

MILITARY SPECIFICATION

NETWORK, PHASE DETECTING CV-279/ARN

This specification has been approved by the
Bureau of Naval Weapons, Department of the Navy

1. SCOPE

1.1 Scope - The equipment covered by this specification shall accept inputs from (1) the fundamental resolver of Azimuth Indicator ID-307/ARN and (2) the course selector synchro resolver of Course Indicator ID-249/ARN, and shall operate the vertical pointers and ambiguity meters of two deviation indicators as well as an automatic pilot.

1.2 Classification - The Phase Detecting Network shall consist of the following item:

<u>Item</u>	<u>Type Designation</u>	<u>Appl. Para.</u>
Network, Phase Detecting	CV-279/ARN	3.4.1

2. APPLICABLE DOCUMENTS

* 2.1 General - The following documents of the issue in effect on the date of invitation for bids form a part of this specification to the extent specified herein:

SPECIFICATIONS

Military

MIL-E-4682	Electron Tubes and Transistors, Choice and Application of
MIL-W-5088	Wiring; Aircraft, Installation of
MIL-E-5400	Electronic Equipment, Aircraft, General Specification for
MIL-T-5422	Testing, Environmental, Aircraft Electronic Equipment
MIL-I-6181	Interference Control Requirements, Aircraft Electrical and Electronic Equipment
MIL-E-7894	Electric Power, Aircraft, Characteristics of
MIL-E-17555	Electronic and Electrical Equipment and Associated Repair Parts, Preparation for Delivery of

MIL-T-18303

Test Procedures, Reproduction and Inspection
for Aircraft Electronic Equipment, Format for

MIL-N-18307

Nomenclature and Nameplates for Aeronautical Electronic
and Associated Equipment

***2.2 Availability of Documents:**

(1) When requesting specifications, standards, drawings and publications, refer to both title and number. Copies of this specification and applicable specifications required by contractors in connection with specific procurement functions may be obtained upon application to the Commanding Officer, Naval Supply Depot, Code CDS, 5801 Tabor Avenue, Philadelphia 20, Pennsylvania.

3. REQUIREMENTS

***3.1 Parts and Materials** - In the selection of parts and materials, fulfillment of major design objectives shall be the prime consideration. In so doing, the following shall govern:

- (1) Parts and materials requirements shall conform to Specification MIL-E-5400.
- (2) Nonrepairable subassemblies, as outlined in Specification MIL-E-5400, shall be used when practicable. The general size of the subassembly, and the amount of circuitry to be included therein, shall be approved by the procuring activity. Non-repairable subassemblies must be reliable. (See 6.5)
- (3) When previously produced models of this equipment did not use nonrepairable subassemblies, the design shall not be changed to employ nonrepairable assemblies without the approval of the procuring activity.

3.1.1 Nonstandard Parts and Material Approval - Approval for use of nonstandard parts and materials shall be obtained as outlined in Specification MIL-E-5400.

*3.1.2 Electron Devices - semiconductor diodes shall be chosen and applied, and the complements reported as outlined in Specification MIL-E-4682. The complement report must be submitted to the procuring activity prior to preproduction testing.

3.2 Design and Construction

3.2.1 General - The equipment shall conform with all the applicable requirements of Specification MIL-E-5400 for design, construction and workmanship, unless otherwise specified herein.

3.2.2 Total Weight - The total weight of the equipment, excluding cables, shall be a minimum consistent with good design and shall not exceed one pound.

3.2.3 Operating Life

*3.2.3.1 Operational Stability - The equipment shall operate with optimum performance for 500 hours, continuously or intermittently, without the necessity for readjustment of any controls which are inaccessible during flight.

3.2.3.2 Total Operating Life - The equipment shall have a minimum total operating life of 5000 hours with reasonable servicing and replacement of parts. Parts requiring replacement within this interval and the life of such parts shall be specified by the manufacturer.

3.2.4 Cabling and Connections -

3.2.4.1 Cables and Connectors - The equipment shall provide for the use of cables and connectors in accordance with Specification MIL-E-5400.

3.2.4.2 Interconnection Cabling - The equipment shall be capable of satisfactory operation using external wiring in accordance with the applicable requirements of Specification MIL-W-5088. The external wiring shall be unshielded, except that a minimum number of the individual wires may be shielded when demonstrated as necessary to meet interference control requirements and provided the assembly of the cable to its plugs may be easily accomplished. External cables and that portion of the connectors attached to the cables shall not be supplied as part of the equipment.

3.2.5 Interchangeability - The equipment shall meet the interchangeability requirements as defined in Specification MIL-E-5400.

* 3.2.6 Interference Control - The generation of radio interference by the equipment and the vulnerability of the equipment to radio interference shall be controlled within the limits of Specification MIL-I-6181.

3.2.7 Maintenance Provisions and Field Testing - Provisions for maintenance shall be as specified in Specification MIL-E-5400.

* 3.2.8 Nomenclature and Nameplates - Nomenclature assignment and nameplate approval for equipment identification shall be in accordance with Specification MIL-N-18307.

* 3.2.9 Standard Conditions - The following conditions shall be used to establish normal performance characteristics under standard conditions and for making laboratory bench tests.

Temperature	Room ambient ($30^{\circ} \pm 10^{\circ}\text{C}$)
Altitude	Normal ground
Vibration	None
Humidity	Room ambient up to 90% relative humidity.
Input power voltage	26 volts, 400 cps

* 3.2.10 Service Conditions - The equipment shall operate satisfactorily under any of the environmental service conditions or reasonable combination of these conditions as specified in Specification MIL-E-5400 for class 1 equipment, except as modified herein.

* 3.2.11 Warm-up Time - The equipment shall not require any time to warm up prior to operation.

* 3.2.12 Input Power Requirements - The equipment shall meet all applicable requirements of Specification MIL-E-7894 and shall give specified performance from a 26 volt, 400 cps, single-phase power source with characteristics as defined in Specification MIL-E-7894. The equipment will be capable of operation between the limits of 23 and 29 volts with a maximum power of 1 VA.

* 3.2.12.1 Undervoltage Protection - The equipment shall not be damaged by voltages below the minimum specified herein and shall automatically resume normal operation when the voltage returns within limits.

3.3 Performance

* 3.3.1 General - Unless otherwise specified, values set forth to establish the requirements for satisfactory performance apply to performance under both standard and extreme service conditions. When reduced performance under the extreme conditions is acceptable, tolerances or values setting forth acceptable variations from the performance under the standard conditions will be specified.

3.3.2 Course Width Tolerance for Multiple Meter Operation - A 35 percent variation shall be tolerated in the course width indication after removing or adding one deviation meter (ID-249A/ARN) for automatic pilot from (or to) the phase detecting network output terminals when the course width adjustment is turned fully clockwise.

Note: The impedance of each meter and/or autopilot is 1000 ohms.

3.3.3 Course Width Sensitivity - The course width sensitivity (vertical pointer full-scale to full-scale) shall be adjustable between the limits of ± 5 and ± 30 degrees for one, two, or three Course Indicators with or without a 1000 microfarad capacitor.

3.3.4 Ambiguity Meter Current vs Position of Aircraft - When the position of the aircraft is within ± 60 degrees of the selected radial (selected by the pilot on the ID-249A/ARN) or within ± 60 degrees of the reciprocal of the selected radial, the current delivered to the ambiguity meter from the phase detecting network shall exceed 250 micro-amperes even though the load impedance is as high as 1200 ohms. When the position of the aircraft is 90 ± 10 or 270 ± 10 degrees from the selected radial, the null current delivered to the ambiguity meter from the phase detecting network shall be less than 50 microamperes even though the load impedance is as low as 600 ohms.

3.3.5 Ambiguity Meter Polarity - When the voltage applied to pin A with respect to ground, and the voltage applied to pin C with respect to ground, are each in phase with the excitation voltage applied to pin H with respect to ground, the potential at G shall be positive with respect to the potential at F.

3.3.6 Deviation Meter Polarity - When the voltage applied to pin A with respect to ground is in phase with the excitation voltage applied to pin H with respect to ground, and the voltage at pin C with respect to ground is zero, the potential at E shall be positive with respect to the potential at D.

3.3.7 Maximum Permissible Sensitivity Change in Course Deviation Output - When the load resistance between terminals D and E is 1000 ohms and the course width adjustment is such as to give a 150 microampere output for a 5° deviation signal, and the input to the phase detecting network is equivalent to an "on course" condition, a 1000 microfarad capacitor across terminals D and E shall cause a change of not more than 6 microamperes in the null output circuit.

3.3.8 Low-Voltage Operation - The phase detecting network shall provide adequate information to the ambiguity and deviation meters and also to the automatic pilot when the source voltage is as low as 23 volts rms at 400 cps. In addition, the course width sensitivity shall be adjustable between the limits of ± 5 and ± 30 degrees when the source voltage drops to this low value.

3.3.9 Maximum Currents - The direct current delivered to the ambiguity meter from the phase detecting network shall in no case exceed 1 milliampere even though the source voltage is raised to 29 volts rms. The direct current delivered to the left-right portion of the deviation meter from the phase detecting network shall in no case exceed 2.5 milliamperes even though the source voltage is raised to 29 volts rms.

3.4 Detail Requirements

3.4.1 Phase Detecting Network CV-279/ARN - The phase detecting network shall meet the following requirements:

3.4.1.1 Function - The phase detecting network, when properly interconnected to the units supplying the required signals (resolver signals) and power (26 volts, 400 cps) shall operate the vertical pointers and ambiguity meters of two Deviation Indicators in addition to an automatic pilot. The operation shall be automatic and continuous. The phase detecting network shall be capable of supplying accurate information to two deviation meters (vertical pointer on ID-249A/ARN) and one

automatic pilot connected in parallel, or to any one alone.

3.4.1.2 Form Factor - The phase detecting network shall measure $4 \frac{7}{8}$ by 3 by $2 \frac{3}{4}$ inches in size as shown in Figure 2.

3.4.1.3 Weight - The weight of the phase detecting network shall not exceed one pound.

3.4.1.4 Controls - The phase detecting network shall contain a Course Width Sensitivity and a Balance adjustment. There shall be no interaction between these controls.

(1) Balance Adjustment - A balance adjustment shall be provided for the purpose of centering the vertical pointer on the ID-249A/ARN deviation indicator when in the "on course" condition. This adjustment shall be made at the factory before the unit is delivered. When the adjustment is set it shall be locked in place with a device that shall be reasonably difficult, but not impossible, to unlock for the purpose of resetting at a field station. Rebalancing shall not normally be necessary.

(2) Course Width Sensitivity Adjustment - The course width (vertical pointer full-scale to full-scale) shall be adjustable from ± 5 to ± 30 degrees. The adjustable control shall be readily accessible and shall have a locking device to keep it set in place. The locking device shall be one which may be easily unlocked for the purpose of resetting. The adjustment shall be one in which a clockwise motion will increase the course width sensitivity.

3.4.1.5 Electrical Connections - Connections to external circuits shall be provided by an MS3102C-18-1P connector mounted at one end of the unit. The pin connections shall be made as follows:

<u>Pin Connection</u>	<u>Function</u>
A and C	Input signal from ID-249A/ARN (neither terminal grounded)
B	Ground
D and E	Output to deviation meters and automatic pilot
F and G	Output to ambiguity meters
H	Power Input, 28 volts, 400 cps
I and J	Spares

3.4.1.6 Mounting - The unit shall be held securely in place with a metal strap. Mounting holes on either side of the cylindrical chassis shall be spaced far enough apart to allow for the possibility of employing shock mounts.

3.4.1.7 Case - The case shall be made of metal and shall be grounded to the mounting strap. The case shall be suitably treated and finished in durable dull black. The case dimensions shall be in accordance with Figure 2.

3.5 Electrical Characteristics - Electrical characteristics shall be measured under Standard Conditions unless otherwise noted. (See 4.3.1.1)

3.5.1 Maximum Course Width Sensitivity - When the line voltage is set at 23 volts rms (400 cps) and the Course Width Sensitivity adjustment is set to its most clockwise position, an input signal corresponding to an off-course bearing of five degrees shall effect a direct current of not less than 150 microamperes through each of three 1000 ohm resistors connected in parallel between terminals D and E on the end connector.

3.5.2 Minimum Course Width Sensitivity - When the line voltage is set at 29 volts rms (400 cps) and the Course Width Sensitivity adjustment is set to its most counterclockwise position, an input signal corresponding to an off-course bearing of thirty degrees shall effect a direct current of not more than 150 microamperes through a resistance of 1000 ohms connected between terminals D and E on the end connector.

3.5.3 Linearity - With the line voltage set at 26 volts it shall be possible to adjust the Course Width Control to produce an output sensitivity of 15 microamperes plus or minus 15% per degree of bearing angle up to a bearing angle of 10 degrees in each direction.

3.5.4 Balance - When the line voltage is set at 29 volts rms (400 cps) and with zero excitation applied to the fundamental resolver transmitter (input terminals short-circuited), the direct current through a load resistance of 1000 ohms connected between terminals D and E on the end connector shall be less than four microamperes.

3.5.5 Interaction - After the Balance control is set and locked in place, and with a supply voltage of 26 volts rms (400 cps) and with zero excitation applied to the fundamental resolver transmitter (input terminals short-circuited), the Course Width Sensitivity adjustment shall be varied from one extreme to the other to study the electrical interaction between the two adjustments. During this variation the current through each of three (1000 ohm resistors connected in parallel across terminals D and E on the end connector shall not exceed four microamperes. This test shall be satisfied when the line voltage is as low as 23 volts rms and as high as 29 volts rms (400 cps).

3.5.6 Course Width Load Variations - If, with the Course Width Sensitivity Adjustment turned fully clockwise, the load resistance between terminals D and E on the end connector is changed by (1) replacing one 1000 ohm resistor with two parallel or (2) replacing two 1000 ohm resistors in parallel with three in parallel, there shall in no case be a variation in current of more than 35 percent through any one load resistor when the initial current is 150 microamperes.

3.5.7 Effect of Capacitor on Deviation Current - When a resistive load of 1000 ohms is connected between terminals D and E on the end connector, and the course width adjustment is such as to give a 150 microampere output for a 5° deviation signal, and the phase Detector input is equivalent to an "on course" condition, the application of a 1000 microfarad capacitor across terminals D and E shall cause a change of not more than 6 microamperes in the null output current.

3.5.8 Ambiguity Meter Current - When the line voltage is 26 volts rms (400 cps) and the input signal is such as to correspond with any off-course bearing of between -60 and + 60 degrees, the current through a load resistance of 1200 ohms connected between terminal G and terminal F on the end connector shall exceed 250 microamperes and the potential at terminal F shall be positive with respect to the potential at terminal G. Also when the input signal is such as to correspond with an off course bearing of $(90 \pm 10$ or $270 \pm 10)$ degrees, the null current through a load resistance of 600 ohms connected between terminal G and terminal F on the end connector shall be less than 50 microamperes. The preceding requirements shall be met to within $\pm 10\%$ when the line volts are set at 23 volts rms and also at 29 volts rms.

4. QUALITY ASSURANCE PROVISIONS

***4.1 Classification of Tests** - The testing and inspection of aircraft electronic equipment shall be classified as follows:

- (1) **Preproduction Tests** - Preproduction tests are those tests conducted on samples which are representative of the production equipment to be supplied under the contract, for the purpose of determining that the equipment meets all the requirements of the applicable specifications. Preproduction tests shall consist of the following two tests:
 - (a) **Contractor Demonstration Tests** - Contractor Demonstration Tests are accomplished under the responsibility of the contractor on a sample, representative of the production equipment, to demonstrate that the equipment complies with all the applicable requirements.
 - (b) **Service Approval Tests** - Service Approval Tests are accomplished under the responsibility of the procuring activity on a sample representative of the production equipment, to determine that the equipment meets all the requirements of the specification. These tests may be accomplished by having the procuring activity supervise the Contractor Demonstration Tests
- (2) **Inspection Tests** - Inspection Tests are those tests accomplished on equipment submitted for acceptance under the contract. Inspection Tests shall consist of the following:
 - (a) **Individual Tests** - Individual Tests are those tests conducted on each equipment submitted for acceptance under the contract.
 - (b) **Sampling Tests** - Sampling Tests are those tests accomplished on a quantity of equipment as approved by the procuring activity and which have previously passed the Sampling Tests.
 - (c) **Special Tests** - Special tests are those tests accomplished on a quantity of equipment as approved by the procuring activity and which have previously passed the Sampling Tests.

4.2 Preproduction Tests

4.2.1 Contractor Demonstration Tests - The contractor shall conduct tests on one or more sample equipments as necessary to determine that the design of the equipment as proposed by the contractor will meet the requirements of all applicable specifications. Contractor Demonstration Tests shall be conducted in accordance with the approved preproduction test procedure. The data obtained by the contractor in conducting these tests shall be included with the design data submitted with the Service Approval Test sample. The Inspector of Naval Material and the procuring activity shall be advised when tests are to be conducted so that the procuring activity may designate a representative to witness or supervise the test when so desired. When tests are supervised the procuring activity may decide to omit certain portions of the Service Approval Tests which will duplicate the Contractor Demonstration Tests; however, in conducting Service Approval Tests the procuring activity may elect to repeat any test previously conducted by the contractor, when deemed necessary. Contractors not having laboratory facilities to satisfactorily conduct all tests shall obtain either the services of a commercial testing laboratory or written approval from the procuring activity to omit that portion of the tests which cannot be conducted.

4.2.2 Service Approval Tests - The Service Approval sample shall consist of one equipment representative of the production equipment to be supplied under the contract. This equipment shall be delivered by the contractor to the destination specified by the procuring activity.

4.2.2.1 Accessory Materials Required - In addition to the complete equipment submitted, the contractor shall submit the accessory material and design data as specified in Specification MIL-E-5400.

4.2.3 Scope Of Tests - Preproduction Tests shall include all tests deemed necessary to determine that the model meets all the requirements of this specification and the contract. Preproduction Tests shall include testing in accordance with Specification MIL-T-5422 and Specification MIL-I-6181. The design and test data supplied by the contractor shall indicate the equipments physical and electrical characteristics and establish that the equipment meets all the requirements of this specification. The test data shall include data obtained by the contractor in testing to MIL-T-5422.

4.2.4 Preproduction Sample Approval - Approval of the preproduction sample shall be by the procuring activity upon satisfactory completion of all tests. No additional equipments shall be delivered prior to the approval of the pre-production sample. Prefabrication of any equipments prior to the approval of the preproduction sample is at the contractor's own risk. The approved preproduction sample will be returned to the contractor for his use in the fabrication and testing of the equipment to be submitted for acceptance under the contract. The preproduction sample shall not be considered as one of the equipments under the contract, however, it may be reworked by the contractor and submitted for acceptance as a production equipment.

***4.3 Inspection Tests** - The contractor shall furnish all samples and shall be responsible for accomplishing the required tests. All inspection and testing shall be under the supervision of the Government Inspector. Contractors not having laboratory testing facilities satisfactory to the Government Inspector shall engage the services of a commercial testing laboratory acceptable to the procuring activity. The contractor shall furnish test reports showing quantitative results for all inspection tests required by this specification and signed by an authorized representative of the contractor or laboratory, as applicable. Acceptance or approval of material during course of manufacture shall in no case be construed as a guarantee of the acceptance of the finished product. Inspection Tests shall consist of the following:

- (1) **Individual Tests** - Individual Tests shall be conducted on each equipment submitted for acceptance under the contract.
- (2) **Sampling Tests** - Sampling Tests shall be conducted on a quantity of equipment as specified in 4.3.2.1. Equipments for sampling tests shall be selected by the Government Inspector after the equipment has passed the Individual Tests and has been packaged and packed ready for shipment.
- (3) **Special Tests** - Special Tests shall be conducted on a quantity of equipment as specified in 4.3.3.1. Equipments for Special Tests shall be selected by the Government Inspector after the equipment has passed the Sampling Tests.

4.3.1 Individual Tests - Each equipment shall be examined carefully to determine compliance with the requirements of this specification with respect to material and workmanship. In addition, the equipment shall be given an operational check, with sufficient data recorded to assure satisfactory operation.

*** 4.3.1.1 Scope of Test** - As a minimum each equipment shall be tested to determine compliance with the following:

<u>Individual Tests</u>	<u>Applicable Paragraph</u>
I. Tests conducted under standard test conditions and nominal input voltages and frequency.	
1. Check material and workmanship.	
2. Electrical Characteristics (See Figure 1)	3.5
3. Function Selector	3.3.3
4. Identification Output Control	3.3.4

4.3.2 Sampling Tests - Sampling Tests shall be conducted under the close supervision of the Government Inspector and shall include a performance check at ambient laboratory conditions. This Test may also include any of the other preproduction tests the Inspector deems necessary to determine conformance of the equipment with the requirements of this specification. These tests shall include also a careful examination of the way the equipment is packaged and packed to determine conformance with the packaging and packing requirements of this specification or the contract. Sampling tests shall be conducted on complete equipments. When individual units of the equipments are tested individually and shipped then the samples selected for Sampling Tests shall consist of all the individual units necessary to comprise a complete operating equipment.

* **4.3.2.1 Sampling Test Schedule** - Sampling Tests shall be performed on the following quantity of equipment unless otherwise stated in the contract or approved in writing by the procuring service.

<u>Quantity of Equipment</u>	<u>Quantity of Equipment to be Tested</u>
First 10 equipments	1
Next 10 to 100	2
Next 100 to 200	1
Over 200	One for each additional 200

* **4.3.2.2 Scope of Test** - As a minimum, each equipment selected for sampling test shall be tested to determine compliance with the following:

<u>Sampling Tests</u>	<u>Applicable Paragraph</u>
I. Tests conducted Standard Test Conditions and Nominal Input Voltages and Frequency	
1. Repeat the Individual Tests	4.3.1.1

4.3.2.3 Equipment Failure - Should an equipment fail to pass any part of the Sampling Test, the following corrective action shall be taken by the contractor.

- (1) Determine the cause of the failure.
- (2) Determine if the failure is an isolated case or design defect.
- (3) If a design defect, suggest corrective action for BuAer Approval.
- (4) Include a test in the Individual Test to check all equipments for this requirement until reasonable assurance can be obtained that the defect has been satisfactorily corrected.

* **4.3.3 Special Test** - Special Tests shall be conducted under the close supervision of the Government Inspector and shall include a performance check at the environmental conditions specified below using the same test procedures as approved for the Preproduction Test. The Special Test may also include any other tests the Inspector deems necessary to determine conformance of the equipment with the contractual and specification requirements. Special Tests shall be conducted on complete equipments

* **4.3.3.1 Special Test Schedule** - Special tests shall be conducted on the first and every fifth equipment that successfully passes the Sampling Test.

* **4.3.3.2 Scope of Test** - As a minimum each equipment selected for Special Test shall be tested to determine compliance with the following:

Special Test

1. Tests using procedures as approved for the preproduction test under the following environmental conditions.

- | | |
|------------------------------|------------|
| 1. High and low temperature. | MIL-E-5400 |
| 2. Humidity. | MIL-E-5400 |

* **4.3.3.3 Equipment Failure** - Should an equipment fail to pass any part of the Special Test, the following corrective action shall be taken by the contractor.

- (1) Determine the cause of the failure.
- (2) Determine if the failure is an isolated case of design defect.
- (3) If a design defect, suggest corrective action and submit to the procuring activity for approval.

4.4 Test Procedures - The procedures and methods for conducting Preproduction Tests and Inspection Tests shall be prepared by the contractor and sent to the procuring activity for approval. The right is reserved by the procuring activity or the Naval Inspector to modify the tests or require any additional tests deemed necessary to determine compliance with the requirements of this specification or the contract. Use MIL-T-18303 as a guide for preparation of Test procedures.

4.5 Pre-Submission Testing - No item, part or complete equipment shall be submitted by the contractor until it has been previously tested and inspected by the contractor and found to comply to the best of his knowledge and belief with all applicable requirements. The design data submitted by the contractor for the preproduction model shall indicate its physical and electrical characteristics and other necessary test data which will establish that the equipment meets all the requirements of this specification.

4.6 Rejection and Retest - The electronic equipment which has been rejected may be reworked or have parts replaced to correct the defects and resubmitted for acceptance. Before resubmitting, full particulars concerning previous rejection and the action taken to correct the defects found in the original shall be furnished the Inspector. Units rejected after retest shall not be resubmitted without the specific approval of the procuring agency.

5. PREPARATION FOR DELIVERY

5.1 General - All major units and parts of the equipment shall be packaged, packed and marked for shipment in accordance with the requirements of Specification MIL-E-17555.

6. NOTES

6.1 Use - The phase detecting network is an equipment suitable for use with Radio Receiver - Transmitter RT-220B/ARN-21, Azimuth Indicator ID-307/ARN, and Cross Pointer Deviation Indicator ID-249A/ARN to provide the pilot or automatic pilot of an equipped aircraft with the information necessary to guide that aircraft along a selected course.

* **6.2 Test Values** - Normal and limiting values of performance data shall be determined at input voltages of 25.0 ± 3 volts, 400 cps. These data are to be used in testing the equipment for compliance with minimum acceptable standards of performance.

6.3 Precedence of Documents - When the requirements of the contract, this specification, or applicable subsidiary specifications are in conflict, the following precedence shall apply:

- (1) **Contract** - The contract shall have precedence over any specification.
- (2) **This Specification** - This specification shall have precedence over all applicable subsidiary specification. Any deviation from this specification, or from subsidiary specifications where applicable, shall be specifically improved in writing by the procuring activity.
- (3) **Referenced Specifications** - Any referenced specification shall have precedence over all applicable subsidiary specifications referenced therein. All referenced specifications shall apply to the extent specified.

* **6.4 Performance Objectives** - Minimum size and weight, simplicity of operation, ease of maintenance, and an improvement in the performance and reliability of the specific functions beyond the requirements of this specification are objectives which shall be considered in the production of the equipment. Where it appears a substantial reduction in size and weight or improvement in simplicity of design, performance, ease of maintenance or reliability will result from the use of materials,

parts and processes other than those specified in Specification MIL-E-5400, it is desired their use be investigated. When investigation shows advantages can be realized, a request for approval shall be submitted to the procuring activity for consideration. Each request shall be accompanied by complete supporting information.

6.5 As a general rule non-repairable subassemblies should be encapsulated or hermetically-sealed. The number of connections internal to the subassembly should be held to a minimum. Detail parts tolerances and ratings should be so selected that the life of the subassembly is greater than that of a similar repairable one. With few exceptions (such as high voltage power supplies), the non-repairable subassembly should evidence a Mean-time-to-failure greater than 5000 hours, and for many applications this figure must be nearer 50,000 hours.

6.6 An asterisk preceding a paragraph number denotes a change in that paragraph from the basic specification.

NOTICE - When Government drawings, specification, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished or in any way supplied the said drawings, specifications or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.

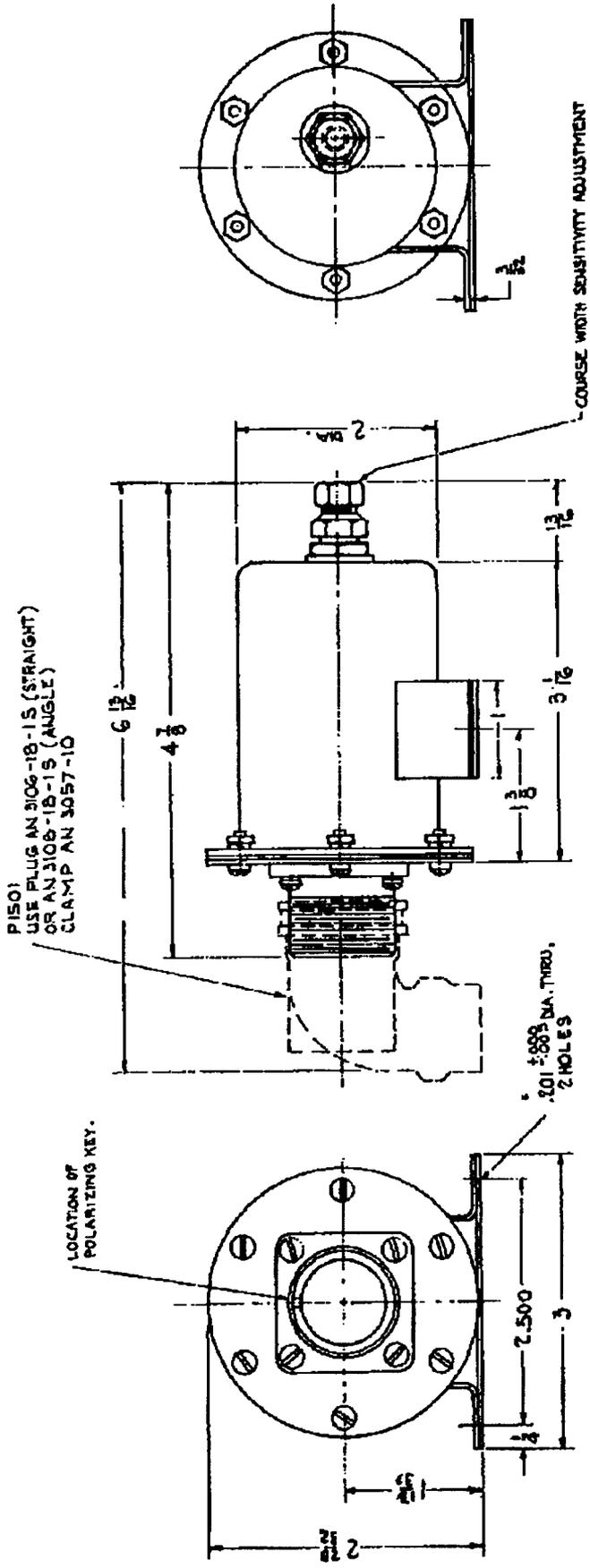


FIGURE 2
 NETWORK, PHASE DETECTING
 CV-279/ARN

