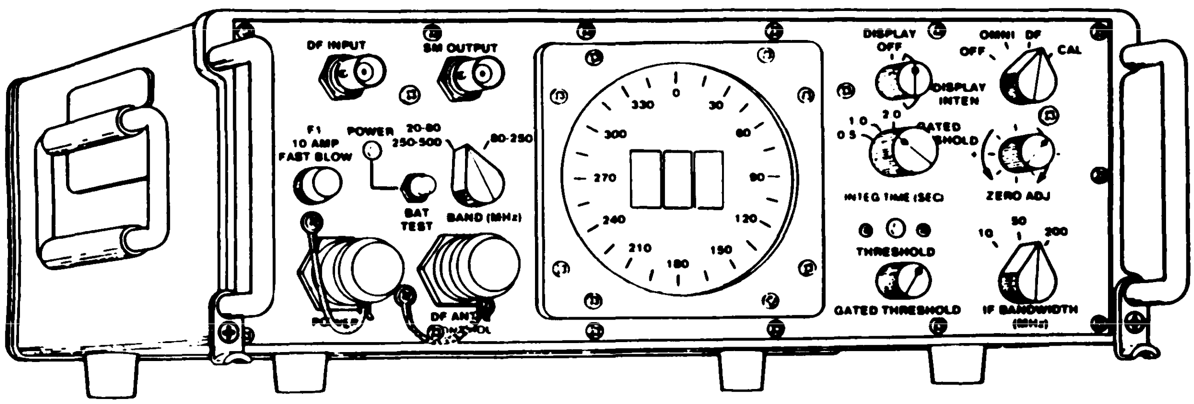
TM 11-5895-1227-14-2

TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL



PROCESSOR DISPLAY CONTROL C-11495/PRD-11 (NSN 5820-01-160-4411)

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HEADQUARTERS, DEPARTMENT OF THE ARMY

1 MARCH 1988

WARNING

The Processor Display Control uses voltages which maybe fatal if contacted. Do not be misled by the term "Low Voltage." Potentials as low as 50 volts may cause death under adverse conditions. Extreme caution should be exercised when working this equipment. Death on contact may result if personnel fail to observe safety precaution.

1. Do not work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid.
2. Whenever possible, turn off the power supply to the equipment before beginning maintenance on the equipment.

3. Do not remove the protective covers to the equipment unless you are authorized to do so.

4. When the technicians are aided by operators, they must be warned about dangerous areas. A periodic review of safety precautions in TB 385-4, Safety Precautions for Maintenance of Electrical/Electronic Equipment, is recommended.

5. Seek advice from your supervisor whenever you are in doubt about electrical safety conditions.

6. For Artificial Respiration, refer to FM 21-11.

WARNING

The batteries used in the Processor Display Control are hazardous and may cause serious injury to personnel if safety precautions are not observed.

1. Remove batteries when processor display control is not in operation. Leaving batteries in the equipment when it is not in use may result in leakage or explosion.

2. Do not crush, puncture, dissemble, or otherwise mutilate batteries.

3. Do not attempt to recharge alkaline batteries.

4. Observe extreme caution when recharging nickel cadmium batteries by ensuring proper electrical connections and keeping charger away from other equipment that may spark and cause explosion.

CAUTION

If the WJ-8975A is to be stored for any length of time, remove the batteries from the battery pack. Possible damage to unit may be encountered if the batteries are stored with the unit.

Technical Manual

No. 11-5895 -1227-14-2

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 March 1988

Operator's, Organizational, Direct Support and General Support Maintenance Manual

PROCESSOR DISPLAY CONTROL C-11495/PRD-11

(NSN 5820-01-160-4411)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of away to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP, Fort Monmouth, NJ 07703-5000. A reply will be furnished direct to you.

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INTRODUCTION

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GENERAL DESCRIPTION

This manual supersedes TM 11-5895-1227-14-2, 1 September 1984.

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SECTION O

INTRODUCTION

0.1 SCOPE

0.1.1 TYPE OF MANUAL. This is an Operator's, organizational, Direct Support and General Support Maintenance commercial manual.

0.1.2 MODEL NUMBERS AND EQUIPMENT NAMES. Processor Display Control C-11495\PRD-11, is part of Radio Receiver Direction Finder Set AN/PRD-l1. The other units of this set include Direction Finder Antenna AS-3732/PRD-11 or AS-3733/PRD-l1, the Receiver AN\GRR-8(V), and Panoramic Indicator IP-1355/GRR-8(V). In this manual, the Processor Display Control will be referred to as the Direction Finder, and by its manufacturer's model number, WJ-8977A. In TM 11-5825-278-12-2, Operator's and organizational Maintenance Manual for the Radio Receiver Direction Finder Set, the Direction Finder is referred to as the df processor. A complete cross-reference of common equipment names and nomenclatures used in this manual is provided in paragraph 0.7.

0.1.3 PURPOSE OF EQUIPMENT. As part of the Radio Receiver Direction Finder Set, the Direction Finder controls the switching action of the Direction Finder Antenna dipoles. Simultaneously, the Direction Finder accepts rf signals from the Receiver in order to visually display a compass bearing of a target transmitter.

0.2 CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to the latest issue of DA Pam 25-30 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

0.3 MAINTENANCE FORMS. RECORDS AND REPORTS

0.3.1 REPORTS OF MAINTENANCE AND UNSATISFACTORY EQUIPMENT. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in Maintenance Management Update.

0.3.2 REPORT OF PACKAGING AND HANDLING DEFICIENCIES. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73B/AFR 400-54/MCO 4430.3H.

0.3.3 DISCREPANCY IN SHIPMENT REPORT (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

0.4 DESTRUCTION OF ARMY ELECTRONICS MATERIEL

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

0.5 ADMINISTRATIVE STORAGE

Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed before storing. When removing the equipment from administrative storage preventive maintenance should be performed to assure operational readiness Disassembly and repacking of equipment for shipment or limited storage are covered in section IV.

0.6 TOOL AND TEST EQUIPMENT

Maintenance of the Direction Finder requires no special tools. Test equipment required for troubleshooting and maintenance of the Direction Finder is listed in paragraph 5.4.

0.7 OFFICIAL NOMENCLATURE. NAMES AND DESIGNATIONS

The list below will help you identify the official nomenclature of the major equipment items used with the Direction Finder. It also provides the common name used in the manual when it is different from the official nomenclature. official nomenclature must be used when completing forms or when looking up technical manuals

Common Name	Official Nomenclature
Battery	Battery BA-30
Battery charger	Battery Charger WJ-8640/BC
Df antenna	Antenna, Direction Finder AS-3732/PRD-l1 Antenna, Direction Finder AS-3733/PRD-11
Df processor	Control, Processor Display C-11495/PRD-11
Direction Finder WJ-8975A	Control, Processor Display C-11495/PRD-11
Direction Finder Set	Direction Finder Set, Radio Receiver AN/PRD-11
D-Cell battery	Battery, Dry, BA-4386/PRC-25
Headset	Headset, Type 994-9913
Lithium battery	Battery, nonrechargeable, Lithium $S0_2$, BA-5598/u
Magnesium battery	Battery BA-4386
Manpack Receiver WJ-8640	Receiver AN/GRR-8(V)
Manportable/Vehicular Direction Finder System	Direction Finder Set Radio Receiver AN/PRD-11.
Nicad battery	Battery, Storage BB-586/U
Signal Monitor WJ-9180-1	Indicator, Panoramic IP-1355/GRR-8(V)

0.8 REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS

If your Direction Finder needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communication-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP, Fort Monmouth, NJ 07703-5000. We'll send you a reply.

0.9 WARRANTY INFORMATION

The Direction Finder is warranted by Watkins-Johnson Company for a period of 1 year following delivery. It starts on the date found in block 23, DA Form 2408-9, in the logbook. This warranty may contain repair restrictions. Report all defects in material or workmanship to your supervisor.

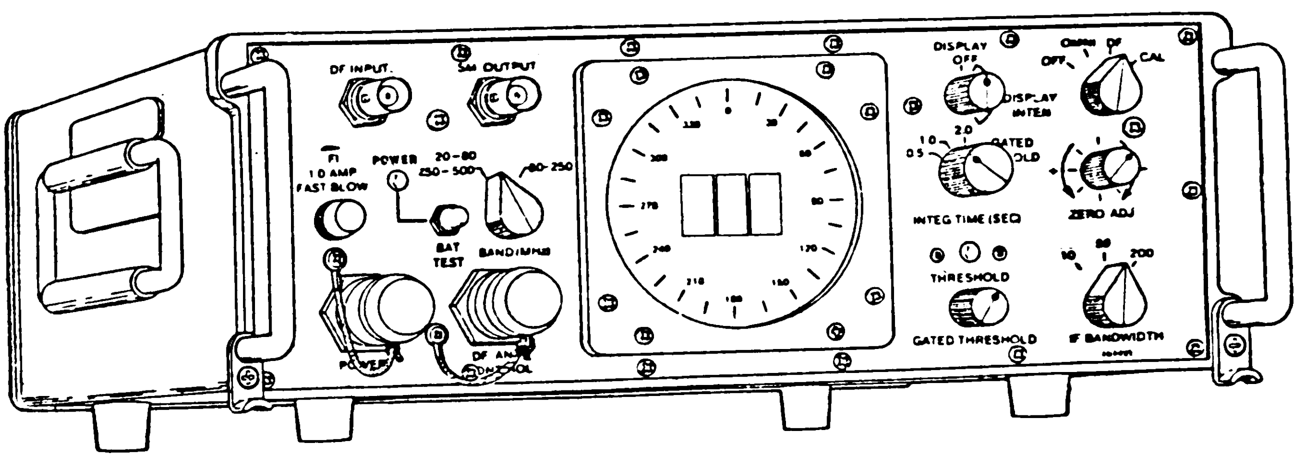


Figure 1-1. Type WJ-8975A Direction Finder

SECTION I

GENERAL DESCRIPTION

1.1 ELECTRICAL CHARACTERISTICS

The WJ-8975A Direction Finder is designed to be used in conjunction with the Watkins-Johnson Company's Manportable/Vehicular Direction Finding System. This system includes the WJ-8640 Series Manpack Receiver, the WJ-9180 Series Signal Monitor, and the WJ-9880 Series Antenna. The WJ-8975A Direction Finder is the central controlling unit in the DF System.

As the central controlling unit in the DF System, the WJ-8975A Direction Finder controls the element switching network at the antenna. The Direction Finder also processes the signals obtained from the WJ-8640 Series Receiver's Signal Monitor Output. An accurate bearing of the incoming signal provided by the WJ-8640 Series Receiver is displayed with an easy to read, 3 digit LED display. This 3 digit display reads in l° increments. Surrounding the 3 digit LED display is a circular array of 60 LED's that simulates a compass. The LED's compass type display is an additional bearing indicator which supports the primary 3 digit LED display.

1.2 MECHANICAL CHARACTERISTICS

The WJ-8975A Direction Finding System was designed for ease of setup and operation either in the field or in a vehicle. The complete Manportable/Vehicular Direction Finding System has been ruggedized to provide dependable service for field applications. The WJ-8975A Direction Finder, WJ-8640 Series Manpack Receiver, and WJ-9180 Series Portable Signal Monitor have rubber feet on the bottom of their cases to enable stacking the equipment in the field. For vehicular use, a WJ-8640/MT (mounting tray) will have to reutilized for each unit. The WJ-8640/MT (mounting tray) provides a means of securing the Direction Finding System to the vehicle.

All controls and connectors needed for field operation of the Direction Finding System are located on the equipment front panels. Refer to Section II for details of operation which pertain to the WJ-8975A. For vehicular operation, one can utilize the vehicle's power supply to energize the WJ-8975A.

1.3 EQUIPMENT SUPPLIED

The equipment supplied with the WJ-8975A Direction Finder includes two cable assemblies, m extender board, and an alignment tool (see main chassis parts list).

1.4 EQUIPMENT REQUIRED BUT NOT SUPPLIED

The WJ-8975A Direction Finder was designed to be used in conjunction with the following units which makeup the Manportable/Vehicular Direction Finding System:

1) WJ-8640 Series Manpack Receiver
2) WJ-9180 Series Portable Signal Monitor (optional)
3) WJ-9880 ADF Antenna

Also available are the WJ-8640/MT (mounting trays) for vehicular use, and audio devices such as WJ-8640 front cover speaker assembly or WJ-8640 headset. The required equipment may vary depending on the application of the Direction Finding System. Each unit in the Direction Finding System can use 10 D cell Alkaline or 10 NICAD cells or one BA-4386 battery as a power source. An optional WJ-8640/BC (battery charger) is also available.

Table 1-1. WJ-8975A Direction Finder Table of Specifications

System Makeup	WJ-8975A Direction Finder, WJ-9880A DF Antenna, Series WJ-8640 Manpack Receiver, WJ-9180 Series Portable Signal Monitor (optional)
System Performance:	
Sensitivity	10 dB S/N ratio for ±3° bearing
Frequency Range	20-175 MHz expandable to 500 MHz (dependent upon receiver and antenna used)
Instrument Accuracy	1°
Typical System Accuracy	3° rms with antenna correction tables
Resolution	1°
Vertical Angle Coverage	±30°
WJ-8975A DIRECTION FINDER	
Bearing Presentation	3-digit numerical LED display indicating bearing of the incoming signal in 1° increments, complemented by a 60-segment circular LED display. Bearing
Integration Times	Integrates information over 0.5 sec., 1.0 sec., and 2.0 sec. Selectable by front-panel control, GATED mode allows COR triggered integration and HOLD to hold last display.
Calibrator	Simulates a signal arriving at 0°. A front-panel control is provided for zero adjustment.
Controls	OFF/OMNI/DF/CAL switch DISPLAY OFF/DISPLAYINTENSITY, INTEGRATION TIME, IF BANDWIDTH, ZERO ADJUST, GATEDTHRESHOLD, BAND SWITCH, BATTERY TEST.
IF Input Frequency	10 MHz
IF Bandwidths	10 kHz, 50kHz, 200kHz
Maximum IF Input	-25 dBm
Weight:	
WJ-8975A	14 lbs., approximately
Standard Battery Pack (with batteries)	5.5 1bs., approximately
Optional Rechargeable Battery Pack, WJ-8640/BC (with NICAD Batteries and Charger)	10 lbs., approximately

Table l-1. WJ-8975A Direction Finder Table of Specifications (Concluded)

Size	4.2" high by 11.38" wide by 11.75" deep. Add 2.5" to the depth for the standard battery pack; add 5.5" for optional rechargeable battery pack with built-in charger. Add 3.1" to the depth for front-panel protective cover.
Power Requirements	Type U318U front-panel connector provided for standard vehicle supply nominal (+12V or +28 V), or the self-contained battery pack accommodates: l each BA-4386 or 10 each D-cell Alkaline, or 10 each NICAD cells (D-size).
Power Requirements for Optional Battery Charger	115/220Vac, ±10%, 50-400 HZ

SPECIFICATIONS NOTE

The specifications and the design of the type WJ-8975A Direction Finder as indicated in the preceding table are subject to change in accordance with modification improvements.

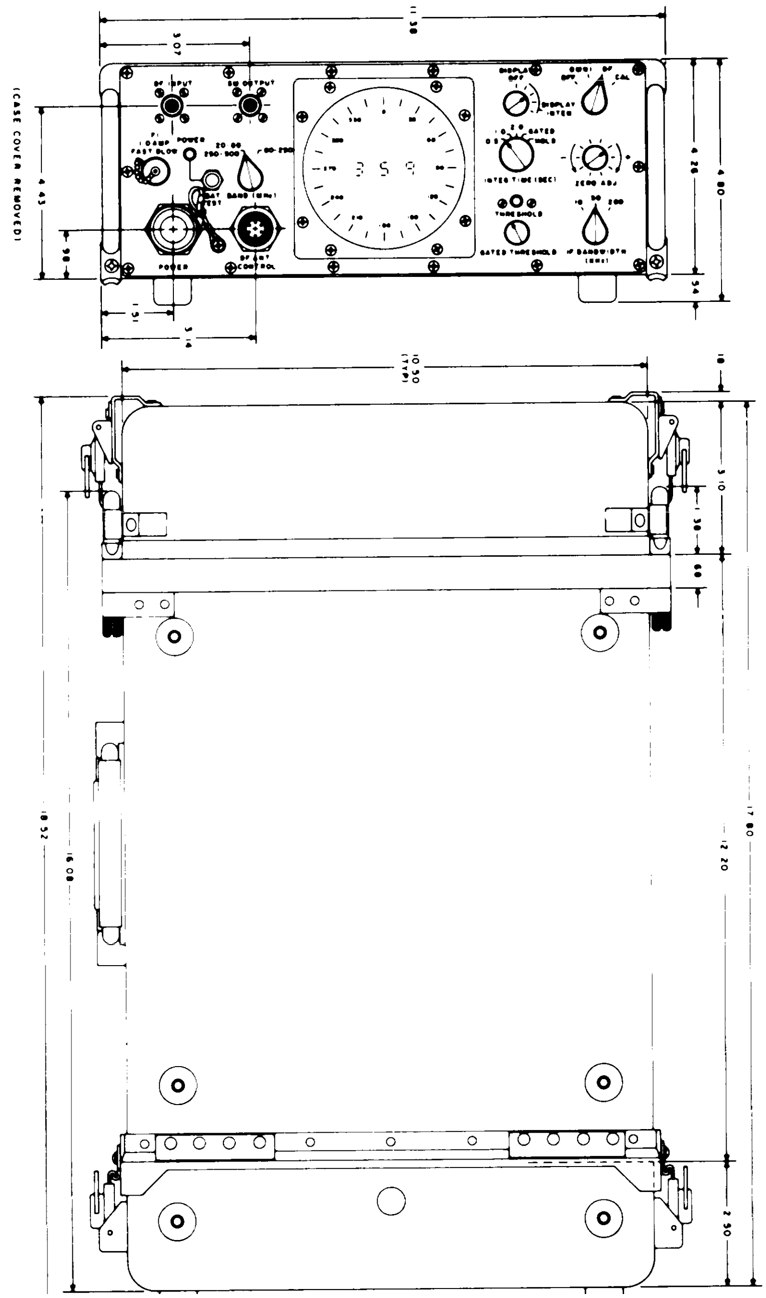


Figure 2-1. WJ-8975A Outline Drawing

SECTION II
INSTALLATION AND OPERATION

2.1 UNPACKING AND INSPECTION

Examine the shipping carton for damage before unpacking the equipment. If the carton appears to be damaged, try to have the carrier's agent present when the equipment is unpacked. If this is not possible, retain all packaging material and shipping containers for the carrier's inspection to verify damage to the equipment after unpacking. Also verify that the equipment shipped corresponds to the packing slip. Contact the Watkins-Johnson Company, CEI Division, or your Watkins-Johnson representative for any discrepancies or shortages.

2.2 INSTALLATION

Utilize the Manportable/Vehicular Direction Finding System Interconnection Diagram, Figure 2-2 as a guide for system installation connections. The WJ-8975 Direction Finder's front and rear panel connectors are outlined in Table 2-1.

For manportable applications, the installation of the Direction Finding System is accomplished by stacking the units on top of one another. The rubber feet underneath each unit provide protection from possible scratching of the cases For vehicular applications, each unit in the Direction Finding System should be secures. The WJ-8640/MT (mounting tray) providesa means of securing each unit to the vehicle. To attach the WJ-8640/MT (mounting tray) to a unit, slide the unit onto the mounting tray. The guides on the underside of the units should match the mating guides on the WJ-8640/MT (mounting tray). Once this is accomplished, secure the Direction Finding unit to the tray by loosening the nut on the hold-down screw and placing the collar over the flange below the unit's front panel handles. By tightening the nut, the unit is secured firmly to the WJ-8640/MT (mounting tray).

2.2.1 CONNECTOR SIGNALS

2.2.1.1 DF Input J1

The Direction Finder Input BNC connector accepts a -25 dBm max. IF Signal into 50 ohms. The center frequency is 10 MHz.

2.2.1.2 SM Output J2

This Signal Monitor Output BNC connector provides a -15 dBm max. output signal into 50 ohms. This signal is utilized by an optional WJ-9180 Series Portable Signal Monitor.

2.2.1.3 DF Antenna Control J4

This Direction Finder Antenna Control multi pin connector provides the interconnection to the WJ-9880A DF Antenna. It provides the signals to the antenna switch for commutation of the dipoles.

2.2.1.4 Power J5

This power connector is a multipin type. It is a standard type U318U connector. When utilizing a vehicle's power supply (+12 V to +28 V), this connector is used.

Table 2-1. Type WJ-8975A Direction Finder Front and Rear Panel Connectors

Connector Number	Connector Nomenclature	Connector Function
J1	DF INPUT	Accepts IF input of 10 MHz @-25 dBm max. from the MJ-8640 Series Manpack Receiver.
J2	SM OUTPUT	Provides a 10 MHz output signal for monitoring on the WJ-9180 Series Portable Signal Monitor (optional).
J4	DF ANT CONTROL	Provides interconnections to the WJ-9880 Series DF Antenna for controlling the commutations of the dipoles.
J5	POWER	Power input for vehicle supply (+12 V to +28 V). This is a standard U318U multipin connector.
J8*	POWER CONNECTOR	This connector mates with the battery pack for portable use.

* Designates rear panel connector.

2.2.1.5 Power Connector J8

Located on the rear panel, this multipin power connector couples to the battery pack or the WJ8640/BC battery charger.

2.2.2 BATTERY INSTALLATION

The information listed below will provide the necessary instructions needed for proper battery installation and removal for Direction Finder use.

2.2.2.1 Type BA-4386/PRC-25

(a) Place the receiver on a clean flat surface so that it rests on the protective handles that extend from the front panel.

(b) Turn the latch handles on the side of the rear cover fully counterclockwise and pull the latches away from the sides of the receiver.

(c) Remove the rear cover and lift the old battery off the rear of the receiver case.

(d) Plug the new battery into the receptacle on the rear of the case.

(e) Put the dust cover over the battery. Fold the latches against the sides of the case.

(f) Turn the handles on the latches fully clockwise, making sure the latches properly engage the hooks on the receiver case.

(g) Return the receiver to its upright positions Energize the receiver by rotating the VOLUME knob from its OFF position and press the BATTERY/TEST pushbutton on the front panel. The red light above the pushbutton should remain lit, indicating that the battery is good. If the light goes off, it is an indication that the battery is below its normal level and should be changed immediately.

NOTE

Do not continue to hold the press-to-test button as this will cause an a necessary battery drain.

2.2.2.2 D-Cells

(a) Remove the D-Cell Insert from the rear of the receiver as in 2.2.2.1 (a) through (c) above.

(b) Unclip the black cardboard tubes holding the D-Cells from the insert.

(c) Remove the cells from the cardboard tubes

(d) Slide the new D-Cells into the cardboard tubes making sure that the cells in each tube point in the same direction.

(e) Clip the cardboard tubes and D-Cells back into their holders, making sure that the cells face in the direction indicated on each of the holders.

(f) Replace the D-Cell insert by reversing steps in 2.2.2.1 (a) through (c) above.

2.3 OPERATION

The operational description of the Manportable/Vehicular Direction Finding System utilizes the following table as an outline. For a detaiilcd description of the system's controls and indicators, refer to 2.3.1.

Table 2-2. Table of Controls and Indicators

Reference Designation	Nomenclature	Function
S4	OFF/OMNI/DF/CAL	Applies power to unit. Selects function of the WJ-8975 Direction Finder.
S3	DISPLAY OFF/ DISPLAY INTEN	Allows the intensity of the digital display to be controlled or completely shut off.
S2	BAND (MHz)	Selects proper band of reception in conjunction with the WJ-8640 Series Manpack Receiver.
S6	IF BANDWIDTH	Selects the IF bandwidth of 10 khz, 50 kHz, or 200 kHz.
S5	INTEG TIME (SEC)	Selects bearing integration times of .5 sec. 1 see, and 2 sec. Also provides Gated and Hold features.
S7	ZERO ADJ	Allows the Direction Finder to be calibrated. (S4 must be in CAL position to accomplish calibration.)
F1	FUSE	Projects the Direction Finder from voltage surges or improper voltage inputs.
RI	GATED THRESHOLD	Allows integration of bearing data to be entered onto the 3 digit display a COR. (S5 must be in the Gated position.)
S1	BAT TEST	A pushbutton control that lights an LED if battery condition is good.

2.3.1 CONTROL AND INDICATOR FUNCTIONS

The following information is an operational description of the WJ-8975A Direction Finder's controls and displays. Figure 2-1 will aid in the location of the described controls and indicators.

2.3.1.1 OFF/OMNI/DF/CAL Switch

Once the proper power source is determined (either +12 V to +28 V for the external power connector J5 or +15.5 V via the battery pack connected to J8), the unit can now be energized. Rotate this control to the right to the desired position. The Direction Finder is now operable.

2.3.1.1.1 OMNI Position

In the OMN1 position, the internal direction finding circuitry is turned off. In this position, one element of the WJ-9880 Series DF Antenna is used for general reception.

2.3.1.1.2 DF Position

The DF position utilizes all direction finding circuitry. To make a DF cut, tune the desired frequency on the WJ-8640 Series Manpack Receiver and determine the proper IF bandwidth for the clearest reception. Turn the IF Bandwidth control on the WJ-8975A to the same bandwidth as on the WJ-8640.

NOTE

Make sure the BAND SELECT switches on both units are set the same. Failure to do this may cause an error of 180°.

2.3.1.1.3 CAL Position

In this position, an internally generated signal simulates a bearing of 0°. This simulated signal is presented to the processing circuitry. Calibration of the unit can be accomplished by utilizing the ZERO ADJ control and the circular display. If the ZERO ADJ control cannot properly set the bearing, the DF may need realignment.

2.3.1.2 DISPLAY OFF/DISPLAY INTENSITY

This control enables the user of the WJ-8975A to control the intensity of the DF display. When turned completely clockwise, the display is shut off while the unit is still operating. By turning the control fully clockwise, the display reaches maximum intensity.

NOTE

Operating under maximum intensity increases battery drain. To optimize battery performance, a lower intensity setting is required.

2.3.1.3 BAND (MHz) Selection

This two position switch provides a selection of the 20-80/250-500 MHz and 80-250 MHz bands. This switch makes the WJ-8975A Direction Finder compatible with the WJ-8640 Series Manpack Receivers and their associated tuners. The BAND switch setting on the WJ-8640 Series Manpack Receivers must correspond to the BAND switch setting on the WJ-8975A. Failure to match the bands can cause an error of 180°.

2.3.1.4 IF BANDWIDTH

This three position switch provides a selection of 10 kHz, 50 kHz, and 200 kHz bandwidths Similar in operation to the BAND selection switch, the IF BANDWIDTH switch setting must correspond to the WJ-8640 Series Manpack Receiver's IF BANDWIDTH switch setting in order to obtain an accurate DF cut.

2.3.1.5 INTEG TIME (SEC)

This control provides response selection on the WJ-8975A Direction Finder. Using a .5 sec integration time, a Direction Finder responds faster to incoming signals. The 2 sec integration time is used to average out excessive FM modulation on incoming signals Also on this switch are GATED and HOLD positions. In the GATED position, the WJ-8975A Direction Finder allows integration of bearing data to be triggered by a COR (Carrier Operated Relay). In the HOLD position, the Direction Finder display will retain the processed bearing data in the presence of a new signal.

2.3.1.6 ZERO ADJ Control

Utilize this control to obtain an accurate compass location. To adjust the WJ-8975A Direction Finder to zero, place the function switch to CAL, and the BAND MHz switch to 80-250. An internal signal generator simulates a bearing of 0°. Turn the ZERO ADJ control to obtain a reading of 0° on the display. The ZERO ADJ may also be used to compensate up to +/-5° of magnetic north variance due to geographical location.

NOTE

When calibrating the WJ-8975A with the band select switch in the 20-80/250-500 position, the indicated bearing during calibration is 180°.

2.3.1.7 GATED THRESHOLD

This control sets the COR (Carrier Operated Relay) Threshold level. Refer to 2.3.1.5 above for GATED operation.

2.3.18 BAT TEST

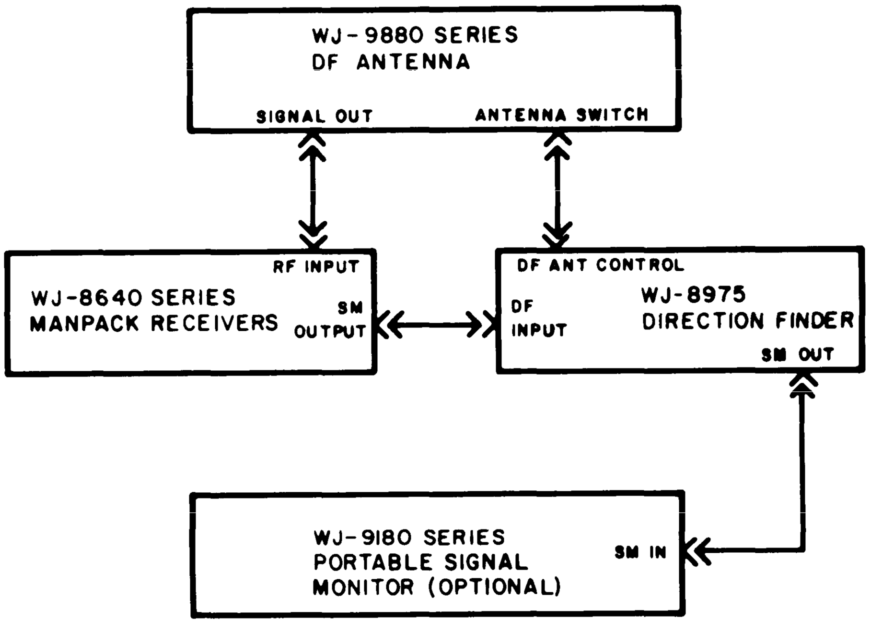
A pushbutton switch, when activated will cause an LED to glow if the batteries are up to charge. If the LED goes out while the button is held in, the batteries should be replaced.

CAUTION

If the WJ-8975A is to be stored for any length of time, remove the batteries from the battery pack. Possible damage to unit may be encountered if the batteries are stored with the unit.

2.4 PREPARATION FOR RESHIPMENT

If the unit must be prepared for reshipment, the packaging methods should follow the patterns established in the original shipment. If retained, the original materials can be reused to a large extent or at least provide guidance for repacking.



1. Set up the tripod to a vertical position and mount antenna onto tripod. (*Refer to paragraph 2-2 on installation instructions.*)

2. Connect multipin control cable to the Antenna Switch (J10) on the antenna and to the DF ANT CONTROL (J4) on the WJ-8975.

3. Connect the RF signal cable from the Signal Output (J9) (for 175 to 850 MHz operation on the WJ-9880-1 only) or from the Signal Output (J11) (for 20 to 175 MHz operation) on the WJ-9880 Series DF Antenna to the RF INPUT (J1) connector on the WJ-8640 Series Manpack Receiver.

4. Connect a cable from the SM OUTPUT (J2) connector on the WJ-8640 Series Manpack Receiver to the DF INPUT (J1) on the WJ-8975 Direction Finder.

5. If the signal is to be monitored, connect a cable from the SM OUTPUT (J2) of the WJ-8975 Direction Finder to the SM INPUT (J3) on the WJ-9180 Series Signal Monitor (optional).

6. Energize all equipment.

7. Set the WJ-8975 Direction Finder's Function Switch (S4) to CAL. If the BAND (MHz) (S2) is in the 80-250 setting, the 3 digit display will read 0°. If the 20-80 MHz/250-500 MHz setting is used, the 3 digit display will read 180°. At this time, the variance for Magnetic North within the geographical location of the WJ-8975 may be compensated for.

8. Tune the desired Frequency on the WJ-8640 Series Manpack Receiver and determine the proper bandwidth for the clearest and strongest reception. Set the same bandwidth on the WJ-8975 Direction Finder via IF BANDWIDTH (S6). Also set the same BAND select (S2).

NOTE

The IF BANDWIDTH and the BAND Select Switches must be set the same on both units. Failure to do this may cause an error of 180°.

Figure 2-2. Manportable/Vehicular Direction Finding System Interconnection Diagram

SECTION III

REPLACEMENT PARTS LIST

3.1 UNIT NUMBERING METHOD

The unit numbering method of assigning reference designations (electrical symbol numbers) has been used to identify assemblies, subassemblies (and modules) and parts. An example of the unit numbering method follows:

Subassembly Designation Al	R1 Class and No. of Item
Identify from right to left as:	First (1) resistor (R) of first (1) subassembly (A)

As shown on the main chassis schematic, components which are an integral part of the main chassis have no subassembly designation.

3.2 REFERENCE DESIGNATION PREFIX

Partial reference designations have been used on the equipment and on the illustrations in this manual. The partial reference designations consist of the class letter(s) and identifying item number. The complete reference designations maybe obtained by placing the proper prefix before the partial reference designations. Reference Designation Prefixes are provided on drawings and illustrations in parentheses within the figure titles.

3.3 LIST OF MANUFACTURERS

Mfr. Code	Name and Address	Mfr. Code	Name and Address
00779	Amp Incorporated P.O. Box 3608 Harrisburg, PA 17105	02735	RCA Corporation Solid State Division Route 202 Somerville, MI 48066
01121	Allen Bradley Company 1201 South 2nd Street Milwaukee, WI 53204	04013	Tarus Corporation 1 Academy Hill Lambertville, NY 08530
01295	Texas Instruments, Inc. Semiconductor-Components Div. 13500 North Central Expressway Dallas, TX 75231	04099	Capco Inc. Foresight Industrial Park P.O. Box 2164 Grand Junction, CO 81501
02114	Ferroxcube Corp. P.O. Box 359 Mt. Marion Road Saugerties, NY 12477	04713	Motorola, Incorporated Semiconductor Products Div. 5005 East McDowell Road Phoenix, AZ 80058

Mfr. Code	Name and Address
07263	Fairchild Camera & Instr., Corp. Semiconductor Division 464 Ellis Street Mountain View, CA 94040
14632	Watkins-Johnson Company 700 Quince Orchard Road Gaithersburg, MD 20760
15818	Teledyne Semiconductor 1300 Terra Bells Avenue Mountain View, CA 94043
16237	Connector Corp. 6025 N. Keystone Avenue Chicago, IL 60646
17856	Siliconix, Inc. 2201 Laurelwood Road Santa Clara, CA 95050
18324	Signetics Corporation 811 East Arques Avenue Sunnyvale, CA 94086
19505	Applied Engineering Products, Co. Division of Samarium, Inc. 300 Seymour Avenue Derby, CT 06418
24355	Analog Devices Inc. Rt. 1, Industrial Park P.O. Box 280 Norwood, MA 02062
25330	General Connector Corp. A Subsidary of the Union Corp. 80 Bridge St. Newton, MA 02158
27014	National Semiconductor Corp. 2900 Semiconductor Dr. Santa Clara, CA 95051
27802	Vectron Laboratories Inc. 166 Glover Ave. Norwalk, CT 06850

Mfr. Code	Name and Address
28480	Hewlett-Packard Co. Corporate Headquarters 1501 Page Mill Road Palo Alto, CA 94304
33095	Spectrum Control, Inc. 152 E. Main Street Fairview, PA 16415
50829	Semiconductor Circuits Inc. 306 River St. Haverhill, MA 01830
56289	Sprague Electric Co. Marshall Street North Adams, MA 01247
71279	Cambridge Thermionic Corp. 445 Concord Avenue Cambridge, MA 02138
71400	Bussman Manufacturing Div. of McGraw-Edison Co. 2536 W. University Street St. Louis, MO 63107
71785	TRW Electronic Components Cinch Connector Operations 1501 Morse Avenue Elk Grove Village, IL 60007
72136	Electro Motive Mfg. Co., Inc. South Park & John Streets Willimantic, CT 06226
72982	Erie Tech. Products, Inc. 644 West 12th Street Erie, PA 16512
73138	Beckman Lnstr., Inc. Helipot Division 2500 Harbor Blvd. Fullerton, CA 92634
73899	JFD Electronics Co. 15th at 62nd Street Brooklyn, NY 11219

Mfr. Code	Name and Address
75042	TRW Electronic Components IRC Fixed Resistors 401 North Broad Street Philadelphia, PA 19108
75915	Little fuse, Inc. 800 E. Northwest Highway Des Plaines, IL 60016
80031	Electra-Midland Corp. MEPCO Division 22 Columbia Road Morristown, NY 07960
80058	Joint Electronic Type Designation System
80131	Electronic Industries Assn. 2001 Eye Street, N.W. Washington, DC 20006
81073	Grayhill Incorporated 561 Hillgrove Avenue Lagrange, IL 60525
81312	Winchester Electronics Div. Litton Industries, In corp. Main Street & Hillside Avenue Oakville, CT 06779
81349	Military Specifications

Mfr. Code	Name and Address
83740	Union Carbide Corporation Consumers Product Division 270 Park Avenue New York, NY 10017
91767	Mite Corporation 466 Blake St. New Haven, CT 06515
92825	Whitso Incorporated 9330 Bryon Street Schiller Park, IL 60176
93332	Sylvania Electric Prod., Inc. Semiconductor Products Div. 100 Sylvan Road Woburn, MA 01801
93958	Republic Electronics Corp. 176 East 7th Street Paterson, NY 07524
95712	Bendix Corporation The Electrical Components Div. Microwave Devices Plant Hurricane Road Franklin, IN 46131
96906	Military Standards
99800	American Precision Industries Delevan Electronics Division 270 Quaker Road East Aurora, NY 14052

3.4 PARTS LIST

The parts list which follows contains all electrical parts used in the equipment and certain mechanical parts which are subject to unusual wear or damage. When ordering replacement parts from the Watkins-Johnson Company, specify the type and serial number of the equipment and the reference designation and description of each part ordered. The list of manufacturers provided in paragraph 3.3 and the manufacturer's part number for components are included as a guide to the user of the equipment in the field. These parts may not necessarily agree with the parts installed in the equipment; however, the parts specified in this list will provide satisfactory operation of the equipment. Replacement parts may be obtained from any manufacturer as long as the physical and electrical parameters of the part selected agree with the original indicated part. In the case of components defined by a military or industrial specification, a vendor which can provide the necessary component is suggested as a convenience to the user.

NOTE

As improved semiconductors become available, it is the policy of Watkins-Johnson to incorporate them in proprietary products. For this reason some transistors, diodes and integrated circuits installed in the equipment may not agree with those specified in the parts lists and schematic diagrams of this manual. However, the semiconductors designated in the manual may be substituted in every case with satisfactory results.

3.5 **TYPE WJ-8975A DIRECTIONAL FINDER, MAIN CHASSIS**

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
A1	IF Demodulator	1	794174-1	14632	
A2	AGC Squelch	1	791817-1	14632	
A3	FM Discriminator	1	794175-1	14632	
A4	Mother Board	1	794176-1	14632	
A5	DF Display Board	1	794036-1	14632	
A6	Battery Pack	1	791795-1	14632	
A7	DC-DC Converter	1	794239-1	14632	
A8	Bandwidth Compensation Amplifier	1	794055-1	14632	
A9	Battery Test Indicator	1	170188	14632	
A10	Threshold Indicator	1	170179	14632	
AI1	Not Used				
AI2	Cable Assembly	1	17300-313-5	14632	
AI3	Cable Assembly	1	270644	14632	
AI4	Extender Board	1	794173-1	14632	
AI5	Alignment Tool	1	5284	73899	
AI6	Connector, Plug, Multipin	1	U-316/U	25330	
C1	Capacitor, Ceramic, Feed-thru: 470 pF, ±20%, 500 V	1	54-794-009-471M	33095	
C2	Capacitor, Electrolytic, Tantalum: 1.0 μF, ±10%, 35 V	2	CS13BF105K	81349	
C3	Capacitor, Electrolytic, Tantalum: 220 μF, ±20%, 10 V	1	196D227X0010TE4	56289	
C4	Same as C2				
CR1	Diode	1	1N5819	80131	
CR2	Diode	2	1N4003		
CR3	Same as CR2				
DS1	Lamp, LED	1	4R0	08717	
DS2	Lamp, LED	1	4A0	08717	
E1	Terminal	8	7A1A1	92825	
E2 Thru E8	Same as E1				
F1	Fuse, 1 Amp, 3AG Fast	1	AGC1	71400	
FB1	Ferrite Bead	4	56-590-65/4A	02114	
FB2	Same as FB1				
FB3	Same as FB1				
FB4	Same as FB1				
J1	Connector, Receptacle, Jack, BNC	2	1-225398-5	95712	
J2	Same as J1				
J3	Connector, Receptacle, Multipin	1	SRE14SNSS	81312	
J4	Connector, Receptacle, Multipin	1	MS3114E10-6S	96906	
J5	Connector, Receptacle, Multipin	1	U3181U	25330	
J6	Connector, Receptacle, Multipin	1	SRE20SNSS	81312	
J7	Connector, Receptacle, Multipin	1	SRE7SNSS	81312	

MAIN CHASSIS

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
J8	Connector, Receptacle, Multipin	1	GC075	25330	
P1	Connector, Multipin	3	3-87499-7	00779	
P2	Same as P1				
P3	Same as P1				
P4	Connector, Plug, Multipin	1	U-317/U	25330	
P5	Connector, Plug, SMB	5	17-0402-RD316	19505	
P6	Same as P5				
P7	Same as P5				
P8	Connector, Plug, SMC	1	17-0305-RD316	80058	
P9	Same as P5				
P10	Same as P5				
R1	Resistor, Variable, Composition: 50 kΩ, 10%, 1/2 W	1	RV6NAYSD503A	81349	
R2	Resistor, Fixed, Film: 33.2 kΩ, 1%, 1/10 W	1	RN55C3322F	81349	
R3	Resistor, Fixed, Wire-Wound: 20 Ω, 1%, 5 W	1	RH5/20/F	91767	
R4	Resistor, Fixed, Composition: 4.7 kΩ, 5%, 1/4 W	1	RCR07G472JS	81349	
R5	Resistor, Fixed, Composition: 2.2 kΩ, 5%, 1/4W	1	RCR07G222JS	81349	
R6	Resistor, Fixed, Composition: 1 kΩ, 5%, 1/4 W	1	RCR07G102JS	81349	
R7	Resistor, Fixed, Composition: 1.5 kΩ, 5%, 1/4 W	1	RCR07G152JS	81349	
S1	Switch, Pushbutton, SPST	1	30-1	81073	
S2	Switch, Rotary	1	9S30-01-2-2N	81073	
S3	Switch, Rotary	1	51S30-01-2-6S	81073	
S4	Switch, Rotary	1	9S30-01-3-4N	81073	
S5	Switch, Rotary	1	59HS18-02-3-5N	81073	
S6	Switch, Rotary	1	9S30-02-3-3N	81073	
S7	Switch, Rotary	1	71AYZ3402	81073	
VR1	Voltage Regulator: 15 V	1	MC7815CK	04713	
W1	Cable Assembly	1	17300-313-1	14632	
W2	Cable Assembly	1	17300-313-2	14632	
W3	Cable Assembly	1	17300-313-3	14632	
XA1	Not Used				
XA2	Connector, P.C. Board	1	250-22-30-170	71785	
XA3 Thru XA7	Not Used				
XA8	Connector, P.C. Board	1	251-06-30-160	71785	

3.5.1 **TYPE 794174-1 IF DEMODULATOR** **REF DESIG PREFIX** A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
A1	10 MHz Amplifier	3	791804-1	14632	
A2	Bandwidth Control	1	24996	14632	
A3	Gain BW Compensation Amplifier	1	791802	14632	
A4	IF Filter and Diode Switches	1	791803-1	14632	
A5	Same as A1				
A6	AM Detector/Buffer Assembly	1	791790	14632	
A7	8 Pole Low Pass Filter	1	794035	14632	
A8	Same as A1				
C1	Capacitor, Ceramic, Disc: 0.01 µF, ±20%, 200 V	5	8131A200Z5U103M	72982	
C2	Capacitor, Ceramic, Feed-thru: 0.05 µF, GMV, 300 V	9	54-785-002-503P	33095	
C3 Thru C7	Same as C2				
C8	Capacitor, Ceramic, Feed-thru: 33 pF, ±10%, 500 V	1	54-794-001-3301	33095	
C9	Same as C1				
C10	Same as C2				
C11	Same as C2				
C12	Not Used				
C13	Same as C2				
C14	Capacitor, Electrolytic, Tantalum: 100 µF, ±20%, 20 V	1	196D107X0020TE4	56289	
C15	Same as C1				
C16	Same as C1				
C17	Capacitor, Ceramic, Feed-thru: 470 pF, ±20%, 500 V	1	54-794-009-471M	33095	
C18	Same as C1				
CR1	Diode	2	1N4449	80131	
CR2	Same as CR1				
E1	Terminal, Feed-thru, Insulated	7	SFU16Y	04013	
E2 Thru E7	Same as E1				
FB1	Ferrite Bead	1	56-590-65-4A	02114	
FL1	Filter	1	92215	14632	
J1	Connector, Receptacle, SMB	6	212	19505	
J2	Not Used				
J3 Thru J7	Same as J1				
L1	Coil, Fixed: 10 µH, 10%	1	1537-36	99800	
P1	Connector, Plug, Multipin: 10 pins	1	SRE20PNSSH13	81312	
R1	Resistor, Fixed, Composition: 68 Ω, 5%, 1/4 W	2	RCR07G680JS	81349	
R2	Resistor, Fixed, Composition: 100 Ω, 5%, 1/4 W	3	RCR07G101JS	81349	
R3	Same as R2				
R4	Resistor, Fixed, Composition: 10 Ω, 5%, 1/4 W	1	RCR07G100JS	81349	

REF DESIG PREFIX A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R5	Same as R2				
R6	Resistor, Fixed, Composition: 180 Ω, 5%, 1/4 W	1	RCR07G181JS	81349	
R7	Resistor, Fixed, Composition: 5.1 kΩ, 5%, 1/4 W	4	RCR07G512JS	81349	
R8	Same as R7				
R9	Same as R7				
R10	Same as R7				
R11	Resistor, Fixed, Composition: 330 Ω, 5%, 1/4 W	1	RCR07G331JS	81349	
R12	Same as R1				
XA1	Connector, P.C. Board	8	251-10-30-160	71785	
XA2	Not Used				
XA3 Thru XA9	Same as XA1				

3.5.1.1 Type 791804-1 10 MHz Amplifier **REF DESIG PREFIX** A1A1, A1A5, A1A8

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.01 µF, 10%, 300 V	3	CK06BX103K	81349	56289
C2	Same as C1				
C3	Capacitor, Electrolytic, Tantalum: 15 µF, 20%, 15 V	1	196D156X0015JA3	56289	
C4	Capacitor, Mica, Dipped: 250 pF, 5%, 500 V	1	DM15-251J	72136	
C5	Capacitor, Mica, Dipped: 560 pF, 5%, 300 V	1	DM15-561J	72136	
C6	Same as C1				
L1	Coil, Variable: 1.35-1.65 µH	1	558-7107-15	71279	
Q1	Transistor	1	2N2857/JAN	80131	02735
R1	Resistor, Fixed, Film: 5.62 kΩ, 1%, 1/10 W	1	RN55C5621F	81349	75042
R2	Resistor, Fixed, Film: 2.21 kΩ, 1%, 1/10 W	1	RN55C2211F	81349	75042
R3	Resistor, Fixed, Film: 3.92 kΩ, 1%, 1/10 W	1	RN55C3921F	81349	75042
R4	Resistor, Fixed, Film: 274 Ω, 1%, 1/10 W	1	RN55C2740F	81349	75042
R5	Resistor, Fixed, Film: 150 Ω, 1%, 1/10 W	1	RN55C1500F	81349	75042
R6	Resistor, Fixed, Film: 10 Ω, 5%, 1/4 W	1	RCR07G100JS	81349	01121
R7	Resistor, Fixed, Film: 1.0 kΩ, 1%, 1/10 W	1	RN55C1001F	81349	75042
R8	Resistor, Fixed, Composition: 22Ω, 5%, 1/4 W	1	RCR07G220JS	81349	
R9	Resistor, Fixed, Composition: 2.7 Ω, 5%, 1/4 W	1	RCR07G2R7JS	81349	

3.5.1.2 Part 24996 BW Control **REF DESIG PREFIX** A1A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.01 µF, 10%, 200 V	9	CK06BX103K	81349	56289
C2 Thru C8	Same as C1				
C9	Capacitor, Electrolytic, Tantalum: 15 µF, 20%, 15 V	2	196D156X0015JE3	56289	
C10	Same as C1				
C11	Same as C9				
E1	Terminal	15	140-1941-02-01	71279	
E2 Thru E15	Same as E1				
Q1	Transistor	3	U1899E	15818	
Q2	Same as Q1				
Q3	Same as Q1				
R1	Resistor, Fixed, Film: 100 Ω, 1%, 1/10 W	3	RN55C1000F	81349	75042
R2	Same as R1				
R3	Resistor, Fixed, Film: 100 kΩ, 1%, 1/10 W	3	RN55C1003F	81349	75042
R4	Same as R3				
R5	Same as R3				
R6	Resistor, Fixed, Film: 1.1 kΩ, 1%, 1/10 W	3	RN55C1101F	81349	75042
R7	Same as R6				
R8	Same as R1				
R9	Same as R6				
R10	Resistor, Fixed, Film: 33.2 kΩ, 1%, 1/10 W	3	RN55C3322F	81349	75042
R11	Same as R10				
R12	Same as R10				
R13	Resistor, Fixed, Composition: 47 Ω, 5%, 1/4 W	1	RCR07G470JS	81349	01121

3.5.1.3 Type 791802 Gain Bandwidth Compensation Amplifier **REF DESIG PREFIX A1A3**

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.01 µF, 10%, 200 V	9	CK06BX103K	81349	56289
C2 Thru C6	Same as C1				
C7	Capacitor, Mica, Dipped: 250 pF, 5%, 500 V	3	DM15-251J	72136	
C8	Capacitor, Mica, Dipped: 560 pF, 5%, 300 V	2	DM15-561J	72136	
C9	Same as C7				
C10	Capacitor, Mica, Dipped: 300 pF, 2%, 500 V	1	CM05FD301G03	81349	
C11	Same as C7				
C12	Same as C8				
C13	Same as C1				
C14	Same as C1				
C15	Same as C1				
C16	Capacitor, Electrolytic, Tantalum: 15 µF, 10%, 20 V	1	CS13BE156K	81349	56289
C17	Capacitor, Ceramic, Disc: 10 pF, 10%, 50 V	1	1C10RK	93958	
L1	Coil, Variable: 1.35-1.65 µH	3	558-7107-15	71279	
L2	Same as L1				
L3	Same as L1				
Q1	Transistor	3	2N2857/JAN	80131	02735
Q2	Same as Q1				
Q3	Same as Q1				
R1	Resistor, Fixed, Film: 5.62 Ω, 1%, 1/10 W	3	RN55C5621F	81349	75042
R2	Resistor, Fixed, Film: 2.21 kΩ, 1%, 1/10 W	3	RN55C2211F	81349	75042
R3	Same as R1				
R4	Same as R2				
R5	Same as R1				
R6	Same as R2				
R7	Resistor, Fixed, Film: 3.92 kΩ, 1%, 1/10 W	3	RN55C3921F	81349	75042
R8	Resistor, Fixed, Film: 475 Ω, 1%, 1/10 W	1	RN55C4750F	81349	75042
R9	Same as R7				
R10	Resistor, Fixed, Film: 274 Ω, 1%, 1/10 W	1	RN55C2740F	81349	75042
R11	Same as R7				
R12	Resistor, Fixed, Film: 200 Ω, 1%, 1/10 W	1	RN55C2000F	81349	75042
R13	Resistor, Trimmer, Film: 500 Ω, 10%, 1/2 W	3	62PR500	73138	
R14	Same as R13				
R15	Same as R13				
R16	Resistor, Fixed, Film: 150 Ω, 1%, 1/10 W	1	RN55C1500F	81349	75042

3.5.1.4 Type 791803-1 IF Filters and Diode Switches **REF DESIG PREFIX** A1A4

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.01 μF, 10%, 200 V	6	CK06BX103K	81349	56289
C2 Thru C6	Same as C1				
CR1	Diode	6	1N4449	80131	93332
CR2 Thru CR6	Same as CR1				
FL1	Crystal, Filter	1	15973-1	14632	
FL2	Crystal, Filter	1	15973-3	14632	
R1	Resistor, Fixed, Film: 100 kΩ, 1%, 1/10 W	3	RN55C1003F	81349	75042
R2	Same as R1				
R3	Same as R1				
R4	Resistor, Fixed, Film: 221 Ω, 1%, 1/10 W	1	RN55C2210F	81349	75042
R5	Resistor, Fixed, Film: 12.1 kΩ, 1%, 1/10 W	3	RN55C1212F	81349	75042
R6	Same as R5				
R7	Same as R5				

3.5.1.5 TYPE 791790 AM Detector/Buffer **REF DESIG PREFIX** A1A6

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.01 µF, 10%, 200 V	9	CK06BX103K	81349	56289
C2	Same as C1				
C3	Same as C1				
C4	Capacitor, Variable, Ceramic: 5-25 pF, 100 V	2	518-000A5-25	72982	
C5	Capacitor, Mica, Dipped: 62 pF, 2%, 500 V	1	CM04ED620G03	81349	72136
C6	Capacitor, Mica, Dipped: 10 pF±0.5 pF, 500 V	1	CM05DC100D03	81349	72136
C7	Capacitor, Electrolytic, Tantalum: 15 µF, 20%, 15 V	3	196D156X0015JA1	56289	
C8	Same as C1				
C9	Same as C1				
C10	Same as C7				
C11	Same as C7				
C12	Same as C1				
C13	Same as C1				
C14	Capacitor, Mica, Dipped: 330 pF, 2%, 500 V	1	CM05FD331G03	81349	72136
C15	Same as C1				
C16	Same as C1				
C17	Capacitor, Mica, Dipped: 75 pF, 2%, 500 V	1	CM04ED750G03	81349	72136
C18	Same as C4				
CR1	Diode	1	1N198A	80131	93332
Q1	Transistor	3	2N2857/JAN	80131	02735
Q2	Transistor	1	2N3251	80131	04713
Q3	Transistor	1	2N2222A	80131	04713
Q4	Same as Q1				
Q5	Same as Q1				
R1	Resistor, Fixed, Film: 3.32 kΩ, 1%, 1/10 W	2	RN55C3321F	81349	75042
R2	Resistor, Fixed, Film: 1.1 kΩ, 1%, 1/10 W	3	RN55C1101F	81349	75042
R3	Resistor, Fixed, Film: 1.5 kΩ, 1%, 1/10 W	2	RN55C1501F	81349	75042
R4	Resistor, Fixed, Film: 121 Ω, 1%, 1/10 W	2	RN55C1210F	81349	75042
R5	Resistor, Fixed, Film: 5.62 kΩ, 1%, 1/10 W	3	RN55C5621F	81349	75042
R6	Resistor, Fixed, Film: 22.1 kΩ, 1%, 1/10 W	1	RN55C2212F	81349	75042
R7	Resistor, Fixed, Film: 47.5 kΩ, 1%, 1/10 W	2	RN55C4752F	81349	75042
R8	Resistor, Fixed, Film: 100 Ω, 1%, 1/10 W	3	RN55C1000F	81349	75042
R9	Same as R5				
R10	Resistor, Fixed, Film: 2.21 kΩ, 1%, 1/10 W	1	RN55C2211F	81349	75042
R11	Resistor, Fixed, Film: 562 Ω, 1%, 1/10 W	1	RN55C5620F	81349	75042
R12	Resistor, Fixed, Film: 182 Ω, 1%, 1/10 W	1	RN55C1820F	81349	75042
R13	Same as R7				
R14	Same as R8				
R15	Resistor, Fixed, Film: 221 Ω, 1%, 1/10 W	2	RN55C2210F	81349	75042
R16	Same as R2				
R17	Same as R15				

REF DESIG PREFIX A1A6

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R18	Same as R8				
R19	Resistor, Fixed, Film: 100 kΩ, 1%, 1/10 W	1	RN55C10003F	81349	75042
R20	Same as R1				
R21	Same as R2				
R22	Same as R3				
R23	Same as R4				
R24	Same as R5				
T1	Transformer	2	21427-50	14632	
T2	Transformer	1	21428-19	14632	
T3	Same as T1				

3.5.1.6 Type 794035 8 Pole Low Pass Filter REF DESIG PREFIX A1A7

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Polycarbon, Tubular: 0.1 µF, ±20%, 100 V	4	MPCW-104-1-2	04099	
C2	Capacitor, Mica Dipped: 150 pF, ±2%, 500 V	1	CM05FD151G03	81349	
C3	Capacitor, Ceramic, Disc: 0.1 µF, ±20%, 100 V	4	8131M100-651-104M	72982	
C4	Same as C3				
C5	Same as C3				
C6	Same as C3				
C7	Same as C1				
C8	Capacitor, Polycarbon, Tubular: 1500 pF, ±2%, 100 V	1	MPCW-152-1-2	04099	
C9	Same as C1				
C10	Capacitor, Polycarbon, Tubular: 6800 pF, ±2%, 100 V	1	MPCW-682-1-2	04099	
C11	Same as C1				
C12	Capacitor, Polycarbon, Tubular: 0.012 µF, ±2%, 100 V	1	MPCW-123-1-2	04099	
C13	Capacitor, Polycarbon, Tubular: 0.033 µF, ±2%, 100 V	1	MPCW-333-1-2	04099	
C14	Capacitor, Mica, Dipped: 2000 pF, ±2%, 500 V	1	CM06FD202G03	81349	
R1	Resistor, Fixed, Film: 261 kΩ, 1%, 1/10 W	1	RN55C2613F	81349	
R2	Resistor, Fixed, Film: 3.83 kΩ, 1%, 1/10 W	1	RN55C3831F	81349	
R3	Resistor, Fixed, Film: 475 Ω, 1%, 1/10 W	2	RN55C4750F	81349	
R4	Resistor, Fixed, Film: 100 kΩ, 1%, 1/10 W	2	RN55C1003F	81349	
R5	Resistor, Fixed, Film: 681 Ω, 1%, 1/10 W	1	RN55C6810F	81349	
R6	Resistor, Fixed, Composition: 22 Ω, 5%, 1/4 W	2	RCR07G220JS	81349	
R7	Same as R6				
R8	Same as R4				
R9	Resistor, Fixed, Film: 8.25 kΩ, 1%, 1/10 W	1	RN55C8251F	81349	
R10	Same as R3				
R11	Resistor, Fixed, Film: 33.2 kΩ, 1%, 1/10 W	1	RN55C3322F	81349	
R12	Resistor, Fixed, Film: 324 Ω, 1%, 1/10 W	1	RN55C3240F	81349	
R13	Resistor, Fixed, Film: 68.1 kΩ, 1%, 1/10 W	1	RN55C6812F	81349	
R14	Resistor, Fixed, Film: 6.34 kΩ, 1%, 1/10 W	1	RN55C6341F	81349	
R15	Resistor, Fixed, Film: 402 Ω, 1%, 1/10 W	1	RN55C4020F	81349	
R16	Resistor, Fixed, Film: 22.1 kΩ, 1%, 1/10 W	1	RN55C2212F	81349	
R17	Resistor, Fixed, Film: 100 Ω, 1%, 1/10 W	1	RN55C1000F	81349	
R18	Resistor, Fixed, Film: 42.2 kΩ, 1%, 1/10 W	1	RN55C4222F	81349	
R19	Resistor, Fixed, Film: 4.12 kΩ, 1%, 1/10 W	1	RN55C4121F	81349	
R20	Resistor, Fixed, Film: 19.6 kΩ, 1%, 1/10 W	1	RN55C1962F	81349	
R21	Resistor, Fixed, Film: 1.54 kΩ, 1%, 1/10 W	1	RN55C1541F	81349	
U1	Integrated Circuit	1	LM324N	27014	

3.5.2 **TYPE 791817-1 AGC SQUELCH** **REF DESIG PREFIX A2**

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Electrolytic, Tantalum: 1.0 µF, 10%, 35 V	5	CS13BF105K	81349	56289
C2	Capacitor, Electrolytic, Tantalum: 15 µF, 20%, 15 V	1	196D156X0015JE3	56289	
C3 Thru C5	Same as C1				
C6	Capacitor, Ceramic, Disc: 0.01 µF, 10%, 200 V	1	CK06BX103K	81349	56289
C7	Same as C1				
CR1	Diode	9	1N4449	80131	93332
CR2 Thru CR9	Same as CR1 (CR5, CR6, and CR7 are type 1N198A)				
CR10	Diode	1	1N198A	80131	93332
Q1	Not Used				
Q2	Transistor	3	2N2222A	80131	04713
Q3	Transistor	1	2N930	80131	
Q4	Same as Q2				
Q5	Same as Q2				
R1	Resistor, Fixed, Film: 100 Ω, 1%, 1/10 W	4	RN55C1000F	81349	75042
R2	Not Used				
R3	Resistor, Fixed, Film: 51.1 kΩ, 1%, 1/10 W	1	RN55C5112F	81349	75042
R4	Resistor, Fixed, Film: 332 kΩ, 1%, 1/4 W	1	MF4C332KF	80031	
R5	Same as R1				
R6	Resistor, Fixed, Film: 100 kΩ, 1%, 1/10 W	1	RN55C1003F	81349	75042
R7	Resistor, Fixed, Film: 3.32 kΩ, 1%, 1/10 W	2	RN55C3321F	81349	75042
R8	Resistor, Fixed, Film: 48.7 kΩ, 1%, 1/10 W	1	RN55C4872F	81349	75042
R9	Resistor, Fixed, Film: 1.21 kΩ, 1%, 1/10 W	1	RN55C1211F	81349	75042
R10	Resistor, Fixed, Film: 1.0 MΩ, 1%, 1/4 W	1	CC1004F	01121	
R11	Resistor, Fixed, Film: 97.6 kΩ, 1%, 1/10 W	1	RN55C9762F	81349	75042
R12	Resistor, Fixed, Film: 10 Ω, 5%, 1/4 W	1	RCR07G100JS	81349	01121
R13	Resistor, Fixed, Film: 10 kΩ, 1%, 1/10 W	5	RN55C1002F	81349	75042
R14	Resistor, Fixed, Film: 33.2 kΩ, 1%, 1/10 W	2	RN55C3322F	81349	75042
R15	Same as R7				
R16	Resistor, Trimmer, Film: 5 kΩ, 10%, 1/2 W	1	62PR5K	73138	
R17	Resistor, Fixed, Film: 100 kΩ, 1%, 1/10 W	5	RN55C1003F	81349	75042
R18	Resistor, Fixed, Film: 2.21 kΩ, 1%, 1/10 W	1	RN55C2211F	81349	75042
R19	Same as R1				
R20	Same as R14				
R21	Same as R17				
R22	Same as R13				
R23	Same as R17				
R24	Same as R13				
R25	Resistor, Trimmer, Film: 100 kΩ, 10%, 1/2 W	1	62PR100K	73138	

REF DESIG PREFIX A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R26	Same as R13				
R27	Same as R17				
R28	Resistor, Fixed, Composition: 22 MΩ, 5%, 1/4 W	1	RCR07G226JS	81349	01121
R29	Resistor, Fixed, Film: 13.3 kΩ, 1%, 1/10 W	1	RN55C1332F	81349	75042
R30	Same as R17				
R31	Resistor, Fixed, Film: 1.0 kΩ, 1%, 1/10 W	1	RN55C1001F	81349	75042
R32	Same as R1				
R33	Resistor, Fixed, Film: 127 kΩ, 1%, 1/4 W	1	MF4C127KF	80031	
R34	Same as R13				
U1	Integrated Circuit	3	741HM	07263	
U2	Same as U1				
U3	Same as U1				
VR1	Diode Zener 8.2 V Silicon	1	1N756A	04713	

3.5.3 **TYPE 794175-1 FM DISCRIMINATOR** **REF DESIG PREFIX** A3

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
A1	FM Discriminator Assembly	1	24925	14632	
C1	Capacitor, Ceramic, Feedthru: 470 pF, ±20%, 500 V	2	54-794-009-471M	33095	
C2	Capacitor, Ceramic, Feed-thru: 33 pF, ±10%, 500 V	1	54-794-001-3301	33095	
C3	Same as C1				
J1	Connector, Receptacle	1	10-0104-002	19505	
P1	Connector, Plug	1	SRE7PNSS	81312	
R1	Resistor, Fixed, Composition: 4.7 kΩ, 5%, 1/4 W	1	RCR07G472JS	81349	
R2	Resistor, Fixed, Composition: 10 kΩ, 5%, 1/4 W	1	RCR07G103JS	81349	

3.5.3.1 Part 24925 FM Discriminator REF DESIG PREFIX A3A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Electrolytic, Tantalum: 15 μF, 20%, 15 V	4	196D156X0015JA1	56289	
C2	Capacitor, Ceramic, Disc: 0.01 μF, 10%, 200 V	10	CK06BX103K	81349	56289
C3	Capacitor, Mica, Dipped: 150 pF, 2%, 500 V	2	CM05FD151G03	81349	56289
C4	Same as C2				
C5	Same as C1				
C6	Same as C2				
C7	Same as C2				
C8	Same as C2				
C9	Same as C2				
C10	Capacitor, Mica, Dipped: 10 pF±0.5 pF, 500 V	2	CM05CD100D03	81349	72136
C11	Same as C2				
C12	Capacitor, Variable, Ceramic: 5.5-18 pF, 350 V	2	538-011A5.5-18	72982	
C13	Same as C2				
C14	Same as C1				
C15	Capacitor, Mica, Dipped: 18 pF, 5%, 500 V	1	CM05CD180J03	81349	72136
C16	Capacitor, Mica, Dipped: 24 pF, 5%, 500 V	1	CM05ED240J03	81349	72136
C17	Same as C12				
C18	Same as C1				
C19	Same as C2				
C20	Same as C10				
C21	Capacitor, Electrolytic, Tantalum: 10 μF, 10%, 20 V	1	CS13BF106K	81349	56289
C22	Same as C2				
C23	Same as C3				
C24	Capacitor, Ceramic, Tubular: 10 pF±0.5 pF, 500 V	1	301-000U2J0100D	72982	
CR1	Diode	2	1N198A	80131	93332
CR2	Same as CR1				
CR3	Diode	1	1N4446	80131	93332
E1	Terminal, Forked	4	140-1941-02-01	71279	
E2	Same as E1				
E3	Same as E1				
E4	Same as E1				
L1	Coil, Fixed	1	20681-146	14632	
Q1	Transistor	4	2N2857/JAN	80131	02735
Q2	Same as Q1				
Q3	Same as Q1				
Q4	Same as Q1				
Q5	Transistor	1	2N3251	80131	04713
Q6	Transistor	1	2N2222A	80131	04713
R1	Resistor, Fixed, Film: 9.09 kΩ, 1%, 1/10 W	4	RN55C9091F	81349	75042
R2	Resistor, Fixed, Film: 4.75 kΩ, 1%, 1/10 W	4	RN55C4751F	81349	75042
R3	Resistor, Fixed, Film: 1.3 kΩ, 1%, 1/10 W	8	RN55C1301F	81349	75042

REF DESIG PREFIX A3A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R4	Same as R3				
R5	Same as R3				
R6	Same as R3				
R7	Same as R1				
R8	Same as R2				
R9	Resistor, Fixed, Film: 200 Ω, 1%, 1/10 W	1	RN55C2000F	81349	75042
R10	Resistor, Fixed, Film: 49.9 Ω, 1%, 1/10 W	4	RN55C49R9F	81349	75042
R11	Same as R1				
R12	Same as R2				
R13	Same as R3				
R14	Same as R3				
R15	Resistor, Fixed, Film: 100 Ω, 1%, 1/10 W	2	RN55C1000F	81349	75042
R16	Resistor, Fixed, Film: 10.5 kΩ, 1%, 1/10 W	1	RN55C1052F	81349	75042
R17	Same as R10				
R18	Same as R3				
R19	Same as R1				
R20	Same as R2				
R21	Same as R10				
R22	Same as R10				
R23	Same as R15				
R24	Same as R3				
R25	Resistor, Fixed, Film: 47.5 kΩ, 1%, 1/10 W	2	RN55C4752F	81349	75042
R26	Resistor, Fixed, Film: 33.2 kΩ, 1%, 1/10 W	1	RN55C3322F	81349	75042
R27	Same as R25				
R28	Resistor, Trimmer, Film: 10 kΩ, 10%, 1/2 W	1	62PR10K	73138	
R29	Resistor, Fixed, Film: 7.5 kΩ, 1%, 1/10 W	1	RN55C1502F	81349	75042
R30	Resistor, Fixed, Film: 332 Ω, 1%, 1/10 W	1	RN55C3320F	81349	75042
R31	Resistor, Fixed, Composition: 4.7 kΩ, 5%, 1/4 W	1	RCR07G472JS	81349	75042
T1	Transformer	1	21427-43	14632	

3.5.4 **TYPE 794176-1 MOTHERBOARD** **REF DESIG PREFIX A4**

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
A1	Commutative Filter	1	794166-1	14632	
A2	Calibrate and Antenna Switch Drivers	1	794237-1	14632	
A3	Antenna and Sine Wave Logic	1	794168-1	14632	
A4	IF Delay Generator	1	794240-1	14632	
A5	Angle Count Generator	1	794170-1	14632	
A6	Master Time Controller and Display Logic	1	794171-1	14632	
C1	Capacitor, Ceramic, Disc: 0.01 µF, ±20%, 200 V	1	8131A200Z5U103M	72982	
C2	Capacitor, Ceramic, Disc: 0.02 µF, ±20%, 100 V	1	C023B101A203M	56289	
C3	Capacitor, Ceramic, Disc: 0.05 µF, -20 +80%, 25 V	1	DFJ1	73899	
C4	Capacitor, Ceramic, Disc: 0.1 µF, ±20%, 100 V	1	8131M100-651-104M	72982	
C5	Capacitor, Electrolytic, Tantalum: 0.22 µF, ±10%, 35 V	1	150D224X9035A2	56289	
J1	Combination, Post: Feed-thru, 20 position	3	1-117888-8	00779	
J2	Same as J1				
J3	Same as J1				
J4	Combination Post: Feed-thru, 10 position	1	117888-8	00779	

3.5.4.1 Part 794166-1 Commutative Filter REF DESIG PREFIX A4A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.01 µF, ±20%, 200 V	24	8131A200Z5U103M	72982	
C2	Same as C1				
C3	Same as C1				
C4	Same as C1				
C5	Capacitor, Polycarbon, Tubular: 0.22 µF, ±1%, 100 V	4	MPCW-224-1-1	04099	
C6	Capacitor, Polycarbon, Tubular: 0.1 µF, ±2%, 100 V	8	MPCW-104-1-2	04099	
C7	Same as C6				
C8 Thru C11	Same as C1				
C12	Same as C5				
C13	Same as C6				
C14	Same as C6				
C15 Thru C18	Same as C1				
C19	Same as C5				
C20	Same as C6				
C21	Same as C6				
C22 Thru C25	Same as C1				
C26	Same as C5				
C27	Same as C6				
C28	Same as C6				
C29 Thru C36	Same as C1				
C37	Capacitor, Electrolytic, Tantalum: 1.0 µF, ±10%, 35 V	1	CS13BF105K	81349	
C38	Capacitor, Electrolytic, Tantalum: 33 µF, ±10%, 10 V	1	CS13BC336K	81349	
C39	Capacitor, Electrolytic, Tantalum: 47 µF, ±10%, 6 V	1	CS13BB476K	81349	
C40	Capacitor, Ceramic, Disc: 0.1 µF, ±20%, 100 V	1	8131M100-651-104M	72982	
C41	Capacitor, Electrolytic, Tantalum: 47 µF, ±10%, 20 V	2	CS13BE476K	81349	
C42	Same as C41				
R1	Resistor, Fixed, Film: 750 Ω, 1%, 1/4 W	1	RN60D7500F	81349	
R2	Resistor, Fixed, Film: 4.64 kΩ, 1%, 1/4 W	1	RN60D4641F	81349	
R3	Resistor, Fixed, Film: 23.7 kΩ, 1%, 1/4 W	1	RN60D2372F	81349	
R4	Resistor, Fixed, Composition: 22 Ω, 5%, 1/4 W	12	RCR07G220JS	81349	
R5	Same as R4				
R6	Resistor, Fixed, Film: 1 kΩ, 1%, 1/4 W	4	RN60D1001F	81349	
R7	Resistor, Fixed, Film: 100 kΩ, 1%, 1/4 W	8	RN60D1003F	81349	
R8	Same as R7				
R9	Resistor, Variable, Film: 10 kΩ, 10%, 3/4 W	4	89PR10K	73138	
R10	Resistor, Fixed, Composition: 5.1 MΩ, 5%, 1/4 W	4	RCR07G515JS	81349	

REF DESIG PREFIX A4A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R11	Same as R4				
R12	Same as R4				
R13	Same as R6				
R14	Same as R7				
R15	Same as R7				
R16	Same as R9				
R17	Same as R10				
R18	Same as R4				
R19	Same as R4				
R20	Same as R6				
R21	Same as R7				
R22	Same as R7				
R23	Same as R9				
R24	Same as R10				
R25	Same as R4				
R26	Same as R4				
R27	Same as R6				
R28	Same as R7				
R29	Same as R7				
R30	Same as R9				
R31	Same as R10				
R32 Thru R35	Same as R4				
R36	Resistor, Fixed, Composition: 1 kΩ, 5%, 1/4 W	1	RCR07G102JS	81349	
U1	Integrated Circuit	1	MM74C08J	27014	
U2	Integrated Circuit	1	CD4066BE	02735	
U3	Integrated Circuit	4	AD515LH	24355	
U4	Same as U3				
U5	Same as U3				
U6	Same as U3				
U7	Integrated Circuit	1	DG201AK	17856	
U8	Integrated Circuit	1	79M05HM	07263	

3.5.4.2 Part 794237-1 Calibrate and Antenna Switch Drivers REF DESIG PREFIX A4A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.01 µF, ±20%, 100 V	24	8131A200Z5U103M	72982	
C2 Thru C12	Same as C1				
C13	Not Used				
C14	Not Used				
C15 Thru C18	Same as C1				
C19	Not Used				
C20	Not Used				
C21 Thru C24	Same as C1				
C25	Not Used				
C26	Not Used				
C27 Thru C30	Same as C1				
C31	Capacitor, Electrolytic, Tantalum: 47 µF, ±10%, 6 V	2	CS13BB476K	81349	
C32	Capacitor, Ceramic, Disc: 0.1 µF, ±20%, 100 V	3	8131M100-651-104M	72982	
C33	Capacitor, Electrolytic, Tantalum: 47 µF, ±10%, 20 V	2	CS13BE476K	81349	
C34	Same as C33				
C35	Same as C31				
C36	Same as C32				
C37	Same as C32				
C38	Not Used				
R1	Resistor, Fixed, Composition: 10 kΩ, 5%, 1/4 W	8	RCR07G103JS	81349	
R2	Resistor, Fixed, Composition: 39 kΩ, 5%, 1/4 W	1	RCR07G393JS	81349	
R3	Same as R1				
R4	Resistor, Fixed, Film: 10 kΩ, 1%, 1/4 W	1	RN60D1002F	81349	
R5	Resistor, Fixed, Film: 5.11 kΩ, 1%, 1/4 W	1	RN60D5111F	81349	
R6	Resistor, Fixed, Film: 9.09 kΩ, 1%, 1/4 W	1	RN60D9091F	81349	
R7	Resistor, Variable, Film: 2 kΩ, 10%, 3/4 W	1	89PR2K	73138	
R8	Resistor, Fixed, Composition: 22 Ω, 5%, 1/4 W	10	RCR07G220JS	81349	
R9	Same as R8				
R10	Same as R1				
R11	Same as R1				
R12	Same as R1				
R13	Same as R8				

REF DESIG PREFIX A4A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
R14	Same as R8				
R15	Resistor, Fixed, Composition: 100 Ω, 5%, 1/4 W	4	RCR07G101JS	81349	
R16	Same as R1				
R17	Same as R8				
R18	Same as R8				
R19	Same as R15				
R20	Same as R1				
R21	Same as R8				
R22	Same as R8				
R23	Same as R15				
R24	Same as R1				
R25	Same as R8				
R26	Same as R8				
R27	Same as R15				
U1	Integrated Circuit	1	MM74C157J	27014	
U2	Integrated Circuit	1	CD4049UBD	02735	
U3	Integrated Circuit	1	MC1558N	18324	
U4	Integrated Circuit	1	DG201AK	17856	
U5	Integrated Circuit	1	LM239AJ	02735	
U6	Integrated Circuit	4	LH0002H	27014	
U7	Same as U6				
U8	Same as U6				
U9	Same as U6				

3.5.4.3 Part 794168-1 Antenna and Sine Wave Logic **REF DESIG PREFIX A4A3**

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Polycarbon, Tubular: 0.047 µF, ±2%, 100 V	1	MPCW-473-1-2	04099	
C2	Capacitor, Polycarbon, Tubular: 0.01 µF, ±2%, 100 V	2	MPCW-103-1-2	04099	
C3	Same as C2				
C4	Capacitor, Mica, Dipped: 300 pF, ±2%, 500 V	1	CM05FD301G03	81349	
C5	Capacitor, Ceramic, Disc: 2700 pF, ±10%, 200 V	2	CK06BX272K	81349	
C6	Same as C5				
C7	Capacitor, Electrolytic, Tantalum: 47 µF, ±10%, 6 V	2	CS13BB476K	81349	
C8	Capacitor, Ceramic, Disc: 0.1 µF, ±20%, 100 V	7	8131M100-651-104M	72982	
C9	Same as C7				
C10 Thru C15	Same as C8				
CR1	Diode	1	1N4446	80131	
R1	Resistor, Fixed, Composition: 110 Ω, 5%, 1/4 W	1	RCR07G111JS	81349	
R2	Resistor, Fixed, Composition: 220 Ω, 5%, 1/4 W	1	RCR07G221JS	81349	
R3	Resistor, Fixed, Composition: 5.1 MΩ, 5%, 1/4 W	1	RCR07G515JS	81349	
R4	Resistor, Fixed, Film: 10 kΩ, 1%, 1/4 W	1	RN60D1002F	81349	
R5	Resistor, Variable, Film: 50 kΩ, 10%, 3/4 W	1	89PR50K	73138	
R6	Resistor, Fixed, Film: 68.1 kΩ, 1%, 1/4 W	1	RN60D6812F	81349	
R7	Resistor, Fixed, Composition: 10 kΩ, 5%, 1/4 W	3	RCR07G103JS	81349	
R8	Resistor, Variable, Film: 10 kΩ, 10%, 3/4 W	3	89PR10K	73138	
R9	Resistor, Fixed, Composition: 5.1 kΩ, 5%, 1/4 W	1	RCR07G512JS	81349	
R10	Same as R8				
R11	Resistor, Fixed, Composition: 1 kΩ, 5%, 1/4 W	2	RCR07G102JS	81349	
R12	Same as R8				
R13	Same as R11				
R14	Same as R7				
R15	Same as R7				
U1	Integrated Circuit	1	CD4093BD	02735	
U2	Integrated Circuit	1	CD4006BD	02735	
U3	Integrated Circuit	1	CD4070BD	02735	
U4	Integrated Circuit	1	CD4071BD	02735	
U5	Integrated Circuit	1	SE555N	18324	
U6	Integrated Circuit	1	MM74C74J	27014	
U7	Not Used				
U8	Integrated Circuit	2	MM74C107J	27014	
U9	Integrated Circuit	1	MM74C08J	27014	
U10	Integrated Circuit	1	SN54LS123J	01295	
U11	Integrated Circuit	1	MC14538BAL	04713	
U12	Same as U8				
U13	Integrated Circuit	1	MM74C00J	27014	

3.5.4.4 Part 794240-1 IF Delay Generator **REF DESIG PREFIX A4A4**

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.01 µF, ±20%, 200 V	9	8131A200Z5U103M	72982	
C2 Thru C4	Same as C1				
C5	Capacitor, Electrolytic, Tantalum: 4.7 µF, 10%, 35 V	1	CS13BF475K	81349	
C6	Same as C1				
C7	Capacitor, Ceramic, Disc: .01 µF, 5%, 100 V	1	8131-100C0G0-103J	72982	
C8	Same as C1				
C9	Capacitor, Ceramic, Disc: 2200 pF, 5%, 100 V	2	8131-100C0G0-222J	72982	
C10	Same as C1				
C11	Same as C9				
C12	Same as C1				
C13	Same as C1				
R1	Resistor, Fixed, Composition: 10 kΩ, 5%, 1/4 W	3	RCR07G103JS	81349	
R2	Resistor, Trimmer, Film: 10 kΩ, 10%, 3/4 W	2	89PR10K	73138	
R3*	Resistor, Fixed, Film: 9.09 kΩ, 1%, 1/4 W	2	RN60D9091F	81349	
R4	Resistor, Fixed, Composition: 2.4 kΩ, 5%, 1/4 W	3	RCR07G242JS	81349	
R5	Same as R2				
R6*	Same as R3				
R7	Same as R4				
R8	Resistor, Variable, Film: 5 kΩ, 10%, 3/4 W	1	89PR5K	73138	
R9*	Resistor, Fixed, Film: 6.19 kΩ, 1%, 1/4 W	1	RN60D6191F	81349	
R10	Same as R4				
R11	Same as R1				
R12	Same as R1				
U1	Integrated Circuit	1	MC14538BAL	04713	
U2	Integrated Circuit	3	LM122H	27014	
U3	Same as U2				
U4	Same as U2				
U5	Integrated Circuit	1	MC14529BAL	04713	
	* Nominal Value, Final Value Factory Selected				

3.5.4.5 Part 794170-1 Angle Count Generator REF DESIG PREFIX A4A5

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.47 µF, ±20%, 100 V	1	8131M100-651-474M	72982	
C2	Capacitor, Ceramic, Disc: 0.01 µF, ±20%, 200 V	8	8131A200Z5U103M	72982	
C3	Same as C2				
C4	Same as C2				
C5	Same as C2				
C6	Capacitor, Ceramic, Disc: 1000 pF, ±10%, 200 V	1	CK05BX102K	81349	
C7 Thru C10	Same as C2				
C11	Capacitor, Ceramic, Disc: 8200 pF, ±10%, 200 V	1	CK06BX822K	81349	
C12	Capacitor, Ceramic, Disc: 0.1 µF, ±20%, 100 V	6	8131M100-651-104M	72982	
C13	Capacitor, Electrolytic, Tantalum: 47 µF, ±10%, 6 V	2	CS13BB476K	81349	
C14 Thru C18	Same as C12				
C19	Capacitor, Electrolytic, Tantalum: 47 µF, ±10%, 20 V	2	CS13BE476K	81349	
C20	Same as C19				
C21	Same as C13				
R1	Resistor, Fixed, Composition: 100 kΩ, 5%, 1/4 W	2	RCR07G104JS	81349	
R2	Resistor, Fixed, Composition: 1 MΩ, 5%, 1/4 W	1	RCR07G105JS	81349	
R3	Resistor, Trimmer, Film: 100 kΩ, 10%, 3/4 W	1	89PR100K	73138	
R4	Resistor, Fixed, Composition: 22 Ω, 5%, 1/4 W	4	RCR07G220JS	81349	
R5	Same as R4				
R6	Resistor, Fixed, Composition: 2.2 kΩ, 5%, 1/4 W	2	RCR07G222JS	81349	
R7	Resistor, Fixed, Composition: 10 kΩ, 5%, 1/4 W	3	RCR07G103JS	81349	
R8	Same as R1				
R9	Same as R6				
R10	Resistor, Variable, Film: 10 kΩ, 10%, 3/4 W	1	89PR10K	73138	
R11	Same as R4				
R12	Same as R4				
R13	Same as R7				
R14	Same as R7				
U1	Integrated Circuit	1	MC1558N	18324	
U2	Integrated Circuit	1	734DM	07263	
U3	Integrated Circuit	5	MM74C74J	27014	
U4	Integrated Circuit	1	MM74C00J	27014	
U5	Same as U3				
U6	Integrated Circuit	1	MC14518BAL	04713	
U7	Integrated Circuit	1	CD4049UBD	02735	
U8	Same as U3				
U9	Integrated Circuit	1	MM74C08J	27014	
U10	Same as U3				

REF DESIG PREFIX A4A5

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
U11	Same as U3				
U12	Integrated Circuit	1	MM74C02J	27014	
U13	Integrated Circuit	1	MM74C20J	27014	

3.5.4.6 Part 794171-1 Master Time Controller & Display Logic **REF DESIG PREFIX A4A6**

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Mica, Dipped: 10 pF, ±.5%, 500 V	1	CM04CD100D03	81349	
C2	Capacitor, Mica, Dipped: 20 pF, ±5%, 500 V	1	CM04ED200J03	81349	
C3	Capacitor, Ceramic, Disc: 1000 pF, ±10%, 200 V	1	CK05BX102K	81349	
C4	Capacitor, Electrolytic, Tantalum: 47 µF, ±10%, 6 V	2	CS13BB476K	81349	
C5	Capacitor, Ceramic, Disc: 0.1 µF, ±20%, 100 V	10	8131M100-651-104M	72982	
C6	Same as C4				
C7 Thru C15	Same as C5				
R1	Resistor, Fixed, Composition: 22 MΩ, 5%, 1/4 W	1	RCR07G226JS	81349	
R2	Resistor, Fixed, Composition: 1 kΩ, 5%, 1/4 W	1	RCR07G102JS	81349	
R3	Resistor, Network: 10 kΩ	1	899-1R10K	73138	
R4	Resistor, Fixed, Composition: 10 kΩ, 5%, 1/4 W	5	RCR07G103JS	81349	
R5	Same as R4				
R6	Same as R4				
R7	Same as R4				
R8	Resistor, Fixed, Composition: 5.1 kΩ, 5%, 1/4 W	1	RCR07G512JS	81349	
R9	Same as R4				
S1	Switch, Dip: 8 SPST	1	76SB08S	81073	
U1	Integrated Circuit	2	CD4049UBD	02735	
U2	Integrated Circuit	3	MM74C74J	27014	
U3	Same as U2				
U4	Integrated Circuit	5	MC14510BAL	04713	
U5	Integrated Circuit	1	MC14518BAL	04713	
U6	Same as U4				
U7	Same as U4				
U8	Same as U2				
U9	Same as U4				
U10	Integrated Circuit	1	MM74C08J	27014	
U11	Same as U1				
U12	Integrated Circuit	1	MC14553BAL	04713	
U13	Integrated Circuit	1	MC14538BAL	04713	
U14	Integrated Circuit	1	MM74C00J	27014	
U15	Same as U4				
U16	Integrated Circuit	1	MM74C20J	27014	
U17	Integrated Circuit	1	MC14040BAL	04713	
U18	Integrated Circuit	1	MC14070BAL	04713	
U19	Integrated Circuit	1	MC14174BAL	04713	
Y1	Crystal, Quartz: 500 kHz	1	CR25BU/500kHz	80058	

3.5.5 **TYPE 794036-1 DF DISPLAY** **REF DESIG PREFIX A5**

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
A1	Display Driver Assembly	1	370139-1	14632	
CR1	Diode/LED	60	5082-4160	28480	
CR2 Thru CR60	Same as CR1				
U1	LED	3	HDSP-3533	28480	
U2	Same as U1				
U3	Same as U1				

3.5.5.1 Part 370139-1 Display Driver Assembly **REF DESIG PREFIX** A5A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.1 µF, ±20%, 100 V	1	8131M100-651-104M	72982	
C2	Capacitor, Electrolytic, Tantalum: 15 µF, ±10%, 20 V	1	CS13BE156K	81349	
P1	Connector, Plug, Multipin	1	88475-4	00779	
R1	Resistor Network: 100 Ω	1	898-3R100	73138	
R2	Resistor Network: 10 kΩ	1	898-3R10K	73138	
R3	Resistor Network: 56 Ω	1	899-3R56	73138	
U1	Integrated Circuit	2	MC14028BAL	04713	
U2	Same as U1				
U3	Integrated Circuit	2	ULS2004H	01295	
U4	Same as U3				
U5	Integrated Circuit	1	DS8645J	27014	
U6	Integrated Circuit	1	MC14511BAL	04713	
U7	Integrated Circuit	1	SN75492J	01295	

3.5.6 **TYPE 791795-1 BATTERY PACK ASSEMBLY** **REF DESIG PREFIX A6**

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
A1	D-Cell Insert	1	791792-1	14632	

3.5.6.1 Type 791792-1 D-Cell Insert Assembly REF DESIG PREFIX A6A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
BT1	Battery	10	E95	83740	
BT2 Thru BT10	Same as BT1				
F1	Fuse, Cartridge: 3/4 Amp, 3AG, Slow-Blow	1	MDL 3/4	71400	
J1	Connector, Receptacle: Multipin	1	M4SLRN	81312	
P1	Connector, Plug: Multipin	1	103-1	16237	
XF1	Fuseholder	1	357001	75915	

NOTE: BT1-BT10 Shown On Schematic But Not Supplied With Unit.

3.5.7 **TYPE 794239-1 DC-DC CONVERTER** **REF DESIG PREFIX A7**

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
A1	DC-DC Converter Assembly	1	270823-1	14632	
C1	Capacitor, Ceramic, Feed-thru: 470 pF, ±20%, 500 V	6	54-794-009-471M	33095	
C2 Thru C6	Same as C1				
P1	Connector, Plug	1	SRE14PNSS	81312	
U1	Voltage Regulator	1	LM140K-5.0	27014	

3.5.7.1 Part 270823-1 DC-DC Converter Assembly REF DESIG PREFIX A7A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Not Used				
C2	Not Used				
C3	Capacitor, Electrolytic, Tantalum: 100 µF, ±20%, 20 V	5	196D107X0020TE4	56289	
C4	Same as C3				
C5	Same as C3				
C6	Same as C3				
C7	Capacitor, Ceramic, Disc: 0.47 µF, ±20%, 100 V	2	8131M100-651-474M	72982	
C8	Same as C7				
C9	Capacitor, Electrolytic, Tantalum: 4.7 µF, ±20%, 35 V	1	196D475X0035JE3	56289	
C10	Same as C3				
CR1	Diode	1	1N4446	80131	
CR2	Diode	1	1N4003	80131	
R1	Resistor, Fixed, Film: 301 Ω, 1%, 1/4 W	1	RN60D3010F	81349	
R2	Resistor, Fixed, Film: 2.00 kΩ, 1%, 1/4 W	1	RN60D2001F	81349	
R3	Resistor, Fixed, Film: 1 MΩ, 1%, 1/4 W	1	CC1004F	01121	
R4	Resistor, Fixed, Film: 3.32 kΩ, 1%, 1/4 W	1	RN60D3321F	81349	
R5	Resistor, Fixed, Film: 4.75 kΩ, 1%, 1/10 W	1	RN55C4751F	81349	
R6	Resistor, Fixed, Film: 22.1 kΩ, 1%, 1/10 W	1	RN55C2212F	81349	
R7	Resistor, Trimmer, Film: 5 kΩ, 10%, 1/2 W	1	62PR5K	73138	
R8	Resistor, Fixed, Film: 10 kΩ, 1%, 1/10 W	1	RN55C1002F	81349	
R9	Resistor, Fixed, Composition: 2 Ω, 5%, 1/2 W	1	RCR20G2R0JS	81349	
U1	Voltage Regulator	1	LM217H	27014	
U2	DC-DC Converter	1	PM962	18655	
U3	Integrated Circuit	1	741HM	07263	
VR1	Zener Diode: 6.8 V	1	1N754A	80131	
VR2	Zener Diode: 16 V	1	1N4963	80131	

3.5.8 **TYPE 794055-1 BANDWIDTH COMPENSATION AMPLIFIER** **REF DESIG PREFIX** A8

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Electrolytic, Tantalum: 22 µF, ±20%, 10 V	2	196D226X0010JE3	56289	
C2	Same as C1				
C3	Capacitor, Electrolytic, Tantalum: 1.0 µF, ±20%, 35 V	2	196D105X0035HE3	56289	
C4	Same as C3				
Q1	Transistor	1	U1899E	15818	
R1	Resistor, Fixed, Composition: 10 kΩ, 5%, 1/4 W	1	RCR07G103JS	81349	
R2	Resistor, Fixed, Composition: 220 Ω, 5%, 1/4 W	2	RCR07G221JS	81349	
R3	Same as R2				
R4	Resistor, Fixed, Composition: 47 kΩ, 5%, 1/4 W	1	RCR07G473JS	81349	
R5	Resistor, Fixed, Composition: 330 kΩ, 5%, 1/4 W	1	RCR07G334JS	81349	
R6	Resistor, Fixed, Composition: 4.7 kΩ, 5%, 1/4 W	1	RCR07G472JS	81349	
R7	Resistor, Fixed, Composition: 22 kΩ, 5%, 1/4 W	1	RCR07G223JS	81349	
U1	Integrated Circuit	1	741HM	07263	

3.5.9 **TYPE 170188 BATTERY TEST INDICATOR** **REF DESIG PREFIX A9**

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	Diode, LED	1	5082-4860	28480	
R1	Resistor, Fixed, Composition: 2.2 kΩ, 5%, 1/4 W	1	RCR07G222JS	81349	

3.5.10 **TYPE 170179 THRESHOLD INDICATOR** **REF DESIG PREFIX** A10

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
CR1	Diode, LED	1	5082-4860	28480	
R1	Resistor, Fixed, Composition: 2.2 kΩ, 5%, 1/4 W	1	RCR07G222JS	81349	

SECTION IV
CIRCUIT DESCRIPTION

4.1 GENERAL

The subsequent paragraphs are provided to give you a basic understanding of the functions performed by the Direction Finder. The descriptions are keyed to the main chassis schematic diagram. Figure 4-1 is an overall functional block diagram of the WJ-8975A. Figure 4-2 will aid you in understanding how the signal flows through the circuitry.

4.2 FUNCTIONAL DESCRIPTION

The WJ-8975A Direction Finder determines the angle of arrival ofa radio wave. The dipoles of the DF Antenna are turned on in a clockwise sequence to provide a RF signal that is continuous except for phase discontinuities which occur when the antenna elements are switched. The Direction Finder takes the phase differences of one sampling cycle of the antenna and converts them into a sine wave. It compares the converted sine wave against the phase of a sine wave for a 0° angle. The phase difference between the two sine waves is the angle of arrival. This is the principle of generating a sine wave from the four measured phase differences and then comparing it to a 0° referenced sine wave. The following paragraphs describe the major modules in the WJ-8975A Direction Finder.

4.2.1 IF DEMODULATOR (Al)

The IF Demodulator (Al) assembly amplifies and demodulates the IF signal provided by the tuner in a WJ-8640 Series Manpack Receiver. The RF signal must have a center frequency of 10 MHz and be taken from the wideband IF output of a receiver. The 10 MHz signal is converted to a 455 kHz IF signal where it is filtered, limited and has FM detected. An 8 pole low pass filter is included in the IF section but is used only with the Mother Board (A4). The bandwidth of the IF amplifier can be set at 10 kHz, 50 kHz or 200 kHz. The IF Demodulator (Al) assembly utilizes eight subassemblies within its circuitry.

4.2.1.1 10 MHz Amplifiers (A1A1, A1A5, A1A8)

The 10 MHz amplifiers (A1Al A1A5, A1A8) increase IF signal amplitude from the receiver.

4.2.1.2 Bandwidth Control (A1A2)

The Bandwidth Control (A1A2) activates the IF bandwidth capabilities within the IF Demodulator when the IF BANDWIDTH switch on the Direction Finder front panel is set.

4.2.1.3 Gain Bandwidth Compensation Amplifier (A1A3)

The Gain Bandwidth Compensation Amplifier (A1A3) increases or decreases the amplitude of the selected IF bandwidth to assure each bandwidth is output at a specific amplitude.

4.2.1.4 IF Filters and Diode Switches (AlA4)

The IF Filters and Diode Switches (A1A4) filters an incoming signal to eliminate the IF signal outside the of the 10 or 50 kHz bandwidth.

4.2.1.5 AM Detector/Buffer (A1A6)

The AM Detector/Buffer (A1A6) amplifies signals from the receiver and passes it on to AGC Squelch (A2) assembly.

4.2.1.6 8 Pole Low Pass Filter (A1A7)

The 8 Pole Low Pass Filter (A1A7) is housed in the IF Demodulator assembly but is used as a low pass filter for the Mother Board (A4) digital circuitry. The filter detects four voltage levels from the Commutative Filter (A4A1) board and produces a sine wave for zero referencing of the Angle Count Generator (A4A5).

4.2.2 AGC SQUELCH (AZ)

The AGC Squelch (A2) provides AGC (Automatic Gain Control) voltage to the IF Demodulator to limit signal gain. The squelch circuit activates the threshold lamp that indicates that the proper squelch level has been attained. The proper squelch level is triggered through rotation of the GATED THRESHOLD knob to allow integration of bearing data from the receiver.

4.2.3 FM DISCRIMINATOR (A3)

The FM Discriminator (A3) changes antenna phase differences into voltage levels. The phase change is a form of frequency modulation. The FM Discriminator sees the phase differences as momentary frequency changes As a result, the output has pulses of various amplitudes which represent the phase information along with any other FM on the signal.

4.2.4 MOTHER BOARD (A4)

The Mother Board (A4) provides interconnections of the circuitry between six subassemblies including the Commutative Filter (A4A1), Calibrate and Antenna Switch Drivers (A4A2), Antenna and Sine Wave Logic (A4A3), IF Delay Generator (A4A4), Angle Count Generator (A4A5) and Master Time Controller and Display Logic (A4A6).

4.2.4.1 Commutative Filter (A4A1)

The Commutative Filter (A4A1) eliminates modulation from the FM Discriminator (A3) output pulses. The output of the A4A1 board is the four antenna pulses represented by four voltage levels.

4.2.4.2 Calibrate and Antenna Switch Drivers (A4A2)

The Calibrate and Antenna Switch Drivers (A4A2) generates an internal signal equal to a zero reference bearing while providing DF antenna switching control. The calibration circuit generates the 0° sine wave which is processed in the same manner as other signals

4.2.4.3 Antenna and Sine Wave Logic (A4A3)

The Antenna and Sine Wave Logic (A4A3) generates 4 antenna driving signals, generates the IF windows for the bandwidths and processes information from the Master Time Controller and Display Logic (A4A6) for switching output of the Commutative Filter (A4A1).

4.2.4.4 IF Delay Generator (A4A4)

The IF Delay Generator (A4A4) provides an 800 Hz trigger pulse to the Antenna and Sine Wave Logic (A4A3) circuit necessary to generate the IF windows between delay time of antenna signals. These signals are used to sample the FM Discriminator (A3) output so that the phase information can be recovered synchronously with the antenna switching.

4.2.4.5 Angle Count Generator (A4A5)

The Angle Count Generator (A4A5) compares a calibrated 0° reference with the incoming sine wave and counts the phase difference between the two. The counter circuit provides a start signal which coincides with the time that the 0° sine wave passes through the zero crossing detector and causes a stop signal to be sent to the counter. The counter measures the difference in time between the two zero crossings of the sine waves and represents the difference as a voltage level. This output is sent to the Master Time Controller and Display Logic (A4A6) assembly for conversion to bearing information. This is the phase measurement and is accurate to 1°.

4.2.4.6 Master Time Controller and Display Logic (A4A6)

The Master Time Controller and Display Logic (A4A6) contains two separate cicuits The Master Time Controller circuit supplies a reference time to the Antenna Sine Wave Logic (A4A3) board. The Display Logic circuit converts the voltage received from the Angle Count Generator (A4A5) as logic voltage for the DF Display (A5) assembly.

4.2.5 DF DISPLAY (A5)

The DF Display (A5) circuit receives logic voltage from the Master Time Controller and Display Logic (A4A6) and converts it into a graphic and numerical Line of Bearing (LOB) display using LED’s.

4.2.6 BATTERY PACK (A6)

The Direction Flncler operates from a detachable battery pack that is fixed to its rear chassis. The battery pack contains either a magnesium BA-4386/PRC-25 battery or ten high capacity D-cell nickle cadmium (NiCad) or alkaline batteries A full charge from the battery pack supplies a minimum of +15 volts.

4.2.7 DC-DC CONVERTER (A7)

The DC-DC Converter (A7) takes 11.0 to 16 volts from a battery pack or external power source and supplies +15 V, -15 V,+9.5 V and +5 VDC to the other modules in the Direction Finder. The DC-DC Converter (A7) also tested the battery by incorporating 20 ohm test load to the battery when the BAT TEST (Battery Test) button is pressedon the front panel of the Direction Finder.

4.2.8 BANDWIDTH COMPENSATION Amplifier (A8)

The Bandwidth Compensation Amplifier ensures that the three different IF bandwidths (10 kHz, 50kHz and 200 kHz) maintain a constant and like amplitude.

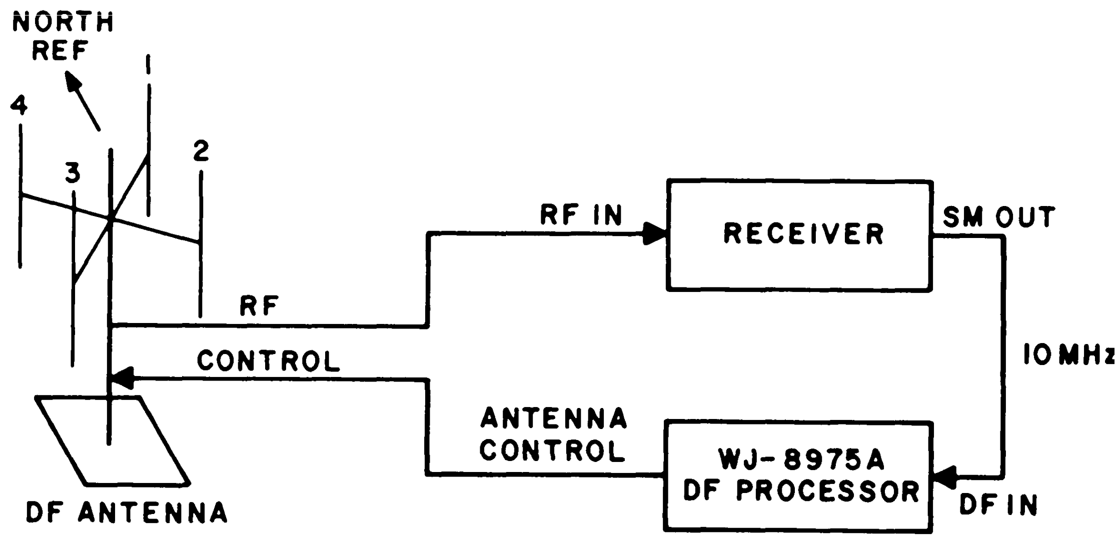


Figure 4-1. WJ-8975A Direction Finder Block Diagram

SECTION V
MAINTENANCE

5.1 GENERAL

The WJ-8975A Direction Finder has been designed to operate for extended periods of time with little or no routine maintenance required. An occasional cleaning and inspection are the only preventive maintenance operations recommended. The intervals for these operations should be based on the operating environment. Should trouble occur, repair time will be minimized if the maintenance technician is familiar with the circuit descriptions found in Section IV. Reference should also be made to the block diagram Figure 4-1 and to the schematic diagrams found in Section VI. A complete parts list and illustrations showing part location can found in Section III.

5.2 CLEANING AND LUBRICATION

The unit should be kept free of dust, moisture, grease and foreign matter. If available, use low velocity compressed air to blow accumulated dust from the exterior and interior of the unit. A clean, dry cloth a soft bristled brush, or a cloth saturated with cleaning compound may also be used. The WJ-8975A Direction Finder does not need lubrication.

5.3 INSPECTION FOR DAMAGE OR WEAR

Many potential or existing troubles can be detected by a visual inspection of the unit. For this reason, a complete visual inspection should be made for indication of mechanical and electrical defects on a periodic basis, or whenever the unit is inoperative. Electronic components that show signs of deterioration should be checked and a thorough investigation of the associated circuitry should be made to verify proper operation. Damage to parts due to heat is often the result of other less apparent troubles in the circuit. It is essential that the cause of overheating be determined and corrected before replacing the damaged parts. Mechanical parts and front panel controls and switches should be inspected for excessive wear, looseness, misalignment, corrosion, and other signs of deterioration.

5.4 TEST EQUIPMENT REQUIRED

The following instruments, or their equivalents, are required to properly troubleshoot the WJ-8975A Direction Finder.

5.4.1 DEPOT TEST EQUIPMENT

The following instruments, or their equivalents, are required to properly. troubleshoot, adjust or align the WJ-8975A Direction Finder at the depot level.

(1) Power Supply, Hewlett Packard Model 6215A.

(2) Oscilloscope, Tektronic Model 503.

(3) Signal Generator, Hewlett Packard Model 8640B.

(4) Sweep Generator, Hewlett Packard Model 675.

(5) Spectrum Analyzer (display, IF, RF sections), Hewlett Packard Models 140T, 8552A, 8555A.

(6) AC VTVM, Hewlett Packard Model 3400.

(7) Digital Voltmeter, no specific model.

(8) Angle Simulator, TF-15403 MKII

5.4.2 DIRECT SUPPORT TEST EQUIPMENT

The following instruments, or their equivalents, are required to properly troubleshoot the WJ-8975A Direction Finder at the direct support level.

(1) Multimeter, Digital, AN/PSM-45.

(2) Voltmeter, RF, Boonton 92C.

(3) Power Supply PP-6547/U.

(4) Oscilloscope AN/USM-281C.

(5) Angle Simulator TF-15403 MKII

5.5 TROUBLESHOOTING PROCEDURES

Troubleshooting efforts should first be directed towards identifying the symptom.

Once the symptom has been identified locate the symptom in the symptom index in Table 5-1. The troubleshooting procedure associated with the symptom will be found on the page number listed in the index. The first page of the troubleshooting procedure includes initial set up, required tools and equipment. The remainder of the procedure is in logic tree form and provides troubleshooting to the assembly, subassembly or piece part level.

Follow the set up procedures and logic tree until the fault is isolated. A reference paragraph is provided within the tree for removal and replacement of the defective assembly, subassembly or piece part.

5.6 ALIGNMENT PROCEDURES

NOTE

Alignment procedures are not to be performed at the direct support maintenance level. Replacement assemblies and subassemblies are pre-aligned at the manufacturing plant. No further alignment is required upon installation. The alignment procedures that follow are for depot level maintenance only.

In the following paragraphs are detailed descriptions of the alignment procedures for the required subassemblies. It is assumed that the Direction Finder is in workable, if not aligned, condition.

1) IF STRIP ALIGNMENT PROCEDURE

a) Construct the circuit as shown.

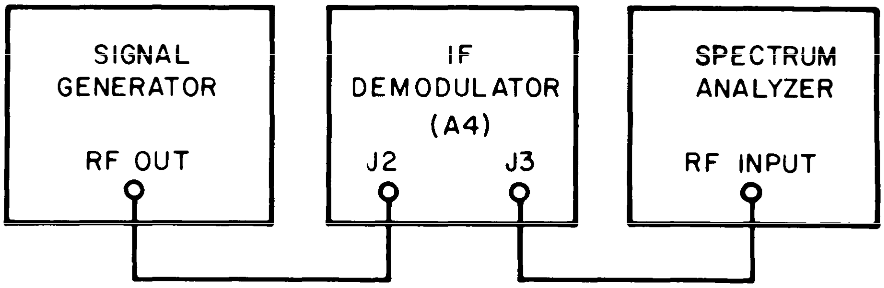


Figure S-l. Test Setup, IF Demodulator (A4) Alignment

b) Adjust the Signal Generator for an output of 10 MHz.

c) Set the controls as follows: S4 - OMNI position, IF BANDWIDTH -200 kHz.

d) Tune the Spectrum Analyzer for a signal of 10 MHz, and set to lowest RF output level.

e) Increase the Signal Generator's output level until a response is detected on the Spectrum Analyzer. (Note: The signal level could possibly be high depending upon the degree of misalignment).

f) Using the 10-pin extender card provided with the DF; extend card A1.

g) Adjust L1 for a maximum response on the Spectrum Analyzer.

h) Remove card Al from the extender and replace it in its normal position.

i) Extend card A3 (Gain BW Compensation Amplifier).

j) Adjust inductor L1 for a maximum response on the Spectrum Analyzer. Also adjust R13 for maximum gain.

NOTE

As the alignment of the IF Demodulator pro gresses, it will be necessary to continually reduce the input level to the module to prevent saturation of the active components.

k) Remove card A3 from extender and replace in its normal position.

l) Extend card A5 (10 MHz Amplifier subassembly).

m) Adjust inductor L1 for a maximum response on the Analyzer.

n) Remove card A5 from the extender and replace in its normal position.

o) Extend card A8 (10 MHz Amplifier Subassembly).

p) Repeat step m.

q) Remove card A8 from the extender and replace in its normal position.

r) Extend card A6 (AM Detector/Buffer).

s) Adjust C18 for a maximum response on the Analyzer.

t) Connect an oscilloscope to pin 2 of A6.

u) Using the signal generator, apply a 1 kHz signal with 50% modulation.

v) Adjust C4 for a maximum dc output at pin 2.

w) Repeat steps a through t until interaction between the alignable components is negligible.

2) TYPE 791802 GAIN BW COMPENSATION AMPLIFIER

a) Construct the circuit as shown.

b) Adjust the Signal Generator for a 10 MHz carrier frequency, 1 kHz audio @ 50% modulation frequency and a signal level at -74 dBm. On the DF, set the bandwidth for 200 kHz.

c) Using the card extender, extend card A3.

d) Adjust R13 for an approximate 1.2Vdc reading on the DVM.

e) Measure and record the reading of the AC VTVM with the input signal present. The reading should be a maximum of 300 mV.

f) Tune the Spectrum analyzer to 10 MHz. record the RF signal level.

g) Adjust the signal level of the Signal Generator to -80 dBm. On the DF, set the bandwidth to 50 kHz.

h) Adjust L2 for the maximum response on the Spectrum Analyzer.

i) Adjust R14 to set the RF level at the Spectrum Analyzer to the same value recorded in step f.

j) Adjust the signal level of the Signal Generator to -87 dBm. On the DF, set the bandwidth to 10 kHz.

k) Adjust L3 for the maximum response on the Spectrum Analyzer.

l) Adjust R15 to set the RF level at the Spectrum Analyzer to the same value recorded instep f.

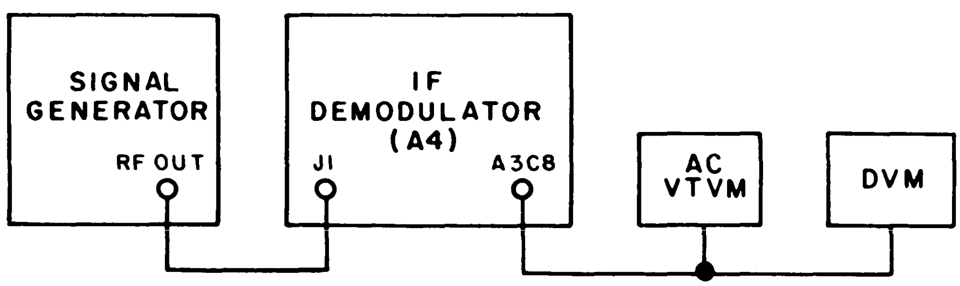


Figure 5-2. Test Setup, Gain Adjustable Ampl. & Diode SW. (A4A3) Alignment

3) TYPE 791817 AGC/SQUELCH (A2)

a) Construct the circuit as shown.

b) Set DF Bandwidth control to 10 kHz.

c) Using the 22-pin extender card supplied with the receiver, extend the AGC/SQUELCH card (A2).

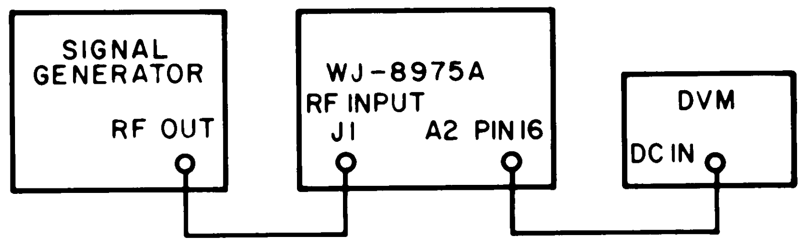


Figure 5-3. Test Setup, AGC/Squelch (A2) Alignment

d) Tune to a frequency within the Receiver's Tuner range on the Signal Generator. Adjust the input signal for a level of -107 dBm.

e) Measure the output level on the DVM.

f) Increase the input signal leve1 30 dB.

g) Adjust resistor R16 until the reading of the DVM begins to increase. (Threshold level).

4) TYPE 791784 FM DISCRIMINATOR (A7)

a) Construct circuit as shown in Figure 5-4.

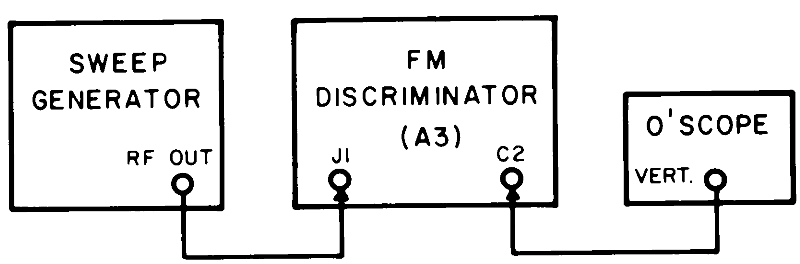


Figure 5-4. Test Setup, FM Discriminator (A3) Alignment

b) Set the Sweep Generator for a center frequency of 10 MHz, sweep width of 300-400 kHz and a signal level of 20 mV.

c) Adjust C12 and C17 for a typical "S" curve response (centered at 10 MHz). A typical response is shown in Figure 5-5.

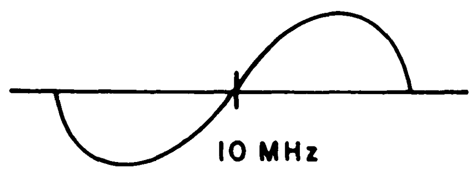


Figure 5-5. Typical Response, FM Discriminator Output

Digital Alignment Procedure for the WJ-8975A

The Alignment of the IF Strip is similar to the alignment described in the WJ-8640 Class A manuals - modules have been deleted and rearranged in sequence but the boards themselves have not changed. The only new board is A1A7 - The 8 pole Low Pass filter - no alignment is performed on that board.

1) Put frequency counter on pin B42 of A4A3 (or Oscilloscope) adjust R5 to 800 Hz ±1 Hz (or 1.25 m Sec/period ± .0015 m Sec).

2) Measure and record the voltage on pin B46 of A4A2. Measure the voltage on B44 of A4A2; adjust R7 until the voltage measured is equal to the negative of the voltage recorded from B46 (i.e., B46 should beat approximately +l Vdc. B44 should be set at approximately -1 Vdc).

3) Observe on an oscilloscope, while triggering on 800 Hz (Pin B42 of A4A3) measure and adjust the length of the IF Windows as follow:

BW	Pin #	Size (±Sec)	Adjustment
200 kHz	A15	1	R8
40 kHz	A17	4	R10
10 kHz	A19	20	R12

Note: All pins and resistors are found on A4A3.

4) Turn S4 (function switch) to the CAL position. Set the bandwidth select to 50 kHz, when observing an oscilloscope connected to pin A7 of A4A1 a stair case patterns should be seen (the exact wave form depends on the trigger level of the oscilloscope and the voltages recorded in Part2); see Figure 5-1. It is important that this connection to the oscilloscope be DC coupled.

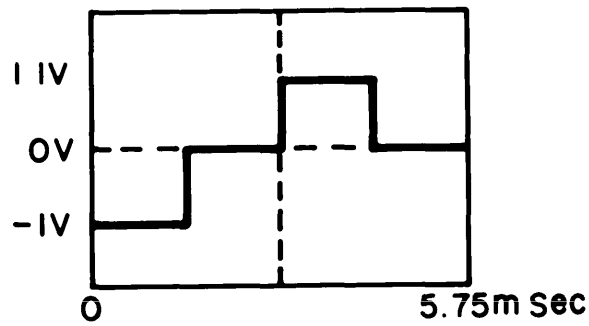


Figure 5-6.

a) Run a ground lead to pin B43 of board A4A1; the display on the oscilloscope should almost go to a straight line. It would be advisable to sync the scope to pin Al0 of board A4A1.

b) Increase the sensitivity of the scope to 5 mV/division. If necessary adjust Resistors R9, R16, R23 and R30 (of board A4Al) to keep the 4 line segments on the screen of the Oscilloscope.

c) Adjust R9, R16, R23 and R30 until they are within ±2.5 m of the ground line (on i.e., the four segments must be completely within 1 division at a setting of 5 mV/division).

d) Remove the ground line from B43, two of the line segments should not be off the screen, the other two should stay at about the ground line.

5) For a preliminary setting, adjust the switches on A4A6 to: MSB01100110. Where the open position is zero (0) and closed position is one (l). Also, the MSB is switch #8, which is furthest from the top of the board. Set the “zero adjust” knob pointing straight down.

6) Connect the oscilloscope to pin B41 of Board A4A5. A square wave of 5.75 ms should appear on the display. (If only a DC value appears, adjust R3 of board A4A5 until the square wave does appear). Adjust R3 until the square wave has a 50% duty cycle.

NOTE

It may be easier to enlarge the square wave until one cycle covers the whole screen. Then adjust R3 until the vertical line is in the center of the screen. After R3 has been adjusted the square wave can be fine tuned by adjusting R10 on board A4A5. See Figure 5-2.

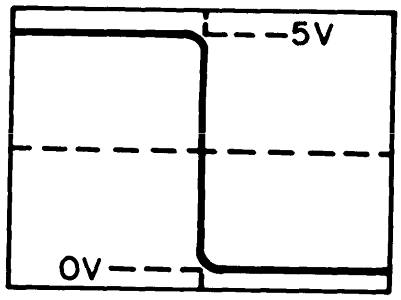


Figure 5-7.

7) Set "band select" to the 80 - 250 MHz position and leaving the "zero adjust" pointing down, adjust the switches on board A4A6 until the bearing display reads 0. Adjust the switches in a binary fashion starting with the LSB, which is the switch closer to the top.

8) Connect a 45 degree (such as the WJ-8975/ASM) simulator to the "DF input"' on the front panel. (If a 45 degree simulator is not available, consult the factory.)

a) Turn the "function switch" to the DF position. Turn the "Bandwidth Switch" to 10 kHz and the "band select" switch to 80-250 MHz.

b) Sync the Oscilloscope on Pin B47 on board A4A3.

c) On Channel 1 of the scope, look at the pulse on pin B45 of board A4A1. On channe1 2 of the scope, look at the IF window found at pin B53 of board A4A1.

d) Adjust Resistor R2 on board A4A4 (it is marked "10 kHz" on the board until the IF window covers the center of the pulse on Channel 1. See Figure 5-8.

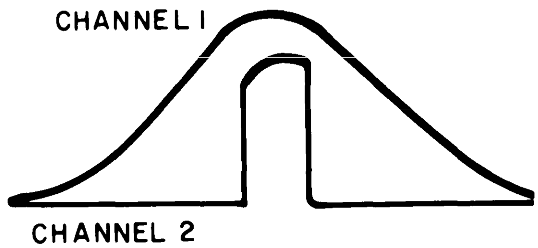


Figure 5-8.

Change the sync to B49, B51, and B53 of board A4A3 consecutively while adjusting R2 to achieve the best overall coverage.

The line of bearing should be 44 to 46 degrees (because of temperature stability of the 45 degrees simulator). Record the line of bearing.

e) Switch the Bandwidth switch to 50 kHz. Move the lead of Channel l from B45 to B43 of A4A1. Adjust the variable resistor marked 50 kHz (R5) on board A4A4, as in step "d", until the IF window is lined up with the pulse.

f) Switch the B and width switch to 200 kHz. Move the lead of Channel 1 from B43 to B41 of A4A1. Adjust the variable resistor marked 200 kHz (R8) on board A4A4 until the IF window is lined up with the pulse. Observing the line of bearing readout, adjust R8 until the bearing agrees with the bearing found in Part d.

5.7 PERFORMANCE CHECKS

An angle simulator is used when performing troubleshooting procedures on the Direction Finder. The simulator verifies that the Direction Finder is calibrated for accurate line of bearing readings. It acts as a Direction Finder Antenna that is receiving a transmission at 45°. Procedures for using the simulator include preparing the Direction Finder for testing and testing it with the simulator. Follow the steps below when using the simulator.

5.7.1 PREPARING DIRECTION FINDER FOR TESTING

a) Connect control cable from DF ANT CONTROL INPUT on angle simulator to DF ANT. CONTROL jack on Direction Finder.

b) Connect bnc cable from DF SIGNAL OUT jack on angle simulator to DF INPUT jack on Direction Finder.

c) Set OFF/OMNI/DF/CAL switch on Direction Finder to CAL.

d) Rotate ZERO ADJ knob on Direction Finder until 000 or 180 appears on display.

e) Set OFF/OMNI/DF/CAL switch on Direction Finder to DF.

f) Set IF BANDWIDTH switch on Direction Finder to 10 kHz.

g) Set INTEG TIME switch on Direction Finder to 0.5.

h) Rotate GATED THRESHOLD knob on Direction Finder fully clockwise.

i) Set BAND MHz switch on Direction Finder to 80-250 MHz.

5.7.2 TESTING DIRECTION FINDER USING ANGLE SIMULATOR

a) Turn on power to the angle simulator.

b) Set angle simulator switch to 45°.

c) Observe Direction Finder display for reading of 45°, +/- 3°.

d) Set angle simulator switch to 135°.

e) Observe Direction Finder display for reading of 135°, +/- 3°.

f) Set angle simulator switch to 225°.

g) Observe Direction Finder display for reading of 225°, +/- 3°.

h) Set angle simulator switch to 315°.

i) Observe Direction Finder display for reading of 315°, +/- 3°.

j) Set IF BAND WIDTH switch on Direction Finder to 50 kHz.

k) Repeat b through i above.

l) Set IF BANDWIDTH switch on Direction Finder to 200 kHz.

m) Repeat b through i above to complete testing procedures.

n) Set BAND (MHz) switch on Direction Finder to 20-80.

o) Repeat b through m above.

p) Set INTEG TIME (SEC) switch on Direction Finder to 1.0.

q) Repeat b through o above.

r) Set INTEG TIME (SEC) switch on Direction Finder to 2.0.

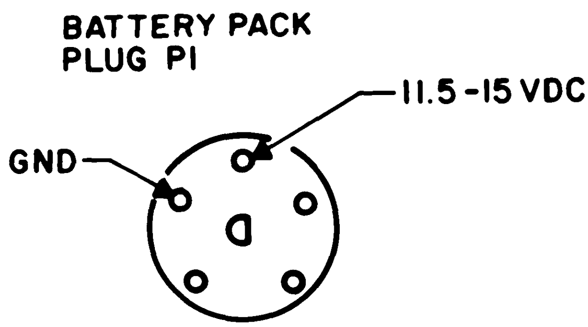
s) Repeat b through o above.

5.8 SUBASSEMBLY REMOVAL, REPAIR AND REPLACEMENT

All Direction Finder assemblies, subassemblies and piece parts are mounted to permit easy access/removal. Before removal, any coaxial cable connections or plug assemblies must be resoldered or disconnected. Repair procedures are straightforward and conventional. Observe the usual precautions regarding temperature on semiconductors and damage to circuit patterns on boards. Piece parts requiring resoldering are listed in the following subparagraphs.

5.8.1 BATTERY PACK PLUG (P1) REMOVAL

The battery pack plug is removed from the battery pack by unscrewing each securing screw, sliding the plug out and resoldering the plug's 3 white wires.



5.8.2 BATTERY JACK (J8) REMOVAL

The battery jack is removed through the rear of the rear panel by unscrewing each securing screw and resoldering the jack's one white wire.

Table 5-1. Type WJ-8975A Direct Support Troubleshooting Chart

SYMPTOM	TROUBLESHOOTING PROCEDURE PAGE
POWER lamp that does not light	5-14
No line of bearing display	5-27
Displays incorrect line of bearing	5-35
Displays random lines of bearing	5-39
Zero adjust control cannot set a 000 or 180 degree bearing	5-96
No circular LED when set to GATED mode	5-106
THRESHOLD lamp that does not light	5-143
Displays random lines of bearing when set to HOLD mode	5-151
Random lines of bearing in one or two IF BANDWIDTH (kHz) positions	5-156
Circular LED that does not turn off when GATED THRESHOLD is adjusted	5-166

POWER LAMP THAT DOES NOT LIGHT

INITIAL SETUP

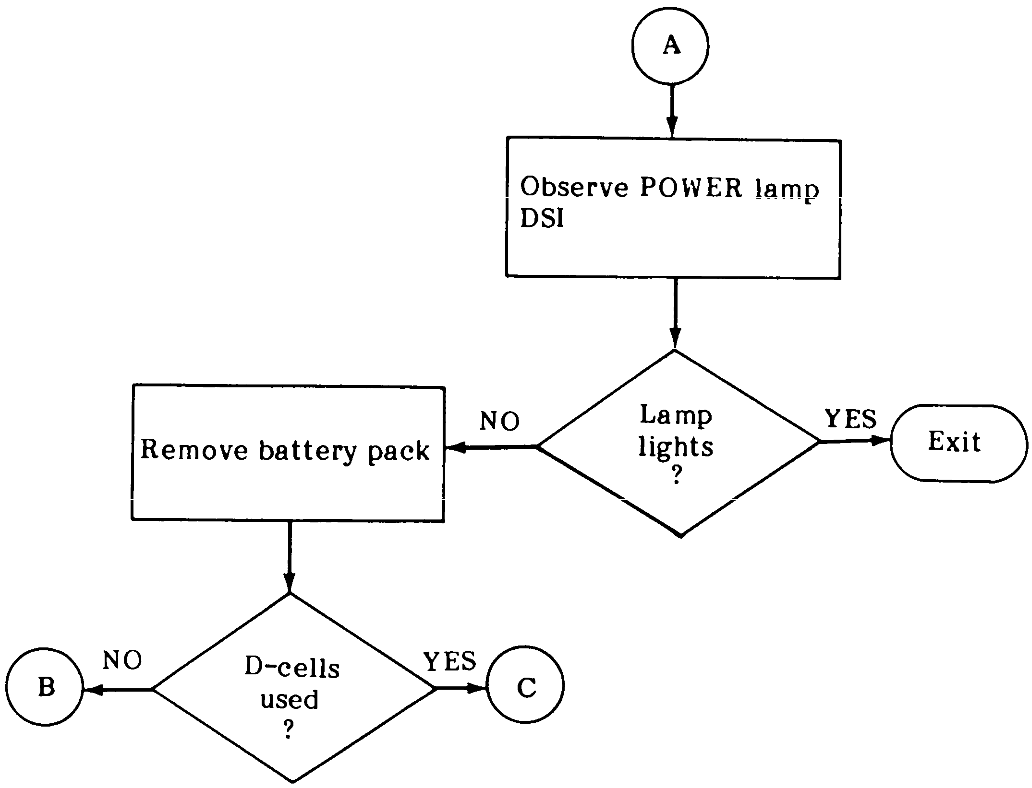
Test Equipment	
Multimeter	AN/PSM-45
Test Lead Set	Simpson 00577
Tools	
4 Inch Flat Tip Screwdriver	5120-00-222-8852
Replacement Parts	
Battery BA-4386/PRC-25	
D-Cells BA-30	
Battery Pack Fuse (Fl)	MDL-3/4
Plu (P1) 103-1	
Jack (J8)CG075	
DF Fuse	AGC1
DC/DC Converter (A7)	

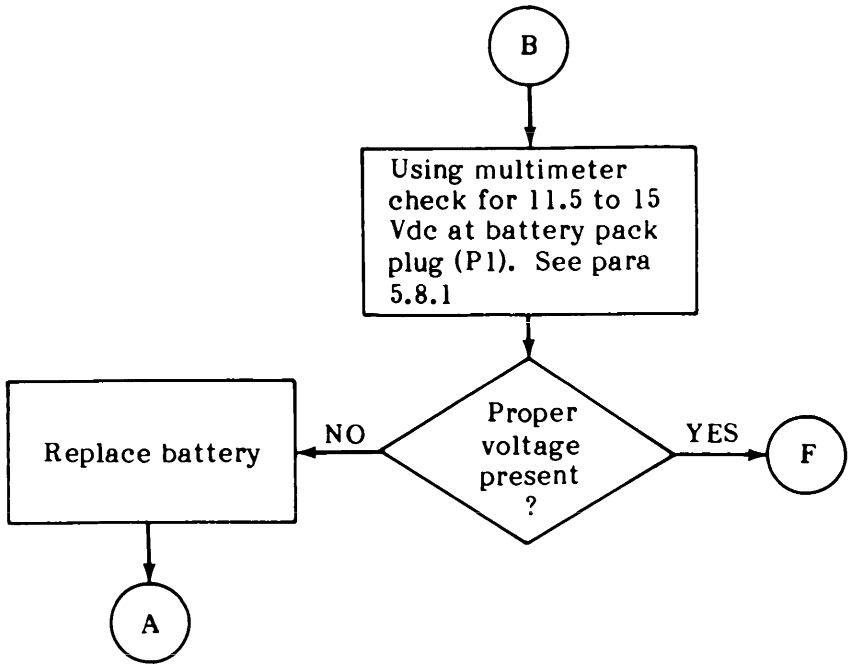
Equipment Condition

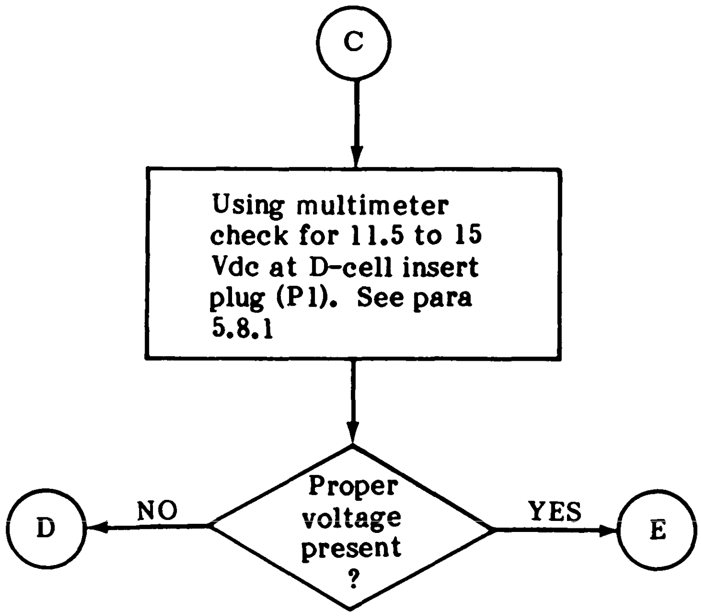
NOTE

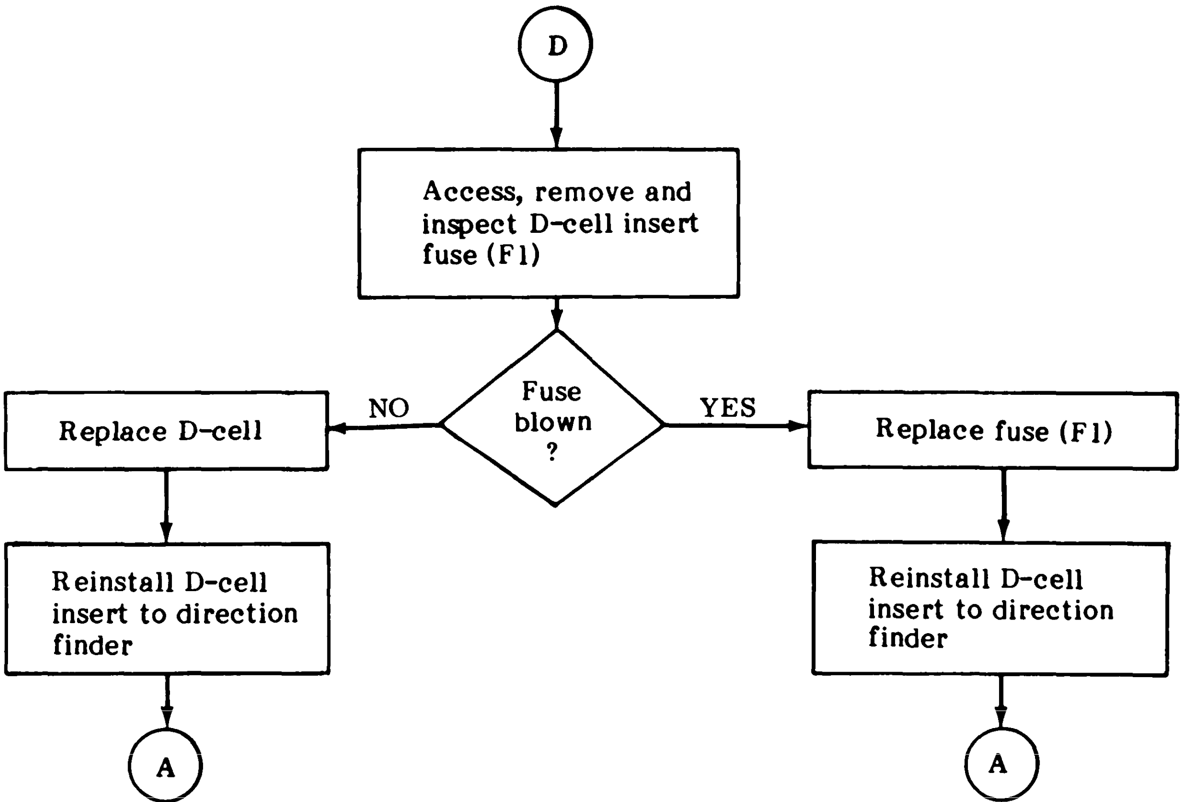
Allow 30 minute warm-up time of Direction Finder before proceeding with troubleshooting procedures.

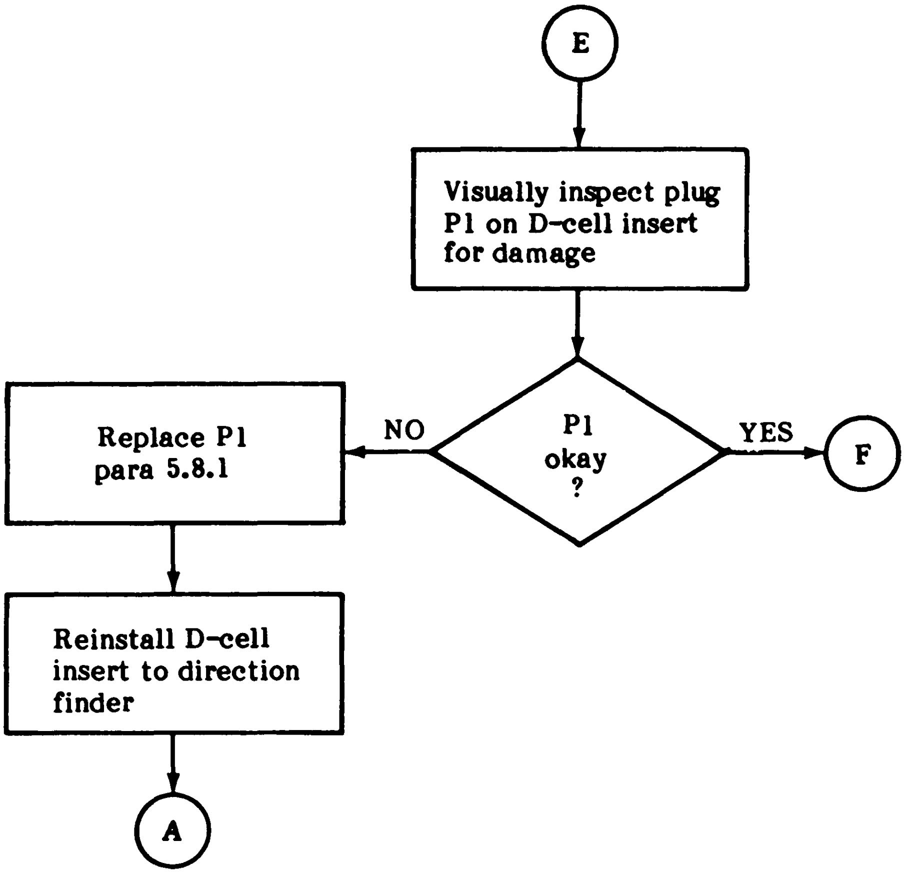
POWER switch set to OMNI
Direction Finder cover removed
Battery Pack installed

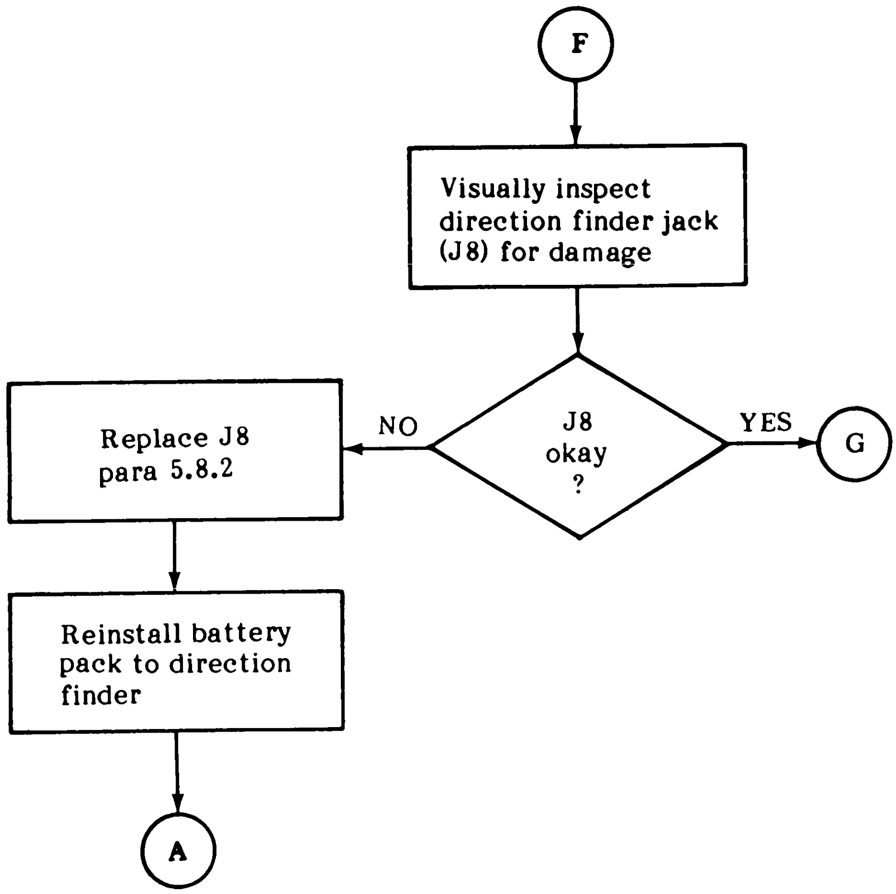

A
Observe POWER lamp DSI
Lamp lights ?
YES
Exit
NO
Remove battery pack
D-cells used ?
NO
B
YES
C

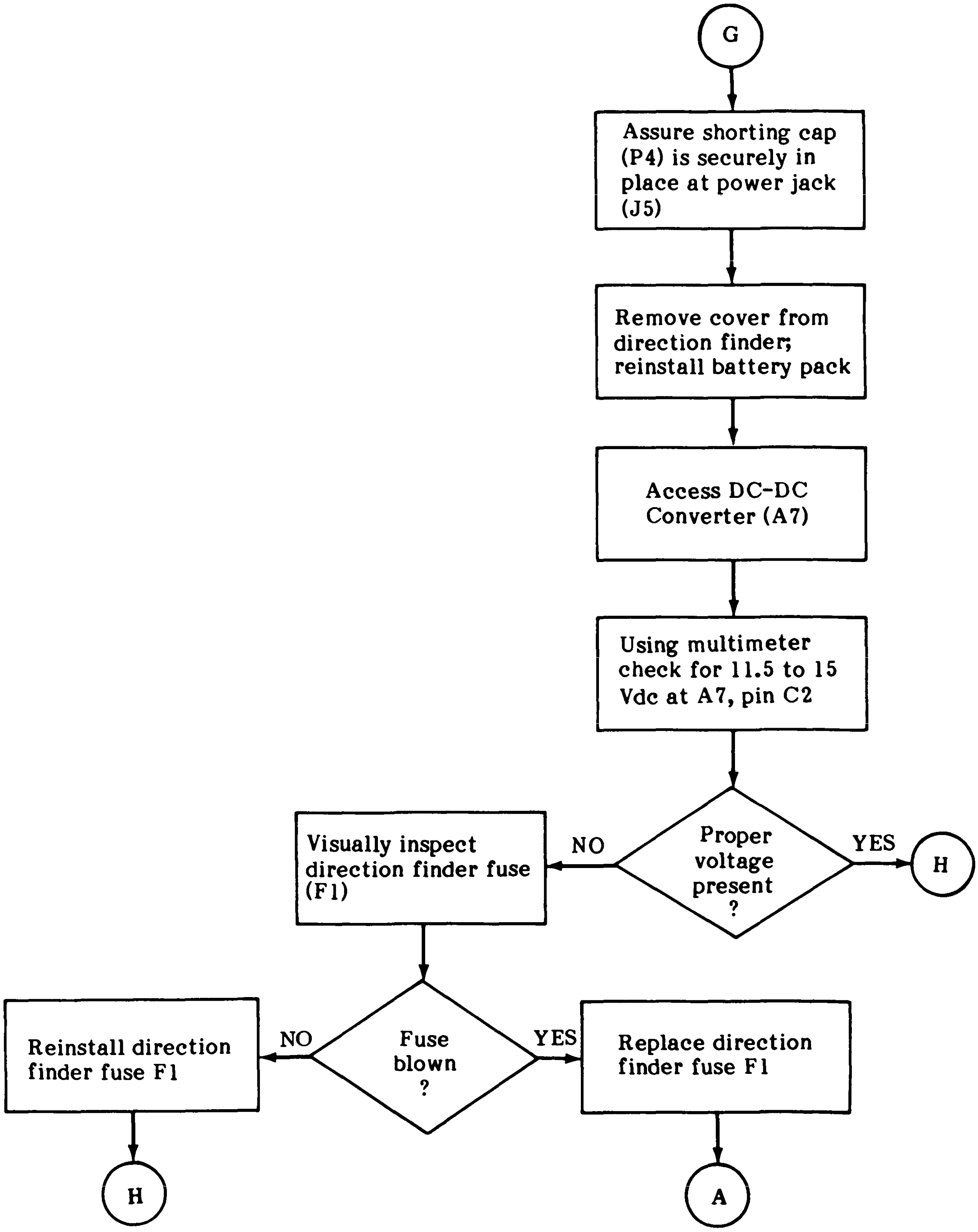

B
Using multimeter check for 11.5 to 15 Vdc at battery pack plug (P1). See para 5.8.1
Proper voltage present ?
NO
YES
F
Replace battery
A

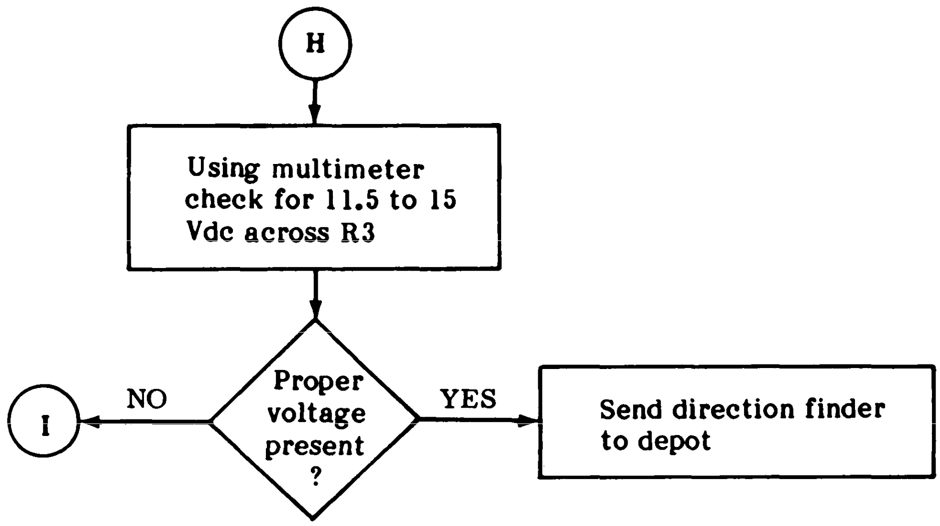

C
Using multimeter check for 11.5 to 15 Vdc at D-cell insert plug (P1). See para 5.8.1
Proper voltage present ?
NO
D
YES
E

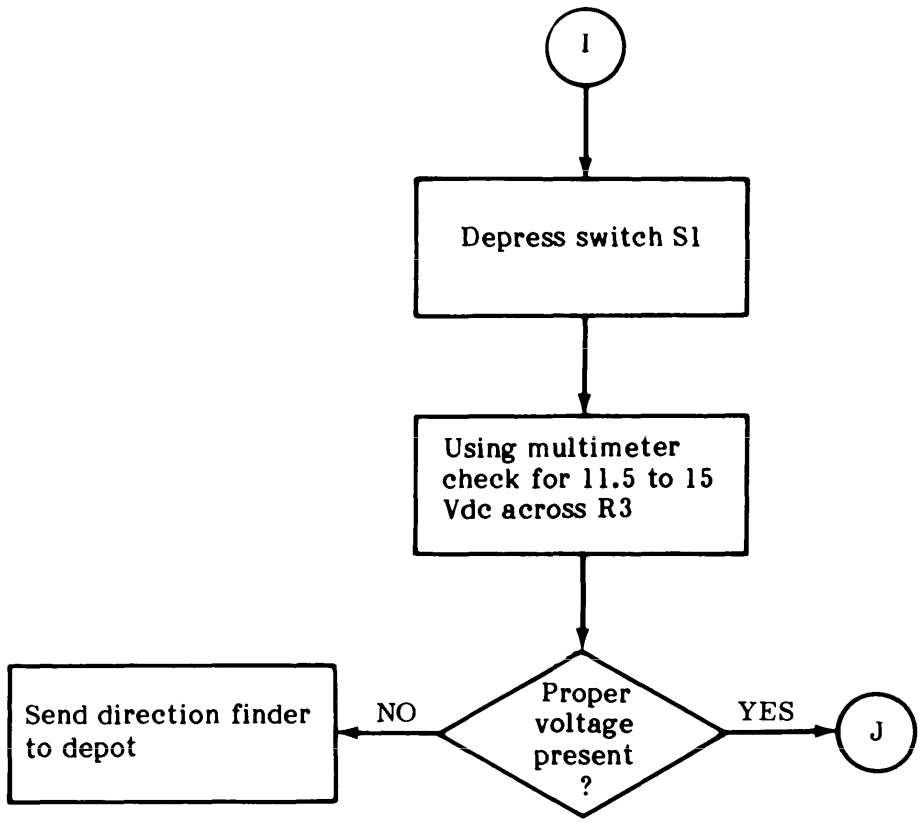

D
Access, remove and inspect D-cell insert fuse (F1)
Fuse blown ?
NO
YES
Replace D-cell
Replace fuse (F1)
Reinstall D-cell insert to direction finder
Reinstall D-cell insert to direction finder
A
A

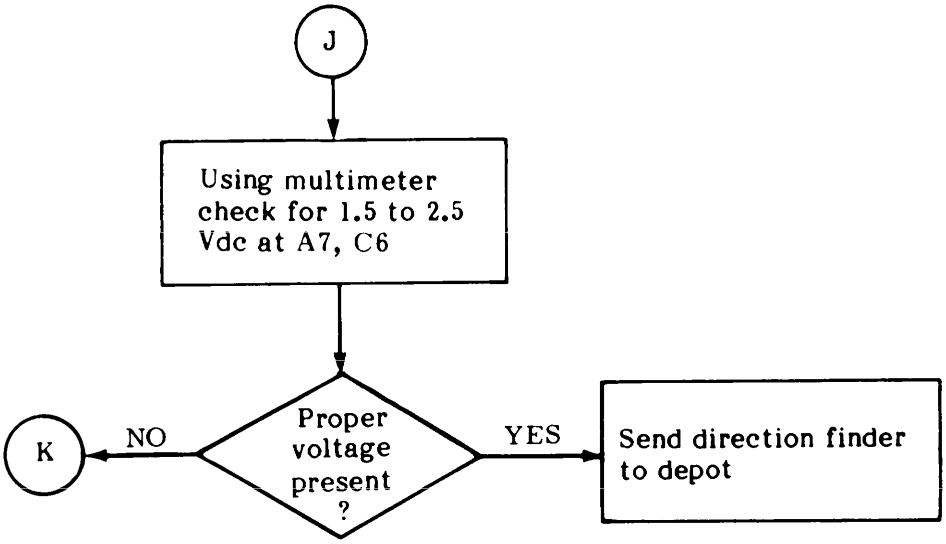

E
Visually inspect plug P1 on D-cell insert for damage
P1 okay ?
NO
YES
F
Replace P1 para 5.8.1
Reinstall D-cell insert to direction finder
A

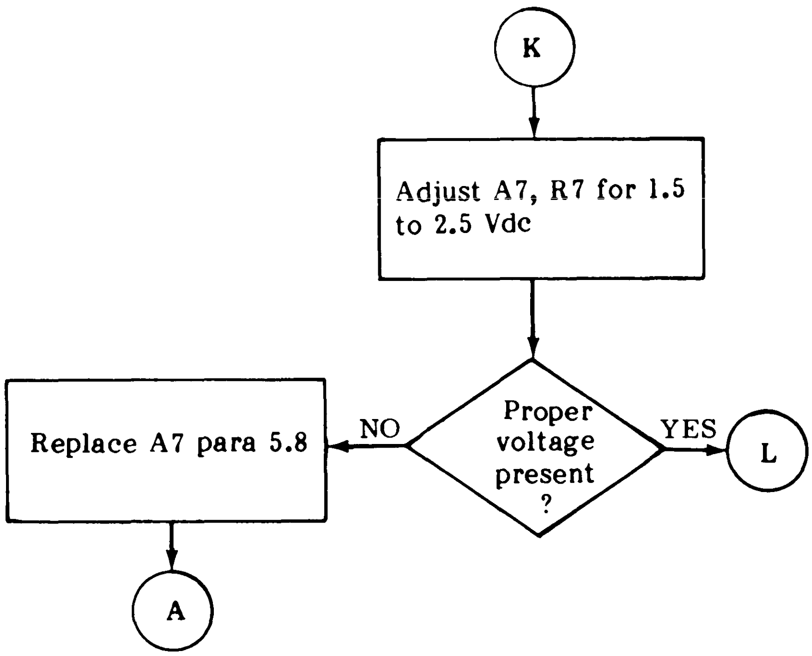

F
Visually inspect direction finder jack (J8) for damage
J8 okay ?
NO
YES
G
Replace J8 para 5.8.2
Reinstall battery pack to direction finder
A

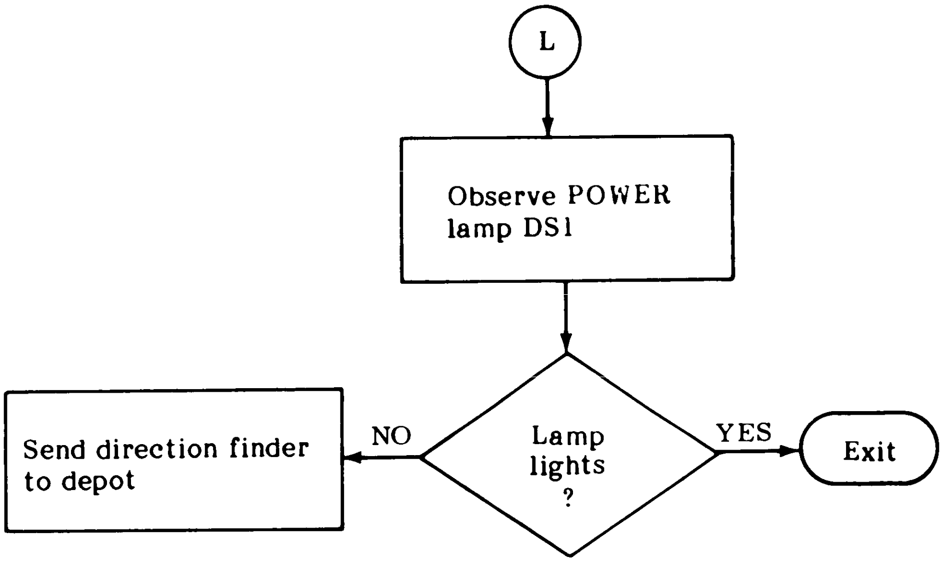

G
Assure shorting cap (P4) is securely in place at power jack (J5)
Remove cover from direction finder; reinstall battery pack
Access DC-DC Converter (A7)
Using multimeter check for 11.5 to 15 Vdc at A7, pin C2
Proper voltage present ?
YES
H
NO
Visually inspect direction finder fuse (F1)
Fuse blown ?
NO
Reinstall direction finder fuse F1
H
YES
Replace direction finder fuse F1
A


H
Using multimeter check for 11.5 to 15 Vdc across R3
Proper voltage present ?
NO
I
YES
Send direction finder to depot


I
Depress switch S1
Using multimeter check for 11.5 to 15 Vdc across R3
Proper voltage present ?
NO
Send direction finder to depot
YES
J


J
Using multimeter check for 1.5 to 2.5 Vdc at A7, C6
Proper voltage present ?
NO
K
YES
Send direction finder to depot


K
Adjust A7, R7 for 1.5 to 2.5 Vdc
Proper voltage present ?
NO
YES
L
Replace A7 para 5.8
A


L
Observe POWER lamp DS1
Lamp lights ?
NO
YES
Send direction finder to depot
Exit

NO LINE OF BEARING DISPLAY

<u>Test Equipment</u>

Power Supply	PP-6547/U
Multimeter	AN/PSM-45
Test Lead Set	Simpson 00577

<u>Tools</u>

4 in flat tip screwdriver	5120-00-222-8852

<u>Replacement Parts</u>

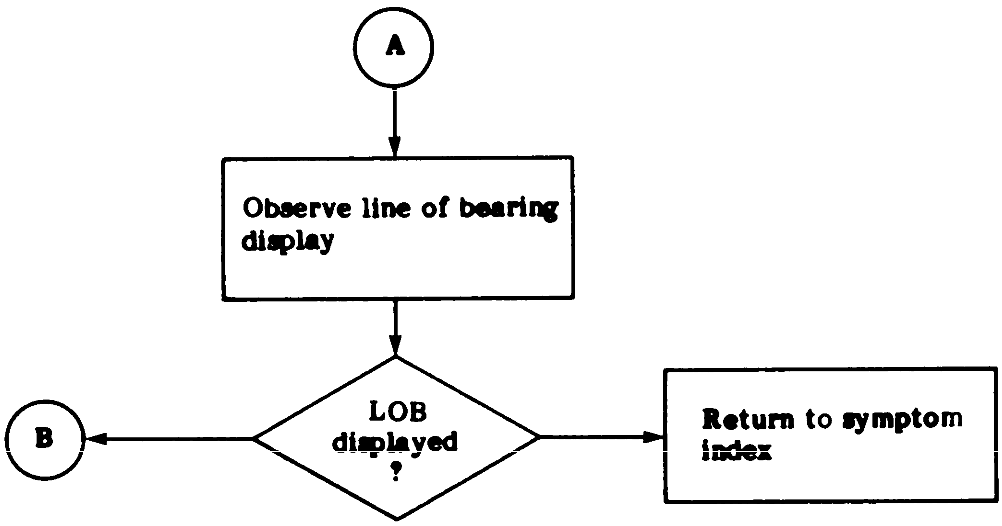
DC/DC Converter (A7)
Master Time Controller and Display Logic (A4A6)
DF Display (A5)

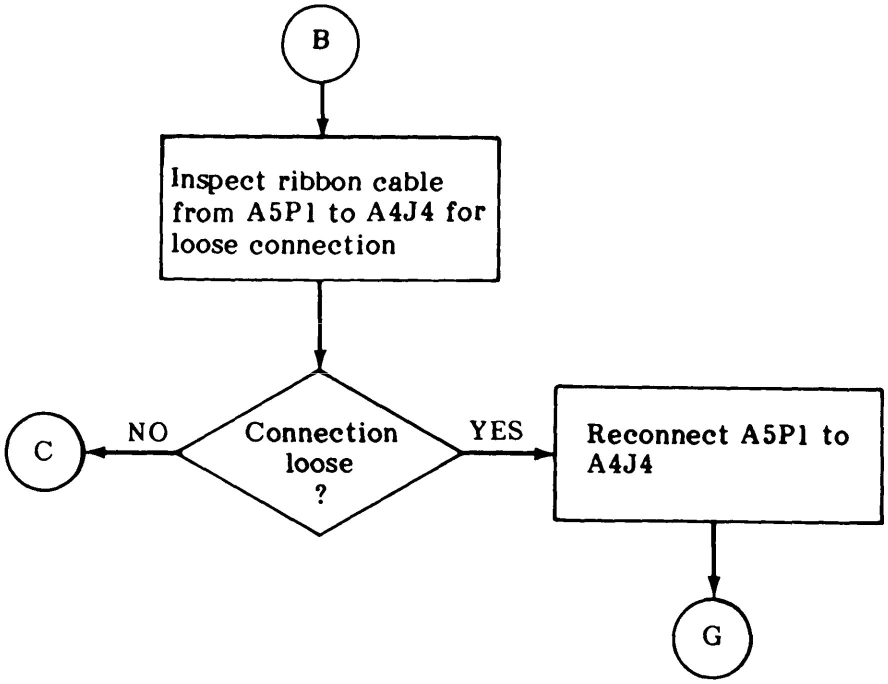
<u>Equipment Condition</u>

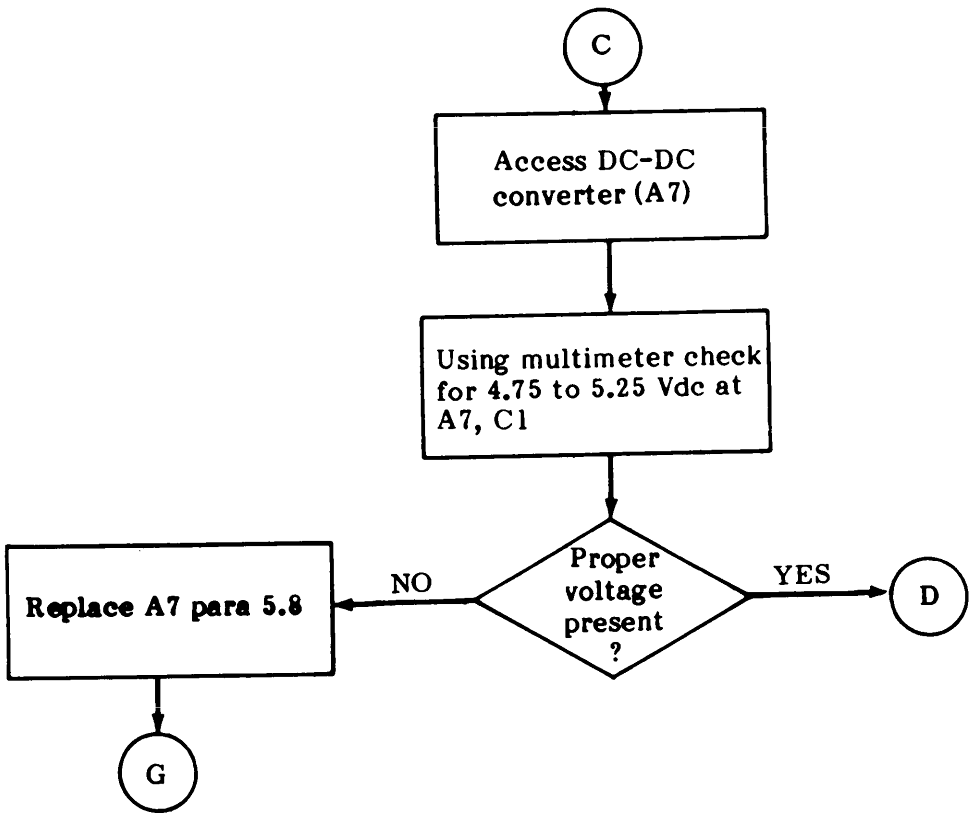
NOTE

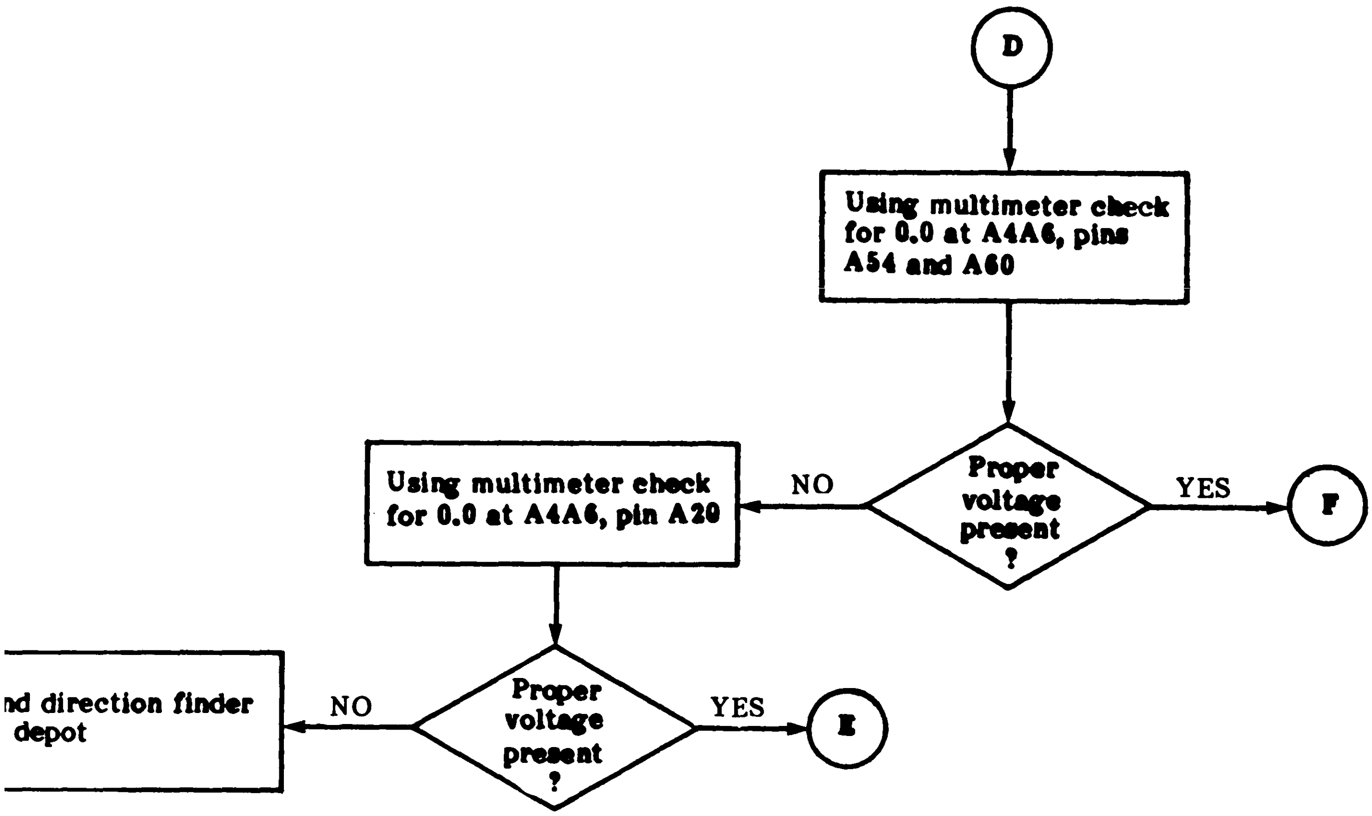
Allow 30 minute warm-up time of Direction Finder before proceeding with troubleshooting procedures

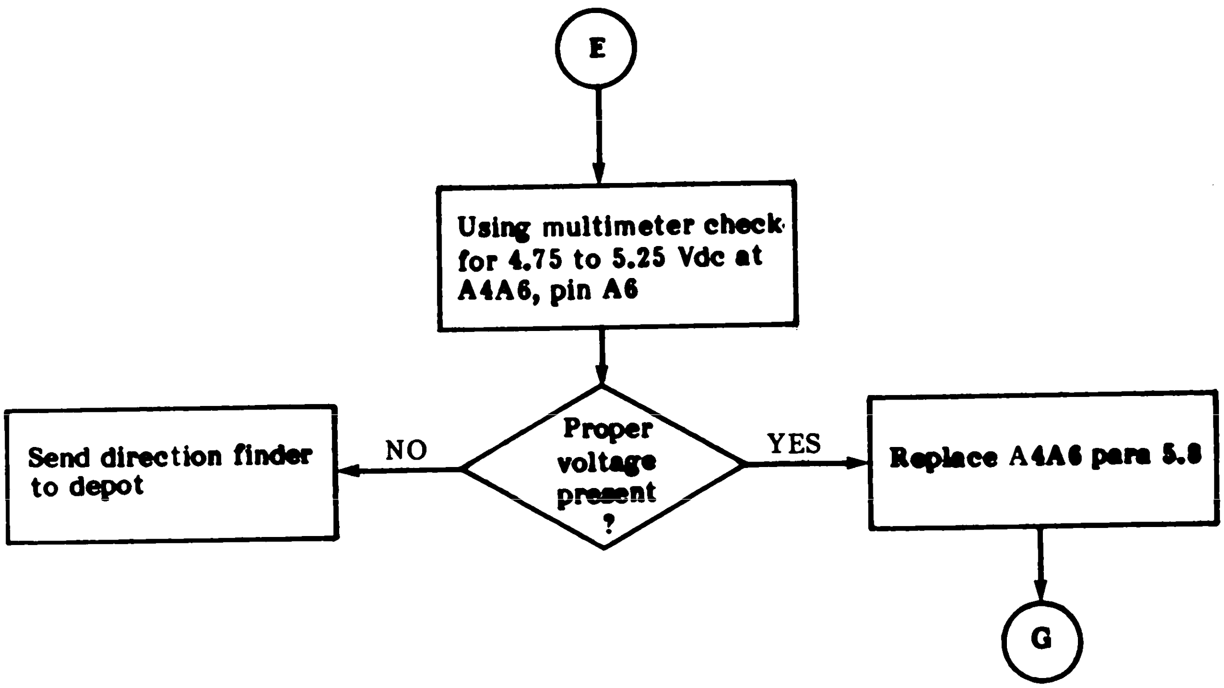
OFF/OMNI/DF/CAL switch set to CAL
DISPLAY OFF/DISPLAY INTENSITY knob set fully clockwise
BAND MHz switch set to 80-250 MHz
IF BANDWIDTH switch set to 200 kHz
INTEG TIME switch set to 2 SEC
ZERO ADJ knob set as required
Power supply set to 24 Vdc and connected to J5
Direction Finder calibrated
Direction Finder cover removed

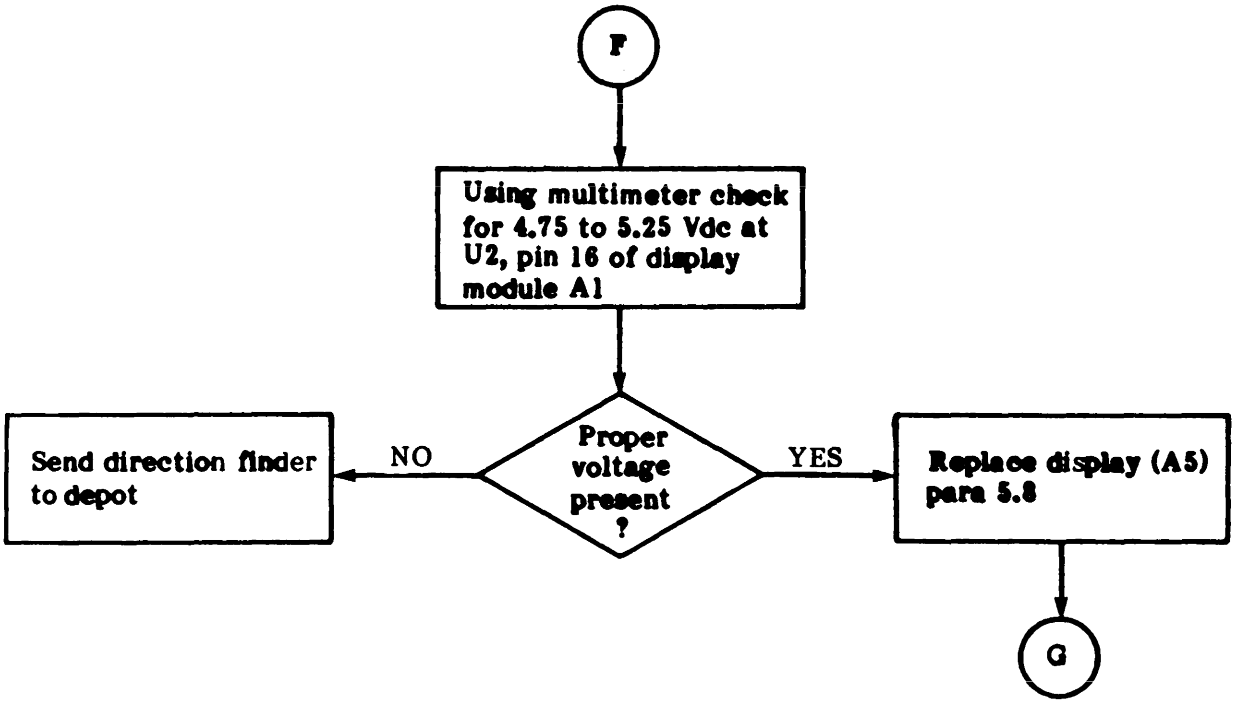

A
Observe line of bearing display
LOB displayed ?
B
Return to symptom index

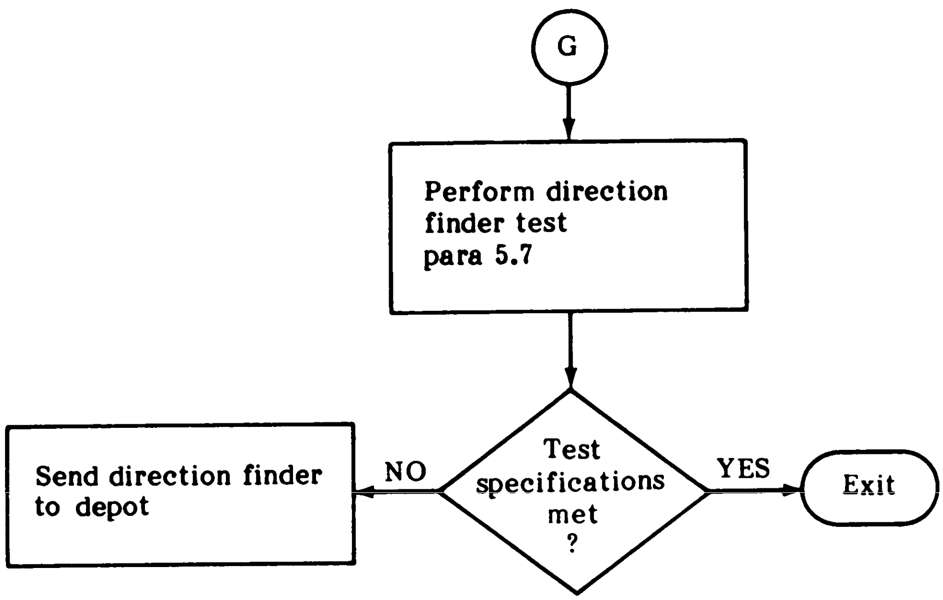

B
Inspect ribbon cable from A5P1 to A4J4 for loose connection
Connection loose ?
NO
C
YES
Reconnect A5P1 to A4J4
G


C
Access DC-DC converter (A7)
Using multimeter check for 4.75 to 5.25 Vdc at A7, C1
Proper voltage present ?
NO
YES
Replace A7 para 5.8
D
G


D
Using multimeter check for 0.0 at A4A6, pins A54 and A60
Proper voltage present ?
NO
YES
F
Using multimeter check for 0.0 at A4A6, pin A20
Proper voltage present ?
NO
YES
E
nd direction finder depot


E
Using multimeter check for 4.75 to 5.25 Vdc at A4A6, pin A6
Proper voltage present ?
NO
Send direction finder to depot
YES
Replace A4A6 para 5.8
G


F
Using multimeter check for 4.75 to 5.25 Vdc at U2, pin 16 of display module A1
Proper voltage present ?
NO
Send direction finder to depot
YES
Replace display (A5) para 5.8
G


G
Perform direction
finder test
para 5.7
Test
specifications
met
?
NO
Send direction finder
to depot
YES
Exit

DISPLAYS INCORRECT LINE OF BEARING

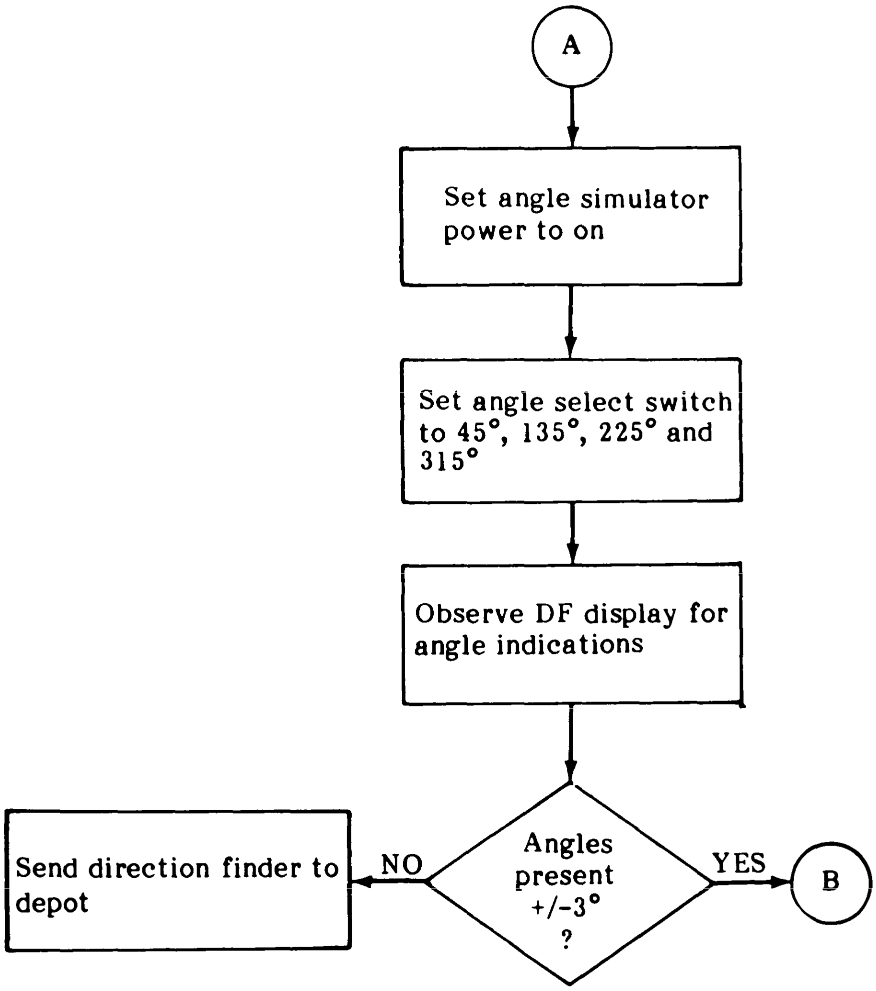
Test Equipment	
Angle Simulator	TF-15043, MKII
Power Supply	PP-8547/U

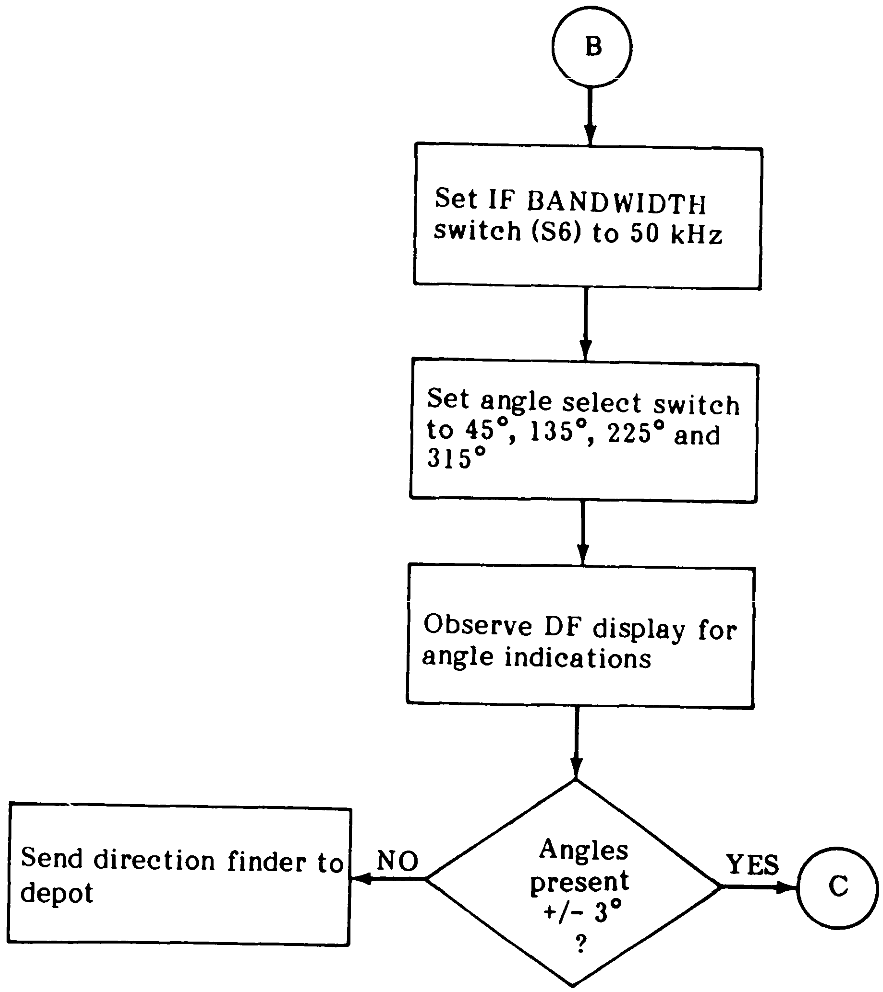
Equipment Condition

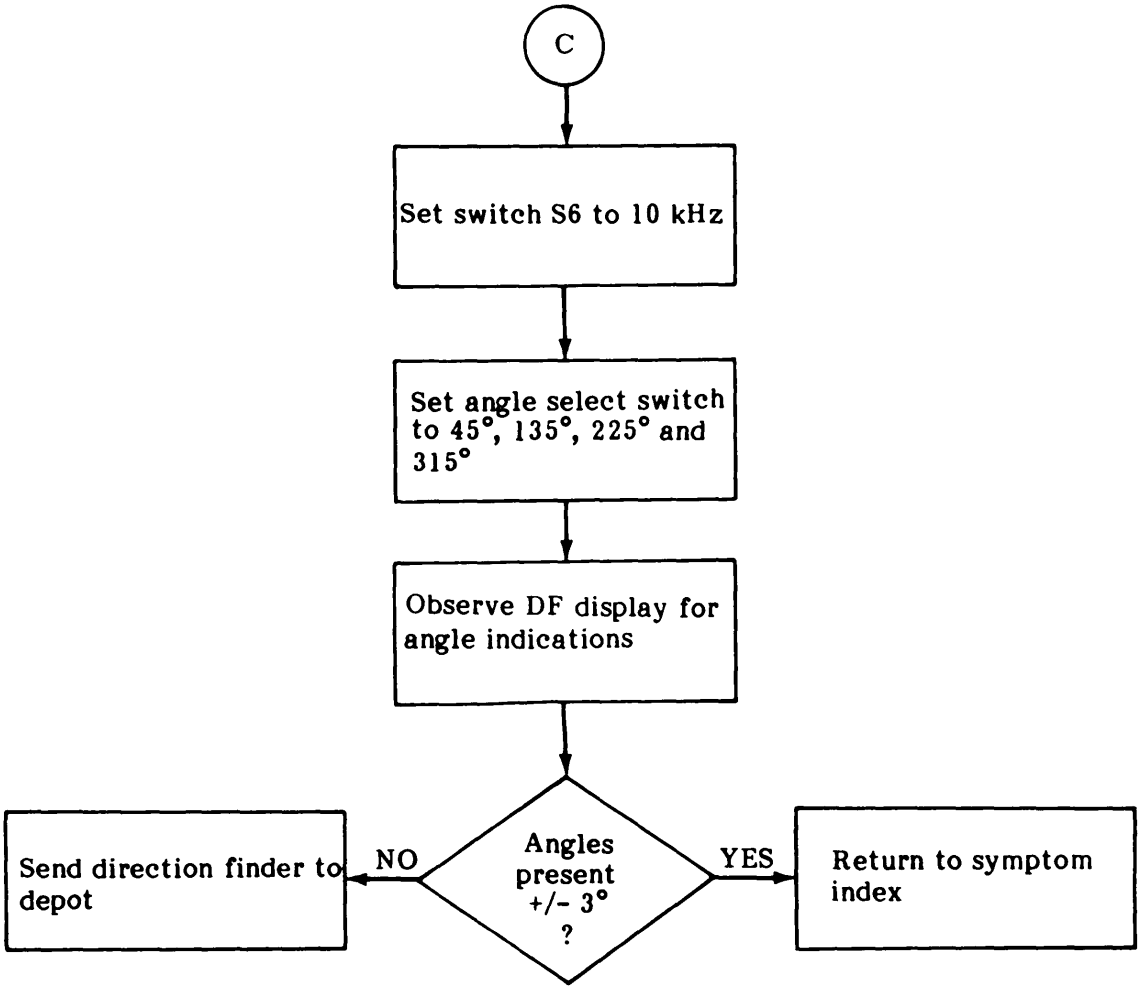
NOTE

Allow 30 minute warm-up time of Direction Finder before proceeding with troubleshooting procedures

Angle simulator connected to df processor
OFF/OMNI/DF/CAL switch set to DF
DISPLAY OFF/DISPLAY INTENSITY knob set to mid-range
IF BANDWIDTH switch set to 200 kHz
INTEG TIME switch set to 0.5
GATED THRESHOLD knob set fully clockwise
BAND MHz switch set to 80-250 MHz
ZERO ADJ knob set as required
Power supply set for 24 Vdc and connected to J5
Direction Finder calibrated
Direction Finder cover removed


A
Set angle simulator power to on
Set angle select switch to 45°, 135°, 225° and 315°
Observe DF display for angle indications
Angles present +/-3° ?
NO
Send direction finder to depot
YES
B


B
Set IF BANDWIDTH switch (S6) to 50 kHz
Set angle select switch to 45°, 135°, 225° and 315°
Observe DF display for angle indications
Angles present +/- 3° ?
NO
Send direction finder to depot
YES
C


C
Set switch S6 to 10 kHz
Set angle select switch to 45°, 135°, 225° and 315°
Observe DF display for angle indications
Angles present +/- 3° ?
NO
Send direction finder to depot
YES
Return to symptom index

DISPLAYS RANDOM LINES OF BEARING

Test Equipment

Power Supply	PP-6547U
Multi meter	AN/PSM-45
Test Lead Set	Simpson 00577
RF Voltmeter	Boonton 92C
High Frequency Probe	Boonton 91-12F
Oscilloscope	AN/USM-281C
Voltage Probe	10X TEK P6006
Signal Generator	SG-1112(V) I/U with options 001, 002, 003
Cable, RF, 50 ohms	HP 10503A
Angle Simulator	TF-15403 MKII
Frequency Counter	TD-12225A(V)I/U
RF Cable	50 ohms, 4', BNC-BNC, HP10503A

Tools

4 in. flat tip screwdriver	5120-00-222-8852

Replacement Parts

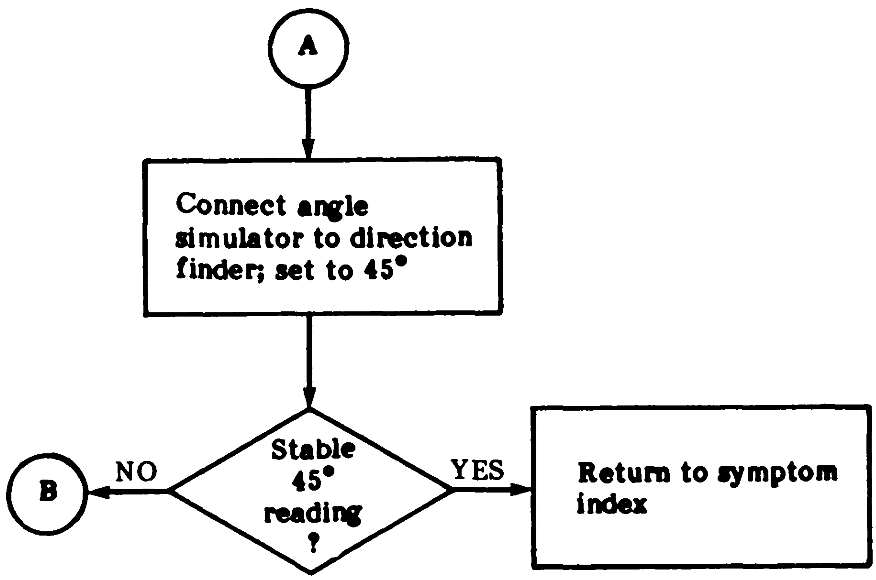
DC/DC Converter (A2)
Cable W1
10 MHz Amplifier (A1A1)
10 MHz Amplifer
Cable W2
Gain Bandwidth Compensation Amplifier (A1A3)
IF Filter and Diode Switches (A1A4)
10 MHz Amplifier (A1A5)
AM Detector Buffer (A1A6)
Cable W 3
FM Discriminator (A3)
Bandwidth Compensation Amplifier (A8)
Angle Count Generator (A4A5)
Master Time Controller and Display Logic (A4A6)
Antenna and Sine Wave Logic (A4A3)
Calibrate and Antenna Switch Drivers (A4A2)
Commutative Filter (A4A1)
8-Pole Low Pass Filter (A1A7)
IF Delay Generator (A4A4)

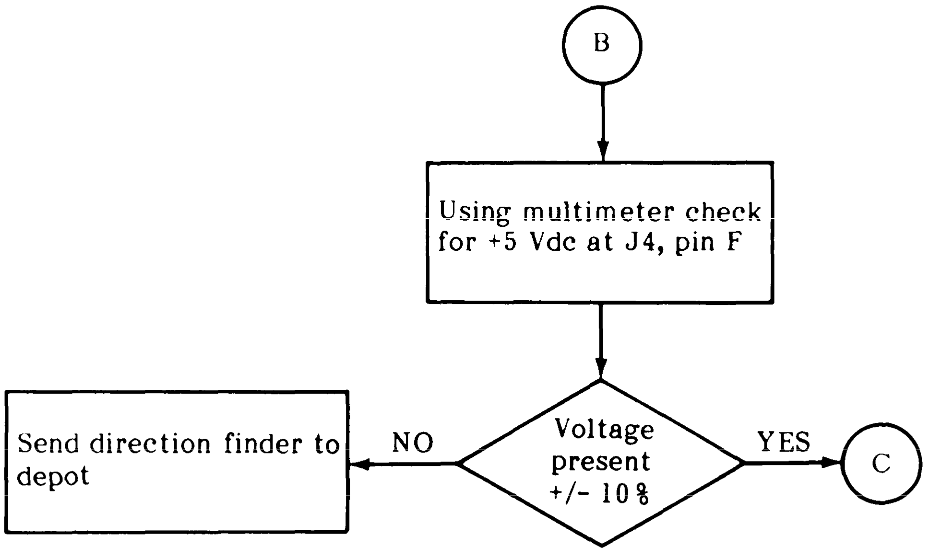
Equipment Condition

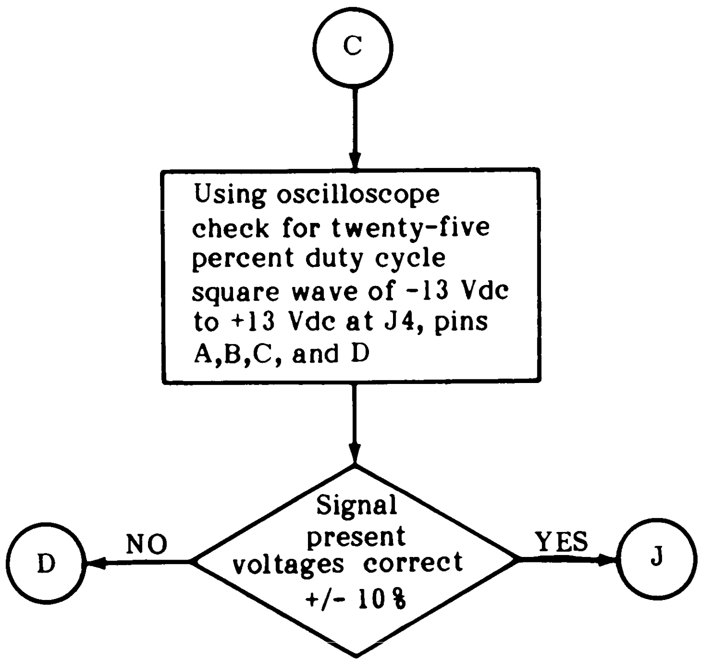
NOTE

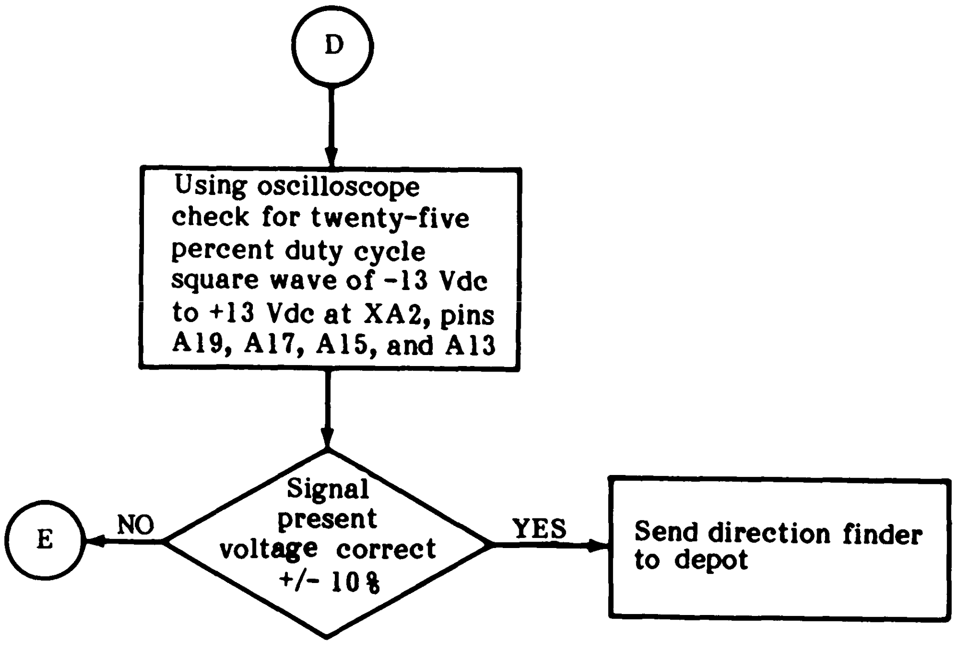
Allow 30 minute warm-up time of Direction Finder before proceeding with troubleshooting procedures

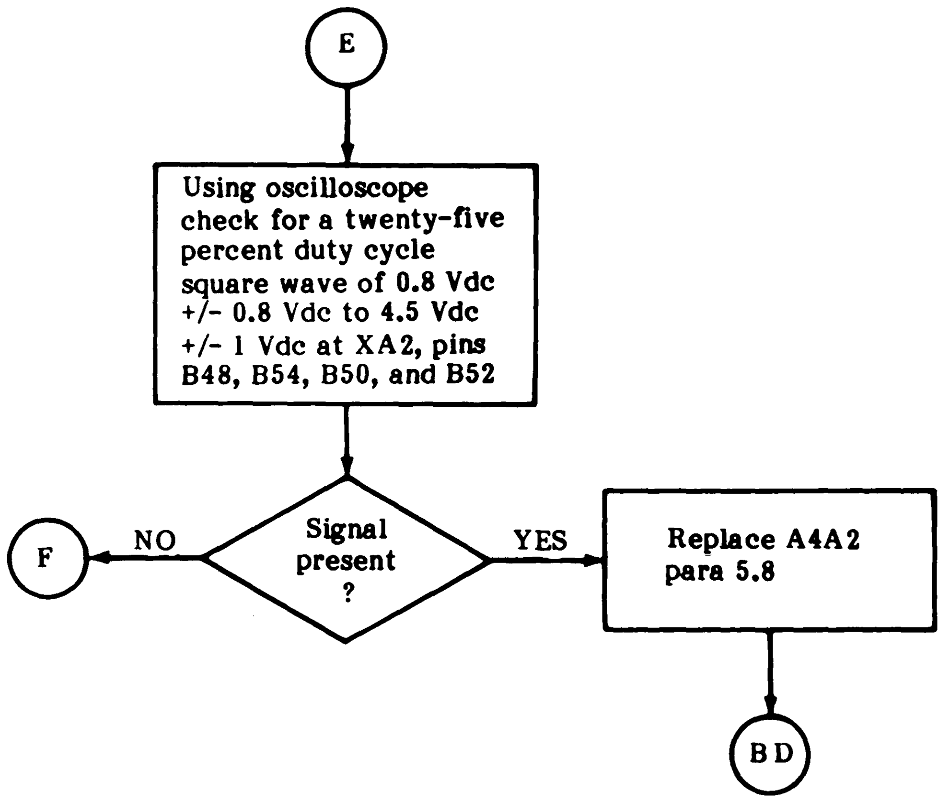
OFF/OMNI/DF/CAL switch set to DF
DISPLAY OFF/DISPLAY INTENSITY knob set to mid-range
BAND MHz switch set to 80-250 MHz
IF BANDWIDTH switch set to 200 kHz
INTEG TIME switch set to 2 SEC
ZERO ADJ knob set as required
Power supply set to 24 Vdc and connected to J5
Signal Generator set to 10 MHz CW at -30 dbm
RF Voltmeter referenced to signal generator
Direction Finder calibrated
Direction Finder cover removed

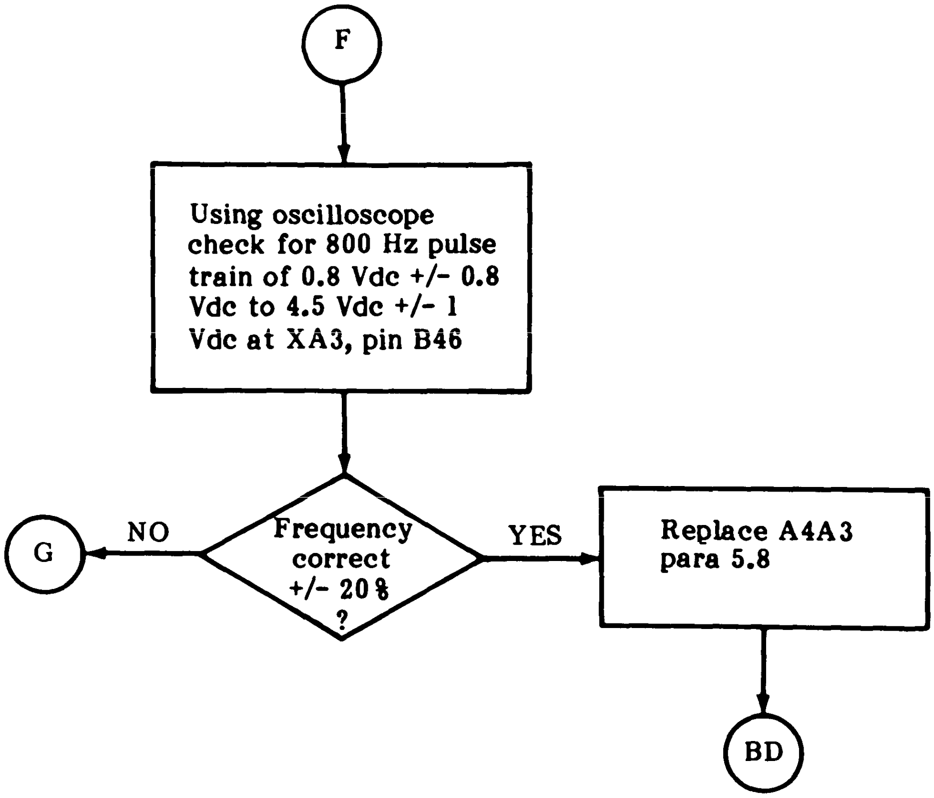

A
Connect angle simulator to direction finder; set to 45°
Stable 45° reading ?
NO
B
YES
Return to symptom index

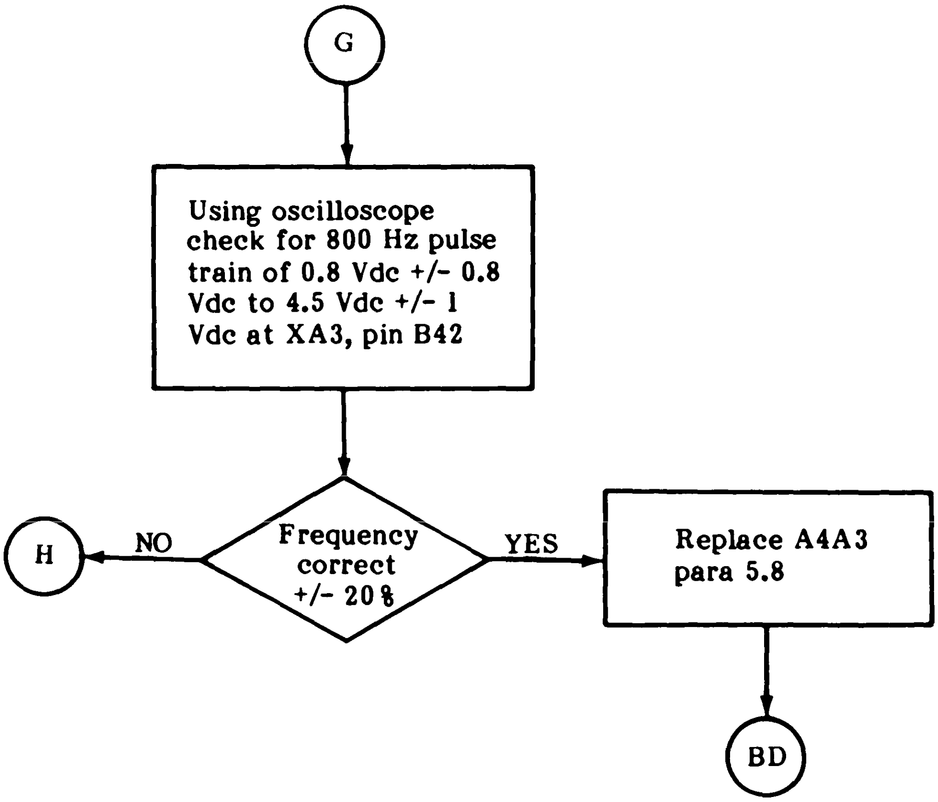

B
Using multimeter check for +5 Vdc at J4, pin F
Voltage present +/- 10%
NO
Send direction finder to depot
YES
C

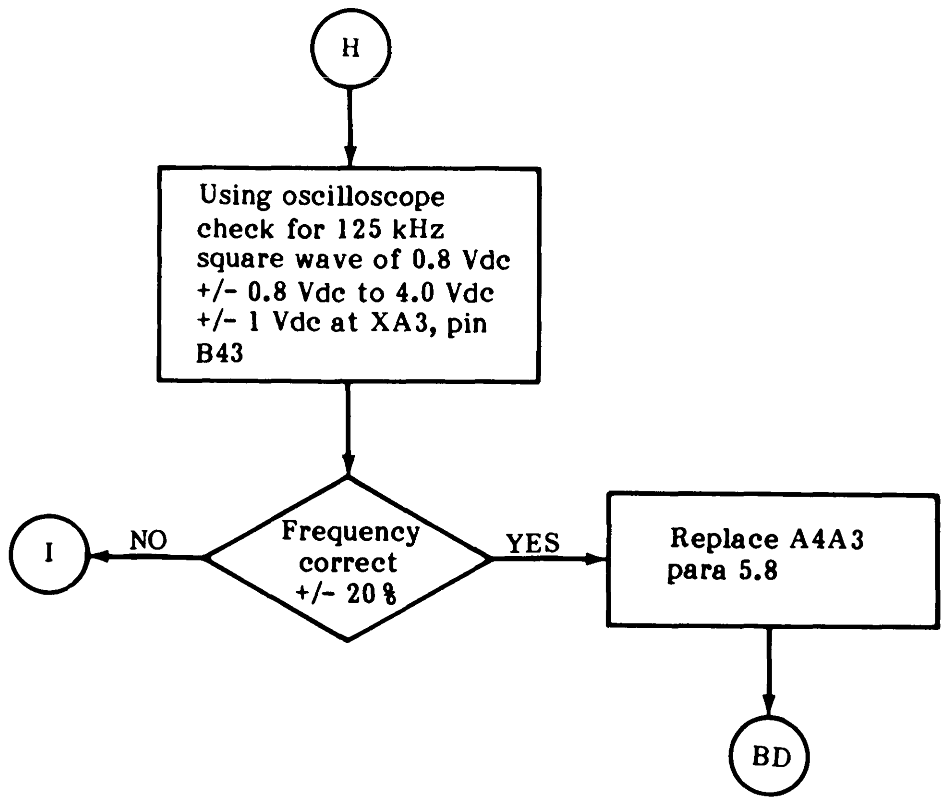

C
Using oscilloscope check for twenty-five percent duty cycle square wave of -13 Vdc to +13 Vdc at J4, pins A,B,C, and D
Signal present voltages correct +/- 10%
NO
D
YES
J

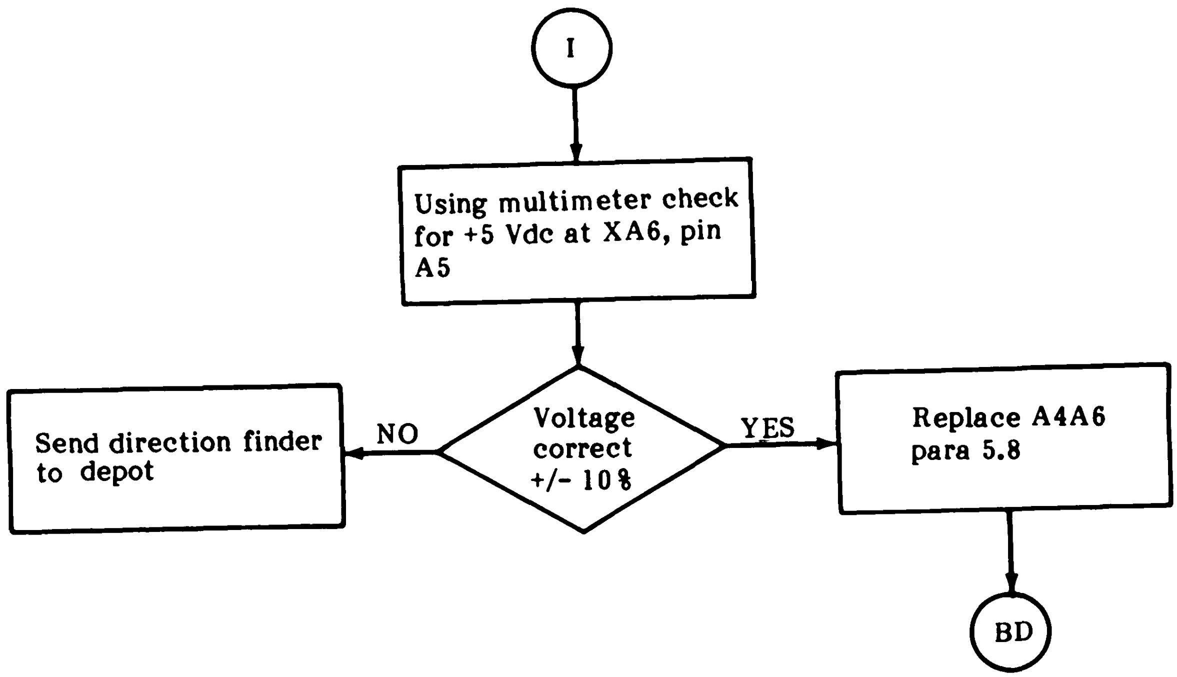

D
Using oscilloscope check for twenty-five percent duty cycle square wave of -13 Vdc to +13 Vdc at XA2, pins A19, A17, A15, and A13
Signal present voltage correct +/- 10%
NO
E
YES
Send direction finder to depot

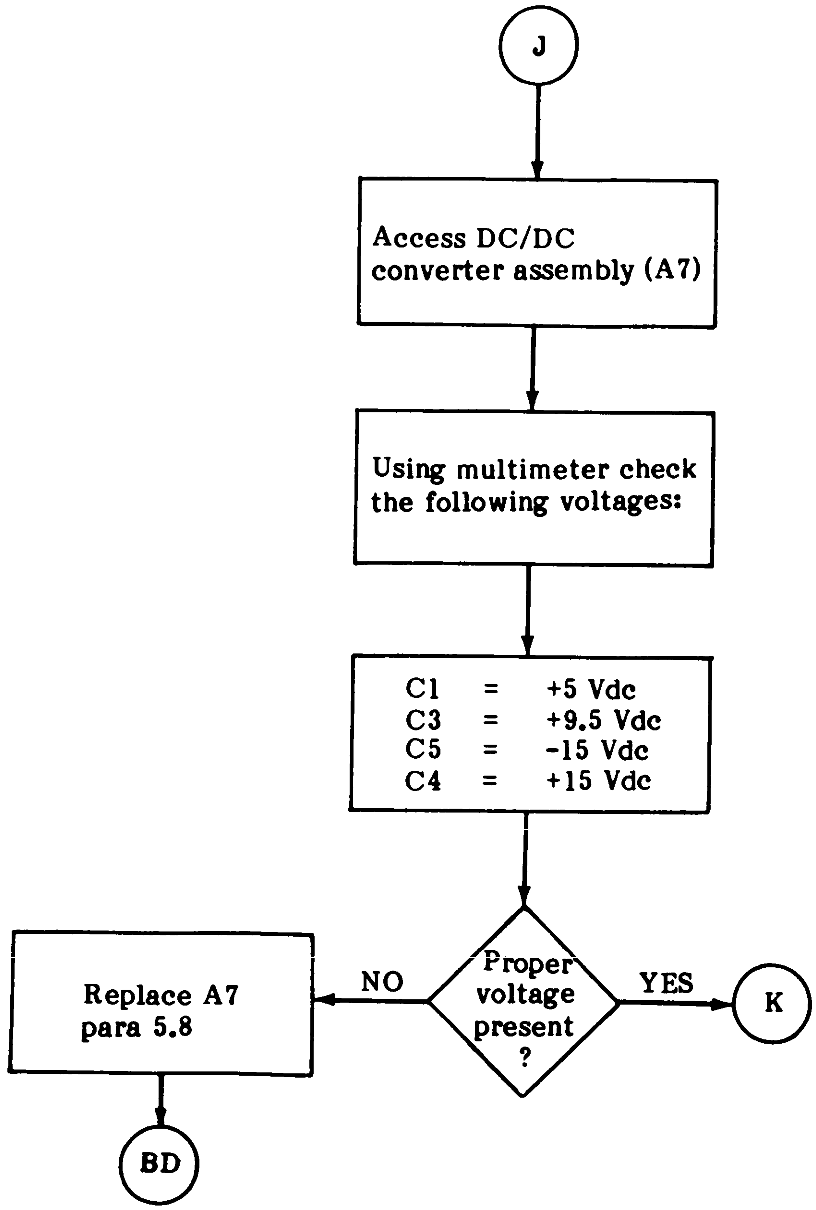

E
Using oscilloscope check for a twenty-five percent duty cycle square wave of 0.8 Vdc +/- 0.8 Vdc to 4.5 Vdc +/- 1 Vdc at XA2, pins B48, B54, B50, and B52
Signal present ?
NO
F
YES
Replace A4A2 para 5.8
BD

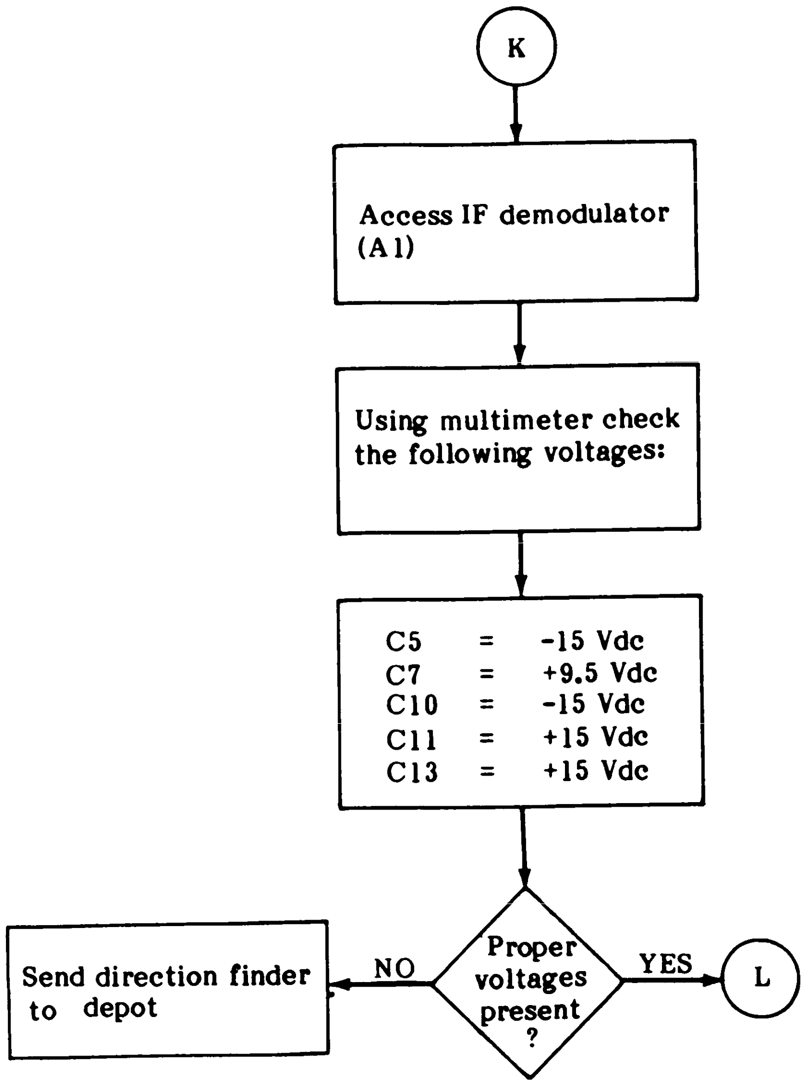

F
Using oscilloscope check for 800 Hz pulse train of 0.8 Vdc +/- 0.8 Vdc to 4.5 Vdc +/- 1 Vdc at XA3, pin B46
Frequency correct +/- 20% ?
NO
G
YES
Replace A4A3 para 5.8
BD

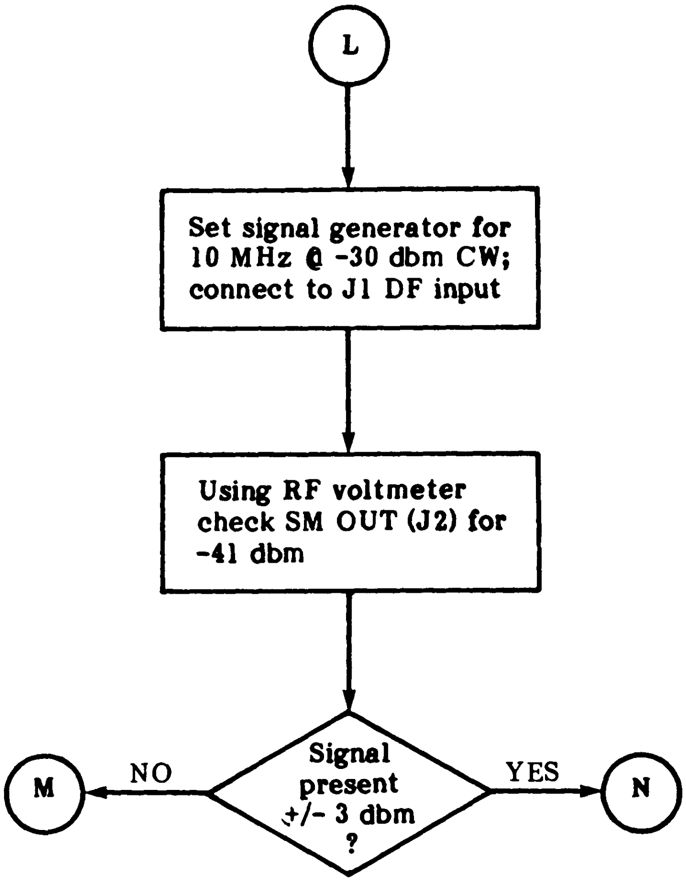

G
Using oscilloscope check for 800 Hz pulse train of 0.8 Vdc +/- 0.8 Vdc to 4.5 Vdc +/- 1 Vdc at XA3, pin B42
Frequency correct +/- 20%
NO
H
YES
Replace A4A3 para 5.8
BD

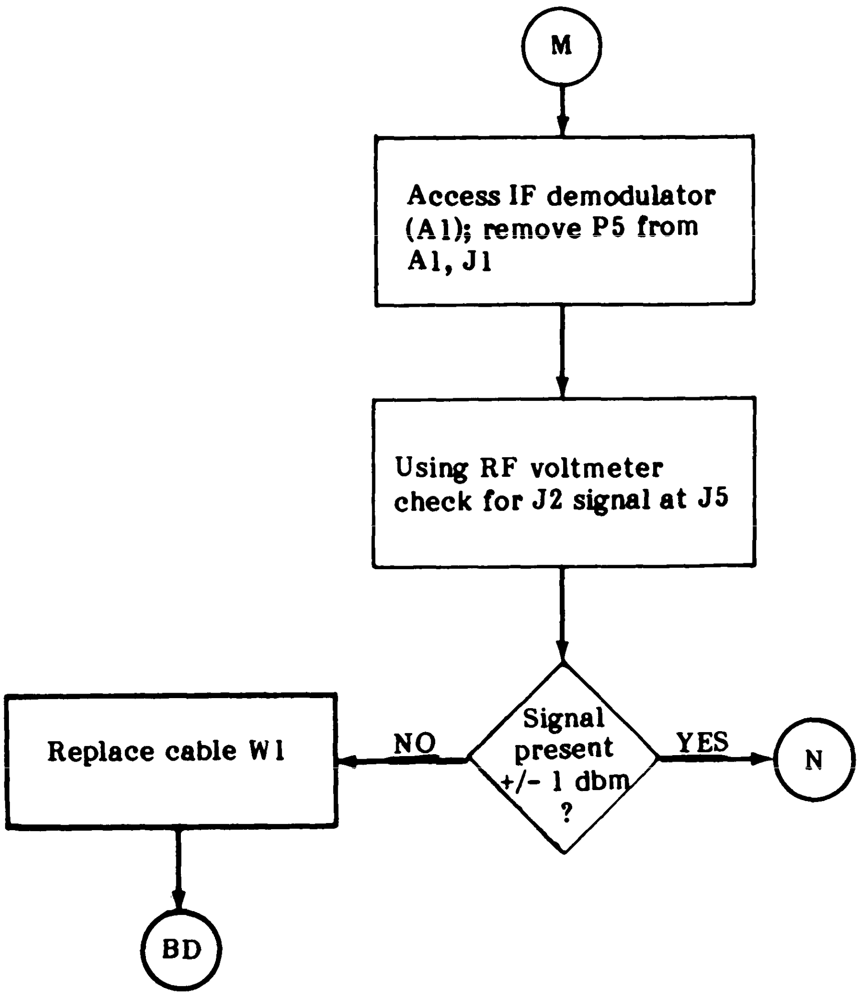

H
Using oscilloscope check for 125 kHz square wave of 0.8 Vdc +/- 0.8 Vdc to 4.0 Vdc +/- 1 Vdc at XA3, pin B43
Frequency correct +/- 20%
NO
I
YES
Replace A4A3 para 5.8
BD

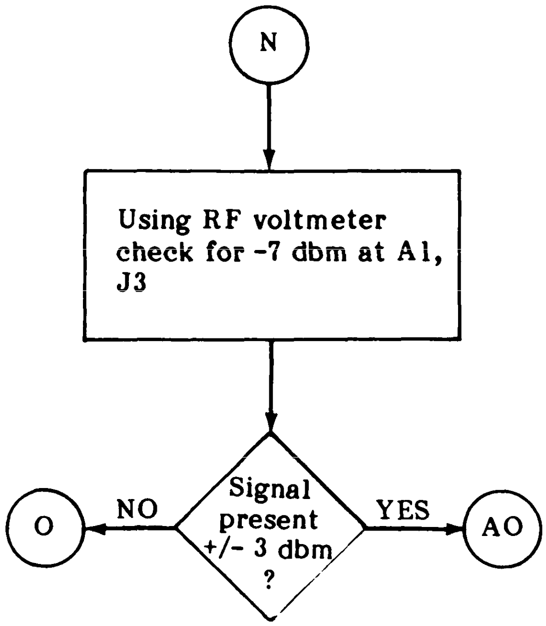

I
Using multimeter check for +5 Vdc at XA6, pin A5
Voltage correct +/- 10%
NO
Send direction finder to depot
YES
Replace A4A6 para 5.8
BD

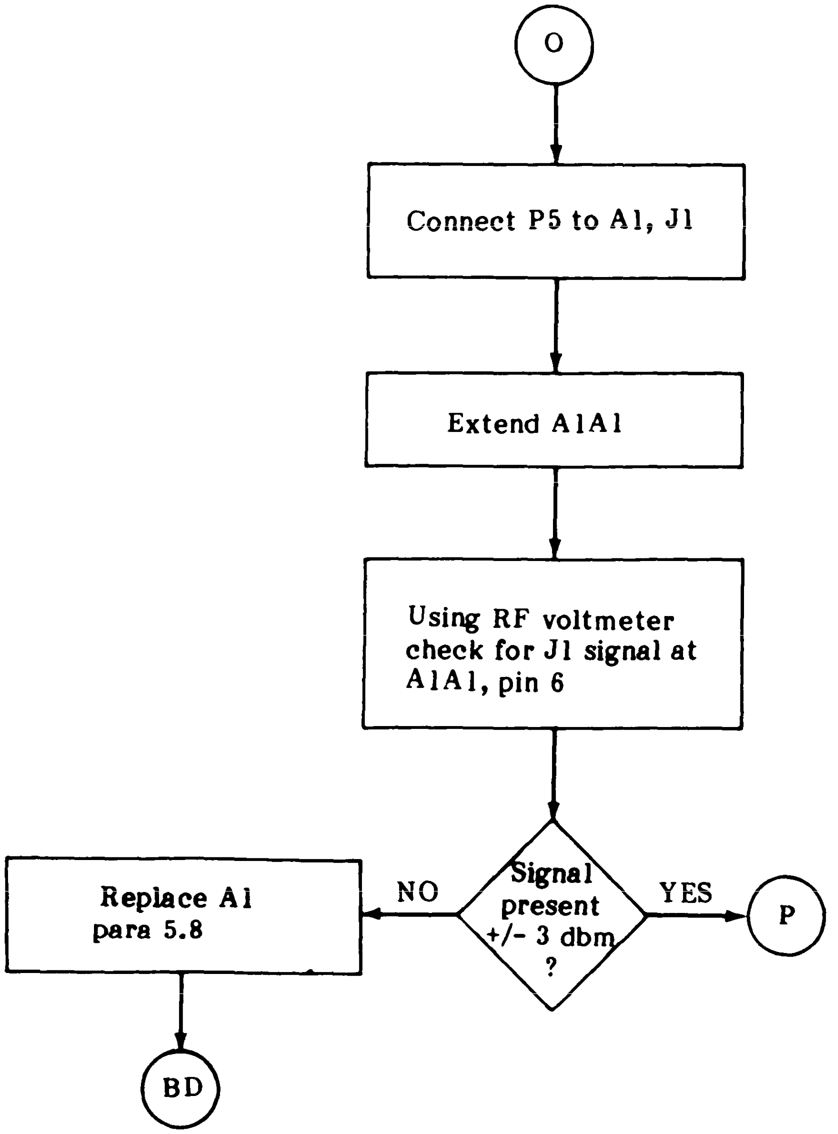

J
Access DC/DC converter assembly (A7)
Using multimeter check the following voltages:
C1 = +5 Vdc
C3 = +9.5 Vdc
C5 = -15 Vdc
C4 = +15 Vdc
Proper voltage present ?
NO
YES
K
Replace A7 para 5.8
BD

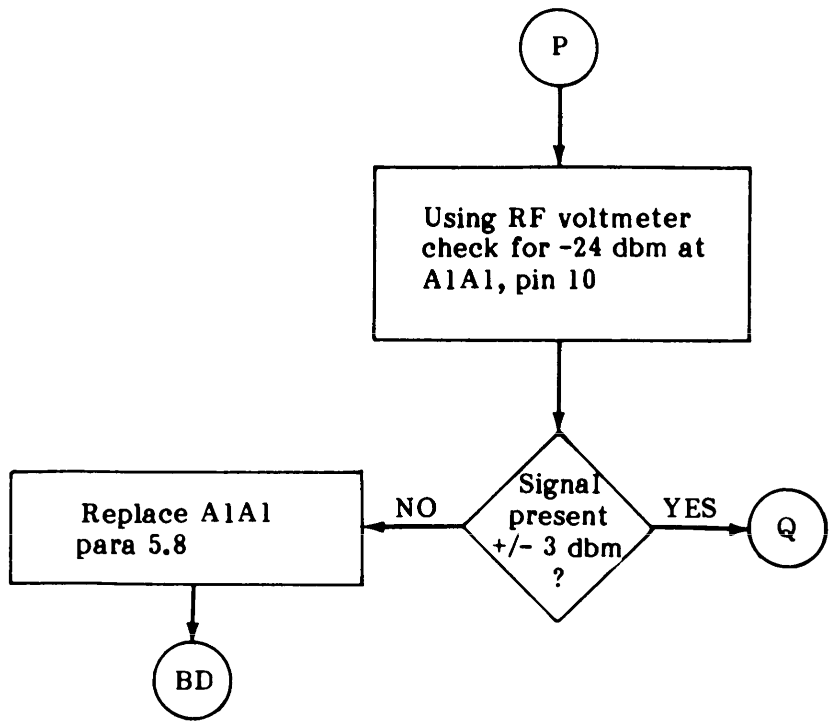

K
Access IF demodulator (A1)
Using multimeter check the following voltages:
C5 = -15 Vdc
C7 = +9.5 Vdc
C10 = -15 Vdc
C11 = +15 Vdc
C13 = +15 Vdc
Proper voltages present ?
NO
Send direction finder to depot
YES
L

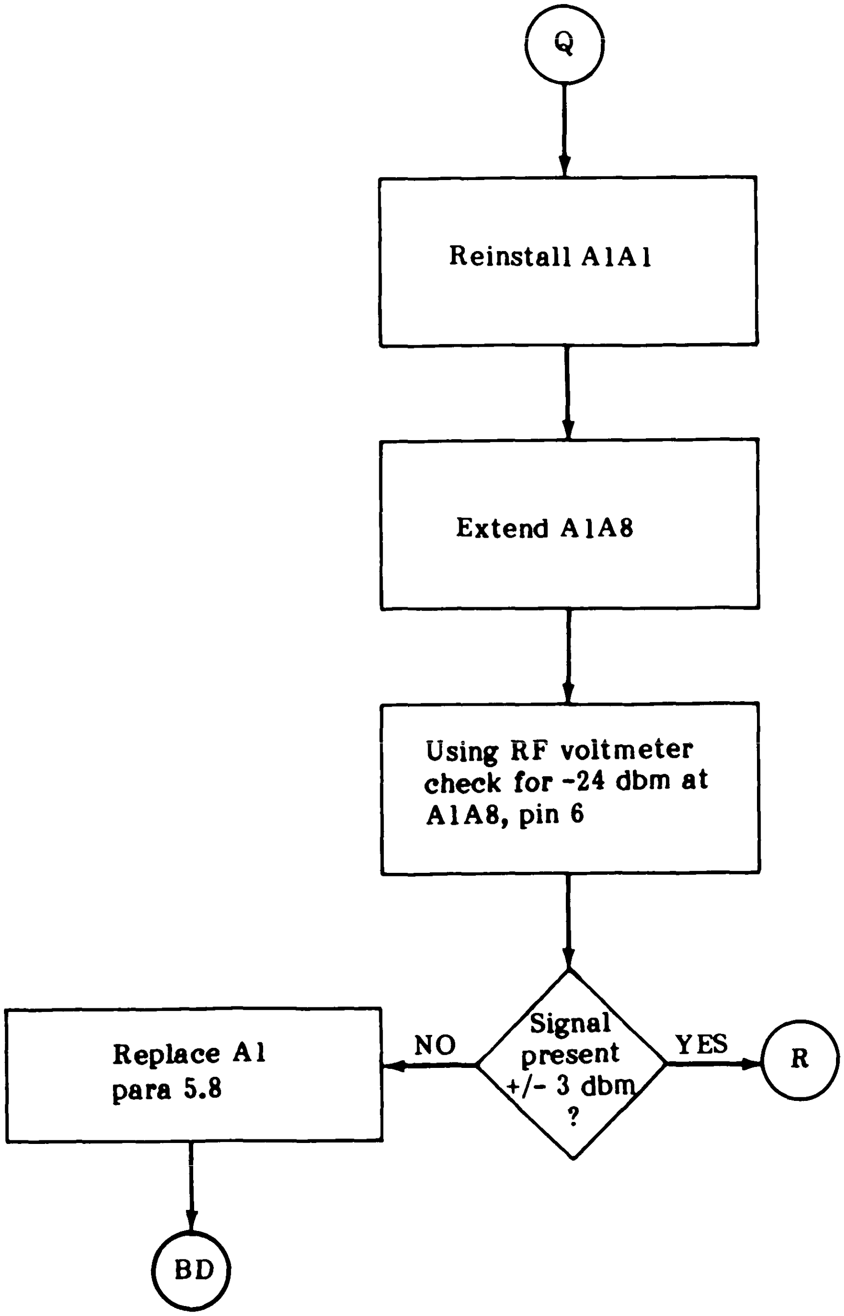

L
Set signal generator for 10 MHz @ -30 dbm CW; connect to J1 DF input
Using RF voltmeter check SM OUT (J2) for -41 dbm
Signal present +/- 3 dbm ?
NO
M
YES
N

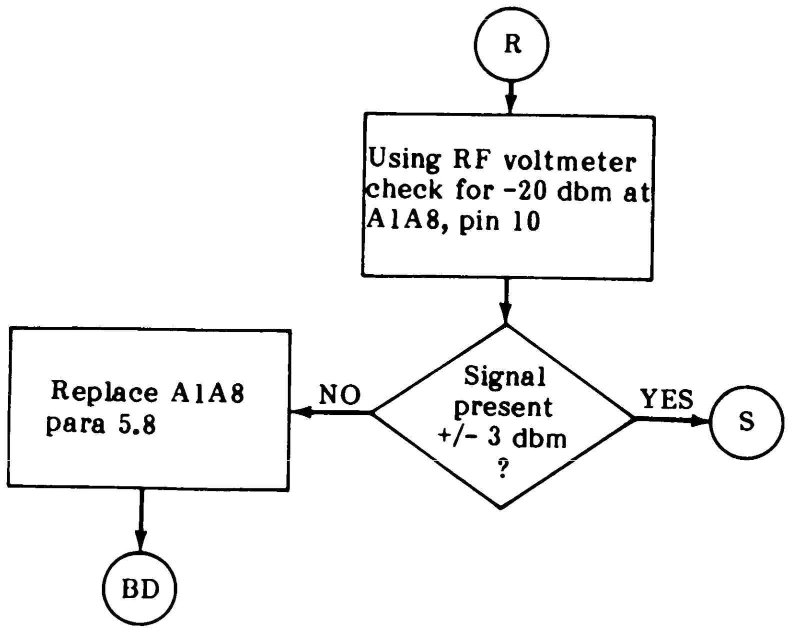

M
Access IF demodulator (A1); remove P5 from A1, J1
Using RF voltmeter check for J2 signal at J5
Signal present +/- 1 dbm ?
NO
YES
Replace cable W1
N
BD

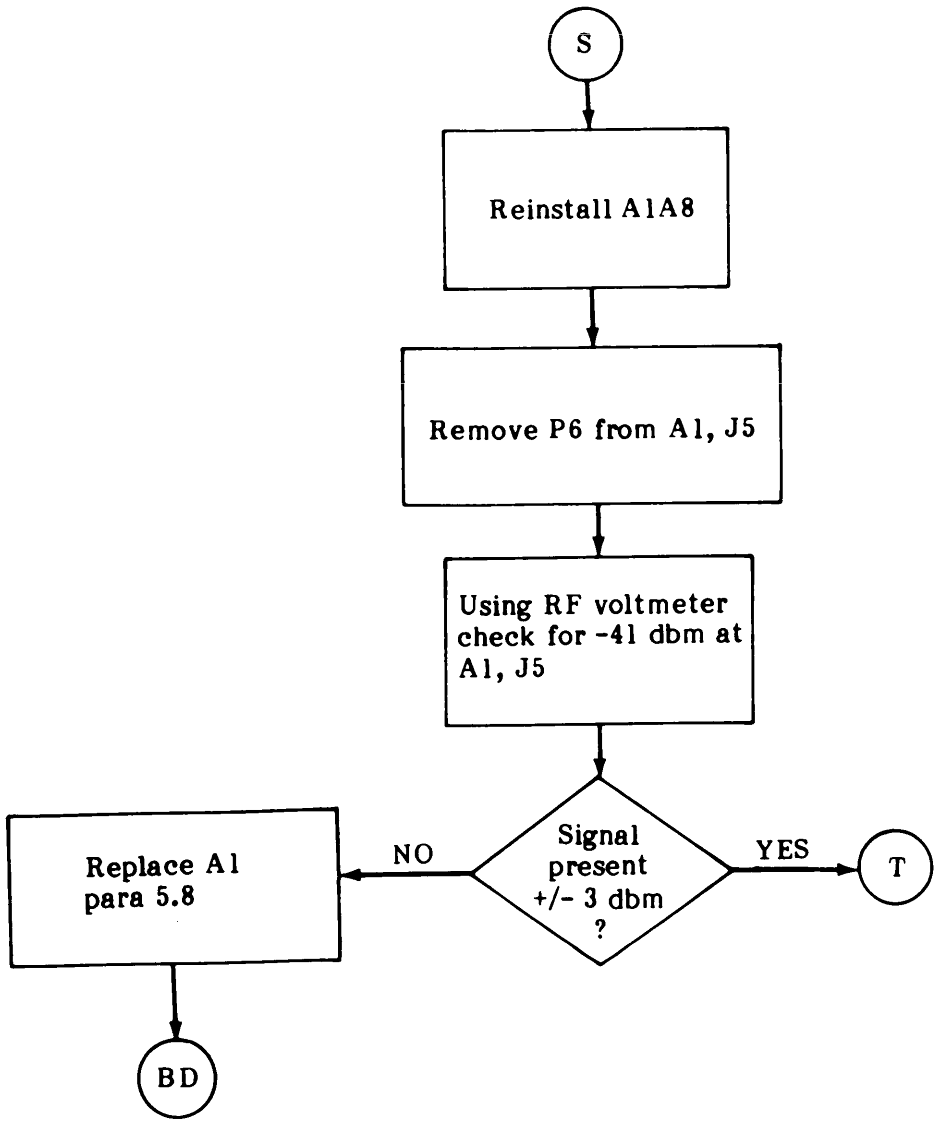

N
Using RF voltmeter check for -7 dbm at A1, J3
Signal present +/- 3 dbm ?
NO
O
YES
AO

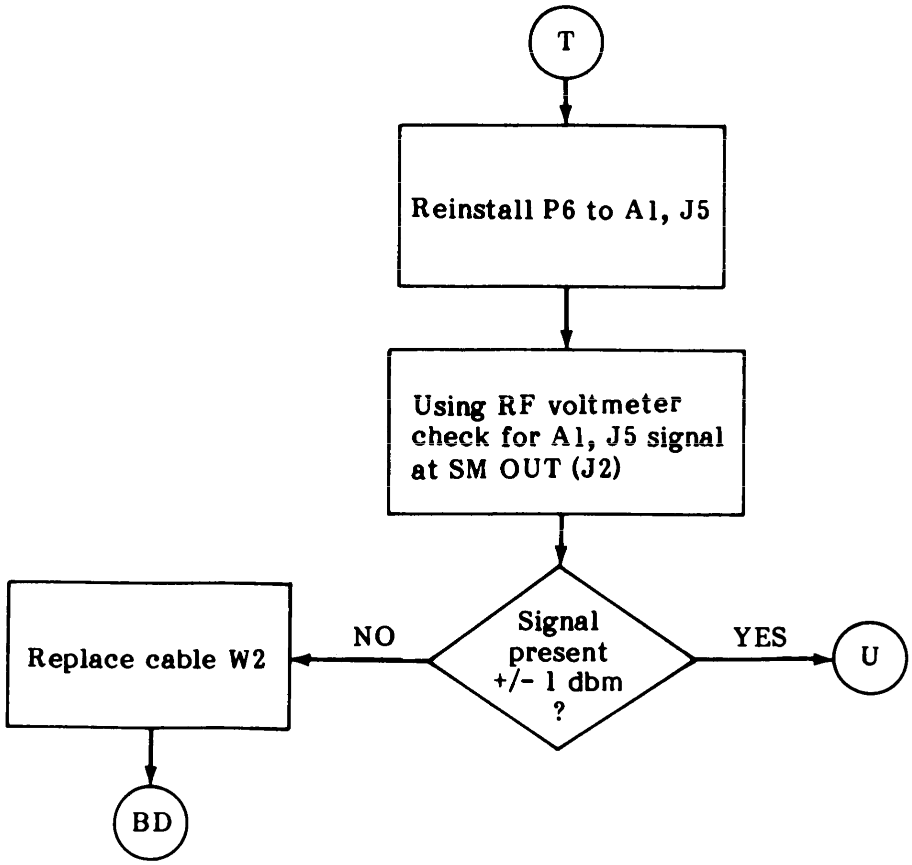

O
Connect P5 to A1, J1
Extend A1A1
Using RF voltmeter check for J1 signal at A1A1, pin 6
Signal present +/- 3 dbm ?
NO
YES
Replace A1 para 5.8
P
BD

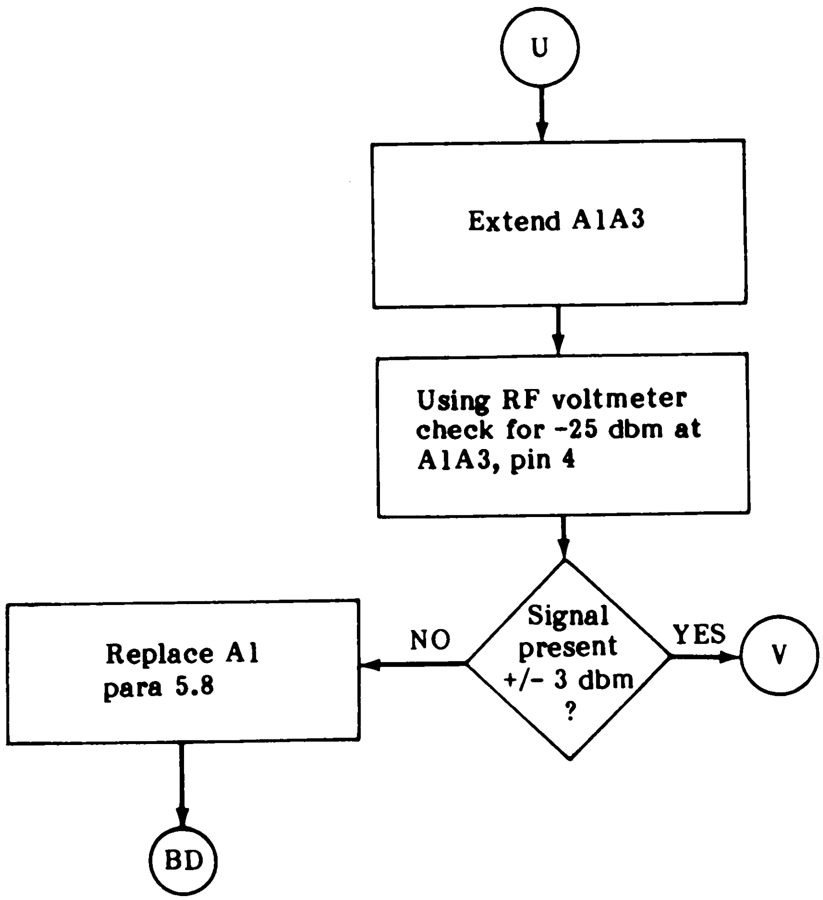

P
Using RF voltmeter check for -24 dbm at A1A1, pin 10
Signal present +/- 3 dbm ?
NO
YES
Q
Replace A1A1 para 5.8
BD

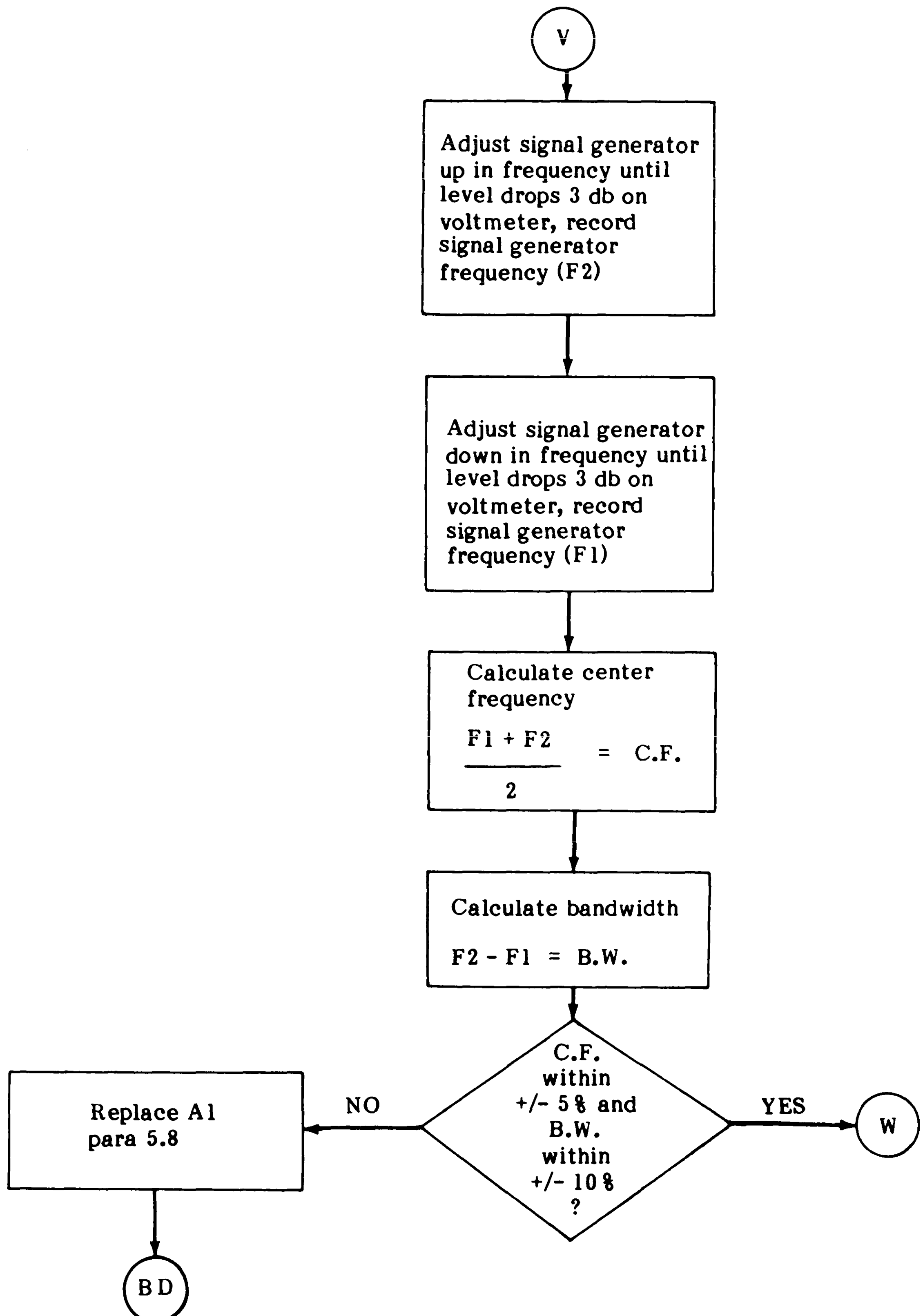

Q
Reinstall A1A1
Extend A1A8
Using RF voltmeter check for -24 dbm at A1A8, pin 6
Signal present +/- 3 dbm ?
NO
YES
Replace A1 para 5.8
R
BD

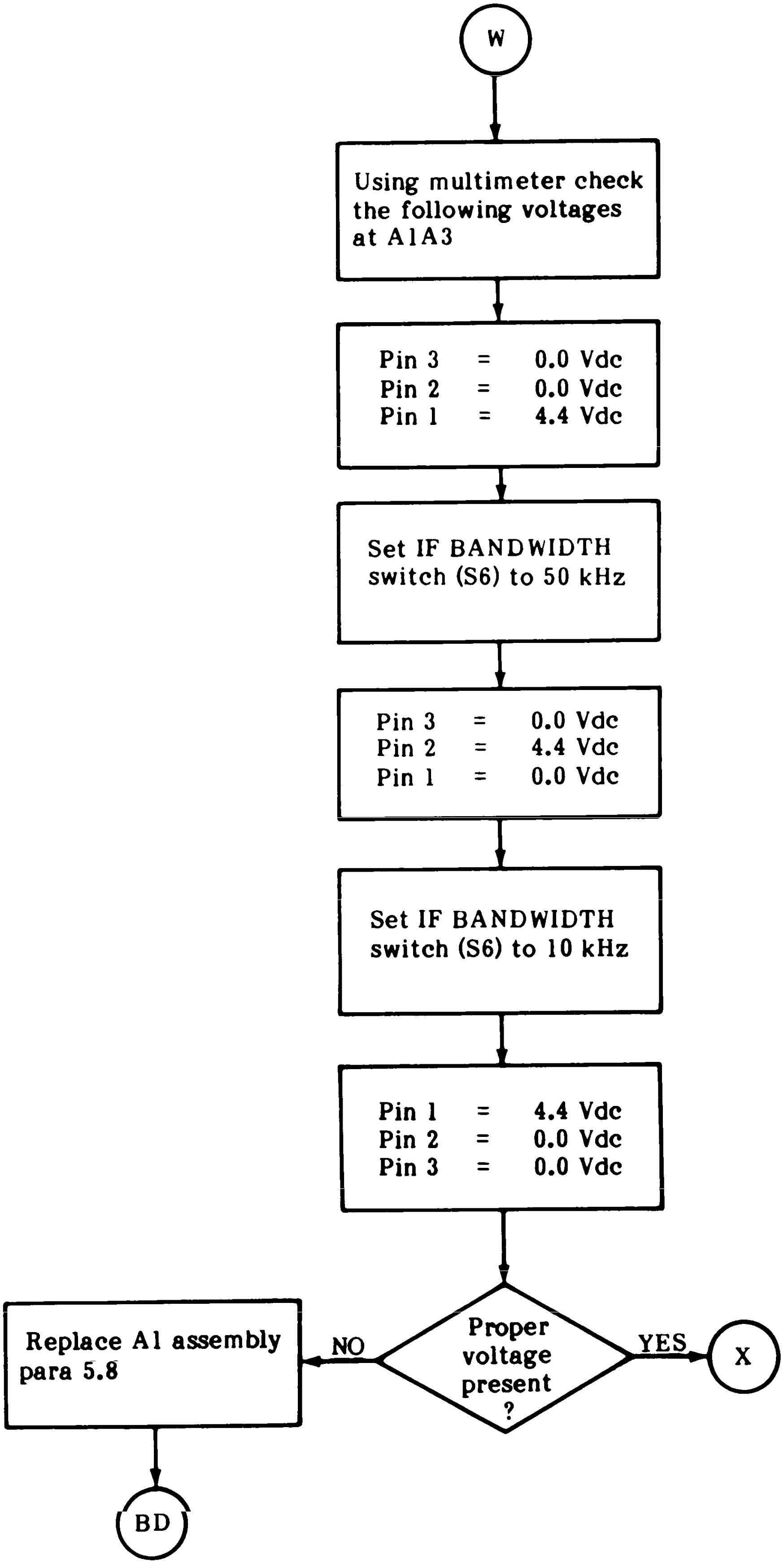

R
Using RF voltmeter check for -20 dbm at A1A8, pin 10
Signal present +/- 3 dbm ?
NO
YES
S
Replace A1A8 para 5.8
BD

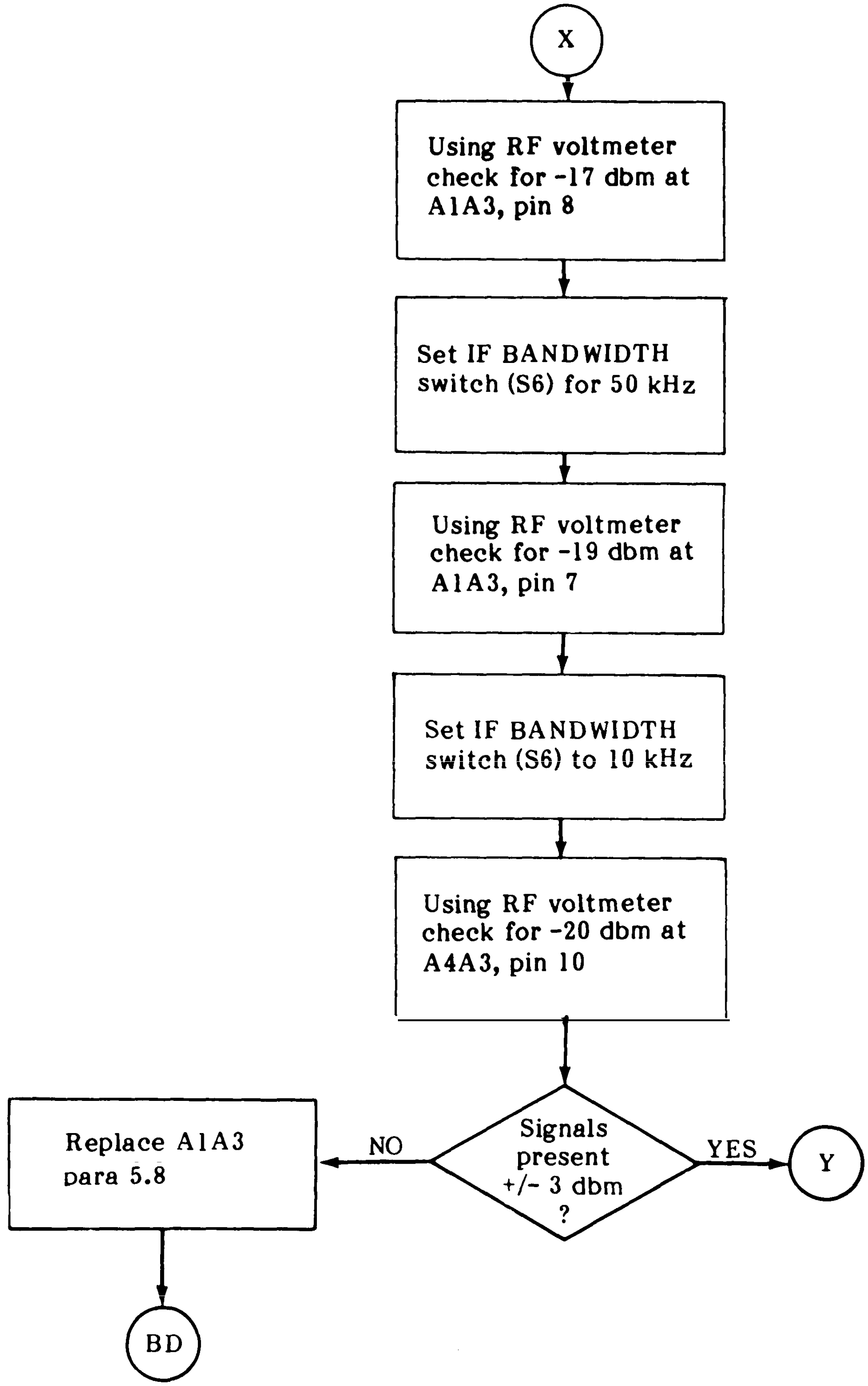

S
Reinstall A1A8
Remove P6 from A1, J5
Using RF voltmeter check for -41 dbm at A1, J5
Signal present +/- 3 dbm ?
NO
YES
T
Replace A1 para 5.8
BD

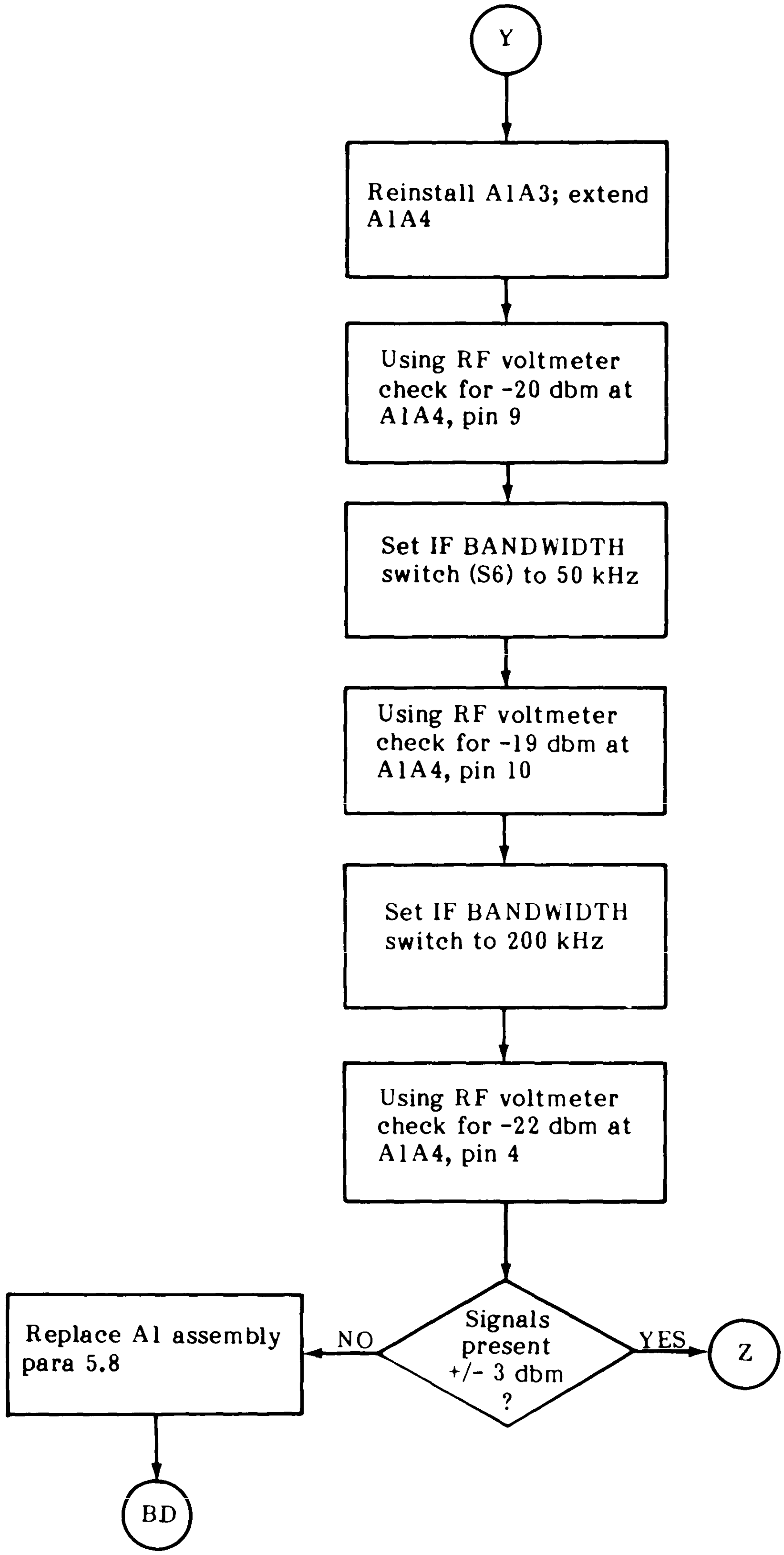

T
Reinstall P6 to A1, J5
Using RF voltmeter check for A1, J5 signal at SM OUT (J2)
Signal present +/- 1 dbm ?
NO
YES
U
Replace cable W2
BD

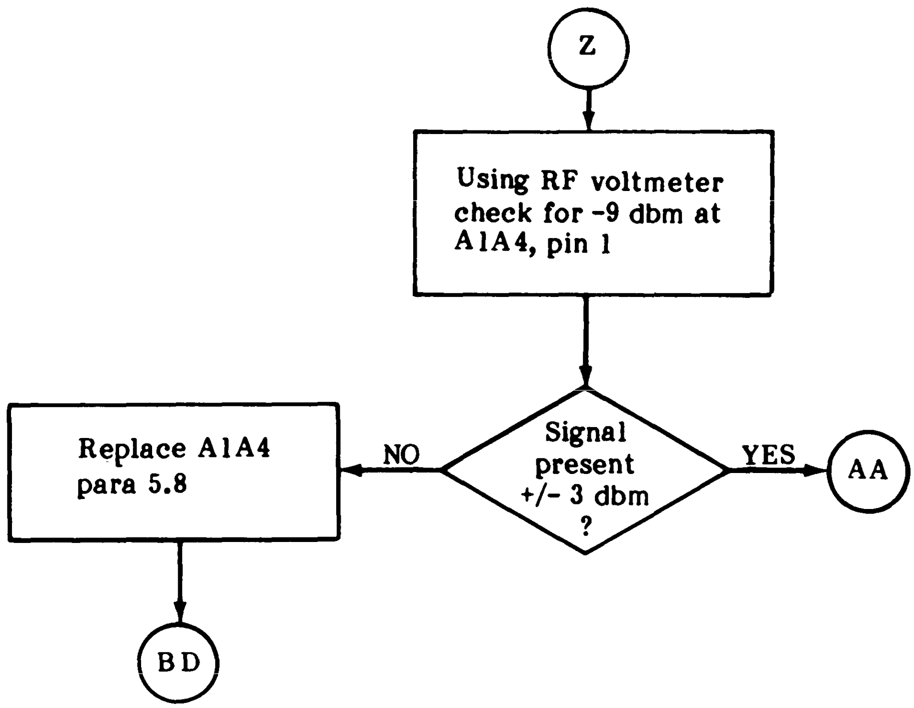

U
Extend A1A3
Using RF voltmeter check for -25 dbm at A1A3, pin 4
Signal present +/- 3 dbm ?
NO
YES
V
Replace A1 para 5.8
BD

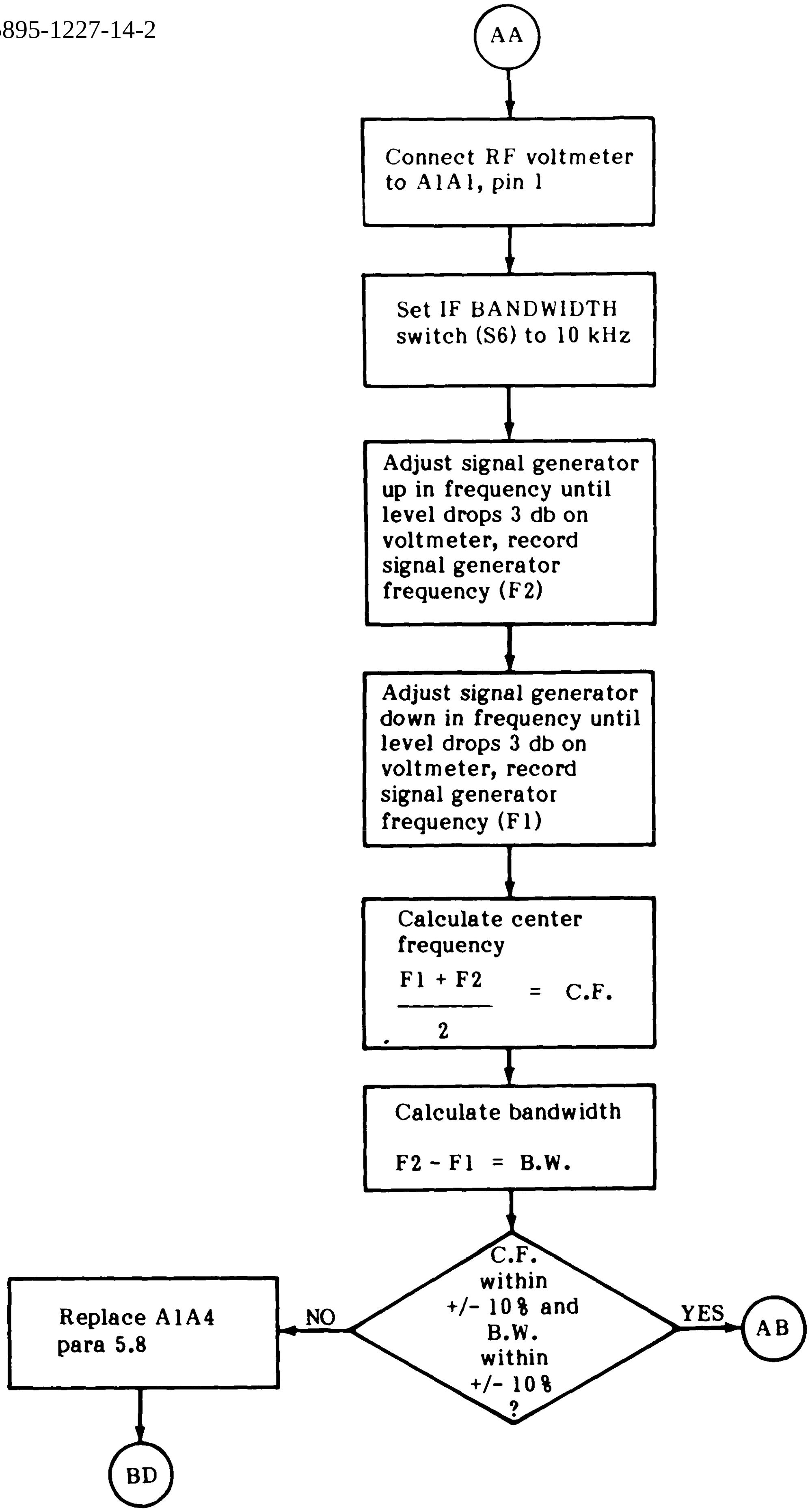

V
Adjust signal generator up in frequency until level drops 3 db on voltmeter, record signal generator frequency (F2)
Adjust signal generator down in frequency until level drops 3 db on voltmeter, record signal generator frequency (F1)
Calculate center frequency
$\frac{F1 + F2}{2}$ = C.F.
Calculate bandwidth
F2 - F1 = B.W.
C.F. within +/- 5% and B.W. within +/- 10% ?
NO
YES
Replace A1 para 5.8
W
BD

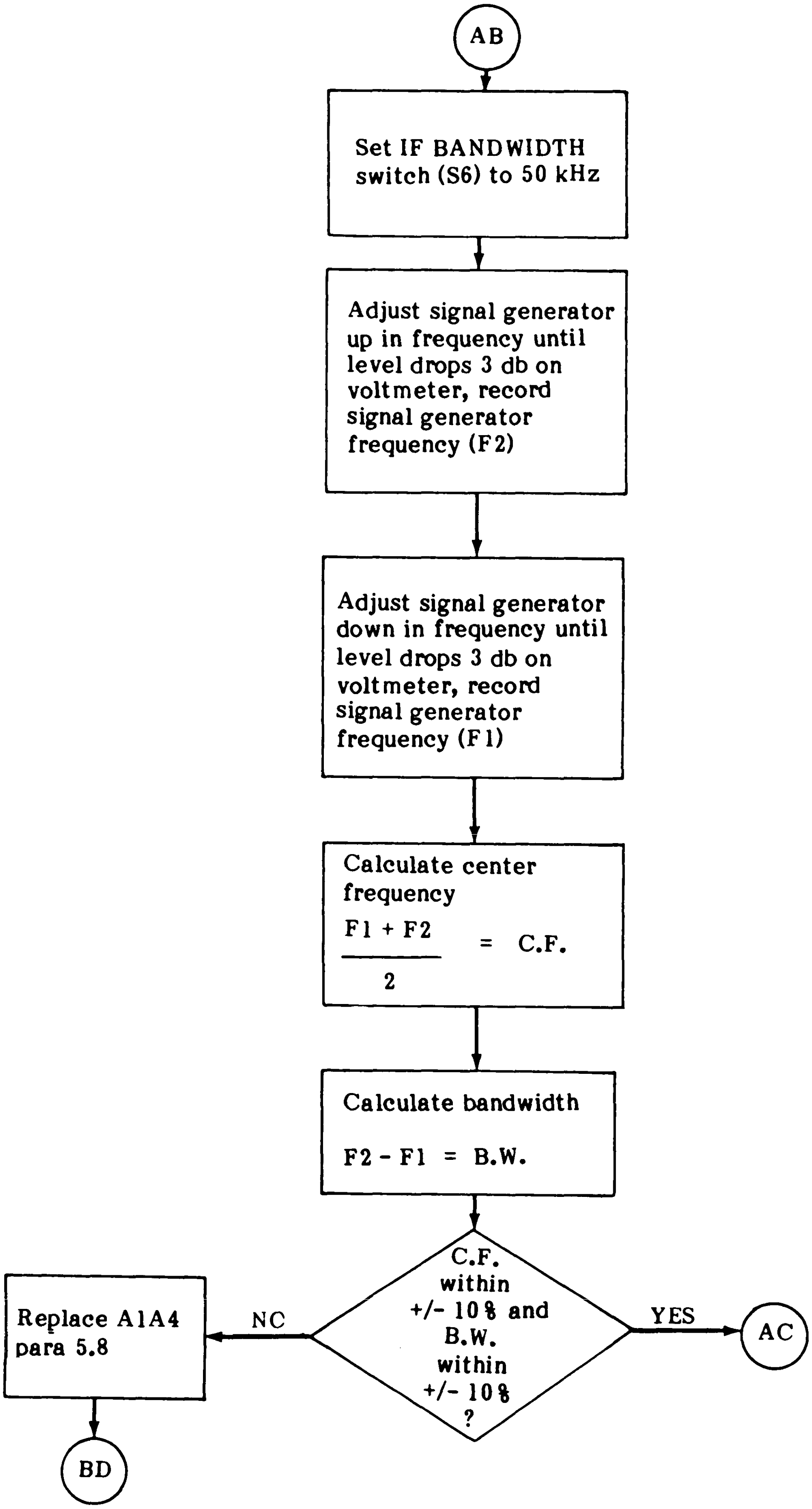

W
Using multimeter check the following voltages at A1A3
Pin 3 = 0.0 Vdc
Pin 2 = 0.0 Vdc
Pin 1 = 4.4 Vdc
Set IF BANDWIDTH switch (S6) to 50 kHz
Pin 3 = 0.0 Vdc
Pin 2 = 4.4 Vdc
Pin 1 = 0.0 Vdc
Set IF BANDWIDTH switch (S6) to 10 kHz
Pin 1 = 4.4 Vdc
Pin 2 = 0.0 Vdc
Pin 3 = 0.0 Vdc
Proper voltage present ?
NO
YES
X
Replace A1 assembly para 5.8
BD

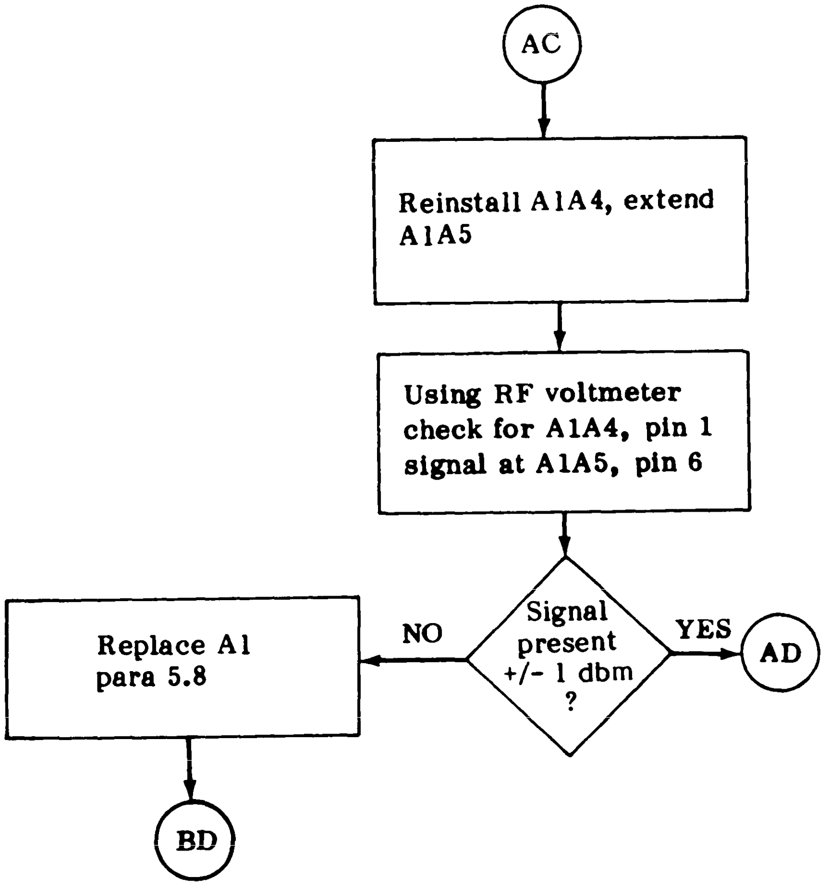

X
Using RF voltmeter check for -17 dbm at A1A3, pin 8
Set IF BANDWIDTH switch (S6) for 50 kHz
Using RF voltmeter check for -19 dbm at A1A3, pin 7
Set IF BANDWIDTH switch (S6) to 10 kHz
Using RF voltmeter check for -20 dbm at A4A3, pin 10
Signals present +/- 3 dbm ?
NO
YES
Y
Replace A1A3 para 5.8
BD

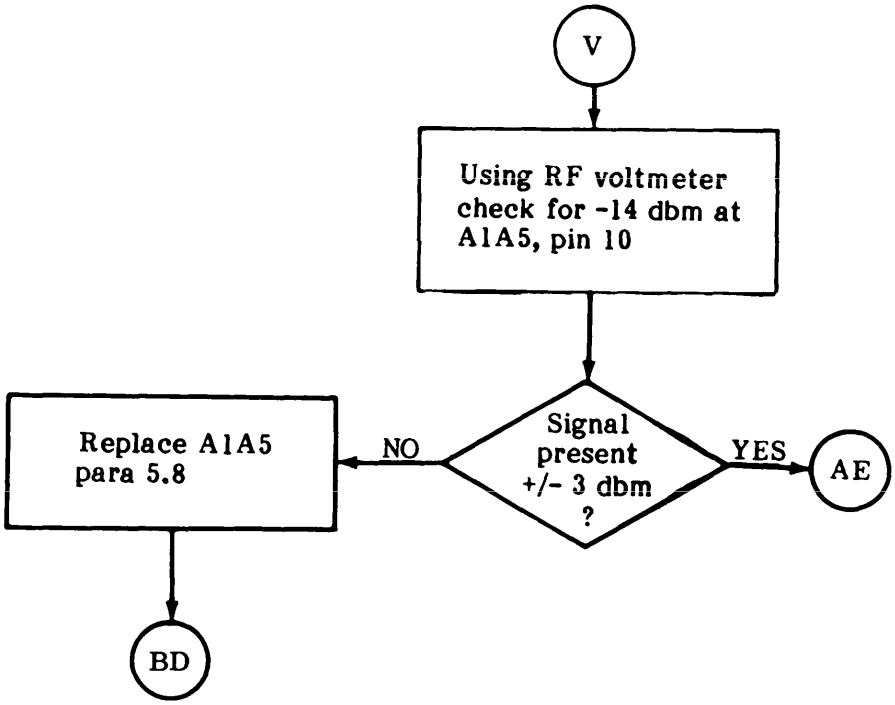

Y
Reinstall A1A3; extend A1A4
Using RF voltmeter check for -20 dbm at A1A4, pin 9
Set IF BANDWIDTH switch (S6) to 50 kHz
Using RF voltmeter check for -19 dbm at A1A4, pin 10
Set IF BANDWIDTH switch to 200 kHz
Using RF voltmeter check for -22 dbm at A1A4, pin 4
Signals present +/- 3 dbm ?
NO
Replace A1 assembly para 5.8
BD
YES
Z

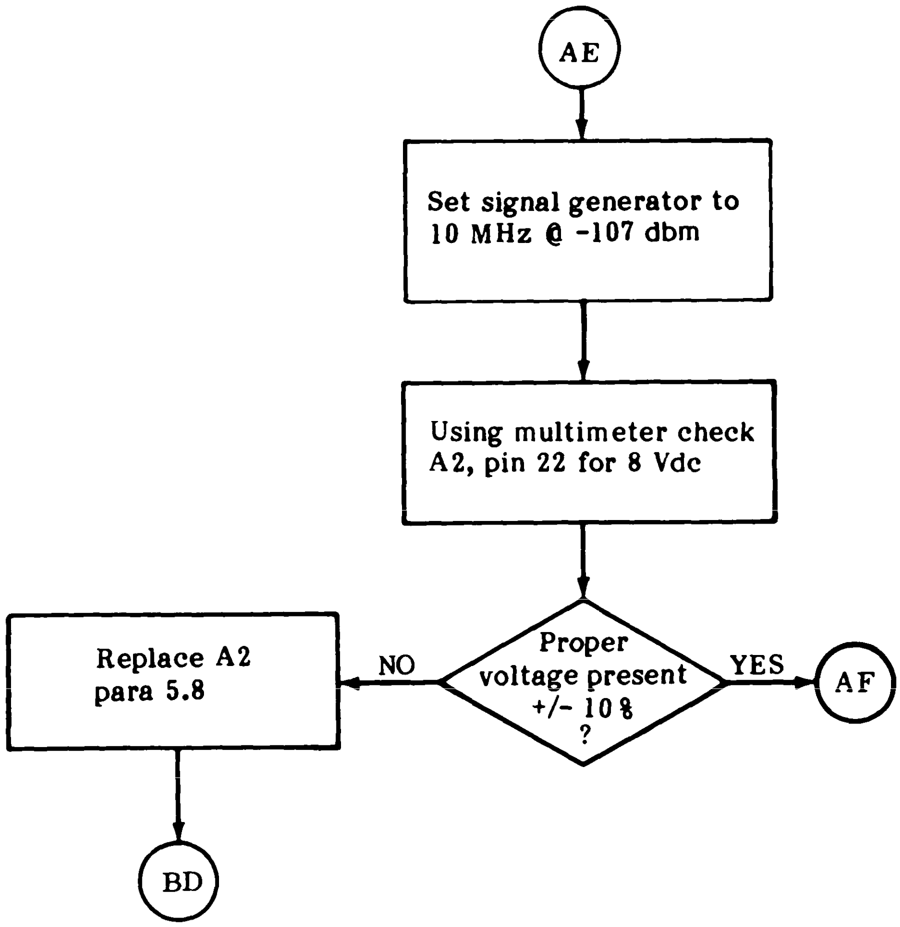

Z
Using RF voltmeter check for -9 dbm at A1A4, pin 1
Signal present +/- 3 dbm ?
NO
YES
AA
Replace A1A4 para 5.8
BD

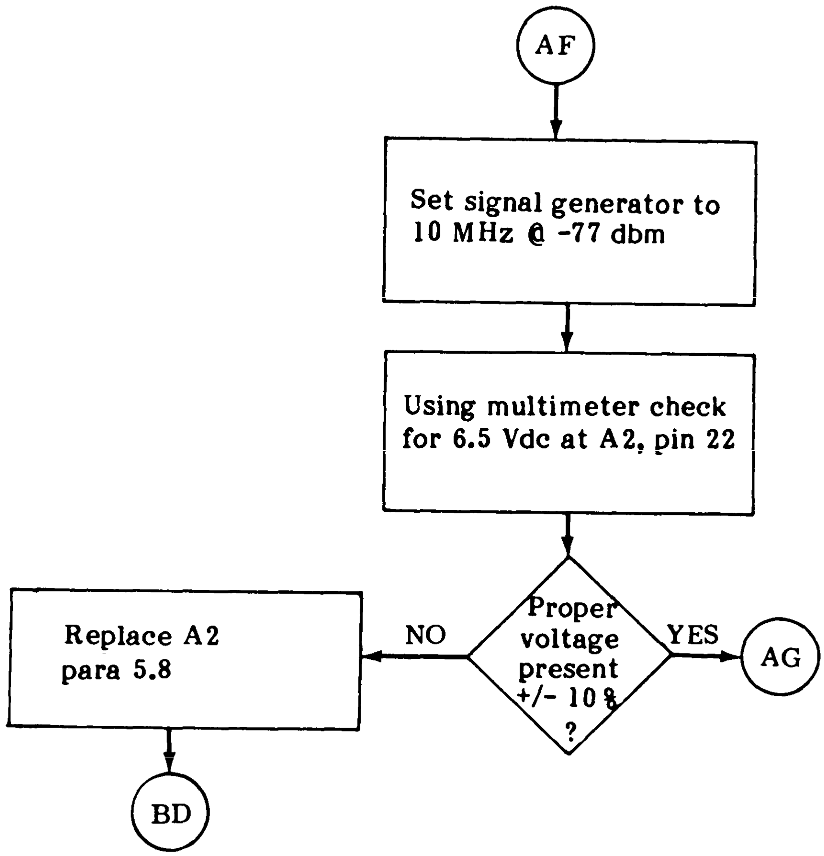

AA
Connect RF voltmeter to A1A1, pin 1
Set IF BANDWIDTH switch (S6) to 10 kHz
Adjust signal generator up in frequency until level drops 3 db on voltmeter, record signal generator frequency (F2)
Adjust signal generator down in frequency until level drops 3 db on voltmeter, record signal generator frequency (F1)
Calculate center frequency
F1 + F2 / 2 = C.F.
Calculate bandwidth
F2 - F1 = B.W.
C.F. within +/- 10% and B.W. within +/- 10% ?
YES
AB
NO
Replace A1A4 para 5.8
BD

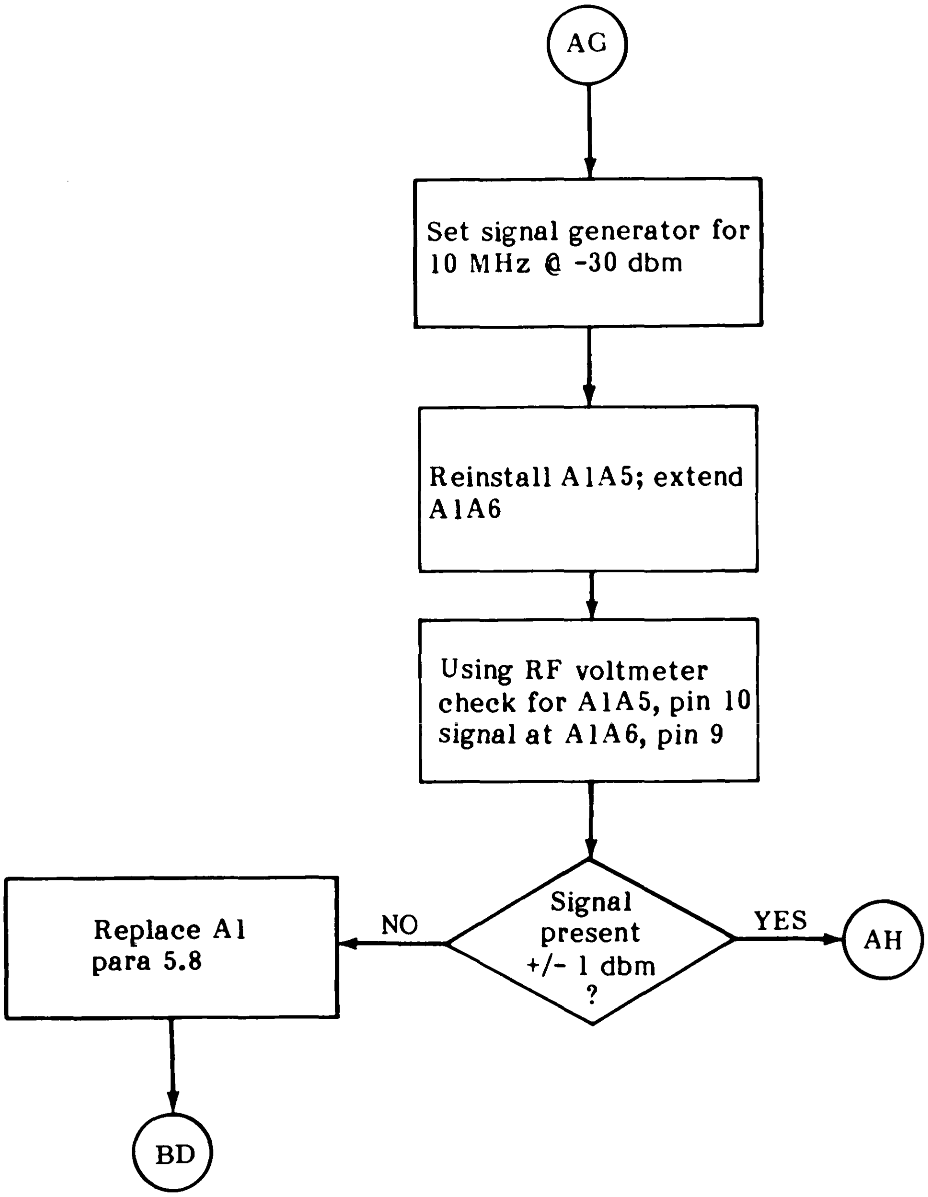

AB
Set IF BANDWIDTH switch (S6) to 50 kHz
Adjust signal generator up in frequency until level drops 3 db on voltmeter, record signal generator frequency (F2)
Adjust signal generator down in frequency until level drops 3 db on voltmeter, record signal generator frequency (F1)
Calculate center frequency
$\frac{F1 + F2}{2} = C.F.$
Calculate bandwidth
F2 - F1 = B.W.
C.F. within +/- 10% and B.W. within +/- 10% ?
NC
Replace A1A4 para 5.8
BD
YES
AC

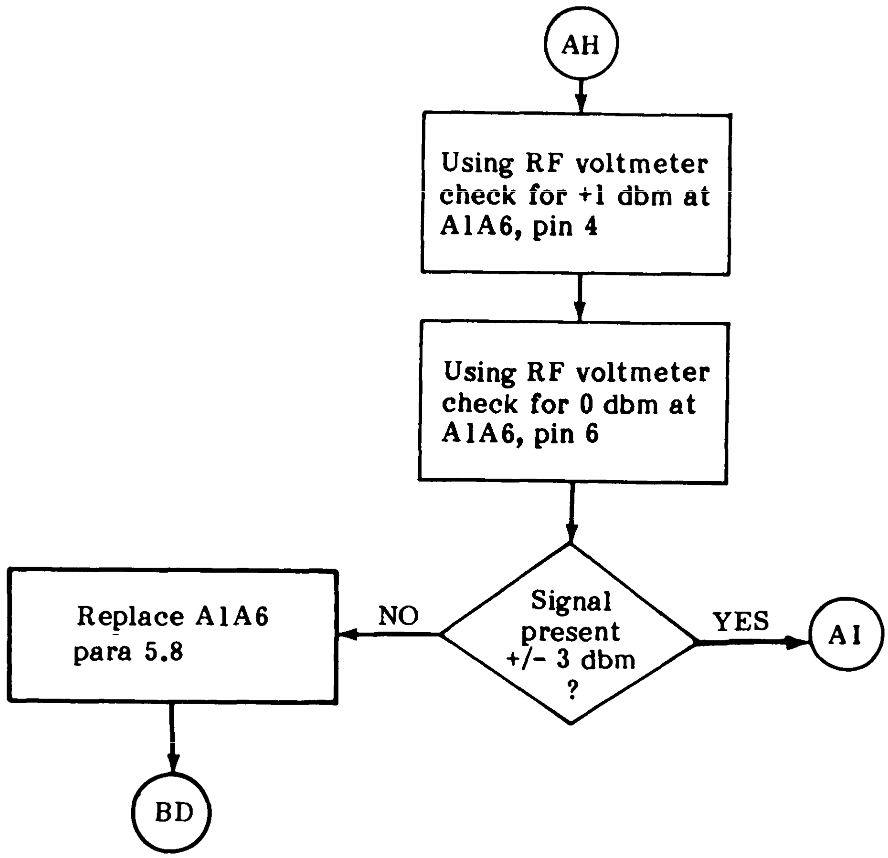

AC
Reinstall A1A4, extend A1A5
Using RF voltmeter check for A1A4, pin 1 signal at A1A5, pin 6
Signal present +/- 1 dbm ?
NO
YES
AD
Replace A1 para 5.8
BD

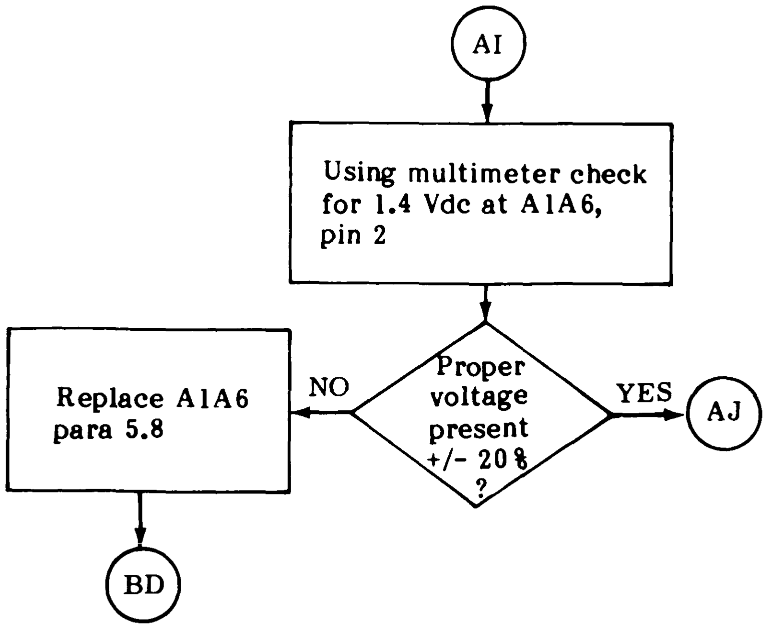

V
Using RF voltmeter check for -14 dbm at A1A5, pin 10
Signal present +/- 3 dbm ?
NO
YES
AE
Replace A1A5 para 5.8
BD

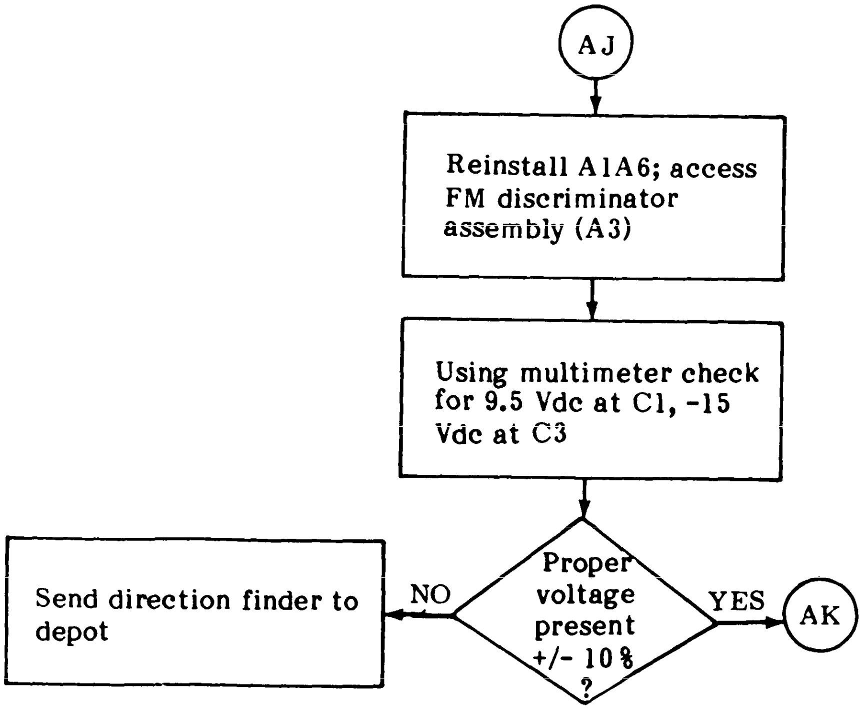

AE
Set signal generator to
10 MHz @ -107 dbm
Using multimeter check
A2, pin 22 for 8 Vdc
Proper
voltage present
+/- 10 %
?
NO
YES
AF
Replace A2
para 5.8
BD

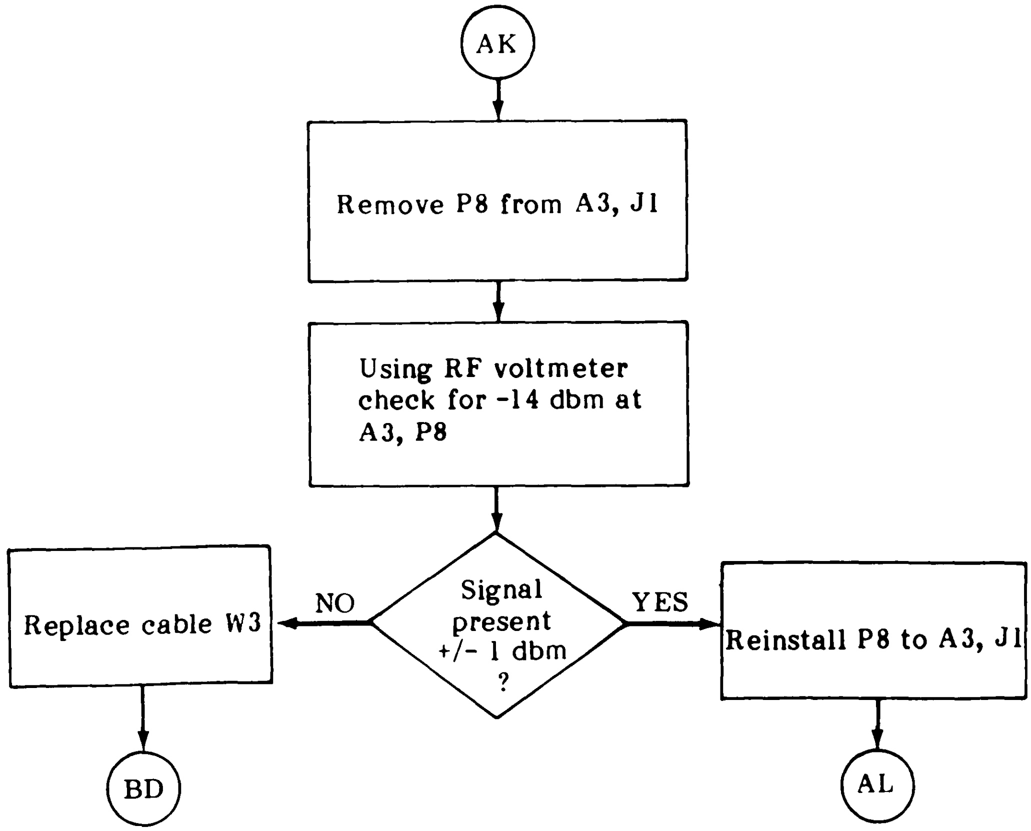

AF
Set signal generator to 10 MHz @ -77 dbm
Using multimeter check for 6.5 Vdc at A2, pin 22
Proper voltage present +/- 10%?
NO
YES
AG
Replace A2 para 5.8
BD

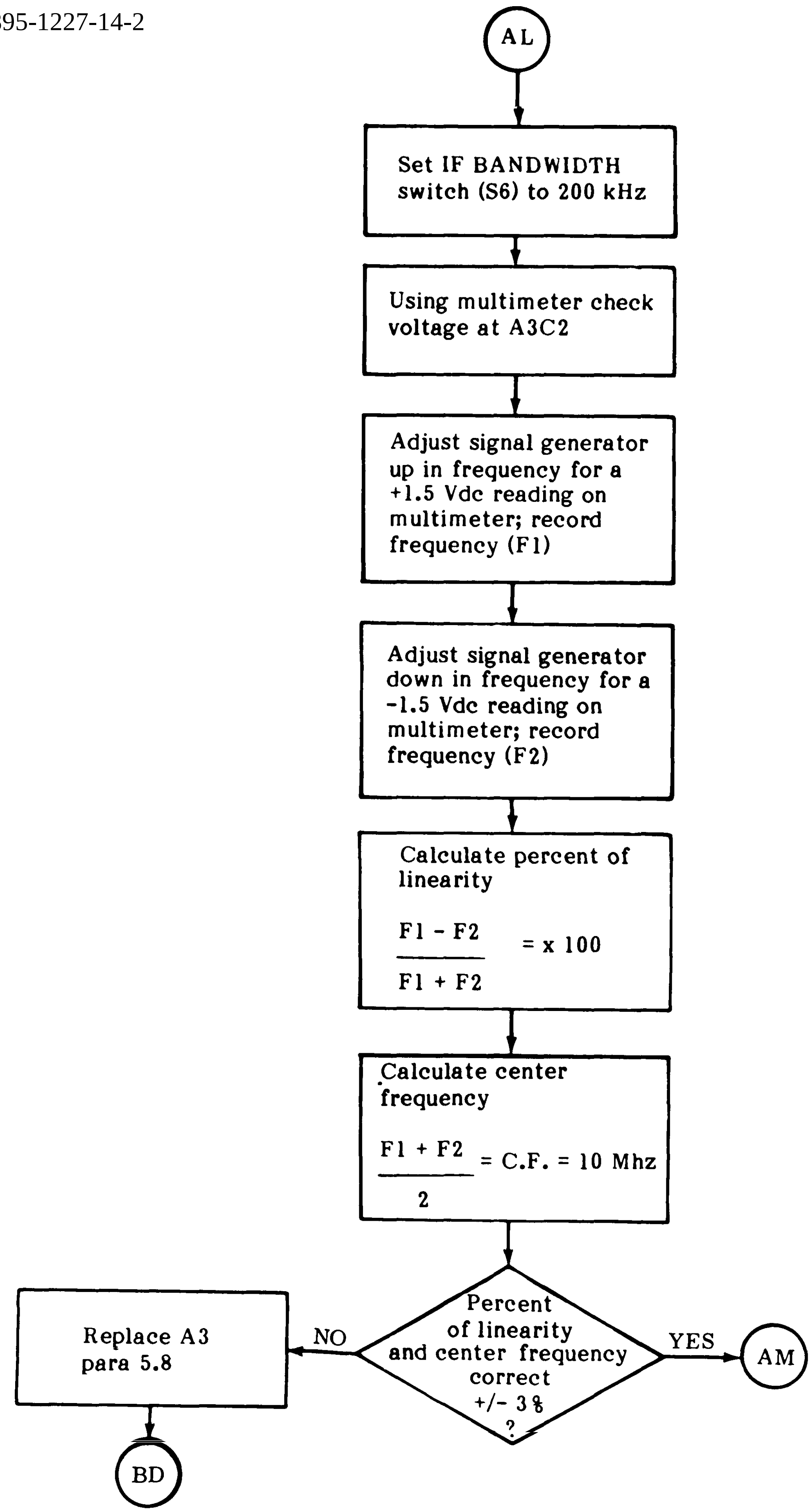

AG
Set signal generator for 10 MHz @ -30 dbm
Reinstall A1A5; extend A1A6
Using RF voltmeter check for A1A5, pin 10 signal at A1A6, pin 9
Signal present +/- 1 dbm ?
NO
YES
Replace A1 para 5.8
AH
BD

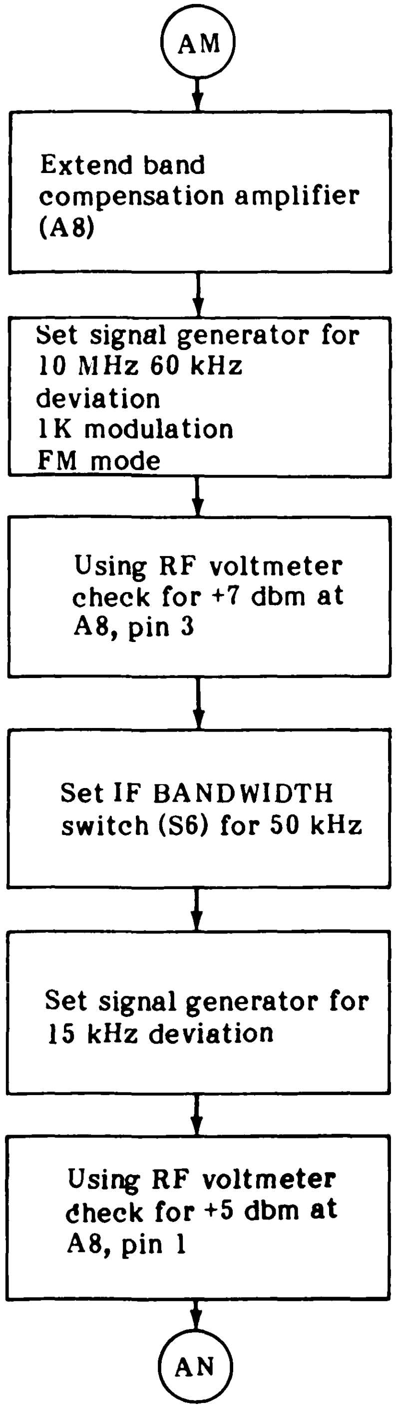

AH
Using RF voltmeter check for +1 dbm at A1A6, pin 4
Using RF voltmeter check for 0 dbm at A1A6, pin 6
Signal present +/- 3 dbm ?
NO
YES
Replace A1A6 para 5.8
AI
BD

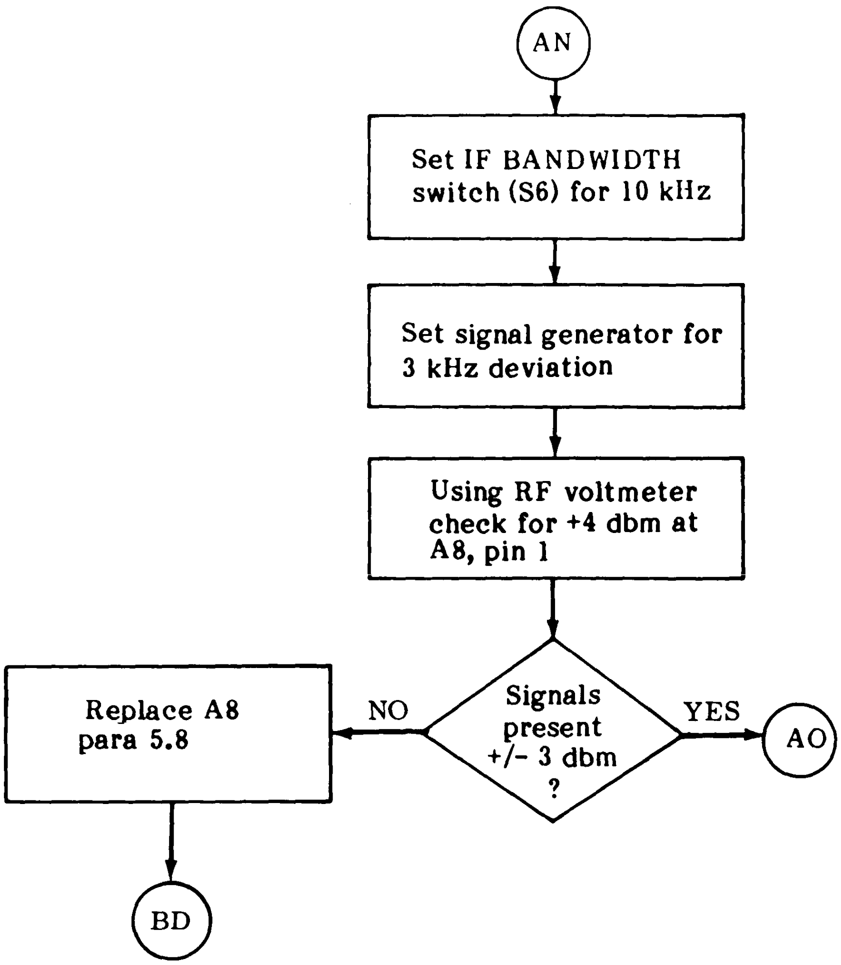

AI
Using multimeter check for 1.4 Vdc at A1A6, pin 2
Proper voltage present +/- 20% ?
NO
YES
Replace A1A6 para 5.8
AJ
BD

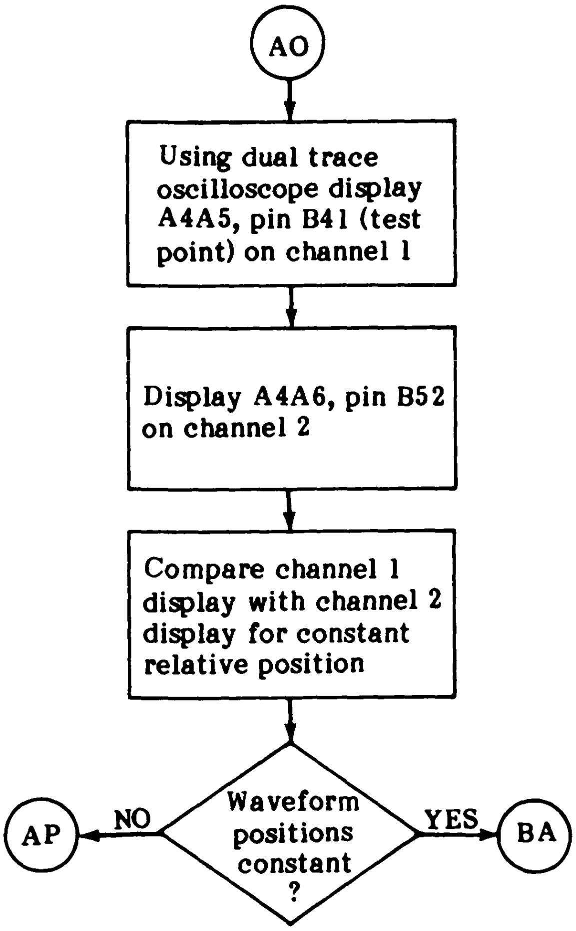

AJ
Reinstall A1A6; access FM discriminator assembly (A3)
Using multimeter check for 9.5 Vdc at C1, -15 Vdc at C3
Proper voltage present +/- 10% ?
NO
Send direction finder to depot
YES
AK

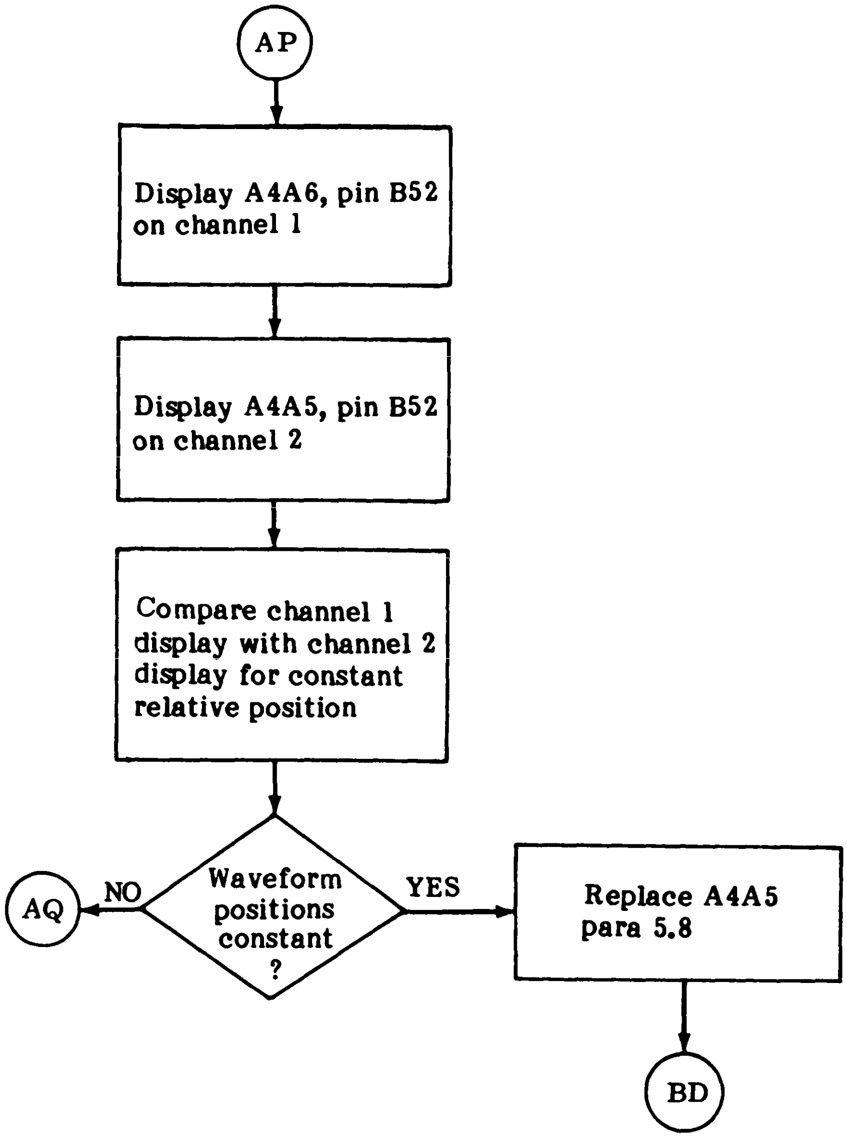

AK
Remove P8 from A3, J1
Using RF voltmeter check for -14 dbm at A3, P8
Signal present +/- 1 dbm ?
NO
YES
Replace cable W3
Reinstall P8 to A3, J1
BD
AL

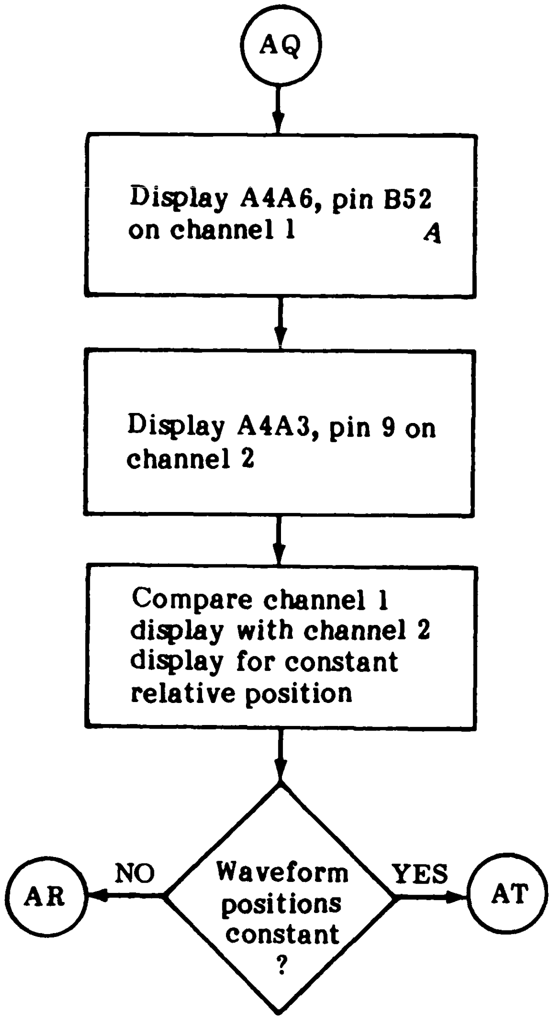

AL
Set IF BANDWIDTH switch (S6) to 200 kHz
Using multimeter check voltage at A3C2
Adjust signal generator up in frequency for a +1.5 Vdc reading on multimeter; record frequency (F1)
Adjust signal generator down in frequency for a -1.5 Vdc reading on multimeter; record frequency (F2)
Calculate percent of linearity
$\frac{F1 - F2}{F1 + F2} = x\ 100$
Calculate center frequency
$\frac{F1 + F2}{2} = C.F. = 10\ Mhz$
Percent of linearity and center frequency correct +/- 3% ?
NO
Replace A3 para 5.8
BD
YES
AM

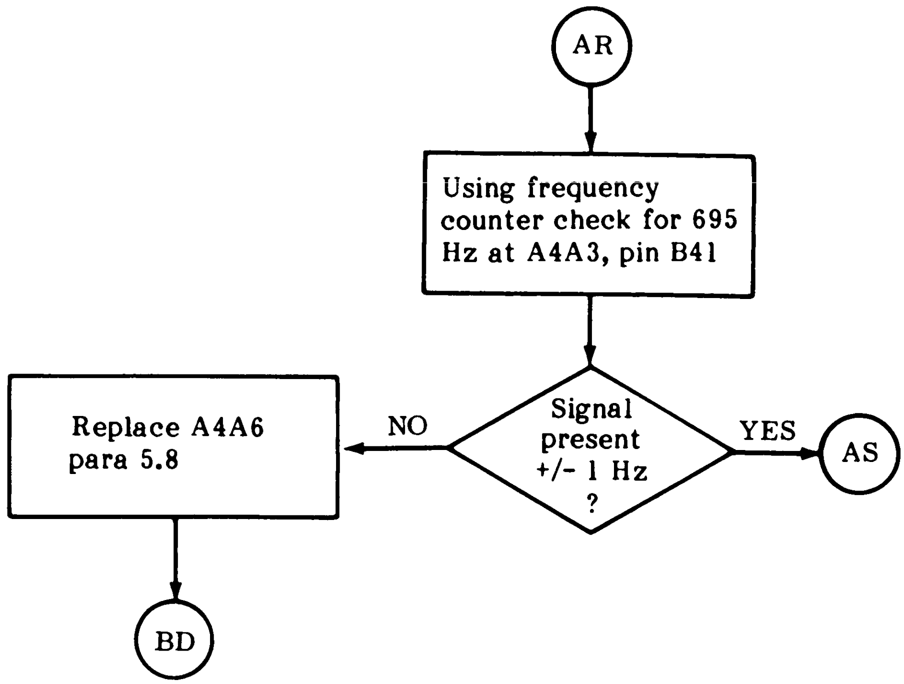

AM
Extend band compensation amplifier (A8)
Set signal generator for 10 MHz 60 kHz deviation 1K modulation FM mode
Using RF voltmeter check for +7 dbm at A8, pin 3
Set IF BANDWIDTH switch (S6) for 50 kHz
Set signal generator for 15 kHz deviation
Using RF voltmeter check for +5 dbm at A8, pin 1
AN

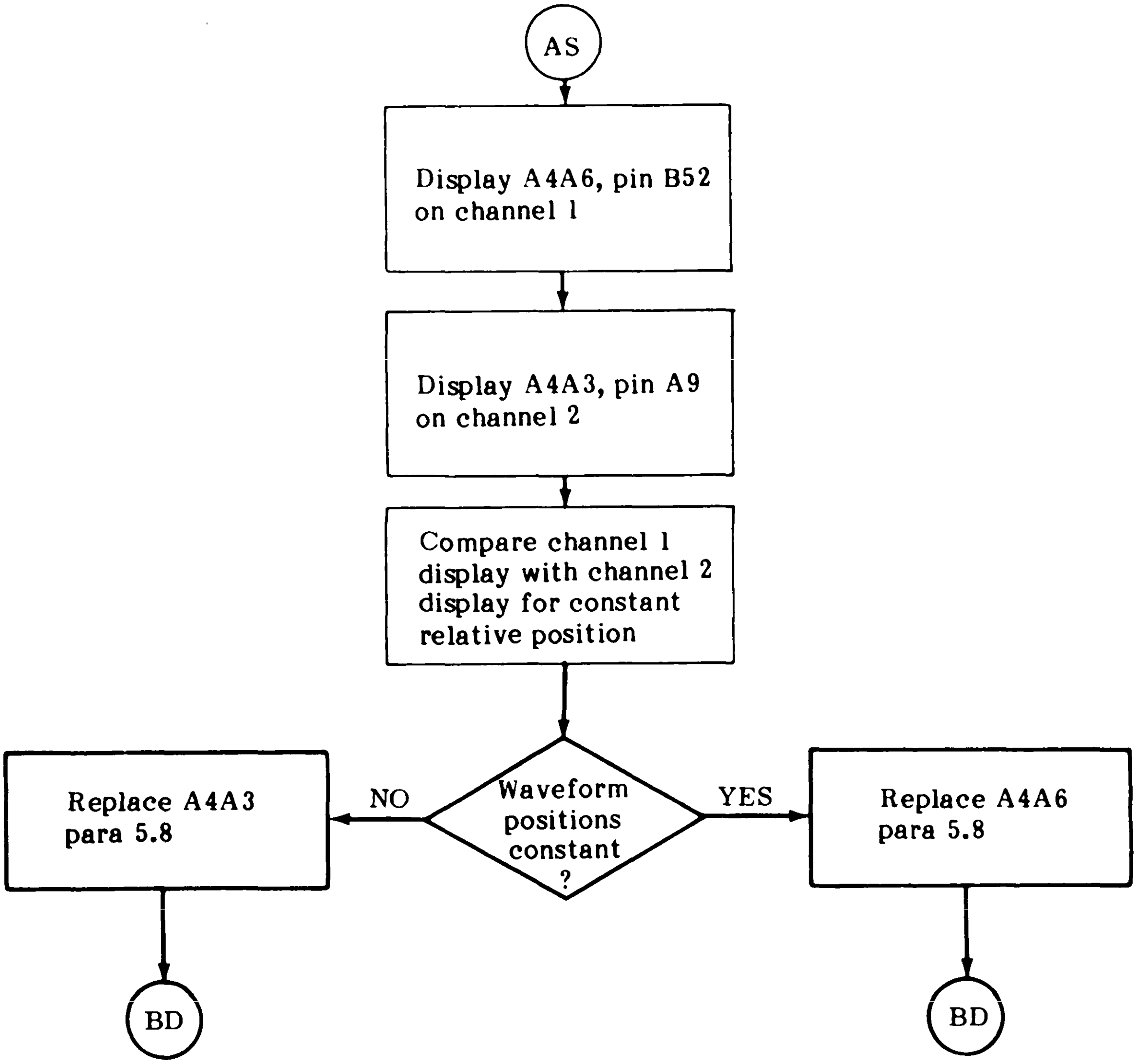

AN
Set IF BANDWIDTH switch (S6) for 10 kHz
Set signal generator for 3 kHz deviation
Using RF voltmeter check for +4 dbm at A8, pin 1
Signals present +/- 3 dbm ?
NO
YES
AO
Replace A8 para 5.8
BD

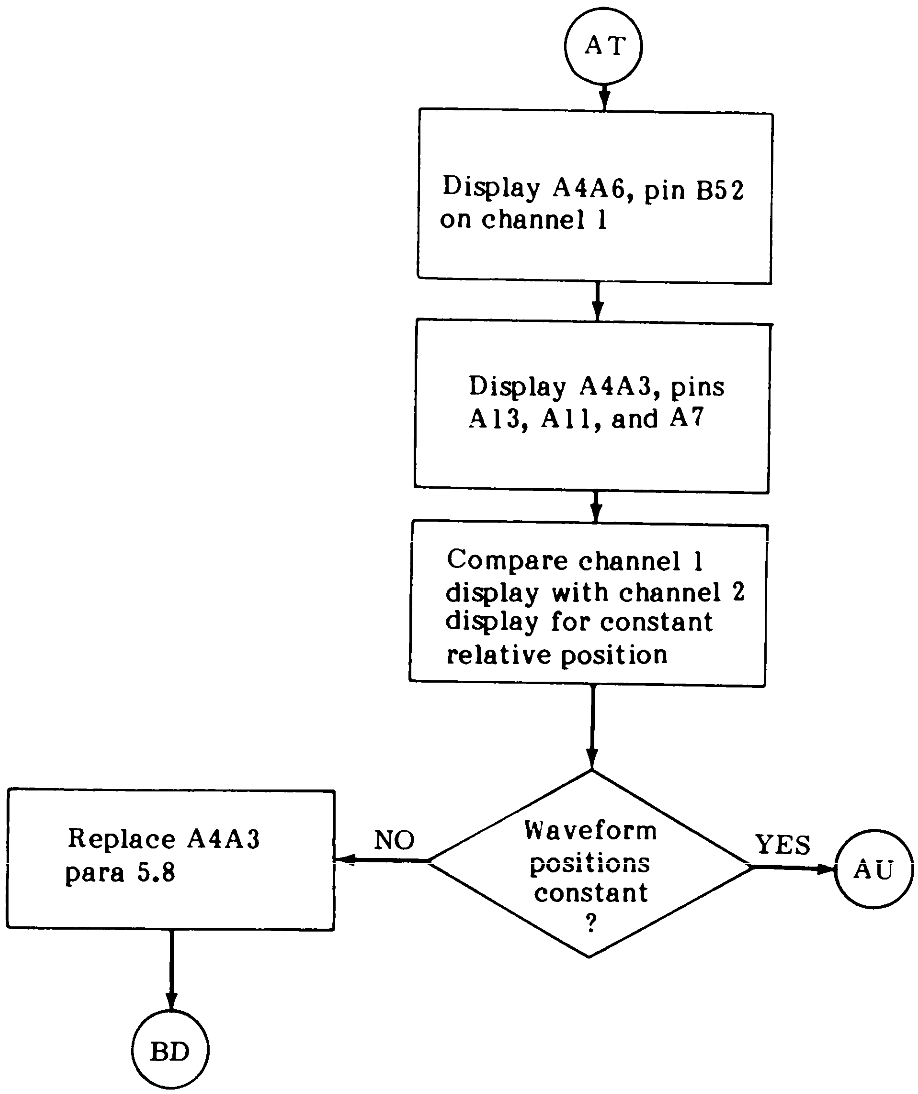

AO
Using dual trace oscilloscope display A4A5, pin B41 (test point) on channel 1
Display A4A6, pin B52 on channel 2
Compare channel 1 display with channel 2 display for constant relative position
Waveform positions constant ?
NO
AP
YES
BA

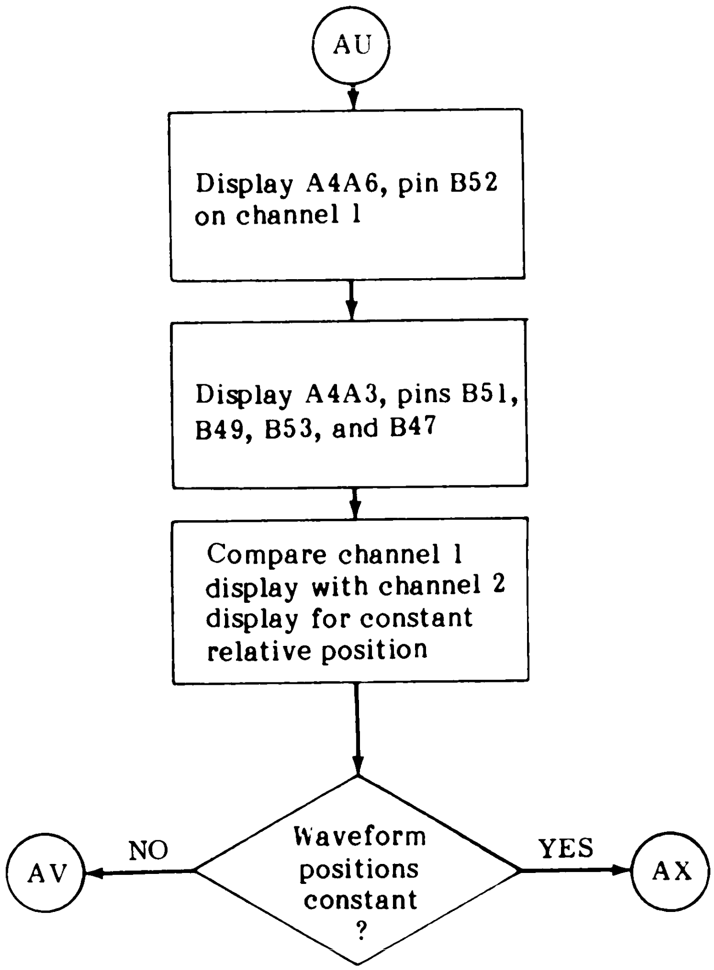

AP
Display A4A6, pin B52 on channel 1
Display A4A5, pin B52 on channel 2
Compare channel 1 display with channel 2 display for constant relative position
Waveform positions constant ?
NO
AQ
YES
Replace A4A5 para 5.8
BD

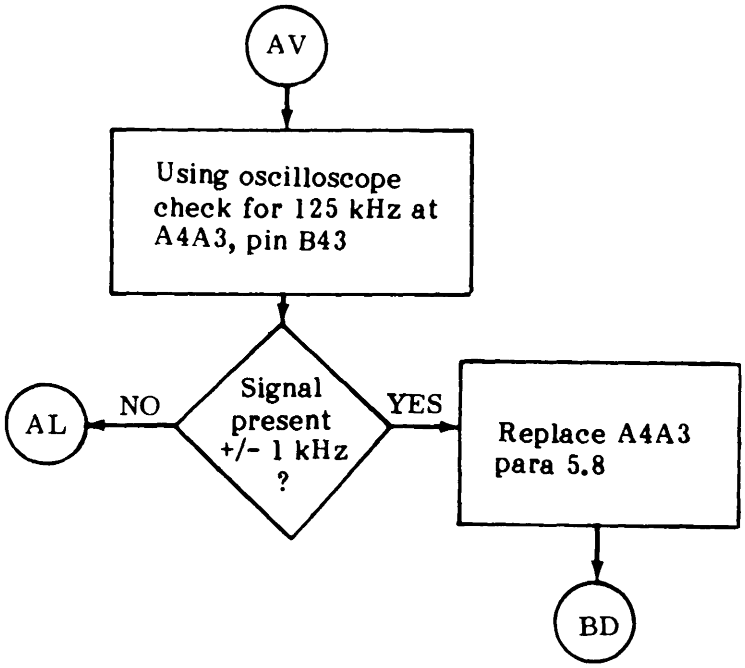

AQ
Display A4A6, pin B52 on channel 1
A
Display A4A3, pin 9 on channel 2
Compare channel 1 display with channel 2 display for constant relative position
Waveform positions constant ?
NO
AR
YES
AT

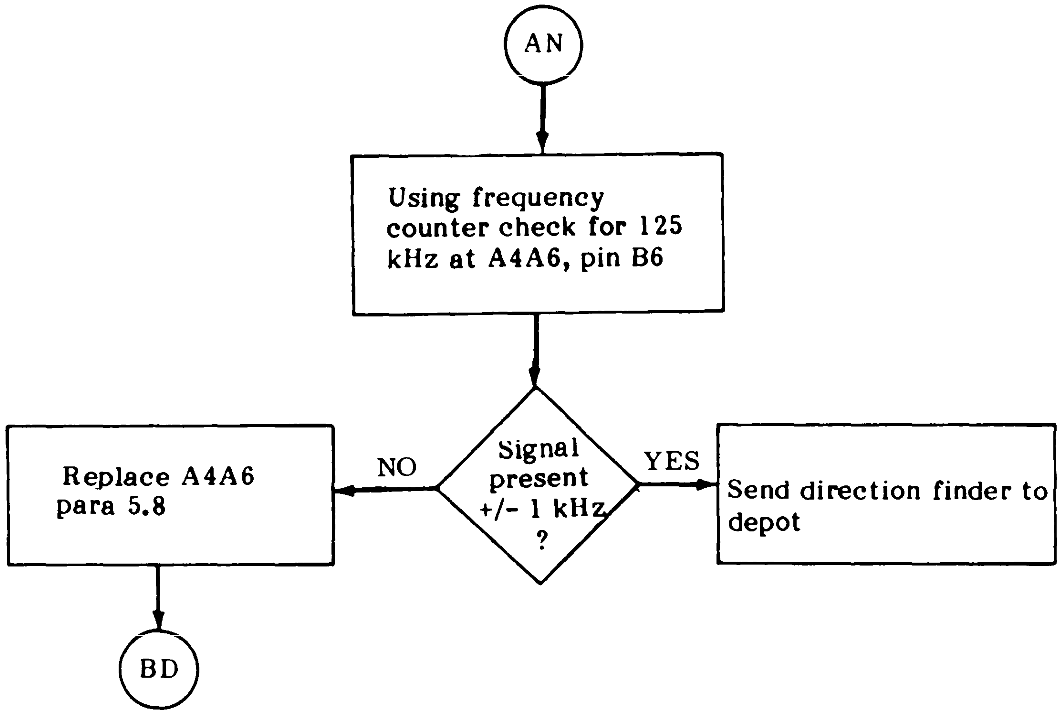

AR
Using frequency counter check for 695 Hz at A4A3, pin B41
Signal present +/- 1 Hz ?
NO
YES
Replace A4A6 para 5.8
AS
BD

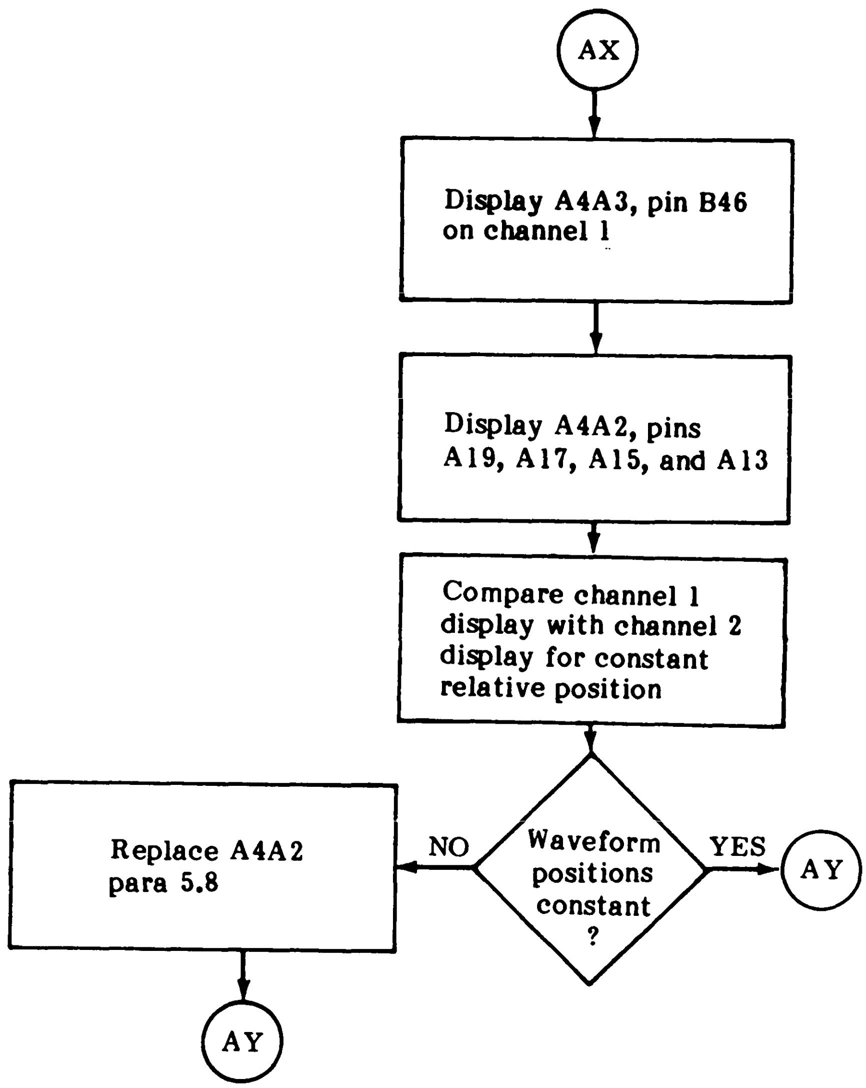

AS
Display A4A6, pin B52 on channel 1
Display A4A3, pin A9 on channel 2
Compare channel 1 display with channel 2 display for constant relative position
Waveform positions constant ?
NO
YES
Replace A4A3 para 5.8
Replace A4A6 para 5.8
BD
BD

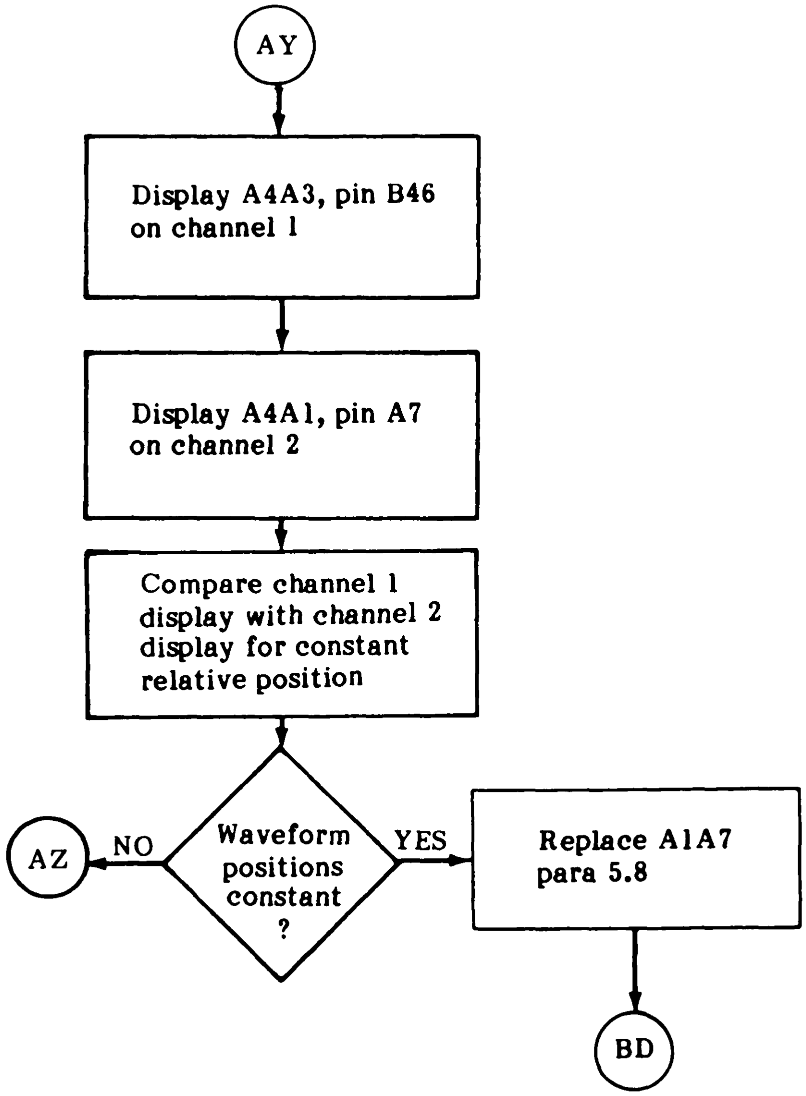

AT
Display A4A6, pin B52 on channel 1
Display A4A3, pins A13, A11, and A7
Compare channel 1 display with channel 2 display for constant relative position
Waveform positions constant ?
NO
YES
Replace A4A3 para 5.8
AU
BD

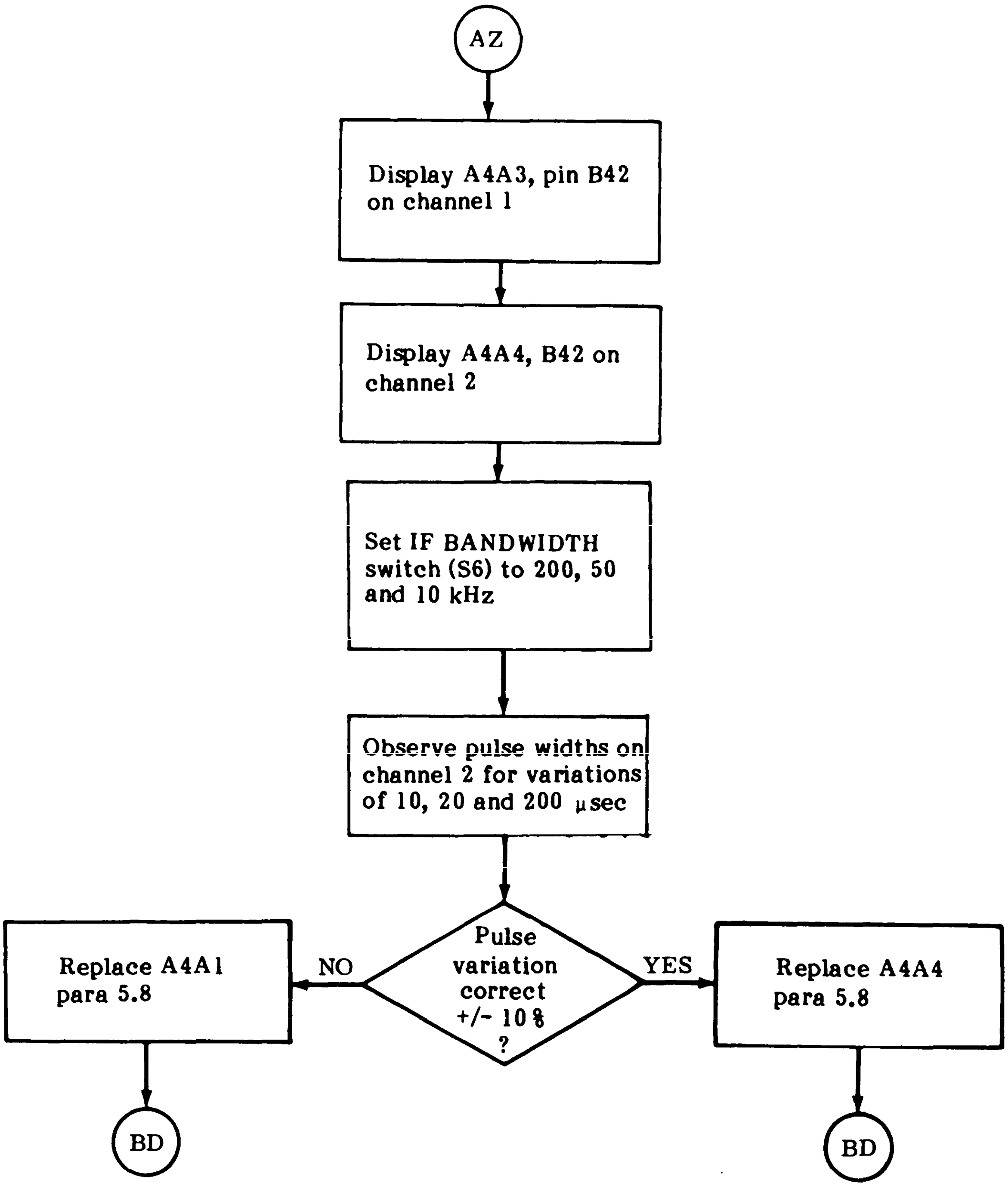

AU
Display A4A6, pin B52 on channel 1
Display A4A3, pins B51, B49, B53, and B47
Compare channel 1 display with channel 2 display for constant relative position
Waveform positions constant ?
NO
AV
YES
AX

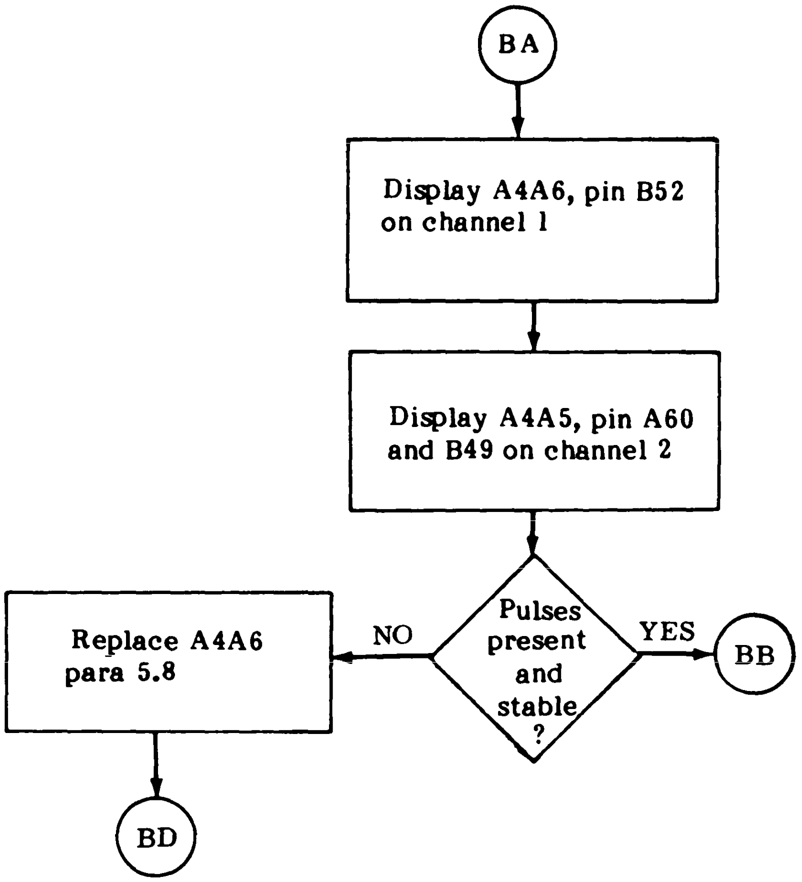

AV
Using oscilloscope check for 125 kHz at A4A3, pin B43
Signal present +/- 1 kHz ?
NO
AL
YES
Replace A4A3 para 5.8
BD

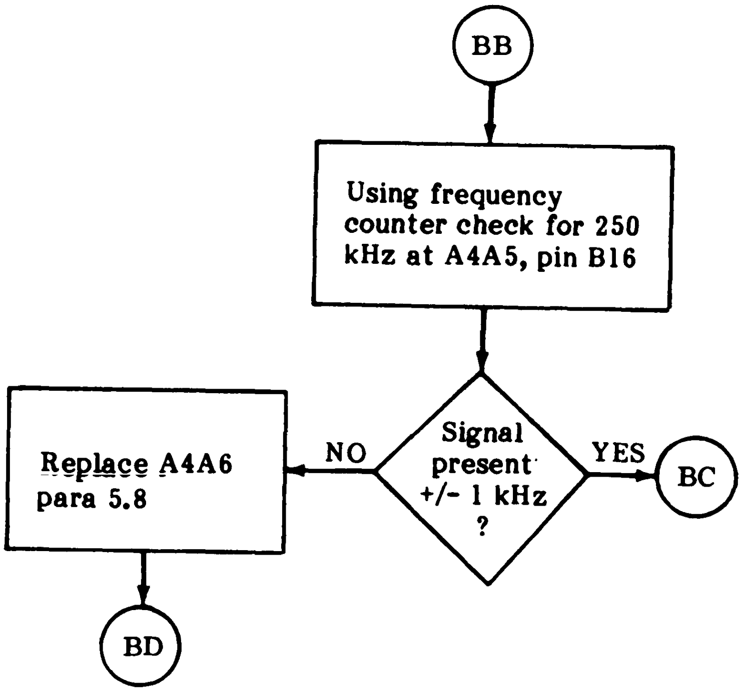

AN
Using frequency counter check for 125 kHz at A4A6, pin B6
Signal present +/- 1 kHz ?
NO
YES
Replace A4A6 para 5.8
Send direction finder to depot
BD

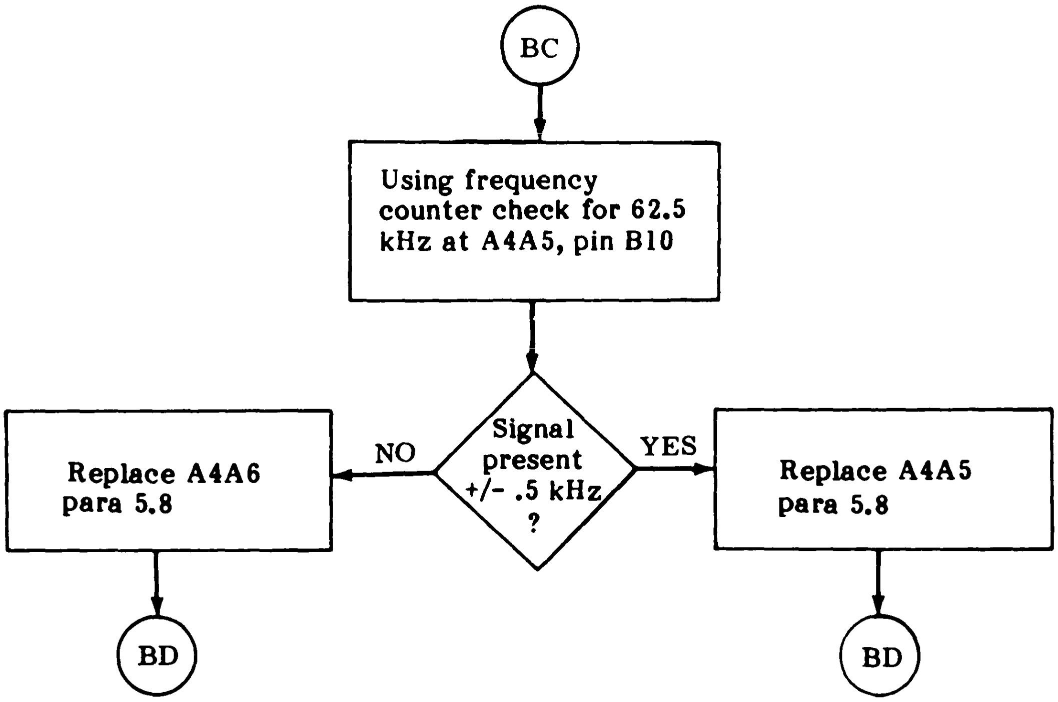

AX
Display A4A3, pin B46 on channel 1
Display A4A2, pins A19, A17, A15, and A13
Compare channel 1 display with channel 2 display for constant relative position
Waveform positions constant ?
NO
Replace A4A2 para 5.8
AY
YES
AY

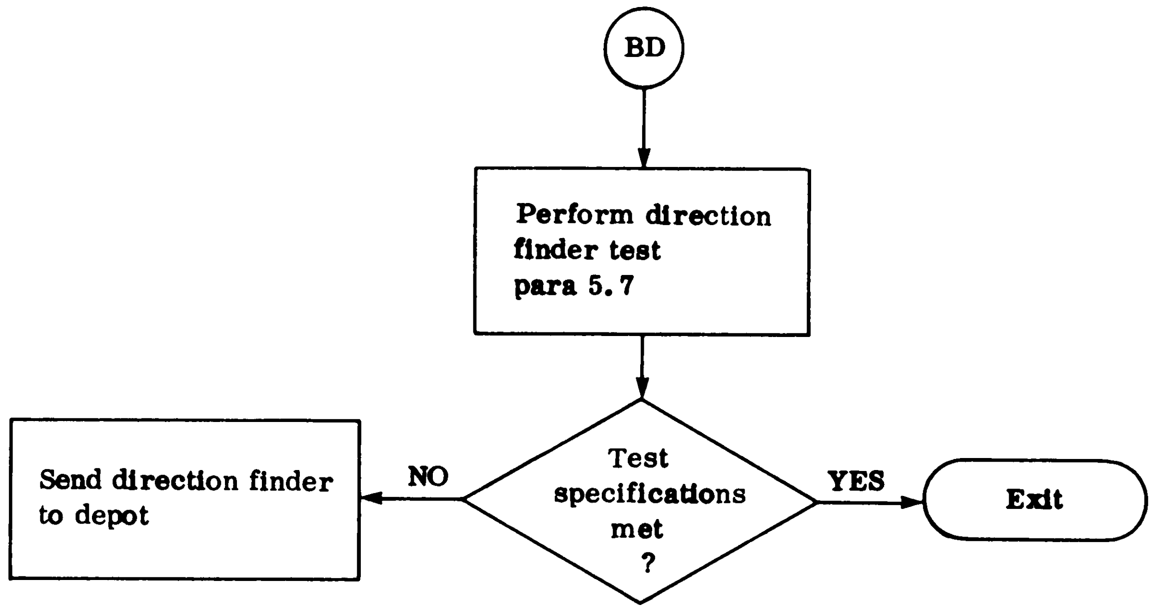

AY
Display A4A3, pin B46 on channel 1
Display A4A1, pin A7 on channel 2
Compare channel 1 display with channel 2 display for constant relative position
Waveform positions constant ?
NO
AZ
YES
Replace A1A7 para 5.8
BD


AZ
Display A4A3, pin B42 on channel 1
Display A4A4, B42 on channel 2
Set IF BANDWIDTH switch (S6) to 200, 50 and 10 kHz
Observe pulse widths on channel 2 for variations of 10, 20 and 200 μsec
Pulse variation correct +/- 10 % ?
NO
Replace A4A1 para 5.8
YES
Replace A4A4 para 5.8
BD
BD


BA
Display A4A6, pin B52 on channel 1
Display A4A5, pin A60 and B49 on channel 2
Pulses present and stable ?
NO
YES
BB
Replace A4A6 para 5.8
BD


BB
Using frequency counter check for 250 kHz at A4A5, pin B16
Signal present +/- 1 kHz ?
NO
YES
BC
Replace A4A6 para 5.8
BD


BC
Using frequency counter check for 62.5 kHz at A4A5, pin B10
Signal present +/- .5 kHz ?
NO
Replace A4A6 para 5.8
YES
Replace A4A5 para 5.8
BD
BD


BD
Perform direction finder test para 5.7
Test specifications met ?
NO
Send direction finder to depot
YES
Exit

ZERO ADJUST CONTROL CANNOT SET A 000 OR 180 DEGREE BEARING

<u>Test Equipment</u>	
Power Supply	PP-6547U
Multi meter	AN/PSM-45
Test Lead Set	Simpson 00577
Oscilloscope	AN/ USM-281C
Voltage Probe	10X TEK P6006
Signal Generator	SG-1112(V) I/U with options 001, 002, 003
Cable, RF, 50 ohms	HP 10503A
<u>Tools</u>	
4 in. flat tip screwdriver	5120-00-222-8852

<u>Replacement Parts</u>

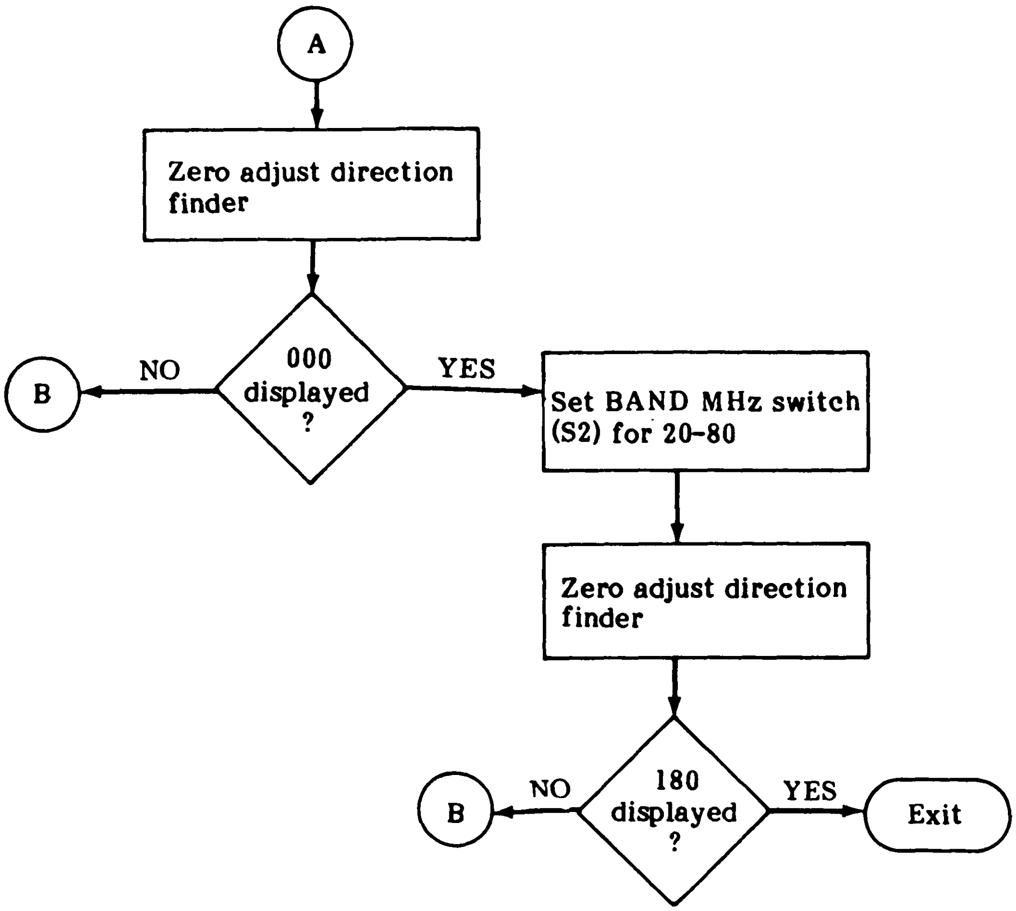
Calibrate and Antenna Switch Drivers (A4A2)
DC/DC Converter (A7)
Master Time Controller and Display Logic (A4A6)

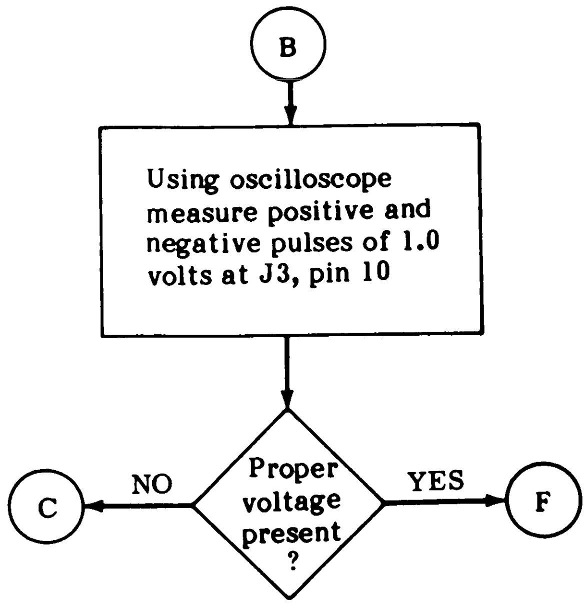
<u>Equipment Condition</u>

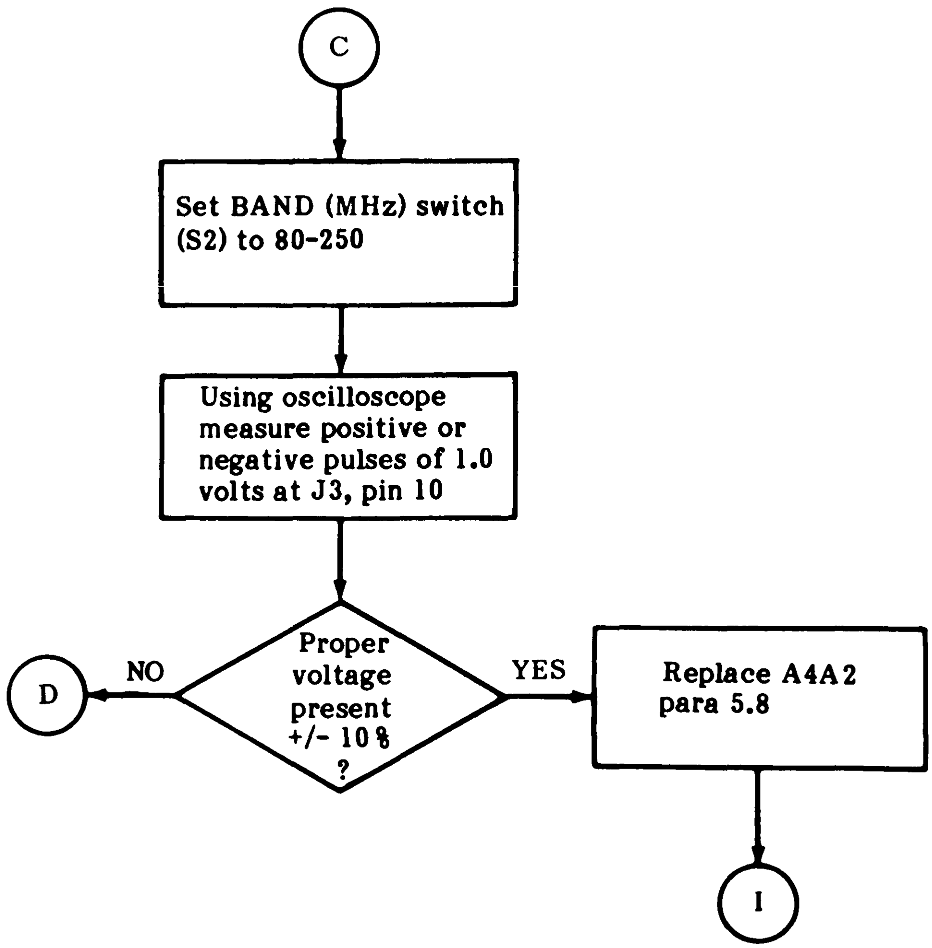
NOTE

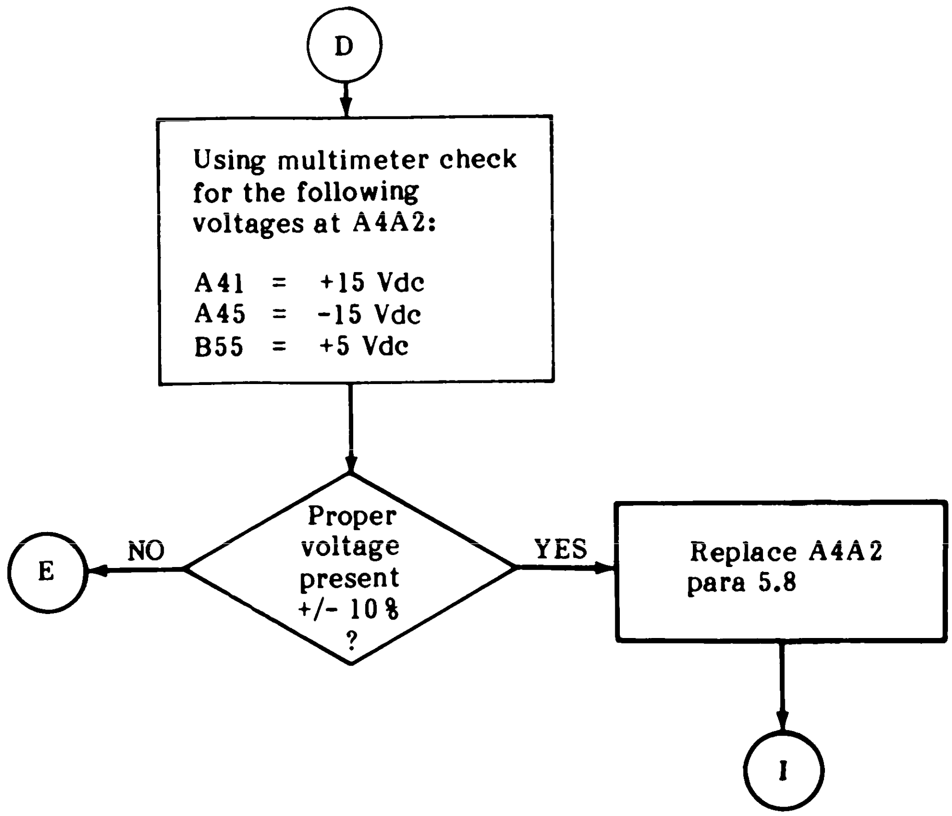
Allow 30 minute warm-up time of Direction Finder before proceeding with troubleshooting procedures.

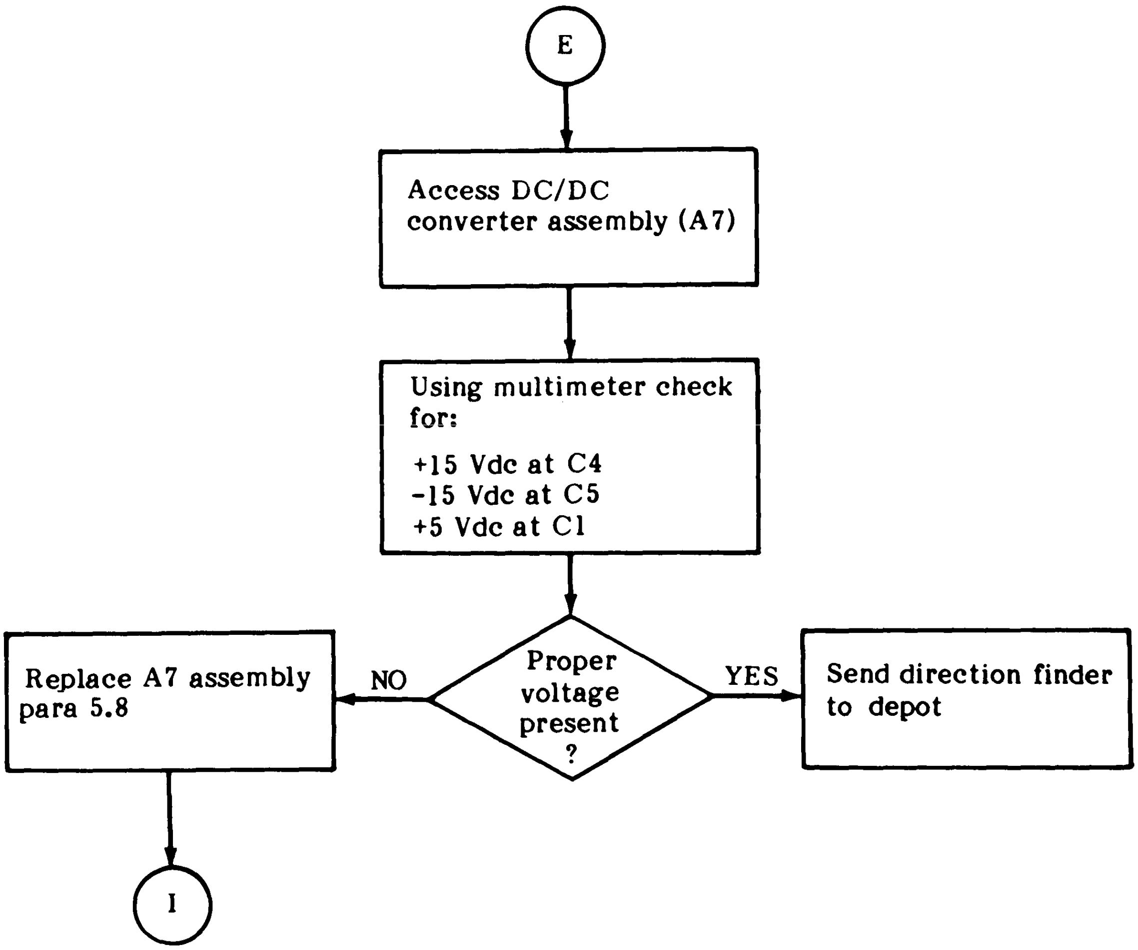
OFF/OMNI/DF/CAL switch set to CAL
DISPLAY OFF/DISPLAY INTENSITY knob set to mid-range
BAND MHz switch set to 80-250 MHz band
IF BANDWIDTH switch set to 200 kHz
INTEG TIME switch set to 2 SEC
ZERO ADJ knob set as required
Power supply set to 24 Vdc and connected to J5
Direction Finder calibrated
Direction Finder cover removed

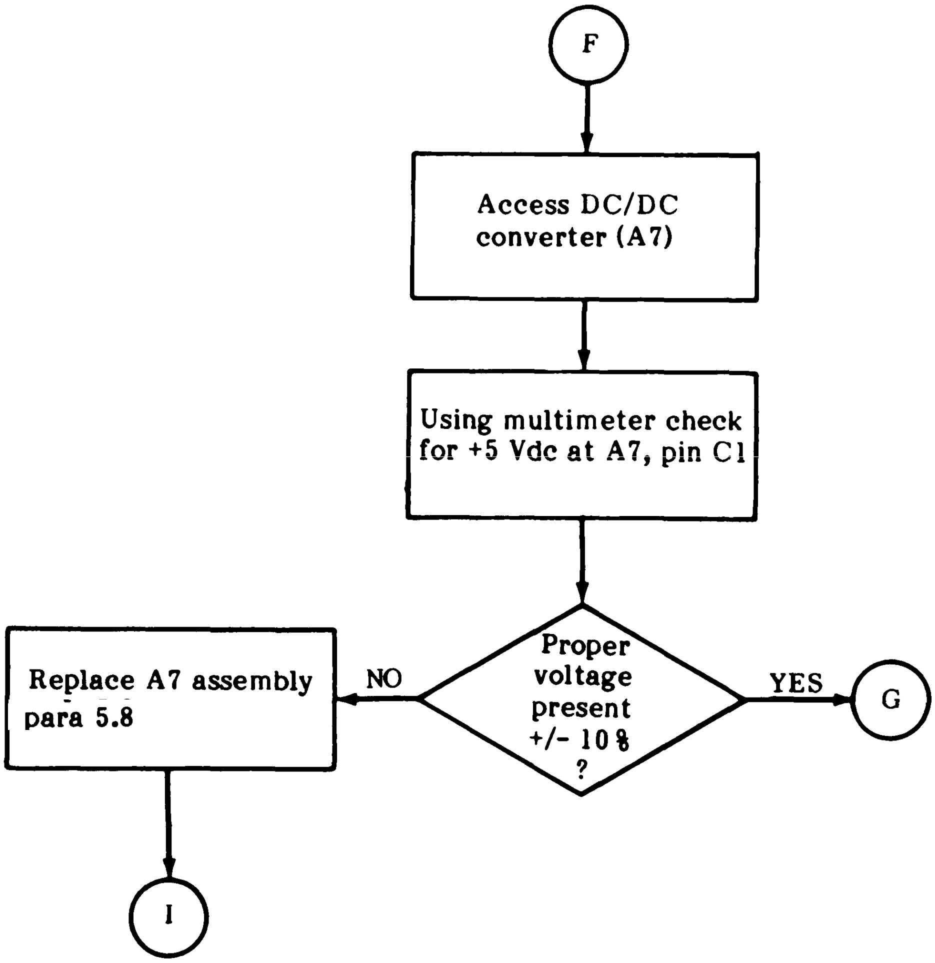

A
Zero adjust direction finder
000 displayed ?
NO
B
YES
Set BAND MHz switch (S2) for 20-80
Zero adjust direction finder
180 displayed ?
NO
B
YES
Exit

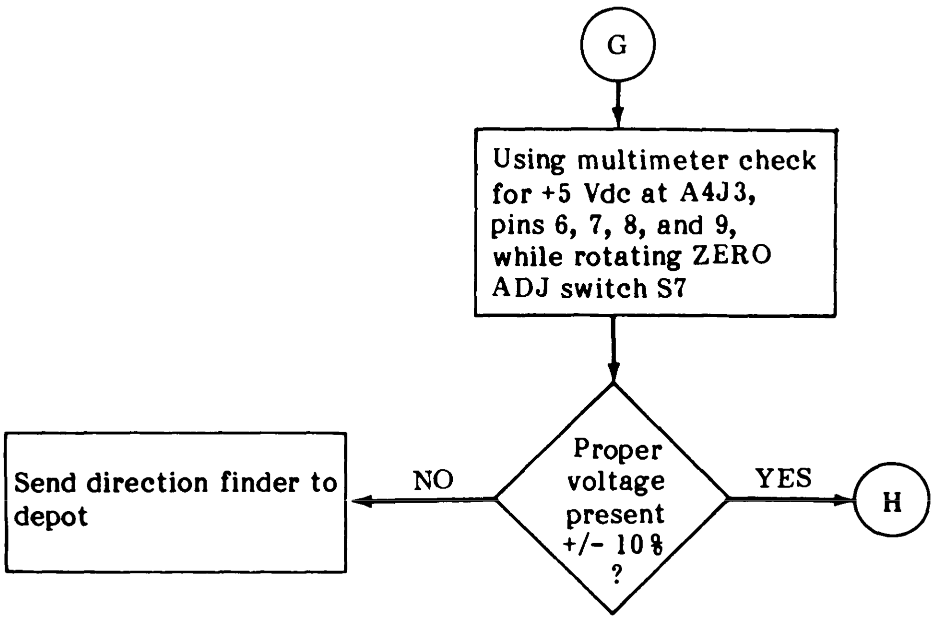

B
Using oscilloscope measure positive and negative pulses of 1.0 volts at J3, pin 10
Proper voltage present ?
NO
C
YES
F

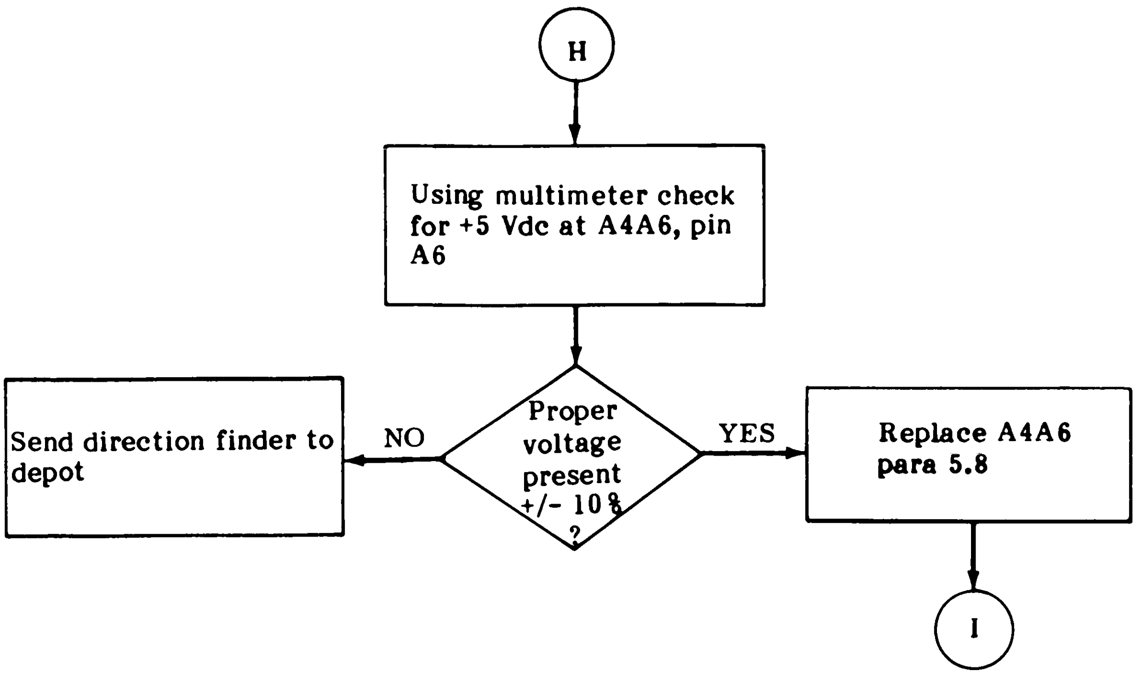

C
Set BAND (MHz) switch (S2) to 80-250
Using oscilloscope measure positive or negative pulses of 1.0 volts at J3, pin 10
Proper voltage present +/- 10% ?
NO
D
YES
Replace A4A2 para 5.8
I

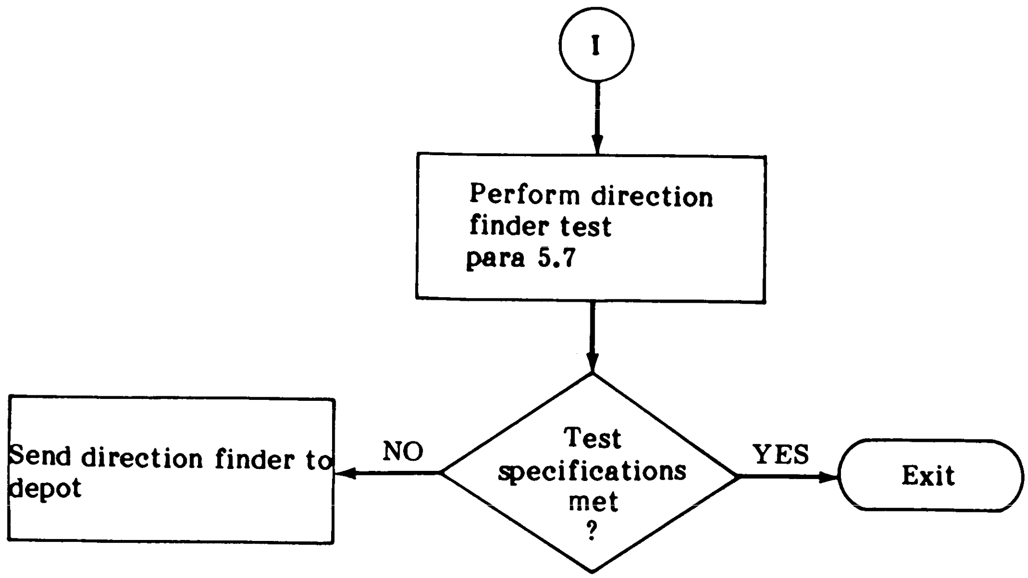

D
Using multimeter check for the following voltages at A4A2:
A41 = +15 Vdc
A45 = -15 Vdc
B55 = +5 Vdc
Proper voltage present +/- 10% ?
NO
E
YES
Replace A4A2 para 5.8
I


E
Access DC/DC converter assembly (A7)
Using multimeter check for:
+15 Vdc at C4
-15 Vdc at C5
+5 Vdc at C1
Proper voltage present ?
NO
YES
Replace A7 assembly para 5.8
Send direction finder to depot
I


F
Access DC/DC converter (A7)
Using multimeter check for +5 Vdc at A7, pin C1
Proper voltage present +/- 10 % ?
NO
YES
G
Replace A7 assembly para 5.8
I


G
Using multimeter check for +5 Vdc at A4J3, pins 6, 7, 8, and 9, while rotating ZERO ADJ switch S7
Proper voltage present +/- 10% ?
NO
Send direction finder to depot
YES
H


H
Using multimeter check for +5 Vdc at A4A6, pin A6
Proper voltage present +/- 10% ?
NO
Send direction finder to depot
YES
Replace A4A6 para 5.8
I


I
Perform direction finder test para 5.7
Test specifications met ?
NO
Send direction finder to depot
YES
Exit

NO CIRCULAR DISPLAY WHEN SET TO GATED MODE

Test Equipment	
Power Supply	PP-6547U
Multimeter	AN/PSM-45
Test Lead Set	Simpson 00577
RF Voltmeter	Boonton 92C
High Frequency Probe	Boonton 91-12F
Signal Generator	SG-1112(V) I/U with options 001, 002, 003
Cable, RF, 50 ohms	HP 10503A
Angle Simulator	TF-15403 MKII

Tools	
4 in. flat tip screwdriver	5120-00-222-8852

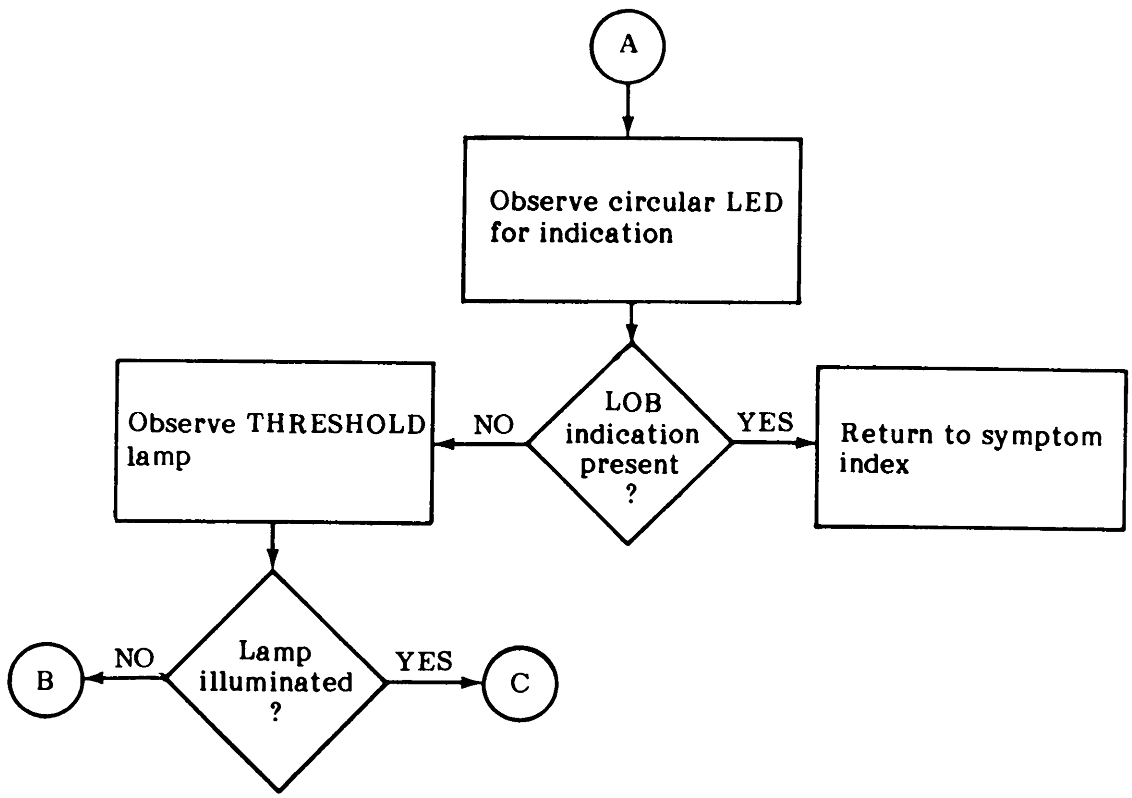
Replacement Parts
AGC Squelch (A2)
Master Time Controller and Display Logic (A4A6)
DC/DC Converter (A2)
Cable W1
10 MHz Amplifier (A1A1)
10 MHz Amplifer
Cable W2
Gain Bandwidth Compensation Amplifier (A1A3)
IF Filter and Diode Switches (AlA4)
10 MHz Amplifier (A1A5)
AM Detector Buffer (A1A6)
FM Discriminator (A3)

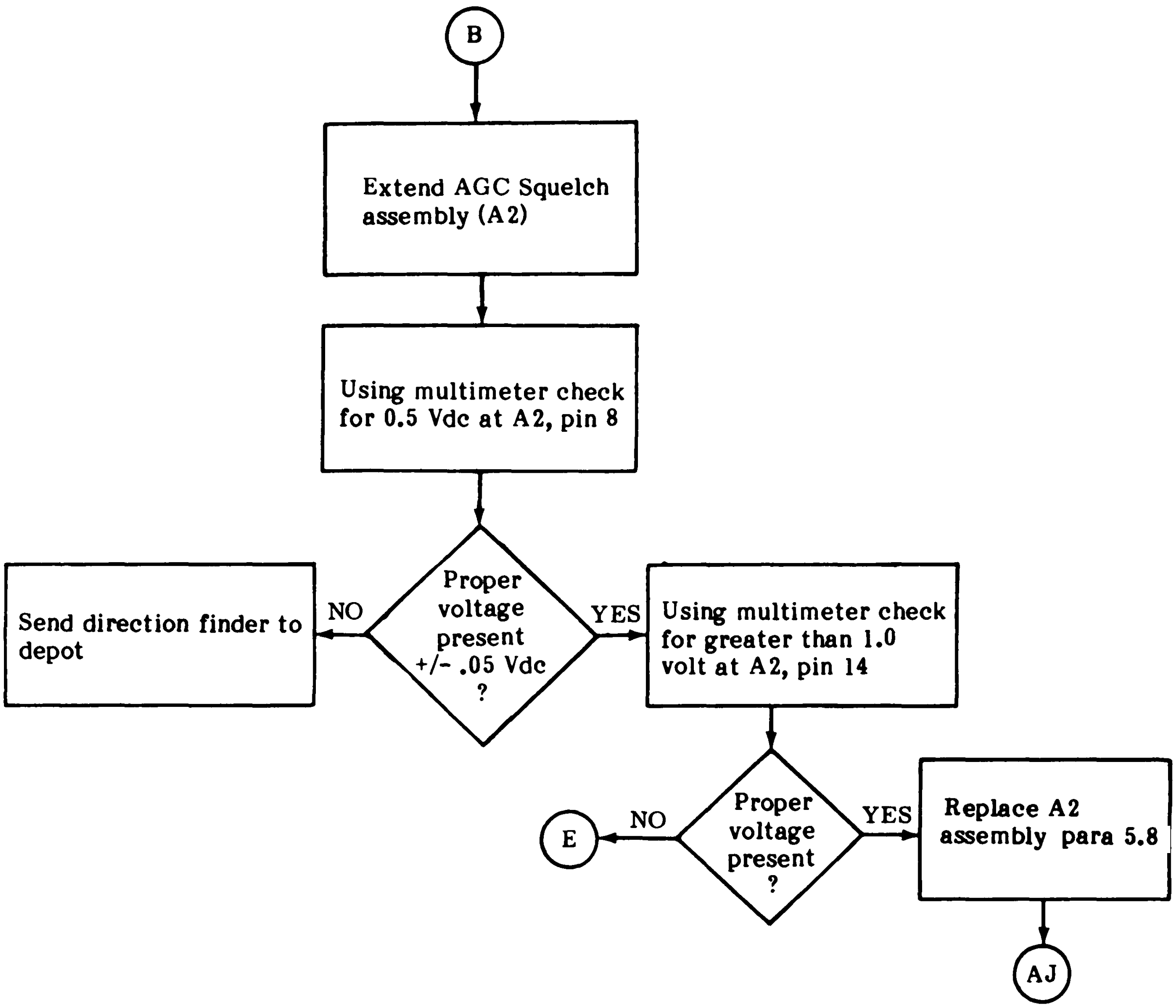
Equipment Condition

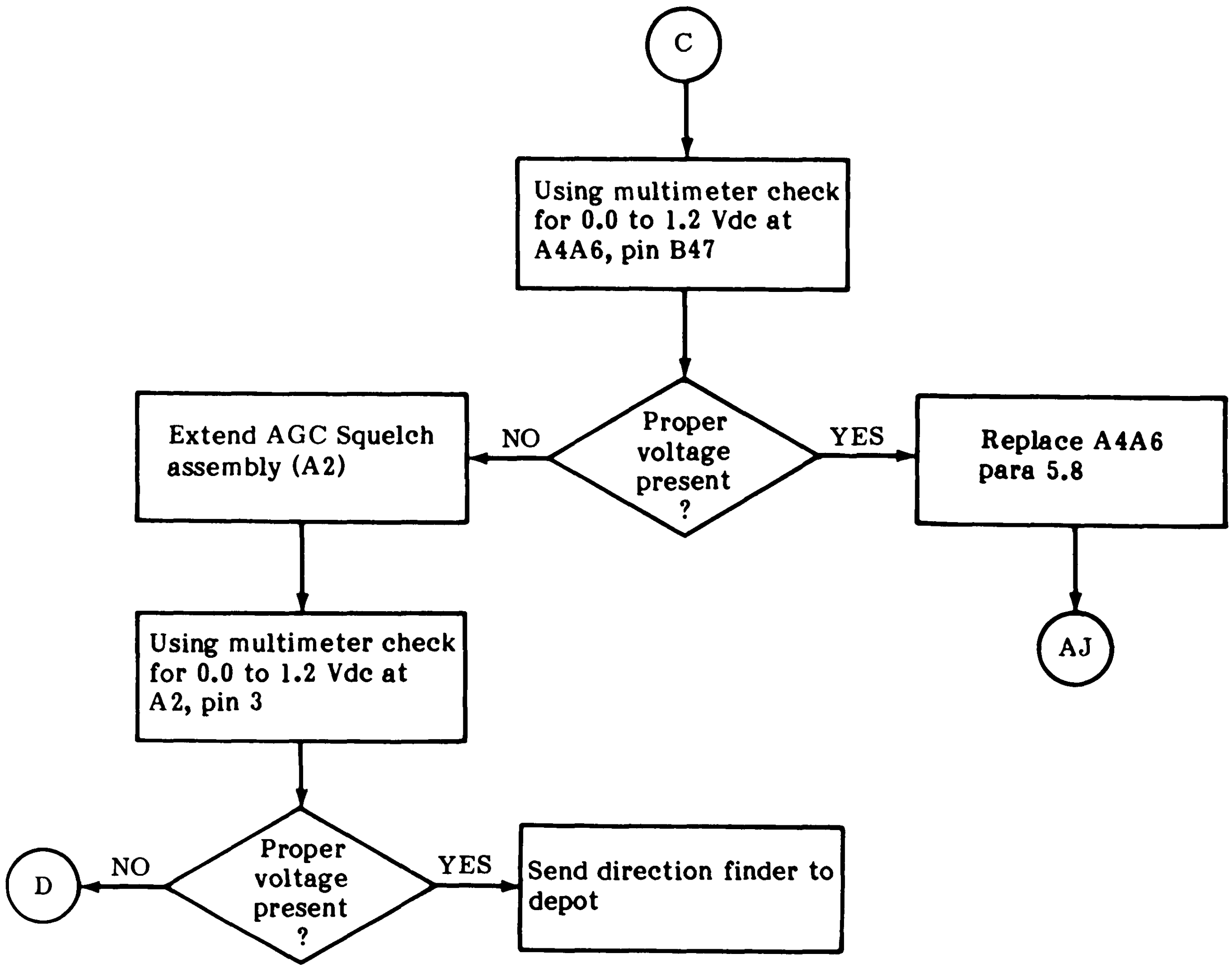
NOTE

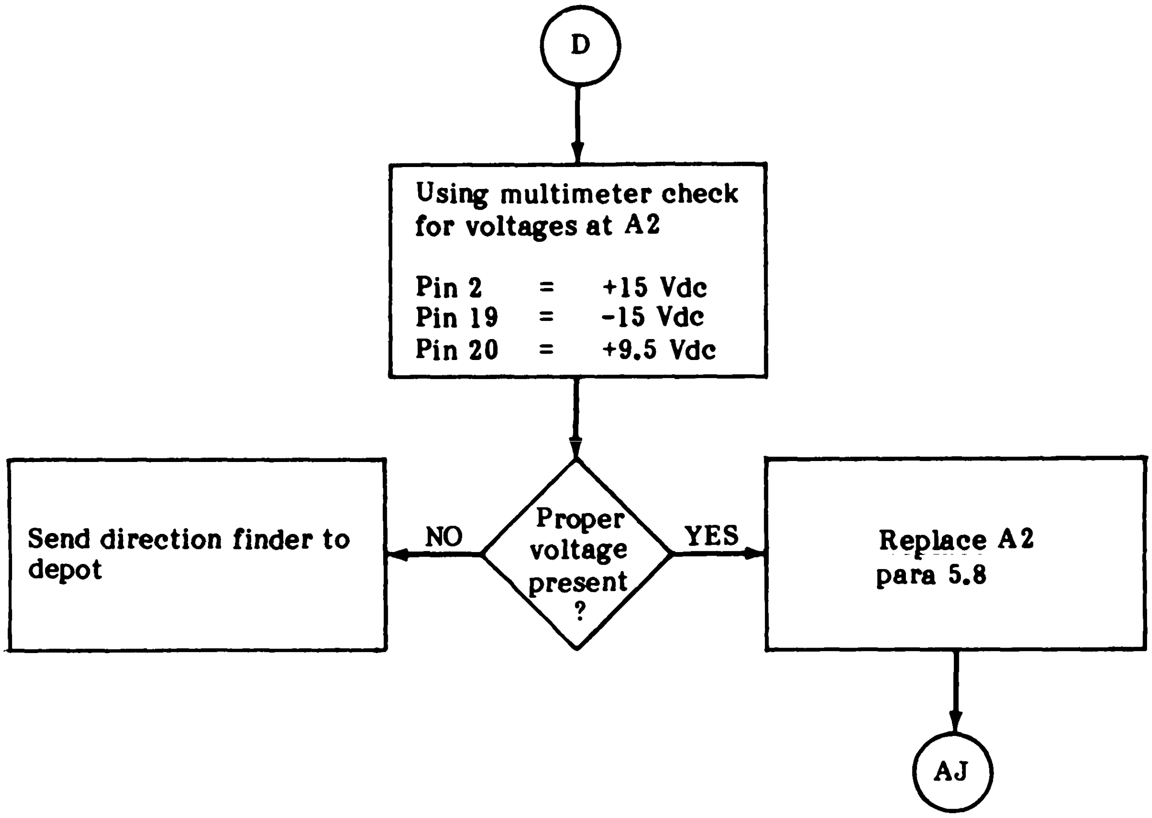
Allow 30 minute warm-up time of Direction Finder before proceeding with troubleshooting procedures.

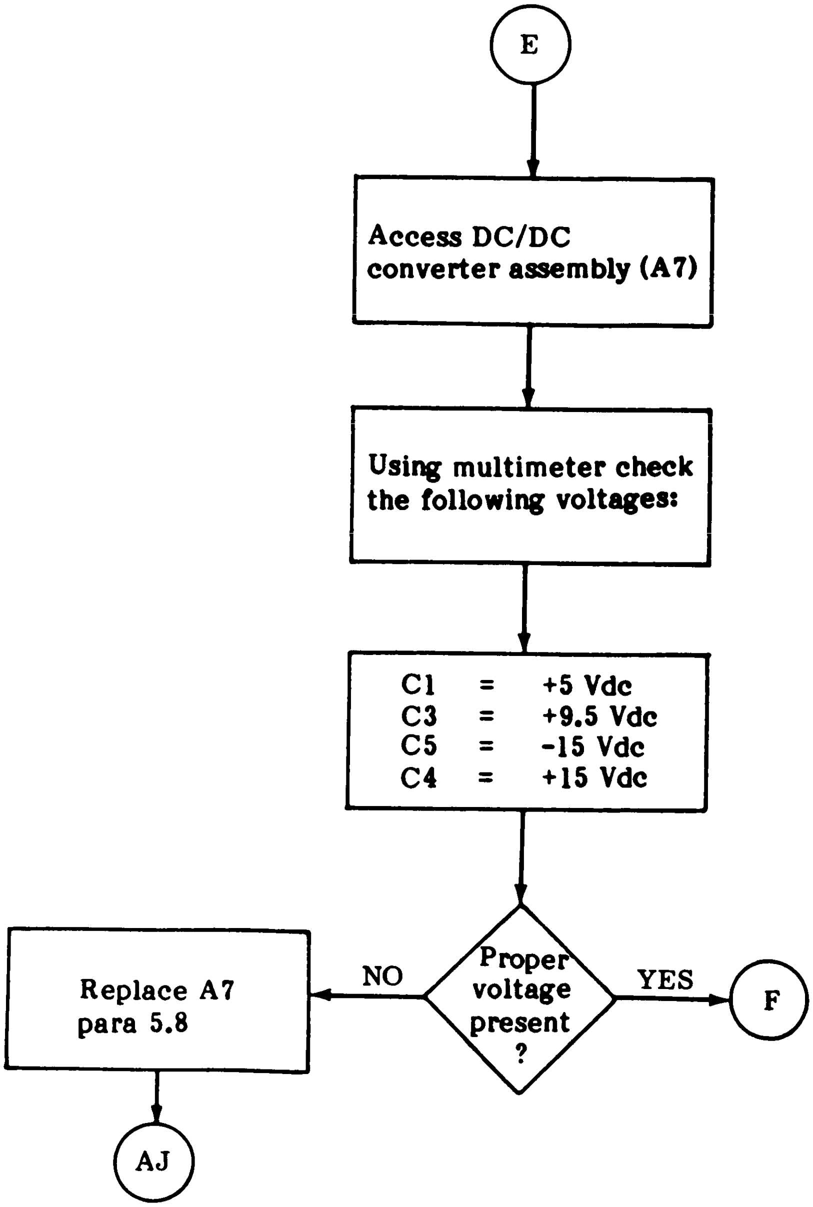
Angle simulator connected to Direction Finder
OFF/OMNI/DF/CAL switch set to DF
DISPLAY OFF/DISPLAY INTENSITY knob set to mid-range
BAND MHz switch set to 80-250 MHz
IF BANDWIDTH switch set to 200 kHz
INTEG TIME switch set to GATED
ZERO ADJ knob set as required
Power supply set to 24 Vdc and connected to J5
Direction Finder calibrated
Direction Finder cover removed

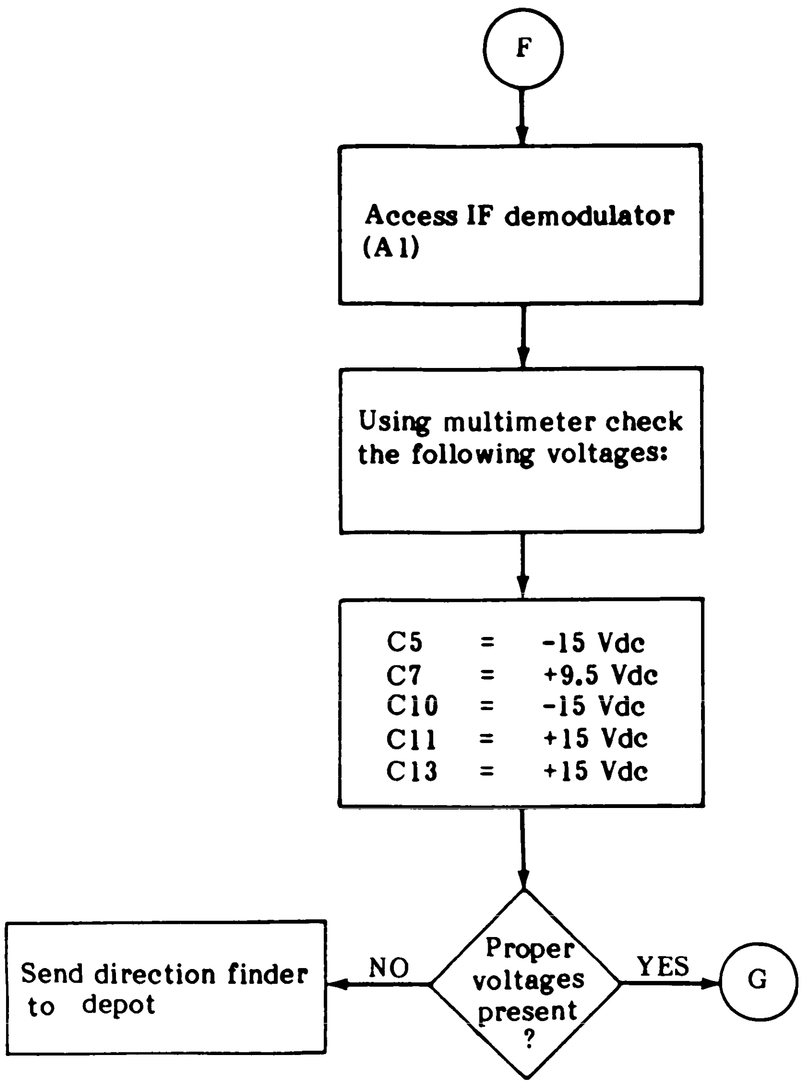

A
Observe circular LED for indication
LOB indication present ?
YES
Return to symptom index
NO
Observe THRESHOLD lamp
Lamp illuminated ?
NO
B
YES
C

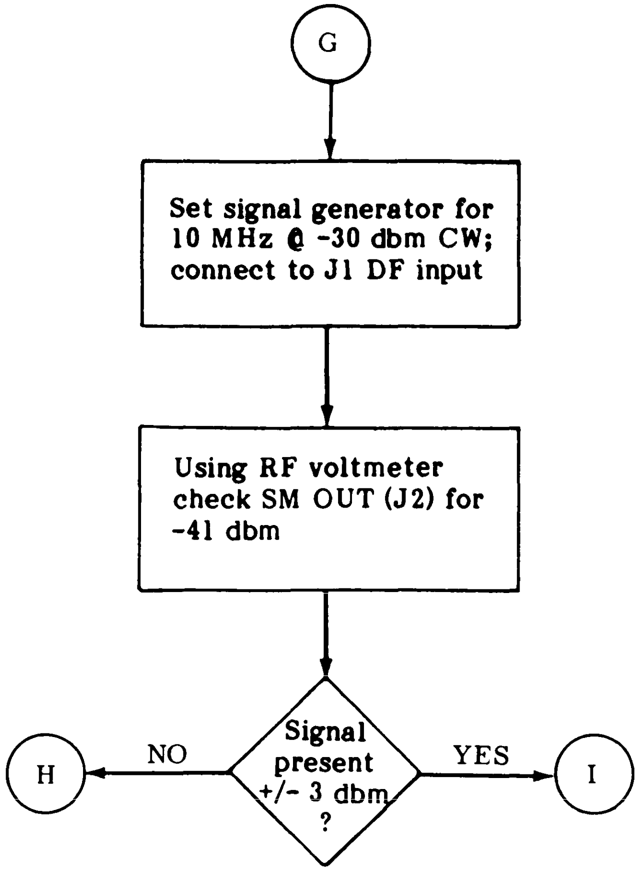

B
Extend AGC Squelch assembly (A2)
Using multimeter check for 0.5 Vdc at A2, pin 8
Proper voltage present +/- .05 Vdc ?
NO
Send direction finder to depot
YES
Using multimeter check for greater than 1.0 volt at A2, pin 14
Proper voltage present ?
NO
E
YES
Replace A2 assembly para 5.8
AJ

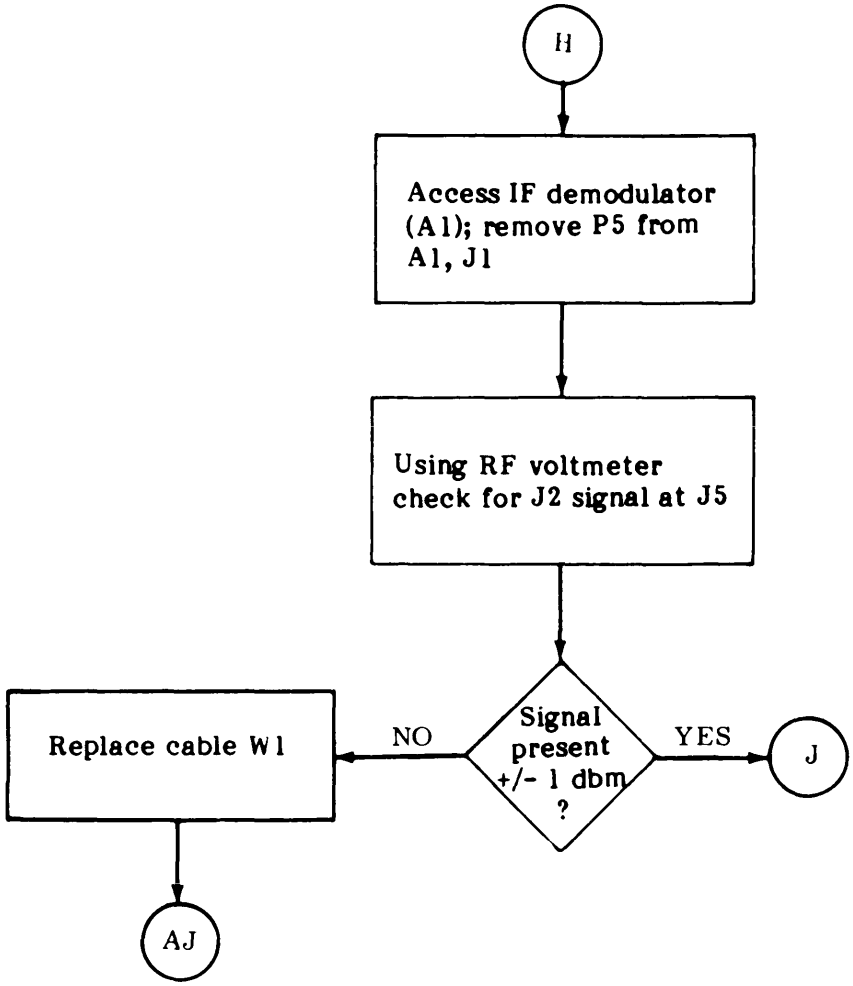

C
Using multimeter check for 0.0 to 1.2 Vdc at A4A6, pin B47
Proper voltage present ?
NO
YES
Extend AGC Squelch assembly (A2)
Replace A4A6 para 5.8
AJ
Using multimeter check for 0.0 to 1.2 Vdc at A2, pin 3
Proper voltage present ?
NO
D
YES
Send direction finder to depot

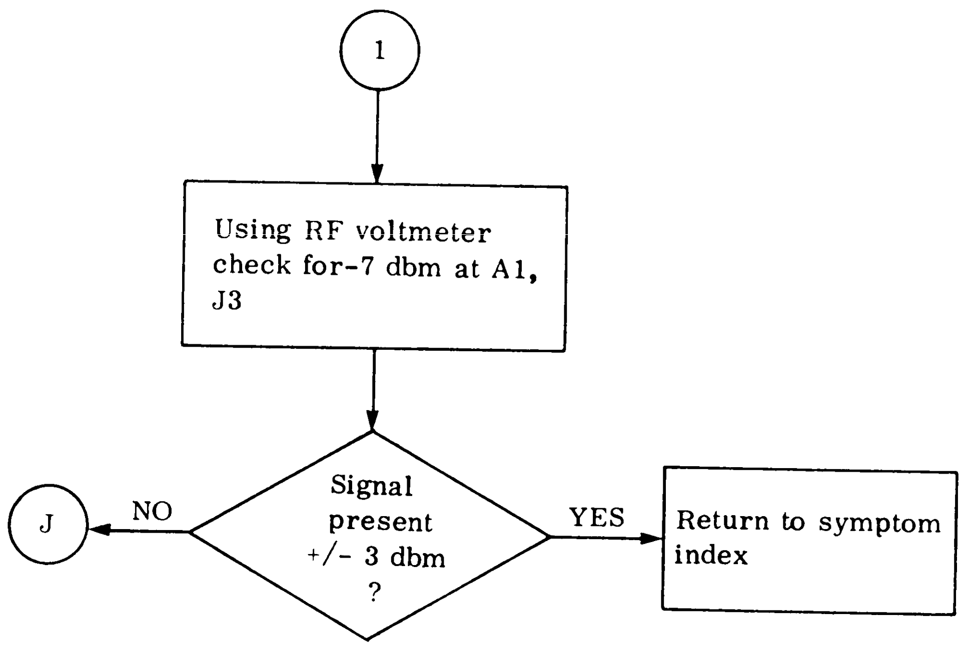

D
Using multimeter check for voltages at A2
Pin 2 = +15 Vdc
Pin 19 = -15 Vdc
Pin 20 = +9.5 Vdc
Proper voltage present ?
NO
Send direction finder to depot
YES
Replace A2 para 5.8
AJ

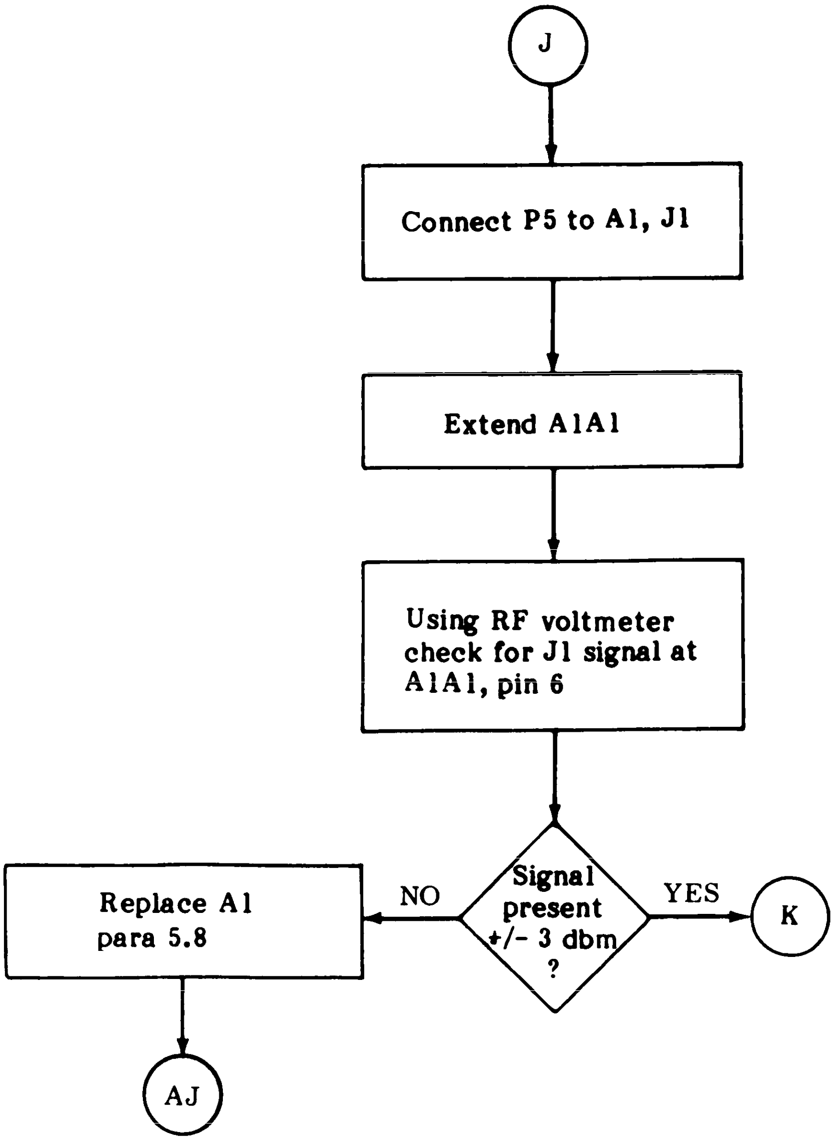

E
Access DC/DC converter assembly (A7)
Using multimeter check the following voltages:
C1 = +5 Vdc
C3 = +9.5 Vdc
C5 = -15 Vdc
C4 = +15 Vdc
Proper voltage present ?
NO
YES
F
Replace A7 para 5.8
AJ

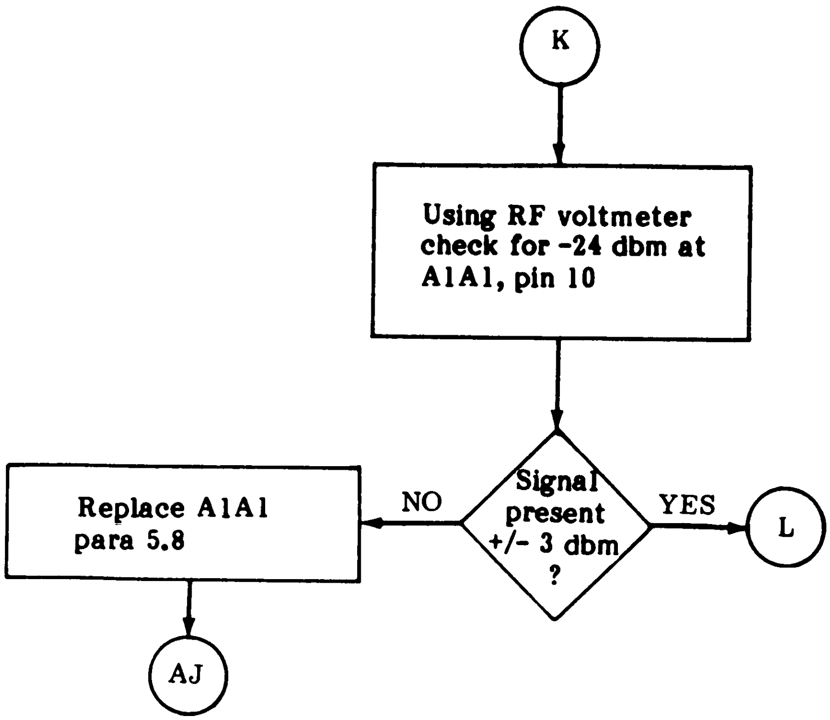

F
Access IF demodulator (A1)
Using multimeter check the following voltages:
C5 = -15 Vdc
C7 = +9.5 Vdc
C10 = -15 Vdc
C11 = +15 Vdc
C13 = +15 Vdc
Proper voltages present ?
NO
Send direction finder to depot
YES
G

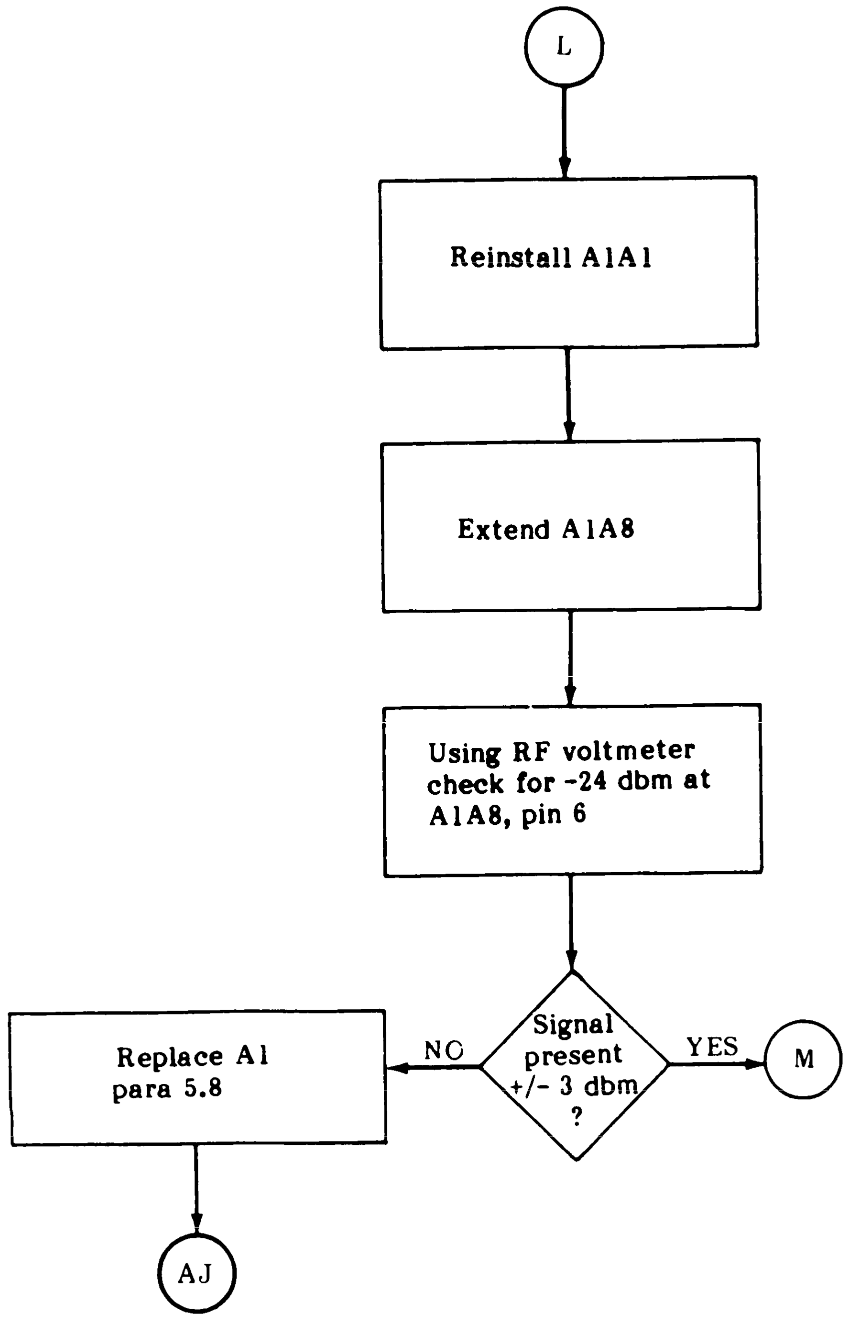

G
Set signal generator for 10 MHz @ -30 dbm CW; connect to J1 DF input
Using RF voltmeter check SM OUT (J2) for -41 dbm
Signal present +/- 3 dbm ?
NO
H
YES
I

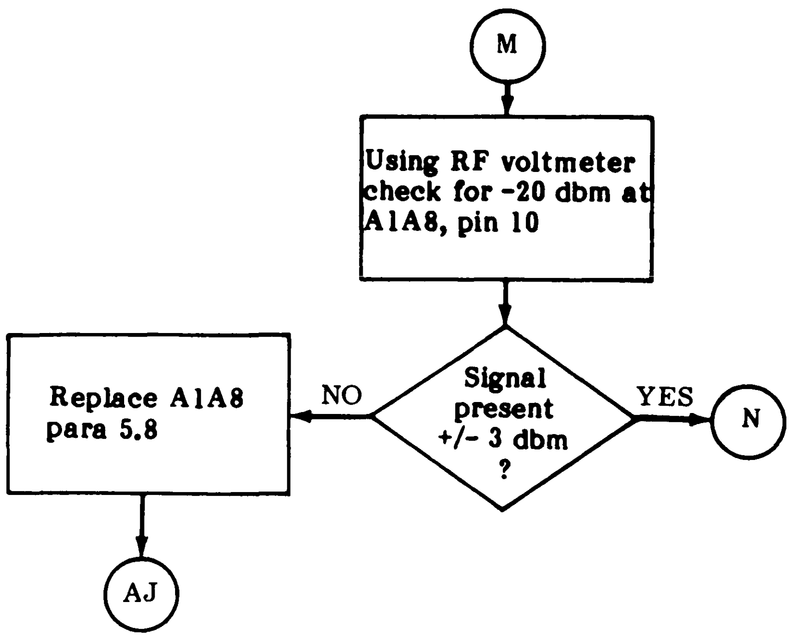

H
Access IF demodulator (A1); remove P5 from A1, J1
Using RF voltmeter check for J2 signal at J5
Signal present +/- 1 dbm ?
NO
YES
Replace cable W1
J
AJ

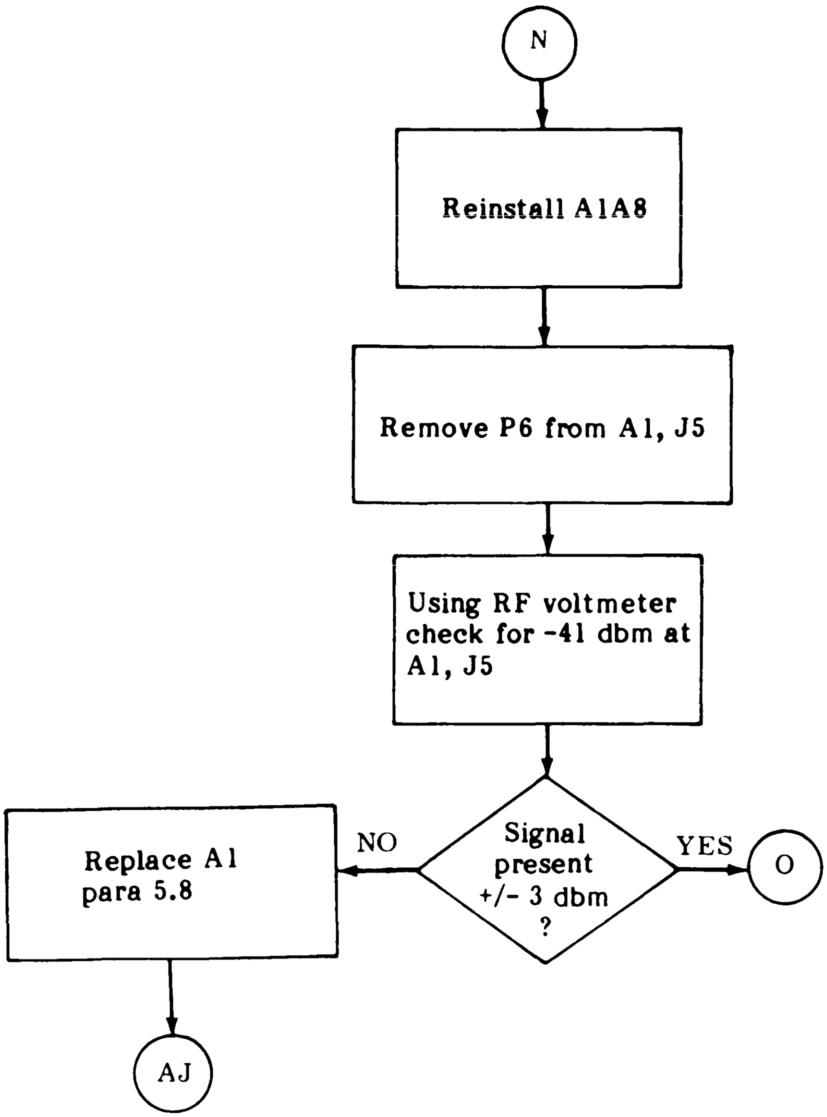

1
Using RF voltmeter check for-7 dbm at A1, J3
Signal present +/- 3 dbm ?
NO
J
YES
Return to symptom index

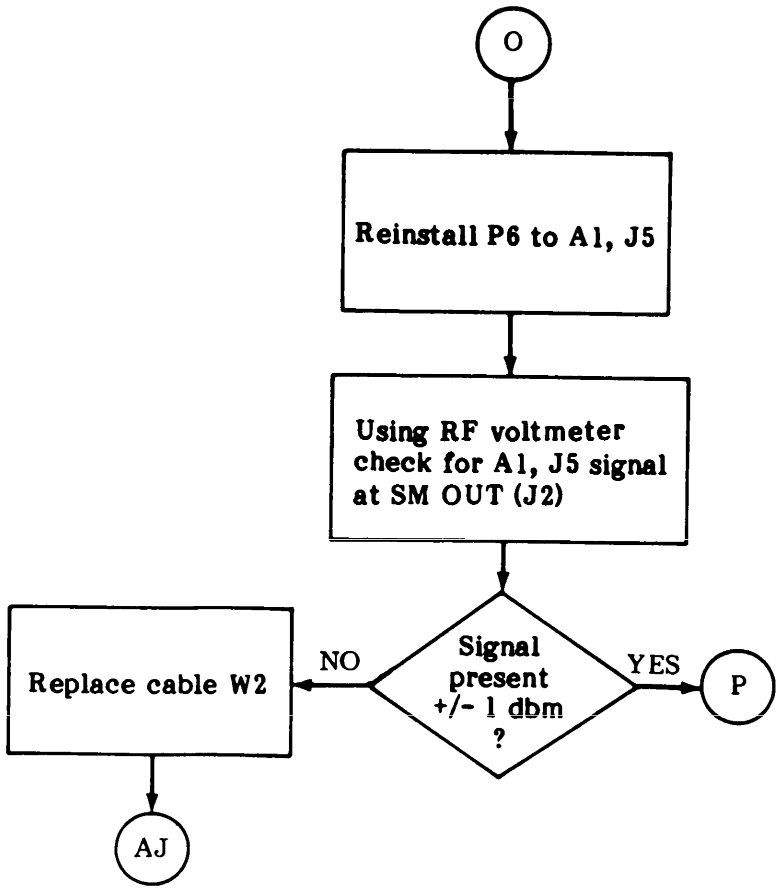

J
Connect P5 to A1, J1
Extend A1A1
Using RF voltmeter check for J1 signal at A1A1, pin 6
Signal present +/- 3 dbm ?
NO
YES
K
Replace A1 para 5.8
AJ

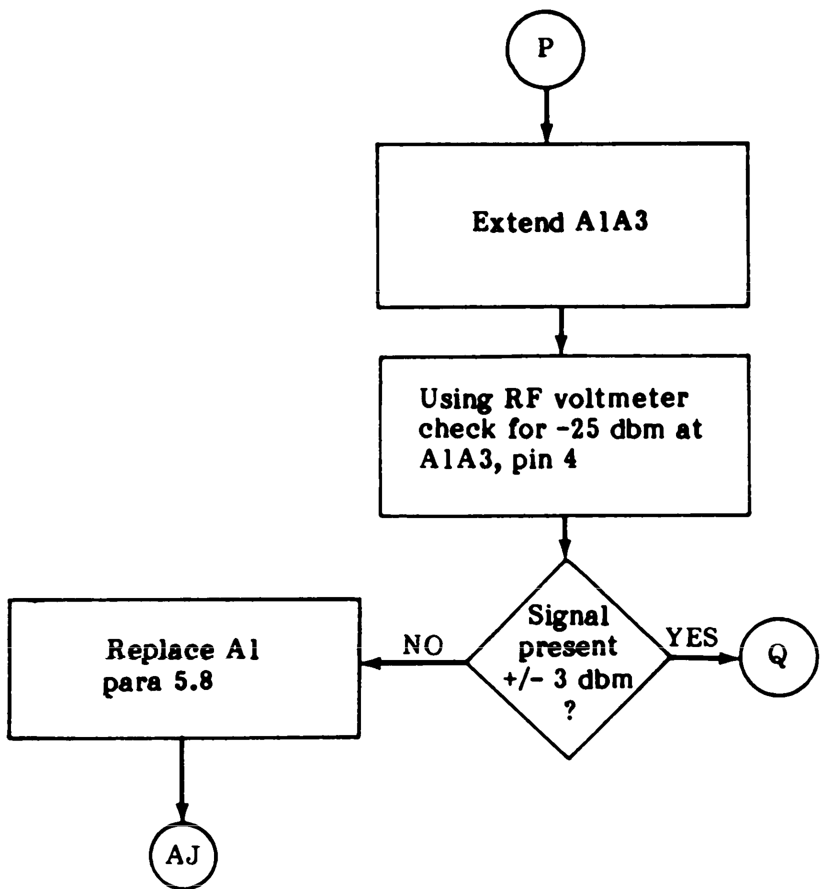

K
Using RF voltmeter check for -24 dbm at A1A1, pin 10
Signal present +/- 3 dbm ?
NO
YES
Replace A1A1 para 5.8
L
AJ

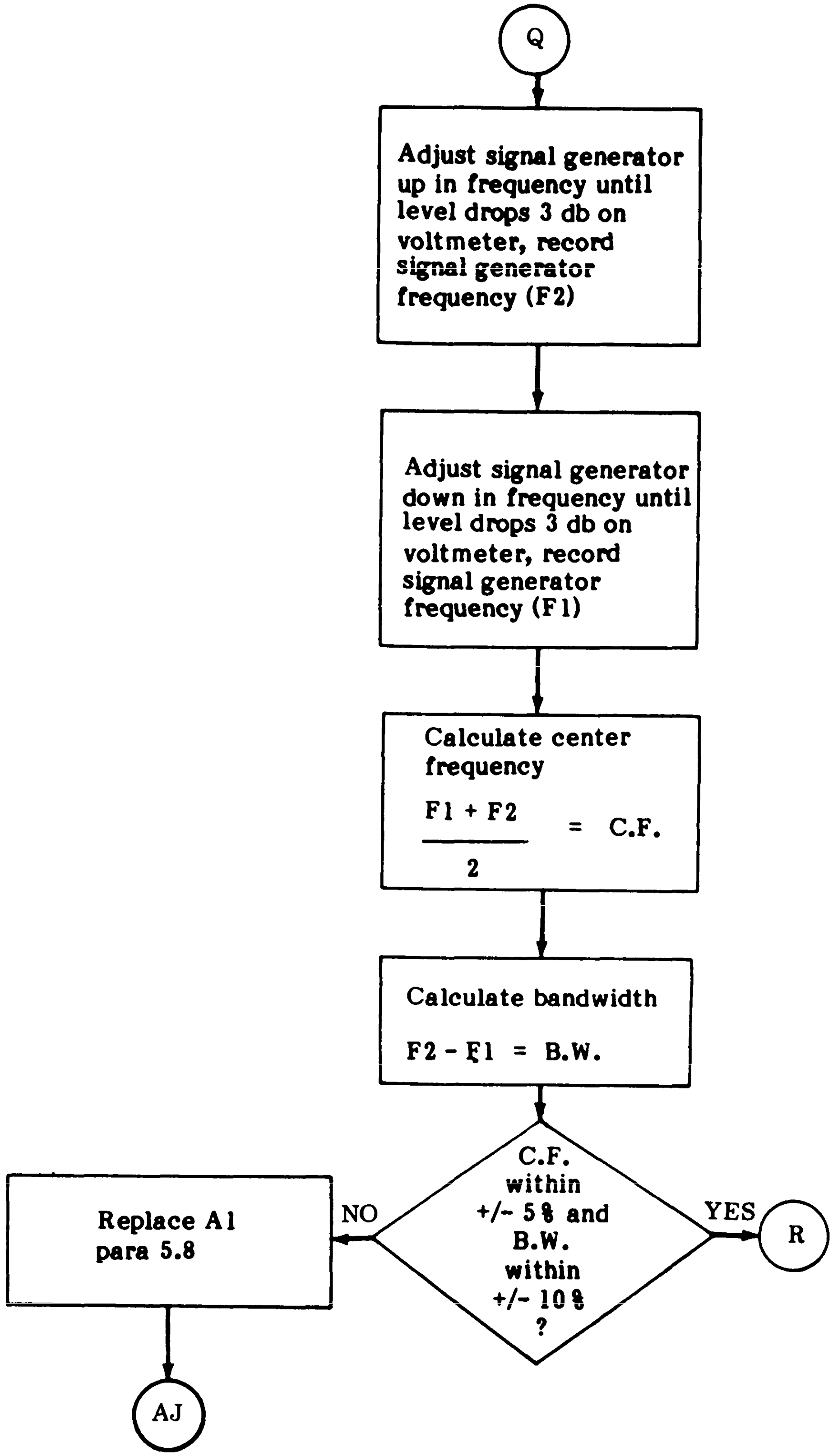

L
Reinstall A1A1
Extend A1A8
Using RF voltmeter check for -24 dbm at A1A8, pin 6
Signal present +/- 3 dbm ?
NO
YES
M
Replace A1 para 5.8
AJ

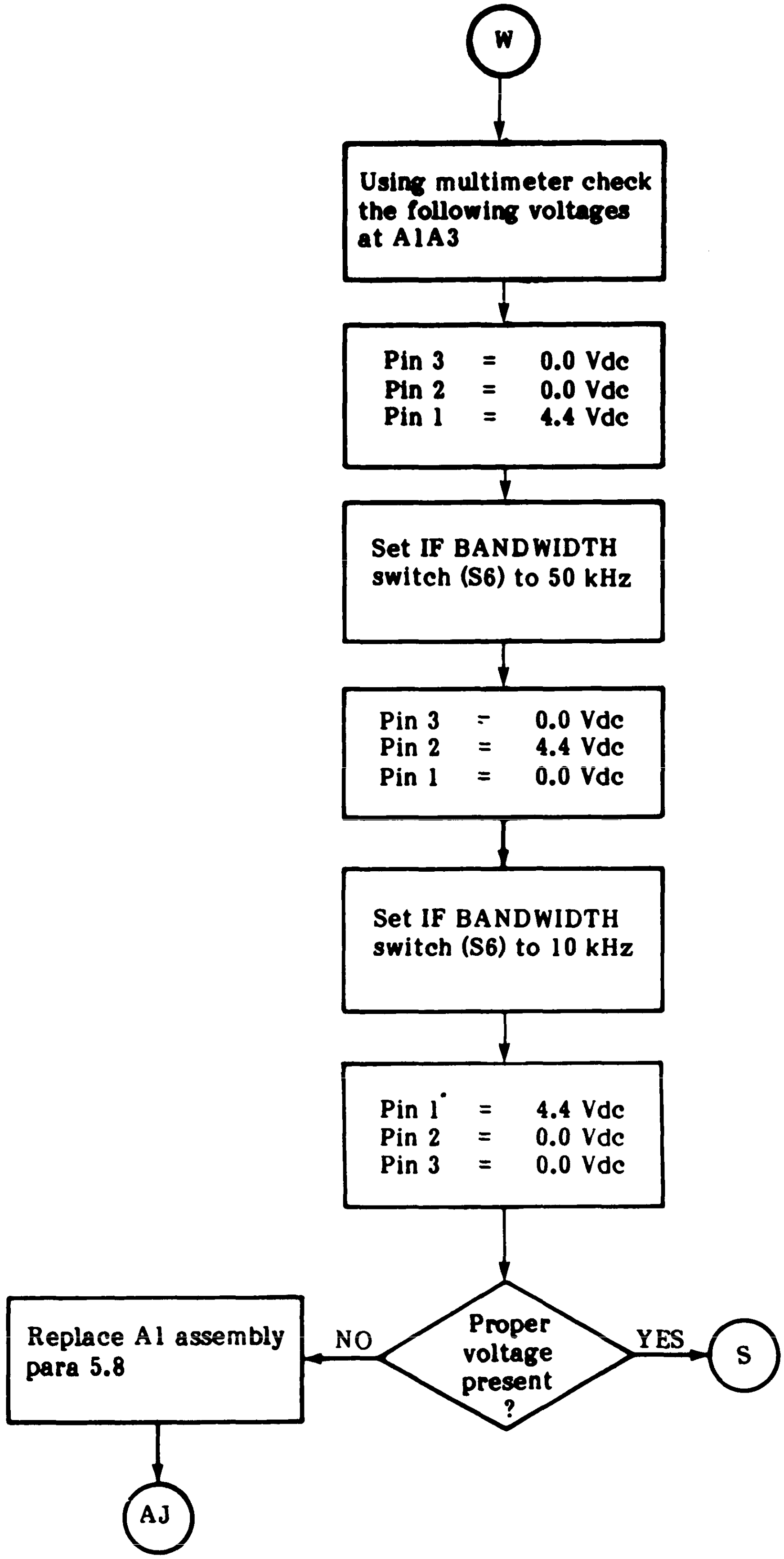

M
Using RF voltmeter check for -20 dbm at A1A8, pin 10
Signal present +/- 3 dbm ?
NO
YES
N
Replace A1A8 para 5.8
AJ

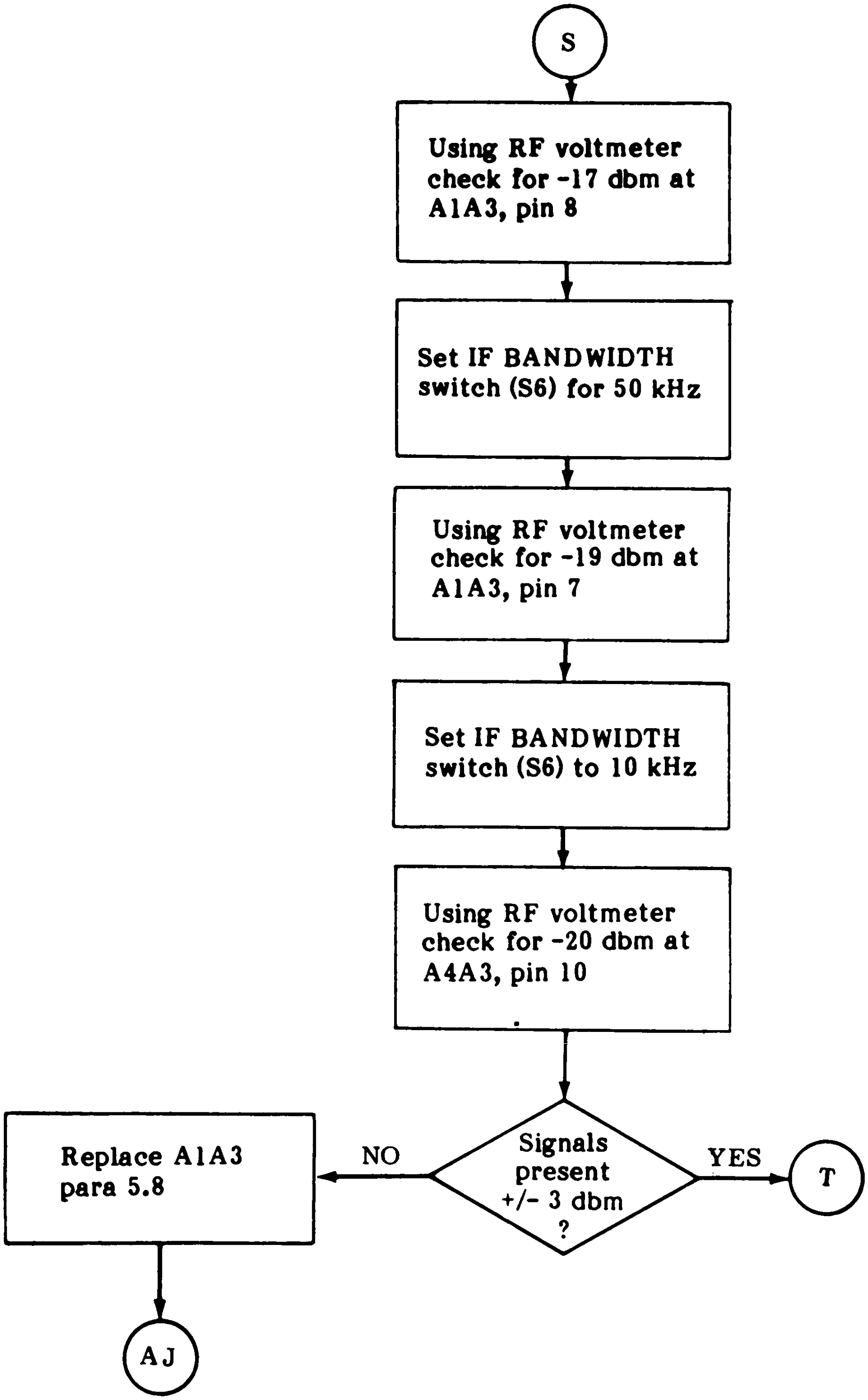

N
Reinstall A1A8
Remove P6 from A1, J5
Using RF voltmeter check for -41 dbm at A1, J5
Signal present +/- 3 dbm ?
NO
YES
Replace A1 para 5.8
O
AJ

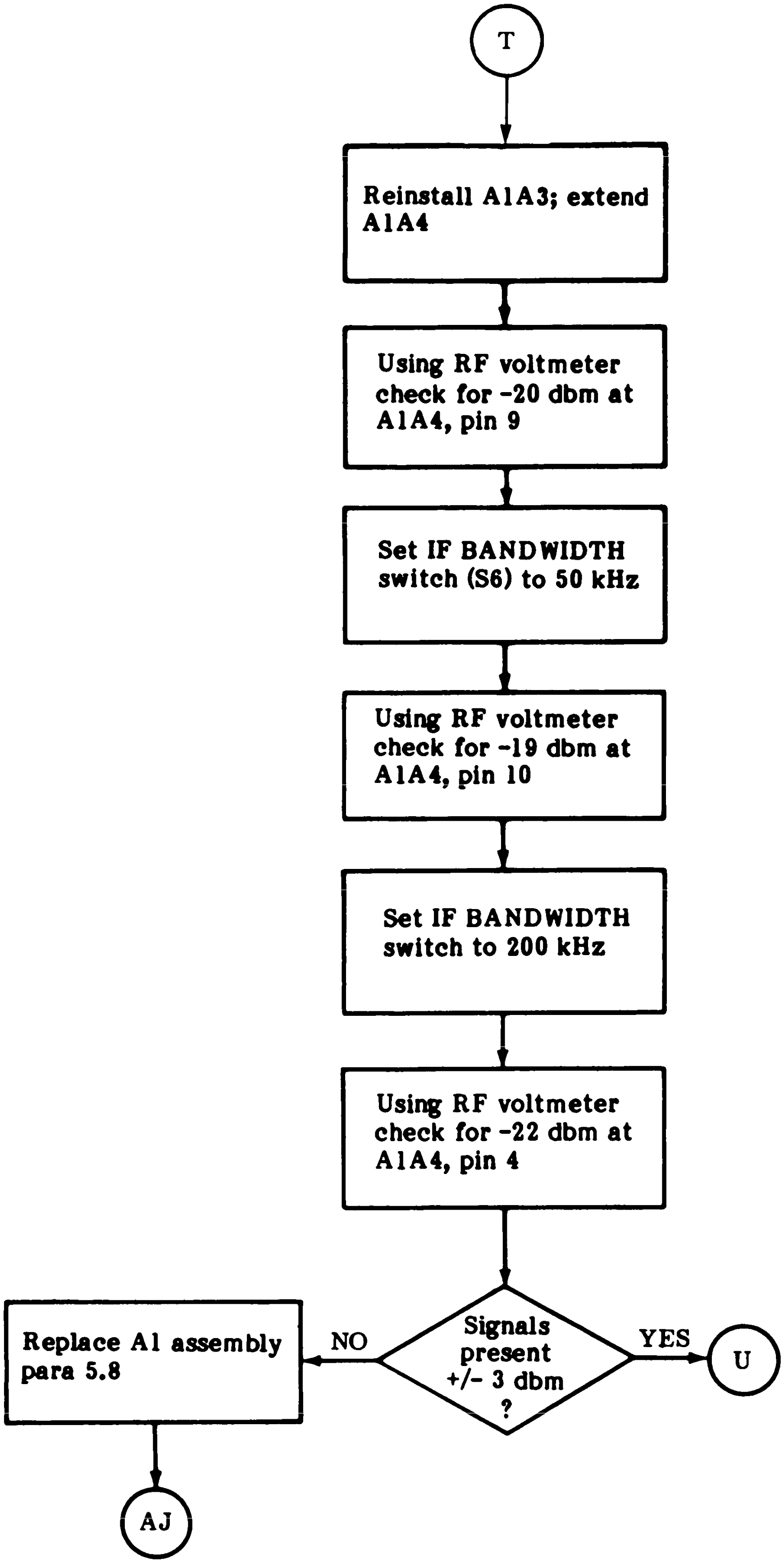

O
Reinstall P6 to A1, J5
Using RF voltmeter check for A1, J5 signal at SM OUT (J2)
Signal present +/- 1 dbm ?
NO
YES
P
Replace cable W2
AJ

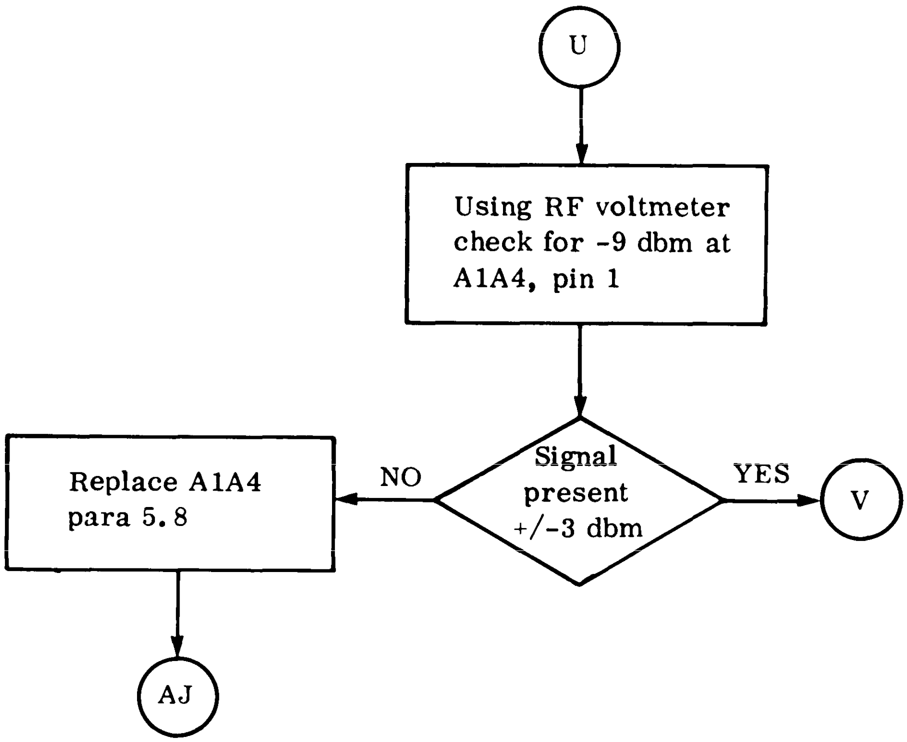

P
Extend A1A3
Using RF voltmeter check for -25 dbm at A1A3, pin 4
Signal present +/- 3 dbm ?
NO
YES
Replace A1 para 5.8
Q
AJ

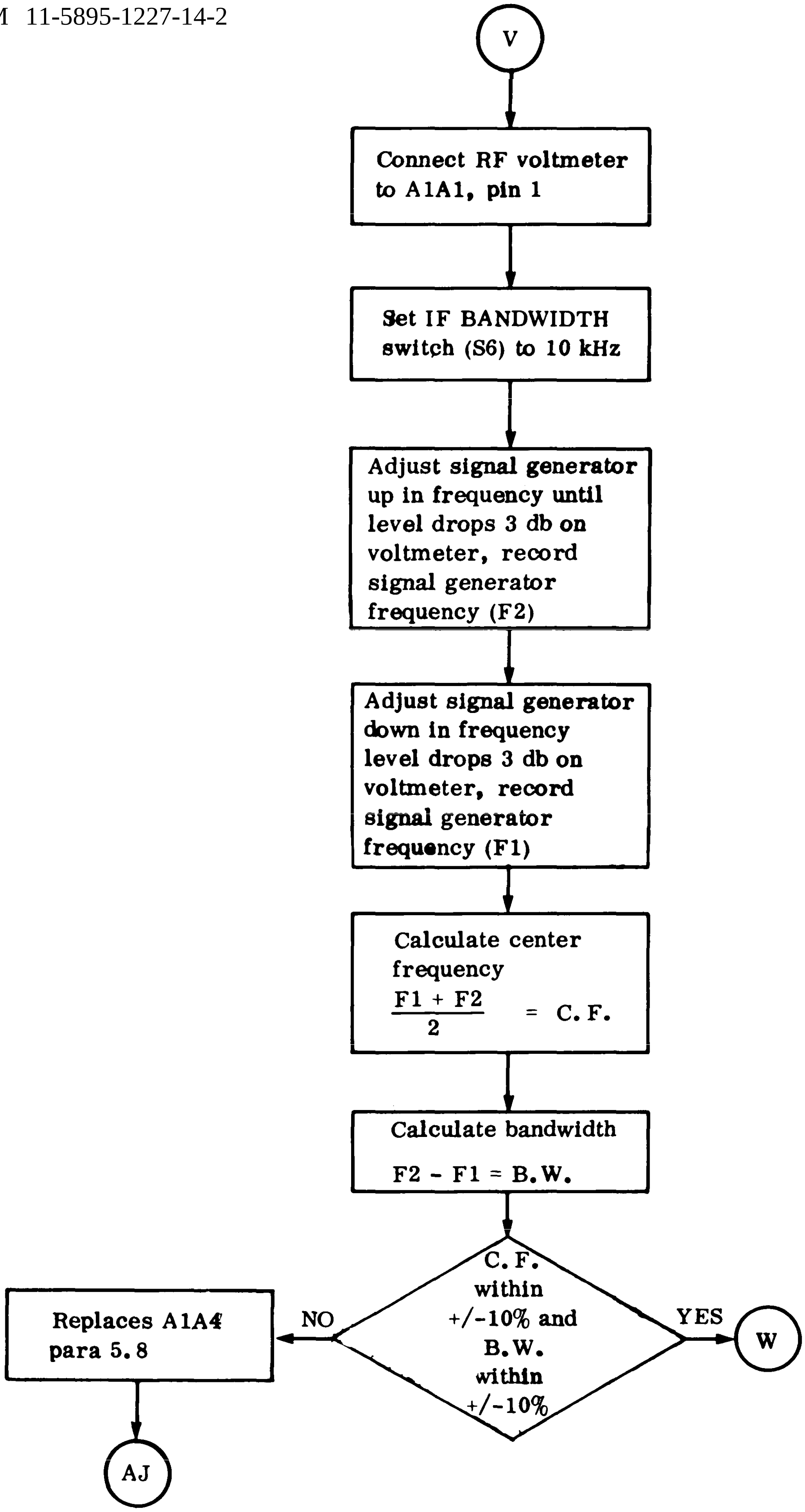

Q
Adjust signal generator up in frequency until level drops 3 db on voltmeter, record signal generator frequency (F2)
Adjust signal generator down in frequency until level drops 3 db on voltmeter, record signal generator frequency (F1)
Calculate center frequency
F1 + F2 / 2 = C.F.
Calculate bandwidth
F2 - F1 = B.W.
C.F. within +/- 5% and B.W. within +/- 10% ?
NO
YES
R
Replace A1 para 5.8
AJ

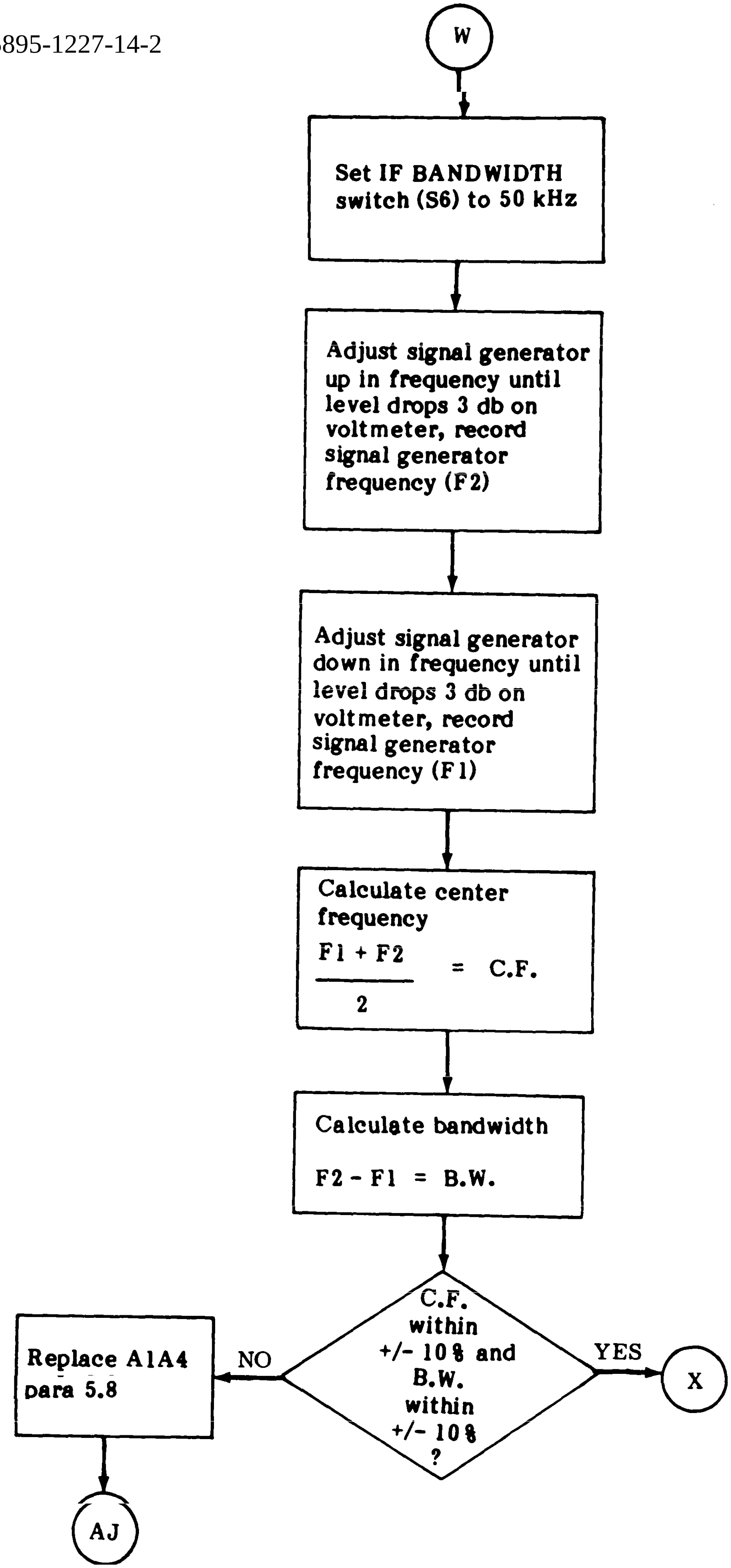

W
Using multimeter check the following voltages at A1A3
Pin 3 = 0.0 Vdc
Pin 2 = 0.0 Vdc
Pin 1 = 4.4 Vdc
Set IF BANDWIDTH switch (S6) to 50 kHz
Pin 3 = 0.0 Vdc
Pin 2 = 4.4 Vdc
Pin 1 = 0.0 Vdc
Set IF BANDWIDTH switch (S6) to 10 kHz
Pin 1 = 4.4 Vdc
Pin 2 = 0.0 Vdc
Pin 3 = 0.0 Vdc
Proper voltage present ?
NO
YES
S
Replace A1 assembly para 5.8
AJ

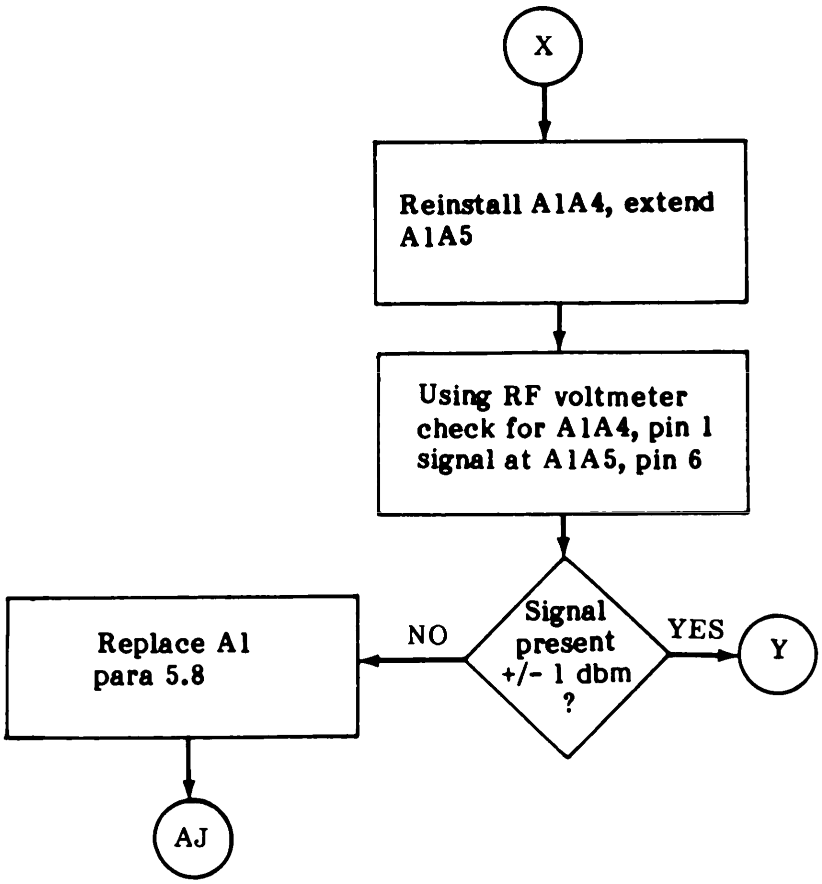

S
Using RF voltmeter check for -17 dbm at A1A3, pin 8
Set IF BANDWIDTH switch (S6) for 50 kHz
Using RF voltmeter check for -19 dbm at A1A3, pin 7
Set IF BANDWIDTH switch (S6) to 10 kHz
Using RF voltmeter check for -20 dbm at A4A3, pin 10
Signals present +/- 3 dbm ?
NO
YES
Replace A1A3 para 5.8
T
AJ

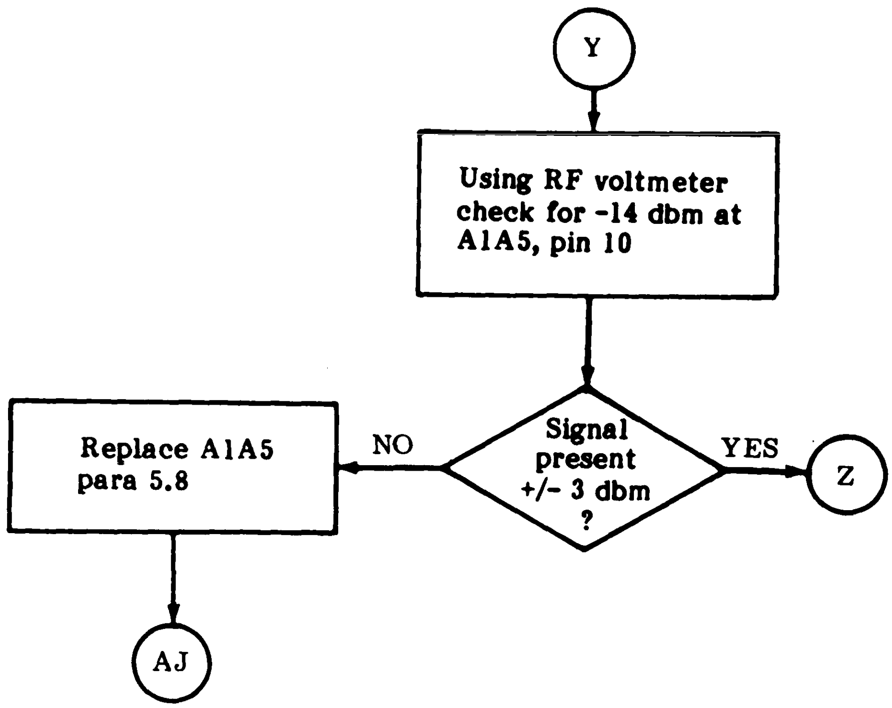

T
Reinstall A1A3; extend A1A4
Using RF voltmeter check for -20 dbm at A1A4, pin 9
Set IF BANDWIDTH switch (S6) to 50 kHz
Using RF voltmeter check for -19 dbm at A1A4, pin 10
Set IF BANDWIDTH switch to 200 kHz
Using RF voltmeter check for -22 dbm at A1A4, pin 4
Signals present +/- 3 dbm ?
NO
Replace A1 assembly para 5.8
AJ
YES
U

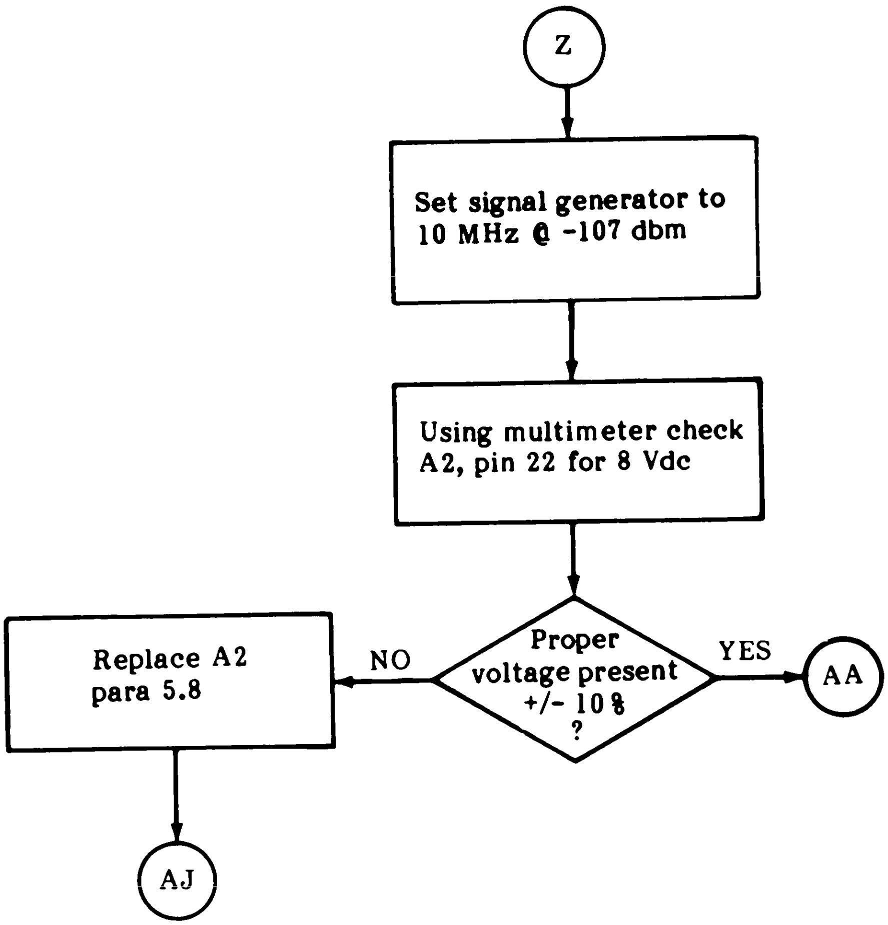

U
Using RF voltmeter check for -9 dbm at A1A4, pin 1
Signal present +/-3 dbm
NO
YES
V
Replace A1A4 para 5.8
AJ

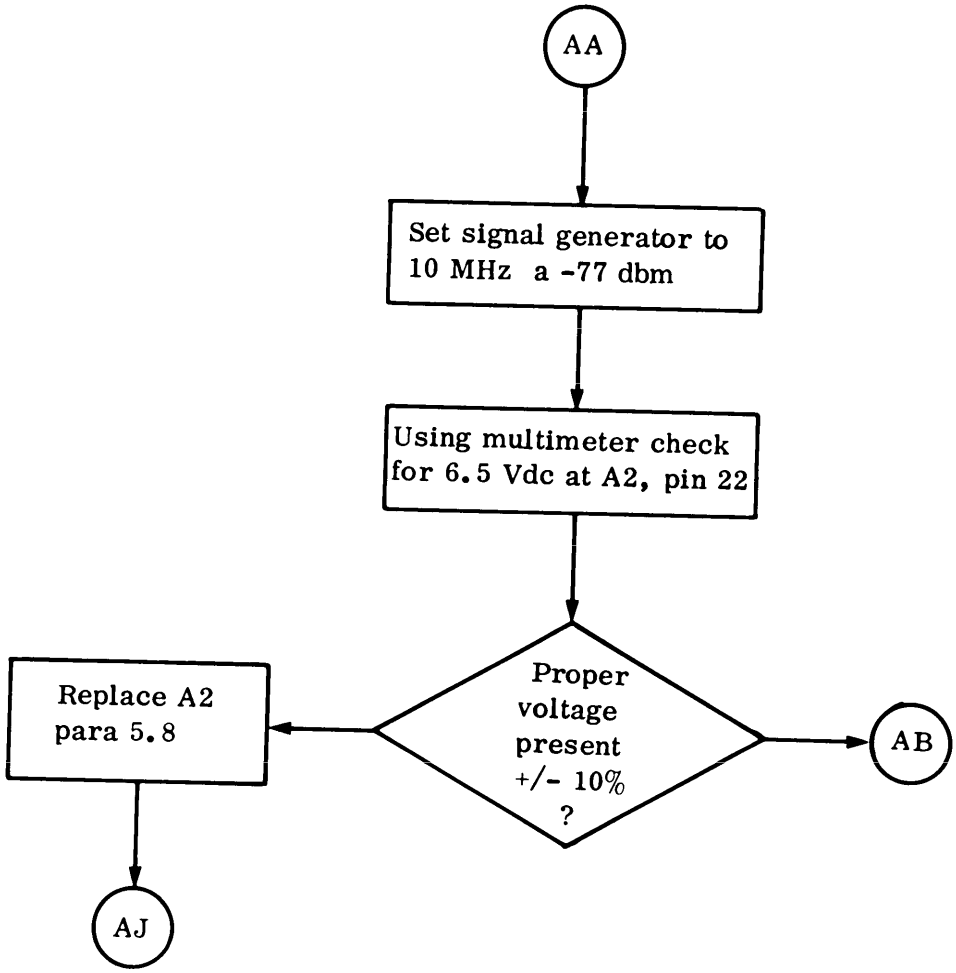

V
Connect RF voltmeter to A1A1, pin 1
Set IF BANDWIDTH switch (S6) to 10 kHz
Adjust signal generator up in frequency until level drops 3 db on voltmeter, record signal generator frequency (F2)
Adjust signal generator down in frequency level drops 3 db on voltmeter, record signal generator frequency (F1)
Calculate center frequency
$\frac{F1 + F2}{2}$ = C.F.
Calculate bandwidth
F2 - F1 = B.W.
C.F. within +/-10% and B.W. within +/-10%
NO
Replaces A1A4 para 5.8
AJ
YES
W

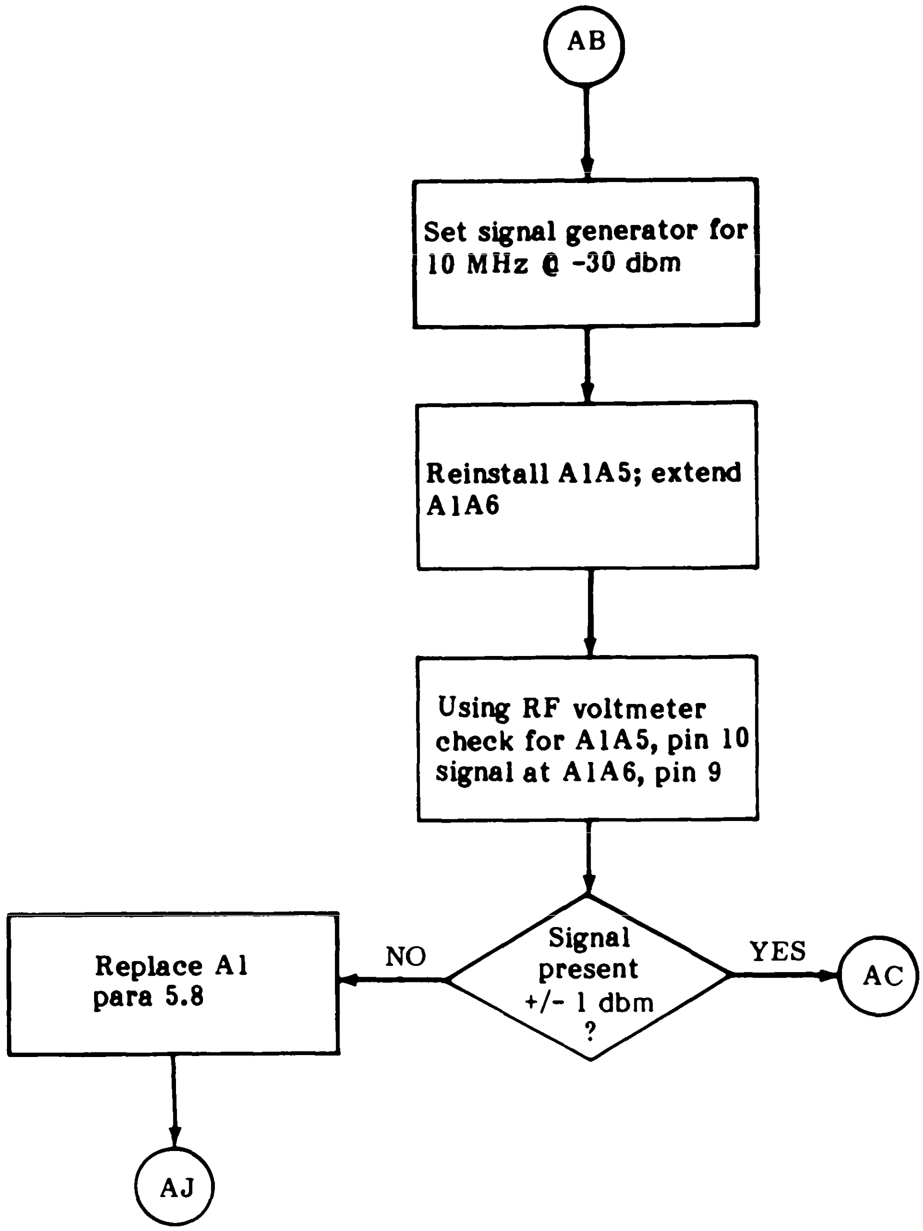

W
Set IF BANDWIDTH switch (S6) to 50 kHz
Adjust signal generator up in frequency until level drops 3 db on voltmeter, record signal generator frequency (F2)
Adjust signal generator down in frequency until level drops 3 db on voltmeter, record signal generator frequency (F1)
Calculate center frequency
F1 + F2 / 2 = C.F.
Calculate bandwidth
F2 - F1 = B.W.
C.F. within +/- 10% and B.W. within +/- 10% ?
NO
YES
Replace A1A4 para 5.8
X
AJ

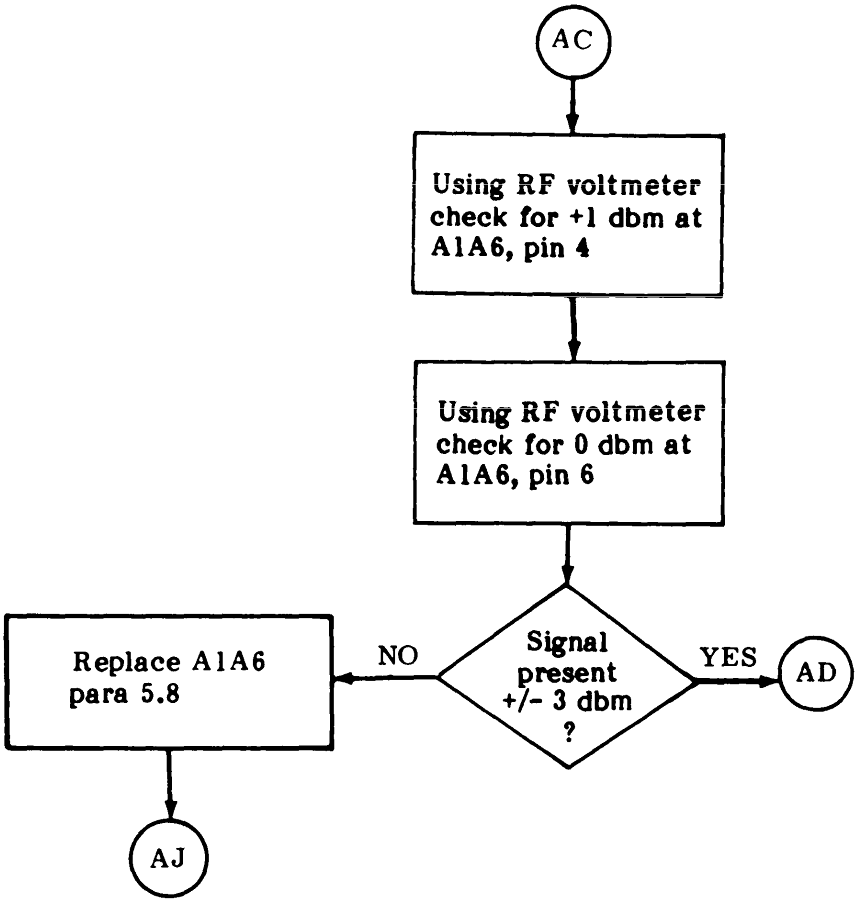

X
Reinstall A1A4, extend A1A5
Using RF voltmeter check for A1A4, pin 1 signal at A1A5, pin 6
Signal present +/- 1 dbm ?
NO
YES
Y
Replace A1 para 5.8
AJ

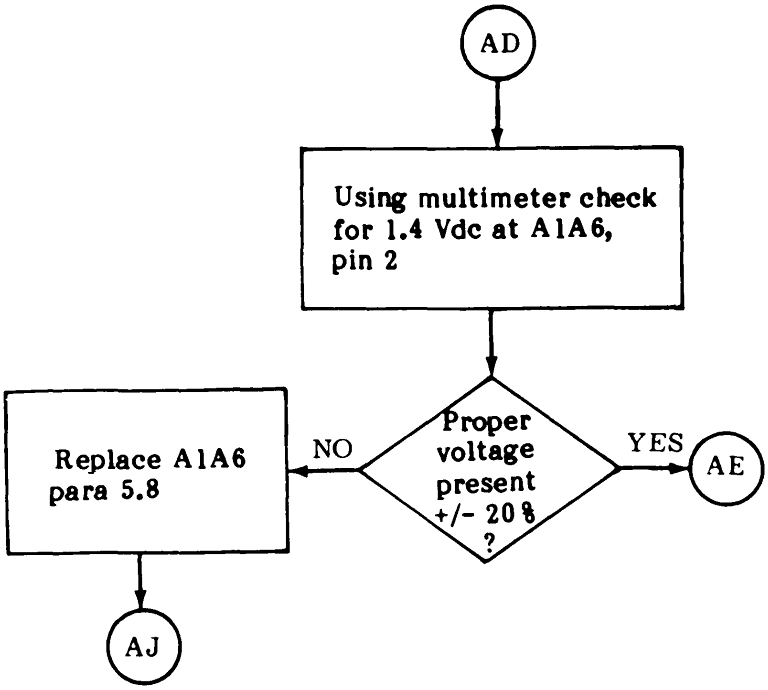

Y
Using RF voltmeter check for -14 dbm at A1A5, pin 10
Signal present +/- 3 dbm ?
NO
YES
Z
Replace A1A5 para 5.8
AJ

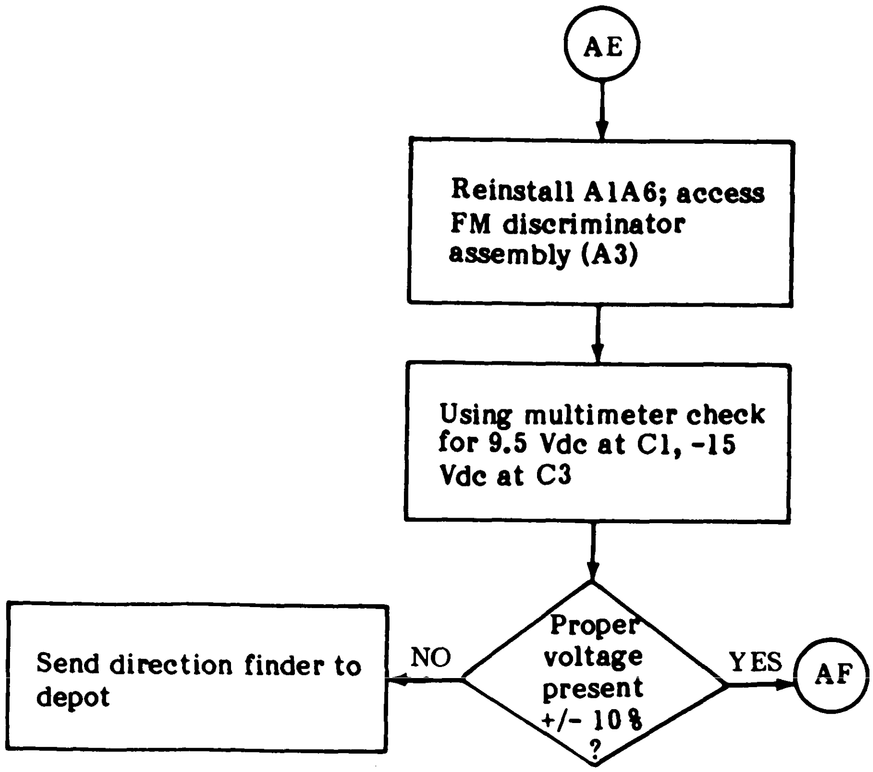

Z
Set signal generator to 10 MHz @ -107 dbm
Using multimeter check A2, pin 22 for 8 Vdc
Proper voltage present +/- 10% ?
NO
YES
AA
Replace A2 para 5.8
AJ

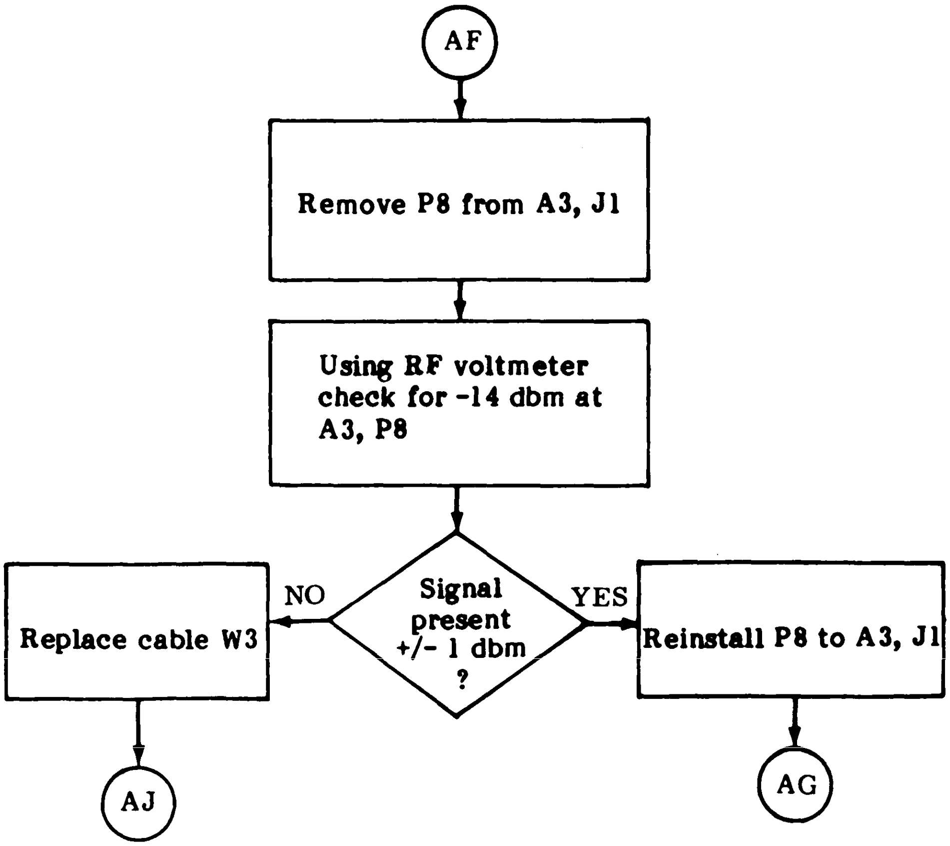

AA
Set signal generator to 10 MHz a -77 dbm
Using multimeter check for 6.5 Vdc at A2, pin 22
Proper voltage present +/- 10% ?
AB
Replace A2 para 5.8
AJ

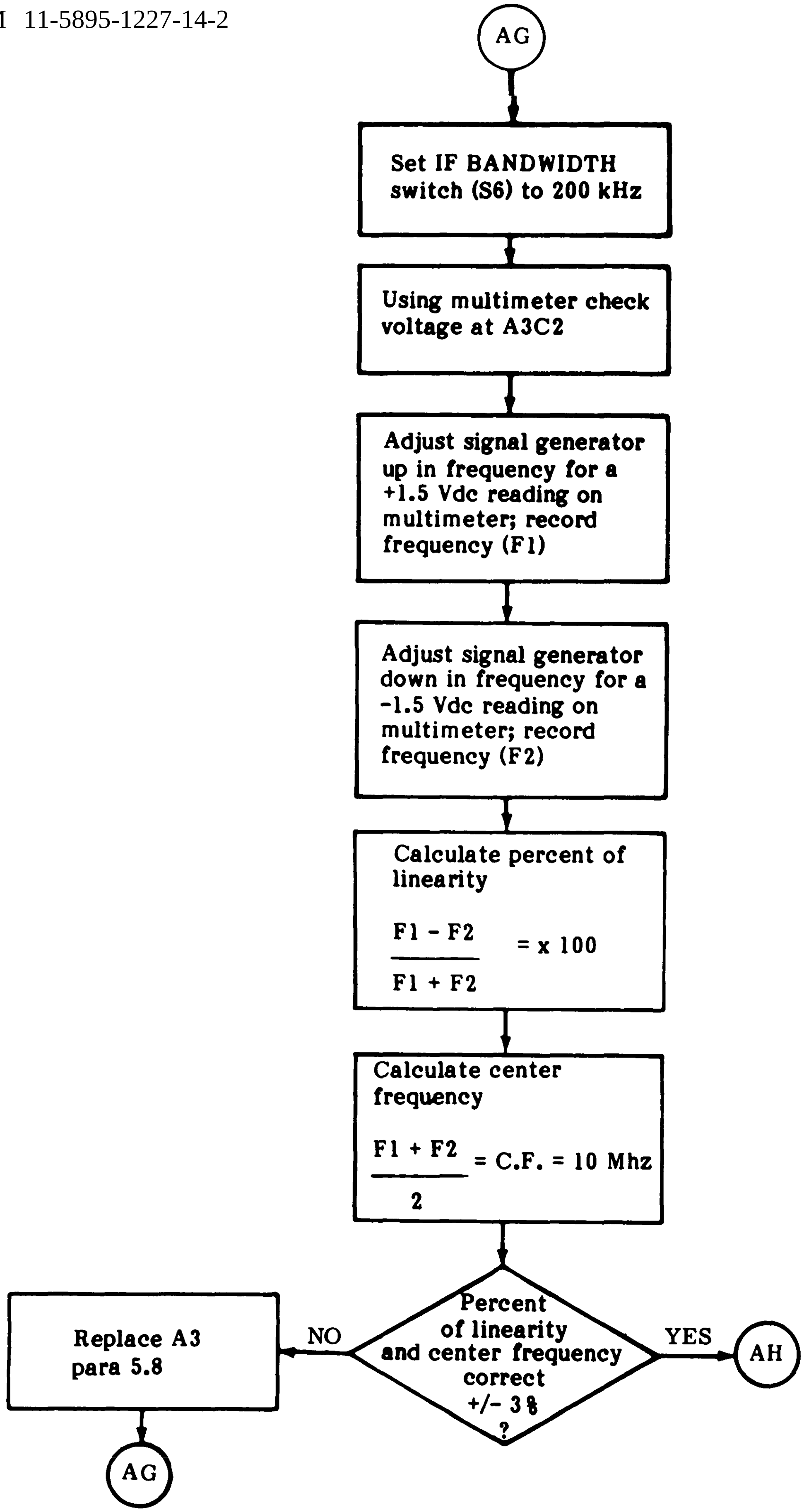

AB
Set signal generator for 10 MHz @ -30 dbm
Reinstall A1A5; extend A1A6
Using RF voltmeter check for A1A5, pin 10 signal at A1A6, pin 9
Signal present +/- 1 dbm ?
NO
YES
AC
Replace A1 para 5.8
AJ

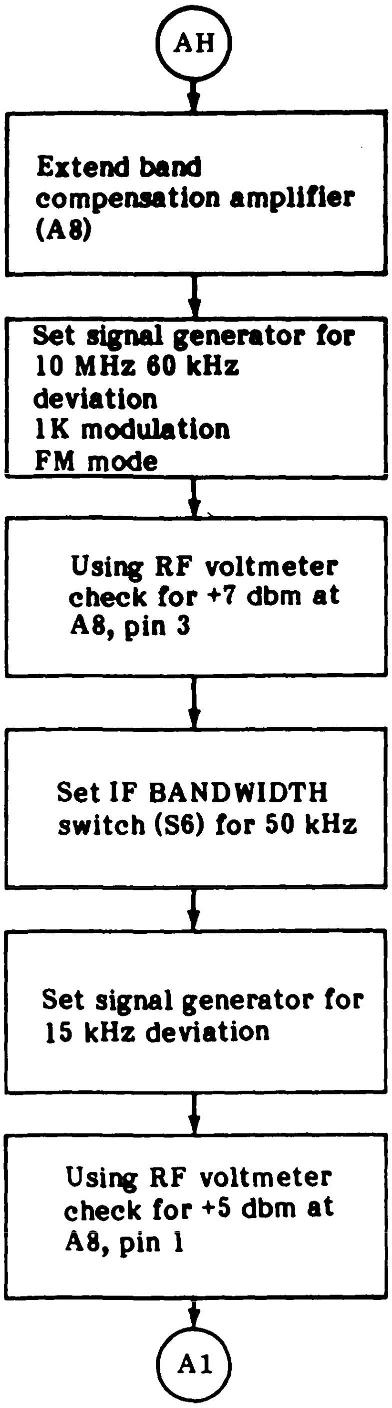

AC
Using RF voltmeter check for +1 dbm at A1A6, pin 4
Using RF voltmeter check for 0 dbm at A1A6, pin 6
Signal present +/- 3 dbm ?
NO
YES
AD
Replace A1A6 para 5.8
AJ

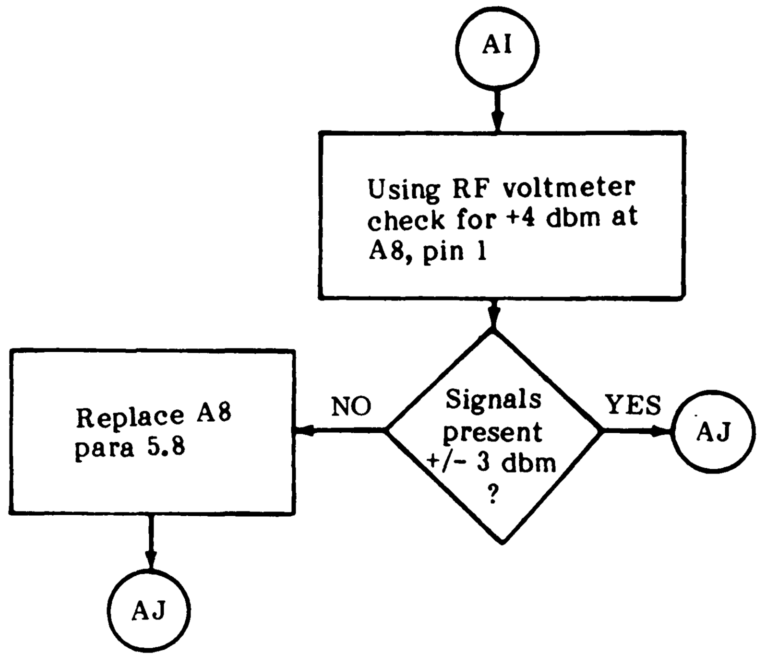

AD
Using multimeter check for 1.4 Vdc at A1A6, pin 2
Proper voltage present +/- 20 % ?
NO
YES
Replace A1A6 para 5.8
AE
AJ

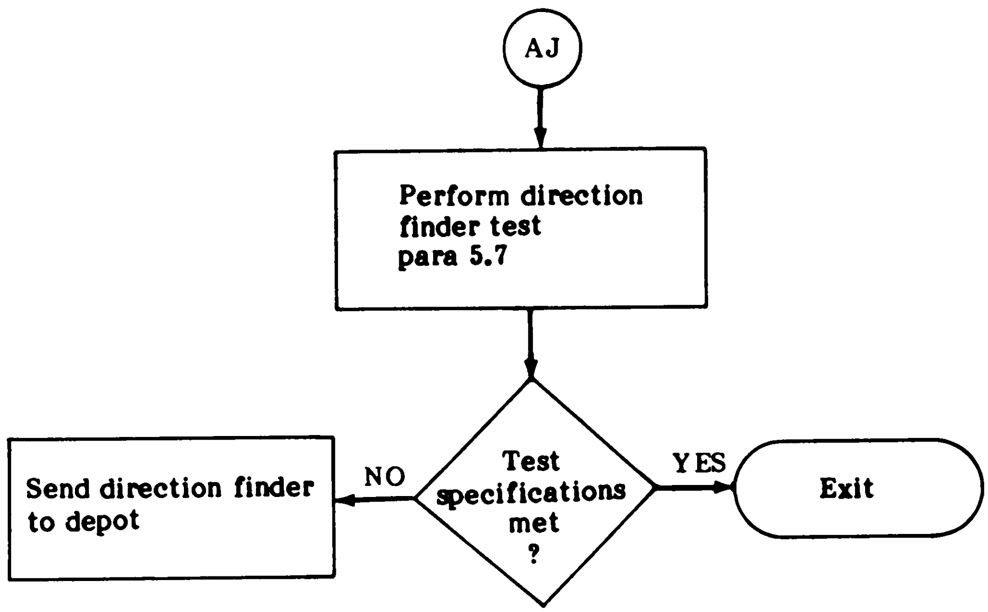

AE
Reinstall A1A6; access FM discriminator assembly (A3)
Using multimeter check for 9.5 Vdc at C1, -15 Vdc at C3
Proper voltage present +/- 10% ?
NO
Send direction finder to depot
YES
AF


AF
Remove P8 from A3, J1
Using RF voltmeter check for -14 dbm at A3, P8
Signal present +/- 1 dbm ?
NO
YES
Replace cable W3
Reinstall P8 to A3, J1
AJ
AG


AG
Set IF BANDWIDTH switch (S6) to 200 kHz
Using multimeter check voltage at A3C2
Adjust signal generator up in frequency for a +1.5 Vdc reading on multimeter; record frequency (F1)
Adjust signal generator down in frequency for a -1.5 Vdc reading on multimeter; record frequency (F2)
Calculate percent of linearity
F1 - F2 / F1 + F2 = x 100
Calculate center frequency
F1 + F2 / 2 = C.F. = 10 Mhz
Percent of linearity and center frequency correct +/- 3% ?
NO
Replace A3 para 5.8
AG
YES
AH


AH
Extend band compensation amplifier (A8)
Set signal generator for 10 MHz 60 kHz deviation 1K modulation FM mode
Using RF voltmeter check for +7 dbm at A8, pin 3
Set IF BANDWIDTH switch (S6) for 50 kHz
Set signal generator for 15 kHz deviation
Using RF voltmeter check for +5 dbm at A8, pin 1
A1


AI
Using RF voltmeter check for +4 dbm at A8, pin 1
Signals present +/- 3 dbm ?
NO
YES
AJ
Replace A8 para 5.8
AJ


AJ
Perform direction finder test para 5.7
Test specifications met ?
NO
YES
Send direction finder to depot
Exit

THRESHOLD LAMP THAT DOES NOT LIGHT

Test Equipment	
Power Supply	PP-6547/U
Multimeter	AN/PSM-45
Test Lead Set	Simpson 00577
Tools	
4 in. flat tip screwdriver	5120-00-222-8852

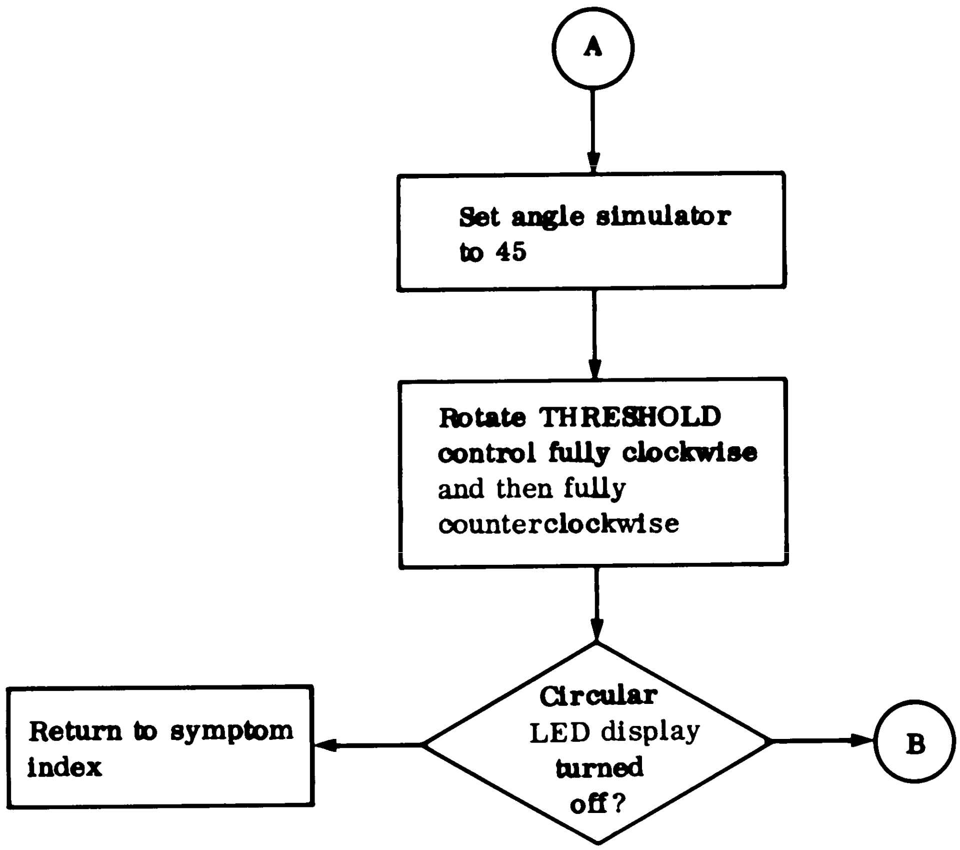
Replacement Parts
AGC Squelch (A2)
DC/DC Converter

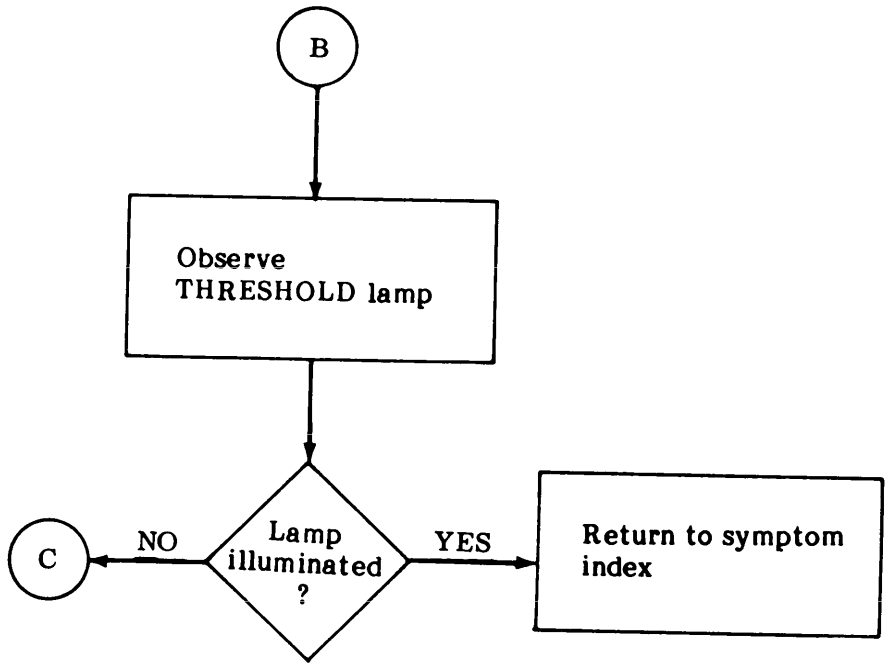
Equipment Condition

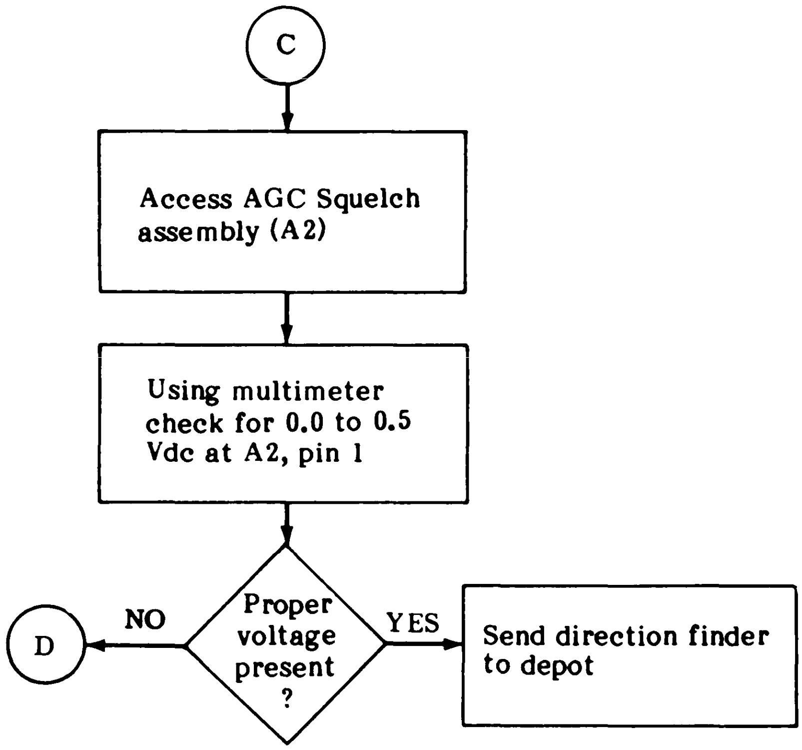
NOTE

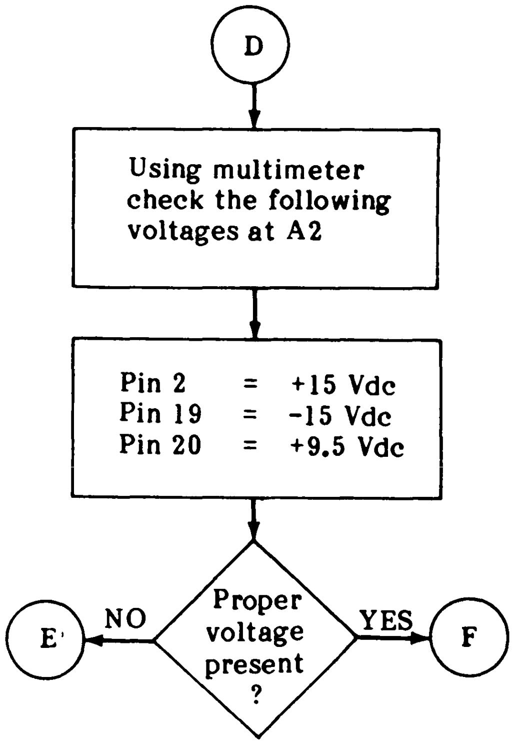
Allow 30 minute warm-up time of Direction Finder before proceeding with troubleshooting procedures

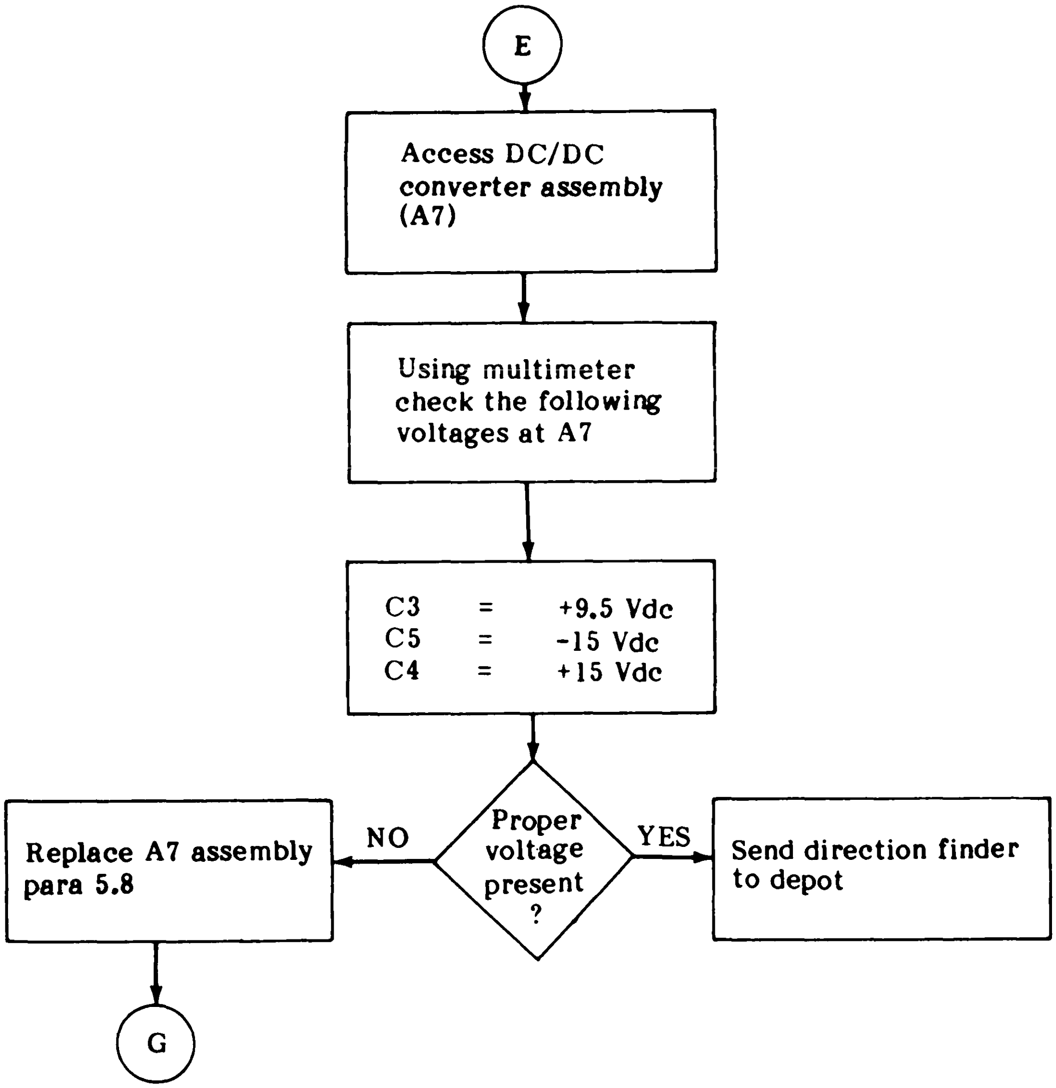
OFF/OMNI/DF/CAL switch set to DF
DISPLAY OFF/DISPLAY INTENSITY knob set to mid-range
BAND MHz switch set to 80-250 MHz band
IF BANDWIDTH switch set to 200 kHz
INTEG TIME switch set to GATED
Angle simulator connected to Direction Finder
ZERO ADJ knob set as required
Power supply set to 24 Vdc and connected to J5
Direction Finder calibrated
Direction Finder cover removed

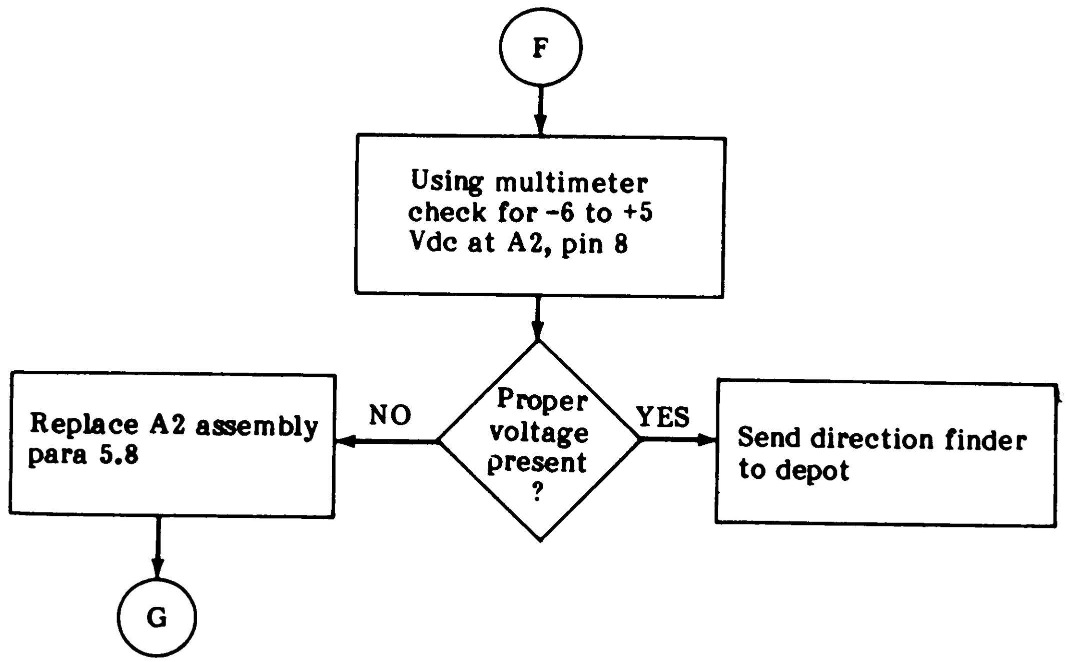

A
Set angle simulator to 45
Rotate THRESHOLD control fully clockwise and then fully counterclockwise
Circular LED display turned off?
Return to symptom index
B


B
Observe
THRESHOLD lamp
Lamp
illuminated
?
NO
C
YES
Return to symptom
index


C
Access AGC Squelch assembly (A2)
Using multimeter check for 0.0 to 0.5 Vdc at A2, pin 1
Proper voltage present ?
NO
D
YES
Send direction finder to depot


D
Using multimeter check the following voltages at A2
Pin 2 = +15 Vdc
Pin 19 = -15 Vdc
Pin 20 = +9.5 Vdc
Proper voltage present ?
NO
E
YES
F


E
Access DC/DC converter assembly (A7)
Using multimeter check the following voltages at A7
C3 = +9.5 Vdc
C5 = -15 Vdc
C4 = +15 Vdc
Proper voltage present ?
NO
Replace A7 assembly para 5.8
YES
Send direction finder to depot
G


F
Using multimeter check for -6 to +5 Vdc at A2, pin 8
Proper voltage present ?
NO
Replace A2 assembly para 5.8
YES
Send direction finder to depot
G

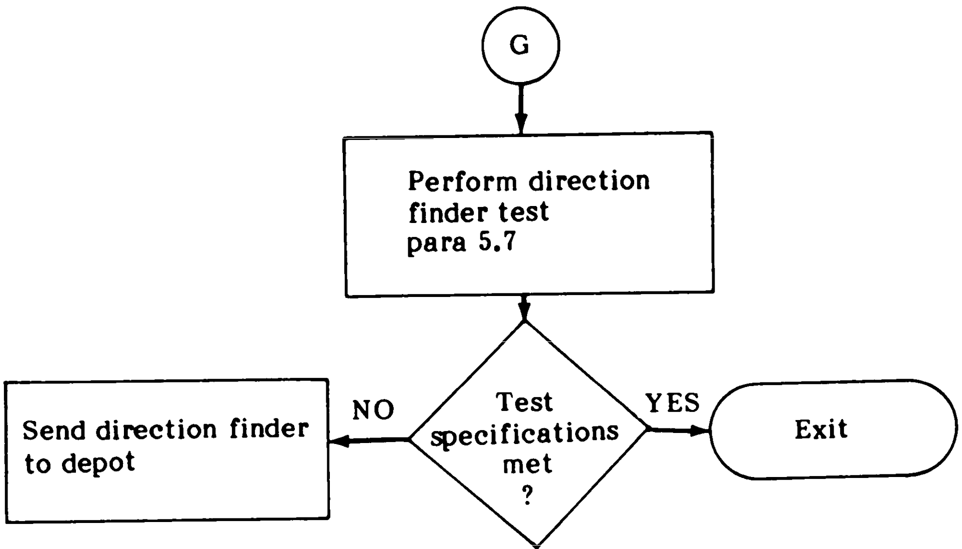

G
Perform direction finder test para 5.7
Test specifications met ?
NO
YES
Send direction finder to depot
Exit

TABLE 5-1

DISPLAYS RANDOM LINES OF BEARING WHEN SET TO HOLD MODE

Test Equipment

Power Supply	PP-6547/U
Multimeter	AN/PSM-45
Test Lead Set	Simpson 00577
Angle Simulator	TF-15043 MK II

Tools

4 in. flat tip screwdriver	5120-00-222-8852

Replacement Parts

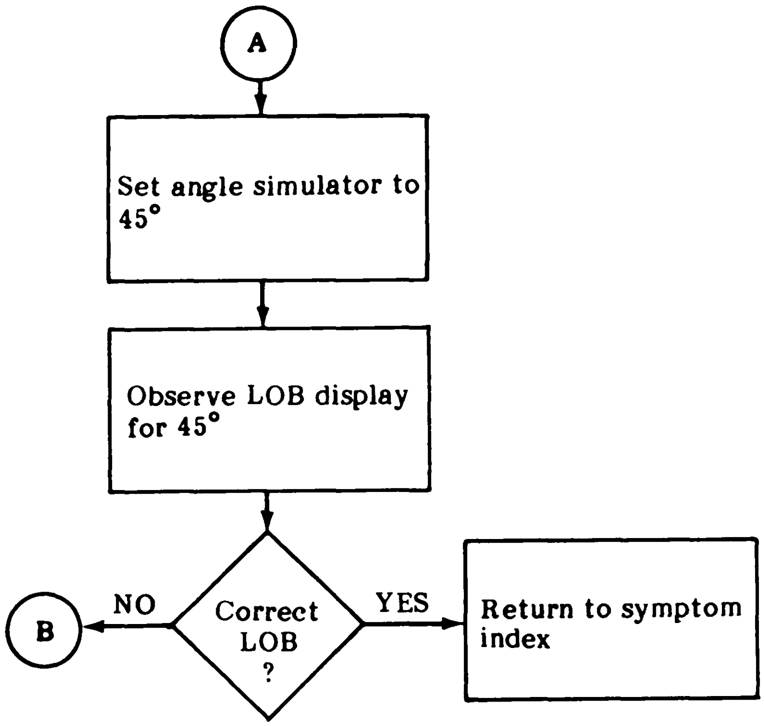
Master Time Controller and Display Logic (A4A6)

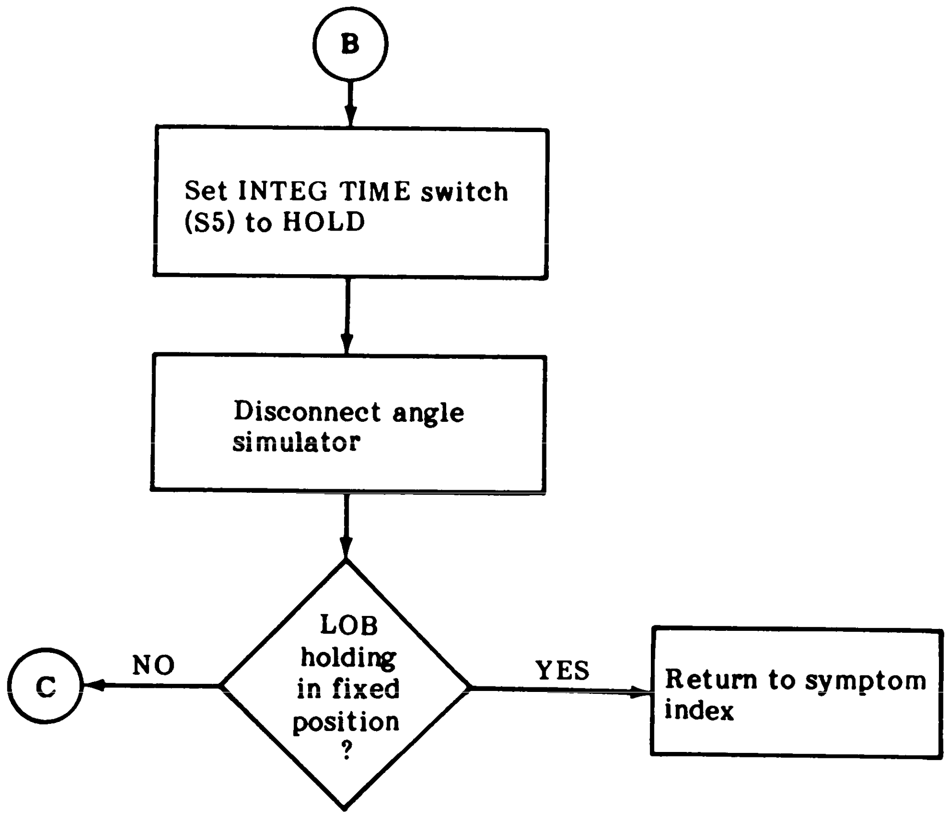
Equipment Condition

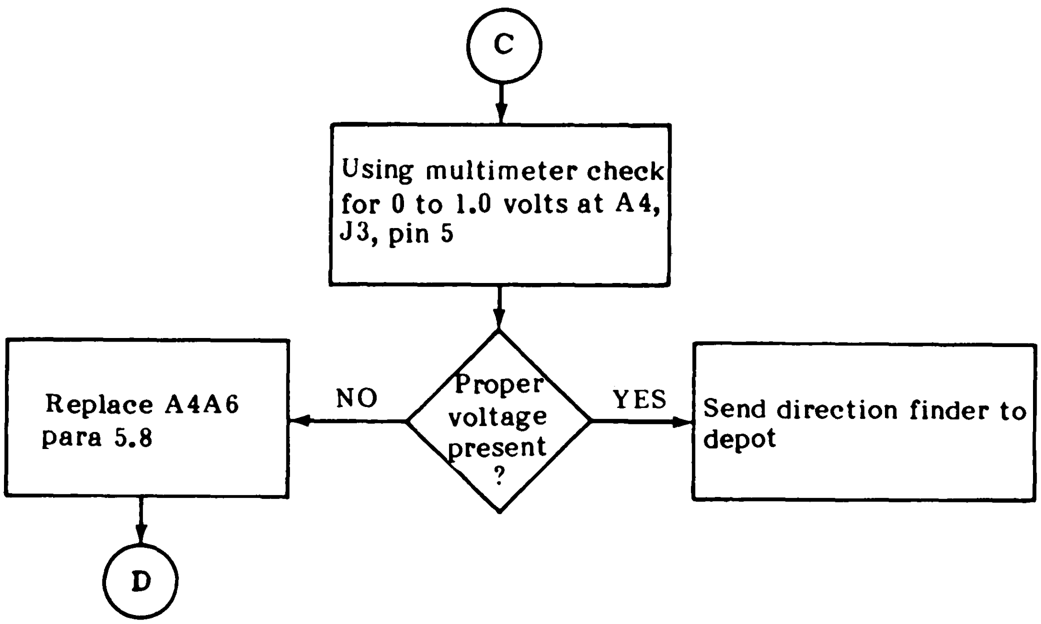
NOTE

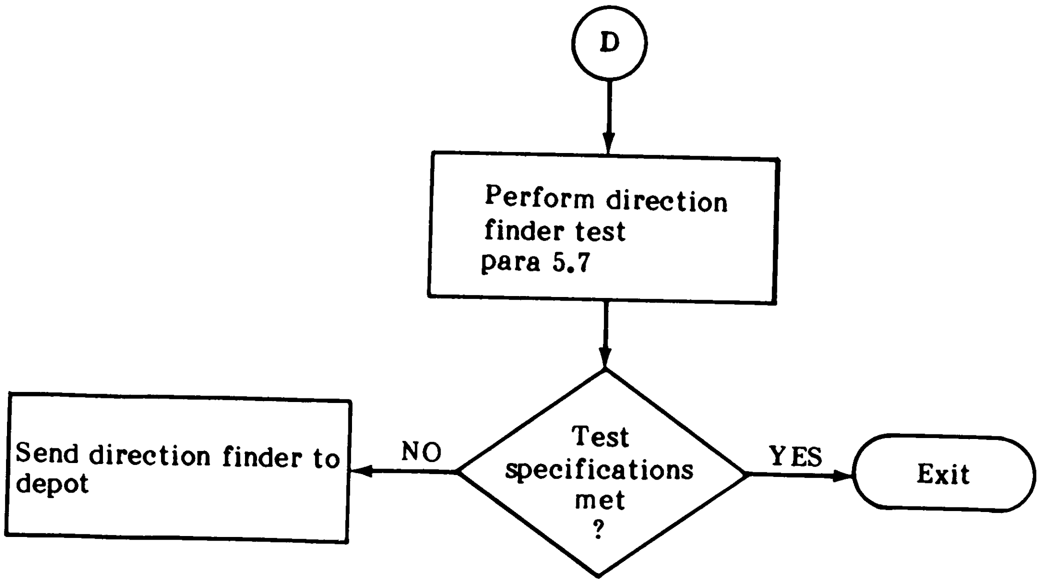
Allow 30 minute warm-up time of Direction Finder before proceeding with troubleshooting procedures.

OFF/OMNI/DF/CAL switch set to DF
DISPLAY OFF/DISPLAY INTENSITY knob set to mid-range
BAND MHz switch set to 20-80 MHz band
IF BANDWIDTH switch set to 200 kHz
INTEG TIME switch set to 0.5 SEC
GATED THRESHOLD knob set fully clockwise
Angle simulator connected to Direction Finder
ZERO ADJ knob set as required
Power supply set to 24 Vdc and connected to J5
Direction Finder calibrated
Direction Finder cover removed


A
Set angle simulator to 45°
Observe LOB display for 45°
Correct LOB ?
NO
B
YES
Return to symptom index


B
Set INTEG TIME switch (S5) to HOLD
Disconnect angle simulator
LOB holding in fixed position ?
NO
C
YES
Return to symptom index


C
Using multimeter check for 0 to 1.0 volts at A4, J3, pin 5
Proper voltage present ?
NO
YES
Replace A4A6 para 5.8
Send direction finder to depot
D


D
Perform direction finder test para 5.7
Test specifications met ?
NO
Send direction finder to depot
YES
Exit

RANDOM LINES OF BEARING IN ON EOR TWO
IF BANDWIDTH (kHz) POSITIONS

Test Equipment	
Power Supply	PP-6547U
Multi meter	AN/PSM-45
Test Lead Set	Simpson 00577
RF Voltmeter	Boonton 92C
High Frequency Probe	Boonton 91-12F
Signal Generator	SG-11 12(V) I/U with options 001, 002, 003
Cable, RF, 50 ohms	HP 10503A
Angle Simulator	TF-15403 MKII

Tools	
4 in. flat tip screwdriver	5120-00-222-8852

Replacement Parts

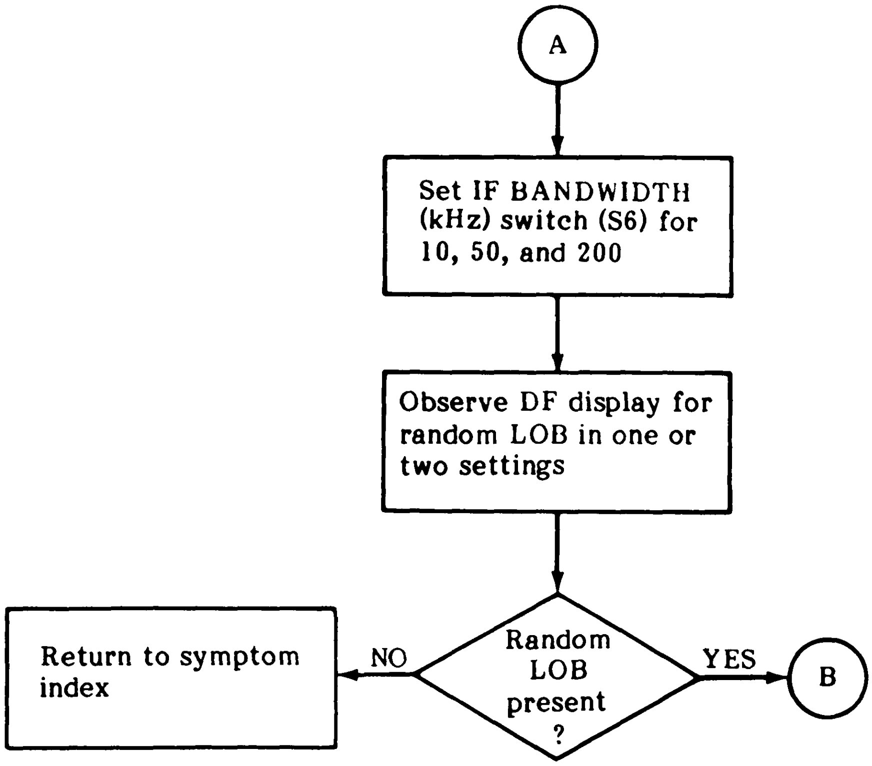
Gain Bandwidth Compensation Amplifier (A1A3)
IF Filter and Diode Switches (A1A4)

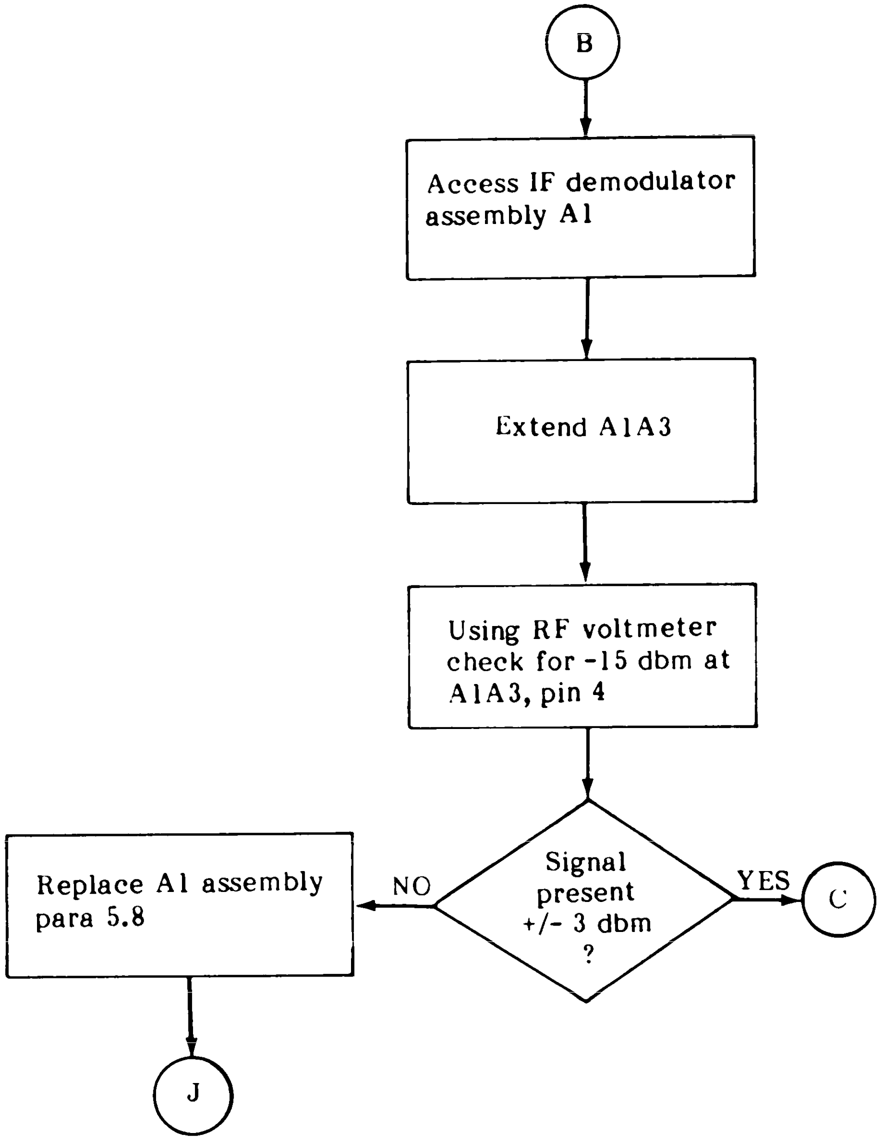
Equipment Condition

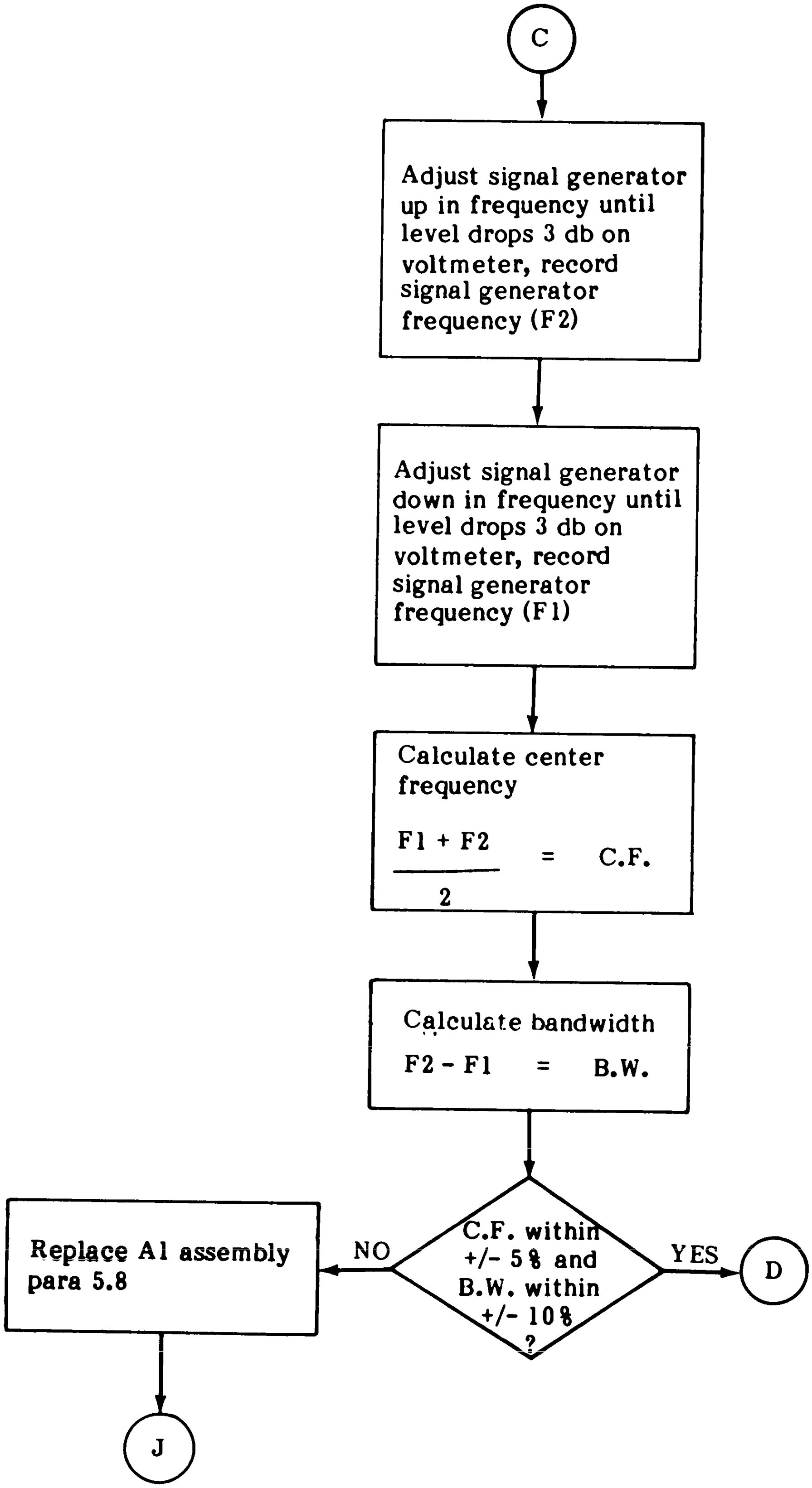
NOTE

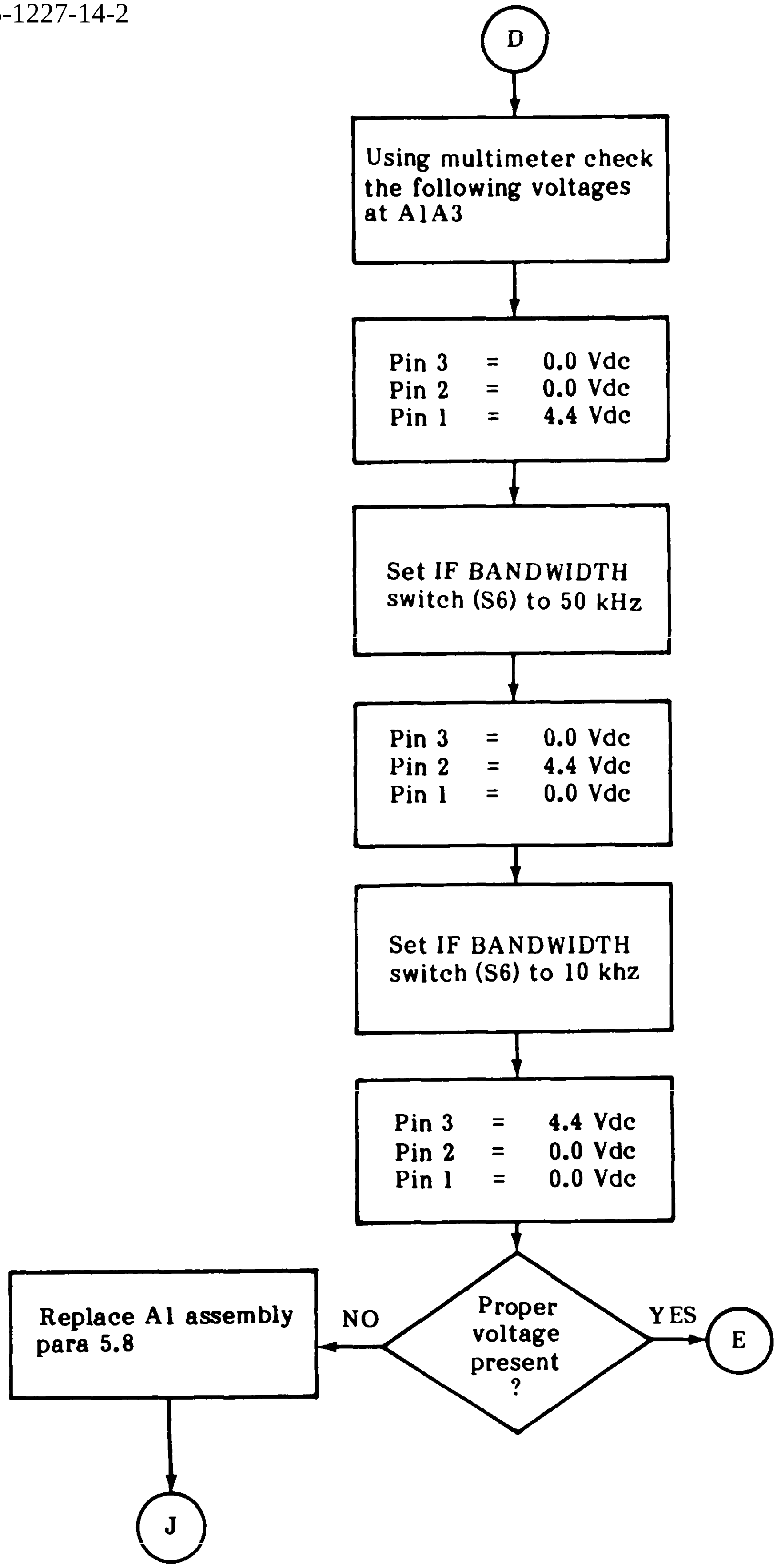
Allow 30 minute warm-up time of Direction Finder before proceeding with troubleshooting procedures.

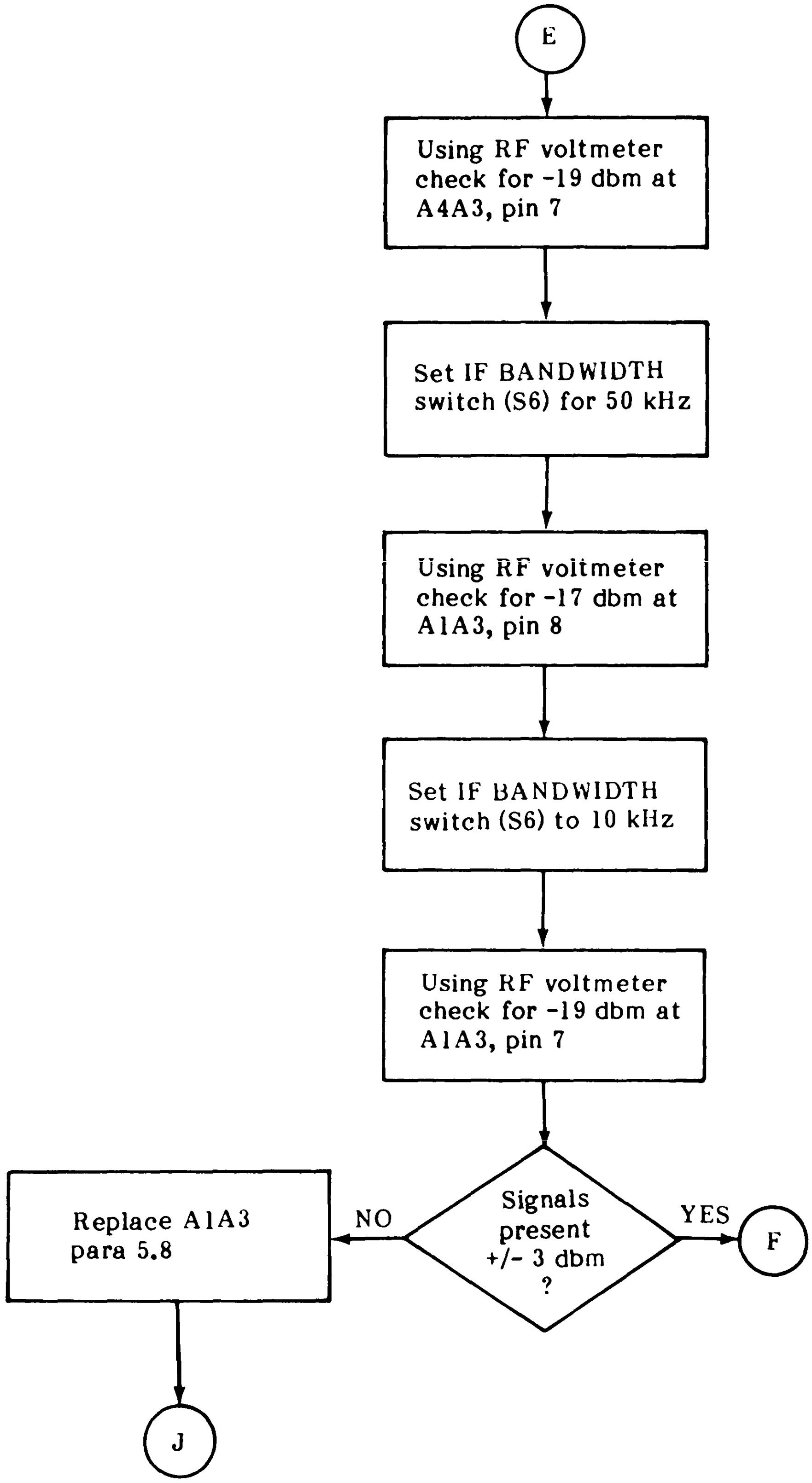
Angle simulator connected to Direction Finder
OFF/OMNI/DF/CAL switch set to CAL
DISPLAY OFF/DISPLAY INTENSITY knob set to mid-range
BAND MHz switch set to 80-250 MHz
IF BANDWIDTH switch set to 200 kHz
INTEG TIME switch set to 2 SEC
ZERO ADJ knob set as required
Power Supply set to 24 Vdc and connected to J5
Direction Finder calibrated
Direction Finder cover removed

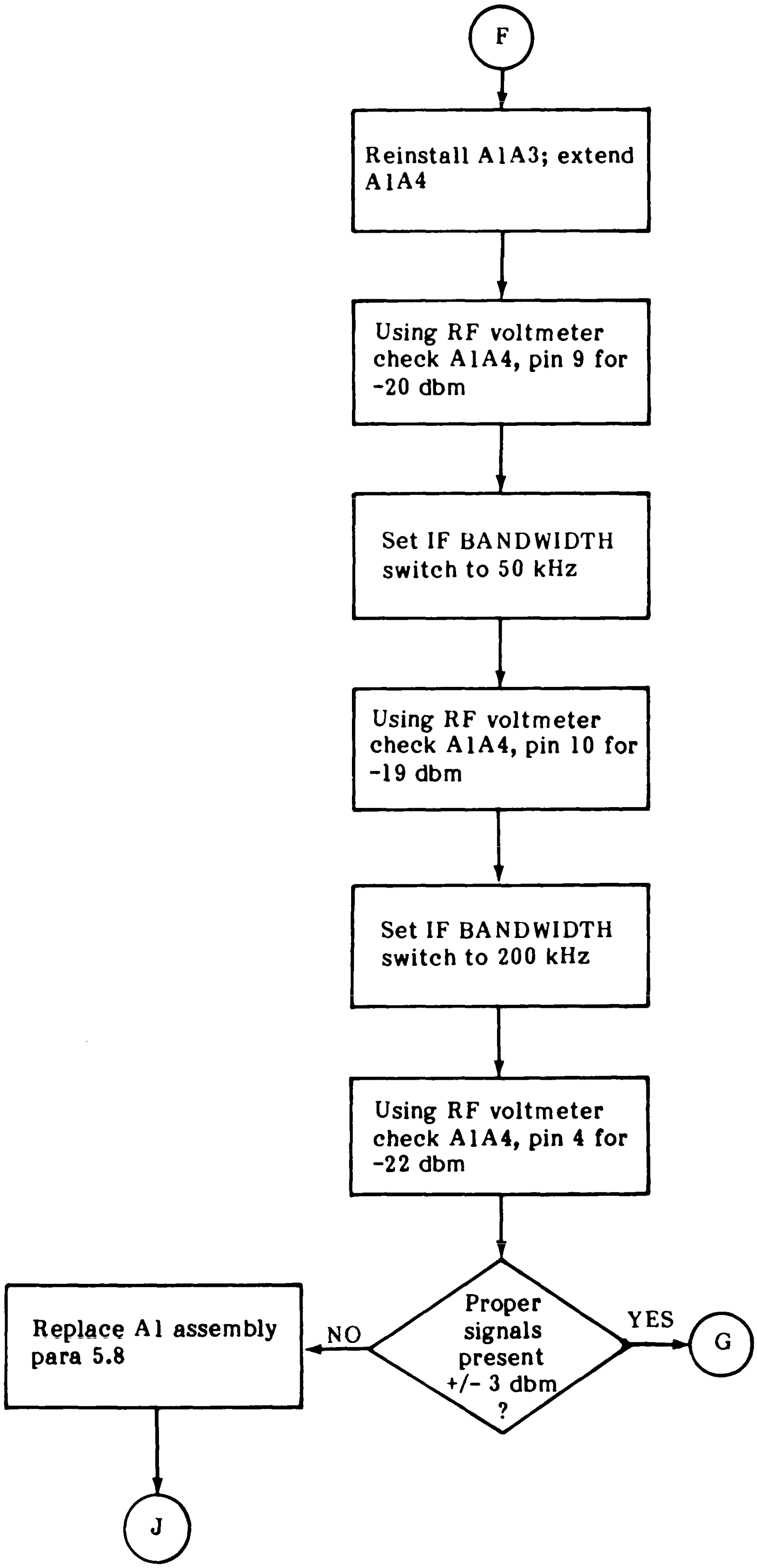

A
Set IF BANDWIDTH (kHz) switch (S6) for 10, 50, and 200
Observe DF display for random LOB in one or two settings
Random LOB present ?
NO
Return to symptom index
YES
B

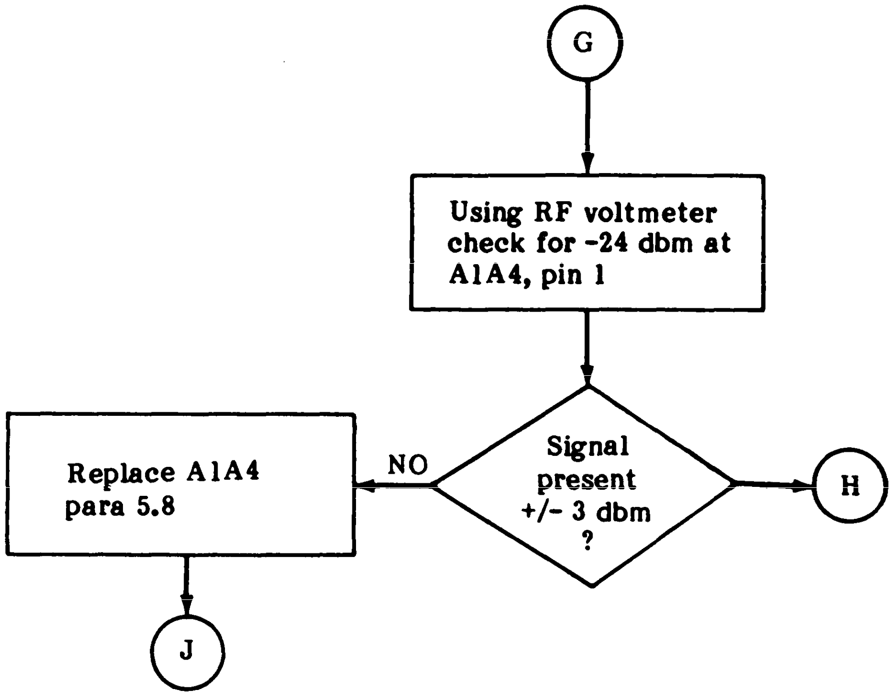

B
Access IF demodulator assembly A1
Extend A1A3
Using RF voltmeter check for -15 dbm at A1A3, pin 4
Signal present +/- 3 dbm ?
NO
YES
C
Replace A1 assembly para 5.8
J

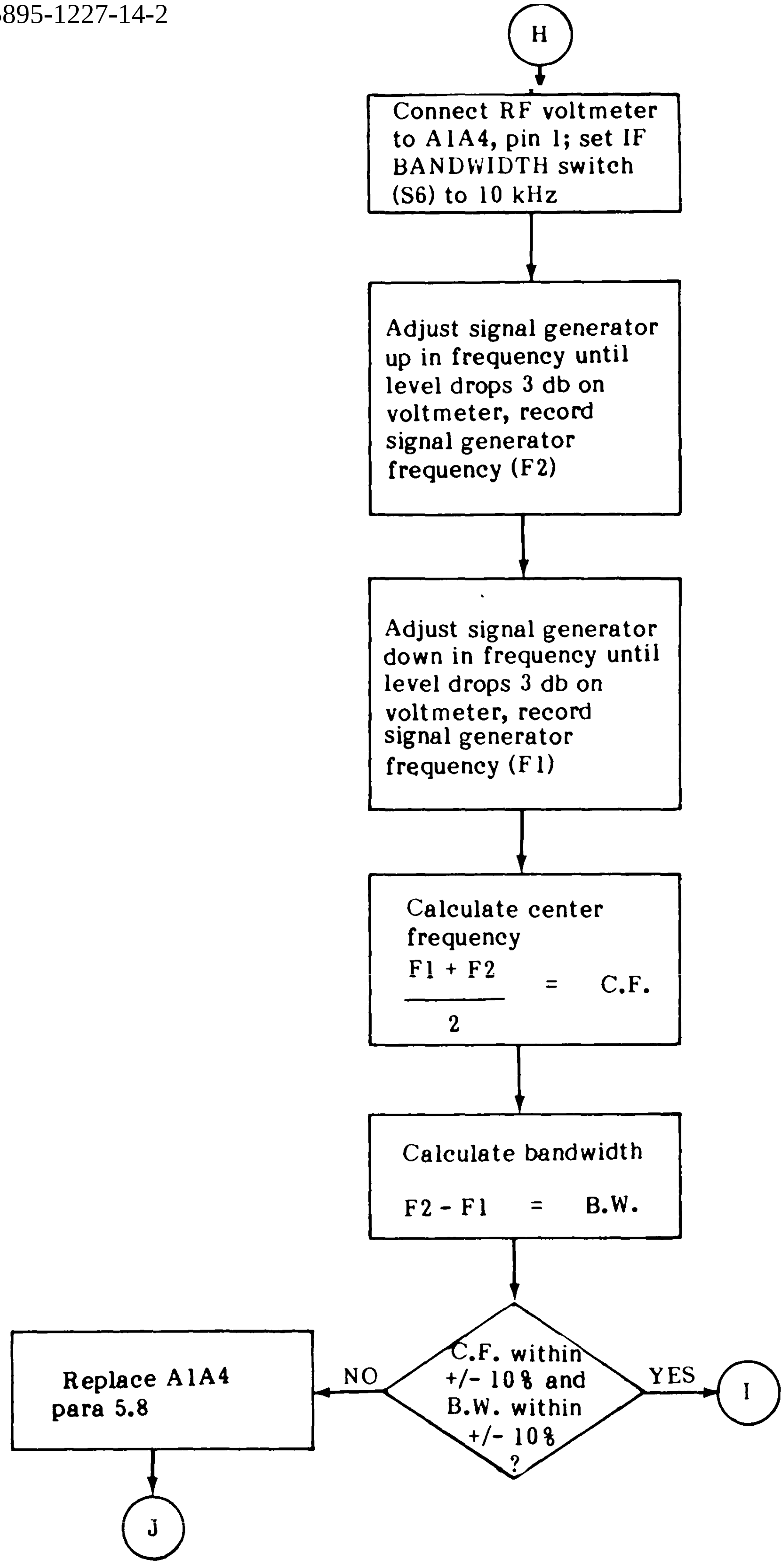

C
Adjust signal generator up in frequency until level drops 3 db on voltmeter, record signal generator frequency (F2)
Adjust signal generator down in frequency until level drops 3 db on voltmeter, record signal generator frequency (F1)
Calculate center frequency
F1 + F2 / 2 = C.F.
Calculate bandwidth
F2 - F1 = B.W.
C.F. within +/- 5% and B.W. within +/- 10% ?
NO
YES
Replace A1 assembly para 5.8
D
J

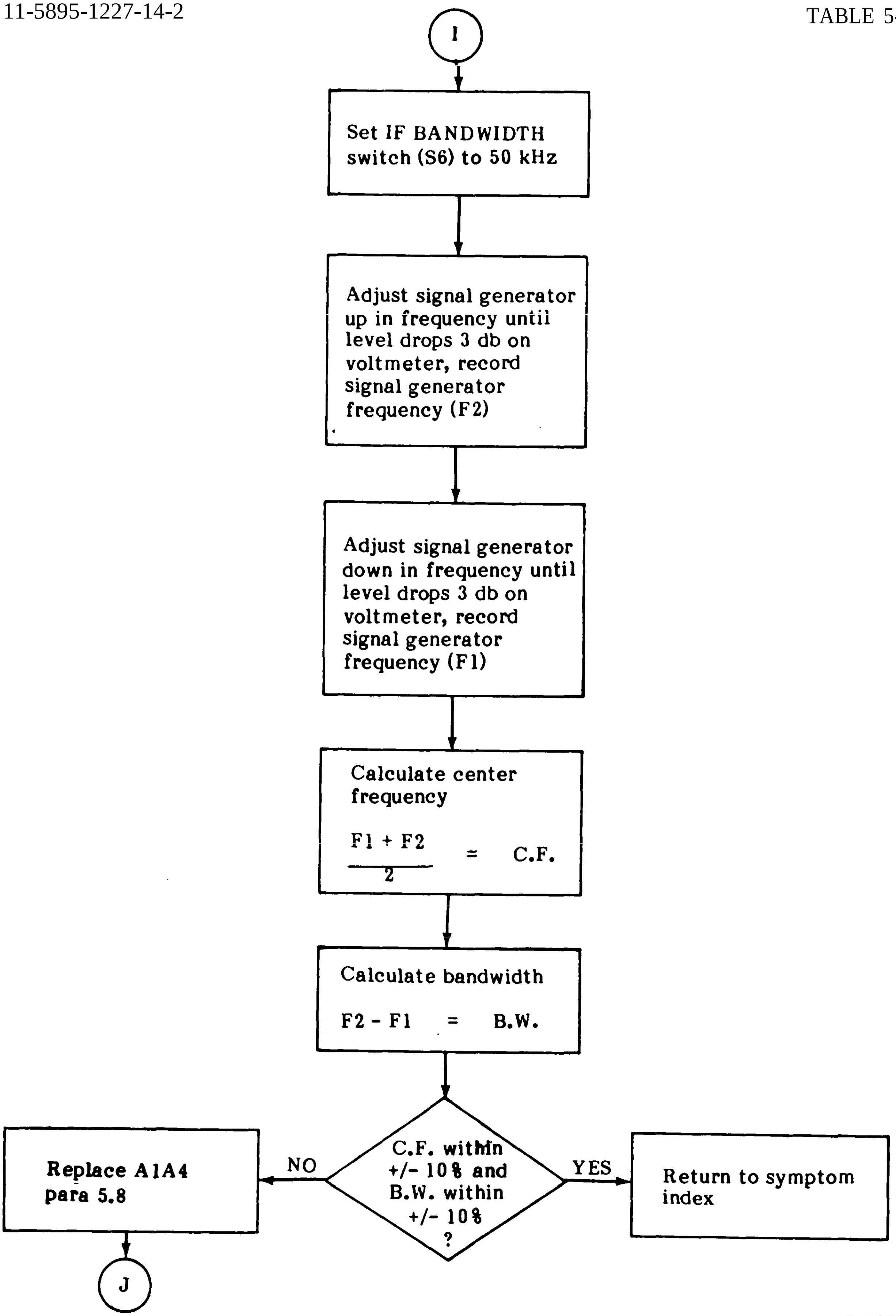

D
Using multimeter check the following voltages at A1A3
Pin 3 = 0.0 Vdc
Pin 2 = 0.0 Vdc
Pin 1 = 4.4 Vdc
Set IF BANDWIDTH switch (S6) to 50 kHz
Pin 3 = 0.0 Vdc
Pin 2 = 4.4 Vdc
Pin 1 = 0.0 Vdc
Set IF BANDWIDTH switch (S6) to 10 khz
Pin 3 = 4.4 Vdc
Pin 2 = 0.0 Vdc
Pin 1 = 0.0 Vdc
Proper voltage present ?
NO
Replace A1 assembly para 5.8
YES
E
J

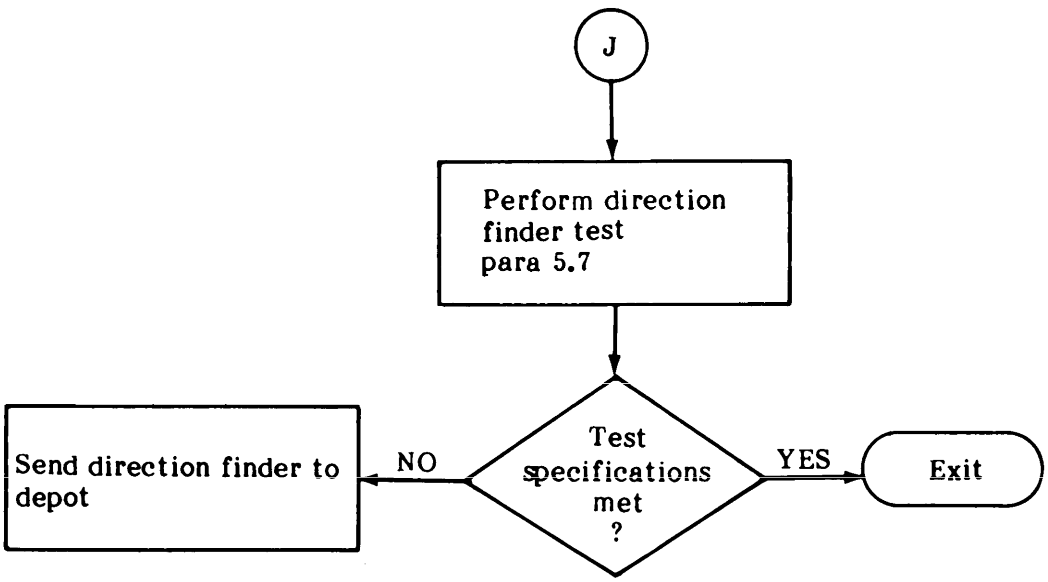

E
Using RF voltmeter check for -19 dbm at A4A3, pin 7
Set IF BANDWIDTH switch (S6) for 50 kHz
Using RF voltmeter check for -17 dbm at A1A3, pin 8
Set IF BANDWIDTH switch (S6) to 10 kHz
Using RF voltmeter check for -19 dbm at A1A3, pin 7
Signals present +/- 3 dbm ?
NO
YES
F
Replace A1A3 para 5.8
J


F
Reinstall A1A3; extend A1A4
Using RF voltmeter check A1A4, pin 9 for -20 dbm
Set IF BANDWIDTH switch to 50 kHz
Using RF voltmeter check A1A4, pin 10 for -19 dbm
Set IF BANDWIDTH switch to 200 kHz
Using RF voltmeter check A1A4, pin 4 for -22 dbm
Proper signals present +/- 3 dbm ?
YES
G
NO
Replace A1 assembly para 5.8
J


G
Using RF voltmeter
check for -24 dbm at
A1A4, pin 1
Signal
present
+/- 3 dbm
?
NO
Replace A1A4
para 5.8
H
J


H
Connect RF voltmeter to A1A4, pin 1; set IF BANDWIDTH switch (S6) to 10 kHz
Adjust signal generator up in frequency until level drops 3 db on voltmeter, record signal generator frequency (F2)
Adjust signal generator down in frequency until level drops 3 db on voltmeter, record signal generator frequency (F1)
Calculate center frequency
F1 + F2 / 2 = C.F.
Calculate bandwidth
F2 - F1 = B.W.
C.F. within +/- 10% and B.W. within +/- 10% ?
NO
YES
I
Replace A1A4 para 5.8
J


I
Set IF BANDWIDTH switch (S6) to 50 kHz
Adjust signal generator up in frequency until level drops 3 db on voltmeter, record signal generator frequency (F2)
Adjust signal generator down in frequency until level drops 3 db on voltmeter, record signal generator frequency (F1)
Calculate center frequency
F1 + F2 / 2 = C.F.
Calculate bandwidth
F2 - F1 = B.W.
C.F. within +/- 10% and B.W. within +/- 10% ?
NO
Replace A1A4 para 5.8
YES
Return to symptom index
J


J
Perform direction finder test para 5.7
Test specifications met ?
NO
YES
Send direction finder to depot
Exit

CIRCULAR LED THAT DOES NOT TURN OFF
WHEN GATED THRESHOLD IS ADJUSTED

Test Equipment	
Power Supply	PP-6547U
Multimeter	AN/PSM-45
Test Lead Set	Simpson 00577
RF Voltmeter	Boonton 92C
High Frequency Probe	Boonton 91-12F
Angle Simulator	TF-15403MKII

Tools	
4 in. flat tip screwdriver	5120-00-222-8852

Replacement Parts

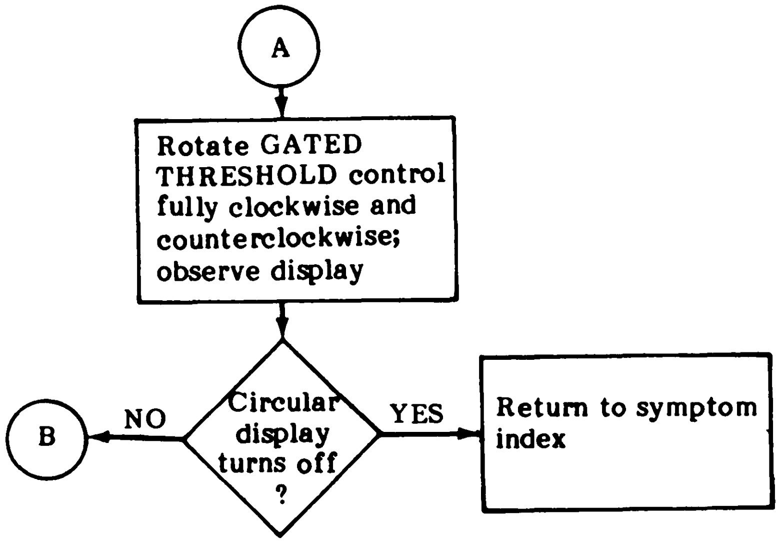
AGC Squelch (A2)
Master Time Controller and Display Logic (A4A6)
DC/DCConverter (A2)
Cable W 1
10 MHz Amplifier (A1A1)
10 MHz Amplifer
Cable W2
Gain Bandwidth Compensation Amplifier (A1A3)
IF Filter and Diode Switches (A1A4)
10 MHz Amplifier (A1A5)
AM Detector Buffer (A1A6)
Cable W3
FM Discriminator (A3)
Bandwidth Compensation Amplifier (A8)

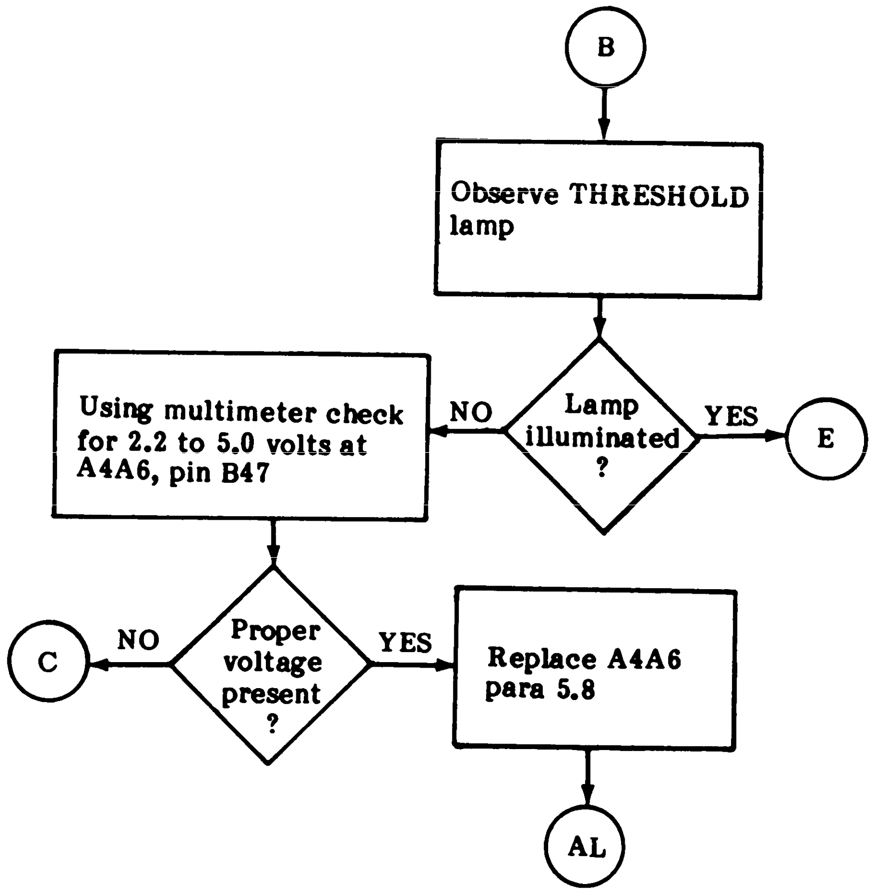
Equipment Condition

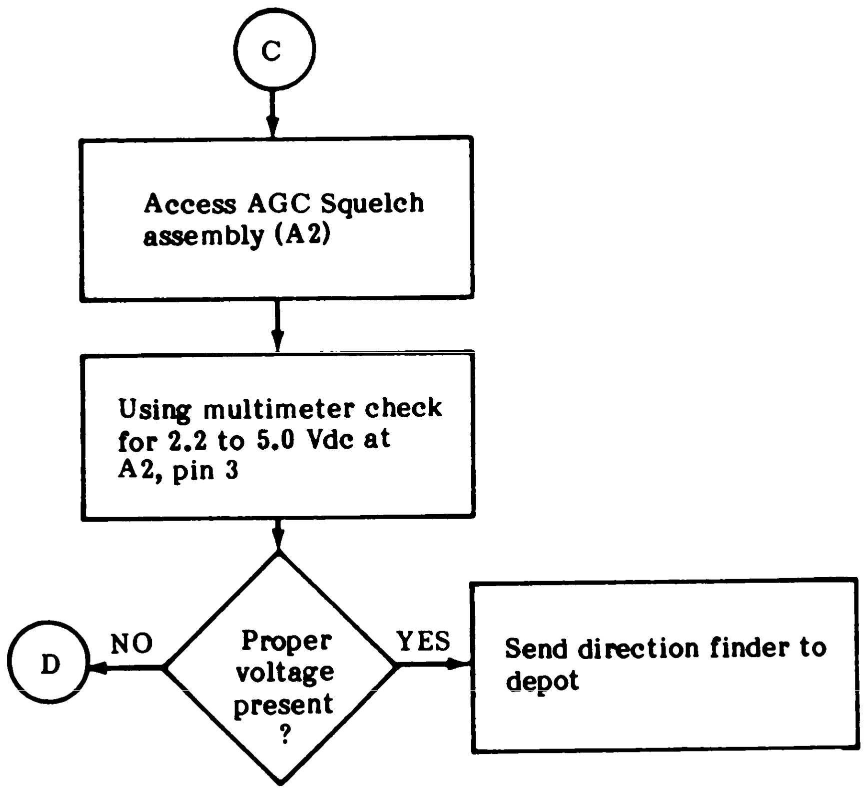
NOTE

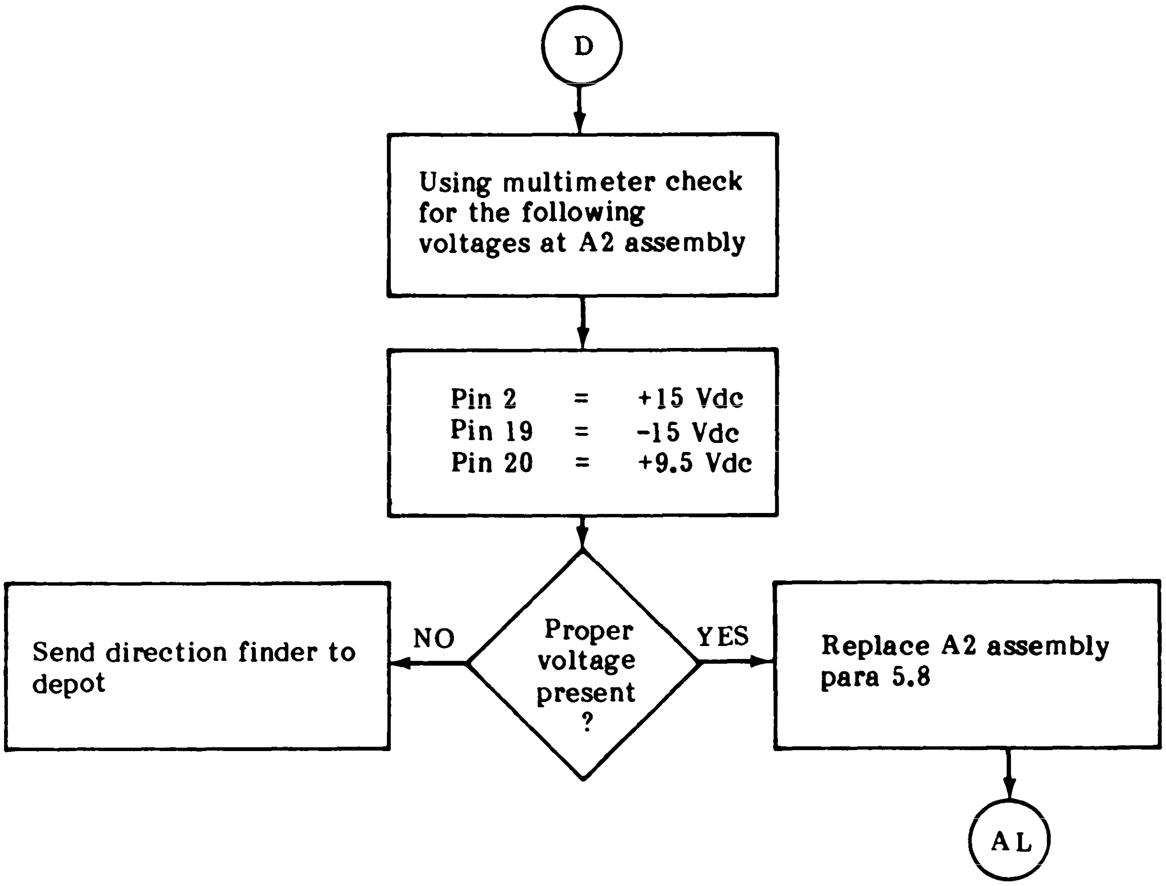
Allow 30 minute warm-up time of Direction Finder before proceeding with troubleshooting procedures.

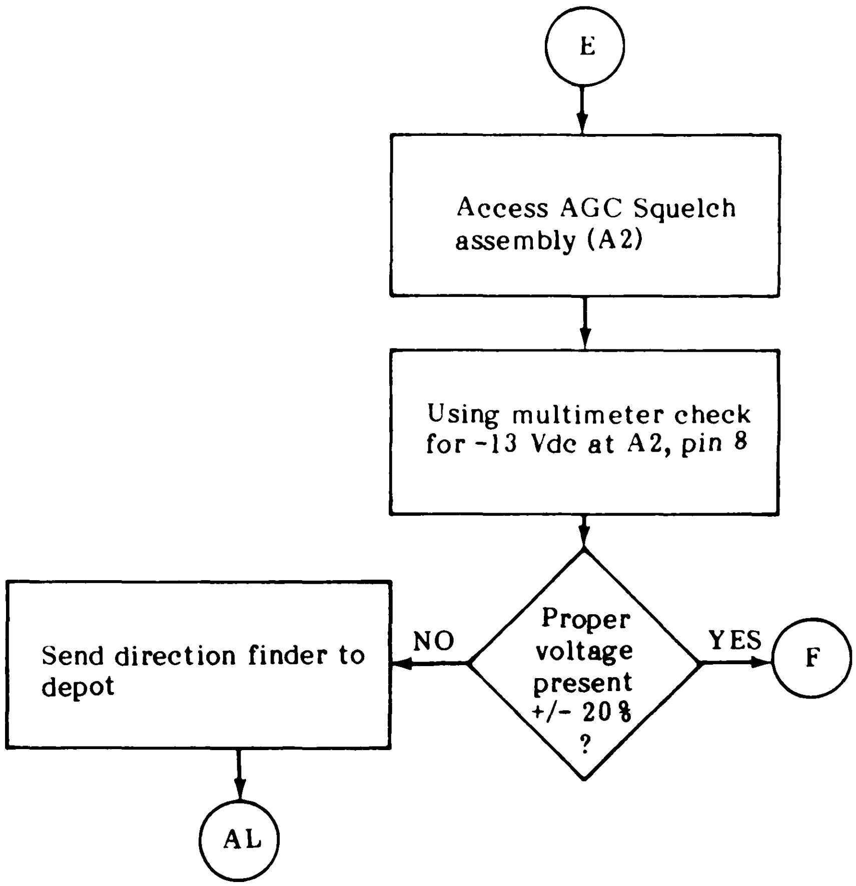
Angle simulator connected to Direction Finder
OFF/OMNI/DF/CAL switch set to DF
DISPLAY OFF/DISPLAY INTENSITY knob set to mid-range
BAND MHz switch set to 20-80 MHz
IF BANDWIDTH switch set to 200 kHz
INTEG TIME (SEC) switch set to 0.5
GATED THRESHOLD knob set fully clockwise
ZERO ADJ knob set as required
Power Supply set to 24 Vdc and connected to J5
Direction Finder calibrated
Direction Finder cover removed

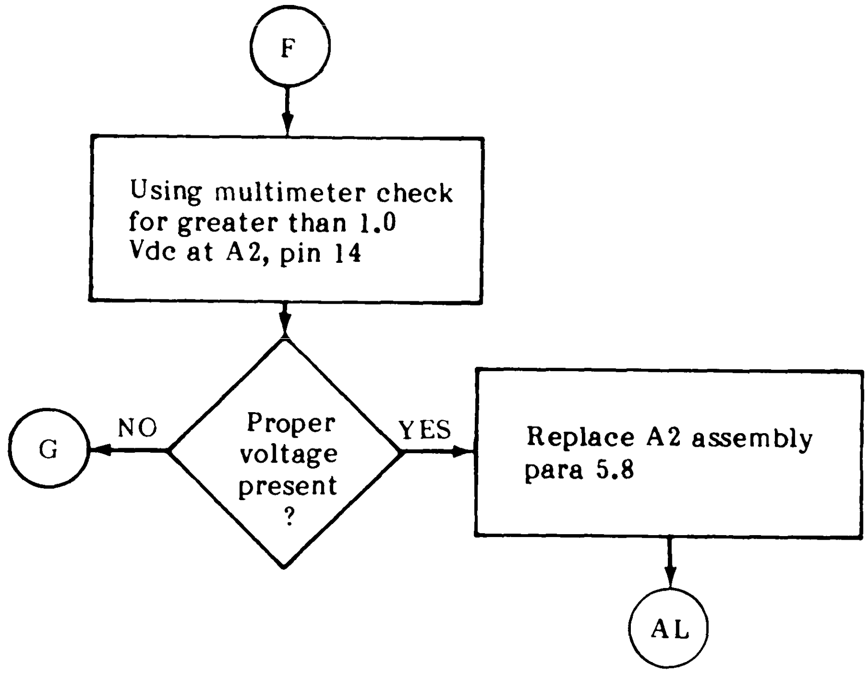

A
Rotate GATED THRESHOLD control fully clockwise and counterclockwise; observe display
Circular display turns off ?
NO
B
YES
Return to symptom index

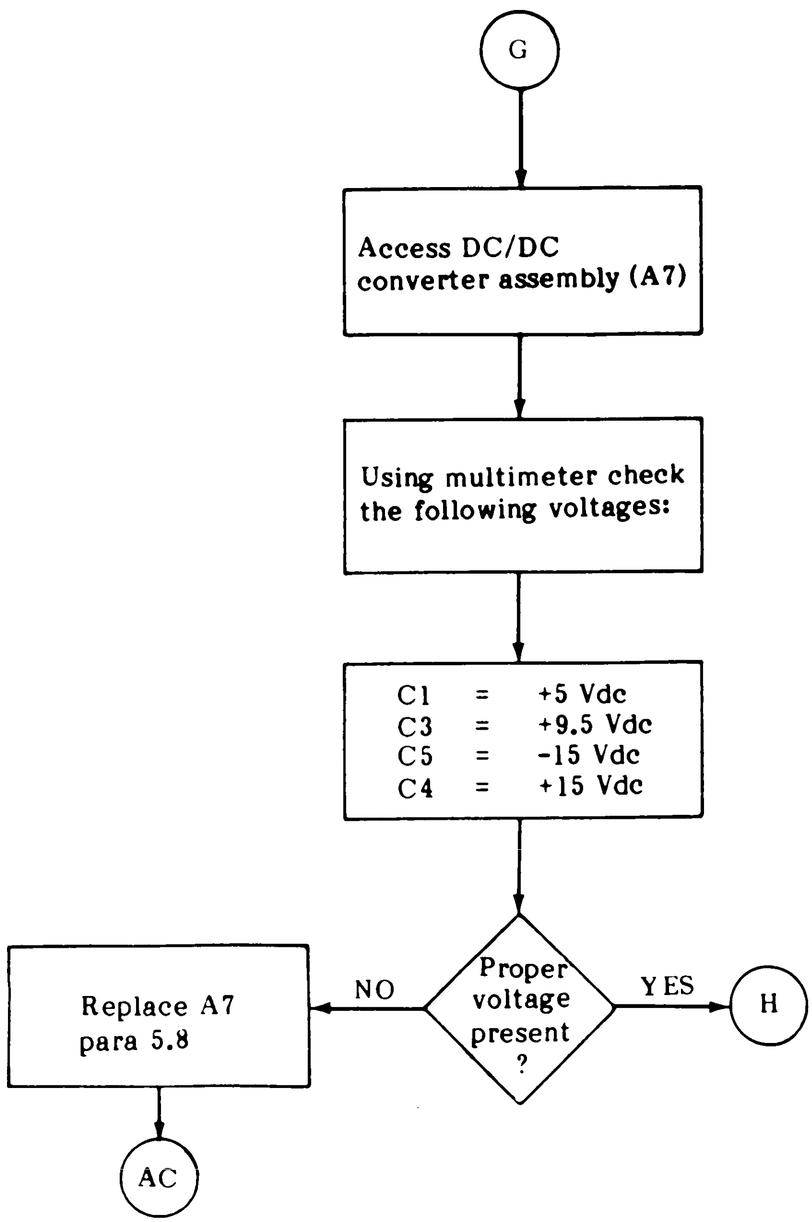

B
Observe THRESHOLD lamp
Lamp illuminated ?
NO
YES
E
Using multimeter check for 2.2 to 5.0 volts at A4A6, pin B47
Proper voltage present ?
NO
C
YES
Replace A4A6 para 5.8
AL

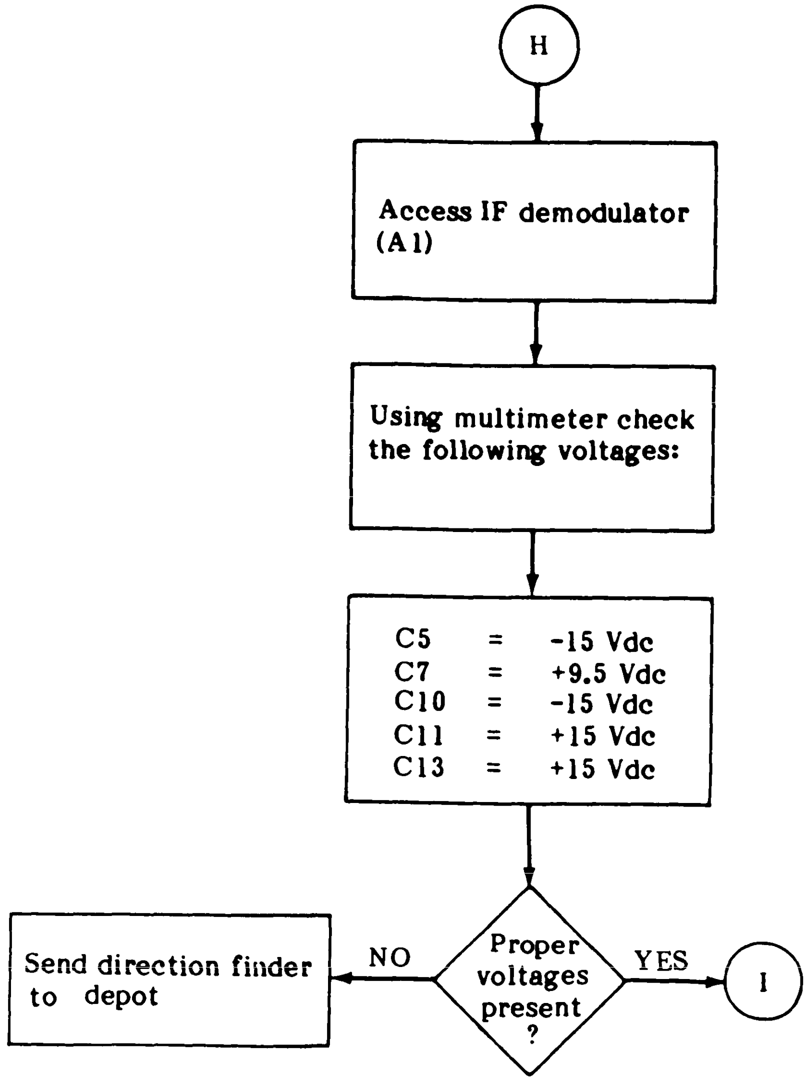

C
Access AGC Squelch assembly (A2)
Using multimeter check for 2.2 to 5.0 Vdc at A2, pin 3
Proper voltage present ?
NO
D
YES
Send direction finder to depot

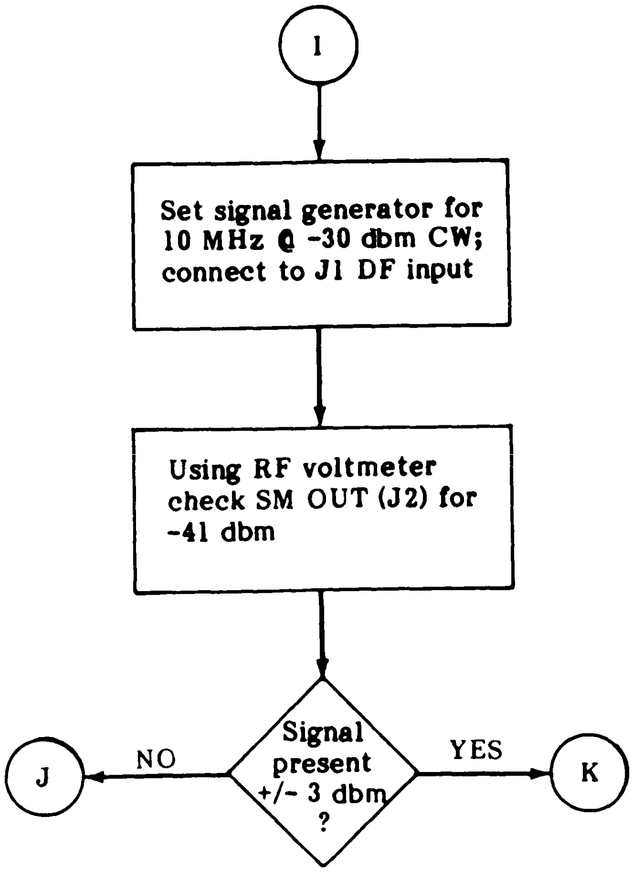

D
Using multimeter check for the following voltages at A2 assembly
Pin 2 = +15 Vdc
Pin 19 = -15 Vdc
Pin 20 = +9.5 Vdc
Proper voltage present ?
NO
Send direction finder to depot
YES
Replace A2 assembly para 5.8
AL

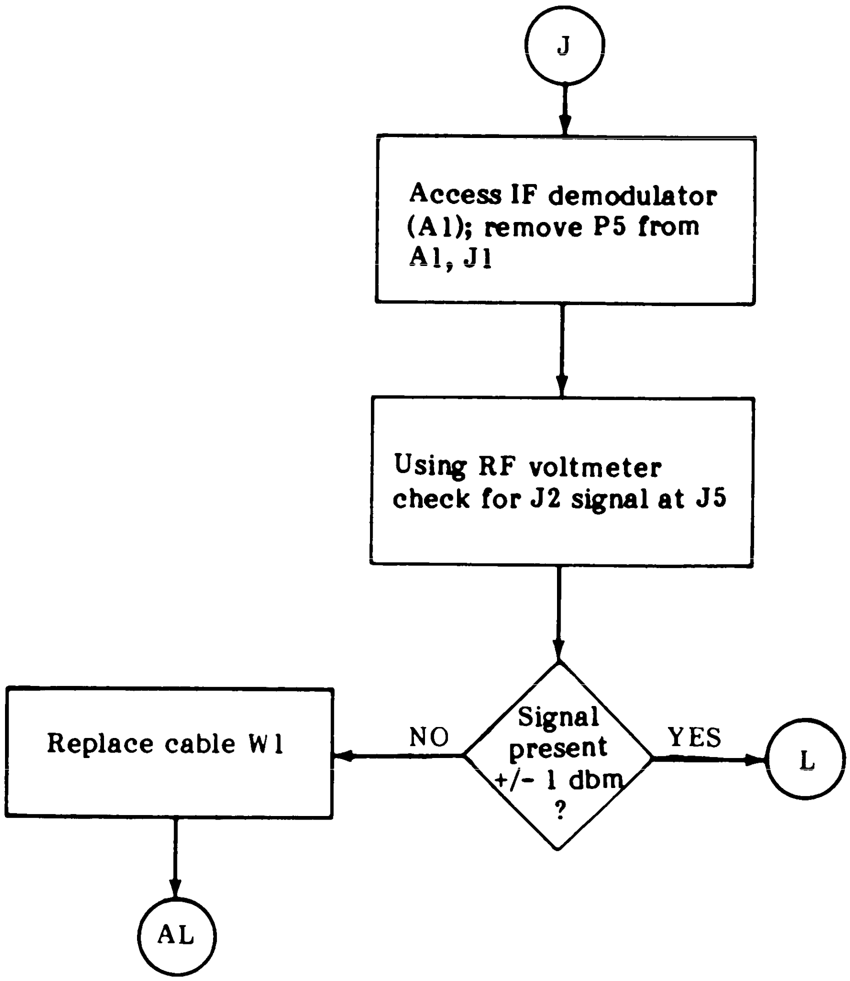

E
Access AGC Squelch assembly (A2)
Using multimeter check for -13 Vdc at A2, pin 8
Proper voltage present +/- 20% ?
NO
YES
F
Send direction finder to depot
AL

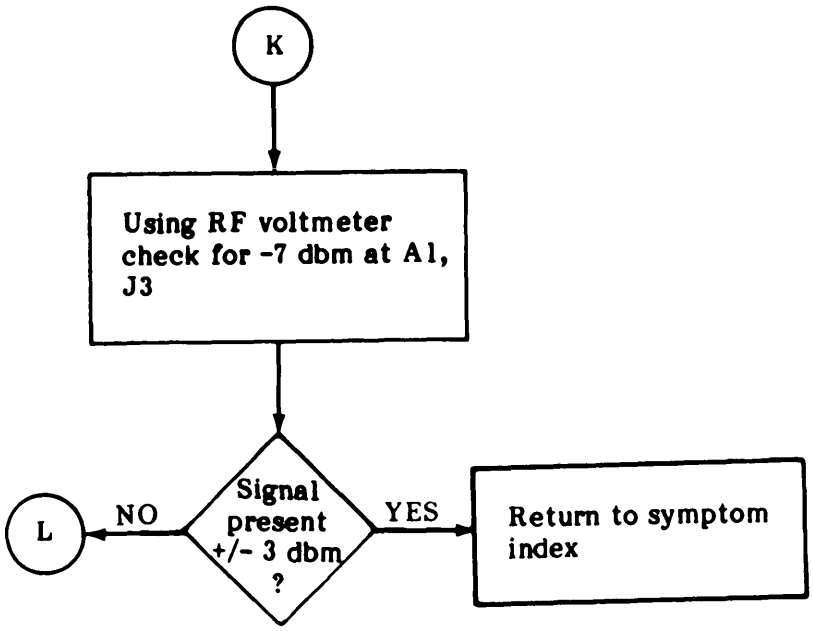

F
Using multimeter check for greater than 1.0 Vdc at A2, pin 14
Proper voltage present ?
NO
G
YES
Replace A2 assembly para 5.8
AL

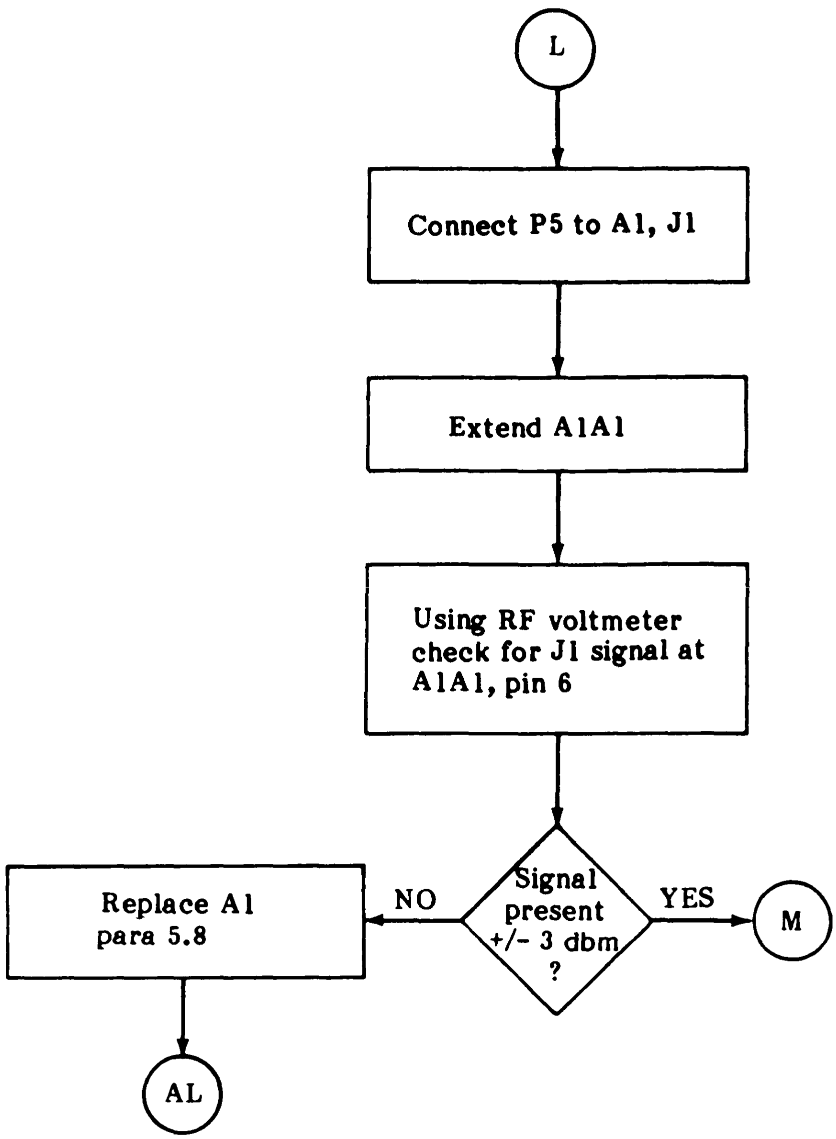

G
Access DC/DC converter assembly (A7)
Using multimeter check the following voltages:
C1 = +5 Vdc
C3 = +9.5 Vdc
C5 = -15 Vdc
C4 = +15 Vdc
Proper voltage present ?
NO
YES
H
Replace A7 para 5.8
AC

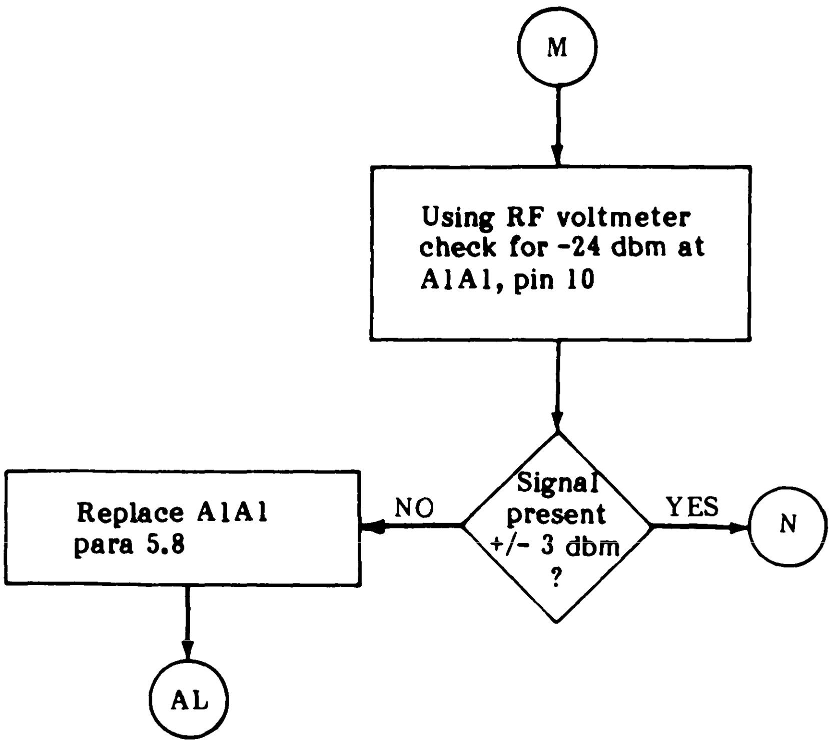

H
Access IF demodulator (A1)
Using multimeter check the following voltages:
C5 = -15 Vdc
C7 = +9.5 Vdc
C10 = -15 Vdc
C11 = +15 Vdc
C13 = +15 Vdc
Proper voltages present ?
NO
Send direction finder to depot
YES
I

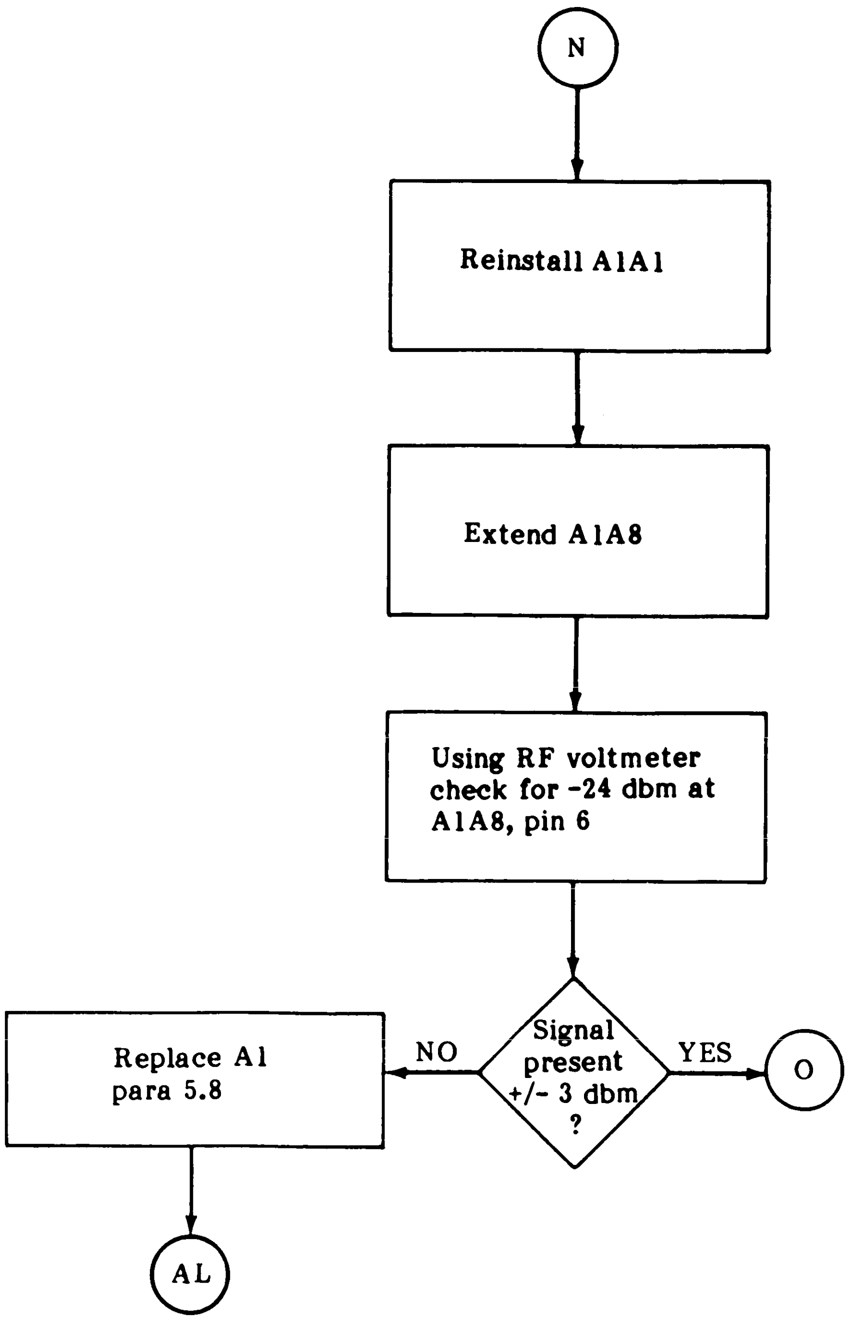

I
Set signal generator for 10 MHz @ -30 dbm CW; connect to J1 DF input
Using RF voltmeter check SM OUT (J2) for -41 dbm
Signal present +/- 3 dbm ?
NO
J
YES
K

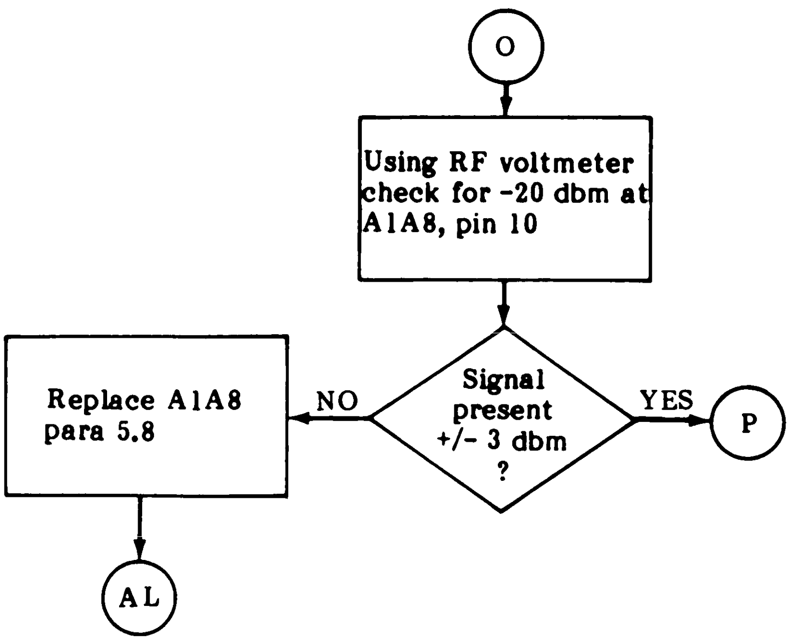

J
Access IF demodulator (A1); remove P5 from A1, J1
Using RF voltmeter check for J2 signal at J5
Signal present +/- 1 dbm ?
NO
YES
L
Replace cable W1
AL

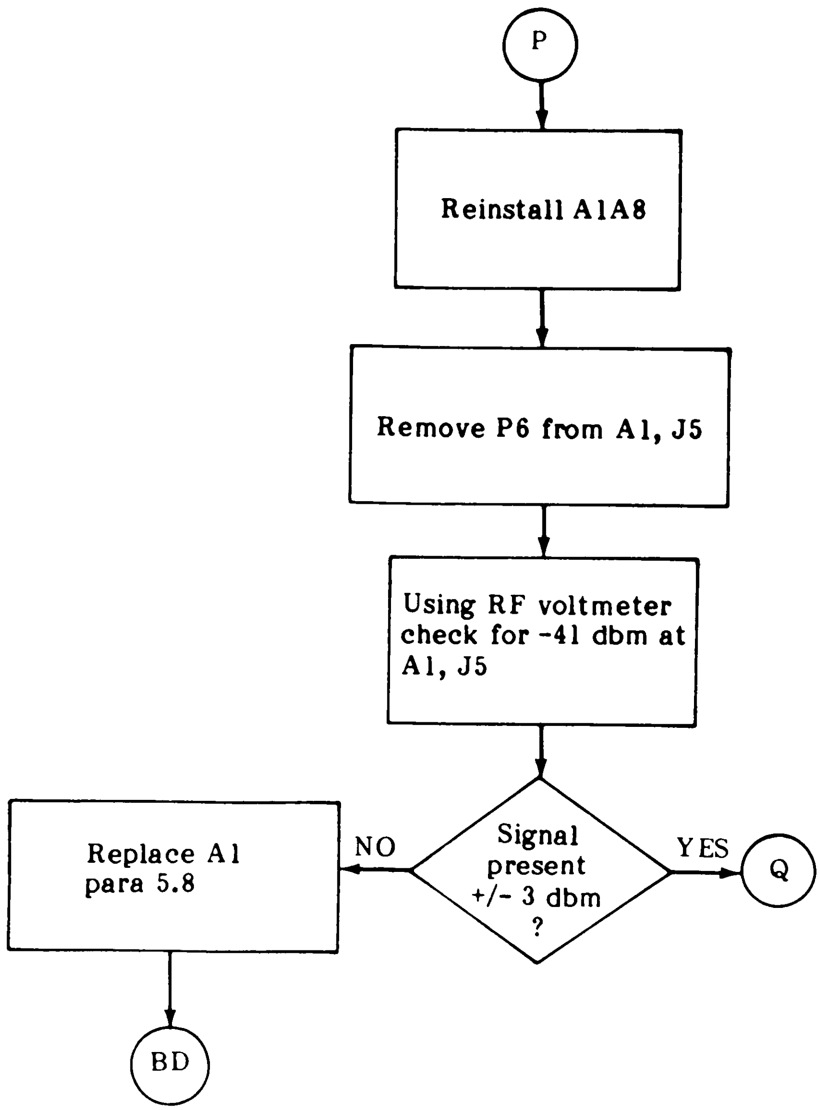

K
Using RF voltmeter check for -7 dbm at A1, J3
Signal present +/- 3 dbm ?
NO
L
YES
Return to symptom index

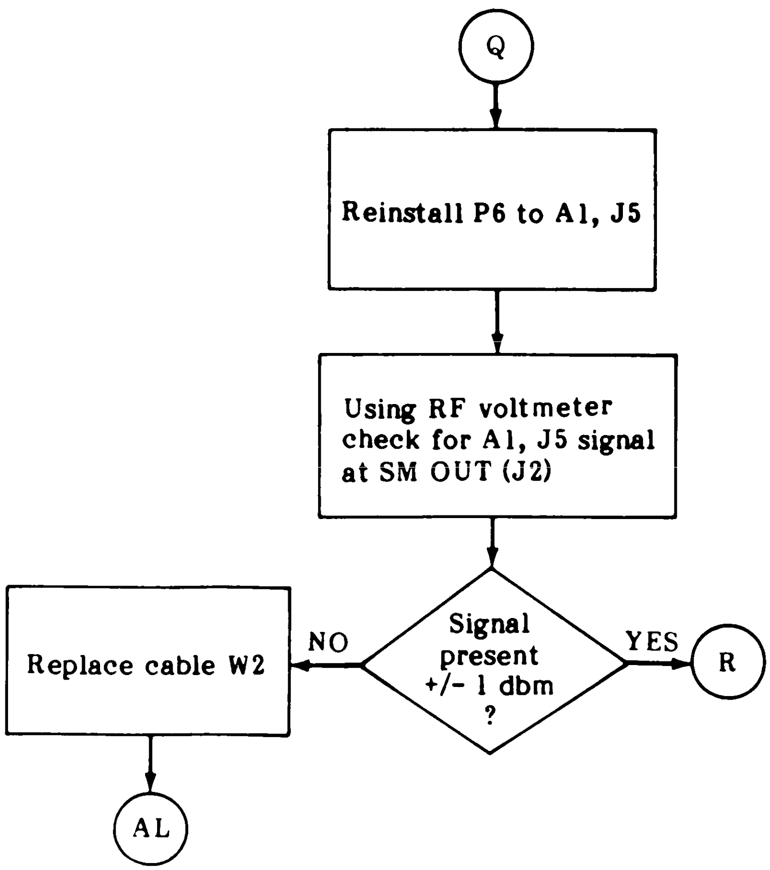

L
Connect P5 to A1, J1
Extend A1A1
Using RF voltmeter check for J1 signal at A1A1, pin 6
Signal present +/- 3 dbm ?
NO
YES
Replace A1 para 5.8
M
AL

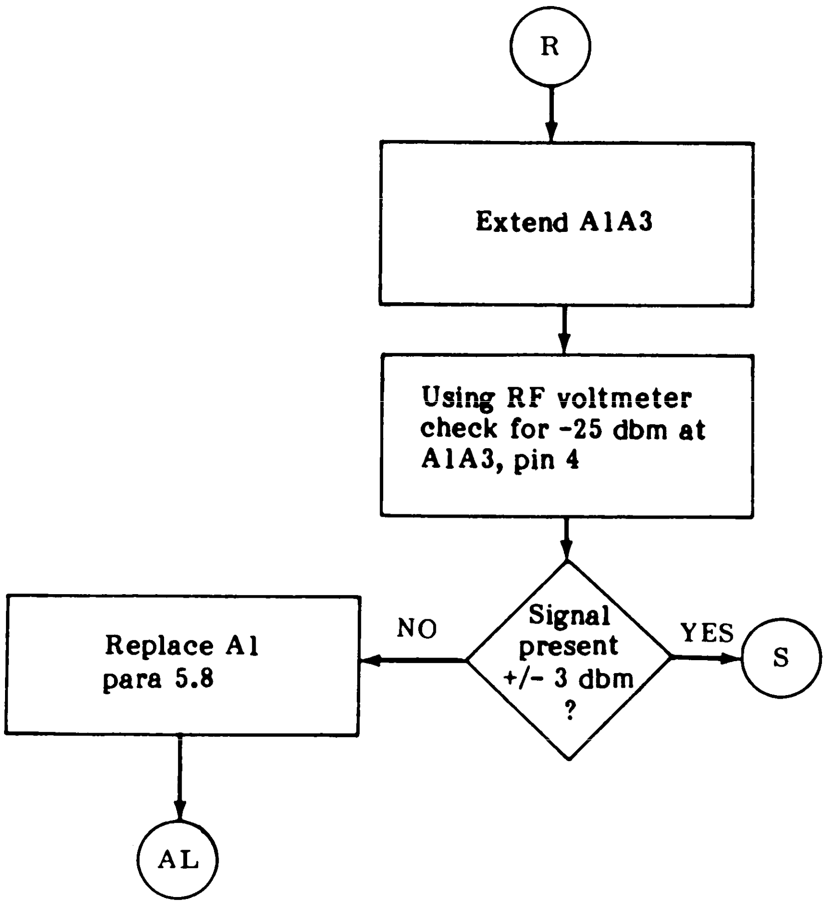

M
Using RF voltmeter check for -24 dbm at A1A1, pin 10
Signal present +/- 3 dbm ?
NO
YES
N
Replace A1A1 para 5.8
AL

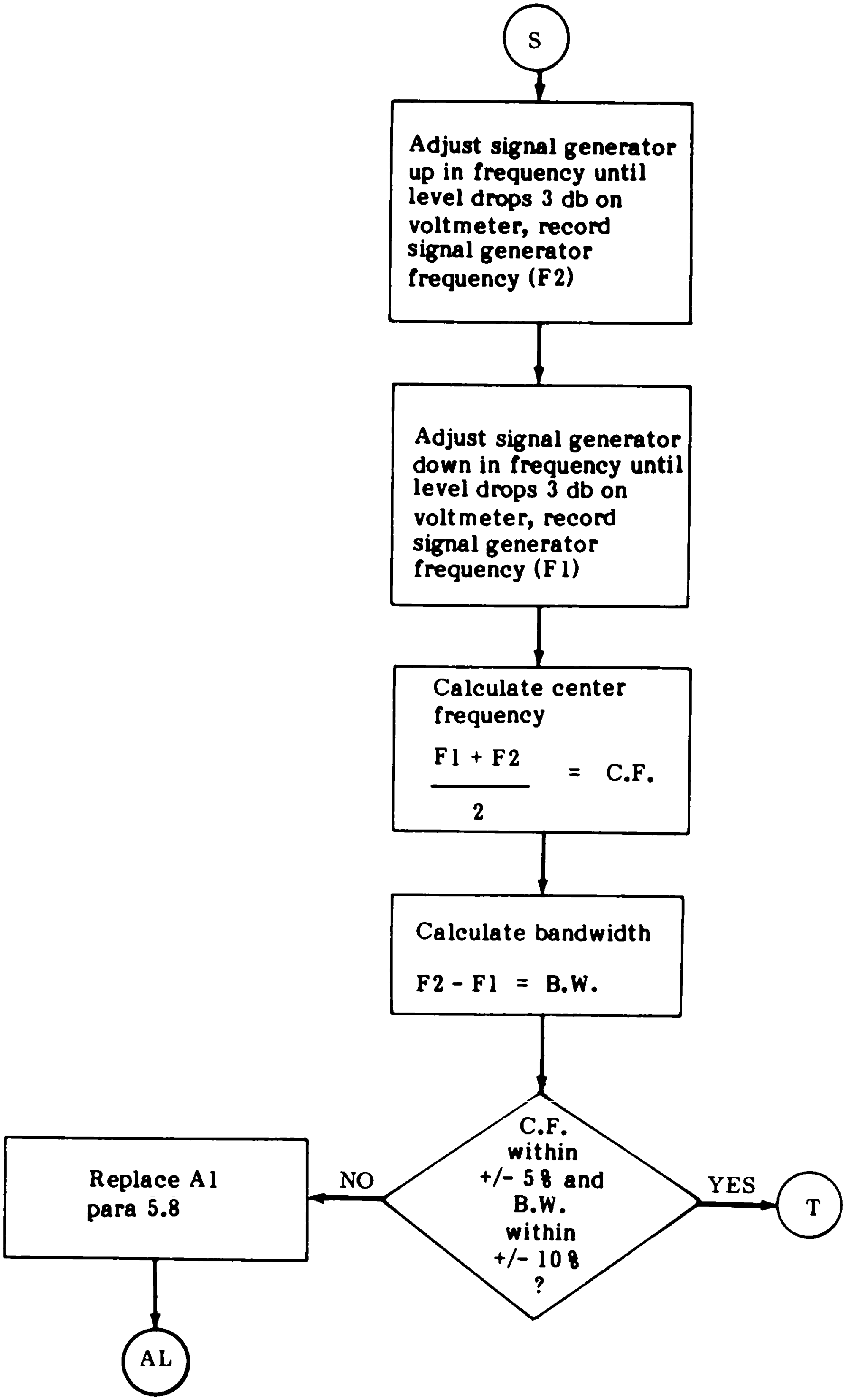

N
Reinstall A1A1
Extend A1A8
Using RF voltmeter check for -24 dbm at A1A8, pin 6
Signal present +/- 3 dbm ?
NO
YES
O
Replace A1 para 5.8
AL

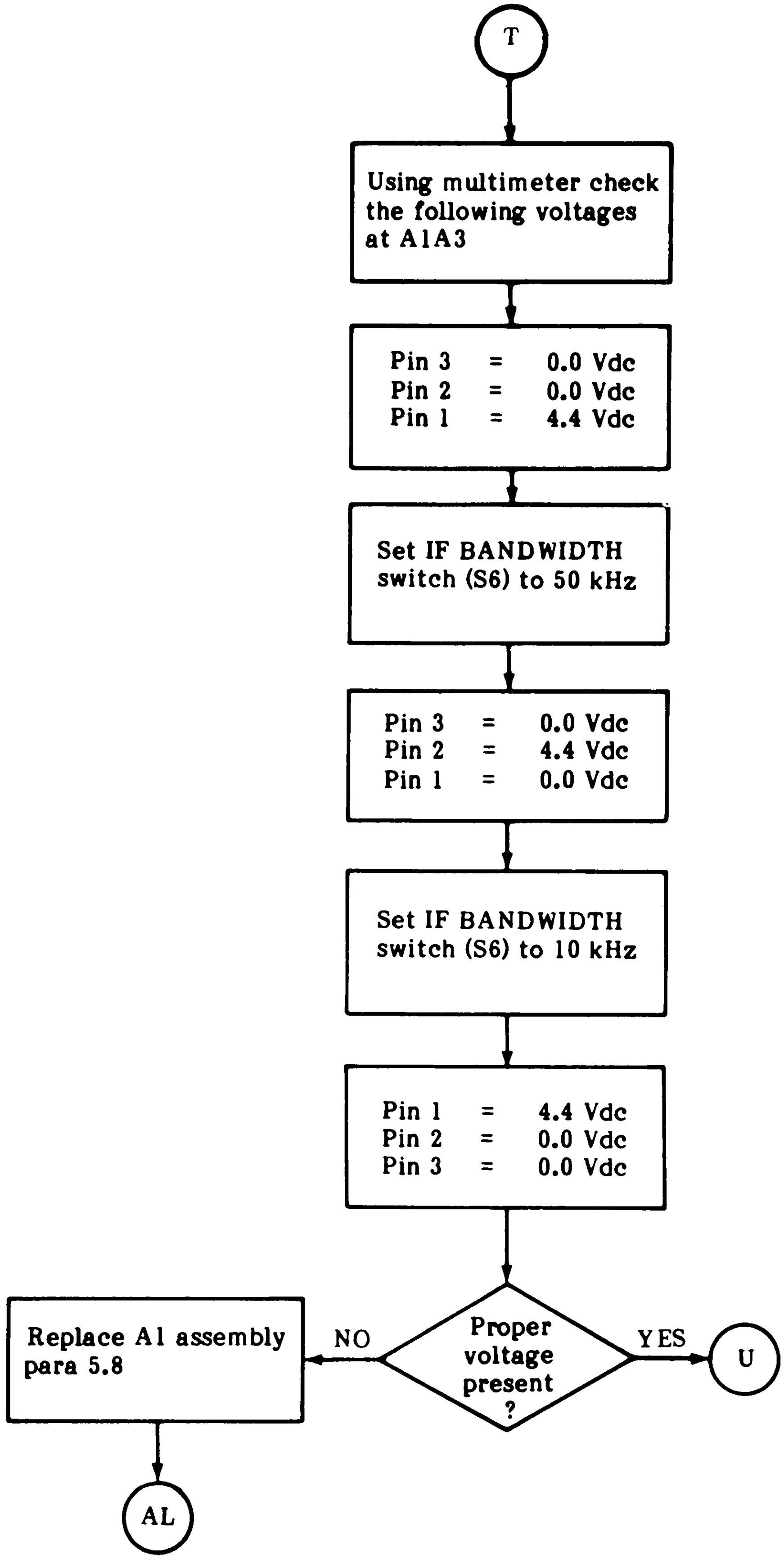

O
Using RF voltmeter check for -20 dbm at A1A8, pin 10
Signal present +/- 3 dbm ?
NO
YES
P
Replace A1A8 para 5.8
AL

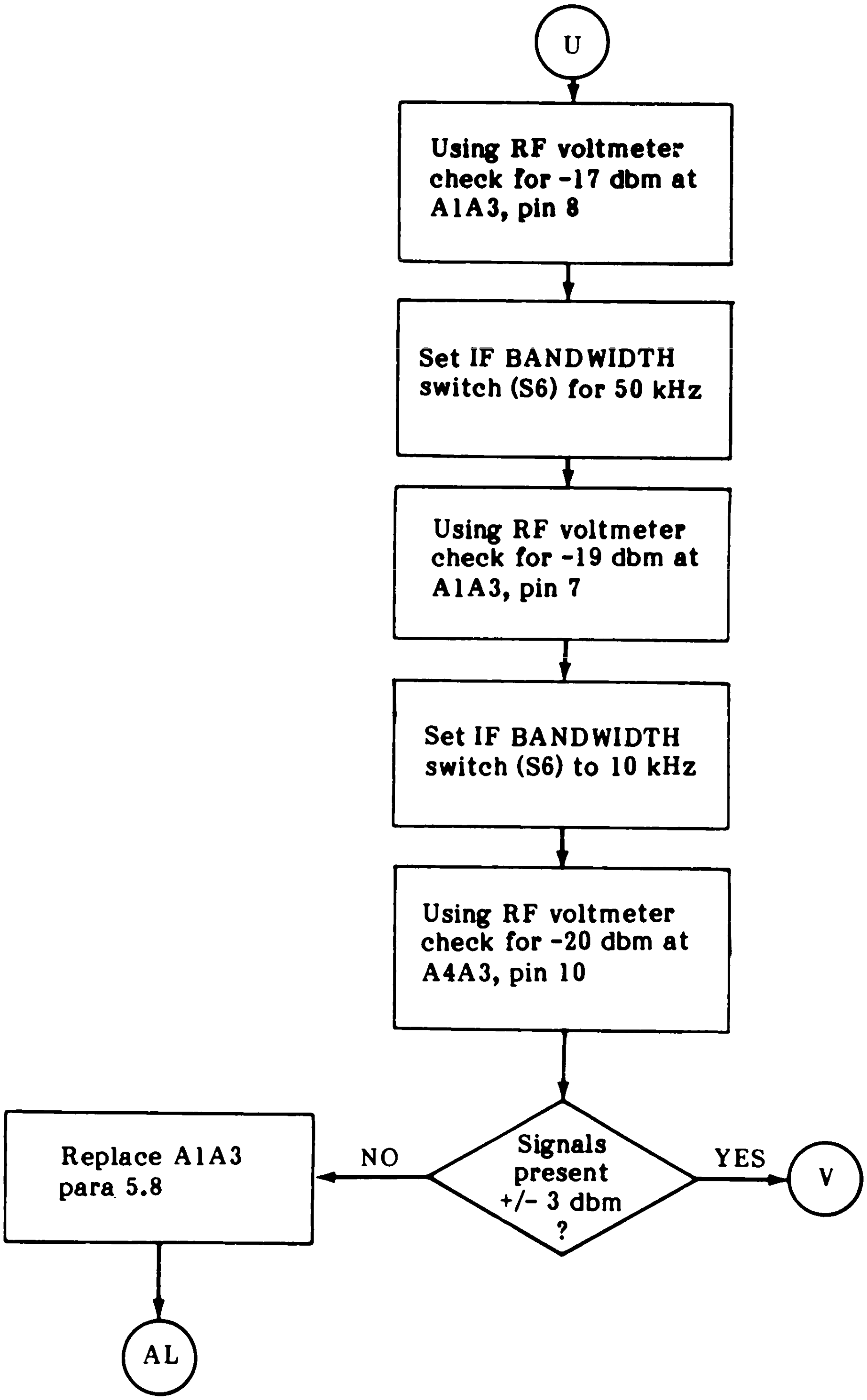

P
Reinstall A1A8
Remove P6 from A1, J5
Using RF voltmeter check for -41 dbm at A1, J5
Signal present +/- 3 dbm ?
NO
YES
Q
Replace A1 para 5.8
BD

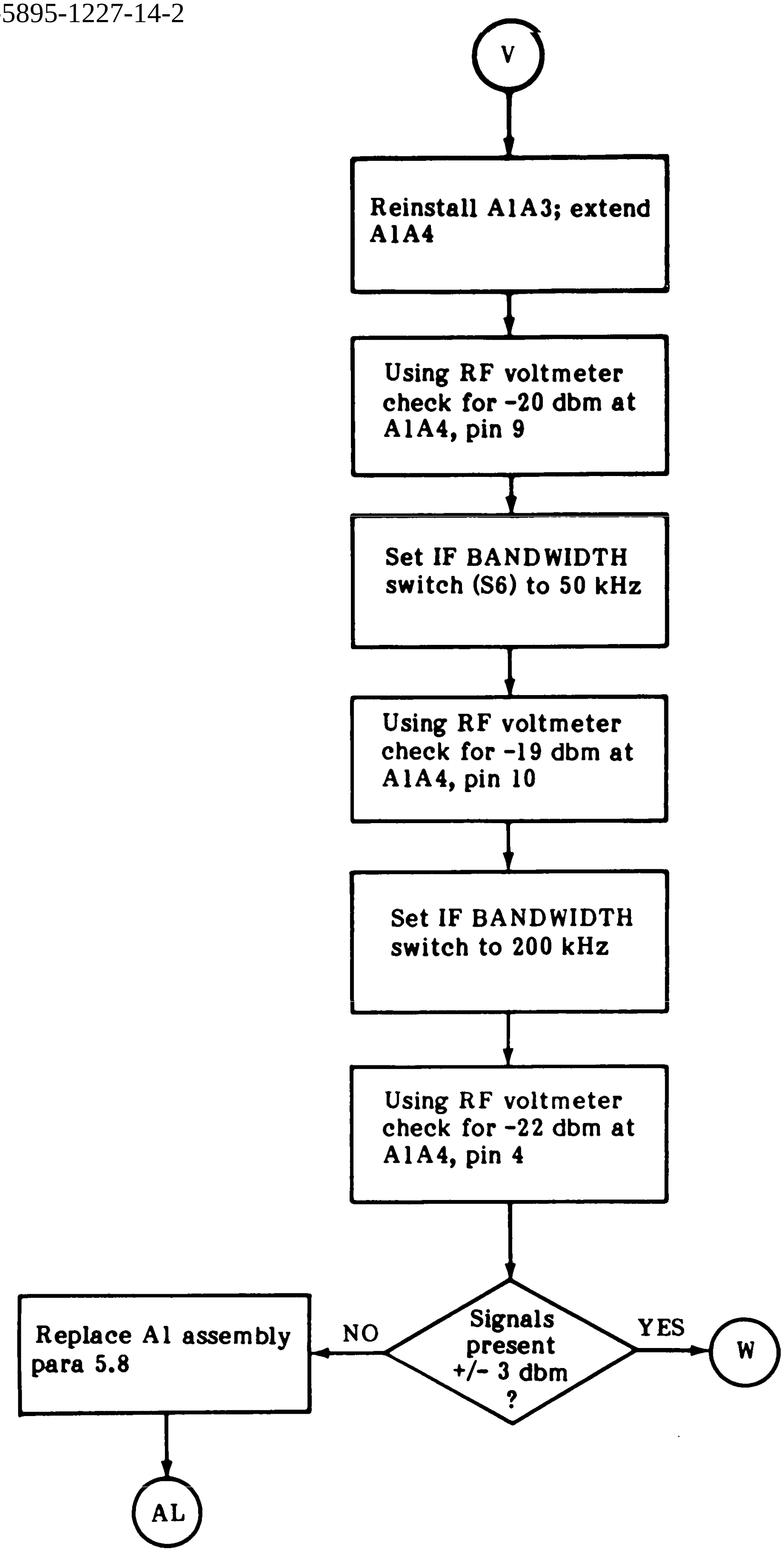

Q
Reinstall P6 to A1, J5
Using RF voltmeter check for A1, J5 signal at SM OUT (J2)
Signal present +/- 1 dbm ?
NO
YES
R
Replace cable W2
AL

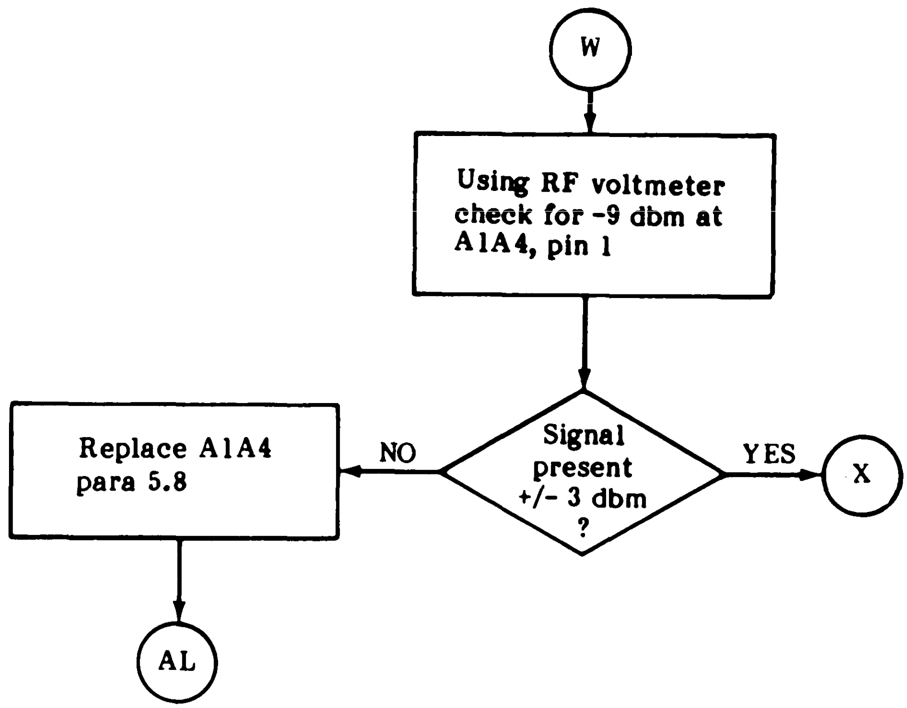

R
Extend A1A3
Using RF voltmeter check for -25 dbm at A1A3, pin 4
Signal present +/- 3 dbm ?
NO
YES
Replace A1 para 5.8
S
AL

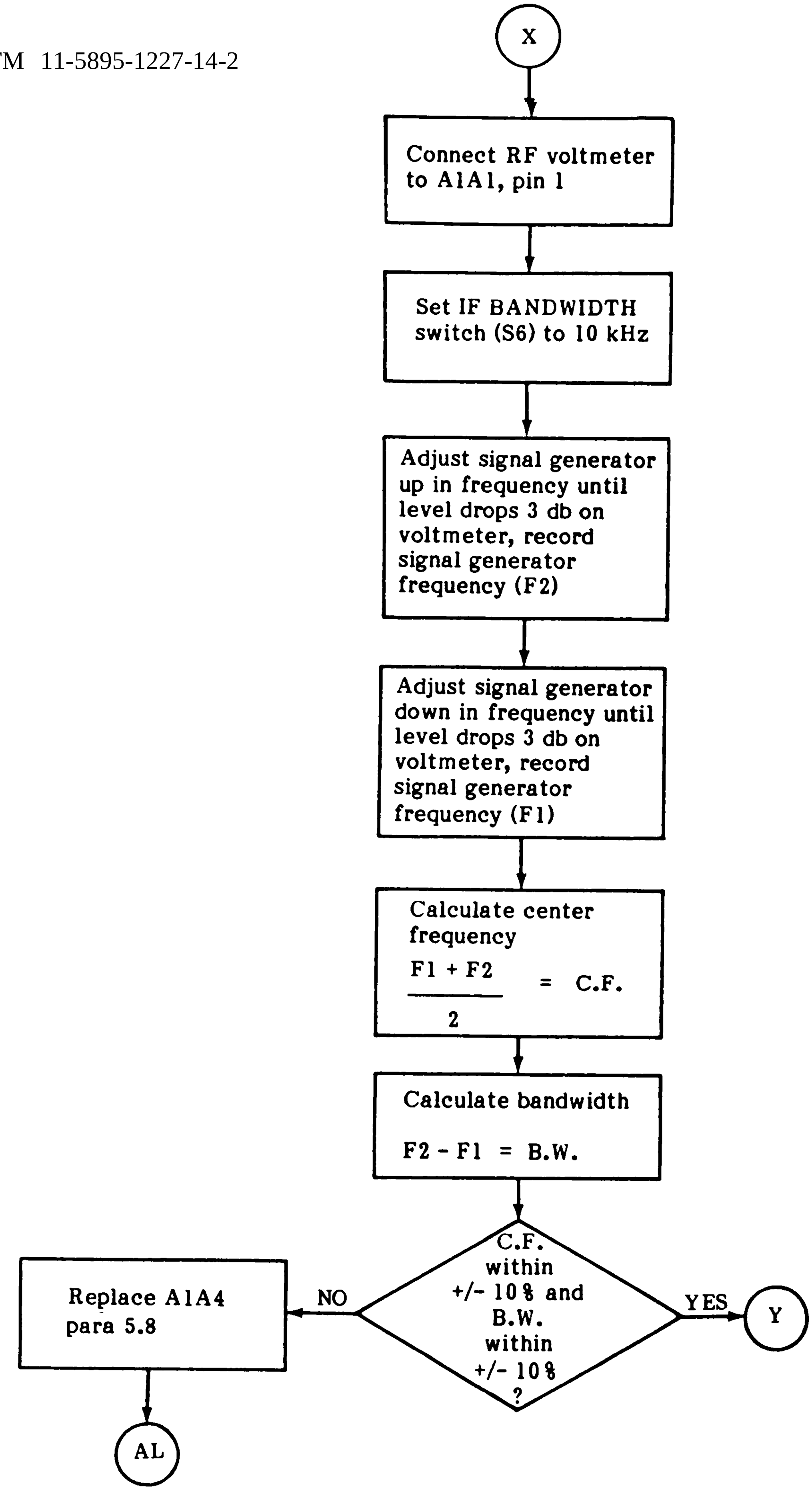

S
Adjust signal generator up in frequency until level drops 3 db on voltmeter, record signal generator frequency (F2)
Adjust signal generator down in frequency until level drops 3 db on voltmeter, record signal generator frequency (F1)
Calculate center frequency
F1 + F2 / 2 = C.F.
Calculate bandwidth
F2 - F1 = B.W.
C.F. within +/- 5% and B.W. within +/- 10% ?
NO
YES
Replace A1 para 5.8
AL
T

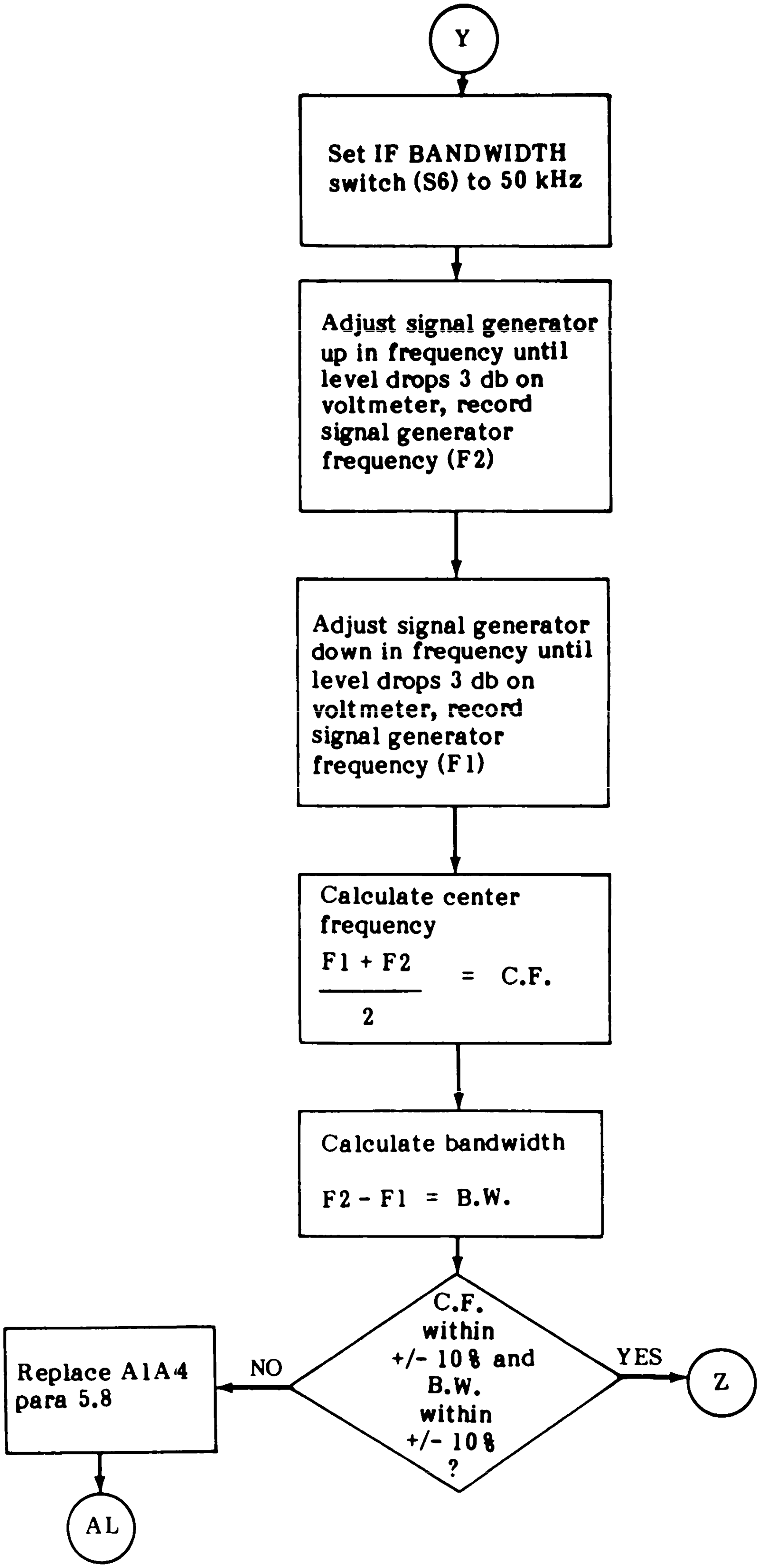

T
Using multimeter check the following voltages at A1A3
Pin 3 = 0.0 Vdc
Pin 2 = 0.0 Vdc
Pin 1 = 4.4 Vdc
Set IF BANDWIDTH switch (S6) to 50 kHz
Pin 3 = 0.0 Vdc
Pin 2 = 4.4 Vdc
Pin 1 = 0.0 Vdc
Set IF BANDWIDTH switch (S6) to 10 kHz
Pin 1 = 4.4 Vdc
Pin 2 = 0.0 Vdc
Pin 3 = 0.0 Vdc
Proper voltage present ?
NO
YES
Replace A1 assembly para 5.8
U
AL

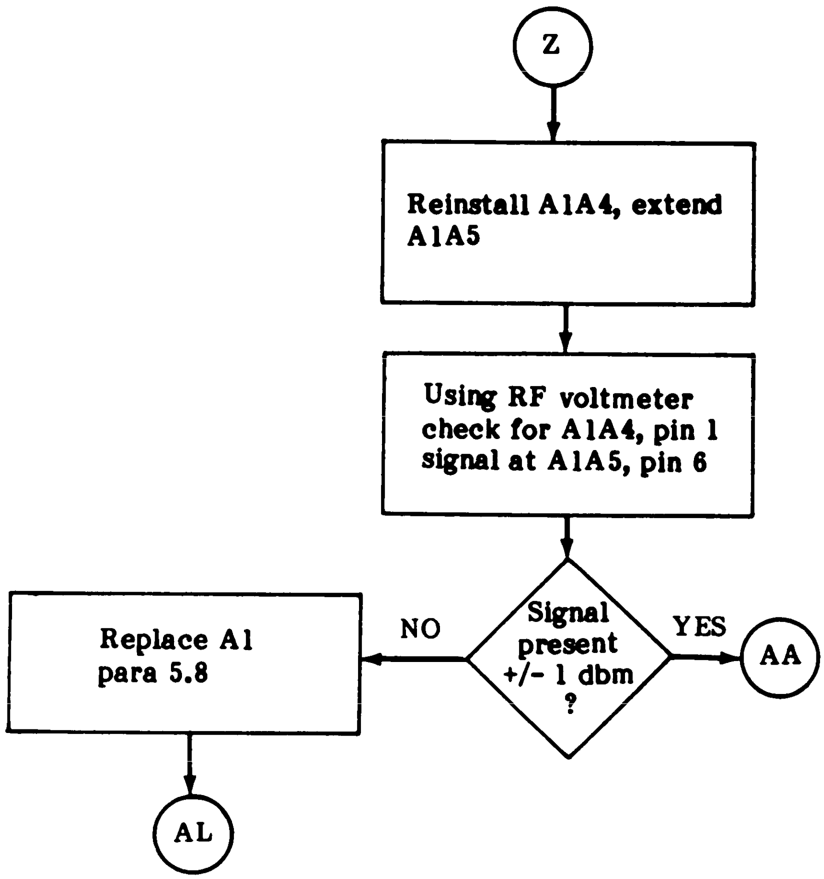

U
Using RF voltmeter check for -17 dbm at A1A3, pin 8
Set IF BANDWIDTH switch (S6) for 50 kHz
Using RF voltmeter check for -19 dbm at A1A3, pin 7
Set IF BANDWIDTH switch (S6) to 10 kHz
Using RF voltmeter check for -20 dbm at A4A3, pin 10
Signals present +/- 3 dbm ?
NO
Replace A1A3 para 5.8
AL
YES
V

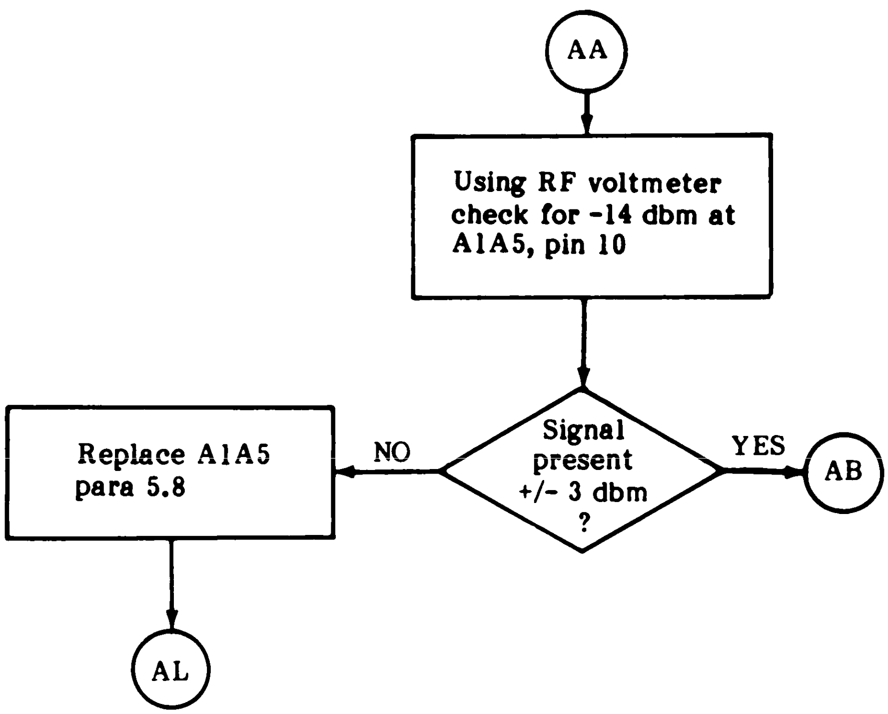

V
Reinstall A1A3; extend A1A4
Using RF voltmeter check for -20 dbm at A1A4, pin 9
Set IF BANDWIDTH switch (S6) to 50 kHz
Using RF voltmeter check for -19 dbm at A1A4, pin 10
Set IF BANDWIDTH switch to 200 kHz
Using RF voltmeter check for -22 dbm at A1A4, pin 4
Signals present +/- 3 dbm ?
NO
YES
W
Replace A1 assembly para 5.8
AL

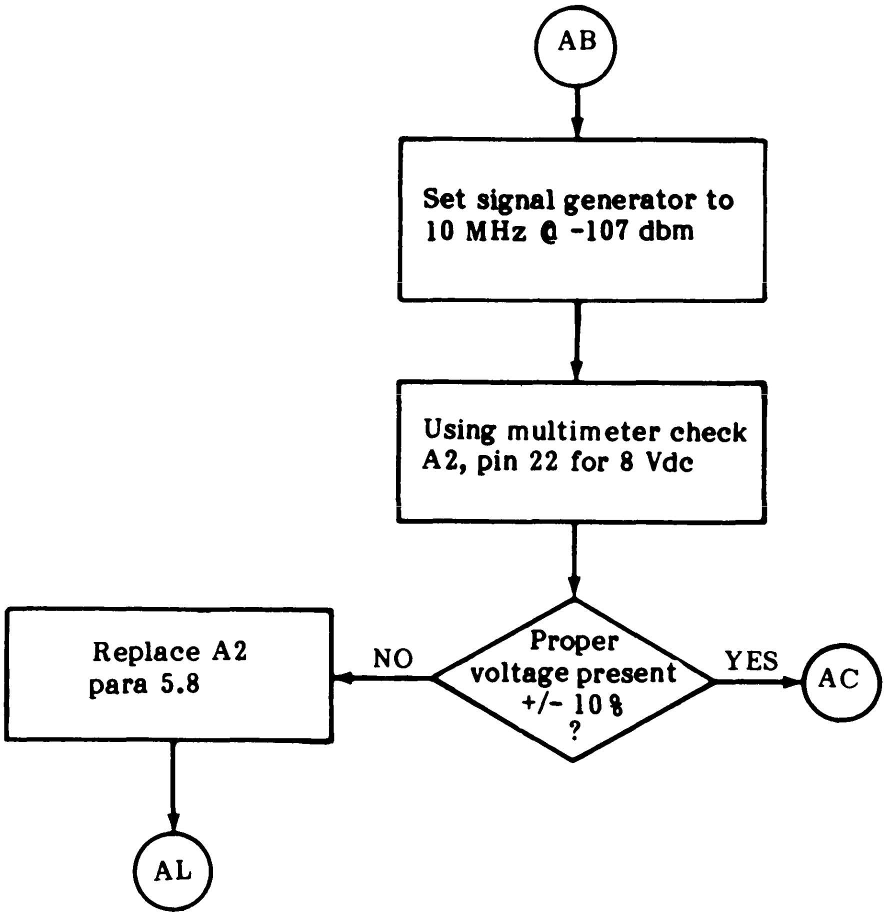

W
Using RF voltmeter check for -9 dbm at A1A4, pin 1
Signal present +/- 3 dbm ?
NO
YES
X
Replace A1A4 para 5.8
AL

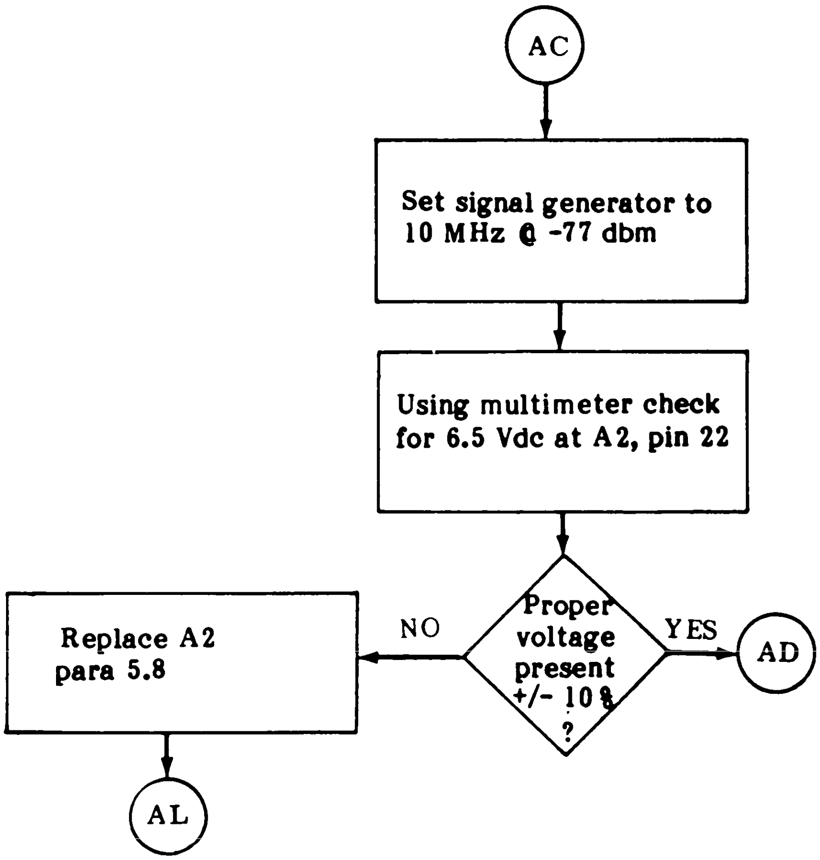

X
Connect RF voltmeter to A1A1, pin 1
Set IF BANDWIDTH switch (S6) to 10 kHz
Adjust signal generator up in frequency until level drops 3 db on voltmeter, record signal generator frequency (F2)
Adjust signal generator down in frequency until level drops 3 db on voltmeter, record signal generator frequency (F1)
Calculate center frequency
$\frac{F1 + F2}{2} = C.F.$
Calculate bandwidth
F2 - F1 = B.W.
C.F. within +/- 10% and B.W. within +/- 10% ?
NO
Replace A1A4 para 5.8
AL
YES
Y

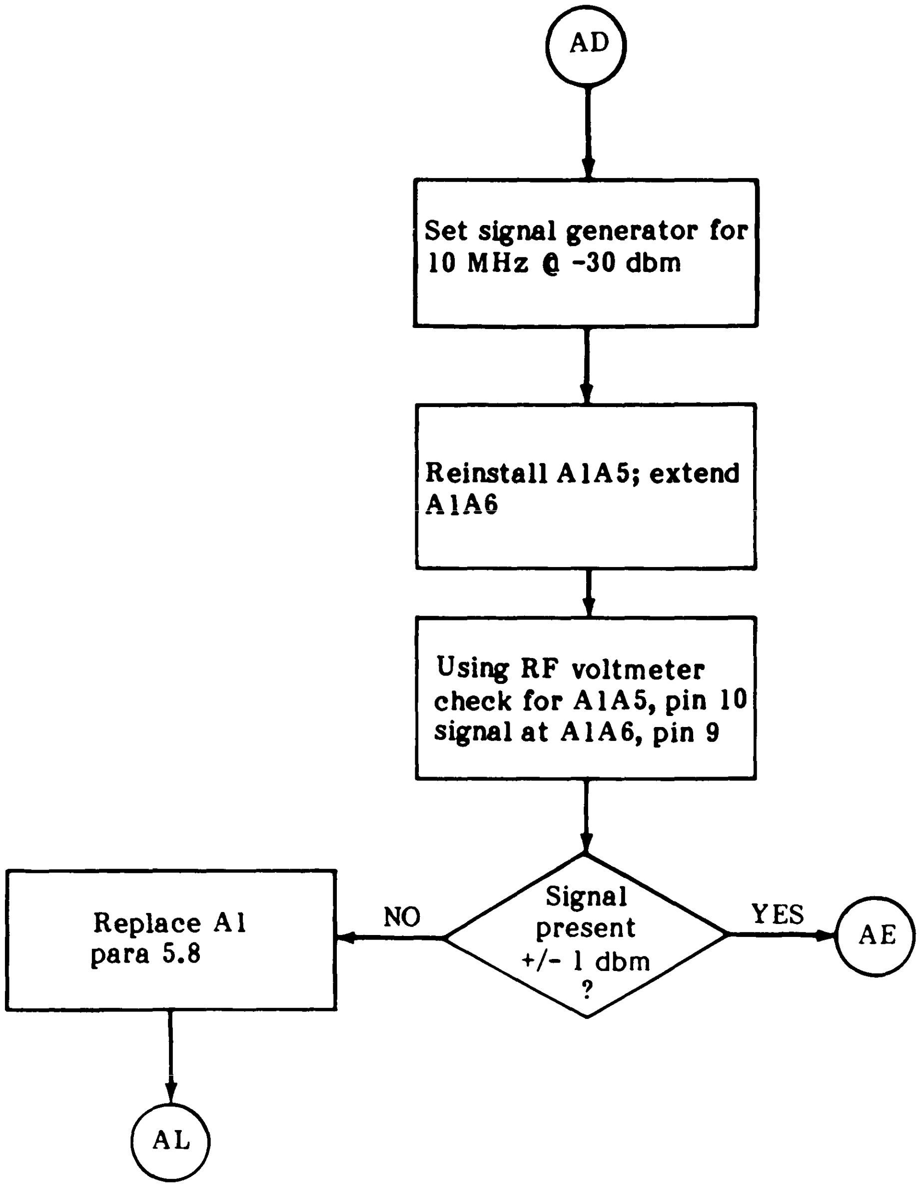

Y
Set IF BANDWIDTH switch (S6) to 50 kHz
Adjust signal generator up in frequency until level drops 3 db on voltmeter, record signal generator frequency (F2)
Adjust signal generator down in frequency until level drops 3 db on voltmeter, record signal generator frequency (F1)
Calculate center frequency
F1 + F2 / 2 = C.F.
Calculate bandwidth
F2 - F1 = B.W.
C.F. within +/- 10% and B.W. within +/- 10% ?
YES
Z
NO
Replace A1A4 para 5.8
AL

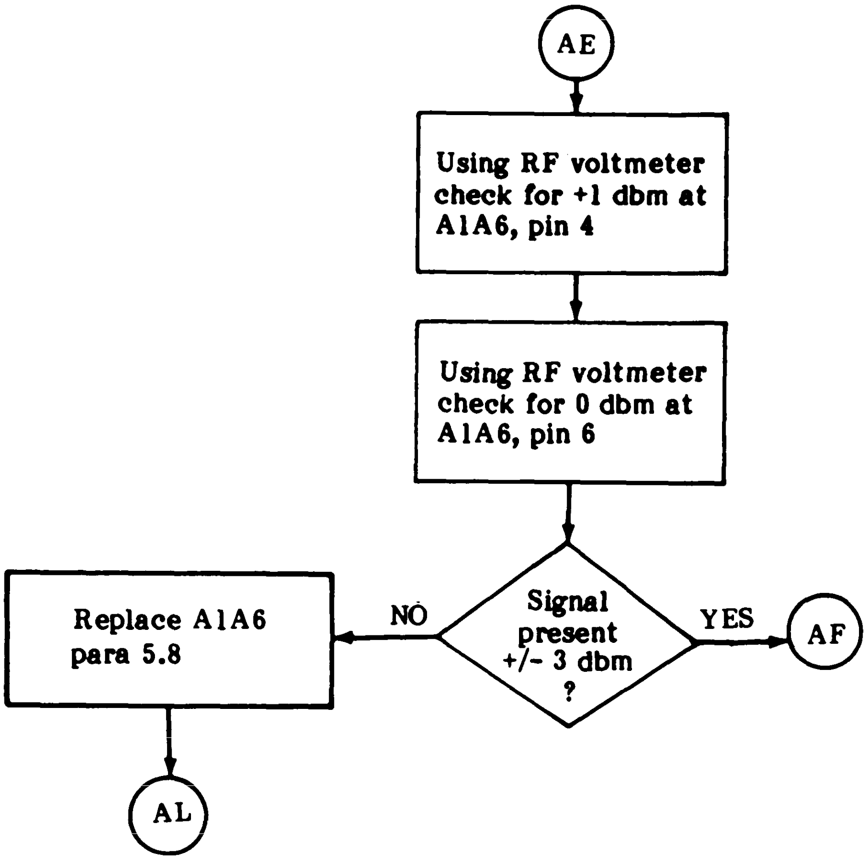

Z
Reinstall A1A4, extend A1A5
Using RF voltmeter check for A1A4, pin 1 signal at A1A5, pin 6
Signal present +/- 1 dbm ?
NO
YES
AA
Replace A1 para 5.8
AL

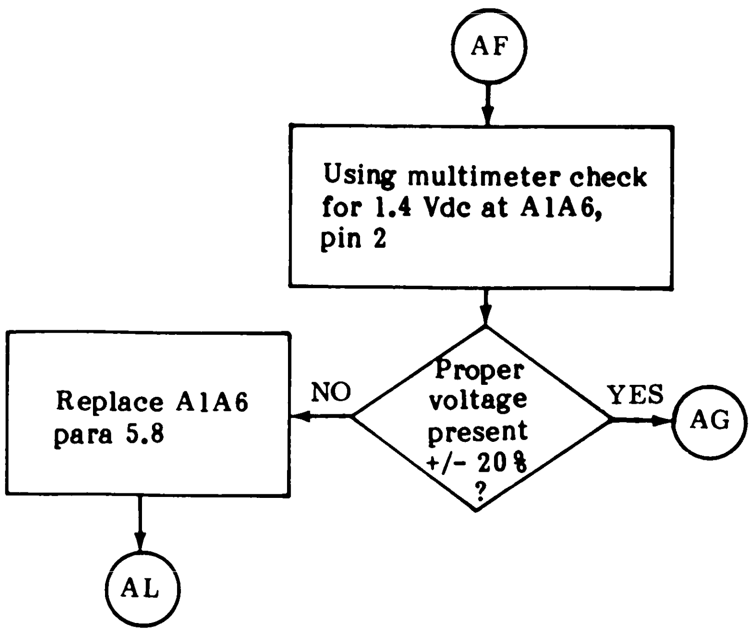

AA
Using RF voltmeter check for -14 dbm at A1A5, pin 10
Signal present +/- 3 dbm ?
NO
YES
AB
Replace A1A5 para 5.8
AL

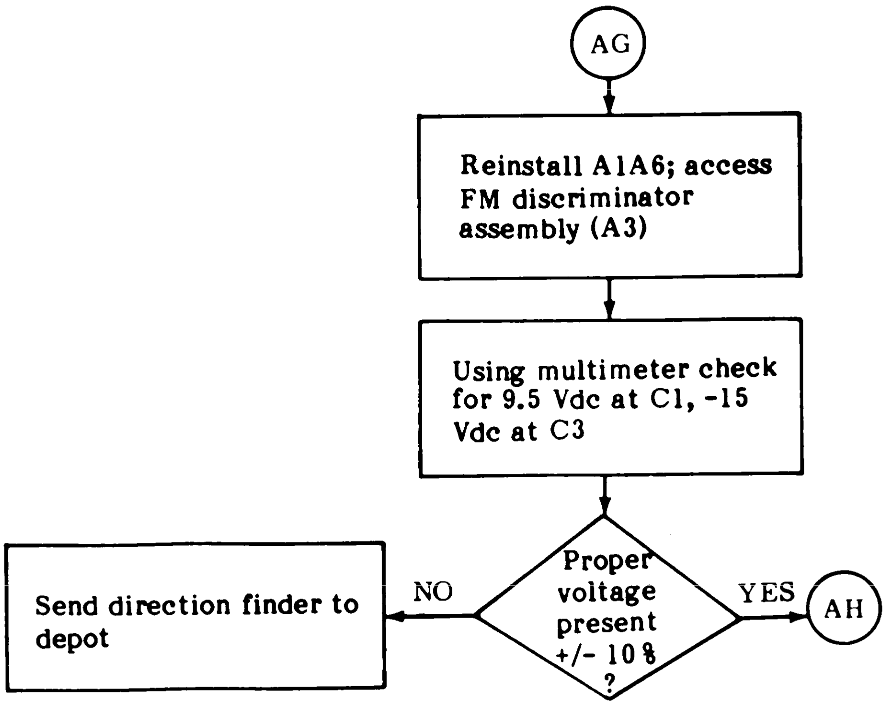

AB
Set signal generator to 10 MHz @ -107 dbm
Using multimeter check A2, pin 22 for 8 Vdc
Proper voltage present +/- 10 % ?
NO
YES
AC
Replace A2 para 5.8
AL

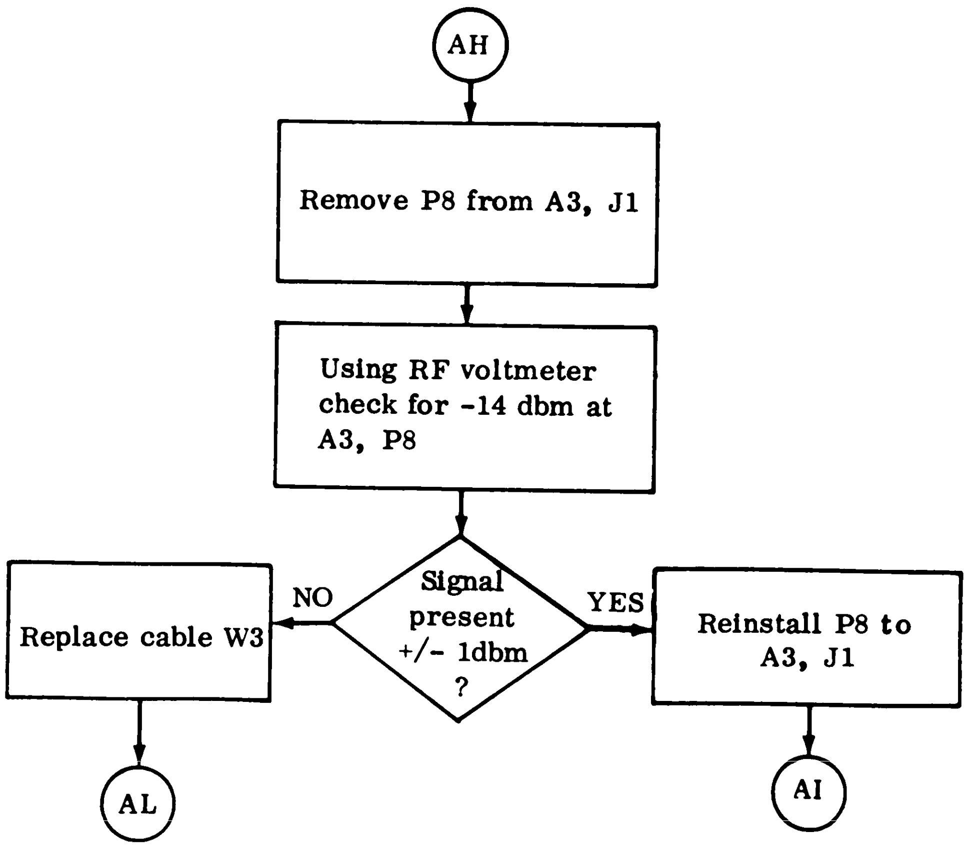

AC
Set signal generator to 10 MHz @ -77 dbm
Using multimeter check for 6.5 Vdc at A2, pin 22
Proper voltage present +/- 10%?
NO
YES
AD
Replace A2 para 5.8
AL

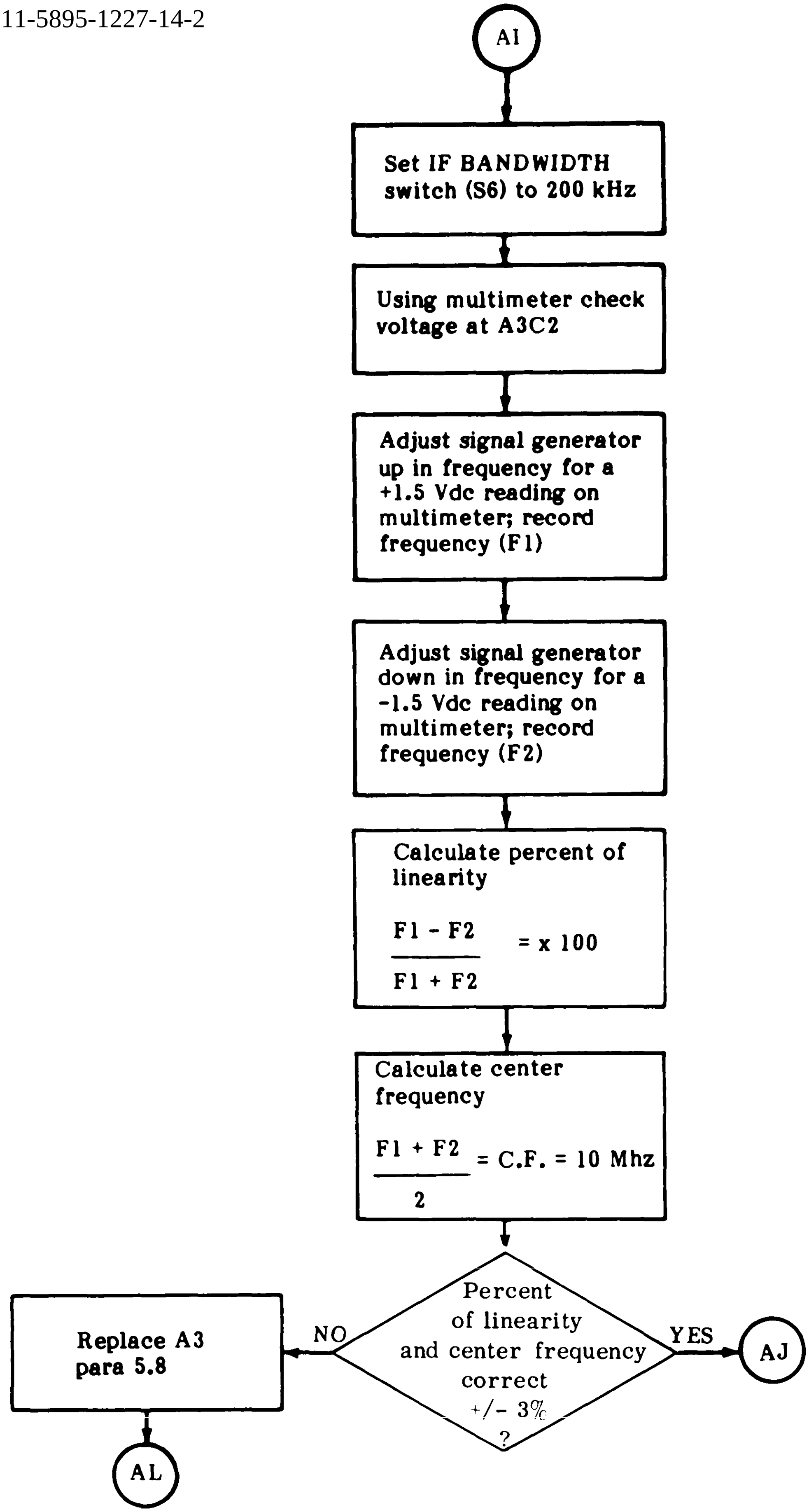

AD
Set signal generator for 10 MHz @ -30 dbm
Reinstall A1A5; extend A1A6
Using RF voltmeter check for A1A5, pin 10 signal at A1A6, pin 9
Signal present +/- 1 dbm ?
NO
YES
Replace A1 para 5.8
AE
AL

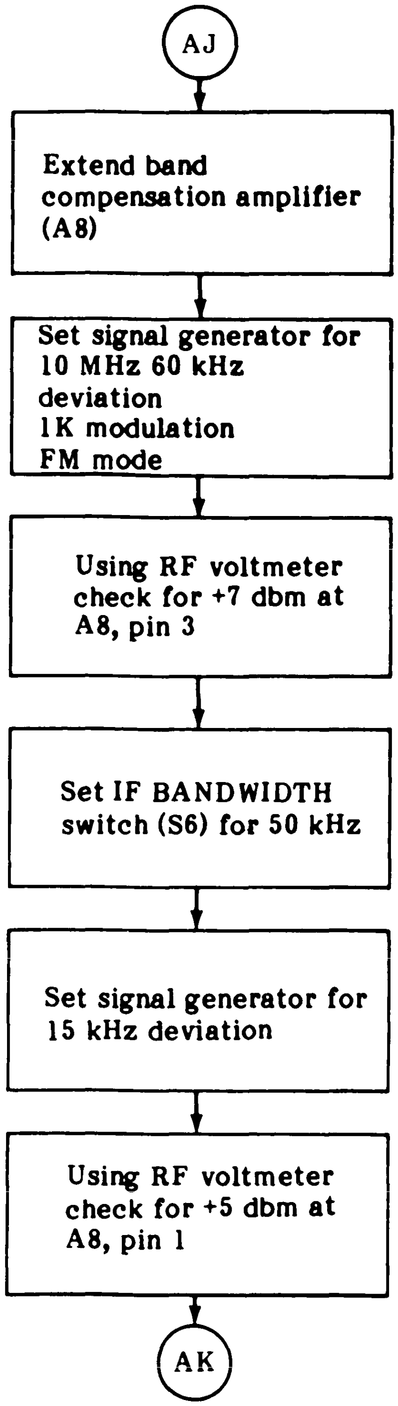

AE
Using RF voltmeter check for +1 dbm at A1A6, pin 4
Using RF voltmeter check for 0 dbm at A1A6, pin 6
Signal present +/- 3 dbm ?
NO
YES
Replace A1A6 para 5.8
AF
AL

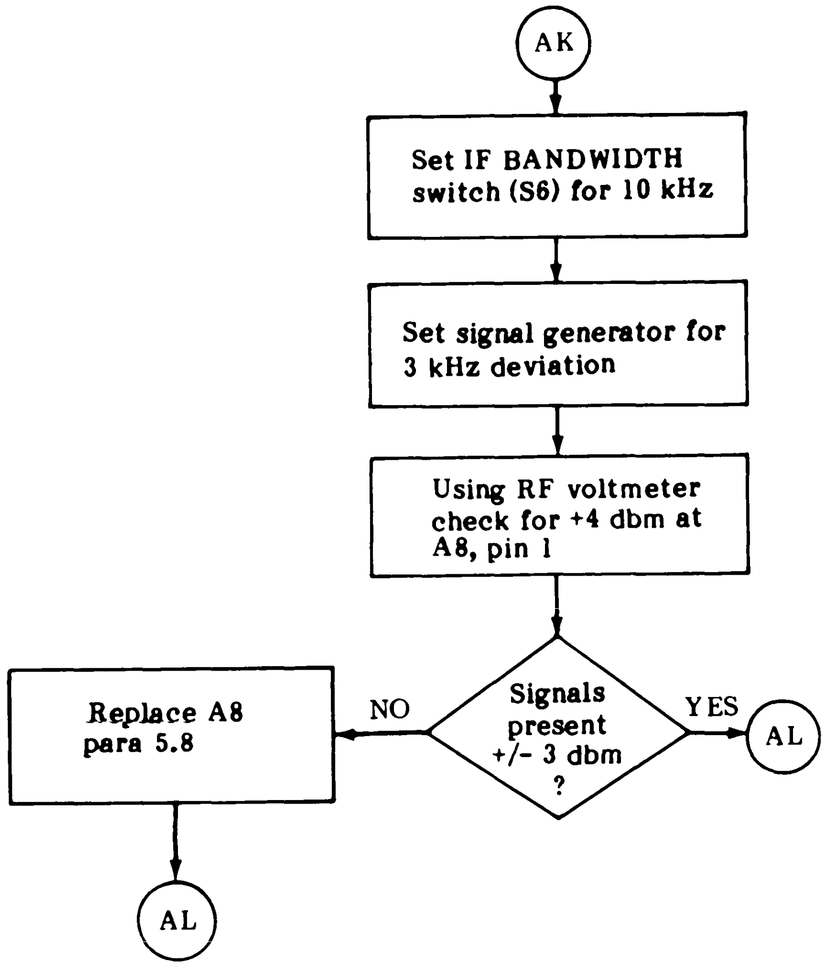

AF
Using multimeter check for 1.4 Vdc at A1A6, pin 2
Proper voltage present +/- 20% ?
NO
YES
Replace A1A6 para 5.8
AG
AL

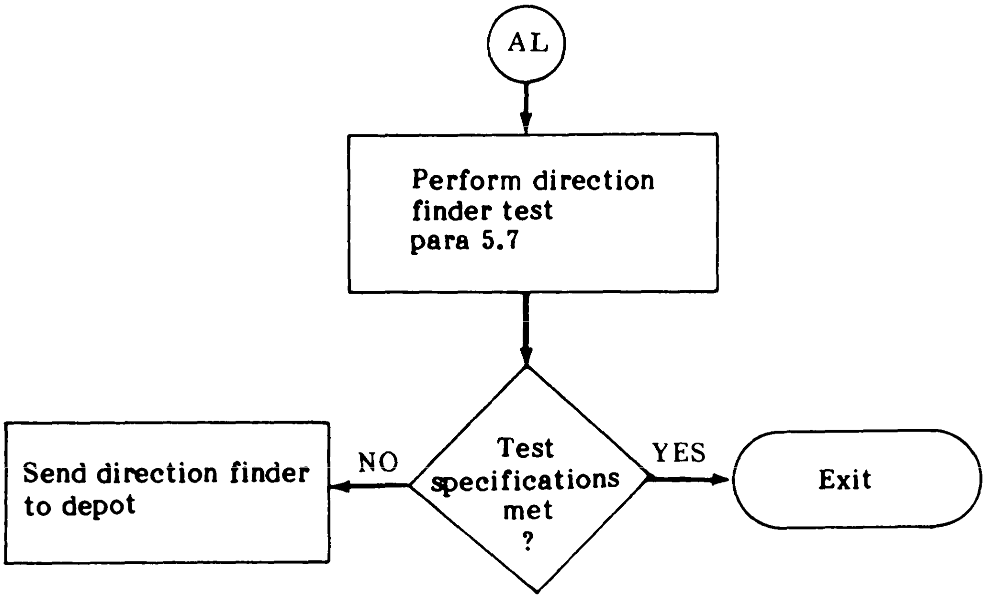

AG
Reinstall A1A6; access FM discriminator assembly (A3)
Using multimeter check for 9.5 Vdc at C1, -15 Vdc at C3
Proper voltage present +/- 10%?
NO
Send direction finder to depot
YES
AH

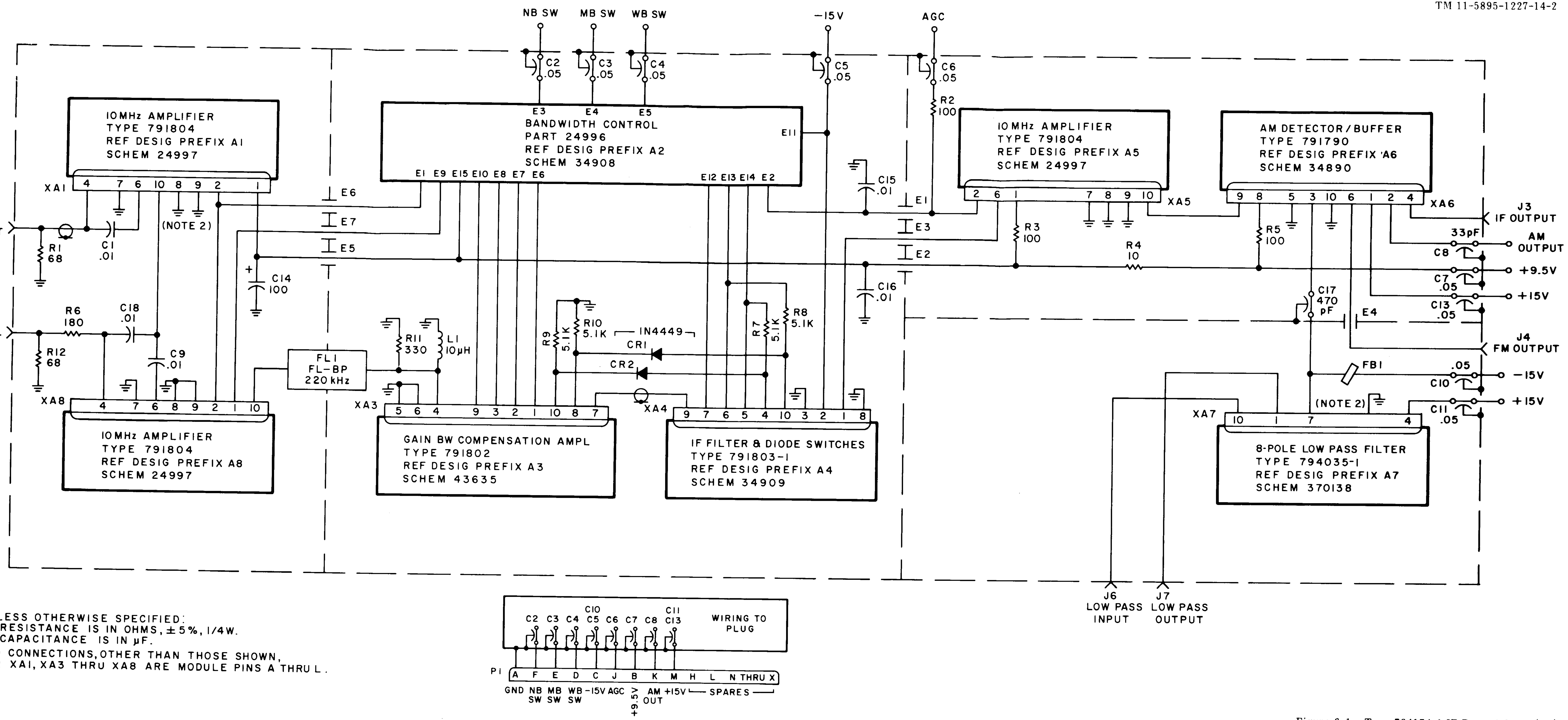

AH
Remove P8 from A3, J1
Using RF voltmeter check for -14 dbm at A3, P8
Signal present +/- 1dbm ?
NO
Replace cable W3
AL
YES
Reinstall P8 to A3, J1
AI


AI
Set IF BANDWIDTH switch (S6) to 200 kHz
Using multimeter check voltage at A3C2
Adjust signal generator up in frequency for a +1.5 Vdc reading on multimeter; record frequency (F1)
Adjust signal generator down in frequency for a -1.5 Vdc reading on multimeter; record frequency (F2)
Calculate percent of linearity
$\frac{F1 - F2}{F1 + F2}$ = x 100
Calculate center frequency
$\frac{F1 + F2}{2}$ = C.F. = 10 Mhz
Percent of linearity and center frequency correct +/- 3% ?
NO
YES
AJ
Replace A3 para 5.8
AL


AJ
Extend band compensation amplifier (A8)
Set signal generator for 10 MHz 60 kHz deviation 1K modulation FM mode
Using RF voltmeter check for +7 dbm at A8, pin 3
Set IF BANDWIDTH switch (S6) for 50 kHz
Set signal generator for 15 kHz deviation
Using RF voltmeter check for +5 dbm at A8, pin 1
AK


AK
Set IF BANDWIDTH switch (S6) for 10 kHz
Set signal generator for 3 kHz deviation
Using RF voltmeter check for +4 dbm at A8, pin 1
Signals present +/- 3 dbm ?
NO
YES
Replace A8 para 5.8
AL
AL

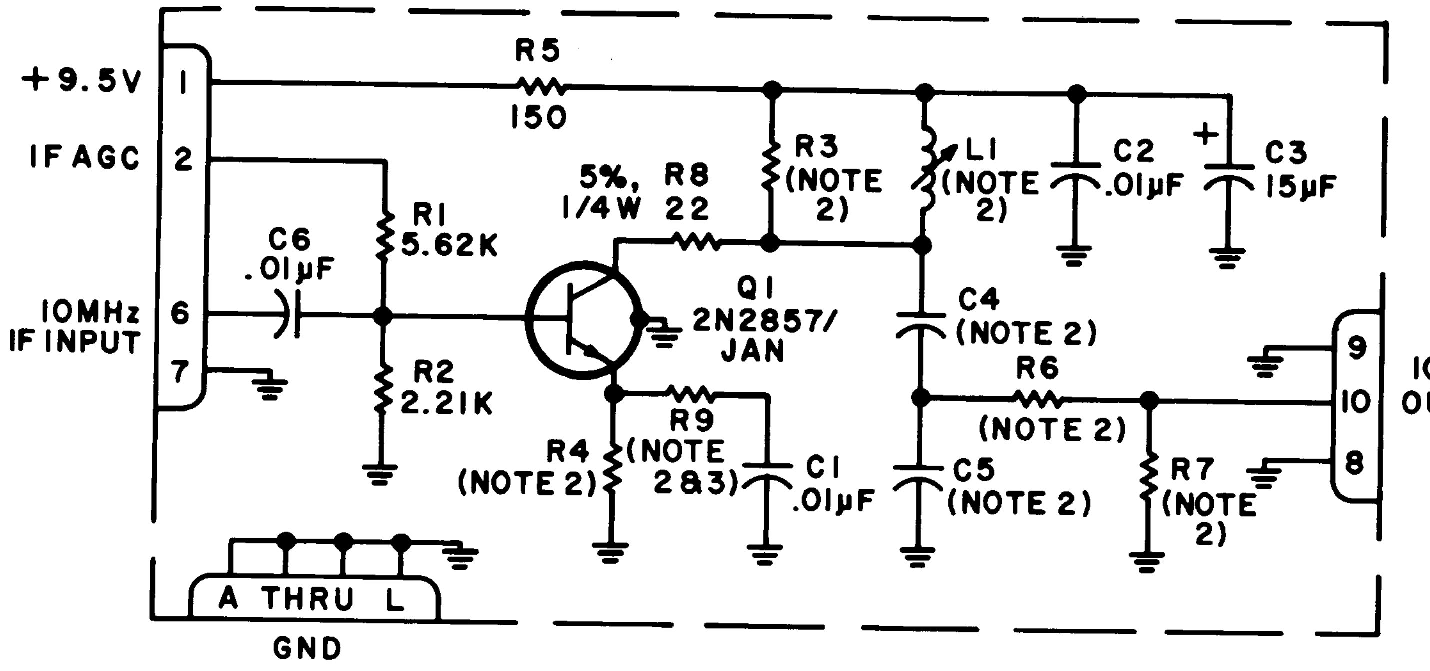

AL
Perform direction finder test para 5.7
Test specifications met ?
NO
Send direction finder to depot
YES
Exit



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS IN μF.
2. GND CONNECTIONS, OTHER THAN THOSE SHOWN, FOR XA1, XA3 THRU XA8 ARE MODULE PINS A THRU L.

Figure 6-1. Type 794174-1 IF Demodulator (A1), Schematic Diagram 470065



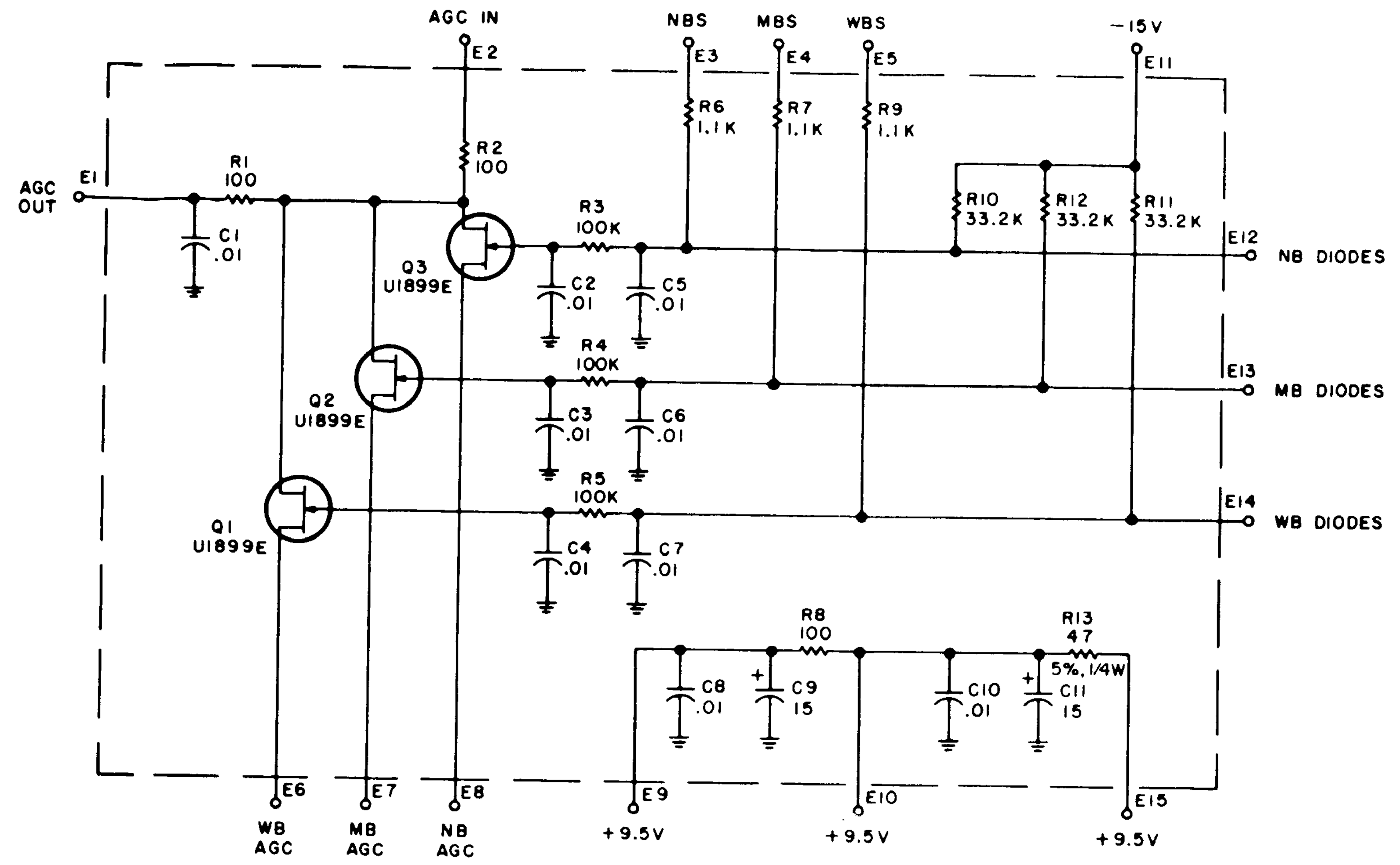
TYPE	R4	R7	R3	R6	C4	C5	L1	R9
791804-1	274	1K	3.92K	10*	250	560	7107-15, 1.5µH	2.7*
791804-2	475	OMIT	2.55K	10*	250	560	7107-15, 1.5µH	2.7*
791804-3	475	680*	5.6K*	150*	120	160	7107-20, 3.9µH	15*
791804-4	475	680*	5.6K*	51*	120	160	7107-20, 3.9µH	15*

* 5%, 1/4W

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ±1%, .1W.
   b) CAPACITANCE IS IN pF.
2. DIFFERENCE BETWEEN TYPES IS LISTED IN TABLE.
3. NOMINAL VALUE; FINAL VALUE FACTORY SELECTED.

Figure 6-2. Type 791804-1 10 MHz Amplifier (A1A1, A1A5, A1A8), Schematic Diagram 24997



NOTE:
UNLESS OTHERWISE SPECIFIED:
a) RESISTANCE IS IN OHMS, ±1%, 1/10W.
b) CAPACITANCE IS IN µF.

Figure 6-3. Part 24966, Bandwidth Control (A1A2) Schematic Diagram 34908

NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ±1%, 1/10W
   b) CAPACITANCE IS IN uF.
2. CW ON POTENTIOMETERS INDICATES FULL CLOCKWISE POSITION OF ACTUATOR.

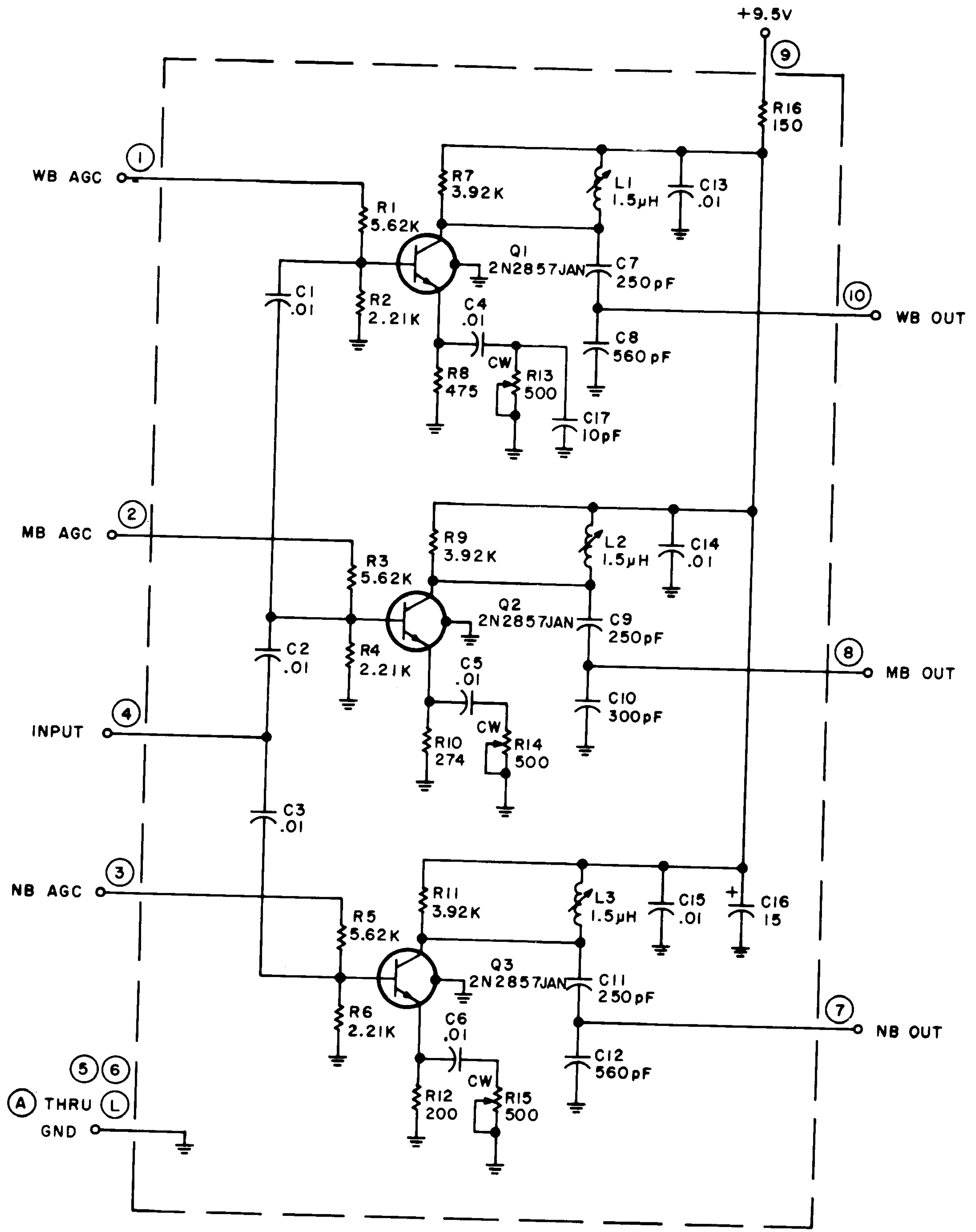


Figure 6-4. Type 791802, Gain Bandwidth Compensation Amplifier (A1A3), Schematic Diagram 43635

NOTES:
1. UNLESS OTHERWISE SPECIFIED:
 a) RESISTANCE IS IN OHMS, ±1%, 1/10W.
 b) CAPACITANCE IS IN μF.
2. DIFFERENCE BETWEEN TYPES IS GIVEN IN TABLE I.

TABLE I		
TYPE NO.	FL1	FL2
791803-1	10 kHz	50 kHz
791803-2	5 kHz	20 kHz
791803-3	20kHz	50kHz

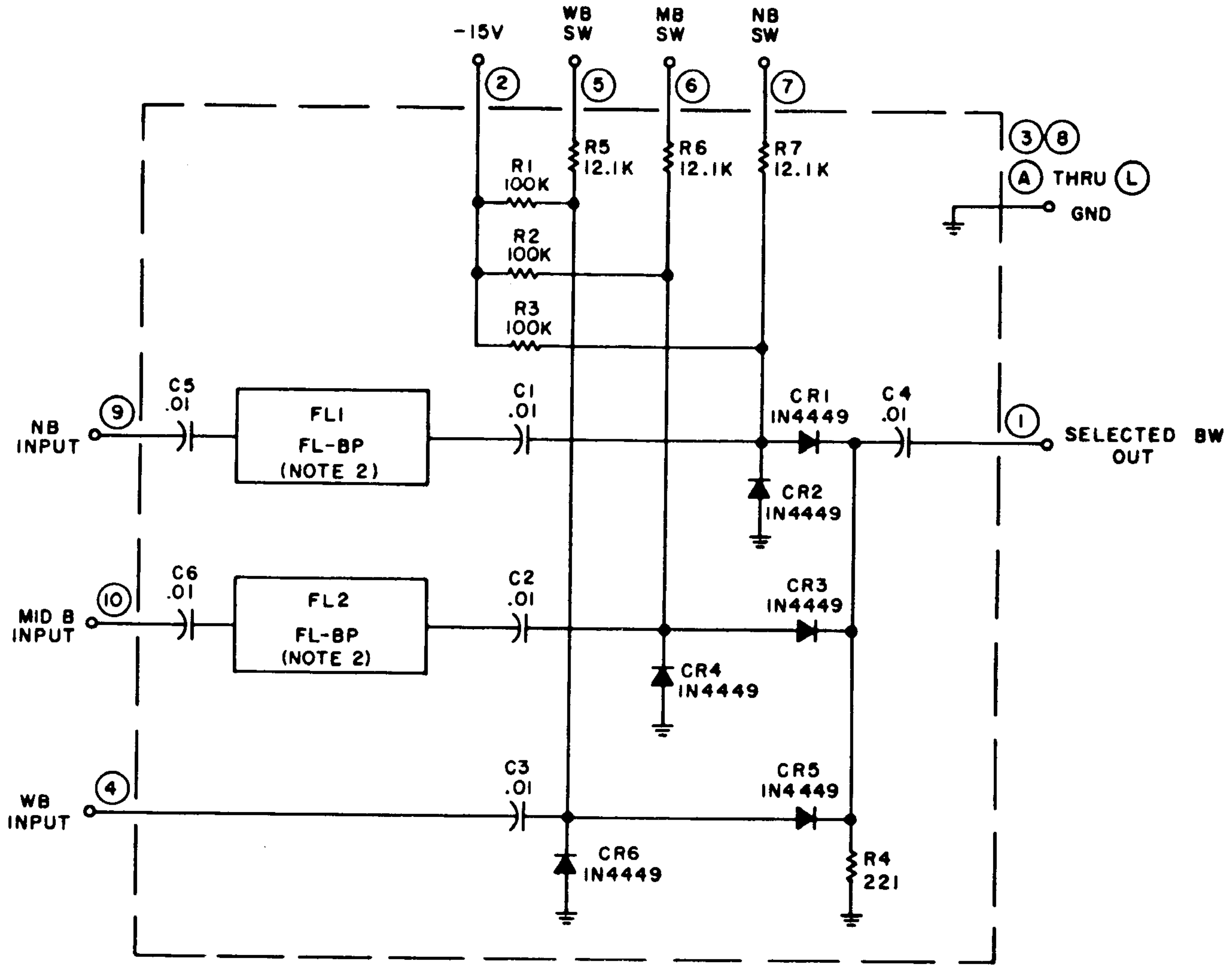
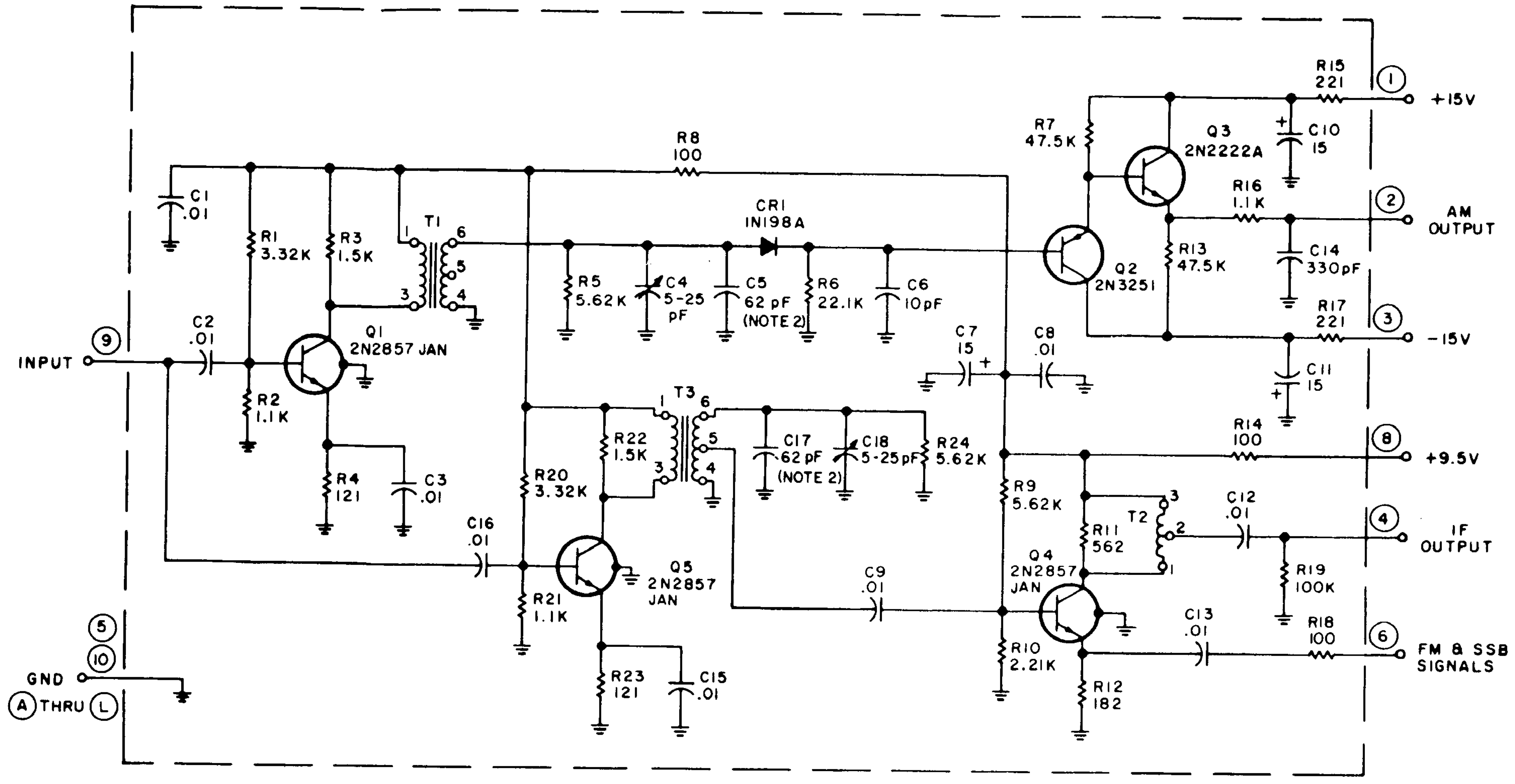
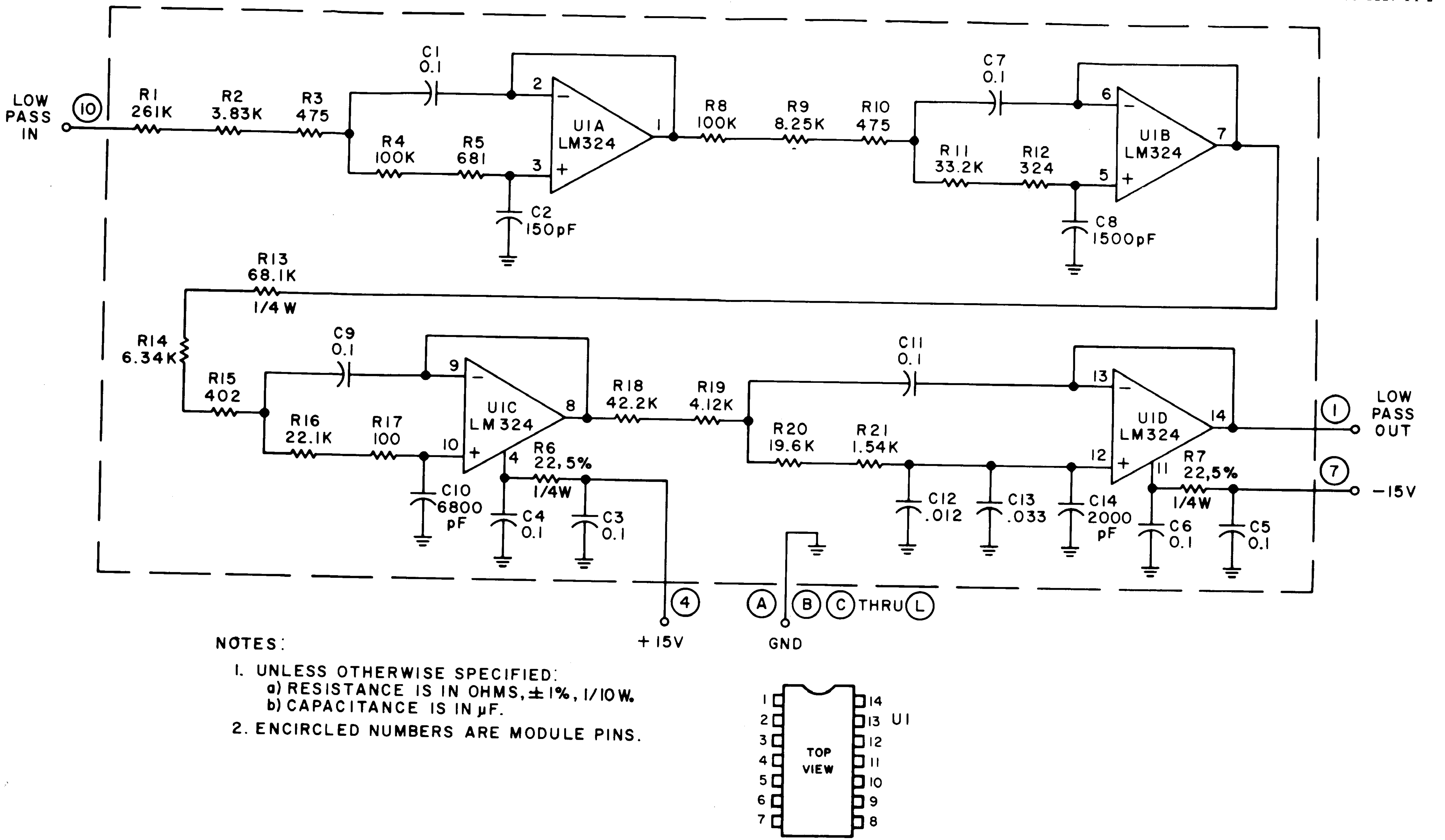


Figure 6-5. Type 791803-1 IF Filters and Diode Switches (A1A4), Schematic Diagram 34909



NOTE:
1. UNLESS OTHERWISE SPECIFIED:
a) RESISTANCE IS IN OHMS, ±1%, 1/10W.
b) CAPACITANCE IS IN μF.
2. NOMINAL VALUE, FINAL VALUE FACTORY SELECTED.

Figure 6-6. Type 791790 AM Detector/Buffer (A1A6), Schematic Diagram 34890

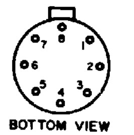


NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ±1%, 1/10 W.
   b) CAPACITANCE IS IN μF.
2. ENCIRCLED NUMBERS ARE MODULE PINS.

Figure 6-7. Type 794035 8 Pole Low Pass Filter (A1A7), Schematic Diagram 370138

DETAIL A



HIGHEST REF DESIG USED	REF DESIG NOT USED
C7	
CR10	
Q5	Q1
R34	R2
U3	
VR1	

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ±1%, .1W
   b) CAPACITANCE IS μF.
2. LEAD ARRANGEMENT FOR U1, U2, & U3 IS SHOWN IN DETAIL A.
3. NOMINAL TYPE, FINAL TYPE, FACTORY SELECTED BETWEEN 1N4449 & 1N198A.

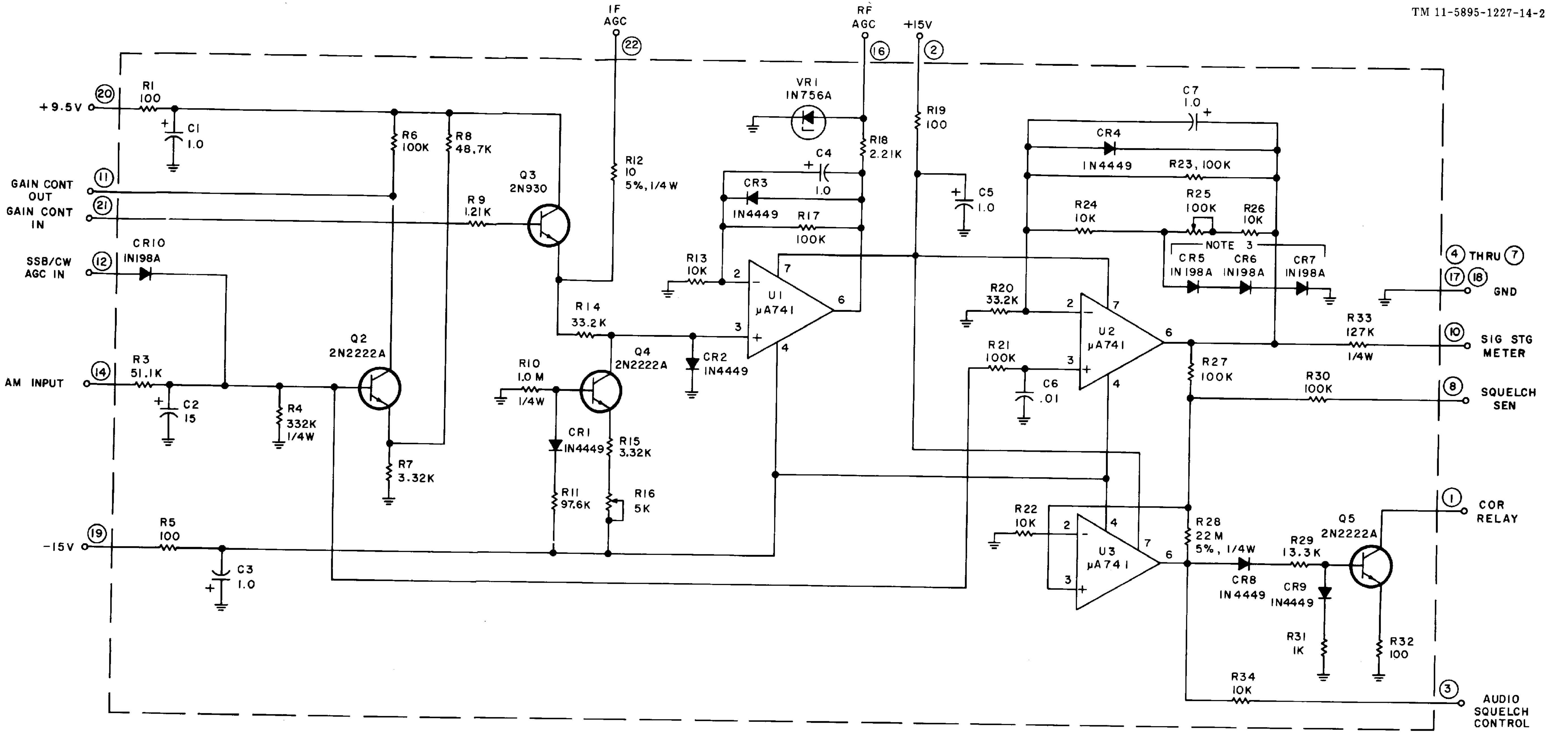
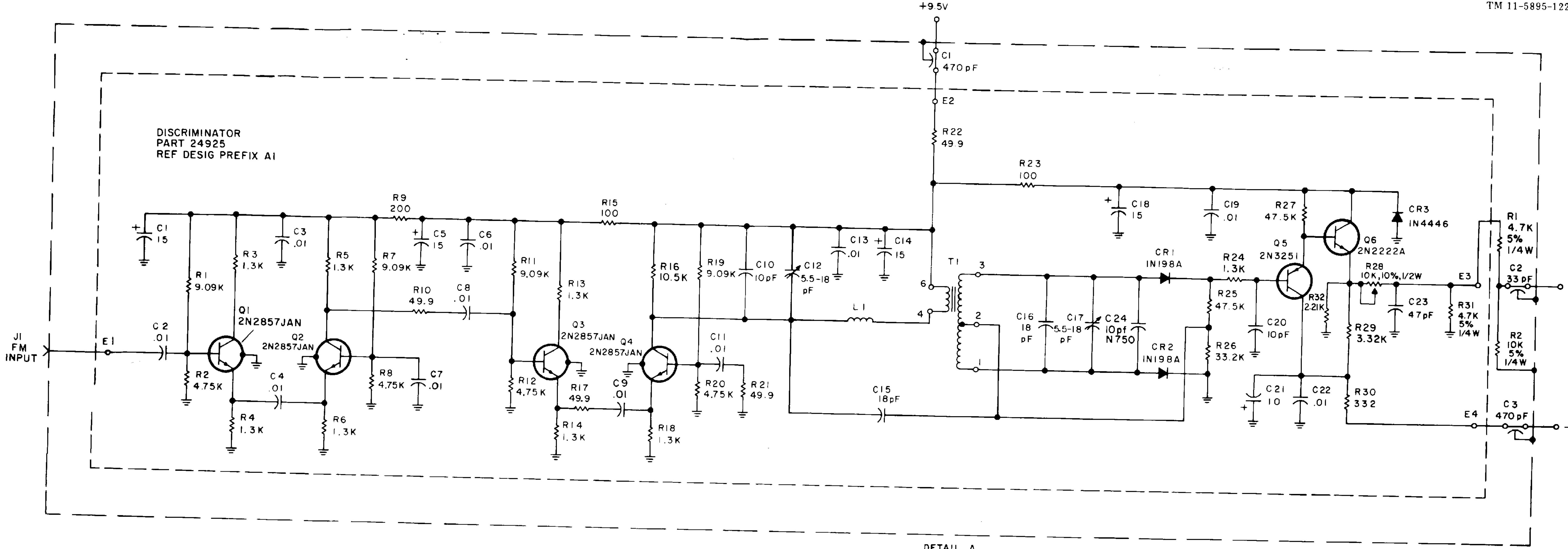


Figure 6-8. Type 791817-1 AGC Squelch (A2), Schematic Diagram 43645



NOTES:
1. UNLESS OTHERWISE SPECIFIED:
   a) ALL RESISTANCE IS IN OHMS ±1%, 1/10W.
   b) CAPACITANCE IS μF.
2. FOR WIRING TO PLUG SEE DETAIL A.
3. DIFFERENCE BETWEEN TYPES IS MECHANICAL ONLY.

HIGHEST REF DESIG USED	REF DESIG NOT USED
A1	
E4 C24 L1 P1 Q6 R31 CR3	J1 P1 A1 T1

DETAIL A

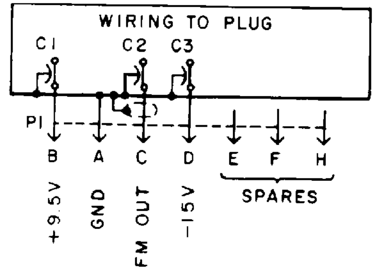
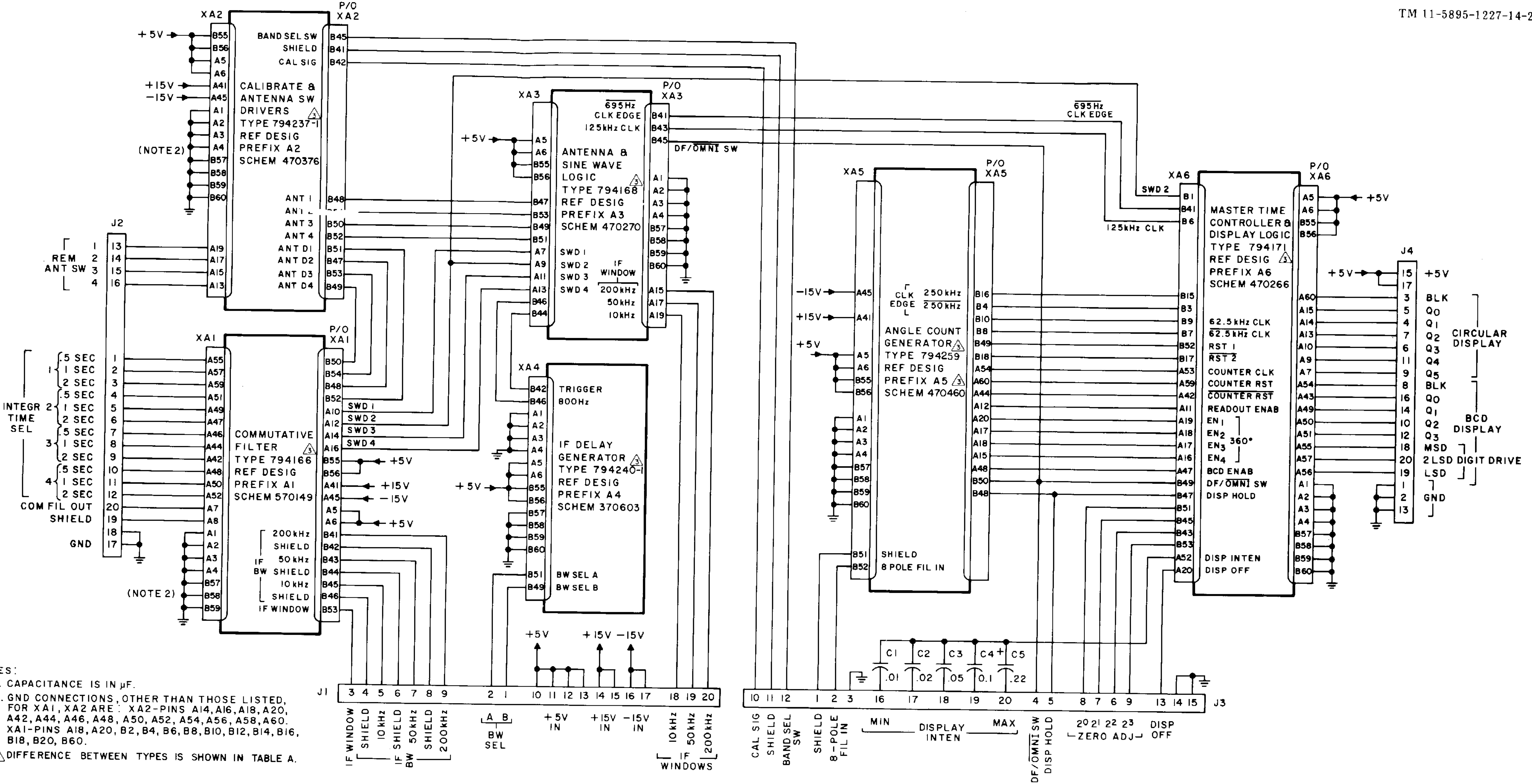


Figure 6-9. Type 794175-1 FM Discriminator (A3), Schematic Diagram 51253

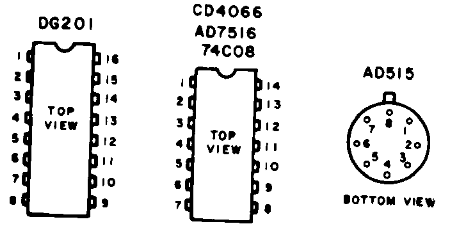


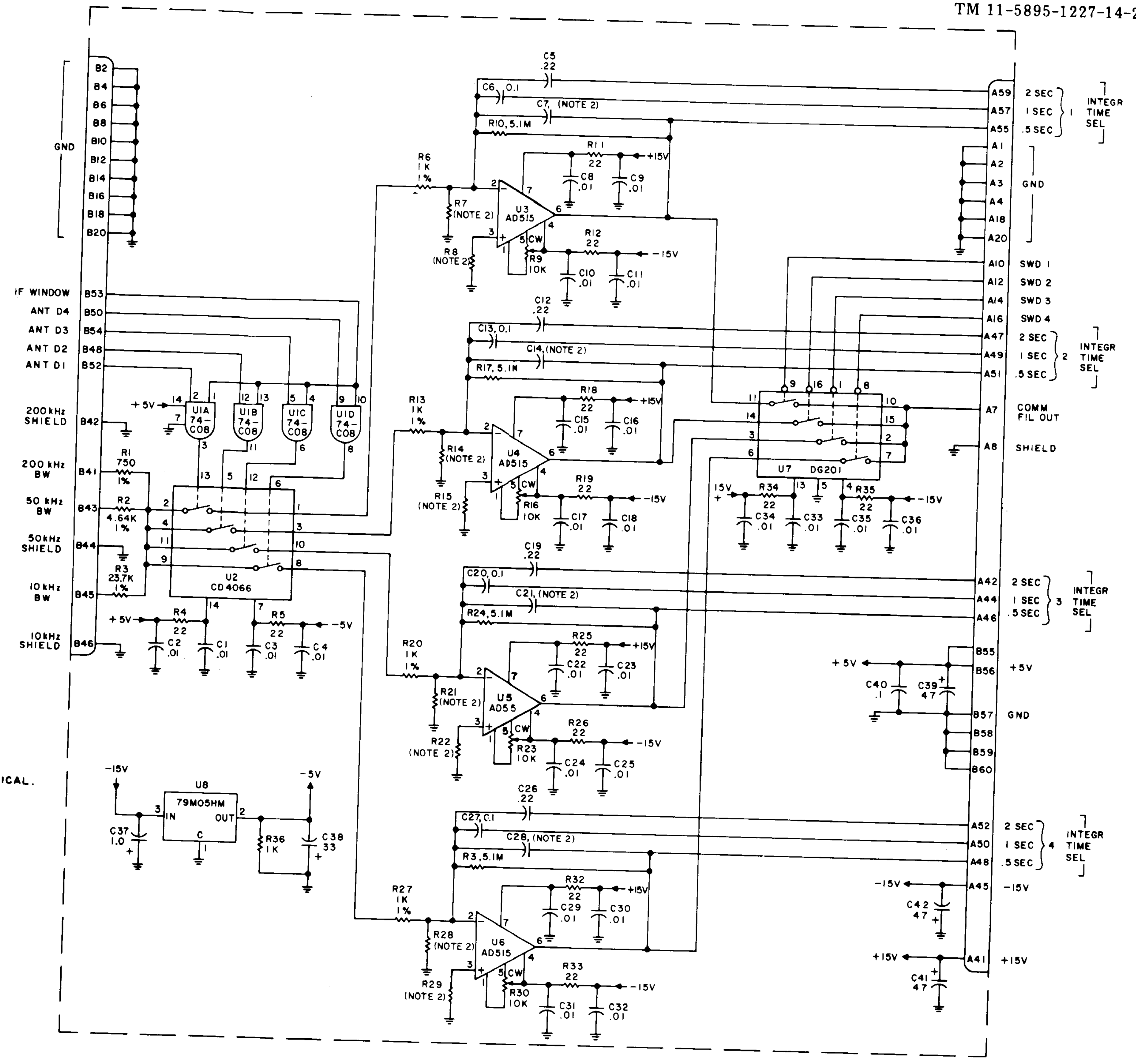
NOTES:

1. CAPACITANCE IS IN µF.
2. GND CONNECTIONS, OTHER THAN THOSE LISTED, FOR XA1, XA2 ARE: XA2-PINS A14, A16, A18, A20, A42, A44, A46, A48, A50, A52, A54, A56, A58, A60. XA1-PINS A18, A20, B2, B4, B6, B8, B10, B12, B14, B16, B18, B20, B60.

3. DIFFERENCE BETWEEN TYPES IS SHOWN IN TABLE A.

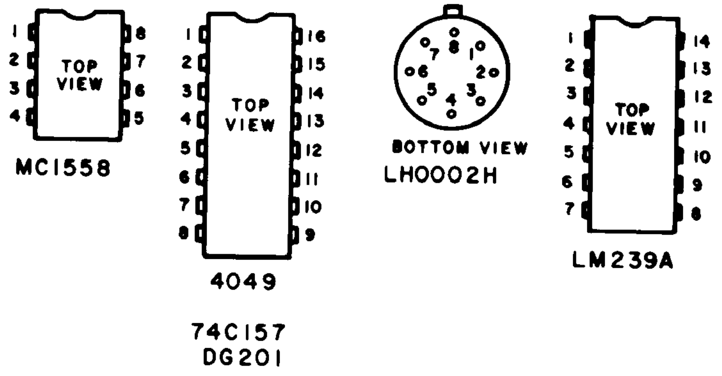
Figure 6-10. Type 794176-1 Mother Board (A4), Schematic Diagram 470260





NOTES:
1. UNLESS OTHERWISE SPECIFIED:
a) RESISTANCE IS IN OHMS, ± 5%, 1/4W.
b) CAPACITANCE IS IN μF.
2. DIFFERENCE BETWEEN TYPES IS MECHANICAL.

Figure 6-11. Type 794166-1 Commutative Filter (A4A1), Schematic Diagram 570149



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS OHMS, ±5%, 1/4 W.
   b) CAPACITANCE IS IN μF.
2. GND PINS NOT LISTED ARE A14, A16, A18, A20, A42, A44, A46, A48, A50, A52, A54, A56, A58, A60.
3. DIFFERENCE BETWEEN TYPES IS MECHANICAL.

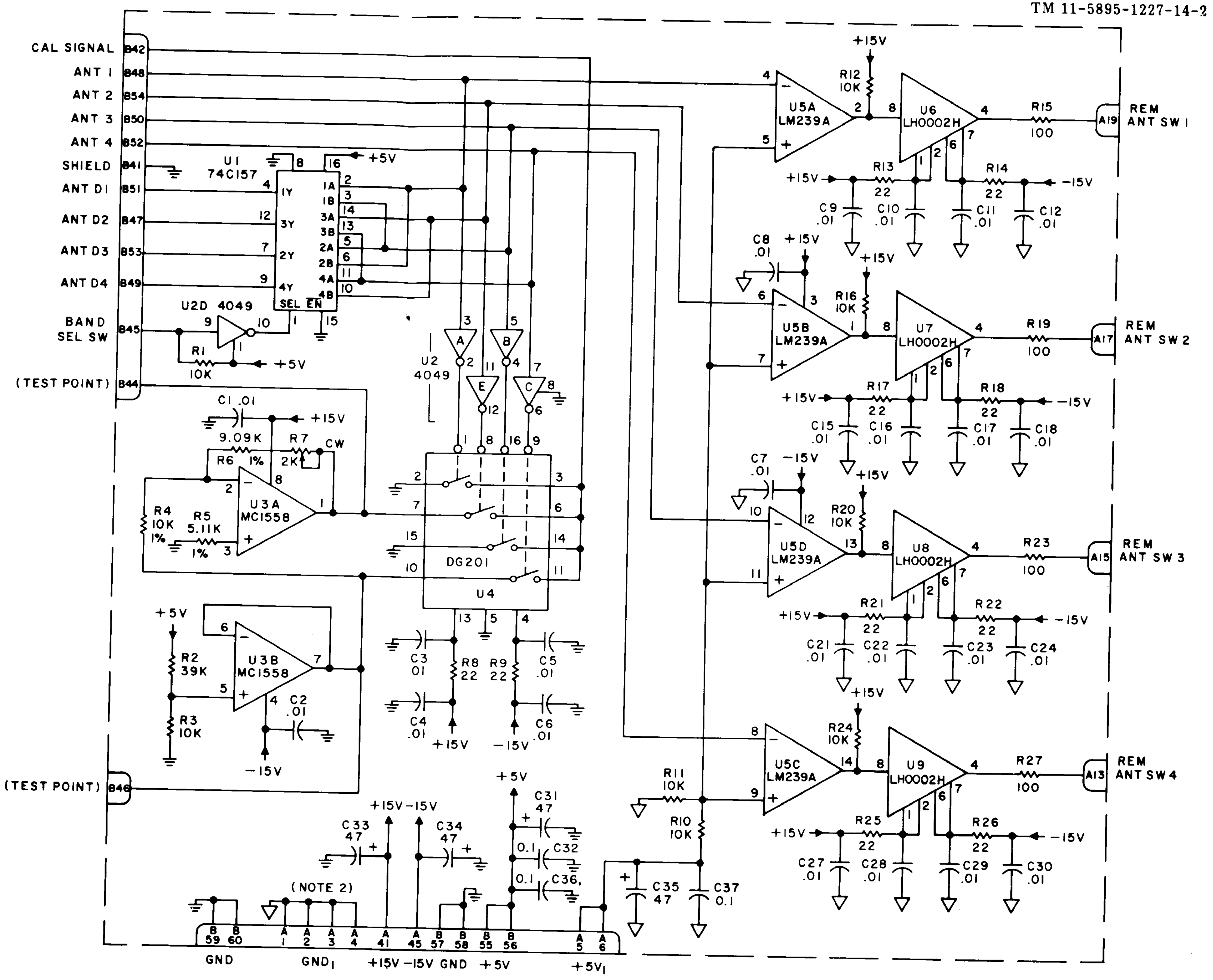


Figure 6-12. Type 794237-1 Calibrate and Antenna Switch Drivers (A4A2), Schematic Diagram 470376

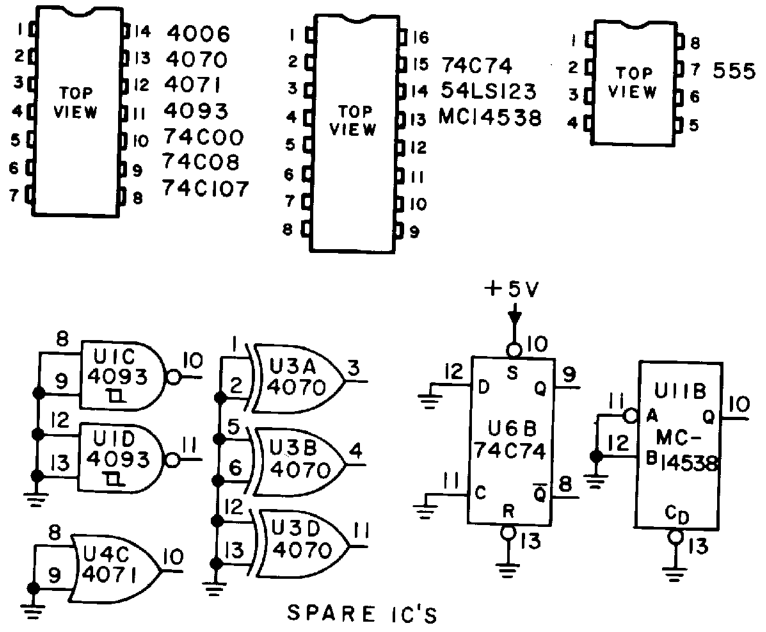


TABLE A

DASH NO	C2
-1	.01μF
-2	6800pF

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS IN μF.
2. DIFFERENCE BETWEEN TYPES IS SHOWN IN TABLE A.

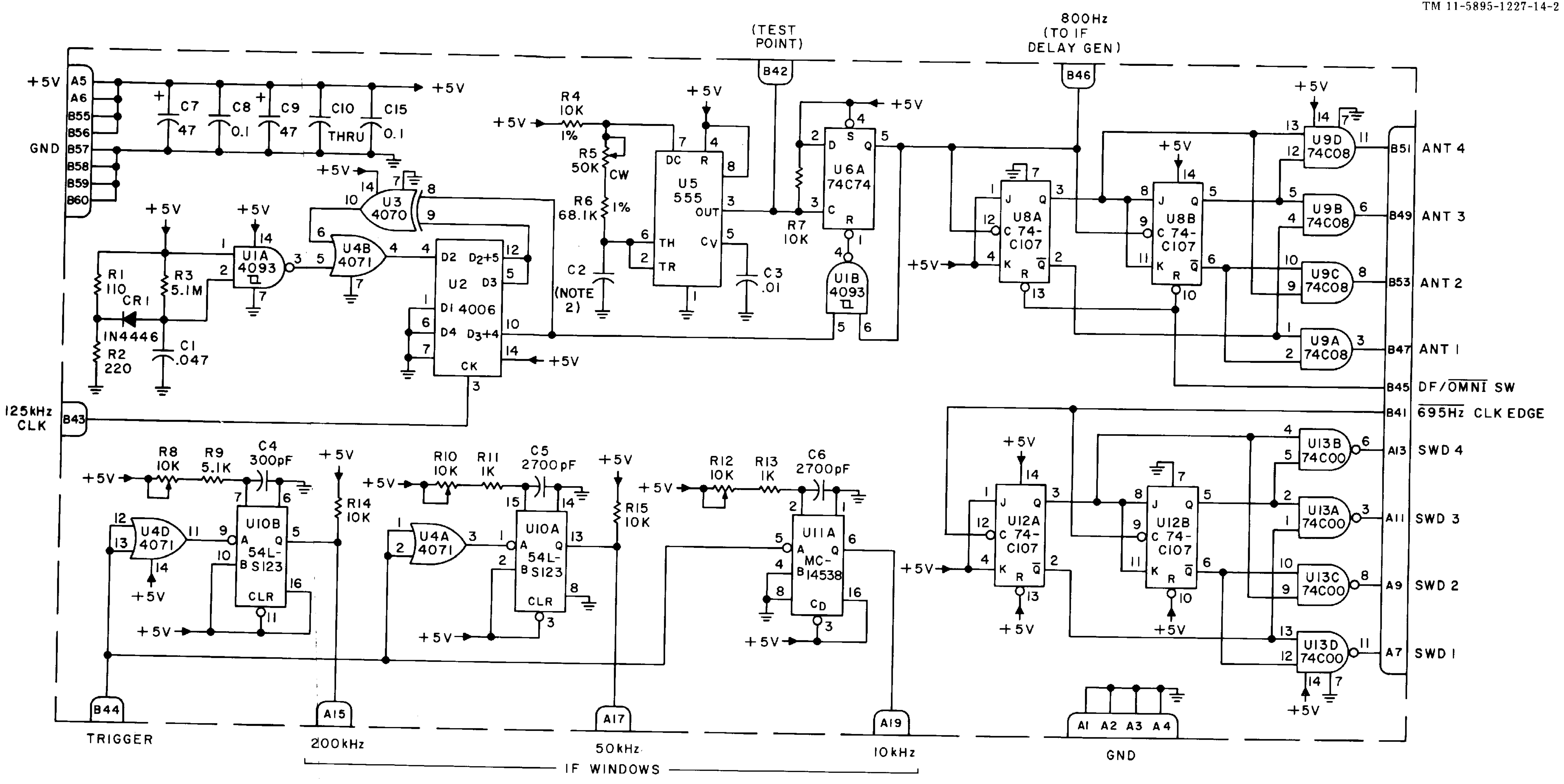
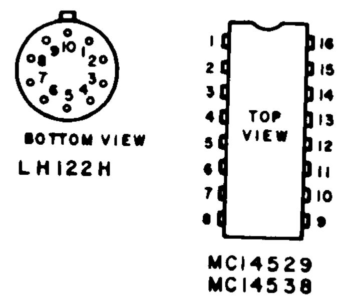


Figure 6-13. Type 794168-1 Antenna and Sine Wave Logic (A4A3), Schematic Diagram 470270

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ± %, 1/4W.
   b) CAPACITANCE IS IN μF.
2. NOMINAL VALUE, FINAL VALUE FACTORY SELECTED.
3. DIFFERENCE BETWEEN TYPES IS MECHANICAL.



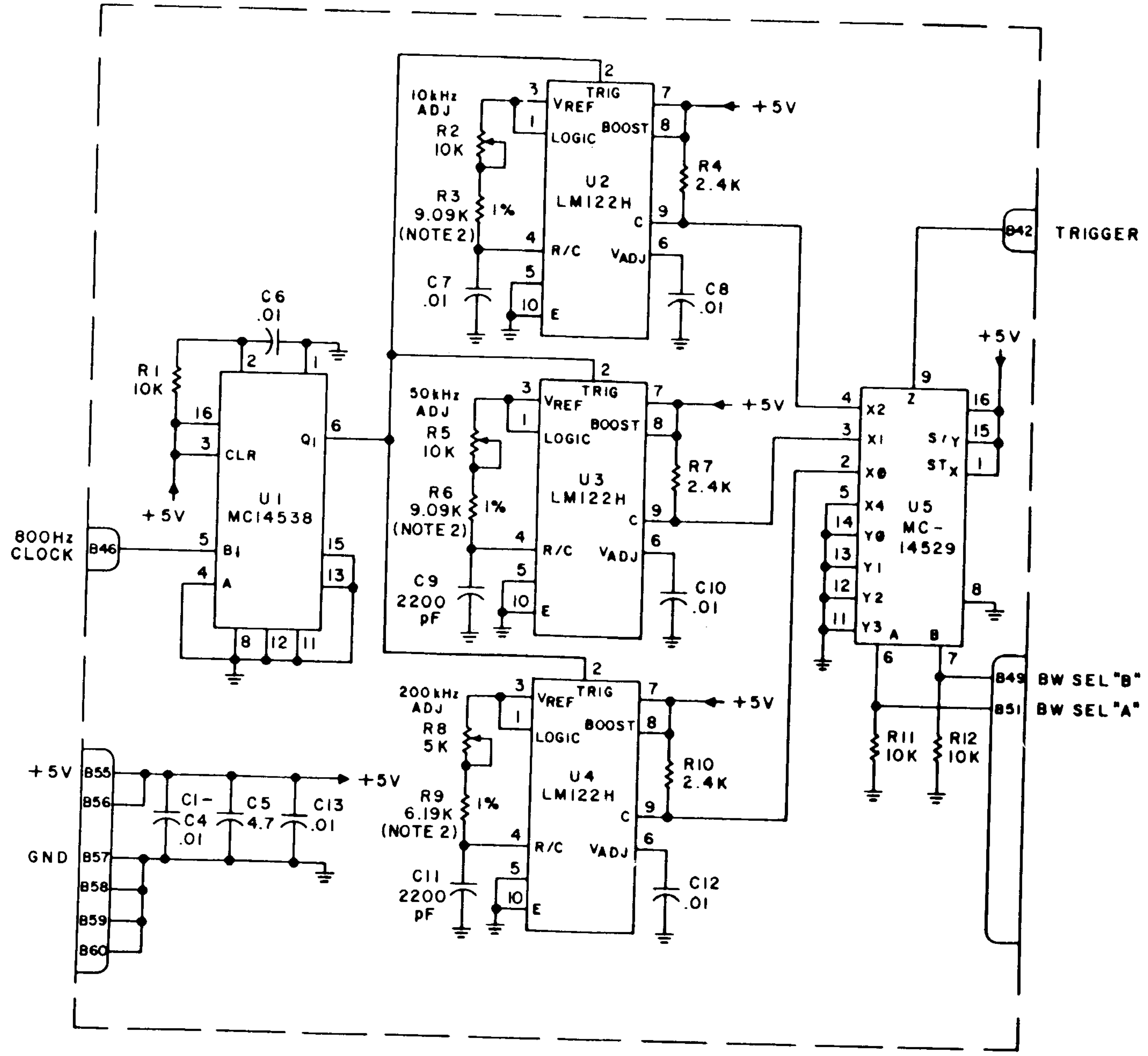
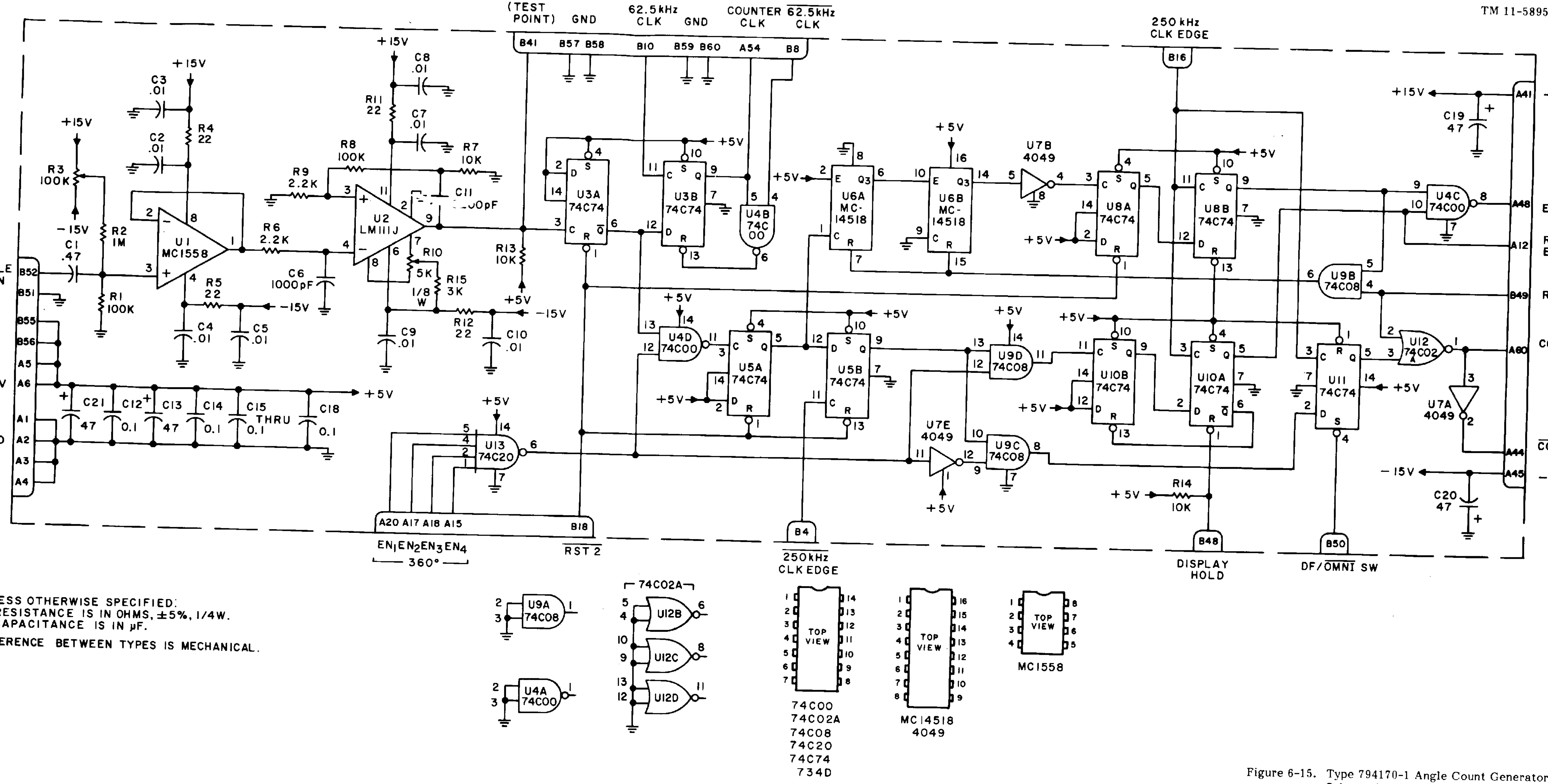


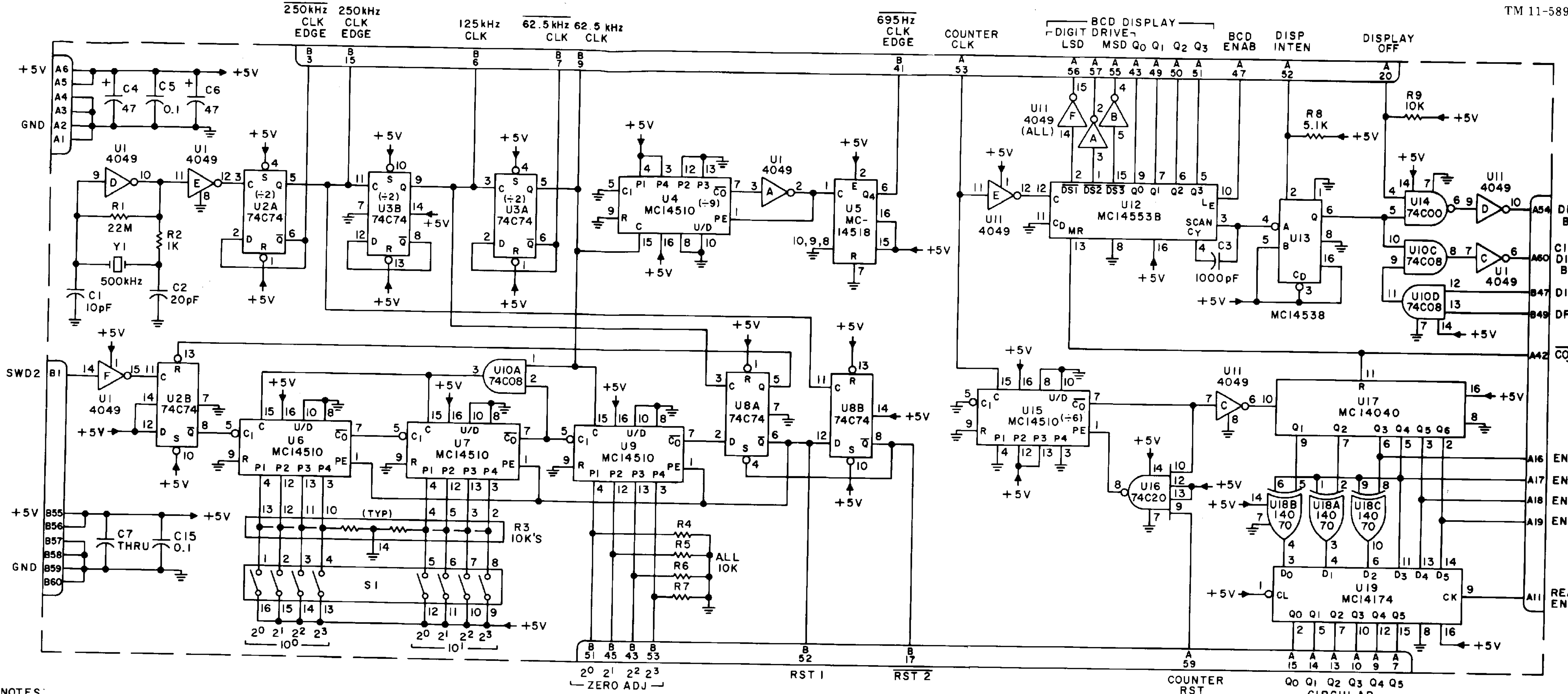
Figure 6-14. Type 794240-1 Angle Count Generator (A4A4), Schematic Diagram 370603



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS IN μF.
2. DIFFERENCE BETWEEN TYPES IS MECHANICAL.

Figure 6-15. Type 794170-1 Angle Count Generator (A4A5), Schematic Diagram 470259



NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ± 5%, 1/4W.
   b) CAPACITANCE IS IN µF.
2. DIFFERENCE BETWEEN TYPES IS MECHANICAL.

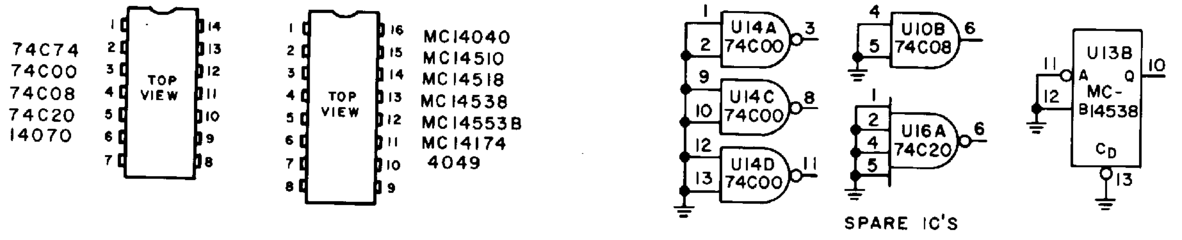


Figure 6-16. Type 794171-1 Master Time Controller and Display Logic (A4A6), Schematic Diagram 470266

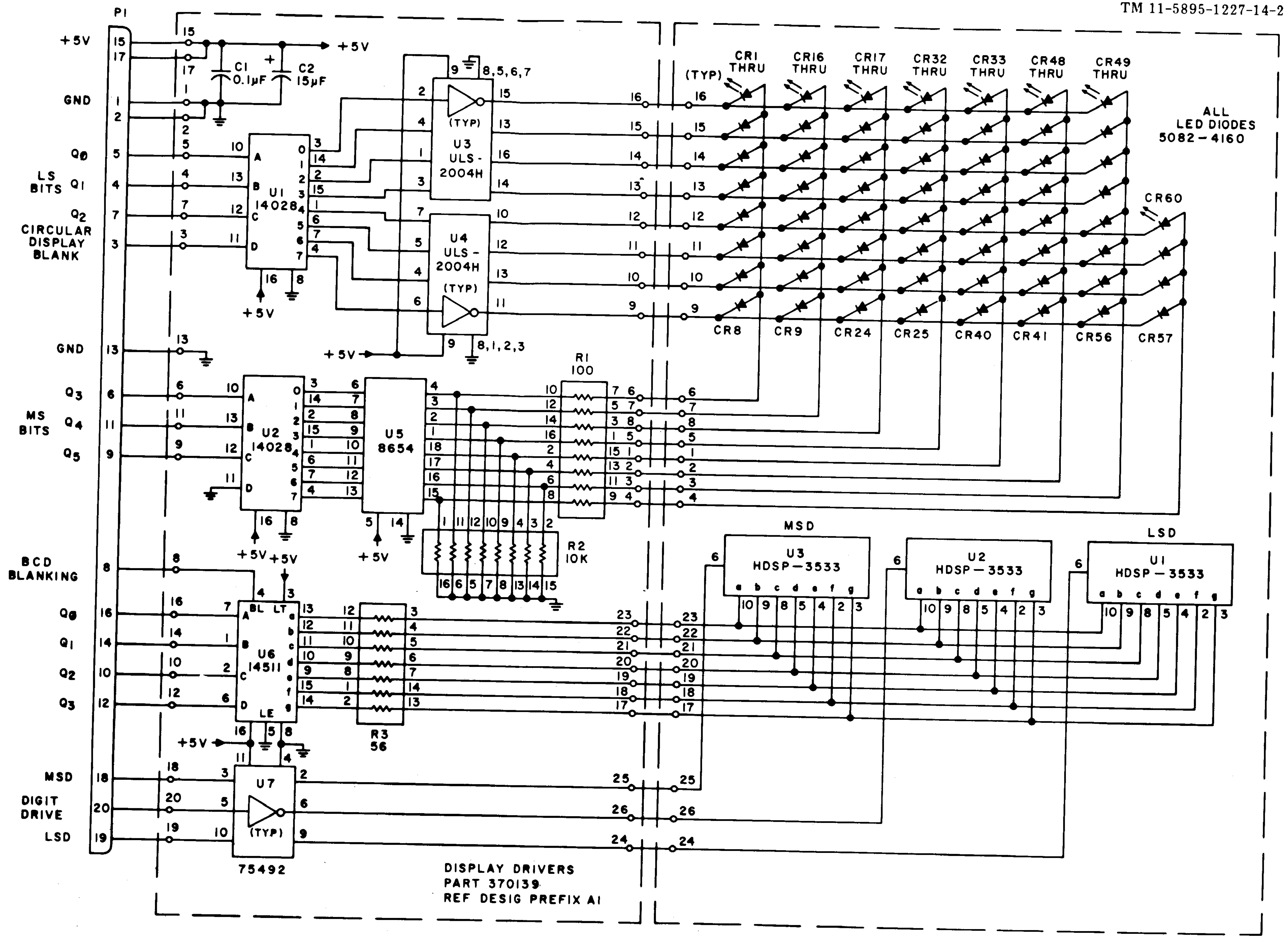


Figure 6-17. Type 794036-1 DF Display (A5), Schematic Diagram 470067

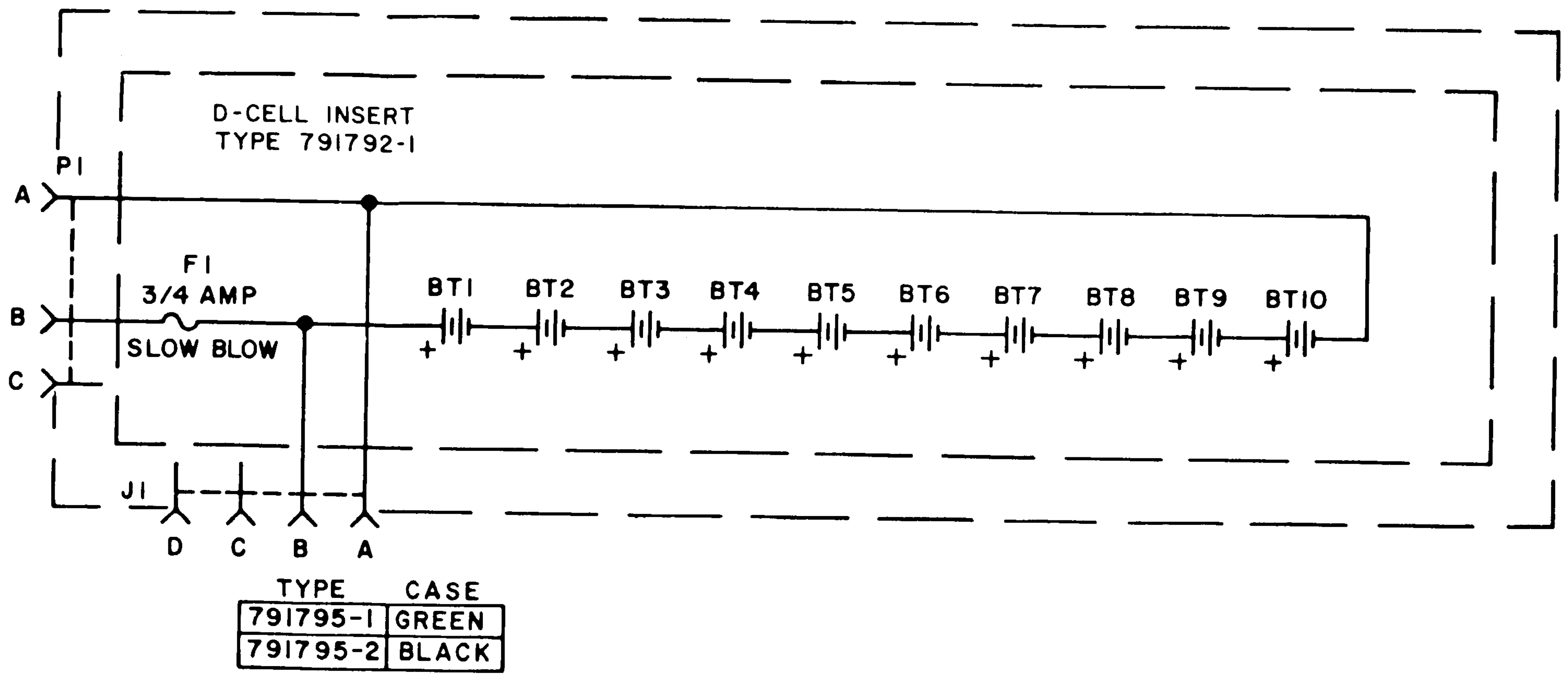
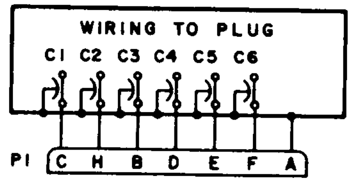


Figure 6-18. Type 791795-1 Battery Pack (A6), Schematic Diagram 24985

NOTES:
UNLESS OTHERWISE SPECIFIED:
a) RESISTANCE IS IN OHMS, ±1%, 1/4W.
b) CAPACITANCE IS IN pF.



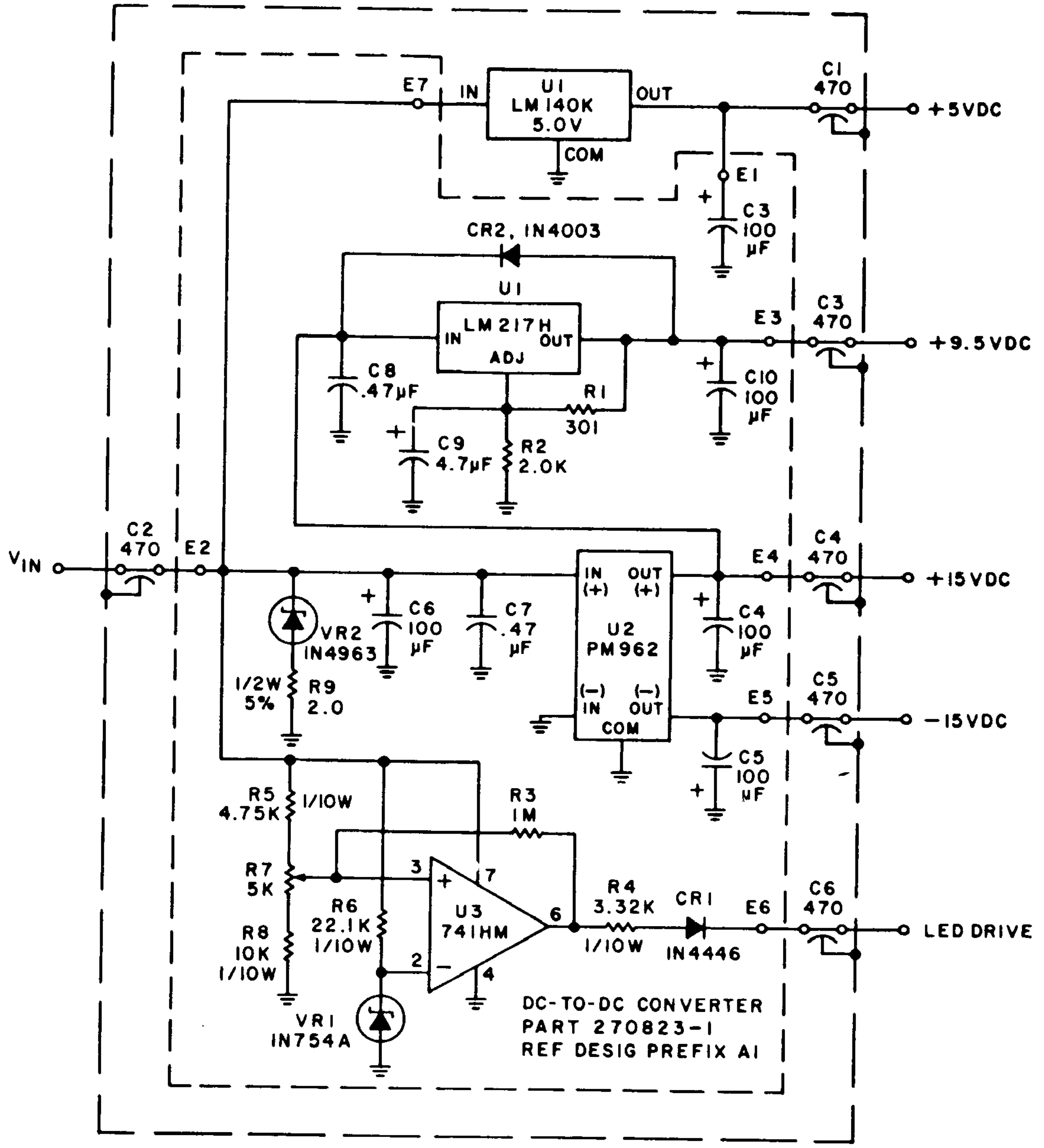


Figure 6-19. Type 794239-1 DC-DC Converter (A7), Schematic Diagram 370602

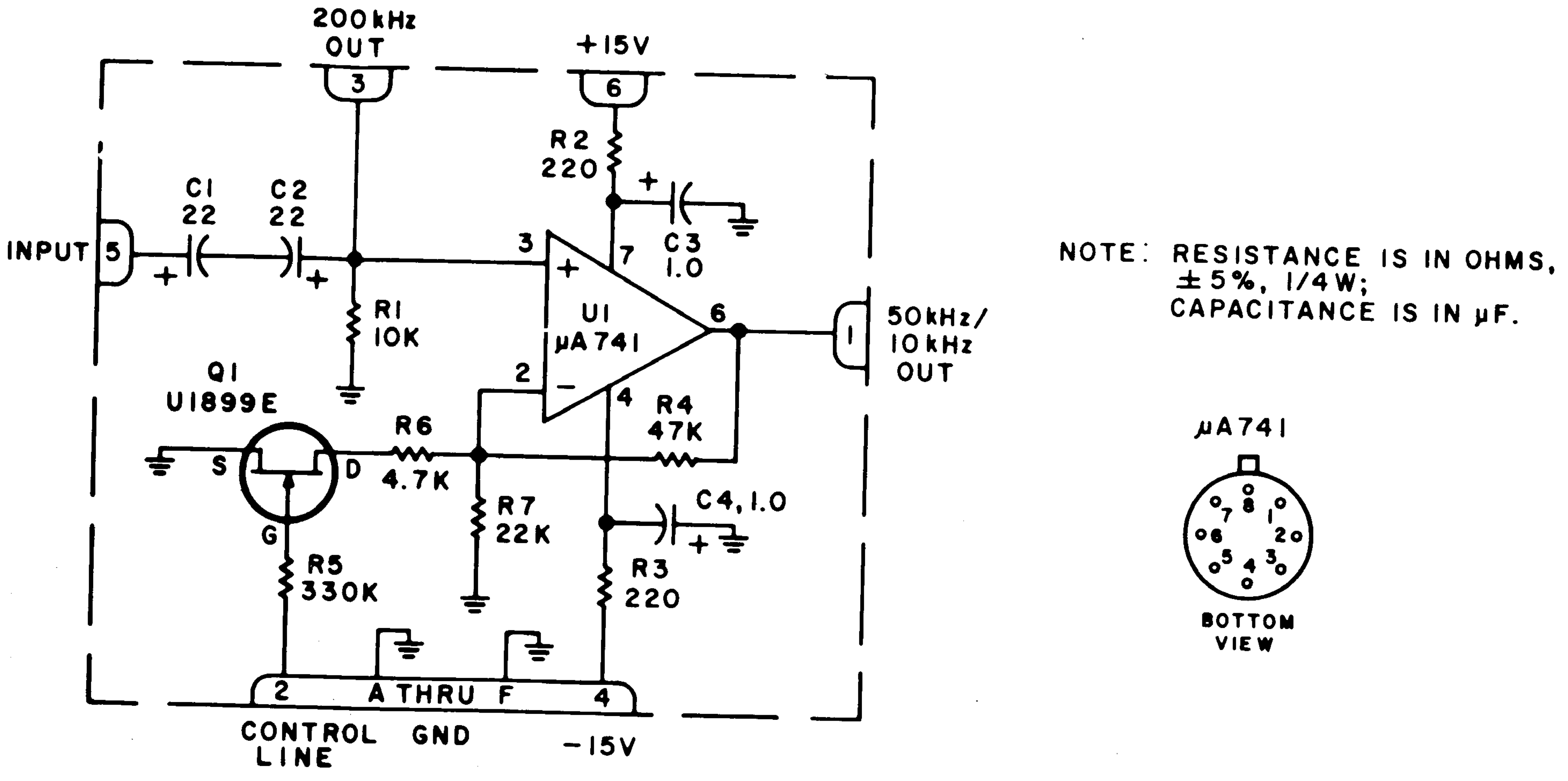


Figure 6-20. Type 794055-1 Bandwidth Compensation Amplifier (A8), Schematic Diagram 270572

NOTES:

1. UNLESS OTHERWISE SPECIFIED:
   a) RESISTANCE IS IN OHMS, ±5%, 1/4W.
   b) CAPACITANCE IS IN µF.
2. ▭ INDICATES FRONT PANEL CONTROL.
3. SWITCHES S2 THRU S6 ARE SHOWN IN EXTREME CCW POSITION AND VIEWED FROM END OPPOSITE CONTROL KNOB. SECTION A IS NEAREST CONTROL KNOB, WITH LETTERS W, X, Y, Z AS SEGMENTS OF THAT WAFER. ARROW INDICATES CW ROTATION OF CONTROL KNOB.

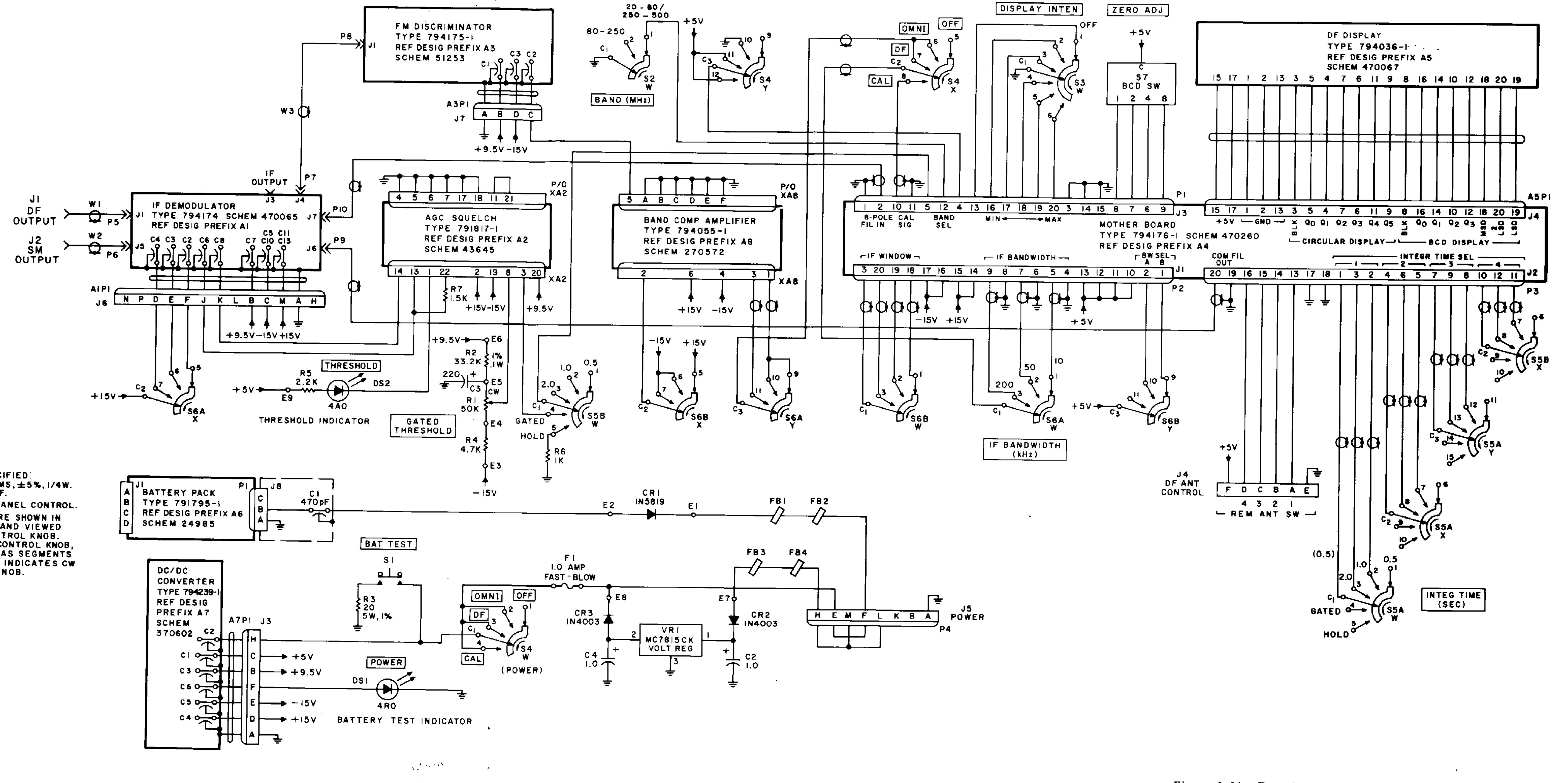


Figure 6-21. Type WJ-8975A Direction Finder, Main Chassis, Schematic Diagram 570189

APPENDIX A

REFERENCES

Refer to TM 11-5895-1227-14-1 for references.

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B.1 GENERAL

This appendix provides a summary of the maintenance operations for the direction finder processor. It authorizes categories of maintenance on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

B.2 MAINTENANCE FUNCTION

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (decontaminate), to preserve, to drain, to paint, or to replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

e. Aline. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) for an unserviceable counterpart.

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

B.2 MAINTENANCE FUNCTIONS - Continued

i. Repair. The application of maintenance services (inspect, test, service, adjust, aline, calibrate, replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards (i.e. DMWR) in appropriate technical publications Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours, miles, etc.) considered in classifying Army equipments/components.

B.3 COLUMN ENTRIES

a. Column 1, Group Number. Column 1 lists group number the purpose of which is to identify components, assemblies subassemblies and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components assemblies subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions it is solely for purpose of having the group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn, the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories appropriate work time figures will be shown for each category. The number of task hours specified by the work time figure represents the average time required to restore an item to serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

C Operator or crew
O Organizational Maintenance
F Direct Support Maintenance
H General Support Maintenance
D Depot Maintenance

B.3 COLUMN ENTRIES-Continued

e. Column 5, Tools and Equipment. Column 5 specifies by code, those common tools sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetical code which leads to the remark in section IV, Remarks, which is pertinent to the item opposite the particular code.

B.4 TOOL AND TEST EQUIPMENT REQUIREMENTS (Section III)

a. Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column in the MAC. The numbers indicate the applicable tool or test equipment for the maintenance function.

b. Maintenance Category. The code in this column indicate the maintenance category allocated the tool or test equipment.

c. Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d. National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e. Tool Number. This column lists the manufacturers part number of the tool followed by the Federal Supply Code for manufacturers (5 digit) in parentheses.

B.5 REMARKS

a. Reference Code. This code refers to the appropriate item in section II, column 6.

b. Remarks. This column provides the required explanatory information necessary to clarity items appearing in section II.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
04	Direction Finder	Inspect	0.1						
		Inspect			0.1				
		Inspect					—		
		Inspect		0.3					
		Replace			1.5			6	G
		Repair					1.5	6	O
		Repair		2.5				2-5,8-14	
		Test				1.0		2-5,8-14	O
		Test				3.0		2-5,10-13	
		Alignment						16-17	
0401	IF Demodulator (A1)	Replace		0.5				6	P
		Repair		0.5				6	H
		Repair					1.5	6	O
		Test		0.3				2-5,8-14	O
040101	IF Filter and Diode Switches (A1A4)	Replace			0.5			6	
		Repair					1.0	6	O
040102	AM Detector Buffer (A1A6)	Replace			0.5			6	
		Repair					1.0	6	O
0402	FM Discriminator (A3)	Replace		0.4				6	
		Repair					1.0	6	O
		Test					1.0	2-3,8-11	O
0403	Mother Board (A4)	Repair			0.3			6	I
		Repair					2.0	6	O
		Test			0.5			1-2,8-14	
		Test					3.0	2-3,8-14	O
040301	Commutative Filter (A4A1)	Replace			0.3			6	
		Repair					1.0	6	O
040302	Calibrate and Antenna Switch Driver (A4A2)	Replace			0.3			6	
		Repair					1.0	6	O
040303	Antenna and Sine Wave Logic (A4A3)	Replace			0.3			6	
		Repair					1.0	6	O
		Test					1.0	2-3	O
040304	Angle Count Generator (A4A5)	Replace			0.3			6	
		Repair					1.0	6	O

Section II. MAINTENANCE ALLOCATION CHART - Continued

(1) Group Number	(2) Component/ Assembly	(3) Maintenance Function	(4) Maintenance Category					(5) Tools and Equipment	(6) Remarks
			C	O	F	H	D		
040305	Master Time Controller and Display Logic (A4A6)	Replace			0.3			6	
		Repair			0.3			6	O
0404	DF Display Assembly (A5)	Replace			0.5			6	P
		Repair					1.0	6	O
0405	D-Cell Insert (A6A1)	Replace		0.2				1	P
		Repair			0.3			6	D
		Repair					0.5	6	O
		Test			0.3			2-3	
0406	DC/DC Converter (A7)	Replace			0.3			6	
		Repair					0.5	6	D

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS

(1) Reference Code	(2) Maintenance Category	(3) Nomenclature	(4) National Stock Number	(5) Tool Number
1	O	Tool Kit, Electronic Equipment, TK-100/G	5180-00-605-0079	
2	O,F,D	Multimeter, Digital, AN/PSM-45	6625-01-134-2512	
3	O,F,D	Test Lead Set, Simpson Catalog No. 00577	N/A	
4	O,F,D	Voltmeter, RF, Boonton 92C	6625-01-116-9500	
5	O,F,D	High Frequency Probe, Boonton 91-21F	N/A	
6	F,D	Tool Kit, Electronic Equipment, TK-105/G	5180-00-510-8177	
7	F,D	High Voltage Probe, 5 KV, Simpson Cat. No. 00053	N/A	
8	F,D	Power Supply, PP-6547/U	6625-01-823-5359	
9	F,D	Power Supply Leads, *Local Manufacturer	N/A	
10	F,D	Generator, Signal, SG-1112(V)I/U, w/options 001,002,003 (2 required)	6625-00-500-6525	
11	F,D	Cable RF, 50 ohms, 4 ft. BNC-BNC, HP-1053A (9 required)	5995-00-070-8747	
12	F,D	Oscilloscope, AN/USM-281C	6625-00-106-9622	
13	F,D	Voltage Probe, 10X TEK P6006	6625-00-524-0572	

*Power Supply Leads, (+24 VDC at less than 1 amp) Banana Plugs-to a U-316/U, 14 pin plug with power (Red) Lead to pin A (Ground), Red Lead to pin E. The ground wire (BLACK) to pin A

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS - Continued

(1) Reference Code	(2) Maintenance Category	(3) Nomenclature	(4) National Stock Number	(5) Tool Number
14	F,D	Counter, Frequency TD-1225A(V)1/U	6625-00-498-8946	
15	D	Power Supply Test Leads, HP-11002A	6625-00-079-1426	
16	D	Analyzer, Spectrum, IP-121/GR with PL-1388/U, PL-1406/U	6625-00-424-4370	
17	D	Generator, Sweep, AN/USM-308(V)1	TBD	

Section IV. REMARKS

Reference Code	Remarks
D	Battery Pack (Receiver, DF and Signal Monitor) Repair is accomplished by removal and replacement of throwaway batteries and fuses, and the battery pack power plug (A9A1 P1-RCVR, A6P1-DF, or A4P1 - Signal Monitor).
G	Direction Finder Repair is accomplished by the removal and replacement of the throwaway BW Comp, Amp, (A8) and AGC Squelch (A2) plus jother selected modules and circuit cards, intraconnecting cables, and chassis mounted piece parts.
H	IF Demodulator (DF) Repair is accomplished by removal and replacement of the throwaway, 10 MHz Amp. (A1A1), 10 MHz Amp. (A1A5), 10 MHz Amp, (A1A8), Gain BW Comp, Amp, (A1A3) and Low Pass Filter (A1A7).
O	Depot Tools and Equipment listed are an engineering estimate of the minimum requirement.
P	Replacement of assemblies includes piece parts and subassemblies mounted thereon.
R	Repair by replacement of subassembly.
I	Mother Board Repair is accomplished by removal and replacement of throwaway, IF Delay Generator (A4A4)

APPENDIX C

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

C-l. SCOPE

This appendix lists the basic issue items for the Direction Finder to help you inventory items required for safe and efficient operation. There are no components of end items

C-2. GENERAL

The Basic Issue Item (BII) has the minimum essential items required to replace the Direction Finder in operation, to operate it and to perform emergency repairs. Although shipped separately packaged, BII must be with the equipment during operation and whenever it is transferred between property accounts. This manual is your authority to request/requisition BII based on Table of Organization and Equipment/Modified Table of Organization and Equipment (TOE/MTOE) authorization of the end item.

C-3. EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

a. Column 1, National Stock Number. This column indicates the national stock number assigned to the item and will be used for requisitioning purposes.

b. Column 2, Description, FSCM and Part Number. This column indicates the federal item name and, when applicable, a brief description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

c. Column 3, Unit of Measure. This column indicates the measure used in performing the actual operation/maintenance function. This measurement is expressed by a two character alphabetical abbreviation.

d. Column 4, Quantity Required. This column indicates the quantity of the item authorized to be used with/on the equipment.

Section II. BASIC ISSUE ITEMS

(1) National Stock Number	(2) Description	FSCM	Part Number	(3) Unit of Measure	(4) Quantity Required
5895-01-073-6839	Power Supply/BA, PP-7566/GRR-8(V)	14632	WJ-8640-1/BC	Ea.	1
N/A	Battery, Nickel Cadmium	09823	CD10	Ea.	10
N/A	Publication N/S TM 11-5825-278-12-2	80058	N/A	Ea.	1
N/A	Publication N/S TM 11-5895-1227-14-2	80058	N/A	Ea.	1
N/A	Angle Simulator	14632	WJ-8975 A/AS	Ea.	1

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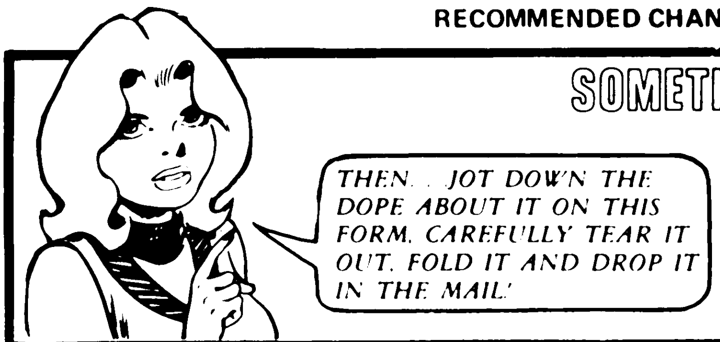

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Stateside Army Depot
ATTN: AMSTA-US
Stateside, N.J. 07703-5007

DATE SENT
10 July 1975

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-5840-340-12	23 Jan 74	Radar Set AN/PRC-76

BE EXACT PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°. REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.
3-10	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		F03		Zone C 3. On J1-2, change "+24 VDC to "+5 VDC." REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER	SIGN HERE
SSG I. M. DeSpiritof 999-1776	SSG I. M. DeSpiritof

TEAR ALONG PERFORATED LINE

DA FORM 2028-2, 1 JUL 79

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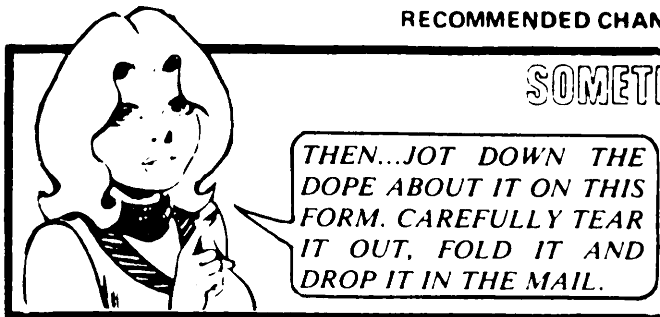

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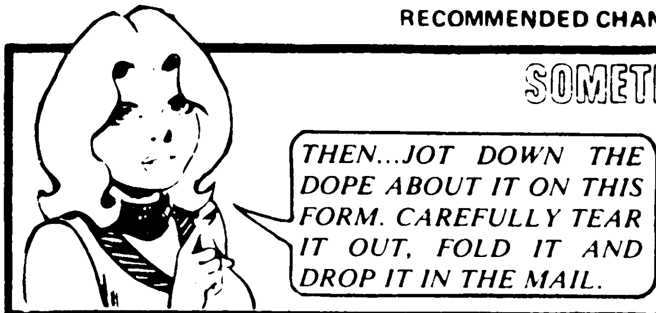

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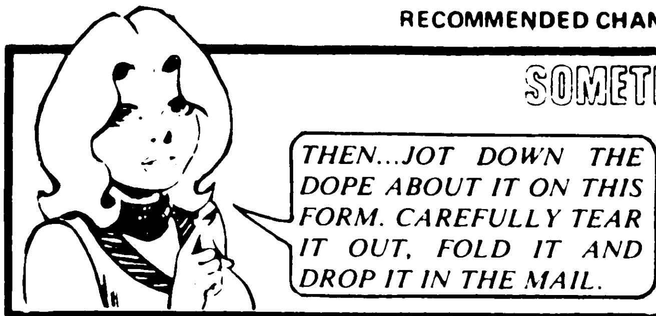

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