TM 9-4931-477-14

TECHNICAL MANUAL

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE

FOR

TARGET DESIGNATOR SET, ELECTRO-OPTICAL

AN/TVQ-2 (G/VLLD)

GROUND SUPPORT EQUIPMENT

(GROUND LASER LOCATOR DESIGNATOR)

This copy is a reprint which includes current pages from Changes 1 through 2.

DEPARTMENT OF THE ARMY

MAY 1984

Change
No. 3

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 28 March 1995

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL FOR TARGET DESIGNATOR SET, ELECTRO-OPTICAL AN/TVQ-2 (G/VLLD) GROUND SUPPORT EQUIPMENT

TM 9-4931-477-14, 9 May 1984, is changed as follows:

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Official:

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00113

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WARNING

LASER LIGHT - INVISIBLE

LASER BEAM IS DANGEROUS AND CAN CAUSE BLINDNESS IF IT ENTERS THE EYE -- EITHER DIRECTLY OR REFLECTED FROM A SHINY SURFACE.

TREAT THE G/VLLD AS A DIRECT FIRE WEAPON, LIKE A RIFLE. Unless you have a backstop it can be hazardous as far as 80 km.

NEVER LOOK INTO LASER; assume it is always dangerous.

DO NOT AIM LASER at unprotected people, animals, or flat reflective surfaces.

WARN PERSONNEL before firing laser or operating the G/VLLD set.

OPERATE ONLY ON APPROVED LASER RANGES which have been cleared of reflective objects.

DO NOT RELY SOLELY ON WINDOW COVER to stop the laser beam.

KEEP THE G/VLLD EXTERNAL LENSES CLEAN; dirt or foreign matter on the optical lenses can cause scattering of laser light.

ALLOW ONLY TRAINED PERSONNEL to operate the G/VLLD set, unless properly supervised.

ALWAYS FOLLOW THE LASER RANGE SAFETY PROCEDURES OF AR 385-63 and TB MED 524,

APPROVED LASER GOGGLES are required ONLY for people who may be exposed to the direct laser beam or its reflection from a flat shiny surface. Goggles should have a density of 5.5 at 1064 nm.

OPTICS WITH MAGNIFICATION CAPABILITIES increase the power of the laser and increase the damage to personnel.

A LASER ATTENUATOR FILTER is available for use on the G/VLLD set to reduce emission hazards. Even when using the attenuator filter a potential eye hazard still exists. See AR 385-63 for operating limitations.

LASER WEAPON - DISCIPLINE

DISCIPLINE

LASER IS A TACTICAL WEAPON AND COUNTER-ORDNANCE CAN FOLLOW IT TO YOUR POSITION.

NON-TACTICAL USE IS STRICTLY FORBIDDEN.

DESIGNATE ONLY ON COMMAND to reduce your vulnerability and extend battery operating time to a maximum.

CHEMICAL

CLEANING SOLVENTS ARE EXTREMELY FLAMMABLE AND TOXIC. THEY CAN CAUSE DEATH IF FUMES ARE INHALED. WORK AREAS SHOULD BE WELL-VENTILATED.

ACCUMULATION OF FLAMMABLE GASES MAY RESULT IN AN EXPLOSION.

KEEP OPEN FLAMES AWAY when using flammable cleaning solutions.

ELECTRICAL

HAZARDOUS VOLTAGES CAN CAUSE SHOCK, DEATH, OR INJURY. USE EXTREME CAUTION WHEN PERFORMING MEASUREMENTS WITH POWER ON. REMOVE POWER BEFORE PERFORMING MAINTENANCE.

ALL POWER MUST BE REMOVED from Ground Support Equipment before start of replacement procedures.

HIGH PRESSURE

HIGH PRESSURE GASEOUS NITROGEN-OXYGEN IS USED TO PURGE AND FILL THE LD/R. WEAR FACE SHIELD TO PROTECT FACE AND EYES. DO NOT POINT ANY PRESSURE OUTLET TOWARDS YOURSELF OR ANY OTHER PERSON. ESCAPING GAS MAY BLOW DIRT OR DUST INTO THE AIR WHICH MAY CAUSE BLINDNESS.

THE NITROGEN-OXYGEN GAS CYLINDER MUST BE SECURELY FASTENED to prevent it from falling and becoming an unguided missile.

HANDLE COMPRESSED GAS CYLINDERS CAREFULLY. They can explode, become projectiles, damage equipment, and injure personnel.

SAFETY

IN CASE OF AN ACCIDENT -- NOTIFY YOUR SUPERVISOR IMMEDIATELY AND OBTAIN MEDICAL TREATMENT FOR ALL INJURIES.

SEE FM 21-11 for general first aid data.

CONSULT MEDICAL OFFICER FOR TB MED 524 data concerning laser medical practices.

REPORT TO YOUR COMMANDER IF YOU THINK YOU HAVE BEEN HIT BY THE LASER BEAM. You may need an eye examination.

TECHNICAL MANUAL
NO. 9-4931-477-14

HEADQUARTERS
Department of the Army
Washington, D.C., 9 May 1984

OPERATOR, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL FOR TARGET DESIGNATOR SET, ELECTRO-OPTICAL AN/TVQ-2 (G/VLLD) GROUND SUPPORT EQUIPMENT

REPORTING OF ERRORS

You can help improve this manual by recommending improvements using DA Form 2028 (Recommended Changes to Publications and Blank Forms) or DA Form 2028-2 located in the back of the manual and mail direct to: Commander, U.S. Army Missile Command, ATTN:AMSMI-MMC-LS-LP Redstone Arsenal, Alabama 35898-5238. A reply will be furnished direct to you.

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CHAPTER 1
INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE

This manual provides operator, organizational, and direct support/general support (DS/GS) instructions for maintenance and operation of the Ground Support Equipment (GSE) of the Target Designator Set, Electro-Optical, AN/TVQ-2, also referred to as Ground/Vehicular Laser Locator Designator (G/VLLD). Theory of operation for the GSE and troubleshooting procedures are also contained in this manual. A list of current References, the Maintenance Allocation Chart, the Components of End Item and Basic Issue Items Lists, the Expendable/Durable Supplies and Materials List, Wiring Lists, Torque Tables, and installation and maintenance procedures for Electronic Shop Shelter AN/ASM-146C Safety Interlock are included in the appendices to this manual.

1-2. MAINTENANCE FORMS, RECORDS, AND REPORTS

a. General. All personnel and organizations responsible for operating or maintaining the GSE are responsible for the preparation and disposition of U.S. Army equipment records.

b. Authorization Forms. Forms that are required for operation and maintenance of equipment are listed and explained in DA PAM 738-750. A complete list of Department of the Army (DA) forms is given in DA PAM 25-30.

Reports of Accidents. Any accident that injures personnel or damages equipment shall be reported as required by AR 385-40.

1-3. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your equipment 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. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to the address stated in DA PAM 738-750.

1-4. PREPARATION FOR STORAGE OR SHIPMENT

No special procedures are required.

1-5. DESTRUCTION OF MATERIEL TO PREVENT ENEMY USE

No special procedures for destruction of the GSE are required. Evacuation rather than destruction, whenever possible, is first priority.

1-6. NOMENCLATURE CROSS-REFERENCE

Common names used in this manual are listed in Table 1-1.

Table 1-1. Nomenclature Cross-Reference

Official Nomenclature	Part Number	Common Name
Adapter Assembly, Purging	11507835	Purge Valve Adapter
Cable Assembly, Charger, Battery	13034390	Battery Charger Cable
Cable Assembly, Power	11507839	Power Cable M2
Cable Assembly, Remote Capabilities Tester	11559506	RCT Cable W2
Cable Assembly, Test	11508261	Test Cable W1
Case, Combination	11507842	Case
Case, Combined - Remote Capabilities Tester	11559504	Combined Case
Charging Assembly, Gas	13012630	High Pressure Gage
Circuit Card Assembly - Fault Locator, Logic	13160370	Logic Card A1
EMI Filter Assembly	11559640	EMI Filter
Fault Locator Panel Assembly	11507820	Panel
G/VLLD Ground Support Equipment	13090516	Ground Support Equipment or GSE
HP 62683 DC Power Supply	62686010-026	HP Power Supply
Panel Assembly, Remote Capabilities Tester	11559501	RCT Panel
Remote Capabilities Tester	11559500	RCT
Resolver Assembly, Gimbal Calibration	11508483	Test Resolver
Target Designator Set, Electro-Optical AN/TVQ-2 (G/VLLD)	13090500	G/VLLD
Wiring Harness, Branched - Fault Locator	11507845	Harness

1-7. ABBREVIATIONS/ACRONYMS/SYMBOLS

Abbreviations/acronyms/symbols used in this manual are defined in Table 1-2.

Table 1-2. List of Abbreviations/Acronyms/Symbols

Abbreviation	Definition
A	Ampere
ac	alternating current
amp	amperage
ar	as required
assy	assembly
AZ	Azimuth
AZ ADJ	Azimuth Adjust
BII	Basic Issue Items
btl	bottle
C	Celsius
CAGEC	Commercial And Government Entity Code
CATH	Cathode
CCW	counterclockwise
CMD	CoMmanD
CMPTR	CoMPuTeR
COEI	Components Of End Item
COM	COMmon
COS	COSine
CW	clockwise
cyl	cylinder
DA	Department of the Army
dc	direct current
DES	DESignate
DMD	Digital Message Device
DMM	Digital MultiMeter
DS/GS	Direct Support/ General Support
ea	each
EL	ELevation
EMI	Electromagnetic Interference
ESDS	ElectroStatic-Discharge Sensitive
EXT	EXTernal
F	Fahrenheit
F/T	FlashTube
FIST	Fire Support Team
f t	foot
G/VLLD	Ground/Vehicular Laser Locator Designator
gal	gallon
GSE	Ground Support Equipment

Table 1-2. List of Abbreviations/Acronyms/Symbols - Continued

Abbreviation	Definition
HP	Hewlett-Packard
HVPS	High Voltage Power supply
Hz	Hertz (cycles per second)
in.	inch
lb	pound
LD/R	Laser Designator/ Rangefinder
LED	Light Emitting Diode
M	Meter
MAX	MAXimum
MIL	MILliradian (Angle equal to 1/6400 of 360°)
MOS	Military Occupational Specialty
N_2	Nitrogen gas
No.	Number
NORM	NORMal
NSN	National Stock Number
NSNL	No Stock Number Listed
OVERTEMP	OVERTEMPerature
oz	ounce
PAM	PAMphlet
PFN	Pulse Forming Network
pr	pair
PRF	Pulse Repetition Frequency
PS	Power Supply
Q/S	Q-Switch
qt	quart
QTY	QuanTitY
RCT	Remote Capabilities Tester
REF	REFerence
REQ	REQuired
RNG	RaNGe
RSLVR	ReSoLVeR
RTN	ReTurN
SEL	SELect
SHLD	SHieLD
SIN	SINe
SW	SWitched
TA	Test Access
TAMMS	The Army Maintenance Management System
TMDE	Test, Measurement, and Diagnostic Equipment

Table 1-2. List of Abbreviations/Acronyms/Symbols - Continued

Abbreviation	Definition
TOE/MTOE	Table of Organization and Equipment/ Modification Table of Organization and Equipment
TOR	Turn-On Reset
TP	Test Point
TPG	Time Program Gain
TRIG	TRIGger
TU	Traversing Unit
TYP	TYPical
U/M	Unit of Measure
V	Volt
o	degrees

Section II. EQUIPIMENT DESCRIPTION AND DATA

1-8. GROUND SUPPORT EQUIPMENT (GSE)

Characteristics. The GSE (Figure 1-O) is used for direct support/general support maintenance of Electro-Optical Target Designator Set AN/TVQ-2 (G/VLLD). The GSE consists of the following items:

(1) Fault Locator (includes Test Cable W1 and Power Cable W2)
(2) Remote Capabilities Tester (RCT)
(3) RCT Cable W2
(4) *Gas Charging Assembly
(5) *Purge Valve Adapter
(6) *Fill Valve Extension
(7) *High Pressure Gage
(8) EMI Filter
(9) Test Resolver
(10) Battery Charger Cable
(11) Power Maintenance Cable
(12) HP Power Supply
(13) Safety Interlock

* Purge and Fill Equipment

b. Features and Capabilities.

(1) Fault Locator, RCT, RCT Cable W2, EMI Filter, Test Resolver, Power Maintenance Cable, and HP Power Supply are used to test and troubleshoot G/VLLD electronic circuitry.

(2) Gas Charging Assembly, Purge Valve Adapter, Fill Valve Extension, and High Pressure Gage are used to purge and fill G/VLLD with nitrogen gas.

(3) Battery Charger Cable is used with Battery Charger PP-7286/U (not part of GSE) to charge BB-704/U G/VLLD batteries.

(4) Safety Interlock (installed into Electronic Shop Shelter AN/ASM-146C) protects personnel entering shelter from G/VLLD laser hazard by disabling G/VLLD laser whenever shelter door is opened.

1-9. FAULT LOCATOR

a. Characteristics. The Fault Locator (Figure 1-1) is a self-contained assembly consisting of the Fault Locator, Test Cable WI, Power Cable W2, and Cover. The weight and dimensions of the Fault Locator are as follows:

Weight:	25 pounds
Height:	10.75 inches
Width:	12.00 inches
Length:	18.00 inches

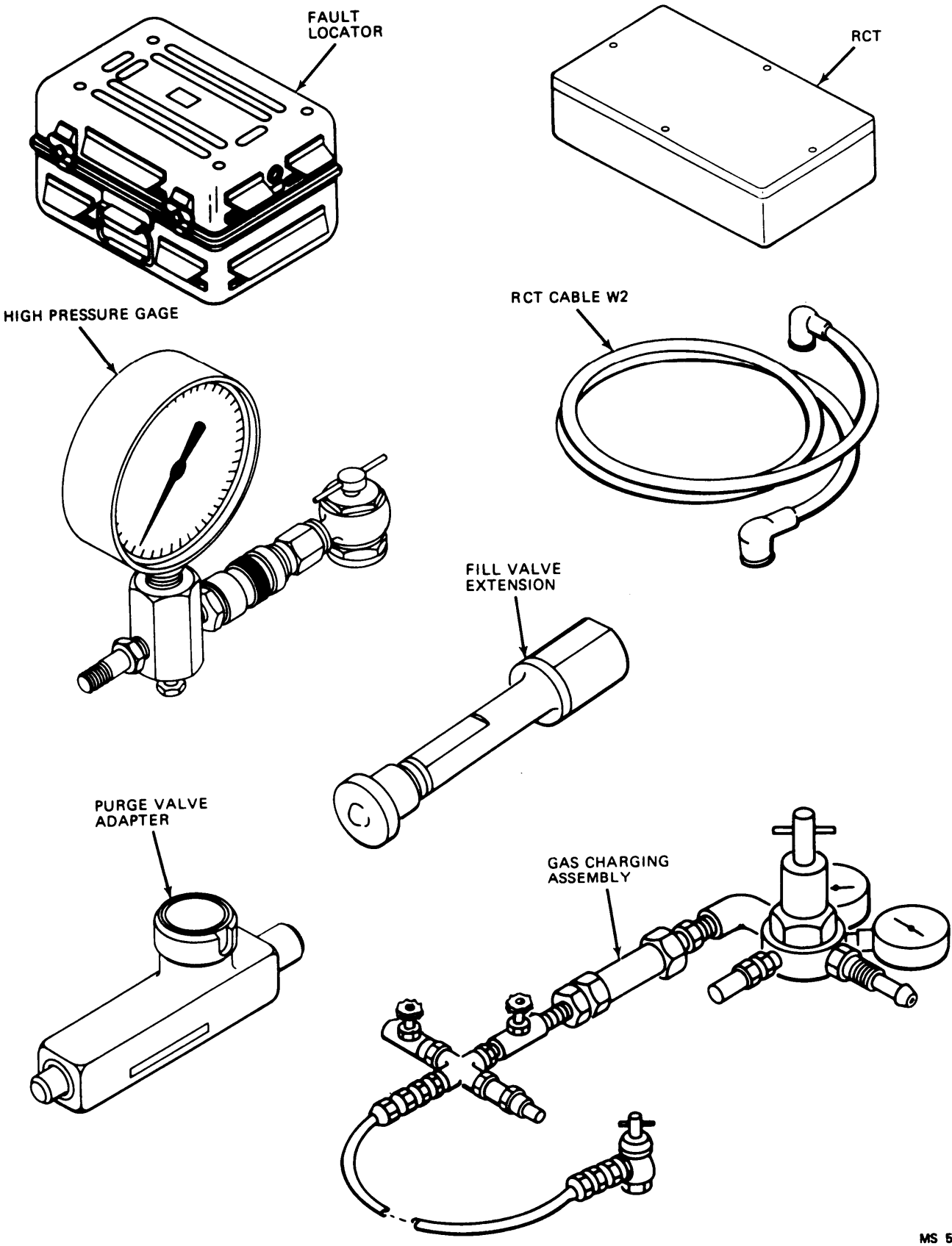


Figure 1-O. GSE (Sheet 1 of 2)

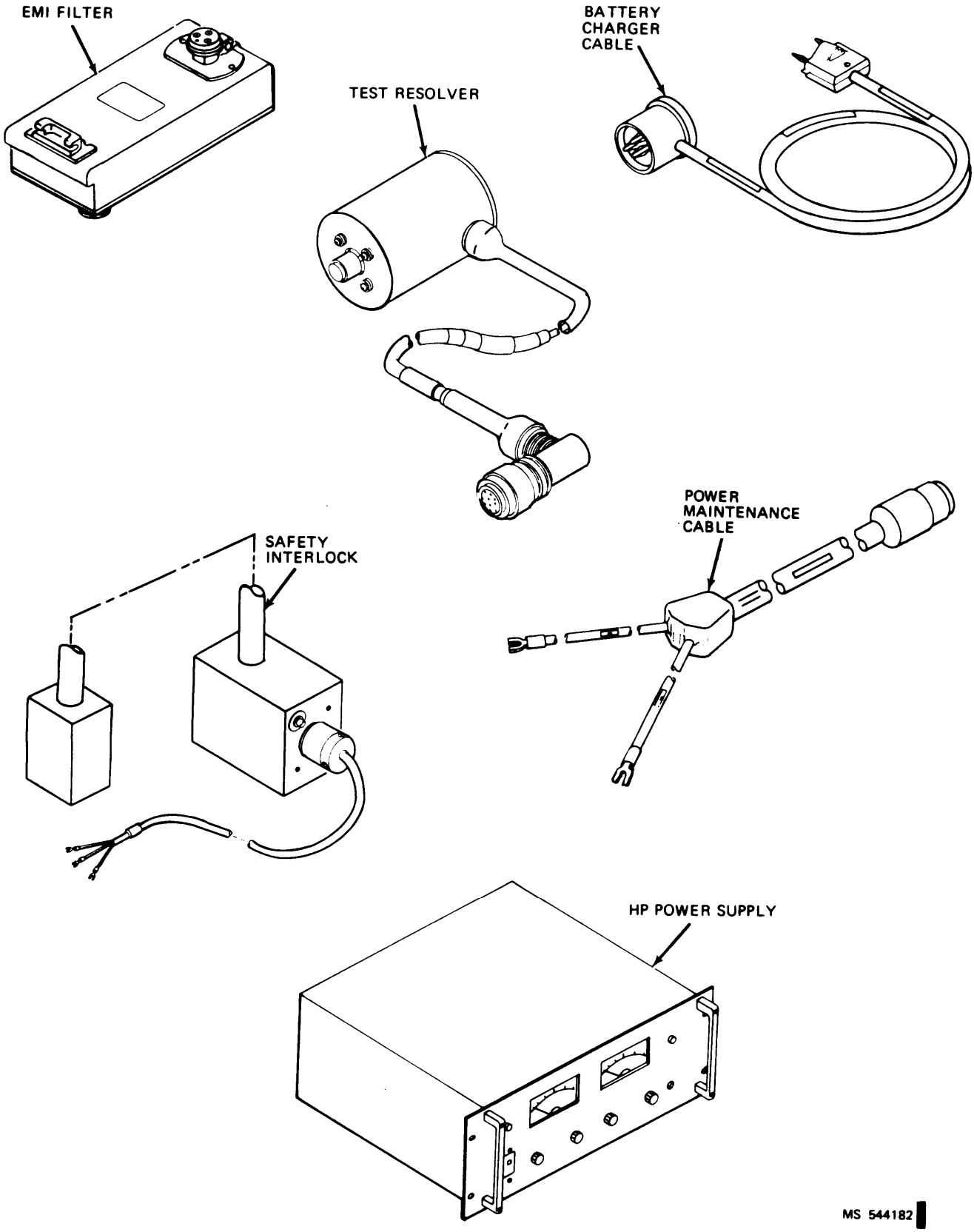


Figure 1-0. GSE (Sheet 2 of 2)

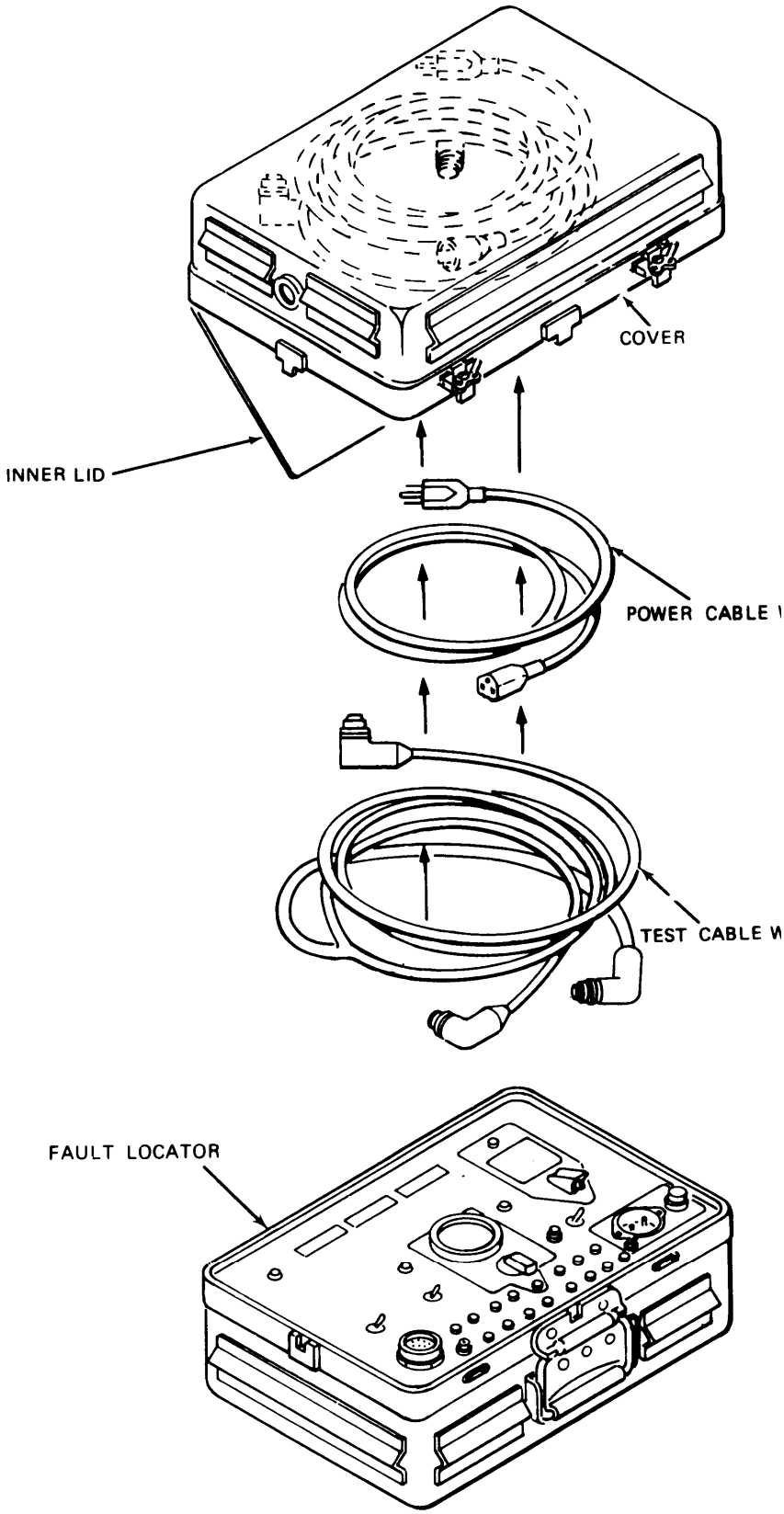


Figure 1-1. Fault Locator

b. Features and Capabilities.

(1) Inner Lid in Cover provides storage space for Test Cable W1 and Power Cable W2.

(2) Provides same readouts (AZ, RNG, EL) as LD/R eyepiece.

(3) Provides remote control of LD/R firing. Remote INHIBIT switches (LASER S1 and HVPS S8) permit troubleshooting of circuits in static conditions.

(4) Provides a meter to monitor all power forms.

(5) Provides test point connectors to monitor signals including signals input to the meter.

(6) Operates from 115V, 60 to 400 Hz.

(7) Contains lamp test for panel indicators.

(8) Tests range capability of LD/R by simulating laser pulse reflection signal.

1-10. REMOTE CAPABILITIES TESTER (RCT)

Characteristics. The RCT (Figure 1-2) is a self-contained, hardwired, passive-switching test set consisting of the RCT Panel, Case Cover, and Combined Case. The weight and dimensions of the RCT are as follows:

Weight:	3 pounds
Height:	3.00 inches
Width:	6.16 inches
Length:	13.66 inches

b. Features and Capabilities.

(1) Simulates FIST Vehicle/LD/R interface for fault isolation of LD/R.

(2) Used with G/VLLD Fault Locator for fault isolation of LD/R replaceable subassemblies.

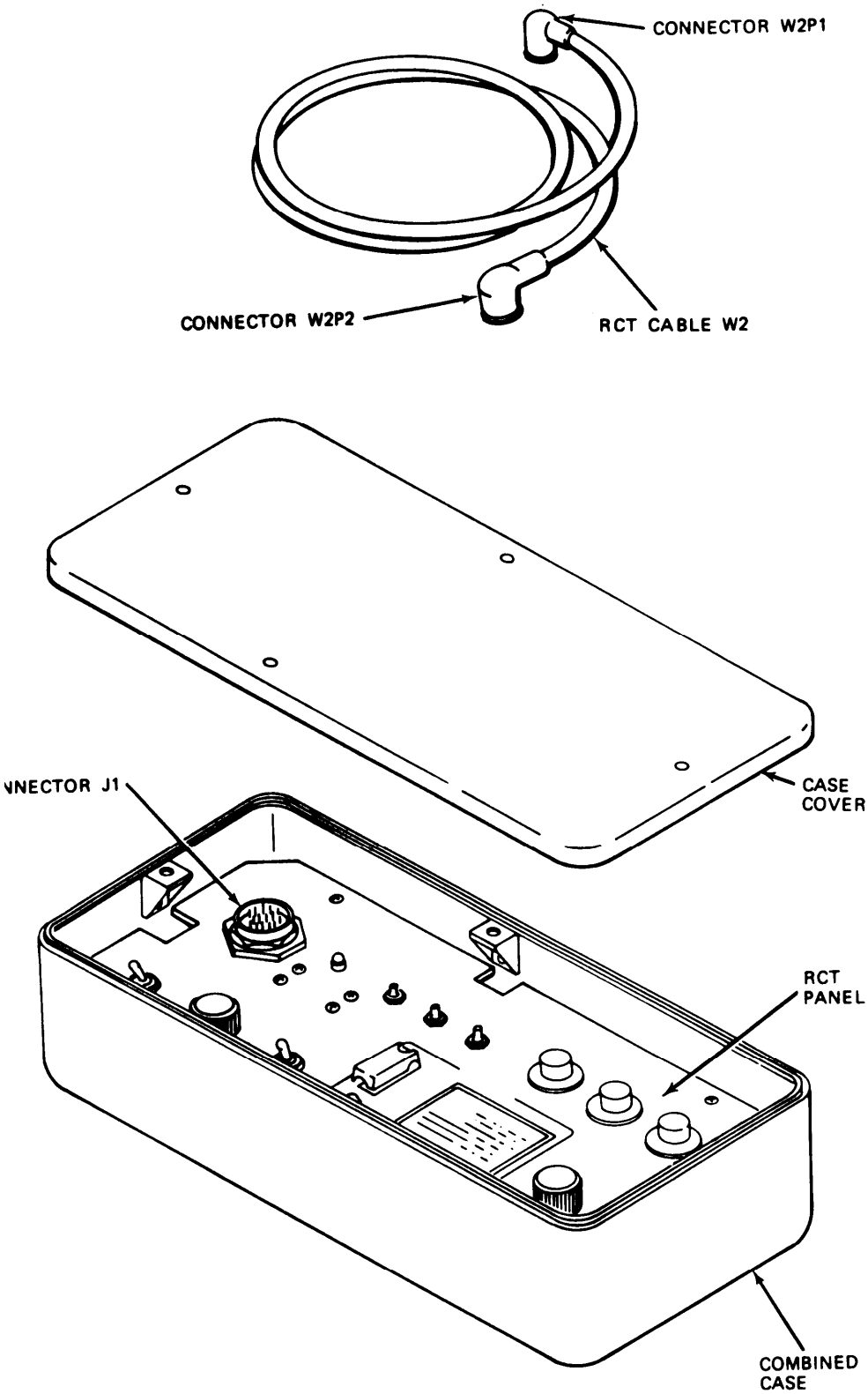


Figure 1-2. RCT and RCT Cable W2

1-11. RCT CABLE W2

a. Characteristics. RCT Cable U2 (Figure 1-2) is approximately 12.5 feet long.

b. Features and Capabilities. Connects RCT to LD/R. Connector W2Pl mates with RCT connector J1. Connector W2P2 mates with LD/R connector 1J7.

1-12. PUR6E AND FILL EQUIPMENT

Characteristics. The Purge and Fill Equipment (Figure 1-3) consists of the Gas[a]Charging Assembly, Purge Valve Adapter, Fill Valve Extension, and High Pressure Gage.

b. Features and Capabilities.

(1) Provides purging and filling of LD/R at high and low pressure.

(2) Checks for leaks in LD/R at low-pressure purge and fill.

(3) Gas Charging Assembly regulates pressure and flow of nitrogen gas into LD/R during high- and low-pressure purge and fill procedures.

(4) Purge Valve Adapter connects Gas Charging Assembly to LD/R low-pressure purge and fill port for low-pressure purge and fill procedures.

(5) Fill Valve Extension connects Gas Charging Assembly to LD/R check valve for high-pressure purge and fill and depressurization procedures.

(6) High Pressure Gage is used to measure nitrogen pressure in LD/R. Gas Charging Assembly can also be used to check nitrogen gas pressure but High Pressure Gage is preferred because less nitrogen gas is lost in the checking process.

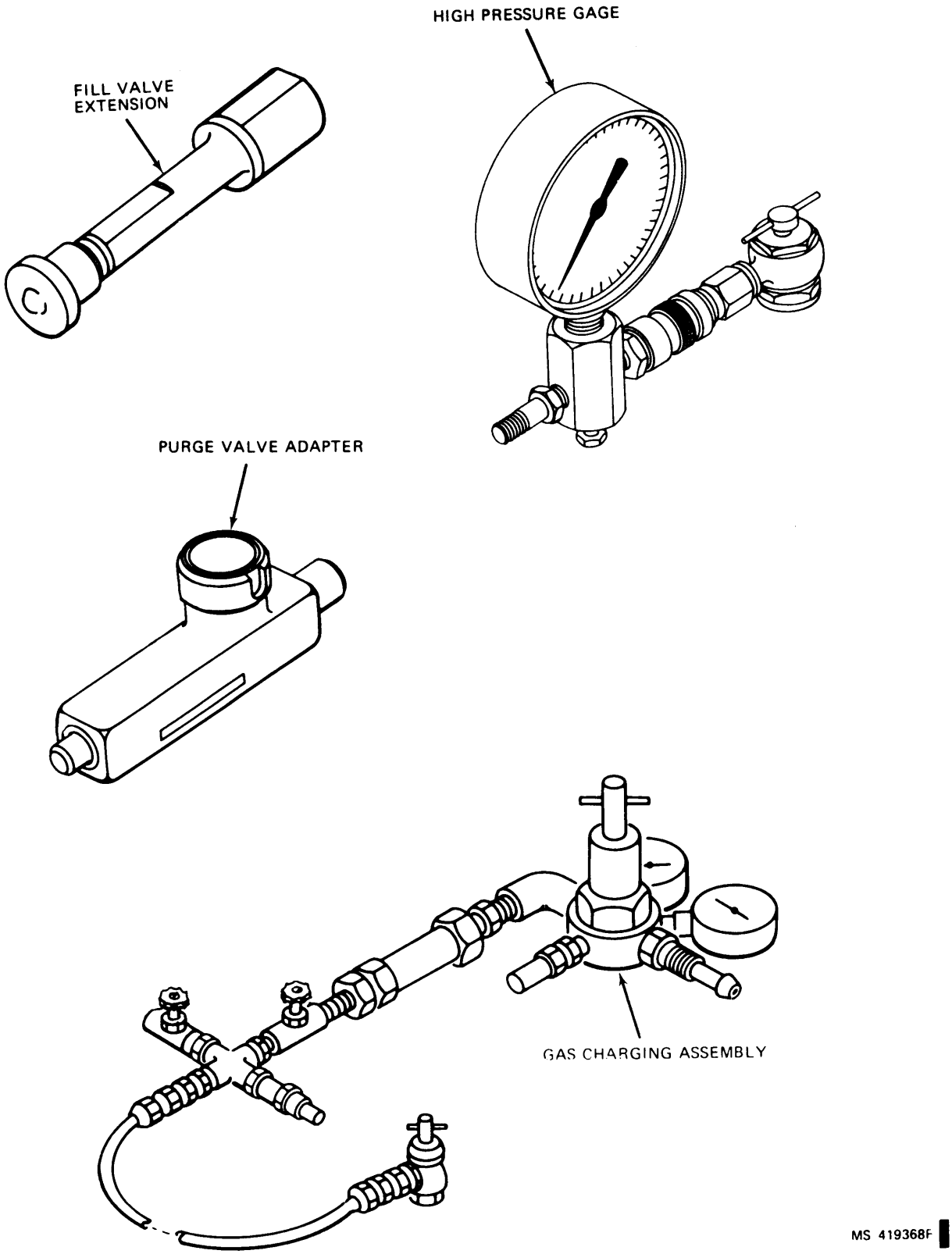


Figure 1-3. Purge and Fill Equipment

1-13. EMI FILTER

a. Characteristics. The approximate weight and dimensions of the EMI Filter (Figure 1-4) are as follows:

Weight:	3.5 pounds
Height:	3.5 inches
Width:	4.0 inches
Length:	9.0 inches

b. Features and Capabilities.

(1) An electromagnetic interference device that filters and regulates power from external power sources (vehicle power or HP Power Supply).

(2) Same size and shape as battery.

(3) Pivot bracket and pin hole allow mounting on LD/R in same way as battery.

(4) 3-hole connector mates with LD/R power connector.

(5) Used with NATO Connector, Slave Cable, and Vehicle Power Cable to provide alternate G/VLLD power source of +24 V for vehicle power operation.

(6) Connector J1 mates with Power Maintenance Cable connector P1 to provide alternate G/VLLD power source of +24 V from HP Power Supply in maintenance van.

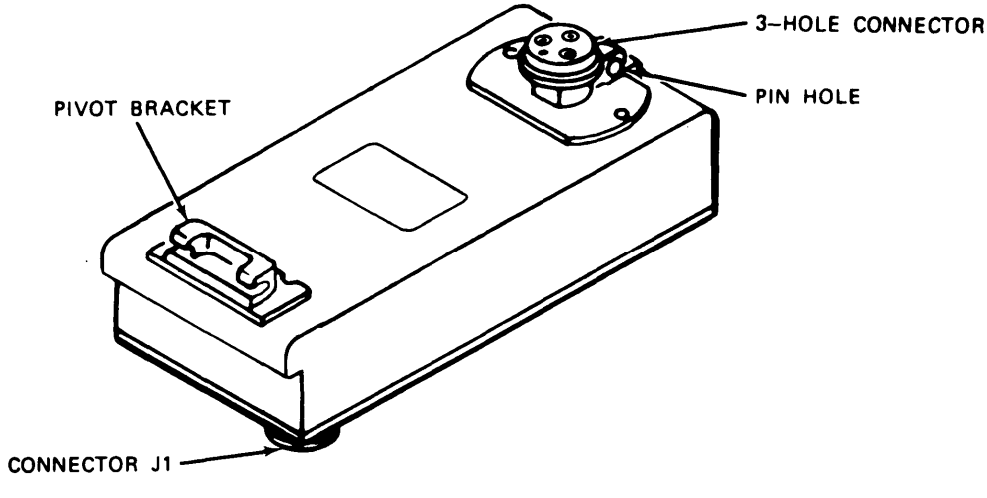


Figure 1-4. EMI Filter

1-14. TEST RESOLVER

a. Characteristics. The Test Resolver (Figure 1-5) is an electromechanical device which consists of a resolver (mounted inside a housing) and a hard-wired cable. The cable is approximately 2.3 feet long. The approximate weight and dimensions of the housing (including the resolver) are as follows:

Weight:	1.0 pound
Length:	3.0 inches
Diameter:	2.2 inches

b. Features and Capabilities.

(1) Tests azimuth and elevation LED displays seen in LD/R eyepiece.

(2) Provides output signals identical to those provided by the TU resolvers.

(3) Cable connector P1 mates with LD/R connector 1J2.

(4) Knob varies resolver test signal and thereby changes LD/R display.

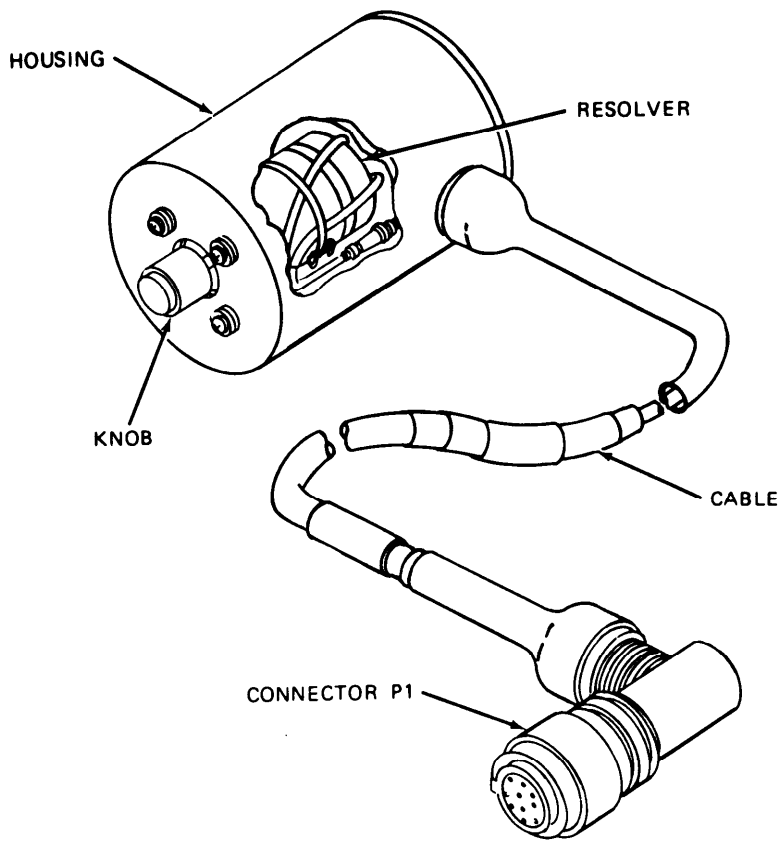


Figure 1-5. Test Resolver

1-15. BATTERY CHARGER CABLE

a. Characteristics. The Battery Charger Cable (Figure 1-6) is approximately 3 feet long with a connector on each end.

b. Features and Capabilities.

(1) Connects Battery Charger to G/VLLD batteries.

(2) One connector mates with Battery Charger connector and the other connector mates with G/VLLD battery connector.

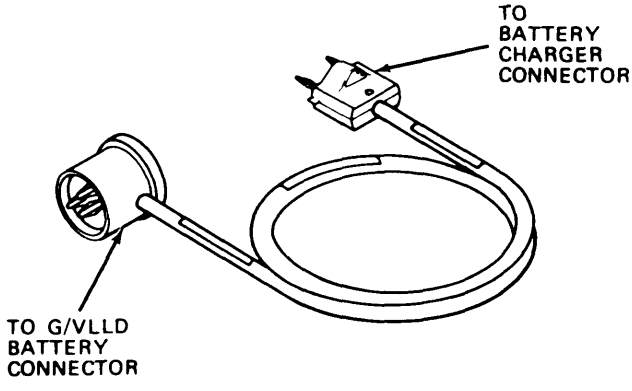


Figure 1-6. Battery Charger Cable

1-16. POWER MAINTENANCE CABLE

Characteristics. The Power Maintenance Cable (Figure 1-7) is approximately 7.2 feet long with two connectors on one end and one connector on the other end.

b. Features and Capabilities.

(1) Connects EMI Filter to HP Power Supply.

(2) Connector P1 mates with EMI Filter connector J1.

(3) Connectors P2 red and P2 black mate with HP Power Supply output terminals.

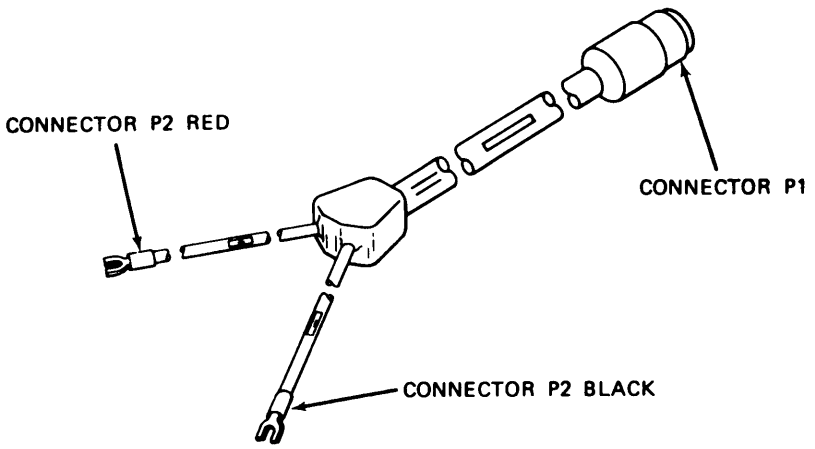


Figure 1-7. Power Maintenance Cable

1-17. HP POWER SUPPLY

a. Characteristics. The approximate weight and dimensions of the HP Power Supply (Figure 1-8) are as follows:

Weight:	76.0 pounds
Height:	7.0 inches
Width:	19.0 inches
Length:	18.9 inches

b. Features and Capabilities.

(1) Provides +24 V output to power G/VLLD for test and troubleshooting.

(2) Variable output voltage O to 40 V dc at O to 30 A.

(3) Overcurrent protection.

(4) Forced-air cooling.

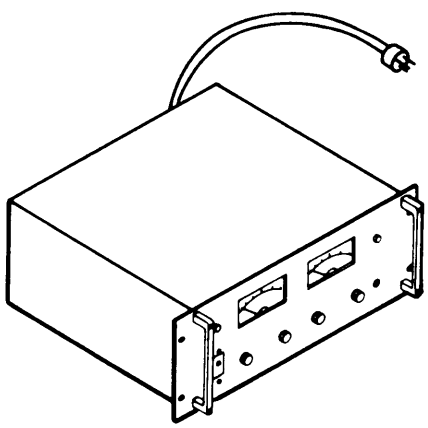
(5) Temperature rating:

(a) Operating: 32 to 131 °F (O to 55 °C).

(b) Storage: -40 to +167 °F (-40 to +75 °C).

(6) HP Power Supply is full rack size and can be rack-mounted in a conventional 19-inch rack panel using standard mounting screws.

(?) Operates from 115 V±10 percent, 57 to 63 Hz.



MS 544183

Figure 1-8. HP Power Supply

1-18. SAFETY INTERLOCK

a. Characteristics. The Safety Interlock (Figure 1-9) is installed in Electronic Shop Shelter AN/ASM-146C to protect personnel entering shelter from G/VLLD laser hazard. The Safety Interlock consists of an electromagnetic relay, a push switch, a sensitive switch, and an electrical power cable with three terminal lugs. These parts are assembled into two small housings connected by wire and raceway conduit.

b. Features and Capabilities.

(1) Disables LD/R laser whenever shelter door is opened by removing power from HP Power Supply (which powers LD/R).

(2) After shelter door is opened, to reactivate power, shelter door must be closed and a push switch must be pressed.

(3) Warning decal next to push switch reads "DANGER WEAR LASER GOGGLES PRIOR TO RESETTING RELAY. INVISIBLE NEODYMIUM LASER RADIATION".

(4) A second warning decal located on shelter door reads "DANGER. AUTHORIZED PERSONNEL ONLY. KNOCK AND WAIT, INVISIBLE NEODYMIUM LASER RADIATION".

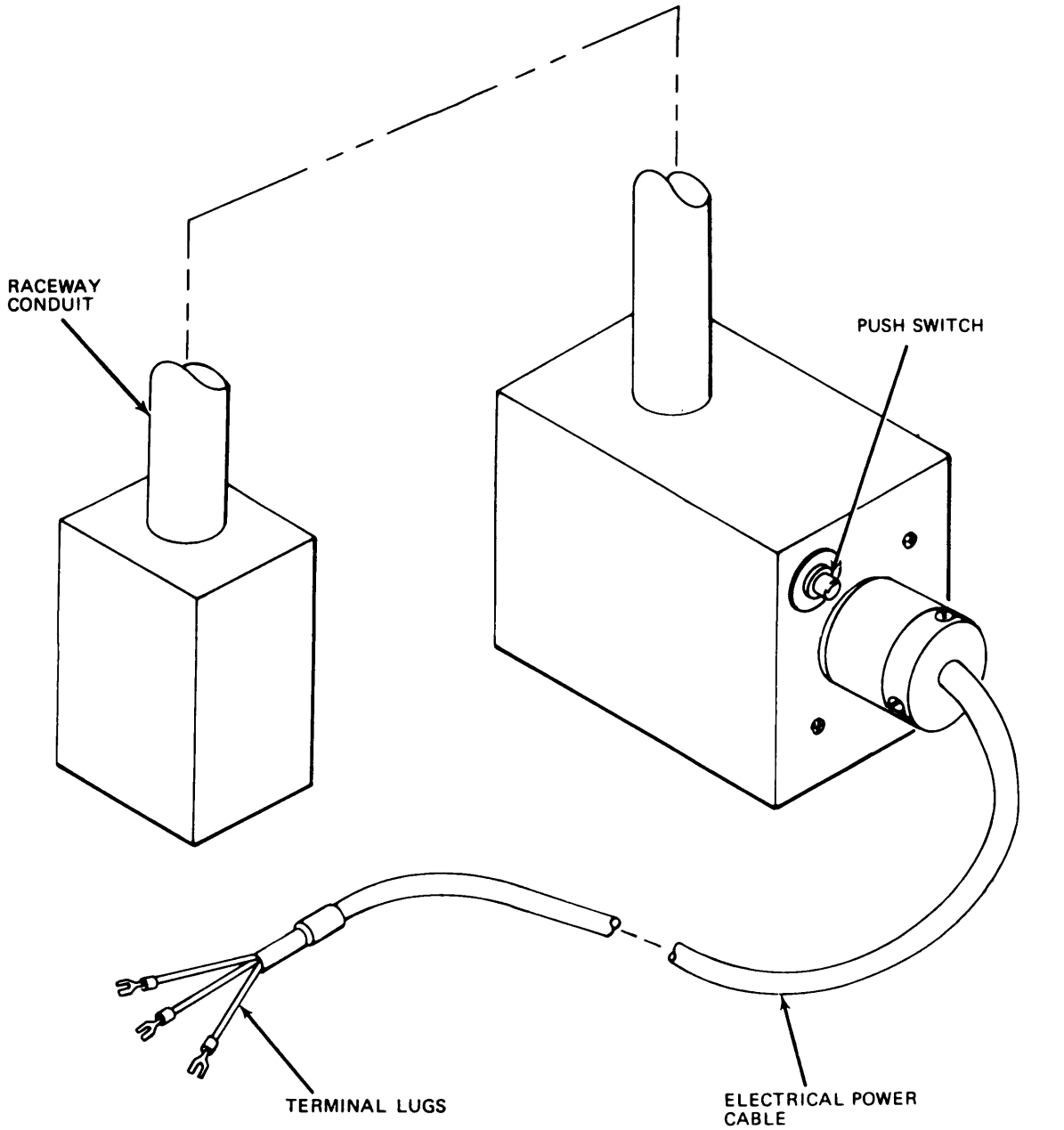


Figure 1-9. Safety Interlock

CHAPTER 2
OPERATION OF GROUND SUPPORT EQUIPMENT

Section I. FAULT LOCATOR

2-1. SCOPE

This section contains theory of operation, description of controls and indicators, operating instructions, and operating instructions for unusual conditions for the Fault Locator.

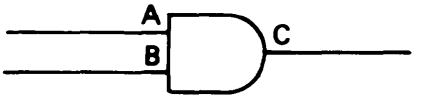
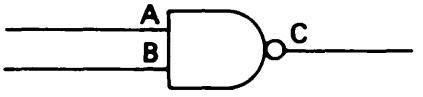
a. Reference Designations. Reference designations are used in the circuit diagrams to identify individual circuit elements (such as resistors, switches, and circuit card assemblies). Reference designations consist of groups of letters and numbers. The letters identify the type of device and the number identifies the individual device. For example, the reference designation, RI, represents a resistor; R2 represents another resistor, and Al represents a circuit card assembly. Reference designations can be combined to identify the relationship of a component to its next higher assembly. For example, the reference designation AIR1 represents resistor R1 on circuit card assembly Al.

The reference designation letter prefixes used in this manual are defined below.

Letter	Definition
A	Assembly
CR	Diode
DS	Display
E	Terminal
F	Fuse
J	Connector jack
K	Relay
M	Meter
L	Inductor
P	Connector plug
PS	Power supply
Q	Transistor
R	Resistor
s	Switch
TP	Test point
W	Cable or wiring
XF	Fuse holder

b. Symbols. Symbols used in the Fault Locator Functional Diagram (FO-1) to show circuits contained on Logic Card Al are defined in Table 2-1.

Table 2-1. Symbols

Symbol	Explanation
	Indicates a complete circuit. Writing inside of box defines circuit.
	Indicates two-input logical "AND" gate. A B C 0 0 0 1 0 0 0 1 0 1 1 1
	Indicates two-input logical "NAND" gate. A B C 0 0 1 1 0 1 0 1 1 1 1 0
	Indicates line signal flow in functional and schematic diagrams. Signal flow is right to left and top to bottom unless specified by arrow.

MS 544070A

2-2. THEORY OF OPERATION

The Fault Locator theory of operation is keyed to areas on the block diagram (Figure 2-1) by white letters placed over black hexagonal symbols. Refer to the functional diagram (Figure FO-1) for circuit detail.

A TEST SELECT Switch S5. Wafer B of S5 selects the signals from the LD/R to be monitored by meter M1. Wafer C of S5 selects the appropriate return for each signal. The signal selected by wafer B is-also applied by S5 wafer A to METER test point TP4 for measurement by external test equipment. Resistor R8 in the meter circuit is a limiting resistor for TP4. Resistors (R9 thru R12) in the meter circuit adjust the signal level for each switch position. The ENERGY ERROR, PFN VOLT SENSE-TA, and +450 V SENSE-TA signals are scaled on Logic Card Al. There is a green band on meter Ml which indicates the required signal level.

B COMPUTER WORD Decoder. The COMPUTER WORD signal from the LD/R contains the azimuth, range, elevation data bits, and a parity bit. Logic Card Al decodes the COMPUTER WORD and displays the data on AZIMUTH, MIL; RANGE, M; and ELEVATION, M display readouts on the Fault Locator. Parity check circuitry checks to see if the COMPUTER WORD is an odd number. (When the COMPUTER WORD is generated by the LD/R, a parity bit is added either as O or 1, so that the COMPUTER WORD is always an odd number.) If the parity check circuit determines that the COMPUTER WORD is not an odd number, it lights the PARITY fail indicator to indicate a data error.

C LASER A-TRIG Indicator. From the LD/R, the A-TRIG signal is applied to the LASER A-TRIG indicator on Logic Card Al. An A-TRIG pulse is generated each time a laser pulse is emitted from the LD/R.

D Buffer circuit. This circuit on Logic Card A1 provides load isolation for the OVERTEMP signal from the LD/R. The buffer circuit also supplies an input to the HVPS controlling OR logic gate in Logic Card Al.

E OVERTEMP Indicator. This indicator on Logic Card A1 lights when the OVERTEMP signal indicates a laser overtemperature condition in the LD/R.

F LAMP TEST Switch S7. S7 tests all indicator lamps and readouts on the Fault Locator for proper operation. A ground is applied to Logic Card Al through S7 to light all indicators and readouts. Readouts display 8888 for AZIMUTH, MIL; 8888 for RANGE, M; and -888 for ELEVATION, MIL.

G HVPS Switch S8. S8 controls the PFN power supply and +450 V power supply in the LD/R. When set to INHIBIT, a ground is provided through S8 to the HVPS-controlling OR logic gate on Logic Card Al.

H OR Logic Circuit. This circuit on Logic Card Al provides the HVPS INHIBIT signal to the LD/R. When an LD/R overtemperature condition exists or when the HVPS switch S8 is set to INHIBIT, the HVPS INHIBIT signal disables the LD/R PFN power supplies.

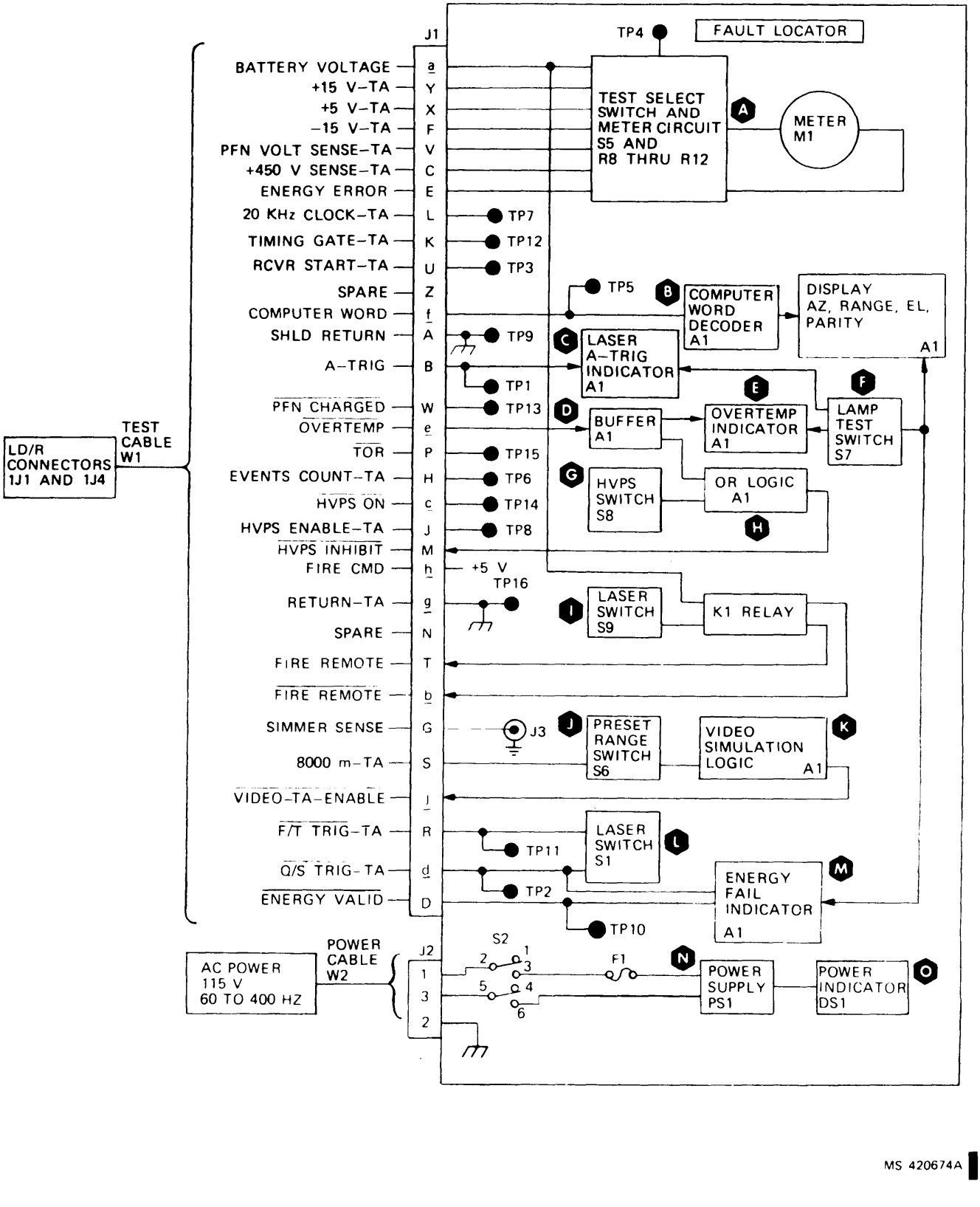


Figure 2-1. Fault Locator Block Diagram

I LASER Switch S9. When set to START, S9 activates laser fire interlock relay K1. BATTERY VOLTAGE and return from the Fault Locator are applied through contacts of S9 to energize K1. BATTERY VOLTAGE goes through K1 and back out of the Fault Locator to the LD/R as the FIRE REMOTE signal. When set to the OFF position, relay K1 is not activated. When set to the ON position, the switch retains the function of the previous position of the switch. That is, when the switch is moved from OFF to ON, K1 remains deactivated, but when the switch is moved from START to ON, K1 remains activated.

J PRESET RANGE Switch S6. When set to ON, S6 allows the 8000M-TA signal from the LD/R to pass through a gate to the video simulation logic on Logic Card A1. When the 8000M-TA signal is applied to the video simulation logic, it outputs two delayed pulses simulating a range of 8300 ±150 meters (LD/R set to RNG 1) or 8800 ±150 meters (LD/R set to RNG 2). This signal is generated by the LD/R as a simulated target return. When S6 is set to OFF, the 8000M-TA signal is prevented from reaching the video simulation logic.

K Video Simulation Logic. This circuit provides the simulated target return to the LD/R. When the 8000M-TA signal is received from the LD/R, an output pulse from a NAND gate in A1 is applied to a pulse delay circuit. The output of this circuit is applied to the LD/R as the VIDEO-TA-ENABLE signal that simulates a target.

L LASER Switch S1. When set to INHIBIT, S1 disables the Q/S TRIG and F/T TRIG signals, which prevents the laser from firing. In the ENABLE position, the signals are unaffected and the laser can be fired.

M ENERGY FAIL Indicator. Low LD/R laser output energy is indicated by the ENERGY FAIL indicator on Logic Card A1, which duplicates the LD/R eyepiece red indicator.

N Power Supply PS1. PS1 provides +5 V power for the Fault Locator. The power supply generates the +5 V operating voltage from the 115 V, 60 to 400-Hz input applied through POWER switch S2 and POWER fuse F1.

O POWER Indicator DS1. DS1 lights when +5 V is present at the output of PSI.

2-3. CONTROLS AND INDICATORS

The controls and indicators of the Fault Locator are all located on the panel illustrated in Figure 2-2.

The controls and indicators are explained in Table 2-2. Panel nomenclature is shown in Figure 2-2; reference designators are shown on the functional diagram (Figure FO-1).

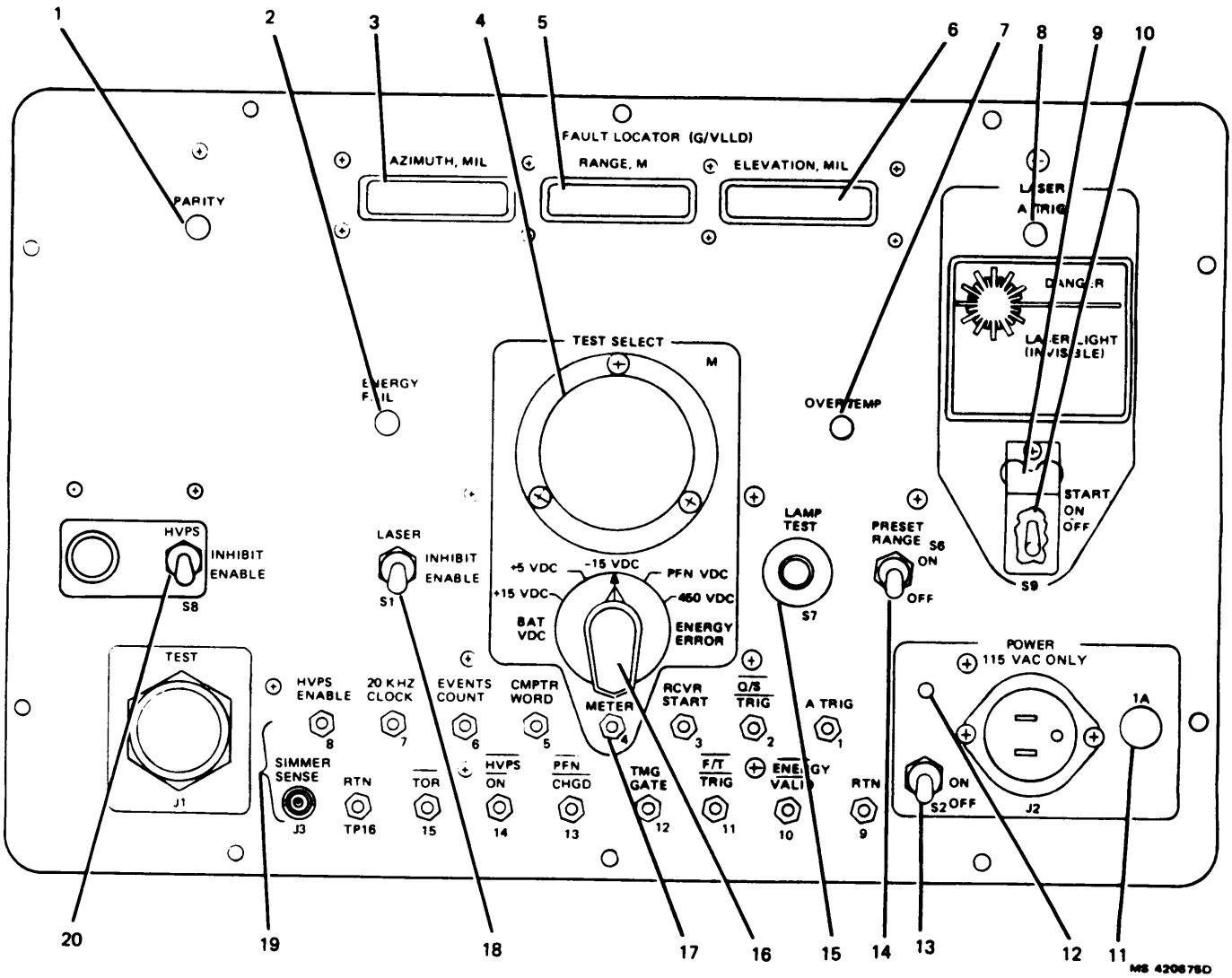


Figure 2-2. Fault Locator Controls and Indicators

Table 2-2. Fault Locator Controls and Indicators

Key to Figure 2-2	Switch, Control, or Instrument	Function
1	PARITY indicator	Indicates one or more of the bits of the data word from LD/R are incorrect.
2	ENERGY FAIL indicator	Indicates low LD/R laser output (duplicates full-on red LD/R eyepiece readout).
3	AZIMUTH, MIL readout	Displays azimuth data received from LD/R in roils (4 digits).
4	TEST SELECT meter	Indicates voltage of signal selected by TEST SELECT switch. Green band indicates region of acceptance.
5	RANGE, M readout	Displays range data received from LD/R in meters (4 digits).
6	ELEVATION, MIL readout	Displays elevation data received from LD/R in roils (3 digits with minus (-) sign for negative, no polarity indication for positive).
7	OVERTEMP indicator	Indicates LD/R is overheating (duplicates blinking red LD/R eyepiece readout).
8	LASER A-TRIG indicator	Indicates LD/R is lasing and senses each pulse.
9	LASER switch cover	Prevents accidental firing. (See label on panel for hazard warning.)
10	LASER switch S9	START (momentary) - Fires laser (if LD/R POWER switch is set to ON). ON - Same as OFF. OFF - Disables Laser Fire Commands Safety Relay inside of Fault Locator.
11	POWER fuse	Provides overload protection.
12	POWER indicator	Indicates POWER S2 switch is in ON position and 115 V ac is applied to circuits.

Table 2-2. Fault Locator Controls and Indicators - Continued

Key to Figure 2-2	Switch, Control, or Instrument	Function
13	POWER switch S2	ON - Applies power to Fault Locator circuits through POWER fuse. OFF - Removes power from Fault Locator circuits.
14	PRESET RANGE switch S6	Controls application of LD/R 8300 ±150 M and 8800 ±150 M VIDEO SIMULATOR signal–to LD/R Video Pulse Processing circuits.
15	LAMP TEST switch S7	Applies power to all Fault Locator indicators and readouts for built-in-test.
16	TEST SELECT switch S5	Selects signal from LD/R to be monitored on TEST SELECT meter.
17	TEST SELECT METER test point TP4	Provides test point for LD/R signals applied to TEST SELECT meter.
18	LASER switch S1	Controls FLASHLAMP and Q-SWITCH firing circuits to allow PFN testing without firing laser.
19	Test points (1 thru 16, J3)	Provides test points for monitoring of signals shown on panel.
20	HVPS switch S8	Controls PFN power supply. When in INHIBIT, disables PFN power supply.

2-4. OPERATING INSTRUCTIONS

a. Remove cover as follows:

(1) Press automatic relief valve on cover to equalize pressure.

(2) Loosen four wing nuts on cover.

(3) Push down and out on four cover clips to clear lip on Fault Locator case.

(4) Remove and invert cover.

b. Check Fault Locator panel to ensure that all switches are in OFF or INHIBIT position. (TEST SELECT switch S5 may be in any position.)

c. Remove Test Cable W1 and Power Cable W2 from cover as follows:

(1) Press on center of two inner lid clips and pull on outer parts.

(2) Pull inner lid open and remove Test Cable W1 and Power Cable W2.

d. Connect Test Cable W1 and Power Cable W2 per Figure 2-3.

e. Set POWER switch S2 to ON (POWER indicator lights and digital readout displays indicate all zeros).

f. Press LAMP TEST switch S7 while observing panel indicators and readouts. Indications are as follows:

(1) All indicators light (PARITY, LASER A-TRIG, ENERGY FAIL, and OVERTEMP).

(2) POWER indicator remains on.

(3) Readouts indicate as follows:

AZIMUTH, MIL	8888
RANGE, M	8888
ELEVATION, MIL	-888

NOTE

Indicators and readouts may be in any state after releasing LAMP TEST switch S7.

g. Set POWER switch S2 to OFF and then set to ON.

h. Set TEST SELECT switch S5 to each position while observing TEST SELECT meter. Meter indicator needle remains at zero for each position if LD/R is not operating or is not connected. ENERGY ERROR position indicates approximately 0.6 on meter. If LD/R is connected and operating, meter indicates status of signals from LD/R.

WARNING

While Fault Locator is connected to LD/R, operator can fire LD/R laser. Observe all WARNINGS in front of this manual.

i. Operate Fault Locator to troubleshoot LD/R per TM 9-1260-477-34-2.

j. Shut down Fault Locator as follows:

(1) Set POWER switch S2 to OFF (all indicators and readouts are off).

(2) Set all switches to OFF or INHIBIT position. (TEST SELECT switch S5 may be in any position.)

(3) Disconnect Test Cable W1 and Power Cable W2.

(4) Stow Test Cable W1 and Power Cable W2 in cover. Close inner lid and press on outer parts of two inner lid clips to secure inner lid.

(5) Install cover, engage four cover clips on lip provided on Fault Locator case, and press up and in on clips. Tighten four wing nuts on cover.

2-5. OPERATION UNDER UNUSUAL CONDITIONS

Follow normal operating instructions. Avoid getting water into electrical connectors or on exposed electrical pins.

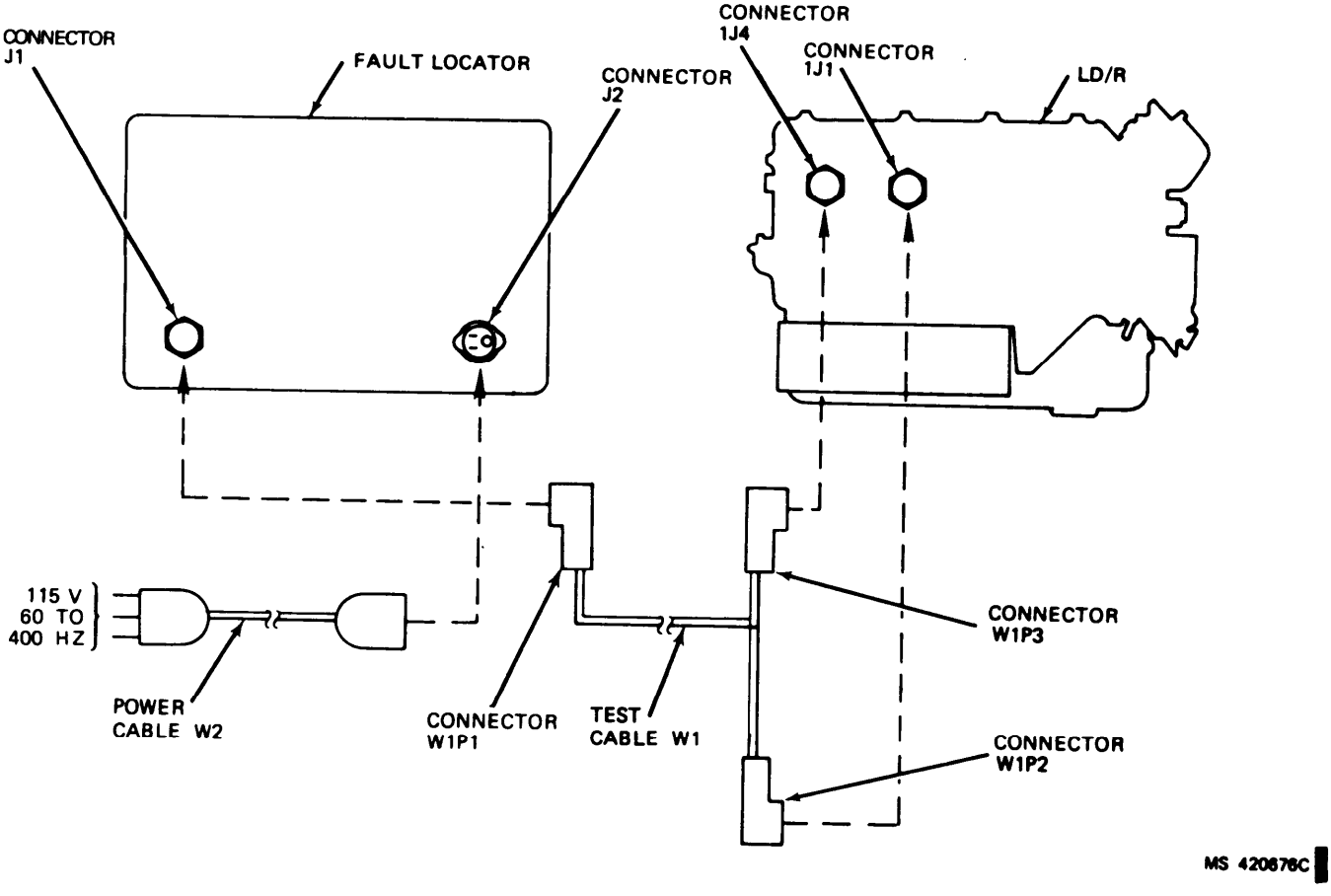


Figure 2-3. Fault Locator Interface

Section II. REMOTE CAPABILITIES TESTER

2-6. SCOPE

This section contains diagrams and general theory to familiarize maintenance personnel with component functions of the Remote Capabilities Tester (RCT). This information will assist personnel in the operation and repair of the RCT. The theory of operation is explained using the block diagram in Figure 2-4. The schematic diagram in Figure FO-3 may be used for references to RCT circuitry.

2-7. THEORY OF OPERATION

The following RCT general operation theory areas are keyed to corresponding areas on the block diagram (Figure 2-4) by use of white letters on a black hexagonal symbol . Refer to the schematic diagram (Figure FO-3) for circuit details.

A The LASER FIRE switch S4 remotely fires the LD/R laser. It simulates remote laser firing from the FIST vehicle.

B The LASER ARMED indicator XDS1 lights when the LD/R laser is in standby mode of operation.

C The RETICLE BRIGHTNESS variable-resistance potentiometer R2 adjusts the brightness of the reticle in the LD/R eyepiece. It simulates the adjustment of the reticle brightness from the FIST vehicle.

D The FIRE CMD switch S2 provides a fire command signal to the UVR. It simulates the signal which is sent to the LD/R from the Digital Message Device (DMD).

E The MODE switch S1 provides selection of the laser mode It allows remote selection of either the designate (DES), range (RNG), or azimuth adjust (AZ ADJ) modes.

F The TESTER ON indicator XDS2 lights when +24 VDC is provided to the RCT through connector J1.

G The Range SELECT switch S3 provides selection of either RNG 1 or RNG 2 ranging mode in the LD/R. It provides remote selection of ranging mode.

H The octal code switches, S5, S6, and S7, provide a pulse repetition frequency (prf) code to the LD/R. Switches permit prf code to be set remotely.

I The test points permit measurement of the serial computer word signal from the LD/R. This signal contains azimuth, range, and elevation information, and the energy fail indication.

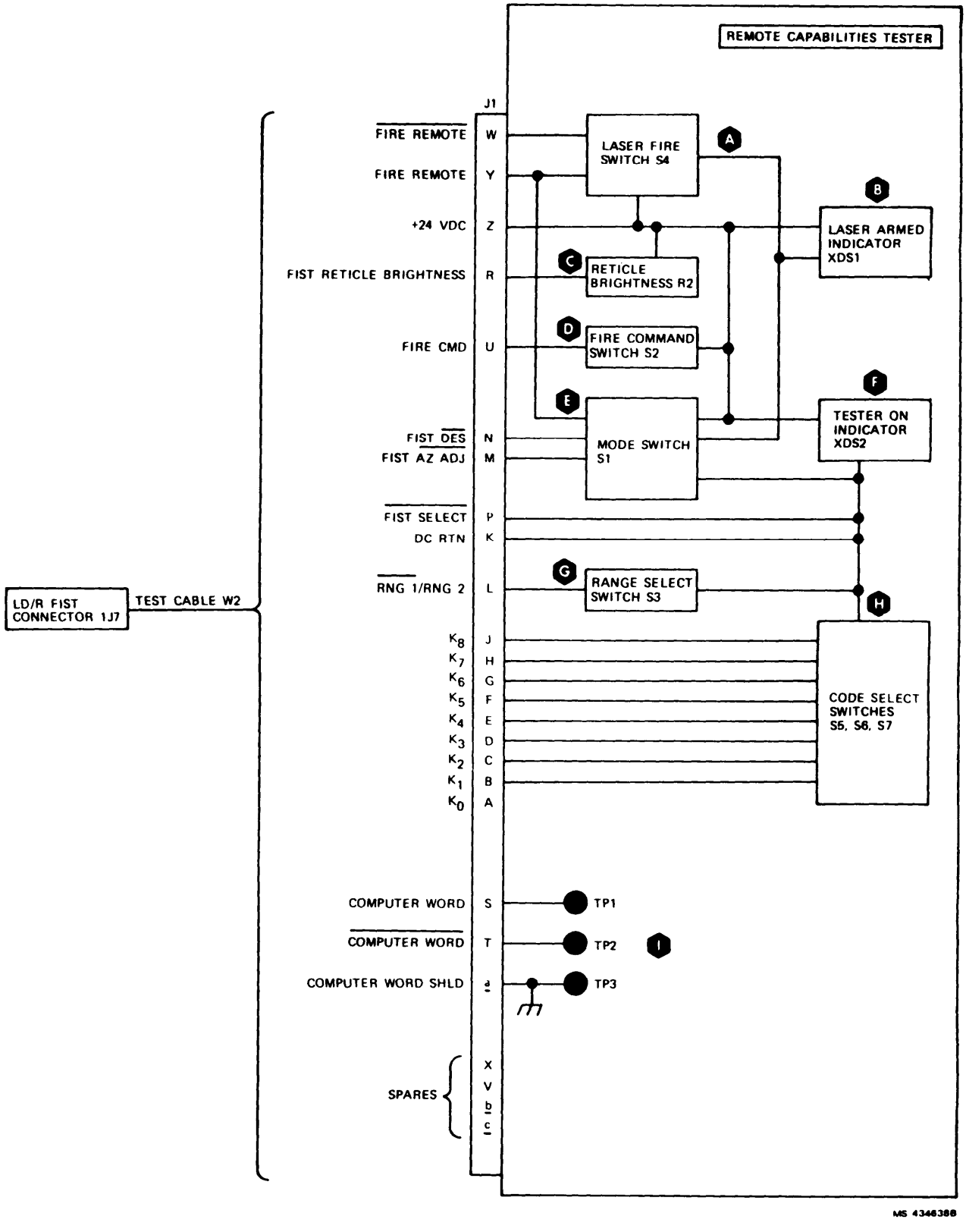


Figure 2-4. Remote Capabilities Tester Block Diagram

2-8. CONTROLS AND INDICATORS

The controls and indicators and panel nomenclature of the RCT are shown in Figure 2-5.

The function of the controls and indicators is explained in Table 2-3.

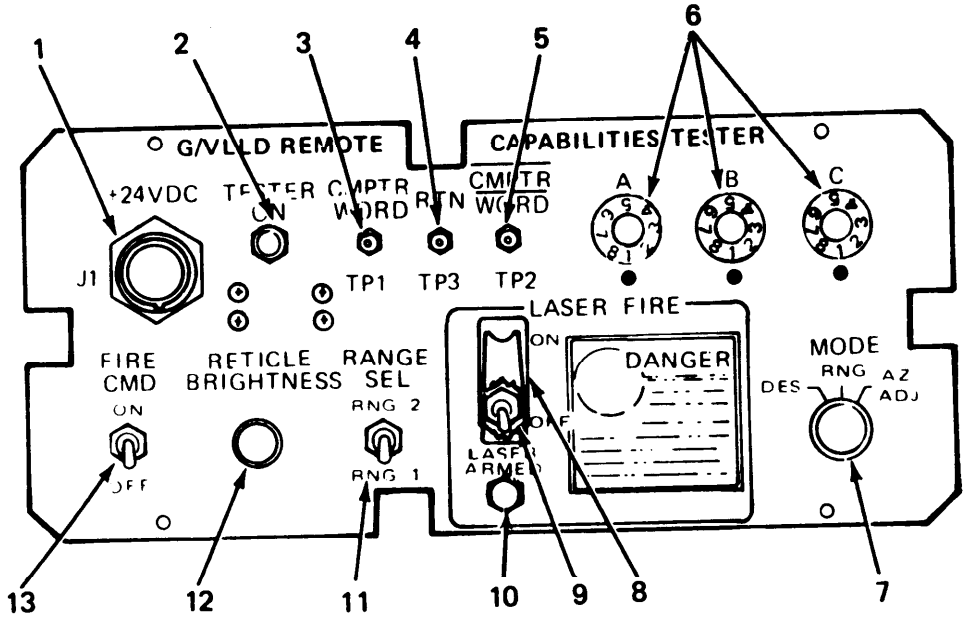


Figure 2-5. Remote Capabilities Tester Controls and Indicators

Table 2-3. Remote Capabilities Tester Controls and Indicators

Key to Figure 2-5	Switch, Control, or Instrument	Function
1	RCT Cable Connector J1	Input and output for 24 VDC and LD/R FIST signals through the RCT cable assembly.
2	TESTER ON indicator XDS2	Indicates 24 VDC is applied to RCT circuits.
3	CMPTR WORD test point (TP1)	Provides test point for monitoring CMPTR WORD signal.
4	RTN test point (TP3)	Provides test point RTN when monitoring CMPTR WORD or CMPTR WORD signal.
5	CMPTR WORD test point (TP2)	Provides test point for monitoring CMPTR WORD signal.
6	Code Select switches A, B, C (S5, S6, S7)	Provides prf code inputs to LD/R.
7	MODE select switch S1	Selects DES, RNG, or AZ ADJ mode of operation.
8	LASER FIRE switch cover	Prevents accidental firing (See label on panel for hazard warning).
9	LASER FIRE switch S4	ON -- Fires laser. OFF -- Disables laser fire relay in tester.
10	LASER ARMED indicator XDS1	Indicates LD/R armed and may be fired.
11	RANGE SEL switch S3	Selects RNG 1 or RNG 2 mode of operation for LD/R.
12	RETICLE BRIGHTNESS control R2	Adjusts brightness of reticle display in LD/R eyepiece.
13	FIRE CMD switch S2	ON -- Inputs FIRE CMD siqnal to LD/R. OFF -- FIRE CMD signal is not remotely inputted to LD/R.

2-9. OPERATING INSTRUCTIONS

Refer to TM 9-1260-477-34-2.

2-10. OPERATION UNDER UNUSUAL CONDITIONS

Follow normal operating instructions. Avoid getting water into electrical connectors or on exposed electrical pins.

Section III. PURGE AND FILL EQUIPMENT

2-11. SCOPE

This section contains theory of operation, description of controls and indicators, operating instructions, and operating instructions for unusual conditions for the Purge and Fill Equipment.

2-12. THEORY OF OPERATION

The Purge and Fill Equipment is used during maintenance of the LD/R.

a. The Gas Charging Assembly is connected between the nitrogen source and the LD/R (using either the Fill Valve Extension or the Purge Valve Adapter). It regulates the pressure and the flow of nitrogen gas into the LD/R during high- and low-pressure purge and fill procedures.

b. The Purge Valve Adapter is connected between the Gas Charging Assembly and the LD/R low-pressure purge and fill port for low-pressure purge and fill procedures.

c. The Fill Valve Extension is connected between the Gas Charging Assembly and the LD/R check valve for high-pressure purge and fill and depressurization procedures.

d. The High Pressure Gage is used to measure the nitrogen pressure in the LD/R.

2-13. CONTROLS AND INDICATORS

The controls and indicators for the Purge and Fill Equipment are described in Table 2-4 and illustrated in Figure 2-6.

2-14. OPERATING INSTRUCTIONS

Refer to TM 9-1260-477-34-2.

2-15. OPERATION UNDER UNUSUAL CONDITIONS

Follow normal operating instructions.

Table 2-4. Purge and Fill Equipment Controls and Indicators

Key to Figure 2-6	Switch, Control, or Instrument	Function
1	Regulator Pressure Gage	Indicates pressure in Regulator.
2	Input Pressure Gage	Indicates supply pressure.
3	Regulator Relief Valve	Allows excess nitrogen to escape.
4	Charging Relief Valve	Allows excess nitrogen to escape.
5	Connection Valve	Connects Gas Charging Assembly to Purge Valve Adapter and Fill Valve Extension.
6	High Pressure Gage	Indicates LD/R high pressure.
7	Valve Deflator	Connects High Pressure Gage to Fill Valve Extension.
8	Fill Valve Extension	Allows nitrogen to fill LD/R check valve.
9	Relief Valve	Allows excess nitrogen to escape.
10	Purge Valve Adapter	Regulates gas pressure at 5 psig.
11	Vent Valve	Vents nitrogen from Gas Charging Assembly.
12	Main Valve	Allows nitrogen to remain in Gas Charging Assembly when closed.
13	Regulator Pressure Tee Handle	Regulates and allows nitrogen to fill Gas Charging Assembly.

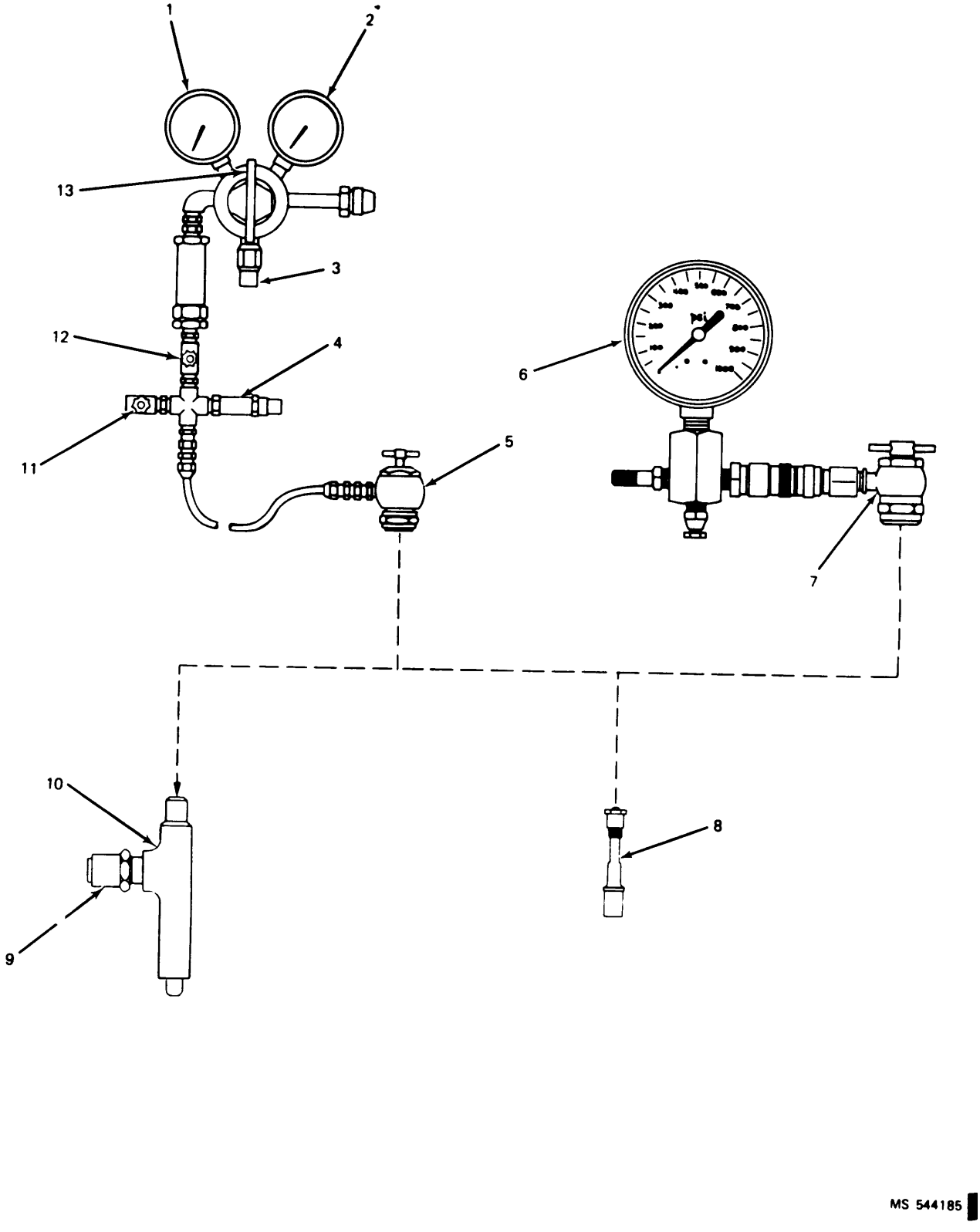


Figure 2-6. Purge and Fill Equipment Controls and Indicators

Section IV. EMI FILTER AND POWER MAINTENANCE CABLE

2-16. SCOPE

This section contains theory of operation, description of controls and indicators, operating instructions, and operating instructions for unusaual conditions for the EMI Filter and Power Maintenance Cable.

2-17. THEORY OF OPERATION

The EMI Filter is used with the Power Maintenance Cable to connect the HP Power Supply to the LD/R (Figure 2-7). The EMI Filter connects between the LD/R and the Power Maintenance Cable and filters the +24 V input to the LD/R. Inputs to the EMI Filter are +24 V and +24 V RTN. Outputs from the EMI Filter are +24 V to the LD/R on EMI Filter connector 2P3(+) and +24 V RTN on EMI Filter connector 2P1(-).

For detailed information on the EMI Filter, refer to TM 9-1260-477-34-2.

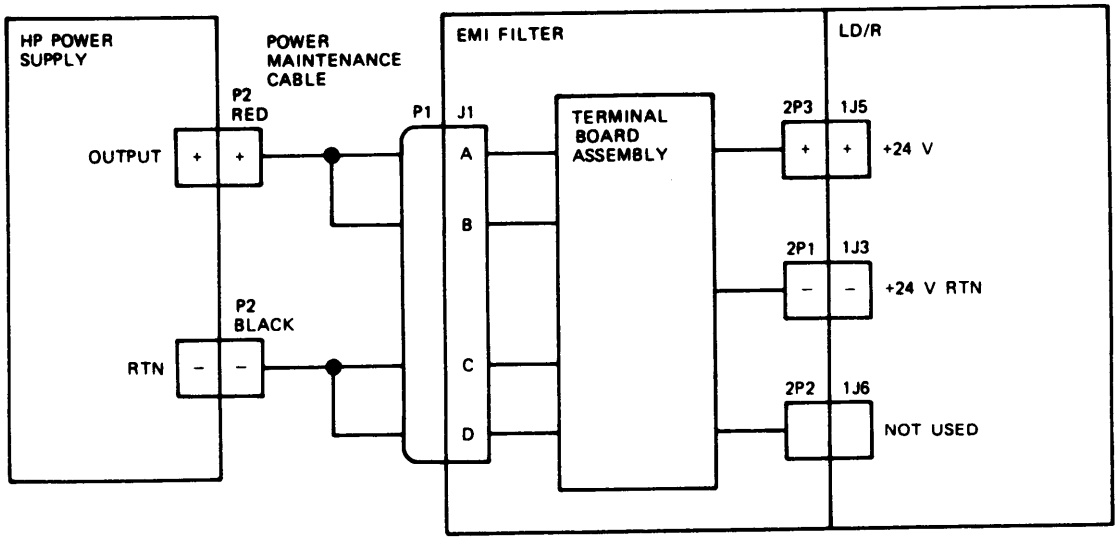


Figure 2-7. EMI Filter and Power Maintenance Cable Attachment to LD/R and HP Power Supply

2-18. CONTROLS AND INDICATORS

The controls and indicators for the EMI Filter and Power Maintenance Cable are described in Table 2-5 and illustrated in Figure 2-8.

Table 2-5. EMI Filter and Power Maintenance Cable Controls and Indicators

Key to Figure 2-8	Switch, Control, or Instrument	Function
3	EMI Filter connector J1	Mates with Power Maintenance Cable connector P1 (4).
4	Power Maintenance Cable connector P1	Mates with EMI Filter connector J1 (3).
5	Power Maintenance Cable connector P2 black	Mates with HP Power Supply RTN (-) (6).
7	Power Maintenance Cable connector P2 red	Mates with HP Power Supply output (+) (8).
10	Pin hole in EMI Filter connector J1	Connects to LD/R battery release pin (13).
11	EMI Filter connector J1	Mates with LD/R power connector (1).
12	EMI Filter pivot bracket	Allows EMI Filter (9) to pivot on LD/R (2).

2-19. OPERATING INSTRUCTIONS

Refer to TM 9-1260-477-34-2.

2-20. OPERATION UNDER UNUSUAL CONDITIONS

Follow normal operating instructions. Avoid getting water into electrical connectors or on exposed electrical pins.

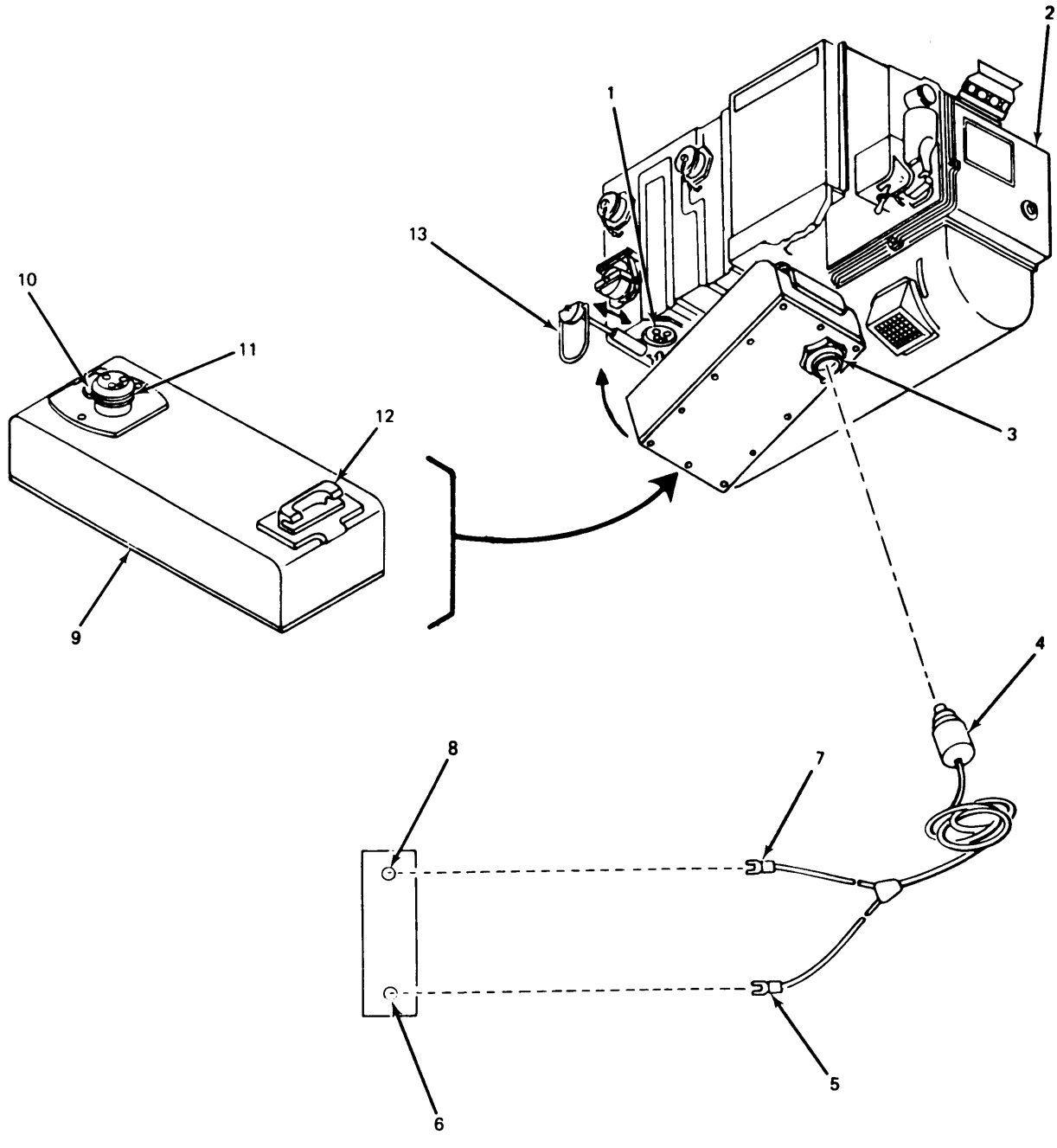


FIgure 2-8. EMI Filter and power Maintenance Cable Controls and Indicators

Section V. TEST RESOLVER

2-21. SCOPE

This section contains theory of operation, description of controls and indicators, operating instructions, and operating instructions for unusual conditions for the Test Resolver.

2-22. THEORY OF OPERATION

The Test Resolver is used to test the azimuth and elevation LED displays seen in the LD/R eyepiece. The Test Resolver connects to LD/R connector 1J2 which is the same connector that the TU cable connects to during actual system operation. The Test Resolver provides output signals identical to those provided by the TU Resolver.

2-23. CONTROLS AND INDICATORS

The controls and indicators for the Test Resolver are described in Table 2-6 and illustrated in Figure 2-9.

Table 2-6. Test Resolver Controls and Indicators

Key to Figure 2-9	Switch, Control, or Instrument	Function
1	Resolver	Outputs signals that indicate rotor position relative to stator.
2	Cable connector P1	Connects Test Resolver to LD/R connector 1J2 (3).
4	Knob	Varies TU Resolver test signal and thereby changes LD/R display.

2-24. OPERATING INSTRUCTIONS

Refer to TM 9-1260-477-34-2.

2-25. OPERATION UNDER UNUSUAL CONDITIONS

Follow normal operating instructions. Avoid getting water into electrical connectors or on exposed electrical pins.

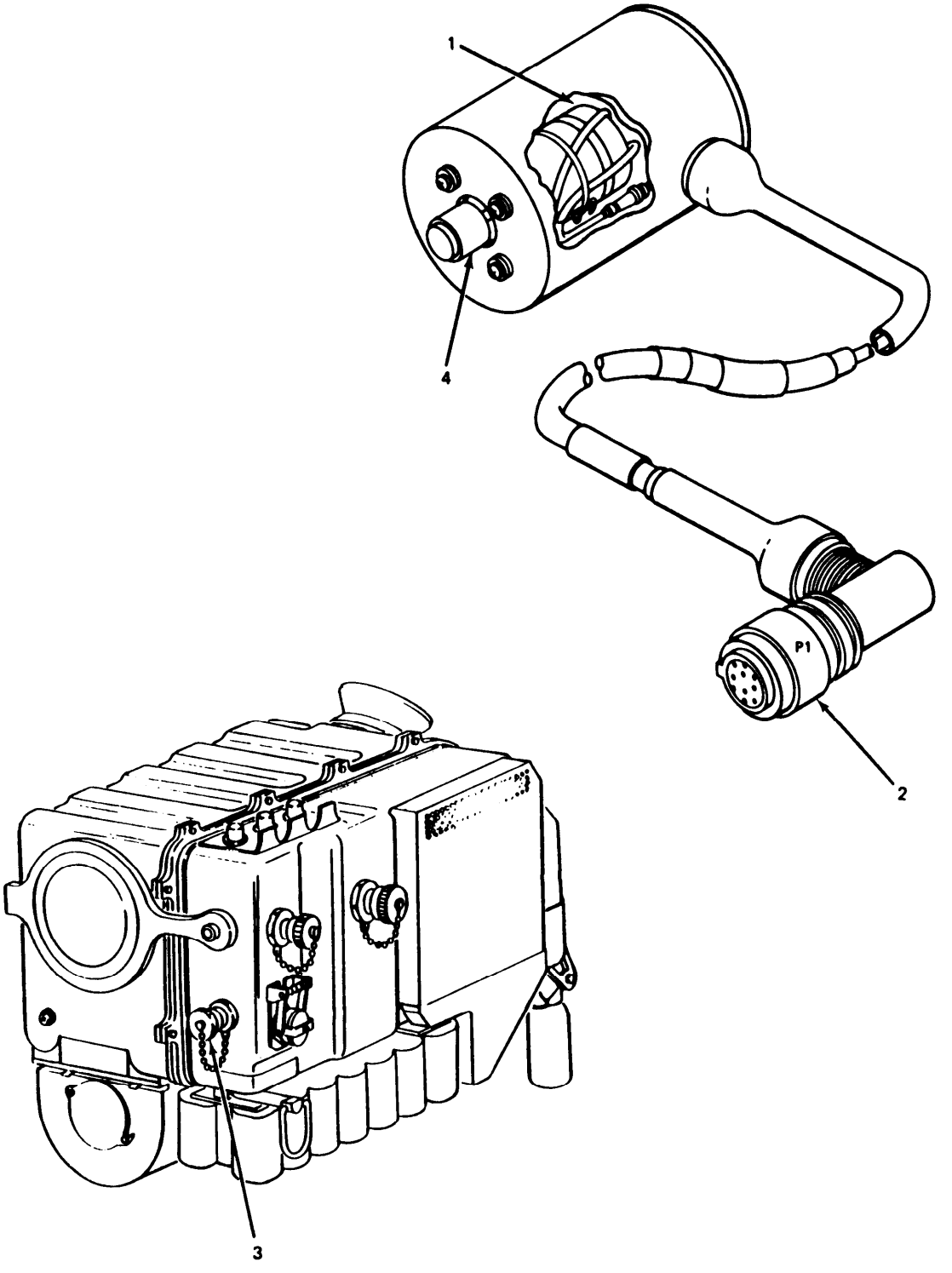


Figure 2-9. Test Resolver Controls and Indicators

Section VI. HP POWER SUPPLY

2-26. SCOPE

This section contains theory of operation, description of controls and indicators, operating instructions, and operating instructions for unusual conditions for the HP Power Supply.

2-27. THEORY OF OPERATION

The HP Power Supply can operate in either a constant voltage or constant current mode. For G/VLLD test and troubleshooting, the constant voltage mode is used. The output voltage is set to +24 V (or some other value as directed by the troubleshooting procedures in TM 9-1260-477-34-2) using the front panel VOLTAGE controls. The CURRENT controls then are used to establish the current limit. If the current limit is reached, the voltage drops automatically so that the current limit is not exceeded.

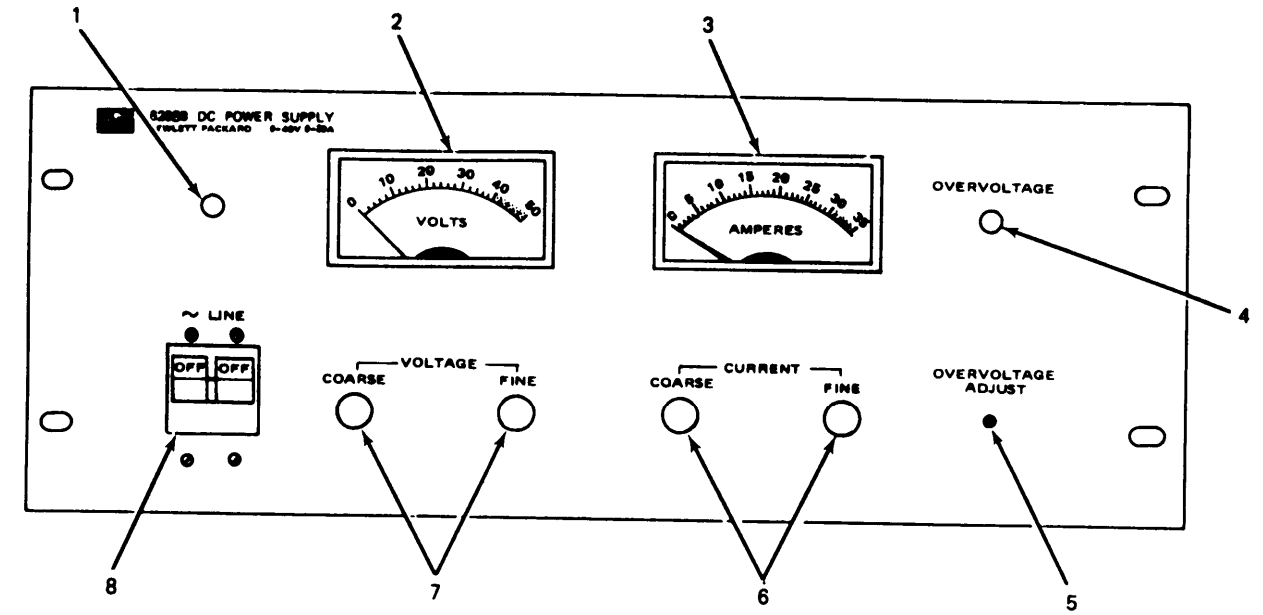
The HP Power Supply features an overvoltage protection circuit which is used only in the constant current operating mode. For G/VLLD tests, only the constant voltage mode is used. The OVERVOLTAGE ADJUST control should be set to fully cw so that it does not override the VOLTAGE control.

2-28. CONTROLS AND INDICATORS

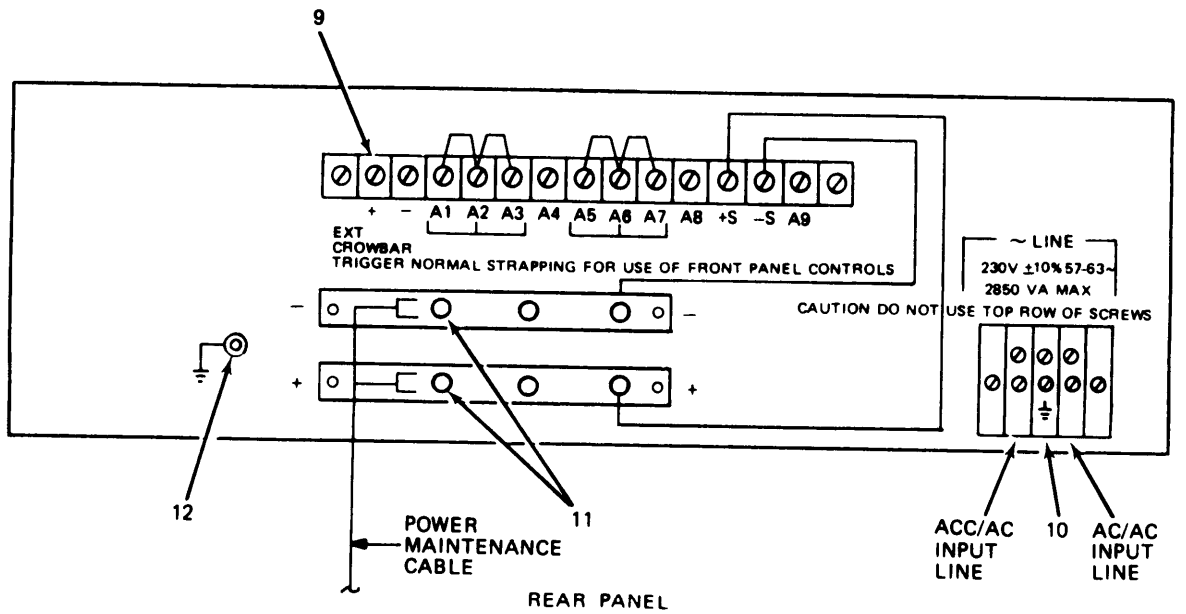
The controls and indicators for the HP Power Supply are described in Table 2-7 and illustrated in Figure 2-10.

Table 2-7. HP Power Supply Controls and Indicators

Key to Figure 2-10	Switch, Control, or Instrument	Function
1	Power indicator	Lights to indicate ac power is applied to unit.
2	VOLTS meter	Indicates voltage output (0 to 50 V dc).
3	AMPERES meter	Indicates current output (0 to 35 A).
4	OVERVOLTAGE indicator	Lights to indicate an overvoltage condition.
5	OVERVOLTAGE ADJUST	Sets overvoltage circuits to trip at a specified voltage level when OVERVOLTAGE (4) occurs.
6	CURRENT controls	
	CURRENT FINE control	Adjusts output current limits.
	CURRENT COARSE control	Adjusts output current limits.
7	VOLTAGE controls	
	VOLTAGE FINE control	Adjusts output voltage.
	VOLTAGE COARSE control	Adjusts output voltage.
8	~ LINE switch	Turns power ON or OFF.
9	Remote sensing terminals	A1 thru A9 not used. +S and -S provide connections for remote voltage sensing.
10	~LINE terminals	Provides input for 115 V, 60 Hz power.
11	Output terminals	Connects to Power Maintenance Cable connector P2. Provides voltage output.
12	Ground terminal	Provides earth ground connection.



FRONT PANEL



REAR PANEL

MS 544186

Figure 2-10. HP Power Supply Controls and Indicators

2-29. OPERATING INSTRUCTIONS

a. Turn CURRENT COARSE and FINE controls (6, Figure 2-10) and VOLTAGE COARSE and FINE controls (7) fully ccw. Turn OVERVOLTAGE ADJUST (5) fully cw.

WARNING

Be sure ac power cable is unplugged.

Be sure to connect input ground terminal (12) to an external earth ground.

CAUTION

Do not interchange ACC/AC and AC/AC input lines.

b. Remove HP Power Supply rear cover.

c. Connect ac power to rear panel by connecting white lead to ACC/AC terminal, black lead to AC/AC terminal, and green lead to ground terminal. Connect ground terminal (12) to an earth ground.

d. Install HP Power Supply rear cover.

e. Plug in ac power cable to 115 V ac.

f. Set ~LINE switch (8) to ON. Power indicator (1) lights.

g. Adjust VOLTAGE COARSE and FINE controls (7) for +24 V on Voltmeter (2).

h. Set ~LINE switch (8) to OFF. Power indicator (1) goes off.

i. Connect a wire between rear panel output terminal (+) to rear panel output terminal (-) (11).

j. Set ~LINE switch (8) to ON and adjust CURRENT COARSE and FINE controls (6) for 25 A on AMPERES meter (3).

k. Set ~LINE switch (8) to OFF.

l. Disconnect wire from rear panel output terminal (+) and rear panel output terminal (-) (11).

m. HP Power Supply is ready for use.

2-30. OPERATION UNDER UNUSUAL CONDITIONS

Follow normal operating instructions. Avoid getting water into electrical connectors or on exposed electrical pins.

Section VII. SAFETY INTERLOCK

2-31. SCOPE

This section contains theory of operation, description of controls and indicators, operating instructions, and operating instructions for unusual conditions for the Safety Interlock.

2-32. THEORY OF OPERATION

Refer to Figure 2-11 for a schematic of the safety interlock. When the shelter door is closed, the sensitive switch closes applying 115 V ac to relay terminal 6. When the push switch is pressed, 115 V ac is applied to relay terminals 1 and 2 activating the relay and applying power to the load. When the relay is activated, the contacts close, connecting terminals 6 and 1, directly. When the push switch is released, the relay remains activated due to the path from terminals 1 to 6. In this condition, 115 V ac remains applied to the load. When the door is opened, the relay is deactivated, removing power from the load.

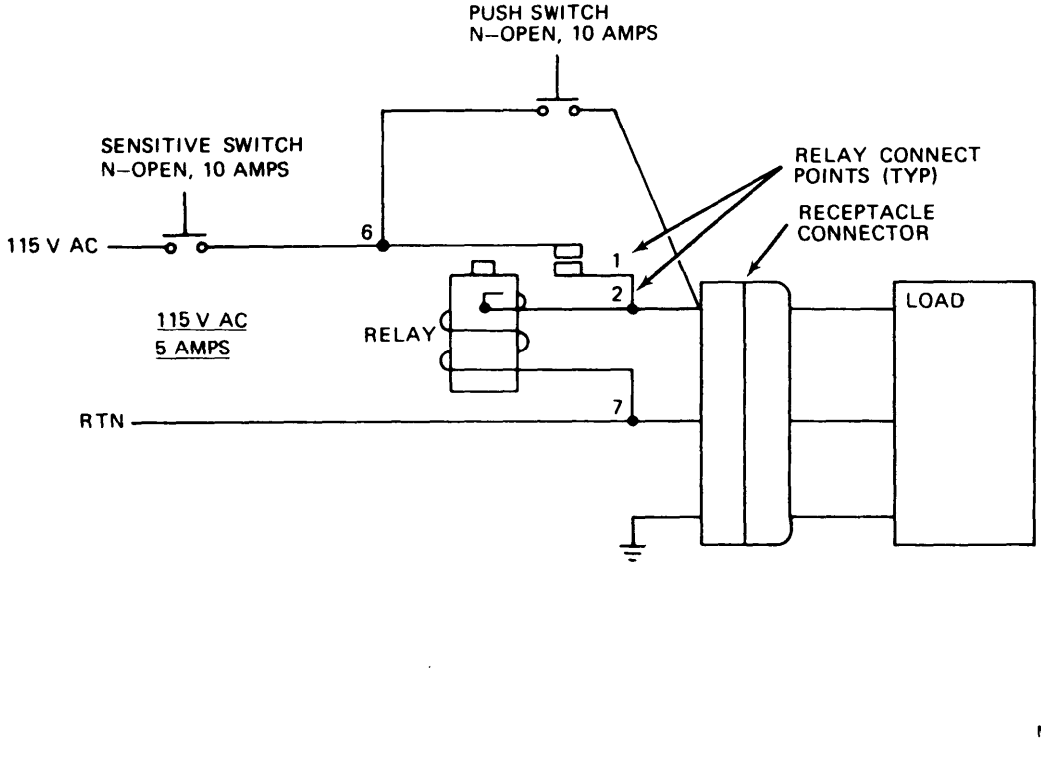


Figure 2-11. Safety Interlock Schematic

2-33. CONTROLS AND INDICATORS

The controls and indicators for the Safety Interlock are described in Table 2-8 and illustrated in Figure 2-12.

Table 2-8. Safety Interlock Controls and Indicators

Key to Figure 2-12	Switch, Control, or Instrument	Function
1	Sensitive switch	When shelter door is opened, power is removed from HP Power Supply disabling LD/R.
2	Push switch	Activates and latches interlock relay when door is closed and thereby applies power to load.
3	Receptacle connector	Mates with electrical power cable electrical plug connector.
4	Electrical plug connector	Mates with electrical cabinet receptacle connector.
5	Terminal lugs	Mate with HP Power Supply ~LINE terminals.

2-34. OPERATING INSTRUCTIONS

a. Close shelter door.

WARNING

When push switch is pressed, all test equipment controlled by the Safety Interlock should be receiving power. Ensure LD/R POWER switch is set to OFF to disable laser. Observe laser warnings on WARNING page.

b. Press push switch (2, Figure 2-12).

c. If shelter door is opened, power is removed from all test equipment controlled by the Safety Interlock. To reactivate power, repeat steps a and b.

2-35. OPERATION UNDER UNUSUAL CONDITIONS

Follow normal operating instructions. Avoid getting water into electrical connectors or on exposed electrical pins.

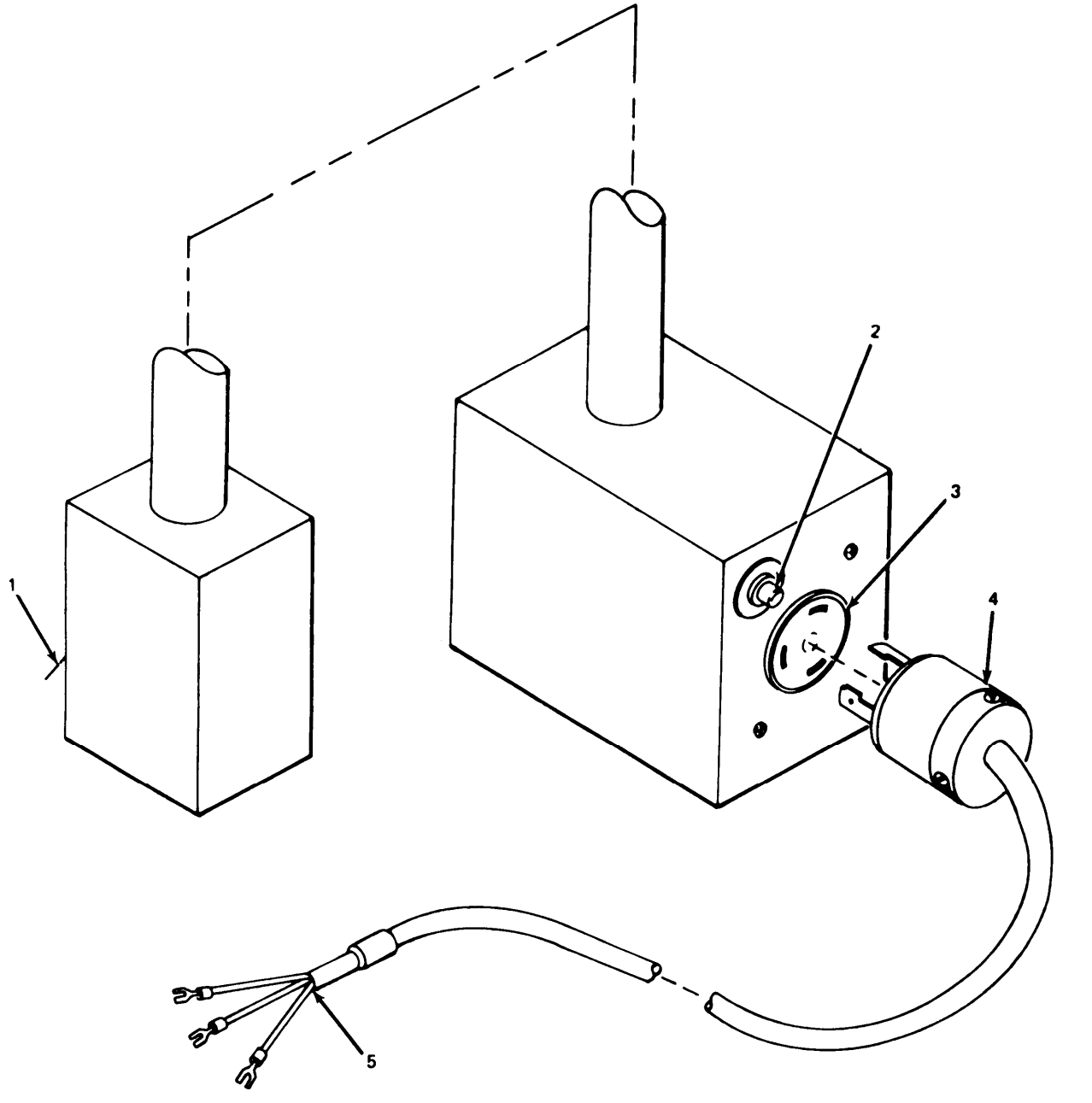


Figure 2-12. Safety Interlock Controls and Indicators

CHAPTER 3
MAINTENANCE

Section 1. SERVICE UPON RECIEPT OF MATERIEL

3-1. GENERAL

This section contains procedures to be used by maintenance personnel upon receiving the GSE. This section also contains information on repair parts, special tools, TMDE, and support equipment required for maintenance of the GSE.

3-2. DUTIES OF USING ORGANIZATION

a. General. When handling, inspecting, and maintaining the GSE, observe the following instructions.

(1) Do not force knobs, switches, or controls beyond their mechanical stops.

(2) If a component cannot be adjusted or repaired in accordance with authorized procedures, refer the problem to the supporting maintenance unit.

(3) Use only those tools, equipment, and materials which are specifically authorized in paragraph 3-3.

b. Services .

(1) Make an initial inventory per Appendix C when equipment is received. Note any missing items and report them promptly.

(2) Check stock numbers and serial numbers to ensure that the correct items were received.

(3) Perform any necessary cleaning in accordance with paragraph 3-6.

(4) Perform an inspection of the GSE components in accordance with paragraph 3-7.

(5) Check the Fault Locator by performing the operating procedures in accordance with paragraph 2-4 with the following exceptions:

(a) Do not connect Test Cable W1 in step d.

(b) Do not perform step h.

(6) Check the RCT by performing the operating procedures in TM 9-1260-477-34-2 with a good LD/R. If fault exists, refer to Table 3-4.

(7) Report any deficiencies using applicable reports, records, and forms required for inventories and inspections.

3-3. REPAIR PARTS, SPECIAL TOOLS, TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE), AND SUPPORT EQUIPMENT

a. Repair Parts. Repair parts are listed and illustrated in TM 9-4931-477-24P.

b. Special Tools, TMDE, and Support Equipment.

(1) No special tools are required.

(2) TMDE and support equipment required for maintenance of the GSE are listed in Table 3-2.

Table 3-1 deleted.

Table 3-2. TMDE and Support Equipment

Item No.	Name	National Stock Number
1	Multimeter AN/PSM-45 or Multimeter AN/PSM-6B	6625-01-139-2512 or 6625-00-957-4374
2	Oscilloscope, Tektronix 7633 or Equivalent	6625-01-093-2261 or 6625-01-134-3220
3	Amplifier, Plug-in, Dual Trace 7A26 or Equivalent	6625-00-361-5318 or 6625-01-132-0244
4	Counter-Timer, Plug-in 7D15 or Equivalent	6625-00-392-2604 or 6625-01-132-0245
5	Clips, Alligator, Red and Black, 2 Sets Mueller PN 63C or Equivalent	6625-00-463-5241 or 6625-01-040-0714
6	Plug, Banana, Cords, 4-Ft Length, 3 Sets H.H. Smith PN 1860-12-102 and 1860-12-103 or Equivalent	NSNL
7	Deleted	
8	Plug AN806-3	4730-00-289-0430
9	Kit, Antistatic Ground	4940-01-087-3458
10	Shop, Electronic, Shelter, Mounted Avionics AN/ASM-146C	4940-01-110-9560
11	Time Base, Dual, Plug-in 7B53A	6625-00-261-5139
12	Digital Multimeter, Plug-in 7D13	6625-00-517-6880
13	Oscilloscope OS-291/G or Equivalent	6625-01-258-0022
14	Digital Electronic Counter, AN/USM-459A or Equivalent	6625-01-271-3012

Section II. MAINTENANCE SERVICES

3-4. GENERAL

This section contains maintenance checks and services, cleaning, inspection, and painting procedures for the GSE. Tools and equipment required to perform these procedures are listed in section I. Supplies and materials required are listed in Table D-1.

3-5. MAINTENANCE CHECKS AND SERVICES

No periodic checks and services are required for the GSE.

3-6. CLEANING

WARNING

Isopropyl alcohol and cleaning solvents are toxic, volatile, and flammable. Use only in well-ventilated area away from heat or open flame. Avoid prolonged breathing of vapor and contact with skin.

CAUTION

Do not get isopropyl alcohol on any rubber parts or sealants. Isopropyl alcohol may cause rubber parts to deteriorate and may cause some sealants to dissolve.

a. General Cleaning Instructions. The GSE components should always be clean. Otherwise, performance may be degraded, and relatively obvious defects that would be noted in a visual inspection may be hidden by dust, grease, or other foreign matter.

(1) Metal Parts. Use dry, clean wiping rags to remove dust, dirt, grease, moisture, or other foreign matter from GSE metal parts. Use a brush to loosen foreign matter from around knobs and indicators. If foreign matter cannot be removed using dry wiping rags, dampen a rag with isopropyl alcohol and gently wipe the area.

CAUTION

Do not get water on electrical pins or connections.

(2) Cables and Rubber Parts. Clean using a mild detergent and warm water. Dry parts using a clean, absorbent wiping rag.

b. Cleaning Procedures for Cold Weather Operation. If temperature is below 32 °F (0 °C), add glycerol to cleaning water. This prevents the water from freezing on the part being cleaned.

3-7. INSPECTION

a. A visual inspection of the GSE must be performed to make sure that it is in good condition.

b. Replacement components should be substituted for those found to be damaged, worn, or beyond serviceable limits. Dirt, grease, and foreign matter should be removed from all inspected surfaces per paragraph 3-6. Preservatives and foreign matter should be removed from electrical connectors. Areas in which the paint is scratched, chipped, or worn should be repainted per paragraph 3-8. Other specific repair functions which are authorized for various levels of maintenance are given in the Maintenance Allocation Chart (Appendix B).

c. After complete inspection is performed, ensure serviceability of the Fault Locator by performing the operating procedures in accordance with paragraph 2-4 with the following exceptions:

(1) Do not connect Test Cable W1 in step d.

(2) Do not perform step i.

d. After complete inspection is performed, ensure serviceability of the RCT by performing the operating procedures in TM 9-1260-477-34-2 with a good LD/R. If fault exists, refer to Table 3-4.

e. A complete inspection is performed for initially received GSE to ensure that the equipment is not damaged. The inspection should also be performed before using the equipment to troubleshoot the LD/R.

3-8. PAINTING

Refer to TM 43-0139.

Section III. TROUBLESHOOTING

3-8.1. GENERAL

This section contains troubleshooting indexes and test and troubleshooting procedures for the GSE. Table 3-2 lists the equipment required to perform these procedures.

The troubleshooting indexes list failure symptoms and troubleshooting actions. The troubleshooting action column of the table provides references to step-by-step procedures used to fault isolate the malfunction to a failed component or wiring fault.

The ellipsis (...) indicates an intentional blank or termination of a procedural step.

An open circuit indicates greater than 20 megohms.

3-9. TROUBLESHOOTING FAULT LOCATOR

CAUTION

Logic Card A1 is electrostatic discharge sensitive. Protect this card by wearing grounding wristband when probing. Handling and/or installation of individual cards should be performed at a static-free work station. This card should be antistatic packaged during handling and storage.

a. The DS/GS level troubleshooting procedures fault isolate to removable components. After a repair is made, the Fault Locator should be checked for proper operation by performing the operating procedures in paragraph 2-4, excluding step i., with a good LD/R. If fault exists, refer to Table 3-3.

b. Common Fault Locator failures are listed in Table 3-3. Fault isolation procedures are contained in Tables 3-5 thru 3-20.

c. Functional diagram (Figure FO-1) and wiring list (Table E-1) provide complete point-to-point wiring information. This information should be used with the troubleshooting tables to reduce time in locating the fault and in restoring equipment to operation.

3-10. TROUBLESHOOTING REMOTE CAPABILITIES TESTER

a. The DS/GS level troubleshooting procedures fault isolate to removable components. After a repair is made, the RCT should be checked for proper operation by performing the operating procedures in TM 9-1260-477-34-2 with a good LD/R. If fault exists, refer to Table 3-4.

b. Common RCT failures are listed in Table 3-4. Fault isolation procedures are contained in Tables 3-21 thru 3-30.

c. Schematic diagram (Figure FO-3) and wiring list (Table E-2) provide complete point-to-point wiring information. This information should be used with the troubleshooting tables to reduce time in locating the fault and in restoring equipment to operation.

Table 3-3. Common Fault Locator Failures, Troubleshooting Index

Item	Failure Symptom	Troubleshooting Action
1	Fault Locator POWER indicator does not light	Perform Table 3-5 procedures.
2	Fault Locator fails LAMP TEST	Perform Table 3-6 procedures.
3	A TRIG indicator does not light	Perform Table 3-7 procedures.
4	OVERTEMP indicator does not light	Perform Table 3-8 procedures.
5	PARITY or ENERGY FAIL indicators do not light	Perform Table 3-9 procedures.
6	Fault Locator readouts fail or are incorrect	Perform Table 3-10 procedures.
7	TEST SELECT switch S5 inoperative	Remove panel per paragraph 3-16.a. Replace switch S5. Install panel per paragraph 3-16.a.
8	Range readout value is incorrect	Replace Al per paragraph 3-16.b.
9	TEST SELECT meter indications are incorrect	Perform Table 3-11 procedures.
10	LASER switch S1 circuit fails	Perform Table 3-12 procedures.
11	HVPS switch S8 circuit fails	Perform Table 3-13 procedures.
12	PRESET RANGE switch S6 circuit fails	Perform Table 3-14 procedures.
13	SIMMER SENSE fault	Perform Table 3-15 procedures.
14	Test point (1, 2, 5, 10, 11, 14, 15) fault	Perform Table 3-16 procedures.
15	Test point (3, 6, 7, 8, 9, 12, 13, 16) fault	Perform Table 3-17 procedures.
16	Power Cable (W2) fault	Perform Table 3-18 procedures.
17	Test cable (W1) fault	Perform Table 3-19 procedures.
18	LASER switch S9 circuit fails	Perform Table 3-20 procedures.

Table 3-4. Common Remote Capabilites Tester Failures, Troubleshooting Index

Item	Failure Symptom	Troubleshooting Action
1	TESTER ON indicator does not light	Perform Table 3-21 procedures.
2	LASER ARMED indicator does not light	Perform Table 3-22 procedures.
3	Test Point (1, 2, 3) fault	Perform Table 3-23 procedures.
4	Code Switch circuit fails	Perform Table 3-24 procedures.
5	RETICLE BRIGHTNESS control circuit fails	Perform Table 3-25 procedures.
6	LASER FIRE switch circuit fails	Perform Table 3-26 procedures.
7	MODE switch circuit fails	Perform Tables 3-27 procedures.
8	FIRE CMD switch circuit fails	Perform Table 3-28 procedures.
9	RANGE SEL switch circuit fails	Perform Table 3-29 procedures.
10	RCT Cable (W2) fault	Perform Table 3-30 procedures.

Table 3-5. Fault Locator POWER Indicator Does Not Light

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to OFF.	. . .	. . .	. . .
2	Fuse	Remove by turning ccw.	. . .	. . .	. . .
3	Fuse	Check 1.0 amp fuse. Verify that fuse rating is 1.0 amp.	Fuse checks OK.	Put fuse back in place. Go to next step.	Replace with a new 1.0 amp fuse and go to next step.
4	POWER Switch S2	Set to ON.	Power indicator lights.	Return fault locator to service.	Go to next step.
5	POWER Switch S2	Set to OFF.	. . .	. . .	. . .
6	Fuse	Remove by turning ccw.	. . .	. . .	. . .
7	Fuse	Check 1.0 amp fuse.	Fuse checks OK	Go to step 20.	Replace fuse and go to next step.
8	Harness	Tag and disconnect wire from PS1 - AC+.	. . .	. . .	. . .
9	Harness	Measure continuity between tagged wire and S2-6.	Measurement indicates an open circuit.	Go to next step.	Troubleshoot harness wiring per FO-1.
10	Harness	Reconect wire to PS1 - AC+	. . .	. . .	
11	Harness	Measure continuity between PS1 - V+ and TP16.	Measurement indicates an open circuit.	Go to next step.	Replace shorted wire and retest.
12	Harness	Tag and disconnect wire from PS1 - V+ (+5 V OUT).	. . .	. . .	. . .
13	Fault Locator	Insure fuse F1 and power cable W2 are installed.	. . .	. . .	. . .
14	POWER Switch S2	Set to ON.	Fuse blows.	Replace PS1 and wires per paragraph 3-16e.	Go to next step.
15	POWER switch S2	Set to OFF.	. . .	. . .	. . .
16	Indicator DS1	Unsolder indicator at DS1-1.	. . .	. . .	. . .
17	Indicator DS1	Measure continuity between DS1-1 and DS1-2.	Measurement indicates an open circuit.	Replace DS1 per para-graph 3-16p.	Go to next step.

Table 3-5. Fault Locator POWER Indicator Does Not Light - Continued

Step	Item	Action	Indication	Yes	No
		CAUTION Insure that the two screws holding P1 to A1J1 are loosened evenly by loosening each screw one or two turns at a time to avoid damage to connector.			
18	Harness	Disconnect P1 from A1J1 by loosening two screws.	. . .	. . .	. . .
19	Harness	Measure continuity between P1-11 and TP16 and between J1-h and TP16.	Measurement indicates an open circuit.	Replace logic card A1 per paragraph 3-16b.	Replace shorted wire and retest.
20	POWER switch S2	Set to ON.	. . .	. . .	. . .
21	Power Supply PS1	Measure voltage at PS1 - V+ (+5V OUT).	Measurement indicates +5V + 0.5V.	Troubleshoot harness wiring. Refer to FO-1.	Go to next step.
22	Power Supply PS1	Measure ac voltage at PS1 - AC+.	Measurement is approximately 115 Vat.	Replace PS1 per paragraph 3-16e.	Go to next step.
23	Indicator DS1	Reconnect and solder indicator at DS1-1.	. . .	. . .	. . .
24	Harness	Reconnect wire to PSI - V+.	. . .	. . .	. . .
		CAUTION Insure screws are tightened evenly, one turn at a time, to avoid damaging connector.			
25	Harness	Reconnect P1 to A1J1 by tightening two screws.	. . .	. . .	. . .
26	Switch S2	Insure POWER switch is set to ON.	. . .	. . .	. . .
27	Switch S2	Measure continuity between S2-3 and S2-2.	Measurement indicates a closed circuit.	Troubleshoot harness wiring. Refer to FO-1.	Replace switch S2 per paragraph 3-16i.

Table 3-6. Fault Locator Fails LAMP TEST

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to ON.	POWER indicater lights.	Go to next step.	Go to Table 3-5.
2	LAMP TEST Switch S7	Press and hold while observing readouts and indicators.	Readout displays are as follows: AZIMUTH 8888 RANGE 8888 ELEVATION -888 The following indicators light: PARITY ENERGY A TRIG OVERTEMP	Release and go to next step.	Release and go to step 4.
3	POWER Switch S2	Set to OFF and then to ON.	All readouts and indications go out.	Return fault locator to service.	Go to next step.
4	POWER Switch S2	Set to OFF.	. . .	. . .	. . .

WARNING

When front panel is removed and power cable W2 is connected to facility power, 115 Vac is present at pins of J2 and S2.

5	Front Panel	Remove per paragraph 3-16a	. . .	. . .	. . .

CAUTION

Insure that the two screws holding P1 to A1J1 are loosened evenly by loosening each screw one or two turns at a time to avoid damage to connector.

6	Harness	Disconnect P1 from A1J1 by loosening two screws.	. . .	. . .	. . .
7	Harness	Test LAMP TEST signal path (from P1-4 to S7-1) for continuity and shorts to ground.	Measurement indicates con tinuous path (resistance less that 2 ohms) and no shorts to ground.	Go to next Step.	Go to step 13.
8	LAMP TEST Switch S7	Press and hold switch down while determining conti-nuity between S7-1 and S7-2.	Measurement indicates less than 2 ohms.	Go go next step.	Go to step 13.
9	LAMP TEST Switch S7	Release.	. . .	. . .	. . .

Table 3-6. Fault Locator Fails LAMP TEST - Continued

Text	Item	Action	Indication	Yes	No
10	Logic Card A1	Replace per paragraph 3-16b.	. . .	. . .	. . .
11	Front Panel	Install per paragraph 3-16a.	. . .	. . .	. . .
12	Fault Locator	Return to service.	. . .	. . .	. . .
13	LAMP TEST Switch S7	Replace LAMP TEST switch S7 or repair harness as necessary.	. . .	. . .	. . .

CAUTION

Insure screws are tightened evenly, one turn at a time, to avoid damaging connector.

14	Harness	Connect P1 to A1J1 by tightening two screws.	. . .	. . .	. . .
15	Front Panel	Install per paragraph 3-16a.	. . .	. . .	. . .
16	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-7. A TRIG Indicator Does Not Light

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to ON.	POWER indicator lights.	Go to next step.	Go to Table 3-5.
2	LAMP TEST Switch S7	Press and hold.	A TRIG indicator lights.	Go to next step.	Go to Table 3-6.
3	LAMP TEST Switch S7	Release.	A TRIG indicator goes out.	. . .	. . .
4	POWER Switch S2	Set to OFF.	POWER indicator goes out.	. . .	. . .
5	Test Cable W1	Remove from TEST J1 on Fault Locator.	. . .	. . .	. . .
6	Test Cable W1	Measure A-TRIG signal path (from W1P2-B to W1P1-B) for continuity.	Measurement indicates less than 2 ohms.	Go to next step.	Replace cable.

WARNING

When front panel is removed and power cable W2 is connected to facility power, 115 Vac is present at pins of J2 and S2.

7	Front Panel	Remove per paragraph 3-16a.	. . .	. . .	. . .

CAUTION

Insure that the two screws holding P1 to A1J1 are loosened evenly by loosening each screw one or two turns at a time to avoid damage to connector.

8	Harness	Disconnect P1 from A1J1 by loosening two screws.	. . .	. . .	. . .
9	Fault Locator	Measure A-TRIG signal path (from J1-B to P1-24) for continuity and shorts to ground.	Measurement indicates less than 2 ohms for continuity and an open circuit for shorts to ground.	Go to next step.	Repair harness; then proceed to step 11.
10	Logic Card A1	Replace per paragraph 3-16b.	. . .	. . .	. . .

CAUTION

Insure screws are tightened evenly, one turn at a time, to avoid damaging connector.

11	Harness	Connect P1 to A1J1 and secure by tightening two screws.	. . .	. . .	. . .

Table 3-7. A TRIG Indicator Does Not Light - Continued

Step	Item	Action	Indication	Yes	No
12	Front Panel	Install per paragraph 3-16a.	. . .	. . .	. . .
13	Test Cable W1	Connect to TEST connector J1 on Fault Locator.	. . .	. . .	. . .
14	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-8. OVERTEMP Indicator Does Not Light

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to ON.	POWER indicator lights.	Go to next step.	Go to Table 3-5.
2	LAMP TEST Switch S7	Press and hold.	OVERTEMP indicator lights.	Go to next step.	Go to Table 3-6.
3	LAMP TEST Switch S7	Release.	OVERTEMP indicator goes out.	. . .	. . .
4	POWER Switch S2	Set to OFF.	POWER indicator goes out.	. . .	. . .
5	Test Cable W1	Remove from TEST Connector J1 on Fault Locator.	. . .	. . .	. . .
6	Test Cable W1	Measure OVERTEMPERATURE signal path (from W1P1-e to W1P2-e) for continuity.	Measurement indicates less than 2 ohms.	Go to next step.	Replace cable; then proceed to step 15.

WARNING

When front panel is removed and power cable W2 is connected to facility power, 115 Vac is present at pins of J2 and S2.

7	Front Panel	Remove per paragraph 3-16a.	. . .	. . .	. . .

CAUTION

Insure that the two screws holding P1 to A1J1 are loosened evenly by loosening each screw one or two turns at a time to avoid damage to connector.

8	Harness	Disconnect P1 from A1J1 by loosening two screws.	. . .	. . .	. . .
9	Harness	Measure OVERTEMPERATURE signal path (from J1-e to P1-25) for continuity and shorts to ground.	Measurement indicates less than 2 ohms for continuity and an open circuit for shorts to ground.	Go to next step.	Repair harness; then proceed to step 11.
10	Logic Card A1	Replace per paragraph 3-16b.	. . .	. . .	. . .

CAUTION

Insure screws are tightened evenly, one turn at a time, to avoid damaging connector.

11	Harness	Connect P1 to A1J1 and secure by tightening two screws.	. . .	. . .	. . .

Table 3-8. OVERTEMP Indicator Does Not Light - Continued

Step	Item	Action	Indication	Yes	No
12	Front Panel	Install per paragraph 3-16a.	. . .	. . .	. . .
13	Test Cable W1	Connect to TEST connector J1 on Fault Locator.	. . .	. . .	. . .
14	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-9. PARITY or ENERGY FAIL Indicators Do Not Light

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to ON.	POWER indicator lights.	Go to next step.	Go to Table 3-5.
2	LAMP TEST Switch S7	Press and hold.	PARITY and ENERGY FAIL indicators light.	Go to next step.	Go to Table 3-6.
3	LAMP TEST Switch S7	Release.	PARITY and ENERGY FAIL indicators go out.	. . .	. . .
4	POWER Switch S2	Set to OFF.	POWER indicator goes out.	. . .	. . .
5	Test Cable W1	Remove from TEST connector J1 on Fault Locator	. . .	. . .	. . .
6	Test Cable W1	Measure COMPUTER WORD signal path (from W1P1-f to W13-B) for continuity.	Measurement indicates less than 2 ohms.	Go to next step.	Replace cable; then proceed to step 15.

WARNING

When front panel is removed and power cable W2 is connected to facility power, 115 Vac is present at pins of J2 and S2.

7	Front Panel	Remove per paragraph 3-16a.	. . .	. . .	. . .

CAUTION

Insure that the two screws holding P1 to A1J1 are loosened evenly by loosening each screw one or two turns at a time to avoid damage to connector.

8	Harness	Disconnect P1 from A1J1 by loosening two screws.	. . .	. . .	. . .
9	Harness	Measure COMPUTER WORD signal path (from J1-f to P1-5) for continuity and for shorts to ground.	Measurement indicates less than 2 ohms for continuity and an open circuit for shorts to ground.	Go to next step.	Repair harness; then proceed to step 11.
10	Logic Card A1	Replace per paragraph 3-16b.	. . .	. . .	. . .

CAUTION

Insure screws are tightened evenly, one turn at a time, to avoid damaging connector.

11	Harness	Connect P1 to A1J1 and secure by tightening two screws.	. . .	. . .	. . .

Table 3-9. PARITY or ENERGY FAIL Indicators Do Not Light - Continued

Step	Item	Action	Indication	Yes	No
12	Front Panel	Install per paragraph 3-16a.	. . .	. . .	. . .
15	Test Cable W1	Connect to TEST connector J1 on Fault Locator.	. . .	. . .	. . .
16	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-10. Fault Locator Readouts Fail or Are Incorrect

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to ON.	POWER indicator lights.	Go to next step.	Go to Table 3-5.
2	LAMP TEST Switch S7	Press and hold.	Readouts display as follows: AZIMUTH 8888 RANGE 8888 ELEVATION -888	Go to next step.	Go to Table 3-6.
3	LAMP TEST Switch S7	Release.	Readout displays go out.	. . .	. . .
4	POWER Switch S2	Set to OFF.	POWER indicator goes out.	. . .	. . .
5	Test Cable W1	Remove from TEST connector J1 on Fault Locator,	. . .	. . .	. . .
6	Test Cable W1	Measure COMPUTER WORD signal path (from W1P1-f to W1P3-B) for continuity.	Measurement indicates than 2 ohms.	Go to next step.	Replace cable; then proceed to step 13.

WARNING

When front panel is removed and power cable W2 is connected facility power, 115 Vac is present at pins of J2 and S2.

7	Front Panel	Remove per paragraph 3-16a.	. . .	. . .	. . .

CAUTION

Insure that the two screws holding P1 to A1J1 are loosened evenly by loosening each screw one or two turns at a time to avoid damage to connector.

8	Harness	Disconnect P1 from A1J1 by loosening two screws.	. . .	. . .	. . .
9	Harness	Measure COMPUTER WORD signal path (from P1-5 to J1-f) for continuity and for shorts to ground.	Measurement indicates less than 2 ohms for continuity and an open circuit for shorts to ground.	Go to next step.	Repair harness; then proceed to step 11.
10	Logic Card A1	Replace per paragraph 3-16b.	. . .	. . .	. . .

CAUTION

Insure screws are tightened evenly, one turn at a time, to avoid damaging connector.

11	Harness	Connect P1 to A1J1 and secure by tightening two screws.	. . .	. . .	. . .

Table 3-10. Fault Locator Readouts Fail or Are incorrect - Continued

Step	Item	Action	Indication	Yes	No
12	Front Panel	Install per paragraph 3-16a,	. . .	. . .	. . .
13	Test Cable W1	Connect to TEST connector J1 on Fault Locator.	. . .	. . .	. . .
14	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-11. TEST SELECT Meter Indications Are Incorrect

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to OFF.	. . .	. . .	. . .
2	Test Cable W1	Remove from TEST connector J1 on Fault Locator.	. . .	. . .	. . .

WARNING

When front panel is removed and power cable W2 is connected to facility power, 115 Vac is present at pins of J2 and S2.

3	Front Panel	Remove per paragraph 3-16a.	. . .	. . .	. . .

CAUTION

Insure that the two screws holding P1 to A1J1 are loosened evenly by loosening each screw one or two turns at a time to avoid damage to connector.

4	Harness	Disconnect P1 from A1J1 by loosening two screws.	. . .	. . .	. . .
5	TEST SELECT Meter	Disconnect terminal of meter by removing nut and washers.	. . .	. . .	. . .
6	Fault Locator	Set TEST SELECT switch to indicated position and measure continuity between S56 pin C and the indicated points.	Measurement indicates as listed below:	Go to next step.	Repair or replace S5 or repair faulty wiring; then proceed to step 24.
7	Fault Locator	Measure continuity between TP16 and the following points:	Measurement indicates an open circuit.	Go to next step.	Repair or replace S5 or repair Faulty wiring; then proceed to step 24.

TEST SELECT	Pin	Indication
BAT VDC	J1-a	27 kilohms to 33 kilohms
+15 VDC	J1-Y	16.8 kilohms to 20.5 kilohms
+5 VDC	J1-X	5.5 kilohms to 6.8 kilohms
	P1-13	5.5 kilohms to 6.8 kilohms
-15 VDC	TP16	16.8 kilohms to 20.5 kilohms
PFN VDC	P1-9	less than 2 ohms
450 VDC	P1-7	Less than 2 ohms
ENERGY ERROR	P1-21	Less than 2 ohms

Pin
J1-a
J1-Y
J1-X
P1-13
P1-9
P1-7
P1-21

Table 3-11. TEST SELECT Meter Indications Are Incorrect - Continued

Step	Item	Action	Indication	Yes	No
8	Fault Locator	Set TEST SELECT switch to indicated position and measure continuity between S5C pin C and the indicate points. TEST SELECT — Pin BAT VDC — TP16 +15 VDC — TP16 -5 VDC — TP16 -15 VDC — J1-F PFN VDC — P1-8 450 VDC — P1-10 ENERGY ERROR — TP16	Measurement indicates less than 2 ohms.	Go to next step.	Repair replace or repa faulty \ ing; the proceed step 24.
9	Fault Locator	Measure continuity between TP16 and the following points: Pin J1-F P1-8 P1-10	Measurement indicates an open circuit.	So to next step.	Repair w ing then proceed step 24.
10	Fault Locator	Set TEST SELECT switch to indicated position and measure continuity between TP4 and the indicated points. TEST SELECT — Pin BAT VDC — J1-a +15 VDC — J1-Y +5 VDC — J1-X P1-13 -15 VDC — J1-F PFN VDC — J1-V 450 VDC — J1-C ENERGY ERROR — J1-E	Measurement indicates 95 to 105 ohms.	Go to next step.	Repair 01 replace or repair faulty w ing; then proceed step 24.
11	Fault Locator	Measure continuity between TP16 and the following points: Pin — Pin J1-a — J1-V J1-Y — J1-C J1-X — J1-E J1-F — P1-13	Measurement indicates an pen circuit.	Go to next step.	Repair c replace or repair faulty ing; then proceed step 2

Table 3-11. TEST SELECT Meter Indications Are Incorrect - Continued

Step	Item	Action	Indication	Yes	No
12	Test Cable W1	Measure continuity between W1P1 pins and W1P2 pins listed below. W1P1 — W1P2 a — a X — X Y — Y F — F V — V C — C E — E	Measurement indicates less less than 2 ohms.	Go to next step.	Replace cable.
13	Test Cable W1	Measure continuity between W1P1 pin g and the following W1P1 pins: Pin a X Y F V C E	Measurement indicates an open circuit.	Go to next step.	Replace cable.
14	TEST SELECT Switch	Set to +5 VDC.	. . .	• • •	• • •
15	TEST SELECT Meter	Reconnect (-) terminal of meter; secure with washers and nut.	. . .	• • •	• • •
16	Harness	Connect P1 to A1J1 by tightening two screws.	. . .	• • •	• • •
17	Test Cable W1	Connect to TEST connector J1 on Fault Locator.	. . .	• • •	• • •
18	Jumper	Connect jumper between pin W1P2-h and E19.	. . .	• • •	• • •
19	POWER Switch S2	Set to ON.	POWER indicator lights. TEST SELECT meter indicates in green band.	Go to next step.	Replace meter per para. 3-16o. Proceed to step 26.

Table. 3-11. TEST SELECT Meter Indications Are Incorrect - Continued

Step	Item	Action	Indication	Yes	No
20	POWER Switch S2	Set to OFF.	. . .	. . .	. . .
21	Jumper	Disconnect from W1P2-h and E19.	. . .	. . .	. . .
22	Front Panel	Install per paragraph 3-16a.	. . .	. . .	. . .
23	Fault Locator	Return to service.	. . .	. . .	. . .
		CAUTION Insure screws are tightened evenly, one turn at a time, to avoid damaging connector.			
24	Harness	Connect P1 to A1J1 by tightening two screws.	. . .	. . .	. . .
25	TEST SELECT Meter	Reconnect (-) terminal of meter; secure with washers and nut.	. . .	. . .	. . .
26	Front Panel	Install per paragraph 3-16a.	. . .	. . .	. . .
27	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-12. LASER Switch S1 Circuit Fails

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to OFF.	. . .	. . .	. . .
		WARNING When front panel is removed and power cable W2 is connected to facility power, 115 Vac is present at pins of J2 and S2.			
2	Front Panel	Remove per paragraph 3-16a.	. . .	. . .	. . .
3	LASER Switch S1	Set to INHIBIT.	. . .	. . .	. . .
4	Harness	Measure $\overline{\text{Q/S TRIGGER}}$ signal path (from W1P2-d to RTN, TP16) for continuity.	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 12.
5	LASER Switch S1	Set to ENABLE.	. . .	. . .	. . .
6	Harness	Measure $\overline{\text{Q/S TRIGGER}}$ signal path (from W1P2-d to ground, TP16) for an open circuit.	Measurement indicates an open circuit.	Go to next step.	Go to step 12.
7	LASER Switch S1	Set to INHIBIT.	. . .	. . .	. . .
8	Harness	Measure $\overline{\text{FLASHTU6E TRIGGER}}$ signal path (from W1P2-R to ground, TP16) for continuity.	Measurement indicates less than 2 ohms.	**Go to next step.**	Go to step 12.
9	LASER Switch S1	Set to ENABLE.	. . .	. . .	. . .
10	Harness	Measure $\overline{\text{FLASHTUBE TRIGGER}}$ signal path (from W1P2-R to ground, TP16) for an open circuit.	Measurement indicates an open circuit.	**Go to next step.**	Go to step 12.
11	Fault Locator	Return to service.	...	. . .	. . .
12	Test Cable W1	Measure continuity from W1P1 pin to W1P2 pin. W1P1 — W1P2 d — d R — R	Measurement indicates less than 2 ohms.	**Go to next step.**	Go to step 17.

Table 3-12. LASER Switch S1 Circuit Fails - Continued

Step	Item	Action	Indication	Yes	No
13	Test Cable W1	Measure continuity from W1P1 pin to M1P2 pin. W1P1 W1P2 d R R d	Measurement indicates an open circuit.	Go to next step.	Go to step 17.
14	LASER Switch S1	Repair or replace S1; repair harness.	. . .	. . .	. . .
15	Front Panel	Install per paragraph 3-16a.	. . .	. . .	. . .
16	Fault Locator	Return to service.	. . .	. . .	. . .
17	Test Cable W1	Replace cable.	. . .	. . .	. . .
18	Front Panel	Install per paragraph 3-16a.	. . .	. . .	. . .
19	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-13. HVPS Switch S8 Circuit Fails

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to OFF.	. . .	. . .	. . .
		WARNING When front panel is removed and power cable W2 is connected to facility power, 115 Vac is present at pins of J2 and S2.			
2	Front Panel	Remove per paragraph 3-16a.	. . .	. . .	. . .
		CAUTION Insure that the two screws holding P1 to A1J1 are loosened evenly by loosening each screw one or two turns at a time to avoid damage to connector.			
3	Harness	Disconnect P1 from A1J1 by loosening two screws.	. . .	. . .	. . .
4	HVPS Switch S8	Set to INHIBIT.	. . .	. . .	. . .
5	Harness	Measure HVPS INHIBIT SW signal path (from ground to pin P1-22) for continuity.	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 14.
6	HVPS Switch S8	Set to ENABLE.		. . .	. . .
7	Harness	Measure HVPS INHIBIT SW signal path (from ground to pin P1-22) for an open circuit.	Measurement indicates an open circuit.	Go to next step.	Go to step 14.
8	Harness	Measure $\overline{\text{HVPS INHIBIT}}$ signal path (from P1-23 to W1P2-M) for continuity.	measurement indicates less than 2 ohms.	Go to next step.	Go to step 10.
9	Harness	Measure $\overline{\text{OVERTEMPERATURE}}$ signal path (from W1P1-e to P1-25) for continuity.	Measurement indicates less than 2 ohms.	Go to step 17.	Go to step 12.
10	Test Cable W1	Remove from TEST connector J1.	. . .	. . .	. . .
11	Test Cable W1	Measure $\overline{\text{HVPS INHIBIT}}$ signal path (from W1P1-M to W1P2-M) for continuity.	Measurement indicates an open circuit.	Go to step 15.	Go to step 16.
12	Test Cable W1	Remove from TEST connector J1.	. . .	. . .	. . .
13	Test cable W1	Measure $\overline{\text{OVERTEMPERATURE}}$ signal path (from W1P1-e to W1P2-e) for continuity.	Measurement indicates an open circuit.	Go to step 15.	Go to step 16.
14	HVPS Switch S8	Replace switch oer para. 3-16n., then proceed to step 17.	. . .	. . .	. . .

Table 3-13. HVPS Switch S8 Circuit Fails - Continued

Step	Item	Action	Indication	Yes	No
15	Harness	Repair harness, then proceed to step 17.	. . .	. . .	. . .
16	Test Cable W1	Replace cable.	. . .	. . .	. . .
17	POWER Switch S2	Set to ON.	. . .	. . .	. . .
18	HVPS Switch S8	Set to ENABLE.	. . .	. . .	. . .
19	Harness	Measure dc volts between W1P2-M and TP16.	Measurement indicates +4.5 to +5.5 volts.	Go to next step.	Go to step 22.
20	HVPS Switch S8	Set to INHIBIT.	. . .	. . .	. . .
21	Harness	Measure dc volts between W1P2-F1 and TP16.	Measurement indicates 0 to 0.5 volts.	Go to step 23.	Go to step 22.
22	Logic Card A1	Replace per paragraph 3-16b.	. . .	. . .	. . .

CAUTION

Insure screws are tightened evenly, one turn at a time, to avoid damaging connector.

23	Harness	Connect P1 to A1J1 by tightening two screws.	. . .	. . .	. . .
24	Front Panel	Install per paragraph 3-16a.	. . .	. . .	. . .
25	Test Cable W1	Connect to TEST connector J1 on Fault Locator.	. . .	. . .	. . .
26	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-14. PRESET RANGE Switch S6 Circuit Fails

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to OFF.	. . .	. . .	. . .
		WARNING When front panel is removed and power cable W2 is connected to facility power, 115 Vac is present at pins of J2 and S2.			
2	Front Panel	Remove per paragraph 3-16a.	. . .	. . .	. . .
		CAUTION Insure that the two screws holding P1 to A1J1 are loosened evenly by loosening each screw one or two turns at a time to avoid damage to connector.			
3	Harness	Disconnect P1 from A1J1 by loosening two screws.	. . .	. . .	. . .
4	PRESET RANGE Switch S6	Set to OFF.	. . .	. . .	. . .
5	Harness	Measure PRESET RNG SW signal path (from ground, TP16 to P1-3) for continuity.	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 21.
6	PRESET RANGE Switch S6	Set to ON.	. . .	. . .	. . .
7	Harness	Measure PRESET RNG SW signal path (from ground, TP16 to P1-3) for an open circuit.	Measurement indicates an open circuit.	Go to next step.	Go to step 21.
8	Harness	Measure $\overline{\text{VIDEO-TA-ENABLE}}$ signal path (from Pi-l to W1P2-j) for continuity.	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 10.
9	Harness	Measure 8000 M-TA signal path (W1P2-S to P1-2) for continuity.	Measurement indicates less than 2 ohms.	Go to step 14.	Go to step 12.
10	Test Cable W1	Remove from TEST connector J1 on Fault Locator.	. . .	. . .	. . .
11	Test Cable W1	Measure $\overline{\text{VIDEO-TA-ENABLE}}$ signal path (from W1P1-j to W1P2-j) for continuity.	Measurement indicates less than 2 ohms.	Go to step 22.	Go to step 23.
12	Test Cable W1	Remove from TEST connector J1 on Fault Locator.	. . .	. . .	. . .
13	Test Cable W1	Measure 8000 M-TA signal path (from W1P1-S to W1P2-S) for continuity.	Measurement indicates less than 2 ohms.	Go to step 22.	Go to step 23.

Table 3-14. PRESET RANGE Switch S6. Circuit Fails - Continued

Step	Item	Action	Indication	Yes	No
		CAUTION Insure screws are tightened evenly, one turn at a time, to avoid damaging connector.			
14	Harness	Connect P1 to A1J1 by tightening two screws.	. . .	. . .	. . .
15	POWER Switch S2	Set to ON.	POWER indicator lights.	Go to next step.	Go to table 3-5.
16	PRESET RANGE Switch S6	Set to ON.	. . .	. . .	. . .
17	Harness	Measure voltage from W1P2-j to TP16.	Measurement indicates 3.9 ± 1.5 volts.	Go to next step.	Go to step 24.
18	PRESET RANGE Switch S6	Set to OFF.	. . .	. . .	. . .
19	Harness	Measure voltage from W1P2-j to TP16.	Measurement indicates 3.9 ± 1.5 volts.	Go to step 26.	Go to step 24.
20	POWER Switch S2	Set to OFF.	POWER indicator goes out.	. . .	. . .
21	PRESET RANGE Switch S6 or Harness	Repair or replace S6 or repair harness; then proceed to step 25.	. . .	. . .	. . .
22	Harness	Repair harness; then proceed to step 25.	. . .	. . .	. . .
23	Test Cable W1	Replace cable; then proceed to step 25.	. . .	. . .	. . .
24	Logic Card A1	Replace per paragraph 3-16b.	. . .	. . .	. . .
25	Harness	Connect P1 to A1J1 connector by tightening two screws.	. . .	. . .	. . .
26	Front Panel	Install front panel per paragraph 3-16a.	. . .	. . .	. . .
27	Test Cable W1	Connect to TEST connector J1 on Fault Locator.	. . .	. . .	. . .
28	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-15. SIMMER SENSE Fault

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to OFF.	. . .	. . .	. . .
2	Fault Locator	Measure continuity between W1P2 pin G and center pin of J3.	Measurement indicates less than two ohms.	Go to next step.	Go to step 4.
3	Fault Locator	Measure continuity between W1P2 pin G and W1P2 pin g.	Measuretnent indicates an open circuit.	Go to step 13.	Go to step 4.
4	Test Cable W1	Remove from TEST connector J1 on Fault Locator.	. . .	. . .	. . .
5	Test Cable W1	Measure continuity between connector W1P2 pin G and W1P1 pin G.	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 10.
6	Test Cable W1	Measure continuity between connector W1P2 pin G and W1P2 pin g.	Measurement indicates an open circuit.	Go to next step.	Go to step 10.
7	Harness	Measure continuity between connector J1-G and J3.	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 11.
8	Harness	Measure continuity between connector J1-G and TP16.	Measurement indicates an open circuit.	Go to next step.	Go to step 11.
9	Fault Locator	Return to service.	. . .	. . .	. . .
10	Test Cable W1	Replace cable; then proceed to step 12.	. . .	. . .	. . .
11	Harness	Repair failed harness wire.	. . .	. . .	. . .
12	Test Cable W1	Connect to TEST connector J1 on Fault Locator.	. . .	. . .	. . .
13	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-16. Test Point (1, 2, 5, 10, 11, 14, 15) Fault

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to OFF.	. . .	. . .	. . .
2	LASER Switch S1	Set to ENABLE.	. . .	. . .	. . .
3	Fault Locator	Measure continuity between W1P2 pin and test point. TP / W1P2 / Signal 1 / B / A TRIG 2 / d / Q/S TRIGGER-TA 5 / f / COMPUTER WORD 10 / D / ENERGY VALID 11 / R / FLASHTUBE TRIGGER-TA 14 / c / HVPS ON 15 / P / TURN-ON RESET	Measurement indicates 950 to 1050 ohms.	Go to next step.	Go to step 6.
4	Fault Locator	Measure continuity between W1P2 pin and W1P2 pin g. W1P2 B d f D R c P	Measurement indicates an open circuit.	Go go next step.	Go to step 6.
5	Fault Locator	Return to service.	. . .	. . .	. . .
6	Test Cable W1	Remove from TEST connector J1 on Fault Locator.	. . .	. . .	. . .
7	Test Cable W1	Measure continuity between W1P2 pin and W1P1 pin. W1P2 / W1P1 B / B d / d f / f D / D R / R c / c P / P	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 12.

Table 3-16. Test Point (1, 2, 5, 10, 11, 14, 15) Fault - Continued

Step	Item	Action	Indication	Yes	No
8	Test Cable W1	Measure continuity between W1P2 pin and W1P1 pin g. W1P2 B d f D R c P	Measurement indicates an open circuit.	Go to next step.	Go to step 12.
9	Harness	Measure continuity between failed test point and J1. TP — J1 1 — B 2 — d 5 — f 10 — D 11 — R 14 — c 15 — P	Measurement indicates 950 to 1050 ohms.	Go to next step.	Go to step 13.
10	Harness	Measure continuity between J1 pin and TP16. J1 — J1 B — R d — c f — P D	Measurement Indicates an open circuit.	Go to next step.	Go to step 13.
11	Fault Locator	Return to service.	. . .	. . .	. . .
12	Test Cable W1	Replace cable.	. . .	. . .	. . .

WARNING

When front panel is removed and power cable W2 is connected to facility power, 115 Vac is present at pins of F1 and S2.

13	Front Panel	Remove per paragraph 3-16a.	. . .	. . .	. . .

Table 3-16. Test Point (1, 2, 5, 10,.11, 14, 15) Fault - Continued

Step	Item	Action	Indication	Yes	No
14	Harness or Resistor	Repair harness or replace failed resistor as follows: TP — Resistor 1 — R1 2 — R2 5 — R3 10 — R4 11 — R5 14 — R6 15 — R7	. . .	. . .	. . .
15	Front Panel	Install per paragraph 3-16a.	. . .	. . .	. . .
16	Test Cable W1	Connect to TEST connector J1 on Fault Locator.	. . .	. . .	. . .
17	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-17. Test Point (3, 6, 7, 8, 9, 12, 13, 16) Fault

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to OFF.	. . .	. . .	. . .
2	Fault Locator	Measure continuity between W1P2 pin and test point. TP / W1P2 / Signal 3 / U / RECEIVER START-TA 6 / H / EVENTS COUNT-TA 7 / L / 20 kHz CLOCK-TA 8 / J / HVPS ENABLE-TA 9 / A / SHIELD RETURN 12 / K / TIMING GATE-TA 13 / W / PFN CHARGED 16 / g / RETURN-TA	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 6.
3	Fault Locator	Measure continuity between W1P2-g and test point. TP 3 6 7 8 12 13	Measurement indicates an pen circuit.	Go to next step.	Go to step 6.
4	Test Cable W1	Measure continuity between W1P2-A and W1P2-g.	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 6.
5	Fault Locator	Return to service.	. . .	. . .	. . .
6	Test Cable W1	Remove from TEST connector J1 on Fault Locator.	. . .	. . .	. . .
7	Test Cable W1	Measure continuity between W1P2 pin and W1P1 pin. W1P2 / W1P1 U / U H / H L / L J / J A / A K / K W / W g / g	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 12.

Table 3-17. Test Point (3, 6, 7, 8, 9, 12, 13, 16) Fault - Continued

Step	Item	Action	Indication	Yes	No
8	Test Cable W1	Measure continuity between W1P2 pin g and W1P1 pin. W1P1 U H L J A K	Measurement indicates an open circuit.	Go to next step.	**Go to step 12.**
9	Harness	Measure continuity between J1 pin and test point. TP — J1 3 — U 6 — H 7 — L 8 — J 9 — A 12 — K 13 — W 16 — g	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 13.
10	Harness	Measure continuity between J1 pin and TP16. J1 U H L J A K W	Measurement indicates an open circuit.	Go to next step.	Go to step 13.
11	Fault Locator	Return to service.	. . .	. . .	. . .
12	Test Cable W1	Replace cable.	. . .	. . .	. . .

WARNING

When front panel is removed and power cable W2 is connected to facility power, 115 Vac is present at pins on J2 and S2.

13	Front Panel	Remove per paragraph 3-16a.	. . .	. . .	. . .

Table 3-17. Test Point (3, 6, 7, 8, 9, 12, 13, 16) Fault - Continued

Step	Item	Action	Indication	Yes	No
14	Harness	Repair failed wiring.	. . .	. . .	. . .
15	Front Panel	Install per paragraph 3-16a.	. . .	. . .	. . .
16	Test Cable W1	Connect to TEST connector J1 on Fault Locator.	. . .	. . .	. . .
17	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-18. Power Cable (W2) Fault

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to OFF.	. . .	. . .	. . .
2	Power Cable W2	Remove from POWER connector J2 on Fault Locator.	. . .	. . .	. . .
3	Power Cable W2	Measure continuity between W2P1 pin and W2P2 pin. W2P1 W2P2 1 1 2 2 3 3	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 6.
4	Power Cable W2	Measure continuity between W2P1 pin and W2P1 pin 2. W2P1 1 3	Measurement indicates an open circuit.	Go to next step.	Go to step 6.
5	Fault Locator	Return to service.	. . .	. . .	. . .
6	Power Cable W2	Replace cable.	. . .	. . .	. . .
7	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-19. Test Cable (W1) Fault

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to OFF.	. . .	. . .	. . .
2	Test Cable W1	Remove from TEST connector J1 on Fault Locator.	. . .	. . .	. . .
3	Test Cable W1	Measure continuity between W1P1 pin and W1P2 pin. W1P1: B thru H, J thru N, R thru Z, a thru e, j, P, g W1P2: B thru H, J thru N, R thru Z, a thru e, j, P, g	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 8.
4	Test Cable W1	Measure continuity between W1P1 pin and W1P1 pin g. W1P1: B thru H, J thru N, R thru Z, a thru e, j, P	Measurement indicates an open circuit.	Go to next step.	Go to step 8.
5	Test Cable W1	Measure continuity between W1P1 pin and W1P3 pin. W1P1: A, f, h W1P3: A, B, C	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 8.
6	Test Cable W1	Measure continuity between W1P3 pin and W1P1 pin g. W1P3: A, B, C	Measurement indicates an open circuit.	Go to next step.	Go to step 8.
7	Fault Locator	Return to service.	. . .	. . .	. . .
8	Test Cable W1	Replace cable.	. . .	. . .	. . .
9	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-20. LASER Switch S9 Circuit Fails

Step	Item	Action	Indication	Yes	No
1	POWER Switch S2	Set to OFF.	. . .	. . .	. . .
		WARNING When front panel is removed and power cable W2 is connected to facility power, 115 Vac is present at pins of J2 and S2.			
2	Front Panel	Remove per paragraph 3-16a.	. . .	. . .	. . .
		CAUTION Insure that the two screws holding P1 to A1J1 are loosened evenly by loosening each screw one or two turns at a time to avoid damage to connector.			
3	Harness	Disconnect P1 from A1J1 by loosening two screws.	. . .	. . .	. . . .
4	Harness	Measure BATTERY VOLTAGE signal path (from W1P1-a to relay contact K1-B2) for continuity.	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 7.
5	Harness	Measure $\overline{\text{FIRE REMOTE}}$ signal path (from W1P1-b to relay contact K1-A1) for continuity.	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 7.
6	Harness	Measure FIRE REMOTE signal path (from W1P1-T to relay contact K1-B1) for continuity.	Measurement indicates less than 2 ohms.	Go to step 11.	Go to next step.
7	Test Cable W1	Remove from Fault Locator.	. . .	. . .	. . .
8	Test Cable W1	Measure BATTERY VOLTAGE signal path (from W1P1-a to W1P2-a) for continuity.	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 16.
9	Test Cable W1	Measure $\overline{\text{FIRE REMOTE}}$ signal path (from W1P1-b to W1P2-b) for continuity.	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 16.
10	Test Cable W1	Measure FIRE REMOTE signal path (from W1P1-T to W1P2-T) for continuity.	Measurement Indicates less than 2 ohms.	Replace cable.	Go to step 16.
11	LASER Switch S9	Measure continuity from switch contacts: S9-2C to S9-2N0 S9-1C to S9-1NC	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 15.

Table 3-20. LASER Switch S9 Circuit Fails - Continued

Step	Item	Action	Indication	Yes	No
12	LASER Switch S9	Hold to START position while measuring continuity from switch contacts: S9-2C to S9-2NC S9-1C to S9-1NO	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 15.
13	LASER Switch S9	Release to ON position while measuring continuity from: S9-2C to S9-2NC S9-1C to S9-1NC	Measurement indicates less than 2 ohms.	Go to next step.	Go to step 15.
14	K1 Relay	Replace K1 relay per paragraph 3-16g, then proceed to step 17.	. . .	. . .	. . .
15	LASER Switch S9	Replace S9 per paragraph 3-16n, then proceed to step 17.	. . .	. . .	. . .
16	Test Cable W1	Replace test cable W1, then proceed to step 17.	. . .	. . .	. . .
		CAUTION Insure screws are tightened evenly, one turn at a time, to avoid damaging connector.			
17	Harness	Connect P1 to A1J1 by tightening two screws.	. . .	. . .	. . .
18	Front Panel	Install per paragraph 3-16a.	. . .	. . .	. . .
19	Fault Locator	Return to service.	. . .	. . .	. . .

Table 3-21. TESTER ON Indicator XDS2 Does Not Light

Step	Item	Action	Indication	Yes	No
1	RCT Cable W2	Remove from +24 VDC connector J1 on RCT.	. . .	. . .	. . .
2	TESTER ON Indicator Bulb DS2	Unscrew bulb from front panel.	. . .	. . .	. . .
3	TESTER ON Indicator Bulb DS2	Measure continuity of bulb DS2.	Measurement indicates an open circuit.	Replace faulty bulb.	Go to next step.
4	Front Panel	Remove per paragraph 3-17a.	. . .	. . .	. . .
5	MODE Switch S1	Set to AZ ADJ.	. . .	. . .	. . .
6	Bulbholder XDS2	Measure continuity of bulbholder XDS2 (without bulb DS2 installed).	Measurement indicates a short.	Replace XDS2 per paragraph 3-17i.	Go to next step.
7	Bulbholder XDS2	Screw bulb DS2 into bulbholder XDS2.	. . .	. . .	. . .
		NOTE In following step, insure MODE switch is set to AZ ADJ.			
8	Bulbholder XDS2	Measure continuity of bulbholder XDS2.	Measurement indicates an open circuit.	Replace faulty bulbholder XDS2 per paragraph 3-17i.	Go to next step.
9	Front Panel	Measure continuity from connector J1 pins K and Z (Figure FO-3).	Measurement indicates an open circuit.	Faulty wiring is indicated. Troubleshoot using RCT schematic diagram (Figure FO-3).	Go to next step.
10	RCT Cable W2	Measure continuity from (Figure FO-3): W2P1 to W2P2 K K Z Z	Measurement indicates less than 2 ohms.	Go to next step.	Replace RCT Cable W2 and retest.
11	RCT	Install front panel per paragraph 3-17a and return to service.	. . .	. . .	. . .

Table 3-22. LASER ARMED Indicator XDS1 Does Not Light

Step	Item	Action	Indication	Yes	No
1	RCT Cable W2	Remove from +24 VDC connector J1 on RCT.	. . .	. . .	. . .
2	LASER ARMED Indicator Bulb DS1	Unscrew bulb from front panel.	. . .	. . .	. . .
3	LASER ARMED Indicator Bulb DS1	Measure continuity of bulb DS1.	Measurement indicates an open circuit.	Replace faulty bulb.	Go to next step.
4	Front Panel	Remove per paragraph 3-17a.	. . .	. . .	. . .
5	MODE Switch S1	Set to DES.	. . .	. . .	. . .
6	TESTER ON Indicator Bulb DS2	Unscrew bulb DS2.	. . .	. . .	. . .
7	Bulbholder XDS1	Measure continuity of bulbholder XDS1 (without bulb DS1 installed).	Measurement indicates a short.	Replace bulbholder XDS1 per paragraph 3-17i.	Go to next step.
8	Bulbholder XDS1	Screw bulb DS1 into bulbholder XDS1.	. . .	. . .	. . .
9	Bulbholder XDS1	Measure continuity of bulbholder XDS1.	Measurement indicates an open circuit.	Replace faulty bulbholder XDS1 per paragraph 3-17i.	Go to next step.
10	Front Panel	Set MODE switch to DES and measure continuity between connector J1 pins K and Z (Figure FO-3).	Measurement indicates an open circuit.	Faulty wiring is indicated. Troubleshoot using RCT schematic diagram (Figure FO-3).	Go to next step.
11	TESTER ON Indicator Bulb DS2	Screw bulb DS2 into bulbholder XDS2.	. . .	. . .	. . .
12	RCT Cable W2	Measure continuity from: W2P1 to W2P2 K K Z Z	Measurement indicates less than 2 ohms.	Go to next step.	Replace RCT Cable W2 and retest.
13	RCT	Install front panel per paragraph 3-17a. and return to service.	. . .	. . .	. . .

Table 3-23. Test Point (1, 2, 3) Fault

Step	Item	Action	Indication	Yes	No
1	RCT Cable W2	Remove from +24 VDC connector J1 on RCT.	. . .	. . .	. . .
2	Front Panel	Measure continuity from connector J1 pin to test point (Figure FO-3). J1 to Test Point S 1 T 2 a 3	Measurement indicates less than 2 ohms.	Go to next step.	Check wiring/ test point, replace as required. Refer to paragraph 3-17d.
3	Front Panel	Measure continuity from connector J1 pin K to connector J1 pins S, T, and a (Figure FO-3).	Measurement indicates an open circuit.	Go to next step.	Replace Test Point per paragraph 3-17d.
4	RCT Cable W2	Measure continuity from (Figure FO-3): W2P1 to W2P2 S S T T a a	Measurement indicates less than 2 ohms.	Go to next step.	Replace RCT Cable W2 and retest.
5	RCT	Return to service.	. . .	. . .	. . .

Table 3-24. Code Switch Circuit Fails

Step	Item	Action	Indication	Yes	No
1	RCT Cable W2	Remove from + 24 VDC connector J1 on RCT.	. . .	. . .	. . .
2	Front Panel	Set code switch C to 1.	. . .	. . .	. . .
3	Front Panel	Measure continuity from connector J1 pin K to: J1 (Figure FO-3) A B C	Measurement indicates less than 2 ohms.	Go to next step.	Replace switch S7 per paragraph 3-17e.
4	Front Panel	Set code switch C to 8.	. . .	. . .	. . .
5	Front Panel	Measure continuity from connector J1 pin K to: J1 (Figure FO-3) A B C	Measurement indicates an open circuit.	Go to next step.	Replace switch S7 per paragraph 3-17e.
6	Front Panel	Set code switch B to 1.	. . .	. . .	. . .
7	Front Panel	Measure continuity from connector J1 pin K to: J1 (Figure FO-3) D E F	Measurement indicates less than 2 ohms.	Go to next step.	Replace switch S6 per paragraph 3-17e.
8	Front Panel	Set code switch B to 8.	. . .	. . .	. . .
9	Front Panel	Measure continuity from connector J1 pin K to: J1 (Figure FO-3) D E F	Measurement indicates an open circuit.	Go to next. step.	Replace switch S6 per paragraph 3-17e.
10	Front Panel	Set code switch A to 1.	. . .	. . .	. . .
11	Front Panel	Measure continuity from connector J1 pin K to: J1 (Figure FO-3) G H J	Measurement indicates less than 2 ohms.	Go to next step.	Replace switch S5 per paragraph 3-17e.
12	Front Panel	Set code switch A to 8.	. . .	. . .	. . .

Table 3-24. Code Switch Circuit Fails - Continued

Step	Item	Action	Indication	Yes	No
13	Front Panel	Measure continuity from connector J1 pin K to: J1 (Figure FO-3) G H J	Measurement indicates an open circuit.	Go to next step.	Replace switch S5 per paragraph 3-17e.
14	RCT Cable W2	Measure continuity from (Figure FO-3): W2P1 to W2P2 Z K A thru H J to Z K A thru H J	Measurement indicates less than 2 ohms.	Go to next step.	Replace cable W2 and retest.
15	RCT	Remove front panel per paragraph 3-17a.	. . .	. . .	. . .
16	Front Panel	Check wiring and soldered connections for breakage or damage.	Breakage or damage exists.	Repair as required.	Go to next step.
17	RCT	Install front panel per paragraph 3-17a. and return to service.	. . .	. . .	. . .

Table 3-25. RETICLE BRIGHTNESS Control R2 Circuit Fails

Step	Item	Action	Indication	Yes	No
1	RCT Cable W2	Remove from +24 VDC connector on RCT.	. . .	. . .	. . .
2	Front Panel	Set RETICLE BRIGHTNESS knob to extreme clockwise (cw) position and measure continuity from R2 pin 1 to R2 pin 3 (Figure FO-3).	Measurement indicates less than 50 ohms.	Go to next step.	Replace R2 per paragraph 3-17j.
3	Front Panel	Set RETICLE BRIGHTNESS knob to extreme counterclockwise (ccw) position and measure continuity from R2 pin 1 to R2 pin 3.	Measurement indicates approximately 5 kilohms.	Go to next step.	Replace R2 per paragraph 3-17j.
4	Front Panel	Set RETICLE BRIGHTNESS knob to extreme clockwise (cw) position and measure continuity from connector J1 pin R to J1 pin Z (Figure FO-3).	Measurement indicates approximately 510 ohms.	Go to step 7.	Go to next step.
5	RCT	Remove front panel per paragraph 3-17a.	. . .	. . .	. . .
6	Front Panel	Measure continuity from RCT connector J1 pin R to terminal E2.	Measurement indicates approximately 510 ohms.	Faulty wiring is indicated. Troubleshoot using RCT schematic diagram (Figure FO-3).	Replace resistor R1 per paragraph 3-17b.
7	RCT Cable W2	Measure continuity from (Figure FO-3): W2P1 to W2P2 R R Z Z K K	Measurement indicates less than 2 ohms.	Go to next step.	Replace RCT Cable W2 and retest.
8	RCT	Install front panel per paragraph 3-17a. and return to service.	. . .	. . .	. . .

Table 3-26. LASER FIRE Switch S4 Circuit Fails

Step	Item	Action	Indication	Yes	No
1	RCT Cable W2	Remove from +24 VDC connector J1 on RCT.	. . .	. . .	. . .
2	RCT	Remove front panel per paragraph 3-17a.	. . .	. . .	. . .
3	Mode Switch S1	Set to DES.	. . .	. . .	. . .
4	Front Panel	Set and hold LASER FIRE switch S4 to ON and measure continuity from S4 Pin 1 to S4 pin 2 and from S4 pin 4 to S4 pin 5 (Figure FO-3).	Measurement indicates less than 2 ohms.	Go to next step.	Replace switch S4 per paragraph 3-17h.
5	Front Panel	Set LASER FIRE switch S4 to OFF and measure continuity from S4 pin 1 to S4 pin 2 and from S4 pin 4 to S4 pin 5 (Figure FO-3).	Measurement indicates an open circuit.	Go to next step.	Replace switch S4 per paragraph 3-17h.
6	Front Panel	Set and hold LASER FIRE switch S4 to ON and measure continuity from connector J1 pin Z to J1 pins W and Y (Figure FO-3).	Measurement indicates continuity.	Go to next step.	Faulty wiring is indicated. Troubleshoot using RCT schematic diagram (Figure FO-3).
7	RCT Cable W2	Measure continuity from (Figure FO-3): W2P1 to W2P2 W to W Y to Y Z to Z K to K	Measurement indicates less than 2 ohms.	Go to next step.	Replace RCT Cable W2 and retest.
8	RCT	Install front Panel per paragraph 3-17a. and return to service.	. . .	. . .	. . .

Table 3-27. MODE Switch S1 Circuit Fails

Step	Item	Action	Indication	Yes	No
1	RCT Cable W2	Remove from +24 VDC connector J1 on RCT.	. . .	. . .	. . .
2	Front Panel	Set MODE switch S1 to DES and measure continuity from connector J1 pin Y to pin Z (Figure FO-3).	Measurement indicates an open circuit.	Go to next step.	Replace switch S1 per paragraph 3-17f.
3	Front Panel	Set MODE switch S1 to DES and measure continuity from connector J1 pin K to pin N (Figure FO-3).	Measurement indicates less than 2 ohms.	Go to next step.	Replace switch S1 per paragraph 3-17f.
4	TESTER ON Indicator Bulb DS2	Unscrew bulb DS2.	. . .	. . .	. . .
5	Front Panel	Set MODE switch S1 to DES and measure continuity from connector J1 pin K to pin Z (Figure FO-3).	Measurement indicates an open circuit.	Replace switch S1 per paragraph 3-17f.	Go to next step.
6	Front Panel	Set MODE switch S1 to AZ and measure continuity from (Figure FO-3): J1 to J1 M K Z Y	Measurement indicates less than 2 ohms.	Go to next step.	Replace switch S1 per paragraph 3-17f.
7	Front Panel	Set MODE switch S1 to RNG and measure continuity from connector J1 pin K to pin Z (Figure FO-3).	Measurement indicates an open circuit.	Replace switch S1 per paragraph 3-17f.	Go to next step.
8	TESTER ON Indicator Bulb DS2	Screw bulb DS2 into bulbholder XDS2.	. . .	. . .	. . .
9	Front Panel	Set MODE switch S1 to RNG and measure continuity from connector J1 pin K to (Figure FO-3): J1 M N	Measurement indicates an open circuit.	Go to next step.	Replace switch S1 per paragraph 3-17f.

Table 3-27. MODE Switch S1 Circuit Fails - Continued

Step	Item	Action	Indication	Yes	No
10	RCT Cable W2	Measure continuity from (Figure FO-3): W2P1 to W2P2 L L M M N N K K Z Z	Measurement indicates less than 2 ohms.	Go to next step.	Replace RCT Cable W2 and retest.
11	Front Panel	Check for faulty wiring using RCT wiring diagram (Figure FO-3).	Fault exists.	Repair fault.	Retest and go to next step.
12	RCT	Return to service.	. . .	. . .	. . .

Table 3-28. FIRE CMD Switch S2 Circuit Fails

Step	Item	Action	Indication	Yes	No
1	RCT Cable W2	Remove from +24 VDC connector J1 on RCT.	. . .	. . .	. . .
2	RCT	Remove front panel per paragraph 3-17a.	. . .	. . .	. . .
3	Front Panel	Set FIRE CMD switch S2 to ON and measure continuity from switch S2 pin 2 to switch S2 pin 3 (Figure FO-3).	Measurement indicates less than 2 ohms.	Go to next step.	Replace switch S2 per paragraph 3-17h.
4	Front Panel	Set FIRE CMD switch S2 to OFF and measure continuity from switch S2 pin 2 to switch S2 pin 3 (Figure FO-3).	Measurement indicates an open circuit.	Go to next step.	Replace switch S2 per paragraph 3-17h.
5	Front Panel	Set FIRE CMD switch S2 to ON and measure continuity from connector J1 pin U to (Figure FO-3): J1 K Z	Measurement is 6.6 to 7.0 kilohms.	Go to step 7.	Go to next step.
6	Front Panel	Measure continuity from from E3 to E4.	Measurement indicates 6.8 kilohms.	Faulty wiring is indicated. Trouble-shoot using RCT schematic diagram (Figure FO-3).	Replace R3 per paragraph 3-17b.
7	Front Panel	Set FIRE CMD switch S2 to OFF and measure continuity from connector J1 pin U to (Figure FO-3): J1 Z K	Measurement indicates an open circuit.	Go to next step.	Perform step 6.
8	RCT Cable W2	Measure continuity from (Figure FO-3): W2P1 to W2P2 K to K Z to Z U to U	Measurement indicates less than 2 ohms.	Go to next step.	Replace RCT Cable W2 and retest.
9	RCT	Install front panel per paragraph 3-17a. and return to service.	. . .	. . .	. . .

Table 3-29. RANGE SEL Switch S3 Circuit Fails

Step	Item	Action	Indication	Yes	No
1	RCT Cable W2	Remove from +24 VDC connector J1 on RCT.	. . .	. . .	. . .
2	RCT	Remove front panel per paragraph 3-17a.	. . .	. . .	. . .
3	Front Panel	Set RANGE SEL switch S3 to RNG 1 and measure continuity from switch S3 pin 1 to switch S3 pin 2.	Measurement indicates less than 2 ohms.	Go to next step.	Replace switch S3 per paragraph 3-17h.
4	Front Panel	Set RANGE SEL switch S3 to RNG 2 and measure continuity from switch S3 pin 1 to switch S3 pin 2.	Measurement indicates an open circuit.	Go to next step.	Replace switch S3 per paragraph 3-17h.
5	Front Panel	Set RANGE SEL switch S3 to RNG 1 and measure continuity from connector J1 pin K to J1 pin L (Figure FO-3).	Measurement indicates less than 2 ohms.	Go to next step.	Faulty wiring is indicated. Troubleshoot using RCT schematic diagram (Figure FO-3).
6	RCT Cable W2	Measure continuity from (Figure FO-3): W2P1 K L to W2P2 K L	Measurement indicates less than 2 ohms.	Go to next step.	Replace RCT Cable W2 and retest.
7	RCT	Install front panel per paragraph 3-17a. and return to service.	. . .	. . .	. . .

Table 3-30. RCT Cable W2 Fault

Step	Item	Action	Indication	Yes	No
1	RCT Cable W2	Remove from LD/R connector 1J7.	. . .	. . .	. . .
2	RCT Cable W2	Remove from +24 V RCT connector J1.	. . .	. . .	. . .
3	RCT Cable W2	Measure continuity from (Figure FO-3): W2P1 to W2P2 A thru H — A thru H J thru N — J thru N P — P R thru Z — R thru Z a thru c — a thru c	Measurements indicate less than 2 ohms.	Go to next step.	Replace RCT Cable W2.
4	RCT Cable W2	Measure continuity from RCT Cable W2 housing to (Figure FO-3): W2P1 A thru H J thru N P R thru Z a b c	Measurements indicate an open circuit.	Go to next step.	Replace RCT Cable W2.
5	RCT Cable W2	Return to service.	. . .	. . .	. . .

3-11. TROUBLESHOOTING PURGE AND FILL EQUIPMENT

Common Purge and Fill Equipment failures are listed in Table 3-31. Fault isolation procedure is contained in Table 3-32.

Table 3-31. Purge and Fill Equipment Troubleshooting Index

Item	Failure Symptom	Troubleshooting Action
1	Gas Charging Assembly leak fault.	Troubleshoot per Table 3-32.
2	Damaged Purge Valve Adapter.	Repair Purge Valve Adapter per paragraph 3-18b.
3	Damaged Fill Valve Extension.	Replace Fill Valve Extension.
4	Damaged High Pressure Gage.	Replace High Pressure Gage.

Table 3-32. Gas Charging Assembly Leak

Step	Item	Action	Indication	Yes	No
		WARNING Handle compressed gas cylinder carefully. It can explode, become a projectile, injure personnel, and damage equipment. Escaping gas may blow dirt or dust particles into the eyes. Relieve all pressures before and after use of Gas Charging Assembly and nitrogen source.			
		NOTE Figure 3-5 shows location of parts and controls. Seal threads with Teflon tape when replacing any item in Gas Charging Assembly.			
1	Gas Charging Assembly	Remove connection valve (5) from end of Gas Charging Assembly hose (11).	. . .	. . .	. . .
2	Gas Charging Assembly	Install an AN806-3 plug (8, Table 3-2) in free end of hose.	. . .	. . .	. . .

Table 3-32. Gas Charging Assembly Leak - Continued

Step	Item	Action	Indication	Yes	No
3	Gas Charging Assembly	Turn regulator pressure tee handle (24) ccw (closed) until handle spins freely.	. . .	. . .	. . .
4	Gas Charging Assembly	Turn main valve (18) to closed position.	. . .	. . .	. . .
5	Gas Charging Assembly	Turn vent valve (16) cw to closed position.	. . .	. . .	. . .

WARNING

The nitrogen cylinder must be securely fastened to keep it from falling. If the cylinder should fall, it could break its outlet fittings and become an unguided missile. Injury or death could result even at a considerable distance.

6	Gas Charging Assembly	Fasten a cylinder of dry nitrogen (GN_2) to a support in an upright position. Remove protective cap.	. . .	. . .	. . .
7	Gas Charging Assembly	Connect with coupling nut (2) to nitrogen source.	. . .	. . .	. . .

WARNING

During application of pressure, be alert for escaping gas. If assembly is faulty, leakage from any part of assembly could cause blindness, injury, or death. If leakage occurs, close cylinder valve (fully cw) immediately.

Handle compressed gas cylinder carefully. It can explode, become a projectile, damage equipment, and injure personnel.

8	Nitrogen Source	Slowly turn nitrogen source supply valve fully ccw (open), until inlet pressure gage indicator stabilizes at cylinder pressure. Then open cylinder valve (ccw).	Regulator input gage indicates supply pressure.	Go to next step.	Perform steps 27 thru 30, then replace regulator.
9	Gas Charging Assembly	Turn main valve (18) ccw to open position.	. . .	. . .	. . .
10	Gas Charging Assembly	Turn vent valve (16) ccw to open position. Check for any gas flow from vent valve outlet.	No noticeable gas flow.	Go to next step.	Perform steps 27 thru 30, then replace regulator.

Table 3-32. Gas Charging Assembly Leak - Continued

Step	Item	Action	Indication	Yes	No
11	Gas Charging Assembly	Turn vent valve (16) cw to closed position.	. . .	. . .	. . .
12	Gas Charging Assembly	Slowly turn regulator pressure tee handle (24) until charging relief valve (12) begins to vent. Observe regulater pressure gage (25).	(a) Gage indicates between 650 and 750 psig.	Go to next step.	Perform steps 27 thru 30, then replace charging valve.
			(b) Gage indicates no pressure, leaks or is sticky.	Perform steps 27 thru 30, then replace charging relief	. . .
			(c) Gas flows from vent valve.	Perform steps 27 thru 30, then replace vent valve.	. . .
13	Gas Charging assembly	Turn regulator pressure tee handle (24) slowly ccw until charging relief valve (12) stops venting.	Gage indicates more than 600 psig.	Go to next step.	Perform steps 27 thru 30, then replace relief valve.

Table 3-32. Gas Charging Assembly Leak - Continued

Step	Item	Action	Indication	Yes	No
		NOTE • Do not allow leak detection compound to enter valve openings. • Occasionally a leak may flow too rapidly to form bubbles when compound is first applied. Such a leak may only be discovered by repeated application of compound to suspected areas until bubble activity occurs. • The actions in the next three steps should be performed at the same time.			
14	Gas Charging Assembly	Coat all threaded connections and any unusual areas of hose with leak detection compound.	No bubbles or stream of bubbles occur over a period of 15 minutes.	Go to next step.	If a leak occurs at a threaded joint, perform steps 27 thru 30, then tighten connection. Return to this table at step 5. If leak still occurs, perform steps 27 thru 30, then replace part that leaks.

Table 3-32. Gas Charging Assembly Leak - Continued

Step	Item	Action	Indication	Yes	No
15	Gas Charging Assembly	Wipe assembly to remove leak detection compound. Use clean rags.	. . .	. . .	. . .
16	Gas Charging Assembly	Turn main valve (18) cw to closed position.	. . .	. . .	. . .
17	Gas Charging Assembly	Turn regulator pressure tee handle (24) slowly cw until regulator relief valve (3) begins to vent. Observe regulator pressure gage (25).	Gage indicates between 1350 and 1450 psig.	Go to next step.	Perform steps 27 thru 30, then replace regulator.
18	Gas Charging Assembly	Turn regulator pressure tee handle (24) slowly ccw until regulator relief valve (3) stops venting.	Gage indicates more than 1300 psig.	Go to next step.	Perform steps 27 thru 30, then replace regulator.

WARNING

Escaping gas may blow dirt or dust particles into the eyes. Protect eyes and area by discharging assemblies into absorbent material.

19	Gas Charging Assembly	Slowly turn vent valve (16) ccw to open position. Do not proceed to next step until gas flow stops.	Gas flows from vent valve outlet then stops flowing within approximately 2 minutes.	Go to next step.	Perform steps 27 thru 30, then disassemble gas charging assembly. Clean orifice nipple located between cross and vent valve.
20	Gas Charging Assembly	Turn vent valve (16) cw to closed position. Wait approximately 5 minutes before proceeding to the next step.	. . .	. . .	. . .

Table 3-32. Gas Charging Assembly Leak - Continued

Step	Item	Action	Indication	Yes	No
21	Gas Charging Assembly	Open vent valve (16) quickly turn handle ccw while observing vent valve outlet for gas flow.	No gas flow is detected.	Go to next step.	Perform steps 27 thru 30, then replace main valve.
22	Gas Charging Assembly	Turn vent valve (16) ccw to open position.	. . .	. . .	. . .
23	Gas Charging Assembly	Turn regulator pressure tee handle (24) ccw until it spins freely.	. . .	. . .	. . .

WARNING

Escaping gas may blow dirt or dust into the air. Use caution when discharging pressurized assembles.

24	**Gas Charging Assembly**	Slowly turn main valve (18) ccw. Do not proceed to next step until gas flow stops.	Gas flows from vent valve outlet, then stops flowing within 2 minutes.	Go to next step.	Perform steps 27 thru 30, then disassemble gas charging assembly. Clean pipe orifice nipple located between regulator and filter. Repeat procedure. If failure repeats, replace filter.
25	Gas Charging Assembly	Turn main valve (18) cw to closed position. Wait approximately 5 minutes before proceeding to the next step.	. . .	. . .	. . .

Table 3-32. Gas Charging Assembly Leak - Continued

Step	Item	Action	Indication	Yes	No
26	Gas Charging Assembly	Quickly turn main valve (18) ccw while observing vent valve (16) outlet for escaping gas.	No gas flow is detected.	Go to next step.	Perform steps 27 thru 30, then replace regulator.
27	Gas Charging Assembly	Turn gas cylinder valve handle fully cw to closed position.	. . .	. . .	. . .
28	Gas Charging Assembly	Check that vent (16) and main valves (18) are fully open (ccw). If not, then open valve(s) (16 and 18) fully ccw.	. . .	. . .	. . .
29	Gas Charging Assembly	Turn regulator pressure tee handle (24) cw until input pressure gage (26) indicates 0 psig.	. . .	. . .	. . .
30	Gas Charging Assembly	Remove Gas Charging Assembly from cylinder.	. . .	. . .	. . .
31	Gas Charging Assembly	Remove AN806-3 plug from free end of hose.	. . .	. . .	. . .
32	Gas Charging Assembly	Install connection valve (5) on free end of hose.	. . .	. . .	. . .

WARNING

Handle compressed gas cylinder carefully. It can explode, become a projectile, injure personnel, and damage equipment. If cylinder is to be moved, install protective cap on cylinder before unfastening cylinder from support.

3-12. TROUBLESHOOTING POWER MAINTENANCE CABLE AND EMI FILTER

Common Power Maintenance Cable and EMI Filter failures are listed in Table 3-33. Fault isolation procedures for the Power Maintenance Cable are contained in Table 3-34. Fault isolation procedures for the EMI Filter are contained in TM 9-1260-477-34-2.

Table 3-33. Power Maintenance Cable and EMI Filter Troubleshooting Index

Item	Failure Symptom	Troubleshooting Action
1	Power Maintenance Cable fault/ open or shorted wires.	Continuity check per Table 3-34.
2	EMI Filter fault/no output or filter action.	Troubleshoot per TM 9-1260-477-34-2.

Table 3-34. Power Maintenance Cable Continuity Check

Step	Item	Action	Indication	Yes	No
1	Power Maintenance Cable	Check continuity between the following points (Figure 3-0): P2 Red to P1-A P2 Red to P1-B P2 Black to P1-C P2 Black to P1-D	Measurements indicate less than 2 ohms.	Go to next step.	Replace Power Maintenance Cable.
2	Power Maintenance Cable	Check continuity between the following points (Figure 3-0): P2 Red to P1-C P2 Black to P1-A	Measurements indicate an open circuit.	Go to next step.	Replace Power Maintenance Cable.
3	Power Maintenance Cable	Return to service.	. . .	. . .	. . .

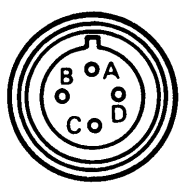


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Figure 3-0. Power Maintenance Cable Connector P1 Pin Orientation

3-13. TROUBLESHOOTING TEST RESOLVER ASSEMBLY

a. Using multimeter (1, Table 3-2) check resistance in accordance with Table 3-36. Any measurement other than that indicated in Table 3-36 indicates a fault. The ellipsis (...) when used in the procedure indicates an intentional blank or termination of a procedural step.

Table 3-36. Test Resolver Troubleshooting

Step	Item	Action	Indication	Yes	No
1	Test Resolver	Disconnect from LD/R.	. . .	. . .	. . .
2	Test Resolver	Rotate resolver shaft by turning knob.	Resolver shaft rotates freely In both cw and ccw directions.	. . .	Send Test Resolver to depot for repair.
3	Test Resolver	Measure for continuity between following pins or on test resolver connector.			
		From / To	Resistance	. . .	Send Test Resolver to depot for repair.
		A / E	less than 2 ohms		
		F / G	less than 2 ohms		
		K / H	less than 2 ohms		
4	Test Resolver	Measure resistance between following pins.		. . .	Send Test Resolver to depot for repair.
		From / To	Resistance		
		A / F	56 ± 10 ohms		
		A / G	56 ± 10 ohms		
		A / H	28 ± 10 ohms		
		A / K	28 ± 10 ohms		
		B / C	56 ± 10 ohms		
		E / F	56 ± 10 ohms		
		E / G	56 ± 10 ohms		
		E / H	28 ± 10 ohms		
		E / K	28 ± 10 ohms		
		F / H	28 ± 10 ohms		
		F / K	28 ± 10 ohms		
		G / H	28 ± 10 ohms		
		G / K	28 ± 10 ohms		

Table 3-36. Test Resolver Troubleshooting - Continued

Step	Item	Action	Indication	Yes	No
5	Test Resolver	Measure resistance between following pins. From To A B,C B E,F,G,H,K, C E,F,G,H,K NOTE Pins D and J are spares.	Resistance greater than 20 megohms greater than 20 megohms greater than 20 megohms	. . .	Send Test resolver to depot for repair.

3-14. TROUBLESHOOTING BATTERY CHARGER CABLE

a. Using multimeter (1, Table 3-2), check resistance in accordance with Table 3-37. Any measurement other than that indicated in Table 3-37 indicates a fault.

b. Battery charger troubleshooting procedures are contained in TM 11-6130-392-34.

Table 3-37. Battery Charger Cable Multimeter Test

Battery Charger Cable		
From BATTERY Connector Pin	To CHARGER Connector Pin	Multimeter
		NOTE BATTERY connector pin P2 is not used.
P1	2	Measurement indicates less than 2.0 ohms.
P3	1	Measurement indicates less than 2.0 ohms.
P1	1	Measurement indicates an open circuit.
P3	2	Measurement indicates an open circuit.

3-14.1. TEST AND TROUBLESHOOTING HP POWER SUPPLY

Test and troubleshooting procedures for the HP Power Supply are contained in Table 3-38.

Table 3-38. HP Power Supply Test and Troubleshooting

Step	Item	Action	Indication	Yes	No
1	HP Power Supply	Turn CURRENT COARSE and FINE controls and VOLTAGE COARSE and FINE controls fully ccw. Turn OVERVOLTAGE ADJUST fully cw.	. . .	. . .	. . .
		WARNING Be sure ac power cable is unplugged. Be sure to connect input ground terminal to an external earth ground.			
		CAUTION Do not interchange ACC/AC and AC/AC input lines.			
2	HP Power Supply	Remove rear cover.	. . .	. . .	. . .
3	HP Power Supply	Connect ac power to rear panel by connecting white lead to ACC/AC terminal, black lead to AC/AC terminal, and green lead to ground terminal. Connect ground terminal to an earth ground.	. . .	. . .	. . .
4	HP Power Supply	Install rear cover.	. . .	. . .	. . .
5	AC Power Cable	Plug in to 115 V ac.	. . .	. . .	. . .
6	HP Power Supply	Set ~LINE switch to ON.	Power indicator lights.	Go to next step.	Send to calibration facility.
7	HP Power Supply	Adjust VOLTAGE COARSE and FINE controls for +24 V on VOLTS meter.	VOLTS meter indicates +24 V.	Go to next step.	Send to calibration facility.
8	HP Power Supply	Slowly turn OVERVOLTAGE ADJUST ccw.	OVERVOLTAGE indicator lights and VOLTS meter indication drops to 0 V.	Go to next step.	Send to calibration facility.
9	HP Power Supply	Set ~LINE switch to OFF and turn OVERVOLTAGE ADJUST fully cw.	. . .	. . .	. . .
10	HP Power Supply	Set ~LINE switch to ON.	VOLTS meter indicates +24 V.	Go to next step.	Send to calibration facility.

Table 3-38. HP Power Supply Test and Troubleshooting - Continued

Step	Item	Action	Indication	Yes	No
11	HP Power Supply	Set ~LINE switch to OFF.	Power Indicator goes off.	Go to next step.	Send to calibration facility.
12	HP Power Supply	Connect a wire between rear panel output terminal (+) to rear panel output terminal (-).	. . .	. . .	. . .
13	HP Power Supply	Set ~LINE switch to ON and adjust CURRENT COARSE and FINE controls for 25 A on AMPERES meter.	AMPERES meter indicates 25 A.	Go to next step.	Send to calibration facility.
14	HP Power Supply	Set ~LINE switch to OFF.	. . .	. . .	. . .
15	HP Power Supply	Disconnect wire from rear panel output terminal (+) and rear panel output terminal (-).	. . .	. . .	. . .
16	HP Power Supply	Return to service.	. . .	. . .	. . .

3-14.2. TROUBLESHOOTING SAFETY INTERLOCK

Refer to Appendix G.

Section IV. REPAIR

3-15. GENERAL

This section contains repair procedures for the GSE. The tools, equipment, and materials required to perform these procedures are listed in the appendices. The time required for each repair task is listed in the Maintenance Allocation Chart in Appendix B. Torque values not otherwise specified are given in Appendix F.

3-16. REPAIR OF FAULT LOCATOR

WARNING

All power must be removed from the Fault Locator before start of replacement procedures. Presence of power during replacement of components may injure personnel or damage equipment.

CAUTION

Logic Card A1 is electrostatic discharge sensitive. Protect this card by wearing grounding wristband when probing. Handling and/or installation of individual cards should be performed at a static-free work station. This card should be antistatic packaged during handling and storage.

a. Front Panel Removal/Replacement (Figure 3-1).

(1) Set POWER switch S2 to OFF.

(2) Remove 10 screws (1) and flat washers (2).

CAUTION

In following step, lift panel carefully to avoid wiring damage.

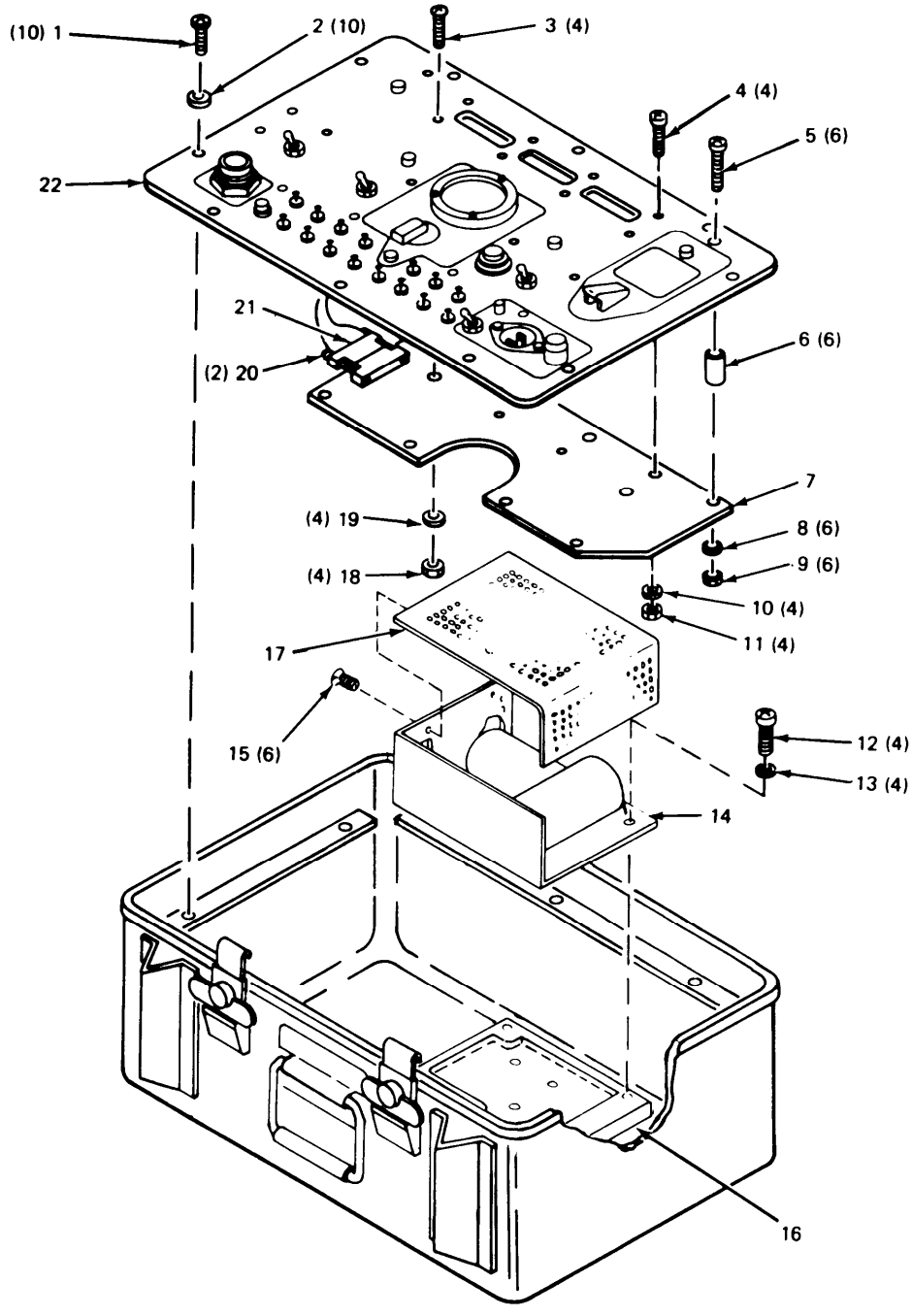
(3) Lift panel (22) out of Fault Locator case.

CAUTION

It is possible to install panel 180° out of position and cause a short between power supply and relay K1. Refer to Figure 3-1 for proper orientation of panel.

(4) Lower panel (22) into Fault Locator case.

(5) Install 10 flat washers (2) and screws (1) (torque 12 to 15 inch-pounds).



LEGEND

1.	SCREW	9.	NUT	16.	HEAT SINK
2.	FLAT WASHER	10.	FLAT WASHER	17.	POWER SUPPLY COVER
3.	SCREW	11.	NUT	18.	NUT
4.	SCREW	12.	SCREW	19.	FLAT WASHER
5.	SCREW	13.	FLAT WASHER	20.	JACKSCREW
6.	SPACER	14.	POWER SUPPLY PS1	21.	HARNESS CONNECTOR P1
7.	LOGIC CARD A1	15.	SCREW	22.	PANEL
8.	FLAT WASHER				

MS 420679E

Figure 3-1. Fault Locator Component Layout

b. Logic Card A1 Removal/Replacement (Figure 3-1).

(1) Remove front panel (22) per paragraph 3-16a.

(2) Remove six screws (5), spacers (6), flat washers (8), and nuts (9).

CAUTION

Insure that the two screws holding P1 to A1J1 are loosened evenly by loosening each screw one or two turns at a time to avoid damage to connector.

(3) Loosen two jackscrews (20) and disconnect harness connector P1 (21).

(4) Remove four screws (4), flat washers (10), and four nuts (11).

(5) Remove logic card A1 (7).

(6) Install new logic card A1.

(7) Install four screws (4), flat washers (10), and four nuts (11) (torque screws 5 to 6 inch-pounds).

CAUTION

Insure screws are tightened evenly, one turn at a time, to avoid damaging connector.

(8) Connect harness connector P1 (21) and tighten two jackscrews (20) (torque 5 to 6 inch-pounds).

(9) Install six screws (5), spacers (6), flat washers (8), and nuts (9) (torque screws 6 to 7 inch-pounds).

(10) Install front panel (22) per paragraph 3-16a.

c. Harness Removal/Replacement (Figures 3-1, 3-2, and FO-2).

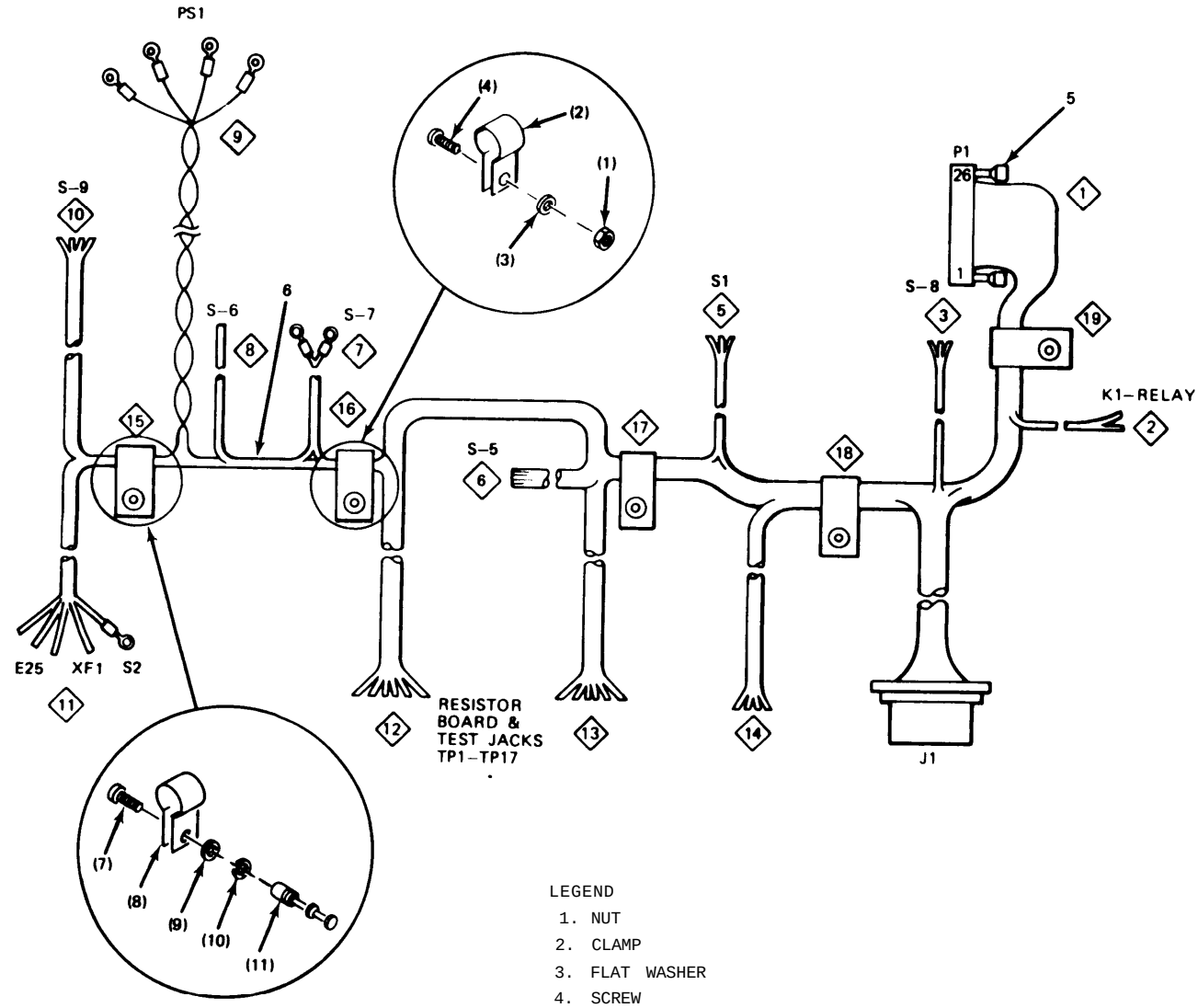
(1) Remove front panel (22, Figure 3-1) per paragraph 3-16a.

(2) Position panel (22, Figure 3-1) so harness (6, Figure 3-2) is accessible.

(3) Tag and unsolder wires (diamond 15, Figure 3-2) from E25 (11). Remove screw (7), flat washer (9), lockwasher (10), and clamp (8).

(4) Remove four screws (4, Figure 3-2), flat washers (3), nuts (1), and clamps (2) from diamonds 16 through 19.

(5) Loosen two jackscrews (5, Figure 3-2) on connector P1 (diamond 1) and disconnect connector P1.



NOTES:

1. NUMBER IN ◇ DENOTES A TEXT REFERENCE.
2. TWO TERMINAL LUGS ARE ATTACHED TO TP4.

LEGEND

1. NUT
2. CLAMP
3. FLAT WASHER
4. SCREW
5. JACKSCREW
6. HARNESS
7. SCREW
8. CLAMP
9. FLAT WASHER
10. LOCKWASHER
11. E25 TERMINAL

MS 420680F

Figure 3-2. Fault Locator Wire Harness Component Layout

(6) Remove locknut (44, Figure FO-2) from connector J1 (20).

(7) Tag and remove four wires from S2 by removing four screws (23, Figure FO-2) from switch S2 (24). Tag and remove three wires from connector J2 (25)

(8) Remove two nuts (10, Figure FO-2), four flat washers (11), and two wire lugs (12) (tag wires) from meter M1 (7).

(9) Remove two screws (38, Figure FO-2) and three wires (39) (tag wires) from switch S7 (5).

(10) Tag and disconnect four terminal lugs (diamond 9, Figure 3-2) from power supply (14, Figure 3-1) terminal posts.

(11) Tag and unsolder all harness wires from panel components (15, typical, Figure FO-2). Remove two terminal lugs from TP4.

(12) Remove DS1 leads (26, Figure FO-2) from harness assembly.

(13) Remove harness.

NOTE

Refer to Appendix E for wire list.

(14) Install new harness.

(15) Connect three wires (39, Figure FO-2) to switch S7 (5); install two screws (38) on S7 (5). Torque 2 to 3 inch-pounds.

(16) Install two nuts (10, Figure FO-2), four flat washers (11), and two wire lugs (12) on meter M1 (7). Torque nuts per Appendix F.

(17) Connect three wires to connector J2 (25 Figure FO-2) and four wires to switch S2 (24); install four screws (23) on switch S2 (24). Torque screws per Appendix F.

(18) Solder wires to panel components (Figure FO-2). Attach two terminal lugs to TP4.

(19) Install locknut (44, Figure FO-2) onto connector J1 (20). Torque 80 to 85 inch-pounds.

(20) Connect connector P1 (diamond 1, Figure 3-2) and tighten two jack-screws (5).

(21) Install four screws (4, Figure 3-2), flat washers (3), nuts (1), and clamps (2) on diamonds 16 through 19. Torque 5 to 6 inch-pounds.

(22) Install screw (7), flat washer (9), lockwasher (10), and clamp (8). Torque 5 to 6 inch-pounds. Solder wires (diamond 15, Figure 3-2) to E25 (11).

(23) Reconnect tagged wires (diamond 9, Figure 3-2) to power supply (14, Figure 3-1) terminal posts.

(24) Use lacing tape (20, Table D-1) to tie wiring harness bundle.

(25) Install front panel (22) per paragraph 3-16a.

d. Resistors R1 thru R12 Removal/Replacement (Figures 3-1 and FO-2).

(1) Remove front panel (22) per paragraph 3-16a.

(2) Locate resistor assembly on rear of panel (Figure FO-2).

(3) Tag and unsolder harness lead(s) from terminals and remove resistor(s) from resistor assembly (detail).

(4) Orient replacement resistor in proper location on resistor assembly (see resistor assembly detail).

(5) Wrap leads around terminals leaving space for one additional wire. Reconnect wires tagged in step 3.

(6) Solder using item (9), Table D-1.

(7) Install front panel (22, Figure 3-1) per paragraph 3-16a.

e. Power Supply, PSI Removal/Replacement (Figure 3-1).

(1) Remove front panel (22) per paragraph 3-16a.

(2) Remove six screws (15) from cover (17) on power supply (14). Remove cover (17) from power supply (14).

(3) Remove four screws (12) and flat washers (13) holding power supply (14) to heat sink (16).

(4) Tag and remove wires from power supply (14) terminal board.

(5) Carefully lift and remove power supply (14) from Fault Locator chassis.

(6) Install new power supply (14) on heat sink (16).

(7) Prime and seal threads of four screws (12) and six screws (15) using primer and sealant items (26) and (25), Table D-1.

(8) Secure power supply (14) to heat sink (16) using four screws (12) and flat washers (13). Torque screws 9 to 12 inch-pounds.

(9) Reconnect tagged wires removed in step 4.

(10) Replace cover (17) on power supply (14) using six screws (15). Torque screws per Appendix F.

(11) Install front panel (22) per paragraph 3-16a.

f. TP 1 thru 16 Connector Removal/Replacement (Figures 3-1 and FO-2).

(1) Remove front panel (22, Figure 3-1) per paragraph 3-16a.

(2) Locate resistor assembly on rear of panel (Figure FO-2).

(3) If necessary to access TP connector(s), remove two nuts (40, Figure FO-2) and two washers (41) and move resistor assembly aside. Do not strain connecting wires.

(4) Tag and unsolder connecting wire(s) from TP connector(s).

(5) Remove TP connector mounting hardware.

(6) Remove faulty TP connector(s).

(7) Install new TP connector(s). If TP4 (45) is replaced, install two ground lugs.

(8) Secure TP connector(s) to panel using mounting hardware. Torque per Appendix F.

(9) Connect and solder wire(s) removed in step 4.

(10) If resistor assembly was removed in step 3, install resistor assembly on mounting posts (42).

(11) Secure resistor assembly with two nuts (40, Figure FO-2) and two washers (41).

(12) Install front panel (22, Figure 3-1) per paragraph 3-16a.

g. K1 Relay Removal/ Replacement (Figures 3-1 and FO-2).

(1) Remove front panel (22, Figure 3-1) per paragraph 3-16a.

(2) Tag and unsolder wires from K1 relay (43, Figure FO-2).

(3) Remove three screws (17), flat washers (18) and nuts (19), and remove K1 relay from its mounting bracket.

(4) Install new K1 relay (43) on its mounting bracket.

(5) Secure K1 relay by tightening three screws (17), flat washers (18) and nuts (19). Torque screws 6 to 7 inch-pounds.

(6) Reconnect tagged wires removed in step 2. Connect shorting wire between K1-C1 and K1-X2.

(7) Solder using item (9), Table D-1.

(8) Install front panel (22, Figure 3-1) per paragraph 3-16a.

h. F1/XF1 Removal/Replacement (Figures 3-1 and FO-2).

(1) Remove fuse and discard if unserviceable.

(2) Remove front panel (22, Figure 3-1) per paragraph 3-16a.

(3) Locate fuseholder XF1 (47, Figure FO-2) on rear of panel.

(4) Tag and unsolder two connecting wires.

(5) Remove XF1 (47) and mounting hardware.

(6) Install new fuseholder XF1 (47).

(7) Secure XF1 (47) to front panel (22, Figure 3-1) with mounting hardware. Torque per Appendix F. Stake threads using enamel, item (21), Table D-1.

(8) Reconnect tagged wires removed in step 4.

(9) Solder using item (9), Table D-1.

(10) Install front panel (22, Figure 3-1) per paragraph 3-16a.

(11) Insert fuse into fuseholder XF1 (47, Figure FO-2).

i. Switch S2 Removal/Replacement (Figures 3-1 and FO-2.)

(1) Remove front panel (22, Figure 3-1) per paragraph 3-16a.

(2) Locate switch S2 (24, Figure FO-2) on rear of front panel.

(3) Tag and remove attaching wires.

(4) Remove mounting hardware and free S2 (24, Figure FO-2) from panel.

(5) Discard lockwasher supplied with new switch S2. Install new switch S2 (24).

(6) Secure S2 (24) to panel using mounting hardware. Torque per Appendix F. Stake threads using enamel, item (21), Table D-1.

(7) Reconnect tagged wires removed in step 3.

(8) Install front panel (22, Figure 3-1) per paragraph 3-16a.

j. Switch S7 Removal/Replacement (Figures 3-1 and FO-2).

(1) Remove front panel (22, Figure 3-1) per paragraph 3-16a.

(2) Locate switch S7 (5, Figure FO-2) on rear of panel.

(3) Tag and remove attaching wires.

(4) Remove switch S7 (5) mounting hardware.

(5) Free switch S7 (5) from panel.

(6) Discard terminal lug (4) supplied with new switch. Install new switch S7 (5).

(7) Secure S7 (5) to panel with mounting hardware. Torque per Appendix F.

(8) Reconnect wires removed in step 3.

(9) Install front panel (22, Figure 3-1) paragraph 3-16a.

k. Switch S5 Removal/Replacement (Figures 3-1 and FO-2).

(1) Loosen two setscrews in knob (35) of switch S5 (15, Figure FO-2).

(2) Remove front panel (22, Figure 3-1) per paragraph 3-16a.

(3) Locate switch S5 (15, Figure FO-2) on rear of panel.

(4) Tag and unsolder harness leads from switch terminals.

(5) Remove mounting hardware from S5 (15).

(6) Free switch S5 (15) from panel.

(7) Install replacement switch S5 (15).

(8) Secure S5 (15) to panel with manufacturer supplied mounting hardware. Torque per Appendix F. Stake threads using enamel, item (21), Table D-1.

(9) Reconnect tagged wires removed in step 4. Connect shorting wires between S5 (15) terminals per Table E-1.

(10) Solder using item (9), Table D-1.

(11) Install front panel (22, Figure 3-1) per paragraph 3-16a.

(12) Secure switch knob (35, Figure FO-2) to switch S5 (12) tightening two setscrews.

(13) Rotate switch knob (35) fully left. Pointer must be at BAT VDC. If not reposition knob to locate pointer at BAT VDC.

l. Connector J2 Removal/Replacement (Figures 3-1 and FO-2).

(1) Remove front panel (22, Figure 3-1) per paragraph 3-16a.

(2) Locate connector J2 (25, Figure FO-2) on rear of panel.

(3) Tag and remove attaching wires.

(4) Remove two screws (46), flat washers (36) and locking nuts (37).

(5) Free connector J2 (25) from panel.

(6) Install new connector J2 (25).

(7) Secure connector J2 (25) to panel using two screws (46), flat washers (36) and locking nuts (37). Torque screws 6 to 7 inch-pounds.

(8) Reconnect tagged wires removed in step 3.

(9) Install front panel (22, Figure 3-1) per paragraph 3-16a.

m. Connector J1 Removal/Replacement (Figures 3-1 and FO-2).

(1) Remove front panel (22, Figure 3-1) per paragraph 3-16a.

(2) Locate connector J1 (20, Figure FO-2) on rear of panel.

(3) Tag and unsolder attaching wires.

(4) Loosen locknut (44) and free connector J1 (20) from panel (Figure FO-2).

(5) Install new connector J1 (20).

(6) Secure connector J1 (20) to panel using locknut (44). Torque locknut (44) 80 to 85 inch-pounds. Stake threads using enamel, item (21), Table D-1.

(7) Reconnect tagged wires removed in step 3.

(8) Solder using item (9), Table D-1.

(9) Install front panel (22, Figure 3-1) per paragraph 3-16a.

n. Switch S1, S6, S8, S9 Removal/Replacement (Figures 3-1 and FO-2).

(1) Remove front panel (22, Figure 3-1) per paragraph 3-16a.

(2) Locate switch(es) to be replaced S1, S6, S8, S9 on rear of panel (Figure FO-2).

(3) Tag and unsolder attaching wires.

(4) Remove mounting hardware and free switch(es) S1, S6, S8, S9 from panel.

(5) Install replacement switch(es) S1, S6, S8, S9.

(6) Secure switch(es) S1, S6, S8, S9 to panel with manufacturer supplied mounting hardware. Torque per Appendix F.

(7) Reconnect tagged wires removed in step 3. If S1 is replaced, connect shorting wire between S1-1NC and S1-2NC.

(8) Solder using item (9), Table D-1.

(9) Install front panel (22, Figure 3-1) per paragraph 3-16a.

o. Meter M1 Removal/Replacement (Figures 3-1 and FO-2).

(1) Remove front panel (22, Figure 3-1) per paragraph 3-16a.

(2) Locate meter M1 (7, Figure FO-2) on rear of panel.

(3) Tag and remove two attaching wire lugs (12) by removing two nuts (10) and four flat washers (11).

(4) Free meter M1 (7) from panel by removing three screws (31), flat washers (32), lockwashers (33), and nuts (34).

(5) Install new meter M1 (7).

(6) Secure M1 (7) to panel using three screws (31), flat washers (32), lockwashers (33), and nut (34). Torque per Appendix F. Stake threads using enamel, item (21), Table D-1.

(7) Reconnect two attaching wire lugs (12), two nuts (10) and four flat washers (11) removed in step 3.

(8) Install front panel (22, Figure 3-1) per paragraph 3-16a.

p. Indicator Light DS1 Removal/Replacement (Figures 3-1 and FO-2).

(1) Remove front panel (22, Figure 3-1) per paragraph 3-16a.

(2) Locate DS1 (26, Figure FO-2) on rear of panel.

(3) Unsolder two DS1 attaching wires from connections at E25 and S9-1NO (see Wiring List, Appendix E).

(4) Free DS1 (26) from panel by removing attaching hardware.

(5) Install replacement DS1 (26).

(6) Secure DS1 (26) to front panel using attaching hardware. Torque per Appendix F.

(7) Connect two DS1 (26) attaching wires to proper connection points E25 and S9-1NO (see Wiring List, Appendix E).

(8) Solder using item (9), Table D-1.

(9) Install front panel (22, Figure 3-1) per paragraph 3-16a.

q. Display Insulator, Support Plate and Filter Window Removal/Replacement (Figures 3-1 and FO-2).

(1) Remove front panel (22, Figure 3-1) per paragraph 3-16a.

(2) Remove logic card A1 (9, Figure FO-2) per paragraph 3-16b.

(3) Remove display insulator, support plate and filter window (28, 29, 30, Figure FO-2) by removing four screws (3, Figure 3-1), washers (19), and nuts (18).

(4) Install filter window, support plate, and display insulator and secure with four screws (3), washers (19), and nuts (18). Torque 5-6 inch-pounds.

(5) Install logic card A1 per paragraph 3-16b.

(6) Install front panel (22, Figure 3-1) per paragraph 3-16a.

r. Diode CR1 Removal/Replacement (Figures 3-1 and FO-2).

(1) Remove front panel (22, Figure 3-1) per paragraph 3-16a.

(2) Locate diode CR1 (16, Figure FO-2) on K1 relay (43, Figure FO-2).

(3) Tag and unsolder diode leads.

(4) Orient replacement diode in proper location on K1 relay. Connect cathode end to pin X1 and anode end to pin X2.

(5) Solder using item (9), Table D-1.

(6) Install front panel (22, Figure 3-1) per paragraph 3-16a.

3-17. REPAIR OF REMOTE CAPABILITIES TESTER COMPONENTS

WARNING

All power must be removed from the Remote Capabilities Tester before starting replacement procedures. Presence of power during replacement of components may injure personnel or may damage equipment.

Before removing any component, inspect all wires and soldered connections for signs of breakage or damage. The Remote Capabilities Tester schematic diagram (Figure FO-3) may be used to identify wiring faults.

a. Panel Removal/Replacement (Figure 3-3).

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

CAUTION

In the following two steps, lift and lower panel carefully to avoid wiring damage.

(2) Lift panel (3) out of RCT case.

(3) Lower panel (3) into RCT case.

(4) Install four screws (1) and flat washers (2) (torque screws 6 to 7 inch-pounds).

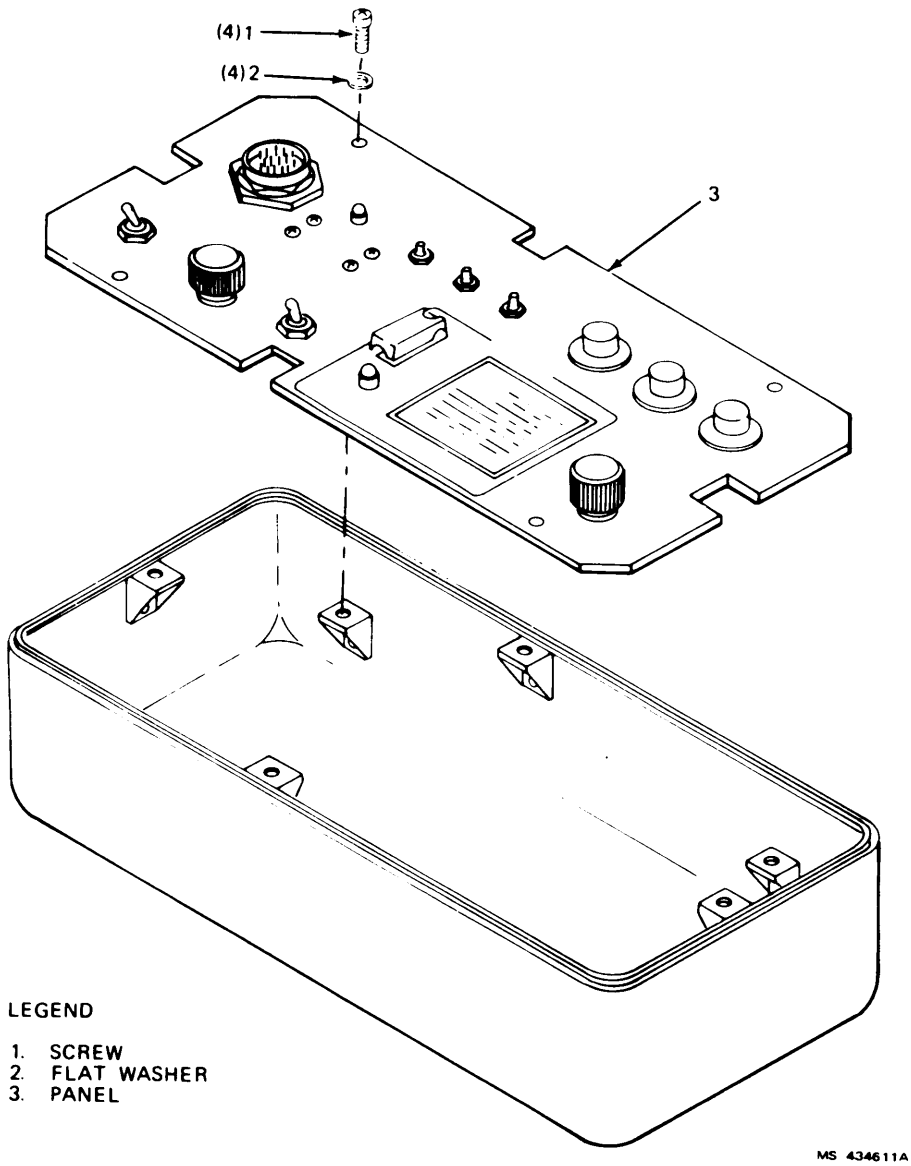


Figure 3-3. Remote Capabilities Tester Panel Removal

b. Resistors R1 (or R3) Removal/Replacement (Figure 3-4).

(1) Remove front panel per paragraph 3-17a.

(2) Locate resistor (13 or 3) on rear of panel.

(3) Tag connecting wires.

(4) Unsolder connecting wires and resistor (13 or 3).

(5) Inspect terminals and if replacement is required remove terminal retaining screws (17) and flat washers from front of panel and remove terminal lugs and lockwashers from back of panel.

(6) Install new terminal lugs and lock washers and secure with retaining screws (17) and flat washers (torque screws 5 to 6 inch-pounds).

(7) Line up replacement resistor on rear of panel.

(8) Wrap resistor leads around terminals and reconnect wires removed in step 4.

(9) Solder resistor leads and wires using item (9), Table D-1.

(10) Install front panel per paragraph 3-17a.

c. Connector J1 Removal/Replacement (Figure 3-4).

(1) Remove front panel per paragraph 3-17a.

(2) Locate connector J1 (1) on rear of panel.

(3) Tag connecting wires.

(4) Extract pin(s) as needed.

(5) To replace faulty pins, cut the wire and remove the faulty pin. Secure new pin to tagged wire.

(6) Remove retaining nut (18) from front of panel and free connector J1 from rear of panel.

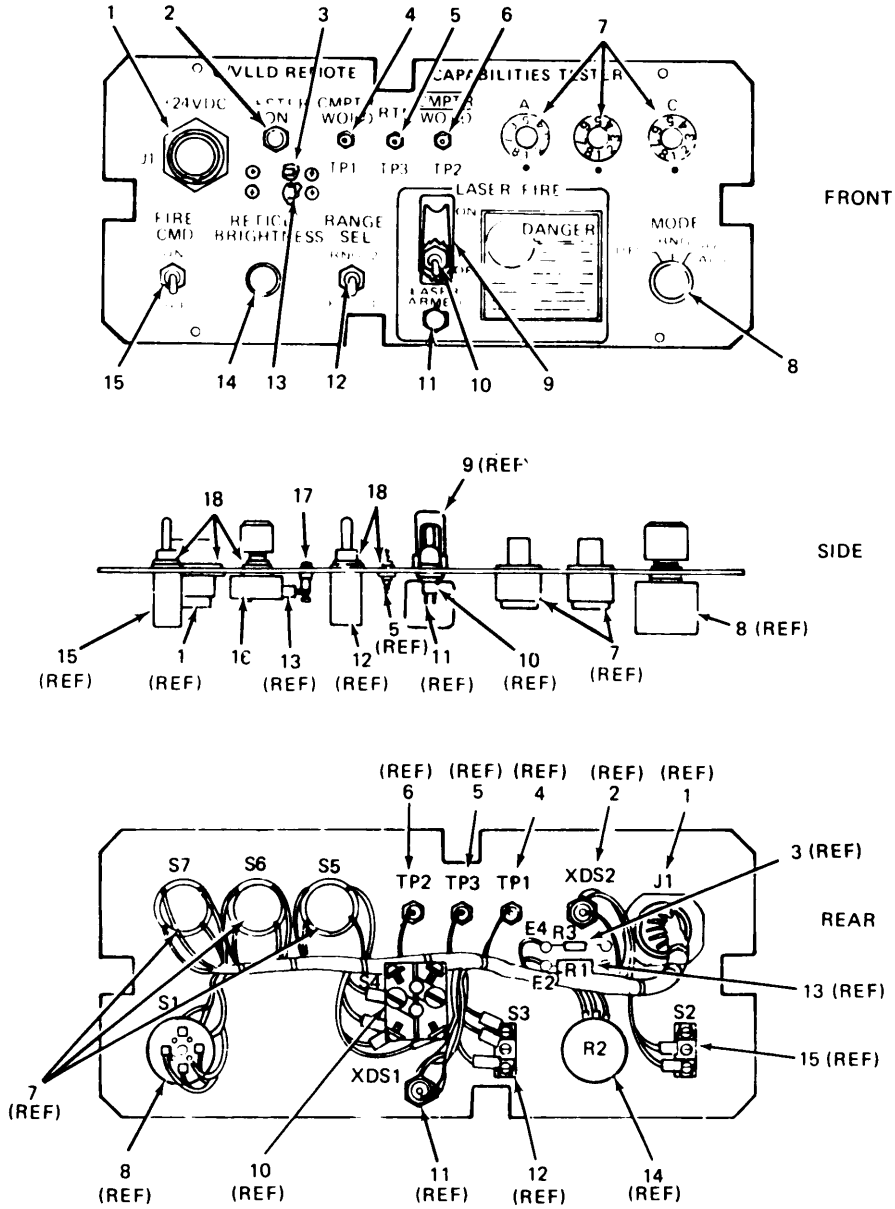
(7) Install pins into connector J1 (1).

(8) Line up and install connector J1 into panel.

(9) Prime and seal connector threads using primer and sealant items (26) and (25), Table D-1.

(10) Secure connector J1 (1) to panel using retaining nut (18).

(11) Install front panel per paragraph 3-17a.



LEGEND:

1. RCT CABLE CONNECTOR J1
2. TESTER ON INDICATOR XDS2
3. RESISTOR R3
4. CMPTR WORD TEST POINT (TP1)
5. RTN TEST POINT (TP3)
6. $\overline{\text{CMPTR WORD}}$ TEST POINT (TP2)
7. CODE SELECT SWITCHES A, B, C
8. MODE SWITCH S1
9. LASER FIRE SWITCH GUARD
10. LASER FIRE SWITCH S4
11. LASER ARMED INDICATOR XDS1
12. RANGE SEL SWITCH S3
13. RESISTOR R1
14. RETICLE BRIGHTNESS CONTROL R2
15. FIRE CMD SWITCH S2
16. RESISTOR R2
17. SCREW
18. NUT

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Figure 3-4. Remote Capabilities Tester Component Layout

d. TP 1, 2, 3 Terminal Removal/Replacement (Figure 3-4).

(1) Remove front panel per paragraph 3-17a.

(2) Locate TP terminals (4), (5), and (6) on rear of panel.

(3) Tag and unsolder connecting wire from TP terminal.

(4) Remove TP terminal nut and star lockwasher from front of panel.

(5) Remove TP terminal from rear of panel.

(6) Install new TP terminal from rear of panel.

(7) Install and tighten retaining nut and star lockwasher from front of panel.

(8) Connect wires removed in step 3 and solder using item (9), Table D-1.

(9) Install front panel per paragraph 3-17a.

e. Code Select Switches S5, S6, S7 Removal/Replacement (Figure 3-4).

(1) Remove front panel per paragraph 3-17a.

(2) Loosen two setscrews on side of code switch knob. Lift knob to remove from code switch (7).

(3) Locate code switch (7) on rear of panel.

(4) Tag and unsolder four wires from code switch (7).

(5) Remove code switch retaining nut and star lockwasher from front of panel.

(6) Remove code switch (7) from rear of panel.

(7) Install new code switch (7) with pins 2 and 4 towards top of rear of panel and pins 1 and 3 towards bottom of rear of panel.

NOTE

Insure the O-ring is properly seated in the base of the code switch. If O-ring is replaced, lubricate new O-ring using item (22), Table D-1.

(8) Install star lockwasher and retaining nut on front of panel and tighten.

(9) Connect wires removed in step 4 and solder using item (9), Table D-1.

(10) Slide code switch knob onto shaft of code switch and tighten setscrews.

(11) Turn code switch (7) fully counterclockwise (CCW).

(12) Loosen setscrews then line knob number “1” up with the white dot and re-tighten setscrews.

(13) Install front panel per paragraph 3-17a.

f. MODE Switch S1 Removal/Replacement Figure 3-4).

(1) Remove front panel per paragraph 3-17a.

(2) Loosen two setscrews on side of switch knob and remove knob.

(3) Locate switch S1 (8) on rear of panel.

(4) Tag and unsolder connecting wires.

(5) Remove switch retaining nut and star lockwasher from front of panel.

(6) Remove switch S1 (8) from rear of panel.

(7) Line up and install new switch S1 (8) from rear of panel.

(8) Install star lockwasher and retaining nut on front of panel (torque nut 16 to 20 inch-pounds).

(9) Connect wires removed in step 4 and solder using item (9), Table D-1.

(10) Place switch knob onto switch shaft and tighten two setscrews.

(11) Turn switch S1 (8) fully counterclockwise (CCW), then loosen setscrews and line up white dot on switch knob with DES.

(12) Tighten setscrews (torque 5 to 6 inch-pounds).

(13) Install front panel per paragraph 3-17a.

g. LASER FIRE Switch Guard Removal/Replacement (Figure 3-4).

(1) Remove front panel per paragraph 3-17a.

(2) Hold nut on back of panel while removing screw on switch guard (9).

(3) Remove switch S4 retaining nut and star lockwasher from front of panel.

(4) Lift off switch guard.

(5) Position new switch guard.

(6) Install retaining screw and switch S4 retaining star lockwasher and nut (torque screw 6 to 7 inch-pounds, torque nut 24 to 26 inch-pounds).

(7) Install front panel per paragraph 3-17a.

h. FIRE CMD Switch S2, RANGE SEL Switch S3, or LASER FIRE Switch S4 Removal/ Replacement (Figure 3-4).

(1) Remove front panel per paragraph 3-17a.

(2) Locate switch (15, 12, or 10) on rear of panel.

(3) Tag connecting wires and unscrew retaining screws from contacts.

(4) Remove retaining screws, washers, and terminal lugs.

(5) Remove retaining nut and star lockwasher from front of panel.

(6) Remove switch (15, 12, or 10), keying washer, and nut from rear of panel.

(7) Install new switch (15, 12, or 10), keying washer and nut in rear of panel. Position tab on switch keying washer with notch in rear of panel.

(8) Install star lockwasher and retaining nut on front of panel (torque nut 24 to 26 inch-pounds).

(9) Position wires on switch contacts removed in step 3.

(10) Secure terminal lugs by installing retaining screws and washers.

(11) Install f rent panel per paragraph 3-17a.

i. LASER ARMED Indicator Holder XDS1 or TESTER ON Indicator Holder XDS2 Removal/Replacement (Figure 3-4).

(1) Remove lens and bulb.

(2) Remove front panel per paragraph 3-17a.

(3) Locate indicator holder (11 or 2) on rear of panel.

(4) Tag and unsolder connecting wires.

(5) Remove retaining nut and star lockwasher from rear of panel.

(6) Remove indicator holder (11 or 2) from front of panel.

(7) Install new indicator holder (11 or 2) from front of panel.

(8) Install and tighten retaining nut and star lockwasher from rear of panel.

(9) Connect wires removed in step 4 and solder using item (9), Table D-1.

(10) Install front panel per paragraph 3-17a.

(11) Install bulb and lens.

j. RETICLE BRIGHTNESS Control R2 Removal/ Replacement (Figure 3-4).

(1) Loosen two setscrews on side of knob.

(2) Lift knob off shaft of control (14).

(3) Remove front panel per paragraph 3-17a.

(4) Locate R2 (14) on rear of panel.

(5) Tag and unsolder connecting wires.

(6) Remove retaining nut and star lockwasher from front of panel.

(7) Remove R2 (14) from rear of panel.

(8) Install new R2 (14) from rear of panel and position R2 keying tab in notch on rear of panel.

(9) Install and tighten retaining nut and washer from front of panel.

(10) Connect wires removed in step 5 and solder using item (9), Table D-1.

(11) Place knob onto control shaft (torque knob setscrews 12 to 15 inch-pounds).

(12) Install front panel per paragraph 3-17a.

k. Laser Warning Plate Removal/Replacement.

(1) Remove decal from front of panel by scraping with a knife.

(2) Clean the front panel surface using solvent and wiping rags (items 5 and 6, Table D-1) prior to placing the new decal in position.

(3) Position and attach the new decal to the front panel.

3-18. REPAIR OF PURGE AND FILL EQUIPMENT

a. Gas Charging Assembly Repair (Figure 3-5).

(1) Locate part to be removed as shown in Figure 3-5.

NOTE

Always minimize number of disconnects in order to reduce wear and to maintain integrity of pressure seals.

(2) Disconnect attached items from part being removed.

(3) Seal all male threads with Teflon tape (30, Table D-l).

(4) Install each part and torque 35 to 70 inch-pounds while maintaining alignment of controls.

b. Purge Valve Adapter Repair (Figure 3-5).

(1) Remove pressure relief valve (7) and preformed packing (10).

(2) Remove preformed packing (9) from purge valve adapter (8).

(3) Insert preformed packing (9) into purge valve adapter (8).

(4) Insert preformed packing (10) and install pressure relief valve (7).

c. Fill Valve Extension Repair (Figure 3-5).

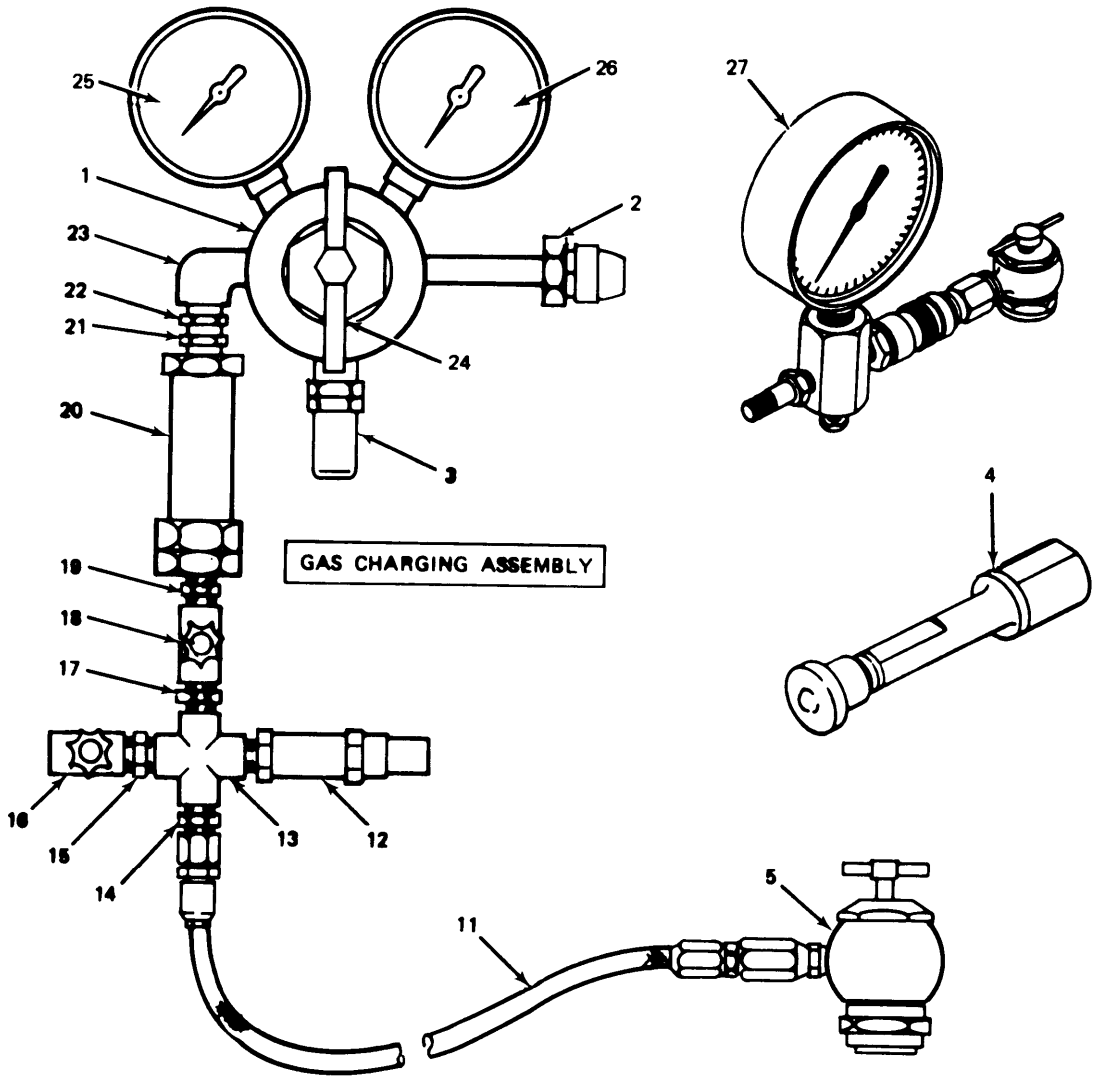
Fill valve extension (4) is a non-repairable item. Replace if damaged.

d. High Pressure Gage Repair (Figure 3-5).

High Pressure Gage (27) is a non-repairable item. Replace if damaged.

3-19. REPAIR OF EMI FILTER

Refer to TM 9-1260-477-34-2.



LEGEND

1. REGULATOR
2. COUPLING NUT
3. REGULATOR RELIEF VALVE
4. FILL VALVE EXTENSION
5. CONNECTION VALVE
6. PURGING ADAPTER ASSEMBLY
7. PRESSURE RELIEF VALVE
8. PURGE VALVE ADAPTER
9. PREFORMED PACKING
10. PREFORMED PACKING
11. HOSE
12. CHARGING RELIEF VALVE
13. PIPE CROSS
14. FLARED TUBE NIPPLE
15. PIPE ORIFICE NIPPLE
16. VENT VALVE
17. PIPE NIPPLE
18. MAIN VALVE
19. PIPE NIPPLE
20. FILTER
21. PIPE ORIFICE NIPPLE
22. REDUCER BUSHING
23. 90° PIPE ELBOW
24. REGULATOR PRESSURE TEE HANDLE
25. REGULATOR PRESSURE GAGE
26. INPUT PRESSURE GAGE
27. HIGH PRESSURE GAGE

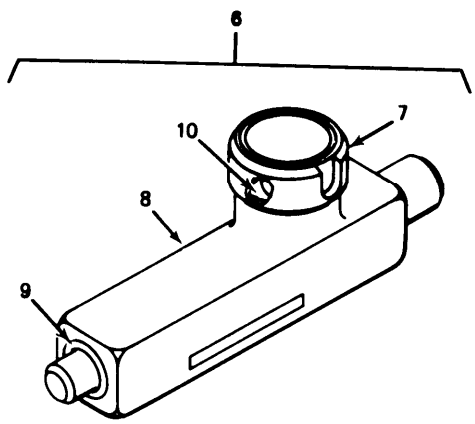


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Figure 3-5. Purge and Fill Equipment Component Layout

3-20. REPAIR OF POWER MAINTENANCE CABLE

Power Maintenance Cable is a non-repairable item. Replace if damaged.

3-21. REPAIR OF RCT CABLE W2

RCT Cable W2 is a non-repairable item. Replace if damaged.

3-22. REPAIR OF TEST RESOLVER

If Test Resolver requires repair, send it to depot.

3-23. REPAIR OF BATTERY CHARGER CABLE

Battery Charger Cable is a non-repairable item. Replace if damaged.

3-24. REPAIR OF HP POWER SUPPLY

If HP Power Supply requires repair, send it to calibration facility.

3-25. REPAIR OF SAFETY INTERLOCK

Refer to Appendix G.

APPENDIX A
REFERENCES

Refer to TM 9-1260-477-L for publications applicable to the G/VLLD System.

APPENDIX B
MAINTENANCE ALLOCATION CHART

B-1. GENERAL

This appendix contains the maintenance allocation chart (Table B-1) which indicates the lowest level of maintenance authorized to perform particular maintenance operations.

B-2. MAINTENANCE FUNCTIONS

Maintenance functions shall be limited to and defined as follows:

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

b. Align. To adjust specified variable element of an item to bring about optimum or desired performance.

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

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

e. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment/system.

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

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

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

i. Replace. The act of substituting a serviceable like-type part, subassembly, module component or assembly) in a manner to allow the proper functioning of an equipment/system.

j. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean, preserve, drain, paint, or to replenish fuel/lubricants/hydraulic fluids or compressed air supplied.

k. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics with prescribed standards.

l. Symbols.The uppercase letter placed in the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

B-3. EXPLANATION OF FORMAT

Purpose and use of the format are as follows:

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

b. Column 2. Functional Group. Column 2 lists the next higher assembly group and the item names of components, assemblies, subassemblies and modules within the group for which maintenance is authorized.

c. Column 3. Maintenance Function. Column 3 lists the eleven maintenance functions defined in B-2above. Each maintenance function required for an item shall be specified in this column.

d. Column 4. Maintenance Category. Column 4 indicates the level responsible for the required maintenance. The following symbols shall be used:

C - Operator/Crew

O - Organizational

F - Direct Support

H - General Support

D - Depot

Under each symbol there shall be listed an approprite work measurement time value determined as indicated in e below.

e. Work Measurement Time. The active repair time required to perform the maintenance function is included directly below the symbol identifying the category of maintenance. The manpower figures are developed under conditions (real or simulated) corresponding to those that are considered normal for G/VLLD units operating in the field. The skill levels used to obtain the measurement times are approximate to those found in typical G/VLLD units. Active repair time is the average aggregate time required to restore an item (subassembly, assembly, component, module, end item or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, fault isolation diagnostic time, and QA/QC time in addition to the time required to perform specific maintenance functions identified for the tasks authorized in the maintenance allocation chart. This time is expressed in man-hours and carried to one decimal place (tenths of hours). An "X" means indeterminate time allotment for checking out maintenance function.

f. Column 5, Tools and Equipment. This column is used to specify, by code, those tools and test equipment required to perform the designated function.

Table B-1. Maintenance Allocation Chart

(1)	(2)	(3)	(4)					(5)
GROUP NUMBER	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE CATEGORY*					TOOLS AND EQUIPMENT
			C	O	F	H	D	
0010	G/VLLD SUPPORT EQUIPMENT	Inspect			.1			2
		Test			X			
		Service			X			
		Replace			X			
		Repair			X			
	Remote Capabilities Tester	Inspect			.1			1, 2
		Test			X			
		Service			X			
		Replace			X			
		Repair					X	
	Plate, Identification	Inspect			.1			
		Replace					X	
	Case, Remote Capabilities Tester	Inspect			.1			2
		Test			X			
		Replace			X			
	Panel Assembly, Remote Capabilities Tester	Inspect			.1			1, 2
		Test			X			
		Replace			X			
		Repair			X			
	Connector, J1	Inspect			X			1, 2
		Replace			X			
	Indicators, Light, DS1, DS2	Inspect			.1			1, 2
		Replace			X			
	Indicator Holder, XDS1, XDS2	Inspect			.1			
		Replace			X			
	Lens, DS1, DS2	Inspect			.1			
		Replace			X			
	Test Point Connectors, TP1 thru TP3	Inspect			.1			1, 2
		Replace			X			
	Potentiometer, R2	Inspect			.1			1, 2
		Replace			X			
	Switches, Toggle, S2, S3	Inspect			.1			1,2
		Replace			X			

Table B-1. Maintenance Allocation Chart - Continued

(1)	(2)	(3)	(4)					(5)
GROUP NUMBER	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE CATEGORY*					TOOLS AND EQUIPMENT
			C	O	F	H	D	
0010 (cont)								
	Switches, Rotary, S1, S5, S6, S7	Inspect Replace			.1 X			1, 2
	Guard, Toggle Switch	Inspect Replace			.1 X			2
	Resistors, R1, R3	Inspect Replace			.1 X			1, 2
	Plate, Laser Warning	Inspect Replace			.1 X			2
	Switch, Toggle, S4	Inspect Replace			.1 X			1, 2
	Panel	Inspect Replace			.1 X			2
	Knobs	Inspect Replace			.1 X			2
	Cable Assembly	Inspect Replace Repair			X X		 X	
0100	FAULT LOCATOR	Inspect Test Service Replace Repair			.1 X X X X			1, 2, 3, 4, 5
. . .	Plate, Identification	Inspect Replace			.1		 X	
. . .	Cable Assembly, Test	Inspect Test Replace			.1 X X			
. . .	Cable Assembly, Power	Inspect Test Replace			.1 X .3			1, 2

Table B-1. Maintenance Allocation Chart - Continued

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY* C	O	F	H	D	(5) TOOLS AND EQUIPMENT
0100 (cont)								
• • •	Power Supply, PS1	Inspect Replace			.2 .5			1, 2
• • •	Case, Fault Locator	Inspect Service Replace			.1 X .8			2
0200	PANEL ASSEMBLY-FAULT LOCATOR	Inspect Test Replace Repair			.1 X X X			1, 2
• • •	Wiring Harness, Branched	Inspect Test Replace Repair			.1 X 1.5 2.8			1, 2
• • •	Connector Receptacle, J1	Inspect Replace			.1 X			
• • •	Connector, Receptacle Power, J2	Inspect Replace			.1 X			
• • •	Connector, Plug, P1	Inspect Replace			.1 X			
• • •	Resistor Assembly	Inspect Replace Repair			.1 .5 .3			1, 2
• • •	Resistors, R12 - R12	Inspect Replace			.1 X			1, 2
	Switches, S1, S2, S5, S6, S7, S8, S9	Inspect Replace			.1 X			1, 2
	Relay	Inspect Replace			.1 X			
	Test Point Connectors TP1 thru TP16	Inspect Replace			.1 X			2

Table B-1. Maintenance Allocation Chart - Continued

(1)	(2)	(3)	(4)					(5)
GROUP NUMBER	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE CATEGORY* C	O	F	H	D	TOOLS AND EQUIPMENT
0200 (Cont)								
	Meter, M1	Inspect Replace			.1 X			2
	Fuseholder	Inspect Replace			.1 X			2
	Indicator, Light, DS1	Inspect Replace			.1 X			2
	Insulator, Display	Inspect Replace			.1 X			2
	Plate, Support	Inspect Replace			.1 X			2
	Window, Filter	Inspect Replace			.1 X			2
	Diode, CR1	Inspect Replace			.1 X			2
0300	CIRCUIT CARD ASSEMBLY, LOGIC	Inspect Test Adjust Replace Repair			.1 .3		X X X	2
3300	EMI FILTER ASSEMBLY	Inspect Test Service Replace Repair		.1 .1 .1	 X X			1, 2
. . .	CHARGING ASSEMBLY, GAS - G/VLLD	Inspect Replace Repair			.2 .1 1.0			2
. . .	CABLE, POWER MAINTENANCE	Inspect Replace			.1 .1			1, 2

Table B-1. Maintenance Allocation Chart - Continued

(1)	(2)	(3)	(4)					(5)
GROUP NUMBER	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE CATEGORY*					TOOLS AND EQUIPMENT
			C	O	F	H	D	
3300 (cont)								
. . .	CABLE ASSEMBLY, CHARGER, BATTERY	Inspect Replace		.1	 .1			1, 2
. . .	TEST RESOLVER ASSEMBLY	Inspect Replace Repair			.1 .1		X	1, 2
. . .	ADAPTER ASSEMBLY, PURGING	Inspect Replace Repair			.1 .1 .5			2
. . .	EXTENSION, FILL VALVE	Inspect Replace			.1 .1			

* C-Crew/Operator O-Organizational F-Direct Support H-General D-Depot

Table B-2. Tools and Test Equipment Requirements

TOOL CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL STOCK NUMBER
1	F	Multimeter,AN/PSM-6B	6625-00-957-4374
2	F	Laser System Field Maintenance Tool Kit	5180-01-048-8570
3	F	Oscilloscope, Tektronix, Model 7633	6625-01-093-2261
4	F	Plug-in, Dual Trace Amplifier 7A26	6625-00-361-5318
5	F	Plug-in, Universal Counter/Timer	6625-00-392-2604
6	F	Oscilloscope, Tektronix, Model 2430A	6625-01-258-0022
7	F	Digital Electronic Counter,Racal Dana, Model 1992	6625-01-271-3012

* U.S. GOVERNMENT PRINTING OFFICE: 1995-633-220/00125

APPENDIX C
COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

Section II. INTRODUCTION

C-1. SCOPE

This appendix lists components of end item and basic issue items for the GSE to help you inventory items required for safe and efficient operation.

C-2. GENERAL

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

a. Section II. Components of End Item. This listing is for informational purposes only, and is not authority to requestion replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the GSE in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, Basic Issue Items (BII) must be with the GSE during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS

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

a. Column (1) - Illustration Number (Item Fig. No). Indicates the item and figure number of the illustration in which the item is shown.

b. Column (2) - National Stock Number. Indicates the national stock number assigned to the item and will be used for requisitioning purposes.

c. Column (3) - Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the CAGEC (in parentheses) followed by the part number.

d. Column (4) - Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

e. Column (5) - Quantity Required (Qty Rqr). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II. COMPONENTS OF END ITEM

Table C-1. Components of End Item List

(1) Illustration Item	Fig. No.	(2) National Stock Number	(3) Description CAGEC and Part Number	(4) U/M	(5) Qty Rqr
9	C-1	1420-01-072-1020	Battery Charger Cable (18876) 13034390	ea	1
5	C-1	1260-01-073-5879	EMI Filter (18876) 11559640	ea	1
1	C-l	4931-01-046-2835	Fault Locator (18876) 11507815	ea	1
10	C-1	4931-01-057-2206	Fill Valve Extension (18876) 11507849	ea	1
12	C-1	4931-01-107-6889	Gas Charging Assembly (18876) 11507817	ea	1
2	C-1	6130-01-004-8974	Hewlett-Packard Power Supply (28480) 6268BO1O-O26	ea	1
13	C-1	4931-01-242-6260	High Pressure Gage (18876) 13012630	ea	1
6	C-1	4931-01-075-6380	Power Maintenance Cable (18876) 13033955	ea	1
11	C-1	4931-01-056-7976	Purge Valve Adapter (18876) 11507835	ea	1
3	C-1	5995-01-122-5709	RCT Cable W2 (18876) 11559506	ea	1
7	C-1	4931-01-142-1289	Remote Capabilities Tester (18876) 11559500	ea	1
8	C-1	4931-01-279-6441	Safety Interlock (18876) 13250989	kt	1
4	C-1	4931-01-075-6310	Test Resolver (18876) 11508483	ea	1

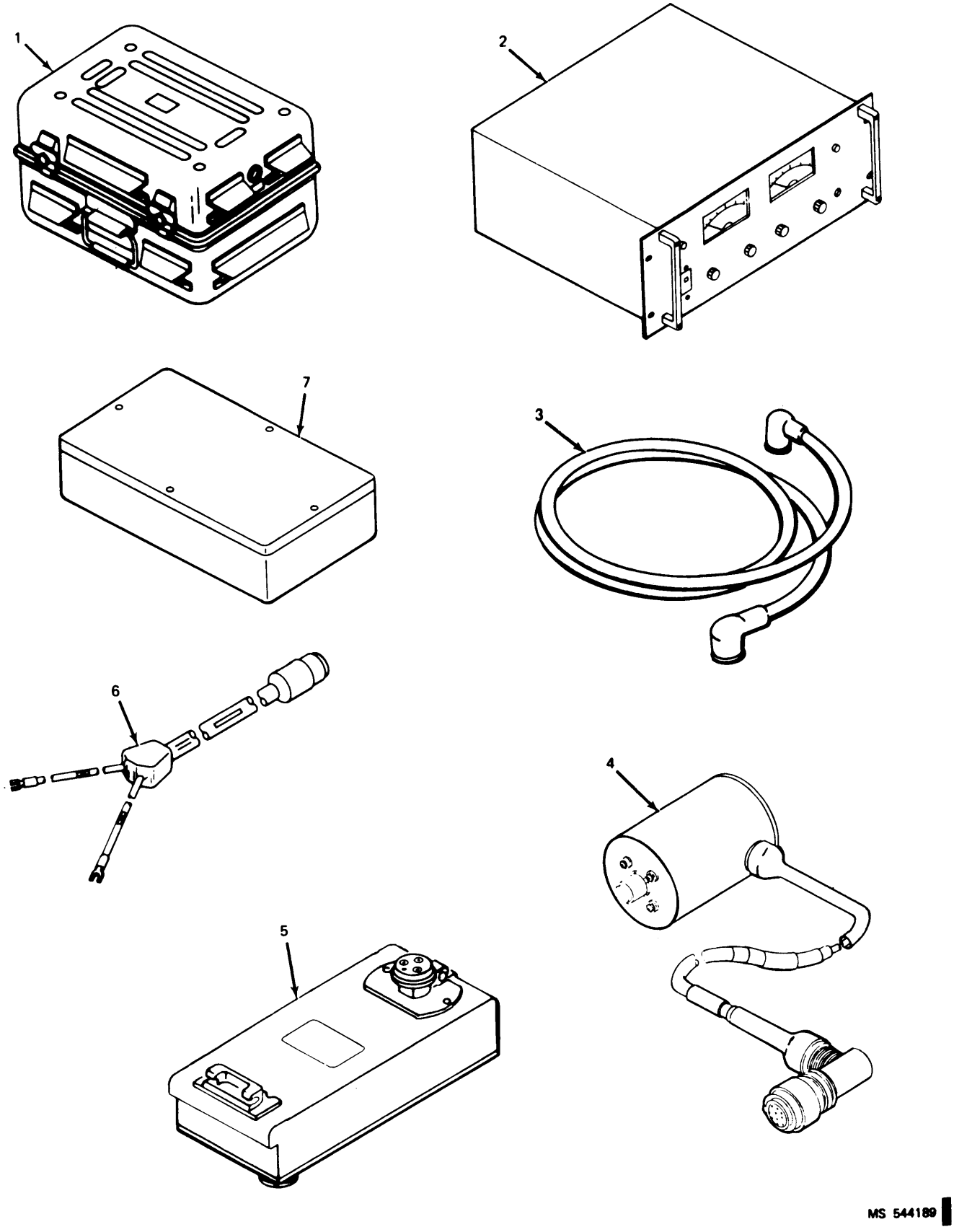


Figure C-1. Components of End Item (Sheet 1 of 2)

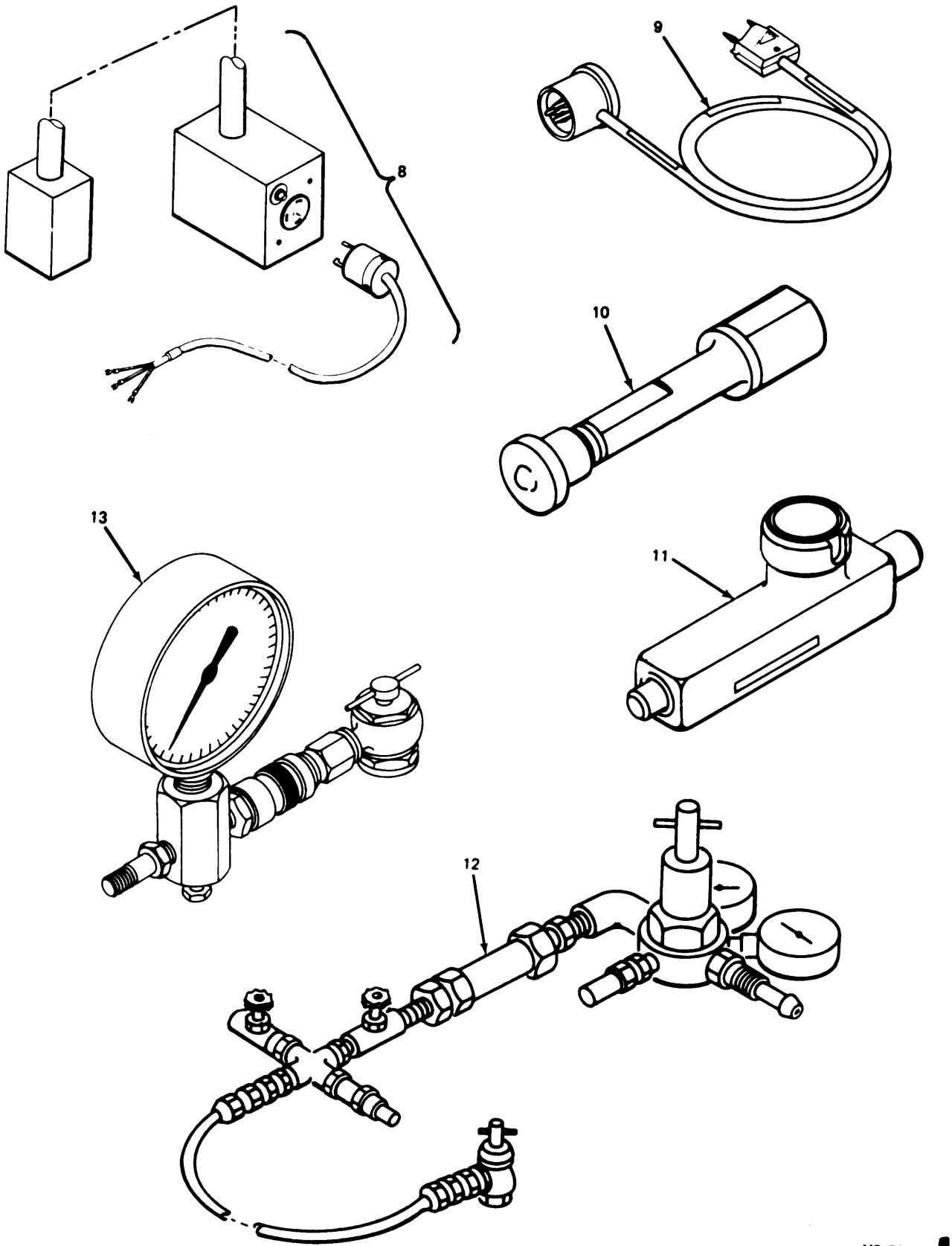


Figure C-1. Components of End Item (Sheet 2 of 2)

Section III. BASIC ISSUE ITEMS

Table C-2. Basic Issue Items List

(1) Illustration		(2) National Stock Number	(3) Description CAGEC and Part Number	(4) U/M	(5) Qty Rqr
Item	Fig. No.				
...	...	NSNL	TM 9-4931-477-14 (none) none	ea	1

APPENDIX D
EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

D-1. SCOPE

This appendix lists expendable/durable supplies and materials you will need to operate and maintain the GSE. This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

D-2. EXPLANATION OF COLUMNS

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, for example, "Using isopropyl alcohol (1, Table D-1).

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

C - Operator/Crew
O - organizational Maintenance
F - Direct Support Maintenance
H - General 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 Commercial and Government Entity Code (CAGEC) in parentheses followed by the part number.

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/DURABLE SUPPLIES AND MATERIALS LIST

Table D-1. Expendable/Durable Supplies and Materials List

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	O	6810-01-136-7012	Isopropyl Alcohol (81348) TT-I-735, Grade A	gal
2	Deleted			
3	Deleted			
4	Deleted			
5	F	6810-00-281-2785	Solvent, Cleaning Methylethyl Ketone (81348) TT-M-261	btl
6	0	7920-00-205-1711	Cotton Wiping Rags (58536) A-A-531	3 ea
7	0	7930-00-880-4454	Detergent (81348) P- D-41 0	pt
8	F	7920-00-514-2417	Acid Swabbing Brush (80244) H-B-643, Type II, Class 1	ea
9	F	3439-00-522-2625	Solder (81348) QQ-S-571 Composition, SN63	rl
10	0	6810-00-264-6548	Technical Glycerol (81348) 0G491	gal
11	Deleted			
12	F	6145-00-577-3420	Copper Wire (81348) QQ-W-343, Type S, 24 AWG, Tinned Soft	25 ft

Table D-1. Expendable/Durable Supplies and Materials List - Continued

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
13	F	6145-00-295-2810	Electrical Wire (81349) MIL-W-16878-4, E-20, 19 Strands, Teflon Insulated, Color White	10 ft
14	F	6145-00-808-4849	Electrical Wire (81349) MIL-W-16878-4, E-24, 19 Strands, Teflon Insulated, Color White	10 ft
15	F	6145-00-062-5700	Electrical Wire (81349) MIL-W-16878-4, E-22, 19 Strands, Teflon Insulated, Color White	10 ft
16	F	6145-00-519-2602	Electrical Wire (81349) MIL-W-16878-4, E-24, 19 Strands, Teflon Insulated, Color Black	10 ft
17	F	6145-00-754-8057	Electrical Wire (81349) MIL-W-16878-4, E-22, 19 Strands, Teflon Insulated, Color Black	10 ft
18	Deleted			
19	F	5970-00-903-8733	Insulation Sleeving (81349) M23053/5-203-C	10 ft
20	F	NSNL	Lacing Tape (81349) MIL-T-43435, Type I, Finish A, Size 3	rl
21	F	8010-00-133-5706	Enamel, Electrical-Insulating (81349) MIL-E-22118	qt

Table D-1. Expendable/Durable Supplies and Materials List - Continued

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
22	F	9150-01-076-1817	Lubricant,Braycote (98308) 3L-38RP	pt
23	Deleted			
24	Deleted			
25	F	8030-00-081-2333	Sealing Compound (80244) MIL-S-22473, Grade C,	qt
26	F	8030-00-900-2373	Sealing Primer (80244) MIL-S-22473, Grade N, Form R	qt
27	F	NSNL	Adhesive (80244) MIL-A-46146, Type I	qt
28	Deleted			
29	F	8040-01-063-7509	Primer, Adhesive (80244) MIL-A-46146, Type I	qt
30	F	8030-00-889-3534	Teflon Tape (99742) MIL-T-27730, 2 roil, l/4-inch wide	rl
31	F	6850-00-621-1820	Leak Detection Compound (81349) MIL-L-25567	btl
32	F	3439-00-255-4571	Flux, Soldering (75297) SN60, Core 66	2 oz
33	F	8105-01-096-9528	Antistatic Pouch/Bag (52942) MIL-P-81997, 12 inch x 18 inch	25

APPENDIX E
WIRING LIST

E-1. SCOPE

Tables E-1 and E-2 contain the wiring lists for the Fault Locator and the Remote Capabilities Tester respectively. The wiring lists contain wire interconnection data and wire size. Also included in the wiring list is the signal name for each wire when applicable.

Table E-1. Wiring List for Fault Locator

From	To	Size (AWG)	Signal Name
CHASSIS	J2-2	20	GROUND
CHASSIS	S1-2NC	20	GROUND
CR1-CATH	K1-X1		*
CR1-ANODE	K1-X2		*
DS1-1	E25		+ 5 V
DS1-2	S9-lNO		GROUND
El	P1-24	22	A TRIG
El	J1-B	22	A TRIG
E2	TP1	20	A TRIG
E3	P1-19	24	$\overline{\text{Q/S TRIGGER}}$-TA
E3	S1-lC	24	$\overline{\text{Q/S TRIGGER}}$-TA
E4	TP2	20	$\overline{\text{Q/S TRIG}}$
E5	J1-f	22	COMPUTER WORD
E5	P1-5	22	COMPUTER WORD
E6	TP 5	20	CMPTR WORD
E7	J1-D	22	$\overline{\text{ENERGY VALID}}$

*Signal name is a function of switch position.

Table E-1. Wiring List for Fault Locator - Continued

From	To	Size (AWG)	Signal Name
E7	P1-26	24	$\overline{\text{ENERGY VALID}}$
E8	TP1O	20	$\overline{\text{ENERGY VALID}}$
E9	S1-2C	24	$\overline{\text{FLASHTUBE TRIGGER-TA}}$
E10	TP11	20	$\overline{\text{FLASHTUBE TRIGGER-TA}}$
E11	J1-C	22	$\overline{\text{HVPS ON}}$
E12	TP14	20	$\overline{\text{HVPS ON}}$
E13	J1-P	22	$\overline{\text{TURN-ON RESET}}$
E14	TP15	20	$\overline{\text{TOR}}$
E15	TP4	20	METER
E16	S5A-C	20	METER
E17	TP 9	20	RETURN-TA
E17	TP16	20	RETURN-TA
E18	S5B-4	20	RETURN
E19	J1-X	22	+5 V-TA
E19	S5A-3	20	+5 V-TA
E20	S5B-3	20	RTN
E21	J1-Y	22	+15 V-TA
E21	S5A-2	20	+15 V-TA
E22	S5B-2	20	RTN
E 23	J1-a	22	BATTERY VOLTAGE
E23	S5A-1	20	BATTERY VOLTAGE
E 24	S5B-1	20	RTN
E25	PS1-V+	24	+5 V

Table E-1. Wiring List for Fault Locator - Continued

From	To	Size (AWG)	Signal Name
E25	DS1-1		+5 V
E25	P1-11	22	+5 V
E25	J1-h	24	FIRE COMMAND (+ 5 V)
F1-1	S2-3	20	115 VAC
F1-2	PS1-AC+	22	115 VAC
J1-A	TP16	22	SHIELD RETURN
J1-B	El	22	A-TRIG
J1-C	S5A-6	22	450 V SENSE-TA
J1-D	E7	22	$\overline{\text{ENERGY VALID}}$
J1-E	S5A-7	24	ENERGY ERROR
J1-F	S5A-4	22	-15 V-TA
J1-G	J3	22	SIMMER SENSE
J1-H	TP6	22	EVENTS COUNT
J1-J	TP8	22	HVPS ENABLE-TA
J1-K	TP12	22	TIMING GATE-TA
J1-L	TP7	22	20 kHz CLOCK-TA
J1-M	P1-23	22	$\overline{\text{HVPS INHIBIT}}$
J1-P	E13	22	$\overline{\text{TURN-ON RESET}}$
J1-R	S1-2C	24	$\overline{\text{FLASHTUBE TRIGGER-TA}}$
J1-S	P1-2	22	8000 METER-TA
J1-T	K1-B1	22	FIRE REMOTE
J1-U	TP3	22	RECEIVER START-TA

Table E-1. Wiring List for Fault Locator - Continued

From	To	Size (AWG)	Signal Name
J1-V	S5A-5	22	PFN VOLTAGE SENSE-TA
J1-W	TP13	22	$\overline{\text{PFN CHARGED}}$
J1-X	E19	22	+5 V-TA
J1-Y	E21	22	+15 V-TA
J1-a	E23	22	BATTERY VOLTAGE
J1-b	K1-A1	22	$\overline{\text{FIRE REMOTE}}$
J1-c	E11	22	$\overline{\text{HVPS ON}}$
J1-d	S1-1C	24	$\overline{\text{Q/S TRIGGER-TA}}$
J1-e	P1-25	22	$\overline{\text{OVERTEMPERATURE}}$
J1-f	E5	22	COMPUTER WORD
J1-g	TP16	22	RETURN-TA
J1-h	E25	24	FIRE COMMAND (+5 V)
J1-j	P1-1	22	$\overline{\text{VIDEO-TA-ENABLE}}$
J2-1	S2-2	20	115 VAC IN
J2-2	Chassis	20	RETURN
J2-3	S2-5	20	115 VAC RTN
J3	J1-G	22	SIMMER SENSE
K1-A1	J1-b	22	$\overline{\text{FIRE REMOTE}}$
K1-A2	S1-1NC	24	GROUND
K1-A2	S8-1C	24	GROUND
K1-B1	J1-T	22	FIRE REMOTE
K1-B2	S9-2C	22	BATTERY VOLTAGE
K1-C1	K1-X2	24	*

*Signal name is a function of switch position.

Table E-1. Wiring List for Fault Locator - Continued

From	To	Size (AWG)	Signal Name
K1-C1	S9-1C	24	*
K1-C2	P1-15	24	K1-C2 RELAY
K1-X1	CR1-CATH		*
K1-X1	S9-2NC	24	*
K1-X2	CR1-ANODE		*
K1-X2	K1-C1	24	*
M1-1	S5B-C	20	*
M1-2	S5C-C	20	*
P1-1	J1-j	22	VIDEO-TA-ENABLE
P1-2	J1-S	22	8000 METER-TA
P1-3	S6-1NO	24	PRESET RNG SW
P1-4	S7-1	24	LAMP TEST
P1-5	E5	22	COMPUTER WORD
P1-6	S5A-5	22	PFN VOLTAGE SENSE-TA
P1-7	S5B-6	22	S5B-6 SWITCH
P1-8	S5C-5	22	S5C-5 SWITCH
P1-9	S5B-5	22	S5B-5 SWITCH
P1-10	S5C-6	22	S5C-6 SWITCH
P1-11	E25	22	+5 V
P1-12	S5A-6	22	450 V SENSE-TA
P1-13	S5A-3	22	+5 V-TA
P1-14	S8-1C	24	GROUND

*Signal name is a function of switch position.

Table E-1. Wiring List for Fault Locator- Continued

From	To	Size (AWG)	Signal Name
P1-15	K1-C2	24	K1-C2 RELAY
P1-19	E3	24	Q/S TRIGGER-TA
P1-20	S5A-7	24	ENERGY ERROR
P1-21	S5B-7	22	S5B-7 SWITCH
P1-22	S8-1NC	24	HVPS INHIBIT SW
P1-23	J1-M	22	HVPS INHIBIT
P1-24	E1	22	A TRIG
P1-25	J1-e	22	OVERTEMPERATURE
P1-26	E7	22	ENERGY VALID
PS1-AC+	F1-2	22	115 VAC
PS1-AC-	S2-6	22	115 VAC RTN
PS1-V+	E25	24	+5 V
PS1-V-	S7-2	24	GROUND
S1-1C	E3	24	Q/S TRIGGER-TA
S1-1C	J1-d	24	Q/S TRIGGER-TA
S1-1NC	K1-A2	24	GROUND
S1-1NC	S1-2NC	24	GROUND
S1-1NC	TP16	24	RETURN
S1-2C	E9	24	FLASHTUBE TRIGGER-TA
S1-2C	J1-R	24	FLASHTUBE TRIGGER-TA
S1-2NC	S1-1NC	24	GROUND
S1-2NC	Chassis	20	GROUND

Table E-1. Wiring List for Fault Locator - Continued

From	To	Size (AWG)	Signal Name
S1-2NC	S6-1C	24	GROUND
S2-2	J2-1	20	115 VAC IN
S2-3	F1-1	22	115 VAC
S2-5	J2-3	20	115 VAC RTN
S2-6	PS1-AC-	22	115 VAC RTN
S5A-C	E16	20	METER
S5A-1	E23	20	BATTERY VOLTAGE
S5A-1	S9-2C	22	BATTERY VOLTAGE
S5A-2	E21	20	+15 V-TA
S5A-3	E19	20	+5 V-TA
S5A-3	P1-13	22	+5 V-TA
S5A-4	S5C-4	20	-15 V-TA
S5A-4	J1-F	22	-15 V-TA
S5A-5	P1-6	22	PFN VOLTAGE SENSE-TA
S5A-5	J1-V	22	PFN VOLTAGE SENSE-TA
S5A-6	P1-12	22	450 V SENSE-TA
S5A-6	J1-C	22	450 V SENSE-TA
S5A-7	P1-20	24	ENERGY ERROR
S5A-7	J1-E	24	ENERGY ERROR
S5B-C	M1-1	20	*
S5B-1	E24	20	RTN
S5B-2	E22	20	RTN

*Signal name is a function of switch position.

Table E-1. Wiring List for Fault Locator -Continued

From	To	Size (AWG)	Signal Name
S5B-3	E 20	20	RTN
S5B-4	E18	20	RTN
S5B-5	P1-9	22	S5B-5 SWITCH
S5B-6	P1-7	22	S5B-6 SWITCH
S5B-7	P1-21	22	S5B-7 SWITCH
S5C-C	M1-2	20	*
S5C-1	S5C-2	24	GROUND
S5C-2	S5C- 1	24	GROUND
S5C-2	S5C-3	24	GROUND
S5C-3	S5C-2	24	GROUND
S5C-3	S5C-7	24	GROUND
S5C-4	S5A-4	20	-15 V-TA
S5C-5	P1-8	22	S5C-5 SWITCH
S5C-6	P1-10	22	S5C-6 SWITCH
S5C-7	TP9	20	RTN
S5C-7	S5C-3	24	GROUND
S6-1C	S9-1NO	24	GROUND
S6-1C	S1-2NC	24	GROUND
S6-1NO	P1-3	24	PRESET RNG SW
S7-1	P1-4	24	LAMP TEST
S7-2	PS1-V-	24	GROUND
S7-2	TP9	24	RTN

*Signal name is a function of switch position.

Table E-1. Wiring List for Fault Locator - Continued

From	To	Size (AWG)	Signal Name
S8-1C	K1-A2	24	GROUND
S8-1C	P1-14	24	GROUND
S8-1NC	P1-22	24	HVPS INHIBIT SW
S9-1C	K1-C1	24	*
S9-1NO	S6-1C	24	GROUND
S9-1NO	DS1-2		GROUND
S9-2C	S5A-1	22	BATTERY VOLTAGE
S9-2C	K1-B2	22	BATTERY VOLTAGE
S9-2NC	K1-X1	24	*
TP1	E2	20	A TRIG
TP2	E4	20	$\overline{\text{Q/S TRIGGER}}$
TP3	J1-U	22	RECEIVER START-TA
TP4	E15	20	METER
TP5	E6	20	CMPTR WORD
TP6	J1-H	22	EVENTS COUNT
TP7	J1-L	22	20 kHz CLOCK-TA
TP8	J1-J	22	HVPS ENABLE-TA
TP9	S7-2	24	RTN
TP9	S5C-7	20	RTN
TP9	E17	20	RTN -TA
TP1O	E8	20	$\overline{\text{ENERGY VALID}}$
TP11	E 10	20	$\overline{\text{FLASHTUBE TRIGGER-TA}}$

*signal name is a function of switch position.

Table E-1. Wiring List for Fault Locator - Continued

From	To	Size (AWG)	Signal Name
TP12	J1-K	22	TIMING GATE-TA
TP13	J1-W	22	$\overline{\text{PFN CHARGED}}$
TP14	E12	20	$\overline{\text{HVPS ON}}$
TP15	E14	20	$\overline{\text{TOR}}$
TP16	E17	20	RETURN-TA
TP16	S1-1NC	24	RETURN
TP16	J1-A	22	SHIELD RETURN
TP16	J1-g	22	RETURN-TA

*Signal name is a function of switch position.

Table E-2. Wiring List for Remote Capabilities Tester

From	To	Size (AWG)	Signal Name
E1	J1-R	22	FIST RETICLE BRIGHTNESS
E2	R2-3	22	FIST RETICLE BRIGHTNESS
E3	S2-3	22	*
E4	R2-1	22	*
E4	S1-Cl	22	*
J1-A	S7-1	22	K_0
J1-B	S7-2	22	K_1
J1-C	S7-4	22	K_2
J1-D	S6-1	22	K_3
J1-E	S6-2	22	K_4
J1-F	S6-4	22	K_5
J1-G	S5-1	22	K_6
J1-H	S5-2	22	K_7
J1-J	S5-4	22	K_8
J1-K	S1-C3	22	DC RTN
J1-L	S3-1	22	$\overline{\text{RNG 1}}$/RNG 2
J1-M	S1-11	22	FIST $\overline{\text{AZ ADJ}}$
J1-N	S1-9	22	FIST $\overline{\text{DES}}$
J1-P	S3-2	22	$\overline{\text{FIST SELECT}}$
J1-R	E1	22	FIST RETICLE BRIGHTNESS
J1-S	TP1	22	COMPUTER WORD

*signal name is a function of switch position.

Table E-2. Wiring List for Remote Capabilities Tester - Continued

From	To	Size (AWG)	Signal Name
J1-T	TP2	22	$\overline{\text{COMPUTER WORD}}$
J1-U	S2-2	22	FIRE CMD
J1-W	S4-1	22	$\overline{\text{FIRE REMOTE}}$
J1-Y	S4-4	22	FIRE REMOTE
J1-Z	XDS2-1	22	+24 VDC
J1-a	TP3	22	COMPUTER WORD SHLD
S1-C1	E4	22	*
S1-C2	S1-C3	22	*
S1-C2	XDS2-2	22	*
S1-C3	J1-K	22	DC RTN
S1-C3	S1-C2	22	*
S1-3	S4-4	22	*
S1-5	S1-6	22	*
S1-6	S1-5	22	*
S1-6	XDS1-1	22	*
S1-9	J1-N	22	FIST $\overline{\text{DES}}$
S1-11	J1-M	22	FIST $\overline{\text{AZ ADJ}}$
S2-2	J1-U	22	FIRE CMD
S2-3	E3	22	*
S3-1	J1-L	22	$\overline{\text{RNG 1}}$/RNG 2
S3-2	J1-P	22	$\overline{\text{FIST SELECT}}$
S3-2	XDS2-2	22	*
S4-1	J1-W	22	$\overline{\text{FIRE REMOTE}}$

*Signal name is a function of switch position.

Table E-2. Wiring List for Remote Capabilities Tester - Continued

From	To	Size (AWG)	Signal Name
S4-2	XDS1-1	22	*
S4-4	S1-3	22	*
S4-4	J1-Y	22	FIRE REMOTE
S4-5	XDS1-2	22	*
S5-C	XDS2-2	22	*
S5-C	S6-C	22	*
S5-1	J1-G	22	K_6
S5-2	J1-H	22	K_7
S5-4	J1-J	22	K_8
S6-C	S5-C	22	*
S6-C	S7-C	22	*
S6-1	J1-D	22	K_3
S6-2	J1-E	22	K_4
S6-4	J1-F	22	K_5
S7-C	S6-C	22	*
S7-1	J1-A	22	K_0
S7-2	J1-B	22	K_1
S7-4	J1-C	22	K_2
R2-1	E4	22	*
R2-1	XDS2-1	22	*
R2-1	R2-2	22	*
R2-2	R2-1	22	*

*signal name is a function of switch position.

Table E-2. Wiring List for Remote Capabilities Tester - Continued

From	To	Size (AWG)	Signal Name
R2-3	E2	22	*
TP 1	J1-S	22	COMPUTER WORD
TP2	J1-T	22	$\overline{\text{COMPUTER WORD}}$
TP3	J1- a	22	COMPUTER WORD SHLD
XDS1-1	S1-6	22	*
XDS1-1	S4-2	22	*
XDS1-2	S4-5	22	*
XDS1-2	XDS2-1	22	*
XDS2-1	J1-Z	22	+24 VDC
XDS2-1	R2-1	22	*
XDS2-1	XDS1-2	22	*
XDS2-2	S1-C2	22	*
XDS2-2	S3-2	22	*
XDS2-2	S5-C	22	*

*Signal name is a function of switch position.

APPENDIX F
TORQUE TABLES

F-1. SCOPE

Tables F-1 and F-2 contain torque values not otherwise specified for Fault Locator and Remote Capabilities Tester respectively.

Table F-1. Fault Locator Torque Values

Size (inches - threads per inch)	Torque (inch-pounds)
0.086-56	2 to 3
0.112-40	5 to 6
0.138-32	6 to 7
0.164-32	9 to 12
0.190-32	9 to 12
0.250-28	12 to 15
0.250-32	12 to 15
0.375-32	11 to 12
0.469-32	24 to 26
0.500-24	24 to 26
0.625-24	24 to 26
1.062-18	12 to 15
1.250-18	80 to 85

Table F-2. Remote Capabilities Tester Torque Values

Size (inches - threads per inch	Torque (inch-pound)
0.112-40	5 to 6
0.138-32	6 to 7
0.250-28	12 to 15
0.250-32	12 to 15
0.375-32	16 to 20
0.469-32	24 to 26
1.000-20	26 to 30

APPENDIX G
ELECTRONIC SHOP SHELTER AN/ASM-146C
SAFETY INTERLOCK

G-1. SCOPE

This appendix contains procedures for installing the 13250989 Safety Interlock to Electronic Shop Shelter AN/ASM-146C. Safety Interlock maintenance procedures are also included.

G-2. SAFETY INTERLOCK INSTALLATION

a. Safety Interlock Components. Inventory Safety Interlock components in accordance with Table G-1.

Table G-1. Safety Interlock Components

Item	National Stock Number	Part Number	Nomenclature	Quantity Required
1	5975-00-681-5778	702	Bushing, Electrical	4
2	NSNL	11509159	Cabinet, Electrical	1
3	6145-00-500-1193	S6CK3/16SRSJ	Cable, Electrical Power	4 ft
4	NSNL	11509160	Cabinet, Electrical	1
5	5975-00-038-2358	7707931	Conduit, Raceway	ar
6	5935-00-299-8035	CJ0248-001	Connector, Electrical Plug	1
7	5935-00-295-5733	GL0520	Connector, Receptacle	1
8	NSNL	11509169	Decal, Warning	1
9	5325-00-007-0392	54G	Grommet, Non-metallic	1
10	5940-00-552-2019	BB-884-10	Lug, Terminal	7
11	5310-00-146-7102	MS25082-C1	Nut, Plain Hexagon	4
12	5935-00-302-6343	SK101O-1	Plug, Socket	1
13	5945-00-877-5047	AZ481-7-1	Relay, Electromagnetic	1

Table G-1. Safety Interlock Components - Continued

Item	National Stock Number	Part Number	Nomenclature	Quantity Required
14	5305-00-066-7327	MS24693C28	Screw, Machine	2
15	5305-00-013-3458	MS35243-43	Screw, Machine	4
16	5305-00-281-5727	MS24615-27	Screw, Tapping	2
17	5305-00-883-0628	MS24617-21	Screw, Tapping	8
18	NSNL	11509168	Sign, Warning	1
19	5970-00-815-1295	BEMS6001-8	Sleeving, Insulation	ar
20	5365-00-826-2483	NAS42HT8-16	Spacer, Sleeve	2
21	5975-00-098-0131	5703	Support	2
22	5930-00-501-4955	MS25089-3CR-RED	Switch, Push	1
23	5930-00-916-7900	MIL-S-8805/1	Switch, Sensitive	1
24	5310-00-809-8544	MS27183-7	Washer, Flat	4
25	6145-00-023-6781	MIL-W-16878/1	Wire, Electrical	ar
26	6145-00-838-6612	MIL-W-16878/1	Wire, Electrical	ar
27	6145-00-881-8177	MIL-W-16878/1	Wire, Electrical	ar

b. Expendable/Durable Supplies and Materials. Table G-2 lists the expendable/durable supplies and materials required to install and maintain the Safety Interlock.

Table G-2. Expendable/Durable Supplies and Materials

Item Number	Level	National Stock Number	Description	U/M
1	F	8010-00-079-2756	Lacquer A-A- 665	ar
2	F	8010-00-899-8825	Primer TT-P-1757	ar
3	F	3439-00-522-2625	Solder SN63, Type WRMAP2	ar

c. Tools and Test Equipment. Table G-3 lists the tools and test equipment required to install and maintain the Safety Interlock.

Table G-3. Tools and Test Equipment

Tool or Test Equipment Reference Code	Maintenance Category	Nomenclature	National Stock Number
1	F	Drill, l/4-inch	NSNL
2	F	Drill bit, l/8-inch	NSNL
3	F	Drill bit, l/4-inch	NSNL
4	F	Iron, Electric Soldering W-TCP-L	3439-00-019-4384
5	F	Multimeter AN/PSM-45 or Multimeter AN/PSM-6B	6625-01-139-2512 or 6625-00-957-4374
6	F	Tool Kit, Laser System Field Maintenance	5180-01-048-8570

d. Safety Interlock Installation (Figure G-1).

WARNING

Ensure facilities power is disconnected from power distribution panel before beginning installation procedure. Hazardous voltages can cause shock, injury, or death.

(1) Set all AN/ASM-146C circuit breakers to OFF.

(2) On power distribution panel (1), set MAIN circuit breaker to OFF.

NOTE

60-Hz single-phase shelter power stub is connected to facilities power source line.

(3) Disconnect 60-Hz single-phase shelter cable from 60-Hz single-phase shelter power stub.

(4) On power distribution panel cover assembly, remove 14 screws and flat washers. Remove cover assembly.

(5) Remove raceway from top of power distribution panel (1) to duplex outlet (6).

(6) Remove electrical cabinet (3) cover by removing four screws.

(7) Position electrical cabinet (3) per Figure G-1. Mark four holes.

(8) Using 1/4-inch drill with 1/8-inch drill bit (items 1 and 2, Table G-3), drill four holes.

(9) Measure 5 inches from edge of raceway (2) to bottom center of raceway (5). Mark location.

(10) Measure 3/8 inch from shelter side wall to raceway (5). Mark location.

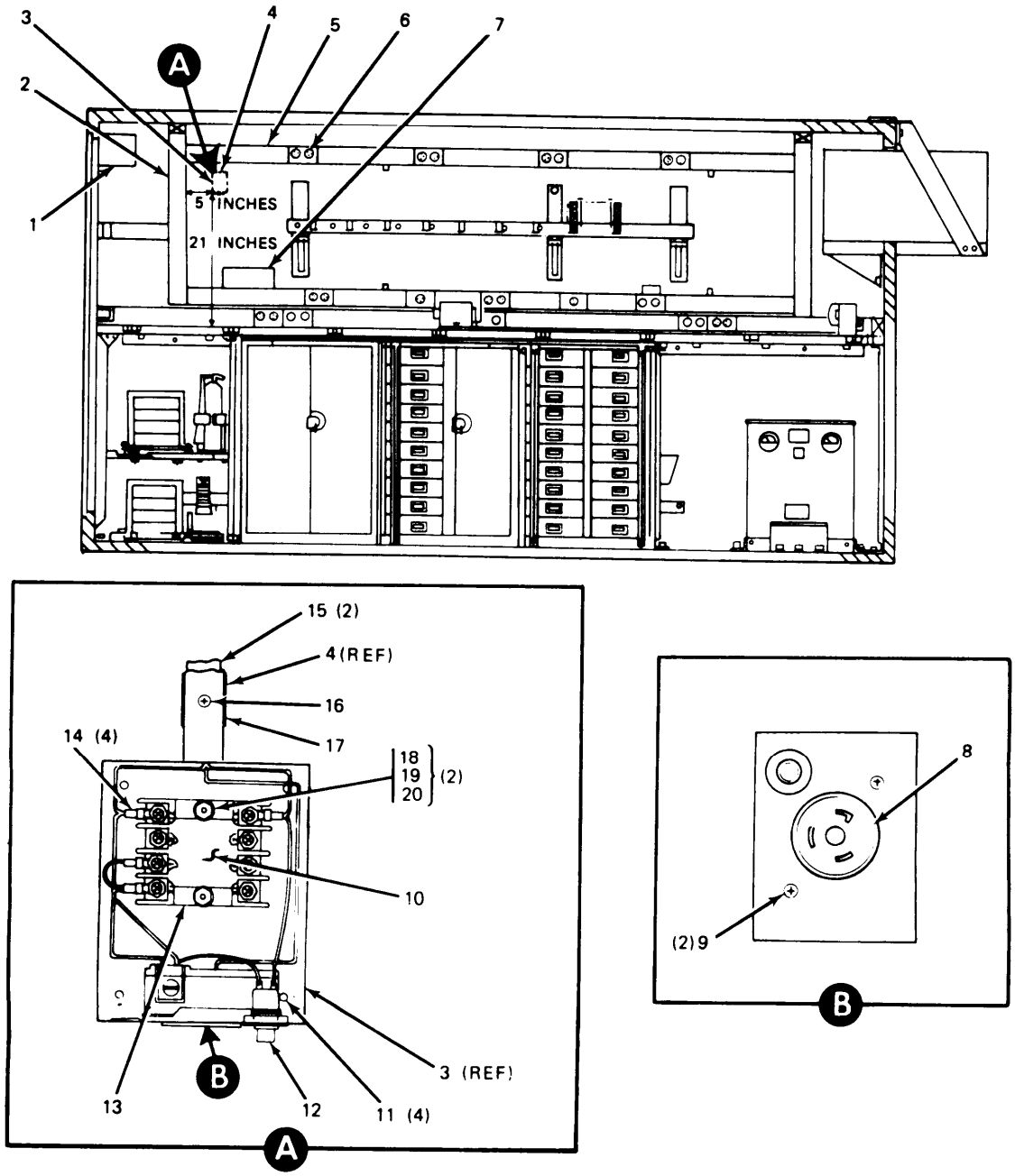
CAUTION

Ensure raceway wires are clear of drill bit path.

(11) Using 1/4-inch drill and 1/8-inch drill bit (items 1 and 2, Table G-3), drill one pilot hole.

(12) Using 1/4-inch drill and 1/4-inch drill bit (items 1 and 3, Table G-3), enlarge pilot hole to 1/4 inch.

(13) Install one non-metallic grommet (item 9, Table G-1) into pilot hole drilled in raceway (5).



LEGEND

1. POWER DISTRIBUTION PANEL
2. RACEWAY
3. ELECTRICAL CABINET (ITEM NO. 4, TABLE G-1)
4. 4–1/2–INCH– LONG RACEWAY CONDUIT (ITEM NO. 5, TABLE G-1)
5. RACEWAY
6. DUPLEX OUTLET
7. HP POWER SUPPLY
8. RECEPTACLE CONNECTOR (ITEM NO. 7, TABLE G-1)
9. MACHINE SCREW (ITEM NO. 14, TABLE G-1)
10. ELECTROMAGNETIC RELAY (ITEM NO. 13, TABLE G–1)
11. TAPPING SCREW (ITEM NO. 17, TABLE G–1)
12. PUSH SWITCH (ITEM NO. 22, TABLE G-1)
13. SOCKET PLUG (ITEM NO. 12, TABLE G–1)
14. TERMINAL LUG (ITEM NO. 10, TABLE G-1)
15. ELECTRICAL BUSHING (ITEM NO. 1, TABLE G–1)
16. TAPPING SCREW (ITEM NO. 16, TABLE G–1)
17. SUPPORT (ITEM NO. 21, TABLE G–1)
18. MACHINE SCREW (ITEM NO. 15, TABLE G-1)
19. PLAIN HEXAGON NUT (ITEM NO. 11, TABLE G-1)
20. FLAT WASHER (ITEM NO. 24, TABLE G-1)

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Figure G-1. Positioning of 11509160 Electrical Cabinet

(14) Position one support (17) 1-3/4 inches directly below hole drilled in raceway (5). Mark location.

(15) Using 1/4-inch drill and 1/8-inch drill bit (items 1 and 2, Table G-3), drill one hole.

(16) Secure support (17) to shelter side wall by installing tapping screw (16).

(17) Mount socket plug (13) to electrical cabinet (3) by installing two machine screws (18), flat washers (20), and plain hexagon nuts (19).

(18) Mount receptacle connector (8) to electrical cabinet (3) by installing two machine screws (9).

(19) Mount push switch (12) to electrical cabinet (3).

(20) Mount electromagnetic relay (10) to socket plug (13).

CAUTION

Do not torque tapping screws (11) more than 3 inch-pounds.

(21) Mount electrical cabinet (3) to shelter wall by installing four tapping screws (11). Torque tapping screws 2 to 3 inch-pounds.

NOTE

Ensure green ground wire is attached to plain hexagon nut securing electromagnetic relay to socket plug.

(22) Route one red and one white electrical wire (items 26 and 25, Table G-1) from electrical cabinet (3) through raceway (5) to top of power distribution panel (1).

(23) Place one electrical bushing (15) into each end of 4-1/2-inch-long raceway conduit (4).

CAUTION

Ensure red and white electrical wires are placed within 4-1/2-inch-long raceway conduit (4) before it is secured to support (17).

(24) Secure 4-1/2-inch-long raceway conduit (4) to support (17).

(25) Using solder (item3, Table G-2) and electric soldering iron (item 4, Table G-3), solder red electrical wire (item 26, Table G-1) to push switch terminals 3 and 4.

NOTE

Ensure all electrical wires being connected to electromagnetic relay (10) have terminal lugs (14) installed.

Table G-4. Electromagnetic Relay Wiring List

Wire	Color	From	To
MIL-W-16878/1	Red	Push Switch, Terminal 4	Electromagnetic Relay Terminal 6
MIL-W-16878/1	Red	Push Switch, Terminal 3	Receptacle Connector (115 V ac Terminal)
MIL-W-16878/1	Red	Electromagnetic Relay Terminal 2	Electromagnetic Relay, Terminal 1
MIL-W-16878/1	White	Receptacle Connector, Terminal W	Electromagnetic Relay, Terminal 7
MIL-W-16878/1	White	Electromagnetic Relay, Terminal 7	Power Distribution Panel, Grounding Terminal Strip
MIL-W-16878/1	Green	Receptacle Connector, Terminal G	Electromagnetic Relay, Plain Hexagon Nut
MIL-W-16878/1	Red	Receptacle Connector (115 V ac Terminal)	Electromagnetic Relay, Terminal 2

(26) Connect wiring per Table G-4.

(27) Install raceway (5) from duplex outlet (6) to top of power distribution panel (l).

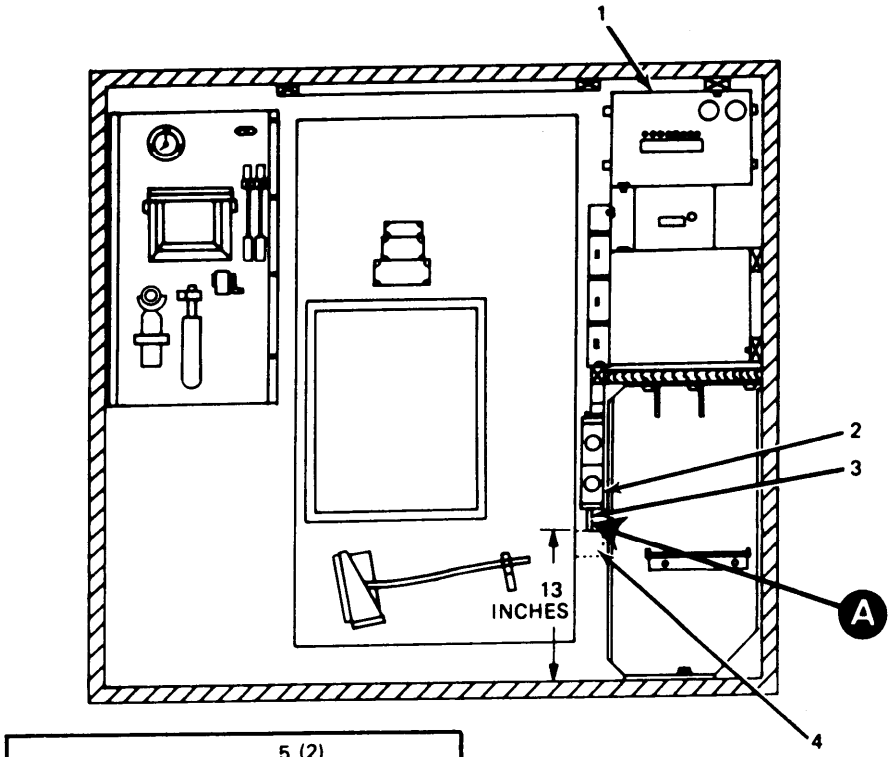
(28) Remove raceway from bottom of power distribution panel (1, Figure G-2) to bottom of HEATER 2 receptacle connector (2).

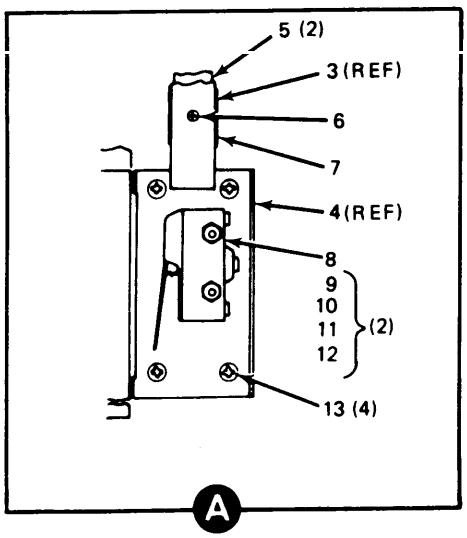
(29) Open shelter door.

(30) Remove electrical cabinet (4) cover by removing four screws.

(31) Route two red electrical wires (item 26, Table G-1) from power distribution panel (1) to HEATER 2 receptacle connector (2).

(32) Remove raceway end fitting.





LEGEND

1. POWER DISTRIBUTION PANEL
2. HEATER 2 RECEPTACLE CONNECTOR
3. 6–1/2–INCH–LONG RACEWAY CONDUIT (ITEM NO. 5, TABLE G–1)
4. ELECTRICAL CABINET (ITEM NO. 2, TABLE G–1)
5. ELECTRICAL BUSHING (ITEM NO. 1, TABLE G–1)
6. TAPPING SCREW (ITEM NO. 16, TABLE G-1)
7. SUPPORT (ITEM NO. 21, TABLE G–1)
8. SENSITIVE SWITCH (ITEM NO. 23, TABLE G–1)
9. MACHINE SCREW (ITEM NO. 15, TABLE G–1)
10. PLAIN HEXAGON NUT (ITEM NO. 11, TABLE G–1)
11. FLAT WASHER (ITEM NO. 24, TABLE G–1)
12. SLEEVE SPACER (ITEM NO. 20, TABLE G–1)
13. TAPPING SCREW (ITEM NO. 17, TABLE G–1)

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Figure G-2. Positioning of 11509159 Electrical Cabinet

Table G-5. Sensitive Switch - Power Distribution Panel Wiring List

Wire	Color	From	To
MIL-W-16878/1	Red	Electromagnetic Relay, Terminal 6	Sensitive Switch, NORM OPEN
MIL-W-16878/1	Red	Power Distribution Panel SPARE Circuit Breaker	Sensitive Switch, COMMON

(33) Connect sensitive switch (item 23, Table G-1) wiring per Table G-5.

(34) Mount sensitive switch (8) to electrical cabinet (4) by installing two machine screws (9), sleeve spacers (12), flat washers (11), and plain hexagon nuts (10).

(35) Position electrical cabinet (4) per Figure G-2. Mark four holes.

NOTE

Before drilling holes, ensure shelter door clears electrical cabinet (4) but makes contact and activates sensitive switch (8) contact blade.

(36) Using 1/4-inch drill and 1/8-inch drill bit (items 1 and 2, Table G-3), drill four holes.

CAUTION

Do not torque tapping screws (13) more than 3 inch-pounds.

(37) Mount electrical cabinet (4) to shelter wall using four tapping screws (13). Torque tapping screws 2 to 3 inch-pounds.

(38) Adjust sensitive switch (8) contact blade as necessary to ensure contact with shelter door.

(39) Install electrical cabinet (4) cover and secure with four screws.

(40) Measure 2-3/4 inches up from top center of electrical cabinet (4). Mark location.

(41) Using 1/4-inch drill and 1/8-inch drill bit (items 1 and 2, Table G-3), drill one hole.

(42) Secure support (7) to shelter rear wall by installing tapping screw (6).

(43) Place one electrical bushing (5) into each end of 6-1/2-inch-long raceway conduit (3).

CAUTION

Ensure electrical wires are placed within 6-1/2-inch-long raceway conduit (3) before it is secured to support (7).

(44) Secure 6-1/2-inch-long raceway conduit (3) to support (7).

(45) Install electrical cabinet (3, Figure G-1) cover and secure with four screws.

(46) Install raceway from HEATER 2 receptacle connector (2, Figure G-2) to bottom of power distribution panel (1).

(47) Install power distribution panel cover assembly to power distribution panel (1) and secure with 14 flat washers and screws.

(48) Install WARNING decal (item 8, Table G-1) to electrical cabinet (3, Figure G-1) cover.

(49) Install WARNING sign (item 18, Table G-1) on exterior rear shelter wall.

e. Electrical Power Cable Fabrication (Figure G-3).

(1) Separate and install electrical plug connector (1) onto electrical power cable (2).

(2) Wire green lead to green terminal nut.

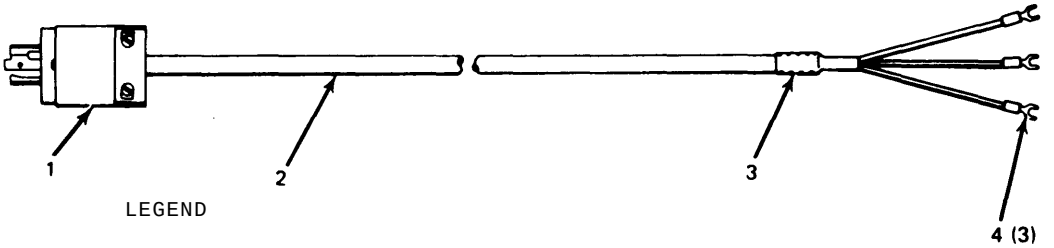
(3) Wire white lead to silver terminal nut.

(4) Wire black lead to gold terminal nut.

(5) Secure electrical plug connector (1) with five screws.

(6) Install insulation sleeving (3) on electrical power cable (2).

(7) Install one terminal lug (4) each on black, green, and white electrical power cable wires.



LEGEND

1. ELECTRICAL PLUG CONNECTOR (ITEM NO. 6, TABLE G-1)
2. ELECTRICAL POWER CABLE (ITEM NO. 3, TABLE G-1)
3. INSULATION SLEEVING (ITEM NO. 19, TABLE G-1)
4. TERMINAL LUG (ITEM NO. 10, TABLE G-1)

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Figure G-3. Electrical Power Cable Fabrication

G-3. SAFETY INTERLOCK PRE-OPERATIONAL CHECK

a. Frequency. Perform the Safety Interlock pre-operational check before any G/VLLD maintenance tasks are initiated.

b. Pre-Operational Check. Verify that the Safety Interlock is operating by performing the following steps.

(1) Remove HP Power Supply rear cover.

(2) Connect electrical power cable (2, Figure G-3) to HP Power Supply (7, Figure G-1) in accordance with Table G-6.

Table G-6. Electrical Power Cable - HP Power Supply Wiring List

From	To
Electrical Power Cable, Green Lead	HP Power Supply, Ground
Electrical Power Cable, Black Lead	HP Power Supply, AC/AC Input Line
Electrical Power Cable, White Lead	HP Power Supply, ACC/AC Input line

(3) Install HP Power Supply rear cover.

(4) Connect electrical power cable (2, Figure G-3) to electrical cabinet (3, Figure G-1) receptacle connector (8).

(5) On power distribution panel (1), set MAIN circuit breaker to OFF.

(6) Close shelter door.

NOTE

60-Hz single-phase shelter power stub is connected to facilities power source line.

(7) Connect 60-Hz single-phase shelter power cable to 60-Hz single-phase shelter power stub.

(8) On power distribution panel (1), set MAIN circuit breaker to ON.

(9) Set all AN/ASM-146C circuit breakers to ON.

(10) On power distribution panel (1), set SPARE circuit breaker to ON.

(11) On electrical cabinet (3), press push switch (12).

(12) On HP Power Supply (7), set ~LINE switch to ON and adjust VOLTAGE COARSE and FINE controls to +24 V.

(13) Open shelter door. Verify that HP Power Supply (7) is not operating.

(14) Close shelter door. Verify that HP Power Supply (7) is not operating.

(15) On electrical cabinet (3), press push switch (12). Verify that HP Power Supply (7) is operating.

G-4. TROUBLESHOOTING SAFETY INTERLOCK

WARNING

Ensure power distribution panel MAIN circuit breaker is set to OFF before beginning troubleshooting. Hazardous voltages can cause shock, injury, or death.

Isolation of faulty Safety Interlock components is accomplished by performing a series of continuity checks using a multimeter (item 5, Table G-3). Troubleshoot Safety Interlock components and wiring in accordance with Figure 2-11. Replace faulty items as required. Perform Safety Interlock pre-operational check per paragraph G-3 after any corrective maintenance.

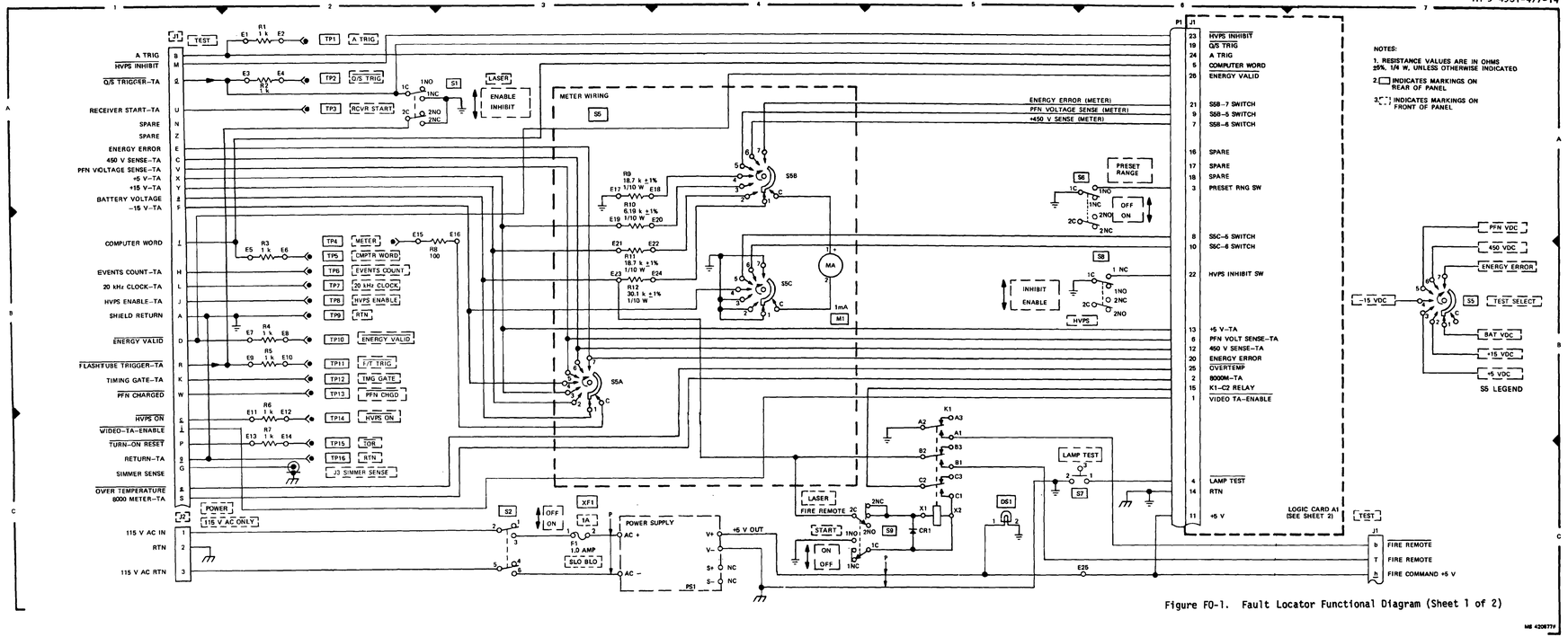

Figure FO-1. Fault Locator Functional Diagram (Sheet 1 of 2)

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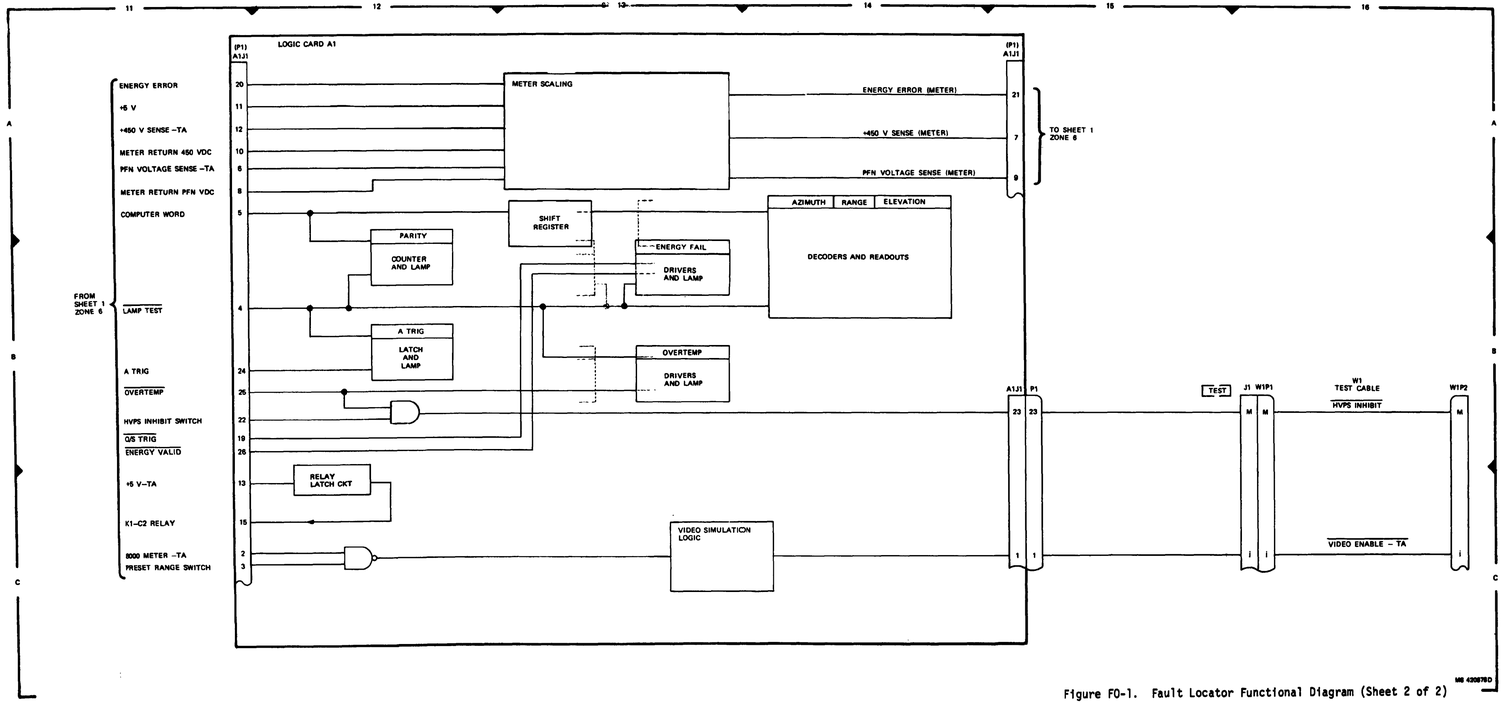
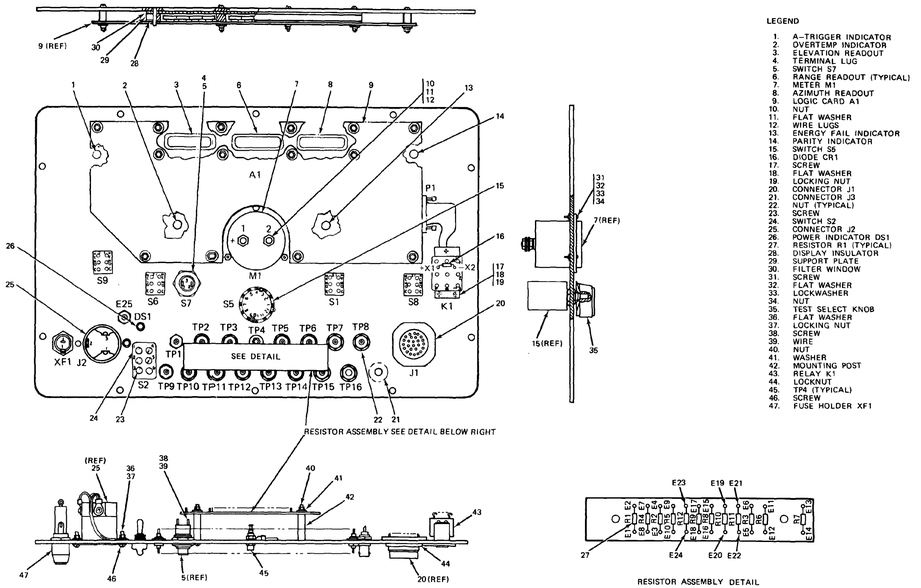


Figure FO-1. Fault Locator Functional Diagram (Sheet 2 of 2)



LEGEND

1. A-TRIGGER INDICATOR
2. OVERTEMP INDICATOR
3. ELEVATION READOUT
4. TERMINAL LUG
5. SWITCH S7
6. RANGE READOUT (TYPICAL)
7. METER M1
8. AZIMUTH READOUT
9. LOGIC CARD A1
10. NUT
11. FLAT WASHER
12. WIRE LUGS
13. ENERGY FAIL INDICATOR
14. PARITY INDICATOR
15. SWITCH S6
16. DIODE CR1
17. SCREW
18. FLAT WASHER
19. LOCKING NUT
20. CONNECTOR J1
21. CONNECTOR J3
22. NUT (TYPICAL)
23. SCREW
24. SWITCH S2
25. CONNECTOR J2
26. POWER INDICATOR DS1
27. RESISTOR R1 (TYPICAL)
28. DISPLAY INSULATOR
29. SUPPORT PLATE
30. FILTER WINDOW
31. SCREW
32. FLAT WASHER
33. LOCKWASHER
34. NUT
35. TEST SELECT KNOB
36. FLAT WASHER
37. LOCKING NUT
38. SCREW
39. WIRE
40. NUT
41. WASHER
42. MOUNTING POST
43. RELAY K1
44. LOCKNUT
45. TP4 (TYPICAL)
46. SCREW
47. FUSE HOLDER XF1

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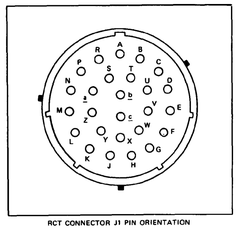
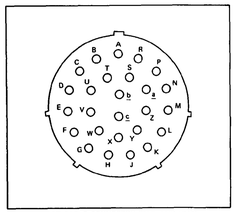
Figure FO-2. Fault Locator Panel Component Layout



RCT CONNECTOR J1 PIN ORIENTATION



RCT CABLE CONNECTOR W2P1 AND W2P2
PIN ORIENTATION

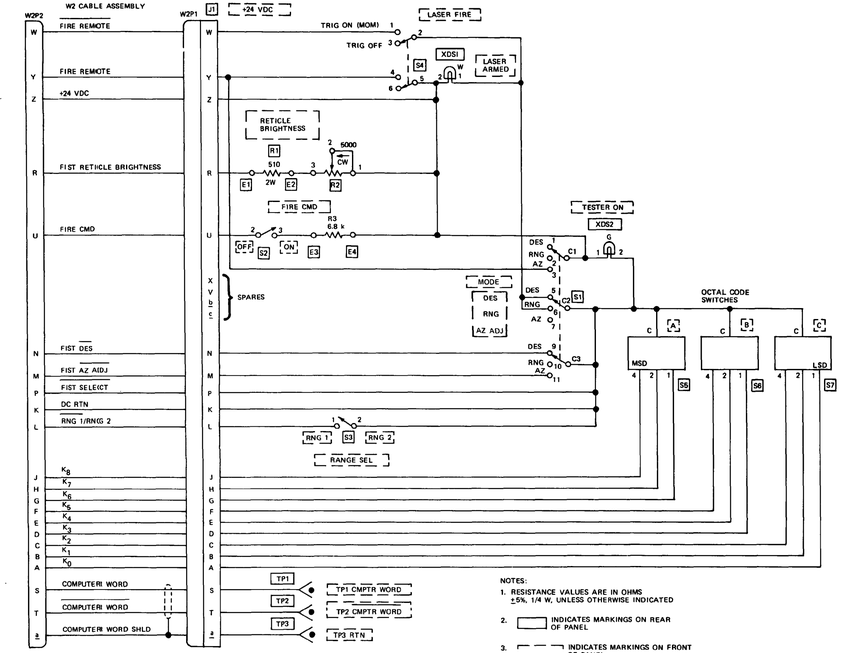


Figure FO-3. Remote Capabilities Tester Schematic Diagram

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
Major General, United States Army
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Distribution:

To be distributed in accordance with DA Form 12-32, Section III, Organizational Maintenance requirements for Ground Laser Locator Designator(GLLD).

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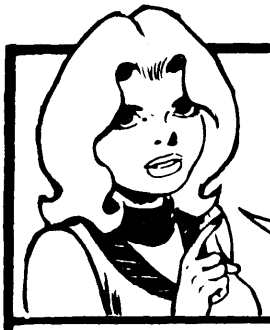

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TM 9-1430-550-34-1	7 Sep 72	Unit of Radar Set AN/MPQ-50 Tested at the HFC

BE EXACT. . PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO
9-19		9-5	
21-2	step 1C		21-2

SAMPLE

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

"B" Ready Relay K11 is shown with two #9 contacts. That contact which is wired to pin 8 of relay K16 should be changed to contact #10.

Reads: Multimeter B indicates 600 K ohms to 9000 K ohms.

Change to read: Multimeter B indicates 600 K ohms minimum.

Reason: Circuit being checked could measure infinity. Multimeter can read above 9000 K ohms and still be correct.

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Your comments will go directly to the writer responsible for this manual, and he will prepare the reply that is returned to you. To help him in his evaluation of your recommendations, please explain the reason for each of your recommendations, unless the reason is obvious.

All comments will be appreciated, and will be given immediate attention. Handwritten comments are acceptable.

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SP4 John Doe, Autovon 222-222

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Commander
U.S. Army Missile Command
ATTN: AMSMI-MMC-LS-LP
Redstone Arsenal, AL 35898-5238

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