D. C., and information pertaining to qualification of products may be obtained from that activity. Application for qualification tests shall be made in accordance with "Provisions Governing Qualification" (see 6.4).

6.4 Copies of "Provisions Governing Qualification" may be obtained upon application to Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia 20, Pennsylvania.

6.5 CHANGES FROM PREVIOUS ISSUE. THE EXTENT OF CHANGES (DELETIONS, ADDITIONS, ETC.) PRECLUDE THE ANNOTATION OF THE INDIVIDUAL CHANGES FROM THE PREVIOUS ISSUE OF THIS DOCUMENT.

Preparing activity:
Navy - SH
(Project 6320-N0315B)

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NOTE: 1/4 HOUR, DURATION OF SUBMERGENCE PER INSTRUMENT.

OPERATION:
 WITH AIR HOSE ON INSTRUMENT, ADJUST THROTTLE VALVE TO PRODUCE A SMALL STREAM OF BUBBLES IN THE STANDPIPE. SUBMERGE INSTRUMENT IN THE TUB AND OBSERVE BRIEFLY FOR BUBBLE LEAKAGE.

Figure 1 - Submergence test apparatus.