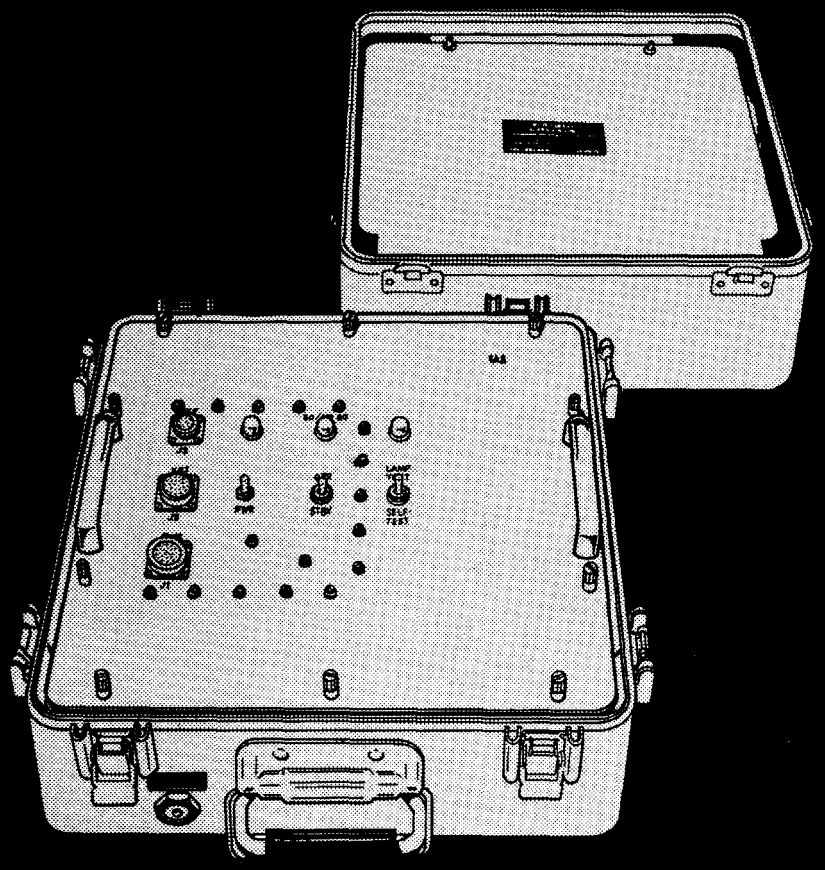
ARMY TM 11-6625-2885-30
NAVY NAVAIR 16-35TS3614-2

AVIATION INTERMEDIATE MAINTENANCE MANUAL



TEST SET, COUNTERMEASURES SET TS-3614/ALQ-136(V) (NSN 6625-01-121-8983)

DEPARTMENTS OF THE ARMY AND THE NAVY

23 FEBRUARY 1984

WARNING

HIGH VOLTAGE

is used in the equipment.
DEATH ON CONTACT MAY RESULT IF SAFETY PRECAUTIONS ARE NOT OBSERVED.

WARNING

Failure of the 65 Volt Power Supply regulator may cause a higher voltage. Be careful when working on this equipment. Contact with the 65 volt connections may cause DEATH or SERIOUS INJURY!

WARNING

Do not be misled by the term “low voltage.” Potentials as low as 50 volts may cause death under adverse conditions. For Artificial Respiration refer to FM 21-11.

WARNING

This equipment weighs 44 pounds. A minimum of two persons must be used in handling or lifting anything in excess of 40 pounds. Extreme care must be used in handling to prevent injury to the individual or damage to equipment.

WARNING

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When the technician is aided by operators, he must warn them about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. Take particular care to ground every capacitor likely to hold a dangerous potential. When working inside the equipment, after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections or 115 volts ac input connections when installing or operating this equipment.

Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through the body.

Do not be misled by the term “low voltage.” Potentials as low as 50 volts may cause death under adverse conditions.

For Artificial Respiration, refer to FM 21-11.

FIRST AID

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 WOODEN POLE OR A 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

TECHNICAL MANUAL
NO. 11-6625-2885-30
TECHNICAL MANUAL
NAVAIR 16-35TS3614-2

TM 11-6625-2885-30
NAVAIR 16-35TS3614-2
DEPARTMENTS OF THE ARMY AND THE NAVY
WASHINGTON, DC, 23 February 1984

AVIATION INTERMEDIATE MAINTENANCE MANUAL

TEST SET, COUNTERMEASURES SET TS-3614/ALQ-136(V) (NSN 6625-01-121-8983)

REPORTING OF ERRORS AND RECOMMENDING 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 Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703.

For Navy, submit comments on OPNAV 4790/66 (Technical Publications Deficiency Report) to the Commander, Naval Air Technical Services Facility, ATTN: Code 04, 700 Robbins Avenue, Philadelphia, Pennsylvania 19111.

In either case, a reply will be furnished direct to you.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

HOW TO USE THIS MANUAL

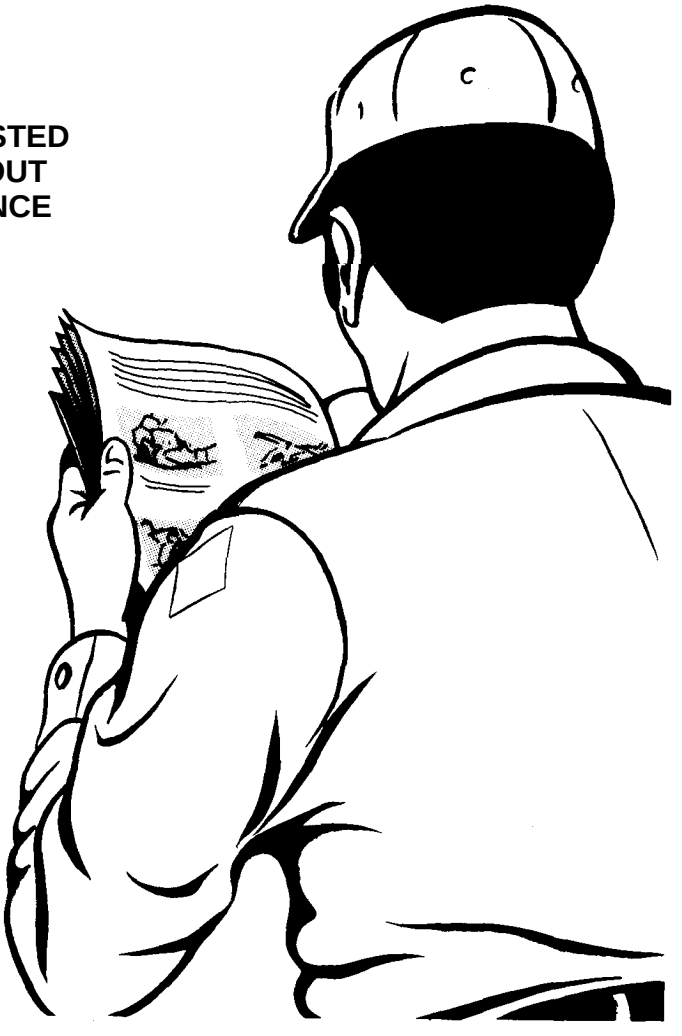
This manual tells you about maintaining the Flight Line Test Set TS-3614/ALQ-136(V) (FLTS) at the aviation intermediate level. This maintenance requires use of Bench Test Set, TS-3615/ALQ-136(V) described in TM 11-6625-2884-12. Relevant classified information is to be found in (S) TM 11-5865-202-30 appendix C (U). A list in TM 11-6625-2885-30P of repair parts and special tools for maintaining the FLTS helps establish stock requirements for maintenance.

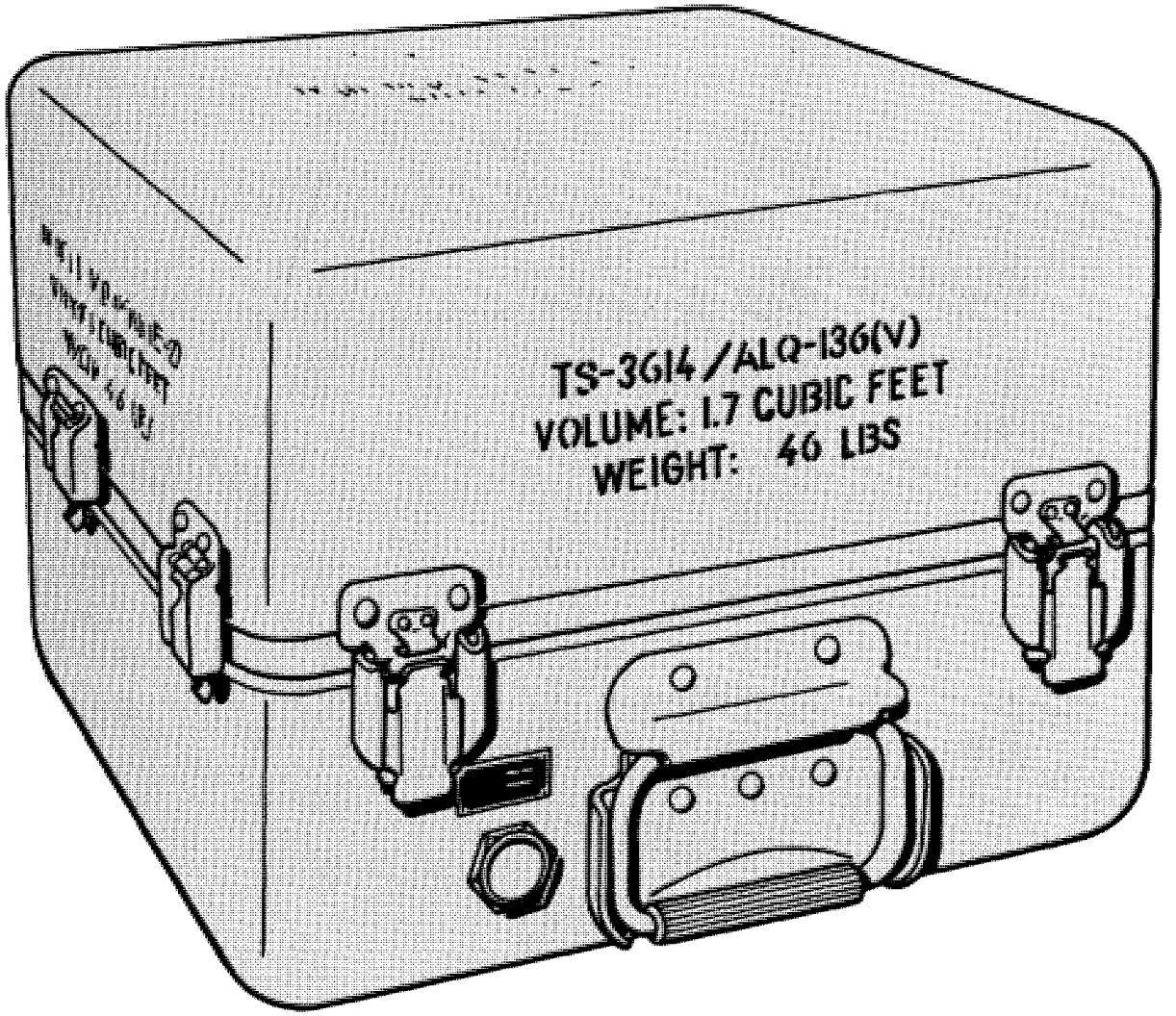
Operators of the FLTS will find a procedure for conducting a flight line test of the AN/ALQ-136(V)l countermeasures set in TM 11-5865-202-12. Operators will find additional information in TM 11-6625-2885-12 regarding operation and organizational maintenance of the FLTS, including its maintenance allocation chart (MAC).

Chapter 1 of this manual contains general information and a description of the FLTS . Chapter 2 tells how it works. Chapter 3 contains maintenance instructions. Schematic diagrams are on foldout sheets in the back of the manual. Appendices list reference documents and expendable supplies.

NO ONE EVER REPAIRED OR TESTED ELECTRONIC EQUIPMENT WITHOUT FIRST READING THE MAINTENANCE MANUAL.

IT IS THE MOST IMPORTANT TOOL YOU HAVE !!!





TEST SET, COUNTERMEASURES SET
TS-3614/ALQ-136(V)

CHAPTER 1
INTRODUCTION

SECTION I
GENERAL INFORMATION

SECTION CONTENTS — PAGE

SCOPE

1-1. This is one of a series of technical manuals covering the operation and maintenance of Countermeasures Set AN/ALQ-136(V)1. It is used by Aviation Intermediate Maintenance (AVIM) personnel.

This manual contains physical and functional descriptions, principles of operation, maintenance instructions and schematic diagrams.

Type of Manual:	Aviation Intermediate Maintenance (AVIM)
Model Number and Equipment Name:	Test Set, Countermeasures Set TS-3614/ALQ-136(V)
Purpose of Equipment:	Tests Countermeasures Set AN/ALQ-136(V)1 at AVUM level.

CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

1-2. Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

MAINTENANCE FORMS, RECORDS AND REPORTS

1-3. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

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. Navy personnel will report maintenance performed utilizing the Maintenance Data Collection Subsystem (MDCS) IAW OPNAVINST 4790.2, Vol 3 and unsatisfactory material/conditions (UR submissions) IAW OPNAVINST 4790.2, Vol 2, chapter 17.

b. Report of Packaging and Handling Deficiencies. Fill out and foward SF 364 (Report of Discrepancy [ROD]) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73/AFR 400-54/MCO 4430.3E.

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

DESTRUCTION OF ARMY ELECTRONICS MATERIEL

1-4. Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

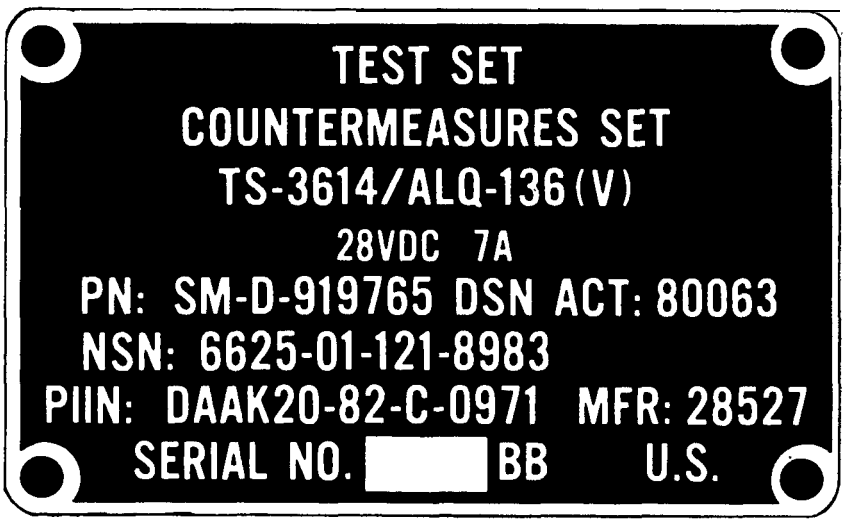
PREPARATION FOR STORAGE OR SHIPMENT

1-5. Administrative storage of equipment issued to and used by Army activities shall be in accordance with TM 740-90-1. Be sure all components are stored in the case (see para 1-9). Be sure all eight latches are securely closed. Store or ship the FLTS in its case. No extra packing is required.

NOMENCLATURE CROSS-REFERENCE LIST

1-6.

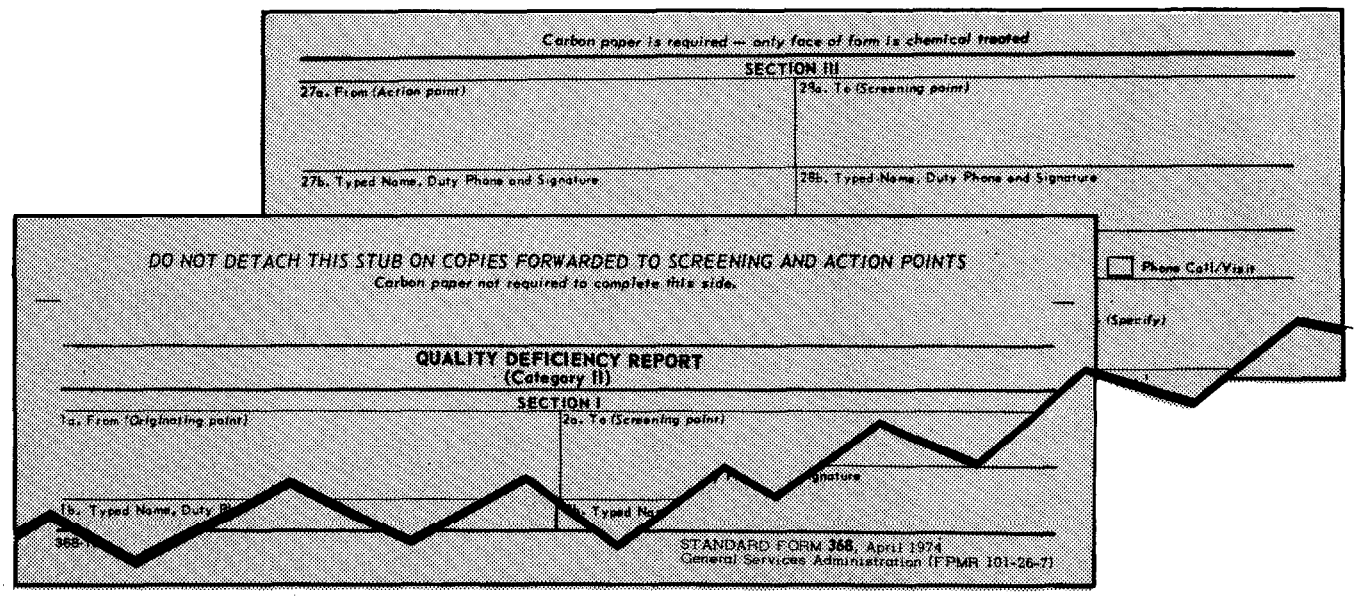
OFFICIAL NAME	COMMON NAME	COMMON ABBREVIATION
Countermeasures Set AN/ALQ-136(V)1	Countermeasures set	CM set
Receiver-Transmitter, Countermeasures Set RT-1149(V)1/ALQ-136 (V)	Receiver-transmitter	LRU-1
Antenna AS-3007/ALQ-137(V)	Receive antenna	LRU-2A
Antenna AS-3007/ALQ-136(V)	Transmit antenna	LRU-2B
Control, Countermeasures Set C-9576/ALQ	Operator's control unit	LRU-3 (OCU)
Test Set, Countermeasures Set TS-3614/ALQ-136(V)	Flight Line Test Set	FLTS
Test Set, Countermeasures Set TS-3615/ALQ-136(V)	Bench Test Set	BTS



REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

a. Army. If your flight line test 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 your equipment. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army, Communication-Electronics Command and Fort Monmouth, ATTEN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703. We'll send you a reply.

b. Navy. Navy personnel are encouraged to submit EIR's through their local Beneficial Suggestion Program.



SECTION II
EQUIPMENT DESCRIPTION AND DATA

SECTION CONTENTS — PAGE

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

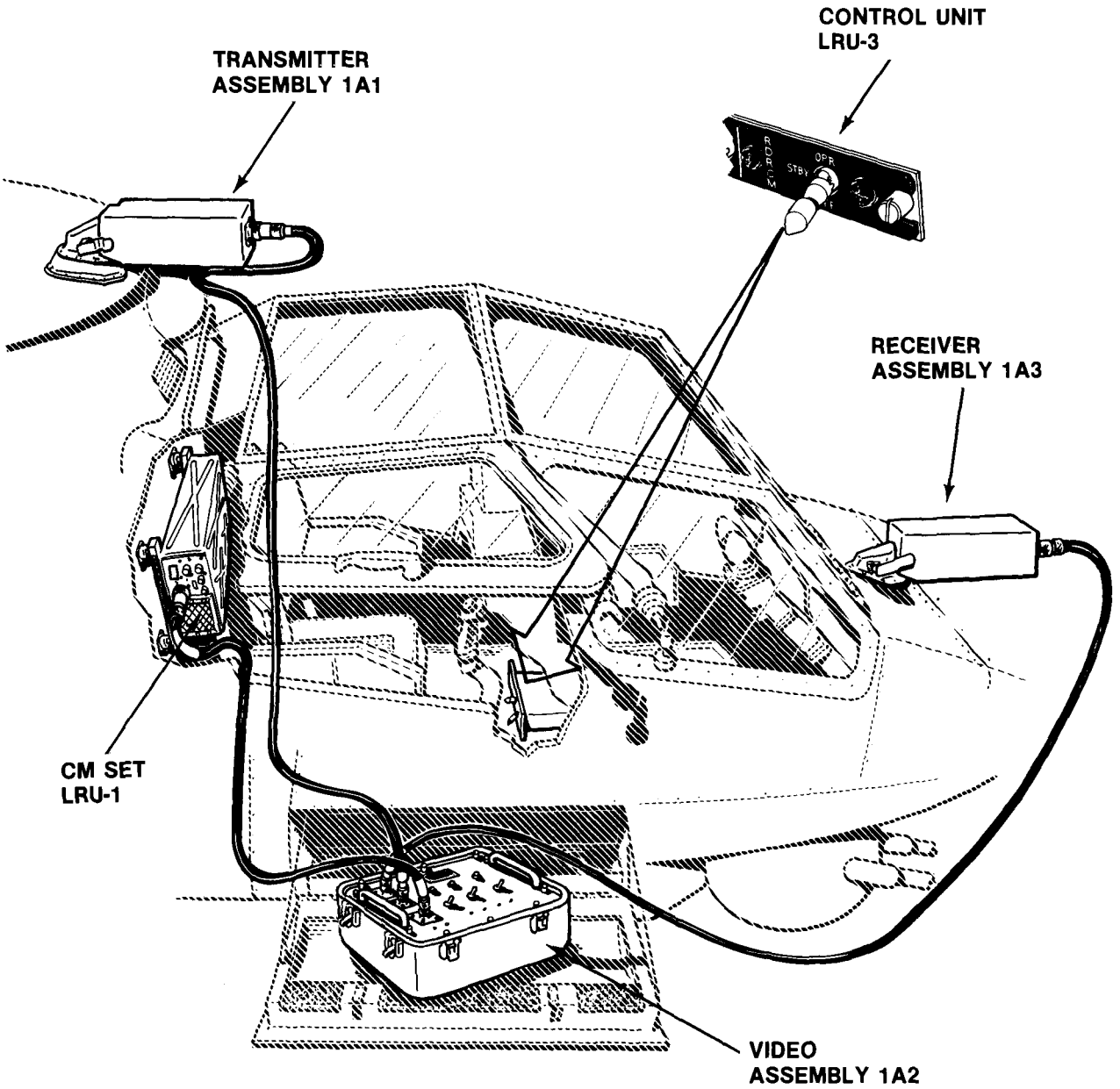
1-8. The FLTS is used to test Countermeasures Set AN/ALQ-136(V)1 (CM set) in an aircraft. It provides a rapid GO/NO GO indication of the CM set's functional status. All controls, indicators, and circuits necessary to perform a GO/NO GO test of an installed CM set are included in the FLTS.

THE FLTS

- Transmits a simulated unfriendly radar (RF) test signal to the CM set.
- Receives modulated RF response signals from CM set.
- Analyzes and presents visual GO indication when CM set is responding correctly.
- Light weight design permits testing of CM set on the aircraft.

  Cover space permits transporting all necessary hook-up cables and accessory antennas in one convenient package.
- Self-test feature permits testing its own operation at the aircraft.

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES (Continued)

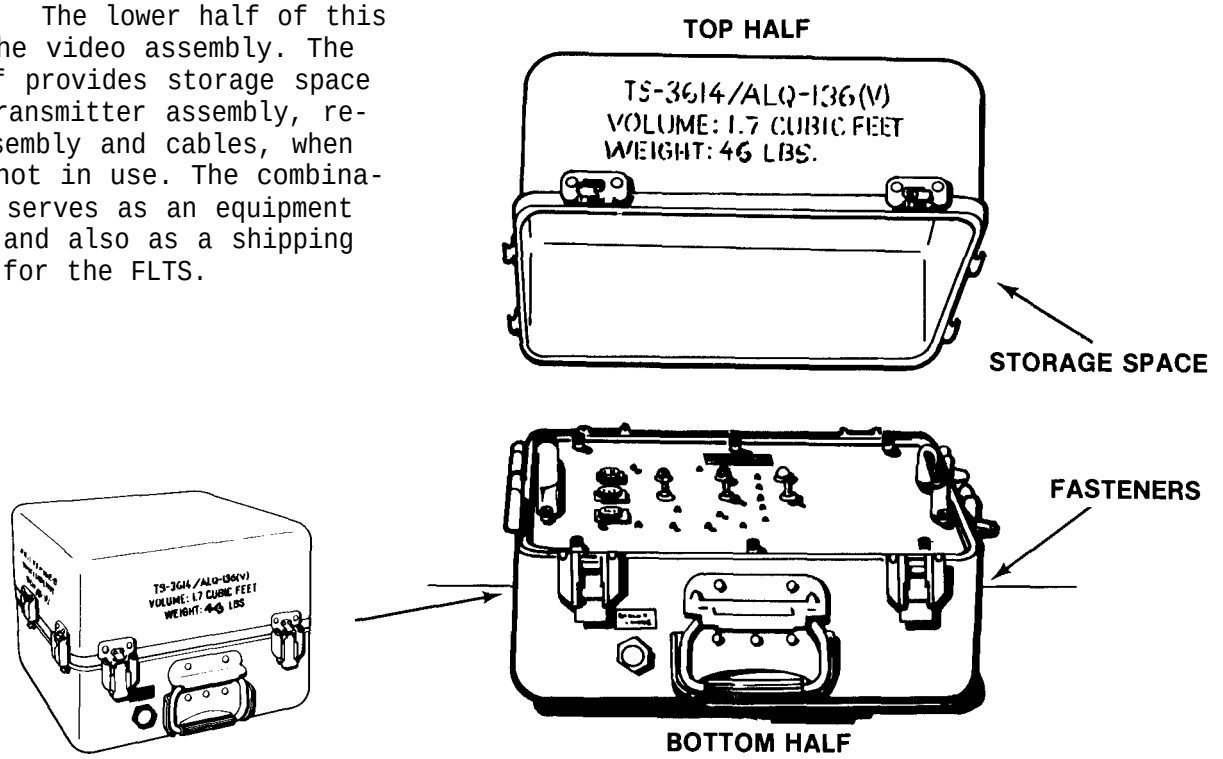


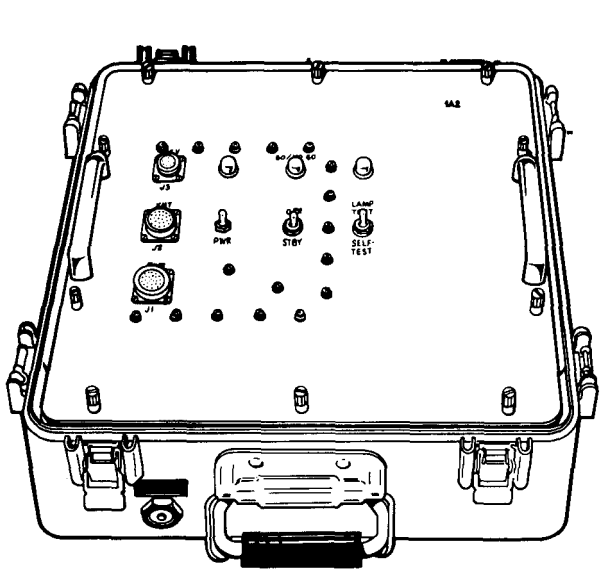
FLTS IN USE

MAJOR COMPONENTS

1-9.

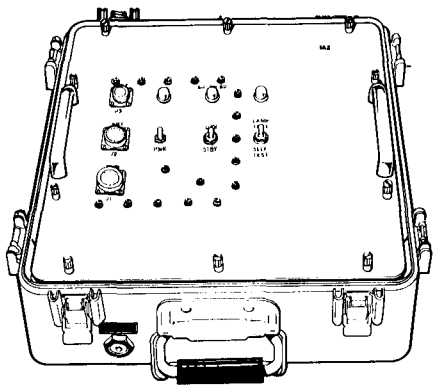
a. General . The FLTS is housed in a two part weatherproof combination case. The lower half of this case is the video assembly. The upper half provides storage space for the transmitter assembly, receiver assembly and cables, when they are not in use. The combination case serves as an equipment enclosure and also as a shipping container for the FLTS.





b. Video Assembly 1A2. The video assembly contains all of the FLTS operational controls and indicators. It consists of a panel assembly mounted in the lower half of the case and power supplies mounted to the bottom of this half of the combination case (see table l-l).

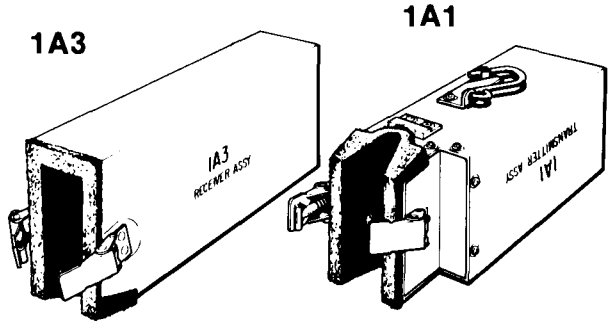
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (Continued)

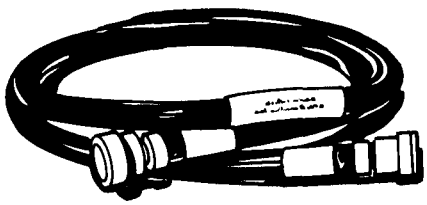


1A2

1A3

1A1





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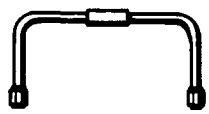
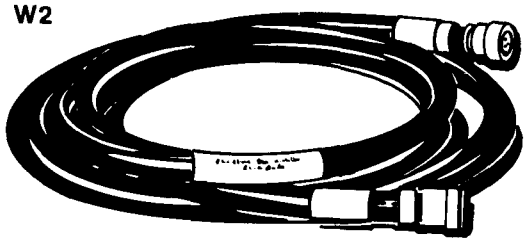


W4

W2



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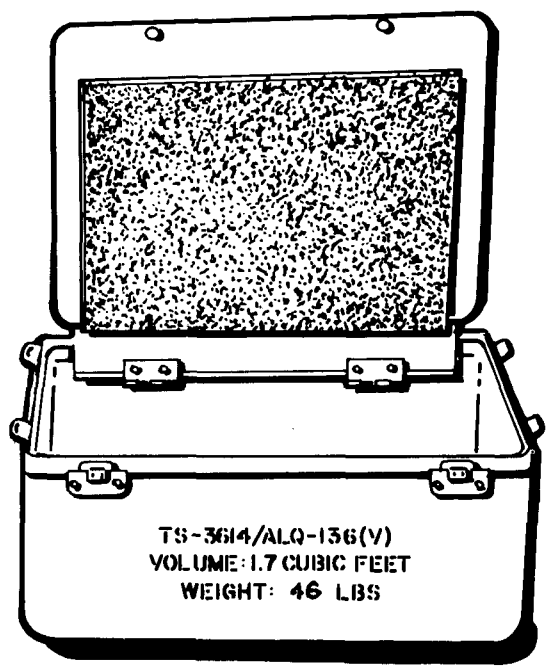

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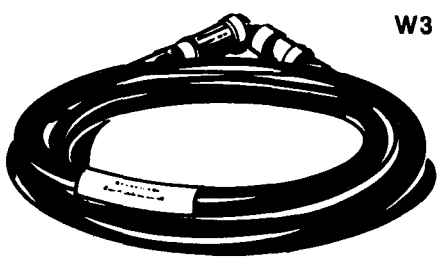
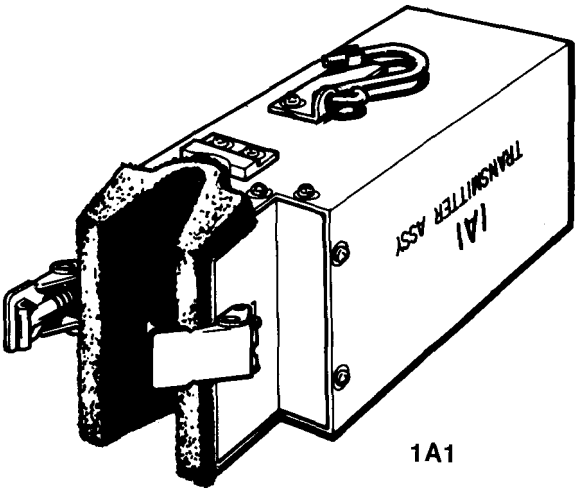
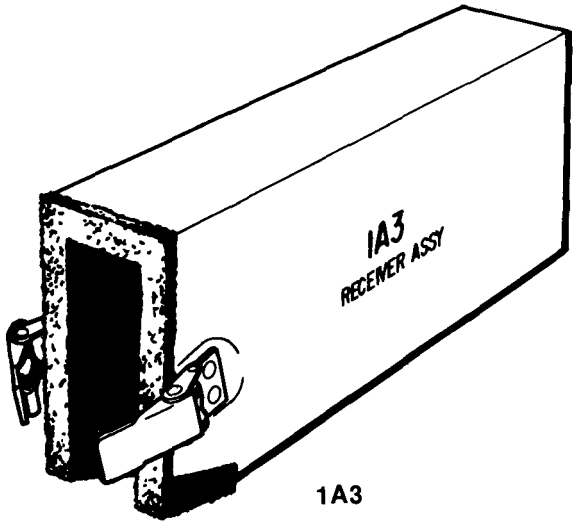


TEST SET, COUNTERMEASURES SET TS-3614/ALQ-136(V)

c. Transmitter Assembly 1A1. The transmitter assembly is a separate weatherproof assembly. It contains an RF generator and a transmit antenna. It clamps to the CM set's receive antenna during a flight line test. It is stored in the upper half of the combination case when not in use.

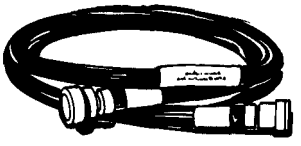


1A1



1A3

d. Receiver Assembly 1A3. The receiver assembly is a separate weatherproof assembly. It contains a receive antenna and detector circuits. It clamps to the CM set's transmit antenna during a flight line test. It is stored in the upper half of the combination case when not in use.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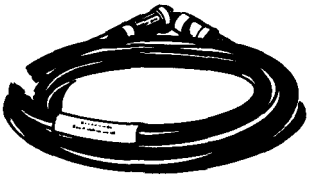
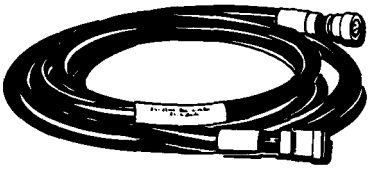

W3

e. Cables. Cable assemblies W1, W2, and W3 are shielded cables to interconnect LRU-1, the video, transmitter, and receiver assemblies. Space in the upper half of the combination case is for the storage of cables, transmitter, and receiver. Cable W4 is a short semi-rigid coaxial cable used for self-test of the FLTS.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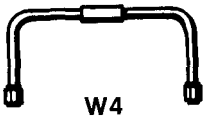
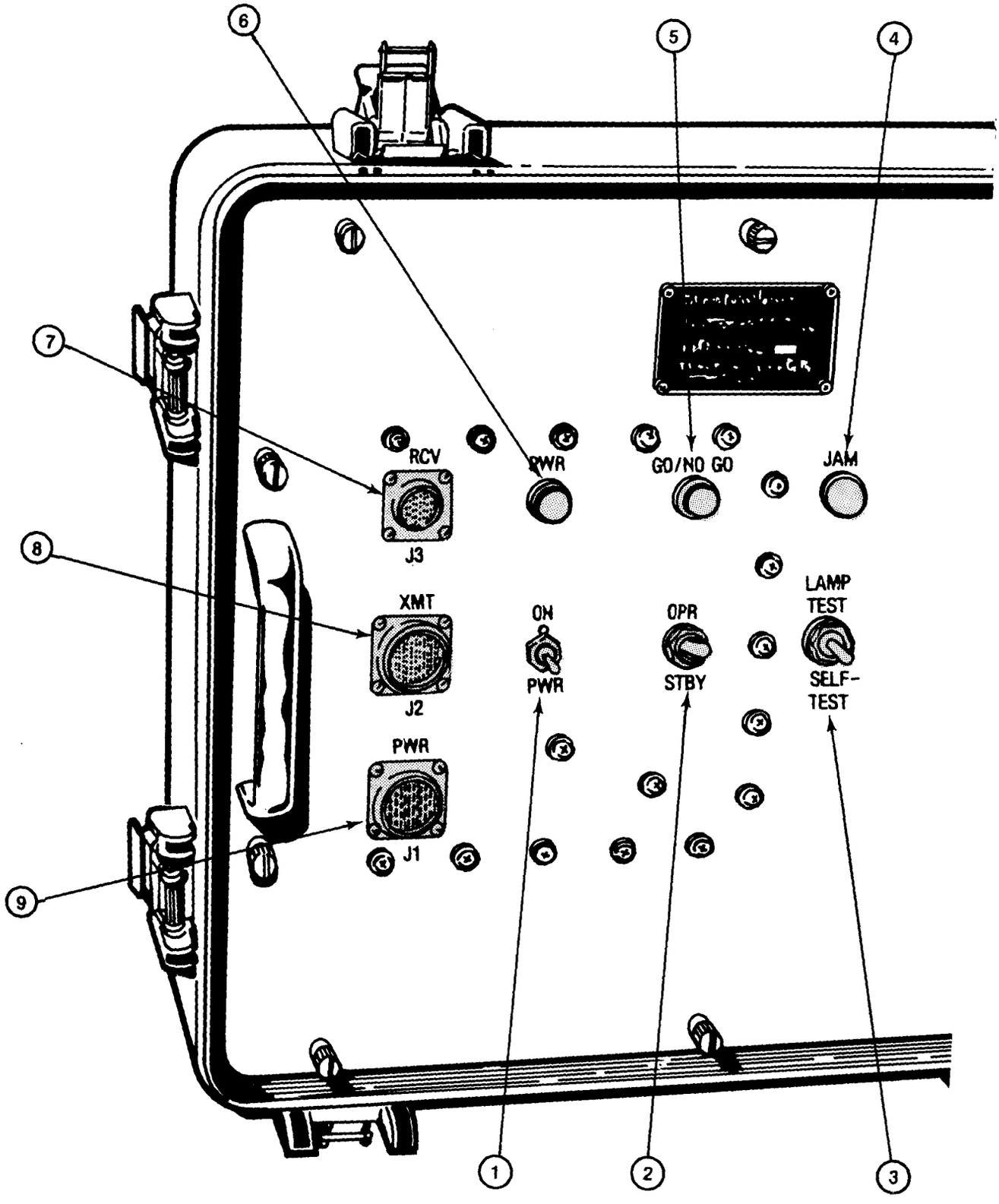

W4

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS (Continued)

TABLE 1-1. VIDEO ASSEMBLY CONTROLS, INDICATORS, AND CONNECTORS

KEY	DEVICE	FUNCTION
	Controls	
1	ON/PWR Circuit Breaker	Allows application of +28 Vdc to the FLTS in the ON position and provides overcurrent protection.
2	STBY/OPR Switch	Allows selection of the STBY mode or the OPR mode. In STBY mode no test signal is generated for either self-test or equipment test.
3	LAMP TEST/SELF-TEST Switch (Momentary)	Allows selection of LAMP TEST or SELF-TEST and is in the center position for normal or standby operation. In LAMP TEST position, the GO/NO GO and JAM lamps illuminate. In SELF-TEST position, signals are generated to check proper signal processing between Receiver (1A3), Transmitter (1A1), and Video (1A2) Assemblies.
	Indicators	
4	JAM Indicator Lamp	Lights white to indicate that the RF power threshold has been exceeded in either self-test or equipment test.
5	GO/NO GO Indicator Lamp	Lights green to indicate proper signal processing between Receiver (1A3) , Transmitter (1A1), and Video (1A2) Assemblies during self-test. In equipment test, lights green to indicate that proper signal processing has occurred in LRU-1.
6	PWR Indicator Lamp	Lights green to indicate that +28 Vdc is supplied to the power supplies in Video Assembly 1A2.
	Connectors	
7	RCV J3	Connects video assembly to Receiver Assembly 1A3.
8	XMT J2	Connects video assembly to Transmitter Assembly 1A1.
9	PWR J1	Connects video assembly to CM set LRU-1.



FLTS VIDEO ASSEMBLY 1A2

EQUIPMENT DATA

1-10. Table 1-2 provides a summary of the characteristics of the FLTS.

TABLE 1-2. LEADING PARTICULARS

CHARACTERISTIC	SPECIFICATION
Power Requirements*	+28 V (+24 to +29 V) supplied through LRU-1 of the AN/ALQ-136(V)1 from aircraft or auxiliary power. Maximum current is 7 A at input voltage
Transmit Output Frequency	F4 (see TM 11-5865-202-30)
Transmit Output Power	+2 dBm minimum
Transmit Output Pulses	Pulse pairs at a PRI of 350 ± 35 µs with a separation of 100 ± 10 µs
Transmit Pulse Width	0.3 ± 0.1 µs
Dimensions	Height: 12.25 inches (31 cm) Width: 16.12 inches (41 cm) Depth: 14.62 inches (37 cm)
Weight	46 lb. (21 kg)

* +28 V is supplied through BTS for maintenance of the FLTS at AVIM.

EQUIPMENT CONFIGURATION

1-11. Table 1-3 provides a summary of the functions of the FLTS equipment units.

TABLE 1-3. EQUIPMENT SUPPLIED

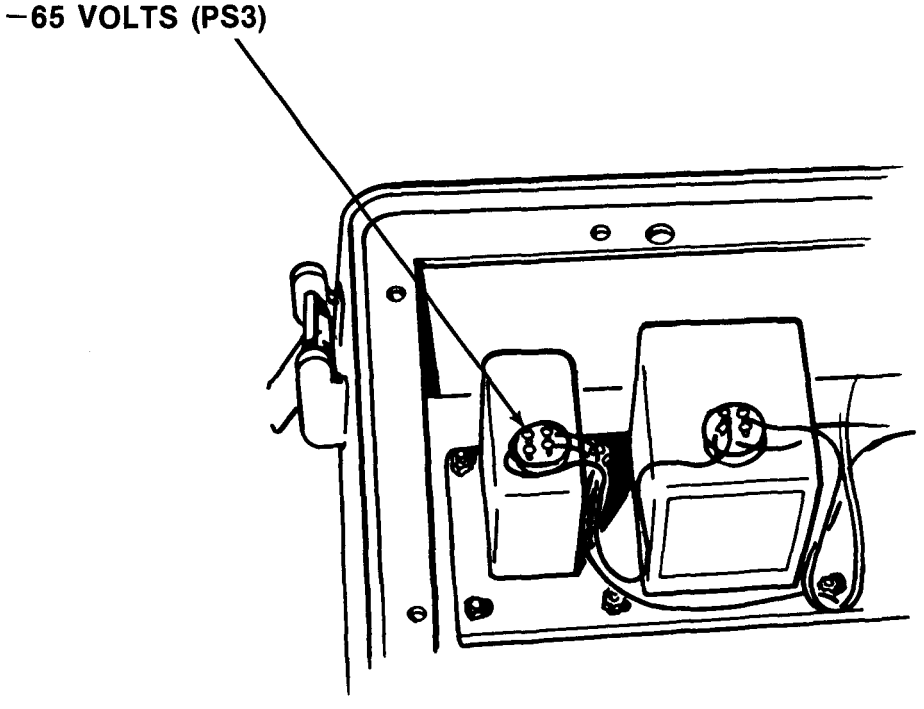
QTY	NOMENCLATURE	FUNCTION
1	Test Set, Countermeasures Set, TS-3614/ALQ-136(V)	Tests CM set.
1	Transmitter Assembly 1A1	Generates RF test signal.
1	Video Assembly 1A2	Modulates Transmitter Assembly 1A1 and analyzes CM set response.
1	Receiver Assembly 1A3	Detects CM set RF signal.
1	Cable Assembly W1	Connects CM set to video assembly.
1	Cable Assembly W2	Connects video. assembly to transmitter.
1	Cable Assembly W3	Connects receiver to video assembly.
1	Cable Assembly W4	Connects transmitter to receiver for FLTS self-test.
1	Case Cover	Stores transmitter, receiver, and cables.

SAFETY, CARE AND HANDLING

1-12. The highest voltage in the FLTS is -65 volts, which is in both the video assembly and the transmitter assembly. Be sure all FLTS components are clean and dry before storing them in the FLTS case. Handle the FLTS with care. It will give you better service if you avoid throwing or dropping it.

WARNING

Failure of the -65 volt power supply regulator may cause a voltage in excess of 65 volts. Be careful when working on the transmitter or the -65 volt power supply. Contact with their connections may cause DEATH or SERIOUS INJURY!



CHAPTER 2
PRINCIPLES OF OPERATION

SECTION CONTENTS — PAGE

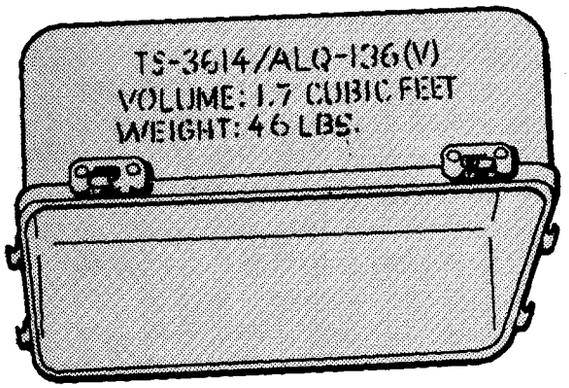
GENERAL INFORMATION

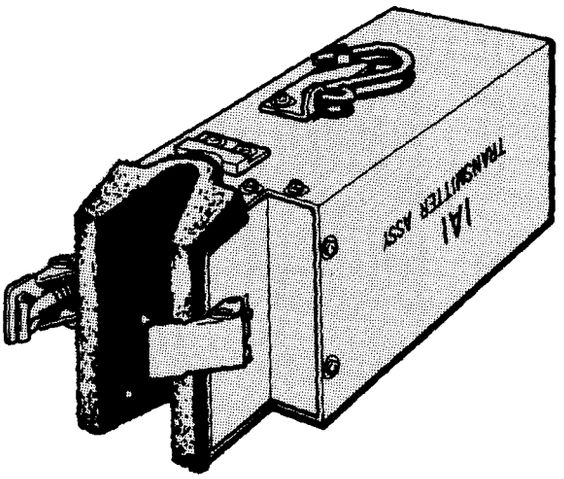
2-1. The FLTS generates radar RF test signals. It sends these signals to the CM set, which sends its response back to the FLTS. Proper response lights JAM and GO lights in the FLTS. The JAM light confirms that the CM set is transmitting RF power. The GO light confirms proper operation of many circuits inside the CM set.

FLTS UNITS

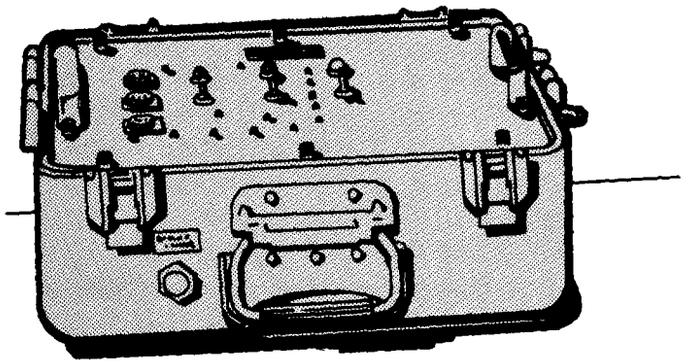
2-2. The FLTS has three units:

Video Assembly 1A2
Transmitter Assembly 1A1
Receiver Assembly 1A3

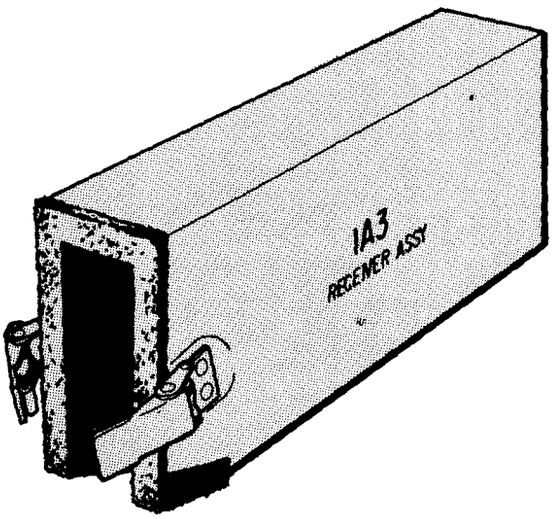




1A1



1A2



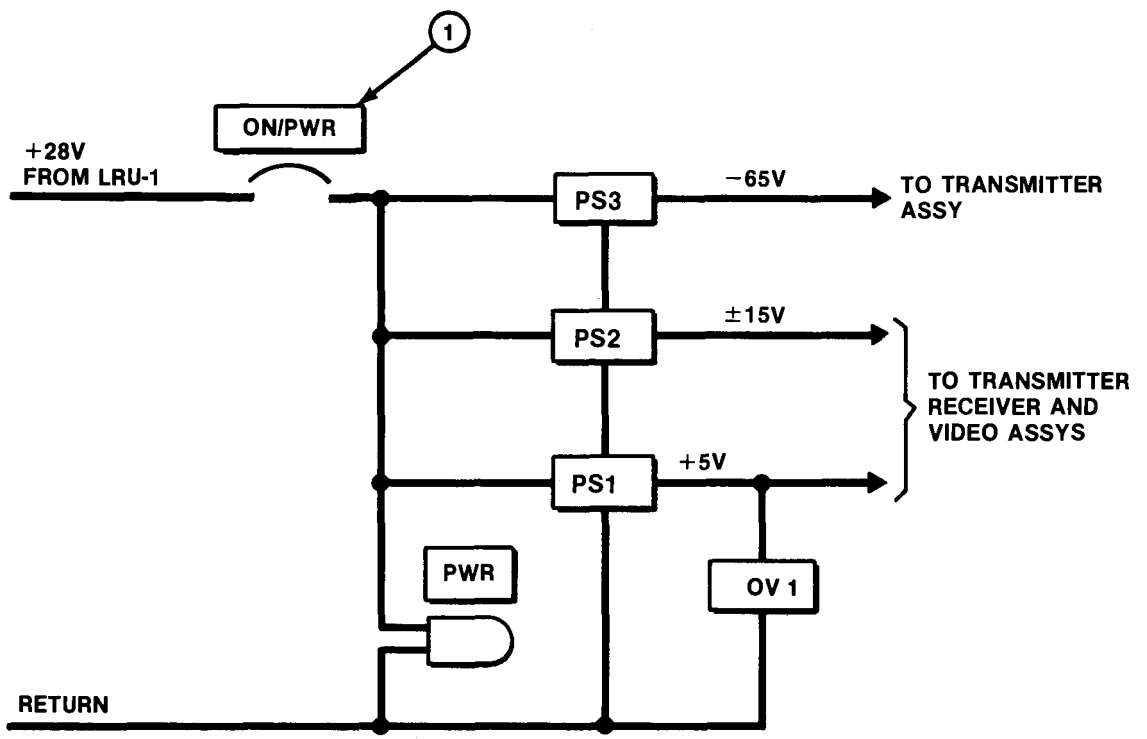
1A3

FLTS VIDEO ASSEMBLY 1A2

2-3. During a CM set test, the receiver-transmitter under test (LRU-1) supplies +28 V and status signals to the FLTS. LRU-1 has a monitor connector (1J7) which carries this power and these signals through FLTS cable WI, to FLTS video assembly connector J1. The video assembly then supplies the FLTS transmitter and receiver with all voltages and signals necessary for their operation. Figure F0-2 shows the circuits in the video assembly. During AVIM tests of the FLTS, the video assembly connects to the bench test set, as in figure F0-1.

POWER SUPPLIES

2-4. The video assembly includes three power supplies, an overvoltage protection circuit, two circuit card assemblies, and all switches and lamps necessary for operation of the FLTS. The AN/ALQ-136(V)1 CM set under test supplies +28 V power to the ON/PWR switch (1), a 7 ampere circuit breaker. When the ON/PWR switch is in the ON position, +28 V feeds power supplies (PS1), (PS2), and (PS3). These power supplies generate +5 V, +15 V, -15 V, and -65V. The voltages +5 V, +15 V, and -15 V are supplied to the video circuit cards and the transmitter and receiver assemblies. The -65 V is supplied only to the transmitter assembly. Overvoltage protection is provided for the +5 V power supply by limiting device (OV1).

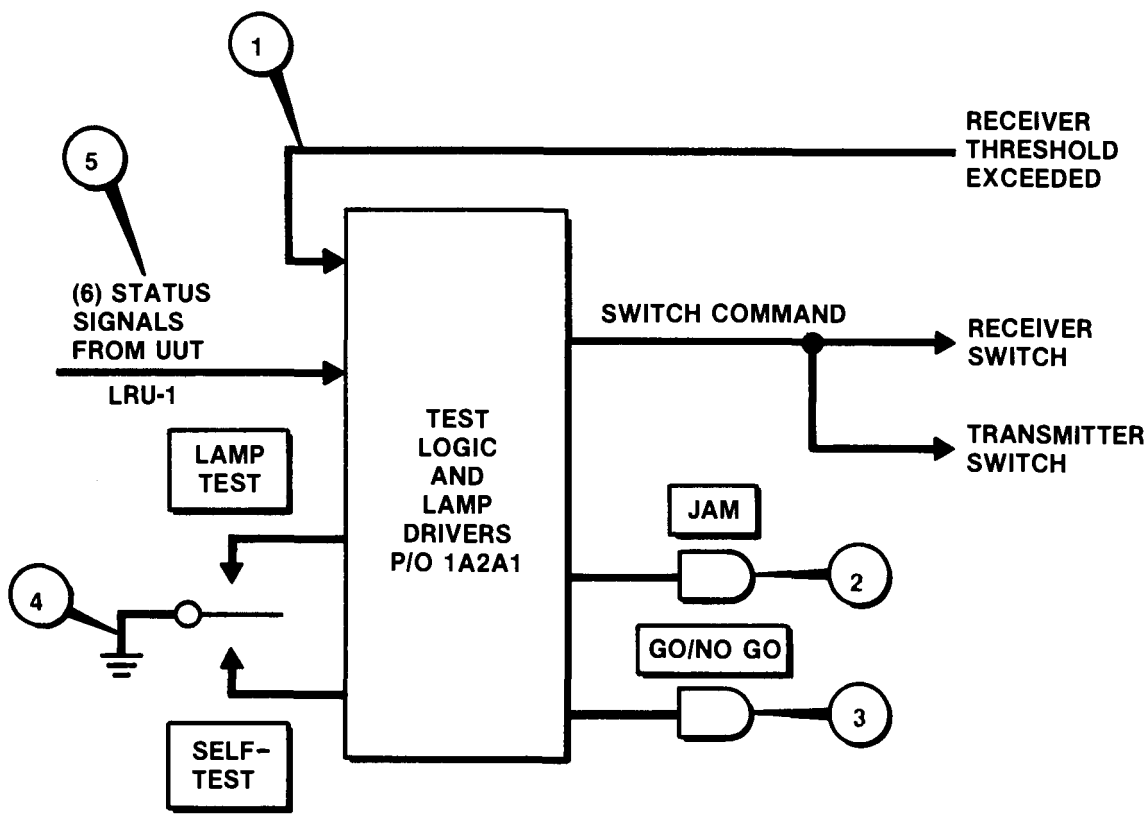


TEST LOGIC AND LAMP DRIVING

2-5. In the following description, SLL 0 is a signal between 0.0 and +0.6 volts. SLL 1 is a signal between +2.4 and +5.0 volts. Normal operation of the FLTS tests a CM set. A normal RF level from the CM set transmit antenna causes a SLL 0 Receiver Threshold Exceeded Signal (1) in the FLTS receiver assembly. This SLL 0 signal lights a JAM indicator (2) in the FLTS video assembly.

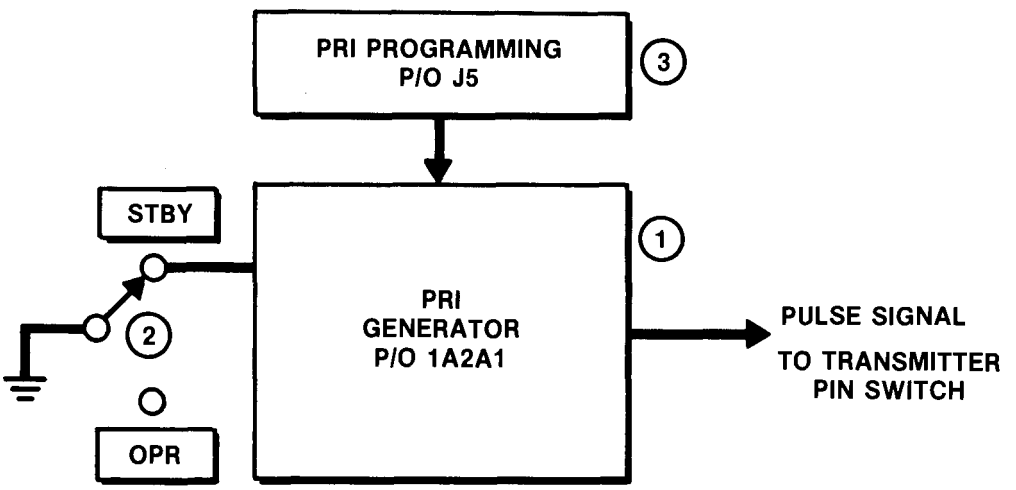
The FLTS transmitter assembly sends test signals to the CM set receive antenna. Normal CM set response to these signals sets six LRU-1 status signals (5) to SLL 0. When these six status signals and the Receiver Threshold Exceeded Signal are all at SLL 0, they light a GO/NO GO indicator (3) in the FLTS video assembly.

In self-test operation, jumper cable W4 sends RF from the transmitter assembly to the receiver assembly. The test logic circuits receive a threshold exceeded signal (1) from the receiver assembly which lights the JAM lamp (2) and enables the GO/NO GO lamp (3). In self-test, the JAM light confirms the RF level at the FLTS transmitter. The test switch (4) replaces the status signals (5), lighting the GO/NO GO lamp.



PRI GENERATION

2-6. Circuit card 1A2A1 (1) includes all the PRI generation circuits in the FLTS. The PRI generator produces a pulse train simulating radar threats, when STBY/OPR switch (2) is in the OPR position. In the STBY position, no pulses are generated.



Programming wires (3) on J5 control the PRI and pulse width. The PRI generator produces pulse pairs which have 100 µs separation, at 350 µs PRI, and 0.3 µs width.

Figure FO-3 is a schematic diagram of 1A2A1. On figure FO-3, sheet 1, decade counters U45, U25, U36 and U37 divide a 10 MHz clock in four decade steps.

Comparators U44, U33, U35 and U47 produce a reset pulse when the decade count reaches the count wired into' programming pins of the card edge connector.

The reset pulse presets the counter to 0.4 µs, to make up for clocked delays.

Decade counter U36 sets flip-flop U17 after a delay of 100 µs from reset.

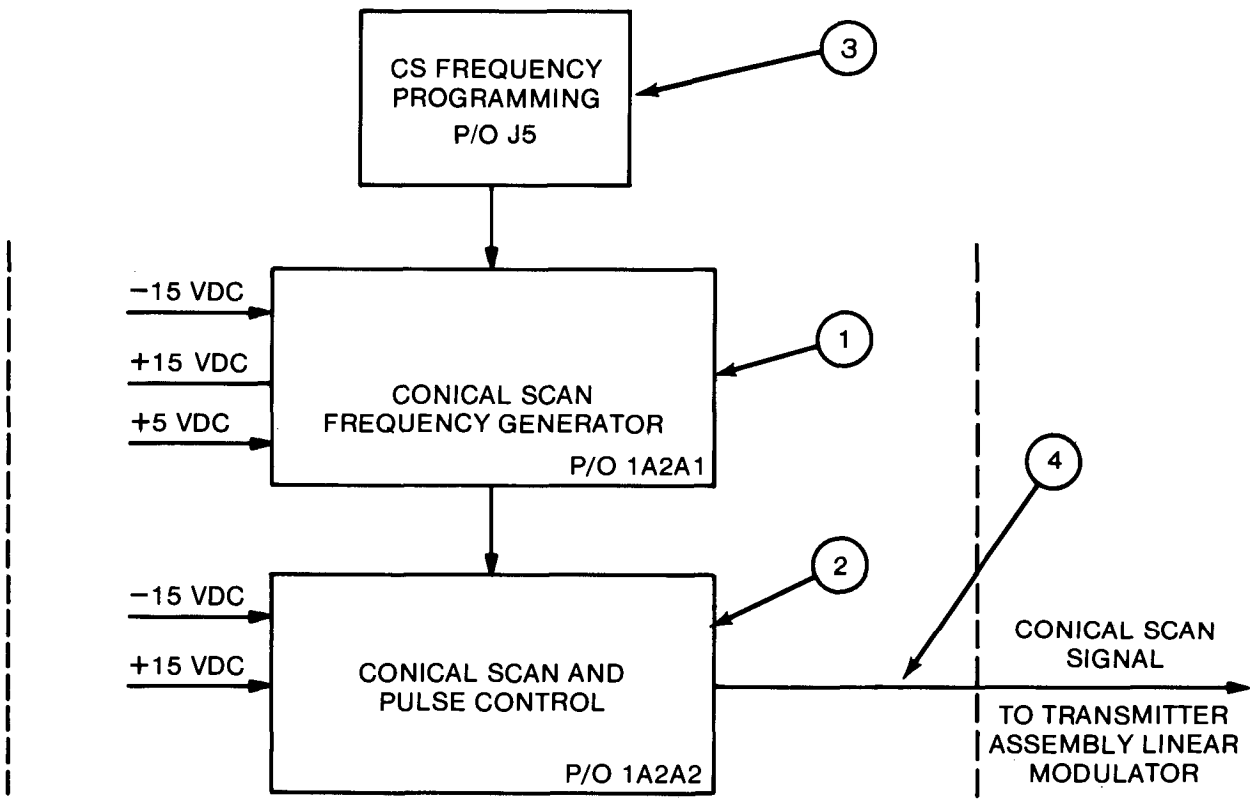
Both the main count and the delayed count supply pulses to dual latch U38. Decade counters U48 and U49 count out the pulse width wired into proqramming pins of the card edge connector. Gate U46 controls output pulses which drive a PIN switch pulse modulator in Transmitter Assembly 1A1.

CONICAL SCAN FREQUENCY GENERATION

2-7.

a. Triangle Wave Generation. The conical scan frequency generator (1) produces a triangle wave, which is supplied to the 1A2A2 circuit card (2). Programming jumpers (3) control the frequency.

The 1A2A2 circuit card (2) receives this triangle wave and shapes it into a sine wave. The conical scan (sine wave) signal (4) is then used for linear modulation in the transmitter assembly.



On figure FO-3 sheet 2, inverter U15 and crystal Y1 make up a 10 MHz clock. Counters U31 and U11 divide this clock by 20, producing 500 kHz.

Decade counters (U12, U14 and U24) divide this 500 kHz to 500 Hz. Comparators U13, U22 and U34 pass 500 kHz clock pulses as long as the count in U12, U14 and U24 is less than that preset in the CS frequency patch field. Thus, the number of pulses passed in one second is 500 times the CS frequency preset.

The passed pulses accumulate in a counter (U7 and U8). This counter (U7 and U8) provides the A input to a comparator (U9 and U39). When the count in U7 and U8 reaches 250, flip-flop U20 sets the B input of the comparator (U9 and U39) to O, while commanding a down count. When U7 and U8 reach a count of O, U20 sets the B inputs of U9 and U39 to 250, while commanding an up count. Thus, this counter (U7 and U8) counts up and down once for every 500 pulses to it. This produces a triangular time function at the preset CS frequency.

Digital-to-analog converter U1 changes the count in U7 and U8 into a triangular analog signal at the preset CS frequency.

b. Wave Shaping. CS and Pulse Control Circuit Card Assembly 1A2A2 shapes an incoming triangle wave from 1A2A1. It produces a sine wave with proper baseline and amplitude to drive a linear modulator in Transmitter Assembly 1A1. Figure FO-4 is the schematic diagram of this circuit card.

In figure FO-4, the diode-resistor network between operational amplifiers U31A and U32A shapes the incoming CS frequency triangle wave to a sine wave. Variable resistor R2 sets the symmetry about zero at test point TP-R.

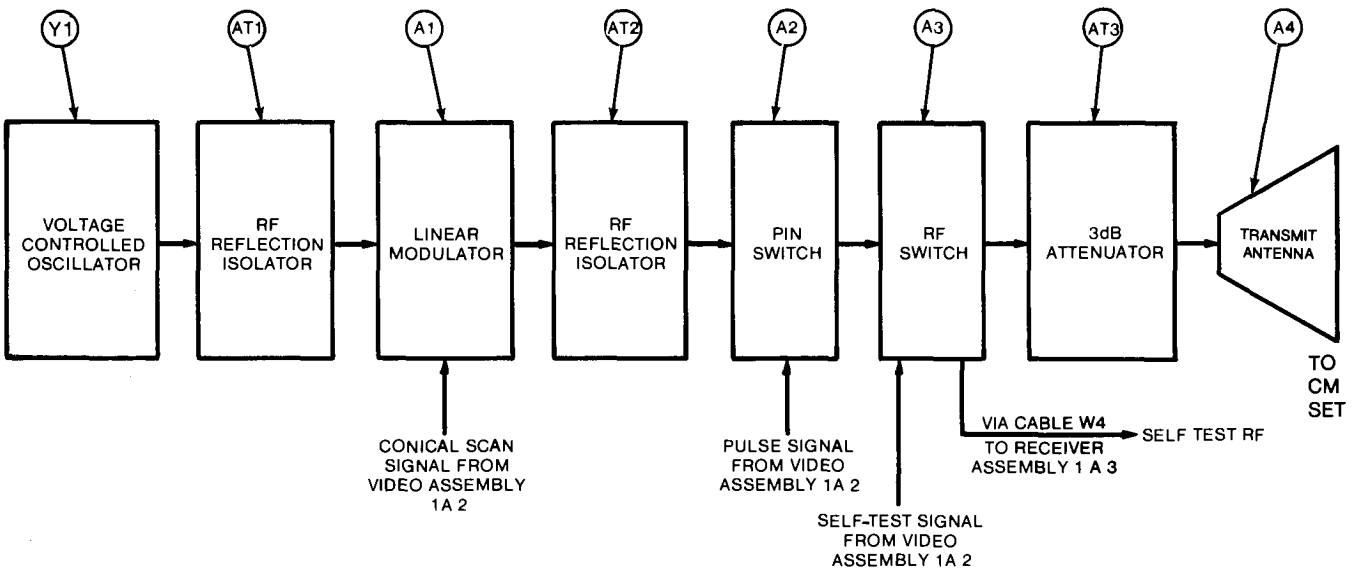
Operational amplifier U32B offsets the baseline of the sine wave. Variable resistor R25 controls the offset and fixed resistor R31 sets the amplitude of the CS output waveform.

The CS output waveform controls a linear modulator in the transmitter assembly.

TRANSMITTER ASSEMBLY 1A1

2-8. In Transmitter Assemblv 1A1. Oscillator (Y1) generates an RF carrier at the output frequency. This RF carrier passes through RF reflection isolator (AT1) to linear modulator (A1), which modulates the carrier with conical scan (sine wave) signals from Video Assembly 1A2. The modulated RF signal then passes through RF Reflection Isolator (AT2) to PIN Switch (A2), which applies pulse modulation from Video Assembly 1A2. In normal operation, the modulated RF signal is then supplied through RF Switch (A3) and Attenuator (AT3) to Transmit Antenna (A4).

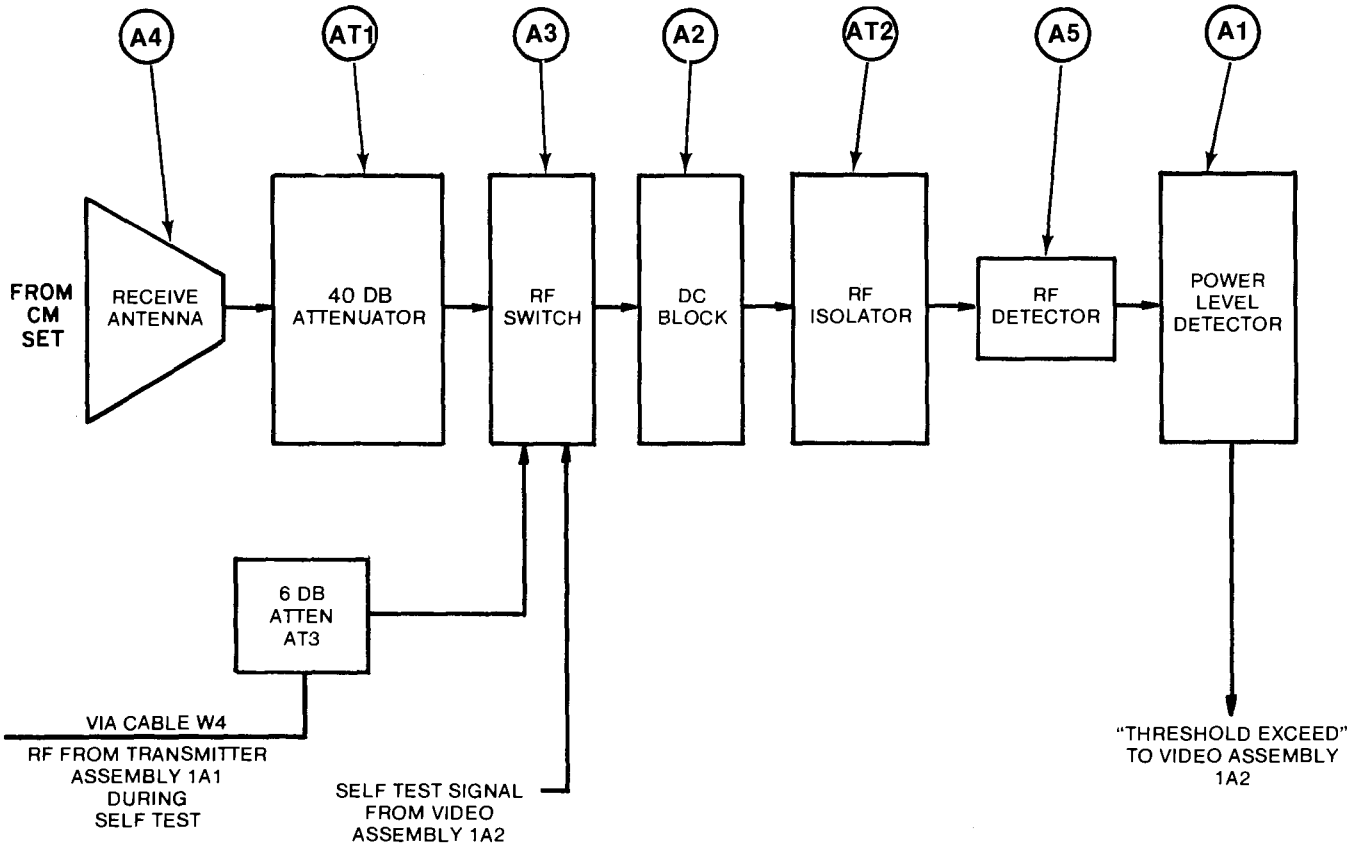
In self test, Video Assembly 1A2 operates RF Switch (A3). This sends the modulated RF signal to Receiver Assembly 1A3 through cable W4. Figure FO-5 shows the transmitter schematic.



RECEIVER ASSEMBLY 1A3

2-9. In normal operation, antenna (A4) receives RF signals generated by the AN/ALQ-136(V)1 system. The RF signals are then attenuated by attenuator (AT1) and passed through RF Switch (A3), DC Block (A2), and RF Isolator (AT2). The RF signals are detected by RF Detector (A5) and compared to a preset value in Power Level Detector (Al). When the preset value is exceeded, a signal (threshold exceed) is generated and sent to Video Assembly 1A2.

In self test, a self test signal from Video Assembly 1A2 operates RF Switch (A3). RF signals are then supplied from Transmitter Assembly 1A1 through test cable W4 and attenuator AT3 to RF Switch (A3). Self test RF then passes from switch A3 through DC Block (AZ), RF Isolator (AT2), and RF Detector (A5) to the power level detector. Figure FO-6 is the schematic for the receiver, and Figure FO-7 is the schematic for the power level detector.



CHAPTER 3
MAINTENANCE INSTRUCTIONS

SECTION I
REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

SECTION CONTENTS — PAGE

TOOLS

3-1. Tool Kit, Electronic Equipment TK-105/G contains the hand tools necessary for maintenance of the FLTS. Various screwdrivers are needed to remove and replace the video assembly and its power supplies.

TEST EQUIPMENT

3-2. The following instruments are required to maintain the FLTS. Instruments similar to and having characteristics equal to these instruments may be used.

COMMON NAME	NOMENCLATURE
Bench Test Set (BTS)	Test Set TS-3615/ALQ-136(V)
Tool Kit	Tool Kit, Electronic Equipment TK-105/G
Power Supply, 28V	Power Supply, PP-1104/G
Oscilloscope	Oscilloscope, AN/USM-281A
Digital Multimeter (DMM)	Digital Multimeter, AN/USM-451
Power Meter	Power Meter, Hewlett Packard Model HP 435A with Model HP 8481A Power Sensor
Adapter	RF Adapters: HP P281B/OPT 013 (2 ea) TNC (female) to SMA (male) TNC (female) to N (female) TNC (female) to N (male) N (female) to SMA (male)
Frequency Meter	Frequency Meter HP P532A

REPAIR PARTS AND SPECIAL TOOLS

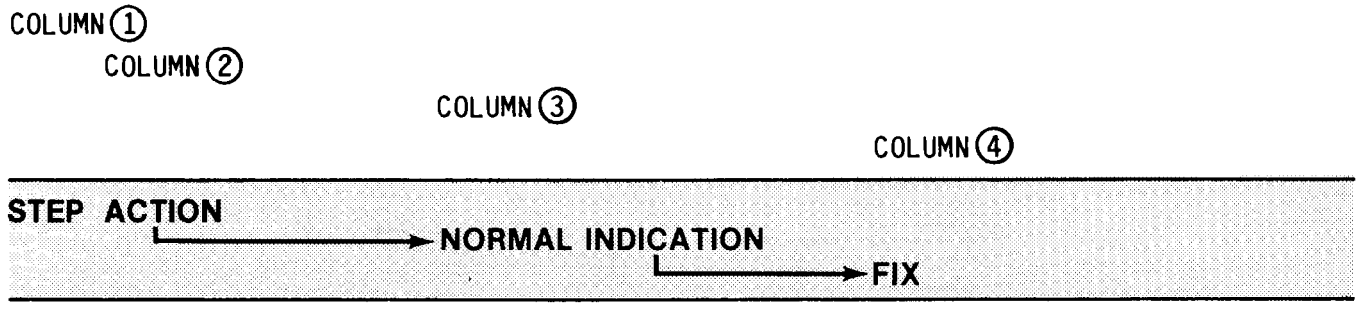
3-3. Repair parts and special tools are listed and illustrated in TM 11-6625-2885-30P, covering AVIM for this equipment.

SECTION II
TROUBLESHOOTING

SECTION CONTENTS — PAGE

INTRODUCTION

3-4. Paragraph 3-8 gives the initial test setup. Troubleshooting information is in paragraphs 3-11 through 3-20. Each paragraph gives the hookup and contains a test in chart form with four columns. The first column (1) numbers the steps in ascending order. The second column (2) explains the test. The third column (3) states what measurements should be observed for normal operation. The fourth column (4) lists what course to follow if you don't get the value stated in the third column. If "Normal Indication" still cannot be obtained, a higher level maintenance is required. The foldout drawings at the rear of this manual provide the details you need to trace circuits through FLTS. References in parentheses are to paragraph numbers.

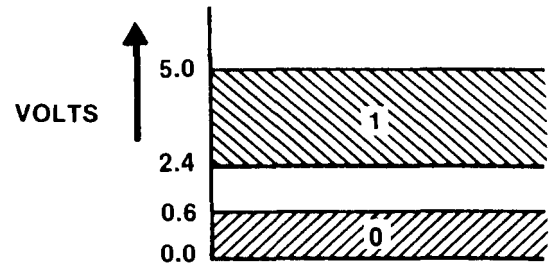


DEFINITIONS

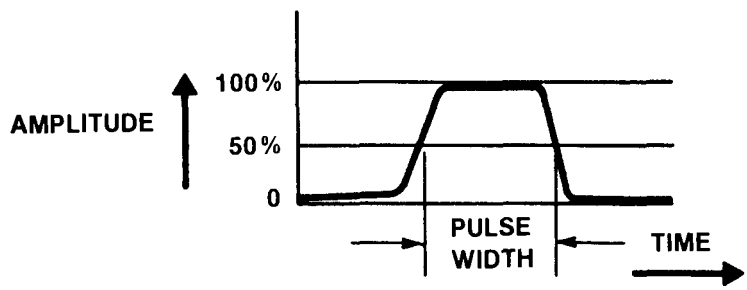
3-5. The following definitions apply throughout this book:

a. Standard Logic Levels (SLL).

Logical 1 = +2.4 to +5.0 volts
Logical 0 = 0 to +0.6 volts



b. Pulse Width. Pulse width is measured between the 50% points of the waveshape.



c. Pulse Repetition Interval (PRI). PRI is the time between consecutive pulses, usually given in microseconds. PRI is measured from a point on one pulse to the corresponding point on the next pulse.

TEST CONDITIONS

3-6. Unless otherwise directed, conduct al 1 tests under the following conditions:

Temperature: 32 to 131°F (0 to 55°C)

Humidity: 0 to 90% relative humidity

Primary Power: 27.5 to 28.5 Vdc

TEST EQUIPMENT

3-7. The following test equipment or equivalent is necessary to troubleshoot the FLTS.

(1) Test Set TS-3615/ALQ-136(V)

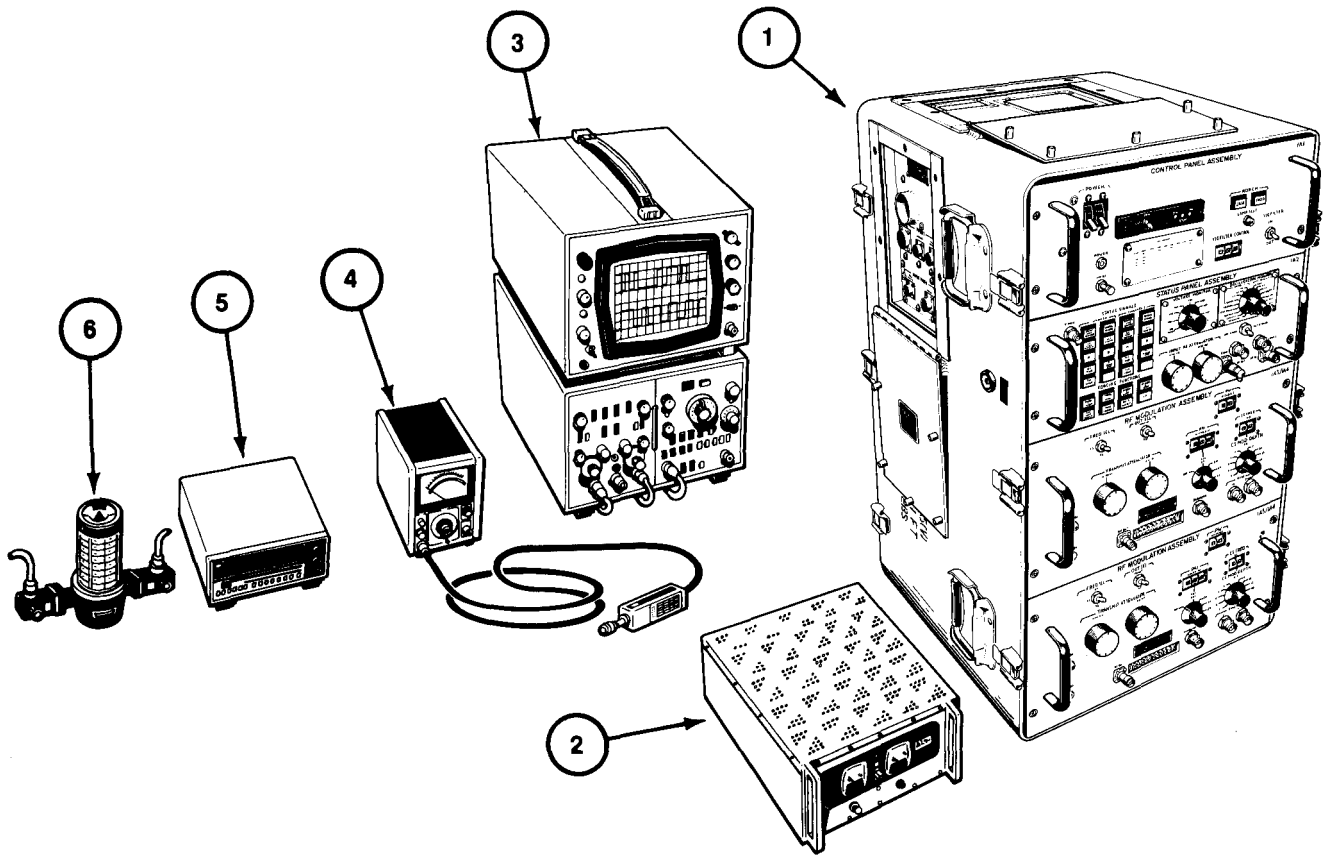
(2) Power Supply, 28 Vdc 30A, PP-1104/G

(3) Oscilloscope AN/USM-281A

(4 Power Meter, Hewlett Packard Model HP435A with Model HP8481A Power Sensor

(5 Digital Multimeter AN/USM-451

(6 Frequency Meter HP P532A with two HP-P281B/OPT 013 Adapters



a. Oscilloscope. Either one of the dual channel vertical inputs may be used. Triggering is specified in the test instructions.

b. Other Test Equipment. Normal Inputs and Outputs implied unless otherwise specified.

EQUIPMENT SETUP

3-8.

a. BTS. See TM 11-6625-2884-12 for BTS operating instructions.

- Remove front cover of BTS.
- Release fasteners and hinge back top (1) and side (2) cover plates on BTS.
- Connect BTS cables to the BTS connector panel (3) as follows:

Connect:	To Jack:
W11	J1 and J3
W6	J5
W7	J6

- Make sure POWER 115 Vac and 28 Vdc circuit breakers (4) are OFF.
- Connect the other end of W6 to 115 Vac 60 Hz.

b. Power Supply.

- Connect the other end of W7 to 28 Vdc power supply (PS), observing polarity markings on cable.

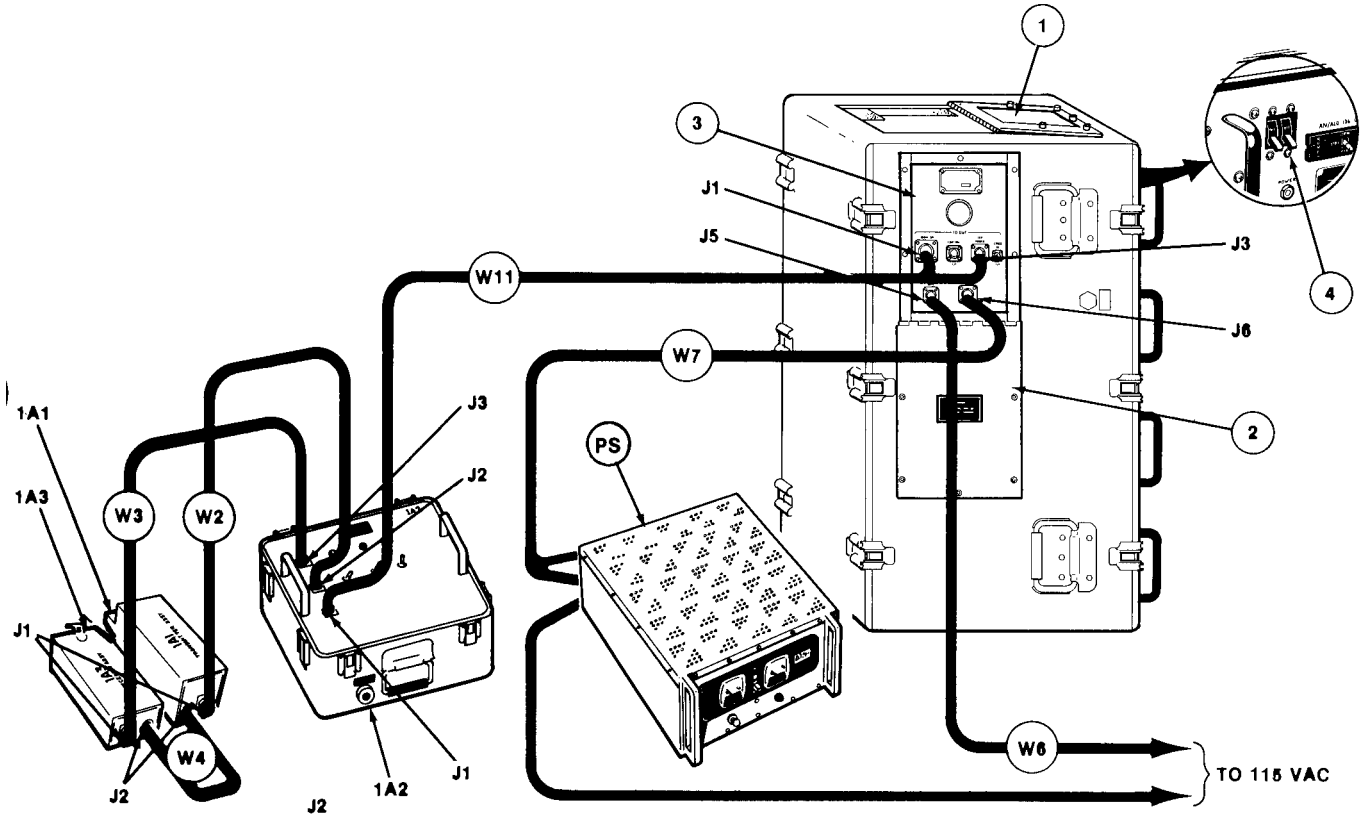
c. FLTS. Remove the FLTS cover and remove the transmitter, receiver, and cable assemblies. Connect the following cables to their respective jacks.

Cable	Video Assembly 1A2 Jack	Transmitter 1A1 Jack	Receiver 1A3 Jack	BTS Jack
BTS W11	1A2J1			J1 & J3
FLTS W2	1A2J2	1A1J1		
FLTS W3	1A2J3		1A3J1	
FLTS W4		1A1J2	1A3J2	

Your setup should look like this.

CAUTION

Do not stress or bend semirigid cable W4.
Semirigid cables are easily broken.

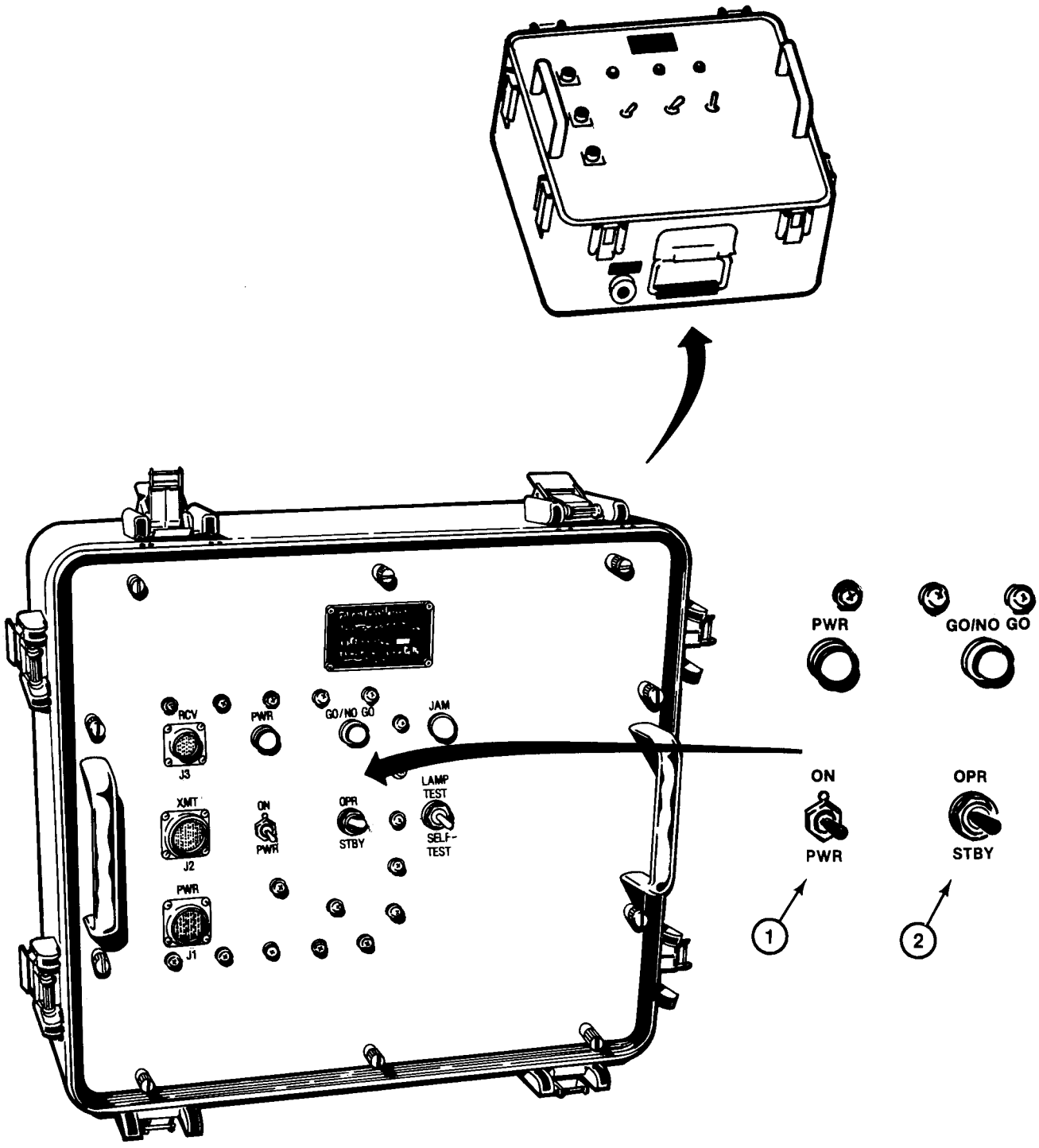


FLTS STARTING PROCEDURE

3-9. On Video Assembly 1A2, set the following switches:

ON/PWR (1) PWR (OFF)

STBY/OPR (2) STBY



BTS STARTING PROCEDURE

3-10.

a. Turn on the 28V power source.

b. RF Modulator Assembly (1A3) and (1A4). Switches may be in any position.

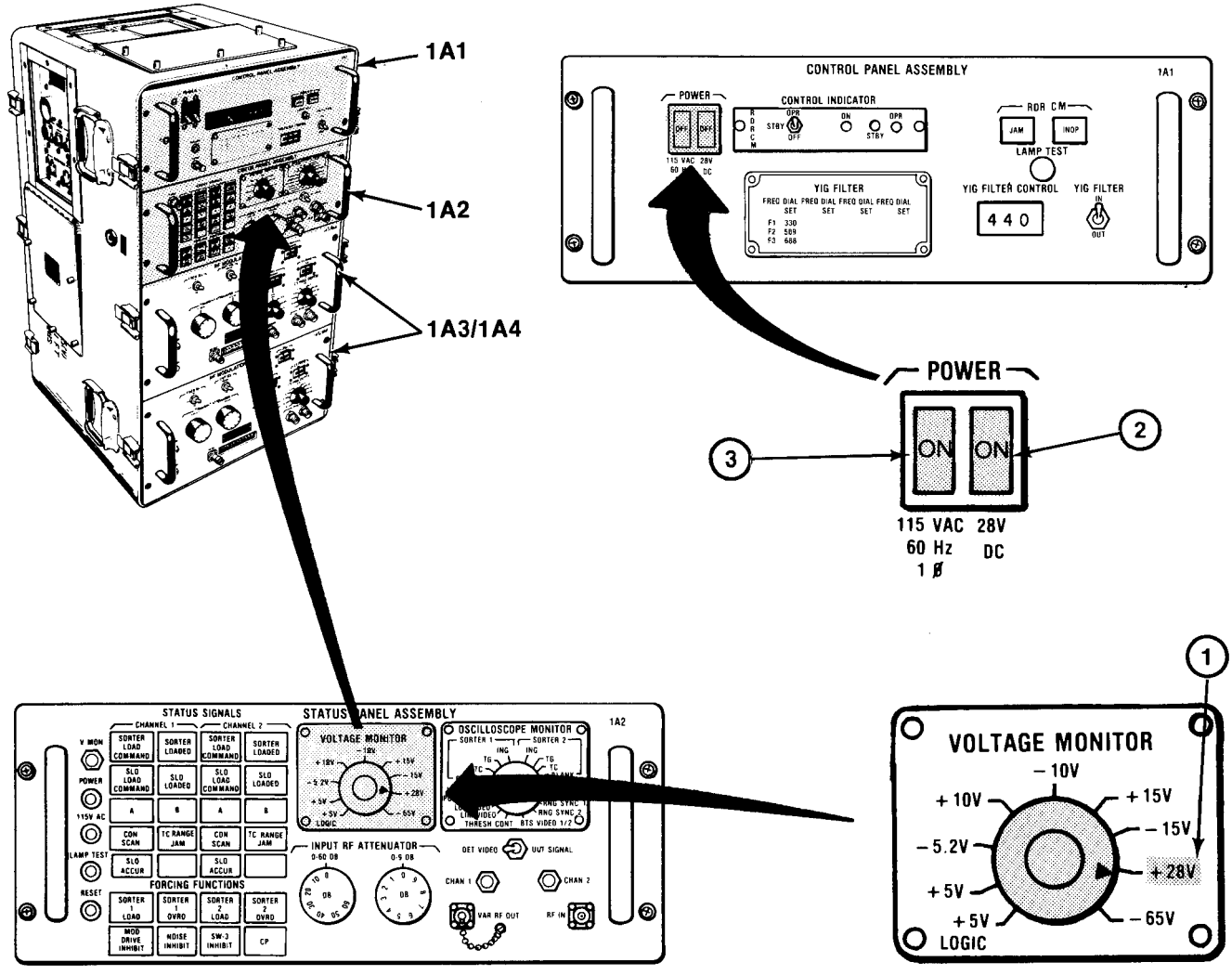
c. Status Panel 1A2:

Set VOLTAGE MONITOR switch (1) to +28V. All other switches may be in any position.

d. On Control Panel Assembly lA1:

(1) Set POWER 28VDC (2) to ON.

(2) Set POWER 115 VAC 60 Hz 10 (3) to ON.

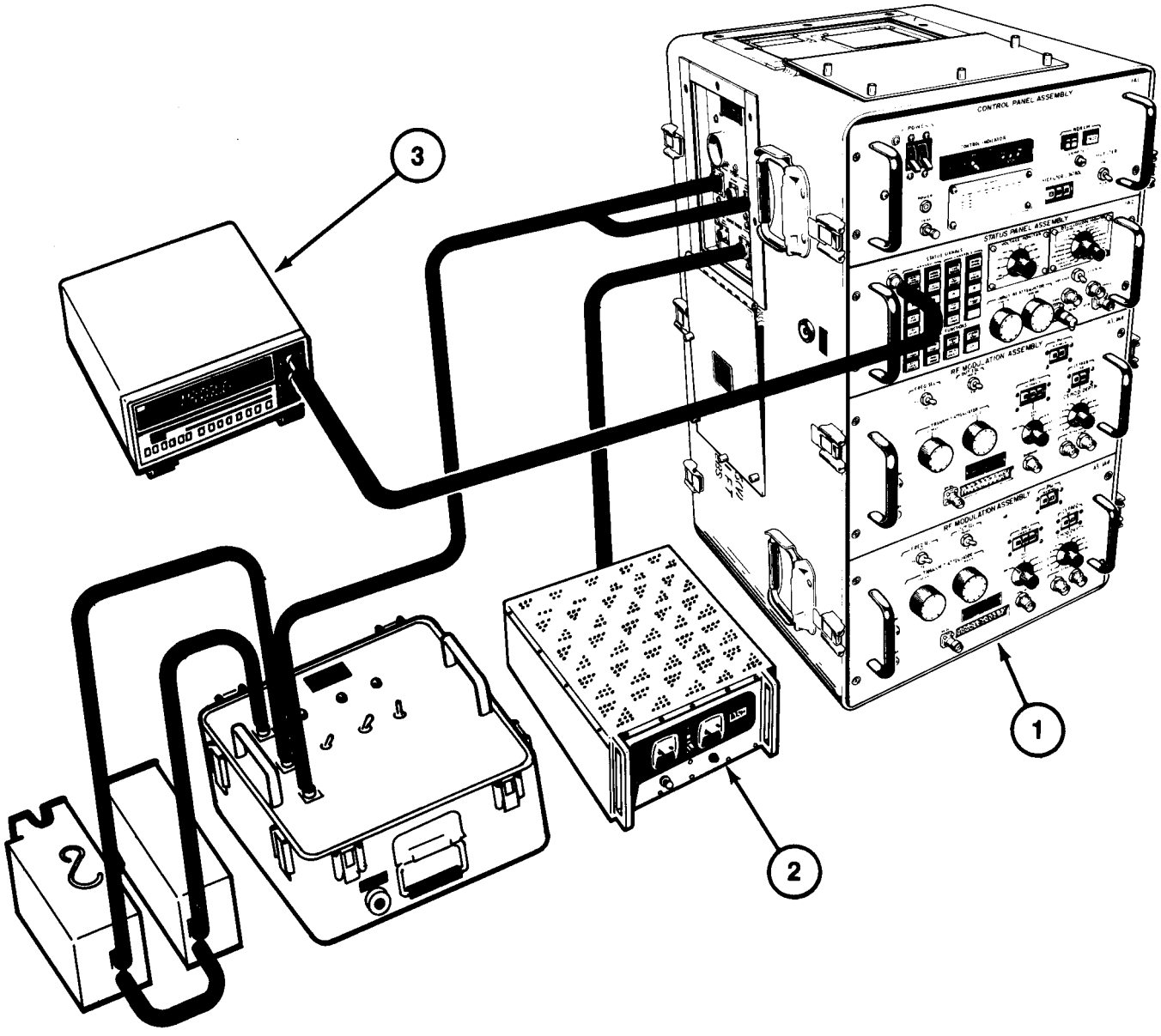


POWER SUPPLIES AND LAMPS CHECK

3-11.

a. Test Equipment. Use the following test equipment or equivalent to check the FLTS power supplies:

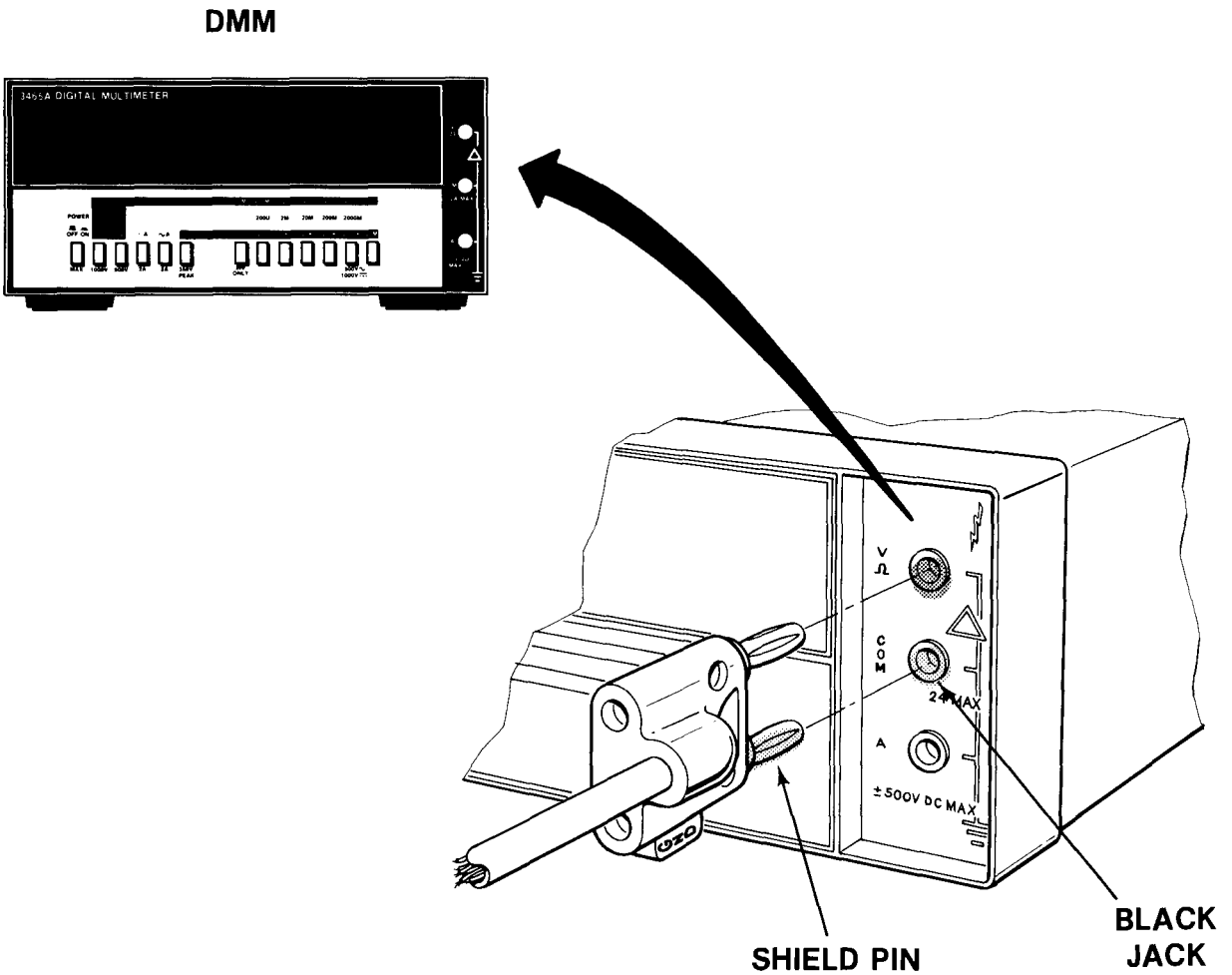
BTS (1)	TS-3615/ALQ-136(V)
Power Supply (2)	PP-1104/G
Digital Multimeter (DMM) (3)	AN/USM-451



b. Test Connections and Conditions. With FLTS connected as in paragraph 3-8, connect digital multimeter to BTS status panel V MON jack, using BNC to double banana plug cable.

CAUTION

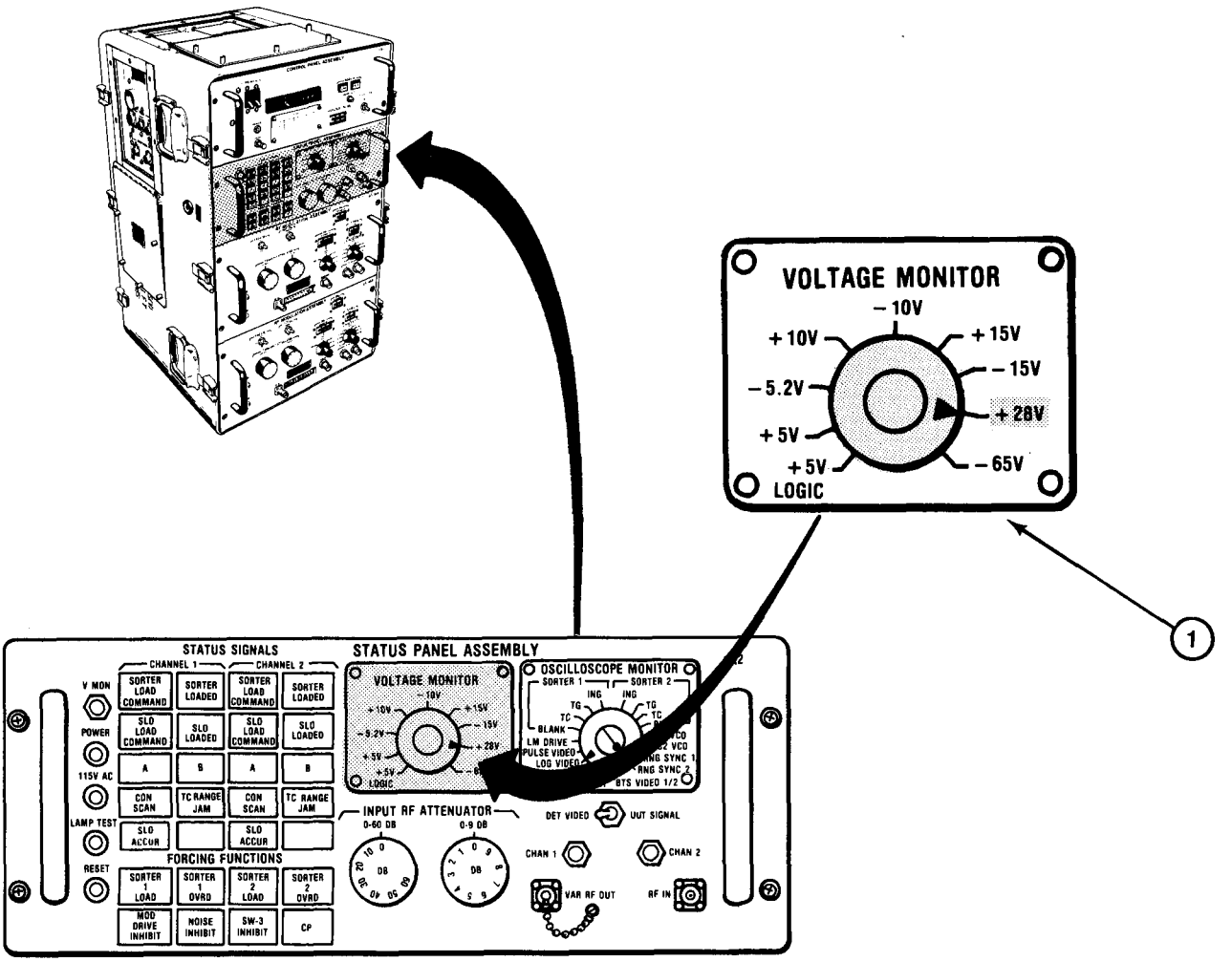
The digital multimeter (DMM) input jacks are polarized. Check double banana plug to identify shield pin. Be sure shield pin goes to black jack on DMM. Reversing the double banana plug grounds the DMM input circuit!



POWER SUPPLIES AND LAMPS CHECK (Continued)

c. Procedure.

STEP	ACTION → NORMAL INDICATION → FIX
1.	On BTS 1A2 set VOLTAGE MONITOR switch (1) to +28V. → +28.0 ± 0.5 Vdc. → Adjust 28 Vdc power supply.

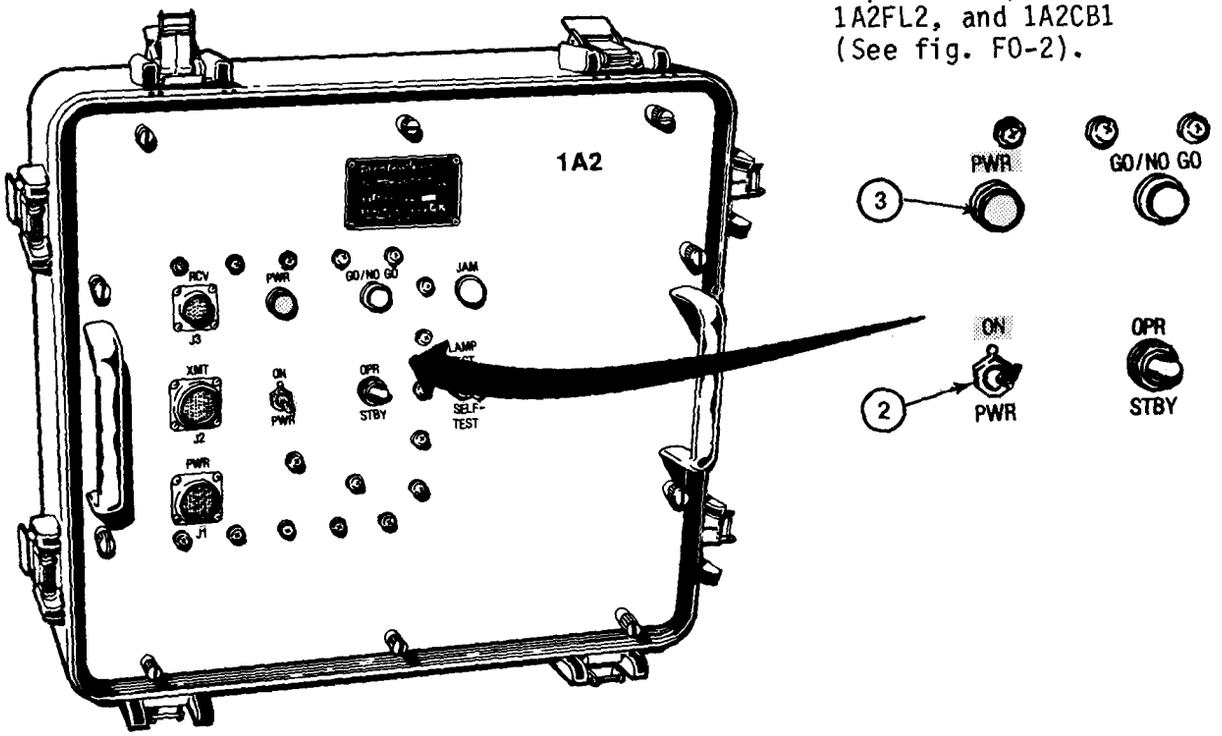


STEP ACTION → **NORMAL INDICATION** → **FIX**

2. On FLTS, set ON/PWR switch (2) to ON.

→ Power light (3) illuminates.

→ Replace lamp. Check 1A2FL1, 1A2FL2, and 1A2CB1 (See fig. FO-2).



3. On BTS, set VOLTAGE MONITOR switch (1) to the following positions and observe the DMM.

→

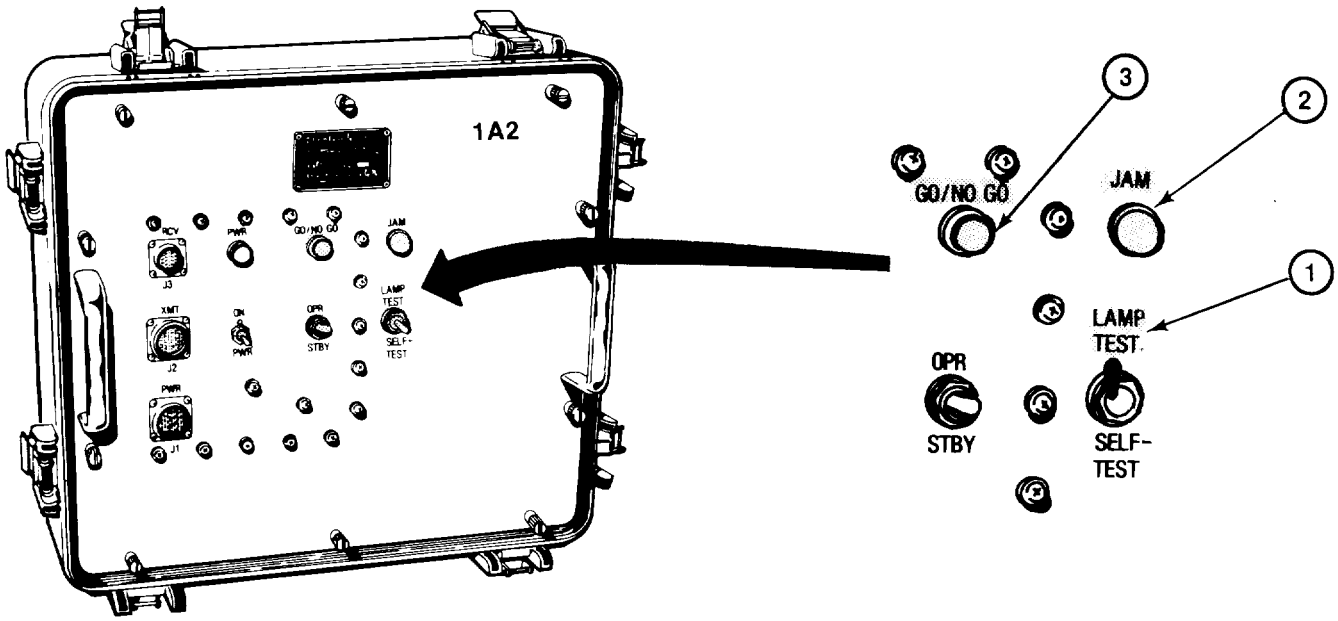
+5V LOGIC	+5.0 ± 0.25 Vdc
+15V	+15.0 ± 0.75 Vdc
-15V	-15.0 ± 0.75 Vdc
-65V	-65.0 ± 2.0 Vdc

→ If voltages are out of tolerance, go to paragraph 3-20.

If voltages are missing, go to paragraph 3-16.

3-11. POWER SUPPLIES AND LAMPS CHECK (Continued)

STEP	ACTION	NORMAL INDICATION	FIX
4.	On FLTS, set Test switch to LAMP TEST (1).	JAM (2) and GO/NO GO (3) lamps illuminate.	Replace lamps. Replace circuit card 1A2A1 (para 3-23).

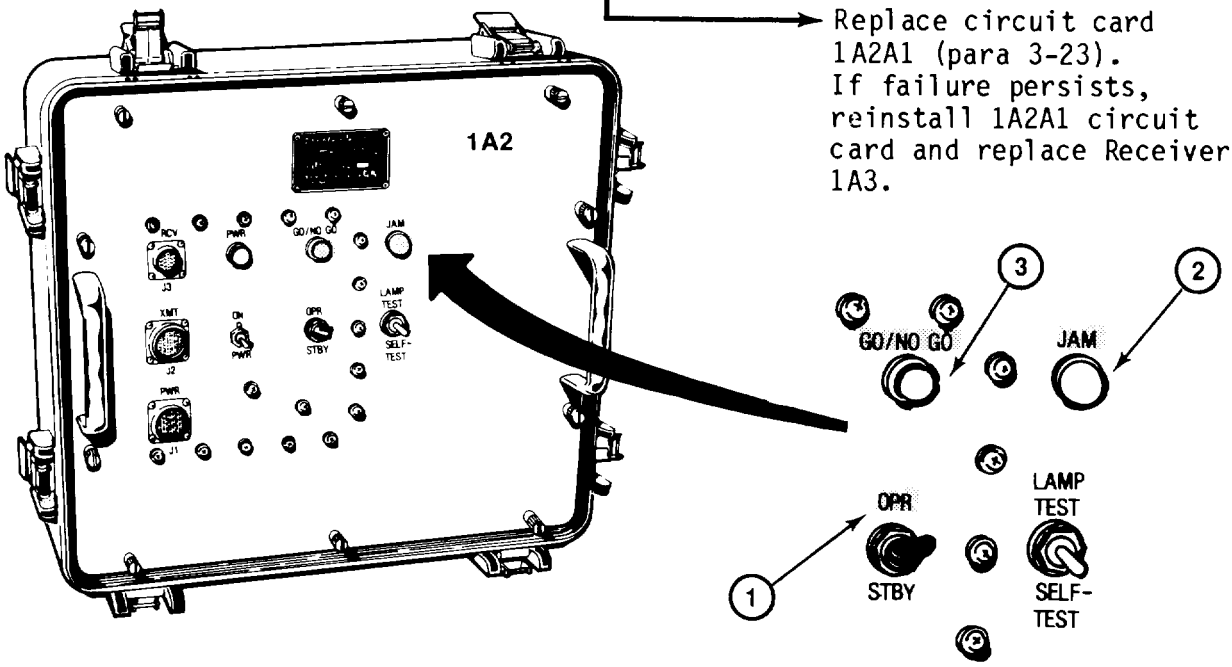


STEP ACTION → **NORMAL INDICATION** → **FIX**

5. On FLTS, set STBY/OPR (1) switch to OPR.

→ JAM (2) and GO/NO GO (3) lamps are extinguished.

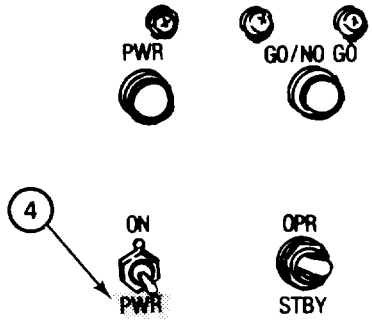
→ Replace circuit card 1A2A1 (para 3-23). If failure persists, reinstall 1A2A1 circuit card and replace Receiver 1A3.



6. On FLTS, set ON/PWR switch to PWR (4).

→ Power light extinguishes.

(End of power supplies and lamp check.)



TEST LOGIC CHECK

3-12.

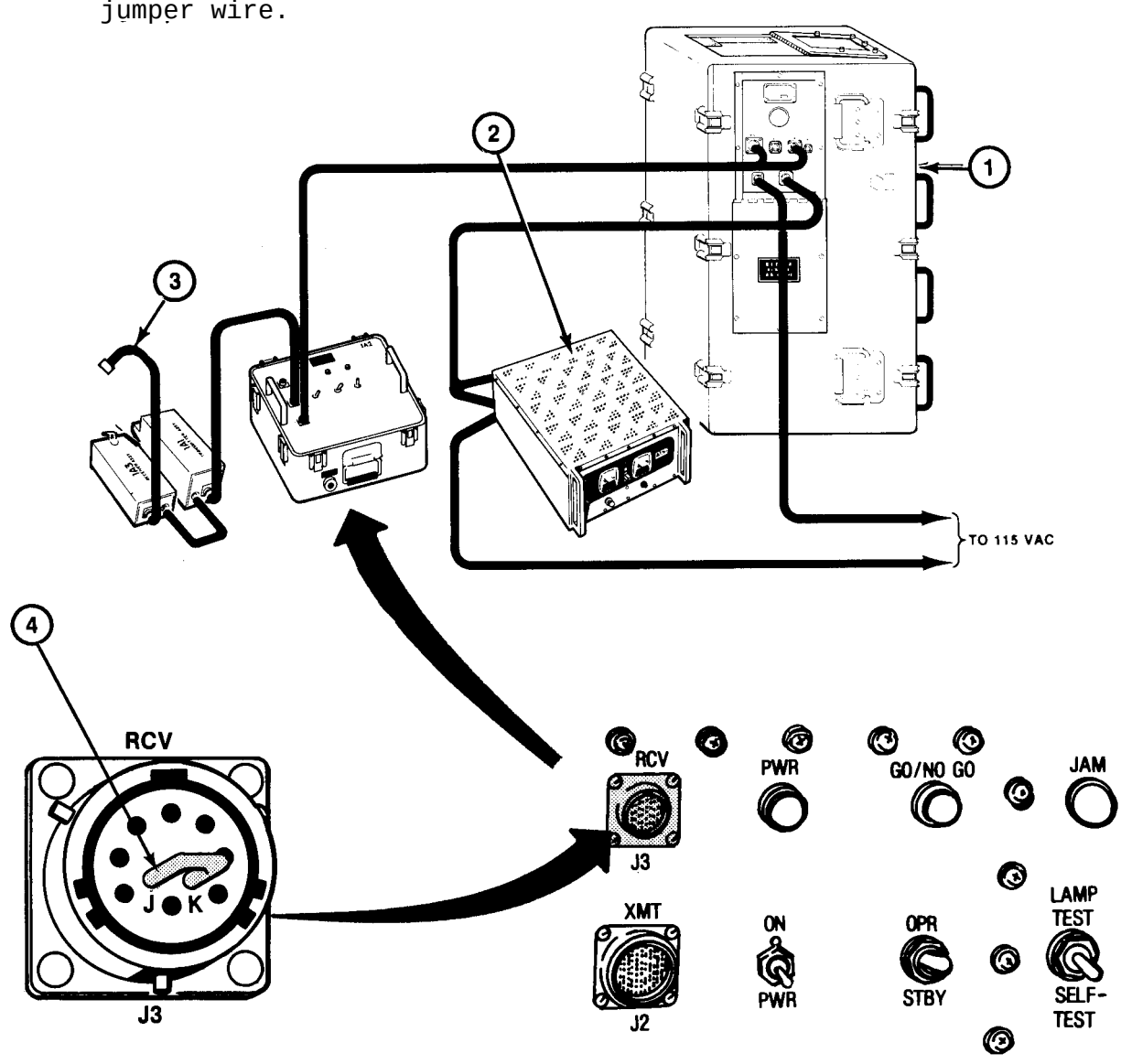
a. Test Equipment. Use the following test equipment for test logic checks:

BTS (1)	TS-3615/ALQ-136(V)
Power Supply (2)	PP-1104/G

b. Test Connections and Conditions.

(1) With FLTS connected as in paragraph 3-8, on FLTS disconnect W3 (3) from 1A2J3 and set ON/PWR switch to PWR (off).

(2) On FLTS video assembly connector 1A2J3 short pin J to pin K with a jumper Use AWG #20 solid wire or two #20 pins soldered to a short jumper wire.



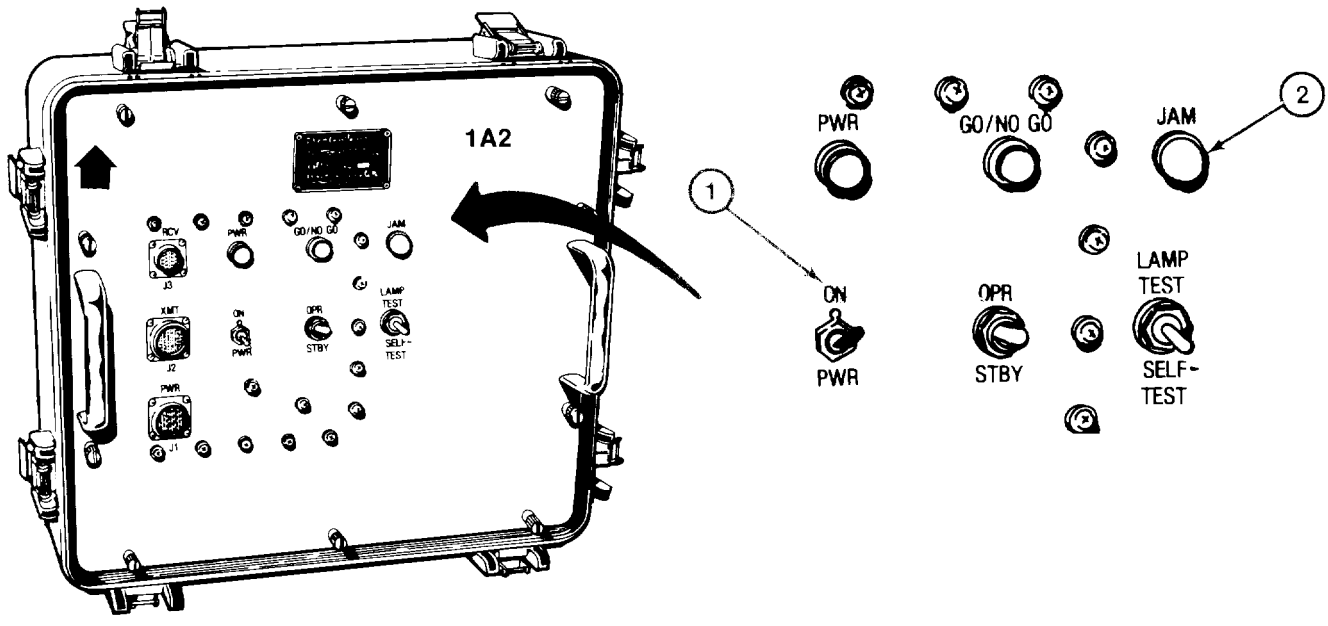
c. Procedure.

STEP ACTION → **NORMAL INDICATION** → **FIX**

1. On FLTS, set ON/PWR switch (1) to ON.

→ JAM (2) lamp illuminates.

→ Replace circuit card 1A2A1 (para 3-23).



TEST LOGIC CHECK (Continued)

STEP ACTION	NORMAL INDICATION	FIX

2. On BTS status panel, press each of the following FORCING FUNCTION buttons to light them.

SORTER 1 LOAD (1)

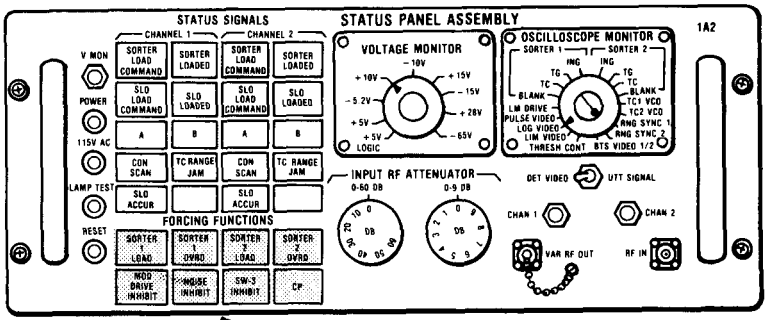
SORTER 1 OVRD (2)

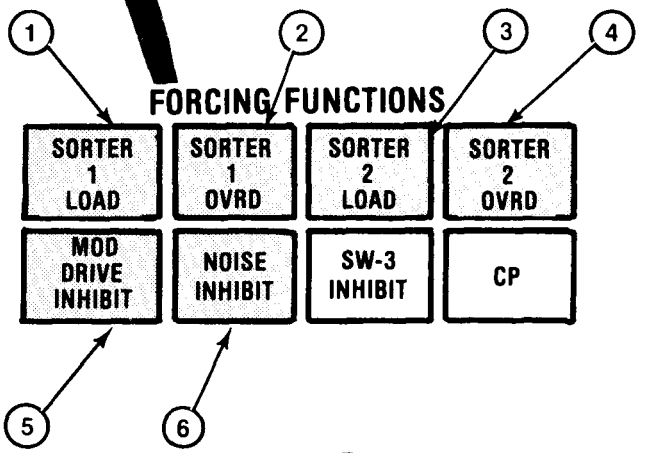
SORTER 2 LOAD (3)

SORTER 2 OVRD (4)

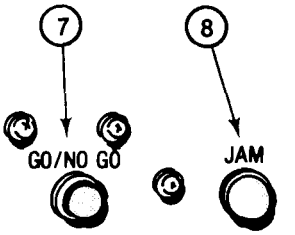
MOD DRIVE INHIBIT (5)

NOISE INHIBIT (6)





On FLTS, GO/NO/GO lamp (7) illuminates. JAM lamp (8) remains illuminated.



Replace circuit card 1A2A1 (para 3-23).

STEP ACTION → **NORMAL INDICATION** → **FIX**

3. On BTS status panel , perform the following while observing FLTS.

Press SORTER 1 LOAD (1) to extinguish it.

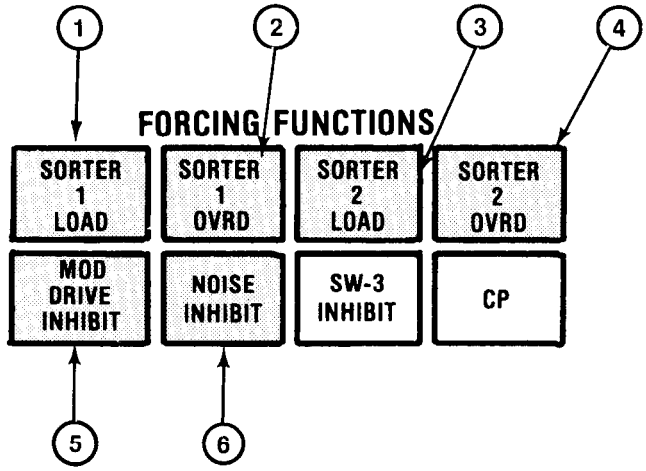
Press SORTER 1 OVRD (2) to extinguish. Press SORTER 1 LOAD to light.

Press SORTER 2 LOAD (3) to extinguish. Press SORTER 1 OVRD to light.

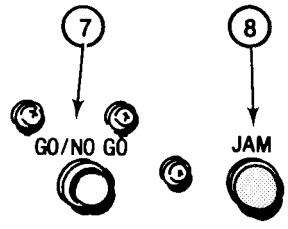
Press SORTER 2 OVRD (4) to extinguish. Press SORTER 2 LOAD to light.

Press MOD DRIVE INHIBIT (5) to extinguish. Press SORTER 2 OVRD to light.

Press NOISE INHIBIT (6) to extinguish. Press MOD DRIVE INHIBIT to light.



→ On FLTS, at each step GO/NO GO lamp (7) is off. JAM lamp (8) remains on.

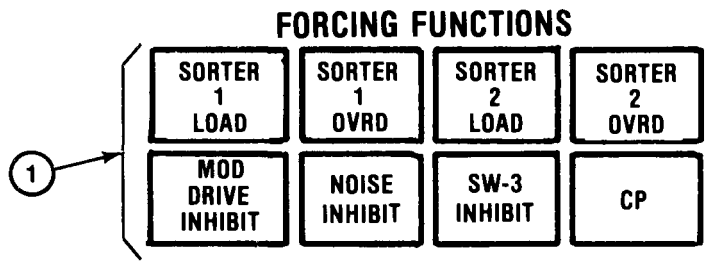


→ Replace circuit card 1A2A1 (para 3-23).

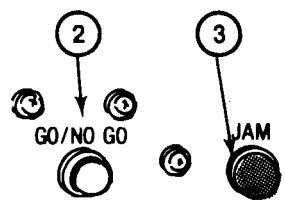
TEST LOGIC CHECK (Continued)

STEP ACTION	NORMAL INDICATION	FIX

4. On BTS status panel, press all illuminated FORCING FUNCTION buttons once to extinguish (1).



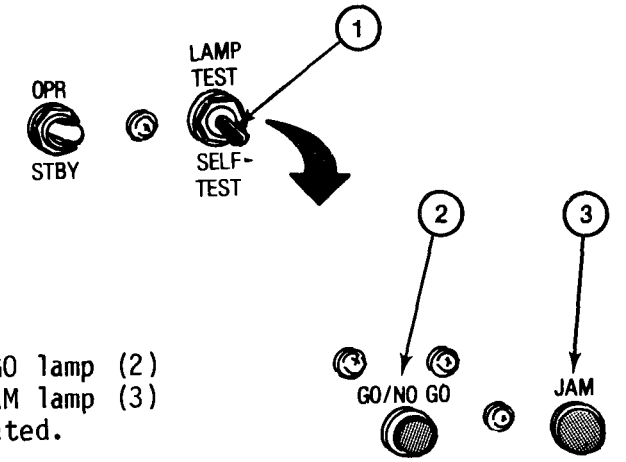
On FLTS, GO/NO GO lamp (2) remains extinguished. JAM light (3) remains illuminated.



Replace circuit card 1A2A1 (para 3-23).

STEP ACTION	NORMAL INDICATION	FIX

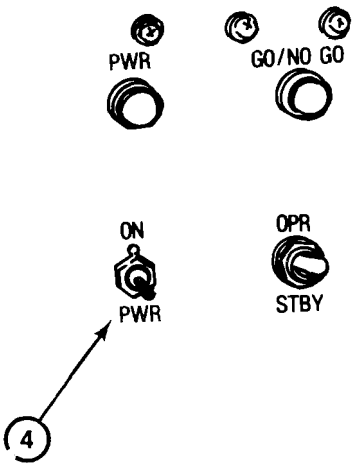
5. On FLTS, set test switch (1) to SELF-TEST.



On FLTS, GO/NO GO lamp (2) illuminates. JAM lamp (3) remains illuminated.

Replace circuit card 1A2A1 (para 3-23).

6. On FLTS, set ON/PWR switch (4) to PWR. Remove jumper from 1A2J3 and connect W3 to 1A2J3.



(End of test logic check.)

RF OUTPUT LEVEL CHECK

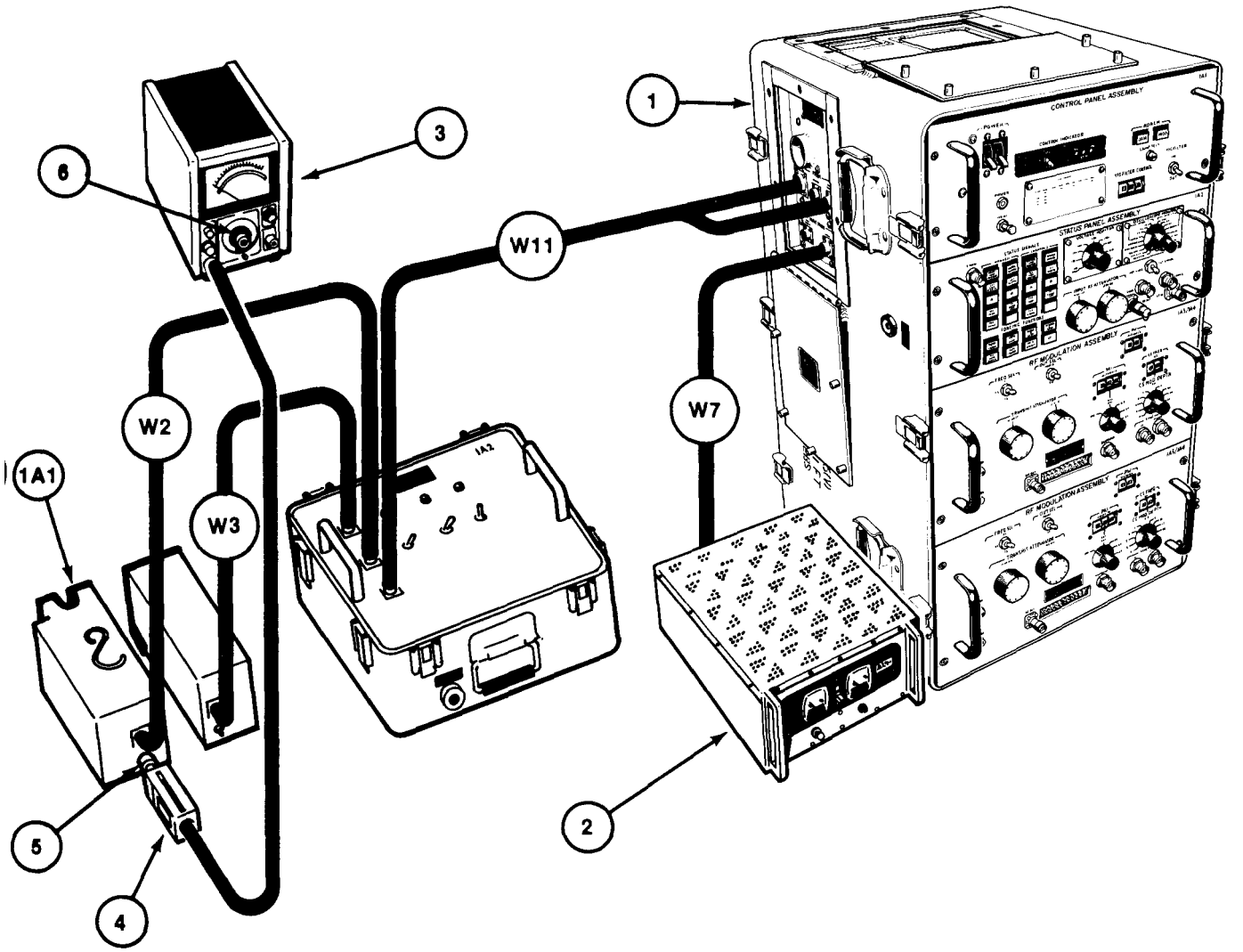
3-13.

a. Test Equipment. Use the following test equipment or equivalent to check the RF- output level:

BTS (1)	TS-3615/ALQ-136(V)
Power Supply (2)	PP-1104/G
Power Meter (3)	HP 435A
Power Sensor (4)	HP 8481A
Adapter (5)	N female to SMA male

b. Test Connections and Conditions. Using RF Adapter, connect RF sensor to J2 of Transmitter Assembly 1A1, with FLTS connected as in paragraph 3-8.

c. Initial Test Equipment Setting. Set the power meter range switch (6) to +10 dBm scale.


1
2
3
4
5
6
W2
W3
W7
W11
1A1
CONTROL PANEL ASSEMBLY
STATUS PANEL ASSEMBLY
RF MODULATION ASSEMBLY
RF MODULATION ASSEMBLY

RF OUTPUT LEVEL CHECK (Continued)

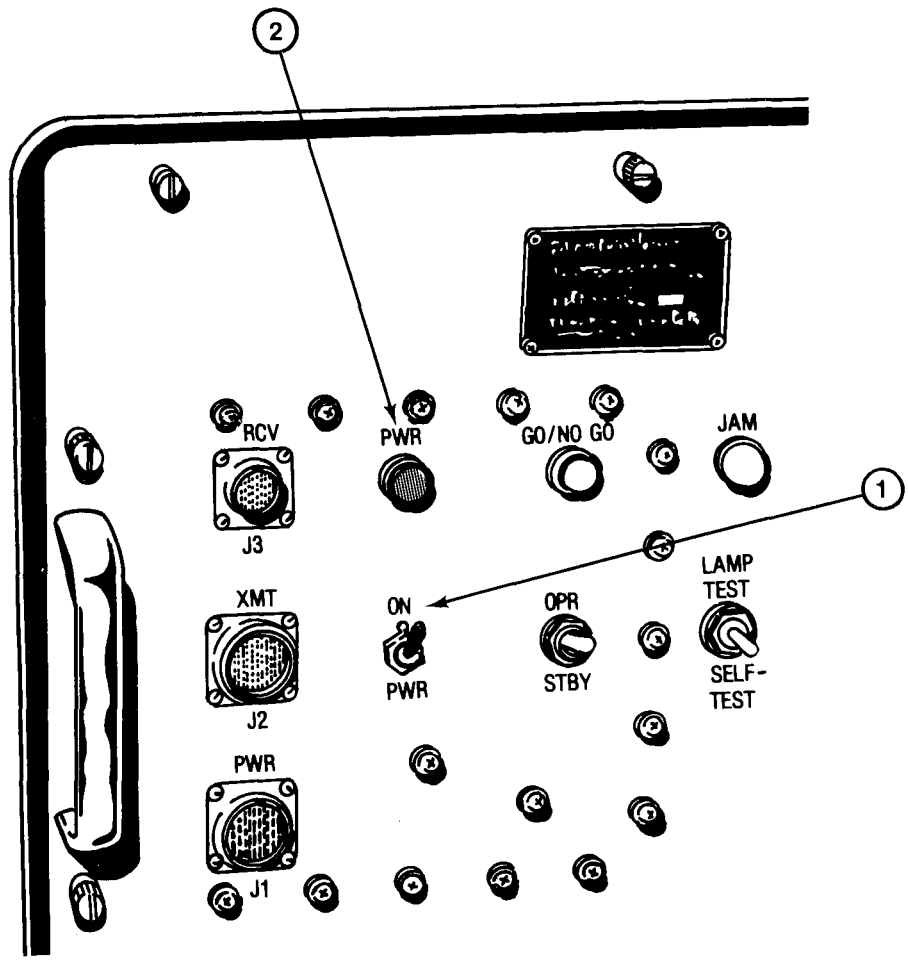
d. Procedure.

STEP	ACTION → NORMAL INDICATION → FIX

1. On FLTS, set ON/PWR switch (1) to ON.

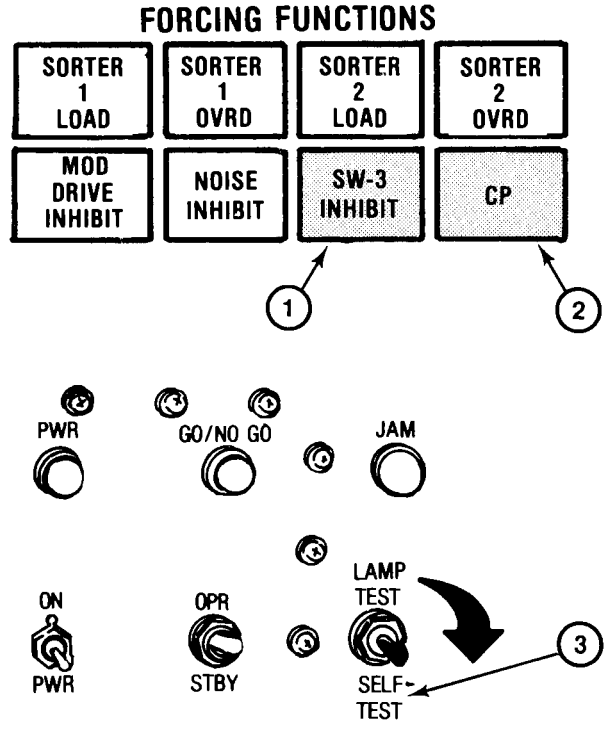
→ PWR indicator (2) is on.

→ Check dc circuits (fig. FO-2).

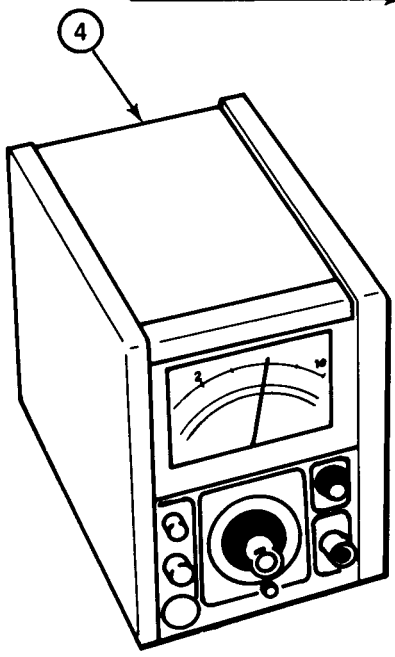


STEP ACTION → **NORMAL INDICATION** → **FIX**

2. On BTS status panel, press FORCING FUNCTION buttons SW-3 INHIBIT (1) and CP (2) to illuminate. While holding FLTS test switch (3) in the SELF-TEST position, observe power meter.



→ Power meter (4) reads from +3 to +8 dBm. Record the reading.



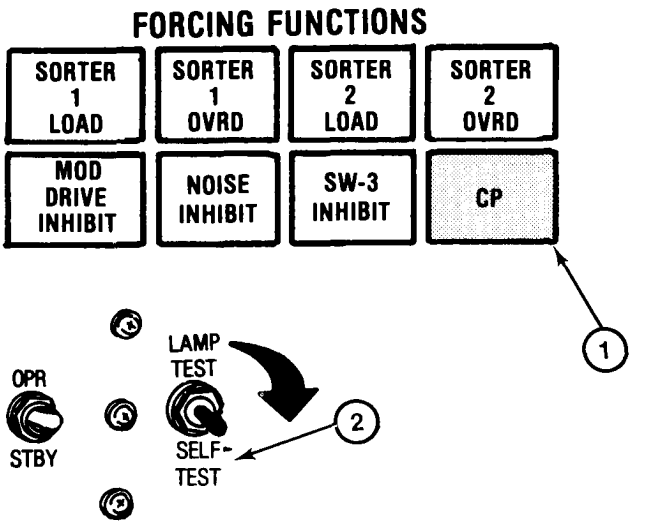
_____dBm

→ Go to paragraph 3-20.

RF OUTPUT LEVEL CHECK (Continued)

STEP	ACTION	NORMAL INDICATION	FIX

3. On BTS status panel, press FORCING FUNCTION button CP (1) to extinguish. While holding FLTS test switch in the SELF TEST (2) position, observe power meter.



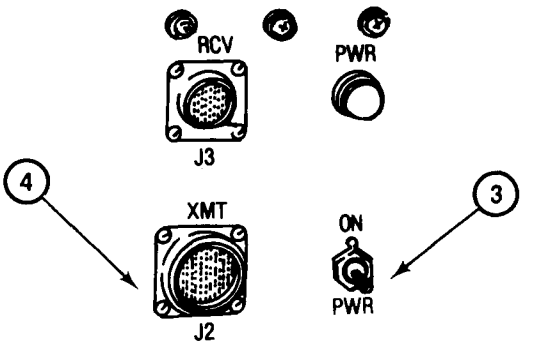
Record power meter reading and subtract it from the reading obtained in step 2. The difference shall be 1 to 3 dB.

_____dB

Replace Transmitter 1A1.

4. On FLTS, set ON/PWR switch (3) to PWR.

5. On FLTS, remove RF sensor (4) from 1A1J2.



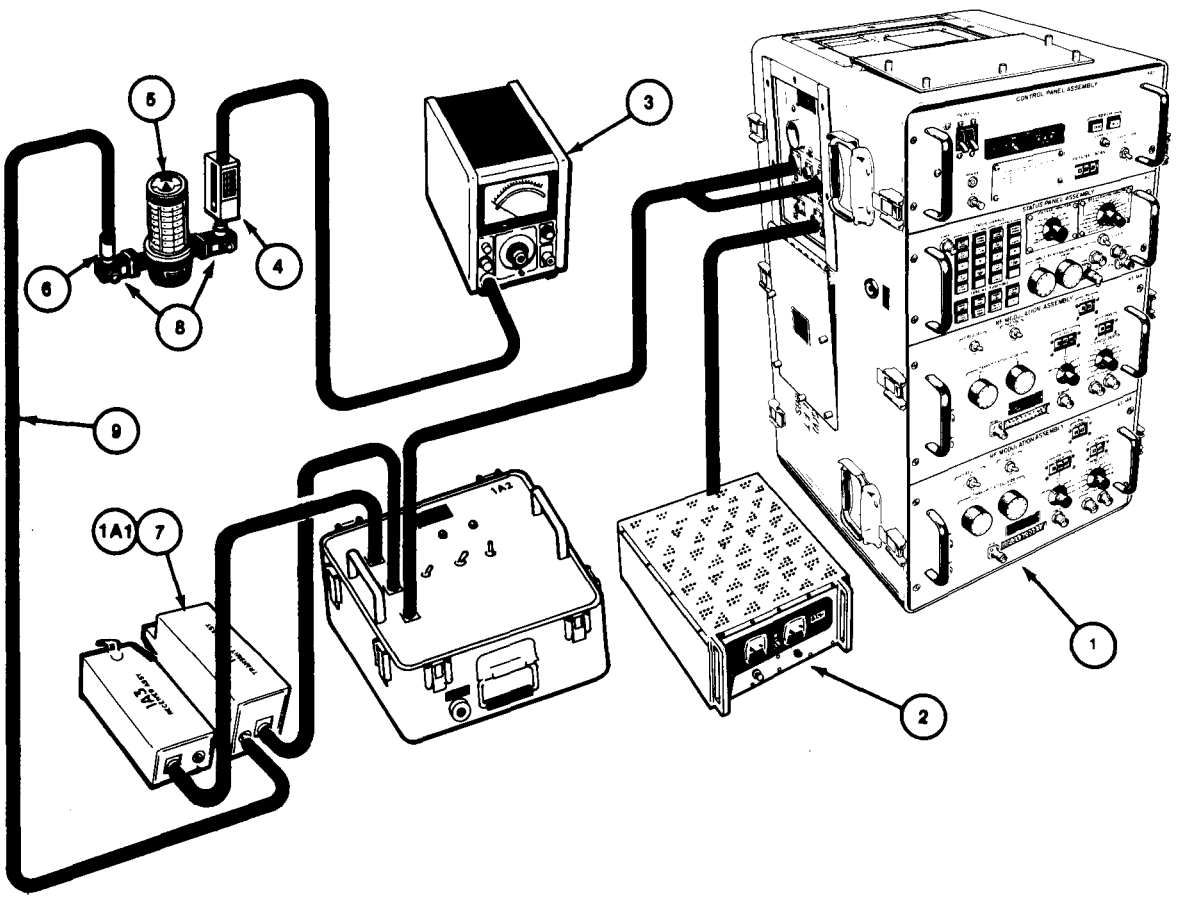
(End of RF output level check.)

RF FREQUENCY CHECK

3-14.

a. Test equipment. Use the following test equipment or equivalent to check

BTS (1)	TS-3615/ALQ-136(V)
Power Supply (2)	PP-1104/G
Power Meter (3)	HP 435A
Power Sensor (4)	HP 8481A
Frequency Meter (5)	HP P532A
Adapters (6, 7)	N male to TNC female (6), TNC female to SMA male (7)
Waveguide to Coax Adapters (8)	HP P281B/OPT 013 (2 ea)
Cable (9)	TNC male to TNC male (BTS W4)

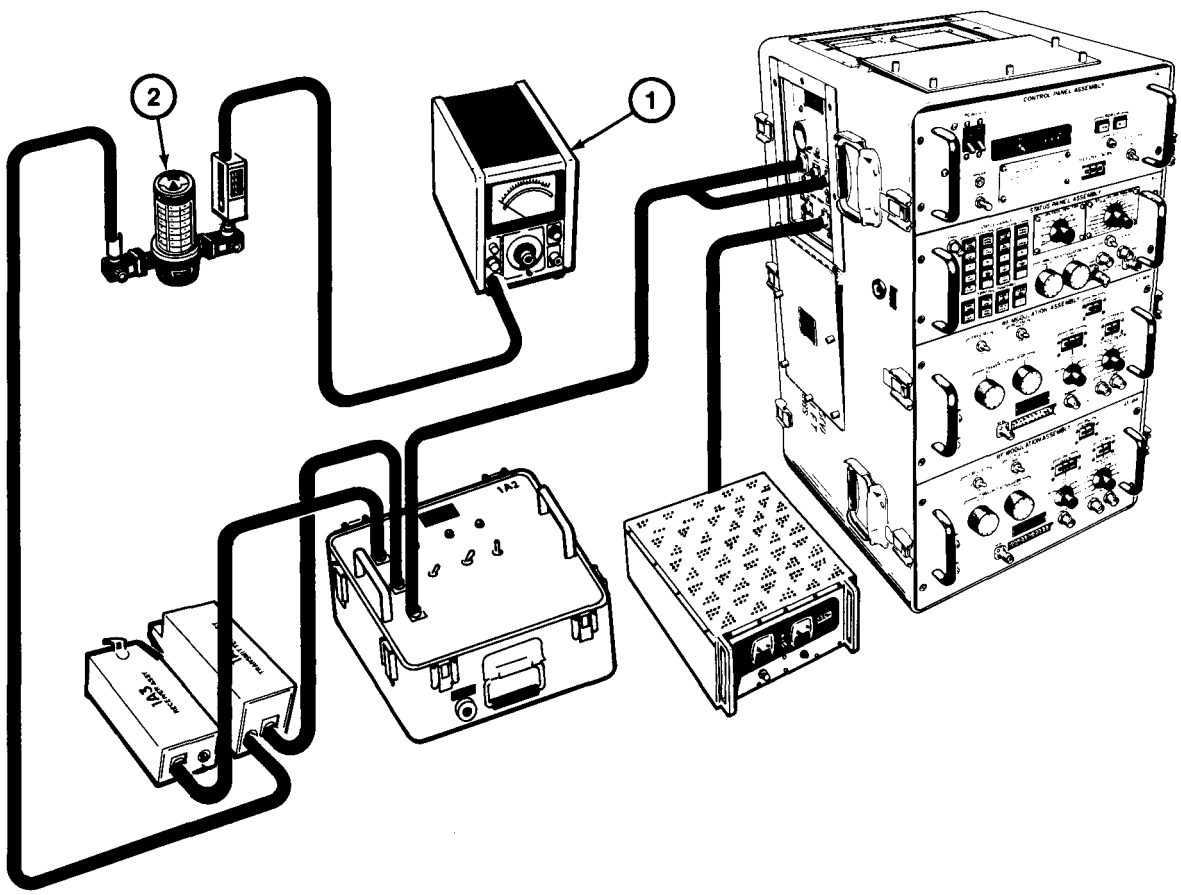


RF FREQUENCY CHECK (Continued)

b. Test Connections and Conditions. Connect test equipment to the transmitter assembly, with FLTS connected otherwise as in paragraph 3-8.

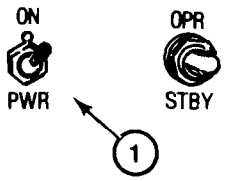
c. Initial Test Equipment Settings.

(1) Set power meter (1) to +5 dBm scale.
(2) Set frequency meter (2) to F4 (see (S) TM 11-5865-202-30 (U) for the value of F4).

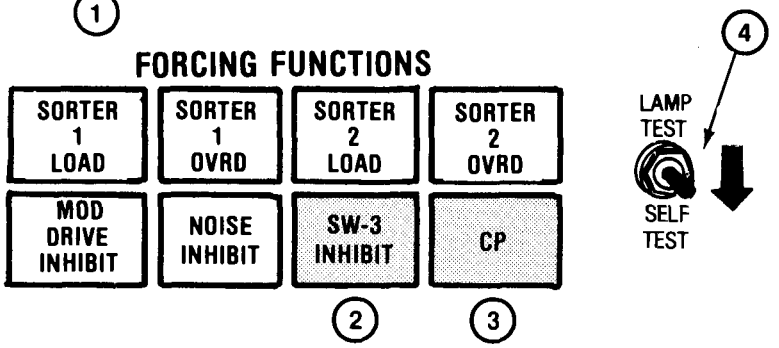


STEP ACTION → **NORMAL INDICATION** → **FIX**

1. On FLTS, set ON/PWR switch (1) to ON.



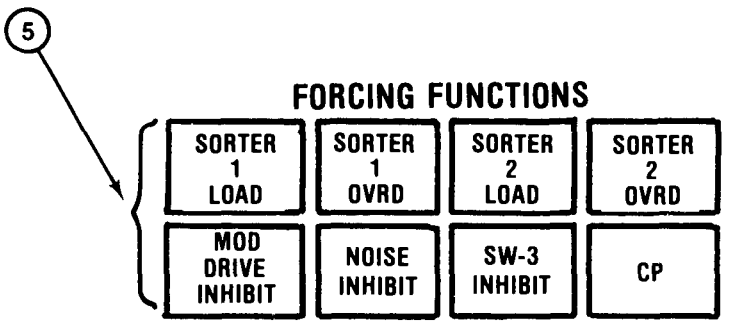
2. On BTS status panel, press FORCING FUNCTIONS pushbuttons SW-3 INHIBIT (2) and CP (3) to light them. While holding the FLTS test switch (4) in the SELF-TEST position, tune the frequency meter for a dip in power reading on power meter.



→ Frequency meter indicates F4 ± 0.5 (See (S) TM 11-5865-202-30, appx C (C)).

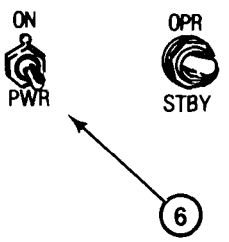
→ Replace Transmitter 1A1.

3. On BTS Status panel, press all lighted FORCING FUNCTIONS pushbuttons (5) to turn off.



4. Disconnect frequency meter from the FLTS.

5. On FLTS set ON/PWR switch (6) to PWR.



(End of RF frequency check.)

PRI AND CS CHECK

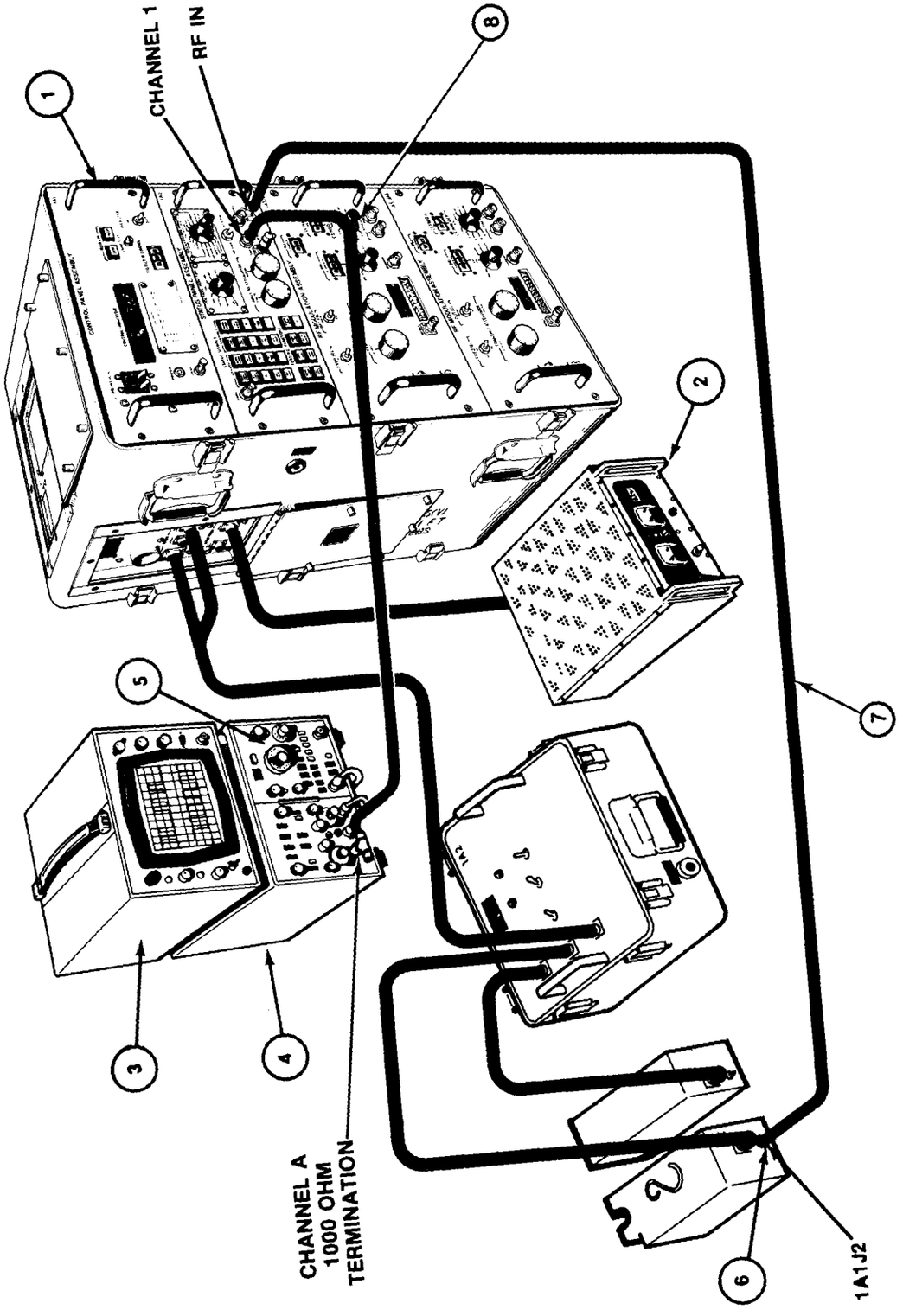
3-15. Use the following test equipment to check the PRI and

BTS (1)	TS-3615/ALQ-136(V)
Power Supply (2)	PP-1104/G
Oscilloscope (3)	AN/USM-281A
Including:	
Oscilloscope Dual Channel Amplifier (4)	
Oscilloscope Time Base and Delay Generator (5)	
Cables	W5 cable (P/O BTS)(7) RG-58C/U with BNC male connectors (8)
Adapter (6)	TNC female to SMA male

b. Test Connections and Conditions.

(1) With FLTS connected as in paragraph 3-8, connect BTS cable W5 (7) between FLTS 1A1J2 and BTS status panel RF IN.

(2) Connect BNC male to BNC male cable (8) between BTS status panel CHAN 1 and oscilloscope Channel A, with 1000 ohm termination.


CHANNEL 1
RF IN
1
2
3
4
5
6
7
8
CHANNEL A
1000 OHM
TERMINATION
1A1J2

PRI AND CS CHECK (Continued)

c. Initial Test Equipment Setting.

On BTS status panel, set INPUT RF ATTENUATOR (1) to O dB.

On BTS status panel, set DET VIDEO/UUT SIGNAL switch 2) to DET VIDEO.

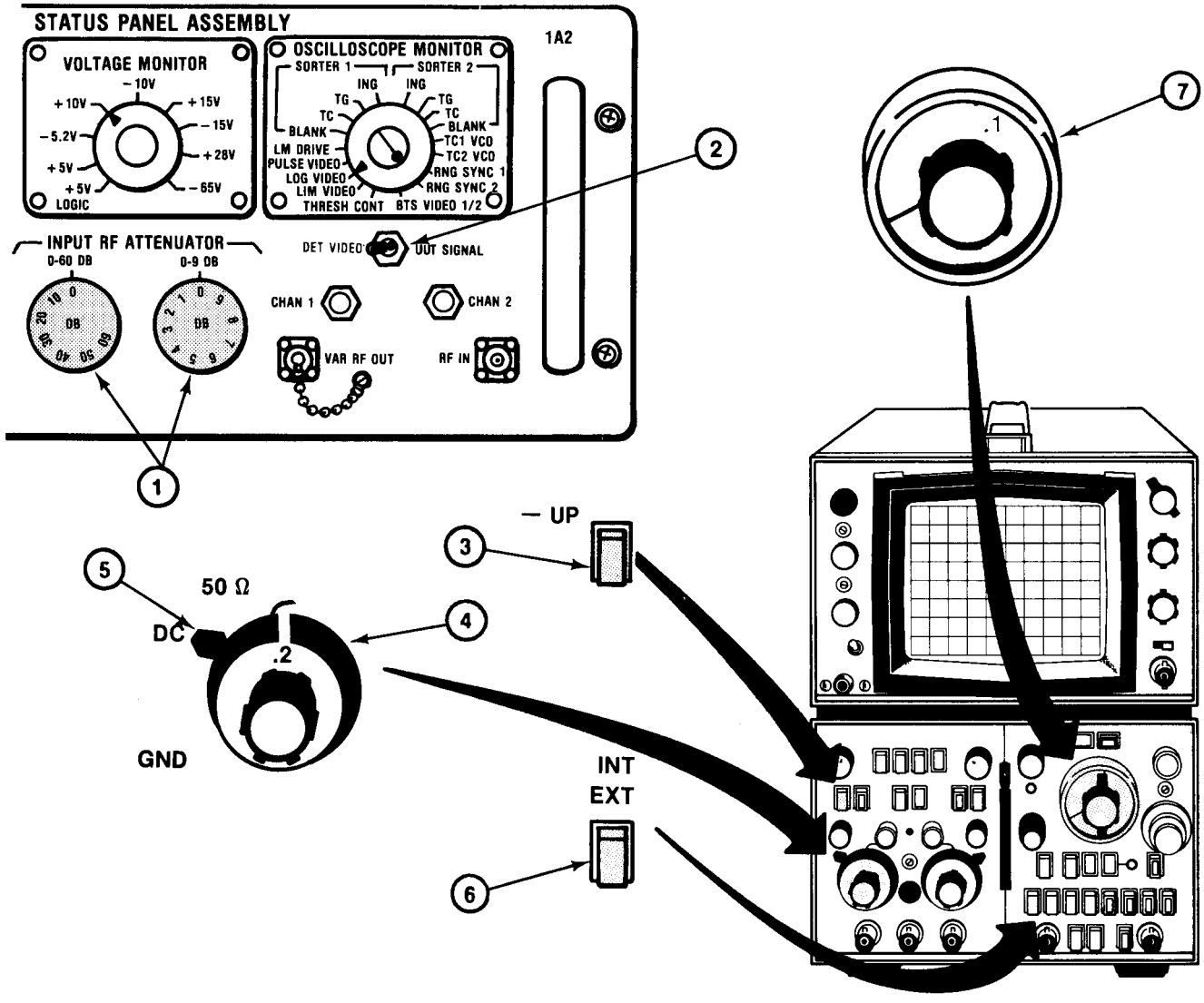
On oscilloscope vertical amplifier set to negative up (3).

On oscilloscope vertical amplifier, set gain (4) to O 2 V/DIV.

On oscilloscope vertical amplifier, set input coupling (5) to DC, 1000 ohm termination.

On oscilloscope, use internal sync (6).

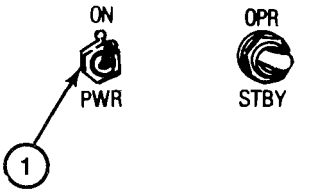
On oscilloscope time base generator, set TIME/DIV (7) to 0.1 ms.



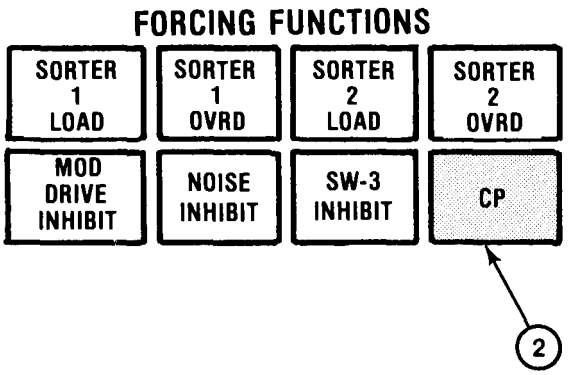
d. Procedure.

STEP ACTION → **NORMAL INDICATION** → **FIX**

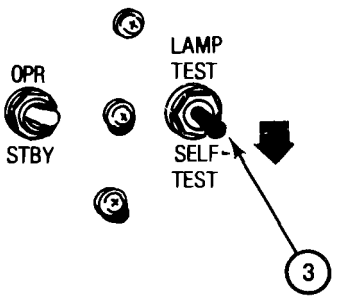
1. On FLTS, set ON/PMR switch (1) to ON.

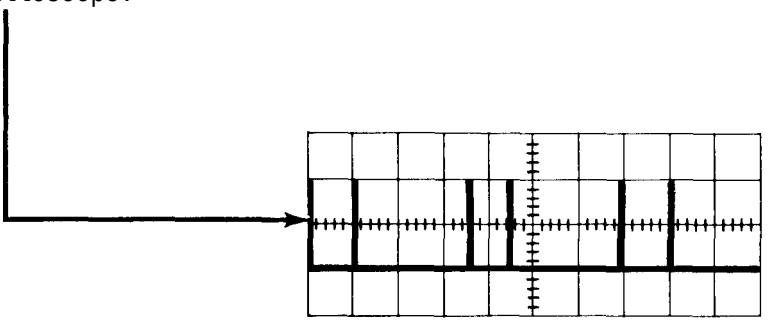


2. On BTS status panel, press FORCING FUNCTION button CP (2) to illuminate.



While holding the FLTS test switch (3) in the SELF-TEST position, observe oscilloscope.





0.2 VOLTS/DIV

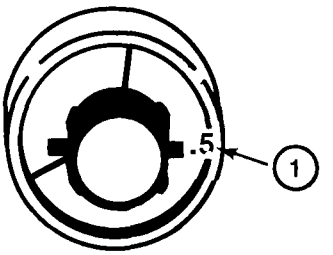
SWEEP: 100 µs/DIV

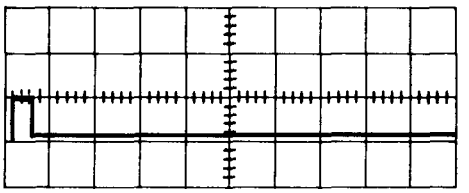
→ Perform PRI trouble-shooting (para 3-17.)

PRI AND CS CHECK (Continued)

STEP	ACTION	NORMAL INDICATION	FIX

3. On oscilloscope, set TIME/DIV (1) to .5 µs/DIV. Observe oscilloscope while holding LAMP TEST/SELF-TEST switch in SELF-TEST position.





SWEEP: 0.5 µs/DIV

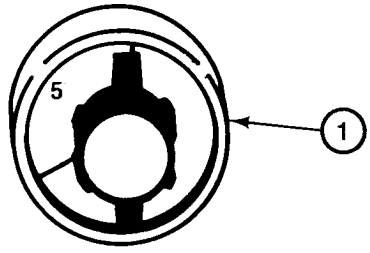
0.5 VOLTS/DIV
50 ohm
termination

Pulse width of 0.3 ±0.1 µs.

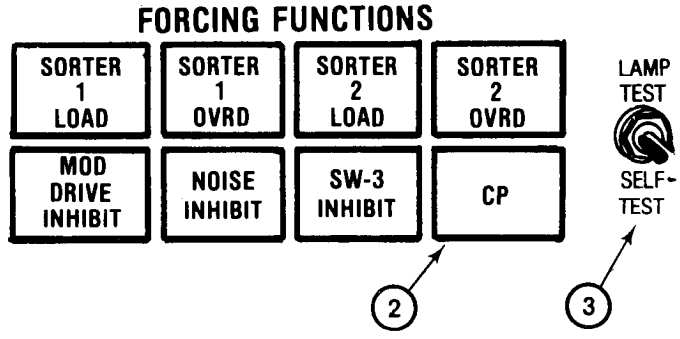
→ Go to paragraph 3-17.

STEP ACTION	NORMAL INDICATION	FIX

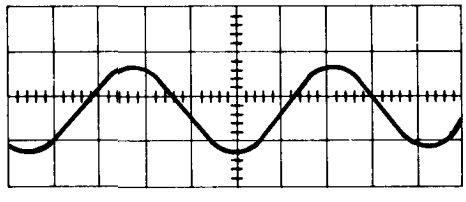
4. On oscilloscope, set TIME/DIV (1) to 5 ms/DIV. Use 100 ohm termination.



5. On BTS status panel, Press FORCING FUNCTION (2) button CP to extinguish. While holding the FLTS test switch in the SELF-TEST (3) position, observe modulated pulse train. Move baseline off screen for better observation of pulse train



Sine wave period of 20 to 25 ms.



0.05 VOLTS/DIV

SWEEP: 5 ms/DIV

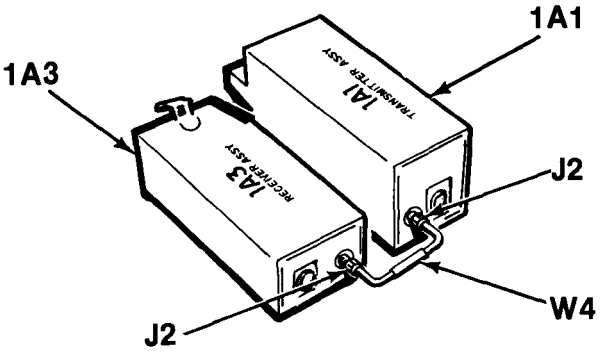
→ Replace circuit card 1A2A1 (para 3-23.)

PRI AND CS CHECK (Continued)

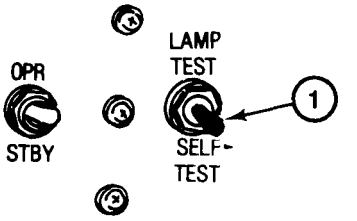
STEP	ACTION → NORMAL INDICATION → FIX

6. Release test switch. Disconnect cable from the FLTS 1A1J2 and BTS status panel RF IN.

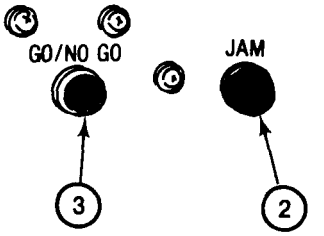
7. On FLTS, connect cable W4 between 1A1J2 and 1A3J2.



8. On FLTS, set test switch (1) to SELF-TEST.



→ JAM (2) and GO/NO GO (3) lamps illuminate.



→ Go to paragraph 3-18.

STEP ACTION	NORMAL INDICATION	FIX
9. On FLTS, release test switch.		
(End of procedure. FLTS is operational.)		

POWER SUPPLY TROUBLESHOOTING

3-16.

a. Test Equipment. Use the following test equipment or equivalent to troubleshoot the power supply:

BTS (1)	TS-3615/ALQ-136(V)
Power Supply (2)	PP-1104/G
Digital Multimeter (DMM) (3)	AN/USM-451

WARNING

Turn off POWER 28 VDC on BTS 1A1 before opening FLTS video assembly. This will avoid accidental shorting of circuits. Turn POWER 28 VDC on to make tests.

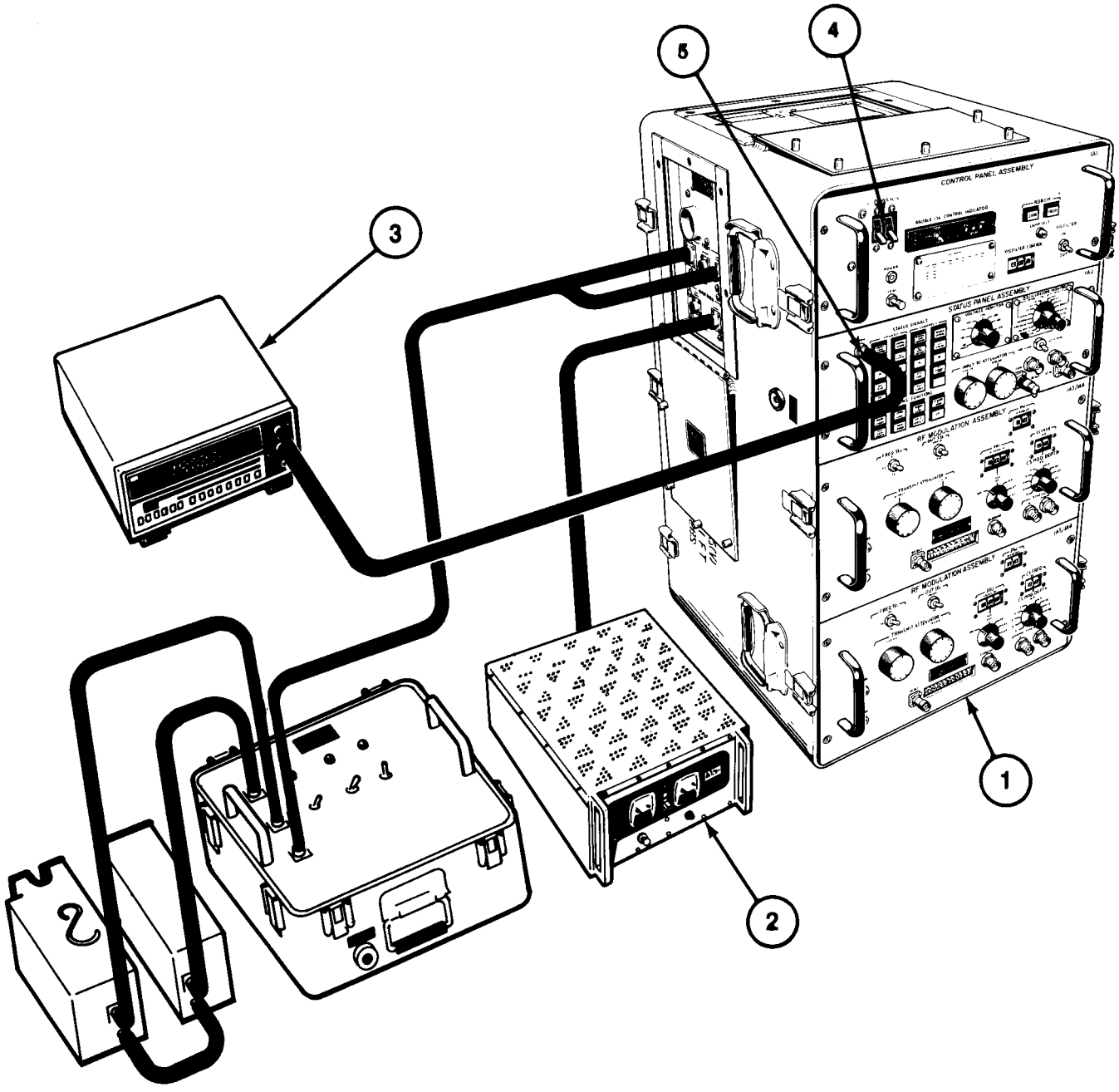
CAUTION

After unfastening video front panel assembly, it is still secured to the case by wires from the power supplies. Remove the video front panel assembly carefully.

b. Test Connections and Conditions.

(1) With FLTS connected as in paragraph 3-8, on BTS control panel, turn on 28 VDC circuit breaker (4).

(2) Connect DMM (3) to BTS status panel V MON jack (5).

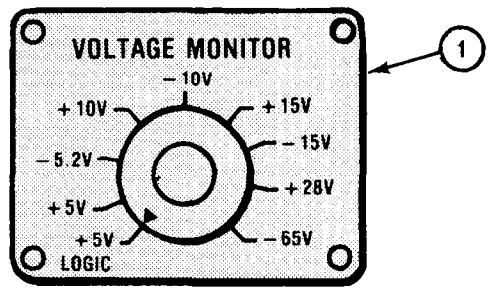

5
4
3
CONTROL PANEL ASSEMBLY
STATUS PANEL ASSEMBLY
RF MODULATION ASSEMBLY
RF MODULATION ASSEMBLY
1
2

POWER SUPPLY TROUBLESHOOTING (Continued)

c. Procedure.

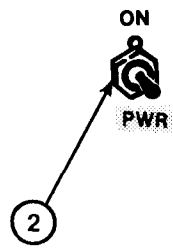
STEP ACTION → NORMAL INDICATION → FIX

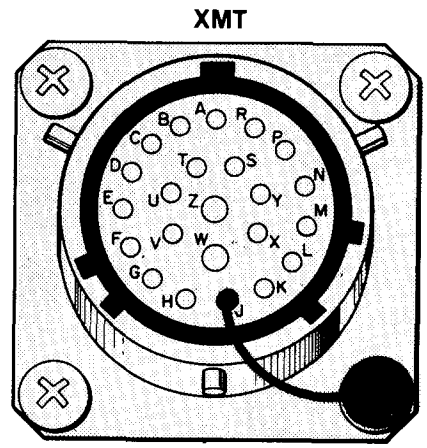
1. On BTS status panel set VOLTAGE MONITOR switch (1) to the position of any defective voltage.



Normal voltage		For a defect go to:
+5V LOGIC	+4.75 to +5.25 V	Step 4
+15V	+14.25 to +15.75 V	Step 3
-15V	-14.25 to -15.75 V	Step 3
	to -67.0 V	Step 2

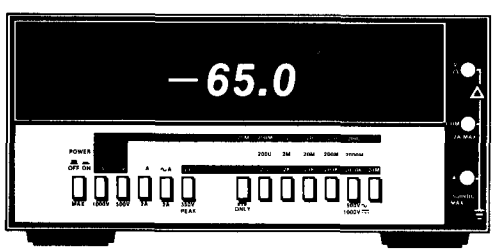
2. -65 V. On FLTS, set ON/PWR switch (2) to PWR (off position). Disconnect Cable W2 from 1A2J2 and use a jumper wire to ground pin J of J2 video assembly. On FLTS, set ON/PWR switch to ON. Observe DMM.





→ -63.0 to -67.0 V on DMM.

Remove ground from pin J.

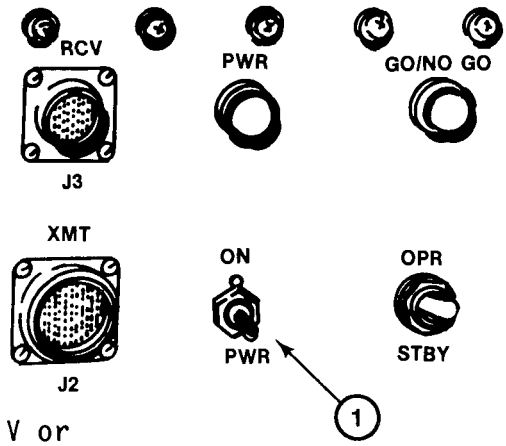


→ If DMM indicates correct voltage, check cable W2. (See para 3-27.) If cable is good, replace Transmitter 1A1.

→ If voltage is missing, replace -65 V dc Power Supply 1A2PS3 and go to paragraph 3-24.

STEP ACTION → **NORMAL INDICATION** → **FIX**

3. +15 or -15. On FLTS, set ON/PWR switch (1) to PWR (off position). Disconnect Cable W2 from 1A2J2 of the video assembly. On FLTS, set ON/PWR switch to ON. Observe DMM.

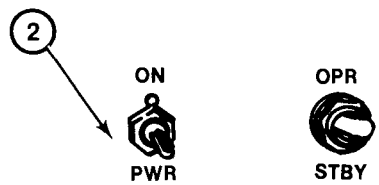


→ +14.25 to +15.75 V or -14.25 to -15.75 V on DMM.

→ If DMM reads correct voltage, check cable W2. If cable is good, replace Transmitter 1A1.

→ If voltage is missing, go to step 3a.

3a. On FLTS, set ON/PWR switch(2) to PWR (off position). Reconnect Cable W2 to 1A2J2 and disconnect Cable W3 from 1A2J3 of the video assembly. Set FLTS ON/PWR switch to ON.



→ +14.25 to +15.75 V or -14.25 to -15.75 V on DMM.

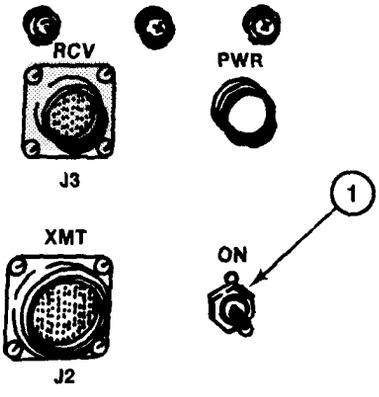
→ If DMM reads correct voltage, check cable W3. If cable is good, replace Receiver 1A3.

→ If voltage is missing, go to step 3b.

POWER SUPPLY TROUBLESHOOTING (Continued)

STEP ACTION → **NORMAL INDICATION** → **FIX**

3b. On FLTS, set ON/PWR switch (1) to PWR (off position). Reconnect Cable W3 to 1A2J3. In the Video Assembly 1A2, remove circuit card 1A2A1 (see para 3-23). On FLTS, set ON/PWR switch to ON.

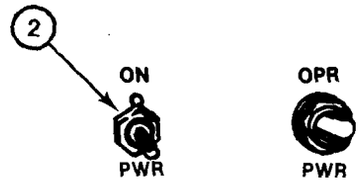


→ +14.25 to +15.75 V or -14.25 to -15.75 V.

→ If DMM reads correct voltage, replace circuit card 1A2A1 with a new circuit card (para 3-23). Repeat step 3.

→ If voltage is missing, go to step 3c.

3c. On FLTS, set ON/PWR switch (2) to PWR (off position). In Video Assembly 1A2, reinstall circuit card 1A2A1 (para 3-23) and remove 1A2A2. On FLTS, set ON/PWR switch to ON.



→ +14.25 to +15.75 V or -14.25 to -15.75 V.

→ If DMM reads correct voltage, replace circuit card 1A2A2 (para 3-23).

→ If voltage is missing, replace ±15 V dc Power Supply 1A2A2, reinstall 1A2A2 and go to paragraph 3-19.

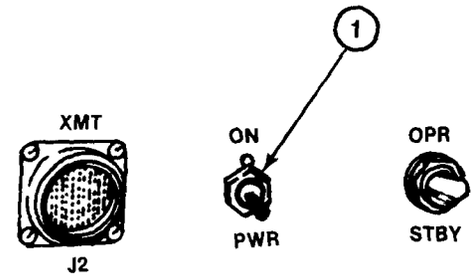
STEP ACTION → **NORMAL INDICATION** → **FIX**

4. +5V Logic.

If DMM reads about 1 V,
go to paragraph 3-19.

If voltage is missing,
go to step 4a.

4a. On FLTS, set ON/PWR switch (1) to PWR (off position). Disconnect Cable W2 from Video Assembly 1A2J2. On FLTS, set ON/PWR switch to ON.



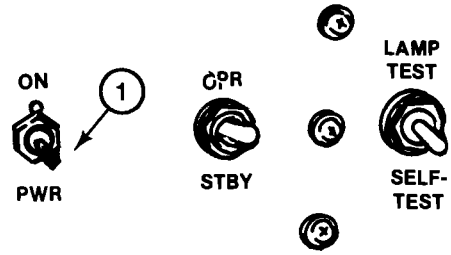
→ +4.75 to +5.25 V on DMM.

→ If DMM reads correct voltage, check cable W2. If W2 is good, replace Transmitter 1A1.

→ If voltage is missing, go to step 4b.

STEP ACTION → **NORMAL INDICATION** → **FIX**

4b. On FLTS, set ON/PWR switch (1) to PWR (off position). Reconnect Cable W2 to 1A2J2 and disconnect Cable W3 from Video Assembly 1A2J3. On FLTS, set ON/PWR switch to ON.

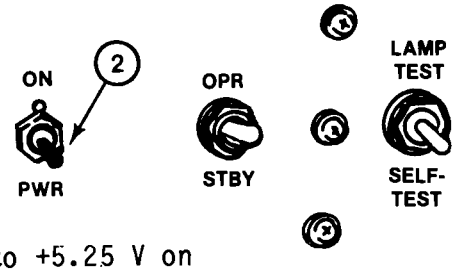


→ +4.75 to 5.25 V on DMM.

- If DMM indicates correct voltage, check cable W3. If W3 is good, replace Receiver 1A3.
- If voltage is missing, go to step 4c.

4c. On FLTS, set ON/PWR switch (2) to PWR (off position). Reconnect cable W3 to 1A2J3. In Video Assembly 1A2, remove circuit card 1A2A1. On FLTS, set ON/PWR switch to ON.

On BTS 1A1 turn off POWER 28 VDC before removing or replacing any components. Turn back on to continue testing.



→ +4.75 to +5.25 V on DMM.

- If DMM indicates correct voltage, replace circuit card 1A2A1 (para 3-23.)
- If voltage is missing, reinstall 1A2A1, replace +5 V Power Supply 1A2PS1 and go to paragraph 3-19.

(End of power supply troubleshooting test.)

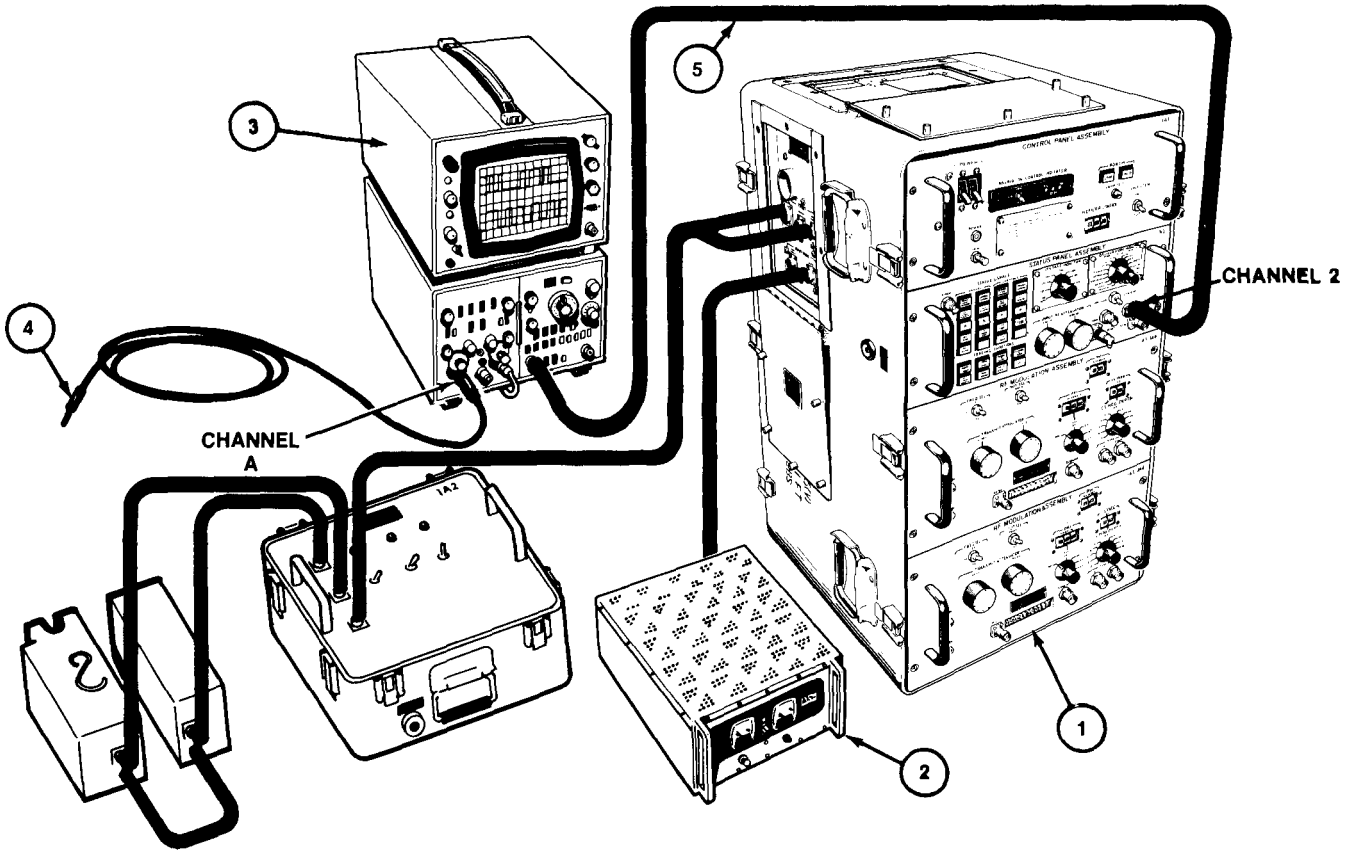
PRI TROUBLESHOOTING

3-17.

a. Test Equipment. Use the following test equipment to troubleshoot the PRI

BTS (1)	TS-3615/ALQ-136(V)
Power Supply (2)	PP-1104/G
Oscilloscope (3)	AN/USM-281A
Probe X10 (4)	Part of AN/USM-281A
BNC Cable (5)	P/O TS-3615/ALQ-136(V)

b. Test Connections and Conditions. With FLTS connected as in paragraph 3-8, connect the probe (4) to Channel A of oscilloscope. Connect BNC cable (5) from oscilloscope Main External Input to BTS Status Panel CHAN 2. Other test connections are as in paragraph 3-8.



PRI TROUBLESHOOTING (Continued)

c. Initial Test Equipment Setting.

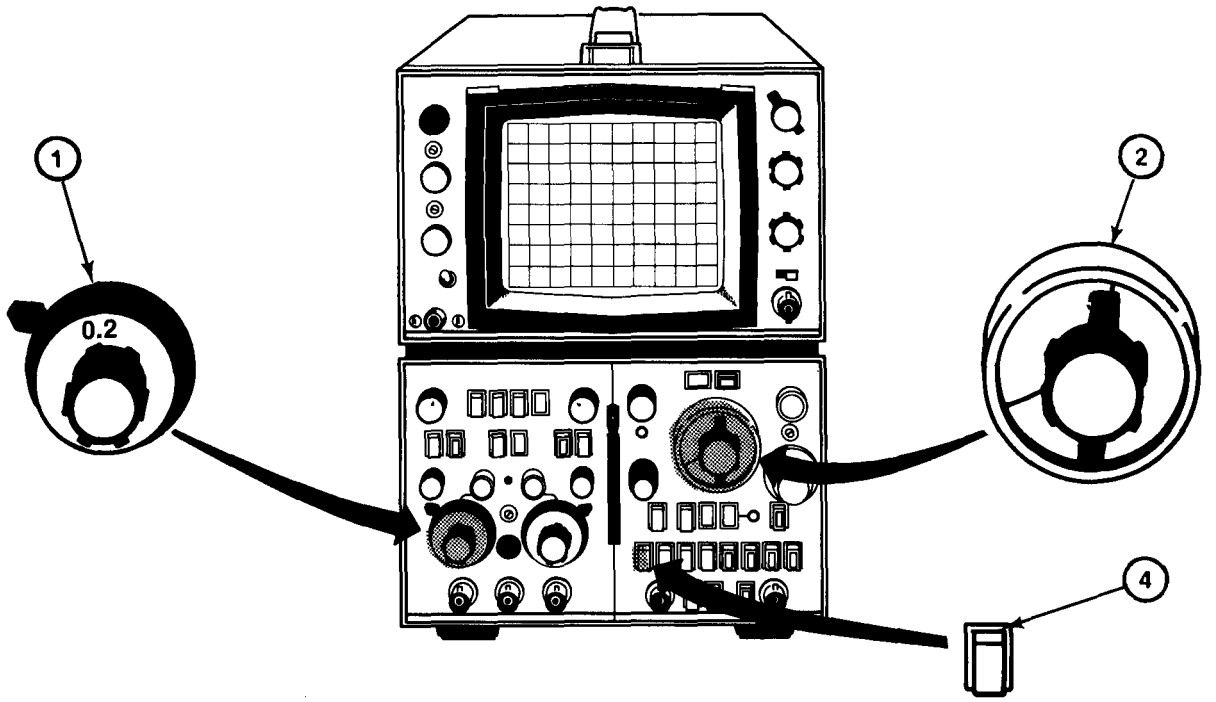
On oscilloscope vertical amplifier, set gain (1) to 0.2V/DIV.

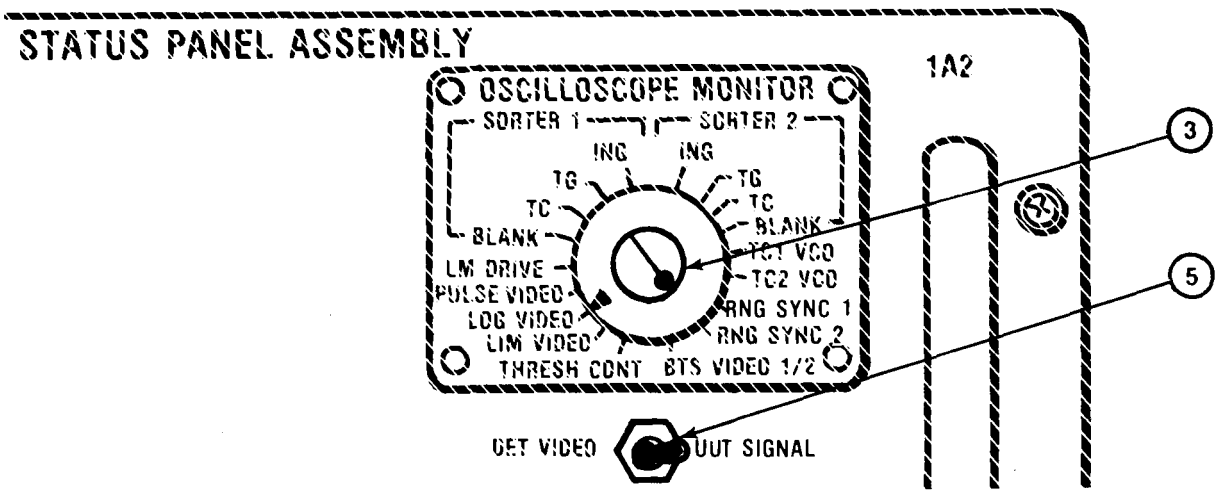
On oscilloscope time base generator, set sweep speed (2) to 50 µs/DIV.

Set BTS status panel OSCILLOSCOPE MONITOR red knob (3) to RNG SYNC 1.

On oscilloscope, use external positive sync (4).

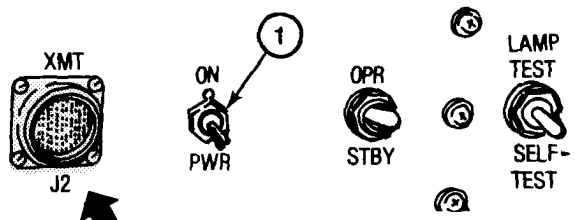
Set BTS status panel DET VIDEO/UUT SIGNAL switch (5) to UUT signal.

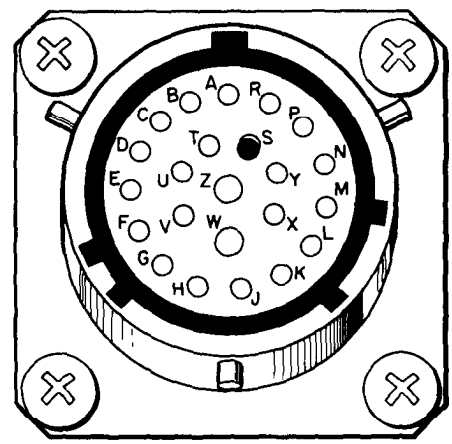




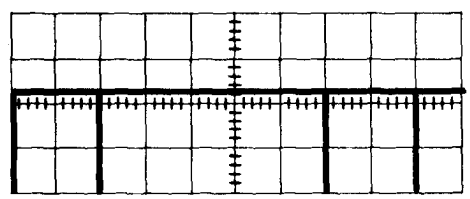
STEP ACTION → **NORMAL INDICATION** → **FIX**

1. On FLTS, set ON/PWR switch (1) to PWR (off). Disconnect Cable W2 from Video Assembly 1A2J2 and connect X10 probe to 1A2J2 pin S. On FLTS, set ON/PWR switch to ON. Observe oscilloscope.





→ Pulses with SLL 0. Pulse pairs at a PRI of 350 ± 35 µs and a separation of 100 ±10 µs



0.2 VOLTS/DIV

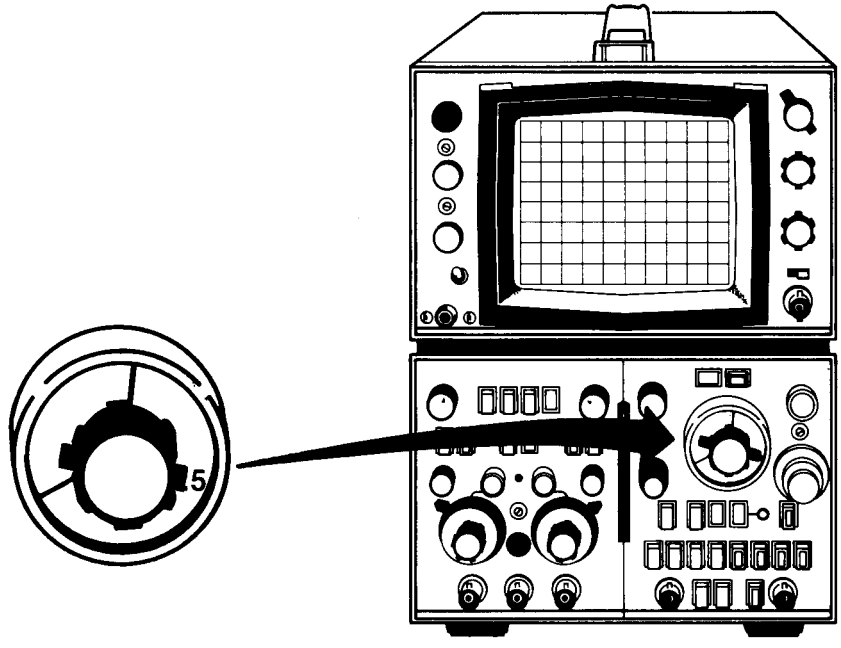
SWEEP: 50 µs/DIV

→ If normal indication cannot be obtained, replace circuit card 1A2A1 (para 3-23).

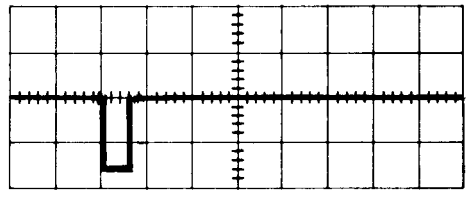
PRI TROUBLESHOOTING (Continued)

STEP	ACTION → NORMAL INDICATION → FIX

2. On oscilloscope, set TIME/DIV to .5 µs. Observe oscilloscope.



→ A SLL 0 pulse with a pulse width of 0.3 ±0.1 µs.



SWEEP: 0.5 µs/DIV

→ Replace circuit card 1A2A1 (para 3-23).

(End of PRI trouble-shooting test.)

SECTION III
MAINTENANCE PROCEDURES

SECTION CONTENTS — PAGE

GENERAL

3-18. This section gives instructions for adjusting the FLTS and for replacing its various units.

a. The power level detector threshold adjustment sets the receiver assembly sensitivity.

b. Power supply adjustments set proper dc voltages.

c. The RF output level adjustment sets the transmitter assembly level.

POWER LEVEL DETECTOR THRESHOLD ADJUSTMENT

3-19.

a. Test Equipment. Use the following test equipment or equivalent to adjust the power level detector:

BTS (1)	TS-3615/ALQ-136(V)
Power Supply (2)	PP-1104/G
Power Meter (3)	HP 435A
Power Sensor (4)	HP 8481A
RFCable (5)	TNC male to TNC male
Adapters	TNC female to N female (6) TNC female to SMA male

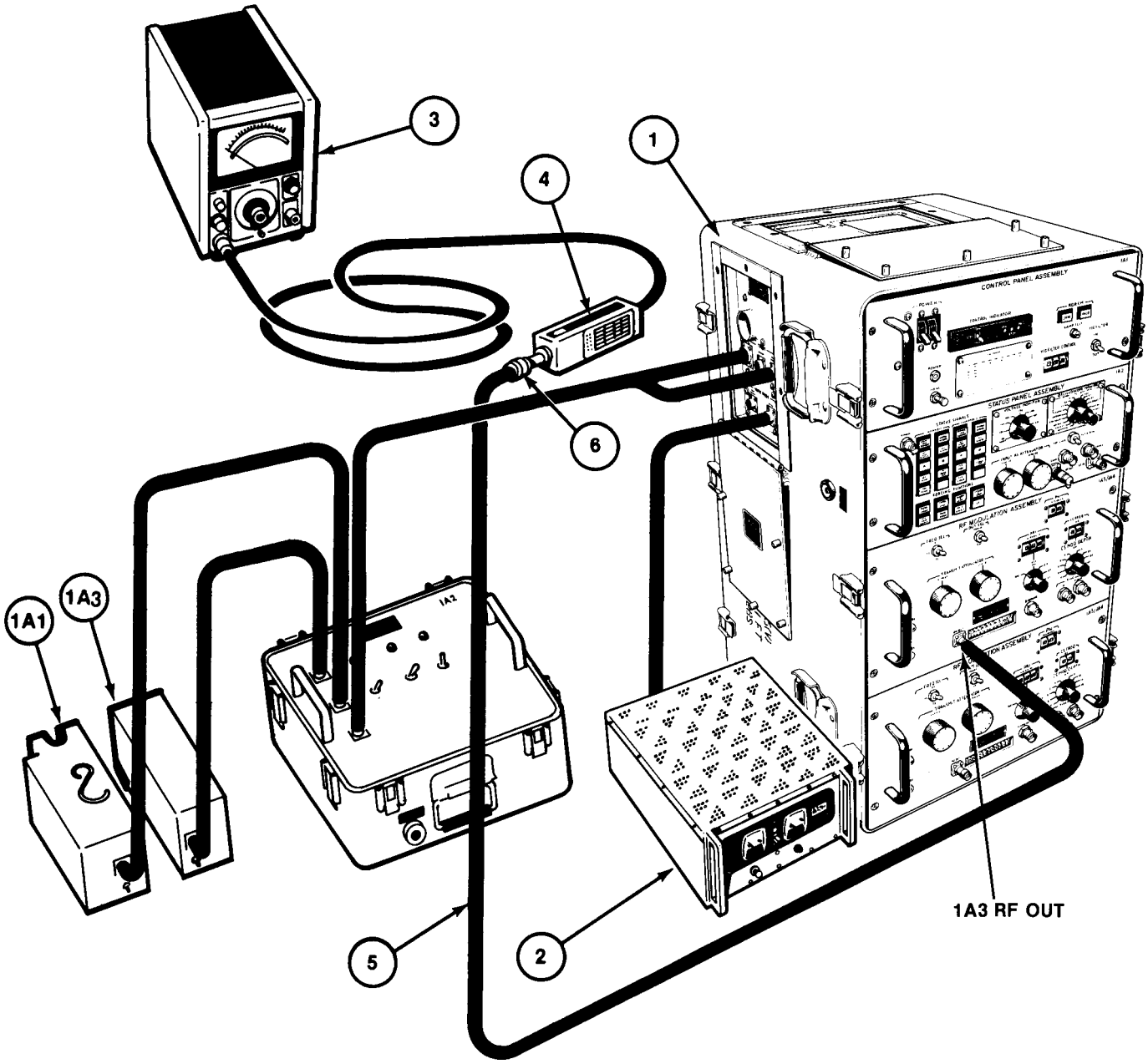
CAUTION

Once the receiver assembly has been removed from its protective case, care should be taken to avoid damaging or bending semirigid coaxial cables.

b. Test Connections and Conditions.

(1) With FLTS connected as in paragraph 3-8, connect cable from BTS RF Modulation Assembly 1A3 RF OUT to Power Sensor (4), using adapter (6). ,

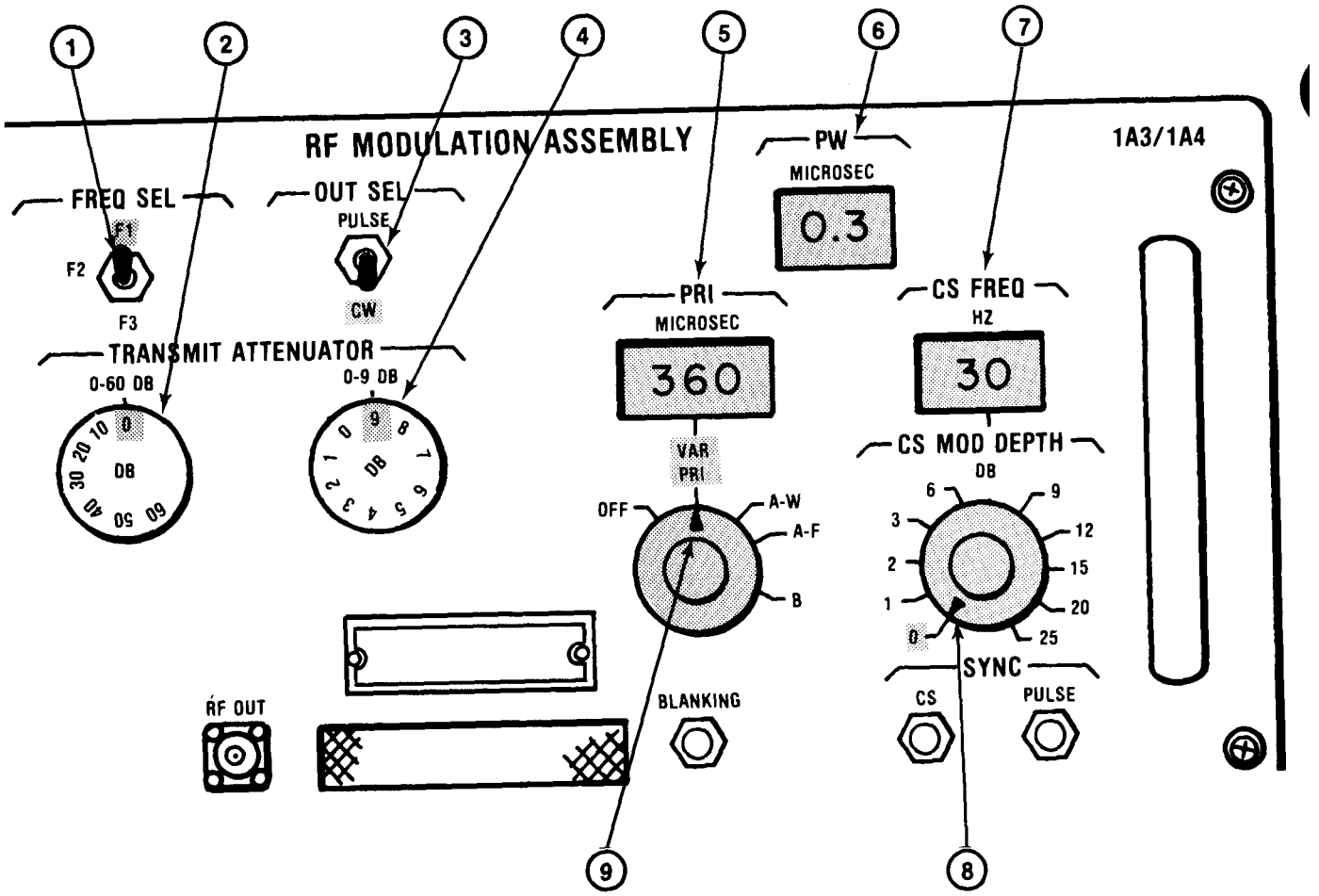
(2) Set power meter to the +5 dBm scale.


3
1
4
6
1A1
1A3
1A2
CONTROL PANEL ASSEMBLY
STATUS PANEL ASSEMBLY
RF MODULATION ASSEMBLY
1A3 RF OUT
5
2

POWER LEVEL DETECTOR THRESHOLD ADJUSTMENT (Continued)

c. Initial Test Equipment Settings. On BTS RF Modulation Assembly 1A3, set the fol lowing:

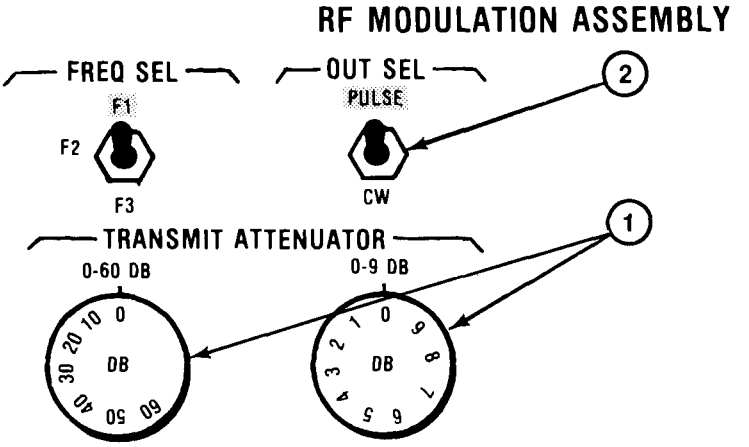
FREQ SEL (1)	F1
TRANSMIT ATTENUATOR 0-60 DB (2)	0
OUT SEL (3)	CW
TRANSMIT ATTENUATOR 0-9 DB (4)	9
PRI (thumbwheel) (5)	360
PW (6)	0.3
CS FREQ (7)	30
CS MOD DEPTH (8)	0
PRI MICROSEC (selector) (9)	VAR PRI



d. Procedure.

STEP ACTION → NORMAL INDICATION → FIX

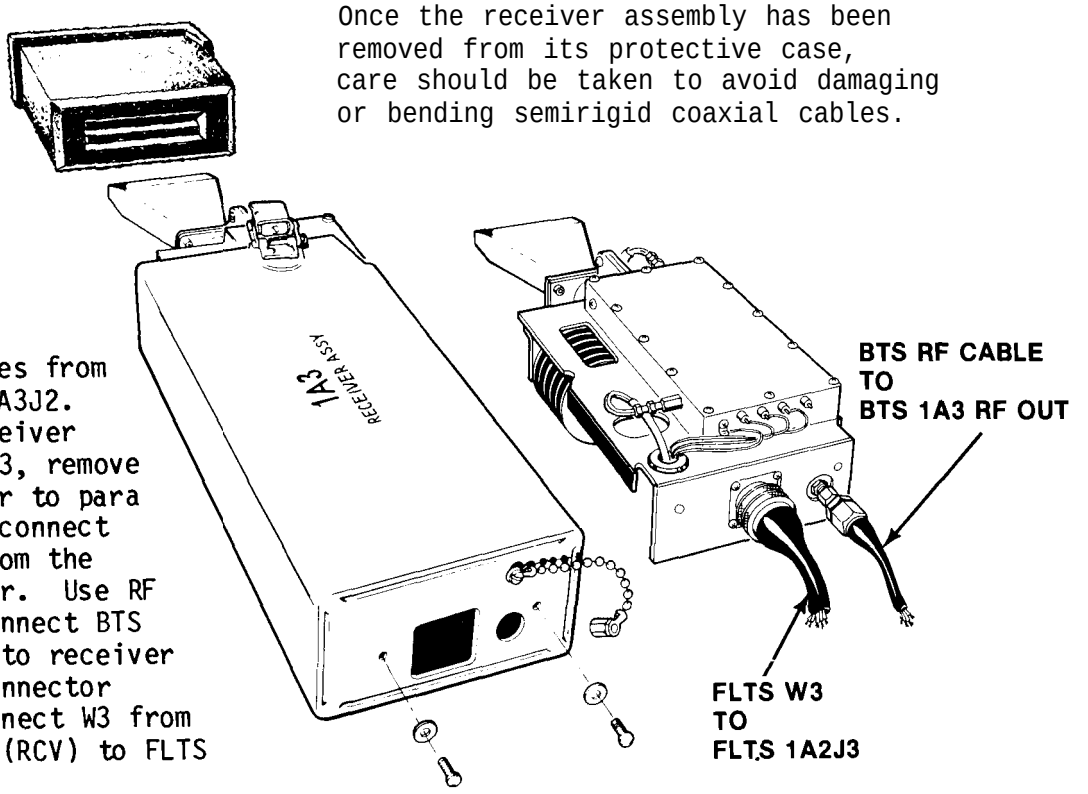
2. On BTS RF Modulation Assembly 1A3, set OUT SEL to PULSE (2).



CAUTION

Once the receiver assembly has been removed from its protective case, care should be taken to avoid damaging or bending semirigid coaxial cables.

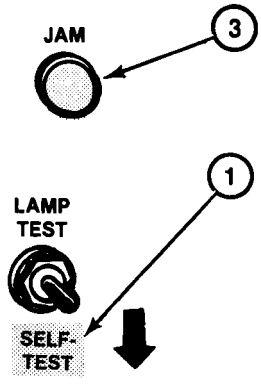
3. Remove cables from 1A3J1 and 1A3J2. On FLTS Receiver Assembly 1A3, remove cover (refer to para 3-26). Disconnect RF cable from the power sensor. Use RF cable to connect BTS 1A3 RF OUT to receiver assembly connector 1A3J2. Connect W3 from FLTS 1A2J3 (RCV) to FLTS 1A3J1.

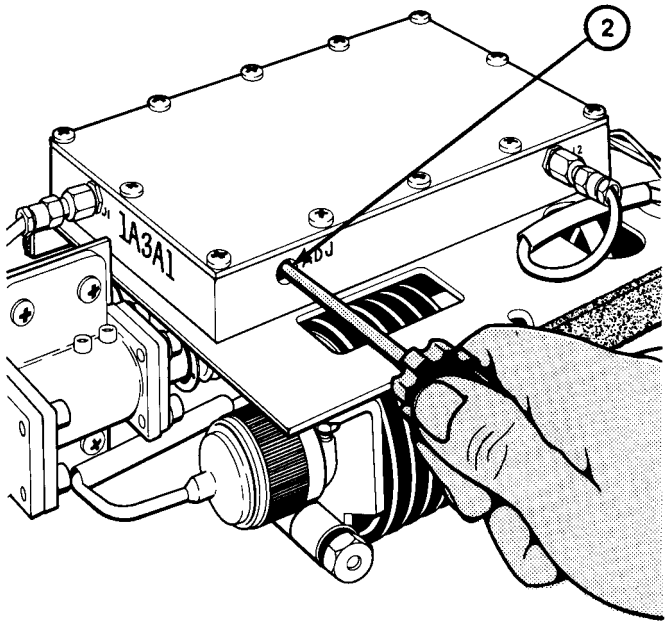


POWER LEVEL DETECTOR THRESHOLD ADJUSTMENT (Continued)

STEP ACTION	NORMAL INDICATION	FIX

4. Set FLTS ON/PWR switch to ON. While holding FLTS test switch in the SELF-TEST (1) position, adjust 1A3A1 ADJ (2) until JAM light (3) just becomes steady.



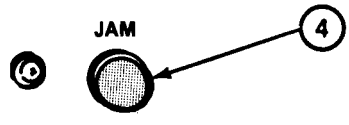


The adjustment screw for the 1A3A1 assembly is located under a protective screw. Remove the protective screw to make adjustments.

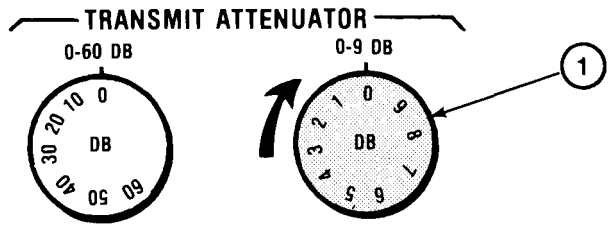
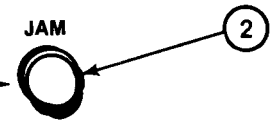
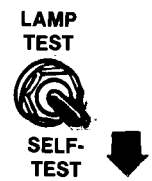
Turn CCW to turn JAM off.

Then CW to turn JAM on.

→ JAM light (4) is on.



→ If normal indication cannot be obtained, replace 1A3 and repeat step 3.

STEP ACTION → NORMAL INDICATION → FIX	
5. On BTS RF Modulation Assembly 1A3, increase TRANSMIT ATTENUATOR setting by 3 dB.	
JAM light (2) is off.	
	
Adjust 1A3A1 ADJ slightly until JAM light is off. Decrease TRANSMIT ATTENUATOR setting by 3 dB. Repeat step 4.	
Set ON/PWR switch to PWR (off). Replace protective screw. Disconnect cables from 1A3J1 and 1A3J2. Replace cover of receiver assembly.	
(End of power level detector threshold adjustment.)	

POWER SUPPLY ADJUSTMENTS

3-20.

a. Test Equipment. Use the following test equipment to adjust the power supplies.

BTS (1)	TS-3615/ALQ-136(V)
Power Supply (2)	PP-1104/G
Digital Multimeter (3)	AN/USM-451

CAUTION

After unfastening video front panel assembly, it is still secured to the case by wires from the power supplies. Remove the video front panel assembly carefully.

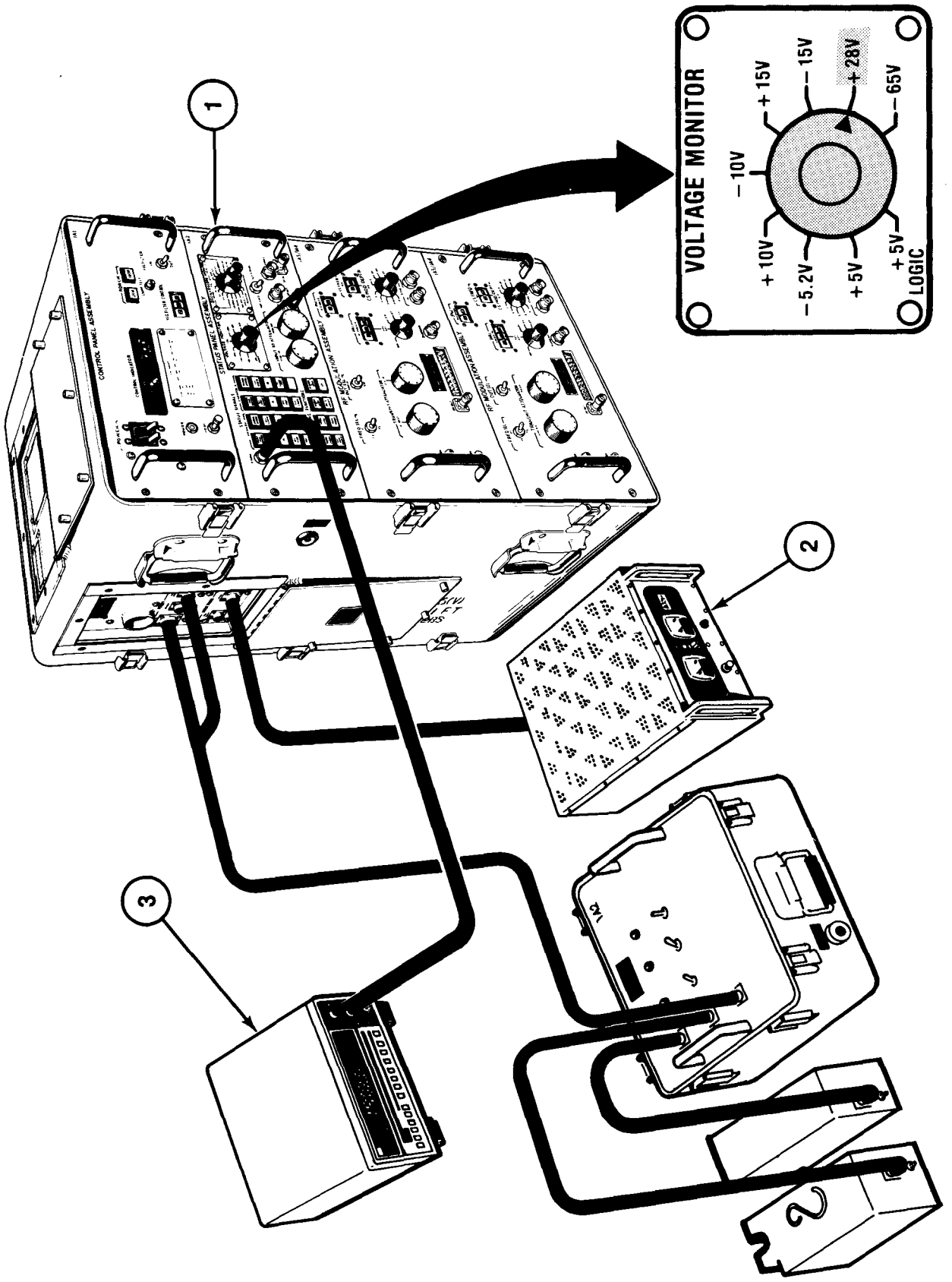
b. Test Connections and Conditions.

(1) With FLTS connected as in paragraph 3-8, connect digital multimeter to BTS status panel V MON jack.

(2) On BTS, set VOLTAGE MONITOR switch to the +28V position.

(3) Remove video front panel assembly from its case in accordance with paragraph 3-22a.

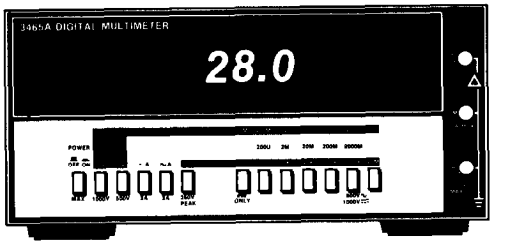
(4) Insure that al 1 cables are connected from Video Assembly 1A2 to Transmitter Assembly 1A1 and Receiver Assembly 1A3.


VOLTAGE MONITOR
+15V
-15V
+28V
-65V
-10V
+10V
-5.2V
+5V
+5V LOGIC
1
2
3

POWER SUPPLY ADJUSTMENTS (Continued)

c. Procedure.

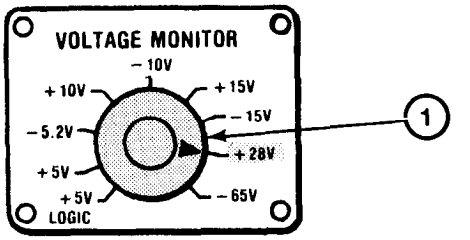
STEP	ACTION → NORMAL INDICATION → FIX
1.	On BTS 1A1 turn on POWER 28 VDC. On FLTS 1A2 set ON/PWR switch to ON. Observe DMM.



→ +27.5 to +28.5 V

→ Adjust +28 V dc power supply.

On BTS status panel, set the VOLTAGE MONITOR switch (1) to the following positions to check for out of tolerance voltage.



+15V → +14.25 to +15.75 V → Go to step 3.

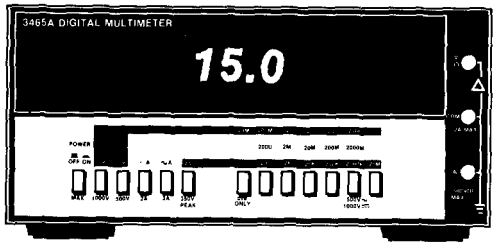
-15V → -14.25 to -15.75 V → Go to step 4.

-65V → -63.0 to -67.0 V → Go to step 5.

+5V LOGIC → +4.75 to +5.25 V → Go to step 6.

STEP ACTION	NORMAL INDICATION	FIX

3. Observe DMM.



→ +14.25 to +15.75 V

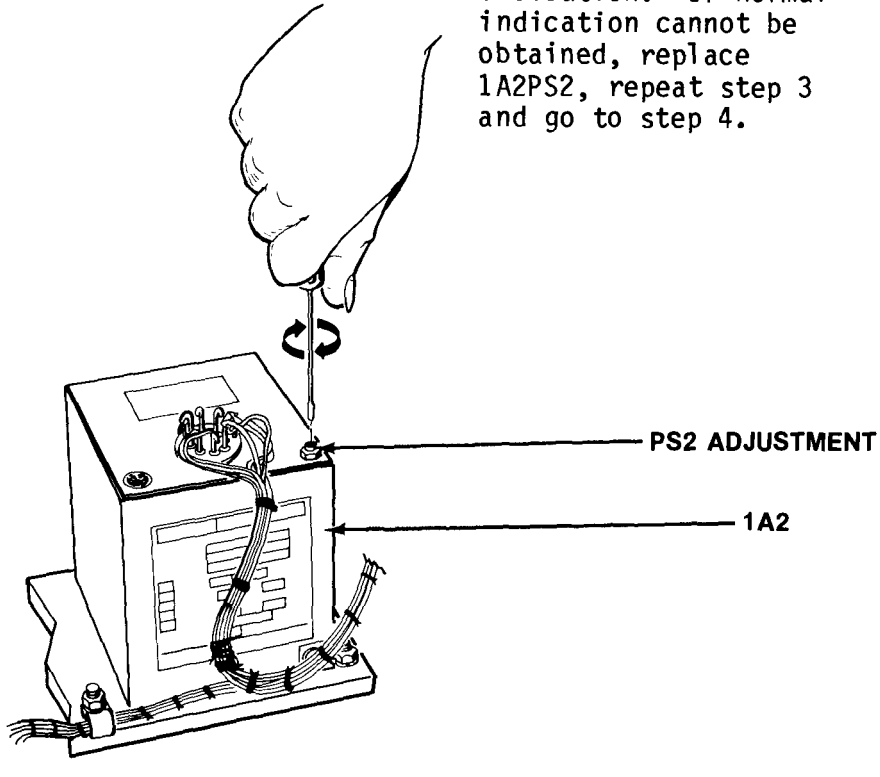
NOTE

Check that the VOLTAGE MONITOR switch is in the +15V position.

Remove protective cap for access to PS2 adjustment.

Reinstall cap after making adjustments.

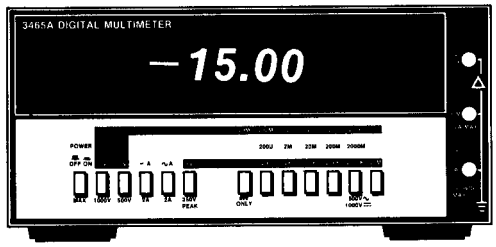
→ Adjust 1A2PS2 for normal indication. If normal indication cannot be obtained, replace 1A2PS2, repeat step 4 and go to step 4.



POWER SUPPLY ADJUSTMENTS (Continued)

STEP ACTION → **NORMAL INDICATION** → **FIX**

4. Observe DMM.

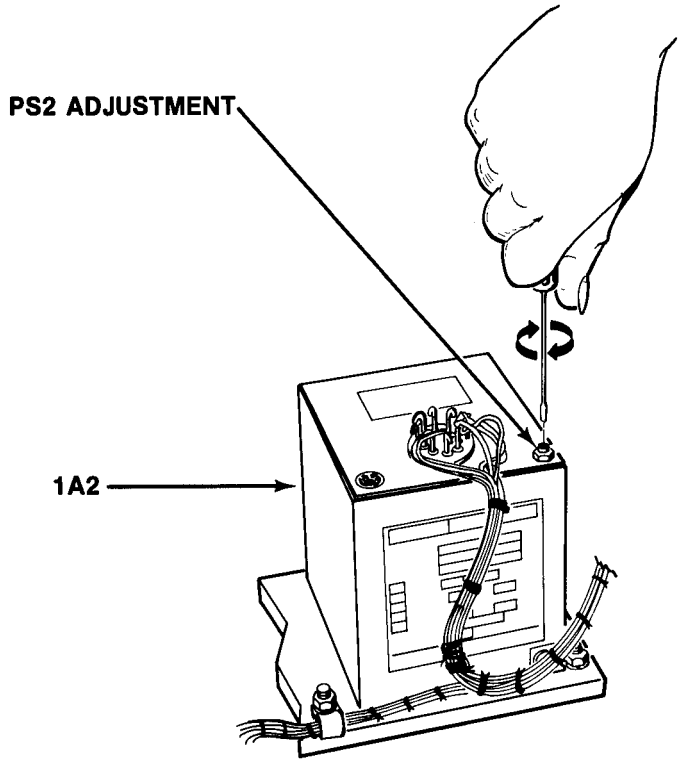


→ -14.25 to -15.75 V

NOTE

Check that VOLTAGE MONITOR switch is in the -15V position.

→ Adjust 1A2PS2 for normal indication. If normal indication cannot be obtained, replace 1A2PS2 (see para 3-24). Repeat steps 4 and 3.



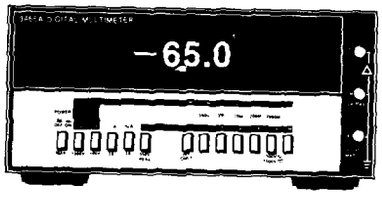
NOTE

PS2 is a tracking supply with a single adjustment. Check both +15 and -15 V after any adjustment. Remove protective cap for access to PS2 adjustment.

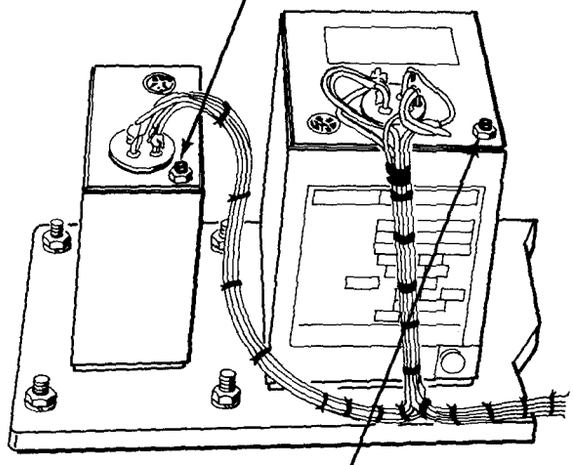
STEP ACTION	NORMAL INDICATION	FIX

5. Observe DMM.

→ -64.0 to -66.0 V



→ Adjust 1A2PS3 for a normal indication. If a normal indication cannot be obtained, replace 1A2PS3 and repeat step 5.



NOTE

Remove cap for access to PS1 adjustment. Set VOLTAGE MONITOR switch to -65 V position. Reinstall cap after making adjustment.

6. Set VOLTAGE MONITOR switch to +5 V LOGIC position. Observe DMM.

→ +4.75 to +5.25 V

→ Adjust 1A2PS1 for a normal indication. If voltage is about 1V, check 1A20V1 (step 7) and repeat step 6.

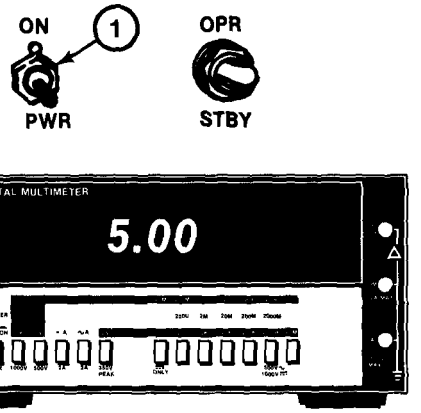
If voltage is greater than 2 V but not within tolerance, replace 1A2PS1 and repeat step 6.

End of test when indication is normal,

POWER SUPPLY ADJUSTMENTS (Continued)

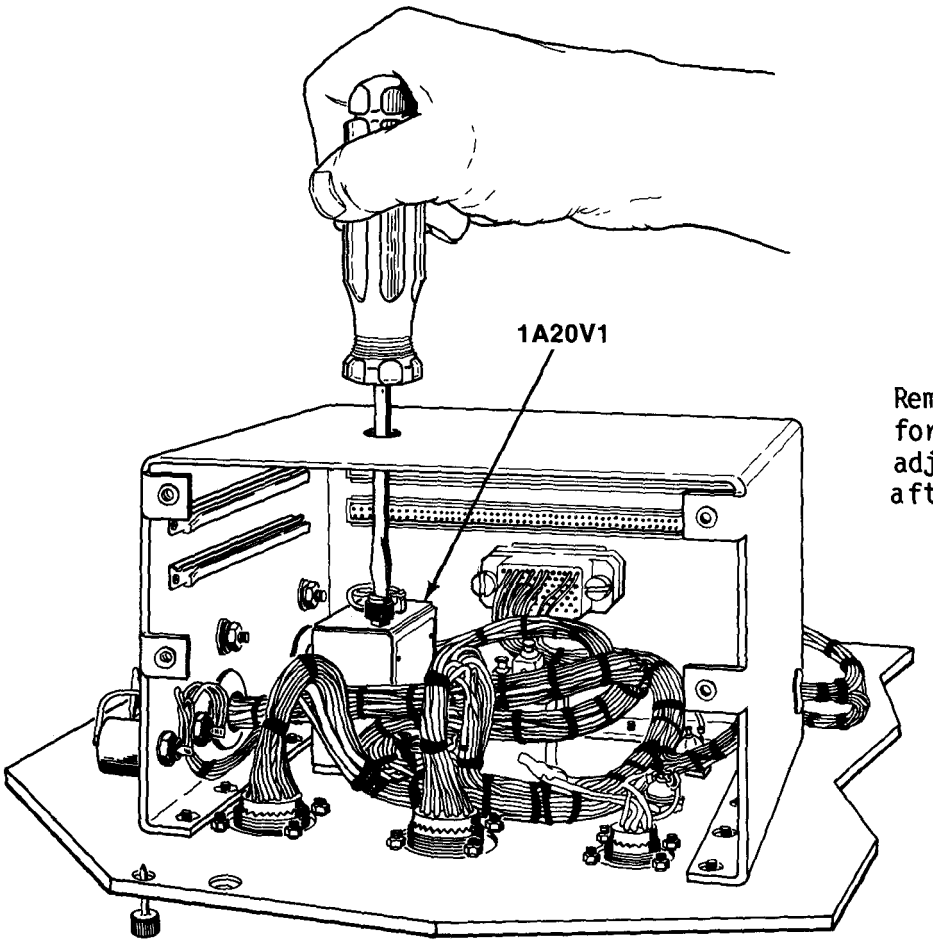
STEP	ACTION → NORMAL INDICATION → FIX

7. Set FLTS ON/PWR switch (1) to PWR and remove circuit cards 1A2A1 and 1A2A2. Adjust 1A20V1 fully clockwise. Set FLTS ON/PWR switch to ON. Observe DMM.



→ +4.75 to +5.25 V

→ Go to step 6.

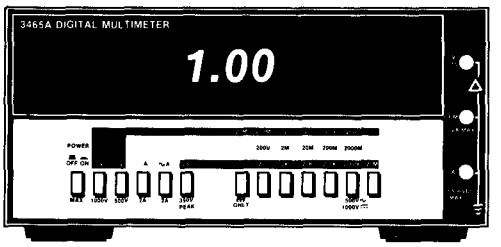


NOTE

Remove protective cap for access to OV1 adjustment. Reinstall cap after making adjustment.

STEP ACTION → **NORMAL INDICATION** → **FIX**

8. Observe DMM. Turn 1A20V1 in a counter-clockwise direction until voltage drops.

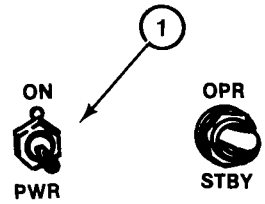


→ Voltage drops to about 1 volt.

→ Replace 1A20V1 (See para 3-25).

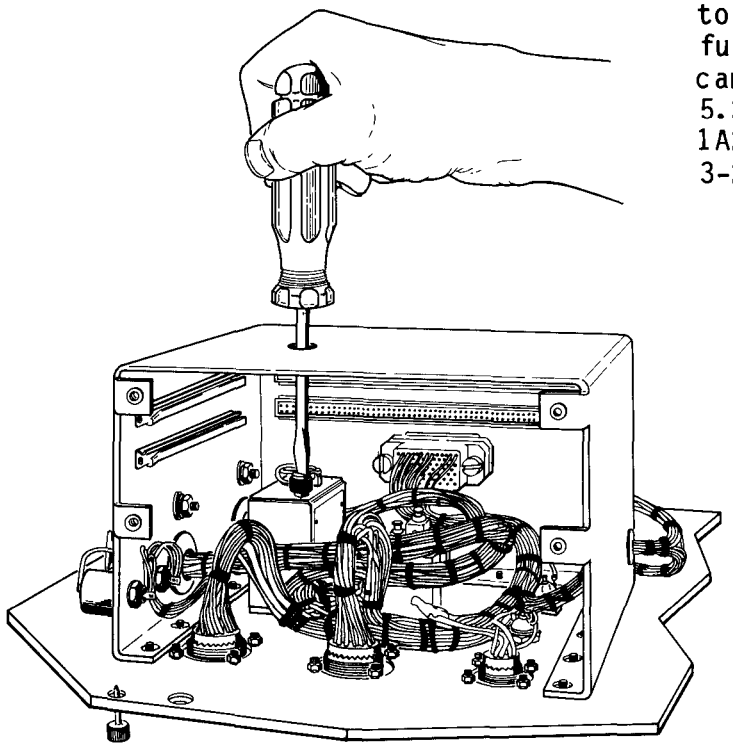
STEP ACTION → NORMAL INDICATION → FIX

9. Turn 1A20V1 one quarter turn clockwise. Set FLTS ON/PWR switch (1) to PWR (off) and then to ON.



→ 4.75 to 5.25 V

→ Repeat step 9 until indication is 4.75 to 5.25 V, (up to 1 full turn). If you cannot get 4.75 to 5.25 V replace 1A20V1 (see para. 3-25).



10. Adjust 1A20V1 five turns clockwise. Reinstall protective cap. Reinstall circuit cards.

(End of +5V LOGIC OVP adjustment.)

RF OUTPUT LEVEL ADJUSTMENT

3-21.

a. Test Equipment. Use the following test equipment or equivalent to adjust the RF output level:

BTS (1)	TS-3615/ALQ-136(V)
Power Supply (2)	PP-1104/G
Power Meter (3)	HP 435A
Power Sensor (4)	HP 8481A
Adapter (5)	N female to SMA male (You may use NF-TNCM and TNCF-SMAM adapters.)

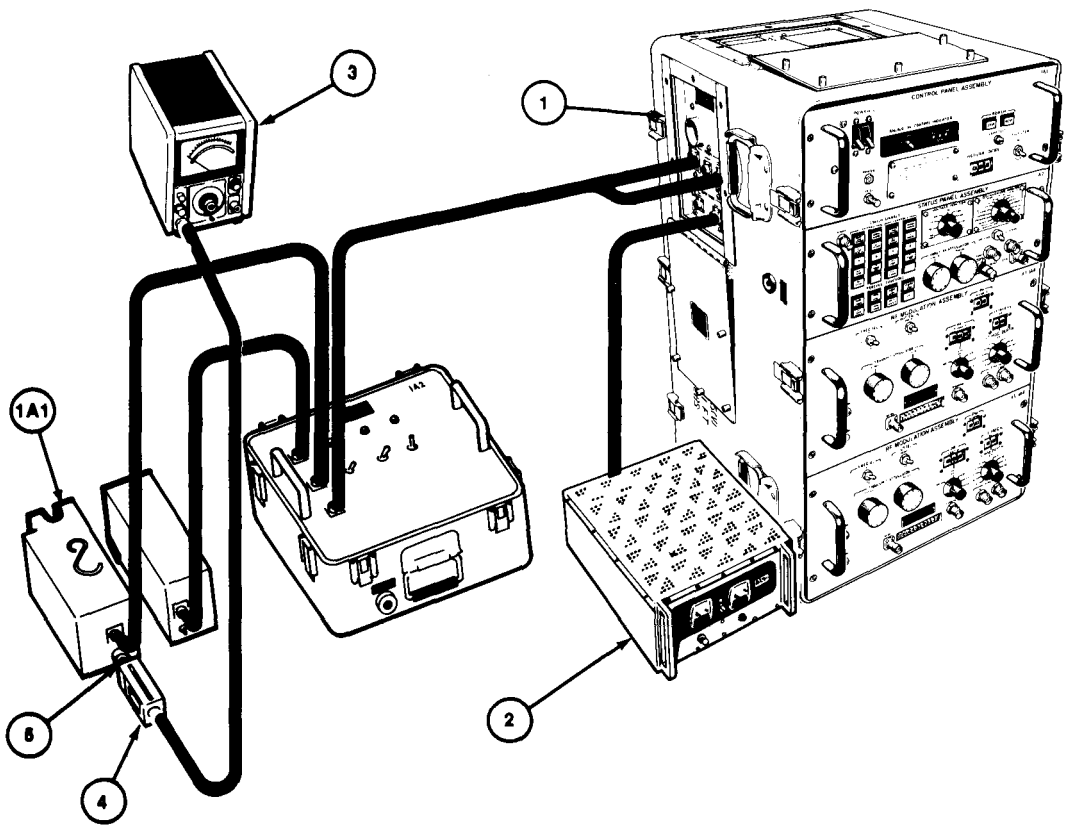
CAUTION

After unfastening video front panel assembly, it is still secured to the case by wires from the power supplies. Remove the video front panel assembly carefully.

b. Test Connections and Conditions.

(1) With FLTS connector as in paragraph 3-8, using adapter, connect Power Sensor to Transmitter Assembly 1A1J2.

(2) Remove video assembly front panel from case as in paragraph 3-22a. Remove circuit card retaining plate for access to adjustment.

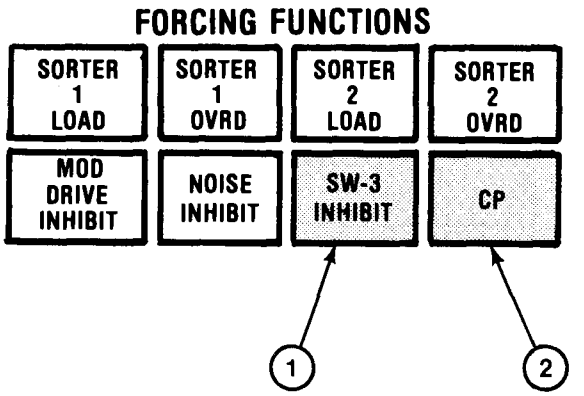


RF OUTPUT LEVEL ADJUSTMENT (Continued)

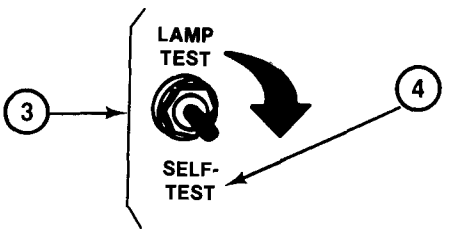
c. Procedure.

STEP ACTION → **NORMAL INDICATION** → **FIX**

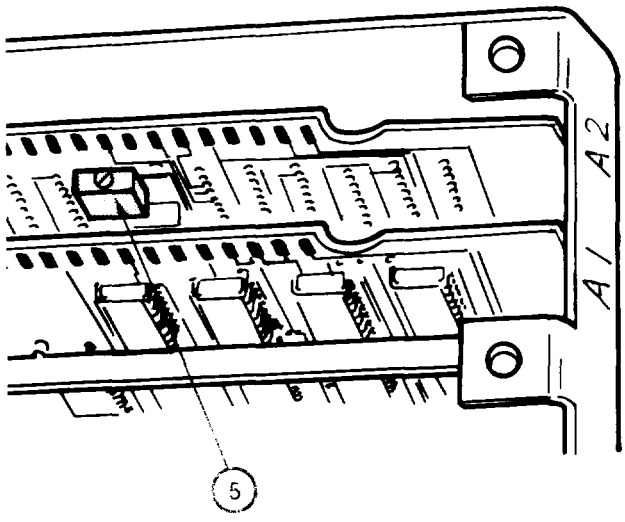
1. On BTS status panel, check that FORCING FUNCTION buttons SW-3 INHIBIT (1) and CP (2) are lit.



2. While holding FLTS test switch (3) in the SELF-TEST (4) position, adjust 1A2A2R25 (5) for +5 dBm.



→ Power reading of +5 dBm.

STEP ACTION	NORMAL INDICATION	FIX
		Replace 1A1 and repeat step 2. Replace circuit card 1A2A2 (para 3-23) and repeat step 2. Replace circuit card 1A2A1 (para 3-23) and repeat step 2.

(End of RF output level adjustment.)

VIDEO FRONT PANEL REMOVAL AND REPLACEMENT

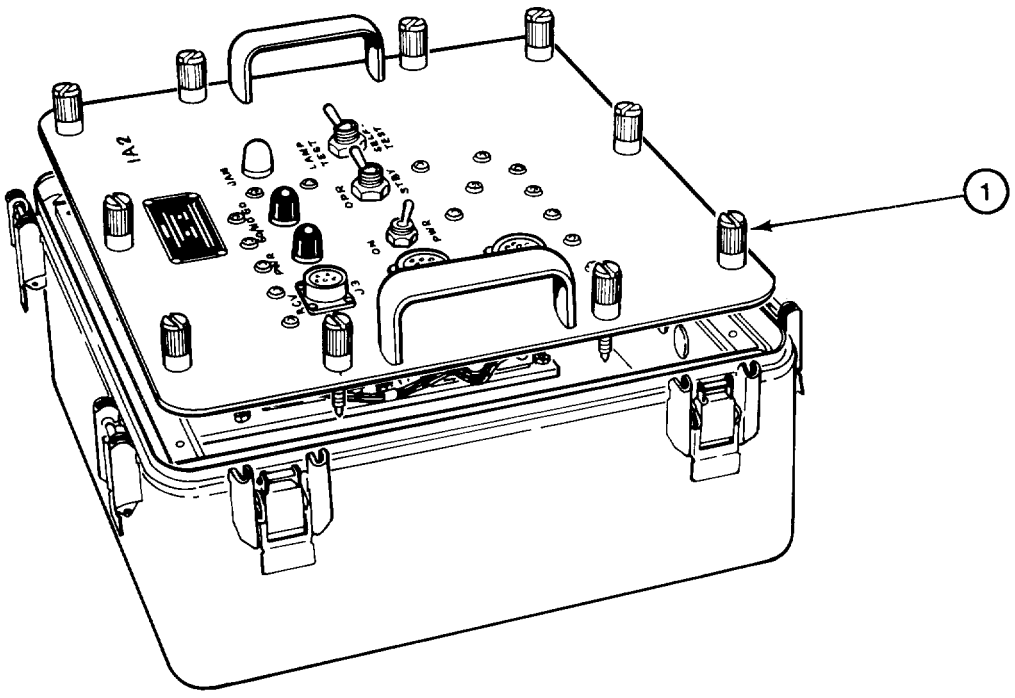
3-22.

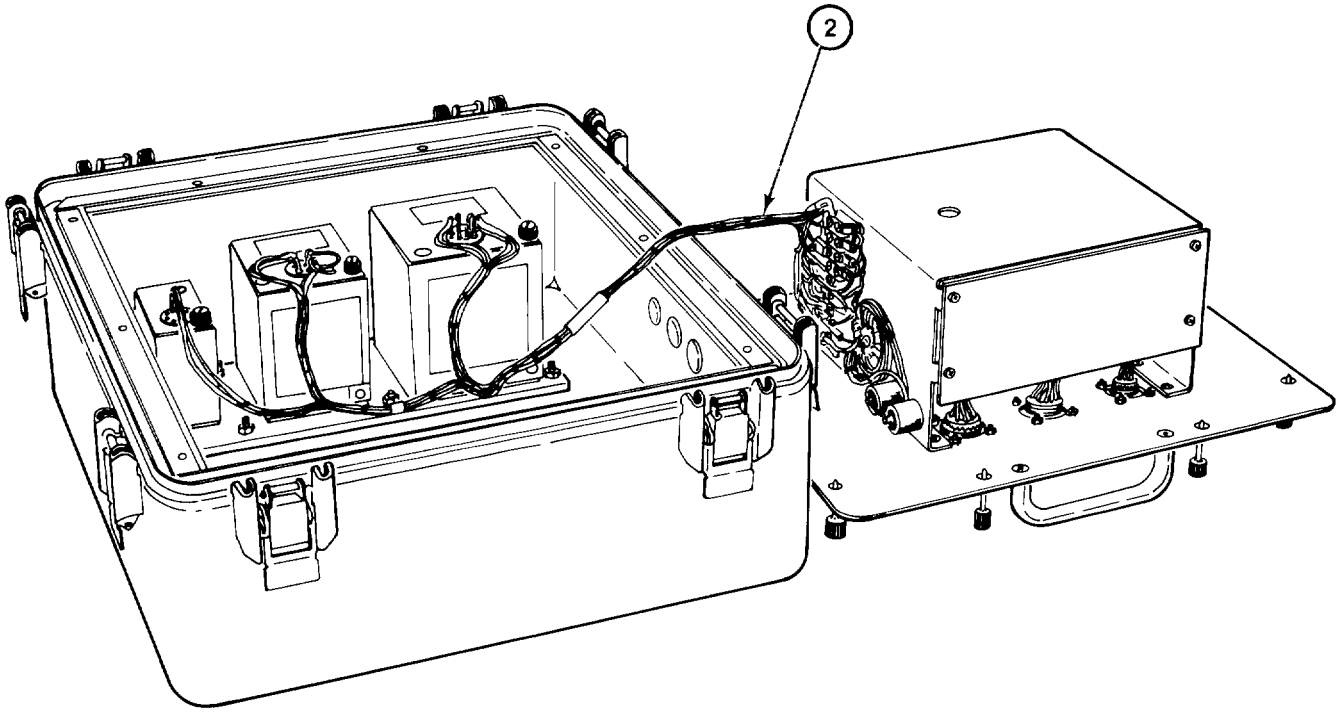
CAUTION

After unfastening of the video front panel assembly, it is still secured to the case by wires from the power supplies. Remove the video front panel assembly carefully.

a. Removal. Unfasten the 10 captive retaining screws (1) on the front of the Video Assembly. Remove the video front panel assembly carefully from its case. Tag and disconnect wires (2) joining panel to case (TB1 and TB2).

b. Replacement. Reconnect wires and replace the video front panel assembly In its case. Fasten the 10 captive retaining screws.


1


2

CIRCUIT CARD REMOVAL AND REPLACEMENT

3-23.

a. Removal . Unfasten the 10 captive retaining screws (1) on the front of the video assembly.

Remove front panel assembly from its case. Be careful not to break any of the wires which connect front panel to case. Set front panel face down as illustrated.

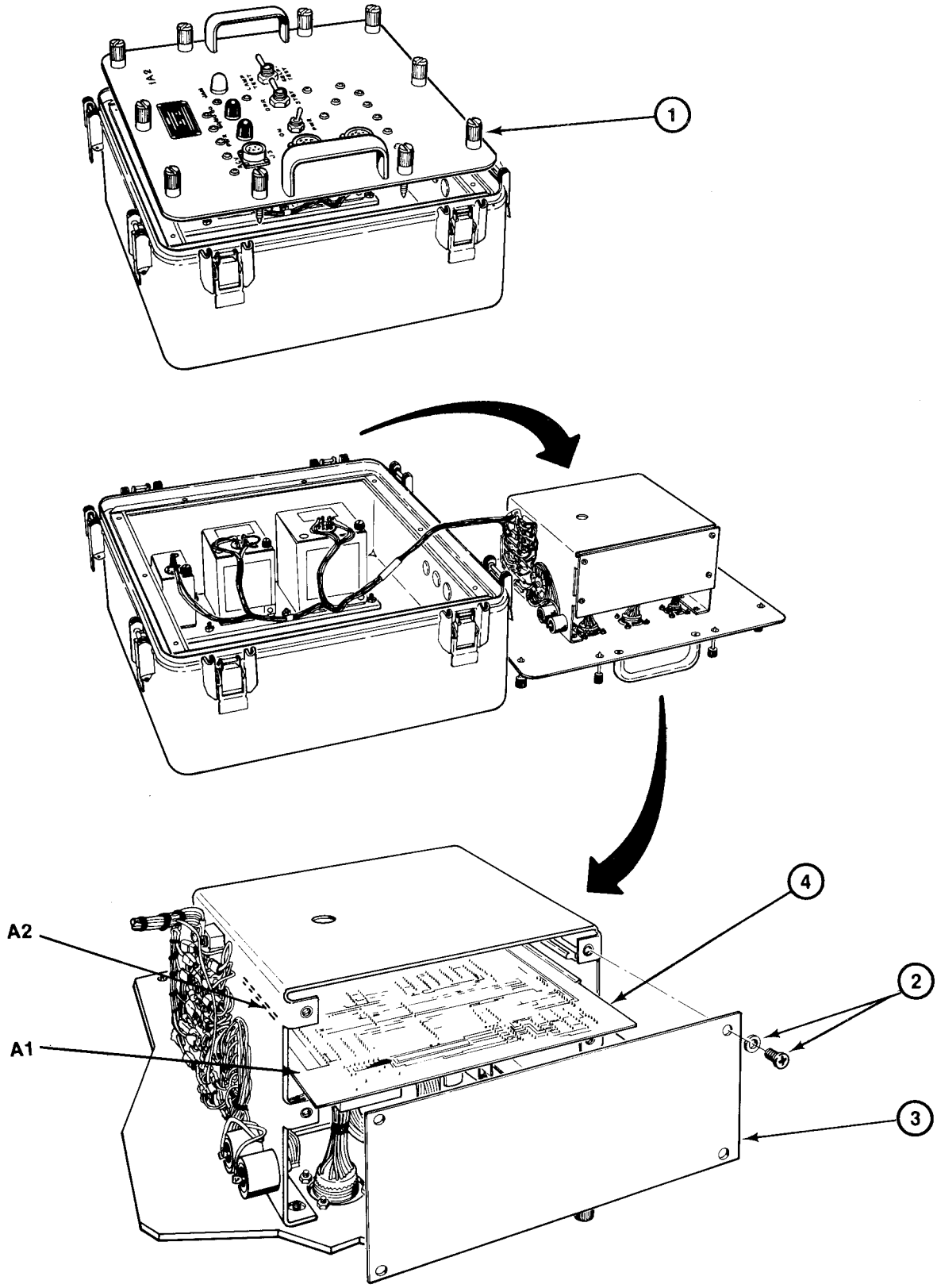
Unfasten 4 screws (2) on circuit card retaining cover (3), and remove cover to expose circuit cards (4).

Remove circuit card (4) by pulling it from its enclosure.

b. Replacement. Place circuit card (4) in its proper slot, push card into enclosure, and mate card edge connector fully.

Replace retaining cover (3) and secure with 4 screws (2).

Replace front panel assembly in its case. Fasten 10 captive screws (l).


1
A2
A1
4
2
3

POWER SUPPLY REMOVAL AND REPLACEMENT

3-24.

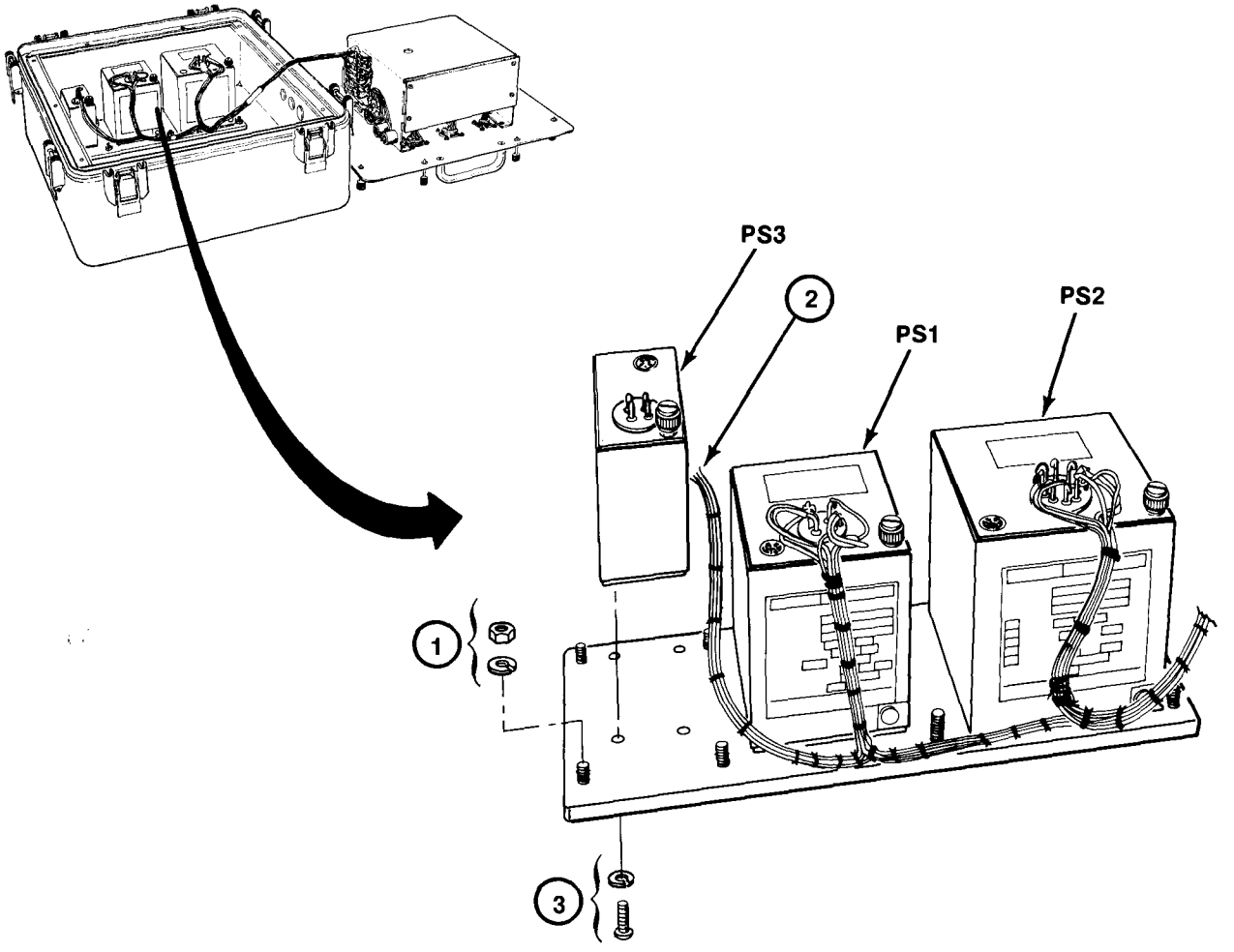
a. Removal. To remove power supplies PSI, PS2 or PS3:

(1) Remove video front panel assembly in accordance with paragraph 3-22a.

(2) Remove eight nuts and lockwashers (1) from the Power supply mounting plate and-lift out the plate with power supplies.

(3) Mark and unsolder wires (2) going to the power supply that is being removed.

(4) Remove four screws (3) from the power supply mounting plate and lift off the power supply.



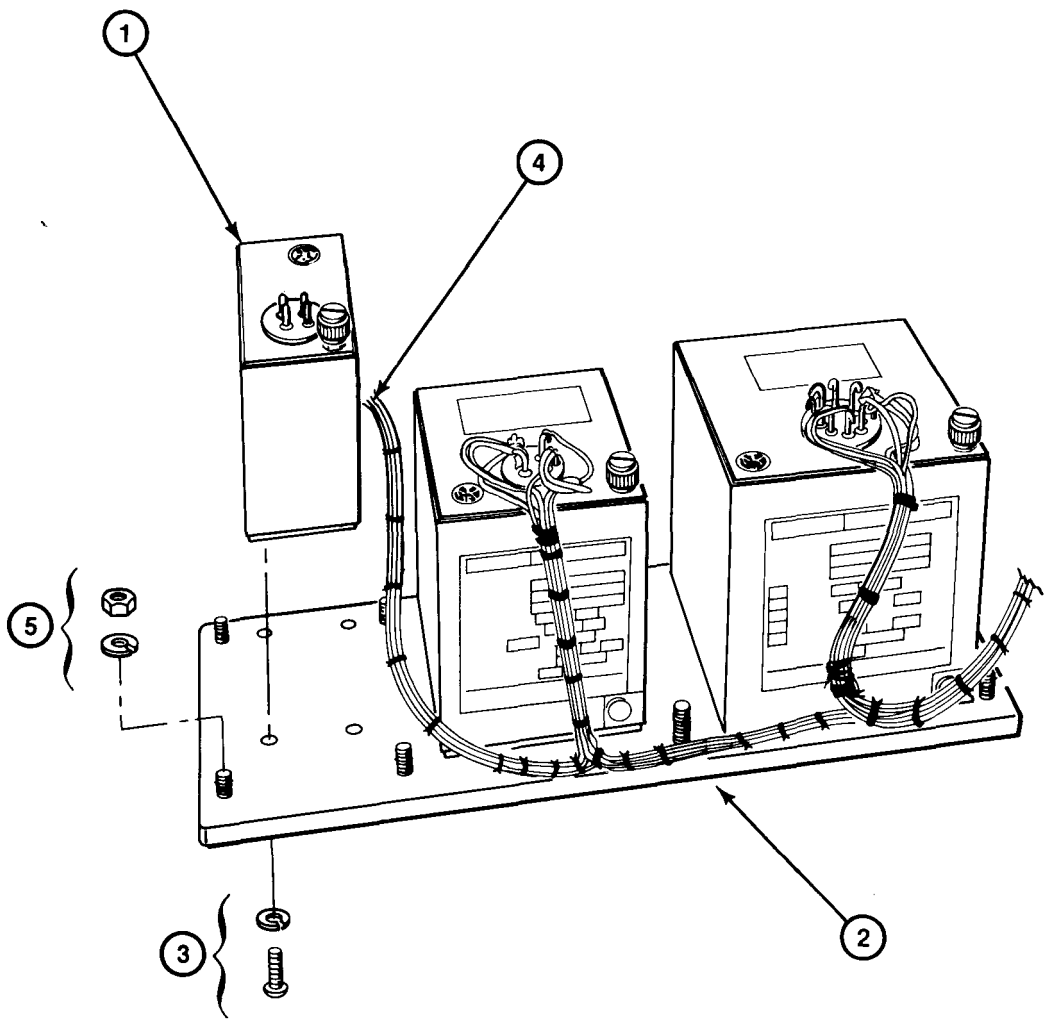
b. Replacement. To replace power supplies PSI, PS2 or PS3:

(1) Place power supply (1) on mounting plate (2). Apply sealing compound (MIL-S-22473 Grade A) to four mounting holes and fasten with four screws and lockwashers (No. 10) (3).

(2) Solder marked wires (4) to power supply.

(3) Replace mounting plate with power supplies in its case and secure with eight nuts and lockwashers (5).

(4) Replace video front panel assembly (para 3-22b).



OVERVOLTAGE PROTECTION CIRCUIT REMOVAL AND REPLACEMENT

3-25.

a. Removal . To remove the overvoltage protection circuit:

(1) Remove the video front panel assembly (1) in accordance with paragraph 3-22a.

(2) Remove both circuit cards (2) in accordance with paragraph 3-23a.

(3) Mark and unsolder wires (3) going to the overvoltage protection circuit 1A20V1 assembly (4).

(4) Remove two retaining screws and washers (5) from the video front panel assembly.

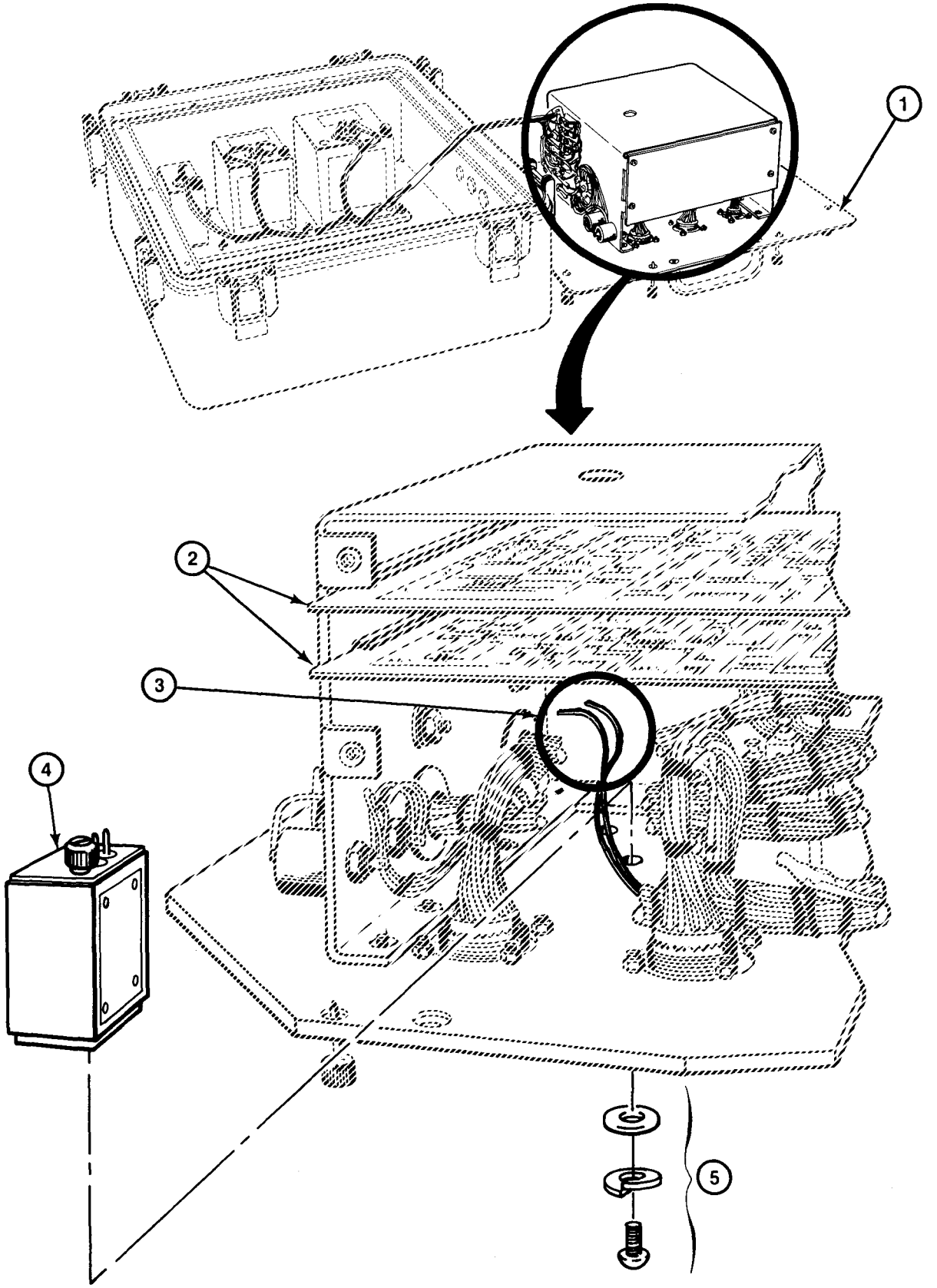
b. Replacement. To replace the overvoltage protect on circuit:

(1) Place the overvoltage protection circuit OV1 assembly (4) in its proper location-and secure to the video front panel assembly with two screws and washers (5).

(2) Solder marked wires (3) to the overvoltage protection circuit.

(3) Replace the circuit cards (2) in accordance with paragraph 3-23b.

(4) Replace the video front panel assembly (1) in accordance with paragraph 3-22b.


1
2
3
4
5

RECEIVER OR TRANSMITTER ASSEMBLY CASE REMOVAL AND REPLACEMENT

3-26.

a. Removal . To remove the receiver or transmitter assembly case:

(1) Remove any cables connected to J1 or J2 (1).

(2) **Remove two screws** (2) from the J1 and J2 side of the assembly.

(3) Carefully slip the assembly (3) from its case.

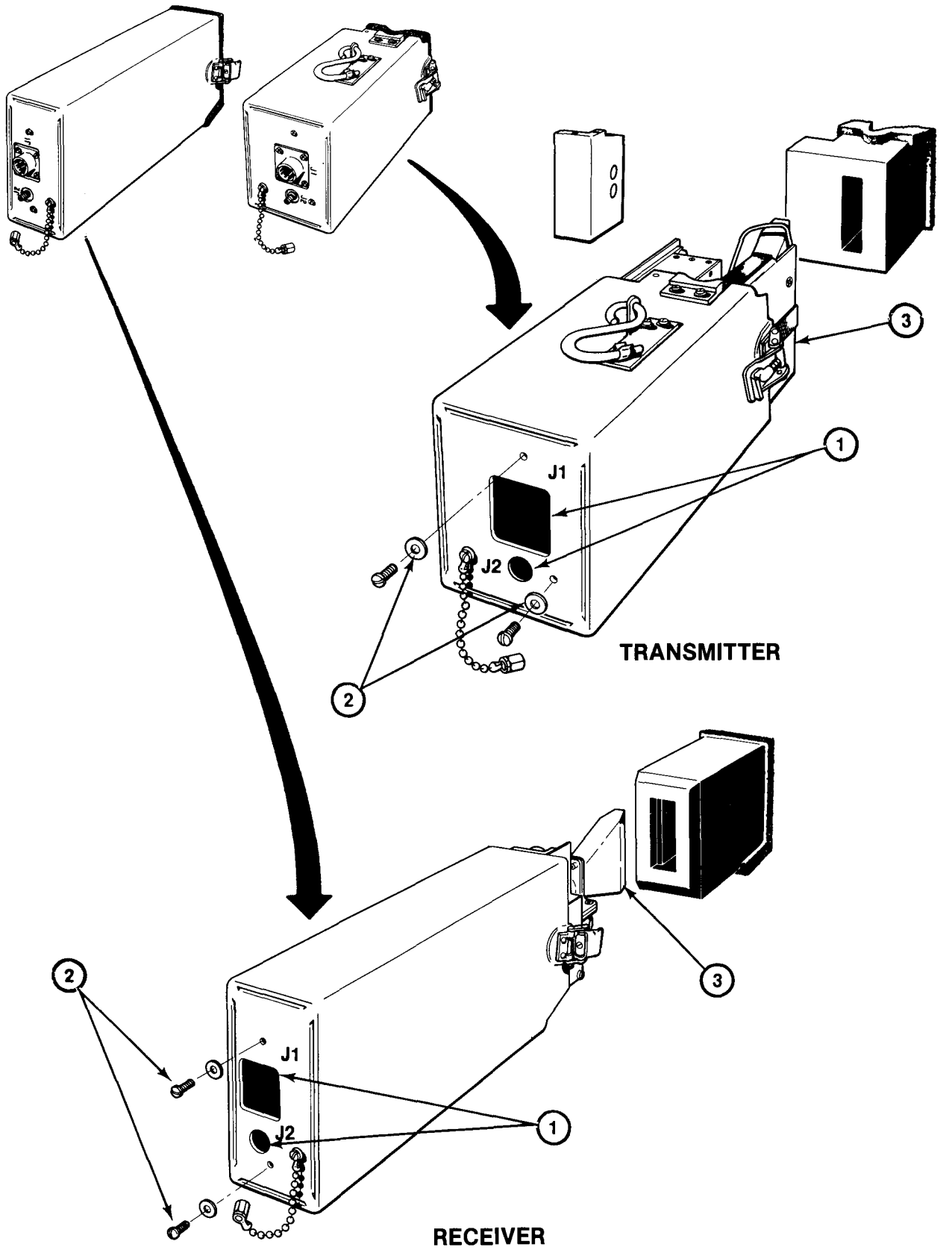
CAUTION

Once the assembly has been removed from its protective case, use care to avoid damaging or bending semirigid coaxial cables.

b. Replacement. To replace the receiver or transmitter assembly (3) In its case:

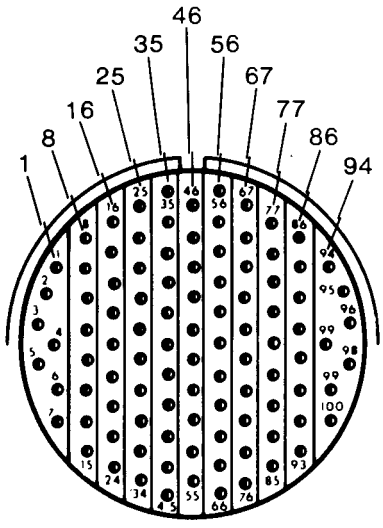
(1) Carefully slip the assembly into its case.

(2) Replace two screws **(2)** in the J1 and J2 side of the assembly.

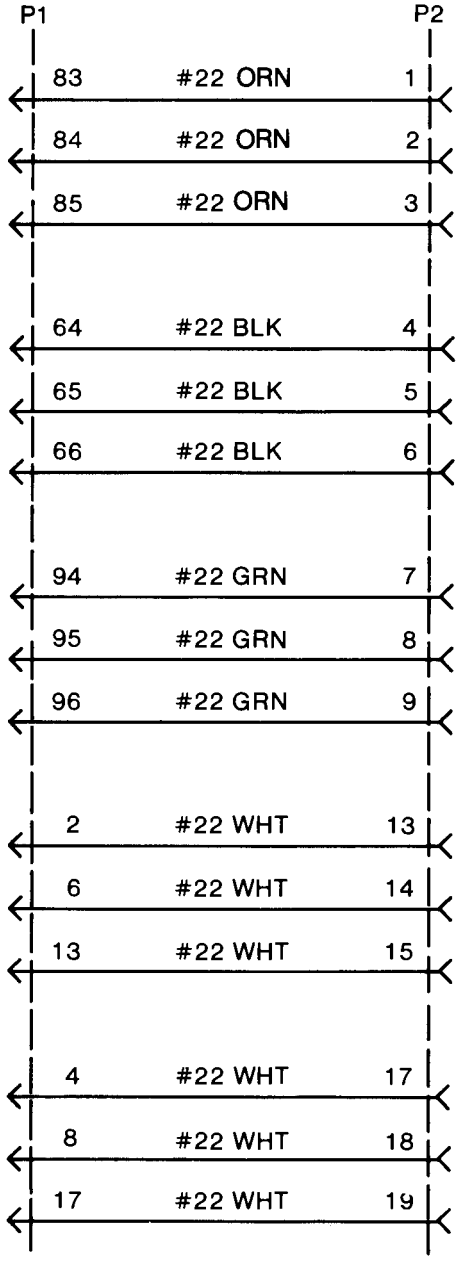

J1
J2
1
2
3
TRANSMITTER
J1
J2
1
2
3
RECEIVER

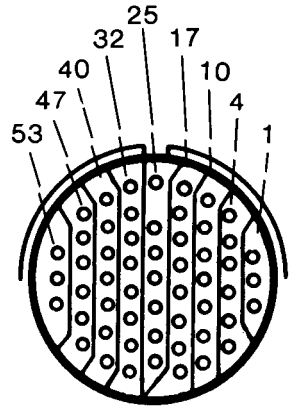
CABLE REPAIR

3-27. TM 55-1500-323-25 tells you how to repair cables. The following diagrams show wiring of the four FLTS cables,



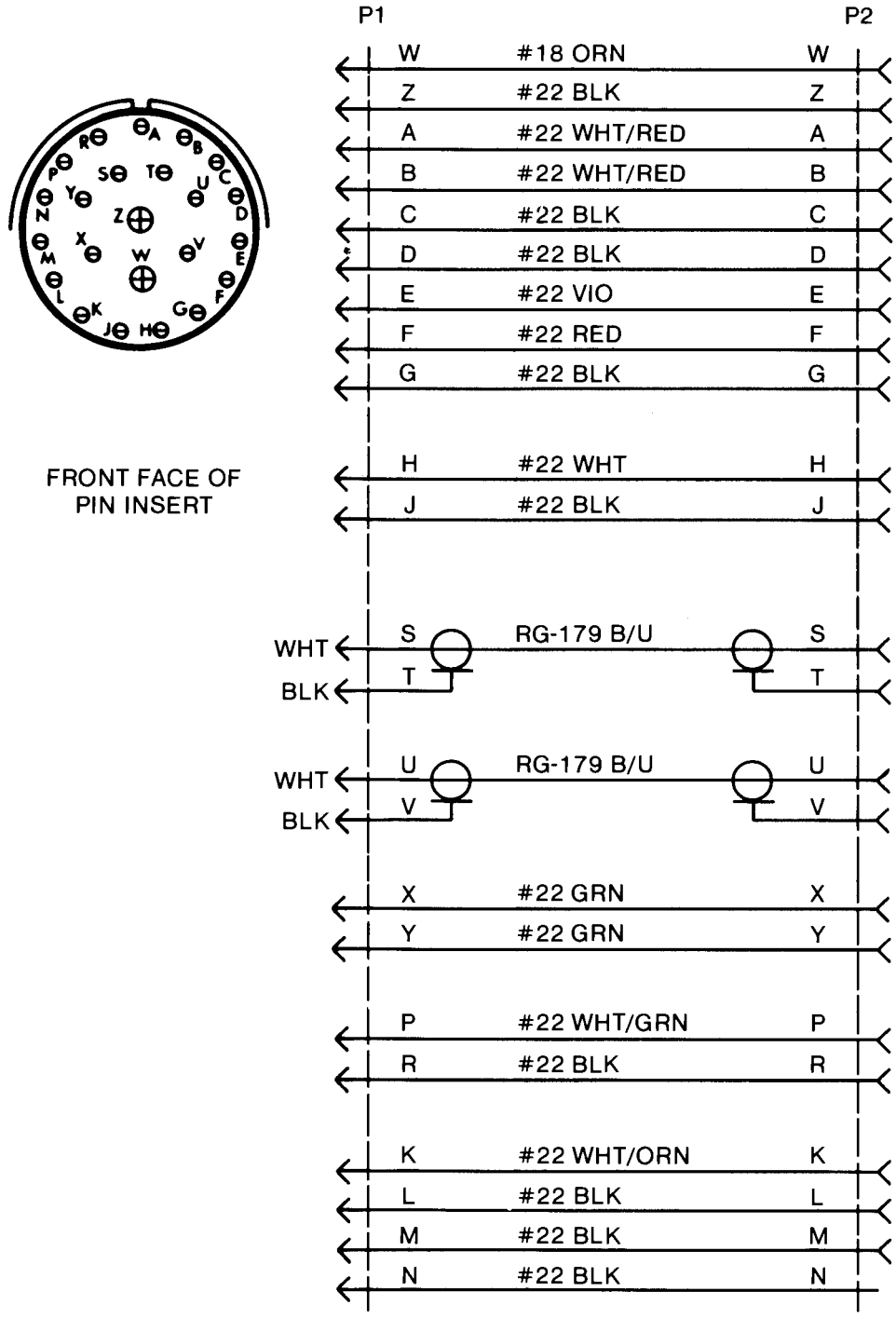
FRONT FACE OF
PIN INSERT





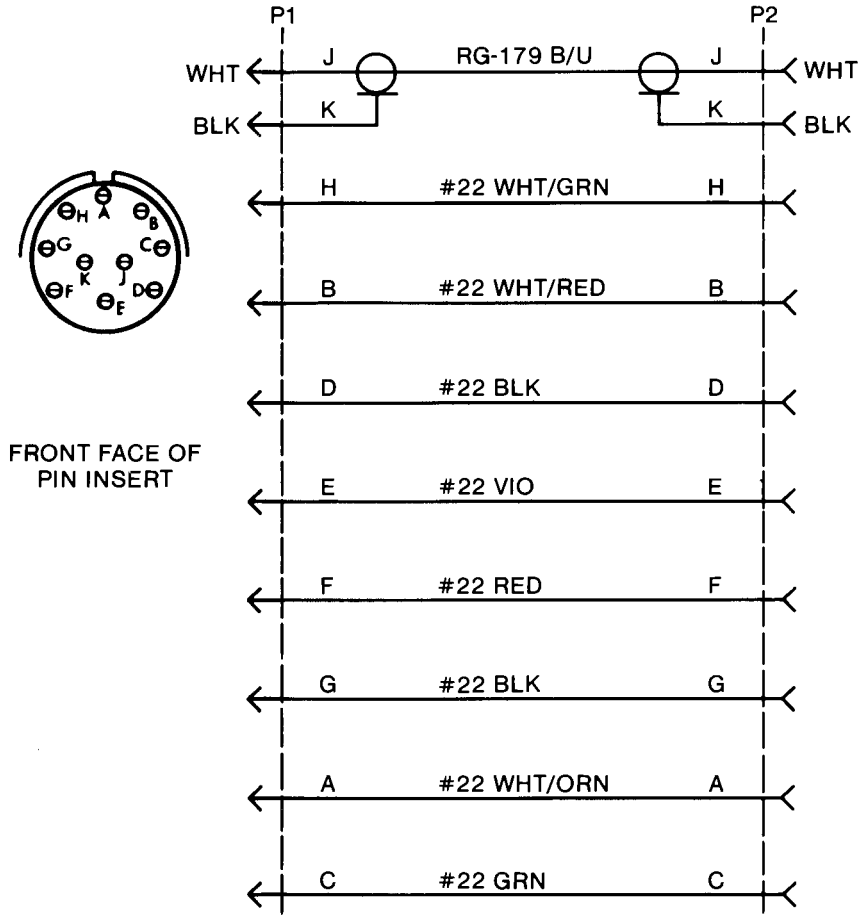
FRONT FACE OF
SOCKET INSERT

FLTS CABLE W1 WIRING

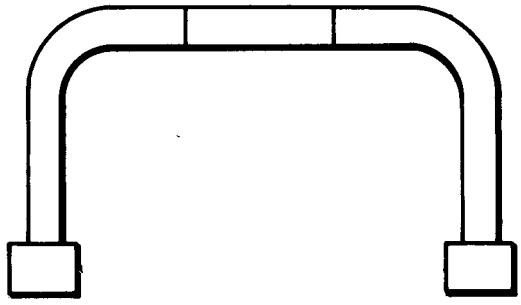


FLTS CABLE W2 WIRING

CABLE REPAIR (Continued)



FLTS CABLE W3 WIRING



FLTS CABLE W4 WIRING

SECTION IV
AVIM TESTING PROCEDURES

SECTION CONTENTS — PAGE

TESTING FLTS

3-28. Operational testing of the equipment uses the troubleshooting procedures in paragraphs 3-1 through 3-15. Step by step conformance to the normal indication columns of the troubleshooting procedure insures that the FLTS meets performance standards.

POST REPAIR RETEST

3-29. After any repair or adjustment to the FLTS, repeat the troubleshooting procedures in paragraphs 3-1 through 3-15. In case of additional trouble while following the procedures, perform the corrective action, and retest. If the malfunction persists, refer the unit to a higher category of maintenance.

APPENDIX A
REFERENCES

A-1 . GENERAL INFORMATION

AR 55-38	Reporting of Transportation Discrepancies in Shipments.
AR 735-11-2	Reporting of Item Discrepancies Attributable to Shippers.
DA Pam-310-l	Consolidated Index of Army Publications and Blank Forms.
TM 38-750	The Army Maintenance Management Systems (TAMMS).
TM 740-90-1	Administrative Storage of Equipment.
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use.

A-2. TECHNICAL MANUALS

TM 11-5865-202-12	Operator’s and Aviation Unit Maintenance Manual Countermeasures Set AN/ALQ-136(V)1 (NSN 5805-01-127-6880).
TM 11-5865-202-30	Aviation Intermediate Maintenance Manual Countermeasures Set AN/ALQ-136(V)1(U) (NSN 5805-01-127-6880)
TM 11-6625-2884-12	Operator’s and Aviation Unit Maintenance Manual Tests Set, Countermeasures Set TS-3614/ALQ-136(V) (NSN 6625-01-121-8984).
TM 11-6625-2884-30	Aviation Intermediate Maintenance Manual Test Set, Countermeasures Set TS-3615/ALQ-136(V) (NSN 6625-01-121-8984) .
TM 11-6625-2885-12	Operator’s and Aviation Unit Maintenance Manual Test Set, Countermeasures Set TS-3614/ALQ-136(V) (NSN 6625-01-121-8983).

REFERENCES (Continued)

A-3. REPAIR PARTS AND SPECIAL TOOLS

TM 11-6625-2885-30P	Aviation Intermediate Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Test Set, Countermeasures Set TS-3614/ALQ-136(V) NSN 6625-01-121-8983.

A-4. GENERAL REPAIR INSTRUCTIONS

SB 38-100	Preservation, Packaging, and Packing Materials, Supplies, and Equipment Used by the Army.
TM 43-0139	Painting Instructions for Field Use.
TM 55-1500-323-25	Organizational, Direct Support, General Support, and Depot Maintenance Manual Installation Practices for Aircraft Electric and Electronic Wiring.

A-5. GENERAL TYPE EQUIPMENT PUBLICATIONS

SC 5180-91-CL-R07	Tool Kit, Electronic Equipment TK-105/G.
TM 11-6625-1703-15	Operator’s Manual for Oscilloscope AN/USM-281A.

APPENDIX B
EXPENDABLE SUPPLIES AND MATERIAL LIST

SECTION 1
INTRODUCTION

B-1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the flight line test set. These items are authorized to you by CTA 50-970, Expendable Items (except Medical, Class V, Repair Parts, and Heraldic Items).

B-2. EXPLANATION OF COLUMNS

The columns in this list are explained below.

a. Column 1 - Item number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., “Use cleaning compound, item 5, App. B").

b. Column 2 - Level. This column identifies the lowest level of maintenance that requires the listed item.

F - Direct Support Maintenance.

c. Column 3 - National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column 4 - Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the part number followed by the Federal Supply Code for Manufacturer (FSCM) in parentheses, if applicable.

e. Column 5 - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II
EXPENDABLE SUPPLIES AND MATERIALS

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	0		Cloth, lint-free	A/R
2	0		Trichlorotrifluoroethane	A/R
3	F		Paint, yellow, FED-STD-595 color no. 23538	QT
4	F		Sandpaper	A/R
5	F		Brush, paint	EA
6	F		Brush, wire	EA
7	F		Sealing Compound (MIL-S-22473 grade A)	A/R

INDEX

INDEX (Continued)

INDEX (Continued)

SUBJECT **PAGE**

T (Continued)

By Order of the Secretaries of the Army and the Navy:

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DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-6625-2885-30	23 Feb 84	Flight Line Test Set TS-3614/ALQ-136(V) (FLTS)

BE EXACT PIN-POINT WHERE IT IS

PAGE NO.	PARAGRAPH	FIGURE NO.	TABLE NO.

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME GRADE OR TITLE AND TELEPHONE NUMBER

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US Army Communications-Electronics Command
and Fort Monmouth
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Fort Monmouth, New Jersey 07703

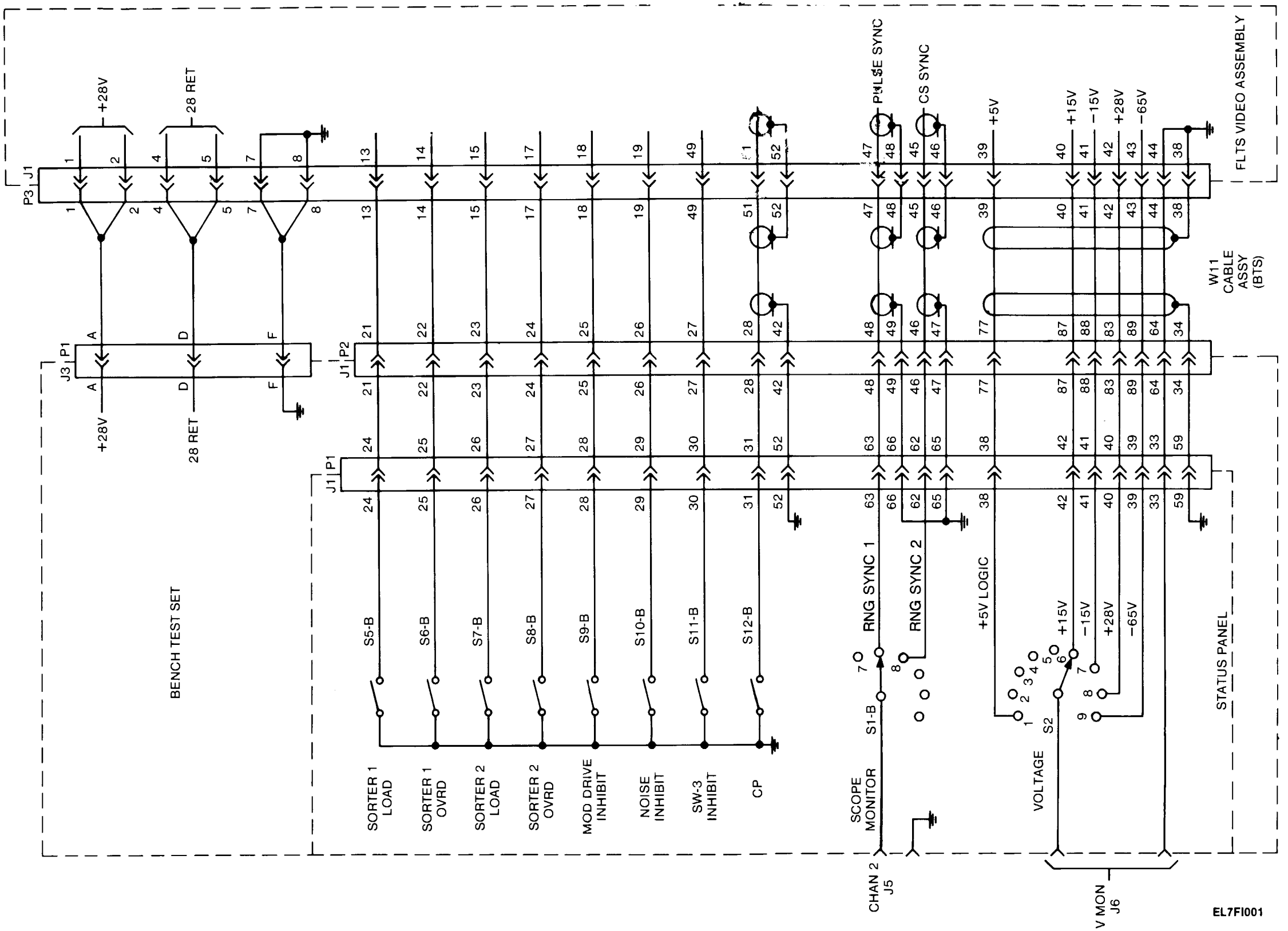

FIGURE FO-1. BTS-FLTS INTERFACE SCHEMATIC DIAGRAM

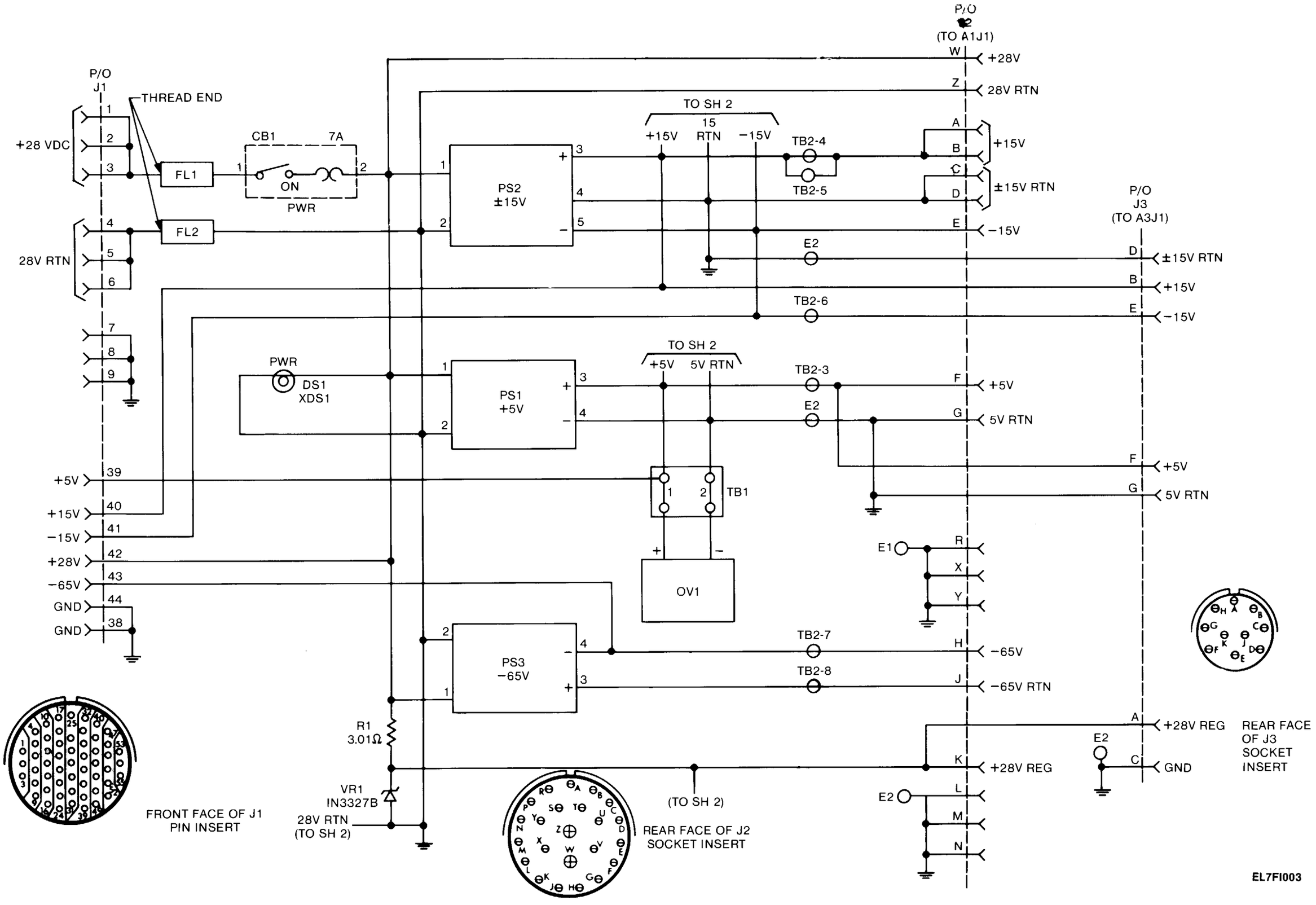

FIGURE FO-2. VIDEO ASSEMBLY 1A2
(Sheet 1 of 2)

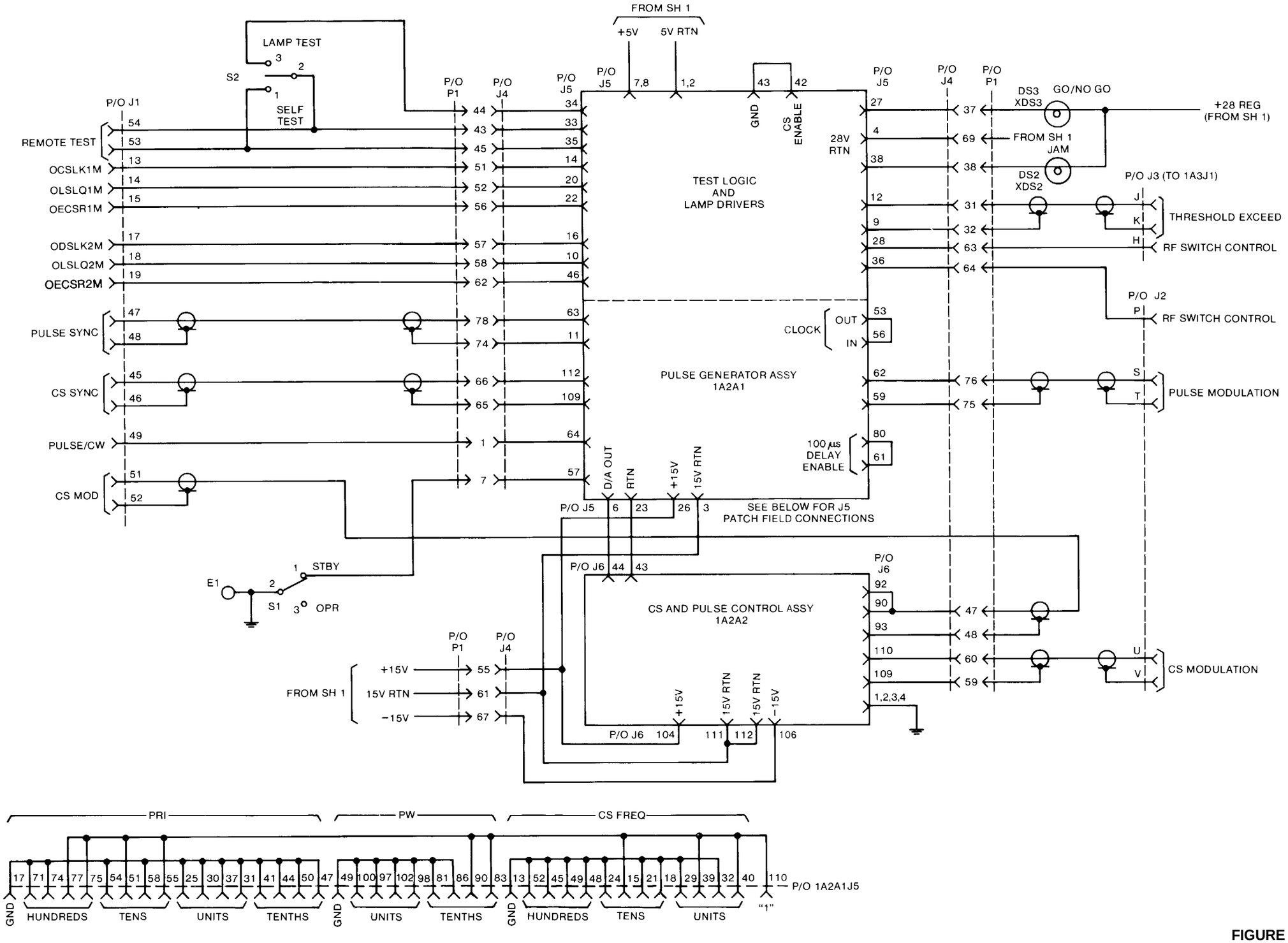

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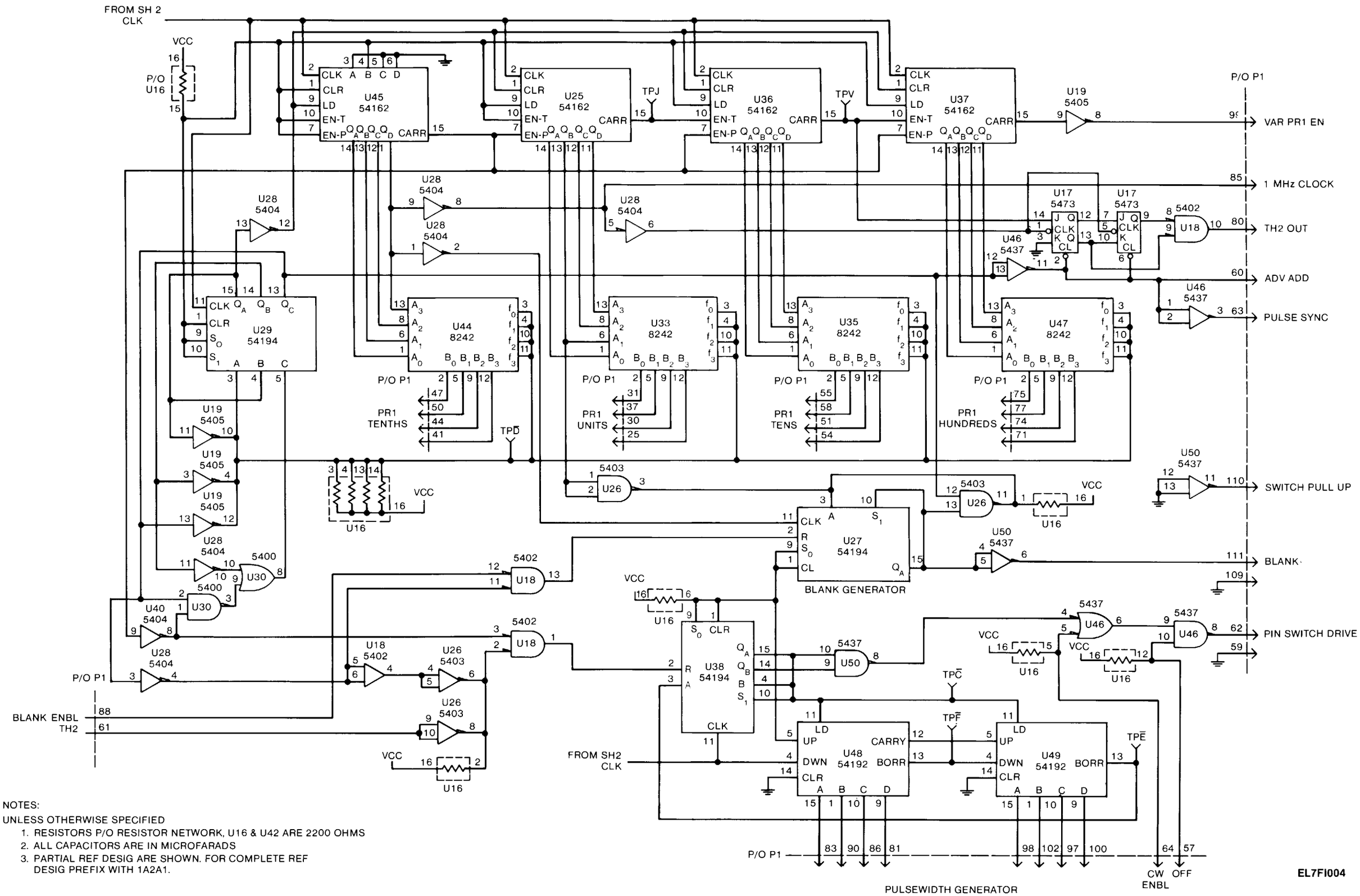
FIGURE FO-2. VIDEO ASSEMBLY 1A2 (Sheet 2 of 2)



NOTES:

UNLESS OTHERWISE SPECIFIED

1. RESISTORS P/O RESISTOR NETWORK, U16 & U42 ARE 2200 OHMS
2. ALL CAPACITORS ARE IN MICROFARADS
3. PARTIAL REF DESIG ARE SHOWN. FOR COMPLETE REF DESIG PREFIX WITH 1A2A1.

FIGURE FO-3. PULSE GENERATOR CIRCUIT CARD 1A2A1 (Sheet 1 of 3)

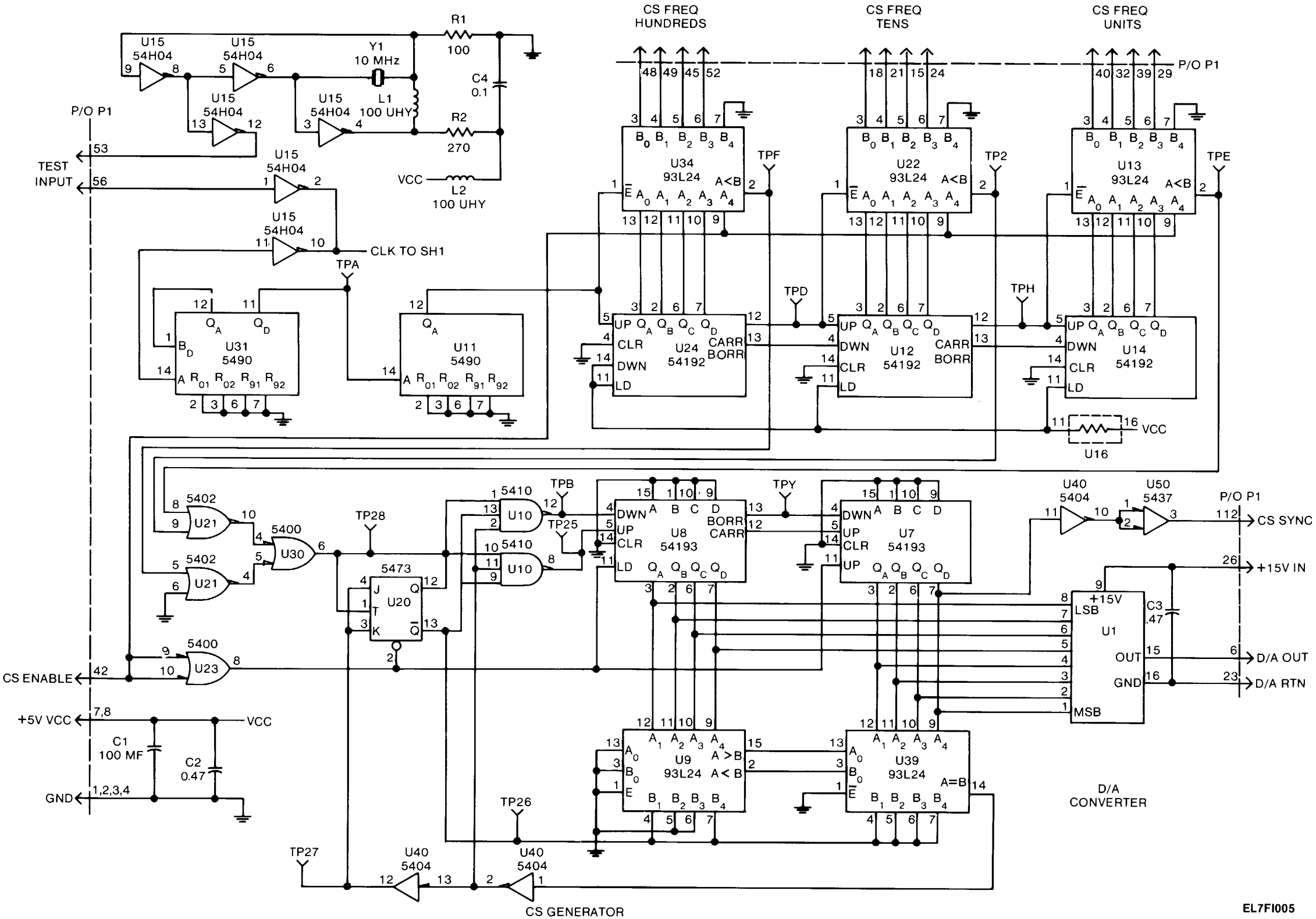


FIGURE FO-3. PULSE GENERATOR CIRCUIT CARD 1A2A1 (Sheet 2 of 3)

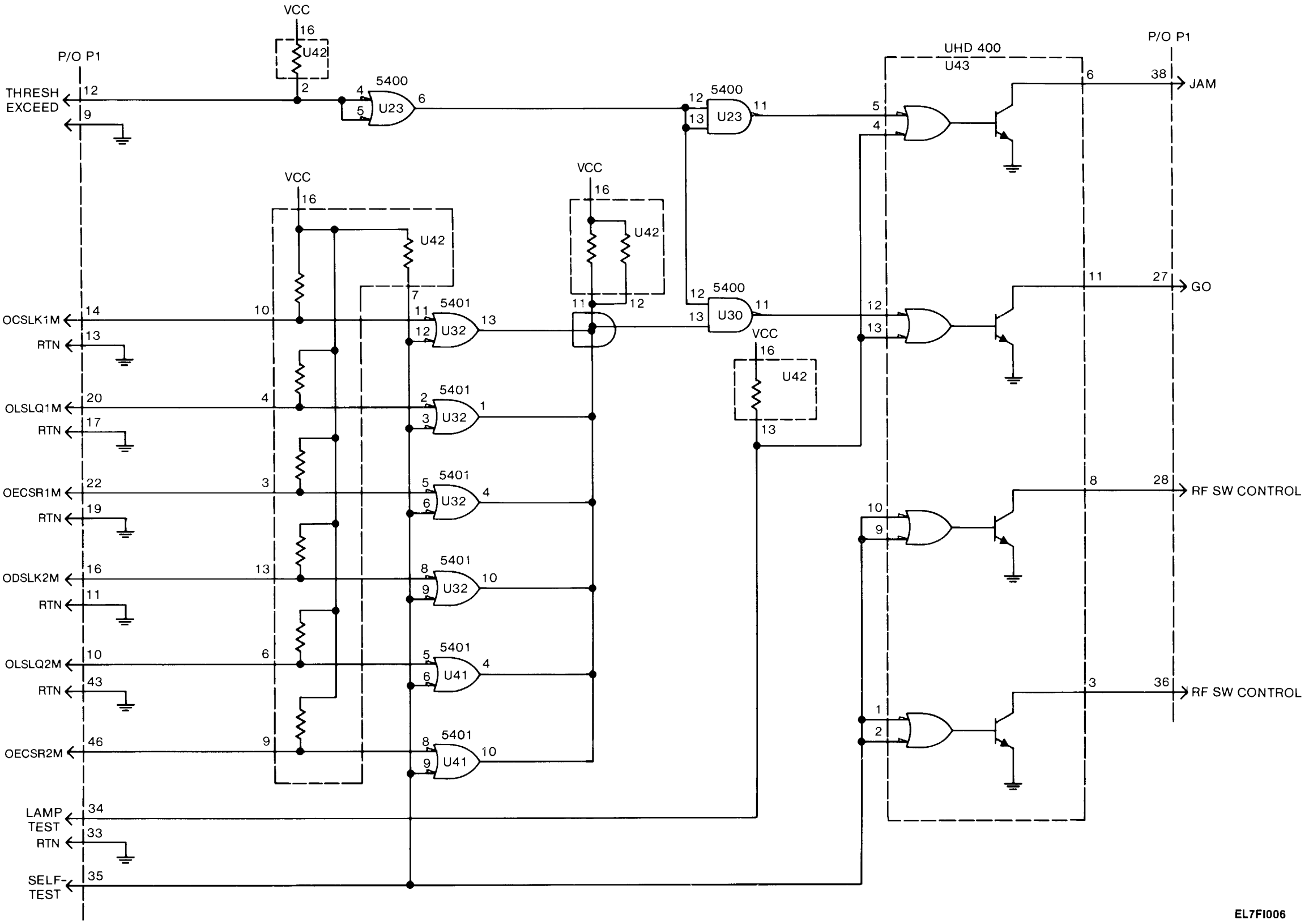
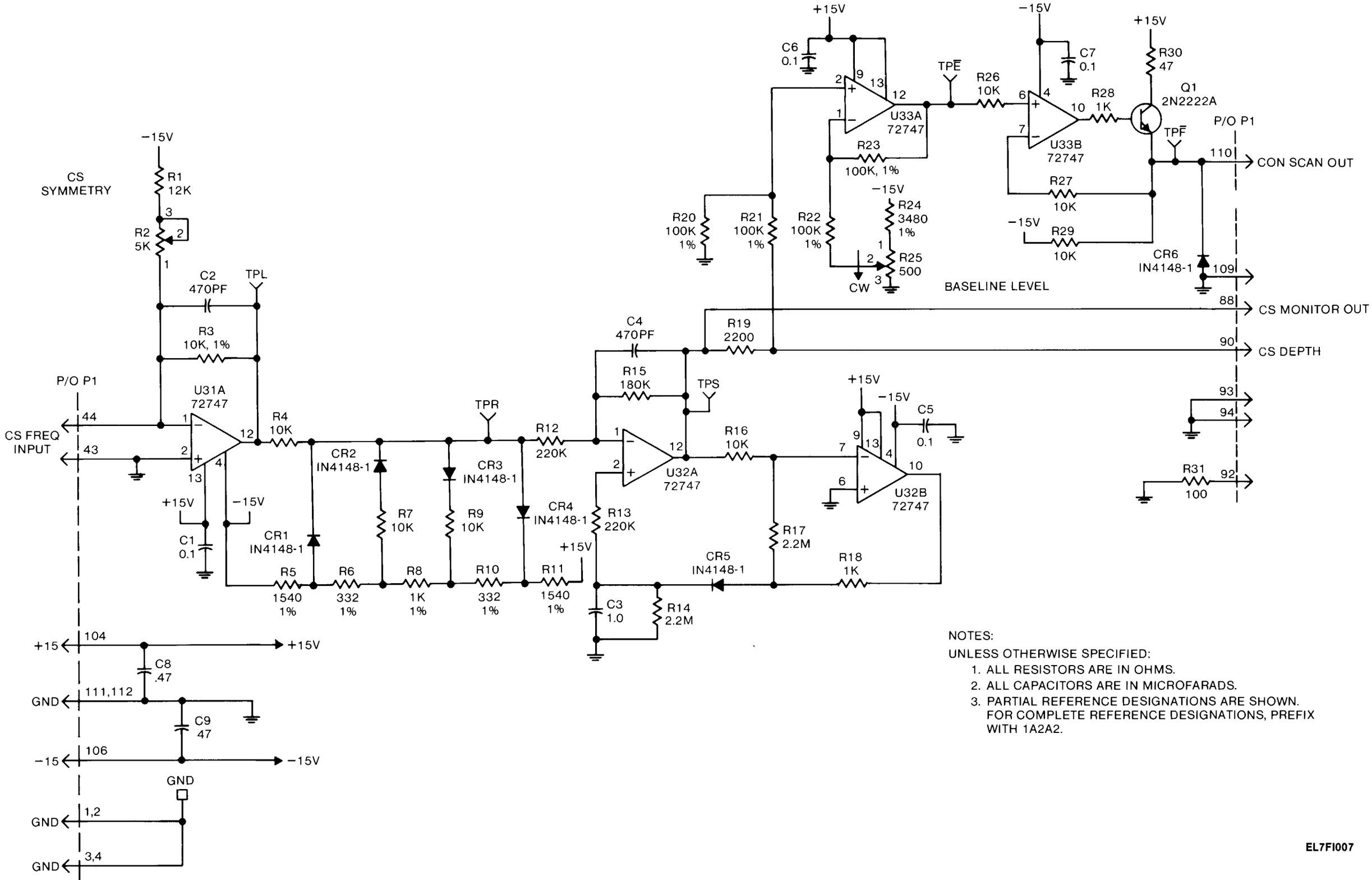


FIGURE FO-3. PULSE GENERATOR CIRCUIT CARD 1A2A1 (Sheet 3 of 3)



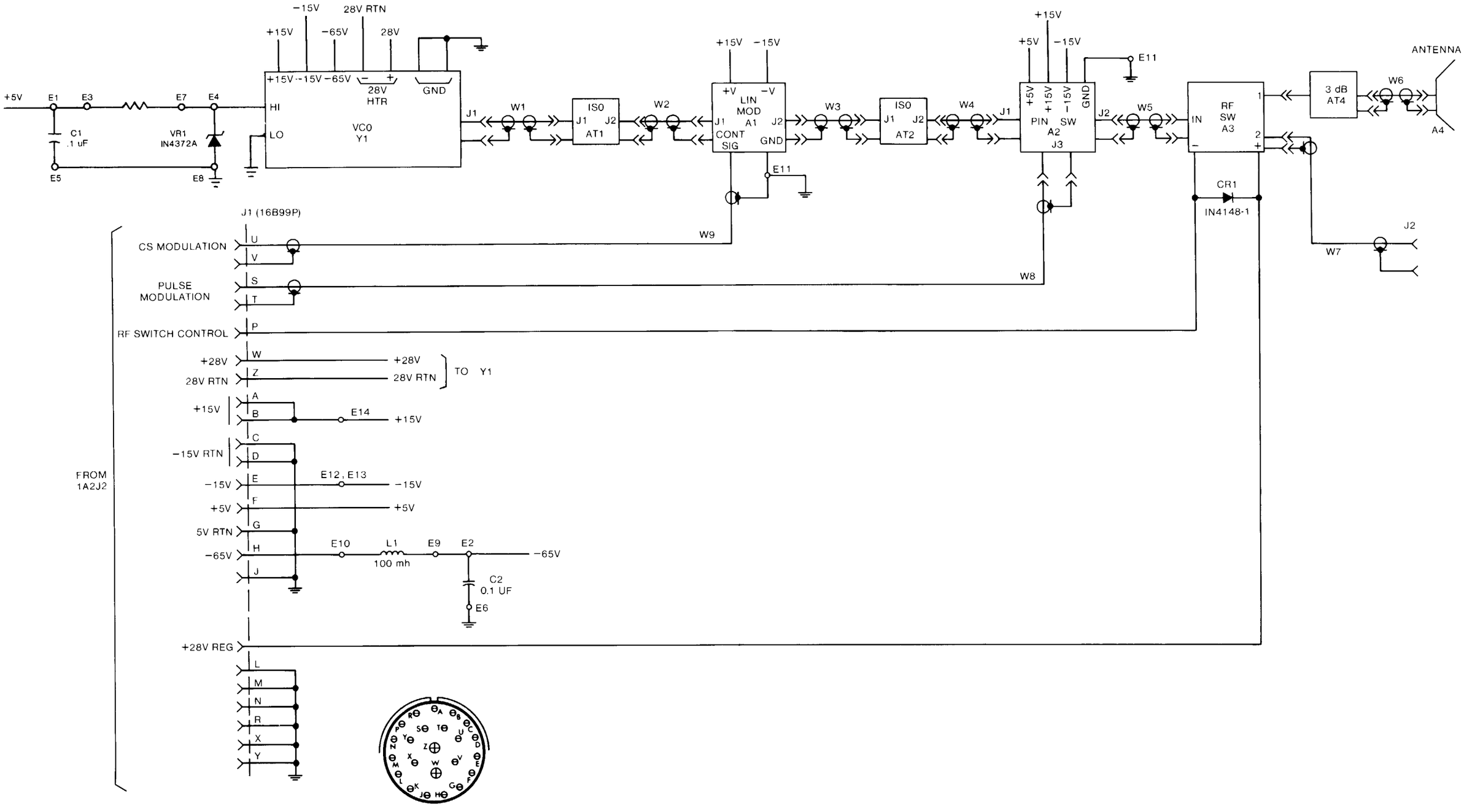
NOTES:

UNLESS OTHERWISE SPECIFIED:

1. ALL RESISTORS ARE IN OHMS.
2. ALL CAPACITORS ARE IN MICROFARADS.
3. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR COMPLETE REFERENCE DESIGNATIONS, PREFIX WITH 1A2A2.

EL7FI007

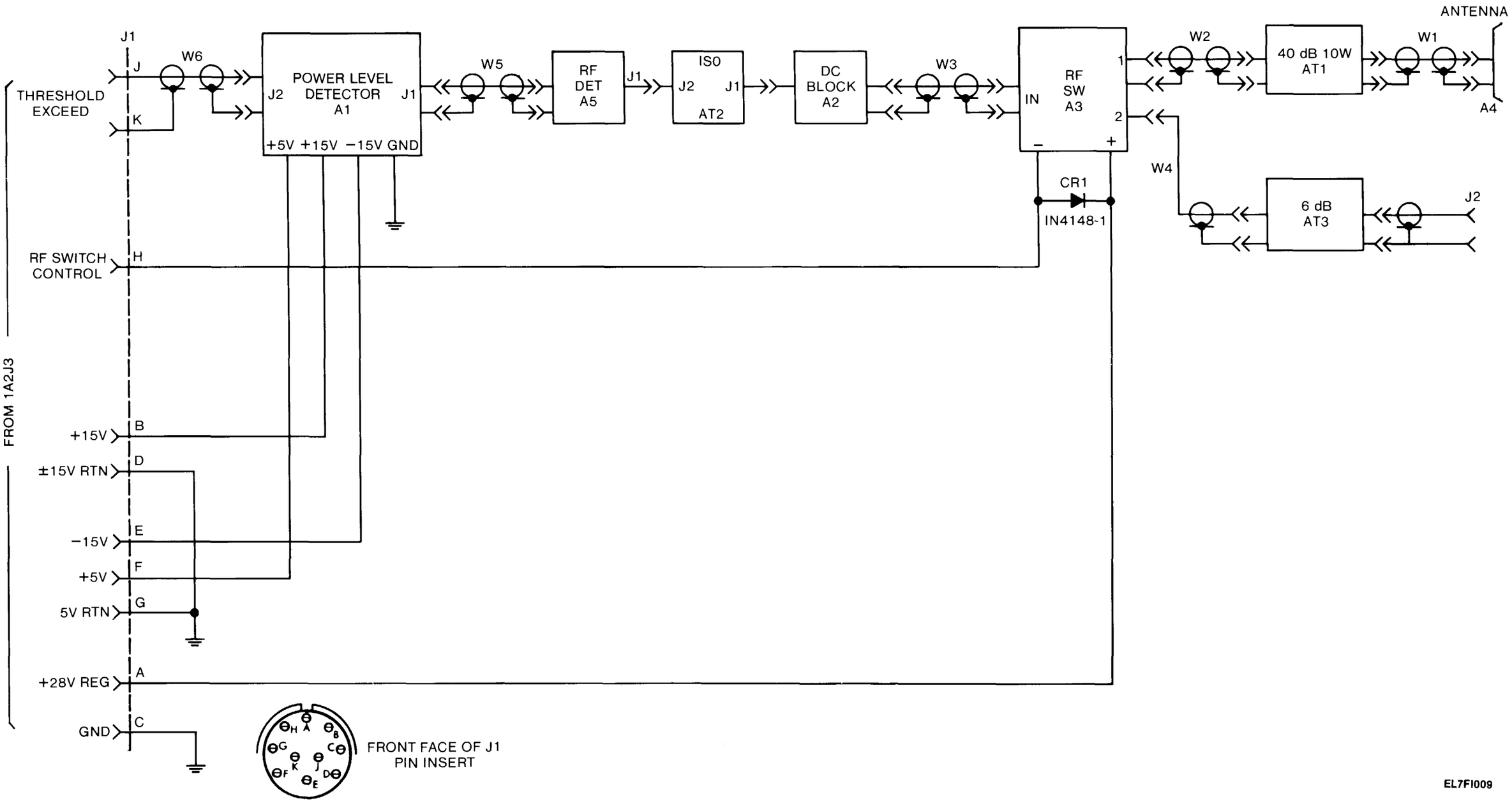
FIGURE FO-4. CS AND PULSE CONTROL CIRCUIT CARD 1A2A2



FRONT FACE OF J1
PIN INSERT

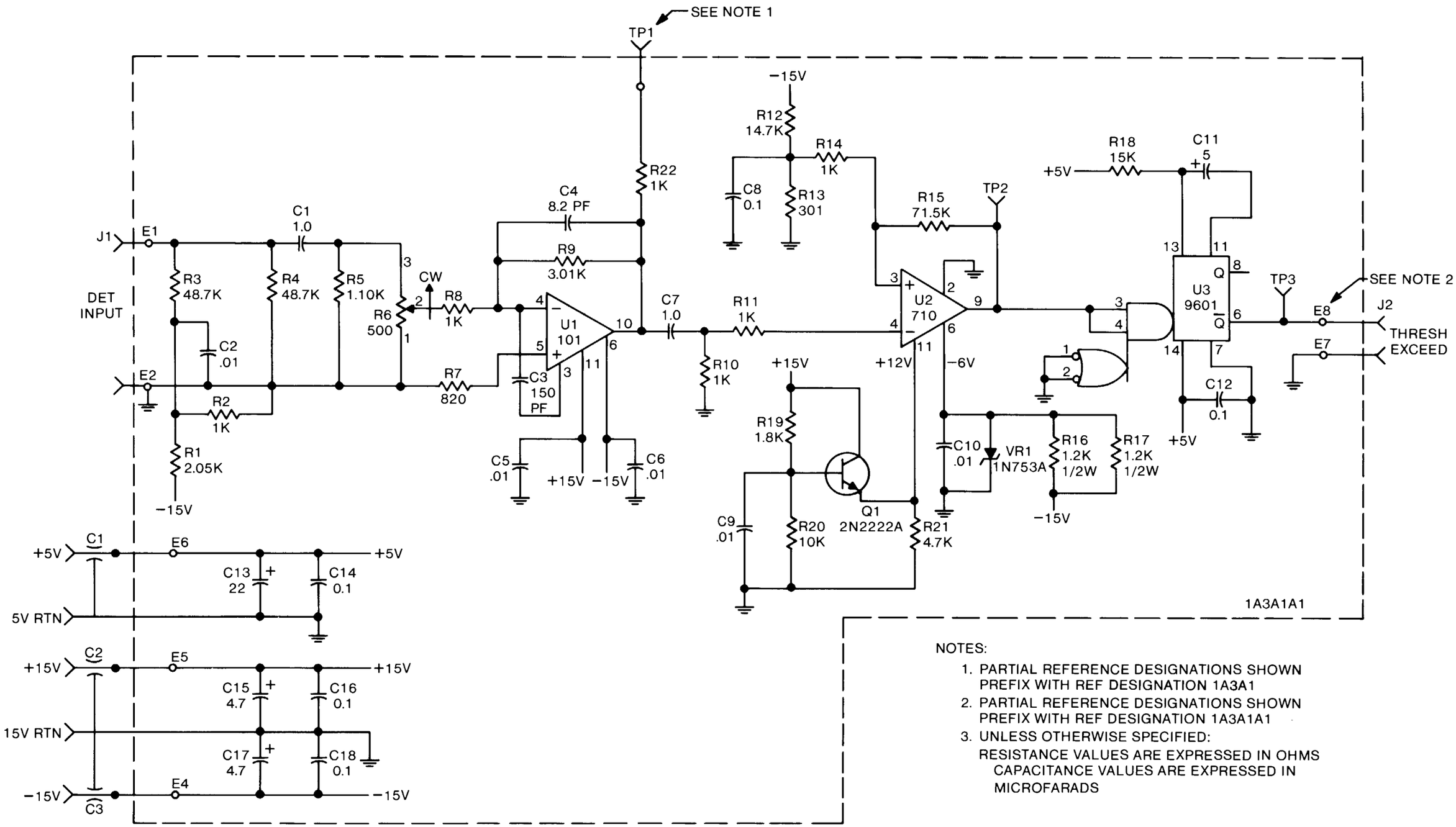
EL7FI008

FIGURE FO-5. TRANSMITTER ASSEMBLY 1A1



EL7FI009

FIGURE FO-6. RECEIVER ASSEMBLY 1A3



NOTES:

1. PARTIAL REFERENCE DESIGNATIONS SHOWN PREFIX WITH REF DESIGNATION 1A3A1
2. PARTIAL REFERENCE DESIGNATIONS SHOWN PREFIX WITH REF DESIGNATION 1A3A1A1
3. UNLESS OTHERWISE SPECIFIED:
   RESISTANCE VALUES ARE EXPRESSED IN OHMS
   CAPACITANCE VALUES ARE EXPRESSED IN MICROFARADS

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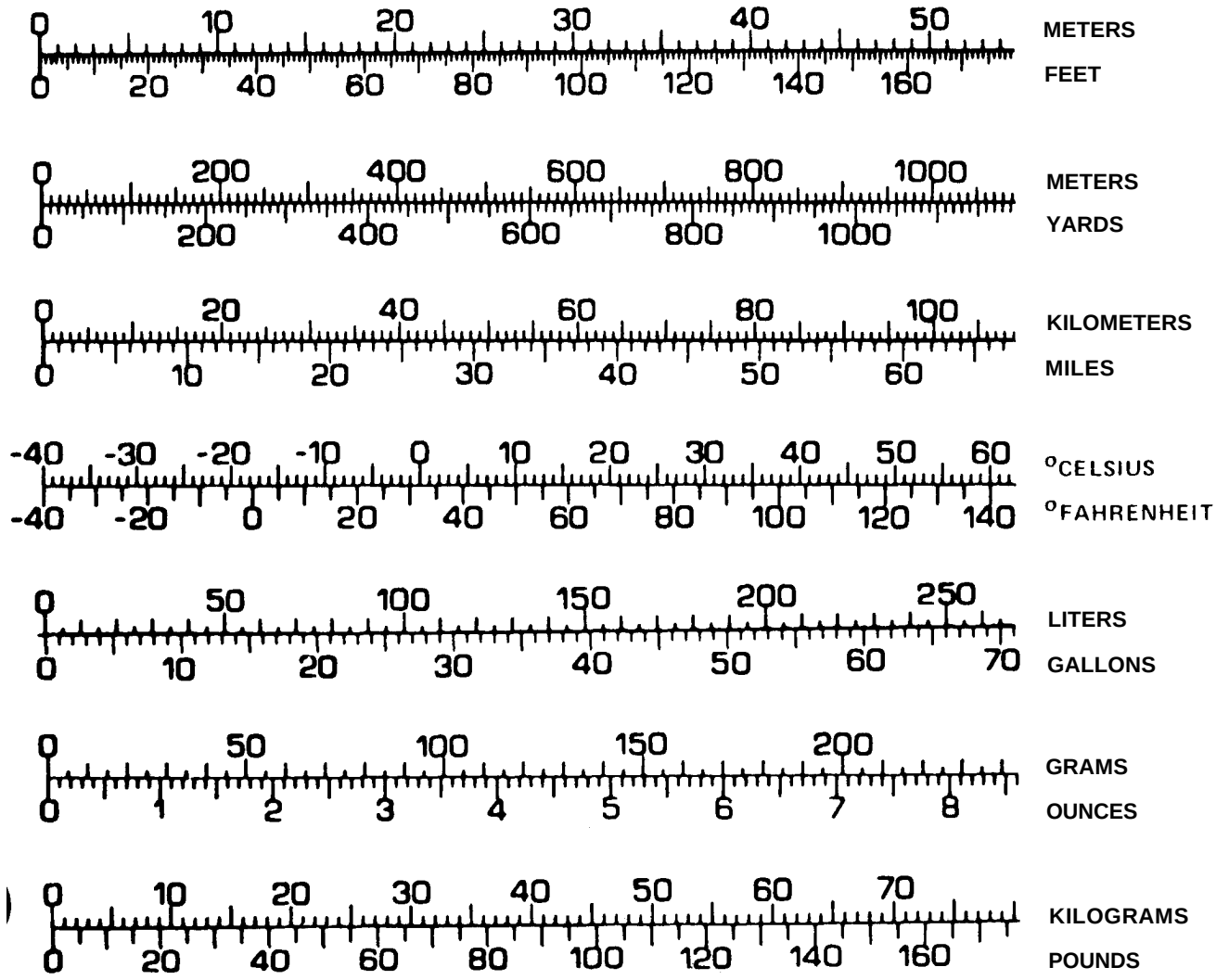
FIGURE FO-7. POWER LEVEL DETECTOR 1A3A1

USE OF METRIC MEASURING SYSTEM

In this manual, you'11 find weights and measurements given in American Standard units with the same measurement in Metric units shown in parentheses.

Tools, or nuts and bolts that have been manufactured in American Standard units are described in those units. For example: 1/2 inch hex nut, 3/4 inch bolt, 1/2 inch wrench.

Use the following Metric/American Standard table as a measurement guide for any conversions you have to make.



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