DEPARTMENT OF THE ARMY TECHNICAL MANUAL

GS AND DEPOT MAINTENANCE

MANUAL

INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS

POLYGRAPH INSTRUMENT

This copy is a reprint which includes current pages from Changes 1 and 2. Title was changed by C 2 to read shown above.

HEADQUARTERS, DEPARTMENT OF THE ARMY

AUGUST 1970

WARNING

DANGEROUS VOLTAGES EXIST IN THIS EQUIPMENT

Be careful not to come in contact with 115-volt line connections when testing or servicing Polygraph Instrument, Recording AN-/USS-2F

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CHANGE
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HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 1 January 1989

General Support and Depot Maintenance Manual
Including Repair Parts and Special Tools Lists
POLYGRAPH INSTRUMENT, RECORDING AN/USS-2F
(NSN 6695-00-543-6078)

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No. 11-6695-210-45

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DEPARTMENT OF THE ARMY
WASHINGTON, DC, *20 August 1970*

General Support and Depot Maintenance Manual
Including Repair Parts and Special Tools Lists
POLYGRAPH INSTRUMENT, RECORDING AN/ USS-2F
(NSN 6695-00-543-6078)
Current as of 9 May 1975

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CHAPTER 1

INTRODUCTION

1-1. Scope

a. This technical manual describes functioning of Polygraph Instrument, Recording AN/USS-2F. It includes instructions appropriate to general support and depot maintenance for troubleshooting, testing, adjustment, alignment, repair, and replacement of defective parts. It also lists tools and materials required for general support and depot maintenance.

b. For instructions pertaining to operation of the equipment, refer to TM 11-6695-210-12.

c. The repair parts and special tools list is contained in appendix B.

1-2. Consolidated Index Of Army Publications And Blank Forms Refer to the latest issue of DA Pam 25-30 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

1-3. Maintenance Forms, Records And Reports

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, as contained in Maintenance Management Update.

b. Report of Item Packaging Discrepancies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/SECNAVINST 4355.18/AFR 400-54/MC04430.3J.

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

1-4. 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 or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to: Commander, U.S. Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-PA-MA-D, Fort Monmouth, New Jersey, 07703-5000. We'll send you a reply.

CHAPTER 2

FUNCTIONING OF EQUIPMENT

Section I. BLOCK DIAGRAM DESCRIPTION

NOTE

The purpose, operation, and interoperation of the various circuits (electrical, electronic, and electromechanical), and mechanical systems in this equipment are explained in this chapter. Familiarity with the equipment, how it works, and why it works that way, are valuable tools in troubleshooting the equipment rapidly and effectively.

2-1. General

The polygraph is comprised of three systems (pneumo, gsr, and cardio) which function independently of each other, but each system functions in conjunction with the chart-drive system.

The systems display three separate but simultaneous ink recordings on a moving chart in the chart-drive, each ink recording being proportional to the subject's various responses to questions. During interrogation, each system provides a measurement of the person's physical characteristics which, when properly evaluated, may determine the subject's truthfulness or deceptiveness. Pulse rate and relative blood pressure are determined by the cardio system; skin resistance, or rate of perspiration is determined by the gsr system respiration, or breathing rate and depth is determined by the pneumo system. Paragraphs 2-2 and 2-3 describe the mechanical functioning of the pneumo and cardio systems, paragraphs 2-4 and 2-5 describe the block diagram functioning of the chart-drive and gsr systems respectively, paragraphs 2-6 and 2-7 describe the circuit functioning of the chart-drive system and the gsr system, respectively.

2-2. Pneumo System, Mechanical Functioning (fig. 2-1)

a. The pneumo system records changes in the length of the chest tube, due to expansion and retraction, in correspondence with the subject's breathing. The expansion and retraction of the tube is in direct relationship to the subject's breathing. The chest tube, which is fastened around the subject's chest, is connected by tubing to the bellows actuator which operates the pneumo pen. The pneumo VENT, which is closed during questioning, is opened when handling the chest tube to prevent pneumo pen whip.

b. After the chest tube is fastened around the chest the pneumo CENTERING control (a mechanical centering control) is adjusted to center the pneumo pen on the pneumo index line of the chart. The pneumo VENT is then closed to provide a closed system, and the subject is ready to be tested. Each time the subject inhales, the chest tube expands and the normal pressure within the system decreases. This drop in pressure causes the pneumo pen mounted on its cradle pivot to swing toward the top of the chart; the greater the subject's inhalation, the greater the swing. Conversely, each time the subject inhales, the chest tube retracts and the normal pressure within the system increases. The rise in pressure causes the pneumo pen to swing toward the bottom of the chart; the greater the subject's inhalation, the greater' the swing.

2-3. Cardio System, Mechanical Functioning (fig. 2-1)

a. The cardio system records pressure changes within the pressurized, cardio system due to pulse rate and blood pressure changes. The cuff, which may be fastened around either the subject's arm or wrist, is connected by tubing to the bellows actuator which operates the cardio pen. The cardio VENT and the hand pump release valve (when the pinch clamp is released) permit rapid release of air pressure when the test is

finished. In addition, the cardio VENT, which is closed during normal operation, is opened when handling the cuff to prevent cardio pen whip. The LOCK ↑ lever immobilizes the cardio pen and prevents pen whip when the VENT is suddenly opened or when the cuff is being installed. During normal operation the LOCK ↓ lever is retracted.

b. After the cuff is attached, the cardio CENTERING control (a mechanical centering control) is adjusted to center the cardio pen on the cardio index line of the chart. The LOCK + lever is set to lock position (direction of arrow). The cardio VENT is then closed to provide a closed system. The repeated squeezing of the hand pump bulb pressurizes the system. When desired pressure is reached (approximately 90 mm Hg) the LOCK + lever is retracted and the subject is ready to be tested. The pressure in the cuff is varied by each pulse beat and blood pressure change. The pressure gage indicates the amount of pressure in mm of Hg in the system.

2-4. Gsr System, Block Diagram Functioning (fig. 2-2)

The gsr system (consisting of the galvo assembly and the gsr amplifier assembly) senses and records changes in skin resistance from the subject's normal resistance level when he is under test. Finger electrodes El and E2, which are applied to the subject's fingers, connect the subject's resistance as part of a modified bridge circuit.

a. When the subject's resistance is normal (no subject response), the bridge is balanced and ' there is effectively no output voltage from the bridge circuit, the galvo pen is not driven and remains at the galvo index line on the chart.

b. When the subject's resistance decreases (due to subject response), the bridge circuit is unbalanced and an output voltage is obtained from the bridge circuit. This voltage is then converted to pulses by the chopper; amplified by signal amplifiers Q1 through Q3 and fed to the driver amplifier Q4 and Q5. The driver amplifier converts the voltage to an output current which drives galvanometer coil M1. Initially, the galvanometer coil halves are excited alternately by dc voltage pulses derived from the ac line. When the subject's resistance is introduced, current flows unequally in the two halves due to the signal (output from the bridge) driving Q5, unbalancing M1 and causing the galvo pen to swing

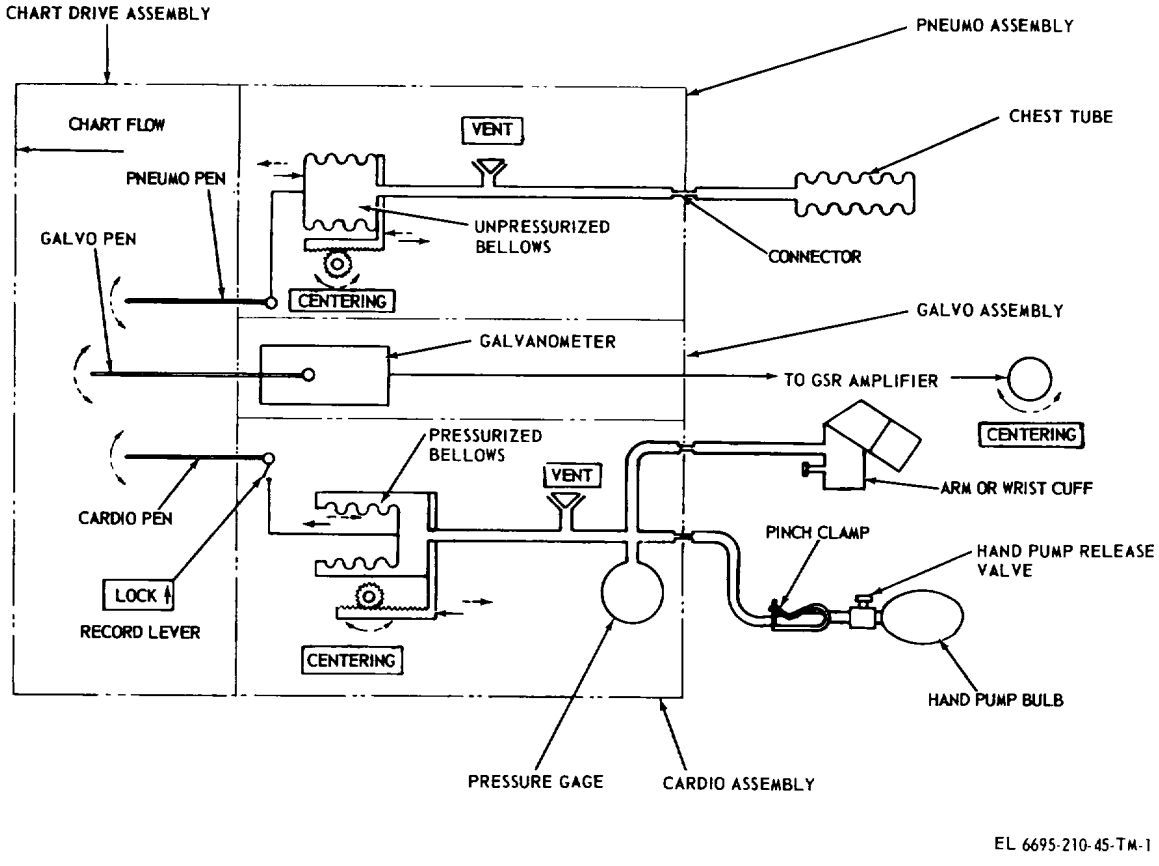


Figure 2-1. Mechanical sections, block diagram.

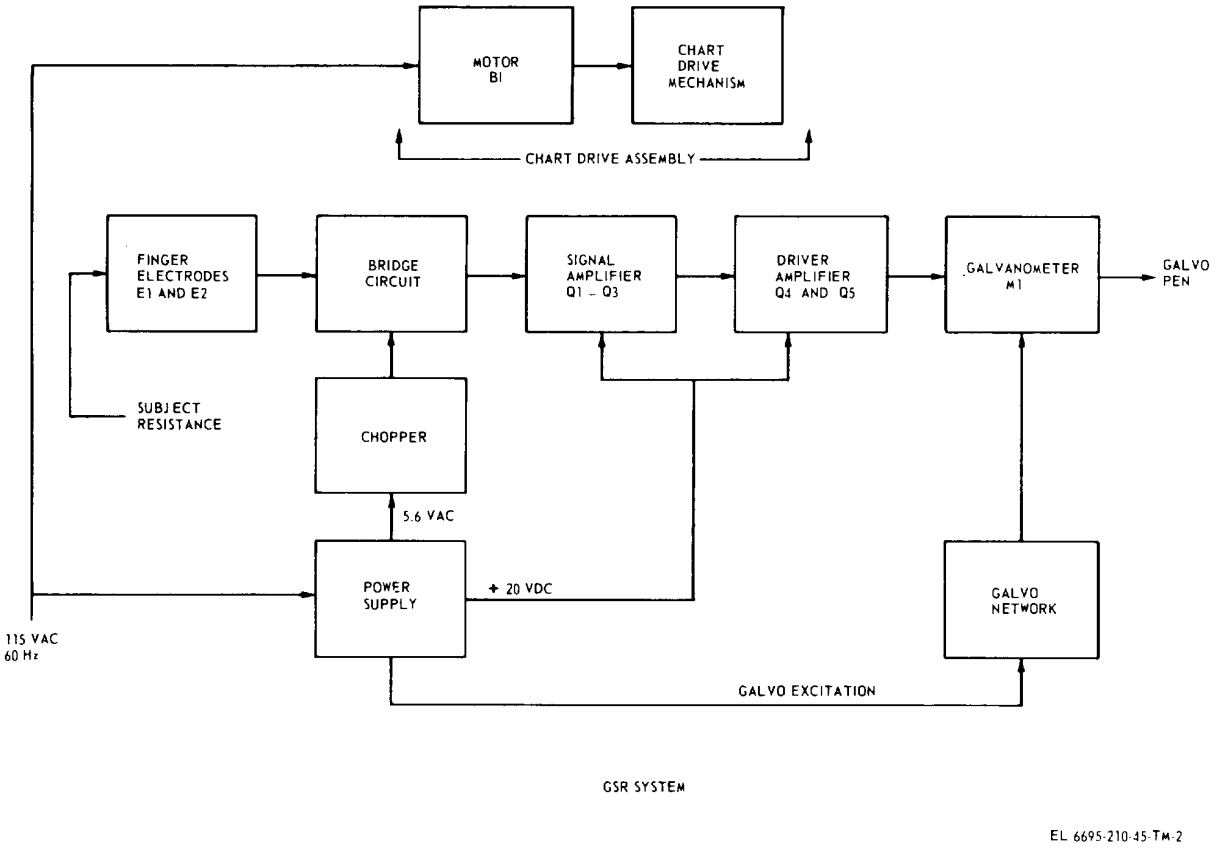


Figure 2-2. Chart-drive and gsr system, block diagram.

above the index line. The galvanometer network provides filtering and isolation for the galvanometer coil halves.

c. As the subject's resistance returns to normal (increases after subject response), the bridge circuit returns to a balanced condition and the output voltage from the bridge circuit decreases to zero. As a result, the output from the amplifier decreases to zero and the galvanometer causes the galvo pen to return to the galvo index line on the chart. The galvo pen remains at the galvo index line until the next subject's response causes the bridge circuit to become unbalanced, at which time the action described in b above is repeated.

d. The power supply supplies 5.6 volts ac for the chopper, +20 volts dc for the amplifiers, and the galvo excitation voltage (27 volts full-wave rectified ac).

2-5. Chart-Drive System, Block Diagram Functioning
(fig. 2-2)

The chart-drive system consists of an assembly comprised of motor B1 geared to the chart-drive mechanism which carries the chart paper. When 115-volt, 60-Hz power is applied to the chart-drive assembly, the motor operates and causes the chart-drive mechanism to move the chart paper at the rate of 6 inches per minute.

Section II. SCHEMATIC DIAGRAM DESCRIPTION

2-6. Chart-Drive Assembly Circuit Functioning
(fig. 5-2)

When chart-drive switch 1A2S1 is set to on, the 115-volt, 60-Hz power is fed through the switch to synchronous motor 1A2A11B, and the motor operates. The motor drives the chart-drive mechanism which, in turn, causes a chart to advance at the rate of 6 inches per minute.

2-7. Gsr System, Circuit Functioning
(fig. 5-2)

a. Bridge and Chopper Circuit (IA5A3) (fig. 2-3).

(1) The bridge circuit is comprised of two branches, subject and reference. Resistors 1A5A3R; CENTERING control 1A5R1, test resistors 1A5R2 and R3 and the subject's resistance form one branch (subject): resistors 1A5A3R3 and R4 comprise the other (reference). The signal output from the bridge is taken between the junction of the ('ENTERING control and 1A5A3R1 and the junction of 1A5A3R3 and R4. 'With mode switch 1A5S3 in the MAN posit ion capacitors 1A5A3C1 and C2 are bypassed and the voltage from the subject's branch (,f the bridge is made directly available to the chopper through isolator resistor 1A5A3R5. This voltage is compared by the chopper against the voltage at the junction of 1A5A3R3 and R4. With mode switch 1A5S3 in the AUTO position, voltage changes in the subject's branch are ac coupled to the chopper through capacitor 1A5A3C1 and C2.

(2) When the bridge circuit is balanced, the voltage developed in the subject branch is equal to the voltage developed at the 1A5A3R3 and R4 junction. As a result, the output of the chopper is zero and the pen remains at the galvo index line on a chart.

(3) When the subject's resistance decreases (due to subject response), the bridge circuit is unbalanced and the voltage in the subject branch is less positive than the voltage (which remains constants at the 1A5A3R3 and R4 junction. The chopper functions as a single-pole-single-throw switch that is open during the positive half-cycle of the ac line and closed during the negative half-cycle. This action causes the voltage existing between the two branches of the bridge to be shorted during the negative half-cycle of the line voltage. The chopping action generates a square wave, at the line frequency, 180 degrees out of phase with the ac line for decreases in subject's resistance and in phase with

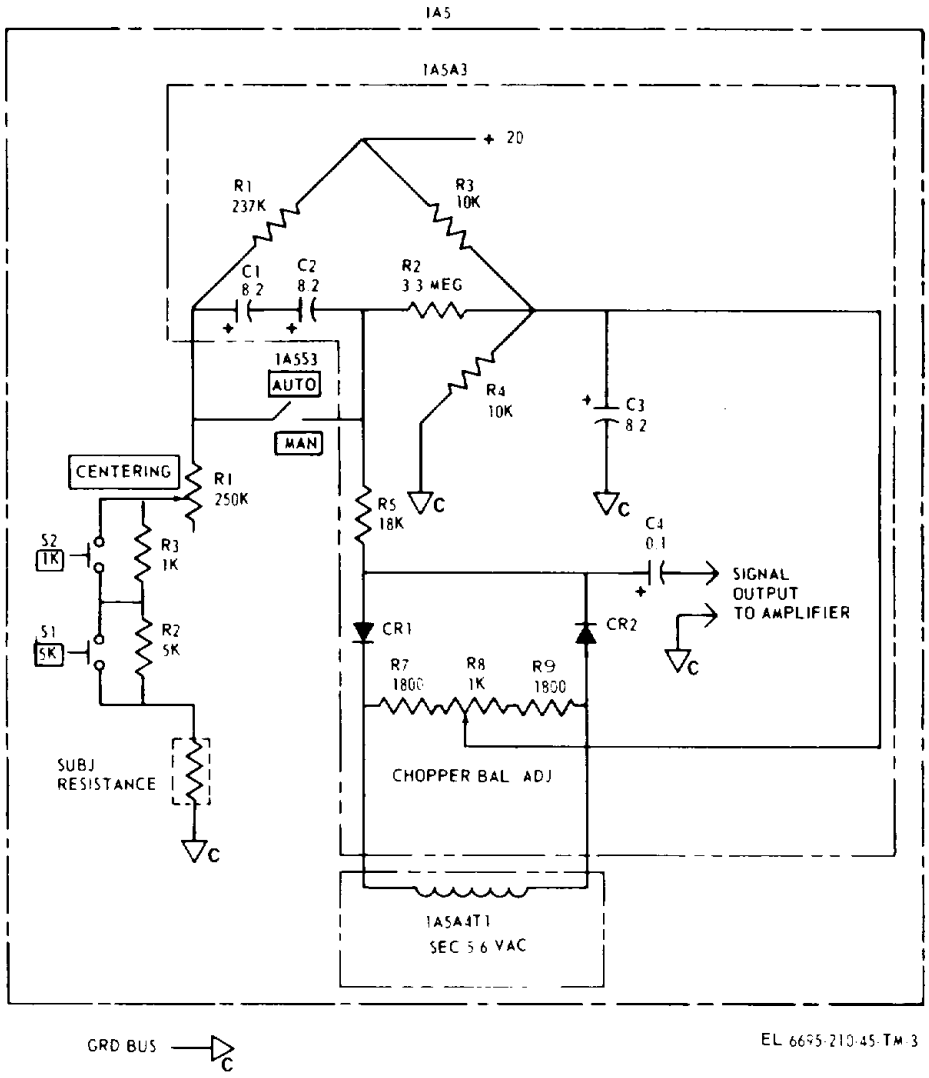


Figure 2-3. Bridge, simplified schematic diagram.

the ac line for increases in subject's resistance. The square wave signal is coupled through capacitor 1A5A3C4 to the amplifiers, causing the galvanometer to deflect upscale, an amount proportional to the change in subject's resistance. Capacitor 1A5C1 connects signal common with power ground to minimize common mode voltage.

(4) When the subject's resistance returns to normal (increases after subject's response), the bridge circuit returns to a balance condition and the voltage at the 1A5A3R1, CENTERING control 1A5R1 junction equals the voltage at the 1A5A3R3 and R4 junction. As a result, the galvanometer causes the pen to return to the galvo index line on the chart.

(5) Push button switches 1A5S1 and 1A5S2 remove a known amount of resistance from the subject branch for calibration and test purposes.

(6) Diodes 1A5A3CR1 and CR2 perform the chopping action. The 5.6 volts ac is supplied to the chopper circuit from the stepdown secondary winding of power supply transformer 1A5A4T1 causing the diodes to conduct on the negative half-cycle. Resistors 1A5A3R6 and R10 limit diode current; resistors 1A5A3R7 and R9 are ranging resistors for chopper balance adjust resistor 1A5A3R8. This adjustment balances the chopper circuit for zero signal to the amplifier when the subject's bridge is balanced. Capacitor 1A5A3C3 connects ac signal common to amplifier dc common.

b. Signal Amplifier 1A5A3Q1, Q2, Q3.

(1) Amplifier 1A5A3Q1 is an emitter follower providing a high impedance load to the bridge circuit and a low impedance output. The voltage gain of this stage is less than unity.

(2) Amplifiers 1A5A3Q2 and Q3 are common emitter, fixed gain, ac voltage amplifiers, coupled by SENSITIVITY control 1A5R4. Gain range adj. potentiometer 1A5A3R16 provides a means for calibrating SENSITIVITY control 1AR4 and limiting the maximum system gain. Capacitor 1A5A3C8 limits the bandwidth of the amplifier.

c. Driver Amplifier 1A5A3Q4 and Q5. Amplifier 1A5A3Q4 is a transconductance amplifier rat provides drive to the galvanometer driver amplifier 1A5A3Q5. Galvo current adj. potentiometer 1A5A3R26 provides a means to set the two operating current. Resistor 1A5A3R27 provides a well-defined load to Q4.

d. Galvanometer 1A6U1 and Galvo Network 1A6A1.

(1) Each galvo coil of 1A6U1M1 is excited by a dc voltage pulse generated by half-wave rectification of a 27-volt ac, 60-Hz sine wave. The voltages to the coils are shifted in time with respect to each other by one-half cycle. Both coils are connected to the collector of galvo driver amplifier 1A5A3Q5, through diodes 1A6A1CR1 and CR2. The diodes provide isolation of the two coil halves and protect filter capacitors 1A6AlC1 and C2 which smooth the varying current in the galvanometer, due to dc voltage pulses derived from the ac line.

(2) With zero signal in the gsr amplifier, equal and opposite currents flow in the galvo coil halves. When the subject's resistance decreases, a negative phase square wave is generated in the bridge-chopper circuit, and coupled to the gsr amplifier'. This signal appears inverted at the base of 1A5A3Q5 as a current, adding to the bias current during the positive half-cycle and subtracting from the bias current during the negative half-cycle. An increase in coil 1 current and a decrease in coil 2 current results causing the galvo pen to deflect up scale. An increase in subject's resistance causes the opposite conditions and a downward movement of the galvo pen.

Capacitor 1A5A4C1 limits the bandwidth of the system.

e. Power Supply 1A5A4.

NOTE

Unless otherwise noted, prefix reference designations with 1A5A4.

(1) The power supply provides all voltages required to operate the gsr system. The 115 volts ac is stepped down by transformer T1 that has two secondary windings. Secondary number 1 provides 27 volts ac and feeds two circuits: the +2f) VDC regulator and the galvanometer. Secondary number 2 provides 5.6 volts chopper drive.

(2) The +20 VDC regulator functions as follows: The 27 volts ac is fullwave rectified by diodes CR1 through CR1 and filtered in RC filter C2, R1, C3. Base current for regulator Q1 and operating current for zener reference diode CR7 are provided by R2. Transistor Q1 regulates by emitter the follower action: the emitter always being 0.7 volt lower' than the base, that is held at constant voltage by Zener diode CR7. Capacitor C4 minimizes line transient effects.

(3) The 27 volts ac is rectified by diodes CR5 and CR6 and fed to galvanometer 1A6U1 coils. Coil 1 current flows through amplifier 1A5A3Q5, dc common and returns to transformer 1A5A4T1 through 1A5A3CR2 diode. Coil 2 current traces the same path but returns to 1A5A4T1 through 1A5A4CR2.

CHAPTER 3

GENERAL SUPPORT MAINTENANCE

Section I. GENERAL TROUBLESHOOTING INFORMATION

3-1. General Instructions

Troubleshooting at general support maintenance category includes all the techniques outlined for organizational maintenance and any special or additional techniques required to isolate a defective part. The general support maintenance procedures are not complete in themselves, but supplement the procedures described in organizational maintenance. The systematic troubleshooting procedure, which begins with the operational and sectionalization checks performed at an organizational category, must be completed by further localizing and isolating techniques. Section II of this chapter provides troubleshooting procedures which must be performed at the general support maintenance category.

3-2. Organization of Troubleshooting Procedures

a. General. The first step in servicing a defective polygraph is to sectionalize the fault. Sectionalization means tracing the fault to a system or section. The second step is to localize the fault. Localization means tracing the fault to a defective assembly or subassembly responsible for the abnormal condition. The third step is to isolate the fault. Isolation means tracing the fault to the defective part. Some faults, such as burned resistors, arcing and shorted transformers can often be located by sight, smell, and hearing. The majority of faults, however, must be isolated by checking mechanical actions, voltages, and resistance, and checking for air pressure leaks. Plug in-pluck out printed circuit boards are sent to depot for repair.

b. System sectionalization. The polygraph consists of four main systems: the pneumo, the gsr, the cardio, and the chart-drive, each of which functions independently of the other, except for the chart-drive which is common to the other three systems. The first step in tracing trouble is to locate the system at fault by the following methods:

(1) *Visual inspection.* The purpose of visual inspection is to locate faults without testing systems, or measuring circuits. All pen tracings, pressure gage indications, or other visual signs should be observed and an attempt made to sectionalize the fault to a particular system.

(2) *Operational tests.* Operational tests frequently indicate the general location of trouble. In many instances the tests will help in determining the exact nature of the fault. The weekly preventive maintenance checks and services chart (TM 11-6695-210-12) contains a good operational test.

c. Localization. Localization procedures should be performed after the trouble has been sectionalized (b above). The localization procedures are in the troubleshooting charts (para 3-5a (chartdrive), b (pneumo), c (cardio), and para 3-6 (gsr) (galvo and gsr amplifier).

d. Isolation. Procedures for isolating troubles in the pneumo assembly are in paragraph 3-10; procedures for isolating troubles in the cardio assembly ale in paragraph 3-11. Procedures for isolating troubles ill the gsr system (galvo assembly and gsr amplifier assembly) are in paragraph 3-6.

e. Techniques. In performing the sectionalization, localization, and isolation procedures, one or more of the techniques below may be applied.

CAUTION

When soldering, use a pencil-type soldering iron with a 25-watt maximum capacity. If ac operated irons are used, connect an isolation transformer between the iron and the power source. DO NOT use a smoldering gun. Damaging voltages can be induced in circuit parts.

(1) Resistance measurements. Use the resistance chart in paragraph 3-9 for galvo assembly 1A6 indications and compare them with the indications made; for the rest of the polygraph ()less 1A5A3 and 1A5A4), refer to figure 5-2

(2) Continuity tests of cable assemblies. Note reference designations on schematic (fig. 5-2) and troubleshoot using wiring list (table 4-1).

(3) Intermittent troubles. In all tests, the possibility of intermittent troubles should not be overlooked. If present, this type of trouble often may be made to appear by tapping or jarring the equipment. Make a visual inspection of the wiring and connections to the parts of the equipment.

(4) Resistor and capacitor color code diagrams. Use color code for military Standard resistor, inductors, and capacitors (fig. 5-1).

(5) Schematic diagram. Use the schematic diagram (fig. 5-2) to trace the circuits in the polygraph.

3-3. Test Equipment Required

The following chart lists test equipment and tools required to troubleshooting the polygraph at general support. Also listed are the associated technical manuals and the assigned common names.

Test equipment	*Technical manual*	*Common name*
Multimeter TS-352B/U.....	TM 11-6625-366-15.....	Multimeter
Tool kit, Electronic Equipment TK-105/G.		
Tension Scale, 0-64 ozs.....	Calibrated in 1-oz gradations.	
Ruler, 12 inch		
Weight, 1 lb.		
Pinch clamp, 2 required ..... (FSN 4730-918-5432).		
Resistor 47K ±5% 1/2W (FSN 5905-254-9201).		

Section II. TROUBLESHOOTING PROCEDURES

CAUTION

Do not attempt removal of parts before noting instructions in para 3-7, and Section III.

3-4. Localizing Trouble

(a) General. Procedures are outlined in the troubleshooting charts (para 3-5) for localizing and, in same cases, isolating troubles in the chartdrive t, pneumo, and cardio assemblies of the polygraph. Procedures for localizing trouble in the g: gsr system are in paragraph 3-6. Parts locations are indicated in figures 3-1 through 3 9. Depending on the nature of the operational symptoms, one or more of the localizing or isolating procedure will be necessary. When use of the procedure, results in localization of trouble to a particular stage, use the techniques outlined in paragraphs 3-9 through 3-11 to isolate the trouble to a particular part.

b. Use of Charts. The troubleshooting charts are designed to supplement the operational checks detailed in the weekly preventive maintenance checks and services chart (TM 11-6695-211)-12). If previous operational checks have resulted in reference to a particular item number of chart, go directly to the referenced item. If no operational symptoms are known, begin with item 4 in the weekly preventive maintenance checks and services chart (TAM 11-6695-210-12) an(d proceed until the trouble is located.

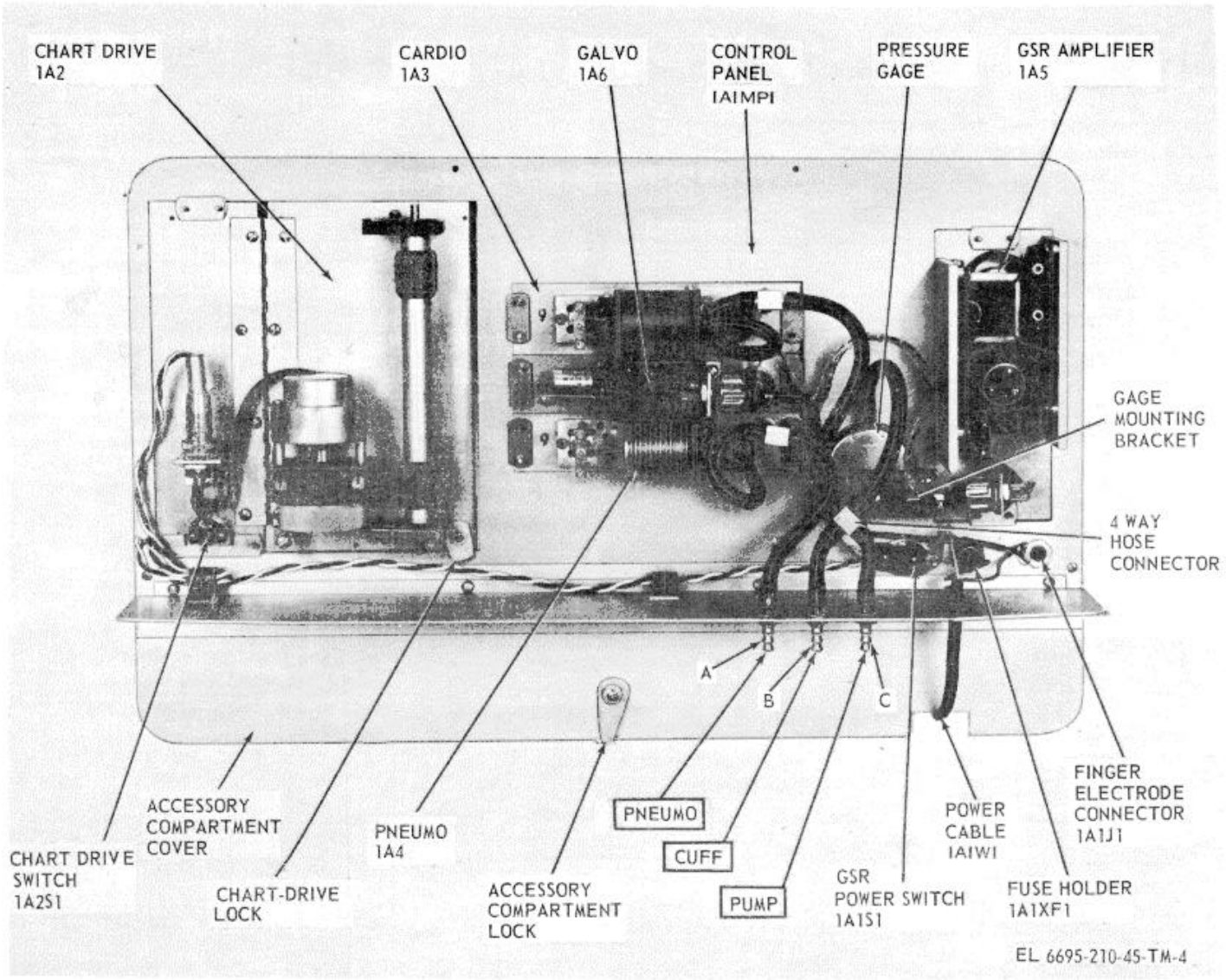


Figure 3-1. Bottom view of polygraph, parts location.

3-5. Troubleshooting Charts

The troubleshooting charts for the chart-drive assembly, pneumo assembly, and cardio assembly are in (a) through (c) below.

a. Chart-Drive Assembly Troubleshooting Chart (fig. 3-7).

Item	Indication	Probable trouble	Procedure
1	Chart advances intermittently or does not advance when chart-drive switch 1A2S1 is set to on (left), but gsr system operates when gsr power roller switch 1A1S1 (fig. 3-1) is set to ON	*a.* Defective chart-drive switch 1A2S1.	*a.* Check switch 1A2S1 and associated wiring. Replace switch if defective. (para 3-27).
		b. Inadequate pressure of pressure	*b.* Check and adjust spring tension to 56 +8 oz. Hook tension scale at end of pressure roller arm (fig. 3-8).
		c. Defective motor 1A2A1B1	*c.* Check the resistance of motor 1A2A1B1. It should be 600 ohms. If the resistance is not 600 ohms, replace the motor (para 3-27).
		d. Defective drive wheel	*d.* Replace drive wheel.
		c. Defective pressure roller	*e.* Replace pressure roller.
		f. Defective chart-drive	*f.* Replace chart-drive (para 3-29).

Item	Indication	Probable trouble	Procedure
2	Chart advances intermittently or does not advance when chart-drive switch 1A2S1 is set to on (left), and gsr system does not operate when gsr power switch 1A1S1 (fig. 3-1) is set to ON.	*a.* Defective fuse 1A1F1 *b.* Defective power cable 1A1W1	*a.* Replace fuse 1A1F1. *b.* Replace power cable 1A1W1 (fig. 3-1).
3	Chart-drive motor 1A2A1B1 does not stop operating when chart-drive switch 1A2S1 is set to off (right).	*a.* Defective switch 1A2S1	*a.* Check switch 1A2S1 and associated wiring. Replace switch if defective (para 3-27).

b. Pneumo Assembly Troubleshooting Chart (fig. 3-4).

Item	Indication	Probable trouble	Procedure
1	Pneumo pen writes but does not move, or pen trace amplitude is too small for proper chart interpretation.	*a.* Bridge jewel screw misadjusted *b.* Pen-travel limiting screw misadjusted. *c.* Pressure leak in pneumo assembly.	*a.* Adjust jewel screw (para 3-20). *b.* Adjust pen-travel limiting screw (para 3-24). *c.* Check pneumo assembly for pressure leaks (para 3-10).
2	Pneumo pen swings with sluggish or jerky movement.	*a.* Loose bellows actuator mounting screws. *b.* Jewel screw dirty - *c.* Bridge jewel screw misadjusted *d.* Defective jewel screw (cracked) *e.* Defective pivot shaft- .------ *f.* Defective link; defective pivot arm, defective bellows assembly, (bellows actuator.)	*a.* Tighten screws. *b.* Clean jewel screw (para 3-18). *c.* Adjust jewel screw (para 3-20). *d* Replace jewel screw (paras 3-19 and 3-21). *e.* Replace pivot shaft (para 3-23). *f.* Replace bellows actuator (para 3-16).
3	Pneumo pen swings but pneumo trace cannot be centered when pneumo CENTERING control (fig. 3-4) is adjusted.	*a.* Loose dovetail slide *b.* Defective bellows assembly *c.* Pen cradle assembly misadjusted.	*a.* Adjust eccentric pinion bushing (para 3-17). *b.* Replace bellows actuator (para 3-16). *c.* Adjust pen cradle para 3-25b (2).
4	Pneumo pen swings but does not swing from 1¼t/s inch above pneumo index line to 1% below the pneumo index line when pneumo CENTERING control is rotated through out its range.	*a.* Pivot arm misadjusted *b.* Loose dovetail slide inch *c.* Defective bellows assembly	*a.* Adjust pivot arm (para 3-22). *b.* Adjust eccentric pinion bushing (para 3-17). *c.* Replace bellows actuator (para 3-16).

c. Cardio Assembly Troubleshooting Chart (fig. 3-6).

Item	Indication	Probable trouble	Procedure
1	Cardio pen swings toward bottom of chart.	Pressure leak in cardio assembly	Check cardio assembly for pressure leaks(para 3-11).
2	Cardio pen writes but does not move, or pen trace amplitude is too small for proper chart interpretation.	*a.* Bridge jewel screw misadjusted..... *b.* Pen-travel limiting screw misad-..... justed..... *c.* Pressure leak in cardio assembly.	*a.* Adjust jewel screw (para 3-20). *b.* .Adjust pen-travel limiting screw (para 3-24). *c.* Check cardio assembly for pressure leaks (para 3-11).
3	Cardio pen swings with sluggish or jerky movement. screws.	*a.* Loose bellows actuator mounting ..... *b.* Bridge jewel screw misadjusted..... *c.* Jewel screw dirty	*a.* Tighten screws. *b.* Adjust jewel screw (para 3 20). *c.* Clean jewel screw (para 3-18).

Item	Indication	Probable trouble	Procedure
		d. Defective jewel screw (cracked).....	d. Replace jewel screw (paras 3-19 and 3-21).
		e. Defective pivot shaft.....	e. Replace pivot shaft (para 3-23).
		f. Defective link; defective pivot..... arm; defective bellows assembly..... (bellows actuator).	f. Replace bellows actuator (para 3-16).
4	Cardio pen swings but cardio trace cannot be centered when cardio CENTERING control is adjusted. 16).	a. Loose dovetail slide	a. Adjust eccentric pinion bushing (para 3-17).
		b. Defective bellows.....	b. Replace bellows actuator (para 3-
		c. Pen cradle assembly misadjusted.....	c. Adjust pen cradle.
5	Cardio pen swings but does not swing from 1/4 inch above cardio index line to 11/8 inch below the cardio index when cardio CENTERING 16). control is rotated throughout its range.	a. Pivot arm misadjusted.....	a. Adjust pivot arm (para 3-22).
		b. Loose dovetail slide.....	b. Adjust eccentric pinion bushing (para 3-17).
		line c. Defective bellows assembly.....	c. Replace bellows actuator (para 3-

3-6. Localizing Trouble in Gsr System

When trouble has been sectionalized to the gsr system, use the following substitution techniques to locate the defective assembly.

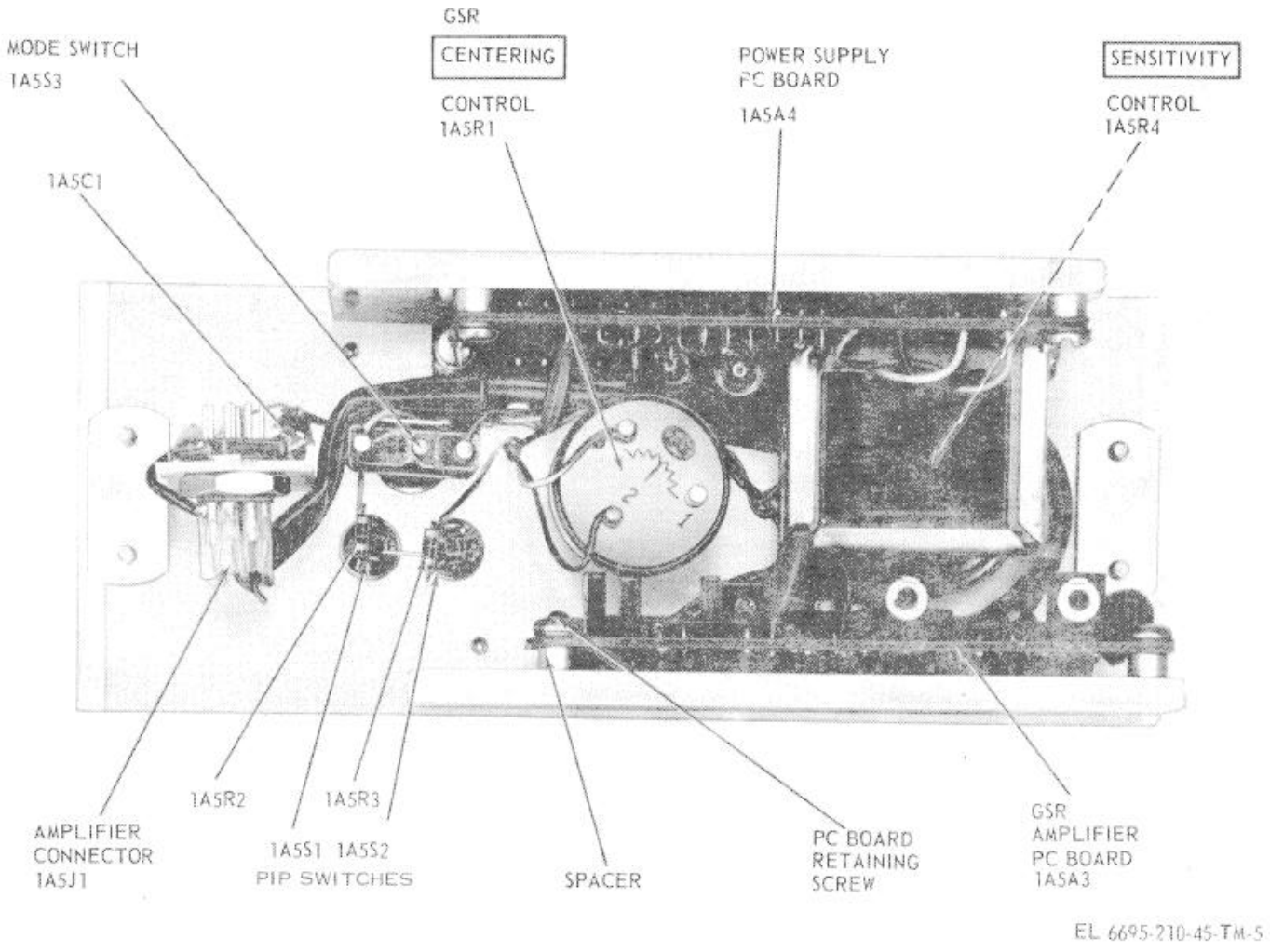


Figure 3-2. Bottom view of gsr amplifier assembly 1A5, parts location.

a. Galvo Assembly Test.

(1) Substitute the gsr amplifier assembly (fig. 3-2) (para 3-7) with a known good amplifier an(d connect it to the suspected galvo assembly (fig. 3-1).

(2) Set SENSITIVITY control 1A5R4 (fig. 3-2) to 25 and mode switch 1A5S3 to MIAN.

(3) Set gsr power switch lA1S1 (fig. 3-1) to ON: the pen should function the same as with the standard galvo in respect to sensitivity and direction of rotation. If the galvo does not perform as above, conduct resistance check (para 3-9).

b. Gsr Amplifier Assembly Test.

(1) Substitute the galvo assembly (fig. 3-1) (para 3-7) with a known good one.

(2) Substitute the suspected power supply PC board (fig. 3-2) with a known good power supply board and repeat a (2) and (3) above. Proper operation of the amplifier would indicate that the trouble is elsewhere.

(3) Substitute the suspected amplifier PC board (fig. 3-2) with a known good amplifier PC board and repeat a (2) and (3) above.

(4) If both boards do not operate properly is in the amplifier cable assembly, connector, potentiometers, resistors, capacitors, or switches. Perform continuity checks of amplifier wiring, use schematic diagram (fig. 5-2) and wiring list (table 4-1) to check for defective parts.

(5) Replace defective boards and parts mounted on the gsr amplifier panel.

NOTE

After replacement of any major components in the gsr system, such as galvo assembly, gsr amplifier assembly, galvo PC board or components, galvanometer, or either of the gsr amplifier PC boards, alignment procedure (para 3-32) has to be performed for proper operation of the gsr system.

3-7. Removal of Assemblies

To remove the cardio, pneumo, galvo, gsr amplifier, or chart-drive assemblies, proceed as follows:

NOTE

Avoid withdrawing screws too far. If screws are removed completely, the clamping plate ,will drop into the polygraph case and it may be necessary to remove additional assemblies just to remove the clamping plate.

(1) Loosen and withdraw four clamping plate screws (two at each end of assembly) about eight turns (A, fig. 3-3). Removed pen from cradle.

(2) Lift one end of the assembly about 3/16 inch and move until it stops on the screws (B, fig. 3-3).

(3) Lift the opposite end up and move the assembly in opposite direction to that in (2) above until

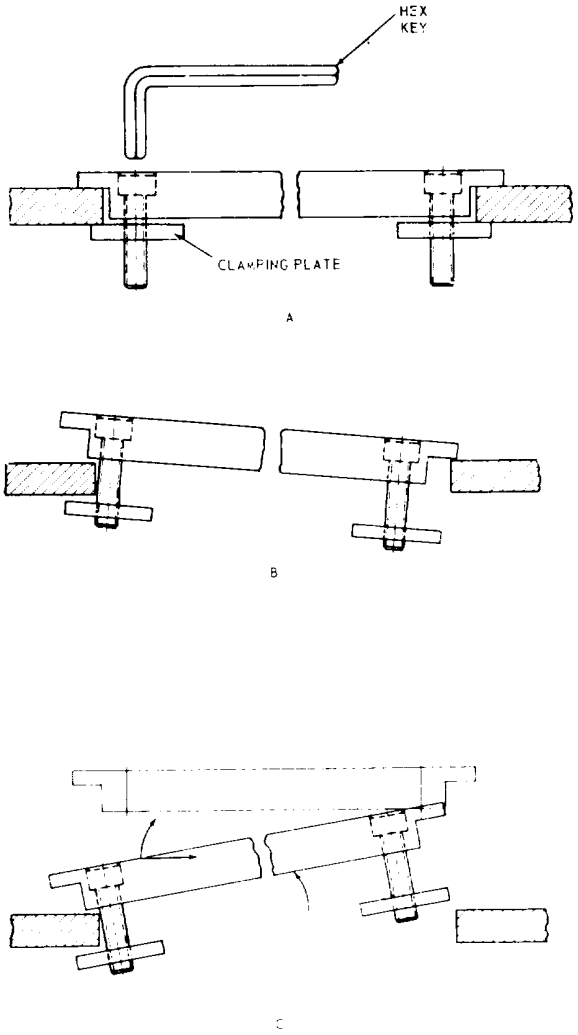


Figure 3-3. Removal and installation of assemblies.

both clamping plates clear the opening (C, fig. 3-3).

(4) Lift the assembly directly up, far enough to disconnect tubing from connector.

3-8. Installation of Assemblies

(fig. 3-3)

To install the cardio, pneumo, galvo, gsr amplifier or chart-drive assemblies, proceed as follows:

(1) Connect rubber tubing or connector.

(2) Adjust clamping plate screws so that the clamping plate drops [1,, inch below the assembly panel.

(3) Insert the assembly straight into opening of control panel.

(4) Move the assembly to one end of the opening, until the clamping plate drops under the control panel.

(5) Move the assembly in opposite direction until the other clamping plate drops under the control panel.

(6) Center assembly in opening and tighten clamping plate screws.

3-9. Resistance Check of Galvo Assembly 1A6

Disconnect 1A1W2P2 from the galvo assembly connector (1A6J1) and using multimeter, make measurements indicated in the following chart; reconnect 1AlW2P2 to 1A6J1 after final measurement is made.

Point of measurement	Normal indication (ohms)	Isolating procedure
Between pins 1 and 3 and between pins 5 and 7 of 1A6A1 (fig. 3-9).	485	If indication is low, check C1 and C2; if there is no indication, check wiring. Replace capacitor or galvo coil if defective.
Between pins 3 and 4 and between pins 4 and 5 of 1A6A1.	Forward: 1K Reverse: Infinity	Replace CR1, CR2 if necessary.
Refer to figures 3-9 and 5-2 for wire continuity of 1A6A1.	Zero	Repair if necessary.

3-10. Locating Pressure Leaks in the Pneumo Assembly or Connecting Rubber Hose

Localize leak within the pneumo assembly or connecting hose as follows:

a. Remove the pneumo assembly (para 3-17).

b. Disconnect the chest tube assembly (A, fig. 3-1) and connect the hand pump bulb assembly.

c. Close the pneumo VENT (turn knob and release) (fig. 3-4).

d. Gently squeeze the hand pump bulb to moderately pressurize the pneumo assembly.

e. Brush soapy water around the pneumo bellows, vent, hose connectors, and connecting rubber hose: watch for appearance of air bubbles.

f. Replace the rubber hose, vent (para 3-15), or pneumo bellows actuator (para 3-6) if leaky due to air bubble appearance.

g. Remove the hand pump bulb assembly from the chest tube hose connector.

h. Reinstall the pneumo assembly (para 3-8).

3-11. Locating Pressure Leaks in Cardio Assembly or Connecting Rubber Hose or Pressure Gage

Localize leak within the cardio assembly, connecting rubber hose, or pressure gage as follows:

a. Remove the cardio assembly (para 3-17).

b. Connect the arm cuff to the CUFF connector and shut it off (B, fig. 3-1) with a pinch clamp.

c. Close the cardio VENT (turn knob and release) (fig. 3-6).

CAUTION

Do not exceed 150-mm Hg pressure as this may damage the equipment.

d. Connect the hand pump to PUMP connector and pressurize the cardio assembly (with hand pump bulb) to 90 mm Hg. Shift the pinch clamp to the PUMP connector and shut off the hand pump with the pinch clamp (C, fig. 3-1).

e. Brush soapy water around the connector, the 4-way hose connector, the vent, and connecting rubber hoses; watch for appearance of air bubbles around the items. The construction of the cardio bellows and pressure gage is such that it is impractical to observe air bubbles with soap test. T(, test the bellows and pressure gage proceed to f below.

f. Repeat the procedure in c above. In addition pinch the pressure gage hose, reinstall the assembly in

the unit and center the pen with the(cardio CENTERING control (fig. 3-5) on the cardio index line. for a decrease in pressure indication on the gage (fig. 3-1) and a gradual movement of the cardio pen toward the bottom of the chart.

(1) If the pen moves more than i1 inch toward(the bottom of the chart in 15 minutes the pressure leak is inside the cardio bellows.

(2) If the pressure drops more than 2 mm Hg (two divisions), in 15 minutes the pressure gage is defective.

NOTE

The bellows may be tested alternatively by immersing pressurized assembly, to 90 mm Hg in water and observing formation of air bubbles.

g. Replace the rubber hose, vent (para 3-15), pressure gage (para 3-14), or cardio bellows actuator (para 3-16) if leaky due to air bubble appearance.

h. Reinstall the cardio assembly (para 3-8).

Section III. REPAIRS AND ADJUSTMENTS

3-12. General Parts Replacement Techniques

Due to the removable assembly construction, most of the parts in the polygraph can be reached easily and replaced without special procedures. Then the trouble has been localized, the suspected assembly should be removed without removing the control panel. Before a part is removed in any assembly, note the position of the part and its leads. Install replacement parts in the same position as the original part to avoid undesirable operation.

3-13. Removal and Replacement of Control Panel

(fig. 3-1)

CAUTION

Insure that the chart-drive lock is engaged.

a. Removal

(1) Remove the power cable from the power source remove the pens and ink reservoirs.

(2) Disconnect and remove accessories from the accessory compartment and the finger electrode from the control panel.

(3) Remove the six screws near the edge of the control panel and lift panel from the case.

(4) Remove and turn the control panel upside down. Set the panel between books or blocks to protect the controls and the pen cradles.

b. Replacement.

(1) the control panel in the case over the screw holes. Make sure the power cable is not caught under the accessory compartment partition.

(2) Insert and tighten all screws.

3-14. Removal and Replacement of Pressure Gage

(fig. 3-1)

a. Removal.

(1) Remove the control panel (para 3-13a).

(2) Pull the rubber hose off the connector on the pressure gage.

(3) Remove the screws and lockwashers that secure the gage mounting bracket to the control panel, and remove the mounting bracket (with pressure gage attached) from the control panel.

b. Replacement.

(1) Connect the rubber hose to the connector on the pressure gage.

(2) Position the gage mounting bracket (with the pressure gage attached) on spacers on the back of the control panel, and secure the mounting bracket to the control panel with screws and washers.

(3) Replace the control panel (para 3-13b).

3-15. Removal and Replacement of the Pneumo or the Cardio Vent

(figs. 3-4 and 3-6)

The procedure for the removal and replacement of the pneumo vent is the same as that for the cardio vent. Therefore only the procedure for the removal and replacement of the pneumo vent is given in a and b below.

a. Removal

(1) Remove the pneumo assembly (para 3-7).

(2) Pull the rubber hose off the connector on the vent.

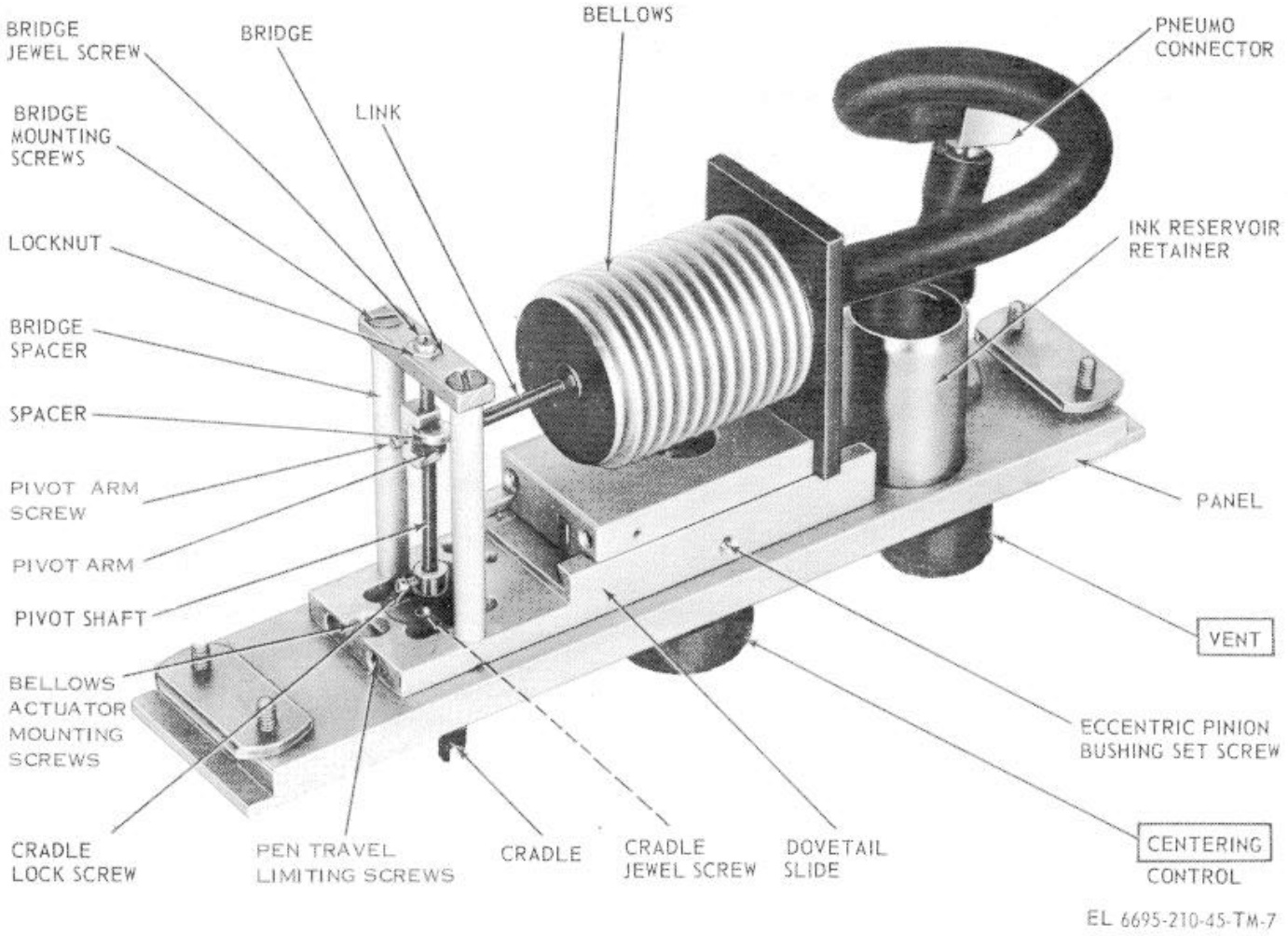


Figure 3-4. Pneumo assembly 1A4, parts location.

(3) Unscrew the nut and remove the vent.

b. Replacement.

(1) Set the vent in open position (VENT pushbutton raised).

(2) Line up the vent body such that the marking (VENT) is parallel to the panel (long side of the assembly) and lock vent body with a hex nut.

(3) Replace the pneumo assembly (para 38).

3-16. Removal and Replacement of the Pneumo or Cardio Bellows Actuator

(figs. 3-4 and 3-6)

Except as indicated, the procedures given in *a* and *b* below apply to both the pneumo and the cardio bellows actuator.

a. Removal.

(1) Remove the pneumo assembly (para 3-7).

(2) Pull the rubber hose off the connector on the bellows.

(3) Loosen the setscrew and remove the CENTERING control knob (and LOCK record lever knob) on the cardio assembly.

(4) Remove the three mounting screws that secure the bellows actuator to the panel and remove the bellows actuator.

b. Replacement.

(1) Position the new bellows actuator over the mounting holes and secure it to the panel with the three screws.

(2) Connect the rubber hose to the connector on the bellows.

(3) Replace the CENTERING control knob (on cardio assembly replace LOCK + record lever knob and adjust (para 3-26)) and tighten the screws.

(4) Replace the assembly (para 3-8).

3-17. Adjustment of Cardio or Pneumo Eccentric Pinion Bushing

(figs. 3-4 and 3-6)

The procedure for adjusting the eccentric pinion bushing in the pneumo assembly is the same as that for the cardio assembly.

a. Remove the pneumo assembly (para 3-7).

b. Loosen the setscrew and remove the CENTERING control knob (and LOCK + record lever knob) on cardio assembly.

c. Remove the three screws that secure the bellows actuator (dovetail slide) to the panel and remove the bellows actuator.

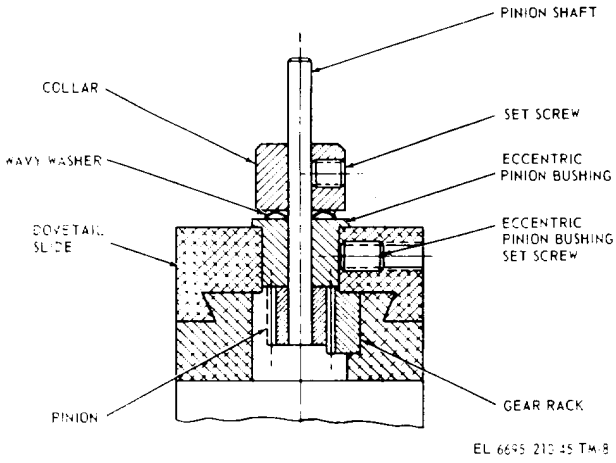


Figure 3-5. Eccentric pinion bushing, cross section.

d. Loosen the setscrew (fig. 3-5) and remove the collar.

e. Loosen the eccentric pinion bushing setscrew and turn the eccentric pinion bushing to eliminate excessive play between pinion and gear rack and h.,1; the eccentric pinion bushing with the setscrew.

f. Replace the collar and press the wavy washer by pulling on the pinion shaft and pushing on the collar. Lock the collar with the setscrew.

e. Position the bellows actuator over the mounting holes and secure it to the panel with the three screws.

h. Replace the CENTERING control knob (and LOCK ↑ record lever lock on the cardio assembly) and tighten the screws.

i. Replacement the pneumo assembly (para 3-8).

3-18. Cleaning the Jewel Screws Bridge and Cradle

(figs. 3-4 and 3-6)

The procedures given below apply to both the pneumo and the cardio jewel screws.

CAUTION

Do not remove the jewel screw from the bridge or the dovetail slide.

a. Remove the assembly (para 3-7).

b. Remove the bridge mounting screws and remove the bridge.

c. Lift the pivot shaft from the cradle jewel screw about l/8 inch and gently wash jewel screws, bridge, and pivot shaft with alcohol or equivalent solvent.

d. Dry the jewel screws, the pivot shaft, the bridge, and the dovetail slide; use low-pressure compressed air or the hand pump bulb.

CAUTION

Do not lubricate any part of the jewel screws or pivot shaft as the lubricant will accumulate dirt and dust and damage the jewel bearings and the pivot shaft.

e. Position the bridge on the bridge spacers and check that the pivot shaft rests in both jewel screws.

f. Secure the bridge to the bridge spacers with screws.

g. Replace the assembly (para 3-8).

3-19. Removal and Replacement of Pneumo and Cardio Bridge Jewel Screws

(figs. 3-4 and 3-6)

The procedures given in a and b below apply to both the pneumo and cardio bridge jewel screws.

a. Removal.

(1) Remove the assembly (para 3-7).

(2) Loosen the locknut on the jewel screw, and unscrew the jewel screw from the bridge.

(3) Remove the locknut from the jewel screw.

b. Replacement

(1) Install the locknut on a new jewel screw.

(2) Carefully screw and hand-tighten the jewel screw into the bridge so that the pivot shaft rests in both jewel screws.

(3) Adjust the jewel screw (para 3-20c); hold the jewel screw with a small screwdriver and tighten the locknut on the jewel screw.

(4) Replace the assembly (para 3-8).

3-20. Adjustment of the Pneumo and Cardio Bridge Jewel Screws

(figs. 3-4 and 3-6)

The procedure for adjusting the jewel screw in the pneumo assembly is the same as that for the cardio assembly. Therefore only the procedure for adjusting the jewel screw in the pneumo assembly is given below.

a. Remove the assembly (para 3-7).

b. Loose the locknut on the jewel screw.

CAUTION

Always leave some play between the pivot shaft and the jewel screws. Tightening the jewel screw to the point where there is no play may result in a cracked jewel screw and a scored pivot shaft.

c. Adjust (turn with a screwdriver) the jewel screw so that there is a free movement of the pivot shaft but with a minimum amount of back and-forth and up-and-down movement.

d. Hold the jewel screw with a screwdriver and tighten the locknut on the jewel screw.

e. Replace the assembly (para 3-8).

3-21. Removal and Replacement of the Pneumo and Cardio Cradle Jewel Screws

(figs. 3-4 and 3-6)

Except as indicated, the procedures given in a and b below apply to both the pneumo and cardio jewel screws.

a. Removal.

(1) Remove the assembly (para 3-7).

(2) Loosen the setscrew and remove the CENTERING control knob (and LOCK ↑ record lever knob) on the cardio assembly.

(3) Remove the three screws that secure the bellows actuator (dovetail slide) to the panel.

(4) Remove the bridge mounting screws and remove the bridge.

CAUTION

Do not drop the small spacer when the pivot arm is removed.

(5) Loosen the pivot arm screw and remove the pivot arm.

(6) Remove the pivot shaft and the cradle assembly.

(7) Loosen the locknut on the cradle jewel screw and unscrew the jewel screw from the dovetail slide.

(8) Remove the locknut from the jewel screw.

b. Replacement.

(1) Install the locknut on a new jewel screw.

(2) Carefully screw the jewel screw into the dovetail slide so that the slotted end of the jewel screw is flush with or just below the slide mounting surface.

(3) Install the pivot shaft and the cradle assembly.

(4) Back-off the bridge jewel screw about 1/16 inch and secure the bridge with the mounting screws to the bridge spacers.

(5) Slide the pivot arm into the pivot shaft and tighten lightly by means of pivot arm screw.

(6) Carefully screw the bridge jewel screw into the bridge insuring that the pivot shaft rests in both jewel screws.

(7) Adjust the bridge jewel screw (para 320c) Hold the jewel screw with a screwdriver and tighten the locknut on the jewel screw.

(8) Adjust the pivot arm (para 3-22).

(9) Replace the assembly (para 3-8).

3-22. Adjustment of Pneumo and Cardio Pivot Arm

(figs. 3-4 and 3-6)

The pivot arm adjustment is the same for the pneumo and the cardio assemblies.

(1) Remove the assembly (para 3-7).

(2) Loosen the pivot arm screw and slide the pivot arm out to decrease sensitivity, move in towards the pivot arm screw to increase sensitivity (para 1-5*c* and *d*, TM 11-6695-210-12).

(3) When adjustment is satisfactory, lock pivot arm screw.

(4) Replace the assembly (para 3-8).

3-23. Removal and Replacement of Pneumo and Cardio Pivot Shaft

(figs. 3-4 and 3-6)

Except as indicated, the procedures given in a and b below apply to both the pneumo and the cardio pivot shaft.

a Removal.

(1) Remove the assembly (para 3-7).

CAUTION

Do not drop the small spacer when the pivot arm is removed.

(2) Loosen the pivot arm screw and remove the pivot arm.

(3) Loosen the locknut on the bridge jewel screw. and back off the jewel screw about 1/'16 inch.

(4) Remove the bridge mounting screws and remove the bridge.

(5) Note the position of the pivot shaft and orientation of the cradle lockscrew on the pivot shaft and then remove the pivot shaft assembly.

(6) loosen the cradle lock screw and remove the cradle from the pivot shaft. (Measure the position of the cradle on the pivot shaft.)

b. Replacement.

(1) Place the cradle in the same position as noted in a(c)(above and lock it with a cradle lock screw.

(2) Install and orient the pivot shaft assembly) in the same position as noted in a(5) above.

CAUTION

Always some play between the pivot shaft and the jewel screws. Tightening the jewel screw to the point where there is no play may result in a cracked jewel screw and a scored pivot shaft.

(3) Install the bridge and carefully screw the bridge jewel screw into the bridge insuring that the pivot shaft rests in both jewel screws.

(4) Install pivot arm and tighten lightly with pivot arm screw.

(5) Adjust jewel screw (para 3-20); adjust pivot arm (para 3-22).

((6) Replace the assembly (para 3-8).

3-24. Adjustment of Pen Travel

Pen travel limiting screws are preadjusted and sealed during manufacturing and should not required read adjustment during the life of the equipment If the travel limiting screws are accidentally disturbed, readjust the screws as described in a and b below.

a. Pnuemo or Cardio Assembly Pen Travel Adjustment (figs. 3-4 and 3-6).

(1) Remove the pneumo or the cardio assembly (para 3-7).

(2) Adjust pen travel limiting screws and check the pen travel adjustment by placing the assembly in respective opening in the polygraph. Limits of pen travel are given in TM 11-6695-203-15 (para 1-5c and c).

(3) Remove the assembly and seal (with glyptal or equivalent) the travel limiting screws if the adjustment was acceptable; if the pen travel was not properly limited, repeat procedures (1) and (2) above.

(4) Replace the assembly (para 3-8).

b. Galvo Assembly Pen Travel Adjustment (fig 3-9).

(1) Remove the galvo assembly (para 3-7).

CAUTION

Do not screw the pen travel limiting screws more than 1/16 inch below the surface of the)back plate. If the screws are turned in 1: 8 inch they will fall into the galvo coil assembly and cause damage to the coil movement.

(2) Adjust the pen travel limiting screws and check the pen travel adjustment by placing the assembly in the respective opening in the polygraph. Limits of pen travel are given in TM 11-6695-203-12.

(3) Repeat procedures in a (3) and (4}) above.

3-25. Removal and Replacement of Cradle

(fig. 3-9)

To remove and replace the pneumo or cardio cradle follow procedures of paragraph 3-23. To remove and replace the galvo cradle proceed to a and b below.

a. Removal.

(1) Remove the galvo assembly (para 3-7).

(2) Loosen the cradle lock screw and remove the cradle from the shaft.

NOTE

Insert thin shaft screwdriver under panel as shown in figure 3-9. Be careful not to damage screw head in process of removal or replacement. Replace screw if head should be damaged.

b. Replacement.

(1) Install a new cradle on the shaft and push (down gently until the cradle hub contacts the galvanometer D'Arsonval movement protective cap.

NOTE

Do not exert excessive pressure on the gal) shaft in the above procedure as it may overload bearings and cause damage to the galvo movement.

(2) up the cradle, lock the cradle lock screw

lightly and test for proper alignment by placing the assembly in the polygraph. The alignment is correct when the galvo pen centers on the galvo index line.

NOTE

Access to the cradle lock screw is possible with the panel unit installed. Tilt the assembly far enough to insert the screwdriver and perform the adjustments in b(2) above.

(3) If the alignment is correct, tighten the cradle lock screw and install the assembly (para 3-8). If the pen is off-center from the galvo index line repeat procedures (1) and (2) above.

3-26. Adjustment of Cardio Cradle Lock Arm (fig. 3-6)

The cradle lock arm requires adjustment after replacement of the cardio bellows actuator and also whenever the LOCK ↑ record lever setscrew becomes loose. The procedure for either case is the same.

a. Remove the assembly (para 3-7).

b. Loosen the LOCK ↑ record lever knob setscrew.

c. Push the cradle lock arm till it rests against the bridge spacer.

d. Turn the LOCK ↑ record lever knob in direction of the arrow on the knob till the pin in the know hits the stop. Lock the LOCK record lever knob in this position with a setscrew.

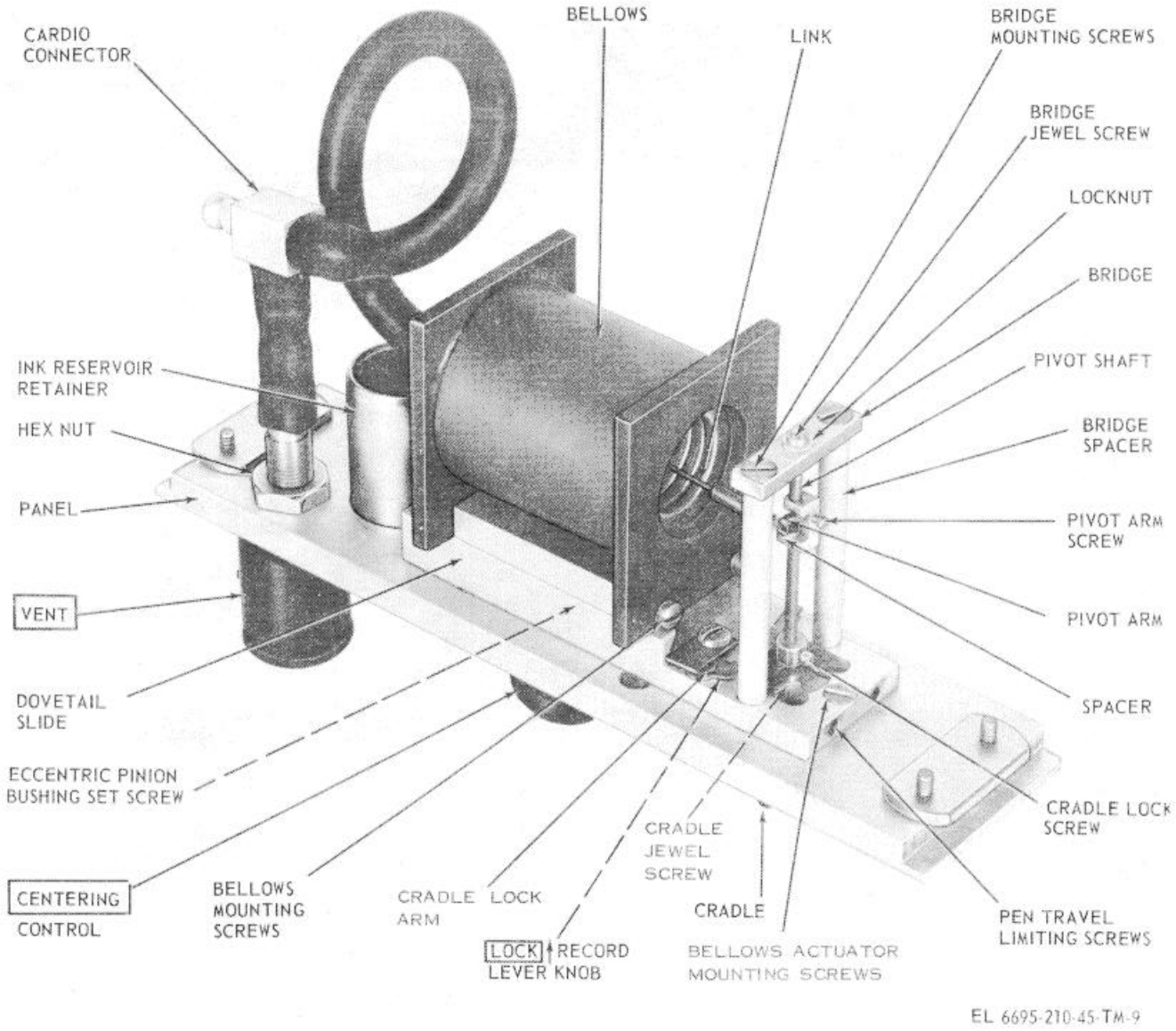


Figure 3-6. Cardio assembly 1A3, parts location.

c. Check the cradle lock arm for proper action. In LOCK ↑ position the cradle should be immobilized with minimum play between the lever and the cradle. In open position the arm should retract and permit full swing of the galvo pen.

3-27. Disassembly and assembly of Chart-Drive (fig. 3-7)

NOTE

Disassemble the chart-drive only to the point required to replace or repair a part.

a Disassembly.

(1) Remove the chart-drive from the polygraph (para 3-7).

(2) Tag and unsolder the leads of chart-drive switch 1A2S1 from chart-drive connector 1A2J1.

(3) Remove the nut that secures 1A2S1 to the mounting plate and remove the switch (note orientation of the switch).

(4) Remove the screws (not shown) that secure chart-drive motor 1A2A1B1 to the motor mounting block, and remove the motor.

(5) Release the pressure roller spring (fig. 3-8)by- loosening and advancing two hexagonal nuts toward the writing table and when tension on the spring is released, unlock the spring.

(6) Remove the two screws that secure the motor mounting block to the writing table and remove the mounting block together with the friction drive wheel.

(7) Remove the collar by means of the setscrew from the friction drive wheel shaft and push out the friction drive wheel together with the shaft from the ball bearings.

NOTE

It may be necessary to drive the friction drive wheel from the shaft by use of hammer and drift pin.

(8) Push out two ball bearings from the motor mounting block.

(9) Carefully push out, with a hand press or

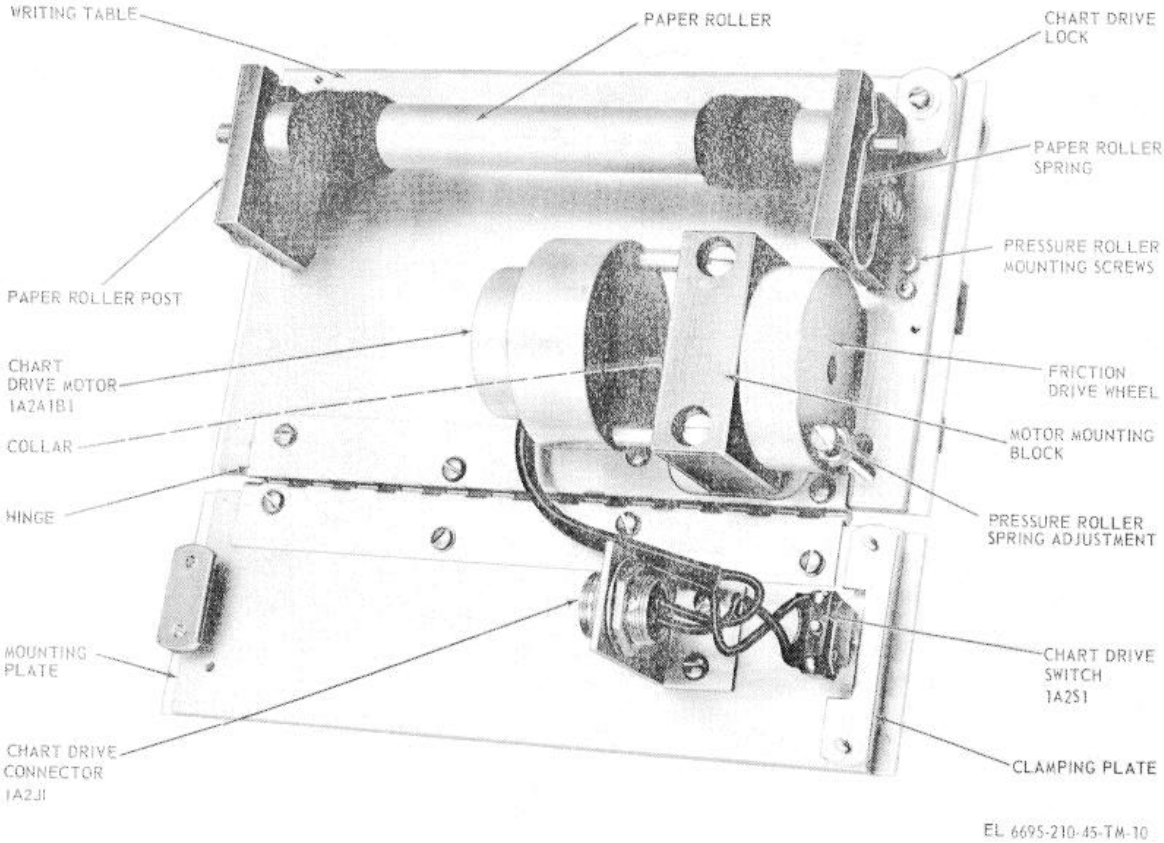


Figure 3-7. Chart-drive assembly 1A1, parts location.

equivalent, the drive wheel shaft from the friction drive wheel.

(10) Remove the screws and the lockwashers that secure the hinge to the writing table and the mounting plate and remove the hinge.

(11) Remove the pressure roller mounting screws and washers and remove the pressure roller assembly.

(12) Remove the screw and washer on the pressure roller side (fig. 3-8) and slide off the pressure roller.

(13) Remove the screw on the bottom of the chart-drive lock and remove the lock.

(14) Remove the four screws that secure the two paper guides (top of the chart-drive) and remove the paper guides and the paper flattening roller mounted between the two paper guides.

(15) Remove the four screws (two on each side) and remove both paper roller posts.

NOTE

To remove the paper roller post only, perform (1), (5), (11), (13), and (14) above.

(16) Remove the two screws that secure the paper roller spring and remove the paper roller spring and the spring retaining block.

b. Assembly.

(1) Place notched paper roller post on the chart-drive lock side and the plain paper roller post on the opposite side. Secure the paper roller posts with flathead screws.

(2) Secure the paper roller springs to the paper roller posts. Insert the paper roller and adjust the paper roller springs. The springs are correctly adjusted when the paper roller is retained in the slots without perceptible play and is free to rotate. Put the paper roller in and out several times and check the above adjustment.

(3) Place the paper flattening roller in holes in the paper guides and secure the paper guides to the writing table with screws. When the chartdrive is placed in operating position the roller should rest on the writing table and rotate freely.

(4) Press the drive shaft (with a hand press or equivalent) into the friction drive wheel. Push the ball bearings into the motor mounting block, insert the drive wheel assembly into the bearings and secure the shaft with the collar. The drive wheel should rotate freely without end play.

(5) Insert the motor shaft into the slots in the drive wheel shaft, line up chart-drive motor 1A2A1B1 and secure it to the motor mounting block, on spacers, with the screws and the lockwashers.

CAUTION

Do not attempt to turn the friction drive wheel by hand as the gears in the motor gear box may be stripped.

(6) Connect the motor leads to 115 VAC, 60 Hz and observe behavior of the chart-drive under light finger load on the friction drive wheel. If the chart drive motor operates properly, line up the motor mounting block at 90 o to the leading edge of the writing table and secure it with the two screws.

(7) Insert and secure the chart-drive block.

(8) Assemble the pressure roller, line up the pressure roller arm parallel to the direction of the paper movement and secure it to the writing table with screws and lockwashers.

(9) Attach the pressure roller spring to the pressure roller arm with a screw. Adjust the spring tension and check it with a tension scale hooked at the attachment of the spring on the pressure roller arm. The tension should be 56 $\pm$ 8 oz with the pressure roller pulled up approximately 1/32 inch above the friction drive wheel (fig. 3-8). Lock the pressure roller adjustment by jamming the adjustment nuts.

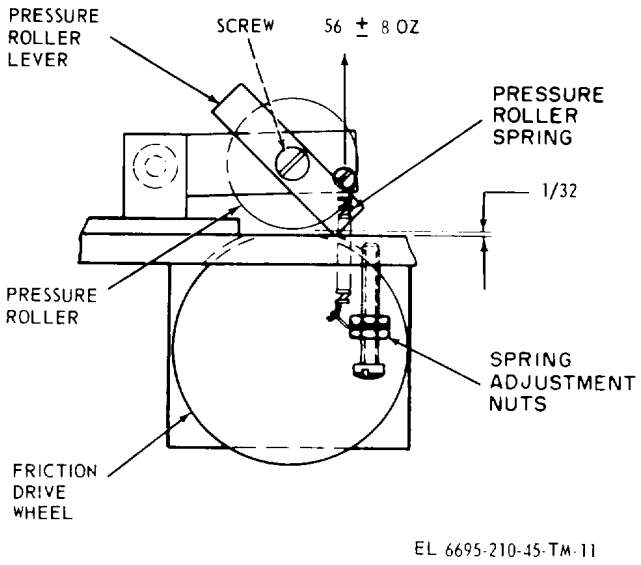


Figure 3-8. Pressure roller adjustment.

(10) Assemble the hinge to the writing table and to the mounting plate with the screws and the lockwashers handtight. Line up edges of the writing table and the mounting plate and tighten the hinge screws.

(11) Position the switch, in the mounting plate, and secure it with the nut.

(12) Solder leads to switch 1A2Sl from chartdrive connector 1A2J1.

(13) Install the chart-drive in the polygraph (para 3-8).

3-28. Removal and Replacement of Power Supply or gsr Amplifier Printed Circuit Board

(fig. 3-2)

The procedures given in a and b below apply to both the power supply and the amplifier printed circuit boards.

a. Removal.

(1) Remove 1A1W2P1 from 1A5J1.

(2) Remove gsr amplifier assembly 1A5 (para 3-7).

(3) Remove the two board retaining screws lockwashers, and spacers that secure each printed circuit board to the sideplate and pluck out the board.

b. Replacement.

(1) Plug in the board into its respective connector. Position the board over retaining screw holes, place spacers between sideplate and printed circuit board and secure the board with the screws and the lockwashers.

(2) Install the gsr amplifier assembly in the polygraph (para 3-8).

3-29. Removal and Replacement of Pip Switches

(fig. 3-2)

a. Removal.

(1) Remove gsr amplifier assembly 1A5 (para 3-7).

(2) Tag and unsolder the jumper, the wire, and the resistors from the pip switch which is to be removed.

(3) Unscrew the pip switch with a pair of pliers.

b. Replacement.

(1) Apply "loctite" to the thread of the new pip switch and screw it into the panel.

(2) Orient the pip switch in the original position, connect the jumper, the wire, and the resistors and solder.

(3) Install the gsr amplifier assembly in the polygraph (para 3-8).

3-30. Removal and Replacement of Galvo Printed Circuit Board 1A6A1

(fig. 3-9)

NOTE

If the printed circuit board is not damaged, change defective parts on the galvo printed circuit board without unsoldering the wires from the galvo printed circuit board.

a. Removal.

(1) Remove the galvo assembly (para 3-7).

(2) Tag and unsolder the galvanometer interconnecting wires and the wires from 1A6J1 from galvo printed circuit board 1A6A1.

(3) Remove the two screws and lockwashers that secure 1A6A1 to the galvo assembly top panel and remove the board.

b. Replacement.

(1) Secure galvo printed circuit board 1A6A1 to the assembly panel with the screws and the lockwashers.

(2) Connect and solder wires to the appropriate terminals.

(3) Install the galvo assembly in the polygraph (para 3-8).

3-31. Removal and Replacement of Galvanometer 1A6U1

(fig. 3-9)

a. Removal.

(1) Remove the galvo assembly (para 3-7).

(2) Tag and unsolder the galvanometer wires from printed circuit board lA6A1.

NOTE

Wire terminals on printed circuit board 1A6A1 are not marked on equipment. Use terminal numbers illustrated in figure 3-9 for identification.

(3) Remove the four screws that secure the galvanometer to the galvo assembly top panel and remove the galvanometer.

b. Replacement.

(1) Orient the galvanometer on the top panel (wires toward printed circuit board lA6A1) and secure it to the top panel with the four screws.

(2) Connect and solder the galvanometer wires to the appropriate terminals on printed board 1A6A1.

(3) Install the galvo assembly in the polygraph (para 3-8).

3-32. Alignment of gsr System

NOTE

After replacement of any of the major components of the gsr amplifier system the following procedure must be performed for proper operation of the system.

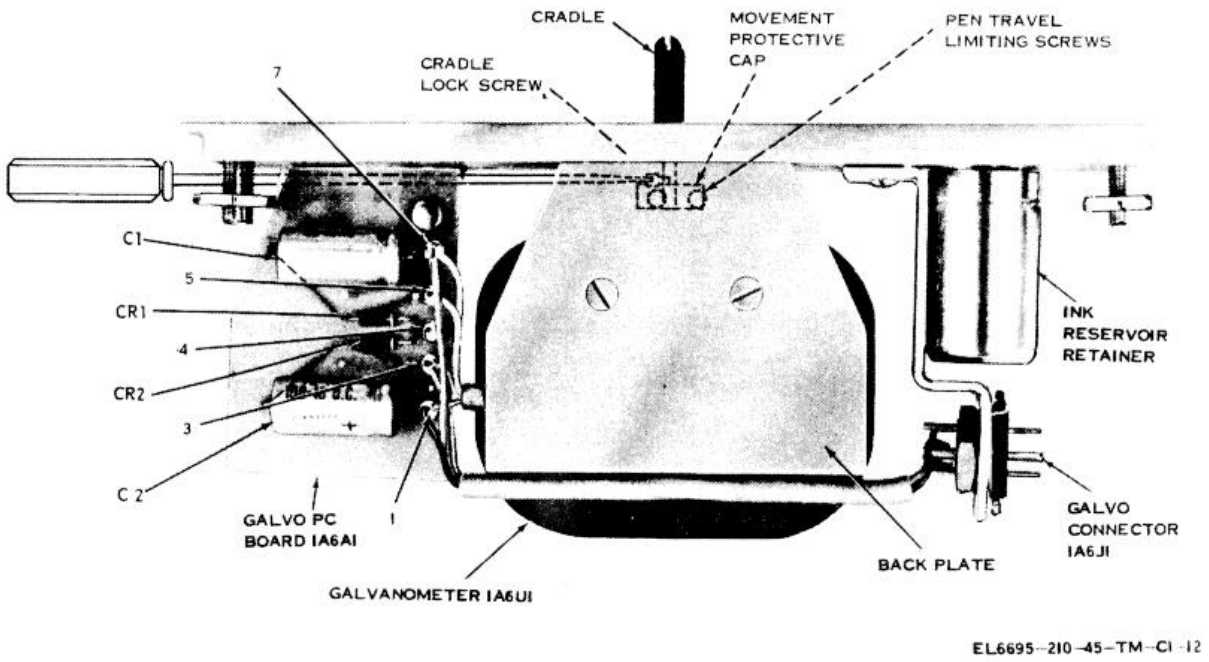


Figure 3-9. Galvo assembly 1A6, parts location

a. Remove the gsr amplifier assembly from the polygraph (para 3-7) but do not disconnect 1A1W2P1 from lA5Jl (fig. 3-2).

b. Connect finger electrode assembly 1A8 to finger electrode connector 1AIJ1 and apply the 47 K resistor (para 3-3).

c. Set SENSITIVITY control 1A5R4 at 0 (low); the galvo pen should be at the gsr index line.

d. Set gsr power switch 1AISI (fig. 3-1) to ON.

e. Connect the positive lead of the multimeter to the emitter of 1A5A3Q5 and adjust galvo current adj. control 1A5A3R26 (fig. 4-4) for a 0.94 vdc indication.

f. Set SENSITIVITY control 1A5R4 (fig. 3-2) fully clockwise and mode switch 1A5S3 to AUTO; the pen may move up or down from the gsr index line.

g. Adjust chopper bal. adj. control 1A5A3R8 (fig. 4-4) so that the galvo pen is returned to the gsr index line.

h. Set mode switch 1A5S3 (fig. 3-2) in AMAN position and recenter the galvo pen with CENTERING control 1A5R1.

i. Press pip switch 1A5S2 and adjust gain range adj. control 1A5A3R16 (fig. 4-4) for a 1inch deflection of the galvo pen.

j. Recheck galvo adj. control 1A5A3R26 setting with SENSITIVITY control 1A5R4 (fig. 3-2) set at 0.

k. Set mode switch 1A5S3 to AUTO and SENSITIVITY control 1A5R4 to 100. Repeat g above.

l. Press pip switch 1A5S2 and hold. The galvo pen should rise rapidly, approximately 1 inch, and fall back to the gsr index line in 5 to 10 seconds.

NOTE

When the pen returns to gsr index line, in l above, and pip switch 1A5S2 is released, the galvo pen should fall approximately 1 inch below the gsr index line and return to the index line in 5 to 10 seconds.

Section IV. GENERAL SUPPORT TESTING PROCEDURES

3-33. General

a. Testing procedures are prepared for use by Signal field maintenance shops and Signal service organizations responsible for general support maintenance of electronic equipment to determine the acceptability of repaired equipment. These procedures set forth specific requirements that repaired equipment must meet before it is returned to the using organization. The testing procedures may also be used as a guide for the testing of electronic equipment that has been

repaired at the organizational maintenance category if the proper tools and test equipments are available.

b. Comply with the instructions preceding the body of each chart before proceeding to the chart.

Perform each test in sequence; do not vary the sequence. For each step, perform all actions required in the Control settings column: then perform each specific test procedure and verify it against its performance standard.

c. Perform all applicable modification work orders pertaining to this unit before making the specified tests. DA Pam 25-30 lists all available MWO's.

3-34. Polygraph Tests

a. Test Equipment and Materials.

(1) Weight, 1 pound.

(2) Ruler, 12 inch.

(3) Tension scale, 0-64 ounces.

(4) Cylindrical object (strong mailing tube or equivalent), 6 inches long, 4 inches diameter.

b. Test Connections. Connect the test equipment and the polygraph as shown in figure 3-10.

NOTE

Testing is simplified if connections and settings are made initially and modifications are made as required for the tests.

c. Preliminary Procedures.

(1) Prepare the unit for operation (TM 11-6695-210-12).

(2) Wrap the arm cuff around the cylindrical

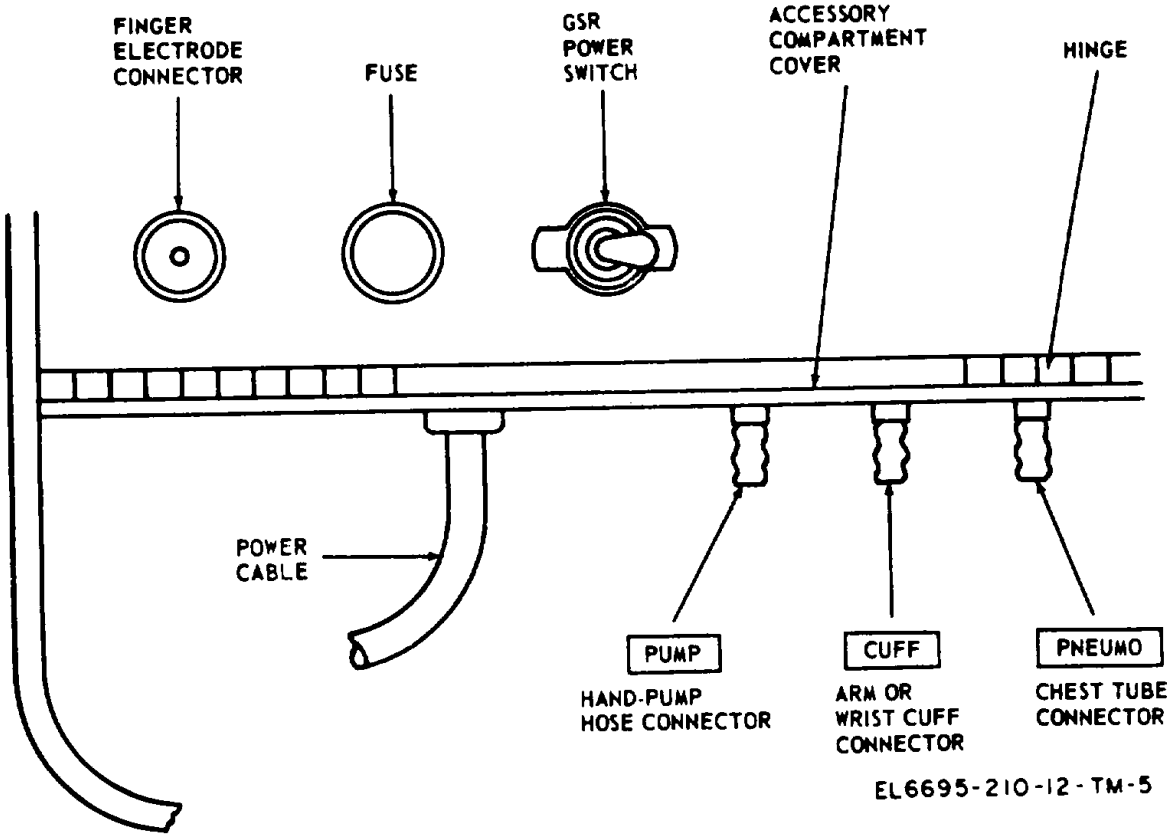


Figure 3-10. Accessory compartment connectors.

object and secure it by pressing firmly to insure proper interlocking of the "hooked" and the "wrapped" section of the closure. Smooth any folds out of the cuff so that it is wrapped flat.

(3) Connect the finger electrode assembly to the finger electrode connector on the top panel.

(4) Place the chest tube by a ruler (fig. 3-10).

d. Procedure.

Step No.	Control settings: Test equipment	Control settings: Equipment under test	Test procedure	Performance standard
1	N/A ----------	N/A ----------	Place 1-pound weight in center of chart paper near paper flattening roller.	None. a
2	N/A ----------	N/A ----------	Set chart-drive switch to on (left) and lower pressure roller (fig. 3-8) by means of pressure roller lever	Chart paper moves smoothly, without binding ing, at rate of 6 inches per minute
3	N/A ----------	N/A ----------	Set chart-drive switch to off (right) ----------	Chart stops moving.
4	N/A ----------	N/A ----------	Set chart-drive switch to on (left) ----------	Chart moves.
5	N/A ----------	N/A ----------	Close pneumo VENT (pushbutton raised) ----------	None.
6	N/A ----------	N/A ----------	Turn pneumo CENTERING control fully clockwise ------	Pneumo pen tip moves up approximately- 1/8 inch above the pneumo index line.
	N/A ----------	N/A ----------	Turn pneumo CENTERING control fully counterclock- wise	Pneumo pen tip moves down approxima- tely 11/8 inch below the pneumo index line.
7	N/A ----------	N/A ----------	Center pneumo pen with CENTERING control on the pneumo index line.	Pneumo pen traces a straight line.
8	N/A ----------	N/A ----------	Extend chest tube 14 inch ----------	Pneumo moves 1 inch above the pneumo index line.
9	N/A ----------	N/A ----------	Hold chest tube extended 1/4 inch for 30 seconds --------	Pneumo pen should not drop more than- 1/4 inch toward the pneumo index line.
10	N/A ----------	N/A ----------	Open pneumo VEN ---------- *CAUTION*: Do not exceed 150-mm Hg pressure or this may damage the equipment.	Pneumo pen moves to pneumo index line.
11	N/A ----------	N/A ----------	Close cardio VENT (pushbutton raised ----------	None.
12	N/A ----------	N/A ----------	Move LOCK ↑ record lever in direction of arrow ----------	Cardio pen is immobilized.
13	N/A ----------	N/A ----------	Close pump release valve and pressurize the system to about 90 mm Hg. Close rubber hose near the hand pump bulb with the pinch clamp.	Pressure does not drop.
14	N/A----------	N/A----------	Release LOCK ↓ record lever (move in direction oppo-- site to arrow).	None.
15	N/A----------	N/A ----------	Turn cardio CENTERING control fully clockwise ---------	Cardio pen moves up approximately 1%1 inch above the cardio index line.
16	N/A ----------	N/A ----------	Turn cardio CENTERING control fully counterclock- wise	Cardio pen tip moves down approximately 1% inch be- low the cardio index line.
17	N/A ----------	N/A ----------	Center cardio pen with CENTERING control on cardio index line.	Cardio pen traces a straight line.
18	N/A ----------	N/A ----------	Increase pressure by 2 mm Hg., by gently squeezing the cuff	Cardio pen moves at least 3% inch above the cardio in- dex line.
19	N/A ----------	N/A ----------	Release the cuff ----------	Cardio pen returns to the cardio index line.
20	N/A ----------	N/A ----------	Set chart drive switch to off (right) ----------	Chart stops moving.
21	N/A ----------	N/A ----------	Move LOCK ↑ record lever in direction of arrow ----------	None.
22	N/A ----------	N/A ----------	Open cardio VENT ----------	None.

23	N/A ----------	N/A ----------	Replace arm cuff with wrist cuff and repeat steps 11 through 22 above.	Performance should be as stated in Steps 11 through 22 above.
24	N/A ----------	N/A ----------	Set chart drive switch to on (left) ----------	Chart paper moves smoothly.
25	N/A ----------	Controls may be in any position.	a. Set gsr power switch to OFF ---------- b. Set SENSITIVITY control to 0. c. Set mode switch to MAN.	Galvo pen rests on the gsr index line.
26	N/A ----------	N/A ----------	a. Set gsr power switch to ON ---------- b. Short finger electrodes by holding plates together. c. Set SENSITIVITY control to 25. d. Set CENTERING control in midposition.	Galvo pen moves up above the gsr index line.
27	N/A ----------	N/A ----------	a. Bring galvo pen to gsr index line by means of gsr CENTERING control. b. Set SENSITIVITY control to 100 and repeat procedure a above. c. Press 1K pip switch and hold.	Galvo pen moves above the gsr index line 1 t+ 4 inch.
28	N/A ----------	N/A ----------	Release 1 K pip switch ----------	Galvo pen returns to gsr index line.
29	N/A ----------	N/A ----------	Set mode switch to AUTO ----------	Galvo pen rests within y4 inch above or below gsr index line.
30	N/A ----------	N/A ----------	a. Press 1 K pip switch and hold ---------- b. Release 1 K pip switch ----------	a. Galvo pen rises rapidly, approximately 1 inch, and returns to gsr index line in 5 to 10 seconds. b. Galvo pen moves down approximately 1 inch and returns to gsr index line in 5 to 10 seconds.
31	N/A ----------	N/A ----------	Rotate gsr CENTERING control clockwise ----------	Galvo pen follows rotation of gsr CENTERING control.
32	N/A ----------	N/A ----------	a. Center galvo pen on gsr index line ---------- b. Set mode switch to MAN. c. Remove short finger electrodes by separating the electrodes.	Galvo pen moves to the bottom of the chart paper.
33	N/A ----------	N/A ----------	Short finger electrodes ----------	Galvo pen returns to gsr index line.
34	N/A ----------	N/A ----------	Disconnect test setup and perform the shutdown procedures in TM 11-6695-210-12.	

CHAPTER 4

DEPOT MAINTENANCE

Section I. GENERAL TROUBLESHOOTING INFORMATION

4-1. General Instruction

Troubleshooting at depot maintenance level includes all the techniques outlined for organizational and general support maintenance. Additional techniques required to isolate a defective part in the power supply printed circuit board or the amplifier printed circuit board of the gsr amplifier assembly are included.

4-2. Test Equipment Required

Check the following list for test equipment and facilities required for troubleshooting the power supply and the amplifier printed circuit boards. Also listed are the associated technical manuals and common names.

Test equipment	Technical manual	Common name
Multimeter TS-352 B/U ----------	TM 11-6625-366-15	Multimeter
Oscilloscope OS-8C/U ----------	TM 11-1214A	Oscilloscope
Power supply 5.6 VAC 60 Hz		
Regulated power supply 20 V Reg. 100 MA.		
Auto Transformer 0-130 V, 1A.		
Power supply test fixture.		
Amplifier test fixture.		

4-3. Fabrication of Special Test Fixtures

The fixtures may be easily constructed from parts listed in a and b below and wiring information provided in figures 4-1 and 4-2.

a. Materials Required for Construction of Power. Supply Printed Circuit Board 1A5A4 Test Fixture (fig. 4-1).

Key	Federal stock No.	Qty.	Description
1	----------	1	Base, Bakelite 1/4 inch thk x 3 x 4 inch
2	----------	2	Spacer, threaded 4-40 x % inch
3	5935-824-4494	1	Connector
4	----------	4	Screw, machine 4-40 x 7/16 inch
5	----------	1	Resistor, 3,300 ohms, 12 w
6	----------	1	Barrier strip (P1) 12 points
7	----------	1	Resistor, 1,500 ohms, 1/2 W
8	----------	1	Resistor, 1,500 ohms, /2 W
			Hookup wire, stranded; red, blk, grn, vio, wht, orn, yel, blu.

b. Materials Required for Construction of Gsr Amplifier Printed Circuit Board 1A5A3 Test Fixture (fig. 4-2).

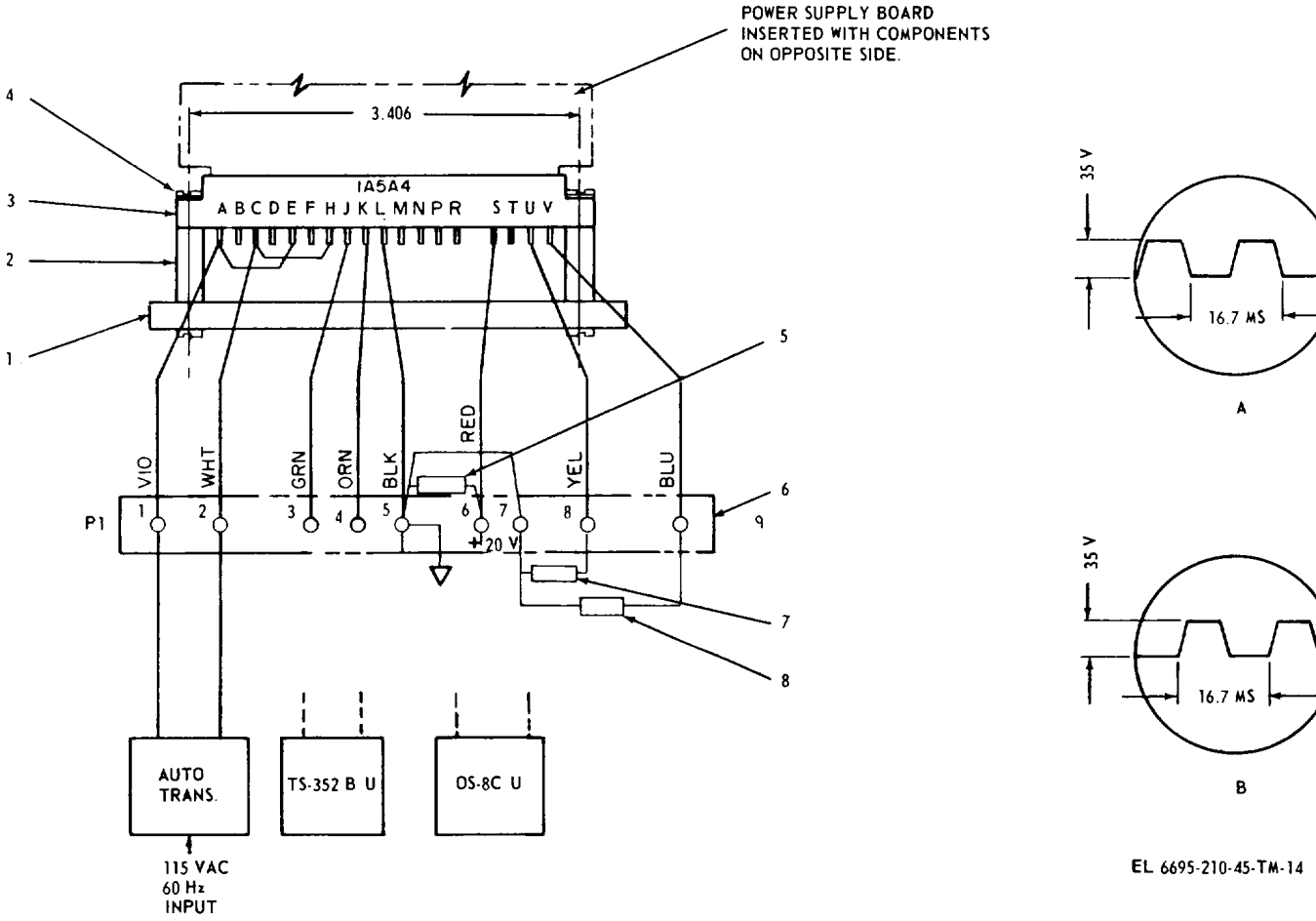


Figure 4-1. Power supply PC board 1A5A4, test fixture.

Key	Federal stock No.	Qty.	Description
1	----------	1	Pushbutton switch
2	----------	1	Resistor, 1 K, 1/2 W
3	----------	1	Resistor, 250 K, variable
4	----------	1	Base, bakelite, 1/4 inch thk x 3 x 4
5	----------	2	Spacer, threaded, 4-40 x % inch
6	5935-553-2789	1	Connector
7	----------	4	Screw, machine 4-40 x 7/16 inch
8	----------	1	Resistor, 1 K, %/ W
9	----------	1	Barrier strip, 12 points
10	----------	1	Resistor, 10 K, variable
11	----------	1	Switch, single-pole---single-throw
			Hookup wire, stranded: red, blk, grn, blu, yel, brn, wht-grn, wht-orn, wht-yel.

4-4. Modification Work Orders

Perform all applicable modification work orders pertaining to the unit before making the specified tests. DA Pam 310-7 lists all available MWO's.

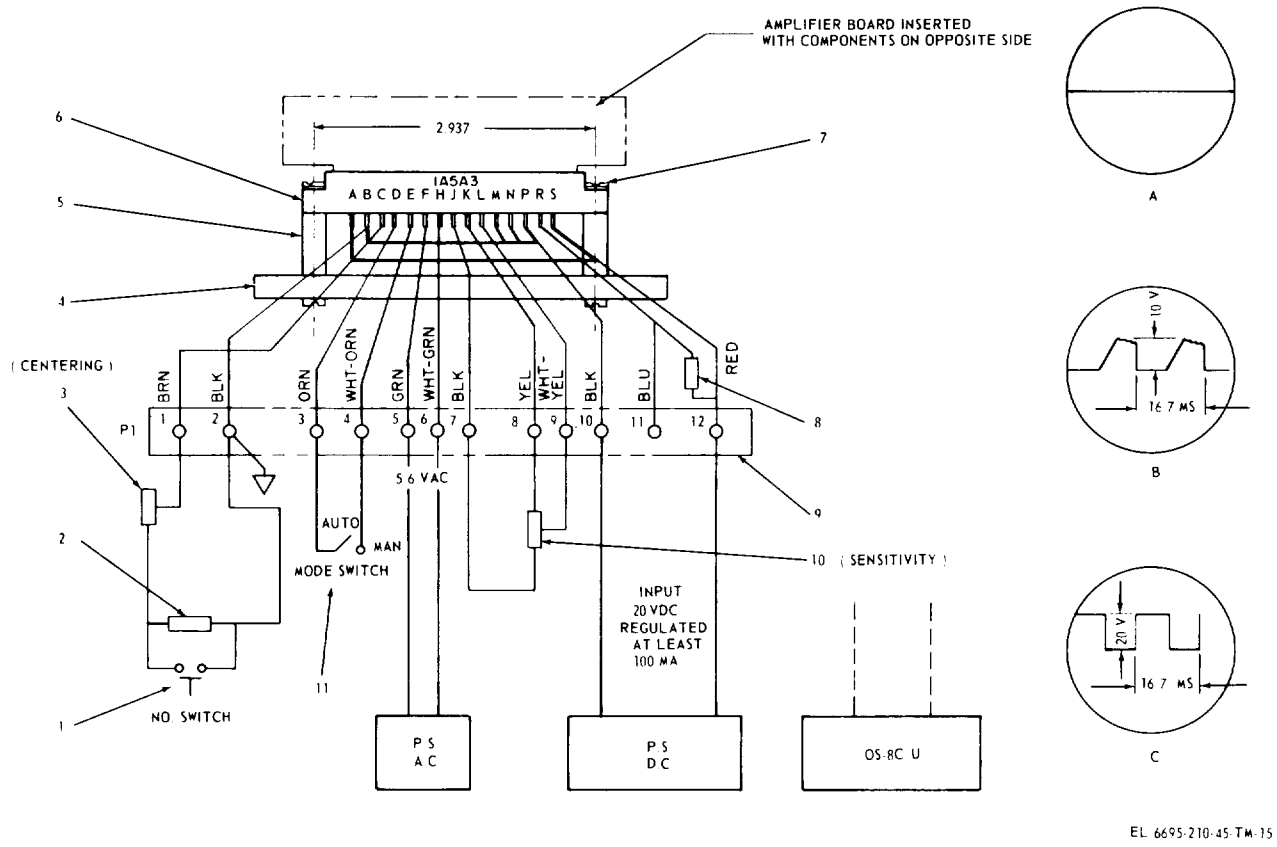


Figure 4-2. Gsr amplifier PC board 1A5A3, test fixture.

SECTION II. TROUBLESHOOTING PROCEDURES

4-5. Troubleshooting Power Supply PC Board 1A5A4

(fig. 4-3)

a. Insert power supply board into fixture 4-1). Note orientation of board in fixture.

b. Apply 115 volts ac to PI-l and 2 using the autotransformer.

c. Connect the TS-352B 'U between P1-3 and 4 and measure the voltage; output should be 5.6 volts ac.

d. Connect the TS-352B,'U between P1-5 and 6 and measure the voltage; output should be 20 volts dc.

CAUTION

Do not allow the input voltage to exceed 125 volts as the power supply may be damaged.

e. Vary the input voltage from 105 to 125 volts by means of the autotransformer control and observe the stability of the regulated dc output.

There should be to noticeable movement of the pointer of the TS-352B U multimeter.

f. Reapply 115 volts ac to P1-1 and 2, and observe the waveform with oscilloscope at. P1-8 (A, fig. 4-1) and P1-9 (B, fig. 4-1).

CAUTION

Before using the multimeter to test transistors or transistor circuits, check the open circuit voltage across the multimeter test leads. Do not use the multimeter if the open circuit voltage exceeds 1.5 volt. Do not use the RX1 range, unless specified.

g. If board 1A5A4 does not perform as described above check voltage and resistance as indicated in

schematic (fig. 5-2) and transistor V and R diagram (fig. 4-5) to isolate a defective part. The forward resistance of the diodes is 1K: the reverse resistance is infinity.
h If necessary replace defective parts and test board 1A5A4 by repeating a through f above.

4-6. Troubleshooting Gsr Amplifier PC Board 1A5A3

(fig. 4-4)

a. Insert gsr amplifier board 1A5A3 into fixture (fig. 4-2). Note orientation of board in fixture.

b. Apply 5.6 volts ac to P1-5 and 6, and apply 20 volts dc regulated to P1-10 and 12 (fig. 4-2); P1-10 is the ground bus line.

c. Rotate the sensitivity potentiometer (10) fully counterclockwise.

d. Connect the TS-352B/U between P1-10 and TP (test point) (fig. 4-4) and adjust galvo current adj. potentiometer 1A5A3R26 for 0.75 volts.

e. Set oscilloscope sensitivity to 10 volts per cm. 60 Hz internal sync and connect to P1-12 (fig.
4-2)

f. Turn the sensitivity potentiometer (10) fully clockwise.

g. Set gain range adj. potentiometer 1A5A3R16 (fig. 4-1 to midposition.

h. Set the mode switch to AUTO (fig. 4-2).

i. Adjust the chopper balance adj. potentiometer 1A5A3R8 and observe (A, fig.
4-2)

j. Set the mode switch to MIAN, adjust the centering potentiometer (2) and observe (A. fig. 4-2).

k. Press and hold the pushbutton switch (1. fig. 4-2).

l. Adjust the gain range adjust potentiometer 1A5A3R16 (fig. 4-4) and observe the wave form (B, fig. 4-2).

m. Release the pushbutton switch. Rotate the centering potentiometer (2) to obtain the waveform (C, fig. 4-2).

n. Set the mode switch to AUTO. Wave form should decay as shown in (A, fig. 4-2).

o. If board 1A5A3 does not perform as described above, check voltage and resistance as indicated on schematic (fig. 5-2), observe waveforms A through G figure 4-6, and troubleshoot as necessary using the transistor V and R diagram (fig. 4-5) to isolate a defective part. The forward resistance of the diodes is 1K the revers2 resistance is infinity.

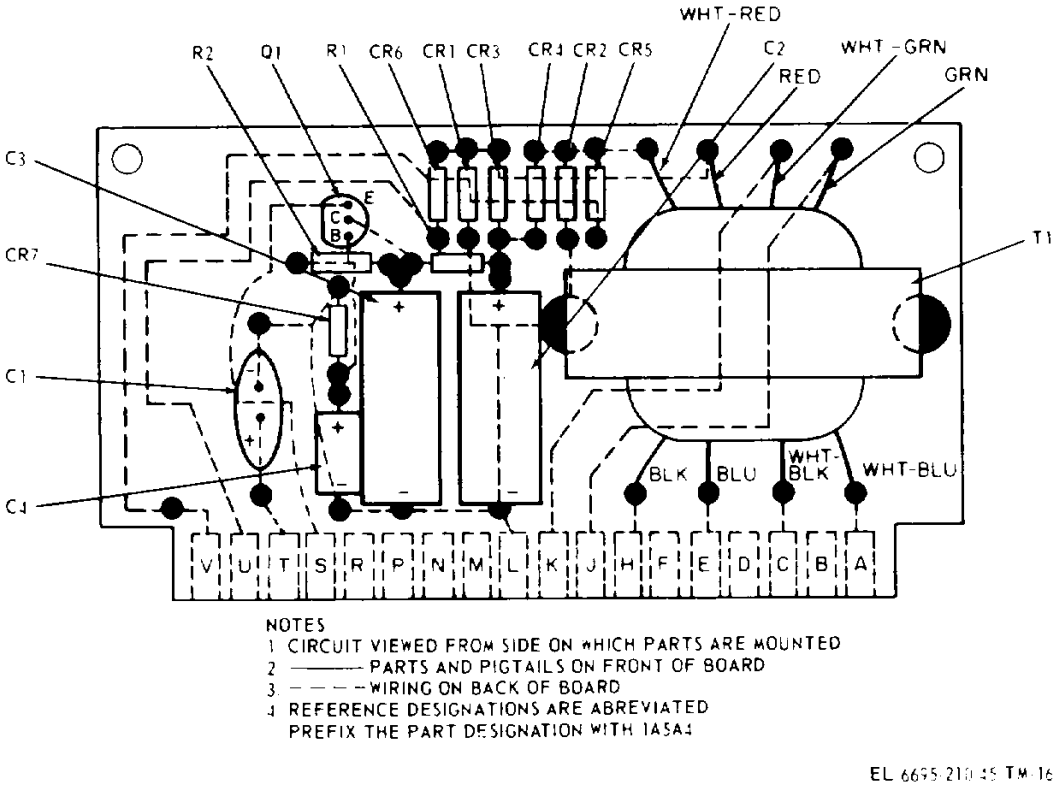


Figure 4-3. Porter supply PC board 1A5A4, ports location.

p. If necessary replace defective parts and test board 1A5A3 by repeating Steps a through n above.

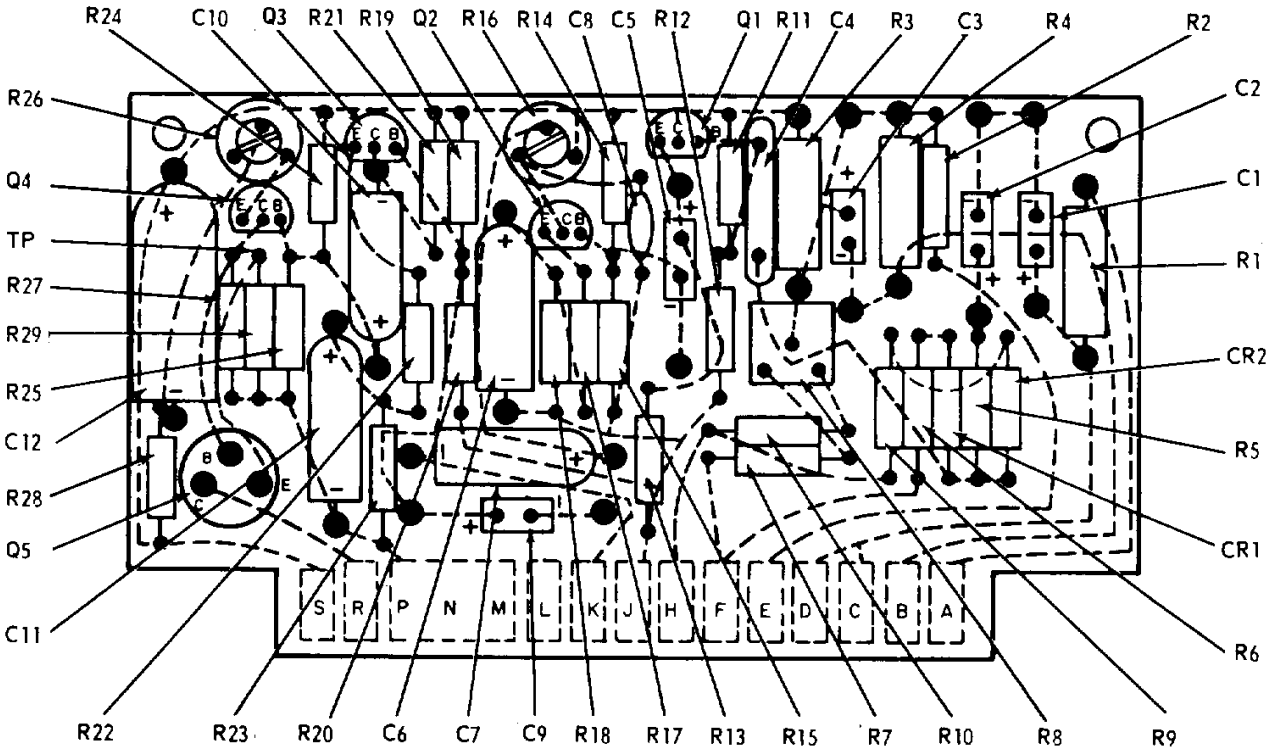
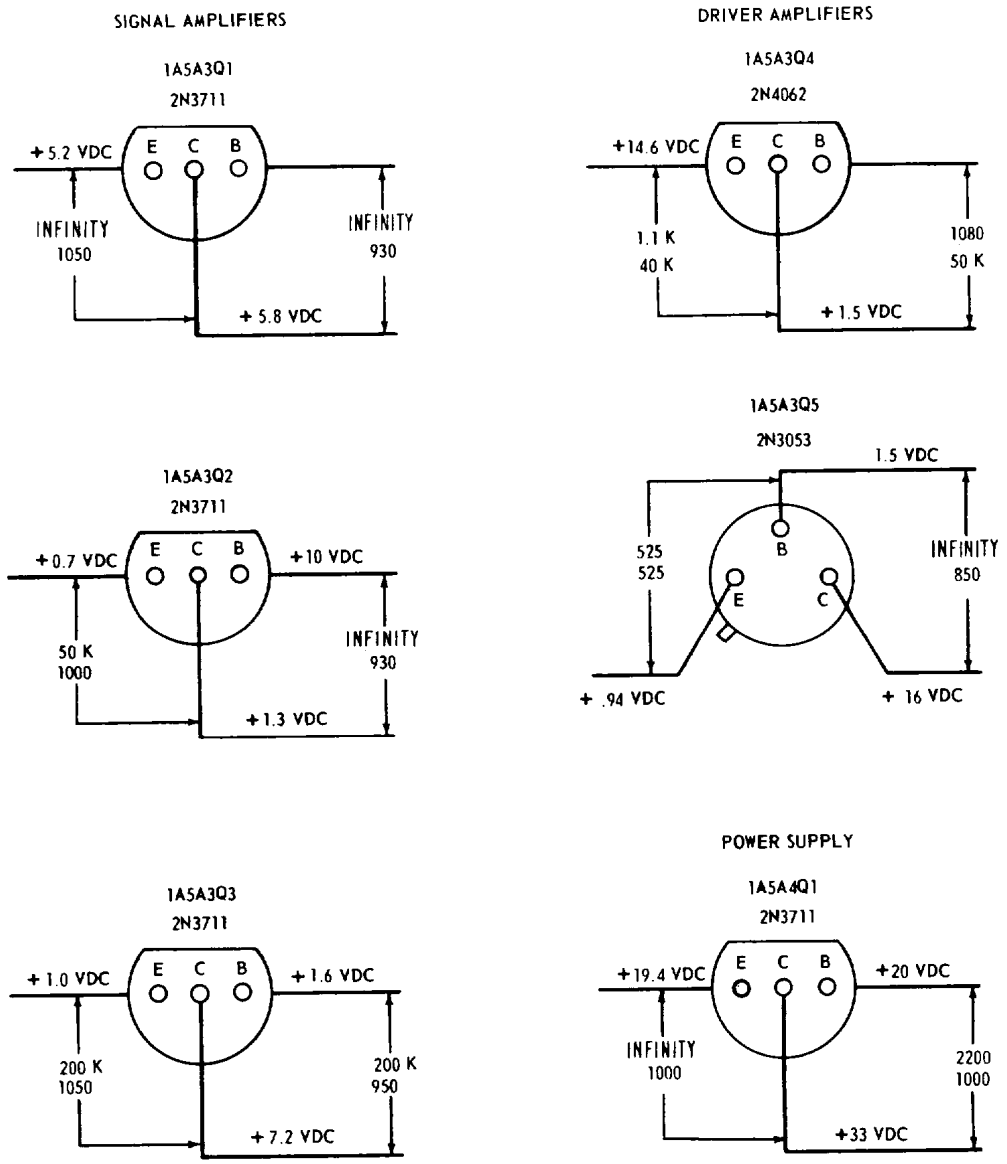


Figure 4-4. Gsr amplifier PC board 1A5A3, parts location.



NOTES

1. **ALL VOLTAGE MEASUREMENTS ARE FROM DESIGNATED TERMINALS TO CHASSIS USING MULTIMETER TS-352B U WITH 1K PIP SWITCH PRESSED.**
2. **TO MAKE RESISTANCE MEASUREMENTS, REMOVE GSR AMPLIFIER FROM EQUIPMENT MAKE MEASUREMENTS BETWEEN INDICATED TERMINALS WITH MULTIMETER TS-352 B U, RX10O RANGE.**
3. **WHERE TWO RESISTANCE READINGS BETWEEN TERMINALS ARE GIVEN, T HE TOP READING IS THE RESISTANCE MEASURED WITH THE NEGATIVE OHMMETER LEAD CONNECTED TO THE BASE, THE BOTTOM READING IS THE RESISTANCE MEASURED WITH THE POSITIVE OHMMETER LEAD CONNECTED TO THE BASE BE SURE TO CHECK THE ACTUAL POLARITY OF THE OHMMETER LEADS BEFORE MAKING MEASUREMENTS**

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Figure 4-5. Voltage resistance diagram for transistors.

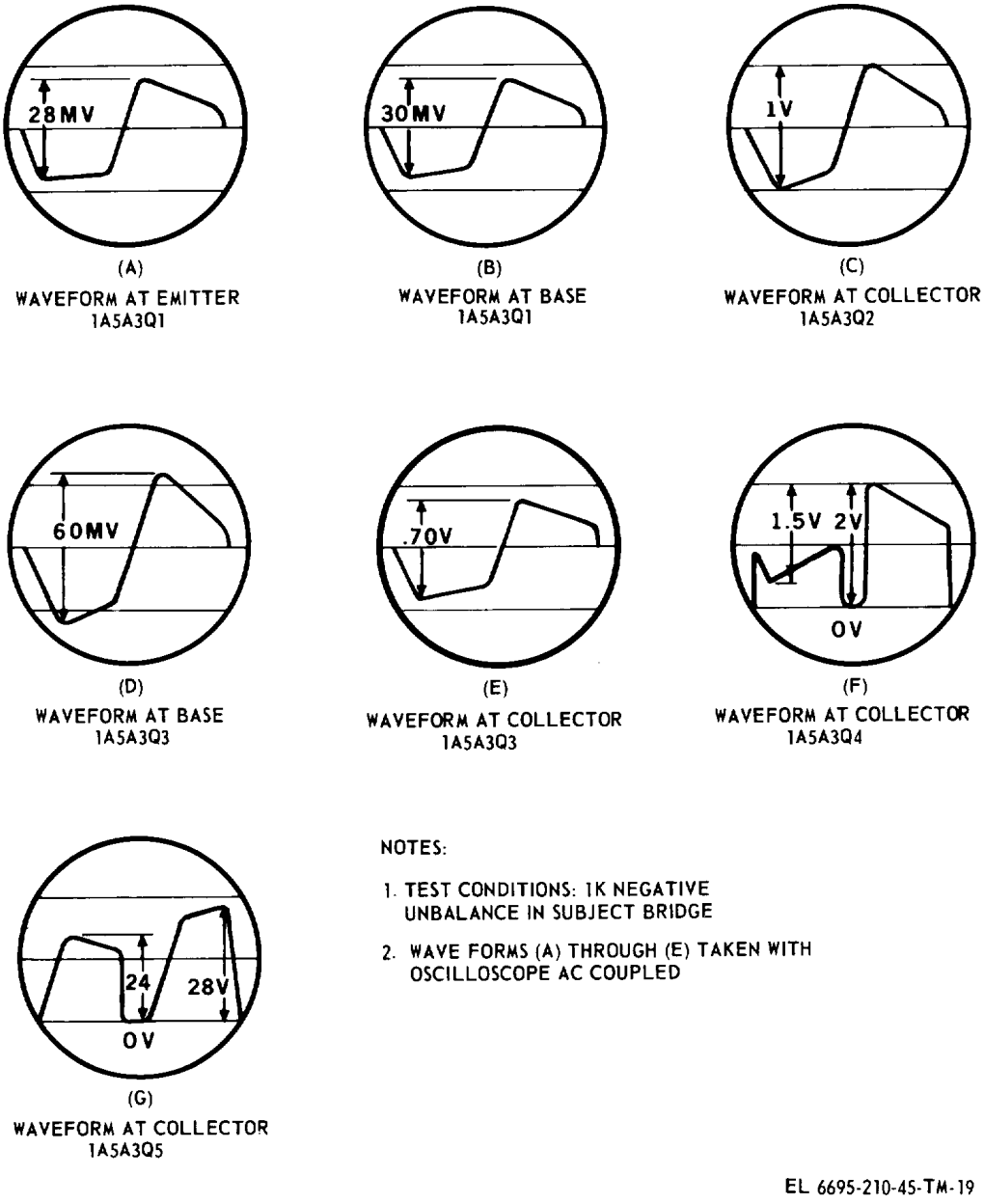

Figure 4-6. Gsr amplifier 1A5A3 waveforms.

Table 4-1. Polygraph Instrument, Recording AN/USS-2F Wire List (Less 1A5A3, 1A5A4, and 1A6U1)

Explanation of columns in table 4-1

WIRE TYPE COLUMN:	Gage of wire; where the letter "S" is used, the reference is to shielding wire.
COLOR CODE COLUMN:	Color code identification of conductor.
FROM COLUMN:	Originating point of conductor.
TO COLUMN:	Destination point of conductor.
REMARKS COLUMN:	Related information or notes.

Wire type	Color code	From--	To--	Remarks
22	Blk	1A1F1 ----------	1A1S1-1	
22	Blk	1A1F1 ----------	1A1W3P1-2	
22	Blk	1A1F1 ----------	1AAW1P11	
	Grn	1A1J1-1 ----------	1A1W2P1-A----------	Coaxia1 cab1e.
S	----------	-2 ----------	-B ----------Coaxia1 cab1e.	
22	Blk	1A1S1-1 ----------	1A1F1	
22	Blk	-1 ----------	1A1W3P1-2	
22	Wht	-2 ----------	-1	
22	Wht	-2 ----------	1A1W1P1	
22	Blk	-3 ----------	1A1W2P1-F	
22	Wht	-4 ----------	-H	
22	Blk	1A1W1P1 1AF1 ----------		
22	Wht	1A1W1P1 1A1S1-2 ----------		
22	Grn	1AW1P1 ----------	Chassis grd	
	Grn	1A1W2P1-A----------	1A1J1-1 ----------	Coaxia1 cable.
S	----------	-B ----------	-2 ----------	Coaxia1 cab1e.
S	----------	-B ----------	Chassis grd	
22	Wht-red	-C ----------	1A1W2P2-A	
22	Wht-blu	-D ----------	E	
22	Wht-blk	-E ----------	-B	
22	Blk	1A1W2P1-F----------	1A1S1-3	
22	Wht	-H ----------	-4	
	----------	-J----------	NC	
	----------	-K ----------	NC	
22	Wht-red 1A1W2P2	-A ----------	1A1W2P1-C	
22	Wht-b1k	-B ----------	-E	
		-D ----------	NC	
22	Wht-b1k	-E ----------	1. 1A1W2P1-D	
		-H ----------	NC	
22	Wht	1A1W3P1 -1----------	1A1S1-2	
22	Blk	-2----------	-1	
22	Blk	1A2A1 ----------	1A2S1	
22	Blk	1A2A1 ----------	1A2J1-1	
22	Blk	1A2J1-1 ----------	1A2A1	
22	Blk	-2----------	1A2S1	
22	Blk	1A2S1 ----------	1A2J1-2	
22	Blk	1A2S1 ----------	1A2A1	
22	Wht-vio	1A5C1+ ----------	1A5J1-H	
22	Wht-vio	1A5C1+ ----------	1A5XA4-A	
22	Blk	1A5C1- ----------	-L	
22	Blk	1A5C1- ----------	1A5XA3-B	
22	Blk	1A5C1- ----------	1A5J1-B	
22	Blk	1A5C1- ----------	1A5R4-1	
22	Wht-brn	1A5J1-A ----------	1A5R2	
22	Wht-brn	-A ----------	1A5S1	
22	Blk	-B ----------	15C1-	
22	Blk	-B ----------	1A5R4	
22	Blk	-B ----------	1A5XA3-B	
22	Blk	-B ----------	1A5XA4-L	
22	Wht-red	-C ----------	U	
22	B1u	-D ----------	T	
22	B1u	-D ----------	1AS5XA3-R	
22	Wht-b1u	-E ----------	1A5XA4-V	
22	Vio	-F----------	-C	
22	Vio	-F----------	-H	
22	Wht-vio	-H ----------	-A	
22	Wht-vio	-H ----------	-E	
22	Wht-vio	-H ----------	A5C1+	
		-J----------	NC	
		-K ----------	NC	

Wire type	Color code	From--	To--	Remarks
22	Brn 1A5R1-2	1A5XA3-C		
22	Wht-brn	-3	1A5R3	
22	Wht-brn	-3	1A5S2	
22	Wht-brn	1A5R2	1A5J1-A	
22	Wht-brn	1A5R3	1A5R1-3	
22	Blk	1A5R4-1	1A5J1-B	
22	Blk	-1	1A5XA4-L	
22	Blk	-1	1A5XA3-B	
22	Wht-yel	-2	L	
22	Yel	-3	K	
22	Wht-brn	1A5S1	1A5J1-A	
22	Wht-brn	1A5S2	1A5R1-3	
22	Orn	1A5S3-1	1A5XA3-D	
22	Wht-orn	-2	-E	
22	Red	1A5XA3-A	1A5XA3-S	
22	Red	-A	1A5XA4-S	
22	Blk	-B	-L	
22	Blk	-B	1A5J1-B	
22	Blk	-B	1A5R4-1	
22	Blk	-B	1A5XA3-J	
22		-B	-M	
22		-B	-N	
22		-B	-P	
22	Brn	-C	1A5R4-2	
22	Orn	-D	1A5S3-1	
22	Wht-orn	-E	-2	
22	Grn	-F	1A5XA4-J	
22	Grn-wht	-H	-K	
22	Blk 1A5XA3	-J	1A5XA3-B	
22	Yel	-K	1A5R4-3	
22	Wht-yel	-L	2	
22		-M	1A5XA3-B	
22		-N	-B	
22		-P	-B	
22	Blu	-R	1A5J1-D	
22	Blu	-R	1A5XA4-T	
22	Red	-S	-S	
22	Red	-S	1A5XA3-A	
22	Blk	-B	-J	
22	Wht-vio	1A5XA4-A	1A5XA4-E	
22	Wht-vio	-A	1A5J1-H	
22	Wht-vio	-A	1A5C1+	
		-B	NC	
22	Vio	-C	1A5XA4-H	
22	Vio	-C	1A5J1-F	
		-D	NC	
22	Wht-vio	-E	1A5XA4-A	
22	Wht-vio	-E	1A5J1-H	
22	Wht-vio	-E	1A5C1 +	
		-F	NC	
22	Vio	1A5XA4-H	1A5XA4-C	
22	Vio	-H	1A5J1-F	
22	Grn	-J	1A5XA3-F	
22	Wht-grn	-K	-H	
22	Blk	-L	-B	
22	Blk	-L	1A5R4-1	
22	Blk	-L	1A5J1-B	
		-M	NC	
		-N	NC	
		-P	NC	
		-R	NC	

Wire type	Color code	From--	To--	Remarks
22	Red	-S ----------	1A5XA3-A	
22	Red	-S ----------	-S	
22	Blu	-T----------	-R	
22	Blu	-T----------	1A5J1-D	
22	Wht-red	-U ----------	-C	
22	Wht-blk	-V ----------	-E	
22	Wht-grn	1A6A1-1 ----------	1A6J1-B	
22	Grn	-1 ----------	A6U1M1	
	----------	-2 ----------	NC	
22	Yel	-3 ----------	1A6U1M1	
22	Blu	-4----------	1A6J1-E	
22	Red	-5 ----------	1A6U1M1	
	----------	-6 ----------	NC	
22	Wht-blk	1A6A1-7 ----------	1A6A1-A	
22	Blk	-7 ----------	1A6U1M1	
22	Blk	1A6J1-A ----------	1A6U1M1	
22	Wht-blk	-A ----------	1A6A1-7	
22	Wht-grn	-B ----------	-1	
22	Grn	-B ----------	1A6U1M1	
	----------	-D ----------	NC	
22	Blu	-E ----------	1A6A1-4	
	----------	-H ----------	NC	
22	Blk	1A8A1-E1 ----------	1A8A3P1-1----------	Coaxial cable.
S	----------	-E2 ----------	-2----------	Coaxial cable.
22	Blk	1A8A3Pl-1 ----------	1A8A1-E1 ----------	Coaxial cable.
S	----------	-2 ----------	-E2 ----------	Coaxial cable.

CHAPTER 5

DEPOT OVERHAUL STANDARDS

5-1. General

The tests outlined in this chapter are designed to measure the performance capability of a repaired equipment. Equipment that is to be returned to stock should meet the standards given in these tests. Applicable procedures of the depots performing these tests and the general standards for repaired electronic equipment given in TB SIG 355-1, TB SIG 355-2, and TB SIG 355-3 form a part of the requirements for testing this equipment.

5-2. Test Procedures

The general support testing procedures (GSTP) in section IV, chapter 3, and paragraphs 4-5a to f and 4-6a to n constitute the depot overhaul standards (DOS).

APPENDIX A

REFERENCES

DA Pam 25-30	Consolidated Index of Army Publications and Blank Forms.
TM 11-1214	Instruction Book for Oscilloscope OS-8C/U.
TM 11-6625-366-15	Operator's Organizational, DS, GS, and Depot Maintenance Manual: Multimeter TS-352B/U.
TM 11-6695-210-12	Operator's and Organizational Maintenance Manual: Polygraph Instrument, Recording AN/USS-2F.

APPENDIX B

GENERAL SUPPORT MAINTENANCE

REPAIR PARTS AND SPECIAL TOOLS LIST

(INCLUDING DEPOT MAINTENANCE REPAIR PARTS

AND SPECIAL TOOLS)

Section I. INTRODUCTION

B-1. Scope

This appendix lists repair parts required for performance of general support and depot maintenance of Polygraph Instrument, Recording AN/USS-2F.

B-2. General

This Repair Parts List is divided into the following sections:

a. Section II Repair Parts List. A list of repair parts authorized for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending numerical sequence, with the parts in each group listed in figure and item number sequence.

b. Section III. Special Tools List. Not applicable.

c. Section IV. National Stock Number and Part Number Index. A list, in ascending numerical sequence, of all National stock numbers appearing in the listings, followed by a list, in alphanumeric sequence, of all part numbers appearing in the listings. National stock numbers and part numbers are cross-referenced to each illustration figure and item number appearance.

B-3. Explanation of Columns

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

a. Illustration. This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration in which the item is shown.

(2) *Item number.* The number used to identify each item called out in the illustration.

b. Source, Maintenance, and Recoverability Codes (SMR).

(1) *Source code.* Source codes are assigned to support items to indicate the manner of acquiring support items for maintenance, repair, or overhaul of end items. Source codes are entered in the first and second positions of the Uniform SMR Code format as follows:

Code *Definition*

PA--Item procured and stocked for anticipated or known usage.

XA--Item is not procured or stocked because the requirements for the item will result in the replacement of the next higher assembly.

XB--Item is not procured or stocked. If not available through salvage, requisition.

NOTE

Cannibalization or salvage may be used as a source of supply for any items source coded above except those coded XA, XD, and aircraft support items as restricted by AR 700-42.

(2) *Maintenance code.* Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace and use the support item. The maintenance code entered in the third position will indicate one of the following levels of maintenance:

Code *Application/Explanation*

O-Support item is removed, replaced, used at the organizational level.

H-Support item is removed, replaced, used at the general support level.

D-Support items that are removed, replaced, used at depot.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies the lowest maintenance level with the capability to perform complete repair (i.e., all authorized maintenance functions). This position will contain one of the following maintenance codes:

Code *Application/Explanation*

H--The lowest maintenance level capable of complete repair of the support item is the general support level.

D--The lowest maintenance level capable of complete repair of the support item is the depot level performed by depot.

Z-- Nonreparable. No repair is authorized.

(3) *Recoverability code.* Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR Code format as follows:

Recoverabilitv *Code Definition*

Z--Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.

H--Reparable item. When unecomically reparable, condemn and dispose at the general support level.

D--Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal not authorized below depot level.

c. National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

d. Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics for the item by means of its engineering drawings, specifications standards, and inspection requirements, to identify an item or range of items.

NOTE

When a stock-numbered item is requisitioned, the repair part received may have a different part number than the part being replaced.

e. Federal Supply Code for Manufacturer (FSCM). The FSCM is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

f. Description. indicates the Federal item name and, if required a minimum description to identify the item.

g. Unit of Measure (U/M). Indicates the, standard of the basic quantity of the listed items as used in performing the actual maintenance function. This measure is expressed by a two character, alphabetical abbreviation (e.g., ea, i pr, etc.). When the unit of measure differs fronts the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. Quantity Incorporated in Unit. Indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly.

B-4. Special Information

(Not applicable)

B-5. How to Locate Repair Parts

a. When National stock number or part number is unknown:

(1) *First.* Using the table of contents, determine the functional group within which the repair part belongs. This is necessary since illustrations are prepared for functional groups and listings are divided into the same group.

(2) *Second.* Find the illustration covering the functional group to which the repair parts belongs.

(3) *Third*. Identify the repair part on the illustration and note the illustration figure and item number of the repair part.

(4) *Fourth*. Using the Repair Parts Listing, find the figure and item number noted on the illustration.

b. When National stock number or part number is known:

(1) *First*. Using the Index of National Stock Numbers and Part Numbers, find the pertinent National stock number or part number. This index is in ascending NSN sequence, followed by a list of part numbers in ascending alphanumeric sequence, cross-referenced to the illustration figure number and item number.

(2) *Second*. After finding the figure and item number, locate the figure and item number in the repair parts list.

B-6. Abbreviations

(Not applicable)

SECTION II REPAIR PARTS LIST

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) UNIT OF MEAS	(8) QTY INC IN UNIT
						GROUP: 00 POLYGRAPH INSTRUMENT, RECORDING AN/USS2F		
B-1	1	XBHHH		SA1269	57800	RECORDER, PNEUMGRAPHIC	EA	1
B-1	2	XAHZZ		SA791	57800	CASE ASSEMBLY	EA	1
B-1	3'	PAHZZ	6625-00-495-0677	SA1300	57800	RECORDER, GALVANO MIXTR	EA	1
B-1	4	XBHDD		SA779	57800	AMPLIFIER, ELECTRONIC, CONTROL	EA	1
B-1	5	PAOZZ	6695-00-073-9178	SA426	57800	CUFF, ASSEMBLY, WRIST, SPHYQ ANOETER	EA	1
B-1	6	PAOZZ	6695-00-489-6088	SA307	57800	CUFF ASSEMBLY, ARM, SPHY ANKETER	EA	1
B-1	7	XBHHH		SA1268	57800	RECORDER, CARDIOGRAPHIC	EA	1
B-1	8	XBOZZ		SA57	57800	BULB ASSEKBLY, SPHYGMOMANOMETER	EA	1
B-1	9	PAOZZ	6695-00-489-6085	57113	57800	PNEUUIGRAPH ASSEMBLY	EA	1
B-1	10	PAOZZ	6695-00-489-6086	24222	57800	ELECTRODE ASSEMBLY, FINGER	EA	1
B-1	11	PAOZZ	6695-00-563-0489	SA27	57800	FILLER ASSEMBLY, INKWELL	EA	1
B-1	12	PAOZZ	6695-00-563-0488	SA29	57800	STARTER, PEN	EA	1
B-1	13	PAOZZ	8125-00-181-7451	SA1271	57800	BOTTLE ASSEMBLY, APPLICATOR	EA	3
B-1	14	PAHZZ	5305-00-068-5414	1S16995-11	96906	SCREW, CAP, SOCKET HEAD	EA	6
B-1	15	PAOZZ	6515-00-327-3800	0034641	98079	ELECTRODE PASTE, ELECTROCARDIOGRAPH	EA	1
B-1	16	PAOZZ	6695-00-753-4560	22495B	57800	CHART, RECORDING INSTRUMMNI	EA	1
B-1	17	PAOZZ	7510-00-159-4475	22490I	57800	INK, RECORDING INSTRUINT	EA	1
B-1	18	XBOZZ		9082	57800	BOX, PEN	EA	1
B-1	19	XBHHH		SA751	57800	ACTUATOR, ELECTRO-UECHANICAL, ROTARY	EA	1
B-1	20	PAOZZ	6695-00-459-3321	SA92	57800	PEN, LONG, RECORDER	EA	1
B-1	21	PAOZZ	6695-00-459-3320	SA91	57800	PEN, SHORT, RECORDER	EA	2
						GROUP: 01 CASE ASSEYBLY		
B-2	1	XBZZ		N66814	57800	PANEL	EA	1
B-2	2	PAHZZ	5935-00-578-9374	126223	02660	CONNECTOR BODY RECEPTACLE, ELECTRICAL	EA	1
B-2	3	PAHZZ	4720-00-470-1809	N3708	57800	TUBING, RUBBER	EA	3
B-2	4	XBHZZ		SA1400	57800	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL	EA	1
B-2	5	PAHZZ	6695-00-930-o410	7855	57800	SPHYGIANOIETER	EA	1
B-2	6	PAHZZ	5305-00-054-6656	M1S51957-32	96906	SCREW, MACHINE	EA	2
B-2	7	PAHZZ	5310-00-209-1366	MS35335-58	78452	WASHER, LOCK	EA	2
B-2	8	XBHZZ		9104	73734	SPACER, SLEEVE	EA	2
B-2	9	XBHZZ		N5823	57800	BRACKET, PRESSURE GAGE	EA	1
B-2	10	XBHZZ		520120620875	72962	PIN STRAIGHT, HEADLESS	EA	1
B-2	11	PAHZZ	5935-00-660-5487	126222	02660	CONNECTOR BODY RECEPTACLE, ELECTRICAL	EA	1
B-2	12	PAOZZ	5920-00-329-8475	MDL6/1OAUP	71400	FUSE, CARTRIDGE	EA	1
B-2	13	PAHZZ	5920-00-280-4156	FHN26G1	81349	FUSEROLDER	EA	1
B-2	14	PAHZZ	5935-00-258-1471	75CLPC1(	02660	CONNECTOR BODY, RECEPTACLE, ELECTRICAL	EA	1
B-2	15	PAHZZ	4730-00-454-9937	SA1440	57800	CONNECTOR, ASSEMBLY, YANIFOLD	EA	1
B-2	16	PAHZZ	5975-00-479-3304	SR5P4	28520	BUSHING, STRAIN RELIEF, CABLE	EA	1
B-2	17	PAHZZ	6695-00-489-6084	N5577	57900	CORD, POWER ELECTRICAL	EA	1
B-2	18	PAOZZ	5975-00-729-8784	205901	04009	PLATE, DESIGNATION, POWER SWITCH	EA	1
B-2	19	PAHZZ	5930-00-839-7517	2BK6263	73559	SWITCH, TOGGLE	EA	1

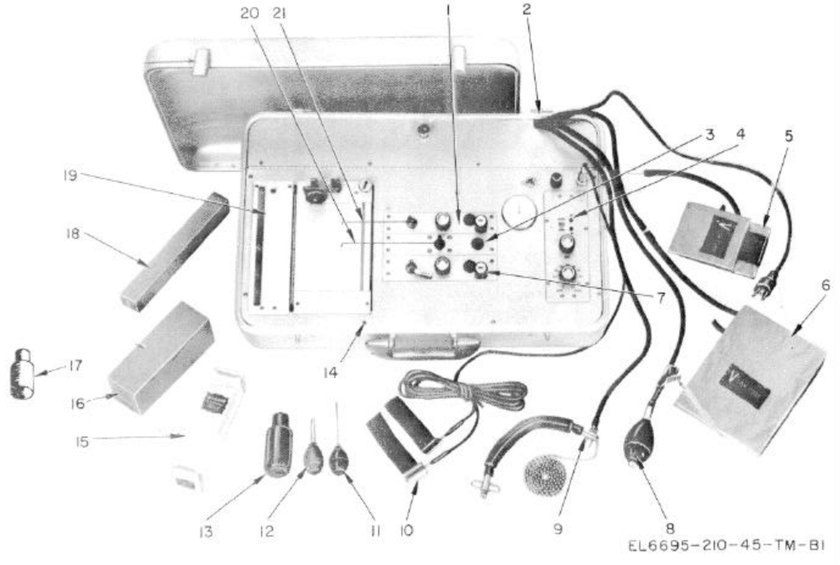

Figure B-1. Polygraph Instrument, Recording AN/USS-2F.

SECTION II REPAIR PARTS LIST (CONTINUED)

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) UNIT OF MEAS	(8) QTY INC IN UNIT
B-2	20	PAHZZ	4730-00-470-1807	N5301	57800	COUPLING, TUBE, PNEUM)	EA	3
B-2	21	PAHZZ	5310-00-760-1257	A500B6400	70318	NUT, PLIAN, HEXAGON	EA	6
B-2	22	XBHZZ		49110	24248	PAWL, ACCESSORY COMPARTIENT	EA	1
B-2	23	XBHZZ		N3960	57800	COVER PLATE, ACCESSORY	EA	1
B-2	24	XBHZZ		H503F	04941	CLAMP, CABLE, ELECTRICAL CONNECTOR	EA	2
B-2	25	XBHZZ		N3805	57800	SPACER, PLATE	EA	1
B-2	26	XBHZZ		A102BO408	70318	SCREW, MACHINE	EA	4
B-2	27	PAHZZ	5935-00-259-5941	80-MC2F1	02660	CONNECTOR BODY RECEPTACLE, ELECTRICAL	EA	1
B-2	28	XBHZZ		SA1401	57800	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL	EA	1
						GROUP: 02 CHART DRIVE ASSEMBLY		
B-3	1	XBHZZ		N6613	57800	PAPER ROLLER POST	EA	1
B-3	2	XBHZZ		N5541	57800	LOCKSPRING, TURN LOCK FASTENER	EA	2
B-3	3	PAHZZ	5305-00-068-5414	MS16995-11	96906	SCREW, CAP, SOCKET HEAD	EA	6
B-3	4	XBHZZ		A102BO406	70318	SCREW, MACHINE	EA	10
B-3	5	PAHZZ	5930-00-556-9217	6AT2	91929	SWITCH, TOGGLE	EA	1
B-3	6	XBHZZ		N6451	57800	CLAMP, BRIDGE	EA	1
B-3	7	XBHZZ		N6453	57800	BRACKET, ELECTRICAL CONNECTOR	EA	1
B-3	8	XBHZZ		N6424	57800	PLATE, MDUNTING	EA	1
B-3	9	PAHZZ	5935-00-257-9324	80-PC2Y	02660	CONNECTOR, RECEPTACLE, ELECTRICAL	EA	1
B-3	10	XBHZZ		N2947	57800	CLAMP, BRIDGE	EA	1
B-3	11	XBHZZ		N6445	57800	HINGE, MDDIFICATION	EA	1
B-3	12	XBHZZ		SA763	57800	ACTUATOR ASSEMBLY	EA	1
B-3	13	PAHZZ	6105-00-405-2163	447-1-56DH-115V60HZ	02770	MOTOR, SYNCHRONOUS	EA	1
B-3	14	XBHZZ		N6615	57800	SHAFT, STRAIGHT	EA	1
B-3	15	PAHZZ	3110-00-498-0540	1602NS	71041	BEARING, ROLLER, CYLINDRICAL	EA	2
B-3	16	XBHZZ		9104	73734	SPACER, SLEEVE	EA	2
B-3	17	XBHZZ		N6500	57800	MOTOR MOUNTING BLOCK	EA	1
B-3	18	XBHZZ		N5838	57800	FRICTION DRIVE WHEEL	EA	1
B-3	19	PAHZZ	3040-00-640-4881	SC25	71041	COLLAR, SHAFT	EA	1
B-3	20	XBHZZ		N5537	57800	PAPER ROLLER POST	EA	1
B-3	21	XBHZZ		N6425	57800	PLATE, TABLE	EA	1
B-3	22	PAHZZ	6695-00-451-8218	SA477	57800	ROLLER ASSEMBLY, RECORDING, INSTRUMENT CHART	EA	1
B-3	23	XBHZZ		N6443	57800	LOCK GUIDE, PAPER	EA	1
B-3	24	XBHZZ		49110	24248	PAWL: CHART DRIVE	EA	1
B-3	25	PAHZZ	6695-00-392-8683	N425	57800	PAPER FLATTING ROLLER	EA	1
B-3	26	XBHZZ		A231B0608	70318	SCREW, CAP, SOCKET HEAD	EA	1
B-3	27	XBHZZ		A70OB0600	70318	WASHER, FLAT	EA	2
B-3	28	XBHZZ		N5539	57800	SPRING, HELICAL EXTENSION	EA	1
B-3	29	XBHZZ		A500B600	70318	NUT, PLAIN, SPRING ADJUST	EA	2
B-3	30	XBHZZ		A102BO641	70318	SCREW, MACHINE	EA	1
B-3	31	XBHZZ		1904	'73734	TERMINAL, LUG	EA	1
B-3	32	PAHZZ	6695-(-451-8240	149903	72653	ROLLER, PRESSURE	EA	1

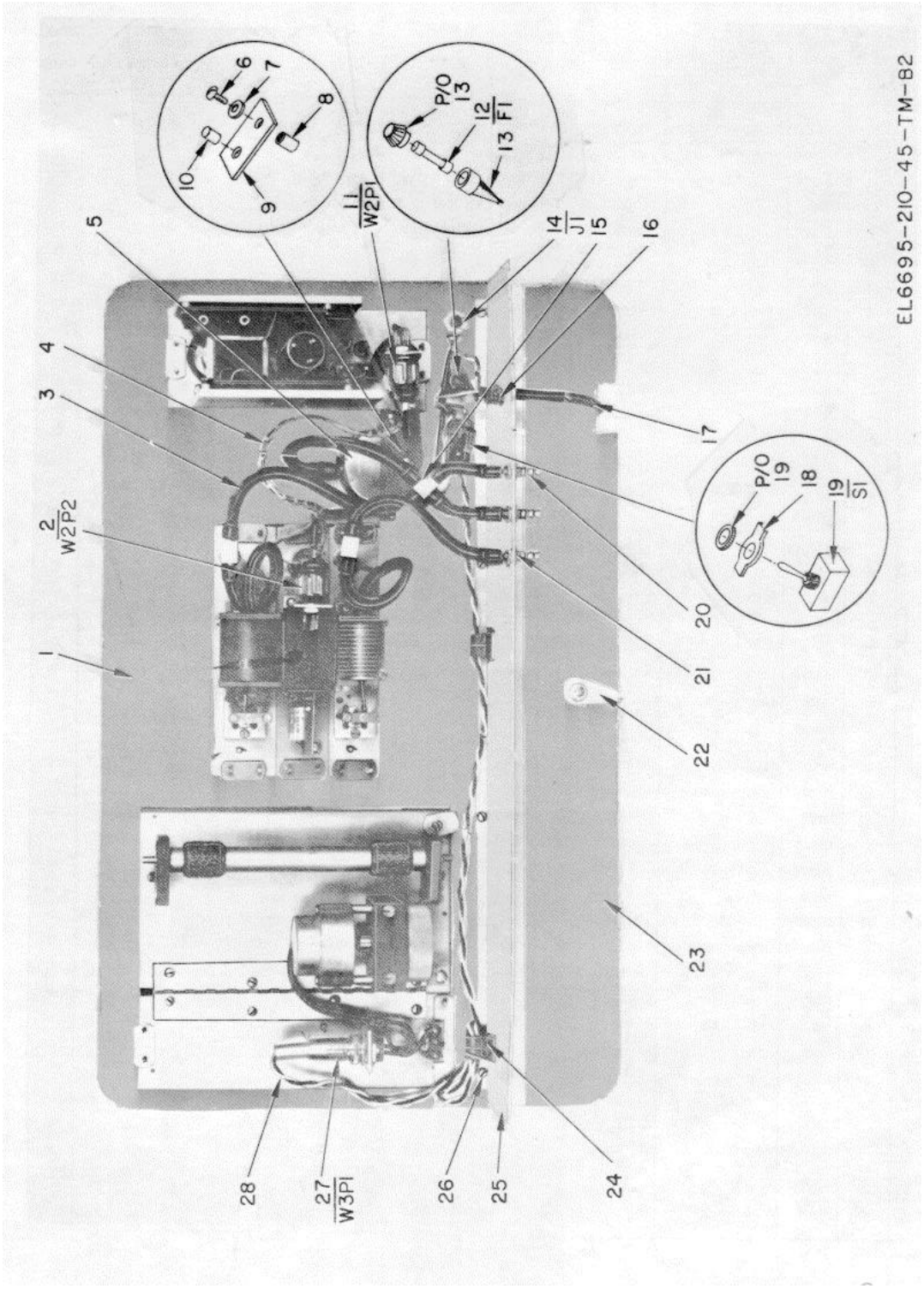

Figure B-2. Case assembly.

SECTION II REPAIR PARTS LIST (CONTINUED)

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) UNIT OF MEAS	(8) QTY INC IN UNIT
B-3	33	XBHZZ		N6454	57800	HOLDER	EA	1
B-3	34	XBHZZ		N6447	57800	LEV, LOCK RELEASE	EA	1
B-3	35	XBHZZ		N6448	57800	LEVER, MANUAL CONTROL	EA	1
B-3	36	XBHZZ		A102B0620	70318	SCREW, MACHINE	EA	1
B-3	37	PAHZZ	5305-00-144-0344	MS24671-1	96906	SCREW, CAP, SOCKET HEAD	EA	2
B-3	38	XBHZZ		N6444	57800	GUIDE, PAPER	EA	1
B-3	39	XBHZZ		N101	57800	KNIFE, PAPER CUTTING	EA	1
B-3	40	XBHZZ		N6614	57800	SPACER, SLEEVE	EA	2
B-3	41	XBHZZ		A231B0412	70318	SCREW, CAP, SOCKET HEAD	EA	2
						GROUP: 03 CARDIO-SPHYGDGRAPH ASSEMBLY		
B-4	1	PAHHH	6695-00-451-8219	SA789	57800	BELLOW, PRESSURE, CARDIOGRAPHIC ASSEMBLY	EA	1
B-4	2	,XBHZZ		N6664	57800	PLATE, BOTTOM	EA	1
B-4	3	XBHZZ		N6663	57800	BELLOWS, PRESSURE ASSEMBLY CARDIOGRAPHIC	EA	1
B-4	4	XBHZZ		N825	57800	SHAFT ASSEMBLY, STRAIGHT	EA	1
B-4	5	XBHZZ		N6665	57800	PLATE, TOP	EA	1
B-4	6	XBHZZ		A105BO412	70318	SCREW, MACHINE:	EA	2
B-4	7	PAHZZ	6695-00-451-8243	7834	57800	JEWEL, SAPPHIRE	EA	2
B-4	8	XBHZZ		7787	57800	NUT, PLAIN, HEXAGON	EA	2
B-4	9	XBHZZ		N6660	57800	STRAP, BRIDGE	EA	1
B-4	10	PAHZZ	6695-00-451-8241	N428	57800	SHAFT ASSEMBLY, CARDIOGRAPHIC	EA	1
B-4	11	XBHZZ		N6659	57800	SPACER, SLEEVE	EA	2
B-4	12	XBHZZ		A104B2004	70318	SCREW, MACHINE	EA	2
B-4	13	XBHZZ		N884	57800	3HAFT ASSEMBLY, PIVOT	EA	1
B-4	14	XBHZZ		N885B	57800	SPACER, RING	EA	1
B-4	15	XBHZZ		A180B0612	70318	SETSCREW: PER TRAVEL	EA	2
B-4	16	XBHZZ		A105BO410	70318	SCREW, MACHINE	EA	3
B-4	17	XBHZZ		SA696	57800	CLEVIS, ASSEMBLY: CRADLE	EA	1
B-4	18	XBHZZ		A102BO404	70318	SCREW, MACHINE	EA	1
B-4	19	XEHZZ		N6668	57800	SHAFT AND ARM ASSENBLY	EA	1
B-4	20	XBHZZ		A104B0410	70318	SCREW, MACHINE	EA	4
B-4	21	XBHZZ		N6624	57800	GEAR, HELICAL PINION	EA	1
B-4	22	XBHZZ		N6658	57800	SLIDE, DOVETAIL, MALE	EA	1
B-4	23	XBHZZ		N6654	57800	SLIDE, DOVETAIL, FEMALE	EA	1
B-4	24	XBHZZ		WB1936	27445	WASIER, SPRING TENSION	EA	1
B-4	25	XBHZZ		SC12	71041	COLLAR, SHAFT	EA	1
B-4	26	XBHZZ		A852BO840	70318	PIN, STRAIGHT, HEADLESS, SHAFT	EA	1
B-4	27	XBHZZ		N426	57800	BUSHING SLEEVE	EA	1
B-4	28	XBHZZ		A180L0404	70318	SETSCREW	EA	1
B-4	29	XBHZZ		N6633	57800	GEAR RACK	EA	1
B-4	30	XBHZZ		N6998	57800	RECORD LEVER KNOB	EA	1
B-4	31	PAOZZ	5355-00-471-9350	N5445	57800	KNOB: CENTERING	EA	1
B-4	32	PAHZZ	4820-00-470-1811	SA301	57800	VALVE, AIR PRESSURE RELIEF	EA	1
B-4	33	XBHZZ		N844	57800	PANEL	EA	1

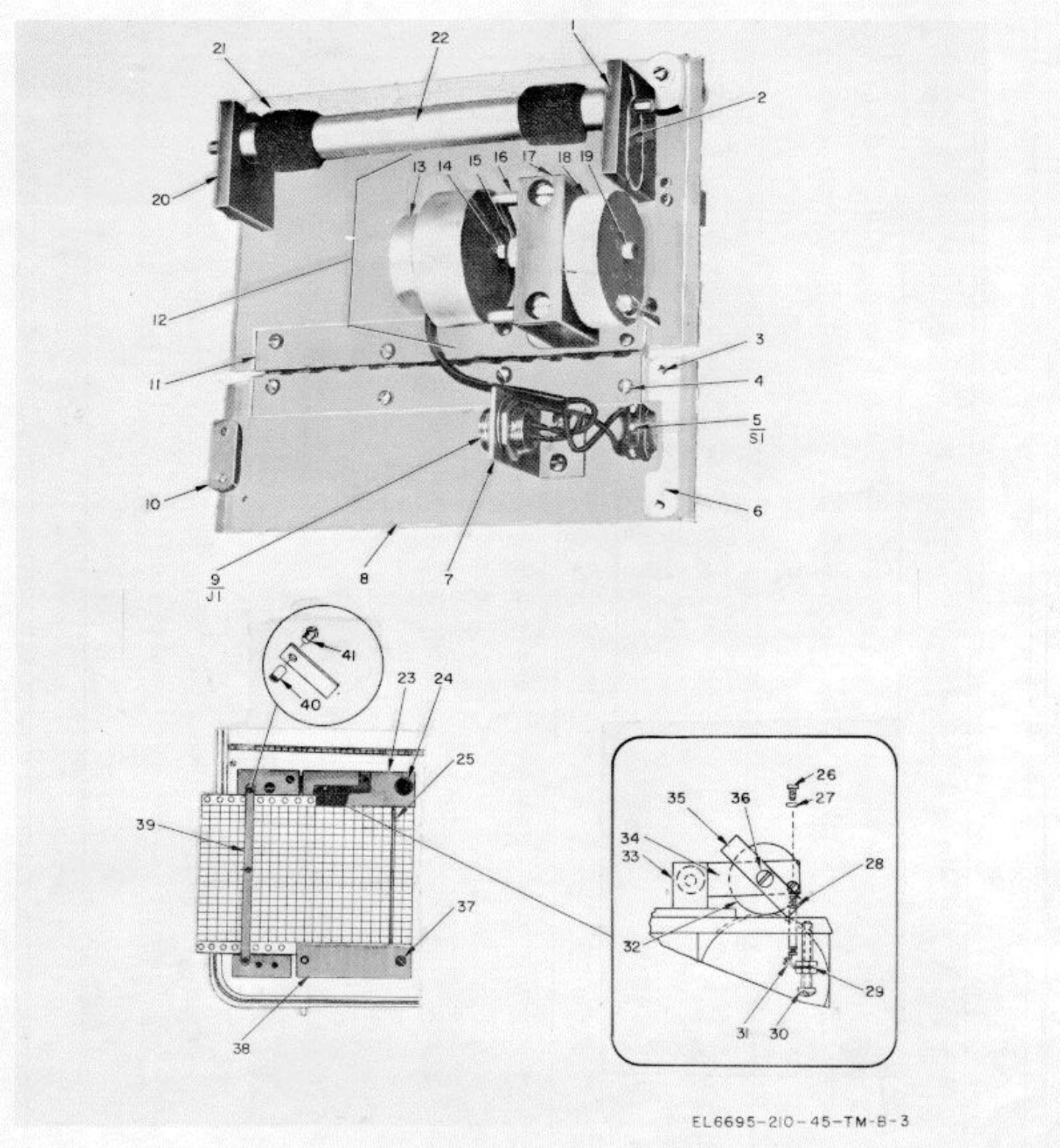

Figure B-3. Chart drive assembly.

SECTION II REPAIR PARTS LIST (CONTINUED)

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) UNIT OF MEAS	(8) QTY INC IN UNIT
B-4	34	XBHZZ		227	17875	NUT, PLAIN, HEXAGON	EA	1
B-4	35	PAOZZ	5305-00-068-5414	MS16995-11	96906	SCREW, CAP, SOCKET HEAD	EA	4
B-4	36	XBHZZ		N2947	57800	CLAMP, BRIDGE	EA	2
B-4	37	XBHZZ		N1002	57800	HOLDER, INK BOTTLE	EA	1
B-4	38	PAHZZ	4730-00-152-3757	SA326	57800	CONNECTOR ASSEMBLY; MANIFOLD	EA	1
B-4	39	PAHZZ	4720-00-470-1809	N3708	57800	TUBING, RUBBER	EA	1
						GROUP: 04 PNEUMGRAPH ASSEMBLY		
B-5	1	PAHZZ	6695-00-137-2265	SA788	57800	POLYGRAPH INSTRUENT SUBASSEMBLY	EA	1
B-5	2	XBHZZ		N6626	57800	BELLOWS, PRESSURE ASSEM4BLY, PNEUMATIC	EA	1
B-5	3	XBHZZ		N6627	57800	PLATE, MOUNTING	EA	1
B-5	4	PAHZZ	4720-00-470-1809	N3708	57800	TUBING, RUBBER	EA	1
B-5	5	PAHZZ	4730-00-152-3757	SA326	57800	CONNECTOR ASSEMBLY MANIFOLD	EA	1
B-5	6	XBHZZ		N1002	57800	HOLDER, INK BOTTLE	EA	1
B-5	7	XBHZZ		N2947	57800	CLAMP, BRIDGE	EA	2
B-5	8	PAOZZ	5305-00-068-5414	NS16995-11	96906	SCREW, CAP, SOCKET HEAD	EA	4
B-5	9	XBHZZ		227	17875	NUT, PLAIN, HEXAGON	EA	1
B-5	10	XBHZZ		N843	57800	PANEL	EA	1
B-5	11	PAHZZ	4820-00-470-1811	SA301	57800	VALVE, AIR PRESSURE RELIEF	EA	1
B-5	12	XBHZZ		N6633	57800	GEAR, RACK	EA	1
B-5	13	XBHZZ		A180BO404	70318	SETSCREW	EA	1
B-5	14	XBHZZ		N426	57800	BUSHING, SLEEVE	EA	1
B-5	15	XBHZZ		A852B0840	70318	PIN, STRAIGHT, HEADLESS, SHAFT	EA	1
B-5	16	XBHZZ		SC12	71041	COLLAR, SHAFT	EA	1
B-5	17	XBHZZ		WB1936	27445	WASHER, SPRING TENSION	EA	1
B-5	18	XBHZZ		N6654	57800	SLIDE, DOVETAIL, FEALE	EA	1
B-5	19	XBHZZ		N6631	57800	SLIDE DOVETAIL, MALE	EA	1
B-5	20	XBHZZ		N6624	57800	GEAR, HELICAL, PINION	EA	1
B-5	21	PAOZZ	5355-00-471-9350	N5445	57800	KNOB: CENTERING	EA	1
B-5	22	XBHZZ		SA696	57800	CLEVIS, ASSEMBLY: CRADLE	EA	1
B-5	23	XBHZZ		A180B0612	70318	SETSCREW: PEN TRAVEL	EA	2
B-5	24	XAHZZ		A104B2004	70318	SCREW, MACHINE	EA	2
B-5	25	XAHZZ		A10SB0410	70318	SCREW, MACHINE	EA	3
B-5	26	PAHZZ	6695-00-432-7290	N6656	57800	SHAFT ASSEMBLY PNEUMOGRAPHIC	EA	1
B-5	27	XBHZZ		N884	57800	SHAFT ASSEMBLY, PIVOT	EA	1
B-5	28	XBRZZ		N885	57800	SPACER, RING	EA	1
B-5	29	XBHZZ		N6659	57800	SPACER, SLEEVE	EA	2
B-5	30	XBHZZ		7787	57800	NUT, PLAIN, HEXAGON	EA	2
B-5	31	XBHZZ		A105BO414	70318	SCREW, MACHINE	EA	2
B-5	32	PAHZZ	6695-00-451-8243	7834	57800	JEWEL, SAPPHIRE	EA	2
B-5	33	XBHZZ		N6660	57800	STRAP, BRIDGE	EA	1
B-5	34	XBHZZ		N902	57800	SHAFT, SHOULDERED	EA	1

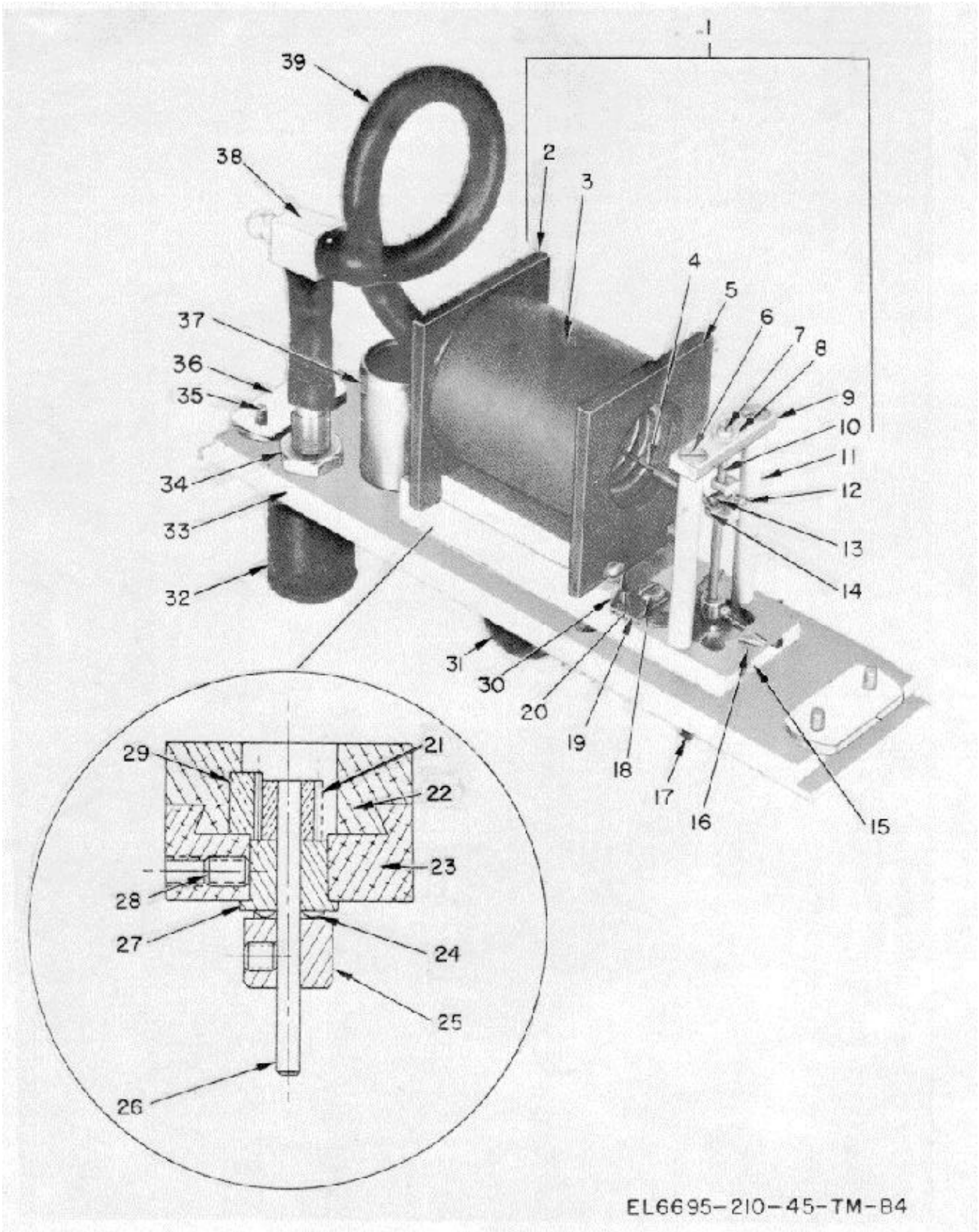

Figure B-4. Cardio-sphygmograph assembly

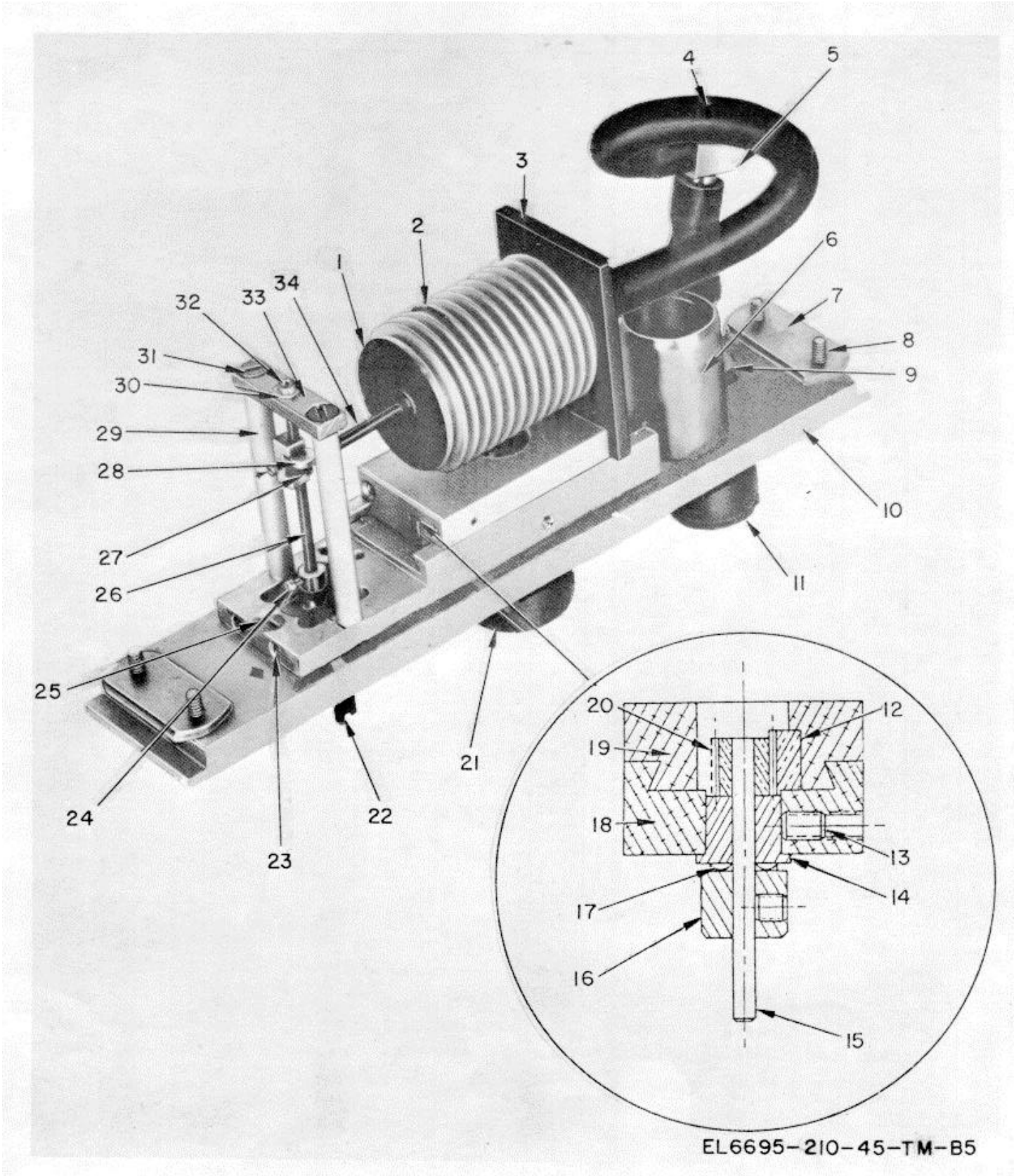

Figure B-5. Pneumograph assembly.

SECTION II REPAIR PARTS LIST (CONTINUED)

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
						GROUP: 05 GALVANIC SKIN RESISTANCE		
						AMPLIFIER ASSEMBLY		
B-6	1	XBHZZ		N6617	57800	PLATE, MOUNTING, PRINTED CIRCUIT BOARD	EA	1
B-6	2	PAHDD	6695-00-474-9515	SA724	57800	POWER SUPPLY ASSEMBLY.....	EA	1
B-6	3	PAHZZ	5905-00-146-4080	RV4NAYSJ103A	81349	RESISTOR, VARIASLE, LINEAR PRECISION	EA	1
B-6	4	XBHZZ		N6618	57800	PANEL.....	EA	1
B-6	5	XBHZZ		N2947	57800	CLAMP, BRIDGE.....	EA	2
B-6	6	PAOZZ	5305-00-068-5414	MS16995-11	96906	SCREW, CAPTIVE SOCKET READ	EA	4
B-6	7	PAHZZ	5935-00-946-6623	143-015-01	02660	CONNECTOR, RECEPTACLE, ELECTRICAL	EA	1
B-6	8	PAHDD	6695-00-451-8239	SA726	57800	PRINTED CIRCUIT BOARD ASSEMBLY,..... AMPLIFIER	EA	1
B-6	9	XBHZZ		N6673	57800	PLATE, MOUNTING, PRINTED CIRCUIT BOARD	EA	1
B-6	10	XBHZZ		108020	73734	SPACER, SLEEVE.....	EA	4
B-6	11	PAHZZ	5930-00-722-2458	30YY1009	81073	SWITCH, PUSH	EA	2
B-6	12	PAOZZ	5355-00-471-9351	N5448	57800	KNOB: CERTERING	EA	1
B-6	13	PAOZZ	5355-00-471-9352	N5446	57800	KNOB: SENSITIVITY.....	EA	1
B-6	14	XBHZZ	5305-00-992-5787	MS16995-10	96906	SCREW, CAPTIVE SOCKET HEAD	EA	4
B-6	15	PAHZZ	5930-00-556-9217	6AT2	91929	SWITCH, TOGGLE	EA	1
B-6	16	PAHZZ	5905-00-681-6462	OC1025	44655	RESISTOR, FIXED, COYPOSITION.....	EA	1
B-6	17	PAHZZ	5905-00-111-1679	RCRO7G512JS	81349	RESISTOR, FIXED, CCOPOSITION.....	EA	1
B-6	18	PAHZZ	5935-00-583-2272	126-219	02660	CONNECTOR, RECEPTACLE, ELECTRICAL	EA	1
B-6	19	XBHZZ		N6398	57800	BRACKET, ANGLE.....	EA	1
B-6	20	PAHZZ	5910-00-056-4557	WF4S1	14655	CAPACITOR, FIXED, PLASTIC DIELECTRIC	EA	1
B-6	21	PAHZZ	6610-00-869-6959	143-018-01	02660	CONNECTOR, RECEPTACLE, ELECTRICAL	EA	1
B-6	22	PARZZ	5905-00-904-6415	H75CNS25OK	84048	RESISTOR, VARIABLE, LINEAR, PRECISION	EA	1
						GROUP: 0501 GALVANIC SKIN RESISTANCE PRINTED CIRCUIT BOARD		
B-7	1	PADZZ	5961-00-226-5968	2N3711	01295	TRANSISTOR.....	EA	3
B-7	2	PADZZ	5905-00-121-9919	RCR07G106JS	81349	RESISTOR, FIXED, COCPOSITION.....	EA	2
B-7	3	PADZZ	5905-00-894-7163	TG-P10	56289	CAPACITOR, FIXED, CERAIC DIELECTRIC..	EA	1
B-7	4	PADZZ	5905-00-983-6914	RN60D1002F	81349	RESISTOR, FIXED, FIIL.....	EA	2
B-7	5	PADZZ	5910-00-415-4649	T330A825M015AS	31433	CAPACITOR, FIXED, ELECTROLYTIC	EA	5
B-7	6	PADZZ	5905-00-800-3955	RCR07G335uS	81349	RESISTOR, FIXED, COMPOSITION.....	EA	1
B-7	7	PADZZ	5905-00-192-3879	RN60D2373F	81349	RESISTOR, FIXED, FILM.....	EA	1
B-7	8	PADZZ	5961-00-727-3562	lN4009	93332	SEICONDUCTOR DEVICE, DIODE	EA	2
B-7	9	PADZZ	5905-00-115-3650	RCR07G183JS	81349	RESISTOR, FIXED, COMPOSITION.....	EA	1
B-7	10	PADZZ	5905-00-114-5343	RCR07G0182JS	81349	RESISTOR, FIXED, CONPOSITION.....	EA	6
B-7	11	PADZZ	5905-00-891-7249	310-1K	84048	RESISTOR, VARIABLE, WIRE WOUND	EA	1
B-7	12	PADZZ	5905-00-686-3903	RCR07G333JS	81349	RESISTOR, FIXED, CONPOSITION.....	EA	3
B-7	13	PADZZ	5905-00-116-8556	RCR07G223JS	81349	RESISTOR, FIXED, C2OPOSITION	EA	1
B-7	14	PADZZ	5905-00-686-9996	RCRO7C821JS	81349	RESISTOR, FIXED, COMPOSITION.....	EA	2
B-7	15	PADZZ	5910-00-405-7600	K8R2C20	22229	8APACITOR, FIXED, ELECTROLYTIC.....	EA	2
B-7	16	PADZZ	5910-00-230-7490	K56Cb	22229	CAPACITOR, FIXED, ELECTROLYT.S.....	EA	2
B-7	17	PADZZ	5961-00-985-9073	N3053	86684	TRANSISTOR.....	EA	1

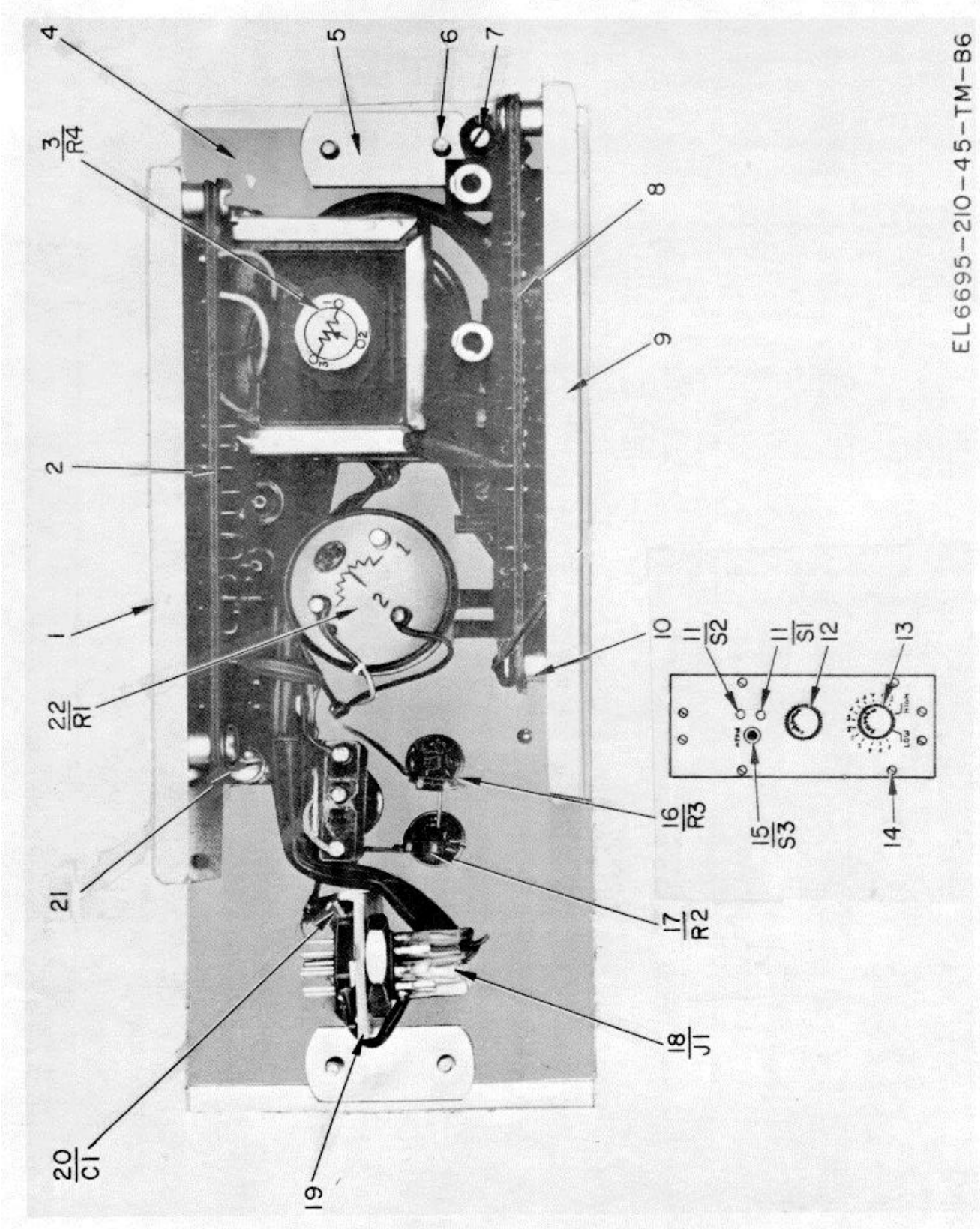

Figure B-6. Galvanic skin resistance amplifier assembly.

SECTION II REPAIR PARTS LIST (CONTINUED)

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-7	18	PADZZ	5905-00-136-3891	RCR07G621JS	81349	RESISTOR, FIXED, CCWPOSITION.....	EA	1
B-7	19	PADZZ	5910-00-260-2639	K82C1OK	22229	CAPACITOR, FIXED, ELECTROLYTIC.....	EA	1
B-7	20	PADZZ	5905-00-400-4528	0C1245	44655	RESISTOR, FIXED, CGOPOSITION.....	EA	1
B-7	21	PADZZ	5905-00-104-8368	0C4705	44655	RESISTOR, FIXED, CIUPOSITION.....	EA	1
B-7	22	PADZZ	5905-00-120-9154	0C4711	44655	RESISTOR, FIXED, COMPOSITION	EA	1
B-7	23	PADZZ	5961-00-813-5963	2N4062	01295	TRANSISTOR.....	EA	1
B-7	24	XBDZZ		N37	57800	PRINTED CIRCUIT BOARD.....	EA	1
B-7	25	PADZZ	5905-00-938-7430	62PR1K	73138	RESISTOR, VARIABLE	EA	1
B-7	26	PADZZ	5905-00-119-3504	0C2731	44655	RESISTOR, FIXED, CCOPOSITION.....	EA	1
B-7	27	PADZZ	5905-00-225-0282	0C3341	44655	RESISTOR, FIXED, COCPOSITION.....	EA	1
B-7	28	PADZZ	5905-00-450-2930	62PR25K	73138	RESISTOR, VARIABLE	EA	1
B-7	29	PADZZ	5905-00-681-8855	RCR07G394JS	81349	RESISTOR, FIXED. CCMPOSITION.....	EA	1
B-7	30	PADZZ	5910-00-810-4849	TG-S10	56289	CAPACITOR, FIXED, CERAIRC DIELECTRIC	EA	1
						GROUP: 0502 POWER SUPPLY PRINTED		
						CIRCUIT BOARD		
B-8	1	PADZZ	5961-00-892-0734	1N483B	81349	SEIACONDUCTOR DEVICE, DIODE.....	EA	6
B-8	2	PADZZ	5910-00-463-9490	30D256G050CC4	56289	CAPACITOR, FIXED, ELECTROLYTIC.....	EA	2
B-8	3	PADZZ	5950-00-256-4591	N6374	57800	TRANSFORMER, POWER STEP DOWN.....	EA	1
B-8	4	PDZZ	5910-00-864-8416	TE1200	56289	CAPACITOR, FIXED, ELECTROLYTIC.....	EA	1
B-8	5	PADZZ	5910-00-577-3281	TG-S50	56289	CAPACITOR, FIXED, ELECTROLYTIC.....	EA	1
B-8	6	PADZZ	5961-00-850-0562	1N4747!	80131	SEMICONDUCTOR DEVICE, DIODE	EA	1
B-8	7	XBDZZ		N24	57800	PRINTED CIRCUIT BOARD.....	EA	1
B-8	8	PADZZ	5905-00-105-7764	0C2221	44655	RESISTOR, FIXED, COCNOSITION.....	EA	1
B-8	9	PADZZ	5961-00-226-5968	2N3711	01295	TRANSISTOR.....	EA	1
B-8	10	PADZZ	5905-00-683-7721	0C1015	44655	RESISTOR, FIXED, COMPOSITION	EA	1
						GROUP: 06 GALVANOMETER ASSENBLY		
B-9	1	XBHZZ		SA696	57800	CLEVIS, ASSEMBLY ROD END.....	EA	1
B-9	2	XBHZZ		A180B0404	70318	SETSCREW	EA	2
B-9	3	XBHZZ		A102B0406	70318	SCREW, MACHINE.....	EA	2
B-9	4	XBHZZ		N2947	57800	CLAMP, BRIDGE.....	EA	2
B-9	5	XBHZZ		N1002	57800	HOLDER, INK BOTTLE	EA	1
B-9	6	XBHZZ		N1359	57800	BRACKET, ANGLE.....	EA	1
B-9	7	PAHZZ	5935-00-660-5913	126-216	02660	CONNECTOR, BODY RECEPTACLE, ELECTRICAL	EA	1
B-9	8	PAHZZ	6625-00-495-0678	SAI431	57800	GALVANONETER ASSEMBLY.....	EA	1
B-9	9	PAHZZ	6695-00-432-7289	SA331	57800	PRINTED CIRCUIT BOARD ASSNBLY.....	EA	1
B-9	10	XAHZZ	5910-00-827-1208	-TE1162	56289	CAPACITOR, FIXED, ELECTROLY.!C.....	EA	2
B-9	11	XAHZZ	5961-00-892-0734	1N483B	81349	SENICONDUCTOR DEVICE, DICDE.....	EA	2
B-9	12	PAOZZ	5305-00-068-5414	MS16995-11	46906	CAP SCREW, SOCKET EAD.....	EA	4
B-9	13	1XBHZZ		A180B0406	70318	SETSCREW	EA	1
B-9	14	XBHZZ		N1362	57800	PANEL	EA	1
						GROUP: 07 PNEUMOGRAPH CHEST TUBE ASSEMBLY		
B-10	1	PAOZZ	4720-00-470-1812	N3707	578D0	TUBING, RUBBER	EA	1
B-10	2	XAOZZ		N3886	57300	STEAM AND CHAIN ASSEMBLY, RIGHT HAND	EA	1

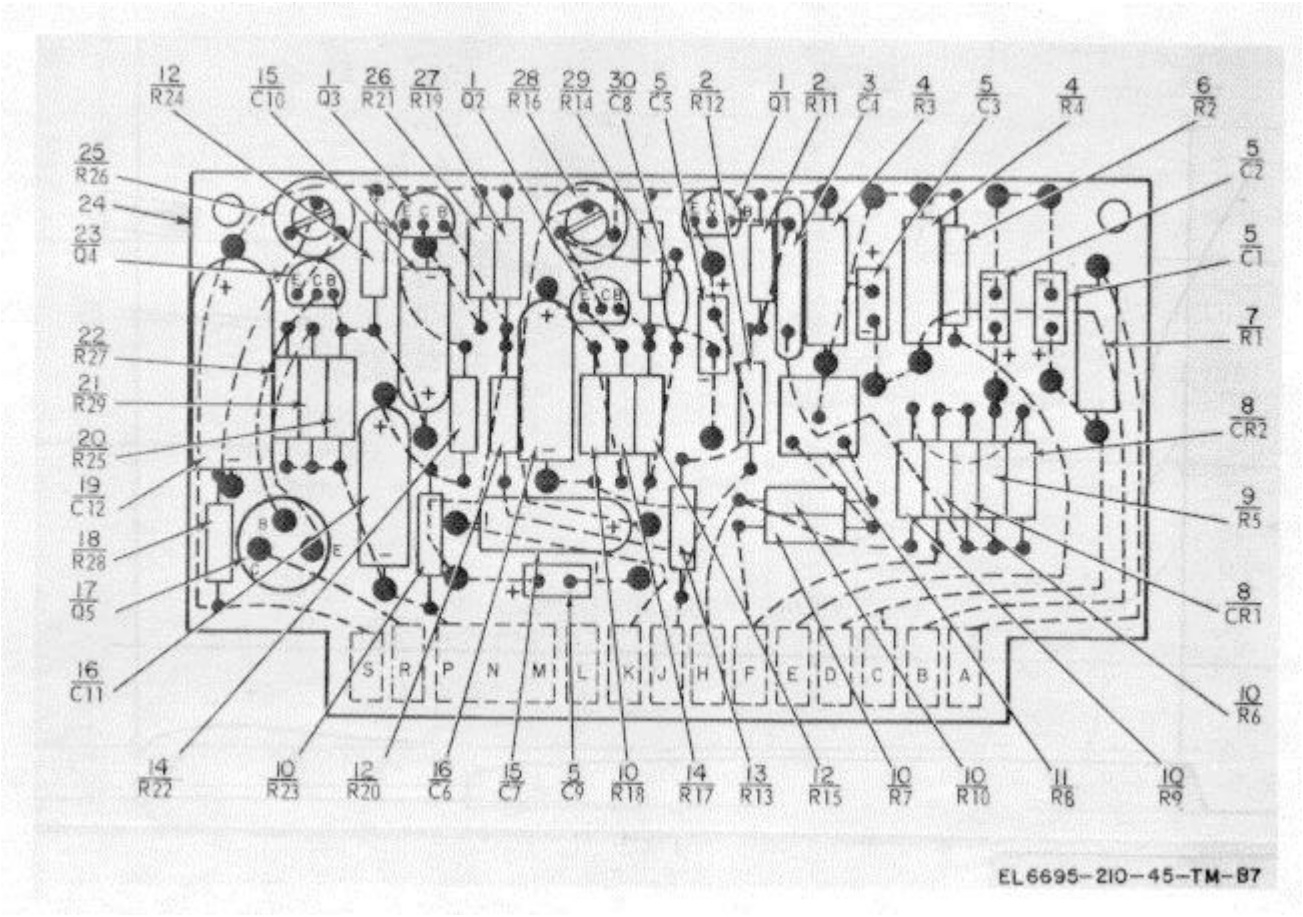

Figure B-7. Galvanic skin resistance printed circuit board.

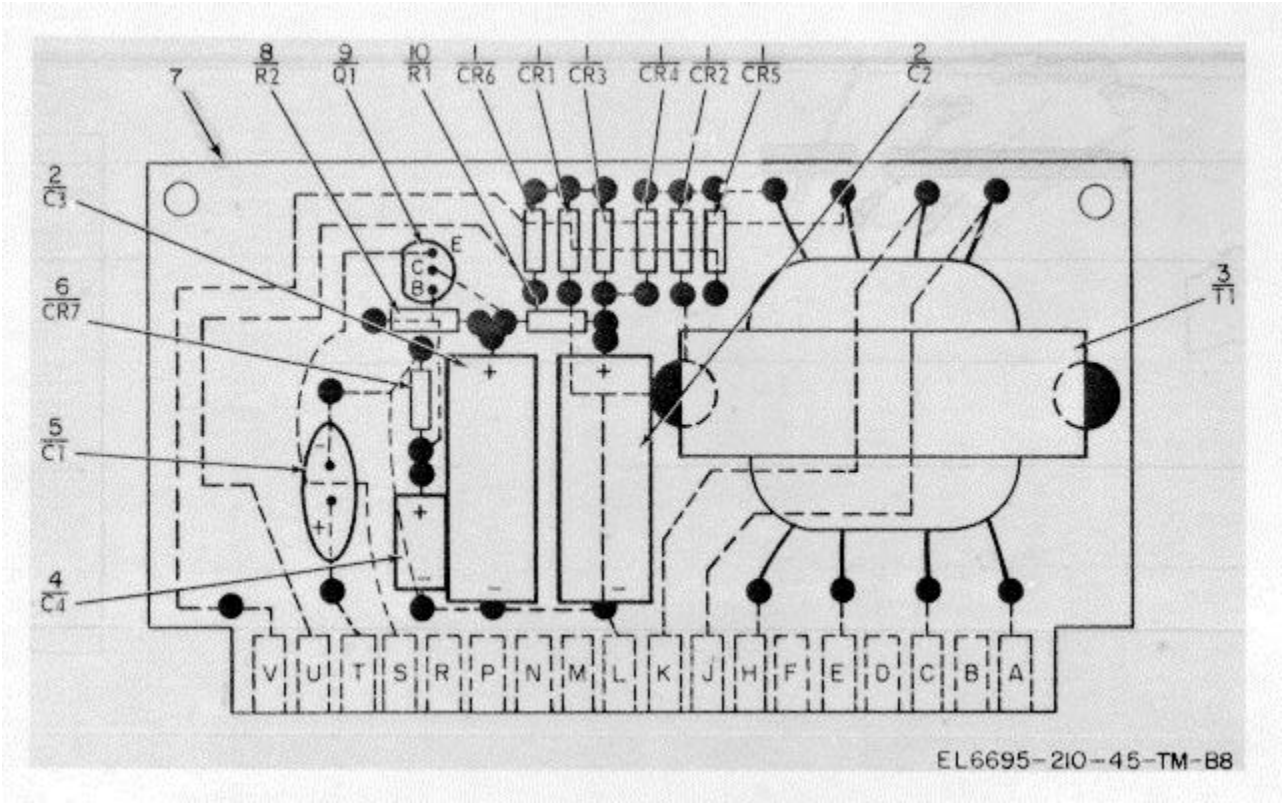

Figure B-8. Power supply printed circuit board.

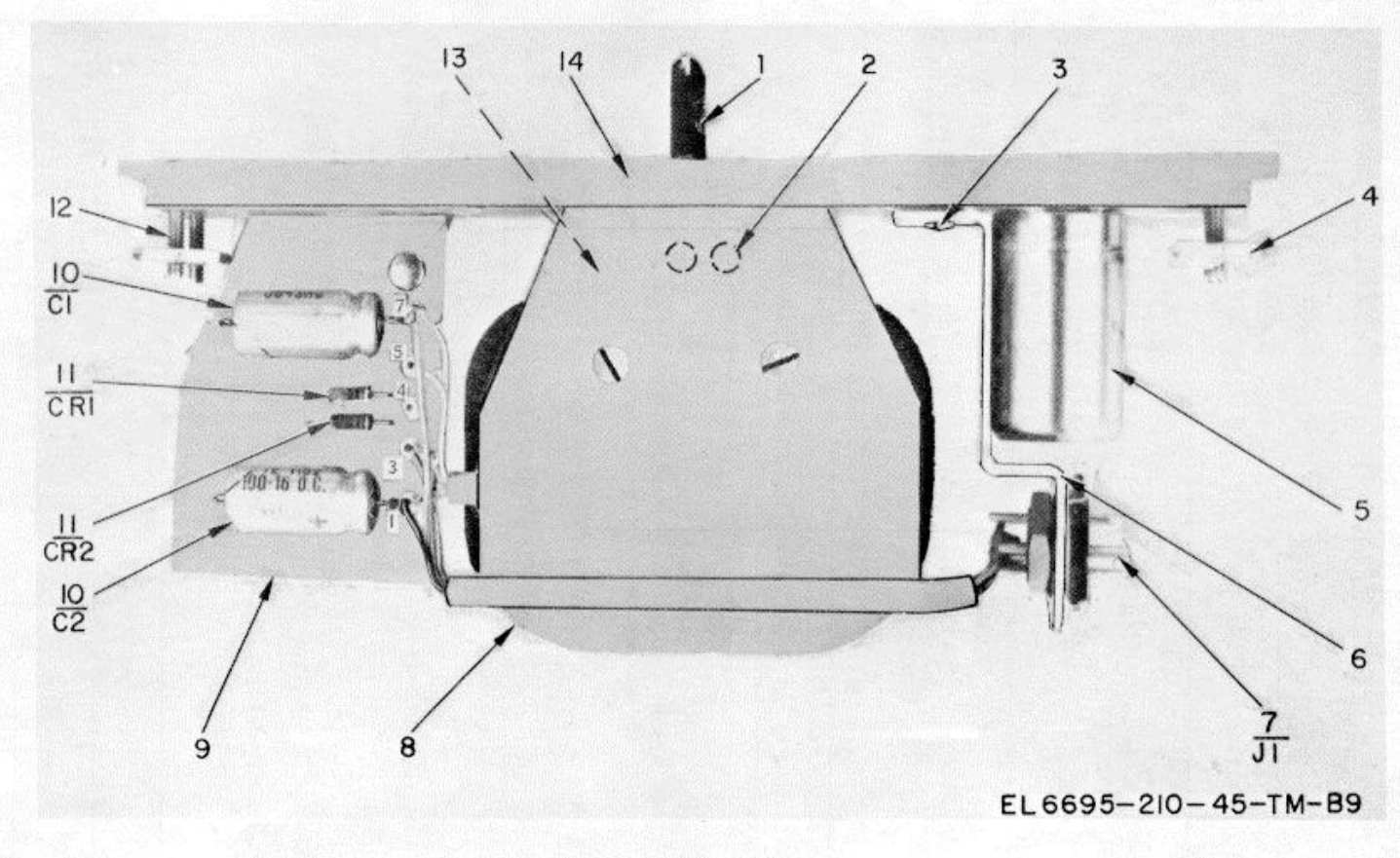

Figure B-9. Galvanometer assembly.

SECTION II REPAIR PARTS LIST CONTINUED

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION USABLE ON CODE	(7) U/M	(8) QTY INC IN UNIT
B-10	3	XAOZZ		N3881	57800	STEM AND CHAIN ASSE],BLY, LEFT HAND	EA	1
B-10	4	PAOZZ	9320-00-448-4330	8205	57800	BELLOWS, RUBBER.....	EA	1
						GROUP: 08 FINGER ELECTRODE ASSEMBLY		
B-11	1	PAOZZ	6150-00-448-4322	SA257	57800	LEAD, ELECTRICAL.....	EA	1
B-11	2	PAOZZ	6695-00-451-8242	SA512	57800	PLATE ASSEMBLY, FINGER ELECTRODE.	EA	2
B-11-	3	PAOZZ	5935-00-149-4266	75MC1F	02660	CONNECTOR, PLUG, ELECTRICAL.....	EA	1
						GROUP: 09 HAND PUMP BULB ASSEMBLY		
B-12	1	PAOZZ	4720-00-470-1812	N3707	57800	TUBING, RUBBER	EA	1
B-12	2	PAOZZ	4730-00-518-3600	0X973F1	77681	CLAMP, HOSE.....	EA	1
B-12	3	PAOZZ	6515-00-371-3440	1892	06156	VALVE, SPHYGMOMANOMETER.....	EA	1
B-12	4	PAOZZ	6515-00-762-2110	1891	06156	BULB, SPHYGMOMANOMETER.....	EA	1
						GROUP: 10 ARM CUFF ASSEMBLY		
B-13	1	PAOZZ	4720-00-470-1812	N3707	57800	TUBING, RUBBER	EA	1
B-13	2	PAOZZ	6695-00-752-9593	8206	57800	TUBE, CONNECTING LABORATORY GLASS-WARE	EA	1

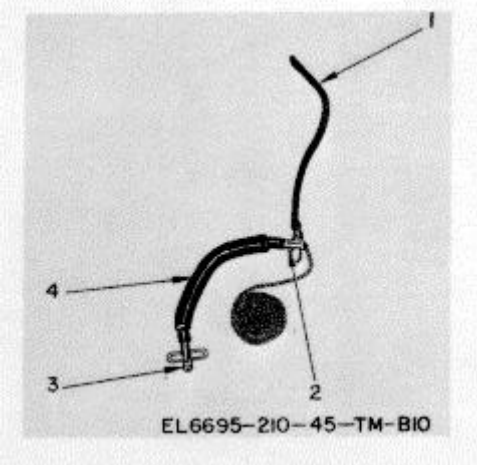

Figure B-10. Pneumograph chest tube assembly.

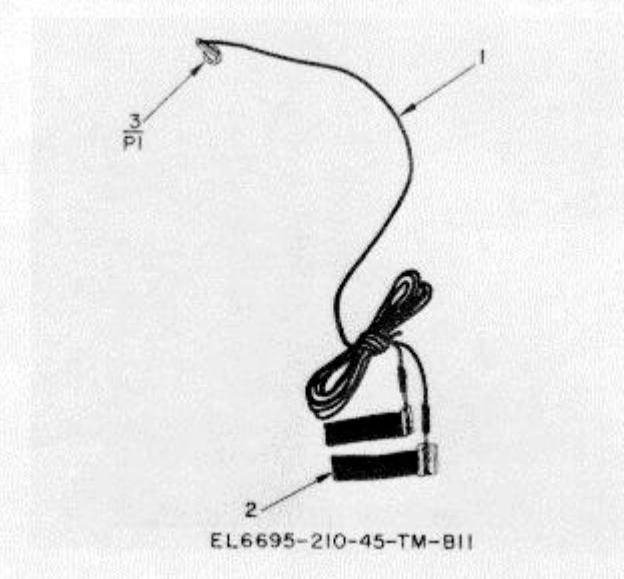

Figure B-11. Finger electrode assembly.

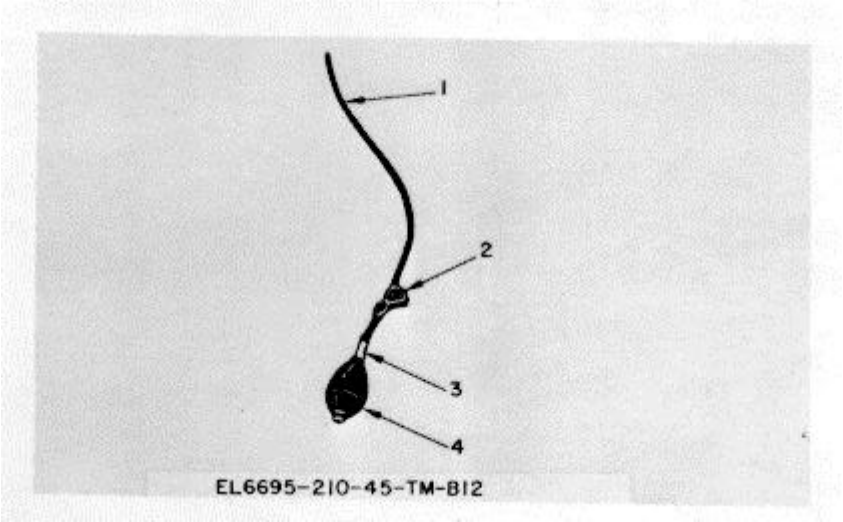

Figure B-12. Hand pump bulb assembly.

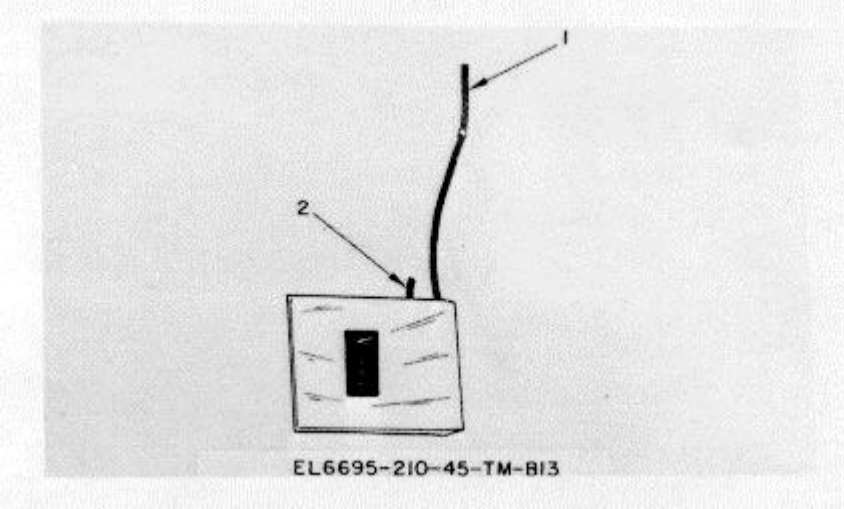

Figure B-13. Arm cuff assembly.

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STOCK NUMBER	FIG. NO.	ITEM NO.
3040-00-640-4881	B-3	19
3110-00-498-0540	B-3	15
4720-00-470-1809	B-2	3
4720-00-470-1809	B-4	39
4720-00-470-1809	B-5	4
4720-00-470-1812	B-13	1
4720-00-470-1812	B-12	1
4720-00-470-1812	B-10	1
4730-00-152-3757	B-4	38
4730-00-152-3757	B-5	5
4730-00-454-9937	B-2	15
4720-00-470-1807	B-2	20
4730-00-518-3600	B-12	2
4820-00-470-1811	B-4	32
4820-00-470-1811	B-5	11
5305-00-054-6656	B-2	6
5305-00-068-5414	B-1	14
5305-00-068-5414	B-3	3
5305-00-068-5414	B-4	35
5305-00-068-5414	B-5	8
5305-00-068-5414	B-6	6
5305-00-068-5414	B-9	12
5305-00-144-0344	B-3	37
5305-00-992-5787	B-6	14
5310-00-209-1366	B-2	7
5310-00-760-1257	B-2	21
5355-00-471-9350	B-4	31
5355-00-471-9350	B-5	21
5355-00-471-9351	B-6	12
5355-00-471-9352	B-6	13
5905-00-104-8368	B-7	21
5905-00-105-7764	B-8	8
5905-00-111-1679	B-6	17
5905-00-114-5343	B-7	10
5905-00-115-3650	B-7	9
5905-00-116-8556	B-7	13
5905-00-119-3504	B-7	26
5905-00-120-9154	B-7	22
5905-00-121-9919	B-7	2
5905-00-136-3891	B-7	18
5905-00-146-4080	B-6	3
5905-00-192-3879	B-7	7
5905-00-225-0282	B-7	27
5905-00-400-4528	B-7	20
5905-00-450-2930	B-7	28
5905-00-681-6462	B-6	16
5905-00-681-8855	B-7	29
5905-00-683-7721	B-8	10
5905-00-686-3903	B-7	12
5905-00-686-9996	B-7	14
5905-00-800-3955	B-7	6
5905-00-891-7249	B-7	11
5905-00-894-7163	B-7	3
5905-00-904-6415	B-6	22
5905-00-938-7430	B-7	25
5905-00-983-6914	B-7	4
5910-00-056-4557	B-6	20
5910-00-230-7490	B-7	16
5910-00-260-2639	B-7	19
5910-00-405-7600	B-7	15
5910-00-415-4649	B-7	5
5910-00-463-9490	B-3	2
5910-00-577-3281	B-8	5
5910-00-810-4849	B-7	30
5910-00-827-1208	B-9	10
5910-00-864-8416	B-8	4
5920-00-280-4156	B-2	13
5920-00-329-8475	B-2	12
5930-00-556-9217	B-3	5
5930-00-556-9217	B-6	15
5930-00-722-2458	B-6	11
5930-00-839-7517	B-2	19
5935-00-149-4266	B-11	3
5935-00-257-9324	B-3	9
5935-00-258-1471	B-2	14
5935-00-259-5941	B-2	27
5935-00-578-9374	B-2	2
5935-00-583-2272	B-6	18
5935-00-660-5487	B-2	11
5935-00-660-5913	B-9	7
5935-00-946-6623	B-6	7
5950-00-256-4591	B-8	3
5961-00-226-5968	B-7	1
5961-00-226-5968	B-8	9
5961-00-727-3562	B-7	8
5961-00-813-5963	B-7	23
5961-00-850-0562	B-8	6
5961-00-892-0734	B-8	1
5961-00-892-0734	B-9	11
5961-00-985-9073	B-7	17
5975-00-479-3304	B-2	16
5975-00-729-8784	B-2	18
6105-00-405-2163	B-3	13
6150-00-448-4322	B-11	1
6515-00-327-3800	B-1	15
6515-00-371-3440	B-12	3
6515-00-762-2110	B-12	4
6610-00-869-6959	B-6	21
6625-00-495-0677	B-1	3
6625-00-495-0678	B-9	8
6695-00-073-9178	B-1	5
6695-00-137-2265	B-5	1
6695-00-392-8683	B-3	25
6695-00-432-7289	B-9	9

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6695-00-432-7290	B-5	26			
6695-00-451-8218	B-3	22			
6695-00-451-8219	B-4	1			
6695-00-451-8239	B-6	8			
6695-00-451-8240	B-3	32			
6695-00-451-8241	B-4	10			
6695-00-451-8242	B-11	2			
6695-00-451-8243	B-4	7			
6695-00-451-8243	B-5	32			
6695-00-459-3320	B-1	21			
6695-00-459-3321	B-1	20			
6695-00-474-9515	B-6	2			
6695-00-489-6084	B-2	17			
6695-00-489-6085	B-1	9			
6695-00-489-6086	B-1	10			
6695-00-489-6088	B-1	6			
6695-00-563-0488	B-1	12			
6695-00-563-0489	B-1	11			
6695-00-752-9593	B-13	2			
6695-00-753-4560	B-1	16			
6695-00-930-6410	B-2	5			
7510-00-159-4475	B-1	17			
8125-00-181-7451	B-1	13			
9320-00-448-4330	B-1	4			

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A102B0404	70318	B-4	18
A102B0406	70318	B-3	4
A102B0406	70318	B-9	3
A102B0408	70318	B-2	26
A102B0620	70318	B-3	36
A102B0641	70318	B-3	30
A104B0410	70318	B-4	20
A104B2004	70318	B-5	24
A104B2004	70318	B-4	12
A105B0410	70318	B-4	16
A105B0410	70318	B-5	25
A105B0412	70318	B-4	6
A105B0414	70318	B-5	31
A180B0404	70318	B-5	13
A180B0404	70318	B-4	28
A180B0404	70318	B-9	2
A180B0406	70318	B-9	13
A180B0612	70318	B-4	15
A180B0612	70318	B-5	23
A231B0412	70318	B-3	41
A231B0608	70318	B-3	26
A500B0600	70318	B-3	29
A500B6400	70318	B-2	21
A700B0600	70318	B-3	27
A852B0840	70318	B-4	26
A852B0840	70318	B-5	15
FHN26G1	81349	B-2	13
H503F	04941	B-2	24
H75CMS250K	84048	B-6	22
K56C6	22229	B-7	16
K8R2C20	22229	B-7	15
K82C100K	22229	B-7	19
MDL6/10AMP	71400	B-2	12
MS16995-10	96906	B-6	14
MS16995-11	96906	B-9	12
MS16995-11	96906	B-6	6
MS16995-11	96906	B-1	14
IS16995-11	96906	B-5	8
MS16995-11	96906	B-4	35
AMS16995-11	96906	B-3	3
MS24671-1	96906	B-3	37
MS35335-58	78452	B-2	7
MS51957-32	96906	B-2	6
N1001	57800	B-3	39
N1002	57800	B-4	37
N1002	57800	B-5	6
N1002	57800	B-9	5
N1359	57800	B-9	6
N1362	57800	B-9	14
N24	57800	B-8	7
N2947	57800	B-9	4
N2947	57800	B-3	10
N2947	57800	B-4	36
N2947	57800	B-5	7
N2947	57800	B-6	5
N37	57800	B-7	24
N3707	57800	B-10	1
N3707	57800	B-13	1
N3707	57800	B-12	1
N3708	57800	B-5	4
N3708	57800	B-4	39
N3708	57800	B-2	3
N3805	57800	B-2	25
N3881	57800	B-I	3
N3886	57800	B-10	2
N3960	57800	B-2	23
N425	57800	B-3	25
N426	57800	B-5	14
N426	57800	B-4	27
N428	57800	B-4	10
N5301	57800	B-2	20
N5445	57800	B-5	21
N5445	57800	B-4	31
N5446	57800	B-6	13
N5448	57800	B-6	12
N5537	57800	B-3	20
N5539	57800	B-3	28
N5541	57800	B-3	2
N5577	57800	B-2	17
N5823	57800	B-2	9
N5838	57800	B-3	18
N6374	57800	B-8	3
N639E	57800	B-6	19
N6424	57800	B-3	8
N6425	57800	B-3	21
N6443	57800	B-3	23
N6444	57800	B-3	38
N6445	57800	B-3	11
N6447	57800	B-3	34
N6448	57800	B-3	35
N6451	57800	B-3	6
N6453	57800	B-3	7
N6454	57800	B-3	33
N6500	57800	B-3	17
N6613	57800	B-3	1
N6614	57800	B-3	40
N6615	57800	B-3	14
N6617	57800	B-6	1
N6618	57800	B-6	4
N6624	57800	B-5	20
N6624	57800	B-4	21
N6626	57800	B-5	2
N6627	57800	B-5	3
N6631	57800	B-5	19
N6633	57800	B-5	12
N6633	57800	B-4	2
N6654	57800	B-5	18
N6654	57800	B-4	23
N6656	57800	B-5	26
N6658	57800	B-4	22
N6659	57800	B-5	29
N6659	57800	B-4	11
N6660	57800	B-5	33
N6660	57800	B-4	9
N6663	57800	B-4	3
N6664	57800	B-4	2

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N6665	57800	B-4	5
N6668	57800	B-4	19
N6673	57800	B-6	9
N6681M	57800	B-2	1
N6998	57800	B-4	30
N825	57800	B-4	4
N843	57800	B-5	10
N884	57800	B-5	27
N844	57800	B-4	13
N844	57800	B-4	33
N855	57800	B-5	28
N885B	57800	B-4	14
N902	57800	B-5	34
RCR07G106JS	81349	B-7	2
RCR07G182JS	81349	B-7	10
RCR07G183JS	81349	B-7	9
RCR07G223JS	81349	B-7	13
RCR07G333JS	81349	B-7	12
RCR07G335JS	81349	B-7	6
RCR07G394JS	81349	B-7	29
RCR07G512JS	81349	B-6	17
RCR07G621JS	81349	B-7	18
RCR07G821JS	81349	B-7	14
RN60D1002F	81349	B-7	4
RN60D2373F	81349	B-7	7
RV4NAYSJ103A	81349	B-6	3
SA1268	57800	B-1	7
SA1269	57800	B-1	1
SA1271	57800	B-1	13
SA1300	57800	B-1	3
SA1400	57800	B-2	4
SA1401	57800	B-2	28
SA1431	57800	B-9	8
SA1440	57800	B-2	15
SA27	57800	B-1	11
SA29	57800	B-1	12
SA257	57800	B-11	1
SA301	57800	B-5	11
SA301	57800	B-4	32
SA307	57800	B-1	6
SA326	57800	B-4	38
SA326	57800	B-5	5
SA331	57800	B-9	9
SA426	57800	B-1	5
SA477	57800	B-3	22
SA512	57800	B-11	2
SA57	57800	B-1	8
SA696	57800	B-4	17
SA696	57800	B-5	22
SA696	57800	B-9	1
SA724	57800	B-6	2
SA726	57800	B-6	8
SA751	57800	B-1	19
SA763	57800	B-3	12
SA779	57800	B-1	4
SA788	57800	B-5	1
SA789	57800	B-4	1
SA791	57800	B-1	2
SA91	57800	B-1	21
SA92	57800	B-1	20
SC12	71041	B-5	16
SC12	71041	B-4	25
SC25	71041	B-3	19
SR5P4	28520	B-2	16
TE1162	56289	B-9	10
TE1200	56289	B-8	4
TG-P10	56289	B-7	3
TG-S10	56289	B-7	30
TG-S50	56289	B-8	5
T330A825M015AS	31433	B-7	5
WB1936	27445	B-5	17
WB1936	27445	B-4	24
WMF4S1	14655	B-6	20
0034641	98079	B-1	15
0C1015	44655	B-8	10
0C1025	44655	B-6	16
0C1245	44655	B-7	20
0C2221	44655	B-8	8
0C2731	44655	B-7	26
OC3341	44655	B-7	27
OC4705	44655	B-7	21
OC4711	44655	B-7	22
OX973F1	77681	B-12	2
1N4009	93332	B-7	8
1N4747A	80131	B-8	6
1N483B	81349	B-9	11
1N483B	81349	B-9	1
108020	73734	B-6	10
126222	02660	B-2	11
126223	02660	B-2	2
126-216	02660	B-9	7
126-219	02660	B-6	18
]43-015-01	02660	B-6	7
143-18-01	02660	B-6	21
149903	72653	B-3	32
1602NS	71041	B-3	15
1891	06156	B-12	4
1892	06156	B-12	3
1904	73734	B-3	31
2BK6263	73559	B-2	19
2N3053	86684	B-7	17
2N3711	01295	B-8	9
2N3711	01295	B-7	1
2N4062	01295	B-7	23
205901	04009	B-2	18
224901	57800	B-1	17
22495B	57800	B-1	16
227	17875	B-4	34
227	17875	B-5	9
24222	57800	B-1	10
30D256G050CC4	56289	B-8	2
30YYl009	81073	B-6	11
310-1K	84048	B-7	11
447-1-56DH115V60HZ	02770	B-3	13
4911u	24248	B-2	22
49110	24248	B-3	24

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520120620875	72962	B-2	10
57113	57800	B-1	9
6AT2	91929	B-3	5
6AT2	91929	B-6	15
62PR1K	73138	B-7	25
62PR25K	73138	B-7	28
75CLPC1M	02660	B-2	14
75MC1F	02660	B-11	3
7787	57800	B-5	30
7787	57800	B-4	8
7834	57800	B-5	32
7834	57800	B-4	7
7855	57800	B-2	5
80-MC2F1	02660	B-2	27
80-PC2M	02660	B-3	9
8205	57800	B-10	4
8206	57800	B-13	2
9082	57800	B-1	18
9104	73734	B-2	8
9104	73734	B-3	16

STOCK NUMBER	FSCM	FIG. NO.	ITEM NO.

APPENDIX A

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.
TB SIG 355-1	Depot Inspection Standard for Repaired Signal Equipment.
TB SIG 355-2	Depot Inspection Standard for Refinishing Repaired Signal Equipment.
TB SIG 355-3	Depot Inspection Standard for Moisture and Fungus Resistant Treatment.
TM 11-1214	Instruction Book for Oscillscope OS-8C/U.
TM 11-6625-366-15	Operator's Organizational, DS, GS, and Depot Maintenance Manual: .Multimeter TS-352B/U.
TM 11-6695-210-12	Operator's and Organizational Maintenance Manual: Polygraph Instrument, Recording AN/USS-2F.

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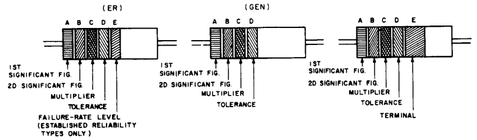
Pneumo assembly or rubber hose	3-10	3-7
Localizing trouble	3-5	3-3
Motor:		
Removal	3-27a(4)	8-14
Replacement	3-27b(5)	3-15
Pen cradle, removal and replacement	3-25	3-12
Pen travel, adjustment	3-24	3-12
Parts replacement techniques, general	3-2e	3-1
Pivot arm, pneumo and cardio, adjustment	3-22	8-11
Pivot shaft, removal and replacement	3-23	3-11
Pneumo assembly, troubleshooting pressure leaks	3-10	3-7
Pneumo system:		
Mechanical functioning	2-2	2-1
Test	3-33	3-18
Troubleshooting chart	3-5b	3-4
Removal and replacement:		
Amplifier gsr, printed circuit boards	3-28	3-16
Bellows actuator, pneumo or cardio	3-16	3-9
Cardio lock arm	3-26	3-18
Chart-drive	3-27	3-10
Cradle	3-25	3-12
Gage, pressure	3-14	3-8
Galvanometer	3-31	3-16
Galvo printed circuit board	3-30	3-16
Jewel screw, bridge	3-19	3-10
Jewel screw, cradle	3-21	3-11
Pip switch	3-29	3-16
Pivot shaft.	3-23	3-11
Vent	3-15	3-8
Test (gstp):		
Cardio system	3-34	3-18
Chart-drive	3-34	3-18
Gsr system	3-34	3-18
Pneumo system	3-34	3-18
Test equipment required:		
Depot	4-2	4-1
Gs	3-34a	3-18
Troubleshooting charts:		
Chart-drive	3-5a	3-3
Cardio	3-5c	3-4
Pneumo	3-5b	3-4
Troubleshooting, gsr system	3-6	3-5
Troubleshooting pressure leaks:		
Cardio assembly	3-11	3-7
Pneumo assembly	3-10	3-7
Vent, cardio or pneumo, removal and replacement		3-8



COLOR CODE MARKING FOR COMPOSITION TYPE RESISTORS.

COLOR-CODE MARKING FOR FILM-TYPE RESISTORS.

TABLE I
COLOR CODE FOR COMPOSITION TYPE AND FILM TYPE RESISTORS.

BAND A		BAND B		BAND C		BAND D		BAND E		
COLOR	FIRST SIGNIFICANT FIGURE	COLOR	SECOND SIGNIFICANT FIGURE	COLOR	MULTIPLIER	COLOR	RESISTANCE TOLERANCE (PERCENT)	COLOR	FAILURE RATE LEVEL	TERM.
BLACK	0	BLACK	0	BLACK	1			BROWN	M	
BROWN	1	BROWN	1	BROWN	10			RED	P	
RED	2	RED	2	RED	100			ORANGE	R	
ORANGE	3	ORANGE	3	ORANGE	1,000			YELLOW	S	
YELLOW	4	YELLOW	4	YELLOW	10,000	SILVER	±10 (COMP. TYPE ONLY)	WHITE		SOLDERABLE
GREEN	5	GREEN	5	GREEN	100,000	GOLD	±5			
BLUE	6	BLUE	6	BLUE	1,000,000	RED	±2 (NOT APPLICABLE TO ESTABLISHED RELIABILITY)			
PURPLE (VIOLET)	7	PURPLE (VIOLET)	7							
GRAY	8	GRAY	8	SILVER	0.01					
WHITE	9	WHITE	9	GOLD	0.1					

BAND A — THE FIRST SIGNIFICANT FIGURE OF THE RESISTANCE VALUE (BANDS A THRU D SHALL BE OF EQUAL WIDTH).

BAND B — THE SECOND SIGNIFICANT FIGURE OF THE RESISTANCE VALUE.

BAND C — THE MULTIPLIER (THE MULTIPLIER IS THE FACTOR BY WHICH THE TWO SIGNIFICANT FIGURES ARE MULTIPLIED TO YIELD THE NOMINAL RESISTANCE VALUE.)

BAND D — THE RESISTANCE TOLERANCE.

BAND E — WHEN USED ON COMPOSITION RESISTORS, BAND E INDICATES ESTABLISHED RELIABILITY FAILURE-RATE LEVEL. ON FILM RESISTORS, THIS BAND SHALL BE APPROXIMATELY 1-1/2 TIMES THE WIDTH OF OTHER BANDS, AND INDICATES TYPE OF TERMINAL.

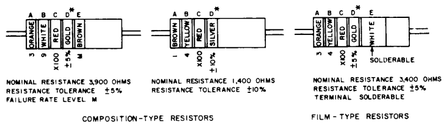
RESISTANCES IDENTIFIED BY NUMBERS AND LETTERS. (THESE ARE NOT COLOR CODED.)

SOME RESISTORS ARE IDENTIFIED BY THREE OR FOUR DIGIT ALPHA NUMERIC DESIGNATORS. THE LETTER R IS USED IN PLACE OF A DECIMAL POINT WHEN FRACTIONAL VALUES OF AN OHM ARE EXPRESSED. FOR EXAMPLE:

2R7 = 2.7 OHMS 10R0 = 10.0 OHMS

FOR WIRE-WOUND-TYPE RESISTORS COLOR CODING IS NOT USED. IDENTIFICATION MARKING IS SPECIFIED IN EACH OF THE APPLICABLE SPECIFICATIONS.

EXAMPLES OF COLOR CODING



NOMINAL RESISTANCE 3,900 OHMS
RESISTANCE TOLERANCE ±5%
FAILURE RATE LEVEL M

NOMINAL RESISTANCE 1,400 OHMS
RESISTANCE TOLERANCE ±10%

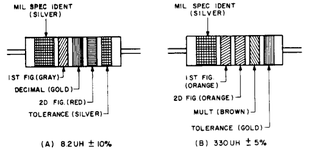
NOMINAL RESISTANCE 3,400 OHMS
RESISTANCE TOLERANCE ±5%
TERMINAL SOLDERABLE

COMPOSITION-TYPE RESISTORS

FILM-TYPE RESISTORS

* IF BAND D IS OMITTED, THE RESISTOR TOLERANCE IS ±20% AND THE RESISTOR IS NOT MIL-STD.

A. COLOR CODE MARKING FOR MILITARY STANDARD RESISTORS.



COLOR CODING FOR TUBULAR ENCAPSULATED R.F. CHOKES. AT A, AN EXAMPLE OF THE CODING FOR AN 8.2UH CHOKE IS GIVEN. AT B, THE COLOR BANDS FOR A 330UH INDUCTOR ARE ILLUSTRATED.

TABLE 2
COLOR CODING FOR TUBULAR ENCAPSULATED R.F. CHOKES.

COLOR	SIGNIFICANT FIGURE	MULTIPLIER	INDUCTANCE TOLERANCE (PERCENT)
BLACK	0	1	
BROWN	1	10	1
RED	2	100	2
ORANGE	3	1,000	3
YELLOW	4		
GREEN	5		
BLUE	6		
VIOLET	7		
GRAY	8		
WHITE	9		
NONE			20
SILVER			10
GOLD	DECIMAL POINT		5

MULTIPLIER IS THE FACTOR BY WHICH THE TWO COLOR FIGURES ARE MULTIPLIED TO OBTAIN THE INDUCTANCE VALUE OF THE CHOKE COIL.

B. COLOR CODE MARKING FOR MILITARY STANDARD INDUCTORS.

CAPACITORS, FIXED, VARIOUS-DIELECTRICS, STYLES CM, CN, CY, AND CB.

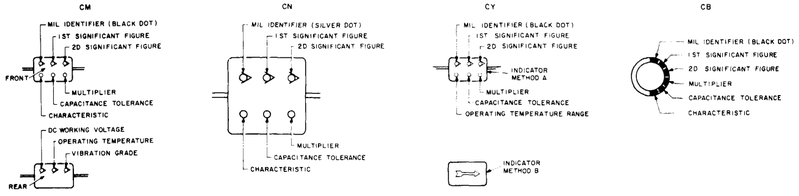
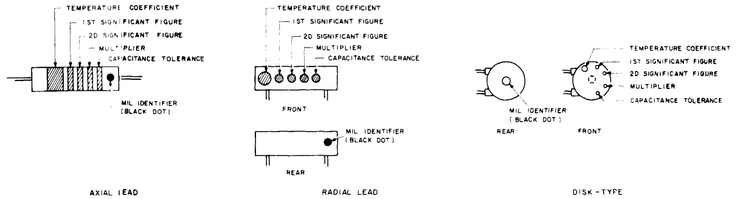


TABLE 3 — FOR USE WITH STYLES CM, CN, CY AND CB.

COLOR	MIL ID	1ST SIG FIG	2D SIG FIG	MULTIPLIER	CAPACITANCE TOLERANCE				CHARACTERISTIC		DC WORKING VOLTAGE	OPERATING TEMP RANGE	VIBRATION GRADE
					CM	CN	CY	CB	CM	CN	CB	CM	CY, CM	CN
BLACK	CM, CY, CB	0	0	1			±20%	±20%		A			-55°TO+70°C	10-55 Hz
BROWN		1	1	10					B	E	B			
RED		2	2	100	±2%		±2%	±2%	C				-55°TO+85°C	
ORANGE		3	3	1,000		±30%			D		D	300		
YELLOW		4	4	10,000					E				-55°TO+125°C	10-2,000 CPS
GREEN		5	5		±5%				F			500		
BLUE		6	6										-55°TO+150°C	
PURPLE (VIOLET)		7	7											
GREY		8	8											
WHITE		9	9											
GOLD				0.1			±5%	±5%						
SILVER	CN				±10%	±10%	±10%	±10%						



C. COLOR CODE MARKING FOR MILITARY STANDARD CAPACITORS

TABLE 4 — TEMPERATURE COMPENSATING, STYLE CC.

COLOR	TEMPERATURE COEFFICIENT[4]	1ST SIG FIG	2D SIG FIG	MULTIPLIER[1]	CAPACITANCE TOLERANCE		MIL ID
					CAPACITANCES OVER 10 UUF	CAPACITANCES 10 UUF OR LESS	
BLACK	0	0	0	1		±2.0 UUF	CC
BROWN	-30	1	1	10	±1%		
RED	-80	2	2	100	±2%	±0.25 UUF	
ORANGE	-150	3	3	1,000			
YELLOW	-220	4	4				
GREEN	-330	5	5		±5%	±0.5 UUF	
BLUE	-470	6	6				
PURPLE (VIOLET)	-750	7	7				
GREY		8	8	0.01			
WHITE		9	9	0.1	±10%		
GOLD	+100					±1.0 UUF	
SILVER							

1. THE MULTIPLIER IS THE NUMBER BY WHICH THE TWO SIGNIFICANT (SIG) FIGURES ARE MULTIPLIED TO OBTAIN THE CAPACITANCE IN UUF.
2. LETTERS INDICATE THE CHARACTERISTICS DESIGNATED IN APPLICABLE SPECIFICATIONS MIL-C-5, MIL-C-20, MIL-C-11272B, AND MIL-C-10950C RESPECTIVELY.
3. LETTERS INDICATE THE TEMPERATURE RANGE AND VOLTAGE-TEMPERATURE LIMITS DESIGNATED IN MIL-C-11015D.
4. TEMPERATURE COEFFICIENT IN PARTS PER MILLION PER DEGREE CENTIGRADE.

Figure 5-1. Color code for military standard resistor, indicators, and capacitors.

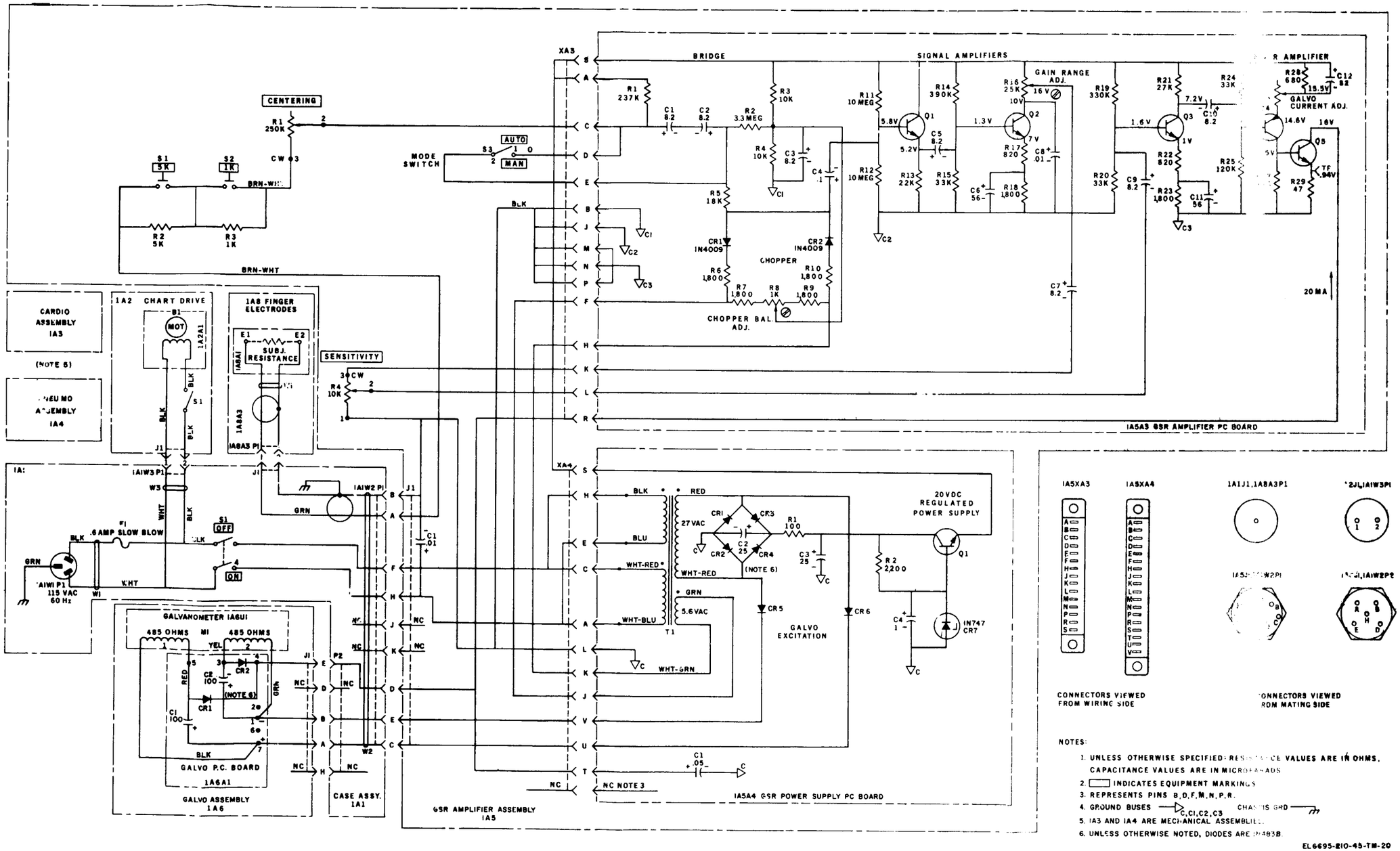


Figure 5-2. Polygraph, schematic diagram

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General, United States Army,
Chief of Staff.

Official:
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USATECOM (2)
USCONARC (5)
USAREUR (5)
USARPAC (5)
USARV (5)
USAYIS (3)
USARHAW (3)
USACDCEC (5)
USACDCINTA (5)
USACDCMPA (2)
USACDCCEA (1)
USACDCCEA (Ft Huachuca) (1)
Armies (2)
Corps (2)
MDW (1)
WRAMC (1)
USASCS (5)
USASESS (10)
USAMPS (3)
USAINTS (3)
LBAD (20)
SAAD (10)
TOAD (10)
LEAD (7)
Gen Dep (1)
Sig Sec, Gen Dep (3)
Sig Dep (3)
Pine Bluff Arsenal (1)
Edgewood Arsenal (1)
Sig FLDMS (1)
Units org under fol TOE:-2 ea.
11-158
11-500(AA-AC)
29-134

ARNG: State AG (3).
USAR: None.
For explanation of abbreviations used, see AR 310-50.

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