DEPARTMENT OF THE ARMY TECHNICAL MANUAL

DS, GS, AND DEPOT
MAINTENANCE MANUAL
RECORDER TEST SET
TS-2854/ASH-23

This copy is a reprint which includes current pages from changes No. 1.

HEADQUARTERS, DEPARTMENT OF THE ARMY
NOVEMBER 1969

WARNING

DANGEROUS VOLTAGE

are used in the operation of this equipment. Observe all safety precautions.

TECHNICAL MANUAL
No. 11-6625-1818-35

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C. 25 November 1969

DS, GS, and Depot Maintenance Manual

RECORDER TEST SET, TS-2845/ASH-23

CHAPTER 1

INTRODUCTION

1-1. Scope.

a. This manual contains direct and general support and depot maintenance instructions for the Recorder Test Set, TS-2854/ASH-23. It includes instructions appropriate to direct and general support and depot for troubleshooting, testing and repairing the equipment, replacing maintenance parts, and repairing specified maintenance parts. It also lists tools, materials, and test equipment for direct and general support and depot maintenance. Detailed functions of the equipment are covered in paragraph 2-1. Throughout this manual, the Recorder Test Set TS-2854/ASH-23 is referred to as the CIPR test set.

b. The complete technical manual for this equipment includes TM 11-6625-1818-12.

1-2. Indexes of Publications

a. DA Pam 310-4. Refer to the latest issue of DA Pam 310-4 to determine whether there are new additions, changes, or additional publications pertaining to the equipment.

b. Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

NOTE

For other applicable forms and records, see TM 11-6625-1818-12.

1-3. Reporting of Equipment Publication Improvements

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended (Changes to Publications) and forwarded direct to Commanding General, US Army Electronics Command, ATTN.: AMSEL-ME-NMP-EM, Fort Monmouth, N. J. 07703.

CHAPTER 2

FUNCTIONING OF EQUIPMENT

2-1. Explanation of Functions

a. General Description. The CIPR test set is used in testing and troubleshooting operations of the Sound Recorder Set AN/ASH-23 (CIPR), at direct support, general support and depot. The CIPR test set is contained in its portable carrying case with power and test cables permanently attached through the front of the test panel. Set up and operation of the test set consists of connecting the power cable to the facility 28 Vdc power source and the attaching of test cable connectors to the CIPR specimen. The test set panel has six functional areas containing two rotary switches, six illuminated switch-indicators and one illuminated indicator providing the signal control between the test set and the CIPR test specimen. The test set may be used in some operations with the recording magazine attached to the CIPR controller. The test set has no capability for playback of signals recorded on the magazine tape.

b. Detailed Descriptions. The following information covers the description and use of functional components of the test set. Refer to (fig. 2-1) for the functional signal flow between the test set and the CIPR test specimen.

(1) Cable connections. The test set's power cable connects to the test facility 28 Vdc power source. The test set's test cable terminates with two connectors P1 and P2. Connector P1 attaches to the CIPR aircraft connector A1A5J1 while connector P2 is attached to the magazine end of the CIPR controller. When the test set's cables are properly connected, the circuit breaker is actuated, and the POWER ON switch-indicator is ON, 28 Vdc power is supplied to the CIPR controller and the motor drive will be in the "pulse" mode of operation.

(2) Lamp testing. The test set's LAMP TEST switch-indicator is used to test lamps in the FAILURE SIGNAL indicator and all of the switch-indicators. This test is recommended each time the test set is put into operation.

(3) CIPR signal monitor. This area provides labeled test jacks used in monitoring the input 28 Vdc, regulated dc voltages produced by the CIPR, timing pulse signals, and CIPR drive motor phasing signals. The +28V input signal is available at the test jacks (+28V and GND) when the test set's POWER ON switch-indicator is ON. The remainder of the DC VOLTAGE MONITOR jacks (+20V, +10V, +5V) are for signals originating in the CIPR regulator circuits. The signals at the TIMING PULSE jacks originate in the CIPR timing controller. The MOTOR PHASE jacks measure outputs from the CIPR motor drive amplifiers.

(4) Record command. The test set's RECORD COMMAND rotary switch provides a 28 Vdc signal to the CIPR motor drive circuits to command the drive motor to operate at the 'record" speed. The drive motor direction control is accomplished through the TAPE END SIMULATION switch-indicator. The VWS COMMAND INHIBIT switch-indicator, when actuated, will inhibit the VWS motor drive command signal when the RECORD COMMAND switch is set at the VWS position.

(5) Output select and monitor. The test set's OUTPUT SELECT rotary switch is used to select any one of the CIPR record amplifier outputs or timing signals for either the A or B channels for monitoring at the adjacent MONITOR 1 and 2 connectors. These signals normally go to the CIPR magazine for recording on tape. The required switching for either channel A or B signal outputs is accomplished through the TAPE END SIMULATION switch-indicators in the INTERNAL mode when P2 is connected. The actuation of the BIAS INHIBIT switch-indicator provides the test set operator with the capability of monitoring the audio output signals by removing the CIPR record amplifier's bias frequency signal from the output signal. The test set's OUTPUT SELECT switch is not used when the CIPR magazine is attached to the controller.

(6) Signal inputs. The test set's INPUT connectors provide the capability to send oscillator generated signals to the CIPR record amplifier circuits. The oscillator input signals are monitored through the INPUT MONITOR PILOT-ALT, VWS, or SPARE jacks.

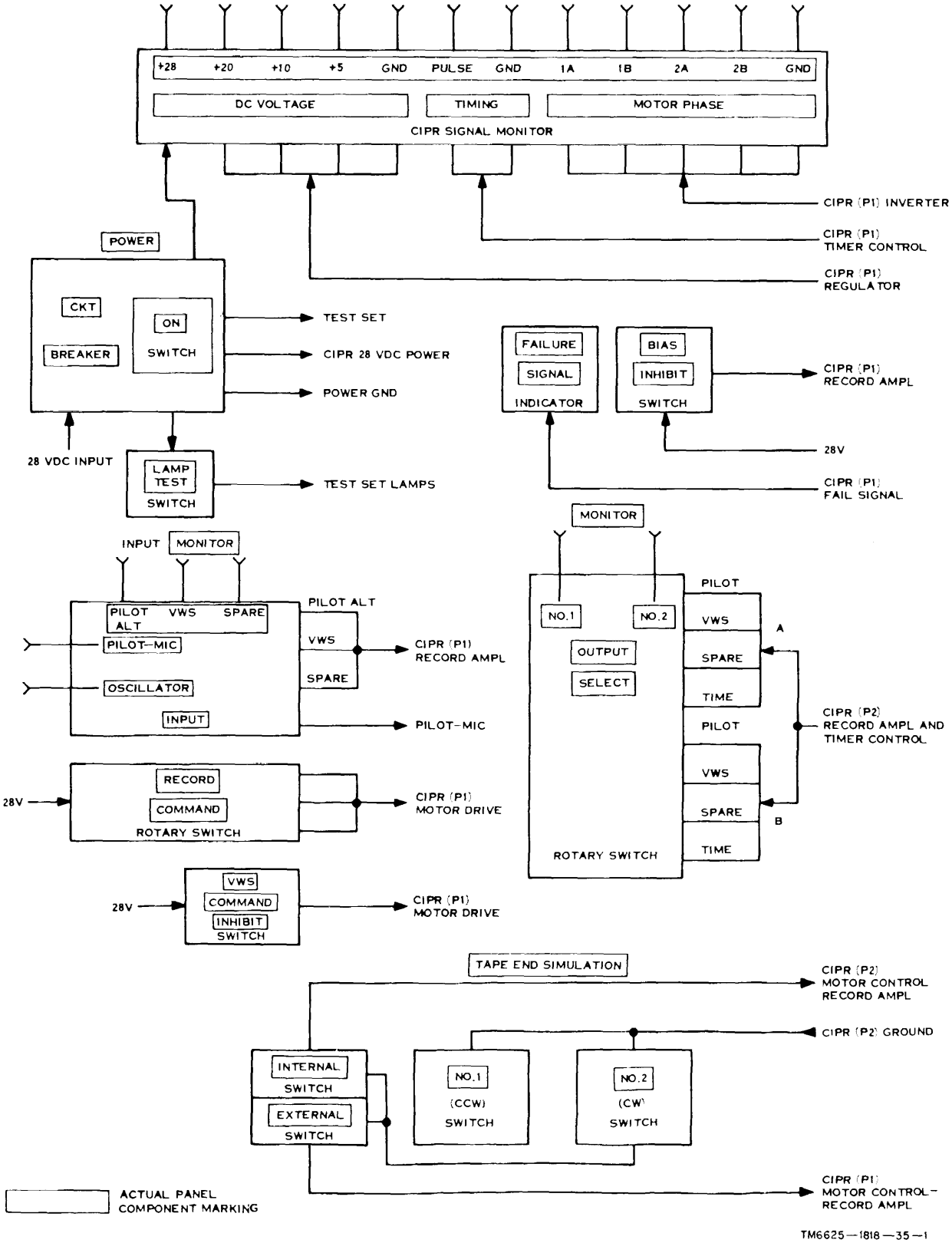

Figure 2-1. CIPR test set signal flow diagram.

CHAPTER 3

DIRECT SUPPORT MAINTENANCE

Section I. GENERAL

3-1. Scope of Direct Support Maintenance

This chapter contains instructions for maintenance operations allocated to the direct support maintenance level. Troubleshooting, adjustment, repair, removal and replacement, and testing instructions are presented in subsequent paragraphs.

3-2. Toils, Test Equipment and Materials

In addition to standard tools available to aircraft and electronic equipment maintenance personnel, Tool Kit TK-100 G and Multimeter TS-3521/U are required for operations described in this chapter.

Section II. DIRECT SUPPORT TROUBLESHOOTING

3-3. General Instructions

Troubleshooting at direct support maintenance includes all techniques given for organizational maintenance and any special or additional techniques required to isolate to a defective part.

3-4. Organization of Troubleshooting Procedures

a. Steps. Test set troubleshooting is performed in two steps. The first step includes preliminary tests that identify or localize the faulty functional circuit within a unit. The second step consists of isolation procedures to verify the preliminary tests and locate the faulty part or component.

b. Localization. The test set localization procedures consist of the following:

(1) Visual inspection. The purpose of this inspection is to locate faults without testing or measuring the circuits. All switch-indicator indications and other visual signs should be observed and an attempt made to localize the fault to -a particular functional section or component.

(2) Operational test. The operational test will frequently indicate the general location of the trouble and in many instances will help in determining the exact nature of the fault. The operator's daily preventive maintenance checks and services charts (TM 11-6625-1818-12) contains an operational type test.

(3) Troubleshooting chart. The troubleshooting chart (para. 3-7) lists symptoms of common troubles and gives corrective measures. The repairman should use this chart as a guide to help isolate trouble by the listed symptoms. The troubleshooting procedures herein assume that the basic trouble has been isolated to be in the test set.

c. Isolation. Isolation procedures are found in paragraph 3-7.

3-5. Preliminary Tests

The tests and procedures in this section require the tools and test equipment listed in paragraph 3-2. The use of special test fixtures specifically designed for the test set checkout (if available) may be used as authorized. Perform the following steps before proceeding to the test set trouble localization chart:

a. Connect test set power cable leads to the facility's 28 Vdc power supply. The input power shall be within the range 21 to 30 Vdc.

b. Place the test set's RECORD COMMAND and OUTPUT SELECT switches in the OFF position. Reset the test set circuit breaker (CKT BRKR) if necessary by pushing the CKT BRKR button.

c. Press the POWER ON switch-indicator and observe that the POWER ON switch-indicator illuminates and one half of the INTERNAL-EXTERNAL switch-indicator. Press the INTERNAL-EXTERNAL switch-indicator and observe that the alternate half of the switch-indicator

illuminates. Connect the multimeter to the test set CIPR SIGNAL MONITOR DC VOLTAGE -28V and GND jacks and observe the input voltage to be within the range of +21 to 30 Vdc.

d. test indicator lamp circuit, press and hold LAMP TEST switch-indicator. All indicator lamps shall light. If any of the indicator lamps fail to light or have a noticeable low illumination intensity, perform the appropriate troubleshooting action indicated in paragraph 3-7.

e. test the FAILURE SIGNAL circuit, place a jumper wire between pins P1-3 and P1-17 and observe that FAILURE SIGNAL lamp illuminates. Remove jumper.

3-6. Continuity and Resistance Data

a. General. Continuity and resistance data is arranged for point-to-point testing using Multimeter TS-352/U according to test set functional area with the points of measurement (To-From data) selected to facilitate the required circuit testing and troubleshooting.

b. Continuity-Resistance Checks.

Test Set Function	*Control/Switch Position*	*From*	*To*	*Performance Standard*
***Note*. Following measurements do not require removal of test panel from case. Do not apply power to test set.**				
1. DC power input:				
Ground circuit.	POWER switch-indicator S3and CKT BRKR pressed in	*a.* Minus lug (black) on 28vdc power cable	*a.* CIPR SIGNAL MONITOR DC VOLTAGE GND jack J9.	*a.* Continuity.
		b. CIPR SIGNAL MONITOR DC VOLTAGE GND jack J9.	*b.* P1-6.	*b.* Continuity.
		c. CIPR SIGNAL MONITOR DC VOLTAGE GND jack J9	c. Chassis ground (panel).	*c.* Continuity.
+28V circuit	POWER ON switch-indicator S3 and CKT BRKR pressed in	*a.* Plus lug (red) on 28 vdc power cable	*a.* CIPR SIGNAL MONITOR DC VOLTAGE -1-28V jack J10.	*a.* Continuity.
		b. CIPR SIGNAL MONITOR DC VOLTAGE +28V jack J10.	*b.* P1-3.	*b*. Continuity.
Circuit breaker.	POWER ON switch-indicator S3 to ON and CKT BRKR pulled out.	Plus lug (red) on 28 vdc power cable.	P1-3.	Open.
2. CIPR SIGNAL MONITOR test points:				
CIPR Regulated voltage.		*a.* DC VOLTAGE t20V jack J5.	*a.* P1-25	*a.* Continuity.
		b. DC VOLTAGE +10V jack J6.	*b.* P1-26.	*b.* Continuity.
		c. DC VOLTAGE +5V jack J7.	*c.* P1-21.	*c.* Continuity.
TIMING PULSE.		*a.* TIMING PULSE jack J8.	*a.* P1-31.	*a.* Continuity.
		b TIMING GND jack J20.	*b.* P1-6.	*b.* Continuity.
CIPR MOTOR PHASE		*a.* PHASE 1A jack J1	*a.* P1-23.	*a.* Continuity.
		b. PHASE 1B jack J2	*b.* P1-24	*b.* Continuity.
		c. PHASE 2A jack J3	*c.* P1-28	*c.* Continuity.
		d. PHASE 2B jack J4	*d.* P1-29	*d.* Continuity.
		e. PHASE GND iack J19	*e.* P1-6	*e.* Continuity.

Test Set Function	Control/Switch Position	From	To	Performance Standard
3. RECORD COMMAND.	RECORD COMMAND switch S1 to PILOT.	CIPR SIGNAL MONITOR DC VOLTAGE +28V Jack J10.	P1-13.	Continuity.
	RECORD COMMAND switch S1 to VWS.	CIPR SIGNAL MONITOR DC VOLTAGE +28V jack J10.	P1-4.	Continuity.
	RECORD COMMAND switch S1 to SPARE.	CIPR SIGNAL MONI TOR DC VOLTAGE +28V jack J10.	P1-22.	Continuity.
4. VWS COMMAND INHIBIT.	VWS COMMAND INHIBIT switch-indicator S4 not actuated.	CIPR SIGNAL MONITOR DC VOLTAGE +28V jack J10.	P1-5.	Open.
	VWS COMMAND INHIBIT switch-indicator S4 pressed in.	CIPR SIGNAL MONITOR DC VOLTAGE +28V jack J10.	P1-5.	Continuity.
5. BIAS INHIBIT.	BIAS INHIBIT switch-indicator S5 not actuated.	CIPR SIGNAL MONI, TOR DC VOLTAGE +28V jack J10.	P1-18.	Open.
	BIAS INHIBIT switch-indicator S5 to ON.	CIPR SIGNAL MONITOR DC VOLTAGE +28V jack J10.	P1-18.	Continuity.
6. FAILURE SIGNAL.	POWER ON switch-indicator S3 to ON.	INPUT MONITOR GND jack J16.	P1-17.	Lamp resistance.
7. TAPE END SIMULATION NO. 1:				
EXTERNAL mode.	INTERNAL-EXTERNAL switch-indicator S10 to EXTERNAL and TAPE END SIMULATION NO. 1 switch-indicator S8 held ON.	a. P1-27 (positive lead of ohmmeter).	*a.* P2-12.	*a.* Continuity.
		b. P1-27 (positive lead ot ohmmeter).	*b.* INPUT MONITOR GND jack J16.	*b.* Continuity.
INTERNAL, mode.	INTERNAL-EXTERNAL switch-indicator S10 to INTERNAL and TAPE END SIMULATION NO. 1 switch-indicator S8 held ON.	a. P2-13.	*a.* P2-12.	*a.* Continuity.
		b. P2-13.	*b.* INPUT MONITOR GND jack J16.	*b*. Continuity.
Ground signal.		P2-12.	INPUT MONITOR GND jack J16.	Continuity.
8. TAPE END SIMULATION NO. 2:				
EXTERNAL mode.	INTERNAL-EXTERNAL switch-indicator S10 to EXTERNAL and TAPE END SIMULATION NO. 2 switch-indicator S9 held ON.	P1-30.	P2-12.	Continuity.
INTERNAL mode.	INTERNAL-EXTERNAL switch-indicator S10 to INTERNAL and TAPE END SIMULATION NO. 2 switch-indicator S9 held ON.	P2-11	P2-12	Continuity.

Test Set Function	Control/Switch Position	From	To	Performance Standard
9. INPUT MONITOR signals:				
PILOT MIC.		*a.* P1-9.	*a.* PILOT MIC connector J14 (center pin).	*a.* Continuity.
		b. P1-9.	*b.* P1-10.	*b.* Open.
		c. P1-10.	*c.* P1-11.	*c.* Continuity.
OSCILLATOR input:				
PILOT-ALT:				
Audio.		*a.* OSCILLATOR jack J15 (center pin).	*a.* PILOT-ALT jack J11.	*a.* 620 ± 31 ohms.
		b. OSCILLATOR jack J15 (center pin).	*b.* P1-14.	*a.* 620 ± 31 ohms.
Return.		*a.* OSCILLATOR jack J15 (outer shell) jack J16.	*a.* INPUT MONITOR GND	*a.* Continuity.
		b. OSCILLATOR jack J15 (outer shell).	*b.* P1-19.	*b.* Continuity.
PILOT-ALT		*a.* OSCILLATOR jack J15 (center pin).	OSCILLATOR jack J15 (outer shell).	*Ope*n.
VWS:				
Audio.		*a.* OSCILLATOR jack J15 (center pin)	*a.* VWS jack J12.	*a.* 620 ± 31 ohms.
		b. OSCILLATOR jack J15 (center pin).	*b.* P1-1	*b.* 620 ± 31 ohms.
Return.		*a.* OSCILLATOR jack J15 (outer shell).	*a.* INPUT MONITOR GND jack J16.	*a.* Continuity.
		b. OSCILLATOR jack J15 (outer shell).	*b.* P1-2.	*b.* Continuity.
VWS gnd		*O*SCILLATOR jack J1.5 (center pin).	OSCILLATOR jack J15 (outer shell).	Open.
SP (spare):				
Audio.		*a.* OSCILLATOR jack J15 (center pin).	*a.* SP (spare) jack J13.	*a.* 620 ± 31 ohms.
		b. OSCILLATOR jack J15 (center pin). ohms.	*b.* P1-7.	*b.* 620 ± 31
Return.		*a.* OSCILLATOR jack J15 (outer shell)	*a.* INPUT MONITOR GND jack J16.	*a.* Continuity.
		b. OSCILLATOR jack J15 (outer shell).	*b.* P1-8.	*b.* Continuity.
SP (spare)-GND.		OSCILLATOR jack J15 (center pin).	OSCILLATOR jack J15 (outer shell).	Open.
10. OUTPUT SELECT signals:				
PILOT A.	OUTPUT SELECT switch S2 to PILOT A.	*a.* MONITOR No. 1 jack J18 (center pin).	*a.* P2-24.	*a.* Continuity.
		b. MONITOR No. 1 jack J18 (center pin).	*b.* P2-25.	*b.* 4750 ± 50 ohms (R4).
VWS A.	S2 to VWS A.	*a.* MONITOR No. 1 jack J18 (center pin).	*a.* P2-21.	*a.* Continuity.
		b. MONITOR No. 1 jack J18 (center pin).	*b.* P2-22.	*b.* 4750 ±50 ohms (R5).
SPARE A.	S2 to SPARE A	*a.* MONITOR No. 1 jack J18 (center pin).	*a.* P2-18.	*a.* Continuity.
		b. MONITOR No. 1 jack J18 (center pin)	*b.* P2-19.	*b.* 4750 ±50 ohms (R6).

Test Set Function	Control/Switch Position	From	To	Performance Standard
TIME A.	S2 to TIME A.	*a.* MONITOR No. 1 jack J18 (center pin).	*a.* P2-9.	*a*. Continuity.
		b. MONITOR No. 1 jack J18 (center pin).	*b.* P2-10.	*b*. 1000 ±50 ohms (R7).
PILOT B.	S2 to PILOT B.	*a.* MONITOR No. 1 jack J18 (center pin).	*a.* P2-15.	*a*. Continuity.
		b. MONITOR No. 1 jack J18 (center pin).	*b.* P2-16.	*b*. 4750 ±-50 ohms (R8).
VWS B.	S2 to VWS B.	*a.* MONITOR No. 1 jack J18 (center pin).	*a.* P2-2.	*a*. Continuity.
		b. MONITOR No. 1 jack 318 (center pin).	*b.* P2-3.	*b*. 4750 ±50 ohms (R9).
SPARE B.	S2 to SPARE B	*a.* MONITOR No. 1 jack J18 (center pin).	*a.* P2-5.	*a*. Continuity.
		b. MONITOR No. 1 jack J18 (center pin)	*b.* P2-6.	*b*. 4750 ±-50 ohms (R10).
TIME B	S2 to TIME B.	*a.* MONITOR No. 1 jack J18 (center pin).	*a.* P2-7	*a*. Continuity.
		b. MONITOR No. 1 jack J18 (center pin).	*b.* P2-8.	*b*. 1000 ±50 ohms (R11).
Ground	S2 to OFF.	*a.* MONITOR No. 1 jack J18 (center pin)	*a.* J18 (outer shell).	*a*. Open.
		b. MONITOR No. 1 jack J18 (outer shell).	*b.* J-16.	*b*. Continuity.
Note. The following procedures require the panel to be removed from the case. Diode polarity must be observed.				
11. Switch lamp and LAMP TEST circuits: dicatol-	LAMP TEST switch-in- S7 pressed to ON.			
POWER ON.		*a.* (+lead) LAMP TEST switch-indicator) S7A-C.	*a.* (-lead) POWER ON switch-indicator S3-5.	*a*. Continuity.
		b. (+lead) LAMP TEST switch-indicator S7A-C.	*b.* POWER ON switch-indicator S3 lamp terminal 3.	*b*. Lamp resistance.
TAPE END SIMU LATION NO 2.		*a.* S7A-C.	*a.* S9 lamp terminal 5.	*a.* Continuity.
		b. S7A-C.	*b.* S9 lamp terminal 3. sistance.	*b.* Lamp re-
FAILURE, SIGNAL,		*a.* S7B-C.	*a.* DS1-5.	*a.* Continuity.
		b. S7B-C.	*b.* DS1-3.	*b.* Lamp resistance.
TAPE, END SIMU-LATION NO. 1.		*a.* S7B-C.	*a.* S8-5.	*a.* Continuity.
		b. S7B-C.	*b.* S8-3	*b.* Lamp resistance.
INTERNAL-EX-TERNAL (internal lamp).		*a.* S10-1.	*a.* S7C-C.	*a.* Continuity.
		b. S10-3	*b.* S7C-C.	*b.* Lamp resistance.
INTERNAL,-EX-TERNAL, (external lamp).		*a* S10-5.	*a.* S7C-C.	*a.* Continuity.
		b S10-3.	*B.* S7C-C.	*b.* lamp resistance.

Test Set Function	Control/Switch Position	From	To	Performance Standard
BIAS INHIBIT		*a.* S7D-C.	*a.* S5-5.	*a.* Continuity.
		b. S7D-C.	*b.* S5-3.	*b.* Lamp resistance.
VWS COMMAND INHIBIT.		*a.* S7D-C.	*a.* S4-5.	*a.* Continuity.
		b. S7D-C.	*b.* S4-3.	*b.* Lamp resistance.
Note. All lamp resistance callouts in the above are two lamps in parallel.				
12. LAMP TEST.	CKT BRKR and POWER ON switch-indicator S3 to ON.	*a.* CKT BRKR contact "A".	*a.* S7A-C.	*a.* Continuity.
		b. CKT BRKR contact "A".	*b.* S7B-C.	*b.* Continuity.
		c. CKT BRKR contact "A"	*c.* S7D-C.	*c* Continuity.
		d. Chassis ground.	*d.* S7C-C.	*d.* Continuity.
	LAMP TEST switch-indicator S7 to ON.	*a.* S7A-C.	*a.* S7A-NO.	*a.* Continuity.
		b. S7B-C.	*b.* S7B-NO.	*b.* Continuity.
		c. S7C-C.	c. S7C-NO.	c. Continuity.

3-7. Troubleshooting Chart Data

a. General. Troubleshooting data arranged by test set functional areas to be used in conjunction with the continuity and resistance data of para-graph 3-6. Refer to the schematic diagram (fig. 5-1) and the wiring diagram, figure 5-2, for location of test points and wiring data in the test set circuits.

b. Troubleshooting Chart

Item	Symptom	Probable Trouble	Corrective Action
1.	Switch-Indicators:		
	Indicator does not light when LAMP TEST switch-indicator is pressed.	*a.* 1N3612 Diode in an applicable switch circuit is open	*a.* Check diodes in LAMP TEST circuit. Remove and replace terminal board TB1.
		b. Wiring trouble in switch circuit (1) Not Grounded. (2) No +28V. (3) Short Circuit in +28V	*b* Check wiring in indicator circuits to +28V, ground, or to connector P4. Resolder wires as necessary.
		c. Both lamps burned out.	*c.* Replace lamps in switch assembly. Inspect circuit before retest.
	Indicator does not light when switch is pressed.	*a* Broken or worn contacts or switch mechanism.	*a.* Replace internal switch assembly.
		b. Switch circuit not complete to lamps. (1) No +28V. (2) No Gnd.	*b.* Check wiring continuity and ground contact.
	Switch does not actuate desired test function.	*a.* Broken or worn contacts or switch mechanism.	*a.* Check continuity of test set circuit. Replace switch.
		b. No power to switch.	*b* Replace wiring or resolder connections.
		c Short in wiring	*c.* Check for continuity and replace wiring.
	FAILURE SIGNAL indicator does not light when TAPE END SIMULATION switch-indicator NO. 1 is pressed (Assuming valid signals from CIPR to P1-17.)	*a* Diode CR1 is open.	*a.* Verify with test equipment and replace terminal board TB1.
		b Wiring or connectors broken.	*b.* Replace wire or soldered connection.
		c. Wiring shorted.	*c.* Check continuity and replace wiring.

Item	*Symptom*	*Probable Trouble*	*Corrective Action*
2.	Power circuits:		
	POWER ON indicator lamp does not light when switch is pressed	*a.* Circuit not complete from facility power supply to test set	*a.* Check cable connections at power supply. Use multimeter to check for power indication at +28V and ground jacks.
		b. Circuit breaker CB1 not actuated.	*b.* Press circuit breaker actuator to reset.
		c. Circuit breaker broken	*c.* Replace circuit breaker.
		d. Power ON switch-indicator S3 not making contact to power circuit or lamp circuit.	*d.* Replace switch.
	Circuit breaker (CKT BRKR) will not stay in pushed position	+28V shorted to ground in test set circuits	Press POWER ON switch-indicator S3 to OFF. Reset circuit breaker. Inspect test set components for shorting evidence. Check +28V circuit for continuity.
	No operating power (+28 Vdc) to CIPR test specimen.	a. Faulty POWER ON switch-indi cator S3.	a. Replace switch.
		b. Poor connections to POWER ON reswitch-indicator S3 or broken wires in circuit.	b. Check continuity. Resolder or wire as necessary.
		c. Power cable or connector damage.	c. Repair or replace cable.
3.	Record command circuits:		
	No command signal to CIPR motor drive circuits.	a. No +28V signal to RECORD b. COMMAND switch S1. and rewire.	a Check +28V to switch, replace
		b. Broken or loose switch or connec tor contacts.	b Perform continuity check (para 3-6) with switch in appropriate position.
			c. Replace switch or wires as necessary.
	Intermittent CIPR motor drive command signal to any of the 3 switch command positions.	*a.* Loose or poor switch contact.	*a.* Check S1 switch contacts for con tinuity.
		b. Poor connector contacts	*b.* Tighten P1 to CIPR unit.
		c. No +28V to switch	*c* Replace switch.
4	OUTPUT SELECT		
	No signal output from CIPR P2 to MONITOR Connectors NO. 1 or NO. 2 (J18 & J17) at any switch setting.	*a.* OUTPUT SELECT switch S2 wires to connector or ground broken.	*a.* Check continuity between S2 and connector.
		b. Poor solder joint at switch or con nectors (P4 to J1), (J2 to P3), or P2.	*b* Check solder joint.
		c. Broken switch mechanism	*c.* Replace switch.
	No Signal output from CIPR only one particular audio or channel setting of S2. (A or B channels).	*a.* S2 defective at indicated setting	*a.* Check continuity at the switch at (S2) position.
		b. Indicated CIPR output circuit wiring or connections are defective.	*b.* Replace switch or resolder wires.
		c. Indicated circuit is defective on terminal board.	*c.* Replace terminal board.
		d. Defective wire in test cable or at connector (P2).	*d.* Repair wire or connector contact.
	Improper signal from one out put channel from CIPR. (Other selected channels have normal signals).	*a.* Defective resistor on terminal board TB1.	*a.* Check resistance of Signal-To Return circuits.
		b. Improper signal return circuit.	*b.* Check continuity of circuit and connectors.
		c. Improper Shielding	*c.* Check Shielding.
		d. Malfunction in input	*d.* Replace terminal board TB1.

Item	*Symptom*	*Probable Trouble*	*Corrective Action*
5.	Signal input circuits:		
	No signal from OSCILLATOR connector (J15) to CIPR (all input circuits).	*a.* J15 OSCILLATOR connector damaged or poor solder joints.	*a.* Continuity check.
		b. Broken or shorted wires at J15	*b* Resolder wires.
		c. No ground (outer shell of J15) d.	*c.* Replace and resolder wire. Replace J15 connector.
	No signal from OSCILLATOR connector J15 to any of the Following audio input cir cuits: CIPR PILOT-ALT VWS, or SPARE.	*a.* Poor circuit connection at P4 or P1 connectors.	*a.* Continuity check.
		b. Poor solder joints.	*b.* Resolder connector lead.
		c. Broken wire	*c.* Replace wire.
		d. Resistor R1, R2, or R3	*d.* Check resistance. Remove defective board and return to GS level for repair.
	No input signal at individual INPUT MONITOR jacks. (J1-J16), (J12-J16), (J13-J16). J15.	*a.* INPUT OSCILLATOR connector J15 broken or damaged.	*a.* Continuity check.
		b. Shorted wire at J11, J12, J13, or	*b.* Replace wire or resolder connector.
			c. Replace connector or jack.
	No input signal to PILOT-MIC connector J14 to CIPR	*a.* Broken or shorted connector J14	*a* Continuity check.
		b. Broken wire or poor connection to P1.	*b* Repair or replace connector.
			c. Resolder lead(s).

Section III. ADJUSTMENT, ALIGNMENT, REMOVAL, REPAIRS AND REPLACEMENT

3-8. General

To replace parts on the CIPR test set, it is necessary to remove the panel from the case. Loosen the 12 screws securing the panel and remove the panel from case. Accomplish additional disassembly for parts replacement as instructed in the following paragraphs. Lead wires attached to components of the panel assembly are either soldered or attached by screws and lockwashers. Use a proper size soldering iron to disconnect soldered wires. Tag wire leads to insure the equipment is wired correctly during reassembly.

3-9. Adjustment

The test set requires no electrical adjustment or alignment. Refer to TM 11-6625-1818-12 for necessary mechanical alignment and adjustments to be performed by the test set operator.

3-10. Removal and Replacement

a. Switch-Indicators. The switch-indicators and the illuminated indicator on the test set are replaced as assemblies as follows. Refer to figure 3-1.

(1) Removal.

(a) Unsolder leads from switch terminals.

(b) Pull the indicator light assembly out of the switch housing.

(c) Release the sleeve assembly which holds the switch on the panel by inserting a small slot screwdriver through the front of the housing and turning each (2) of the small jack-screws in the counter-clockwise direction.

(d) Push the holding lugs back into the switch housing recess with a small screwdriver or an orangestick.

(e) Pull the switch housing through the panel front.

(2) Replacement

(a) Replace the new switch housing through the panel cutout with the switch label UP.

(b) Slide the sleeve over the housing with the gap in the sleeve exposing the switch label.

(c) Rotate the holding lugs to the outward position for engagement with the sleeve.

(d) Tighten each of the jack-screws in a clockwise direction until the pressure on the sleeve firmly secures the switch housing on the panel. Torque each jack-screw to at least 2 but not more than 3 inch-pounds.

(e) Resolder tagged wires to proper switch terminals.

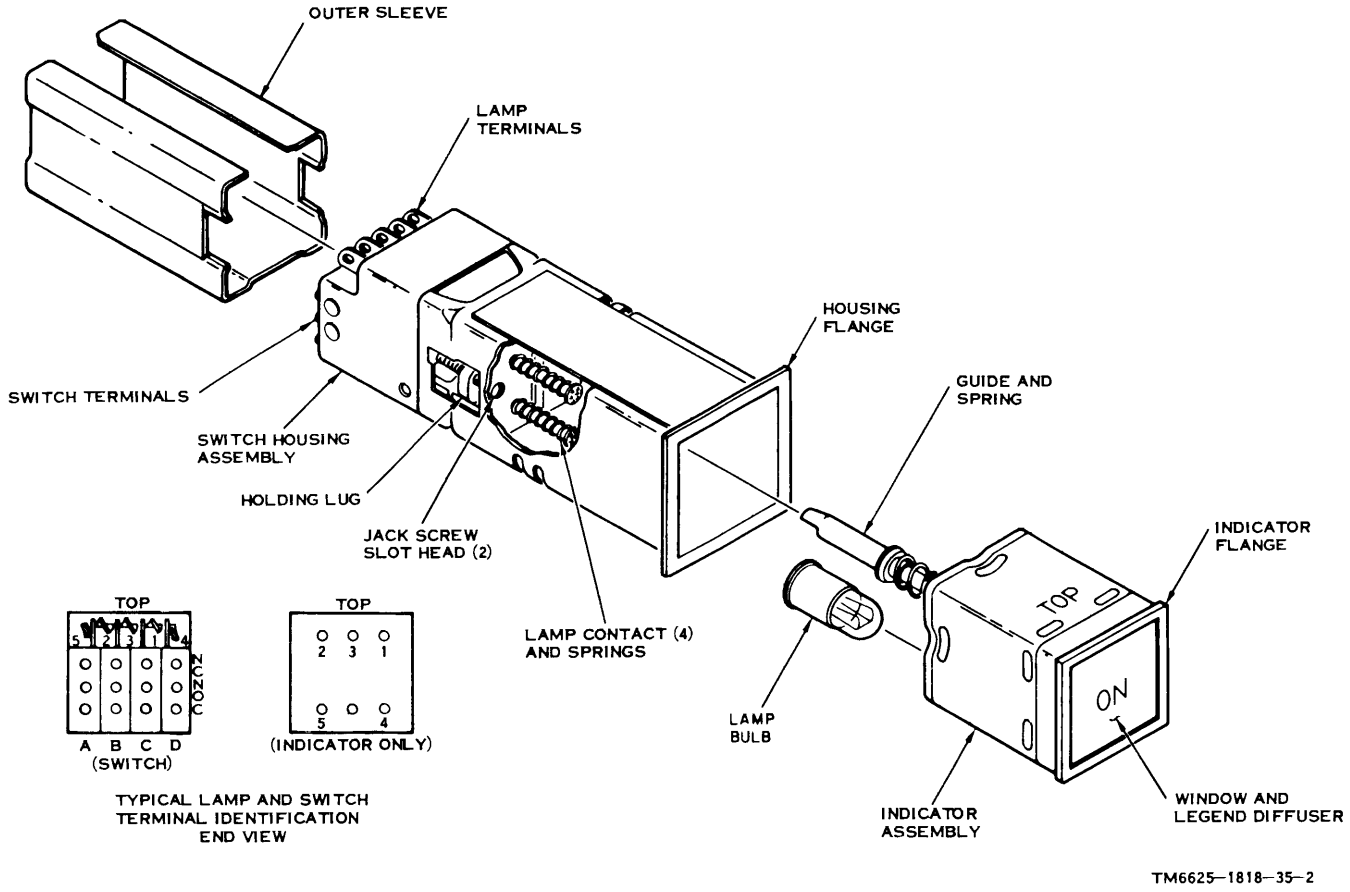

Figure 3-1. Switch-indicator assembly.

NOTE

The spare switch indicator is supplied without a legend. If the original indicator assembly is not to be used with the new housing, the following procedures outline the change of indicator legend to the new indicator assembly.

(f) Remove the plastic indicator window by inserting a small knife blade (TL-29) into the top of the window and gently prying outward. The diffuser (legend is marked on diffuser) will fall out of the opening.

(g) Replace the marked diffuser into the frame and secure in place with the plastic window.

(h) Place the light indicator assembly into the switch housing. Check switch action (on switch-indicators) to insure proper installation.

b. Electronic Component Assembly Terminal Board TB1. The terminal board is removed and replaced on the underside of the panel as follows (fig. 3-2):

(1) Disconnect plugs P4 and P3 from board connectors. Keep attachment hardware with plugs for use in reassembly.

(2) Remove the six screws and hex nuts securing the board to the three mounting brackets. Remove board from panel assembly.

(3) Secure replacement terminal board to mounting brackets at six places. Insure that the ground lug from board terminal 69 is securely attached and grounded to the board mounting bracket.

(4) Replace plugs P3 and P4 and secure with correct hardware.

(5) Inspect the board and installation.

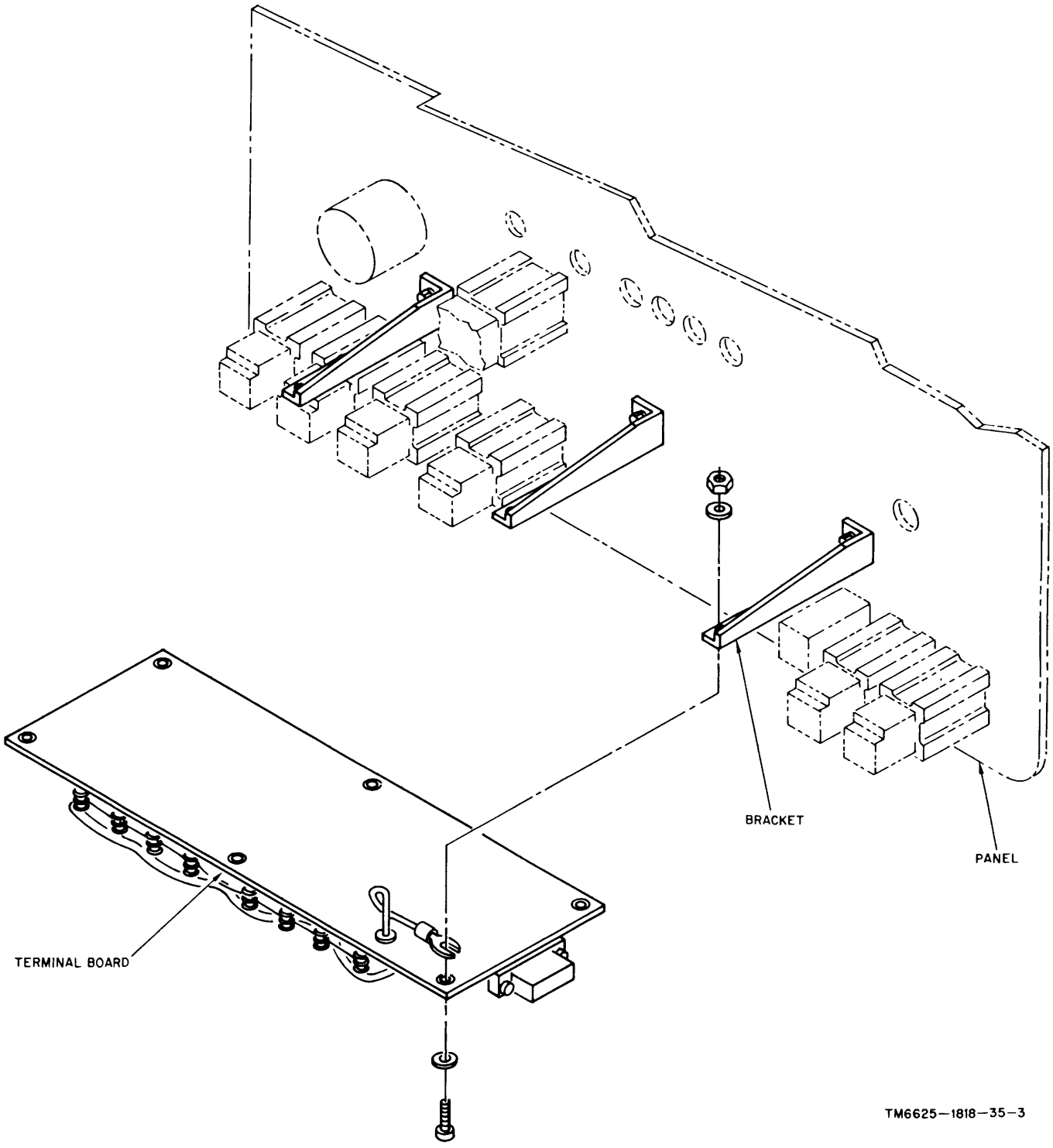

Figure 3.-2. Electronic component assembly removal.

c. Circuit Breaker.

(1) Disconnect lead wires from circuit breaker at terminals.

(2) Remove nut and lockwasher securing unit from panel front.

(3) Remove circuit breaker from back of panel.

(4) new unit in reverse order of removal and inspect installation.

d. Test Connectors and Jacks.

(1) Disconnect or unsolder lead wires from units from back of panel.

(2) Remove sealant from nut securing unit to panel back, then remove nut.

(3) Remove jack or connector from panel front.

(4) Replace unit on panel in reverse order of disassembly. Do not apply sealant on surfaces to be soldered.

e. Rotary Selector Switches.

(1) Disconnect and tag lead wires from switch terminals.

(2) Loosen set screws on knob and remove knob from shaft.

(3) Remove nut and lockwasher on front of panel. Remove switch from back of panel.

(4) Reinstall new switch in reverse order of steps above. Align knob pointer to proper position line on panel.

f. Electrical Cables.

(1) Disconnect or unsolder lead wires secured to components of panel assembly.

(2) Unfasten tubes and clamps securing cable or lead wires to panel.

(3) Withdraw cable from front of panel.

(4) Install new cable in reverse order of steps above.

Section IV. TESTING PROCEDURES

3-11. General

This section contains instructions for testing the CIPR test set at the direct support maintenance level. Testing is performed to insure the proper operation of the equipment prior to issue and to isolate defects when repair is required. The testing consists of inspection, voltages, and continuity-resistance tests of functional sections. For operational checks, the CIPR test set may be tested using a Sound Recorder Set, AN/ASH-23 (CIPR) together with the specified general purpose test equipment to provide signals which normally go through the test set during test operations. For information pertaining to the CIPR system associated test equipment, refer to TM 11-5835-239-35, Sound Recorder Set, AN/ASH-23.

3-12. Physical Test and Inspection

Test Equipment	*Equipment Test*	*Test Procedure*	*Performance Standard*
None	None	a. Visually inspect equipment for damage and security of assembly.	Equipment undamaged and securely assembled.
		b. Inspect Cables and connectors for damage.	Connectors and cables undamaged.
		c. Inspect case and condition of finish and identification. data.	Case undamaged, for damage finish unmarred and identification legible.

3-13. Operational Tests

The operational tests consist of the operations and procedures outlined in paragraph 3-5 and the test procedures in *b* and *c* below. Satisfactory completion of these procedures will provide assurance that the test set is in an operational condition. Continuity-resistance tests (para 3-7) of specific test set functional areas may be used in conjunction with the operational tests to verify completion of repairs or to checkout circuits suspected of malfunctions.

a. Test Equipment and Materials. A multimeter, TS-352/U, a D.C. Power Supply (21 to 30 Vdc), and the Tool Kit, TK-100/G, are required for operational tests.

b. Test Connections and Conditions. Insure that procedures outlined in para 3-5 have been accomplished and that the controls and switches are in the position indicated by the test procedures. Adjust the input voltage to +28 ±1 Vdc using the multimeter.

c. -Procedure-Continuity-Resistance-Output Voltage.

Step No.	*Control Settings* *Test Equipment*	*Test Set*	*Test Procedure*	*Standard Performance*
1.	Multimeter: 50 volt dc range	POWER ON switch-indicator to ON and RECORD COMMAND switch set to:	Measure voltage at connector P1 pins:	
		a. PILOT	*a.* 13 and 6	*a.* +28±2vdc.
		b. VWS	*b.* 4 and 6	*b.* +28±2 vdc.
		c. SPARE	*c.* 22 and 6	*c.* 28 ± 2 vdc.
2.	Multimeter: 50 volt dc range	POWER ON switch-indicator to ON and VWS COMMAND INHIBIT switch indicator held ON.	Measure voltage between pins 5 and 6 at connector P1.	+28 ± 2 vdc.
3.	Multimeter: 50 volt dc range	POWER ON switch-indicator to ON and BIAS INHIBIT switch-indicator held ON	Measure voltage between pins 18 and 6 at connector P1.	+28 ± 2 vdc.
4.	Multimeter FUNCTION switch to OHMS	POWER ON switch-indicator to OFF.	Measure between:	
			a. P1 pin 23 to PHASE 1A jack.	*a.* Continuity.
			b. P1 pin 24 to PHASE 1B jack.	*b.* Continuity.
			c. P1 pin 28 to PHASE 2A jack.	*c.* Continuity.
			d. P1 pin 29 to PHASE 2B jack.	*d.* Continuity.
			e. P1 pin 25 to +20V jack.	*e.* Continuity.
			f. P1 pin 26 to +10V jack.	*f.* Continuity.
			g. P1 pin 21 to +5V jack.	*g.* Continuity.
			h. P1 pin 31 to PULSE jack.	*h.* Continuity.
I			*i.* P1 pin 20 to chassis (panel).	*i.* Continuity.
			j. P1 pin 12 to chassis (panel).	*j.* Continuity.
			k. P1 pin 15 to chassis (panel).	*k.* Continuity.
I			*l.* P1 pin 11 to chassis (panel).	*l.* Continuity.
			m. P1 pin 6 to VOLTAGE GND jack.	*m.* Continuity.
			n. P1 pin 6 to PHASE GND jack.	*n.* Continuity.
			o. P1 pin 6 to INPUT MON. GND jack.	*o.* Continuity.
			p. P1 pin 6 to TIMING GND jack.	*p.* Continuity.
5.	Multimeter OHMS R X 10	POWER ON switch-indicator to OFF	Measure between INPUT MONITOR OSCILLATOR connector J15 (center pin only) and:	
			a. INPUT MONITOR PILOT-ALT jack.	*a.* 620±31 ohms.
			b. INPUT MONITOR VWS jack.	*b.* 620±31 ohms.
			c. INPUT MONITOR SP jack.	*c.* 620±31 ohms.
			d. INPUT MONITOR GND jack.	*d.* Open.

Step No.	Control Settings: Test Equipment	Test Set	Test Procedure	Standard Performance
			e. P1 pin 14.	*e.* 620 ±31 ohms.
			f. P1 pin 7.	*f.* 620 ±31 ohms.
			g. P1 pin 1.	*g.* 620 ±31 ohms.
			h P1 pin 19.	*h.* Open.
			i. P1 pin 8.	*i.* Open.
			j. P1 pin 2.	*j.* Open.
6.	Multimeter OHMS RX10.	POWER ON switch-indicator to OFF and OUTPUT SELECT switch to OFF.	Measure between connector P2 pins:	
			a. 24 and 25.	*a.* 4750 ±50 ohms.
			b. 21 and 22.	*b.* 4750 ±50 ohms.
			c. 18 and 19.	*c.* 4750 ±50 ohms.
			d. 15 and 16.	*d.* 4750 ±50 ohms.
			e. 2 and 3.	*e.* 4750 ±50 ohms.
			f. 5 and 6.	*f.* 4750 ±50 ohms.
			g. 9 and 10.	*g.* 1000 ±50 ohms.
			h. 7 and 8.	*h.* 1000 ±50 ohms.
7.	Multimeter FUNCTION switch to OHMS.	POWER ON switch-indicator to OFF and OUTPUT SELECT switch set to:	Measure between OUTPUT MONITOR connector No. 1 center pin and:	
		a. OFF.	*a.* Outer shell.	*a.* Open.
		b. PILOT A.	*b.* P2 pin 24.	*b.* Continuity.
		c. VWS A.	*c.* P2 pin 21.	*c.* Continuity.
		d. SPARE A.	*d.* P2 pin 18.	*d.* Continuity.
		e. TIME A.	*e.* P2 pin 9.	*e.* Continuity.
		f. PILOT B.	*f.* P2 pin 15.	*f.* Continuity.
		g. VWS B.	*g.* P2 pin 2.	*g.* Continuity.
		h. SPARE B.	*h.* P2 pin 5.	*h.* Continuity.
i		*i.* TIME B.	*i.* P2 pin 7.	*i.* Continuity.
			Measure between OUTPUT MONITOR connector No. 1 and No. 2 outer shells.	Continuity.
8.	Multimeter FUNCTION switch to OHMS.	POWER ON switch-indicator to OFF and TAPE END SIMULATION INTERNAL - EXTERNAL switch indicator to INTERNAL.	Measure between:	
		a. Press switch No. 1.	*a.* P2-12 to P2-13.	*a.* Continuity.
		b. Press switch No. 2.	*b.* P2-12 to P2-11.	*b.* Continuity.
		c. P2-12 to DC VOLTAGE GND jack J9.	*c.* Continuity.	
9.	Multimeter FUNCTION switch to OHMS.	POWER ON switch-indicator to OFF and TAPE END SIMULATION INTERNAL-EXTERNAL switch indicator to EXTERNAL.	Measure between:	
		a. Press switch No. 1.	*a.* P1-27 to DC VOLTAGE GND jack J9.	*a.* Continuity.
		b. Press switch No. 2.	*b.* P1-30 to DC VOLTAGE GND jack J9.	*b.* Continuity.

CHAPTER 4

GENERAL SUPPORT AND DEPOT MAINTENANCE

Section I. GENERAL

4-1. Scope

Test set maintenance at these levels consists of those operations performed at direct support and the testing and repair of those items removed from the test set at direct support.

4-2. Tools, Test Equipment and Materials

In addition to standard tools available to aircraft and electronic equipment maintenance personnel, the Tool Kit, TK100/G and a Multimeter, TS-352/U are required for operations described in this chapter.

Section II. GENERAL SUPPORT AND DEPOT TROUBLESHOOTING

4-3. General Instructions

Troubleshooting at these maintenance levels includes all techniques given for direct support and any additional techniques required to isolate to a defective part on those components returned to this level of maintenance for repair. The test set's electronics component assembly terminal board TB1 and cable assemblies are the major items repaired at this level.

4-4. Troubleshooting

a. *Electronics Component Assembly (Terminal Board).* Troubleshooting the terminal board assembly is accomplished by a visual inspection and a point-to-point trouble localization procedure.

(1) *Visual Inspection.* The terminal board (fig. 4-1) in inspected visually for damaged com ponents, wiring or connectors. The maintenance documentation describing the symptoms or apparent trouble found at direct support level is to be used as the basis for initial troubleshooting.

(2) *Troubleshooting.* Troubleshooting consists of continuity or resistance measurements. The trouble localization chart, below, lists the functional circuit, applicable component and the probable locale of the trouble. The symptoms for the cause of malfunctions reported by the direct support level will be verified by these procedures.

b. Cable Assemblies. Troubleshooting the test set's cable assemblies and associated connectors consists of visual inspection and pin-to-pin continuity checks at the connectors and wire ends.

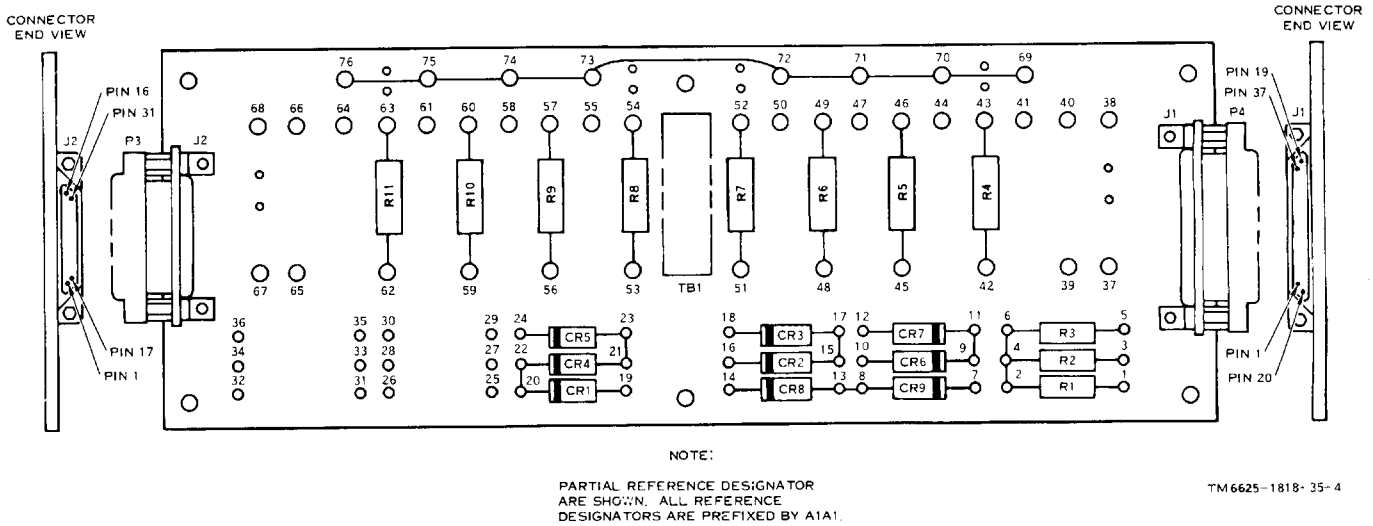

Figure 4-1. Test Set Electronics Component Assembly.

c. Trouble Localization Chart.

Item	*Symptom*	*Probable Trouble*	*Corrective Action*
1.	Terminal board TB1 lamp test circuits:		
	Lamps are good but any one of the switch-indicators or FAILURE SIGNAL indicator fail in LAMP TEST.	*a.* Diode CR2, CR3, CR8 or CR9 open.	*a.* Check diode circuit on the terminal board. Replace defective diode. Observe correct diode direction.
		b. Connector terminal or wire broken, poor solder joints.	*b* Repair or replace connector. Resolder joints and replace wiring.
	INTERNAL - EXTERNAL switch-indicator S10 illuminates in either INTERNAL or EXTERNAL with POWER ON switch-indicator to ON, but not in LAMP TEST.	*a.* Diode CR6 or CR7 open. *b.* Terminal contact or wire broken. Poor solder joint. joints.	*a.* Replace defective diode. *b.* Replace wiring and resolder
	FAILURE SIGNAL indicator does not light in tests using CIPR controller.	*a.* Diode CR1 open. *b.* Poor terminal contacts.	*a.* Replace diode. *b.* Resolder terminals.
2.	Output signal circuits.		
	No audio output signals (from CIPR controller) at individual positions of OUTPUT SELECT switch S2.	*a.* Defective resistor or resistors.	*a.* Check the 4750 ohm resistors R4 through R6 and R8 through R10. Replace if necessary.
		b. Return circuits ,pen or poor solder joints.	*b.* Check continuity, resolder joints and replace wiring.
	Distorted or poor audio signals from controller at selected positions of OUTPUT SELECT switch S2.	Shielding or grounds not present. Poor solder joints or connections.	Replace shields or wires and resolder joints.
	No timing signals.	*a.* Defective resistor R7 or R11. *b.* Poor contacts, improper ground, or defective wiring.	*a.* Replace defective resistor. *b.* Repair contacts and replace wiring.
3.	Input signal circuits.		
	No audio inputs to CIPR controller unit at PILOT-ALT, VWS, or SPARE circuits.	*a.* Defective R1, R2, or R3 resistor.	*a.* Check circuit for resistance and continuity. Replace defective resistor or resistors.
		b. Broken wires or poor solder joints.	*b* Replace wiring and resolder joints.
4.	Cables and connectors.		
	Open circuits, intermittent signals.	*a.* Broken pins or poor solder joints.	*a.* heck continuity. Resolder connections and repair or replace pins.
		b. Damaged contacts, shells.	*b.* Repair or replace contacts. Replace wiring, clamps or wire jackets.

CHAPTER 4.1

DEPOT OVERHAUL STANDARDS

4.1-1. Applicability of Depot Overhaul Standards

]The tests outlined in this chapter are designed to measure the performance capability of a repaired Sound Recorder Test Set TS-2854/ASH-23, referred throughout this chapter as the CIPR test set. A CIPR test set that is returned to stock should meet the standards provided in these tests.

4.1-2. Applicable References

Additional information regarding the CIPR test set is provided in TM 11-6625-1818-12. Since the CIPR test set is used to check out the Sound Recorder Set AN/ASH-23, additional information regarding the use of the CIPR test set is also provided in TM 11-5835-239-35.

4.1-3. Test Facilities Required

The following equipment, or suitable equivalent, should be used when determining compliance with the requirements of the specific standard.

Equipment	*Stock No.*
Sound Recorder Set AN/ASH-23	5835-179-4690
Multimeter TS-352/U	6625-242-5023

Qty req.	*Applicable literature*
1	TM 11-5835-239-35
1	TM 11-6625-366-15

4.1-4. General Test Requirement

Test procedures contained in this chapter consists of input circuit voltage and continuity checks, output circuit resistance and continuity checks, and a general operational test. The required test conditions are specified in the subsequent paragraphs. Test procedures include performance standards necessary to determine the operability of the equipment under test. Detailed procedures using the CIPR test set are provided in TM 11-5835-239-35.

a. Input Control Voltage Check.

(1) Adjust dc power source for +28 ±1 volts.

(2) Connect test set to 28-volt power source.

(3) Energize (push in) the test set POWER CKT BRKR.

(4) Press and release test set POWER ON switch-indicator; POWER ON and onehalf of the TAPE END SIMULATION INTERNAL/EXTERNAL indicators shall light.

(5) Check voltage between test set DC VOLTAGE +28V and GND test jacks; voltmeter shall indicate +28 ±2 volts.

(6) Rotate test set RECORD COMMAND switch to PILOT.

(7) Check voltage between pins 13 (+) and 6 (-) on connector P1; voltmeter shall indicate +28 ±2 volts.

(8) Rotate test set RECORD COMMAND switch to VWS.

(9) Check voltage between pins 4 (+) and 6 (-) on connector P1; voltmeter shall indicate +28 ±2 volts.

(10) Rotate test set RECORD COMMAND switch to SPARE.

(11) Check voltage between pins 22 (+) and 6 (-) on connector P1; voltmeter shall indicate +28 ±2 volts.

(12) Rotate test set RECORD COMMAND switch to OFF.

(13) Press and hold test set VWS COMMAND INHIBIT switch-indicator and check voltage between pins 5 (+) and 6 (-) on connector P1; VWS COMMAND INHIBIT indicator shall light and voltmeter shall indicate +28 ±2 volts.

(14) Release test set VWS COMMAND INHIBIT switch-indicator; VWS COMMAND INHIBIT indicator shall extinguish.

(15) Press and hold test set BIAS INHIBIT switch-indicator and check voltage between pins 18 (+) and 6 (-) on connector P1; BIAS INHIBIT indicator shall light and voltmeter shall indicate +28 ±2 volts.

(16) Release test set BIAS INHIBIT switch-indicator: BIAS INHIBIT indicator shall extinguish.

(17) Press and release test set POWER ON switch-indicator; POWER ON and the lighted half of the TAPE END SIMULATION INTERNAL/EXTERNAL indicator shall extinguish.

(18) Deenergize (pull out) test setPOWER CKT BRKR.

(19) Disconnect test setfrom28-voltpower source.

b. Circuit Continuity Check.

(1) Insure that power is not connected to the test set.

(2) Check resistance between pin 23 on connector P1 and test set PHASE 1A test jack; multimeter shall indicate continuity.

(3) Check resistance between pin 24 on connector P1 and test set PHASE 1B test jack; multimeter shall indicate continuity.

(4) Check resistance between pin 28 on connector P1 and test set PHASE 2A test jack; multimeter shall indicate continuity.

(5) Check resistance between pin 29 on connector P1 and test set PHASE 2B test jack; multimeter shall indicate continuity.

(6) Check resistance between pin 3 on connector P1 and test set DC VOLTAGE +28V test jack; multimeter shall indicate continuity.

(7) Check resistance between pin 25 on connector P1 and test set DC VOLTAGE +20V test jack; multimeter shall indicate continuity.

(8) Check resistance between pin 26 on connector P1 and test set DC VOLTAGE +10V test jack; multimeter shall indicate continuity.

(9) Check resistance between pin 21 on connector P1 and test set DC VOLTAGE +5V test jack; multimeter shall indicate continuity.

(10) Check resistance between pin 31 on connector P1 and test set TIMING PULSE test jack; multimeter shall indicate continuity.

(11) Check resistance between pin 20 on connector P1 and test set front panel (chassis); multimeter shall indicate continuity.

(12) Check resistance between pin 12 on connector P1 and test set frontpanel (chassis); multimeter shall indicate continuity.

(13) Check resistance between pin 15 on connector P1 and test set front panel (chassis); multimeter shall indicate continuity.

(14) Check resistance between pin 11 on connector P1 and test set front panel (chassis); multimeter shall indicate open.

(15) Check resistance between pin 6 on connector P1 and test set DC VOLTAGE GND test jack; multimeter shall indicate continuity.

(16) Check resistance between pin 6 on connector P1 and test set MOTOR PHASE GND test jack; multimeter shall indicate continuity.

(17) Check resistance between pin 6 on connector P1 and test set INPUT MONITOR GND test jack; multimeter shall indicate continuity.

(18) Check resistance between pin 6 on connector P1 and test set TIMING GND test jack; multimeter shall indicate continuity.

c. Record Control Circuit.

(1) Insure that power is not connected to the test set.

(2) Check resistance between test set INPUT MONITOR OSCILLATOR connector center pin and INPUT MONITOR PILOT/ ALTN test jack; multimeter shall indicate 620 $\pm$31 ohms.

(3) Check resistance between test set INPUT MONITOR OSCILLATOR connector center pin and INPUT MONITOR VWS test jack; multimeter shall indicate 620 $\pm$31 ohms.

(4) Check resistance between test set INPUT MONITOR OSCILLATOR connector center pin and INPUT MONITOR SPARE test jack; multimeter shall indicate 620 $\pm$31 ohms.

(5) Check resistance between test set INPUT MONITOR OSCILLATOR connector center pin and INPUT MONITOR GND test jack; multimeter shall indicate open.

(6) Check resistance between test set INPUT MONITOR OSCILLATOR connector center pin and pin 14 on connector P1; multimeter shall indicate 620 $\pm$31 ohms.

(7) Check resistance between test set

INPUT MONITOR OSCILLATOR connector center pin and pin 7 on connector P1; Multimeter shall indicate 620 ±31 ohms.

(8) Check resistance between test set INPUT MONITOR OSCILLATOR connector center pin and pin 1 on connector P1; multimeter shall indicate 620 ±31 ohms.

(9) Check, resistance between test set INPUT MONITOR OSCILLATOR connector center pin and pin 19 on connector P1; multimeter shall indicate open.

(10) Check resistance between test set INPUT MONITOR OSCILLATOR connector center pin and pin 8 on connector P1; multimeter shall indicate open.

(11) Check resistance between test set INPUT MONITOR OSCILLATOR connector center pin and pin 2 on connector P1; multimeter shall indicate open.

d. Output Monitor Circuit.

(1) Insure that power is not connected to the test set.

(2) Insure that test set OUTPUT SELECT switch is set to the OFF position.

(3) Check resistance between pins 24 and 25 on connector P2; multimeter shall indicate 4750 ±50 ohms.

(4) Check resistance between pins 21 and 22 on connector P2; multimeter shall indicate 4750 ±50 ohms.

(5) Check resistance between pins 18 and 19 on connector P2; multimeter shall indicate 4750 ±50 ohms.

(6) Check resistance between pins 15 and 16 on connector P2; multimeter shall indicate 4750 +50 ohms.

(7) Check resistance between pins 2 and 3 on connector P2; multimeter shall indicate 4750 ±50 ohms.

(8) Check resistance between pins 5 and 6 on connector P2; multimeter shall indicate 4750 ±50 ohms.

(9) Check resistance between pins 9 and 10 on connector P2; multimeter shall indicate 1000 ±50 ohms.

(10) Check resistance between pins 7 and 8 on connector P2; multimeter shall indicate 1000 ±50 ohms.

(11) Check resistance between test set OUTPUT SELECT MONITOR 1 connector center pin and its outer shell; multimeter shall indicate open.

(12) Rotate test set OUTPUT SELECT switch to PILOT A.

(13) Check resistance between test set OUTPUT SELECT MONITOR 1 connector center pin and pin 24 on connector P2; multimeter shall indicate continuity.

(14) Rotate test set OUTPUT SELECT switch to VWS A.

(15) Check resistance between test set OUTPUT SELECT MONITOR 1 connector center pin and pin 21 on connector P2; multimeter shall indicate continuity.

(16) Rotate test set OUTPUT SELECT switch to SPARE A.

(17) Check resistance between test set OUTPUT SELECT MONITOR 1 connector center pin and pin 18 on connector P2; multimeter shall indicate continuity.

(18) Rotate test set OUTPUT SELECT switch to TIME A.

(19) Check resistance between test set OUTPUT SELECT MONITOR 1 connector center pin and pin 9 on connector P2; multimeter shall indicate continuity.

(20) Rotate test set OUTPUT SELECT switch to PILOT B.

(21) Check resistance between test set OUTPUT SELECT MONITOR 1 connector center pin and pin 15 on connector P2; multimeter shall indicate continuity.

(22) Rotate test set OUTPUT SELECT switch to VWS B.

(23) Check resistance between test set OUTPUT SELECT MONITOR 1 connector center pin and pin 2 on connector P2; multimeter shall indicate continuity.

(24) Rotate test set OUTPUT SELECT switch to SPARE B.

(25) Check resistance between test set OUTPUT SELECT MONITOR 1 connector center pin and pin 5 on connector P2; multimeter shall indicate continuity.

(26) Rotate test set OUTPUT SELECT switch to TIME B.

(27) Check resistance between test set OUTPUT SELECT MONITOR 1 connector center pin and pin 7 on connector P2; multimeter shall indicate continuity.

(28) Check resistance between test set OUTPUT SELECT MONITOR 1 and OUTPUT SELECT MONITOR 2 connector outer shells; multimeter shall indicate continuity.

(29) Set test set TAPE END SIMULATION INTERNAL/EXTERNAL switch-indicator for INTERNAL.

(30) Press and hold test set TAPE END SIMULATION NO. 1 switch-indicator and check resistance between pins 12 and 13 on connector P2; multimeter shall indicate continuity. If continuity cannot be observed, press and release test set TAPE END SIMULATION INTERNAL/EXTERNAL switch-indicator. Multimeter shall indicate continuity. Release TAPE END SIMULATION NO.1 switch-indicator.

(31) Press and hold test set TAPE END SIMULATION NO. 2 switch-indicator and check resistance between pins 11 and 12 on connector P2; multimeter shall indicate continuity. Release TAPE END SIMULATION NO. 2 switch-indicator.

(32) Press and hold test set TAPE END SIMULATION NO. 2 switch-indicator and check resistance between pin 12 on connector P2 and test set DC VOLTAGE GND test jack; multimeter shall indicate continuity. Release TAPE END SIMULATION NO. 2 switch indicator.

(33) Press and release test setTAPE END SIMULATION INTERNAL/EXTERNAL switch-indicator to set the TAPE END SIMULATION INTERNAL/EXTERNAL switch-indicator for EXTERNAL.

(34) Press and hold test set TAPE END SIMULATION NO. 1 switch-indicator and check resistance between pin 27 on connector P1 and test set DC VOLTAGE GND test jack; multimeter shall indicate continuity. Release TAPE END SIMULATION NO. 1 switch indicator.

(35) Press and hold test set TAPE END SIMULATION NO. 2 switch-indicator and check resistance between pin 30 on connector P1 and test set DC VOLTAGE GND test jack; multimeter shall indicate continuity. Release TAPE END SIMULATION NO. 2 switch indicator.

e. Operational Test. The following procedure can be used to determine if all indicators can be illuminated and the CIPR magazine drive control circuit can be operated properly. Detailed procedures using the CIPR test set are provided in TM 11-5835-239-35.

(1) Insure that test set POWER CKT BRKR is deenergized (pulled out).

(2) Adjust dc power source for +28 $\pm$1 volts.

(3) Connect test set to the 28-volt power source.

(4) Energize (push in) test set POWER CKT BRKR.

(5) Press and release test set POWER ON switch-indicator; POWER ON and onehalf of the test set TAPE END SIMULATION INTERNAL/EXTERNAL switch-indicator shall light.

(6) Check voltage between test set DC VOLTAGE +28V and GND test jacks; voltmeter shall indicate +28 $\pm$2 volts.

(7) Press and hold test set LAMP TEST switch-indicator; all remaining front panel indicators shall illuminate.

(8) Release test set LAMP TEST switchindicator; POWER ON and one-half of the TAPE END SIMULATION INTERNAL/EXTERNAL indicators shall remain on and the remainder of the front panel indicators shall extinguish.

(9) Press and release test set POWER ON switch-indicator; POWER ON and TAPE END SIMULATION INTERNAL/EXTERNAL indicators shall extinguish.

(10) Connect Recorder Control C8203/ ASH-23 to the CIPR test set.

(11) Press and release test set POWER ON switch-indicator; POWER ON and onehalf of the TAPE END SIMULATION INTERNAL/EXTERNAL indicators shall light.

(12) With the test set RECORD COMMAND switch set at OFF, observe that the pulse driven CIPR magazine drive gear (magazine end of the recorder control) is being pulsed approximately 1/3 revolution each minute. Note direction of rotation.

(13) Rotate test set RECORD COMMAND switch to PILOT; CIPR magazine drive gear shall rotate continuously at approximately 193 rpm in the direction observed in step (12) above.

(14) Rotate test set RECORD COMMAND

switch to VWS; CIPR magazine drive gear shall rotate in the same manner observed in step (13) above.

(15) Press and hold test set VWS COMMAND INHIBIT switch-indicator; VWS COMMAND INHIBIT indicator shall light and CIPR magazine drive gear shall stop.

(16) Release test set VWS COMMAND INHIBIT switch-indicator; VWS COMMAND INHIBIT indicator shall extinguish and CIPR magazine drive gear shall rotate in the same manner observed in step (13) above.

(17) Rotate test set RECORD COMMAND switch to SPARE; CIPR magazine drive gear shall rotate in the same manner observed in step (13) above.

(18) Rotate test set RECORD COMMAND switch to OFF; CIPR magazine drive gear shall stop.

(19) Observe test set TAPE END SIMULATION INTERNAL/EXTERNAL indicator.

If the EXTERNAL segment is illuminated proceed to step (20) below. If the EXTERNAL segment is not illuminated, press and release the TAPE END SIMULATION INTERNAL/EXTERNAL switch-indicator until EXTERNAL segment illuminates and then proceed to step (20) below.

(20) Rotate test set RECORD COMMAND switch to PILOT, VWS, or SPARE; CIPR magazine drive gear shall rotate continuously at approximately 193 rpm. The CIPR magazine drive gear can rotate in either clockwise or counterclockwise direction.

(21) Press and hold test set TAPE END SIMULATION NO. 1 switch-indicator; TAPE END SIMULATION NO. 1 indicator shall light and the CIPR magazine drive gear shall rotate continuously in the counterclockwise (CCW) direction at approximately 193 rpm.

(22) Release test set TAPE END SIMULATION NO. 1 switch-indicator; TAPE END SIMULATION NO. 1 indicator shall extinguish, but the CIPR magazine drive gear shall continue to rotate in the counterclockwise direction.

(23) Press and hold test set TAPE END SIMULATION NO. 2 switch-indicator; TAPE END SIMULATION NO. 2 indicator shall light and the CIPR magazine drive gear shall rotate continuously in the clockwise (CW) direction at approximately 193 rpm.

(24) Release test set TAPE END SIMULATION NO. 2 switch-indicator; TAPE END SIMULATION NO. 2 indicator shall extinguish, but the CIPR magazine drive gear shall continue to rotate in the clockwise direction.

(25) Rotate test set RECORD COMMAND switch to OFF; CIPR magazine drive gear shall stop.

(26) Press and release test set POWER ON switch-indicator; POWER ON and TAPE END SIMULATION EXTERNAL indicator shall extinguish.

(27) Deenergize (pull out) test set CKT BRKR.

(28) Disconnect test setfrom28-voltpower source.

CHAPTER 5

FOLDOUT ILLUSTRATIONS

This chapter contains all foldout illustrations.

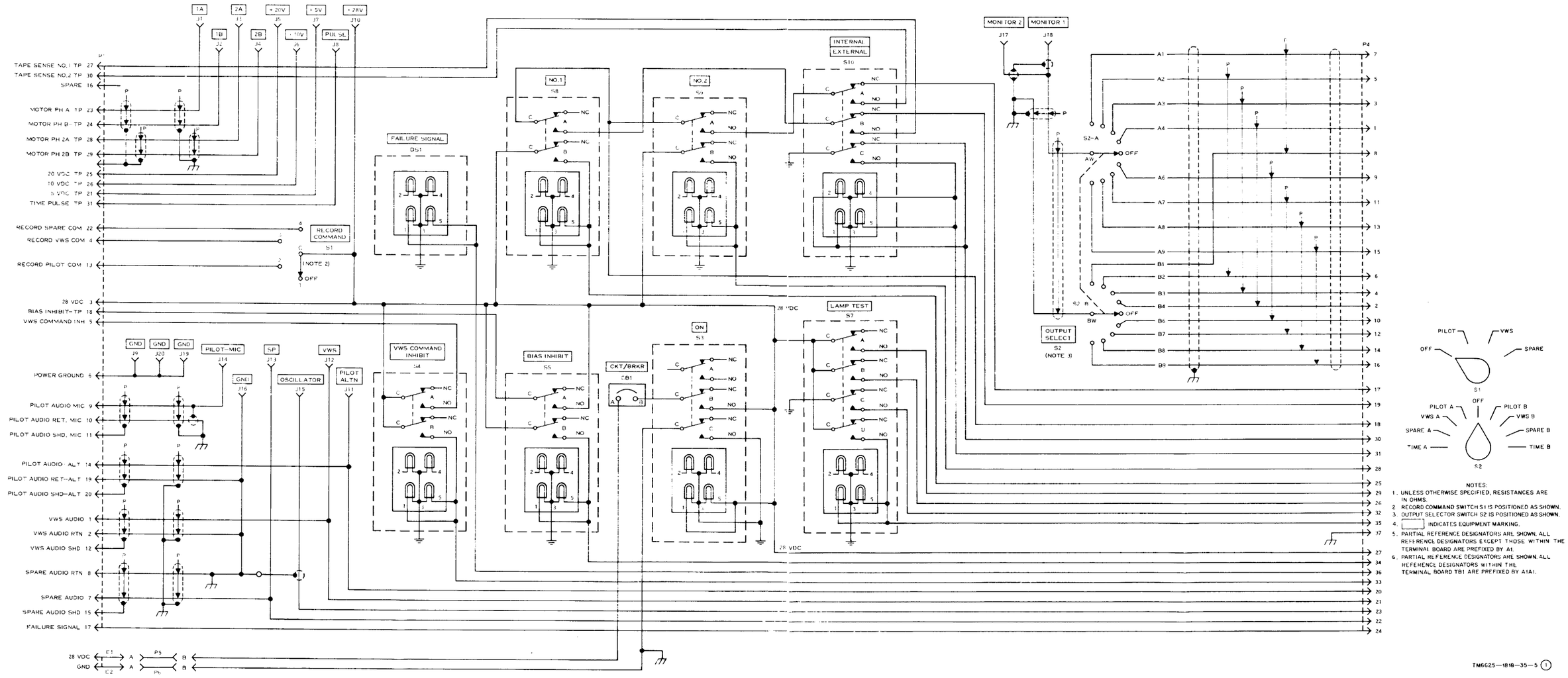

Figure 5-1. CIPR test set schematic diagram (part 1 of 2)

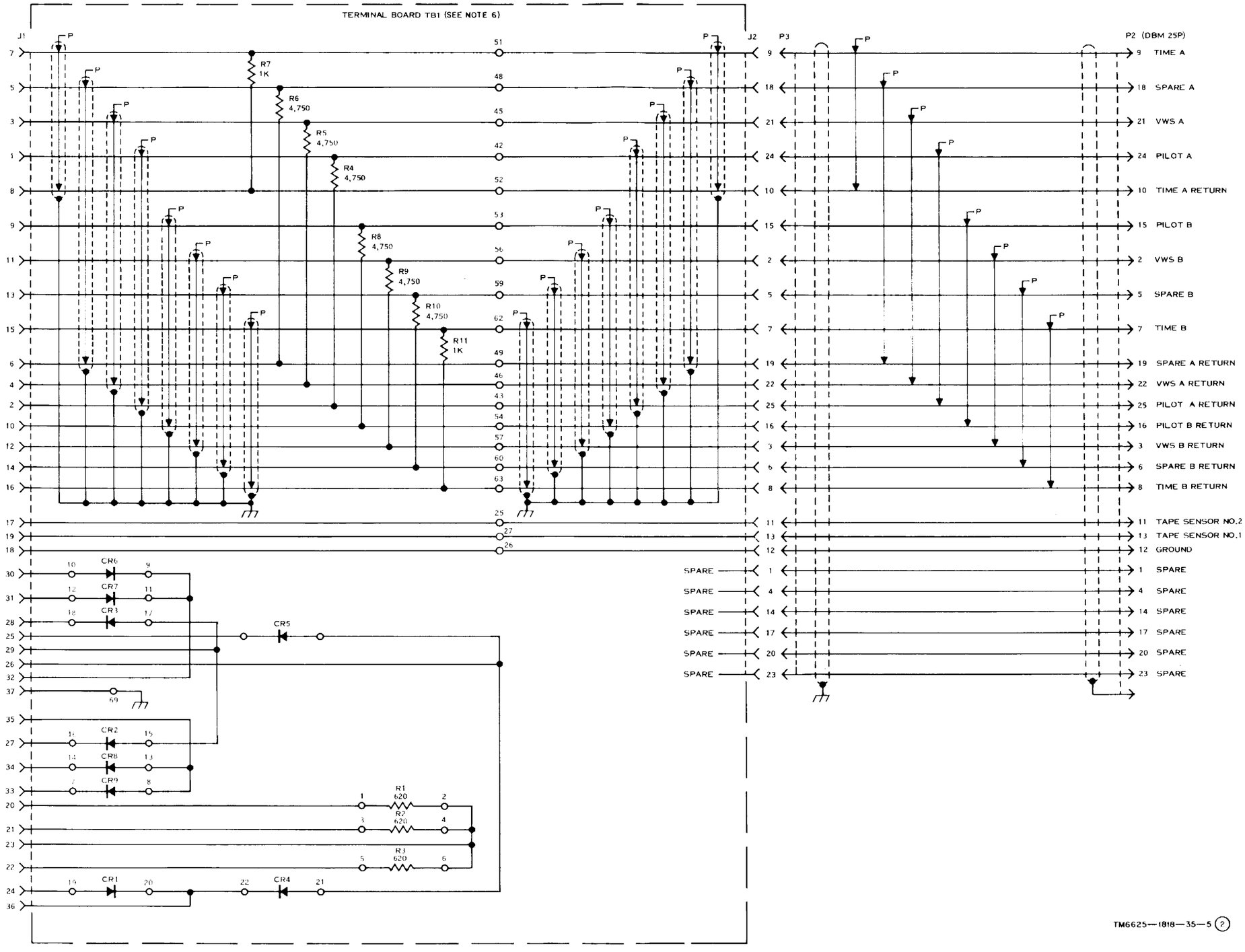

Figure 5-1. CIPR test set schematic diagram (part 2 of 2)

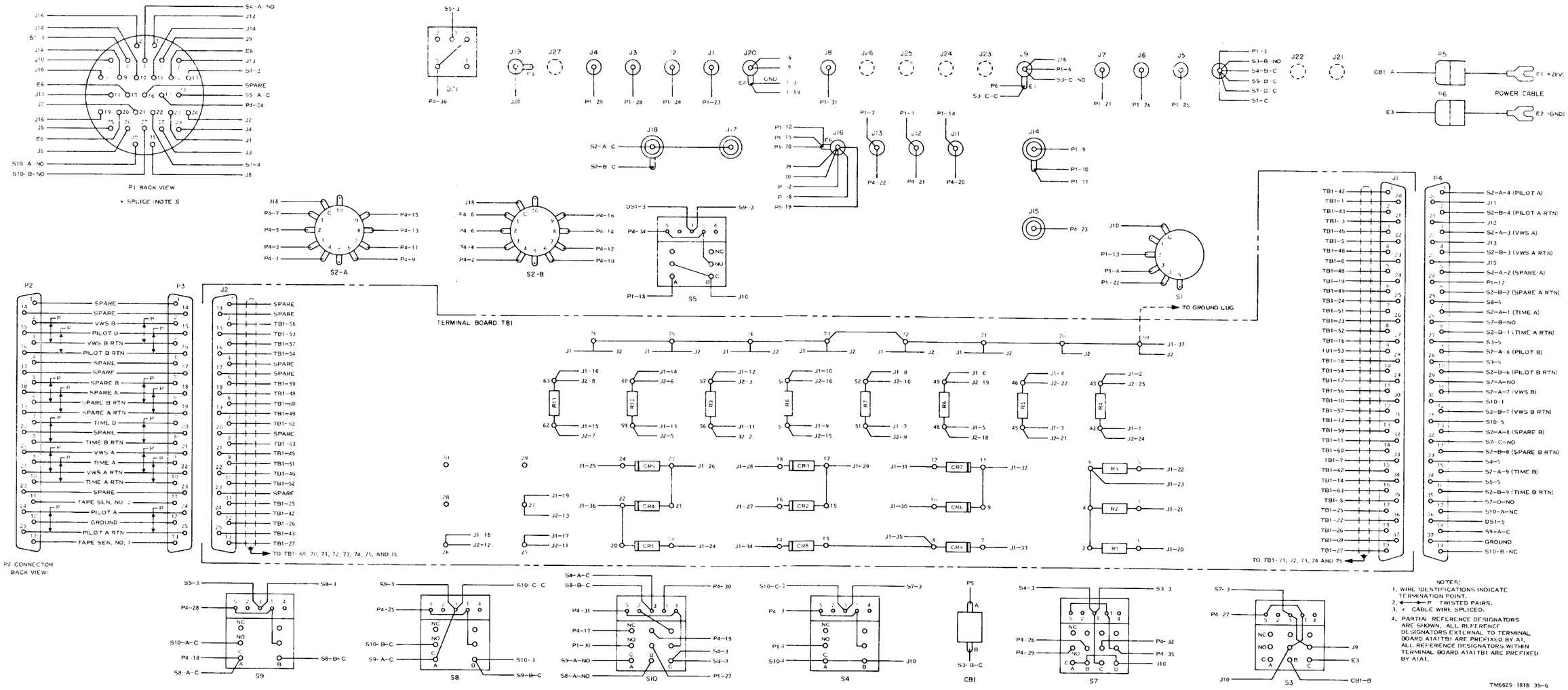

Figure 5-2. CIPR test set wiring diagram.

APPENDIX

REFERENCES

DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (Types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	U. S. Army Equipment Index of Modification Work Orders.
TM 11-5835-239-12	Operator and organizational maintenance manual: Recorder Set, Sound AN/ASH-23 and Reproducer Set, Sound AN/ASH-24.
TM 11-6625-366-15	Organizational, DS, GS, and depot maintenance manual: Multimeter TS-352/U.
TM 11-6625-1818-12	Operator and organizational maintenance manual: Recorder Test Set TS-2854/ASH-23

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-36, Direct and General Support Maintenance requirements for the OV-1A, OV-1B, OV-1C and CH-47A, AH-1G, AH-56A, CH-54 Aircraft.

*U.S. GOVERNMENT PRINTING OFFICE; 1970-O-405-867

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE

BE EXACT. . .PIN-POINT WHERE IT IS

PAGE NO.	PARA-GRAPH	FIGURE NO.	TABLE NO.

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

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

P.S.—IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS.

PIN: 017545