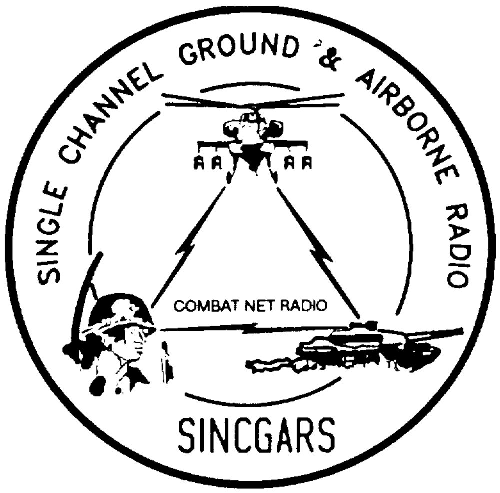
TM 11-5821-333-30

TECHNICAL MANUAL

AVIATION INTERMEDIATE MAINTENANCE MANUAL



SINCGARS AIRBORNE COMBAT NET RADIO, ICOM AND NON-ICOM

AN/ARC-201(V)
(NSN: N/A) (EIC: N/A)

AND

AN/ARC-201A(V)
(NSN: N/A) (EIC: N/A)

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HEADQUARTERS, DEPARTMENT OF THE ARMY

1 AUGUST 1992

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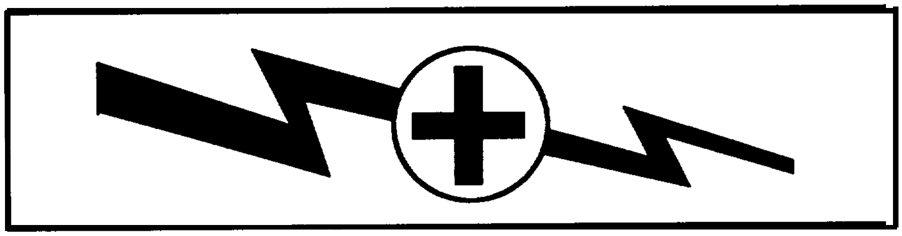

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK.

1 DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL.

2 IF POSSIBLE TURN OFF THE ELECTRICAL POWER.

3 IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A DRY WOODEN POLE OR A DRY ROPE OR SOME OTHER INSULATING MATERIAL.

4 SEND FOR HELP AS SOON AS POSSIBLE.

5 AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 21-11.

WARNING

Lithium manganese dioxide ($LiMnO_2$) holding batteries maybe used with your radio set. Strictly follow these precautions to prevent injury to personnel:

- DO NOT use any lithium battery which shows signs of damage such as swelling, disfigurement, or leaking. If the sealed plastic bag is swollen, do not open.
- DO NOT test lithium batteries for capacity.
- DO NOT recharge lithium batteries.
- DO NOT store lithium batteries in your equipment. Remove lithium batteries from unused equipment.
- DO NOT allow lithium batteries to become short circuited.
- DO NOT heat, crush, puncture, mutilate, open, dissect, or attempt to disassemble lithium batteries.
- DO NOT store lithium batteries with hazardous materials.
- DO NOT overdischarge lithium batteries. Remove the lithium battery immediately after it fails to operate.
- DO NOT dispose of lithium batteries with ordinary trash/refuse. Turn in batteries to your local servicing Defense Reutilization and Marketing Office,
- If the battery compartment becomes hot to the touch, if you hear hissing or burping (i.e. battery venting), or smell irritating gas, IMMEDIATELY TURN OFF the equipment and leave the area. Allow the equipment to cool for one hour. Remove the battery when cool to the touch.
- DO NOT use a Halon type fire extinguisher on a lithium battery fire. In the event of a fire near a lithium battery rapid cooling of the battery is important. Use a carbon dioxide (CO_2) extinguisher. Control of the equipment fire and cooling may prevent the battery from venting and potentially exposing lithium metal. In the event that lithium metal becomes involved in fire, the use of a graphite based Class D fire extinguisher, such as Lith-X or Met-L-X, is recommended.

WARNING

RF ENERGY may be present near the antenna during transmission, DO NOT touch or stand within 30 inches of antenna when the rt is keyed.

HIGH VOLTAGE is used in the radio. DEATH ON CONTACT can result. So observe the following safety precautions:

- If at all possible, work on the equipment only when another person is nearby, That person should be competent in CARDIOPULMONARY RESUSCITATION (CPR). Both of you need to know the five safety steps on page A.
- DO NOT BE MISLED by the terms "low voltage" and " low potential". Voltages and potentials as low as 50 volts can cause death.
- Remove or tape all your exposed personal metal objects when working on C-E equipment.

DEATH OR SERIOUS INJURY can result from the improper use of solvent TRICHLOROTRIFLUOROETHANE. Fumes from this solvent are toxic (poisonous). Prolonged breathing of vapors must be avoided. This solvent dissolves natural skin oils. Prolonged contact with skin must be avoided. Use TRICHLOROTRIFLUOROETHANE only when:

- Adequate ventilation is provided.
- Protective goggles, gloves, sleeves, and an apron are worn.

DO NOT use compressed air to dry parts.

If solvent is taken internally, CONSULT A DOCTOR IMMEDIATELY.

CAUTION

The radio set has been designed to survive the effects of a nuclear explosion. For this reason, use only the replacement parts fielded with the radio. Do not substitute or add other parts.

CAUTION

THIS EQUIPMENT CONTAINS PARTS
SENSITIVE TO DAMAGE
BY ELECTROSTATIC DISCHARGE (ESD).

USE PRECAUTIONARY PROCEDURES
WHEN TOUCHING, REMOVING OR INSERTING
PRINTED CIRCUIT BOARDS.

GENERAL HANDLING PROCEDURES FOR ESD ITEMS

USE WRIST GROUND STRAPS OR MANUAL GROUNDING PROCEDURES.
KEEP ESD ITEMS IN PROTECTIVE COVERING WHEN NOT IN USE.
GROUND ALL ELECTRICAL TOOLS AND TEST EQUIPMENT.
PERIODICALLY CHECK CONTINUITY AND RESISTANCE OF GROUNDING SYSTEM,
USE ONLY METALIZED SOLDER SUCKERS,
HANDLE ESD ITEMS ONLY IN PROTECTED AREAS.

MANUAL GROUNDING PROCEDURE

MAKE CERTAIN EQUIPMENT IS POWERED DOWN.
TOUCH GROUND PRIOR TO REMOVING ESD ITEMS.
TOUCH PACKAGE OF REPLACEMENT ESD ITEM TO GROUND BEFORE OPENING,
TOUCH GROUND PRIOR TO INSERTING REPLACEMENT ESD ITEMS.

ESD PROTECTIVE PACKAGING AND LABELING

INTIMATE COVERING OF ANTISTATIC MATERIAL WITH AN OUTER WRAP OF EITHER TYPE 1 ALUMINIZED MATERIAL OR CONDUCTIVE PLASTIC FILM

OR

HYBRID LAMINATED BAGS HAVING AN INTERIOR OF ANTISTATIC MATERIAL WITH AN OUTER LAYER OF METALIZED MATERIAL,
LABEL WITH SENSITIVE ELECTRONIC SYMBOL AND CAUTION NOTE, AS ABOVE.

CAUTION

Devices such as CMOS, NMOS, VMOS, HMOS, thin-film resistors PMOS, and MOSFET used in many equipments can be damaged by static voltages present in most repair facilities. Most of the components contain internal gate protection circuits that are partially effective, but sound maintenance practice and the cost of equipment failure in time and money dictate careful handling of all electrostatic sensitive components.

The following precautions should be observed when handling all electrostatic sensitive components and units containing such components.

CAUTION

Failure to observe all of these precautions can cause permanent damage to the electrostatic sensitive device. This damage can cause the device to fail immediately or at a later date when exposed to an adverse environment.

STEP
1 Turn off and/or disconnect all power and signal sources and loads used with the unit.

STEP
2 Place the unit on grounded conductive work surfaces.

STEP
3 Ground the repair operator using a conductive wrist strap or other device using a1MΩ series resistor to protect the operator.

STEP
4 Ground any tools (including soldering equipment) that will contact the unit. Contact with the operator's hand provides a sufficient ground for tools that are otherwise electrically isolated.

STEP
5 All electrostatic sensitive replacement components are shipped in conductive foam or tubes and must be stored in the original shipping container until installed.

STEP
6 When these devices and assemblies are removed from the unit, they should be placed on the conductive work surface or in conductive containers.

STEP
7 When not being worked on wrap disconnected circuit boards in aluminum foil or in plastic bags that have been coated or impregnated with a conductive material.

STEP
8 Do not handle these devices unnecessarily or remove from their packages until actually used or tested.

STEP
9 Static Pads do not mount on conductive surfaces. No test equipment is to be placed on static pads, No equipment resting on a static pad is to be plugged into an electrical outlet.

Technical Manual
No. 11-5821-333-30

Headquarters
Department of the Army
Washington, DC, 1 August 1992

AVIATION INTERMEDIATE MAINTENANCE MANUAL RADIO SETS AN/ARC-201 (V) (NSN: N/A) (EIC: N/A) and AN/ARC-201 A(V) (NSN: N/A) (EIC: N/A)

REPORTING ERRORS AND RECOMMENCING IMPROVEMENTS

You can help improve this manual. if you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA For 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-LC-LM-LT, Fort Monmouth, New Jersey 07703-5007. A reply will be furnished direct to you.

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HOW TO USE THIS MANUAL

VOLUMES. This manual has one volume.

CHAPTERS. There are six chapters in this manual. Chapter 1 is an introductory chapter. You will find useful general information there, It has general maintenance instructions, information on maintenance forms and records, and how to send in EIRs. Chapters 2 through 6 contain aviation intermediate maintenance instructions. The maintenance instructions include principles of operation, troubleshooting information, operational checks, and repair instructions.

SECTIONS, Each chapter is divided into two or more sections.

PARAGRAPHS. The paragraphs contain the necessary procedures and information required for maintenance. Read all procedures completely before starting.

APPENDICES. There are two appendices at the back of the manual.

Appendix A. REFERENCES.
This appendix lists the other manuals you may need.

Appendix B. EXPENDABLE SUPPLIES AND MATERIALS.
This appendix contains a list of all expendable supplies and materials needed for maintenance.

COVER INDEX. The cover index helps you to quickly find those parts of the manual used most often. Each tab on the cover is alined with a matching tab on the first page of the subject in the manual. Flex the manual, look for the black tab, and open the book to the subject selected from the front cover.

WARNING

Warnings alert you to anything that might kill or injure you or other persons,

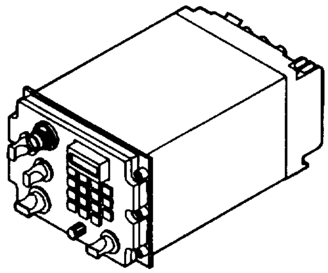
CAUTION

Cautions alert you to anything that could damage the equipment.

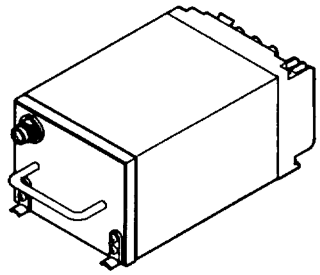
NOTE

Notes give you help in making the job easier to do, They contain information telling you why or how something needs to be done.

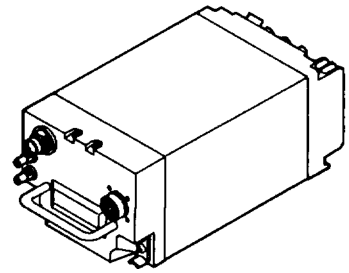
MAJOR COMPONENTS OF RADIO SETS



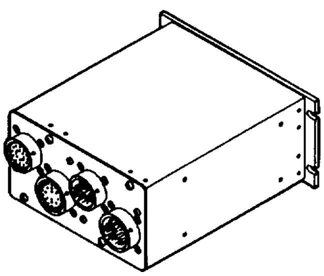
RADIO RECEIVER-TRANSMITTER
RT-1476/ARC-201(V)
RT-1476A/ARC-201A(V)



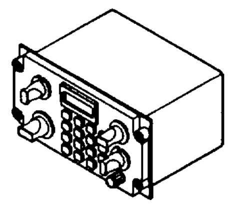
RADIO RECEIVER-TRANSMITTER
RT-1477/ARC-201(V)
RT-1477A/ARC-201A(V)



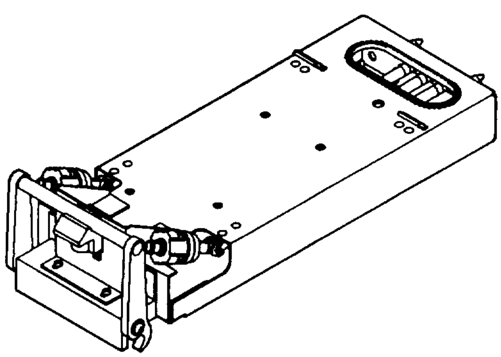
RADIO RECEIVER-TRANSMITTER
RT-1478/ARC-201(V)
RT-1478A/ARC-201A(V)



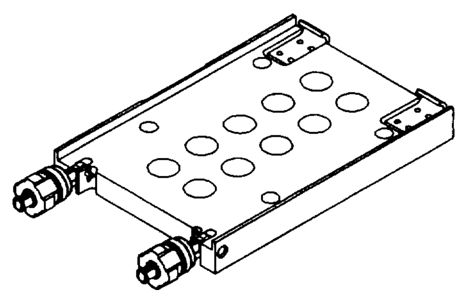
DATA RATE ADAPTER
CV-3885/ARC-201(V)



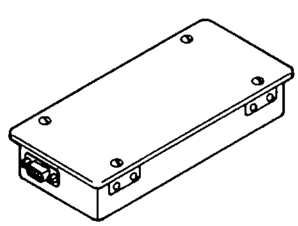
RADIO SET CONTROL
C-11466/ARC-201(V)
C-11466A/ARC-201A(V)



ELECTRICAL EQUIPMENT
MOUNTING BASE
MT-6373/ARC-201 (V)



ELECTRICAL EQUIPMENT
MOUNTING BASE
MT-6374/ARC-201 (V)



BATTERY BOX
CY-8515/ARC-201 (V)

CHAPTER 1

INTRODUCTION

Section 1. GENERAL INFORMATION

1-1. SCOPE

This manual covers the maintenance of the AN/ARC-201(V) and AN/ARC-201A(V) families of radio sets, used in aircraft and ground applications for both voice and data communications.

1-2. 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.

1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS

a. 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.

b. Reporting of Item and Packaging Discrepancies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/SECNAVINST 4355.18/AFR 400-54/MCO 4430.3J.

c, Transportation Discrepancy Report (TDR) (SF 361). Fill out and forward Transportation Discrepancy Report (TDR) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1-4, DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

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

1-5. PREPARATION FOR STORAGE OR SHIPMENT

Refer to the following maintenance chapters for storage and shipment procedures.

1-6. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your radio set 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 (Product Quality Deficiency Report), Mail it to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ED-PH, Fort Monmouth, NJ 07703-5007. We’ll send you a reply.

1-7. NOMENCLATURE CROSS-REFERENCE LIST

Common Name	Official Nomenclature
Battery	Battery BA-13721/U
Battery box	Battery Box CY-8515/ARC-201(V)
Dra	Adapter, Data Rate CV-3885/ARC-201(V)
ECCM fill device	Fill Device MX-10579/VRC or MX-18290/VRC
IFM power amplifier	Power Amplifier AM-7189A/VRC
Maintenance group	Maintenance Group, OA-9264A/ARC
Mounting base	Mounting Base, Electrical Equipment MT-6373/ARC-201(V) or MT-6374/ARC-201(V)
Radio set	Radio Set AN/ARC-201(V) or AN/ARC-201A(V)
Rcu	Control, Radio Set C-11466/ARC-201(V) or C-11466A/ARC-201A(V)
Rt	Receiver-Transmitter, Radio RT-1476/ARC-201 (V), RT-1477/ARC-201(V), RT-1478/ARC-201(V), RT-1476A/ARC-201A(V), RT-1477A/ARC-201A(V), or RT-1478A/ARC-201A(V)

Section II. EQUIPMENT DESCRIPTION AND DATA

1-8. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

Refer to Operator's and Aviation Unit Maintenance Manual TM 11-5821-333-12 for general information on the characteristics, capabilities, and features of this equipment.

1-9. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Refer to sections I and IV of the maintenance chapters for the location and description of major internal components.

1-10. EQUIPMENT DATA

Refer to Operator's and Aviation Unit Maintenance Manual TM 11-5821-333-12 for equipment data.

1-11. SAFETY, CARE, AND HANDLING

Safety hazards are present when testing and troubleshooting the equipment. Review the WARNINGS and CAUTIONS in the front of this manual and in each maintenance chapter. WARNINGS provide information on safety hazards that can cause personal injury. The high voltage present during some of the tests can cause death. CAUTIONS provide information on safety hazards that can cause equipment damage. Most of the modules have integrated circuits that can be damaged by static electricity.

CHAPTER 2

MAINTENANCE INSTRUCTIONS FOR RADIO RECEIVER-TRANSMITTER RT-1476/ARC-201(V), RT-1477/ARC-201(V), RT-1478/ARC-201(V), RT-1476A/ARC-201A(V), RT-1477A/ARC-201A(V), AND RT-1478A/ARC-201A(V)

Section I. PRINCIPLES OF OPERATION

2-1. INFORMATION

The rt can be divided into five parts or functional sections.

- Control Section
- Rf Section
- Front Panel
- Power Supply
- Rt Chassis

Figure 2-1 is an rt block diagram. It shows how the five sections are connected.

The control section contains the microprocessors, memory, and interface circuits that

- Scan the front panel for operator instructions
- Send display data to the operator display
- Select frequencies and tune the frequency synthesizer
- Control signal routing between modules
- Control optional IFM power amplifier
- Provide homing signals to homing indicator
- Provide interface to aircraft intercom
- Provide interface to data rate adapter
- Receive and store ECCM fill information

The control section is described in paragraph 2-2.

The rf section is digitally tuned by the control section. When receiving, it demodulates the rf signal. It routes recovered audio or data to the control section, When transmitting, the rf section modulates a rf carrier with audio or data, The rf section is described in paragraph 2-3.

For local control, the front panel is the operator control point. For remote control, the front panel is the interface between the rt and the control unit. The front panel is described in paragraph 2-4.

The power supply converts the aircraft bus 28 V dc into the dc voltages required by the other rt modules. The power supply is described in paragraph 2-5.

The rt chassis includes:

- The module interconnections
- Frame for physical support of the modules

It is described in paragraph 2-6.

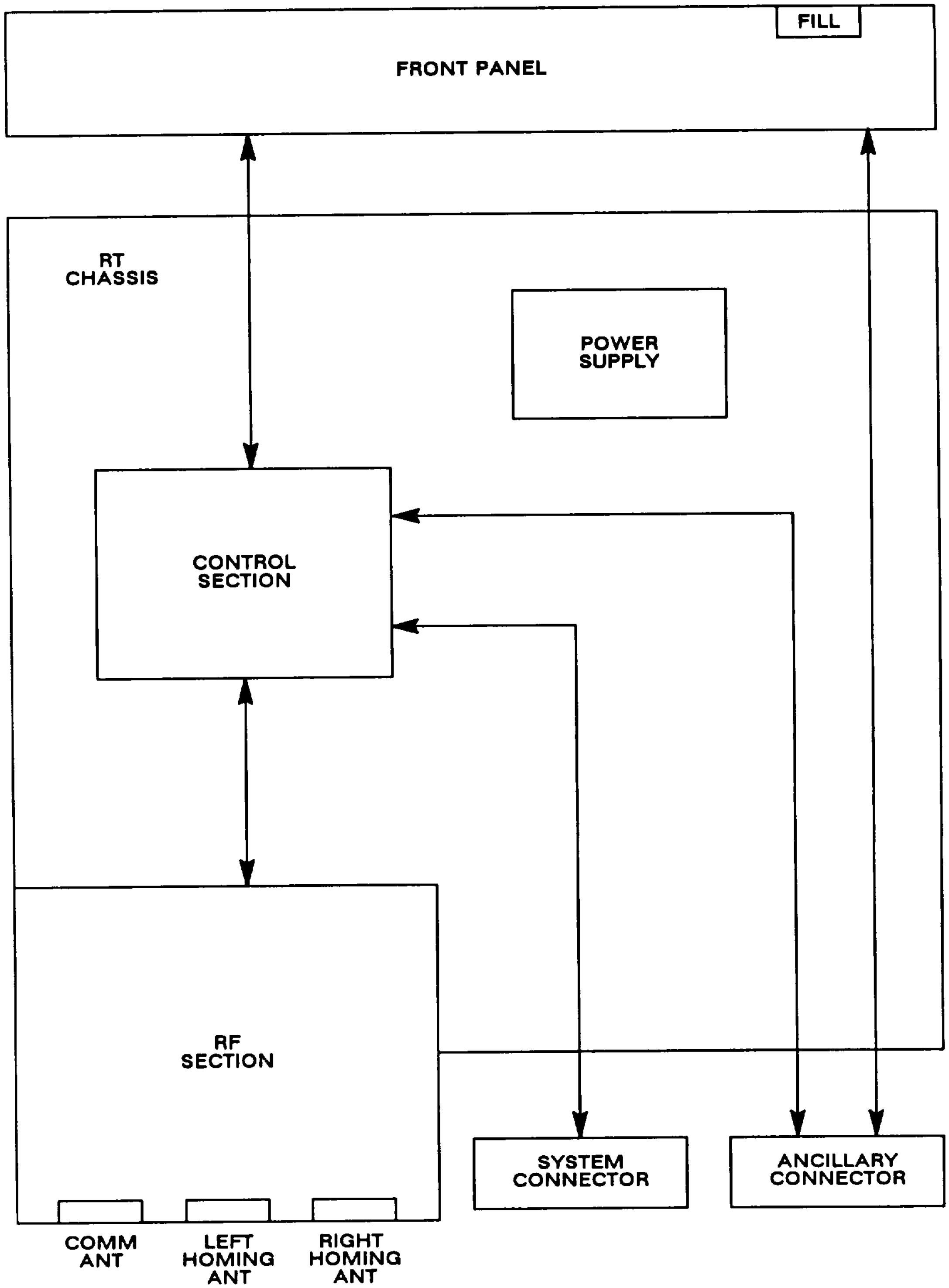


Figure 2-1. Rt Block Diagram

2-2. CONTROL SECTION

The control section has four modules:

Electronic Components Assembly - Control 1A2 (control module)
Control, Counter-Countermeasures, Electronics 1A3 (ECCM module)
Circuit Card Assembly - Interface 1A4 (interface module)
Circuit Card Assembly - Switching 1A5 (switching module)

The control module contains a microprocessor and all programming needed for single channel operation. The microprocessor uses additional programming in the ECCM module during frequency hopping operation. The control module has buffers, registers, and interface circuits to permit the microprocessor to communicate with other rt modules. The control module receives operator actions as serial data from the front panel. If the operator's actions are valid, the other modules and the front panel display are informed of any changes. The control module microprocessor also tunes the frequency synthesizer and runs the self test when the FUNCTION switch is set to TEST.

The ECCM module contains a microprocessor and the programming used in frequency hopping operation. The ECCM module has two connectors. One connects to the control module and the other to the rt chassis. When the MODE switch is set to FH or FH-M, the microprocessor in the control module executes instructions in the ECCM module and uses variables stored in the ECCM module, It uses the hopset and lockout sets to build a look-up table of frequencies. The TRANSEC variable, FH sync time, and hopset net ID number are used to select a frequency from that table. When transmitting, the ECCM module converts the analog signal into a digital data signal. The ECCM module microprocessor interleaves the data signal onto the frequency hops. When receiving the process is reversed. Frequency hopping operation is described in detail in paragraph 2-15.

The interface module processes several information and control signals. It performs the following functions:

Filters and amplifies receive voice signals, adds sidetone,

Filters, amplifies, pre-emphasizes, and compresses transmit voice signals,

Buffers and amplifies transmit and receive 16 kb/s data signals,

Detects and debounces transmit push-to-talk (PTT) signal input from intercom,

Processes homing antenna signals to drive homing indicator,

Buffers input ECCM fill information,

Buffers IFM power amplifier control signals,

Monitors the +28 V line for low voltage condition, Supplies a reset to front panel when voltage drops to about +18 V.

The switching module functions like a railroad switching yard, Many signals are routed between modules through the switching module. The path the signals take is determined by control input signals. It also performs the following functions:

Bit synchronization

Premodulation filtering

Tone squelch

Notch filtering (150 Hz)

Module level control

Generation of clock frequencies using the 3.2 MHz clock signal from the synthesizer

Input and output control during retransmit operation

The switching module is involved in most functions of the rt.

2-3. RF SECTION

The rf section consists of four modules.

IF/Demodulator (A6)	Synthesizer (A8)
Tuner/Mixer (A7)	Amplifier-Oscillator (A9)

The IF/demodulator and tuner/mixer perform basic receive functions. The tuner/mixer filters and amplifies the received rf signal and mixes it with the local oscillator signal from the synthesizer. The resulting rf signal is sent to the IF/demodulator where the transmitted voice or data signal is recovered. The IF/demodulator detects cue signals during FH operation. Receive operation is described in paragraph 2-8.

The amplifier-oscillator performs basic transmit functions and performs rf switching functions. It generates the rf carrier. It frequency modulates the carrier with voice or data signal. It then amplifies the carrier to output level, filters it to remove harmonics, and connects it to the communications antenna. The transmit/receive switch connects the receiver to the communications antenna when not transmitting. The homing switch connects the receiver to the homing antenna signal when in homing mode or to the transmit/receive switch when in communications mode. Transmit operation is described in paragraph 2-9.

The synthesizer provides the local oscillator signal for the receiver and the amplifier-oscillator injection (reference) signal for the transmitter.

2-4. FRONT PANEL

There are three types of front panel used:

RT Type	Front Panel Type
RT-1476/RT-1476A	Local Control Panel
RT-1477/RT-1477A	Dedicated Remote Panel
RT-1478/RT-1478A	MIL-STD-1553B Panel

The difference between the three rt types is the type of front panel used. The three front panels all talk to their rt control module over identical serial data interfaces.

The local control panel has controls, a display, and the FILL connector. These are used to operate the rt. The FILL connector is used when loading FH data. The local control panel also has drivers and receivers to interface with an optional C-11466 or C-11466A control unit. Local control is discussed in paragraph 2-12.

The dedicated remote panel is the only one without a microprocessor. It receives control and display data, stores them, and passes them on when commanded. It interfaces with a C-11466 or C-11466A control unit on one end and the rt control module on the other. It will also interface with an optional second C-11466 or C-11466A control unit. It houses the FILL connector used for loading FH data. Dedicated remote control is discussed in paragraph 2-13.

Like the dedicated remote panel, the MIL-STD-1553B panel receives and stores control and display data. In addition, it reformats the data to meet the requirements of the MIL-STD-1553B bus controller and the rt control module. The MIL–STD-1553B panel is capable of operating with a dual redundant bus system and uses the transformer coupled stub bus interface method per MIL-STD-1553B. The MIL-STD-1553B panel houses a FILL connector for loading FH data. An additional cockpit switch can be utilized so that FH data can be zeroized in case of emergency to avoid a security compromise. This switch connects to the MIL–STD-1553B bus. MIL-STD-1553B control operation is discussed in paragraph 2-14.

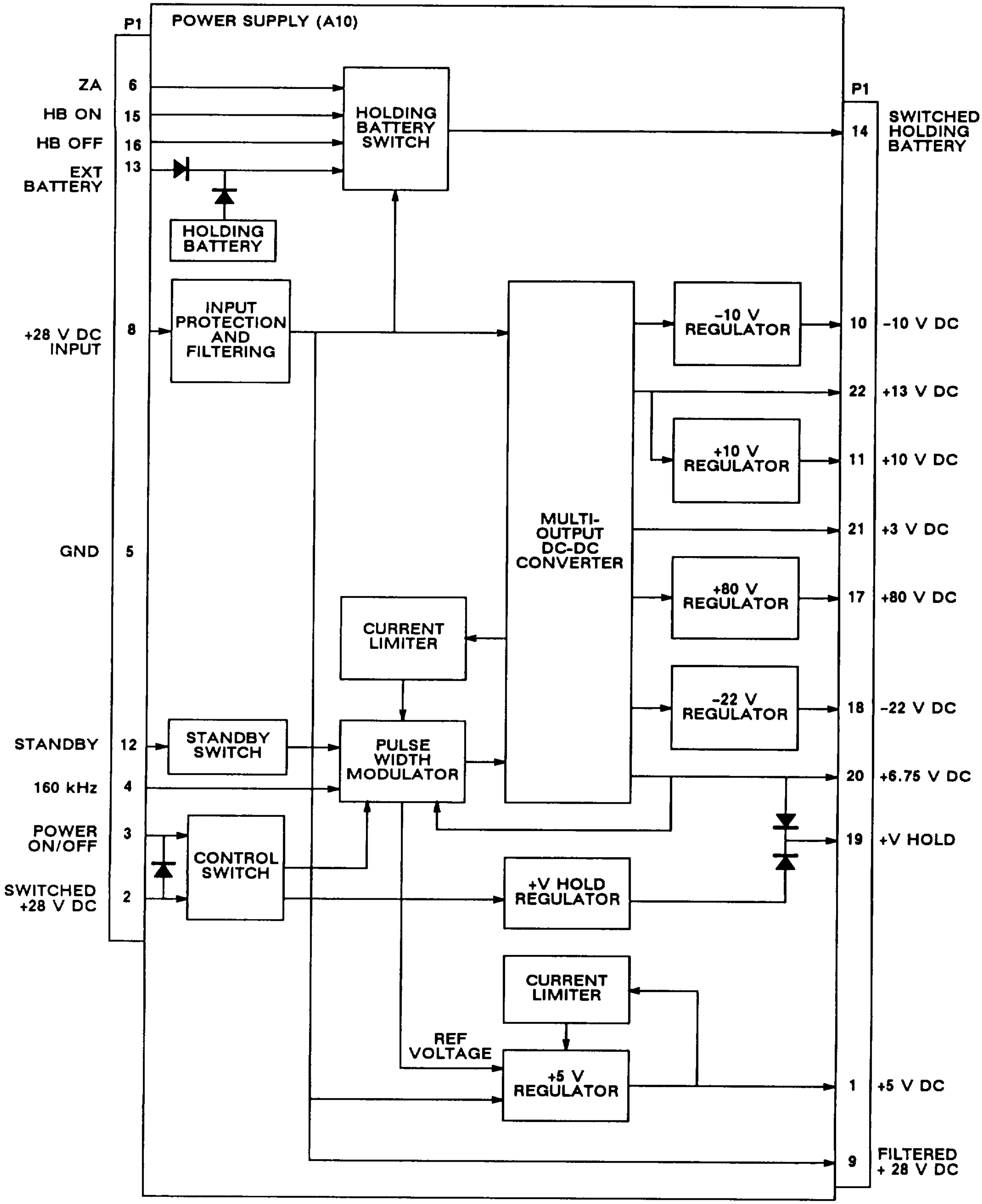


Figure 2-2. Power Supply Functional Block Diagram

2-5. POWER SUPPLY

The power supply is a pulse width modulator de-de converter. It operates from the aircraft 28 V dc bus. It supplies multiple dc outputs. Its output voltages are as follows:

DC Output Voltage (V dc)	Maximum Current (mA)	Maximum Ripple (mV rms)
3.0 (2.70 to 3.3)	200	20
5.0 (4.75 to 5.25)	300	20
6.75 (6.55 to 6.95)	500	20
10.0 (9.7 to 10.3)	200	20
13.0 (12.5 to 14.4)	500	20
80.0 (64.0 to 96.0)	1	30
-10,0 (-9.7 to -10.3)	150	20
-22.0 (-19.8 to -24.2)	1	30

Figure 2-2 is a functional block diagram of the power supply.

The 28 V dc input is filtered and protected against transients, overvoltage, and reverse voltage.

A multi-output de-de converter has outputs of –10 V dc, +13 V dc, +10 V dc, +3 V dc, +80 V dc, -22 V dc, and +6.75 V dc. The +6.75 V dc output is sampled, and the sample is returned to a pulse width modulator. The pulse width modulator regulates dc output by varying pulse width in the de-de converter. Additional regulators are used on the -10 V dc, +10 V dc, +80 V dc, and -22 V dc outputs. A current limiter senses overcurrent conditions and shuts down the de-de converter.

The +VHOLD output is used by rt memory circuits. It normally comes from the +6.75 V dc output. The +VHOLD regulator supplies +VHOLD when the de-de converter is shut down.

The +5 V dc output comes from a separate regulator and current limiter. A reference voltage is taken from the pulse width modulator.

A control switch turns the power supply on/off either from a remote control unit (POWER ON/OFF) or from a local control panel (SWITCHED +28 V dc). The POWER ON/OFF is also used by the data rate adapter (dra). A diode between SWITCHED +28 V dc and POWER ON/OFF allows SWITCHED +28 V dc to control the dra in local control radio sets.

The standby switch shuts down the multi-output de-de converter when the FUNCTION switch is set to OFF. The +5 V dc output and +VHOLD outputs remain on.

The holding battery powers selected rt memory circuits when the aircraft +28 V dc is off or the rt is disconnected. The holding battery switch circuit connects the holding battery except when the FUNCTION switch is in Z-A or STOW. HB (holding battery) ON and HB OFF come from the front panel. ZA input at pin 6 is also needed to turn the holding battery off. This assures that the holding battery is not accidentally turned off during power up. An external holding battery may also be connected via pin 13.

2-6. RT CHASSIS

The rt chassis (A11) includes the backplane assembly and right and left card guide panels. Ten modules (A1 through A10) plug into the backplane. The front panel (A1), amplifier-oscillator (A9), and power supply (A10) complete the rt. (See figure 2-3.) The amplifier-oscillator houses the system and ancillary connectors J1 and J2. They connect to the backplane through a flex cable. A *cover closes* the top of the rt and covers the right and left panels.

Also on the backplane are an audio transformer for receiver audio, a relay circuit that grounds the homing indicator when not in homing mode, an integrated circuit latch on the power supply standby input, and a clock divider for the power supply.

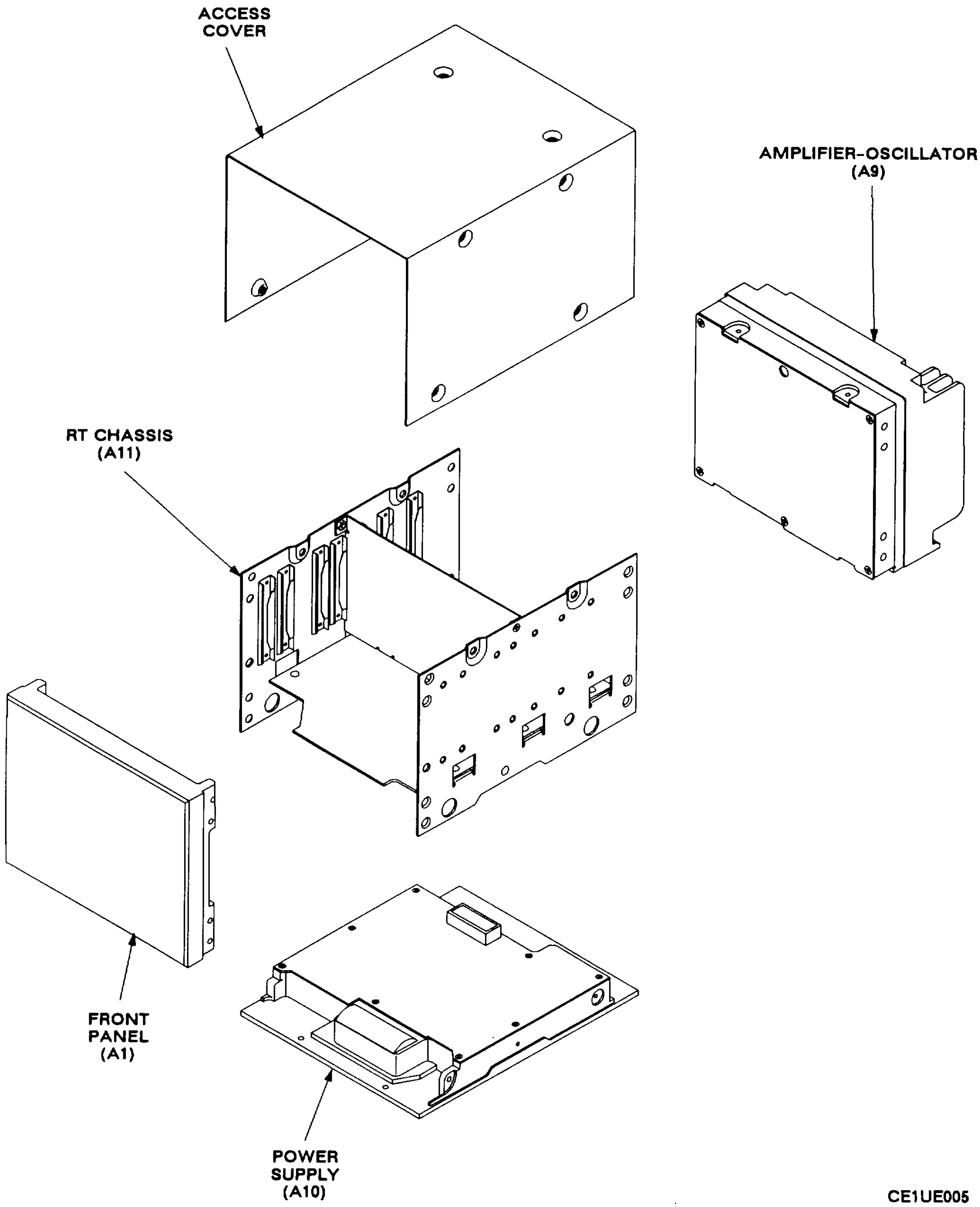


Figure 2-3. Module Locations (Sheet 1 of 2)

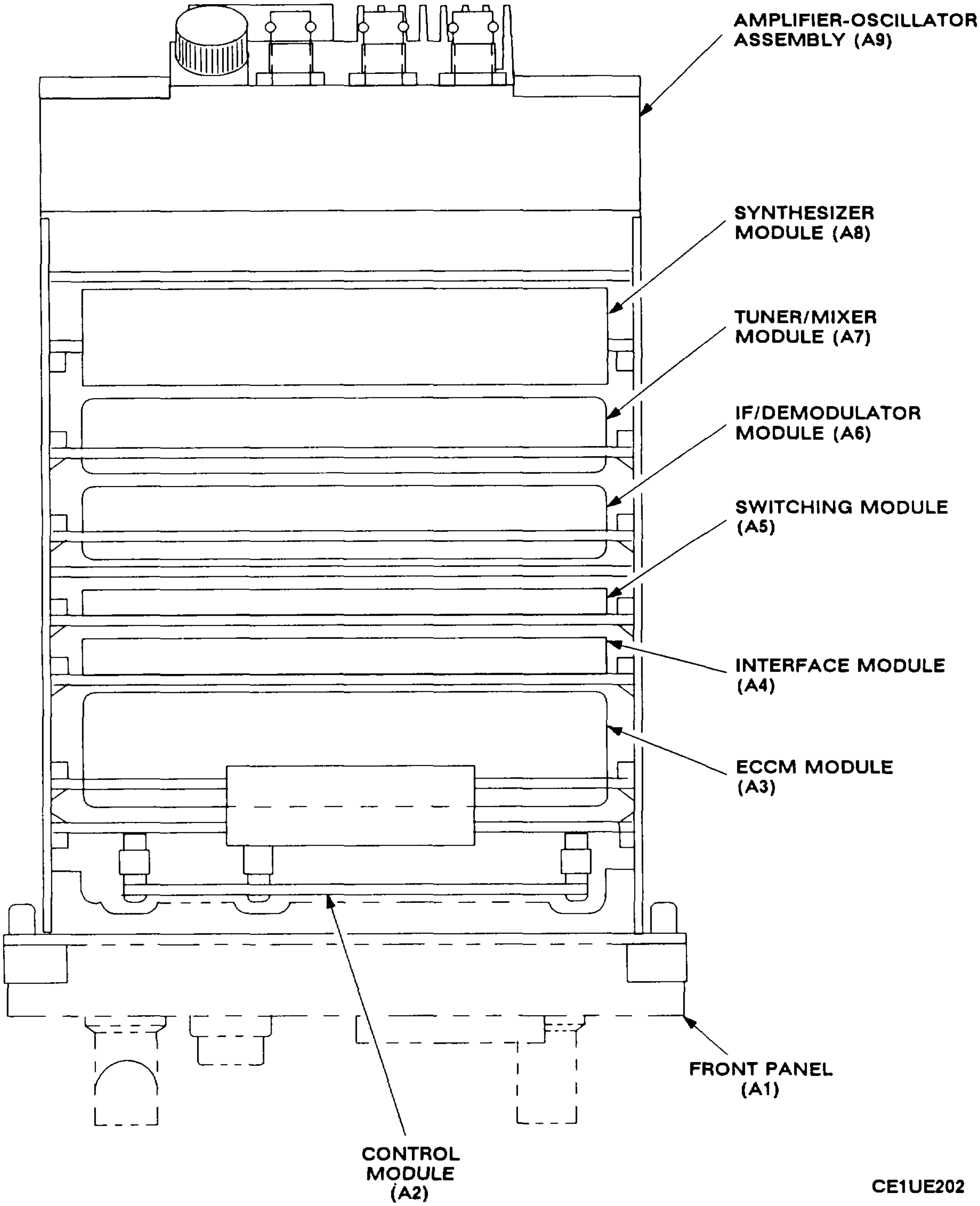


Figure 2-3. Module Locations (Sheet 2 of 2)

2-7, BASIC RT SIGNAL TYPES

There are five basic signal types used in the rt.

- Analog
- Digital
- Control
- Power
- Rf

Analog signals include the voice audio. Analog signals can vary greatly in signal level, shape, and frequency.

Digital signals include timing clocks and digital data signals. The clocks are used to synchronize the serial data streams between modules. Clock frequencies vary, Voltage levels are normally logic 0 or logic 1. Within the rt, logic O is typically -0.5 to 0.5 V dc. Logic 1 is typically 6.25 to 7.25 V dc, Rt I/O digital signals use the ±5 V logic level as required by MIL-STD–188-114, Logic 0 is 5 V dc. Logic 1 is -5 V dc. The ECCM fill device uses 0 V for logic 1 and -6.75 V for logic 0.

Control signals include status and control lines. They will be set to logic 1 to indicate or direct a particular condition. In some cases, a " -N" is used to indicate that the logic is reversed. For example, a logic 1 on PTT-N indicates the absence of a PTT; logic 0 indicates PTT.

Power signals are at constant V dc levels. Most are provided by the power supply as described in paragraph 2-5.

Rf and IF signals are present in the rt. Coaxial cables are used to pass these signals between modules. Frequencies range from 12.5 MHz to 100.5 MHz.

2-8. RECEIVE RF SIGNAL PATH

The receive rf path processes the rf signal to recover audio, data, or homing signal. The signal passes through three modules:

- Amplifier-Oscillator (A9)
- Tuner/Mixer (A7)
- IF/Demodulator (A6)

See Figure FO-1 for the block diagram of this signal path.

Rf modulated with audio or data signals enter the rt at communications connector J3. Homing signals enter the rt at homing connectors J4 and J5. The communications rf passes through a bandpass filter, low-pass filter, T/R switch, and homing switch. The homing rf passes through a sampling network and homing switch. The sampling network switches between the right and left homing antenna at a 150 Hz rate,

The rf signal from the homing switch is routed to the tuner/mixer, The tuner/mixer filters and amplifies the rf signal and then mixes it with the local oscillator (LO) signal from the synthesizer, The LO is 12.5 MHz higher than the operating frequency, The tuner/mixer and synthesizer are digitally tuned using the SERIAL DATA line. The 12.5 MHz IF signal is routed to the IF/demodulator. The IF/demodulator demodulates the IF signal to recover the baseband audio or data (FM DEMOD).

During FH operation a SYNC CODE signal is recovered from the received signal and used to synchronize the receiver with the transmitter. DATA SW-N, HOP TIME, and WB SEL are control lines from the ECCM module used during FH operation. DATA SW-N is held at logic 1 during FH operation. HOP TIME goes to logic 1 while the frequency is being changed. WB SEL (wideband select) goes to logic 0 when the rt looks for a cue signal. If a cue signal is detected, the IF/demodulator sets CUE PRESENT to logic 1.

Two homing signals are taken from the IF/demodulator. They are signal strength and AGC. SIG STR RCV is proportional to signal strength received from the transmitter on which you are homing. AGC in homing mode is a 150 Hz square wave with amplitude proportional to the difference between left and right signals, Homing is disabled in FH mode and when the rt is keyed,

2-9. TRANSMIT RF SIGNAL PATH

The transmit mode is initiated by a PTT input from the intercom. The RADIO PTT-N line is set to logic 0. See Figure FO-2. If the request is valid (frequency loaded and control switches set correctly), the control module responds by setting the T/R line to logic 1.

The amplifier-oscillator and synthesizer are digitally tuned by the SERIAL DATA signal from the control module. TUNE GATE-N and TUNE CLK are used to decode SERIAL DATA.

2-9, TRANSMIT RF SIGNAL PATH. Continued

The amplifier-oscillator modulates the carrier with FM MOD signal from the switching module. The RF REFERENCE signal from the synthesizer is 7 MHz higher than the carrier frequency. A 3.2 MHz reference frequency is also provided by the synthesizer.

The amplifier-oscillator generates the FM signal using two phase-locked loops (PLL). In the first, FM MOD signal modulates a 3.9 MHz voltage controlled crystal oscillator (VCXO). The VCXO output is a frequency modulated 3.9 MHz signal. Mixing it with 3.2 MHz reference signal results in 700 kHz FM. A phase detector samples the 700 kHz to regulate VCXO frequency. The second PLL has the 30-87.975 MHz oscillator. The 30-87.975 MHz signal is mixed with RF REFERENCE from the synthesizer. The 7 MHz difference is divided by 10 and compared with the 700 kHz from the first PLL. This results in an FM output rf signal that is 7 MHz below the RF REFERENCE frequency. The rf signal is then amplified, filtered, and sent to the communications antenna.

The modulated rf passes through VSWR and power sensors. The power sensors are used for automatic level control (ALC). The ALC controls power amplifier gain. The VSWR signal causes the power to be reduced and disables sidetone when antenna VSWR exceeds 5:1. The same power reduction and sidetone disable occur if an overtemperature condition is detected by the temperature sensor. The temperature sensor is mounted in the amplifier-oscillator adjacent to the power amplifier stage.

A 52 MHz detect circuit sends a control signal to the optional IFM power amplifier. The output is logic 1 when transmit frequency is 52 MHz or greater.

2-10. RECEIVE AUDIO/DATA SIGNAL PATH

The received signal enters the audio/data section as FM DEMOD from the lF/demodulator. Its audio path is shown in Figure FO-3.

The switching module detects the 150-Hz squelch tone. If present, the BIT SYNC/TONE SQUELCH line is set to logic 1. The switching module and interface module processes the FM DEMOD signal. For single channel (SC), plain text (PT) audio operation, the signal leaves the switching module as RCV PT AUDIO. In the interface module, processing includes filtering, volume control, and amplification. When a local control rt is remote controlled, TAKE CONTROL input bypasses the volume control. The PT audio logic disconnects receive audio and sidetone for certain rt faults (SIDETONE/SQUELCH) and IFM power amplifier faults (IFM FAULT). Also the audio is disconnected during transmit as is the sidetone during receive by the inverted T/R signal. An audio transformer matches the RCV RT AUDIO output to the line going to the intercom.

In the frequency hopping (FH), plain text (PT) voice mode, the FM DEMOD signal is a digital data stream. It is routed to the ECCM module as BIT SYNC DATA to be deinterleaved. (See para 2-15.) The signal is sent through a digital-to-analog converter to recover the original audio. The audio signal is returned to the switching module as RCV FH PT AUDIO. In the switching module it is connected to the RCV PT AUDIO output and is processed in the interface module like the SC/PT audio.

In the single channel (SC), cipher text (CT) voice mode and in the SC data mode (PT or CT), the FM DEMOD signal is again a digital data stream. It is routed to the interface module as RCV X-MODE. In the interface module it is buffered and amplified before being routed to external equipment via the rt system connector. The X-mode logic in the interface module disconnects RCV X-MODE during transmit and during retransmit (RXMT).

In FH/CT voice mode and in FH data mode (PT or CT), the ECCM module deinterleaves the data stream. The digital signal is returned to the switching module as FH DATA. In the switching module it is connected to the RCV X-MODE output and is processed in the interface module like the SC/CT voice and SC data signals.

2-11. TRANSMIT AUDIO/DATA SIGNAL PATH

The transmit audio signal, data signal, and PTT are processed in the interface module and switching module. See Figure FO-4.

The interface module furnishes speech processing for audio signals. Processing includes pre-emphasis and compression. The compressor output goes three places: 1) sidetone to receive audio circuits, 2) SC/PT audio to the switching module, and 3) FH/PT audio to the ECCM module. The SC/PT audio is summed with 150-Hz squelch tone. The FH/PT audio is band limited by a low pass filter.

During retransmit (RXMT) operation (para 2-18), the PT audio is disconnected and RXMT audio enters the audio path by way of a summing circuit. From that point the RXMT audio is processed identical to the PT audio.

The interface module has a buffer amplifier for X-mode signals and detect/debounce circuits for the PTT signal, XMT X-MODE signals are cipher-text (CT) audio signals or data signals. X-MODE SEL enables the digital path in the switching mode.

The switching module contains digital and analog switches which route digital and analog signals under supervision of the control module. All audio/data signals pass through a final amplifier and are routed to the amplifier-oscillator for modulation of the FM carrier. In the FH mode, FH/PT AUDIO or BS DATA is sent to the ECCM module for interleaving. The FH DATA is returned to the switching module to continue the digital signal path.

2-12. LOCAL CONTROL OPERATION

The local control panel includes:

- rt controls and display
- serial data interface with control module
- serial data interface with optional remote control unit

See Figure FO-5. The microprocessor reads instructions stored in ROM and controls operation of the rest of the local control panel. A RAM is used to store data for transfer to the rt circuits or display.

Most rt control information is sent through the level shifter to the rt control module. This information includes FUNCTION switch position, MODE switch position, PRESET switch position, and keyboard data. The level shifter changes signals from the 5 V dc logic of the local control panel to the 6.75 V dc logic of the rt. Switch data is sent on the REM DATA line accompanied by sixteen 640-Hz clock pulses on the REM 24 CLOCK line and one pulse on the REM 24 STROBE line. Keyboard data is sent on the REM DATA line accompanied by eight 640-Hz clock pulses on the REM 8 CLOCK line and one pulse on the REM 8 STROBE line.

The 115 V ac is used for display lighting and front panel lighting.

Display data is provided by the rt control module to the control panel DMA control and buffer. The DMA control and buffer changes serial data from the rt to parallel data for the microprocessor. The display data is received on the SERIAL DATA line and is accompanied by the DISP CLOCK.

The IFM PWR A and IFM PWR B signals are derived from the IFM RF PWR switch setting and are used to control the output power of the optional IFM power amplifier. The signals are connected from the decoder timer and DMA control and buffer to buffers on the rt interface module.

The decoder timer also provides STBY, STBY RESET-N, HB ON, and HB OFF signals for use by the rt power supply (para2-5).

Interface with an optional remote control unit is through the drivers/receivers. Eight-bit serial data words are sent in either direction on the DATA (+) and DATA (-) lines accompanied by a clock on the CLOCK (+) and CLOCK (-) lines. The DATA DIRECTION signal from the control unit determines whether the data is an input or output.

A reset circuit generates a negative reset pulse at power turn-on. This is used to start the microprocessor at the correct place in its program. A negative reset pulse is also generated whenever the TAKE CONTROL switch changes. This starts the microprocessor at the beginning of its program whenever relinquishing or taking control of the rt. The reset circuit also holds the reset negative when LV RESET is present. LV RESET is present when the +28V line drops to about +18V.LV RESET is supplied by the interface module.

2-12. LOCAL CONTROL OPERATION. Continued

Local fill is initiated by the operator. The ECCM module puts a 6.75 V negative pulse on the FILL REQ line. The FILL INFO is input from the fill device. It is a serial data stream that contains the variables to be stored in the ECCM module. The FILL VA is a clock signal from the fill device. The interface module buffers the signals. FILL VA is processed into FILL CLK and FILL DETECT. FILL CLK follows FILL I/A. When the fill device is attached, FILL l/A is detected, and FILL DETECT drops to logic 0.

2-13, DEDICATED REMOTE CONTROL OPERATION

The dedicated remote control panel interfaces between the C-11466 or C-11466A control unit and the rt. It has a serial data interface with the rt control module and a serial data interface with the remote control unit. It receives control and data words from the control unit, decodes them, and directs the appropriate outputs to the rt control module. In the reverse direction, it receives display information from the rt, stores it, signals the control unit, and transfers the information on command of the control unit,

The data control (See Figure FO-6) monitors data sent by the control unit and extracts synchronization from it. The status register stores IFM PWR A and IFM PWR B signals for use by the optional IFM power amplifier and STBY, STBY RESET-N, HB ON, and HB OFF signals for use by the rt power supply (para 2-5).

The data gating directs other control information to the rt control module, This information includes FUNCTION switch position, MODE switch position, PRESET switch position, and keyboard data. Switch data is sent on the REM DATA line accompanied by sixteen clock pulses on the REM 24 CLOCK line and one pulse on the REM 24 STROBE line. Keyboard data is sent on the REM DATA line accompanied by eight clock pulses on the REM 8 CLOCK line and one pulse on the REM 8 STROBE line.

The data buffer receives display data on the SERIAL DATA line and a 320-kHz clock on the DISP CLOCK line, stores the data, and signals the remote control unit through the remote control interface. The remote control unit generates a 640-Hz clock and takes the data from the data buffer through the remote control interface.

The remote control interface handles 8-bit serial data words in either direction. Data words are sent on the DATA (+) and DATA (-) lines accompanied by a 640-Hz clock on the CLOCK (+) and CLOCK (-) lines. The DATA DIRECTION signal from the control unit determines whether the data is an input or output.

The fill circuit is identical to that described for local control operation (para 2-12).

2-14. MIL-STD-1553B CONTROL OPERATION

The MIL-STD-1553B control panel allows control and status readout by a MIL-STD-1553B bus controller. A microprocessor follows instructions stored in ROM to translate messages from the MIL-STD-1553B bus format to the rt control format and vice versa. A RAM is used to store messages during message transfer. The control panel recognizes its address on the MIL-STD-1553 bus, receives command messages, and sends status messages on command of bus controller. There are two redundant, 2-wire MIL-STD-1553B data buses. Only one bus is active at a time.

The BUS A and BUS B connectors (See Figure FO-7) receive command words, send status words, and send or receive data words. All words begin with three sync bits. The command word includes address bits, one bit which determines whet her the message is transmit or receive, subaddress bits, message word count bits, and a parity bit. Status words are transmitted only in response to command words and include address bits, status bits, and a parity bit. Data words may be sent by bus controller or control panel. Except for the usual sync bits and parity bit, all data word bits are used for data.

The transceivers receive and transmit phase-modulated bipolar, 1-MHz Manchester coded data through bus coupling transformers. In receive mode, the decoder converts Manchester coded serial data to 16-bit parallel data. Each received word is checked for valid sync field, proper Manchester coding, correct parity, and correct address. A valid word pulse is generated if all checks are passed. In transmit mode, the encoder converts 16-bit parallel data to serial format, adds a sync field and parity bit, and encodes the serial data in Manchester code. Data received from the MIL-STD-1553B bus is temporarily stored in first-in-first-out (FIFO) memory. The protocol control circuit interfaces with the microprocessor and provides control functions for the encoder/decoder and FIFO circuits.

2-14. MIL-STD-1553B CONTROL OPERATION. Continued

The address connector permits connecting five address lines and a parity line. This determines the odd parity and address to be looked for on the MIL-STD-1553B buses, When the EMERG-N pin is activated, the front panel will place the rt in single channel and preset 1. If no preset is present, the f rent panel will load the emergency frequency (40 .500 MHz) into preset 1. The ZEROIZE-N pin is used to activate the Z-A (zeroize all) function.

A reset circuit generates a negative reset pulse at power turn-on. This is used to start the microprocessor at the correct place in its program. The reset circuit also holds the reset negative when LV RESET is present. LV RESET is present when the +28V line drops to about +18V. LV RESET is supplied by the interface module.

Interface between the MIL-STD-1553B control panel and the rt is identical to that described for the local control operation (para 2-12).

The fill circuit is identical to that described for local control operation (para 2-12).

2-15. FREQUENCY HOPPING OPERATIONS

The programming for FH operation is stored in the ECCM module ROM. The control module executes these commands to control the rt while in FH.

Received FH signals are digital. Received digital signals are bit synchronized by the switching module. The synchronized FH signal is called BS DATA. See figure 2-4. BS DATA has been synchronized with internal rt clocks and converted to rt signal levels. BS DATA is applied to the ECCM module deinterleaver. The deinterleaver removes synchronization and frequency hopping information that is embedded in the signal. After deinterleaving the signal is reclocked at a 16 kb/s rate. It is now called FH DATA, In X-mode, FH DATA is routed to the switching module. In audio mode, FH DATA is converted back to an analog signal by the continuously variable slope detector (CVSD) on the ECCM module. The RCV FH AUDIO output is routed to the switching module.

The ECCM module can process BS DATA or PT AUDIO during FH transmit. ES DATA goes directly to the interleaver. It is interleaved with the synchronization and FH information needed by the receiving rt to coordinate communications. The CVSD converts XMT PT AUDIO to a 16 kb/s digital signal which is output as CVSD DATA to the interleave. It too is interleaved with data, re-clocked, and output on the FH DATA line to the switching module.

The interleave supplies the control and data signals needed by the time sync/correlator. The correlator's function is to synchronize the operation of the rt and the ECCM module. It manipulates control signal outputs such as HOP-TIME and SYNC. These and others control rt operations in FH mode. They shut down reception/transmission during frequency shifts, provide the next frequency to the control module (via the data and address busses), and supply clocking for the ECCM module.

The ECCM module is also responsible for: storage of the FH operation programming, generation of random numbers for hopping frequency selection, and processing and storage of FILL data. The rt chooses the frequencies in FH by pseudo random number generation. The TRANSEC variable, sync time, and hopset net ID number are used to select the next frequency. The control module uses the hopset and lockout set to create a look-up table in memory of frequencies for the net. The ECCM module picks one of these frequencies from the table. The result is passed to the control module over the data bus. The control module informs the rest of the modules of the frequency selected by the SERIAL DATA LINE.

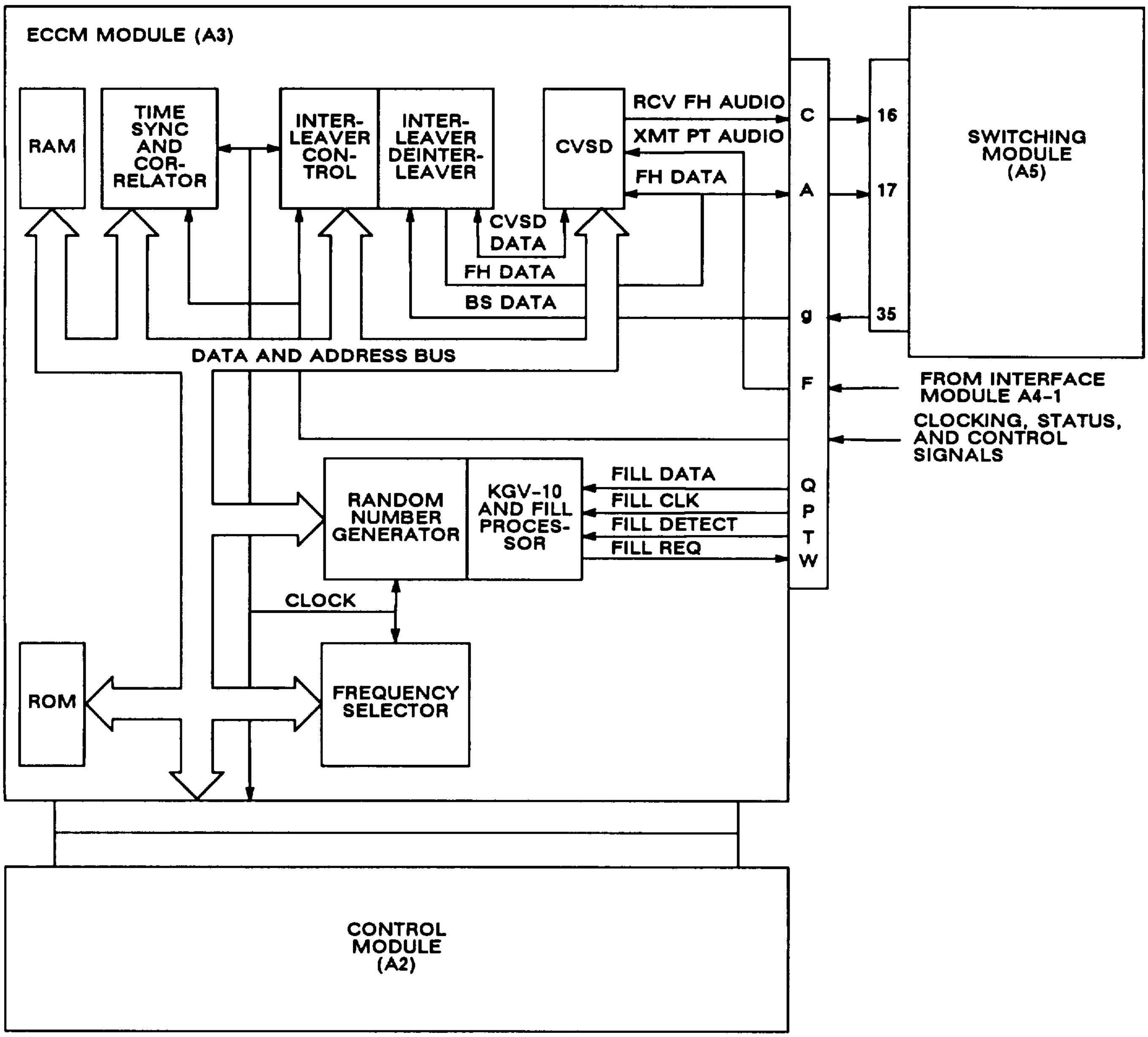


Figure 2-4. FH Block Diagram

2-16. RECEIVE HOMING SIGNAL PATH

Figure 2-5 shows the homing circuits, The AGC and SIG STR RCV inputs are from the IF/demodulator module in the rf receive signal path (paragraph 2-8). The AGC input is a 150 Hz square wave that has an amplitude proportional to the amplitude difference between the left and right homing antennas. This signal is applied to sample and hold circuits which change it to a dc voltage proportional to the rf level at the right and left homing antennas. The dc voltages are applied to inverting and non-inverting buffers and summed to produce a difference voltage. This voltage (STEERING RIGHT) drives the homing indicator meter.

The SIG STR RCV input is a dc voltage proportional to the received rf signal strength. This input is processed to develop the SIG STR RTN, STA APPROACH, and NOISE PRESENT outputs. The SIG STR RTN signal activates a flag in the homing indicator when the SIG STR RCV input exceeds a reference corresponding to -103 dBm. The STA APPROACH output drives the station approach meter in the homing indicator. The NOISE PRESENT output is a logic 1 or logic O developed by comparing SIG STR RCV to a reference. The NOISE PRESENT output is used by the ECCM module.

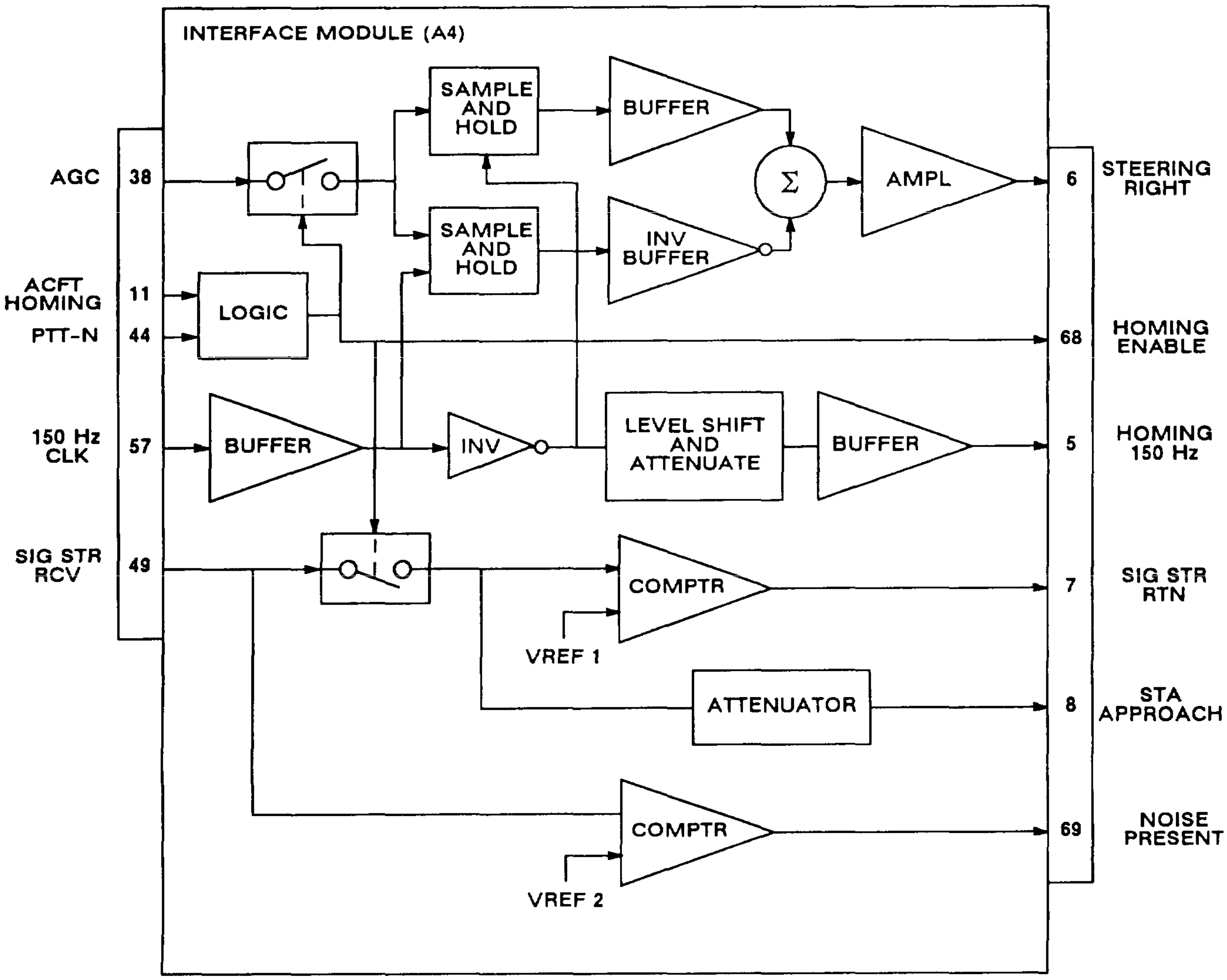


Figure 2-5. Homing Circuits Block Diagram

2-17. SELF TEST

When its FUNCTION switch is set to TEST, the local control panel or the remote control unit tests itself and the interface to the control module. If good, the control module begins the rt self tests. The rt receive path and ECCM module are then checked.

a. Control Panel or Control Unit Test (FAIL 7 and FAIL 8). The local control panel or remote control unit first requests a display update from the control module. If a response is made, the control interface is considered good. If not, "FAIL 7" is displayed. Then the control panel or control unit tests its RAM, ROM, and connections to the front panel switches. If a check fails, "FAIL 8" is displayed. Pressing any key after FAIL 8 will display as follows:

DISPLAY	FAILED TEST
8-01	ROM
8-02	RAM
8-03	Switch connections

If neither FAIL 7 nor FAIL 8 occur, the control panel or control unit signals the control module to begin rt checks.

b. Display Checks. "E -" should be displayed when FUNCTION is set to TEST if the control test passes. The control module checks for the presences of the ECCM module. The ECCM module grounds the FH HERE-N line. See FO-8. If the ECCM module is absent, the letter" E" is replaced by a dash (-). The next display is "88888". It checks the display segments.

c. Receive Path Test (FAIL 1). The receive path is tested in three steps. First, the control module performs a memory check (RAM and ROM). Second, the TONE SQUELCH line is checked with no squelch tone present. (It should be at logic O). Third, the receive path is checked at eight frequencies in the SC mode and two frequencies in the FH mode. Squelch tone is included and the test passes if TONE SQUELCH line is at logic 1.

The 150-Hz squelch tone modulates the 3.9 MHz oscillator located in the amplifier-oscillator. The harmonics from the 3.9 MHz oscillator serve as test frequencies. The control module steps the synthesizer through the test frequencies. Because the tuner/mixer and synthesizer have several bands, it is possible that only one or two frequencies will fail.

There are secondary displays for each failed test. They will be displayed when a keyboard button is pressed as the FUNCTION switch is set to TEST. They are:

DISPLAY	FAILED TEST
1-01	Control module RAM
1-02	Control module ROM
1-03	Receive at 30.0 MHz, SC (no tone)
1-04	Receive at 78.0 MHz, SC (tone)
1-05	Receive at 66.3 MHz, SC (tone)
1-06	Receive at 58.5 MHz, SC (tone)
1-07	Receive at 50.7 MHz, SC (tone)
1-08	Receive at 46.8 MHz, SC (tone)
1-09	Receive at 39.0 MHz, SC (tone)
1-10	Receive at 35.1 MHz, SC (tone)
1-11	Receive at 31.2 MHz, SC (tone)
1-12	Receive at 35.1 MHz, FH (tone)
1-13	Receive at 78.0 MHz, FH (tone)

The audio present during the "88888" display is a result of the receive tests. There will be 10 short bursts of unsquelched rushing noise. However, because they are so quick and close together, they are difficult to count.

d. ECCM module (FAIL 3). The ECCM module also performs an independent self-test. It checks its RAM, ROM, interleave, linear sequence generator, and other circuits. If it does not pass, "FAIL 3" is displayed. The beep heard at the end of "88888" display indicates the presence of ECCM module.

DISPLAY	FAILED TEST
3-01	ECCM ROM #l
3-02	ECCM RAM #2
3-03	ECCM RAM
3-04	Interleaver/Alarm
3-05	Linear Sequence Gen.
3-06	Non-Vol. Memory Protect
3-07	Sync Signal
3-08	interrupt Signal

2-18. RETRANSMIT OPERATIONS

The retransmit (RXMT) function allows two rts to be used as a radio relay.

When the FUNCTION switch is set to RXMT, the rt operates as in SQON. The switching module controls retransmit operation. See Figure FO-9. The receiving rt demodulates the rf as described in paragraph 2-8. The demodulated signal is routed to pin X of system connector J1 (RXMT SIG OUT). The switching module sets RXMT CONT OUT line to logic O when squelch is broken by detection of 150 Hz or by the bit sync acquiring lock. RXMT CONT OUT is routed through a buffer on the interface module.

The cable that connects the two rts route the receiving RT OUT lines to the transmitting rt IN lines. When the RXMT CONT IN line is at logic 0, the rt is keyed. RXMT SIG IN is routed through the switching module to the interface module. The interface module processes the signal and routes it to the switching module for amplification and switching to the amplifier-oscillator.

The RXMT A/D SEL line is used to select the analog or digital mode. The analog mode is selected if it is open (about 2.5 V). The digital mode is selected if it is grounded.

Section II. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

2-19. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit. Common tools required for maintenance of the rt are listed in the Maintenance Allocation Chart. It is appendix B of TM 11-5821-333-12.

2-20. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

No special tools are required. For TMDE and support equipment refer to the Maintenance Allocation Chart, appendix B of TM 11-5821-333-12.

2-21. REPAIR PARTS

Repair parts are listed and illustrated in TM 11-5821-333-23P.

Section III. TROUBLESHOOTING

2-22. GENERAL

This section has an operational check and troubleshooting flow charts. The operational check is a complete evaluation of the rt. If passed, the rt can be returned to service. The troubleshooting flowcharts are used when the rt fails an operational check step. The troubleshooting flowcharts are used to find the bad module.

When an rt is received for troubleshooting, do the following:

a. Inspect rt for damage. Repair any damage before proceeding.

b. Do the operational check.

c. Do any troubleshooting called for by the operational check.

d. Replace the bad module.

e. Verify the repair by doing all of the operational check.

NOTE

The troubleshooting procedures are for both AN/ARC-201(V) and AN/ARC-201A(V) radio sets. But some of the rt/rcu keyboard markings are different. In the troubleshooting procedures, the AN/ARC-201A(V) marking is given first, followed by the AN/ARC-201(V) marking in paran-theses. Example: ERF/OFST (SEnd/OFST).

2-23. OPERATIONAL CHECK

The operational check is a series of steps used to evaluate rt operation. It is used both during troubleshooting and to verify the rt is good after repair.

NOTE

When testing an RT-1478 or RT-1478A remove its front panel and replace with the RT-1477 front panel in the maintenance group. Then test the rt as an RT-1477. If the rt passes, the RT-1478 or RT-1478A front panel is assumed bad. If the rt fails, replace the bad module. When testing and repair are complete, install a good RT-1478 or RT-1478A front panel. Replace identification plate to assure proper information, if necessary.

Test Description. Each step checks the response of the rt to an operator action. The steps are numbered so they can be used for reference on maintenance worksheets. Each step is titled according to the function being checked.

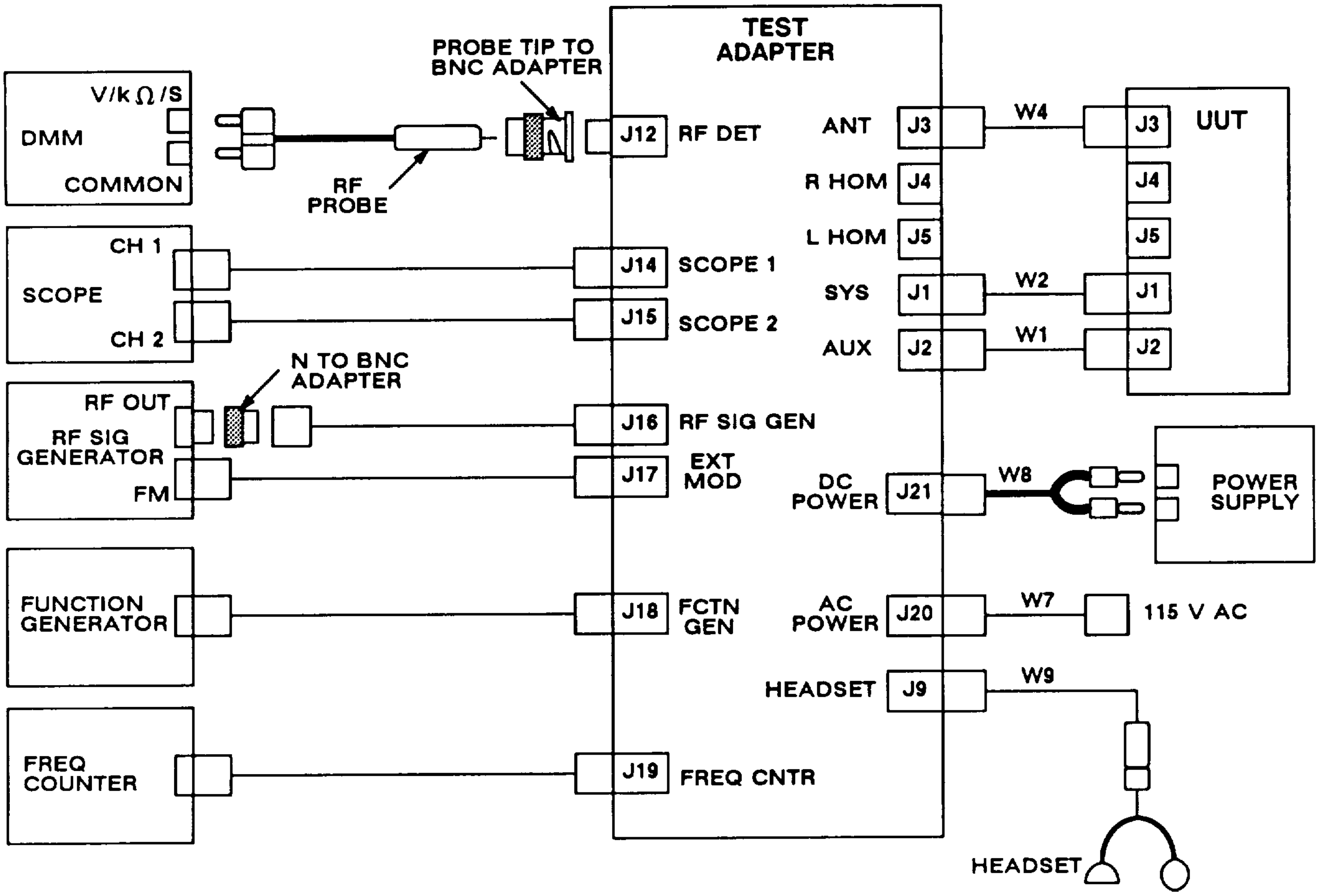
How to Proceed. If normal results are found proceed to the next step. If abnormal results are found, replace the indicated module or go to the indicated troubleshooting flowchart.

WARNING

Connect the test setups only when directed and with the power supply turned off. The large current capacity of the test power supply can cause personal injury. Verify the test setup before turning the power supply on.

CAUTION

- To avoid damage to equipment, always set DC switch on test adapter to OFF before turning power supply on.
- Before setting DC switch on test adapter to ON, always set rt and rcu FUNCTION switches to STOW or OFF. This applies to the uut, the ref rt, and the ref rcu. Failure to do so may damage an rt or rcu.
- You should not have an rcu connected to J6 of the test adapter. Having an rcu connected may cause bad test readings or may damage the equipment.



EQUIPMENT PRESETS

UUT SWITCHES (See note)

FUNCTION	STOW
PRESET	MAN
IFM RF PWR	OFF
MODE	SC
VOL	FULLY RIGHT

NOTE

For RT-1477 or RT-1477A, use switches on REF RCU. For RT-1476 or RT-1476A, set REF RCU FUNCTION switch to STOW.

REF RT SWITCHES

FUNCTION	STOW
PRESET	MAN
IFM RF PWR	OFF
MODE	SC
VOL	FULLY RIGHT

ICS SWITCHES

TOP SWITCHES	OFF
ROTARY SWITCH	1
HOT MIKE	OFF
VOL	MIDRANGE

TEST ADAPTER SWITCHES

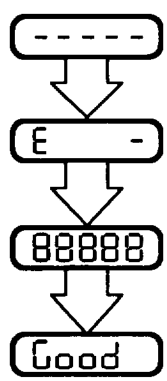
S1-S6	OFF
DC	OFF
AC	OFF
TAKE CTRL:	
RT-1476/RT-1476A	RT
RT-1477/RT-1477A	RCU
TEST EQUIPMENT SELECTOR	ICS
TEST EQPT INPUT	INTL
PTT(S8)	OFF
CAL	OUT

Figure 2-6. Operational Check Test Setup

2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 1. SELF TEST	
a. Set up equipment using figure 2-6.	a, No response.
b. Ensure a known good holding battery is installed in uut.	b. No response.
c. Set frequency counter input to 1 megohm.	c. No response.
d. Set function generator attenuation to 40 dB.	d. No response
e. Set rf signal generator output to -120 dBm.	e. No response.
f. Turn power supply on and set to 28 V dc.	f. No response.
g. Set DC switch on test adapter to ON.	g. No response.
h. Set FUNCTION switch on ref rt to Z-A and then to SQ ON.	h. No response.
i. Set uut FUNCTION switch to Z-A and then to TEST.	i. Responses: (see below)

i. Responses:



Displayed for about 3 seconds.

Displayed for about 2 seconds.

Displayed for about 7 seconds.

End of cycle.

If not, go to chart 1.

ACTION	RESPONSE
Step 2. CONTROL TESTS	
a. Set uut FUNCTION switch to Z-A.	a, Response:  If not, go to chart 2.
b. Set uut FUNCTION switch to SQ ON.	b. Response:  If not, go to chart 3.

2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 2. CONTROL TESTS. Continued	
c. If uut is not RT-1476 or RT-1476A, set PRESET switch to 1, and go to step 3.	c. No response,
d. Set uut PRESET switch to 1.	d. Response: FILL 1 If not, go to chart 4.
e. Set uut FUNCTION switch to LD.	e. No response.
f. Press uut FREQ button.	f. Response: 00000 If not, go to chart 5.
g. Press uut FREQ and then CLR.	g. Response: - - - - - If not, go to chart 6.
h. With five dashes in display, press 3, 5, 8, 7, 5.	h. Response: 35875 If not, go to chart 7.
i. With 35875 in display, press STO (Sto/ENT).	i. Display blinks and then reads 35875. If not, go to chart 8.
Step 3. SC LOAD CHECKS	
Load following frequencies into channels indicated:	All frequencies load correctly. If not, go to chart 9.

PRESET	FREQ
MAN	30000
1	35875
2	39975
3	47175
4	55000
5	55700
6	72000
CUE	87600

ACTION	RESPONSE
Step 4. OFFSET LOAD CHECK (RT-1476 OR RT-1476A ONLY)	
a. Set uut switches: FUNCTION SQ ON PRESET MAN	a. No response.
b. Press uut ERF/OFST (SEnd/OFST) button.	b. Response: 00 If not, go to chart 10.

2-23. OPERATIONAL CHECK. Continued

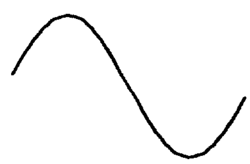
ACTION	RESPONSE
Step 5. RF OUTPUT AT PRESETS	
a. Set uut switches: FUNCTION SQ ON PRESET MAN	a. No response.
b. Set test adapter switch: S1 2	b. No response.
c. Set DMM to read dBm at 50 ohms.	c, No response.
d. Set PTT (S8) on test adapter to UUT and read DMM. Repeat at other presets: 1, 2, 3, 4, 5, 6, CUE.	d. DMM reads 17.5 to 22.5 dBm. If not, go to chart 11.
e. Set PTT (S8) on test adapter to OFF.	e. No response.
f. Set frequency counter input to 1 megohm.	f. No response.
g. Remove rf probe and probe tip adapter from J12 on test adapter.	g. No response.
h. Move rf cable from J19 to J12 on test adapter.	h. No response.
i. Set PTT (S8) on test adapter to UUT.	i. No response,
j. Read frequency counter at all presets.	j. Responses:

PRESET	FREQ
MAN	29.999700 to 30.000300
1	35,874641 to 35.875359
2	39.974600 to 39.975400
3	47.174528 to 47.175472
4	54.999450 to 55.000550
5	55.699443 to 55.700557
6	71.999280 to 72.000720
CUE	87.599124 to 87.600876

If not, go to chart 12.

k. Set PTT (S8) on test adapter to OFF.	k. No response.
1. Move rf cable on test adapter from J12 to J19.	1. No response.

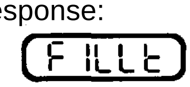
2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 6. RECEIVER SENSITIVITY TEST	
a, Set test adapter switches: PTT(S8) OFF S1 7 TEST EQUIPMENT SELECTOR SCOPE	a. No response.
b. Set uut FUNCTION switch to SQ OFF.	b. No response.
c. Set uut VOL control fully right.	c. No response.
d. Set frequency counter input to 1 megohm.	d. No response,
e. Set rf signal generator: Modulation 1 kHz, INT, FM Deviation 6.5 kHz Output level -86 dBm	e. No response,
f. Read scope at following settings of uut and signal generator: UUT PRESET Switch / Rf Signal Gene ator(MHz) MAN 30.000 4 55.000 5 55.700 CUE 87.600	f, Scope displays 5 to 11 V peak-to-peak noise free sine wave. If not, go to chart 13 (see waveform), 
g. If uut is not RT-1476 or RT-1476A, go to step 7.	g. No response.
h. If uut is RT-1476 or RT-1476A, set uut VOL control fully left.	h. Scope displays less than 1 V peak-to-peak sine wave. If not, front panel (Al) is bad.
Step 7. SQUELCH CHECK	
a. Set test adapter: S1 5 TEST EQUIPMENT SELECTOR ICS	a. No response.
b. Set uut VOL control fully right,	b. No response.
c. Move uut FUNCTION switch between SQ ON and SQ OFF while listening to headset.	c. Noise present at SQ OFF; no noise at SQ ON. If not go to chart 14.

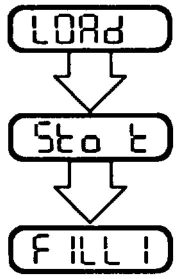
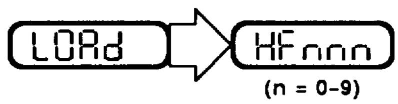
2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 8. SC TRANSMIT CHECKS	
a. Set test adapter switches: S1 — 3 TEST EQUIPMENT SELECTOR — ICS	a. No response.
b. Set uut switches: PRESET — MAN FUNCTION — SQ ON	b. No response.
c. Set PTT(S8) on test adapter to UUT.	c. No response.
d. Speak into headset and listen to audio.	d. Clear and intelligible audio is present. If not, go to chart 15.
e. Set test adapter switches: PTT(S8) — OFF CAL — IN	e, No response.
f. Use channel 2 of scope and frequency counter to set function generator for 1.0 kHz, 10±1 V peak-to-peak square wave.	f. No response.
g. Set test adapter switches: TEST EQUIPMENT SELECTOR — SCOPE S1 — 4	g. No response.
h. Set PTT(S8) on test adapter to UUT and check scope channel 1.	h. Scope displays 6 V peak-to-peak or greater square wave. If not, set PTT(S8) to OFF and go to chart 16.
Step 9. SC RECEIVE CHECKS	
a. Set test adapter switches: PTT(S8) — OFF S1 — 5 CAL — OUT	a. No response.
b. Set function generator attenuator to 40 dB.	b. No response.
c. Set TEST EQUIPMENT SELECTOR on test adapter to ICS.	c. No response.

2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 9. SC RECEIVE CHECKS. Continued	
d. Hold PTT (S8) on test adapter in REF position. Speak into headset and listen to audio.	d. Clear and intelligible audio is present. If not, go to chart 17.
e. Release PTT(S8).	e. No response.
f, Set test adapter switches: TEST EQUIPMENT SELECTOR S1 — SCOPE 6	f. No response.
g. Set rf signal generator: Modulation — 1 kHz, INT, FM Deviation — 6.5 kHz Output frequency — 30 MHz Output level — -50 dBm	g. No response.
h, Check scope channel 1.	h. Scope displays 7.0 to 10.0 V peak-to-peak sine wave. If not, go to chart 18.
Step 10. AN/ARC-201(V) FILL CHECKS	
a. Set rf signal generator output to -120 dBm.	a. No response.
b. Set S1 on test adapter to OFF.	b. No response.
c. Set uut switches: FUNCTION — LD-V PRESET — 1 MODE — FH	c. Response:  If not, go to chart 19.
d. Set ECCM fill device function switch to OFF.	d. No response.
e. Connect fill device to uut.	e. No response.
f. Set fill device select switch to TRANSEC variable. Make note of which variable you use (T1 or T2).	f. No response.
g. Set fill device function switch to ON.	g. No response.

2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 10. AN/ARC-201(V) FILL CHECKS. Continued	
h. Press H-Ld/0.	h. Response:  If not, go to chart 20.
i. Set uut FUNCTION switch to LD.	i. No response.
j. Set fill device select switch to hopset.	j. No response.
k. Press H-Ld/0.	k. Response:  If not, ECCM module (A3) is bad.
l. Press Sto/ENT.	l. Response:  If not, ECCM module (A3) is bad.
m. With “ Sto _“ in display, press 1.	m. Display reads “ Sto 1“. then blinks, If not, ECCM module (A3) is bad.
n. Set fill device function switch to OFF.	n. No response.
o. Disconnect fill device.	o. No response,
p. Load same TRANSEC variable and same hopset into ref rt, preset 1.	p. No response,
q, Press FREQ key on ref rt.	q. No response,
r. Turn off and disconnect fill device.	r. No response.

2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 11. AN/ARC-201A(V) FILL CHECKS	
a. Set rf signal generator output to -120 dBm.	a. No response.
b. Set S1 on test adapter to OFF.	b. No response.
c. Set uut switches: FUNCTION LD PRESET 1 MODE FH	c. Response: If not, go to chart 19.
d. Set ECCM fill device function switch to OFF.	d. No response.
e. Connect fill device to uut.	e. No response.
f. Set fill device to hopset.	f. No response,
g. Set fill device function switch to ON.	g. No response,
h. Press LOAD.	h, Response:  (n = 0-9) If not, go to chart 20.
i. Press STO.	i. Response:  If not, ECCM module (A3) is bad.
j. With " Sto _" in display, press 1.	j. Display reads " Sto 1," then blinks. If not, ECCM module (A3) is bad.
k. Set fill device function switch to OFF.	k. No response.
l. Disconnect fill device.	l. No response.
m. Load same hopset in ref rt, preset 1.	m. No response.
n. Press FREQ key on ref rt.	n. No response.
o. Turn off and disconnect fill device.	o. No response.

2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 12. FH SYNC TIME LOAD CHECK	
a. Press uut •••/TIME button.	a. Response: 00 If not, go to chart 21.
b. With "00" in display, press CLR, 1, 1, Sto/ENT.	b. Display reads " ", then "11", then blinks. If not ECCM module (A3) is bad.
c. Press •••/TIME. CLR, 2, 2, 3, 3.	c. Response: If not, ECCM module (A3) is bad.
d. Load and store day of 11 in ref rt.	d. No response.
e. Load but do not store hour of 22 and minute of 33 in ref rt.	e. No response.
f. Watch uut display, Simultaneously press Sto/ENT button for both uut and ref rt.	f. Display blinks. if not, ECCM module (A3) is bad.
Step 13. FH-M SWITCH POSITION CHECK (RT-1476 OR RT-1476A ONLY)	
a. Set uut switches: FUNCTION SQ ON MODE FH-M	a. No response.
b. On uut, press FREQ.	b. Response: Fnnn (n = 0-9) If not, go to chart 22.

2-23. OPERATIONAL CHECK. Continued

ACTION		RESPONSE
Step 14. FH TRANSMIT CHECKS		
a. Press uut FREQ button.		a. No response.
b. Set uut switches:		b. No response.
FUNCTION	SQ ON	
MODE	FH-M	
c. Set ref rt switches:		c. No response.
FUNCTION	SQ ON	
PRESET	1	
MODE	FH	
d. Set test adapter switches:		d. No response.
S1	3	
TEST EQUIPMENT SELECTOR	ICS	
PTT(S8)	UUT	
e. Speak into headset and listen to audio.		e. Clear and intelligible audio present. If not, go to chart 23.
f. Set test adapter switches:		f. No response.
PTT(S8)	OFF	
CAL	IN	
S1	8	
TEST EQUIPMENT SELECTOR	SCOPE	
g. Use frequency counter and scope channel 2 to set function generator:		g, No response.
Function	square wave	
Frequency	1.0 kHz±100HZ	
output	1 0 ± 1 V peak-to-peak	
h. Set PTT(S8) on test adapter to UUT and check scope channel 1.		h. Scope displays 3.0 to 5.0 V peak-to-peak square wave (may quiver). If not, go to chart 24.

2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 15. FH RECEIVE CHECKS	
a. Set test adapter switches: PTT(S8) OFF S1 5 TEST EQUIPMENT SELECTOR ICS	a. No response.
b. Hold PTT(S8) on test adapter in REF position. Speak into headset and listen to audio.	b. Clear and intelligible audio present. If not, go to chart 25.
c. Set test adapter switches: S1 9 TEST EQUIPMENT SELECTOR SCOPE	c. No response.
d. Hold PTT (S8) on test adapter in REF position and check scope channel 1.	d. Scope displays 3.0 to 5.0 V peak-to-peak square wave. If not, ECCM module (A3) is bad.
e. Set function generator attenuation to 40 dB.	e. No response.
f. Load 87600 into CUE position of ref rt.	f. No respons.
g. Set test adapter switches: S1 OFF CAL OUT	g. No response.
h. Set ref rt switches: MODE SC PRESET CUE FUNCTION SQ ON	h. No response.
i. Hold PTT (S8) on test adapter in REF position.	i. UUT display reads “CUE”. If not, go to chart 26.

2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 16. HOMING CHECKS	
a. Connect test cable W5 between J4 on uut and J4 on test adapter.	a. No response.
b. Connect test cable W6 between J5 on uut and J5 on test adapter.	b. No response.
c. Set uut switches: MODE HOM PRESET 4	c. No response.
d. Set test adapter switches: S1 10 TEST EQUIPMENT SELECTOR DMM	d. No response.
e. Disconnect rf probe from DMM.	e. No response.
f. Connect double banana to BNC adapter to DMM .	f. No response.
g. Set DMM to read dc volts.	g, No response.
h. Connect coaxial cable between DMM and J13 on test adapter.	h, No response.
i. Set rf signal generator: Frequency 55 MHz Modulation OFF Output level -69 dBm	i. No response.
j. Turn off rf signal generator and read DMM.	j. DMM reading is greater than or equal to 26 V dc. If not, interface module (A4) is bad.
k. Turn on rf signal generator and read DMM.	k. DMM reading is less than or equal to 2 V dc. If not, go to chart 27.
1. Set S1 on test adapter to 11.	1. No response.
m Set rf signal generator output level to -80 dBm and read DMM.	m. DMM reads -25 to +25 mV dc. If not interface module (A4) is bad.
n. Set rf signal generator output level to -4 dBm and read DMM.	n. DMM reads 120 to 220 mV dc. If not, go to chart 28.

2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE

Step 16. HOMING CHECKS. Continued

o. Set test adapter switches: S1 OFF S2 1	o. No response.
p. Set rf signal generator output level to -28 dBm and read DMM.	p. DMM reads -30 to +30 mV dc. If not, go to chart 29.
q. Connect 3 dB pad between test cable and J4 on test adapter.	q. DMM reads -400 to -100 mV dc. If not, fails steering left. Go to chart 30.
r. Remove 3 dB pad from between test cable and J4. Connect it between test cable and J5.	r. DMM reads 100 to 400 mV dc. If not, fails steering right, Go to chart 30.
s. Remove 3 db pad, and set rf signal generator level to -120 dBm.	s. No response,

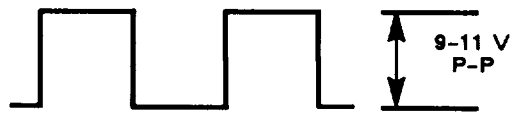
Step 17. RETRANSMIT CHECKS

a. Set uut switches: FUNCTION RXMT MODE SC PRESET MAN	a. No response.
b. Set PRESET switch on ref rt to MAN,	b. No response.
c. Set test adapter switches: S2 4 TEST EQUIPMENT SELECTOR ICS PTT(S8) UUT	c. No response.
d. Speak into headset and listen to audio.	d. Voice is heard in headset, If not and LAMP 3 is lit, switching module (A5) is bad. If not and LAMP 3 is not lit, go to chart 31.
e. Set test adapter switches: PTT(S8) OFF S2 5 TEST EQUIPMENT SELECTOR SCOPE CAL IN	e. No response.

2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 17. RETRANSMIT CHECKS. Continued	
f. Use scope channel 2 and frequency counter to set function generator: Function — square wave Frequency — 1.0 kHz ± 100Hz Amplitude — 1 0 ± 1 V peak-to-peak	f. No response.
g. Set PTT (S8) on test adapter to UUT and check scope channel 1.	g. Scope displays 6 to 10 v peak-to-peak square wave. If not, go to chart 32.
h. Set test adapter switches: PTT (S8) — OFF S2 — 6 TEST EQUIPMENT SELECTOR — SCOPE	h. No response.
i. Set function generator attenuation to 40 dB.	i. No response.
j. Hold PTT (S8) on test adapter in REF position, speak into headset, and check scope channel.	j. Scope displays greater than 500 mV peak-to-peak audio. If not, go to chart 33.
k, Hold PTT (S8) on test adapter in REF position, speak into headset, and check LAMP 6 on test adapter.	k. LAMP 6 is lit. If not, go to chart 34.
1. Set rf signal generator: Frequency — 30 MHz FM mode — EXT AC Level — -70 dBm	e. No response.
m. Set test adapter switches: CAL — IN S2 — 7	m. No response.
n. Use scope channel 2 and frequency counter to set function generator: Function — square wave Frequency — 2 kHz±1Hz Level — to cause 6.5 kHz deviation	n. No response.

2-23, OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 17. RETRANSMIT CHECKS. Continued	
o. Check scope channel 1.	o. Scope display:  If not, switching module (A5) is bad.
p. Check lamps on test adapter.	p. LAMP 3 and LAMP 6 are lit. If not, switching module (A5) is bad.
Step 18. SIDETONE CHECKS	
a. Set function generator attenuation to 40 dB.	a. No response.
b. Set rf signal generator output level to -120 dBm.	b. No response.
c. Set uut FUNCTION switch to SQ ON.	c. No response.
d. Set test adapter switches: S2 — 8 TEST EQUIPMENT SELECTOR — ICS PTT (S8) — UUT	d. No response.
e. Speak into headset and listen to audio,	e. Sidetone is present, If not, set PTT (S8) on test adapter to OFF and go to chart 35.
f. Set PTT (S8) on test adapter to OFF.	f. No response.
g. Set uut IFM RF PWR switch to LO.	g. No response,
h. Set PTT (S8) on test adapter to UUT.	h. No response,
i. Speak into headset and listen to audio.	i. Sidetone is absent. If not set PTT (S8) on test adapter to OFF and go to chart 36.
j. Set PTT (S8) on test adapter to OFF.	j. No response.
Step 19. IFM CONTROL TEST	
a. Set S2 on test adapter to OFF,	a. LAMP 5 is on; LAMP 10 is off. If not, go to chart 37.
b. If uut is not RT-1476 or RT-1476A, go to step e.	b. No response,

2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 19. IFM CONTROL TEST. Continued	
c. Set uut switch: IFM RF PWR NORM	c. LAMP 5 is off; LAMP 10 is on. If not, front panel (A1) is bad.
d. Set uut switch: IFM RF PWR HI	d. LAMP 5 is on; LAMP 10 is on. If not, front panel (A1) is bad.
e. Set uut switch: IFM RF PWR OFF	e. No response,
f. Change uut MODE switch between SC and FH while watching LAMP 7 on test adapter.	f. LAMP 7 is off for SC. LAMP 7 is on for FH. If not go to chart 38.
g. Set uut switch: MODE SC	g. No response.
h. Change uut PRESET switch between 3 and 4 while watching LAMP 8 on test adapter.	h. LAMP 8 is on for 3. If not, go to chart 39. LAMP 8 is off for 4. If not, go to chart 40.
i. While watching LAMP 9 on test adapter, set PTT(S8) to UUT.	i. LAMP 9 is off with PTT(S8) at OFF. LAMP 9 is on with PTT(S8) at UUT. If not, go to chart 41.
j. Set PTT(S8) on test adapter to OFF.	j. No response.
Step 20. HOLDING BATTERY TEST	
a. Set uut switches: MODE FH PRESET 1 FUNCTION OFF	a. No response.
b. Set reference rt FUNCTION switch to OFF.	b. No response.
c. On test adapter, set DC switch to OFF for 5 seconds and back to ON.	c. No response.
d. Set to TEST.	d. Response: 
e. Set uut and reference rt FUNCTION switches to SQ ON.	e. Response:  (n = 0-9) If not, go to chart 42.
f. Press uut and reference rt .../TIME buttons three times. **NOTE** Ref rt must have a known good holding battery.	f. Time displays on uut and reference rt are equal within 2 seconds, If not, control module (A2) is bad.

2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 21. PANEL ILLUMINATION TEST (RT-1476 OR RT-1476A ONLY)	
a. Set AC switch on test adapter to ON.	a. Front panel lights. If not, go to chart 43.
b. Set AC switch on test adapter to OFF.	b. No response.
Step 22. OTHER TESTS	
a. Set uut switches: PRESET MAN MODE SC	a. No response.
b. Set test adapter switches: S2 9 TEST EQUIPMENT SELECTOR DMM	b, No response.
c. Set DMM to read ohms.	c. DMM reads 1.057 to 1.293 kilohms, If not, chassis (A11) is bad.
d. Set DMM to read dc volts,	d. No response.
e. If uut is not RT-1476 or RT-1476A, go to step h.	e. No response.
f. Ensure that ref rcu FUNCTION switch is set to STOW.	f. No response.
g. Check LAMP 1 on test adapter.	g. LAMP 1 is lit. If not, go to chart 44.
h. Set uut FUNCTION switch to SQ OFF.	h. No response,
i. Set test adapter switches: CAL IN S2 10 TEST EQUIPMENT SELECTOR SCOPE	i. No response.
j. Set function generator for approximately 150 Hz,	j. No response.
k. Use scope channel 2 to set function generator for a 6,75 V square wave.	k. No response.

2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 22. OTHER TESTS. Continued	
l. Set rf signal generator: Frequency 30 MHz FM modulation INT, 1 kHz Deviation 6.5 kHz Output level -70 dBm	l. No response.
m. Observe scope channel 1 and channel 2 at the same time.	m. Channel 1 changes audio level in step with channel 2. If not, go to chart 45.
n. If uut is an RT-1476A or RT-1477A, go to step v.	n. No response,
o. Set uut FUNCTION switch to OFF.	o. No response.
p. Set test adapter switches: CAL OUT DC OFF	p. No response.
q. Set uut switches: MODE FH PRESET 1	q. No response.
r. Set uut FUNCTION switch to Z-A for 2 seconds and back to OFF.	r. No response.
s. Set DC switch on test adapter to ON.	s. No response.
t. Set uut FUNCTION switch to SQ ON.	t. Display reads "FILL t" for AN/ARC-201(V). If not, go to chart 46.
u. If uut is not RT-1476, go to step x.	u. No response.
v. Set uut switches: MODE SC PRESET MAN	v. No response.
w. Set reference rcu switches: FUNCTION SQ ON MODE SC PRESET 1 IFM-RF PWR OFF	w. No response.
x. While watching uut display, set TAKE CTRL switch on test adapter to RCU.	x. Display changes from "30000" to "35875." If not, go to chart 47.

2-23. OPERATIONAL CHECK. Continued

ACTION	RESPONSE

Step 22. OTHER TESTS. Continued

ACTION	RESPONSE
y. Set uut FUNCTION switch to RXMT.	y. No response.
z. Set test adapter switches: S2 OFF S3 6 TAKE CTRL RT TEST EQUIPMENT SELECTOR DMM	z. No response.
aa. Read DMM.	aa. DMM reads 5.75 to 7.75 V dc. If not, go to chart 48.

2-24. TROUBLESHOOTING FLOWCHARTS

The troubleshooting flowcharts are used to find a bad module in the rt. The user will be sent to the flowchart from a step in the operational check. When sent to a flowchart, do the following:

a. Unless otherwise directed, keep all switches and controls as they were from the operational check,

b. Do action described in first rectangle of flowchart.

c. Answer yes or no to question in decision diamond.

d. Go to next block as directed by answer to yes/no question.

e. Continue until bad module is located.

Refer to figure 2-7 for an explanation of the symbols used on the flowcharts.

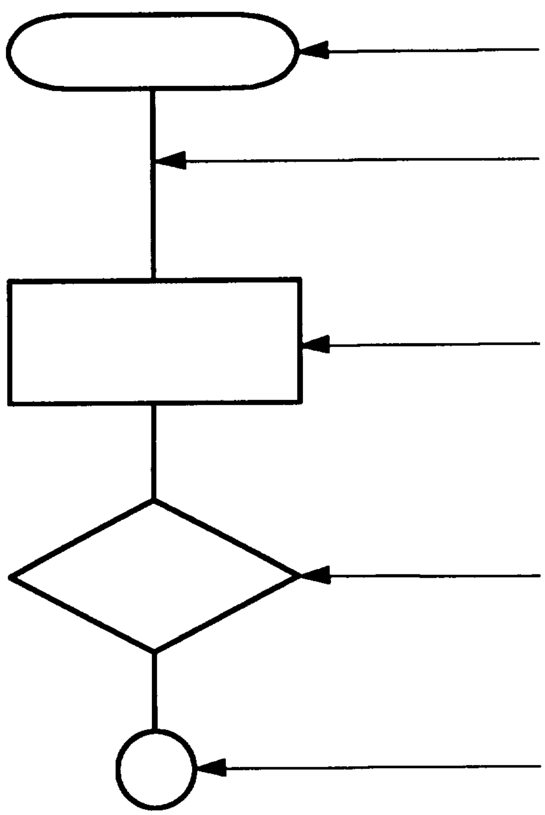


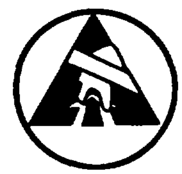
Figure 2-7. Explanation of Symbols

2-24. TROUBLESHOOTING FLOWCHARTS, Continued

WARNING

Connect the test setups only when directed and with the power supply turned off. The large current capacity of the test power supply can cause personal injury. Verify the test setup before turning the power supply on.

CAUTION



Static electricity and stray voltages can damage the rt modules. Use an antistatic pad on the work surface and wear a grounded wrist strap when troubleshooting or handling the modules.

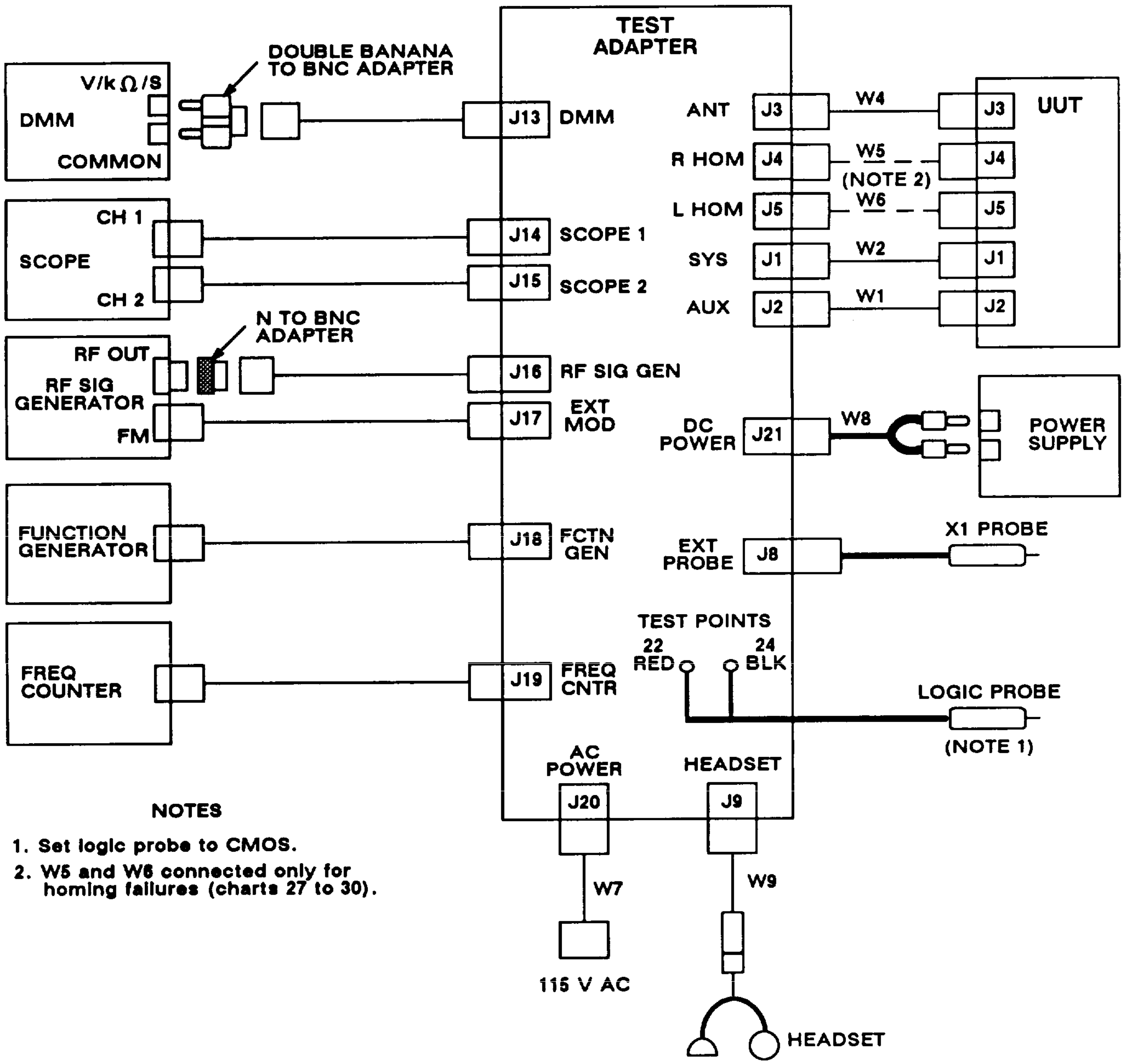
CAUTION

- To avoid damage to equipment, always set DC switch on test adapter to OFF before turning power supply on.
- Before setting DC switch on test adapter to ON, always set rt and rcu FUNCTION switches to STOW or OFF. This applies to the uut, the ref rt, and the ref rcu. Failure to do so may damage an rt or rcu.
- You should not have an rcu connected to J6 of the test adapter. Having an rcu connected may cause bad test readings or may damage the equipment.

NOTE

The principles of operation section can be used to fault isolate any unusual problems that may not be covered in the troubleshooting procedures.

1. SET UUT AND REF RT FUNCTION SWITCHES TO STOW.
2. SET TEST ADAPTER DC SWITCH TO OFF.
3. REMOVE TOP COVER FROM UUT.
4. REMOVE POWER SUPPLY (A10) FROM UUT.
5. CONNECT EQUIPMENT AS SHOWN BELOW:



NOTES

1. Set logic probe to CMOS.
2. W5 and W6 connected only for homing failures (charts 27 to 30).

6. CONNECT POWER SUPPLY (A10) TO UUT AS SHOWN IN FIGURE F0-10.
7. SET TEST ADAPTER DC SWITCH TO ON.
8. SET UUT AND REF RT FUNCTION SWITCHES TO Z-A AND THEN TO SQ ON.

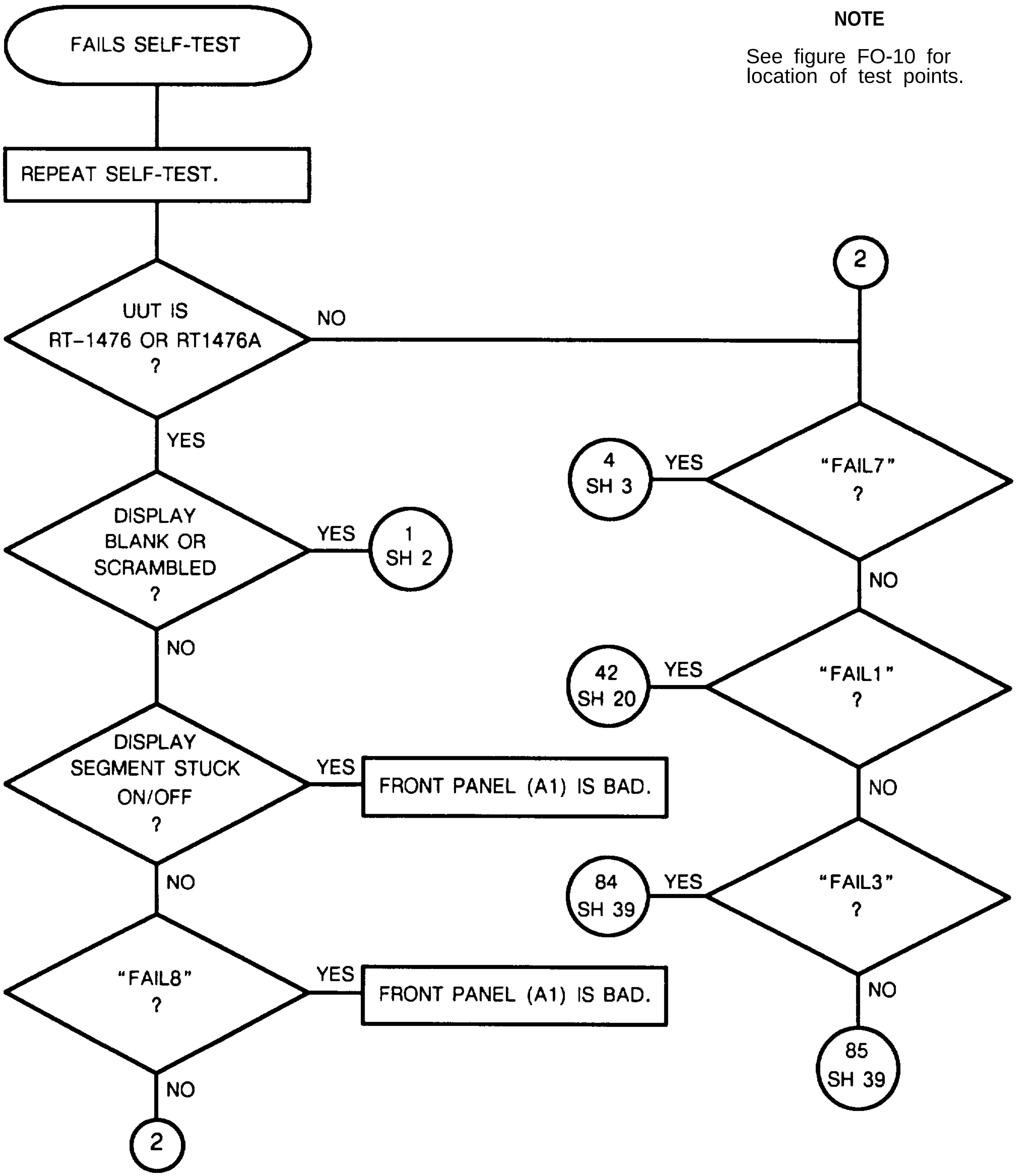
Figure 2-8. Troubleshooting Test Setup No. 1

2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 1 of 40)

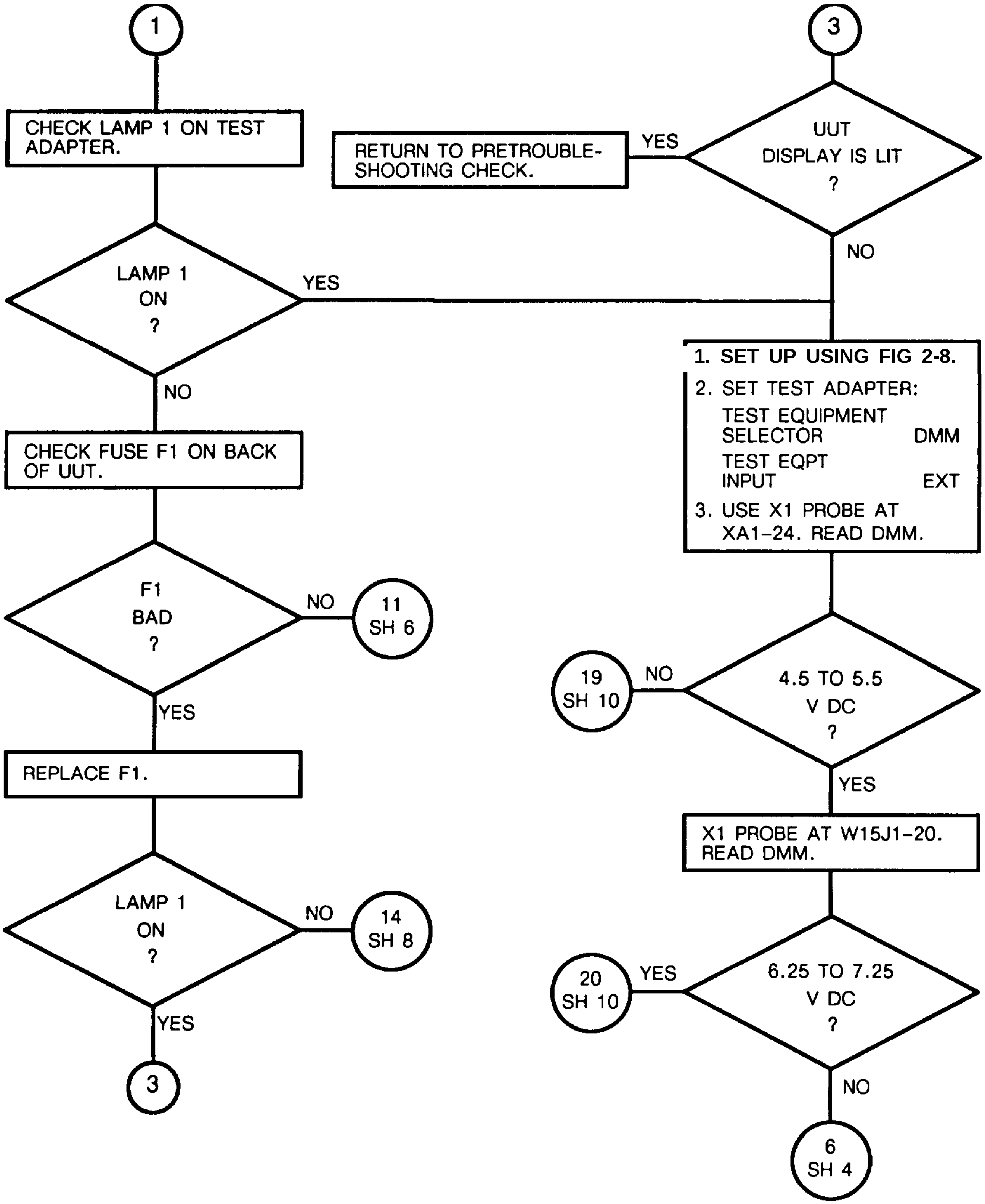
NOTE

See figure FO-10 for location of test points.



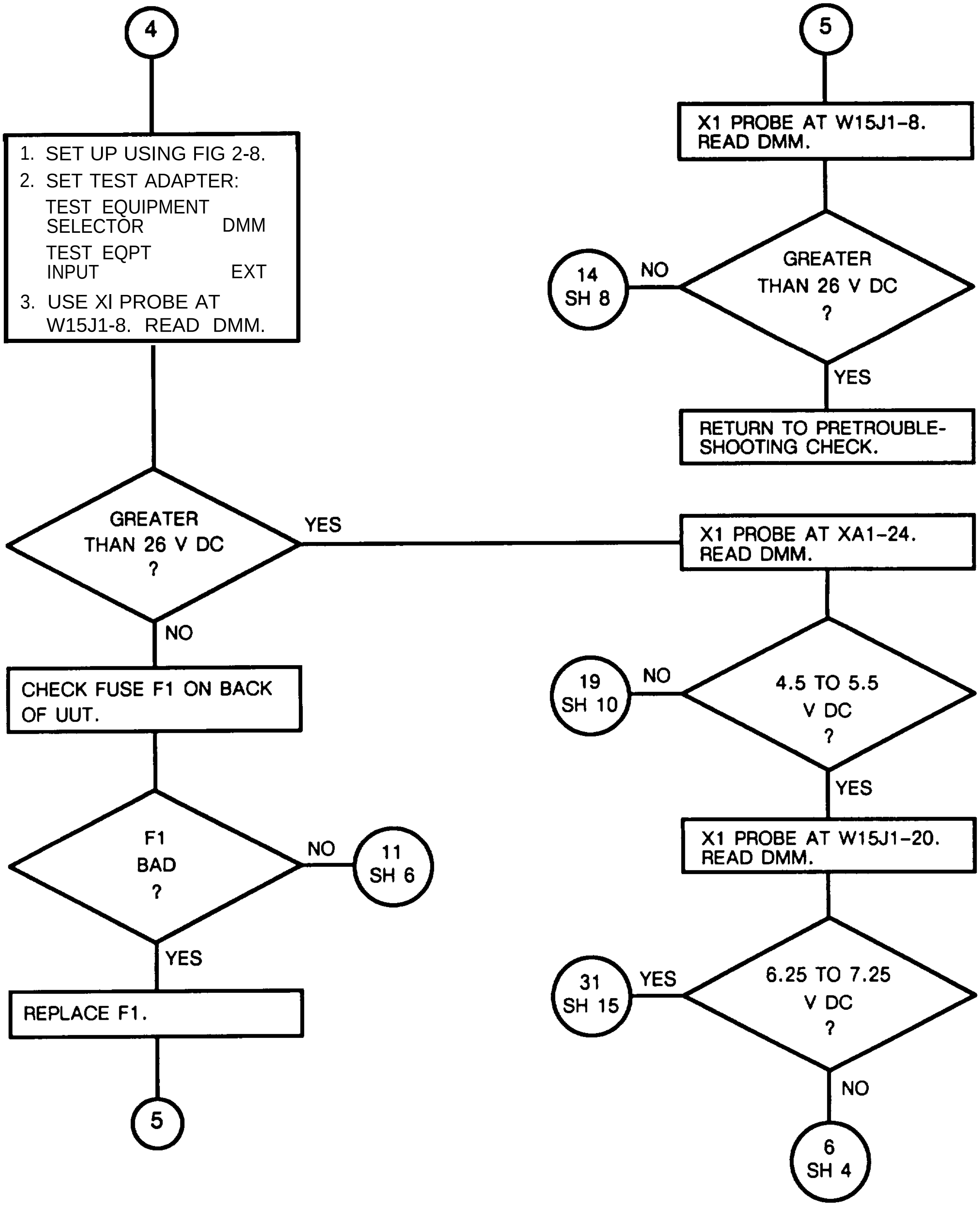
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 2 of 40)



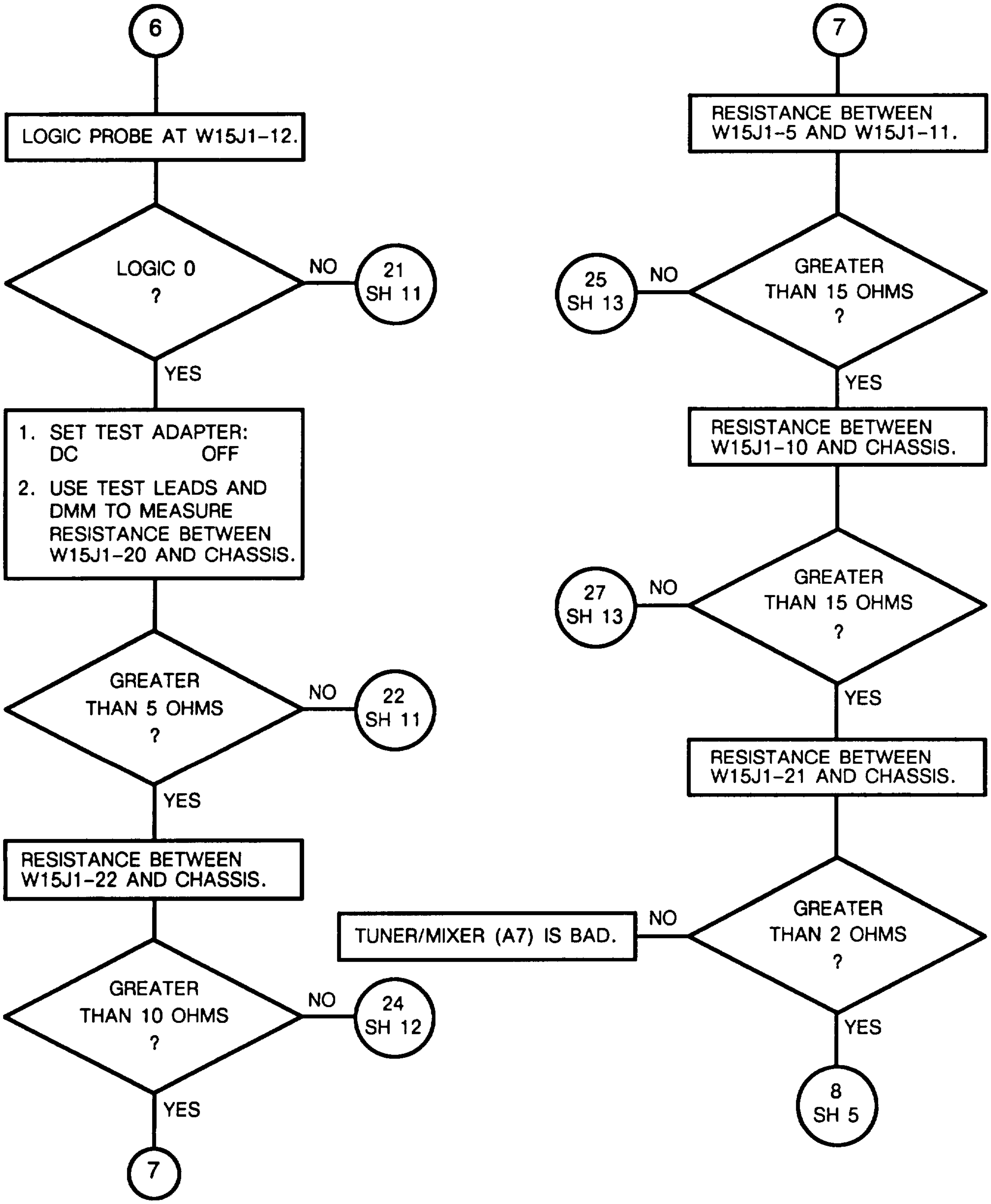
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 3 of 40)



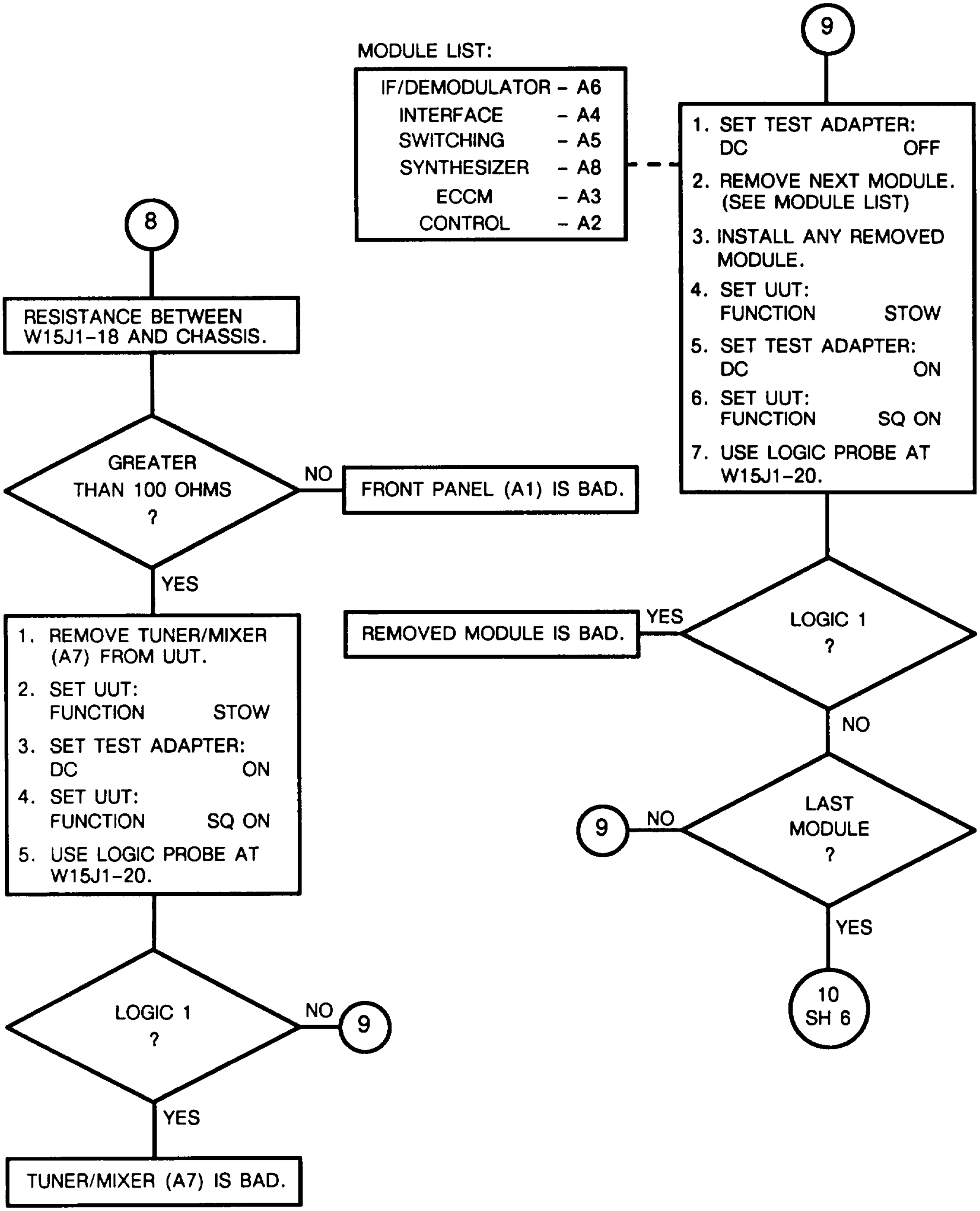
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 4 of 40)



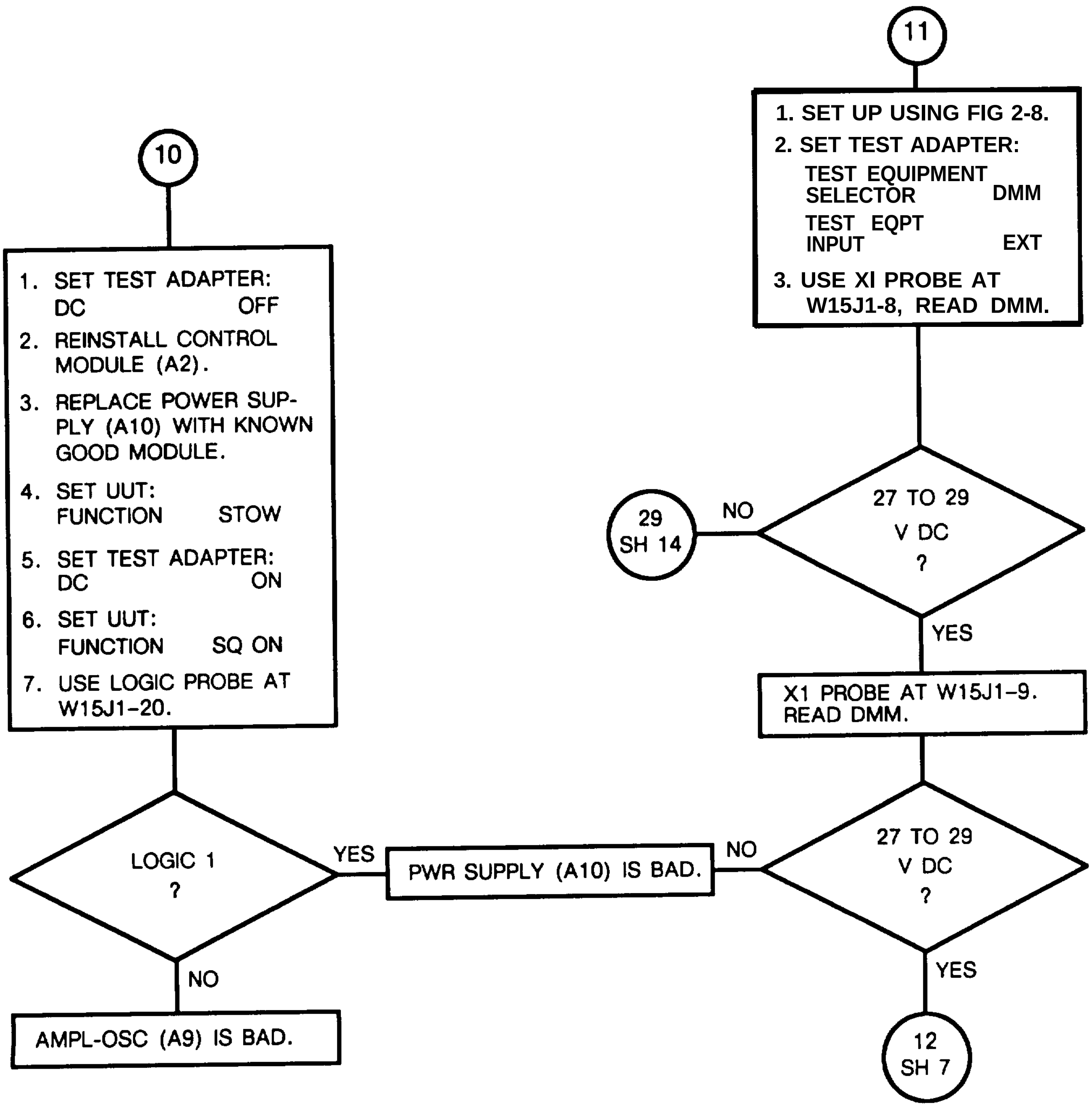
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 5 of 40)



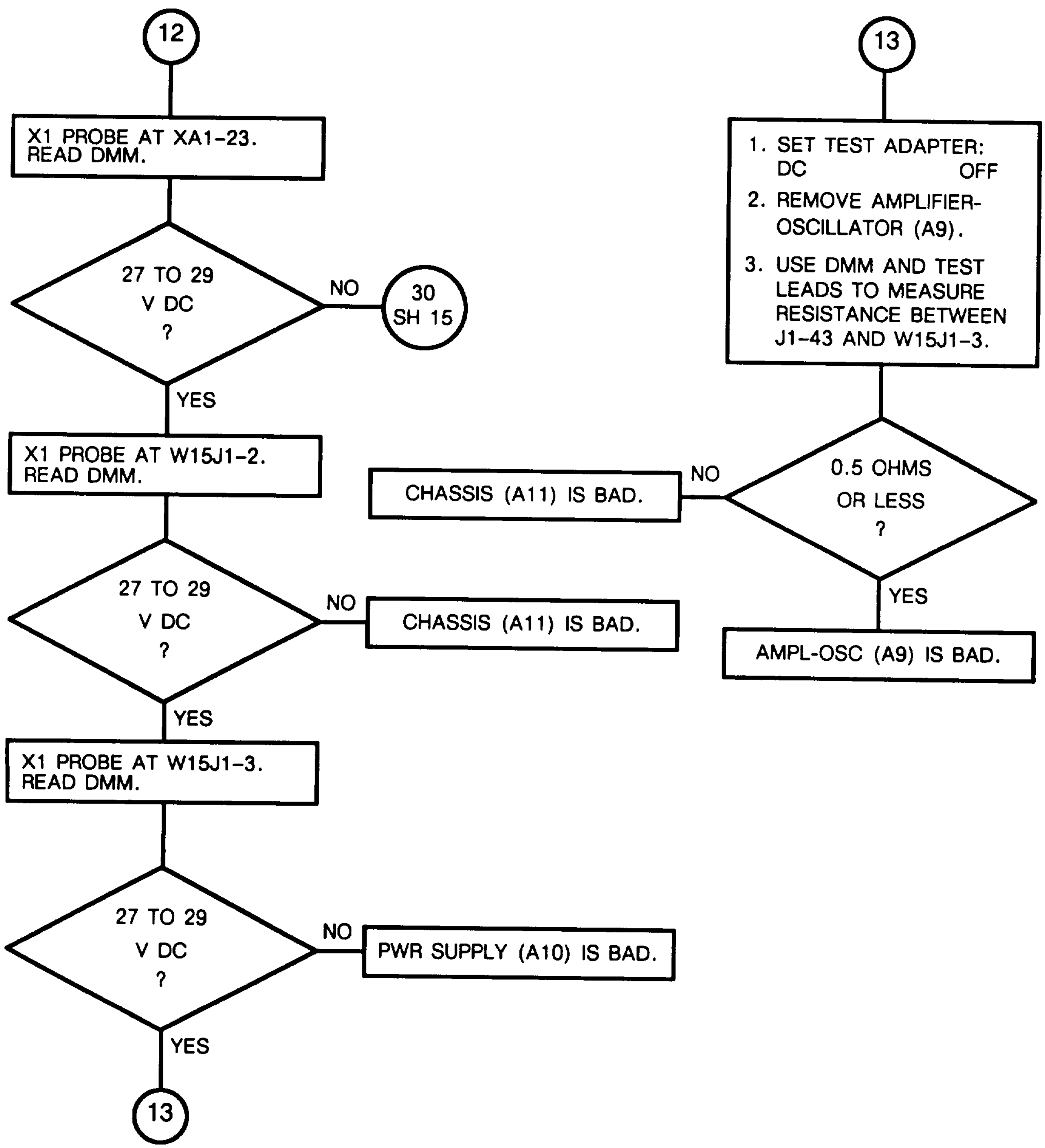
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 6 of 40)



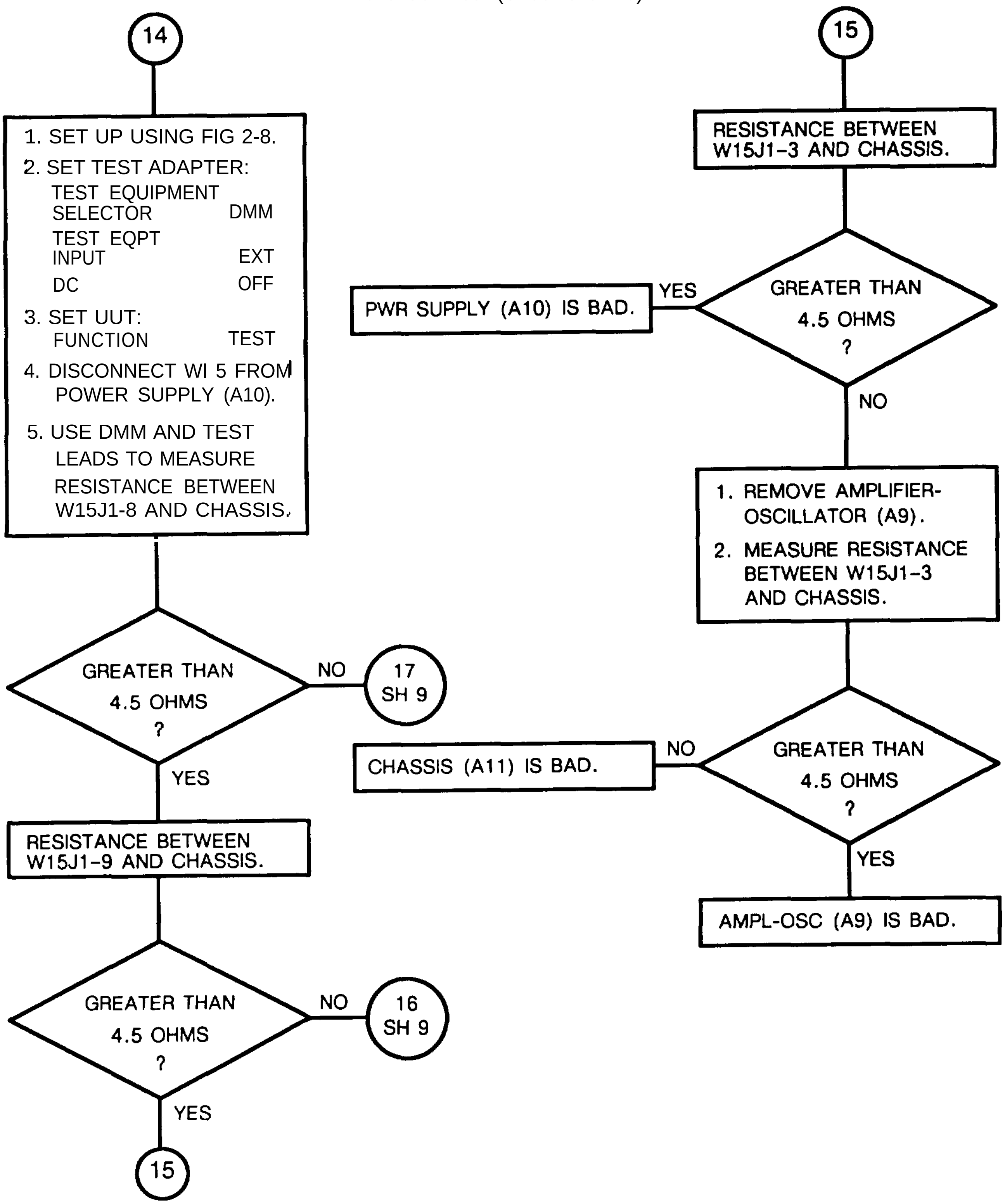
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 7 of 40)



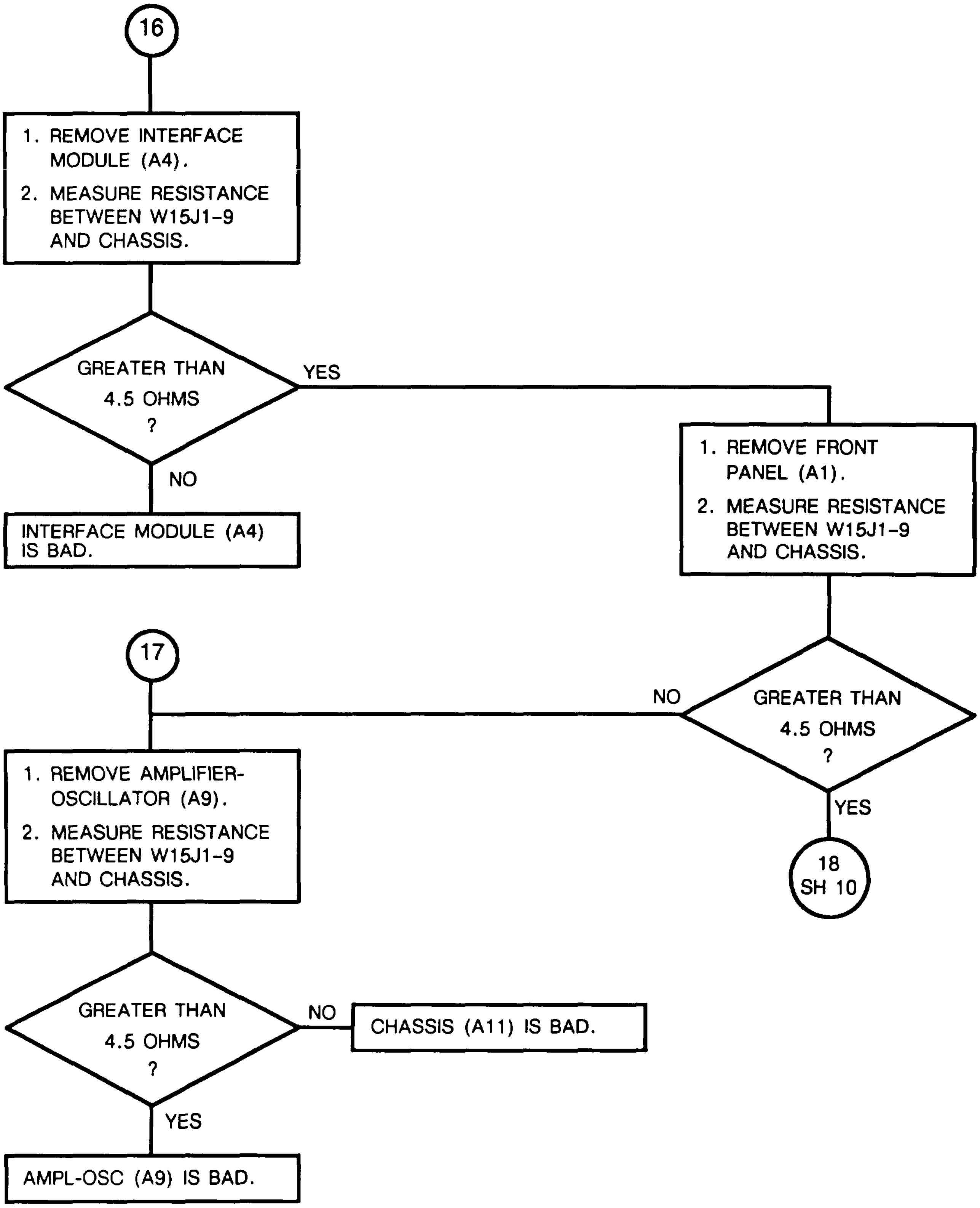
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 8 of 40)



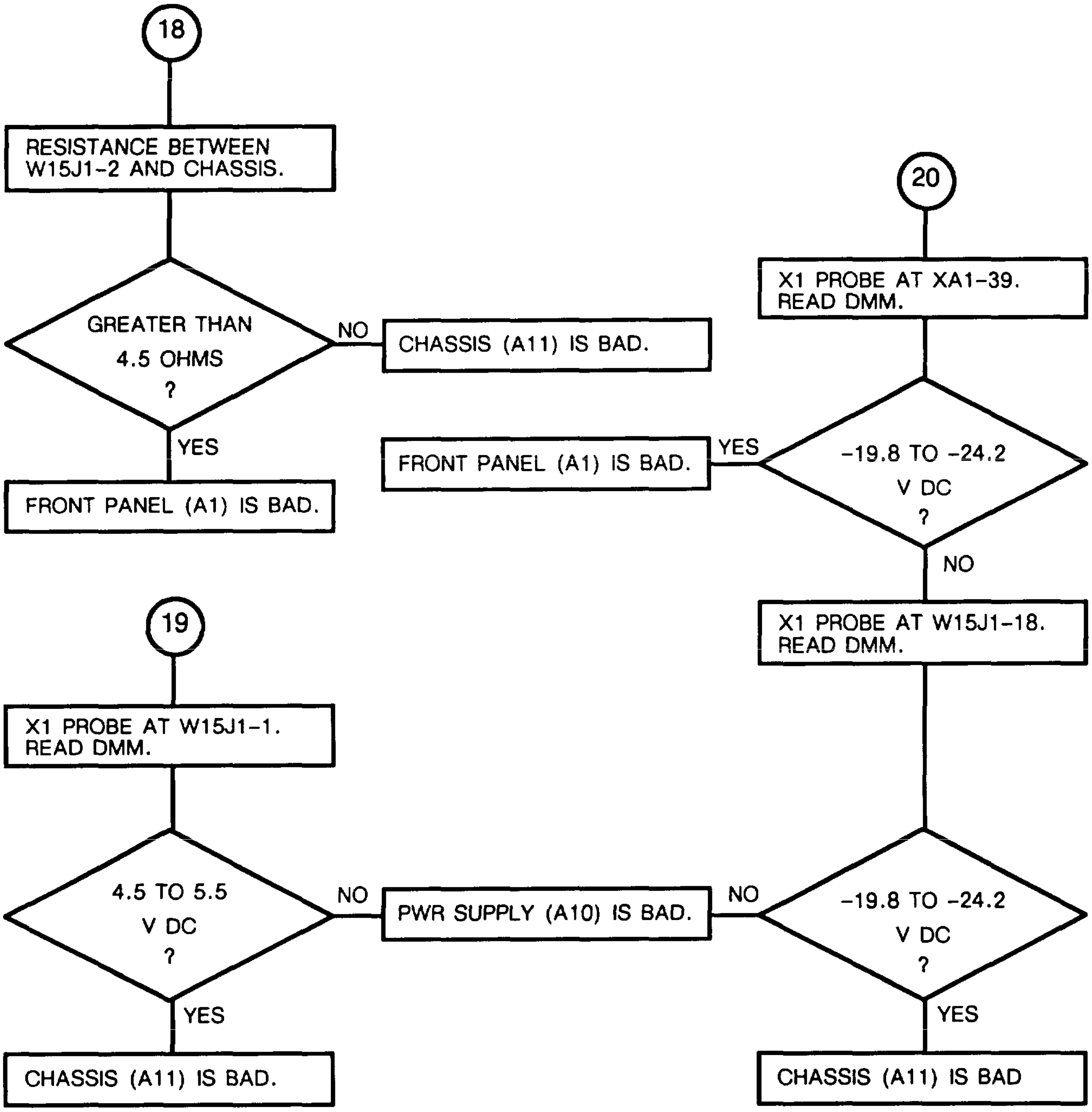
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 9 of 40)



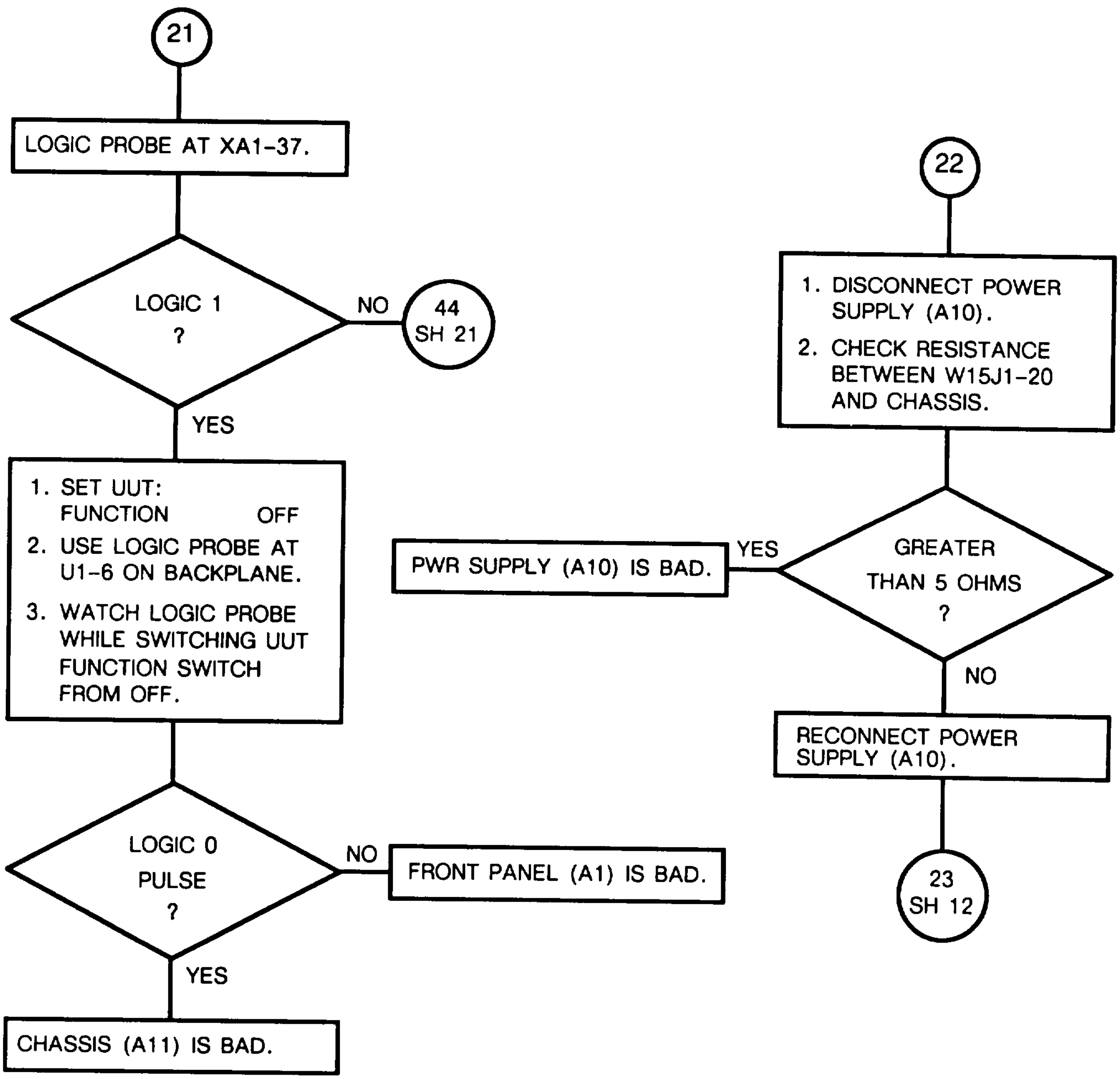
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 10 of 40)



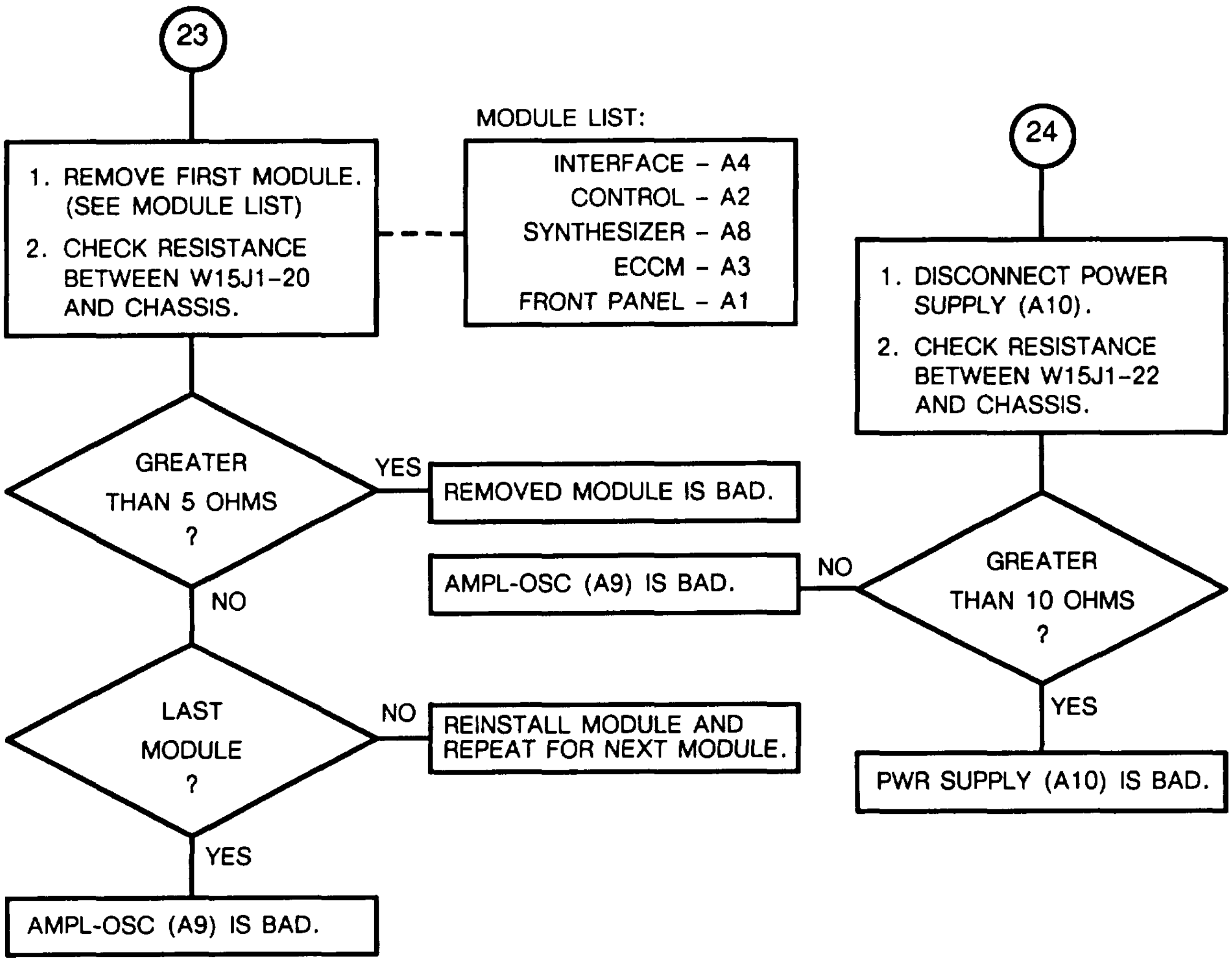
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 11 of 40)



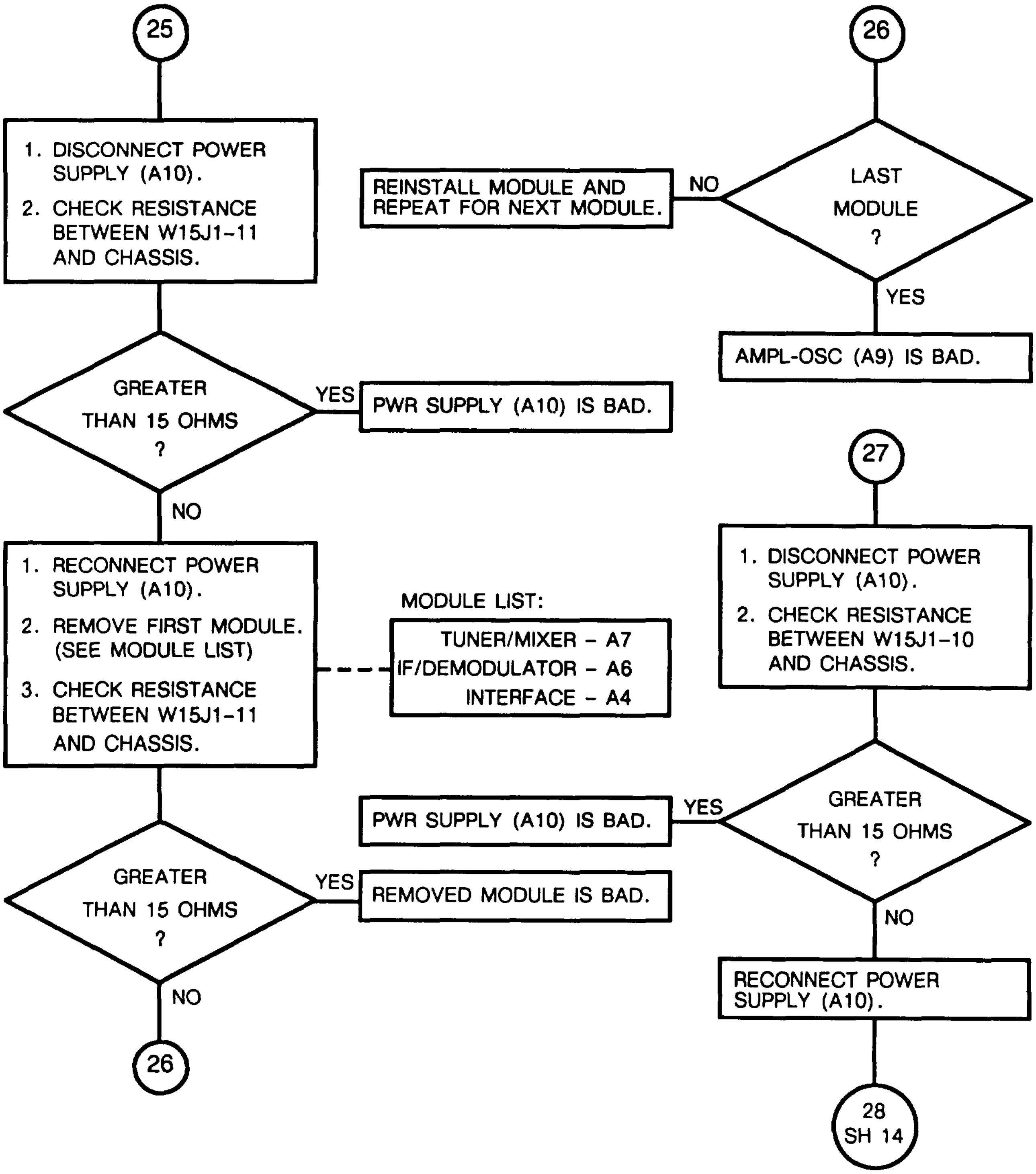
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 12 of 40)



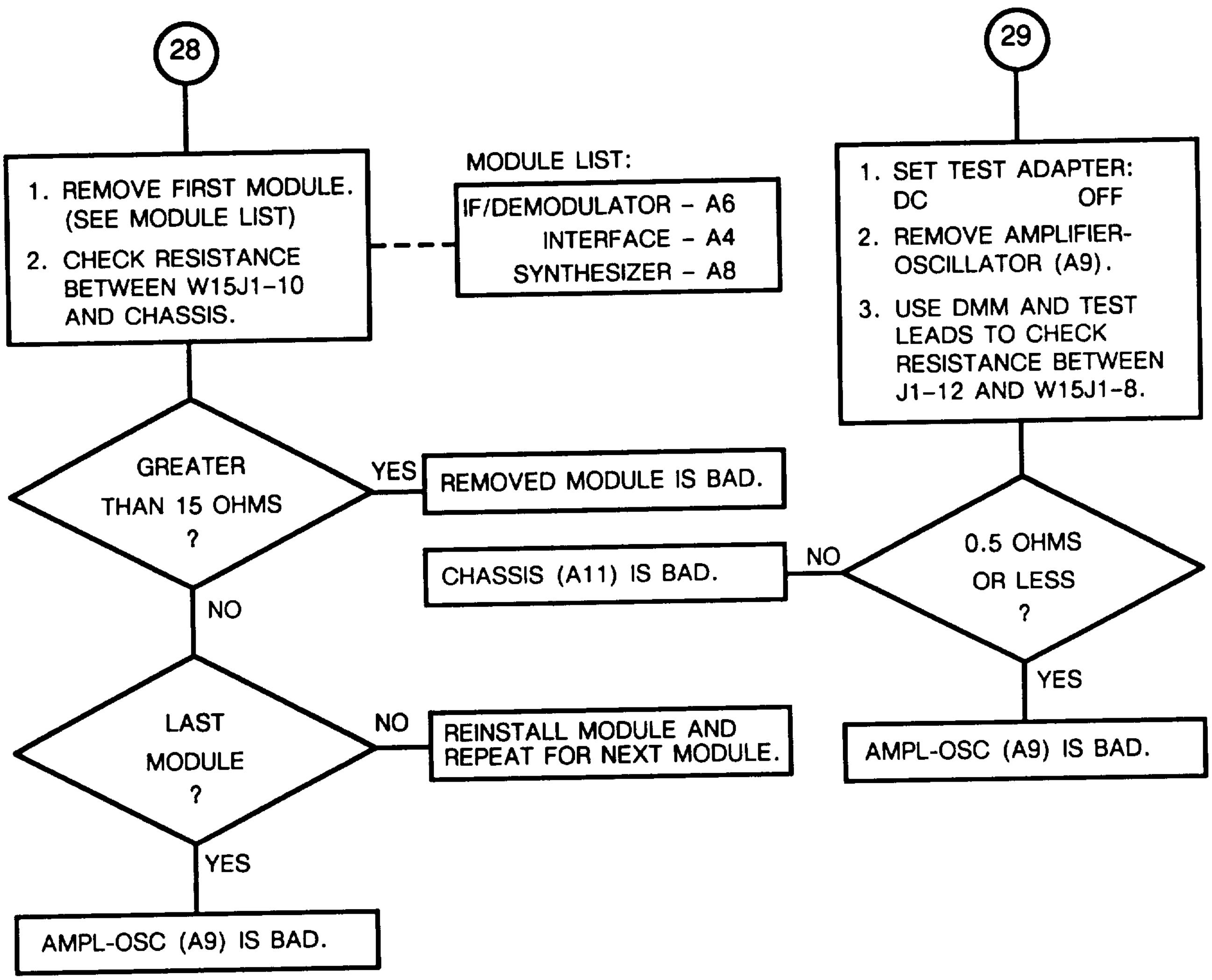
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 13 of 40)



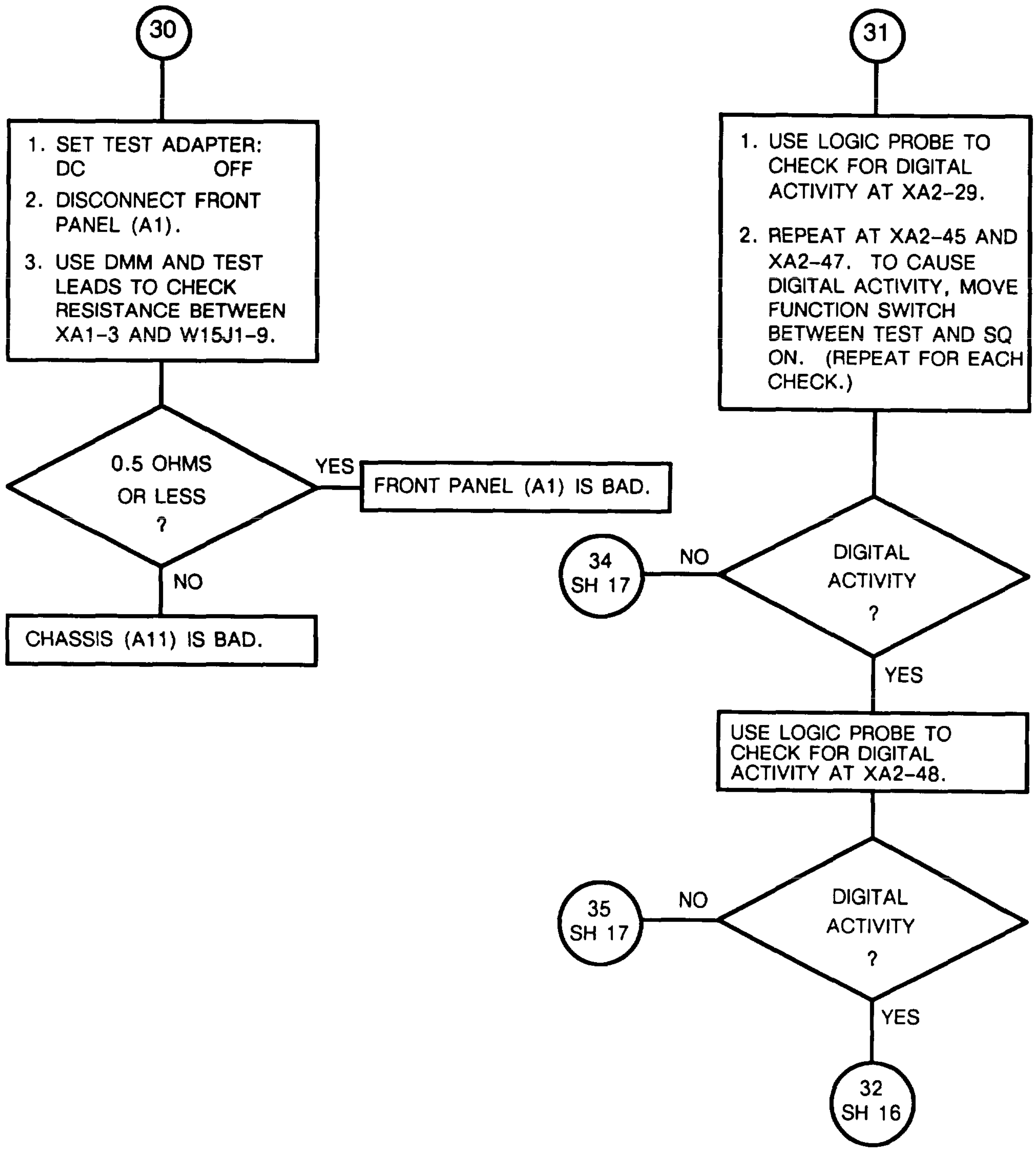
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 14 of 40)



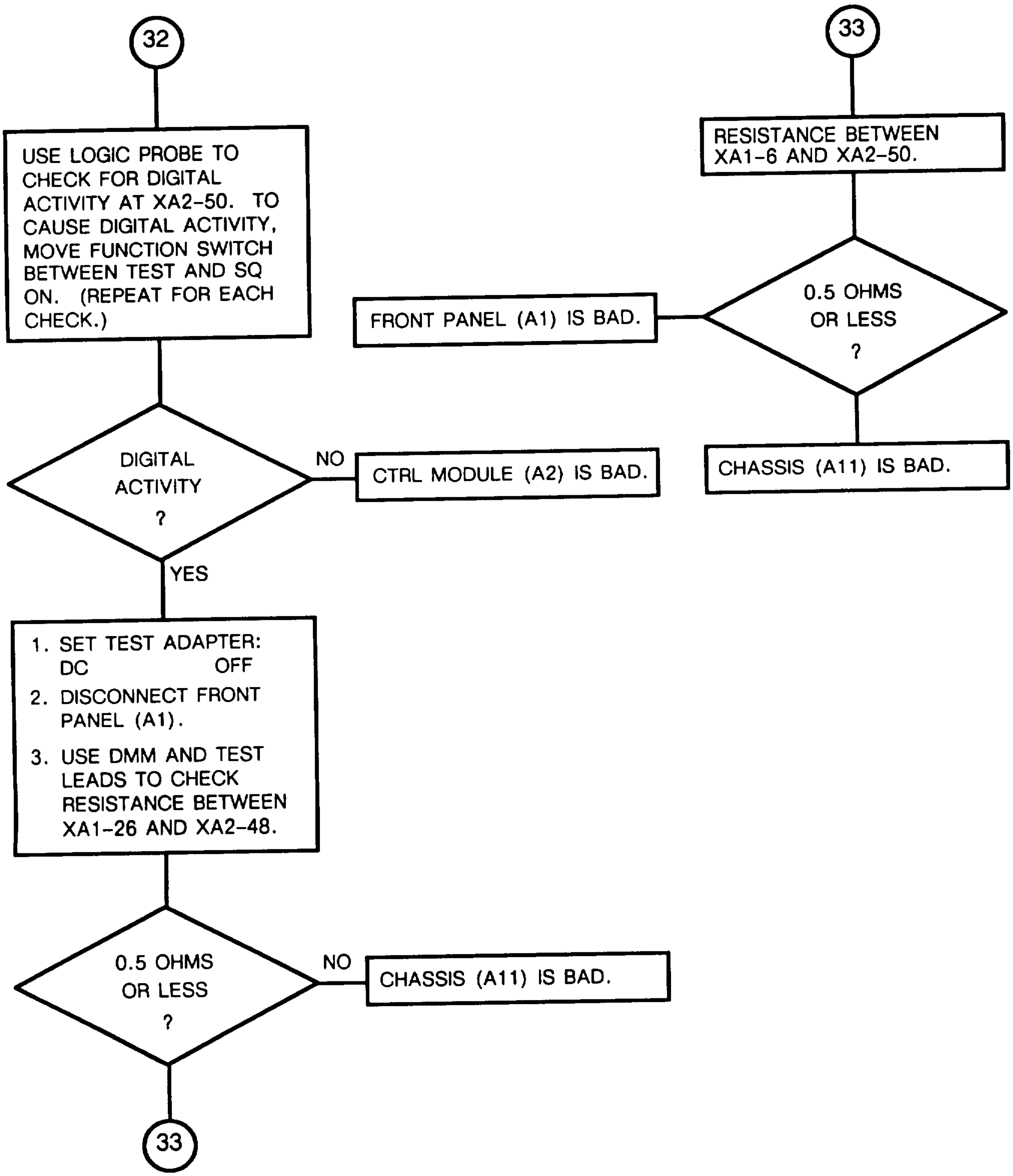
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 15 of 40)



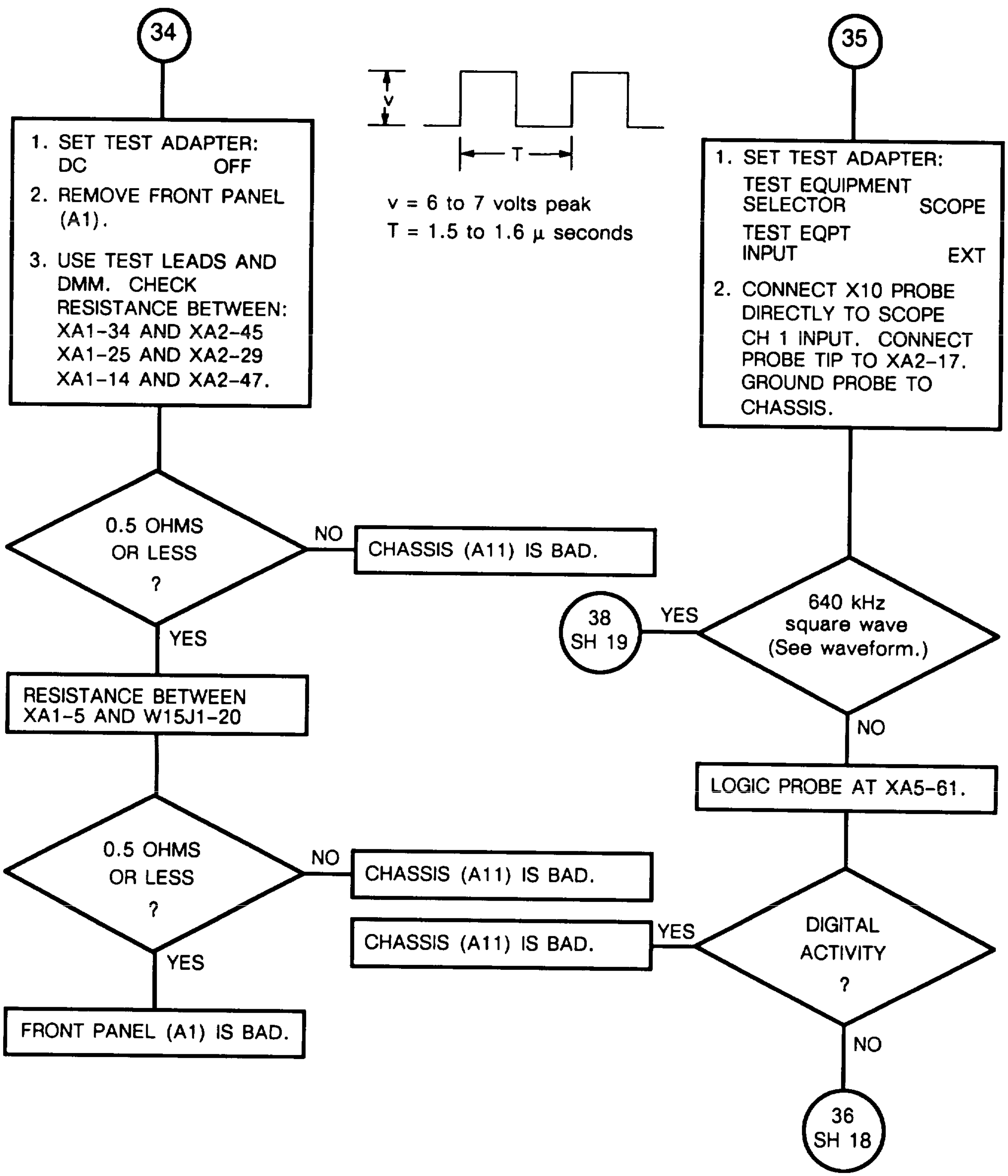
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 16 of 40)



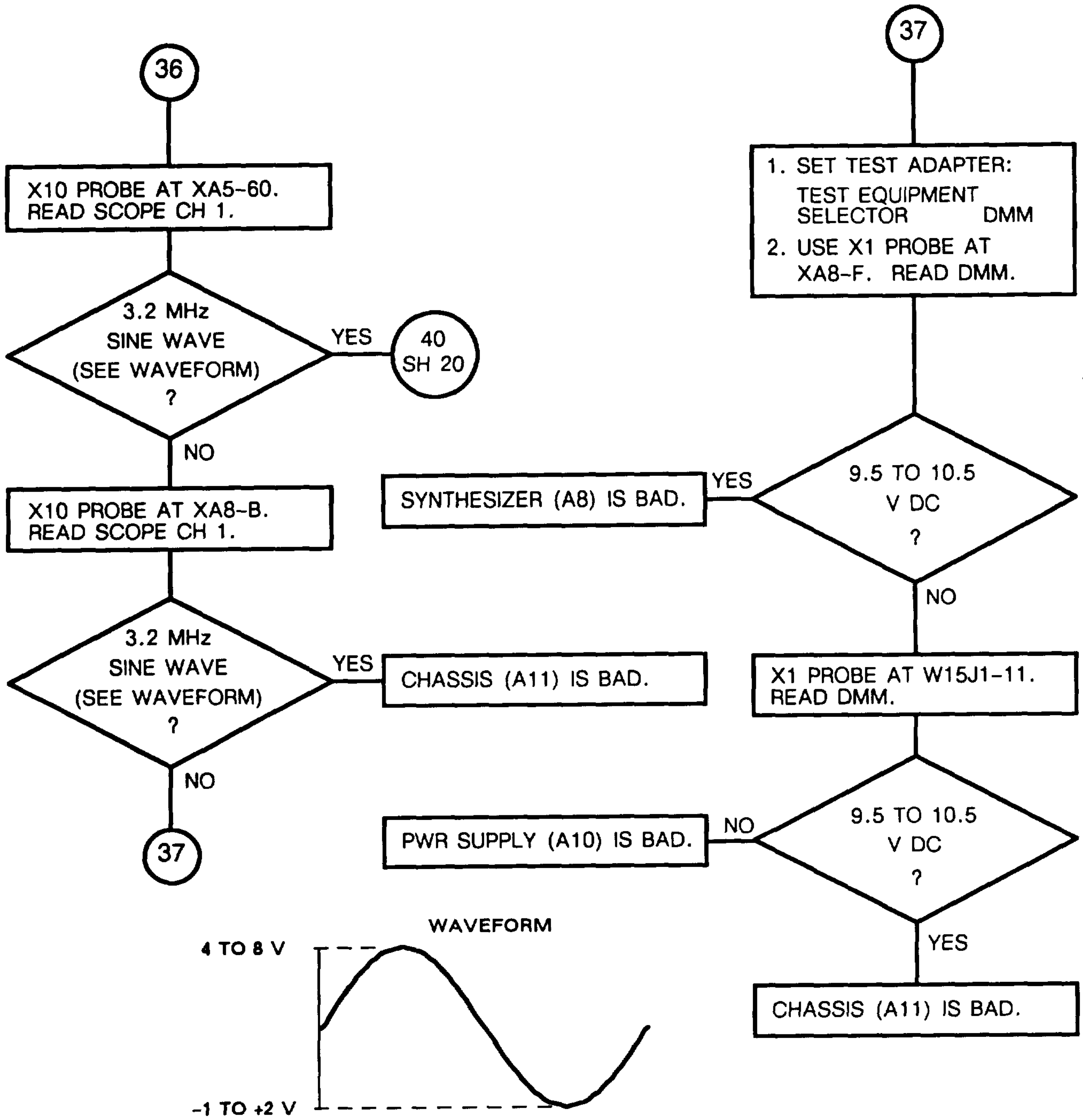
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 17 of 40)



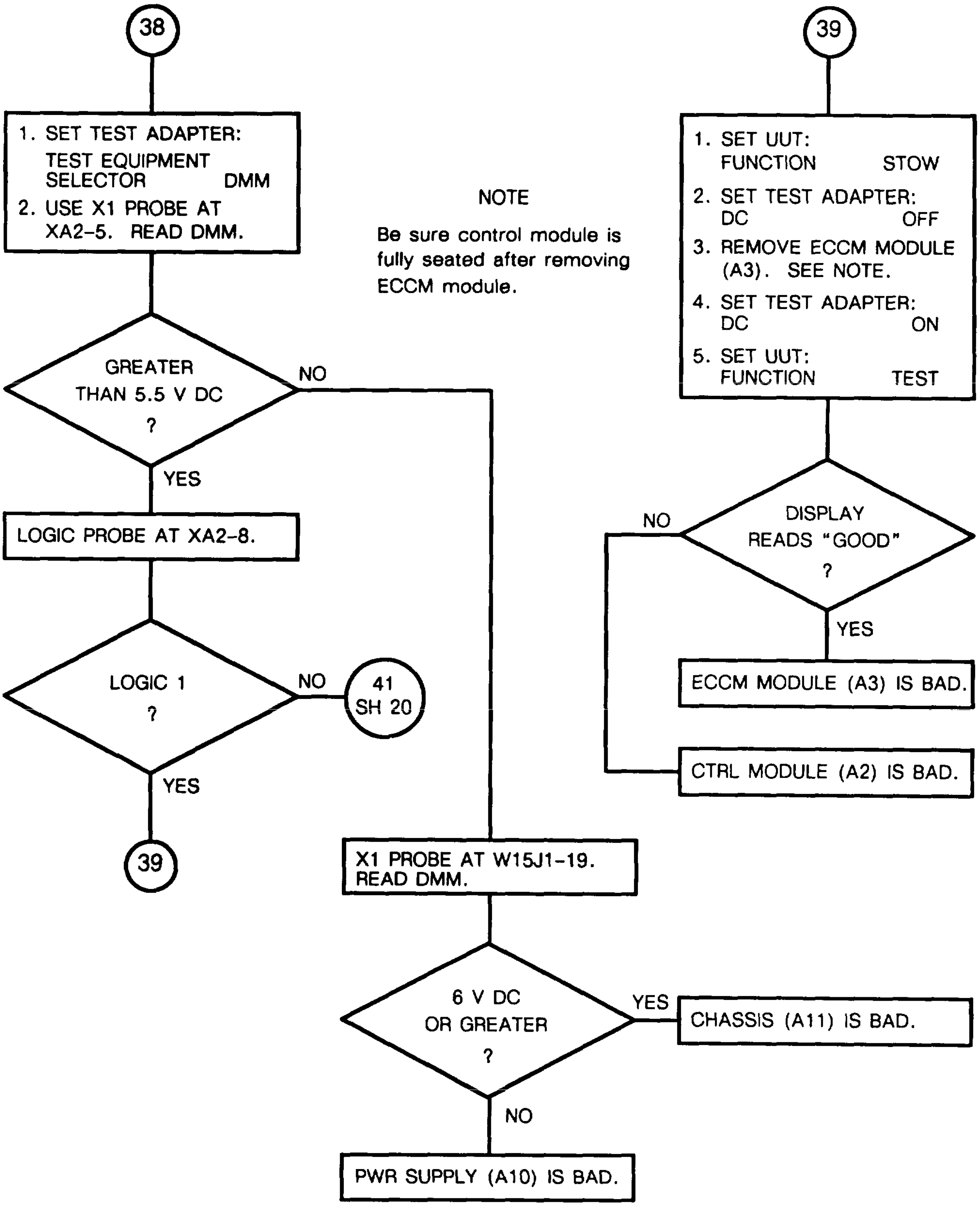
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 18 0f 40)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

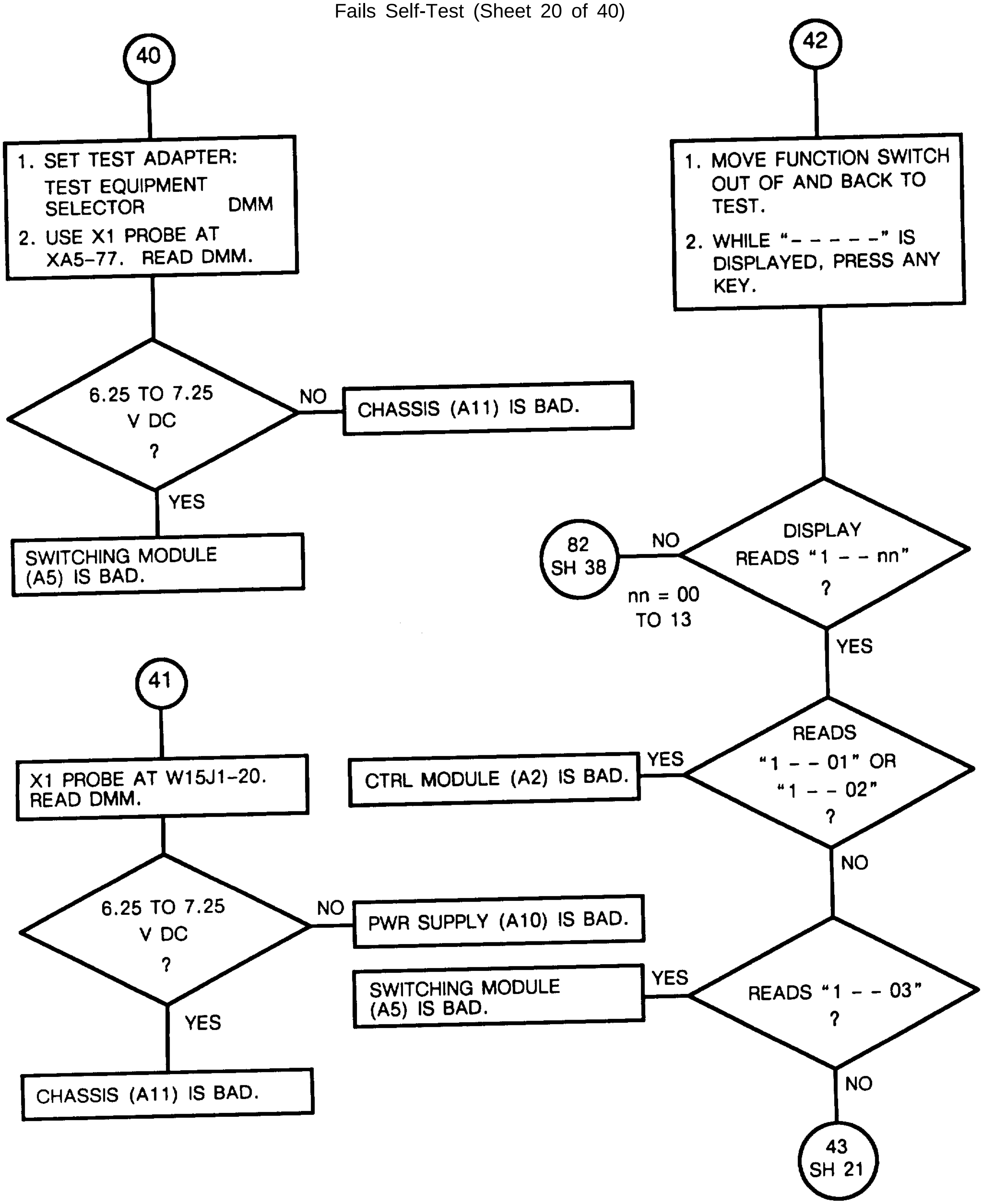
CHART 1
Fails Self-Test (Sheet 19 of 40)



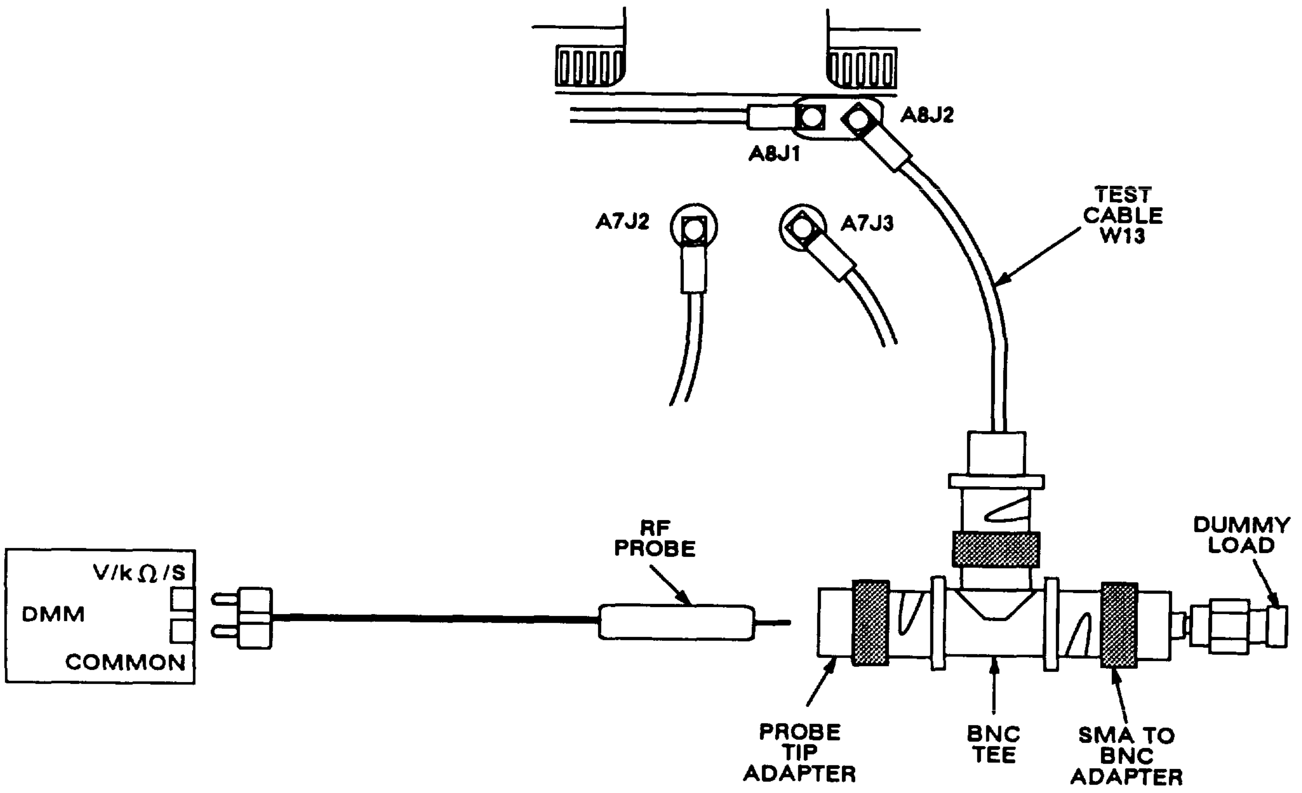
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

Fails Self-Test (Sheet 20 of 40)



1. SET UUT AND REF RT FUNCTION SWITCHES TO STOW.
2. SET TEST ADAPTER DC SWITCH TO OFF.
3. REMOVE TOP COVER FROM UUT.
4. REMOVE POWER SUPPLY (A10) FROM UUT.
5. CONNECT POWER SUPPLY (A10) TO UUT AS SHOWN IN FIGURE F0-10.
6. DISCONNECT CABLE W3 FROM A8J2 ON BOTTOM OF UUT.
7. CONNECT EQUIPMENT AS SHOWN BELOW:

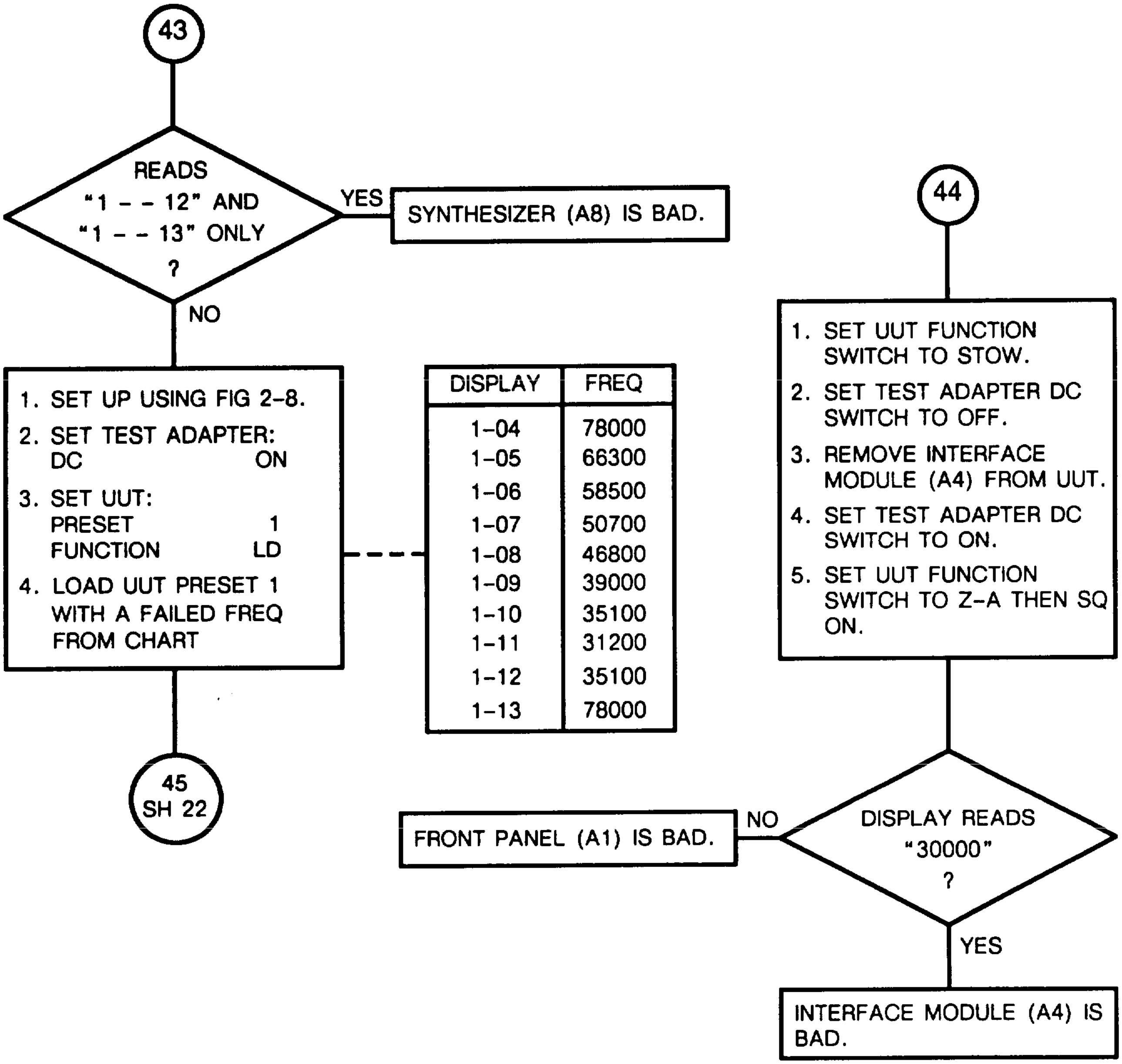


8. CHECK THAT SYNTHESIZER MODULE (A8) IS FULLY SEATED AFTER CONNECTING TEST CABLE W13.

Figure 2-9. Troubleshooting Test Setup No. 2

2-24. TROUBLESHOOTING FLOWCHARTS. Continued

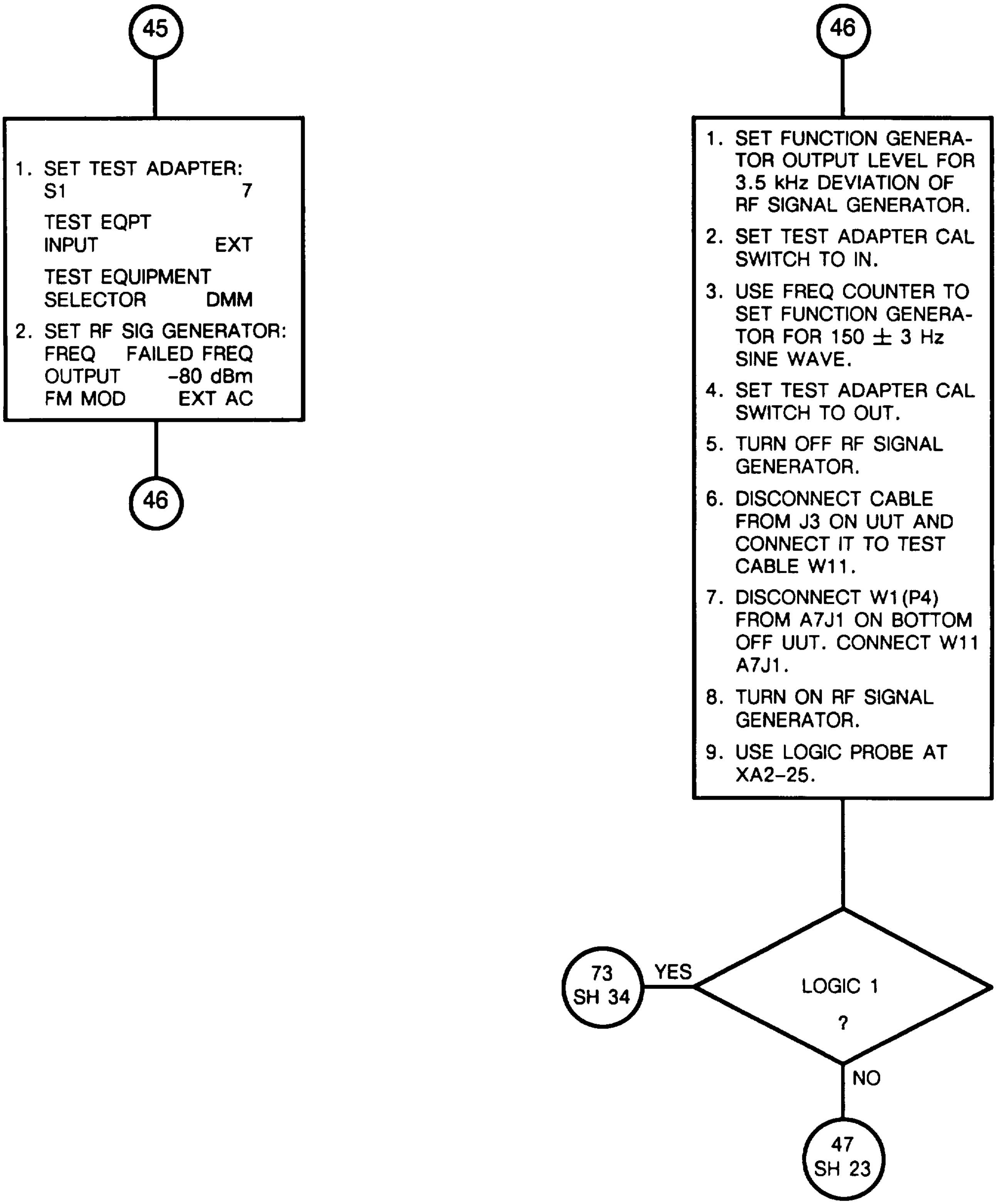
CHART 1
Fails Self-Test (Sheet 21 of 40)



DISPLAY	FREQ
1-04	78000
1-05	66300
1-06	58500
1-07	50700
1-08	46800
1-09	39000
1-10	35100
1-11	31200
1-12	35100
1-13	78000

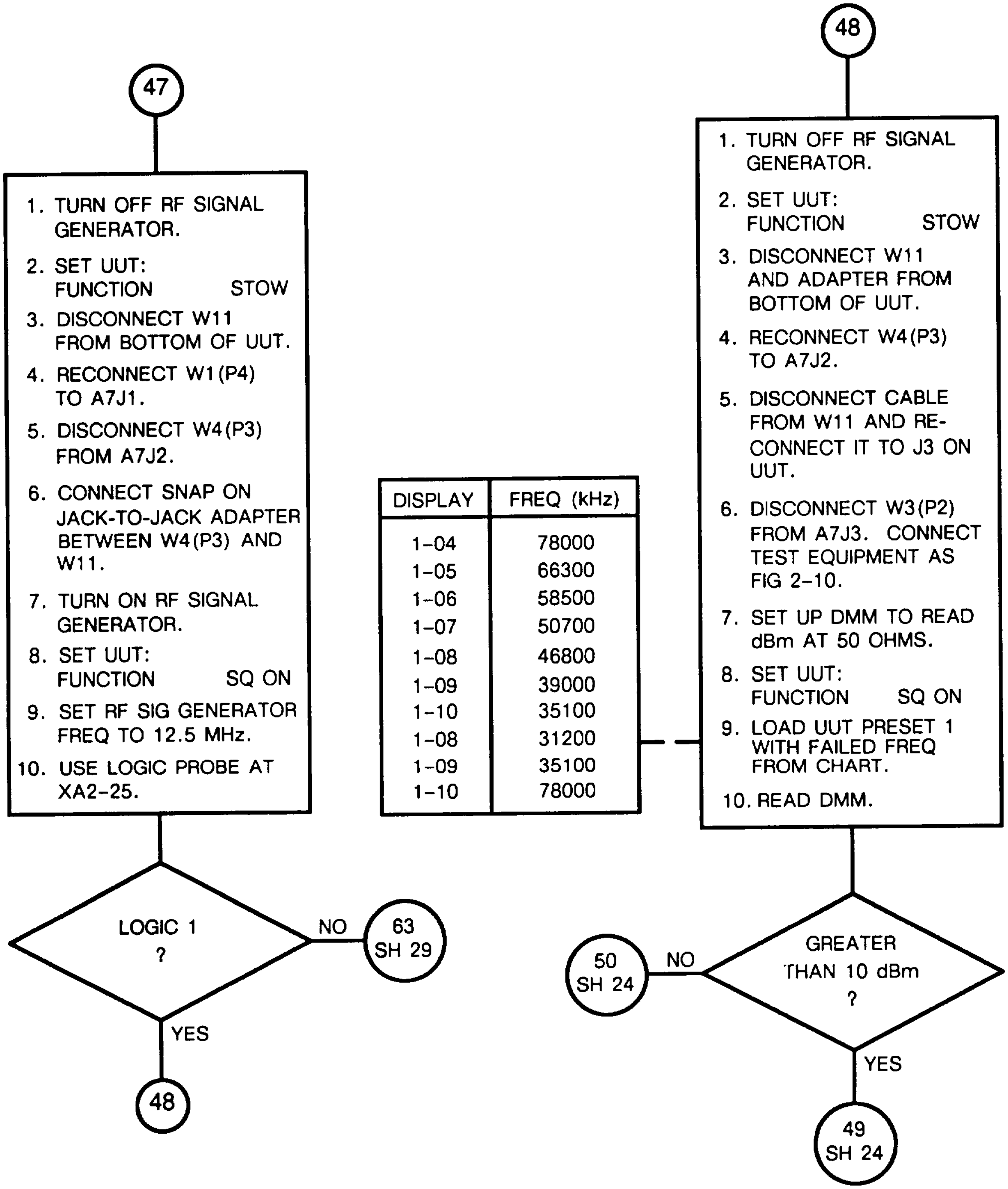
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 22 of 40)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 23 of 40)



DISPLAY	FREQ (kHz)
1-04	78000
1-05	66300
1-06	58500
1-07	50700
1-08	46800
1-09	39000
1-10	35100
1-08	31200
1-09	35100
1-10	78000

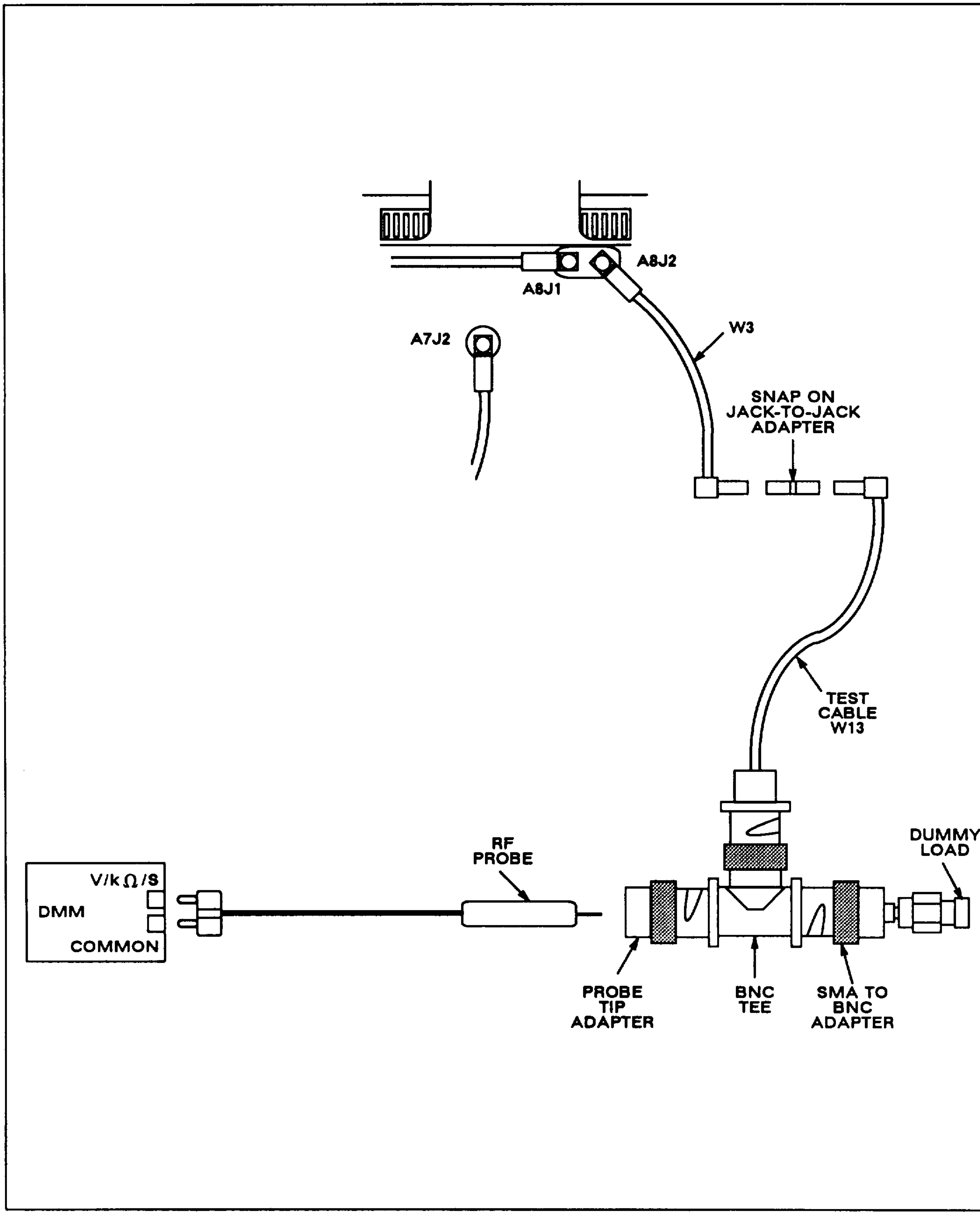
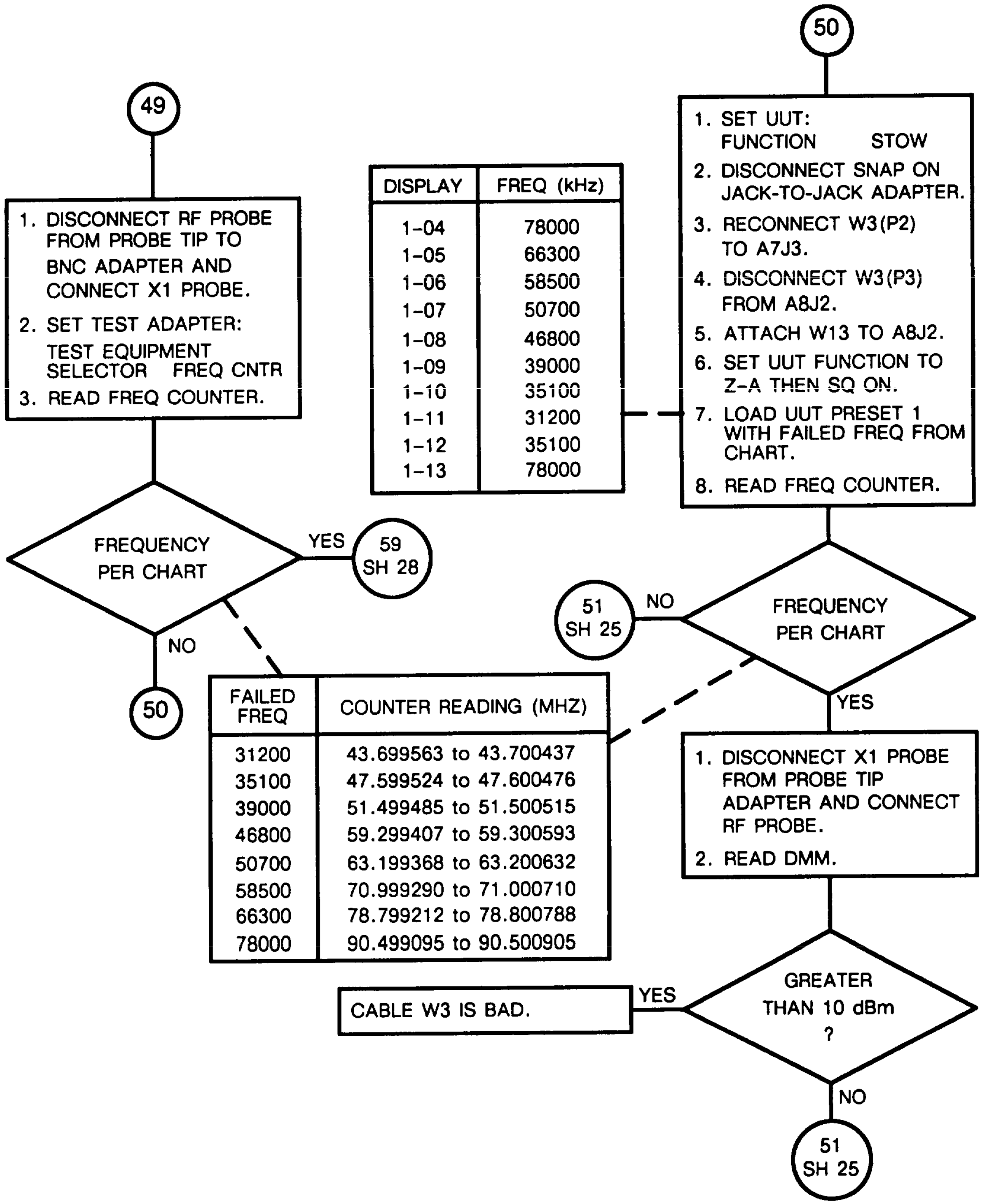


Figure 2-10. Troubleshooting Test Setup No. 3

2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 24 of 40)

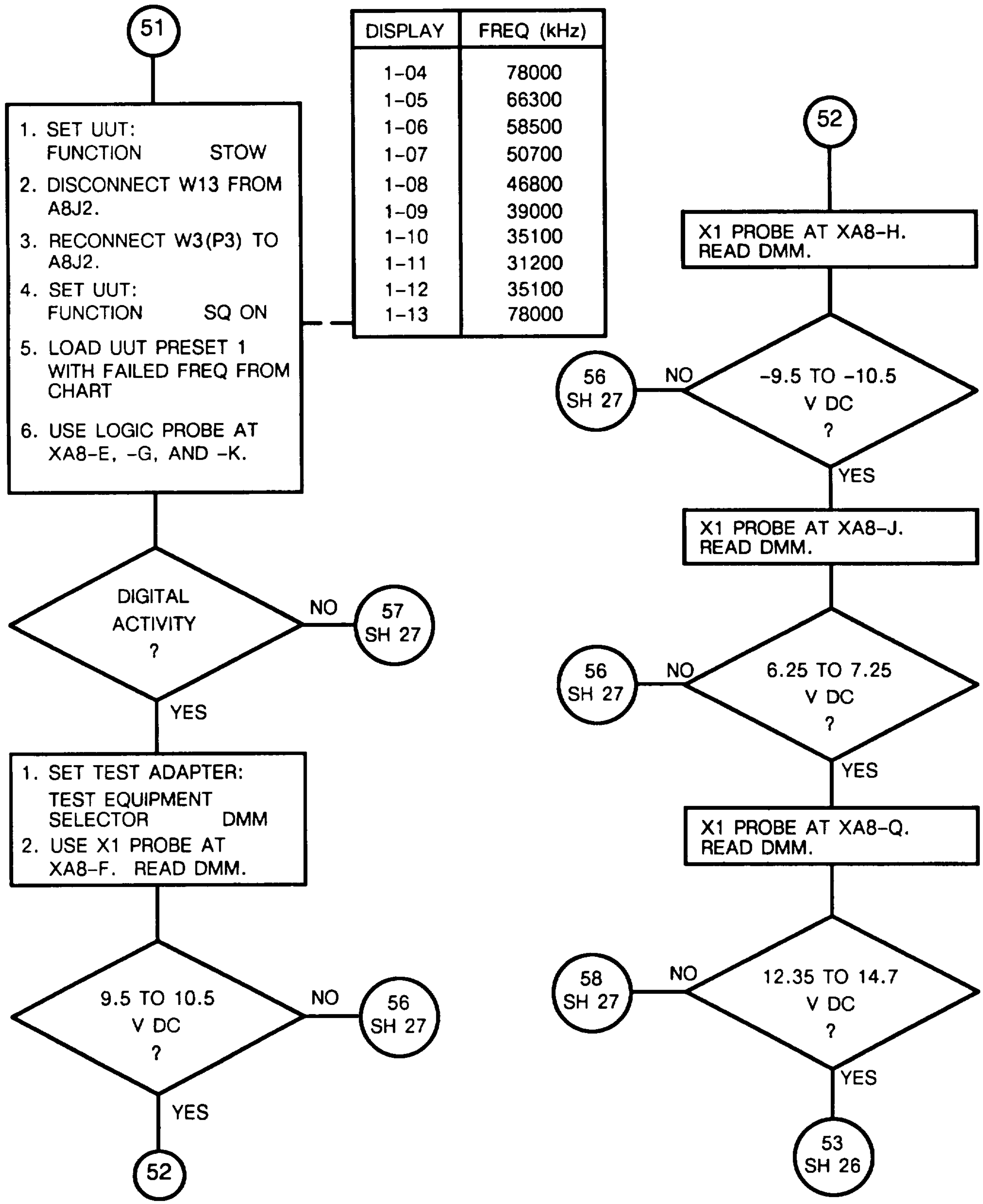


DISPLAY	FREQ (kHz)
1-04	78000
1-05	66300
1-06	58500
1-07	50700
1-08	46800
1-09	39000
1-10	35100
1-11	31200
1-12	35100
1-13	78000

FAILED FREQ	COUNTER READING (MHZ)
31200	43.699563 to 43.700437
35100	47.599524 to 47.600476
39000	51.499485 to 51.500515
46800	59.299407 to 59.300593
50700	63.199368 to 63.200632
58500	70.999290 to 71.000710
66300	78.799212 to 78.800788
78000	90.499095 to 90.500905

2-24. TROUBLESHOOTING FLOWCHARTS. Continued

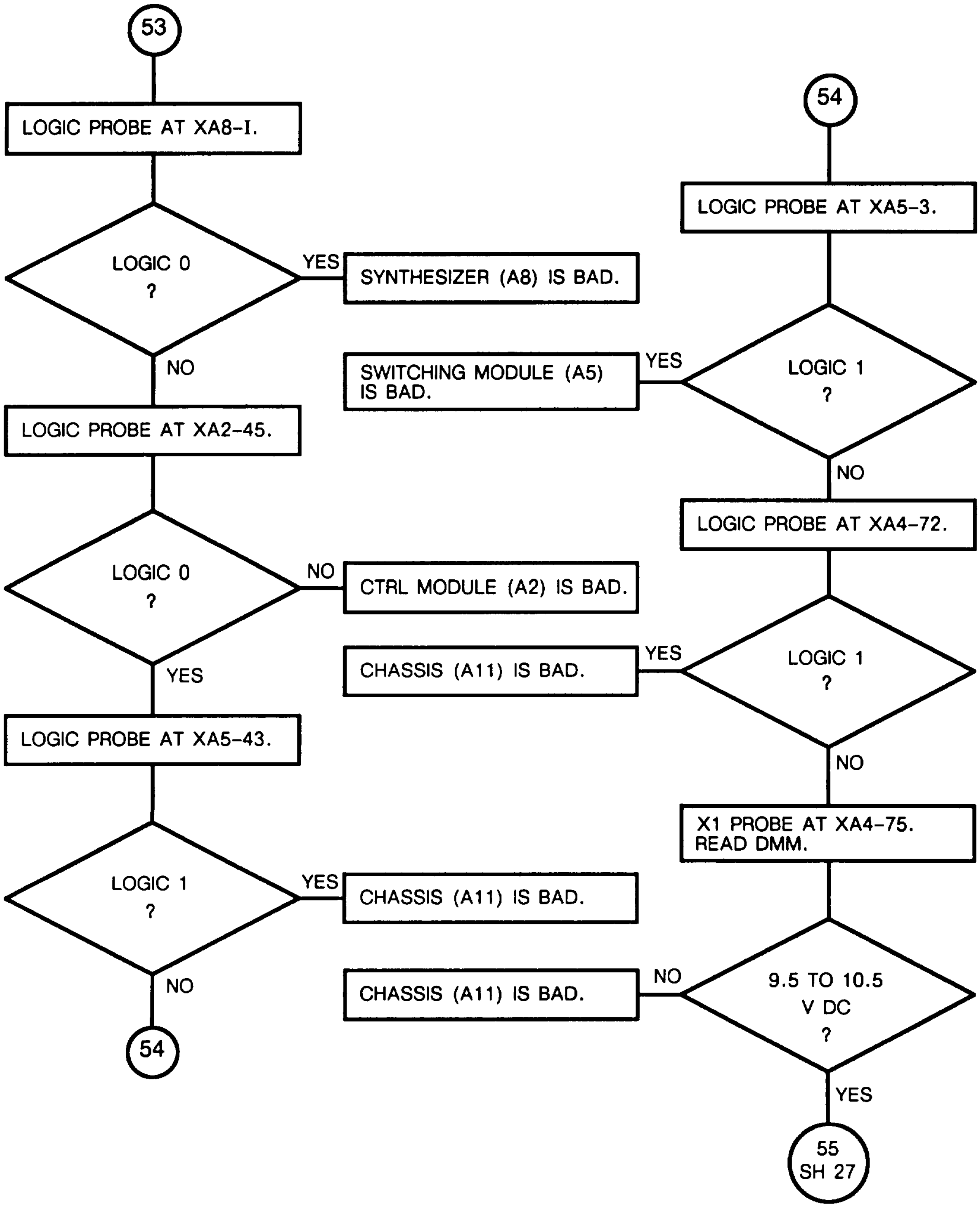
CHART 1
Fails Self-Test (Sheet 25 of 40)



DISPLAY	FREQ (kHz)
1-04	78000
1-05	66300
1-06	58500
1-07	50700
1-08	46800
1-09	39000
1-10	35100
1-11	31200
1-12	35100
1-13	78000

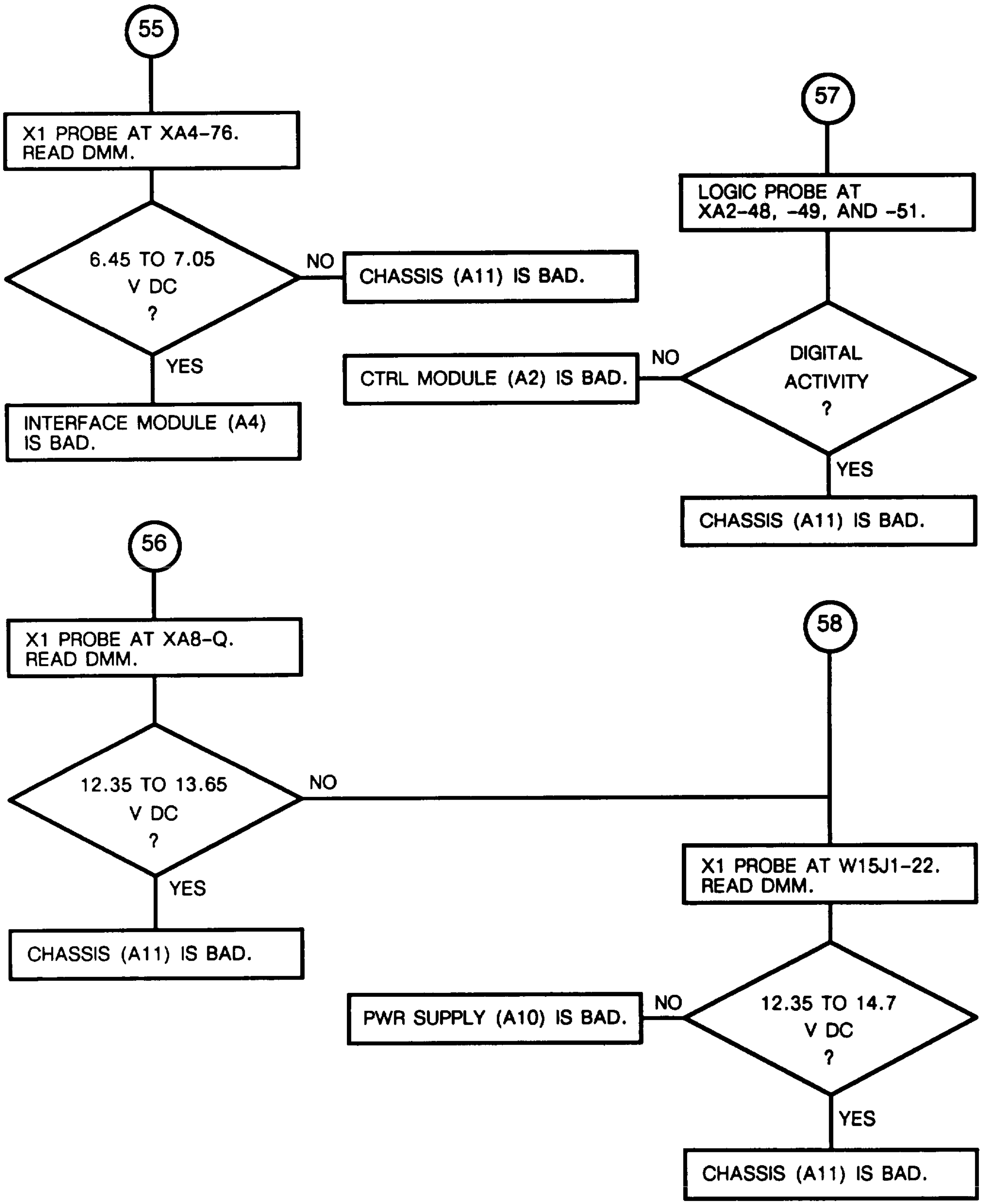
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 26 of 40)



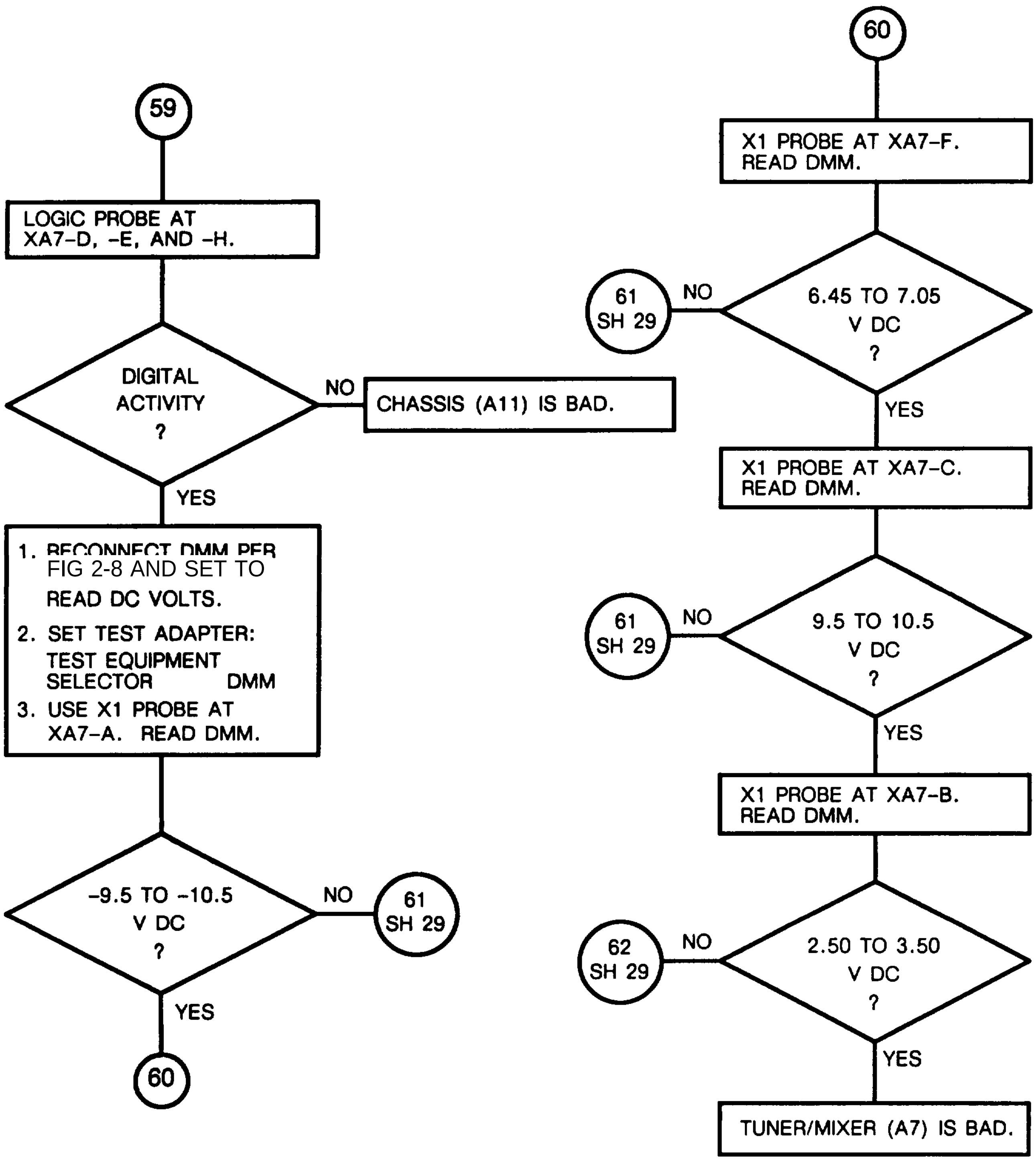
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 27 of 40)



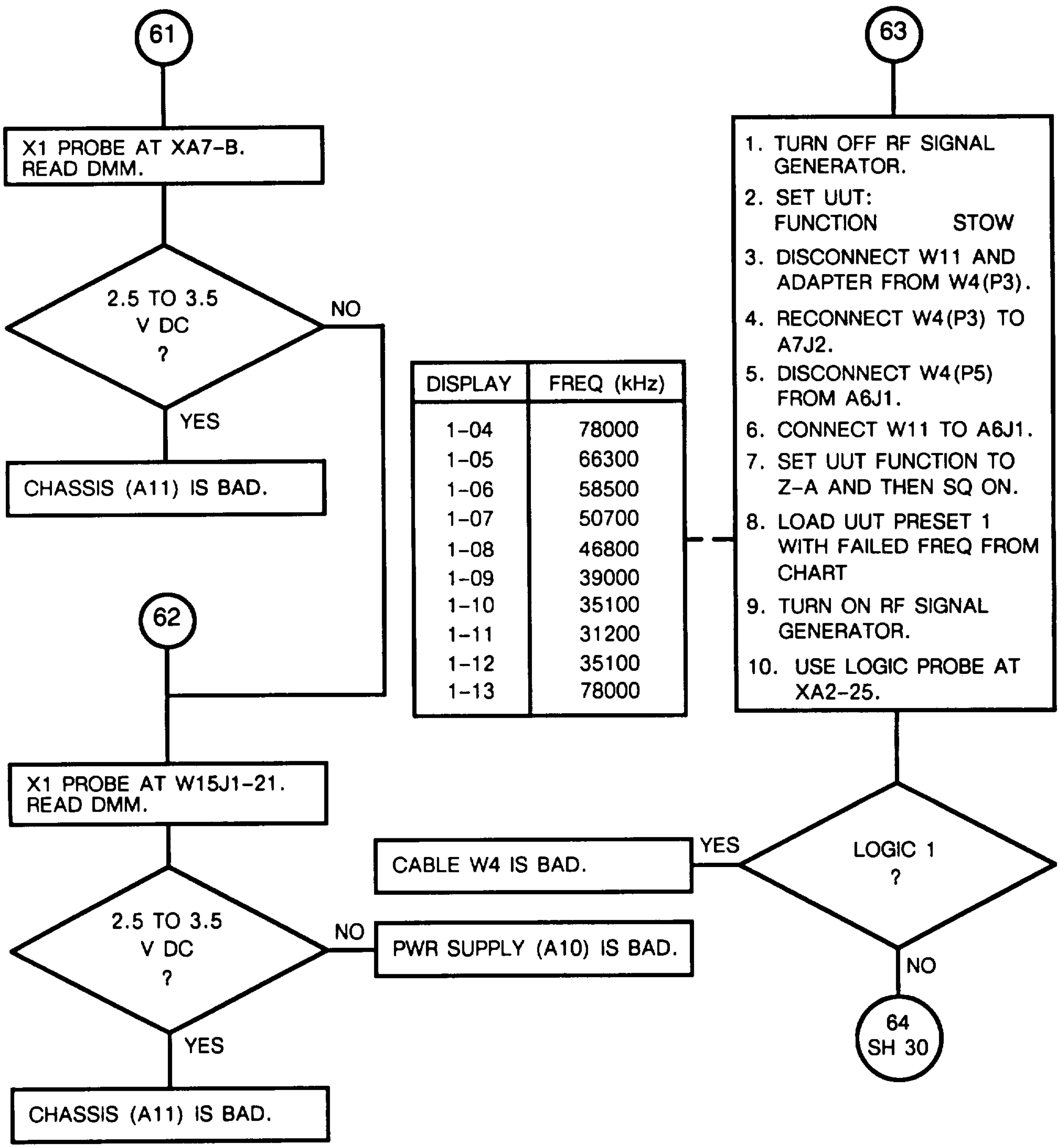
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 28 of 40)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

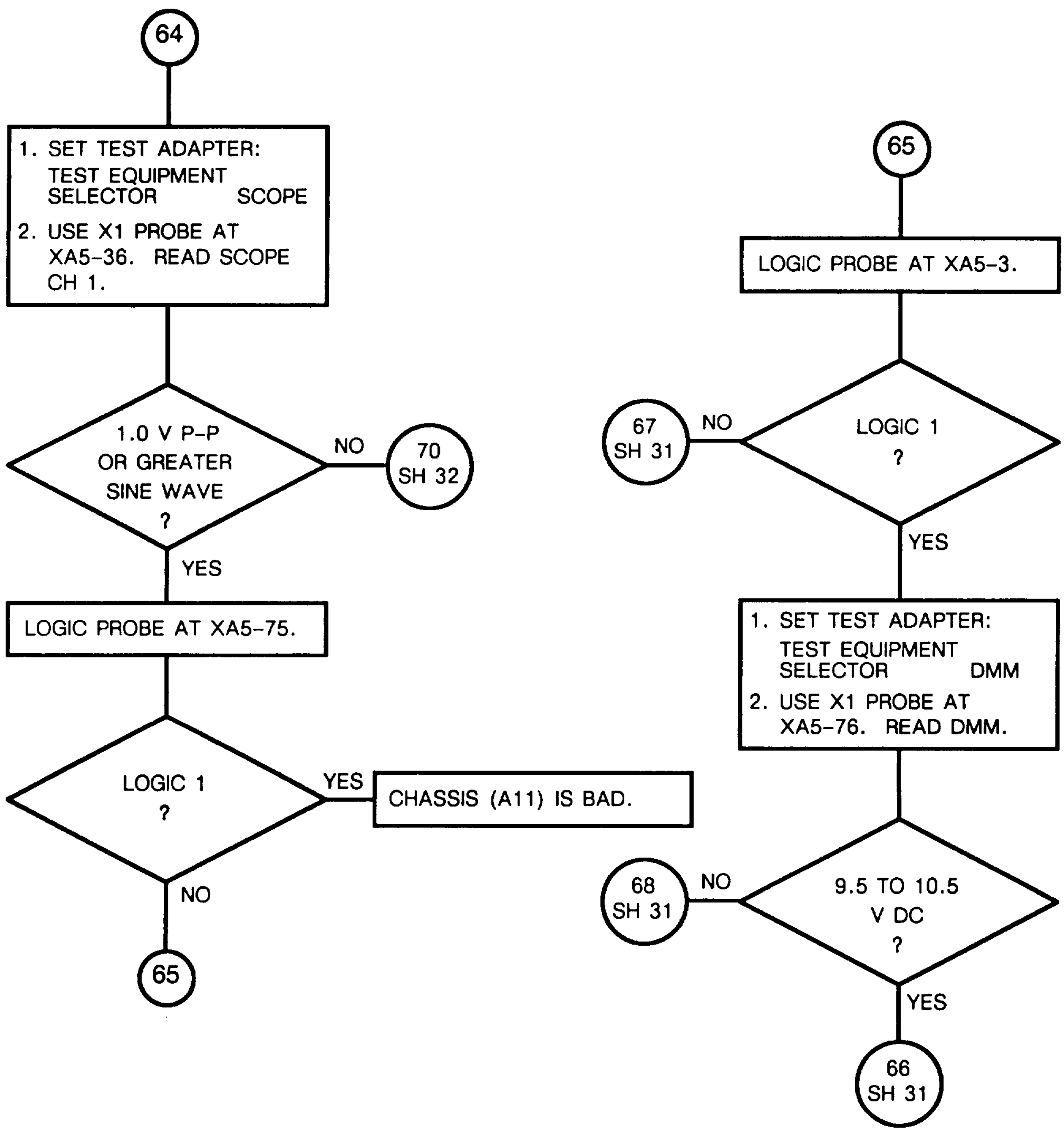
CHART 1
Fails Self-Test (Sheet 29 of 40)



DISPLAY	FREQ (kHz)
1-04	78000
1-05	66300
1-06	58500
1-07	50700
1-08	46800
1-09	39000
1-10	35100
1-11	31200
1-12	35100
1-13	78000

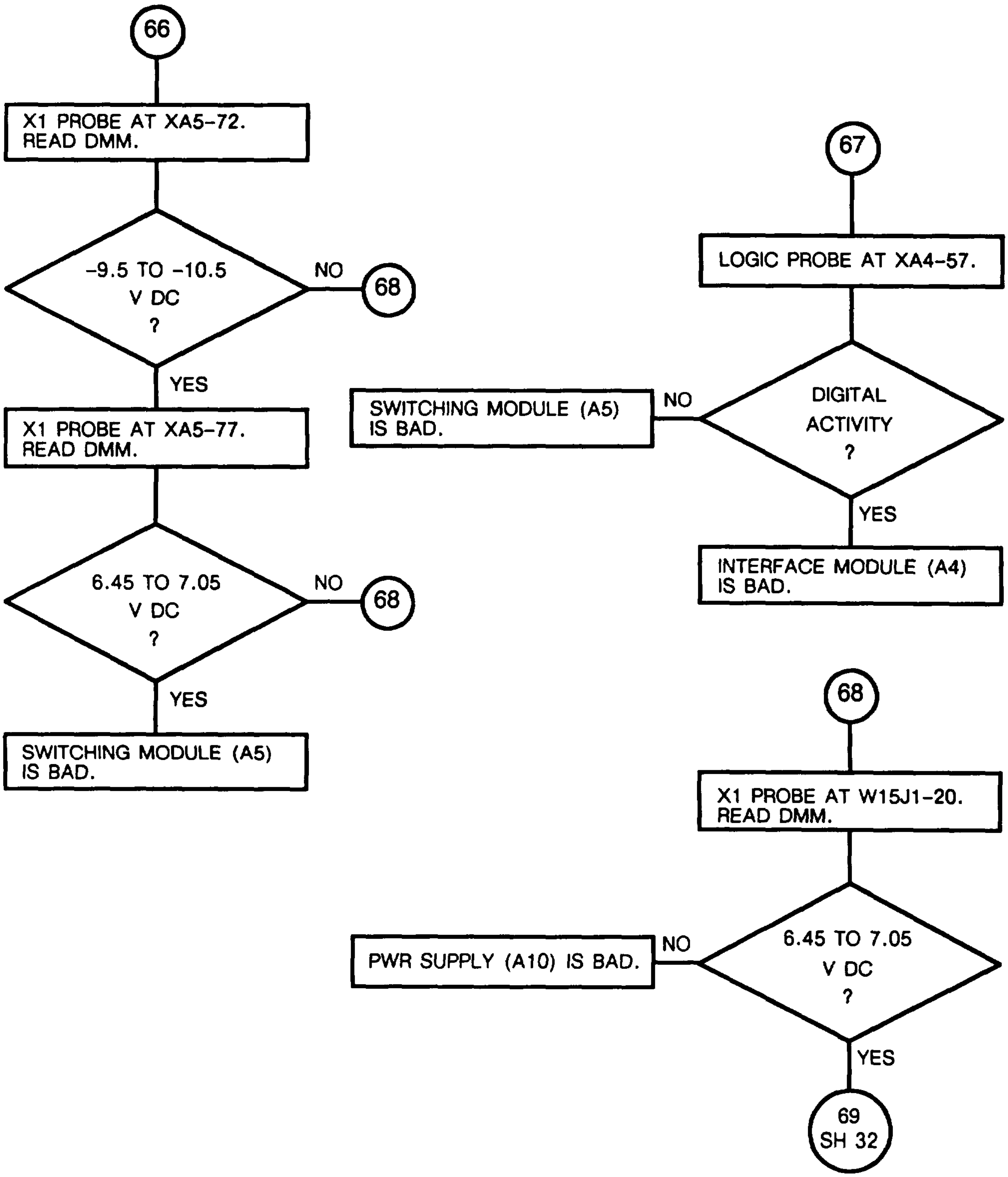
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 30 of 40)



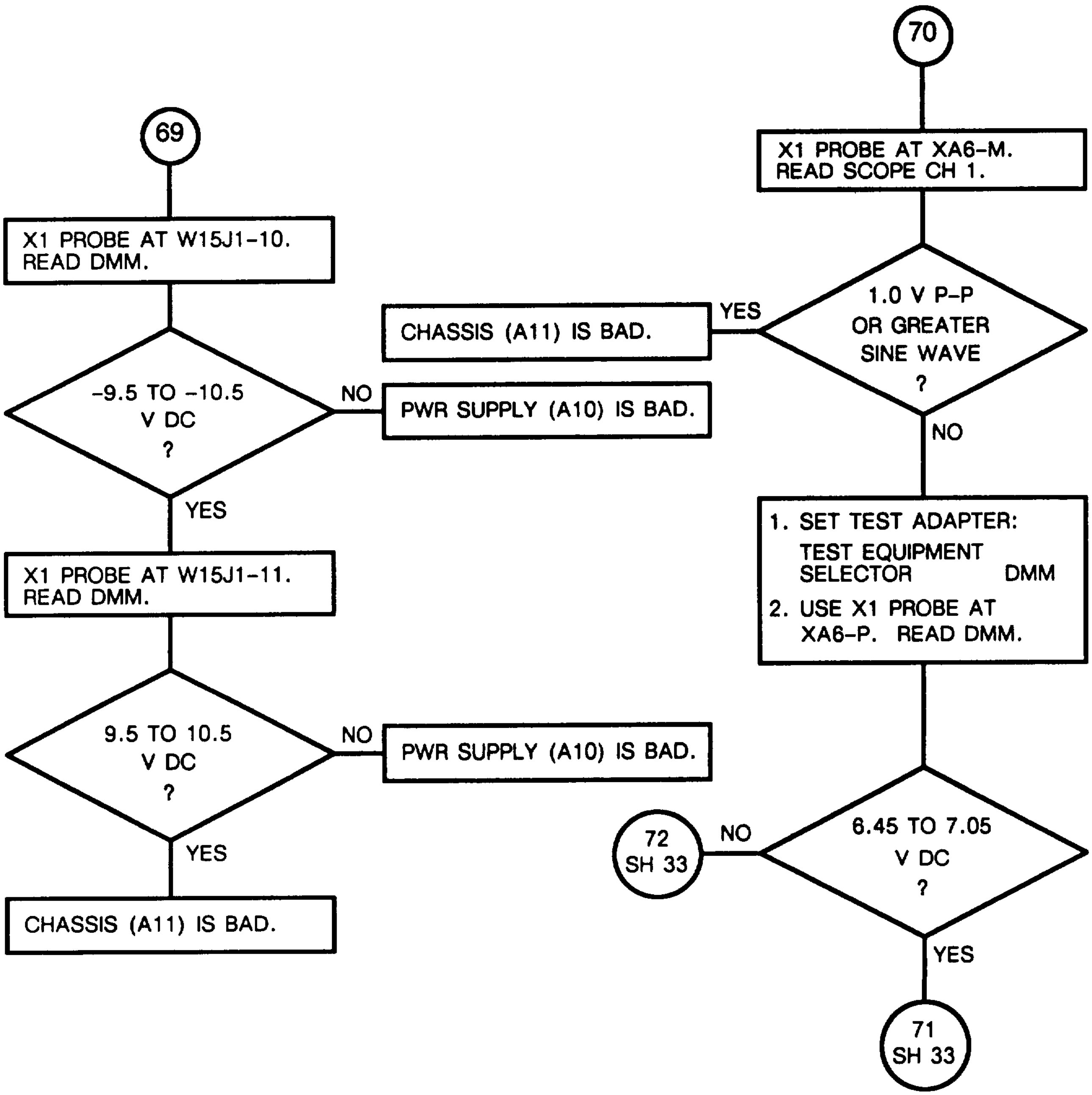
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 31 of 40)



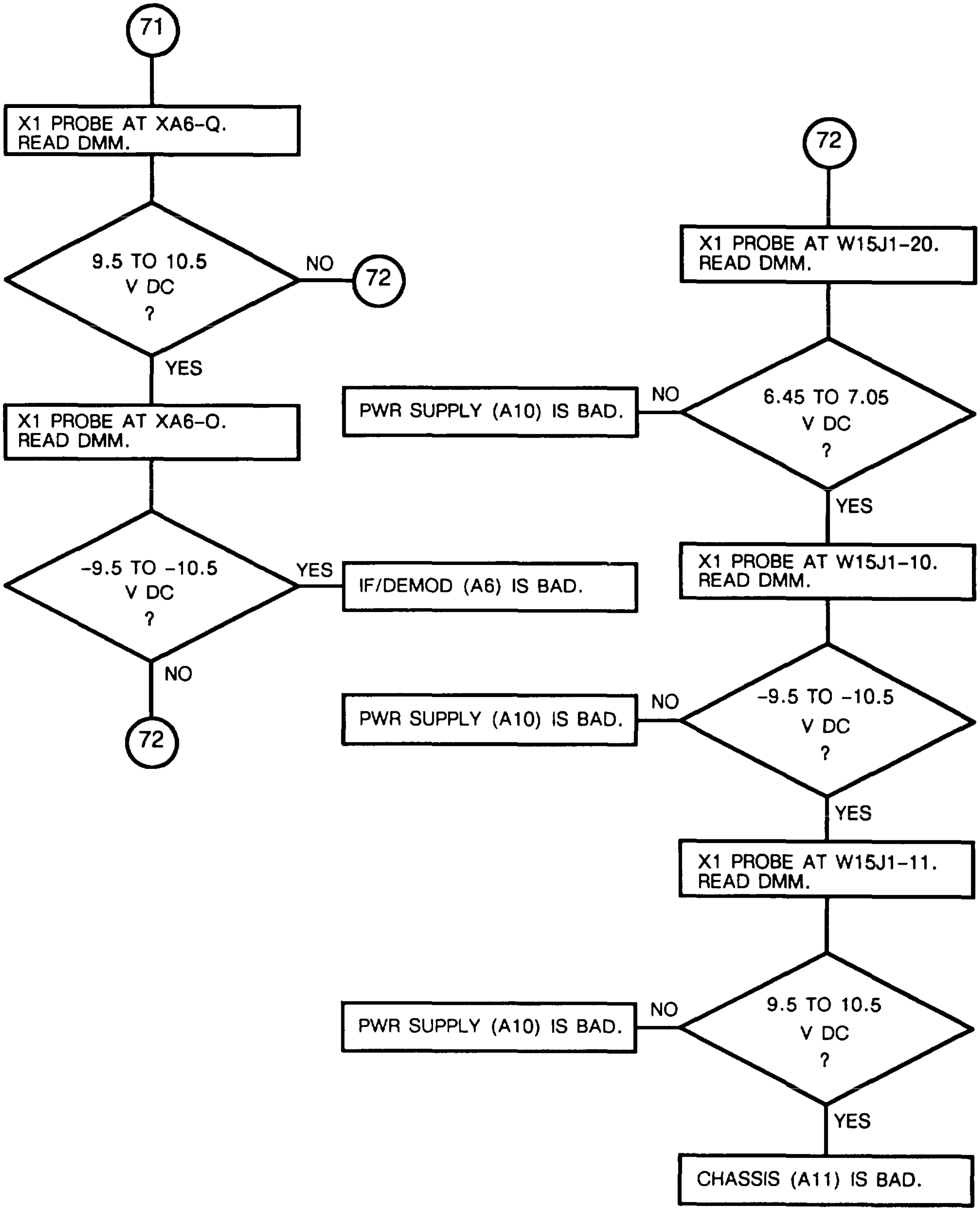
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 32 0f 40)



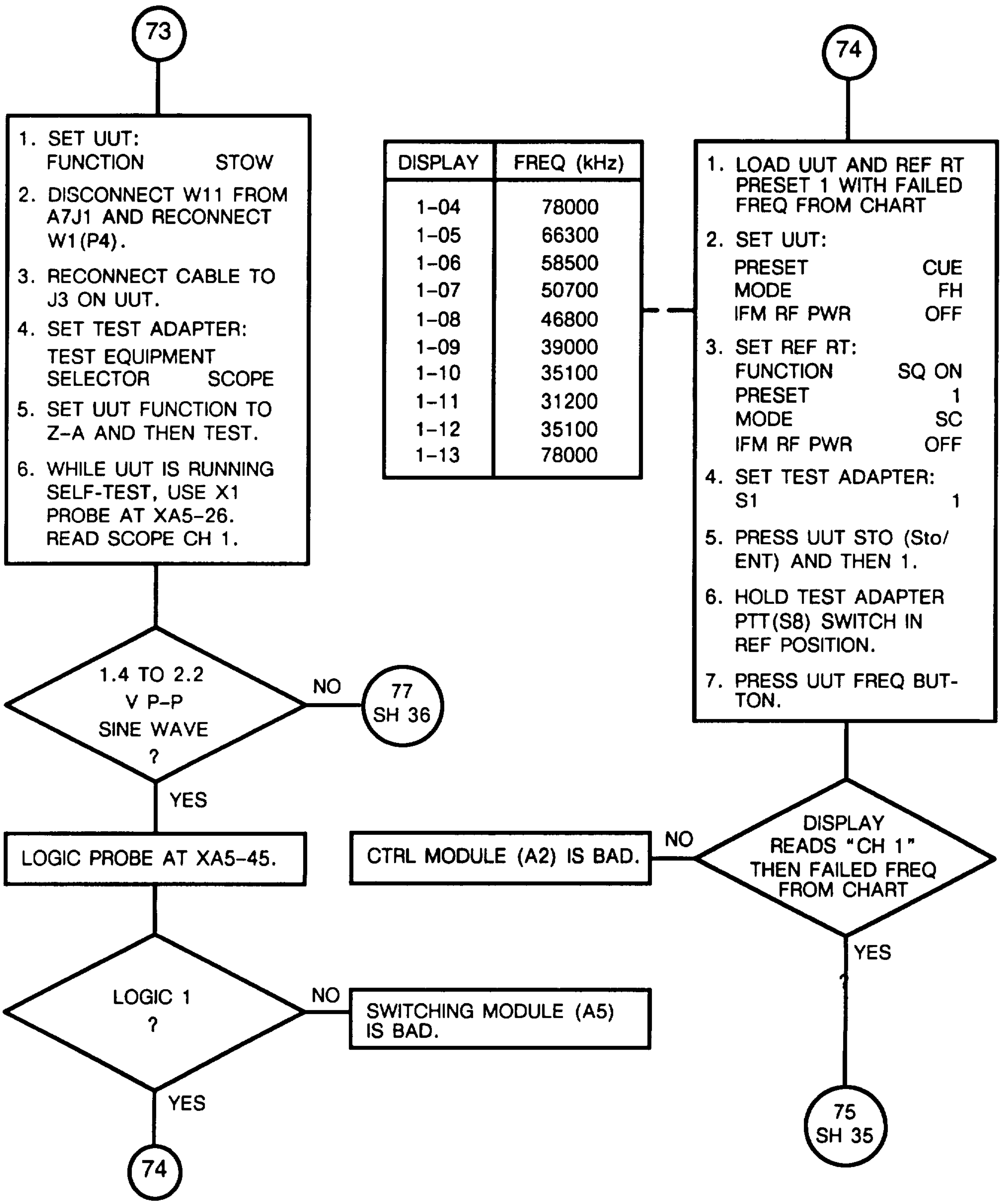
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 33 of 40)



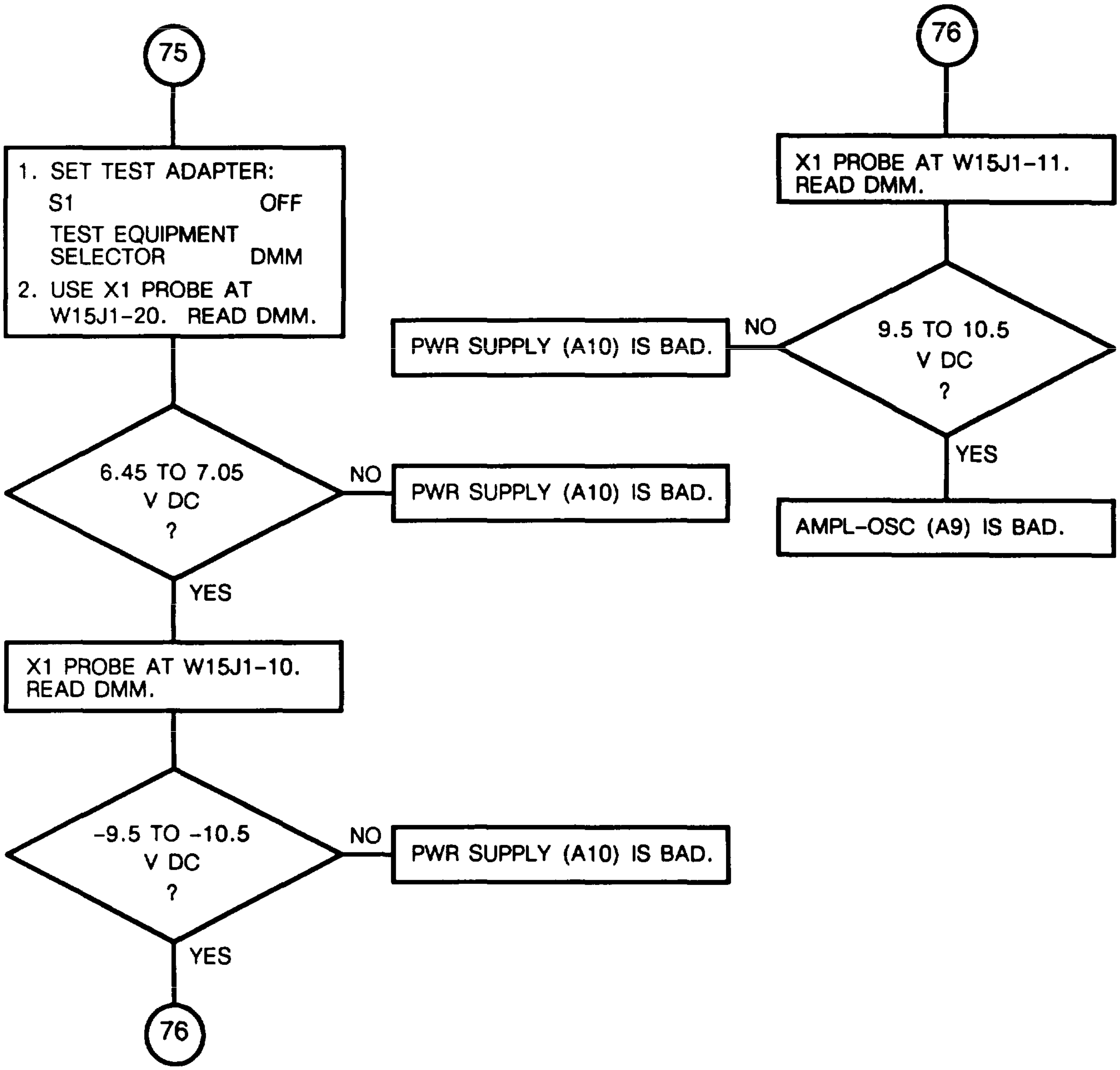
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 34 of 40)



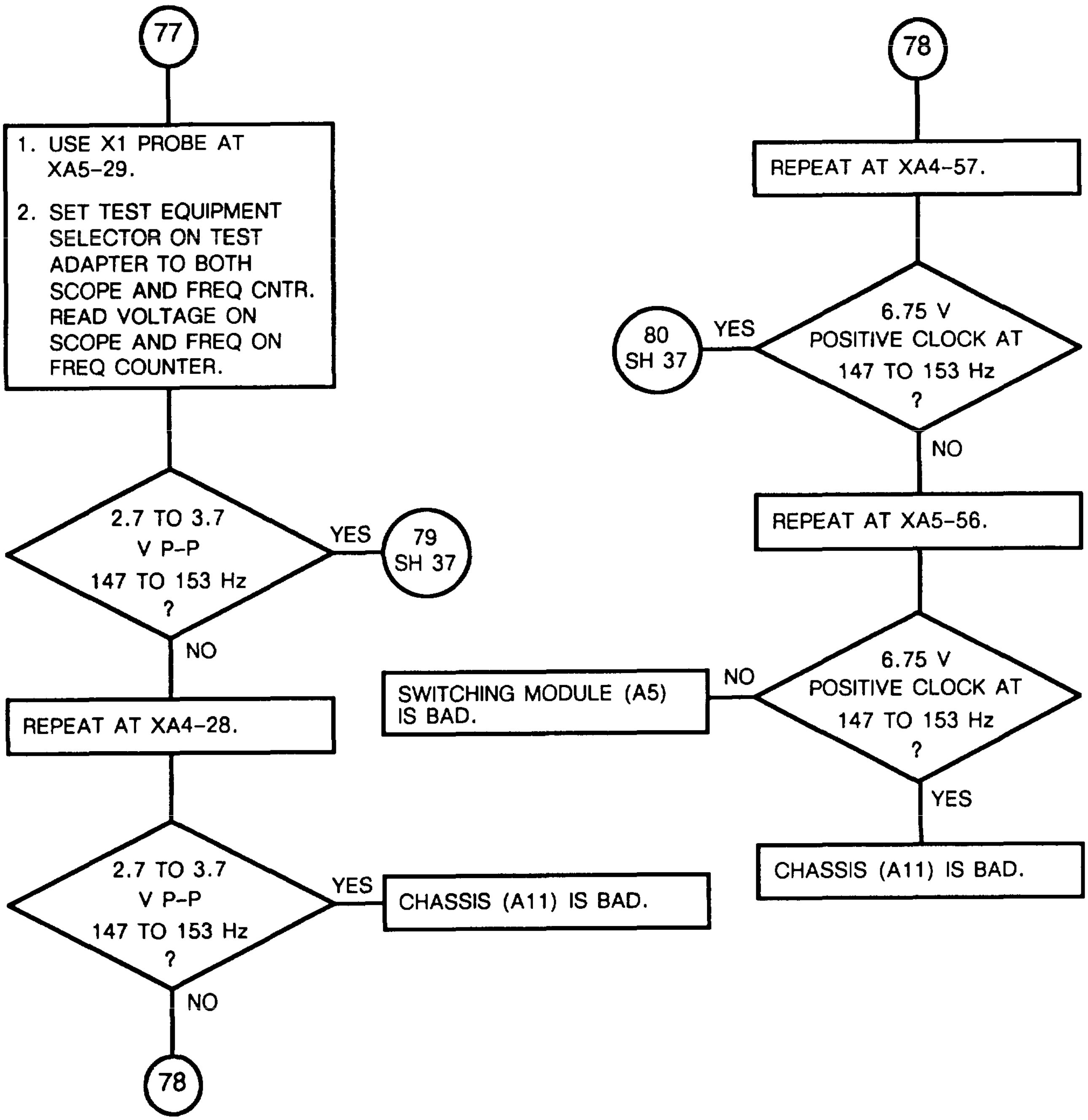
2-24, TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 35 of 40)



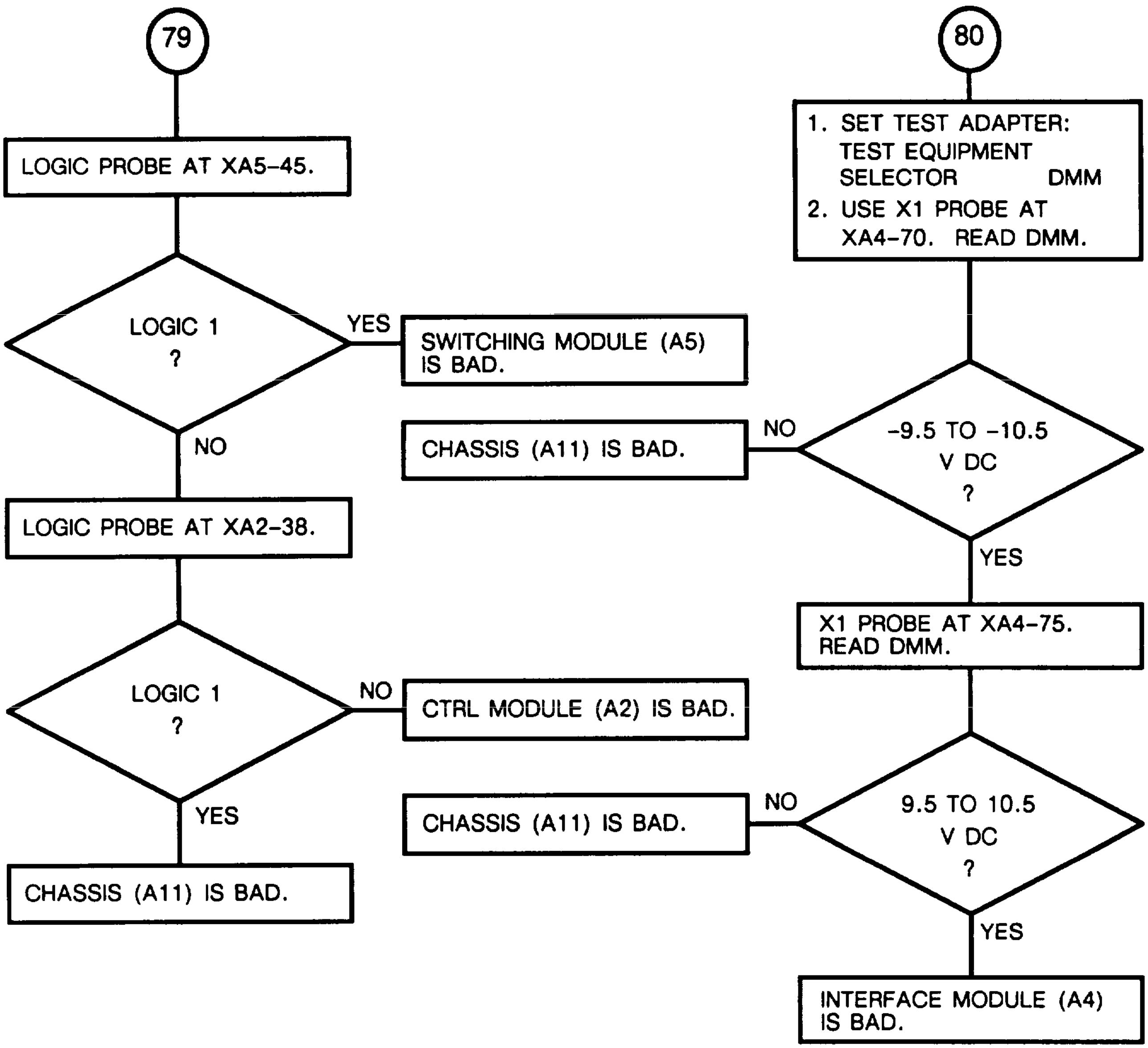
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 36 of 40)



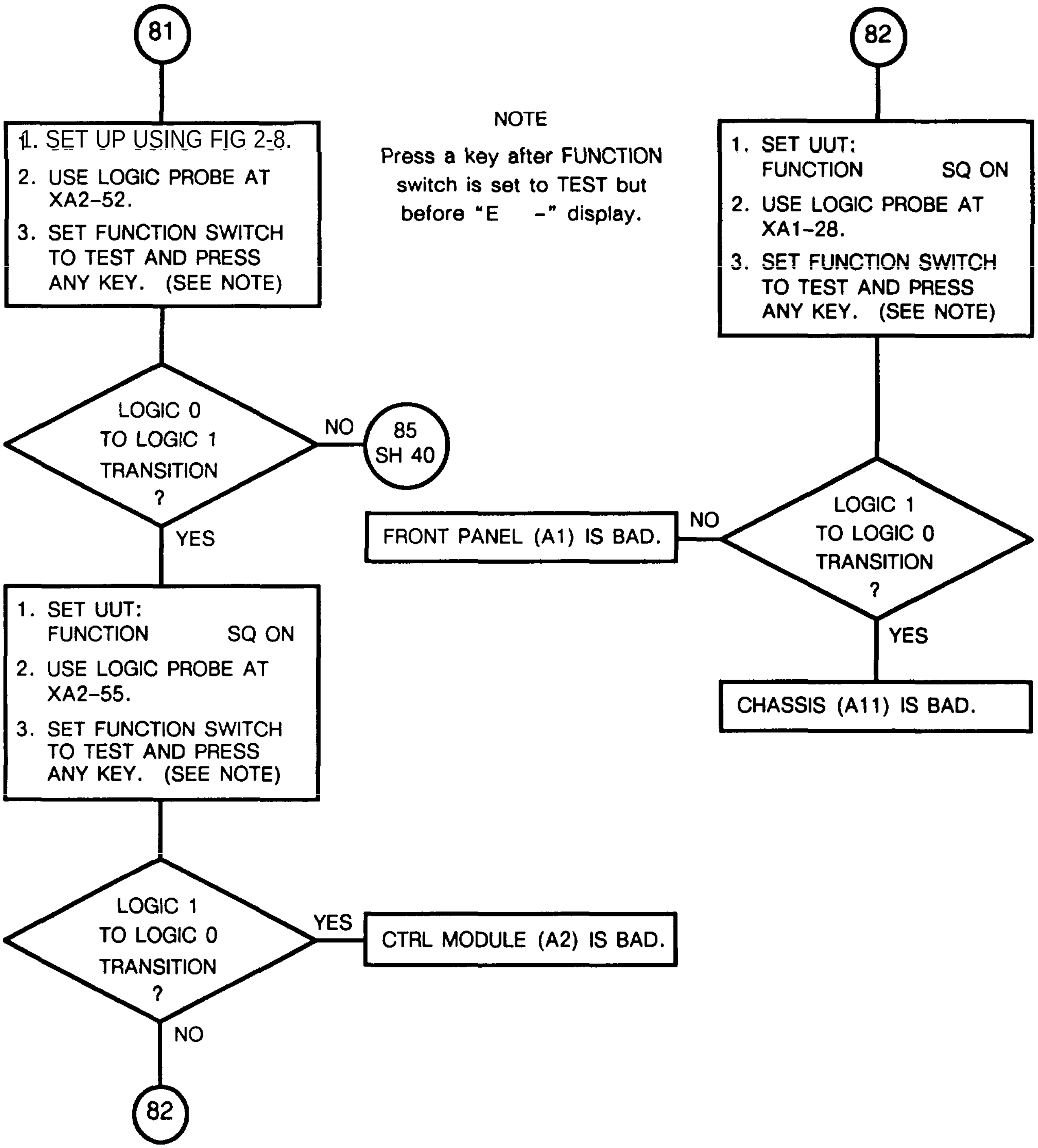
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 37 of 40)



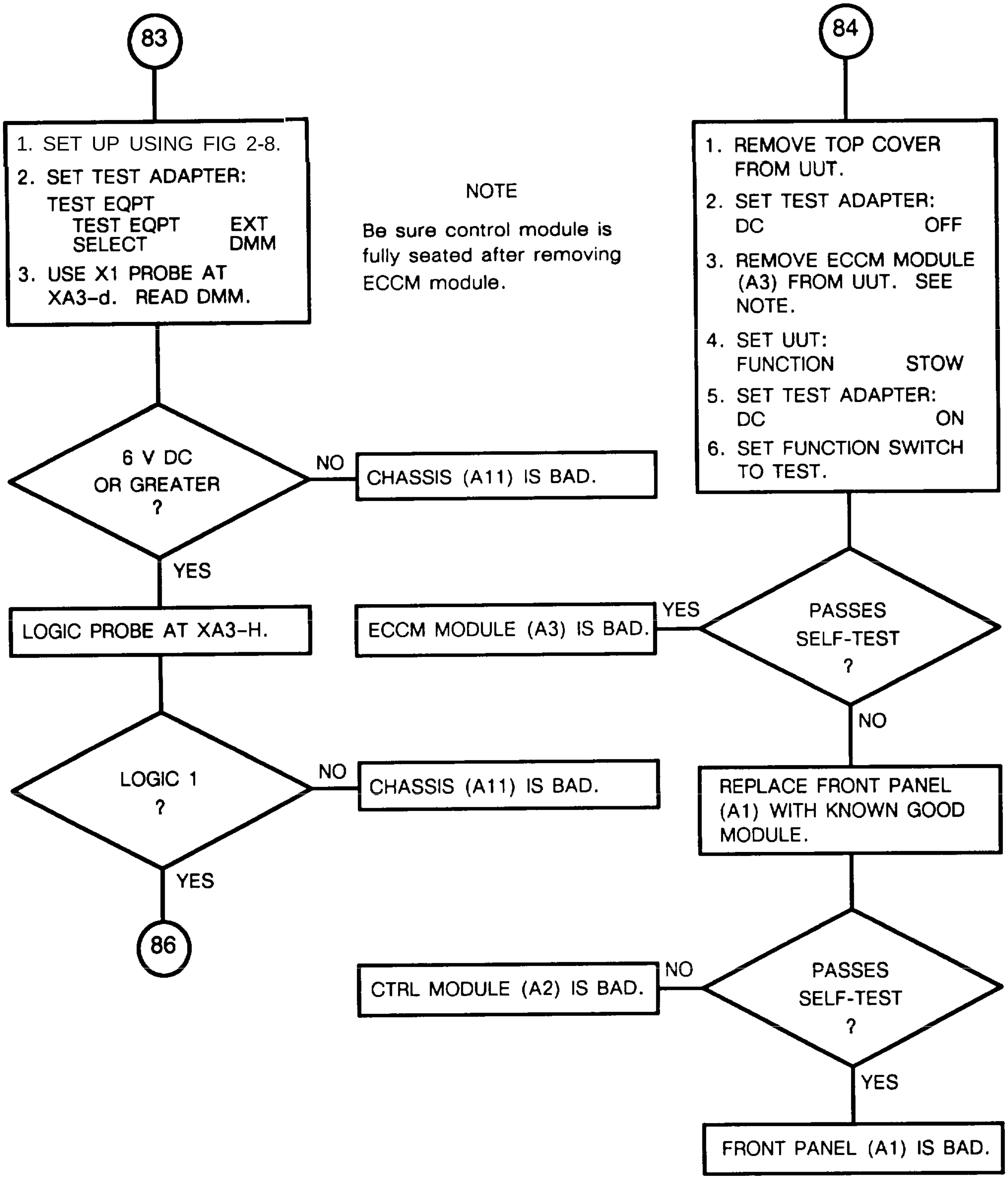
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 38 of 40)



2-24. TROUBLESHOOTING FLOWCHARTS, Continued

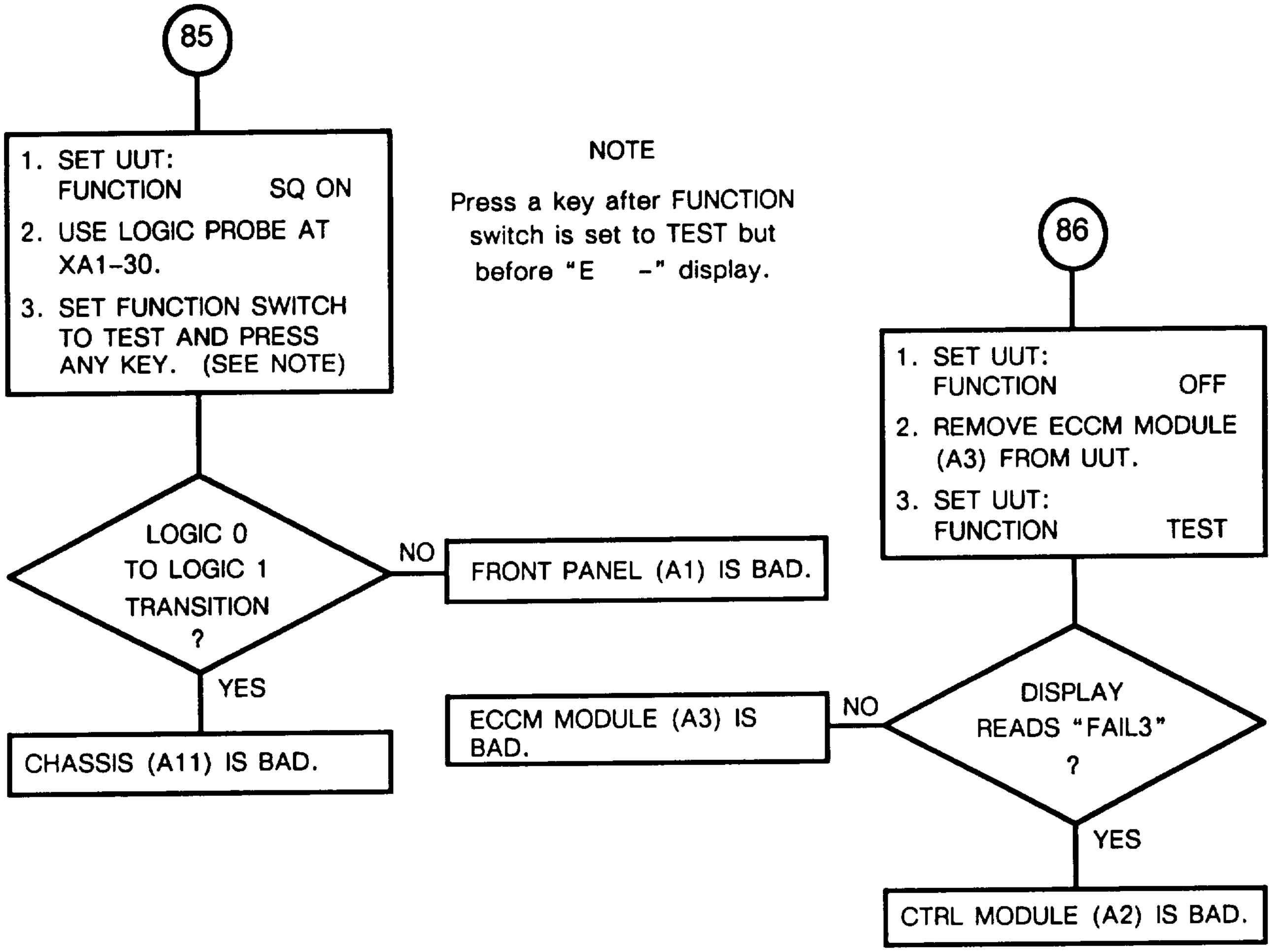
CHART 1
Fails Self-Test (Sheet 39 of 40)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

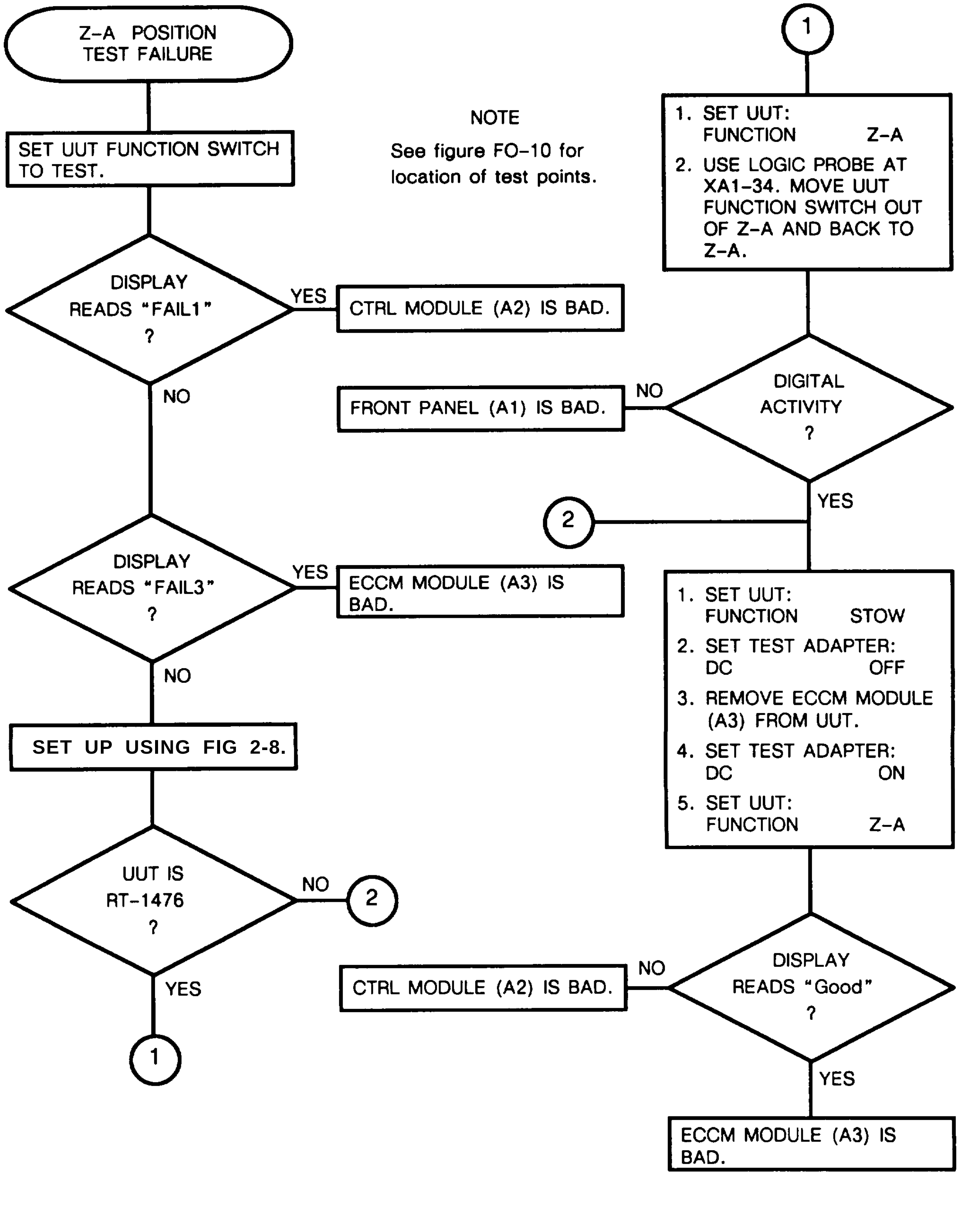
CHART 1

Fails Self-Test (Sheet 40 of 40)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2
Fails Z-A Position Test

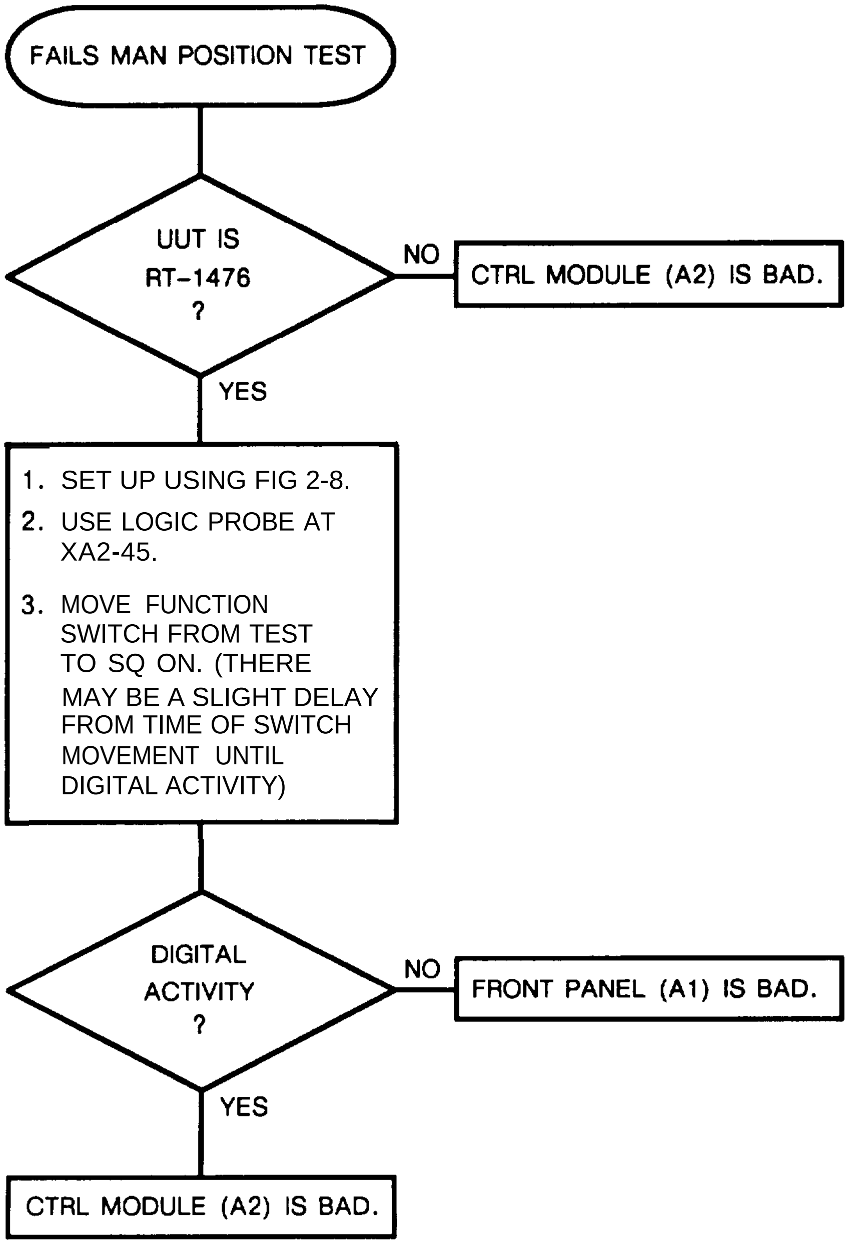


2-24. TROUBLESHOOTING FLOWCHARTS, Continued

CHART 3
Fails MAN Position Test

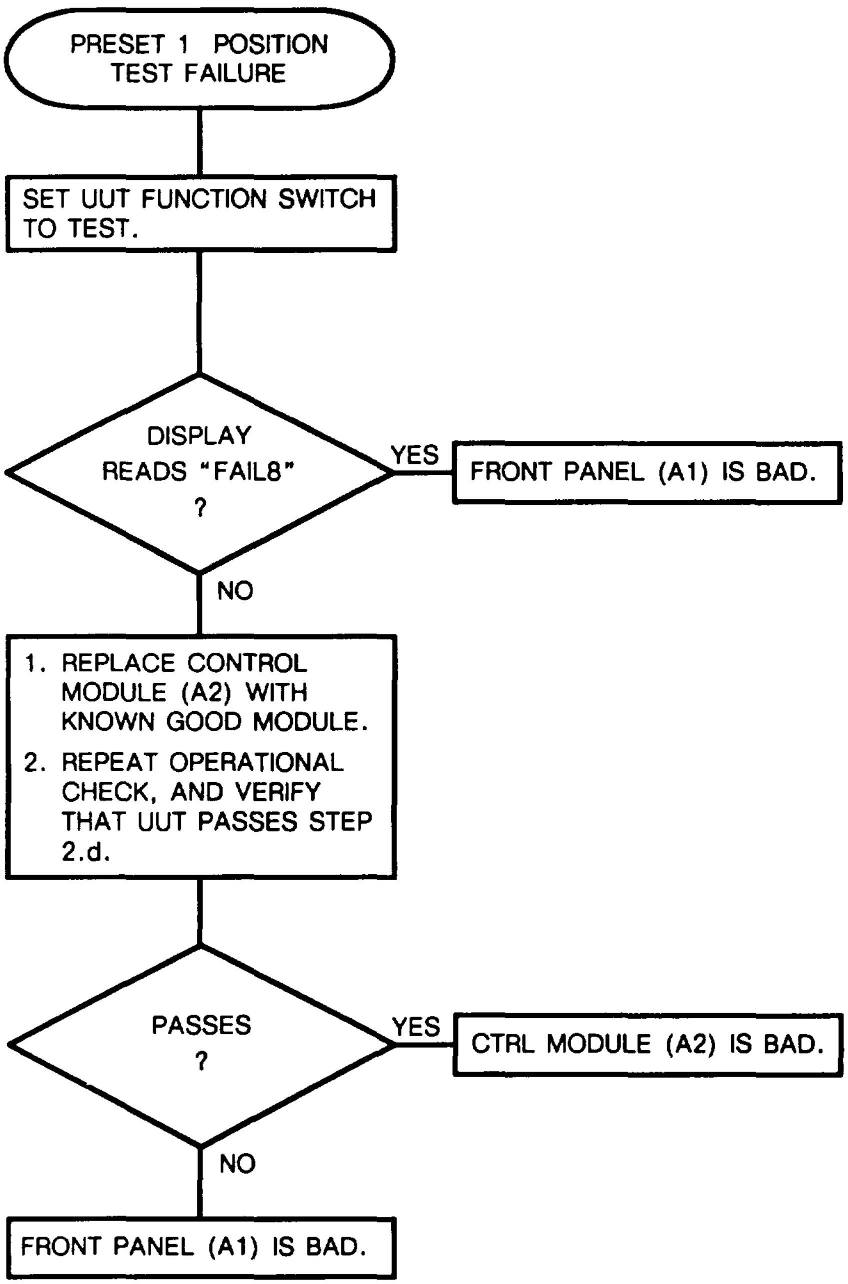
NOTE

See figure FO-10 for location of test points.



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 4
Fails Preset 1 Position Test

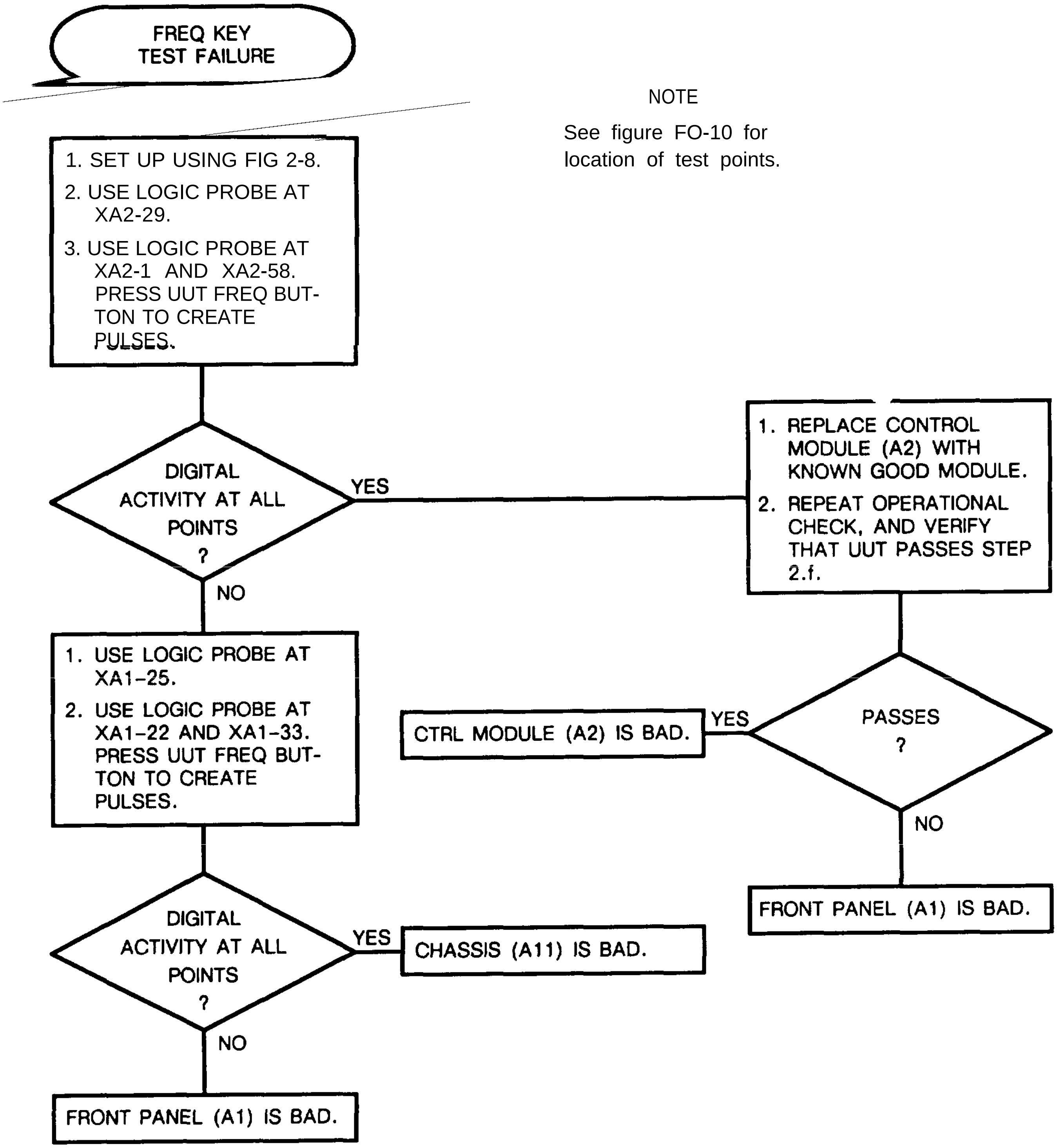


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 5
Fails FREQ Key Test

NOTE

See figure FO-10 for location of test points.

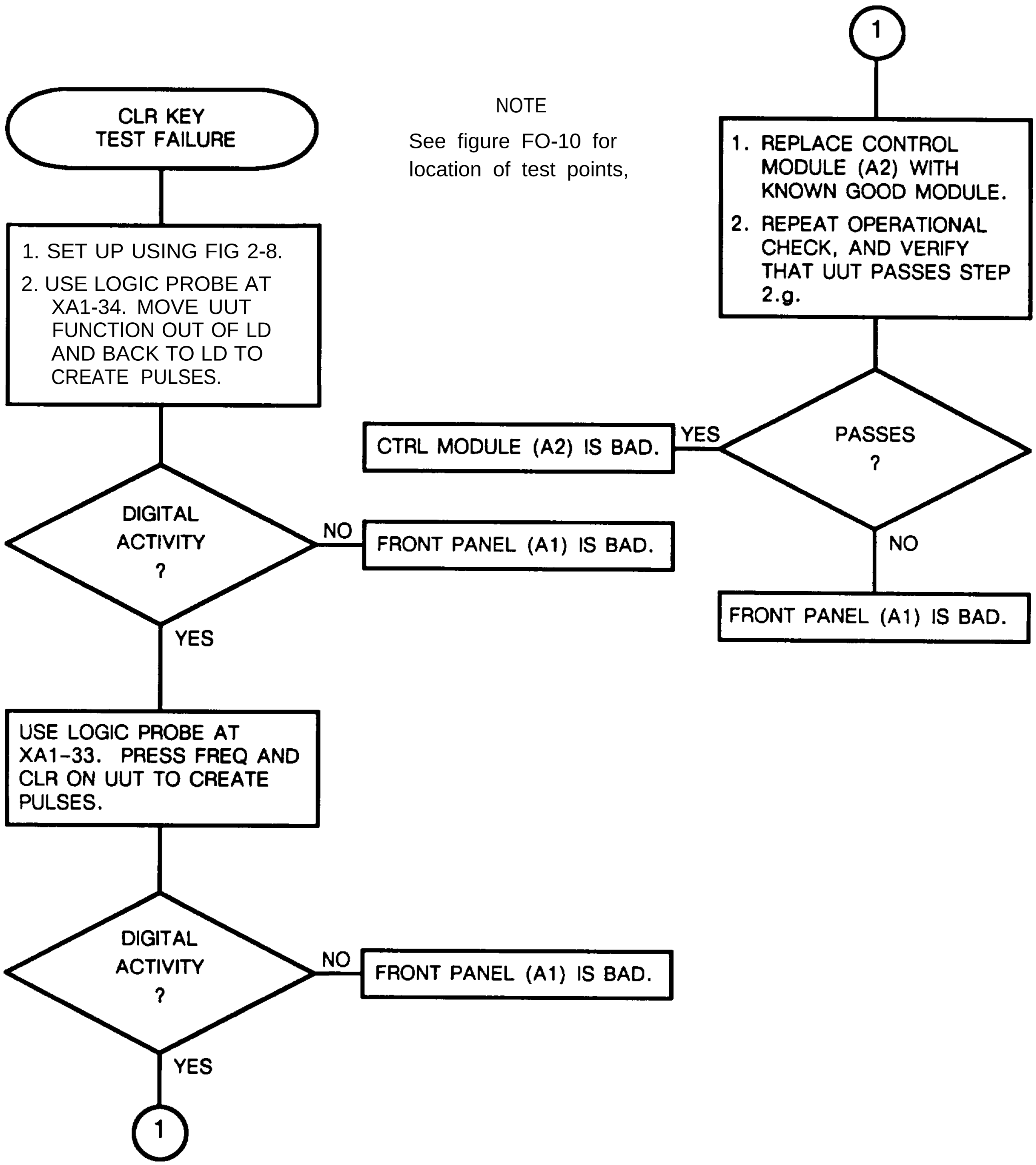


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 6
Fails CLR Key Test

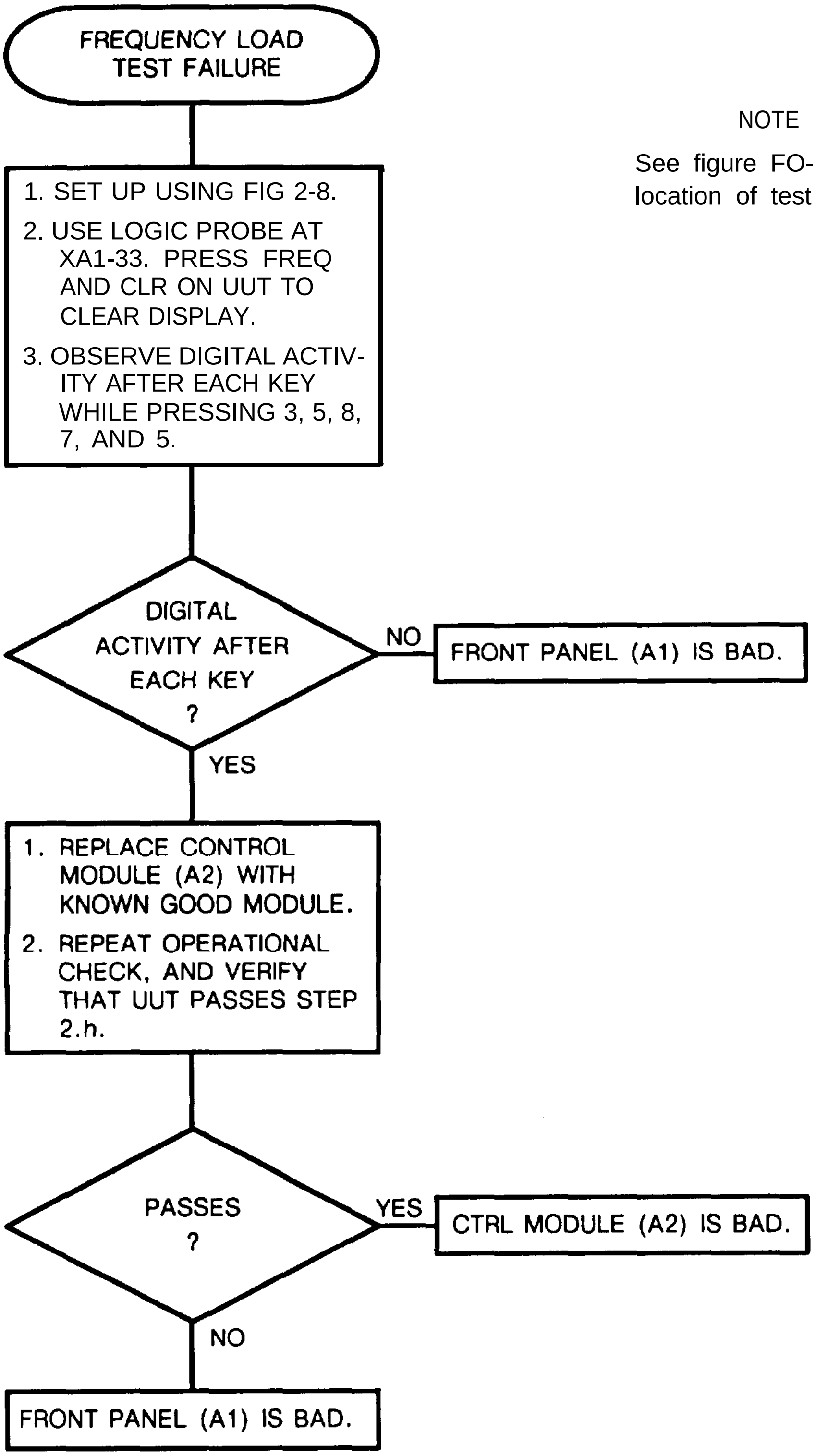
NOTE

See figure FO-10 for location of test points,



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 7
Frequency Load Test Failure



NOTE

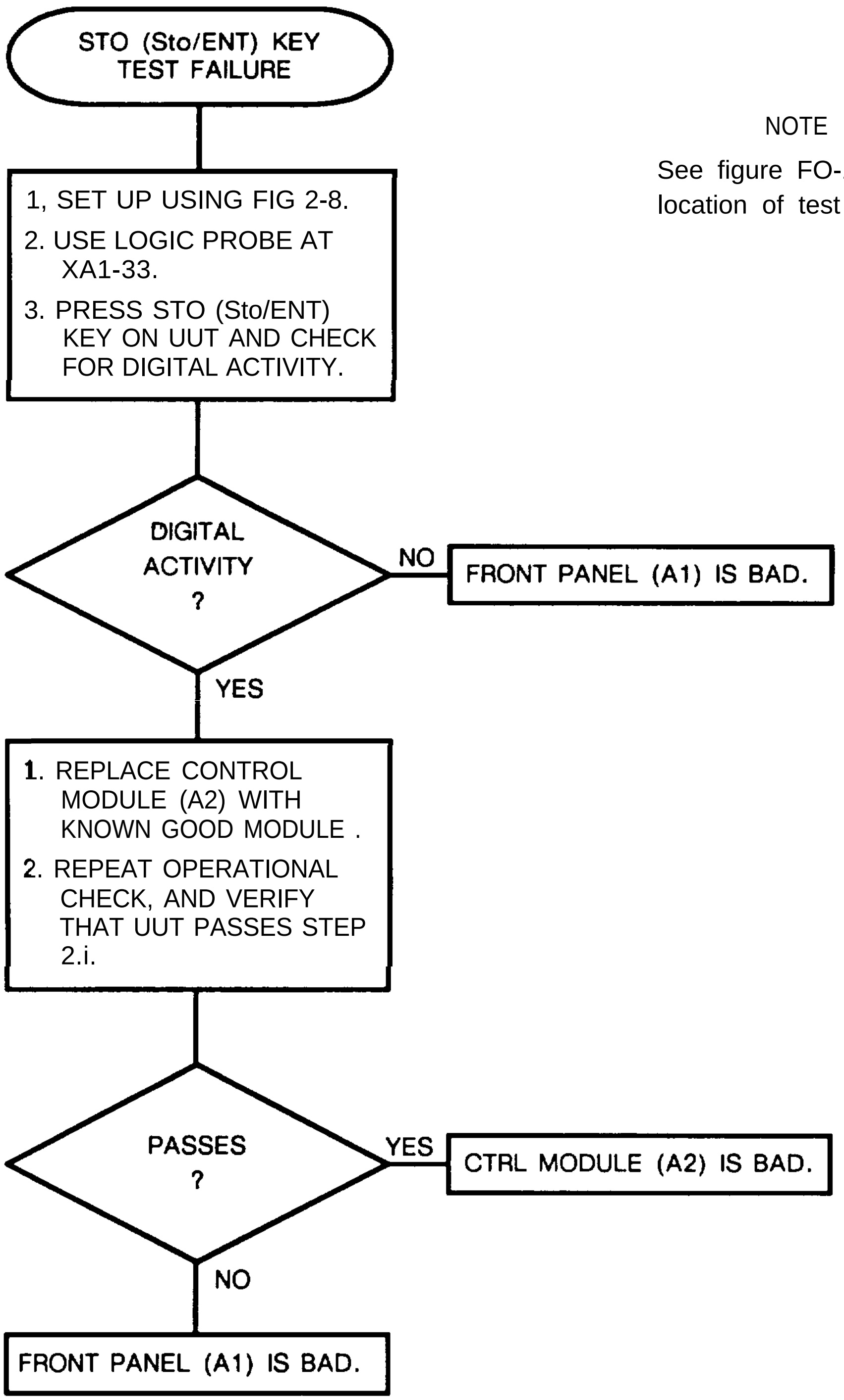
See figure FO-10 for location of test points.

2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 8
STO (Sto/ENT) Key Test Failure

NOTE

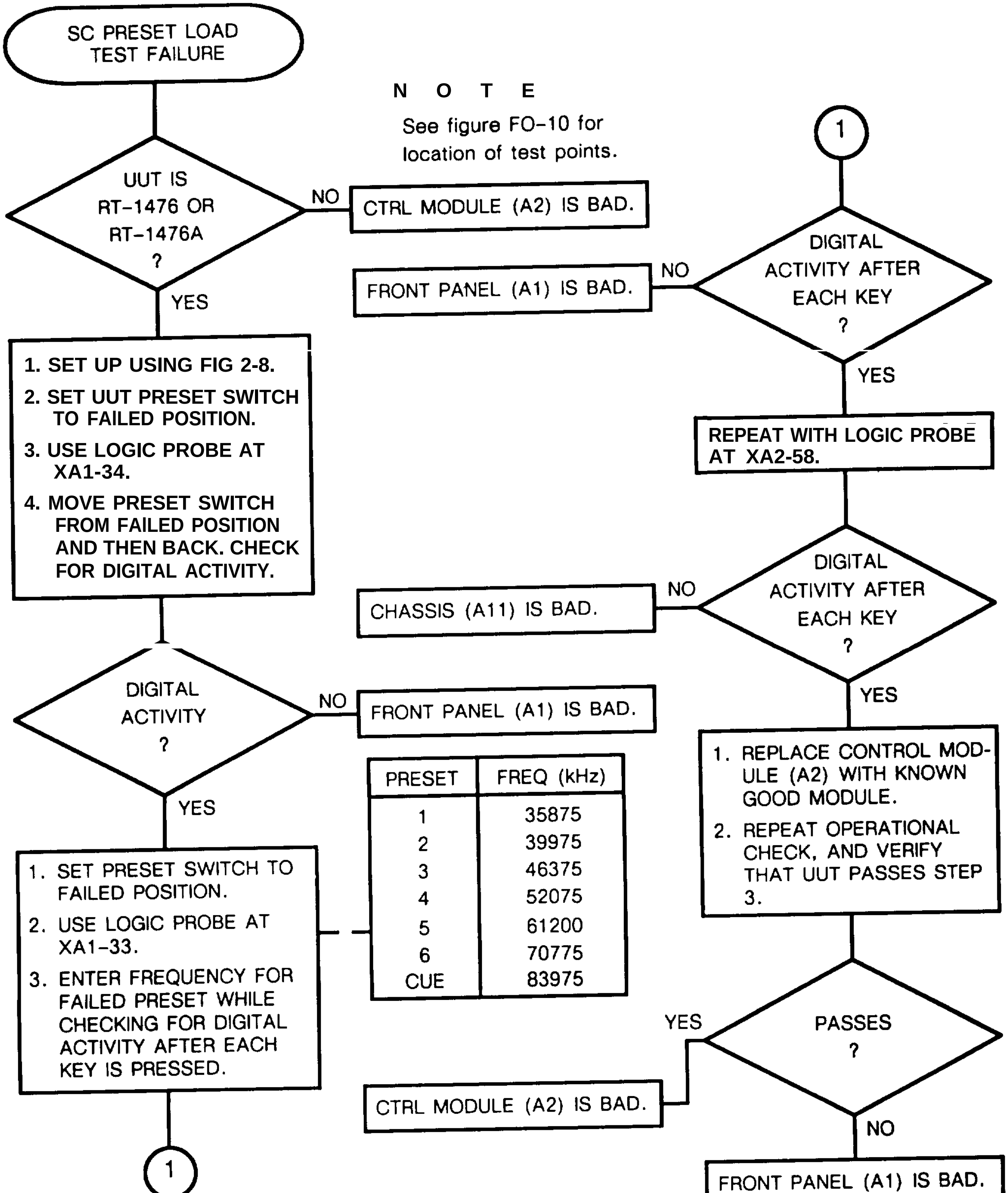
See figure FO-10 for location of test points.



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 9

SC Preset Load Test Failure



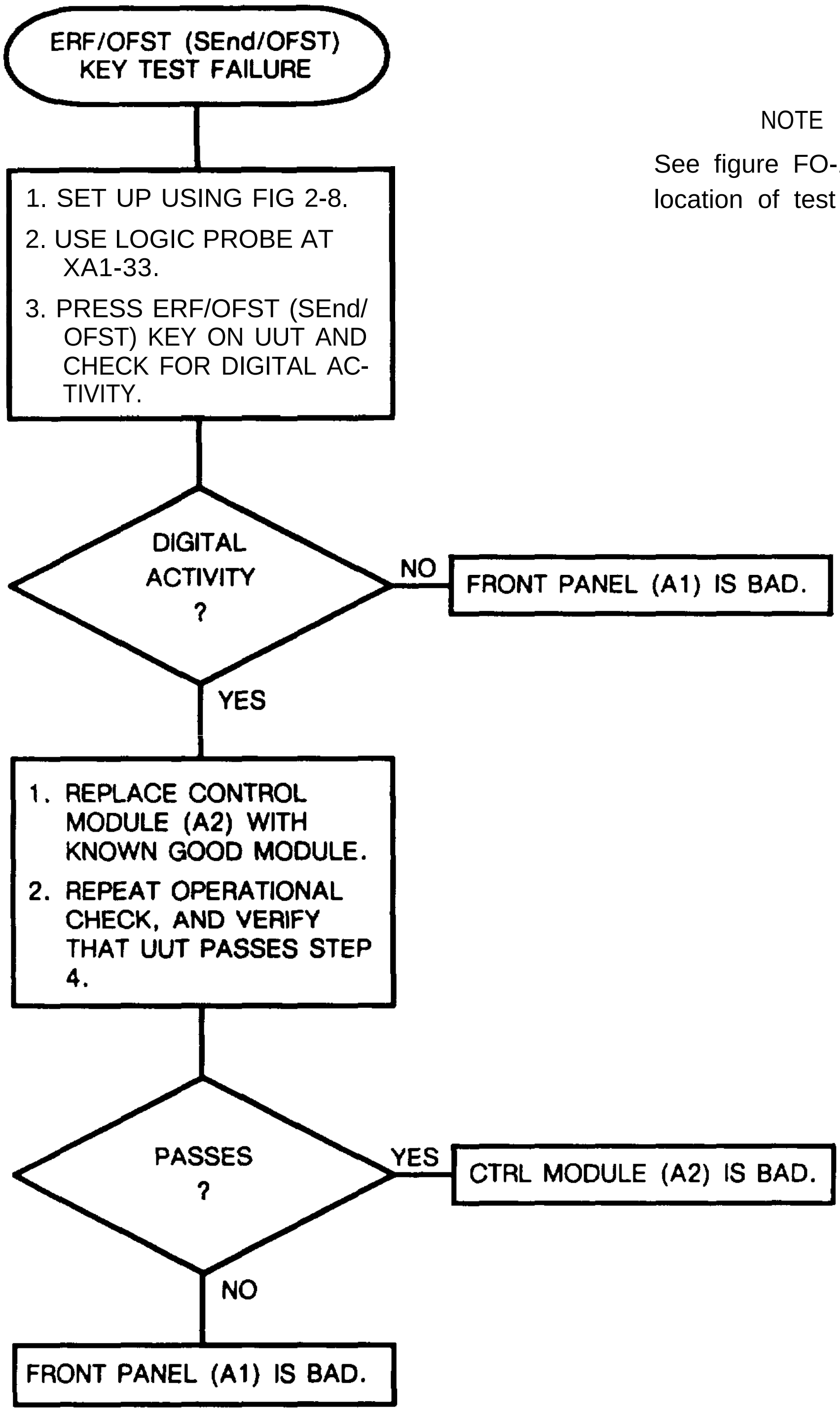
PRESET	FREQ (kHz)
1	35875
2	39975
3	46375
4	52075
5	61200
6	70775
CUE	83975

2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 10
ERF/OFST (SEnd/OFST) Key Test Failure

NOTE

See figure FO-10 for location of test points.



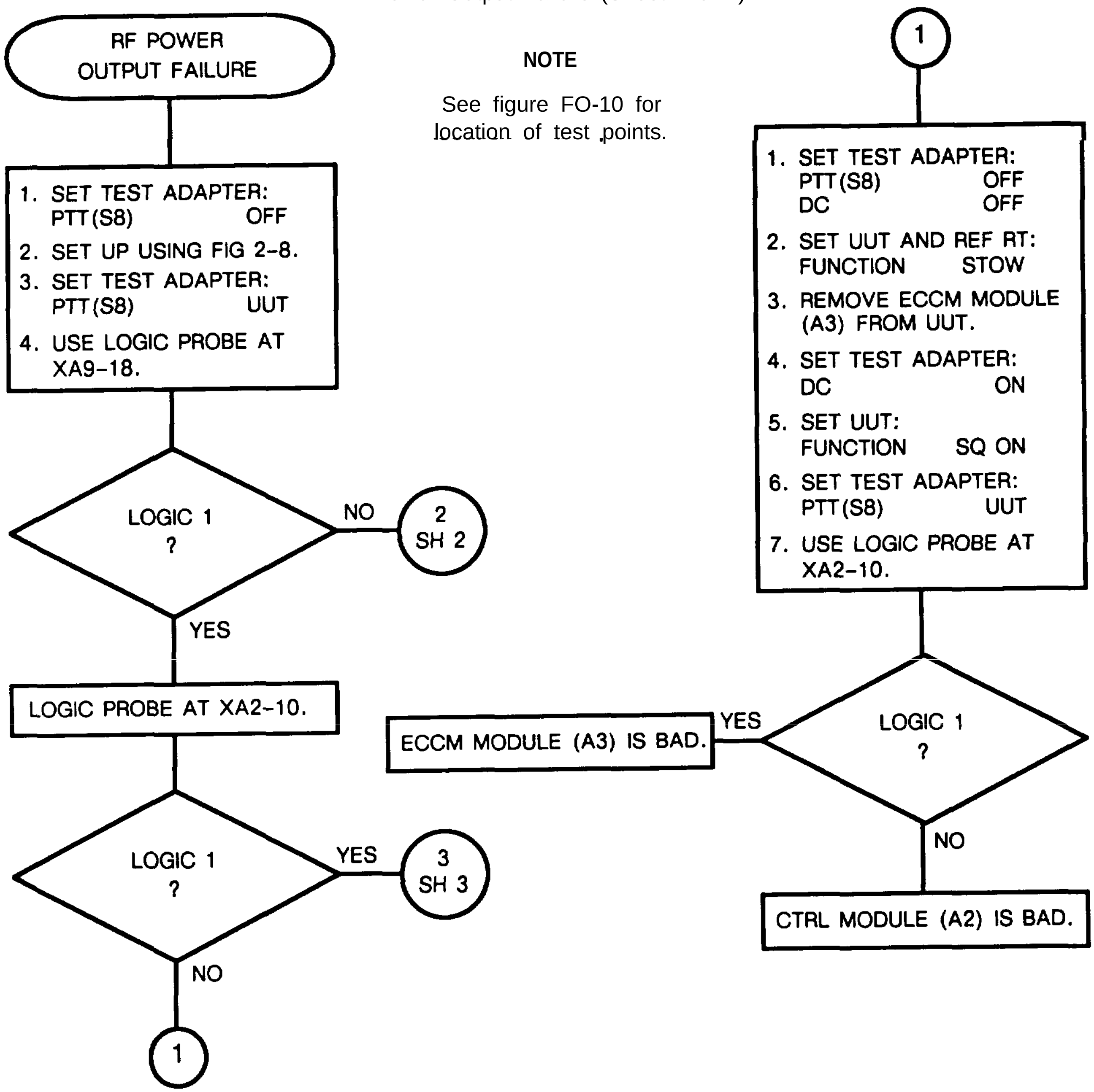
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 11

Rf Power Output Failure (Sheet 1 of 4)

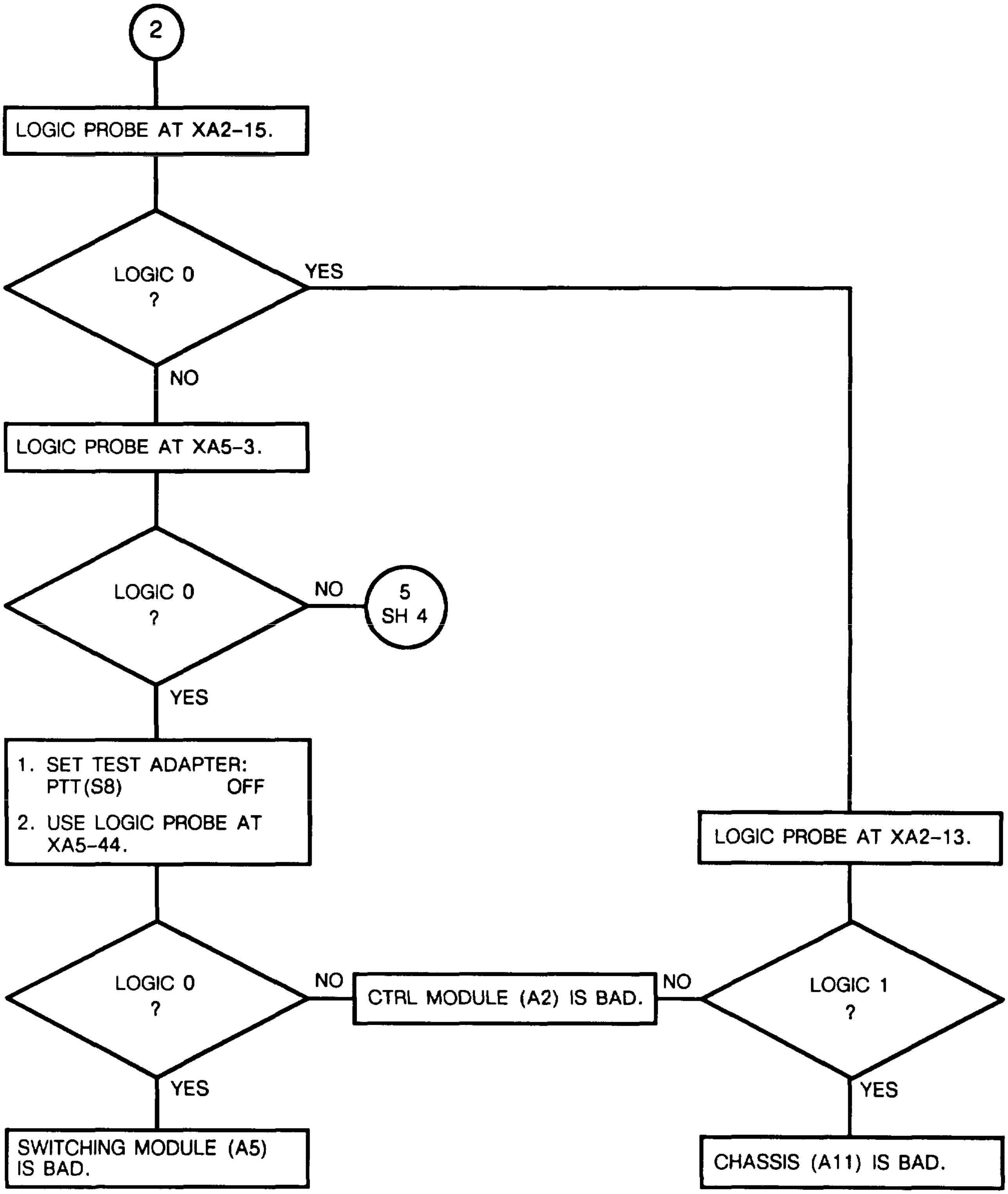
NOTE

See figure FO-10 for location of test points.



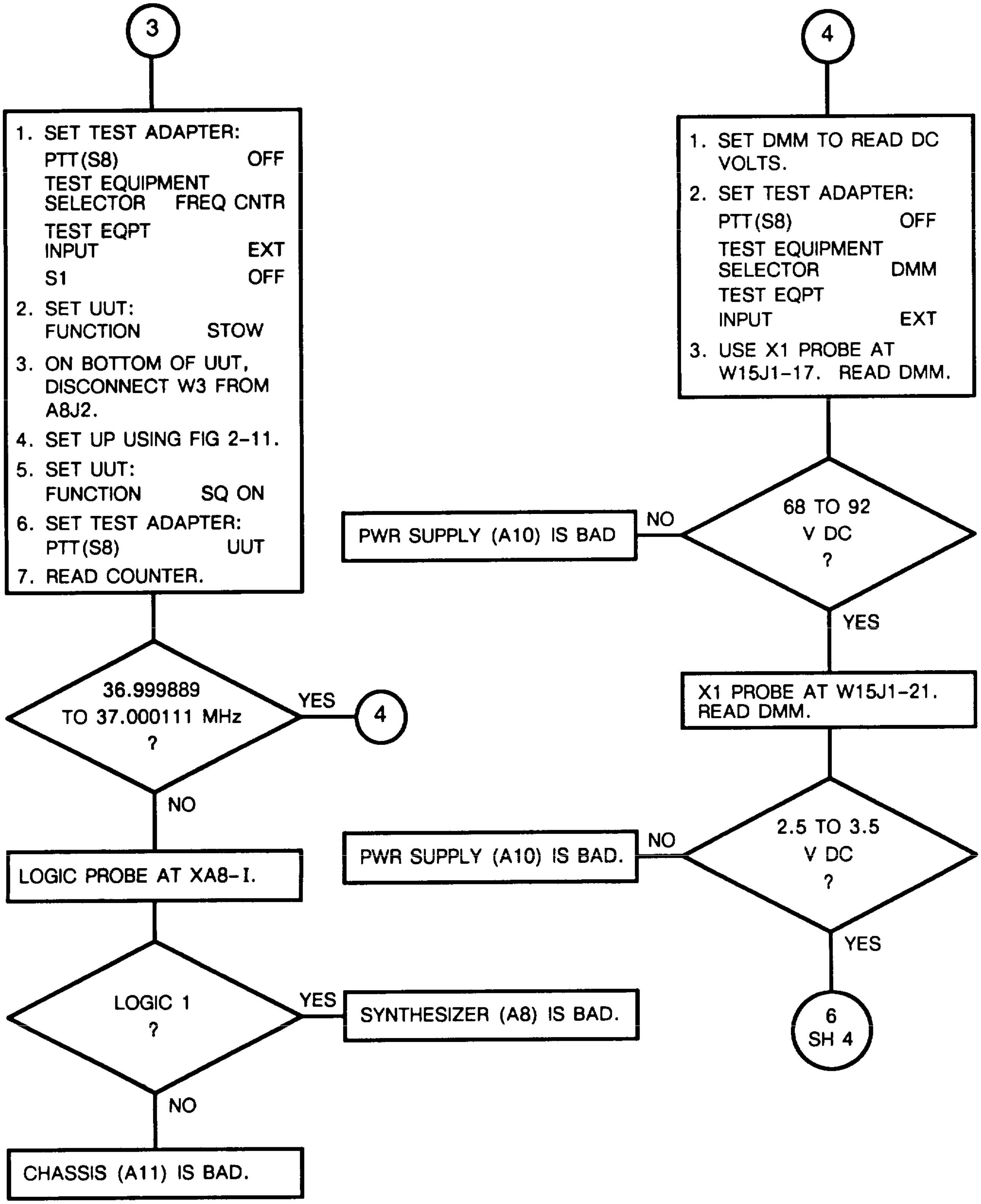
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 11
Rf Power Output Failure (Sheet 2 of 4)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 11
Rf Power Output Failure (Sheet 3 of 4)



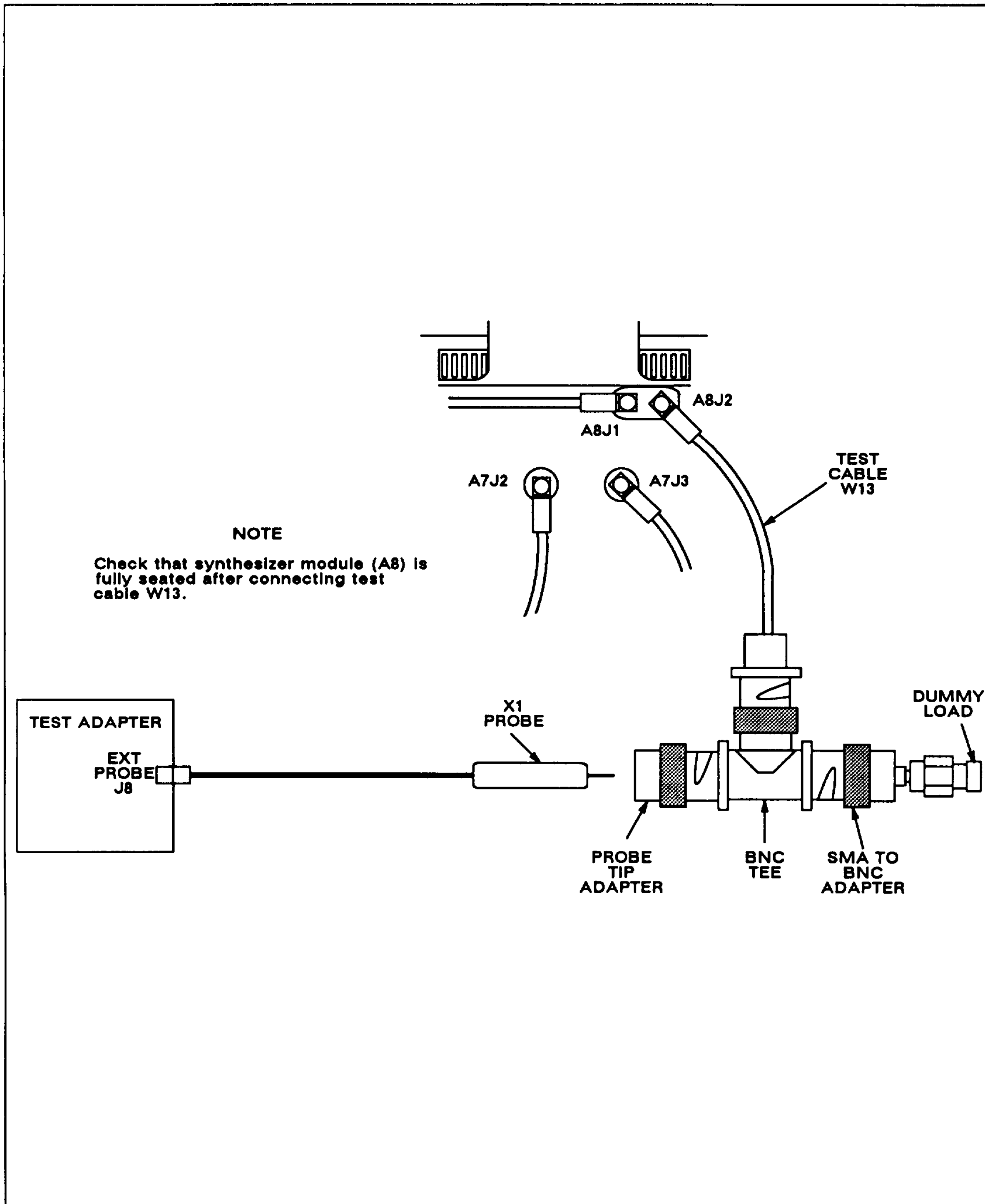
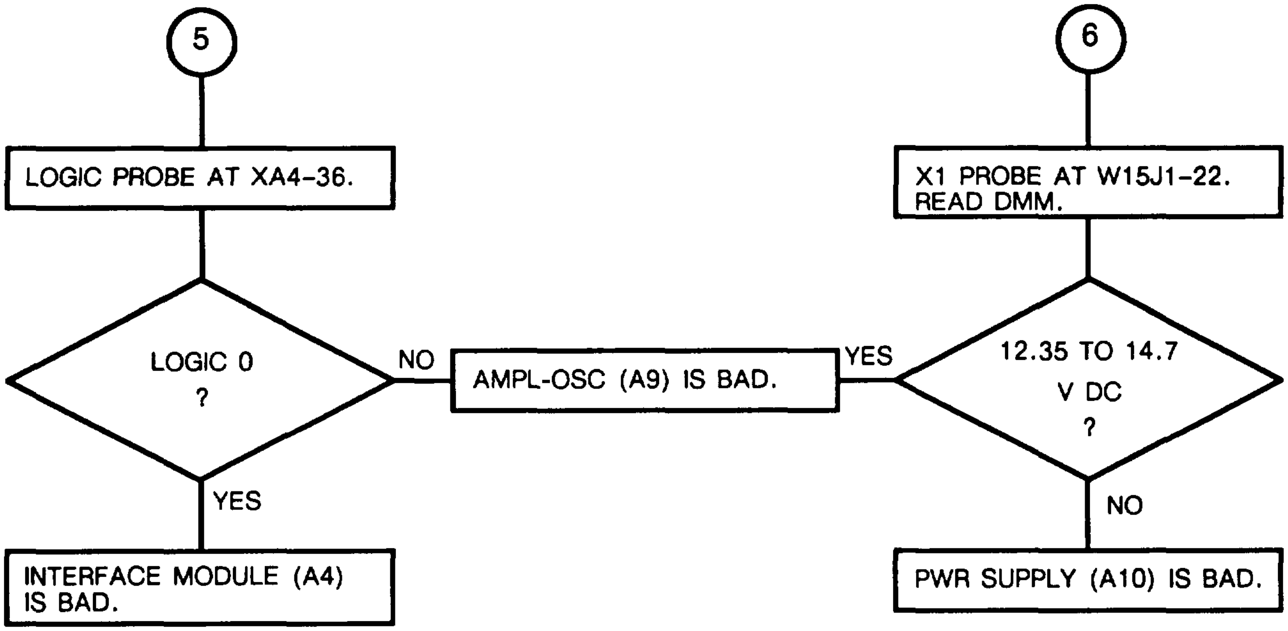


Figure 2-11. Troubleshooting Test Setup No, 4

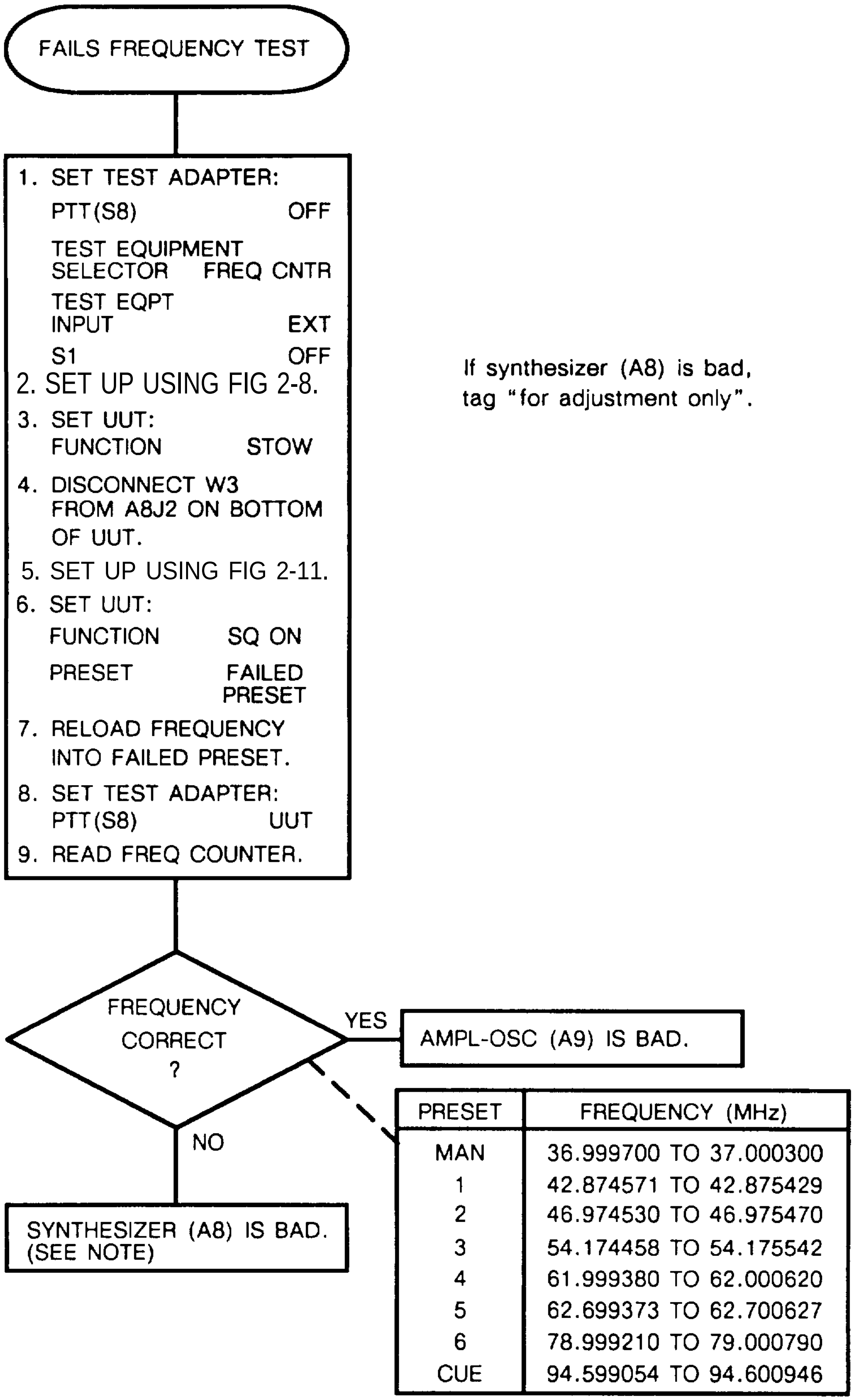
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 11
Rf Power Output Failure (Sheet 4 of 4)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 12
Fails Frequency Test



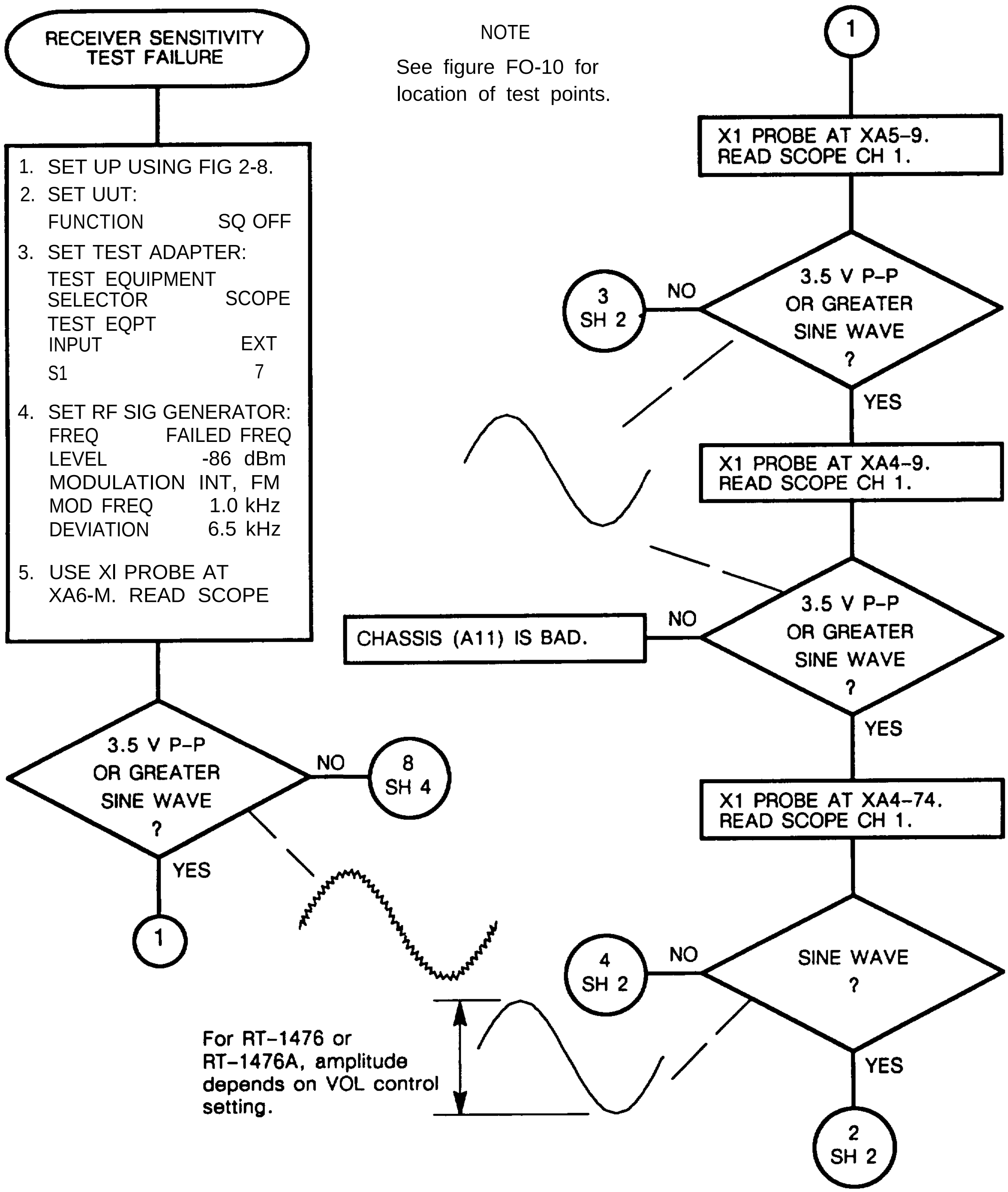
PRESET	FREQUENCY (MHz)
MAN	36.999700 TO 37.000300
1	42.874571 TO 42.875429
2	46.974530 TO 46.975470
3	54.174458 TO 54.175542
4	61.999380 TO 62.000620
5	62.699373 TO 62.700627
6	78.999210 TO 79.000790
CUE	94.599054 TO 94.600946

2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 13
Receiver Sensitivity Test Failure (Sheet 1 of 6)

NOTE

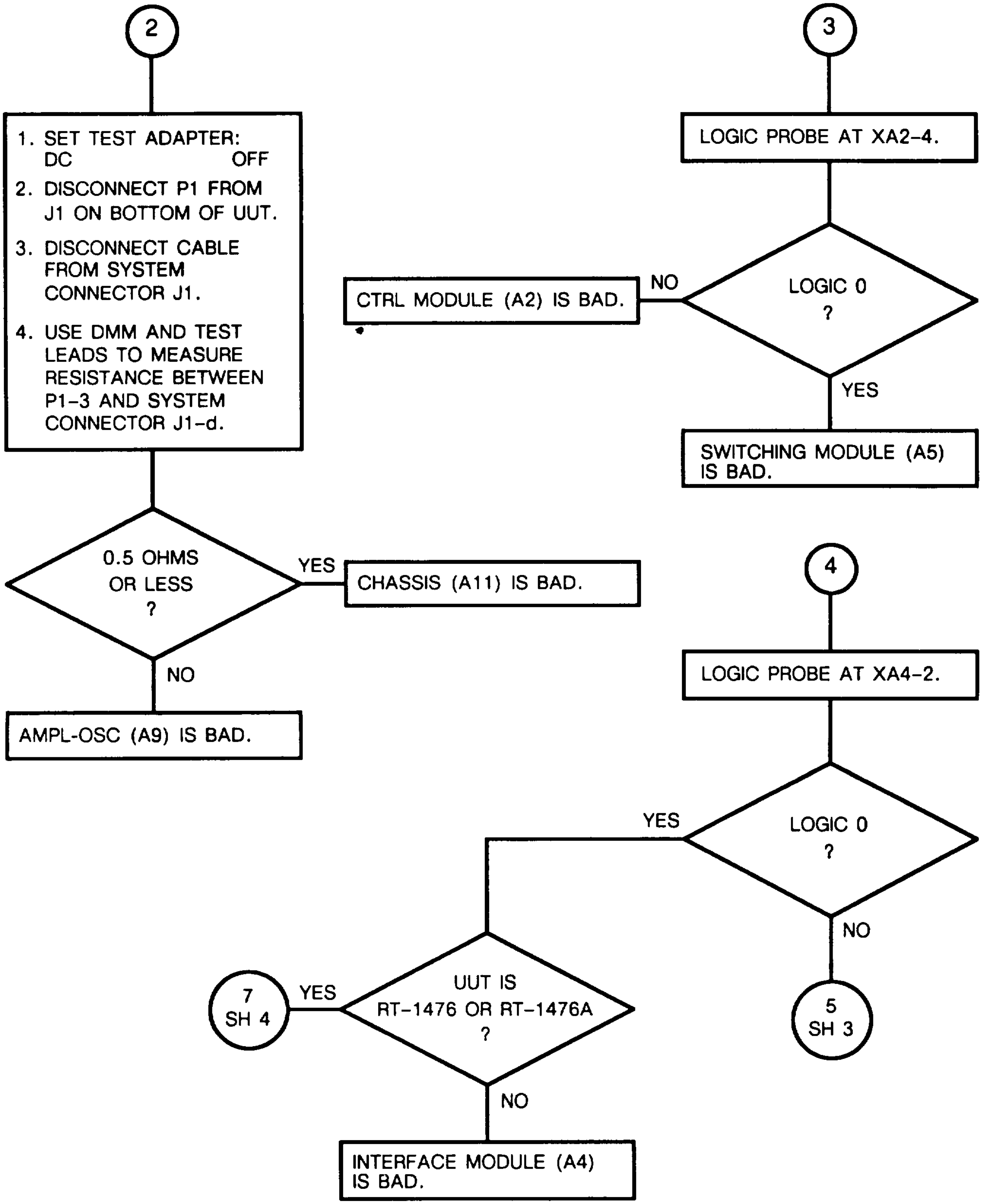
See figure FO-10 for location of test points.



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

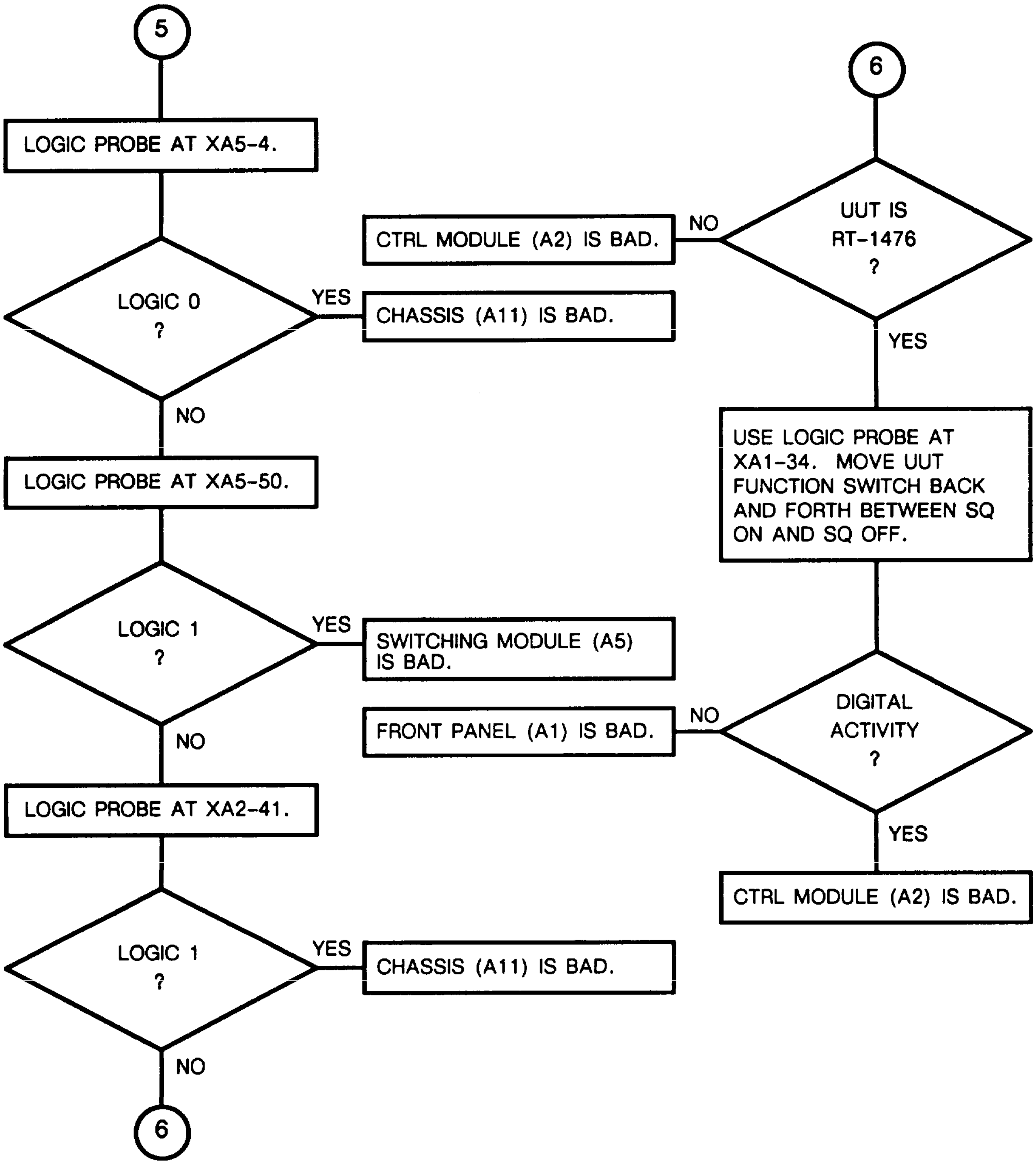
CHART 13

Receiver Sensitivity Test Failure (Sheet 2 of 6)



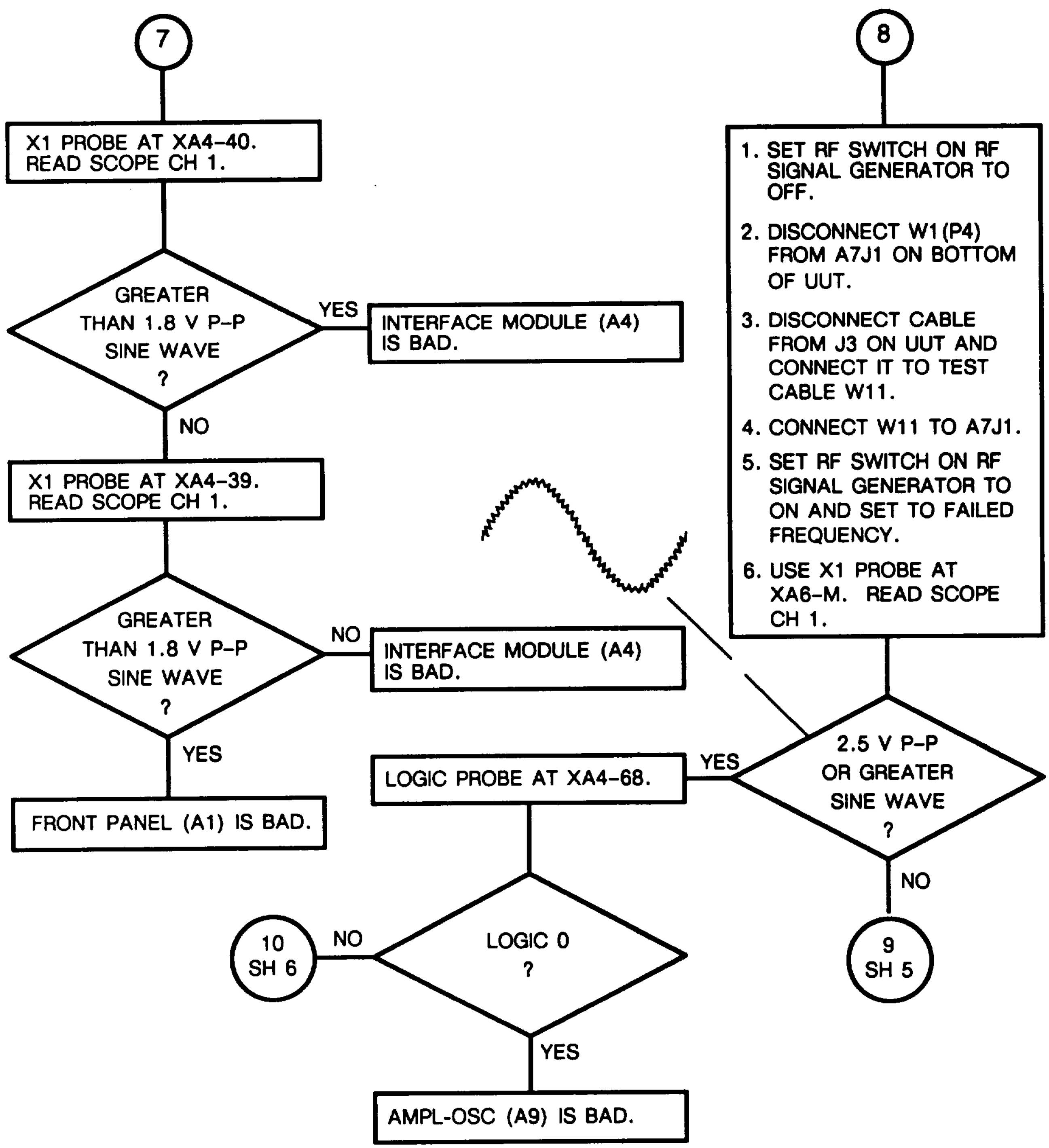
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 13
Receiver Sensitivity Test Failure (Sheet 3 of 6)



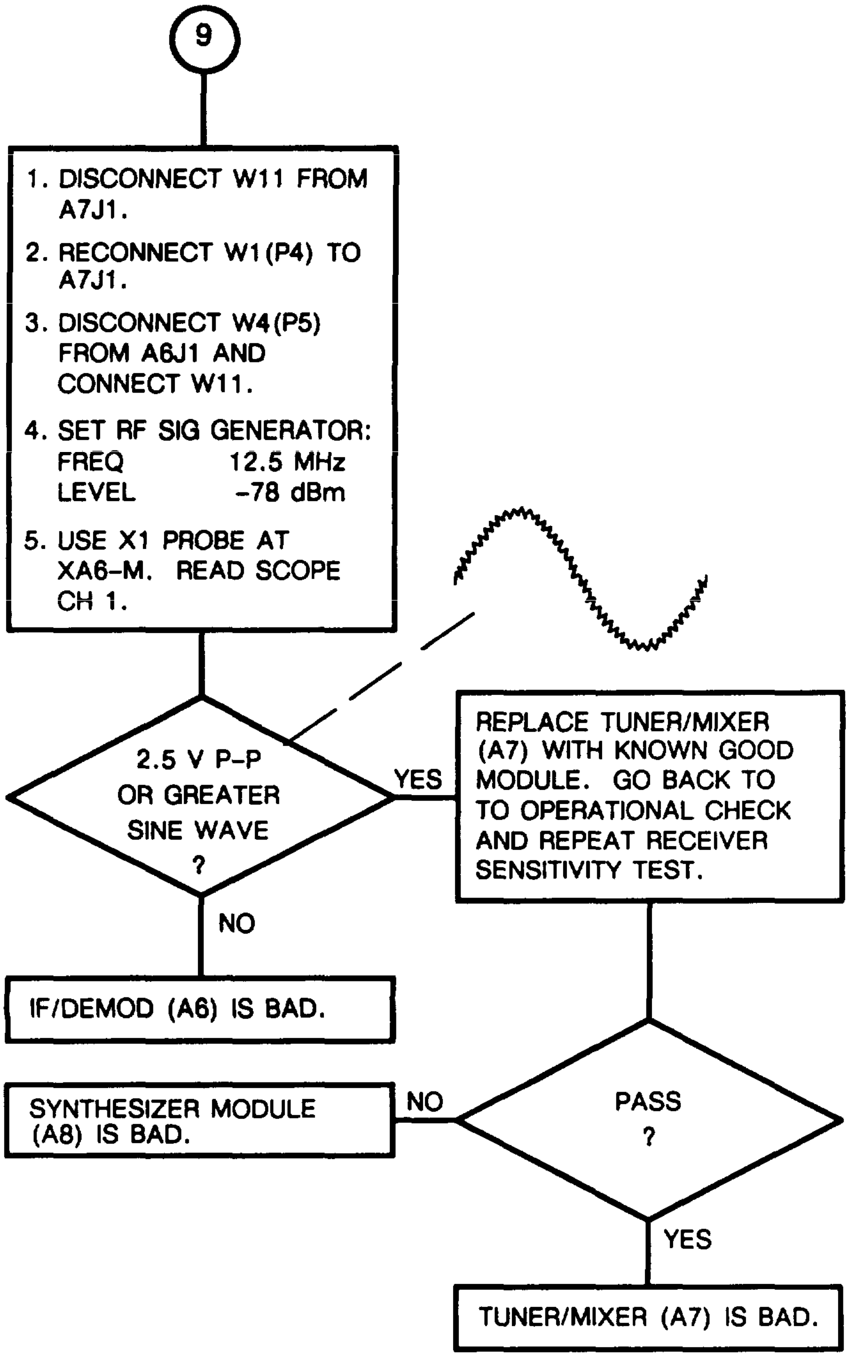
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 13
Receiver Sensitivity Test Failure (Sheet 4 of 6)



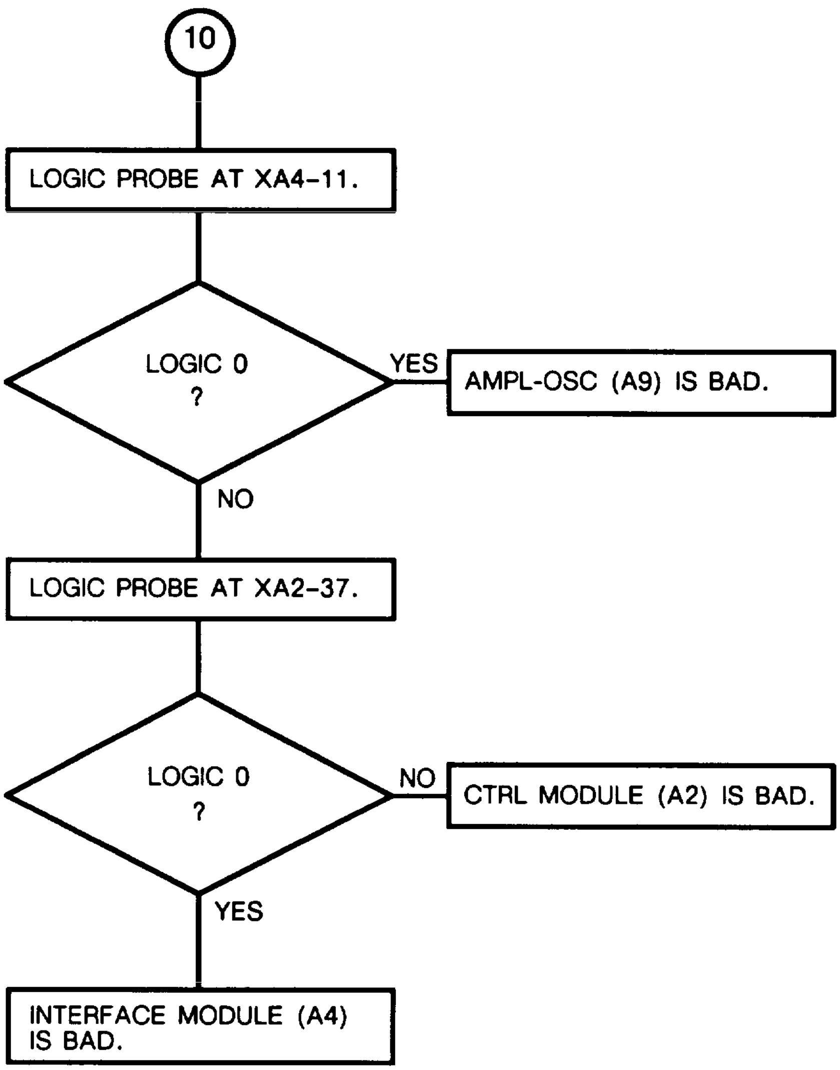
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 13
Receiver Sensitivity Test Failure (Sheet 5 of 6)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 13
Receiver Sensitivity Test Failure (Sheet 6 of 6)

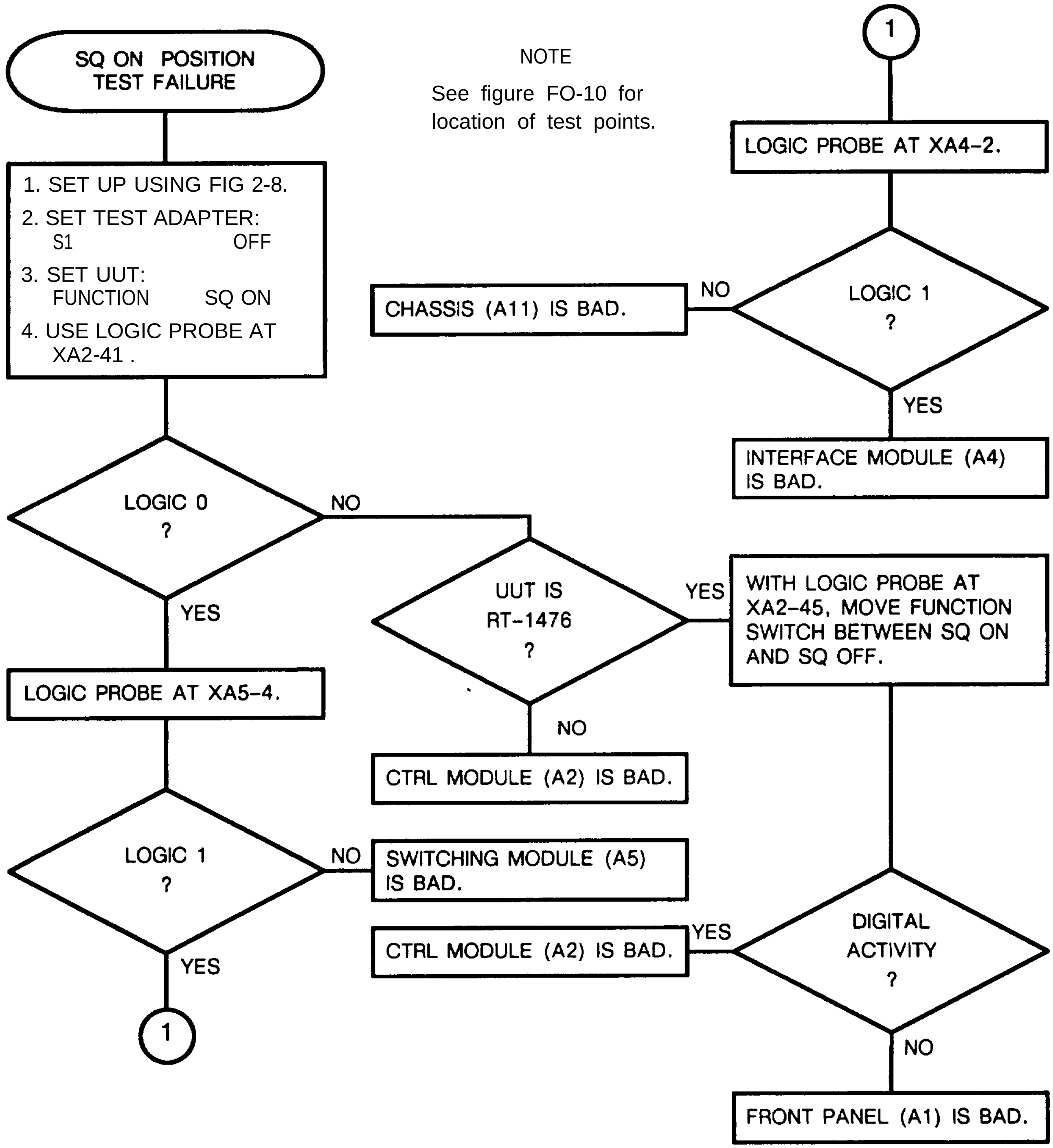


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 14
Fails SQ ON Position Test

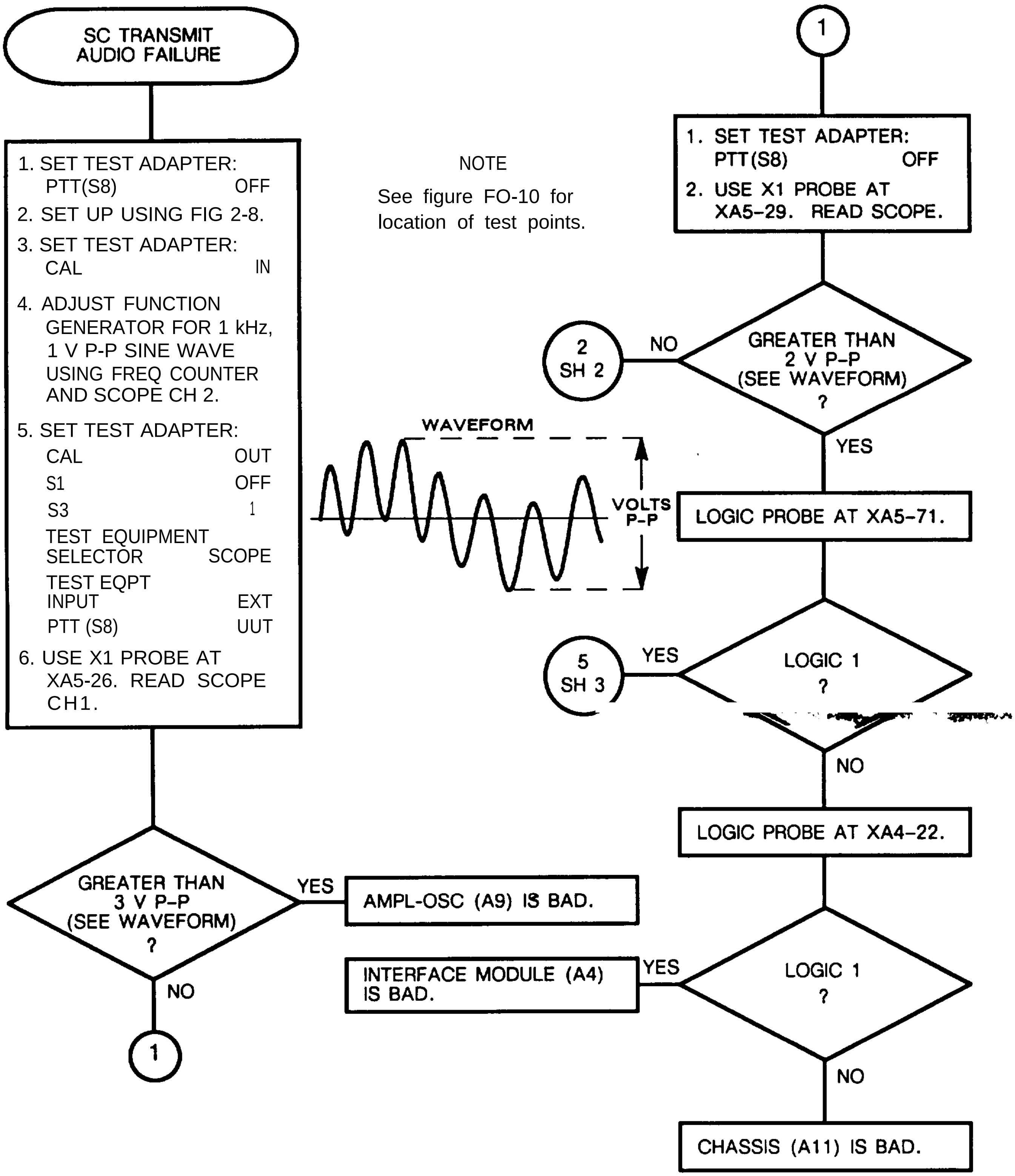
NOTE

See figure FO-10 for location of test points.



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

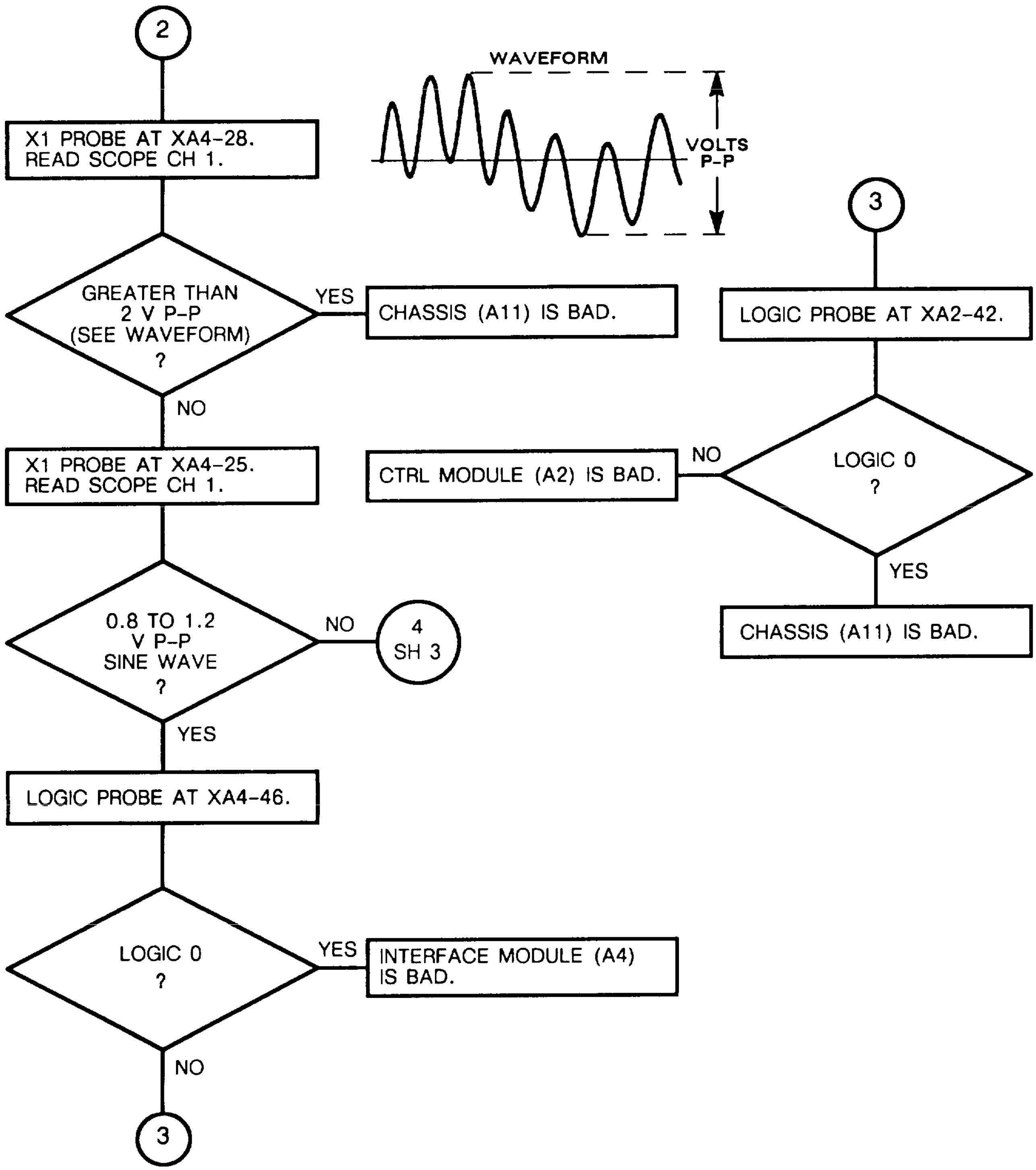
CHART 15
SC Transmit Audio Failure (Sheet 1 of 3)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

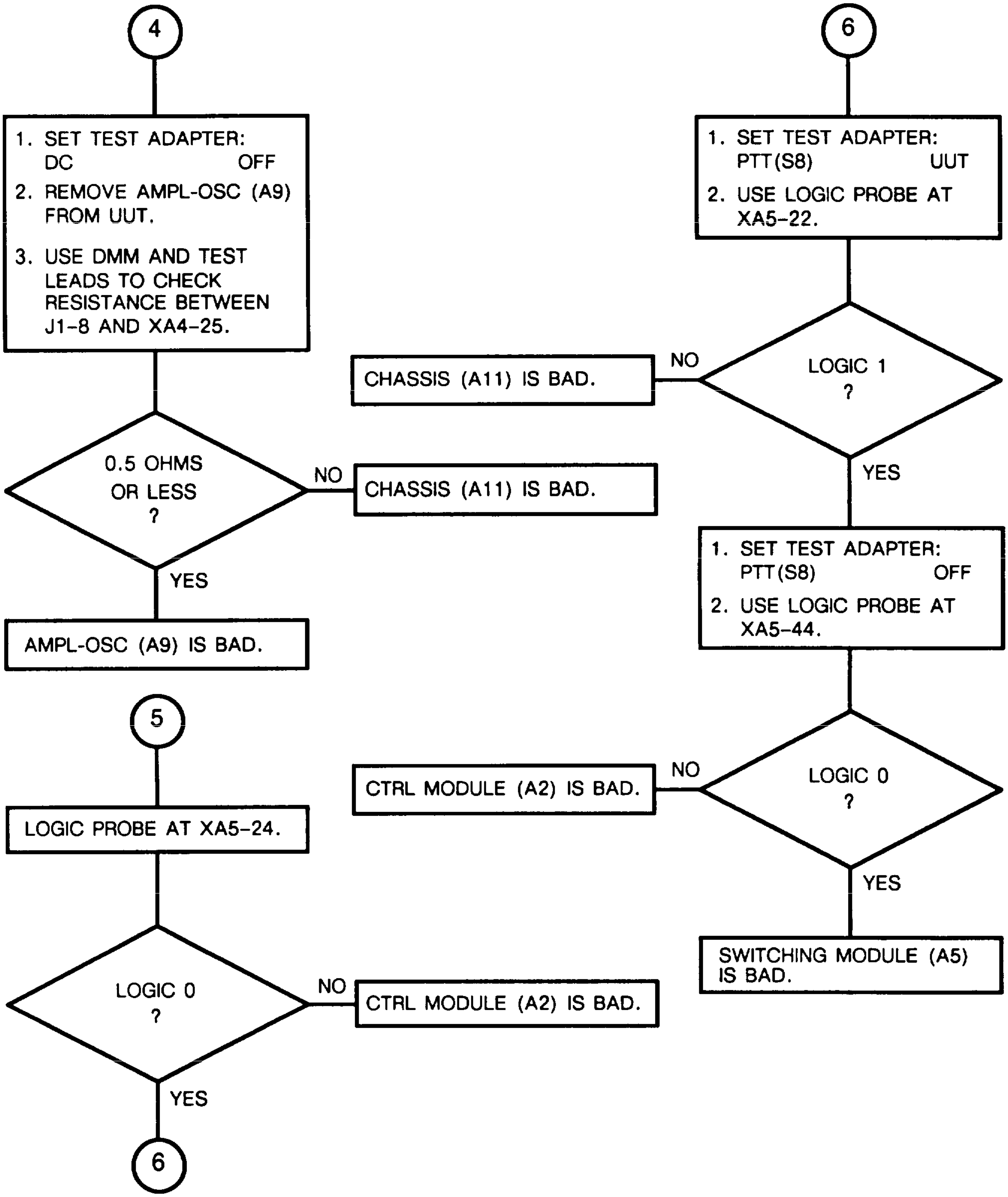
CHART 15

SC Transmit Audio Failure (Sheet 2 of 3)



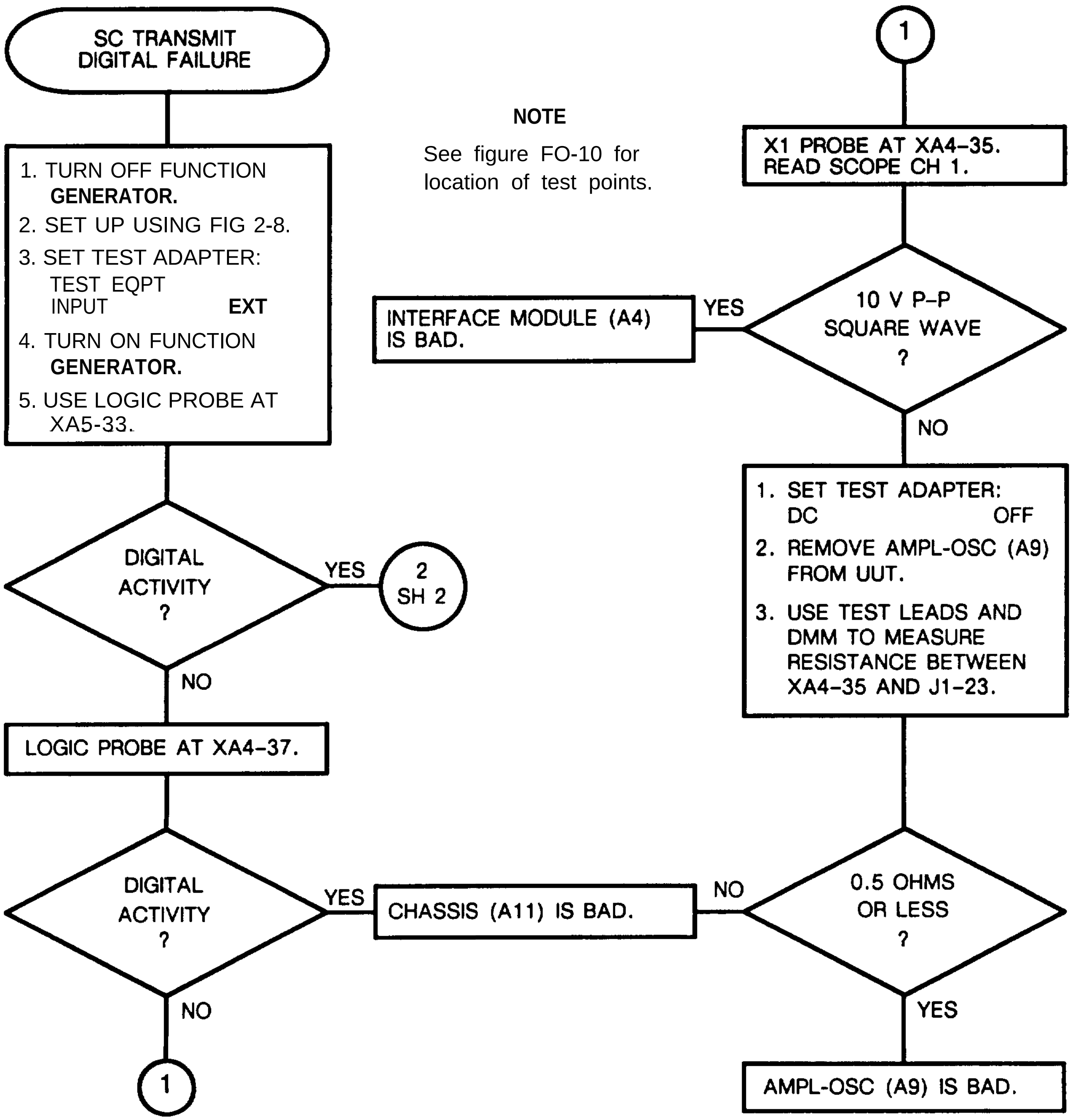
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 15
SC Transmit Audio Failure (Sheet 3 of 3)



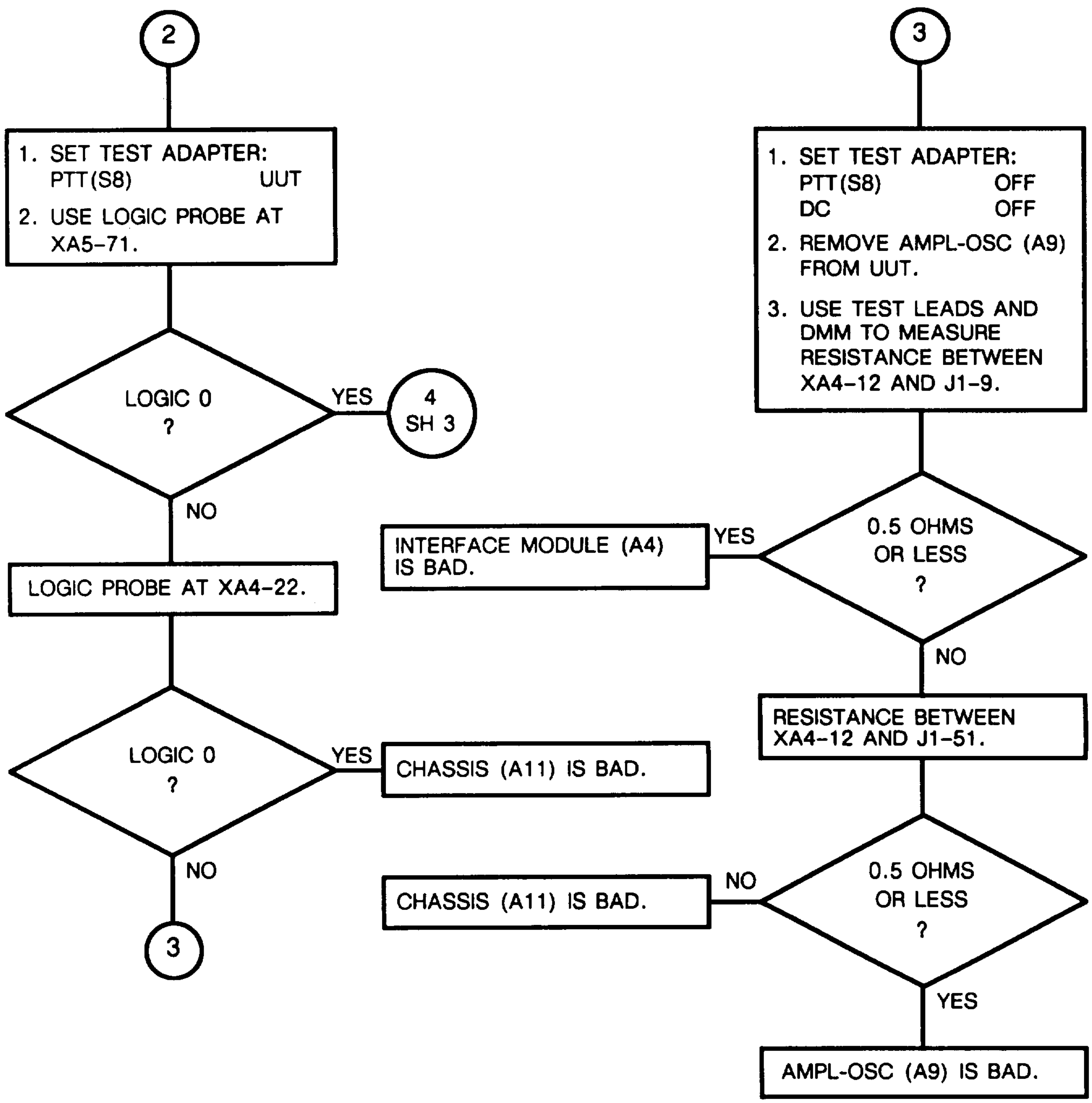
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 16
SC Transmit Digital Failure (Sheet 1 of 3)



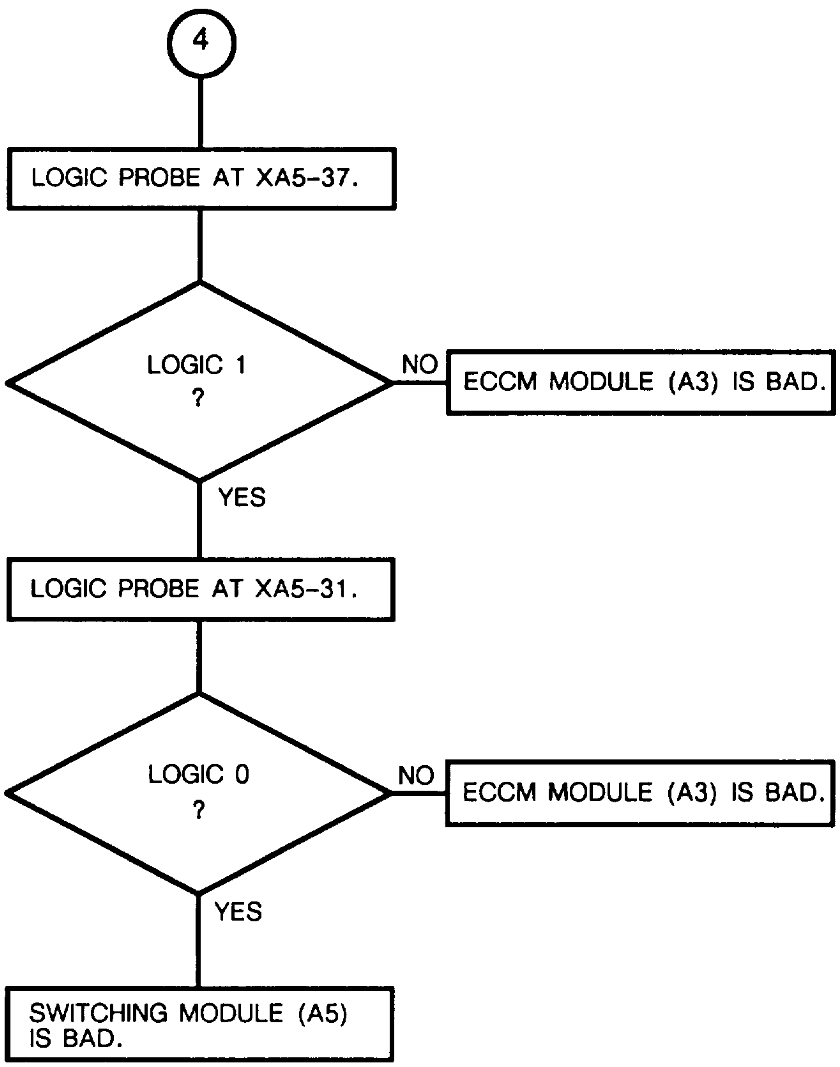
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 16
SC Transmit Digital Failure (Sheet 2 of 3)



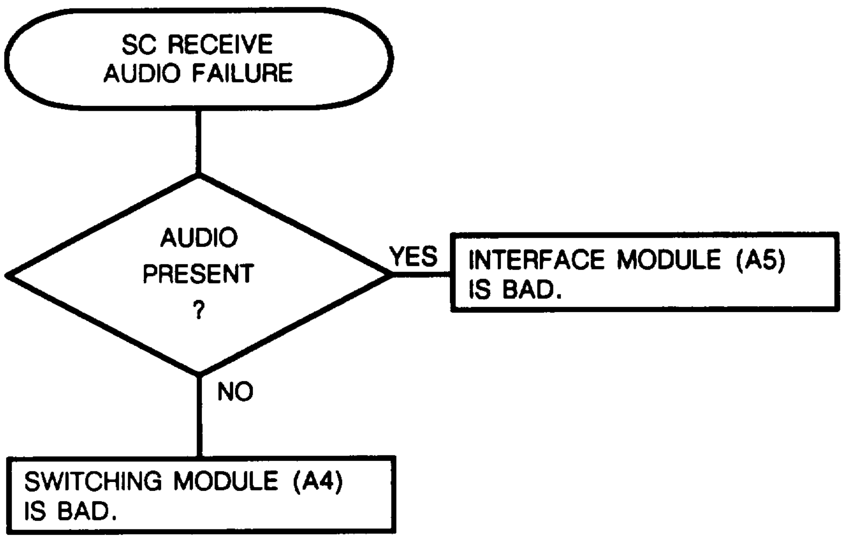
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 16
SC Transmit Digital Failure (Sheet 3 of 3)



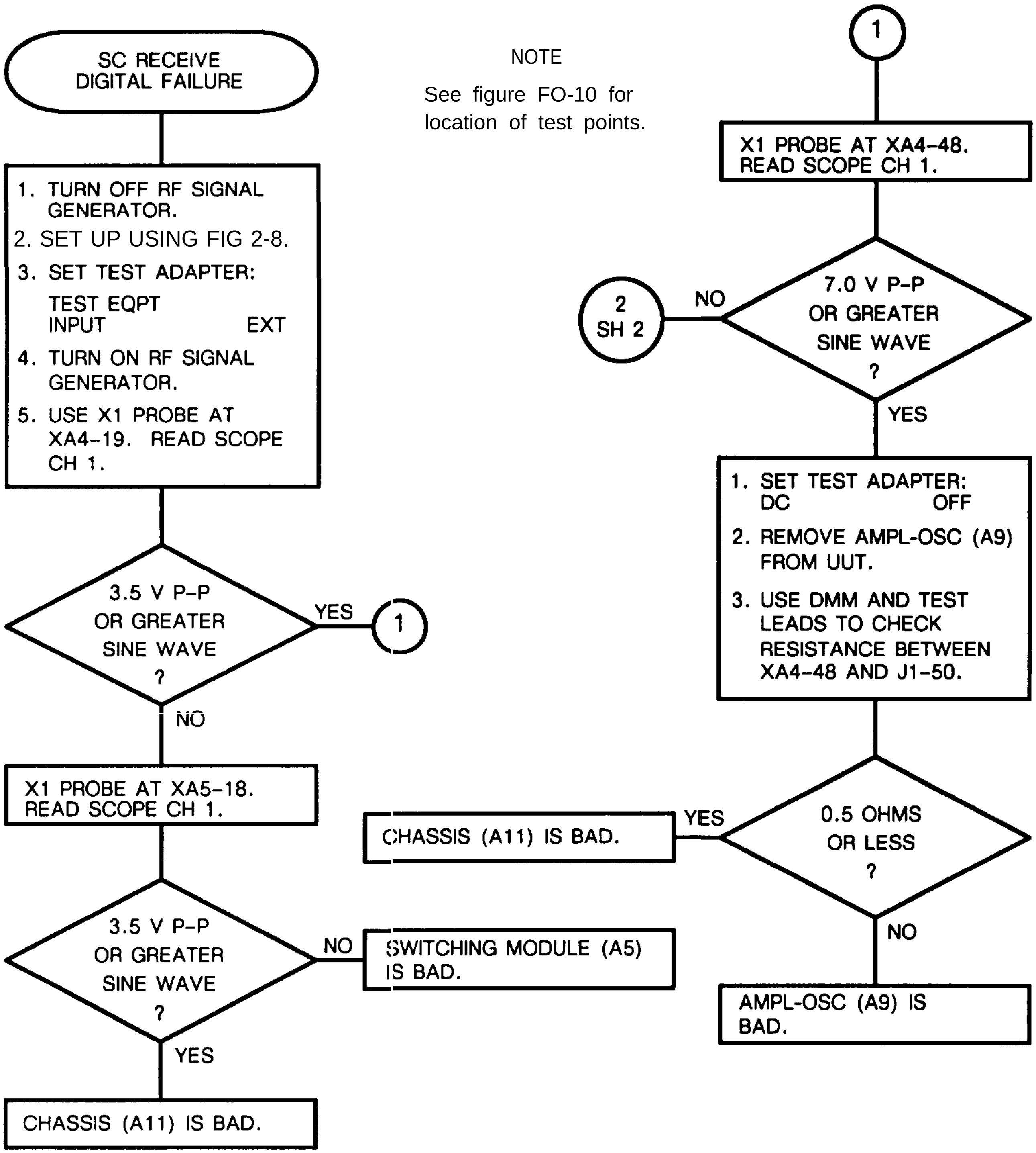
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 17
SC Receive Audio Failure



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

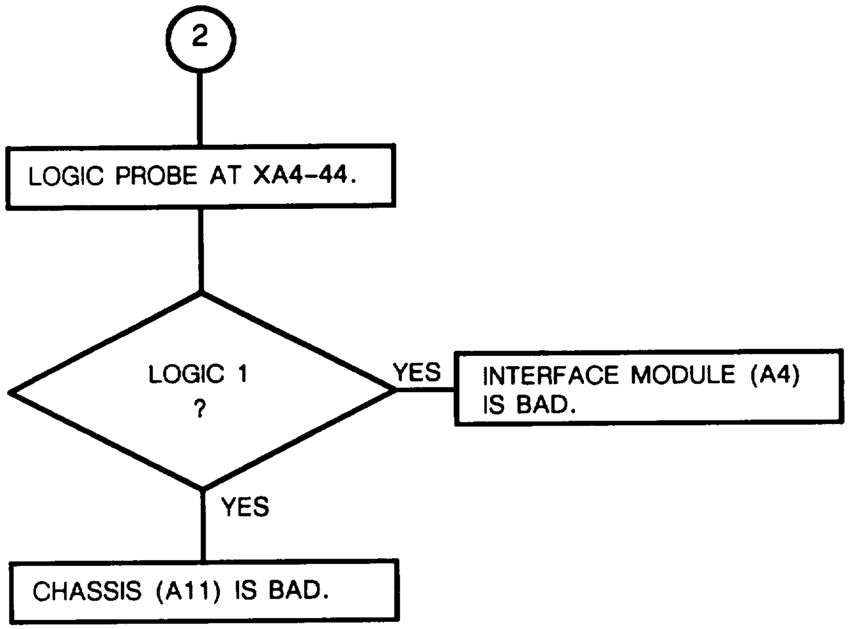
CHART 18
SC Receive Digital Failure (Sheet 1 of 2)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

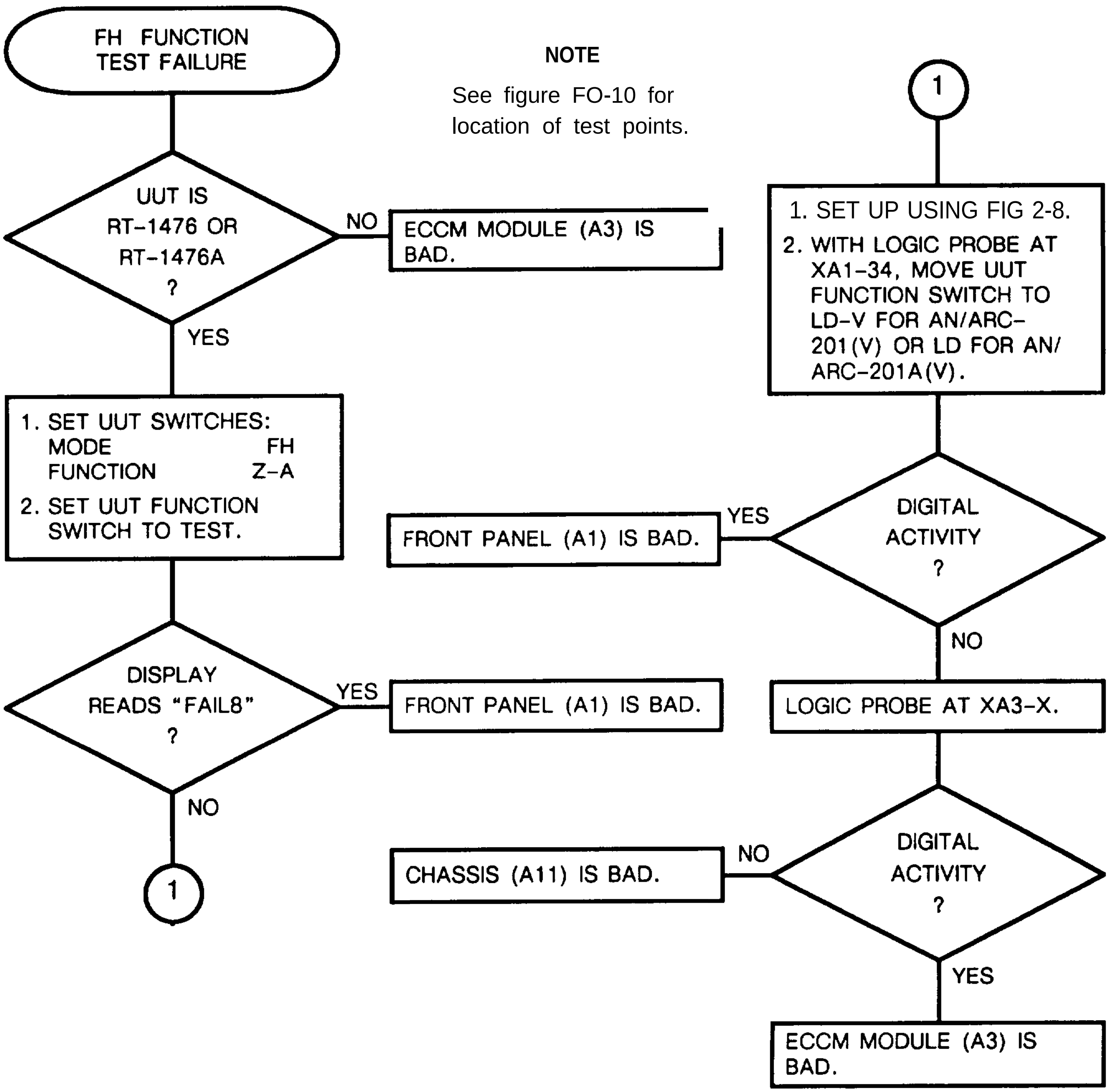
CHART 18

SC Receive Digital Failure (Sheet 2 of 2)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 19
FH Function Test Failure

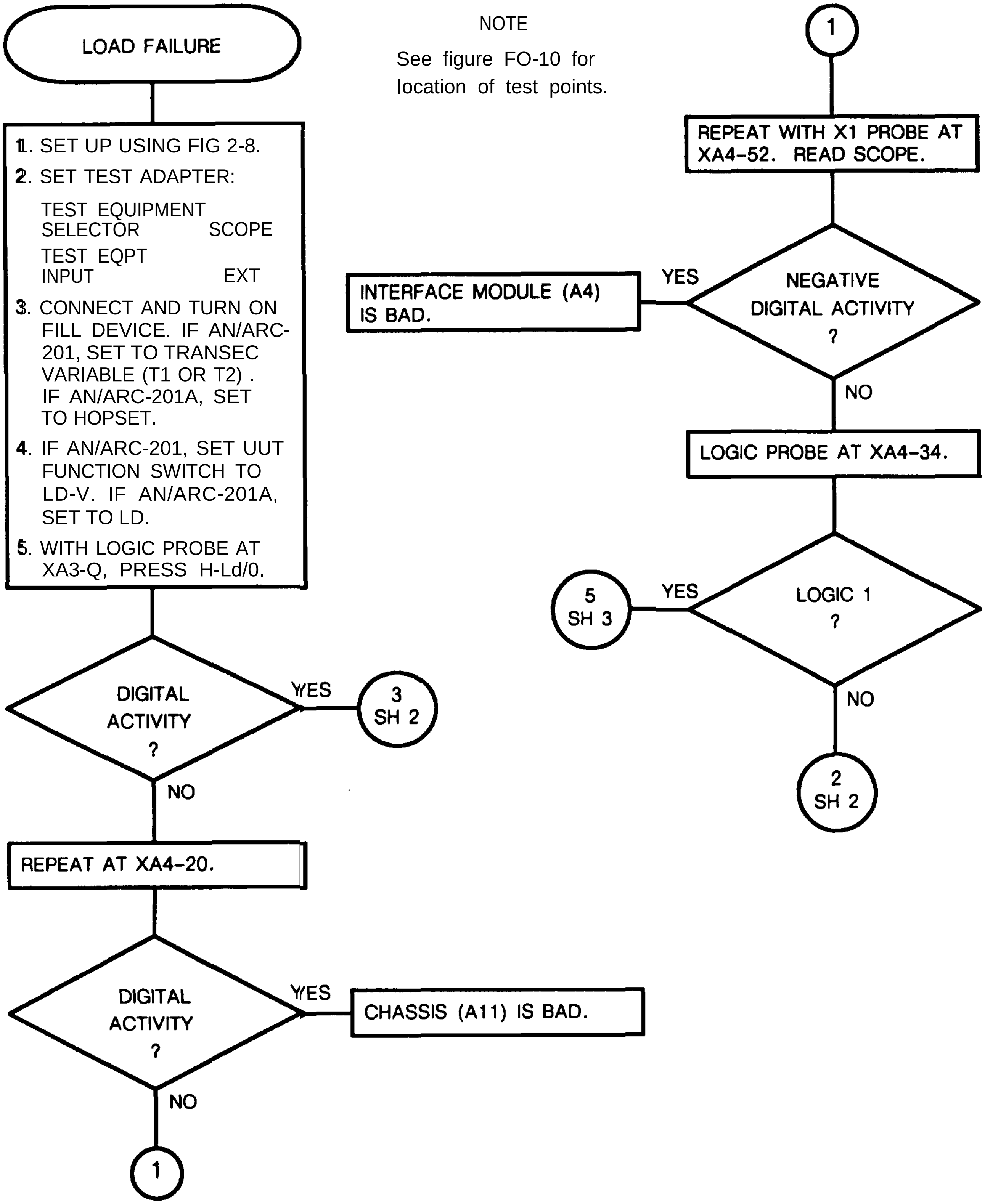


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 20
Load Failure (Sheet 1 of 4)

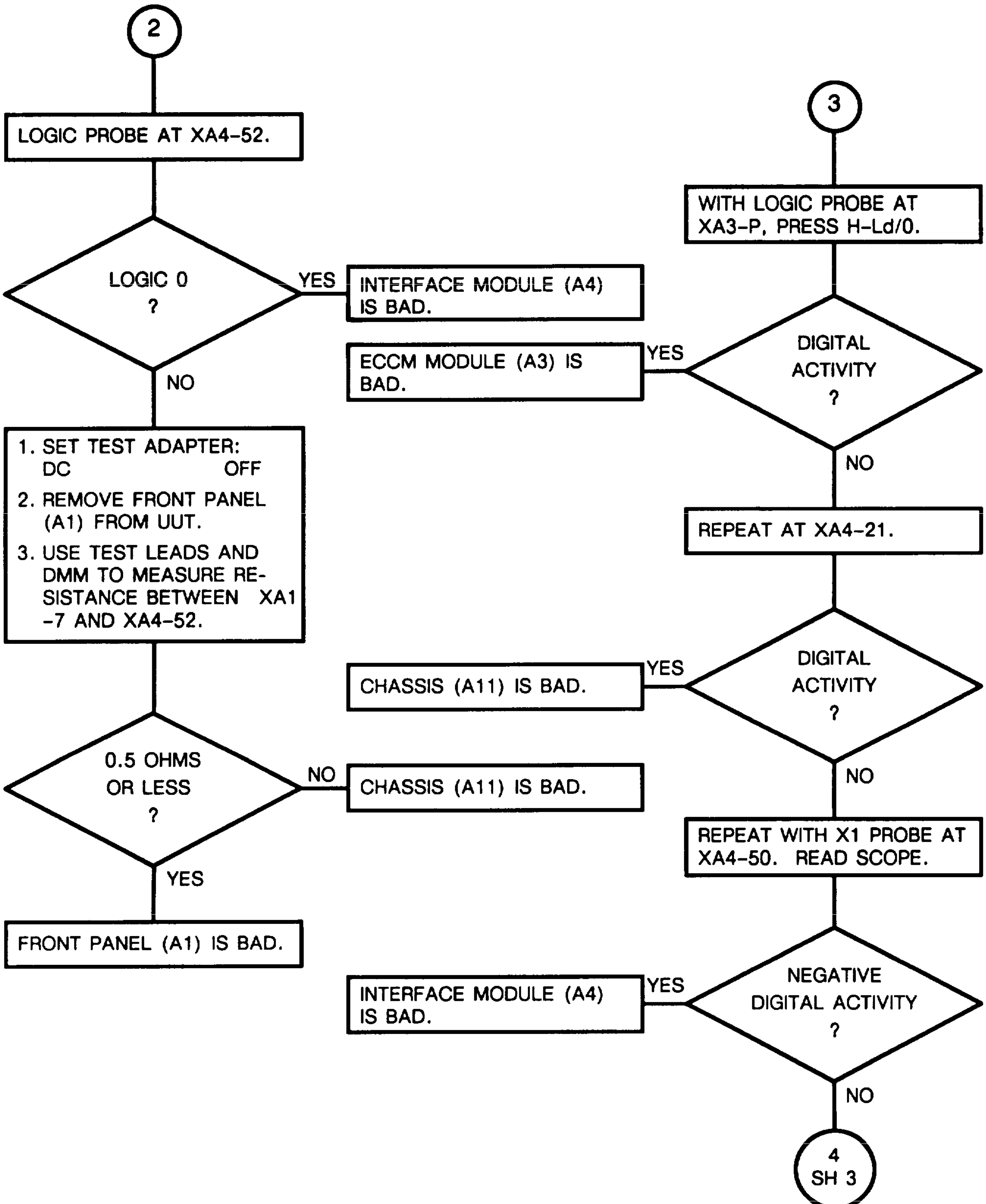
NOTE

See figure FO-10 for location of test points.



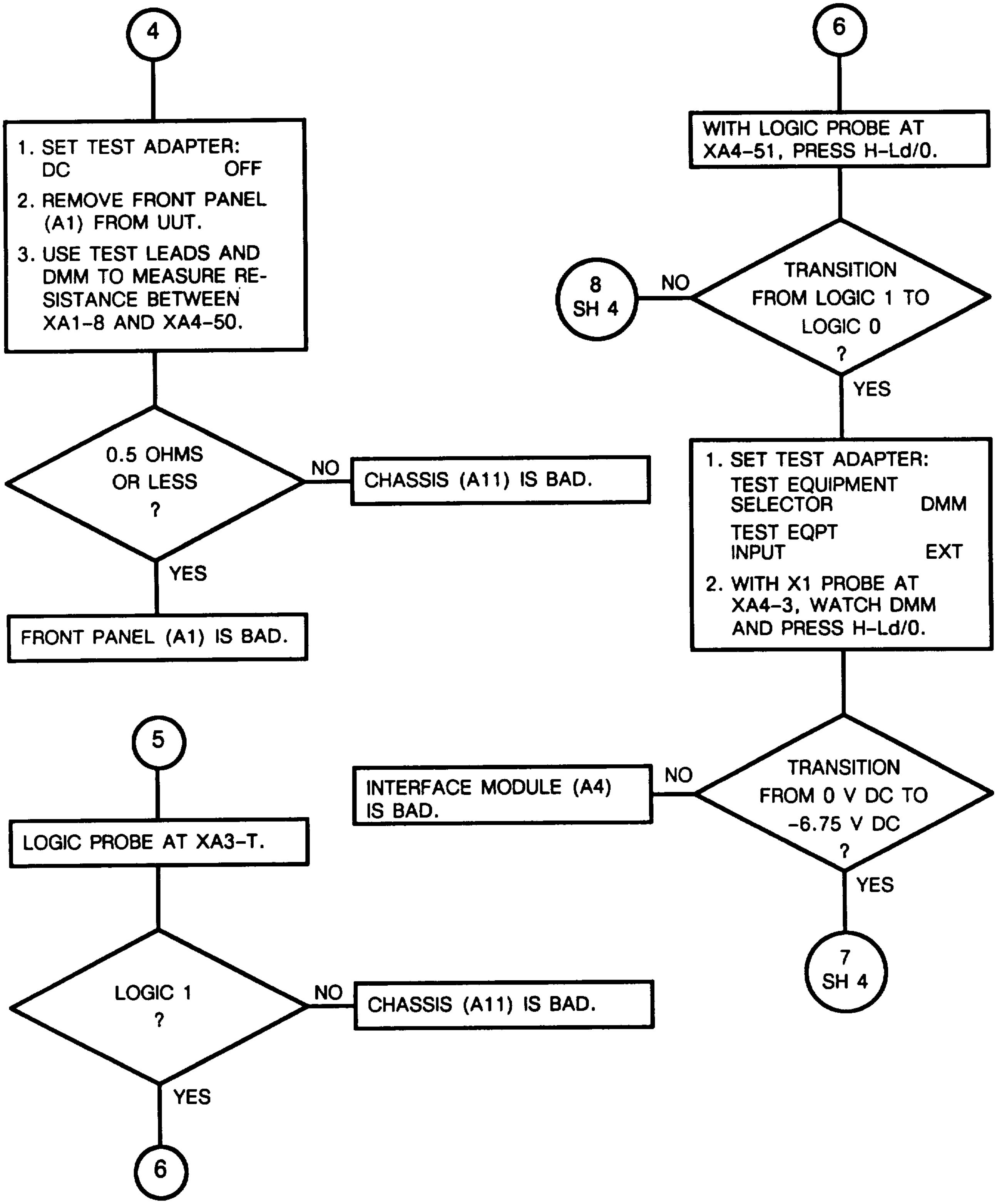
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 20
Load Failure (Sheet 2 of 4)



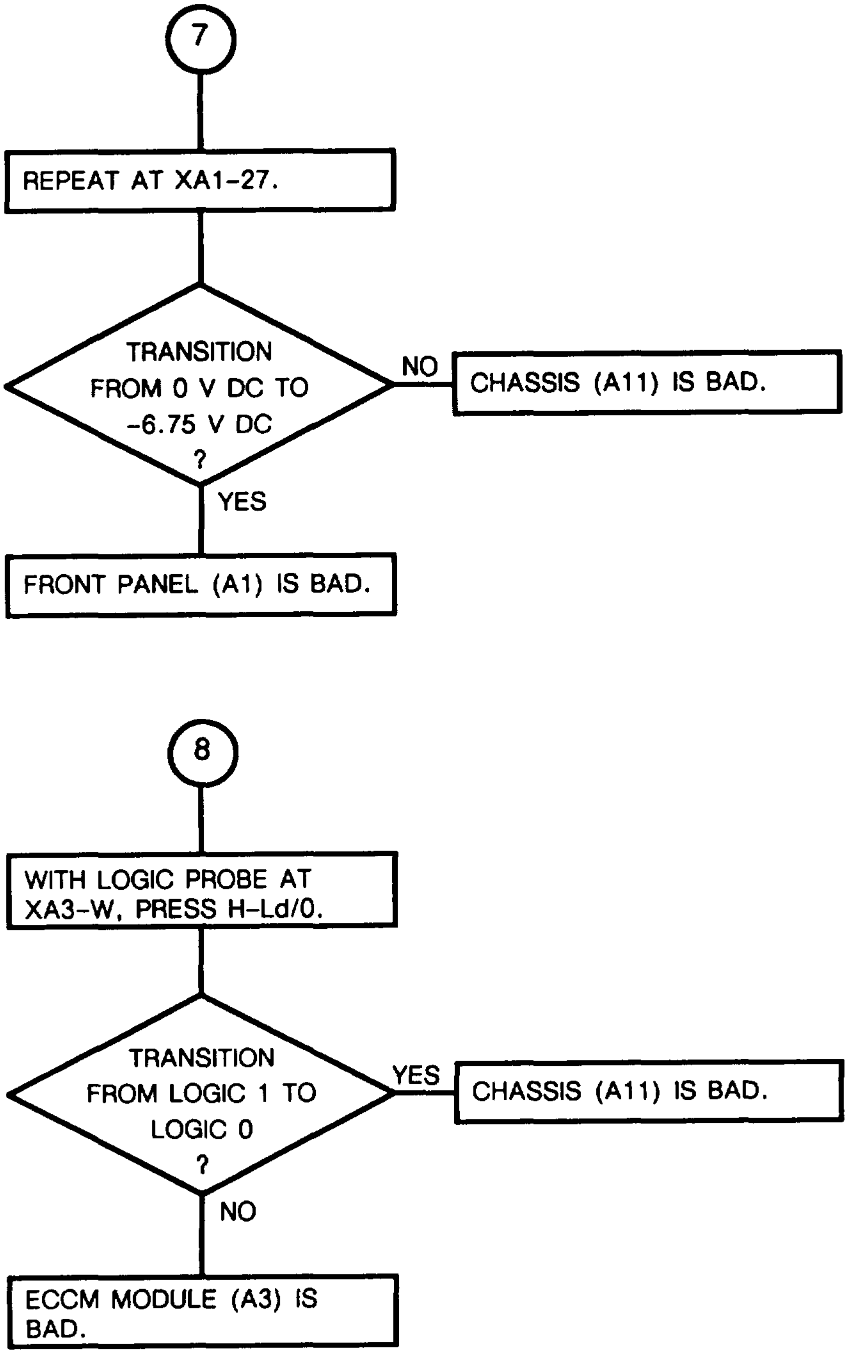
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 20
Load Failure (Sheet 3 of 4)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 20
Load Failure (Sheet 4 of 4)

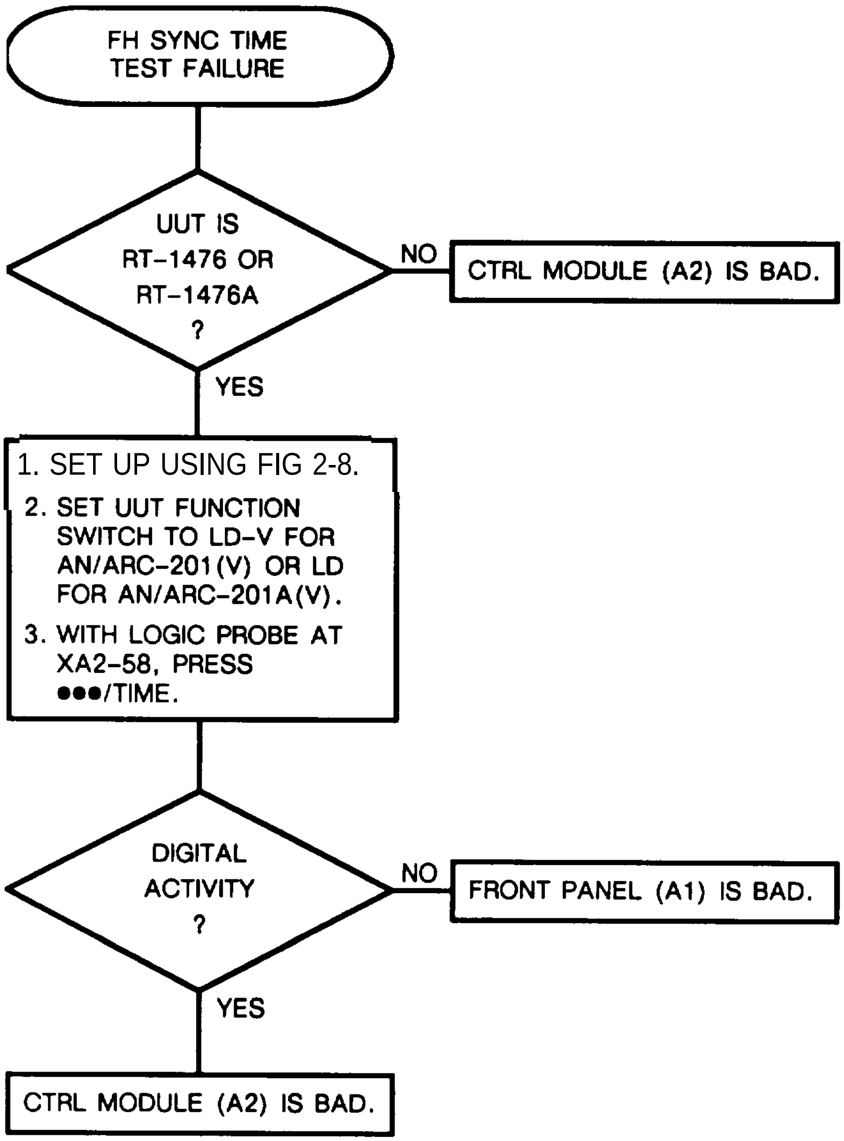


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 21
FH Sync Time Test Failure

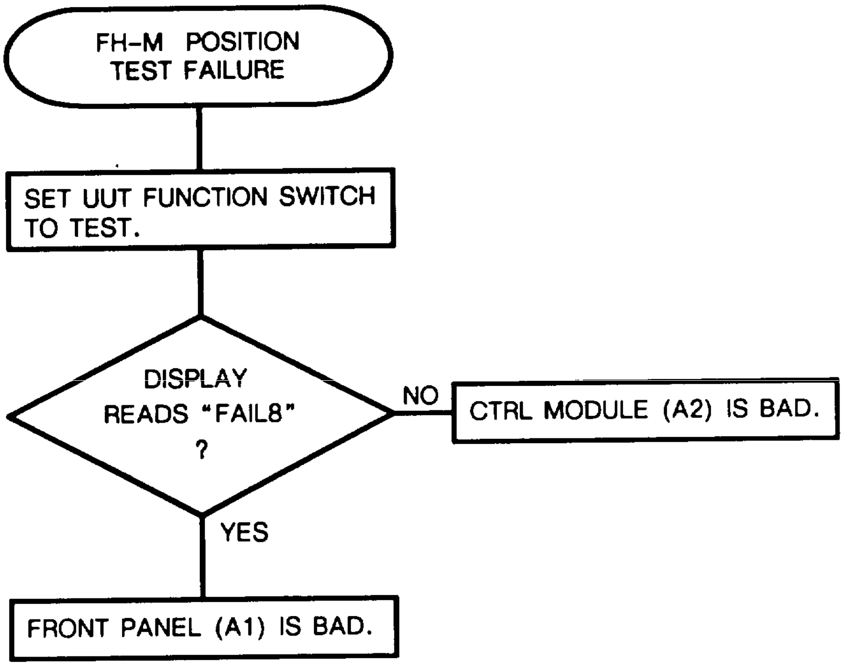
NOTE

See figure FO-10 for location of test points.



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

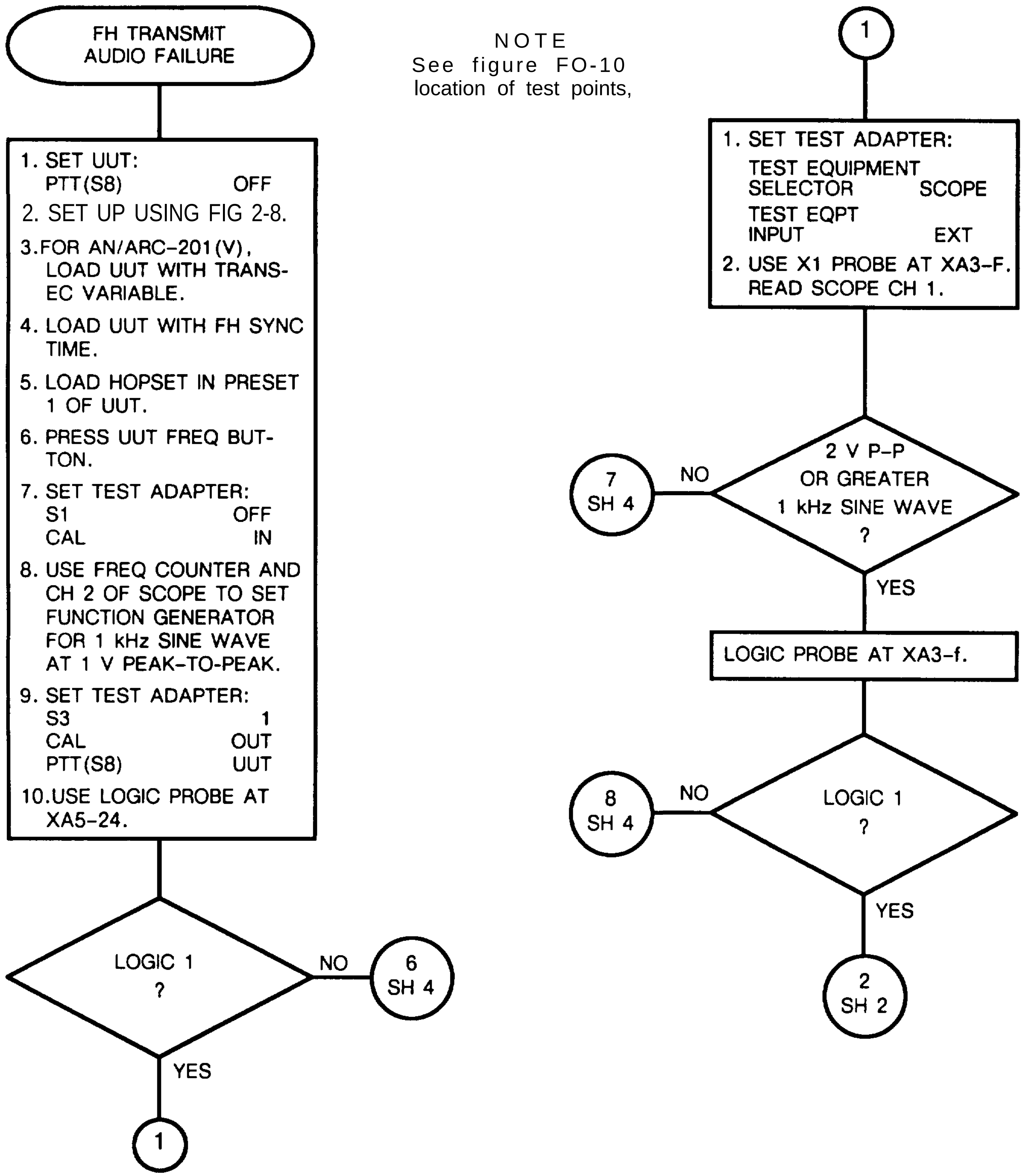
CHART 22
Fails FH-M Position Test



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

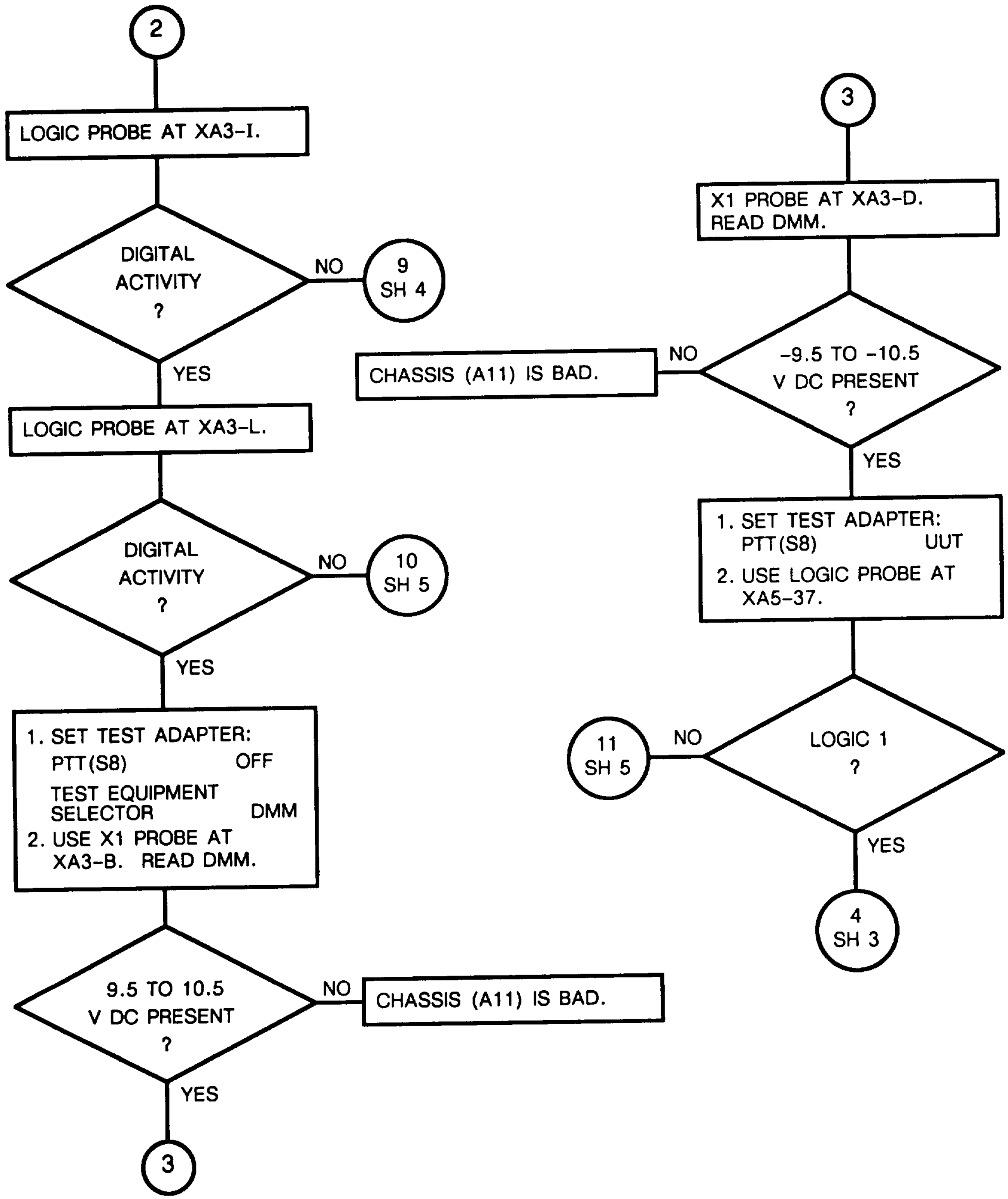
CHART 23
FH Transmit Audio Failure (Sheet 1 of 5)

NOTE
See figure FO-10
location of test points,



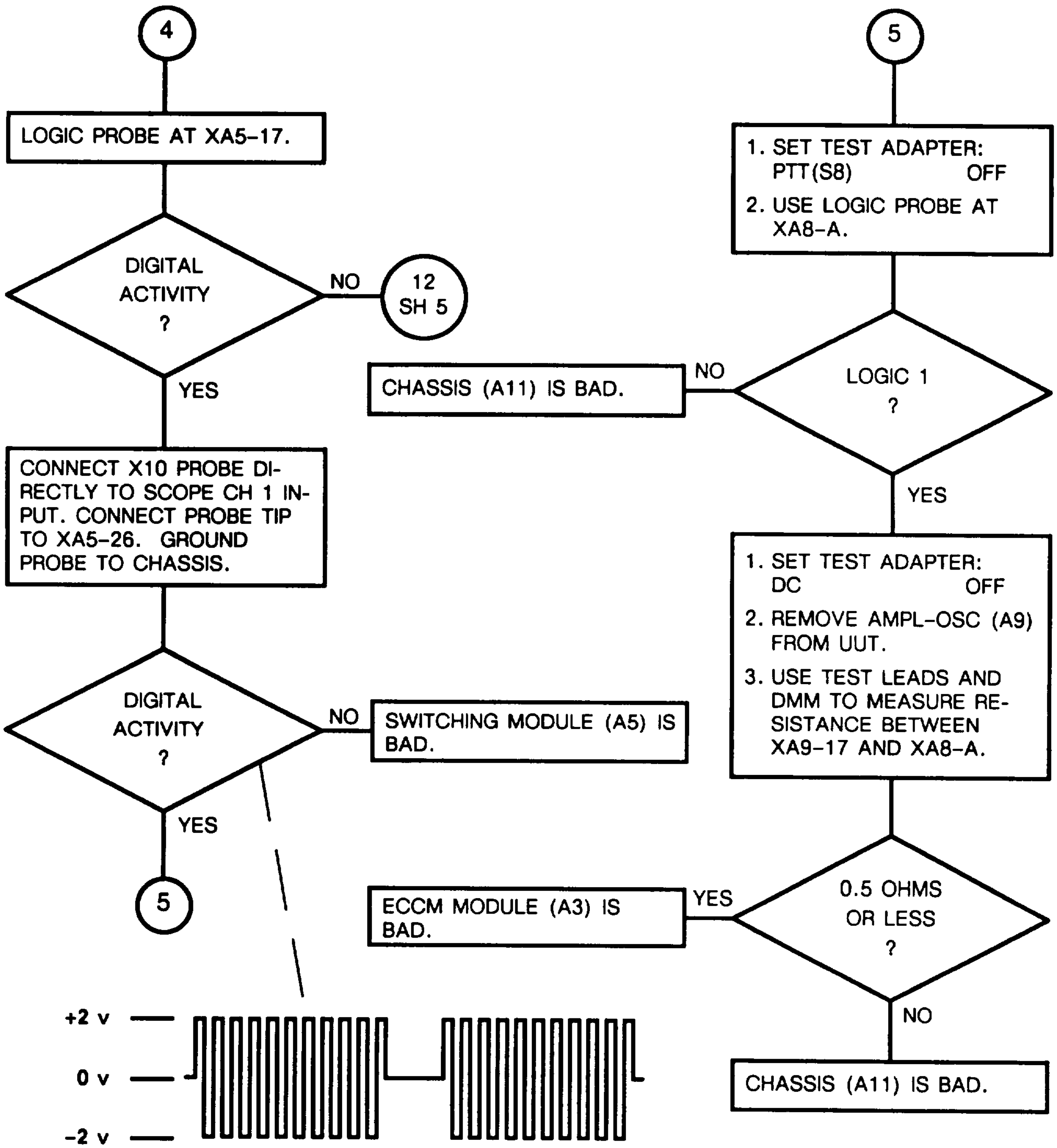
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 23
FH Transmit Audio Failure (Sheet 2 of 5)



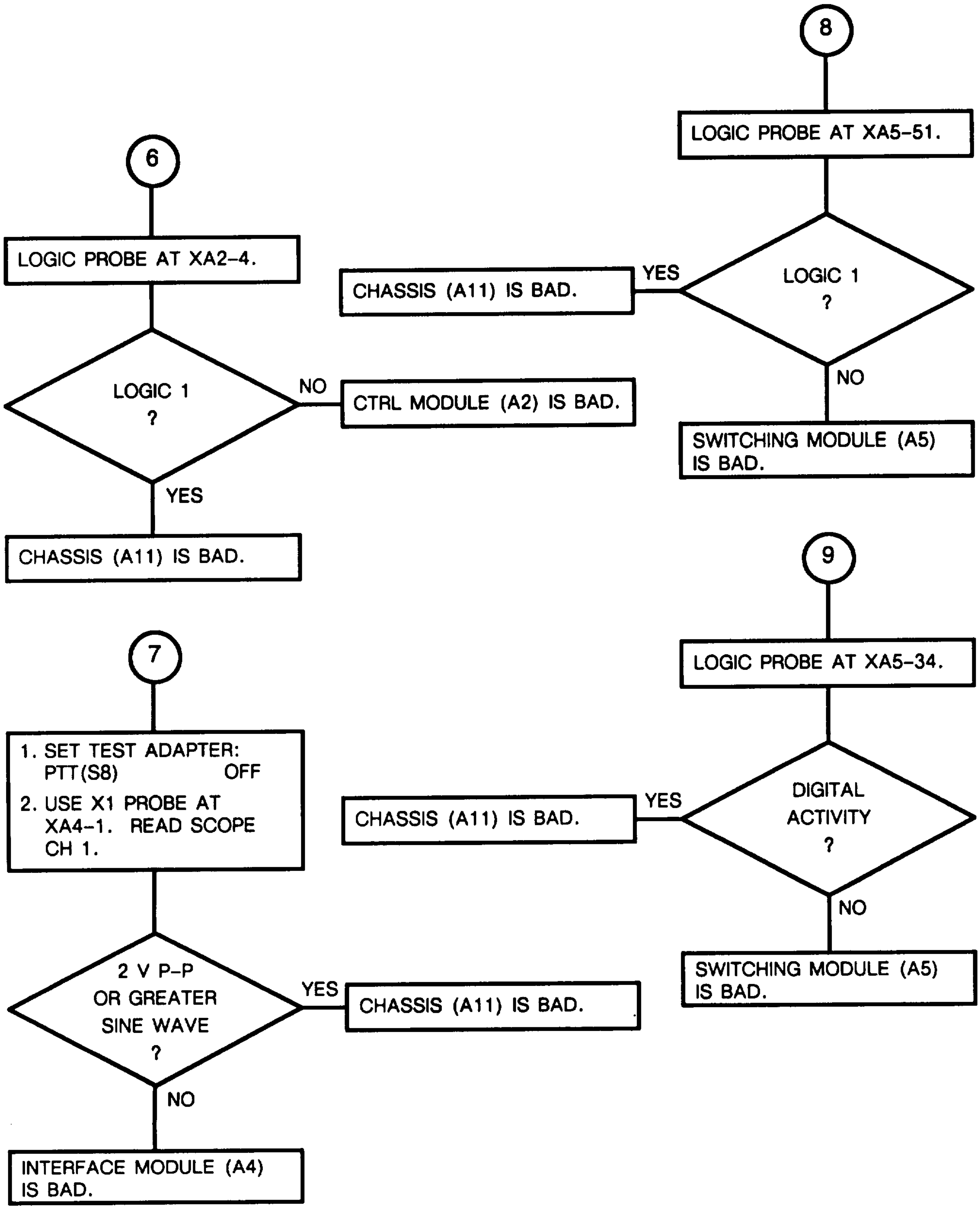
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 23
FH Transmit Audio Failure (Sheet 3 of 5)



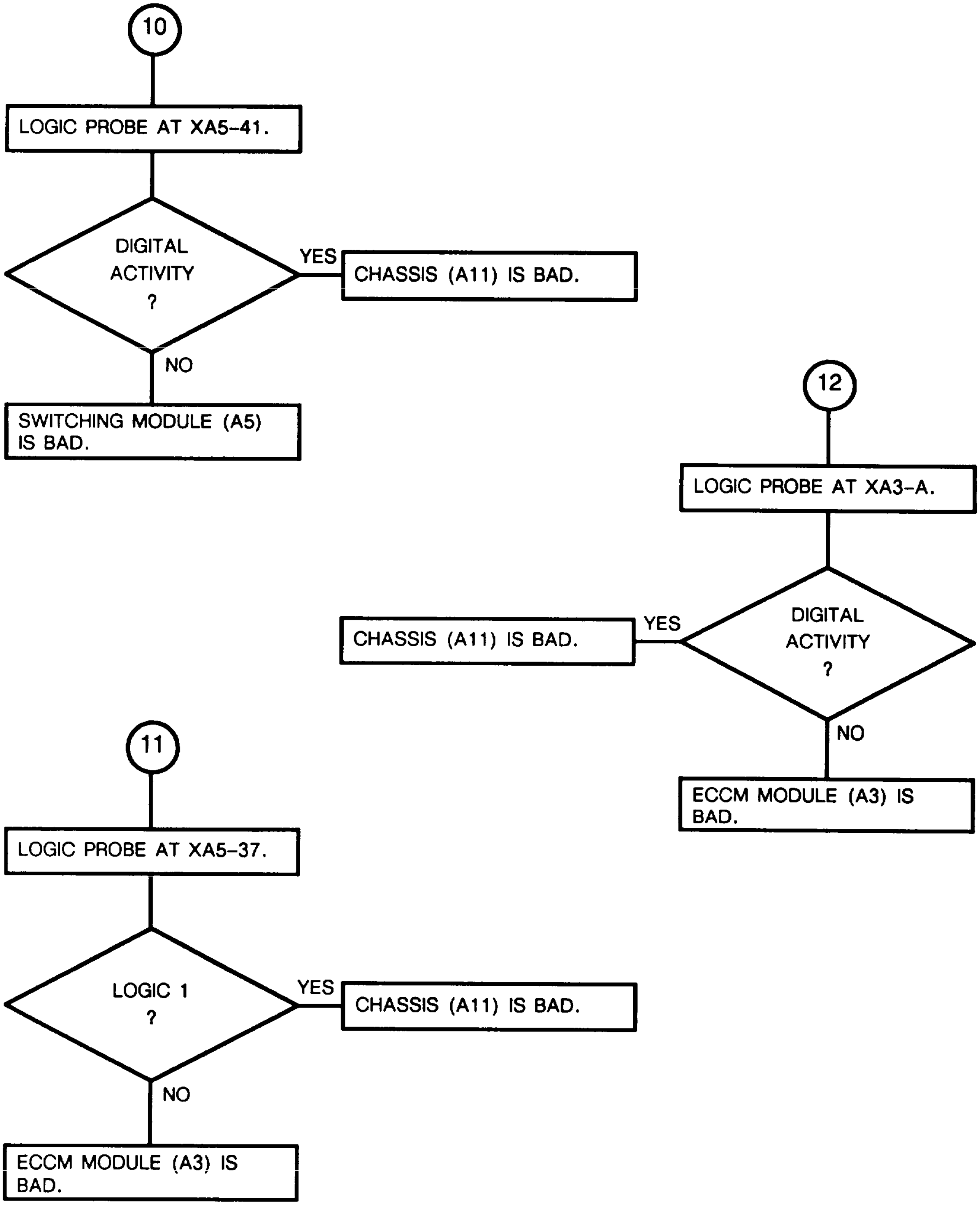
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 23
FH Transmit Audio Failure (Sheet 4 of 5)



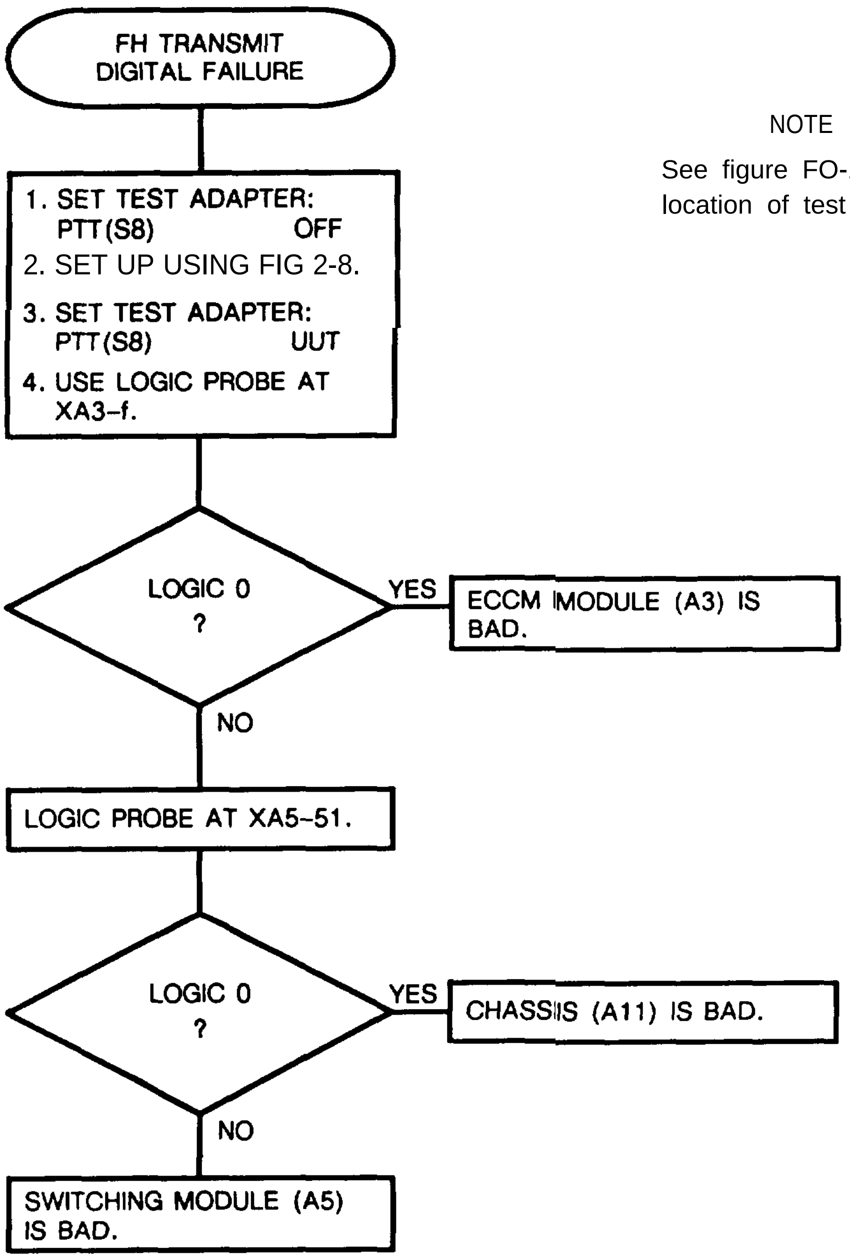
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 23
FH Transmit Audio Failure (Sheet 5 of 5)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 24
FH Transmit Digital Failure

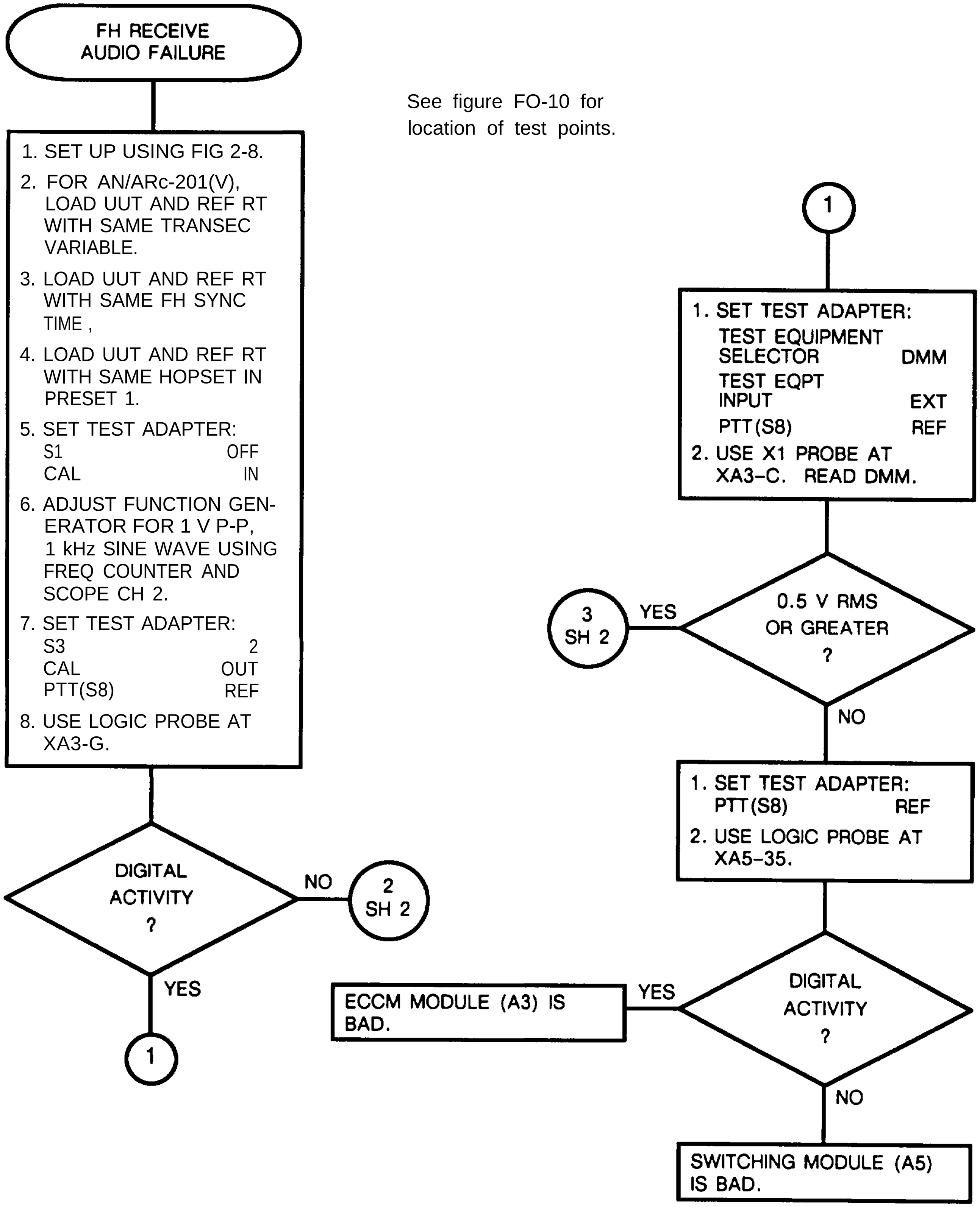


NOTE

See figure FO-10 for location of test points.

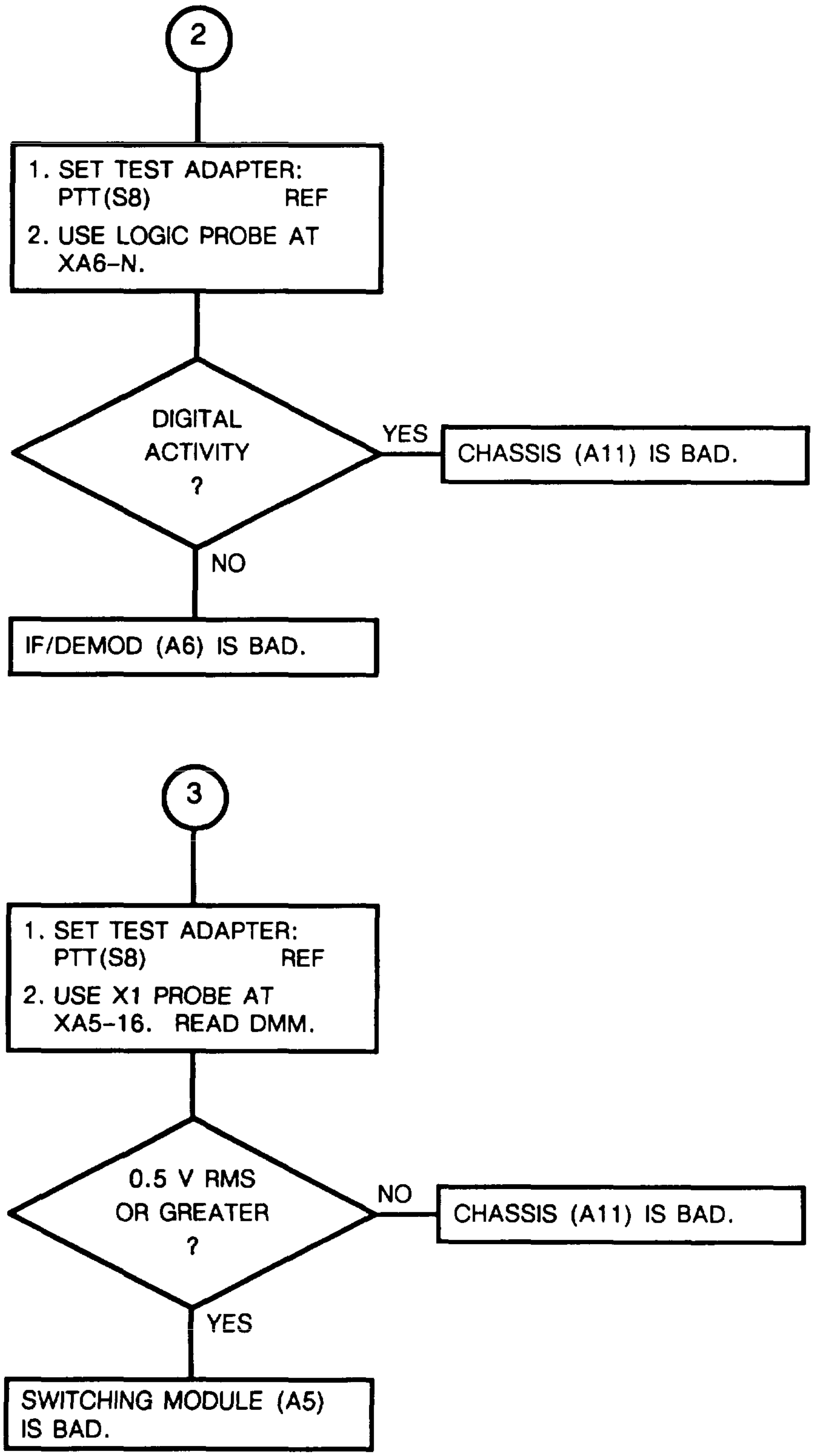
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 25
FH Receive Audio Failure (Sheet 1 of 2)



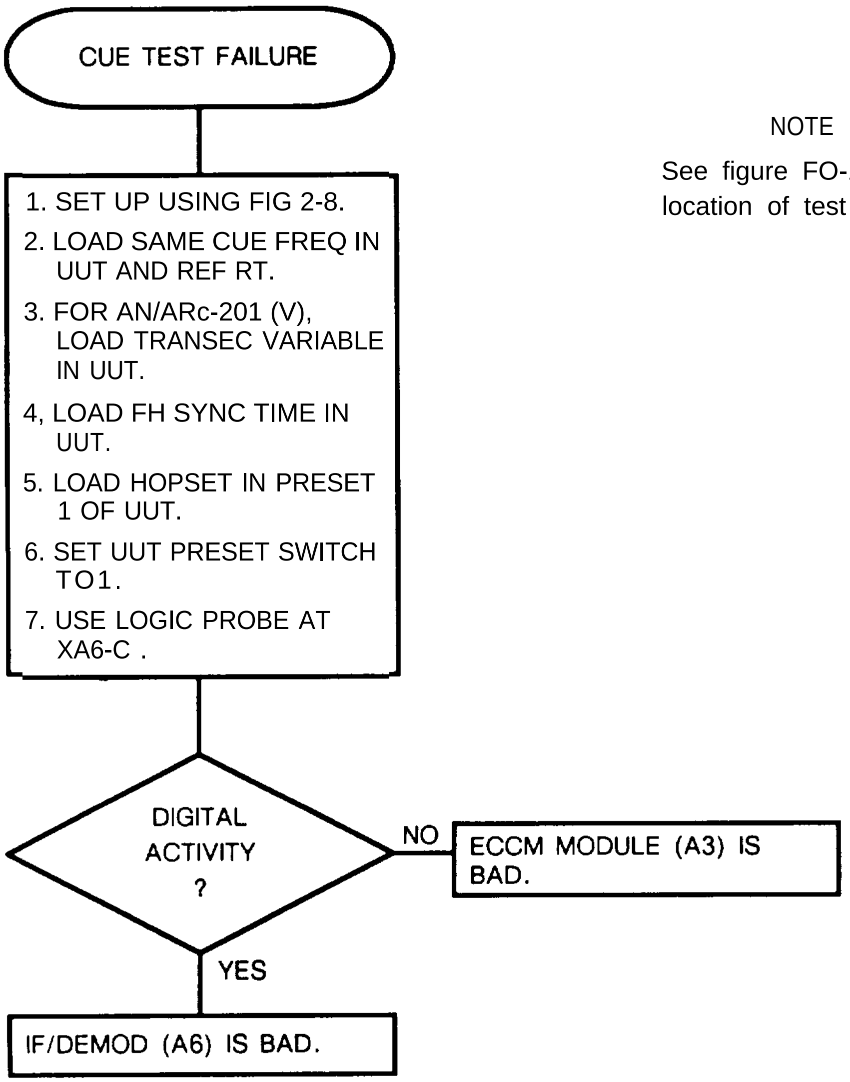
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 25
FH Receive Audio Failure (Sheet 2 of 2)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 26
CUE Test Failure



NOTE

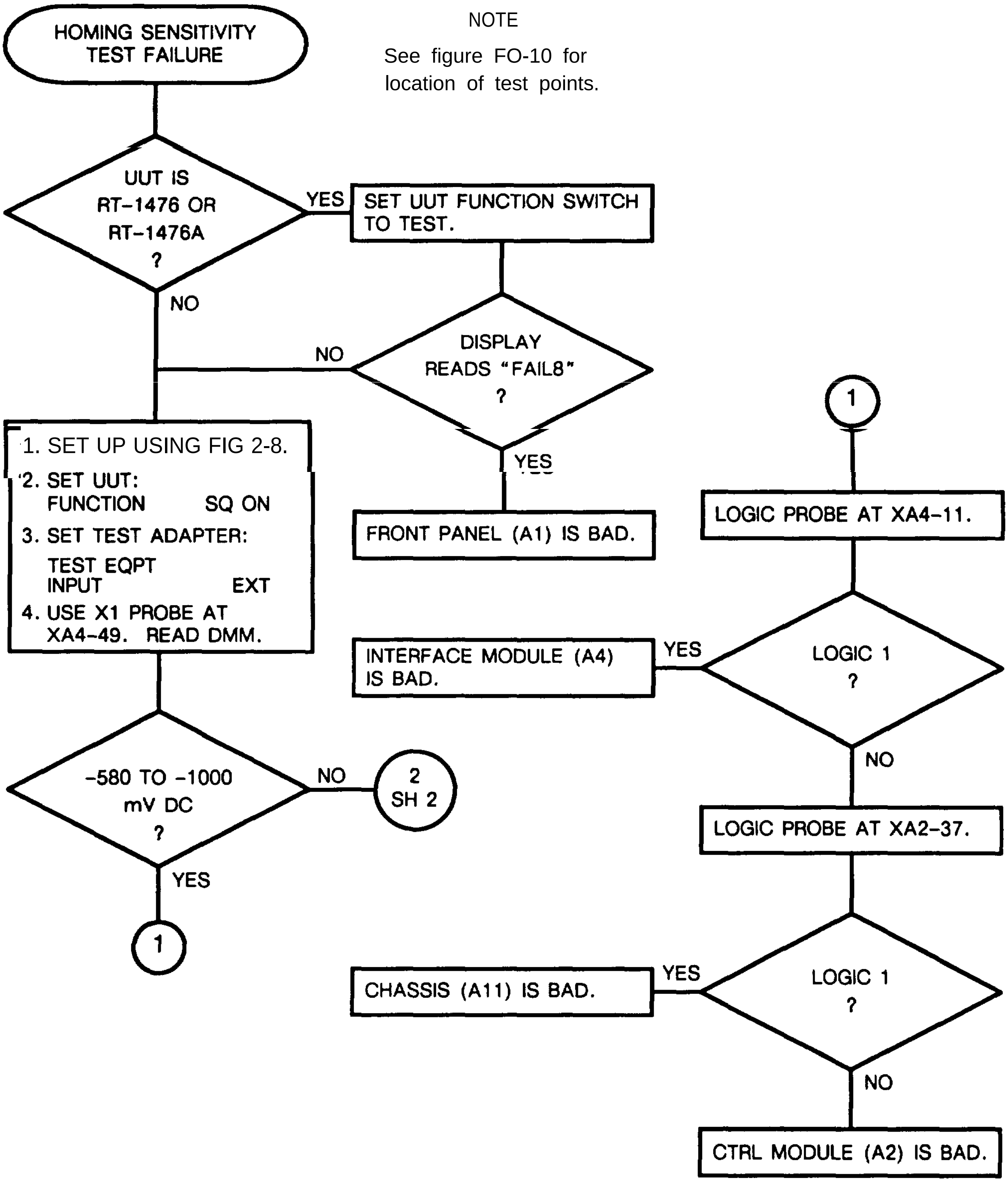
See figure FO-10 for location of test points.

2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 27
Fails Homing Sensitivity Test (Sheet 1 of 2)

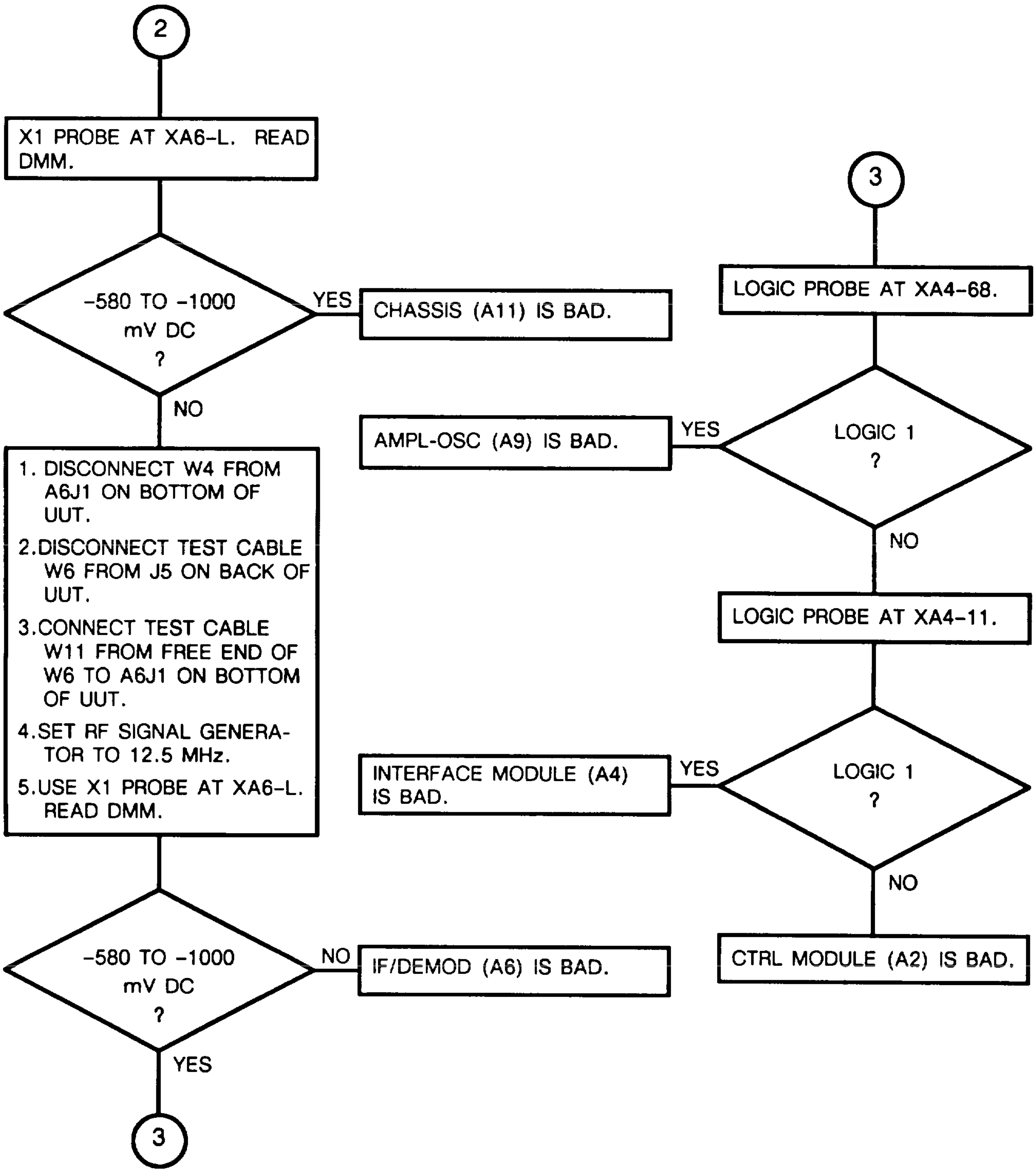
NOTE

See figure FO-10 for location of test points.



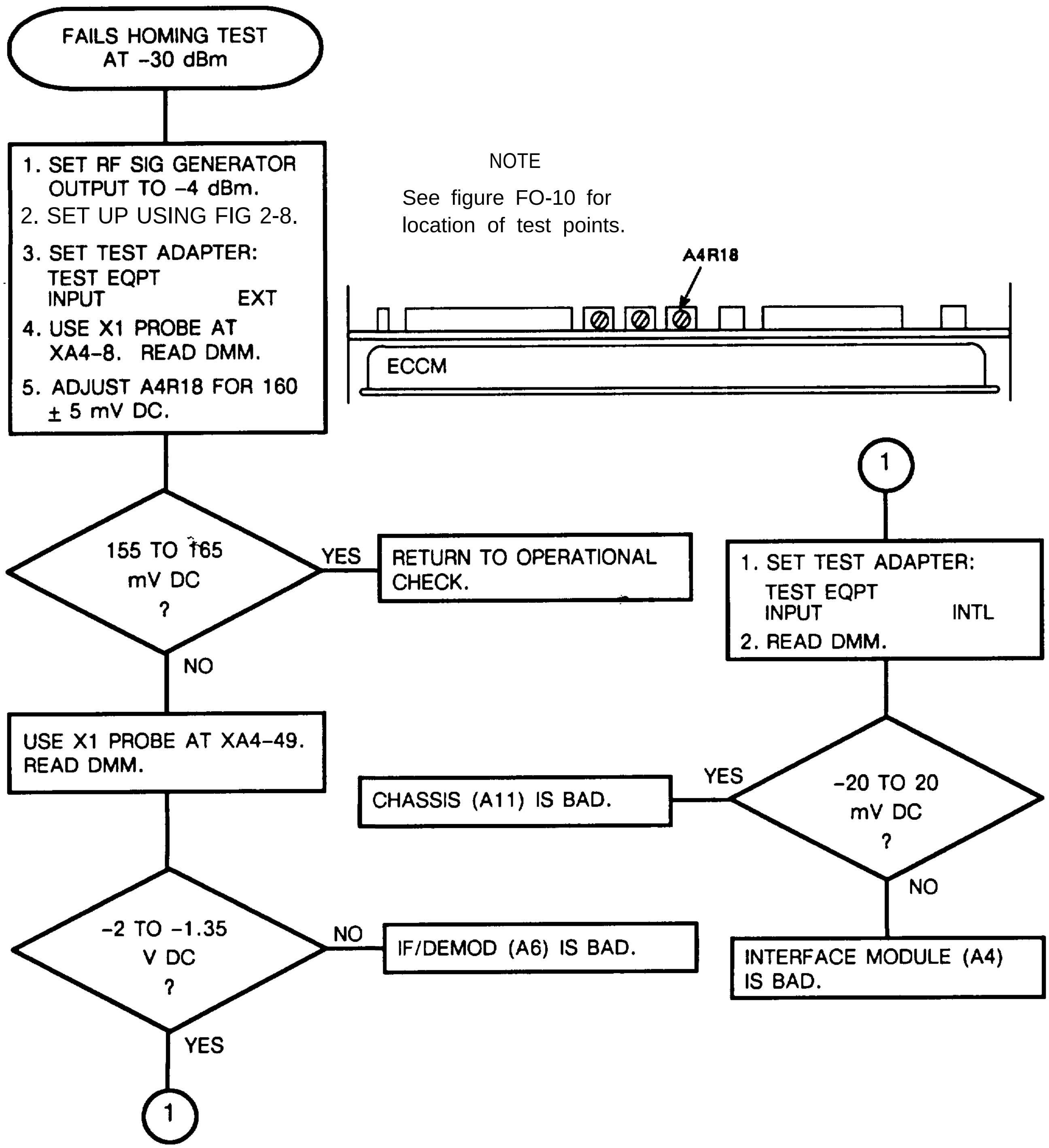
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 27
Fails Homing Sensitivity Test (Sheet 2 of 2)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 28
Fails Homing Test at -30 dBm



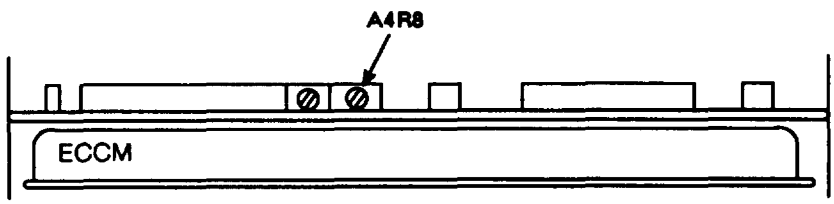
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 29
Fails Homing Steering Balance Test (Sheet 1 of 2)

FAILS HOMING STEERING BALANCE TEST

1. TURN RF SIG GENERATOR OFF.
2. SET UP USING FIG 2-8.
3. SET TEST ADAPTER:
   TEST EQPT INPUT — EXT
4. USE X1 PROBE AT XA4-8. READ DMM.
5. ADJUST A4R8 FOR 0±25 mV DC.

See figure FO-10 for location of test points.



-25 TO 25 mV DC ?

NO: INTERFACE MODULE (A4) IS BAD.

YES:

1. SET RF SIGNAL GENERATOR TO ON.
2. SET TEST ADAPTER:
   TEST EQPT INPUT — INTL
3. READ DMM.

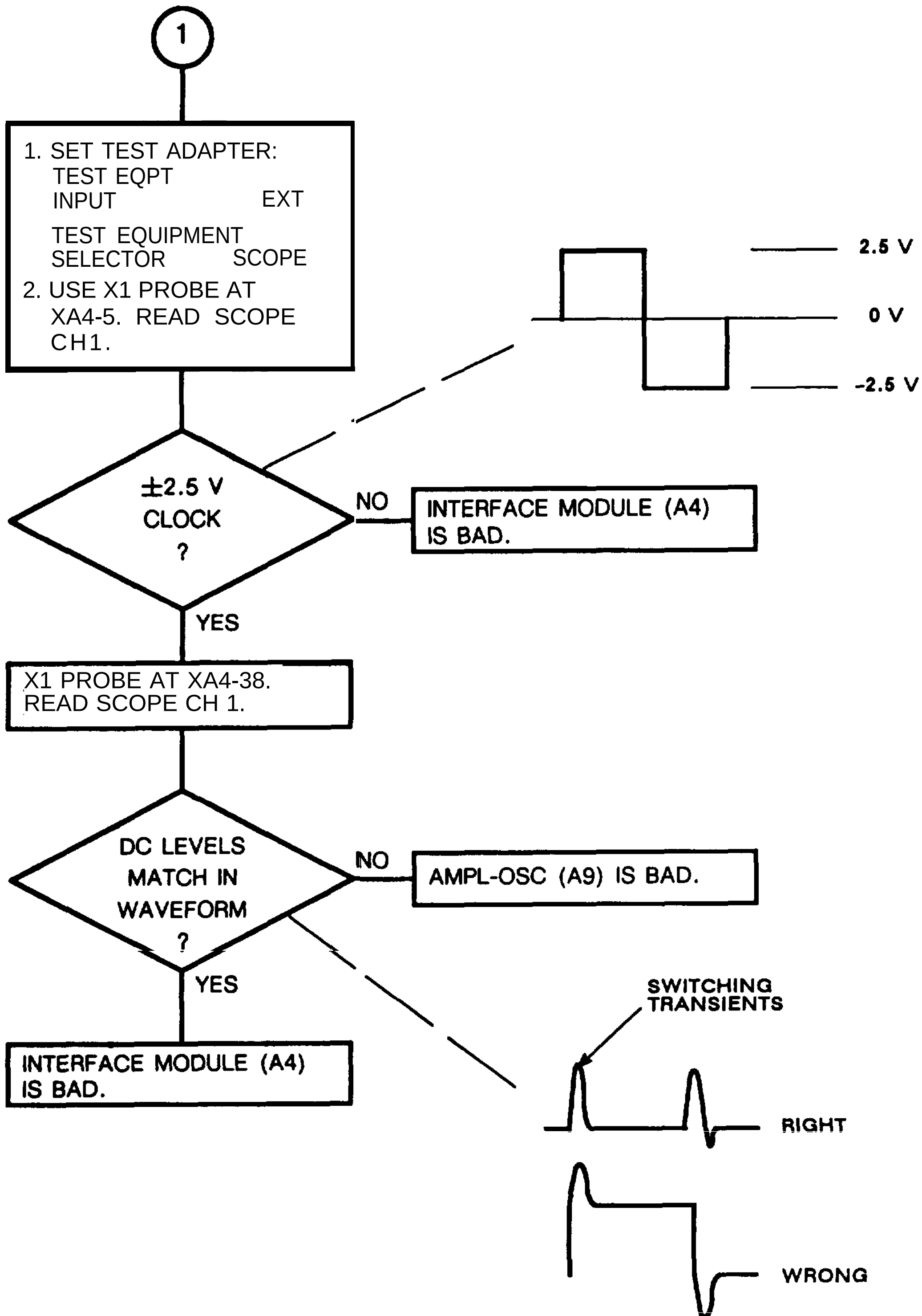
-30 TO 30 mV DC ?

YES: RETURN TO OPERATIONAL CHECK.

NO: 1 SH 2

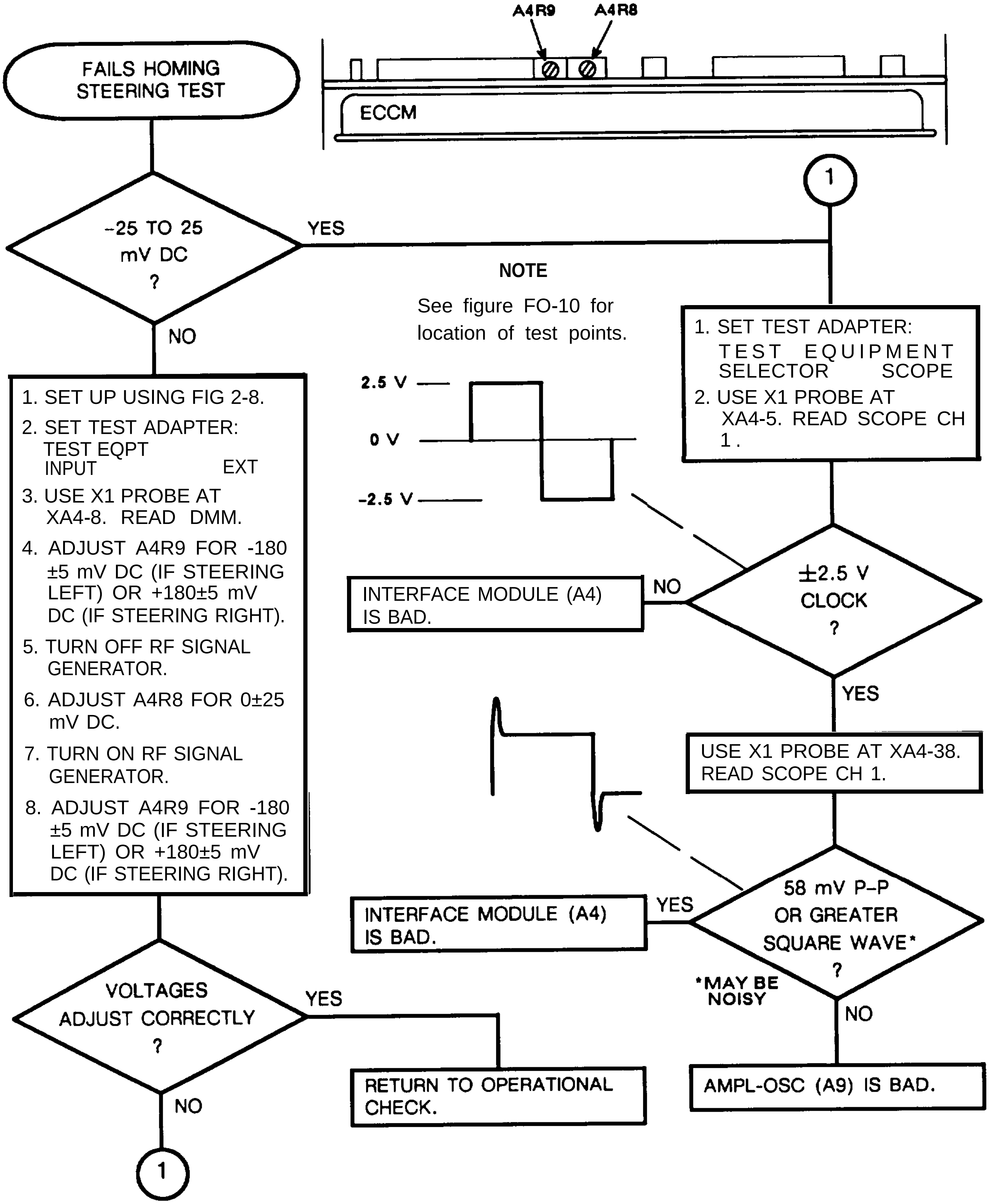
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 29
Fails Homing Steering Balance Test (Sheet 2 of 2)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 30
Fails Homing Steering Test

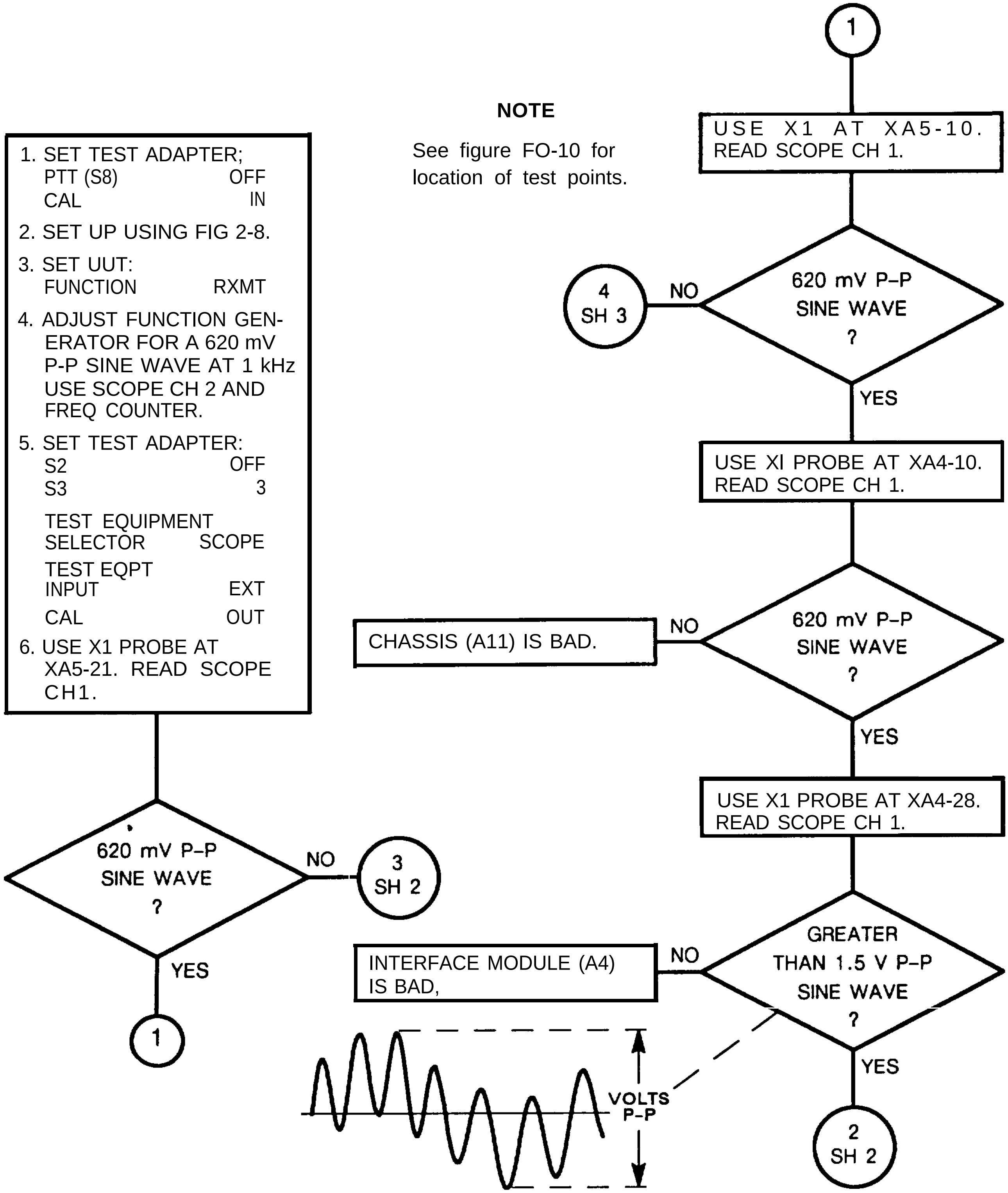


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 31
SC RXMT Transmit Audio Failure (Sheet 1 of 3)

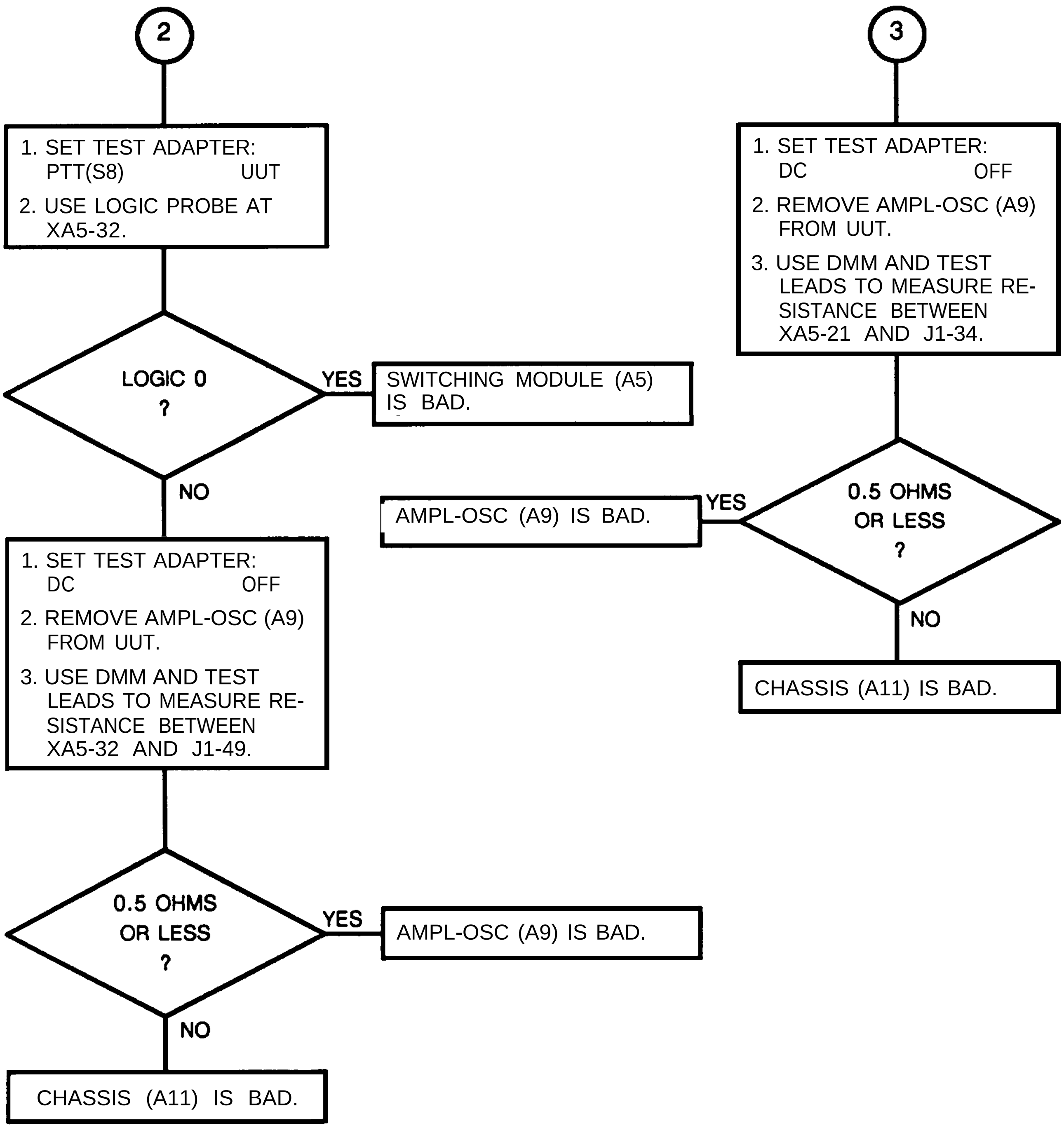
NOTE

See figure FO-10 for location of test points.



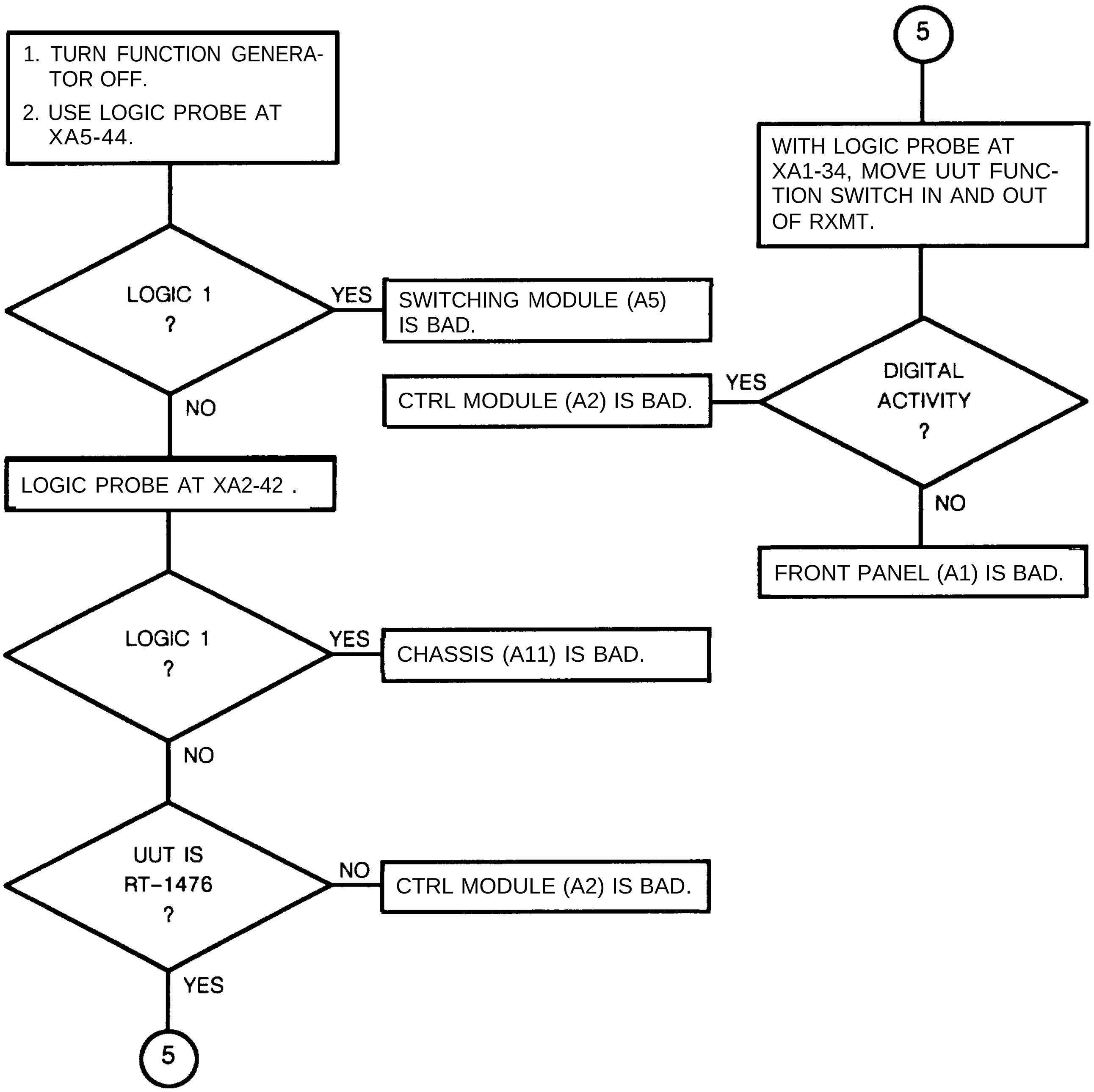
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 31
SC RXMT Transmit Audio Failure (Sheet 2 of 3)



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 31
SC RXMT Transmit Audio Failure (Sheet 3 of 3)

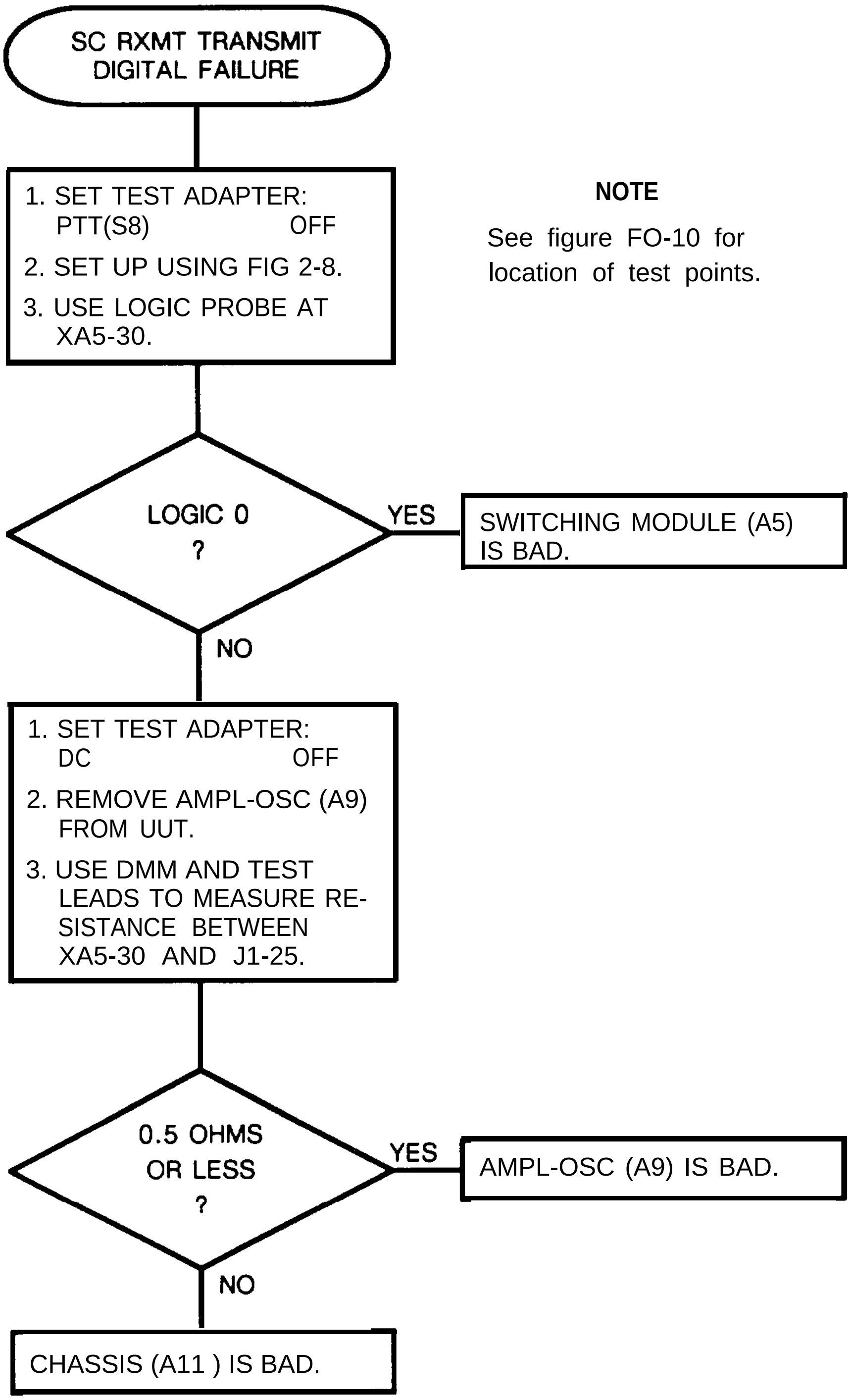


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 32
SC RXMT Transmit Digital Failure

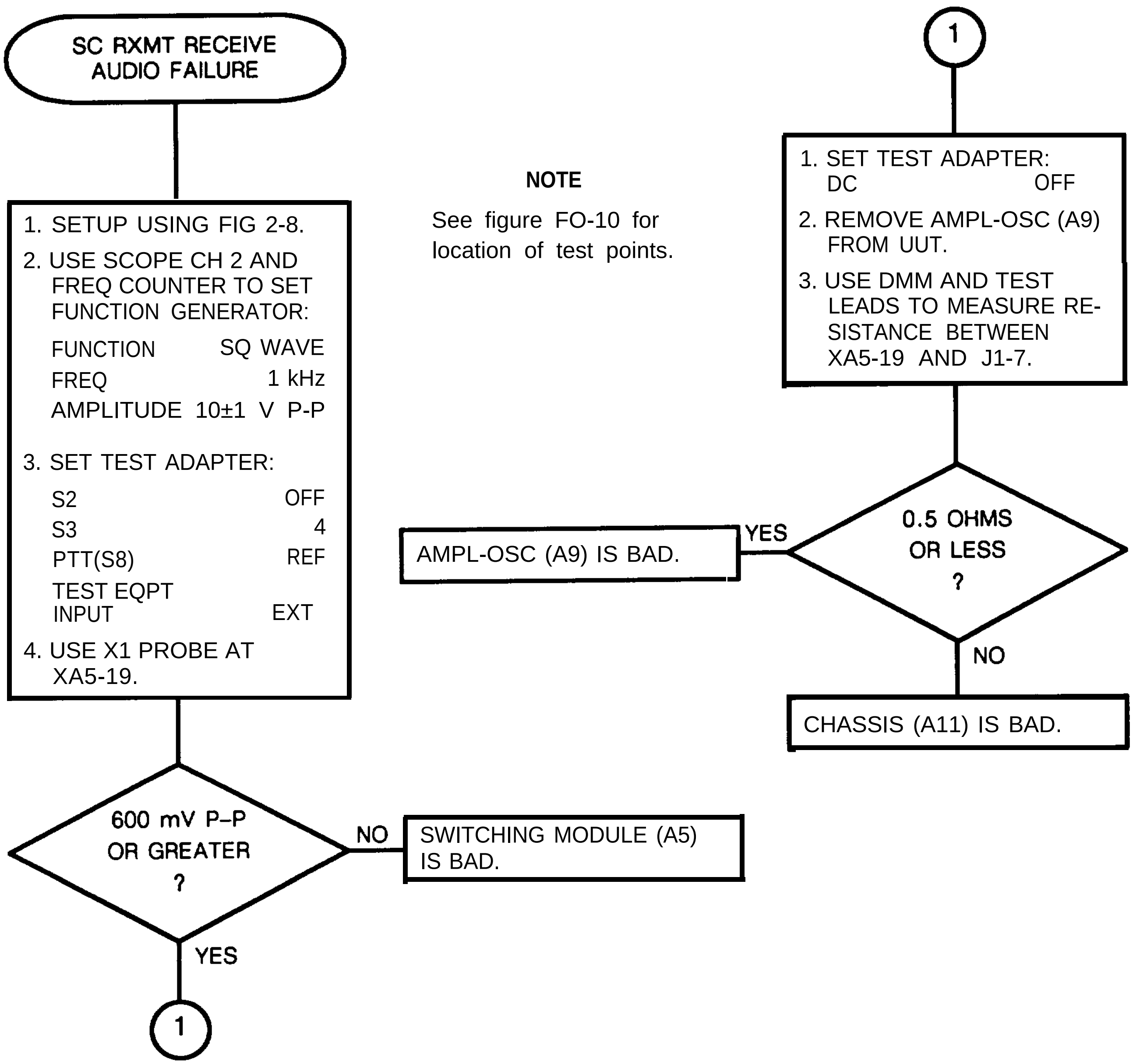
NOTE

See figure FO-10 for location of test points.



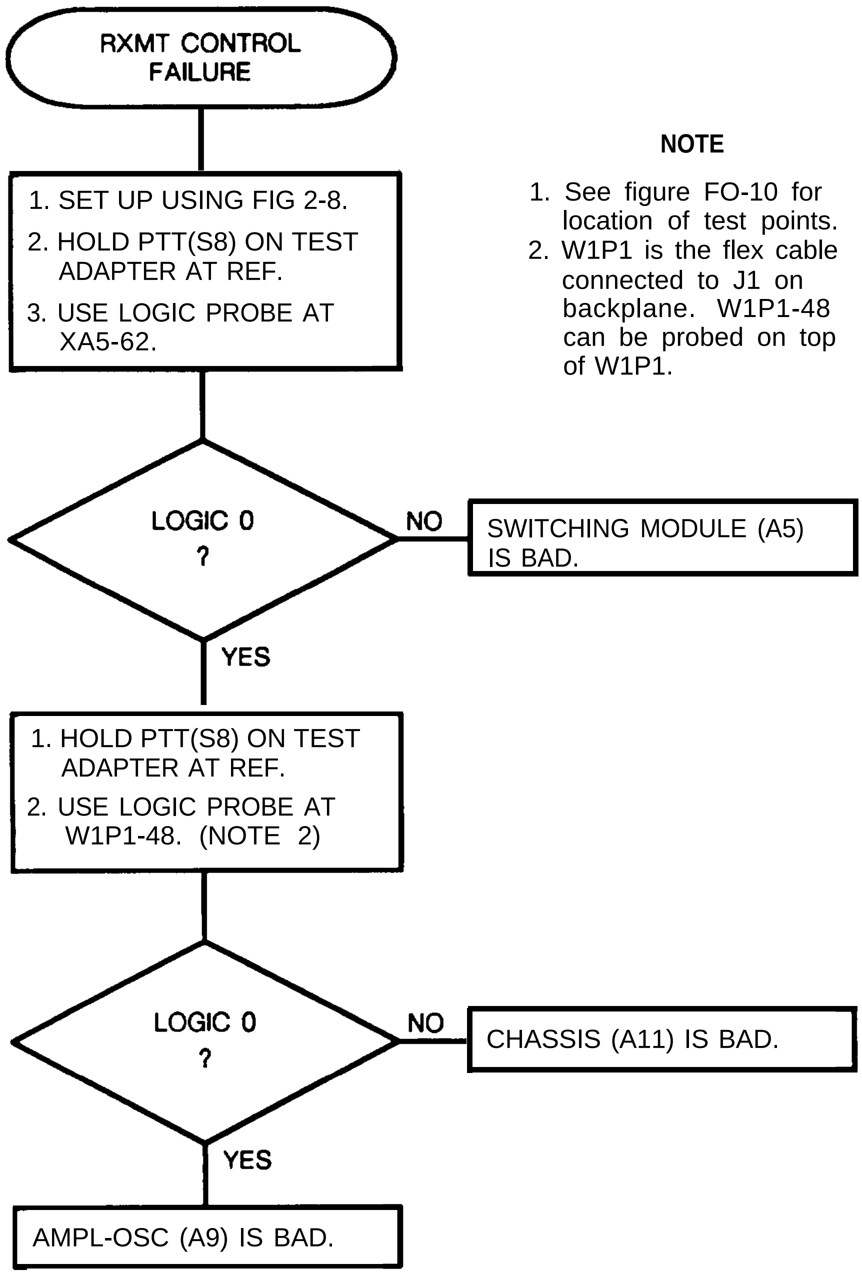
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 33
SC RXMT Receive Audio Failure



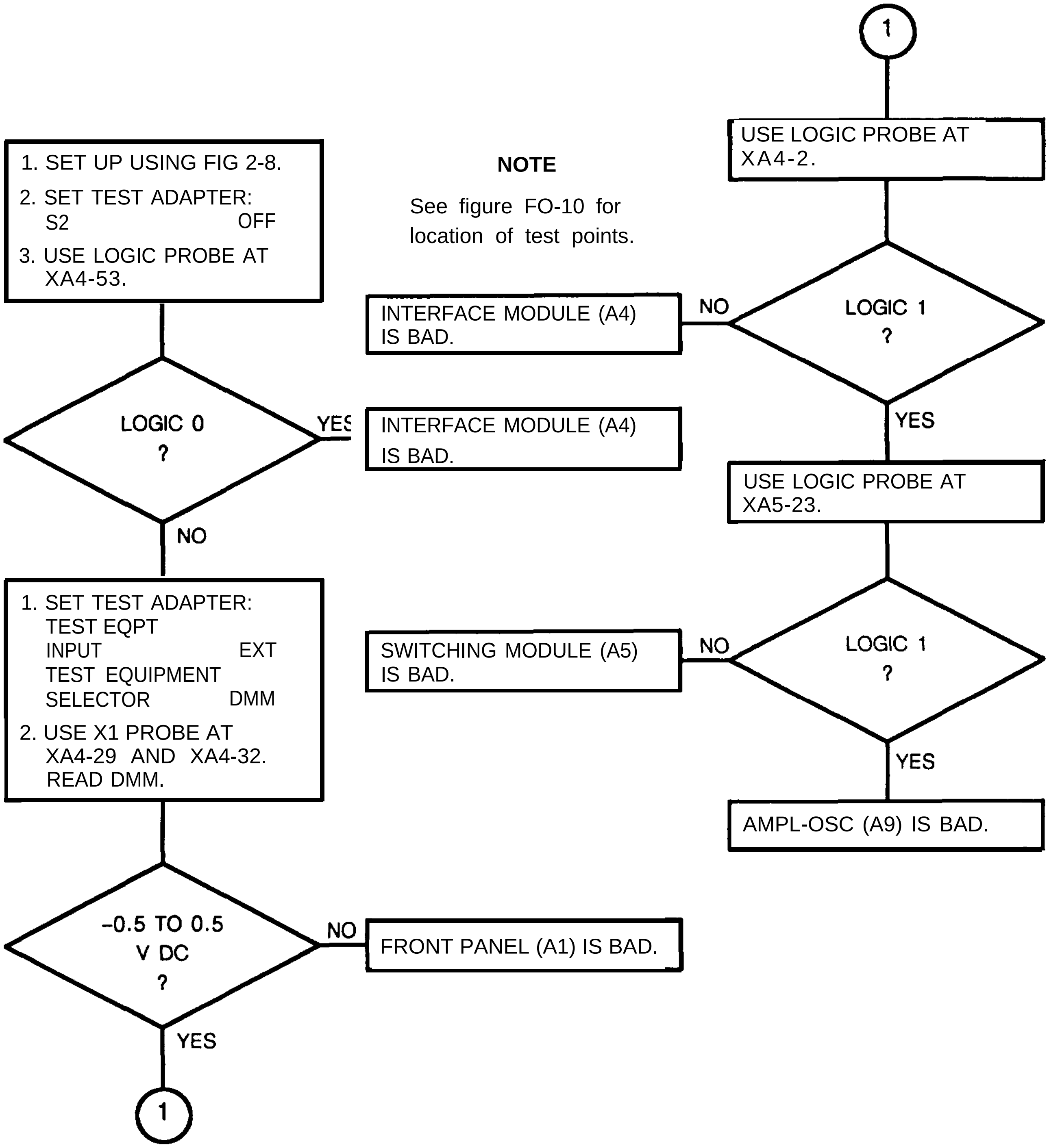
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 34
RXMT Control Failure



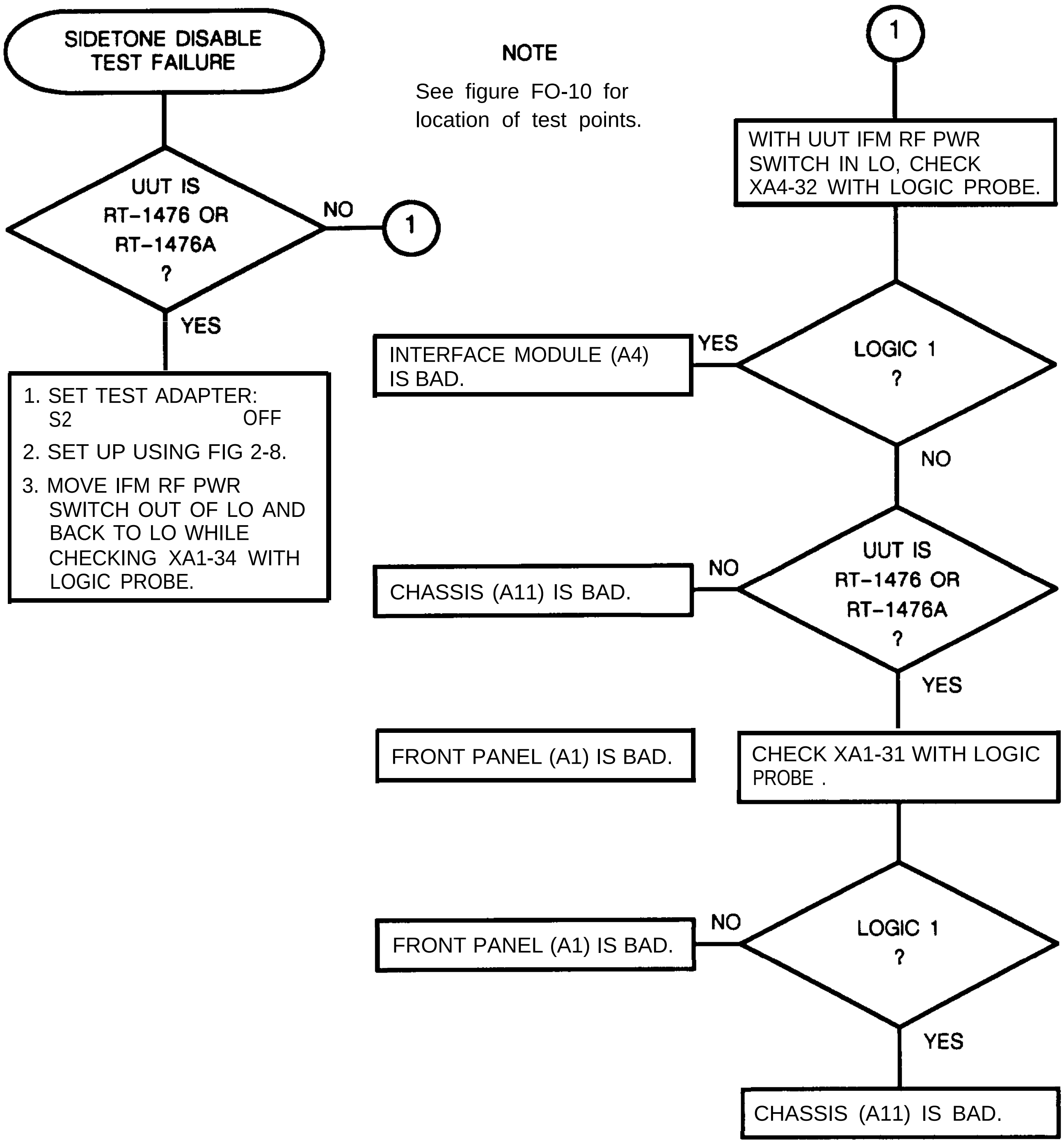
2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 35
Sidetone Enable Test Failure



2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 36
Sidetone Disable Test Failure

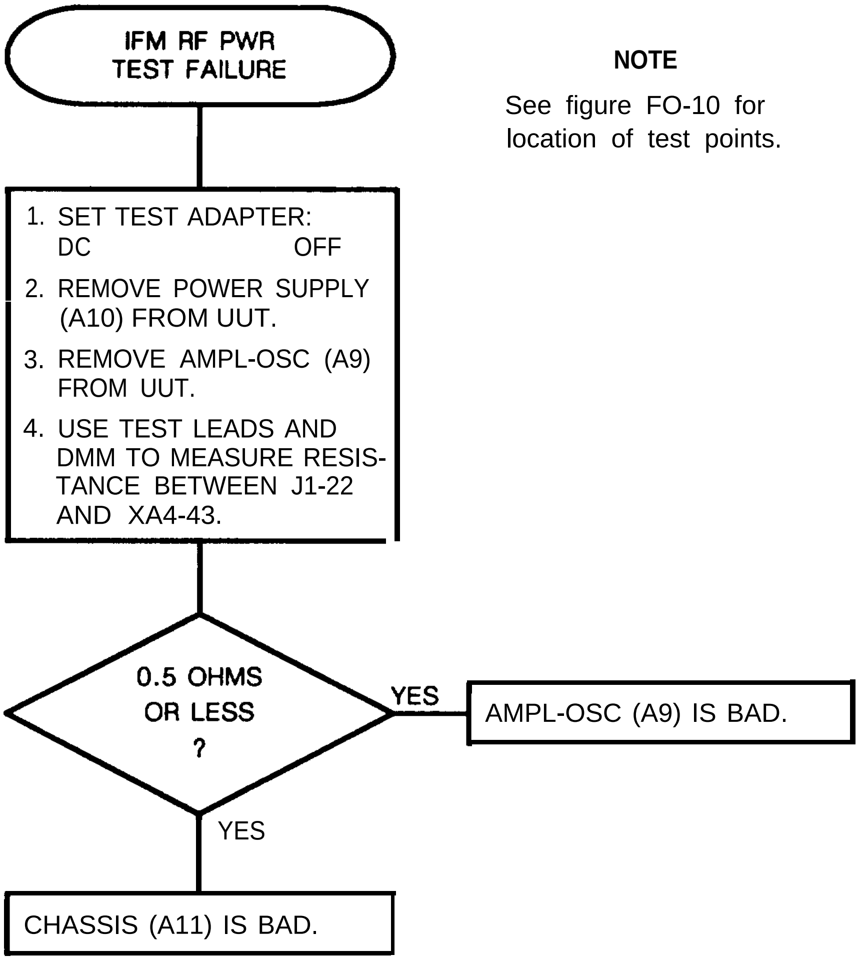


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 37
IFM RF PWR Test Failure

NOTE

See figure FO-10 for location of test points.

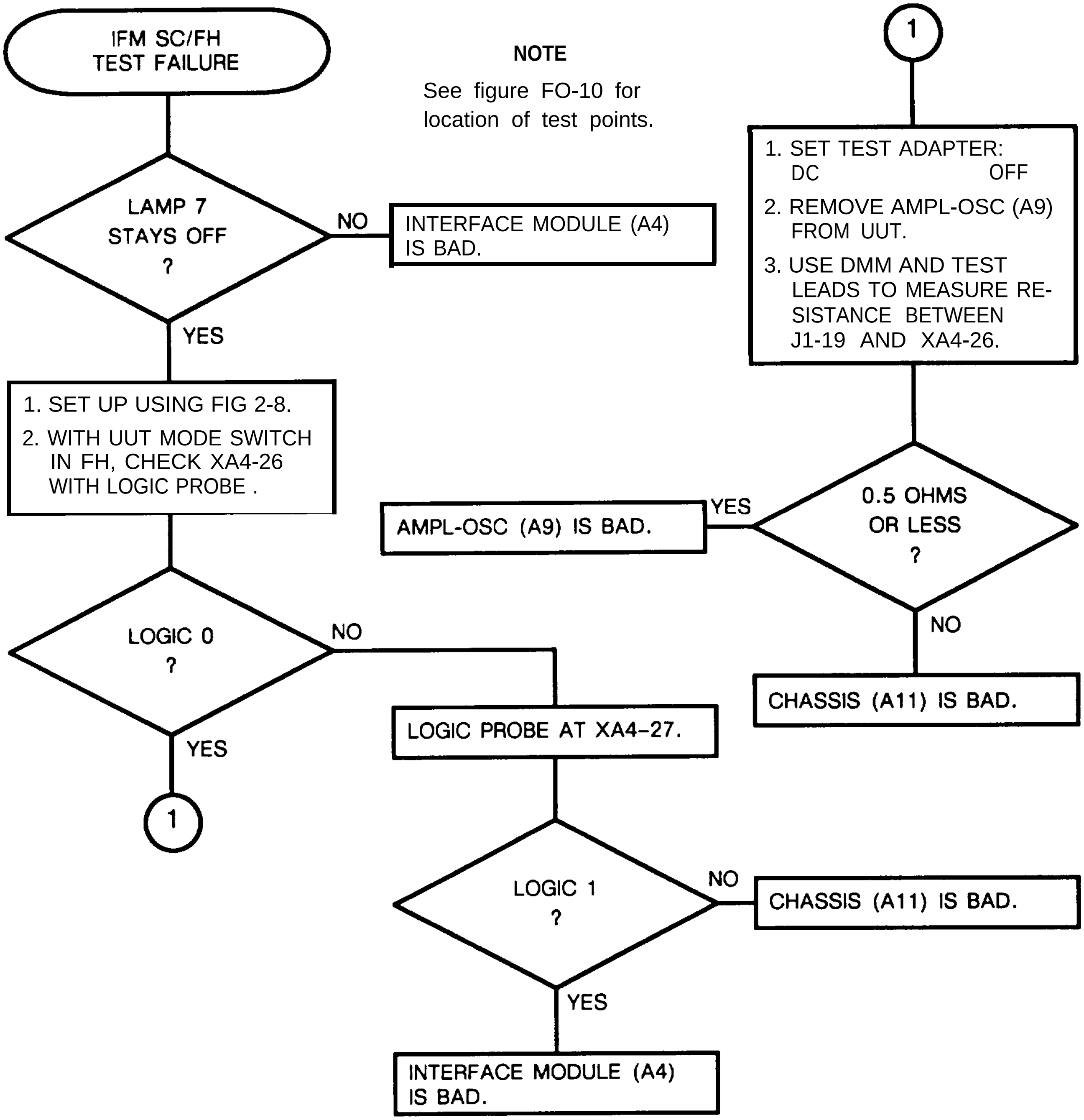


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 38
IFM CC/FH Test Failure

NOTE

See figure FO-10 for location of test points.

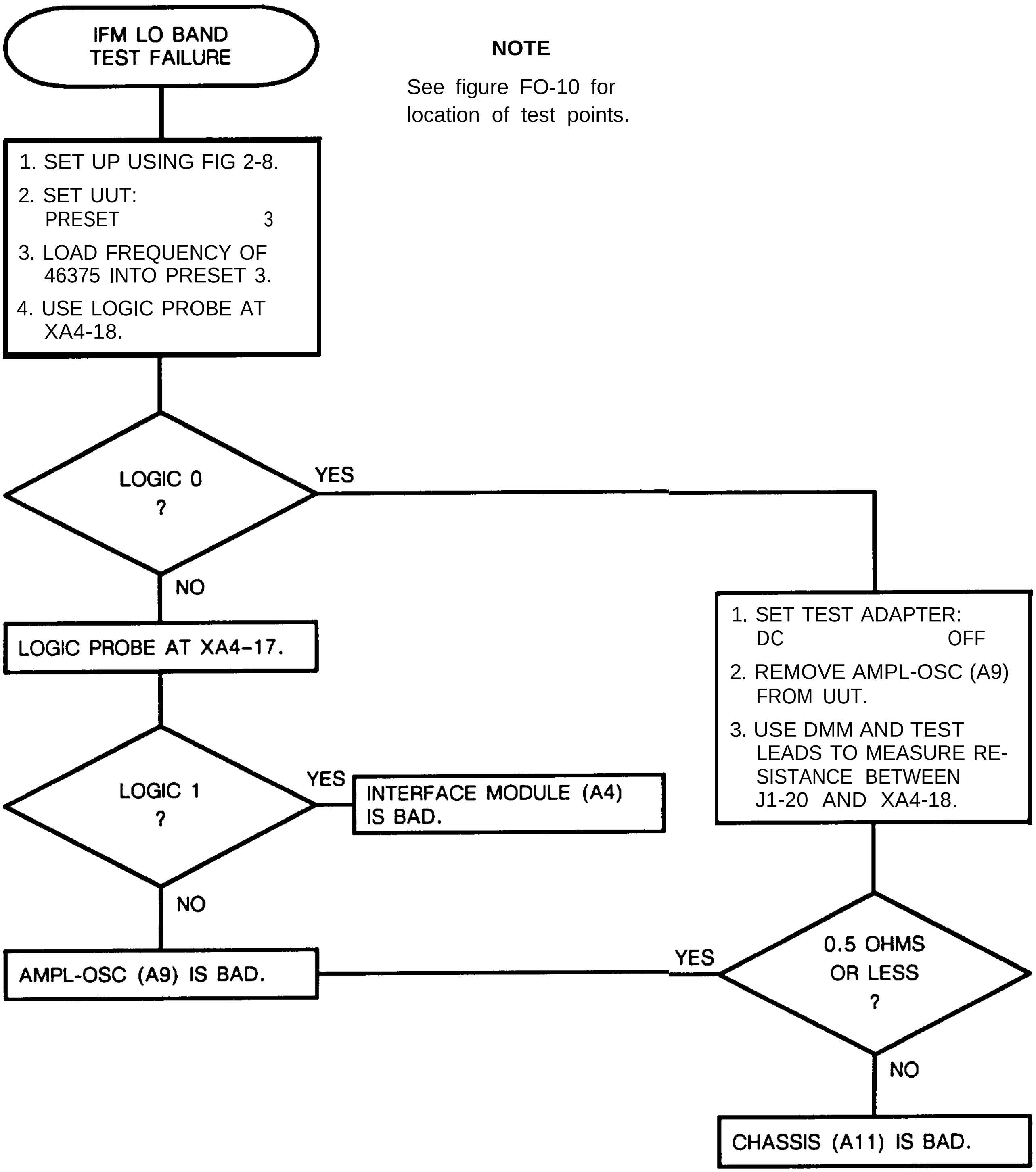


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 39
IFM LO Band Test Failure

NOTE

See figure FO-10 for location of test points.

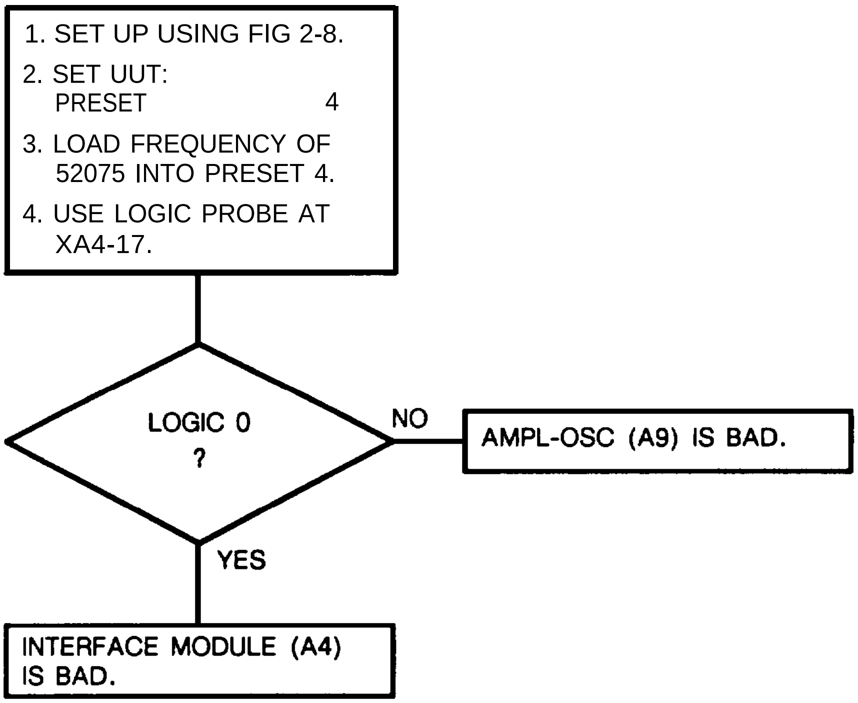


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 40
IFM HO Band Test Failure

NOTE

See figure FO-10 for location of test points.

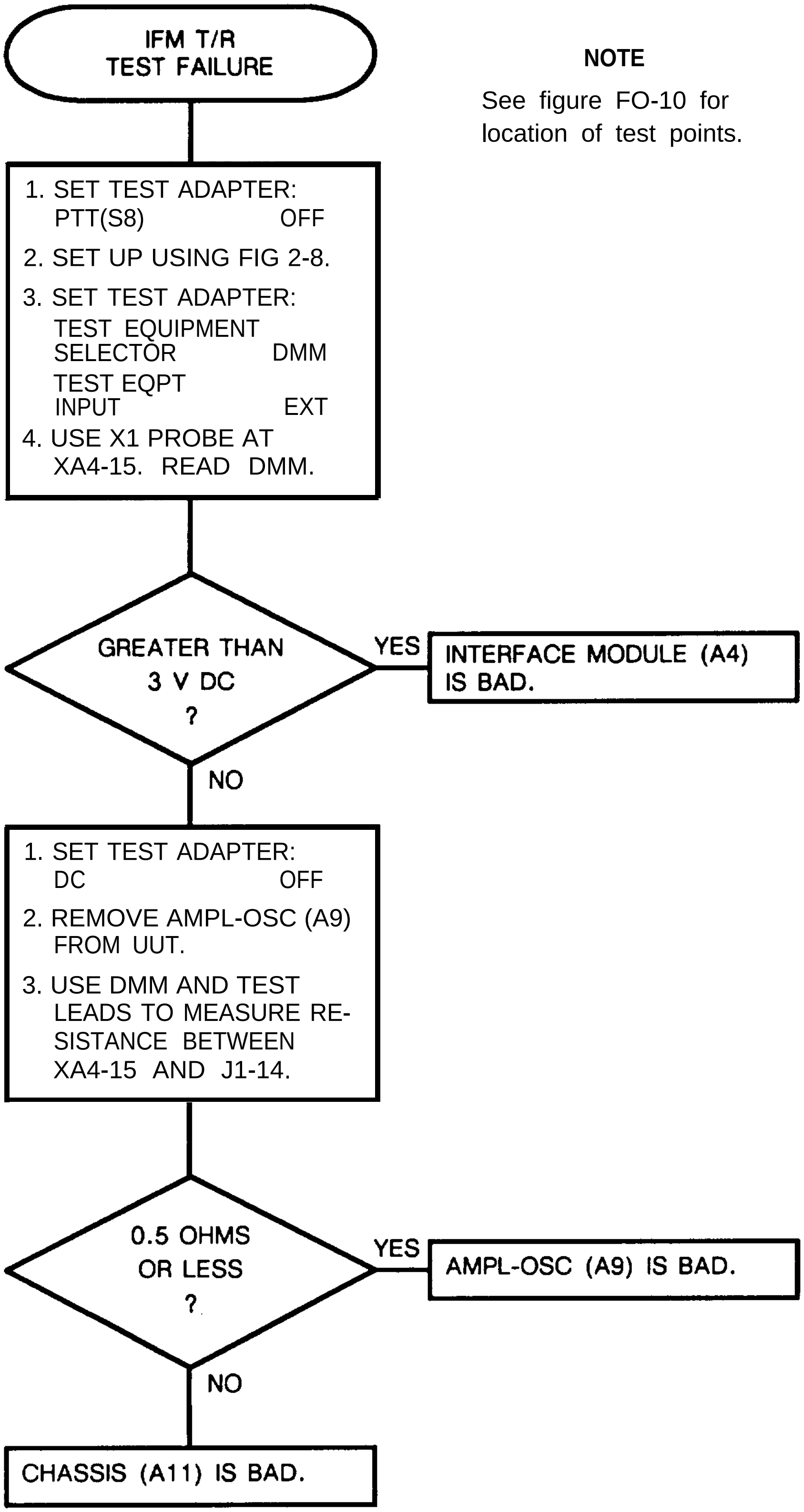


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 41
IFM T/R Test Failure

NOTE

See figure FO-10 for location of test points.

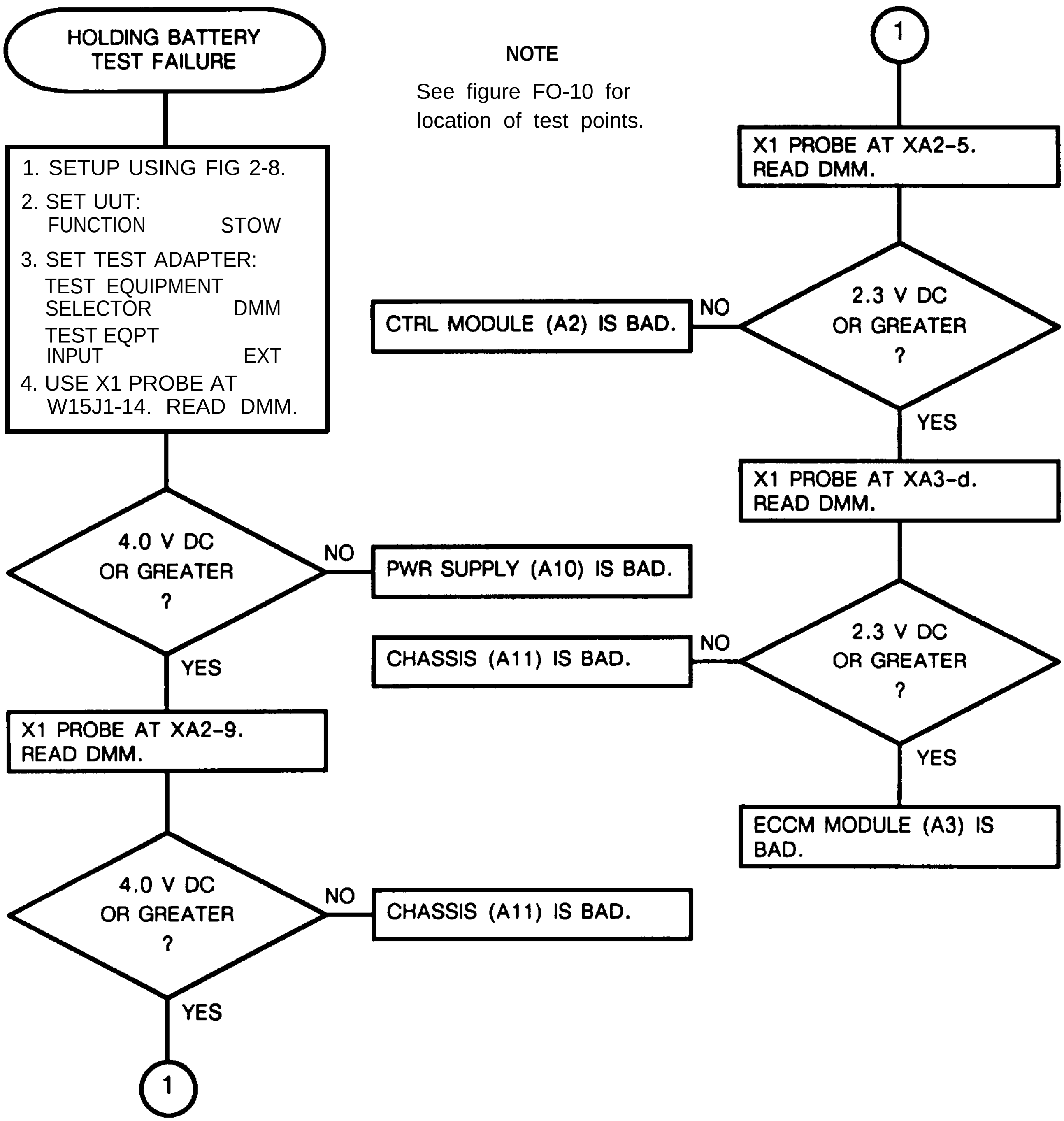


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 42
Holding Battery Test Failure

NOTE

See figure FO-10 for location of test points.

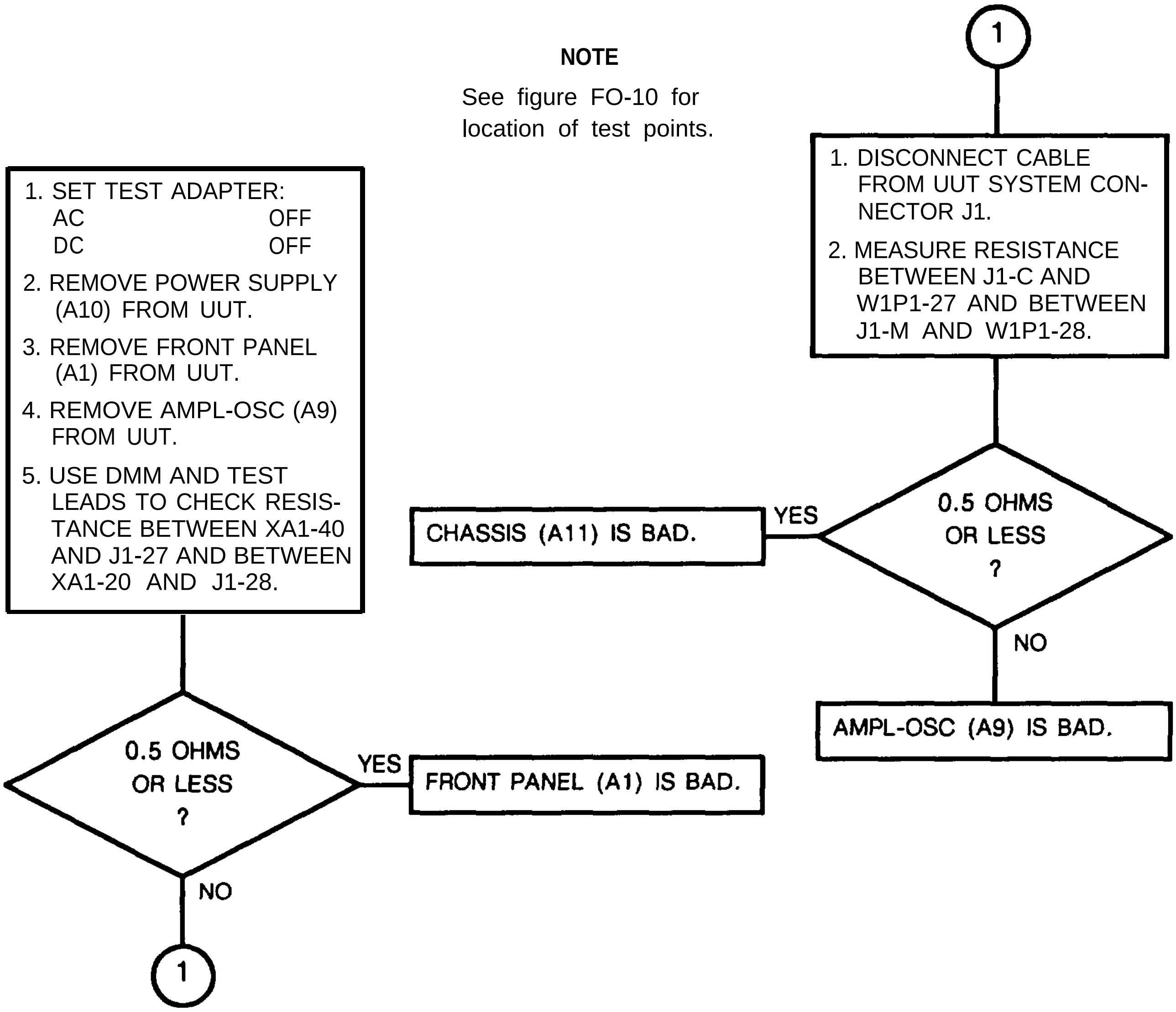


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 43
Panel Illumination Test Failure

NOTE

See figure FO-10 for location of test points.

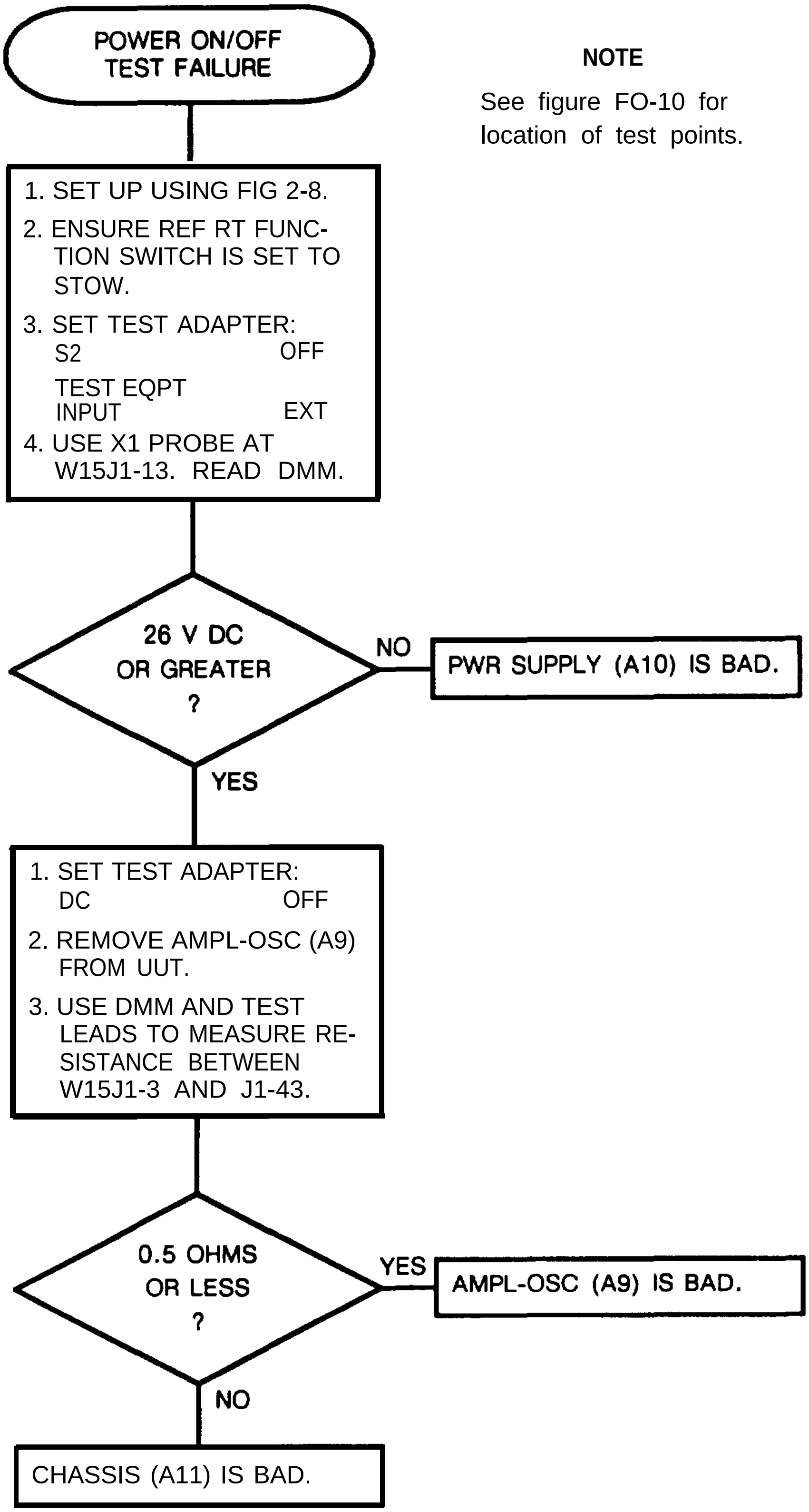


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 44
Power On/Off Test Failure

NOTE

See figure FO-10 for location of test points.

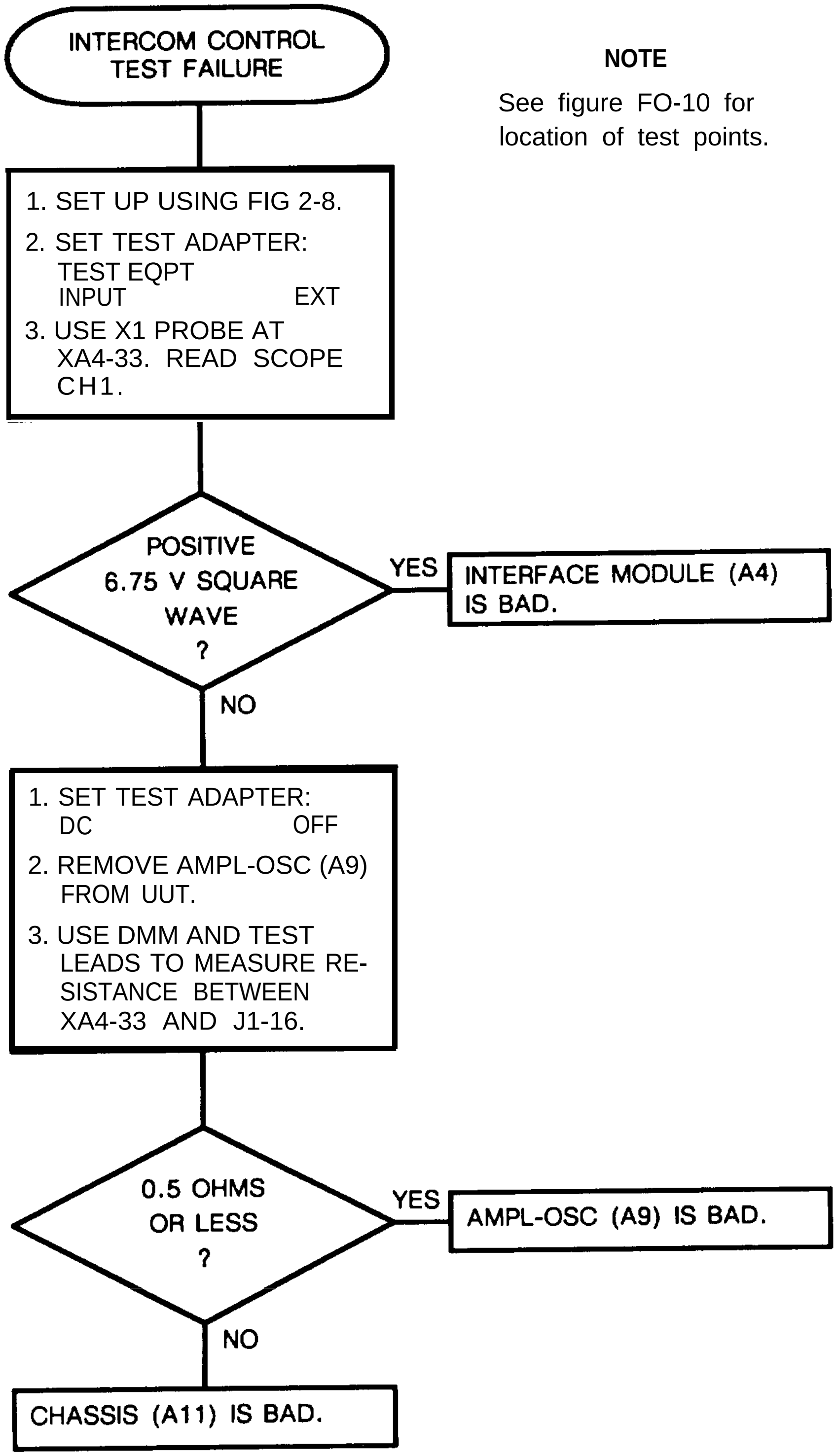


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 45
Intercom Control Test Failure

NOTE

See figure FO-10 for location of test points.

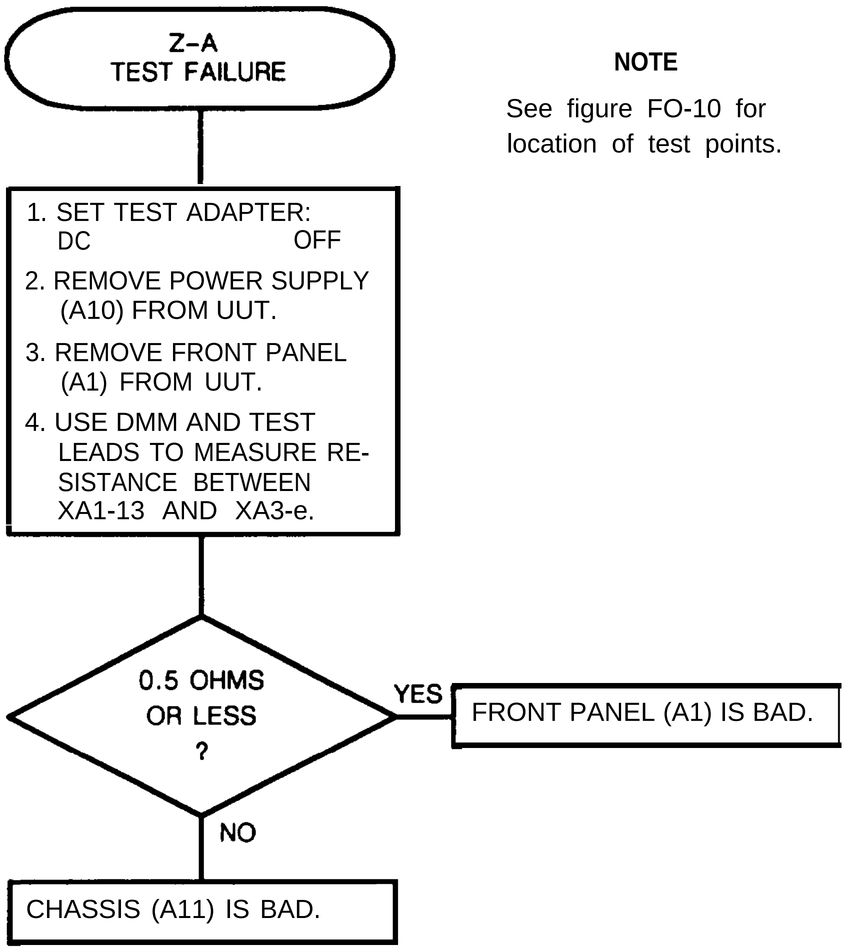


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 46
Z-A Test Failure

NOTE

See figure FO-10 for location of test points.

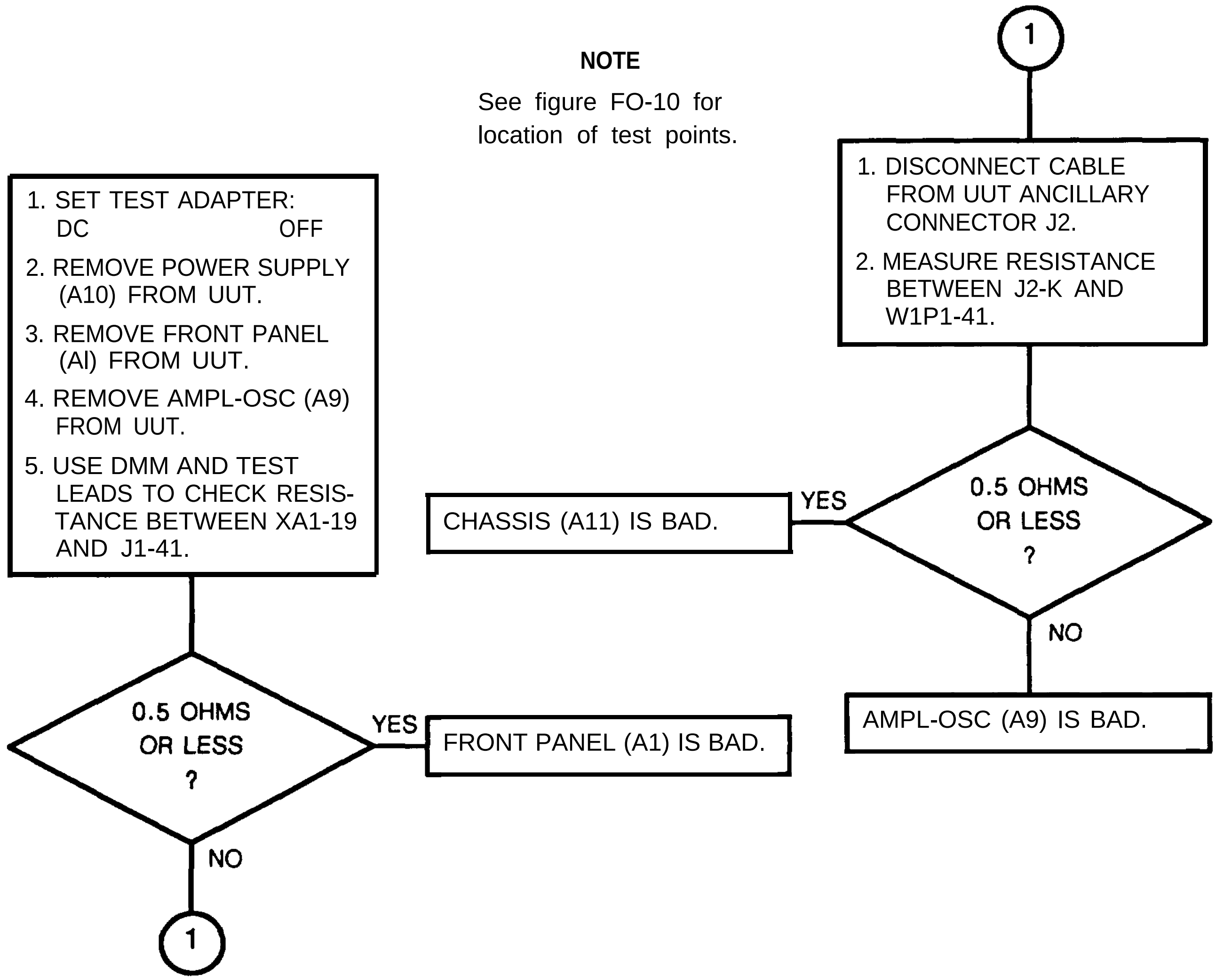


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 47
Take Control Test Failure

NOTE

See figure FO-10 for location of test points.

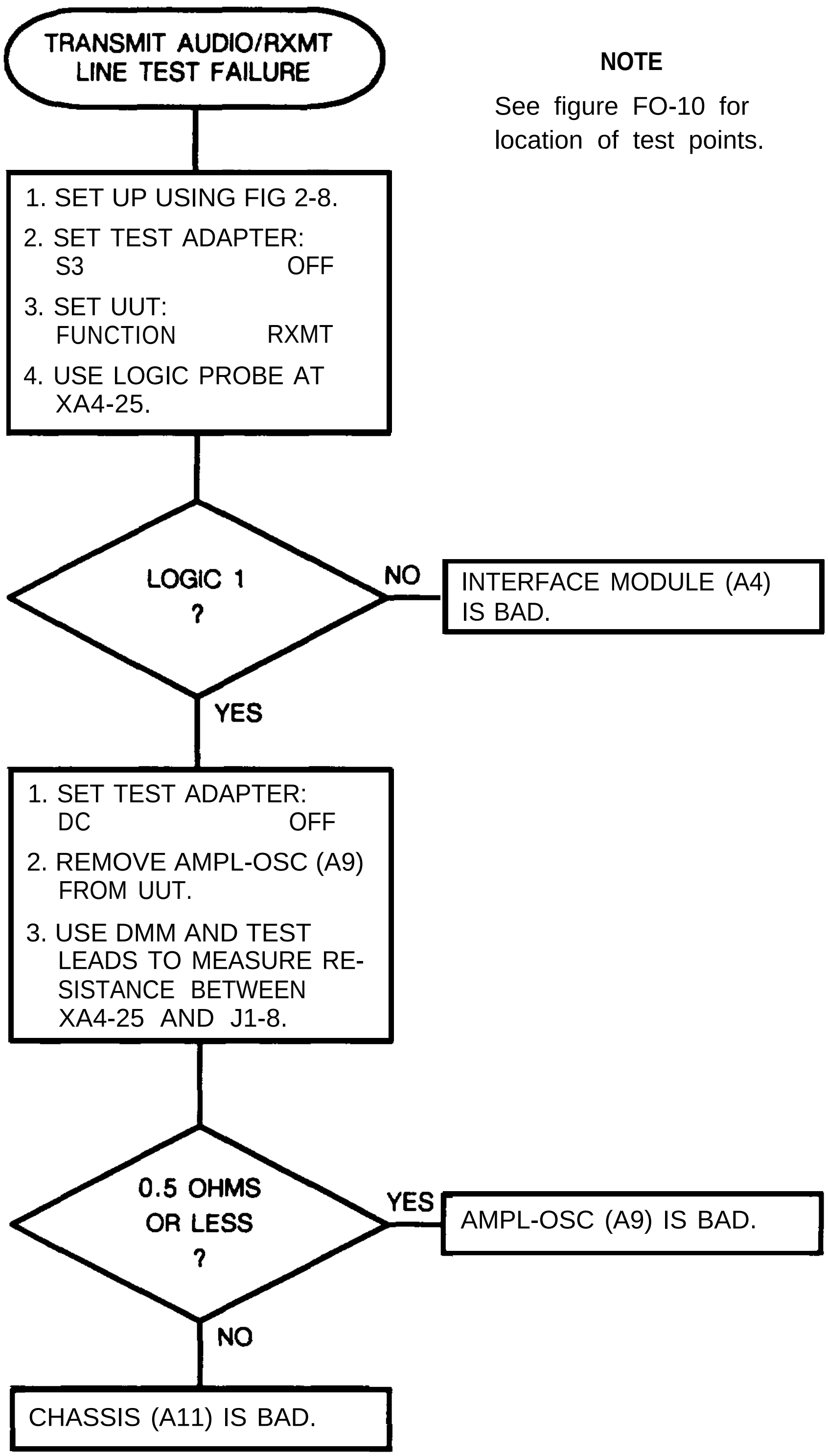


2-24. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 48
Transmit Audio/RXMT Line Test Failure

NOTE

See figure FO-10 for location of test points.



Section IV. MAINTENANCE PROCEDURES

2-25. GENERAL

This section has inspection, operational check, and repair procedures.

Normally you should do maintenance in this order:

a. Inspection. Check if the rt is damaged or incomplete. Replace any damaged or missing components.

b. Troubleshooting. Done on faulty rt noted in operation or during operational check. Do not troubleshoot good equipment.

c. Repair. The repair procedures are used to restore a faulty rt to serviceable/operable condition. Repair is by replacement of bad module.

d. Placing in Service. After bad modules have been replaced, the rt must be retested using operational check. When the rt is working, it may be placed in service.

2-26. INSPECTION

Many faults can be found by inspection. If any are found, replace the bad item. The following chart can be used as a guide.

ITEM	REMARKS
Front panel	No cracks, dents, or missing parts such as screws, knobs, mounting hardware, or handle.
Switches	Check for freedom of movement.
Connectors	No broken or missing pins.
Display	No cracks, chips or moisture seepage.
Covers	Check for security. No missing screws. No chipped or missing paint.

2-27. OPERATIONAL CHECK

Perform the operational check in paragraph 2-23 to verify correct rt operation.

2-28. REPAIR

Repair consists of removing a bad item and installing another.

a. General Instructions. The following instructions apply to all repair tasks.

1. Set FUNCTION switch to STOW.
2. Remove any cables connected to rt.
3. Inspect the rt for damage. Repair any obvious physical damage.
4. Use the module extractor to remove the circuit card assemblies. It is used as follows:

2-28. REPAIR. Continued

a) Locate the module to be removed.

CAUTION

Rf cables must first be disconnected from the following modules:

- IF/demodulator (A6)
- tuner/mixer (A7)
- synthesizer (A8)

If not done, connectors may be damaged.

b) Hook the module extractor through the two holes in the top corners of the module.

c) Hold the module extractor with one hand. Rest the other hand on the rt with the fingers of the hand on top of the module to be removed.

d) Pull steadily with the module extractor until the module connector is free of the backplane.

e) Remove the module.

f) Unhook the module extractor from the module.

5. Handle all modules carefully.
6. Before installing a module, check the connector for bent or broken pins. Do not install if damaged.
7. Perform operational check before returning to service..

b. Repair Precautions

WARNING

Remove power from rt before repair. Serious burns or electrical shock can result from contact with exposed electrical wires or connectors.

CAUTION

Static electricity and stray voltages can damage the rt modules. Use an antistatic pad on the work surface and attach a grounded wrist strap to self before removing top cover.

2-29. TOP COVER

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

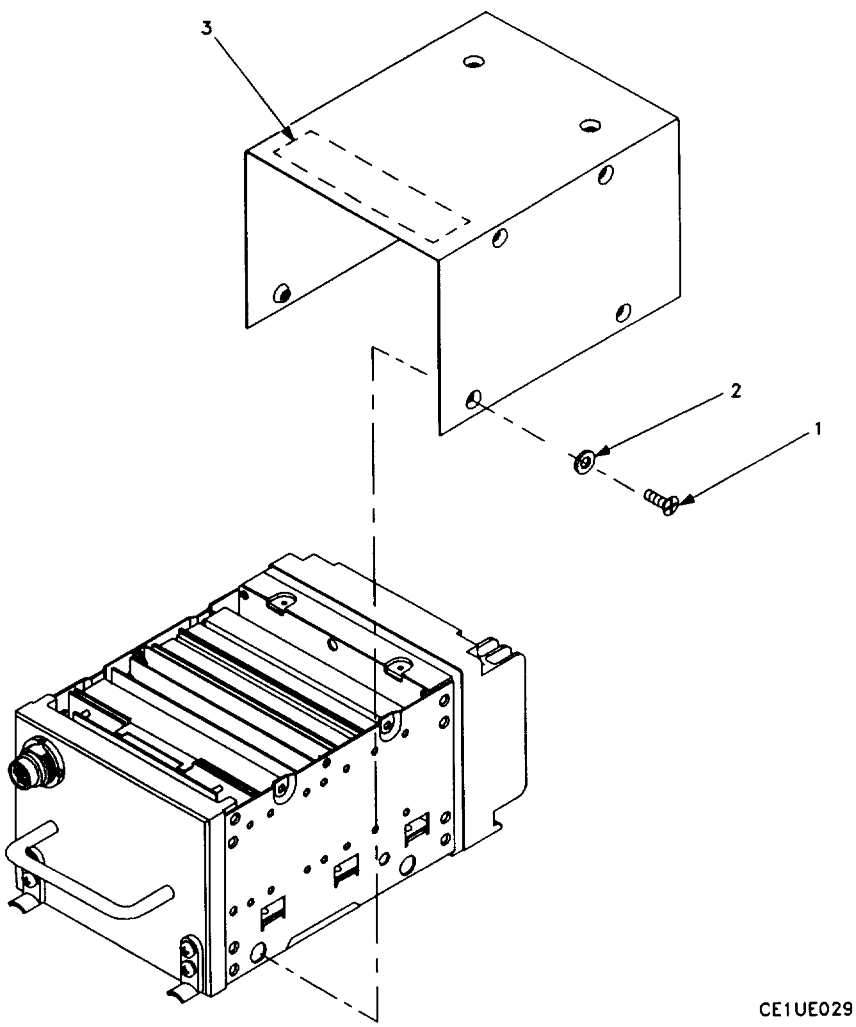
Tool Kit, Electronic Equipment, TK-105/G

REMOVAL

1. Set rt on work surface with top side up.
2. Remove ten screws (1) and ten washers (2).
3. Remove top cover.

INSTALLATION

1. Position top cover on rt with clip (3) under top of front panel.
2. Insert screws (1) with washers (2) and tighten.



2-30. POWER SUPPLY (A10)

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

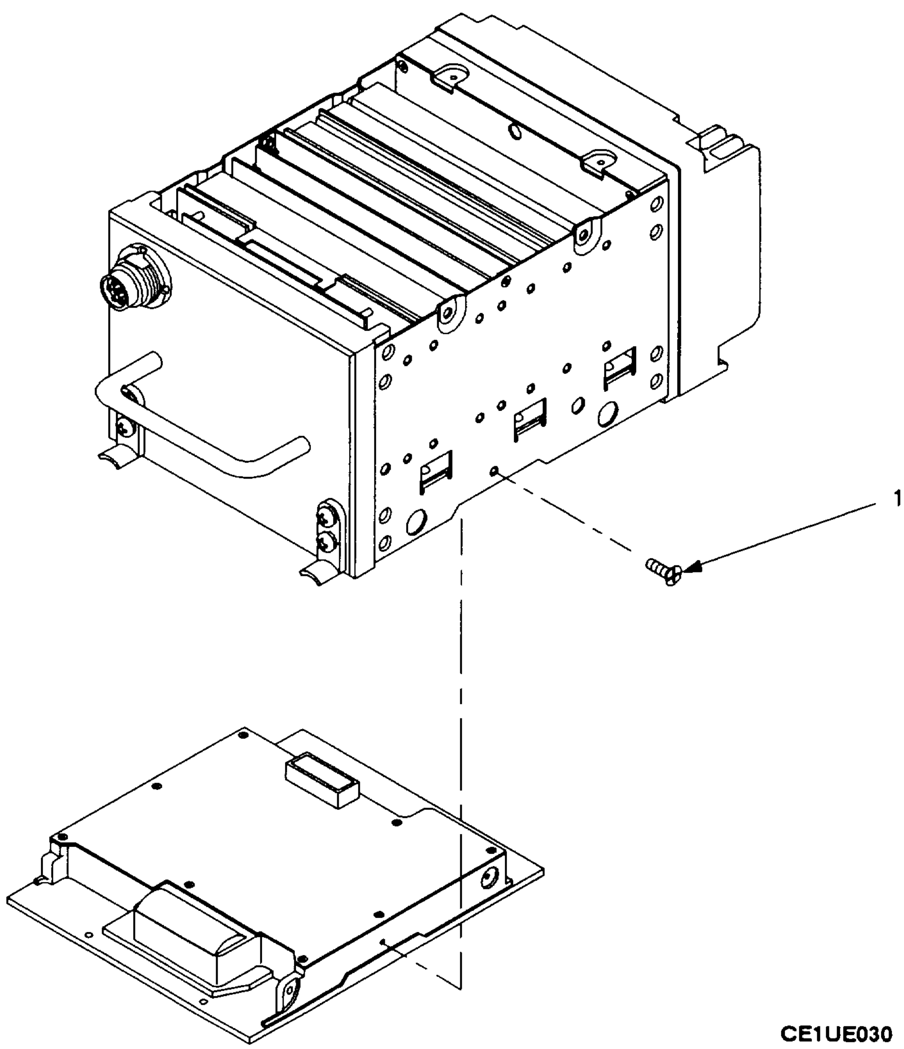
Tool Kit, Electronic Equipment, TK-105/G

REMOVAL

1. Remove top cover (para 2-29).
2. Remove six screws (1), one each side and four on bottom.
3. Remove power supply.

INSTALLATION

1. Position power supply on rt.
2. Install and tighten six screws (1), one each side and four on bottom.
3. Install top cover (para 2-29).



CE1UE030

2-31. CONTROL MODULE (A2), ECCM MODULE (A3), INTERFACE MODULE (A4), OR SWITCHING MODULE (A5)

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G
Maintenance Group, OA-9264A/ARC

References

Figure 2-12 shows module locations.

REMOVAL

1. CONTROL MODULE (A2)

   a. Remove top cover (para 2-29).

   b. Hook module extractor to ECCM module (A3), and pull free of rt.

   c. Hook module extractor to control module, and pull free of rt.

2. OTHER MODULES (A3, A4, A5)

   a. Remove top cover (para 2-29).

   b. Hook module extractor to module, and pull free of rt.

INSTALLATION

1. CONTROL MODULE (A2)

   CAUTION

   Be careful not to damage or bend connector pins.

   a. Insert control module in slide guides. Check alignment of connector. Press down firmly to fully seat.

   b. Install ECCM module (A3).

   c. Install top cover (para 2-29).

2. OTHER MODULES (A3, A4, A5)

   CAUTION

   Be careful not to damage or bend connector pins.

   a. Insert module in slide guides. Check alignment of connector. Press down firmly to fully seat module.

   b. Install top cover (para 2-29).

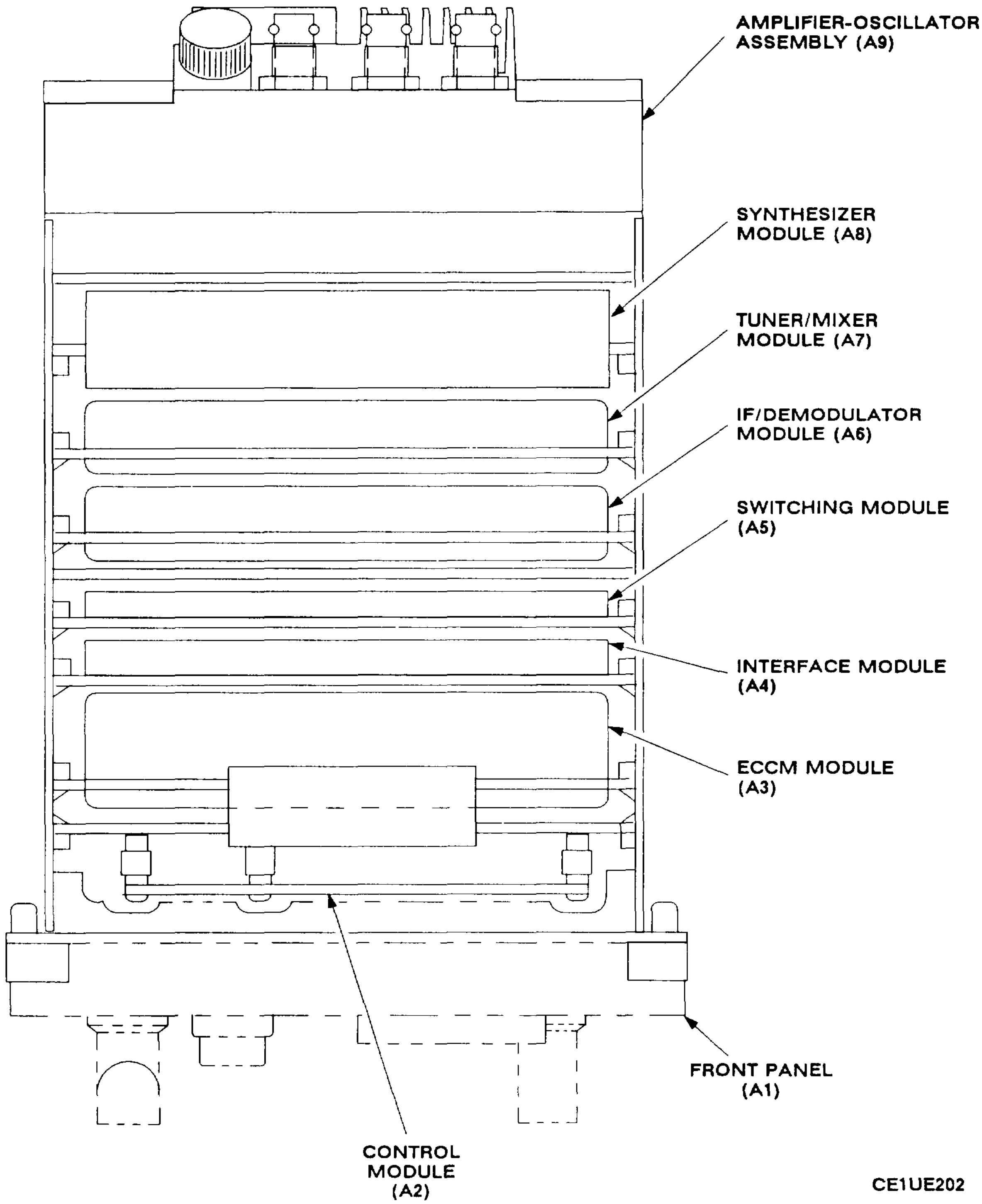


Figure 2-12. Module Location - Top View

2-32. IF/DEMODULATOR MODULE (A6) OR TUNER/MIXER MODULE (A7)

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit; Electronic Equipment, TK-105/G
Maintenance Group, OA-9264A/ARC

References

Figure 2-12 shows location of modules.
Figure 2-13 shows location of rf cables.

REMOVAL

1. IF/DEMODULATOR MODULE (A6)
   a. Remove top cover (para 2-29).
   b. Remove power supply (para 2-30).
   c. Use needle nose pliers to disconnect rf cable (W4) from IF/demodulator (see figure 2-1 3).
   d. Hook module extractor to IF/demodulator and pull free of rt.

2. TUNER/MIXER MODULE (A7)
   a. Remove top cover (para 2-29).
   b. Remove power supply (para 2-30).
   c. Use needle nose pliers to disconnect rf cables (W1, W3, and W4) from tuner/mixer (see figure 2-13).
   d. Hook module extractor to tuner/mixer and pull free of rt.

INSTALLATION

1. IF/DEMODULATOR MODULE (A6)

CAUTION

Be careful not to damage or bend connector pins.

   a. Insert IF/demodulator in slide guides. Check alignment of connector. Press down firmly to fully seat.
   b. Connect rf cable (W4) to IF/demodulator (see figure 2-13).
   c. Install power supply (para 2-30).
   d. Install top cover (para 2-29).

2. TUNER/MIXER MODULE (A7)

CAUTION

Be careful not to damage or bend connector pins.

   a. Insert tuner/mixer in slide guides. Check alignment of connector. Press down firmly to fully seat module.
   b. Connect rf cables (W1, W3, and W4) to tuner/mixer (see figure 2-13).
   c. Install power supply (para 2-30).
   d. Install top cover (para 2-29).

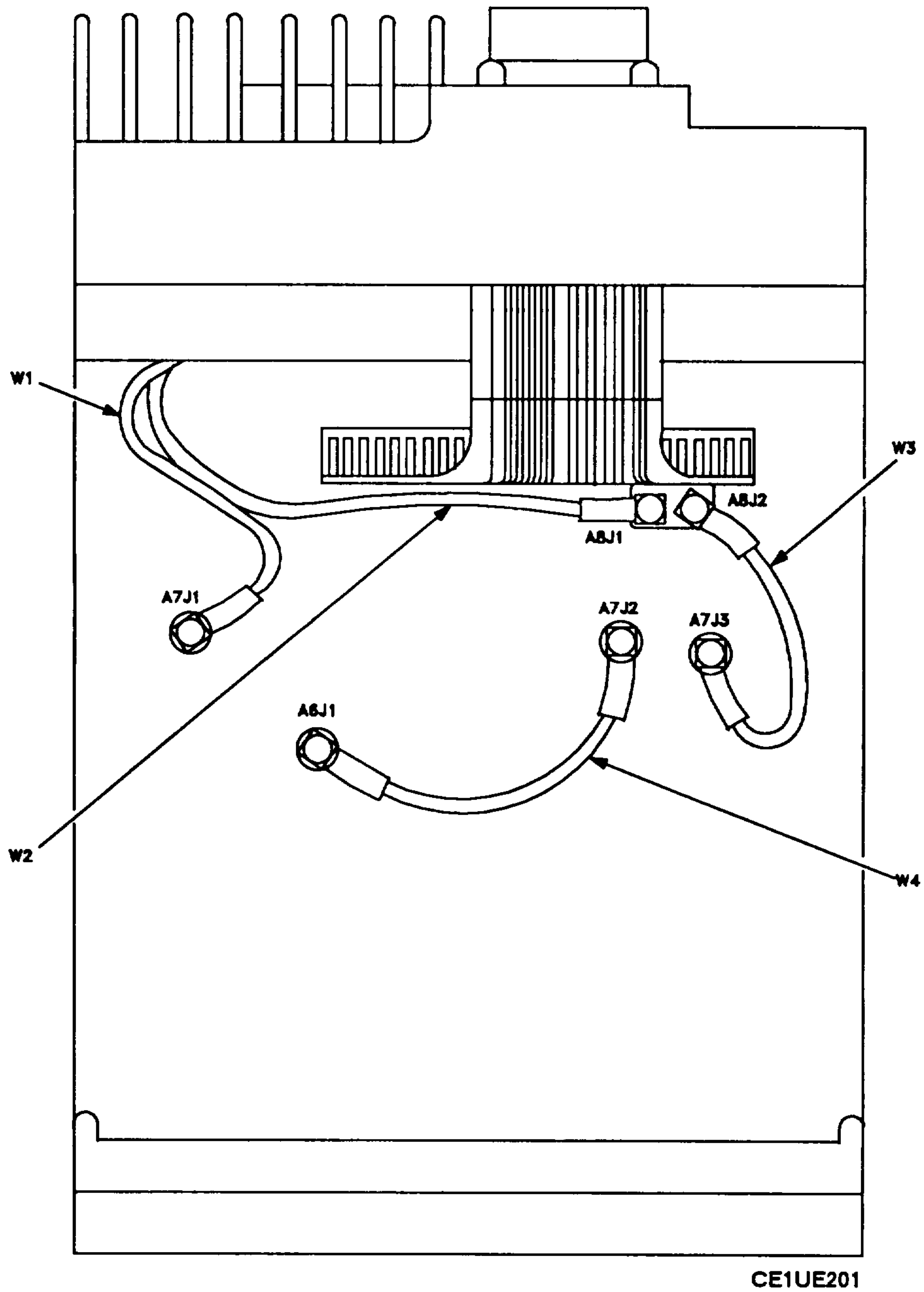


Figure 2-13. Rf Cable Locations

2-33. SYNTHESIZER MODULE (A8)

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit Electronic Equipment, TK-105/G
Maintenance Group, OA-9264A/ARC

References

Figure 2-12 shows location of modules.
Figure 2-13 shows location of rf cables.

REMOVAL

1. Remove top cover (para 2-29).
2. Remove power supply (para 2-30).
3. Use needle nose pliers to disconnect rf cables (W2 and W3) from synthesizer (see figure 2-13).
4. Hook module extractor to synthesizer and pull free of rt.

INSTALLATION

CAUTION

Be careful not to damage or bend connector pins.

1. Insert synthesizer in slide guides. Check alignment of connector. Press down firmly to fully seat.
2. Connect rf cables (W2 and W3) to synthesizer (see figure 2-13).
3. Install power supply (para 2-30).
4. Install top cover (para 2-29).

2-34. FRONT PANEL (A1)

This task covers: a. Removal b. Repair c, Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

REMOVAL

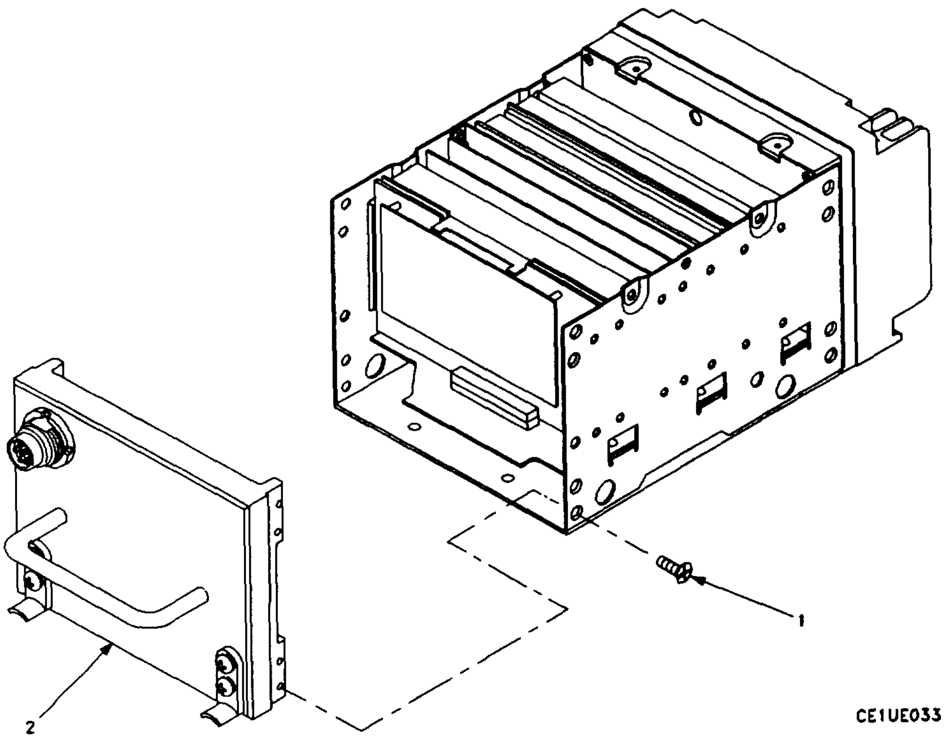
1. Remove top cover (para 2-29).
2. Remove ten screws (1), four each side and two on bottom.
3. Gently pull front panel from rt.

INSTALLATION

CAUTION

Be careful not to damage or bend connector pins.

1. Position front panel (2) so connector pins are aligned, Gently push until properly seated.
2. Insert and tighten ten screws (1), four each side and two on bottom.
3. Install top cover (para 2-29).



2-35. AMPLIFIER-OSCILLATOR (A9)

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

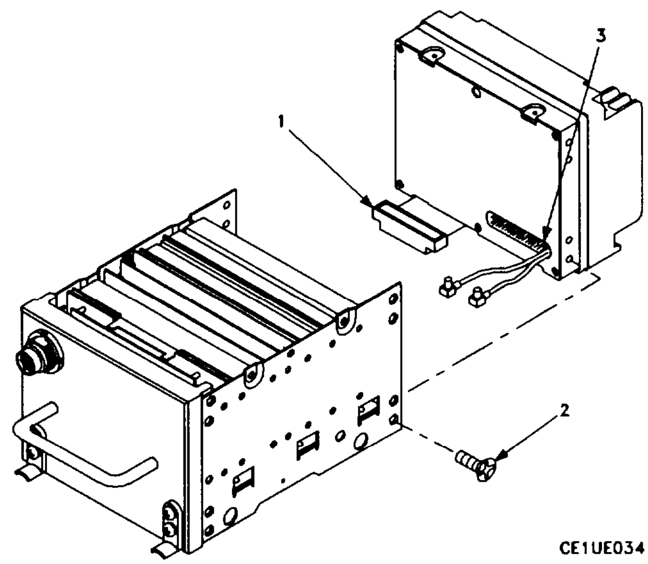
Tool Kit, Electronic Equipment, TK-105/G

References

Figure 2-12 shows location of modules.

REMOVAL

1. Remove top cover (para 2-29).
2. Remove power supply (para 2-30).
3. Use needle nose pliers to disconnect rf cables (W1 and W2) from tuner/mixer and synthesizer (see figure 2-13).
4. Disconnect flex cable (1) from rt.
5. Remove eight screws (2).
6. Pull amplifier-oscillator away from rt to disconnect connector (3).



INSTALLATION

CAUTION

Be careful not to damage or bend connector pins.

1. Position amplifier-oscillator so that connector (3) lines up with jack on rt. Position rf cables and flex cable (1) below rt chassis. Push amplifier-oscillator until connector is fully seated.
2. Install and tighten eight screws (2).

CAUTION

Make sure the amplifier-oscillator flex cable (1) is properly alined when connected with the pins of the chassis header connector (J1). If not alined correctly, electrical damage can result when power is applied.

3. Connect flex cable (1) to rt.
4. Connect rf cables (W1 and W2) to tuner/mixer and synthesizer (see figure 2-13).
5. Install power supply (para 2-30).
6. Install top cover (para 2-29).

2-36. RT CHASSIS

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G
Module Extractor, A3013669-1

REMOVAL

1. Remove top cover (para 2-29).
2. Remove front panel (para 2-34).
3. Remove ECCM module, interface module, and switching module (para 2-31).
4. Remove control module (para (2-31).
5. Remove power supply (para 2-30).
6. Remove IF/demodulator (para 2-32).
7. Remove tuner/mixer (para 2-32).
8. Remove synthesizer (para 2-33).
9. Remove amplifier-oscillator (para 2-35).

INSTALLATION

1. Install front panel (para 2-34).
2. Install control module (para 2-31).
3. Install ECCM module, interface module, and switching module (para 2-31).
4. Install IF/demodulator (para 2-32).
5. Install tuner/mixer (para 2-32).
6. Install synthesizer (para 2-33).
7. Install amplifier-oscillator (para 2-35).
8. Install power supply (para 2-30).
9. Install top cover (para 2-29).

2-37. RF CABLES (W3 AND W4)

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

References

Figure 2-13 shows location of rf cables.

REMOVAL

1. Remove top cover (para 2-29).
2. Remove power supply (para 2-30).
3. Use needle nose pliers to disconnect cables (see figure 2-13).

INSTALLATION

1. Connect cable W3 to A8J2 and A7J3 (see figure 2-13).
2. Connect cable W4 to A7J2 and A6J1 (see figure 2-13).
3. Install power supply (para 2-30).
4. Install top cover (para 2-29).

2-38. IDENTIFICATION PLATE (RT-1477, RT-1477A, RT-1478, AND RT-1478A)

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

Expendable Supplies

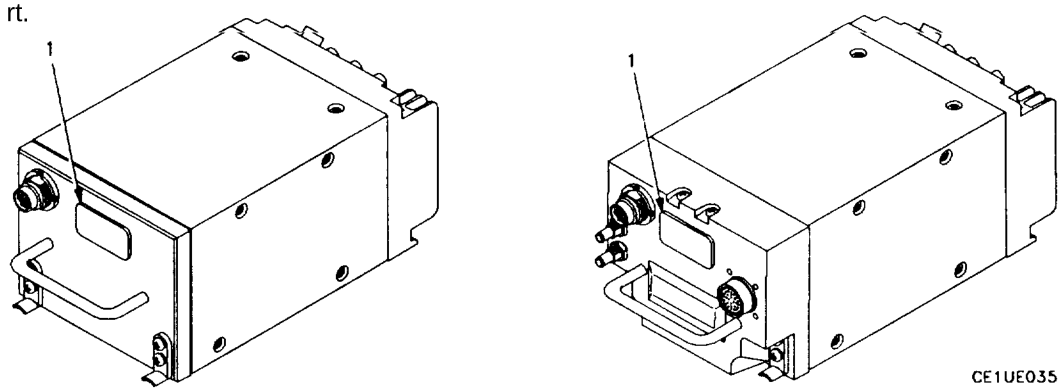
Cotton Swab and Alcohol

REMOVAL

1. With a pocket knife, peel off identification plate (1).
2. With cotton swab and alcohol, clean adhesive from rt.

INSTALLATION

1. Peel backing from new identification plate.
2. Press into place on rt.



Section V. PREPARATION FOR STORAGE OR SHIPMENT

2-39. GENERAL INFORMATION

a. Pack the rt and modules in approved shipping containers.

b. All modules must be shipped enclosed in material that provides protection from static electricity. See the following paragraph.

2-40. PACKING STATIC SENSITIVE MODULES

The following steps should be followed when packing a static sensitive module for storage or shipment.

CAUTION

To avoid damaging static sensitive modules, use an antistatic pad on the work surface and wear a grounded wrist strap when handling the module.

ITEM	ACTION
a. Module (1)	a. Place inside antistatic bag (2) or inside antistatic wrapping material (3). See figure 2–14.
b. Antistatic package (4)	b. Seal with adhesive tape. Attach “sensitive electronic device” unit pack label (5).
c. Antistatic package (4)	c. Place inside approved shipping container (6).
d. Shipping container (6)	d. Attach “sensitive electronic device” intermediate pack label (7).

2-40. PACKING STATIC SENSITIVE MODULES. Continued

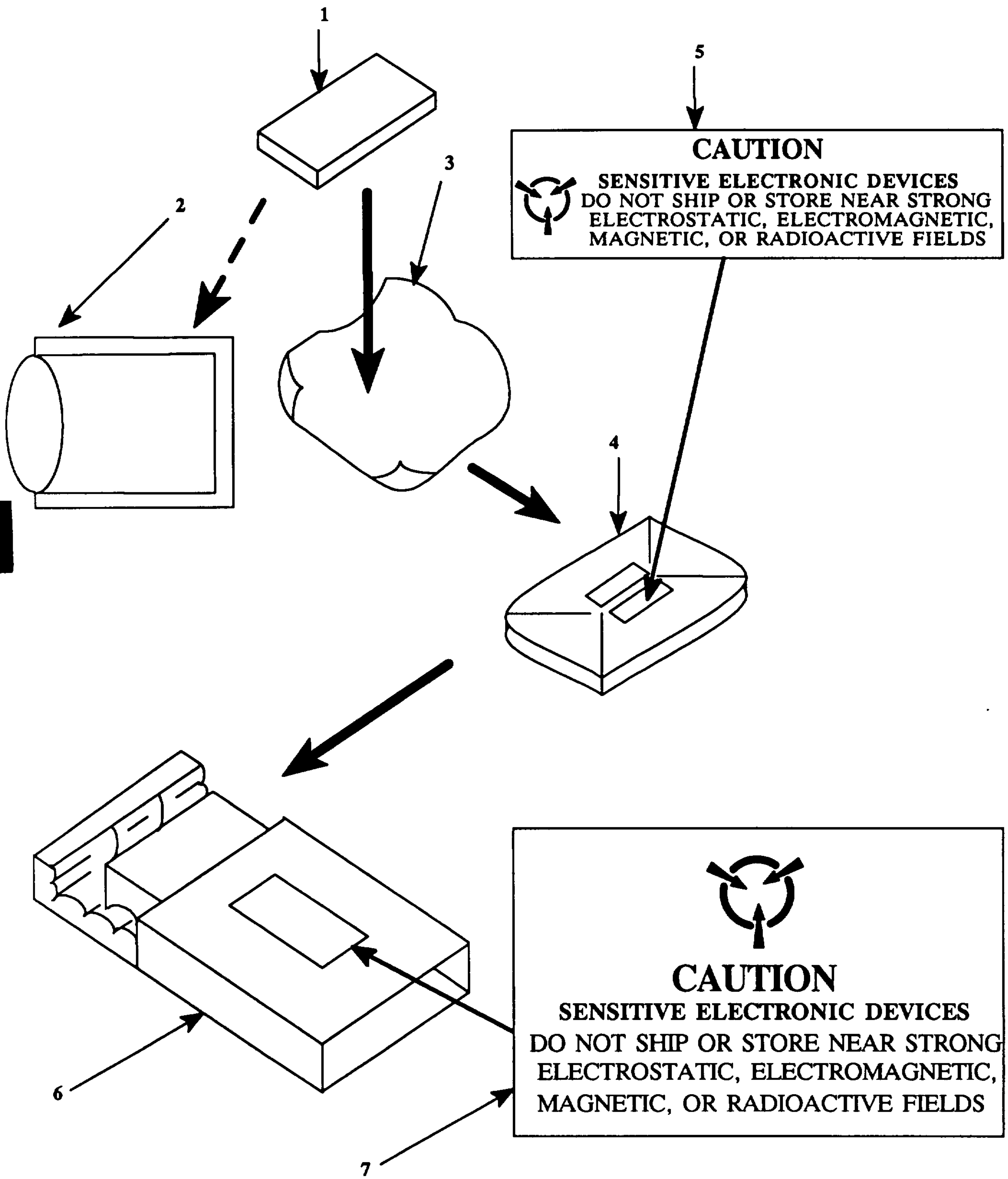


Figure 2-14. Packing Static Sensitive Modules.

CHAPTER 3

MAINTENANCE INSTRUCTIONS FOR RADIO SET CONTROL C-11466/ARC-201(V) AND C-11466A/ARC-201A(V)

Section I. PRINCIPLES OF OPERATION

3-1. INTRODUCTION

The control unit has three electronic modules, a control panel, and a chassis. Figure 3-1 is a functional block diagram.

The control panel (A1) includes the control switches, volume control, data entry keyboard, and display.

The electronic modules are

- Circuit Card Assembly, Bus Interface (A2)
- Circuit Card Assembly, Processor (A3)
- Electronic Components Assembly, Power Supply (A4)

The chassis (A5) includes the backplane assembly (parent board) and the chassis side rails.

All inputs and outputs pass through J1 on the power supply. Many signals pass through unchanged. The power supply converts +28 V dc into +5 V dc for digital circuits and -22 V dc for the display. A grounded TAKE CONTROL input disables the control unit. A circuit on the power supply bypasses the volume control when TAKE CONTROL is grounded.

The control unit is processor controlled. The processor has a microprocessor, memory, and DMA control circuits. These command the operation of the rest of the control unit and store data for later transfer to display or rt. DATA DIRECTION output determines direction of data transfer between control unit and rt. Display data is transferred to the front panel over a serial data line. Switch status signals are received from the front panel over an eight-bit parallel data bus.

The bus interface consists of buffers and timing circuits used between rt and processor. Some functions are

- energizes front panel switches for reading by processor,
- reads keyboard switch closures, decodes, and sends to processor,
- converts parallel data from processor to serial data and sends data to rt over differential DATA (+) and DATA (-) lines,
- supplies differential CLOCK (+) and CLOCK (–) signal to transfer data to rt,
- supplies clock to display,
- receives differential data from rt on DATA (+) and DATA (–) and sends to processor,
- resets processor on power-up, whenever TAKE CONTROL switch changes position, or for low voltage condition on 28 V dc input.

The 115 V ac input is used to illuminate the front panel, The T-ZERO-N output is from the Z-A position of the FUNCTION switch. POWER ON/OFF is also from the FUNCTION switch and supplies +28 V dc to the rt in all positions except STOW.

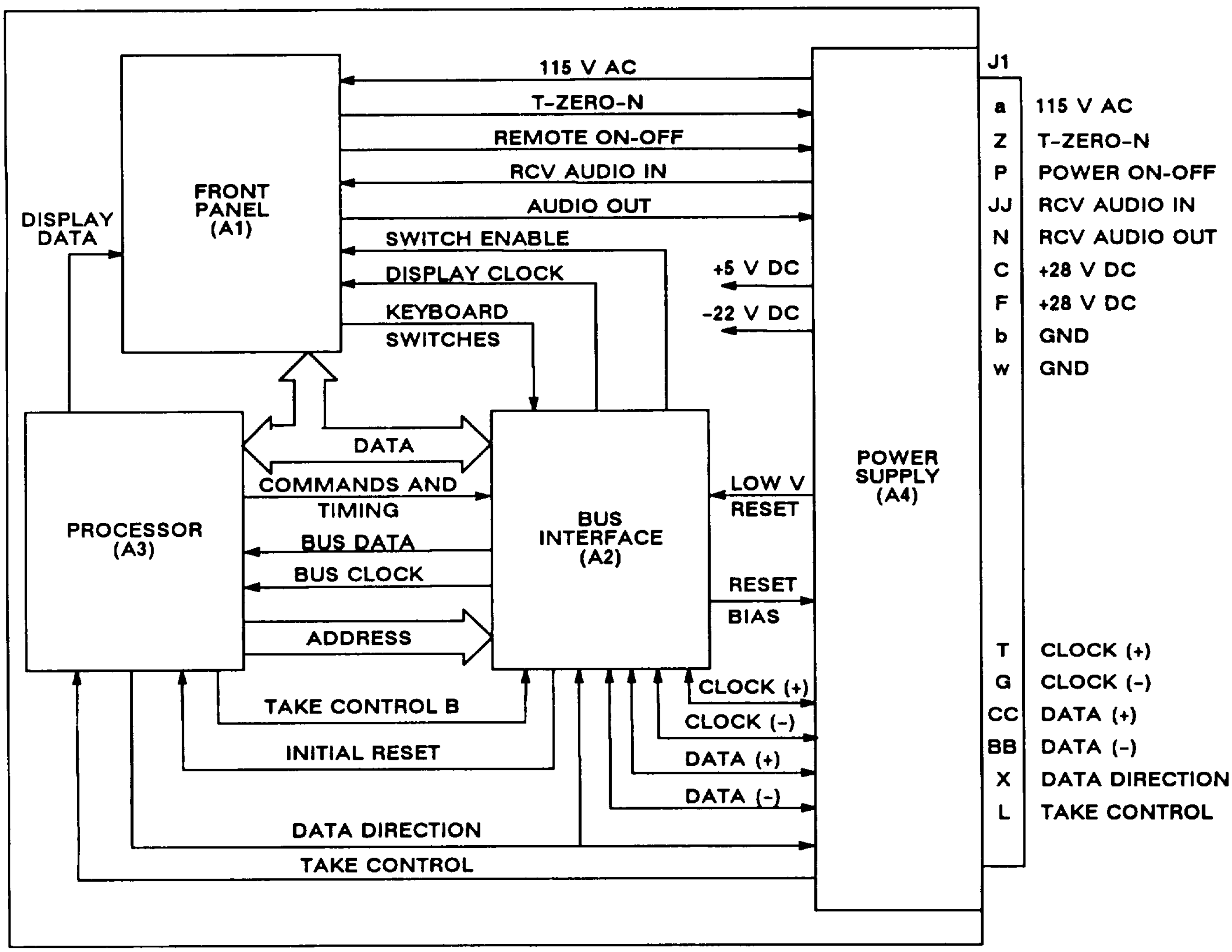


Figure 3-1. Radio Set Control Functional Block Diagram

3-2. BUS INTERFACE MODULE

Figure 3-2 is a block diagram of the bus interface module.

The decoder/timer decodes commands from the microprocessor and provides enable and clock signals as needed. Three commands enable the f rent panel switches. One is used to sample the keyboard through the keyboard encoder. Others are used to clock data to the front panel display and the output buffer. The DMA IN-N signals the microprocessor that data is available for reading into memory.

The output buffer is a parallel-to-serial converter. Data to be sent to the rt is put on the data lines by the microprocessor and clocked into the output buffer. The last data word into the buffer is a command word telling how many bits of data and how many clocks to output to the drivers. The buffer then clocks the data out while the microprocessor continues its program.

3-2. BUS INTERFACE MODULE. Continued

The keyboard encoder converts keyboard switch closures into a hexadecimal code. When the microprocessor is ready to read the keyboard, the code is put onto the data lines. The keyboard encoder also provides a debounce function and a two-key-closure inhibit function.

The receivers and drivers form a data line transceiver. They transform serial data and clock signals from the output buffer into balanced differential signal output to drive the rt interface bus. In receive, they transform the balanced differential signals into BUS DATA and BUS CLOCK for the processor module.

A reset circuit generates a negative reset pulse at power turn-on. This is used to start the microprocessor at the correct place in its program. A negative reset pulse is also generated whenever the TAKE CONTROL switch changes. This starts the-microprocessor at the beginning of its program whenever relinquishing or taking control of the rt. The reset circuit also holds the reset negative when LOW V RESET is present. LOW V RESET is present when the +28V line drops to about +18V. LOW V RESET is supplied by the power supply.

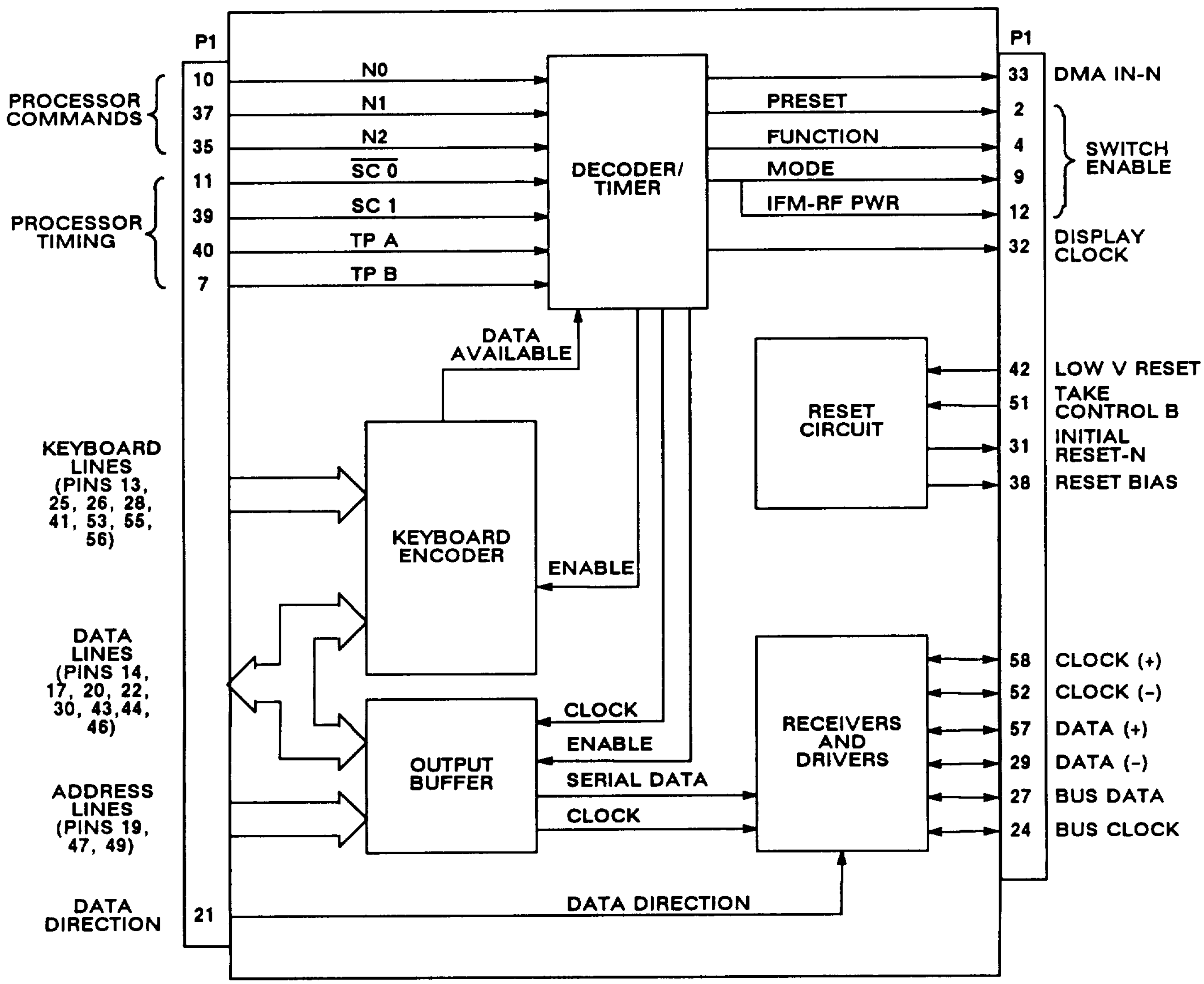


Figure 3-2. Bus Interface Module Functional Block Diagram

3-3. PROCESSOR MODULE

Figure 3-3 is a block diagram of the processor module. The processor module has a clock, microprocessor, RAM, ROM, and DMA control buffer. The functions of the microprocessor are to

- read and execute instructions stored in memory,
- control input/output devices,
- transfer data between input/output devices and memory,
- transfer data between memory locations.

The functions of the DMA control buffer are to

- receive serial data from the rt via the bus interface module and make the data available to the microprocessor on the data bus,
- receive TAKE CONTROL input from external take control input and inform microprocessor,
- perform parallel to serial data conversion for data going from microprocessor to front panel display,
- buffers DATA DIRECTION output.

Data transfers that do not go through the DMA control buffer are control data to rt (output), rotary switch data (input), and pushbutton switch data (input). Rt control data is sent to the bus interface module via the data bus. Rotarv switch data is received from the front panel via the data bus. Pushbutton switch data is received from the keyboard encoder on the bus interface module via the data bus.

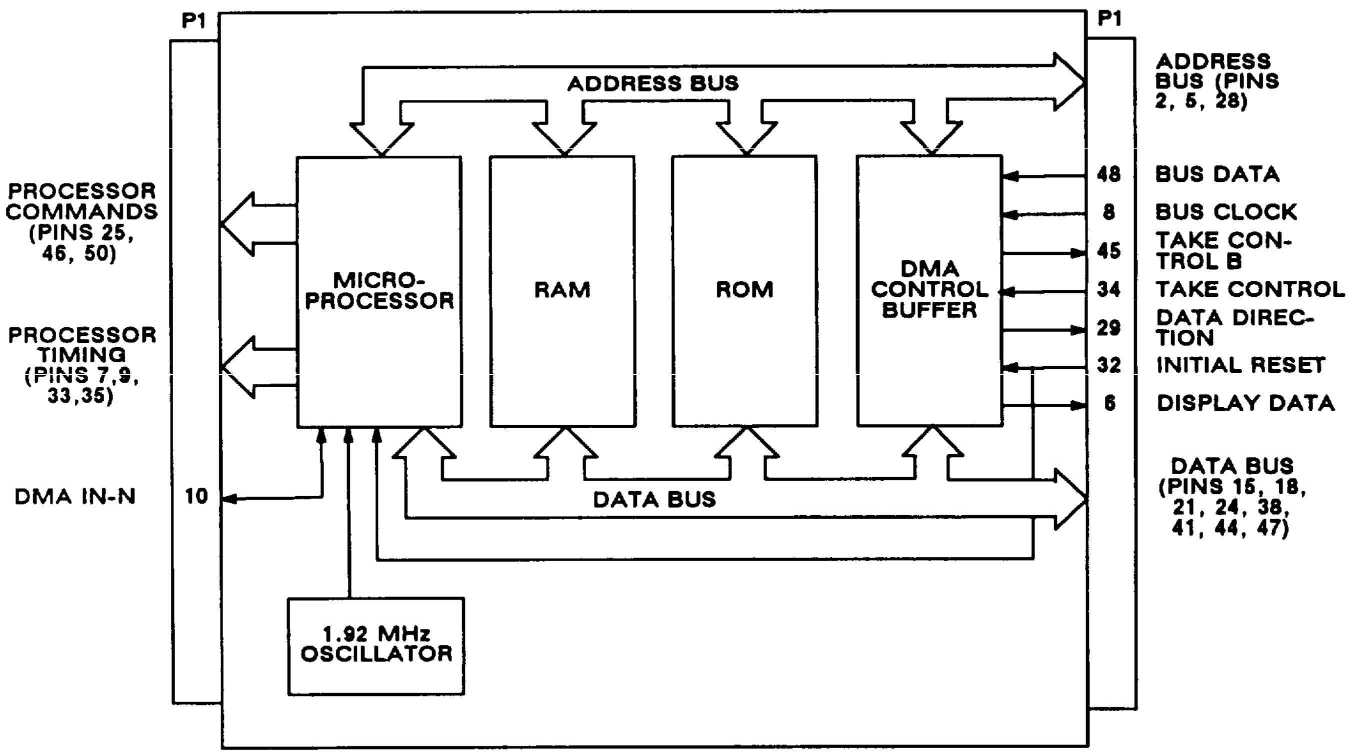


Figure 3-3. Processor Module Functional Block Diagram

3-4. POWER SUPPLY MODULE

Figure 3-4 is a block diagram of the power supply module.

The protection circuit has +28 V dc filtering. It attenuates spikes and surges per MIL-STD-704B. It also protects against reverse voltage and over voltage. The pulse width modulator is a constant frequency, variable pulse-width circuit. It regulates output voltage by varying pulse width to the de-de converter. The de-de converter chops the +28 V dc. The resulting square wave is rectified, filtered, and regulated to the required output voltages: +5 V dc and -22 V dc. Current limiters protect the power supply in case of thermal runaway caused by overheating. Also they limit output current if a short circuit is applied. A low-voltage reset circuit monitors the

3-4. POWER SUPPLY MODULE. Continued

+28 V line and supplies LOW V RESET to the bus interface module when the voltage drops to about +18 V. The take control circuit switches the front panel VOL control in or out of the circuit depending on the TAKE CONTROL input. TAKE CONTROL is either ground or an open circuit. Ground input bypasses the VOL control.

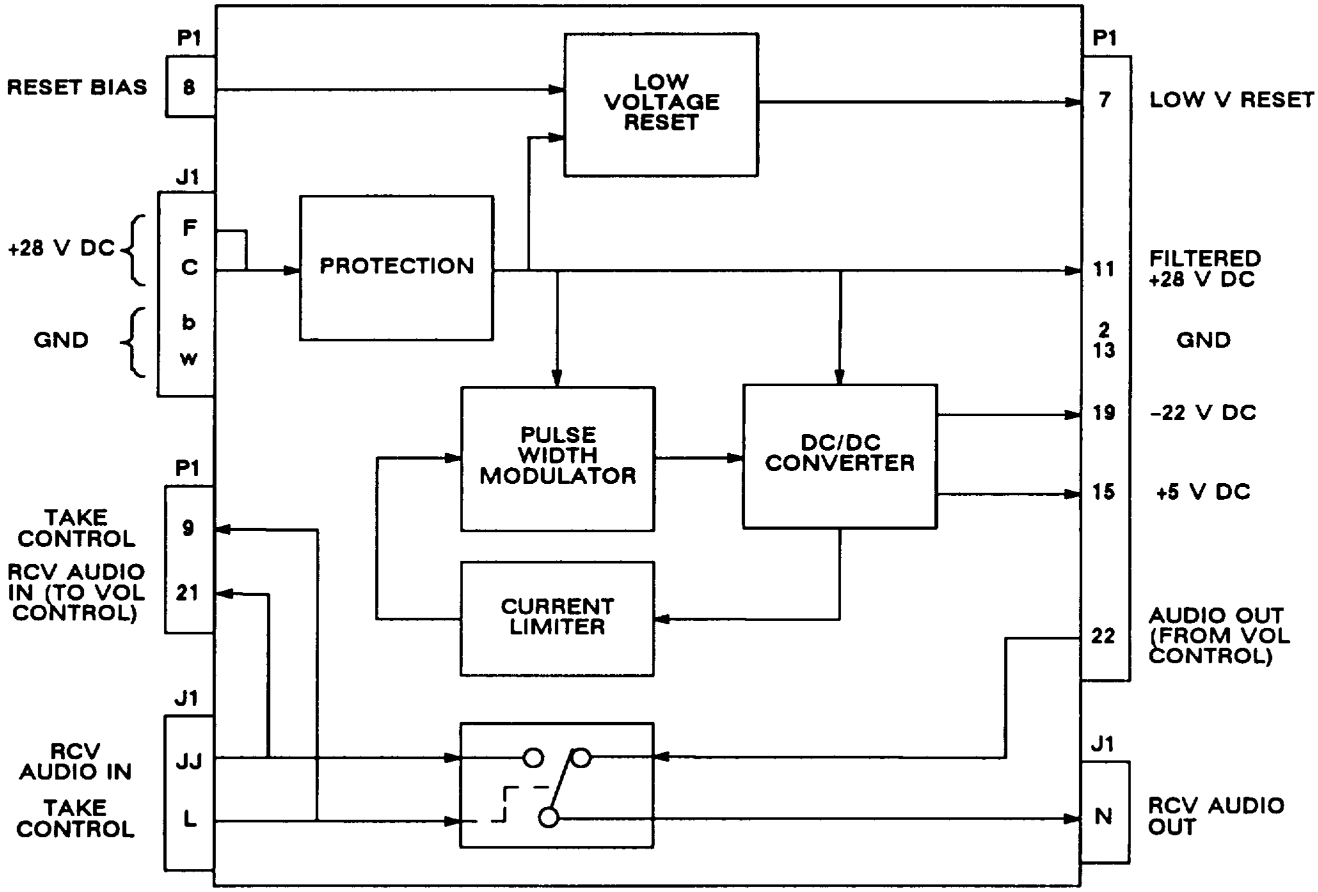


Figure 3-4. Power Supply Functional Block Diagram

Section II. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

3-5. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit. Common tools required for maintenance of the rcu are listed in the Maintenance Allocation Chart. It is appendix B of TM 11-5821-333-12.

3-6. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

No special tools are required. For TMDE and support equipment refer to the Maintenance Allocation Chart, appendix B of TM 11-5821-333-12.

3-7. REPAIR PARTS

Repair parts are listed and illustrated in TM 11-5821-333-23P.

Section III. TROUBLESHOOTING

3-8. GENERAL

This section has an operational check and troubleshooting flow charts. The operational check provides a complete evaluation of the rcu. If passed, the rcu can be returned to service. The troubleshooting flowcharts are used when the rcu fails an operational check step. The troubleshooting flowcharts are used to find the bad module.

When an rcu is received for troubleshooting, do the following:

a. Inspect rcu for damage. Repair any damage before proceeding.

b. Do the operational check.

c. Do any troubleshooting called for by the operational check.

d. Replace the bad module.

e. Verify the repair by doing all of the operational check.

NOTE

The troubleshooting procedures are for both AN/ARC-201(V) and AN/ARC-201A(V) radio sets. But some of the rcu keyboard markings are different. In the troubleshooting procedures, the AN/ARC-201A(V) marking is given first, followed by the AN/ARC-201(V) marking in parentheses. Example: ERF/OFST (SEnd/OFST).

3-9. OPERATIONAL CHECK

The operational check is a series of steps used to evaluate rcu operation. They are used both during troubleshooting and to verify the rcu is good after repair.

Test Description. Each step checks the response of the rcu to an operator action. The steps are numbered so they can be used for reference on maintenance worksheets. Each step is titled according to the function being checked.

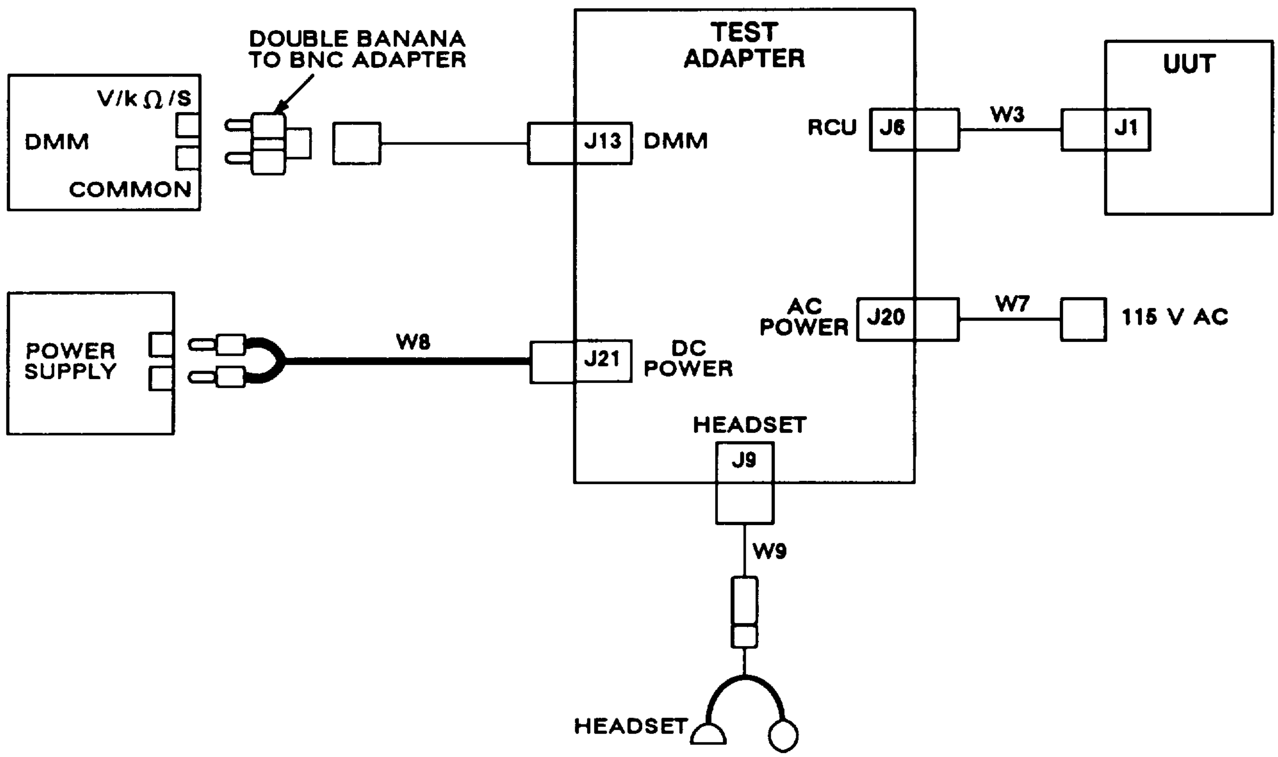
How to Proceed. If normal results are found proceed to the next step. If abnormal results are found, replace the indicated module or go to the indicated troubleshooting flowchart.

WARNING

Connect the test setups only when directed and with the power supply turned off. The large current capacity of the test power supply can cause personal injury. Verify the test setup before turning the power supply on.

CAUTION

- To avoid damage to equipment, always set DC switch on test adapter to OFF before turning power supply on.
- Before setting DC switch on test adapter to ON, always set rt and rcu FUNCTION switches to STOW or OFF. This applies to the uut, the ref rt, and the ref rcu. Failure to do so may damage an rt or rcu.



EQUIPMENT PRESETS

UUT SWITCHES

FUNCTION	STOW
PRESET	MAN
IFM-RF PWR	NORM
MODE	SC
VOL	FULLY RIGHT

REF RT SWITCHES

FUNCTION	STOW
PRESET	MAN
IFM RF PWR	OFF
MODE	SC
VOL	FULLY RIGHT

REF RCU SWITCHES

FUNCTION	STOW

ICS SWITCHES

TOP SWITCHES	OFF
ROTARY SWITCH	1
HOT MIKE	OFF
VOL	MIDRANGE

TEST ADAPTER SWITCHES

S1-S6	OFF
DC	OFF
AC	OFF
TAKE CTRL	RCU
TEST EQUIPMENT SELECTOR	DMM
TEST EQPT INPUT	INTL

Figure 3-5. Operational Check Test Setup

3-9. OPERATIONAL CHECK. Continued

ACTION	RESPONSE

Step 1. SELF TEST

a. Set up equipment using figure 3-5.

a. No response.

b. Turn power supply on and set to 28 V dc.

b. No response.

c. Set DC switch on test adapter to ON.

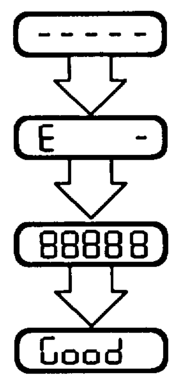
c. No response.

d. Set FUNCTION switch on ref rt to SQ OFF.

d. No response.

e. Set uut FUNCTION switch to Z-A and then to TEST.

e. Responses:



Displayed for about 3 seconds.

Displayed for about 2 seconds.

Displayed for about 7 seconds.

End of cycle.

If display is blank, go to chart 1.

If display reads	Go to
Good	Step f
FAIL8	Chart 2
Steady Dashes	Chart 3
FAIL7	Chart 3
All 8's	Chart 4

For any other reading, go to chart 1.

f. SET uut FUNCTION switch to SQ ON and then TEST for each uut PRESET switch setting 1 through CUE.

f. Responses: same as step e, except ignore results after " E –". If not, go to chart 5.

g. Set uut FUNCTION switch to SQ ON and then TEST for each uut IFM-RF PWR switch setting Hl, LO, and OFF.

g. Responses: same as step e, except ignore results after " E -". If not, go to chart 6.

h. Set uut FUNCTION switch to SQ ON and then TEST for each uut MODE switch setting HOM, FH, AND FH-M.

h. Responses: same as step e, except ignore results after " E -". If not, go to chart 7.

3-9. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 2. OUTPUT CHECKS	
a. Set uut switches: FUNCTION — SQ ON PRESET — MAN IFM-RF PWR — OFF MODE — HOM	a. No response.
b. Set S3 on test adapter to 7 and read DMM.	b. Greater than 26 V dc. If not, go to chart 8.
c. Set S3 on test adapter to 8 and read DMM.	c. Greater than 26 V dc. If not, power supply (A4) is bad.
d. Set uut MODE switch to SC.	
e. Check LAMP 4 on test adapter.	e. LAMP 4 is lit. If not go to chart 9.
f. Check uut display.	f. Response: 30000 If not, W2 flex cable assembly is bad.
g. Set test adapter switches: S3 — 9 TEST EQUIPMENT SELECTOR — Ics	g. No response.
h. On uut, set FUNCTION switch to SQ OFF. Listen to headset.	h. Noise is present. If not, go to chart 10.
i. Set S3 on test adapter to 10.	
j. Vary uut VOL control and listen to noise in headset.	j. A changing noise level is present. If no noise is heard, go to chart 11. If noise is heard but does not change, go to chart 12.
k. Set TAKE CTRL switch on test adapter to RT.	
l. Vary VOL control on uut.	l. Noise level in headset does not change. If it changes, power supply (A4) is bad.
m. Set test adapter switches: S3 — 11 TEST EQUIPMENT SELECTOR — DMM TAKE CTRL — RCU	m. No response.
n. Set uut FUNCTION switch to RXMT. Read DMM.	n. DMM reads 6.70 to 6.80 V dc. If not, go to chart 13.

3-9. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 3. KEYBOARD CHECKS	
a. Set uut FUNCTION switch to SQ ON.	a. No response.
b. On uut, press FREQ and then CLR.	b. Response: [-----] If not, go to chart 14.
c. On uut, press FREQ and then CLR. After the five dashes appear, press 6.	c. Response: [b----] If not, go to chart 15.
d. On uut, press FREQ and then CLR. After the five dashes appear, press 6, 8.	d. Response: [b8---] If not, go to chart 16.
e. On uut, press FREQ and then CLR. After the five dashes appear, press 3, 1, 2, 5, 0.	e. Response: [31250] If not, keyboard is bad.
f. On uut, press FREQ and then CLR. After the five dashes appear, press 4, 9, 7.	f. Response: [497--] if not, keyboard is bad.
g. On uut, press FREQ, then CLR, then ●●● / TIME.	g. Display shows number (00 to 99). If not, keyboard is bad.
h. On uut, press FREQ and then CLR. After the five dashes appear, press 3, 1, 2, 5, 0.	h. Response: [31250] If not, keyboard is bad.
i. On uut, press STO (Sto/ENT).	i. Display blinks then displays “31250”. If not, keyboard is bad.

3-9. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 4. FUNCTION SWITCH CHECKS	
a. Set uut switches: FUNCTION LD PRESET 1 MODE SC	a. No response.
b. On uut, press FREQ and then CLR.	b. Response:  If not, W2 flex cable assembly is bad.
c. If rcu is C-11466A, go to step f.	c. No response.
d. On uut, set FUNCTION switch to LD-V and then MODE switch to FH.	d. Response:  if not, W2 flex cable assembly is bad.
e. Skip step f.	e. No response.
f. On uut, set MODE switch to FH.	f. Response:  if not, W2 flex cable assembly is bad.
g. On uut, set FUNCTION switch to Z-A.	g. Response:  if not, W2 flex cable assembly is bad.
h. Check LAMP 2 on test adapter.	h. LAMP 2 is lit, If not, go to chart 17.
Step 5. LOOP TEST	
Check LAMP 6 on test adapter.	LAMP 6 is lit. If not, power supply (A4) is bad.
Step 6. PANEL ILLUMINATION CHECK	
a. On test adapter, set AC switch to ON.	a. Front panel of uut is lit. If not, go to chart 18.
b. On test adapter, set AC switch to OFF.	b. No response.

3-10. TROUBLESHOOTING FLOWCHARTS

The troubleshooting flowcharts are used to find a bad module in the rcu. The user will be sent to the flowchart from a step in the operational check. When sent to a flowchart, do the following:

a. Unless otherwise directed, keep all switches and controls as they were from the operational check.

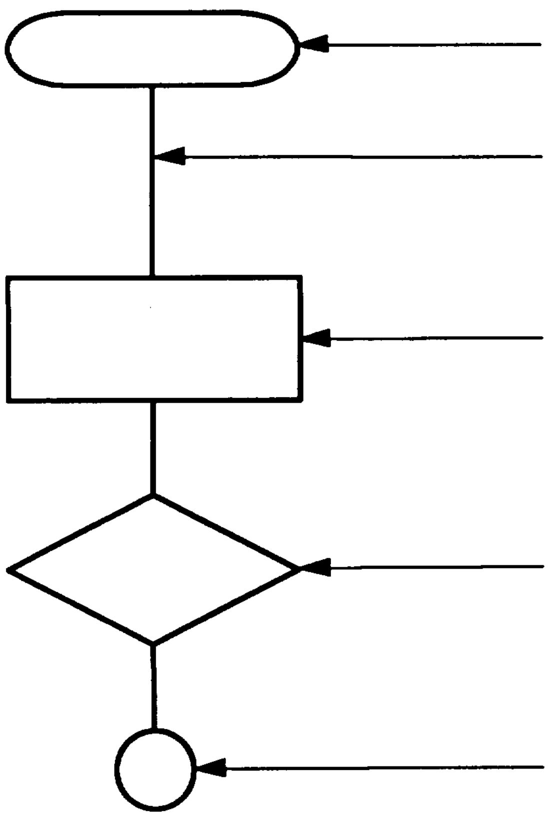
b. Do action described in first rectangle of flowchart.

c. Answer yes or no to question in decision diamond.

d. Go to next block as directed by answer to yes/no question.

e. Continue until bad module is located.

Figure 3-6 explains the symbols used on the troubleshooting flowcharts.



Test Procedure Start: (Rectangle with rounded sides) Indicates start of the test procedure and contains a brief description of the symptom of trouble.

Test Procedure Flow Line: (Line) Indicates procedure flow.

Test Procedure Instruction: (Rectangle) Provides instructions for doing a specific test.

Decision: (Diamond) Indicates that a decision must be made (YES or NO) in answer to a question about the previous test. Path taken depends on the answer (YES or NO).

Connector: (Circle) Directs user to another place in the chart. Contains a number and a sheet number (SH No.). Go to the sheet indicated and find the entry number.

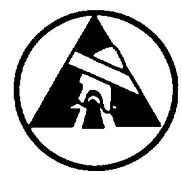
Figure 3-6. Explanation of Symbols

3-10. TROUBLESHOOTING FLOWCHARTS. Continued

WARNING

Connect the test setups only when directed and with the power supply turned off. The large current capacity of the test power supply can cause personal injury. Verify the test setup before turning the power supply on.

CAUTION

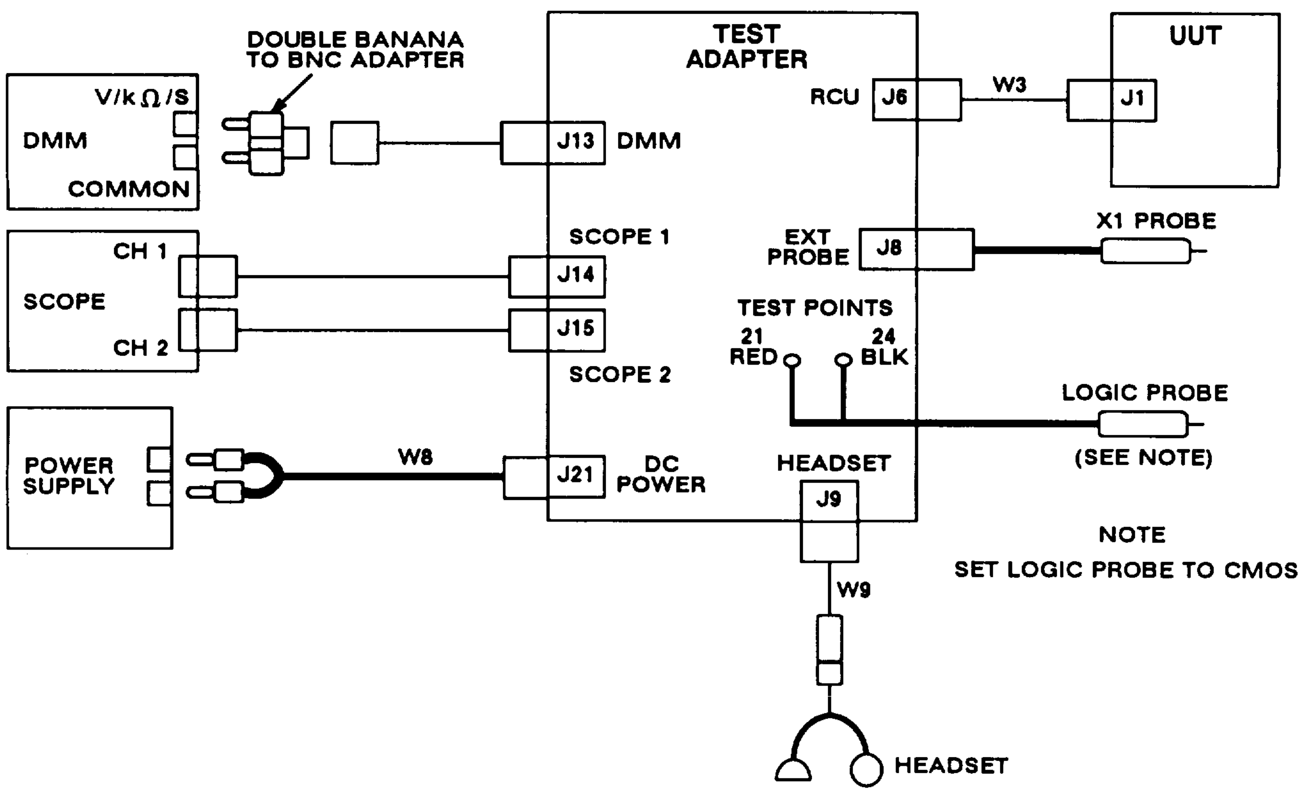


- Static electricity and stray voltages can damage the rcu modules. Use an antistatic pad on the work surface and wear a grounded wrist strap when troubleshooting or handling the modules.
- To avoid damage to equipment, always set DC switch on test adapter to OFF before turning power supply on.
- Always set rt and rcu FUNCTION switches to STOW or OFF before setting DC switch on test adapter to ON. This applies to the uut, the ref rt, and the ref rcu. Failure to do so may damage an rt or rcu.

NOTE

The principles of operation section can be used to fault isolate any unusual problems that may not be covered in the troubleshooting procedures.

1. SET TEST ADAPTER DC SWITCH TO OFF.
2. SET UUT FUNCTION SWITCH TO STOW.
3. DISCONNECT TEST CABLE W3 FROM UUT.
4. REMOVE ACCESS COVER FROM UUT.
5. RECONNECT TEST CABLE W3 TO UUT.
6. CONNECT EQUIPMENT AS SHOWN BELOW:

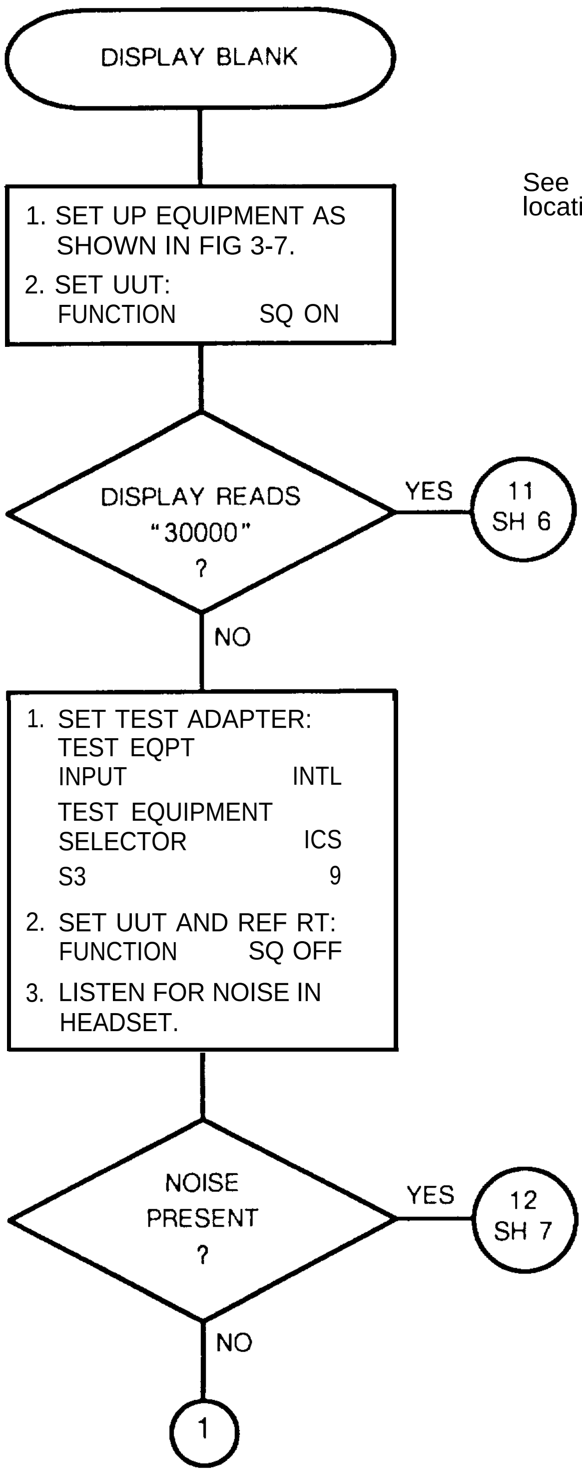


7. SET DC SWITCH ON TEST ADAPTER TO ON.

Figure 3-7. Troubleshooting Test Setup

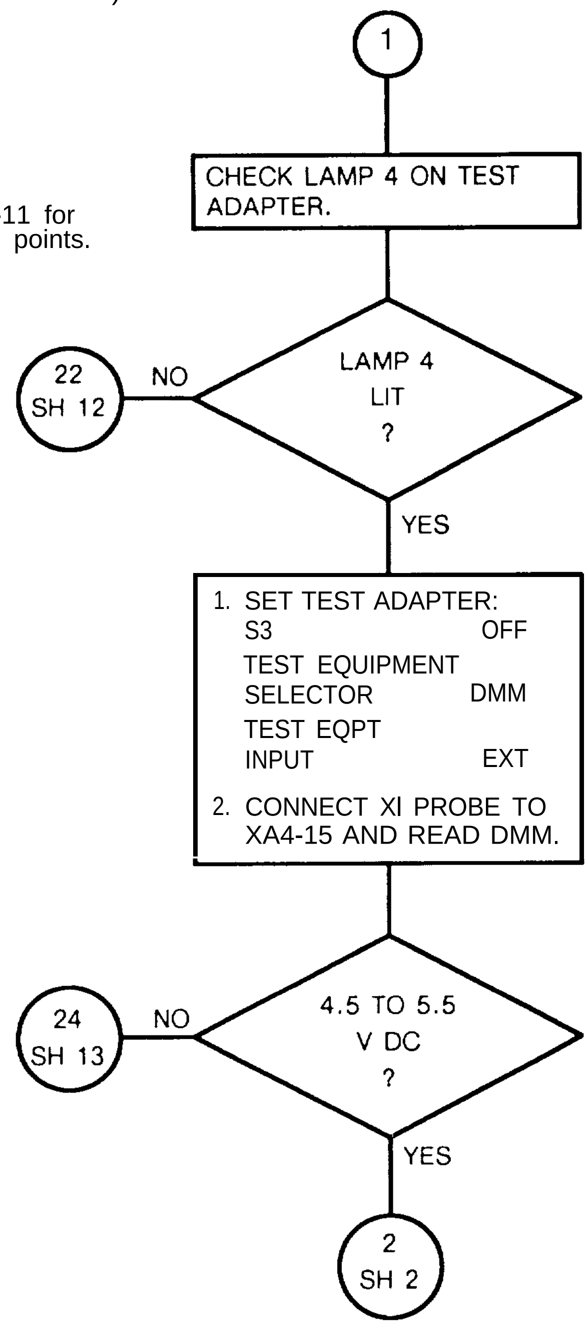
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Display Blank (Sheet 1 of 18)



NOTE

See figure FO-11 for location of test points.



3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
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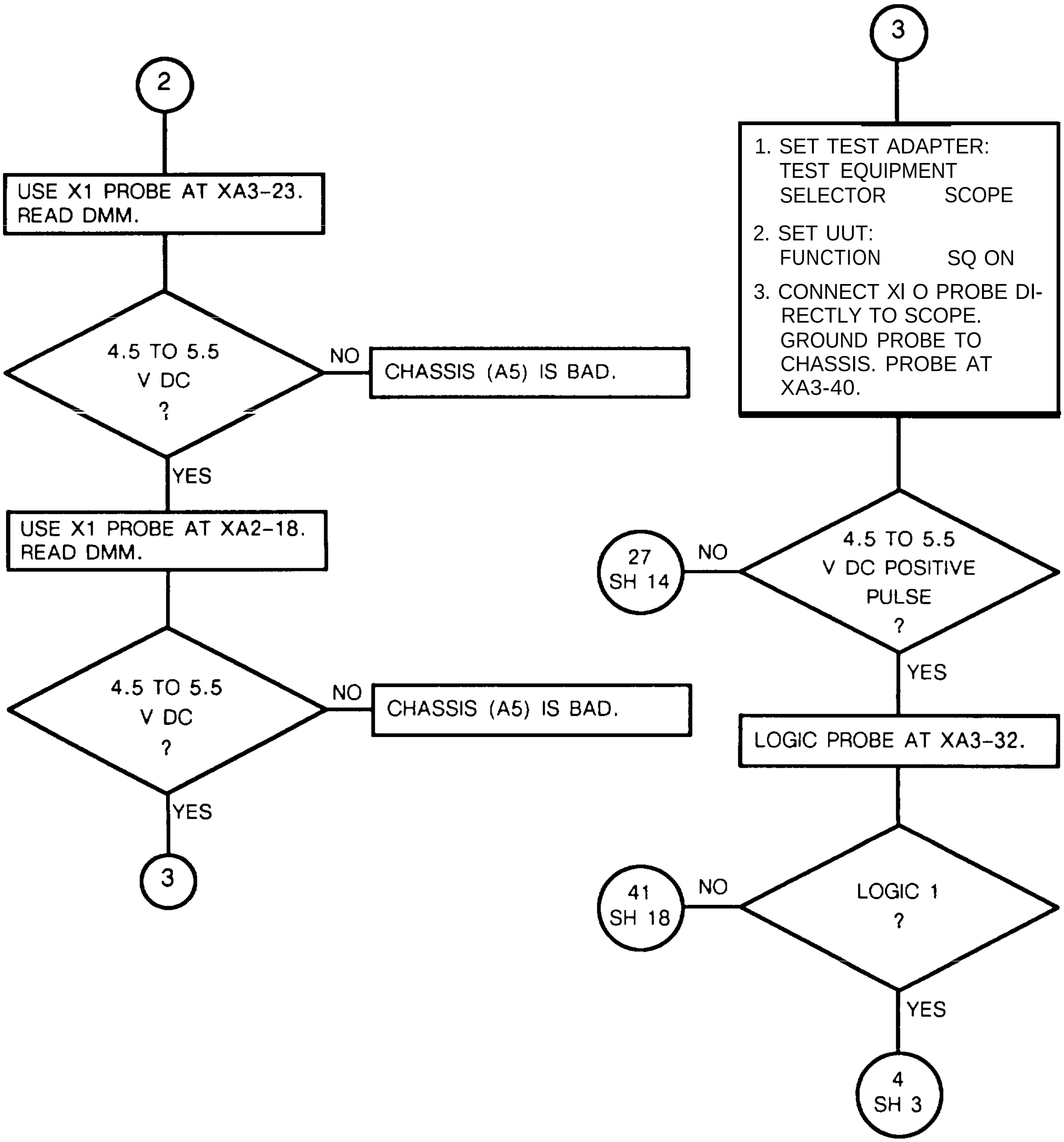
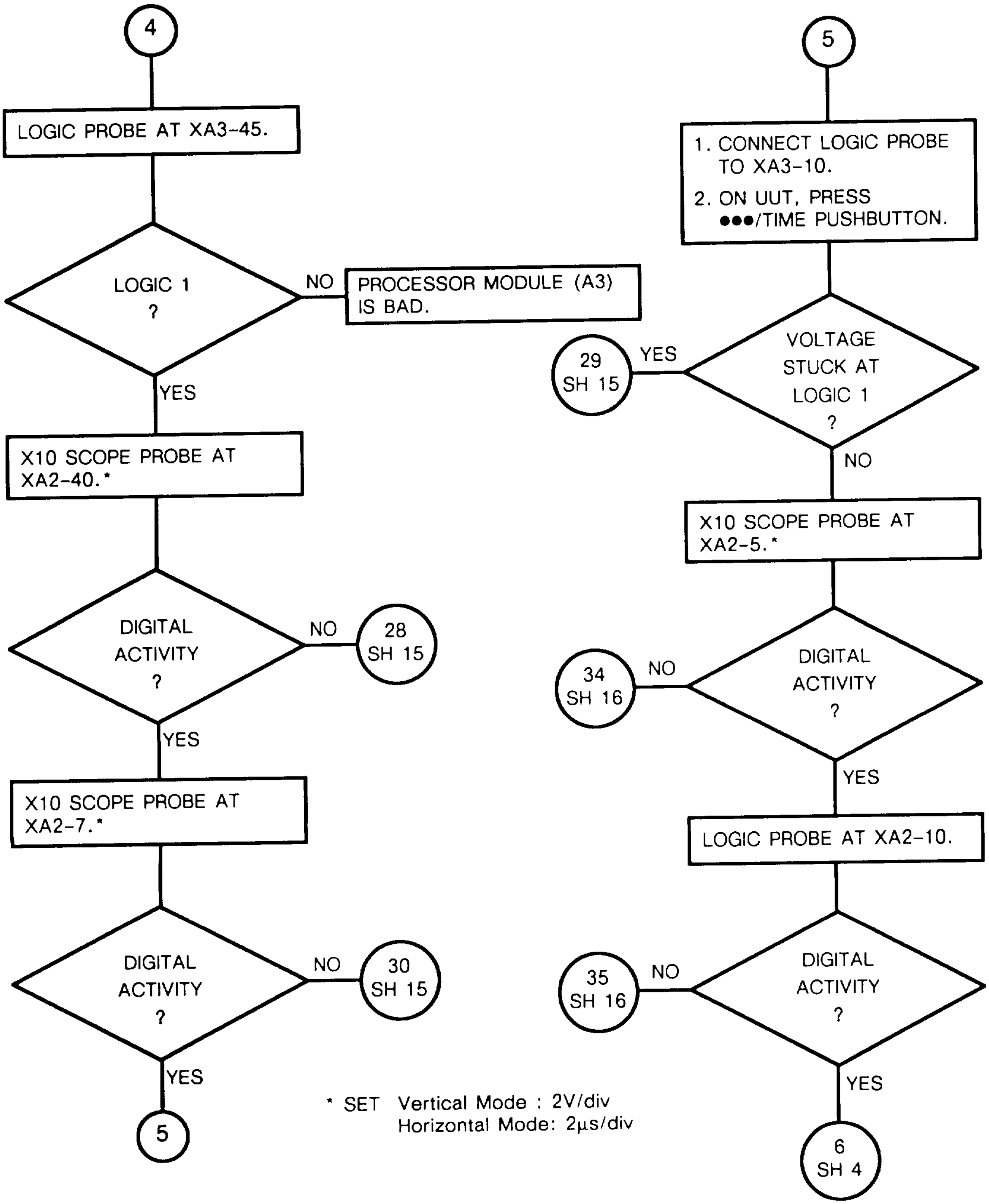


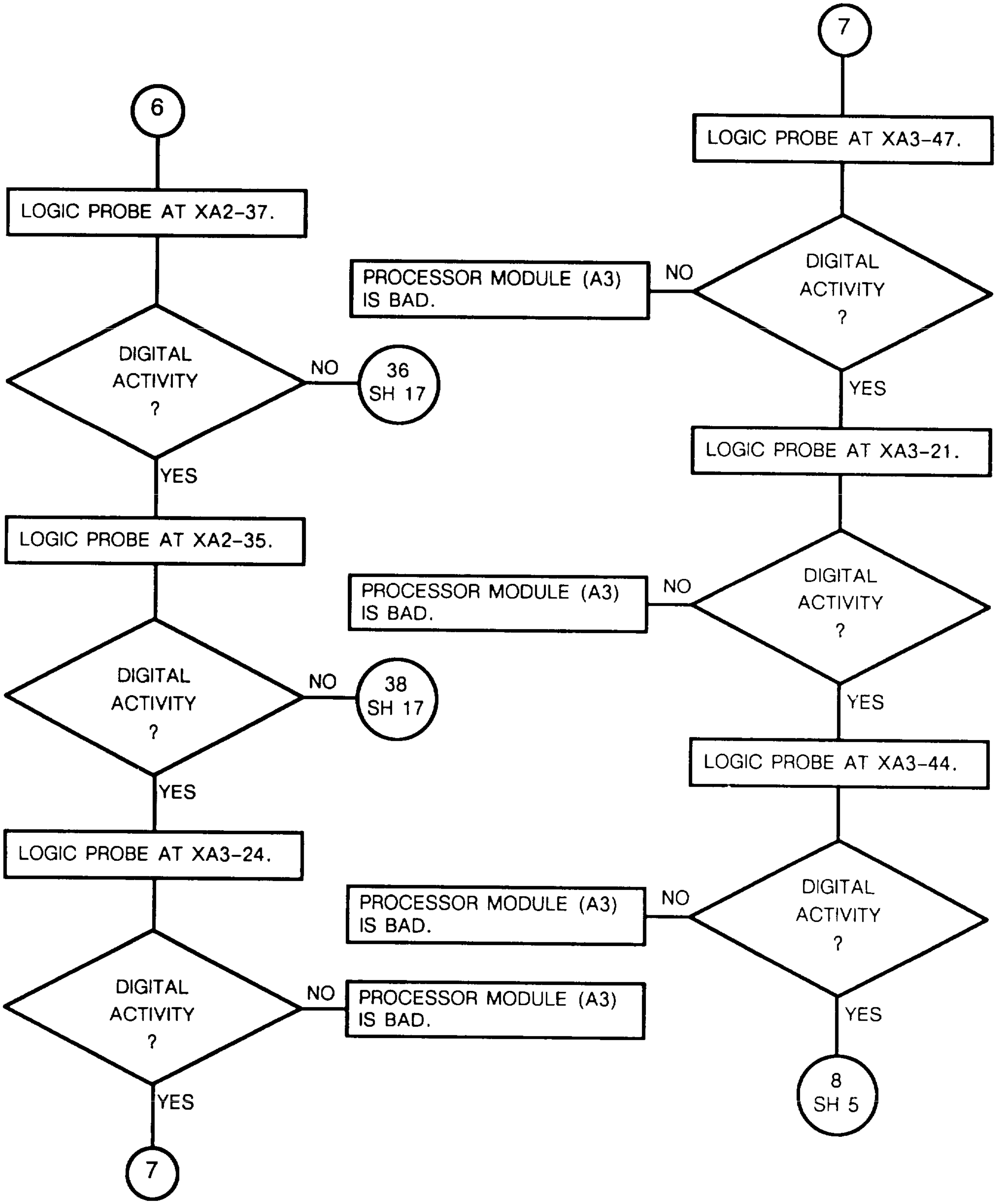
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Display Blank (Sheet 3 of 18)



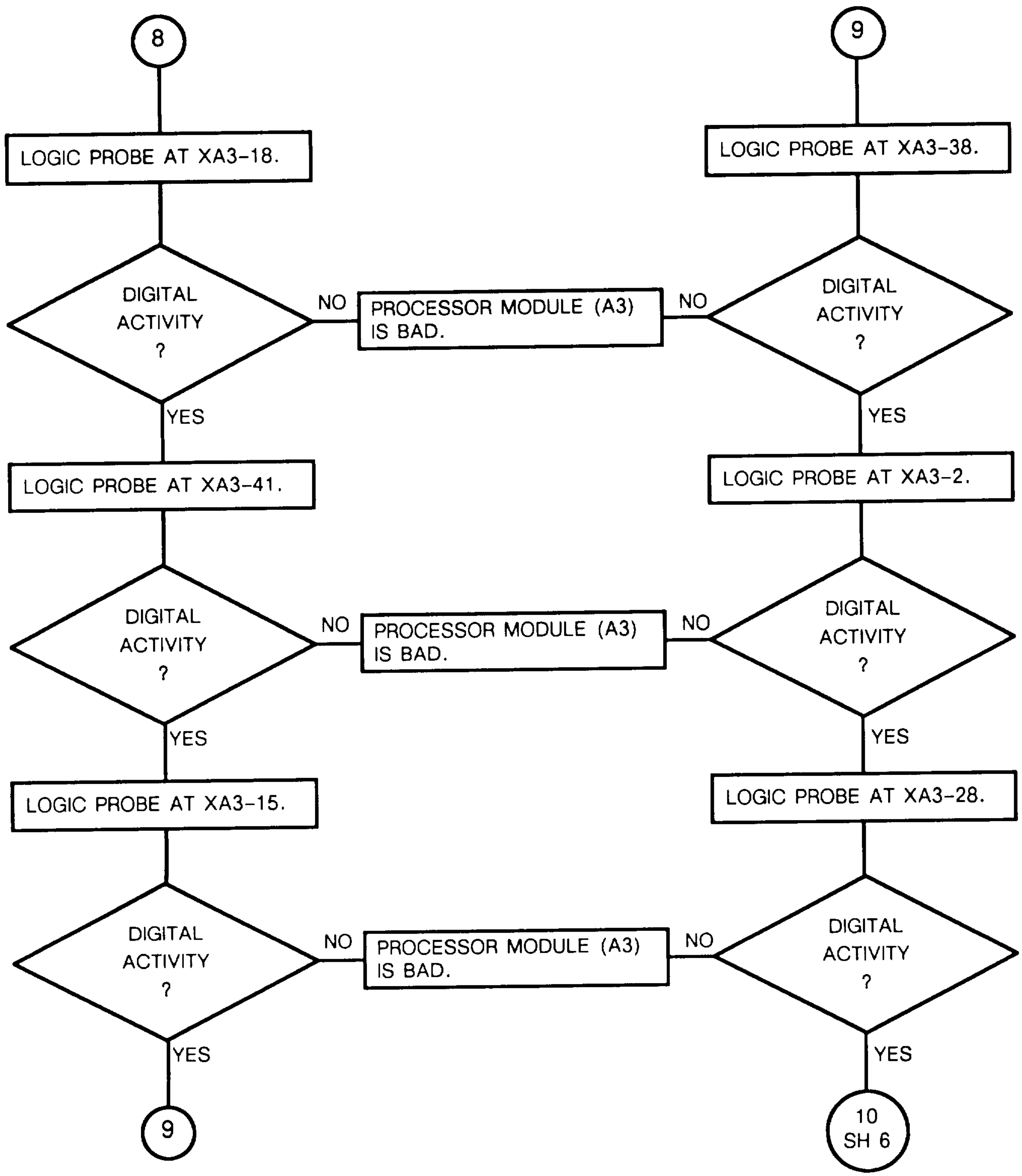
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Display Blank (Sheet 4 of 18)



3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Display Blank (Sheet 5 of 18)



3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
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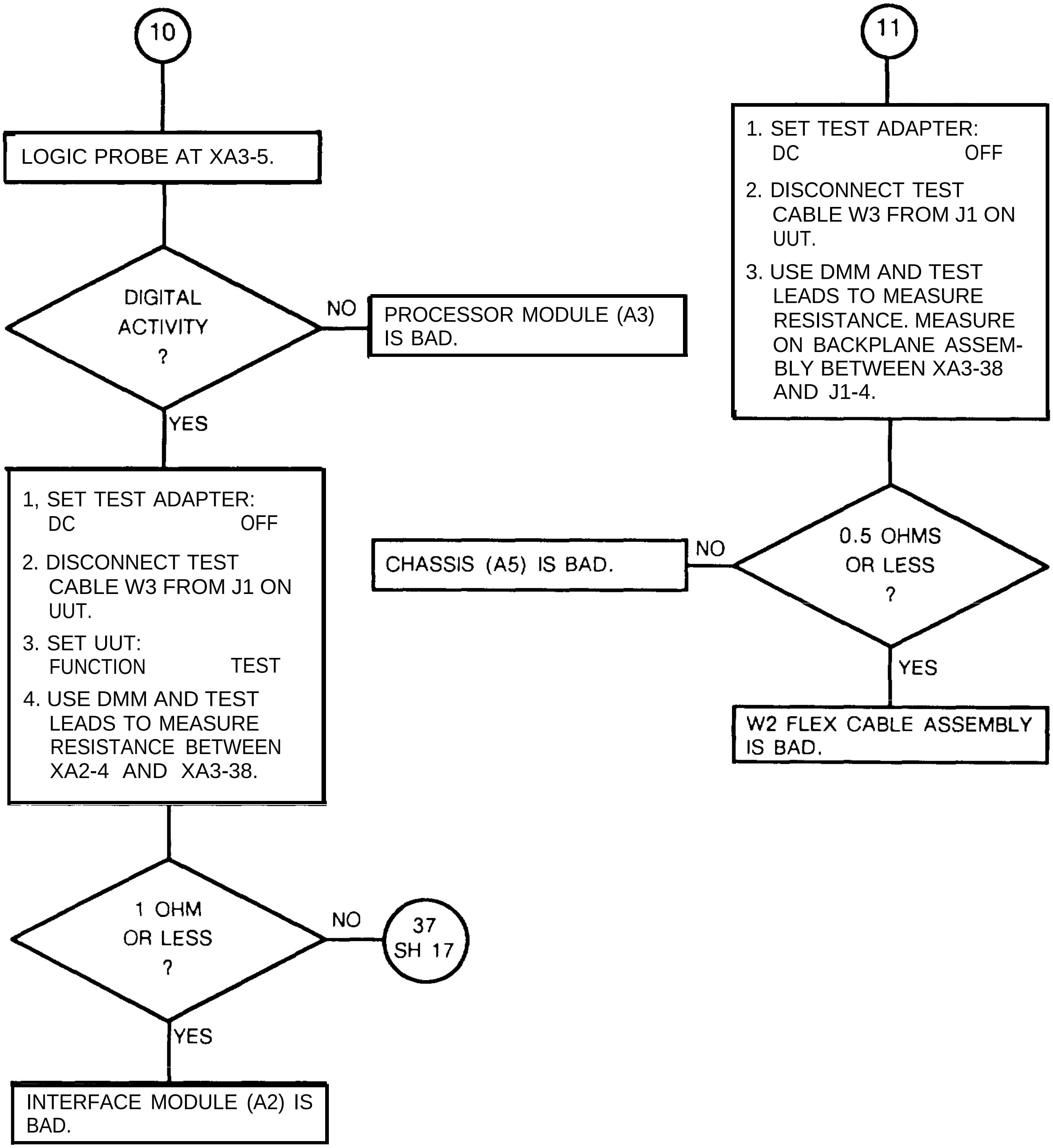

3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
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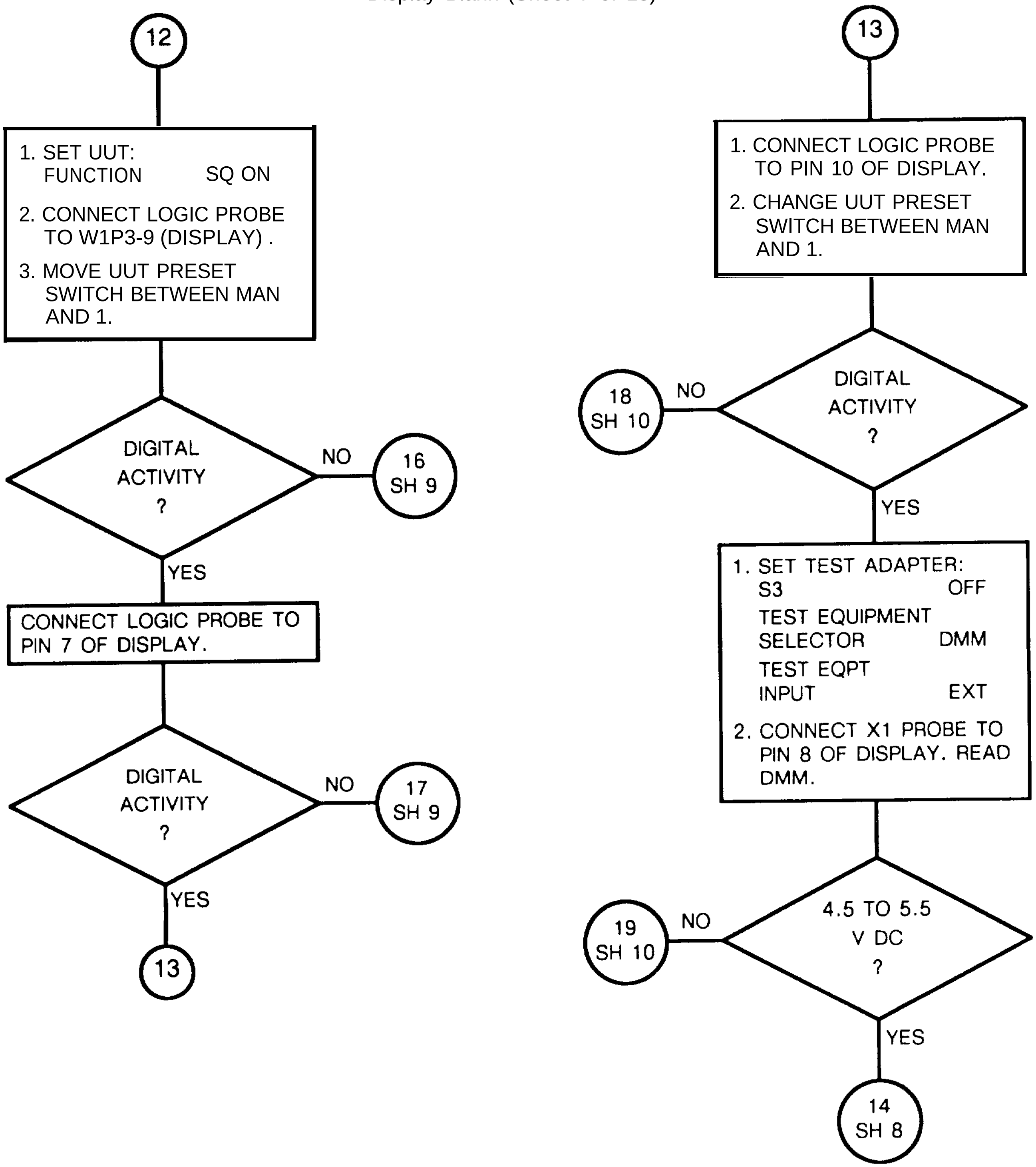

3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
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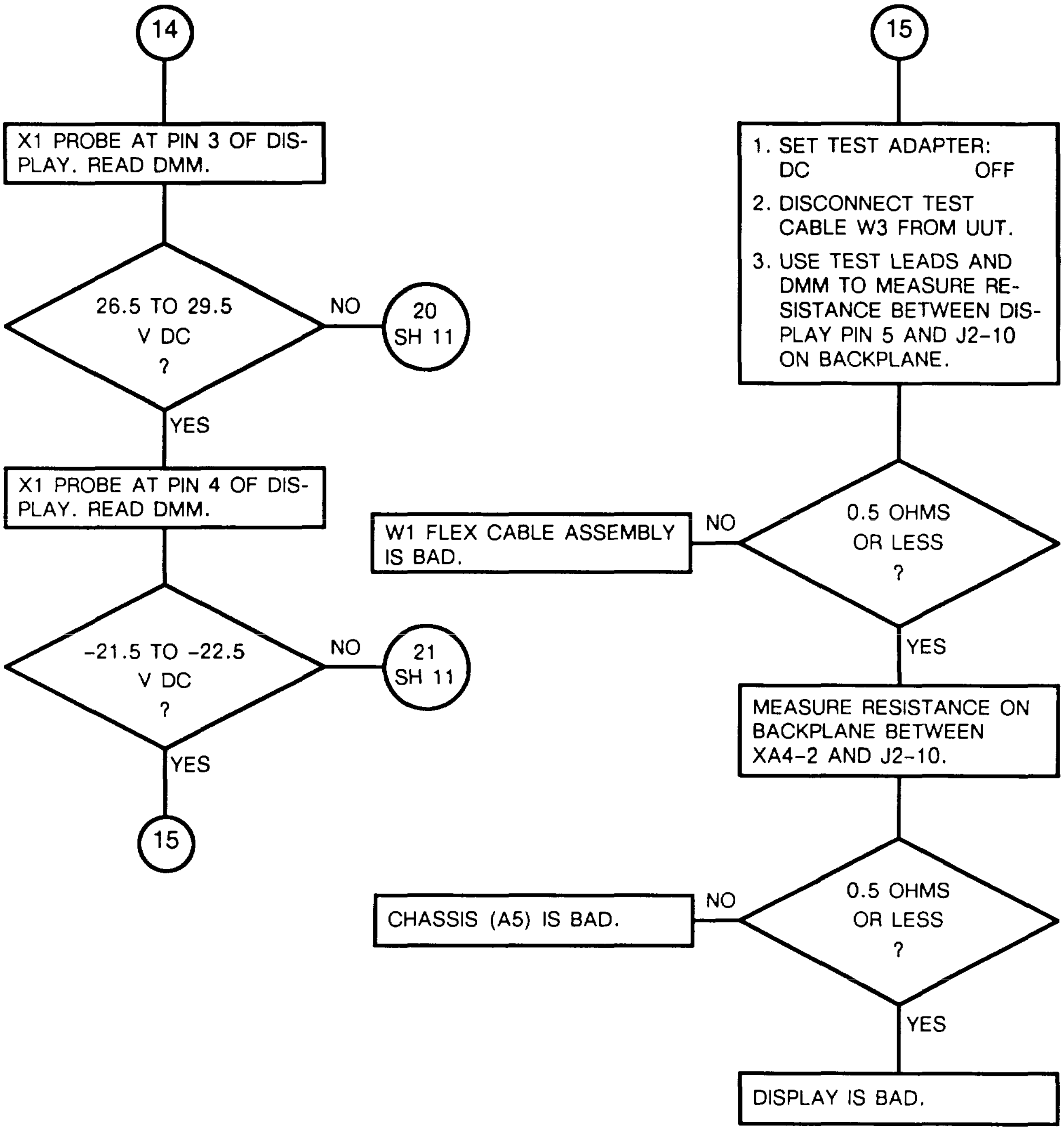
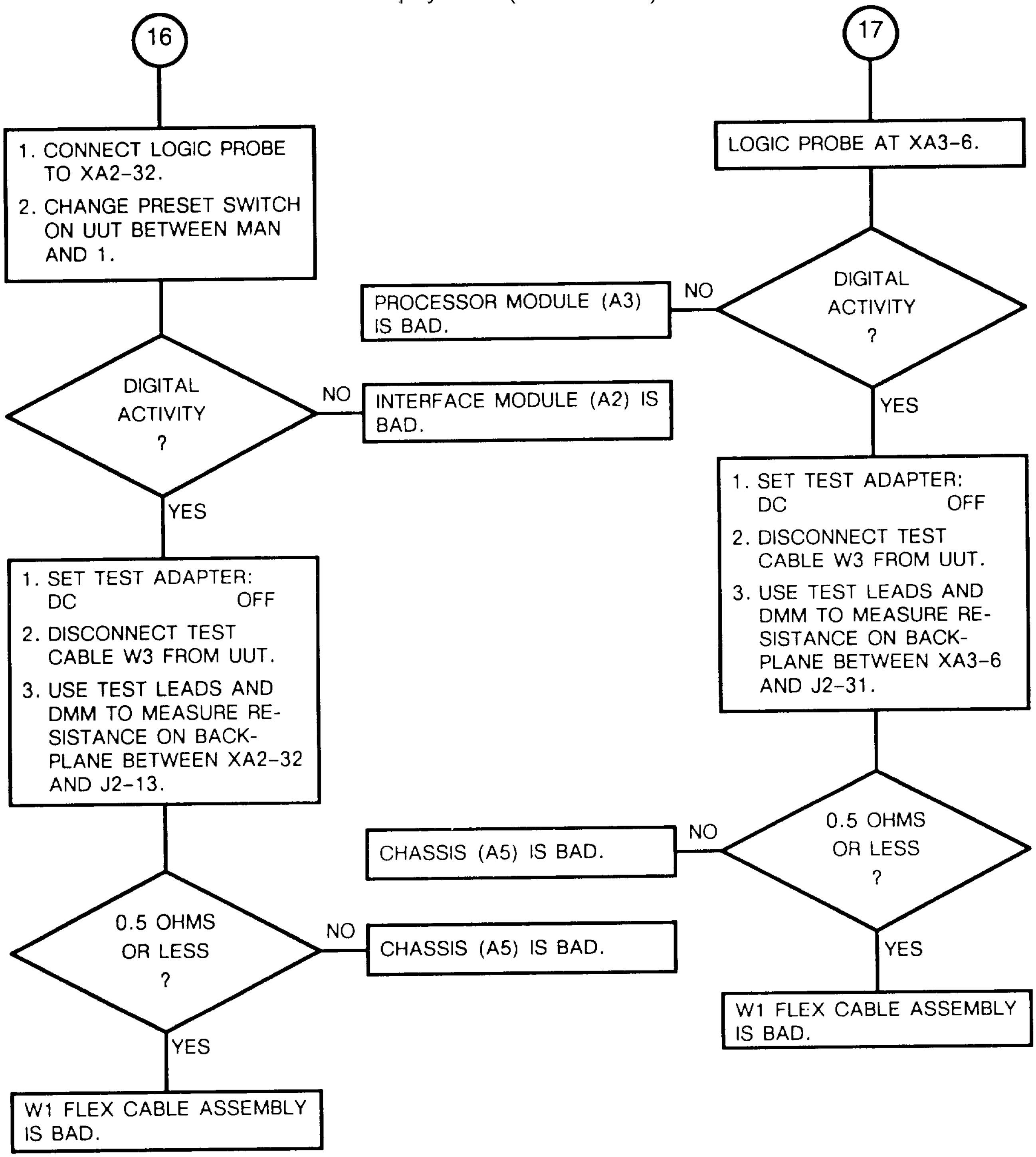


3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Display Blank (Sheet 9 of 18)



3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
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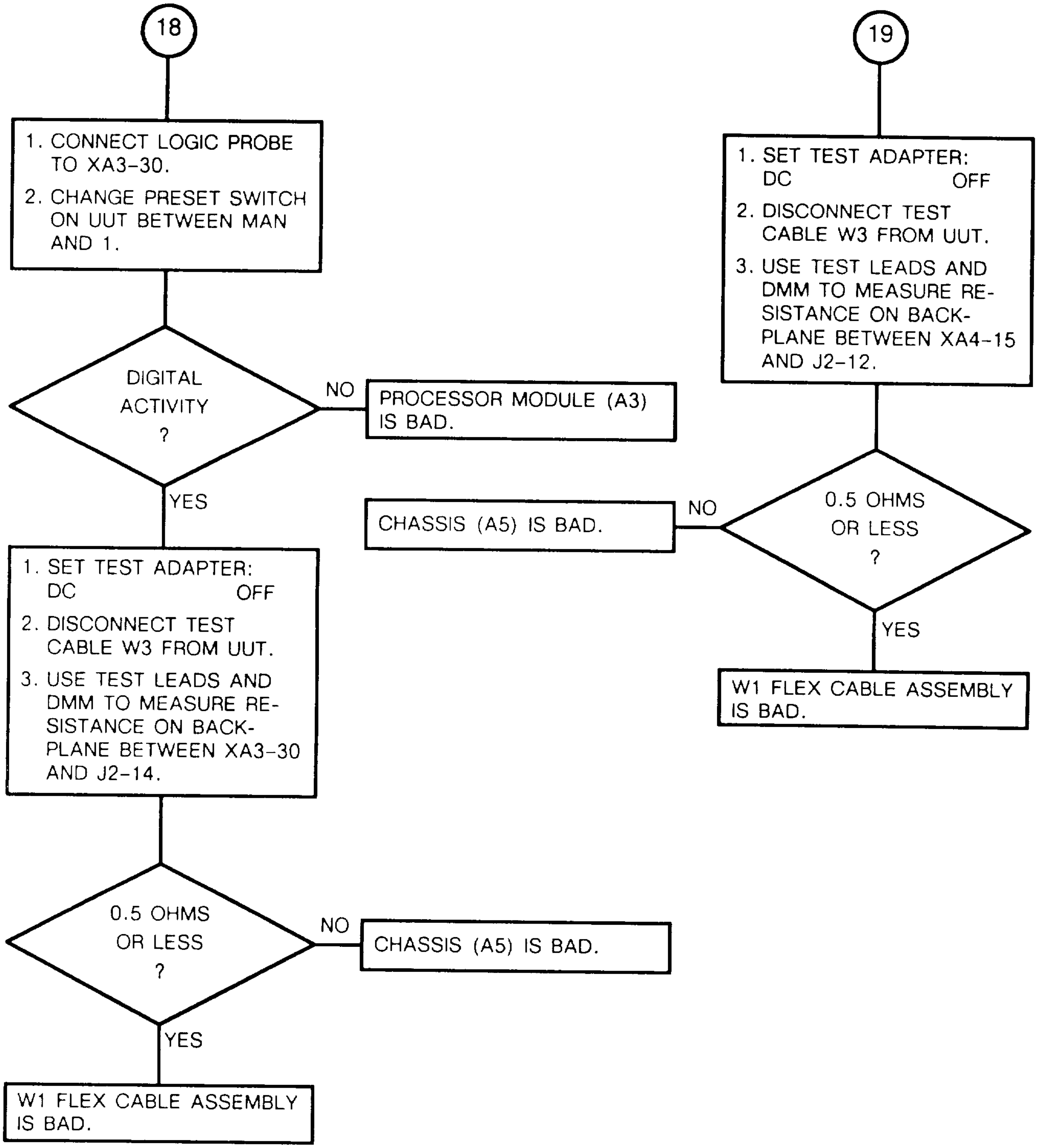

3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
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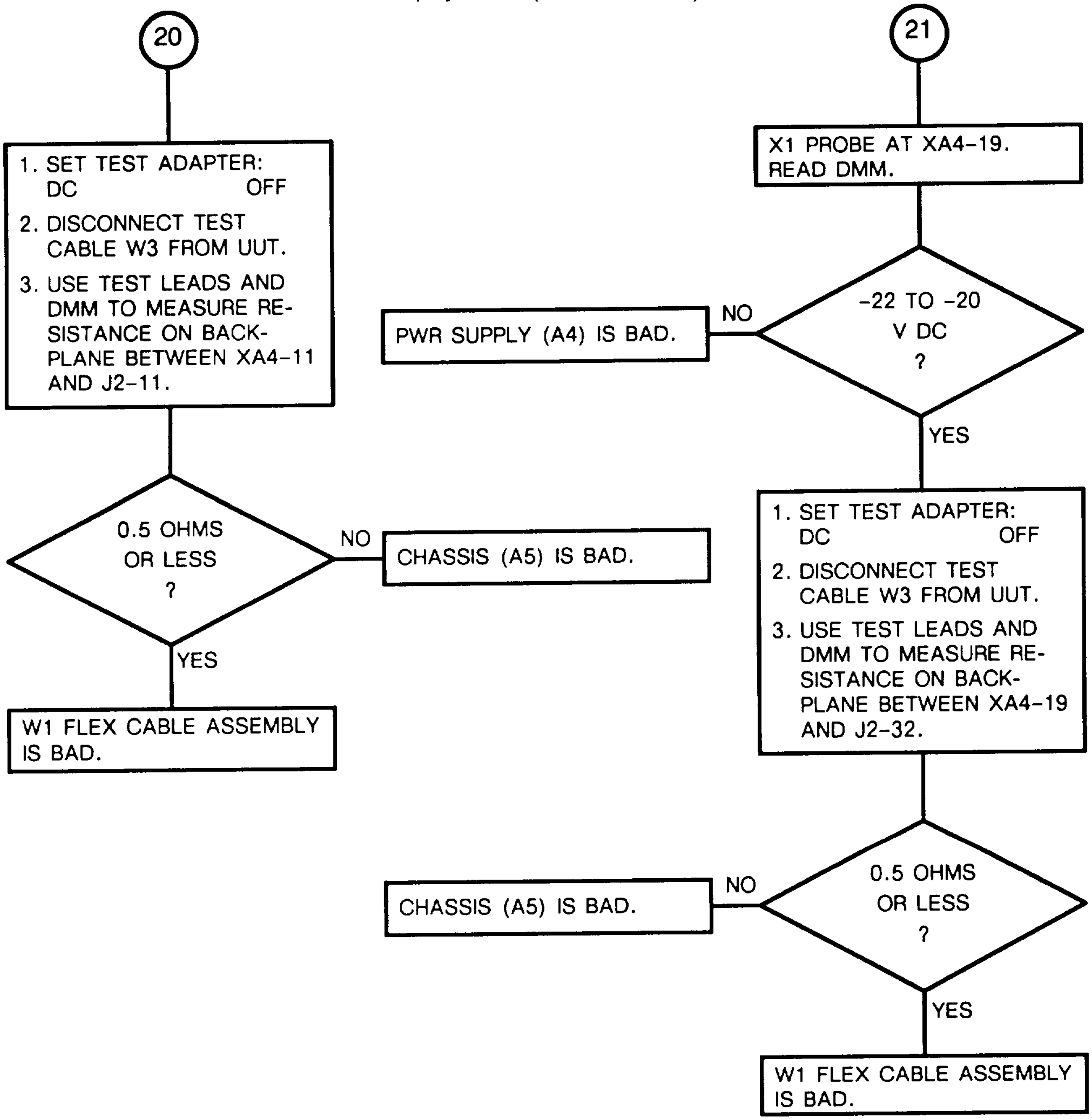

3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
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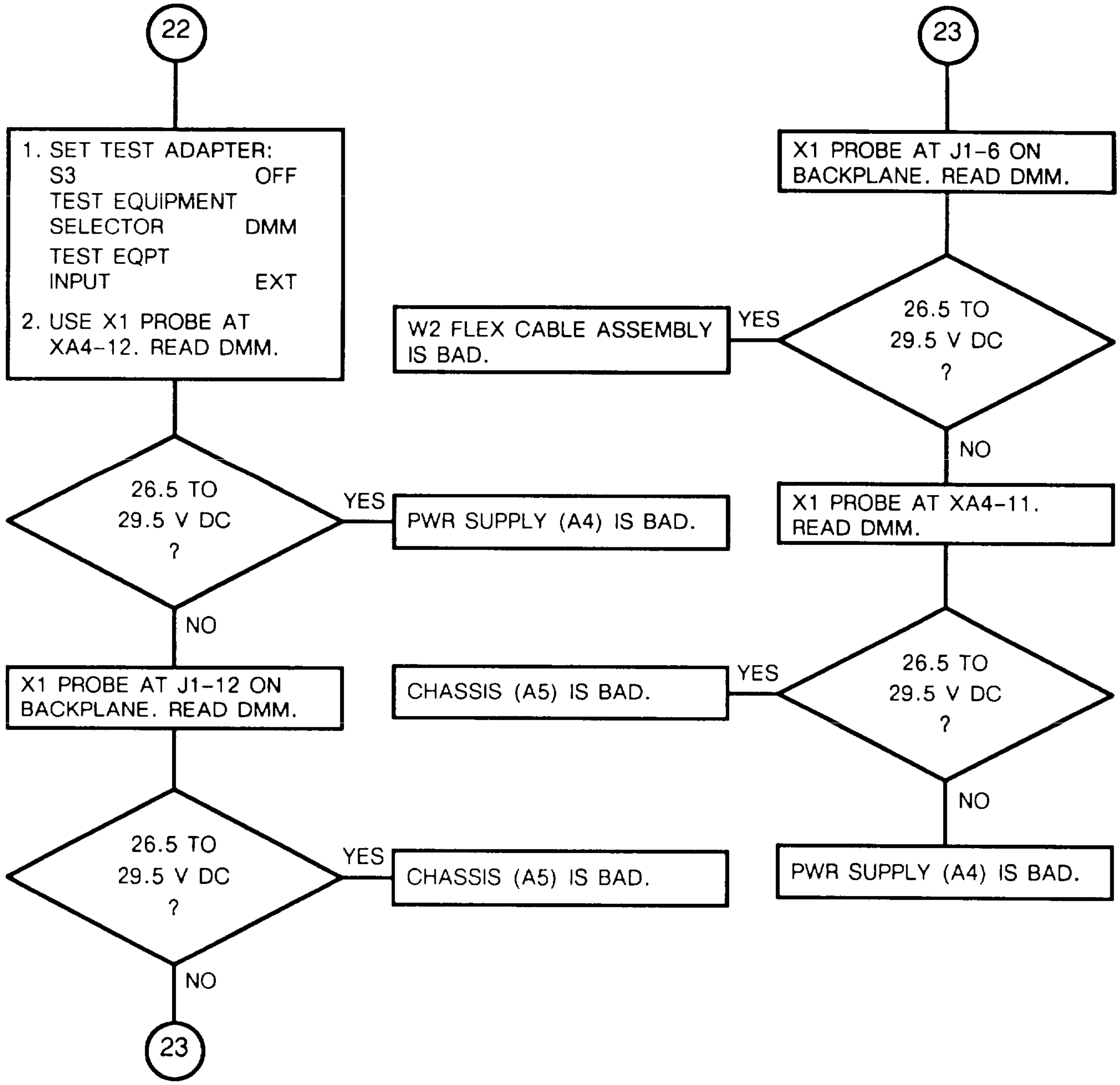
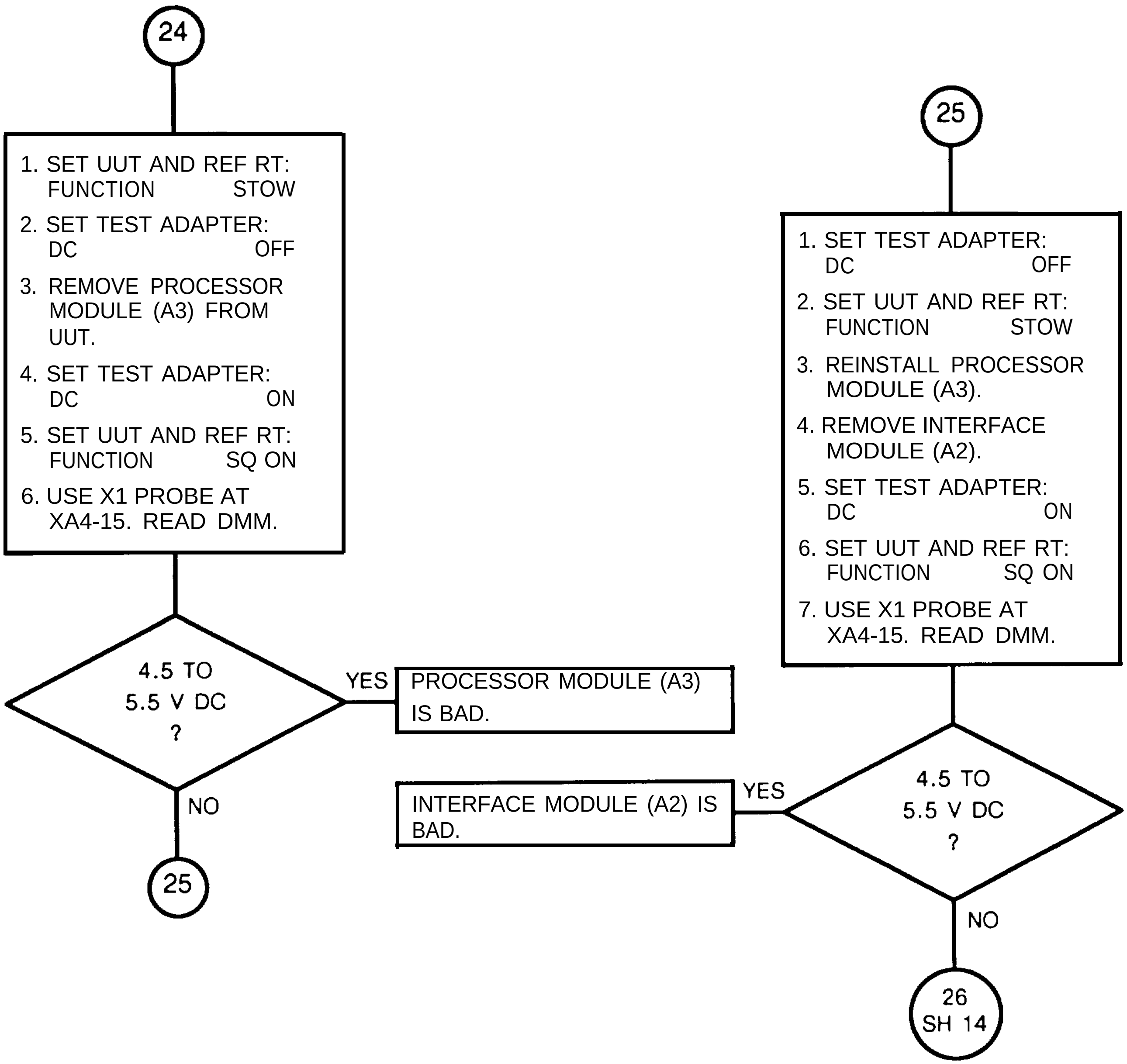


3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Display Blank (Sheet 13 of 18)



3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
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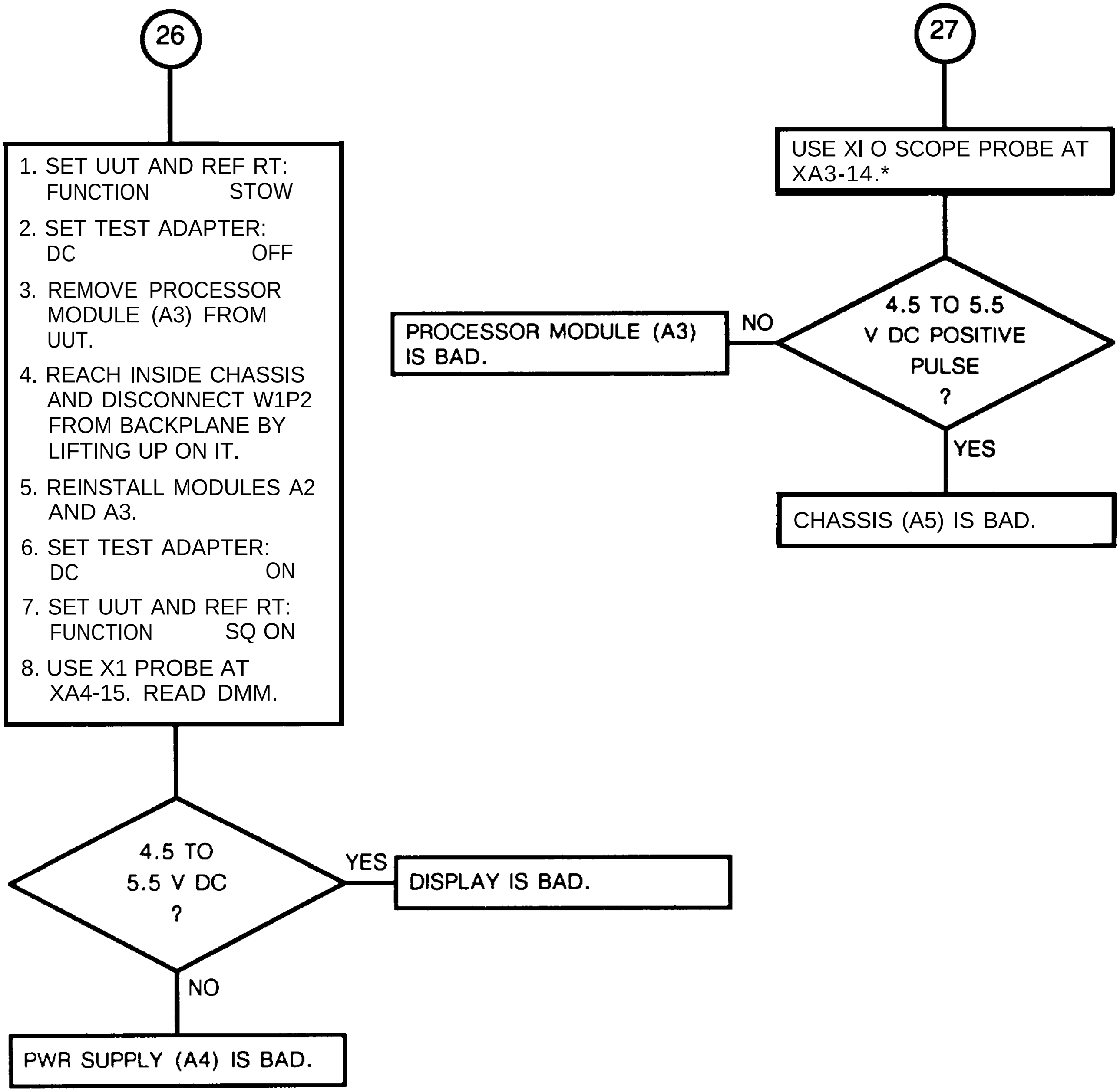

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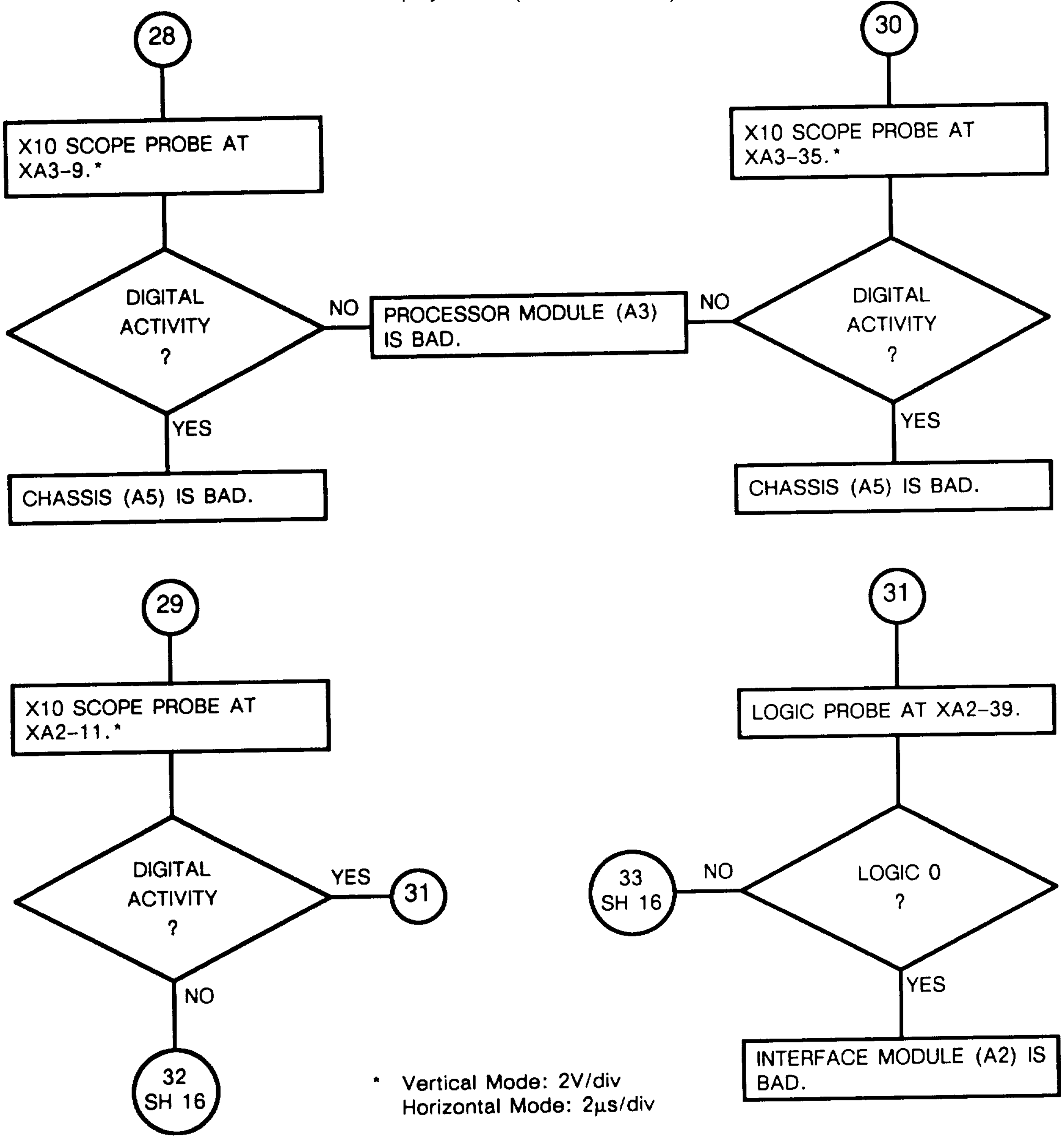
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Display Blank (Sheet 15 of 18)



3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
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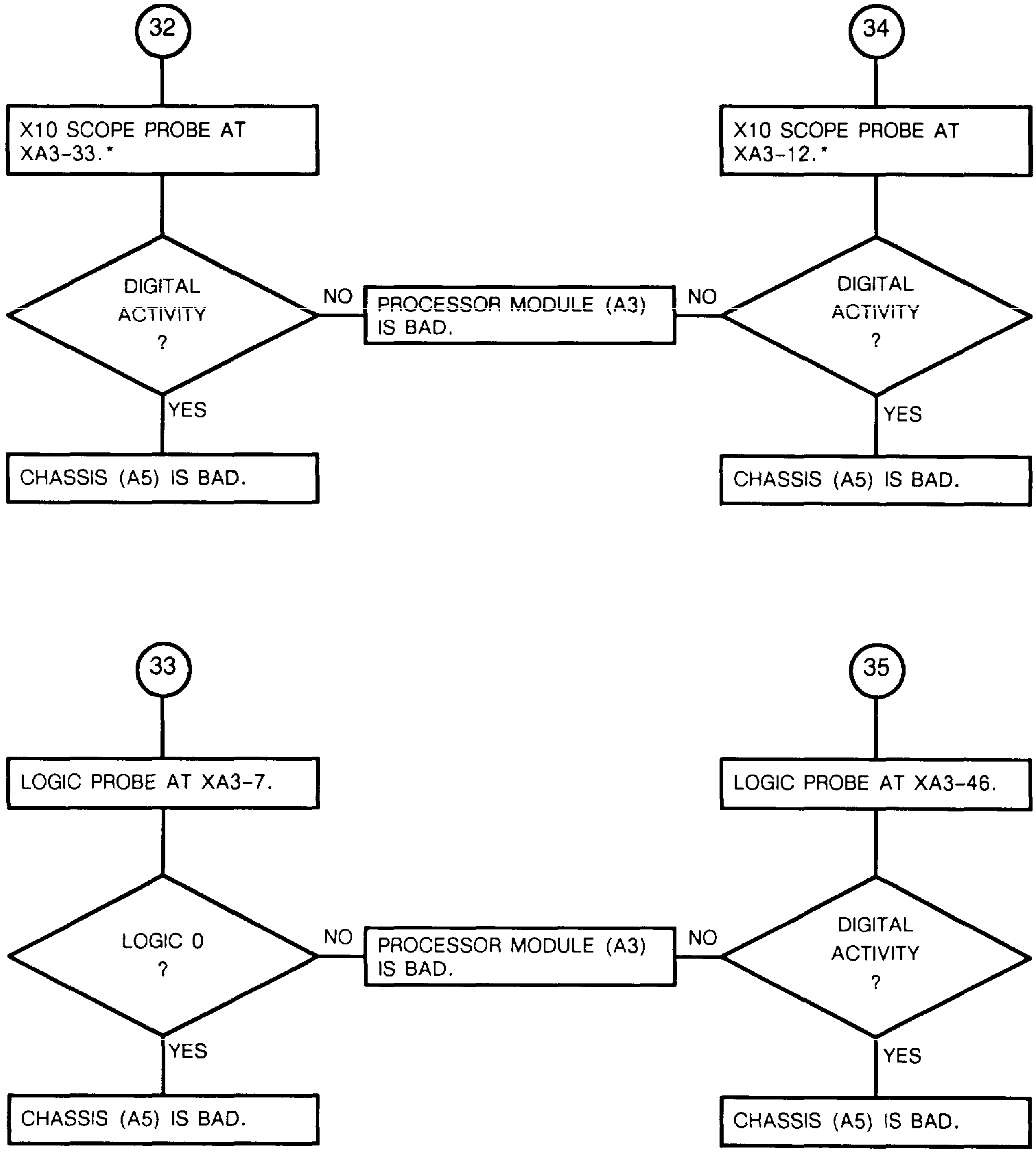

*SET: Vertical Mode: 2V/div
Horizontal Mode: 2µs/div

3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
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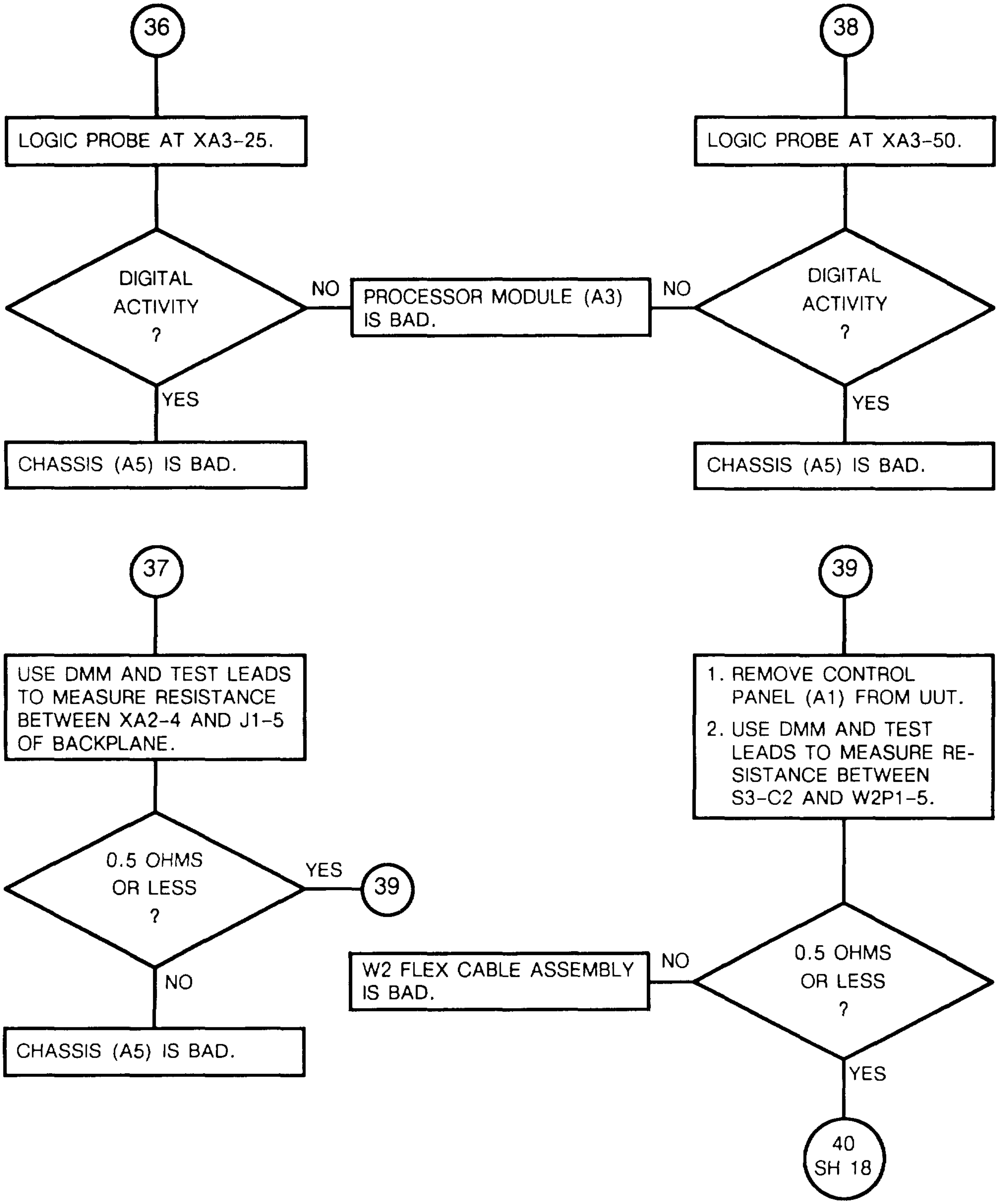

3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
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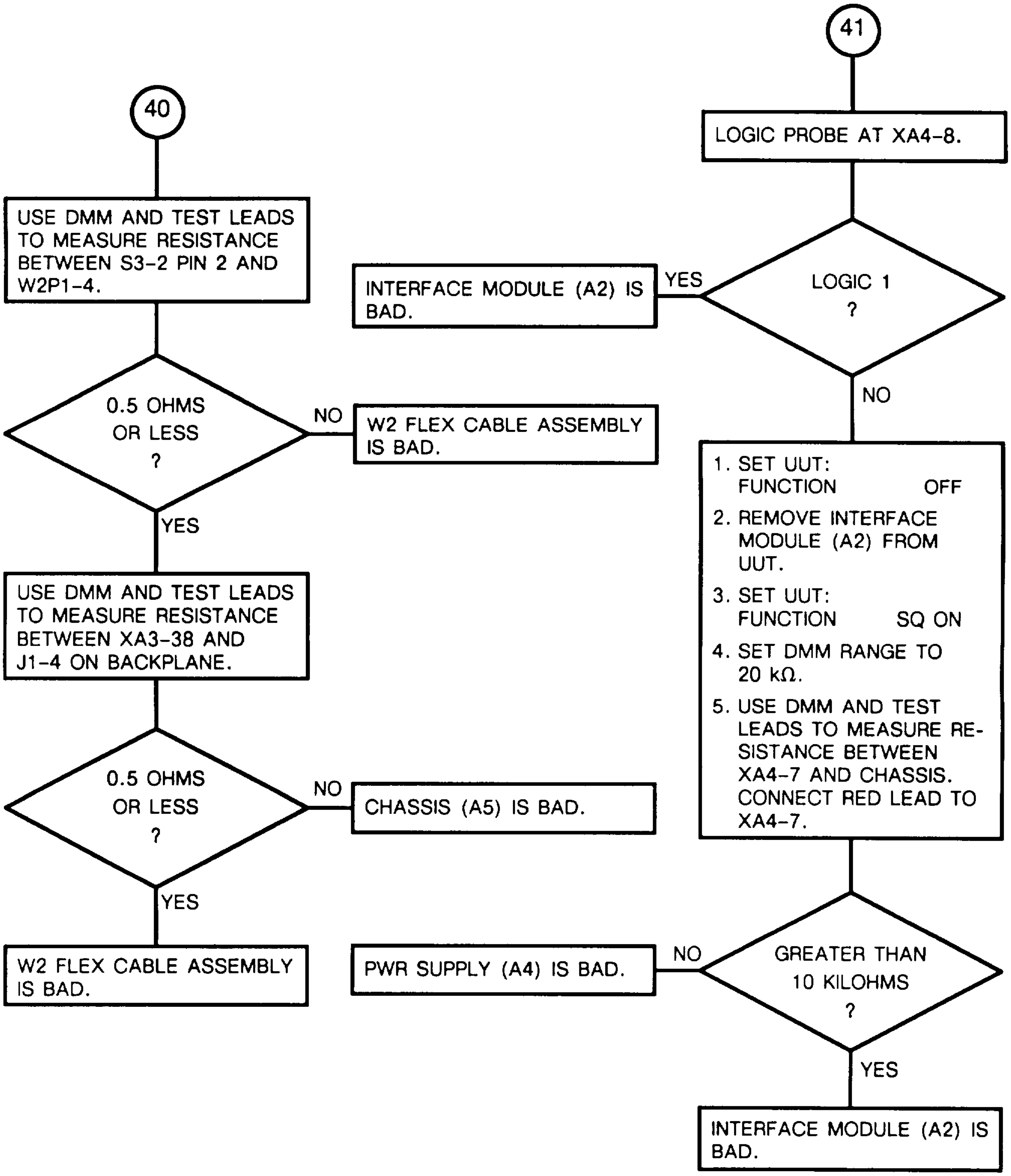
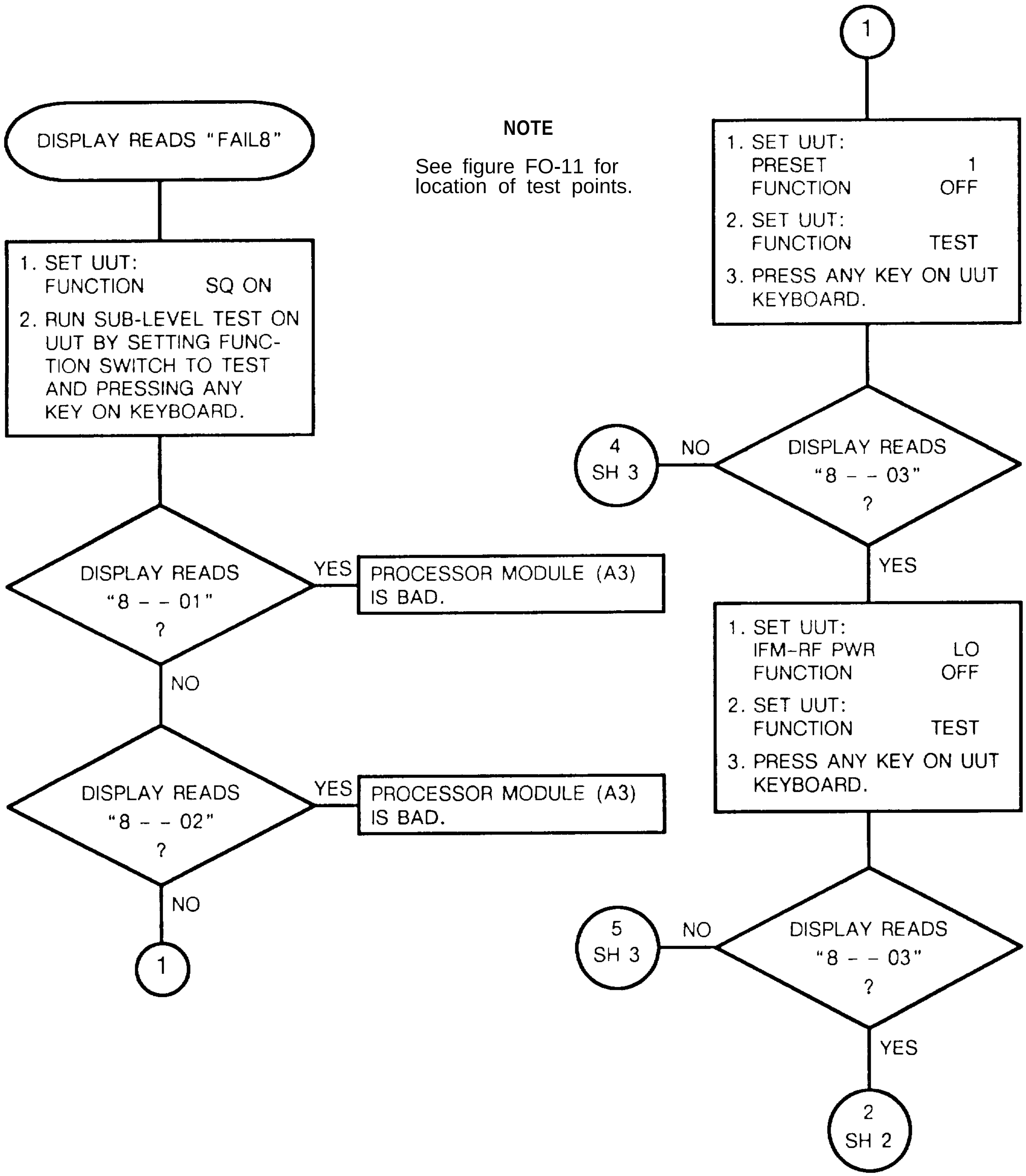


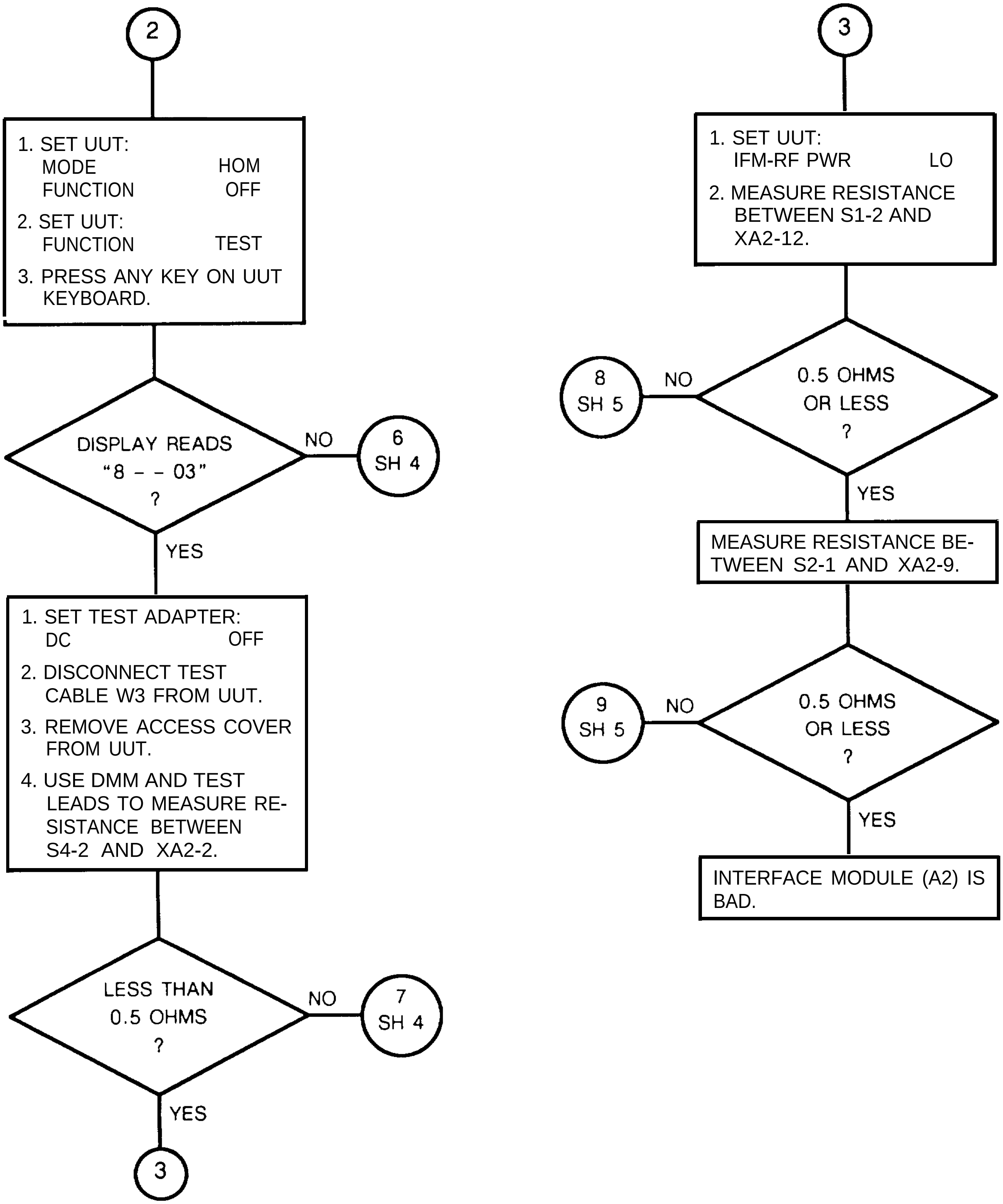
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2
Display Reads "FAIL8" (Sheet 1 of 5)



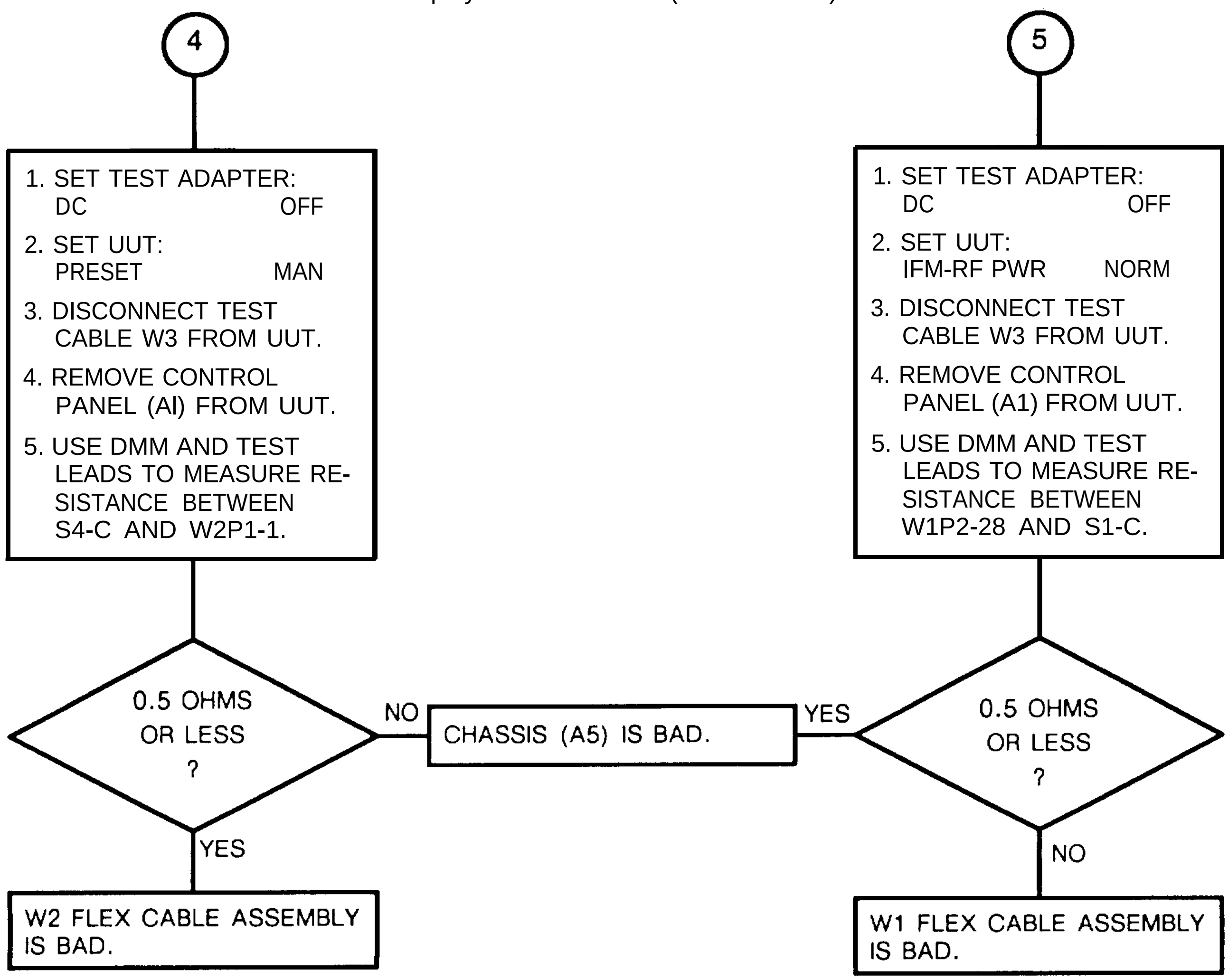
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2
Display Reads “FAIL8” (Sheet 2 of 5)



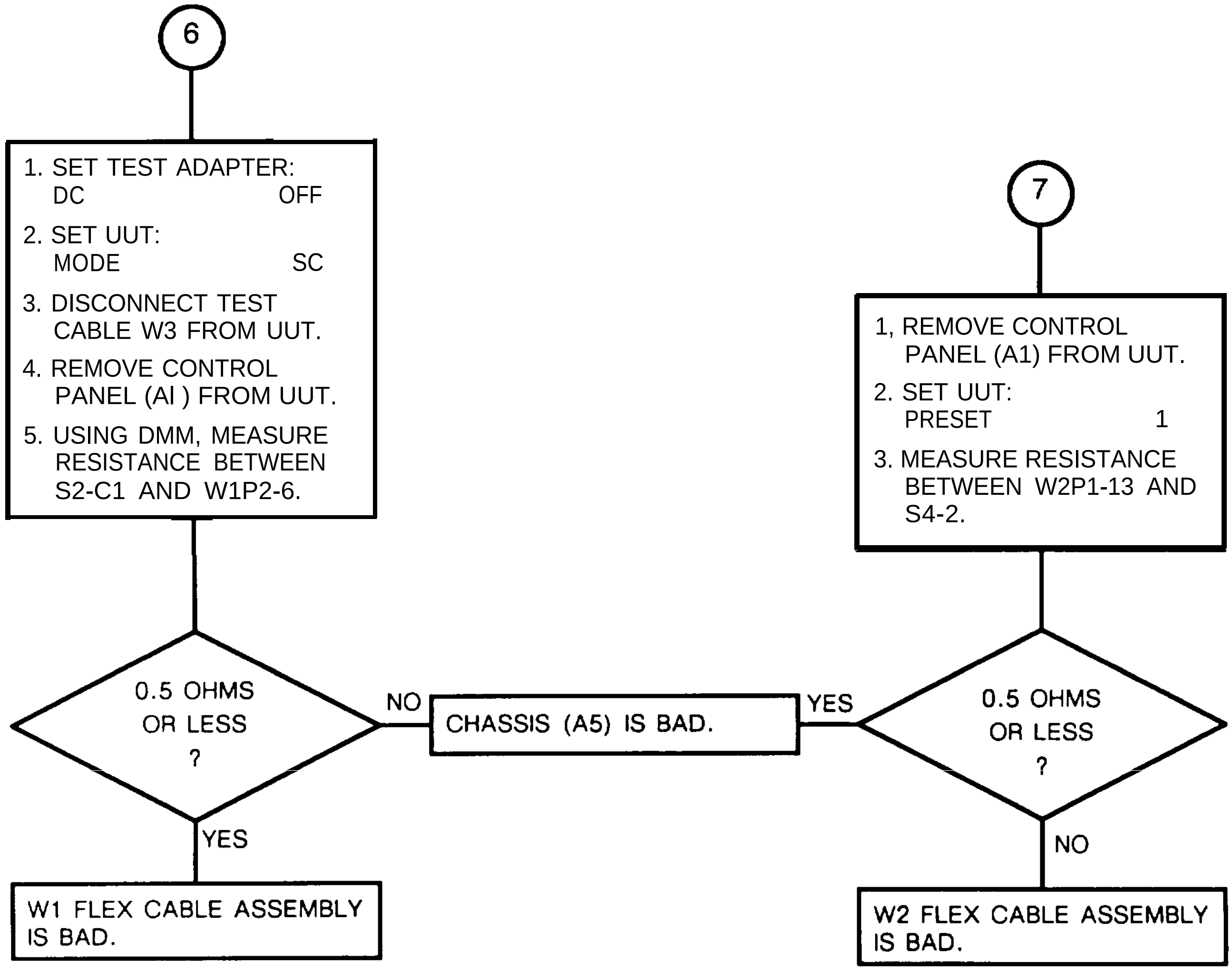
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2
Display Reads “FAIL8” (Sheet 3 of 5)



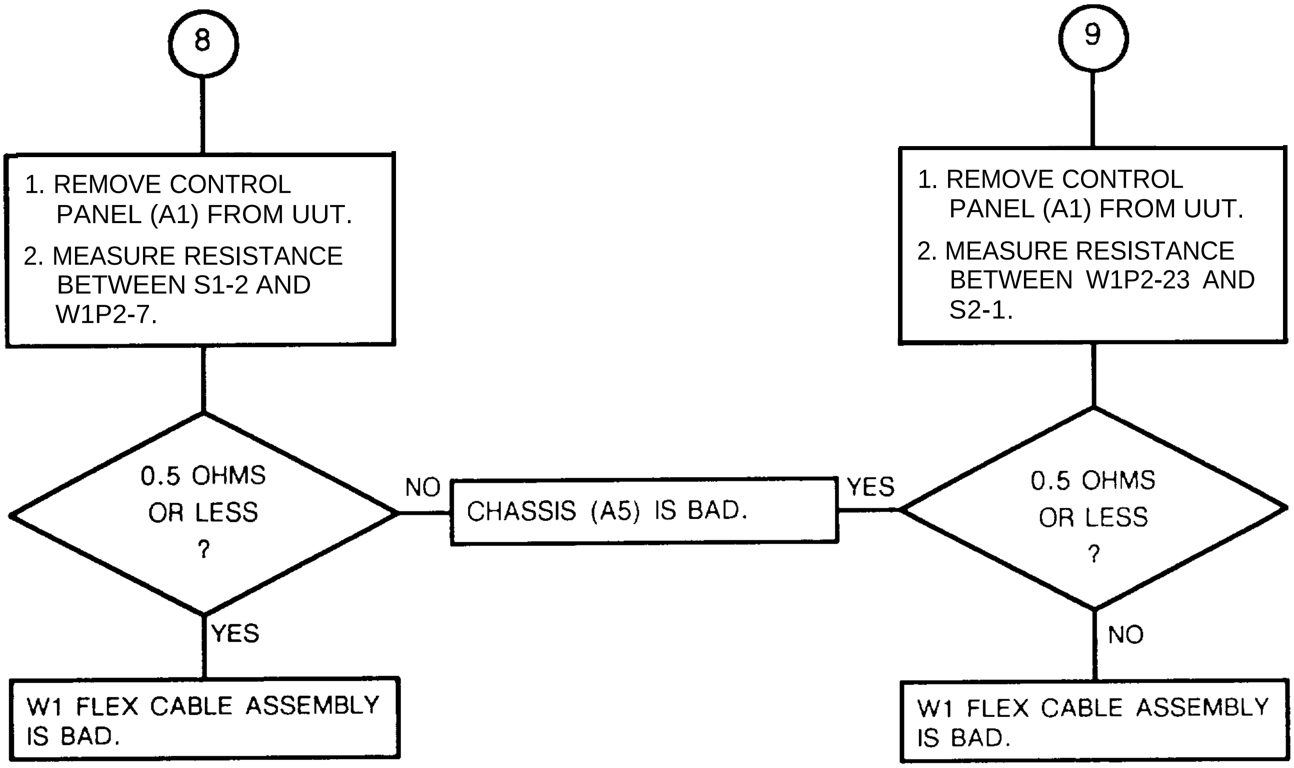
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2
Display Reads "FAIL8" (Sheet 4 of 5)



3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2
Display Reads "FAIL8" (Sheet 5 of 5)



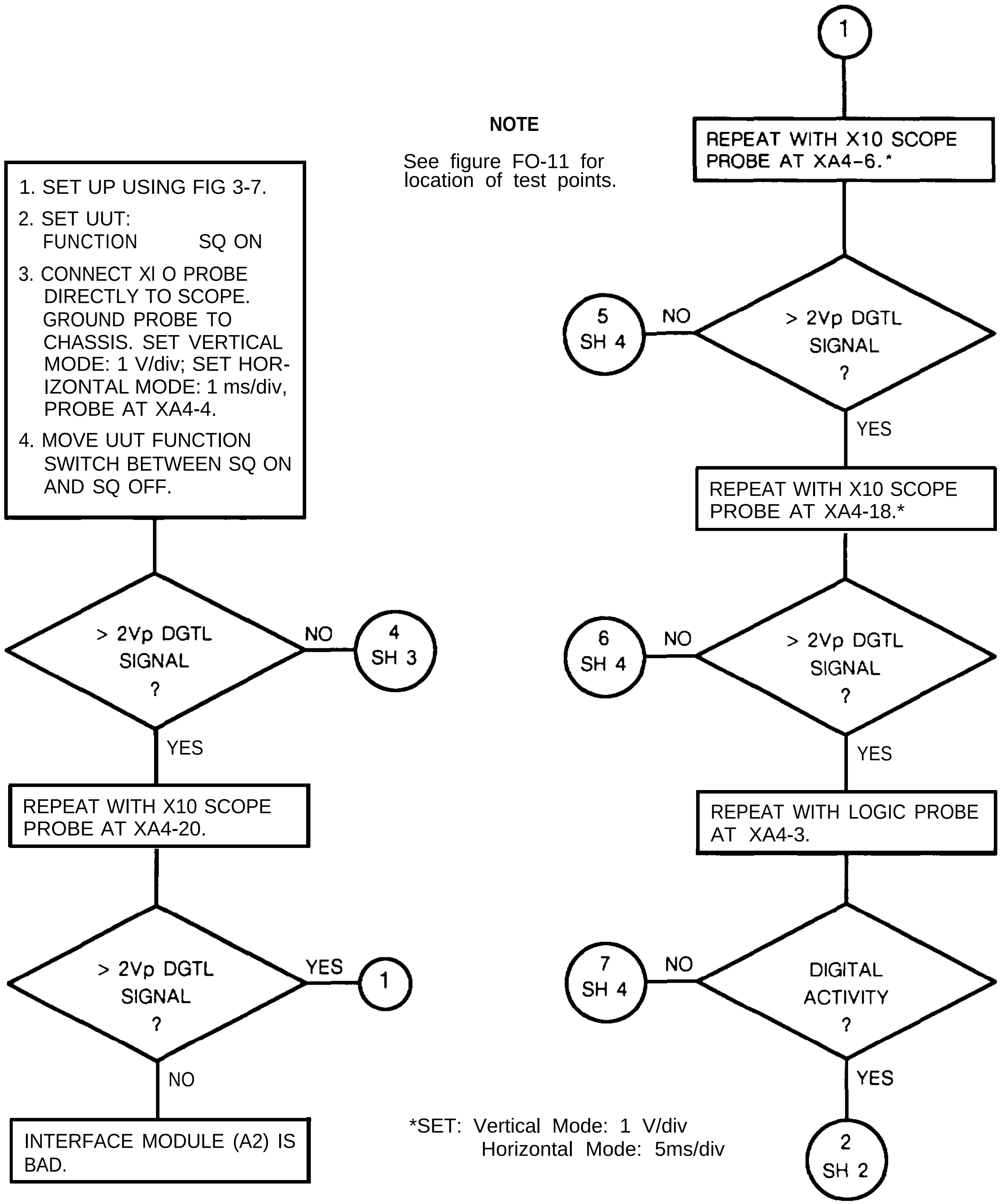
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 3

Display Reads Continuous Dashes or “FAIL7” (Sheet 1 of 7)

NOTE

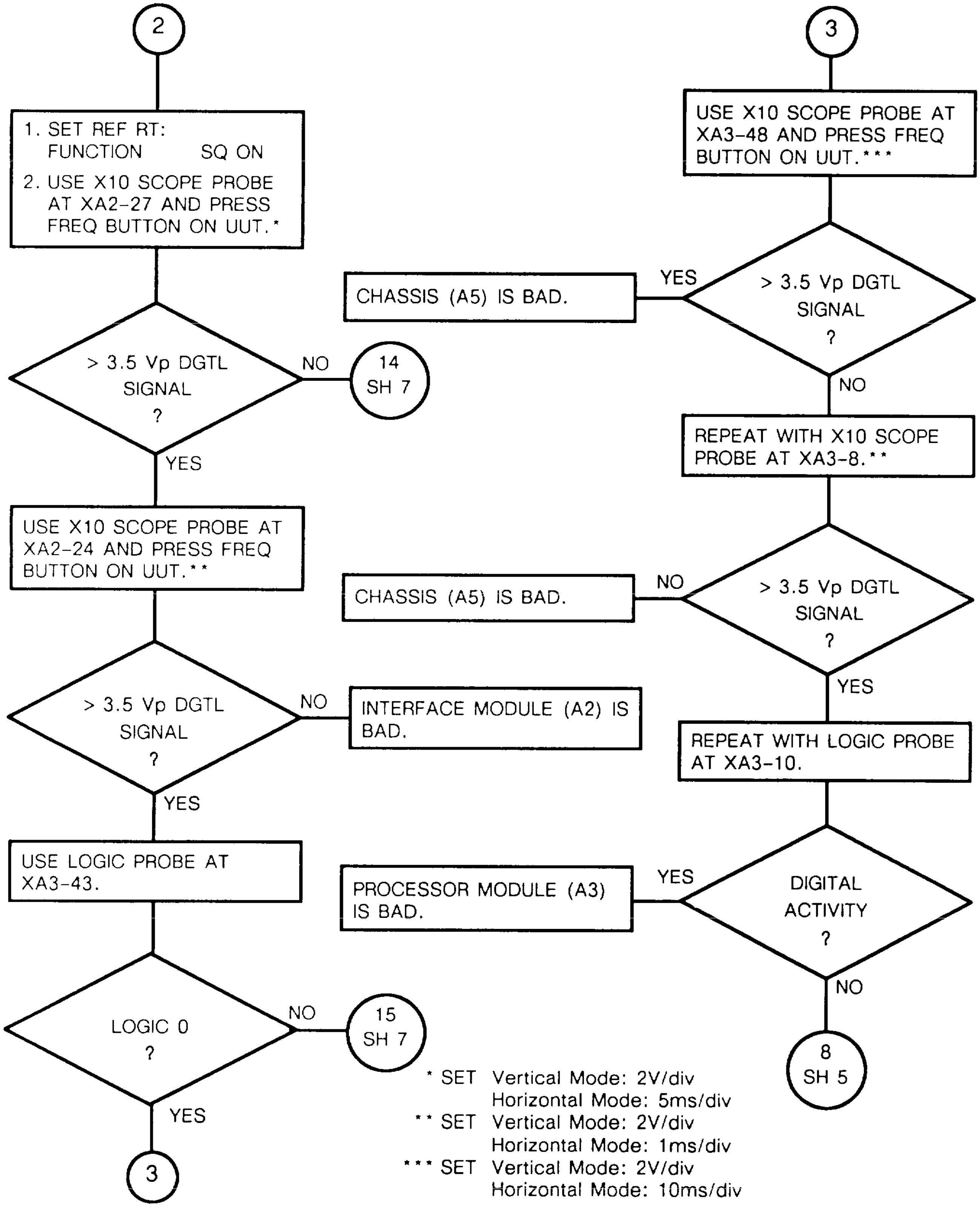
See figure FO-11 for location of test points.



*SET: Vertical Mode: 1 V/div
Horizontal Mode: 5ms/div

3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 3
Display Reads Continuous Dashes or "FAIL7" (Sheet 2 of 7)



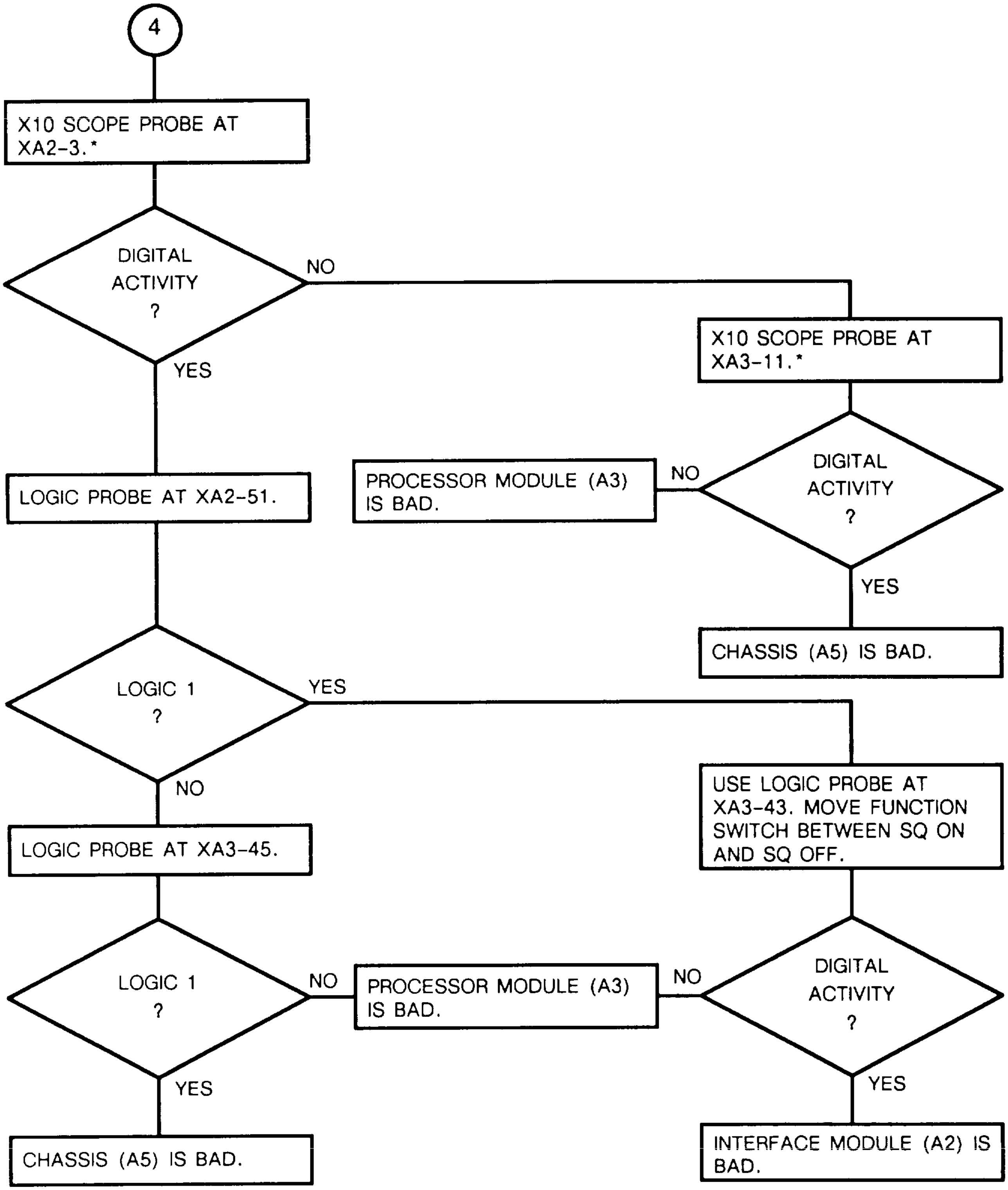
* SET Vertical Mode: 2V/div
Horizontal Mode: 5ms/div

** SET Vertical Mode: 2V/div
Horizontal Mode: 1ms/div

*** SET Vertical Mode: 2V/div
Horizontal Mode: 10ms/div

3-10. TROUBLESHOOTING FLOWCHARTS. Continued

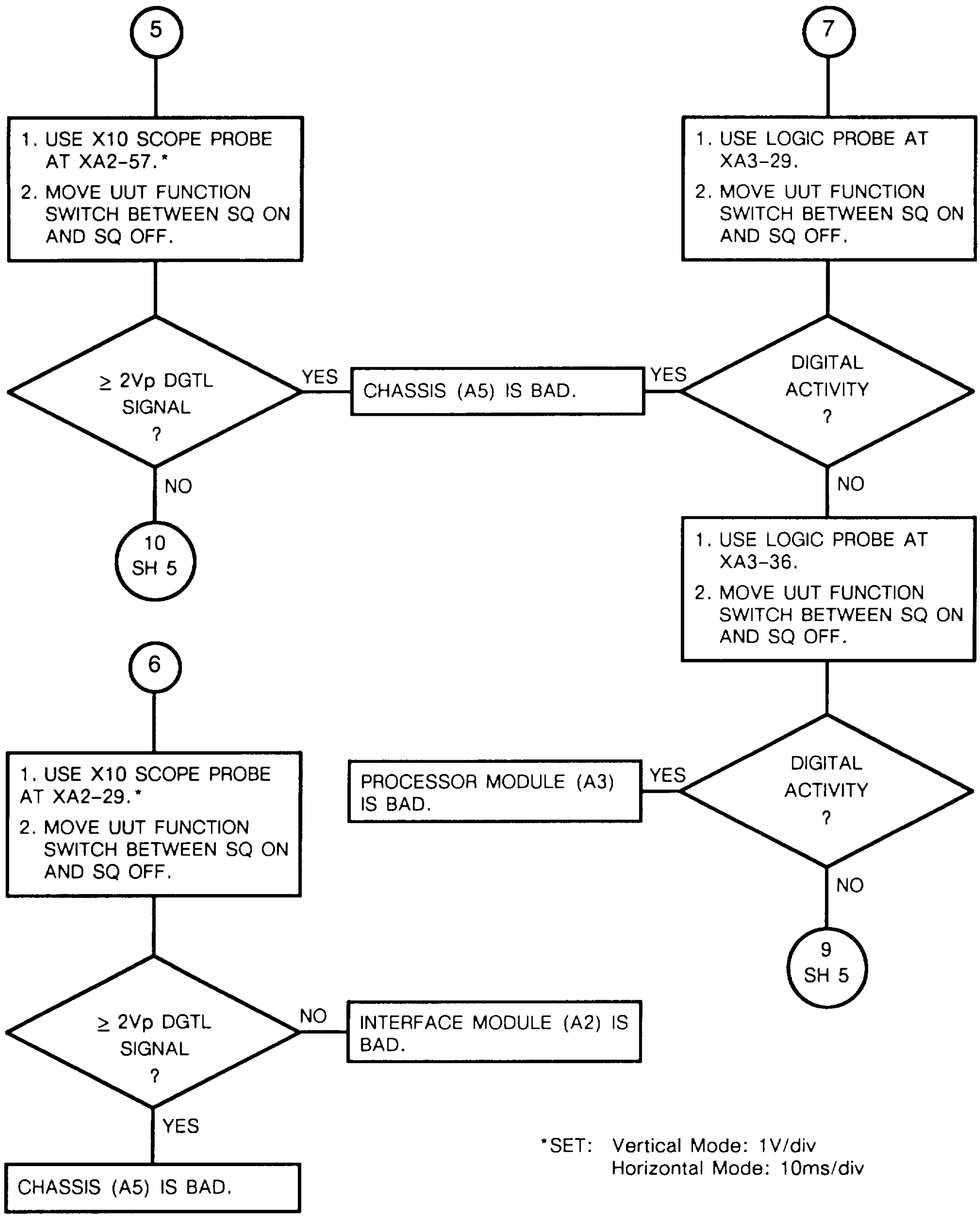
CHART 3
Display Reads Continuous Dashes or “FAIL7” (Sheet 3 of 7)



*SET: Vertical Mode: 2V/div
Horizontal Mode: 1µs/div

3-10. TROUBLESHOOTING FLOWCHARTS. Continued

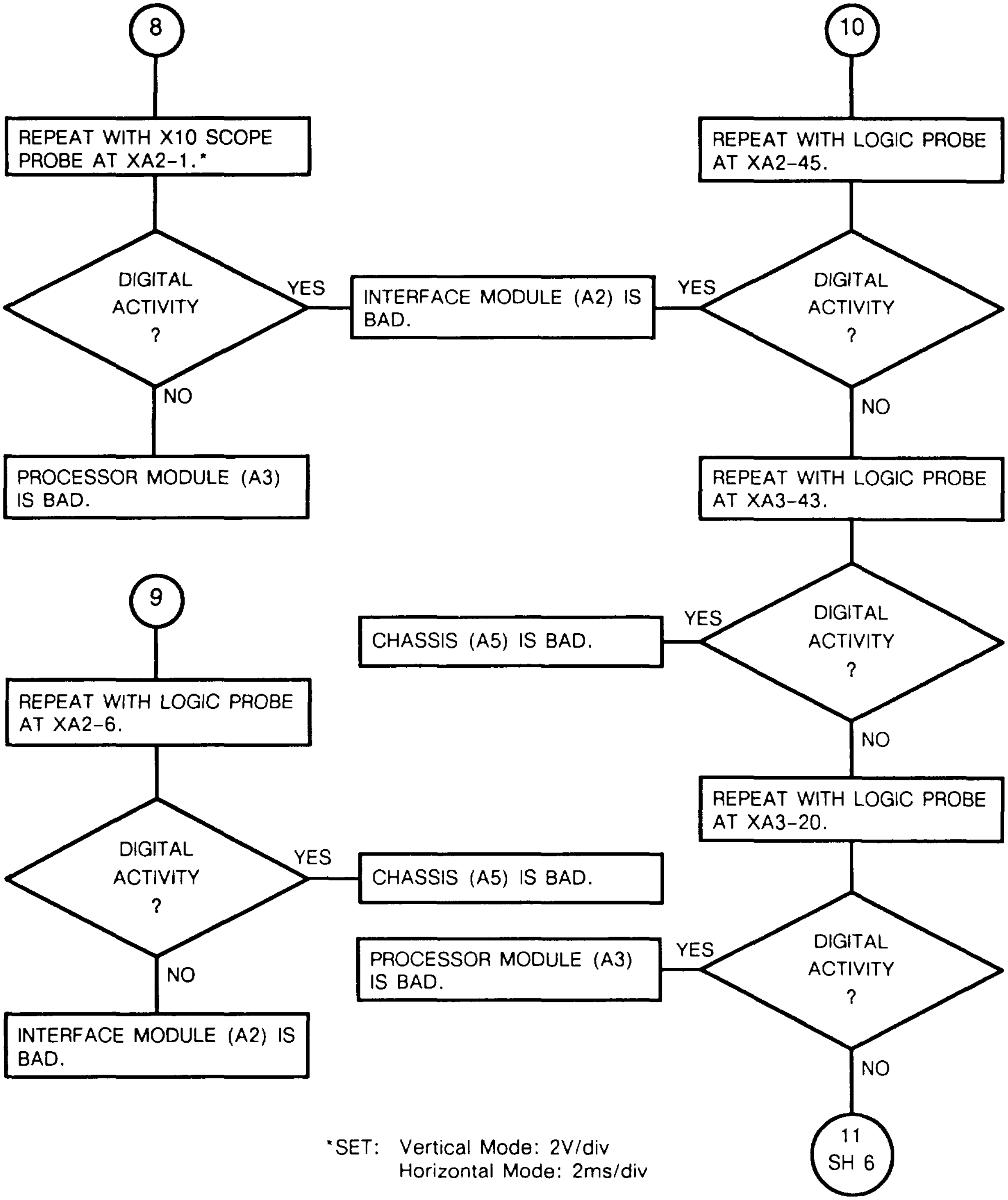
CHART 3
Display Reads Continuous Dashes or "FAIL7" (Sheet 4 of 7)



*SET: Vertical Mode: 1V/div
Horizontal Mode: 10ms/div

3-10. TROUBLESHOOTING FLOWCHARTS. Continued

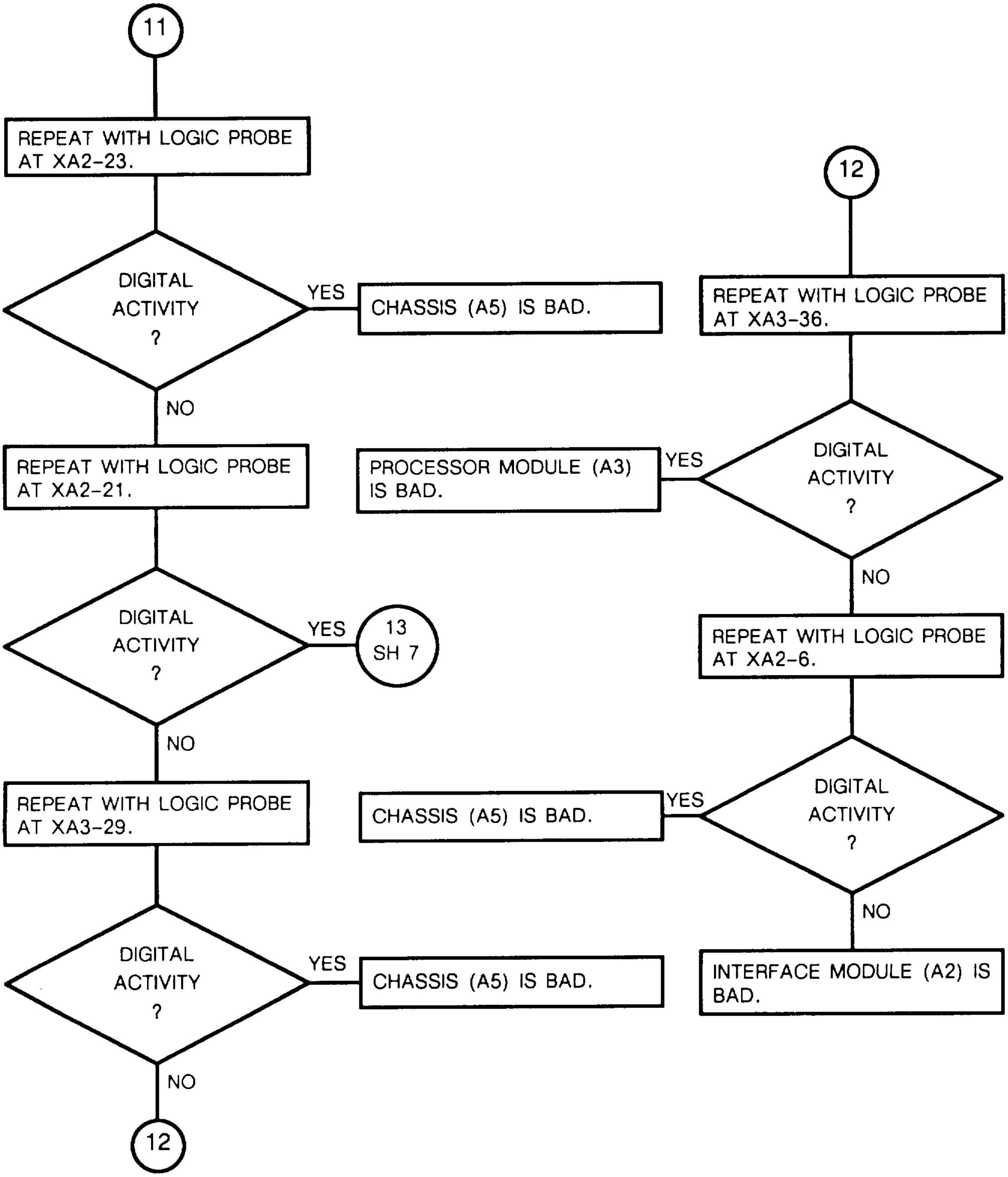
CHART 3
Display Reads Continuous Dashes or " FAIL7" (Sheet 5 of 7)



*SET: Vertical Mode: 2V/div
Horizontal Mode: 2ms/div

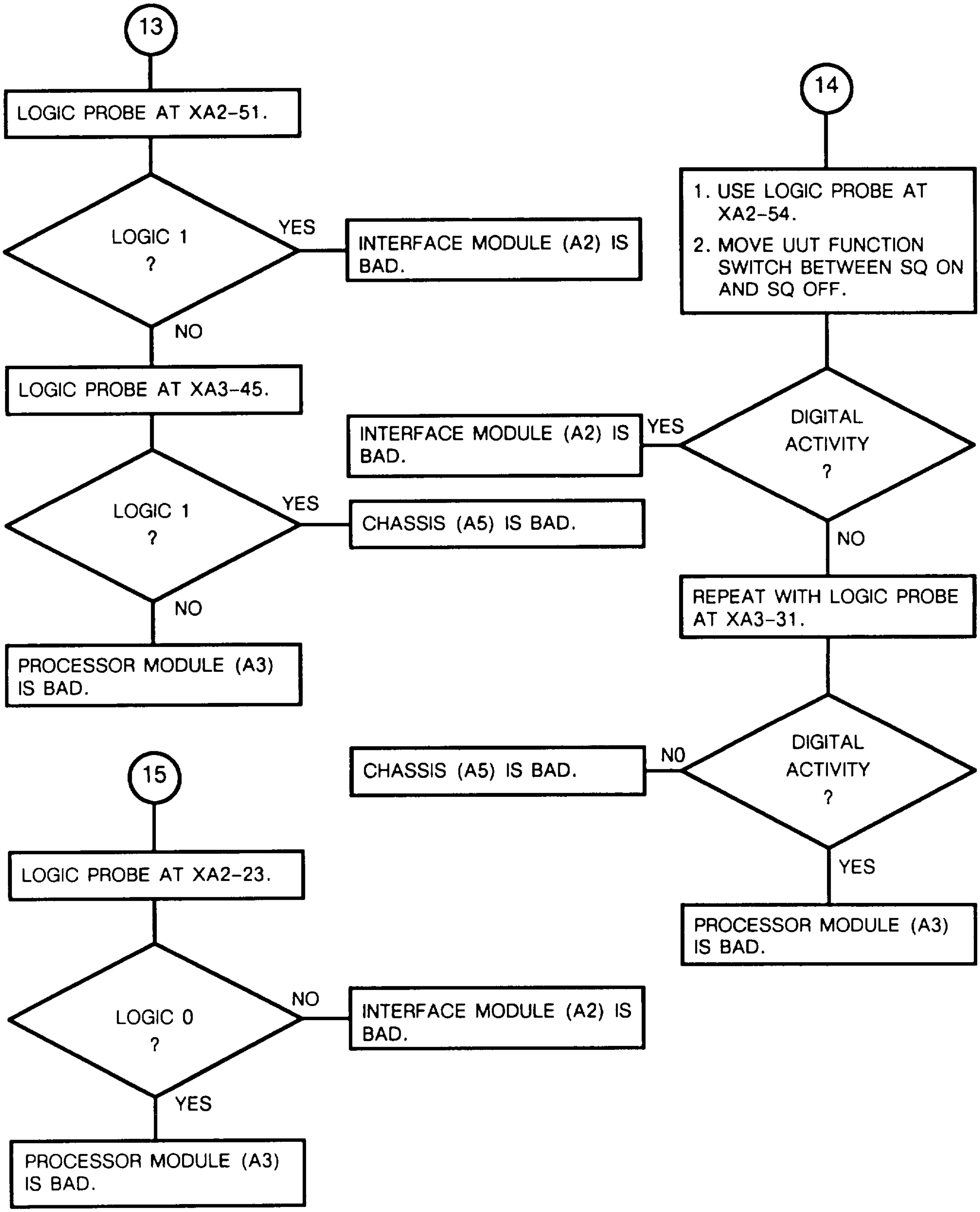
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 3
Display Reads Continuous Dashes or "FAIL7" (Sheet 6 of 7)



3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 3
Display Reads Continuous Dashes or "FAIL7" (Sheet 7 of 7)

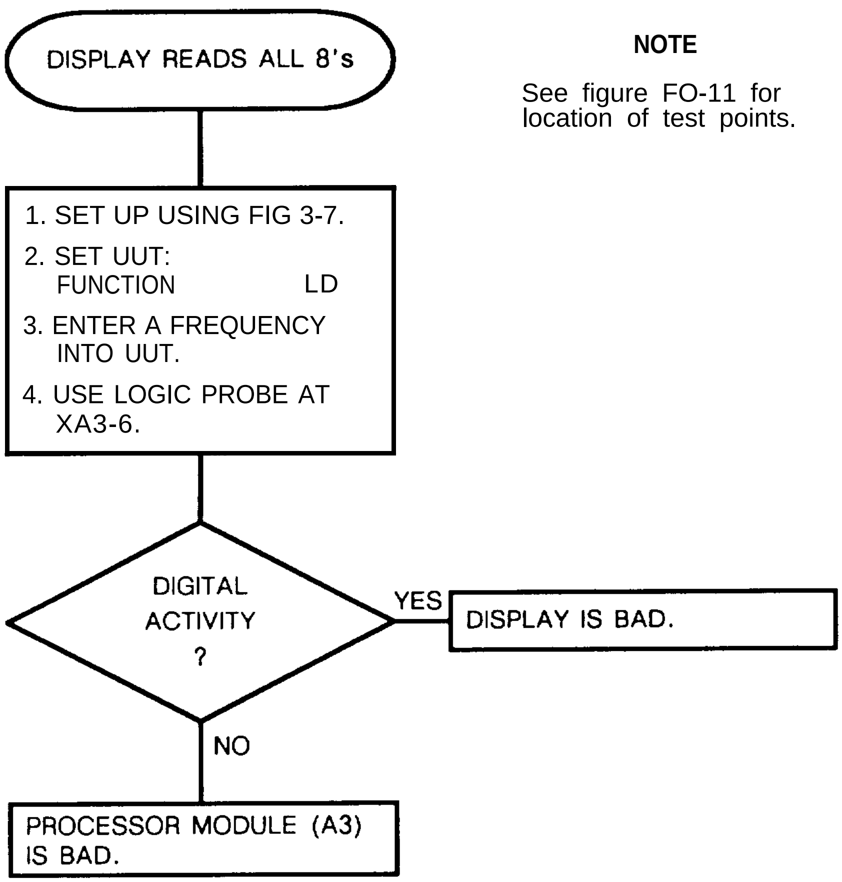


3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 4
Display Reads all 8's

NOTE

See figure FO-11 for location of test points.

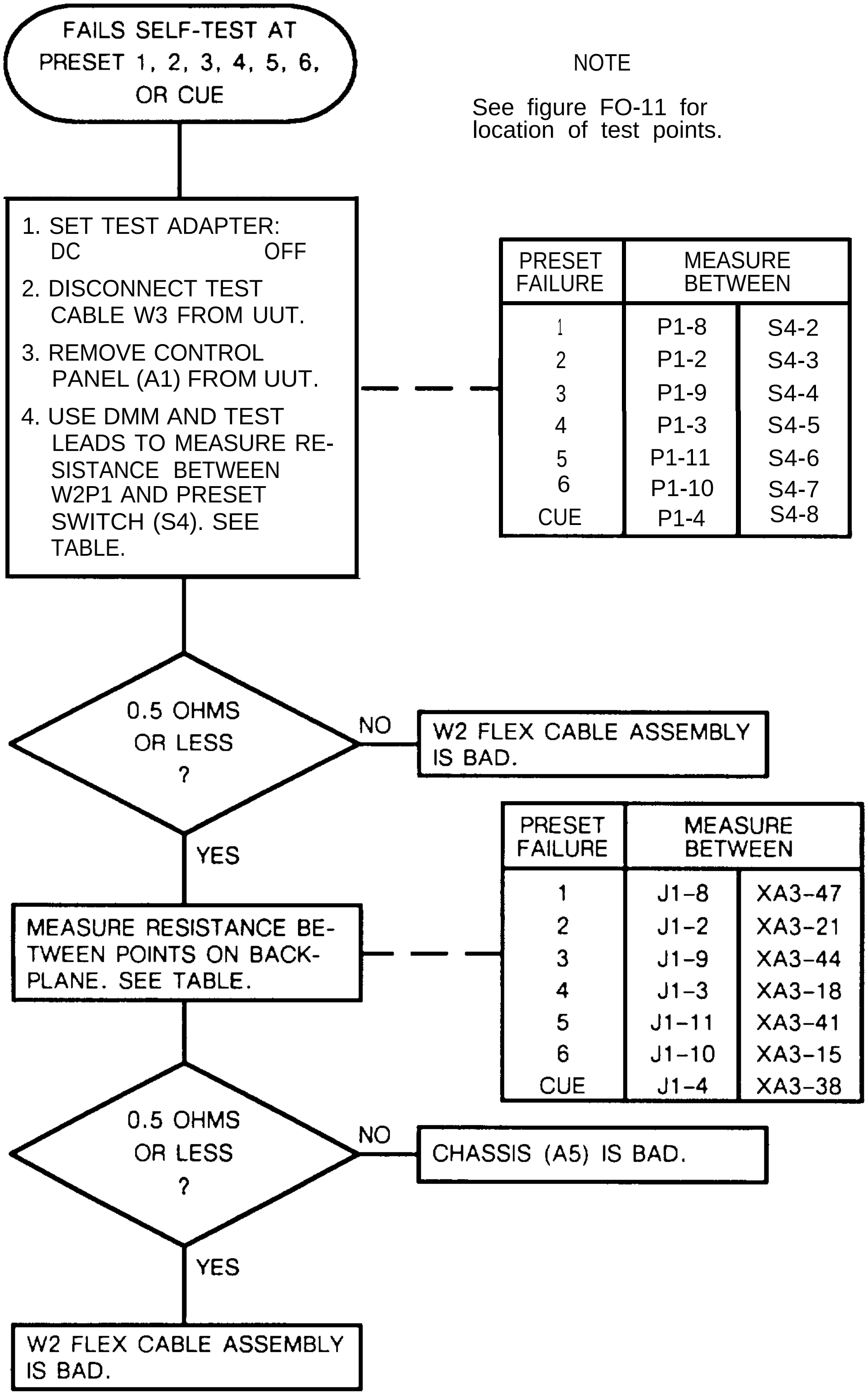


3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 5
Fails Self-Test at Preset 1, 2, 3, 4, 5, 6, or CUE

NOTE

See figure FO-11 for location of test points.



PRESET FAILURE	MEASURE BETWEEN	
1	P1-8	S4-2
2	P1-2	S4-3
3	P1-9	S4-4
4	P1-3	S4-5
5	P1-11	S4-6
6	P1-10	S4-7
CUE	P1-4	S4-8

PRESET FAILURE	MEASURE BETWEEN	
1	J1-8	XA3-47
2	J1-2	XA3-21
3	J1-9	XA3-44
4	J1-3	XA3-18
5	J1-11	XA3-41
6	J1-10	XA3-15
CUE	J1-4	XA3-38

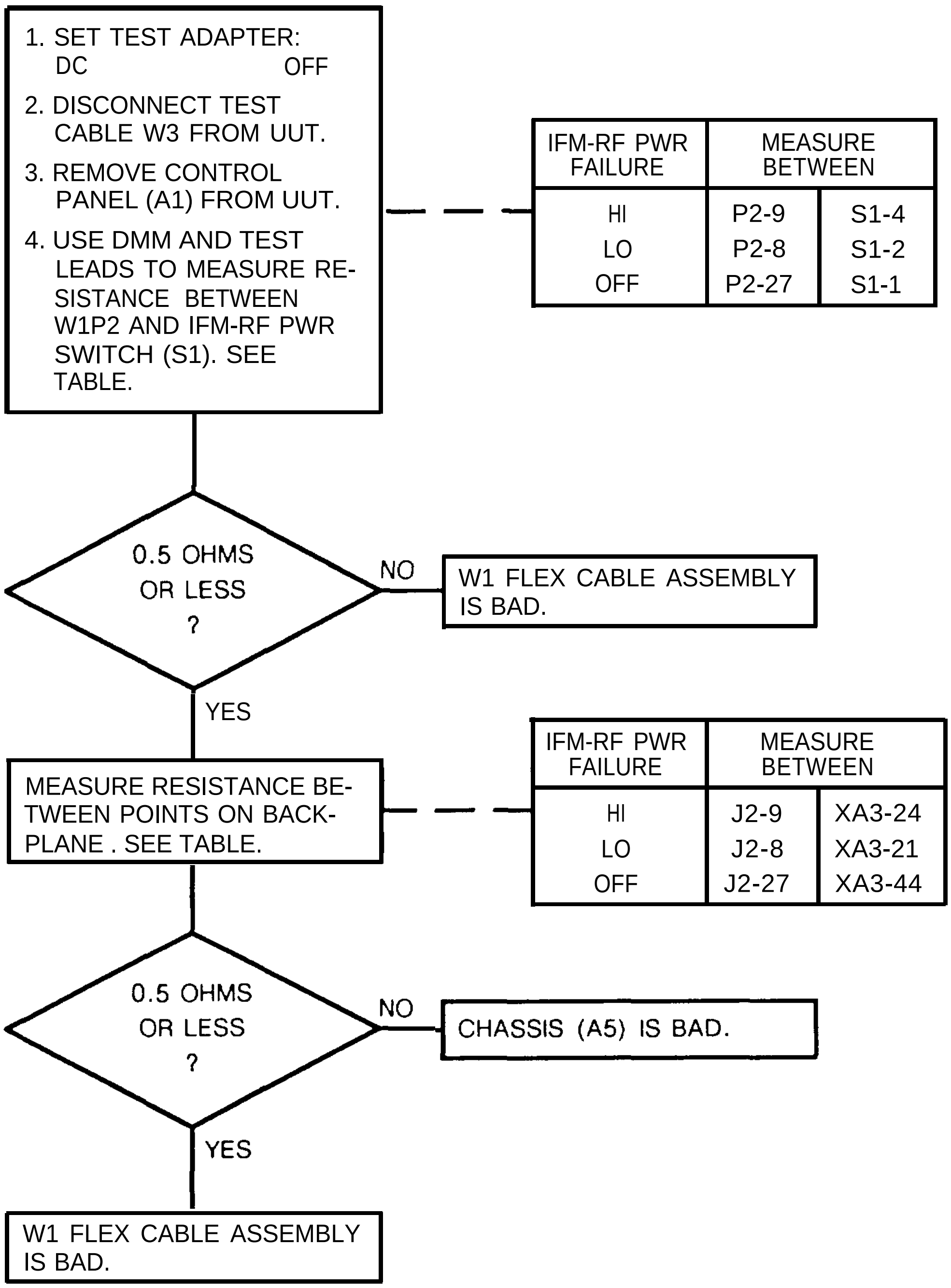
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 6

Fails Self-Test with IFM-RF PWR Switch at HI, LO, or OFF

NOTE

See figure FO-11 for location of test points.

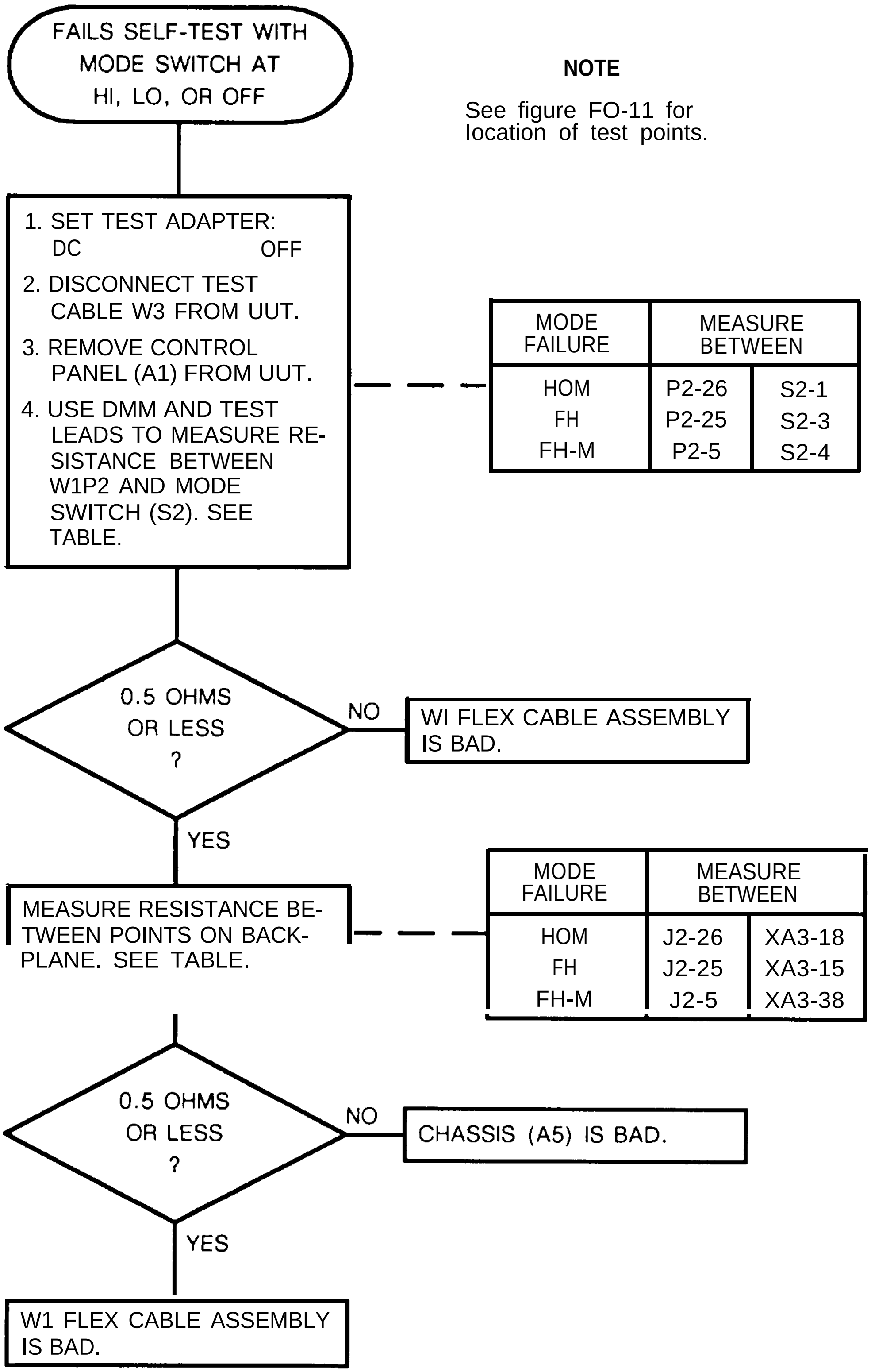


3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 7
Fails Self-Test with MODE Switch at HOM, FH, OR FH-M

NOTE

See figure FO-11 for location of test points.



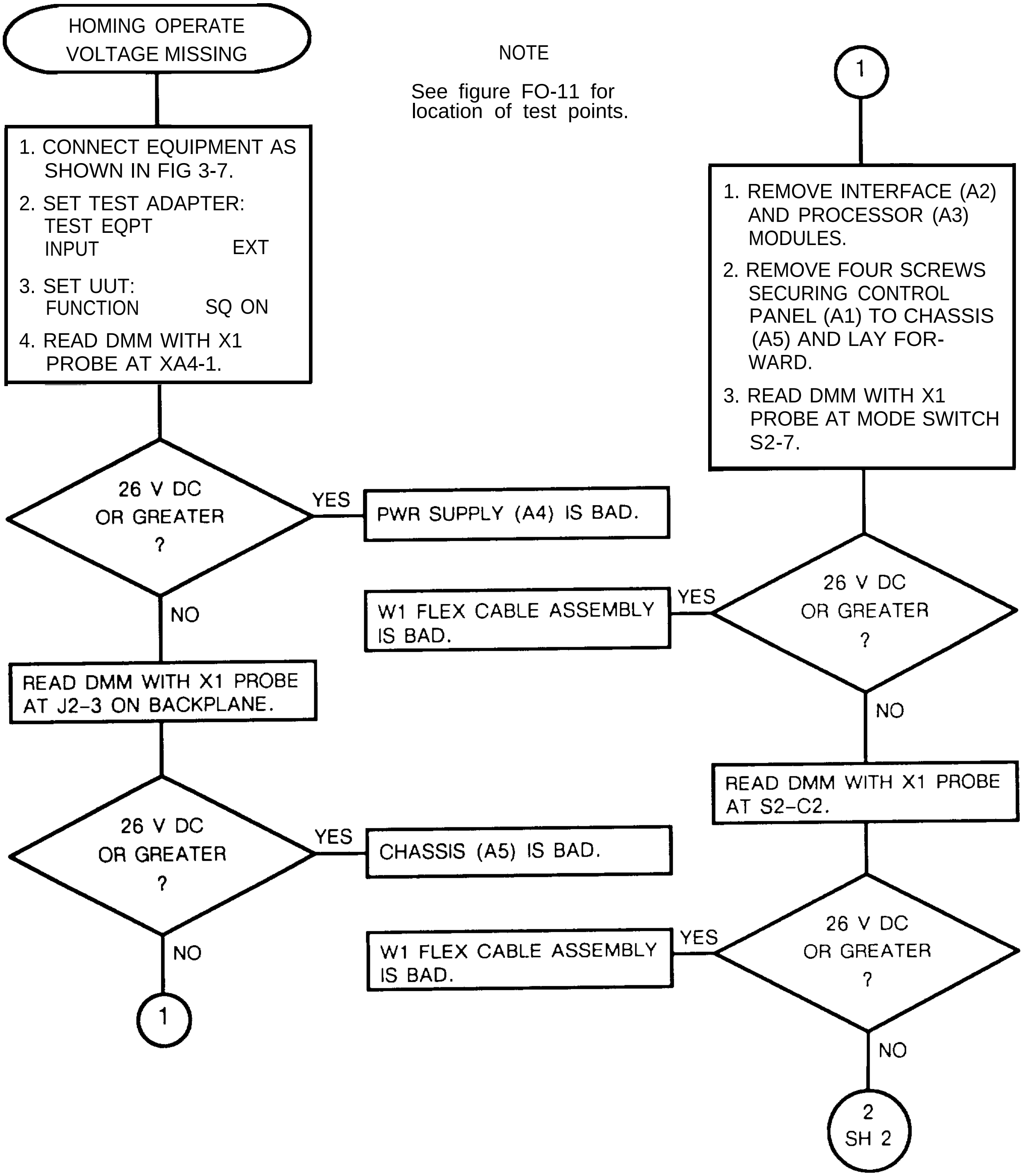
MODE FAILURE	MEASURE BETWEEN	
HOM	P2-26	S2-1
FH	P2-25	S2-3
FH-M	P2-5	S2-4

MODE FAILURE	MEASURE BETWEEN	
HOM	J2-26	XA3-18
FH	J2-25	XA3-15
FH-M	J2-5	XA3-38

3-10. TROUBLESHOOTING FLOWCHARTS. Continued

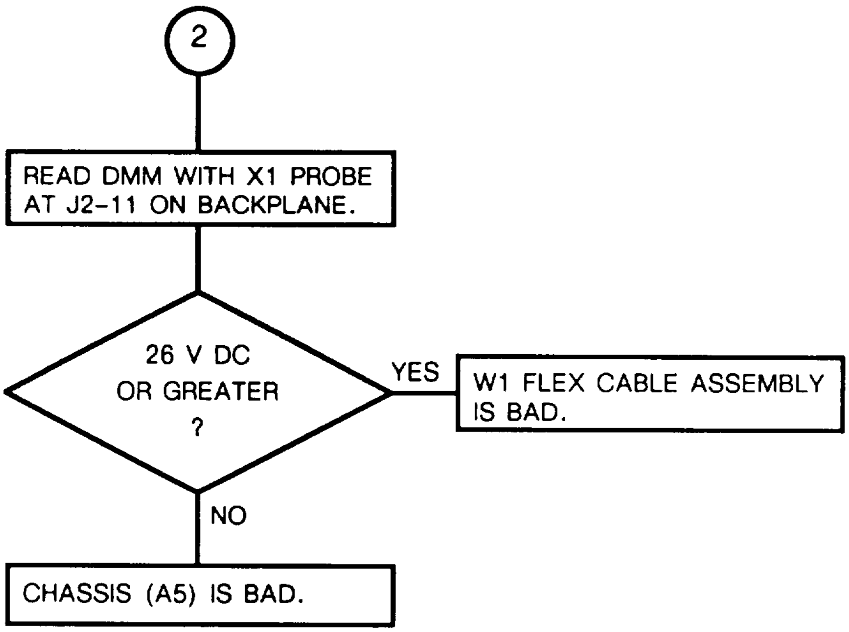
CHART 8

Homing Operate Voltage Missing (Sheet 1 of 2)



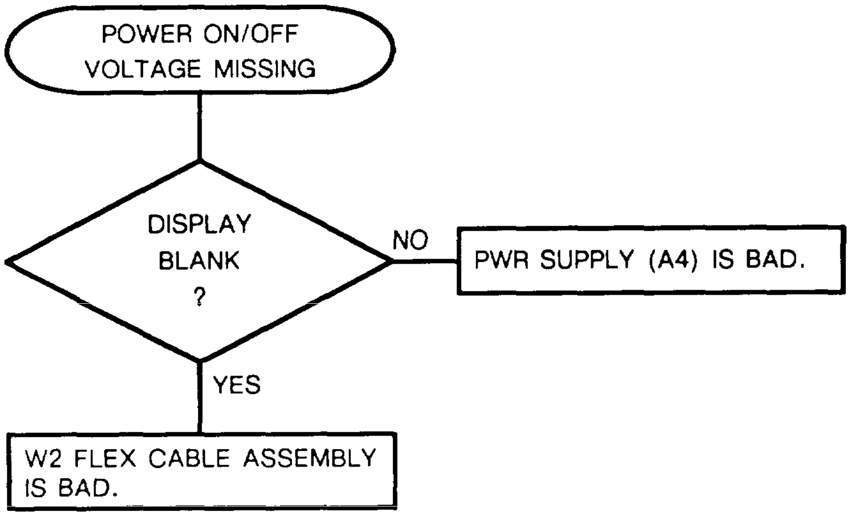
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 8
Homing Operate Voltage Missing (Sheet 2 of 2)



3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 9
Power ON/OFF Voltage Missing

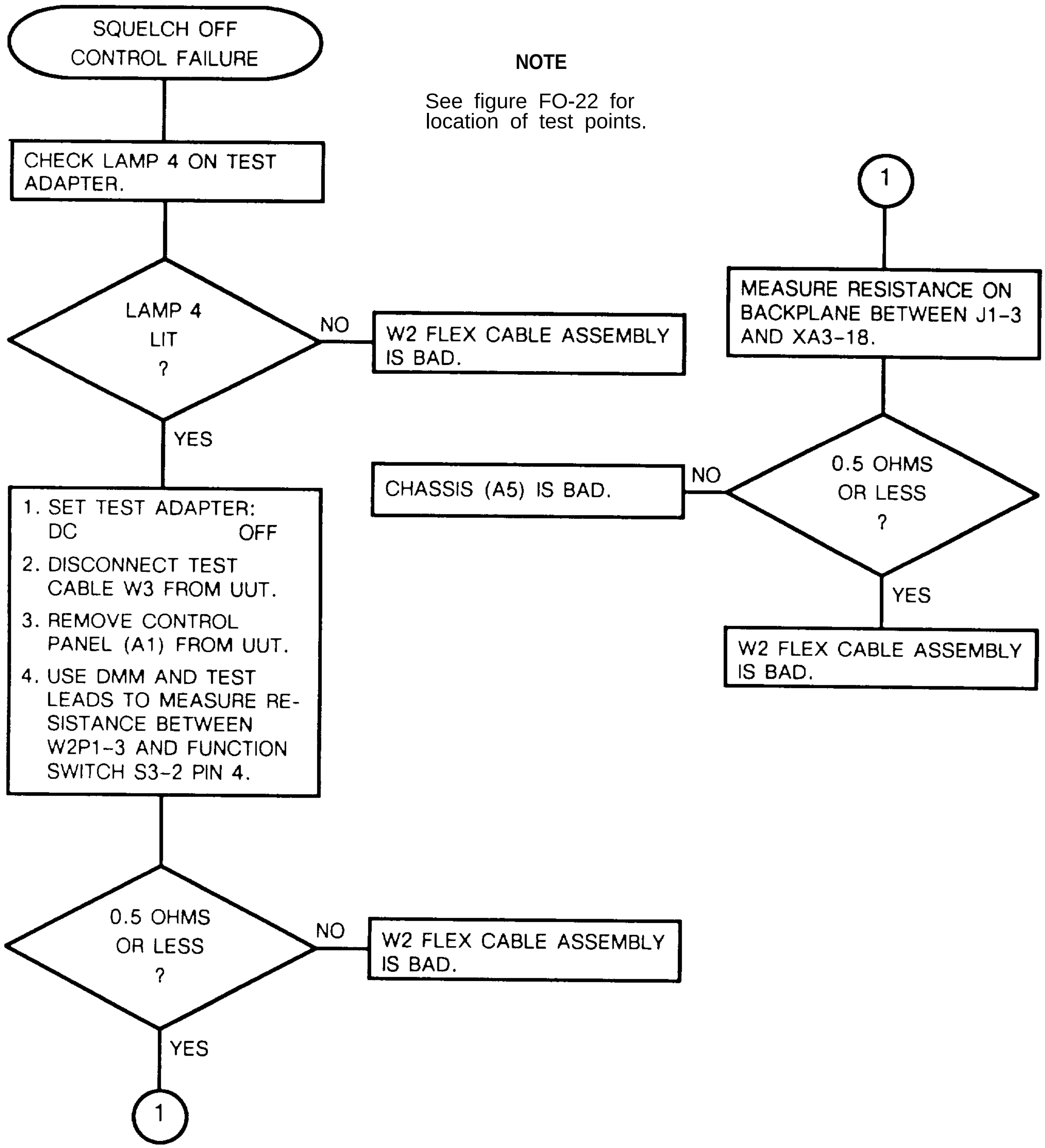


3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 10
Squelch Off Control Failure

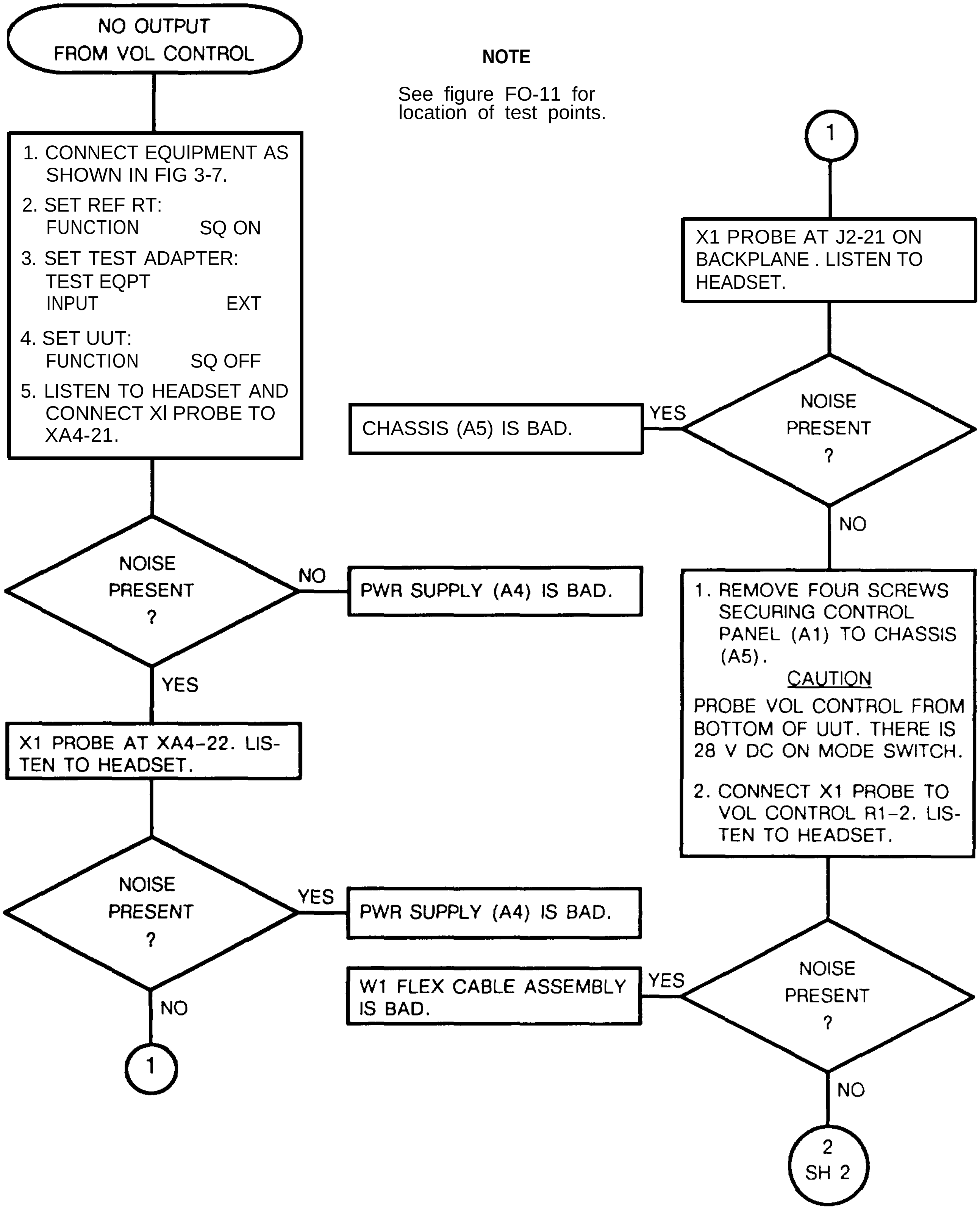
NOTE

See figure FO-22 for location of test points.



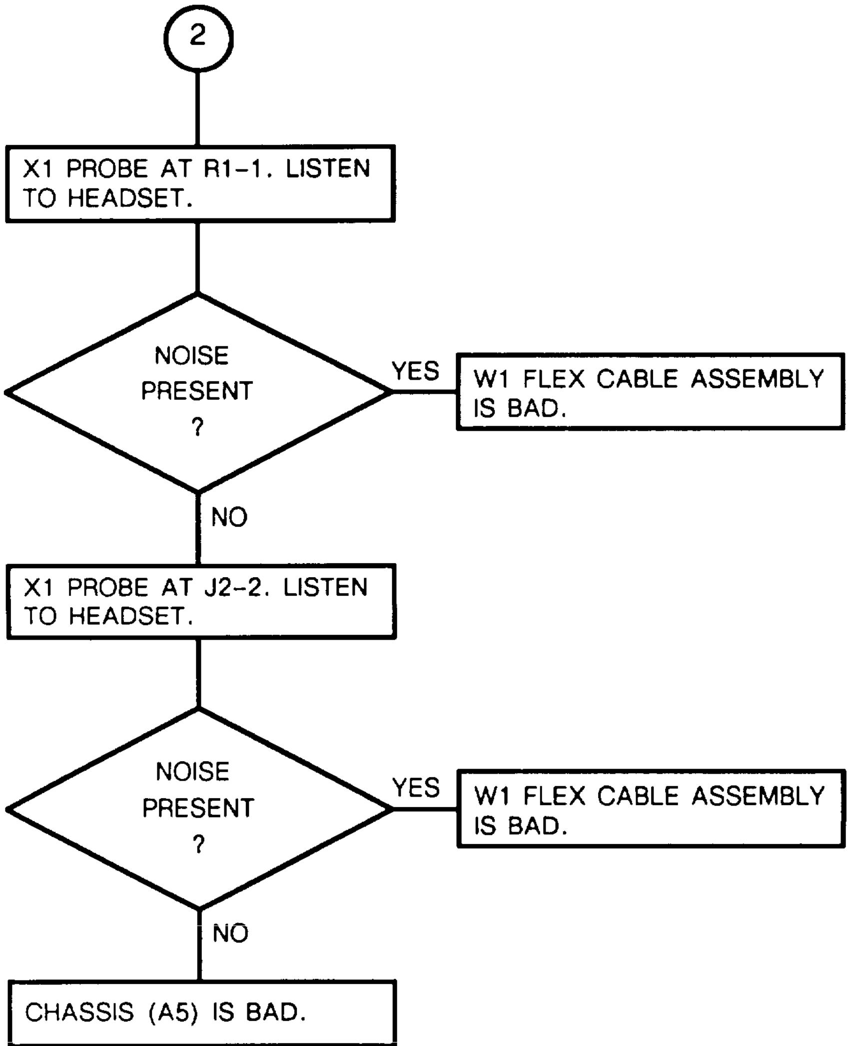
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 11
No Output from VOL Control (Sheet 1 of 2)



3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 11
No Output from VOL Control (Sheet 2 of 2)



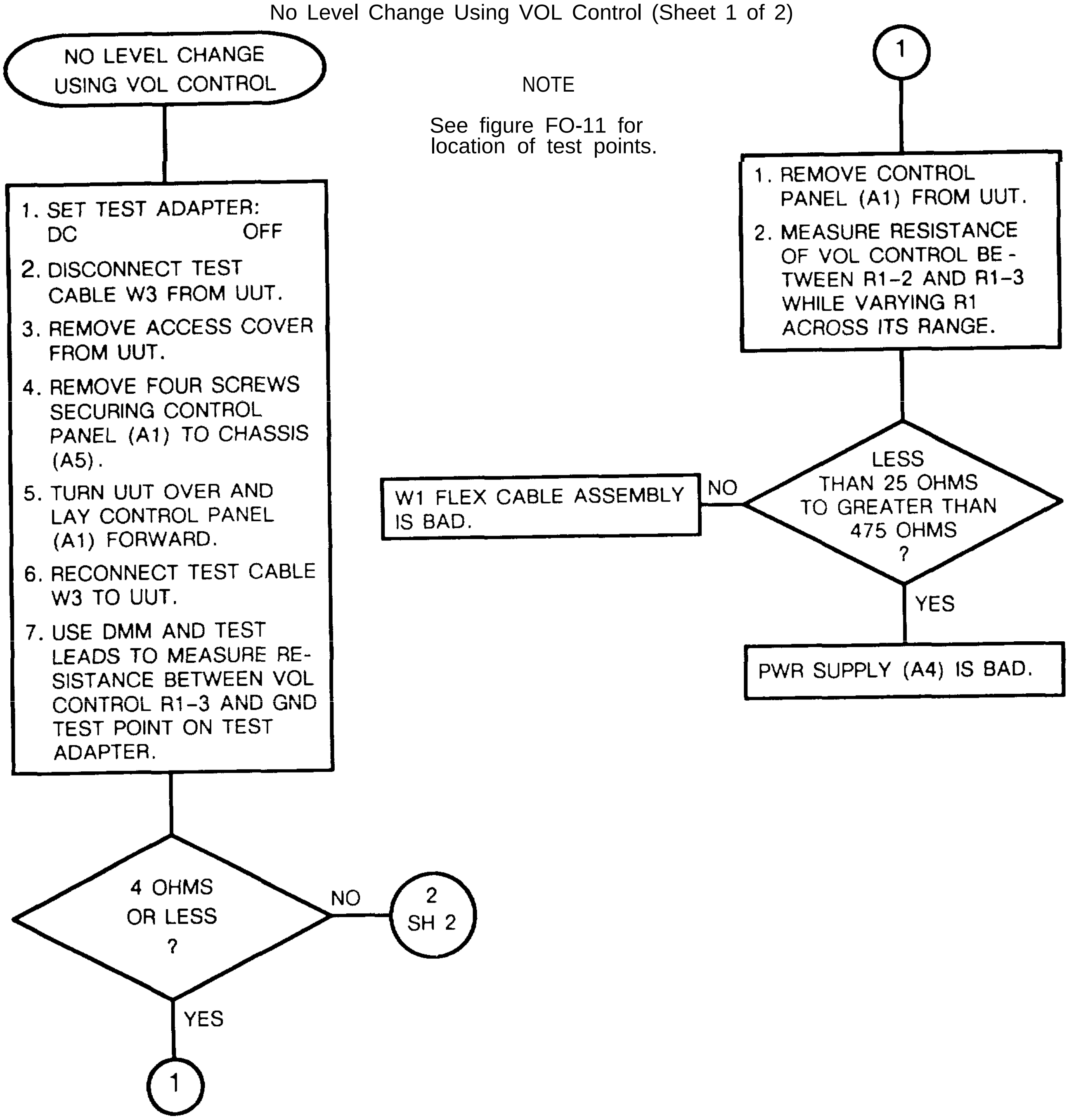
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 12

No Level Change Using VOL Control (Sheet 1 of 2)

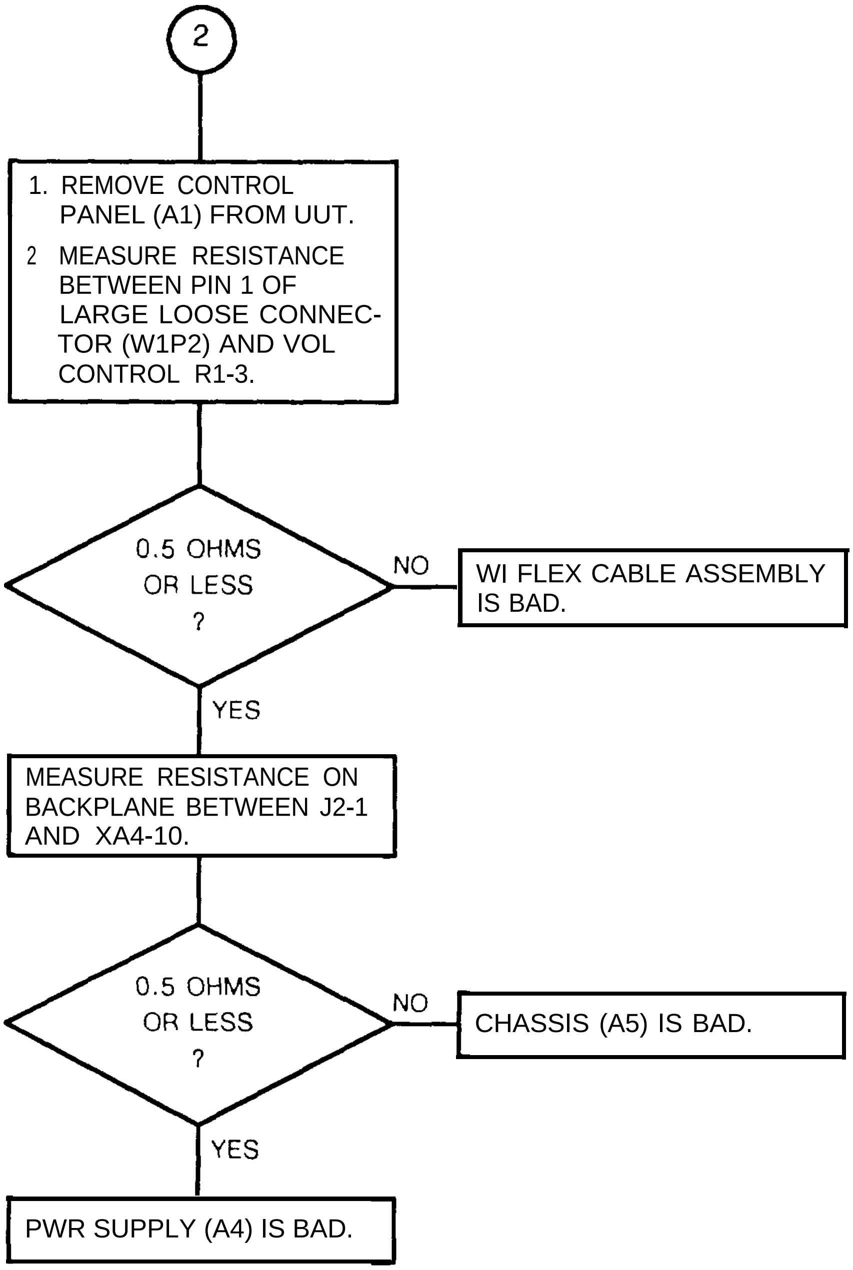
NOTE

See figure FO-11 for location of test points.



3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 12
No Output from VOL Control (Sheet 2 of 2)

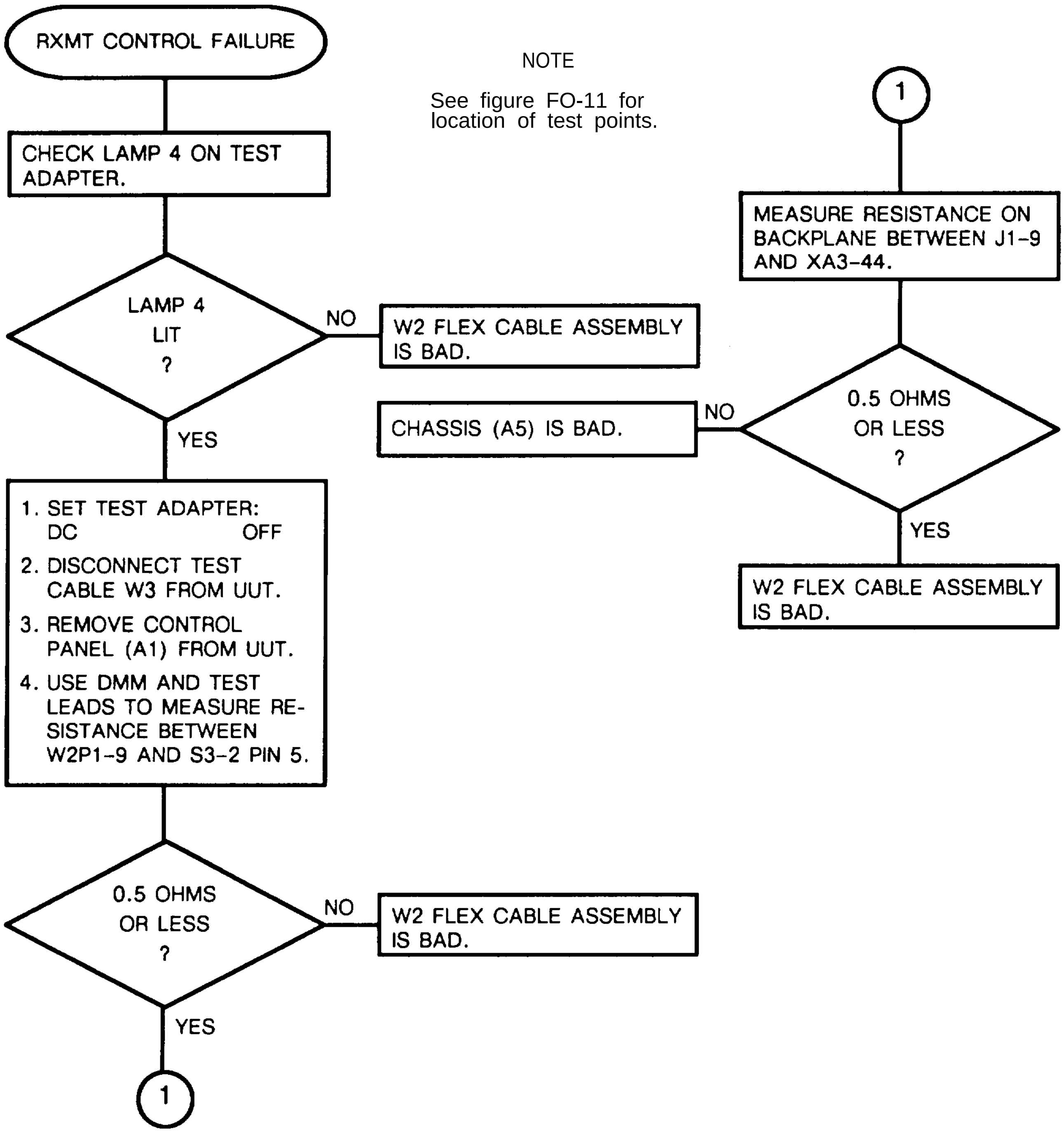


3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 13
RXMT Control Failure

NOTE

See figure FO-11 for location of test points.

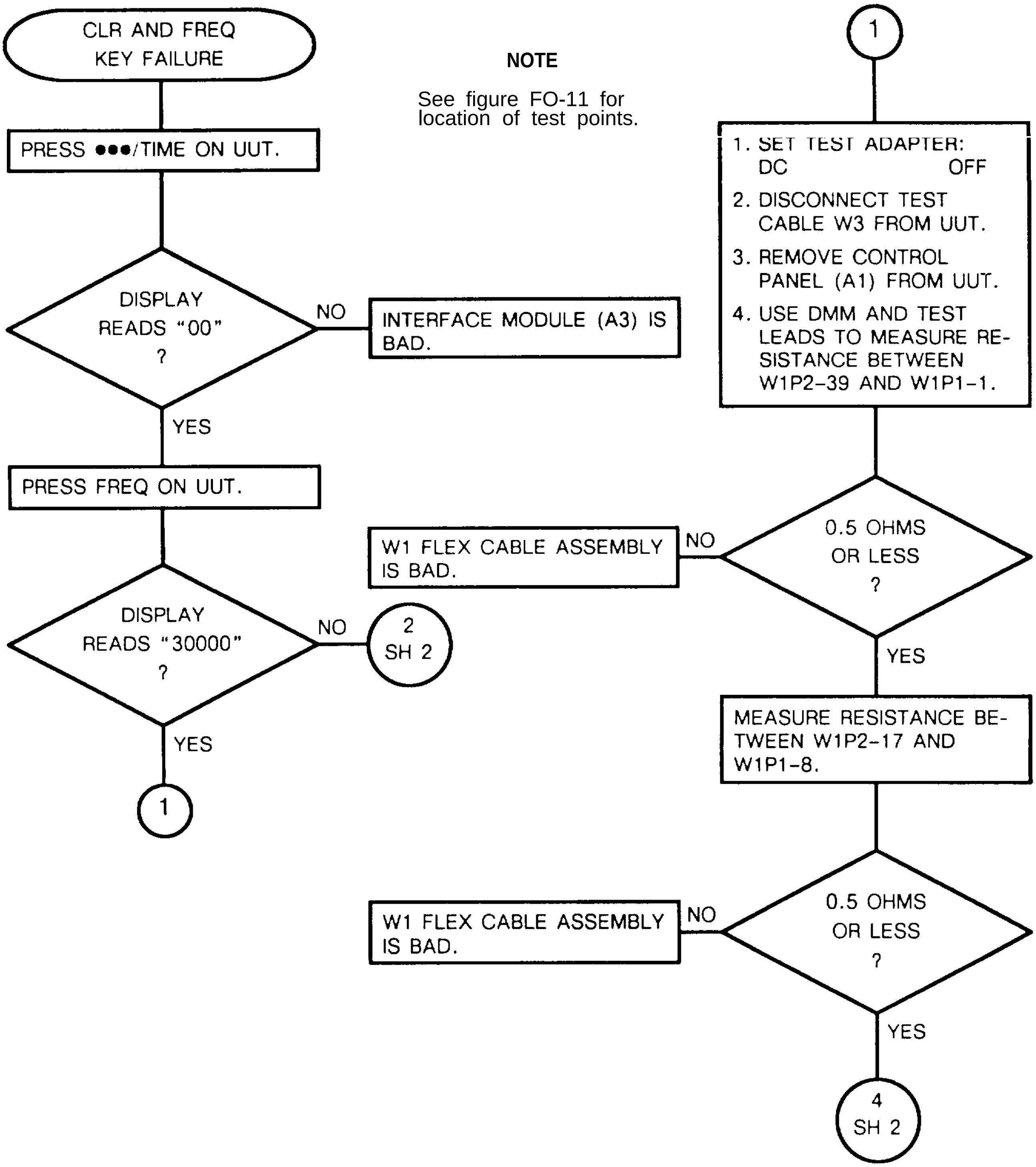


3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 14
CLR and FREQ Key Failure (Sheet 1 of 2)

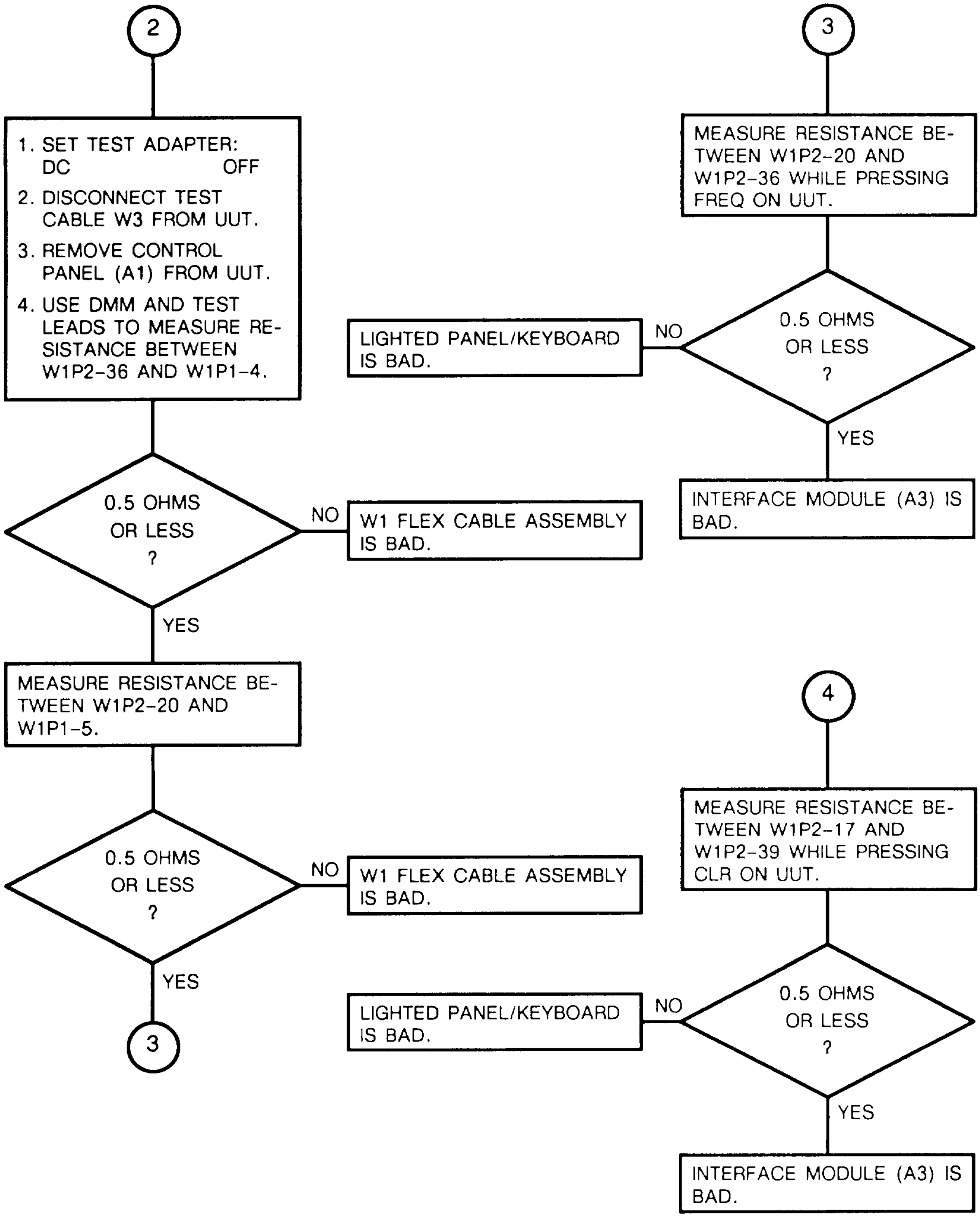
NOTE

See figure FO-11 for location of test points.



3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 14
CLR and FREQ Key Failure (Sheet 2 of 2)

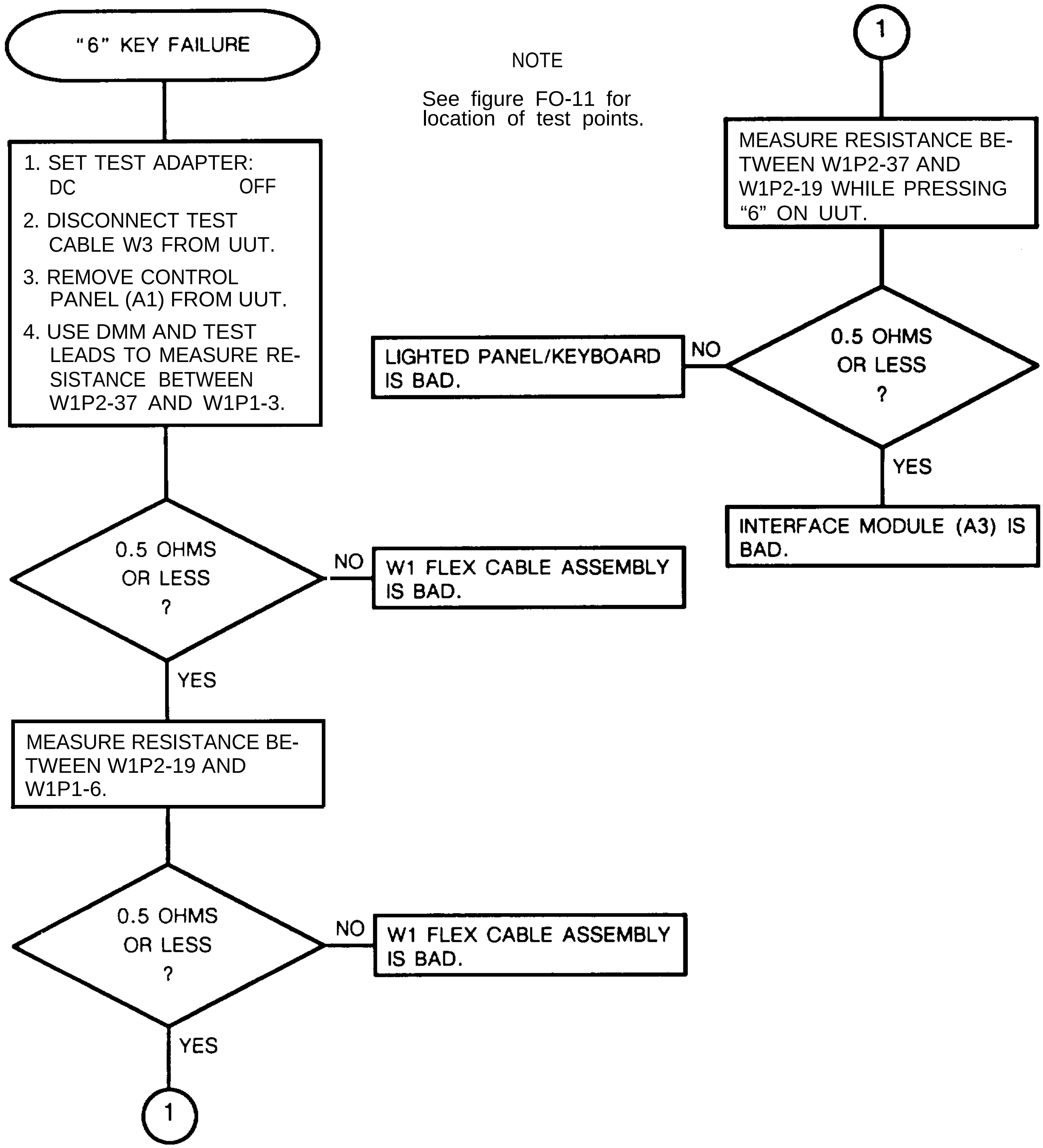


3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 15
"6" Key Failure

NOTE

See figure FO-11 for location of test points.

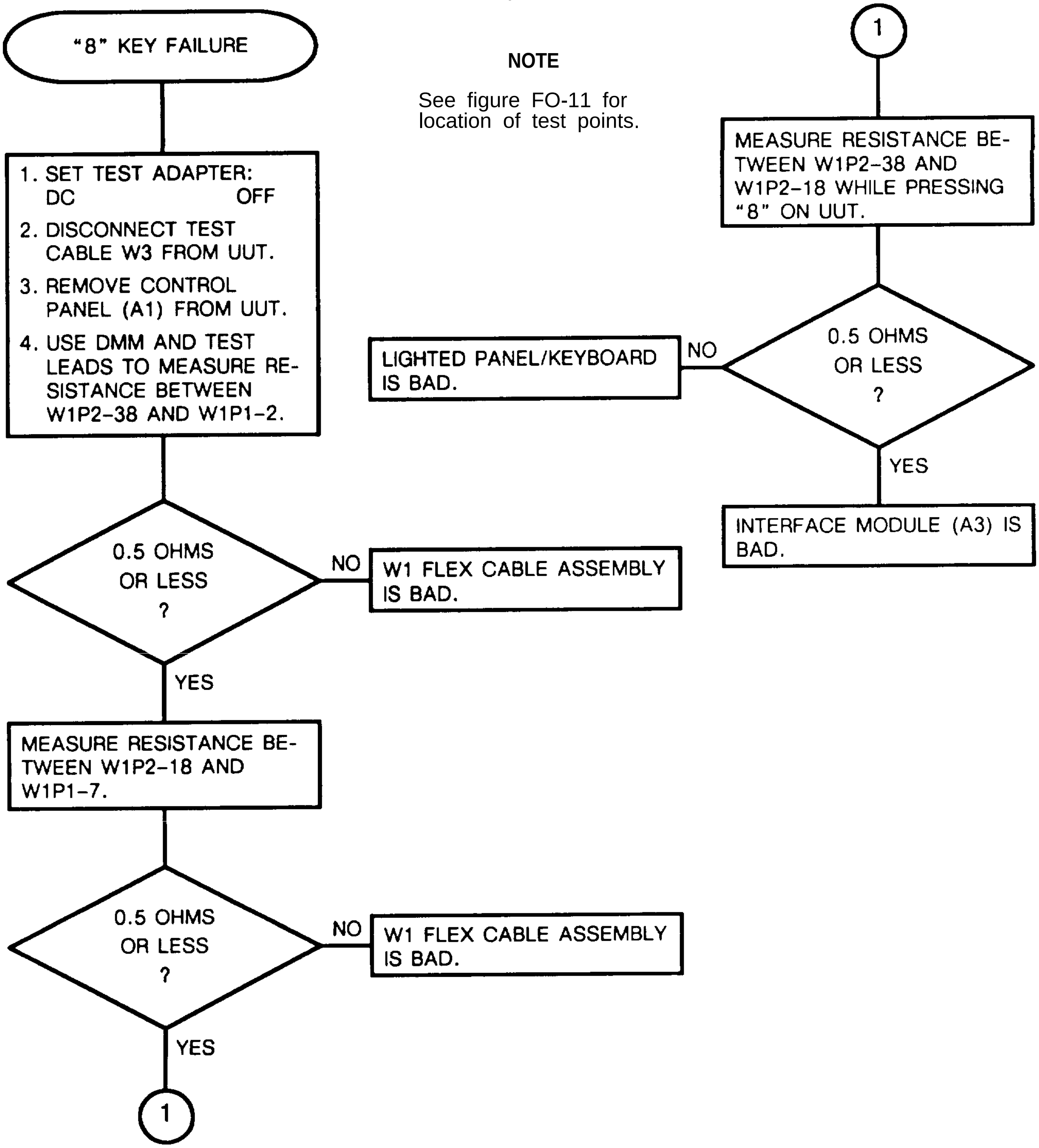


3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 16
"8" Key Failure

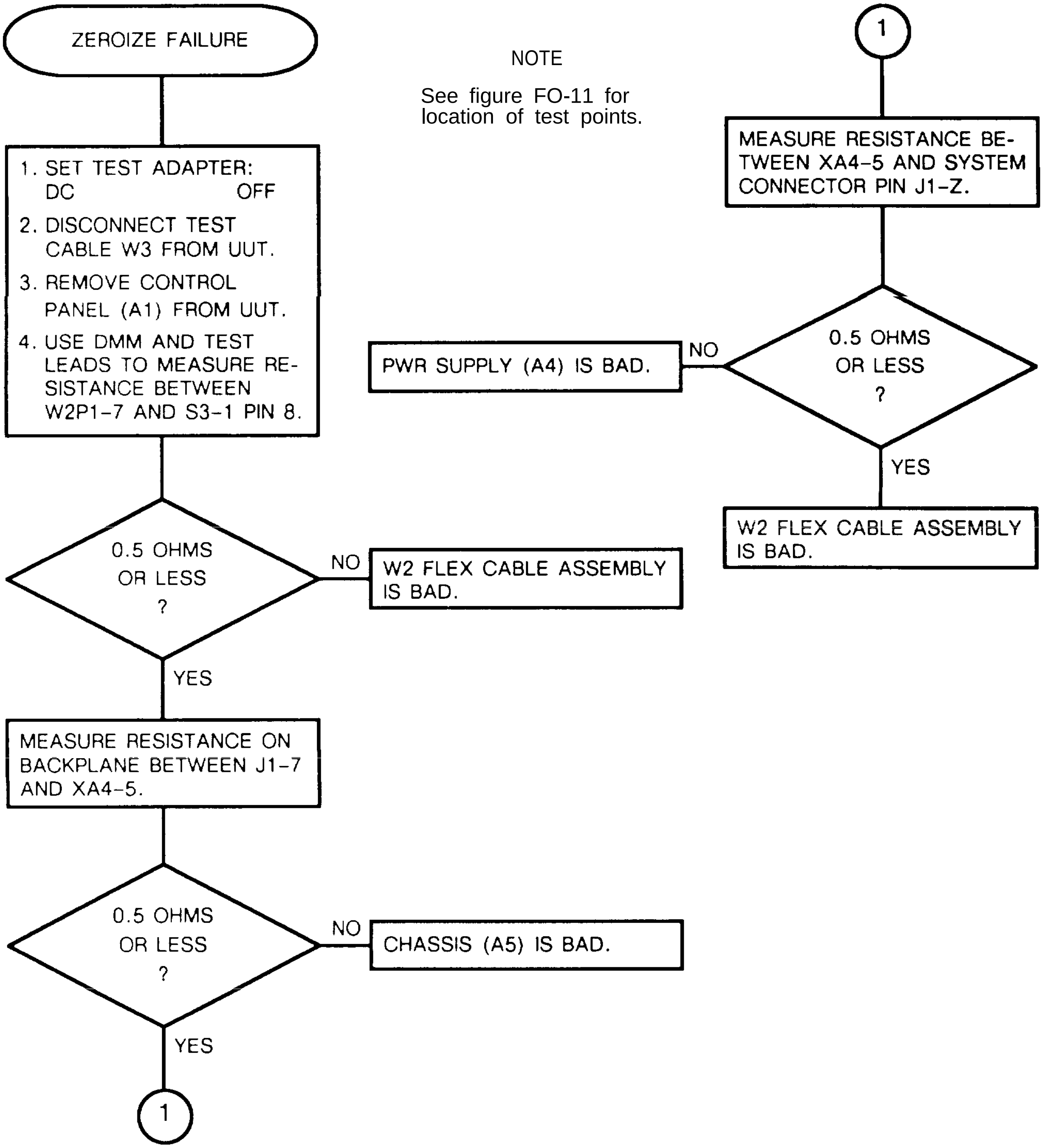
NOTE

See figure FO-11 for location of test points.



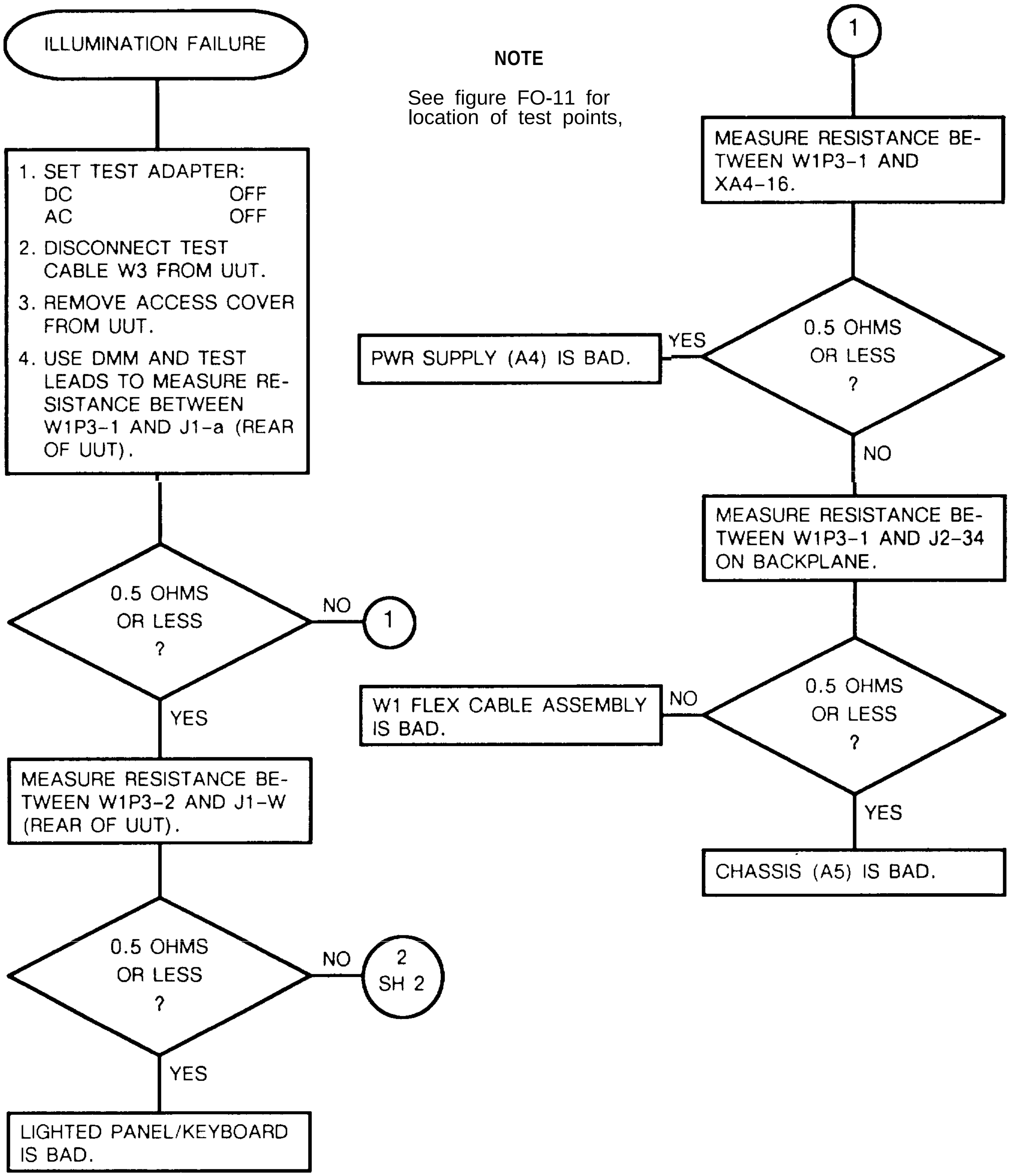
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 17
Zeroize Failure



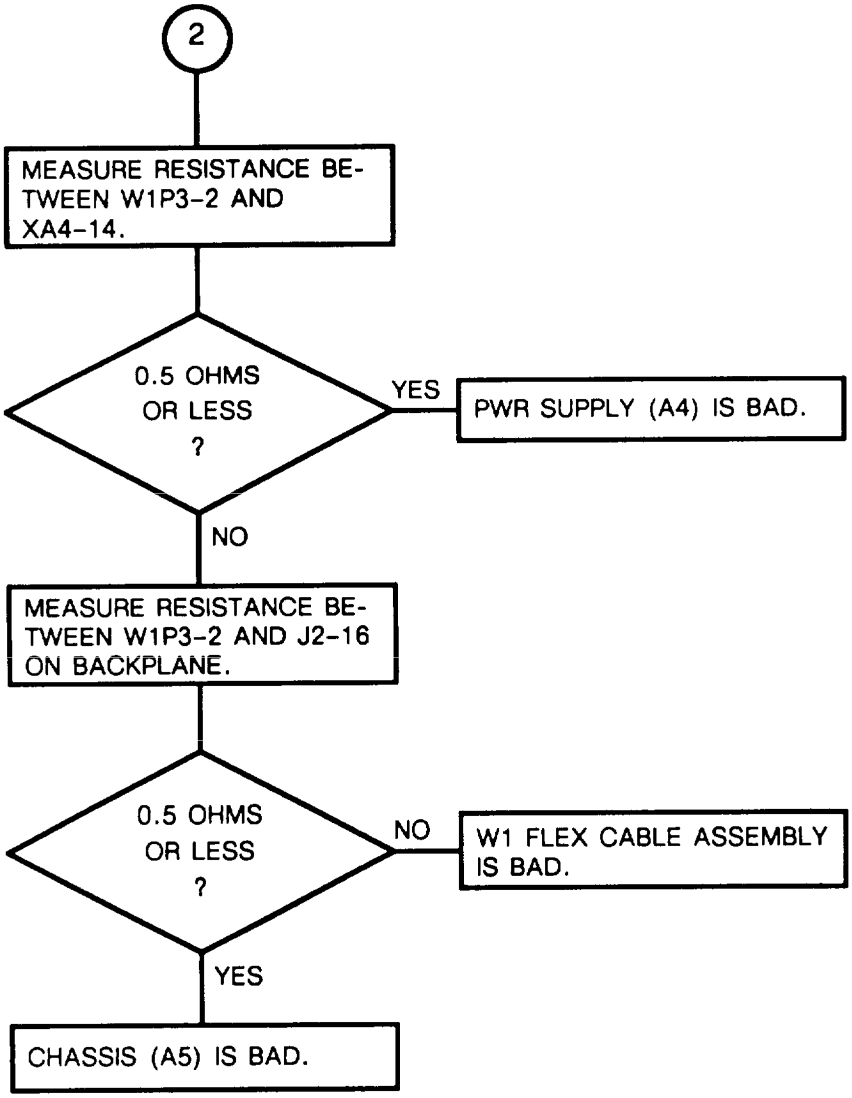
3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 18
Illumination Failure (Sheet 1 of 2)



3-10. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 18
Illumination Failure (Sheet 2 of 2)



Section IV. MAINTENANCE PROCEDURES

3-11. GENERAL

This section has inspection, operational check, and repair procedures.

Normally you should do maintenance in this order:

a. Inspection. Check if the rcu is damaged or incomplete. Replace any damaged or missing components.

b. Troubleshooting. Done on faulty rcu noted in operation or during operational check. Do not troubleshoot good equipment.

c. Repair. The repair procedures are used to restore a faulty rcu to serviceable/operable condition, Repair is by replacement of bad module or part.

d. Placing in Service. After bad item have been replaced, the rcu must be retested using operational check. When the rcu is working, it may be placed in service.

3-12. INSPECTION

Many faults can be found by inspection. If any are found, replace the bad item. The following chart can be used as a guide.

ITEM	REMARKS
Front panel and cover	No cracks or dents, No broken or missing parts such as knobs or screws.
Connector	No broken or missing pins.
Display	No cracks, chips or moisture seepage.
Switches	Check for freedom of movement.

3-13. OPERATIONAL CHECK

Do the operational check in paragraph 3-9 to verify correct rcu operation.

3-14. REPAIR

Repair consists of removing a bad item and installing another.

a. General Instructions. The following instructions apply to all repair tasks.

1. Set FUNCTION switch to STOW.
2. Remove any cable if connected to rcu.
3. inspect the rcu for damage. Repair any obvious physical damage.
4. Handle all modules carefully.
5. Before installing a module, check the connector for bent or broken pins. Do not install if damaged.
6. Perform operational check before returning to service.

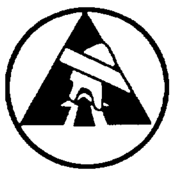
3-14.REPAIR. Continued

b. Repair Precautions

WARNING

Remove power from rcu before repair. Serious burns or electrical shock can result from contact with exposed electrical wires or connectors.

CAUTION



- Static electricity and stray voltages can damage the rcu modules. Use an antistatic pad on the work surface and attach a grounded wrist strap to self before removing access cover.
- When replacing circuit cards or assemblies, care must be taken not to bend, break, or damage connector pins. Ensure connector pins align with backplane jack before pushing any circuit card or module assembly into place. Bent or broken pins can result if improperly aligned or if care is not taken during removal.

3-15. ACCESS COVER

This task covers: **a.** Removal b. Installation

INITIAL SETUP

Tools

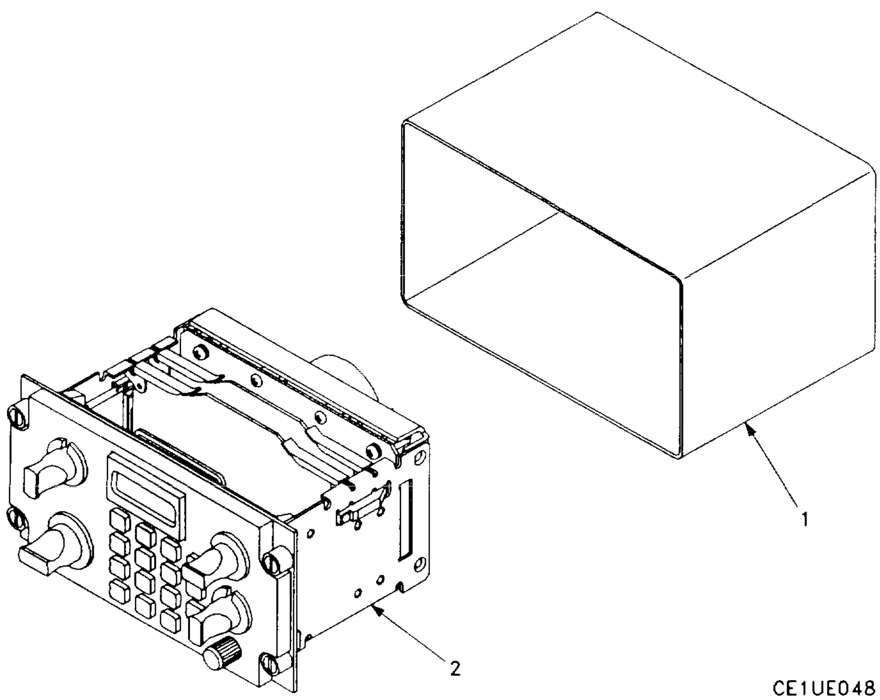
Tool Kit, Electronic Equipment, TK-105/G

REMOVAL

1. Loosen two 1/4-turn fasteners on back of access cover (1).
2. Remove access cover (1) from chassis (2).

INSTALLATION

1. Slide **access** cover (1) onto chassis (2) with drain holes on bottom.
2. Tighten two fasteners on back of access cover (1).



3-16. BUS INTERFACE MODULE (A2) OR PROCESSOR MODULE (A3)

This task covers: a. Removal b. Installation

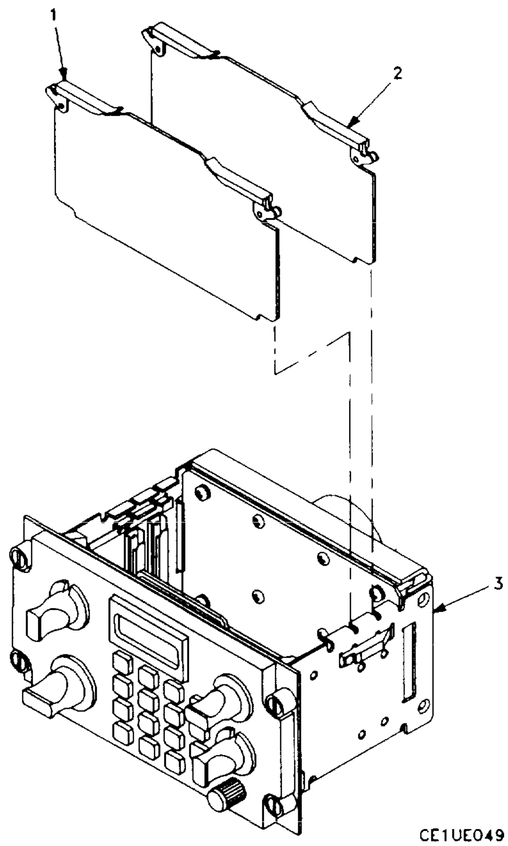
INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK–105/G

REMOVAL

1. Remove access cover (para 3-15).
2. Lift two card ejectors on bus interface module (1) or processor module (2). If modules have no card ejectors, use a module extractor to remove modules.
3. Pull module free of chassis (3).



INSTALLATION

1. Lift up card ejectors , if present, on bus inter–face module (1) or processor module (2).

CAUTION

Be careful not to damage or bend connector pins.

2. Insert module into card guides.
3. Press down on module. If present, card ejectors should touch top of chassis (3).
4. Check alignment of connector. If present, push down card ejectors.
5. Push down firmly on module until fully seated.
6. Install access cover (para 3-15).

3-17. POWER SUPPLY (A4)

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

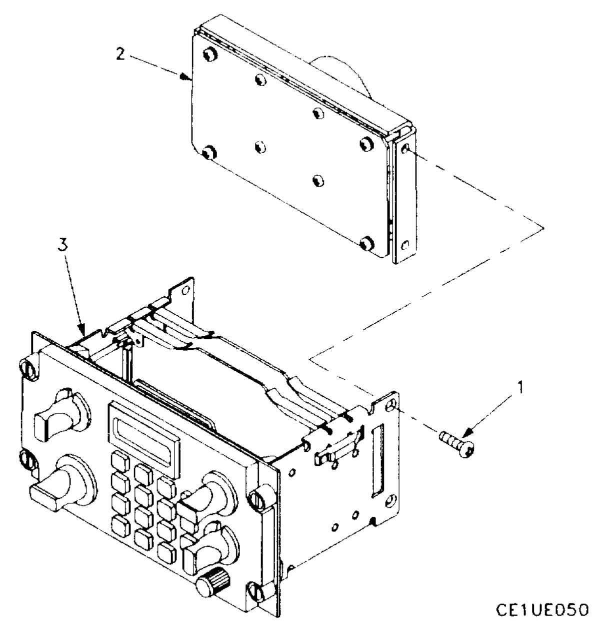
Tool Kit, Electronic Equipment, TK-105/G

REMOVAL

1. Remove access cover (para 3-15).
2. Remove four screws (1).
3. Lift power supply (2) from chassis (3).

INSTALLATION

1. Position power supply (2) in chassis (3).
2. Insert and tighten four screws (1).
3. Install access cover (para 3-15).



3-18. CONTROL PANEL (A1)

This task covers: a. Removal/installation b. Disassembly/Assembly

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

Expendable Supplies

Sealing Compound

REMOVAL/INSTALLATION

1, REMOVE CONTROL PANEL.

a. Remove access cover (para 3-15).

b. Remove bus interface module and processor module (para 3-16).

c. Remove power supply (para 3-17).

d. Remove four screws (4) securing control panel (5) to chassis (2).

e. Disconnect flex cable W1 (1) from chassis (2) .

f. Disconnect flex cable W2 (3) from chassis (2).

2. INSTALL CONTROL PANEL.

a. Connect flex cable WI (1) to chassis (2).

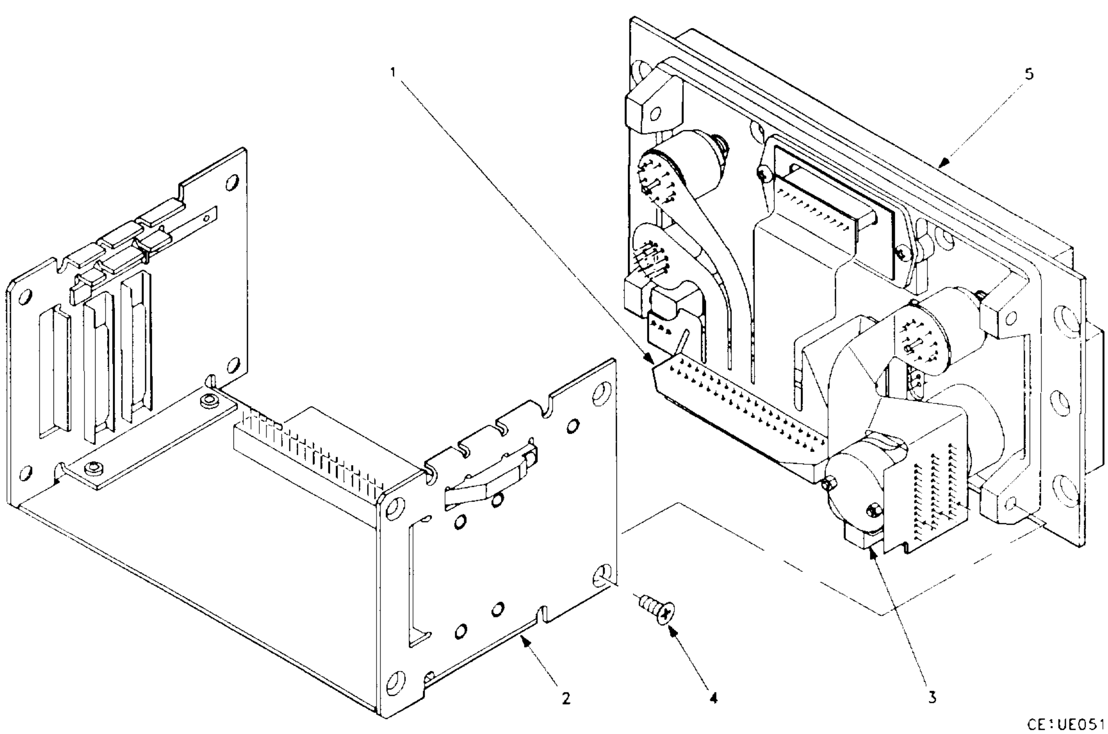
b. Connect flex cable W2 (3) to chassis (2).

c. Install four screws (4) to secure control panel (5) to chassis (2).

d. Install power supply (para 3-17).

e. Install bus interface module and processor module (para 3-16).

f. Install access cover (para 3-15).



3-18. CONTROL PANEL (A1). Continued

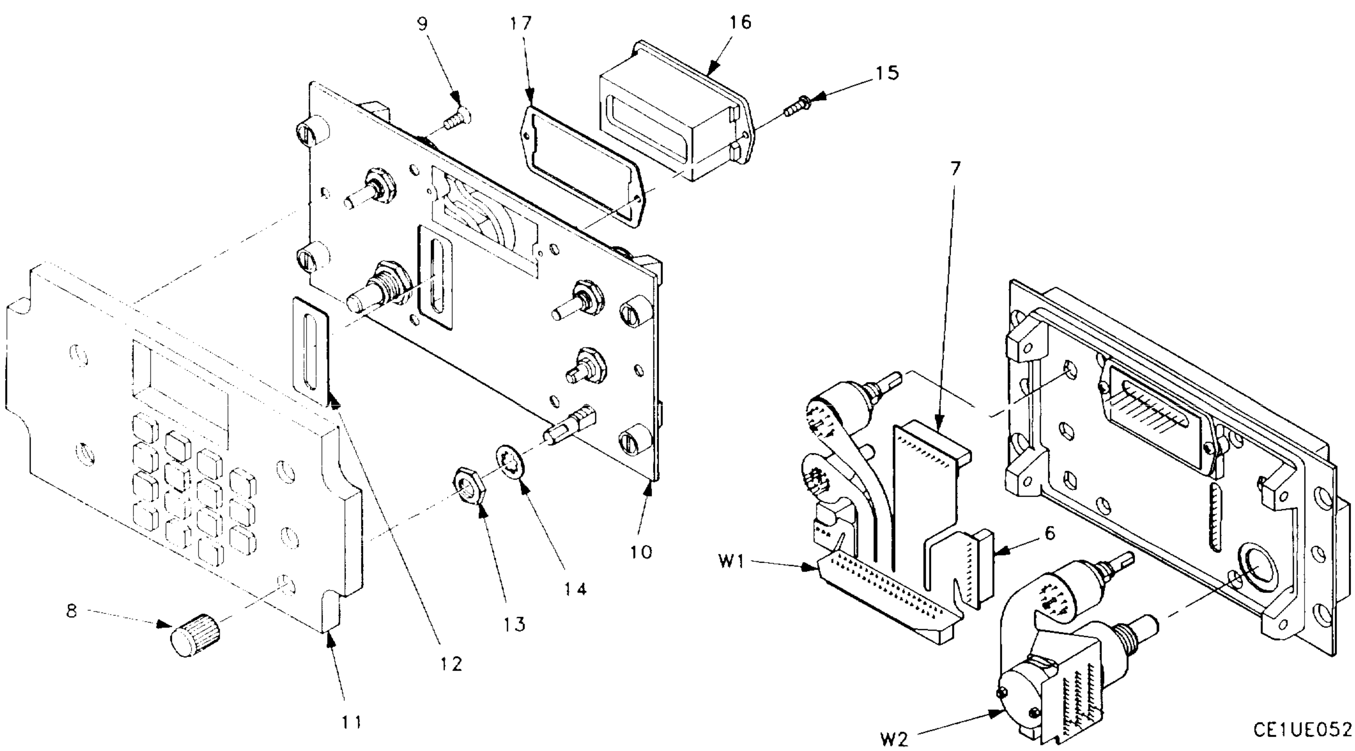
DISASSEMBLY/ASSEMBLY

1. REMOVE FLEX CABLE ASSEMBLIES W1 AND W2.
   a. When removing W1, disconnect W1P1 (6) and W1P3 (7).
   b. Loosen set screws on knobs (8) and remove all knobs.
   c. Loosen six screws (9) securing front panel (10) to lighted panel/keyboard (11).
   d. Remove lighted panel/keyboard (11) and gasket (12).
   e. Remove nuts (13) and lockwashers (14) that secure switches/controls to front panel (10).

NOTE

The nuts (13) are not all the same size.

   f. Remove flex cable assembly,



2. INSTALL FLEX CABLE ASSEMBLIES W1 AND W2.
   a. Secure controls to front panel (10) using nuts (13) and lockwashers (14).
   b. Attach lighted panel/keyboard (11) and gasket (12) to front panel (10) using six screws (9). Use sealing compound on six screws.
   c. When installing W1: connect W1P1 (6) and W1P3 (7).
   d. Install knobs (8) and tighten setscrews.

3-18. CONTROL PANEL (A1). Continued

3. REMOVE DISPLAY AND DISPLAY GASKET.

NOTE

It is not necessary to remove control panel.

a. Disconnect W1P3 (7) from back of display (16).

b. Remove two screws (15) that secure display (16) and display gasket (17) to front panel (10).

4, INSTALL DISPLAY AND DISPLAY GASKET.

a. Position display (16) and display gasket (17) on front panel.

b. Install and tighten two screws (15).

c. Connect W1P3 (7) to back of display (16).

5. REMOVE LIGHTED PANEL/KEYBOARD AND GASKET,

a. Disconnect W1P1 (6) from back of front panel (10).

b. Remove six screws (9) securing lighted panel/keyboard (11) and gasket (12) to front panel (10).

6. INSTALL LIGHTED PANEL/KEYBOARD AND GASKET.

a. Secure lighted panel/keyboard (11) and gasket (12) to front panel (10) using six screws (9). Use sealing compound on six screws.

b. Connect W1P1 (6) to back of front panel (10).

3-19o CHASSIS (A5)

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

REMOVAL

1. Remove access cover (para 3-15).
2. Remove bus interface module and processor module (para 3-16).
3. Remove power supply (para 3-17).
4. Remove control panel (para 3-18).

INSTALLATION

1. Install control panel (para 3-18).
2. Install power supply (para 3-17).
3. Install bus interface module and processor module (para 3-16).
4. Install access cover (para 3-15).

3-20. IDENTIFICATION PLATE

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

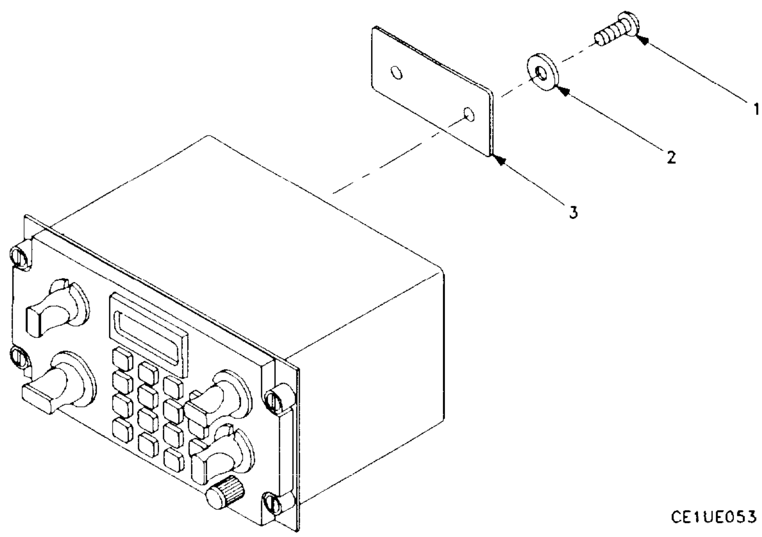
REMOVAL

1. Remove two screws (1) and two washers (2) securing plate (3).

2. Remove plate (3).

INSTALLATION

Position plate (3) and secure using two screws (1) and two washers (2).



Section V. PREPARATION FOR STORAGE OR SHIPMENT

3-21. GENERAL INFORMATION

a. Pack the rcu and modules in approved shipping containers.

b. All modules must be shipped enclosed in material that provides protection from static electricity. See the following paragraph.

3-22. PACKING STATIC SENSITIVE MODULES

The following steps should be followed when packing a static sensitive module for storage or shipment.

CAUTION

To avoid damaging static sensitive modules, use an antistatic pad on the work surface and wear a grounded wrist strap when handling the module.

ITEM	ACTION
a. Module (1)	a. Place inside antistatic bag (2) or inside antistatic wrapping material (3). See figure 3–8.
b. Antistatic package (4)	b. Seal with adhesive tape. Attach “sensitive electronic device” unit pack label (5),
c. Antistatic package (4)	c. Place inside approved shipping container (6).
d. Shipping container (6)	d. Attach “sensitive electronic device” intermediate pack label (7).

3-22. PACKING STATIC SENSITIVE MODULES. Continued

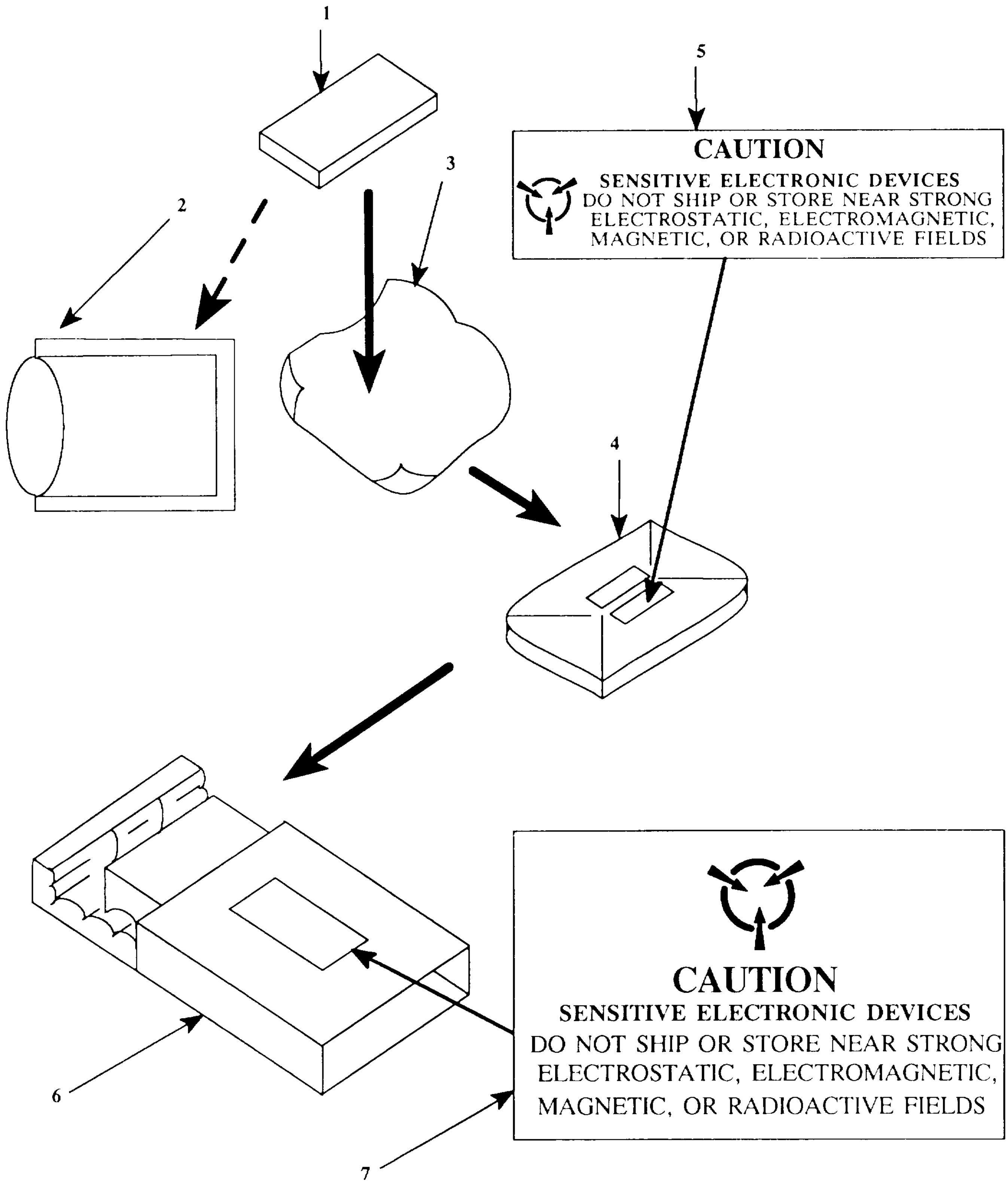


Figure 3-8. Packing Static Sensitive Modules

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CHAPTER 4

MAINTENANCE INSTRUCTIONS FOR DATA RATE ADAPTER CV-3885/ARC-201 (V)

Section L PRINCIPLES OF OPERATION

4-1, INTRODUCTION

The data rate adapter (dra) has four electronic modules. lt also has a backplane assembly (parent board) and a connector housing. The modules are:

Circuit Card Assembly, FSK Detector (A1)
Circuit Card Assembly, Data Processor (A2)
Circuit Card Assembly, Bit Sync (A3)
Circuit Card Assembly, Power Supply (A4)

The backplane (A5) connects the modules to one another and to the connector housing (A6). The connector housing has four connectors for external connections.

4-2. TRANSMIT AUDIO/DATA SIGNAL PATH

Figure FO-12 shows the audio/data signal paths. There are four types of transmit operation:

- plain-text voice
- plain-text data
- cipher-text voice
- cipher-text data

Plain-Text Voice

Voice audio from the intercom enters the dra as XMT AUDIO at J2-A and J2-B. The data processor module has a buffer and a push-pull driver. The data processor module then routes the audio through a PT/CT switch and to the bit sync module The data processor output is called PT XMT AUDIO. The bit sync module passes the signal without change. From the bit sync module, the signal is routed to the rt. It leaves the dra on the XMT AUDIO/ RXMT MODE line from J1-A.

Plain-Text Data

Plain-text data enters the dra from the intercom as XMT AUDIO at J2–A and J2-B. It is processed on the data processor and FSK detector modules, level shifted on the bit sync module, and routed to the rt as X-MODE XMT from J1-F.

Each data transmission has four main blocks, three blocks of preamble and one of data. The first block consists of 256 msec of a 16kb/s’1’, ‘0’ phasing pattern. The receiving equipment uses the phasing pattern to build a 16 kb/s clock from the data transmission. The phasing pattern is generated on the FSK detector module and routed to the bit sync module through a PT/CT switch. On the bit sync module it is routed through PT/CT and NORMAL/ SELF-TEST switches and a level shifter and output to the rt.

The second block consists of 30 repetitions of a 15-bit code word, The code word serves two functions, First it informs the receiving equipment that the incoming signal is a valid data transmission and not the digitized voice as would occur in frequency hopping voice transmissions. Second it allows the receiving equipment to synchronize its deinterleaver to the interleaver of the transmitting radio. The code word is generated on the data processor module and sent to the FSK detector module from which it follows the same path as the phasing pattern.

The third block is a single inverted code word. It tells the receiving equipment that what follows is data.

4-2. TRANSMIT AUDIO/DATA SIGNAL PATH. Continued

Plain-Text Data. Continued

The fourth block is data. The data has been exclusive OR'd with the 15-bit code word. FSK audio from the intercom enters the dra as XMT AUDIO on J2–A and J2–B, It is hard limited and applied to the FSK detector circuit on the FSK detector module. When FSK is detected, the FSK audio is demodulated from FSK to digital by the FSK demodulator. The low-speed data is converted to 16 kb/s by the 16 kb/s rate converter. An interleaver redistributes the data in time. Next the data is exclusive OR'd with the code word. This is to ensure the signal has a 50% duty cycle. The exclusive OR'd signal is sent to the FSK detector module. From there it follows the same path as the phasing pattern.

Cipher-Text Voice

Voice audio from the intercom enters the dra as XMT AUDIO at J2-A and J2-B. It is buffered and amplified on the data processor module. A PT/CT switch on the data processor routes the audio out to the KY-58 as XMT AUDIO on J4-A and J4-B. After encryption in the KY-58, the signal returns to the bit sync module as CT100 at J3–F. The signal is routed through a CT/PT switch and out to the rt as X-MODE XMT at J1-F.

Cipher-Text Data

In cipher-text operation, each data transmission has three main blocks. Compared with plain-text data, the phasing pattern is omitted because the KY-58 supplies a 16 kb/s clock.

The first block consists of 30 repetitions of a cipher-text code word. The code word is generated on the data processor module. **As** with plain-text data, the code word **is** used by the receiving equipment. It tells the receiver that the incoming signal is data, not digitized voice, Also, the receiver uses it to synchronize the deinterleaver with the transmitter interleave,

The second block is a single inverted code word. This tells the receiving equipment that what follows is data.

The third block consists of interleaved data. Unlike plain-text data, this data is not exclusive OR'd with the code word. The data will be encrypted by the KY–58 which will ensure 50% duty cycle,

FSK audio from the intercom enters the dra as XMT AUDIO on J2-A and J2–B. It is hard limited and applied to the FSK detector circuit on the FSK detector module. When FSK is detected, the FSK audio is demodulated from FSK to digital by the FSK demodulator. The low-speed data is converted to 16 kb/s by the 16 kb/s rate converter. An interleaver redistributes the data in time. The data is then level shifted and output to the KY–58 as DIG DATA IN at J4-D. The KY-58 returns the encrypted data to the bit sync module as CT100 at J3-F. The data passes through a PT/CT switch on the bit sync module and is sent out to the rt as X-MODE XMT at J1-F.

4-3. RECEIVE AUDIO/DATA SIGNAL PATH

Figure FO-12 shows the audio/data signal paths. There are four types of receive operation:

- plain-text voice
- plain-text data
- cipher–text voice
- cipher-text data

Plain-Text Voice

Voice audio from the rt enters the dra as RCV AUDIO at J1-R. It passes through PT/CT switches on the bit sync module and data processor module. It passes through a VOICE/FSK switch and push-pull driver on the data processor module and is routed out to the intercom as RCV AUDIO at J2-K and J2-L.

Plain-Text Data

Digital data from the rt is applied to the dra at J1-b. It is routed through an integrate and dump network on the bit sync module to reshape the signal. The resultant signal is routed through the bit sync and digital squelch network. The bit sync portion derives a synchronous clock from the received signal, The digital squelch portion detects when the bit sync has acquired synchronization with the data. It then supplies control signal DIG SQUELCH (see para 4-5) that alerts the dra to the presence of a locked-in digital signal,

4-3. RECEIVE AUDIO/DATA SIGNAL PATH. Continued

Plain-Text Data. Continued

The data output from the bit sync and digital squelch network is routed through PT/CT switches on the bit sync module, FSK detector module, and data processor module. The code correlator on the data processor module checks for presence of the 15-bit (see para 4-2) code word. if no code is detected, the data processor supplies a control signal (NO CODE DET) which sets VOICE/FSK select to VOICE.

The data signal is exclusive OR'd with the same code signal as was used on transmit. This returns the data to its original format. Majority logic error correction is applied to improve the bit error rate and the data is returned to its original low-speed rate. An FSK modulator changes the digital data back to FSK. The data is routed through an AND/OR select with the FSK/alarm generator signal (used for self-test) on the FSK detector module and returned to the data processor as AD2 RCV/GEN FSK. After low-pass filtering and amplification it is output to the intercom as RCV AUD on J2-K and J2-L.

Cipher-Text Voice

Encrypted voice from the rt enters the dra as X–MODE RCV at J1–b. A PT/CT switch on the bit sync module routes the signal out to the KY-58 as CT IN on J3-b. The voice is decrypted in the KY-58 and returned to the dra as RCV AUDIO on J4-K and J4-L. It goes through PT/CT and VOICE/FSK switches on the data processor, is amplified by a push-pull driver, and is output to the intercom as RCV AUDIO on J2-K and J2–L.

Cipher-Text Data

Digital data from the rt is applied to the dra at J1-b. A PT/CT switch on the bit sync module routes the data out to the KY-58 on J3-b as CT IN. The data is decrypted in the KY-58 and returned to the dra as RCV DIG DATA IN on J4-C. It is level shifted on the data processor and applied to the code correlator. The code correlator checks for the presence of the 15-bit code word (see para 4–2). If no code word is detected, the data processor supplies a control signal (NO CODE DET) which sets VOICE/FSK select to voice. The data is not exclusive OR'd with the code because it was not on transmit. The data goes to the deinterleaver and from there is processed the same as PT data.

4-4. SELF-TEST

The dra is located away from the operator in the aircraft. For this reason, the self-test is made to operate every time power is turned on. The self-test actions are as follows:

- test data processor circuits,
- test that FSK detector will detect an internally generated FSK signal,
- test that bit sync module will lock onto an internally generated digital signal.

The self-test sequence begins with the start/stop control on the FSK detector module. See figure FO-13. The start/stop control resets the timer when the 6.75 V dc starts to rise. At 96 msec, the timer sends a pulse back to the star! /stop control which causes self-test mode to begin. The timer then times the self-test sequence. If any of the DRA modules fail self-test, the status correlator on the FSK detector module sends fail signal to the FSK/ alarm generator. The FSK/alarm generator then sends a 1200-Hz alarm tone to the intercom.

To test the FSK detector, the FSK alarm generator sends an FSK signal to the data processor on the AD2 RCV/ GEN FSK line. FSK passes through the low-pass filter and hard limiter to the FSK detector. The FSK detector circuit signals the status correlator if FSK is detected. If FSK is not detected, an alarm is generated.

To test the bit sync module, an 8-kHz digital clock is connected to the bit sync and digital squelch network. If the bit sync locks onto the digital signal, the digital squelch signals the status correlator by way of a debouncer on the data processor. If bit sync does not occur, an alarm is generated.

4-5. CONTROL SIGNALS

The dra has many control functions that determine how signals preprocessed and routed. The data processor module handles the major portion of control for the dra. It makes decisions which instruct the other modules in their operating modes: voice/FSK, transmit/receive, plain-text/cipher-text, analog/digital.

The following chart is a list of control signals and a list of their functions. Figure FO-14 shows routing of the signals.

SIGNAL	DESCRIPTION
AUDIO MOD PTT	Logic 0 = Transmit Logic 1 = Otherwise
CGC	Gnd = Cipher-text selected Open = Plain-text selected
DATA I/O ENBL	Logic 1 = Valid digital mode Logic 0 = Otherwise In rcv mode, goes to logic 0 until inverted code is detected.
DATA 1/0 ENBL OUT	Logic 1 = Valid plain-text digital mode Logic 0 = Otherwise
DDMC	Gnd = Digital data mode Open = Otherwise
DELAYED PTT	Logic 1 = Plain-text xmt mode Logic 0 = Rev, standby, or cipher text mode Delayed approximately 2 msec on release.
DIG DATA CLK IN	16 kHz clock from KY-58
DIG DATA CLK OUT	16 kHz clock to digital data device
DIG SQUELCH	Logic 1 = Digital signal received in plain-text or KY-58 active in cipher-text Logic 0 = Otherwise
RCV CLK IN	16 kHz clock; regenerated by bit sync in plain text: from KY-58 in cipher text
RCV CLK OUT	Buffered version of RCV CLK IN; during self- test clock is generated on FSK detector module
RED DDMC	Logic 0 = Digital data mode Logic 1 = Otherwise
SQ CONT	Logic 0 = KY-58 active (digital signal received or encrypting transmit signal) Open = Otherwise
SQUELCH	Buffered version of DIG SQUELCH
VOICE/FSK SEL	Logic 1 = FSK receive, FSK test, or self-test Logic 0 = Voice receive

4-5. CONTROL SIGNALS. Continued

SIGNAL	DESCRIPTION
X-MODE CONT	Open = Audio or standby mode Gnd = Digital mode
NO CODE DET	Logic 1 = No code detected; pulsed approximately every 1 msec in plain text, latched in cipher text Logic 0 = Code detected or standby; in pulsed mode, signal is extremely short duration
PT/CT IN	+28 V = Z-AHP selects plain text Open = Z-AHP selects cipher text Gnd = DRA overrides plain-text selection
PT/CT OUT	Open = KY-58 in plain text Gnd = KY-58 in cipher text
PT DIG CLK	16 kHz clock; in rcv mode is from bit sync module; in xmt mode clock is from FSK detector
PTT	Logic 0 = Transmit mode or self-test Logic 1 = Otherwise
PTT IN	Gnd = Transmit mode Open = Otherwise
PTTO	Gnd = Cipher-text transmit mode Open = Otherwise
PTT OUT	Gnd = Transmit mode Open = Otherwise

4-6. POWER SUPPLY

The 28 Vdc input is filtered and protected against transients, overvoltage, and reverse voltage. A pulse width modulator regulates output voltage by varying the pulse width to the de/de converter. The de/de converter chops the 28 V dc at a constant frequency. The square wave produced is then rectified and filtered to the correct dc values.

The series regulators charge the regulated black dc voltages into lower dc voltages. The shunt regulators provide a constant current to the red outputs. In addition, they regulate **to** a **lower** dc voltage.

The PT/CT OUT is a pull-up voltage to the PT/CT OUT from the bit sync module.

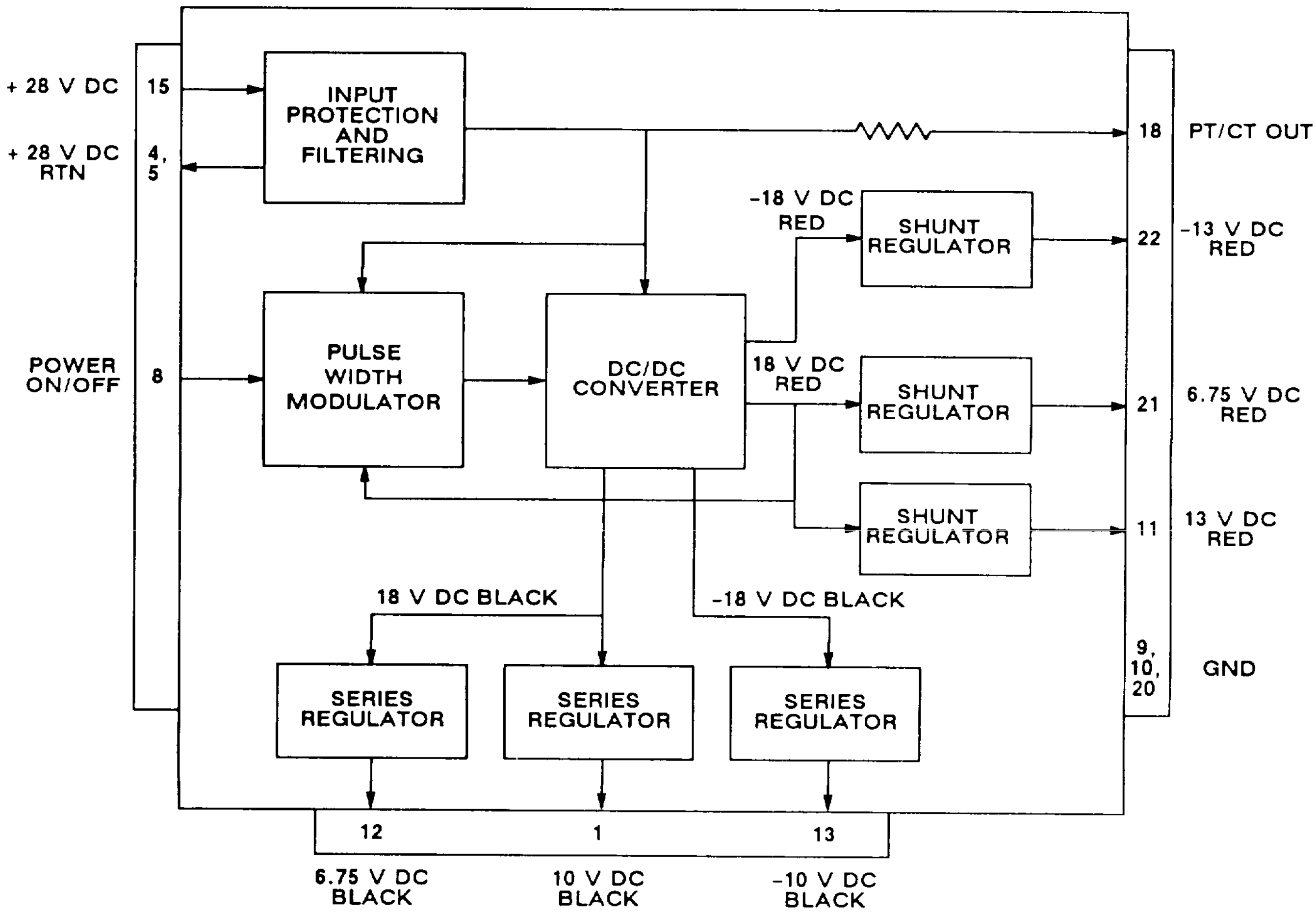


Figure 4-1. Power Supply Functional Block Diagram

Section II. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

4-7. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit, Common tools required for maintenance of the dra are listed in the Maintenance Allocation Chart. It is appendix B of TM 11-5821-333-12.

4-8. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

No special tools are required. For TMDE and support equipment refer to the Maintenance Allocation Chart, appendix B of TM 11–5821-333-12.

4-9. REPAIR PARTS

Repair parts are listed and illustrated in TM 11-5821-333-23P.

Section III. TROUBLESHOOTING

4-10. GENERAL

This section has an operational check and troubleshooting flow charts. The operational check provides a complete evaluation of the dra. If passed, the dra can be returned to service. The troubleshooting flowcharts are used when the dra fails an operational check step. The troubleshooting flowcharts are used to find the bad module,

When a dra is received for troubleshooting, do the following:

a. Inspect dra for damage. Repair any damage before proceeding.

b. Do the operational check.

c. Do any troubleshooting called for by the operational check.

d. Replace the bad module.

e. Verify the repair by doing all of the operational check.

4-11. OPERATIONAL CHECK

The operational check is a series of steps used to evaluate dra operation. They are used both during troubleshooting and to verify the dra is good after repair.

Test Description. Each step checks the response of the dra to an operator action. The steps are numbered so they can be used for reference on maintenance worksheets. Each step is titled according to the function being checked.

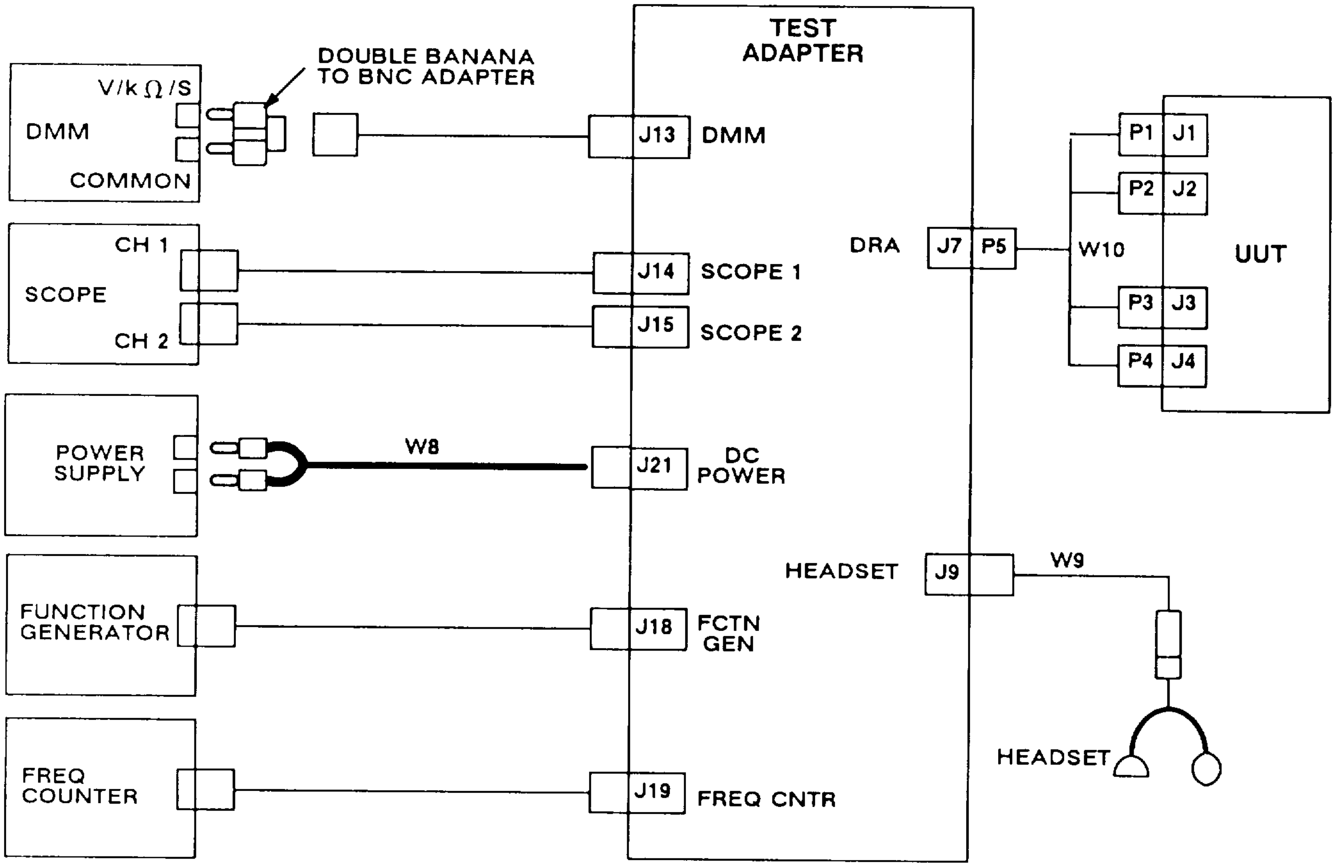
How to Proceed. If normal results are found proceed to the next step. If abnormal results are found, replace the indicated module or go to the indicated troubleshooting flowchart.

WARNING

Connect the test setups only when directed and with the power supply turned off. The large current capacity of the test power supply can cause personal injury. Verify the test setup before turning the power supply on.

CAUTION

- To avoid damage to equipment, always set DC switch on test adapter to OFF before turning power supply on.
- Before setting DC switch on test adapter to ON, always set ref rt and ref rcu FUNCTION switches to STOW or OFF. Failure to do so may damage an rt or rcu.



SWITCH PRESETS

ICS SWITCHES

TOP SWITCHES	OFF
ROTARY SWITCH	1
HOT MIKE	OFF
VOL	MIDRANGE

REF RT SWITCH

FUNCTION STOW

REF RCU SWITCH

FUNCTION STOW

TEST ADAPTER SWITCHES

CAL	OUT
PTT(S8)	OFF
TAKE CTRL	RT
PT/CT	ON
SQ/CLK	OFF
RXMT	OFF
PTT(S13)	OFF
DC	OFF
AC	OFF
TEST EQUIPMENT SELECTOR	ICS
TEST EQPT INPUT	INTL
S1 THRU S4	OFF
S5, S6	1

Figure 4-2. Operational Check Test Setup

4–11. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 1. SELF TEST	
a. Set up equipment using figure 4-2.	**a. No** response.
b. Turn power supply on and set to 28 V dc.	b. No response.
c. Listen to headset and set DC switch on test adapter to ON.	c. Short two-tone beep is heard. Continuous 1200-Hz tone is not heard. If not, go to chart 1.
d. Set test adapter: DC OFF S5, S6 2	d. No response.
e. Listen to headset and set DC switch on test adapter to ON.	e. Two-tone beep is not heard. If heard, go to chart 2.
Step 2. OUTPUT CHECKS	
a. Set test adapter: S5 1 S6 2 PTT(S8) UUT	**a. No** response.
b. Talk into headset. Listen to audio and check lamps on test adapter.	**b.** Audio is clear and intelligible and lamps are as follows: LAMP 2 off LAMP 3 off LAMP 5 on LAMP 7 off LAMP 8 off If not, go to chart 3.
c. Set test adapter: PTT (S8) OFF PTT(S13) UUT	c. No response.
d. Talk into headset. Listen to audio and check lamps on test adapter.	d. Audio is clear and intelligible and lamps are as follows: LAMP 7 on LAMP 8 on If not, go to chart 4.

4-11. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 3. PT DATA TEST	
a. Set test adapter: PTT (S8) OFF S5, S6 3 PTT(S13) REF	a. **No** response,
b. Listen to headset for tones.	b. Tones present. If not, go to chart 5.
c. Check lamps on test adapter.	c. Lamps are as follows: LAMP 2 on LAMP 3 on LAMP 5 off If not, go to chart 5.
d. Set test adapter: **PTT(S13) OFF** **S5, S6 4** **PTT(S13) UUT**	d. Tones present. If not, go to chart 6.
e. Check LAMP 3 on test adapter.	e. LAMP 3 is on. If not, go to chart 6.
Step 4. CT VOICE TEST	
a. Set test adapter: PTT(S13) OFF CAL IN	**a. No** response.
b. Use scope channel 2 to set function generator for 10 V peak-to-peak square wave going from -5 ± 0.5 V dc to +5 ± 0.5 V dc.	b. No response.
c. Use frequency counter to set function generator to 16 kHz ± 0.1 kHz.	c. No response,
d. Set test adapter: CAL OUT S5, S6 5 PT/CT OFF SQ/CLK ON PTT(S8) UUT	d. No response.
e. Talk into headset, Listen to audio and check lamps on test adapter,	**e. Voice is clear and intelligible. Lamps are as follows:** **LAMP 2 on** **LAMP 5 on** If not, go to chart 7.

4-11. OPERATIONAL CHECK. Continued

ACTION	RESPONSE

Step 4. CT VOICE TEST. Continued

ACTION		RESPONSE
f. Set test adapter:		f. No **response.**
PTT(S8)	OFF	
PT/CT	ON	
S5, S6	6	
SQ/CLK	OFF	
TEST EQUIPMENT SELECTOR	DMM	
g. On DMM, reverse connection of double banana to BNC adapter. (Connect GND to V/kΩ/S.)		g. No response.
h. Set DMM to 2 kilohm range.		h. No **response.**
i. Set SQ/CLK switch on test adapter to ON while observing DMM.		i. Resistance changes from less than 100 ohms to open circuit. If not, FSK detector (A1) is bad.
j. Set PTT(S13) switch on **test adapter to** UUT and check LAMP 7 on test adapter.		j. LAMP 7 is on. If not, go to chart 8.

Step 5. CT DATA TEST

ACTION		RESPONSE
a. Set test adapter:		a. No response.
PTT(S13)	OFF	
SQ/CLK	OFF	
S5, S6	7	
TEST EQUIPMENT SELECTOR	ICS	
PTT(S13)	REF	
b. Set SQ/CLK switch on test adapter to ON.		b. No response.
c. Listen for tones in headset.		c. Tones present. If not, go to chart 9.
d. Set test adapter:		d. No response.
PTT(S13)	OFF	
S5, S6	9	
SQ/CLK	OFF	
PTT(S13)	UUT	
e. Set SQ/CLK switch on test adapter to ON.		e. No response.
f. Listen for tones in headset.		f. Tones present. If not go to chart 10,

4-11. OPERATIONAL CHECK. Continued

ACTION	RESPONSE

Step 6. RETRANSMIT TEST

ACTION		RESPONSE
a. Set test adapter:		a. No **response.**
PTT(S13)	OFF	
S5, S6	11	
TEST EQUIPMENT SELECTOR	DMM	
b. While watching DMM, set RXMT switch on test adapter to ON.		b. **Resistance changes from open circuit to less** than 100 ohms, LAMP 2 on test adapter is on. If not, go to chart 11.
c. Set test adapter:		**c. LAMP 2** on test adapter is off. if not, bit sync module (A3) is bad,
RXMT	OFF	
S5, S6	4	
SQ/CLK	OFF	
PTT(S13)	UUT	
RXMT	ON	

Step 7. LOOP TEST

ACTION	RESPONSE
a. Set **PTT(S13) switch on test adapter to OFF.**	**a. No** response,
b. Check **LAMP 6** on test adapter.	b. LAMP 6 is on. If not, connector housing assembly (A6) is bad.

4-12. TROUBLESHOOTING FLOWCHARTS

The troubleshooting flowcharts are used to find a bad module in the dra. The user **will be sent to the flowchart** from a step in the-operational check. When sent to a flowchart, do the following:

a. Unless otherwise directed, keep all switches and controls as they were from the operational check.

b. Do action described in first rectangle of flowchart.

c. Answer yes or no to question in decision diamond.

d. Go to next block as directed by answer to yes/no question.

e. Continue until bad module is located.

Figure 4-3 explains the symbols used on the flow charts.

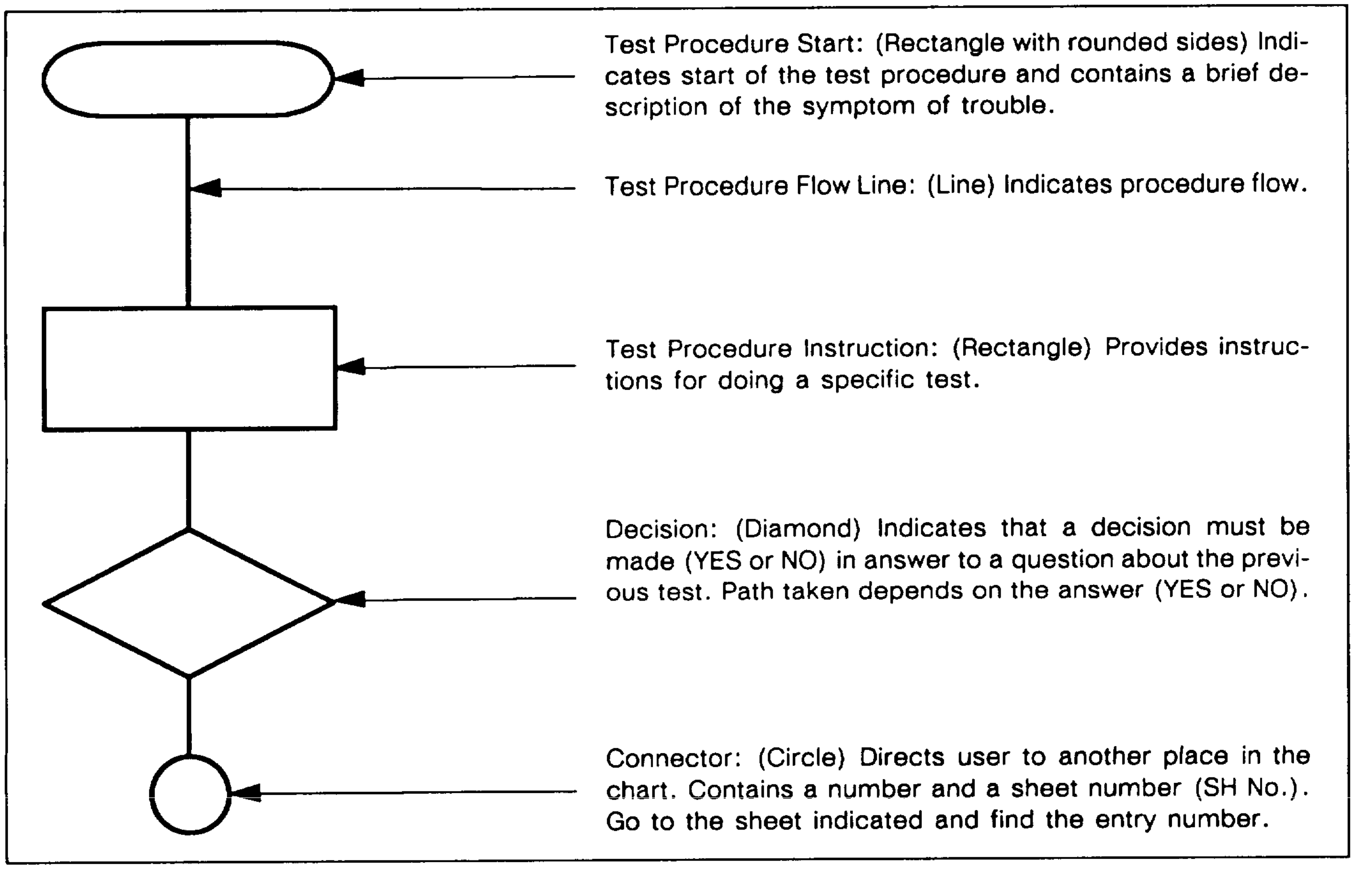


Figure 4-3. Explanation of Symbols

WARNING

Connect the test setups only when directed and with the power supply turned off. The large current capacity of the test power supply can cause personal injury. Verity the test setup before turning the power supply on.

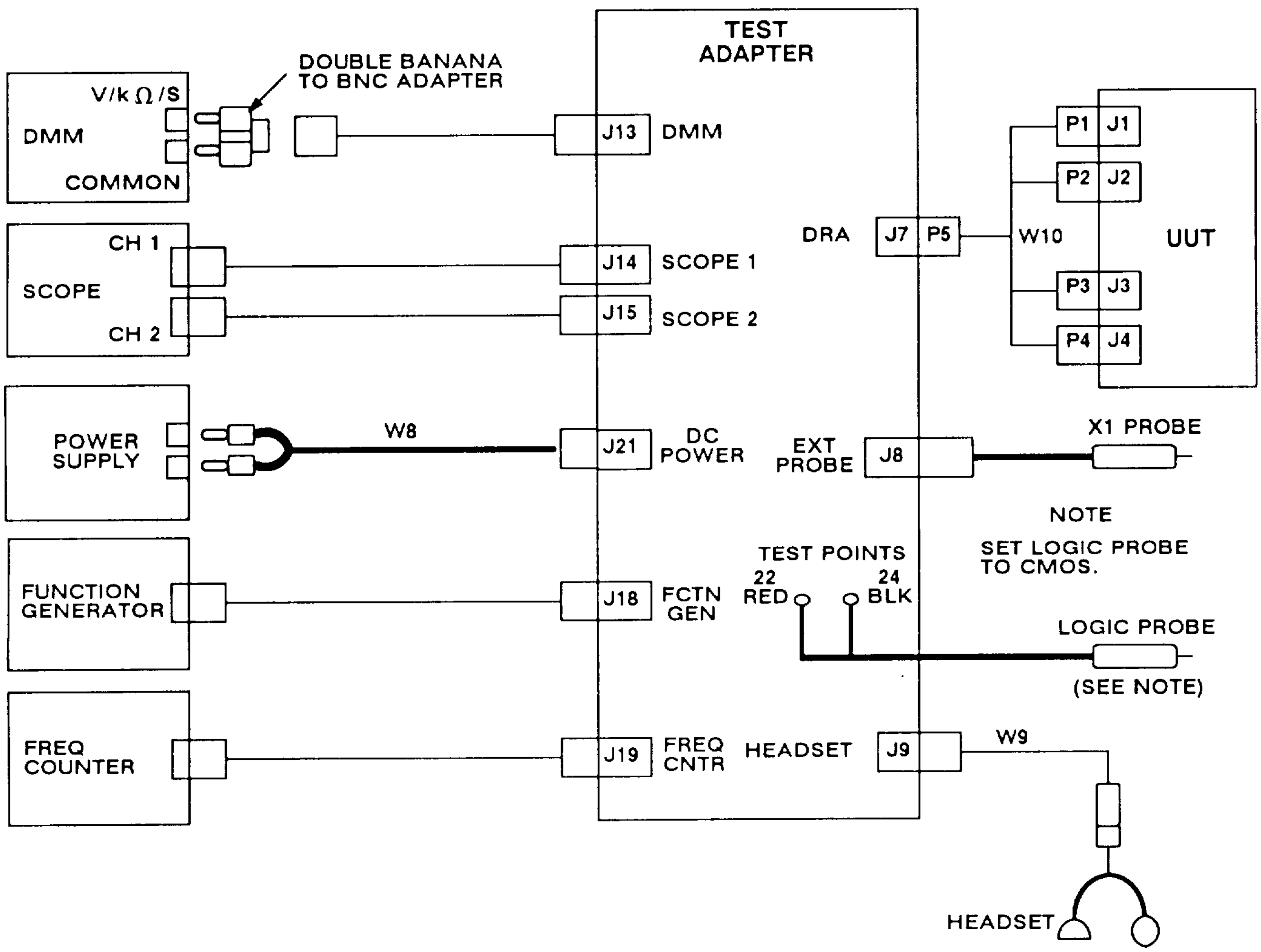
CAUTION

- Static electricity and stray voltages can damage the dra modules. Use an antistatic pad on the work surface and wear a grounded wrist strap when troubleshooting or handling the modules.
- To avoid damage to equipment, always set DC switch on test adapter to OFF before turning power supply on.
- Alwavs set ref rt and ref rcu FUNCTION switches to STOW or OFF before setting DC switch on test adapter to ON. Failure to do so may damage the rt or rcu.

NOTE

The principles of operation section can be used to fault isolate any unusual problems that may not be covered in the troubleshooting procedures.

1. SET TEST ADAPTER DC SWITCH TO OFF.
2. CONNECT EQUIPMENT AS SHOWN BELOW:

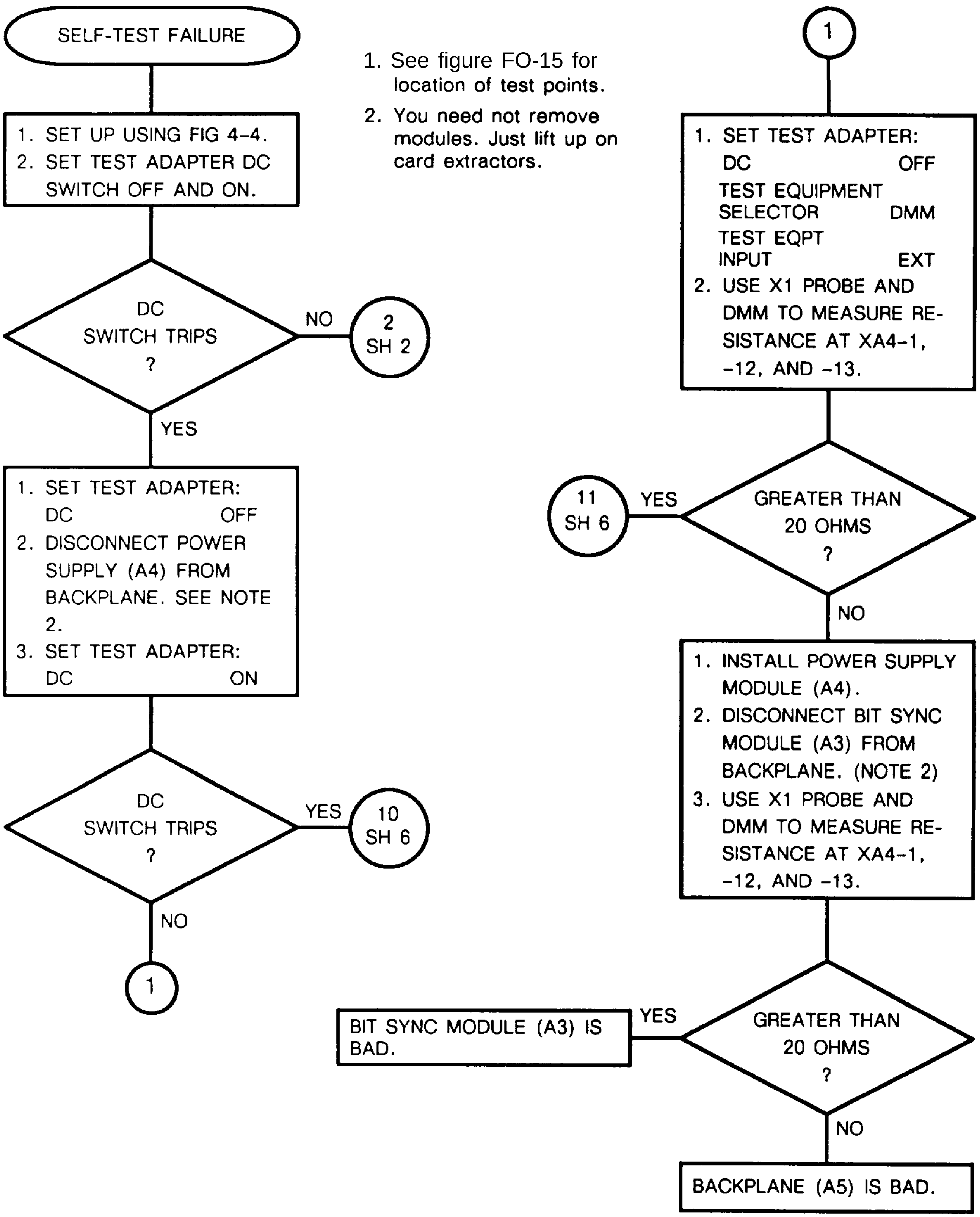


3. REMOVE CONNECTOR HOUSING (A6) FROM UUT.
4. ATTACH JUMPER CABLES (W16) BETWEEN CONNECTOR HOUSING (A6) AND BACKPLANE (A5) .
5. SET TEST ADAPTER DC SWITCH TO ON.

Figure 4-4. Troubleshooting Test Setup

4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 1 of 17)



4-12, TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 2 of 17)

(2)

ANY TONES HEARD ?

NO → (4 SH 3)

YES

1. SET TEST ADAPTER:
   DC OFF
2. REMOVE ACCESS COVER FROM UUT.
3. CHECK THAT W16 TEST CABLES ARE STILL CONNECTED.
4. SET TEST ADAPTER:
   TEST EQUIPMENT SELECTOR DMM
   TEST EQPT INPUT EXT
   DC ON
6. SET PTT(S13) ON TEST ADAPTER TO UUT AND BACK TO OFF.
7. USE X1 PROBE AT A1TP1. (SEE FIGURE.) READ DMM.

LESS THAN 5 V DC ?

NO → (13 SH 7)

YES

(3)

(3)

USE X1 PROBE AT A1TP2. READ DMM.

LESS THAN 5 V DC ?

NO → (14 SH 8)

YES

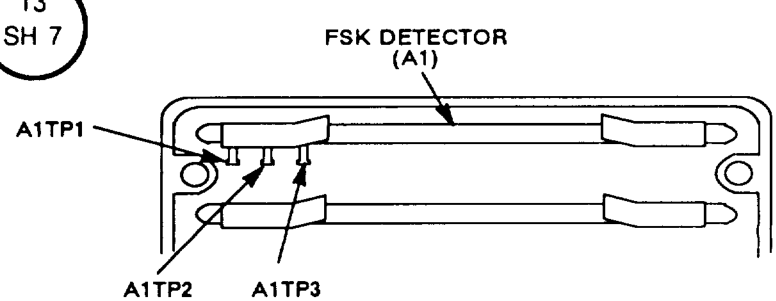
USE X1 PROBE AT A1TP3. READ DMM.

LESS THAN 5 V DC ?

NO → (18 SH 10)

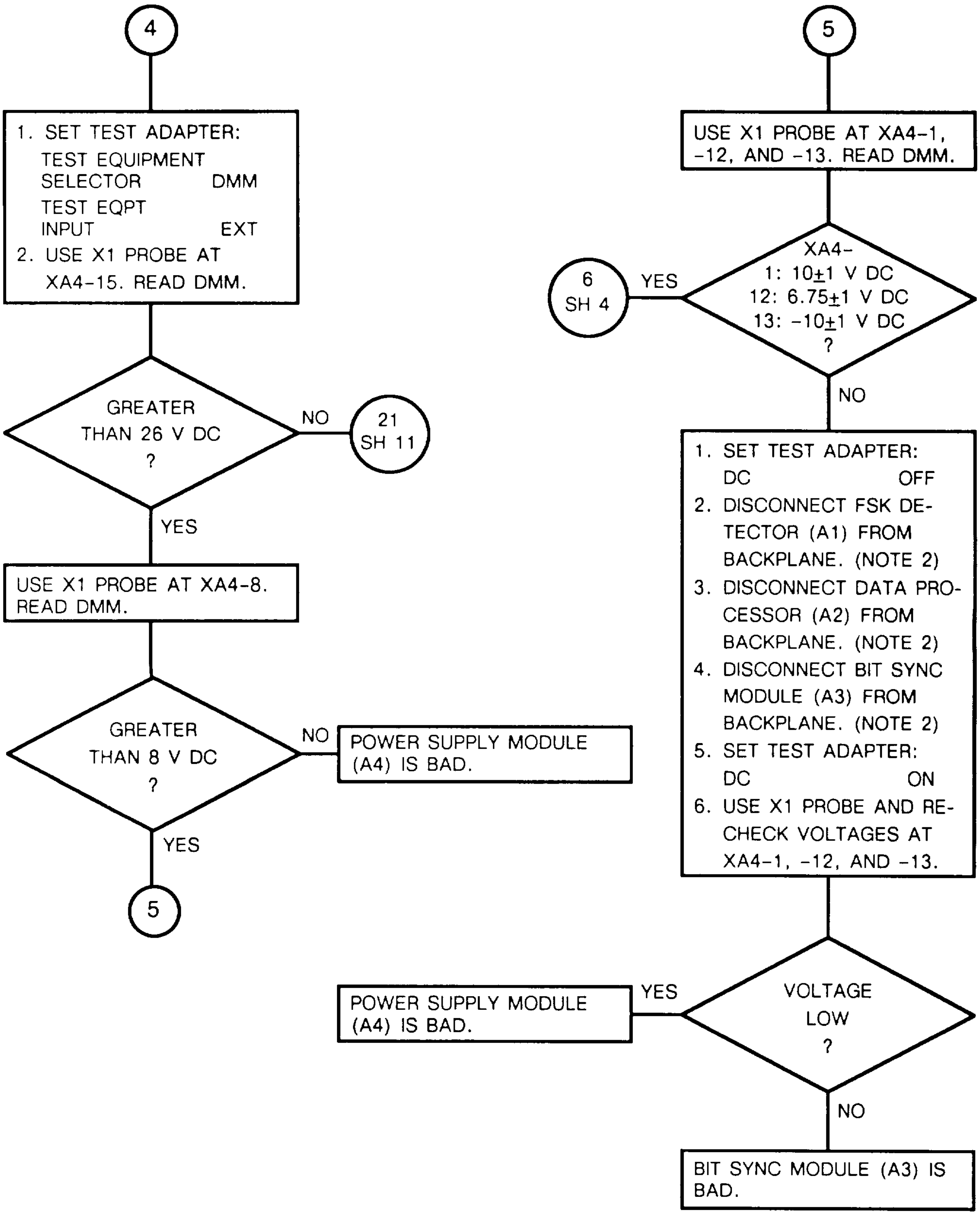
YES

FSK DETECTOR (A1) IS BAD.



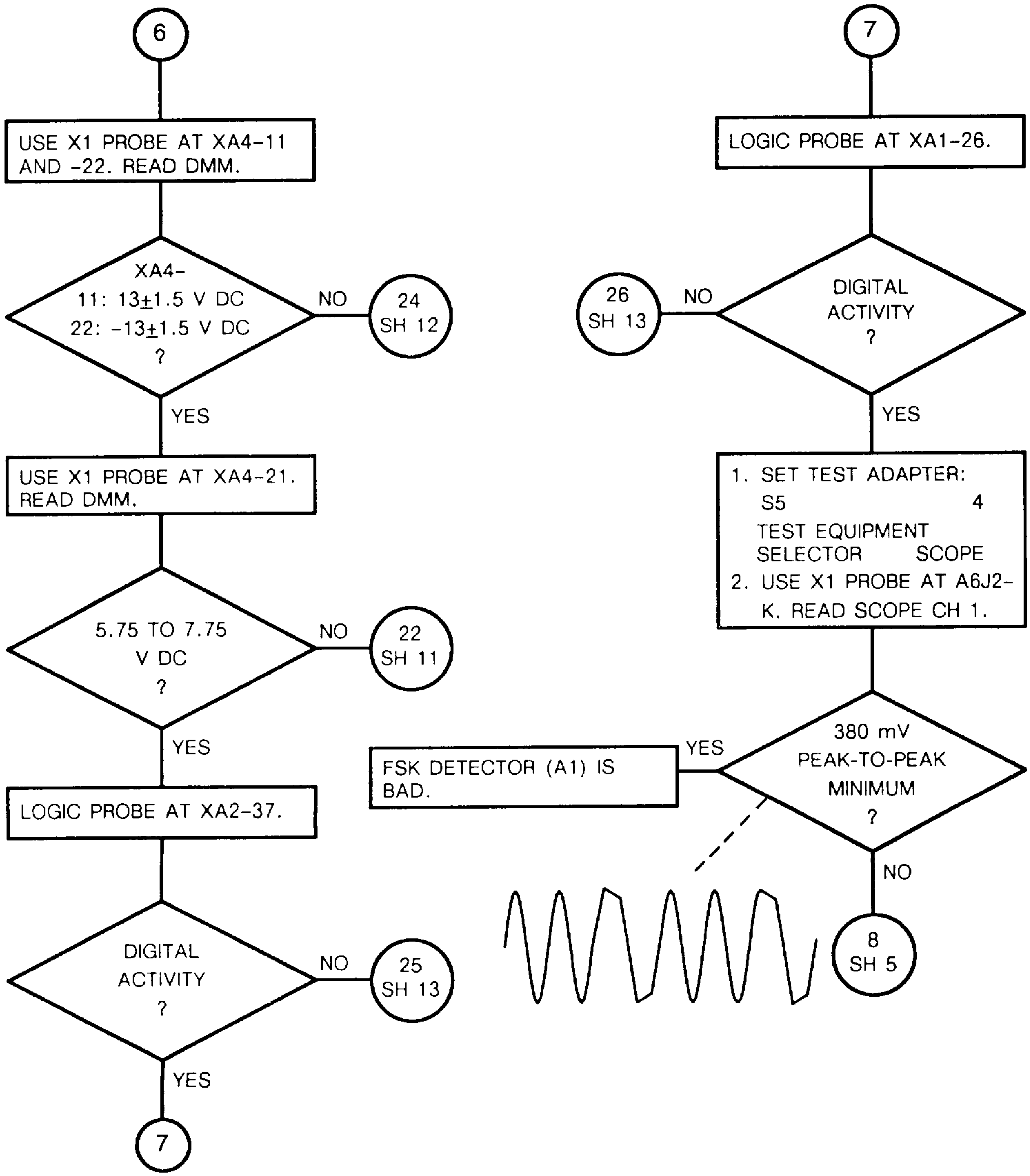
4-12. **TROUBLESHOOTING FLOWCHARTS,** Continued

CHART 1
Fails Self-Test (Sheet 3 of 17)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

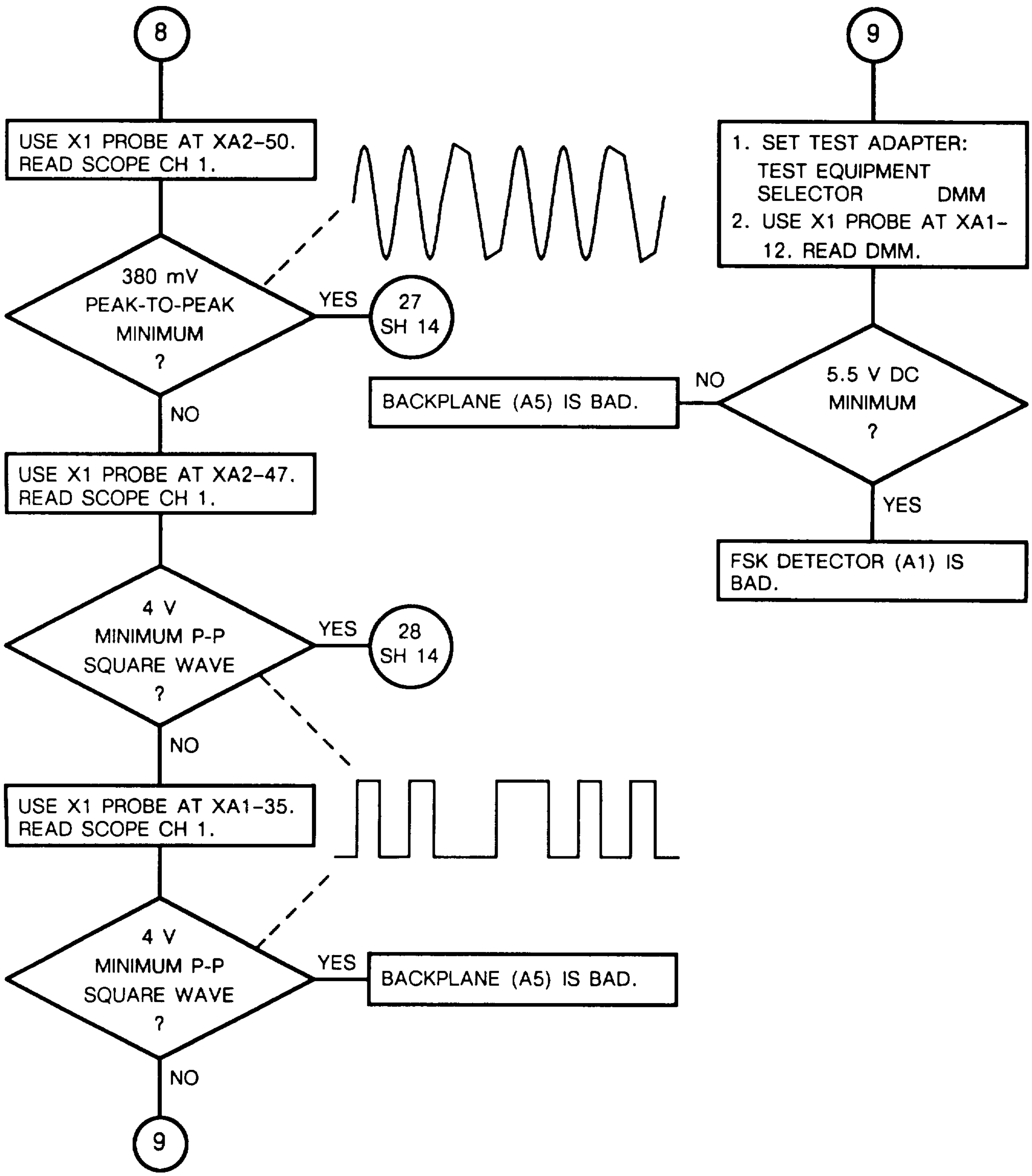
CHART 1
Fails Self-Test (Sheet 4 of 17)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

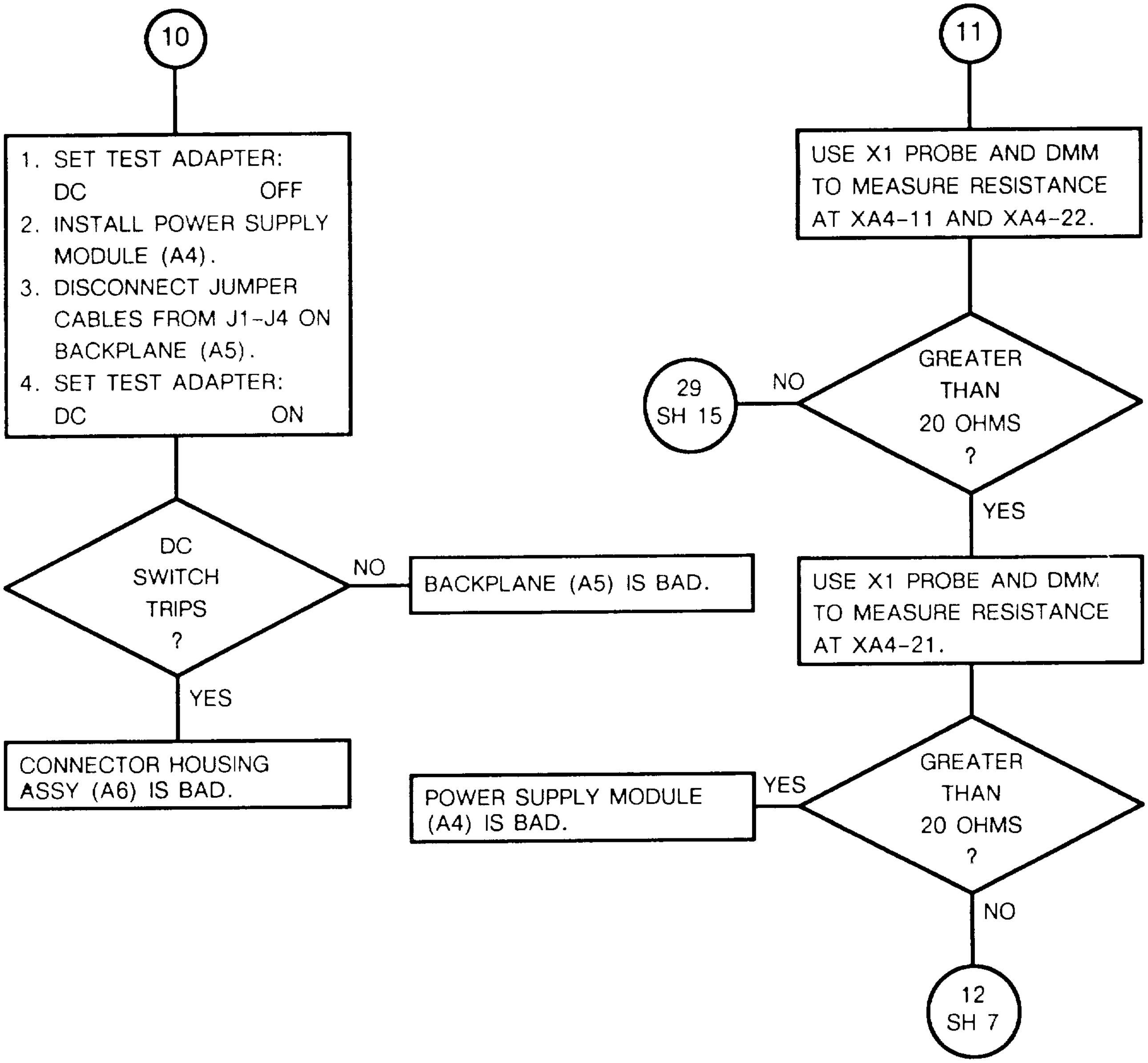
CHART 1

Fails Self-Test (Sheet 5 of 17)



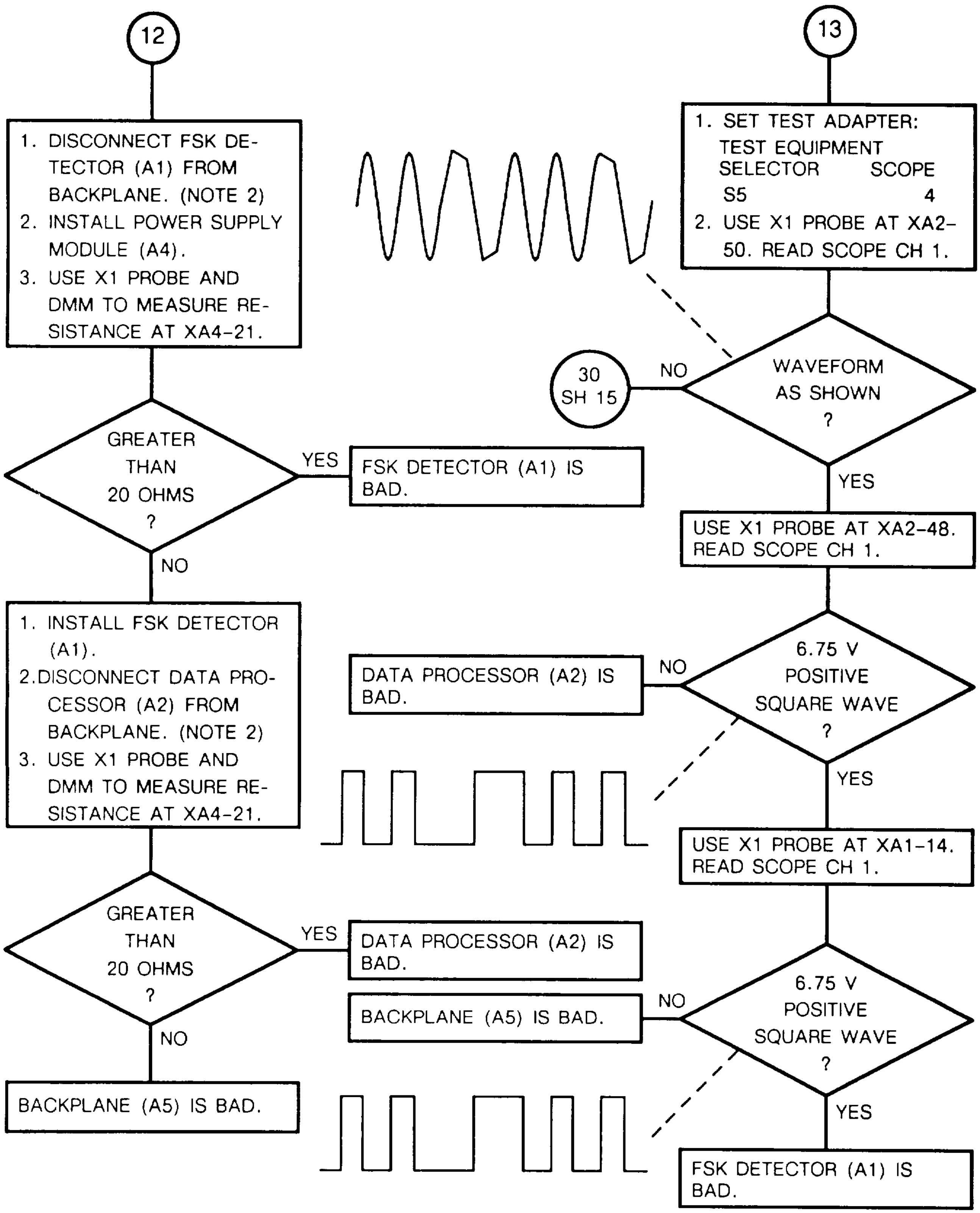
4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 6 of 17)



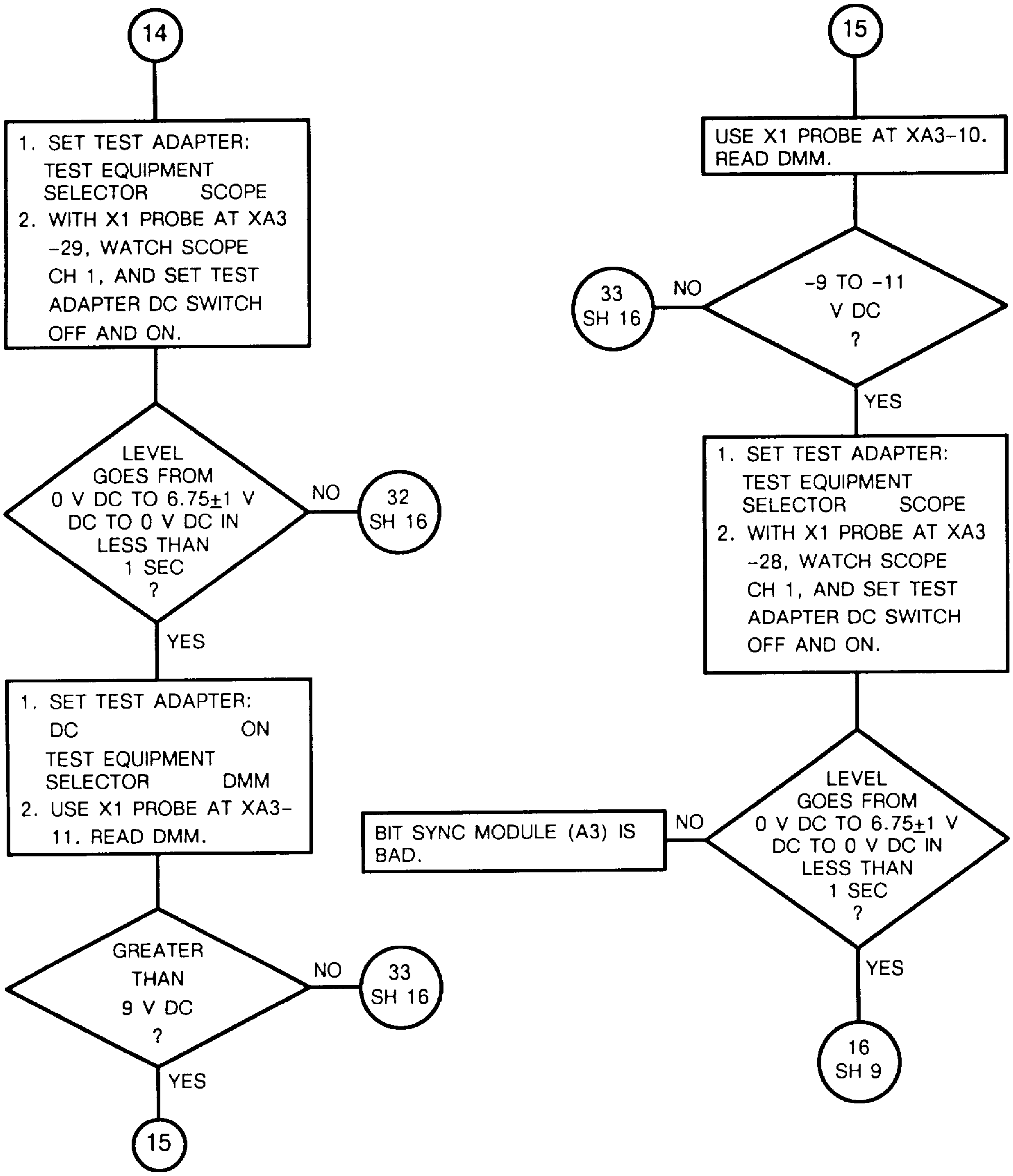
4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 7 of 17)



4-12. **TROUBLESHOOTING FLOWCHARTS.** Continued

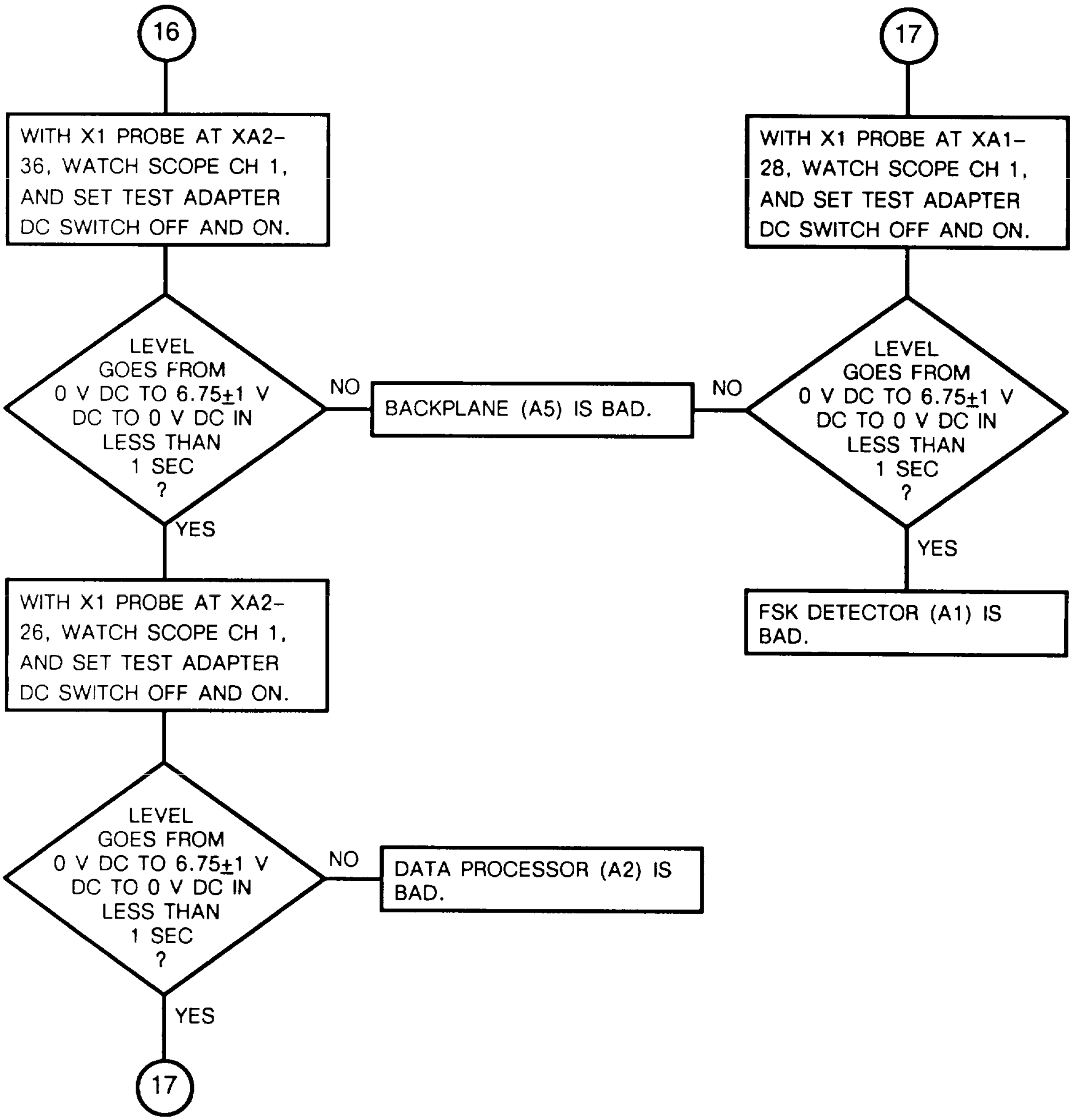
CHART 1
Fails Self-Test (Sheet 8 of 17)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

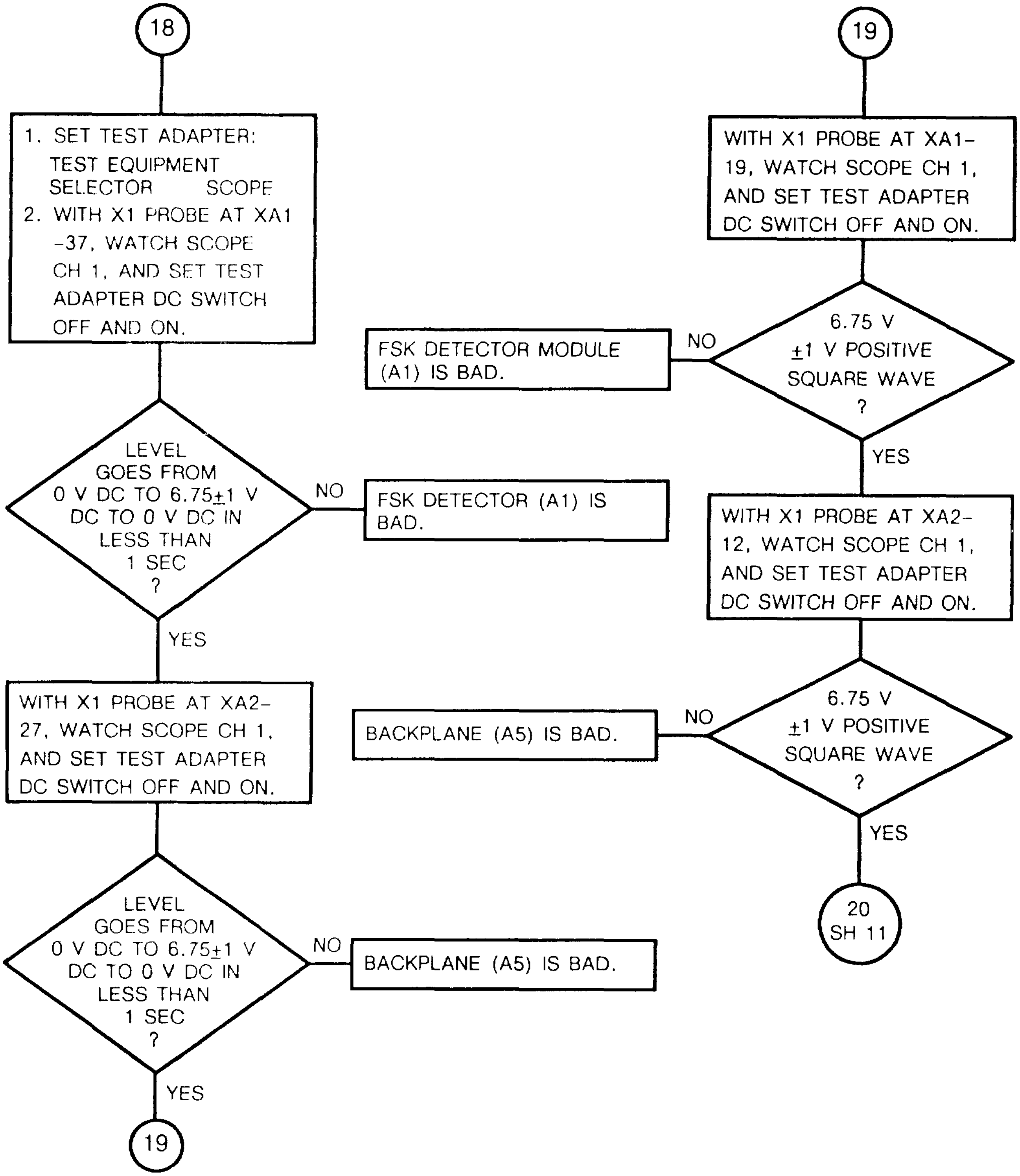
Fails Self-Test (Sheet 9 of 17)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

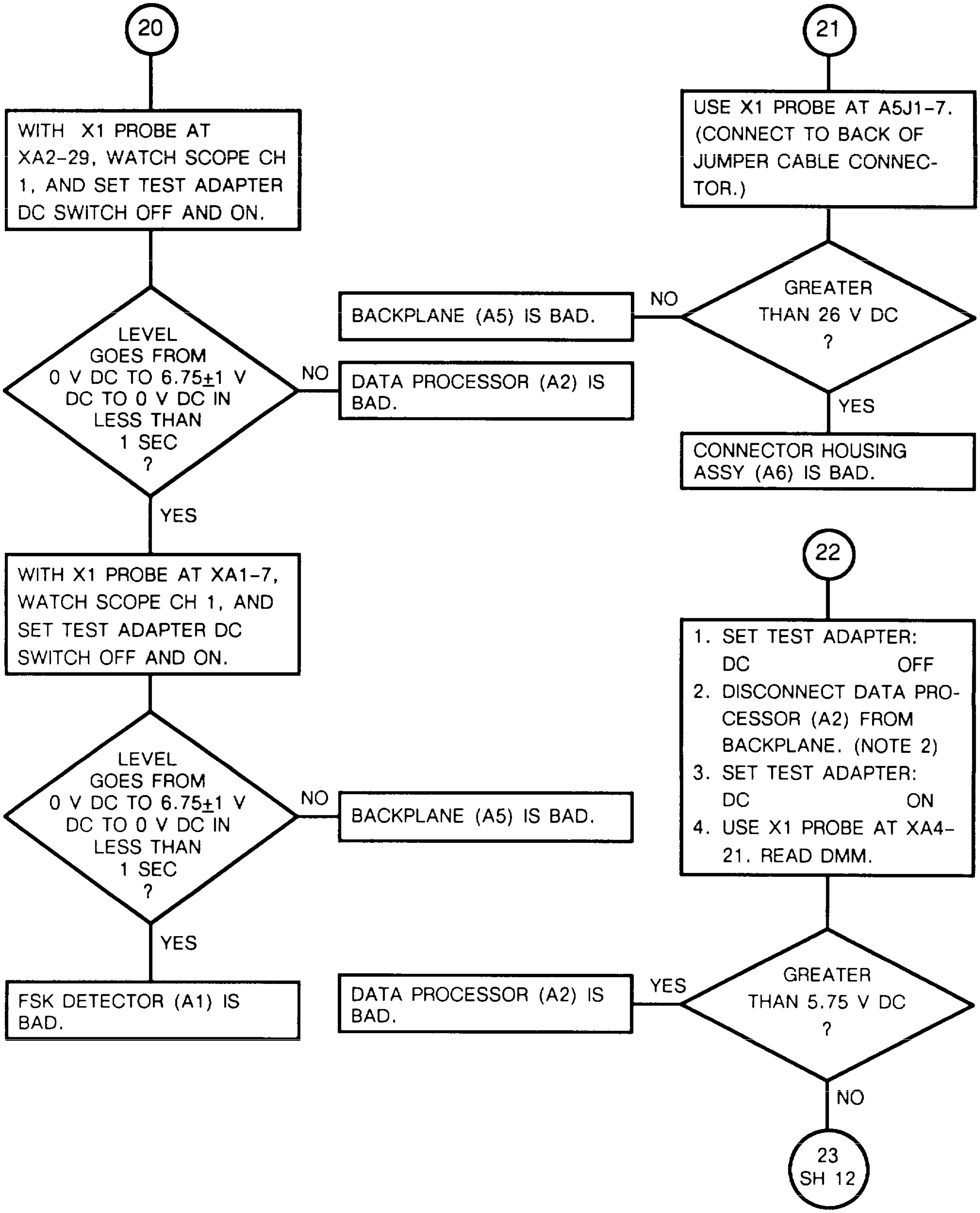
Fails Self-Test (Sheet 10 of 17)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

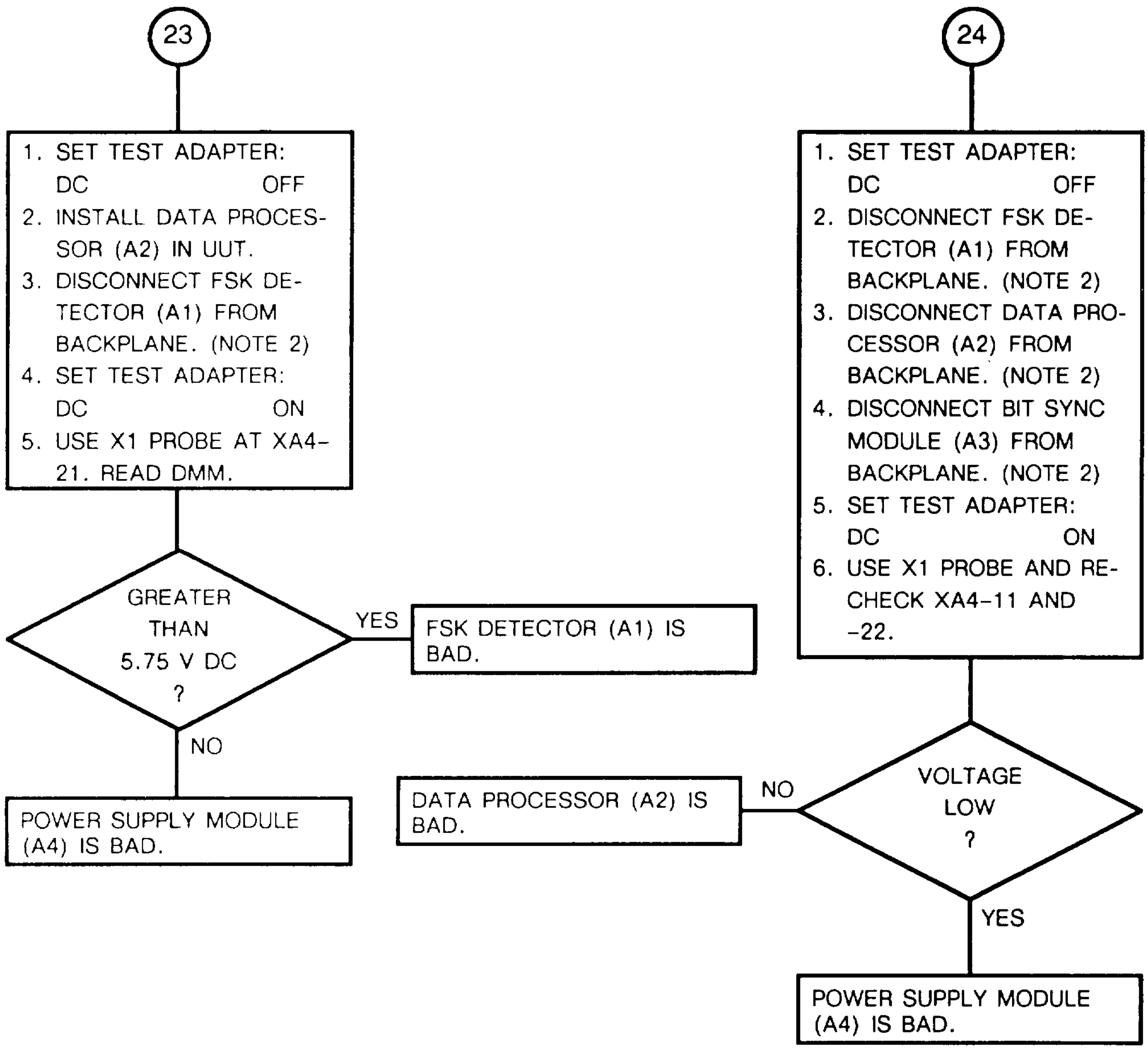
CHART 1

Fails Self-Test (Sheet 11 of 17)



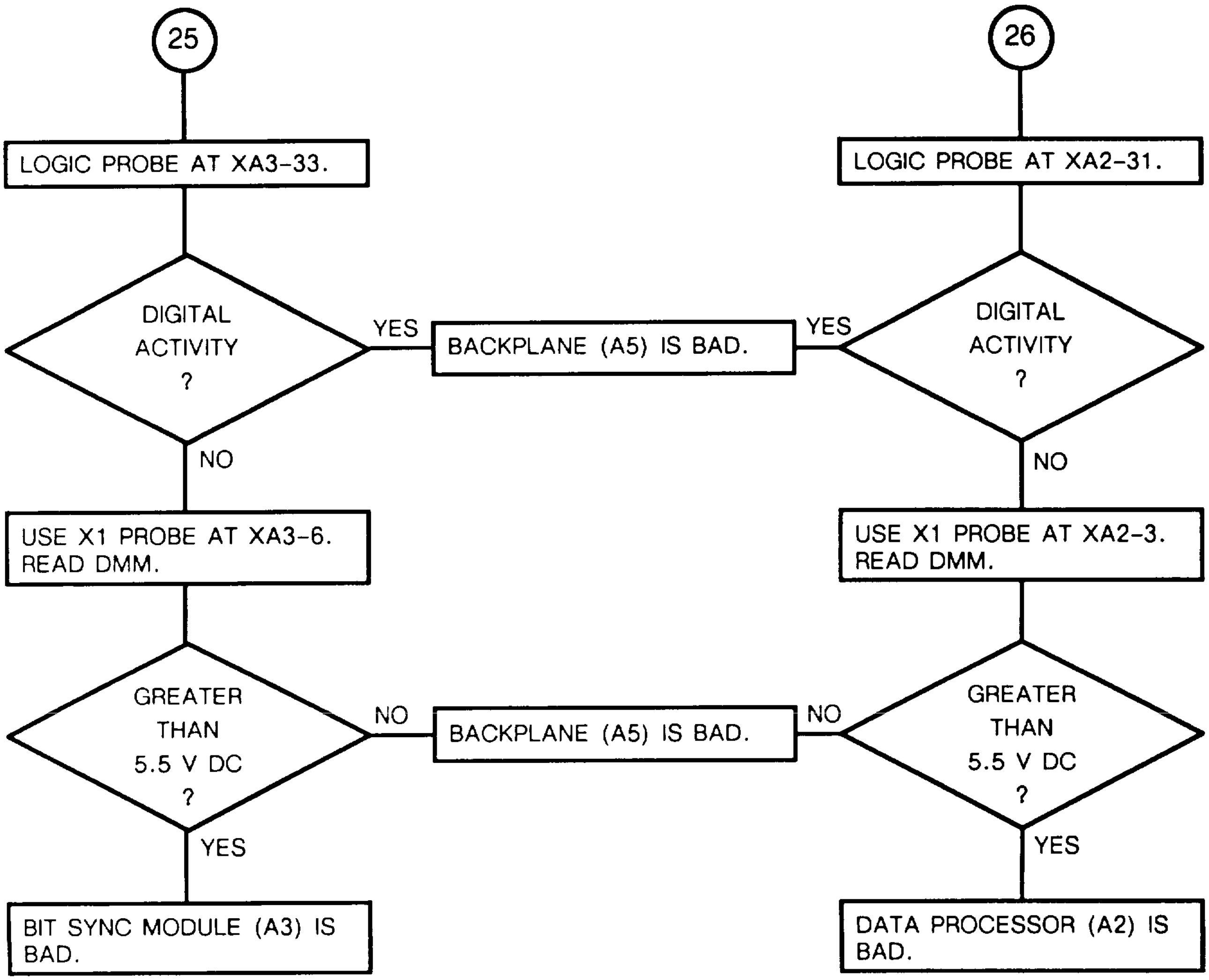
4–12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 12 of 17)



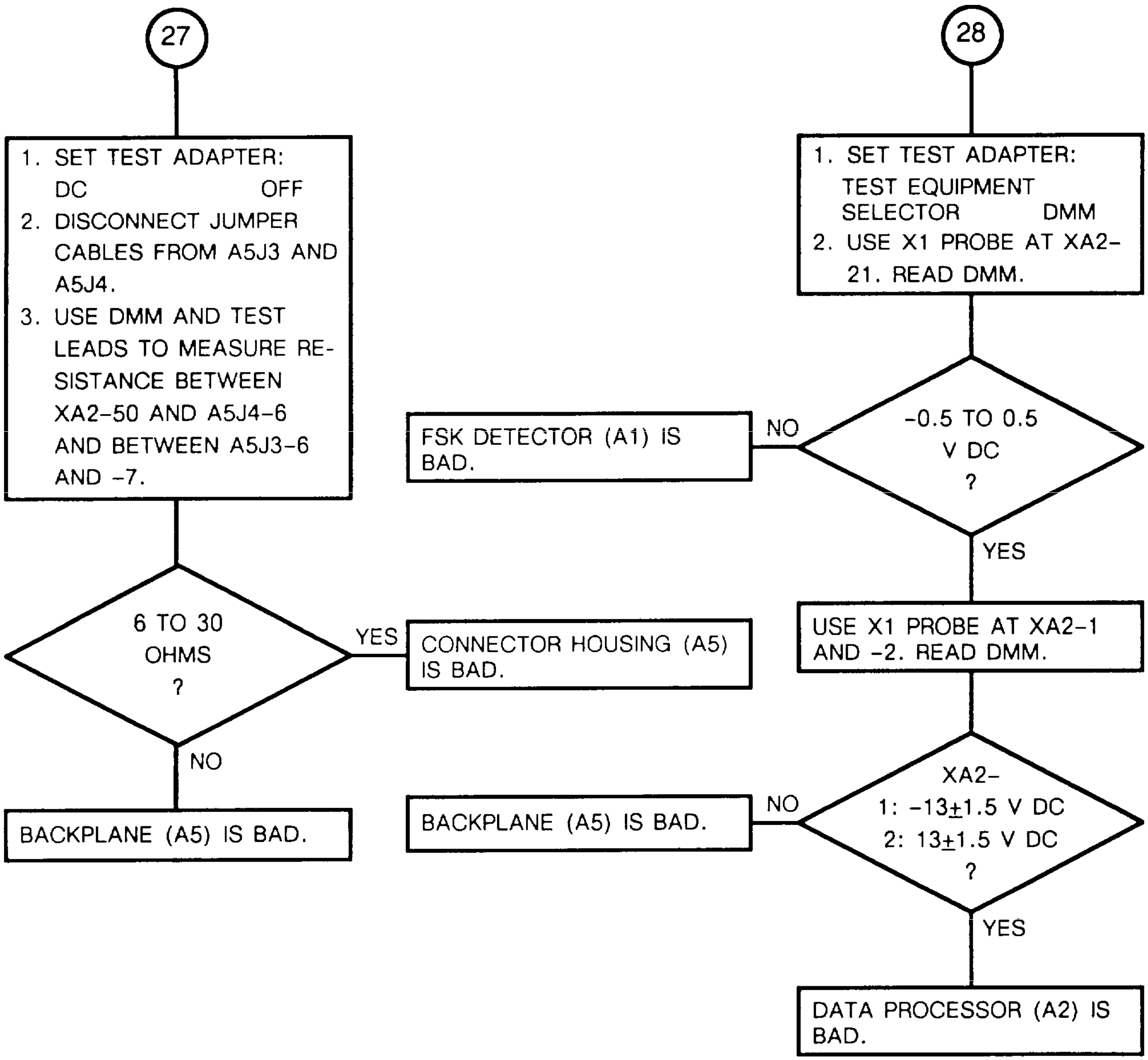
4-12. **TROUBLESHOOTING FLOWCHARTS,** Continued

CHART 1
Fails Self-Test (Sheet 13 of 17)



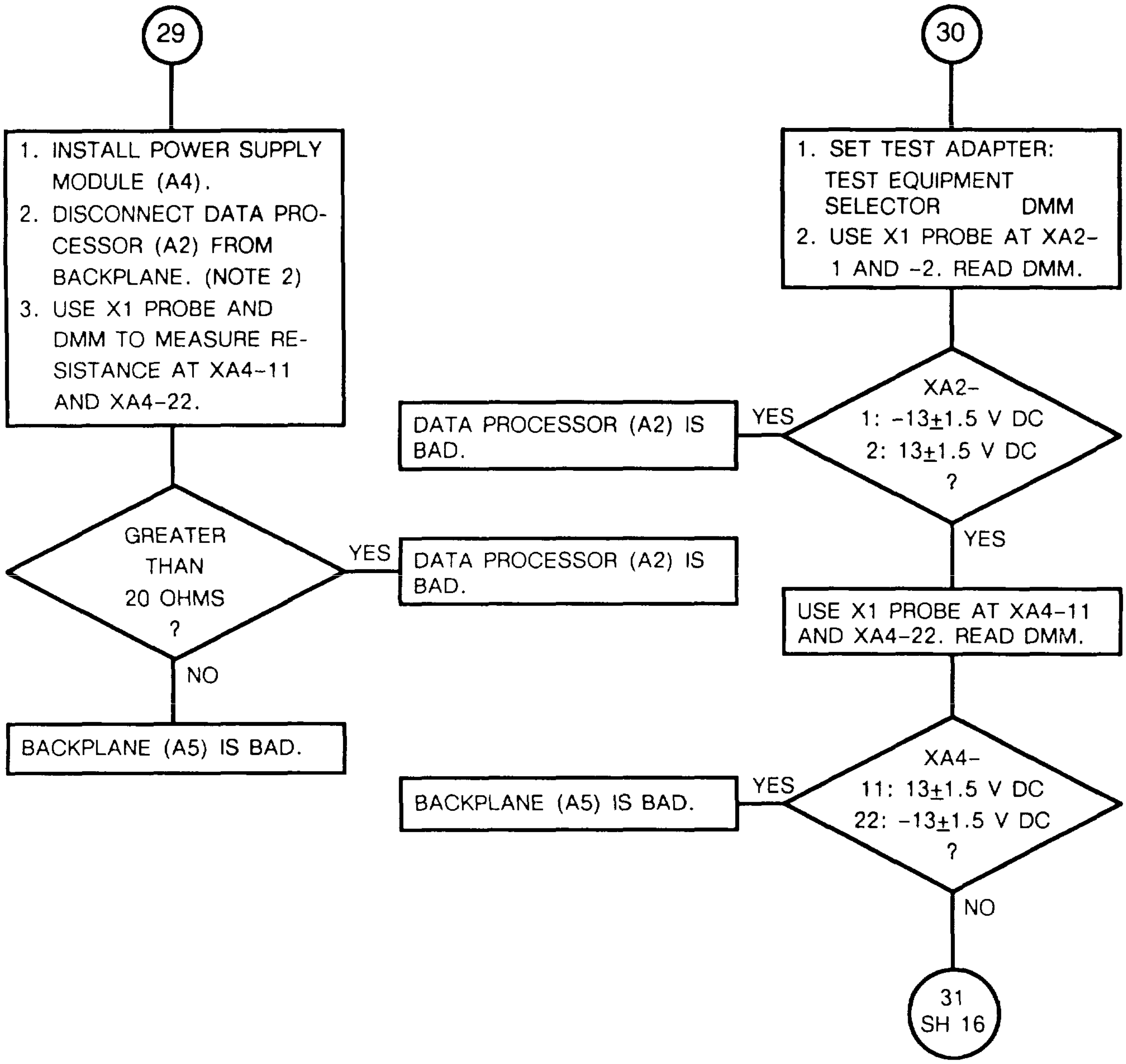
4–12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Fails Self-Test (Sheet 14 of 17)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

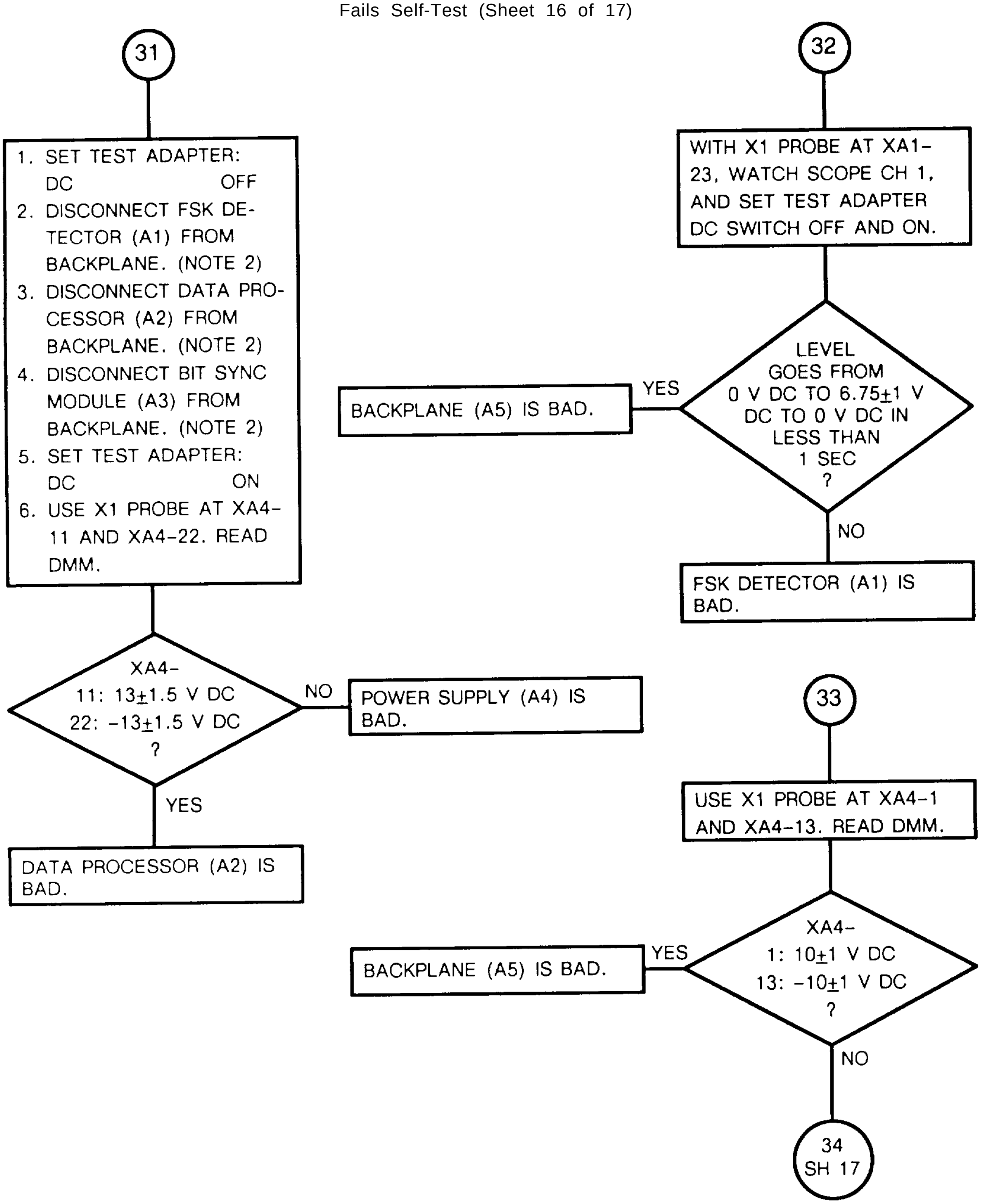
CHART 1
Fails Self-Test (Sheet 15 of 17)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

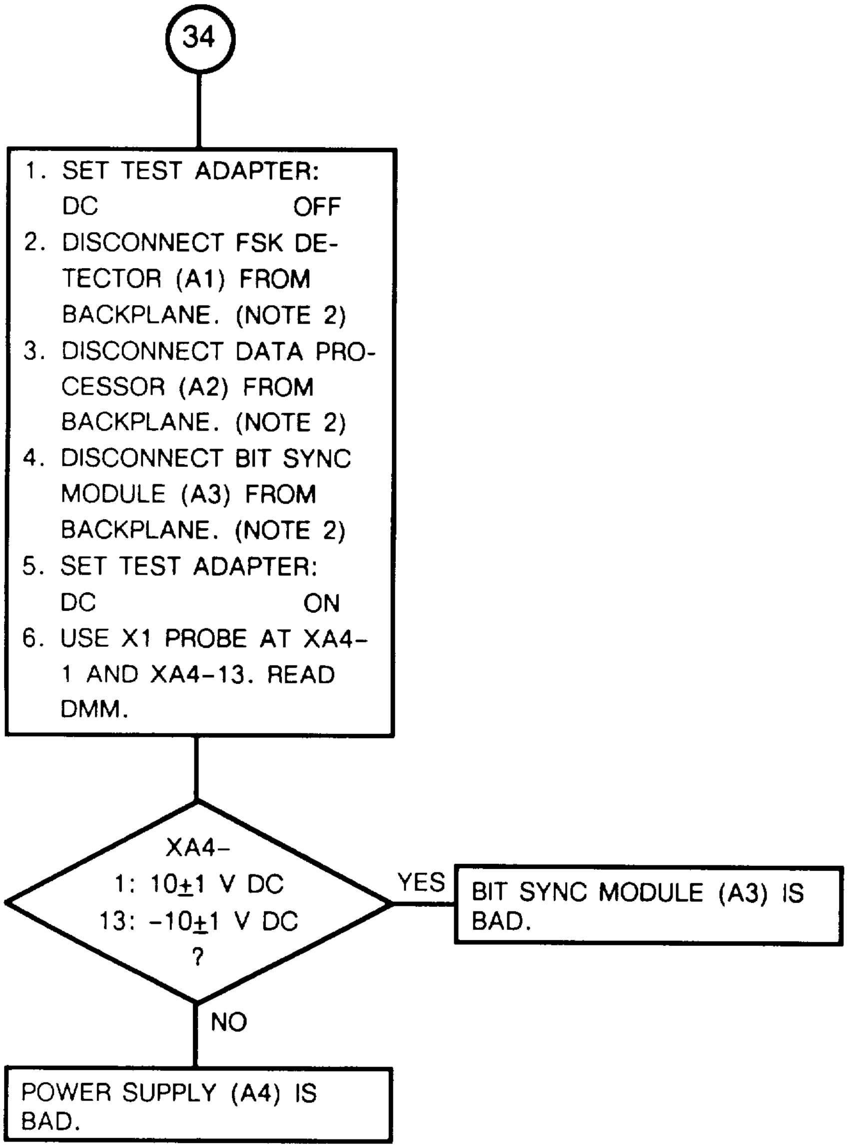
Fails Self-Test (Sheet 16 of 17)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

Fails Self-Test (Sheet 17 0f 17)



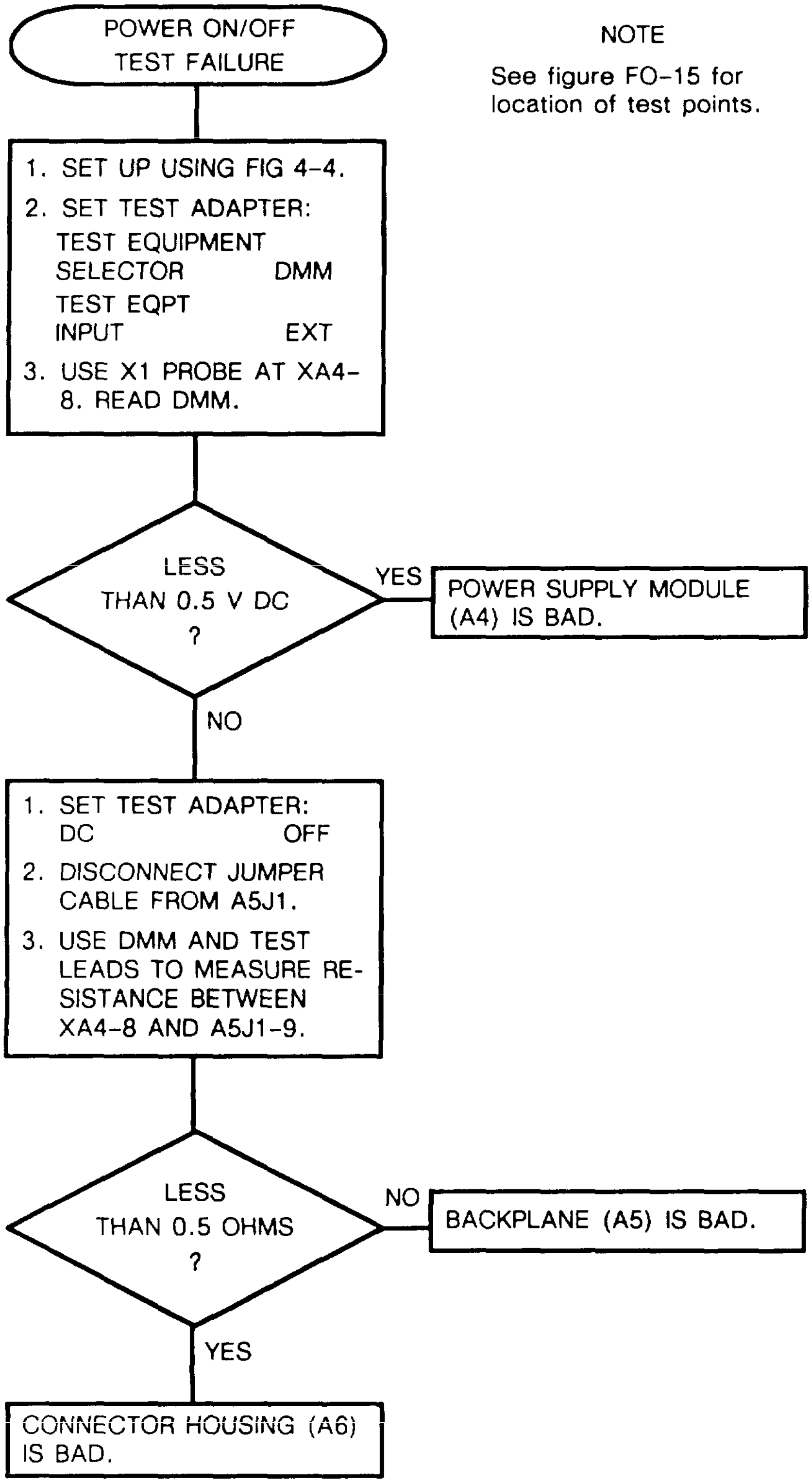
4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2

Fails **Power ON/OFF Test**

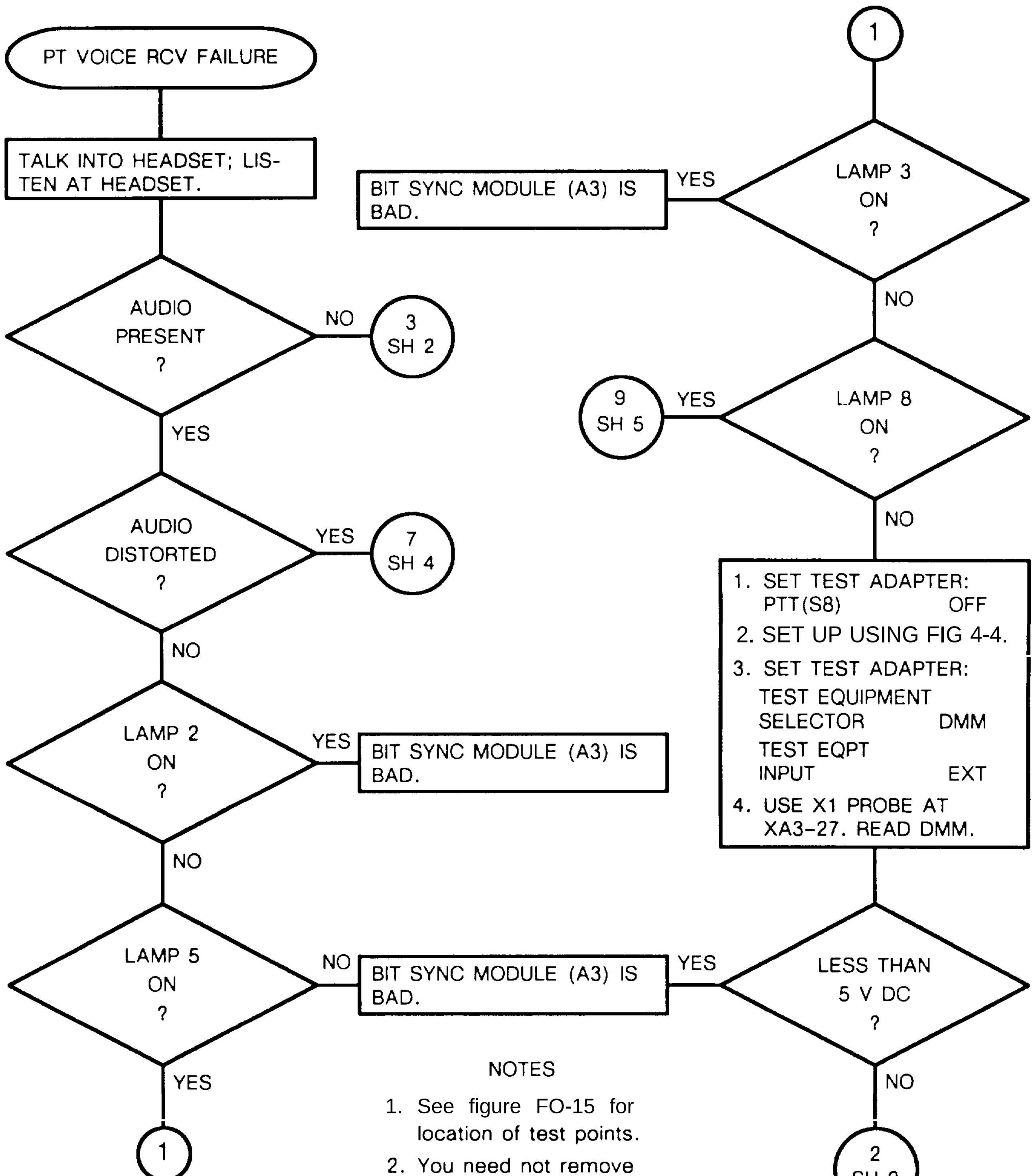
NOTE

See figure FO-15 for location of test points.



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 3

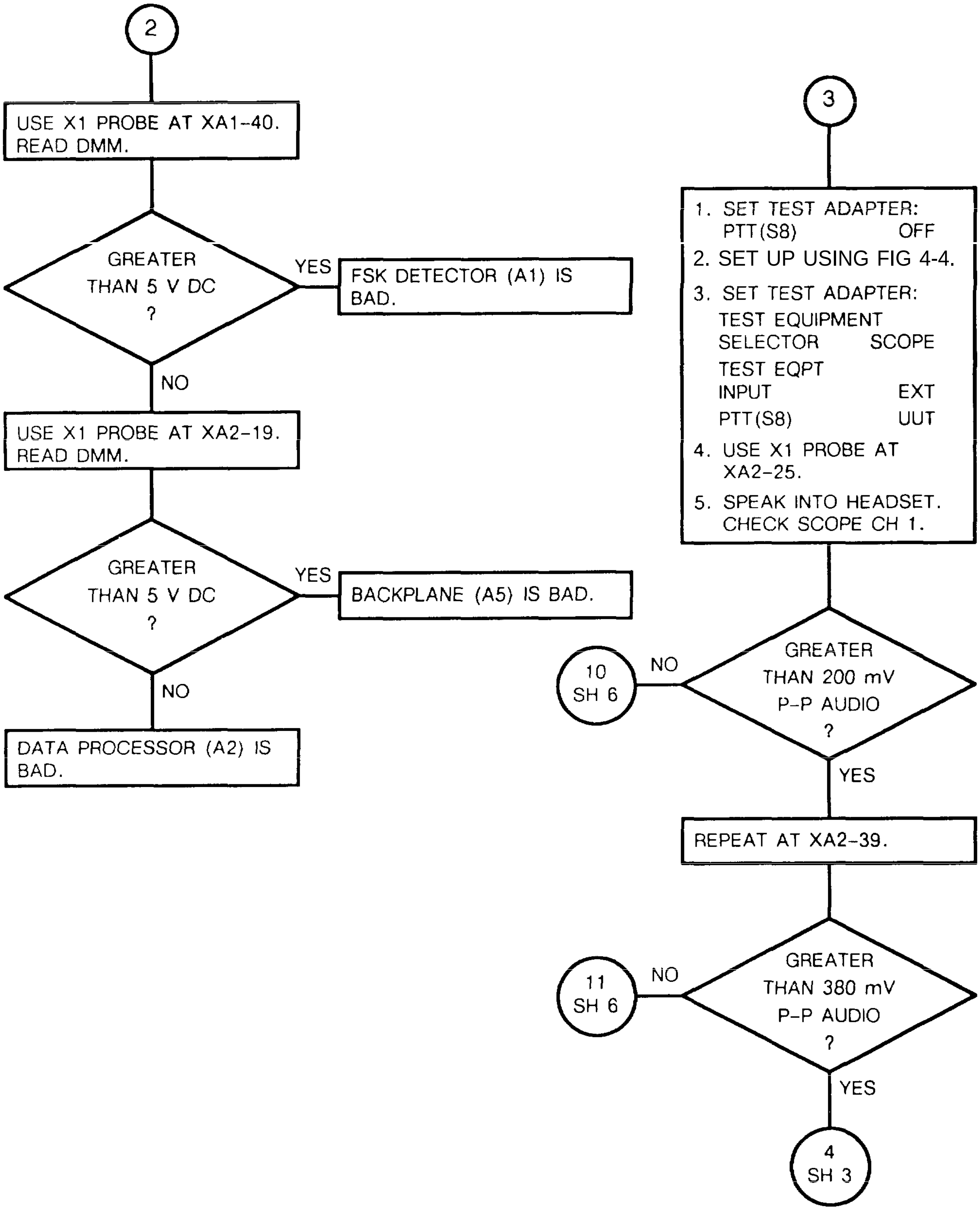


NOTES

1. See figure FO-15 for location of test points.
2. You need not remove modules. Just lift up on card extractors.

4-12. TROUBLESHOOTING FLOWCHARTS. Continued

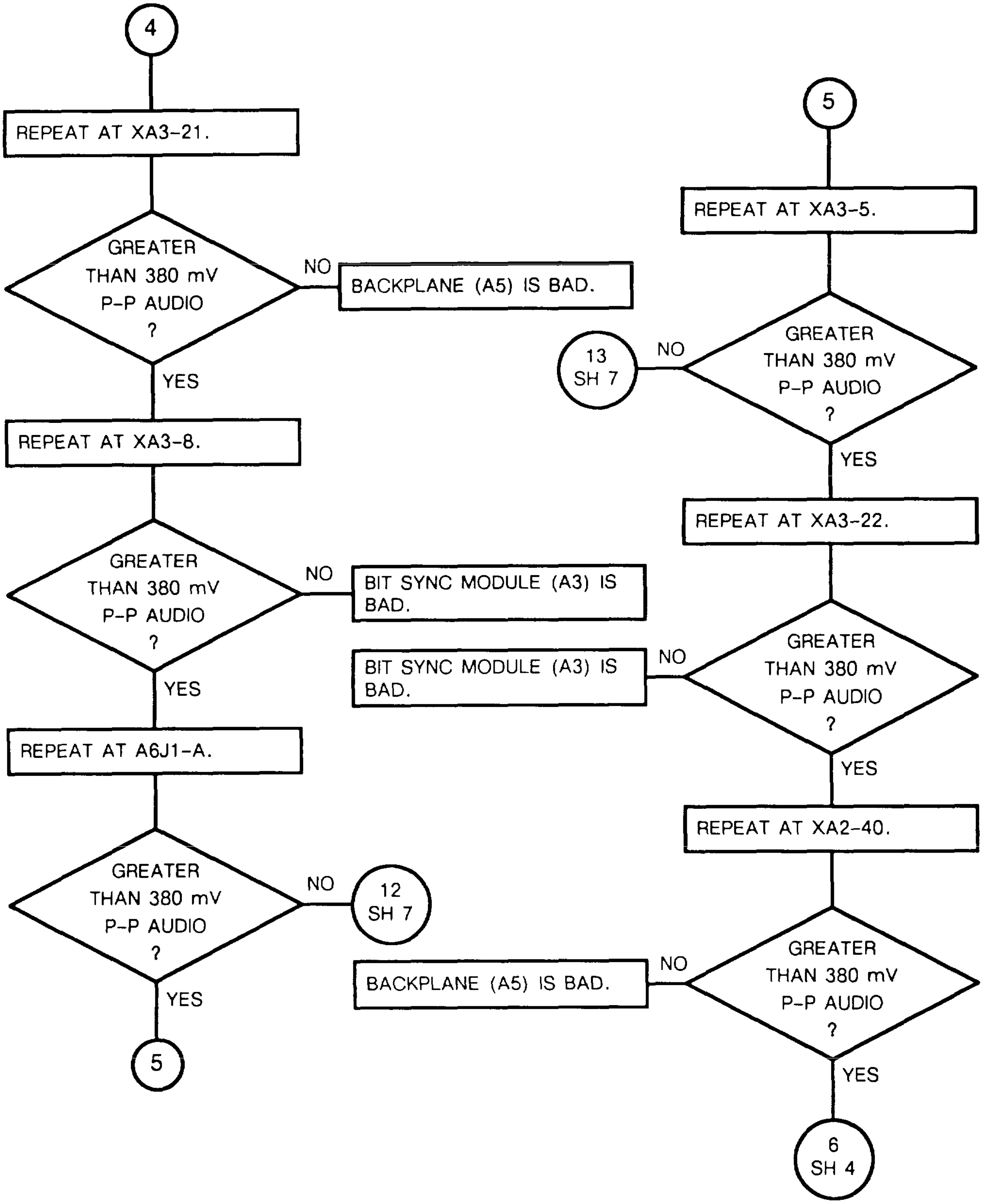
CHART 3
PT Voice Receive Failure (Sheet 2 of 7)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 3

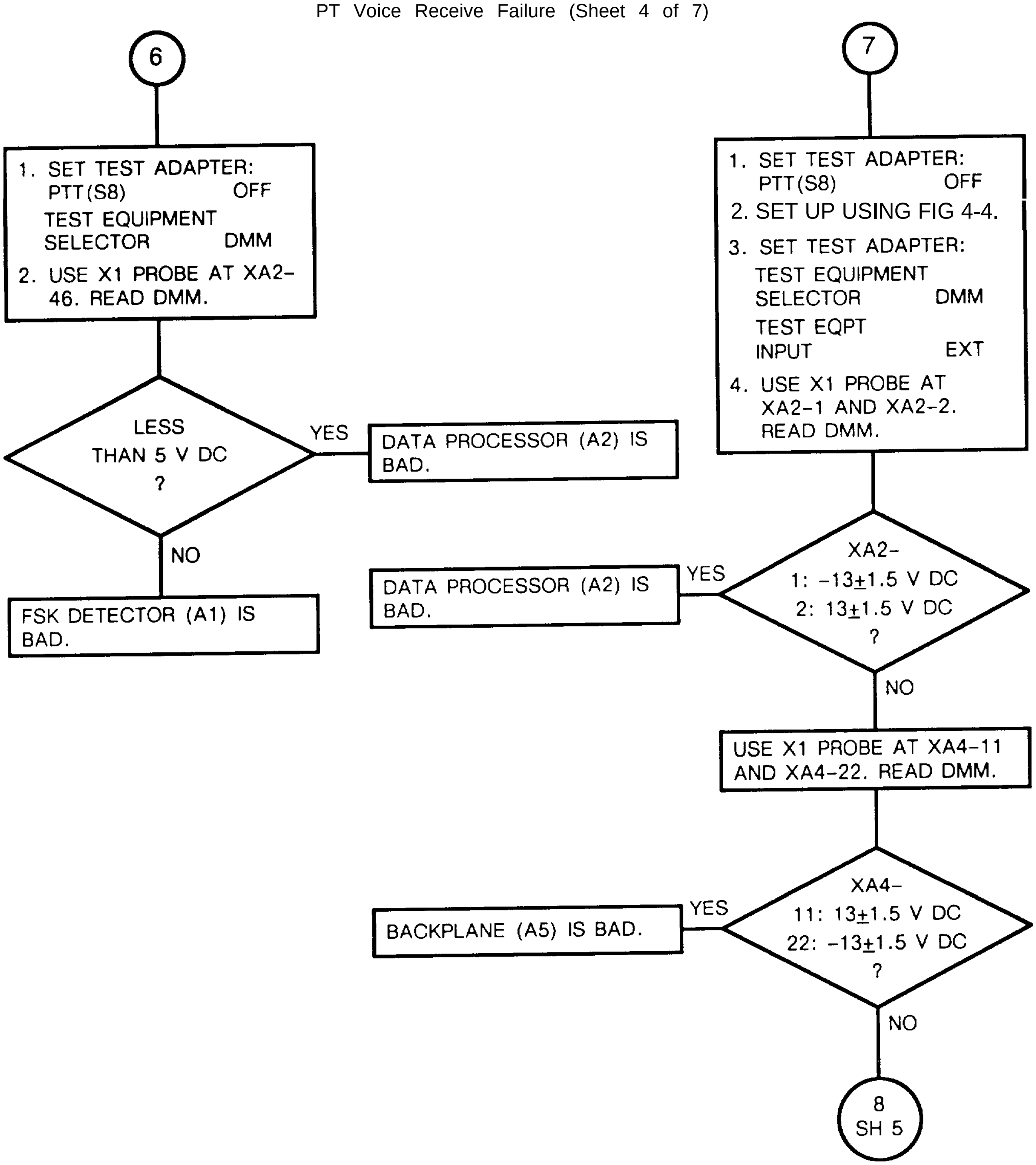
PT Voice Receive Failure (Sheet 3 of 7)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

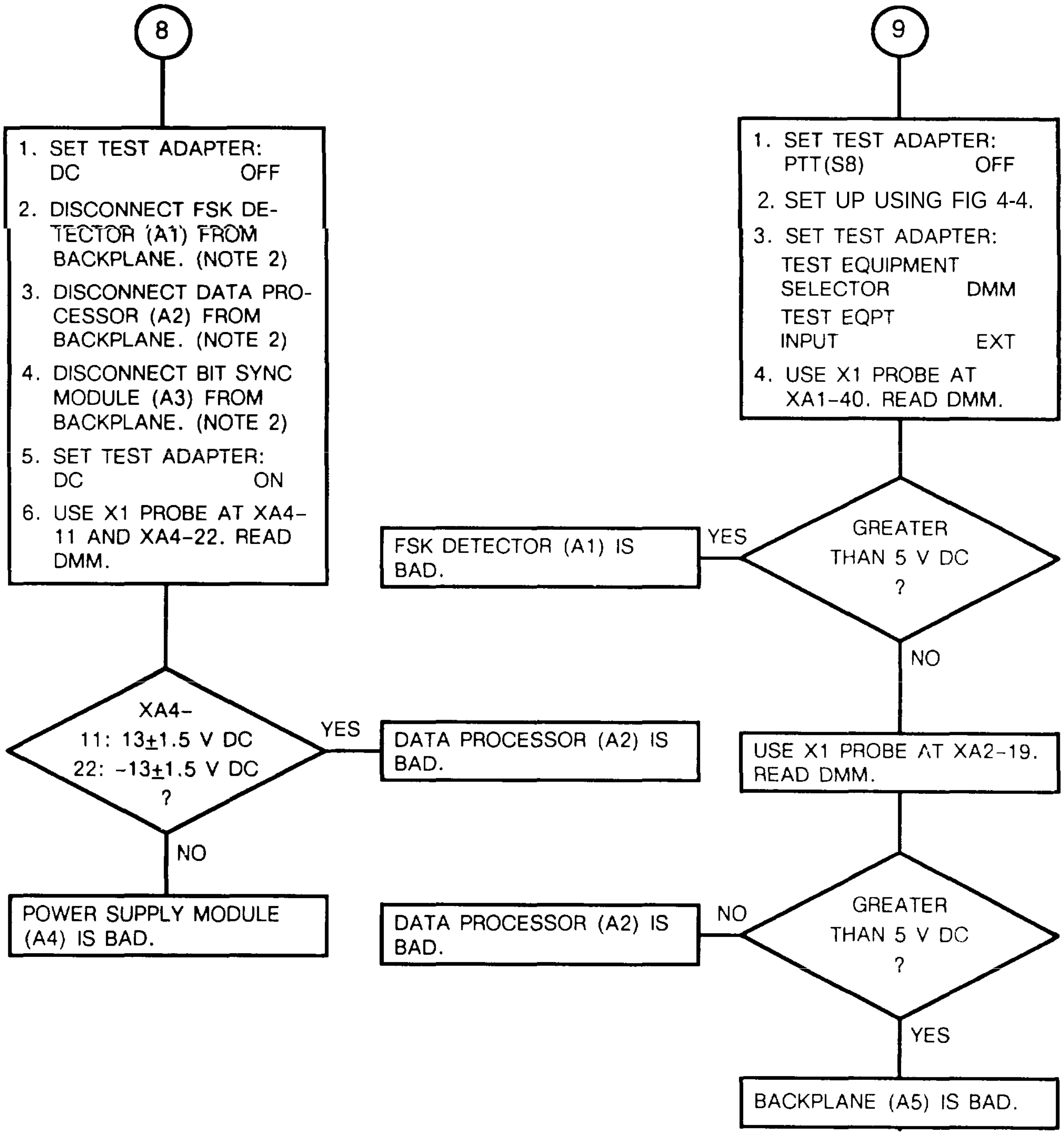
CHART 3

PT Voice Receive Failure (Sheet 4 of 7)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

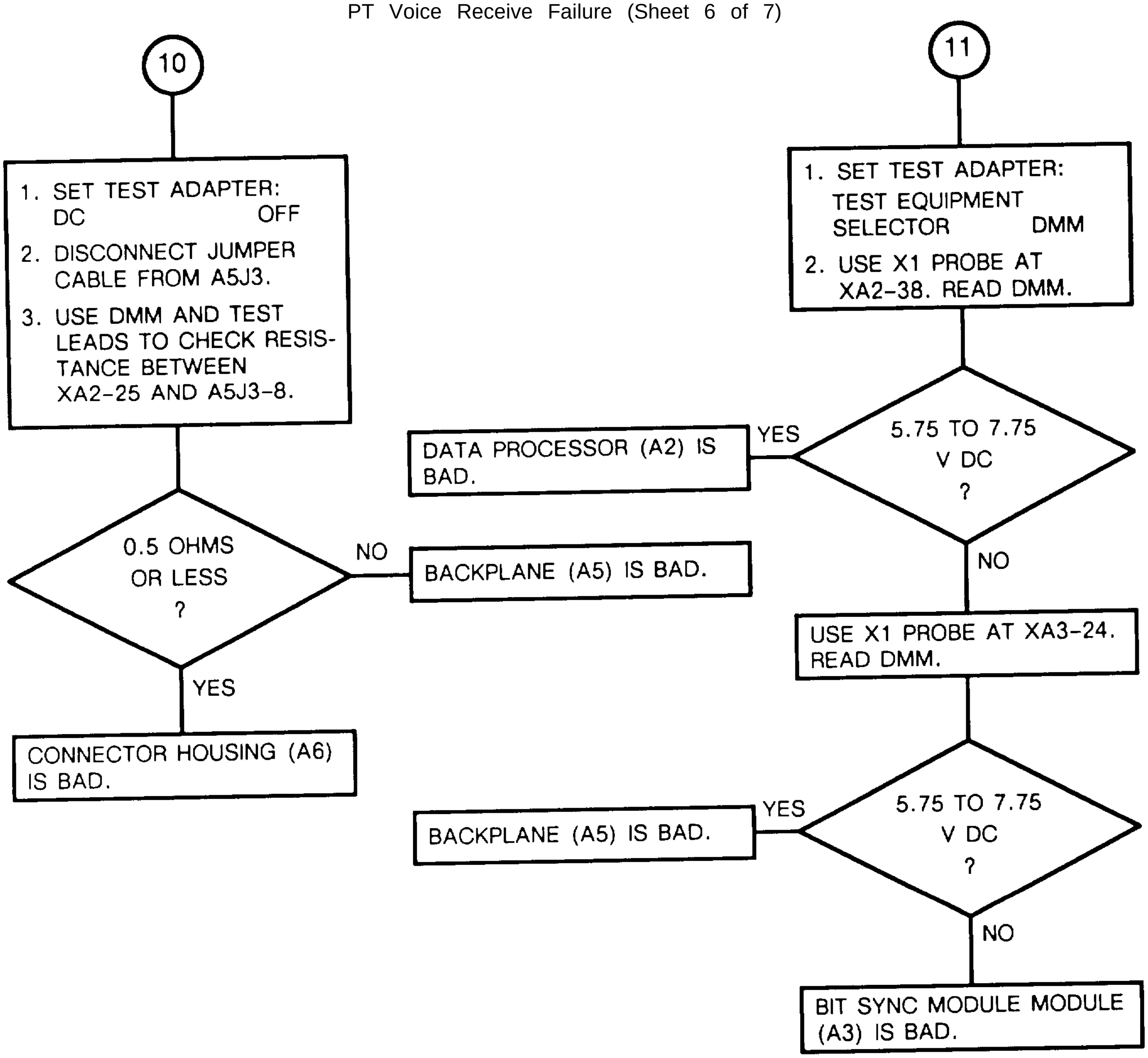
CHART 3
PT Voice Receive Failure (Sheet 5 of 7)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

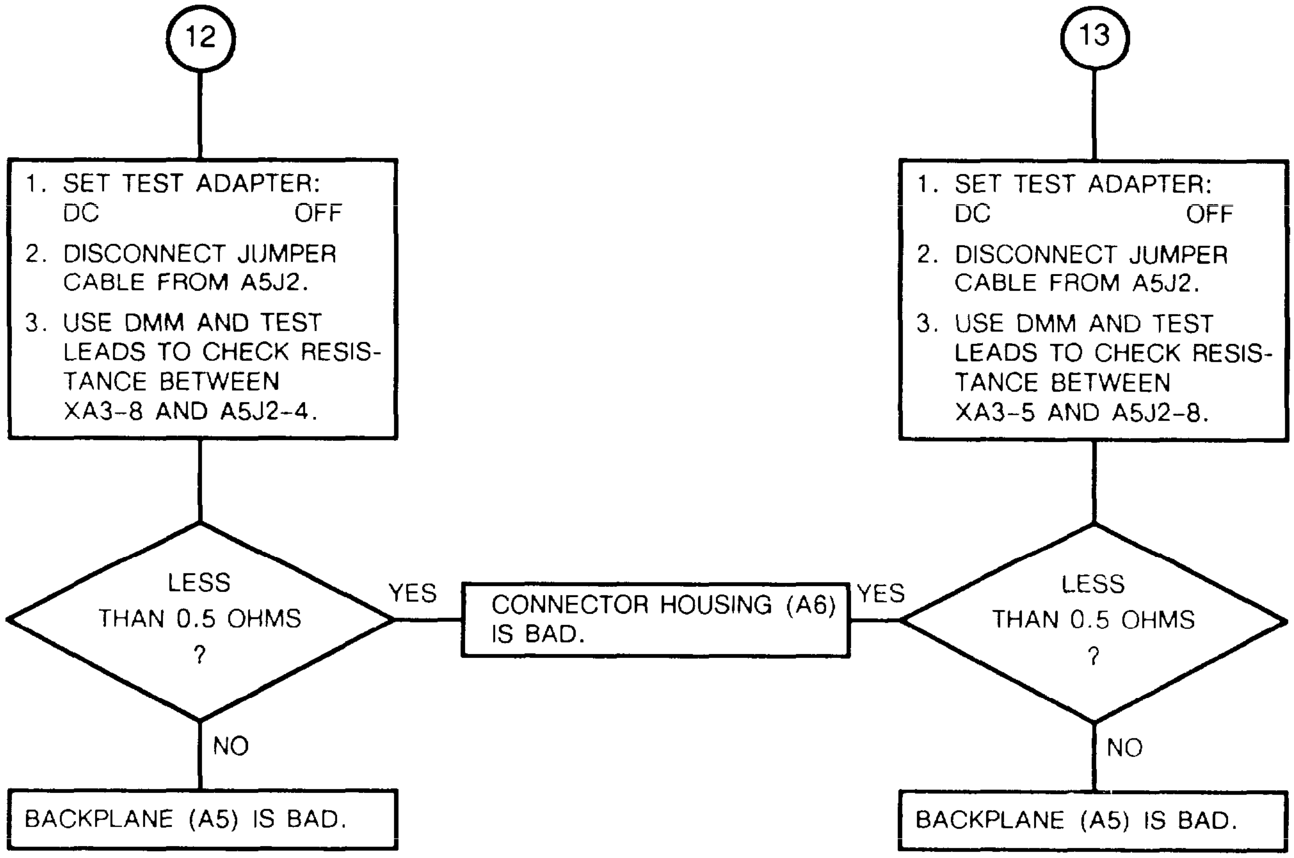
CHART 3

PT Voice Receive Failure (Sheet 6 of 7)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

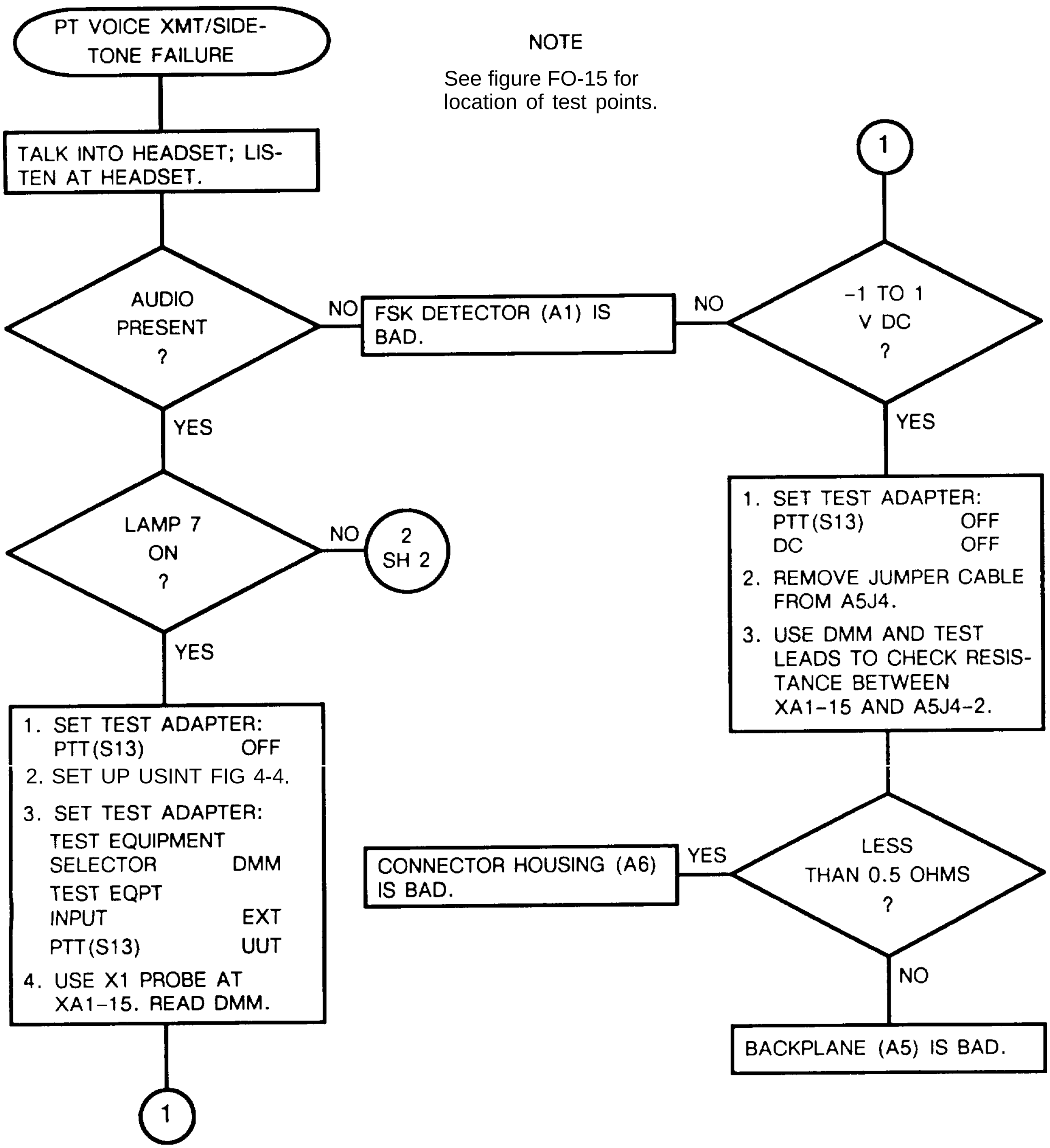
CHART 3
PT Voice Receive Failure (Sheet 7 of 7)



4–12. TROUBLESHOOTING FLOWCHARTS. Continued

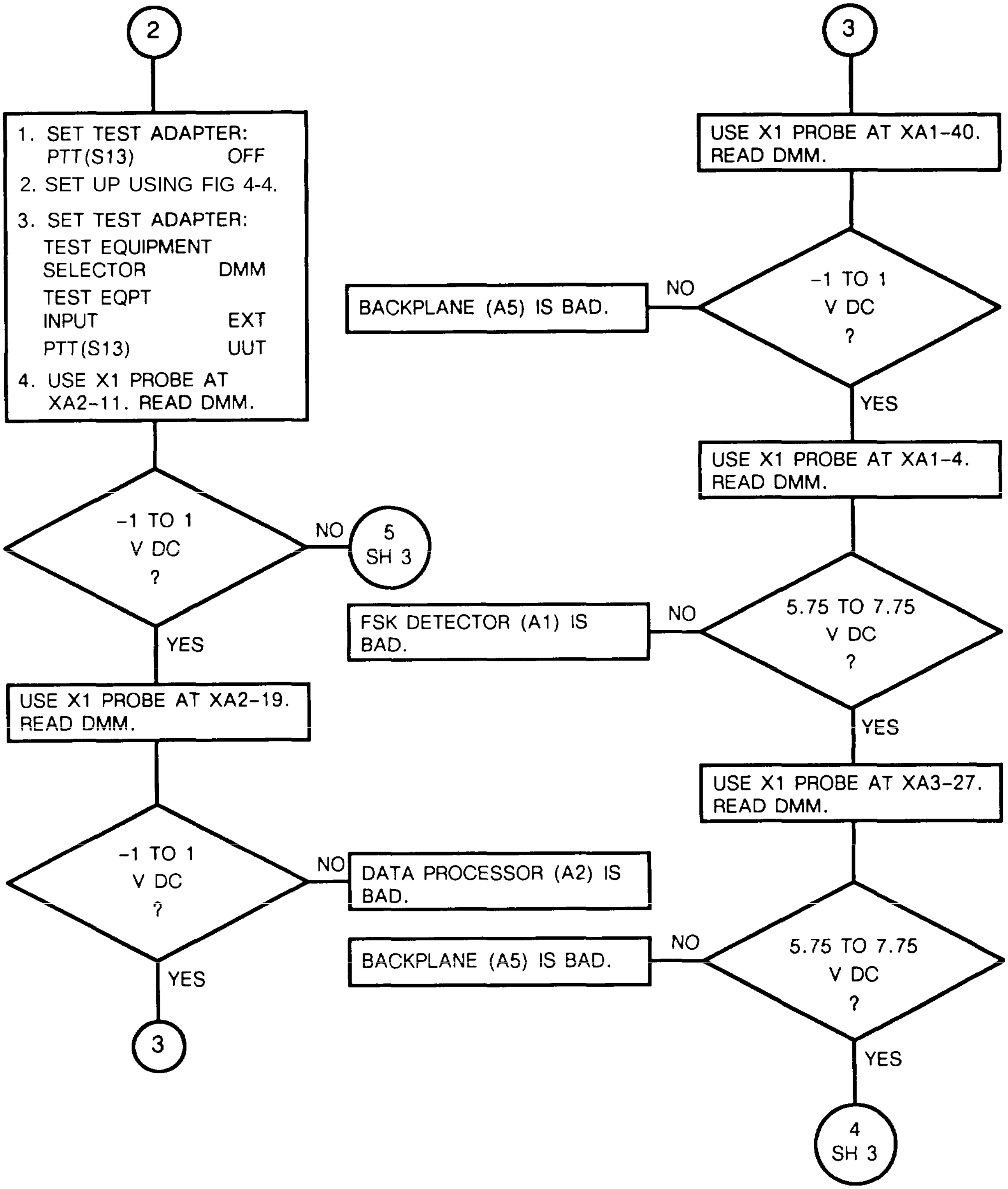
CHART 4

PT Voice Transmit/Sidetone Failure (Sheet 1 of 3)



4-12, TROUBLESHOOTING FLOWCHARTS. Continued

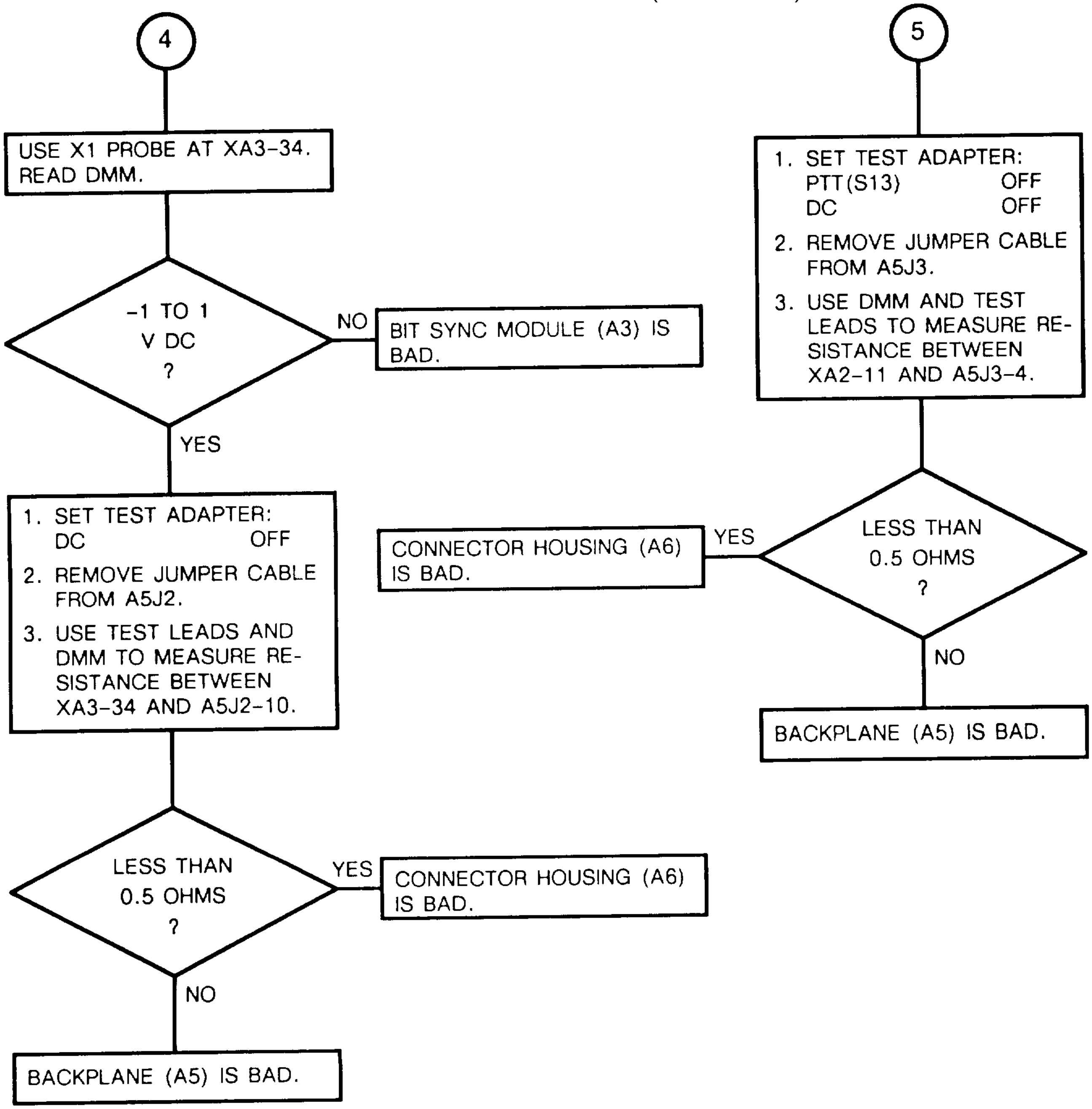
CHART 4
PT Voice Transmit/Sidetone Failure (Sheet 2 of 3)



4–12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 4

PT Voice Transmit/Sidetone Failure (Sheet 3 of 3)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

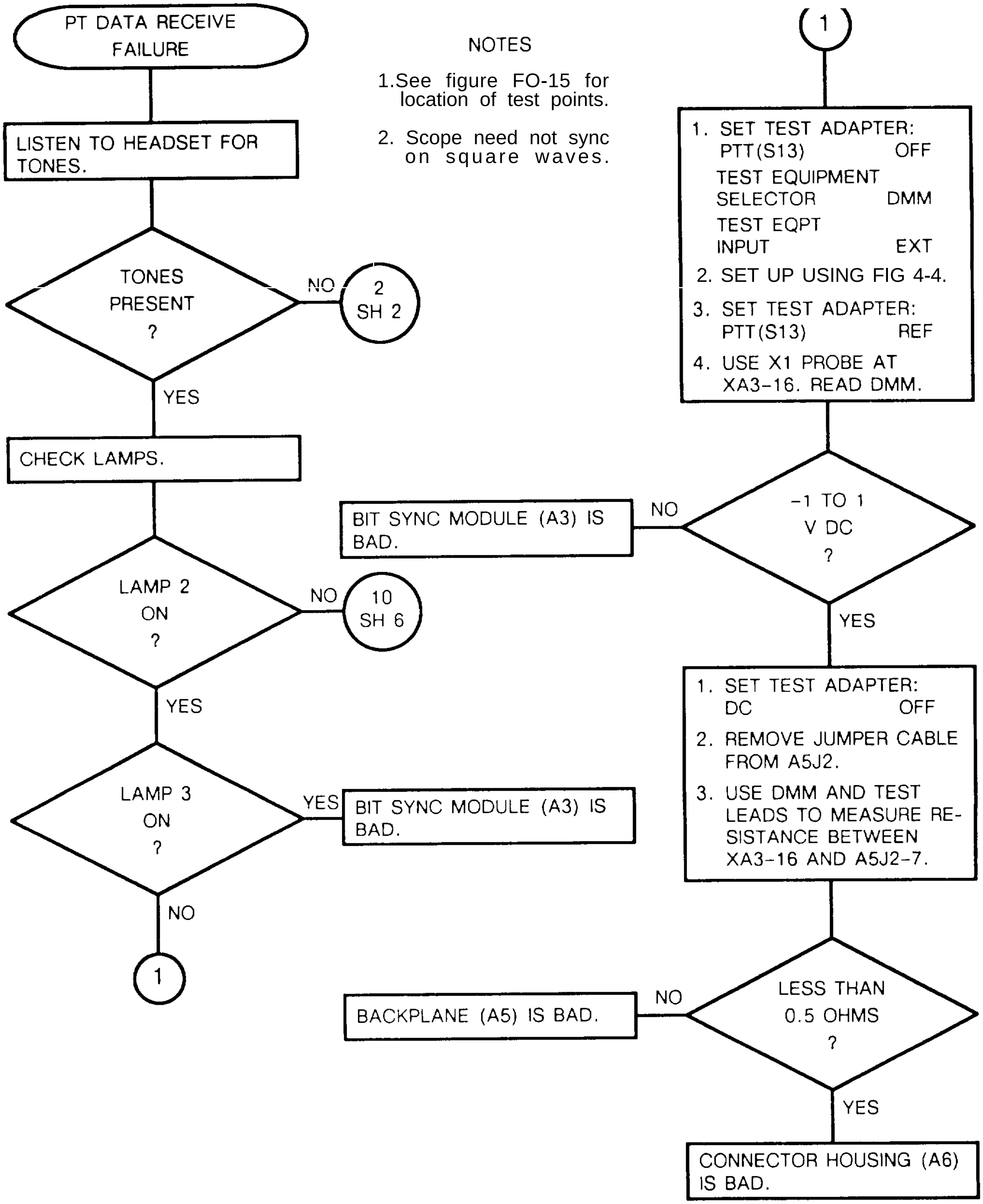
CHART 5

PT Data Receive Failure (Sheet 1 of 7)

NOTES

1. See figure FO-15 for location of test points.

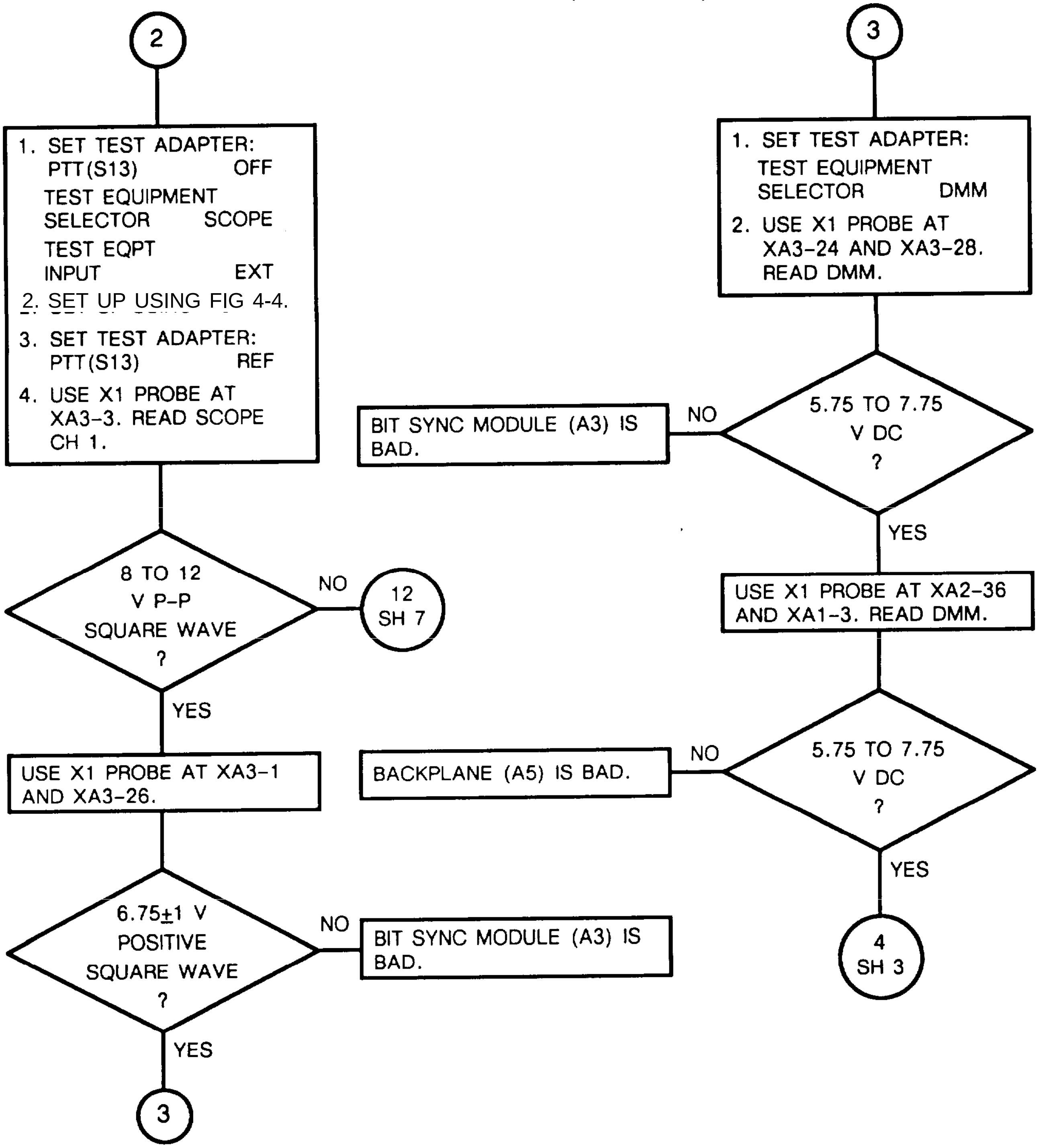
2. Scope need not sync on square waves.



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

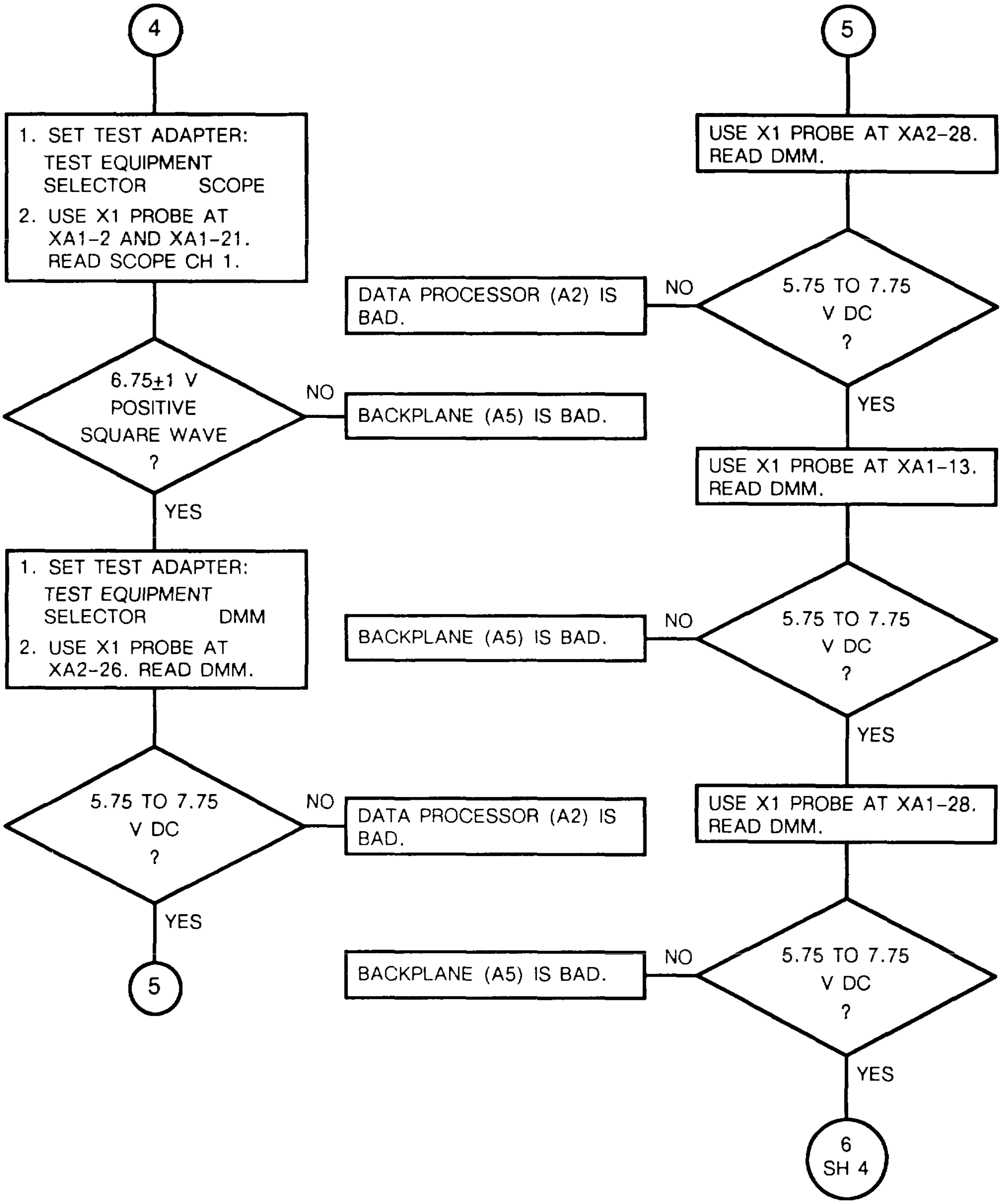
CHART 5

PT Data Receive Failure (Sheet 2 of 7)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

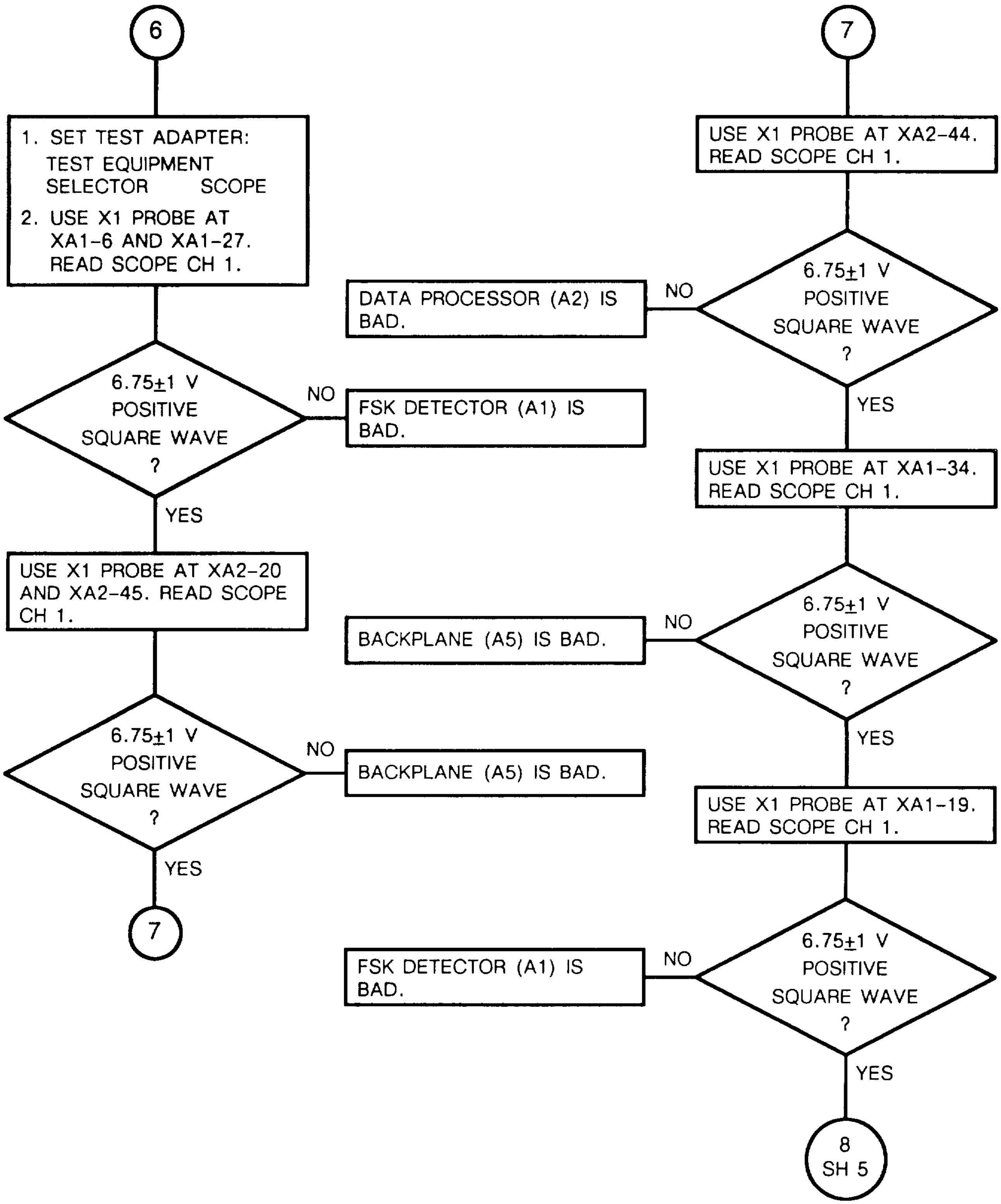
CHART 5
PT Data Receive Failure (Sheet 3 of 7)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

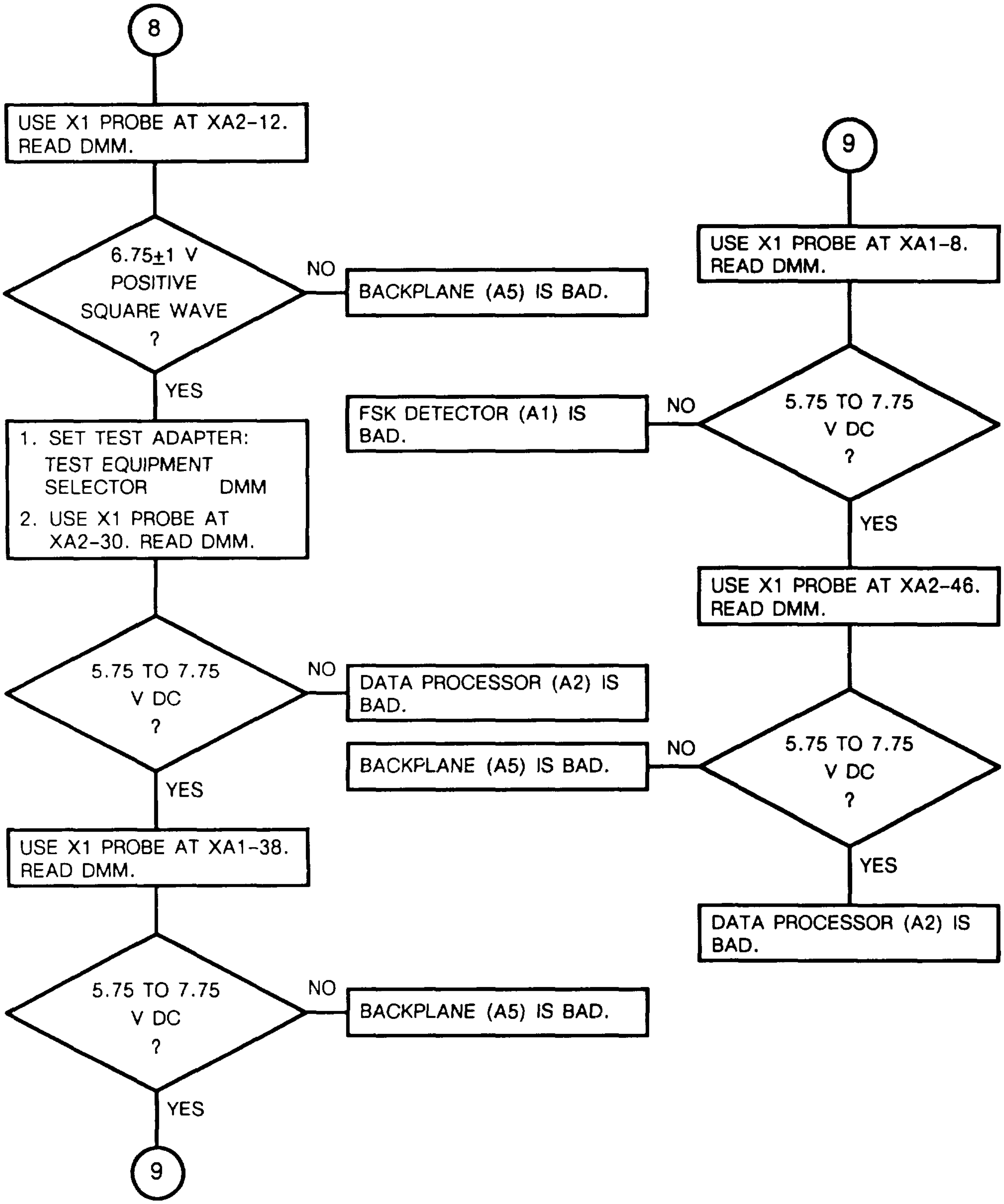
CHART 5

PT Data Receive Failure (Sheet 4 of 7)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

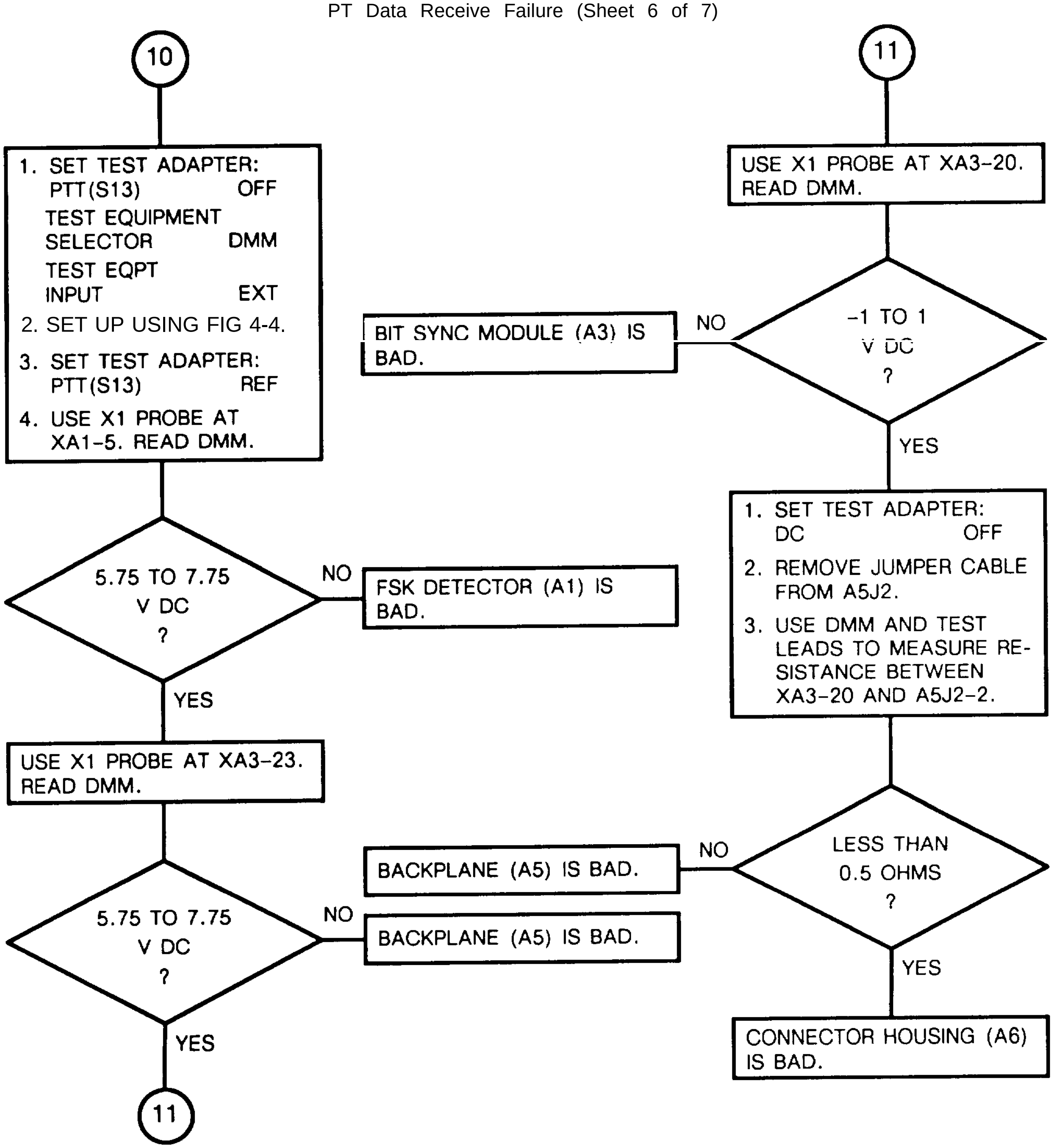
CHART 5
PT Data Receive Failure (Sheet 5 of 7)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 5

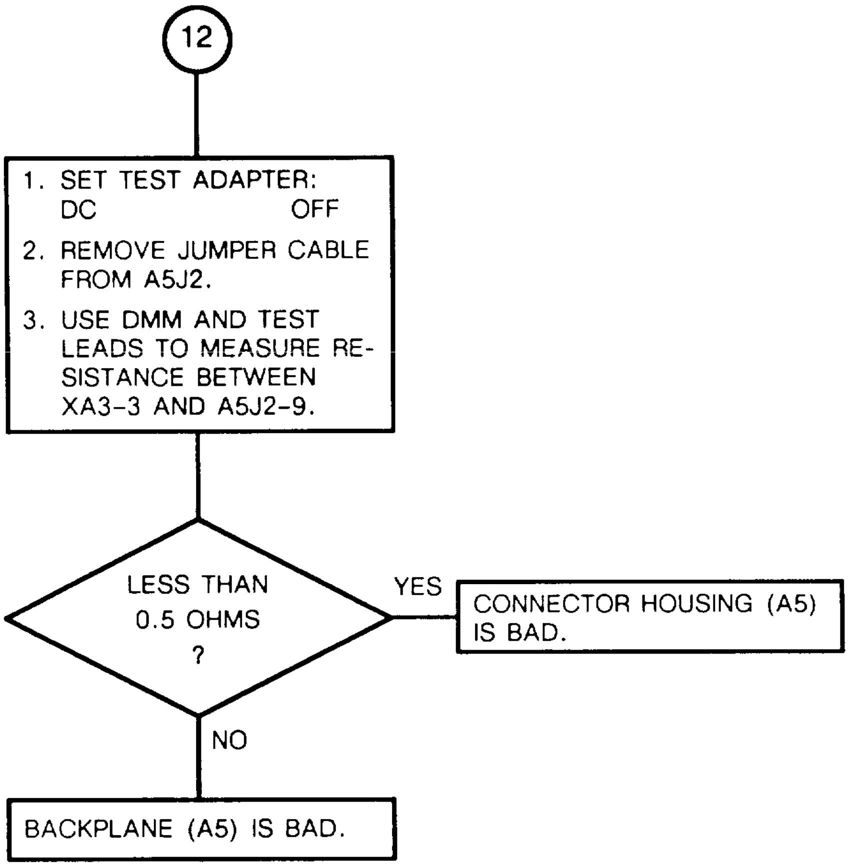
PT Data Receive Failure (Sheet 6 of 7)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 5

PT Data Receive Failure (Sheet 7 of 7)



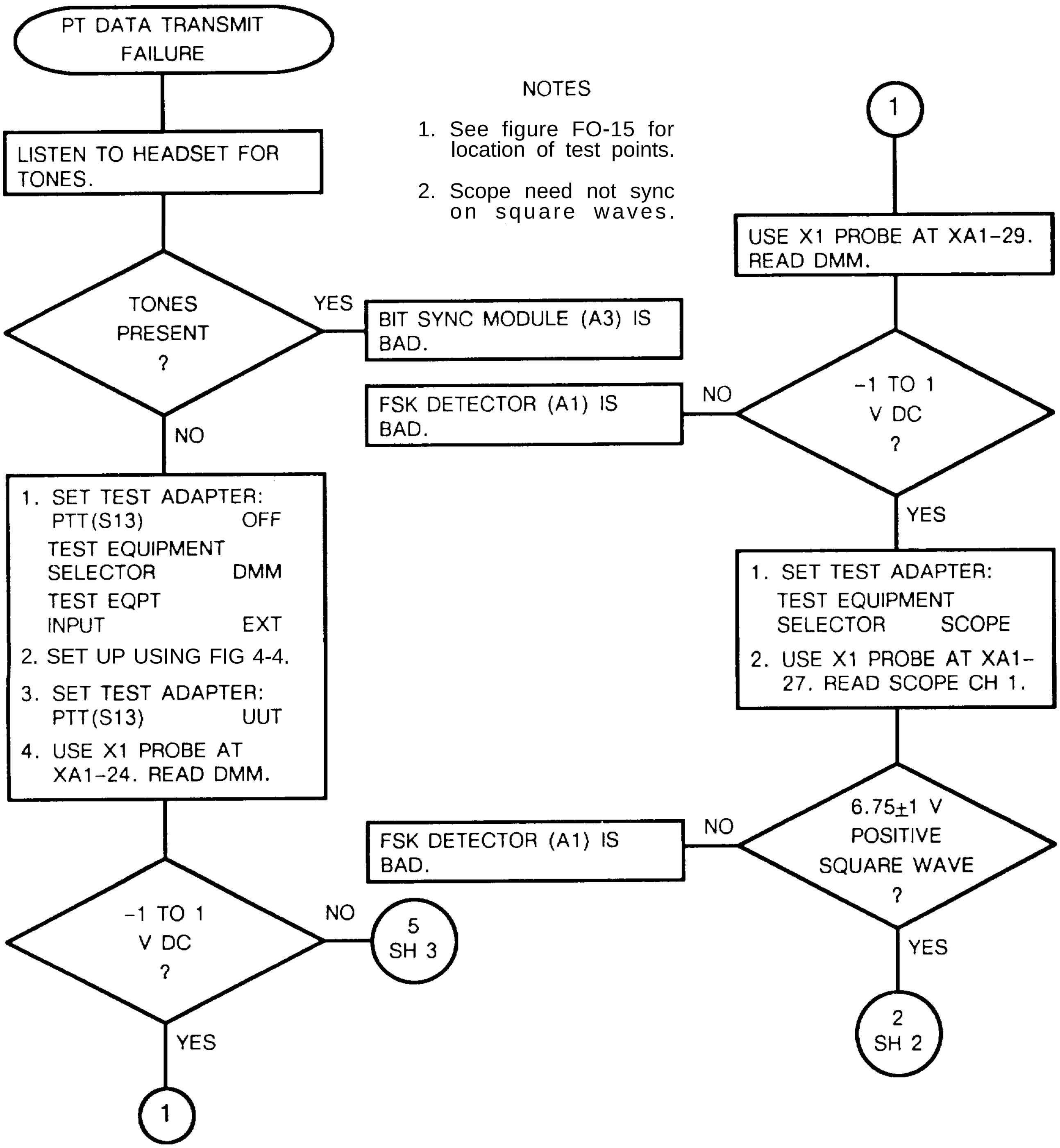
4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 6

PT Data Transmit Failure (Sheet 1 of 3)

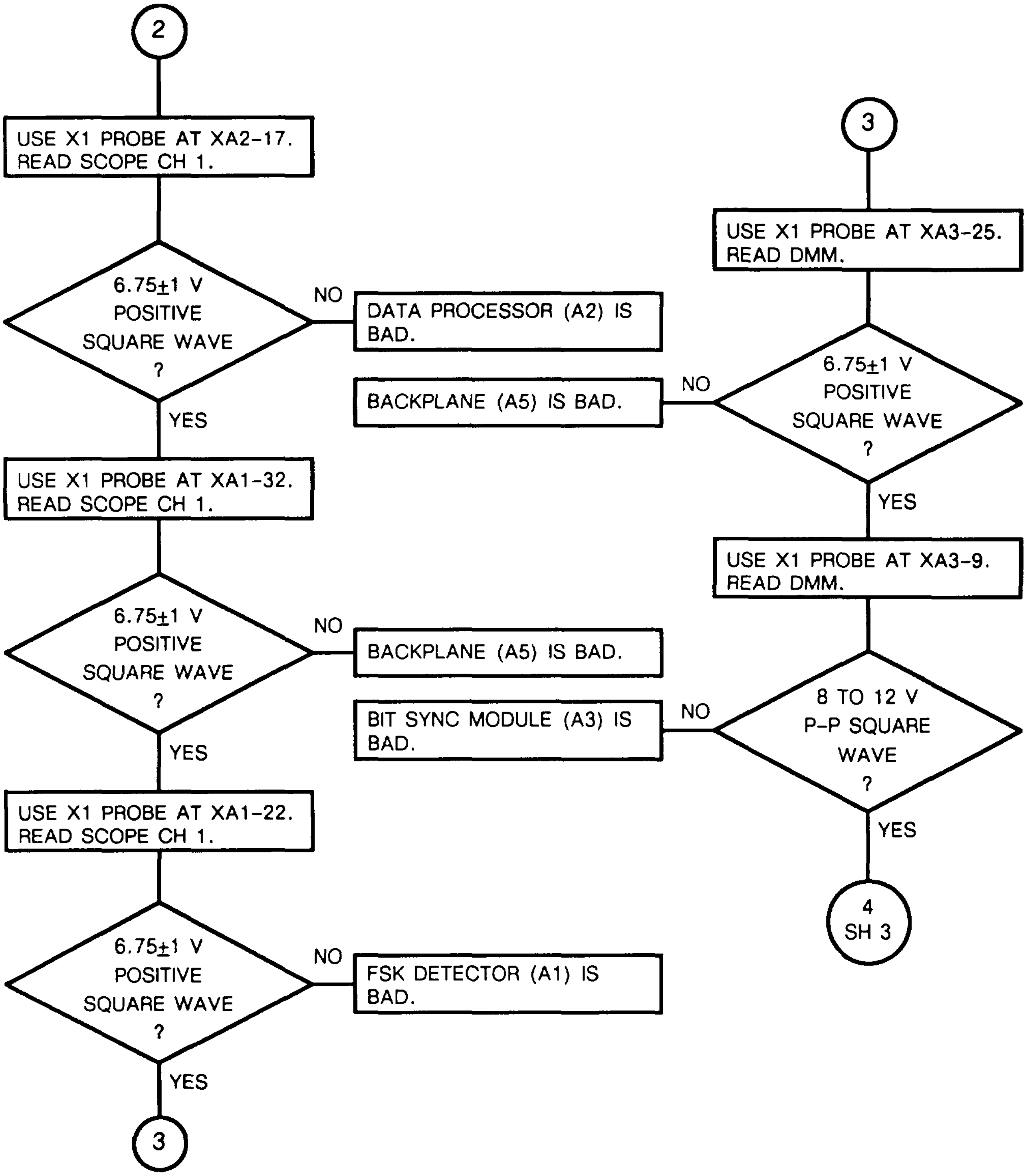
NOTES

1. See figure FO-15 for location of test points.
2. Scope need not sync on square waves.



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

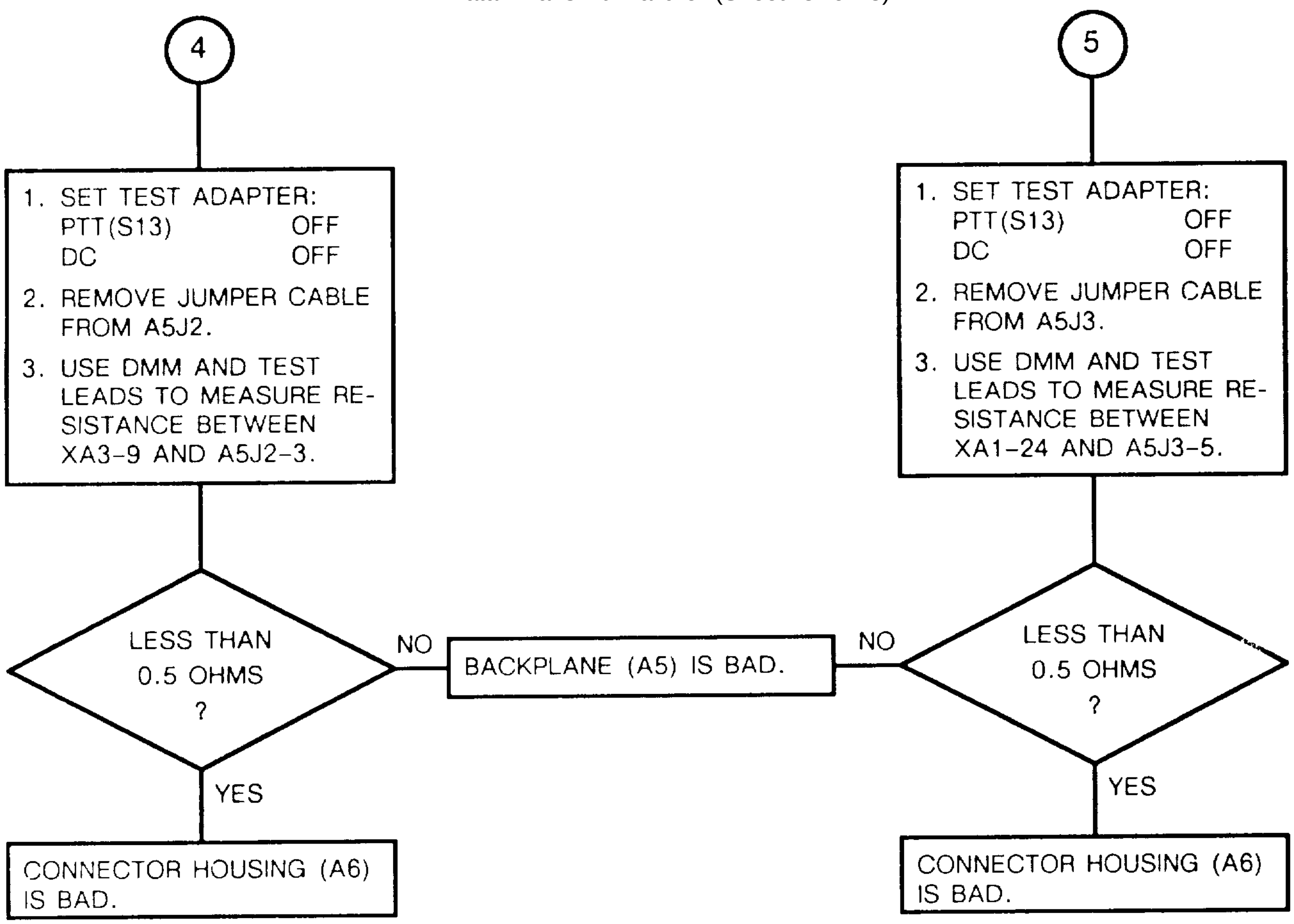
CHART 6
PT Data Transmit Failure (Sheet 2 of 3)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 6

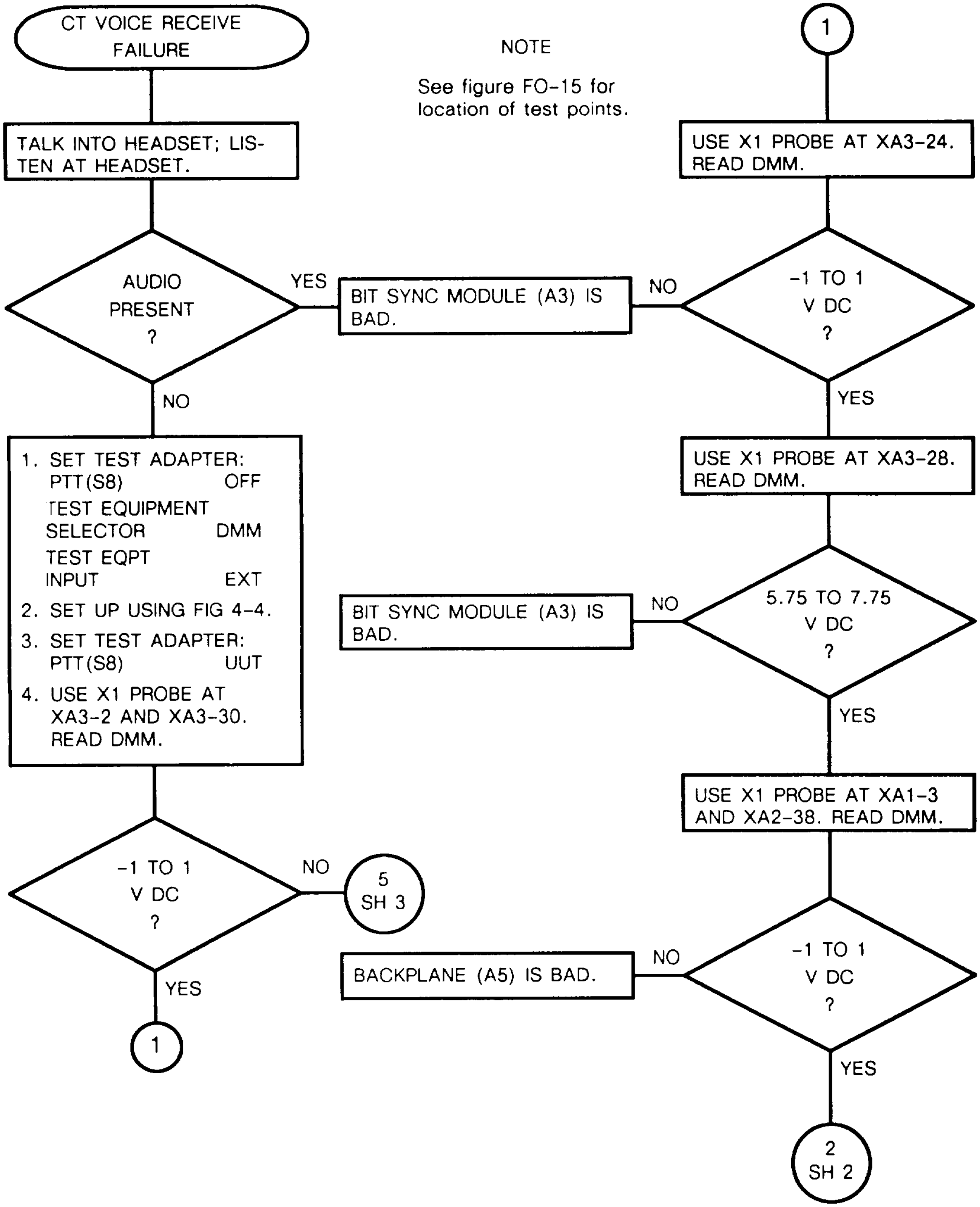
PT Data Transmit Failure (Sheet 3 of 3)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

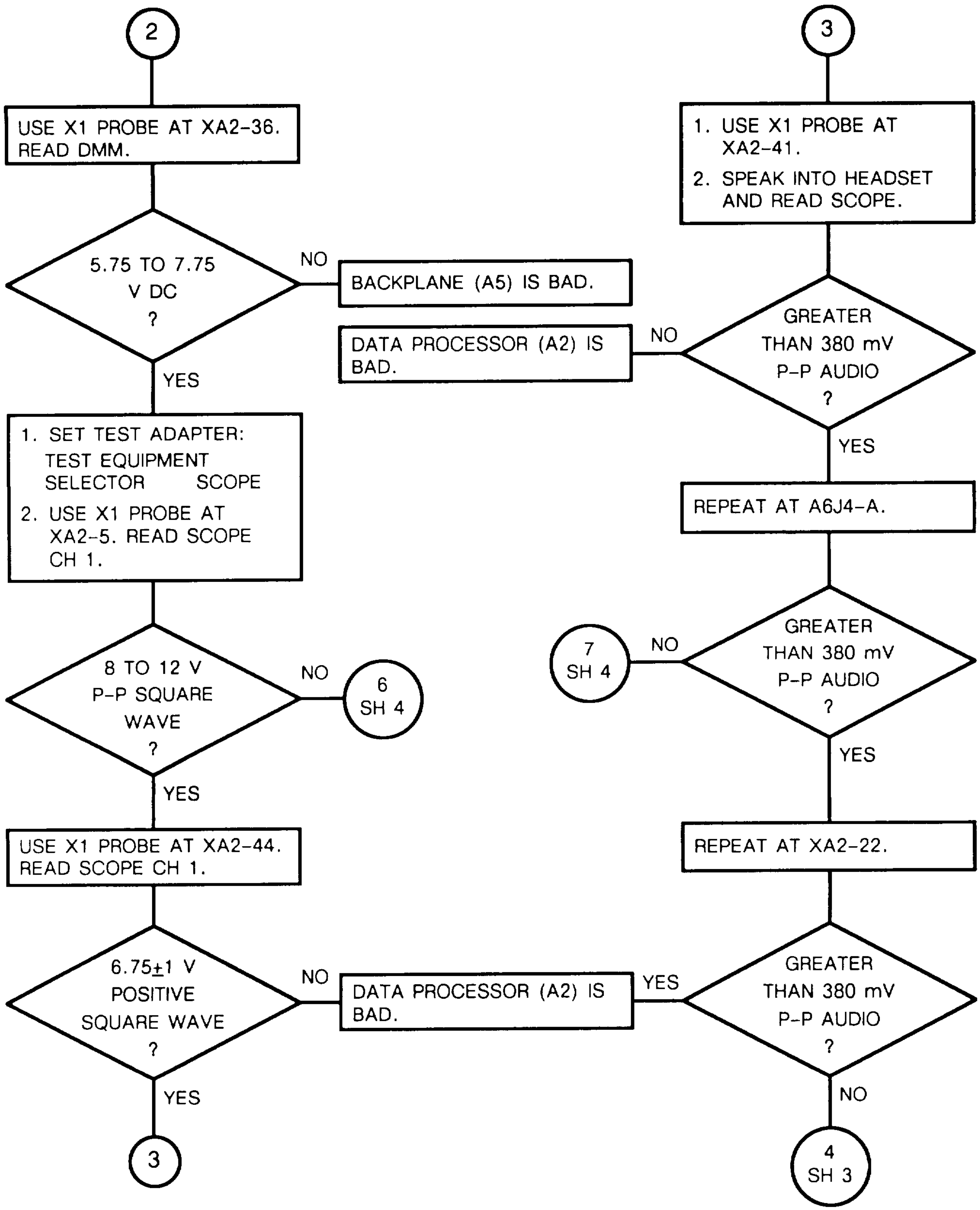
CHART 7

CT Voice Receive Failure (Sheet 1 of 4)



4-12. TROUBLESHOOTING FLOWCHARTS, Continued

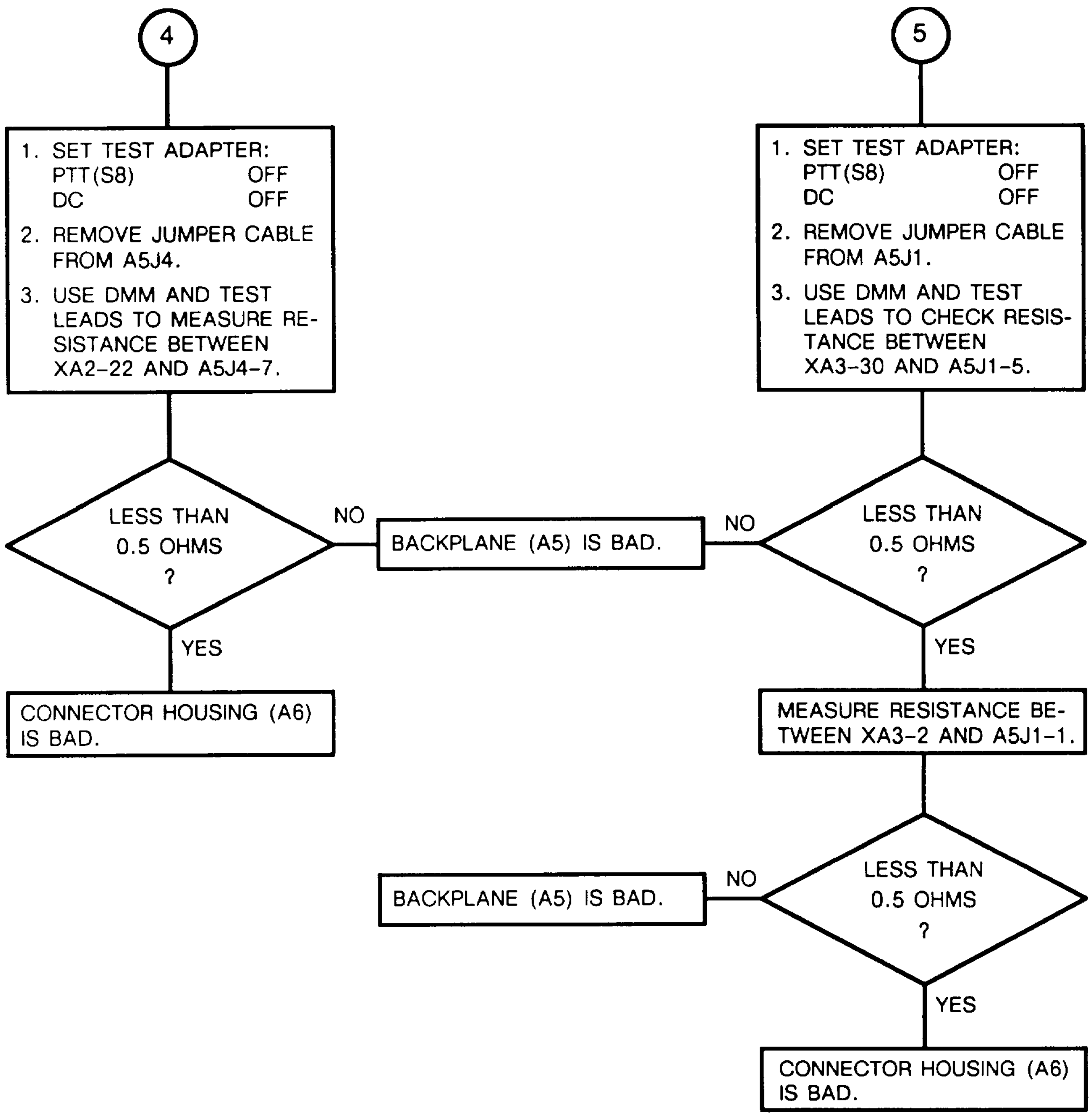
CHART 7
CT Voice Receive Failure (Sheet 2 of 4)



4–12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 7

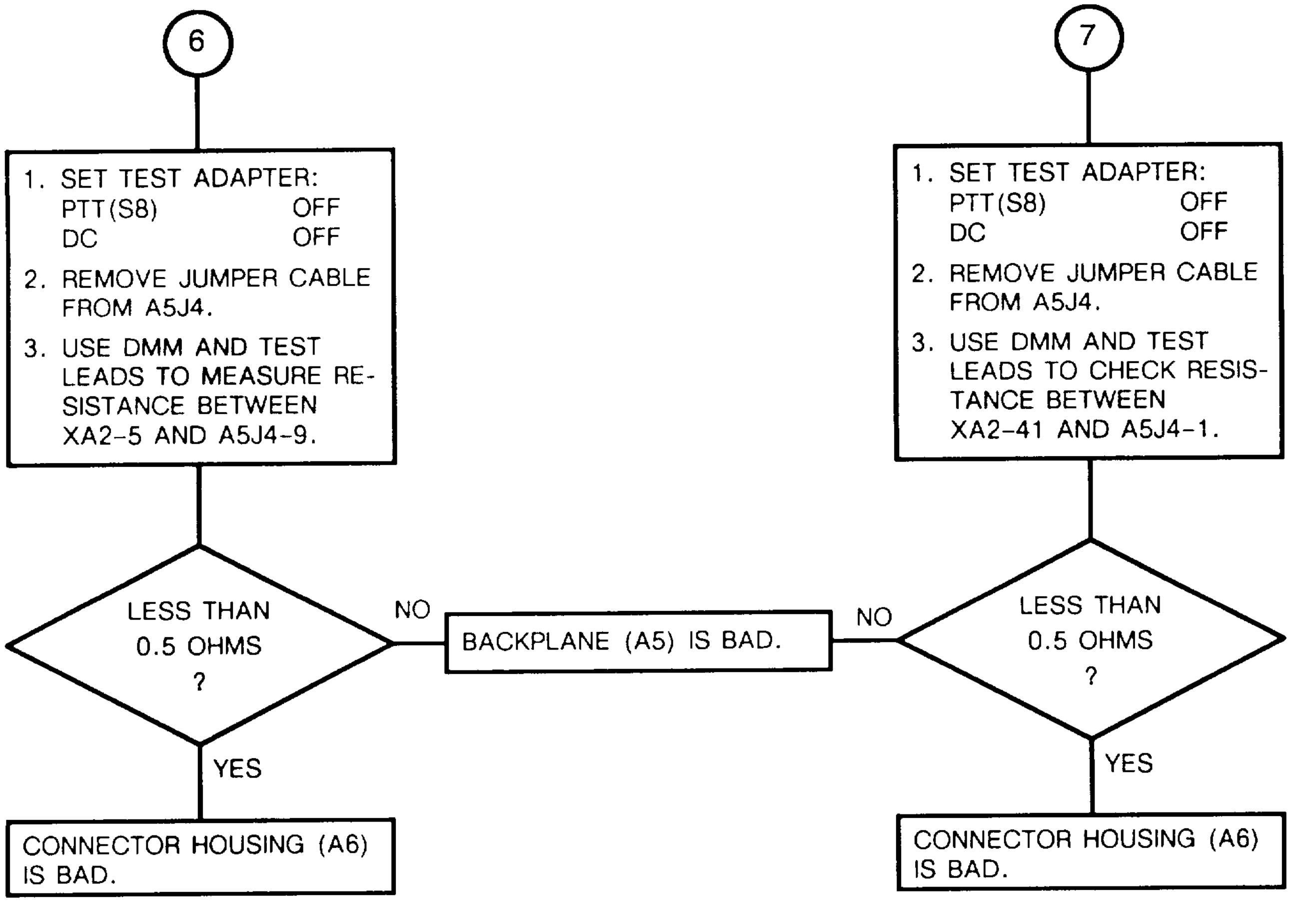
CT Voice Receive Failure (Sheet 3 of 4)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 7

CT Voice Receive Failure (Sheet 4 of 4)

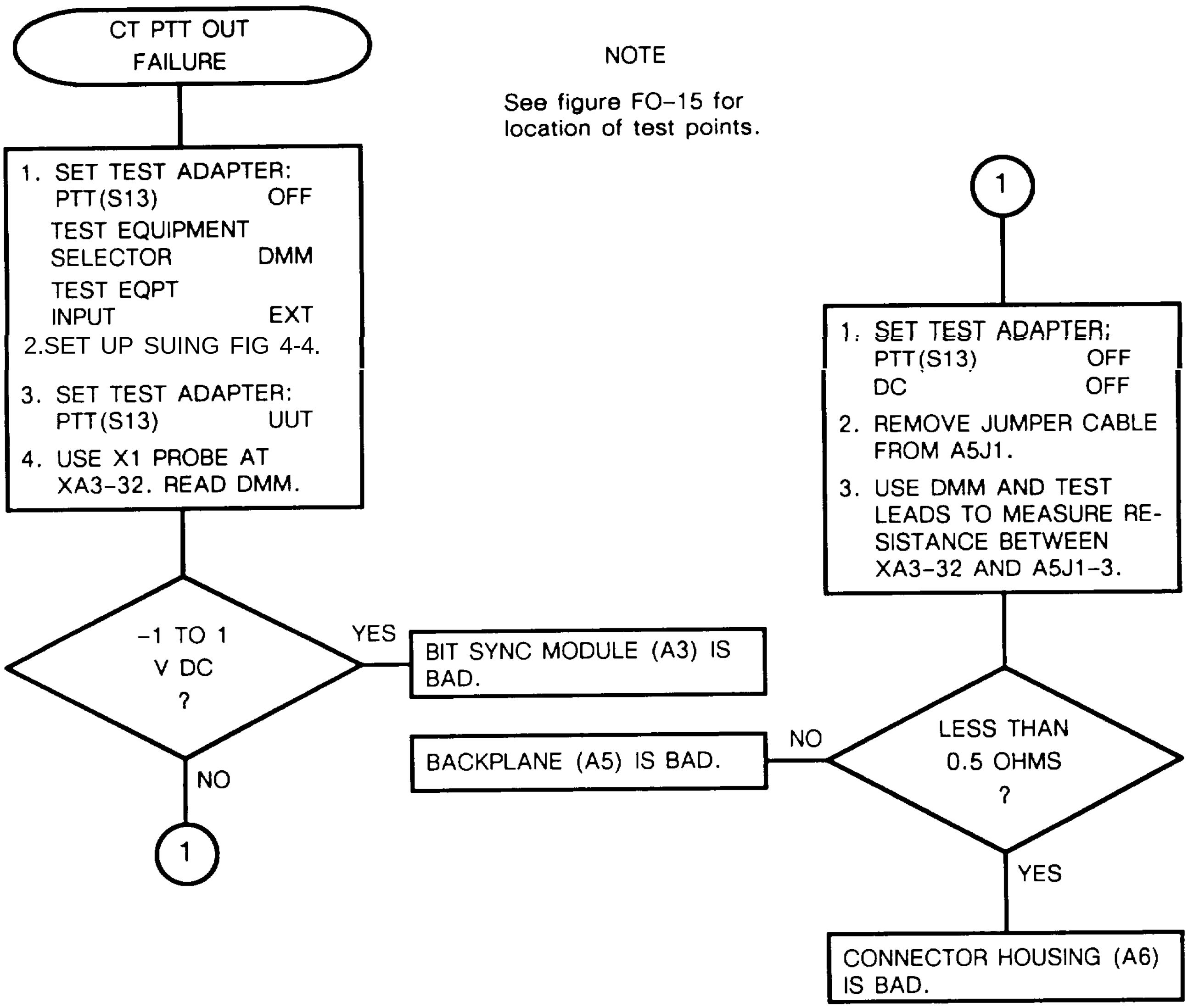


4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 8
CT PIT Out Failure

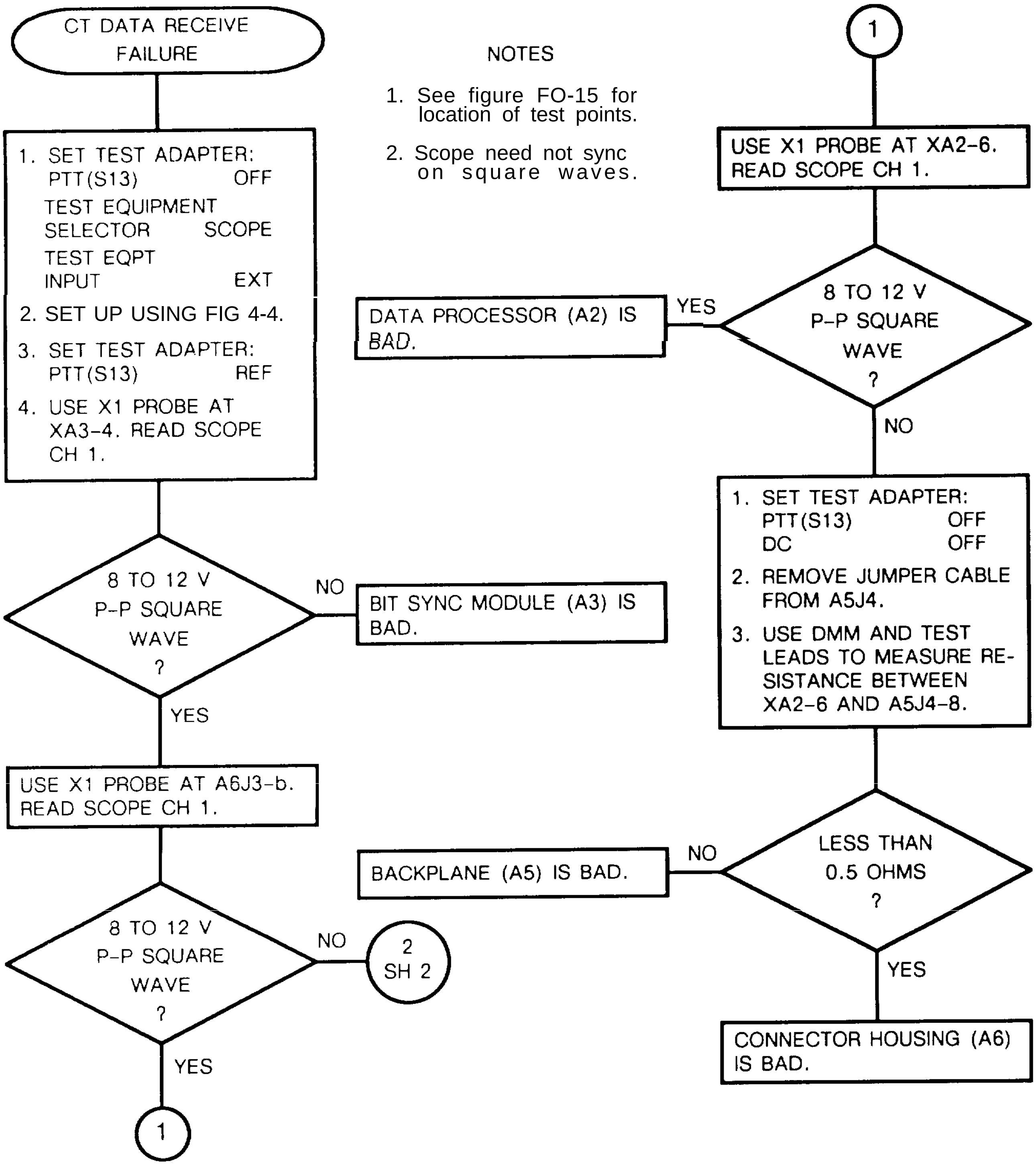
NOTE

See figure FO-15 for location of test points.



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

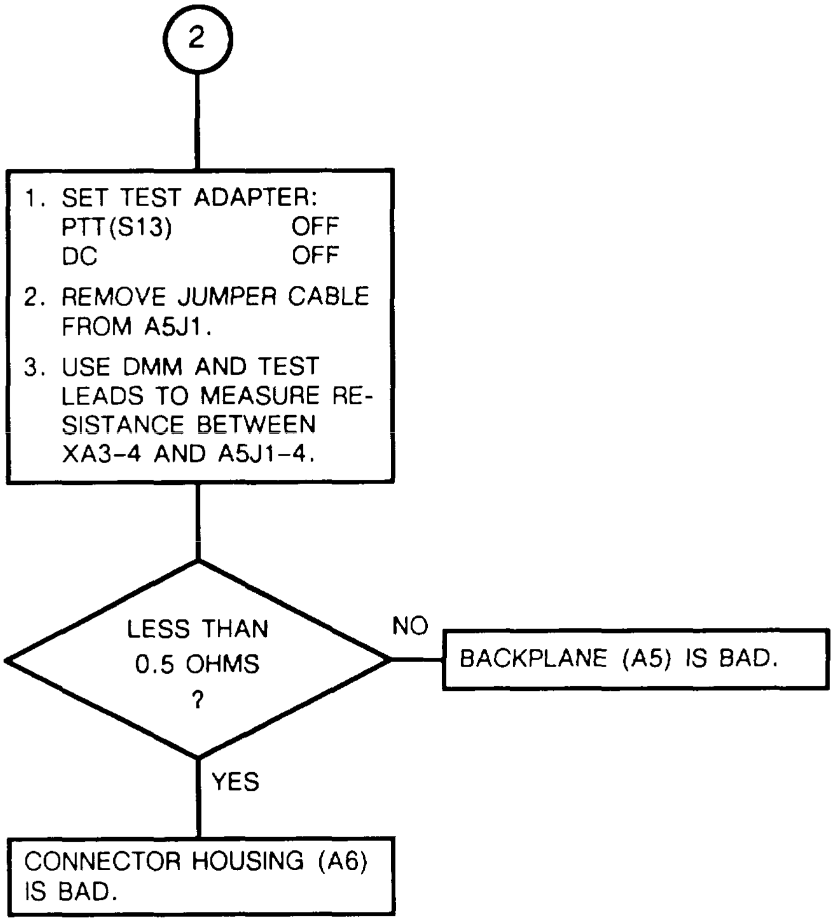
CHART 9
CT Data Receive Failure (Sheet 1 of 2)



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 9

CT Data Receive Failure (Sheet 2 of 2)

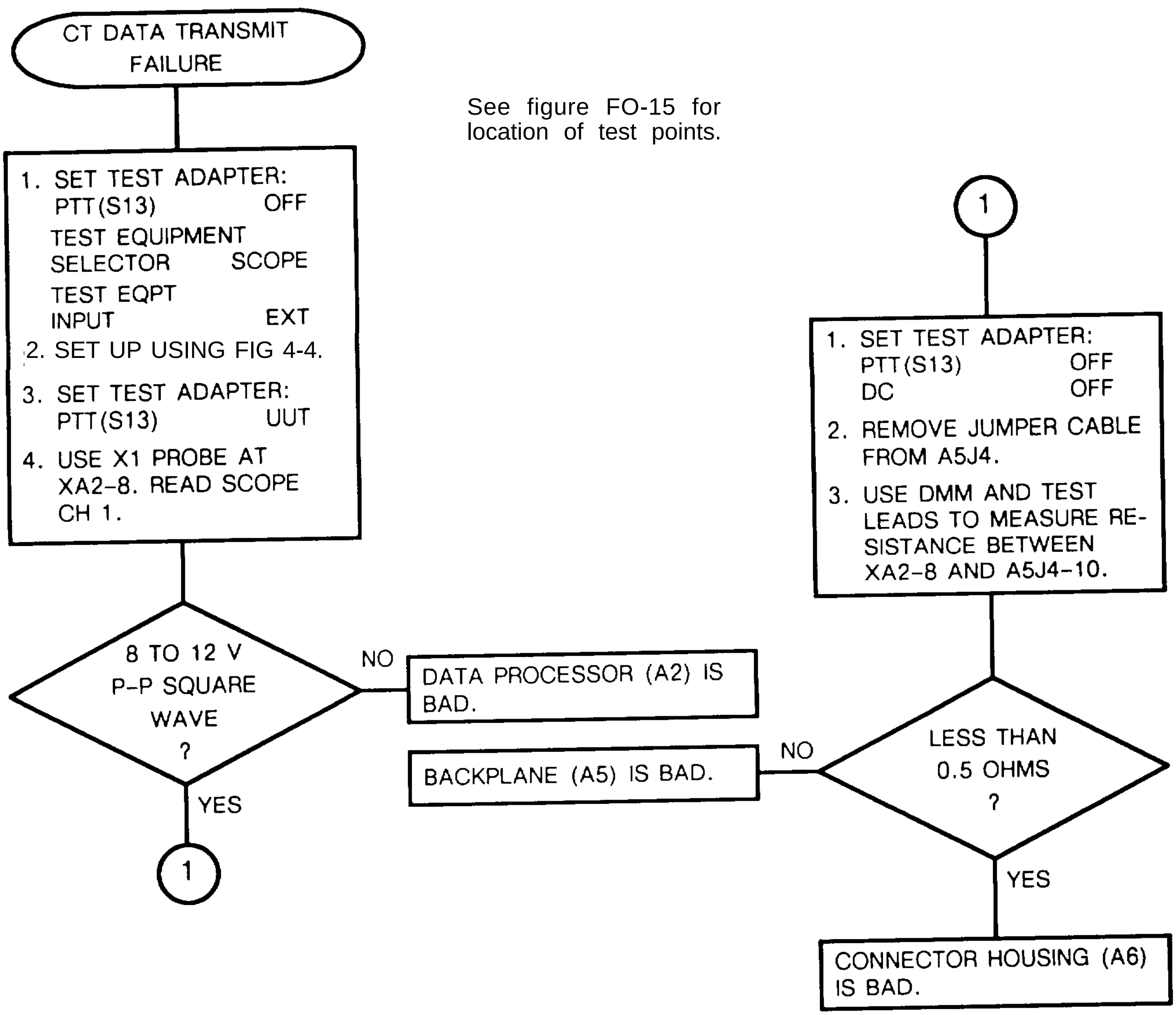


4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 10

CT Data Transmit Failure

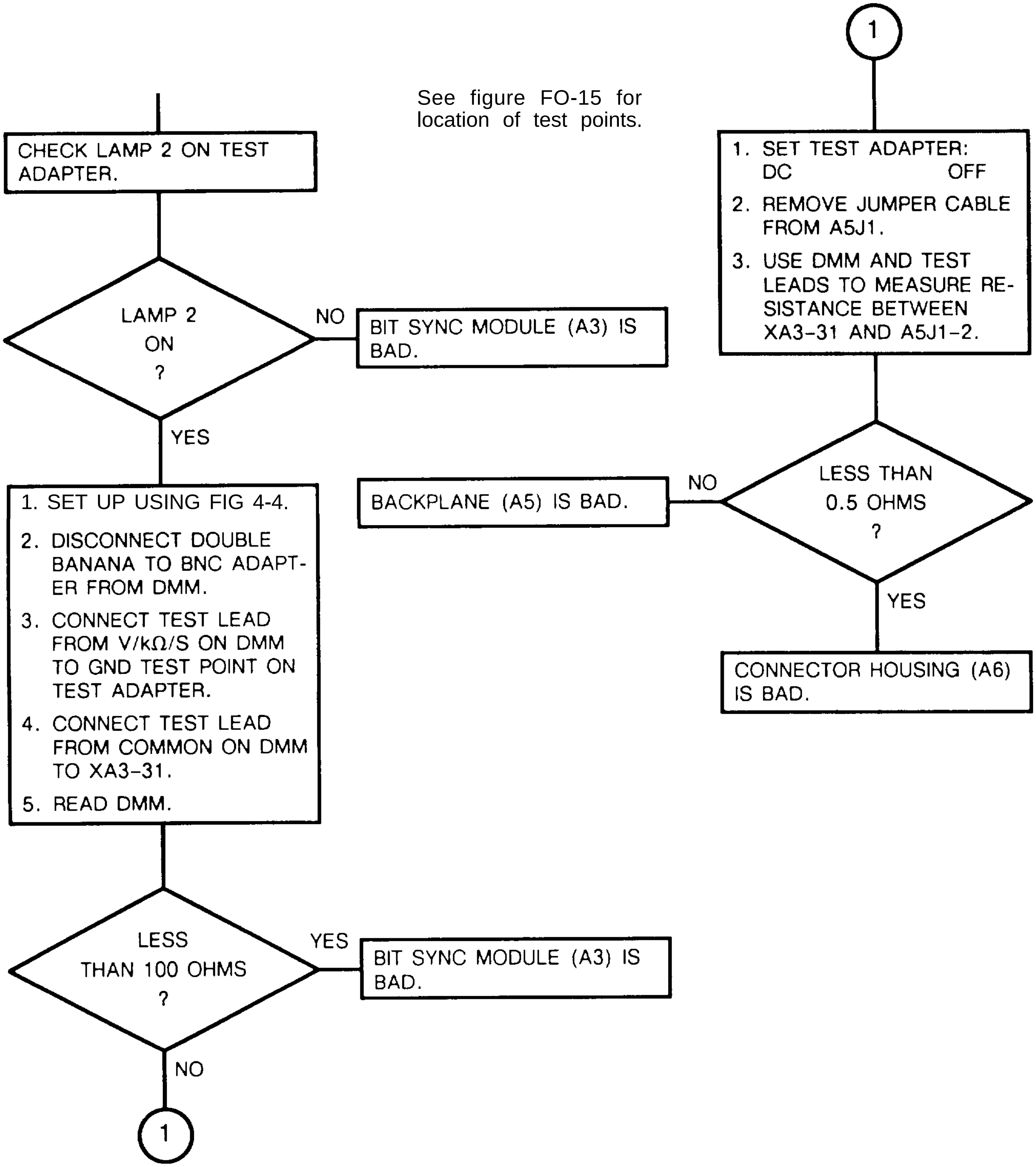
See figure FO-15 for location of test points.



4-12. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 11
CT Retransmit Failure

See figure FO-15 for location of test points.



Section IV. MAINTENANCE PROCEDURES

4-13. GENERAL

This section has inspection, operational check, and repair procedures.

Normally you should do maintenance in this order:

a. Inspection. Check if the dra is damaged or incomplete. Replace any damaged or missing components.

b. Troubleshooting, Done on faulty dra noted in operation or during operational check. Do not troubleshoot good equipment.

c. Repair. The repair procedures are used to restore a faulty dra to serviceable/operable condition. Repair is by replacement of bad module or part.

d. Placing in Service. After bad item have been replaced, the dra must be retested using operational check. When the dra is working, it may be placed in service,

4-14. INSPECTION

Many faults can be found by inspection. If any are found, replace the bad item. The following chart can be used as a guide.

ITEM	REMARKS
Access cover and chassis	No cracks or dents. No loose or missing screws.
Connectors	No broken or missing pins.

4-15. OPERATIONAL CHECK

Do the operational check in paragraph 4–11 to verify correct dra operation.

4-16. REPAIR

Repair consists of removing a bad item and installing another.

a. General Instructions. The following instructions apply to all repair tasks.

1. Remove any cables connected to the dra.
2. Inspect the dra for damage. Repair any obvious physical damage.
3. Handle all modules carefully.
4. Before installing a module, check the connector for bent or broken pins. Do not install if damaged.
5. Perform operational check before returning to service.

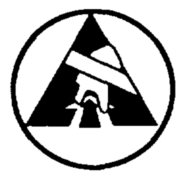
4-16. REPAIR. Continued

b. Repair Precautions

WARNING

Remove power from dra before repair. Serious burns or electrical shock can result from contact with exposed electrical wires or connectors.

CAUTION



- Static electricity and stray voltages can damage the dra modules. Use an antistatic pad on the work surface and attach a grounded wrist strap to self before removing access cover.
- When replacing circuit cards or assemblies, care must be taken not to bend, break, or damage connector pins. Ensure connector pins align with backplane jack before pushing any circuit card or module assembly into place. Bent or broken pins can result if improperly aligned or if care is not taken during removal.

4-17. ACCESS COVER AND IDENTIFICATION PLATE

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

Expendable Supplies

Cotton Swab and Alcohol

REMOVAL

1, REMOVE ACCESS COVER.

a. Remove four screws (1) and four washers (2).

b. Remove access cover (3) from chassis (4).

2. REMOVE IDENTIFICATION PLATE.

a. With pocket knife, peel off identification plate (3) .

b. With cotton swab and alcohol, clean adhesive from chassis (4).

INSTALLATION

1. INSTALL ACCESS COVER

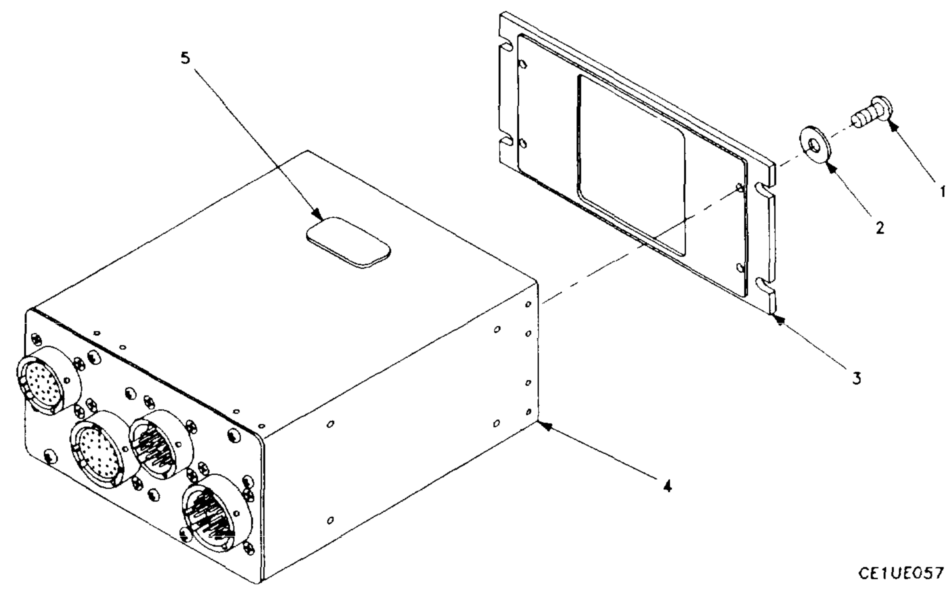
a. Position access cover (3) on chassis (4).

b. Install and tighten four screws (1) and washers (2).

2. INSTALL IDENTIFICATION PLATE.

a. Peel backing from new identification plate (5) .

b. Press into place on chassis (4).



4-18. FSK DETECTOR (A1), DATA PROCESSOR (A2), BIT SYNC (A3), OR POWER SUPPLY MODULE (A4)

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

REMOVAL

1, Remove access cover (para 4-17).

2. Lift both card extractors (1). If modules have no card ejectors, use a module extractor to remove modules. Gently pull FSK detector (2), data processor (3), power supply (4), or bit sync module (5) from chassis (6).

INSTALLATION

1. If present, push both card extractors (1) down.

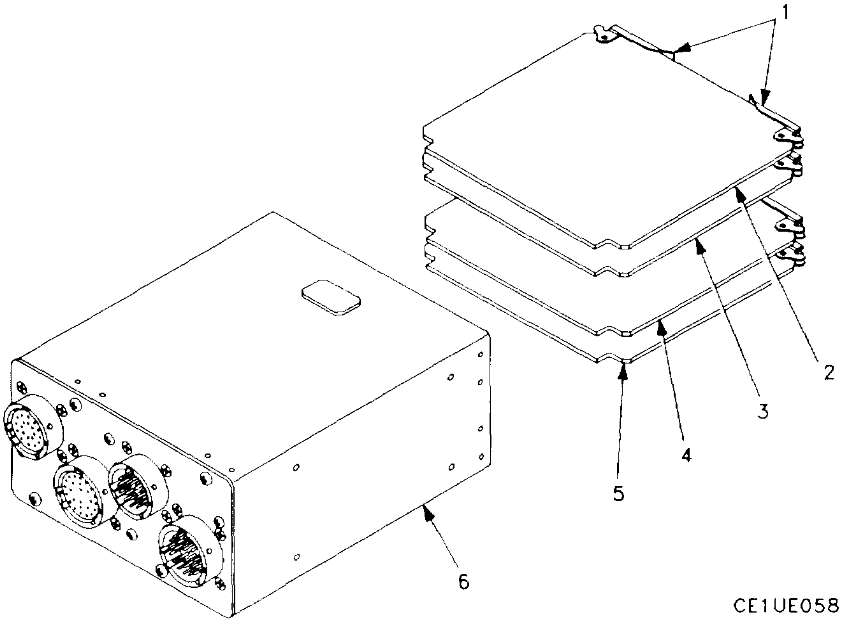
CAUTION

Be careful not to damage or bend connector pins.

2. Insert module in chassis (6). Be sure module edges are in guides. Component side faces to center of chassis (6).

3. Check alignment of module connector with backplane connector. Press down on module or card extractors (1), if present, to fully seat module.

4. Install access cover (para 4-17).



4-19. CENTER SHIELD

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

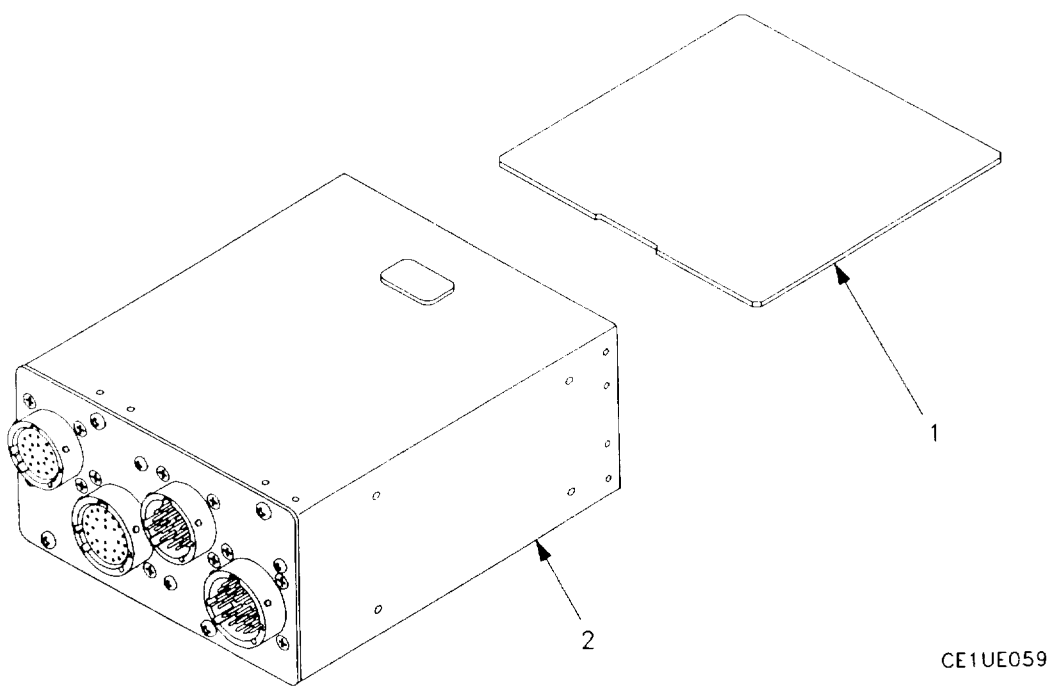
Tool Kit, Electronic Equipment, TK-105/G

REMOVAL

1. Remove access cover (para 4-17).
2. Pull center shield (1) from chassis (2).

INSTALLATION

1. Install center shield (1) with notched side inward.
2. Install access cover (para 4-7).



4-20. CONNECTOR HOUSING (A6)

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

REMOVAL

1. Remove four screws (1) and four washers (2) that secure connector housing (3) to chassis (4) .

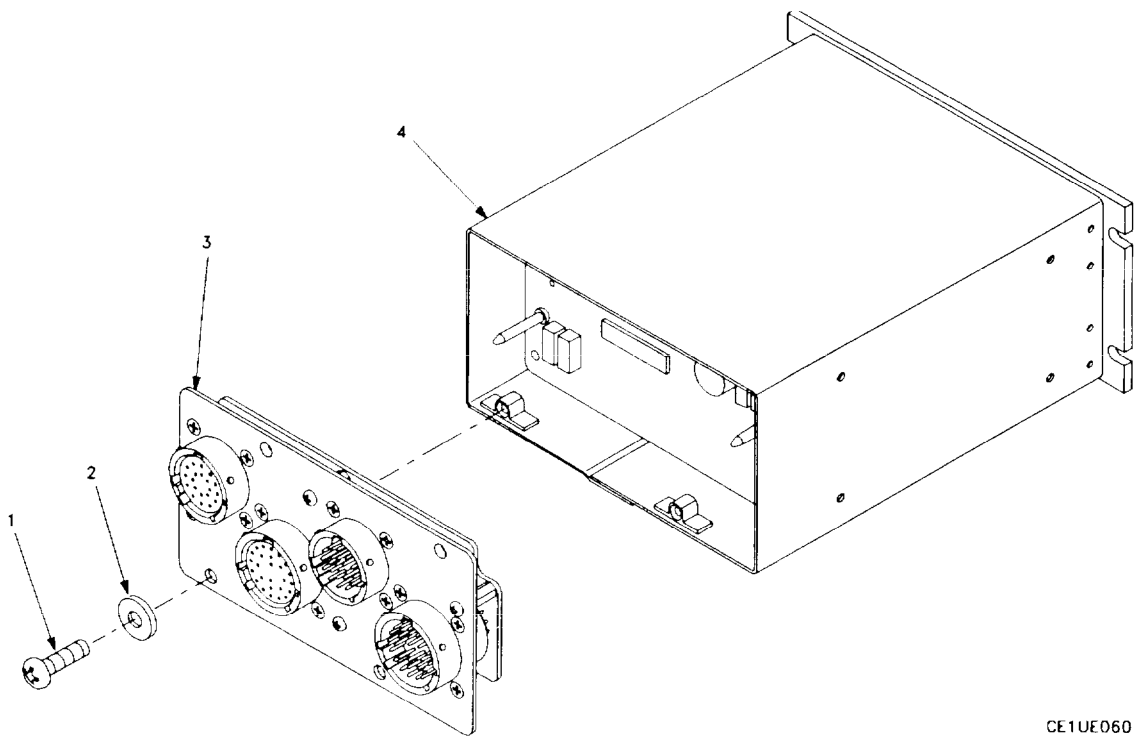
2. Carefully pull connector housing (3) straight out.

INSTALLATION

1. Position connector housing (3) on two guide pins.

2. Press down on connector housing (3) until fully seated.

3. Install four screws (1) and four washers (2) that secure connector housing (3) to chassis (4) .



4-21. BACKPLANE (A5)

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

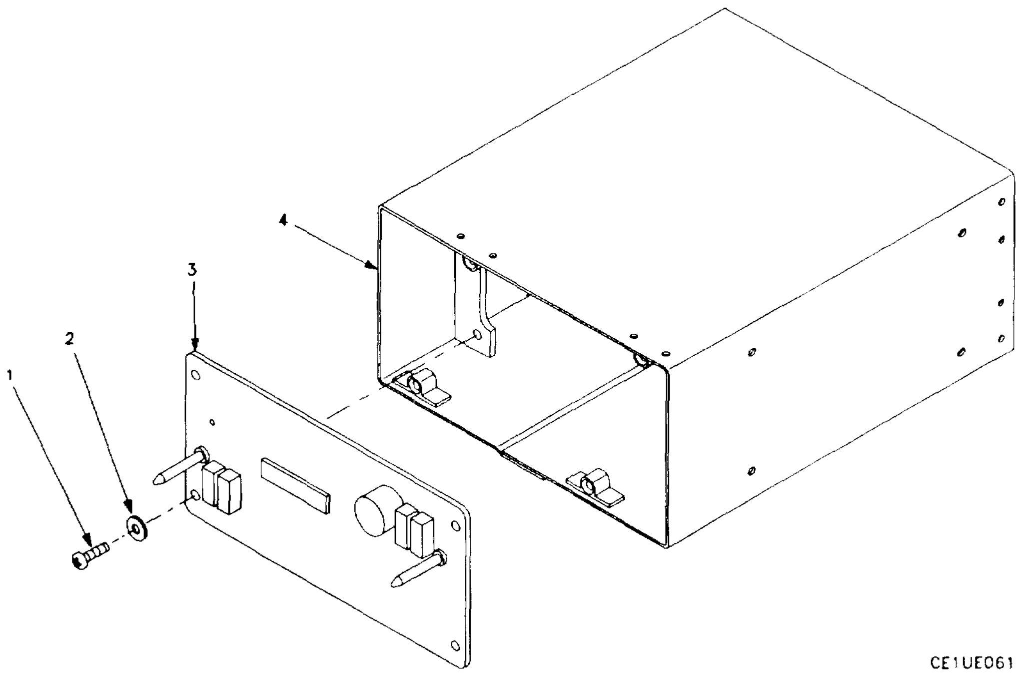
Tool Kit, Electronic Equipment, TK-105/G

REMOVAL

1. Remove access cover (para 4-17).
2. Remove connector housing (para 4-20).
3. Lift card extractors to disconnect modules from backplane (para 4-18).
4. Remove center shield from backplane (para 4-19).
5. Remove four screws (1) and four washers (2) that secure backplane (3) to chassis (4).

INSTALLATION

1. Install four screws (1) and four washers (2) that secure backplane (3) to chassis (4).
2. Install access cover (para 4-17).
3. Press down on card extractors to fully seat modules.
4. Install connector housing (para 4-20).
5. Install access cover (para 4-17).



4-22. CHASSIS

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

REMOVAL

1. Remove access cover (para 4-17).
2. Remove FSK detector, data processor, bit sync, and power supply modules (para 4-18).
3. Remove center shield (para 4-19).
4. Remove connector housing (para 4-20).
5. Remove backplane (para 4-21).

INSTALLATION

1. Install backplane (para 4-21).
2. install connector housing (para 4-20).
3. Install center shield (para 4-19).
4. Install FSK detector, data processor, bit sync, and power supply modules (para 4-18).
5. Install access cover (para 4-17).

Section V. PREPARATION FOR STORAGE OR SHIPMENT

4-23. GENERAL INFORMATION

a. Pack the dra and modules in approved shipping containers.

b. All modules must be shipped enclosed in material that provides protection from static electricity. See the following paragraph.

4-24. PACKING STATIC SENSITIVE MODULES

The following steps should be followed when packing **a** static sensitive module for storage or shipment.

CAUTION

To avoid damaging static sensitive modules, use an antistatic pad on the work surface and wear a grounded wrist strap when handling the module.

ITEM	ACTION
a. Module (1)	a. Place inside antistatic bag (2) or inside antistatic wrapping material (3). See figure 4–5.
b. Antistatic package (4)	b. Seal with adhesive tape. Attach “ sensitive electronic device” unit pack label (5).
c. Antistatic package (4)	c. Place inside approved shipping container (6).
d. Shipping container (6)	d. Attach “sensitive electronic device” intermediate pack label (7).

4–24. PACKING STATIC SENSITIVE MODULES. Continued

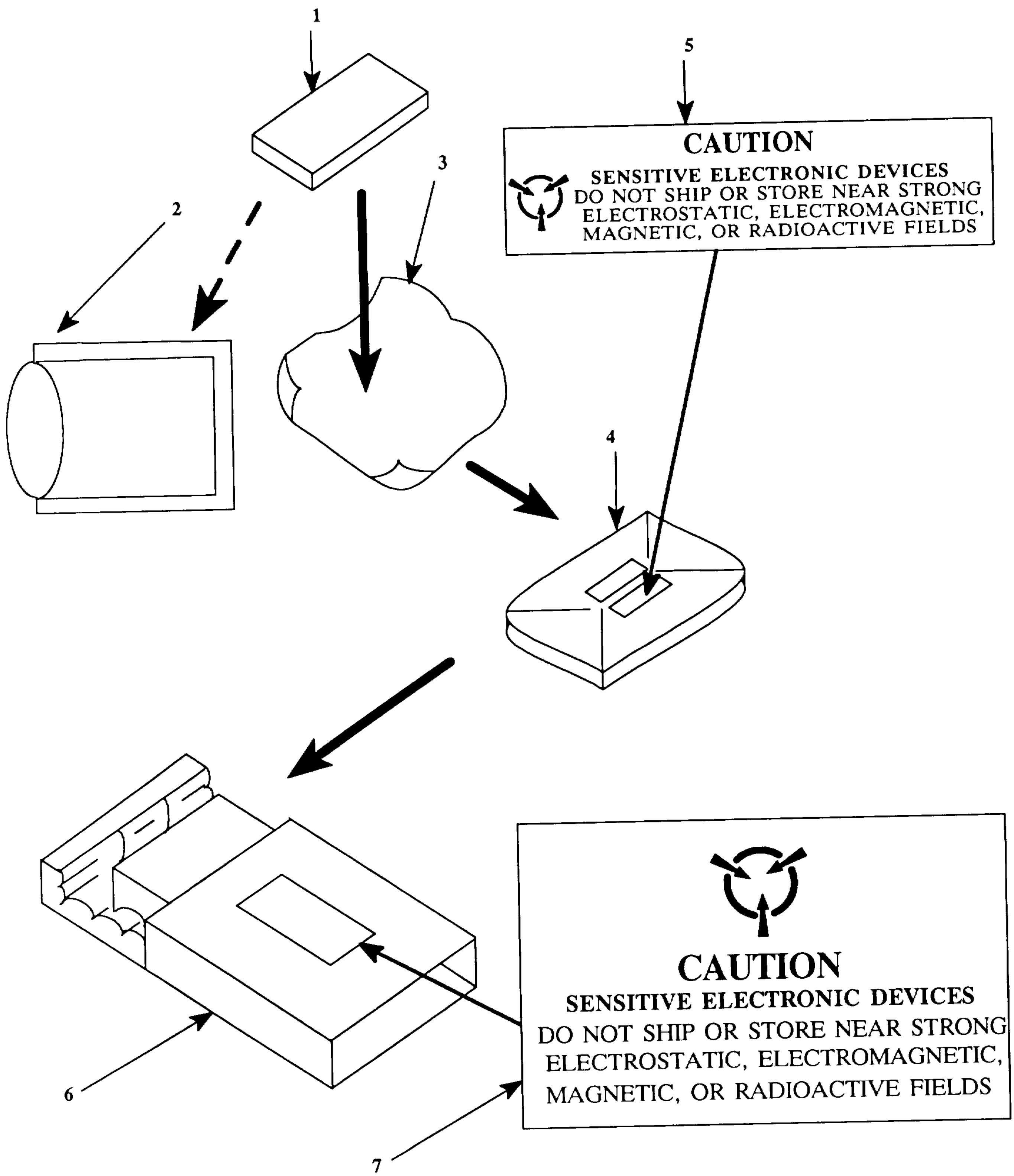


Figure 4-5. Packing Static Sensitive Modules

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CHAPTER 5

MAINTENANCE INSTRUCTIONS FOR ELECTRICAL EQUIPMENT MOUNTING BASES MT-6373/ARC-201 (V) AND MT-6374/ARC-201 (V)

Section I. Principles OF OPERATiON

5-1. MOUNTiNG BASE FUNCTiON

The mounting bases physically support the rts.

The MT-6373 mounting base is used with RT-1477 and RT-1477A rts. It has cables and connectors that adapt the rt to the aircraft. The combination of rt and mounting base can be used to replace an AN/ARC-54/131/186 radio.

The MT-6374 mounting base is used with both RT-1477, RT-1477A, RT-1478, and RT-1478A rts. It is a mechanical mount only. Electrical connections are made directly to the rt.

Section ii. REPAiR PARTS, SPECiAL TOOLS, TMDE, AND SUPPORT EQUiPMENT

5-2. COMMON TOOLS AND EQUiPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit. Common tools required for maintenance of the mounting base are listed in the Maintenance Allocation Chart. It is appendix B of TM 11-5821-333-12.

5-3. SPECiAL TOOLS, TMDE, AND SUPPORT EQUiPMENT

No special tools are required. For TMDE and support equipment refer to the Maintenance Allocation Chart, appendix B of TM 11–5821 -333-12.

5-4. REPAiR PARTS

Repair parts are listed and illustrated in TM 11-5821-333-23P.

Section iii. TROUBLESHOOTiNG

5-5. TROUBLESHOOTiNG

When a mounting base is received from unit maintenance, inspect it for damage. Repair any damage following instructions in section IV. If an MT-6373 mounting base has an electrical problem, use a digital multimeter (DMM) and figure 5–1 to locate the fault. Check that resistance of wires is 1 ohm or less. Check that resistance of coaxial conductors is less than 1 ohm and resistance between coaxial conductors is greater that 100 kilohms. If there is a short or open circuit, repair it. Follow the instructions in section IV.

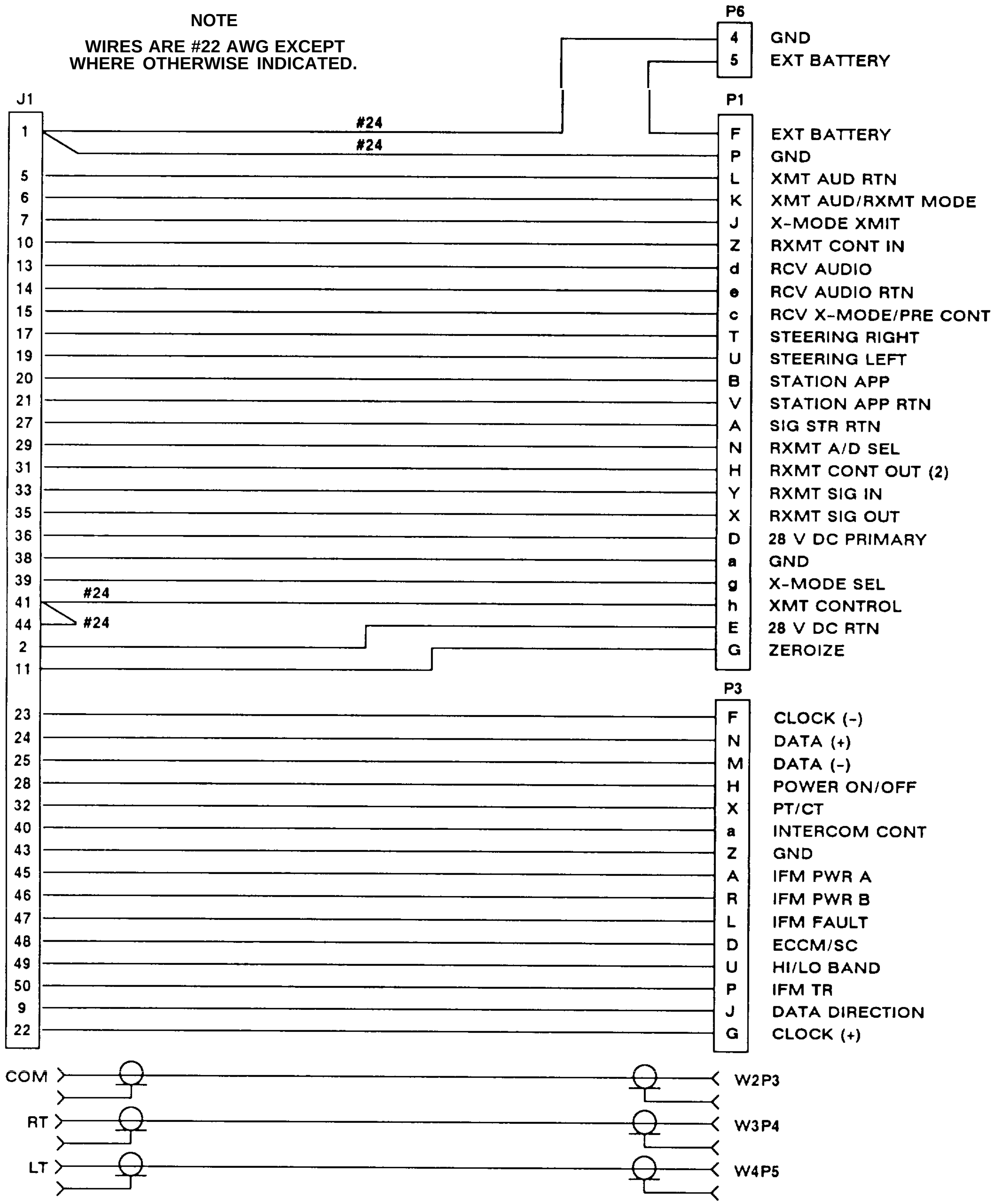


Figure 5-1. MT-6373 Mounting Base Wiring Diagram

Section IV. MAINTENANCE PROCEDURES

5-6. GENERAL

Maintenance should be performed in the following sequence.

a. Inspection. Determine if the mounting base is damaged or incomplete. If a component is damaged or missing, replace it.

b. Troubleshooting. Done on a bad MT-6373 mounting base noted in operation or during operational check. Do not troubleshoot good equipment.

c. Repair. The repair procedures are used to restore a faulty mounting base to serviceable/operable condition, Repair is by replacement of bad item.

5-7. INSPECTION

Many faults can be found by inspection. If any are found, replace bad item. The following chart can be used as a guide.

ITEM	REMARKS
Tray assembly	No dents, cracks, rust, or bends.
Cables	No broken wires or damaged insulation.
Connectors	No cracks, No broken or missing pins.
Handle assembly	No bends, rust, or missing parts.

5-8. REPAIR

a. General Instructions. The following instructions apply to all repair tasks.

1. Remove any cables connected to the mounting base.
2. Inspect the mounting base for damage. Repair any obvious physical damage.

b. Repair Precautions

WARNING

Remove power from MT-6373 mounting base before repair. Serious burns or electrical shock can result from contact with exposed electrical wires or connectors.

5-9. MT-6373 MOUNTING BASE

This task covers: a. Disassembly b. Assembly

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

Expendable Supplies

Cotton Swab and Alcohol

References

Figure 5-2 shows parts location.

5-9. MT-6373 MOUNTING BASE. Continued

DISASSEMBLY

1. REMOVE INJECT/EJECT LEVER.

   a. Remove two screws (1), two lockwashers (2), two washers (3), and two shoulder washers (4), securing lever **(5)** to structural section (17).

   b. Remove four screws (14), four lockwashers (15), and four washers (16) securing structural section (17) and shim (17A) to tray (6).

   c. Save all shim material (17A) for reinstallation.

2. REMOVE LATCH.

   a. Remove four screws (10), four washers (11), four lockwashers (12), and four nuts (13) securing guide (9) to tray (6).

   b. Lift handle latch (7) and spring (8) from guide (9).

3. REMOVE IDENTIFICATION PLATE.

   a. With pocket knife, peel off identification plate (18).

   b. With cotton swab and alcohol, clean adhesive from structural section (17).

4. REMOVE CABLE (W1).

   a. Remove screw (18), washer (19), lockwasher (20), and nut (21) securing clamp (22) to tray (6). Remove clamp (22).

   b. Remove two screws (23), two washers (24), two lockwashers (25), and two nuts (26) securing W1J1 (27) to back of tray (6).

   c. Remove cable by pulling W1J1 (27) and W1P6 (36) through hole in tray (6).

5. REMOVE RF CABLE (W2, W3, or W4).

   a. Remove screw (18), washer (19), lockwasher (20), and nut (21) securing clamp (22) to tray (6),

   b. Remove two pins (32), two lockwashers (33), and two washers (34) securing connector retainer (31) to tray (6).

   c. Remove assembly consisting of cables (28, 29, and 30) and connector retainer (31)

   d. Grip cable (28, 29, or 30) near where connector is seated in connector retainer (31) Use pliers to compress spring (37), and pull cable free.

6. REMOVE GROMMET.

   Compress grommet (35) and remove from tray (6).

7. REMOVE BOLT ASSEMBLY.

   a. Using a needle nose pliers, remove cotter pin (38) from straight pin (39).

   b. Remove straight pin (39) and bolt assembly (40) from tray (6).

ASSEMBLY

1. INSTALL LATCH.

   a. Place spring (8) on guide (9).

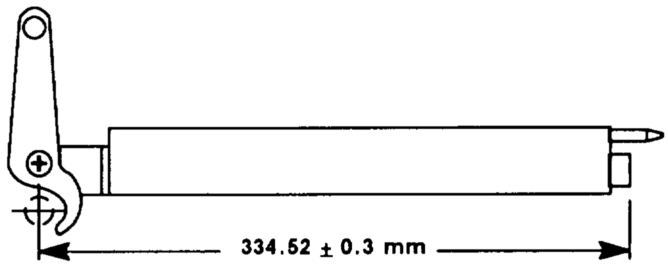
   b. Place handle latch (7) on guide (9).

   c. Attach guide (9) using four screws (10), four washers (11), four lockwashers (12), and four nuts (13).

5-9. MT-6373 MOUNTING BASE. Continued

2. INSTALL INJECT/EJECT LEVER.

   a. Attach structural section (17) and shim (17A) using four screws (14), four lockwashers (15), and four washers (16). Select shim (17A) material to maintain dimension shown in following figure.



   b. Install two screws (1), two lockwashers (2), two washers (3), and two shoulder washers (4) to secure lever (5) to structural section (17).

3. INSTALL IDENTIFICATION PLATE.

   a. Peel backing from new identification plate (18).

   b. Press into place on structural section (17).

4. INSTALL CABLE (W1).

   a. Feed W1J1 (27) and W1P6 (36) through hole in tray (6).

   b. Attach W1J1 (27) to tray (6) using two screws (23), two washers (24), two lockwashers (25), and two nuts (26). Connector mounting flange must be on outside of tray. Narrow side of shell around pins must be to top of tray.

   c. Place clamp (22) around cables W1 through W4 as shown on sheet 2 of figure 5-2.

   d. Attach clamp (22) to tray (6) using screw (18), washer (19), lockwasher (20), and nut (21).

5. INSTALL RF CABLE (W2, W3, or W4).

   a. Position connector retainer (31) so countersunk side is away from cable, and press cable into connector retainer (31).

   b. Attach assembly consisting of cables (28, 29, and 30) and connector retainer (31) to tray (6) using two pins (32), two lockwashers (33), and two washers (34).

CAUTION

Be sure to position connector retainer (31) so that W2 is marked COM, W3 is marked RT, and W4 is marked LT.

   c. Feed cables through clamp (22) as shown on sheet 2 of figure 5-2.

   d. Install screw (18), washer (19), lockwasher (20), and nut (21) to secure clamp (22) to tray (6).

   e. Feed cables (28, 29, and 30) through hole in tray (6).

6. INSTALL GROMMET.

   a. Trim grommet (35) to size.

   b. Compress grommet (35) and install in tray (6).

7. INSTALL BOLT ASSEMBLY.

   a. Position bolt assembly (40) into hinge on tray (6).

   b. Install straight pin (39) through hinge and bolt assembly (40).

   c. Using needle nose pliers, install cotter pin (38) through straight pin (39).

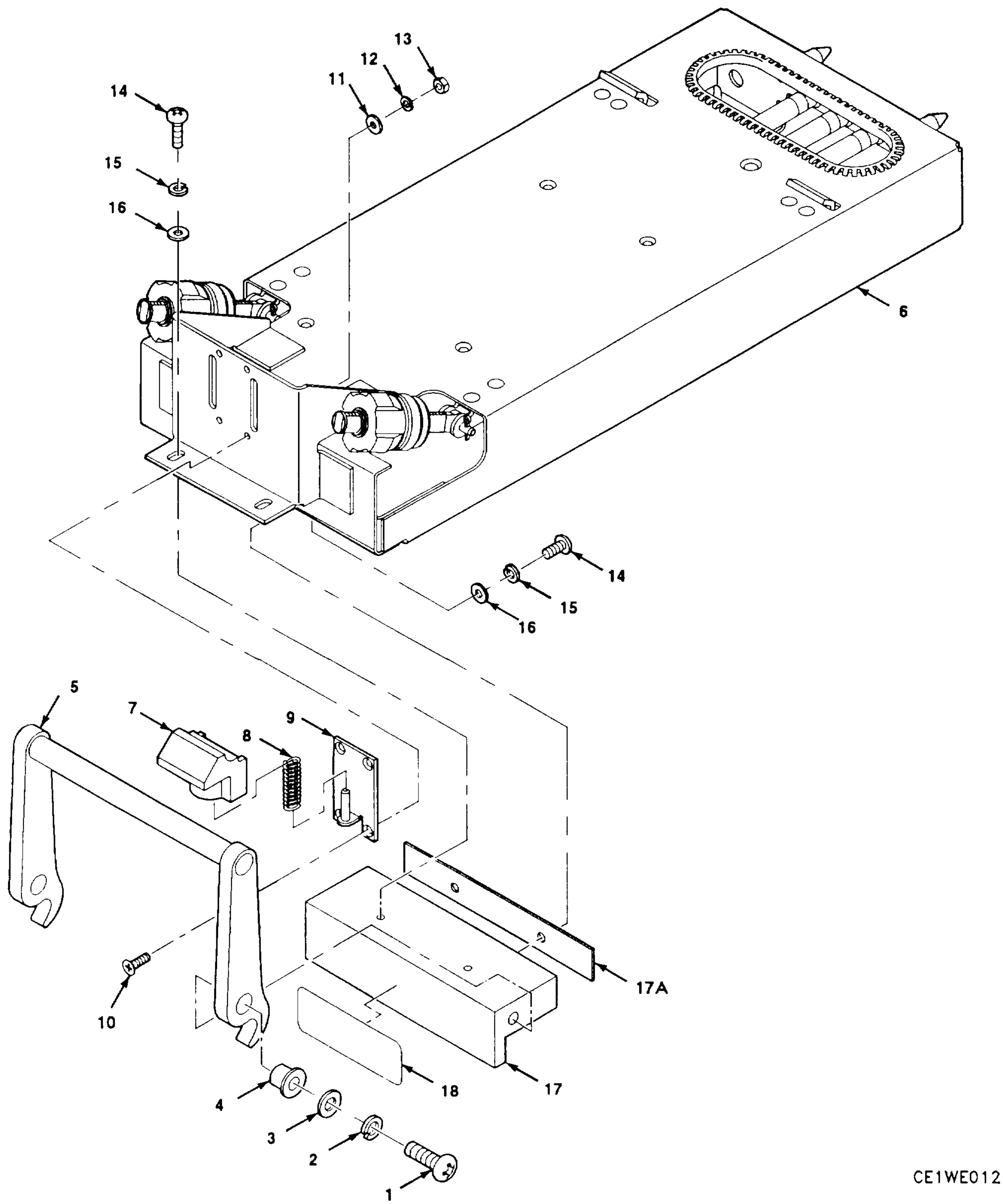


Figure 5-2. MT-6373 Mounting Base Exploded View (Sheet 1 of 3)

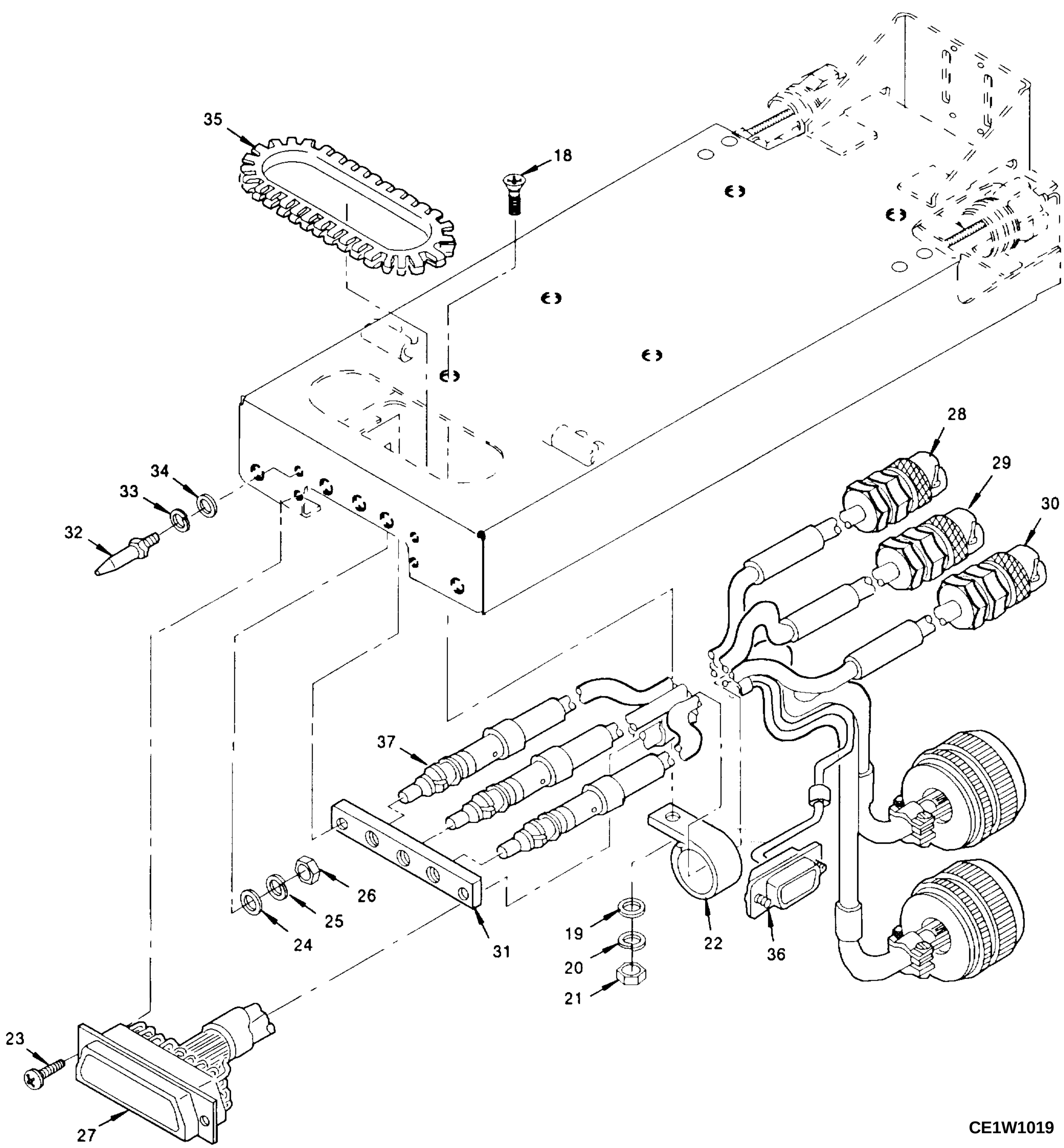


Figure 5-2. MT-6373 Mounting Base Exploded View (Sheet 2 of 3)

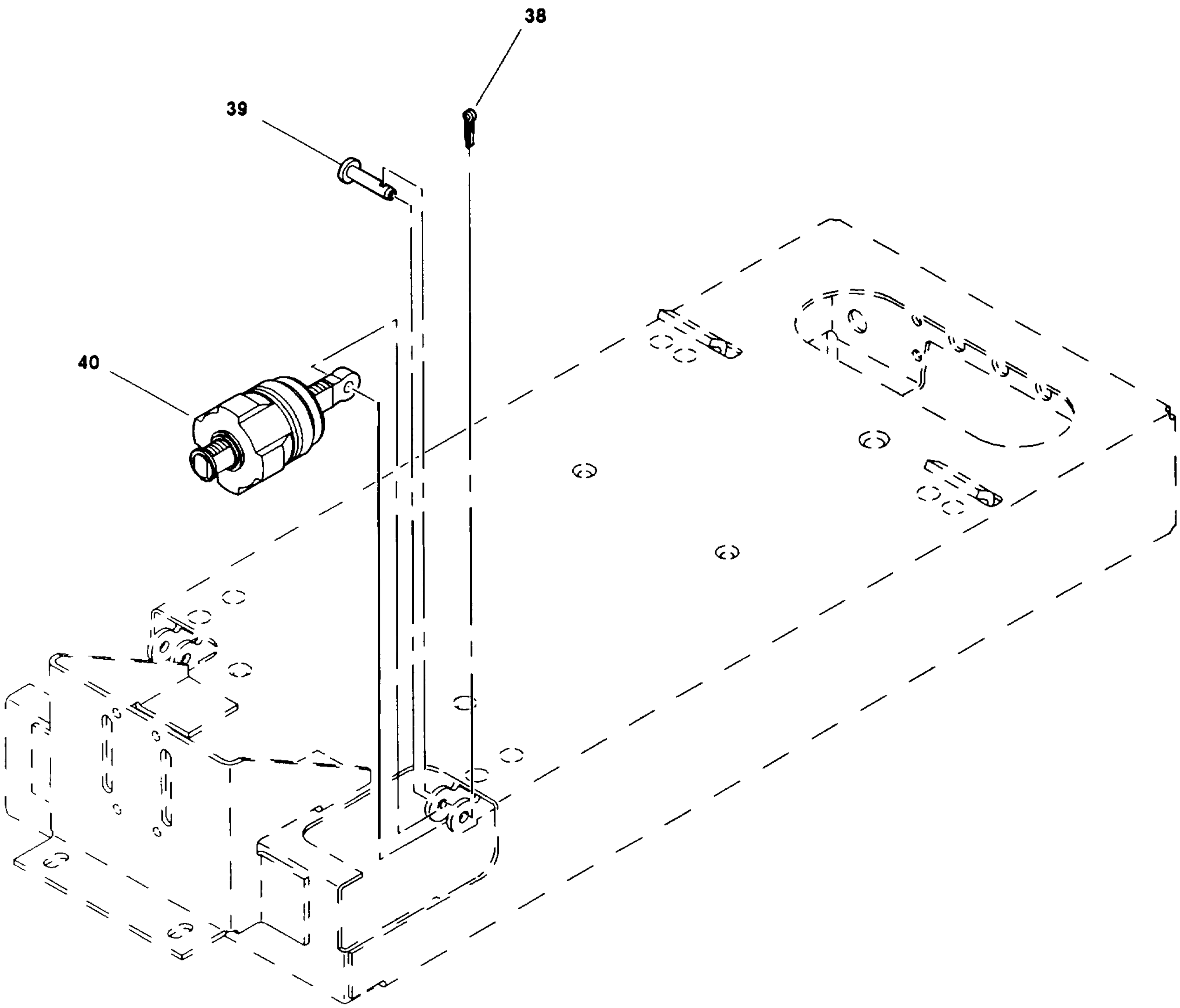


Figure 5-2. MT-6373 Mounting Base Exploded View (Sheet 3 of 3)

5-10. MT-6373 SYSTEM CABLE (W1)

This task covers: a. Disassembly b. Assembly

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G
Insertion/Removal Tool
Crimping Tool

References

Figure 5-3 shows parts location.

DISASSEMBLY

1. REMOVE CONNECTOR - J1 or P6.

   Use removal tool to remove contacts from connector (1 or 2). Tag wires for reassembly.

2. REMOVE CONNECTOR - P1 or P2.

   a. Loosen two screws that secure backshell (3) to cable.

   b. Unscrew backshell (3) from connector (4).

   c. Use removal tool to remove contacts from connector (4).

ASSEMBLY

1. INSTALL CONNECTOR - J1 or P6.

   a. If any contacts are damaged, remove using diagonal cutters. Install new contact using crimping tool.

   b. Use insertion tool to insert contacts into connector (1 or 2).

2. INSTALL CONNECTOR - P1 or P2.

   a. If any contacts are damaged, remove using diagonal cutters. Install new contact using crimping tool,

   b. Use insertion tool to install contacts in connector (4).

   c. Screw backshell (3) onto connector (4).

   d. Tighten two screws on backshell (3).

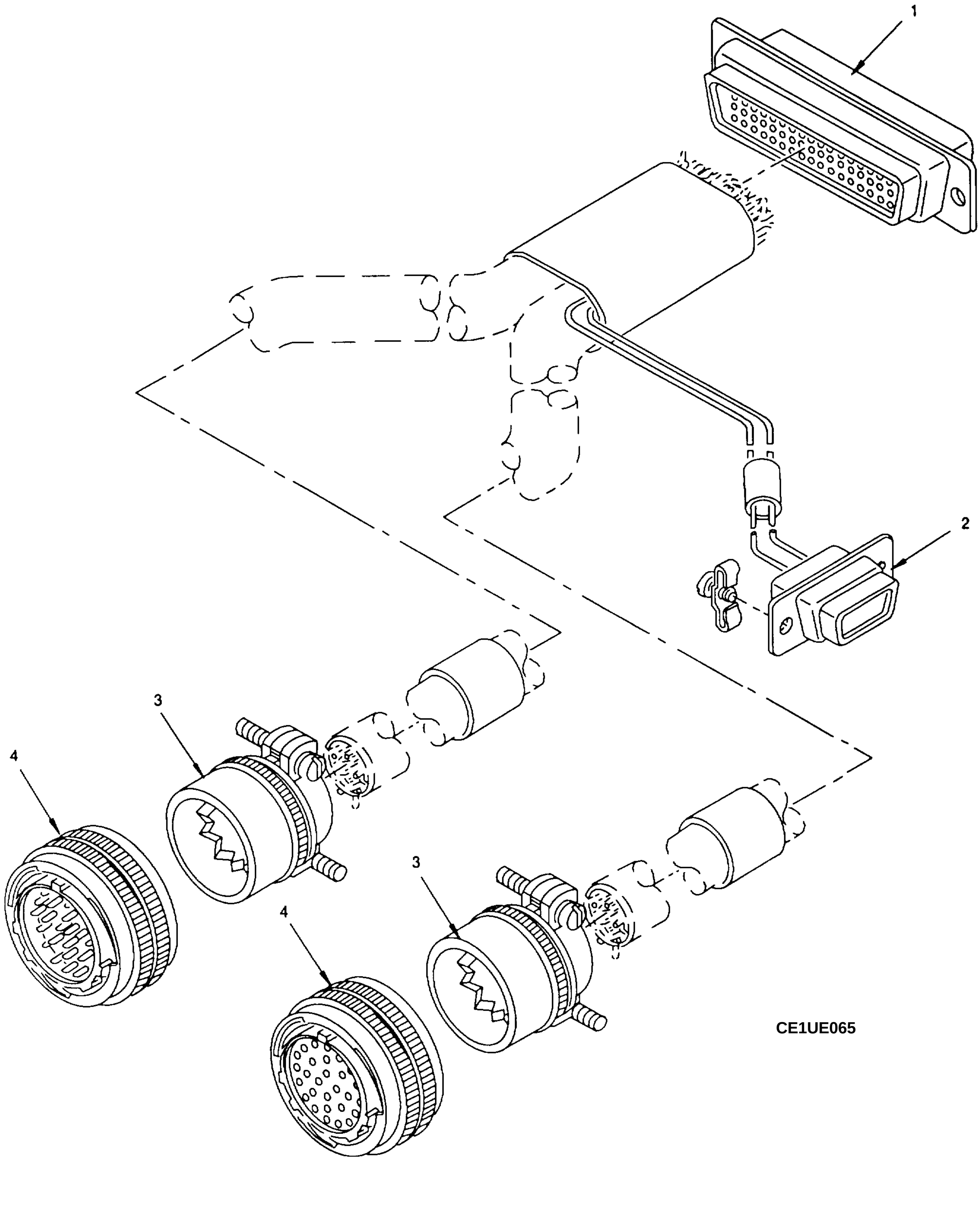


Figure 5-3. MT-6373 Cable WI Exploded View

5-11. MT-6374 MOUNTING BASE

This task covers: a. Disassembly b. Assembly

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

Expendable Supplies

Cotton Swab and Alcohol

References

Figure 5-4 shows parts location.

DISASSEMBLY

1. REMOVE BOLT ASSEMBLY.
   a. Using a needle nose pliers, remove cotter pin (1) from straight pin (2).
   b. Remove straight pin (2) and bolt assembly (3) from tray (4).
2. REMOVE IDENTIFICATION PLATE.
   a. With pocket knife, peel off identification plate (5).
   b. With cotton swab and alcohol, clean adhesive from tray (4).

ASSEMBLY

1. INSTALL BOLT ASSEMBLY.
   a. Position bolt assembly (3) into hinge on tray (4).
   b. Install straight pin (2) through hinge and bolt assembly (3).
   c. Using needle nose pliers, install cotter pin (1) through straight pin (2).
2. INSTALL IDENTIFICATION PLATE.
   a. Peel backing from new identification plate (5).
   b. Press into place on tray (4).

Section V. PREPARATION FOR STORAGE OR SHIPMENT

5-12. GENERAL INFORMATION

Pack the mounting base in an approved shipping container.

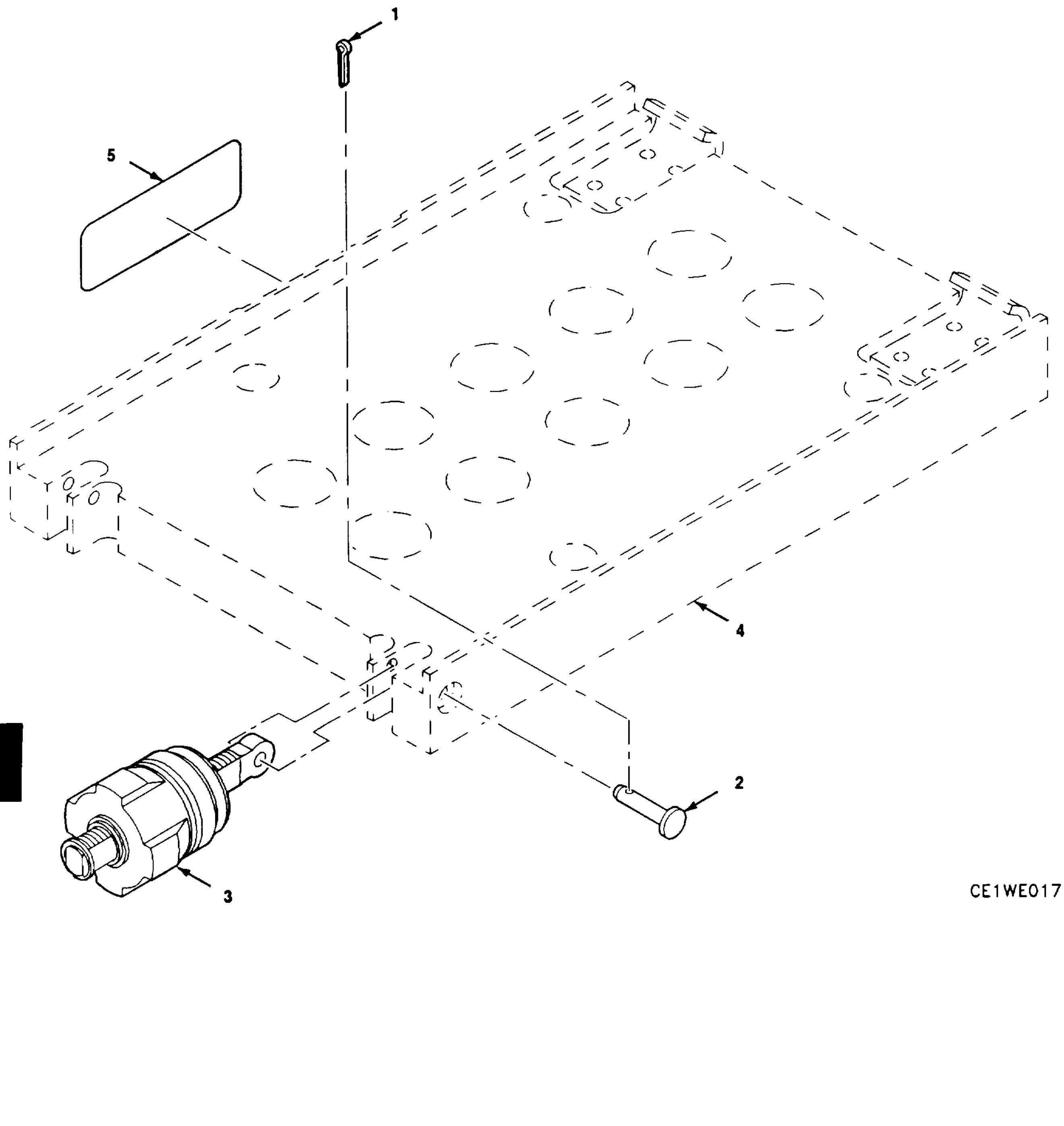


Figure 5-4. MT-6374
Mounting Base Exploded View

CHAPTER 6

MAINTENANCE INSTRUCTIONS FOR MAINTENANCE GROUP OA-9264A/ARC

Section I. PRINCIPLES OF OPERATION

6-1. INTRODUCTION

Maintenance Group 0A-9264A/ARC is used to test and troubleshoot AN/ARC-201(V) and AN/ARC-201A(V) radio set components. It is made up of the following:

- Interconnecting Device,
- Fill Device, Electronic Counter-Countermeasures MX-18290/VRC,
- Panel, Receiver-Transmitter RT–1477/ARC–201 (V),
- Parts Kit, Electronic Equipment,
- Case, Transit,
- Headset, H-157/AIC
- Cable Assemblies W1 through W8, W10, and W17.

6-2. INTERCONNECTING DEVICE

The interconnecting device is made up of five main pieces. They are:

- Receiver-Transmitter, Radio RT-1476A/ARC-201A(V),
- Control, Radio Set C-11466A/ARC-201A(V),
- Adapter, Data Rate CV-3885/ARC-201(V),
- Intercom C-6533/ARC.
- Test Adapter.

The interconnecting device mounts in the bottom section of the transit case. The interconnecting device is shown in figure 6-1.

a. *Receiver-Transmitter, Radio RT–1476A/ARC–201A(V).* This is the reference rt (ref rt) mounted in the test adapter. It exchanges radio signals with an rt unit under test (rt uut). It provides an rt for an rcu unit under test (rcu uut) to control.

b. Control, Radio Set C-11466A/ARC-201A(V). This is the reference remote control unit (ref rcu) mounted in the test adapter. It exchanges remote control signals with an rt uut which tests the rt's ability to operate under remote control.

c. Adapter, Data Rate CV–3885/ARC–201(V). This is the reference data rate adapter (ref dra) mounted in the test adapter. It exchanges data signals with a data rate adapter unit under test (dra uut) to test its ability to transmit/receive data signals properly.

d. /ntercom C-6533/ARC. This is the intercommunications system (its) mounted in the test adapter. It provides interface with the headset which connects to connector J9. It routes audio signals to or from the operator to the ref rt or rt uut.

e. Test Adapter. The test adapter holds the units listed above. It is described in detail in paragraph 6-6.

Each unit is mounted in the front panel of the test adapter and secured with dzus fasteners. Each is connected to the test adapter as shown in figure 6-2.

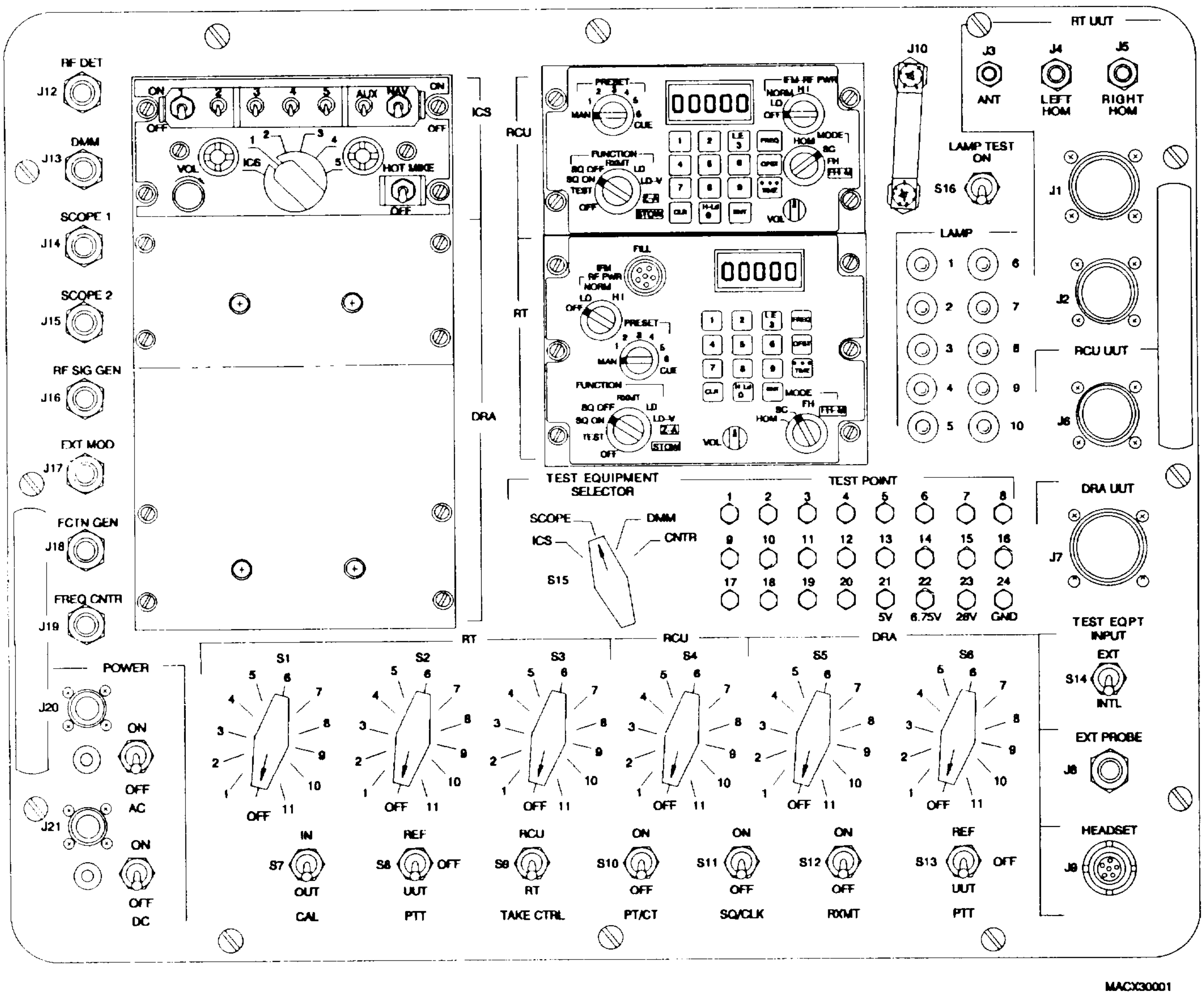


Figure 6-1. Interconnecting Device

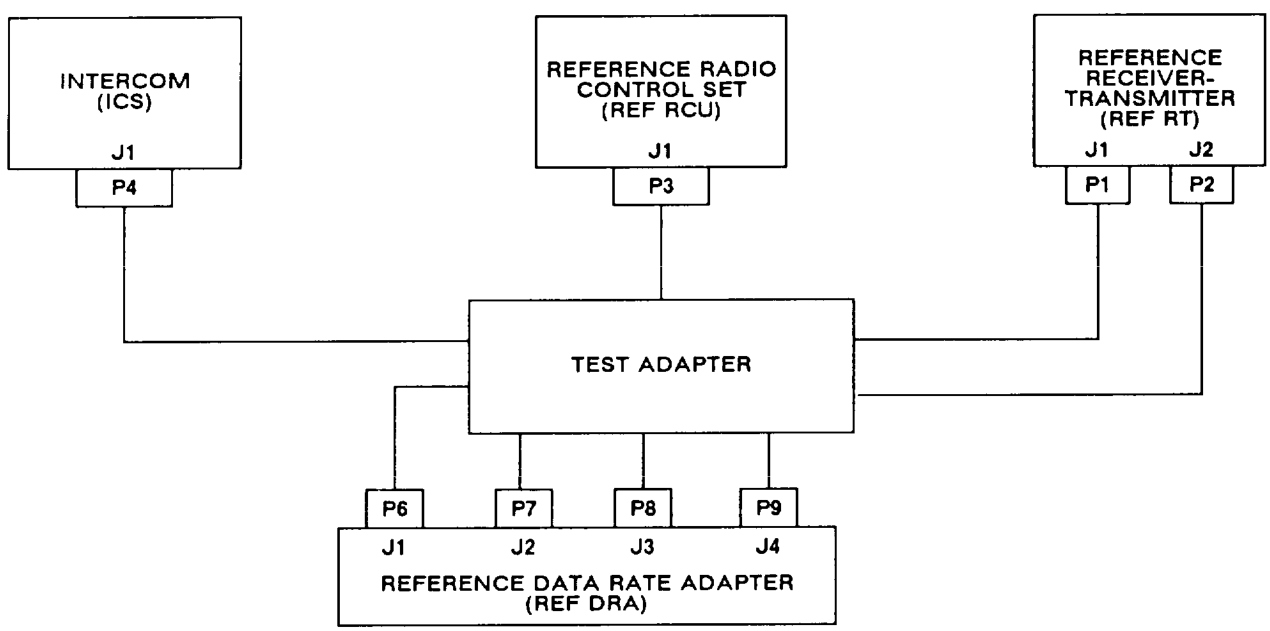


Figure 6-2. Interconnecting Device System Connection

6-3. ECCM FILL DEVICE

The ECCM fill device stores the TRANSEC variables, hopsets, and lockout sets used for frequency hopping (FH) operation of rt. ECCM fill device principles of operation are covered in TM 11-5821-333-12.

6-4. PANEL, RECEIVER-TRANSMITTER RT-1477/ARC-201(V)

This is the front panel for an RT-1477 radio. The principles of operation are in chapter 2.

6-5. ELECTRONIC EQUIPMENT PARTS KIT

The parts kit is included with the maintenance group. It is a zippered storage pouch containing the logic probe, test cables W9 and W11 through W16, and assorted parts needed for troubleshooting. The following is a list of the parts kit parts:

DESCRIPTION	QUANTITY
Probe Assembly, Digital	1
Cable Assembly, Special Purpose (W15)	1
Cable Assembly, Special Purpose (W12)	1
Cable Assembly, Module Test, RF (W11)	1
Adapter, BNC to Dual Banana Plug	2
Bag, Parts	1
Cable Assembly, Module Test, RF (W13)	1
Extractor, Elec Card	1
Adapter, SMA Tee	1
Adapter, BNC Tee, Jack-Plug-Jack	1
Adapter, BNC Plug to SMA Plug	2
Adapter, BNC Jack to BNC Jack	2
Adapter, Probe Tip to BNC	2
Cable Assembly, Special Purpose (W14)	1
Dummy Load, Coaxial	2
Adapter, Snap On, Jack to Jack	2
Adapter, N Jack to SMA Jack	1
Connector, Plug, Electrical, Tip-Modified-Red	1
Connector, Plug, Electrical, Tip-Modified-Black	1
Adapter, SMA Plug to SMA Plug	2
Adapter, BNC Jack to SMA Jack	2
Cable Assembly, Special Purpose (W16)	4
Adapter, N Plug to BNC Jack	2
Cable Assembly, Special Purpose (W9)	1
Attenuator, Fixed, Coaxial, 3 dB	1

6-6. TEST ADAPTER

The test adapter provides the following services:

- Provides physical support for the reference radio equipment,
- Supplies ac and dc power to the reference radio and units under test that are connected,
- Provides connections for inputs and outputs of the test equipment and switches for routing desired signals to and from the test equipment,
- Switches and routes rf signals between rts and to test equipment for diagnosis,
- Switches and routes control signals from reference radio to unit under test,
- Shows status of signals between reference and under test radios with status lights,
- Provides access to signals between reference and under test radios with test points,
- Provides audio input and output to the radios through the headset,
- Sets test conditions to simulate different modes of operation.

See figure FO-16 for a schematic of the test adapter.

The test adapter can be divided into the following sections:

- Power supply,
- Test equipment connection and routing,
- Rf section,
- Routing switches,
- Test lamps,
- Test condition switches,
- Test points.

Each of these is covered in the following paragraphs.

a. Power Supply. Dc power at a +28 V level is input at connector J21. It may be switched on and off with the DC switch, which is circuit breaker CB2. When dc power is on, the DC lamp (DS12) is lit. The +28 V may be tested at TP23. A +6.75 V level is supplied to TP22. This may be used to power the digital logic probe during troubleshooting. The +28 V is supplied to all reference and unit under test radio units.

Ac power is input at a 115 V ac !evel at connector J20. It may be switched on and off with the AC switch, which is circuit breaker CB1. When ac power is switched on, the AC lamp (DS11) will be lit. Ac power is supplied to rt and rcu units under test.

b. Test Equipmenf Connection and Routing. Connectors J8 through J19 provide input and output ports for test equipment connection to the test adapter. Figure 6-3 gives a partial schematic diagram of the test equipment inputs, outputs, and switching. The routing switches of the test adapter send signals for testing to the test equipment input (TEST EQPT INPUT) switch, S14. When S14 is set for internal signals (INTL), the selected signal is routed to the test equipment, If S14 is set to EXT, then the signal tested will be the one sampled by the external probe (EXT PROBE) connected to J8. S14 sends the selected signal to the TEST EQUIPMENT SELECTOR, S15. Depending on the setting, S15 may send the signal to:

- the headset via the its,
- scope channel 1 (SCOPE),
- the digital multimeter (DMM),
- the frequency counter (FREQ CNTR).

The calibrate switch (CAL, S7) will, when set to IN, route the input function generator signal (FCTN GEN) to both the frequency counter and scope channel 2. This allows the operator to set an input signal's frequency and level without moving cables.

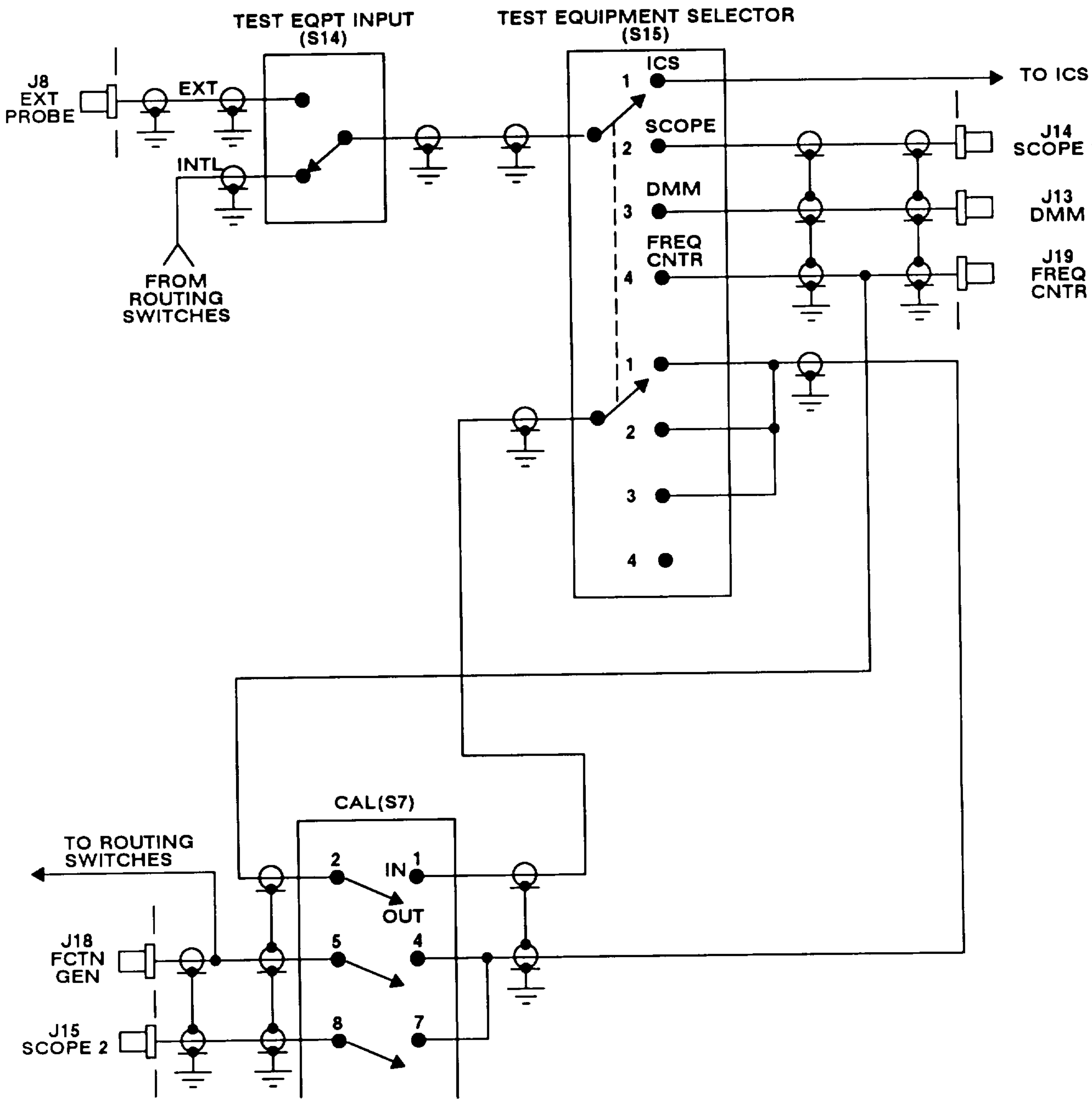


Figure 6-3. Test Equipment Switching Block Diagram

6-6. TEST ADAPTER. Continued

c. *Rf Section.* The rf section of the test adapter, as shown in the partial schematic diagram of figure 6-4, is a series of rf cables, dividers, relays and attenuators. The path of signals is controlled by the relays K1 through K3. The relays are shown in their inactive positions. When ground is applied to the negative control lead, the current flow from +28V to GND activates the relay coil and the signal path switches to the alternate route. The negative control lead for each relay is grounded by the routing switches. The rf section provides:

- Rf signals into rt uut homing antenna connectors for calibrating rt homing function,
- A signal path between the reference rt and rt uut antenna connectors,
- Signal from a signal generator to the rt uut,
- Signals from the rt uut at connector J12 (RF DET) or samples of the signals for the test equipment.

d. Routing Switches. The routing switches are switches S1 through S6. They are 12 position switches with five decks or layers each. They provide a method for routing a large number of control and communication signals between unit-under-test radios, reference radios, and test equipment. Switches S1 through S3 are mainly for routing rt and rcu signals; S4 through S6 are for dra signals.

e. *Test Lamps.* These 10 lamps show the status of some of the important signals routed through the test adapter. The signals monitored are listed in table 6–1. The +5 V supply for the test lamps is derived by U1, a voltage regulator, from the +28 V supply. The control circuits for the test lamps are mounted on the TEST LAMP circuit card assembly (CCA). All the test lamps may be turned on for maintenance checks with the LAMP TEST switch, S16.

Table 6-1. Test Lamp Signals

LAMP #	SIGNAL(S) MONITORED	LAMP LIT WHEN SIGNAL IS
1	POWER ON/OFF from ref rcu POWER ON/OFF from rt uut	+28 V +28 V
2	T-ZERO-N from rcu uut XMODE CNTRL from dra uut	LOGIC O LOGIC O
3	RXMT A/D SEL from rt uut ON from PT/CT SWITCH	LOGIC O +6.75 V
4	POWER ON/OFF from rcu uut +28 V from TEST LED SWITCH	+28 V +28 V
5	PT/CT OUT from dra uut IFM PWR B OUT from rt uut	LOGIC O LOGIC O
6	RXMT CONT OUT (2) from rt uut LOOP TEST from dra uut LOOP TEST from rcu uut	LOGIC O LOGIC O LOGIC O
7	PTT from dra uut ECCM/SC from rt uut	LOGIC O LOGIC O
8	PTT OUT from dra uut HI LO BAND from rt uut	LOGIC O LOGIC O
9	IFM TR	LOGIC O
10	IFM PWR A OUT	LOGIC O

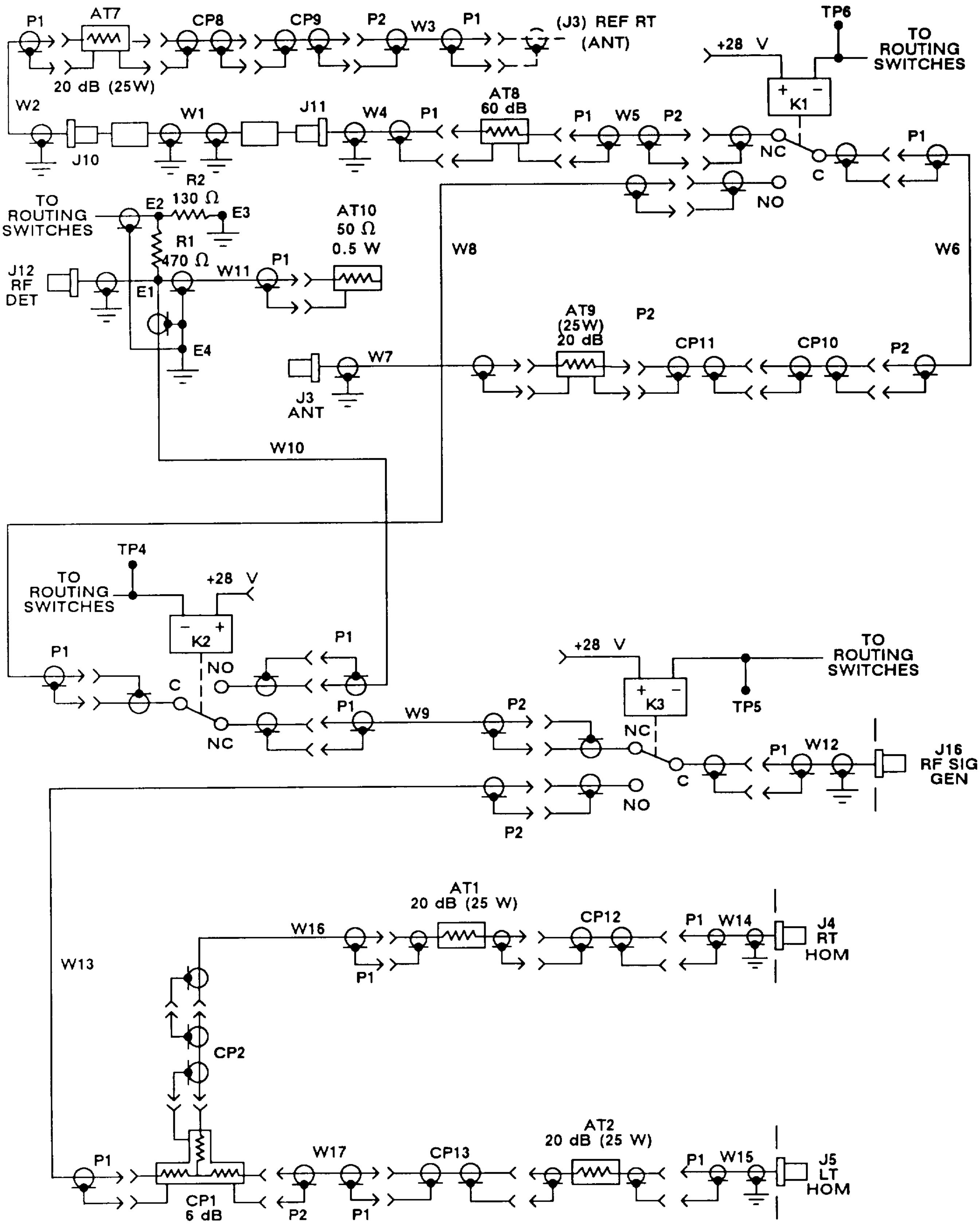


Figure 6-4. Test Adapter Rf Section

6-6. TEST ADAPTER. Continued

f. Test Points. There are 24 test points (TP) on the test adapter. They provide access to individual signals during operation. Their signals are listed in table 6-2.

Table 6-2, Test Point Signals

TEST POINT	MONITORS	USUAL SIGNAL (WHEN ACTIVE)
1	RT UUT TUNE CLOCK (J2-B)	DIGITAL CLOCK
2	RT UUT TUNE GATE-N (J2-C)	DIGITAL PULSES (LOGIC 1 TO LOGIC O)
3	RT UUT SERIAL DATA (J2-T)	DIGITAL DATA
4	RELAY K2	+28 V RELAY INACTIVE O V RELAY ACTIVE
5	RELAY K3	+28 V RELAY INACTIVE O V RELAY ACTIVE
6	RELAY K1	+28 V RELAY INACTIVE O V RELAY ACTIVE
7	(NOT USED)	
8	(NOT USED)	
9	REF RT DATA OUT	DIGITAL DATA
10	REF RT RCV XMODE	DIGITAL DATA
11	REF RT RCV AUDIO	AUDIO SIGNALS
12	REF RT XMT AUDIO	AUDIO SIGNALS
13	REF RT XMODE XMT	DIGITAL DATA
14	XMODE SEL	LOGIC 1 FOR DIGITAL XMODE SIGNALS LOGIC O FOR ANALOG XMODE SIGNALS
15	(NOT USED)	
16	(NOT USED)	
17	ICS XMT AUDIO	AUDIO SIGNALS
18	ICS RCV AUDIO	AUDIO SIGNALS
19	(NOT USED)	
20	(NOT USED)	
21	VOLTAGE REGULATOR U1 OUTPUT	5 V DC
22	6.75 V SUPPLY	6.75 V DC
23	28 V SUPPLY	28 V DC
24	GROUND (J21-B)	GND (O V DC)

6-6. TEST ADAPTER. Continued

g. Test Condition Switches. These are switches S7 through S13. They are used to set up different test conditions for the reference and uut units, Their functions are listed in table *6-3.*

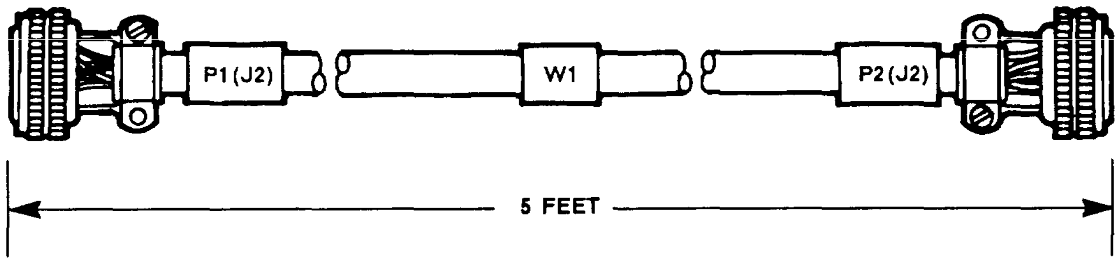
Table 6-3. Test Condition Switches

SWITCH	NAME	FUNCTION
S7	CAL	Routes input FCTN GEN signals to FREQ CNTR and SCOPE 2 when set to IN.
S8	Pi-r	Provides PTT signal (GND) to ref rt or rt uut, also to its.
S9	TAKE CTRL	Provides TAKE CTRL signal (GND) that determines when an rcu may control an rt. The settings are: RT: Ref rt runs independently of rcu uut or rt uut runs independently of ref rcu. RCU: Rcu uut controls ref rt or ref rcu controls rt uut.
S10	PT/CT	Provides signal (logic 1) to dra uut to run in cipher text mode when set to ON. Also used to force dra uut into PT during AD2 test.
S11	SQ/CLK	When set to ON, grounds the ref dra and dra uut squelch control (SQ CONTROL) lines, and provides connections for DIG DATA CLK IN to each dra.
S12	RXMT	Provides logic 1 signals to dra uut to select for retransmit mode.
S13	PTT	Provides PTT signal (GND) to ref dra or dra uut, also to its.

6-7. TEST CABLES

There are 20 test cables in the maintenance group. Cables W10 through W16 are part of the electronic equipment parts kit, Figure 6-5 contains a drawing and schematic of each cable. They are:

REF DES (QTY)	CONNECTS
W1	J2 of test adapter to J2 of rt uut
W2	J1 of test adapter to J1 of rt uut
W3	J6 of test adapter to J1 of rcu uut
W4	J3 of test adapter to J3 of rt uut
W5	J4 of test adapter to J4 of rt uut
W6	J5 of test adapter to J5 of rt uut
W7	J20 of test adapter to AC power supply
W8	J21 of test adapter to DC power supply
W9	J9 of test adapter to headset
W10	J7 of test adapter to dra uut
W11	TPS jack to micro RF connector
W12	J2 of test adapter to J6 of test adapter
W13	TPS plug to micro RF connector
W14	J9 of test adapter to BNC jack connector
W15	Rt uut power supply to rt uut backplane
W16 (4)	Dra uut connector housing to dra
WI 7	(Not presently used)



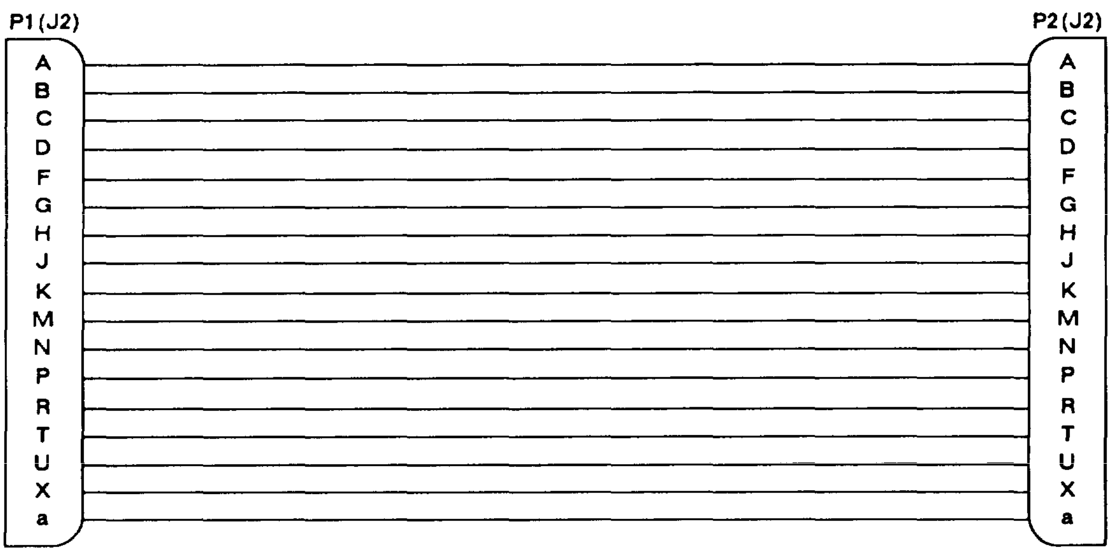


Figure 6-5. Maintenance Group Test Cables (Sheet 1 of 12)

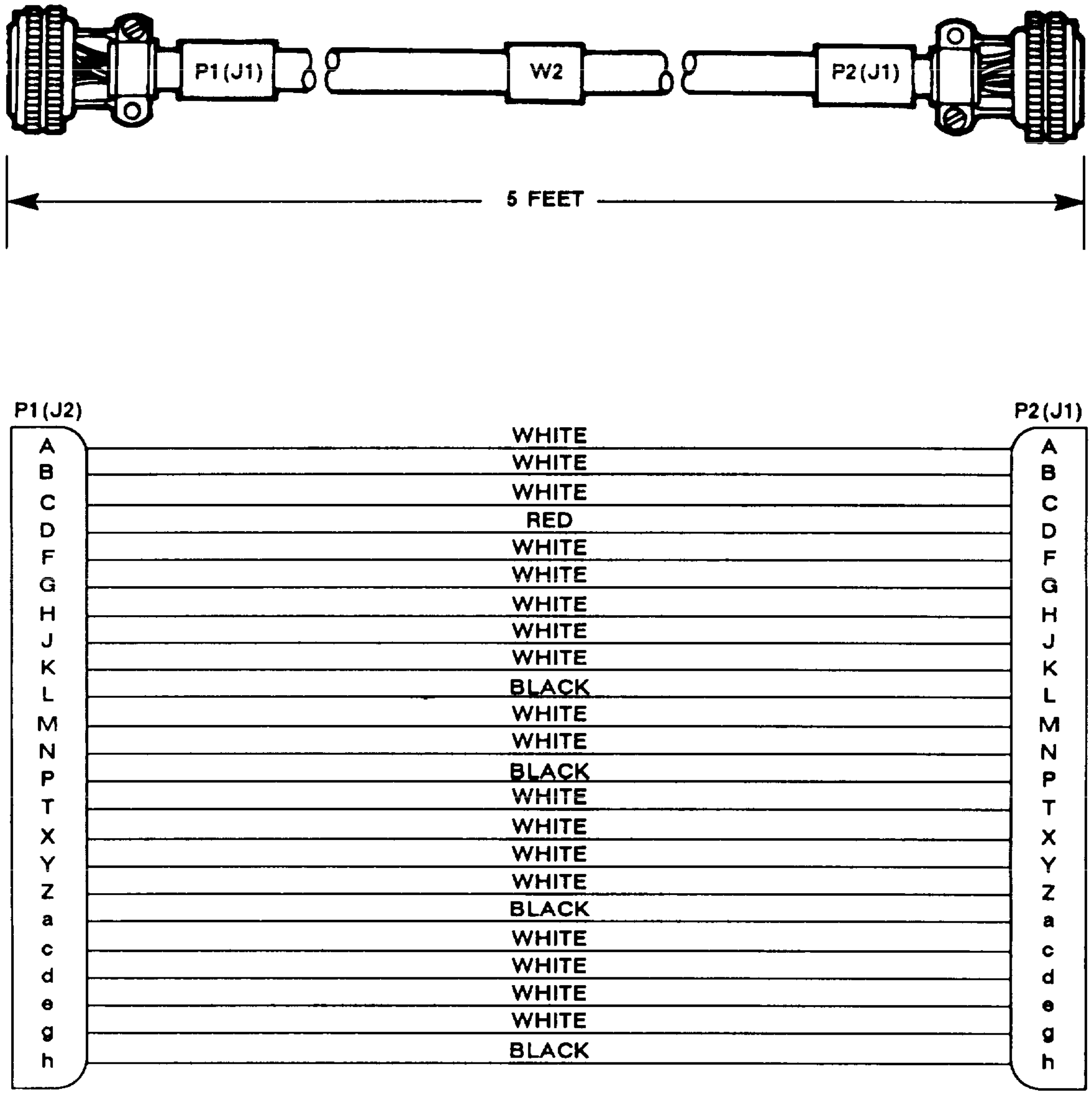


Figure 6-5. Maintenance Group Test Cables (Sheet 2 of 12)

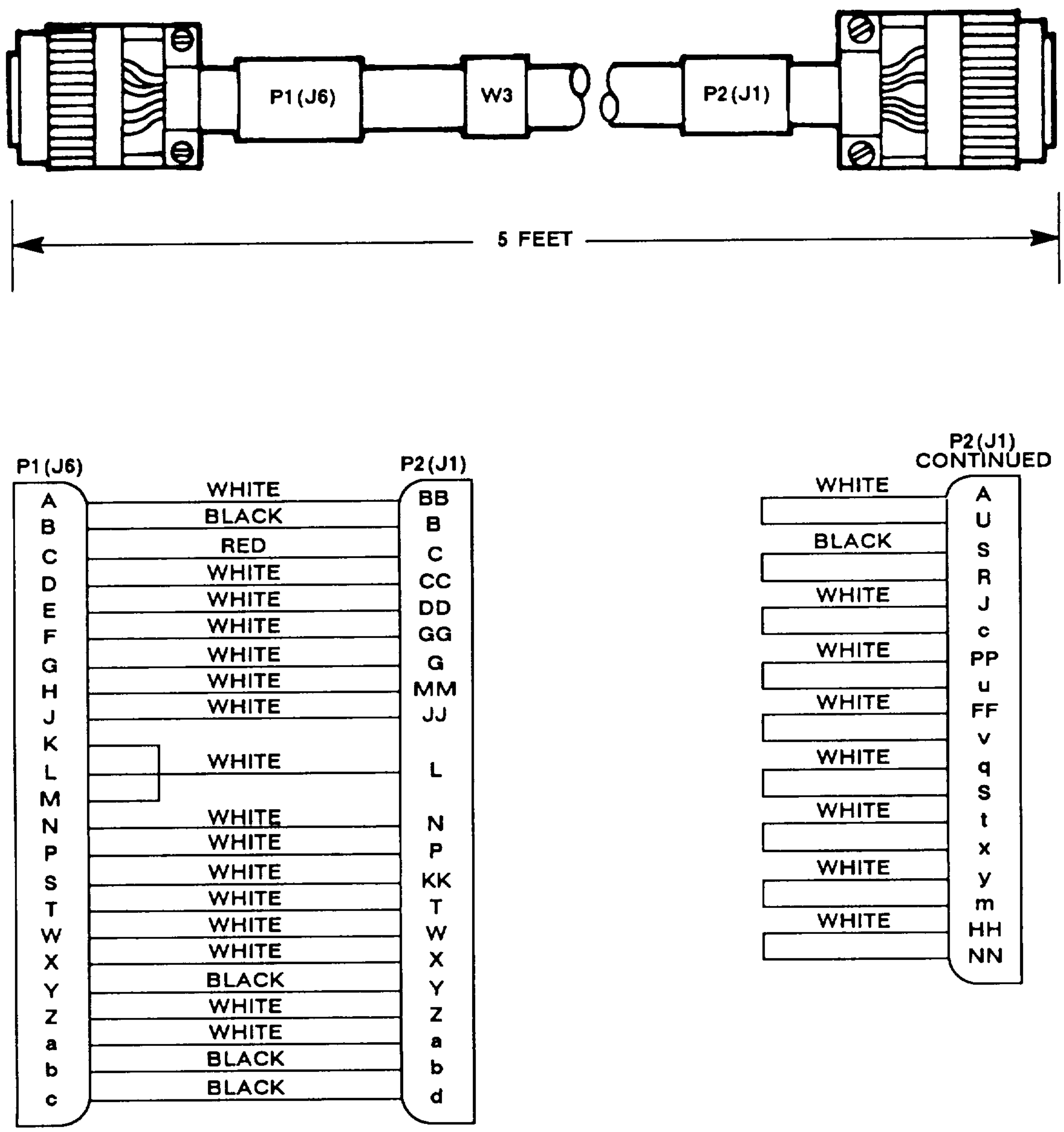
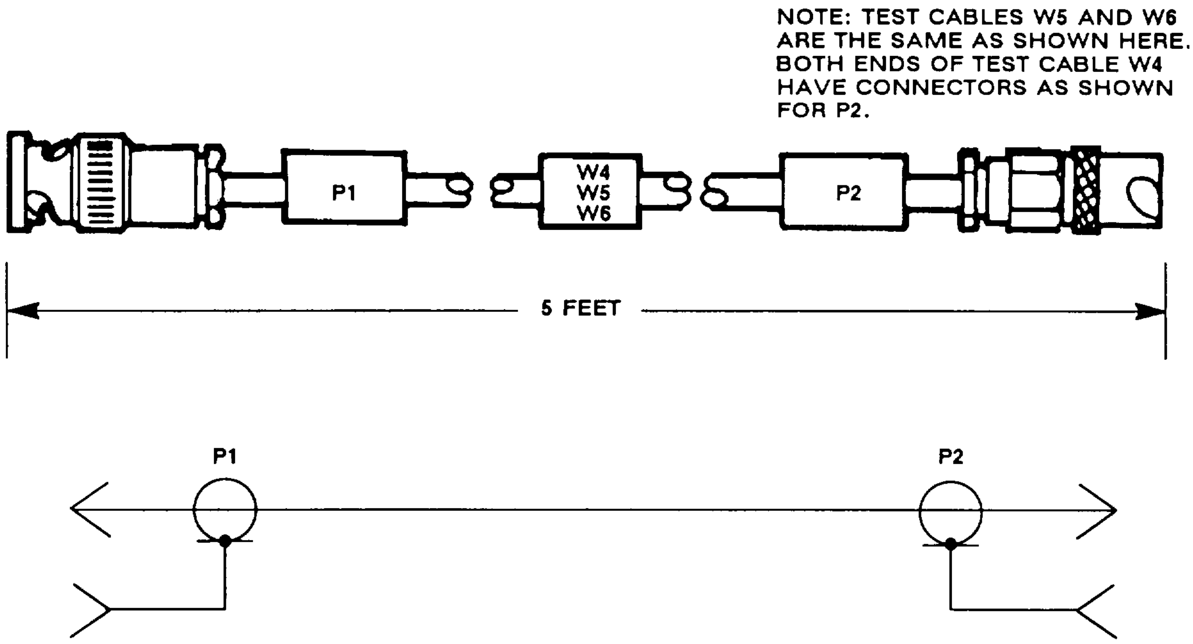


Figure 6-5. Maintenance Group Test Cables (Sheet 3 of 12)



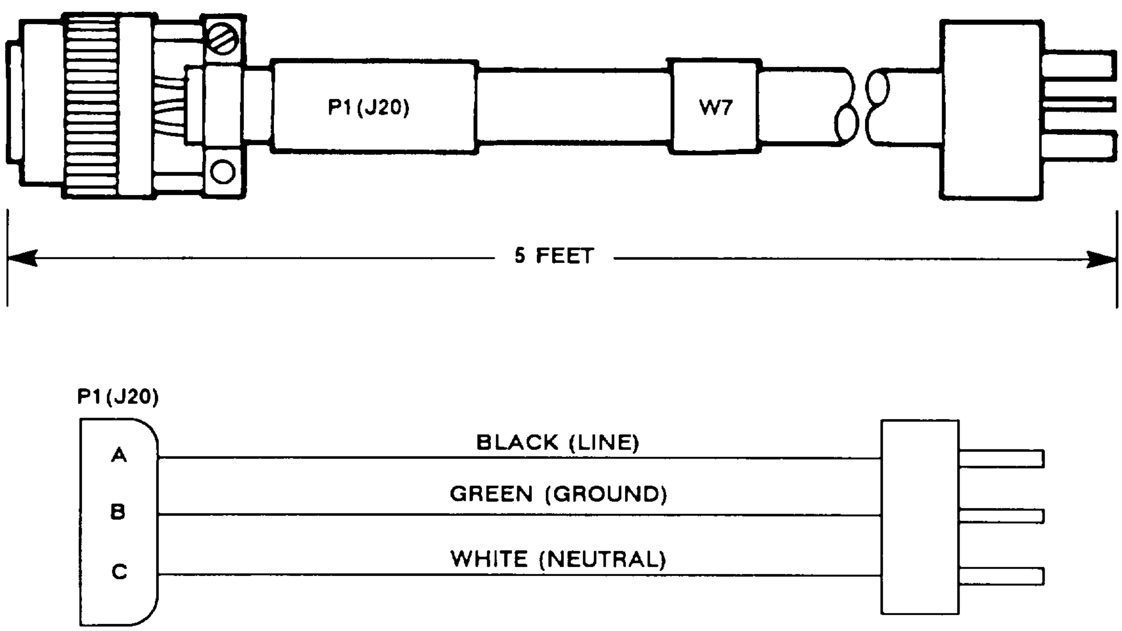


Figure 6-5. Maintenance Group Test Cables (Sheet 4 of 12)

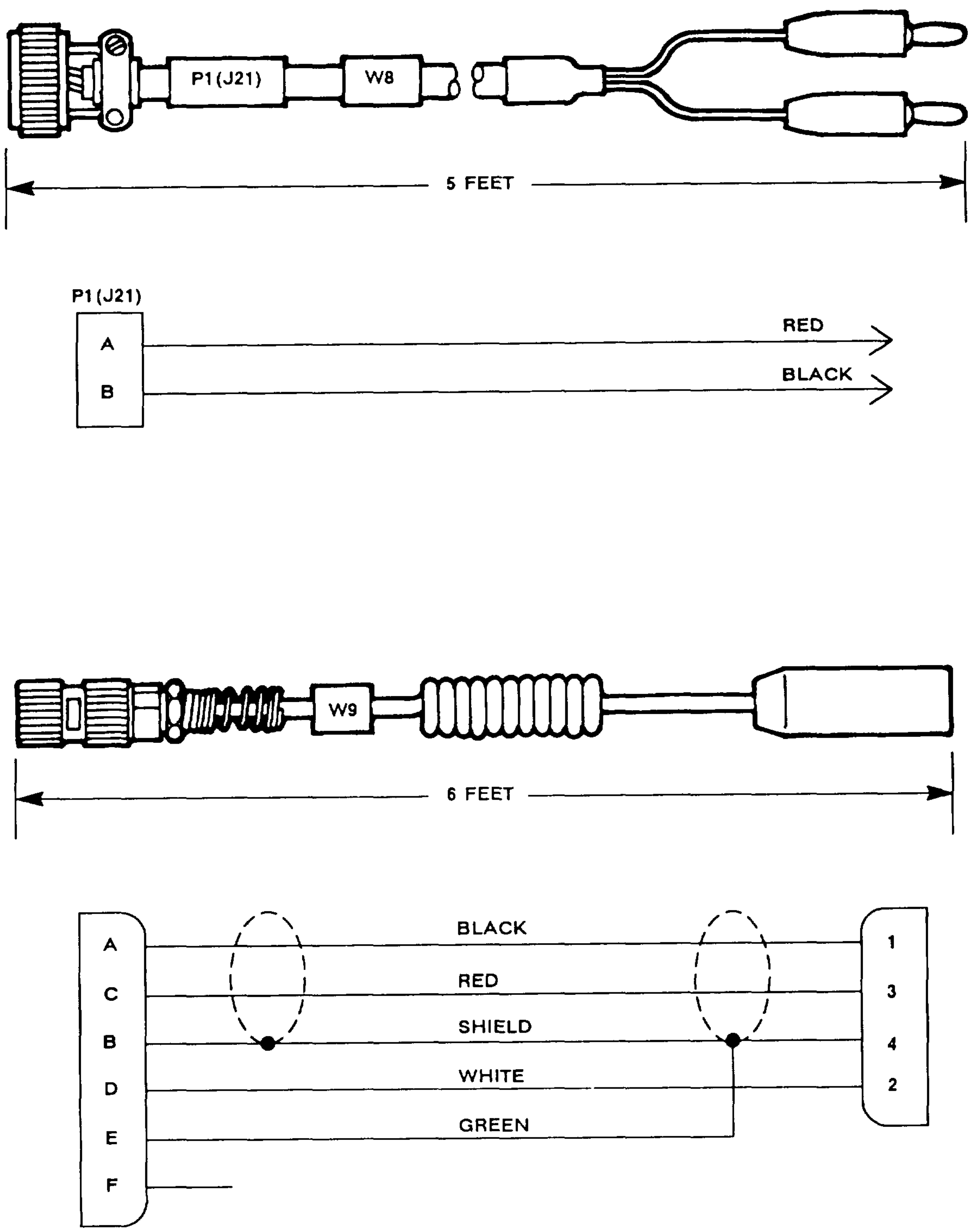


Figure 6-5. Maintenance Group Test Cables (Sheet 5 of 12)

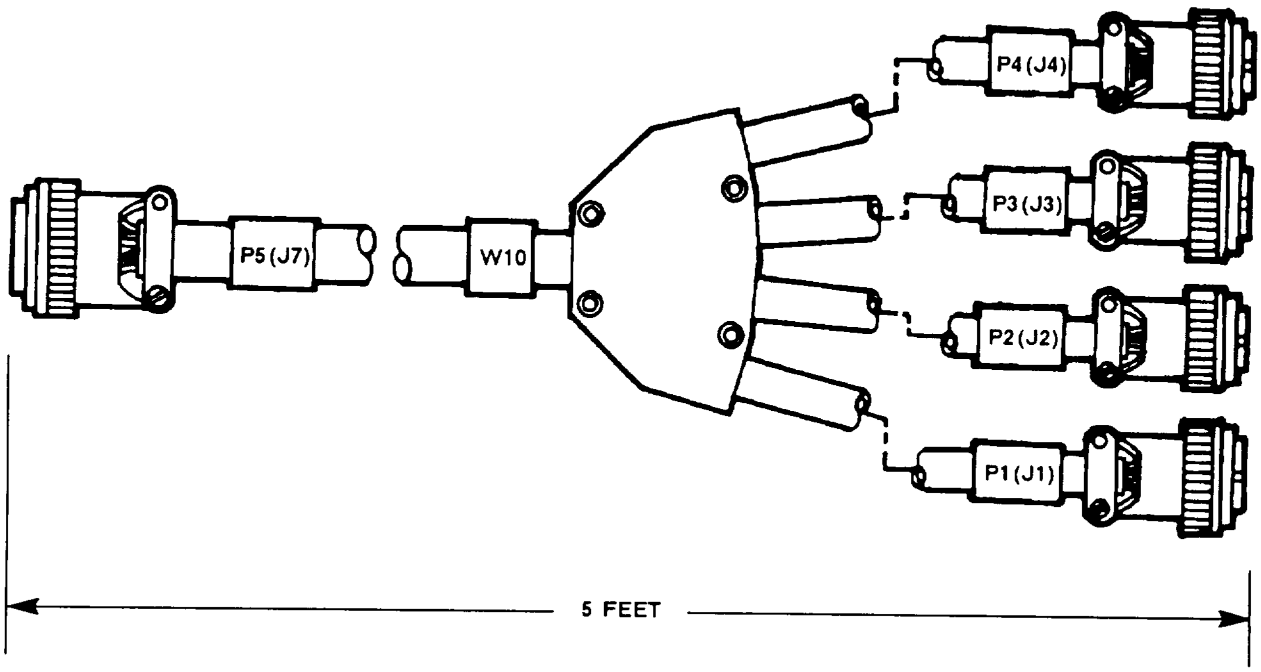


Figure 6-5. Maintenance Group Test Cables (Sheet 6 of 12)

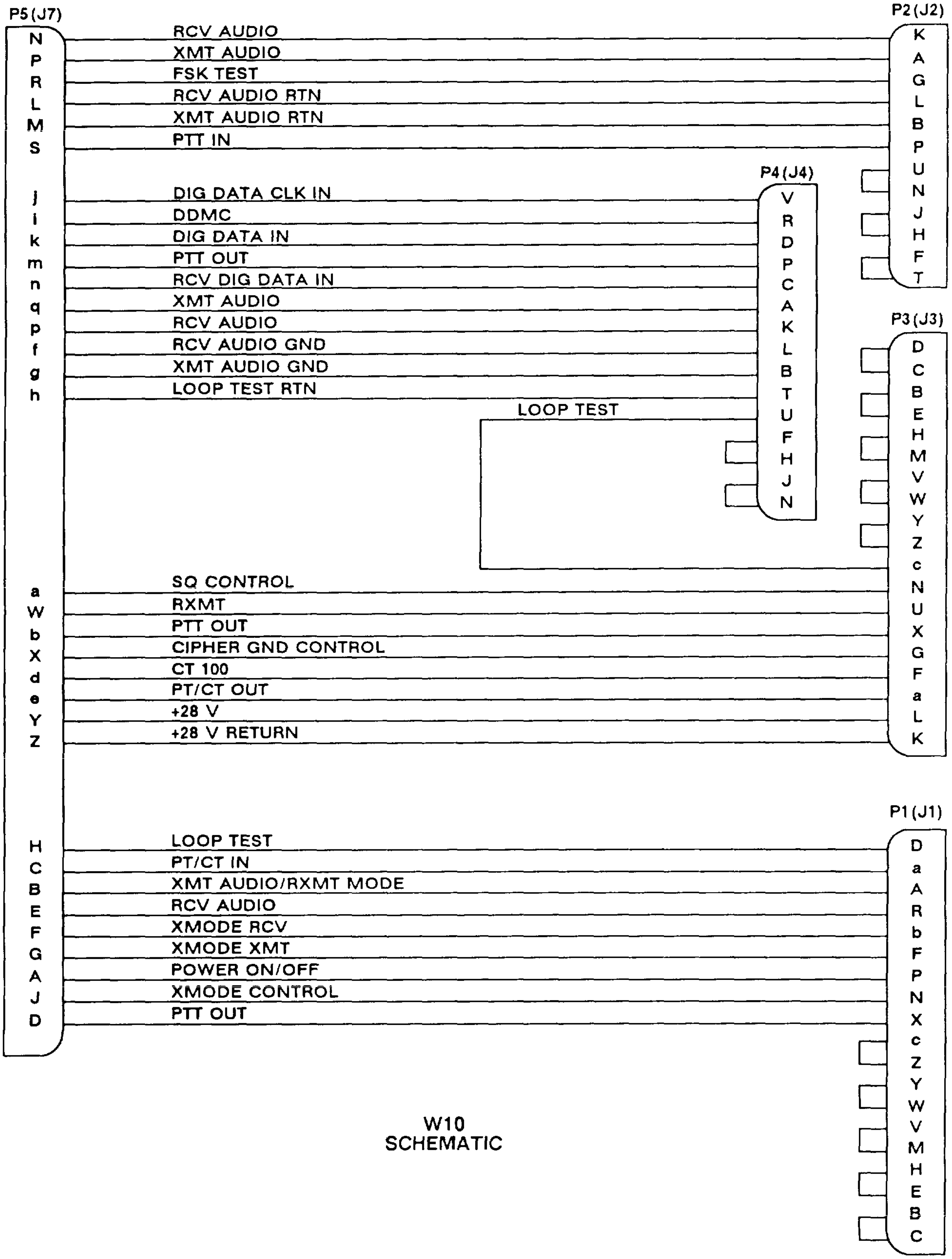


Figure 6-5. Maintenance Group Test Cables (Sheet 7 of 12)

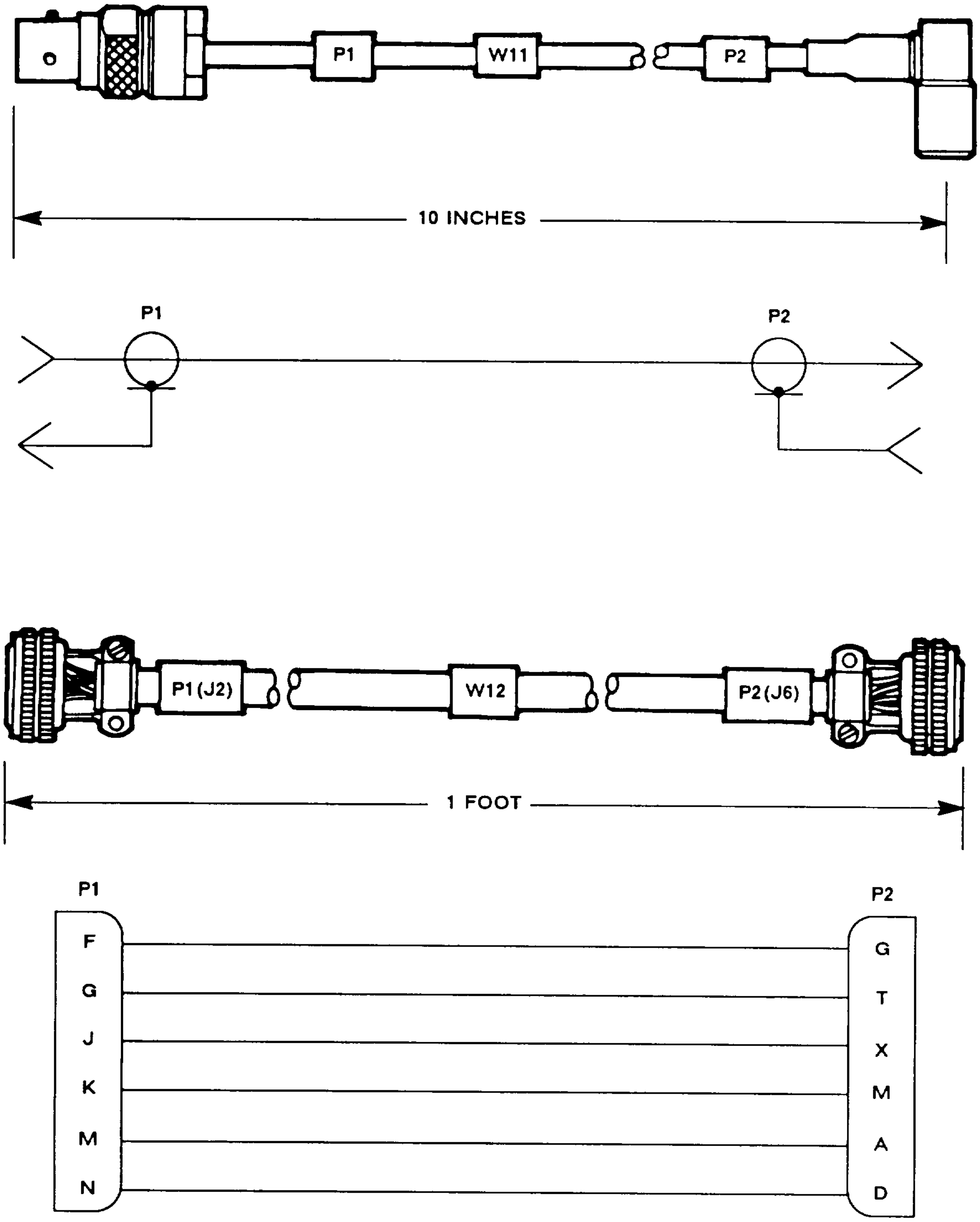


Figure 6-5. Maintenance Group Test Cables (Sheet 8 of 12)

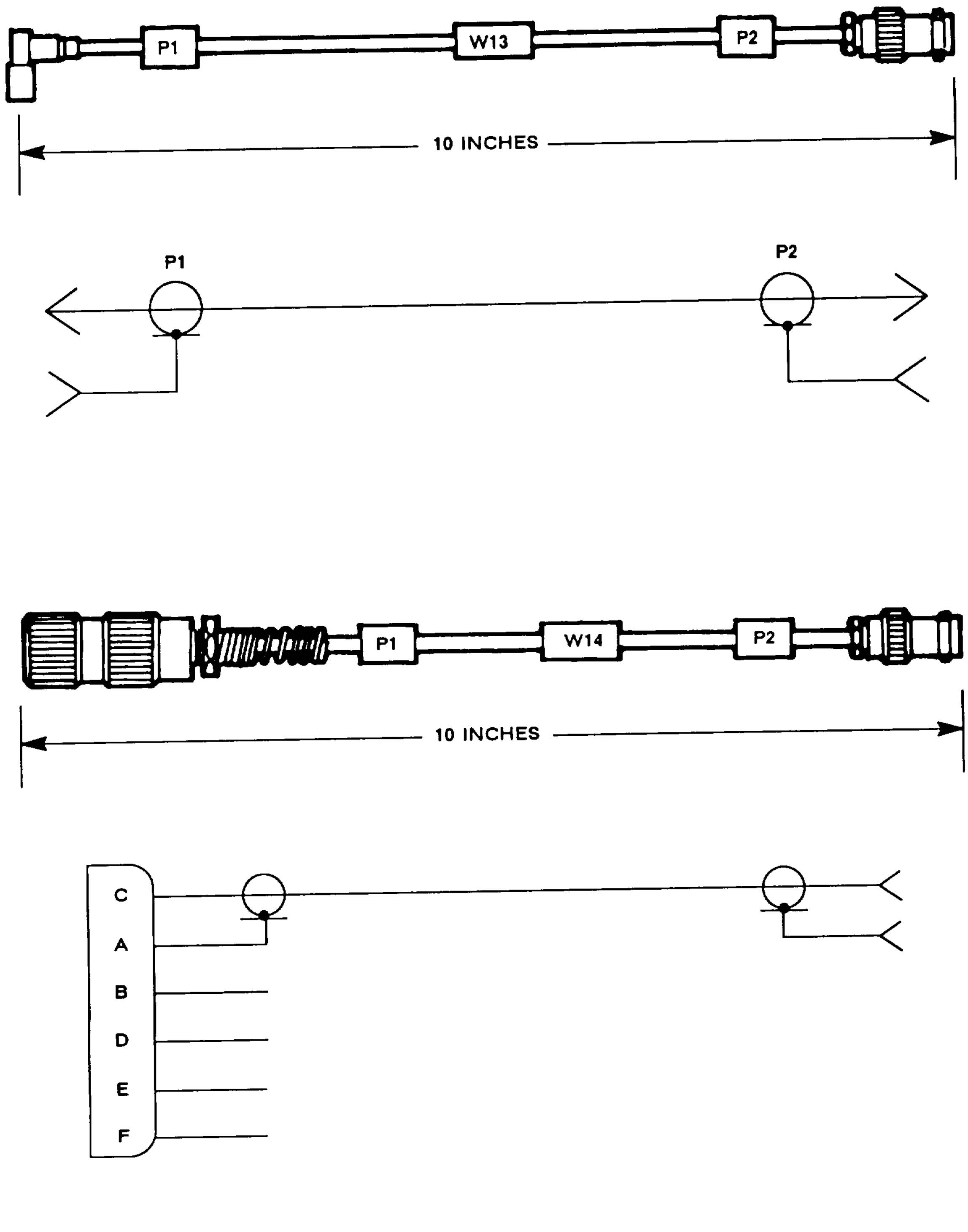
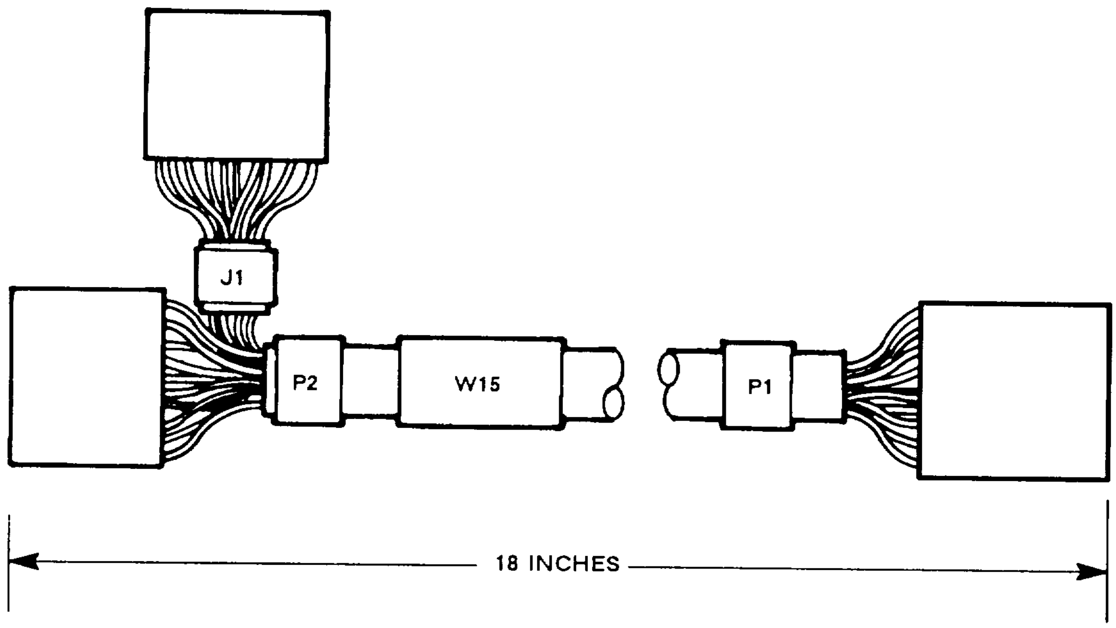


Figure 6-5. Maintenance Group Test Cables (Sheet 9 of 12)



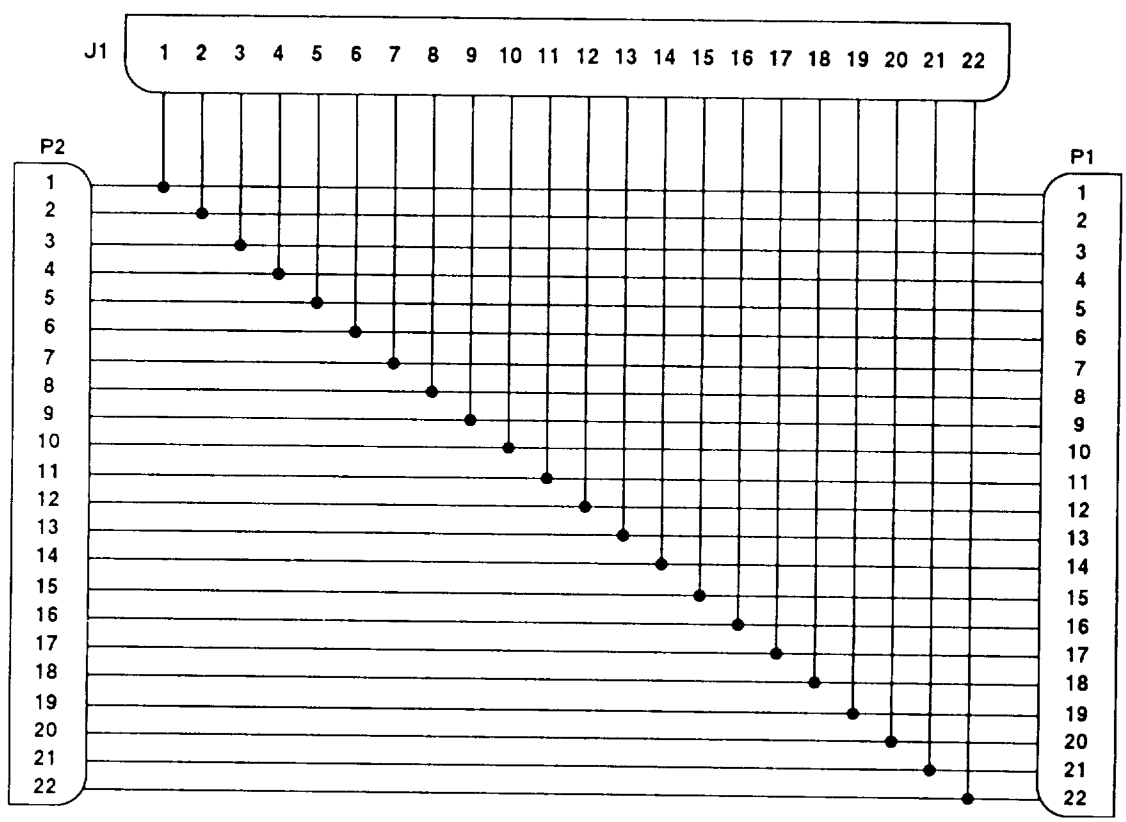
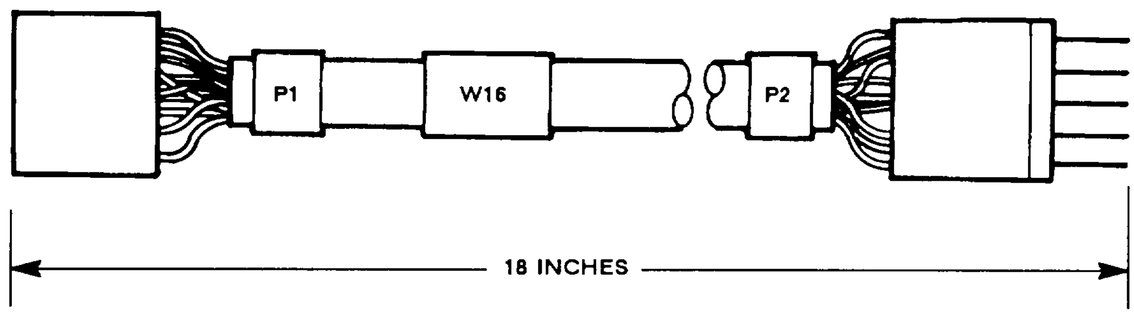


Figure 6-5. Maintenance Group Test Cables (Sheet 10 of 12)



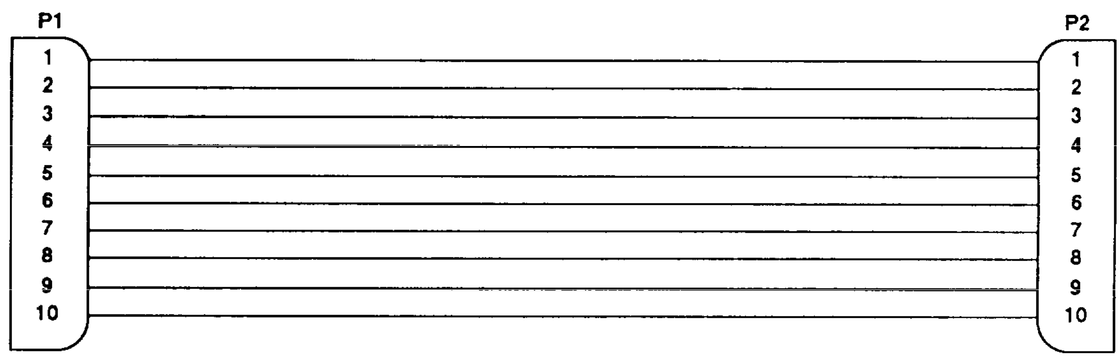


Figure 6-5. Maintenance Group Test Cables (Sheet 11 of 12)

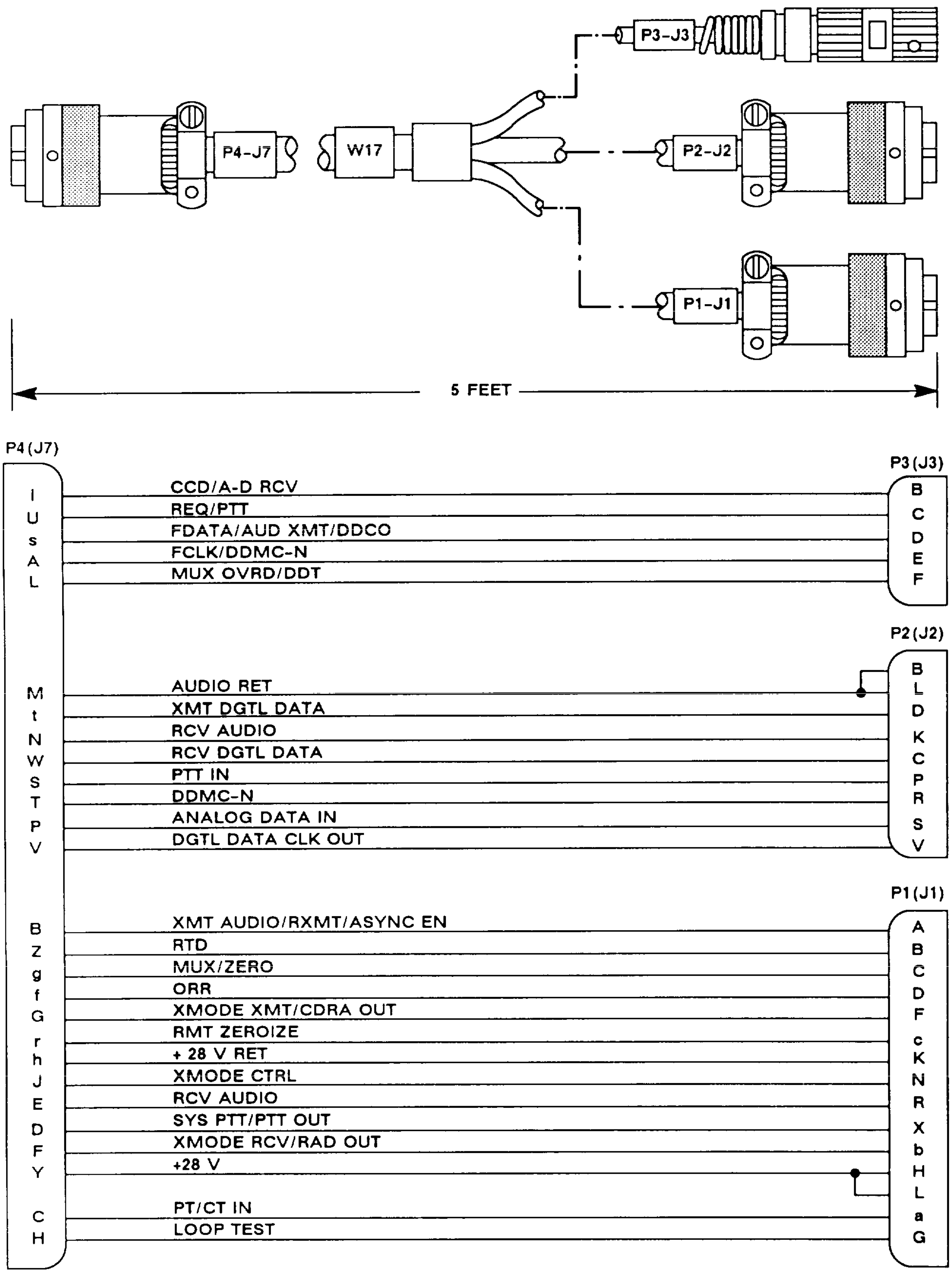


Figure 6-5. Maintenance Group Test Cables (not presently used) (Sheet 12 of 12)

Section II. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

6-8. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit. Common tools required for maintenance of the rt are listed in the Maintenance Allocation Chart. It is appendix B of TM 11-5821-333-12.

6-9. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

No special tools are required. For TMDE and support equipment refer to the Maintenance Allocation Chart, appendix B of TM 11-5821-333-12.

6-10. REPAIR PARTS

Repair parts are listed and illustrated in TM 11-5821-333-23P.

Section III. TROUBLESHOOTING

6-11. GENERAL

This section provides the troubleshooting procedures used to fault isolate a defective maintenance group. The troubleshooting information is presented in the form of flow charts. They systematically get from a symptom to the bad component(s).

6-12. EQUIPMENT DATA

This paragraph provides equipment data for the maintenance group. This data may prove useful during trouble-shooting.

Physical Characteristics:

Weight	86 lb. (39 kg)
Length	26 in. (66.0 cm)
Width	20 in. (50.8 cm)
Height	22 in. (56,3 cm)

Power Input:

DC: 28 V (25 to 31 V) at 10 A (9 to 11 A)
AC: 115 V at 60 Hz at 20 mA (18 to 22 mA)

Voltages Output:

TP21: 5 V dc (4.5 to 5.5 V dc)
TP22: 6.75 V dc (6.25 to 7.25 V dc)
TP23: 28 V dc
TP24: 0 V dc (ground)

Logic Levels:

Logic 1: 4.7 to 7,25 V dc
Logic 0: 0 to 2.25 V dc

Rf Power Output (40 dBm ref rt output power):

at J10: 100 mW (20 dBm)
at J3: 0.001 µW (–60 dBm)

Rf Power Input (minimum levels based on ref rt receiver sensitivity of -117 dBm):

at J3	max: 25 W (+44 dBm)	rein: 20 µW (-17 dBm)
at J10	max: 251 mW (+24 dBm)	rein: 0.2 µµW (-97 dBm) minimum levels based on ref rt receiver sensitivity of –117 dBm

Rf Load Capabilities:

	AT1	AT2	AT7	AT8	AT9	AT10
Power Limit:	25W	25W	25W	2W	25W	0.5W
Attenuation:	20dB	20dB	20dB	60dB	20dB	----

6-13. TROUBLESHOOTING

Troubleshooting is done on a faulty maintenance group. The steps to determine if a maintenance group is faulty and how to troubleshoot it are illustrated in the flow chart (next page). The following is a description of the flow chart. (See paragraph 6-16 for a description of the symbols.)

1. Use the MAPS flow chart in paragraph 6-15 to relate the maintenance group fault symptoms to the proper test procedures for fault isolation. The MAPS flow chart references specify numbered sections of troubleshooting flow chart 1 based on the maintenance group symptoms. If no symptoms are known, all of troubleshooting flow chart 1 should be performed.

2. Troubleshooting flow chart 1 will isolate to a fault, a faulty component, or another troubleshooting flow chart to be performed. The other troubleshooting flow charts identify faults or faulty components.

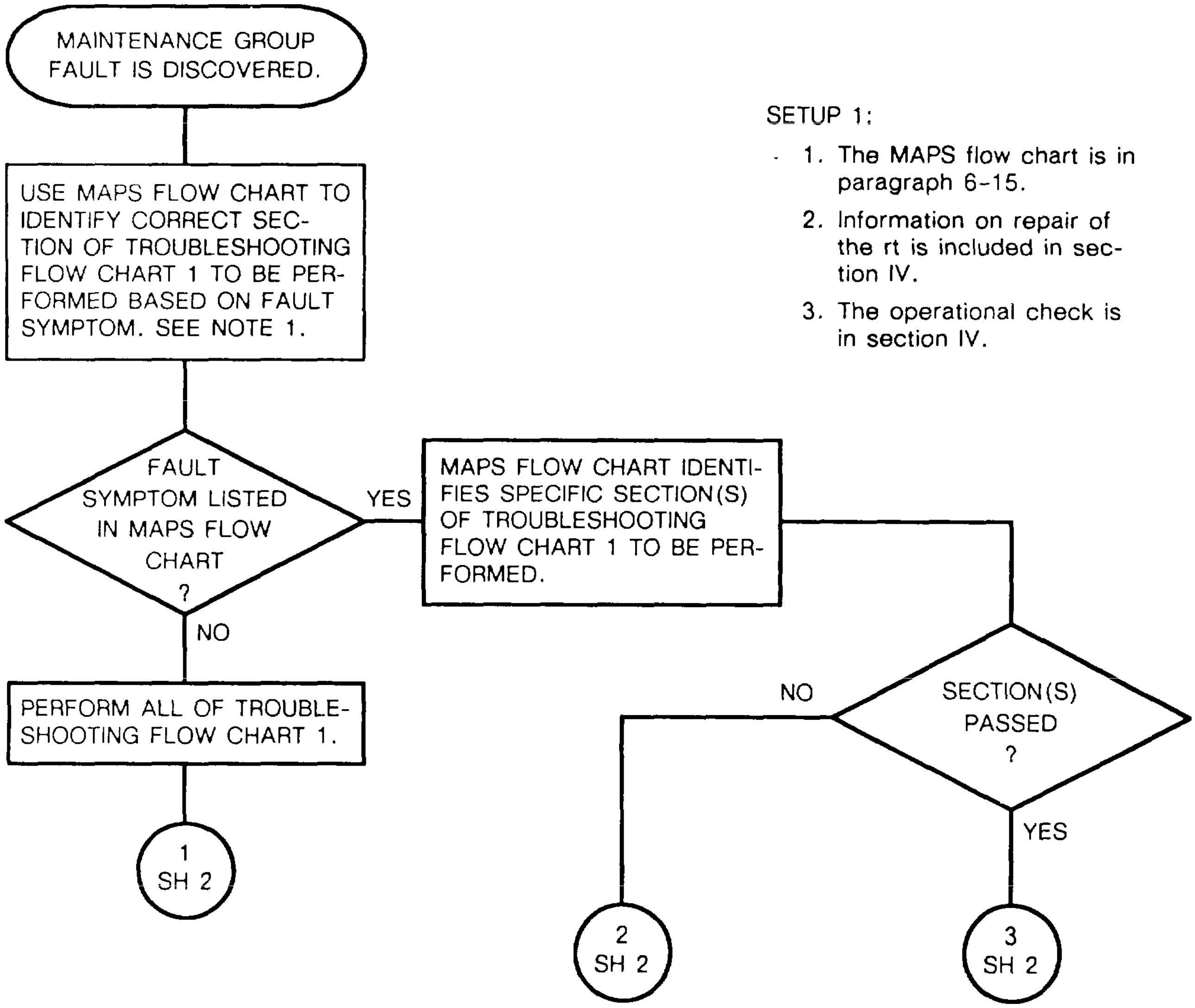
3. If the section, or sections, specified by the MAPS flow chart is passed successfully, then the MAPS flow chart references troubleshooting schematics in paragraph 6-18. These are used *to* fault isolate problems in the test adapter wiring,

4. Repair faults and replace faulty components. Follow the procedures in section IV.

5. Verify the repair. Perform the operational check in section IV. When the operational check (OPCHECK) is passed, the maintenance group can be returned to service.

6-13. TROUBLESHOOTING. Continued

(Sheet 1 of 2)

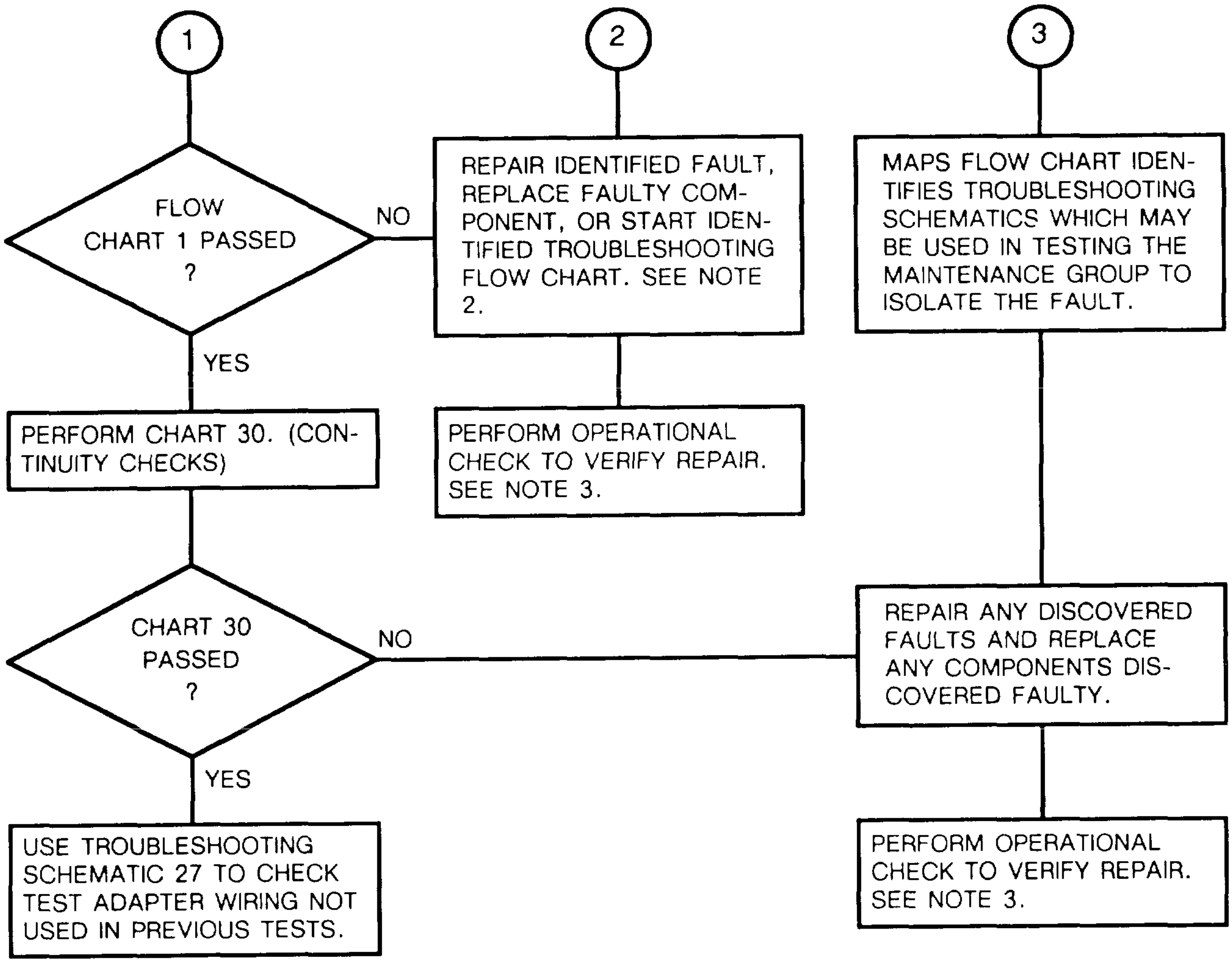


SETUP 1:

1. The MAPS flow chart is in paragraph 6-15.
2. Information on repair of the rt is included in section IV.
3. The operational check is in section IV.

6-13. TROUBLESHOOTING. Continued

(Sheet 2 of 2)



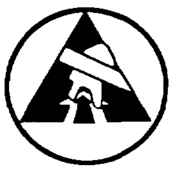
6-14. TEST PRECAUTIONS AND NOTES

WARNING

- Connect the test setups only when directed and with the power supply turned off. The large current capacity of the test power supply can cause personal injury. Verify the test setup before turning the power supply on.

- High voltage is present in the test adapter (115 V ac). Use caution when troubleshooting to avoid personal injury.

CAUTION



Static electricity and stray voltages can damage the rt modules. Use an antistatic pad on the work surface and wear a grounded wrist strap when removing or installing the rt front panel.

NOTE

- The principles of operation section, functional block diagrams, and the test adapter schematic in FO-16 can be used to fault isolate any unusual problems that may not be covered in the troubleshooting procedures.

- If a problem cannot be found in the test adapter, check the test cables using the schematics in figure 6–5 and the DMM.

6-15. MAINTENANCE ACTION PRECISE SYMPTOM (MAPS) CHART

The MAPS chart is used to find the troubleshooting flow chart or troubleshooting schematic to use for fault isolation of a faulty maintenance group. It is used when a maintenance group becomes faulty during maintenance operations. The symptoms of the fault are used on the MAPS chart to select the correct troubleshooting procedures. If the fault is not found on the MAPS chart, the chart instructs the user to perform troubleshooting chart 1.

Troubleshooting flow chart 1 contains the same test as the operational check, but in flow chart form, The MAPS chart directs the user to perform certain sections of the flow chart. Chart 1 will identify faulty components, wiring faults, or further troubleshooting charts necessary. The purpose of the MAPS chart is to locate the correct troubleshooting flow chart without performing the entire operational check. Many times, multiple symptoms will be present, The MAPS chart identifies which symptom should be checked first.

Sometimes the chart 1 sections referenced by the MAPS chart are passed without finding the fault or a troubleshooting procedure to isolate the fault. When this happens, the MAPS chart references one or more troubleshooting schematics in paragraph 6-18. These schematics are then used to search the maintenance group wiring for faults.

The MAPS chart is a flow chart similar to the troubleshooting flow charts. A description of the flow chart symbols is in paragraph 6-16,

To use the MAPS chart:

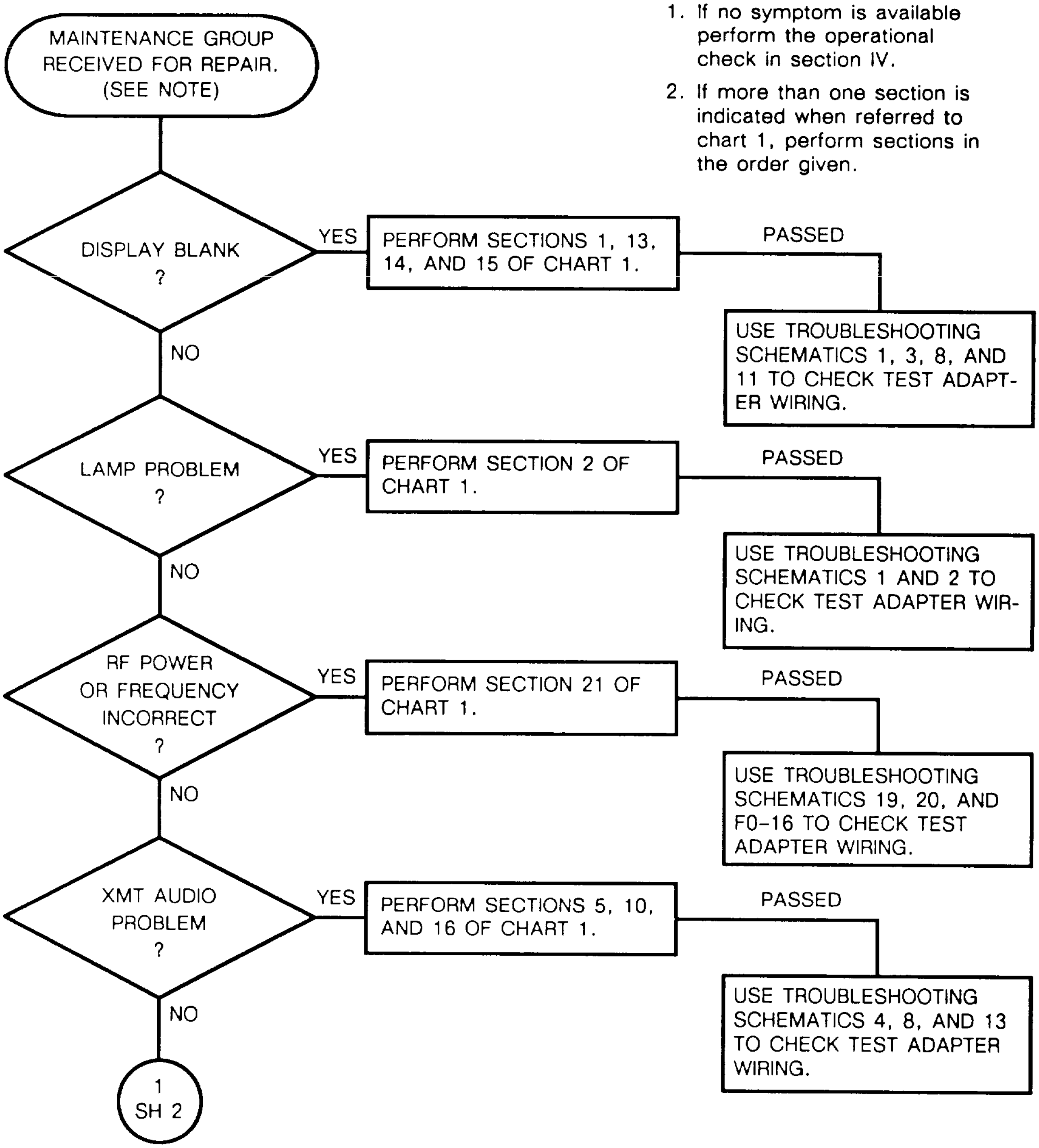
1. Be sure to start the MAPS chart at the beginning and then proceed through the flow until an instruction block is reached that directs you to a section (or sections) in troubleshooting flow chart 1.
2. Perform that section (or sections) of chart 1. If more than one section is indicated, perform them in the order listed.
3. If all of the sections are passed, return to the MAPS chart. Follow the PASSED path to the instruction block that lists troubleshooting schematics to use.
4. Use troubleshooting schematics to search for faulty wiring.
5. Verify repairs by performing the operational check in section IV.
6. If the maintenance group fault is not listed in the MAPS chart, then perform all of troubleshooting flow chart 1. If chart 1 does not discover the fault, then follow the CHART 1 PASSED path and perform the troubleshooting flow chart listed in the following block. If that is passed, then use the troubleshooting schematic listed in the next block.

6-15. MAINTENANCE ACTION PRECISE SYMPTOM (MAPS) CHART. Continued

(Sheet 1 of 4)

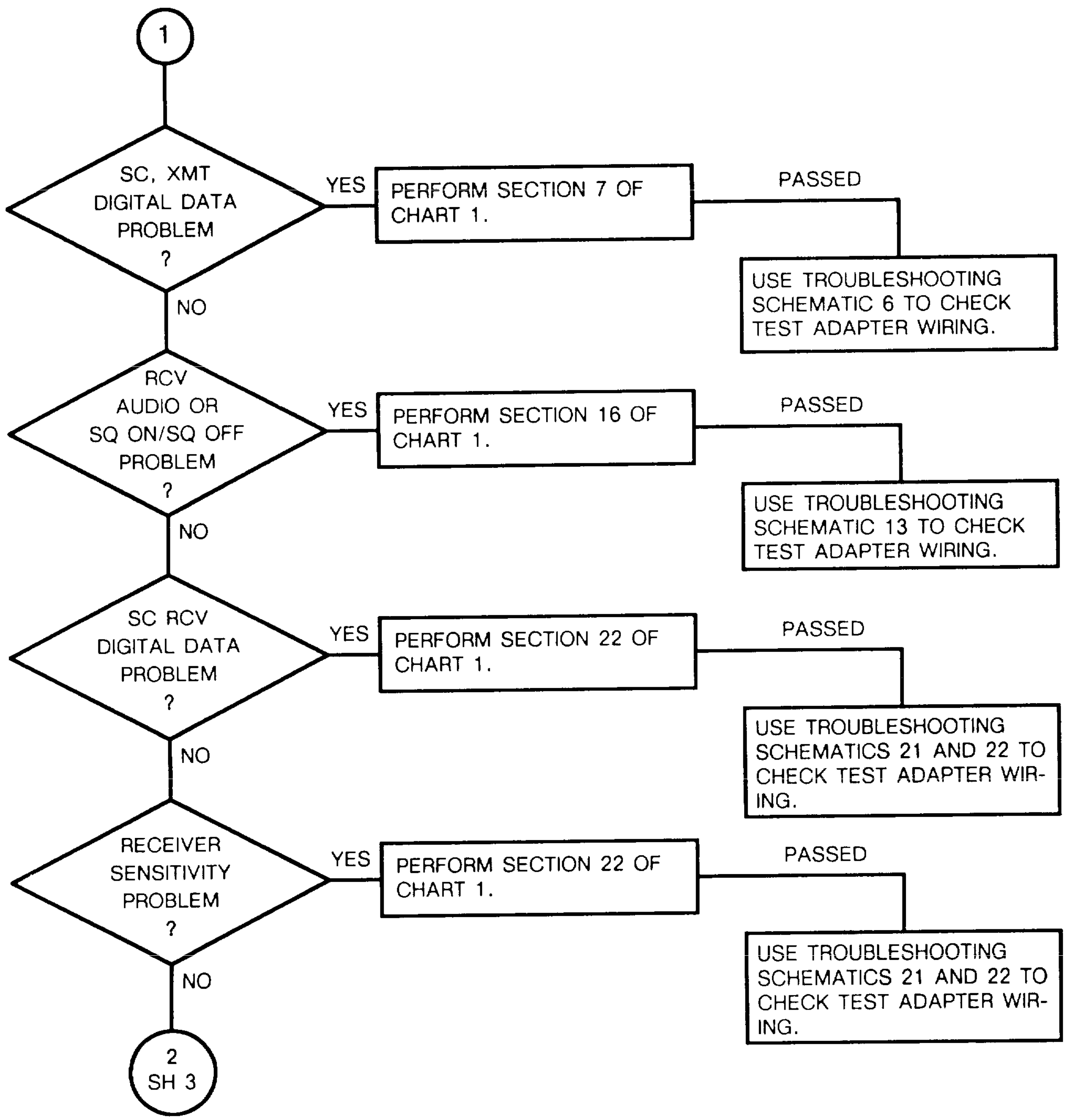
NOTE

1. If no symptom is available perform the operational check in section IV.
2. If more than one section is indicated when referred to chart 1, perform sections in the order given.



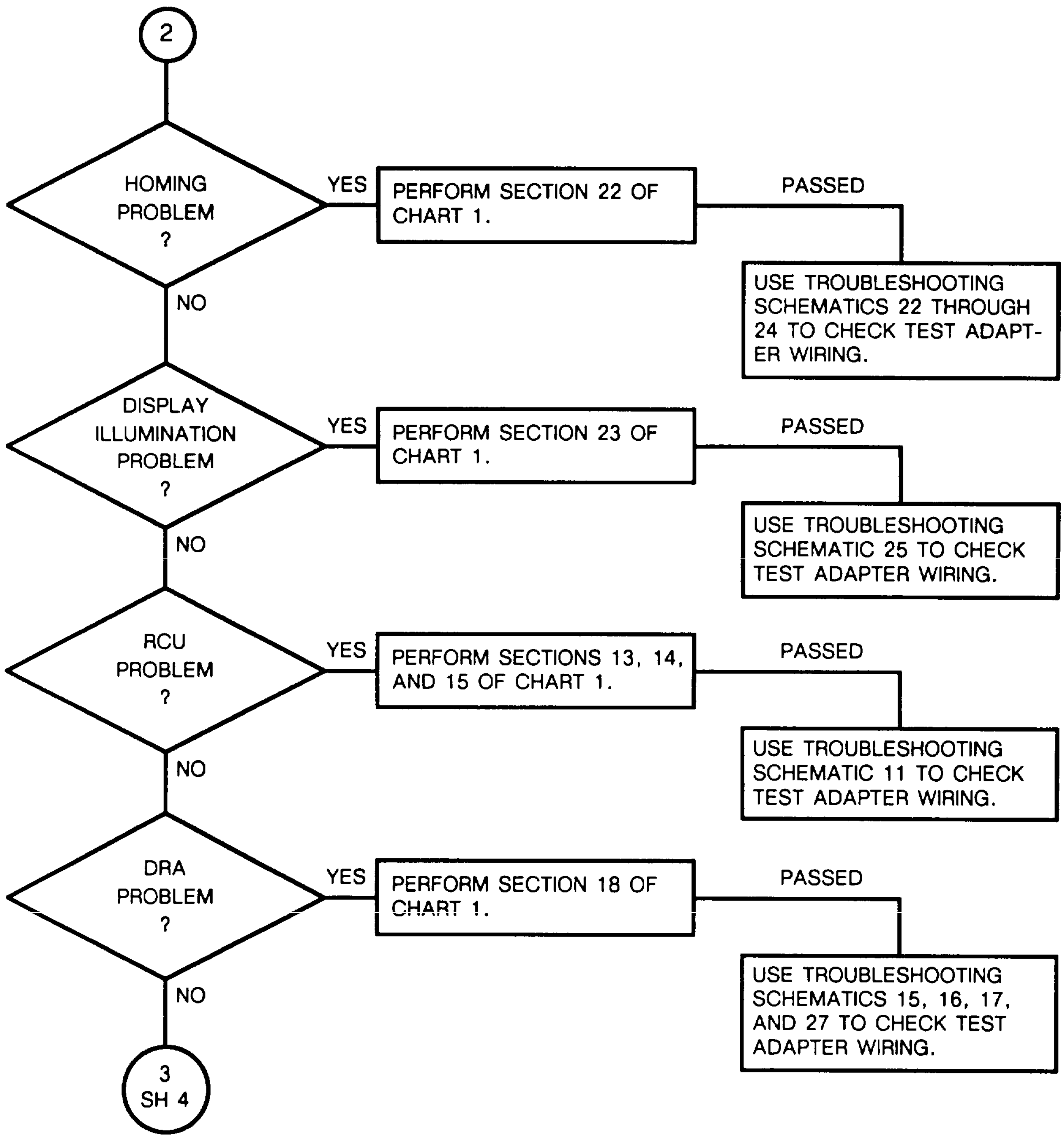
6-15. MAINTENANCE ACTION PRECISE SYMPTOM (MAPS) CHART. Continued

(Sheet 2 of 4)



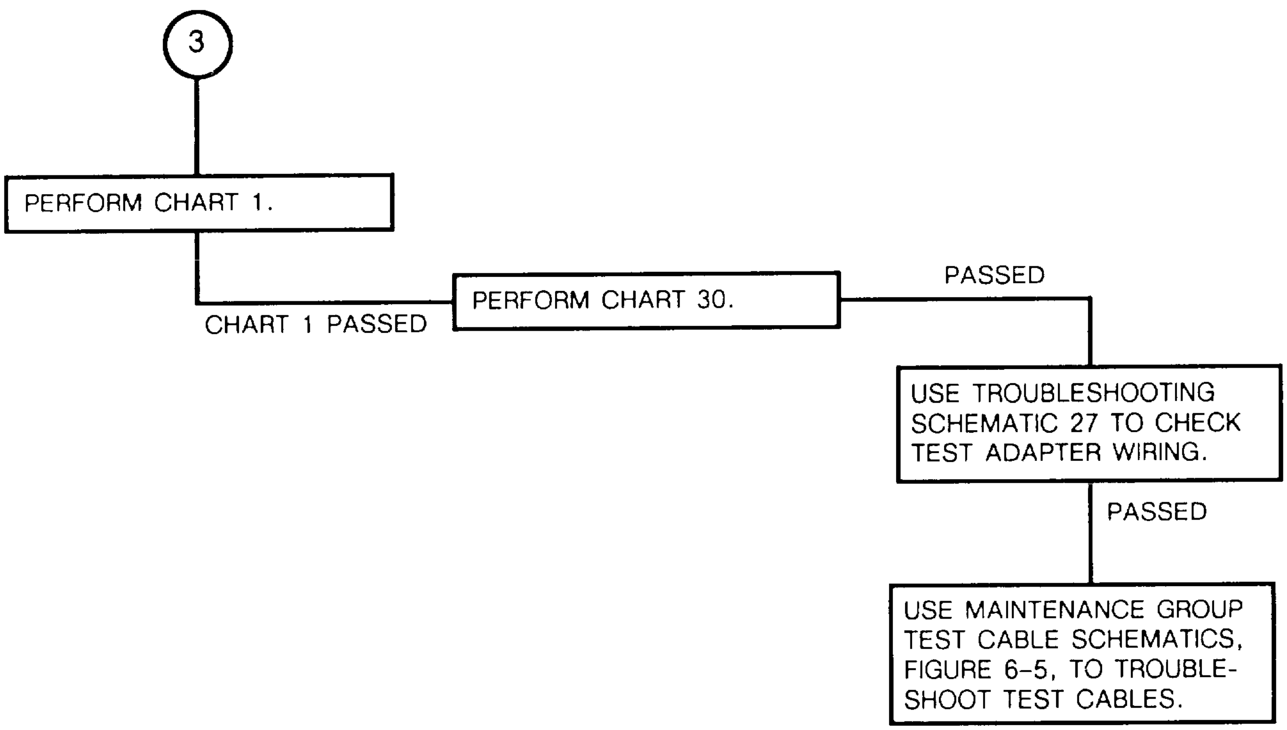
6-15. MAINTENANCE ACTION PRECISE SYMPTOM (MAPS) CHART. Continued

(Sheet 3 of 4)

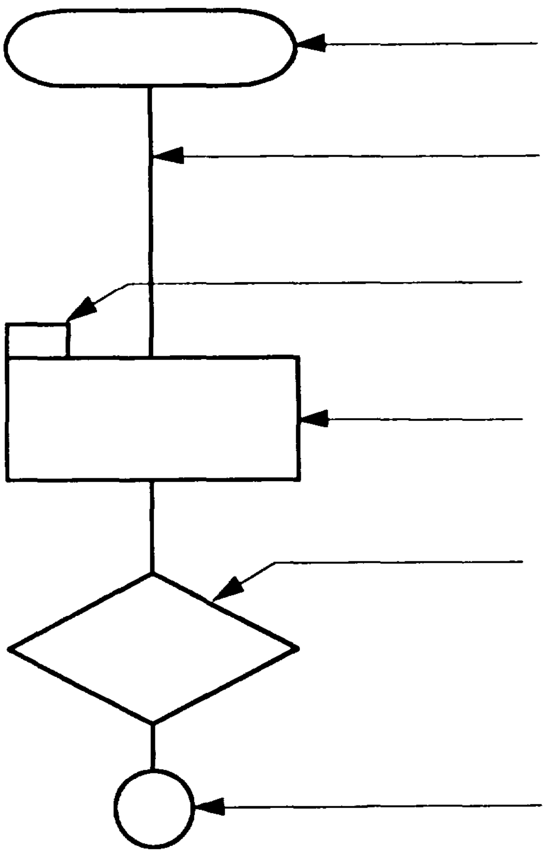


6-15. MAINTENANCE ACTION PRECISE SYMPTOM (MAPS) CHART. Continued

(Sheet 4 of 4)



6-16. EXPLANATION OF SYMBOLS AND NOTES



Test Procedure Start: (Rectangle with rounded sides) indicates start of the test procedure and contains a brief description of the symptom of trouble.

Test Procedure Flow Line: (Line) Indicates procedure flow.

Reference Number: (Square attached to upper left edge of an instruction block) Indicates that this is the start of one of

Test Procedure Instruction: (Rectangle) Provides instructions for doing a specific test.

Decision: (Diamond) Indicates that a decision must be made (YES or NO) in answer to a question about the previous test. Path taken depends on the answer (YES or NO).

Connector: (Circle) Directs user to another place in the chart. Contains a number and a sheet number (SH No.). Go to the sheet indicated and find the entry number.

NOTES	Notes Column: Present additional information, such as: more specific instructions about how to do a test, cautions and warning that have to be observed when doing a test, additional information about what to do after doing a test, and references to appropriate circuit diagrams.
SETUP:	Setup Instructions: Provides switch settings for the test adapter, ref rt, ref rcu, its, and all test equipment used in a test. Also tells of any special cabling requirements for a test. Change only the switches listed.
VIEW A:	Illustration Labels: Provides labels to reference illustrations called out in tests.

6-17. TROUBLESHOOTING FLOWCHARTS

The following flowcharts contain the troubleshooting procedures used to fault isolate problems in the maintenance group. Observe the following when using a flowchart:

1. Do not start a flow chart unless directed to it by the MAPS chart, the operational check, or another flowchart.

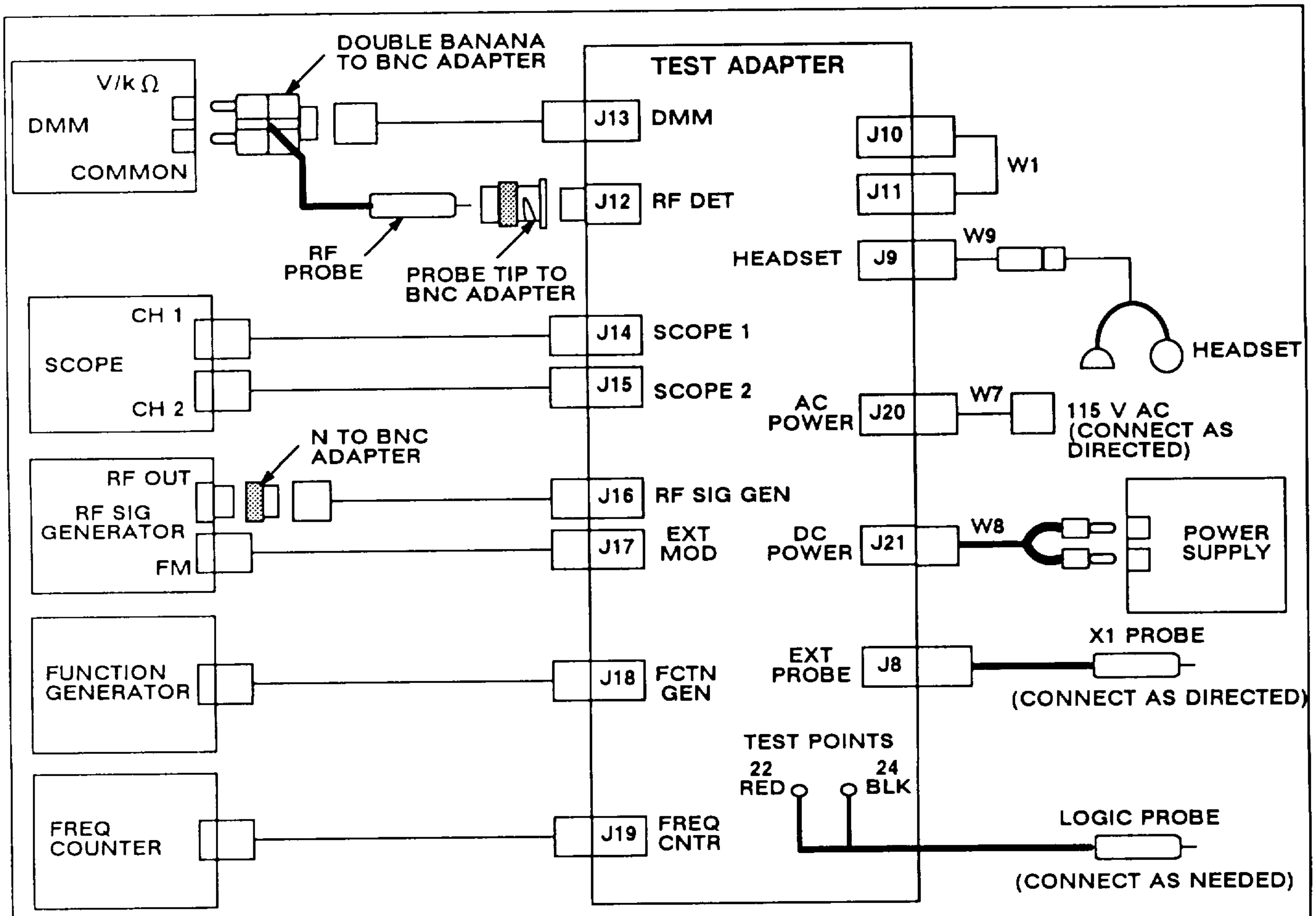
2. Do not change any switch settings or cable connections unless directed to do so by the flowchart.

3. See FO-16 for complete test adapter schematics.

4, See the maintenance procedures of section IV for any removal or installation instructions that may be necessary,

5. When referred to a section of chart 1 by MAPS, start at the reference number given in MAPS and do only the section referenced. When more than one section is referenced, perform them in the order listed by the MAPS chart.

6. Set the test adapter DC switch to OFF before disconnecting or connecting any part inside the test adapter.



EQUIPMENT PRESETS

TEST ADAPTER:
- AC : OFF
- DC : OFF
- S1 : OFF
- S2 : OFF
- S3 : OFF
- S4 : OFF
- S5 : OFF
- S6 : OFF
- CAL(S7) : OUT
- PTT(S8) : OFF
- TAKE CTRL(S9) : RT
- PT/CT(S10) : OFF
- SQ/CLK(S11) : OFF
- RXMT(S12) : OFF
- PTT(S13) : OFF
- TEST EQPT INPUT(S14) : INTL
- TEST EQUIPMENT SELECTOR(S15) : SCOPE

TEST POWER SUPPLY:
- LEVEL : 28 V DC
- CURRENT LIMIT : 4 A

FREQUENCY COUNTER
INPUT: 1 MΩ

REF RT AND REF RCU:
- FUNCTION : OFF
- PRESET : MAN
- IFM RF PWR : OFF
- MODE : SC
- VOL : FULLY CW

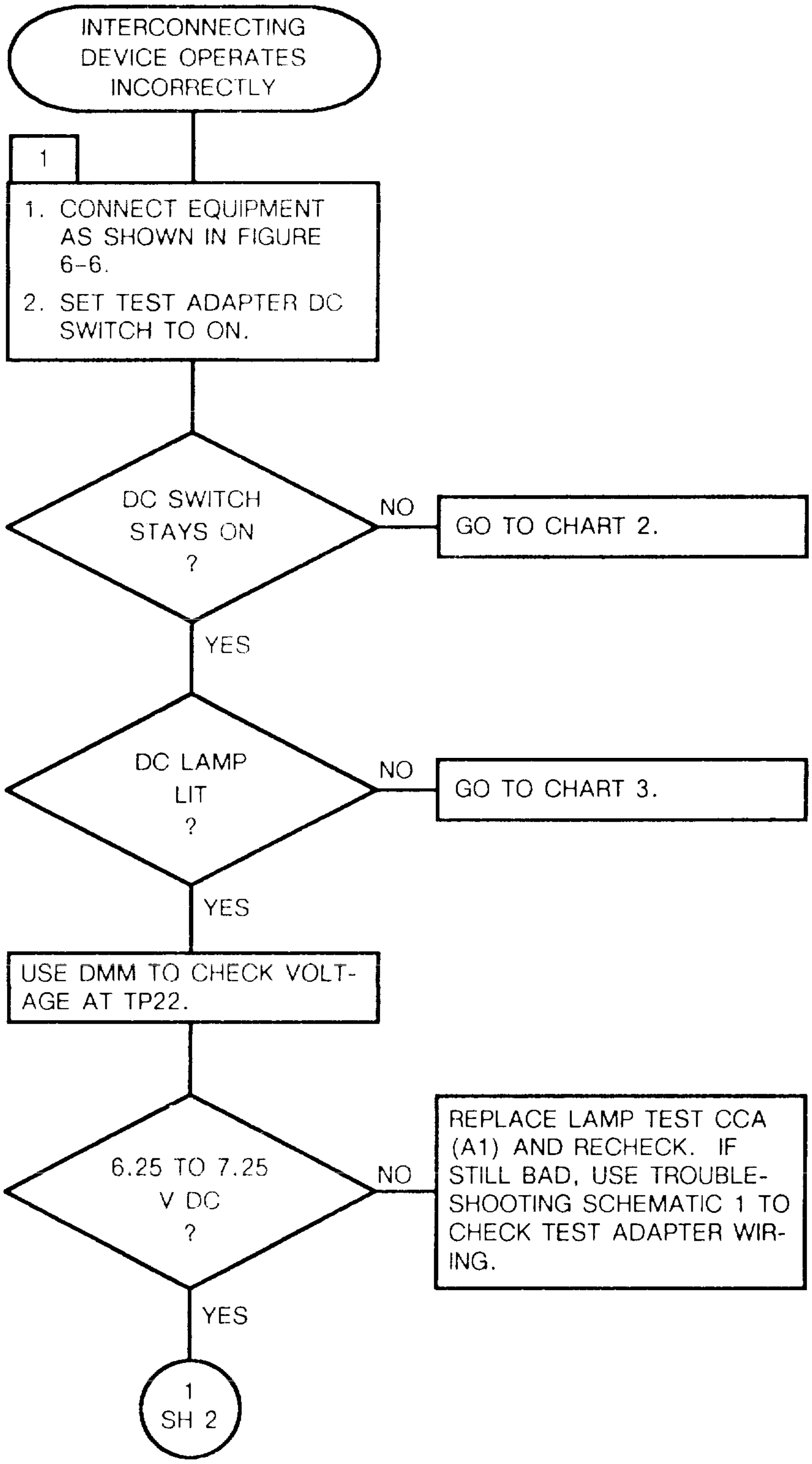
ICS:
- SELECTOR : 1
- TOP SWITCHES : OFF
- HOT MIKE : OFF
- VOL : FULLY CW

LOGIC PROBE: CMOS

Figure 6-6. Basic Troubleshooting Test Setup Diagram

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

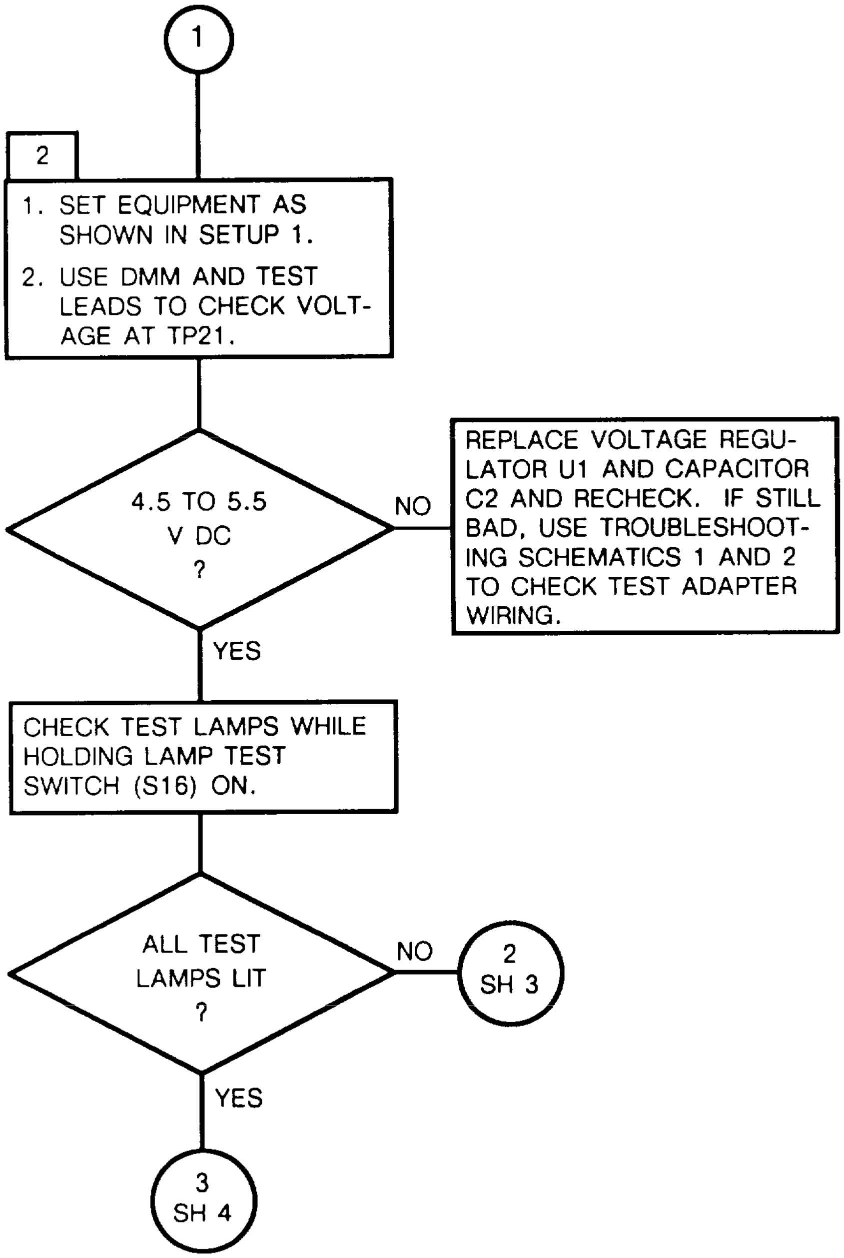
CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 1 of 36)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

Troubleshooting Interconnecting Device Operation (Sheet 2 of 36)



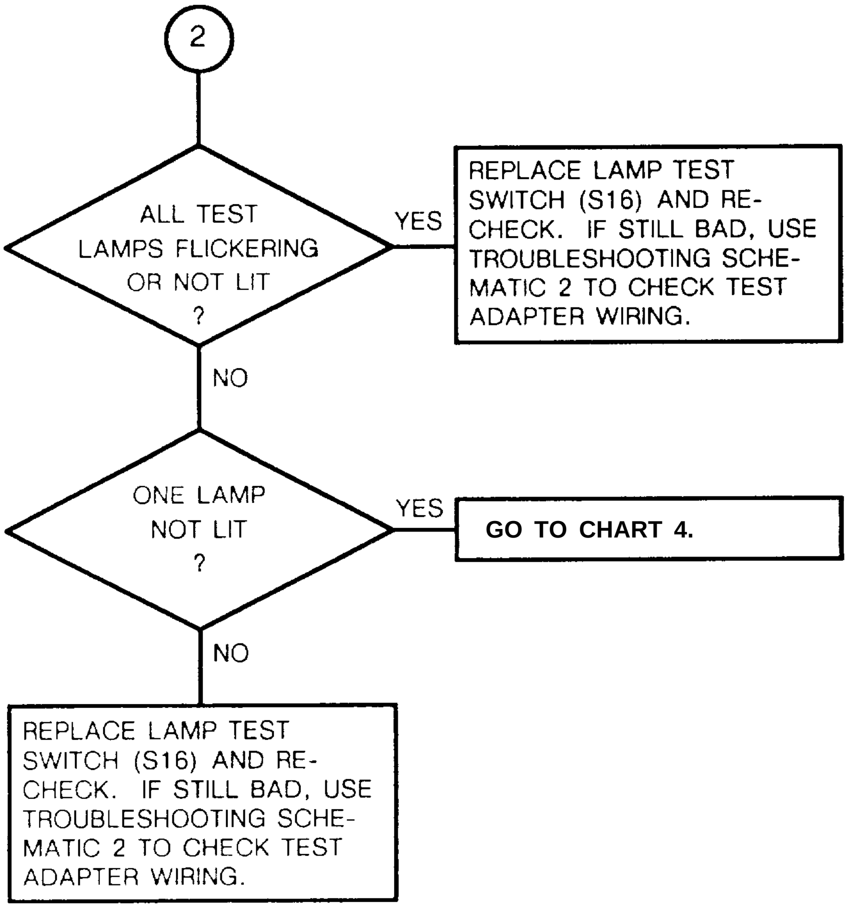
SETUP 1:

1. SET UP AS SHOWN ON FIGURE 6-6.
2. SET TEST ADAPTER–DC: ON

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

Troubleshooting Interconnecting Device Operation (Sheet 3 of 36)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

Troubleshooting Interconnecting Device Operation (Sheet 4 of 36)

3

3

1. SET EQUIPMENT AS SHOWN IN SETUP 2.
2. SET REF RT FUNCTION TO Z–A THEN TEST.
3. OBSERVE REF RT DISPLAY FOR CORRECT SELF-TEST DISPLAYS AS SHOWN IN VIEW A.

REF RT PASSES SELF-TEST ?

NO: REPLACE REFERENCE RT AND RECHECK. IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 1 TO CHECK TEST ADAPTER WIRING.

YES

4

1. SET EQUIPMENT AS SHOWN IN SETUP 3.
2. LOAD THE FOLLOWING FREQUENCIES INTO THE INDICATED PRESET POSITIONS:

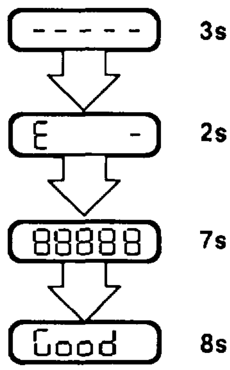
PRESET	FREQUENCY
1	35875
2	39975
3	47175
4	55000
5	55700
6	72000
CUE	87600

4 SH 5

SETUP 2:

1. SET UP AS SHOWN ON FIGURE 6-6.
2. SET TEST ADAPTER–DC: ON

VIEW A: SELF-TEST DISPLAYS



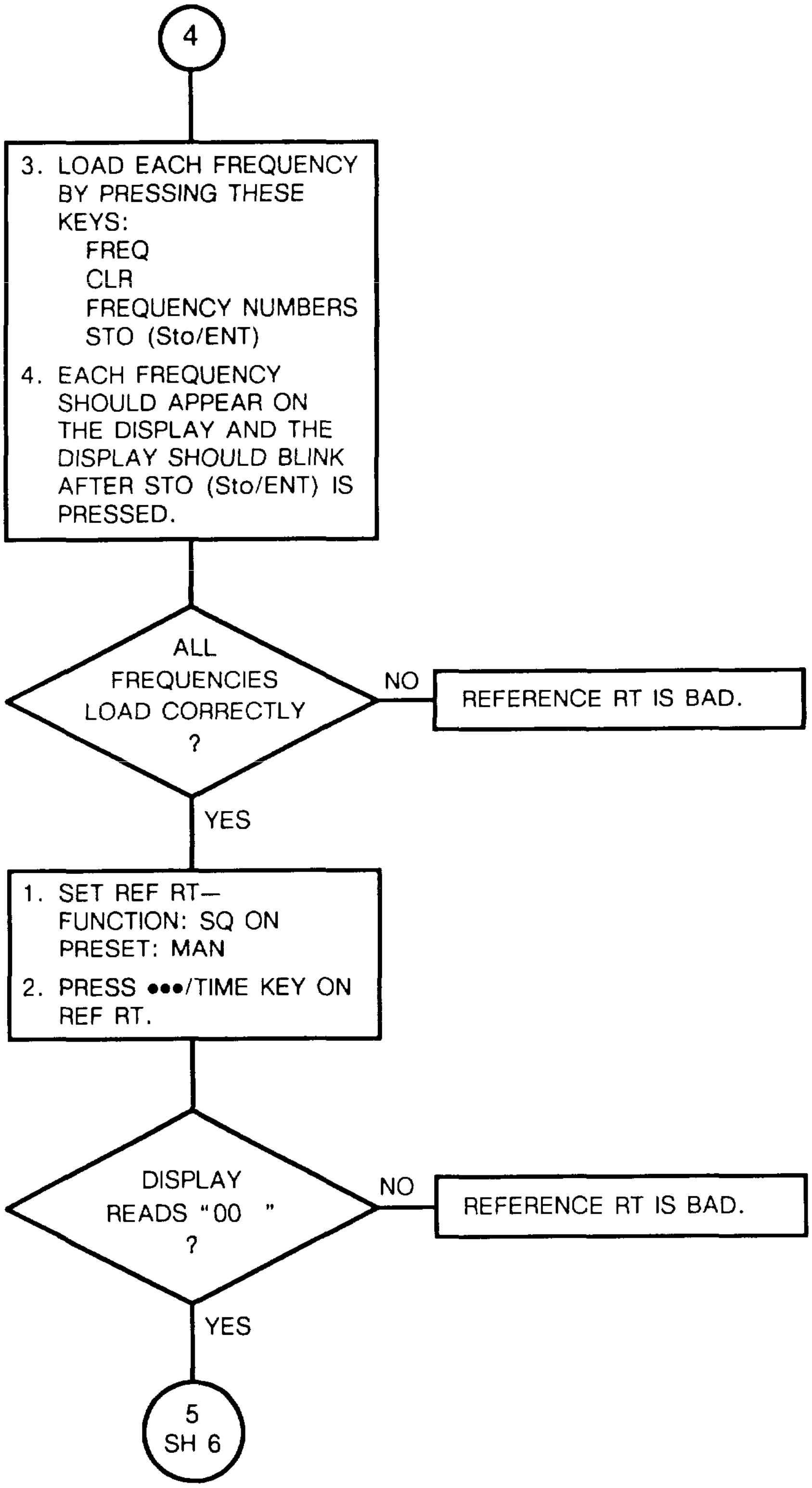
SETUP 3:

1. SET UP AS SHOWN ON FIGURE 6-6.
2. SET TEST ADAPTER–DC: ON
3. SET REF RT–FUNCTION: Z-A THEN LD

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

Troubleshooting Interconnecting Device Operation (Sheet 5 of 36)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 6 of 36)

(5)

5

1. SET EQUIPMENT AS SHOWN IN SETUP 4.
2. REMOVE JUMPER W1 FROM J10 AND J11.
3. CONNECT RF PROBE TO J10 AS SHOWN IN VIEW B.
4. USE DMM TO CHECK RF OUTPUT AT J10 FOR EACH PRESET POSITION OF REF RT. SET PTT(S8) TO REF POSITION FOR EACH MEASUREMENT.

17 TO 23 dBm EACH ?

NO → GO TO CHART 5.

YES

1. CONNECT RF CABLE FROM FREQUENCY COUNTER TO J10.
2. USE FREQUENCY COUNTER TO CHECK RF OUTPUT AT J10 FOR EACH PRESET POSITION OF REF RT. SET PTT(S8) TO REF POSITION FOR EACH MEASUREMENT.

(6 SH 7)

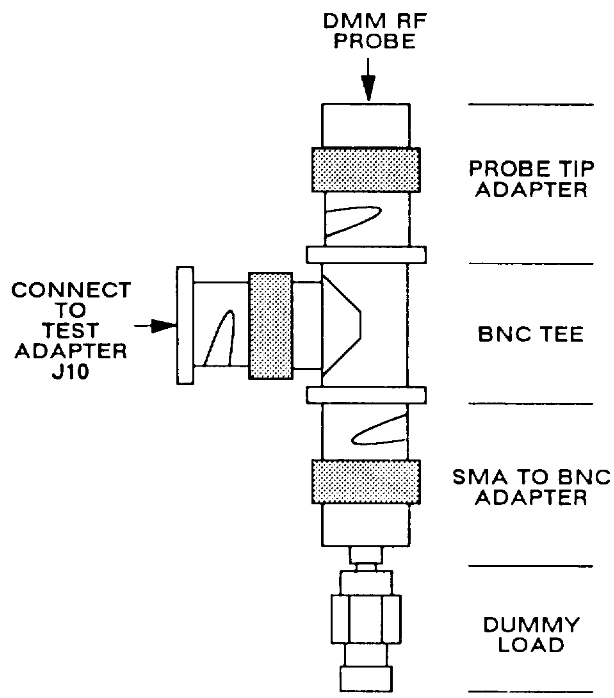
SETUP 4:

1. THESE FREQUENCIES MUST BE LOADED IN REF RT PRESETS:

PRESET	FREQUENCY
MAN	30000
1	35875
2	39975
3	47175
4	55000
5	55700
6	72000
CUE	87600

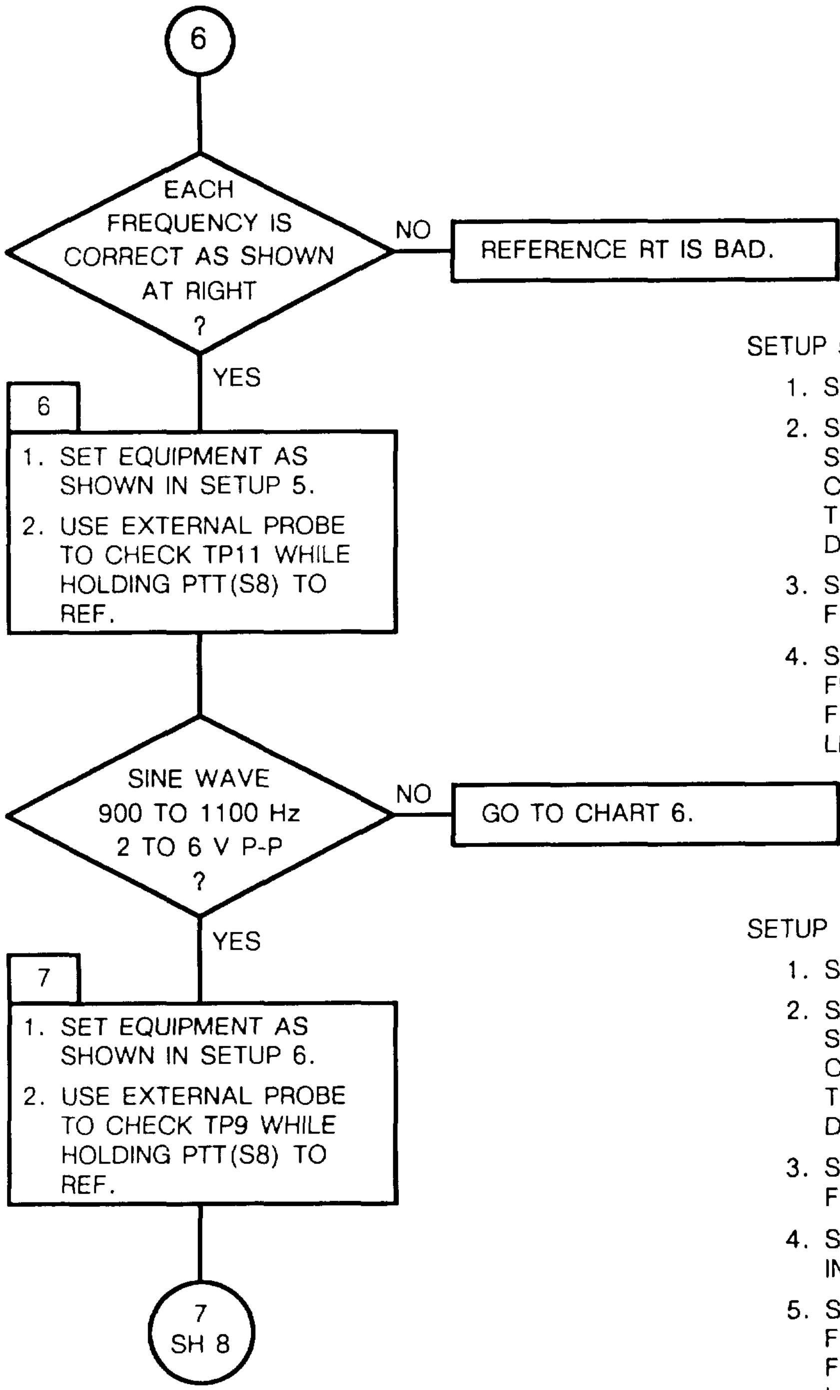
2. SET FREQUENCY COUNTER—
INPUT: 50 OHMS
3. SET DMM—
FUNCTION: dB, 50 OHM REFERENCE

VIEW B:



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 7 of 36)



PRESET	FREQUENCY
MAN	29999700 to 30000300
1	35874640 to 35875360
2	39974600 to 39975400
3	47174528 to 47175472
4	54999450 to 55000550
5	55699440 to 55700560
6	71999280 to 72000720
CUE	87599120 to 87600880

SETUP 5:

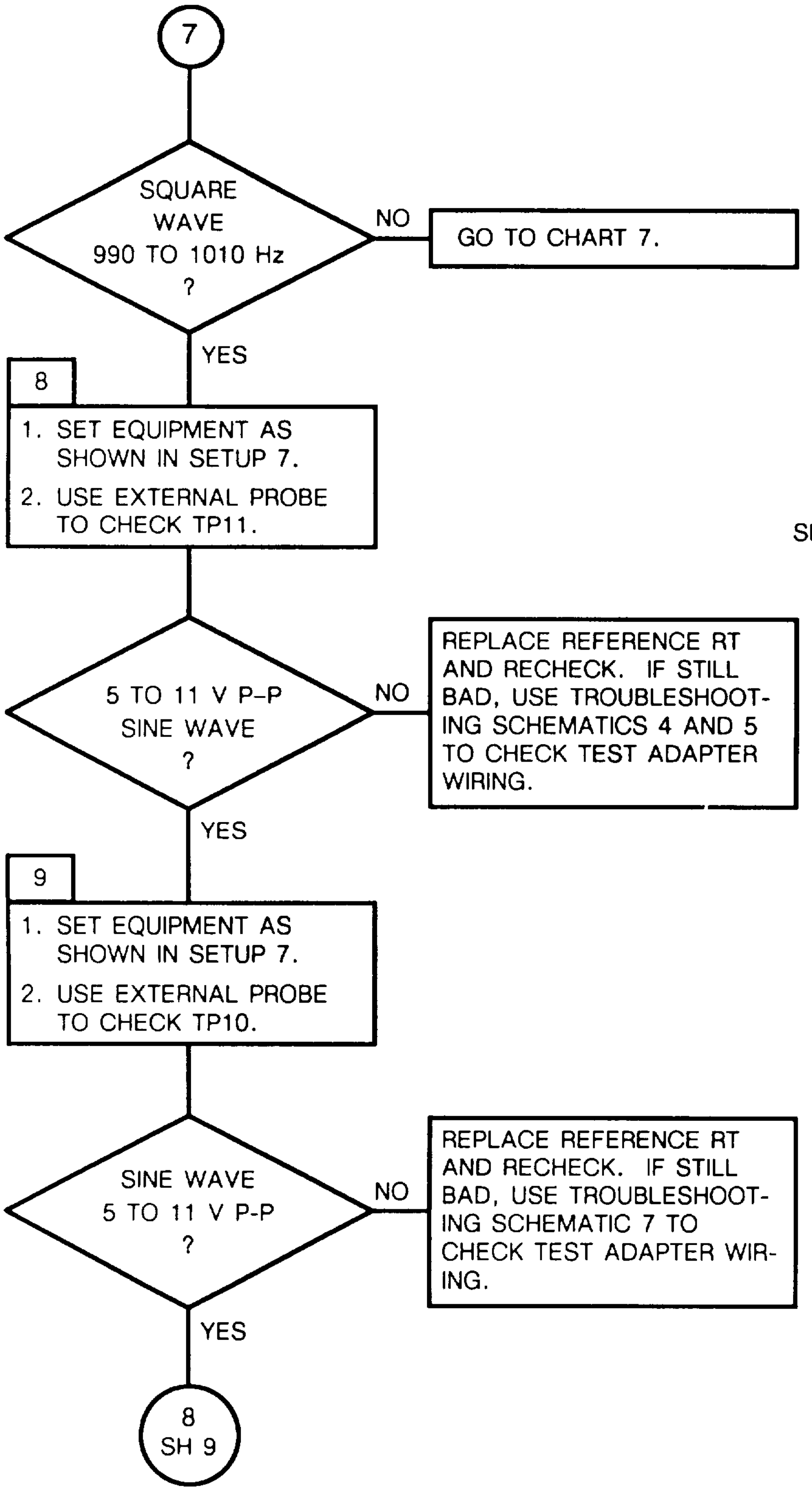
1. SET UP AS SHOWN ON FIG 6-6.
2. SET TEST ADAPTER—
   S3: 2
   CAL (S7): IN
   TEST EQPT INPUT(S14): EXT
   DC: ON
3. SET REFERENCE RT—
   FUNCTION: Z-A THEN SQ ON
4. SET FUNCTION GENERATOR—
   FUNCTION: SINE
   FREQ: 1 kHz (900 to1100 Hz)
   LEVEL: 1 V P-P (0.9 to 1.1 V P-P)

SETUP 6:

1. SET UP AS SHOWN ON FIG 6-6.
2. SET TEST ADAPTER—
   S1: 9
   CAL (S7): IN
   TEST EQPT INPUT(S14): EXT
   DC: ON
3. SET REFERENCE RT—
   FUNCTION: SQ ON
4. SET FREQ COUNTER—
   INPUT: 1 MEGOHM
5. SET FUNCTION GENERATOR—
   FUNCTION: SQUARE
   FREQ: 1 kHz (900 to1100 Hz)
   LEVEL: 10 V P-P (9 to 11 V P-P)

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 8 of 36)

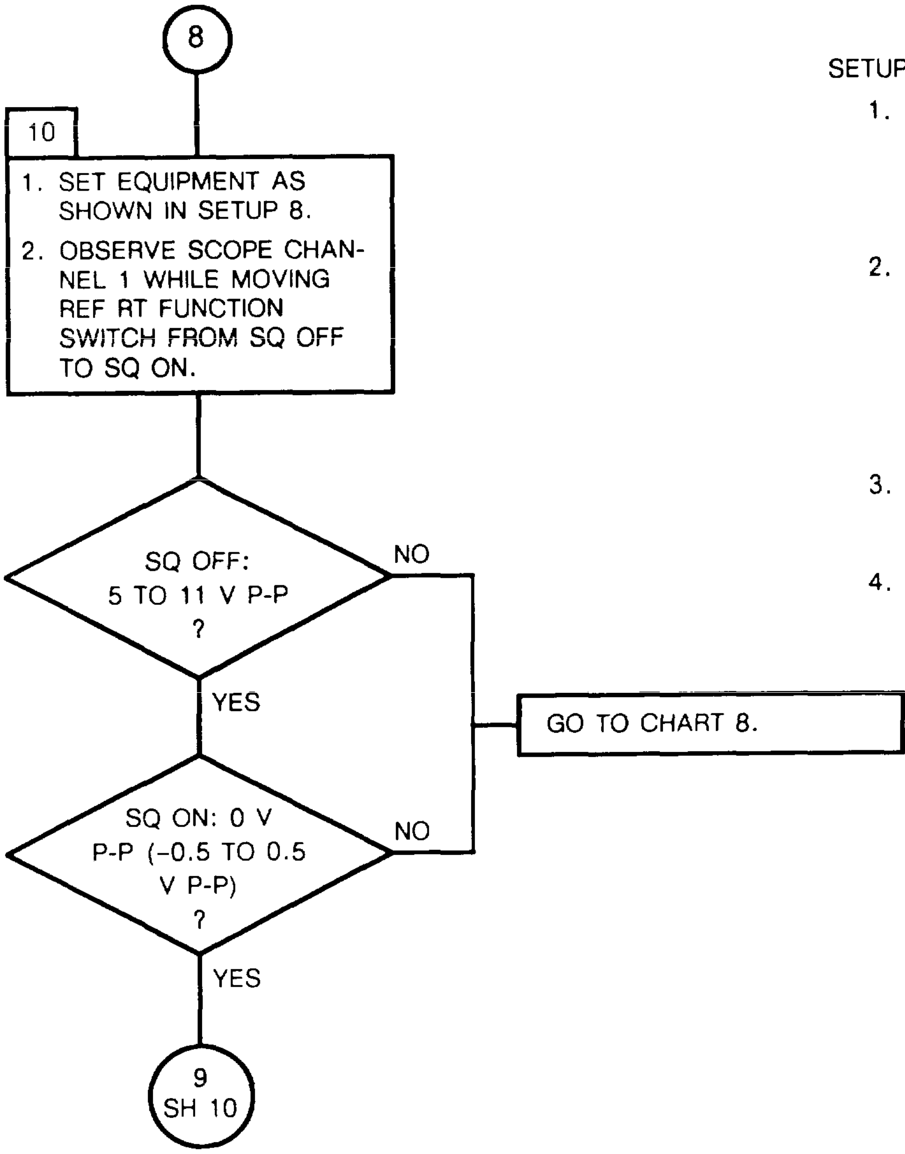


SETUP 7:

1. SET UP AS SHOWN ON FIG 6-6.
2. SET TEST ADAPTER—
   TEST EQPT INPUT(S14): EXT
   DC: ON
3. DISCONNECT JUMPER W1 FROM J10 AND J11 ON TEST ADAPTER. CONNECT RF CABLE FROM J10 TO SIGNAL GENERATOR OUTPUT.
4. SET REFERENCE RT—
   FUNCTION: Z-A THEN SQ OFF
5. SET RF SIGNAL GENERATOR—
   FREQ: 30 MHz
   LEVEL: -60 dBm
   FM MODE: INT
   MODULATION: 1 kHz WITH 6.5 kHz (6 to 7 kHz) DEVIATION

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 9 of 36)

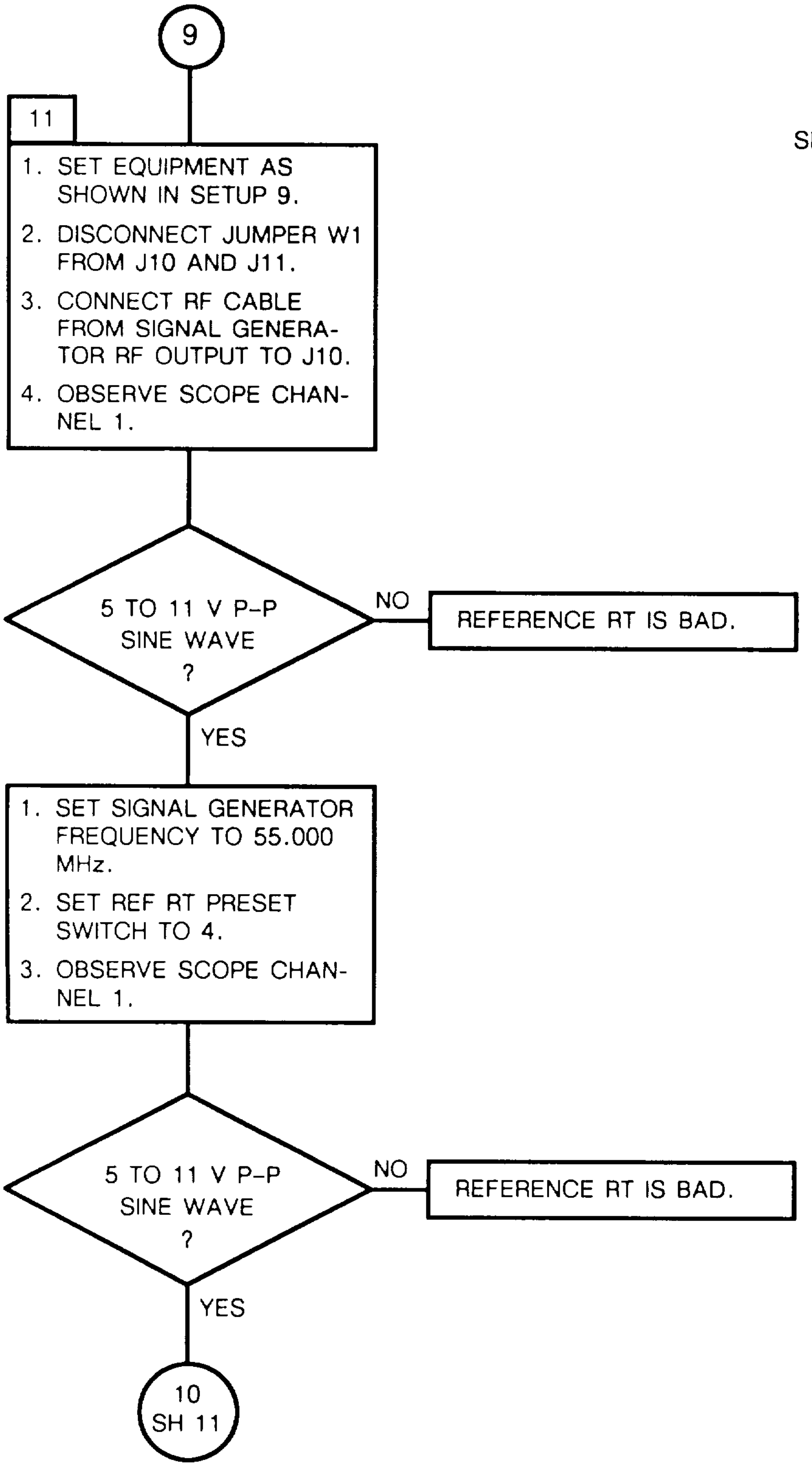


SETUP 8:

1. SET TEST ADAPTER—
   S1: 3
   S3: OFF
   CAL(S7): OUT
   TEST EQPT INPUT(S14): INTL
2. SET SIGNAL GENERATOR—
   FREQ: 30 MHz
   LEVEL: –60 dBm
   FM MODE: INT
   MODULATION: 1kHz WITH 6.5 kHz (6 to 7 kHz) DEVIATION
3. DISCONNECT JUMPER W1 FROM J10 AND J11 ON TEST ADAPTER.
4. CONNECT RF CABLE FROM J10 TO SIGNAL GENERATOR OUTPUT.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 10 of 36)



SETUP 9:

1. SET UP AS SHOWN ON FIG 6-6.
2. SET TEST ADAPTER—
   S1: 3
   DC: ON
3. THESE FREQUENCIES MUST BE LOADED IN THE REF RT:

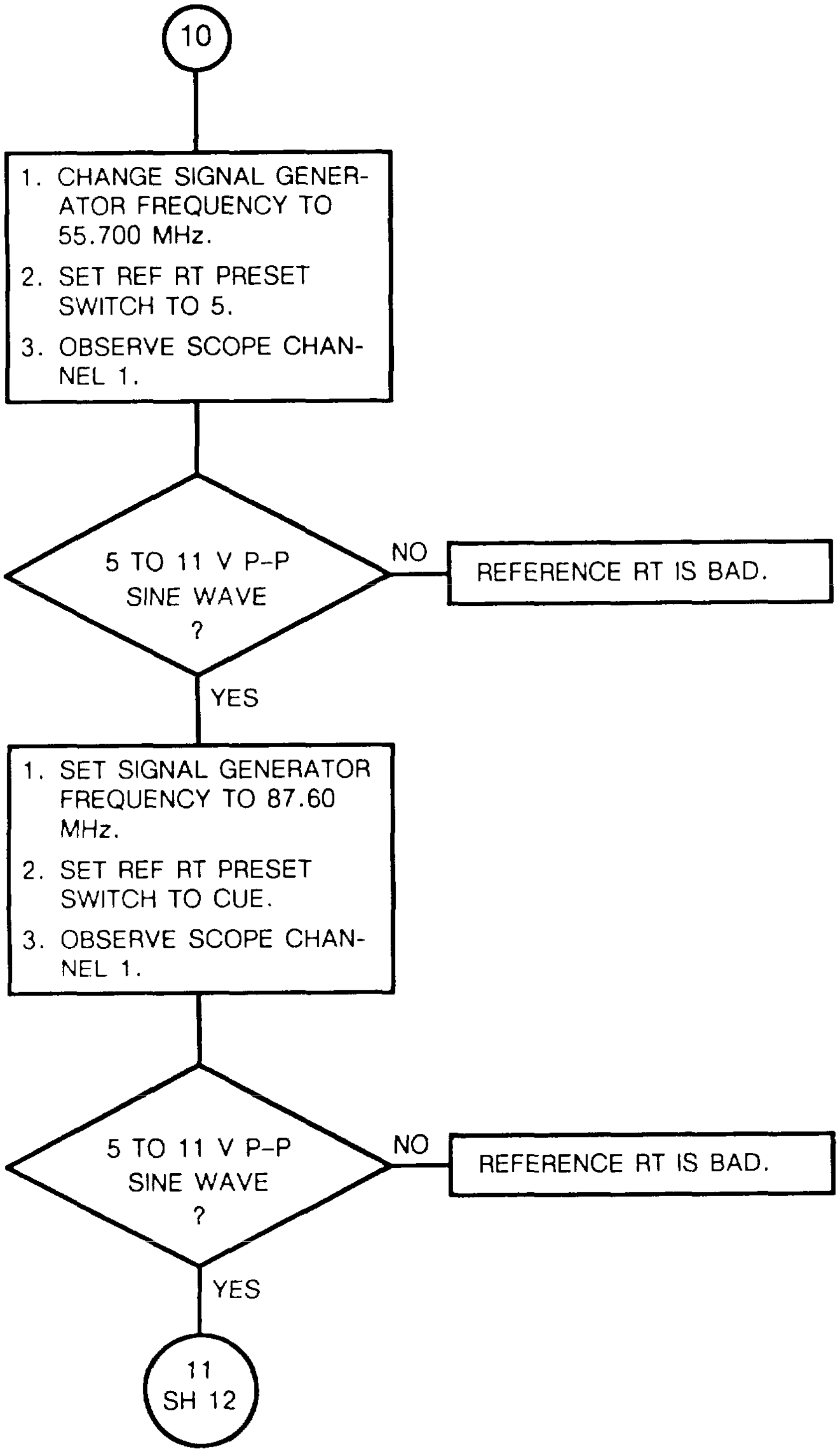
PRESET	FREQUENCY
4	55000
5	55700
CUE	87600

3. SET REFERENCE RT—
   FUNCTION: SQ OFF
   PRESET: MAN
4. SIGNAL GENERATOR—
   FREQ: 30 MHz
   LEVEL: -90 dBm
   FM MODE: INT
   MODULATION: 1 kHz WITH 6.5 kHz (6 to 7 kHz) DEVIATION.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

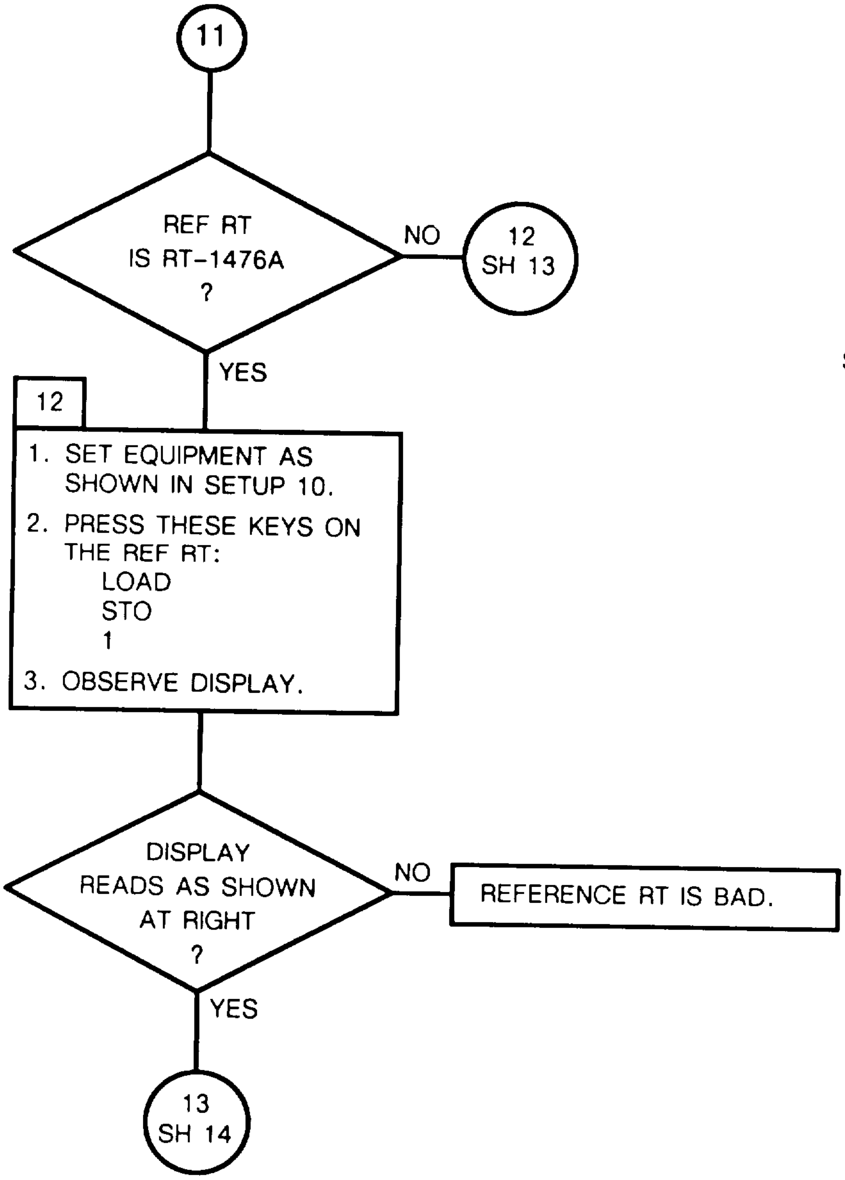
CHART 1

Troubleshooting Interconnecting Device Operation (Sheet 11 of 36)



6-17, TROUBLESHOOTING FLOWCHARTS, Continued

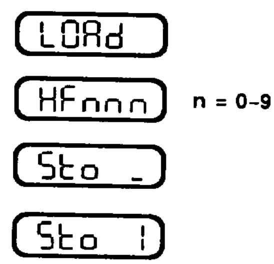
CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 12 of 36)



SETUP 10:

1. SET REFERENCE RT—
   FUNCTION: LD
   PRESET: 1
2. SET ECCM FILL DEVICE—
   FUNCTION: ON
   SELECT SWITCH: ANY POSITION WITH A HOPSET LOADED.

REF RT LOAD DISPLAY:



CAUTION

Before leaving this page, turn off ECCM fill device and disconnect it from the reference rt.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

Troubleshooting Interconnecting Device Operation (Sheet 13 of 36)

12

12A

1. CONNECT ECCM FILL DEVICE TO FILL CONNECTOR OF REF RT.
2. SET EQUIPMENT AS SHOWN IN SETUP 11.
3. PRESS H-Ld KEY OF REF RT, AND OBSERVE DISPLAY.

DISPLAY READS AS SHOWN AT RIGHT ?

NO — REFERENCE RT IS BAD.

YES

1. SET EQUIPMENT AS SHOWN IN SETUP 12.
2. PRESS THESE KEYS ON THE REF RT:
   H-Ld
   Sto/ENT
   1
3. OBSERVE DISPLAY.

DISPLAY READS AS SHOWN AT RIGHT ?

NO — REFERENCE RT IS BAD.

YES

13 SH 14

SETUP 11:

1. SET UP AS SHOWN ON FIG 6-6.
2. SET TEST ADAPTER—
   DC: ON
3. SET REFERENCE RT—
   FUNCTION: Z-A THEN LD-V
   PRESET: 1
   MODE: FH
4. SET ECCM FILL DEVICE—
   FUNCTION: ON
   SELECT SWITCH: T1 OR T2

REF RT LOAD DISPLAY:

LOAd

Sto t

FILL 1

SETUP 12:

1. SET REFERENCE RT—
   FUNCTION: LD
2. SET ECCM FILL DEVICE—
   FUNCTION: ON
   SELECT SWITCH: ANY POSITION WITH A HOPSET LOADED.

REF RT LOAD DISPLAY:

LOAd

HFnnn n = 0-9

Sto _

Sto 1

CAUTION

Before leaving this page, turn off ECCM fill device and disconnect it from the reference rt.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 14 of 36)

(13)

13

1. SET EQUIPMENT AS SHOWN IN SETUP 13.
2. USE LOGIC PROBE AT PINS A, D, G, AND T* OF CONNECTOR J6. (SEE VIEW C) LOOK FOR DIGITAL ACTIVITY ON EACH PIN WHEN THE REF RT FUNCTION SWITCH IS TURNED FROM SQ ON TO TEST.

*NOTE: PULSE AT J6-T IS OF SHORT DURATION. USE PULSE MEMORY ON LOGIC PROBE.

DIGITAL ACTIVITY PRESENT ON EACH PIN?

- NO → GO TO CHART 9.
- YES ↓

14

1. CONNECT CABLE W12 FROM J2 TO J6.
2. SET EQUIPMENT AS SHOWN IN SETUP 14.
3. SET REF RT—FUNCTION: SQ ON
4. OBSERVE REF RCU DISPLAY.

REF RCU DISPLAY READS "30000"?

- NO → GO TO CHART 10.
- YES ↓

(14 SH 15)

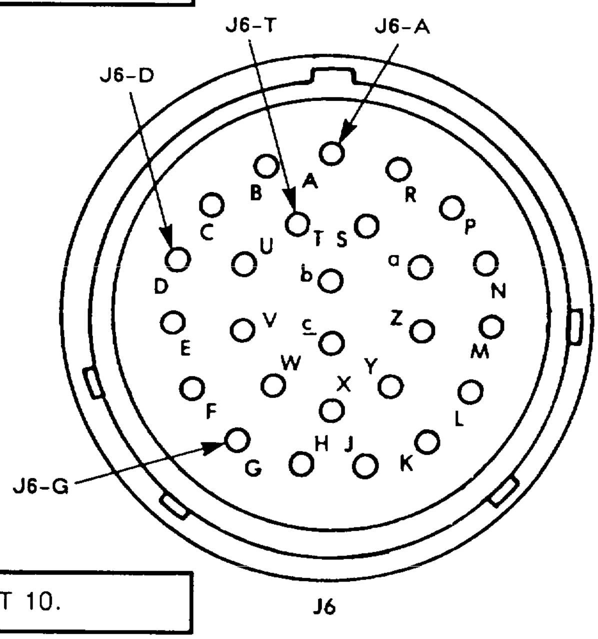
SETUP 13:

1. SET UP AS SHOWN ON FIG 6-6.
2. SET TEST ADAPTER—DC: ON
3. SET REFERENCE RT—FUNCTION: SQ ON

SETUP 14:

1. SET UP AS SHOWN ON FIG 6-6.
2. SET TEST ADAPTER—DC: ON

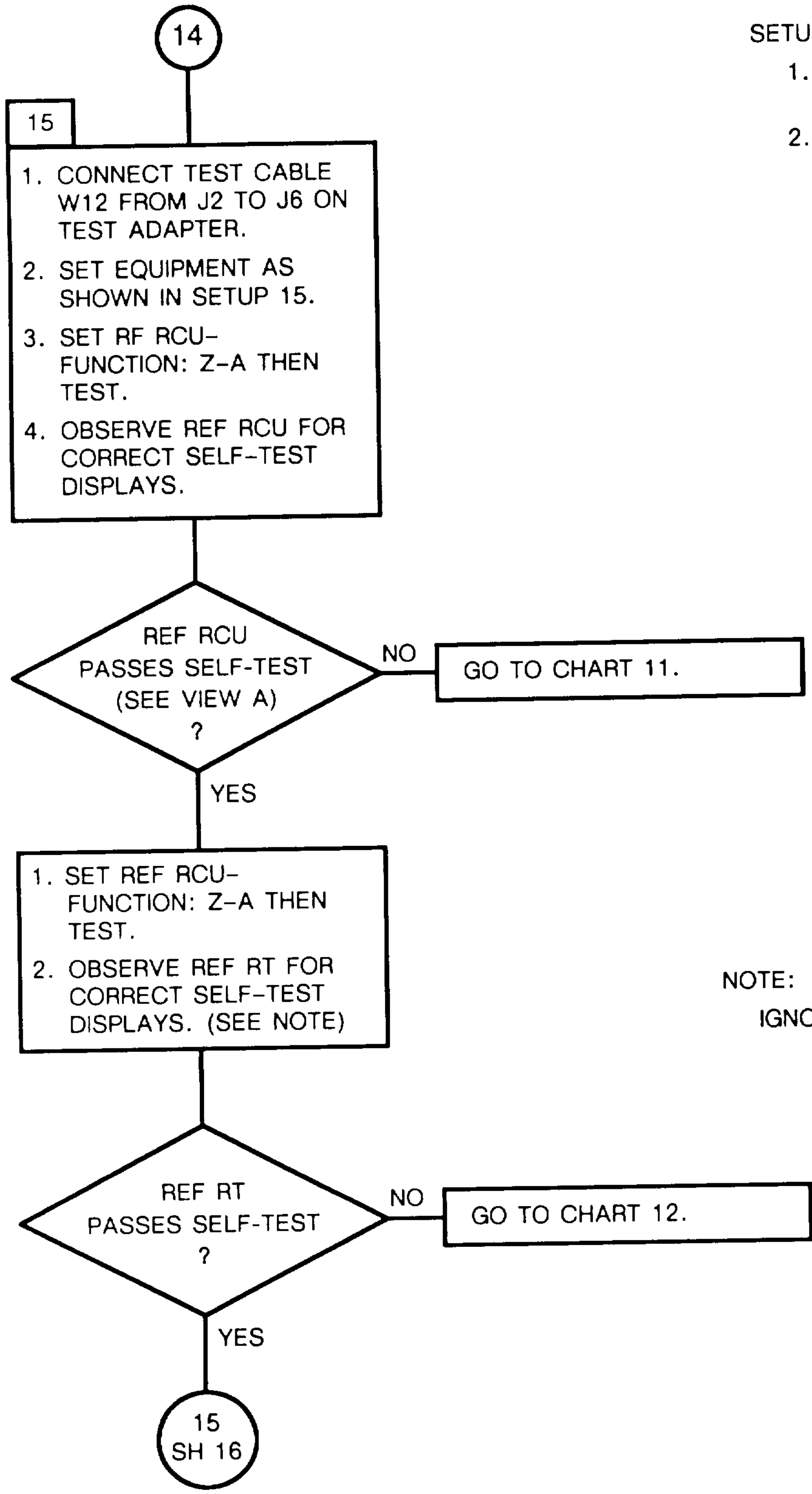
VIEW C:



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

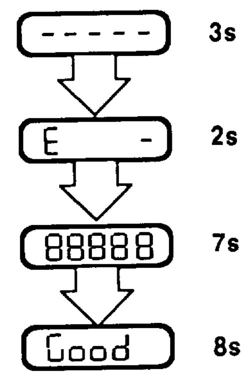
Troubleshooting Interconnecting Device Operation (Sheet 15 of 36)



SETUP 15:

1. SET UP AS SHOWN ON FIG 6–6.
2. SET TEST ADAPTER— TAKE CTRL(S9): RCU DC: ON

VIEW A: SELF-TEST DISPLAYS



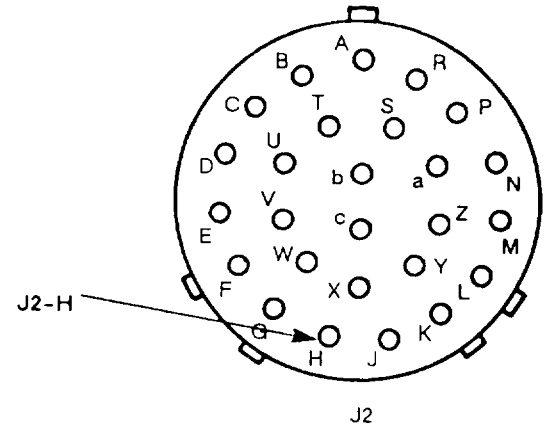
NOTE:

IGNORE DISPLAYS AFTER "E –".

CHART 1

Troubleshooting Interconnecting Device Operation (Sheet 16 of 36)

VIEW D:



(15)

SET REF RCU—
FUNCTION: SQ ON

REF RCU DISPLAY READS "30000" ?

NO → REFERENCE RCU IS BAD.

YES ↓

1. DISCONNECT TEST CABLE W12 FROM J2.
2. USE DMM TO CHECK VOLTAGE AT J2-H. (VIEW D)

24 TO 31 V DC ?

NO → REPLACE LAMP TEST CCA (A1). IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 11 TO CHECK TEST ADAPTER WIRING.

YES ↓

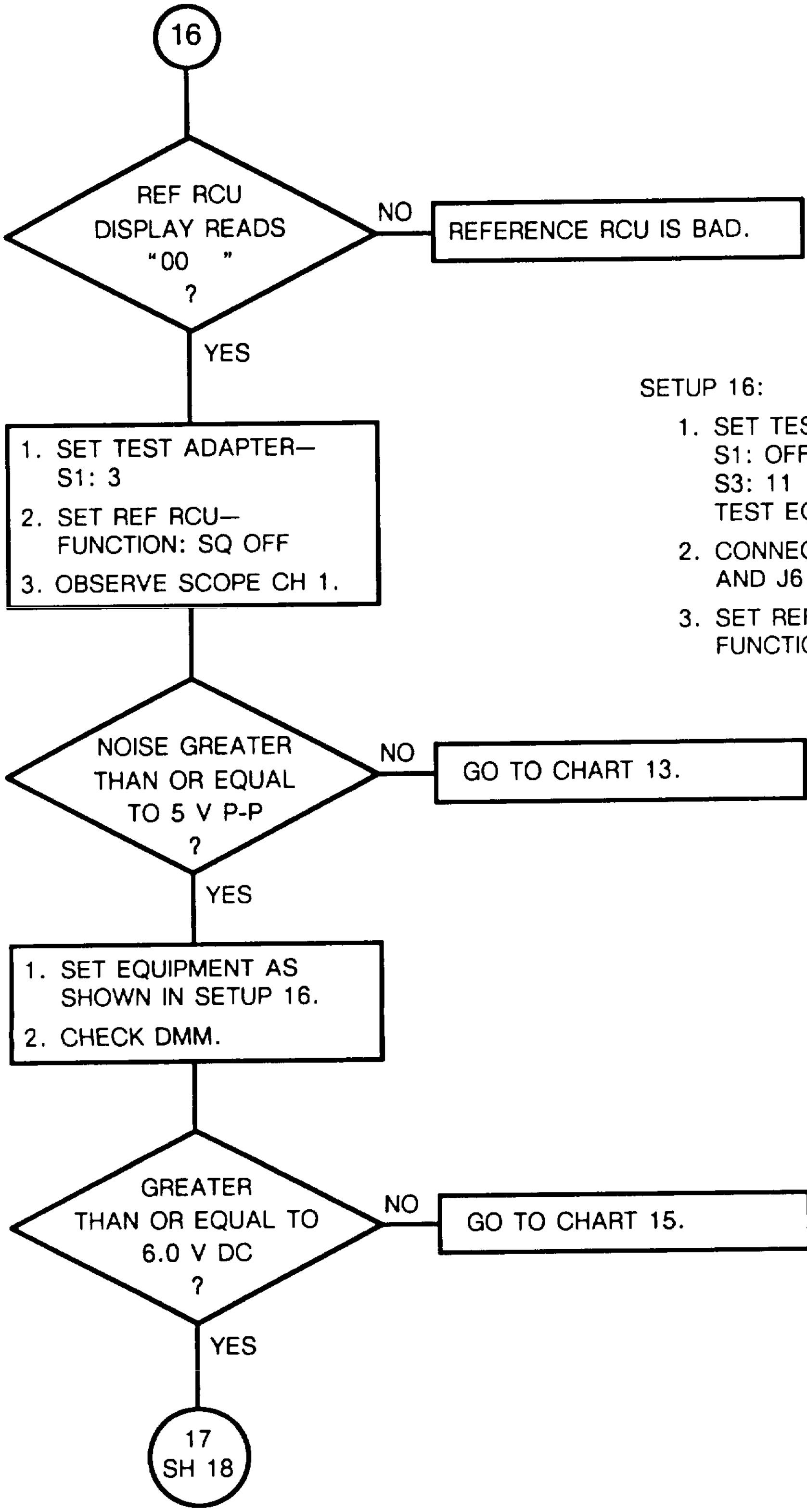
1. RECONNECT TEST CABLE W12 TO J2.
2. PRESS •••/TIME KEY ON REF RCU.

(16 SH 17)

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

Troubleshooting Interconnecting Device Operation (Sheet 17 of 36)

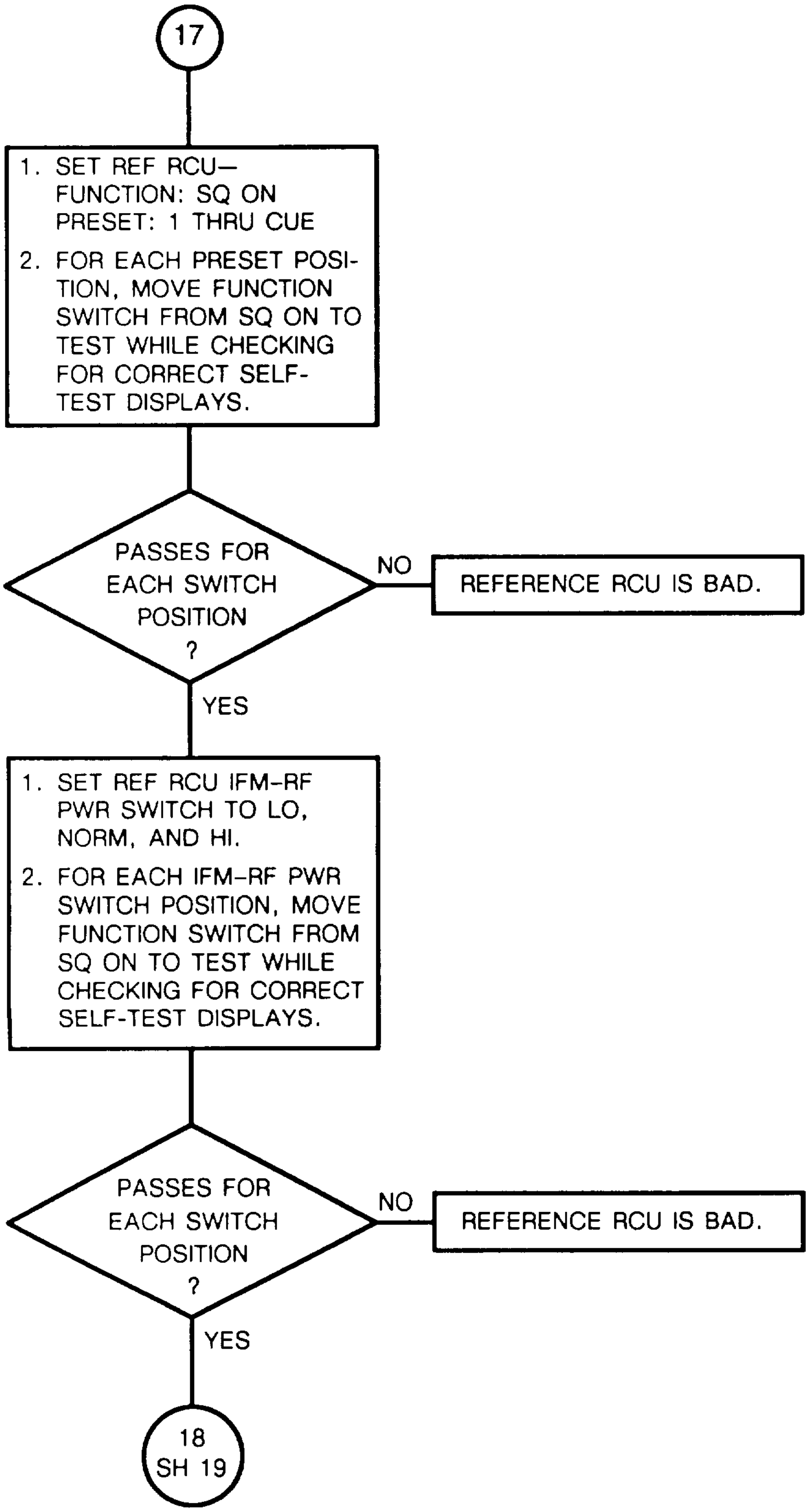


SETUP 16:

1. SET TEST ADAPTER—
   S1: OFF
   S3: 11
   TEST EQUIPMENT SELECTOR(S15): DMM
2. CONNECT TEST CABLE W12 BETWEEN J2 AND J6 ON TEST ADAPTER.
3. SET REF RCU—
   FUNCTION: RXMT

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

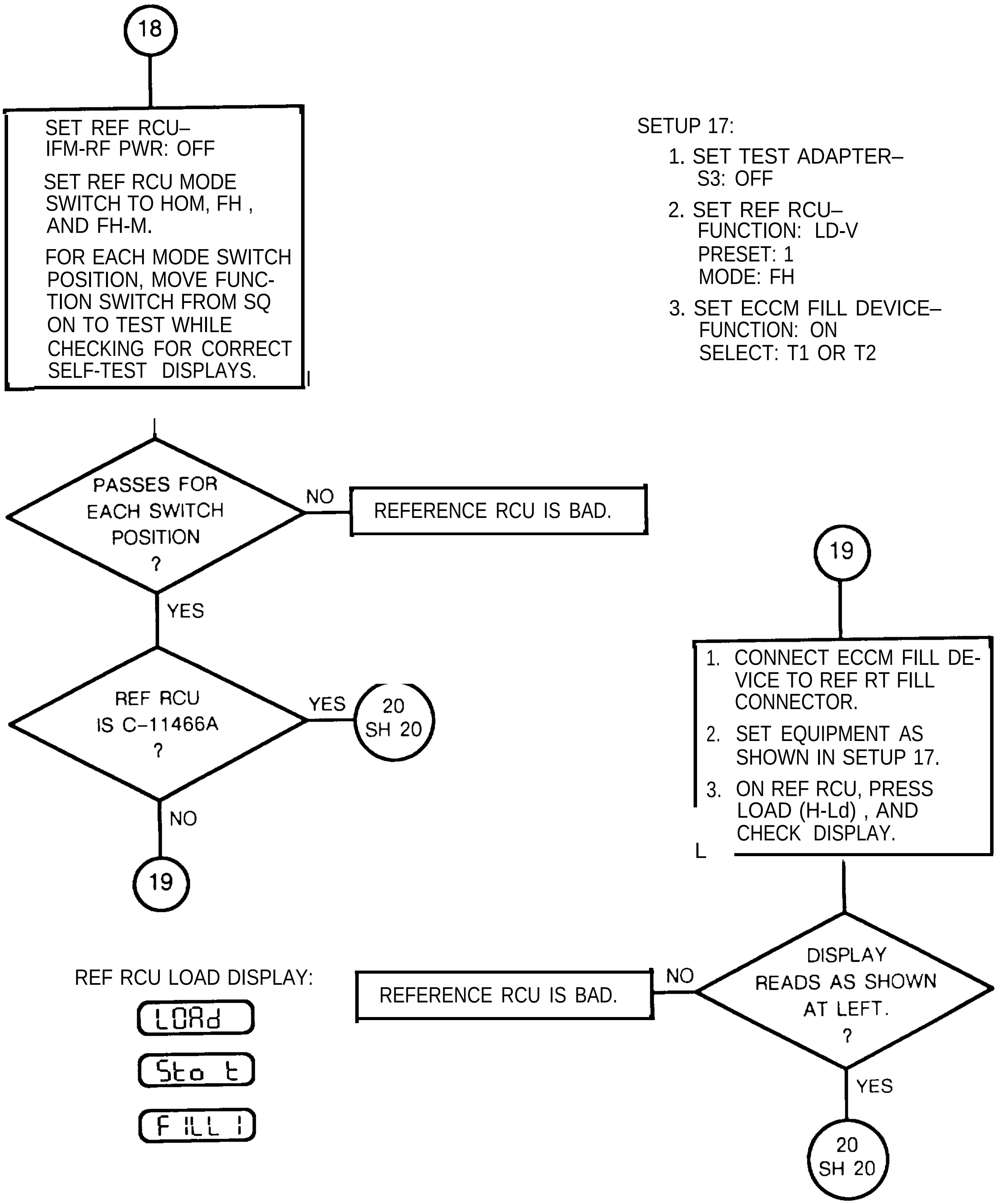
CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 18 of 36)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

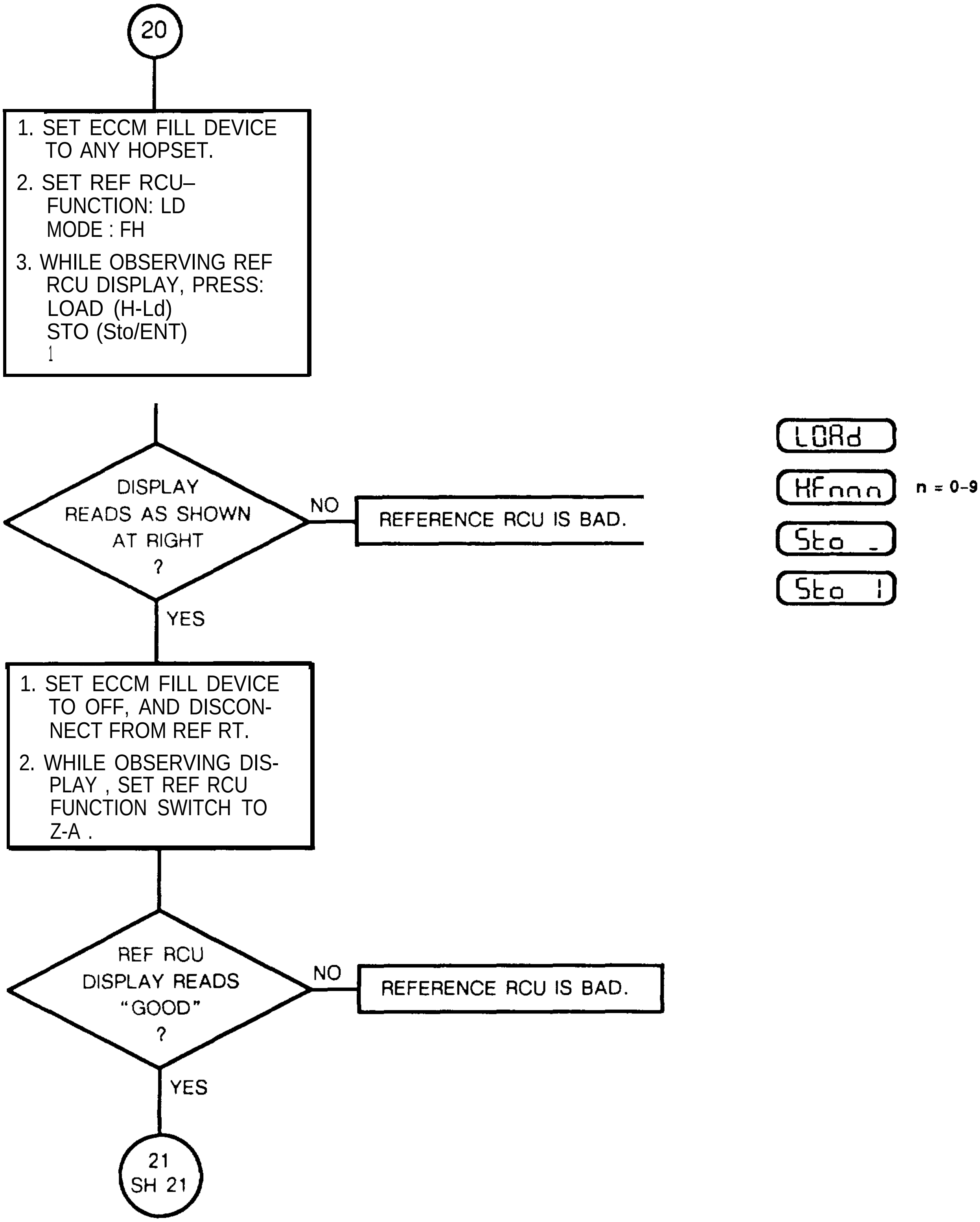
CHART 1

Troubleshooting Interconnecting Device Operation (Sheet 19 of 36)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 20 of 36)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 21 of 36)

(21)

USE DMM TO CHECK RESISTANCE FROM TP24 TO J1-G. (VIEW E)

LESS THAN 5 OHMS ?

NO: REPLACE REFERENCE RCU. IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 11 TO CHECK TEST ADAPTER WIRING.

YES:

1. SET REF RCU—
   FUNCTION: LD
   MODE: SC
2. WHILE OBSERVING REF RCU DISPLAY, PRESS:
   FREQ
   CLR
   3
   1
   2
   5
   0
   STO (Sto/ENT)

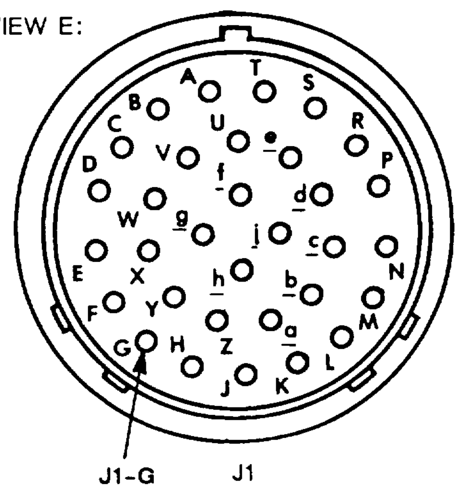
READS "-----", "31250", AND THEN BLINKS ?

NO: REFERENCE RCU IS BAD.

YES:

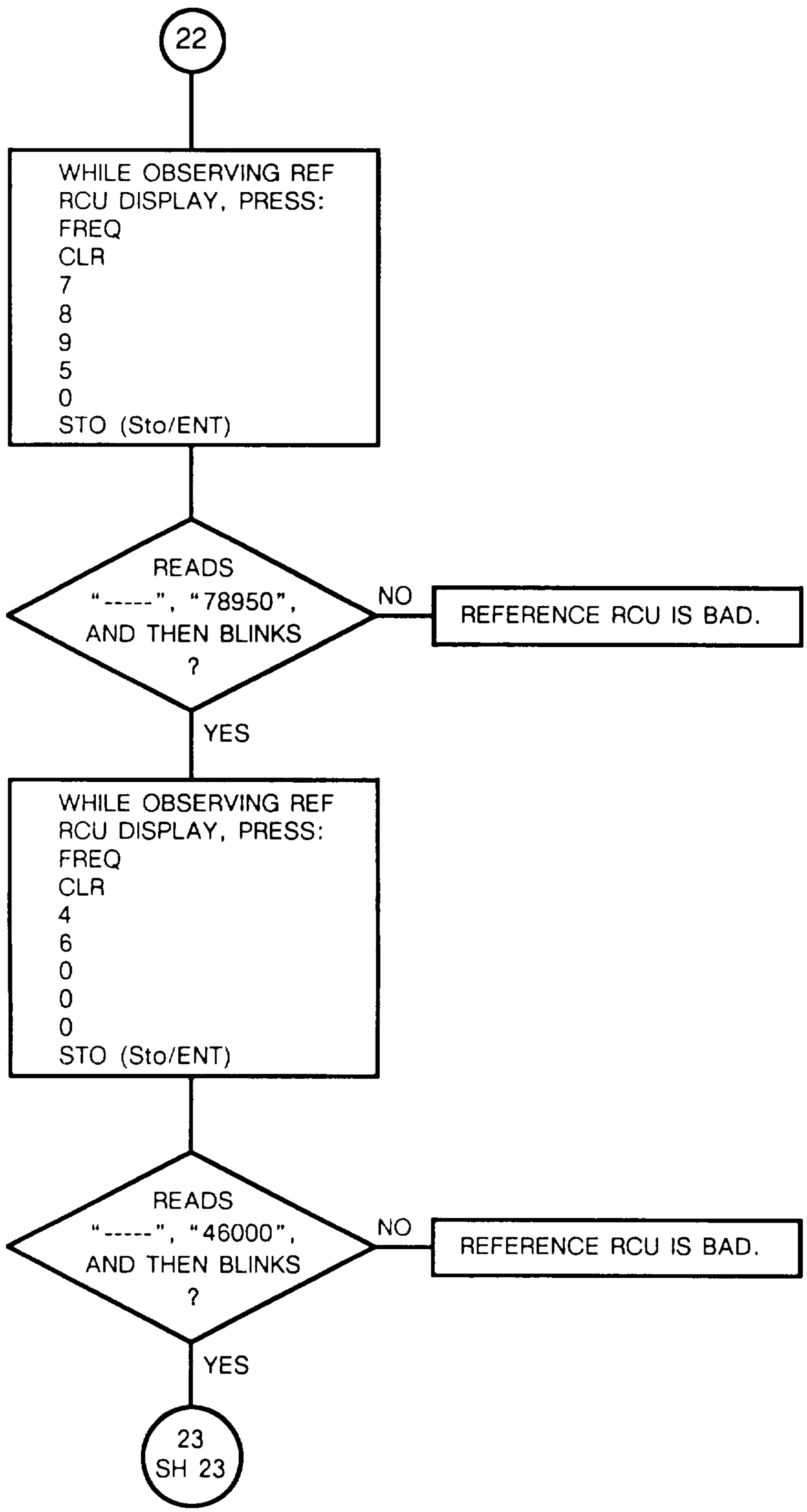
(22 SH 22)

VIEW E:



6-17. TROUBLESHOOTING FLOWCHARTS, Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 22 of 36)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

Troubleshooting Interconnecting Device Operation (Sheet 23 of 36)

23

16

1. SET EQUIPMENT AS SHOWN IN SETUP 18.
2. CONNECT TEST CABLE W14 TO J9 ON TEST ADAPTER.
3. CONNECT CABLE FROM FUNCTION GENERATOR OUTPUT TO LOOSE END OF CABLE W14.
4. USE EXTERNAL PROBE TO CHECK PIN K OF J1 WHILE PTT(S8) IS SET TO REF. (VIEW F)

GREATER THAN 8 V P-P 900 TO 1100 Hz SINE WAVE ?

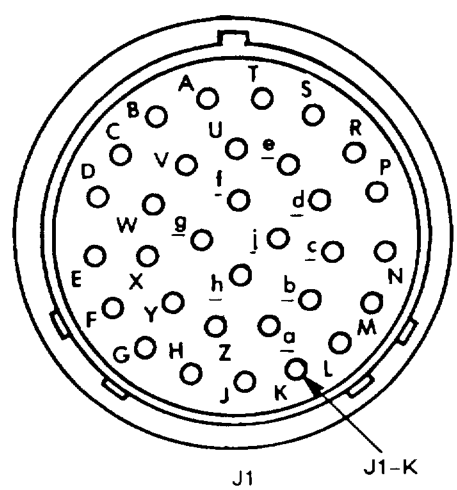
NO — GO TO CHART 14.

YES — 24 SH 24

SETUP 18:

1. SET TEST ADAPTER—
   S1: 3
   TEST EQPT INPUT(S14): EXT
   TEST EQUIPMENT SELECTOR(S15): SCOPE
   DC: ON
   CAL(S7): IN
2. SET FUNCTION GENERATOR—
   FUNCTION: SINE
   FREQ: 1 kHz (900 to 1100 Hz)
   LEVEL: 100 mV P-P (90 to 110 mV P-P)

VIEW F:



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

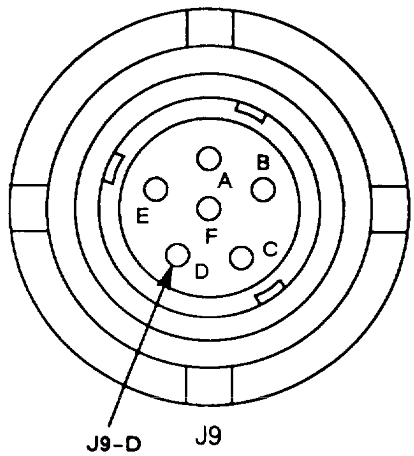
CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 24 of 36)

(24)

17

1. REMOVE CABLE W14 FROM J9, IF CONNECTED.
2. CONNECT CABLE FROM FUNCTION GENERATOR OUTPUT TO J8.
3. SET EQUIPMENT AS SHOWN IN SETUP 19.
4. USE SCOPE PROBE TO CHECK PIN D OF J9. (VIEW G)

VIEW G:



SINE WAVE PRESENT ?

NO → GO TO CHART 16.

YES

18

1. SET EQUIPMENT AS SHOWN IN SETUP 20.
2. WHILE LISTENING TO HEADSET, TURN TEST ADAPTER DC SWITCH FROM OFF TO ON.

TWO-TONE BEEP(NOT STEADY 1200-Hz TONE) ?

NO → GO TO CHART 17.

YES

(25 SH 25)

NOTE

In setup 19, calibrate function generator output using scope channel 1 and the frequency counter.

SETUP 19:

1. SET REF RT AND REF RCU—
   FUNCTION: OFF
2. CONNECT SIGNAL GENERATOR RF OUTPUT TO J16 ON TEST ADAPTER.
3. CONNECT JUMPER W1 FROM J10 TO J11 ON TEST ADAPTER.
4. CONNECT X10 SCOPE PROBE TO SCOPE CH 1.
5. SET TEST ADAPTER—
   S1: OFF
   TEST EQUIPMENT SELECTOR(S15): ICS
   CAL(S7): IN
6. SET FUNCTION GENERATOR—
   FUNCTION: SINE
   FREQ: 1 kHz (900 to 1100 Hz)
   LEVEL: 5 V P-P (4.5 to 5.5 V P-P)

SETUP 20:

1. SET UP AS SHOWN ON FIG 6-6.
2. SET TEST ADAPTER—
   S5: 4
   TEST EQUIPMENT SELECTOR(S15): ICS
   TEST EQPT INPUT(S14): INTL

6-17, TROUBLESHOOTING FLOWCHARTS, Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 25 of 36)

(25)

1. SET EQUIPMENT AS SHOWN IN SETUP 21.
2. USE EXTERNAL PROBE TO CHECK J7-F. (VIEW H)

DIGITAL DATA SIGNAL ?

NO — GO TO CHART 18.

YES

1. SET EQUIPMENT AS SHOWN IN SETUP 22.
2. USE EXTERNAL PROBE TO CHECK J7-F. (VIEW H)

DIGITAL DATA SIGNAL ?

NO — GO TO CHART 19.

YES

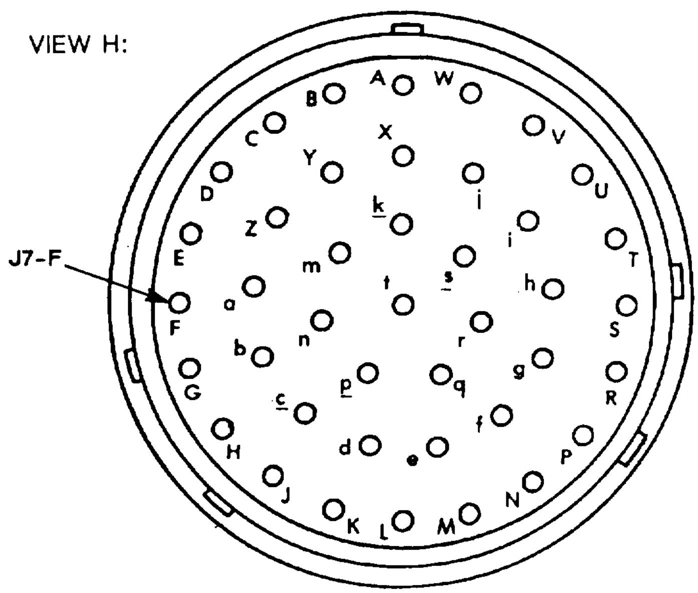
(26 SH 26)

SETUP 21:

1. SET TEST ADAPTER—
   S5: 3
   S6: 3
   PTT(S13): REF
   TEST EQUIPMENT SELECTOR(S15): SCOPE
   TEST EQPT INPUT(S14): EXT
   CAL(S7): IN
2. EXT PROBE CONNECTED TO J8.

J7

VIEW H:

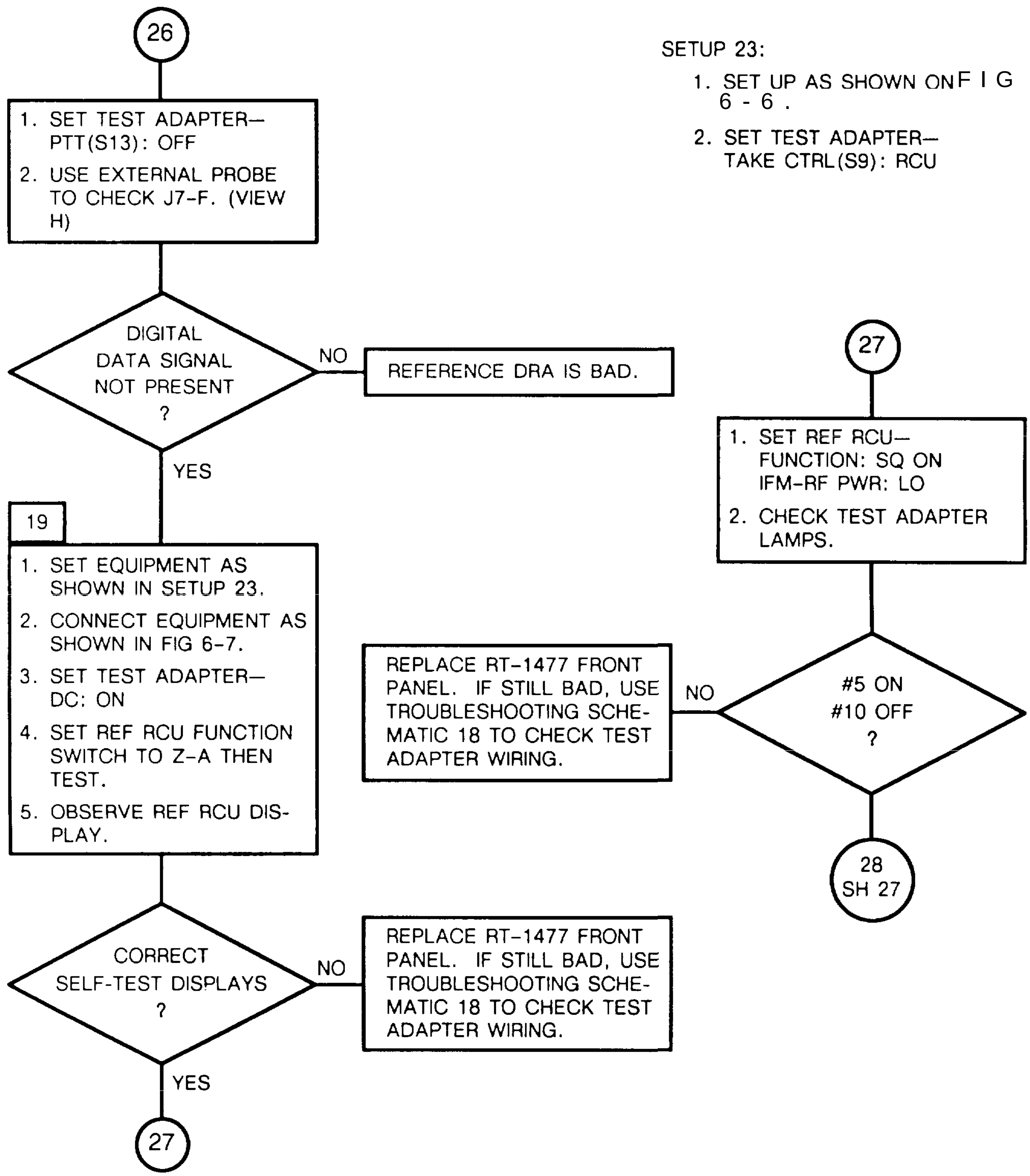


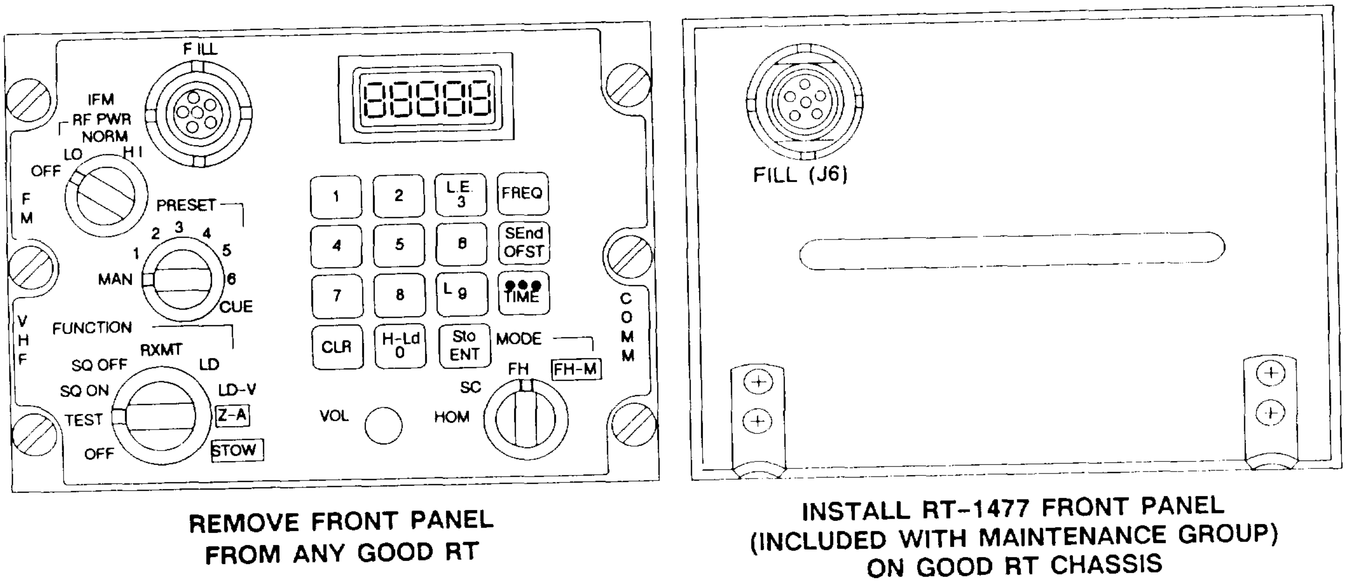
SETUP 22:

1. SET TEST ADAPTER—
   S5: 7
   S6: 7
   PTT(S13): REF
2. SET FUNCTION GENERATOR—
   FUNCTION: SQUARE
   FREQ: 16 kHz (14400 to 17600 Hz)
   LEVEL: 5 V P-P (4.5 to 5.5 V P-P)
3. SET TEST ADAPTER—
   SQ/CLK(S11): ON

6-17. TROUBLESHOOTING FLOWCHARTS, Continued

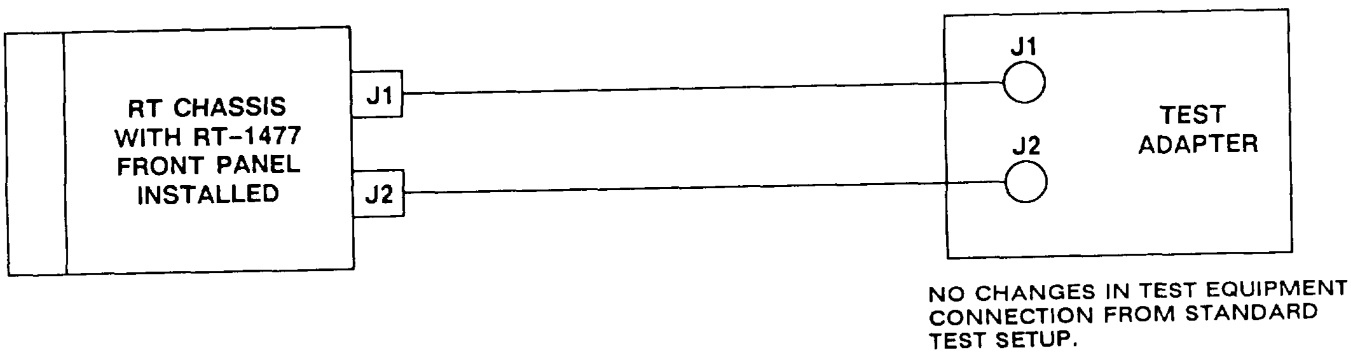
CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 26 of 36)





NOTE

Rt and ref rcu must both be AN/ARC-201(V)
or must both be AN/ARC-201A(V).



NOTE

If a good RT-1476 or RT-1477 is not available, the
ref rt may be used instead, after removing it from
the test adapter.

Figure 6-7. RT-1477 Front Panel Test Setup Diagram

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 27 of 36)

28

1. SET IFM-RF PWR SWITCH ON REF RCU TO HI.
2. CHECK TEST ADAPTER LAMPS.

#5 ON
#10 ON
?

NO

REPLACE RT-1477 FRONT PANEL. IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 18 TO CHECK TEST ADAPTER WIRING.

YES

REF RCU
IS C-11466A
?

YES

31
SH 29

NO

1. CONNECT ECCM FILL DEVICE TO RT-1477 FRONT PANEL.
2. SET EQUIPMENT AS SHOWN IN SETUP 24.
3. ON REF RCU, PRESS LOAD (H-Ld), AND OBSERVE DISPLAY.

29

29

DISPLAY
READS AS SHOWN
BELOW
?

NO

RT-1477 FRONT PANEL IS BAD.

NO

30
SH 28

REF RCU LOAD DISPLAY:

LOAd

Sto t

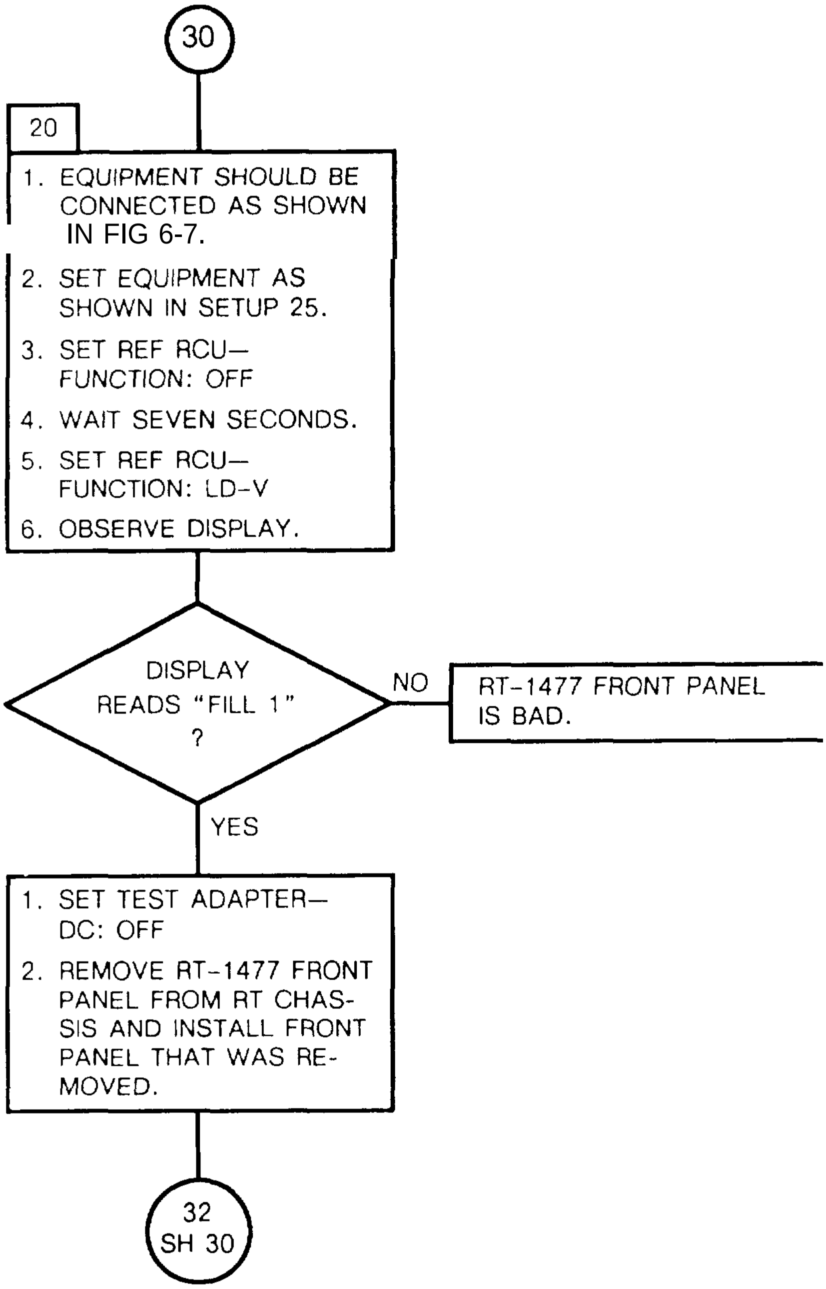
F ILL I

SETUP 24:

1. SET TEST ADAPTER—
   DC: ON
2. SET REF RCU—
   FUNCTION: LD-V
   PRESET: 1
   IFM-RF PWR: OFF
   MODE: FH
3. SET ECCM FILL DEVICE—
   FUNCTION: ON
   SELECT: T1 OR T2

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 28 of 36)

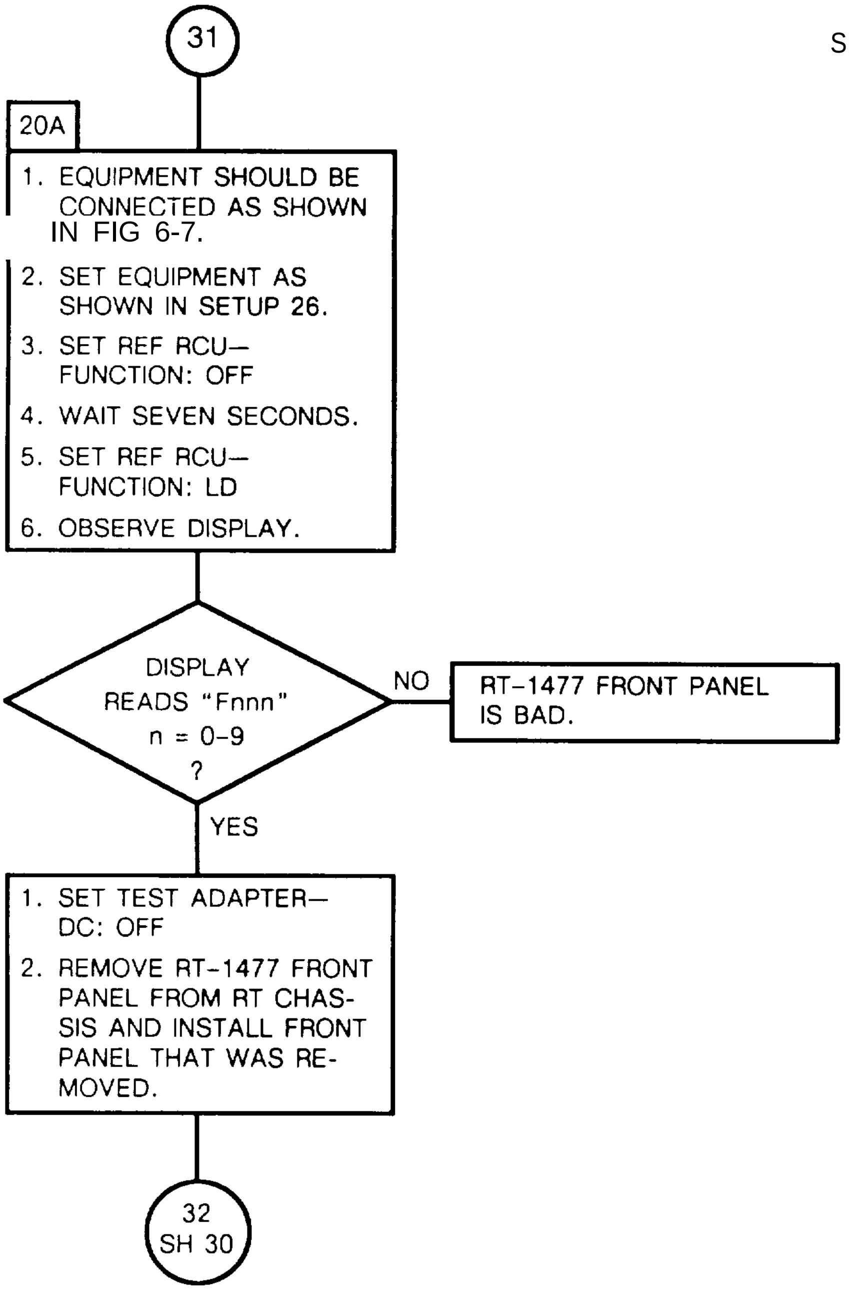


SETUP 25:

1. SET UP AS SHOWN ON FIG 6-6.
2. SET TEST ADAPTER–
   DC: ON
   TAKE CTRL S9) : RCU
3. SET REF RCU–
   FUNCTION: LD-V
   PRESET: 1
   MODE: FH
4. THE RT WITH RT-1477 FRONT PANEL MUST HAVE HOLDING BATTERY INSTALLED AND TRANSEC VARIABLE LOADED.
5. IF ECCM FILL DEVICE IS CONNECTED, SET FUNCTION SWITCH TO OFF, AND DISCONNECT FROM RT-1477.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 29 of 36)



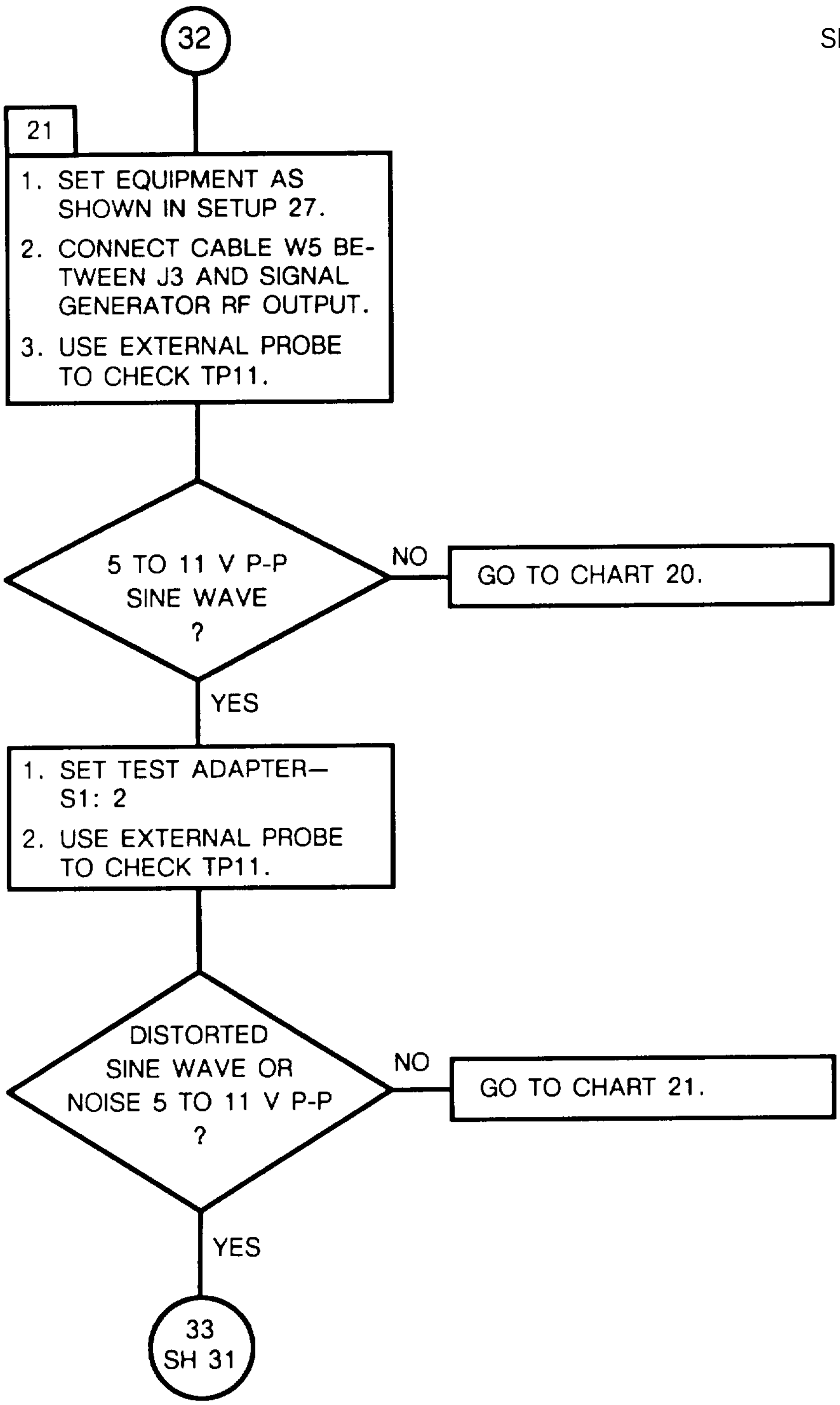
SETUP 26:

1. SET UP AS SHOWN ON FIG 6-6.
2. SET TEST ADAPTER–
   DC: ON
   TAKE CTRL (S9) : RCU
3. SET REF RCU–
   FUNCTION: LD
   PRESET: 1
   MODE: FH
4. THE RT WITH RT-1 477 FRONT PANEL MUST HAVE HOLDING BATTERY INSTALLED AND HOPSET LOADED AND STORED.
5. IF ECCM FILL DEVICE IS CONNECTED, SET FUNCTION SWITCH TO OFF, AND DISCONNECT FROM RT-1477.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

Troubleshooting Interconnecting Device Operation (Sheet 30 of 36)

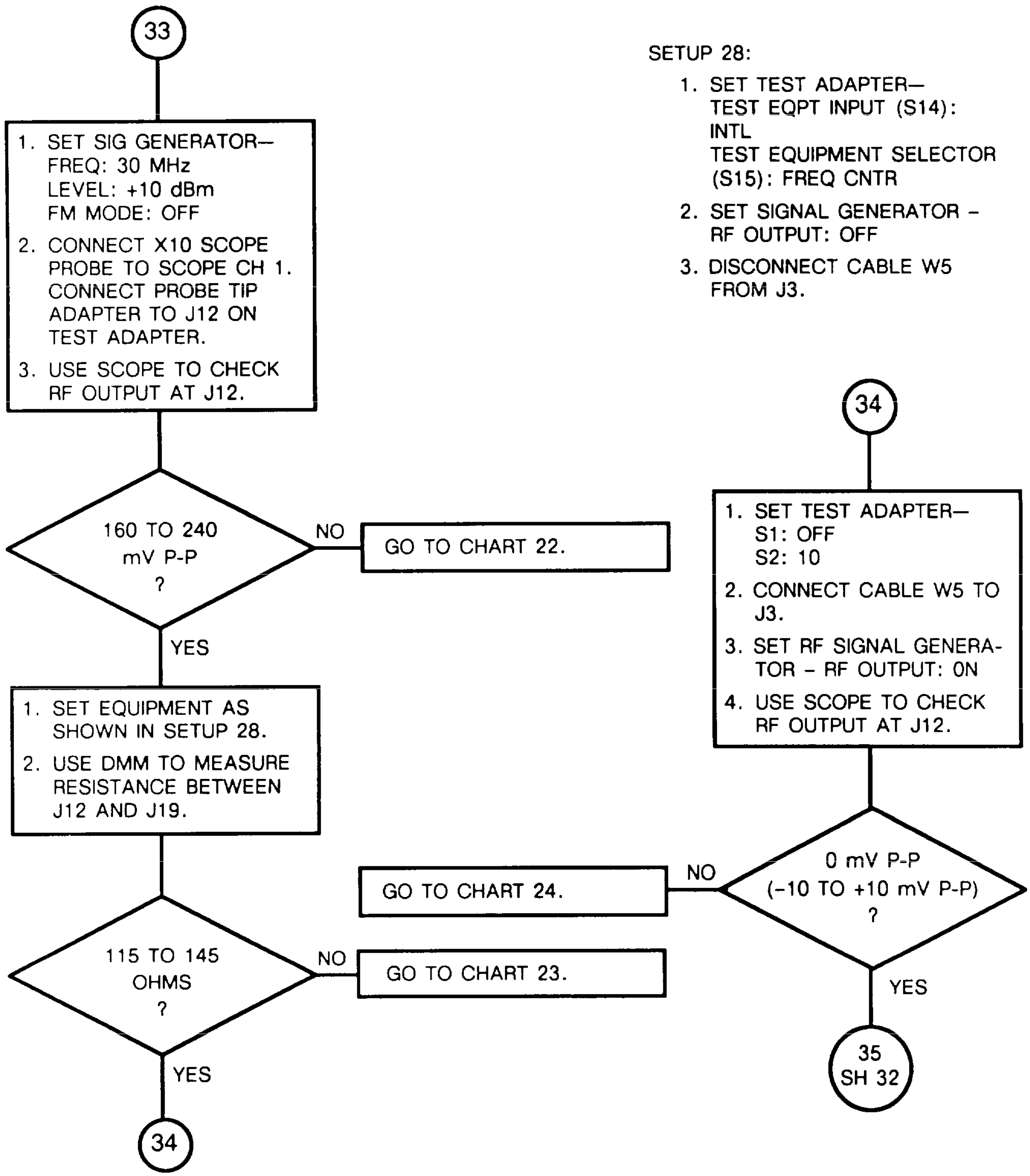


SETUP 27:

1. SET UP AS SHOWN ON FIG 6-6.
2. SET TEST ADAPTER–
   S1:1
   TEST EQPT INPUT (S14) : EXT
   DC: ON
3. SET REF RT–
   PRESET: 1
   LOAD FREQUENCY 45000 INTO PRESET 1
   FUNCTION: SQ OFF
4. SET REF RCU–
   FUNCTION: STOW
5. SET SIGNAL GENERATOR–
   FREQ: 45 MHz
   LEVEL: -10 dBm
   FM MODE: INT
   MODULATION : 1 kHz WITH 6.5 kHz (6,0 to 7.0 kHz) DEVIATION

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 31 of 36)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 32 of 36)

35

22

1. SET EQUIPMENT AS SHOWN IN SETUP 29.
2. CONNECT X10 SCOPE PROBE TO SCOPE CH 1.
3. USE SCOPE TO CHECK RF OUTPUT AT J16 USING SETUP SHOWN IN VIEW I.

160 TO 240 mV P-P ?

NO: GO TO CHART 25.

YES

1. SET TEST ADAPTER—
   S1: 10
2. CONNECT SIGNAL GENERATOR RF OUTPUT TO J16 ON TEST ADAPTER.
3. CONNECT X10 SCOPE PROBE TO J4 USING SETUP SHOWN IN VIEW I.
4. USE SCOPE CH 1 TO CHECK RF OUTPUT AT J4.

80 TO 120 mV P-P ?

NO: GO TO CHART 26.

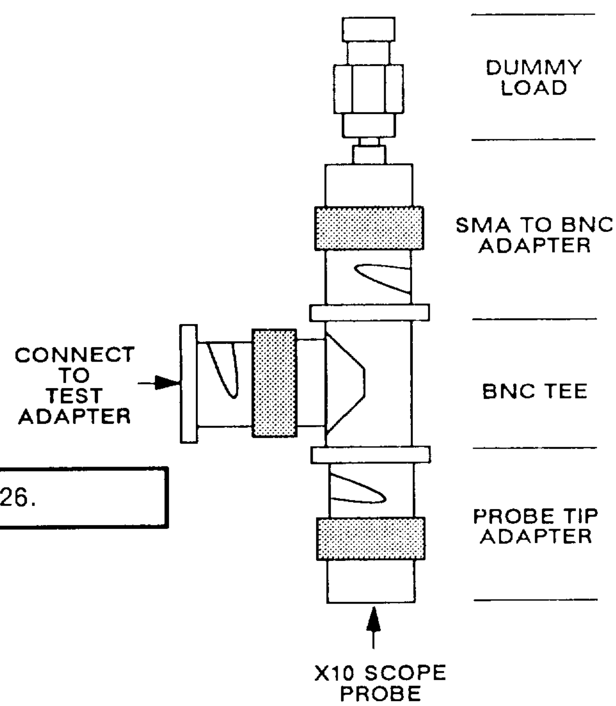
YES

36 SH 33

SETUP 29:

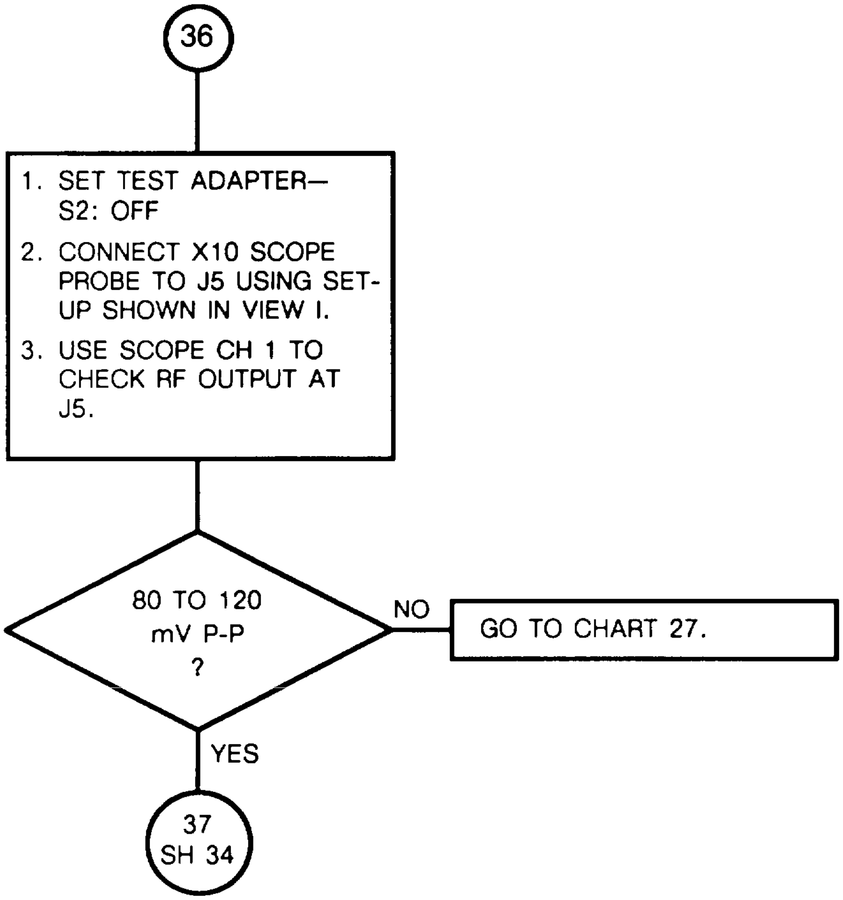
1. SET UP AS SHOWN ON FIG 6-6.
2. SET TEST ADAPTER—
   S1: 7
   DC: ON
3. SET SIGNAL GENERATOR—
   FREQ: 30 MHz
   LEVEL: +10 dBm
   FM MODE: OFF
4. CONNECT SIGNAL GENERATOR RF OUTPUT TO J3 ON TEST ADAPTER USING TEST CABLE W5.
5. SET REF RT—
   FUNCTION: Z-A THEN SQ OFF

VIEW I:



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 33 of 36)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 34 of 36)

37

23

1. SET UP AS SHOWN IN FIGURE 6-6.
2. CONNECT CABLE W7 FROM AC POWER SUPPLY (WALL OUTLET) TO J20 ON TEST ADAPTER.
3. SET TEST ADAPTER AC SWITCH TO ON.

AC SWITCH TRIPS ?

YES — GO TO CHART 28.

NO

24

1. TURN OFF AC AND DC POWER SUPPLIES AND DISCONNECT CABLES W7 AND W8 FROM TEST ADAPTER.
2. USE DMM TO CHECK RESISTANCE FROM TP23 TO J1-A. (VIEW J)

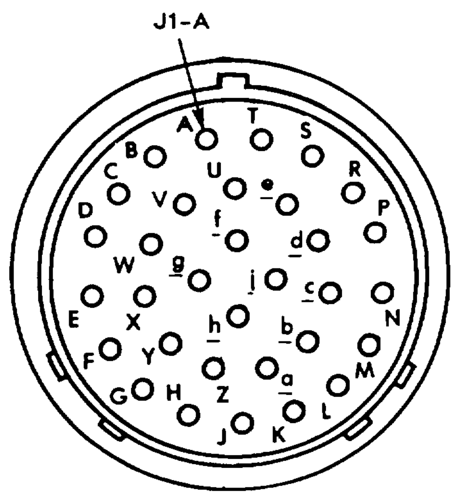
2700 TO 3300 OHMS ?

NO — REPLACE LAMP TEST CCA (A1). IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 26 TO CHECK TEST ADAPTER WIRING.

YES

38
SH 35

VIEW J:



J1

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1
Troubleshooting Interconnecting Device Operation (Sheet 35 of 36)

38

25

1. SET TEST ADAPTER DC SWITCH TO OFF.
2. USE DMM TO CHECK RESISTANCE FROM J7-C TO TP24. (VIEW K)

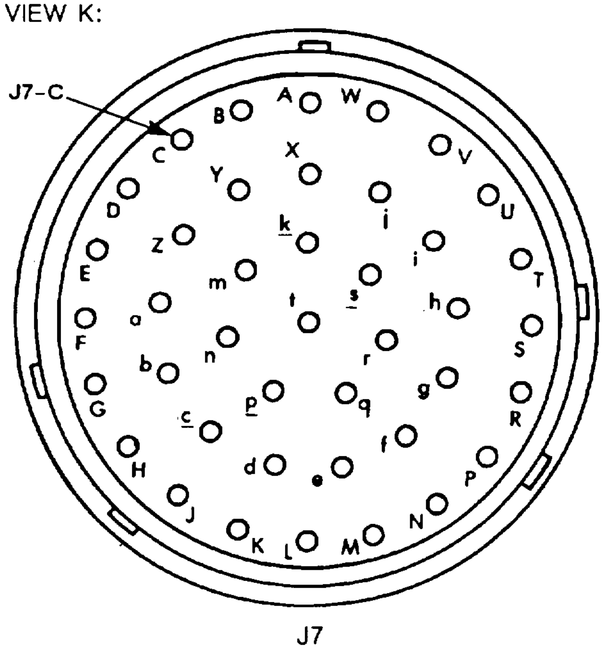
1600 TO 2000 OHMS ?

NO — GO TO CHART 29.

YES

39 SH 36

VIEW K:



J7

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 1

Troubleshooting Interconnecting Device Operation (Sheet 36 of 36)

(39)

26

1. SET TEST ADAPTER—
   DC: OFF
   S1: 1
2. USE DMM TO CHECK RESISTANCE FROM TP24 TO J1-T. (VIEW L)

900 TO 1100 OHMS ?

NO: REPLACE LAMP TEST CCA (A1). IF STILL BAD, GO USE TROUBLESHOOTING SCHEMATIC 26 TO CHECK TEST ADAPTER WIRING.

YES:

27

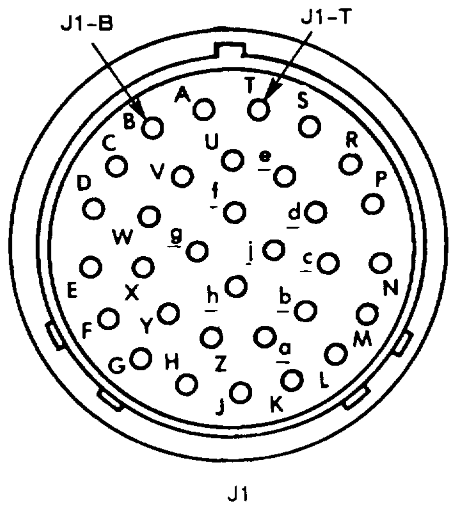
1. SET TEST ADAPTER—
   DC: OFF
   S1: OFF
2. USE DMM TO CHECK RESISTANCE FROM TP24 TO J1-B. (VIEW L)

900 TO 1100 OHMS ?

NO: REPLACE LAMP TEST CCA (A1). IF STILL BAD, GO USE TROUBLESHOOTING SCHEMATIC 26 TO CHECK TEST ADAPTER WIRING.

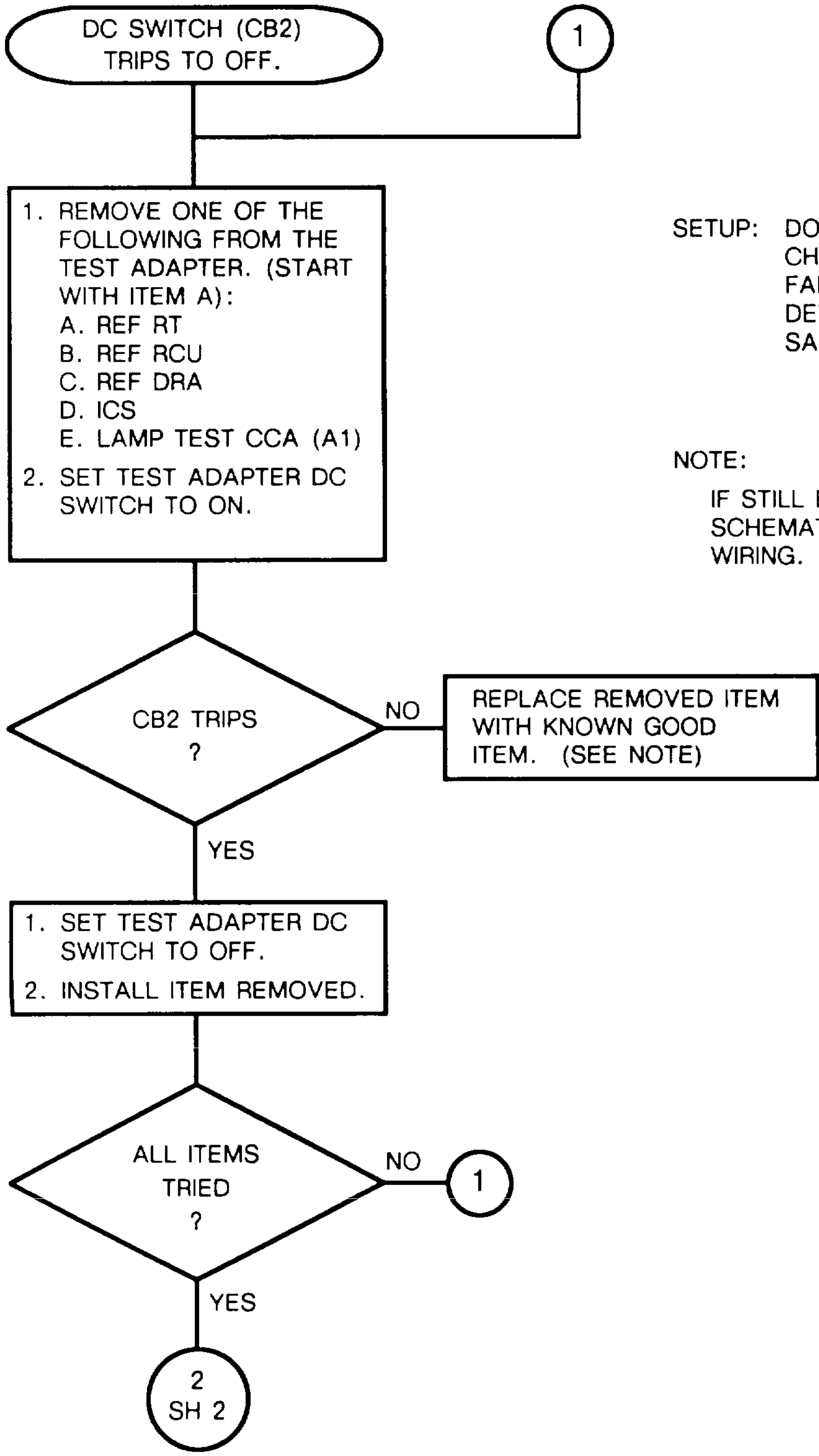
YES: INTERCONNECTING DEVICE IS OPERATIONAL.

VIEW L:



6–17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2
Troubleshooting Excess Current (Sheet 1 of 2)



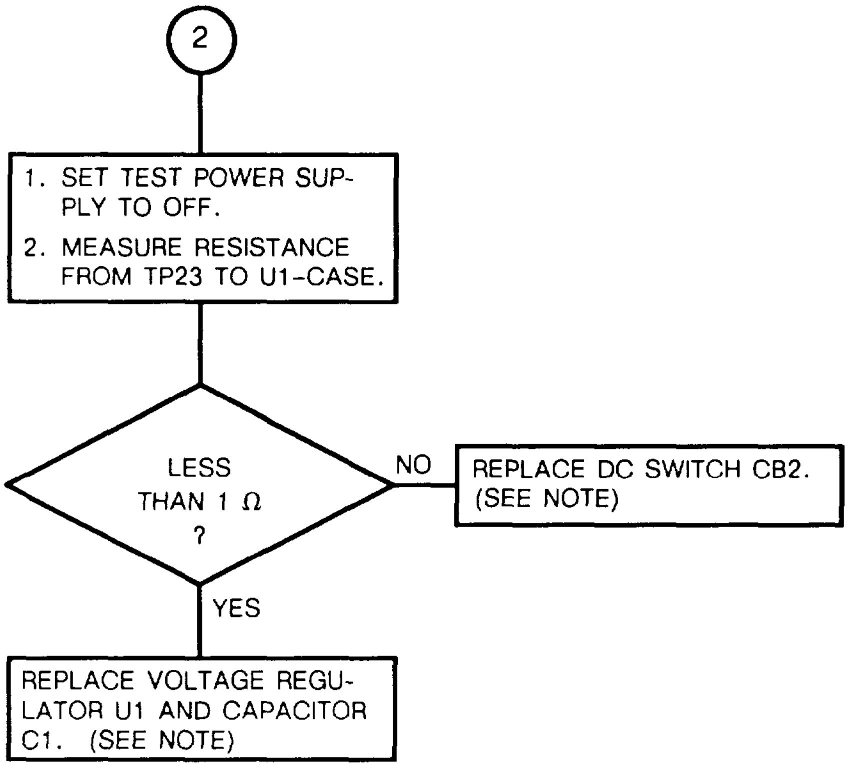
SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 1 TO CHECK TEST ADAPTER WIRING.

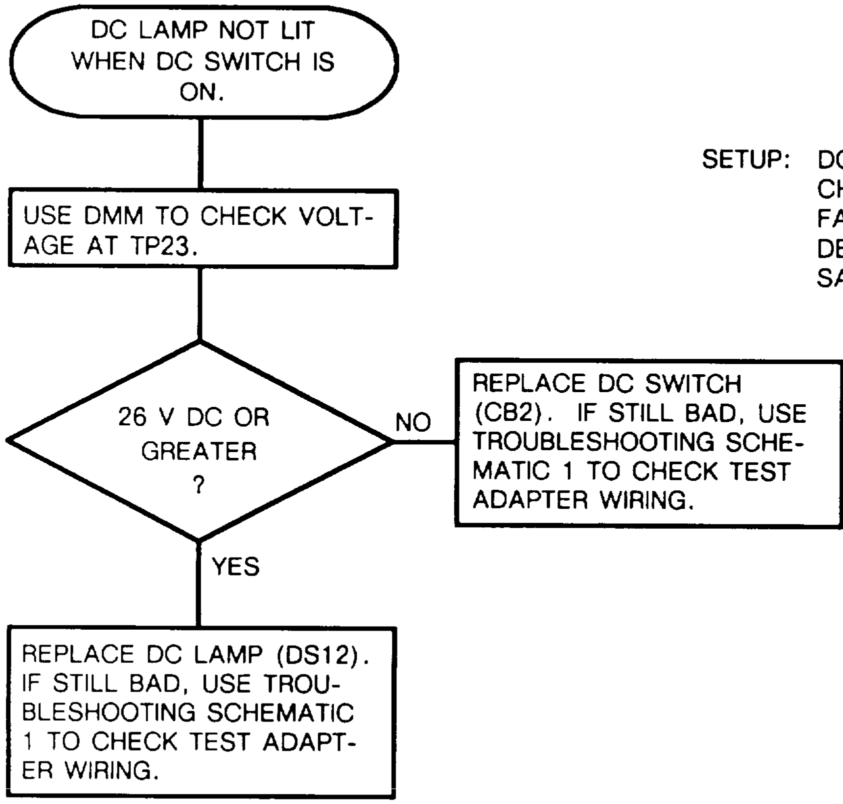
6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 2
Troubleshooting Excess Current (Sheet 2 of 2)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 3
Troubleshooting Dc Power Failure

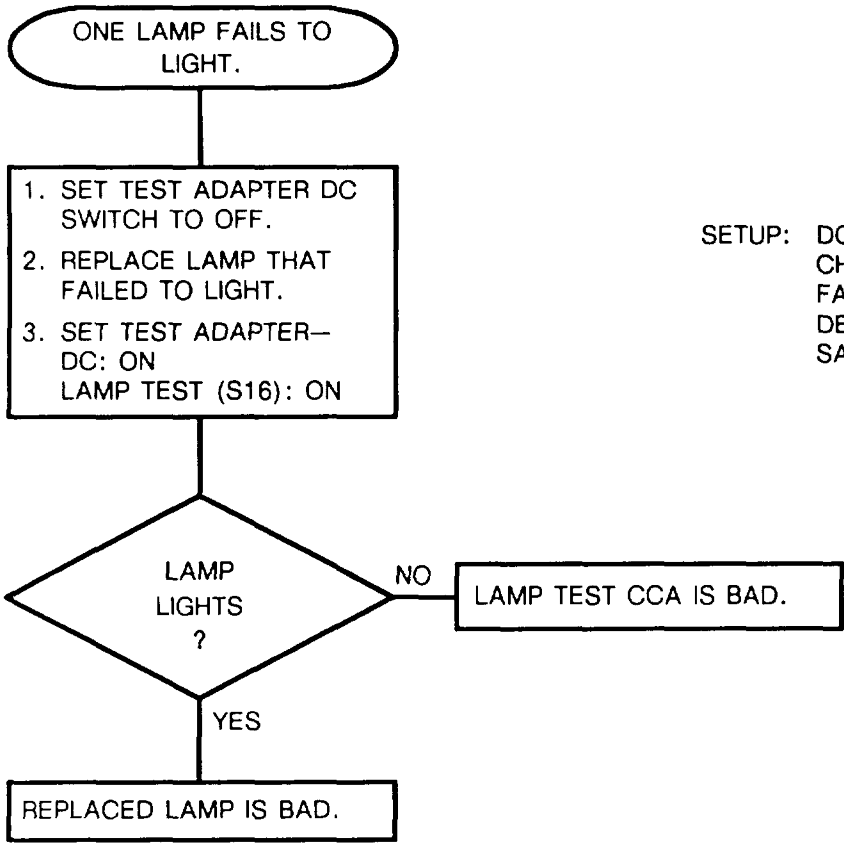


SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 4
Troubleshooting Faulty Test Lamp

SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 5
Troubleshooting Incorrect Rf Output (Sheet 1 of 4)

RF OUTPUT IS WRONG.

TEST FAILS FOR ALL PRESET POSITIONS ?

NO: REFERENCE RT IS BAD.

YES:

1. SET TEST ADAPTER DC SWITCH TO OFF.
2. REMOVE REF RT FROM TEST ADAPTER.
3. USE DMM TO CHECK RESISTANCE FROM P1-h (VIEW A) TO TP24 WHILE PTT(S8) IS SET TO REF.

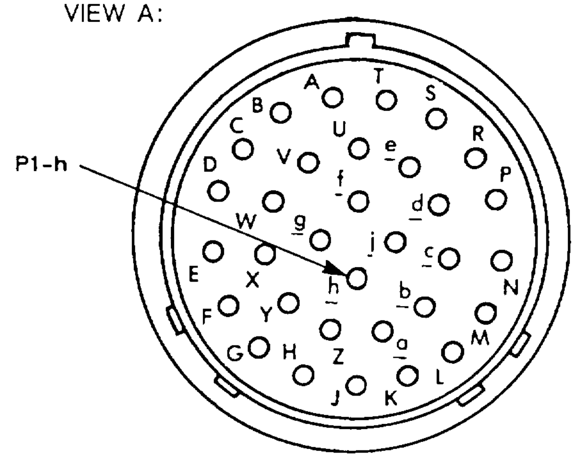
SETUP 1: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

0.5 OHMS OR LESS ?

NO: REPLACE PTT SWITCH (S8). IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 4 TO CHECK TEST ADAPTER WIRING.

YES: 1 SH 2

VIEW A:



P1

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 5
Troubleshooting Incorrect Rf Output (Sheet 2 of 4)

1

1. REPLACE REF RT.
2. SET EQUIPMENT AS SHOWN IN SETUP 2.
3. SET TEST ADAPTER DC SWITCH TO ON.
4. USE DMM TO CHECK RF OUTPUT AT ATTENUATOR AT7 WHILE PTT(S8) IS SET TO REF.

18 TO 22 dBm ?

YES: RF CABLE W2 IS BAD.

NO:

1. SET EQUIPMENT AS SHOWN IN SETUP 3.
2. USE DMM TO CHECK RF OUTPUT AT J12 WHILE PTT(S8) IS SET TO REF.

18 TO 22 dBm ?

YES: ATTENUATOR AT7 IS BAD.

NO: 2 SH 3

SETUP 2:

1. SET REF RT—
   FUNCTION: SQ OFF
   MODE: SC
   PRESET: MAN
   IFM RF PWR: OFF
2. DISCONNECT RF CABLE W2 FROM ATTENUATOR AT7.
3. CONNECT DMM RF PROBE TO AT7 USING SETUP SHOWN IN FIGURE 6-8a.

SETUP 3:

1. SET TEST ADAPTER—
   S1: 2
   TEST EQPT INPUT (S14): INTL
2. CONNECT DMM RF PROBE TO J12 ON TEST ADAPTER USING PROBE TIP ADAPTER.
3. DISCONNECT ATTENUATOR AT7 FROM ADAPTER CP8.
4. CONNECT CP8 TO J3 OF TEST ADAPTER USING SETUP SHOWN IN FIGURE 6-8b.

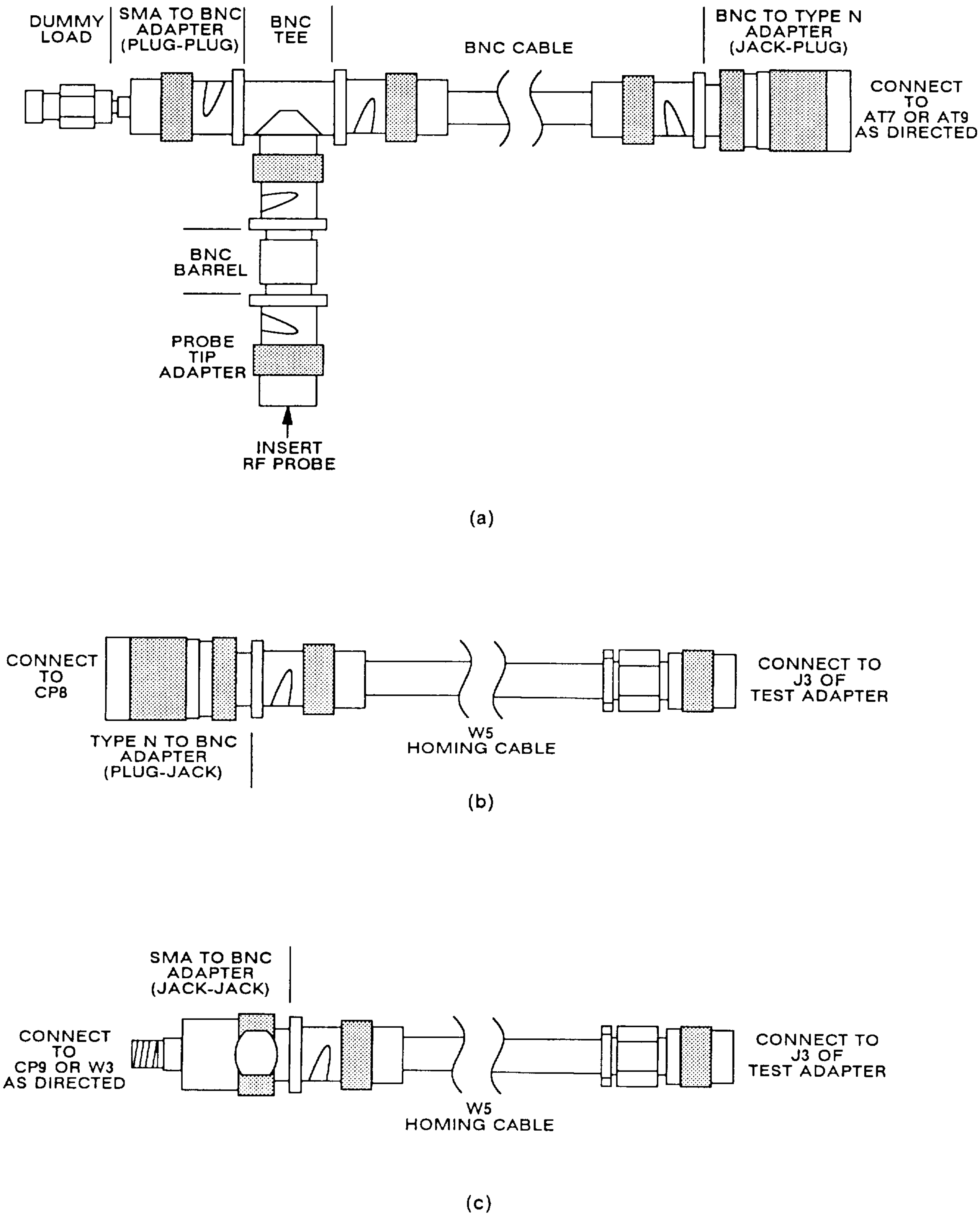
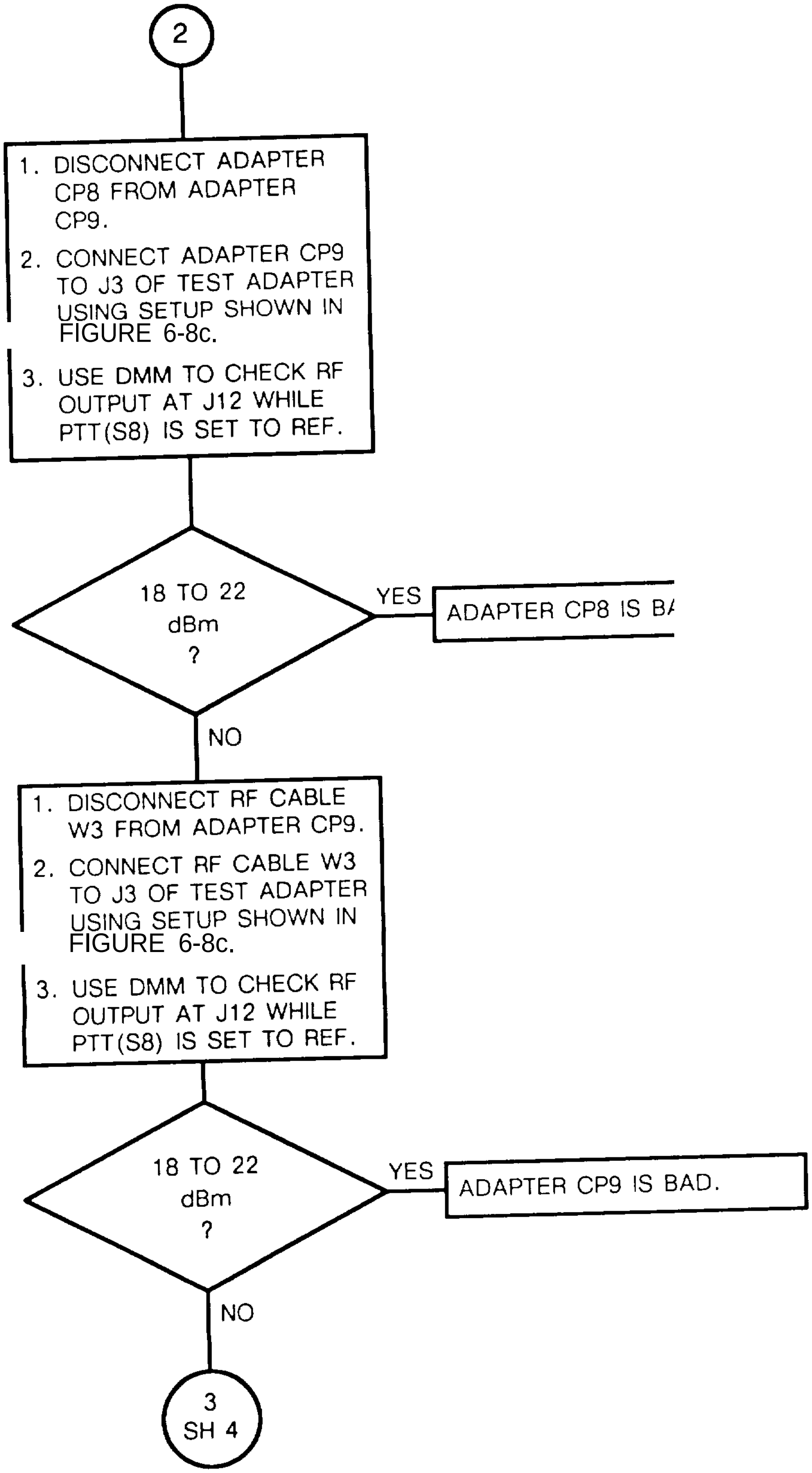


Figure 6-8. Rf Test Connections

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

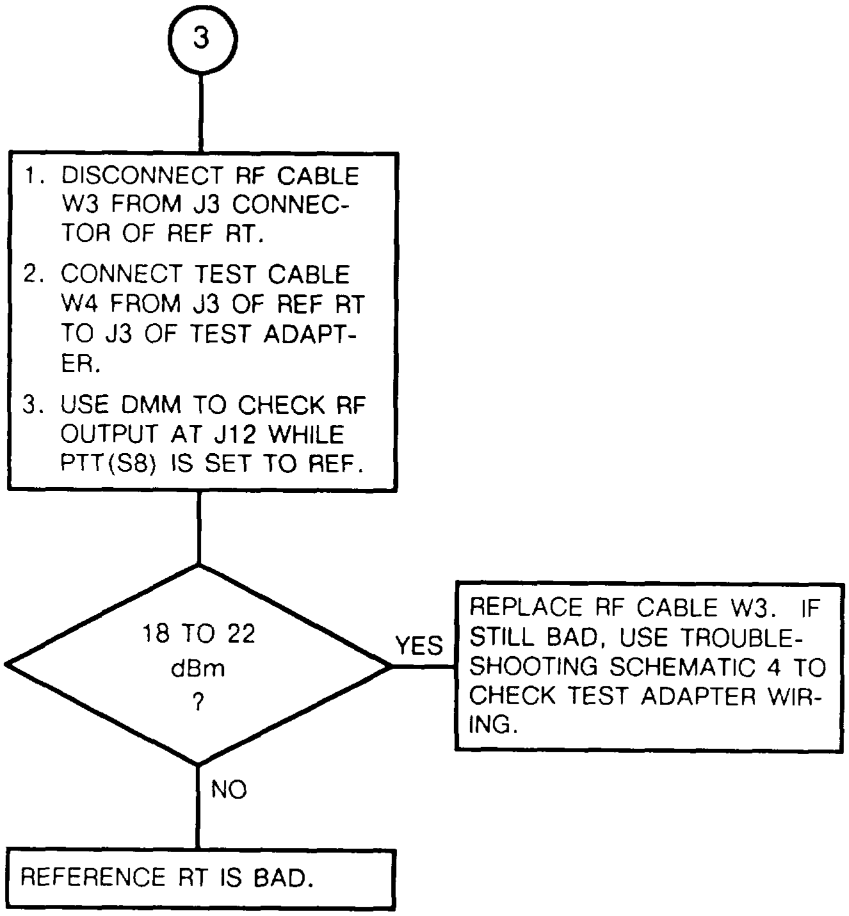
CHART 5

Troubleshooting Incorrect Rf Output (Sheet 3 of 4)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

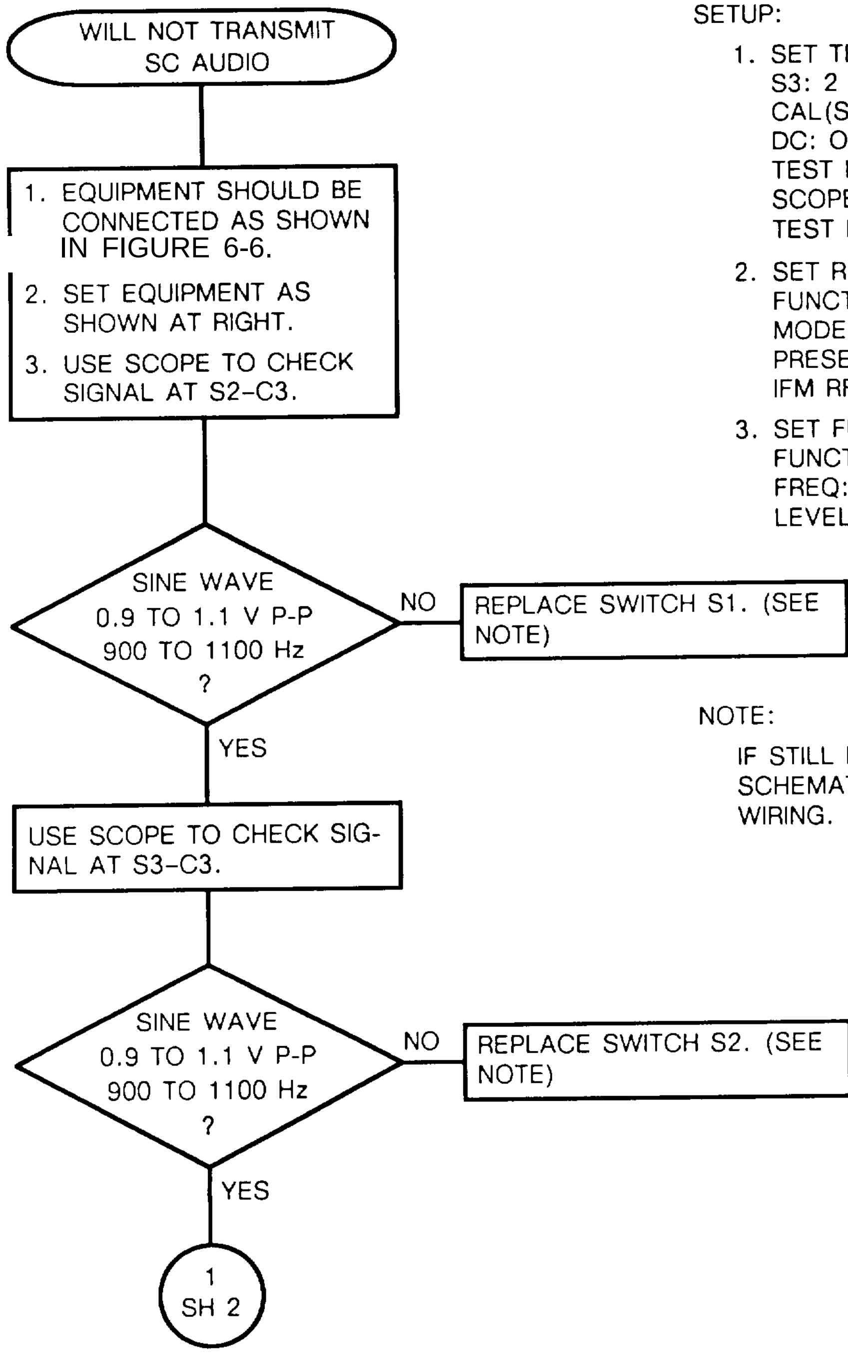
CHART 5
Troubleshooting Incorrect Rf Output (Sheet 4 of 4)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 6

Troubleshooting Audio Transmit Failure (Sheet 1 of 2)



SETUP:

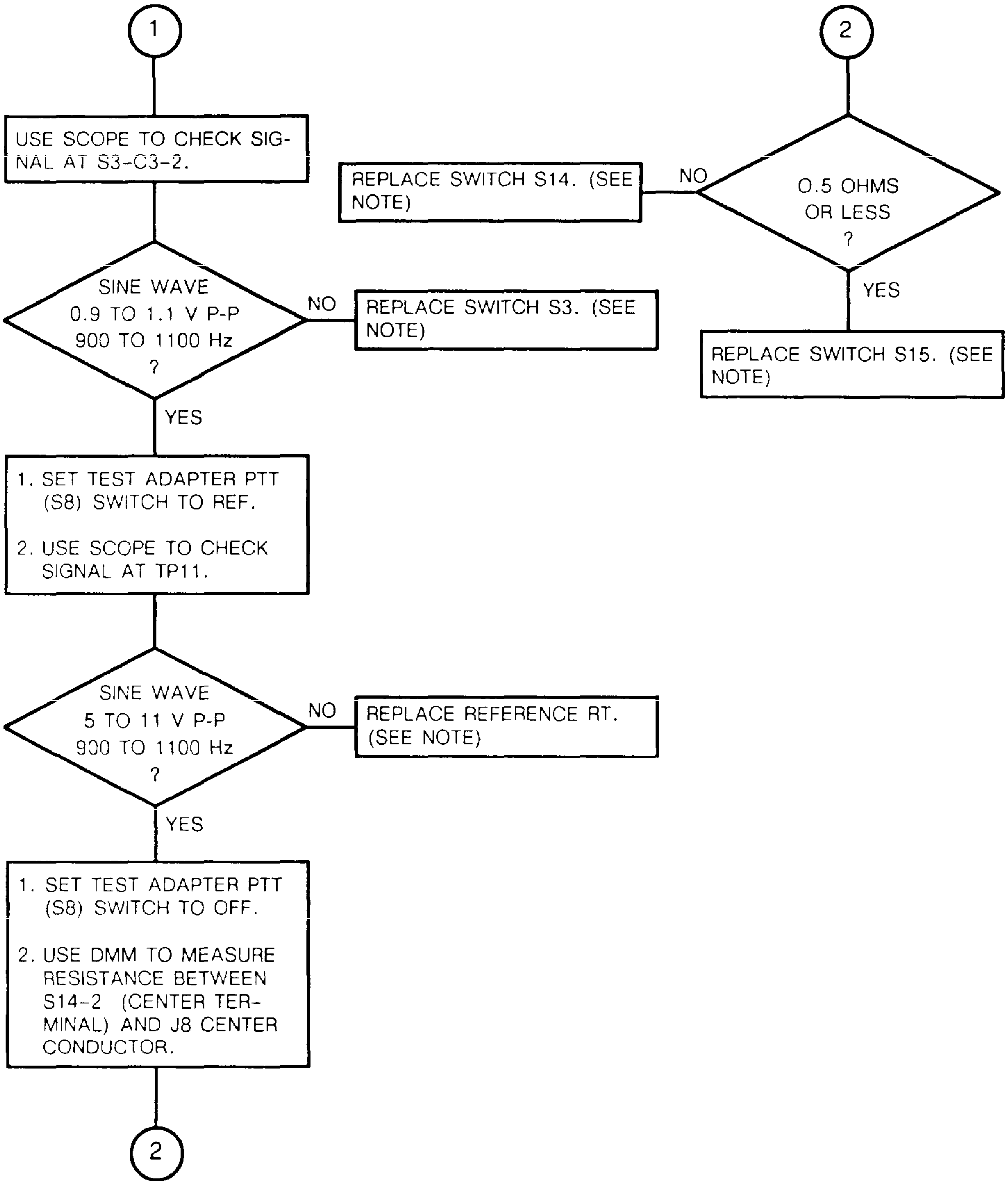
1. SET TEST ADAPTER—
   S3: 2
   CAL(S7): IN
   DC: ON
   TEST EQUIPMENT SELECTOR(S15): SCOPE
   TEST EQPT INPUT(S14): EXT
2. SET REF RT—
   FUNCTION: SQ ON
   MODE: SC
   PRESET: MAN
   IFM RF PWR: OFF
3. SET FUNCTION GENERATOR—
   FUNCTION: SINE
   FREQ: 1 kHz (900 TO 1100 Hz)
   LEVEL: 1.0 V P-P (0.9 TO 1.1 V P-P)

NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 5 TO CHECK TEST ADAPTER WIRING.

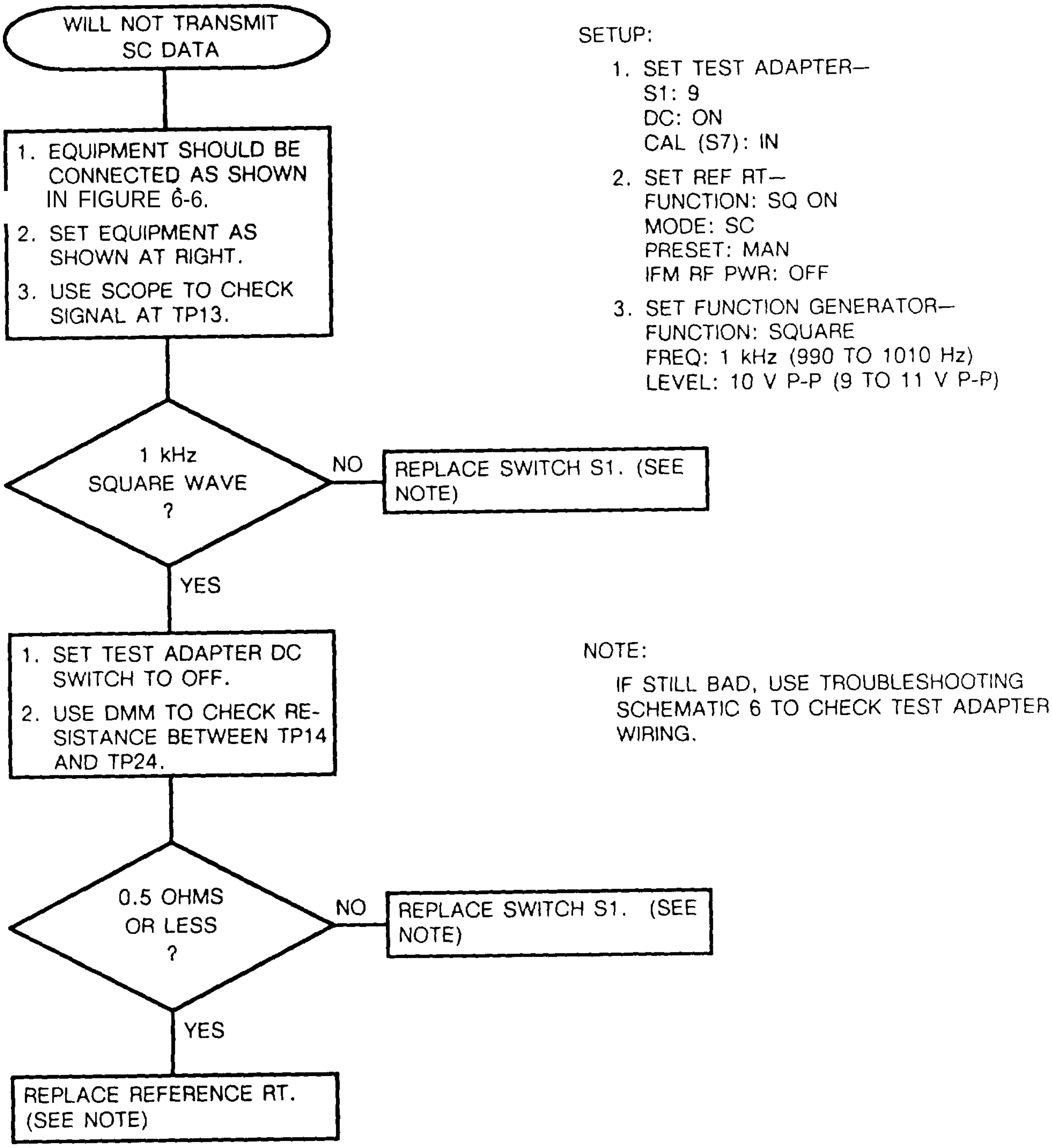
6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 6
Troubleshooting Audio Transmit Failure (Sheet 2 of 2)



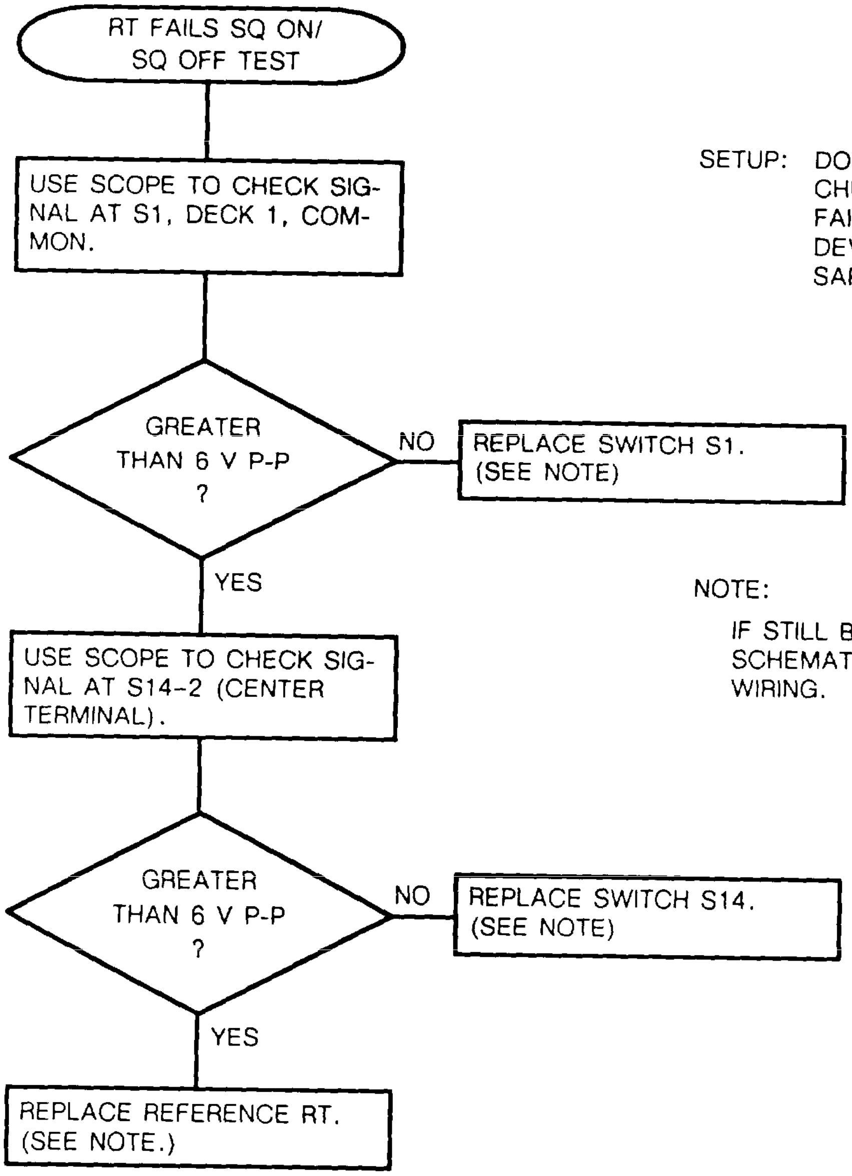
6-17, TROUBLESHOOTING FLOWCHARTS, Continued

CHART 7
Troubleshooting Data Transmit Failure



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 8
Troubleshooting Squelch On/Squelch Off Problem



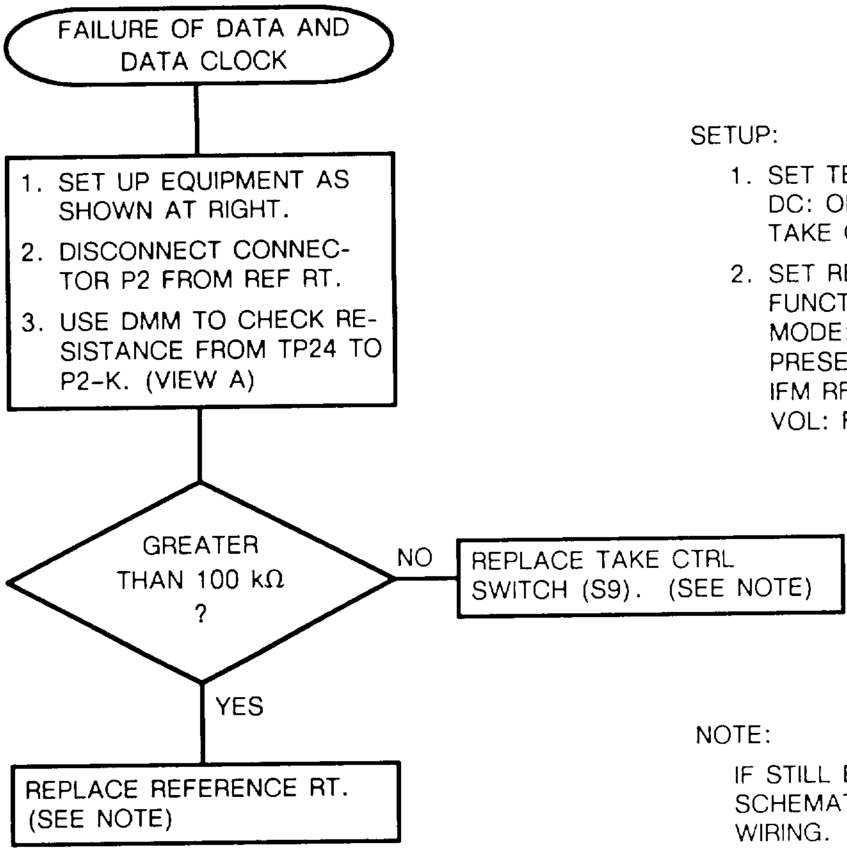
SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 8 TO CHECK TEST ADAPTER WIRING.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 9
Troubleshooting Rcu Clock and Data



SETUP:

1. SET TEST ADAPTER—
   DC: OFF
   TAKE CTRL(S9): RT
2. SET REF RT—
   FUNCTION: SQ OFF
   MODE: SC
   PRESET: MAN
   IFM RF PWR: OFF
   VOL: FULLY CW

NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 8 TO CHECK TEST ADAPTER WIRING.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 10
Troubleshooting Rcu Echo Function

RCU DOESN'T OPERATE IN ECHO MODE.

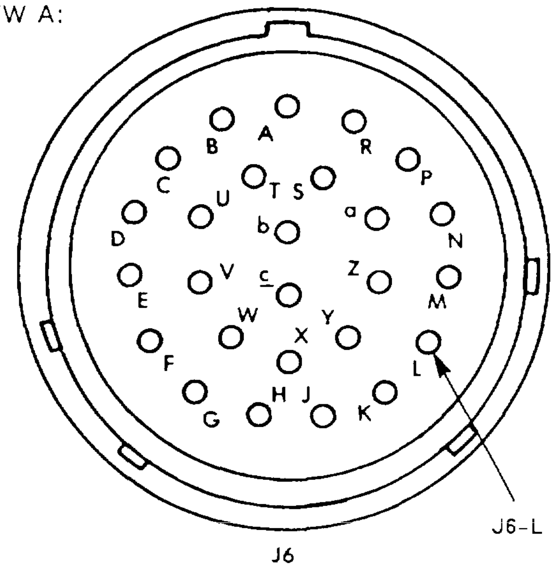
1. SET UP EQUIPMENT AS SHOWN AT RIGHT.
2. SET TEST ADAPTER DC SWITCH TO OFF.
3. USE DMM TO CHECK RESISTANCE FROM TP24 TO J6-L. (VIEW A)

0.5 OHMS OR LESS ?

NO: REPLACE TAKE CTRL SWITCH (S9). (SEE NOTE)

YES: REPLACE REFERENCE RCU. (SEE NOTE)

VIEW A:



SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 8 TO CHECK TEST ADAPTER WIRING.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 11
Troubleshooting Rcu Self-Test

REF RCU FAILS SELF-TEST

1. REPLACE REF RT FRONT PANEL WITH RT-1477 FRONT PANEL.
2. RETEST.

RCU PASSES SELF TEST ?

YES: REFERENCE RT IS BAD.

NO:

1. SET TEST ADAPTER—
   DC: OFF
   TAKE CNTL (S9): RCU
2. DISCONNECT P3 FROM RCU.
3. USE DMM TO MEASURE RESISTANCE FROM P3-L TO TP24.

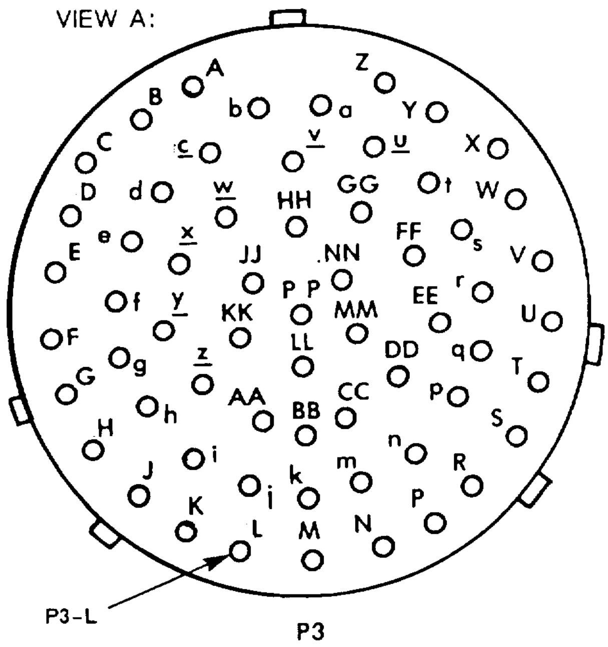
GREATER THAN 100 KOHMS ?

YES: REPLACE REF RCU. (SEE NOTE)

NO: REPLACE TALE CNTL SWITCH (S9). (SEE NOTE)

NOTE:
IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 8 TO CHECK TEST ADAPTER WIRING.

VIEW A:



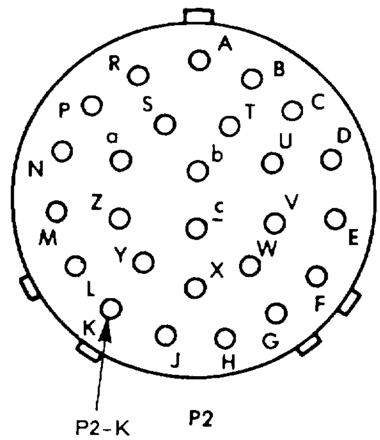
6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 12
Troubleshooting Rcu Take Control

REF RCU FAILS TAKE CONTROL

1. SET UP EQUIPMENT AS SHOWN AT RIGHT.
2. DISCONNECT P2 FROM REF RT.
3. USE DMM TO CHECK RESISTANCE FROM P2-K TO TP24. (VIEW A)

VIEW A:



SETUP:

1. SET TEST ADAPTER—
   DC: OFF
2. SET REF RT—
   FUNCTION: OFF
   MODE: SC
   PRESET: MAN
   IFM RF PWR: OFF
   VOL: FULLY CW
3. SET REF RCU—
   FUNCTION: SQ ON
   PRESET: MAN
   IFM-RF PWR: OFF
   VOL: FULLY CW

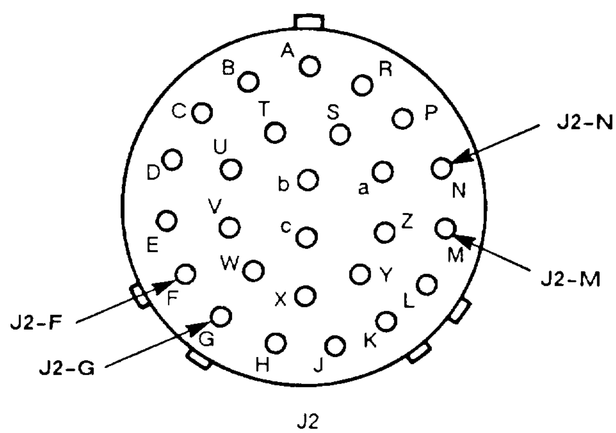
0.5 OHMS OR LESS ?

NO: TAKE CTRL SWITCH (S9) IS BAD.

YES:

1. REMOVE TEST CABLE W12 FROM J2 AND J6.
2. SET TEST ADAPTER DC SWITCH TO ON.
3. USE LOGIC PROBE TO CHECK J2-M, N, F, AND G WHEN FUNCTION SWITCH IS TURNED FROM SQ ON TO TEST. (SEE VIEW B)

VIEW B:



DIGITAL SIGNALS PRESENT AT EACH ?

NO: REPLACE REFERENCE RCU. (SEE NOTE)

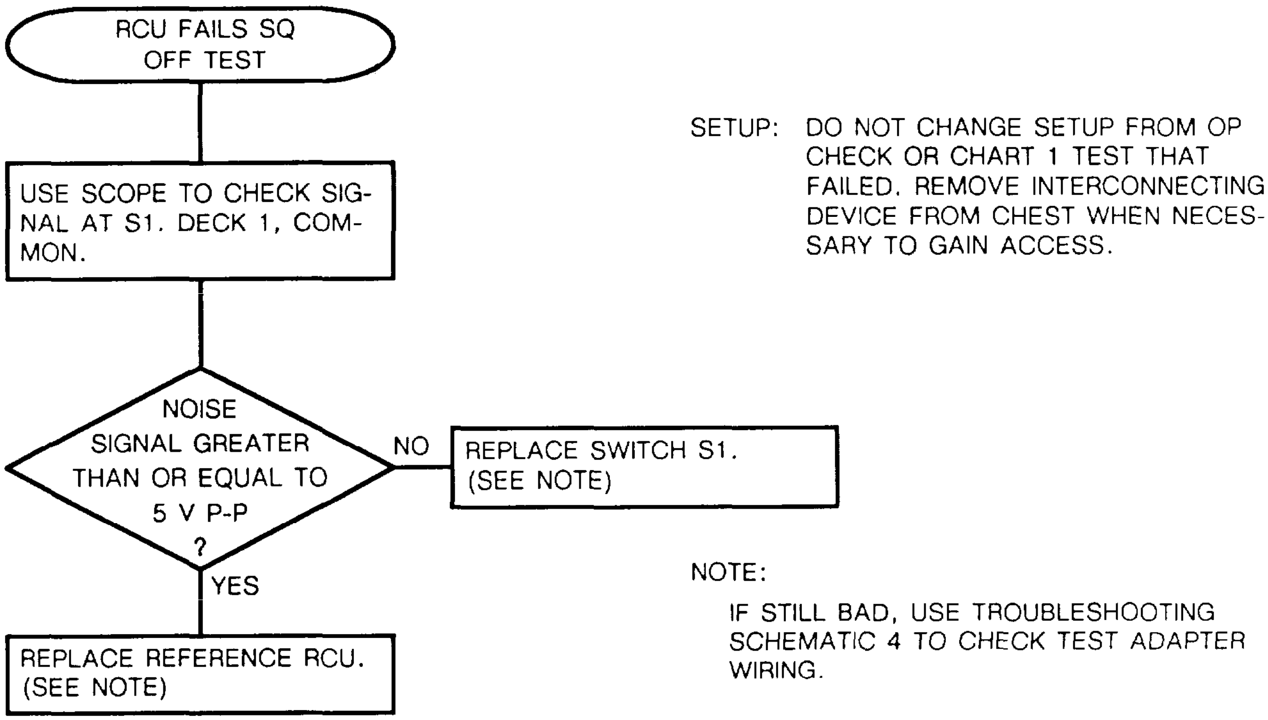
YES: REPLACE REFERENCE RT. (SEE NOTE)

NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 8 TO CHECK TEST ADAPTER WIRING.

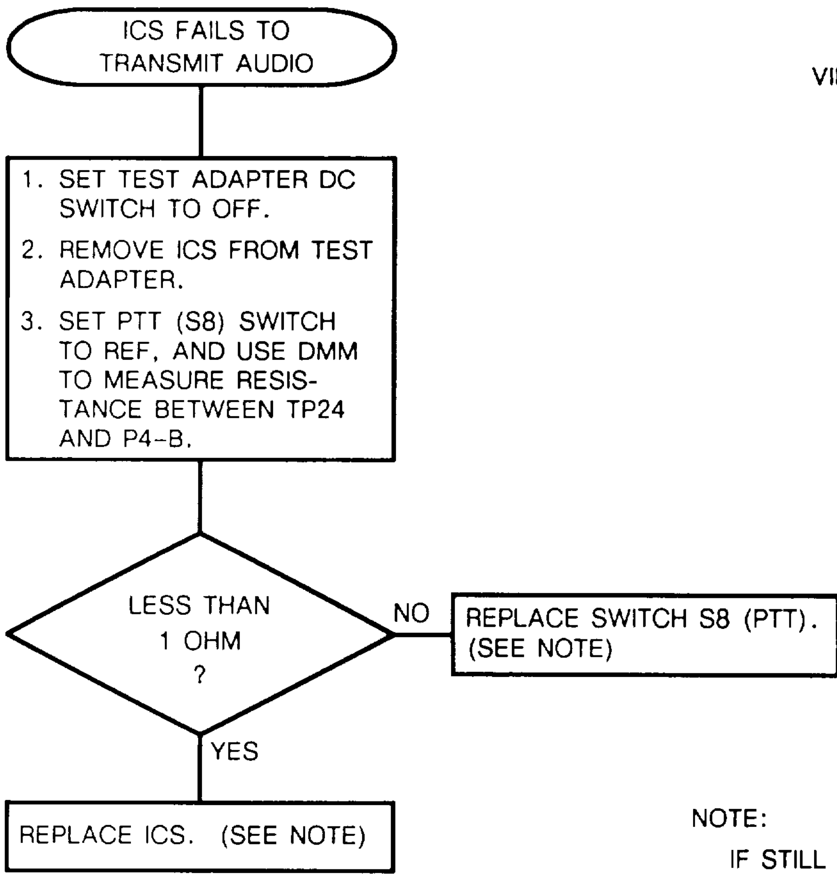
6-17. TROUBLESHOOTING FLOWCHARTS. Continued

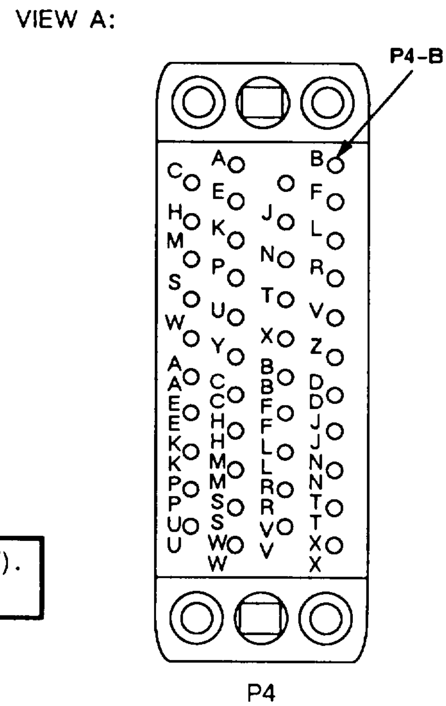
CHART 13
Troubleshooting Rcu Squelch Off Failure



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 14
Troubleshooting Ics Audio Transmit Failure



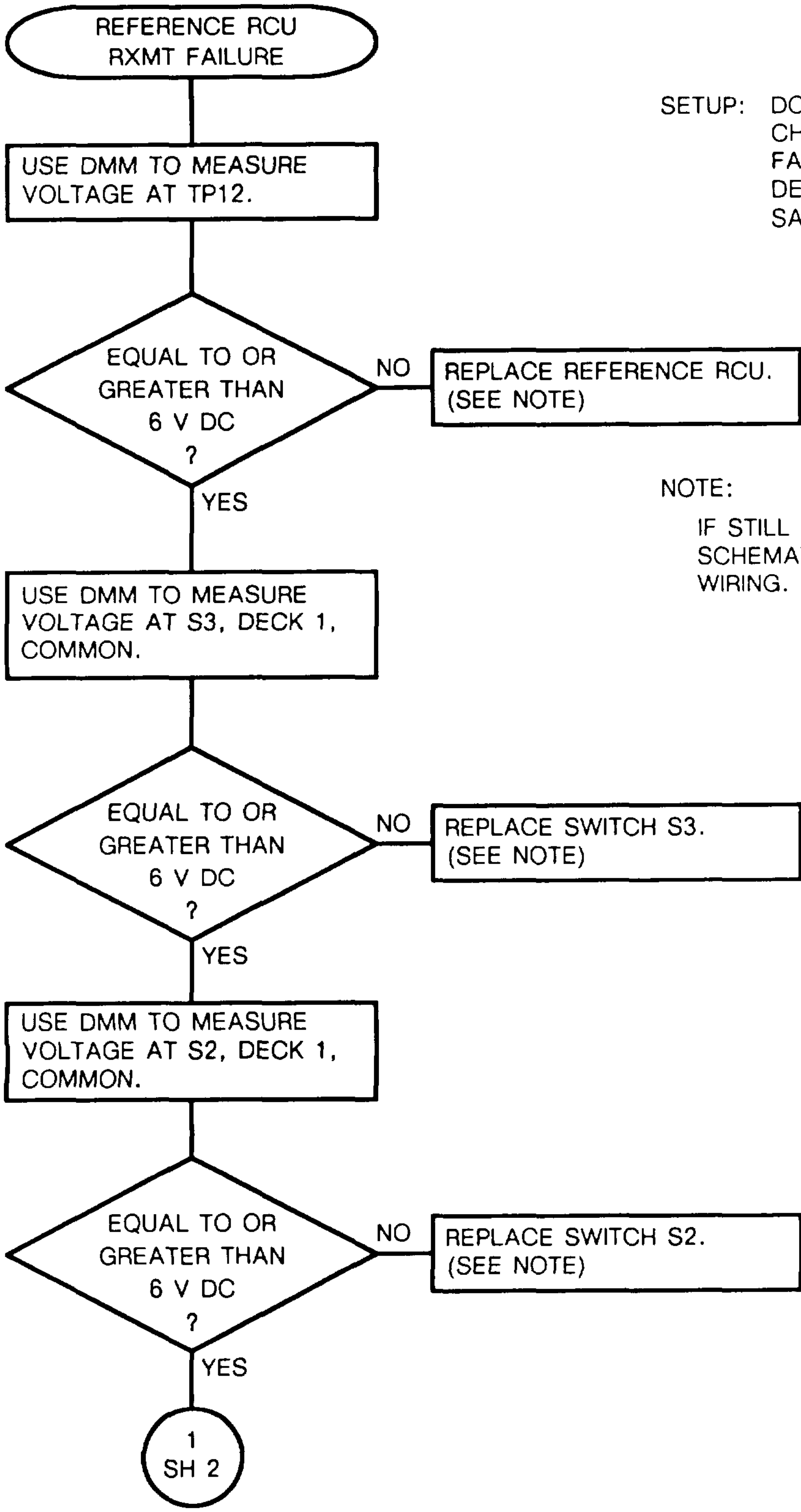


NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 13 TO CHECK TEST ADAPTER WIRING.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 15
Troubleshooting Reference Rcu RXMT Failure (Sheet 1 of 2)



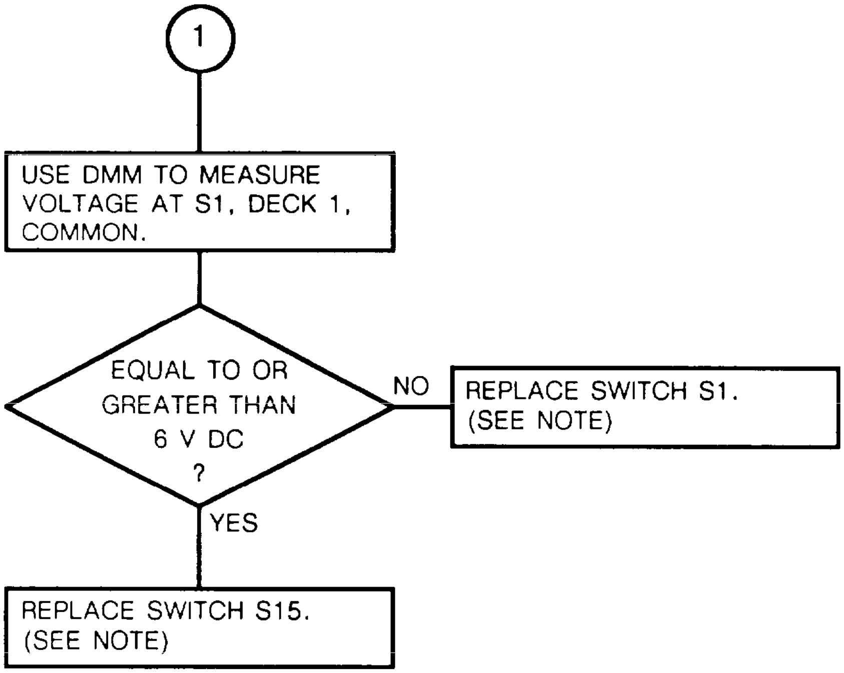
SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 12 TO CHECK TEST ADAPTER WIRING.

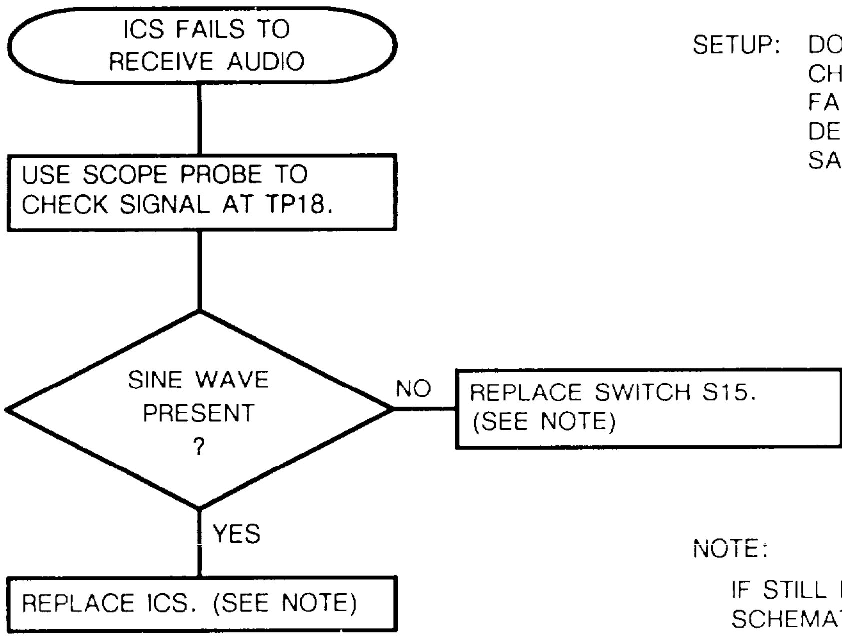
6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 15
Troubleshooting Reference Rcu RXMT Failure (Sheet 2 of 2)



6–17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 16
Troubleshooting Ics Audio Receive Problem



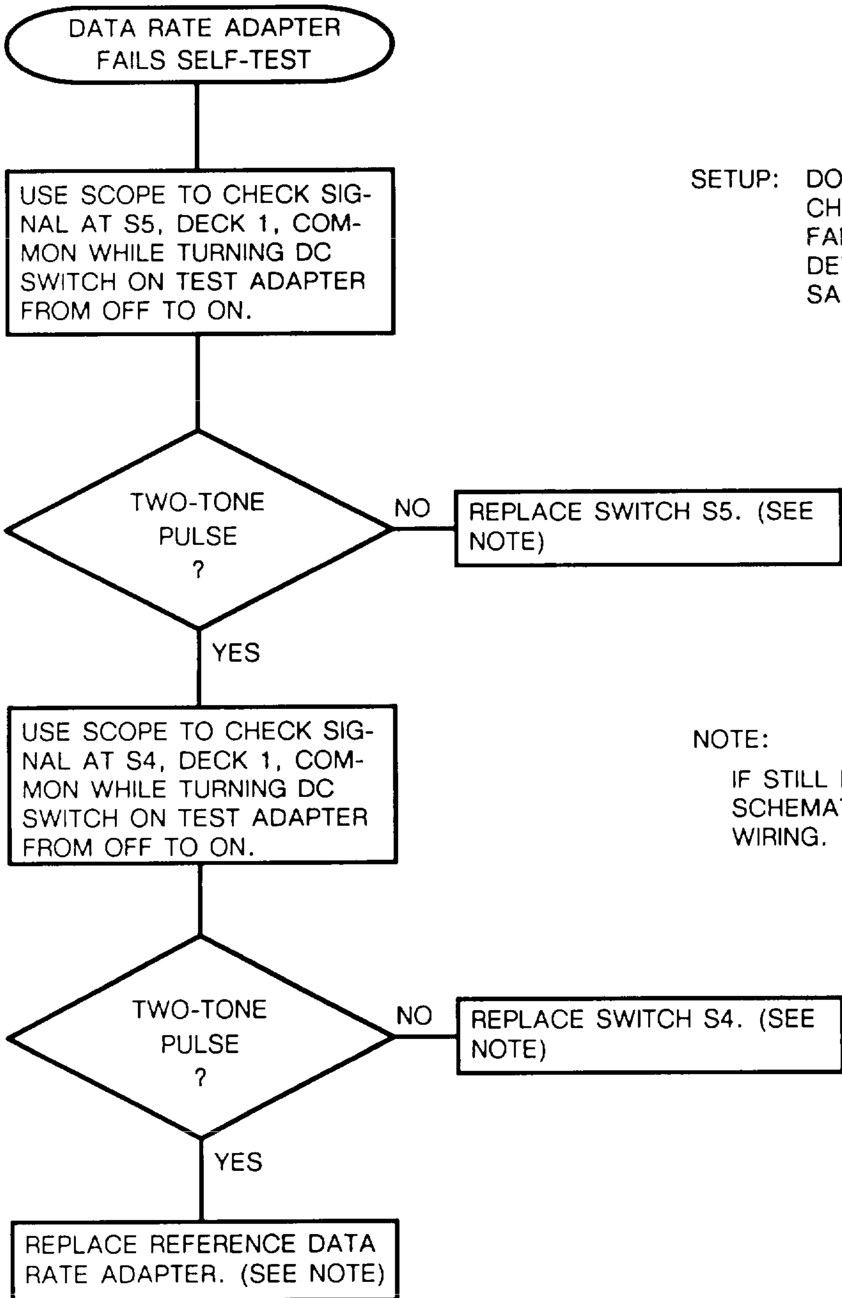
SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 14 TO CHECK TEST ADAPTER WIRING.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 17
Troubleshooting Faulty Data Rate Adapter



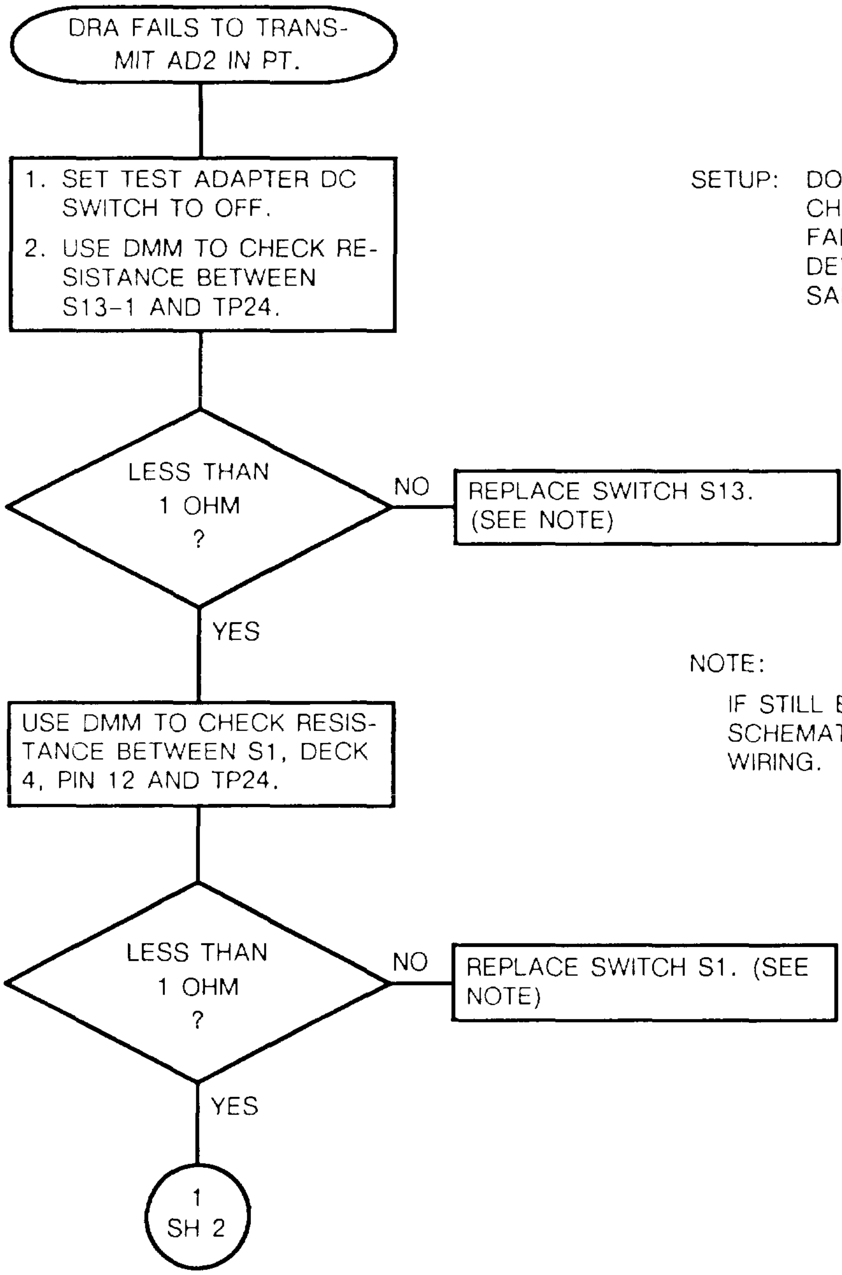
SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 15 TO CHECK TEST ADAPTER WIRING.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 18
Troubleshooting Data Rate Adapter Failure (Sheet 1 of 3)



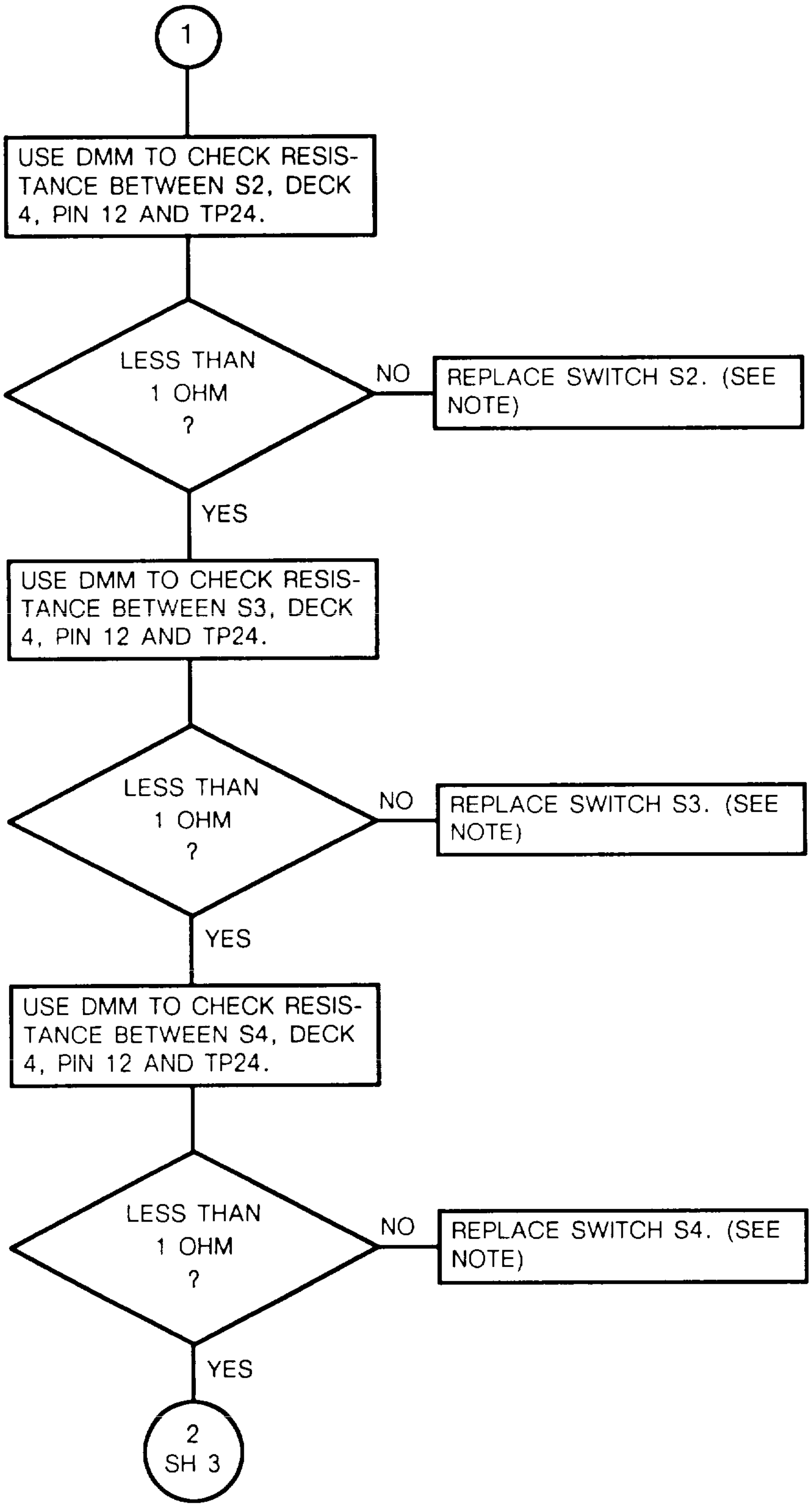
SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 16 TO CHECK TEST ADAPTER WIRING.

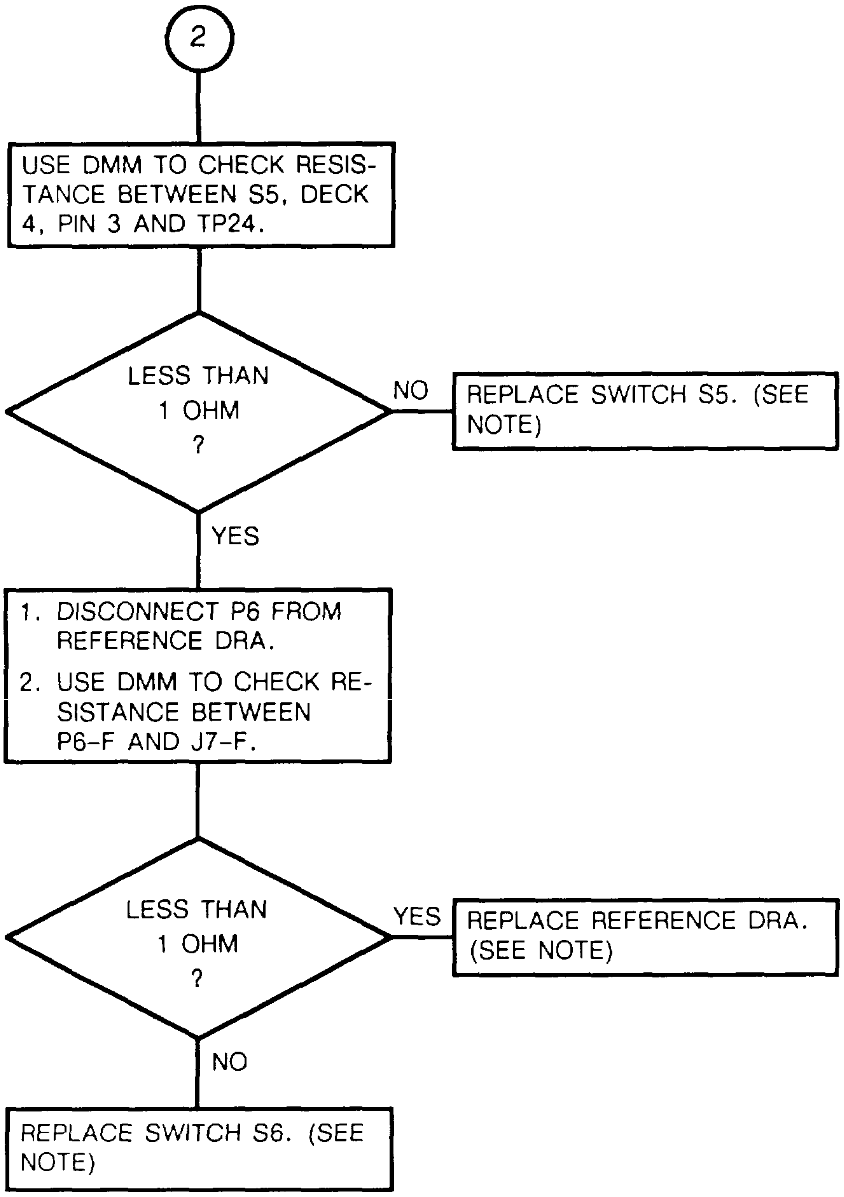
6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 18
Troubleshooting Data Rate Adapter Failure (Sheet 2 of 3)



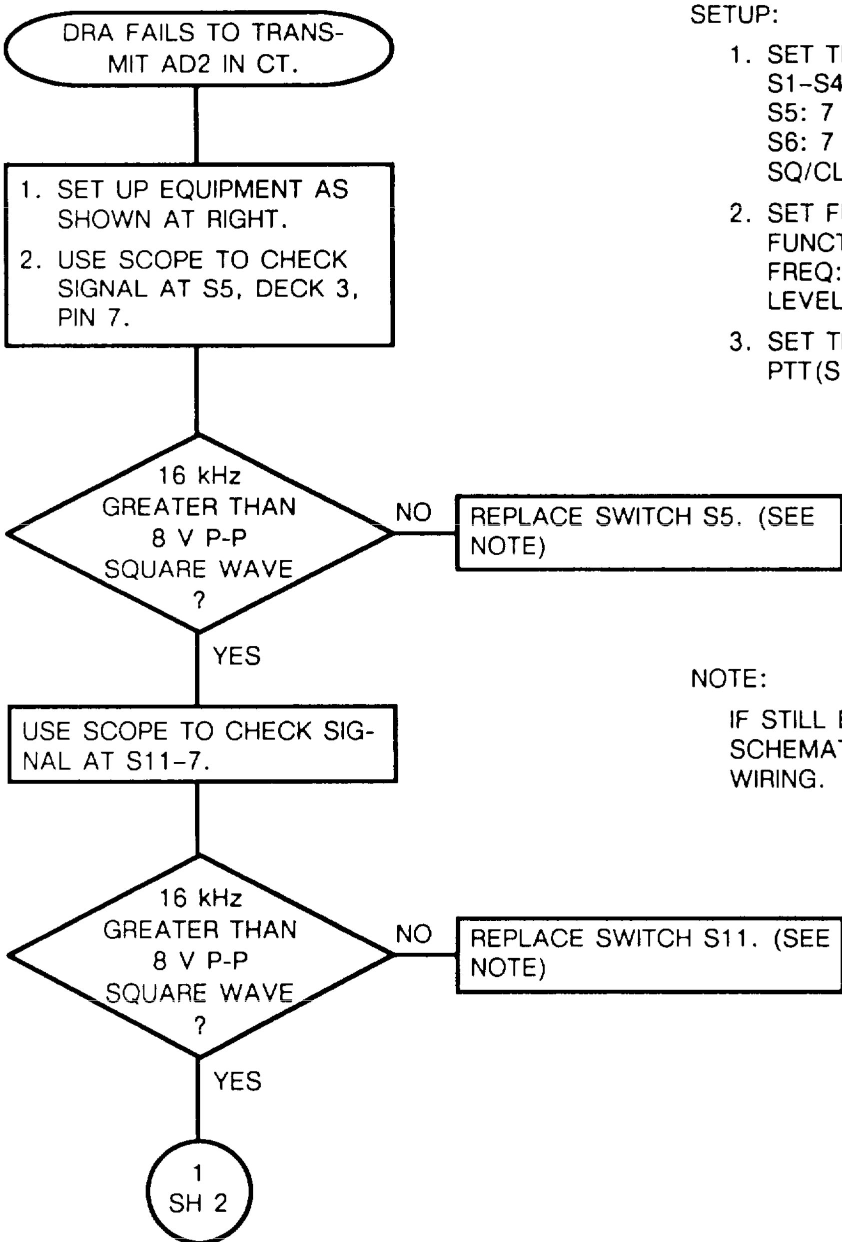
6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 18
Troubleshooting Data Rate Adapter Failure (Sheet 3 of 3)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 19
Troubleshooting Data Rate Adapter Failure (Sheet 1 of 4)



SETUP:

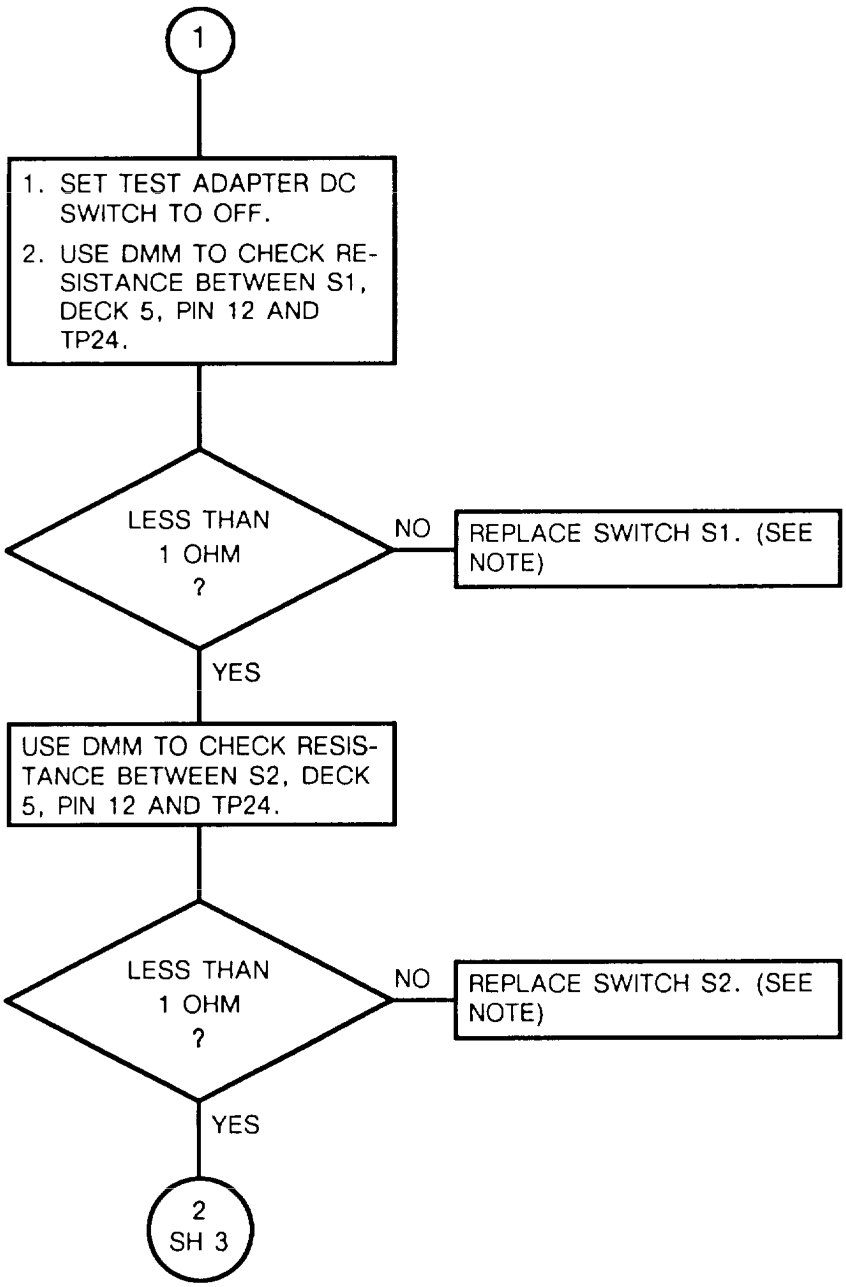
1. SET TEST ADAPTER—
   S1-S4: OFF
   S5: 7
   S6: 7
   SQ/CLK(S11): ON
2. SET FUNCTION GENERATOR—
   FUNCTION: SQUARE WAVE
   FREQ: 16 kHz (15900 TO 16100 kHz)
   LEVEL: 5 V P-P
3. SET TEST ADAPTER—
   PTT(S13): REF

NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 17 TO CHECK TEST ADAPTER WIRING.

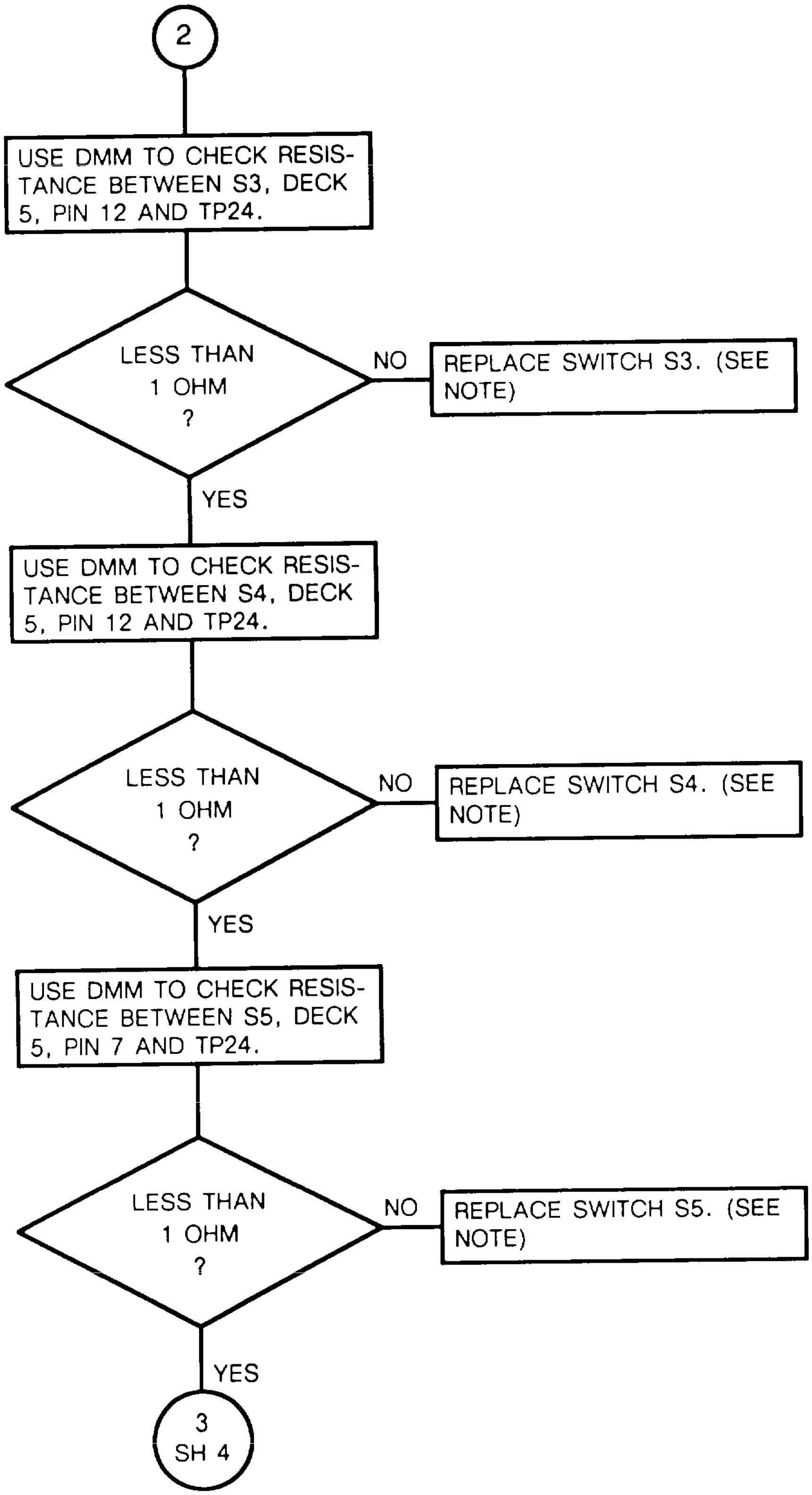
6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 19
Troubleshooting Data Rate Adapter Failure (Sheet 2 of 4)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 19
Troubleshooting Data Rate Adapter Failure (Sheet 3 of 4)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 19
Troubleshooting Data Rate Adapter Failure (Sheet 4 of 4)

3

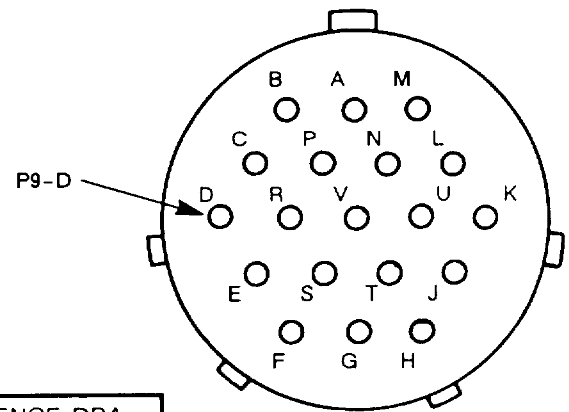
1. DISCONNECT P9 FROM REFERENCE DRA.
2. USE DMM TO MEASURE RESISTANCE BETWEEN P9-D AND J7-F.

LESS THAN 1 OHM ?

YES: REPLACE REFERENCE DRA. (SEE NOTE)

NO: REPLACE SWITCH S6. (SEE NOTE)

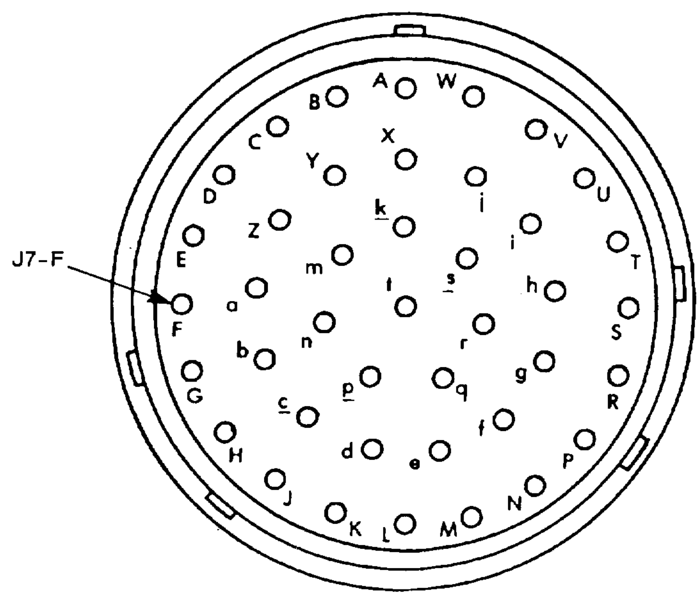
VIEW A:



P9

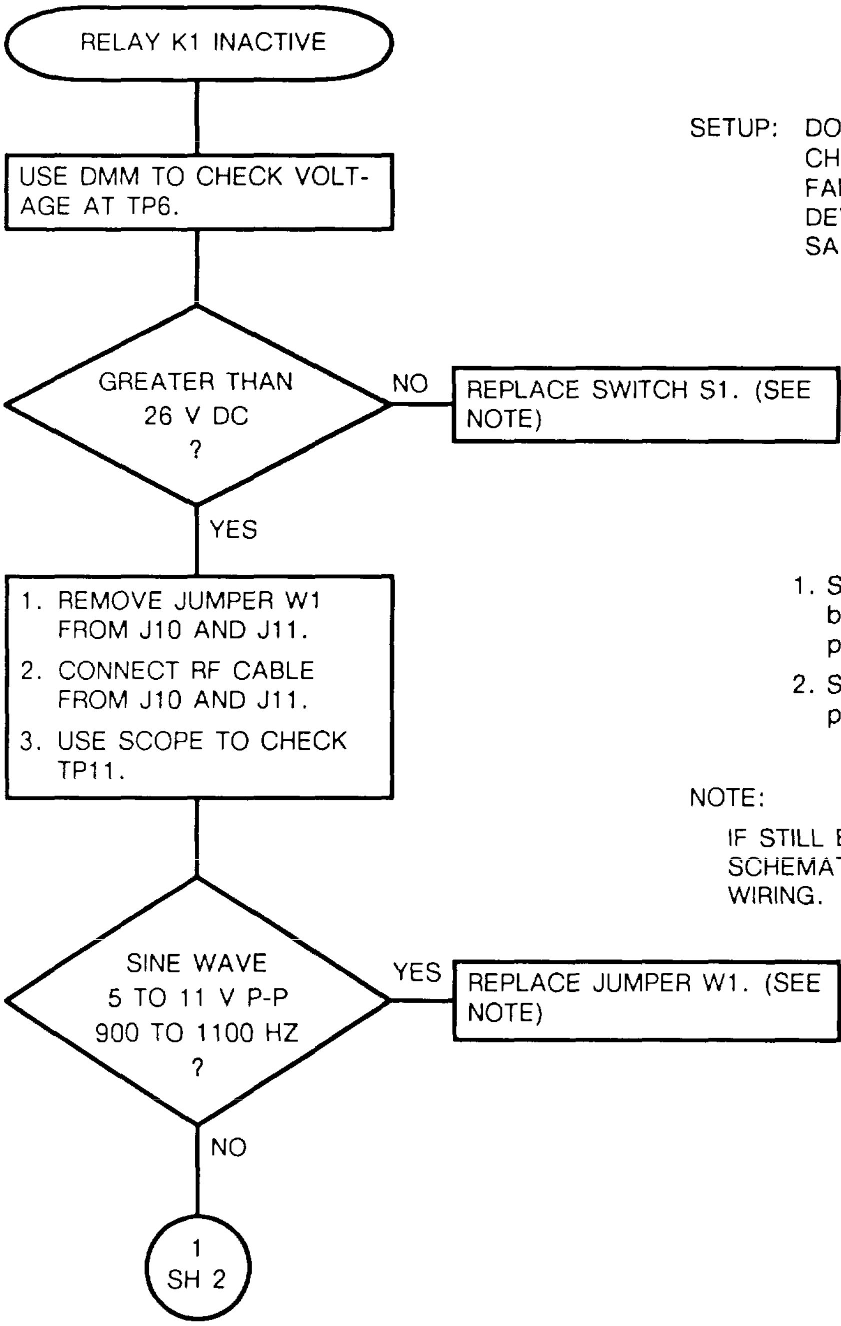
VIEW B:

J7



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 20
Troubleshooting Relay K1 (Sheet 1 of 4)



SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

CAUTION

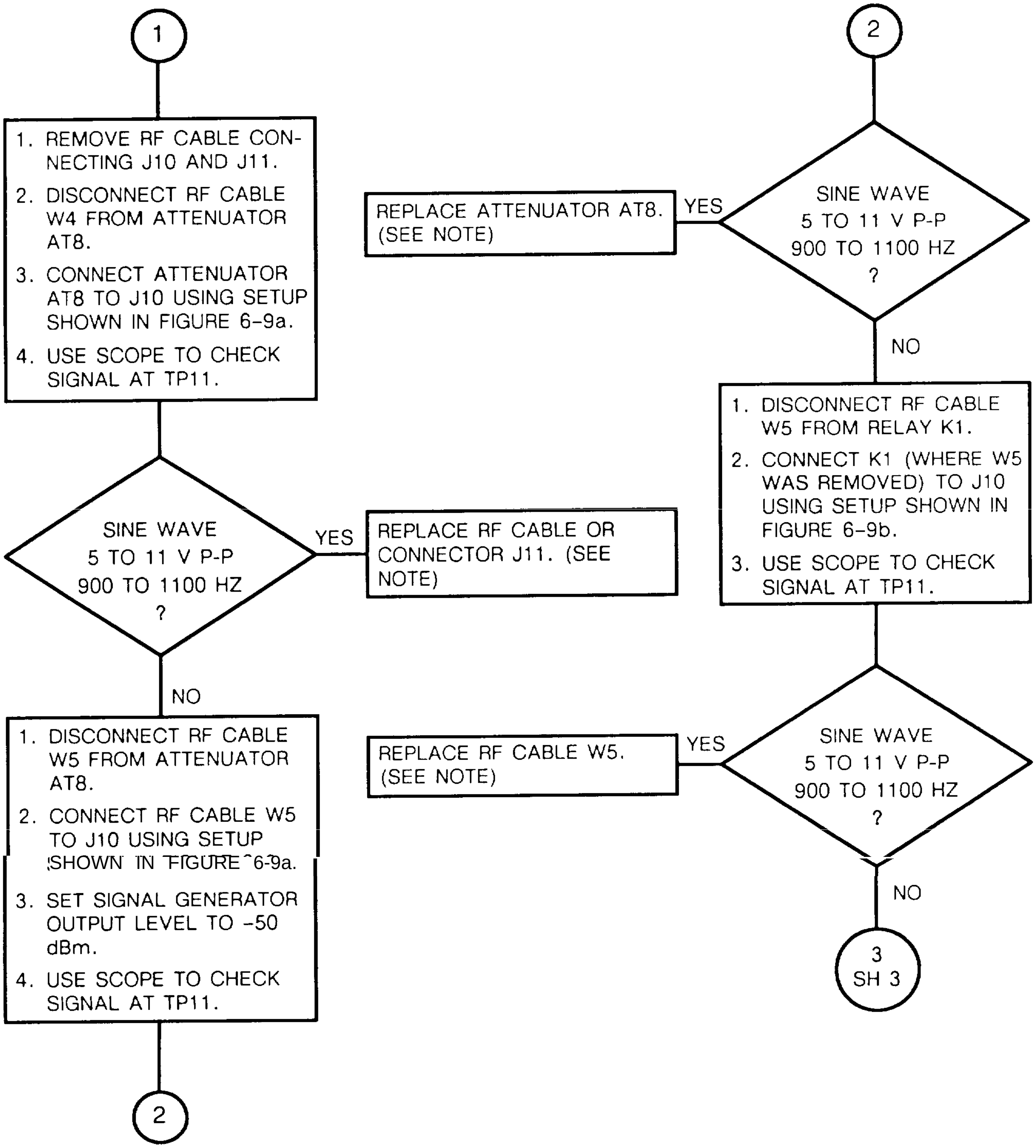
1. Set test adapter DC switch to OFF before connecting test adapter components.
2. Set test adapter DC switch to ON to perform test.

NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 19 TO CHECK TEST ADAPTER WIRING.

6-17. TROUBLESHOOTING FLOWCHARTS, Continued

CHART 20
Troubleshooting Relay K1 (Sheet 2 of 4)



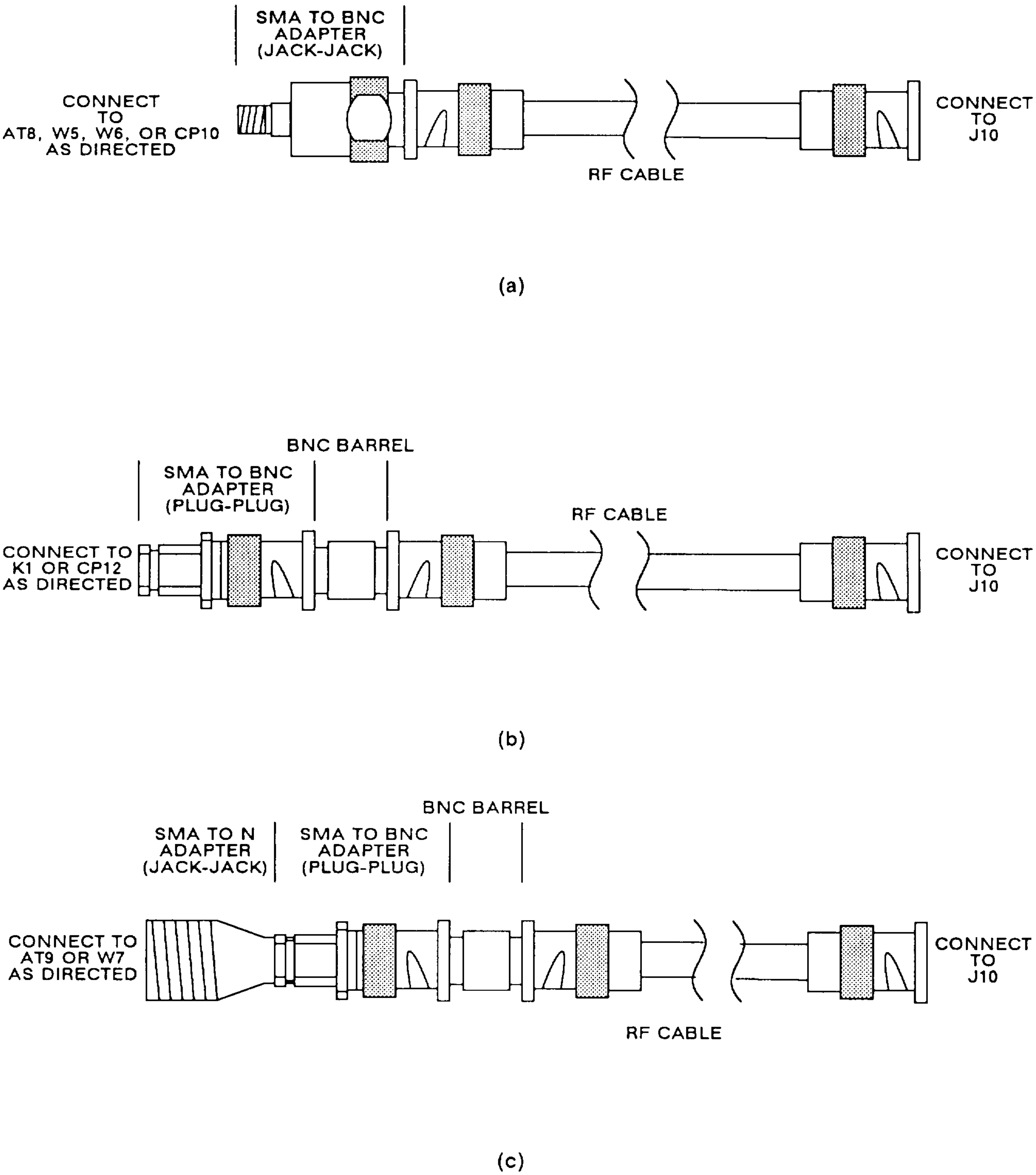
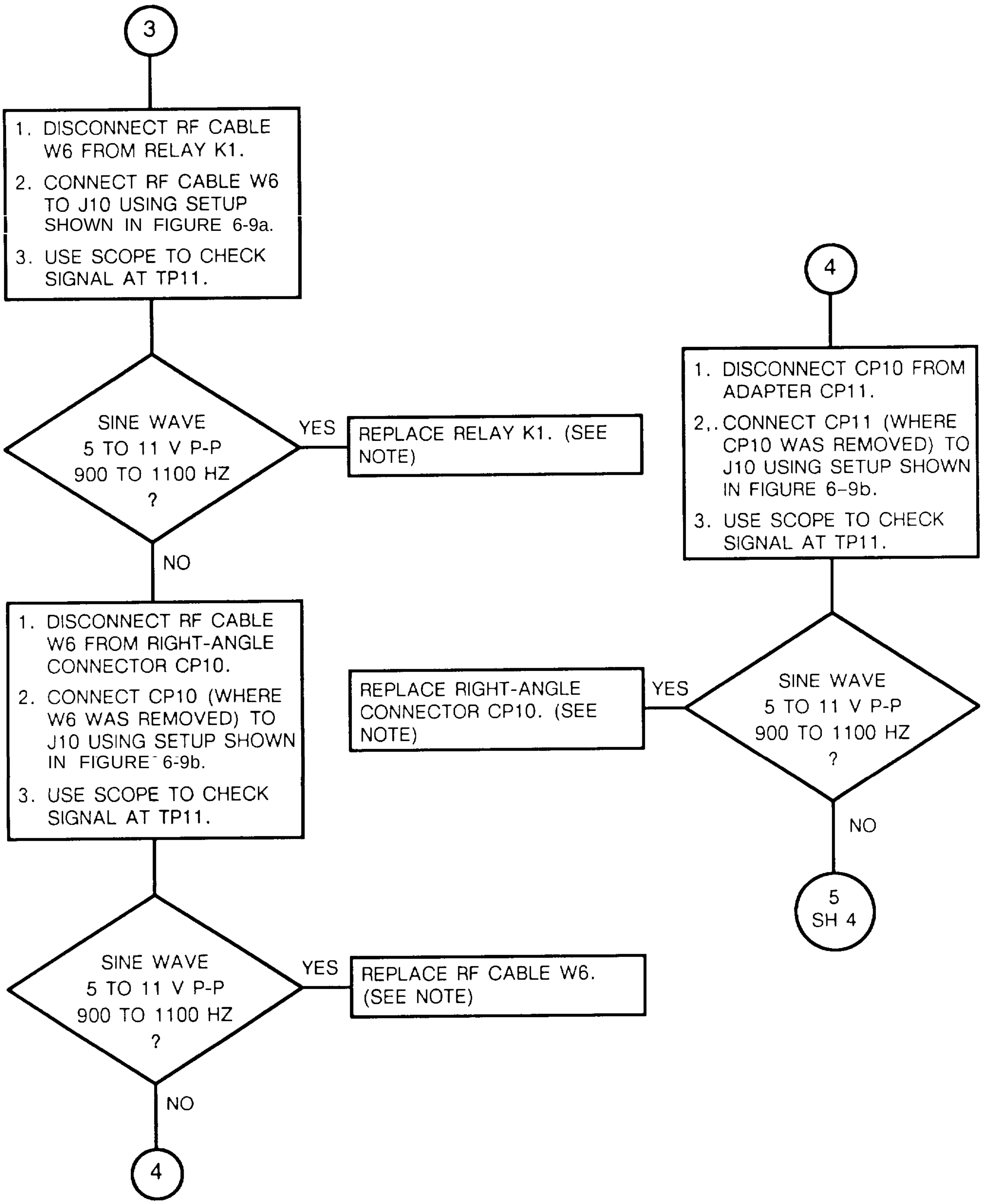


Figure 6-9. Internal Rf Section Test Setup Connections

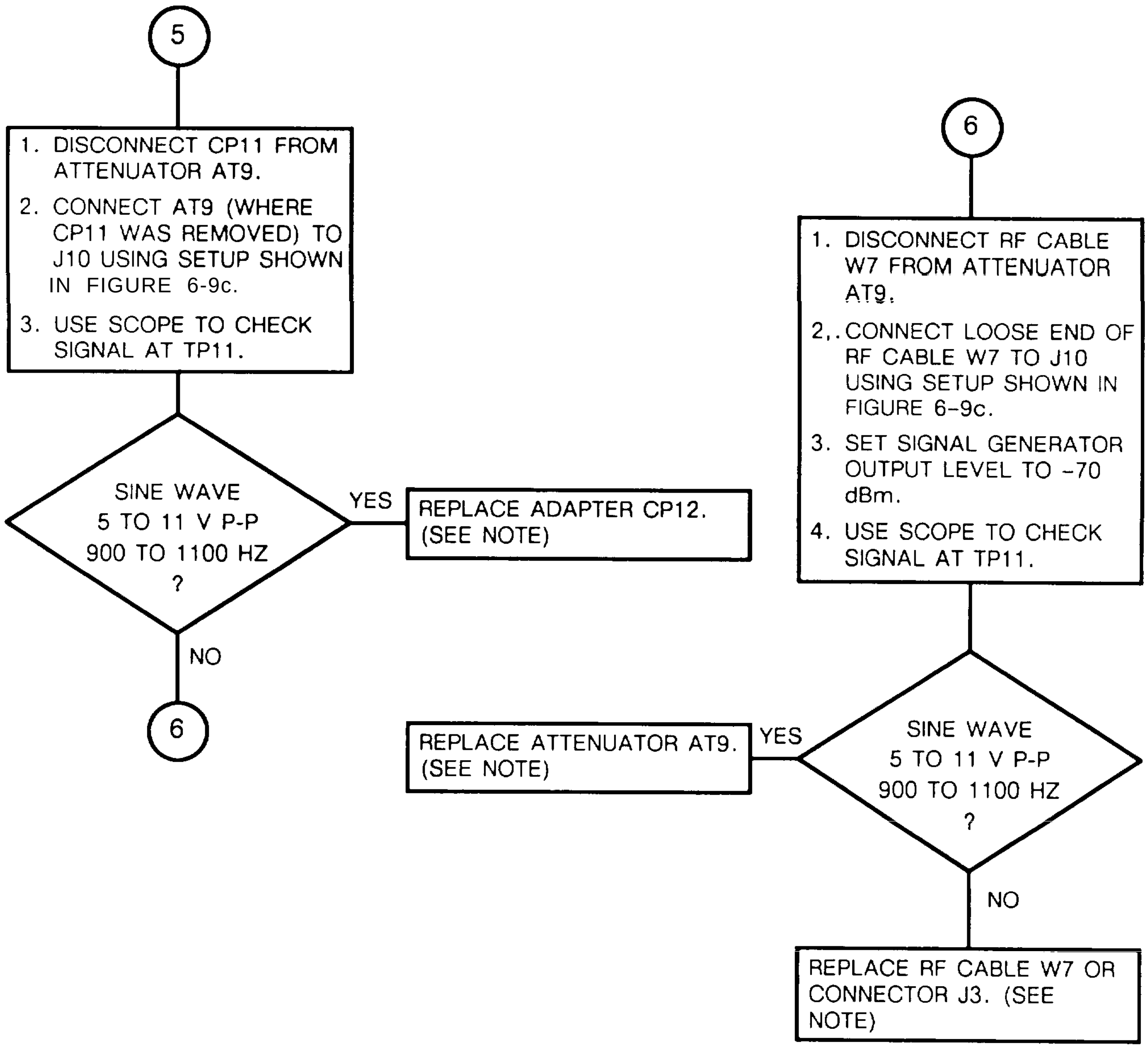
6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 20
Troubleshooting Relay K1 (Sheet 3 of 4)



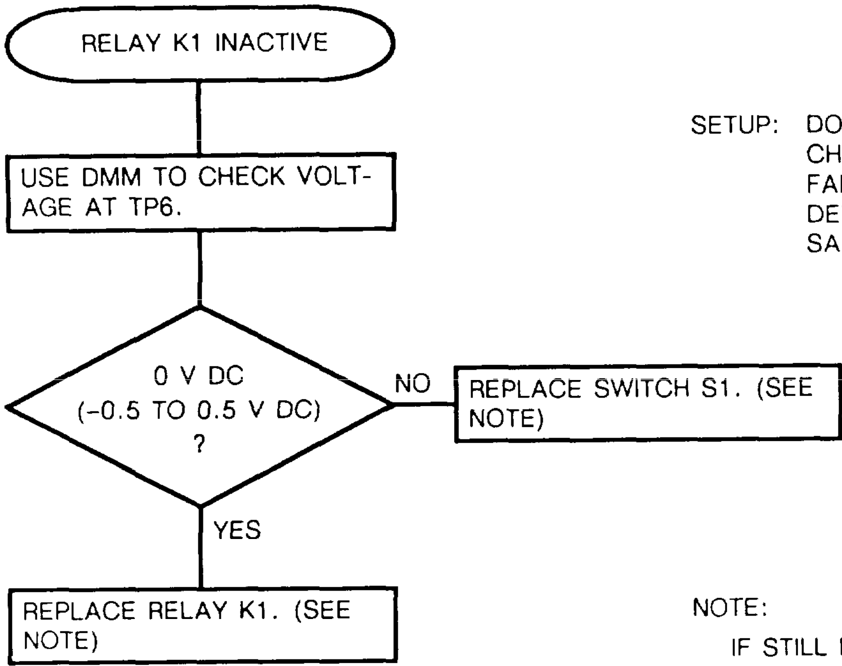
6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 20
Troubleshooting Relay K1 (Sheet 4 of 4)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 21
Troubleshooting Relay K1 Control Fault

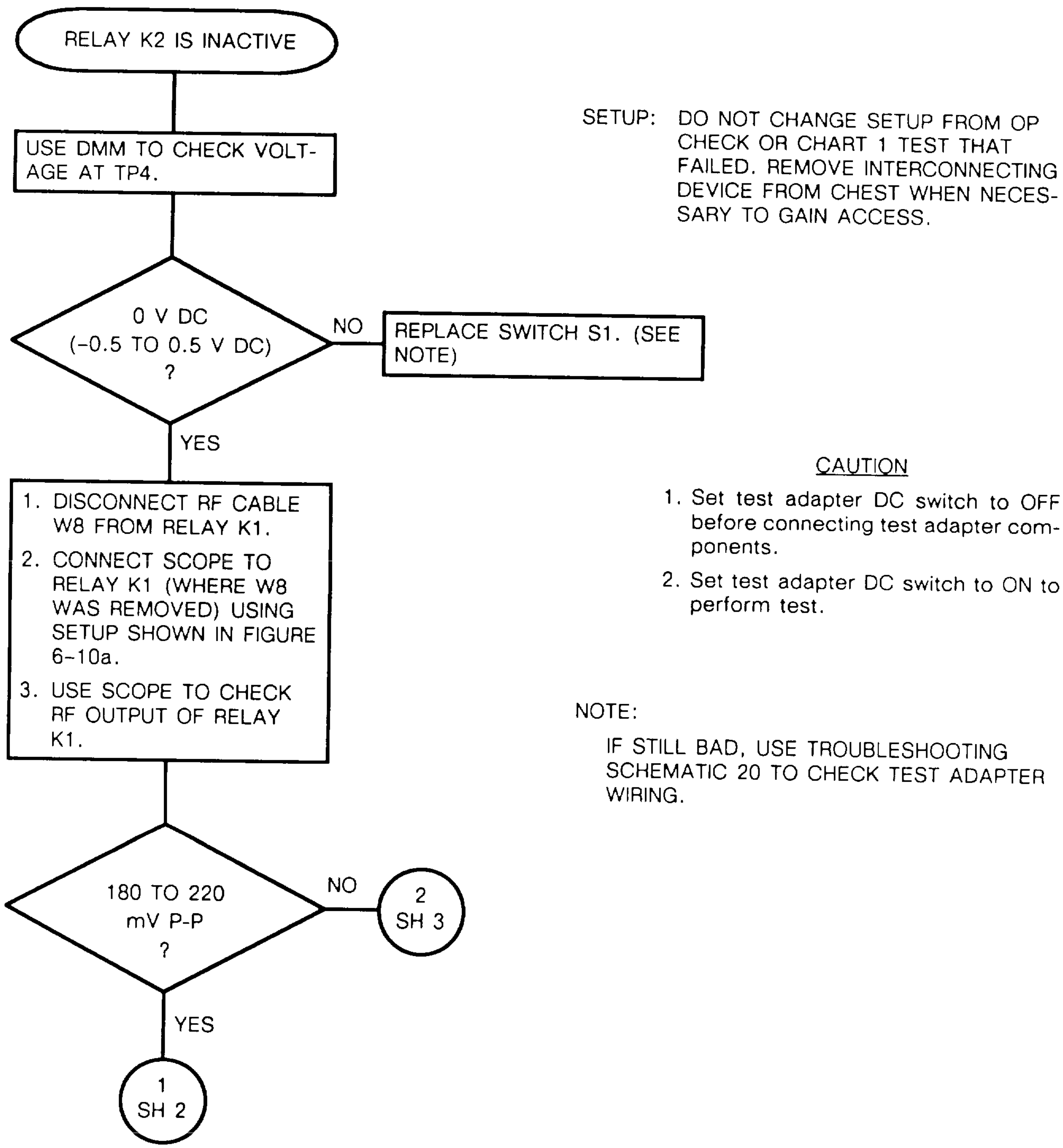


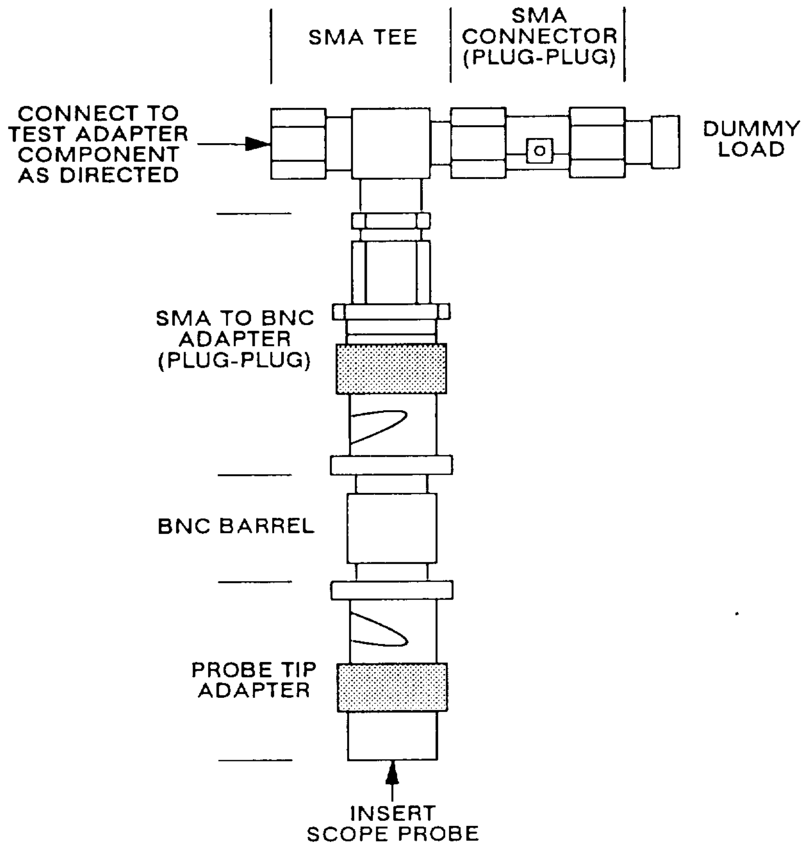
SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECES-SARY TO GAIN ACCESS.

NOTE:
IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 19 TO CHECK TEST ADAPTER WIRING.

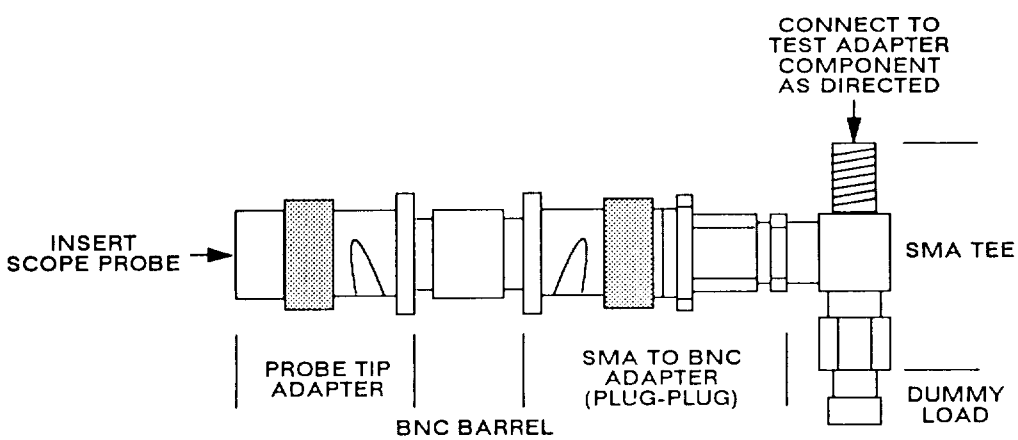
6-17. TROUBLESHOOTING FLOWCHARTS. Continued0

CHART 22
Troubleshooting Relay K2 (Sheet 1 of 3)





(a)

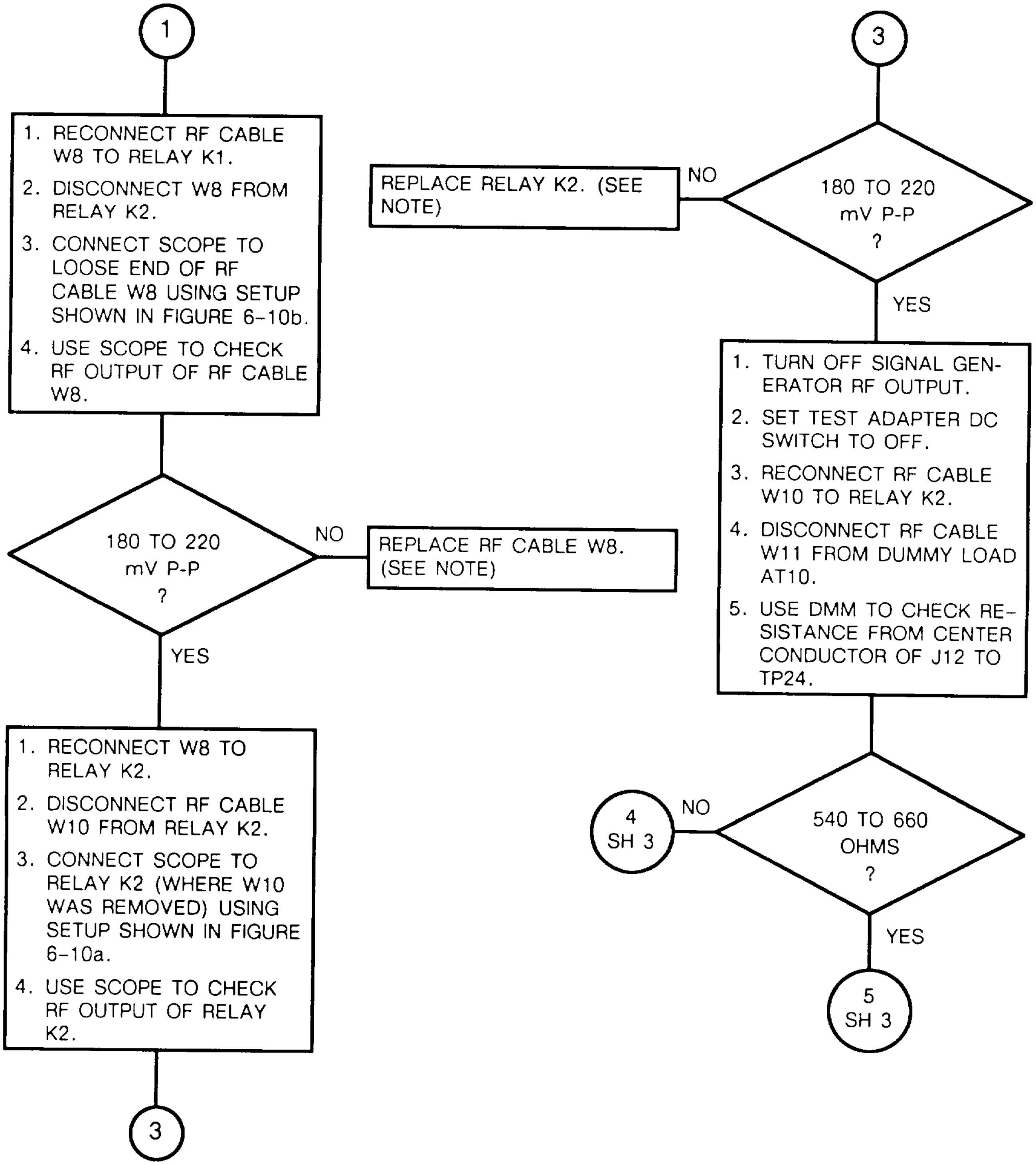


(b)

Figure 6-10. Rf Section Impedance Matching Test Setup Connections

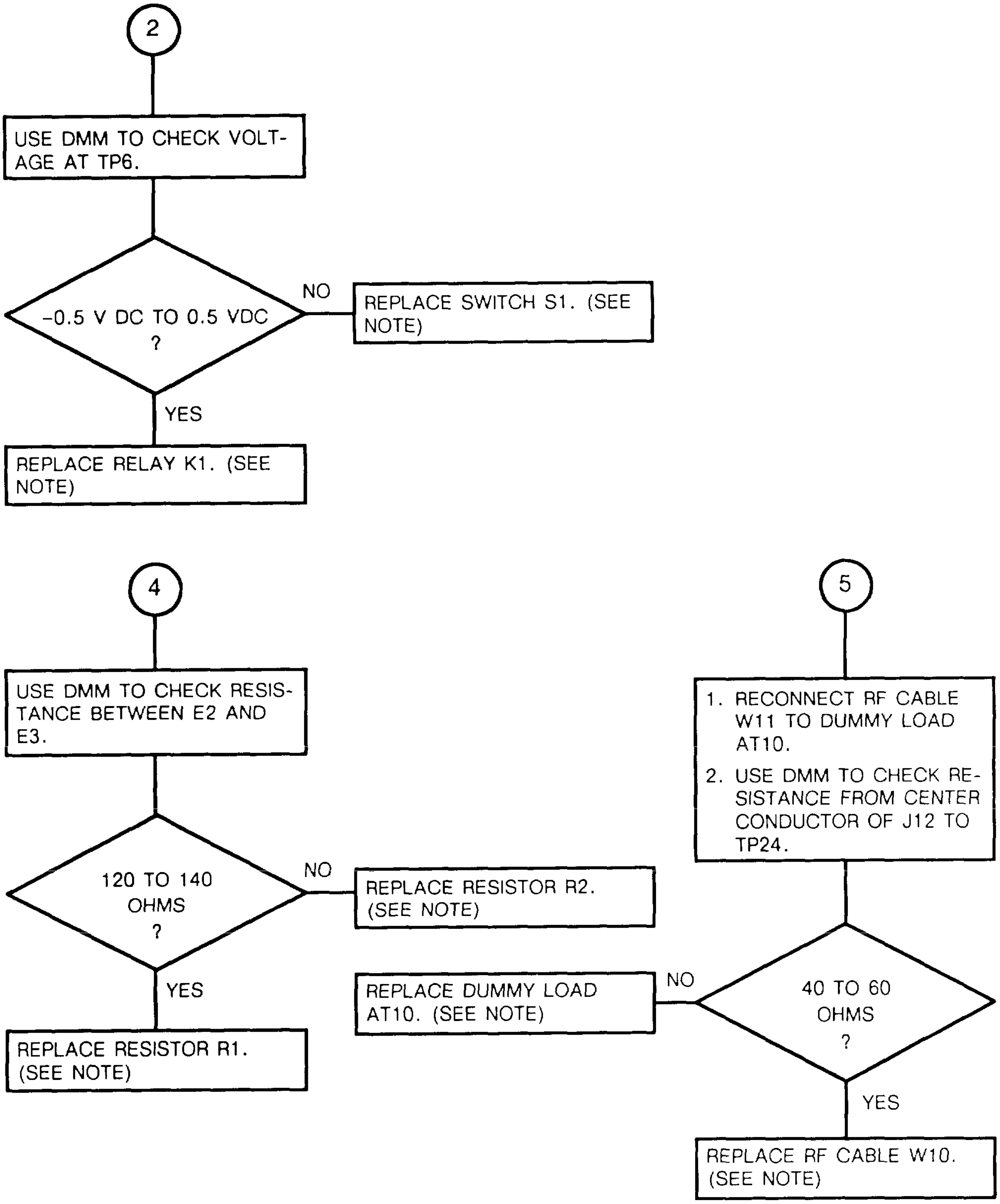
6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 22
Troubleshooting Relay K2 (Sheet 2 of 3)



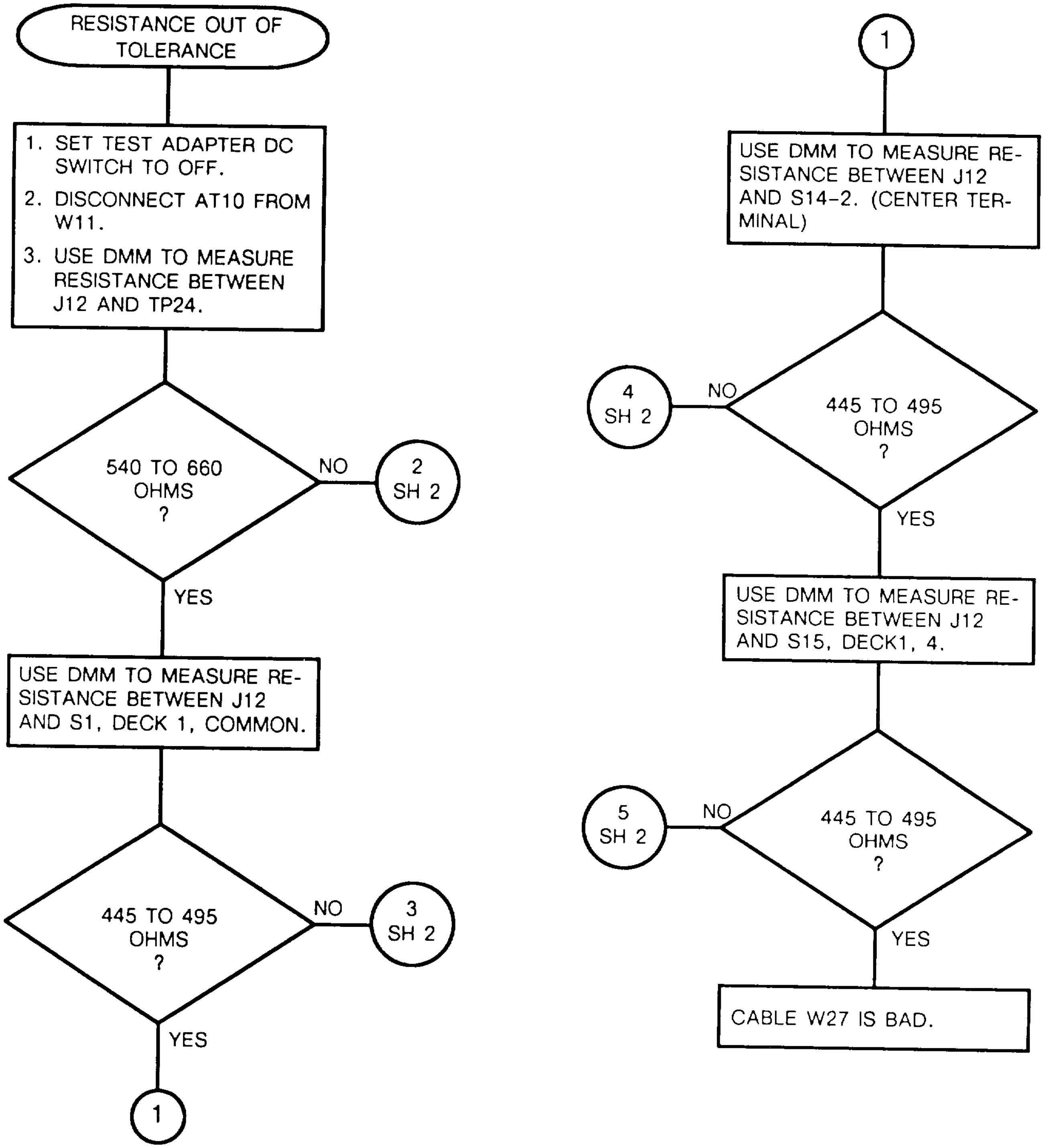
6-17. TROUBLESHOOTING FLOWCHARTS, Continued

CHART 22
Troubleshooting Relay K2 (Sheet 3 of 3)



6–17. TROUBLESHOOTING FLOWCHARTS. Continued

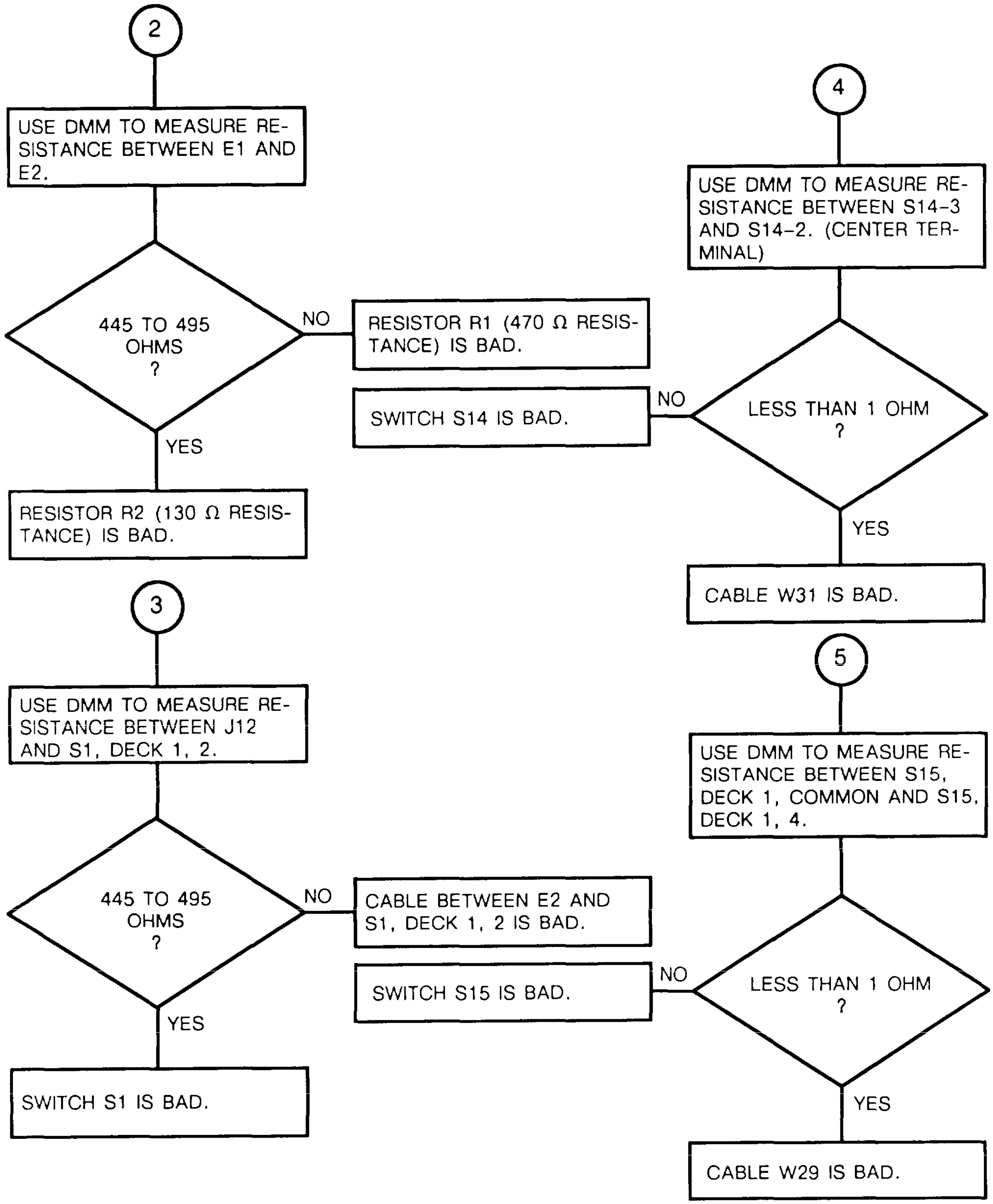
CHART 23
Rf Section Fault (Sheet 1 of 2)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

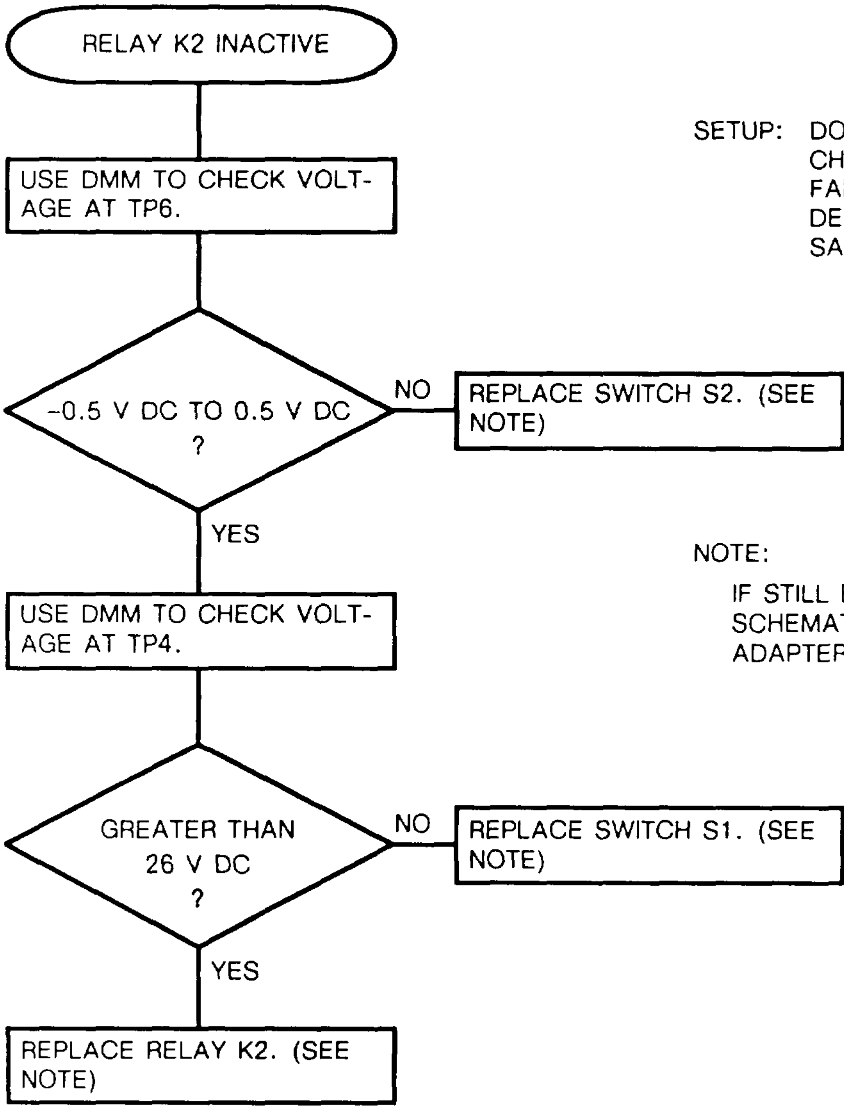
CHART 23

Rf Section Fault (Sheet 2 of 2)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 24
Troubleshooting Relay K2 Control Fault



SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

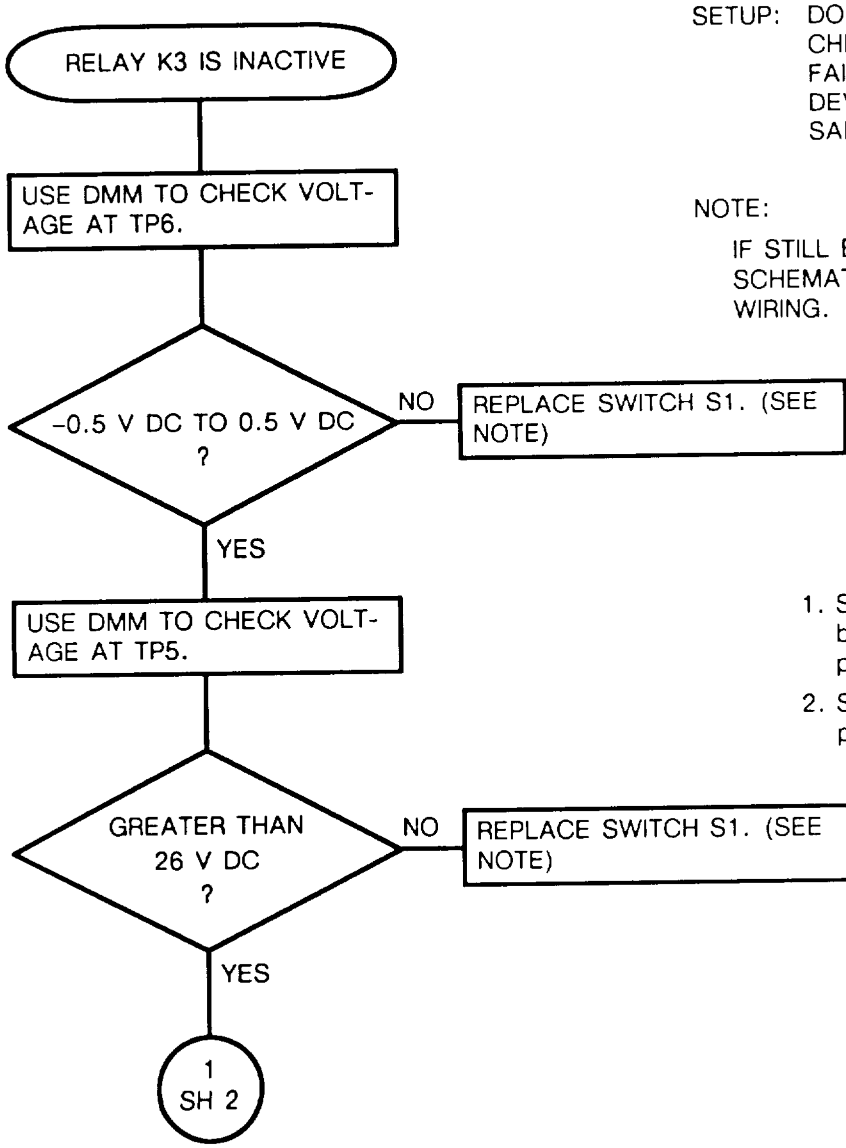
NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 20 AND 21 TO CHECK TEST ADAPTER WIRING.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 25

Troubleshooting Relay K3 (Sheet 1 of 2)



SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

NOTE:

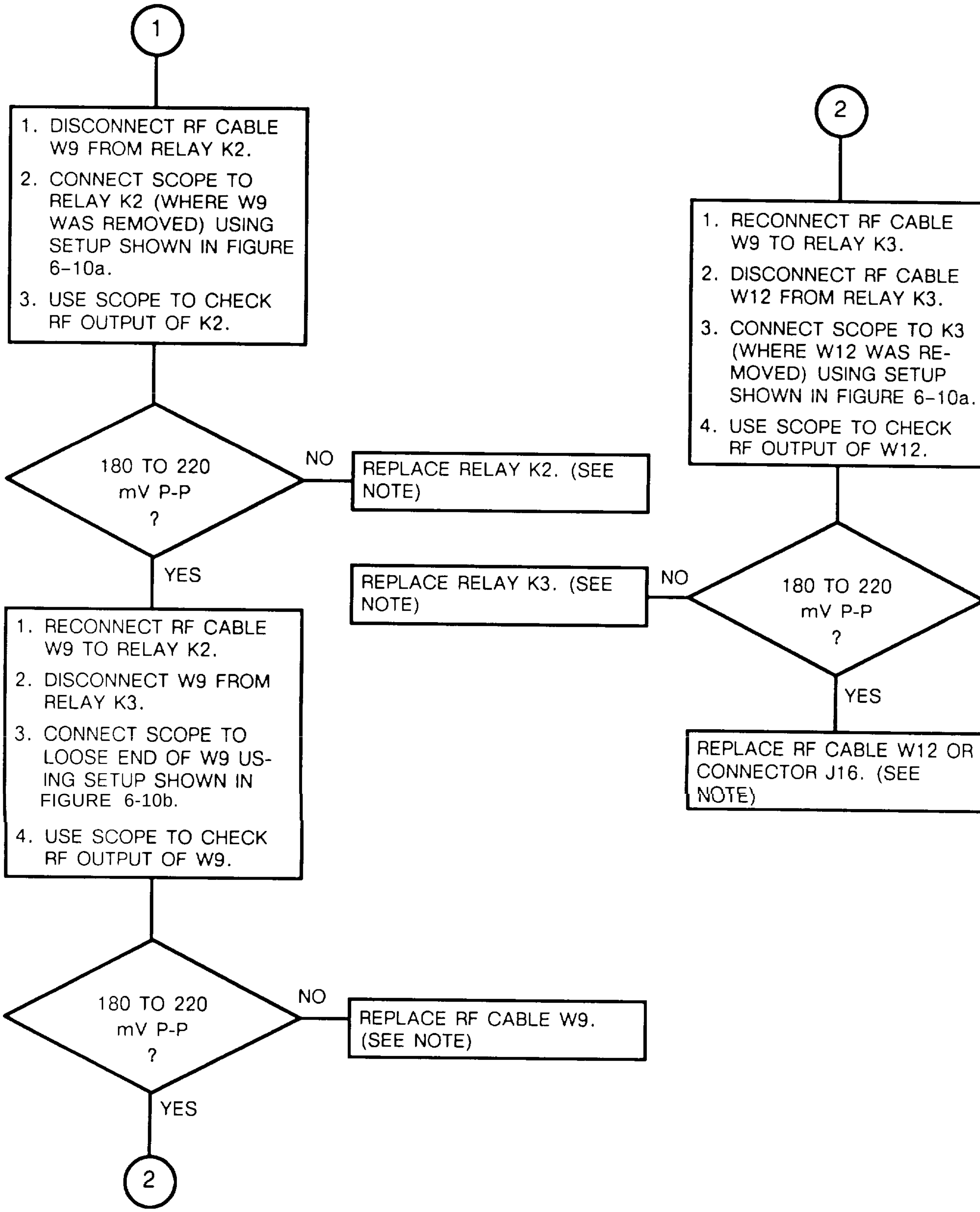
IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 22 TO CHECK TEST ADAPTER WIRING.

CAUTION

1. Set test adapter DC switch to OFF before connecting test adapter components.
2. Set test adapter DC switch to ON to perform test.

6-17. TROUBLESHOOTING FLOWCHARTS, Continued

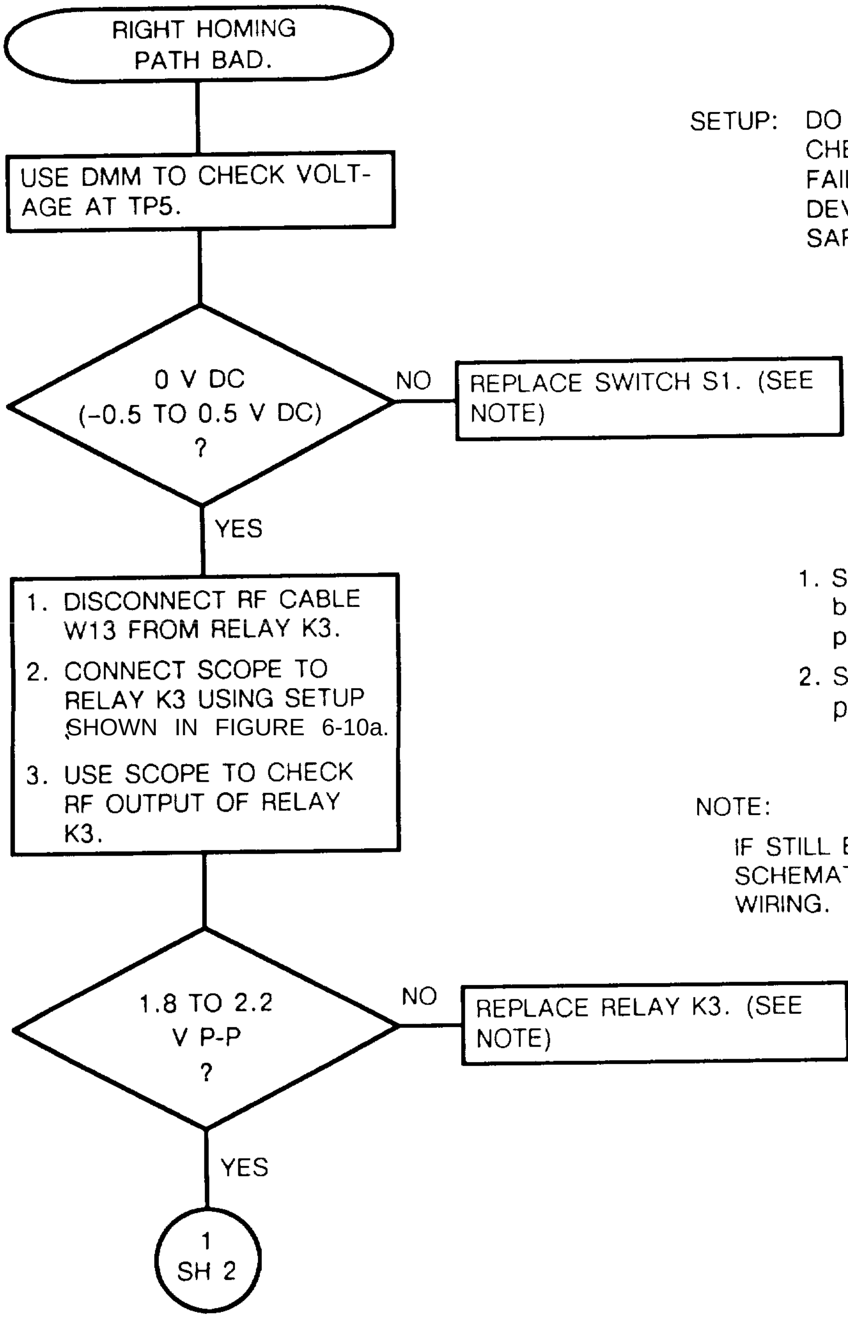
CHART 25
Troubleshooting Relay K3 (Sheet 2 of 2)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 26

Troubleshooting Right Homing Path (Sheet 1 of 3)



SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

CAUTION

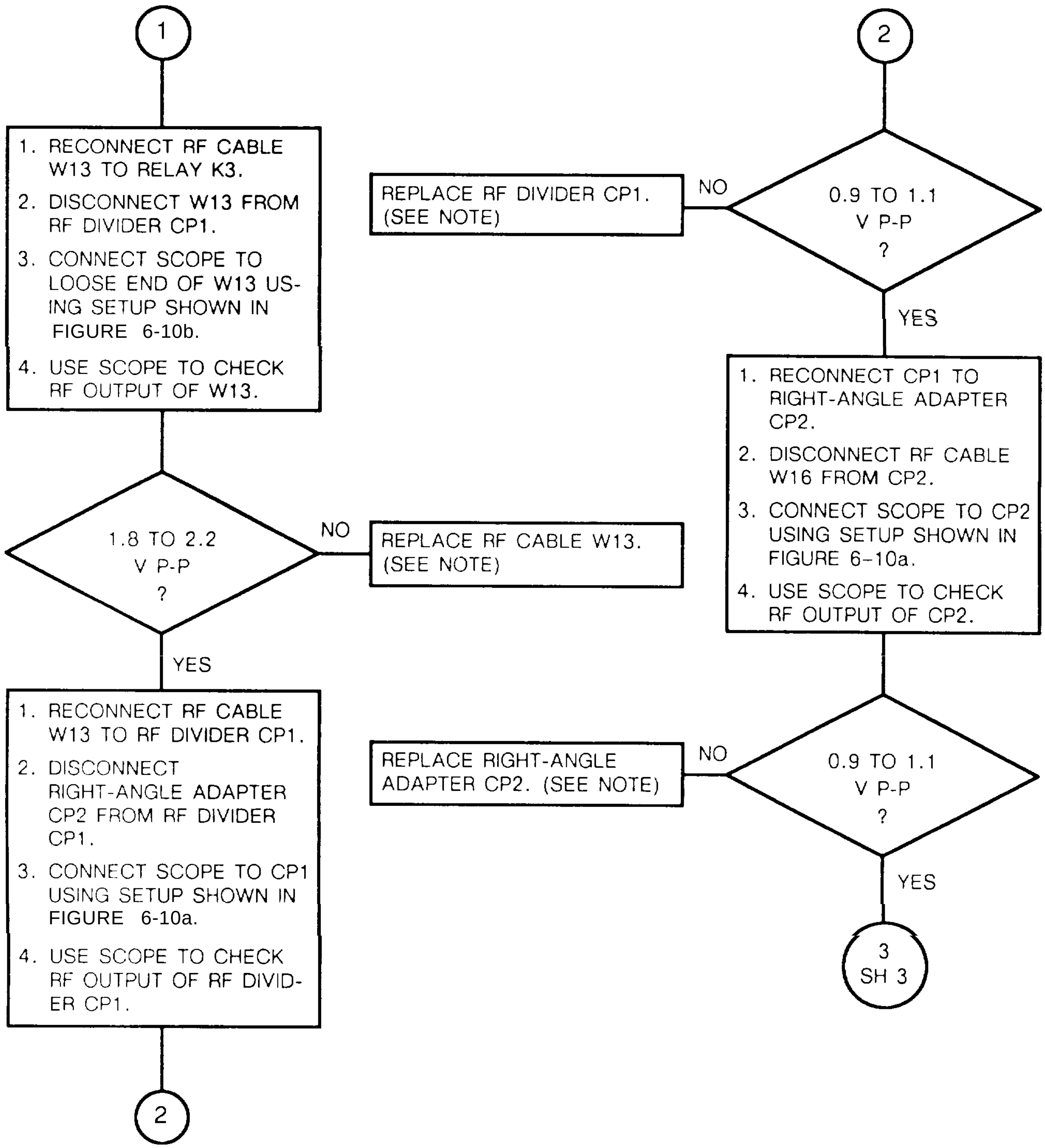
1. Set test adapter DC switch to OFF before connecting test adapter components.
2. Set test adapter DC switch to ON to perform test.

NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 23 TO CHECK TEST ADAPTER WIRING.

6–17. TROUBLESHOOTING FLOWCHARTS. Continued

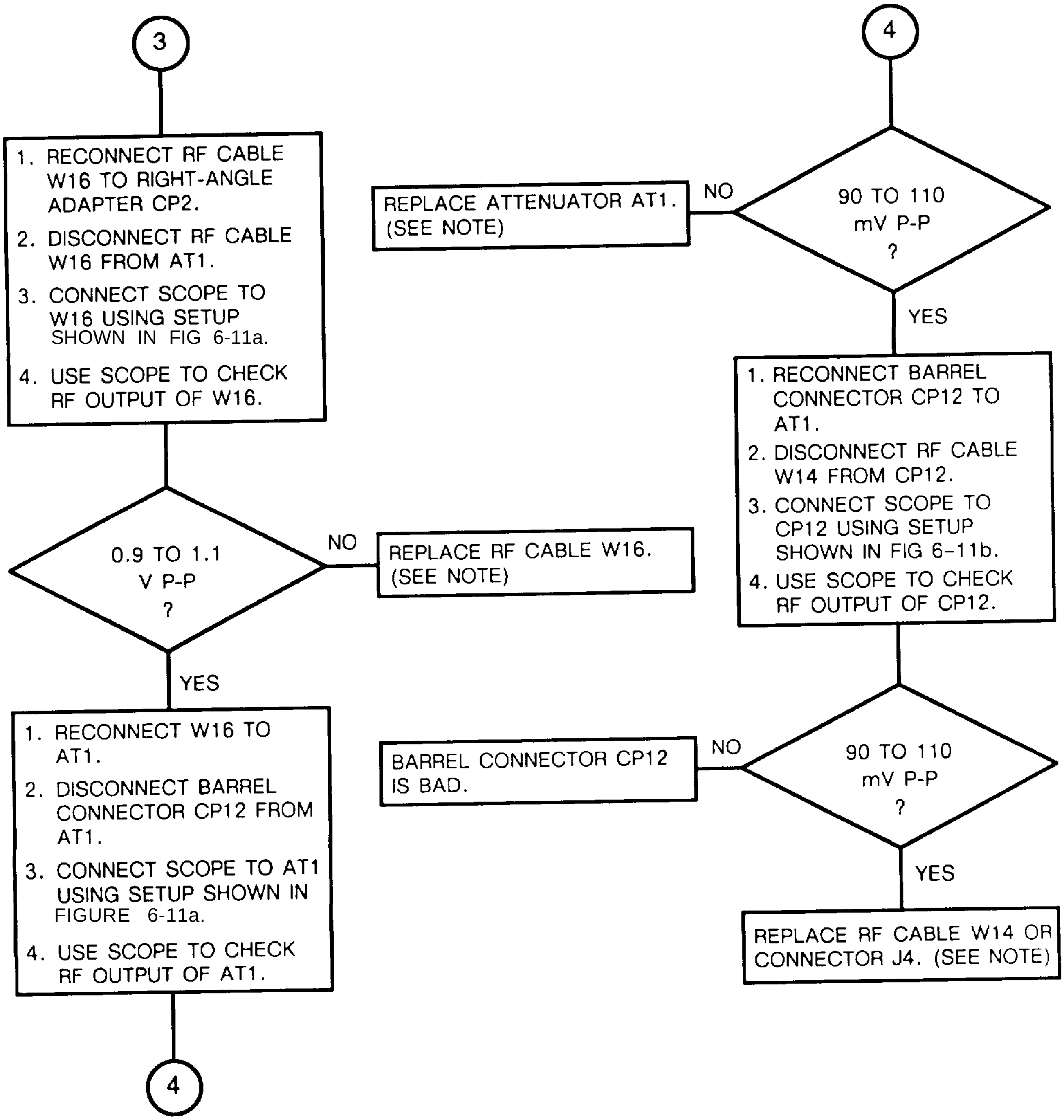
CHART 26
Troubleshooting Right Homing Path (Sheet 2 of 3)

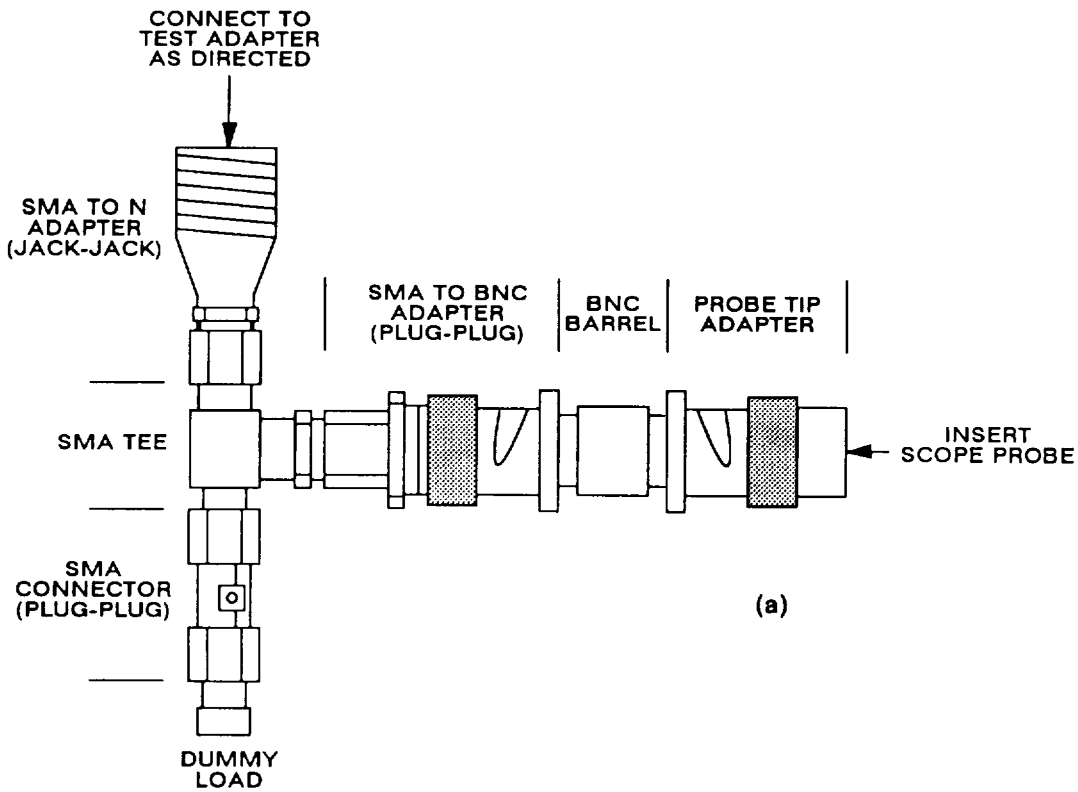


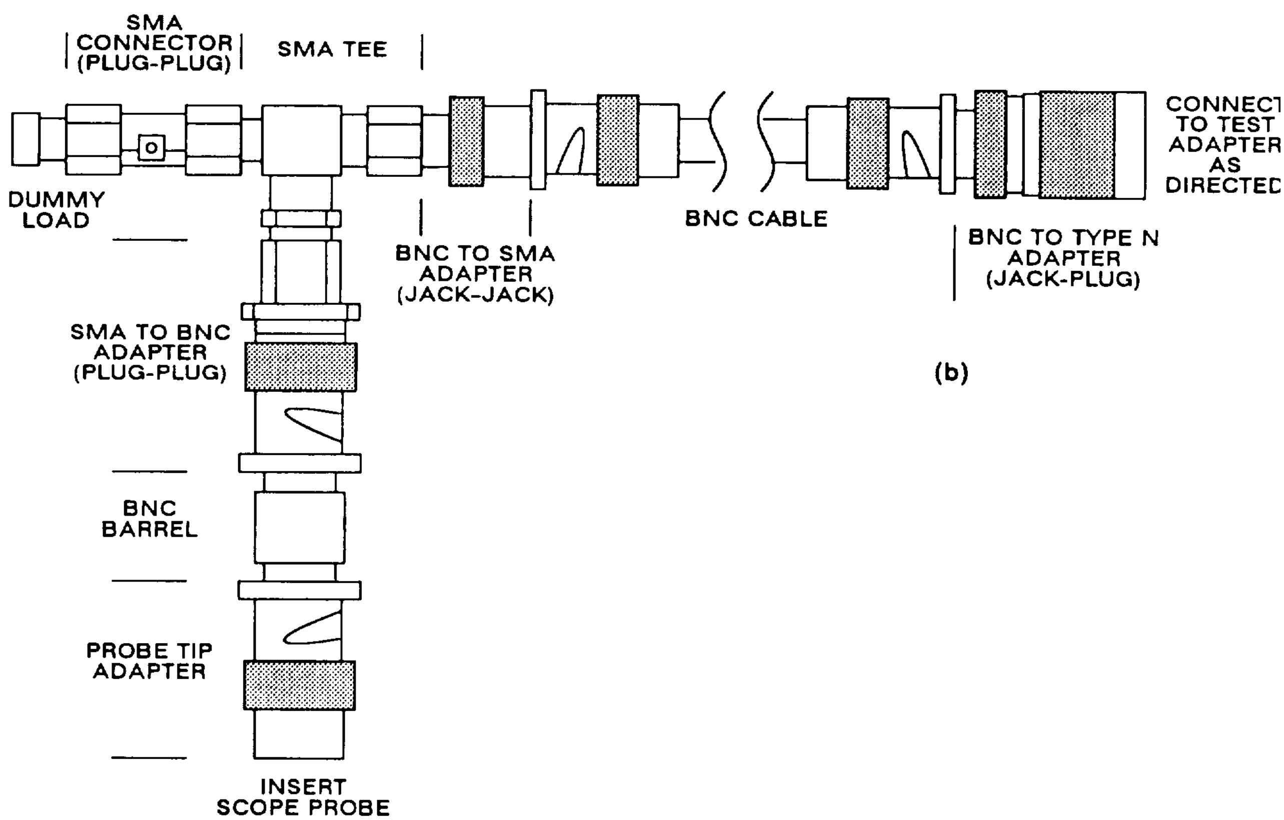
6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 26

Troubleshooting Right Homing Path (Sheet 3 of 3)



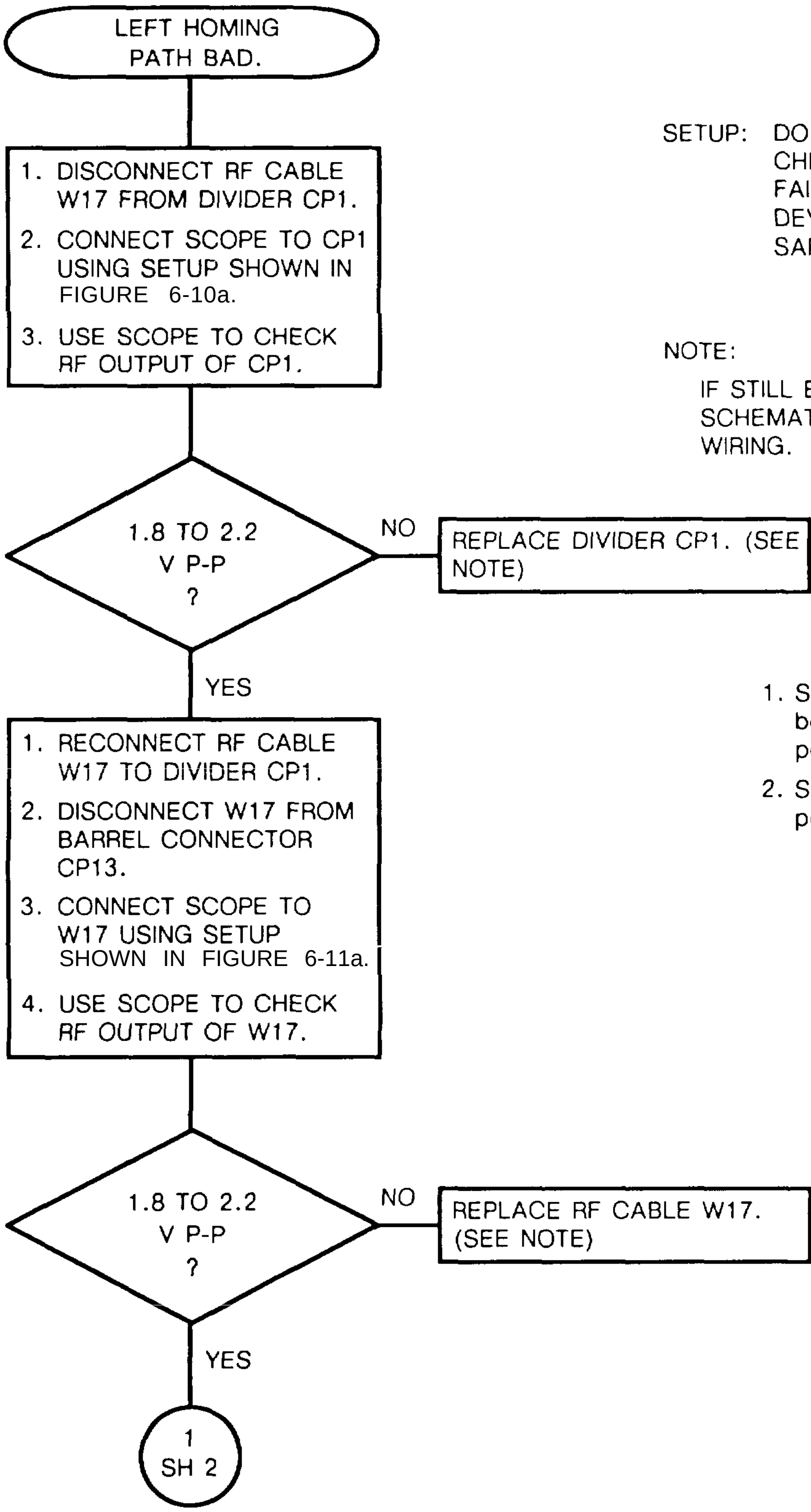

CONNECT TO
TEST ADAPTER
AS DIRECTED
SMA TO N
ADAPTER
(JACK-JACK)
SMA TO BNC
ADAPTER
(PLUG-PLUG)
BNC
BARREL
PROBE TIP
ADAPTER
SMA TEE
INSERT
SCOPE PROBE
SMA
CONNECTOR
(PLUG-PLUG)
(a)
DUMMY
LOAD


SMA
CONNECTOR
(PLUG-PLUG)
SMA TEE
CONNECT
TO TEST
ADAPTER
AS
DIRECTED
DUMMY
LOAD
BNC CABLE
BNC TO SMA
ADAPTER
(JACK-JACK)
BNC TO TYPE N
ADAPTER
(JACK-PLUG)
SMA TO BNC
ADAPTER
(PLUG-PLUG)
(b)
BNC
BARREL
PROBE TIP
ADAPTER
INSERT
SCOPE PROBE

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 27

Troubleshooting Left Homing Path (Sheet 1 of 2)



SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

NOTE:

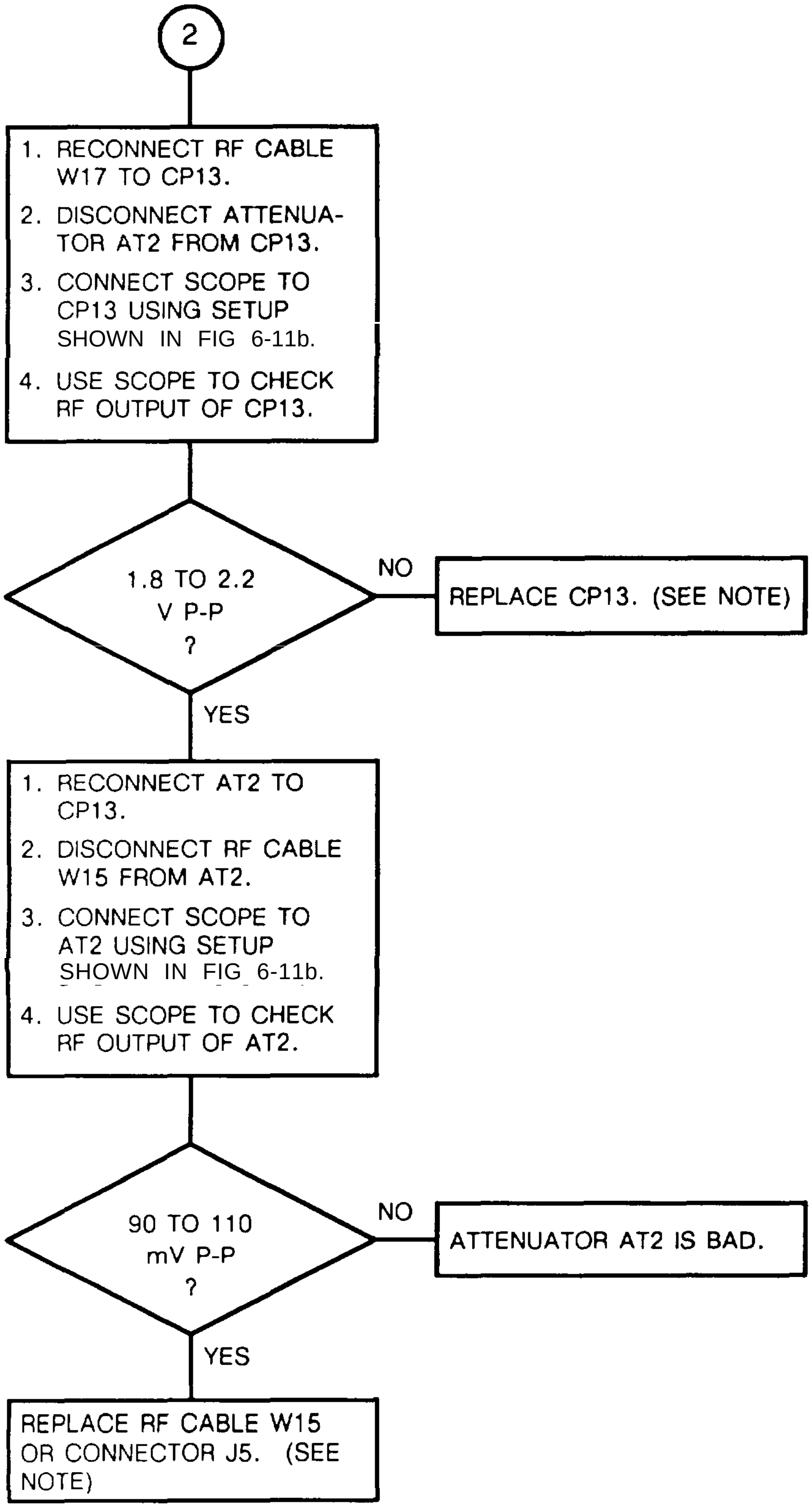
IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 24 TO CHECK TEST ADAPTER WIRING.

CAUTION

1. Set test adapter DC switch to OFF before connecting test adapter components.
2. Set test adapter DC switch to ON to perform test.

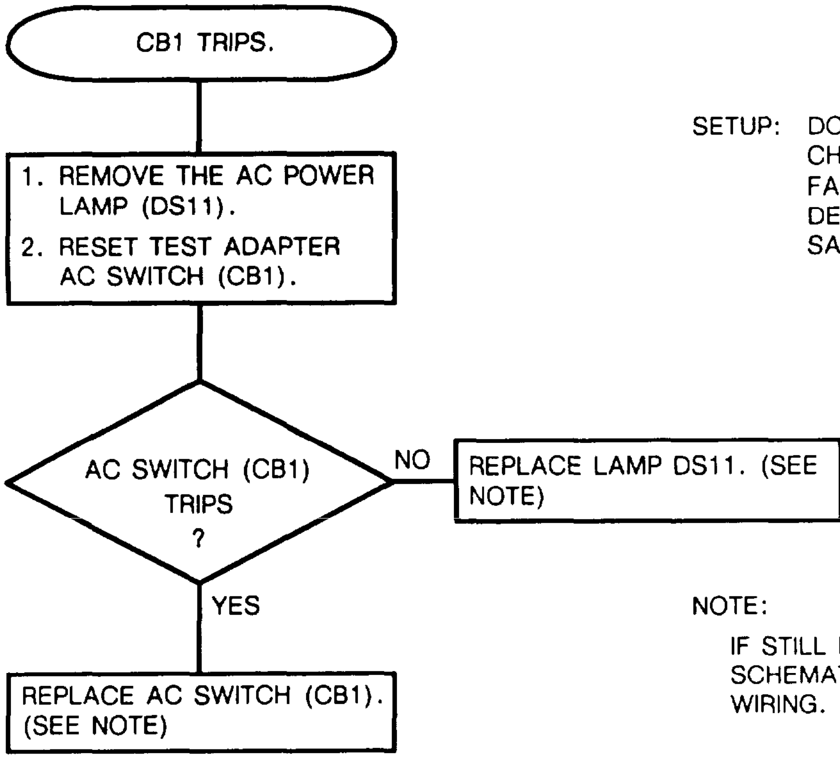
6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 27
Troubleshooting Left Homing Path (Sheet 2 of 2)



6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 28
Troubleshooting Ac Supply



SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

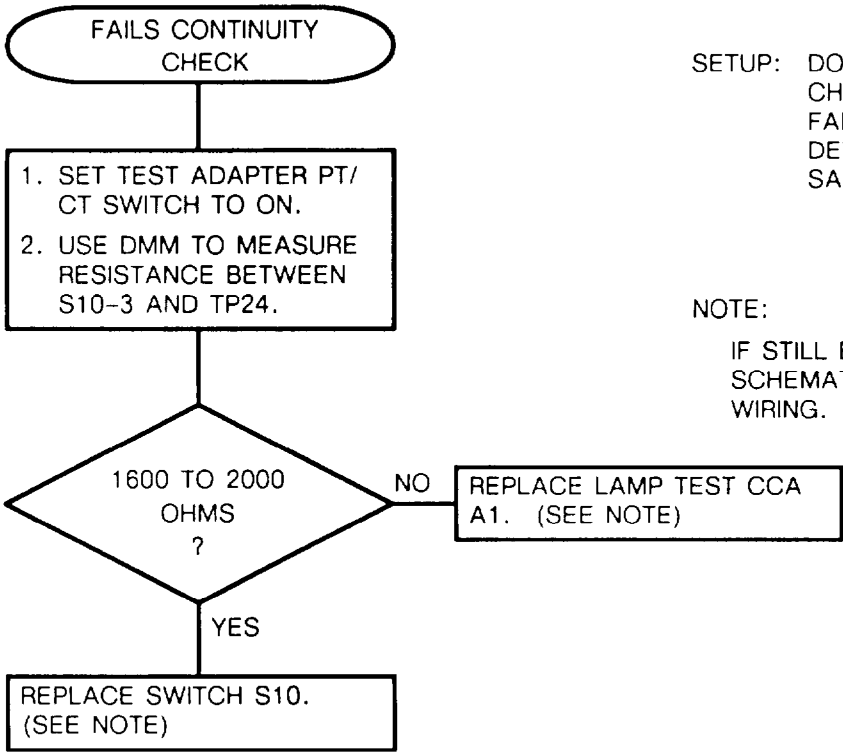
NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 25 TO CHECK TEST ADAPTER WIRING.

6-17. TROUBLESHOOTING FLOWCHARTS. Continue

CHART 29

Continuity Check



SETUP: DO NOT CHANGE SETUP FROM OP CHECK OR CHART 1 TEST THAT FAILED. REMOVE INTERCONNECTING DEVICE FROM CHEST WHEN NECESSARY TO GAIN ACCESS.

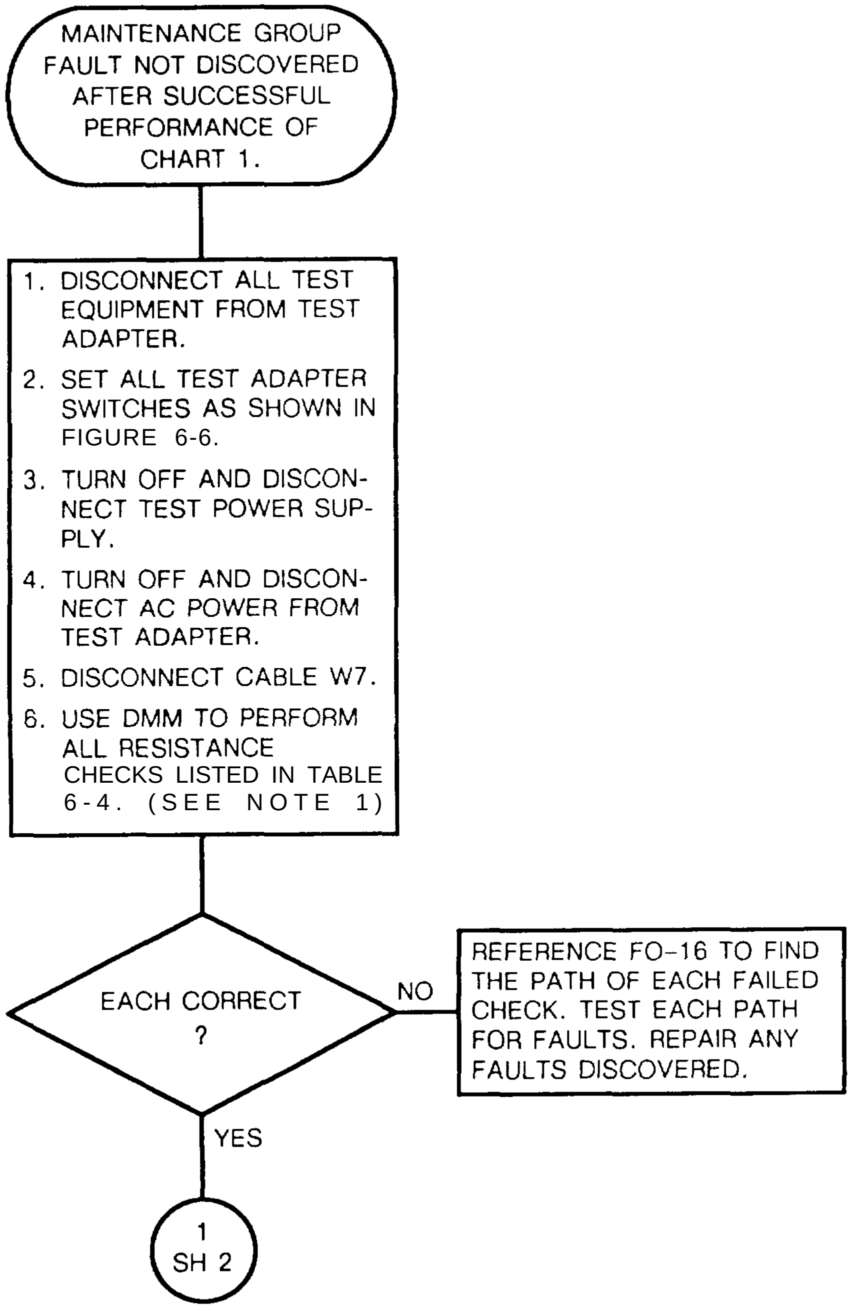
NOTE:

IF STILL BAD, USE TROUBLESHOOTING SCHEMATIC 26 TO CHECK TEST ADAPTER WIRING.

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 30

Troubleshooting Unidentified Faults (Sheet 1 of 4)



NOTES

1. When performing table 6-4 do the following:
   - Set test adapter switches as listed for each test and change them only when they are listed differently.
   - Connect the DMM probes to the points listed and check the results against those listed in the table.
2. When performing table 6-5 do the following:
   - Connect the function generator and scope to the points listed. Use TP24 for ground.
   - Set test adapter switches as listed for each test and change them only when they are listed differently.

Table 6-4, Maintenance Group Resistance Checks (Sheet 1 of 4)

SET:	DMM(+)	DMM(-)	RESULT
S1:1, S1:INT, S15:DMM	J1-d	J13 CC	Less than 1 ohm
S1:2	J12 CC	J13 CC	117 to 143 ohms
S1:4	TP9	J13 CC	Less than 1 ohm
S1:5	J1-d	J13 CC	Less than 1 ohm
S1:6	J1-c	J13 CC	Less than 1 ohm
S1:7	J1-d	J13 CC	Less than 1 ohm
S1:8	TP1O	J13 CC	Less than 1 ohm
S1:9	J1-c	J13 CC	Less than 1 ohm
S1:10	J1-A	J13 CC	Less than 1 ohm
S1:11	J1-B	J13 CC	Less than 1 ohm
S1:OFF, S2:1	J1-T	J13 CC	Less than 1 ohm
S2:2	J1-T	J13 CC	Less than 1 ohm
S2:3	J1-T	J13 CC	Less than 1 ohm
S2:4	TP11	J13 CC	Less than 1 ohm
S2:5	TP1O	J13 CC	Less than 1 ohm
S2:6	J1-X	J13 CC	Less than 1 ohm
S2:7	J1-X	J13 CC	Less than 1 ohm
S2:8	J1-d	J13 CC	Less than 1 ohm
S2:9	J2-X	J13 CC	Less than 1 ohm
S2:10	J1-d	J13 CC	Less than 1 ohm
S2:11	J1-F	J13 CC	Less than 1 ohm
S2:OFF, S3:1	TP11	J13 CC	Less than 1 ohm
S3:2	J1-d	J13 CC	Less than 1 ohm
S3:3	TP11	J13 CC	Less than 1 ohm
S3:4	J1-X	J13 CC	Less than 1 ohm
S3:5	J1-d	J13 CC	Less than 1 ohm
S3:6	J1-K	J13 CC	Less than 1 ohm
S3:7	J6-E	J13 CC	Less than 1 ohm
S3:8	J6-F	J13 CC	Less than 1 ohm
S3:9	J6-J	J13 CC	Less than 1 ohm
S3:10	J6-N	J13 CC	Less than 1 ohm
S3:11	TP12	J13 CC	Less than 1 ohm
S3:OFF, S4:1	J7-W	J13 CC	Less than 1 ohm
S4:3	J7-i	J13 CC	Less than 1 ohm
S4:4	J7-i	J13 CC	Less than 1 ohm
S4:6	J7-N	J13 CC	Less than 1 ohm
S4:7	J7-N	J13 CC	Less than 1 ohm
S4:8	J7-N	J13 CC	Less than 1 ohm
S4:9	J7-G	J13 CC	Less than 1 ohm
S4:10	J7-N	J13 CC	Less than 1 ohm
S4:1	P7-D	J18 CC	Less than 1 ohm
S4:2	J7-t	J18 CC	Less than 1 ohm
S4:4	P7-D	J18 CC	Less than 1 ohm
S4:5	J7-L	J18 CC	Less than 1 ohm
S4:6	J7-Z	J18 CC	less than 1 ohm
S4:7	J7-f	J18 CC	Less than 1 ohm

CC = Center Conductor

Table 6-4. Maintenance Group Resistance Checks (Sheet 2 of 4)

SET:	DMM(+)	DMM(-)	RESULT
S4:8	J7-g	J18 CC	Less than 1 ohm
S4:9	J7-B	J18 CC	140 to 160 ohms
S4:1	P7-R	TP24	Less than 1 ohm
	J7-T	TP24	Less than 1 ohm
S4:2	P7-R	TP24	Less than 1 ohm
	J7-T	TP24	Less than 1 ohm
S4:4	J7-A	TP24	Less than 1 ohm
	P7-R	TP24	Less than 1 ohm
S4:5	J7-A	TP24	Less than 1 ohm
	P7-R	TP24	Less than 1 ohm
S4:9	J7-F	TP24	140 to 160 ohms
S4:10	J7-r	TP24	Less than 1 ohm
S4:OFF, S5:1	J7-N	J13 CC	Less than 1 ohm
S5:2	J7-N	J13 CC	Less than 1 ohm
S5:3	J7-N	J13 CC	Less than 1 ohm
S5:5	J7-N	J13 CC	Less than 1 ohm
S5:6	J7-i	J13 CC	Less than 1 ohm
S5:7	J7-N	J13 CC	Less than 1 ohm
S5:8	J7-i	J13 CC	Less than 1 ohm
S5:9	P7-K	J13 CC	Less than 1 ohm
S5:10	J7-i	J13 CC	Less than 1 ohm
S5:11	J7-W	J13 CC	Less than 1 ohm
S6:4	J7-G	P6-b	Less than 1 ohm
S6:3, S10:ON	TP23	P6-a	14250 to 15750 ohms
S6:4	J7-C	TP23	14250 to 15750 ohms
S8:UUT	J1-h	TP24	Less than 1 ohm
S8:UUT	J1-Z	TP24	Less than 1 ohm
S9:RT	J6-L	TP24	Less than 1 ohm
S11:ON	J7-a	TP24	Less than 1 ohm
S9:RT, S13:UUT	J7-S	TP24	Less than 1 ohm
S1:4	J1-g	TP24	Less than 1 ohm
S1:6	TP6	TP24	Less than 1 ohm
S1:8	J1-g	TP24	Less than 1 ohm
S1:11	TP5	TP24	Less than 1 ohm
S1:OFF, S2:1	TP5	TP24	Less than 1 ohm
S2:2	TP5	TP24	Less than 1 ohm
S2:3	TP5	TP24	Less than 1 ohm
S2:5	J1-N	TP24	Less than 1 ohm
S2:7	TP6	TP24	Less than 1 ohm
S2:8	TP4	TP24	Less than 1 ohm
S2:8	TP6	TP24	Less than 1 ohm
S2:9	J1-g	TP24	Less than 1 ohm
S2:OFF, S3:5	TP4	TP24	Less than 1 ohm
	TP6	TP24	Less than 1 ohm

CC = Center Conductor

Table 6-4. Maintenance Group Resistance Checks (Sheet 3 of 4)

SET:	DMM(+)	DMM(-)	RESULT
S3:OFF, S4:OFF, S5:2	J7-A	TP24	Less than 1 ohm
S5:4	J7-R	TP24	Less than 1 ohm
S5:5	J7-X	TP24	Less than 1 ohm
S5:6	J7-X	TP24	Less than 1 ohm
S5:9	J7-R	TP24	Less than 1 ohm
S5:10	J7-R	TP24	Less than 1 ohm
S5:11	J7-X	TP24	Less than 1 ohm
S9:RCU, S13:UUT	J7-U	TP24	Less than 1 ohm
S1:4	J1-J	J18 CC	Less than 1 ohm
S1:7	J17 CC	J18 CC	Less than 1 ohm
S1:8	J1-J	J18 CC	Less than 1 ohm
S1:OFF, S2:5	J1-Y	J18 CC	Less than 1 ohm
S2:7	J17 CC	J18 CC	Less than 1 ohm
S2:10	J2-a	J18 CC	Less than 1 ohm
S2:OFF, S3:1	J1-K	J18 CC	Less than 1 ohm
S3:3	J1-Y	J18 CC	Less than 1 ohm
S3:4	TP12	J18 CC	Less than 1 ohm
S3:5	J1-K	J18 CC	Less than 1 ohm
S3:OFF, S4:OFF, S5:5, S11:ON	J7-j	J18 CC	Less than 1 ohm
S5:6	J7-j	J18 CC	Less than 1 ohm
S5:8	J7-j	J18 CC	Less than 1 ohm
S5:9	J7-j	J18 CC	Less than 1 ohm
S5:10	J7-j	J18 CC	Less than 1 ohm
S10:ON	J1-N	J7-C	Less than 1 ohm
S12:ON	TP21	J7-B	140 to 160 ohms
S6:2	J7-E	J7-B	Less than 1 ohm
S6:5	J7-b	J7-m	Less than 1 ohm
S6:5	J7-q	J7-p	Less than 1 ohm
S6:6	J7-b	J7-m	Less than 1 ohm
S6:6	J7-q	J7-p	Less than 1 ohm
S6:7	J7-G	J7-n	Less than 1 ohm
S6:7	J7-d	J7-c	Less than 1 ohm
S6:8	J7-G	J7-n	Less than 1 ohm
S6:8	J7-d	J7-c	Less than 1 ohm
	J1-P	TP24	Less than 1 ohm
	J1-L	TP24	Less than 1 ohm
	J1-a	TP24	Less than 1 ohm
	J1-e	TP24	Less than 1 ohm
	J6-c	TP24	Less than 1 ohm
	J6-b	TP24	Less than 1 ohm
	J6-S	TP24	Less than 1 ohm
S14:EXT, S15:FREQ CNTR	J8 CC	J19 CC	Less than 1 ohm
	J6-B	TP24	Less than 1 ohm
	J6-Y	TP24	Less than 1 ohm
	J7-M	TP24	Less than 1 ohm
	J7-h	TP24	Less than 1 ohm

CC = Center Conductor

Table 6-4. Maintenance Group Resistance Checks (Sheet 4 of 4)

SET:	DMM(+)	DMM(-)	RESULT
	P9-L	TP24	Less than 1 ohm
	P9-B	TP24	Less than 1 ohm
	P6-L	TP23	Less than 1 ohm
	P6-J, K	TP24	Less than 1 ohm
	P7-L	TP24	Less than 1 ohm
	P7-B	TP24	Less than 1 ohm
	P4-Y	TP24	Less than 1 ohm
	P4-M	TP24	Less than 1 ohm
	P4-H	TP24	Less than 1 ohm
	P4-Z	TP24	Less than 1 ohm
	TP1	J2-B	Less than 1 ohm
	TP2	J2-C	Less than 1 ohm
	TP3	J2-T	Less than 1 ohm
	TP23	J1-D	Less than 1 ohm
	TP23	J6-C	Less than 1 ohm
	J1-H	J7-H	Less than 1 ohm
	J2-D	J7-D	Less than 1 ohm
	J2-R	J7-e	Less than 1 ohm
	J2-U	J7-m	Less than 1 ohm
	J6-H	J7-H	Less than 1 ohm
	J6-Z	J7-J	Less than 1 ohm
	J7-V	TP20	Less than 1 ohm
	J7-Y	TP23	Less than 1 ohm
	TP11	J6-J	Less than 1 ohm
CB1 (AC) :ON	J20-A	J6-a	Less than 800 ohm
	J20-B	J6-W	Less than 800 ohm
	J20-B	J1-M	Less than 800 ohm
	J20-A	J1-C	Less than 800 ohm

Table 6-5. Maintenance Group Signal Path Checks

SET:	FUNCTION GENERATOR	SCOPE	RESULT
S1:5	TP17	TP12	Sine wave, 4.5 to 5.5 V P-P, 900 to 1100 Hz
S1:OFF, S2:4	TP17	J1-Y	Sine wave, 4.5 to 5.5 V P-P, 900 to 1100 Hz
S2:6	TP17	TP12	Sine wave, 4.5 to 5.5 V P-P, 900 to 1100 Hz
S2:8	TP17	J1-K	Sine wave, 4.5 to 5.5 V P-P, 900 to 1100 Hz
S2:OFF, S3:OFF S4:OFF, S5:1	TP17	J7-P	Sine wave, 4,5 to 5.5 V P-P, 900 to 1100 Hz
S5:5	TP17	J7-P	Sine wave, 4.5 to 5.5 V P-P, 900 to 1100 Hz
S5:6	TP17	J7-P	Sine wave, 4.5 to 5.5 V P-P, 900 to 1100 Hz
S1-S3:OFF, S4:3	TP17	J7-s	Sine wave, 4.5 to 5.5 V P-P, 900 to 1100 Hz
S4:4	TP17	J7-s	Sine wave, 4.5 to 5.5 **V** P-P, 900 to 1100 Hz
S4:5	TP17	J7-s	Sine wave, 4.5 to 5.5 V P-P, 900 to 1100 Hz
S1-S4:OFF, S5:3	TP17	P7-A	Sine wave, 4.5 to 5.5 V P-P, 900 to 1100 Hz
S1-S3: OFF, S4:3	TP17	TP19	Sine wave, 4.5 to 5.5 V P-P, 900 to 1100 Hz
S1-S4:OFF, S5:4	TP17	J7-P	Sine wave, 4.5 to 5.5 V P-P, 900 to 1100 Hz

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 30
Troubleshooting Unidentified Faults (Sheet 2 of 4)

(1)

1. SET FUNCTION GENERATOR—
   FUNCTION: SINE
   FREQ: 1 kHz
   (900 TO 1100 Hz)
   LEVEL: 5 V P-P
   (4.5 TO 5.5 V P-P)
2. PERFORM EACH SIGNAL PATH CHECK LISTED IN TABLE 6-5. (SEE NOTE 2)

EACH RESULT CORRECT ?

NO: REFERENCE FO-16 TO FIND THE PATH OF EACH FAILED CHECK. TEST EACH PATH FOR FAULTS. REPAIR ANY FAULTS DISCOVERED.

YES:

1. CONNECT CABLE W8 FROM TEST POWER SUPPLY TO J21.
2. TURN ON TEST POWER SUPPLY AND DC SWITCH.
3. CONNECT JUMPER FROM TP24 TO J2-P. (VIEW A)

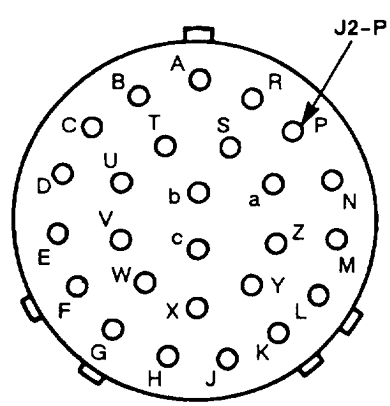
TEST LAMP 9 LIT ?

NO: REFERENCE FO-16 TO FIND THE PATH FROM J2-P TO TP21. TEST THE PATH FOR FAULTS AND REPAIR ANY FAULTS DISCOVERED.

YES:

(2 SH 3)

VIEW A:



J2

6-17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 30

Troubleshooting Unidentified Faults (Sheet 3 of 4)

(2)

1. REMOVE JUMPER FROM TP24 AND J2-P.
2. CONNECT JUMPER FROM TP23 TO J6-P. (VIEW B)

TEST LAMP 4 LIT ?

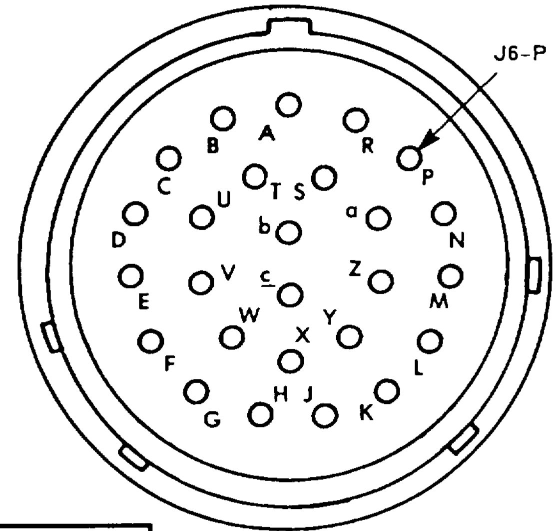
NO: REFERENCE FO-16 TO FIND THE PATH FROM J6-P TO GROUND VIA TEST LAMP 4 (DS4). TEST THE PATH FOR FAULTS AND REPAIR ANY FAULTS DISCOVERED.

YES:

1. REMOVE JUMPER FROM TP23 AND J6-P.
2. SET TEST ADAPTER DC SWITCH TO OFF.
3. SET DMM TO DIODE TEST POSITION: OHMS, 2 —▶|—
4. CONNECT DMM(+) PROBE TO J7-X AND DMM(-) TO TP24. (VIEW C)

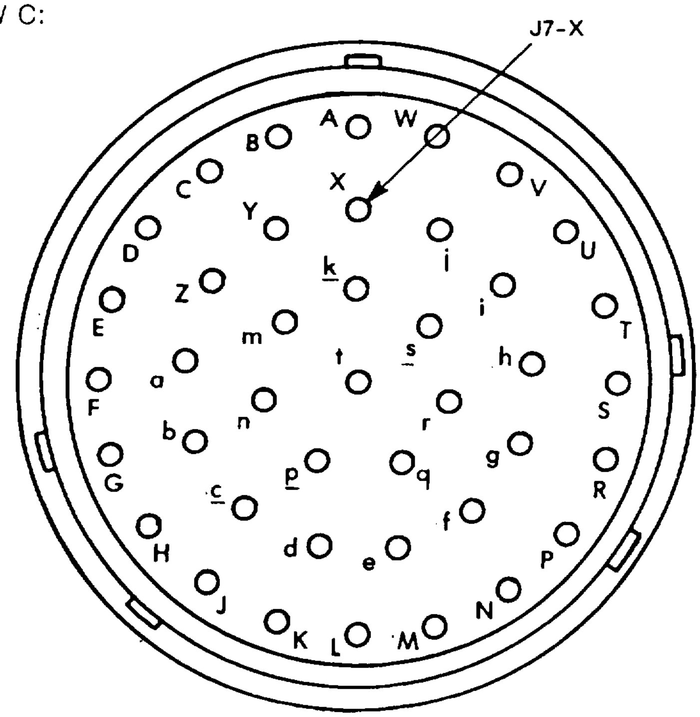
(3 SH 4)

VIEW B:



J6

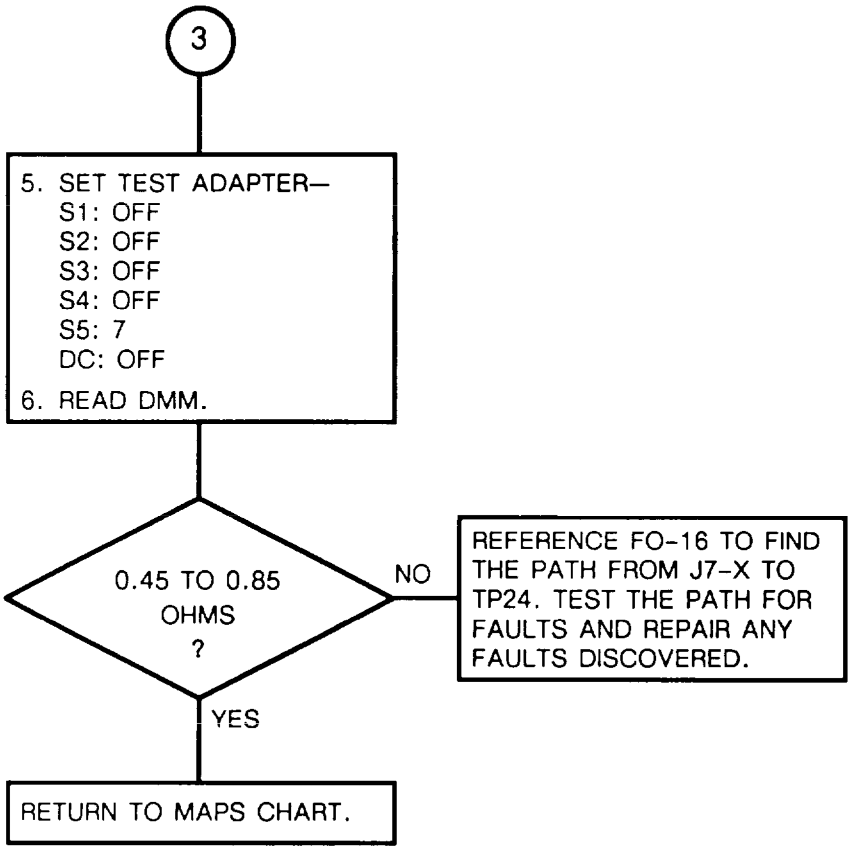
VIEW C:



J7

6–17. TROUBLESHOOTING FLOWCHARTS. Continued

CHART 30
Troubleshooting Unidentified Faults (Sheet 4 of 4)



6-18. TROUBLESHOOTING SCHEMATICS

These are the troubleshooting schematics that are referenced by the MAPS chart. Each figure is a partial schematic diagram of the test adapter. Each shows only the wiring and components that would be in use when a particular fault occurred. These are used as a guide for testing the test adapter wiring for opens, shorts, faulty switches, etc. All the wiring involved in a fault may be tested without having to check the entire test adapter.

Do the following when using the troubleshooting schematics:

1. Disconnect all test equipment from the test adapter. Turn off the test power supply.

2. Remove test adapter from chest. If necessary, remove the ref rt, ref dra, ref rcu, and ics from the test adapter.

3. Use the DMM to test for:
   open circuits
   short circuits
   continuity through relay control lines
   correct resistances
   correct switch operation
   correct indicated voltage levels (test power supply and DC switch must be turned on)

WARNING

If you connect the test adapter to a 115 V ac supply, observe all high voltage safety precautions.

4. Check only the schematics listed in the MAPS chart and check them in the order listed.

5. Repair any repairable faults that are discovered. After each repair is made, test it again to verify repair.

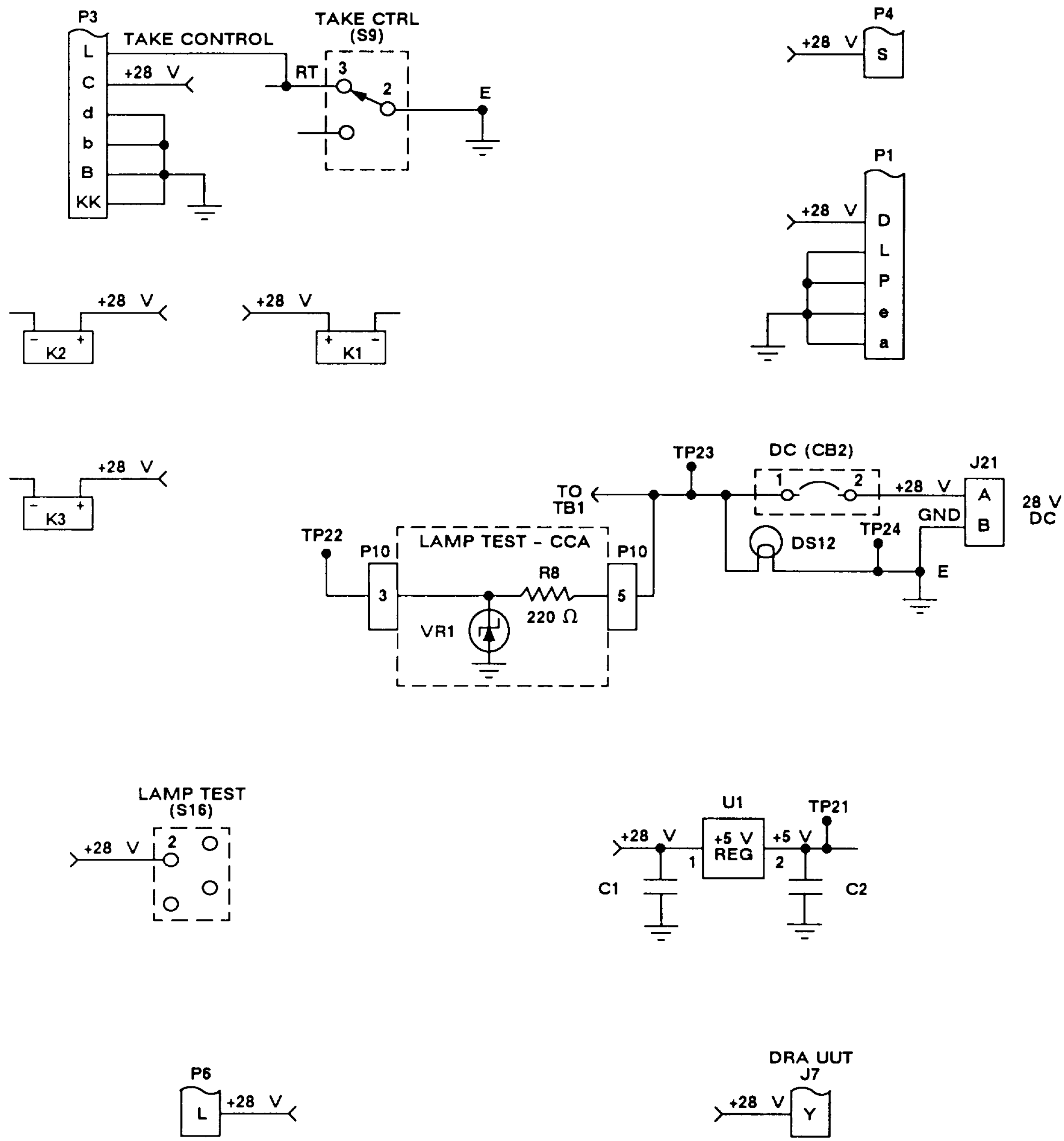


Figure 6-12. Troubleshooting Schematic 1, Dc Power Supply Paths

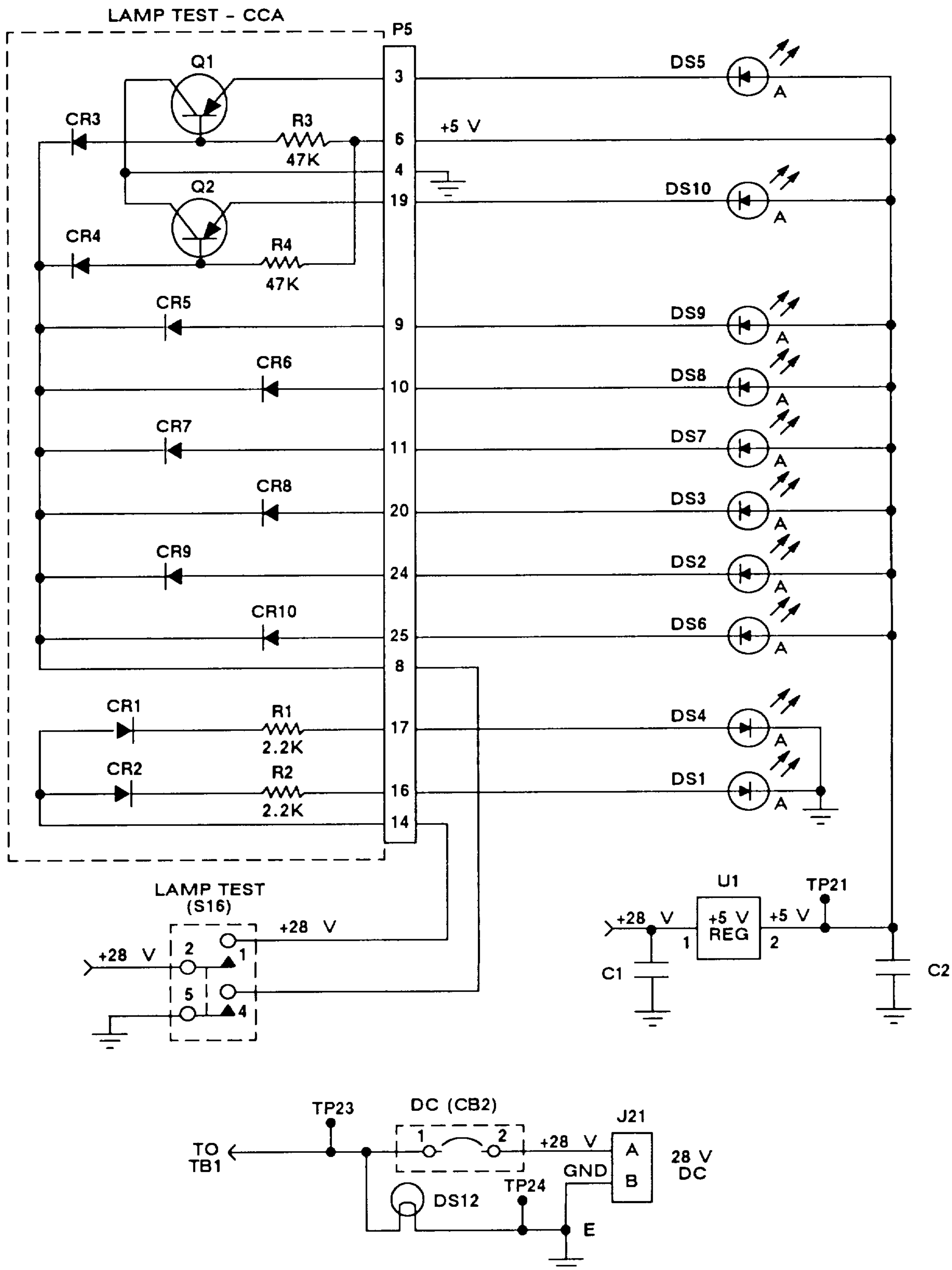


Figure 6-13. Troubleshooting Schematic 2, Test Lamp Paths

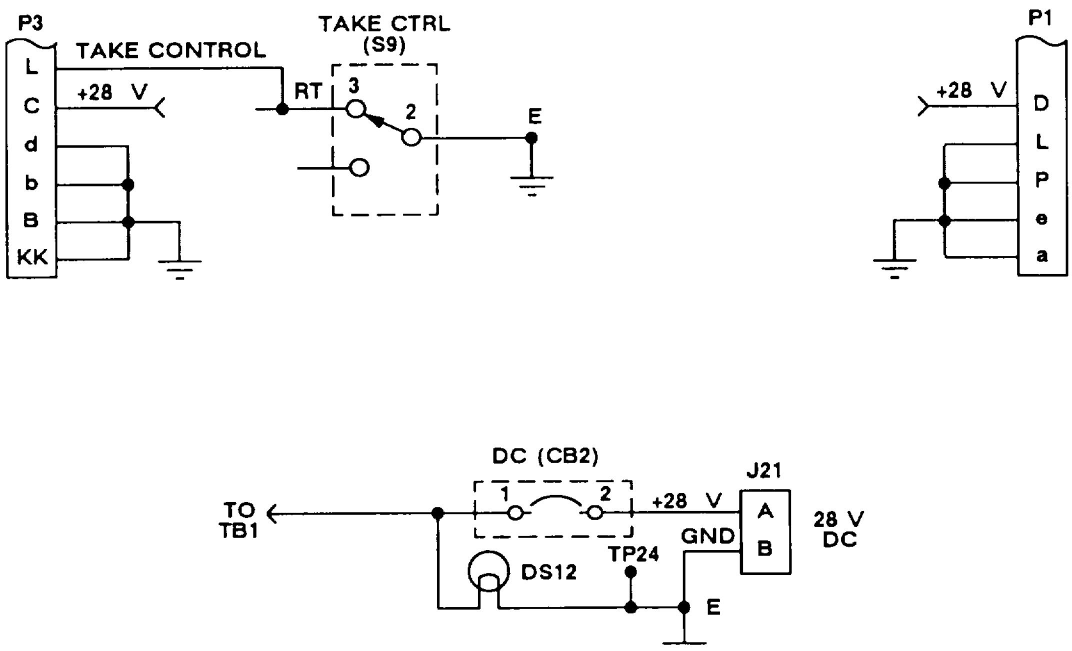


Figure 6-14. Troubleshooting Schematic 3, Reference Rt Power Supply Paths

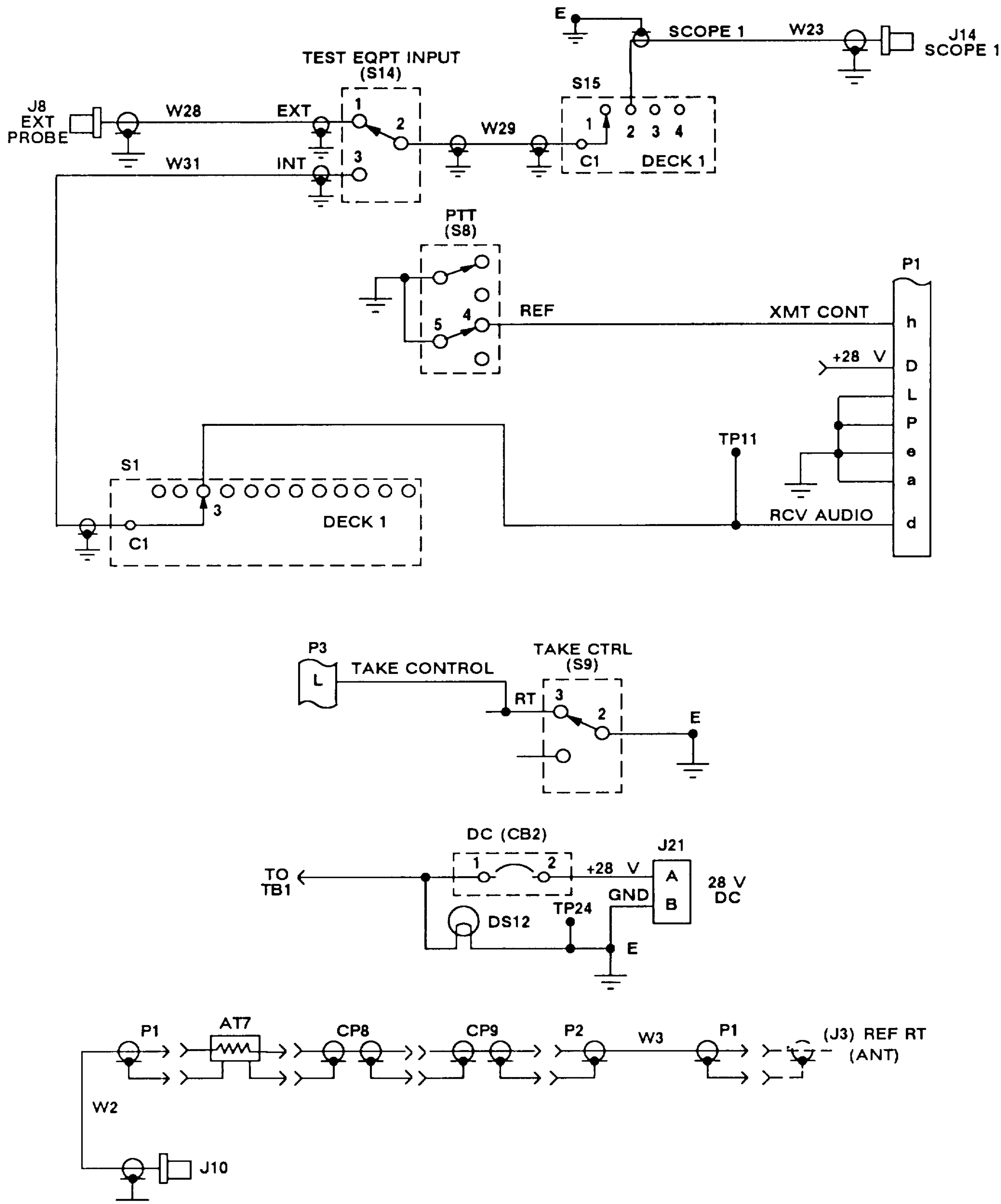


Figure 6-15. Troubleshooting Schematic 4, Reference Rt Rcv and Xmt Paths

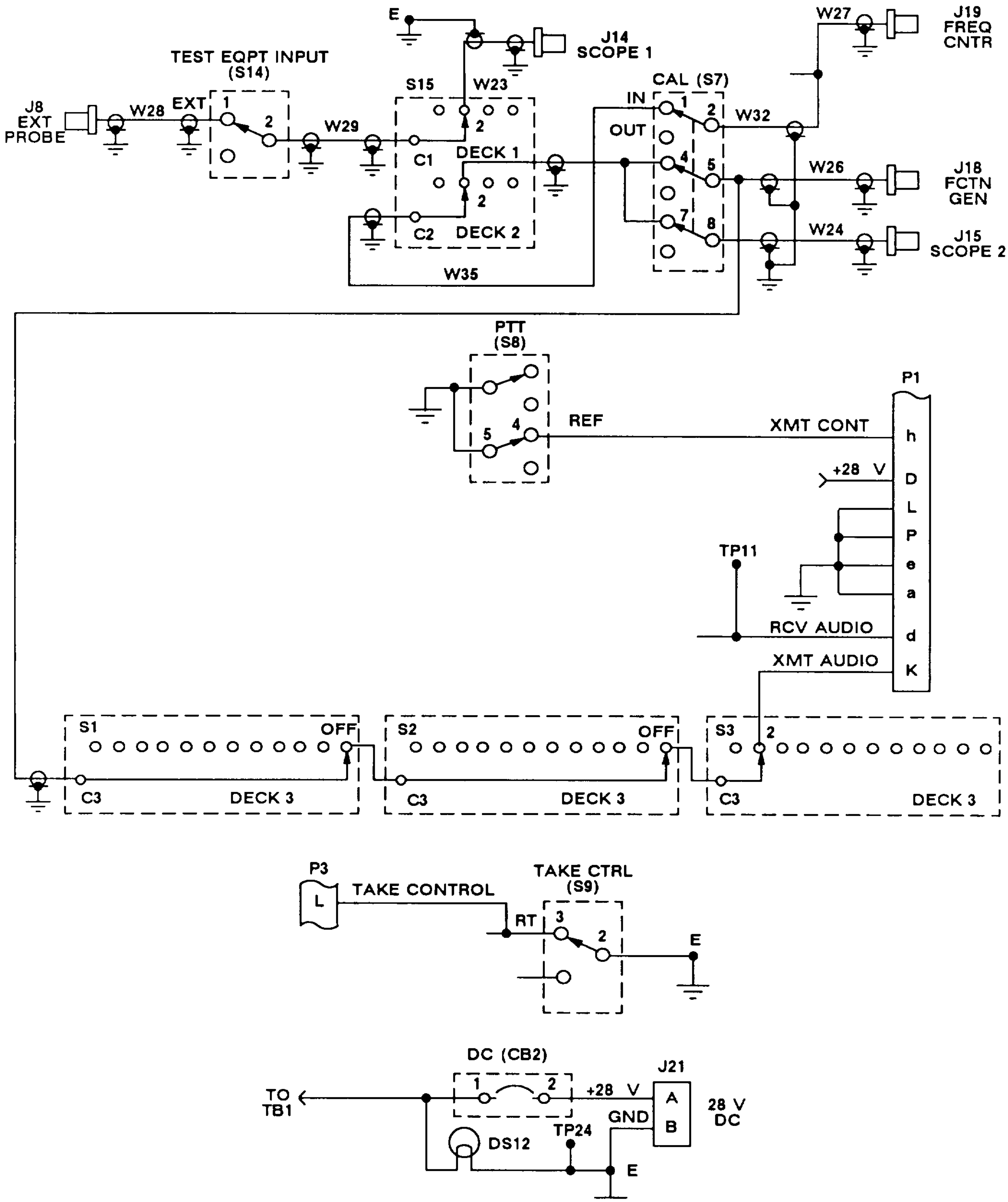


Figure 6-16. Troubleshooting Schematic, Reference Rt Rcv and Xmt Audio Paths

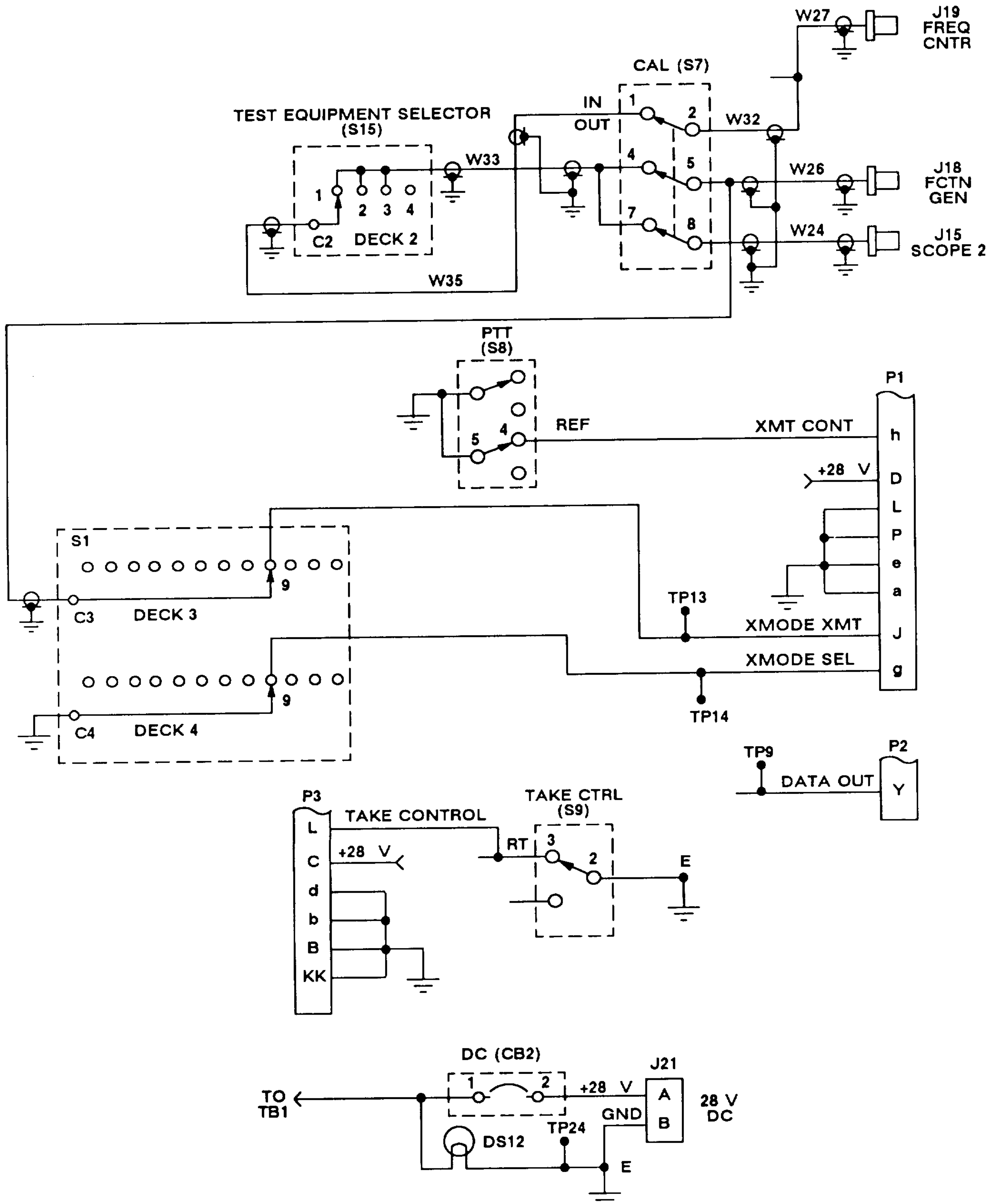


Figure 6-17. Troubleshooting Schematic 6, Reference Rt Xmt Digital Paths

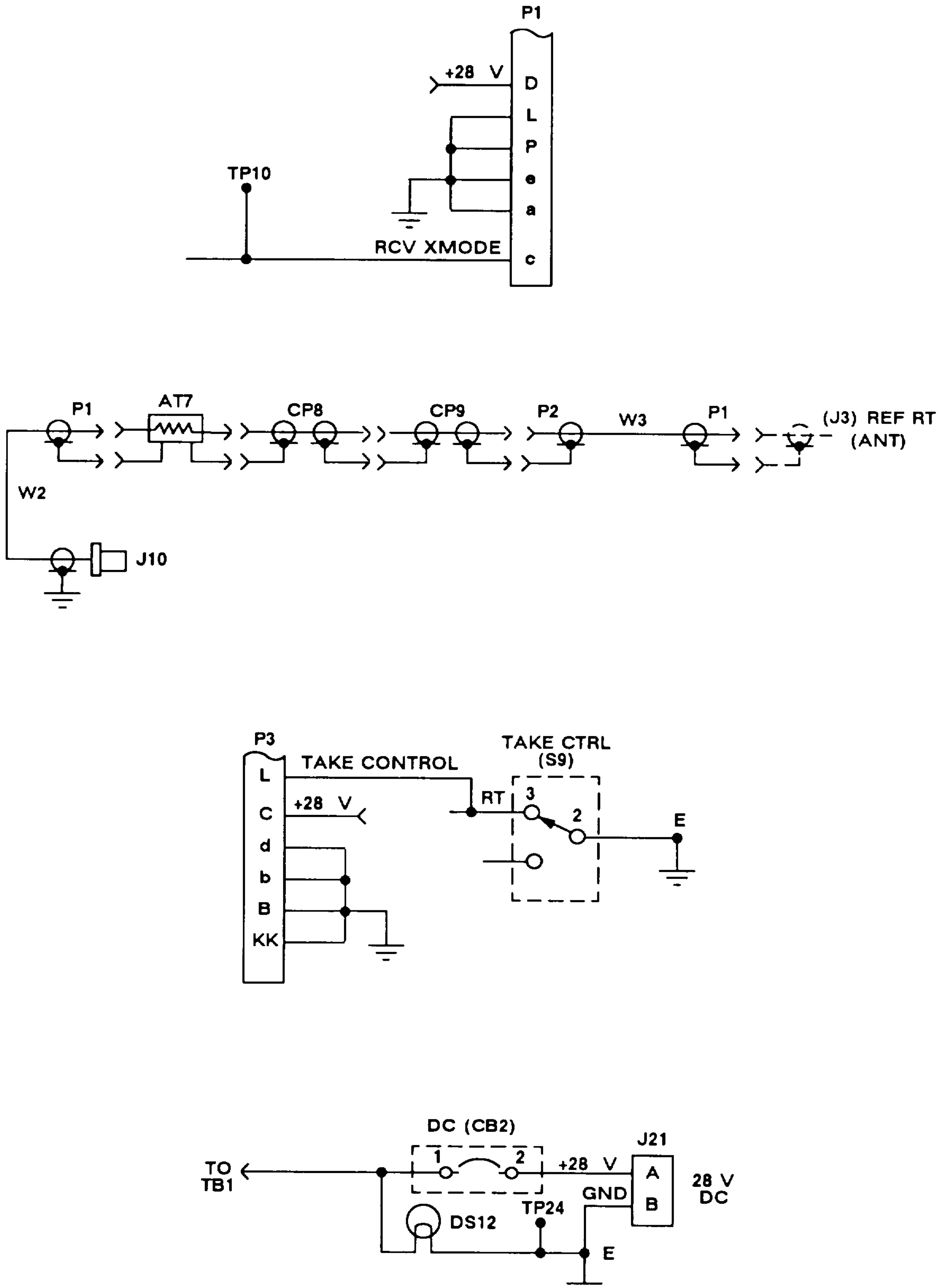


Figure 6-18. Troubleshooting Schematic 7, Reference Rt Rcv Digital Paths

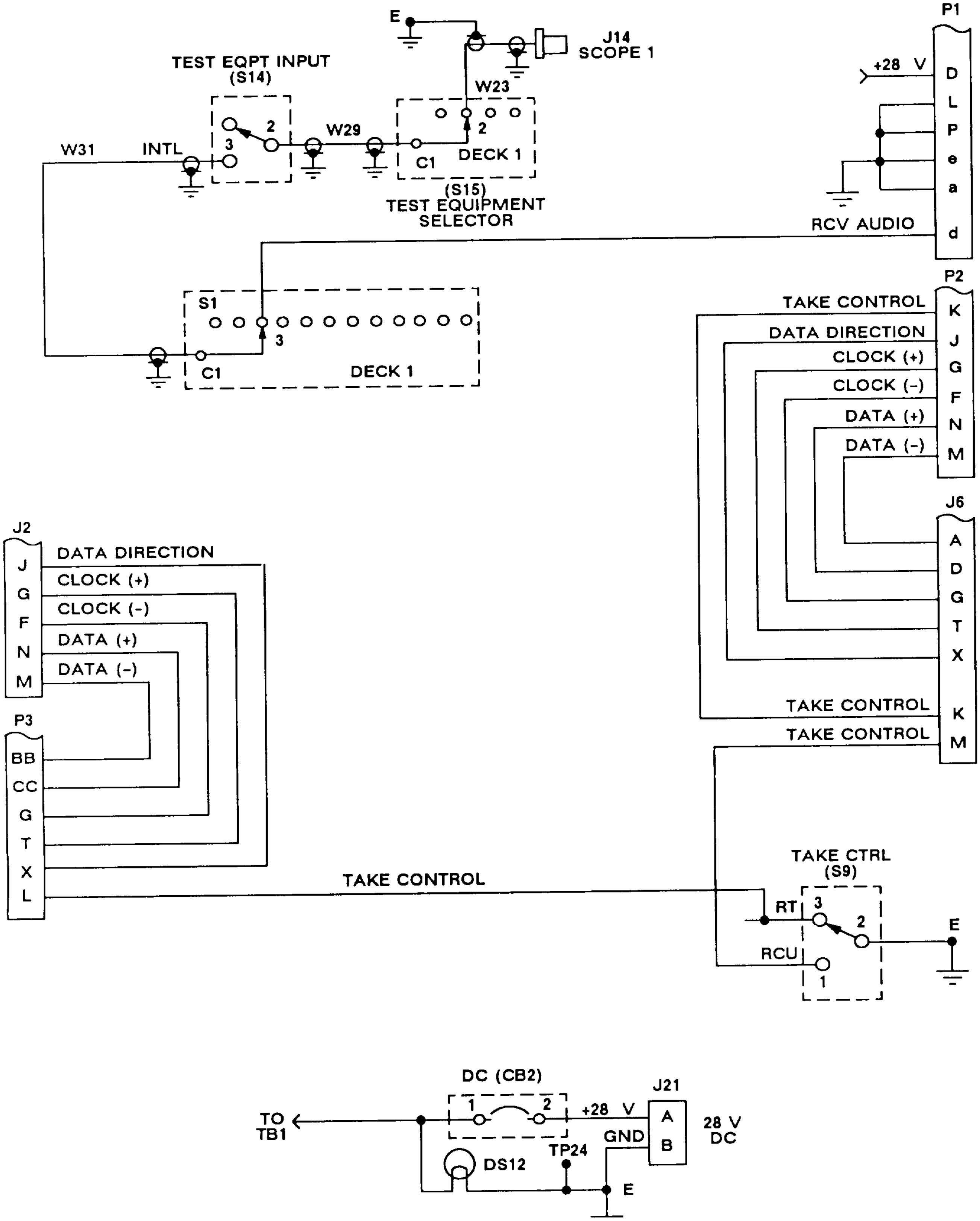


Figure 6-19. Troubleshooting Schematic 8, Reference Rt and Rcu Self-Test and Squelch Paths

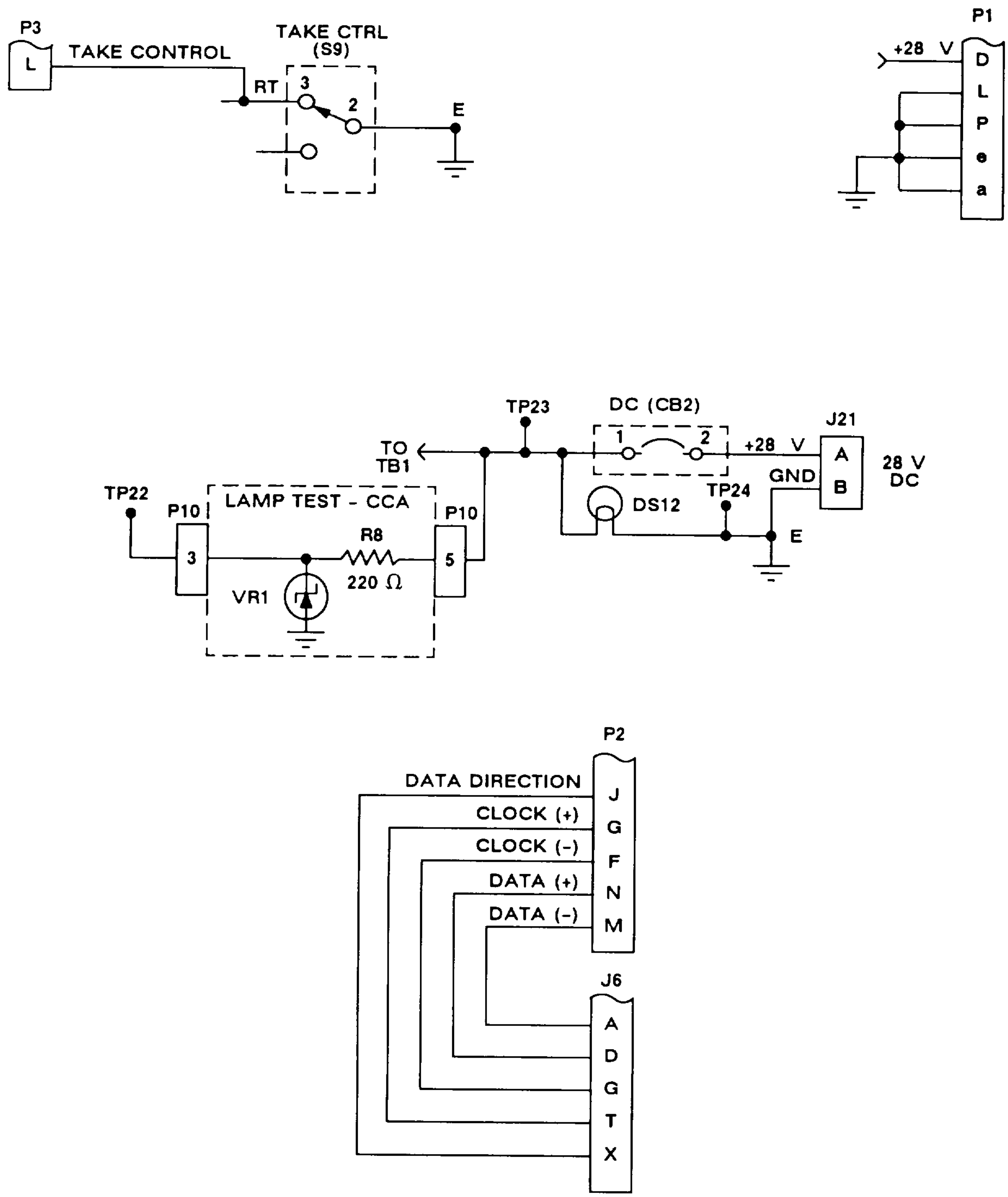


Figure 6-20. Troubleshooting Schematic 9, Reference Rcu to Rcu Uut Interface Paths

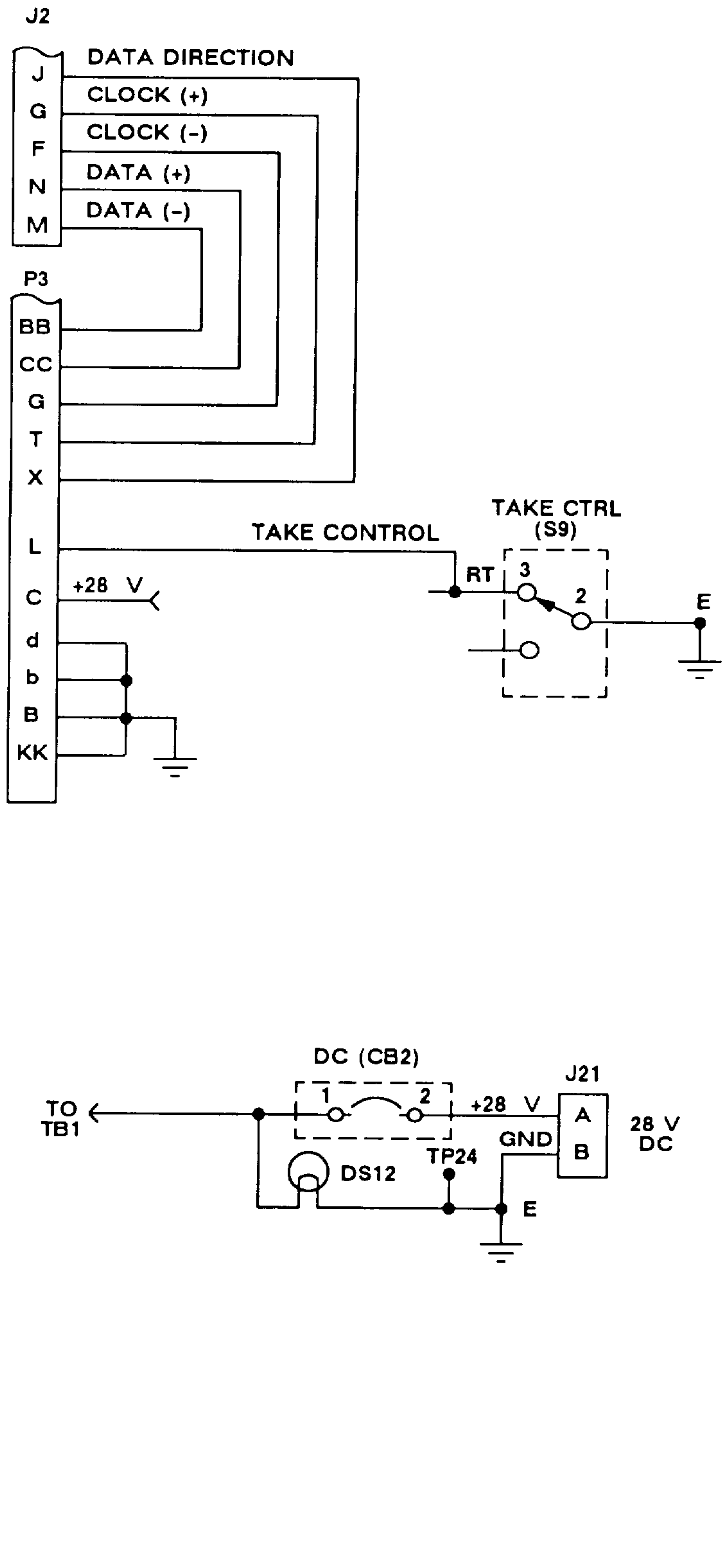


Figure 6-21. Troubleshooting Schematic 10, Reference Rcu Echo Function Paths

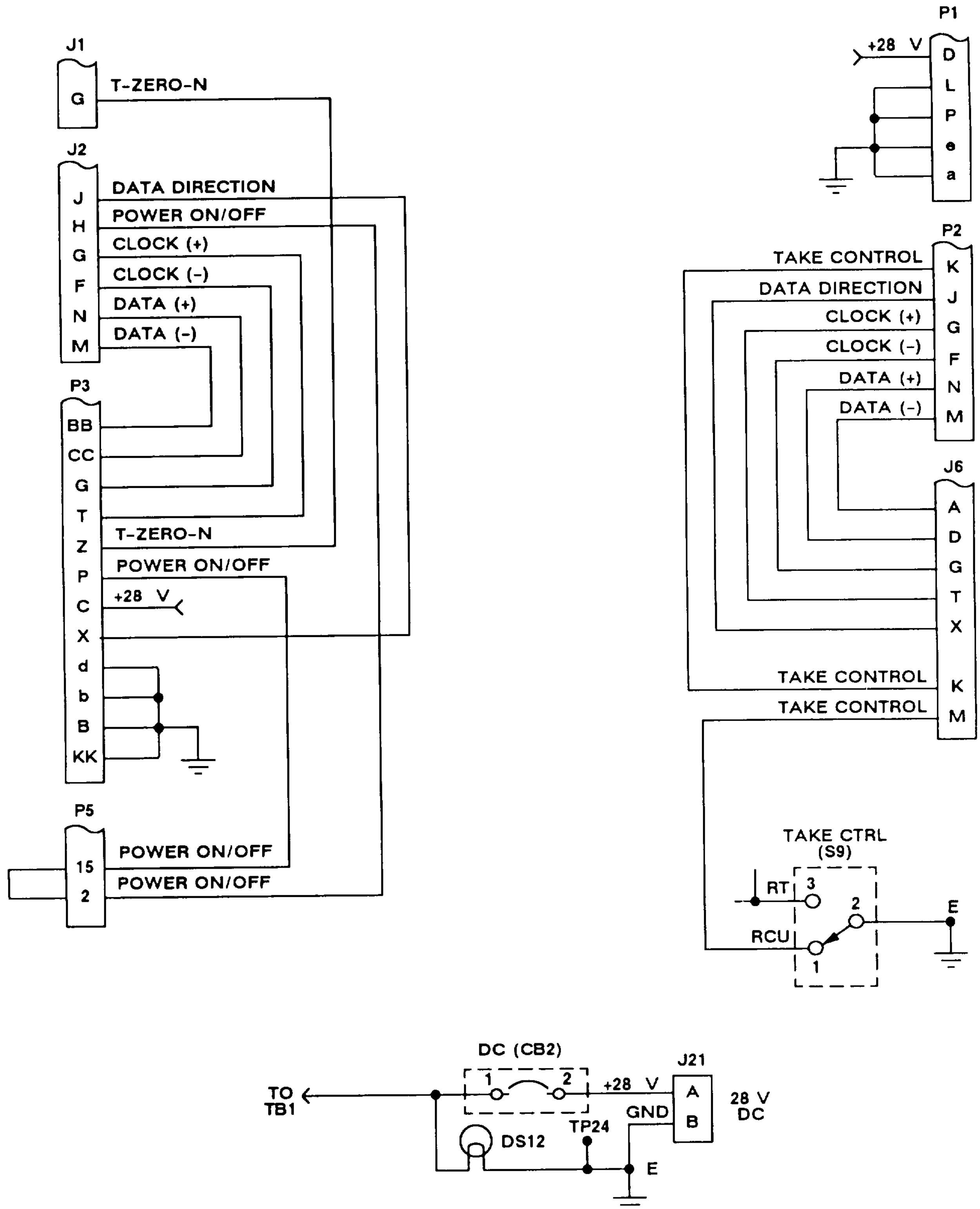


Figure 6-22. Troubleshooting Schematic 11, Reference Rcu Operation Paths

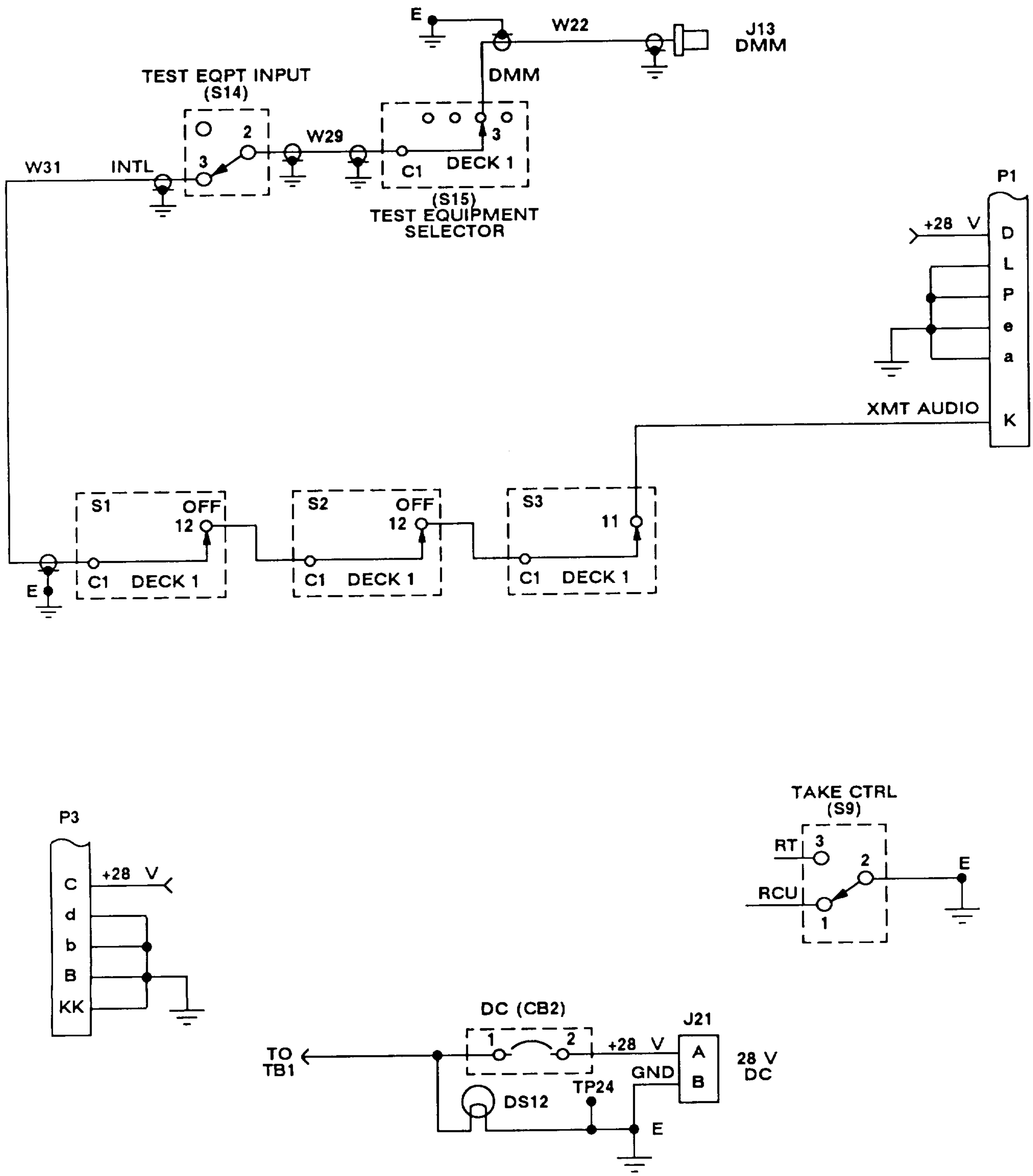


Figure 6-23. Troubleshooting Schematic 12, Reference Rcu RXMT Operation Paths

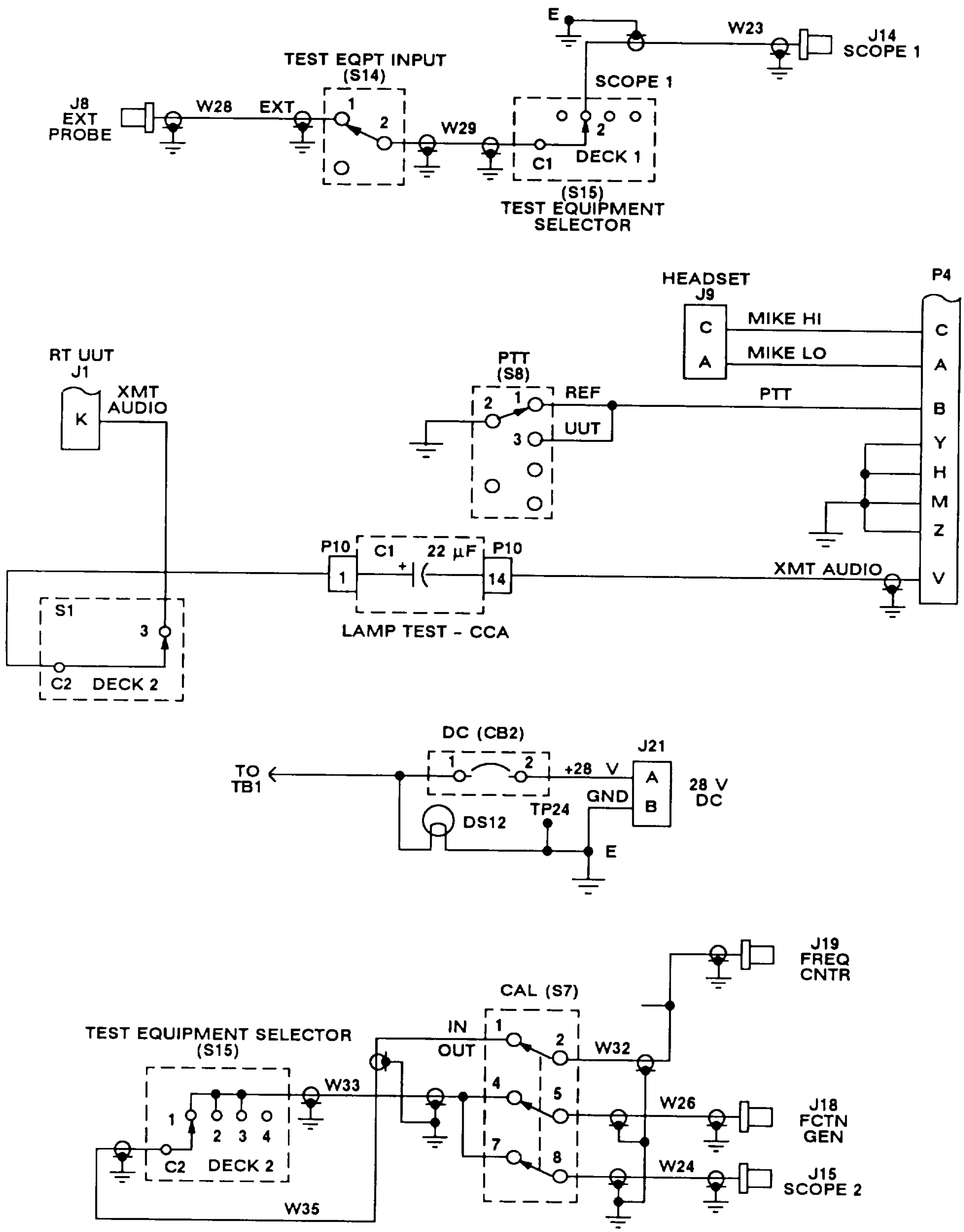


Figure 6-24. Troubleshooting Schematic 13, Reference Intercom Selector Operation Paths

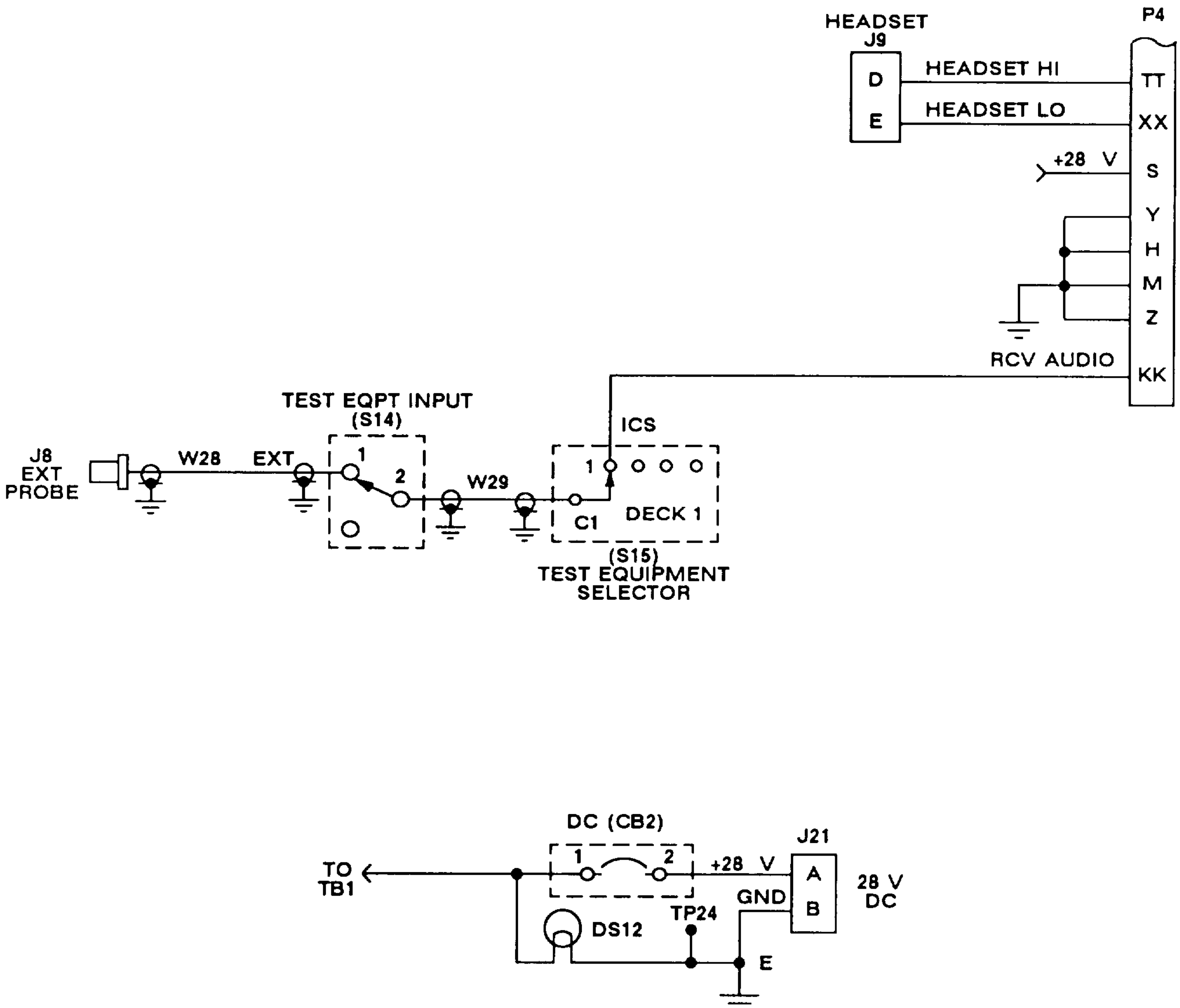


Figure 6-25. Troubleshooting Schematic 14, Intercom Selector Rcv Audio Paths

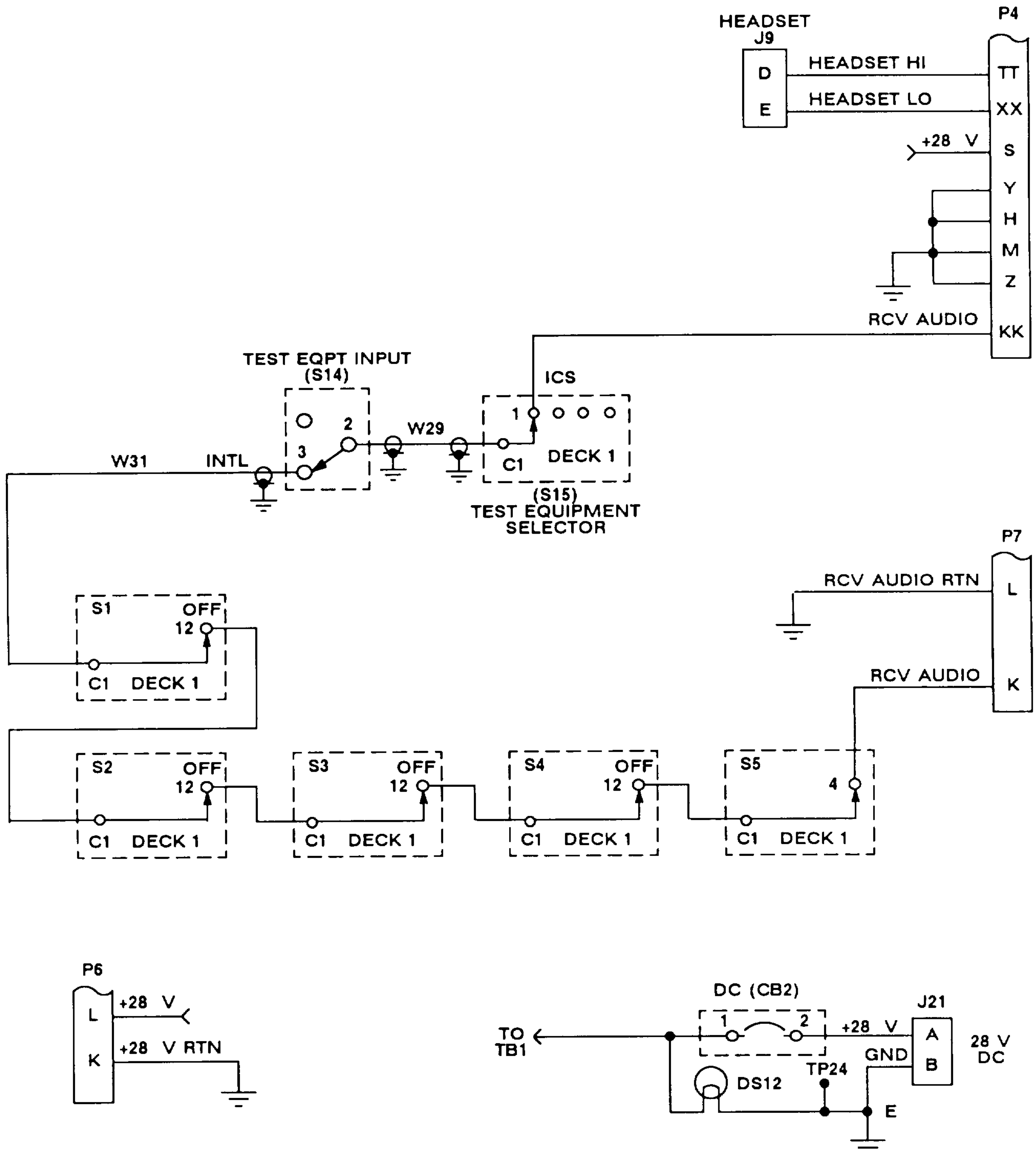


Figure 6-26. Troubleshooting Schematic 15, Reference Dra Self-Test Paths

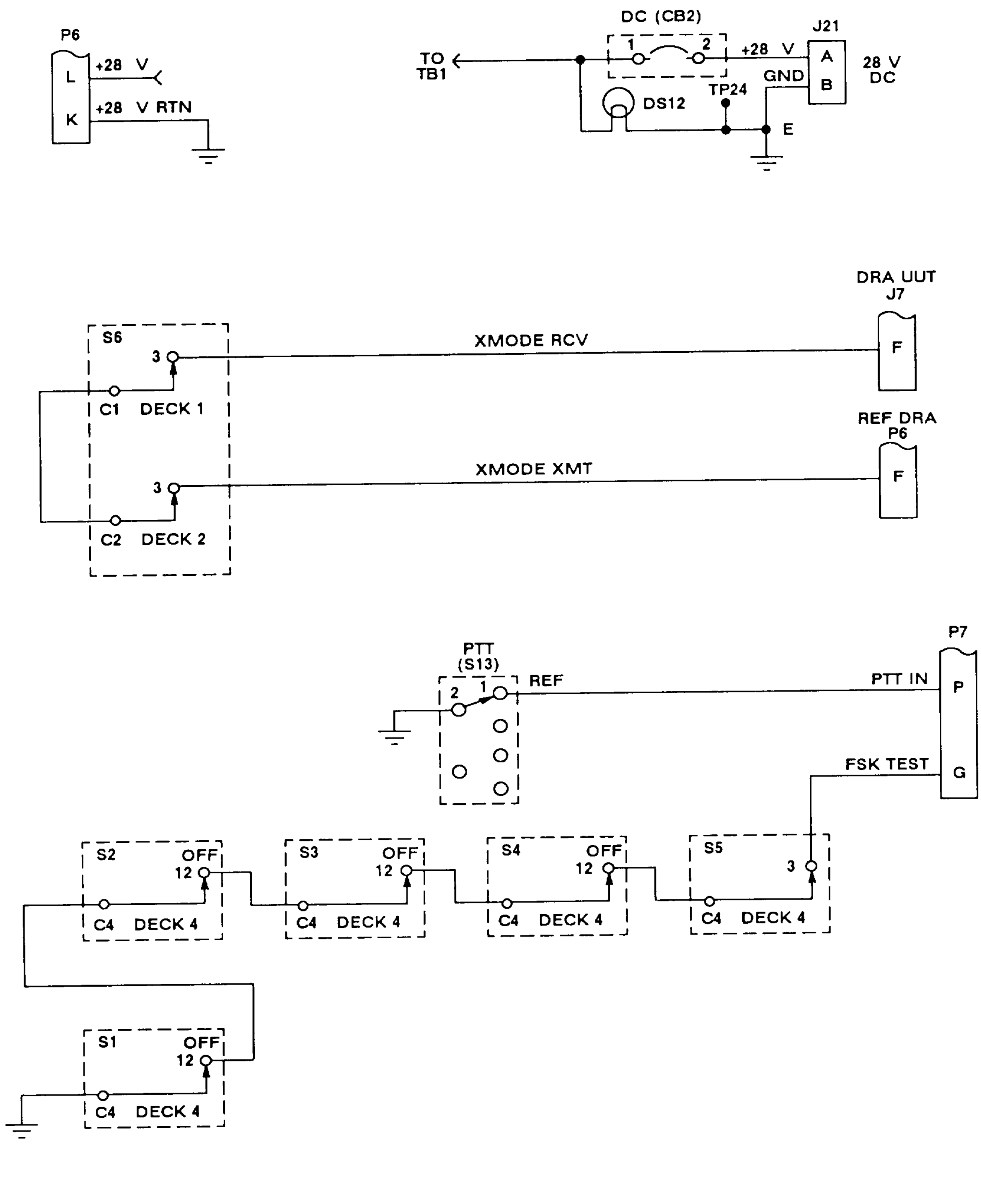


Figure 6-27. Troubleshooting Schematic 16, Reference Dra Operation Paths

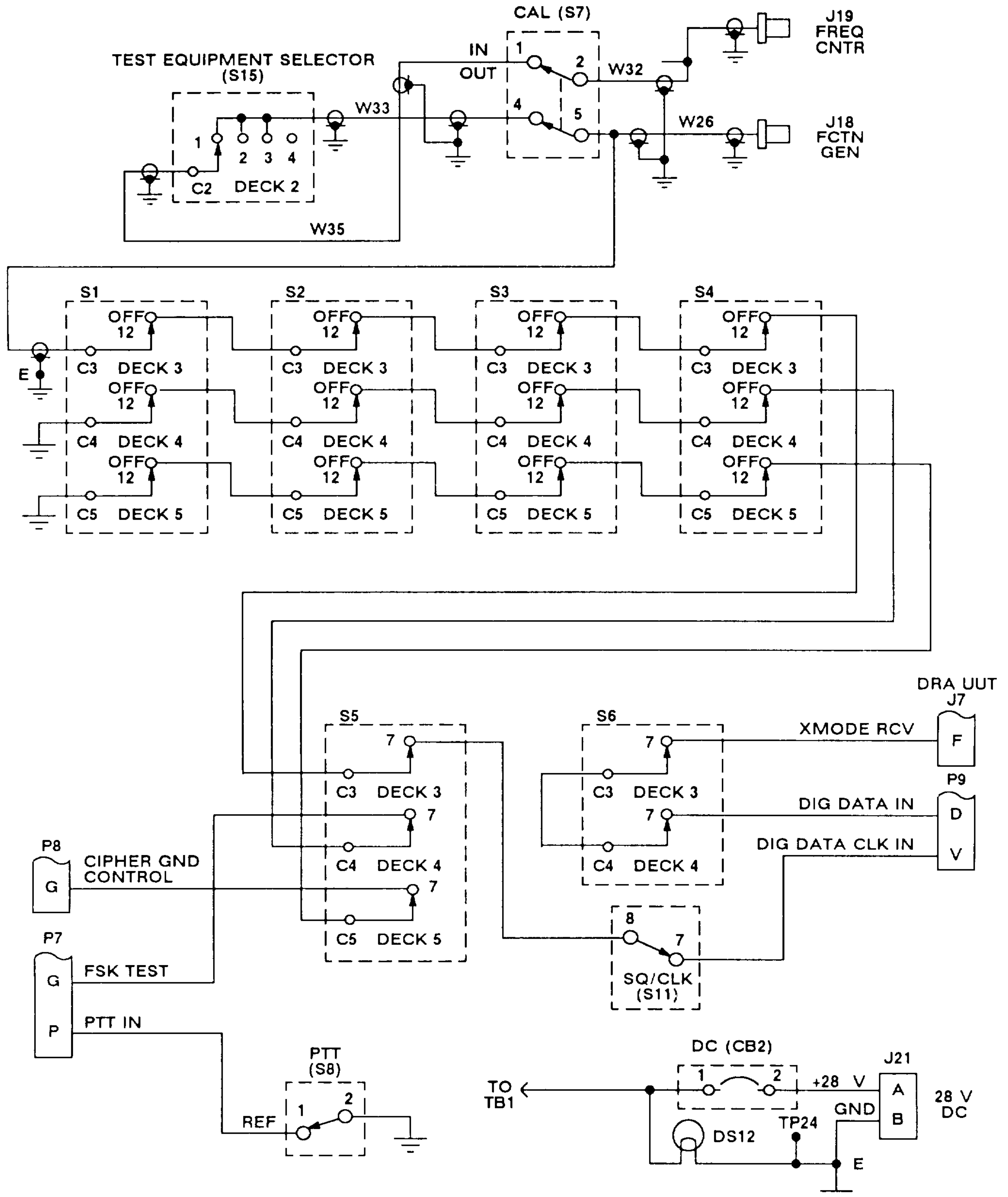


Figure 6-28. Troubleshooting Schematic 17, Reference Dra Xmt CT AD2 Paths

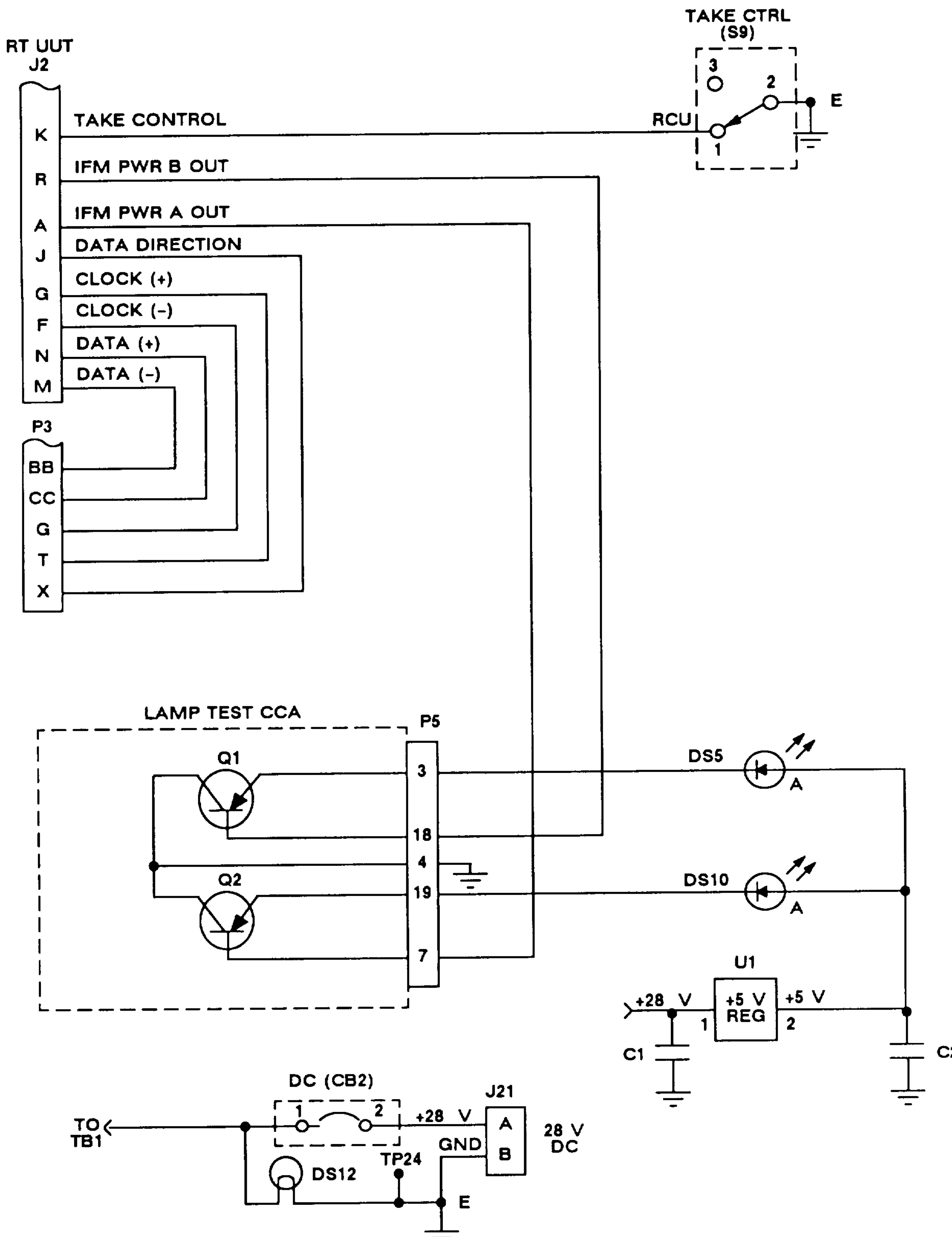


Figure 6-29. Troubleshooting Schematic 18, RT-1477 Front Panel Test Paths

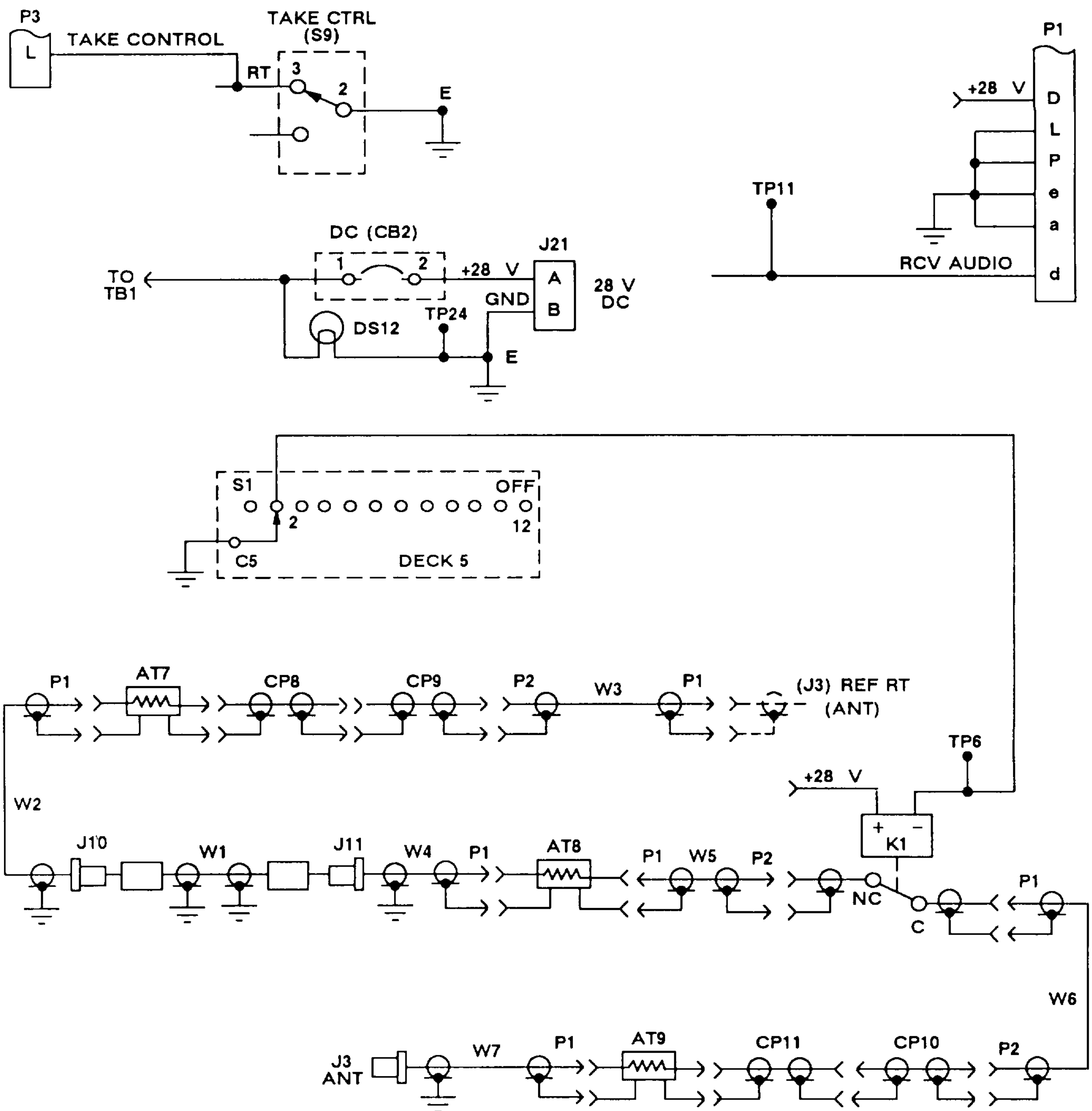


Figure 6-30. Troubleshooting Schematic 19, Rf Section (Relay K1) Test Paths

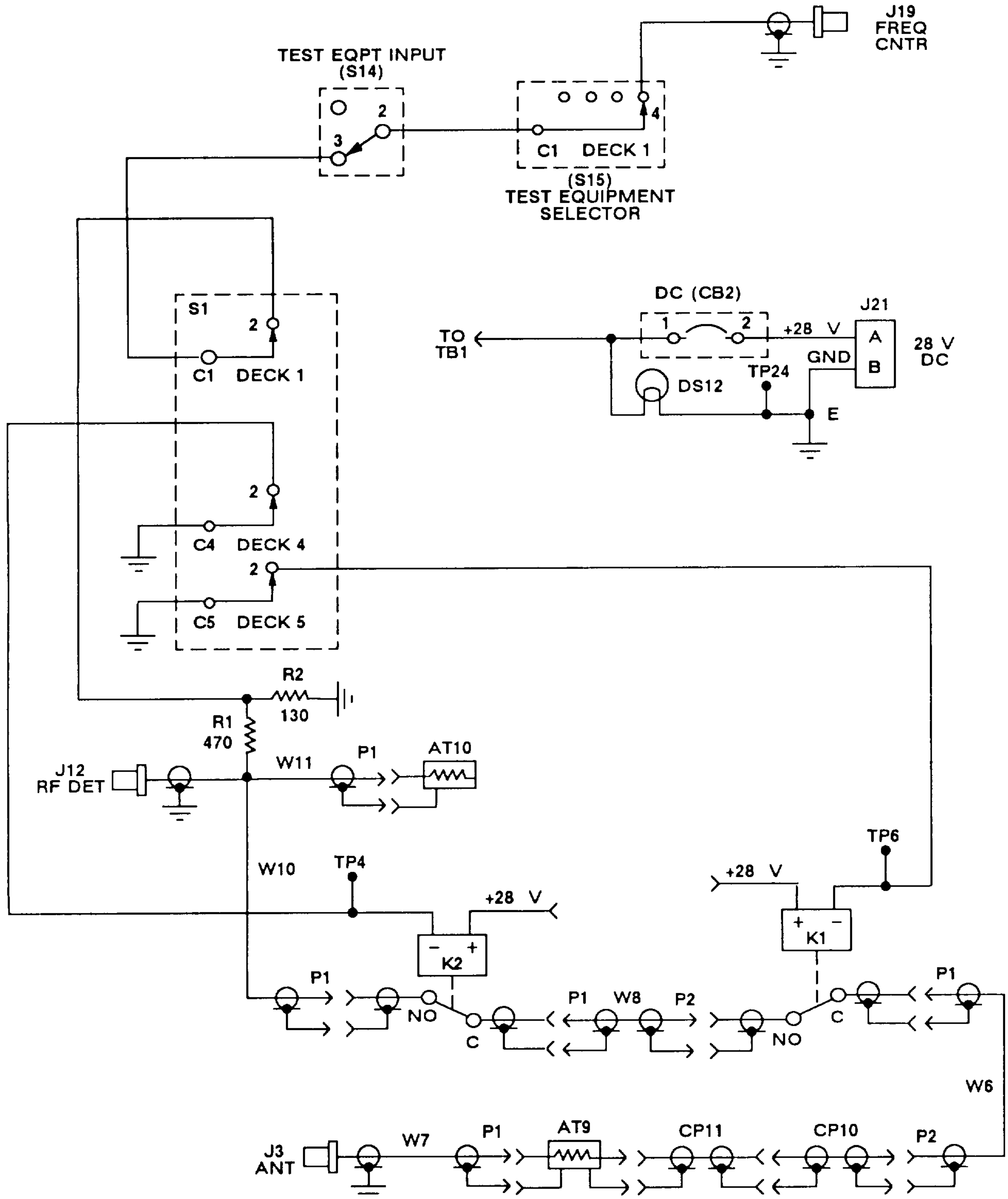


Figure 6-31. Troubleshooting Schematic 20, Rf Section (Relays K1 and K2) Test Paths

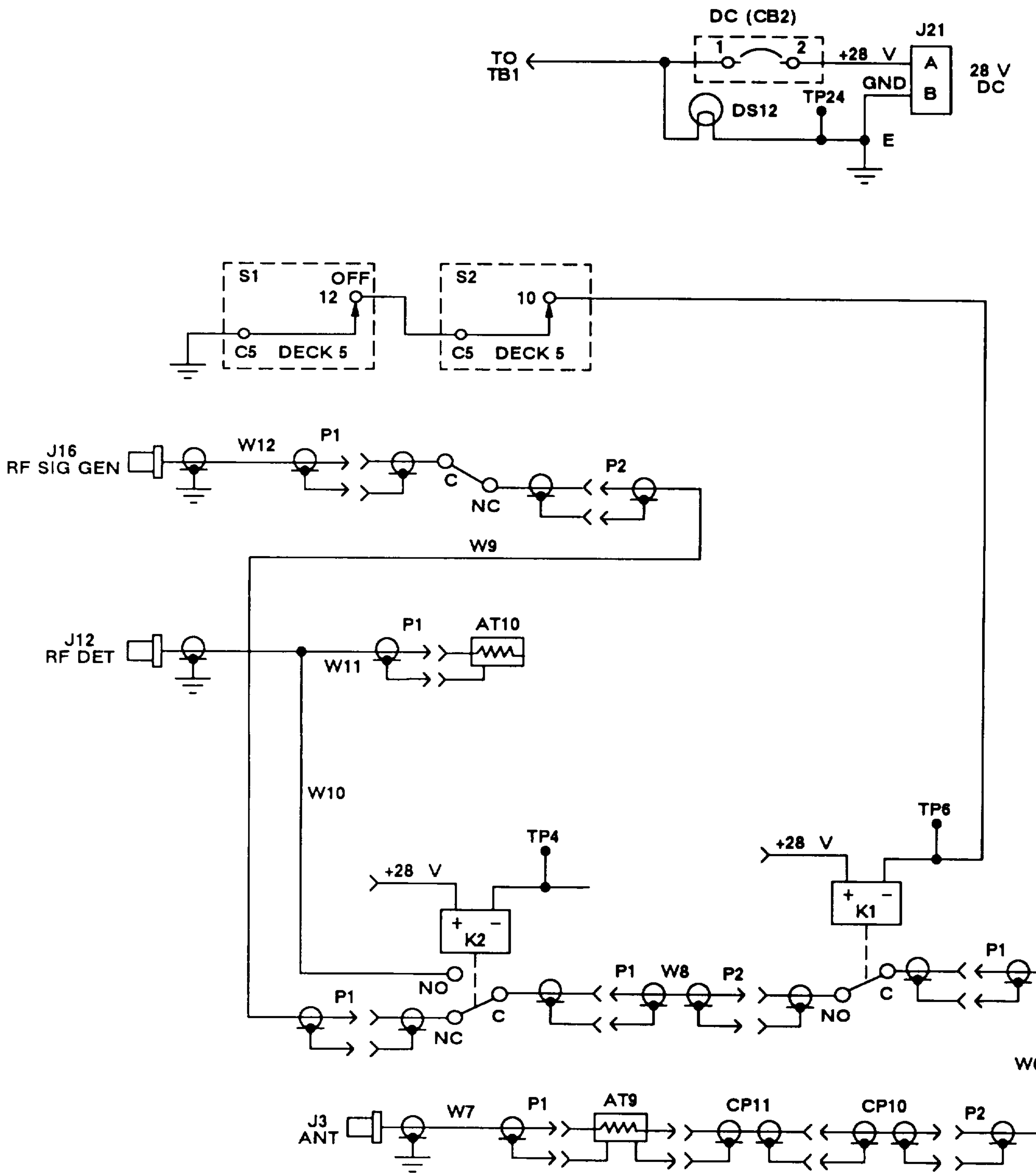


Figure 6-32. Troubleshooting Schematic 21, Rf Section (Relay K1) Test Paths

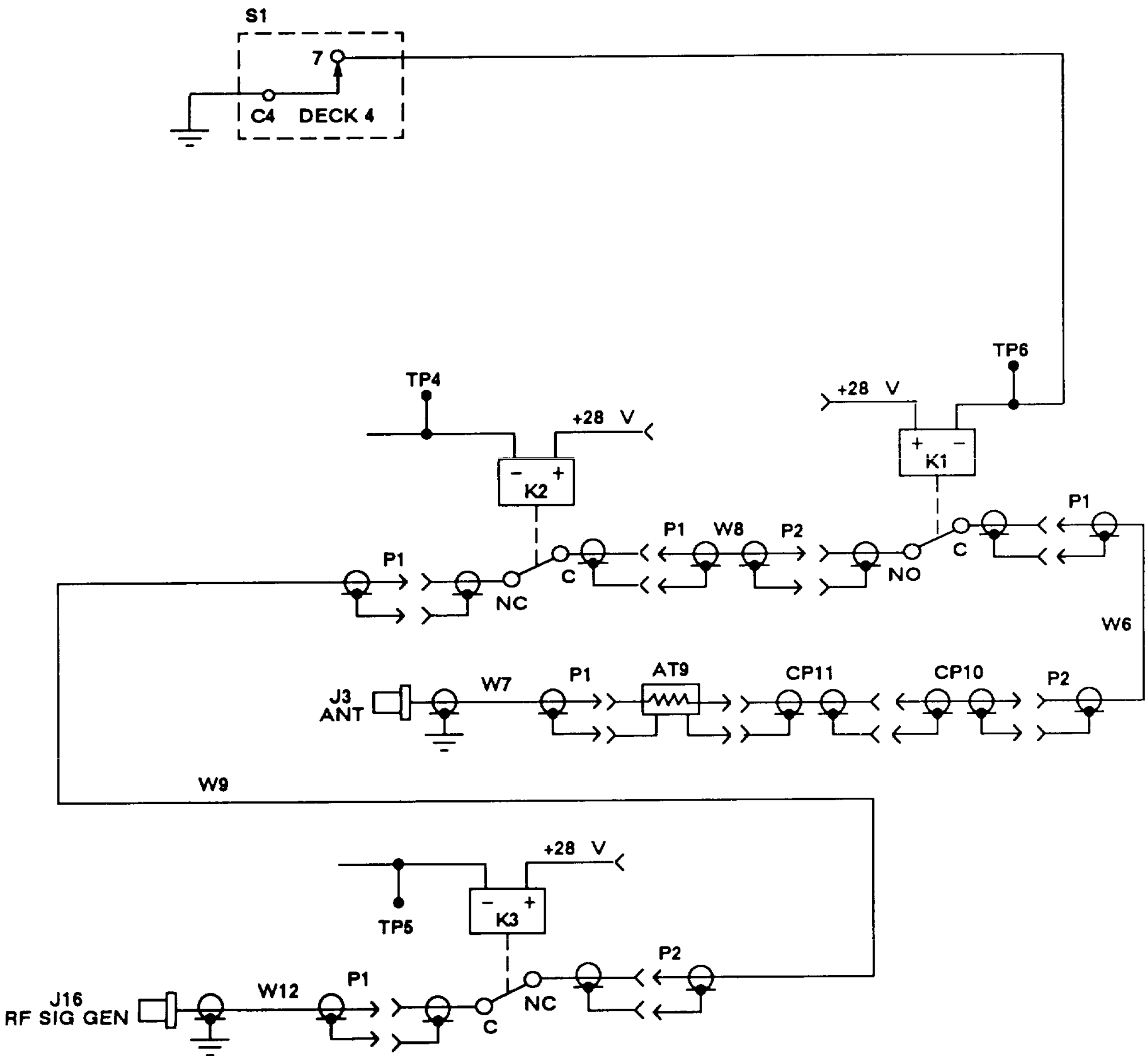


Figure 6-33. Troubleshooting Schematic 22, Rf Section (Relay K3) Test Paths

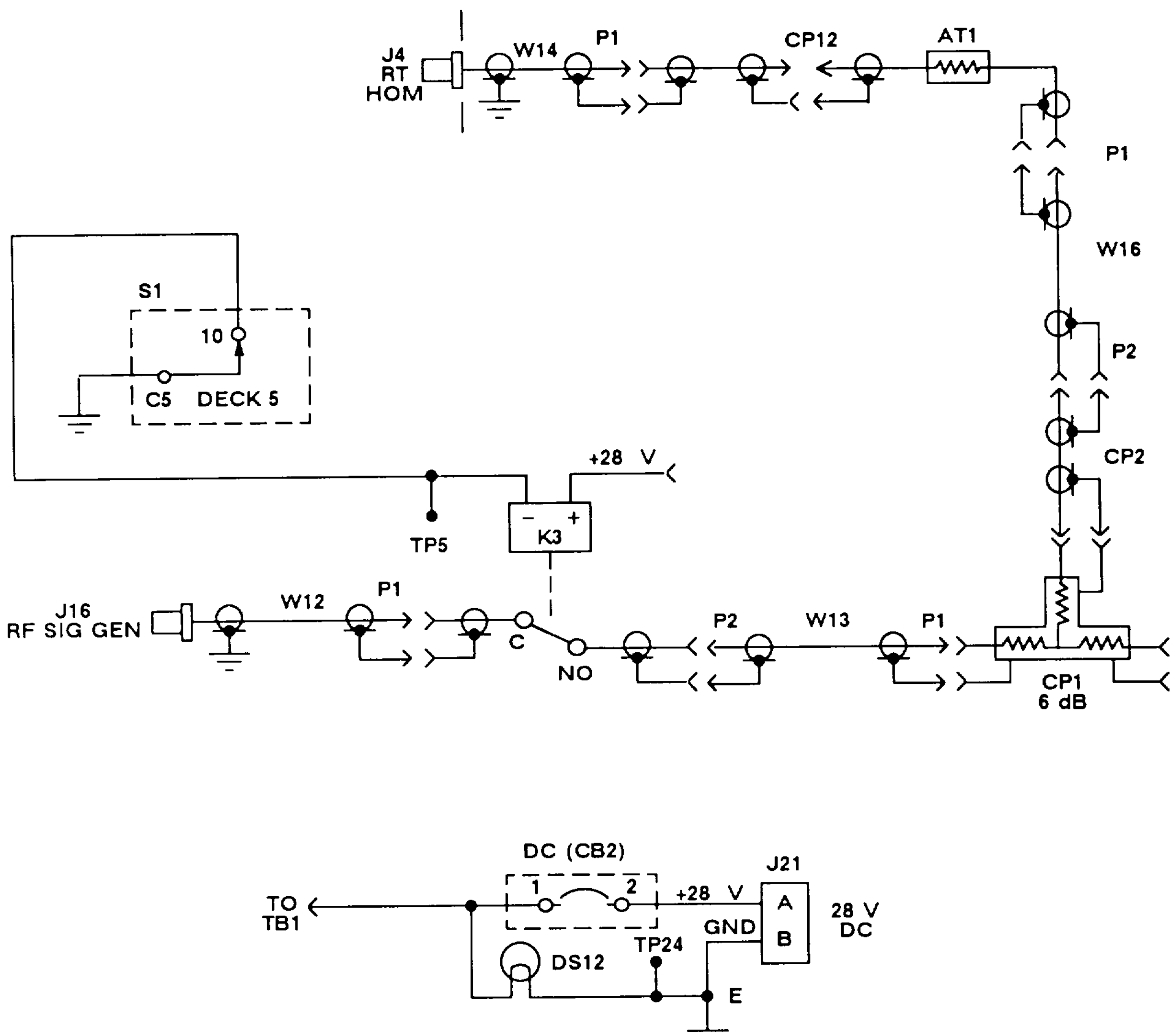
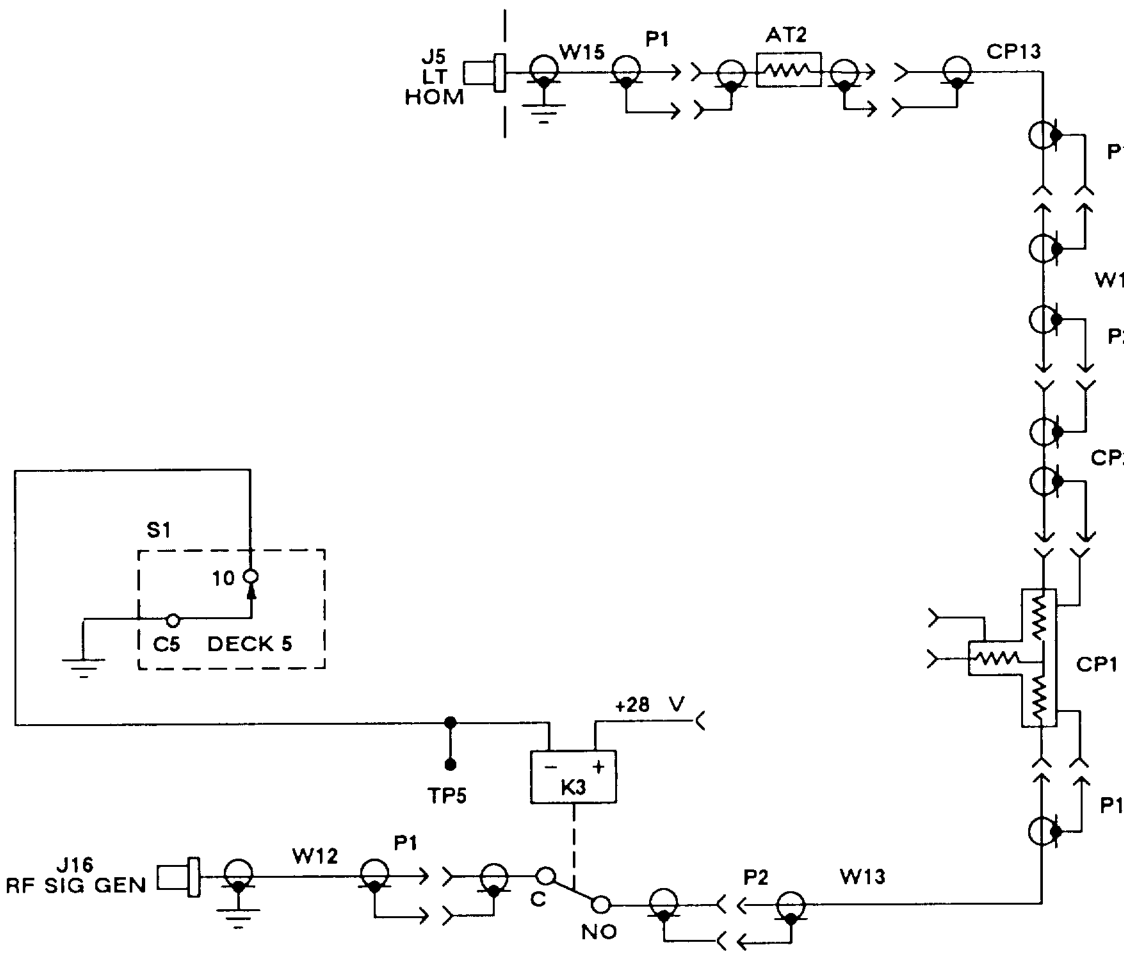


Figure 6-34. Troubleshooting 23, Rf Section (Right Homing) Test Paths



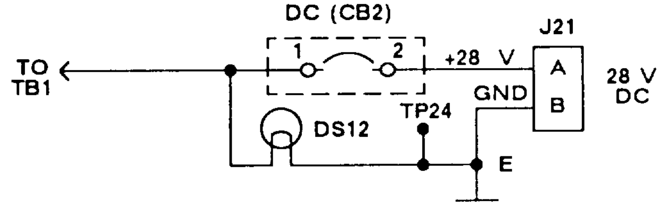


Figure 6-35. Troubleshooting Schematic 24, Rf Section (Left Homing) Test Paths

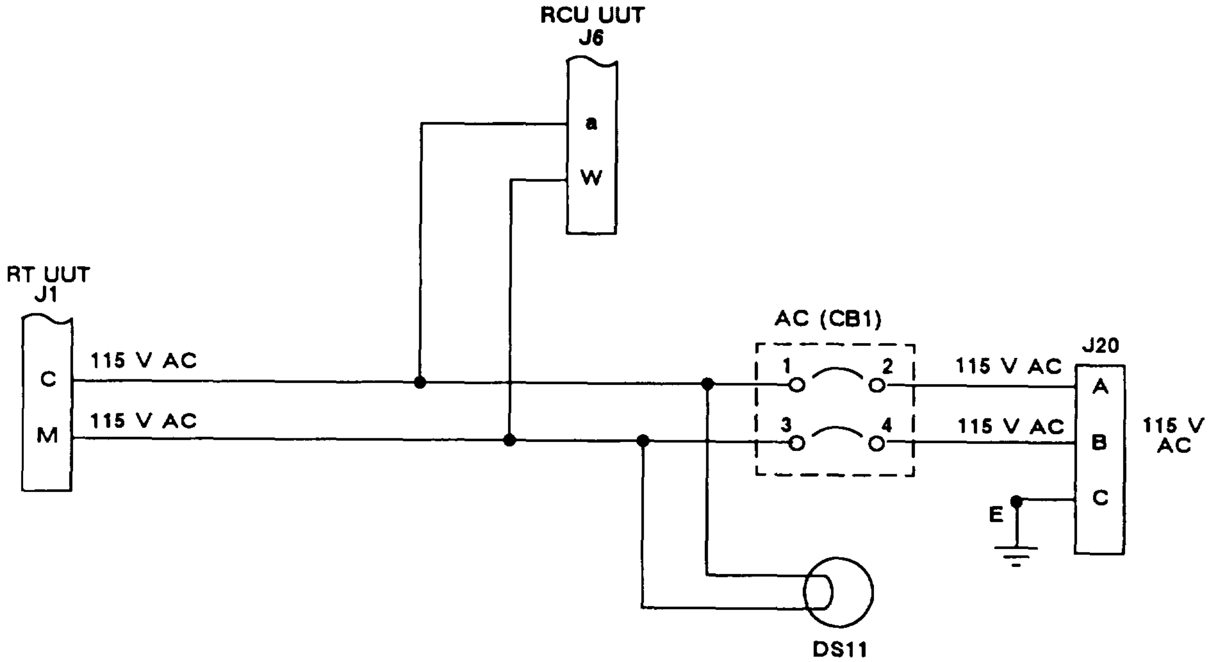


Figure 6-36. Troubleshooting Schematic 25, Ac Power Supply Test Paths

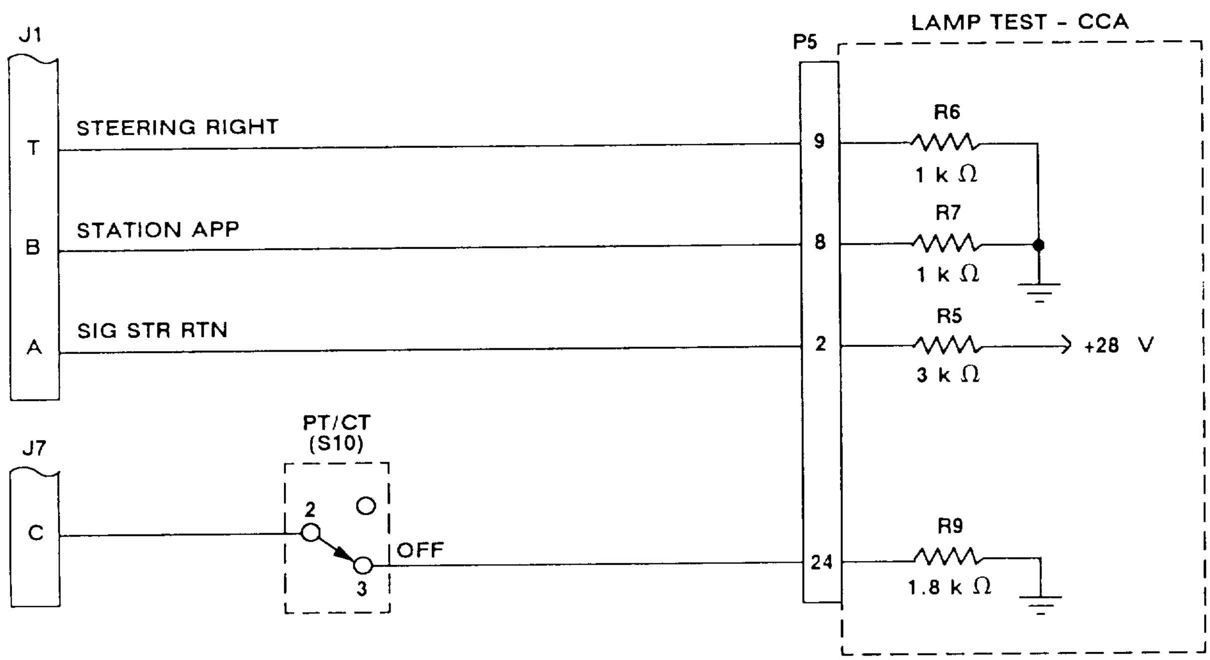
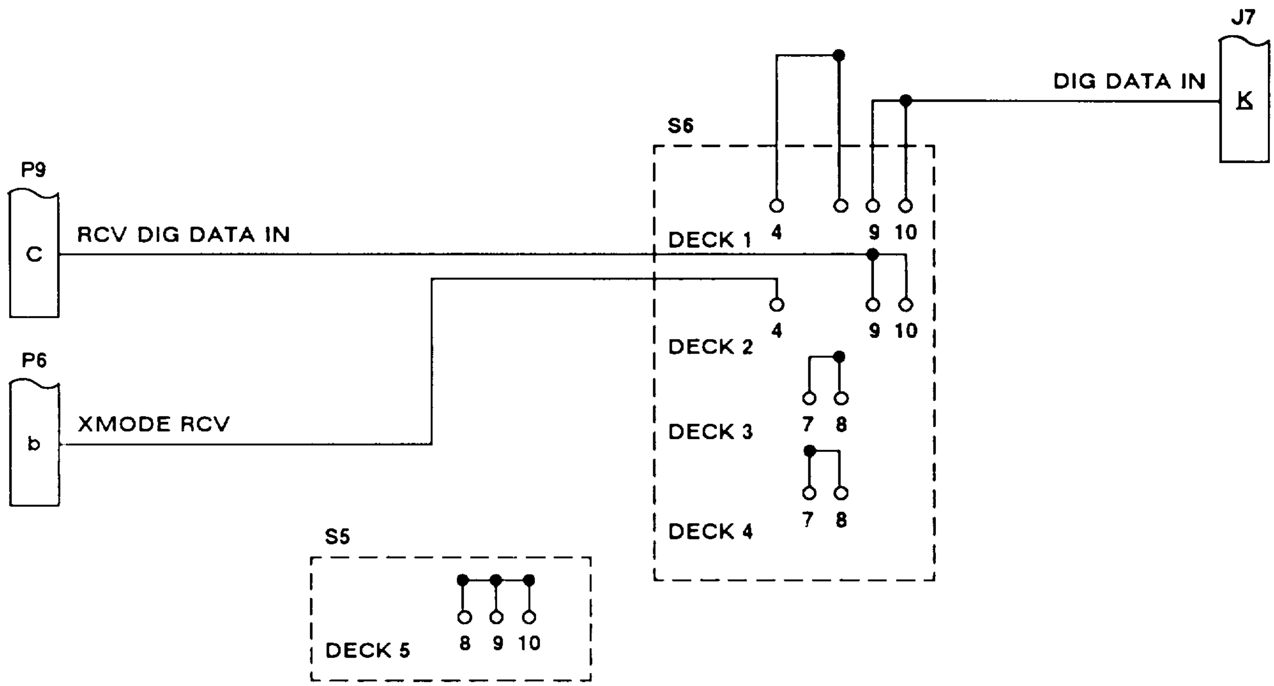


Figure 6-37. Troubleshooting Schematic 26, Test Adapter Resistors



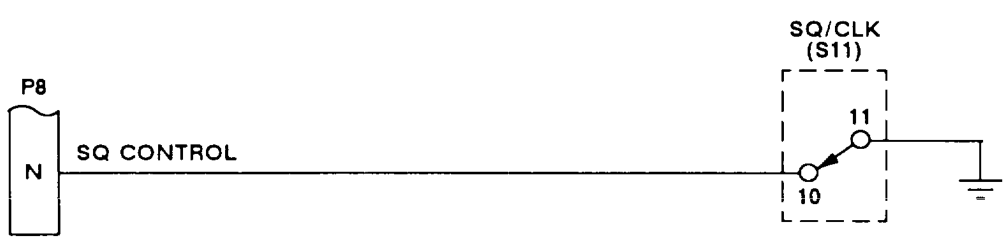


Figure 6-38. Troubleshooting Schematic 27, Test Lines Untested by OP CHECK

Section IV. MAINTENANCE PROCEDURES

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6-19. GENERAL

This section includes the operational check and the repair procedures, The operational check is used to verify the operation of a repaired maintenance group. lt will identify the troubleshooting chart to be used if anyfaultsare still present. When a fault is identified, repair it using the procedure in this section.

6-20. OPERATIONAL CHECK

The operational check provides a step-by-step procedure for evaluating a maintenance group. lf the operational check is passed, the maintenance group can be returned to service. If it does not, the fault will be identified or you will be referred to a troubleshooting chart or schematic. The troubleshooting charts and troubleshooting schematics are in section II.

The operational check is divided into steps. Each step verifies a particular function. Follow the instruction in the "Action'' column. Check the response. lf the response incorrect, proceed with the next lettered action. When a step has been completed, proceed to the next step. A “No response “ in the ''Response” column means that any response is not of interest.

WARNING

Connect the test setups only when directed, and with the power supply off. The large current capacity of the test power supply can cause personal injury. Verify the test setup before turning the power supply on.

CAUTION

During the operational check the rt cover is removed. Whenever the cover is removed, take all proper electro-static discharge (ESD) precautions. Static electricity can damage the rt modules.

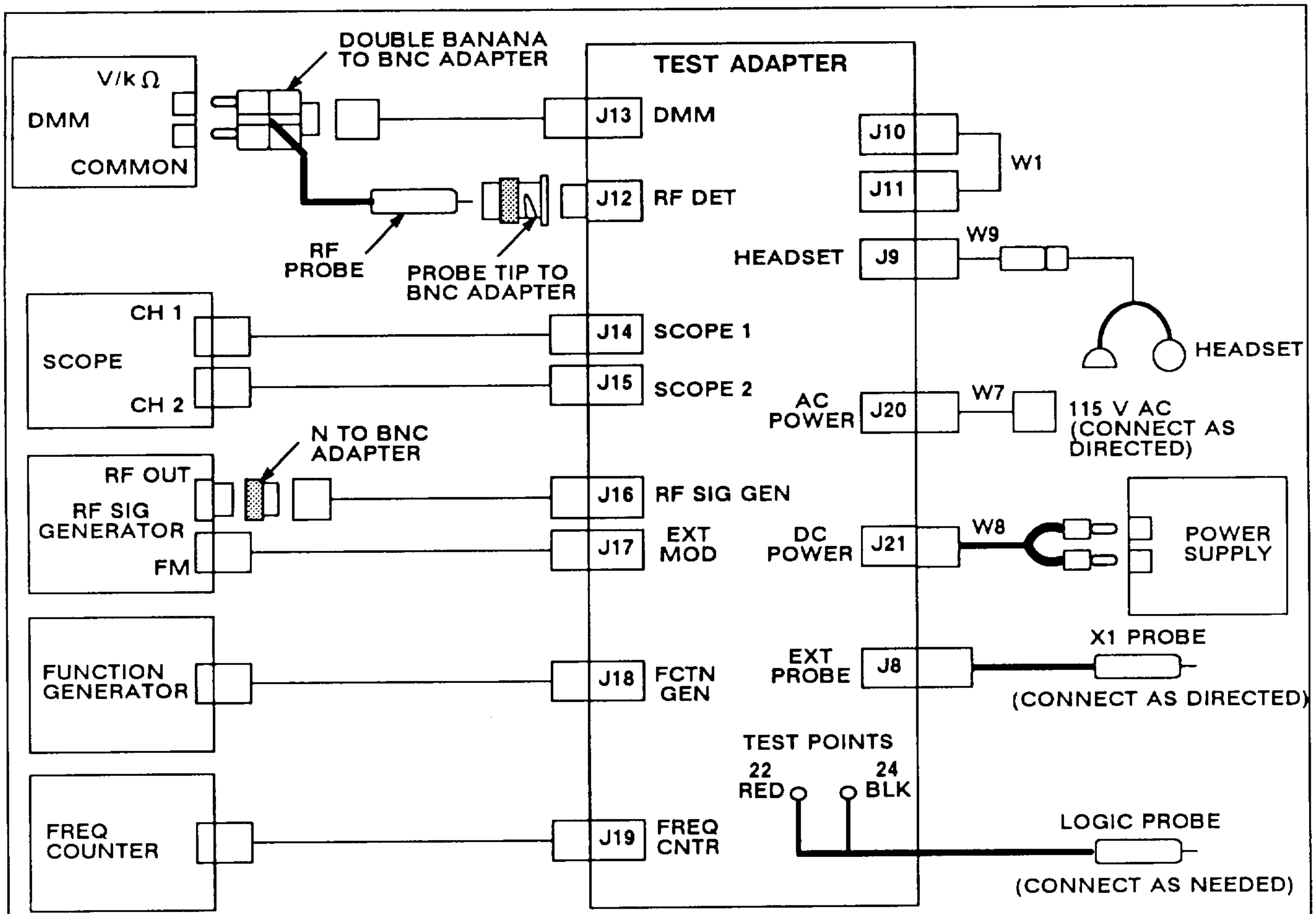
6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 1. DC POWER TEST	
a. Connect equipment as shown in figure 6-39. Set all switches as listed,	a. No response.
b. Set test adapter DC switch to ON.	b. DC switch stays ON. If DC trips OFF, go to chart 2. DC lamp is lit. If not, go to chart 3.
c. Set DMM to read voltage. Connect DMM probes to TP22 (+) and TP24 (-).	c. DMM reading is 6.25 to 7.25 V dc. If not, replace lamp test CCA. If still bad, use troubleshooting schematic 1.
Step 2. TEST LAMPS TEST	
a. Connect DMM probes to TP21(+) and TP24(-).	a. DMM reading is 4,5 to 5,5 V dc. If not, replace voltage regulator U1 and capacitor C2. If still bad, use troubleshooting schematics 1 and 2.
b. Set test adapter LAMP TEST switch (S16) to ON.	b. All test lamps light, If not, then do the following:

IF	THEN
No test lamps lit.	Replace LAMP TEST switch (S16).
Test lamps flicker on and off.	Replace LAMP TEST switch (S16).
One test lamp fails to light.	Go to chart 4.
Only test lamps 1 and 4 light.	Replace LAMP TEST switch (S16).
Only test lamps 2, 3, and 5 through 10 light.	Replace LAMP TEST switch (S16).

NOTE

If problem not corrected, use troubleshooting schematic 2.



EQUIPMENT PRESETS

TEST ADAPTER:
- AC : OFF
- DC : OFF
- S1 : OFF
- S2 : OFF
- S3 : OFF
- S4 : OFF
- S5 : OFF
- S6 : OFF
- CAL(S7) : OUT
- PTT(S8) : OFF
- TAKE CTRL(S9) : RT
- PT/CT(S10) : OFF
- SQ/CLK(S11) : OFF
- RXMT(S12) : OFF
- PTT(S13) : OFF
- TEST EQPT INPUT(S14) : INTL
- TEST EQUIPMENT SELECTOR(S15) : SCOPE

TEST POWER SUPPLY:
- LEVEL : 28 V DC
- CURRENT LIMIT : 4 A

FREQUENCY COUNTER
INPUT: 1 MΩ

REF RT AND REF RCU:
- FUNCTION : OFF
- PRESET : MAN
- IFM RF PWR : OFF
- MODE : SC
- VOL : FULLY CW

ICS:
- SELECTOR : 1
- TOP SWITCHES : OFF
- HOT MIKE : OFF
- VOL : FULLY CW

LOGIC PROBE: CMOS

Figure 6-39. Operational Check Test Setup Diagram

6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 3. REFERENCE RT SELF-TEST	
Set ref rt FUNCTION switch to Z-A then TEST.	Ref rt display reads: "---- - -" for 3s "E - " for 2s "88888 " for 7s "Good" for 8s If not, replace reference rt. If still bad, go to troubleshooting schematic 1.
Step 4. REFERENCE RT FREQUENCY LOAD TEST	
a. Set ref rt– FUNCTION: LD	a. No response.
b. Load the following frequencies into the presets shown.	b. Each frequency loads correctly, If not, ref rt is bad.

PRESET	FREQUENCY (kHz)
1	35875
2	39975
3	47175
4	55000
5	55700
6	72000
CUE	87600

ACTION	RESPONSE
c. Set ref rt– FUNCTION: SQ ON PRESET: MAN	c. No response.
d. Press .../TIME key on ref rt.	d. Ref rt display reads "00 ". If not, ref rt is bad.
Step 5. REFERENCE RT RF OUTPUT TEST	
a. Remove jumper WI from J10 and J11.	a. No response.
b. Connect DMM rf probe to J10 using setup shown in figure 6–40. Set DMM to read dB, 50 ohm reference.	b. No response.

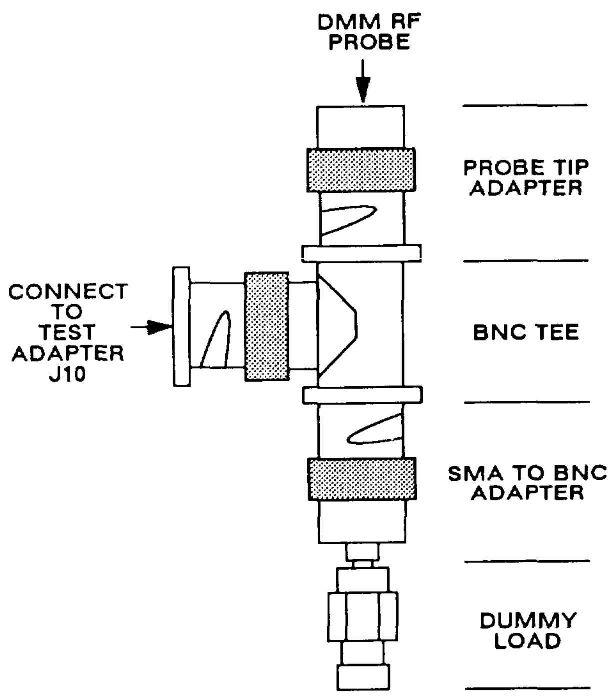


Figure 6-40. Rf Output Test Setup Diagram

6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE

Step 5. REFERENCE RT RF OUTPUT TEST. Continued

ACTION	RESPONSE
c. Set PTT switch (S8) to REF. Repeat for each PRESET switch position.	c. DMM reading is 17 to 23 dBm for each PRESET switch position. If not, go to chart 5.
d. Disconnect DMM rf probe and setup from J10. Connect frequency counter to J10, and set to 50 ohms for measuring frequency.	d. No response.
e. Set PTT switch (S8) to REF. Repeat for each ref rt PRESET switch position.	e. Frequency counter readings for each PRESET switch position are:

PRESET	FREQUENCY (Hz)
MAN	29999700 to 30000300
1	35874640 to 35875360
2	39974600 to 39975400
3	47174530 to 47175470
4	54999450 to 55000550
5	55699440 TO 55700560
6	71999280 TO 72000720
CUE	87599120 TO 87600880

If any are wrong, ref rt is bad.

Step 6. REFERENCE RT SC XMT AUDIO TEST

Presets:

SET REF RT–
PRESET: MAN

CONNECT–
JUMPER W1 FROM J10 TO J11
FREQUENCY COUNTER TO J19

SET TEST ADAPTER–
S3: 2
CAL(S7) : IN
TEST EQPT INPUT(S14) : EXT

SET FUNCTION GENERATOR–
FUNCTION: SINE
FREQ: 1 kHz (900 to 1100 Hz)
LEVEL: 1.0 V P-P (0.9 to 1.1 V P-P)

ACTION	RESPONSE
Connect X1 probe to TP11, set PTT switch (S8) to REF, and hold.	Scope channel 1 displays sine wave: 1 kHz (900 to 1100 Hz) 4.0 V P-P (2.0 to 6.0 V P-P) If not, go to chart 6.

6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE

Step 7. REFERENCE RT SC XMT DIGITAL TEST

Presets:

SET TEST ADAPTER–
S1:9
S3: OFF

SET FUNCTION GENERATOR–
FUNCTION: SQUARE
FREQ: 1kHz (990 to 1010 Hz)

SET FREQ COUNTER INPUT TO 1 Mfl AND THEN FUNCTION GENERATOR LEVEL TO 10 V P-P (9 TO 11 v P-P)

ACTION	RESPONSE
Connect XI probe to TP9, set PTT switch (S8) to REF, and hold.	Scope channel 1 displays square wave: 1 kHz (990 to 1010 Hz) Duty cycle same as square wave on scope channel 2. (voltage may not be the same) If not, go to chart 7.

Step 8. REFERENCE RT SC RCV AUDIO TEST

Presets:

SET REF RT–
FUNCTION: SQ OFF

SET TEST ADAPTER–
S1: OFF

SET SIGNAL GENERATOR–
FREQ: 30 MHz
LEVEL: -60 dBm
FM MODE: INT
MODULATION: 1 kHz at 6 to 7 kHz deviation

CONNECT: SIGNAL GENERATOR OUTPUT TO J10, AFTER REMOVING JUMPER W1 FROM J10 AND J11.

ACTION	RESPONSE
Connect ext probe to TP11 .	Scope channel 1 displays 5 TO 11 V P-P level. If not, replace reference rt. If still bad, use troubleshooting schematics 4 and 5.

Step 9. REFERENCE RT SC RCV DIGITAL TEST

ACTION	RESPONSE
Connect ext probe to TP10.	Scope channel 1 displays a 5 to 11 V P-P signal. If not, replace reference rt. If still bad, go to troubleshooting schematic 7.

6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE

Step 10. REFERENCE RT SQUELCH TEST

ACTION	RESPONSE
a. Set test adapter– S1:3 TEST EQPT INPUT (S14) : INTL	a. No response.
b. Watch scope while turning ref rt FUNCTION switch from SQ OFF to SQ ON.	b. Scope channel 1 displays an 8.0 V P-P (5 to 11 V P-P) signal when FUNCTION switch is set to SQ OFF, and O V P-P when FUNCTION switch is set to SQ ON. If not, go to chart 8.

Step 11. REFERENCE RT RCV SENSITIVITY TEST

Presets:

SET REF RT–
FUNCTION: SQ OFF

SET SIGNAL GENERATOR–
FREQ: 30 MHz
LEVEL: -90 dBm
FM MODE: INT
MODULATION: 1 kHz at 6 to 7 kHz deviation

Watch scope channel 1 when the following settings are made:

REF RT PRESET	RF SIGNAL GENERATOR FREQ
MAN	30.000 MHz
4	55.000 MHz
5	55.700 MHz
CUE	87.600 MHz

Scope channel 1 displays sine wave for each PRESET position:
1 kHz (900 to 1100 Hz)
8.0 V P-P (5 to 11 V P-P)

If not, ref rt is bad.

Step 12. RT-1476 REFERENCE RT FILL TEST

Presets:

SET REF RT–
FUNCTION: STOW, THEN Z-A, THEN LD-V
PRESET: 1
MODE : FH

SET TEST ADAPTER–
S1: OFF

SET ECCM FILL DEVICE–
FUNCTION: OFF
SELECT: T1 OR T2

CONNECT ECCM FILL DEVICE–
REF RT FILL CONNECTOR

6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 12. RT-1476 REFERENCE RT FILL TEST. Continued	
a. Set ECCM fill device function switch to ON.	a. No response.
b. On ref rt, press H-Ld.	b. Ref rt display reads: " LOAd " " Sto t" "FILL 1" If not, reference rt is bad.
c. Set ECCM fill device select switch to any hop-set position.	c. No response.
d. Set ref rt FUNCTION switch to LD.	d. No response.
e. On ref rt, press H-Ld.	e. Ref rt display reads " LOAd" and "HFnnn" (n = 0-9). If not, ref rt is bad.
f. On ref rt, press Sto/ENT.	f. Ref rt display reads " Sto ". If not, ref rt is bad.
g. On ref rt, press 1,	g. Ref rt display reads " Sto 1 ". If not ref rt is bad.

Step 12A. RT-1476A REFERENCE RT FILL TEST

Presets:

SET REF RT–
FUNCTION: STOW, THEN Z-A, THEN LD
PRESET: 1
MODE: FH

SET TEST ADAPTER–
S1: OFF

SET ECCM FILL DEVICE–
FUNCTION: OFF
SELECT: ANY HOPSET

CONNECT ECCM FILL DEVICE–
REF RT FILL CONNECTOR

ACTION	RESPONSE
a. Set ECCM fill device function switch to ON.	a. No response.
b. On ref rt, press LOAD.	b. Ref rt display reads " LOAd" and " HFnnn" (n = 0-9). If not, reference rt is bad.
c. On ref rt, press STO.	c. Ref rt display reads " Sto ". If not, ref rt is bad.
d. On ref rt, press 1.	d. Ref rt display reads "Sto 1 ". If not ref rt is bad.

]6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE

Step 13. REFERENCE RT/RCU UUT INTERFACE CLOCK AND DATA TEST

Presets:

SET ECCM FILL DEVICE TO OFF, AND DISCONNECT FROM REF RT.

SET REF RT–
FUNCTION: SQ ON
MODE: SC

ACTION	RESPONSE
a. Use logic probe to check J6-A when ref rt FUNCTION switch is turned from SQ ON to TEST.	a. Logic probe shows digital signals are present during self-test. If not, go to chart 9.
b. Repeat for J6-D, -G, and -T.	b. Logic probe shows digital signals are present on each during self-test, (Pulse at J6-T is of short duration. Use memory on logic probe.) If not, go to chart 9.

Presets:

SET REF RT AND REF RCU–
FUNCTION: OFF
PRESET: MAN

CONNECT TEST CABLE W12 FROM J2 TO J6.

ACTION	RESPONSE
Set ref rt FUNCTION switch to SQ ON.	Ref rcu display reads “30000”. If not, go to chart 10.

Step 15. REFERENCE RCU TEST

Presets:

SET REF RT FUNCTION SWITCH TO OFF.

SET TEST ADAPTER–
TAKE CTRL (S9) : RCU
TEST EQPT INPUT (S14) : EXT
TEST EQUIPMENT SELECTOR (S15) : DMM

ACTION	RESPONSE
a. Set ref rcu FUNCTION switch to Z-A then TEST.	a. Ref rcu display read: " - - - - - “ for 3s (ref rt is “30000”) “E -” for 2s “8 888 8“ for 7s “Good” for 8s If not, go to chart 11.

6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 15. REFERENCE RCU TEST. Continued	
b. Set ref rcu FUNCTION switch to Z-A then TEST,	b. Ref rt display read: · - - - - -“ for 3s (ref rt is “30000”) “E -“ for 2s NOTE: Ignore displays after “ E -”. If not, go to chart 12.
c. Set ref rcu FUNCTION switch to SQ ON.	c. Ref rcu display reads “30000”. If not, ref rcu is bad.
d. Disconnect test cable W12 from J2.	d. No response.
e. Use ext probe to check voltage at J2-H.	e. DMM reading is 24 to 31 V dc. If not, replace lamp test CCA. If still bad, go to troubleshooting schematic 11.
1. Reconnect test cable W12 to J2.	f. No response.
g. Press ref rcu • ••/TIME key.	g. Ref rcu display reads “00 “. If not, ref rcu is bad.
h. Set test adapter– S1:3 TEST EQPT INPUT (S14) : INTL TEST EQUIPMENT SELECTOR (S15) : SCOPE	h. No response.
i. Set ref rcu FUNCTION switch to SQ OFF.	i. Scope channel 1 displays noise signal with a level greater than or equal to 5 V P-P. If not, go to chart 13.
j. Set test adapter– S1: OFF S3: 11 TEST EQUIPMENT SELECTOR (S15) : DMM	j. No response.
k. Set ref rcu FUNCTION switch to RXMT.	k. DMM reading is greater than or equal to 6 V dc. If not, go to chart 15.

6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 15. REFERENCE RCU TEST. Continued	
l. Set ref rcu PRESET switch to positions 1 through CUE, one at a time. For each PRESET position, turn the ref rcu FUNCTION switch from SQ ON to TEST and watch the display,	l. Ref rcu display reads: " - - - - - " for 3s "E -" for 2s "8 888 8" for 7s "Good" for 8s for each PRESET switch position. If not, ref rcu is bad.
m. Set ref rcu PRESET switch to MAN.	m. No response
n. Set ref rcu IFM-RF PWR switch to the LO, NORM, and HI positions. For each position, turn the ref rcu FUNCTION switch from SQ ON to TEST, and watch the display.	n. Ref rcu display reads: " - - - - - " for 3s "E -" for 2s "8 888 8" for 7s "Good" for 8s for each IFM-RF PWR switch position. If not, ref rcu is bad.
o. Set ref rcu IFM-RF PWR switch to OFF.	o. No response,
p. Set ref rcu MODE switch to the HOM, FH, and FH-M positions. For each position, turn the ref rcu FUNCTION switch from SQ ON to TEST, and watch the display,	p. Ref rcu display reads: " - - - - - " for 3s "E -" for 2s "8 888 8" for 7s "Good" for 8s for each MODE switch position. If not, ref rcu is bad.
q. Set ref rcu– MODE: FH PRESET: 1	q, No response.
r. Connect ECCM fill device to ref rt FILL connector.	r. No response,
s. If ref rcu is C-11466A, go to step w.	s. No response.
t. Set ref rcu– FUNCTION: LD-V	t. No response.

6-20. OPERATIONAL CHECK, Continued

ACTION	RESPONSE
Step 15. REFERENCE RCU TEST. Continued	
u. Set ECCM fill device– Function: ON Select: T1 or T2	u. No response.
v. On ref rcu, press H-Ld.	v. Ref rcu display reads: “LOAd” then “Hid t“ If not, ref rcu is bad.
w. Set ref rcu FUNCTION switch to LD.	w. No response.
x. Set ECCM fill device select switch to any hop-set.	x. No response.
y. Press ref rcu LOAD (H-Ld) key.	y, Ref rcu display reads “ LOAd” and “ HFnnn” (n = 0-9). If not, ref rcu is bad.
z. On ref rcu, press STO (Sto/ENT).	z. Ref rcu display reads “Sto “ . If not, ref rcu is bad.
aa. On ref rcu, press 1.	aa. Ref rcu display reads “Sto 1 “. If not, ref rcu is bad.
ab. Turn ECCM fill device off and disconnect from ref rt.	ab. No response.
ac. Set ref rcu— FUNCTION: Z-A MODE: SC	ac. Ref rcu display reads “Good”. If not, ref rcu is bad.
ad. Set DMM to measure resistance. Connect DMM probes to J1-G(+) and TP24(-).	ad. DMM reading is less than 5 ohms. If not, replace reference rcu. If still bad, go to troubleshooting schematic 11.
ae, Set ref rcu FUNCTION switch to LD.	ae. No response.
af. Load these frequencies one after another into PRESET 1 of the ref rcu: 31250 78950 46000	af. Each frequency loads correctly. If not, ref rcu is bad,

6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE

Step 16. INTERCOMMUNICATIONS SYSTEM XMT AUDIO TEST

Presets:

SET ICS–	SET TEST ADAPTER–	SET FUNCTION GENERATOR–
1:ON	S1:3	FUNCTION: SINE
SELECTOR: 1	S3: OFF	FREQ: 1 kHz (900 to 1100 Hz)
AUX: OFF	TEST EQPT INPUT (S14) : EXT	LEVEL: 100 mVP-P (90 to 110 mV P-P)
NAV: OFF	TEST EQUIPMENT SELECTOR (S15) : SCOPE	
HOT MIKE: OFF		
VOL: FULLY CW		

CONNECT: TEST CABLE W14 FROM FUNCTION GENERATOR OUTPUT TO J9.

ACTION	RESPONSE
Use ext probe to check J1 -K while holding PTT switch (S8) at REF.	Scope channel 1 displays sine wave: 1 kHz (900 to 1100 Hz) greater than 8 V P-P level If not, go to chart 14.

Step 17. INTERCOM SELECTOR RCV AUDIO TEST

Presets:

SET TEST ADAPTER–	SET FUNCTION GENERATOR–
TEST EQUIPMENT SELECTOR (S15) : ICS	FUNCTION: SINE
	FREQ: 1 kHz (900 to 1100 Hz)
	LEVEL: 5 V P-P (4.5 to 5.5 V P-P)

REMOVE: EXT PROBE AND TEST CABLE W14.

CONNECT: -FUNCTION GENERATOR OUTPUT TO J8
-SCOPE PROBE TO SCOPE CHANNEL 1 INPUT (GND PROBE TO TP24)

ACTION	RESPONSE
Use scope probe to check J9-D.	Scope channel 1 displays sine wave: 1 kHz (900 to 1100 Hz) 5 v P-P (4.5 to 5.5 v P-P) If not, go to chart 16.

6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE

Step 18. DATA RATE ADAPTER TEST

Presets:

SET TEST ADAPTER–
S1: OFF
S5: 4
TAKE CTRL (S9): RT
TEST EQPT INPUT (S14): INTL
DC: OFF

SET FUNCTION GENERATOR–
FUNCTION: SQUARE
FREQ: 16 kHz (14400 to 17600 Hz)
LEVEL: 5 VP-P (4.5 to 5.5 VP-P)

CONNECT: -HEADSET TO J9 USING TEST CABLE W9
-FUNCTION GENERATOR OUTPUT TO J18
-EXT PROBE TO J8
-SCOPE CHANNEL 1 TO J14

ACTION	RESPONSE
a. Set test adapter DC switch to ON while listening to headset.	s. There should be a short two tone beep. There should not be a 1200 Hz continuous tone, If what is heard is different, go to chart 17.
b. Set test adapter– S5: 3 S6: 3 PTT (S13) : REF TEST EQPT INPUT (S14) : EXT TEST EQUIPMENT SELECTOR (S15) : SCOPE	b. No response.
c. Use ext probe to check J7-F.	c. Scope channel 1 displays a digital data signal. If not, go to chart 18.
d. Set test adapter– S5: 7 S6: 7 SQ/CLK (S11): ON	d. No response.
e. Use ext probe to check J7-F,	e. Scope channel 1 displays digital data signal. If not, go to chart 19.

6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE

Step 19. RT-1477 FRONT PANEL TEST

Presets:

REMOVE THE FRONT PANEL FROM ANY KNOWN GOOD RT-1476, (USE THE REF RT IF ANOTHER RT IS NOT AVAILABLE.)
INSTALL THE RT-1477 FRONT PANEL (INCLUDED IN MAINTENANCE GROUP) ON THE RT CHASSIS.

SET TEST ADAPTER–
S5: OFF
S6: OFF
TAKE CTRL (S9) : RCU
SQ/CLK (S11) : OFF
PTT (S13) : OFF
DC: OFF

SET REF RCU–
FUNCTION : OFF
PRESET: MAN
IFM-RF PWR: OFF
MODE: SC

CONNECT: -TEST CABLE W2 FROM J1 OF RT-1 477 TO J1 OF TEST ADAPTER
-TEST CABLE W1 FROM J2 OF RT-1477 TO J2 OF TEST ADAPTER (REMOVE AND SET ASIDE TEST CABLE W12)

ACTION	RESPONSE
a. Set test adapter DC switch to ON.	a. No response,
b. Set ref rcu FUNCTION switch to TEST.	b. Ref rcu display reads: "------ " for 3s "E -" for 2s "8888 8" for 7s "Good" for 8s If not, replace RT-1477 front panel. If still bad, go to troubleshooting schematic 18.
c. Set ref rcu– FUNCTION: SQ ON IFM-RF PWR: LO	c. Test lamp 5 is lit. Test lamp 10 is not lit. If these lamps are not lit correctly, replace RT-1477 front panel. If still bad, go to trouble-shooting schematic 18.
d. Set ref rcu IFM-RF PWR switch to H1.	d. Test lamp 5 is lit. Test lamp 10 is lit. If these lamps are not lit correctly, replace RT-1477 front panel. If still bad, go to trouble-shooting schematic 18.
e. If ref rcu is C-11466A, go to step 20c.	e. No response.
f. Connect ECCM fill device to FILL connector of RT-1477 front panel.	f. No response.

6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE

Step 19. RT-1477 FRONT PANEL TEST, Continued

g. Set ECCM fill device– Function: ON Select: T1 or T2	g. No response.
h. Set ref rcu– FUNCTION: Z-A then LD-V PRESET: 1 IFM-RF PWR: OFF MODE: FH	h. No response.
i. On ref rcu, press H-Ld.	i. Ref rcu display reads: " LOAd " " Sto t " " FILL 1" If not, RT-1477 front panel is bad.
j. Turn ECCM fill device off and disconnect from RT-1477.	j. No response.

Step 20. HOLD-UP BATTERY CIRCUITRY TEST

NOTE: THIS TEST ASSUMES A HOLDING BATTERY IS INSTALLED IN RT.

a. Turn ref rcu FUNCTION switch to OFF, wait 7 seconds, and turn it back to LO-V.	a. Ref rcu display reads " FILL 1". If not, RT-1477 front panel is bad.
b. Go to step d.	b. No response.
c. Turn ref rcu FUNCTION switch to OFF, wait 7 seconds, and turn it back to LD.	c. Ref rcu display reads "Fnnn" (n = O-9). If not, RT-1477 front panel is bad.
d. Set test adapter DC switch to OFF. Remove RT-1477 front panel from rt chassis and install original front panel.	d. No response.
e. Disconnect test cables W1 and W2 from test adapter and from rt. If ref rt was used for these tests, install it in the test adapter.	e. No response.

6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE

Step 21. RF SECTION TEST

Presets:

SET REF RT–
PRESET: 1

SET REF RCU–
FUNCTION: STOW

SET TEST ADAPTER–
S1: 1
TAKE CNTL (S9) : RT
DC: ON

SET SIGNAL GENERATOR–
FREQ: 45 MHz
LEVEL: -10 dBm
FM MODE: INT
MODULATION:
1 kHz at 6 to 7 kHz deviation

LOAD: REF RT PRESET 1 WITH 45000.

SET: REF RT FUNCTION TO SQ OFF

CONNECT: -TEST CABLE W5 FROM SIGNAL GENERATOR OUTPUT TO J3
-JUMPER W1 FROM J1O TO J11 (IF DISCONNECTED)

ACTION	RESPONSE
a. Use ext probe to check TP11.	a. Scope channel 1 displays an 8.0 V P-P (5 to 11 V P-P) sine wave. If not, go to chart 20.
b. Set test adapter switch S1 to 2.	b. No response.
c. Use ext probe to check TP11.	c. Scope channel 1 displays distorted sine wave or noise at 8.0 V P-P (5 to 11 VP–P). If not, go to chart 21.
d. Set signal generator– FREQ: 30 MHz LEVEL: +10 dBm FM MODE: OFF	d. No response.
e. Connect X10 probe to scope channel 1. Use probe tip adapter to connect to J12.	e. Scope channel 1 displays a 160 to 240 mVP-P signal. If not go to chart 22.
f. Set test adapter– TEST EQPT INPUT (S14) - INTL TEST EQUIPMENT SELECT (S15) - FREQ CNTR	f. No response.
g. Set signal generator– RF OUTPUT: OFF	g. No response.
h. Disconnect cable W5 from J3.	h. No response.
i. Use DMM to measure resistance between J12 and J19.	i. DMM reads 130 Ohms (115 to 145 Ohms), If not, go to chart 23.

6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 21. RF SECTION TEST. Continued	
j. Set test adapter- S1: OFF S2: 10	j. No response.
k. Connect cable W5 to J3.	k. No response.
l. Set RF signal generator- RF OUTPUT: ON.	l, Scope channel 1 displays signal with a level less than 10 mV P-P, If not, to go chart 24.
m. Set test adapter- S1:7 S2: OFF	m. No response.
n. Connect scope channel 1 to J16 using setup shown in figure 6-41.	n. Scope channel 1 displays 160 to 240 mV P-P signal. If not, go to chart 25.
0. Set test adapter- S1 :10.	0. No response.
p. Connect signal generator output to J16.	p. No response.
q. Connect scope probe to J4 using setup shown in figure 6-41.	q. Scope channel 1 displays 80 to 120 mV P-P signal. If not, go to chart 26.
r. Connect scope probe to J5 using setup shown in figure 6-41.	r. Scope channel 1 displays 80 to 120 mV P-P signal. If not, go to chart 27.

Step 22. AC POWER TEST

Presets:	
SET TEST ADAPTER– S2: OFF DC: OFF	CONNECT: TEST CABLE W7 FROM AC SUPPLY TO J20.

ACTION	RESPONSE
Set test adapter AC switch to ON.	AC switch stays on. If AC switch trips, then go to chart 28.

SET TEST ADAPTER– AC: OFF	DISCONNECT TEST CABLE FROM AC SUPPLY AND J20.

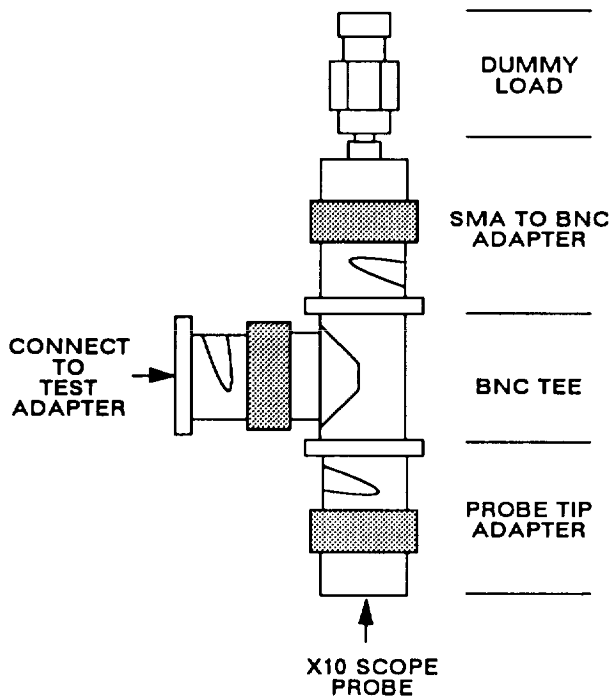


Figure 6-41. Rf Section Test Setup Diagram

6-20. OPERATIONAL CHECK. Continued

ACTION	RESPONSE
Step 23. RESISTOR R3 TEST	
Set DMM to measure resistance. Connect DMM probes to TP23(+) and J1-A(-).	DMM reading is 2700 to 3300 ohms. If not, replace lamp test CCA. If still bad, go to troubleshooting schematic 26.
Step 24. RESISTOR R9 TEST	
Connect DMM probes to J7-C(+) and TP24(-).	DMM reading is 1600 to 2000 ohms. If not, go to chart 29.
Step 25. RESISTOR R4 TEST	
a. Set test adapter switch S1 to 1.	a. No response.
b. Connect DMM probes to J1-T(+) and TP24(-).	b. DMM reading is 900 to 1100 ohms. If not, replace lamp test CCA. If still bad, go to troubleshooting schematic 26.
Step 26. RESISTOR R6 TEST	
a. Set test adapter switch S1 to OFF.	a. No response,
b. Connect DMM probes to J1-B(+) and TP24(-) .	b. DMM reading is 900 to 1100 ohms. If not, replace lamp test CCA. If still bad, go to troubleshooting schematic 26.

MAINTENANCE GROUP IS OPERATIONAL.

6-210 REPAIR PROCEDURES

The following instructions apply to all repair tasks unless otherwise noted in the procedure,

1. Begin procedure with ac and dc power supplies turned off and disconnected from the test adapter,
2. Disconnect any other external cable connected to the test adapter,
3. Inspect maintenance group, Repair any obvious physical damage,
4. Repair fault identified by troubleshooting.
5. Verify fault repair by performing operational check. If any wiring is repaired, verify the repair immediately using the DMM.

WARNING

- Remove power from maintenance group before repair. Serious burns or electrical shock can result from contact with exposed electrical wires or connectors.
- Isopropyl alcohol is flammable and toxic to skin, eyes, and respiratory tract. Avoid skin and eye contact. Good general ventilation is normally adequate, Keep away from open flames or other sources of ignition.

6-22. INTERCONNECTING DEVICE

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

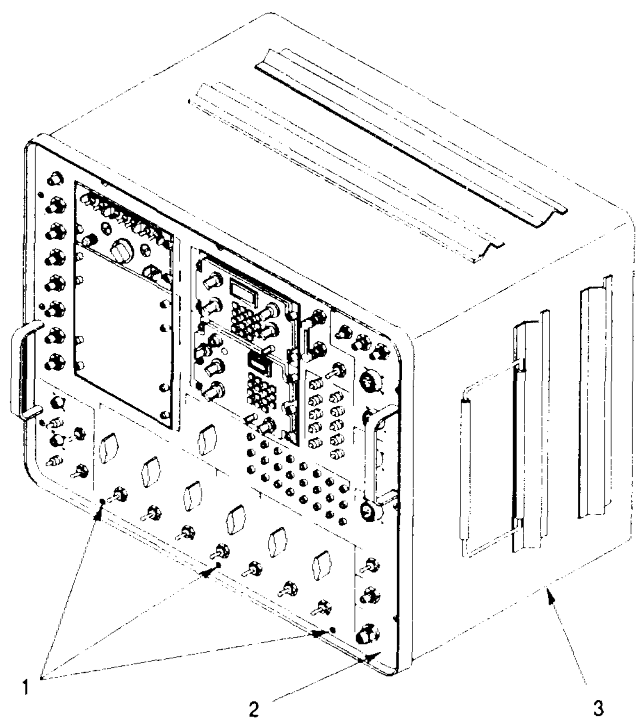
Tool Kit, Electronic Equipment, TK-105/G

REMOVAL

1. Fully loosen 12 captive screws (1) securing interconnecting device (2) to maintenance group chest (3).
2. Lift and remove interconnecting device from maintenance group chest.

INSTALLATION

1. Position interconnecting device (2) in chest (3).
2. Thread and tighten 12 captive screws (1).



MACX30003

6-23. REFERENCE RT

This task covers: a, Removal b. Installation

INITIAL SETUP

Tools

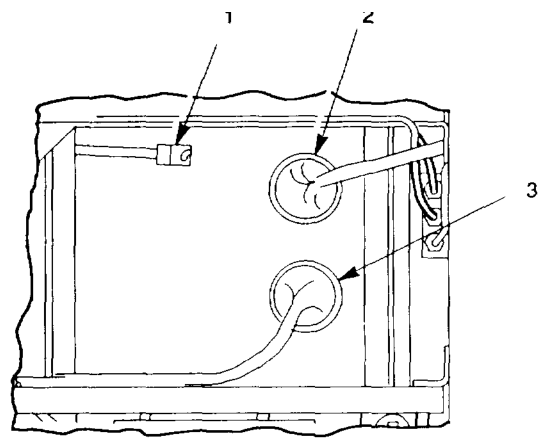
Tool Kit, Electronic Equipment, TK-105/G

Equipment Conditions

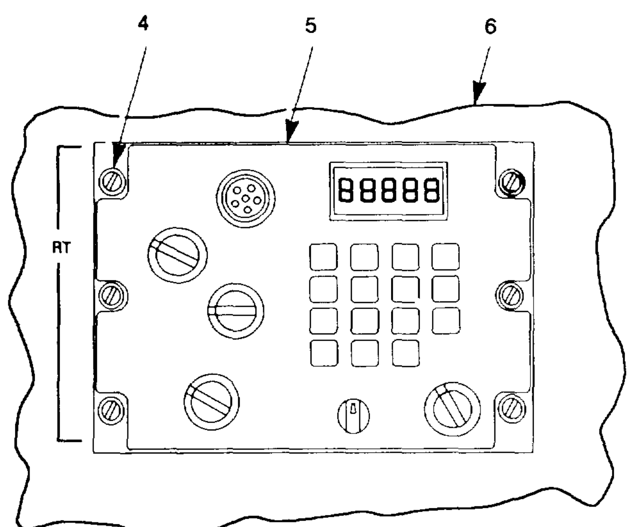
Interconnecting device removed from chest (paragraph 6-22).

REMOVAL

1. Disconnect rt cable W3 (1), connector PI (2) and connector P2 (3) from rear of reference rt.
2. Loosen six Dzus fasteners (4) securing reference rt (5) to test adapter (6).
3. Pull reference rt out of test adapter. Get good rt.



33330004



33330005

INSTALLATION

1. Position good rt into RT slot of test adapter.
2. Tighten six Dzus fasteners (4) securing reference rt (5) to test adapter (6).
3. Connect rf cable W3 (1), connector P1 (2), and connector P2 (3) to rear of reference rt.

CAUTION

Be sure cable W3 is connected to J3, not to J4 or J5.

6-24. INTERCOMMUNICATIONS SYSTEM (ICS)

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

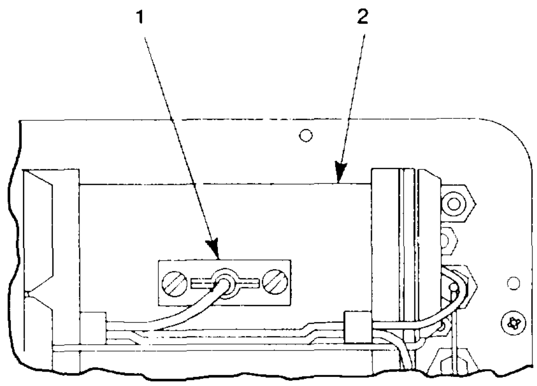
Tool Kit, Electronic Equipment, TK-105/G

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

REMOVAL

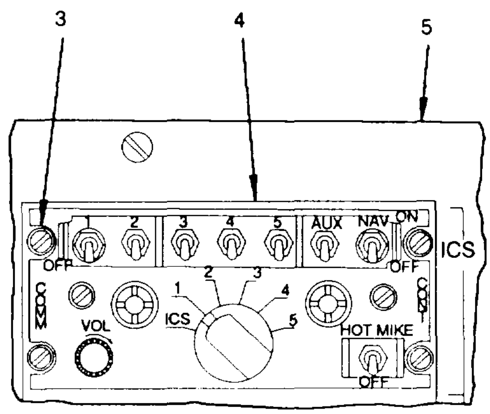
1. Loosen two captive screws , and disconnect P4 (1) from rear of ics (2).
2. Loosen four Dzus fasteners (3) securing ics (4) to test adapter (5).
3. Pull ics from test adapter. Get good its.



MAC30006

INSTALLATION

1. Slide good ics into ICS slot of test adapter.
2. Tighten four Dzus fasteners (3) securing ics (4) to test adapter (5).
3. Connect P4 (1) to rear of ics (2), and tighten two captive screws.



MAC30007

6-25. REFERENCE RCU

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

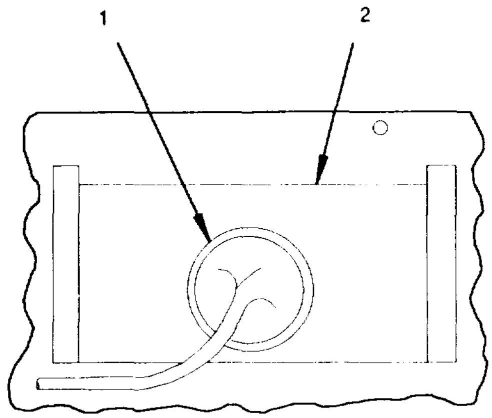
Tool Kit, Electronic Equipment, TK-105/G

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

REMOVAL

1. Disconnect connector P3 (1) from rear of reference rcu (2).
2. Loosen four Dzus fasteners (3) securing reference rcu (4) to test adapter (5).
3. Pull reference rcu out of test adapter. Get good rcu.

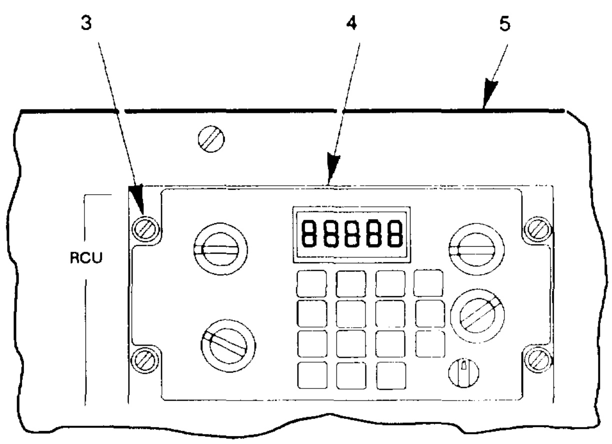


MACX30008

INSTALLATION

1, Slide good rcu into RCU slot of test adapter,

2. Tighten four Dzus fasteners (3) securing reference rcu (4) to test adapter (5).
3. Connect P3 (1) to rear of reference rcu (2).



MAC30009

6-26. REFERENCE DRA

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit, Electronic Equipment, TK-1015/G

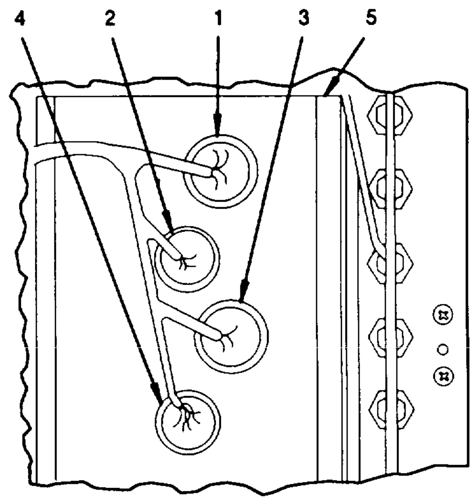
Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

REMOVAL

1. Disconnect connectors P6 (1), P7 (2), P8 (3), and P9 (4) from rear of reference dra (5).

2. Use screwdriver and nut driver. Loosen and remove four nuts (9), lockwashers, and screws and eight flat washers securing blank panel to reference dra. Get a good dra.

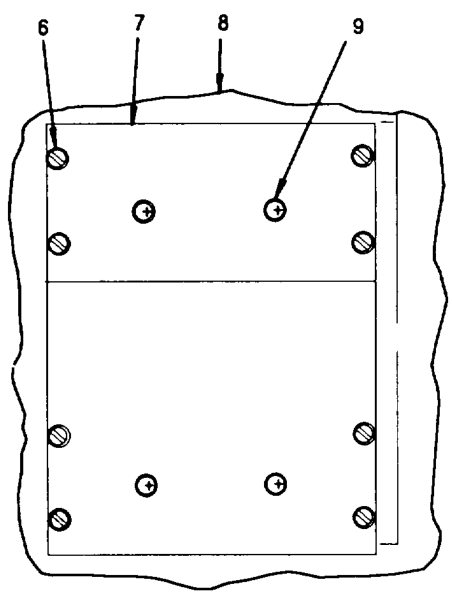


MACX30010

INSTALLATION

1. Use screwdriver and nut driver. Secure blank panel (7) to good dra (5) with four nuts (9), lockwashers, and screws and eight flat washers.

2. Connect P6 (1), P7 (2), P8 (3), and P9 (4) to rear of reference dra (5).



MACX30011

6-27. TEST CABLES

This task covers repair of cables W1, W2, W3, W7, W8, and W17.

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G
Pin removal/installation tool included in connector packages

1. Remove two screws, their washers, and the brackets from the cable clamp adapter.
2. The connector's outer collar has three holes through it. Aline one of these holes with a notch in the flange under the collar. Place a small jeweler's screwdriver through the collar hole and into the notch. Unscrew the cable clamp adapter from the connector.
3. Using a pin insert/extract tool supplied with the connector, remove all the pin from the connector. Mark each pin by its location on the connector. If insulating sleeving or sleeve markers are damaged, replace as needed.
4. Discard connector, and obtain a new or known good one.
5. Using a pin insert/extract tool supplied with the connector, install the pins according to their marked locations. Check to make sure all pins are fully seated.
6. Hand tighten the cable clamp adapter onto connector. Aline one of the holes in the collar with a notch in the flange under the collar, Place a small jeweler's screwdriver through the collar hole and into the notch. Tighten the cable clamp adapter the rest of the way.
7. Position rubber grommet into place. Install and tighten the two screws, their washers, and the two brackets.

6-28. TEST ADAPTER

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit, Electronic Equipment, TK-105/G

REMOVAL

1. Remove interconnecting device from chest (para 6-22).
2. Remove reference rt from test adapter (para 6-23) .
3. Remove ics from test adapter (para 6-24).
4. Remove reference rcu from test adapter (para6-25).
5. Remove reference dra (para 6-26) from test adapter.

INSTALLATION

1, Install reference dra (para 6-26) in test adapter.
2, Install reference rcu in test adapter (para 6-25) .
3. Install ics in test adapter (para 6-24).
4. Install reference rt in test adapter (para 6-23) .
5. Install interconnecting device in chest (para 6-22) .

6-29. TEST ADAPTER RF CABLES

This paragraph gives the procedures for removing or installing rf cables in the test adapter. Paragraph 6-29a gives the general procedures for replacing cables. The other paragraphs give specific instructions for removal and installation of each type of connector used on the rf cables. These connector types are:

TYPE	PARAGRAPH
TPS	6-29.b
N	6-29.c
SMA	6-29.d
Front panel mounted connector	6-29.e
Terminal lug and wire connection	6-29.f
Two wire connection	6-29.g

a. Removal and Installation of Rf Cables W2 through W6 and W8 through W36

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit, Electronic Equipment, TK-105/G

Expendable Supplies

Tiedown Straps

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

6-29. TEST ADAPTER RF CABLES. Continued

REMOVAL

1. Loosen and remove all screws, lockwashers, flat washers, loop clamps, and nuts securing the bad cable.
2. Use diagonal cutting pliers to cut any tiedown straps securing the bad cable.
3. Disconnect both ends of cable. See paragraph 6-29.b through 6-29.g for any special instructions needed.
4. Pull cable out of the test adapter, and get a new cable.

INSTALLATION

1. Route good cable into correct position,
2. Connect both ends of cable to correct positions,
3. Install all loop clamps, screws, nuts, lockwashers, and flat washers used to secure cable to test adapter.
4. Replace any tiedown straps that were cut to remove cable.

b. Removal and Installation of TPS Type Connectors

This type of connector is found on one end of rf cable W3.

This task covers: a. Removal b. Installation

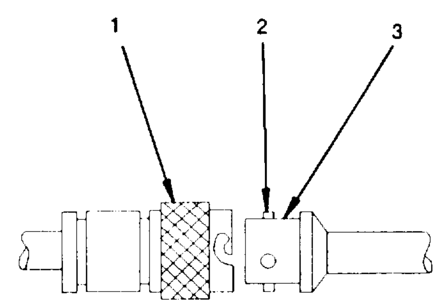
REMOVAL

1. Twist connector plug (1) CCW until pins (2) on jack (3) are clear of slots.
2. Pull plug clear of jack.

INSTALLATION

1, Slide plug (1) onto jack (3) and aline pins (2) with slots,

2. Turn plug CW until pins lock.



MACX30035

6-29. TEST ADAPTER RF CABLES. Continued

c. Removal and Installation of N Type Connectors

This type of connector is found on at least one end of rf cables W2, W7, and W 14 through WI 7.

This task covers: a. Removal b. Installation

REMOVAL

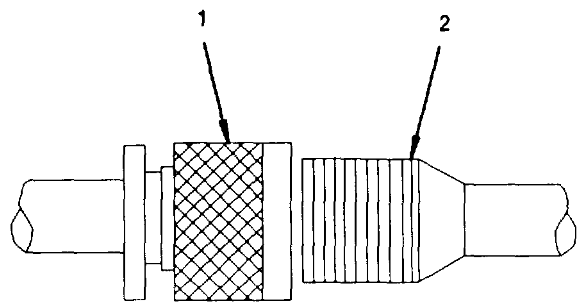
1. Twist connector plug (1) CCW until threads are disengaged.

2. Pull plug clear of jack (2).

INSTALLATION

1. Slide plug (1) onto jack (2). Turn CW until threads are engaged.

2. Turn plug CW until tight.



MACX30036

d. Removal and Installation of SMA Type Connectors

This type of connector is found on at least one end of rf cables W3 through W6, W8 through W13, W16, and W17.

This task covers: a. Removal b. Installation

REMOVAL

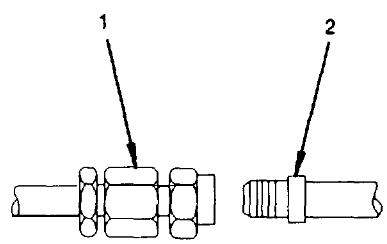
1. Turn plug (1) CCW until threads are disengaged, If necessary, use a wrench to *loosen* plug.

2. Pull plug clear of jack (2).

INSTALLATION

1. Slide plug (1) onto jack (2) and turn until threads are engaged.

2. Turn plug CW until tight.



MACX30037

e. Removal and Installation of Front Panel Mounted Connectors

This type of connector is found on at least one end of rf cables W2, W4, W7, W12, W14, W15, and W22 through W28.

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-100/G

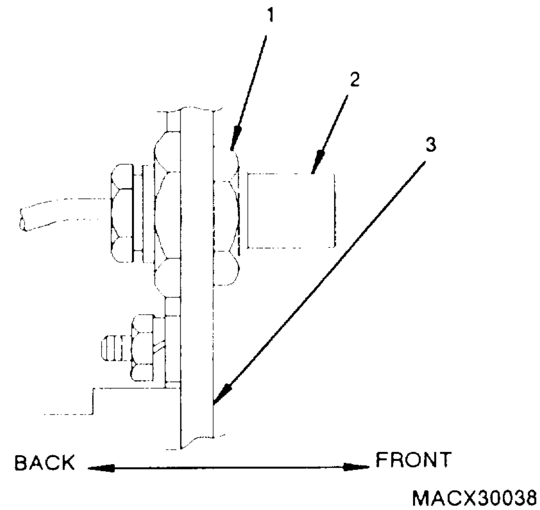
6-29. TEST ADAPTER RF CABLES, Continued

REMOVAL

1. Remove and discard nut and lockwasher (1) securing connector (2) to front panel (3).
2. Pull connector out of front panel.

INSTALLATION

1. Insert connector through hole in front panel.
2. Thread lockwasher and nut (1) onto connector (2).
3. Tighten nut.



f. Removal and Installation of Terminal Lug and Wire Connections
This type of connector is found on at least one end of rf cables W24, W26, W28, W29, and W31 through W33.

This task covers: a. Removal b. Installation

INITIAL SETUP

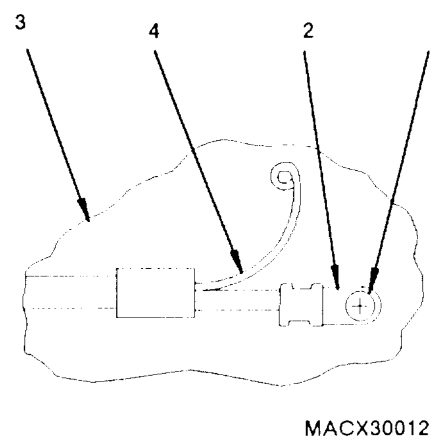
Tools	Expendable Supplies
Tool Kit, Electronic Equipment, TK-105/G	Solder

REMOVAL

1. Loosen and remove screw (1) securing terminal lug (2) to test adapter (3).
2. Unsolder wire (4) from test adapter.

INSTALLATION

1. Thread and tighten screw (1) through terminal lug (2) into mounting hole.
2. Solder wire to test adapter.



6-29. TEST ADAPTER RF CABLES. Continued

g. Removal and Installation of Two Wire Connections

This type of connector is found on at least one end of rf cables W10, W11, W22, W23, W25, W27, W29 through W33, W35, and W36.

This task covers: a. Removal b. Installation

INITIAL SETUP

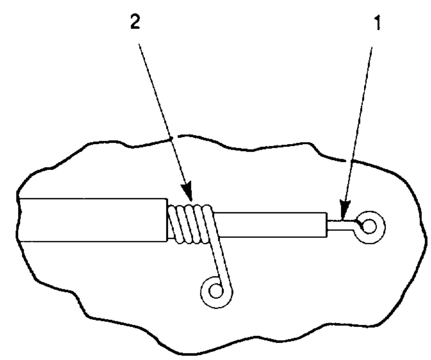
Tools	Expendable Supplies
Tool Kit, Electronic Equipment, TK-105/G	Solder

REMOVAL

1. Unsolder cable's center conductor wire (1) from test adapter.
2. Unsolder cable's ground shield wire (2) from test adapter,

INSTALLATION

1. Solder cable's ground shield wire (2) to test adapter.
2. Solder cable's center conductor wire (1) to test adapter.



MACX30013

6-30. TEST ADAPTER WIRES

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit. Electronic Equipment, TK-105/G

Expendable Supplies

Wire
Tiedown Straps
Solder

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22) .

References

Removal and installation of soldered wire connections (paragraph 6-29.g).
Removal and installation of terminal lug wire connections (paragraph 6-29.f).
Removal and installation of pins from circular multi-pin connectors (paragraph 6-31).
Removal and installation of wires from connectors P4, P5, and P10 (paragraph 6-31).

REMOVAL

1. Find ends of wire to be replaced.
2. Disconnect ends of wire.
3. Use diagonal cutting pliers. Cut any tiedown straps securing wire.
4. Use screwdriver and nut driver. Loosen and remove all screws, lockwashers, flat washers, loop clamps, and nuts securing wire.
5. Remove wire from test adapter.

INSTALLATION

1. Route wire into place in the test adapter.
2. Connect ends of wire to correct positions.
3. Use screwdriver and nutdriver. Install all loop clamps, screws, nuts, lockwashers, and flat washers used to secure wire to test adapter.
4. Replace any tiedown straps cut to remove wire.

NOTE

If wire is bundled in plastic spiral wrap, then use the bad wire to pull the good wire into place when removing the bad wire.

6-31. TEST ADAPTER CONNECTORS

a. Replacement of Connectors J3, J4, J5, J8, J10, J11, J13, J14, J15, J16, J17, J18, and J19

These are connectors mounted in the front panel of the test adapter. They are also part of test adapter rf cables. If one of these connectors must be replaced, replace the rf cable (see paragraph 6-29). The connectors are part of the following cables:

CONNECTOR	CABLE
J3	W7
J4	W14
J5	W15
J8	W28
J10	W2
J11	W4
J13	W22
J14	W23
J15	W24
J16	W12
J17	W25
J18	W26
J19	W27

6-31. TEST ADAPTER CONNECTORS. Continued

b. Replacement of Connectors J1, J2, J6, J7, J20, and J21

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit, Electronic Equipment, TK-105/G
Pin removal/installation tool included in connector packages

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

References

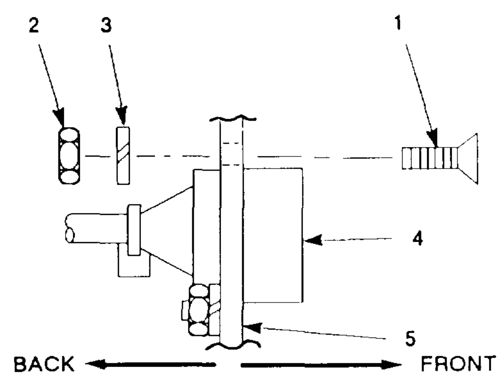
See paragraph 6-35 to remove and install shield panel when replacing J20 and J21 .

REMOVAL

1. Use screwdriver and nut driver. Loosen and remove four screws (1), lockwashers (2), and nuts (3) securing connector (4) to front panel (5). Discard lockwashers.
2. Pull connector out of front panel.
3. Tag wires.
4. Use pin removal/insertion tool to remove all pins from connector.
5. Dispose of connector.

NOTE

When replacing connector J6, remove three loop clamps securing wires connected to J6.



INSTALLATION

1. Get new connector and lockwashers.
2. If any pins are damaged or missing, replace them.
3. Use pin removal/insertion tool to install all pins in new connector, Check that pins are in correct positions.
4. Insert connector in front panel. Orient to allow normal reading of pin designations on front of connector,
5. Thread and tighten four screws (1) through front panel (5), connector (4), lockwashers (2), and nuts (3).

6-31. TEST ADAPTER CONNECTORS. Continued

c. Replacement of Connector J9

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

Expendable Supplies

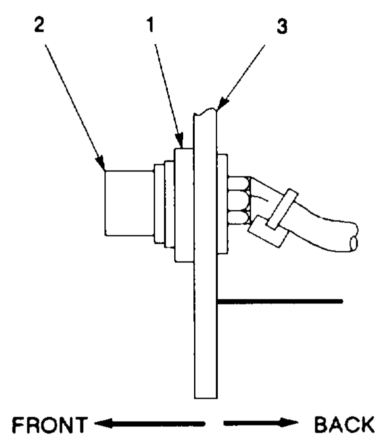
Tiedown Straps
Solder

REMOVAL

1. Use diagonal cutting pliers. Cut and remove any tiedown straps that interfere with unsoldering wires from connector.
2. Tag wires, and unsolder wires from connector.
3. Use spanner wrench. Remove spanner nut (1), securing J9 (2) to front panel (3).
4. Remove J9.

INSTALLATION

1. Insert new connector in front panel J9 opening,
2. Use spanner wrench. Thread and tighten spanner nut (1) on J9 connector (2).
3. Solder wires to connector.
4. Replace any tiedown straps removed.



6-31, TEST ADAPTER CONNECTORS, Continued

d. Replacement of Connector P1, P2, P3, P6, P7, P8, and P9

These are the connectors connected to the reference rt, reference rcu, and reference dra.

This task covers: a. Removal   b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G
Pin removal/installation tool included with replacement connector

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

REMOVAL

1. Loosen two captive screws on strain relief on rear of connector.
2. Loosen strain relief by rotating nut counter-clockwise, and slide free of connector.
3. Tag wires, and remove pins from connector using tool supplied with replacement connector.

INSTALLATION

1. Inspect connector strain relief for damage, If damaged, obtain replacement.
2. Place strain relief on cable.
3. Using tool supplied with replacement connector, insert pins into connector.
4. Slide strain forward and engage connector. Tighten coupling nut by rotating clockwise.
5. Tighen two captive screws on strain relief.

6-31. TEST ADAPTER CONNECTORS. Continued

e. Replacement of Connector P4

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit, Electronic Equipment, TK-105/G

Expendable Supplies

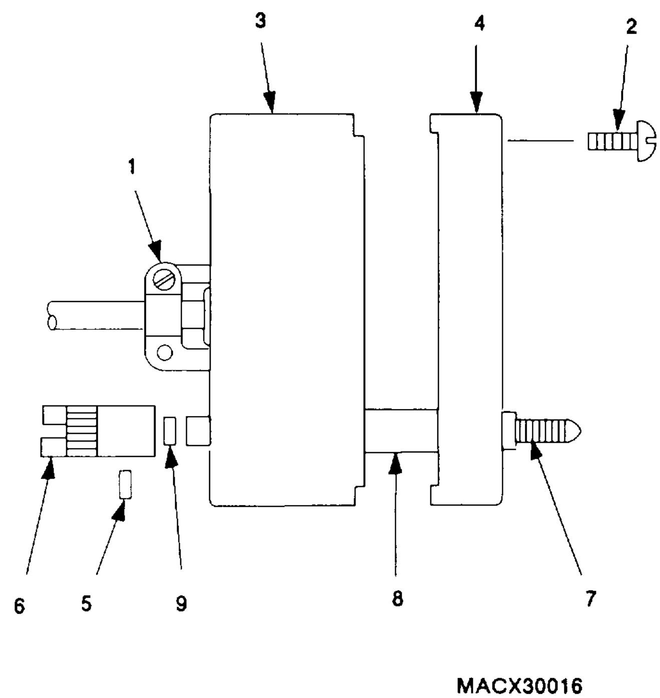
Solder

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

REMOVAL

1. Fully loosen two screws securing cable clamp (1).
2. Remove four screws (2) securing shield (3) to connector (4).
3. Use small jewelers screwdriver. Push out pin (5) securing jackscrew knob (6) to each of the two jackscrews (7).
4. Remove jackscrew knobs (6) by rotating knobs counterclockwise.
5. Remove jackscrews (7), spacer tubes (8), and washers (9).
6. Pull shield (3) away from connector (4) and tag position of each wire.
7. Unsolder each wire from connector leads.
8. Remove connector.



6-31, TEST ADAPTER CONNECTORS. Continued

e. Replacement of Connector P4. Continued

INSTALLATION

1. Place shield (3) on cable.
2. Solder wires to connector leads.
3. Remove wire tags.
4. Insert connector (4) into shield (3). The groove on the shield (3) must be on the end next to pin A.
5. Install jackscrews (7) from front of connector. The male jackscrew must be on the end next to pin A.
6. Install spacer tubes (8) and washers (9) on jackscrews (7).
7. Install jackscrew knobs (6) on jackscrews (7). Removal of one or more of the washers supplied with the connector may be necessary to maintain snug fit between jackscrew knobs (6) and spacer tubes (8).
8. Use needle nose pliers. Install pins (5) in jackscrew knobs (6) and jackscrews (7).
9. Install and tighten four screws (2) securing connector (4) to shield (3).
10. Tighten two screws on cable clamp (1).

6-31. TEST ADAPTER CONNECTORS. Continued

f. Replacement of Connectors P5 and P10

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

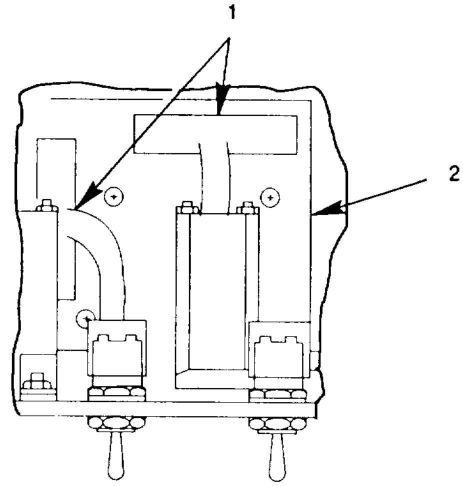
Tool Kit, Electronic Equipment, TK-105/G
Pin removal/installation tool included with replacement connector

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

REMOVAL

1. Loosen screw locks securing connector (1) to circuit card (2),
2. Disconnect connector (1) from circuit card (2) .
3. Remove and retain two screw lock assemblies from connector.
4. Tag wires for reinstallation,
5. Using tool supplied with connector, remove wires/pins from connector.
6. Remove connector,



MACX30017

INSTALLATION

1. Using tool supplied with connector, install wires/pins into connector.
2. Install two screw lock assemblies retained from old connector,
3. Connect connector (1) to circuit card (2).
4. Tighten connector screw locks.

6-31. TEST ADAPTER CONNECTORS. Continued

g. Replacement of Connector J12

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

Equipment Conditions

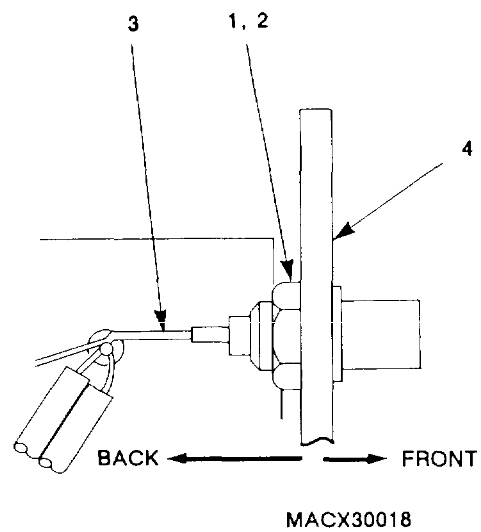
Interconnecting device removed from chest (paragraph 6-22).

Expendable Supplies

Insulated Sleeving
Solder

REMOVAL

1. Remove insulated sleeving.
2. Unsolder wire (3) from connector.
3. Loosen and remove hex nut (1) with lock-washer (2) from connector.
4. Remove connector from front panel (4).



INSTALLATION

1. Insert good connector.
2. Use adjustable wrench. Thread and tighten hex nut (1) with lockwasher (2) onto connector.
3. Install replacement insulated sleeving.
4. Solder wire (3) to connector.

6-32. TEST ADAPTER SWITCHES

a. Replacement of Multi-Deck Switches S1, S2, S3, S4, S5, S6, and S15.

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

Equipment Conditions

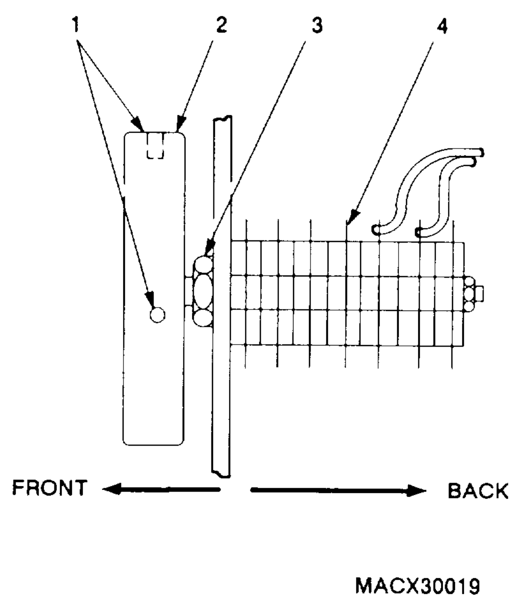
Interconnecting device removed from chest (paragraph 6-22).

Expendable Supplies

Tiedown Straps
Solder

REMOVAL

1. Use key set, Note position of switch, Loosen two set screws (1) securing knob (2) to switch (3). Pull knob off switch.
2. Loosen and discard hex nut (4) and lock-washer securing switch to front panel.
3. Pull switch from rear of front panel.
4. Use diagonal cutters to cut and remove any tiedown straps that interfere with desoldering.
5. Tag wires, and desolder from switch.
6. Remove switch.



INSTALLATION

1. Solder wires to terminals of switch.
2. Remove wire tags.
3. Insert switch in front panel opening aligning tab.
4. Thread and tighten hex nut (4) and lockwasher supplied with switch to secure switch to front panel,
5. Replace any tiedown straps removed.
6. Use key set. Position knob (2) on the switch (3), and secure by tightening two set screws (1).

6-32. TEST ADAPTER SWITCHES. Continued

b. Replacement of Switches S7, S8, S9, S1O, S12, S13, S14, and S16.

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

REMOVAL

1. Remove and discard hex nut (4) and lockwasher securing switch (5) to front panel (6),
2. Pull switch from rear of front panel.
3. Tag wires connected to switch.
4. Loosen and remove screws (1) and lockwashers securing wire terminal lugs (2) to switch leads (3).
5. Remove switch.

INSTALLATION

1. Secure wire terminal lugs (2) to correct switch leads (3) with screws (1) and lockwashers.
2. Remove wire tags.
2. Insert good switch into front panel. Check for correct switch orientation.
4. Thread and tighten hex nut (4) and lockwasher supplied with switch to secure switch (5) to front panel (6).

6-33. TEST ADAPTER TEST POINTS

This task covers: a. Removal b. Installation

Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit, Electronic Equipment, TK-105/G

Expendable Supplies

Tiedown Straps
Solder

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

REMOVAL

1. Cut and remove any tiedown straps that may interfer with resoldering.
2. Unsolder wire (1) from test point (2).
3. Loosen and remove hex nut (3) and lock-washer securing test point to front panel.
4. Pull test point out of front panel.
5. Get good test point.

INSTALLATION

1. Insert good test point in test adapter.
2. Thread and tighten hex nut (3) and lockwasher onto test point.
3. Solder wire (1) onto test point (2).
4. Replace any removed tiedown straps.

6-34. TEST ADAPTER LAMPS AND LAMP HOLDERS

This task covers: a. Removal b, Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit, Electronic Equipment, TK-105/G

Expendable Supplies

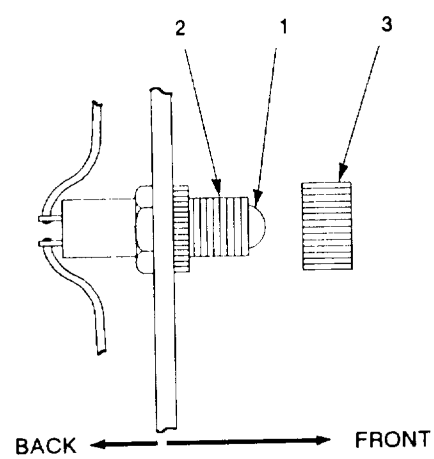
Solder

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).
Shield panel removed prior to AC or DC lamp replacement (paragraph 6-35).

REMOVAL

1. Remove lamp (1) from lamp holder (2).
   a. Unscrew and remove lens cover (3) from lamp holder (2).
   b. Pull lamp (1) out of lamp holder (2).
2. Remove wires from lamp holder.
   a. Tag wires connected to lamp holder.
   b. Unsolder wires from lamp holder.
3. Remove lamp holder from front panel.
   a. Loosen and remove knurled nut securing lamp holder to front panel.
   b. Pull lamp holder out of front panel.



MACX30022

INSTALLATION

1, Install good lamp holder in front panel.
   a. Insert lamp holder (2) through hole in front panel, Install and tighten knurled flange nut.
   b. Tighten knurled flange nut.
2. Solder wires to correct positions on lamp holder.
3. Remove wire tags.
4. Insert lamp (1) into lamp holder (2).
5. Thread and tighten lens cover (3) on lamp holder (2).

6-35. TEST ADAPTER CIRCUIT BREAKERS CB1 AND CB2

This task covers: a, Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit, Electronic Equipment, TK-105/G

Expendable Supplies

Tiedown Straps
Solder

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

References

See figure 6-42 for parts location.

REMOVAL

1. Remove shield panel.
   a. Loosen and remove two screws and flat washers securing shield panel to lower left support bracket.
   b. Remove shield panel.
2. Remove wires connected to circuit breaker.
   a. Cut and remove any tiedown straps that interfere with unsoldering wires from circuit breaker.
   b. Tag wires soldered to circuit breaker: eight wires to CB1, three wires to CB2.
   c. Unsolder wires from circuit breaker.
3. Remove circuit breaker.
   a. Remove and discard hex nut and lockwasher securing circuit breaker to front panel.
   b. Remove circuit breaker from test adapter.

INSTALLATION

NOTE

Replacement circuit breaker includes hex nut, Iockwasher, ON/OFF indicator backplate, and lockring. Discard supplied backplate and lockring,

1. Install good circuit breaker,
   a. Insert circuit breaker in front panel, observing proper orientation.
   b. Thread and tighten hex nut with lockwasher on circuit breaker.
2. Connect wires to circuit breaker,
   a. Check position of wires from tags affixed during removal.
   b. Solder wires to circuit breaker, removing tags as you go.
   c. Replace any tiedown straps that were cut.
3. Install shield panel,
   a. Place shield panel in position.
   b. Thread and tighten two screws and flat washers securing shield panel to lower left support bracket,

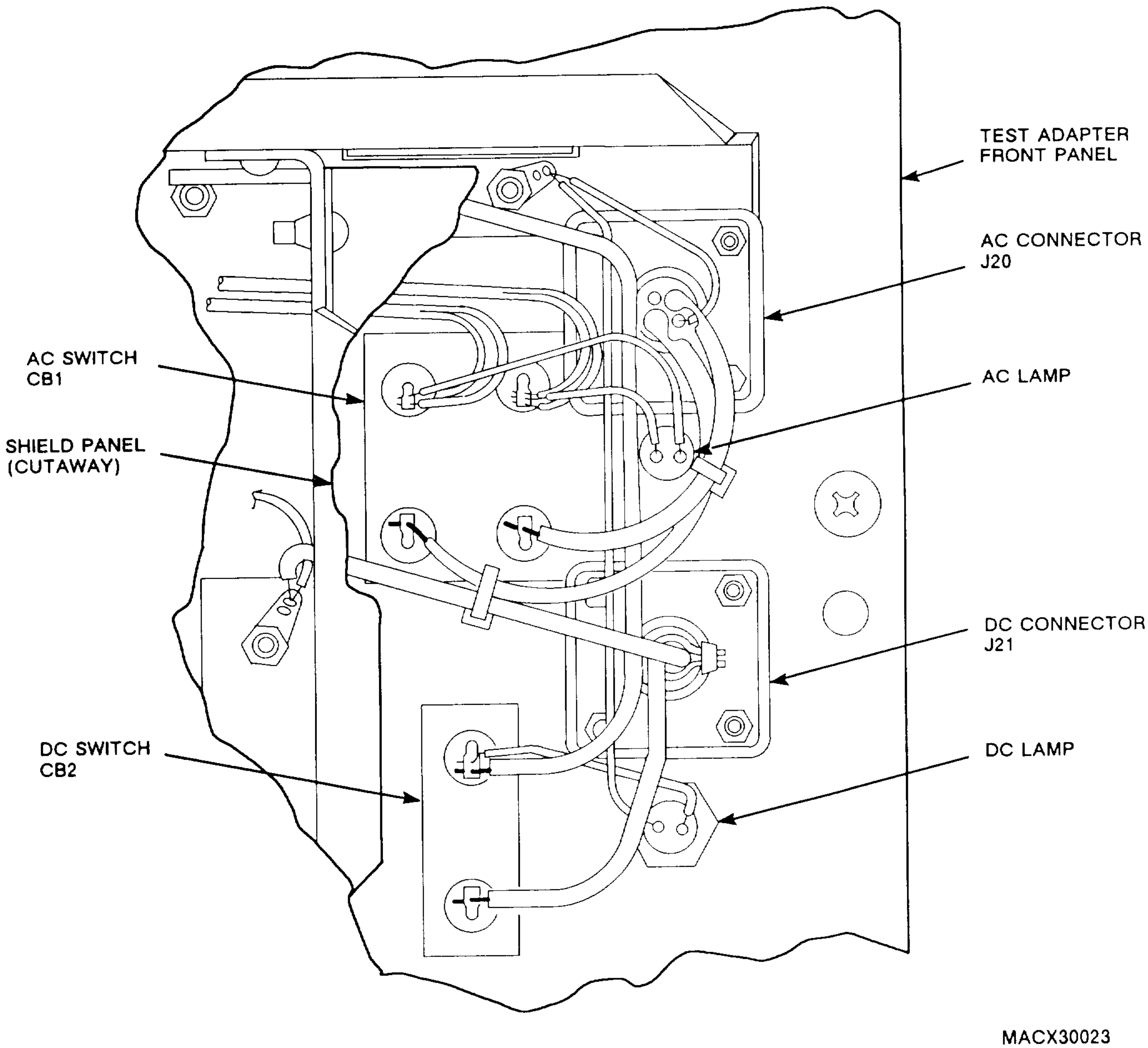


Figure 6-42. Power Supply Parts Location

6-36. TEST ADAPTER RELAYS

This procedure covers replacement of relays K1, K2, and K3.

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit, Electronic Equipment, TK-105/G

Expendable Supplies

Tiedown Straps
Solder

Equipment Conditions

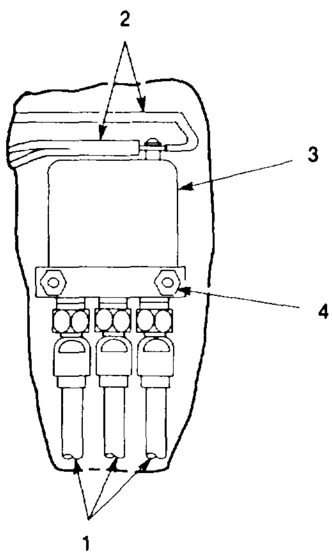
Test adapter removed from interconnecting device (paragraph 6-28).

REMOVAL

1. Using diagonal cutting pliers, cut and remove any tiedown straps that interfere with desoldering.
2. Tag wires soldered to relay, and desolder.
3. Tag rf cables (1) and wires (2) connected to relay (3).
4. Disconnect rf cables.
5. Loosen and remove two screws, washers, lockwashers, and nuts (4) securing relay. Discard lockwashers.
6. Remove relay.

INSTALLATION

1. Thread two screws through relay, washers, lockwashers, and nuts (4). Tighten.
2. Connect rf cables (1) to correct coaxial connectors on relay (3).
3. Solder wires to relay.
4. Remove wire tags,
5. Replace any tiedown straps removed.



MACX30024

6-37. TEST ADAPTER LAMP TEST CCA (A1)

This task covers: a. Removal b. Installation

INITIAL SETUP

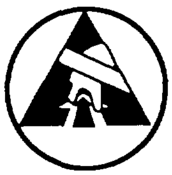
Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit, Electronic Equipment, TK-105/G

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

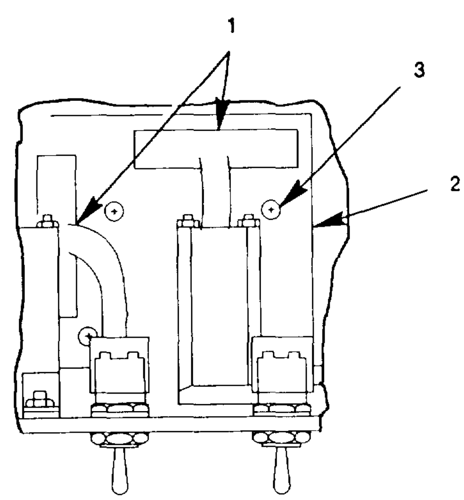
CAUTION



Static electricity and stray voltages can damage the CCA. Use an antistatic pad on the work surface and attach a grounded wrist strap to self before handling CCA.

REMOVAL

1. Disconnect P5 and P1O (1) from lamp test CCA (2).
2. Fully loosen and remove four screws (3). lockwashers, and flat washers securing CCA to four aluminum spacer sleeves.
3. Discard lockwashers.
4. Remove lamp test CCA.



MACX30025

INSTALLATION

1. Thread and tighten four screws (3) with flat washers and lockwashers through good CCA and into spacer sleeves.
2. Connect P5 and P1O (1) to CCA (2).

6-38. TEST ADAPTER RF SECTION COMPONENTS

This paragraph gives the replacement procedure for all attenuators, rf dividers, and adapters used in the test adapter rf section.

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment TK-100/G
Tool Kit, Electronic Equipment TK-105/G

Equipment Conditions

Test adapter removed from interconnecting device (paragraph 6-28).

References

See paragraph 6-29 for removal and installation of rf cables.
See figure 6-43 for location of rf section components.

REMOVAL

1. Loosen and remove any loop clamps securing bad component.
2. Disconnect any rf cables or other rf section components from bad component.
3. Remove bad component.

INSTALLATION

1. Place good component in position.
2. Connect any rf cables or other rf section components that were disconnected.
3. Install any loop clamps used to secure the replaced component.

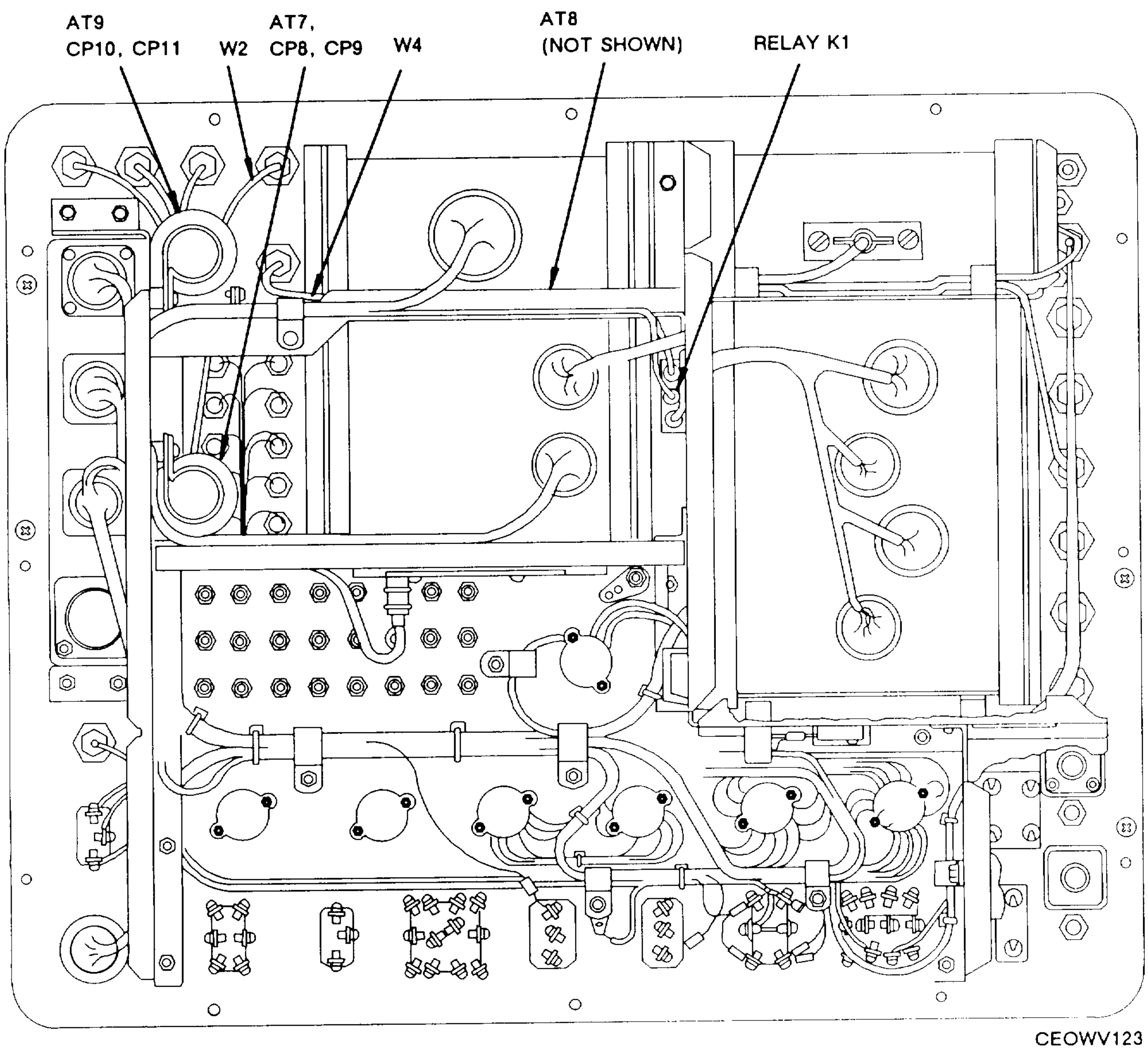


Figure 6-43. Rf Section Components (Sheet 1 of 3)

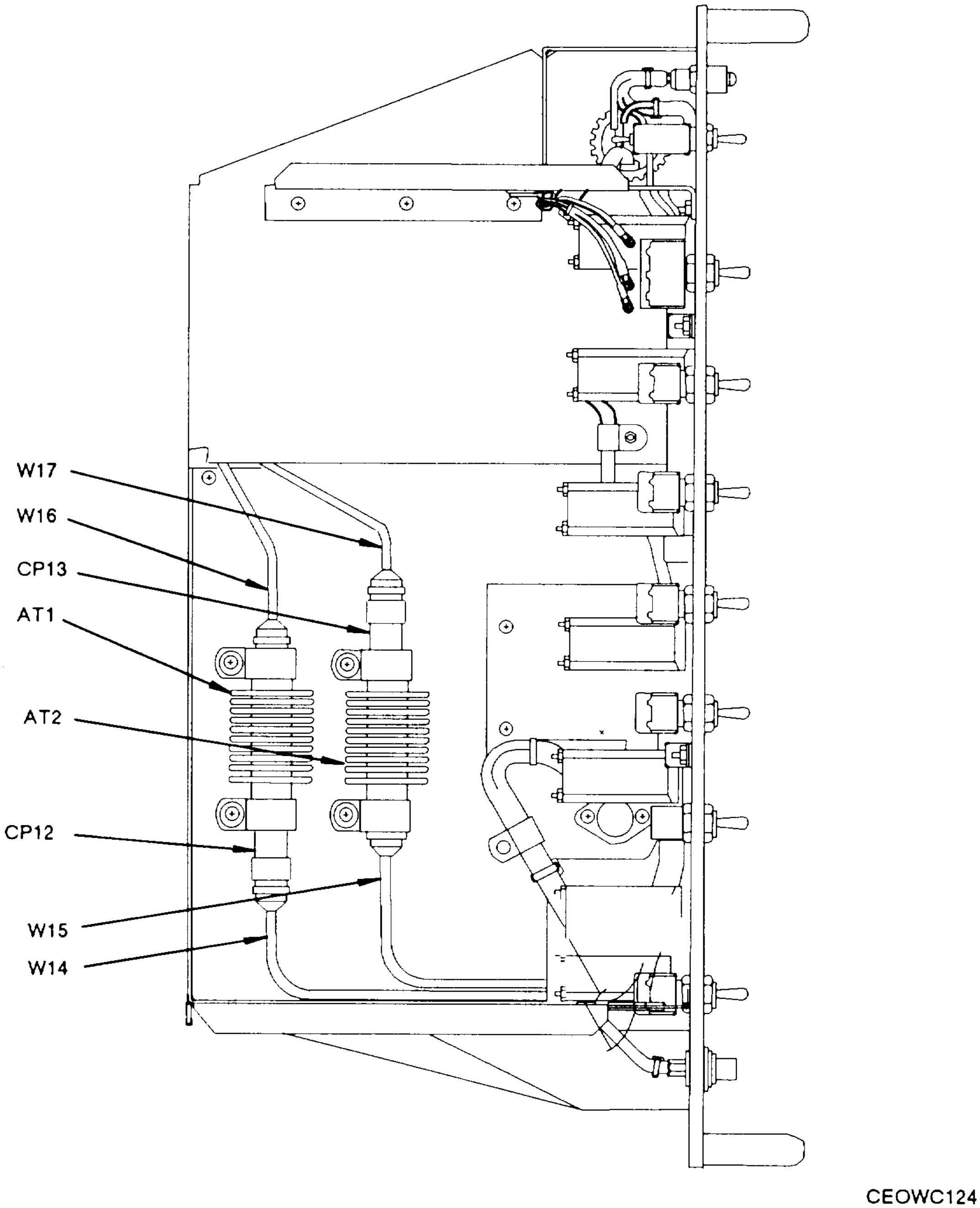


Figure 6-43. Rf Section Components (Sheet 2 of 3)

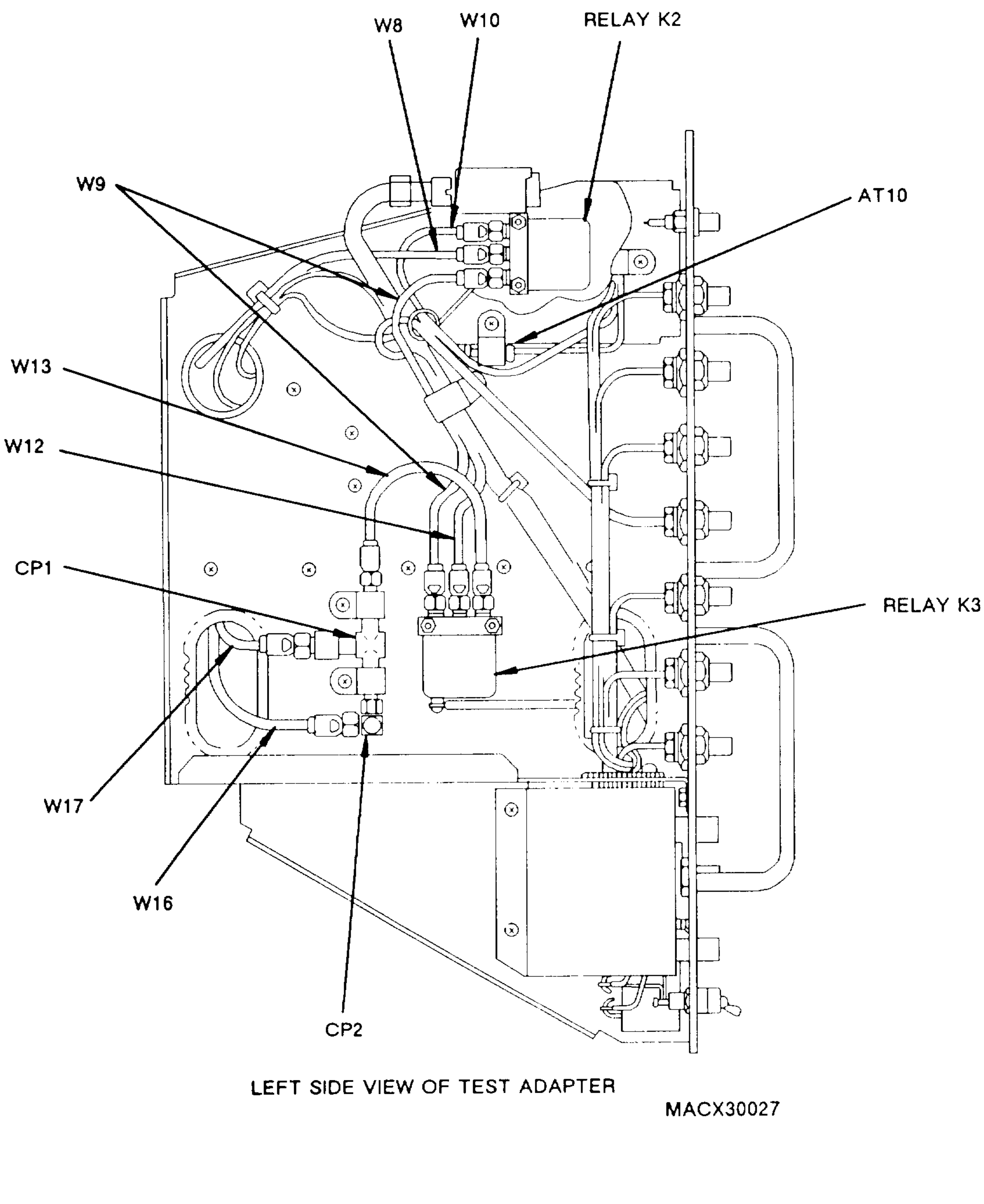


Figure 6-43. Rf Section Components (Sheet 3 of 3)

6-39. TEST ADAPTER VOLTAGE REGULATOR U1 AND SOCKET

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit, Electronic Equipment, TK-105/G

Expendable Supplies

Solder

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

REMOVAL

1. REMOVE U1

   a. Loosen and remove screw (1) and lock-washer (2).

   b. Loosen and remove screw (3), two lock-washers (4 and 7), flat washer (5), and nut (6) securing loop clamp (8). Discard lockwashers.

   c. To unseat U1 , apply pressure to pins using blade of flat-tip screwdriver.

   d. Remove U1 from socket.

2. REMOVE SOCKET.

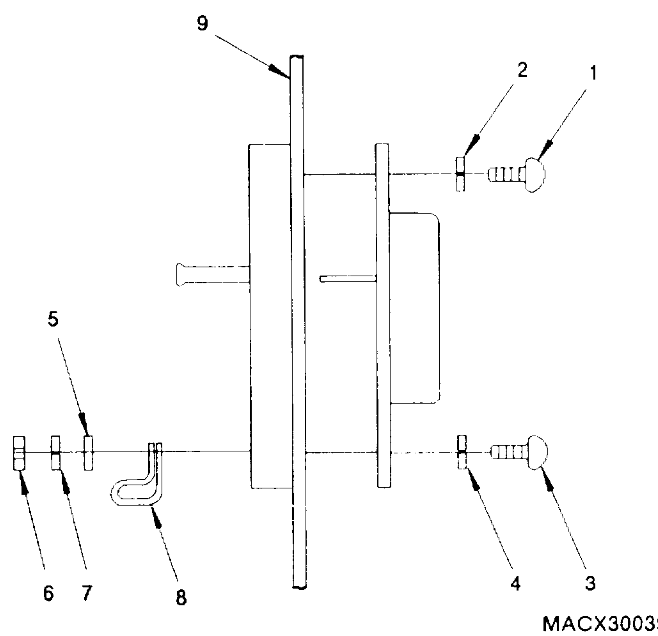
   a. Remove Cl and C2 (para 6-41).

   b. Refer to step 1, and remove U1.

   c. Tag wires soldered to socket.

   d. Unsolder wires from socket.

   e. Remove socket.



INSTALLATION

1. INSTALL U1 .

   a. Plug U1 into socket.

   b. Install screw (1) and lockwasher (2).

   c. Install screw (3) and lockwasher (4).

   d. Install flat washer (5), lockwasher (7), nut (6), and loop clamp (8) on screw (3).

2. INSTALL SOCKET

   a. Position socket on of panel (9).

   b. Solder wires to terminals of socket.

   c. Remove wire tags.

   d. Plug U1 into socket.

   e. Install screws (1 and 3) and lockwashers (2 and 4).

   f. Loosely install flat washer (5), lockwasher (7), nut (6), and loop clamp (8).

   g. Install Cl and C2 (para 6-41).

6-40. TEST ADAPTER RESISTORS R1 AND R2

This paragraph gives the procedure for replacing resistors RI and R2.

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-105/G

Equipment Conditions

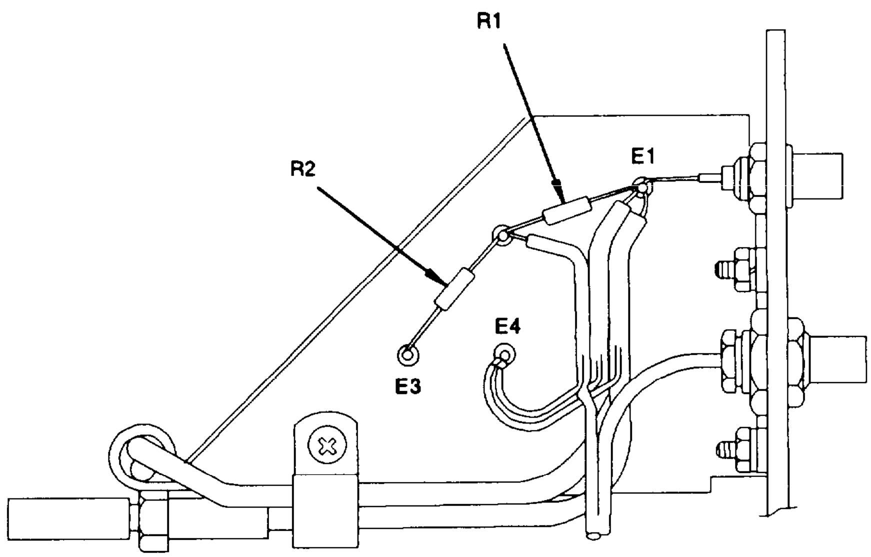
Interconnecting device removed from chest (paragraph 6-22).

Expendable Supplies

Solder

1. Unsolder both leads of bad resistor.
2. Remove bad resistor.

Solder good resistor into place.



MACX30029

6-41. TEST ADAPTER CAPACITORS C1 AND C2

This paragraph gives the procedure for replacing resistors C1 and C2. C1 and C2 are mounted on the voltage regulator U1 receptacle.

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit, Electronic Equipment, TK-105/G

Equipment Conditions

Interconnecting device removed from chest (paragraph 6-22).

Expendable Supplies

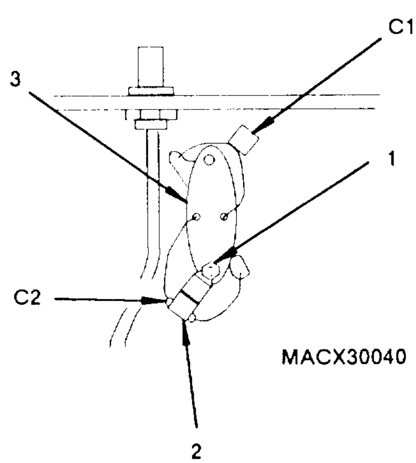
Insulated Sleeving
Solder

REMOVAL

1. Unsolder both leads of bad capacitor.
2. For capacitor C2 only: loosen hex nut (1) securing loop clamp (2) to voltage regulator socket (3).
3. Remove bad capacitor.

INSTALLATION

1. Cut lengths of insulated sleeving to cover leads of capacitor.
2. For capacitor C2 only: slide capacitor into loop clamp (2) on socket (3) with (+) lead oriented toward pin 2 of U1 . Tighten hex nut (1) securing loop clamp to socket.
3. Solder good capacitor into place.



6-42. TEST ADAPTER TERMINAL BOARDS TB1 AND TB2

This paragraph gives the procedure for replacing terminal boards TB1 and TB2.

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit, Electronic Equipment, TK-105/G

Equipment Conditions

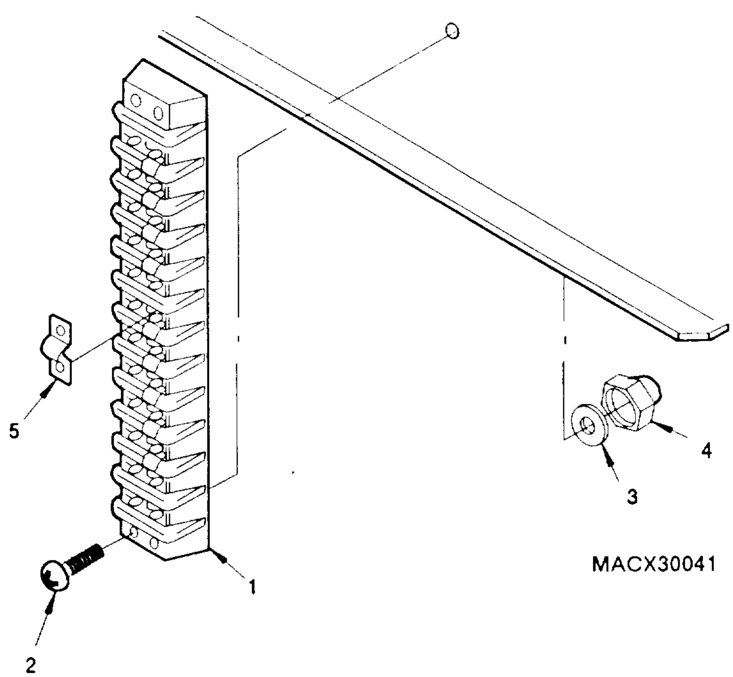
Interconnecting device removed from chest (paragraph 6-22).

REMOVAL

1. Tag wires for reinstallation.
2. Use screwdriver to remove wires from terminal board (1).
3. Loosen and remove two screws (2), flat washers (3), and self-locking nuts (4) securing terminal board (1) to test adapter. Retain screws and flat washers. Discard self-locking nuts.
4. If bus connectors (5) are present, note position, and transfer to new terminal board.

INSTALLATION

1. Install and tighten two screws (2), flat washers (3), and replacement self-locking nuts (4) to secure terminal board (1) to test adapter.
2. Attach wires to terminal board.
3. Remove wire tags.



6-43. TEST ADAPTER FRONT PANEL

This task covers: a. Removal b. Installation

INITIAL SETUP

Tools

Tool Kit, Electronic Equipment, TK-100/G
Tool Kit, Electronic Equipment, TK-105/G

Equipment Conditions

Test adapter removed (paragraph 6-28).

References

See paragraph 6-29 for removal and installation of rf cables.
See paragraph 6-31 for removal and installation of connectors.
See paragraph 6-32 for removal and installation of switches.
See paragraph 6-33 for removal and installation of test points.
See paragraph 6-34 for removal and installation of lamp holders.
See paragraph 6-35 for removal and installation of shield panel and circuit breakers.

REMOVAL

1. Set switches S1 through S6 to OFF. Set S15 to ICS.

2. Remove shield panel.

3. Disconnect from front panel–
   switches: S1 through S16
   circuit breakers: CB1 and CB2
   connectors: J1 through J21

4. Remove—
   lamp holders: test lamps 1 through 10, AC, and DC
   test points: 1 through 24

5. Remove handles.

6. Remove five loop clamps secured to front panel.

7. Loosen and remove three nuts securing terminal lugs to front panel. One is next to S15, and two are next to S7.

8. Loosen and remove nuts and flat washers securing panel brackets to front panel.

6-43. TEST ADAPTER FRONT PANEL. Continued

INSTALLATION

1. Set test adapter on new front panel. Make sure all threaded posts set in front panel are through holes in panel brackets.
2. Thread and tighten nuts with washers securing front panel to panel brackets.
3. Secure three terminal lugs to threaded posts set in front panel.
4. Install five loop clamps to threaded posts set in front panel.
5. Install handles.
6. Install lamp holders and test points.
7. Install f rent panel connectors and switches. Check S1 through S6 and S15 for correct orientation.

6-44. RT FRONT PANEL

Refer to chapter 2.

Section V. PREPARATION FOR STORAGE OR SHIPMENT

6-45. GENERAL INFORMATION

CAUTION

Remove the reference rt, reference rcu, and reference dra from the test adapter and pack separately. DO NOT ship installed in the test adapter or damage may result.

a. Pack the maintenance group or any depot maintained components in approved shipping containers.

b. The lamp test CCA must be shipped enclosed in material that provides protection from static electricity. See the following paragraph.

6-46. PACKING STATIC SENSITIVE MODULES

The following steps should be followed when packing a static sensitive module for storage or shipment.

CAUTION

To avoid damaging static sensitive modules, use an antistatic pad on the work surface and wear a grounded wrist strap when handling the module.

ITEM	ACTION
a. Module (1)	a. Place inside antistatic bag (2) or inside antistatic wrapping material (3), See figure 6–44.
b. Antistatic package (4)	b. Seal with adhesive tape. Attach “sensitive electronic device” unit pack label (5).
c. Antistatic package (4)	c. Place inside approved shipping container (6).
d. Shipping container (6)	d. Attach "sensitive electronic device” intermediate pack label (7).

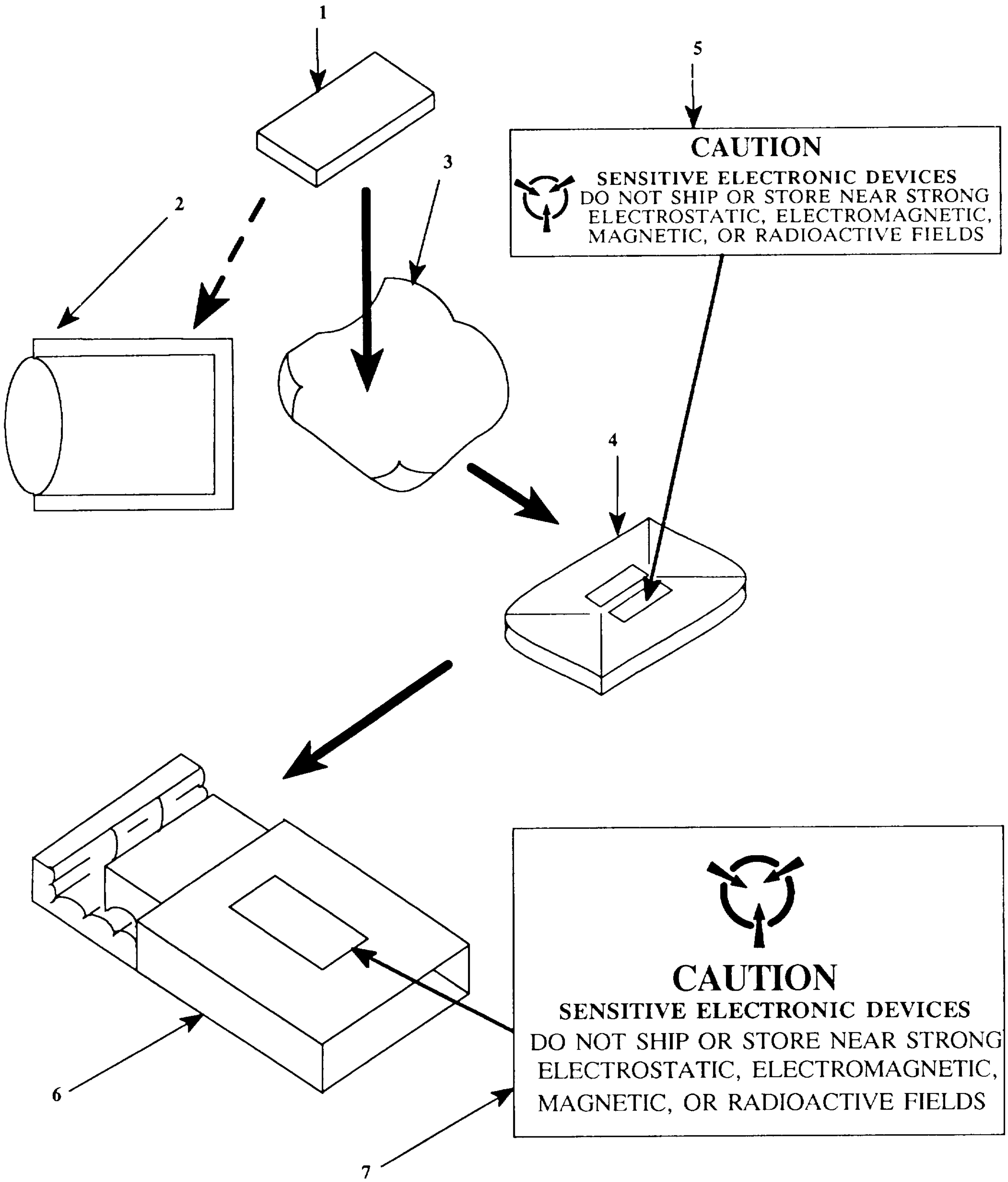


Figure 6-44. Packing Static Sensitive Modules

APPENDIX A

REFERENCES

DA PAM 25-30	Consolidated Index of Army Publications and Blank Forms
DA PAM 738-750	Maintenance Management Uppdate
TM 11-5820-333-12	Operator's and Aviation Unit Maintenance Manual for Radio Set AN/ARC-201 (V)
TM 55-1500-204-25/1	General Aircraft Maintenance Manual

APPENDIX B

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

B-1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the radio set. This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable [terns.

B-2. EXPLANATION OF COLUMNS

a. Column (1). Item Number.

b. Column (2). National Stock Number. This is the National Stock Number (NSN) assigned to the item; use it to request or requisition the item.

c. Column (3). Description. Indicates the Federal item name and, if required, a description to identify the item.

d. Column (4). Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. The measure is expressed by a two-character alphabetical abbreviation (e. g. ea, in, pr), If the unit of measure differs from the unit if issue, requisition the lowest unit if issue that will satisfy your requirements.

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) National Stock Number	(3) Description	(4) U/M
1	6810-00-753-4993	Alcohol, Isopropyl, Grade A MIL-A-2048	oz
2	6515-01-234-6838	Cotton swabs (Disposable Applicator)	dz
3	8030-01-267-5398	Sealing Compound (MIL-S-22473) Grade H	cc
4	5970-00-837-0647	Sleeving, Insulated (ASTM-D-3295) 22 AWG	ft
5	5975-00-727-5153	Strap, Tiedown (MS3367-4-9)	ea
6	3439-01-008-7580	Solder (SN63WRMAP3)	lb
7	6145-00-062-5700	Wire, Electrical, White, 22 AWG (81349) M16878/4BFE9	ft
8	6145-00-808-4849	Wire, Electrical, White, 24 AWG (81349) M16878/4BEE9	ft
9	6145-01-179-0642	Wire, Electrical, White, 24 AWG (81349) M16878/4DEE9	ft
10	6145-01-178-9265	Wire, Electrical, Black, 24 AWG (81349) M16878/4DEE0	ft

GLOSSARY

Section I, ABBREVIATIONS

AC	Alternating current
ACFT	Aircraft
A/D	Analog to digital
ADDR	Address
AGC	Automatic gain control
ALC	Automatic level control
AMPL	Amplifier
ANT	Antenna
AUD	Audio
AUX	Auxiliary
AVIM	Aviation intermediate maintenance
BS	Bit sync
CAL	Calibration
CCA	Circuit card assembly
CCW	Counterclockwise
CGC	Cipher ground control
CH	Channel
CLK	Clock
CLR	Clear
CNTR	Counter
COM	Communication
CONT	Control
CT	Cipher text
CTRL	Control
CVSD	Continuously variable slope detector
CW	Clockwise
DC	Direct current
DDMC	Digital data mode control
DEMOD	Demodulated
DET	Detect
DEV	Deviation
DIG	Digital
DISP	Display
DMA	Direct memory access
DMM	Digital multimeter
dra	Data rate adapter
ENBL	Enable
EPROM	Erasable programmable read only memory
EQPT	Equipment
EXT	External
FH	Frequency hopping
FH/M	Frequency hopping/master
FIFO	First-in-first-out
FM	Frequency modulation
FREQ	Frequency
FSK	Frequency shift keying
GEN	Generator
GND	Ground
HB	Holding battery
HI	High
ICS	Intercommunication system
IF	Intermediate frequency
IN	Input
INFO	Information
INTL	Internal
INV	Inverter
I/O	Input/output
L	Left
L	Low
LD	Load
LD-V	Load variable
LO	Local oscillator
LO	Low
LT	Left
LPF	Low pass filter
MAN	Manual
MOD	Modulation
N	Not
OUT	Output
PLL	Phase locked loop
P-P	Peak-to-peak
PT	Plain text
PTT	Push-to-talk
PWR	Power
R	Right
RAM	Random access memory
rcu	Remote control unit
RCV	Receiver
REF	Reference
REM	Remote
REQ	Request
RF	Radio frequency
ROM	Read only memory
rt	Receiver-transmitter
RT	Right
RTN	Return
RXMT	Retransmit
SC	Single channel
SCOPE	Oscilloscope
SEL	Select
SIG	Signal
SQ	Squelch
STA	Station
STBY	Standby
STR	Strength
SW	Switch
SYS	System
T/R	Transmit/receive
UUT	Unit under test
V	Volt
VCXO	Voltage controlled crystal oscillatc
VOL	Volume
VSWR	Voltage standing wave ratio
VTO	Voltage tuned oscillator
WB	Wideband
XFMR	Transformer
XMT	Transmit
XTAL	Crystal
Z-A	Zero all

GLOSSARY
Section II. UNUSUAL TERMS

Term	Definition
Bit synchronization	Alinement of incoming data bits with internal clocks.
Cue signal	A single channel signal used to contact a frequency hopping net by a radio that is not a net member.
De-interleave	A signal is stripped of data speed or frequency hopping control information, leaving only the signal and collapsing it down to the original data speed.
Frequency hopping	An ECCM mode of operation; rt automatically changes operating frequency very quickly.
Hopset	Data in the rt that determines which frequencies will be used by the rt during frequency hopping.
Interleave	Insert data speed or frequency hopping control information into a signal by creating gaps in the information flow and inserting the control data into the gaps. The process will increase a signal's data speed.
Single channel	A mode of operation in which a radio operates on one selected frequency.
Sidetone	Feedback of the operator's voice into the headset receiver when transmitting.
Squelch tone	Tone accompanying received signals, necessary to break squelch.
TRANSEC variable	Electronic control data needed for frequency hopping operation.
X-mode	A signal that is in digital form either because it is data or because it has been encrypted.

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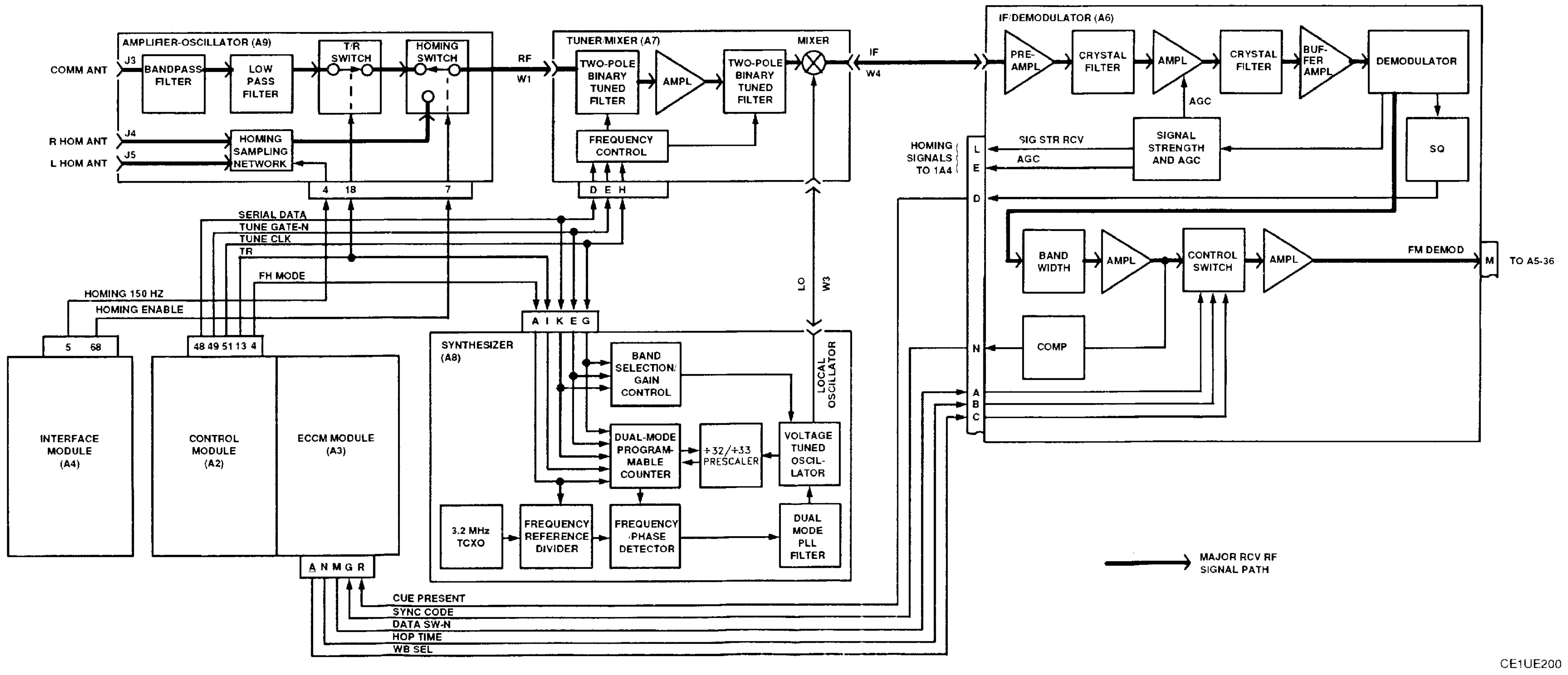


Figure FO-1. Rt Rf Receive Signal Path
Functional Block Diagram

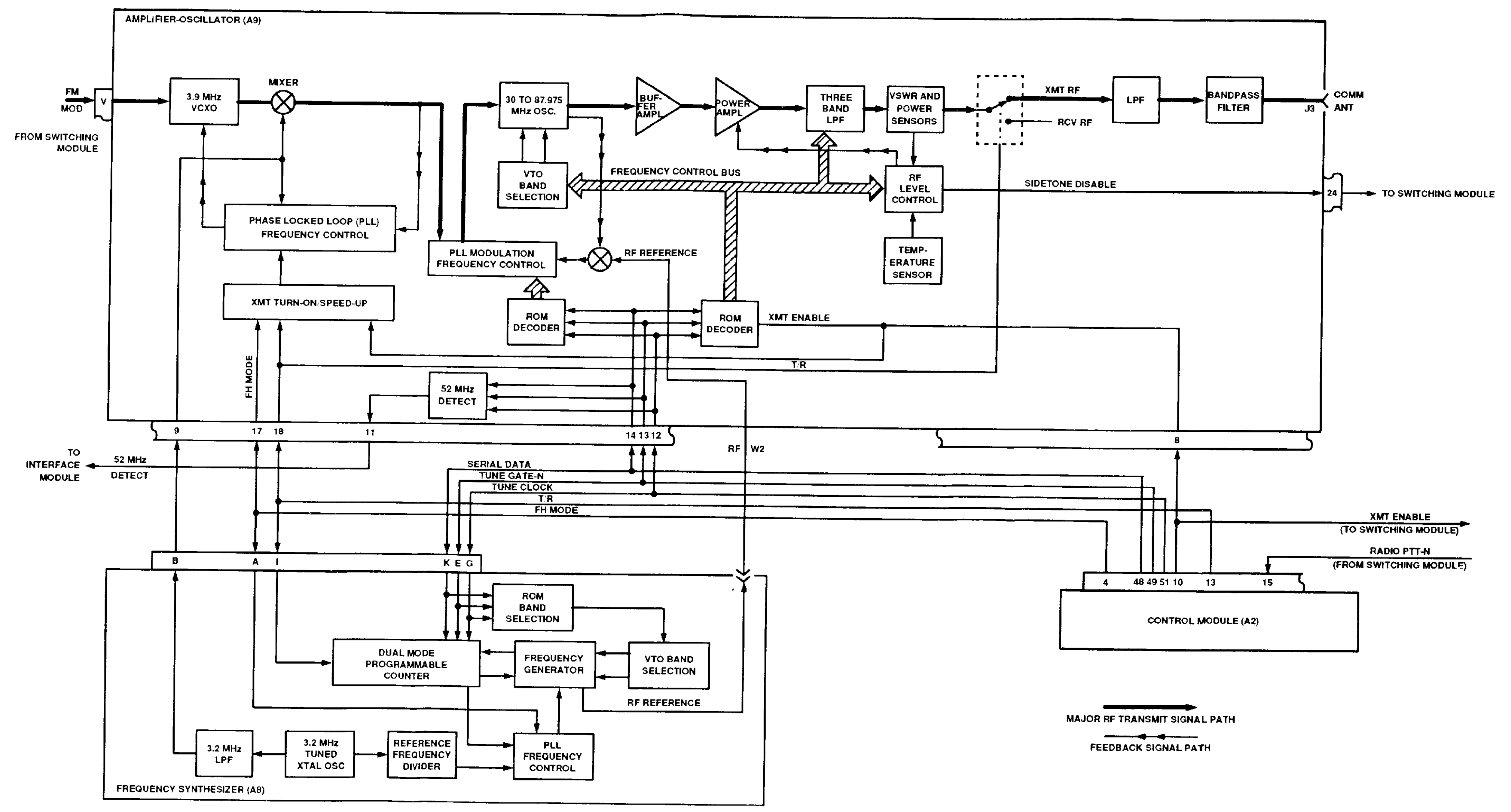


Figure FO-2. Rt Rf Transmit Signal Path Functional Block Diagram

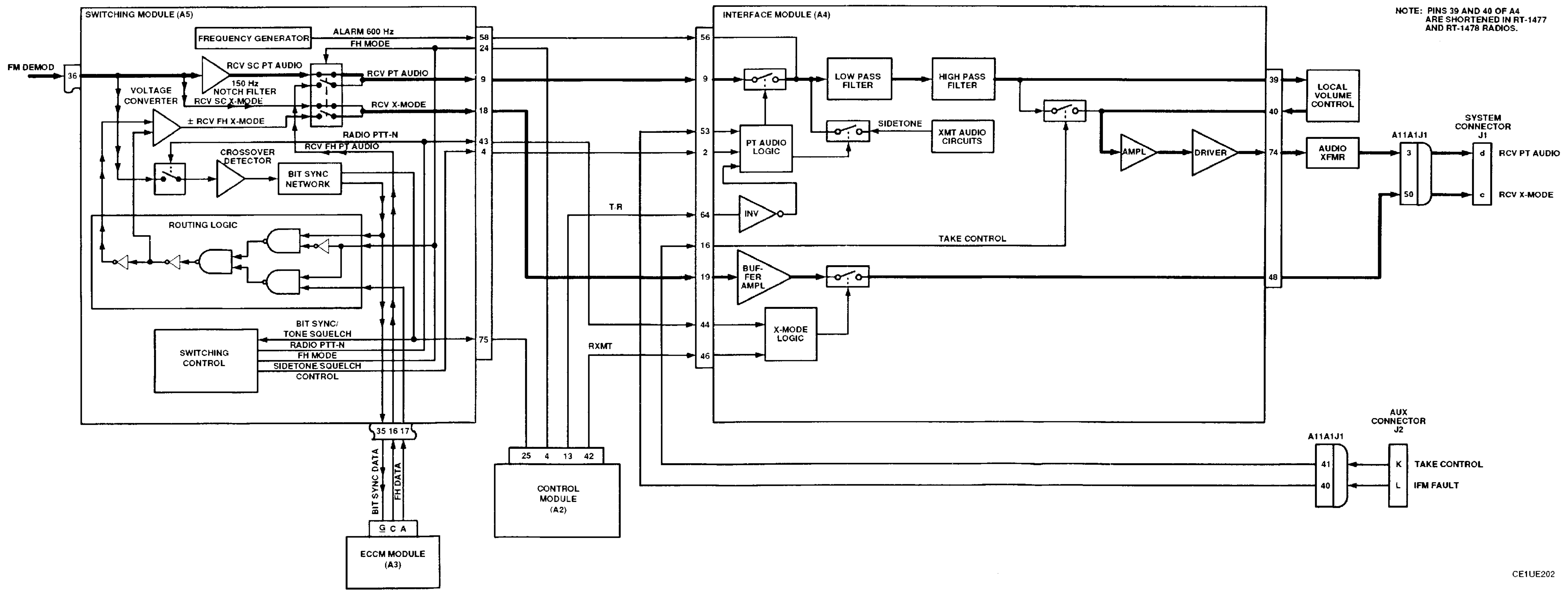


Figure FO-3. Receiver Audio/Data Signal Path
Functional Block Diagram

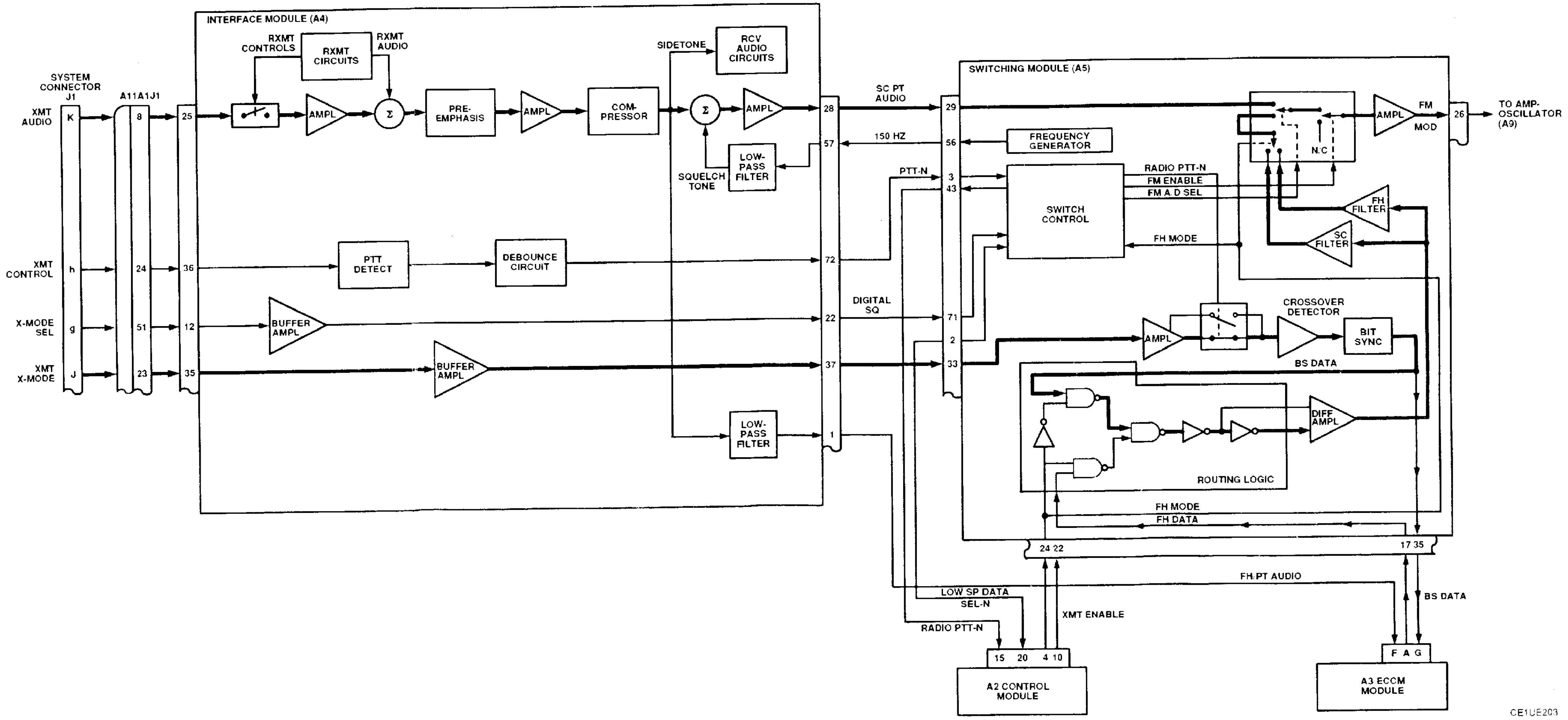


Figure FO-4. Transmit Audio/Data Signal Path
Functional Block Diagram

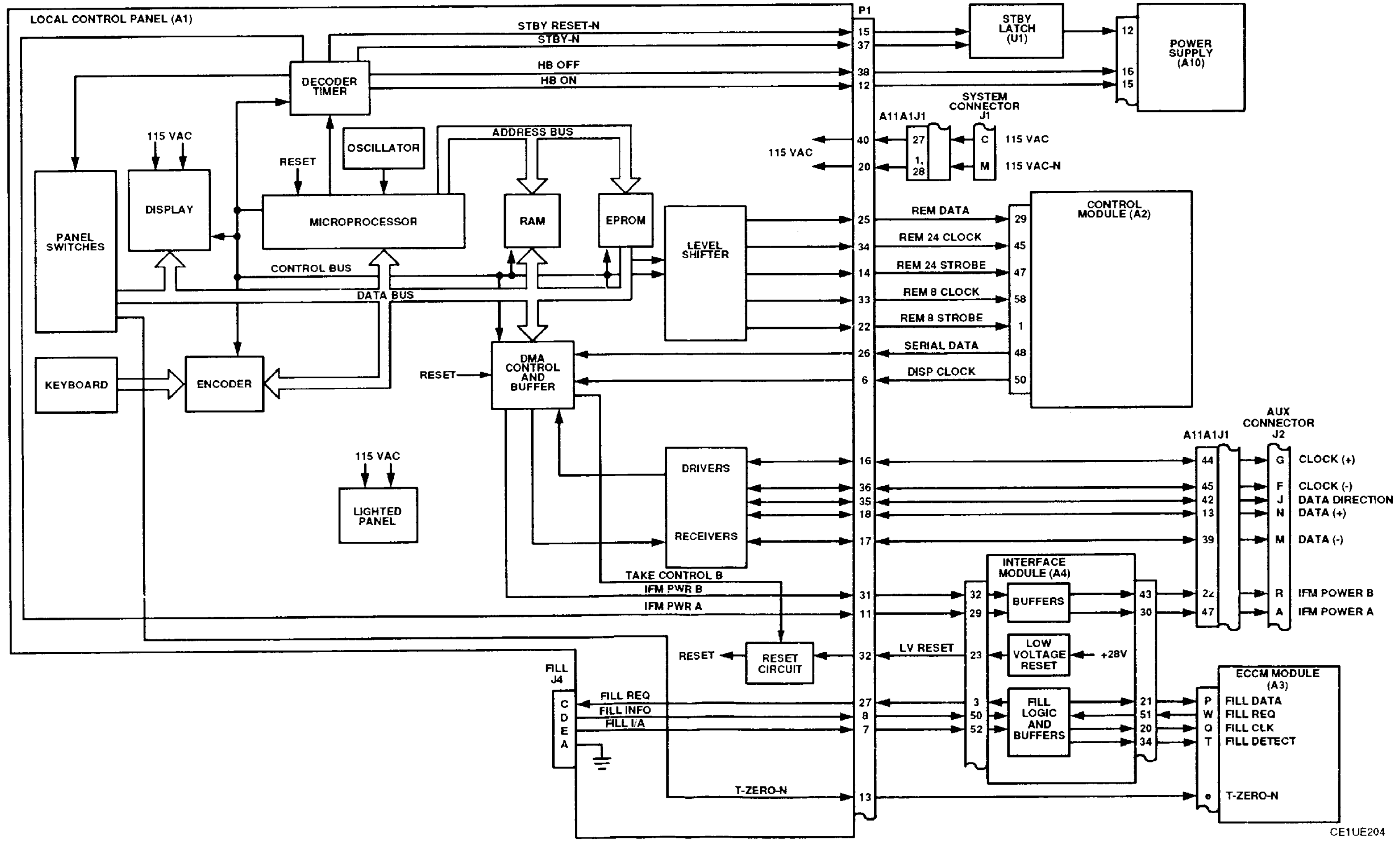


Figure FO-5. Local Control Functional Block Diagram

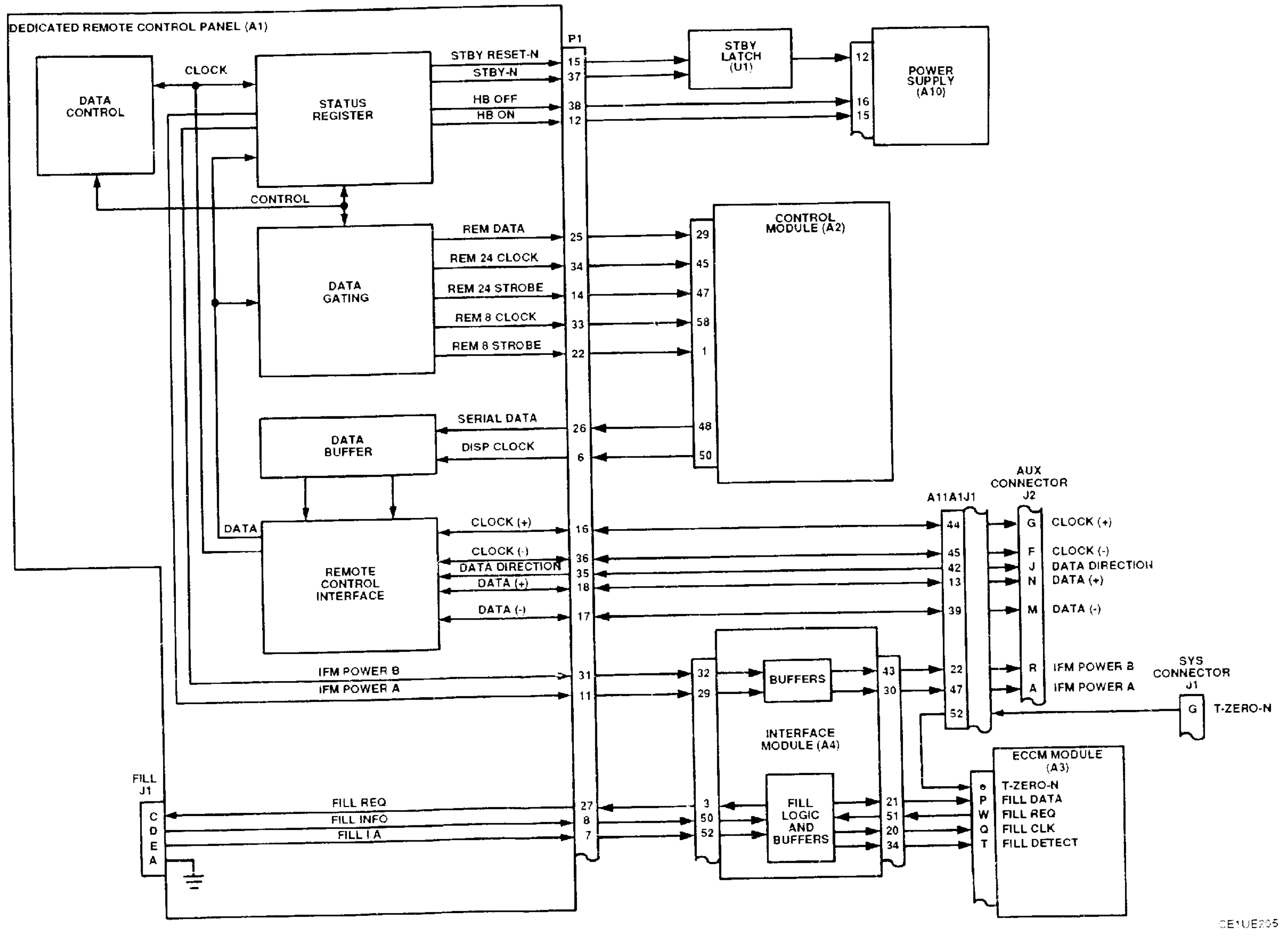


Figure FO-6. Dedicated Remote Control
Functional Block Diagram
FP-11 (FP-12 Blank)

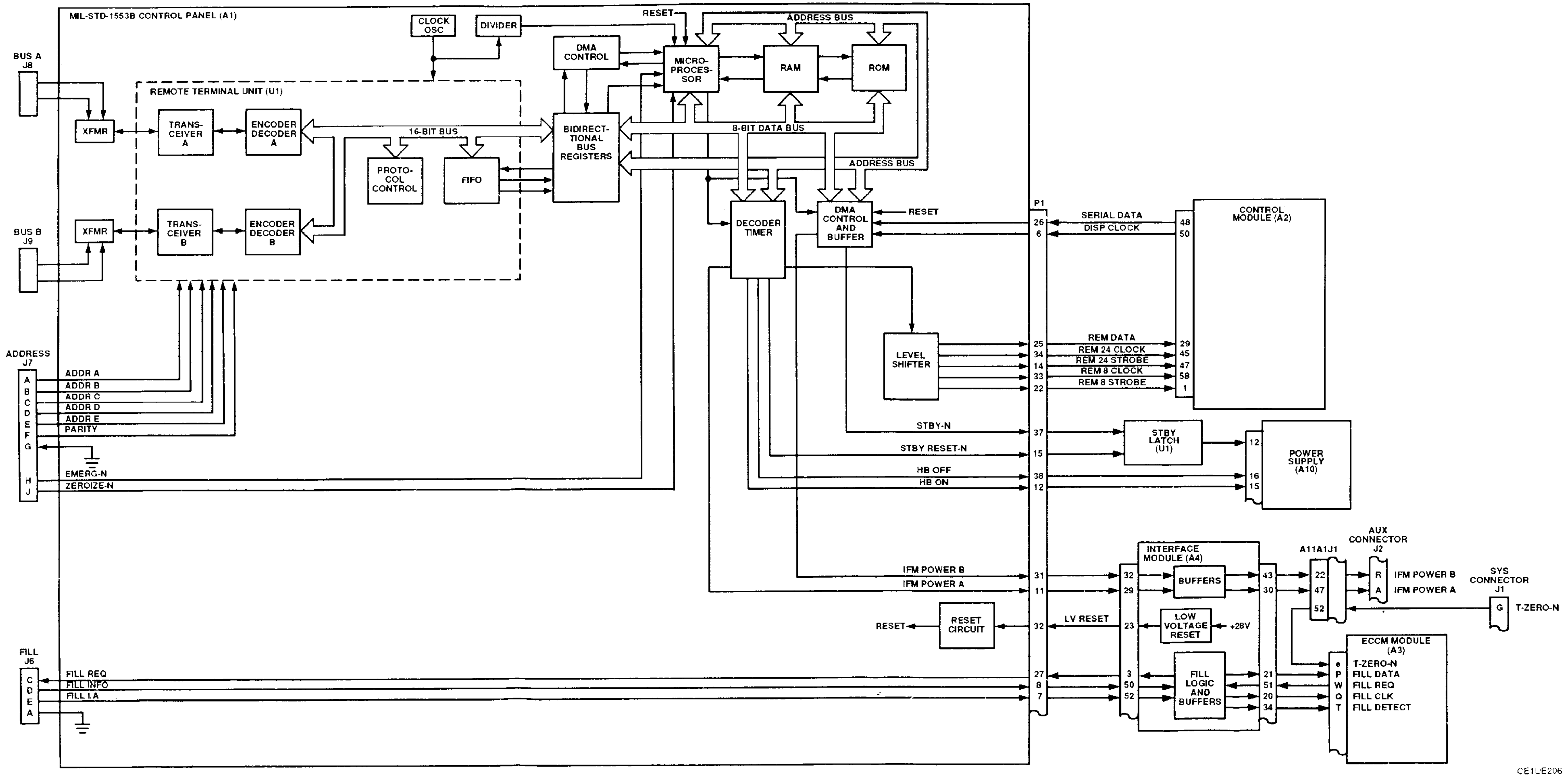


Figure FO-7. MIL-STD-1553B Control Functional Block Diagram

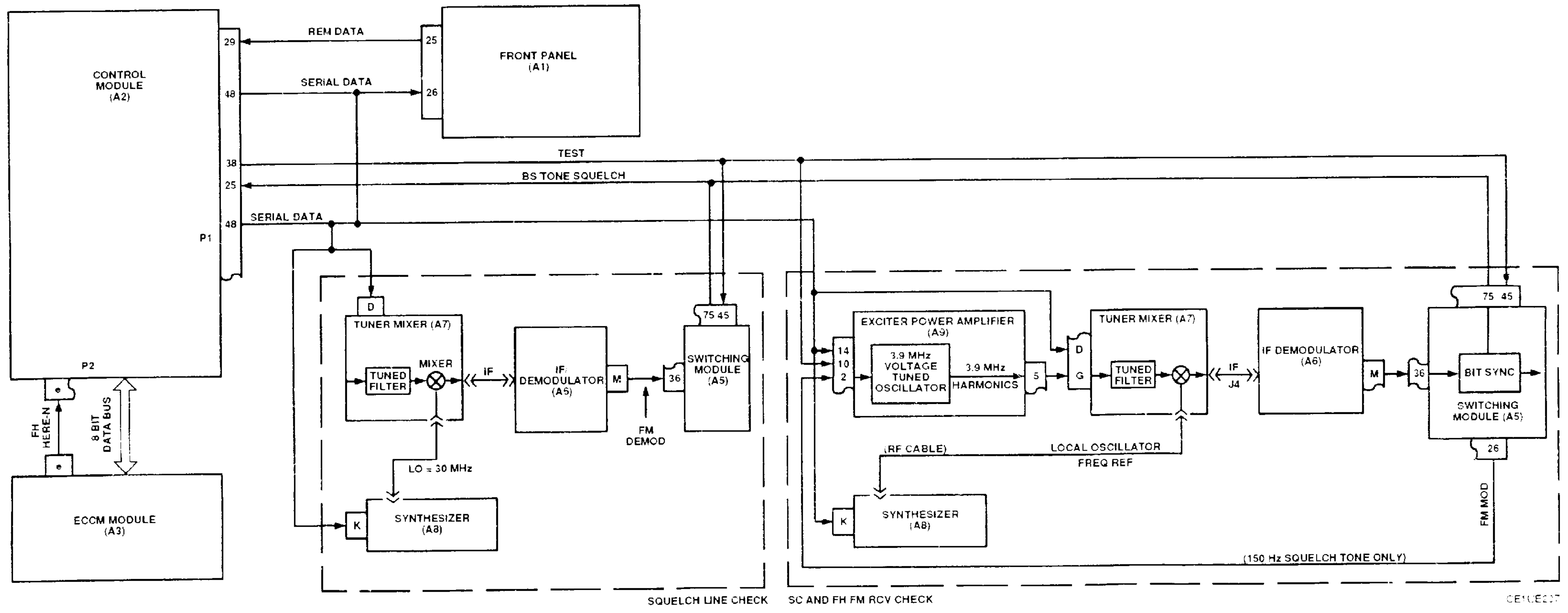


Figure FO-8. Rt Self-Test Signal Path
Functional Block Diagram
FP-15/(FP-16 blank)

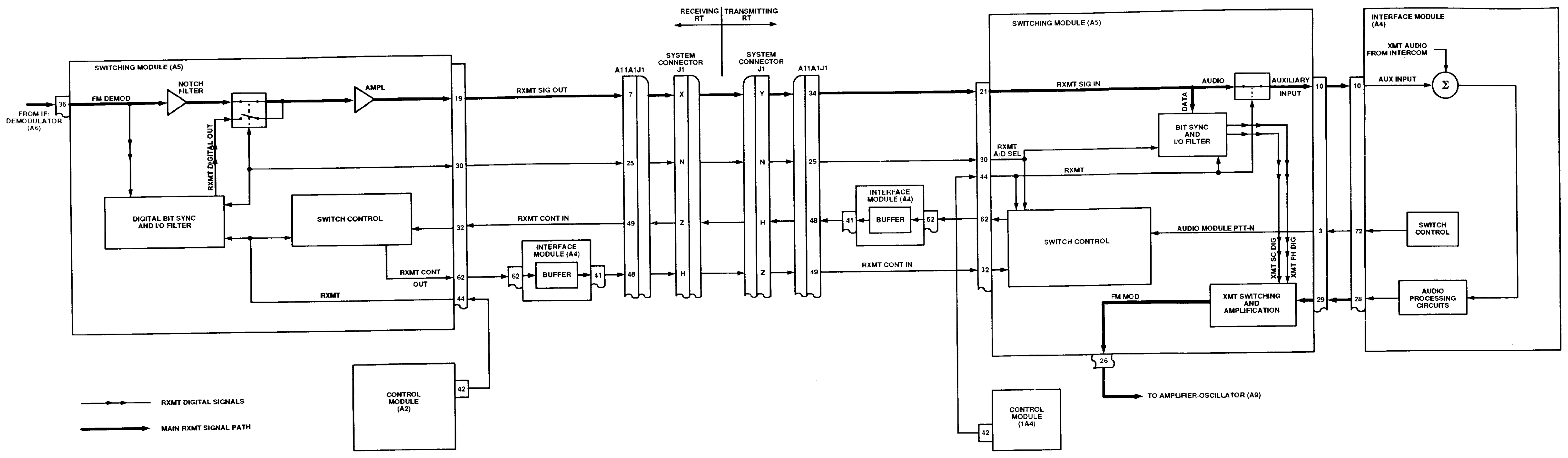
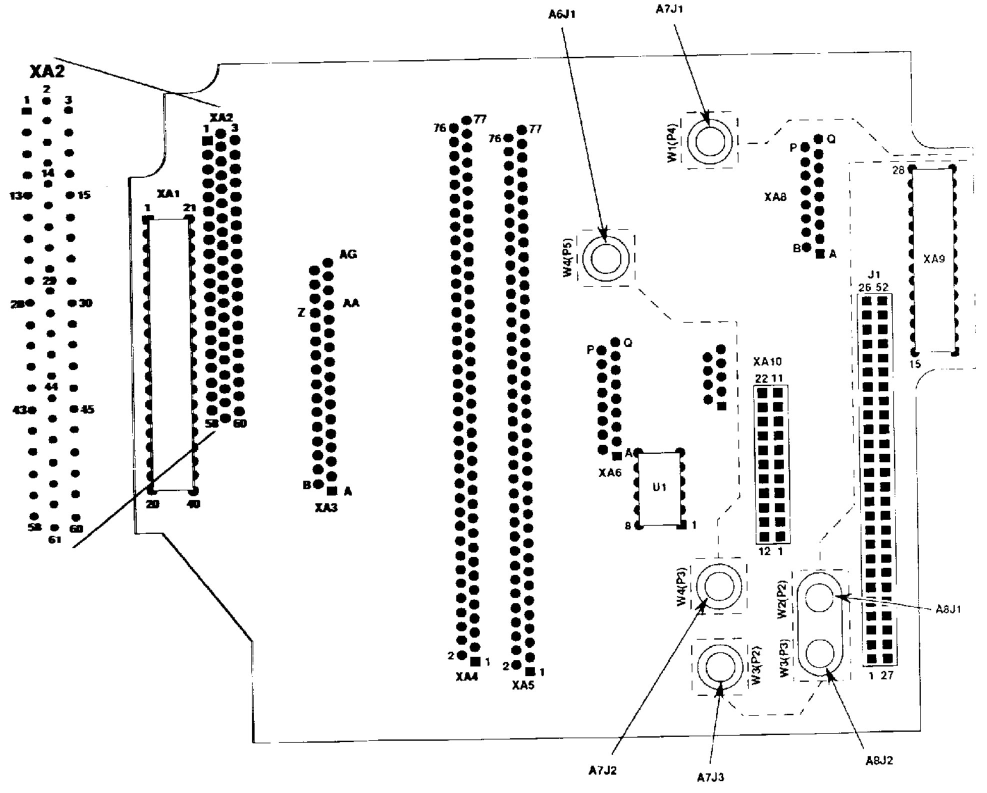
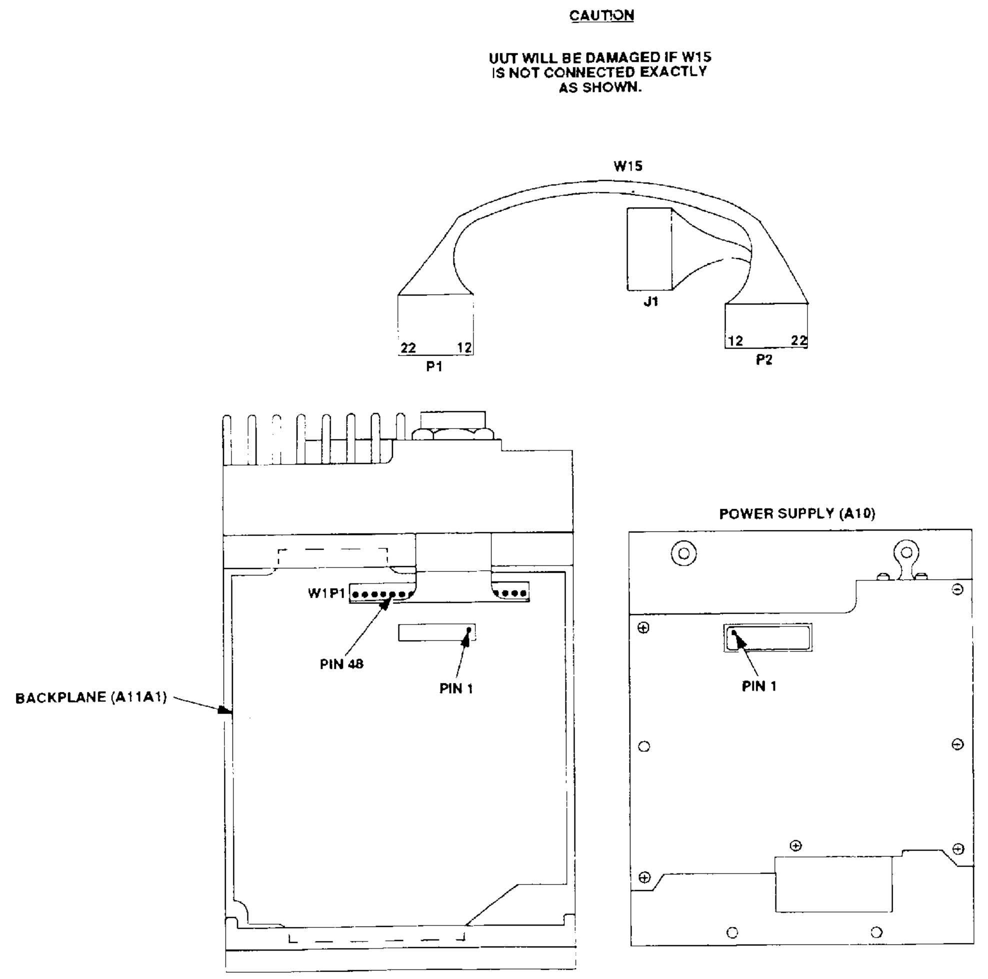


Figure FO-9. Rt Retransmit Signal Path
Functional Block Diagram

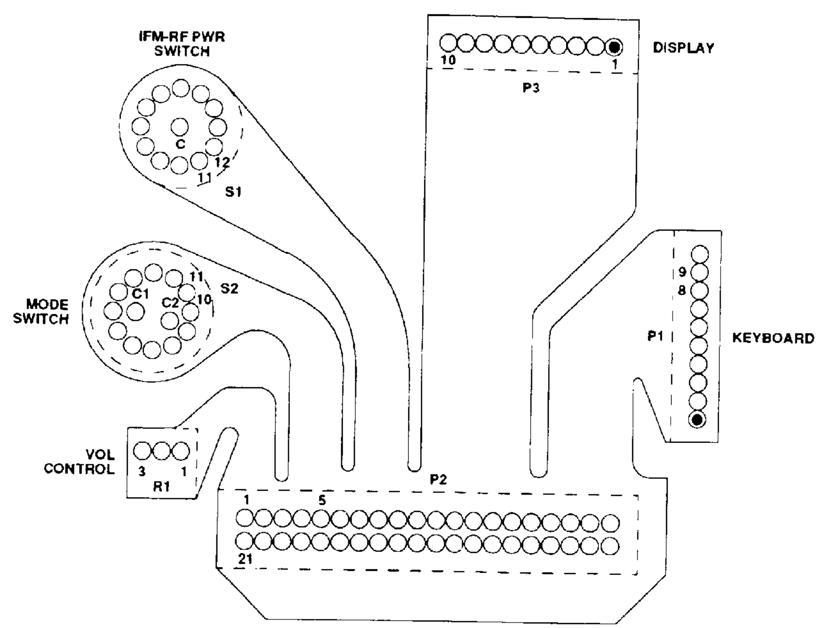




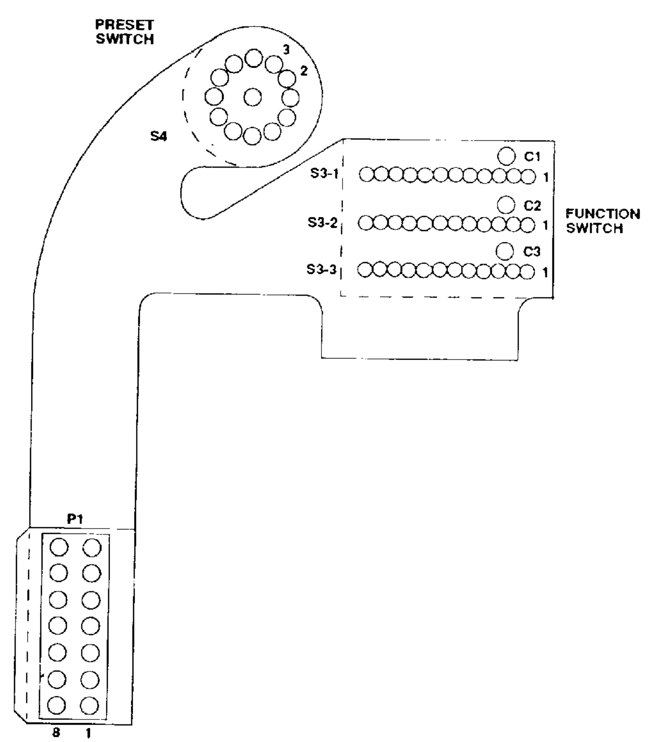
CE1UE209

Figure FO-10. Rt Test Point Locations

FLEX CABLE (W1)



FLEX CABLE (W2)



BACKPLANE

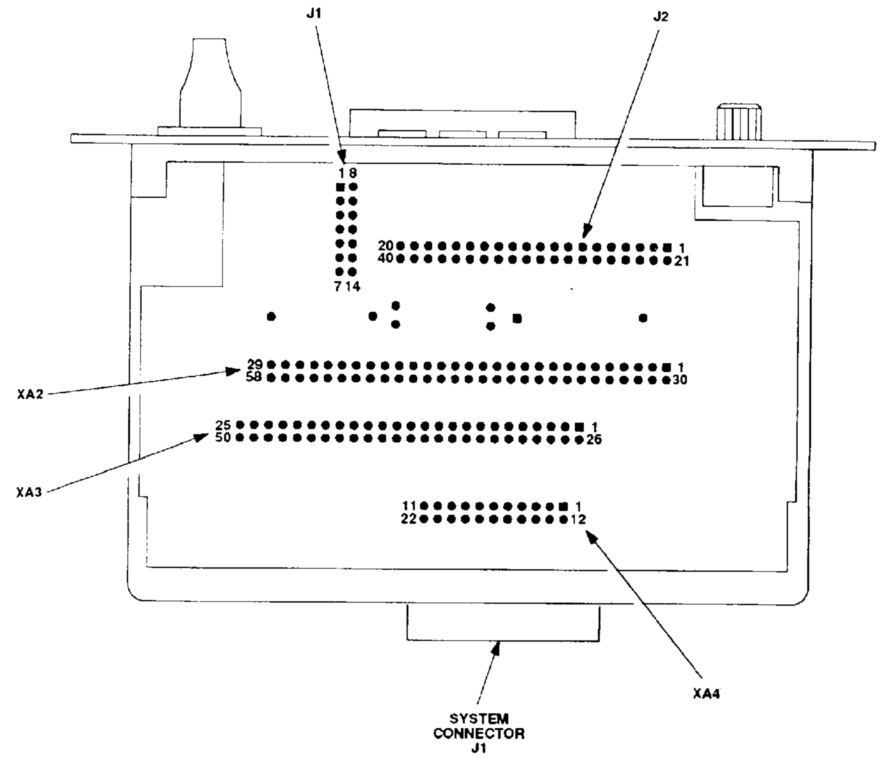


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Figure FO-11. Rcu Test Point Locations

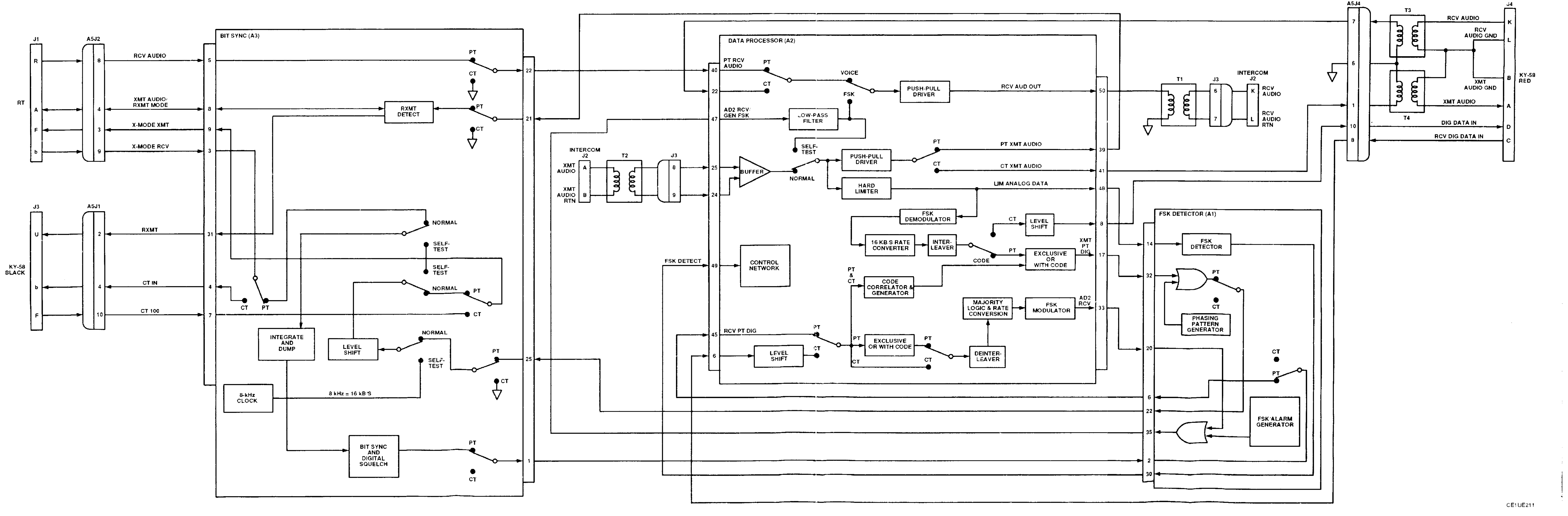

Figure FO-12. Dra Audio/Data Signal Paths
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FP-23/(FP-24 blank)

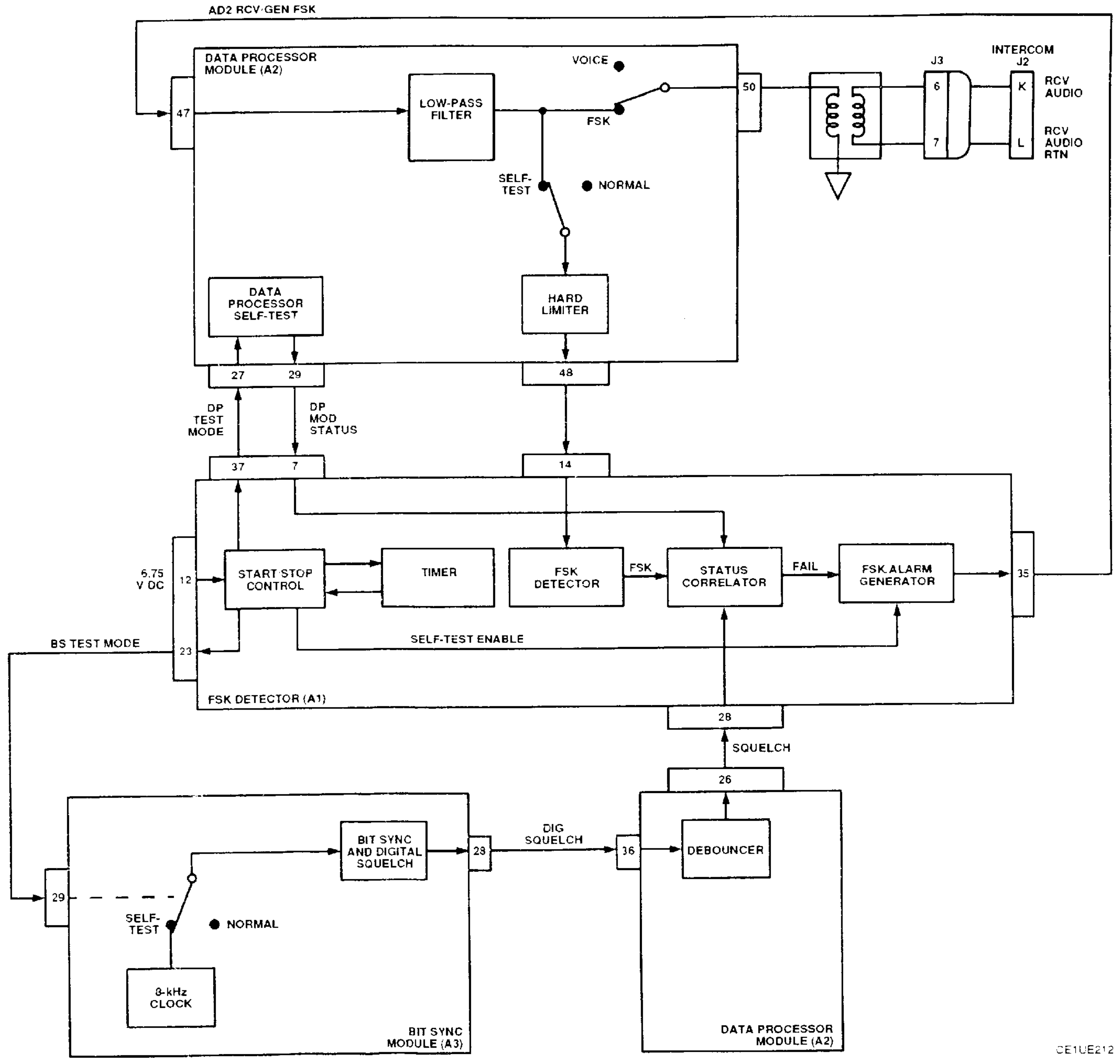
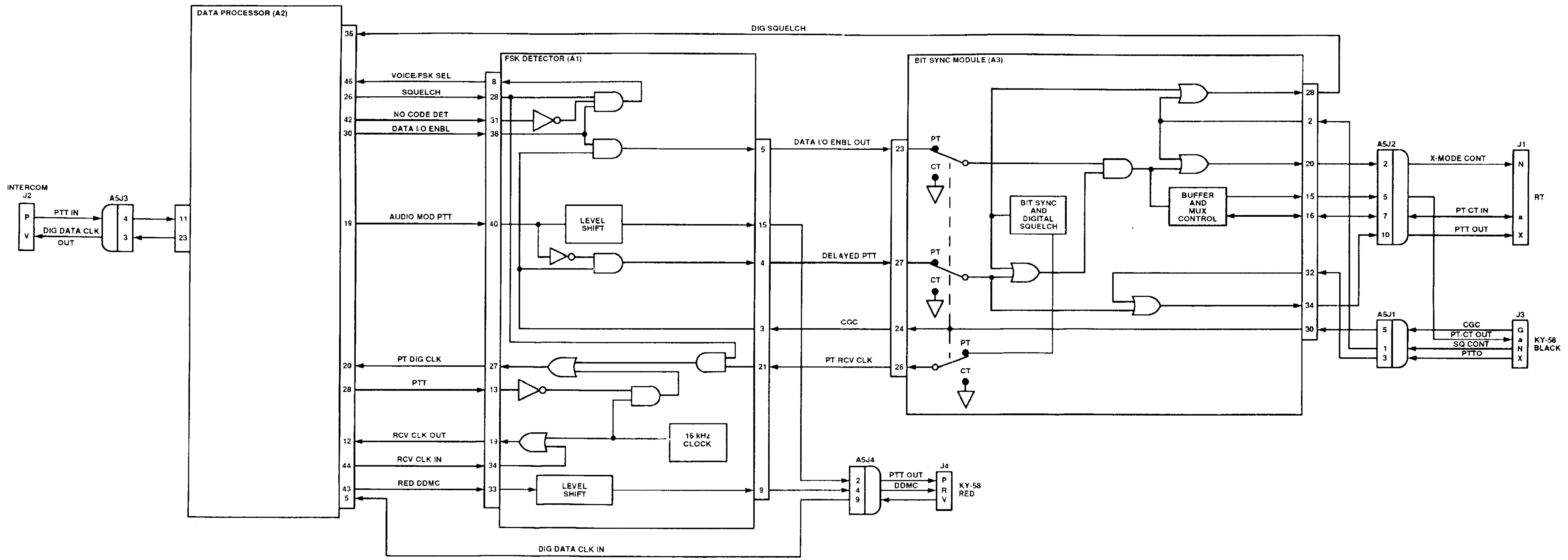


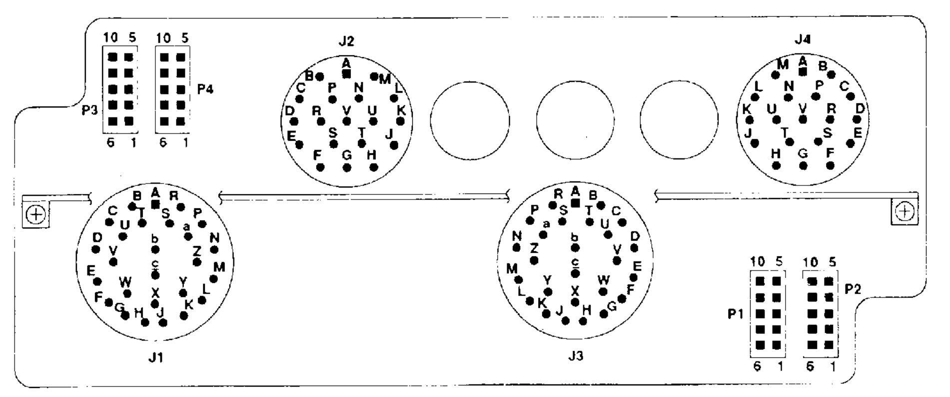
Figure FO-13. Dra Self-Test Signal Path
Functional Block Diagram
FP-25 (FP-26 blank)



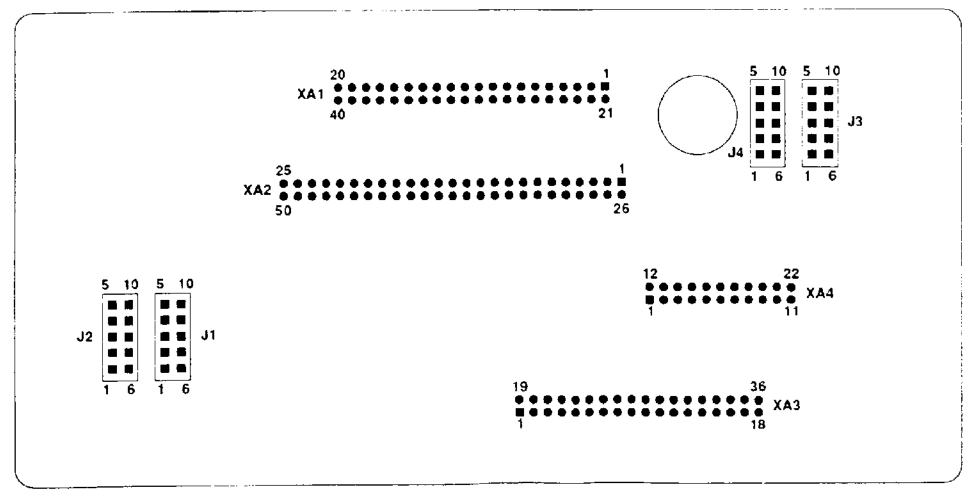
CE1UE213

Figure FO-14. Dra Control Signals Functional Block Diagram

CONNECTOR HOUSING (A6)



BACKPLANE (A5)



CAUTION

COLLECT ALL FOUR W15 CABLES SO THAT PIN 1 ON BOTH ENDS IS CONNECTED TO PIN 1 ON CIRCUIT BOARD CONNECTOR.

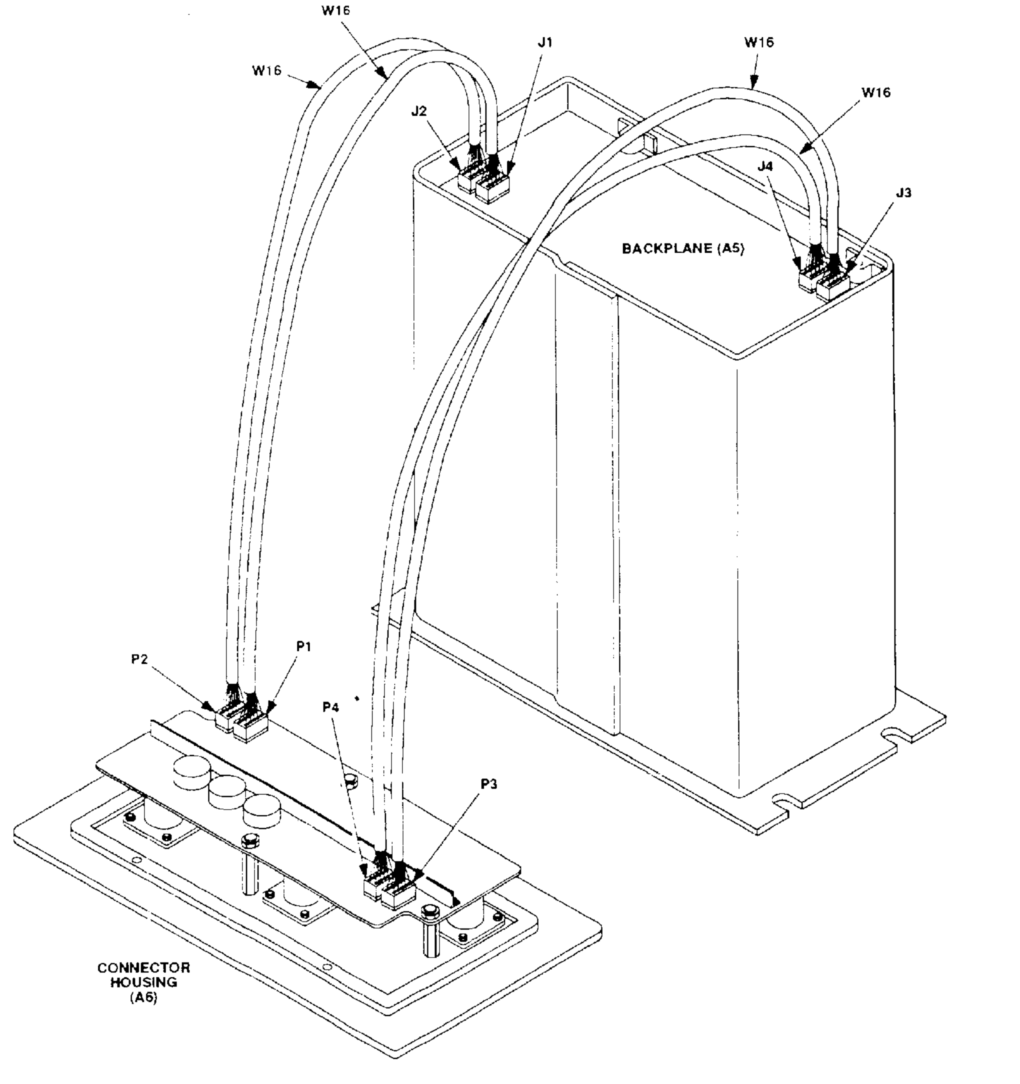


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Figure FO-15. Dra Test Point Locations

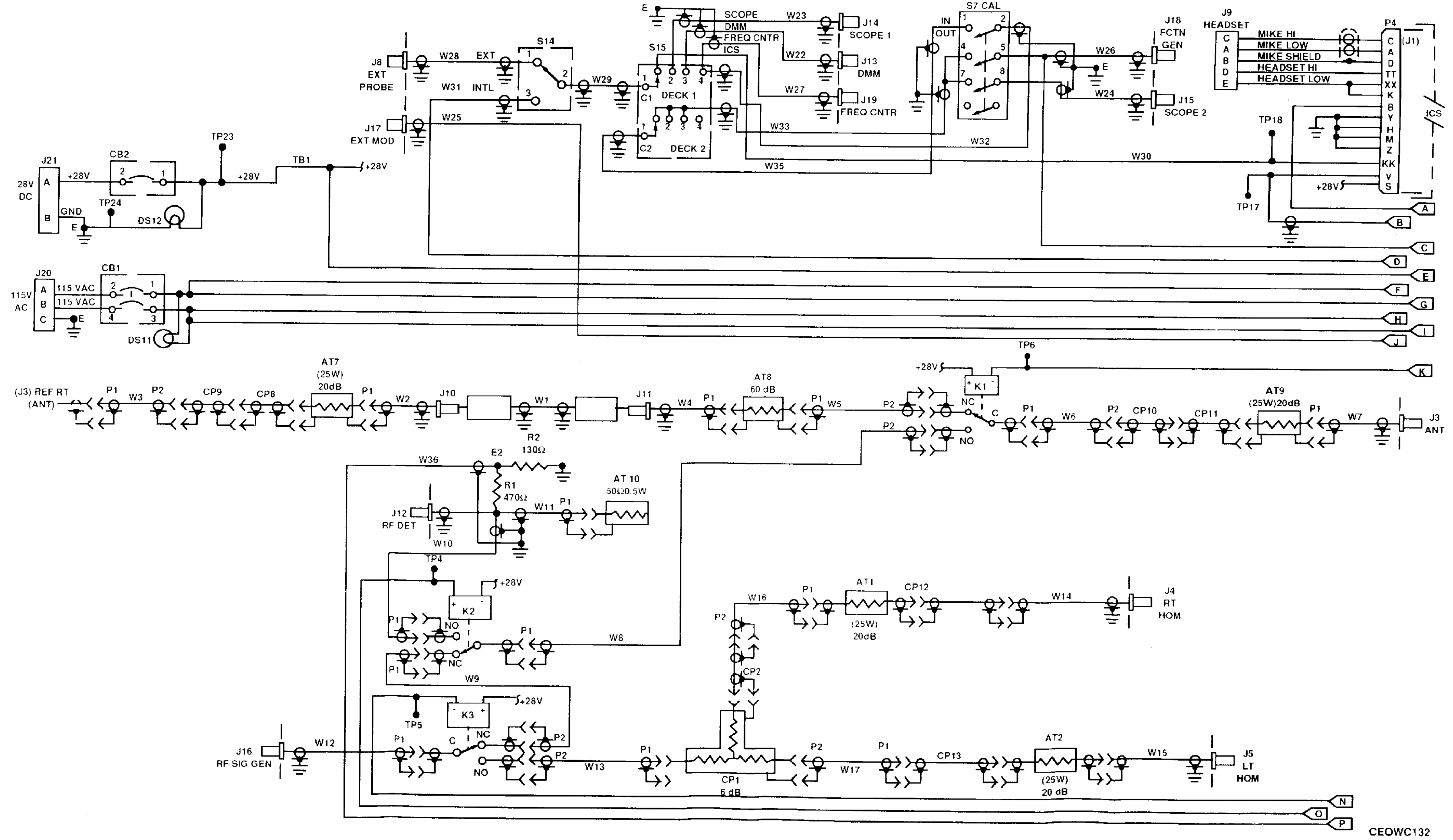

Figure FO-16. Test Adapter Schematic (Sheet 1 of 3)

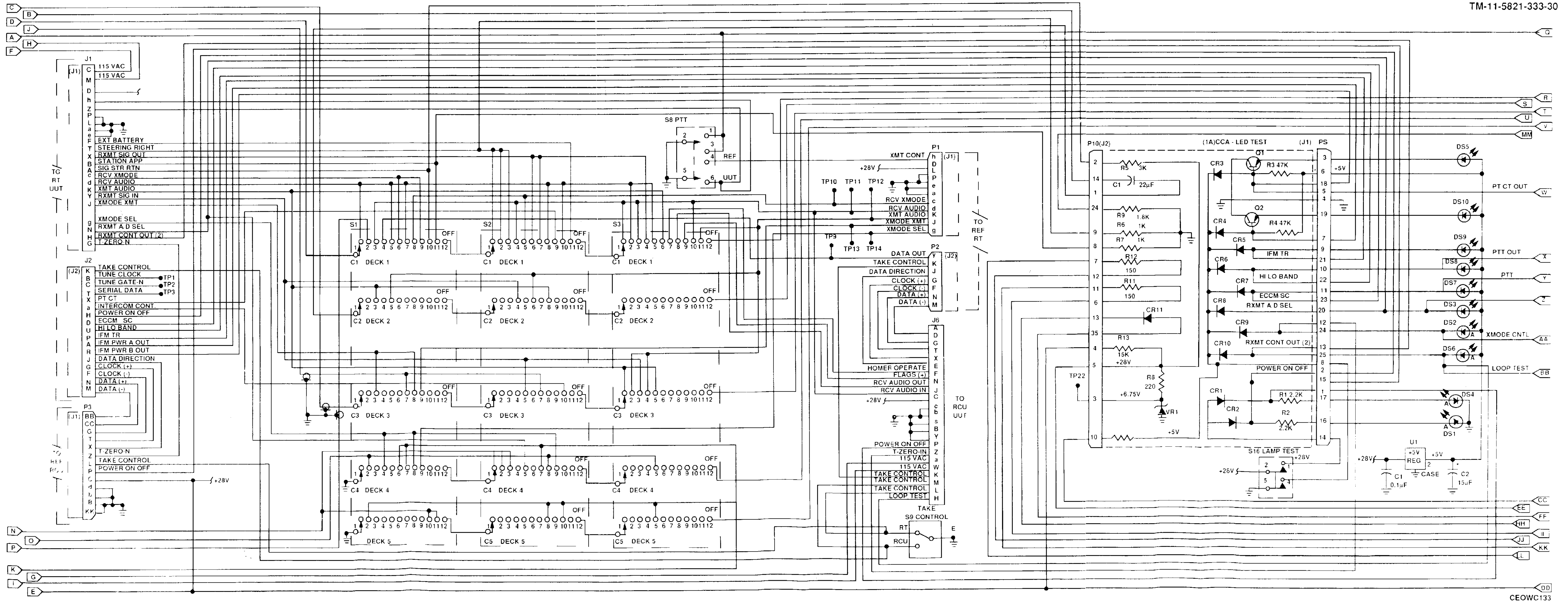

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Figure FO-16. Test Adapter Schematic (Sheet 2 of 3)

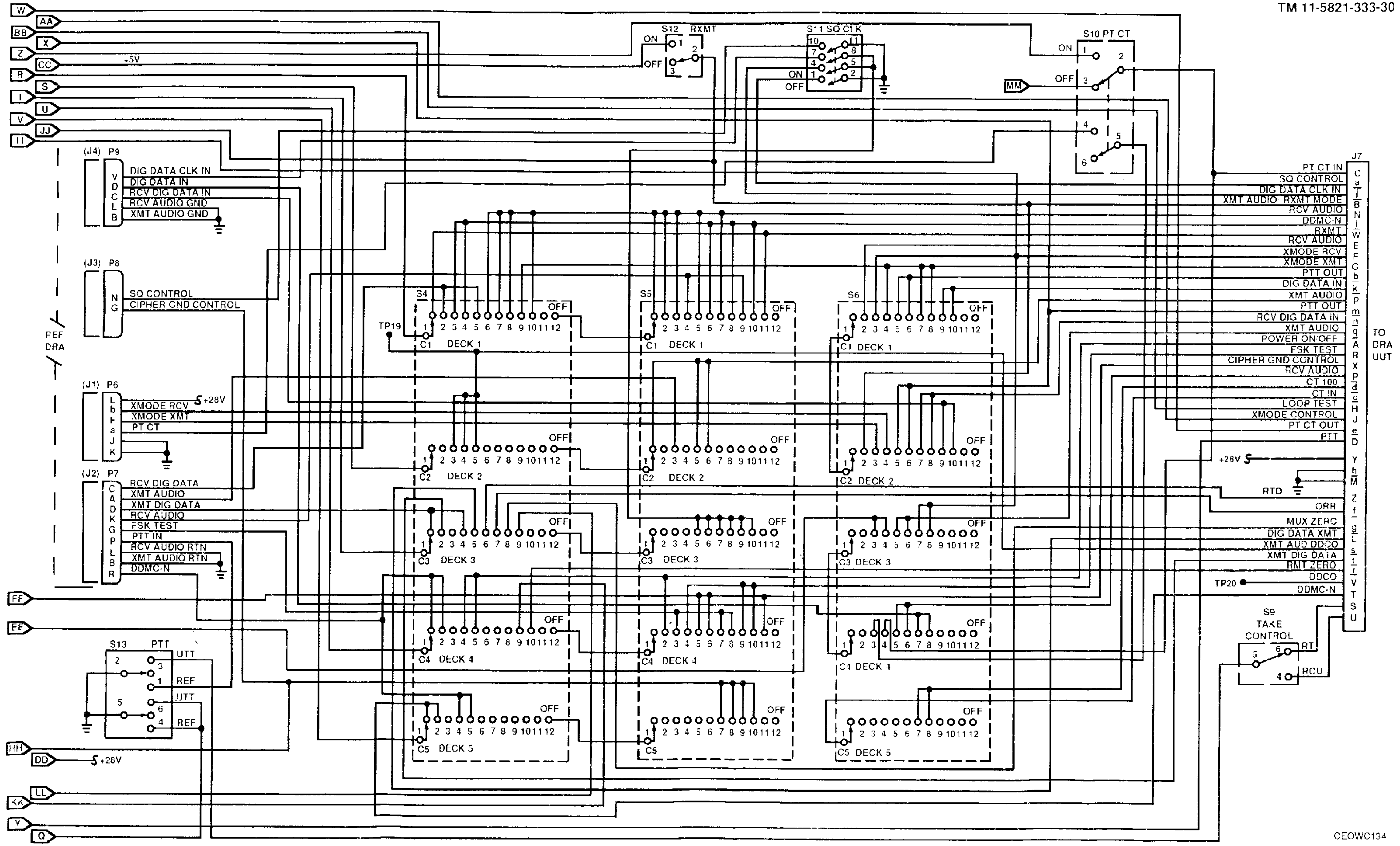

Figure FO-16. Test Adapter Schematic (Sheet 3 of 3)

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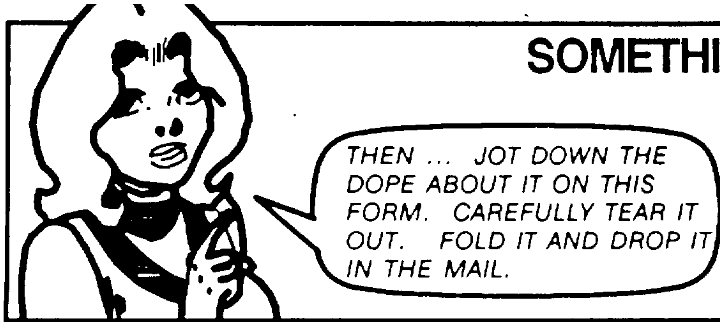

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TM 11-5840-340-12	23 Jan 74	Radar Set AN/PRC-76

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
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, Functional column. Change "2 dB" to "3 dB". 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.
		FO-3		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.

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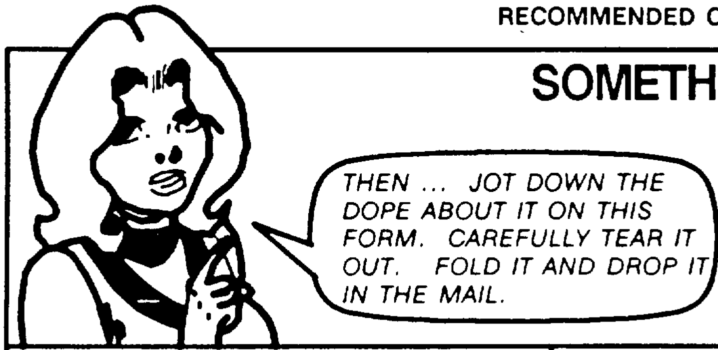

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