

TECHNICAL MANUAL

**ORGANIZATIONAL, DIRECT SUPPORT,
AND GENERAL SUPPORT MAINTENANCE
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS)**

**RECORDER-REPRODUCER SET, SOUND
AN/UNH-16A**

V1 (AIRCRAFT) 5835-00-529-6291

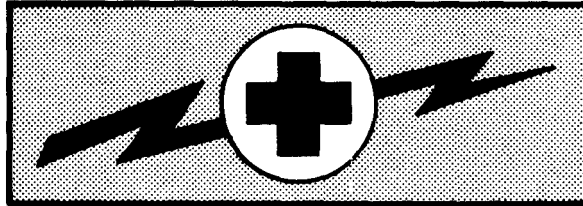
V2 (VEHICLE) 5835-00-529-6306

V3 (SHELTER) 5835-00-529-6307

HEADQUARTERS, DEPARTMENT OF THE ARMY

JULY 1980

WARNING



WARNING

HIGH VOLTAGE

is used in the operation of this equipment.

DEATH ON CONTACT

may result if operating personnel fail to observe safety precautions.

Voltages of 117 Vac or 230 Vac are present inside the power connector, which is connected to POWER connector J 2 on the rear of the power supply.

Be careful not to make contact with high voltage connections when installing or maintaining this equipment.

This publication is not available through AG Publications Center. Requisition through Commander, US Army Electronics Materiel Readiness Activity, Vint Hill Farms Station, Warrenton, VA 22186.

TECHNICAL MANUAL
32-5835-001-24&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D C, 20 July 1980

Organizational, Direct Support and General Support
Maintenance Manual (Including Repair Parts and Special Tools List)

RECORDER-REPRODUCER SET, SOUND
AN/UNH-16A

- V1 (Aircraft) 5835-00-529-6291
- V2 (Vehicle) 5835-00-529-6306
- V3 (Shelter) 5835-00-529-6307

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes, or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) , or DA Form 2028-2 located in the back of this manual direct to U.S. Army Electronics Materiel Readiness Activity, ATTN: SELEM-ME-E, Vint Hill Farms Station, Warrenton, VA 22186. A reply will be furnished to you.

HOW TO USE THIS MANUAL

	Paragraph	Page
CHAPTER 1.	INTRODUCTION	
Section I.	General Information	1-1 1-1
Section II.	Equipment Description and Data	1-7 1-4
Section III.	Repair Parts, Special Tools, TMDE, and Support Equipment	1-10 1-4
CHAPTER 2.	ORGANIZATIONAL MAINTENANCE	
Section I.	Service Upon Receipt	2-1 2-1
Section II.	Preventive Maintenance Checks and Services .	2-6 2-7
Section III.	Principles of Operation	2-7 2-10
Section IV.	Test/Troubleshooting	2-8 2-10
Section V.	Recorder Set Maintenance	2-10 2-14
Section VI.	Preparation for Storage or Shipment	2-12 2-17
CHAPTER 3.	DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE	
Section I.	Principles of Operation	3-1 3-1
Section II.	Troubleshooting	3-3 3-6
Section III.	Base (Unit 1) Maintenance	3-16 3-70
Section IV.	Power Supply (Unit 2) Maintenance	3-18 3-73
Section V.	Recorder (Unit 3) Maintenance	3-23 3-86
APPENDIX A.	REFERENCES	A-1
B.	MAINTENANCE ALLOCATION CHART	B-1
C.	REPAIR PARTS AND SPECIAL TOOLS LIST . .	C-1
D.	EXPENDABLE SUPPLIES AND MATERIALS LIST	D-1
INDEX	ALPHABETICAL INDEX	INDEX 1

*This manual, together with TM 32-5835-001-10. 20 October 1980, supersedes TM 32-5835-001-14, 9 August 1974.

HOW TO USE THIS MANUAL

- a. General. The information in this manual is presented in a manner to help you maintain the equipment in the shortest possible time. Read the manual to become familiar with the content prior to working on the equipment. Two maintenance levels are covered in this manual:

- Organizational in Chapter 2
- Direct Support in Chapter 3

Organizational level technicians are authorized to perform only the maintenance covered in Chapter 2. Direct Support technicians are authorized to perform all maintenance covered in this manual. General support maintenance is not authorized. All technicians should read the Introduction in Chapter 1 of this manual. To find specific information, use the table of contents located in the front of this manual and the index located in the back of this manual.

- b. Organizational Maintenance. Information in Chapter 2 is presented to the level necessary for the Organizational level technician to perform the authorized tasks.

- (1) The information in Sections I, II, III, and VI is used in the normal manner.
- (2) The information in Section IV is used for troubleshooting and testing the recorder set. When troubleshooting, use all columns of Table 2-2. After repairs are made, completely assemble the recorder set and perform final testing by using the "Procedure" and "Normal Indication" columns of Table 2-2. This final testing ensures the recorder set is fully operational before turning it over to the using activity or stock.
- (3) Maintenance in Section V covers all functions which you may perform on the recorder set.

- c. Direct Support. Information in Chapter 3 is presented to the level necessary for the Direct Support technician to perform the authorized tasks.

NOTE

A sample on how to use the direct support troubleshooting, maintenance, and final testing is included at the end of this discussion.

- (1) Principles of Operation in Section I provides an overall description to the functional circuit level. Descriptions within the functional circuits are presented on the corresponding fold-out schematic diagrams located at the back of this manual to aid in troubleshooting.
- (2) Troubleshooting in Section II is organized to enable you to quickly determine the cause of the trouble. The following is an example of how to use the information in troubleshooting the power supply.

(a) How to find the troubleshooting information:

- If the trouble symptom is not known, turn to the Index at the end of the manual and find "Power Supply" and then "Troubleshooting" under it. Turn to paragraph 3-6 and Table 3-1.

OR

Look under "Troubleshooting" and then "Power Supply" under it.

- If the trouble symptom is known, turn to the "Maintenance Action Precise Symptom List" in paragraph 3-5. Find the "power supply" and then the known trouble symptom "Output voltage incorrect". The troubleshooting procedure is then found in paragraph 3-6.


(b) How to find the problem: Paragraph 3-6 references you to table 3-1 which contains the proper troubleshooting procedure. The procedure has columns with headings: "Procedure", "Normal Indication", and "Corrective Action". Starting at step 1, read the procedure across the page. Each step tells what to do ("Procedure" column), what to look for ("Normal Indication" column), and corrective action ("Corrective Action" column). Assume step 1 of the troubleshooting procedure in table 3-1 is being performed. The manual states to replace 2A1F2 or 2A1CR2 to repair the power supply and references maintenance instruction paragraph 3-20. The numbered star and lettered circle test points in the "Normal Indication" column are not marked on the equipment. They are assigned to help you quickly locate the physical point at which to make the measurement as shown in the parts location figure (FO- 1) at the back of the manual. Facing the parts location figure is the schematic diagram which shows the electrical location of the test points, groups and names the functional stages, and shows major signal flow as heavy lines with arrowheads to depict direction of signal flow. Numbered star test points isolate a malfunction to the defective assembly; lettered circle test points isolate a malfunction to the defective stage within an assembly.

(c) How to fix the problem: Turn to paragraph 3-20. This maintenance instruction is arranged with an "Item" column, "Action" column, and "Remarks" column. Find the REPAIR function of the procedure, perform the action in each step, starting at the left hand column and reading across. Since a printed circuit card is being repaired, detailed step-by-step procedures are not required. The "Remarks" column references parts location diagram FO - 1. The power supply repair is now ready to be completed.

- (3) Maintenance in Sections III, IV and V covers the base, power supply, and recorder, respectively. The information is organized so that all maintenance which can be performed on a unit or an assembly is grouped together for that item.
- (4) Final testing for the power supply is in paragraph 3-22 and for the recorder is in paragraph 3-49. These procedures are to be performed after repairs are made, the unit is completely assembled, and before returning the unit to the using activity or stock.

SAMPLE USE OF TROUBLESHOOTING, MAINTENANCE, AND FINAL TESTING
(DIRECT SUPPORT)

Table 3-1. Power Supply Troubleshooting

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
1. Dc source	Power switch	ON				Replace 2A1F2 or 2A1CR2, Para. 3-20 and figure FO-1.
	ADJUST control	+24.0 Vdc.	Test Point 	Multimeter	+10.4 to +12.4 Vdc	

3-20. Fuse Card (2A1) Maintenance Instructions

This task covers:

- a. Inspect
- b. RePAIR
- c. Replace
- d. Test

INITIAL SETUP

Item	Action	Remarks
REPAIR		
Fuse card 2A1 (4)	Repair by replacing defective parts.	Figure FO-1.
TEST		
Fuse card 2A1 (4)	Perform final test, paragraph 3-22.	

Table 3-11. Power Supply Final Test

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
1. Dc source	Power	ON				If normal indications are not obtained, perform troubleshooting procedure in para. 3-6.
	output control	+24 Vdc	Load resistor TX-9	Multimeter	+10.4 to +12.4 Vdc	

CHAPTER 1

INTRODUCTION

Section I. GENERAL INFORMATION

1-1. Scope. This manual provides organizational, direct support and general support maintenance for the Recorder-Reproducer Set, Sound AN/UNH-16A (figure 1-1). Use it to keep the Recorder-Reproducer Set, Sound AN/UNH-16A in peak condition, and maintain your proficiency. Throughout this manual the Recorder-Reproducer Set, Sound AN/UNH-16A will be referred to as recorder set.

1-2. Maintenance Forms and Records.

a. Reports of Maintenance and Unsatisfactory Equipment. Maintenance forms, records and reports are to be used by maintenance personnel at all maintenance levels listed as prescribed by TM 38-750, The Army Maintenance Management System (TAMMS).

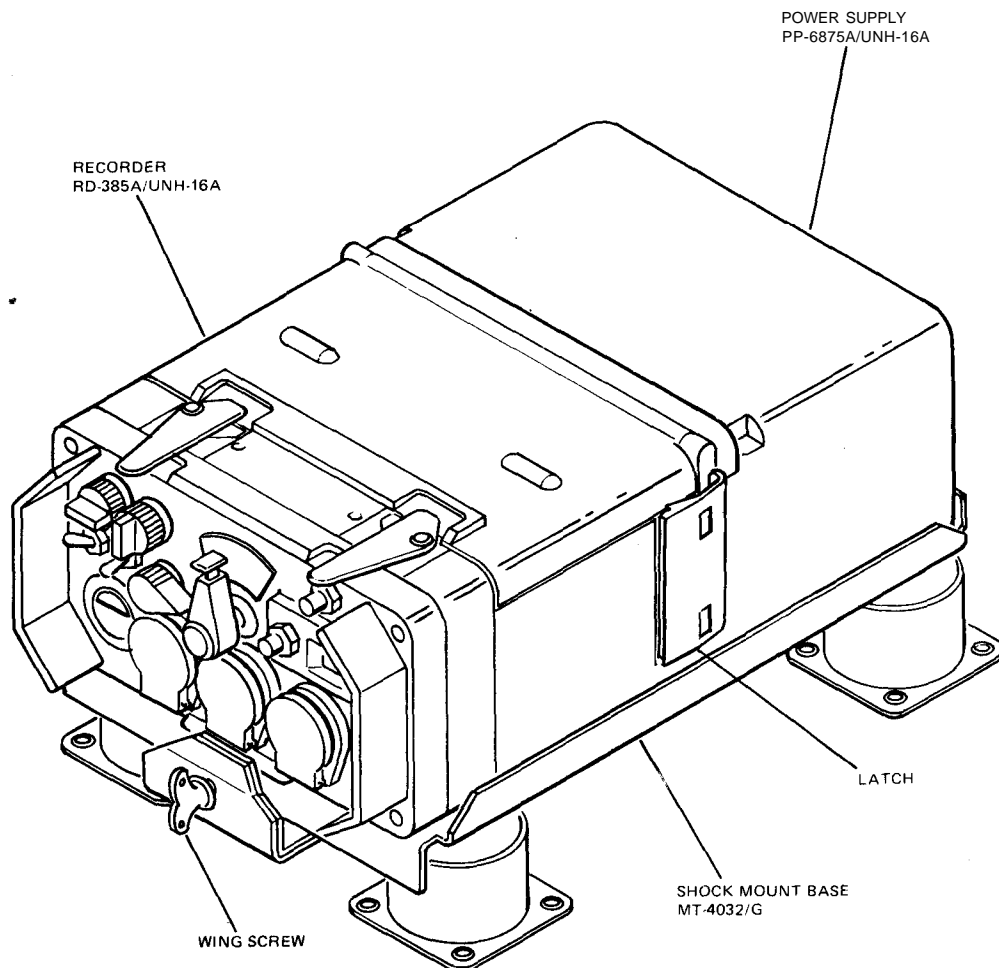


Figure 1-1. Recorder-Reproducer Set, Sound AN /UNH-16A

b. Report of Packaging and Handling Deficiencies. Fill out and forward DD Form 6 (Packaging Improvement Report) as prescribed in AR 700-58 /NAVSUPINST 4030.29/ AFR 75-13/MCO P4030.29A and DSAR 4145.8.

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

1-3. Destruction of Army Material. Destruction of Army material to prevent enemy use will be as prescribed in TM 750-244-2.

1-4. Administrative Storage. Repacking of equipment or limited storage normally will be performed at a packing facility, or by a packing team. Refer to paragraph 2-13 for packaging instructions.

1-5. Nomenclature Cross-Reference List

NOMENCLATURE		CROSS-REFERENCE
COMMON	NAME	OFFICIAL NOMENCLATURE
Recorder Set		Recorder-Reproducer Set, Sound AN/UNH-16A
Base		Shock Mount Base, Electrical Equipment MT-4032/G
Power Supply		Power Supply PP-6875A/UNH-16A
Fuse Card		Semiconductor Device-Fuse Assembly 2A1
Power Card		Circuit Card Assembly 2A2
Recorder		Recorder-Reproducer, Sound RD-385A/UNH-16A
Front Panel		Recorder-Reproducer Control 3A3
Knob		Knob Assembly 3A3A1
Mag Transport		Magnetic Tape Transport Subassembly 3A4
Slide Plate		Slide Plate Subassembly 3A4A1
Audio Head		Head Mounting Assembly 3A4A1A1
Roller		Sound Recorder Roller 3A4A1A2
Roller		Sound Recorder Roller 3A4A1A3
Drive Wheel		Drive Wheel Subassembly 3A4A1A4
Idler Wheel		Idler Wheel Assembly 3A4A1A4A1
Slide Plate		Plate Subassembly 3A4A1A5
Erase Head		Erase Head 3A4A1PU2
Switches		Switches, Sensitive 3A4S1J through 3A4S1P
Counter		Counter Pulley Assembly 3A4A2
Ejector		Ejector Assembly 3A4A3
Mode Switch		Switch Assembly 3A4A4
Amplifier Card		Circuit Card Assembly 3A4A5
Motor-Bias Card		Circuit Card Assembly 3A4A6
Sensor Card		Circuit Card Assembly 3A4A7
Meter Card		Circuit Card Assembly 3A4A8
Resistor Card		Resistor Assembly 3A4A9

NOMENCLATURE		CROSS-REFERENCE
COMMON	NAME	OFFICIAL NOMENCLATURE
R filter.....		Filter Assembly 3A4A10
C Filter		Circuit Card Assembly 3A4A11
Sensor		Recorder-Reproducer Sensor 3A4A12
Actuator.		Actuator Assembly 3A4A13
Disk Reel.		Disk Reel Assembly 3A4A14
Cartridge Plate		Mounting Cartridge Plate 3A4A15
Disk Reel		Disk Reel Assembly 3A4A16
Reel Motor.. . . .		DC Motor Assembly 3A4A17
Capstan Motor		DC Motor Assembly 3A4A18
J1 Connector		Wiring Harness, J1 Connector 3A4A19
Main Harness.		Main Wiring Harness 3A4A20
Battery Box.		Battery Box CY-7293A/UNH-16A
Accessories Case		Accessories Case CY-7291/UNH-16A
Recorder Case		Recorder-Reproducer Case CY-7292A/ UNH-16A
Headset		Headset H-216/U (MODIFIED)
Microphone		Magnetic Microphone M-104/PNH-4 (MODIFIED)
Cassette		Tape Cartridge Norelco C-60
117 Vac Cable		Electrical Power Cable Assembly CX-12896A/UNH-16A
230 Vac Cable		Electrical Power Cable Assembly CX-12893A/UNH-16A
22 to 30 vdc Cable		Electrical Special Purpose Cable Assembly CX-12893A/UNH-16A
333 Hz Test Tape		Prerecorded Cassette Tape 333 Hz
3 kHz Test Tape		Prerecorded Cassette Tape 3 kHz
Dc Source		Power Supply 8 to 30 Vdc, 5 Amperes
Multimeter		Multimeter AN/USM-223
Flutter Meter		Flutter Meter ME-254A/U
Variac		Transformer, Variable CN-16U
Filter		Variable Filter, Krohn Hite 3103-4
Oscilloscope		Oscilloscope AN/USM-281C
Frequency Counter		Electronic Digital Readout Counter AN /USM-207A
Generator		Audio Generator AN/URM-127A
Distortion Indicator		Distortion Indicator AN/URM-184A
Voltmeter		Electronic Voltmeter AN/USM-224
600 Ohm Load TX-1		Special Purpose Adapter (TX-1)
Test Cable TX-2		Special Purpose Cable (TX-2)
Test Cable TX-3		Special Purpose Cable (TX-3)
Test Cable TX-4		Special Purpose Cable (TX-4)
Test Cable TX-5		Special Purpose Cable (TX-5)
Test Cable TX-6		Test Clip, Miniature (TX-6)
Adapter TX-7		Receptacle, BNC (TX-7) (2 req.)
Adapter TX-8		Adapter, TEE, BNC (TX-8)
Load Resistor TX-9.....		Resistor 56 ohm, 5 watt, 5% (TX-9)
Test Cable TX-10		Special Purpose Cable (TX-10)

1-6. Reporting Equipment Improvement Recommendations (EIR). EIR's can and must be submitted by anyone who is aware of an unsatisfactory condition with the equipment design or use. It is not necessary to show a new design or list a better way to perform a procedure, just simply tell why the design is unfavorable or why a procedure is difficult. EIR's may be submitted on SF 368, Quality Deficiency Report, in accordance with TM 38-750. Mail directly to U.S. Army Electronics Materiel Readiness Activity, ATTN: SE LEM-ME-I, Vint Hill Farms Station, Warrenton, VA 22186. A reply will be furnished to you.

Section II. EQUIPMENT DESCRIPTION AND DATA

1-7. Description and Data. Refer to TM 32-5835-001-10 for equipment description and data.

1-8. Difference in Equipment. There is a major difference between models of the Recorder-Reproducer, Sound RD-385/UNH-16A and RD-385A/UNH-16A. Recorder-Reproducer, Sound RD-385 /UNH-16A is authorized to be repaired at the depot maintenance level. Therefore, it will not be covered in this manual.

1-9. Equipment Configuration. There are three equipment configurations as identified in table 1-1. These configurations are (V1) , which is an aircraft configuration, (V2) which is a vehicle configuration, (V3) which is a shelter configuration.

Section III. REPAIR PARTS , SPECIAL TOOLS, TMDE , AND

SUPPORT EQUIPMENT

1-10. Common Tools and Equipment. For authorized common tools and equipment refer to the Modified Table of Organization and Equipment (MTOE) applicable to the appropriate unit.

1-11. Special Tools, TMDE, and Support Equipment. No special tools or test equipment are required to support the recorder set.

1-12. Repair Parts. Repair parts are listed and illustrated in Appendix C of this manual.

Table 1-1. Recorder Set Versions

Item	Version		
	Aircraft V1	Vehicle V2	Shelter V3
Power Supply PP-6875A/UNH-16A	X	X	X
Base Mount W/Shocks MT-4032/G	X	X	X
117 Vac Cable CX-12896A/UNH-16A		X	X
22 to 30 Vdc Cable CX-12894A/UNH-16A	X		
Connector M81511/06EB01P1	X	X	
Clamp M81511-13-10A	X	X	
Recorder RD-385A/UNH-16A	X	X	X
Microphone M-104/PNH-4 (MODIFIED)	X	X	X

CHAPTER 2

ORGANIZATIONAL MAINTENANCE

Section I. SERVICE UPON RECEIPT

2-1. Service Upon Receipt of Material.

SERVICE UPON RECEIPT-RECORDER SET SURFACES			
LOCATION	ITEM	ACTION	REMARKS
1. Power Supply	Components	a. Inspect for dents, missing hardware, and damaged connectors.	
2. Recorder	Components	a. Inspect for dents, damaged knobs, latches, connectors, and indicators.	

2-2. Checking Unpacked Equipment.

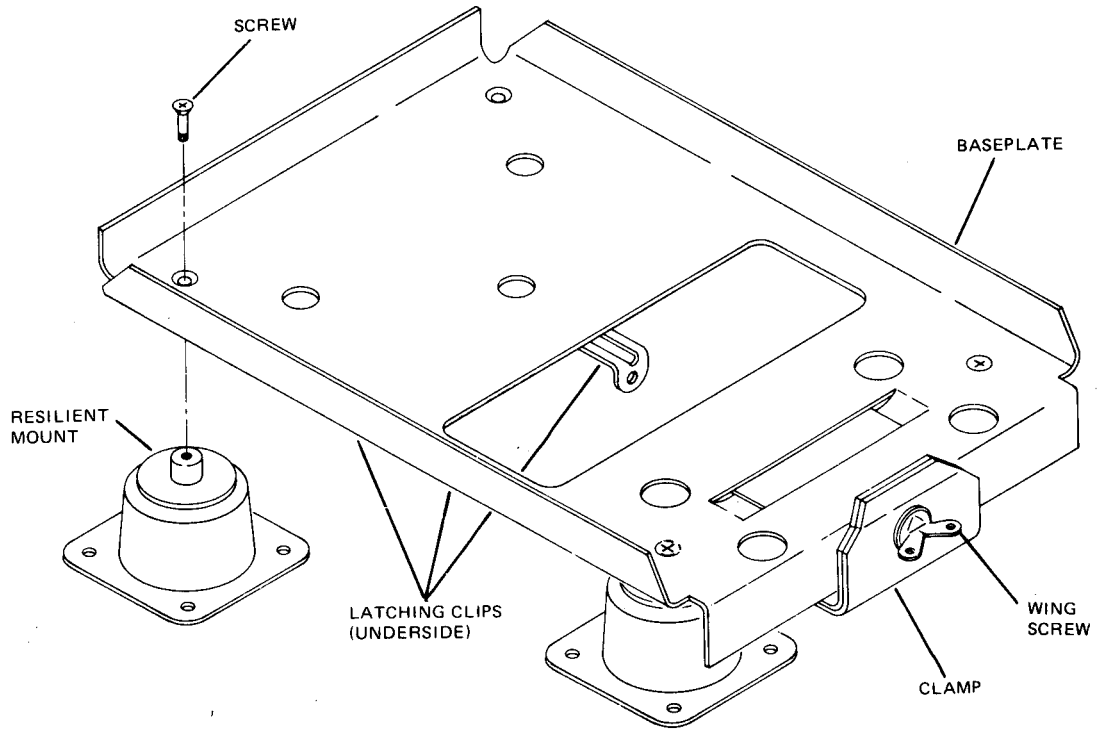
- a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6, Packing Improvement Report.
- b. Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of TM 38-750.
- c. Check to see whether the equipment has been modified.

2-3. Installation.

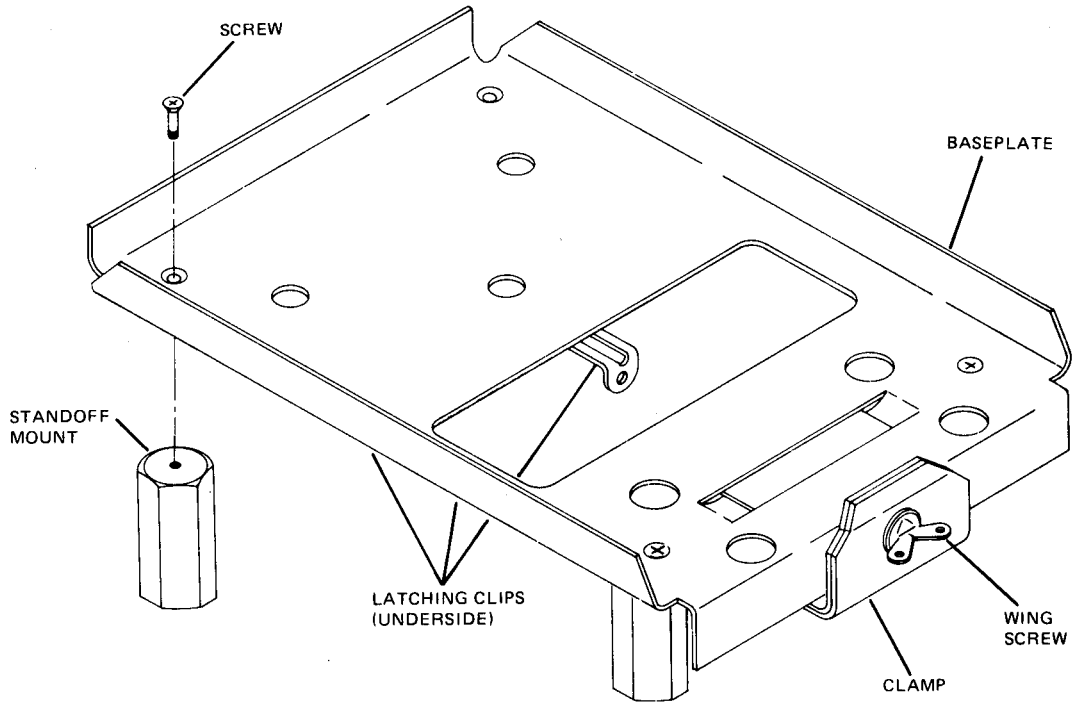
a. Resilient Mounting Method. (figure 2-1A)

(1) Aircraft.

- (a) Place base into assigned area of aircraft for installation.
- (b) Mark mounting surface through four holes in each resilient mount (figure 2-1A).
- (c) Remove base and drill holes to receive approved aircraft hardware.
- (d) Remove four resilient mounts from baseplate.
- (e) Secure resilient mounts to aircraft mounting surface.
- (f) Position baseplate over four resilient mounts and secure.
- (g) Attach power supply to recorder (figure 1-1) and secure latches.



A. Resilient Mount



B. Standoff Mount

Figure 2-1. Base, Mounting Methods

(h) Position recorder set on base and secure three latching clips, on underside of baseplate (figure 2-1).

(i) Tighten wing screw on base.

(j) Connect cables as shown in Figure 2-2.

NOTE

The 22 to 30 Vdc cable must be terminated to mate with aircraft 22 to 30 Vdc power source. Connector M81511/06EP01p1 and Clamp M81511-13-10A are connected to power supply connector J1 and terminated as required in the aircraft.

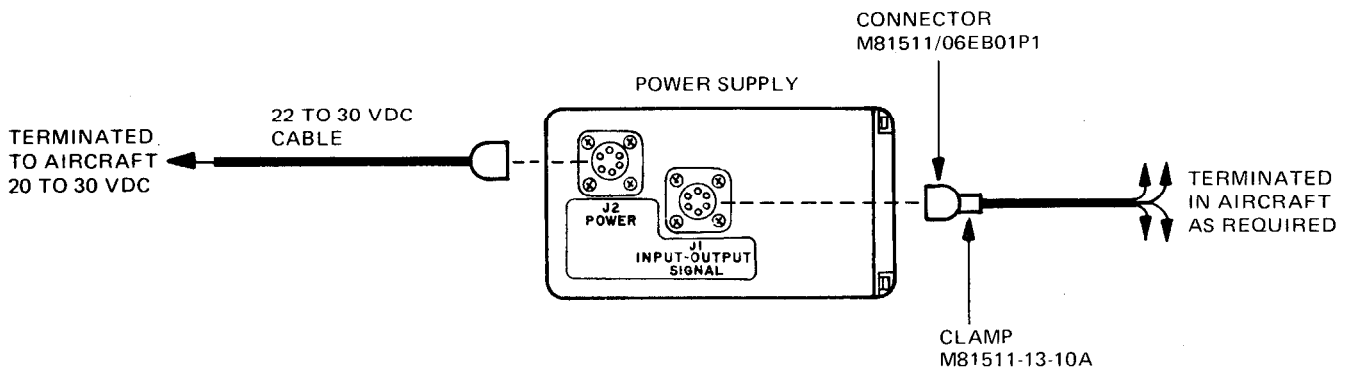


Figure 2-2. Aircraft Configuration

(2) Vehicle .

(a) Place base into assigned area of vehicle for installation.

(b) Mark mounting surface through four holes in each resilient mount (figure 2- 1A) .

(c) Remove base and drill holes to receive approved vehicle hardware.

(d) Remove four resilient mounts from baseplate.

(e) Secure four resilient mounts to vehicle mounting surface.

(f) Position baseplate over four resilient mounts and secure.

(g) Attach power supply to recorder (figure 1-1) and secure latches.

(h) Position recorder set on base and secure three latching clips, on underside of baseplate (figure 2-1).

- (i) Tighten wing screw on base.
- (j) Connect cables as shown in figure 2-3.

NOTE

Connector M81511/06EB01P1 and clamp M81511-13-10A are connected to power supply connector J 1 and terminated as required in the vehicle.

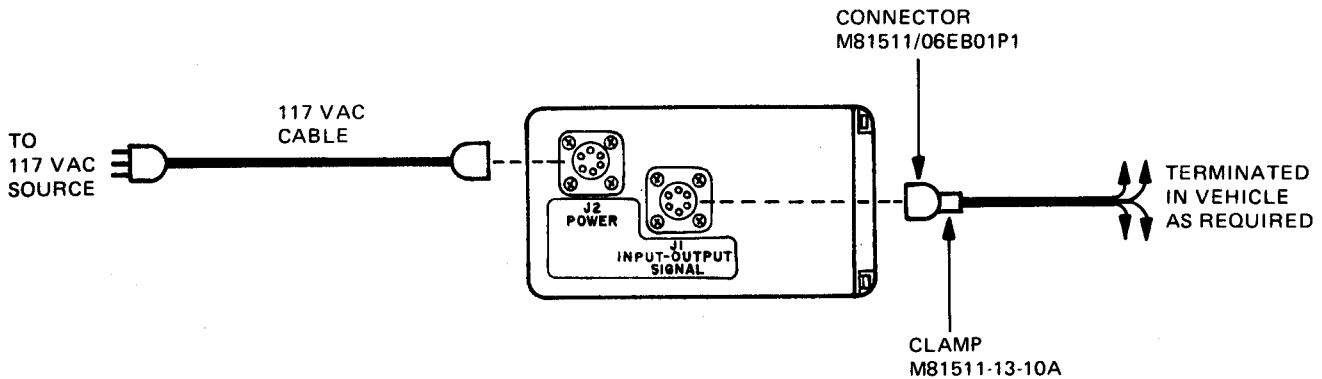


Figure 2-3. Vehicle Configuration

(3) Shelter.

- (a) Place base into assigned area of shelter for installation.
- (b) Mark mounting surface through four holes in each resilient mount (figure 2-1A).
- (c) Remove base and drill holes to receive approved shelter hardware.
- (d) Remove four resilient mounts from baseplate.
- (e) Secure four resilient mounts to shelter mounting surface.
- (f) Position baseplate over four resilient mounts and secure.
- (g) Attach power supply to recorder (figure 1-1) and secure latches.
- (h) Position recorder set on base and secure three latching clips, on underside of baseplate (figure 2-1).
- (i) Tighten wing screw on base.
- (j) Connect cable as shown in figure 2-4.

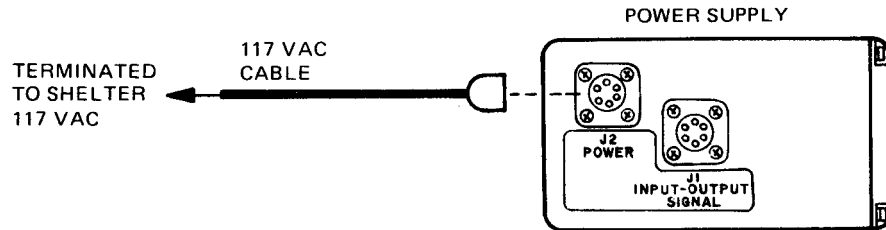


Figure 2-4. Shelter Configuration

b. Standoff Mounting Method. (figure 2-1B). The standoff mounting method is very similar to the resilient mounting method and is identical for each version listed in table 1-1.

- (1) Remove four standoffs from baseplate.
- (2) Position baseplate into installation position.
- (3) Mark mounting surface through the four standoff position holes.
- (4) Drill through the mounting surface at the four marked positions.
- (5) Attach four standoffs to mounting surface with approved hardware.
- (6) Position baseplate over standoffs and secure.
- (7) Refer to paragraphs (1)(g), (2)(g), or (3)(g) to install the recorder set in its position.

2-4. Microphone Wiring. Magnetic Microphone M-104/PNH-4 (MODIFIED) is wired for channel 2 operation. The modification to the microphone plug consists of leaving the braid fastened to the sleeve, the tip wire in place, and clipping the ring wire. There is no requirement to use the microphone for channel 1 operation. However, a second microphone can be used with channel 1 by leaving the sleeve and ring in place and clipping the tip wire. See figure 2-5.

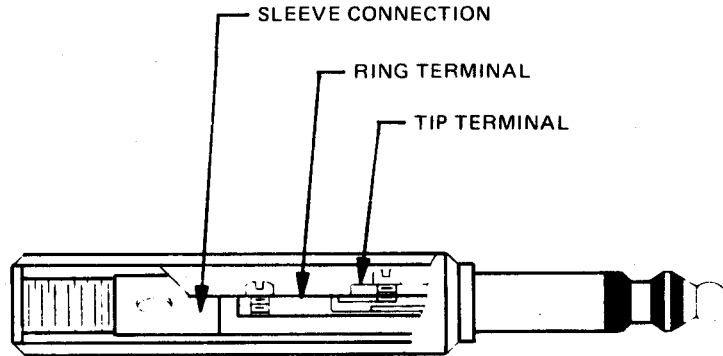


Figure 2-5. Telephone Plug Configuration

2-5. Preliminary Adjustment of Equipment.

a. Preoperational Checks. Make the following checks of the recorder set before operating.

(1) Check signal cable (if used) and power cable connections to make sure they are correct and secure.

(2) Check that proper power is available to operate the recorder set by setting mode selector to REPRO position and pressing BAT TEST button; LEVEL meter should indicate in green area.

b. Operational Checks.

(1) Record Mode.

(a) Insert cassette into recorder set.

(b) Connect microphone to MIC jack and headset to HD PHONE jack.

(c) Set mode selector to REC.

(d) Press BAT TEST button.

(e) LEVEL meter should read in green area.

(f) Set channel selector to channel 2 and note counter reading.

(g) Set AGC/MAN 2 switch to AGC .

(h) Press microphone button, speak into microphone, and make short recording.

(i) LEVEL meter should read in red area while speaking.

(j) Set mode selector to OFF and note counter reading.

(k) Set mode selector to F/R and rewind cassette to counter reading noted in step (f).

(2) Reproduce Mode.

(a) Set mode selector to REPRO.

(b) LEVEL meter should read in red area during playing of recording made from step (f) through step (j).

(c) Monitor cassette reproduction through headset.

(d) Set mode selector to F/F; counter reading should increase.

(e) Set mode selector to OFF.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

2-6. General. To keep a recorder set in its best operating condition and ready for field use, perform scheduled PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) as listed in table 2-1.

a. Monthly and quarterly PMC S are important checks to keep serious problems from suddenly happening.

b. Stowing items not in use, covering unused receptacles, and checking for loose nuts and screws are not listed as PMCS checks and are things that should be done anytime that they become necessary.

When troubleshooting, use proper equipment (paragraphs 3-6 and 3-8). Report any deficiencies using the proper forms, see TM 38-750.

d. When performing any PMCS or routine checks, keep in mind the warnings and cautions.

NOTE

Use the ITEM NO. column in PMC S table to get the numbers for the TM ITEM NO. Column on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) when the form is filled out.

Table 2-1. Organizational Preventive Maintenance Checks and Services

Item No.	Interval		Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary
	M	Q		
				<u>WARNING</u>
1	x		Power Supply	Be sure power supply is disconnected from power source when performing maintenance on power supply. HIGH VOLTAGE may be present at the power connector connected to POWER connector J2. This HIGH VOLTAGE could cause death. Remove power supply cover and slide power supply from case. Check power supply and case for evidence of water, corrosion, and damaged components. Clean and replace fuses as necessary. For component damage, forward to your direct support maintenance unit. (Paragraph 2-11)
2	x		Gasket	Inspect waterproof gasket for leaks and worn or loose edges. Gaskets must be clean, flexible and in good condition. If gaskets are defective, direct support level maintenance is required. (Figure 2-7)
3	x		Fuses	Check fuses for correct value, and that holders are clean and in good condition. Clean contacts. (Figure 2-7)
4	x		Connectors	Check power cable connectors to be sure that they are not damaged and intact. Be sure that attached wires within cable connectors are not broken, frayed or under undue strain. Forward to direct support maintenance unit for repair. (Paragraph 2-3)
5	x		Knobs and Switches	While making the operating checks, make sure that mechanical action of each control and switch is smooth and does not bind internally or externally. Make sure knobs are tight on shafts. Forward to direct support maintenance unit for repair and adjustments. (Paragraph 2-5)

Table 2-1. Organizational Preventive Maintenance Checks and Services (Cont.)

Item No.	Interval		Item to be Inspected	Procedures Check for and have repaired or adjusted as necessary
	M	Q		
6	x		Recorder Set	Check recorder set for proper operation.
7	x			General Inspection and cleaning. (Paragraph 2-5)
8		x	Completeness	Check completeness of equipment. Refer to parts list. (Appendix C)
9		x	Installation	See that recorder set is properly installed. (Paragraph 2-3)
10		x	Cleanliness	See that equipment is clean.
11		x	Connections	See that power cables and connectors are clean and intact.
12		x	Operation	Check recorder set for proper operation. (Paragraph 2-5)

Section III. PRINCIPLES OF OPERATION

2-7. Functional Description. The recorder set consists of two major assemblies: power supply and recorder (figure 2-6). A microphone and/or receiver and headset are used during normal operation.

a. Power Supply. Fuse card (2A1) provides overload protection in normal operation of the recorder set.

b. Recorder. Authorized maintenance at organizational level is limited to fuse replacement of the power supply, therefore, principles of operation of the recorder will not appear in this chapter.

c. Operation. A microphone and/or a receiver may be used to apply voice information to the recorder set, to be recorded on a cassette tape for future use. To monitor this recorded or reproduced information a headset is used.

NOTE

Microphone information cannot be monitored during recording.

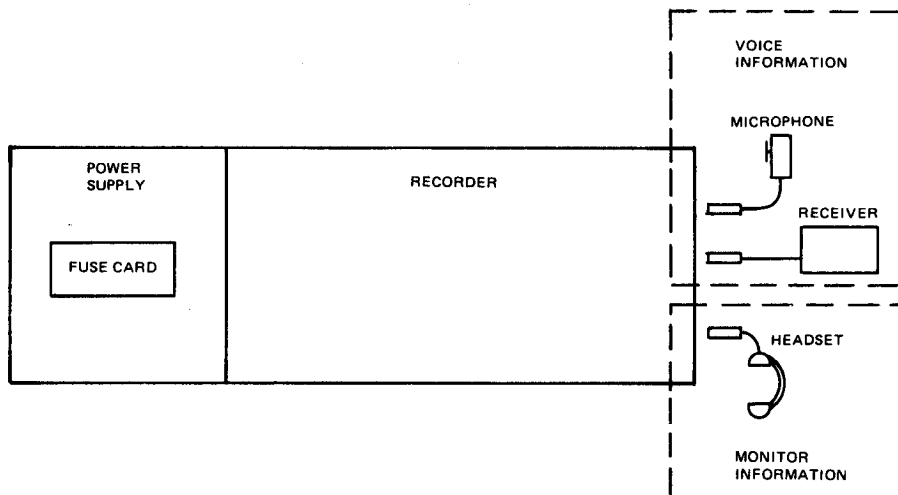


Figure 2-6. Recorder Set, Functional Block Diagram

Section IV. TEST/TROUBLESHOOTING

2-8. General.

Organizational testing consists of performing the procedural steps of the Procedure and NORMAL INDICATION column of table 2-2. When normal indication cannot be obtained, troubleshooting must be performed on the recorder set.

b. Organizational troubleshooting consists of performing the procedural steps in NORMAL INDICATION and CORRECTIVE ACTION columns when indications in the NORMAL INDICATION columns cannot be obtained, during testing.

2-9. Removal. To remove recorder set from its installed position in aircraft, vehicle, or shelter for maintenance or replacement perform the following steps:

- a. Disconnect all cables and equipment.
- b. Loosen wing screw on baseplate.
- c. Unlatch three latching clips on underside of baseplate.
- d. Remove recorder set.

NOTE

To perform test and troubleshooting procedures, a cassette must be inserted into the recorder set, a headset connected to HD PHONE jack, a microphone connected to MIC jack, and the 117 Vac cable connected between the recorder set connector J2 and a 117 Vac power source.

Table 2-2. Recorder Set Test/Troubleshooting

Procedure			Normal Indication			Corrective Action			
Location	Item	Action	Location	Indicator	Indication				
1. Recorder set	Mode selector	REC	Recorder	LEVEL meter	Green area	Check cable connections. Replace defective fuses 2A 1F1 through 2A 1F3 in power supply, figure 2-7. Forward to direct support for repair.			
	Channel selector	2							
	BAT TEST button	Press							
	AGC/MAN 2 switch	AGC							
	Microphone	Press button and talk into microphone.					LEVEL meter	Red area	Forward to direct support for repair.
	AGC/MAN 2 switch	MAN					LEVEL meter	Red area	Forward to direct support for repair.
	GAIN control	Adjust while speaking into microphone.					LEVEL meter	Red area	Forward to direct support for repair.
Mode selector	F/F	Counter	Reading increases.	Forward to direct support for repair.					
		Permit cassette to run to near end of tape.							

Table 2-2. Recorder Set Test/Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
1. Recorder Set- continued	Mode selector	REC Allow tape to run to end.		Counter Headset	Stops Tone is heard.	Forward to direct support for repair.
	Mode selector	F/R		Counter	Reading increases	Forward to direct support for repair.
	Channel selector	1				
	AGC/MAN 1 switch	AGC				
2. Repeat step 1 for channel 1.						
NOTE						
To check channel 1, microphone connector must be modified as shown in para. 2-4.						
3. Recorder Set	Mode selector	OFF				
	RESET button	Press	Recorder Set	Counter	Indication 000	Forward to direct support for adjustment or repair.
	Cassette loading door	Open				
	EJECT button	Press		Cassette	Raises to allow removal.	Forward to direct support for adjustment or repair.

Section V. RECORDER SET MAINTENANCE

2-10. General. This section provides organizational maintenance for the recorder set. Maintenance instructions are contained in paragraph 2-11 and a final test procedure in table 2-2.

2-11. Recorder Set Maintenance Instructions.

This task covers:

- a. Inspect
- b. Service
- c. Repair
- d. Replace
- e. Test

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Materials/Parts

Cleaning Compound, 6850-00-597-9765
Xylene, FED-SPEC TT-X-916B

Troubleshooting References

Table 2-2

Personnel Requirements

E W /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

No power applied.

Special Environmental Conditions

None

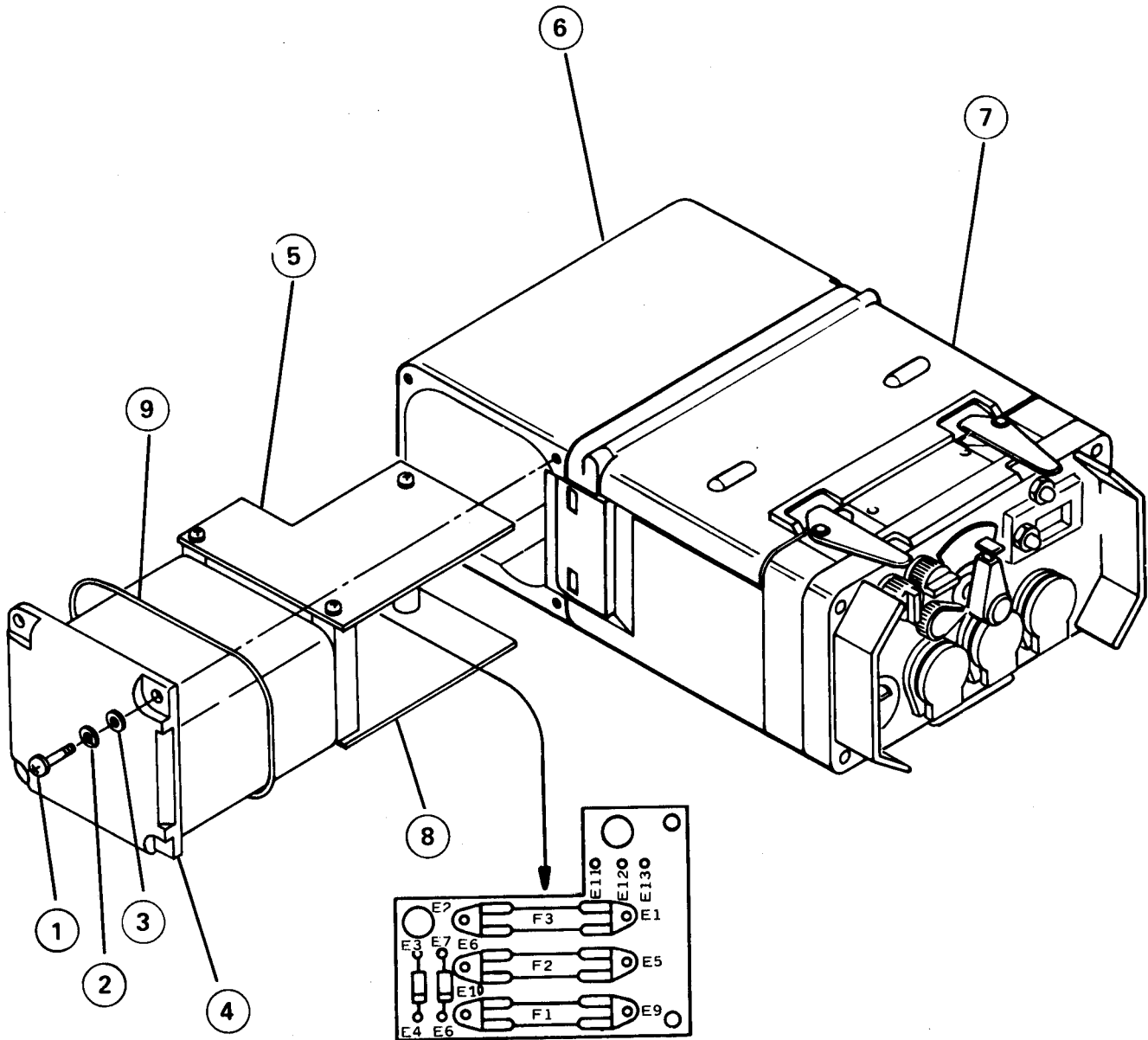
General Safety Instructions

High voltage present when power is applied.

Approximate Time Required (minutes)

Inspect	6
Service	6
Repair	12
Replace	6
Test	<u>6</u>
	36

Item	Action	Remarks
INSPECT		
1. Power supply (4), 4 screws (1), lock washers (2), and flat washers (3)	Remove	Figure 2-7 Retain
	Slide power supply out of case (7) as far as possible.	Items are connected by wiring harness.
2. Power supply (4)	Check for evidence of overheating (charred components) and physical damage (fractured cards or open printed wiring), to fuse card 2A 1(5) and power card 2A 2(8) and for accumu- lations of dust and dirt. Check gasket for damage or excessive dirt.	Figure 2-7
3. Recorder (7)	Inspect for accumula- tions of dirt, grease, and for damage to latches, hinges, and other compo- nents. Check for loose knobs or switches.	
SERVICE		
1. Power supply	Clean using a soft brush or compressed air. Clean case using cleaning com- pound, lint free rags, and a soft brush.	
2. Recorder	Clean external surfaces using cleaning com- pound, lint-free rags, and a soft brush. Clean audio head using a lint- free swab moistened (not saturated) with Xylene (FED-SPEC-TT-X-916B).	Figure 2-8 for recorder cleaning locations.



- | | |
|--------------------|---------------------|
| 1. Screw | 6. Case |
| 2. Lock washer | 7. Recorder |
| 3. Flat washer | 8. Power card (2A2) |
| 4. Power supply | 9. Gasket |
| 5. Fuse card (2A1) | |

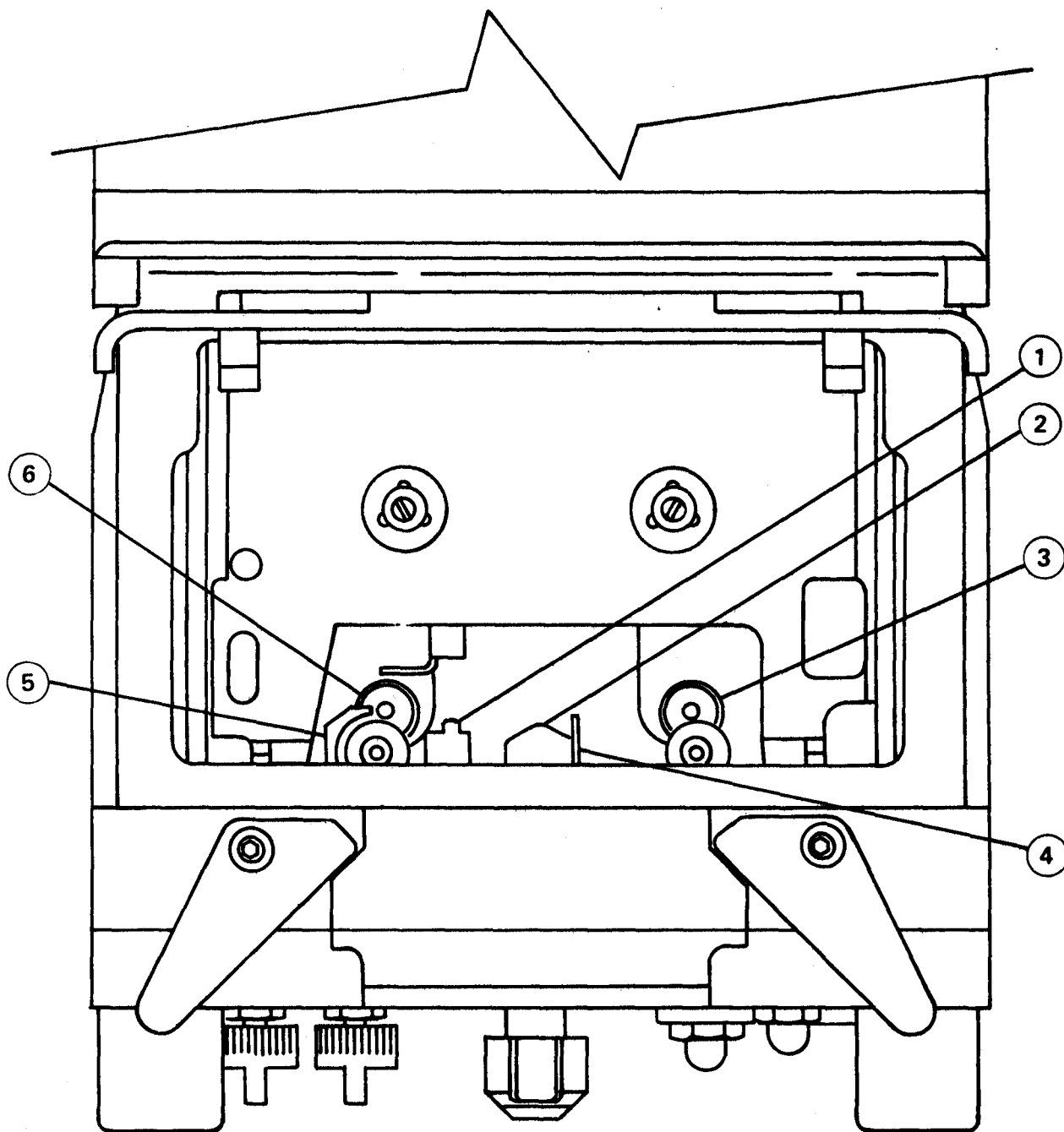
Figure 2-7. Power Supply, Remove/Replace

Item	Action	Remarks
REPAIR		
Recorder set	Limited to repair of power supply. Repair of power supply is limited to replacement of fuses. For further repair send power supply to direct support.	Figure 2-7
REPLACE		
1. Power supply	Replace if BAT TEST fails and fuses are not defective.	
2. Power supply (4)	Slide into case.	
3. 4 screws (1), lock-washers (2), and flat washers (3).	Install	
4. Recorder	Replace if recorder is not performing properly.	
TEST		
Recorder set	Perform test procedure in table 2-2 PROCEDURE and NORMAL INDICATION columns.	If recorder set fails any part of this test and authorized maintenance has been performed, forward recorder set to direct support.

Section VI. PREPARATION FOR STORAGE OR SHIPMENT

2-12. Preparation for Travel. No special preparation is required.

2-13. Preparation for Shipment and Storage. Repacking of equipment for shipment or limited storage normally will be performed at a packaging facility or by a packaging team. Repackage the recorder set in accordance with the original packaging as much as possible with available materials.



- | | |
|------------------|------------------|
| 1. Erase head | 4. Tape guide |
| 2. Audio head | 5. Tape guide |
| 3. Capstan shaft | 6. Capstan shaft |

Figure 2-8. Recorder Cleaning Locations

CHAPTER 3

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE

Section I. PRINCIPLES OF OPERATION

3-1. Recorder Set. Operating principles of the recorder set are contained in this section. The recorder set consists of two major assemblies: recorder and power supply .

a. Recorder.

(1) Recording technique. Standard direct recording techniques are used in which a direct record amplifier records the time relationship of analog input signals directly on magnetic tape. Basically, the record circuit is composed of two sections: a data signal amplifier and a bias oscillator. The signal amplifier amplifies the input signal and provides a current source to drive the record head with signals proportional to the applied input signals. This creates, in the magnetic oxide coating of the tape, magnetic flux changes which correspond in intensity and timing to the input signals. Since the flux density in a magnetic medium does not vary linearly with the magnetizing force, the data signal is superimposed on a high frequency (38 kHz) bias signal to overcome the hysteresis nonlinearity of the magnetic tape. A symmetrical low distortion bias signal is adjusted to optimize system parameters such as frequency response, signal-to-noise ratio, and distortion. The data signal is adjusted for recording at normal record level (3 percent third harmonic distortion upon reproduction of a 400 Hz signal at an input record signal level of 0 dBm.) The bias and data signal record levels are both a function of the characteristics of the record head and the magnetic tape used and must be adjusted accordingly.

(2) Equalization technique. Two techniques are commonly used for direct recording of signals on magnetic tape. One of these, known as constant flux recording is used in instrumentation applications in which there is an equal probability of high level signals at any frequency within the passband to be recorded. For audio applications, in which the spectral energy of the signal to be recorded diminished with increasing frequency, a pre-emphasized or "pre-equalized" recording technique is used to allow optimum utilization of the recording medium. Pre-emphasized recording is the method used in this recorder.

(3) Recorder functional sections. Refer to figure 3-1. The recorder is functionally divided into the electromechanical tape drive system, the control logic electronics, the data signal electronics, and the plug-in power supply. The recorder, which is the major functional assembly, consists of a rigid chassis upon which all of the required electronic subassemblies and the mechanical tape handling subassemblies are mounted, enclosed in a protective housing. The chassis assembly and the control panel (which form an integral component) slide into the case and are secured by four screws. A gasket between the front panel and the case provides a moisture seal and electrical continuity to prevent RFI radiation. The chassis provides mounting facilities for an electromechanical capstan drive system, and electromechanical reel drive system, and the modular electronic circuits to control the tape handling components and signal processing.

(4) Tape drive system. The purpose of a recorder is to make a record on tape of signal data which may be recovered in its original form at a later date. This is accomplished by moving a magnetic tape past a record head. The input data signal changes the magnetic field generated by the head, which in turn changes the magnetic flux of the iron oxide particles on the tape in accordance with the applied signal. Data is then reproduced by moving the magnetized tape past a reproduce head to induce a voltage in head windings equivalent to changes in flux. Since, in analog recording the data signal is a function of the time and amplitude of the magnetic field, it is essential that the tape be moved past the reproduce head at the same rate it was moved past the record head originally. Therefore, the primary function of the tape drive system is to move the magnetic tape in a smooth and uniform manner past the record and reproduce heads to preserve the fidelity of the data signals with regard to time. This is accomplished by a dual capstan drive system when the unit is operated in the record or reproduce mode. In the modes F/F (i.e., Fast Forward) and F/R (i.e., Fast Reverse) the tape is moved by the reel drive system only and speed is not regulated.

(5) Capstan drive system. Refer to figure 3-2. The recorder uses a dual capstan drive to provide positive control of tape motion. During recording and reproducing, the tape leaves the supply reel (in cassette), is fed over a tape guide between the input capstan and pinch roller, and past a tape guide to the takeup reel (in cassette). The stability of the linear speed of the surfaces of the capstans determines the precision with which the tape is moved in the record and reproduce modes. For this reason, a capstan motor servo circuit (figure FO-6) is used to minimize speed changes of the capstan drive motor due to variations in torque loading supply voltage. The capstans are belt driven by the servo controlled drive motor and the pinch rollers clamp the tape to the capstans in the record and reproduce modes. Since the capstan drive pulleys have slightly different diameters, the capstans operate at slightly different speeds with the exit capstan rotating slightly faster than the input capstan. This differential speed produces a controlled tension in the head area which greatly reduces the possibility of tape-to-head separation during vibration, shock, or acceleration. The mode selector switch on the front panel is mechanically attached to the slide plate assembly so that the pinch rollers are engaged and the audio head is in contact with the tape when the record or reproduce modes are selected. When the mode selector switch is in the F/F mode, F/R mode, and OFF mode, the pinch rollers and head are retracted and tape movement is controlled by the reel motor drive system.

(6) Reel motor drive system. Figure 3-3 is a functional schematic of the electromechanical system used to drive the tape reels (within the tape cassette). The function mode selector 3A4S1 on the front panel is physically connected to a slide plate on which idler wheels A and B are mounted. By proper positioning of the mode selector knob, the main slide plate is moved in or out and a cam plate is moved to one side or the other to engage one or the other of the idler wheels with the reel motor drive shaft and the rubber-covered reel drive hubs. Idler A is used to drive the reels in the fast forward and fast reverse modes. When the mode selector knob is in the F/R position, idler A is moved into contact with the motor drive shaft and one drive surface of the supply reel hub. The ratio of the diameters is such that the reels are driven at the selected fast speed (forward or reverse). When the mode selector knob is pushed in toward the panel and turned to the REC or REPRO position, idler A is moved out of contact with the reel hubs and idler B is moved into contact with the motor drive shaft and the take-up reel hub drive surface. This provides

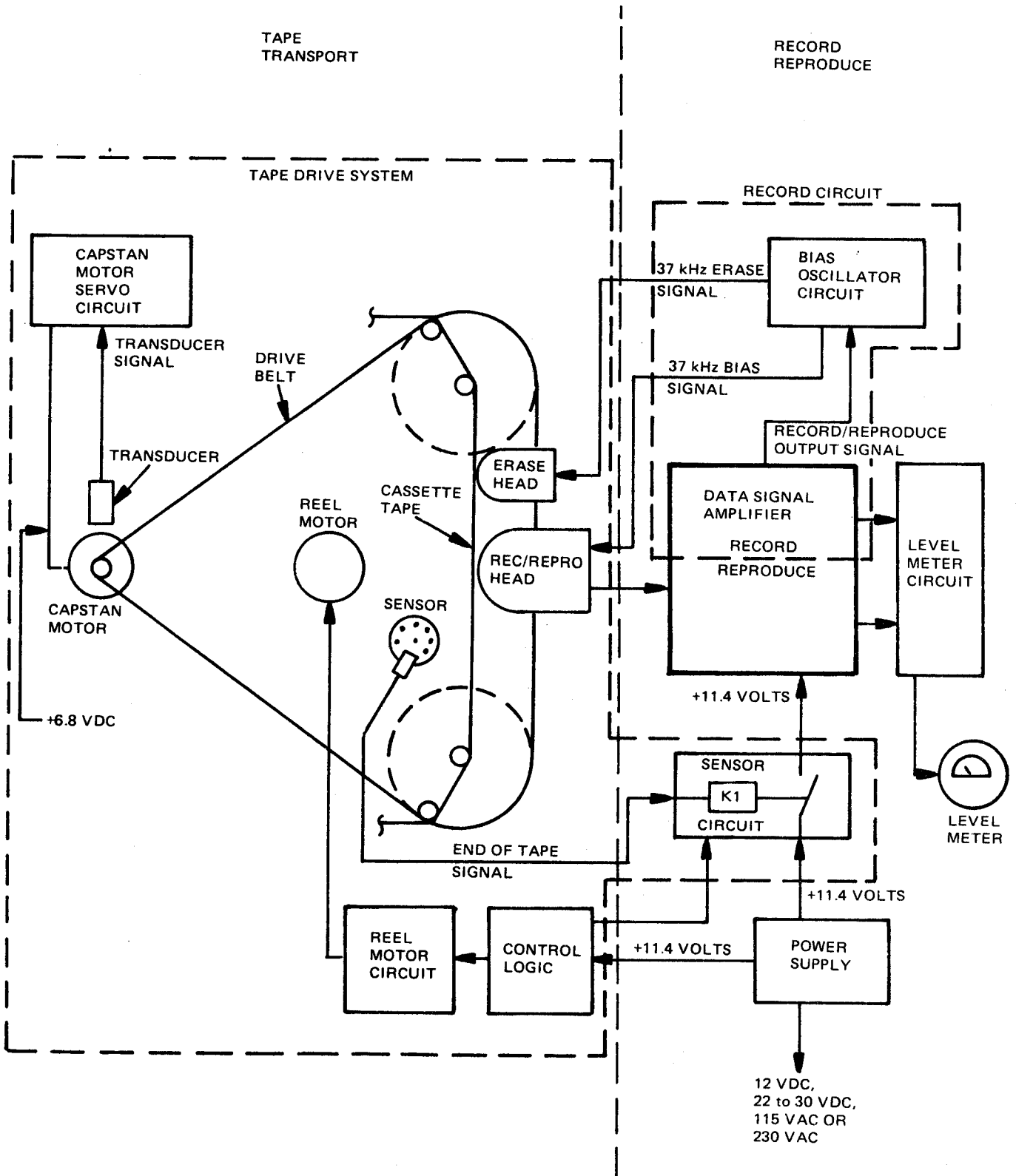


Figure 3-1. Recorder Simplified Block Diagram

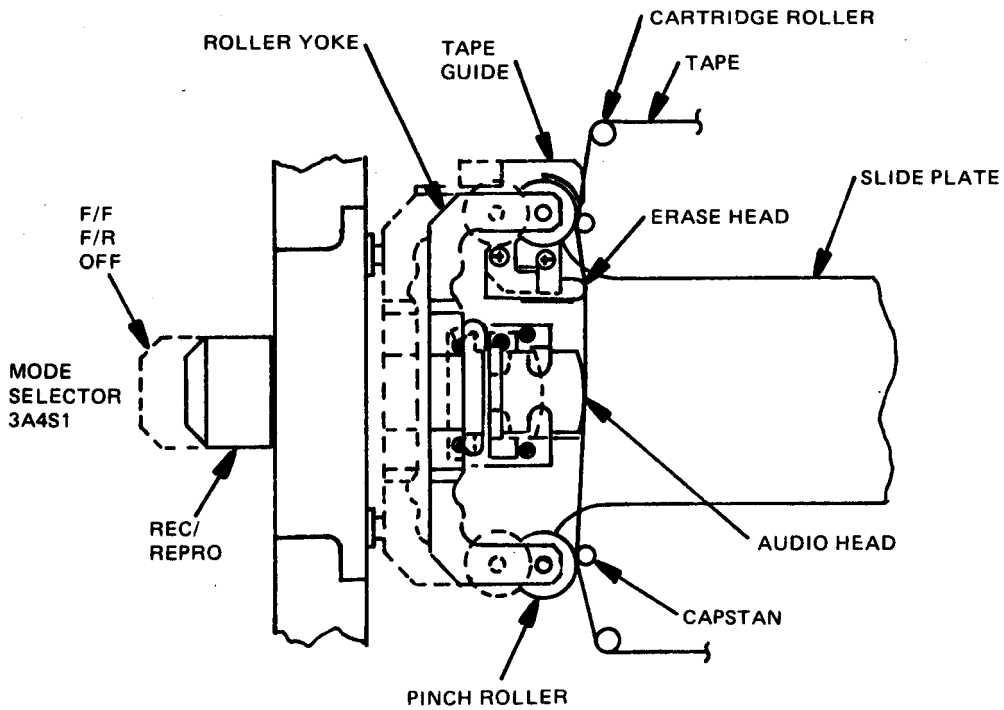


Figure 3-2. Capstan/Pinch Roller Tape Drive

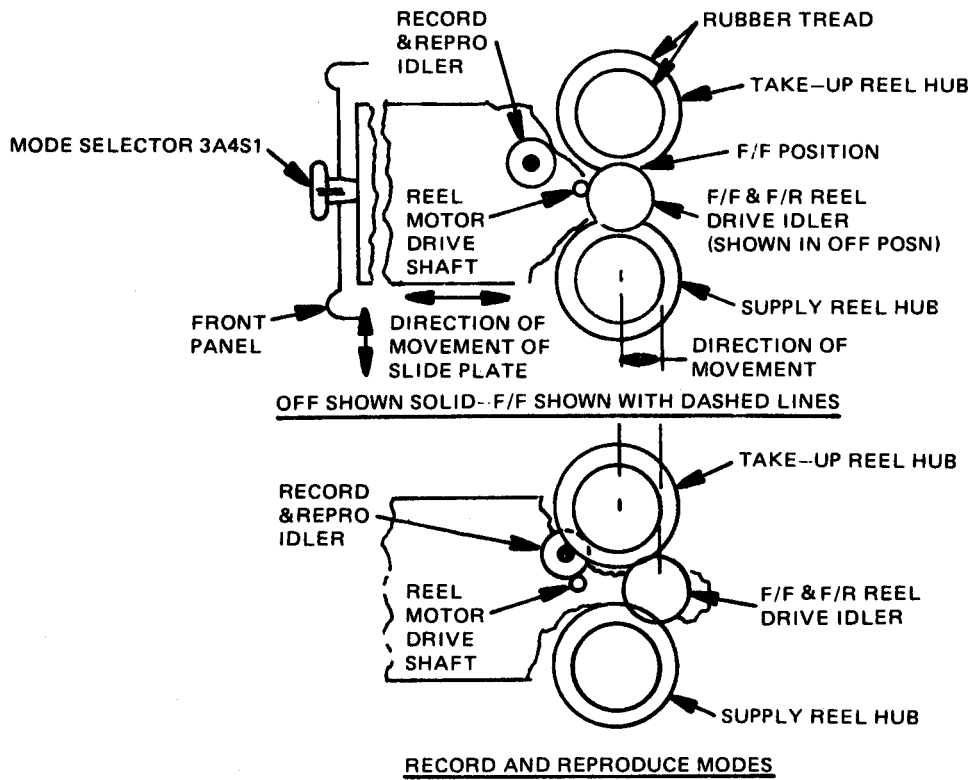


Figure 3-3. Reel Drive, Functional Schematic

drive for the take-up reel while the capstans control the speed of the tape past the heads. In conjunction with moving the slide plate to provide the selected tape speed, the mode selector knob also actuates switch 3A4S1 to provide voltage of the proper polarity to drive the reel motor in the correct direction. When F/F, REC, or REPRO modes are selected, the motor rotates in a direction to move the tape in a forward (from supply to take-up reel) direction. When F/R (fast reverse or rewind) is selected, the tape moves from the take-up to the supply reel.

(7) Record /reproduce electronics. The recorder set utilized a common signal amplifier for the record and playback (reproduce) processes. For two channel operation there are two identical circuits. Only the bias oscillator is common for the channels. In the following discussion the operation of channel 1 will be explained in detail. When the mode selector is in the REC position, signals from the microphone jack 3A3J2 and the radio receiver jack 3A3J1 are combined and connected to a summing point on the motor-bias card for mixing with the bias signal. The bias oscillator is turned on to provide the high frequency bias required for recording with low distortion, and the combined data and bias signals are applied to the record head directly. The other lead of the record head is grounded through 3A4S4 (channel selector) with the receiver jack to permit listening to the receiver signals, whether or not the recorder is operating. The function of the channel selector is as follows:

Channel Selector Position	Headphone 1	Headphone 2
1	Channel 1	
1-2	Channel 1	Channel 2
2		Channel 2

The headphone ground is connected to the receiver ground at terminal 3A4E3. When the REPRO function is selected, the microphone and radio receiver inputs are disconnected from the amplifier and the audio (record /reproduce) head is connected to the amplifier input. The bias oscillator is turned off and the audio head functions as a reproduce head. The headset is switched to the amplifier output to permit monitoring of the previously recorded data. The following are nominal input /output characteristics of the signal electronics; receiver, 0.5 to 5 mVrms; microphone input, 0.1 to 1 mVrms; and headphone output, 0.0 to 20 milliwatts.

(8) Control logic circuits. Control logic in the recorder consists of the mechanical positioning of the mode selector and the applicable portions of the mechanically coupled switch 3A3S1, and the automatic end-of-tape sensor circuit. In addition, the end-of-tape sensor circuit contains an Elapsed Time Indicator and a Tone Generator which alerts the operator that end of tape has been reached.

b. Power Supply. As shown on the schematic diagram (figure FO-1), the power supply will operate with any one of four inputs (+12 Vdc, +28 Vdc, 117 Vac, or 230 Vat) to provide the output power required for the recorder.

3-2. Functional Circuits. Operating principles of each functional circuit of the recorder set are located with its functional schematic on foldout pages at the end of this manual.

Section II. TROUBLESHOOTING

3-3. General. Troubleshooting in this manual will be performed on functional circuits within the recorder or power supply. To enable effective troubleshooting three types of information are available in this manual.

- a. Principles of Operation
- b. Schematic Diagrams
- c. Parts Location Diagrams

Principles of operation is a brief description of how each functional circuit operates. The schematic diagrams employ a two level test point system:

- a. Numbered Star. Locates test points necessary to isolate a malfunction to the defective assembly.
- b. Lettered Circle. Locates test points necessary to isolate to the defective stage within an assembly. The parts location diagram physically locates all the test points identified on the schematic diagram in addition to the associated assemblies and parts. The selection of the physical test point locations was made to minimize access time and eliminate disassembly which thereby reduces technician repair time and equipment down time. The parts location diagram also includes applicable quiescent voltages on the pins of active devices to aid in troubleshooting within the stage to the defective piece part; pin location diagrams and test conditions are also included. A Maintenance Action Precise Symptom List (paragraph 3-5) assists technicians to accurately troubleshoot a recorder set when the fault symptom has been identified.

NOTE

Before performing troubleshooting procedures on the recorder, clean and demagnetize the audio head.

3-4. Demagnetization.

a. General. Occasionally the audio and erase heads may become permanently magnetized through improper use of the equipment or by contact with magnetized objects. Magnetized heads may cause an increase in distortion and can impair good recordings by partially erasing high frequencies.

b. Procedure.

- (1) Set Mode selector to OFF.
- (2) Open cassette loading door and remove cassette.
- (3) Plug demagnetizer into 117 Vac source.

NOTE

If tips of demagnetizer are uncoated (plastic) , place one layer of electrical friction tape on the demagnetizer tips to prevent scratching of the heads.

(4) Bring tips of demagnetizer to within approximately 0.125 inch (3.175 millimeters) of the audio head if possible, straddle the head gap, and draw the demagnetizer tips up and down the length of the audio head three or four times.

(5) Remove demagnetizer slowly in a circular motion from the audio head to a distance of 3 or 4 feet, allowing its ac field to diminish gradually. This slow removal is extremely important.

CAUTION

Do not unplug demagnetizer while it is near the audio or erase heads; the collapse of its magnetic field may demagnetize the head.

(6) **Repeat steps (4) and (5)** for the erase head.

(7) If necessary, repeat the process until total demagnetization is completed in each case.

NOTE

The erase head under certain conditions is susceptible to magnetization by spurious sources and can require demagnetization. If capstan, tape guides, or other metal parts become magnetized, a few passes of the demagnetizer along their lengths and the use of the slow withdrawing technique should be adequate to complete the demagnetization process for these items.

3-5. Maintenance Action Precise Symptom List.

	Troubleshooting Procedure (Para.)
Power Supply	
Output voltage incorrect	3-6.
Recorder	
Front panel	
Mode switch binding	3-7.
Counter inoperative	3-7.
Transport	
Tape speed incorrect	3-8.
Flutter incorrect	3-8.
Record /Reproduce circuit	
No output; channel 1 or 2	3-9.
Poor frequency response	3-9.
Excessive noise	3-9.
Excessive crosstalk	3-9.
Distortion	3-9.
AGC incorrect	3-9.
Microphone circuit inoperative	3-9.
Meter drive circuit	
Meter not functioning; channel 1, channel 2, or both channels	3-10.

Motor-Bias card	
Erase not functioning	3-11.
Capstan motors not operating	3-12.
Sensor circuit	
No tone in headset at end of tape	3-13.
Reel Motor circuit	
Not operating; F/F mode	3-14.
Not operating; F/R mode	3-14.

3-6. Power Supply.

a. General. Troubleshooting procedures in table 3-1 provide information to determine the operating condition of the power supply. Output voltage is tested, under a simulated operating load, for each of four input voltages that may be required when using the recorder set.

b. Equipment.

- (1) DC Source
- (2) Multimeter
- (3) Variac
- (4) Oscilloscope
- (5) 230 Vac Cable
- (6) 117 Vac Cable
- (7) 22 to 30 Vdc Cable
- (8) Test Cable TX-2
- (9) Load Resistor TX-9

WARNING

HIGH VOLTAGE is used in the operation of this equipment, DEATH ON CONTACT may result if personnel fail to observe safety precautions. Voltages of 117 Vac or 230 Vac are present inside the power connector, which is connected to POWER connector J 2 on the rear of the power supply. Be careful not to make contact with high voltage connections when installing or operating this equipment. Before working inside the equipment, turn power off and be sure to ground points of high potential before touching them.

CAUTION

To avoid damage to your equipment, be sure the dc source and variac output adjustment controls are set fully counterclockwise before use.

c. Procedure.

- (1) Remove power supply from case by removing four screws from cover.
- (2) Slide cover away from case as far as possible.
- (3) Connect equipment as shown in figure 3-4.
- (4) Refer to figure FO-1 for test point locations.
- (5) Perform procedure listed in table 3-1.

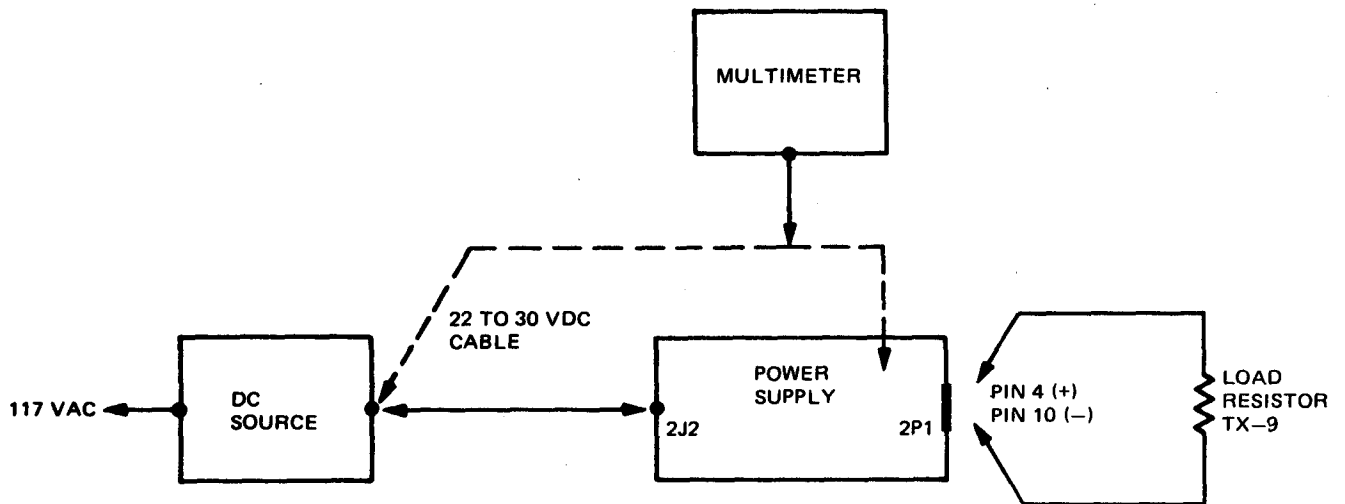


Figure 3-4. Power Supply, DC Input, Equipment Setup

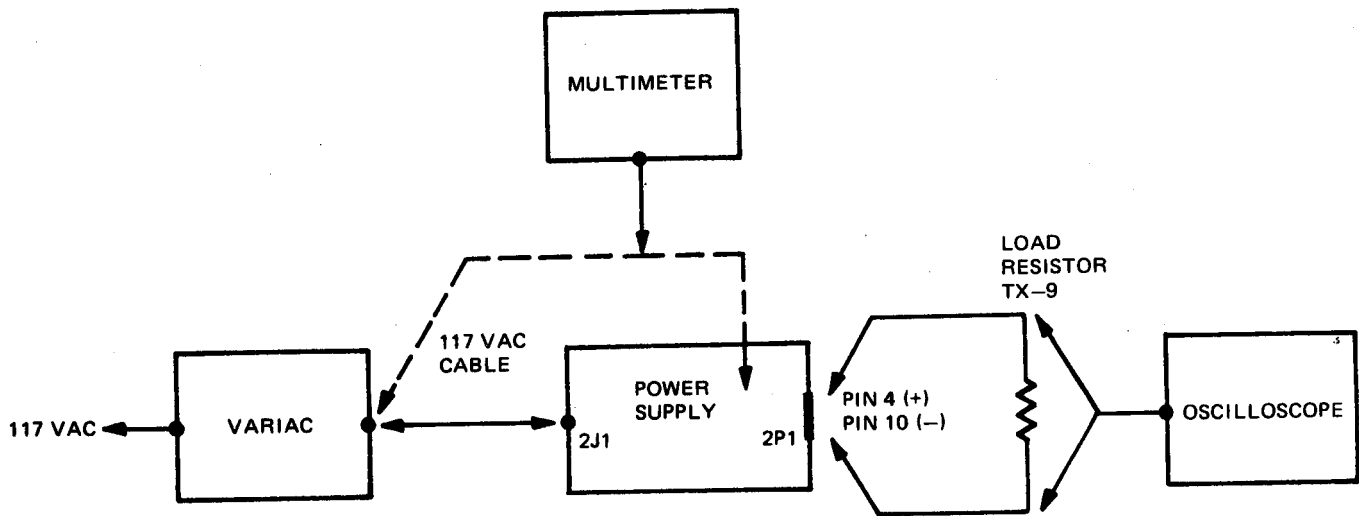


Figure 3-5. Power Supply, AC Input, Equipment Setup


Table 3-1. Power Supply Troubleshooting

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
1. Dc source	Power switch	ON				
	ADJUST control	+24.0 Vdc.	Test Point ★ 1	Multimeter	+10.4 to +12.4 Vdc	Replace 2A 1F2 or 2A 1CR2, para. 3-20 and figure FO-1.
	ADJUST control	+22 to +24.0 Vdc.	Same as step 1.		Output voltage remains between +10.4 and +12.4 Vdc.	Same as step 1. Replace 2A 2CR5 or 2Q1, figure FO-1.
2. Dc source	ADJUST control	+12.0 Vdc.				
	Power switch	OFF				
3. Dc source	Power switch	Replace 22 to 30 Vdc cable with test cable TX-2.				
	Power switch	ON	Test point ★ 1	Multimeter	+10.4 to +12.4 Vdc	Replace 2A 1F3 or 2A 1CR1, figure FO-1.
3. Dc source	Power switch	OFF				
			EQUIPMENT SETUP: FIGURE 3-5			
4. Variac	POWER switch	ON				
	ADJUST control	117 Vac	Test point ★ 1	Multimeter	+10.4 to +12.4 Vdc	Replace 2A 1F1, figure FO-1.

Table 3-1. Power Supply Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
4. Variac- cont.			Same	Oscilloscope	Ripples less than 100 mV peak-to-peak.	
			Test point Ⓓ	Multimeter	16 to 20 Vac	Replace 2A 1F1, figure FO-1.
			Test point Ⓒ	Multimeter	+10 to +12 Vdc	Replace 2T1, figure 3-20.
			Test point Ⓐ	Multimeter	+10.4 to +12.4 Vdc	Replace 2A 2CR1 through 2A 2CR4, figure FO-1.
			Test point Ⓑ	Multimeter	+10.4 to +12.4 Vdc	Replace 2A1, para. 3-20.
	ADJUST control	104 Vac	Repeat step 4 test points.			Replace 2A 2R2, figure FO-1.
	ADJUST control	126 Vac	Repeat step 4 test points.			Replace 2A 2CR5, figure FO-1.
5. Variac	POWER switch	OFF				
		Replace 117 Vac cable with 230 Vac cable.				

Table 3-1. Power Supply Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
6. 230 Vac source	230 Vac cable	Connect between 230 Vac source and power supply.	Test point 	Multimeter	+10.4 to +12.4 Vdc	Replace 2A 2C 1 and 2A 2C 2, figure FO-1.
	Power switch	ON		Oscilloscope	Ripple less than 100 mV peak-to-peak	
7. 230 Vac source	Power switch	OFF	Connectors 2J1 and 2P1	Multimeter	Less than 1 ohm	
	230 Vac cable	Remove from 230 Vac source.				
8. Power supply	Wiring between 2J1 and 2P1.	Measure continuity, figure FO-1.				

3-7. Recorder, Electromechanical

a. General Troubleshooting. The procedure in table 3-2 provides information to troubleshoot electromechanical operations of the recorder under normal operating conditions.

b. Equipment.

- (1) Power Supply
- (2) Microphone
- (3) Headset
- (4) 117 Vac Cable
- (5) Test Cable TX-3

c. Procedure.

- (1) Remove recorder housing, refer to paragraph 3-25.
- (2) Connect equipment as shown in figure 3-6.
- (3) Insert blank cassette into recorder.
- (4) Perform procedure listed in table 3-2.

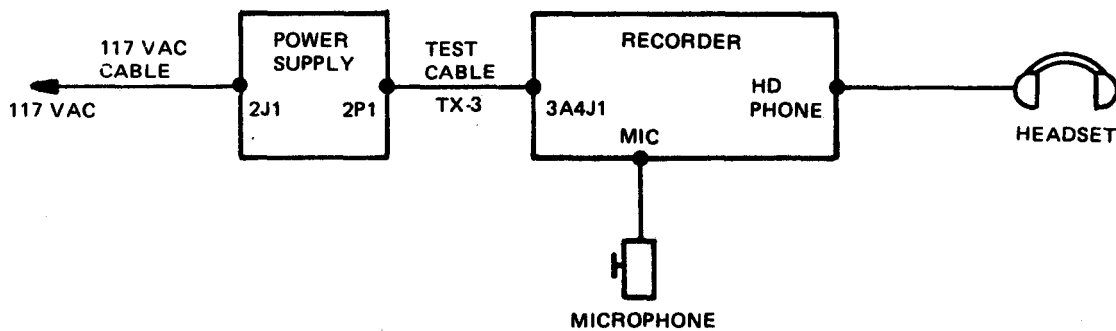


Figure 3-6. Recorder, Electromechanical, Equipment Setup

Table 3-2. Recorder Electromechanical Troubleshooting

Procedure			Normal Indication			Corrective Action									
Location	Item	Action	Location	Indicator	Indication										
1. Recorder	Mode selector	REC	Recorder	LEVEL meter	Green area.	Perform trouble-shooting in para. 3-6.									
	BAT TEST	Press					Mode selector	Does not bind.	Align mode selector shaft in front panel. para. 3-26.						
	Mode selector	Move to all positions.								Latch	Returns to up position.	Repair mode selector knob, para. 3-27.			
		Press latch and release.											Cassette tape window	Tape winds onto right spool.	Check disk reel, para. 3-46.
		F/F													
		F/R											Capstans	Rotating	Check drive belt, para. 3-37.
	REC	Counter								Reading changing.	Check counter belt, para. 3-35.				
	Mode selector											OFF	Counter	Resets to 000 reading.	Check counter, para. 3-35.
	RESET button	Press													

Table 3-2. Recorder Electromechanical Troubleshooting

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
2. Recorder	Mode selector	REC				
	Channel selector	2				
	AGC/MAN 2 switch	AGC				
3. Microphone	Press-to talk button	Press and talk into microphone.	Recorder	LEVEL meter	Reading fluctuates while recording voice.	Replace microphone. Perform troubleshooting in para. 3-9 (steps 71 through 81 of Table 3-4).
4.	Revise microphone plug for channel 1 (para. 2-4) and insert plug into MIC jack. Repeat steps 2 and 3 with channel selector set to 1.					
5. Recorder	Mode selector	REC	Recorder	Cassette	Both supply and take-up reels rotate. Tape passes by head smoothly.	Replace cassette. Check roller tension on capstans, para. 3-31.
	EJECTOR button	OFF Press	Recorder	Cassette	Cassette raises to remove position	Check ejector, para. 3-36.

Table 3-2. Troubleshooting Procedure - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
5. Recorder-continued	Cassette	Remove				
	Cartridge mounting plate	Remove, para. 3-29.				
	Mode selector	REC	Slide plate	Drive wheel	Drive wheel rotates.	Check drive wheel, para. 3-32.
				Disk reel	Disk reel rotates.	Check disk reel, para. 3-45.
				Supply reel	Supply reel is stopped.	Adjust supply reel brake, para. 3-29.

3-8. Recorder,

a. General. The procedures in table 3-3 provide information to troubleshoot recorder tape speed and flutter.

b. Equipment.

- (1) Blank Cassette Tape
- (2) Power Supply
- (3) Multimeter
- (4) DC Source
- (5) Frequency Counter.
- (6) Voltmeter
- (7) Flutter Meter
- (8) Filter
- (9) Test Tape, 3 kHz
- (10) 600 Ohm Load TX-1
- (11) Test Cable TX-2
- (12) Test Cable TX-3
- (13) Test Cable TX-6
- (14) Adapter TX-7
- (15) Adapter TX-8
- (16) Test Cable TX-10

c. Procedure.

- (1) Remove recorder housing, refer to paragraph 3-25.
- (2) Connect equipment as shown in figure 3-7, connection A.
- (3) Insert 3 kHz test tape.
- (4) Perform procedure of table 3-3.

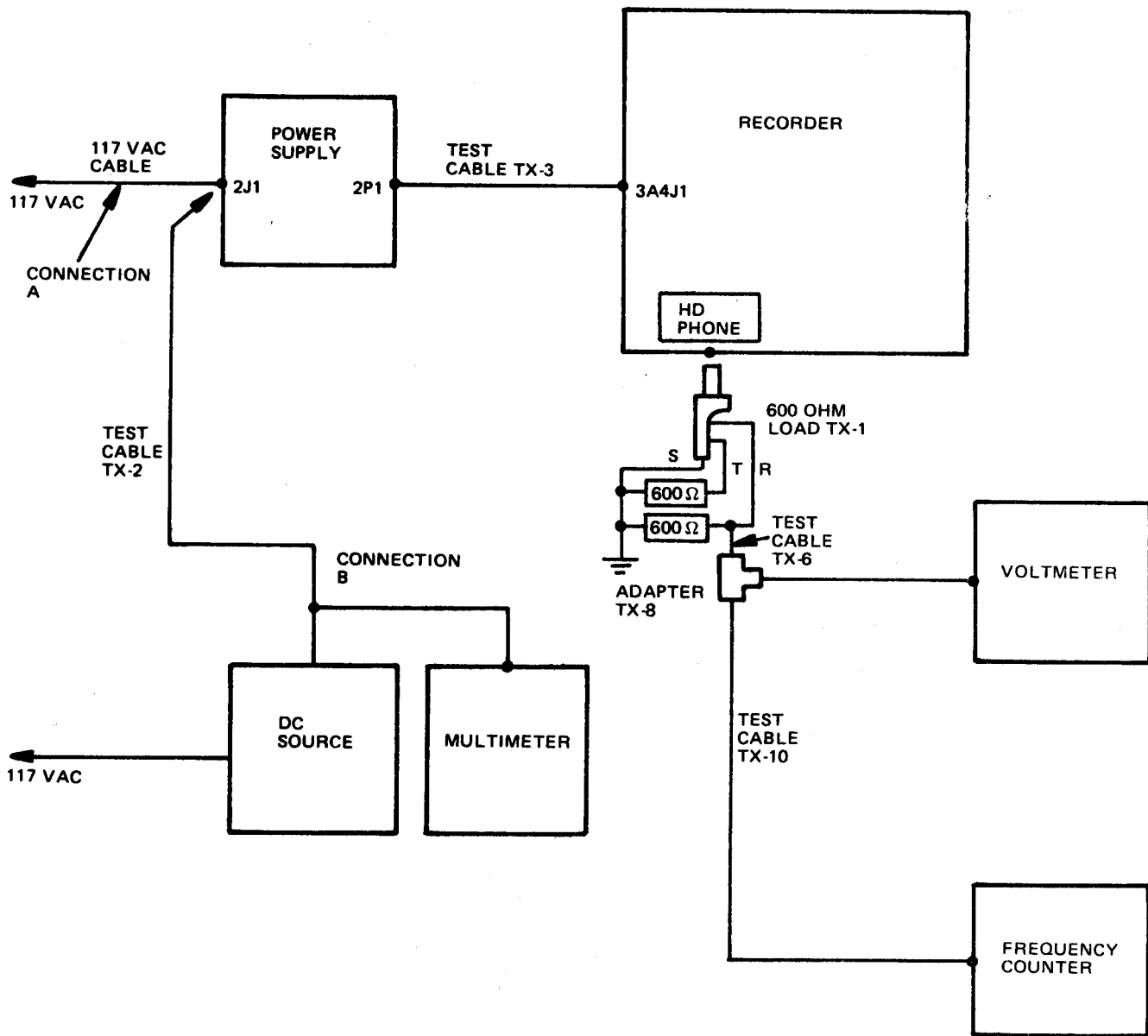


Figure 3-7. Tape Speed, Equipment Setup

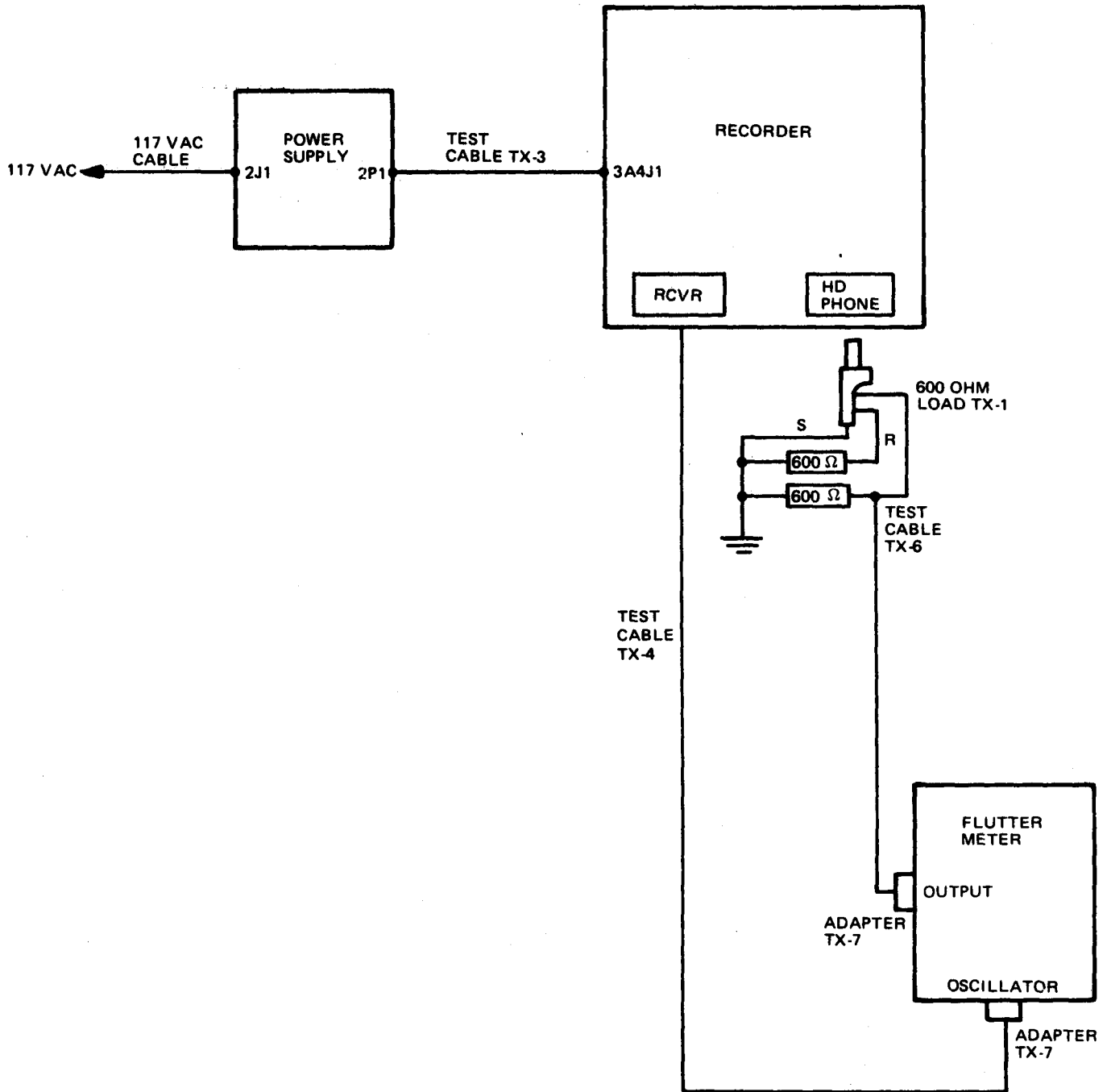


Figure 3-8. Flutter, Equipment Setup

Table 3-3. Recorder Troubleshooting

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
TAPE SPEED			EQUIPMENT SETUP: FIGURE 3-7, CONNECTION A			
1. Recorder	Channel selector	1				
	Mode selector	Wind tape to approximately mid-point.				
	AGC/MAN 1 switch	MAN				
	Mode selector	REPRO				
	GAIN 1 control	Adjust		Voltmeter	0 dBm	Check equipment setup.
	Mode selector	OFF		Frequency counter	Tape frequency 2.850 to 3.150 kHz.	Troubleshoot capstan motor servo circuit, para. 3-12.
			EQUIPMENT SETUP: FIGURE 3-7, CONNECTION B			
2. Dc source	Output control	Adjust		Multimeter	10.4 Vdc	Check equipment setup.
	Mode selector	REPRO		Voltmeter	Greater than -3 dBm.	Troubleshoot amplifier circuit, para. 3-9.

Table 3-3. Recorder Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
2. Dc source- continued				Frequency counter	Stable frequency between 2.855 and 3.155 kHz.	
FLUTTER			EQUIPMENT SETUP: FIGURE 3-8			
3. Recorder	Blank cassette	Install				
	Channel selector	1				
	AGC/MAN 1 switch	MAN				
	Mode selector	REC	Recorder	Counter	Note reading.	
	GAIN 1 control	Adjust		LEVEL meter	Red area	Check equipment setup.
	Mode selector	STOP after 1 minute of recording.		Counter	Note reading.	
	Mode selector	F/R Rewind to be- ginning of re- cording made above.				
Mode selector	REPRO		Flutter Meter	Flutter less than 1.5% RMS, 0.1 to 250 Hz.	Troubleshoot cap- stan motor servo circuit, para. 3-12.	

3-9. Amplifier Circuit (Record/Reproduce)

a. General. The procedure in table 3-4 provides information to troubleshoot the record amplifier circuit of the recorder. The record and reproduce circuits of amplifier card 3A4A5 use a common signal amplifier for the record and reproduce functions. All functions of the amplifier card will be tested in this table.

b. Equipment.

- | | |
|--------------------------|-----------------------|
| (1) Voltmeter | (7) 117 Vac Cable |
| (2) Distortion Indicator | (8) 600 Ohm Load TX-1 |
| (3) Generator | (9) Test Cable TX-3 |
| (4) Oscilloscope | (10) Test Cable TX-4 |
| (5) Power Supply | (11) Test Cable TX-6 |
| (6) Filter | (12) Test Cable TX-10 |
| | (13) Demagnetizer |

NOTE

Make sure a cassette is not in the recorder.

- (1) Remove recorder housing, refer to paragraph 3-25.
- (2) Connect equipment as shown in figure 3-9.
- (3) Demagnetize audio and erase heads, paragraph 3-4.
- (4) Refer to figures FO-2 and FO-3 for test point and adjustment locations.
- (5) Insert blank cassette into recorder.
- (6) Press RESET button for 000 reading on counter.
- (7) Perform procedure in table 3-4.

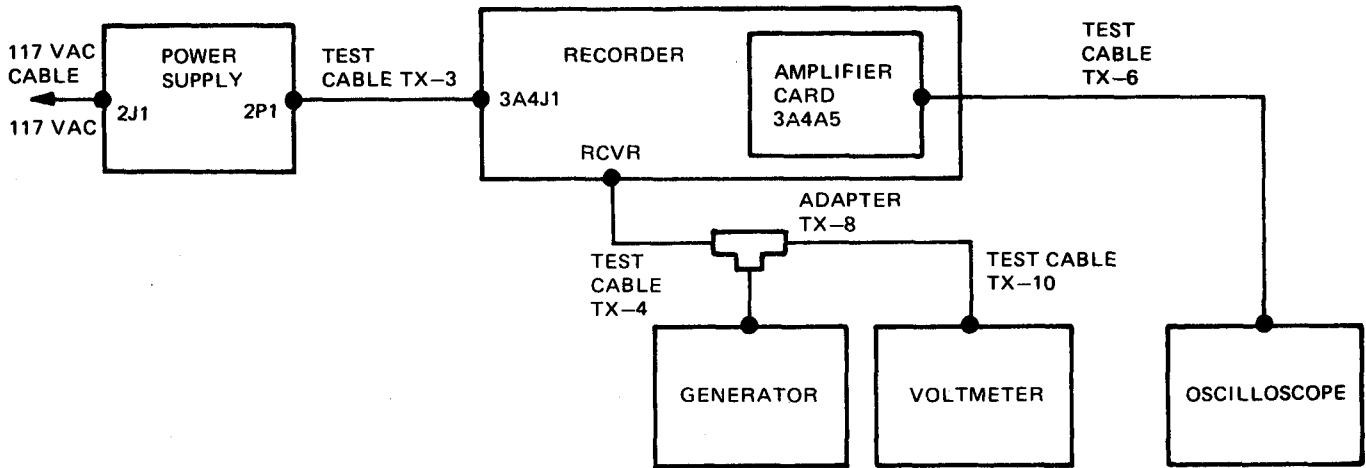


Figure 3-9. Channels, Equipment Setup

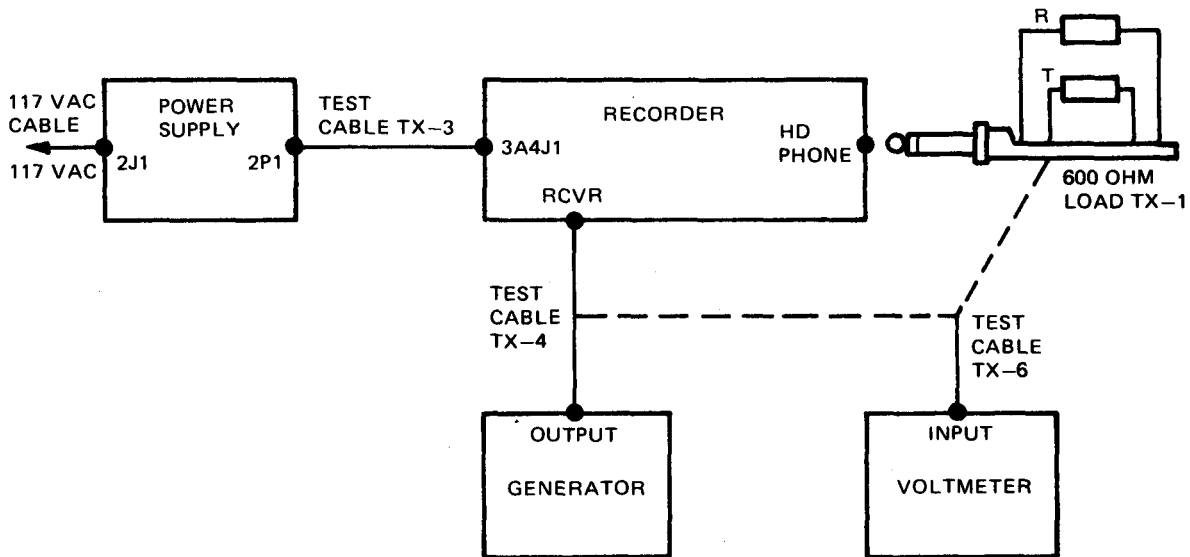


Figure 3-10. Frequency Response, Equipment Setup

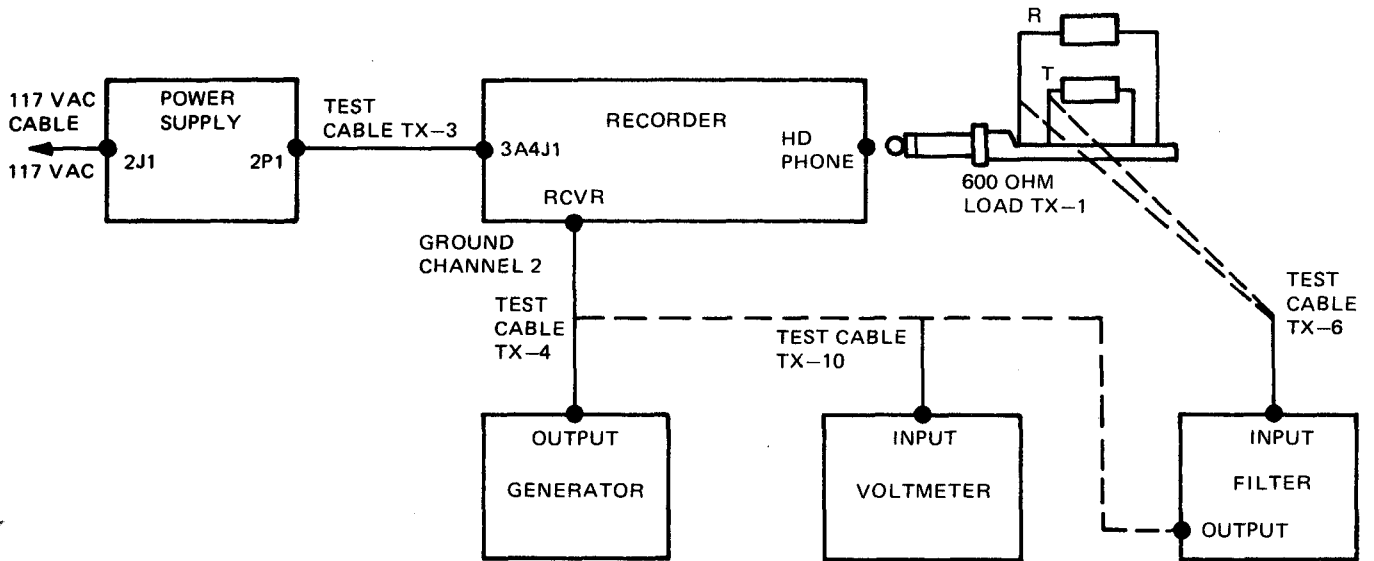


Figure 3-11. Crosstalk, Equipment Setup

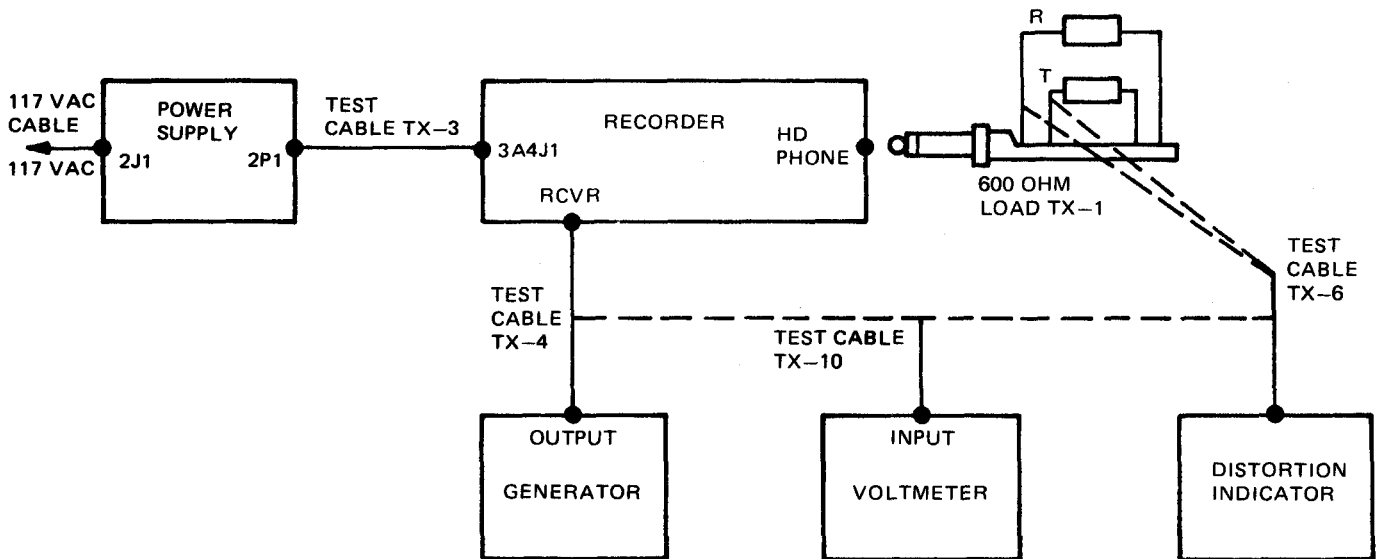


Figure 3-12. Audio Output and Distortion, Equipment Setup

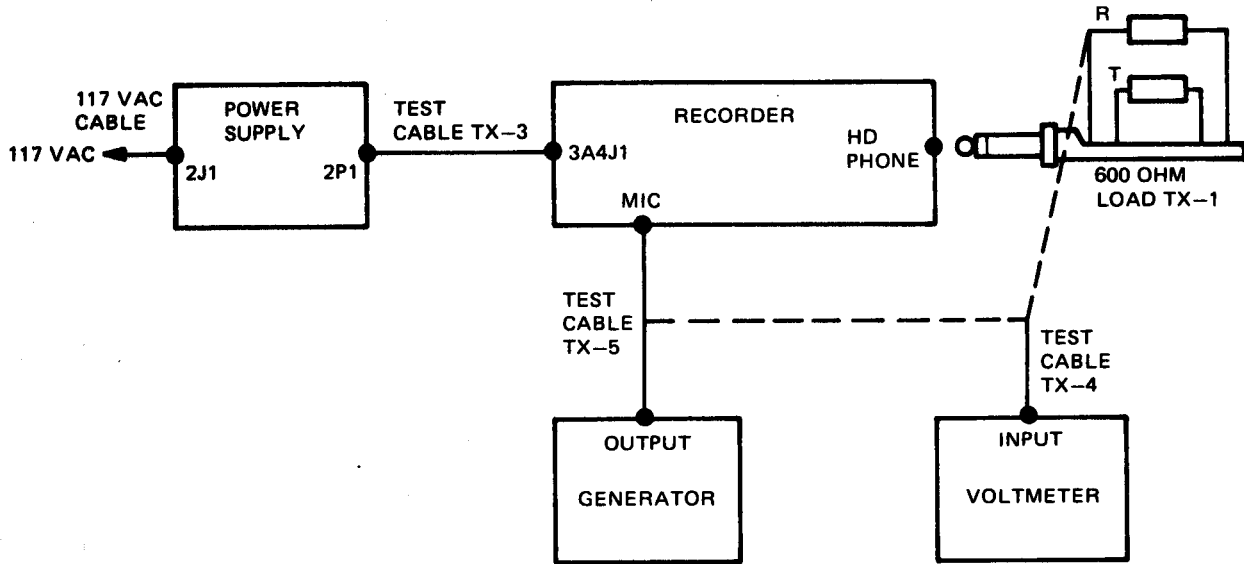


Figure 3-13. Microphone, Equipment Setup

Table 3-4. Record/Reproduce Circuit Troubleshooting



Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
CHANNEL 1						
1. Generator	Frequency dial	1 kHz.				
	Output control	Adjust	See figure FO-2 Test point	Voltmeter	0 dBm	
2. Recorder	Channel selector	1				
	AGC/MAN 1 switch	MAN				
	Mode selector	REC				
	GAIN 1 control	Adjust	Recorder	Level meter	Red area	Adjust audio head, para. 3-30. Troubleshoot meter drive circuit, para. 3-10. Check 3A4A4S1B and 3A4A4S1K, para. 3-37. Check actuator, para. 3-43.
			Test point	Oscilloscope	See figure FO-2.	Check 3A4A9, para. 3-40.
						

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
2. Recorder-continued				Multimeter	200 ohms	Check 3A4S1K, para. 3-37.
			Test point ★ 3	Oscilloscope	See figure FO-2.	Check audio head, para. 3-30.
			Test point ★ 7	Multimeter	+7.4 to +9.0 Vdc	Replace 3A4A5, para. 3-38.
			Test points ★ 8 ★ 9	Multimeter	+10.4 to +12.4 Vdc	Troubleshoot meter drive circuit, para. 3-10.
3. Recorder	Mode selector	OFF				
CHANNEL 2						
4. Recorder	Channel selector	2				
	AGC/MAN 2 switch	MAN				
	Mode selector	REC	Recorder	LEVEL meter	Red area	Check 3A4A4S1B and 3A4A4S1L, paras. 3-37 and 3-44.
	GAIN 2 control	Adjust	Test point ★ 2	Oscilloscope	See figure FO-2.	

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
4. Recorder-continued						Check 3A4A9, para. 3-40.
			Test point ★ 4	Oscilloscope	See figure FO-2.	Check actuator, para. 3-43.
			Test point ★ 7	Multimeter	+7.4 to +9.0 Vdc. See figure FO-2.	Replace 3A4A5, para. 3-38.
5. Recorder	Mode selector	OFF	Test points ★ 10 and ★ 11	Multimeter	+10.4 to +12.4 Vdc. See figure FO-2.	Troubleshoot meter drive circuit, para. 3-10.
FREQUENCY RESPONSE			EQUIPMENT SETUP: FIGURE 3-10			
6. Recorder	Channel selector	1				
	Mode selector	F/R and hold	Recorder	Counter	000 reading at beginning of tape.	

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
7. Generator	Output control	Adjust	Generator output	Voltmeter	0 dBm	
8. Recorder	Reset button	Press Repeat step 1	Recorder	Counter	000	
	Mode control	REC				
	GAIN 1 control	Adjust	Recorder	LEVEL meter	Red area	Check GAIN 1 control.
		NOTE Gain 1 control is set for record gain reference. Do not disturb through step 11.				
9. Generator	Output control	Adjust	Generator output	Voltmeter	-10 dBm	Check equipment setup.
			Recorder	Counter	Note reading.	
10. Recorder		Record for 30 seconds. Continue recording.		Counter	Note reading.	
		NOTE Do not change any recorder controls when changing generator settings.				

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued



Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
11. Generator	Frequency dial	200 Hz	Adjust generator output.	Voltmeter	-10 dBm	Check equipment setup.
	Recorder			Counter	Note reading.	
	Output control	Repeat step 11 for the following frequencies: 400 Hz, 800 Hz, 1 kHz, 2 kHz, 3 kHz, and 4 kHz.	Generator output	Voltmeter	-10 dBm at each frequency.	Check equipment setup.
12. Recorder	Mode selector	OFF				
13. Recorder	Mode selector	F/R	Recorder	Counter	000 reading at beginning of tape	
	Mode selector	REPRO				
	GAIN 1 control	Adjust	See figure FO-3 Test point 	Voltmeter	0 dBm after counter reading noted in step 10 is reached (1 kHz).	Check GAIN 1 control.
			See figure FO-3 Test point 	Voltmeter	-3 dBm to +3 dBm after each counter reading noted in step 11.	Remove blank cassette. Connect generator to RCVR jack channel 1 and adjust for 1 kHz at -10 dBm output.

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued


Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
13. Recorder-continued						<p>Connect voltmeter to test point  figure FO-3. Adjust R31 for 0 dBm on voltmeter, adjust generator to 400 Hz and then to 4 kHz. Voltmeter remains between - and +3 dBm.</p> <p style="text-align: center;">NOTE</p> <p>Spin supply spindle by hand so that recorder does not go into automatic shut off.</p> <p>Repeat above procedure for channel 2. Remove cartridge plate to gain access to adjustment. Adjust R57 for channel 2.</p> <p>Replace amplifier card 3A 4A 5, para. 3-38.</p>
14. Recorder	Mode selector	OFF				
15. Recorder	Channel selector	2				

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued


Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
15. Recorder-continued	AGC/MAN 2 switch	MAN				
16. Repeat steps 6 through 12			See figure FO-3 test point 	Voltmeter	-3dBm to +3dBm for each counter reading in step 11.	
SIGNAL PLUS NOISE TO NOISE			EQUIPMENT SETUP: FIGURE 3-10			
17. Generator	Frequency dial	400 Hz				
	Output control	Adjust	Generator output	Voltmeter	0 dBm	Check equipment setup.
18. Recorder	Channel selector	1				
	AGC/MAN 1 switch	MAN				
	Mode selector	REC				
	GAIN 1 control	Adjust	Recorder	LEVEL meter	Red area	

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
18. Recorder-continued		NOTE GAIN 1 control is set for record gain reference. Do not disturb through step 25.				
19. Generator	Output control	Adjust	Generator output	Voltmeter	+10 dBm	Check equipment set-up. Adjust audio head, para. 3-30.
			Recorder	LEVEL meter	Meter exceeds full scale.	
20. Recorder		Record for 10 counts	Recorder	Counter	Note reading.	
21. Generator	Test Cable TX-4	Disconnect from RCVR jack.				
22. Recorder		Note counter reading and record for 10 counts.				
23. Recorder	Mode selector	OFF				
24. Recorder	Mode selector	F/R	Recorder	Counter	Reading recorded in step 19.	
	Mode selector	REPRO				

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued


Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
24. Recorder-continued	GAIN 1 control	Adjust	See figure FO-3 test point 	Voltmeter	+10 dBm until recording of step 21. Voltmeter reading must be less than -25 dBm.	Replace 3A4A5, para. 3-38. Check 3A4A4S1D, 3A4A4S1G, and 3A4A4S1H, para. 3-37.
25. Recorder	Mode selector	OFF	Recorder	Counter	000	
	RESET button	Press				
26. Recorder	Channel selector	2				
	AGC/MAN 2 switch	MAN				
27. Repeat steps 17 through 25.						
CROSSTALK			EQUIPMENT SETUP: FIGURE 3-11			
28. Generator	Frequency dial	400 Hz	Generator output	Voltmeter	0 dBm	Check equipment setup.
	Output control	Adjust				

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
29. Recorder	Mode selector	F/R	Recorder	Counter	000 reading at beginning of tape.	
30. Recorder	Mode selector	OFF				
	RESET button	Press	Recorder	Counter	000	
	Channel selector	1				
31. Recorder	AGC/MAN 1 and 2 switches	MAN				
	GAIN 2 control	Max CCW				
	Mode selector	REC				
	GAIN 1 control	Adjust	Recorder	LEVEL meter	Red area	Check equipment setup.
		Note counter reading and record for 10 counts.				
32. Recorder	Mode selector	OFF	Recorder	Counter	Note reading.	

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
33. Recorder	Mode selector	F/R	Recorder	Counter	Rewind tape to reading noted in step 31.	
34. Generator		Connect to RCVR jack channel 2 and ground RCVR jack channel 1.				
35. Repeat step 22.						
36. Recorder	Channel selector	2				
	GAIN 1 control	Max CCW				
	Mode selector	REC "				
	GAIN 2 control	Adjust	Recorder	LEVEL meter	Red area	Check equipment setup.
		Note counter reading and record for 10 counts.				
37. Recorder	Mode selector	OFF	Recorder	Counter	Note reading.	

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued


Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
38. Recorder	Mode selector	F/R	Recorder	Counter	Rewind tape to reading noted in step 31.	
39. Filter		Connect to test point  See figure FO-3.				
	LOW CUT-OFF FREQUENCY Hz dial	200				
	HIGH CUT-OFF FREQUENCY Hz dial	800				
40. Recorder	Mode selector	REPRO				
	GAIN 2 control	Adjust	Filter output	Voltmeter	0 dBm	Check equipment setup.
			Recorder	Counter	Note reading.	
		NOTE GAIN 2 control is set for reference. Do not disturb setting through step 51.				

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued


Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
41. Recorder	Mode selector	F/R	Recorder	Counter	Rewind tape to 000 reading.	Check equipment setup.
42. Filter		Connect to test point figure  See FO-3				
43. Voltmeter		Connect to filter.				
44. Recorder	Channel selector	1				
	Mode selector	REPRO				
	GAIN 1 control	Adjust		Voltmeter	0 dBm	
		NOTE GAIN 1 control is set for reference. Do not disturb through step 51.				
45. Recorder	Mode selector	OFF				
46. Recorder	Mode selector	F/R	Recorder	Counter	Rewind tape to 000 reading.	

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued



Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
47. Filter		Connect between voltmeter and test point  See figure FO-3.				
48. Recorder	Channel selector	2	Recorder			Replace 3A4A5, para. 3-38. Adjust audio head, para. 3-30.
	Mode selector	REPRO		Voltmeter	Less than -35 dBm.	
	Mode selector	F/F		Counter	Reading noted in step 31.	
49. Filter		Connect to test point  See figure FO-3.				
50. Recorder	Channel selector	1				Replace 3A4A5, para. 3-38.
	Mode selector	REPRO		Voltmeter	Less than -35 dBm.	
51. Recorder	Mode selector	OFF				
AUDIO OUTPUT AND DISTORTION			EQUIPMENT SETUP: FIGURE 3-12			
52. Recorder	Channel selector	1				000 reading at beginning of tape.
	Mode selector	F/R		Counter		

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
53. Recorder	Mode selector	OFF		Counter	000	
	RESET button	Press				
	AGC/MAN 1 switch	MAN				
54. Generator	Frequency dial	1 kHz	Generator output	Voltmeter	0 dBm	Check equipment setup.
	Output control	Adjust				
55. Recorder	Mode selector	REC	Recorder	LEVEL meter	Meter exceeds full scale.	Check equipment setup.
	GAIN 1 control	Max CW Note counter reading and record for 10 counts.				
56. Recorder	Mode selector	OFF	Recorder	Counter	000 reading at beginning of tape.	
57. Recorder	Mode selector	F/R				

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued


Procedure			Normal Indication			Corrective Action	
Location	Item	Action	Location	Indicator	Indication		
57. Recorder-continued	Mode selector	REPRO	See figure FO-3 test point 	Voltmeter	+13 dBm minimum	Replace 3A4A5, para. 3-38.	
				Analyzer	Less than 5% distortion as 1 kHz is reproduced on tape.		
58. Recorder	Mode selector	OFF					
59. Recorder	Channel selector	2					
	AGC/MAN 2 switch	MAN					
60. Repeat steps 54 through 58.							
AGC			EQUIPMENT SETUP: FIGURE 3-7				
61. Recorder	Mode selector	F/R	Recorder	Counter	000 reading at beginning of tape.		
	Mode selector	OFF					
	RESET button	Press		Counter	000		

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued





Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
62. Generator	Frequency dial	1 kHz.	Generator output	Voltmeter	0 dBm	Check equipment setup.
	Output control	Adjust				
63. Recorder	Channel selector	1	Recorder	LEVEL meter	Red area	Check equipment setup.
	AGC/MAN 1 switch	MAN				
	Mode selector	REC				
	GAIN 1 control	Adjust				
	AGC/MAN 1 switch	AGC				
		Note counter reading and record for 10 counts.		LEVEL meter	Continues to read in red area.	Adjust channel 1: Connect voltmeter to test point  . Adjust R23  for 0 dBm on voltmeter, figure FO-3. Adjust channel 2: Connect voltmeter to test point  . Adjust R50  for 0 dBm on voltmeter, figure FO-4.

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
63. Recorder-continued						NOTE Remove cassette to gain access through hole in cartridge plate. Spin supply spindle by hand so that recorder does not go into automatic shutoff. Replace 3A4A5, para. 3-38.
64. Generator	Output control	Adjust	Generator output	Voltmeter	+15 dBm	
			Recorder	LEVEL meter	Continues to read in red area.	Replace 3A4A5, para. 3-38.
65. Recorder	Mode selector	OFF				
66. Recorder	Mode selector	F/R	Recorder	Counter	000 reading at end of tape.	
67. Recorder	Mode selector	OFF				
68. Recorder	AGC/MAN 1 switch	MAN				
	Mode selector	REPRO				
	GAIN 1 control	Adjust	See figure FO-3 test point	Voltmeter	0 dBm for recording made	Replace 3A4A5, para. 3-38.

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
68. Recorder-continued		<p style="text-align: center;">NOTE</p> <p>GAIN 1 control is set for reference. Do not disturb during this test.</p>		Voltmeter	Must remain between -3 dBm and +3 dBm for remainder of 10 count recording made in step 63.	Replace 3A4A5, para. 3-38.
69. Recorder	Mode selector	OFF				
70. Recorder	Channel selector	2				
71. Repeat steps 61 through 69.						
MICROPHONE CIRCUIT			EQUIPMENT SETUP: FIGURE 3-13			
72. Recorder	Channel selector	1				
	Mode selector	F/R	Recorder	Counter	000 reading at beginning of tape.	

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
73. Recorder	Mode selector	OFF	Recorder	Counter	000	
	RESET button	Press				
74. Recorder	AGC/MAN 1 switch	MAN				
75. Generator	Frequency dial	1 kHz	Generator output	Voltmeter	0.0005V	Check equipment setup.
	Output control	Adjust				
76. Recorder	Mode selector	REC	Recorder	LEVEL meter	Red area	
	GAIN 1 control	Adjust				
	AGC/MAN 1 switch	AGC	Recorder	LEVEL meter	Continues reading in red area.	Check 3A4A9, para. 3-40.
		Note counter reading and continue to record.				
		Note counter reading and record for 10 counts.				

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued



Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
77. Recorder	Mode selector	OFF				
78. Recorder	Mode selector	F/R	Recorder	Counter	Rewind tape to first reading noted in step 76.	
	AGC/MAN 1 switch	MAN				
	Mode selector	REPRO				
79. Recorder	GAIN 1 control	Adjust	See figure FO-3 test point 	Voltmeter	0 dBm for the second reading noted in step 76.	
		NOTE				
		GAIN 1 control is set for reference. Do not disturb during this test.				
				Voltmeter	-3 dBm to +3 dBm for the second reading noted in step 76.	Perform adjustment in step 63. Replace 3A4A5, para. 3-38.

Table 3-4. Record/Reproduce Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
80. Recorder	Mode selector	OFF				
81. Recorder	Mode selector	F/R	Recorder	Counter	Rewind tape to 000 reading.	
	Mode selector	OFF				
	RESET button	Press		Counter	000	
82. Recorder	Channel selector	2		NOTE		
	AGC/MAN 2 switch	MAN		For channel 2 testing use test point  5		
				See figure FO-3.		
83. Repeat steps 72 through 82.						

3-10. Meter Drive Circuit,

a. General. The procedures in table 3-5 provide information to troubleshoot the meter drive circuit.

b. Equipment.

- (1) Power supply
- (2) Voltmeter
- (3) Generator
- (4) Oscilloscope
- (5) Multimeter
- (6) 117 Vac Cable
- (7) 600 Ohm Load Tx-1
- (8) Test Cable TX-3
- (9) Test Cable TX-4
- (10) Test Cable TX-6
- (11) Adapter TX-8

c. Procedure.

NOTE

Make sure a cassette is not in recorder.

- (1) Remove recorder housing, refer to paragraph 3-25.
- (2) Connect equipment as shown in figure 3-14.
- (3) Refer to figure FO-4 for test point and adjustment locations.
- (4) Insert blank cassette into recorder.
- (5) Perform procedure listed in table 3-5.

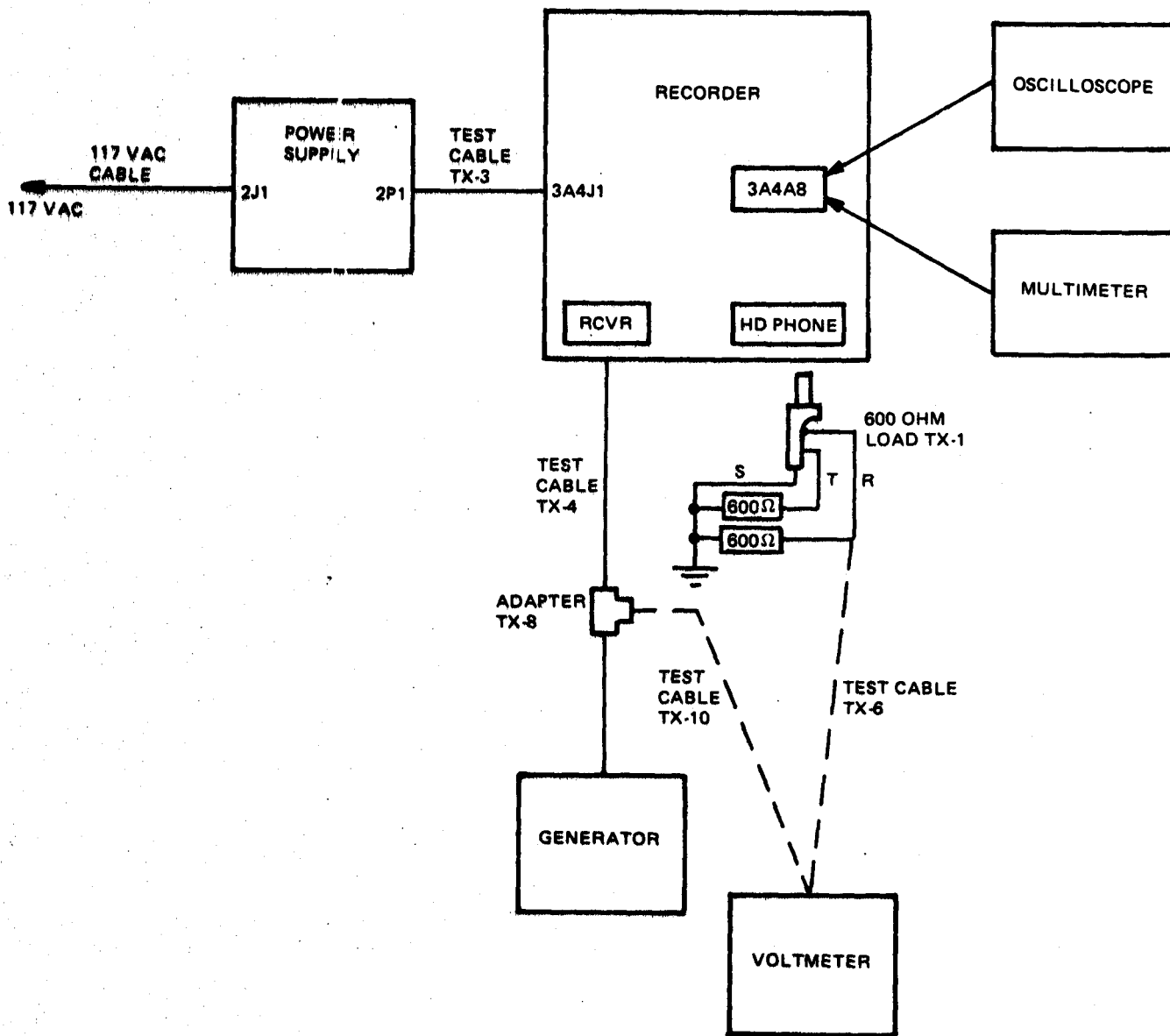


Figure 3-14. Meter Drive Circuit, Equipment Setup

Table 3-5. Meter Drive Circuit Troubleshooting


Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
1. Generator	Frequency dial	1 kHz				
	Output control	Adjust	Generator output	Voltmeter	0 dBm	
CHANNEL 1						
2. Recorder	Channel selector	1				
	AGC/MAN 1 switch	MAN				
	Mode selector	REPRO				
	GAIN 1 control	Adjust	600 ohm load TX-1, R terminal	Voltmeter	+1 dBm	
			Recorder	LEVEL meter	Bottom of red area.	Adjust 3A4A8: Connect voltmeter to test point 
						figure FO-2. Adjust GAIN 1 control for + dBm on voltmeter. Adjust 3A4AR3, figure FO-4, so that LEVEL meter indicates at bottom of red area.

Table 3-5. Meter Drive Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
2. Recorder-continued	Mode selector	REC	Test point ★ 1	Multimeter	+10.0 to +12.0 Vdc	Check power supply, para. 3-6. Check 3A4A8R1, para. 3-39.
			Test point ★ 2	Multimeter	+8.2 to 9.0 Vdc	Check 3A4A8Q1 and 3A4A8CR1, para. 3-39.
			Test point ★ 2	Multimeter	8.2 to 9.0 Vdc	Check 3A4A8Q1 and 3A4A8CR1, para. 3-39.
			Test point ★ 3	Oscilloscope	See FO-4.	Replace 3A4A5, para. 3-38.
	GAIN 1 control	Adjust fully CW	Test point ★ 5	Multimeter	+0.4 to 0.5 Vdc	Check 3A4A8Q2, 3A4A8R3 and 3A4A8R4, para. 3-39.
	Channel selector	1 & 2	Test point ★ 7	Multimeter	0.24 to 0.30 Vdc	Check 3A4A8R5, para. 3-39.
			Test point ★ 12	Multimeter	+10.0 to 12.0 Vdc	Check 3A4A8L1, para. 3-39.
			Test point ★ 13	Multimeter	+10.0 to 12.0 Vdc	Check 3A4A8L1, para. 3-39.
	BAT TEST button	Press	Recorder	LEVEL meter	Green area	Check 3A3M1, 3A3S3, 3A3S4C and 3A3S4D, para. 3-26.

Table 3-5. Meter Drive Circuit Troubleshooting - Continued





Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
CHANNEL 2						
3. Recorder	Channel selector	2				
	AGC/MAN 2 switch	MAN				
	Mode selector	REPRO				
	GAIN 2 control	Adjust	600 ohm load TX-1, T terminal	Voltmeter	+1 dBm	Adjust 3A4A8: Connect voltmeter to test point 
			Recorder	LEVEL meter	Bottom of red area.	figure FO-2. Adjust GAIN 2 control for +1 dBm on voltmeter. Adjust 3A4A8R6, figure FO-4, so that LEVEL meter indicates at bottom of red area.
			Test point 	Oscilloscope	See FO-4.	Replace 3A4A5, para. 3-38.
	GAIN 2 control	Adjust fully CW.	Test point 	Multimeter	0.4 to 0.5 Vdc	Check 3A4A8Q3, 3A4A8R6 and 3A4A8R7, para. 3-39.
			Test point 	Multimeter	0.24 to 0.30 Vdc	Check 3A4A8R8, para. 3-38.

Table 3-5. Meter Drive Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
3. Recorder continued	BAT TEST button	Press	Test points ★10 ★11	Voltmeter	+10.0 to 12.0 Vdc	Check 3A4A8L2, para. 3-38. Check 3A3M1, 3A3S3, 3A3S4C and 3A3S4D, para. 3-26.
			Recorder	LEVEL meter	Green area	

3-11. Bias Oscillator Circuit.

a. General. The procedures in table 3-6 provide information to troubleshoot the bias oscillator circuit.

b. Equipment

- | | |
|-----------------------|-----------------------|
| (1) Multimeter | (11) Test Cable TX-4 |
| (2) Oscilloscope | (12) Test Cable TX-6 |
| (3) Power Supply | (13) Adapter TX-7 |
| (4) 117 Vac Cable | (14) Adapter TX-8 |
| (5) Generator | (15) Test Cable TX-10 |
| (6) Voltmeter | |
| (7) Filter | |
| (8) Blank Cassette | |
| (9) 600 Ohm Load TX-1 | |
| (10) Test Cable TX-3 | |

c. Procedure.

- (1) Remove recorder housing, refer to paragraph 3-25.
- (2) Connect equipment as shown in figure 3-15.
- (3) Refer to figure FO-5 for test point and adjustment locations.
- (4) Insert blank cassette into recorder.
- (5) Perform procedure of table 3-6.

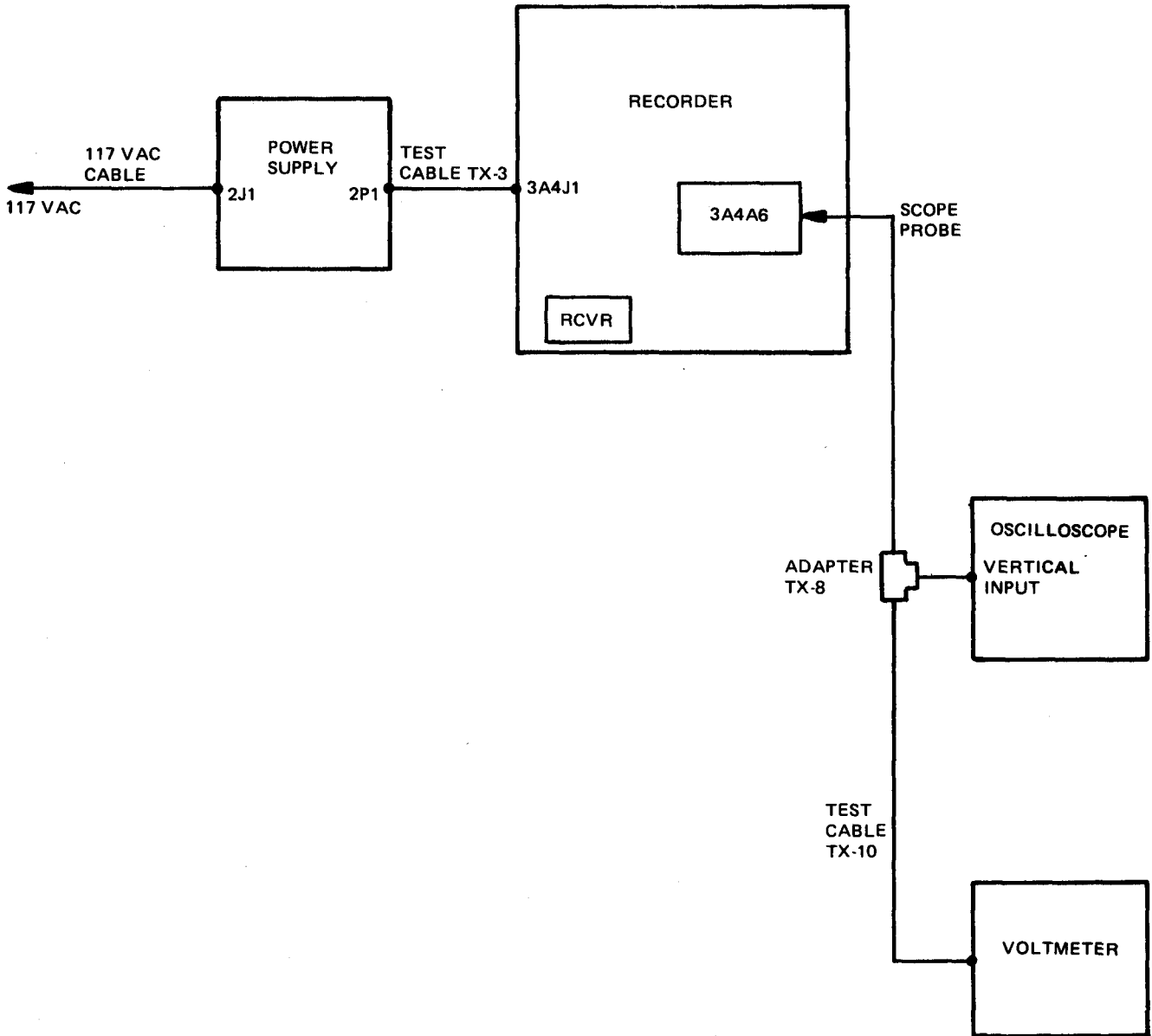


Figure 3-15. Bias Oscillator Circuit, Equipment Setup

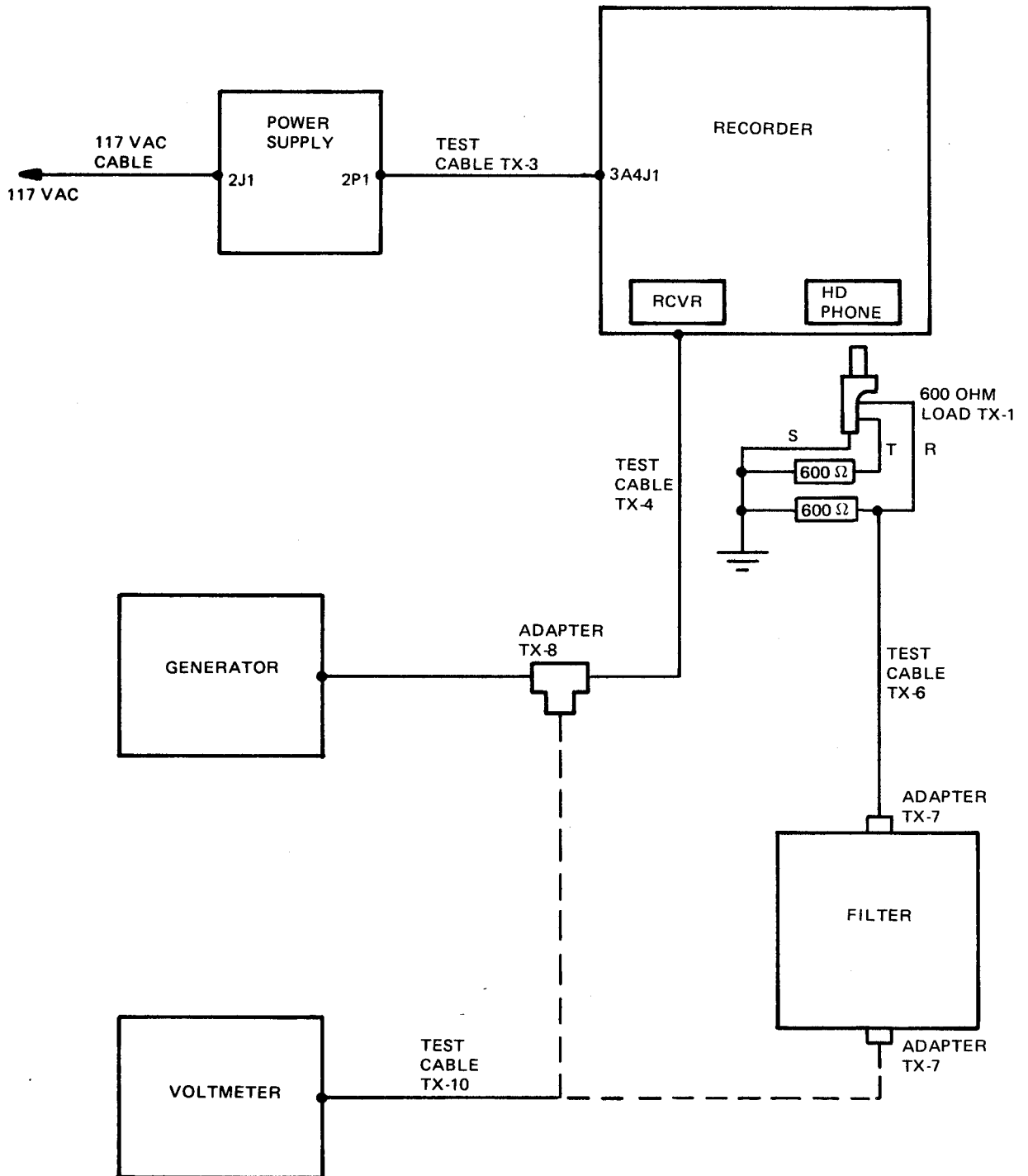


Figure 3-16. Erase Efficiency, Equipment Setup

Table 3-6. Bias Oscillator Circuit Troubleshooting

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
OSCILLATOR						
1. Recorder	Mode selector	REC	Test point ★ 1	Multimeter	+10.4 to +12.4 Vdc	Check 3A4A4S1B and 3A4A4S1F, para. 3-37. Troubleshoot sensor circuit, para. 3-13.
			Test point ★ 2	Oscilloscope	See figure FO-5.	
SUMMING SIGNALS						
2. Recorder	Mode selector	REC	Test point ★ 3	Oscilloscope	See figure FO-5.	Check equipment setup. Check erase head, para. 3-34.
			Test point ★ 4	Oscilloscope	See figure FO-5.	
			Test point ★ 5	Oscilloscope	See figure FO-5.	Adjust 3A4A6R12 for distortion free waveform on oscilloscope and 5 Vrms on voltmeter.
				Voltmeter	5 Vrms	
	Test point ★ 6	Oscilloscope	See figure FO-5.	Adjust 3A4A6R18 for distortion free waveform on oscilloscope and 5 Vrms on voltmeter.		

Table 3-6. Bias Oscillator Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
CHANNEL 1 ERASE EFFICIENCY			EQUIPMENT SETUP: FIGURE 3-16			
3. Recorder	Channel selector	1				
	Blank cassette	Install				
	AGC/MAN 1 switch	MAN				
	Mode selector	REC				
	GAIN control	Adjust	Recorder	LEVEL meter	Red line	Check equipment setup
4. Generator	Frequency dial	1 kHz.				
	Output control	Adjust		Voltmeter	+12 dBm	Check equipment setup
					NOTE Recorder LEVEL meter exceeds full scale.	
5. Recorder	Mode selector	Record for 1 minute then stop.	Recorder	Counter	Note count at start and end of recording.	

Table 3-6. Bias Oscillator Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
5. Recorder-continued	Mode selector	Rewind tape to mid-point of recording made above.				
	6. Generator	Test Cable TX-4	Disconnect from generator and short channel 1 to ground.			
7. Recorder	Mode selector	REC Record until counter passes end of recording made in step 5, then stop recorder.				
	Mode selector	F/R Rewind tape to beginning of recording made in step 5.	Recorder	Counter	Same as end of step 5.	
	Mode selector	REPRO				

Table 3-6. Bias Oscillator Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
7. Recorder-continued	GAIN 1 control	Adjust	Filter output	Voltmeter	+10 dBm. When re-cording of step 5 is re-produced, then reading drops to less than -30 dBm.	Check erase head, para. 3-34.
CHANNEL 2 ERASE EFFICIENCY						
8. Repeat steps 3 through 7 for channel 2, using channel 2 input connections, output connection, and gain control. The channel selector switch must be set to 2 and the AGC/MAN 2 switch set to MAN position.						

TM 32-5835-001-24 & P

3-12. Capstan Motor Servo Circuit.

a. General. The procedures in table 3-7 provide information to troubleshoot the capstan motor servo circuit.

b. Equipment.

- (1) Oscilloscope
- (2) Multimeter
- (3) Power Supply
- (4) 117 Vac Cable
- (5) Blank Cassette
- (6) Test Cable TX-3

c. Procedure

- (1) Remove recorder housing, refer to paragraph 3-25.
- (2) Connect equipment as shown in figure 3-17.
- (3) Insert blank cassette into recorder.
- (4) Refer to figure FO-6 for test point locations.
- (5) Perform procedure of table 3-7.

3-13. Sensor Circuit

a. General. The procedures in table 3-8 provide information to troubleshoot the end of tape sensor circuit.

b. Equipment.

- (1) Oscilloscope
- (2) Multimeter
- (3) Power Supply
- (4) 117 Vac Cable
- (5) Blank Cassette
- (6) Test Cable TX-3
- (7) Headset

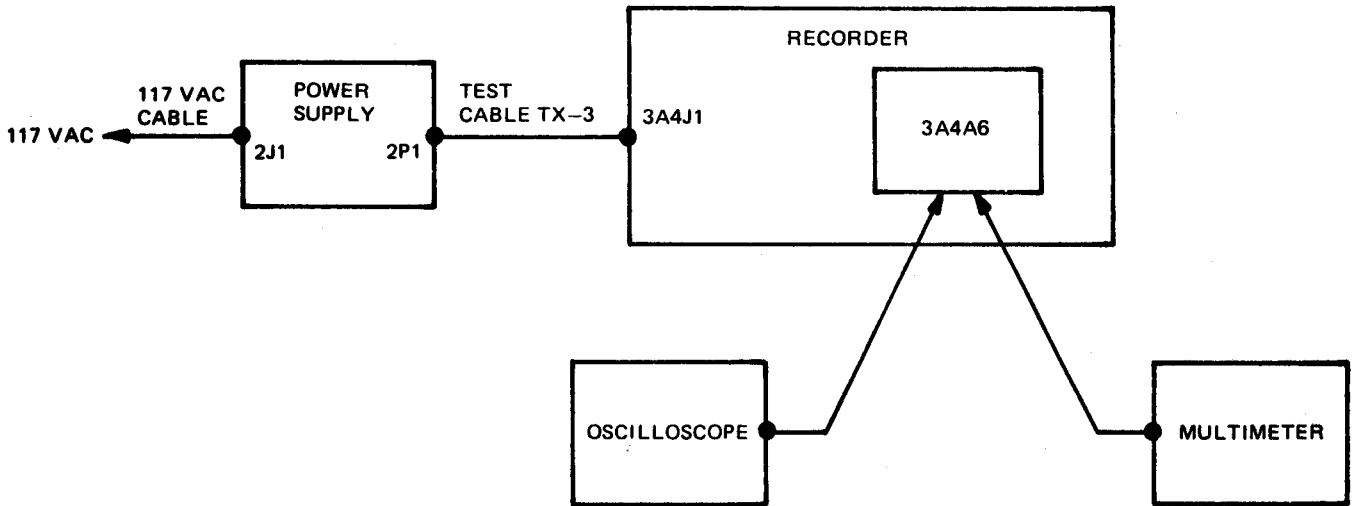


Figure 3-17. Capstan Motor Servo Circuit, Equipment Setup

Table 3-7. Capstan Motor Servo Circuit Troubleshooting

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
1. Recorder	Mode selector	REPRO	Test point ★ 1	Multimeter	+10.4 to +12.4 Vdc	Troubleshoot sensor circuit, para. 3-13.
			Test point ★ 2	Multimeter	+6.0 to +7.0 Vdc	
			Test point ★ 3	Oscilloscope	See figure FO-6.	Replace 3A4A6, para. 3-38.
			Test point ★ 5	Oscilloscope	See figure FO-6.	Check wiring from test point ★ 3 to test point ★ 5 .
			Test point ★ 6	Oscilloscope	See figure FO-6.	Replace 3A4A11, para. 3-39.
			Test point ★ 4	Oscilloscope	See figure FO-6.	Replace 3A4MT1, para. 3-48.

c. Test Procedure.

- (1) Remove recorder housing, refer to paragraph 3-25.
- (2) Connect equipment as shown in figure 3-18.
- (3) Insert blank cassette into recorder.
- (4) Refer to figure F0-7 for test point locations.
- (5) Perform procedure in table 3-8.

3-14. Reel Motor Circuit.

a. General. The procedure in table 3-9 provides information to troubleshoot the reel motor circuit.

b. Equipment.

- (1) Multimeter
- (2) Power Supply
- (3) 117 Vac Cable
- (4) Test Cable TX-3

c. Procedure.

- (1) Remove housing, refer to paragraph 3-25.
- (2) Connect equipment as shown in figure 3-19.
- (3) Refer to figure F0-8 for test point locations.
- (4) Perform procedure of table 3-9.

NOTE

Be sure a cassette is not in the recorder.

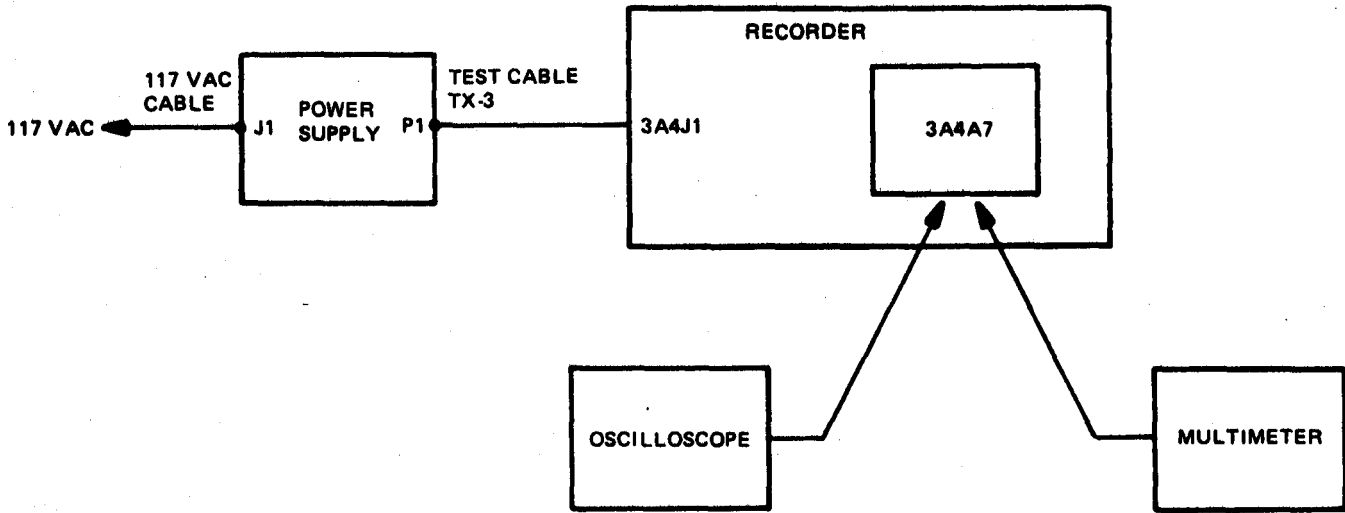


Figure 3-18. Sensor Circuit, Equipment Setup

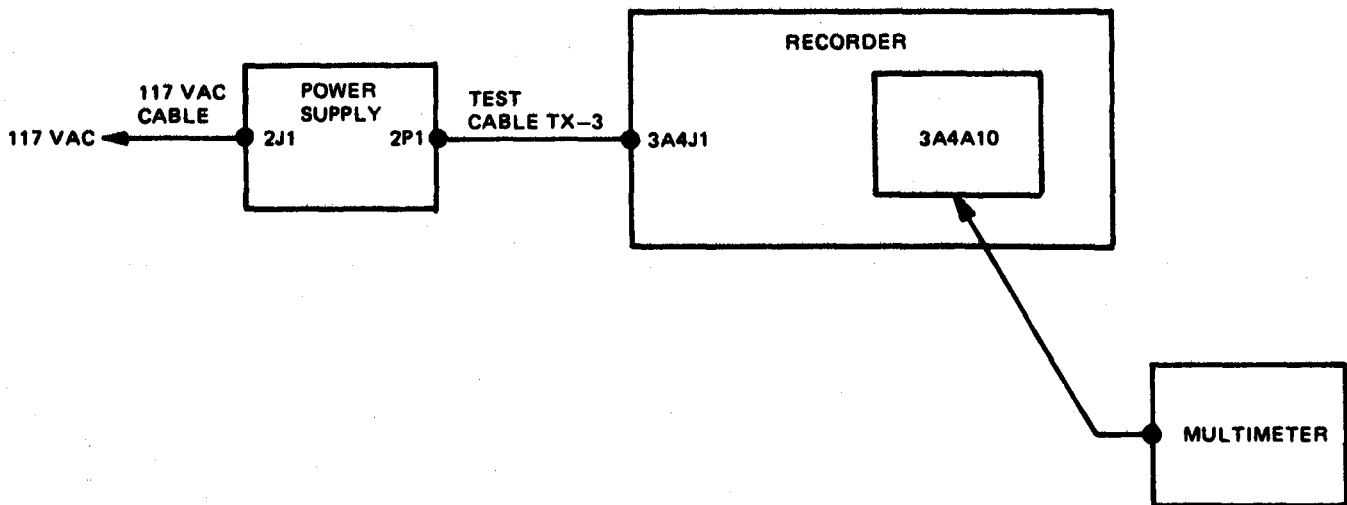


Figure 3-19. Reel Motor Circuit, Equipment Setup

Table 3-8. Sensor Circuit Troubleshooting

Procedure			Normal Indication			Corrective Action	
Location	Item	Action	Location	Indicator	Indication		
1. Recorder	Mode selector	REC	Test point ★ 1	Multimeter	+10.4 to +12.4 Vdc	Check 3A4A7R1, para. 3-39. Check 3A4A4S1E and 3A4A4S1F, para. 3-37.	
			Test point ★ 2	Multimeter	+9.5 to +11.5 Vdc		Check 3A4A7R11, para. 3-39. Check 3A4A4S1E and 3A4A4S1F, para. 3-37.
			Test point ★ 3	Multimeter	+10.4 to +12.4 Vdc		
			Test point ★ 4	Oscilloscope	See figure FO-7.		Repair 3A4A12, para. 3-42.
2. Recorder	Mode selector	OFF					
	Mode selector	F/F wind to near end of tape.	Recorder	Motor controller	Motor controller stops.	Replace 3A4A7Q3, para. 3-39.	
3. Recorder	Mode selector	REC Allow tape to run to end.		Headset	Tone.	Replace headset.	
			Test points ★ 6 and ★ 7	Oscilloscope	See figure FO-7.	Check 3A4A7K1, para. 3-39.	
			Test point ⓐ	Oscilloscope	See figure FO-7.	Check 3A4A7K1, para. 3-39.	

Table 3-8. Sensor Circuit Troubleshooting - Continued

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
3. Recorder- continued			3A4A7Q3	Multimeter	DC voltage chart on figure FO-7.	Check 3A4A7K1, 3A4A7R5, 3A4A7R6 and 3A4A7Q3, para. 3-39.
			Test point Ⓐ	Oscilloscope	See figure FO-7.	
			3A4A7Q5	Multimeter	DC voltage chart.	Check 3A4A7R2 and 3A4A7Q5 para. 3-39.
			Test point Ⓑ	Oscilloscope	See figure FO-7.	Check 3A4A7R7, 3A4A7R8 and 3A4A7Q1, para. 3-39.
			3A4A7Q1	Multimeter	DC voltage chart.	Check 3A4A7R3, para. 3-39.
			3A4A7Q2	Multimeter	DC voltage chart.	Check 3A4A7K1, 3A4A7R8, 3A4A7C7 and 3A4A7Q2, para. 3-39.
			Test point Ⓗ	Multimeter	+6.7 to +6.96 Vdc	Troubleshoot Cap- stan motor servo circuit, para. 3-12.
			Test point Ⓙ	Multimeter	+10.4 to +12.4 Vdc	Check 3A4A7K1, para. 3-39.

Table 3-9. Reel Motor Circuit Troubleshooting

Procedure			Normal Indication			Corrective Action
Location	Item	Action	Location	Indicator	Indication	
F/F MODE						
1. Recorder	Mode selector	F/F	Test point ★ 1	Multimeter	+10.4 to +12.4 Vdc	Check 3A4S1A, 3A4S1E, and 3A4S1F, para. 3-37.
			Test point ★ 2	Multimeter	+10.4 to +12.4 Vdc	
2. Recorder	Mode selector	F/R	Test point ★ 3	Multimeter	+10.4 to +12.4 Vdc	Replace 3A4S1C, para. 3-37.
			Test point ★ 4	Multimeter	+10.4 to +12.4 Vdc	
REC/REPRO						
3. Recorder	Mode selector	REC	Test point ★ 1	Multimeter	+10.4 to +12.5 Vdc	Check 3A4A4S1A and 3A4A4S1C, para. 3-37. Check 3A4CR1, figure FO-8. Troubleshoot sensor circuit, para. 3-13.
	Mode selector	REPRO	Same as above.			Same as above.

TM 32-5835-001-24 & P

3-15. Power Distribution Circuit. The power distribution circuit schematic diagram (figure FO-9) will assist in locating power faults at a system level. This permits a point-to-point check to be made to isolate power failures. The VOLTAGE POINT LOCATION CHART references detailed circuits in order to isolate component failures.

Section III. BASE (UNIT 1) MAINTENANCE

3-16. General. This section provides information for direct support maintenance of the base (unit 1). There is no general support maintenance authorized for the base.

3-17. Base (Unit 1) Maintenance Instructions

This task covers:

- a. Inspect
- b. Service
- c. Repair

INITIAL SETUP

Applicable Configurations

All

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Test Equipment

None

Equipment Condition

Power supply and recorder removed
from base

Special Tools

None

General Safety Instructions

None

Materials /Parts

Cleaning Compound,
NSN 6850-00-597-9765

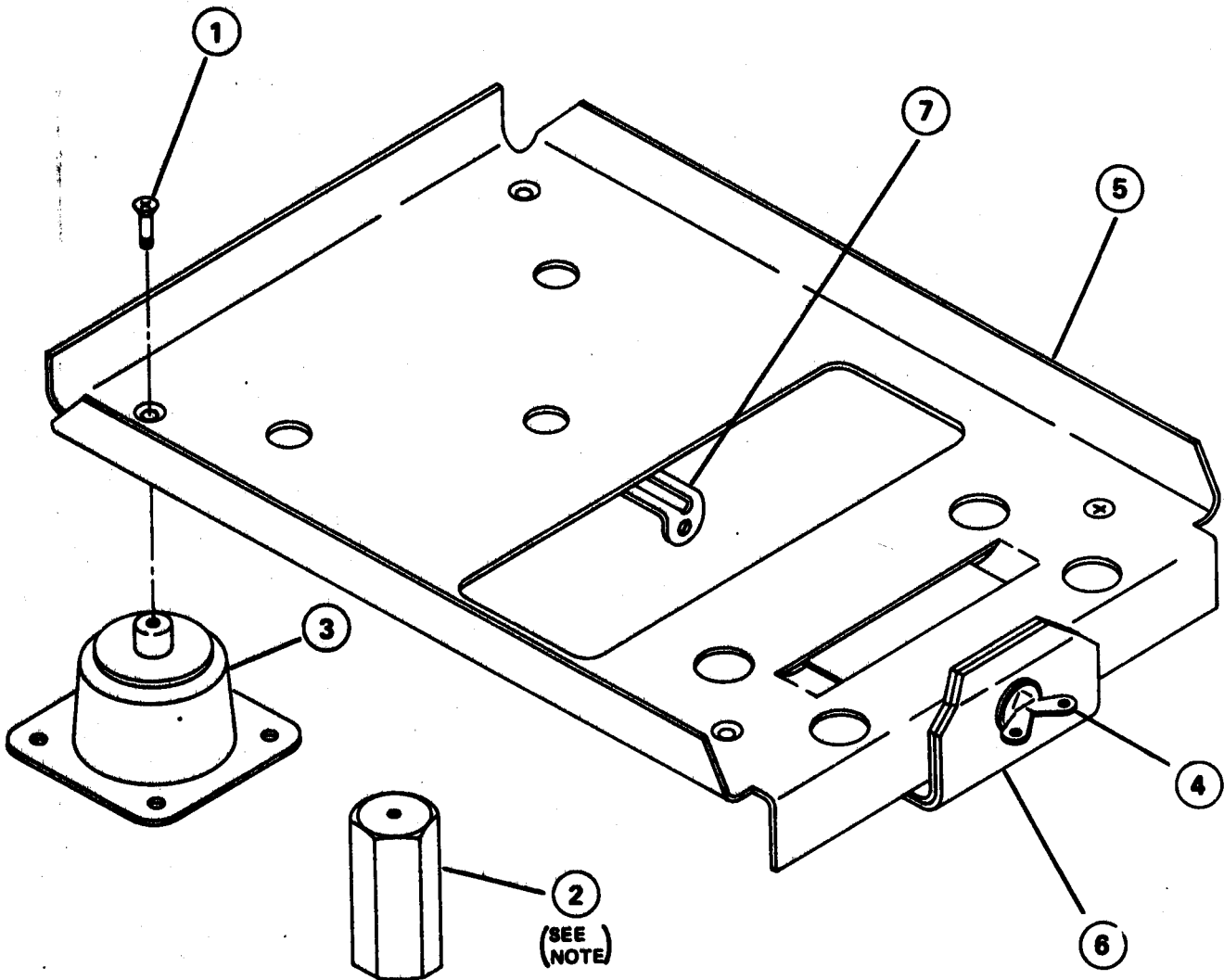
Approximate Time Required (minutes)

Inspect	6
Service	12
Repair	<u>12</u>
	30

Troubleshooting References

None

Item	Action	Remarks
INSPECT		
1. Base (unit 1)	Check for damaged or missing components. Check for accumulation of dirt and grease.	
2. Clamp (6)	Check for binding or damage to clamp screw.	
3. 3 fasteners (7)	Check for bent or damaged fastener slides.	
SERVICE		
Base (unit 1)	Clean using cleaning compound, lint-free rags, and a soft brush.	
REPAIR		
Base (unit 1)	Repair by replacing defective parts.	



- 1. Screw (4)
- 2. Standoff (4)
- 3. Mount (4)
- 4. Screw (4)

- 5. Plate
- 6. Clamp
- 7. Fastener (3)

Note: Standoffs item 2 are supplied for installations not requiring mounts item 3

Figure 3-20. Base, Assemble/Disassemble

Section IV. POWER SUPPLY (UNIT 2) MAINTENANCE

3-18. General. This section provides information for direct support maintenance of power supply (unit 1). There is no general support maintenance authorized for the power supply. Table 3-10 lists maintenance instructions tasks for the power supply.

Table 3-10. List of Tasks for Power Supply

Task No.	Task	Task Ref	Troubleshooting Ref No. (Para.)
1	Power Supply Maintenance Instructions	3-19	3-9
2	Fuse Card (2A1) Maintenance Instructions	3-20	3-9
3	Power Card (2A2) Maintenance Instructions	3-21	3-9

3-19. Power Supply Maintenance Instructions

This task covers:

- a. Inspect
- b. Service
- c. Repair
- d. Replace
- e. Test

INITIAL SETUP

Applicable Configurations

All

Personnel Required

EW /Intercept Equipment
Repairman MOS33S20

Test Equipment

None

Condition Description

Power supply
detached from recorder.

TM 32-5835-001-24 & P

Special Tools

None

Material/Parts

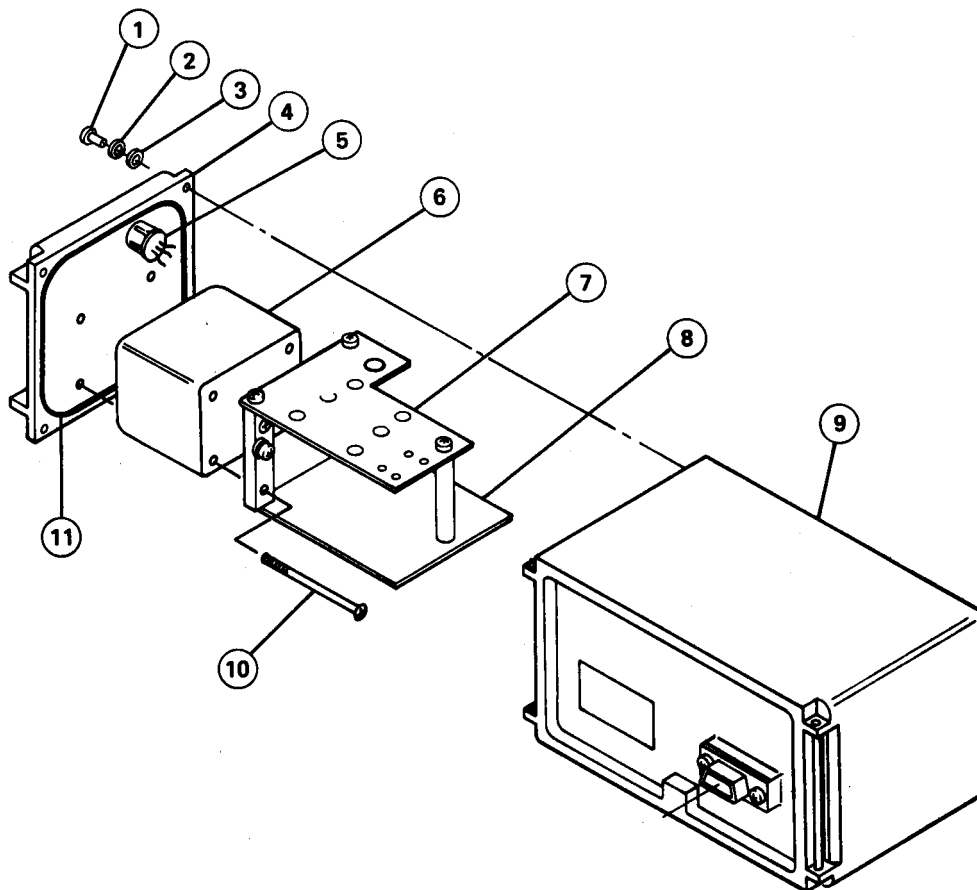
Solder, SN-60
CHO-BOND 1029

Approximate Time Required (minutes)

Inspect	12
Service	12
Repair	120
Replace	6
Test	<u>12</u>
	162

Troubleshooting Reference

Paragraph 3-6



- | | |
|---------------------|---------------------|
| 1. Screw (4) | 7. Fuse card (2A1) |
| 2. Lock washer (4) | 8. Power card (2A2) |
| 3. Flat washer (4) | 9. Case |
| 4. Power supply | 10. Screw (4) |
| 5. Transistor (2Q1) | 11. Gasket |
| 6. Transformer | |

Figure 3-21. Power Supply, Assemble/Disassemble

Item	Action	Remarks
INSPECT		
1. Power Supply (4)		
4 screws (1), lock washers (2), and flat washers (3)	Remove	Retain
2. Power Supply (4)	Slide out of case (9) as far as it will go.	Items are connected by wiring harness.
	Check for evidence of overheating (charred components), for physical damage to cards 2A1 and 2A2 (such as fractured cards or open printed wiring), and for accumulation of dust and dirt.	
	Check gasket for dirt, damage, or breaks.	
SERVICE		
Power supply (4)	Clean using a soft brush or compressed air.	
REPAIR		
Power supply (4)	Repair by replacing defective piece parts. Replace 2A1 or 2A2 only if cards are fractured, charred, or have open printed circuit wiring. Replace transistor 2Q1(5). Replace gasket by digging out defective gasket. Clean out gasket groove with toluene. Secure new gasket with CHO-BOND 1029 (Mfd by Chromerics, Inc., Woburn, Mass.).	Figure FO-1

TM 32-5835-001-24 & P

Item	Action	Remarks
REPLACE		
1. Power supply (4)	Slide into case (9).	
2. 4 screws (1), lockwashers (2), and flat washers (3)	Install Package and forward to depot.	

TEST

Power supply Perform final test,
 paragraph 3-22.

3-20. Fuse Card (2A1) Maintenance Instructions

This task covers:

- | | |
|------------|---------|
| a. Inspect | d. Test |
| b. Repair | |
| c. Replace | |

INITIAL SETUP

Applicable Configurations

All

Personnel Required

EW/Intercept Equipment
Repairman MOS33S20

Test Equipment

None

Equipment Condition

Paragraph 3-19

Material/Parts

Solder, SN-60

Condition Description

Power supply removed from case.

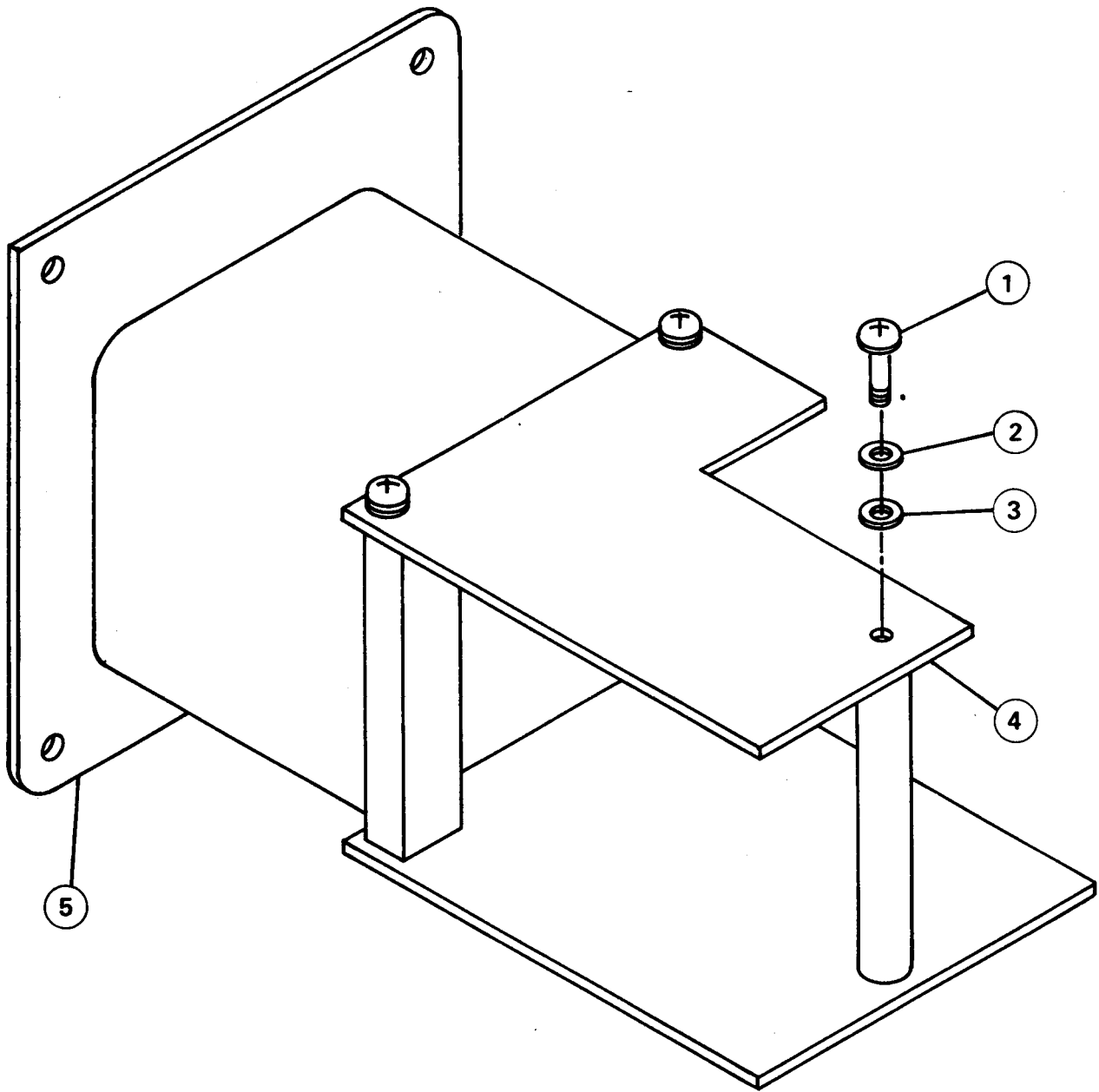
Troubleshooting Reference

Paragraph 3-6

Approximate Time Required (minutes)

Inspect	6
Repair	60
Replace	30
Test	<u>12</u>
	108

Item	Action	Remarks
Fuse card 2A1 (4)	Check for fractures, charring, and open printed wiring.	Replace fuse card if fractures, charring, or or open wiring are found; otherwise, repair.
REPAIR		
Fuse card 2A1 (4)		
1. 3 screws (1), lock washers (2), and flat washers (3)	Remove	Retain
	Move away from power supply (5) .	Connected by wiring harness.
	Repair by replacing defective parts.	Figure FO-1.
REPLACE		
1. Harness wires	Tag for identification.	For installation
2. Harness wires	Unsolder from terminals.	
3. New fuse card 2A1 (4)	Position for resoldering.	
4. Harness wires	Solder to terminals identified by tags.	
5. Harness wires	Remove tags.	
6. Fuse card 2A1 (4)	Place onto power supply (5) .	
7. 3 screws (1) , lock washers (2), and flat washers (3)	Install	
8. Case	Install	Paragraph 3-19.
TEST		
Fuse card 2A1 (4)	Perform final test, paragraph 3-22.	



- 1. Screw (3)
- 2. Lock washer (3)
- 3. Flat washer (3)
- 4. Fuse card (2A1)
- 5. Power supply

Figure 3-22. Fuse Card (2A1), Remove/Replace

3-21. Power Card (2A2) Maintenance Instructions

This task covers:

- a. Inspect
- b. Repair
- c. Replace
- d. Test

INITIAL SETUP

Applicable Configurations

All

Test Equipment

See paragraph 3-2

Special Tools

None

Material/Parts

Solder, SN-60

Troubleshooting Reference

Paragraph 3-8

Personnel Required

EW /Intercept Equipment
Repairman MOS 33DS20

Equipment Condition

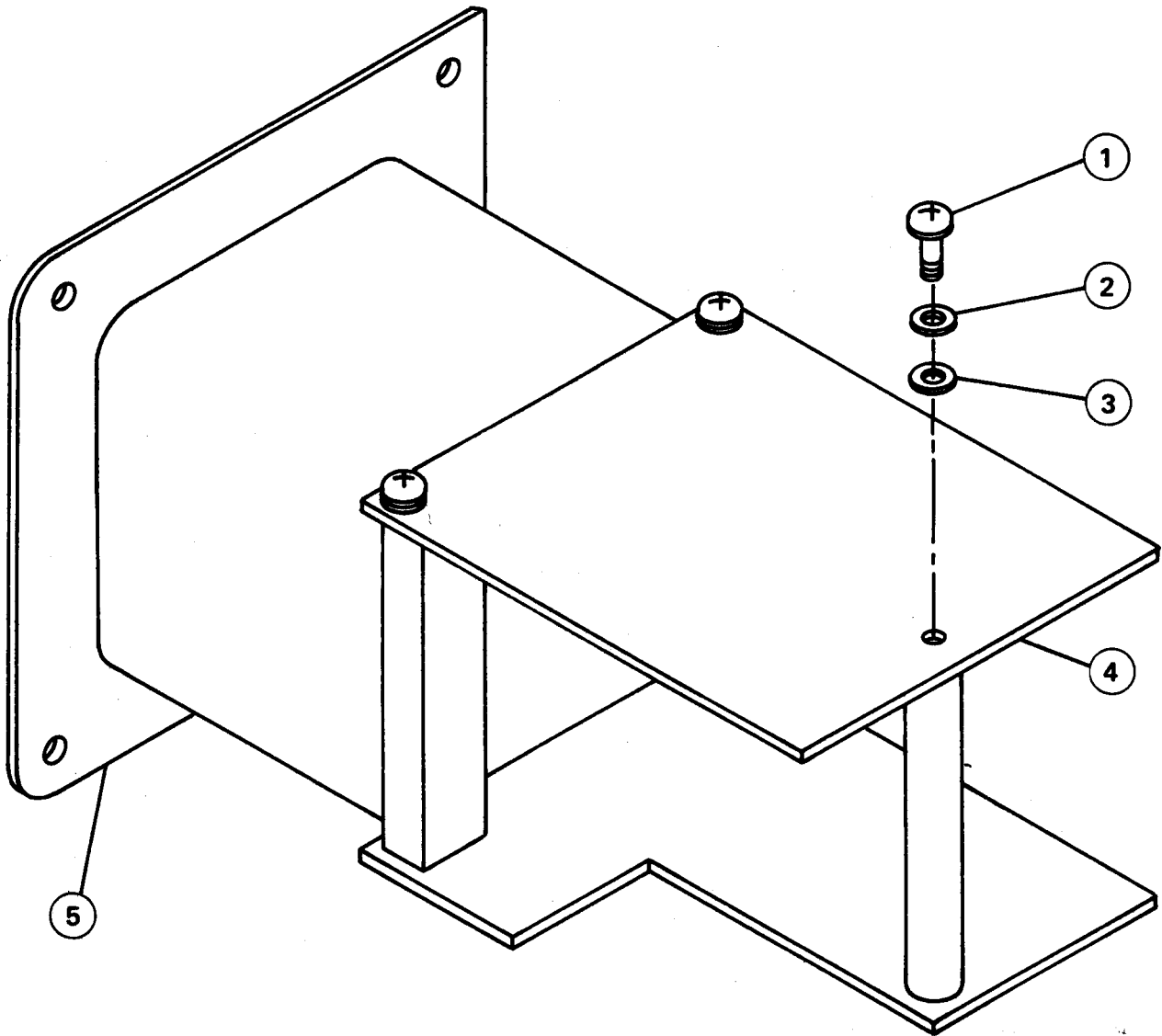
Paragraph 3-19

Condition Description

Power supply removed from case.

Approximate Time Required (minutes)

Inspect	6
Repair	120
Replace	30
Test	<u>12</u>
	168



1. Screw (3)
2. Lock washer (3)
3. Flat washer (3)
4. Power card (2A2)
5. Power supply

Figure 3-23. Power Card (2A2), Remove/Replace

Item	Action	Remarks
INSPECT		
Power card 2A2 (4)		
1. 3 screws (1), lock washers (2), and flat washers (3)	Remove	Retain
2. Power card 2A2 (4)	Move away from power supply (5) . Check for fractures, charring, and open printed wiring.	Connected by wiring har- ness. Replace power card 2A2 if fractures, charring, or open printed wiring are found; otherwise, repair.
REPAIR		
Power card 2A2 (4)	Repair by replacing defective parts.	Figure FO-1
REPLACE		
1. Harness wires	Tag for identification,	For installation
2. Harness wires	Unsolder from terminals.	
3. New power card 2A2 (4)	Position for resoldering.	
4. Harness wires	Solder to terminals identified by tags.	
5. Harness wires	Remove tags	
6. Fuse card 2A1 (4)	Place onto power supply (5)	
7. 3 screws (1), lockwashers (2), and flat washers (3)	Install	
8. Case	Install	Paragraph 3-19
TEST		
Power card 2A2 (4)	Perform final test, paragraph 3-22.	

3-22. Power Supply Final Test Procedure. This final test procedure should be performed on the power supply after any repairs are made. This test is performed with the equipment completely assembled.

a. Equipment.

- (1) DC Source
- (2) Multimeter
- (3) Variac
- (4) Oscilloscope
- (5) 230 Vac Cable
- (6) 117 Vac Cable
- (7) 22 to 30 Vac Cable
- (8) Test Cable TX-2
- (9) Load Resistor TX-9

WARNING

HIGH VOLTAGE is used in the operation of this equipment. DEATH ON CONTACT may result if personnel fail to observe safety precautions. Learn the areas containing high voltage in your equipment. Be careful not to make contact with high voltage connections when testing this equipment.

CAUTION

To avoid damage to your equipment be sure the dc source and variac output adjustment controls are set fully counterclockwise before use.

b. Procedure.

- (1) Connect equipment as shown in figure 3-24.
- (2) Perform test procedure listed in table 3-11.

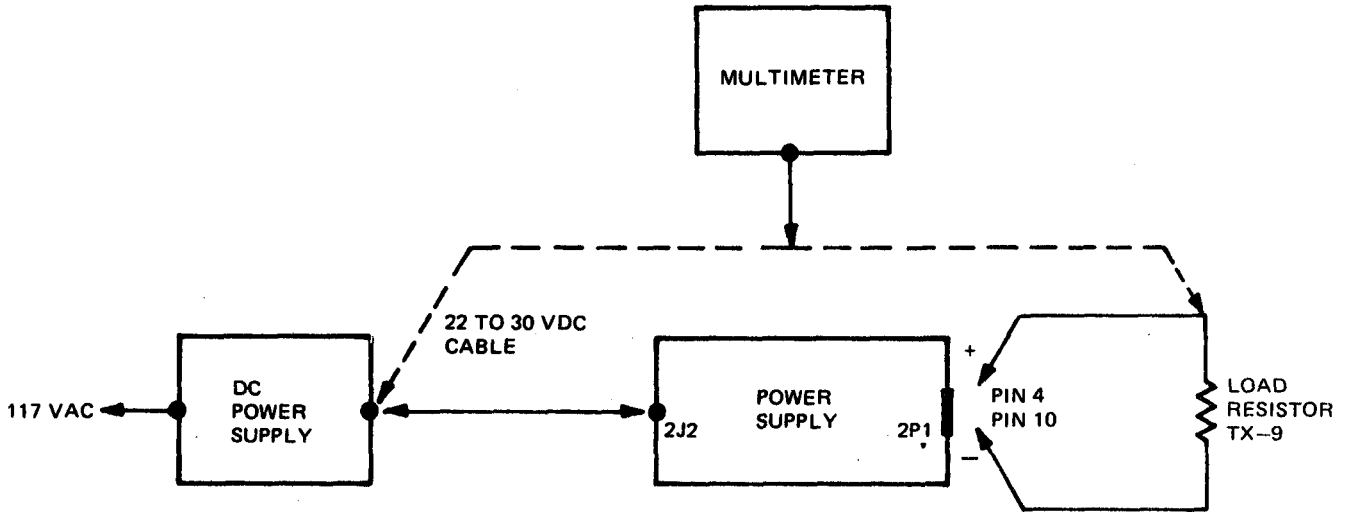


Figure 3-24. Power Supply DC Final Test, Equipment Setup

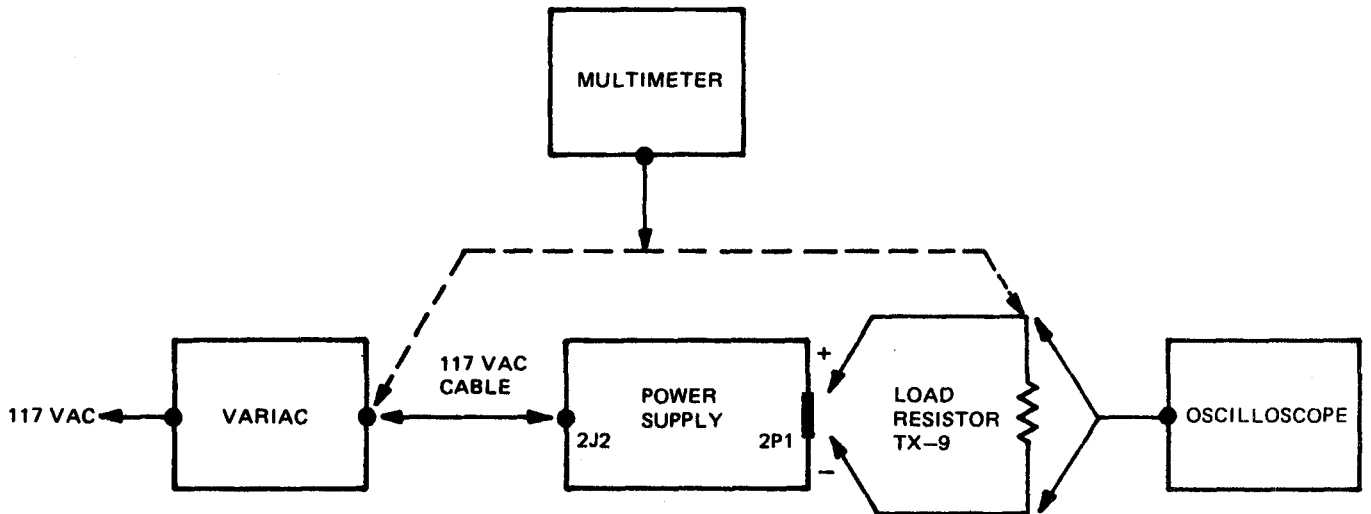


Figure 3-25. Power Supply AC Final Test, Equipment Setup

Table 3-11. Power Supply Final Test

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
1. Dc source	Power	ON				If normal indications are not obtained, perform troubleshooting procedure in para. 3-6.
	Output control	+24 Vdc	Load resistor TX-9	Multimeter	+10.4 to +12.4 Vdc	
2. Dc source	Output control	22 Vdc then 30 Vdc	Load resistor TX-9	Multimeter	Voltage remains between +10.4 and +12.4 Vdc.	
3. Dc source	Output control	+12 Vdc	Output of dc source	Multimeter	+12 Vdc	
4. Dc source	Power switch	OFF				
	22 to 30 Vdc cable	Replace with test cable TX-2.				
6. Dc source	Power switch	ON	Load resistor TX-9	Multimeter	+10.4 to +12.4 Vdc	
7. Dc source	Power switch	OFF				
8. Connect equipment as shown in figure 3-25.						
9. Variac	Power switch	ON				

Table 3-11. Power Supply Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
10. Variac	Adjust control	117 Vac	Load resistor TX-9	Multimeter	+10.4 to +12 Vdc	
				Oscilloscope	Ripple less than 100 mv peak-to-peak	
11. Variac	Adjust control	104 Vac then 126 Vac	Load resistor TX-9	Multimeter	+10.4 and +12.4 Vdc	
				Oscilloscope	Ripple less than 100 mv peak-to-peak	

Section V. RECORDER (UNIT 3) MAINTENANCE

3-23. General. This section provides information for maintenance of recorder (unit 3). There is no general support maintenance authorized for the recorder. Table 3-12 lists maintenance instructions tasks for the recorder.

Table 3-12. List of Tasks for Recorder

Task No.	Task	Task Ref	Troubleshooting Ref. No. (Para)
1	Recorder (3) Maintenance Instructions	3-24	3-7 to 3-14
2	Recorder Housing (3A1) Maintenance Instructions	3-25	
3	Front Panel (3A3) Maintenance Instructions	3-26	3-7
4	Knob (3A3A1) Maintenance Instructions	3-27	
5	Mag Transport (3A4) Maintenance Instructions	3-28	3-7
6	Slide Plate (3A4A1) Maintenance Instructions	3-29	3-7
7	Audio Head Assembly (3A4A1A1) Maintenance Instructions	3-30	3-9
8	Rollers (3A4A1A2, 3A4A1A3) Maintenance Instructions	3-31	3-7
9	Drive Wheel (3A4A1A4) Maintenance Instructions	3-32	3-7
10	Idler Wheel (3A4A1A4A1) Maintenance Instructions	3-33	
11	Erase Head (3A4A1PU2) Maintenance Instructions	3-34	3-11
12	Counter (3A4A2) Maintenance Instructions	3-35	3-7
13	Ejector (3A4A3) Maintenance Instructions	3-36	3-7
14	Mode Selector (3A4A4) Maintenance Instructions	3-37	3-9
15	Circuit Cards (3A4A5, 3A4A6) Maintenance Instructions	3-38	3-9, 3-11
16	Circuit Cards (3A4A7 and 3A4A8) and C Filter (3A4A11) Maintenance Instructions	3-39	3-10
17	Resistor Card (3A4A9) Maintenance Instructions	3-40	3-9
18	R Filter (3A4A10) Maintenance Instructions	3-41	3-14
19	Sensor (3A4A12) Maintenance Instructions	3-42	3-13
20	Actuator (3A4A13) Maintenance Instructions	3-43	3-9
21	Switches (3A4S1J through 3A4S1P) Maintenance Instructions	3-44	3-9
22	Disk Reel (3A4A14) Maintenance Instructions	3-45	3-7
23	Disk Reel (3A4A16) Maintenance Instructions	3-46	3-7
24	Reel Motor (3A4A17) Maintenance Instructions	3-47	3-14
25	Capstan Motor (3A4A18) Maintenance Instructions	3-48	3-13
26	Recorder Final Test Procedure	3-49	

3-24. Recorder Maintenance Instructions

This task covers:

- | | |
|------------|------------|
| a. Inspect | d. Adjust |
| b. Service | e. Replace |
| c. Repair | f. Test |

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material /Parts

Cleaning Compound
NSN 6850-00-597-9765

Troubleshooting Reference

Paragraphs 3-7 to 3-14

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

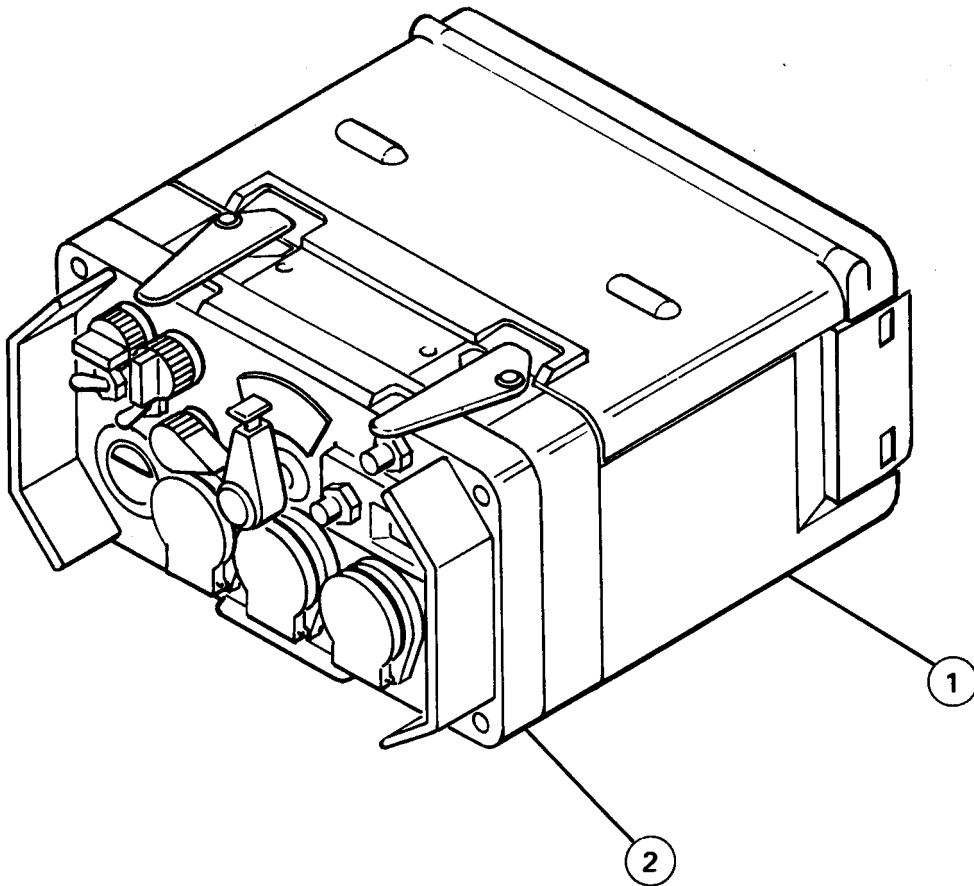
Equipment Condition

Recorder detached from power supply

Approximate Time Required (minutes)

Inspect	12
Service	6
Repair	12
Adjust	30
Replace	6
Test	<u>60</u>
	126

Item	Action	Remarks
INSPECT	Inspect for accumulation of dirt and grease and for damage to the recorder housing (3A1) or the front panel (3A3).	
SERVICE	Clean using cleaning compound, lint-free rags, and a soft brush.	



- 1. Housing
- 2. Front Panel

Figure 3-26. Recorder

Item	Action	Remarks
REPAIR	Repair by following paragraphs 3-24 through 3-46 and replacing defective parts.	
REPLACE	Replace amplifier card 3A4A5 and/or motor-bias card 3A4A6 by following paragraph 3-38.	
ADJUST		
TEST	Perform final test, paragraph 3-49.	

3-25. Recorder Housing (3A1) Maintenance Instructions

This task covers:

- a. Inspect
- b. Service
- c. Repair

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material/Parts

Cleaning Compound,
NSN 6850-00-597-9765

CHO-BOND 1029

Troubleshooting Reference

None

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

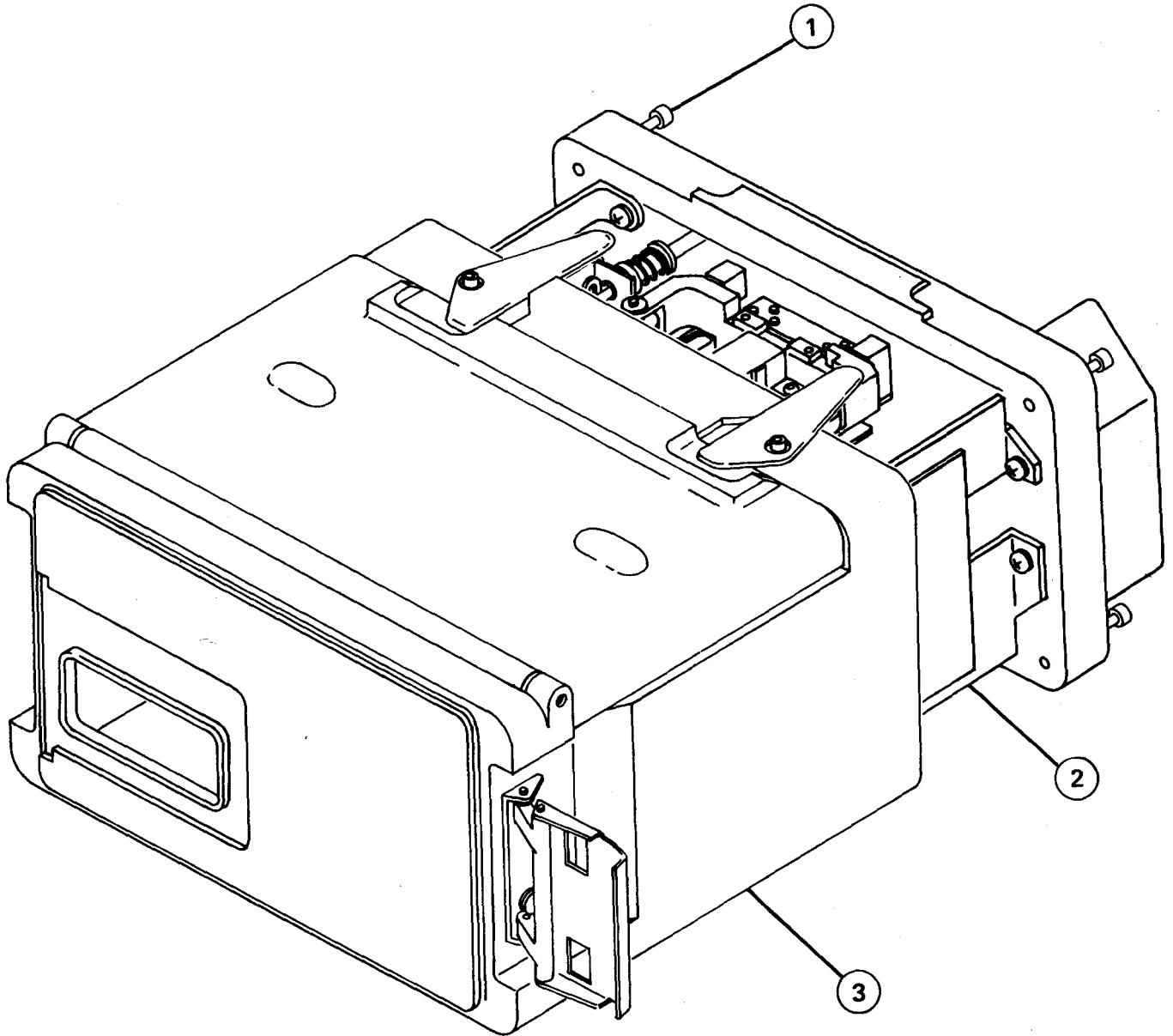
Equipment Condition

All power removed.

Approximate Time Required (minutes)

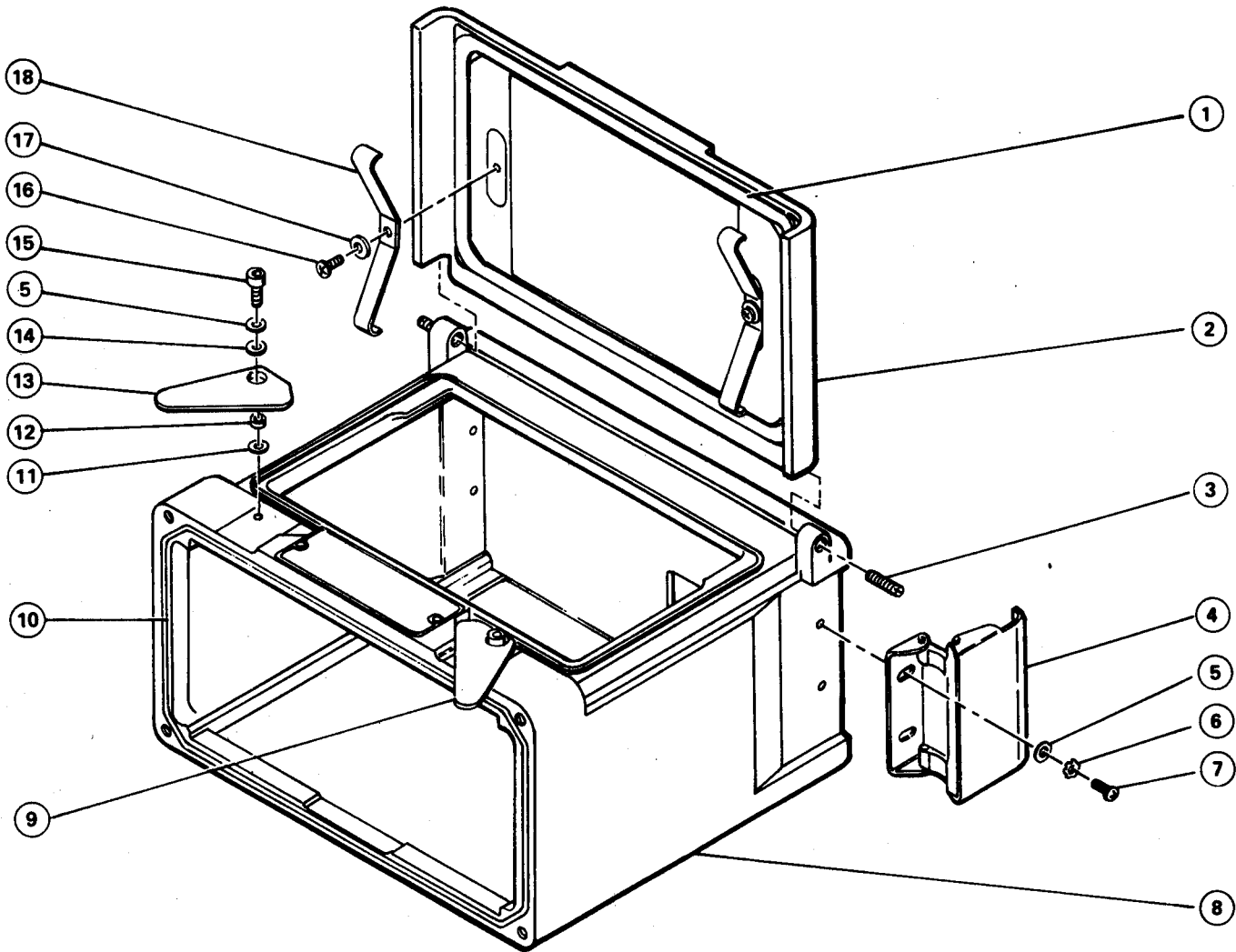
Inspect	6
Service	6
Repair	<u>48</u>
	60

Item	Action	Remarks
INSPECT		
1. 4 front panel captive screws (1)	Loosen	
2. Housing (3)	Slide off recorder.	
	Inspect for accumulation of dirt and grease and for damage to latches, hinges, and other components. Inspect gasket for dirt, cracks, or breaks.	
SERVICE		
Housing (3)	Clean using cleaning compound, lint-free rags, and a soft brush.	
REPAIR		
1. Housing	Repair by replacing defective parts. Replace gasket by digging out defective gasket. Clean out gasket grooves with toluene. Secure new gasket with CHO-BOND 1029 (Mfd by Chromatics, Inc. , Woburn, Mass.).	Figure 3-28
2. Recorder (2)	Slide into housing (3).	
3. 4 front panel captive screws (1)	Tighten	



- 1. Screw (4)
- 2. Recorder
- 3. Housing

Figure 3-27. Recorder Housing (3A1), Remove/Replace



- | | | |
|-----------|------------|--------------|
| 1. Gasket | 7. Screw | 13. Spacer |
| 2. Cover | 8. Housing | 14. Screw |
| 3. Pin | 9. Latch | 15. Screw |
| 4. Latch | 10. Gasket | 16. Washer |
| 5. Washer | 11. Shim | 17. Retainer |
| 6. Washer | 12. Spacer | |

Figure 3-28. Recorder Housing (3A1), Assemble/Dissemble

3-26. Front Panel (3A3) Maintenance Instructions

This task covers:

- | | |
|------------|----------|
| a. Inspect | d. Align |
| b. Service | e. Test |
| c. Repair | |

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

Spanner Wrench
Alignment Bushing Tool

Material/Parts

Cleaning Compound,
NSN 6850-00-597-9765

Troubleshooting Reference

Paragraph 3-7

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraph 3-25

Condition Description

Housing removed.

Approximate Time Required (minutes)

Inspect	6
Service	12
Repair	30
Align	18
Test	<u>60</u>
	126

Item	Action	Remarks
------	--------	---------

INSPECT

- | | |
|---|--------|
| 1. Screw (2),
retainer (2),
and knob 3A3A1 (3) | Remove |
| 2. 4 screws (4), lock
washers (5), and
flat washers (6) | Remove |

TM 32-5835-001-24 & P

Item	Action	Remarks
3. Front panel 3A3 (7)	Move from chassis as far as possible. Check for damage to knobs and cracks in rubber switch covers. Make sure that clear plastic on meter face and counter can be seen through. Check for accumulation of dirt and grease.	Movement is limited by length of wiring harness.

SERVICE

Front panel
3A3 (7)

Clean using cleaning compound and soft brush.

REPAIR

1. Front panel
3A3

Repair by replacing defective parts. (Figure 3-30).

Spanner wrench is required for replacing meter.

2. Front panel
3A3 (7)

Position onto chassis.

3. 4 screws (4), lock washers (5), and flat washers (6)

Install, but do not tighten.

ALIGN

1. Front panel
3A3 (7)

Align front panel to mode selector using alignment bushing tool. Place alignment bushing tool through front panel and over mode selector shaft (8). Tighten four captive screws (4) to secure front panel to transport frame. Remove alignment bushing tool.

2. Knob 3A3A1 (3), retainer (2), and screw (1)

Install

3. Housing

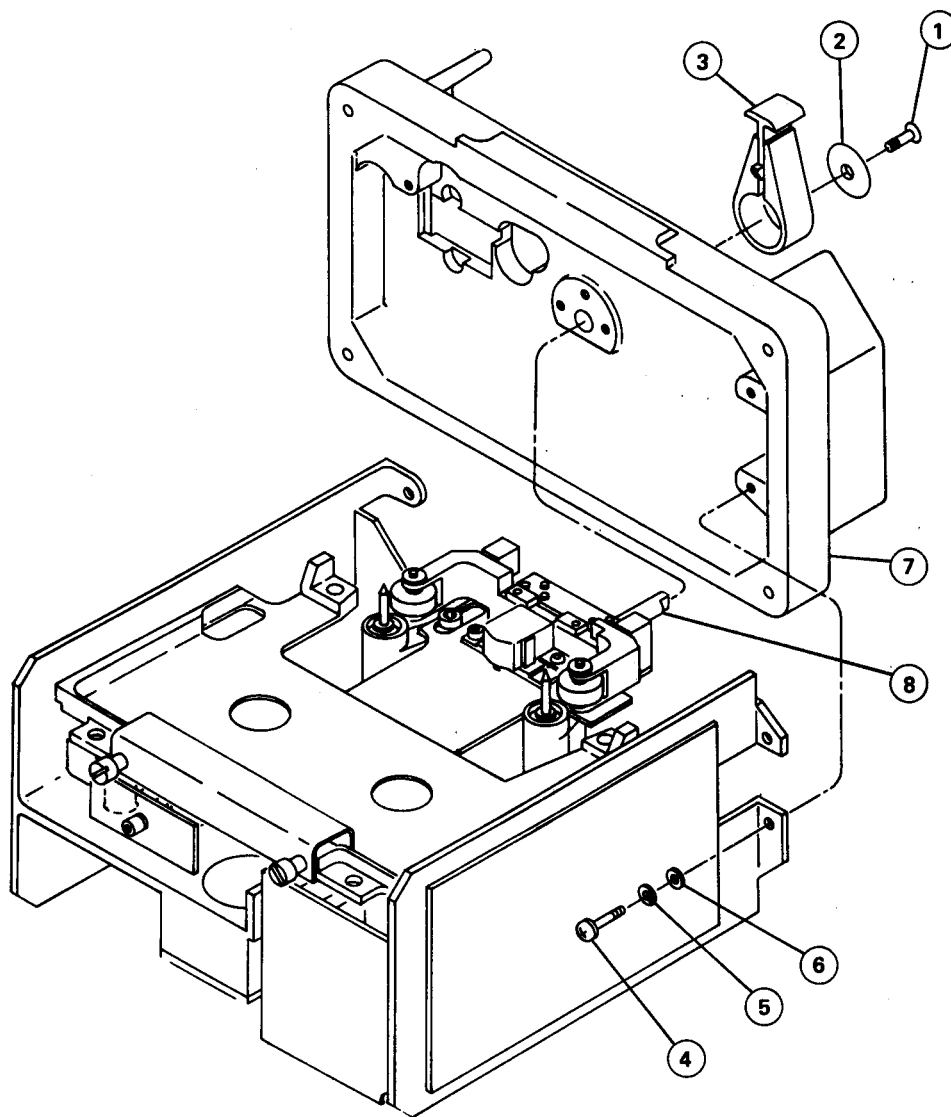
Install

Paragraph 3-25

TEST

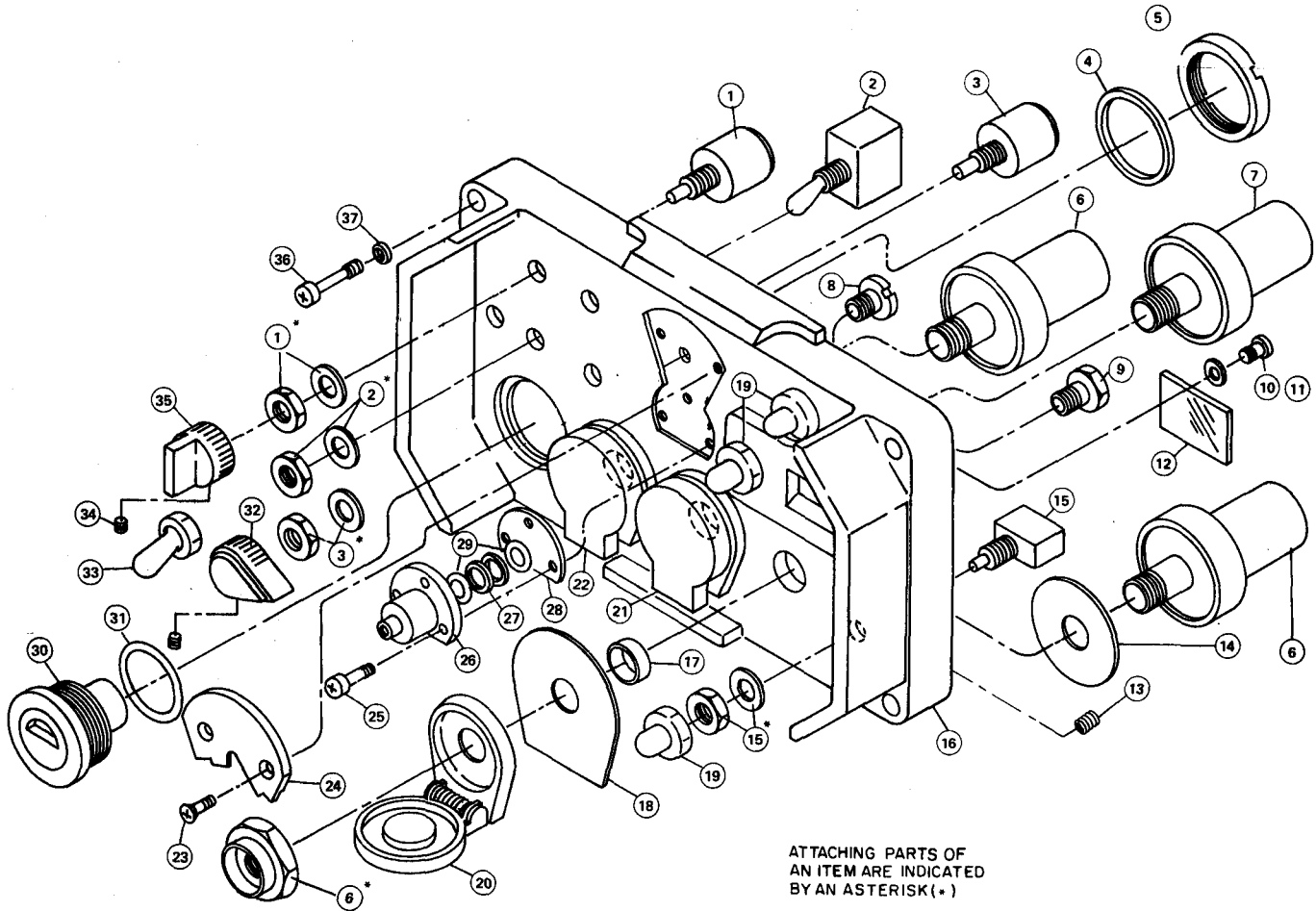
Front panel
3A3 (7)

Perform final test,
paragraph 3-49.



- | | |
|---------------|------------------------|
| 1. Screw | 5. Lock washer (4) |
| 2. Retainer | 6. Flat washer (4) |
| 3. Knob 3A3A1 | 7. Front panel (3A3) |
| 4. Screw (4) | 8. Mode selector shaft |

Figure 3-29. Front Panel (3A3), Remove/Replace



ATTACHING PARTS OF AN ITEM ARE INDICATED BY AN ASTERISK(*)

- | | | | |
|-------------|---------------|-------------|---------------|
| 1. Resistor | 11. Washer | 21. Cover | 31. Packing |
| 2. Switch | 12. Window | 22. Cover | 32. Knob |
| 3. Switch | 13. Insert | 23. Screw | 33. Boot |
| 4. Washer | 14. Insulator | 24. Plate | 34. Set screw |
| 5. Retainer | 15. Switch | 25. Screw | 35. Knob |
| 6. Jack | 16. Panel | 26. Seal | 36. Screw |
| 7. Jack | 17. Insulator | 27. Packing | 37. Washer |
| 8. Bushing | 18. Insulator | 28. Gasket | |
| 9. Bushing | 19. Boot | 29. Washer | |
| 10. Screw | 20. Cover | 30. Meter | |

Figure 3-30. Front Panel (3A3), Assemble/Disassemble

3-27. Knob (3A3A1) Maintenance Instructions

This task covers:

- a. Inspect
- b. Service
- c. Repair

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material/Parts

Cleaning Compound,
NSN 6850-00-597-9765

Troubleshooting Reference

None

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraph 3-26

Condition Description

Knob 3A3A1 removed from unit 3.

Approximate Time Required (minutes)

Inspect	6
Service	6
Repair	<u>30</u>
	42

Item

Action

Remarks

1. Knob 3A3A1

Check for accumulation
of dirt and grease.

2. Latch (1)

Make sure latch (1) moves
freely within knob (3)
and moves outward by
action of spring (2).

SERVICE

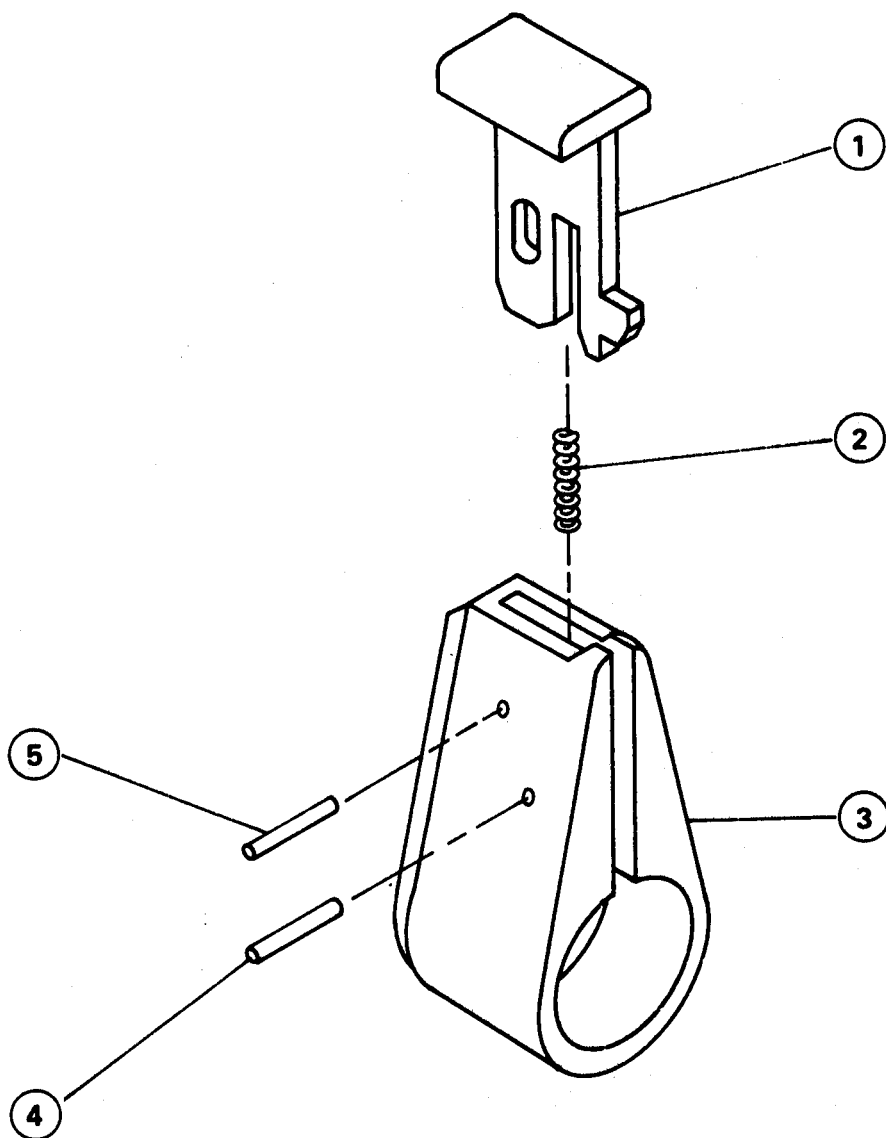
Knob 3A3A1

Clean using cleaning
compound and a soft
brush.

REPAIR

Knob 3A3A1

Repair by replacing
defective parts.



- 1. Latch
- 2. Spring
- 3. Knob
- 4. Pin
- 5. Pin

Figure 3-31. Knob (3A3A1), Assemble/Disassemble

3-28. Mag Transport (3A4) Maintenance Instructions

This task covers:

- | | |
|------------|-----------|
| a. Inspect | c. Repair |
| b. Service | d. Test |

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material/Parts

Cleaning Compound,
NSN 6850-00-597-9765

Troubleshooting Reference

Paragraph 3-7

Personnel Required

EW/Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraph 3-25

Condition Description

Housing removed.

Approximate Time Required (minutes)

Inspect	6
Service	12
Repair	60
Test	<u>60</u>
	138

Item

Action

Remarks

INSPECT

Mag transport 3A4

Check for accumulation of dust, dirt, or grease. Check for missing or physically damaged assemblies and components. Ensure that all hardware is present.

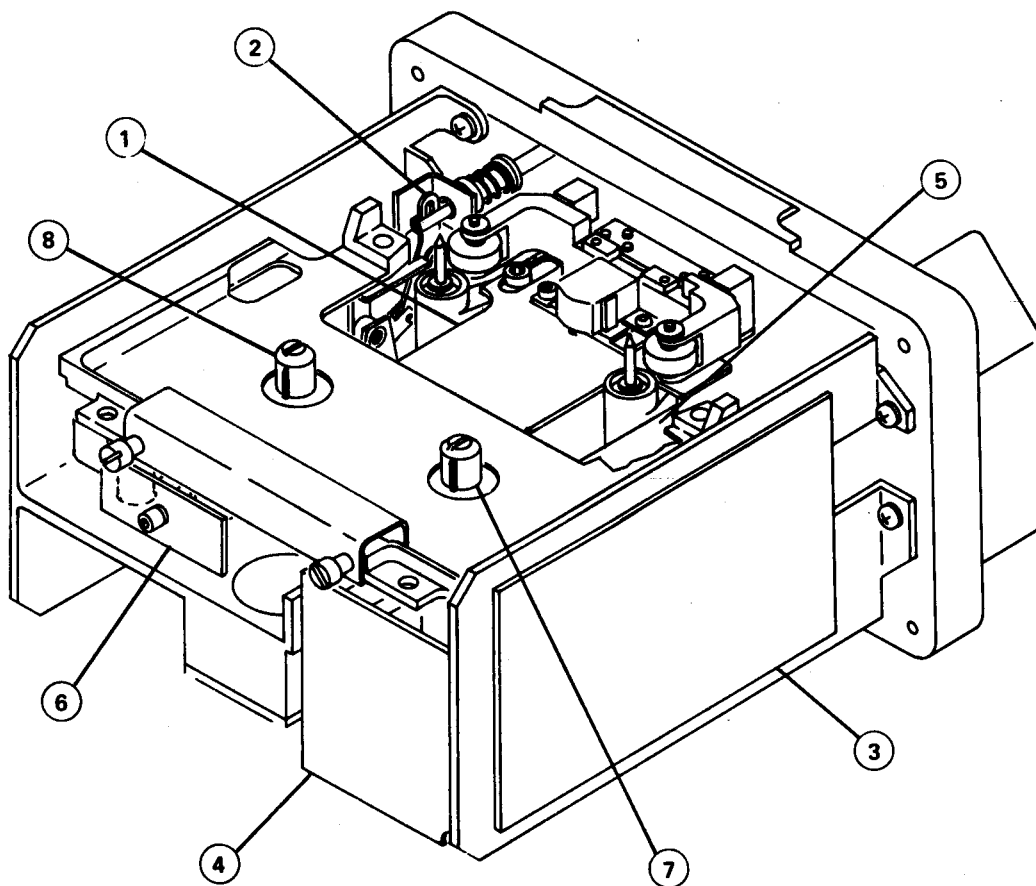
SERVICE

Mag transport A4

Remove dust and dirt using compressed air and a soft brush. Remove grease using cleaning compound, lint-free rags, and a soft brush.

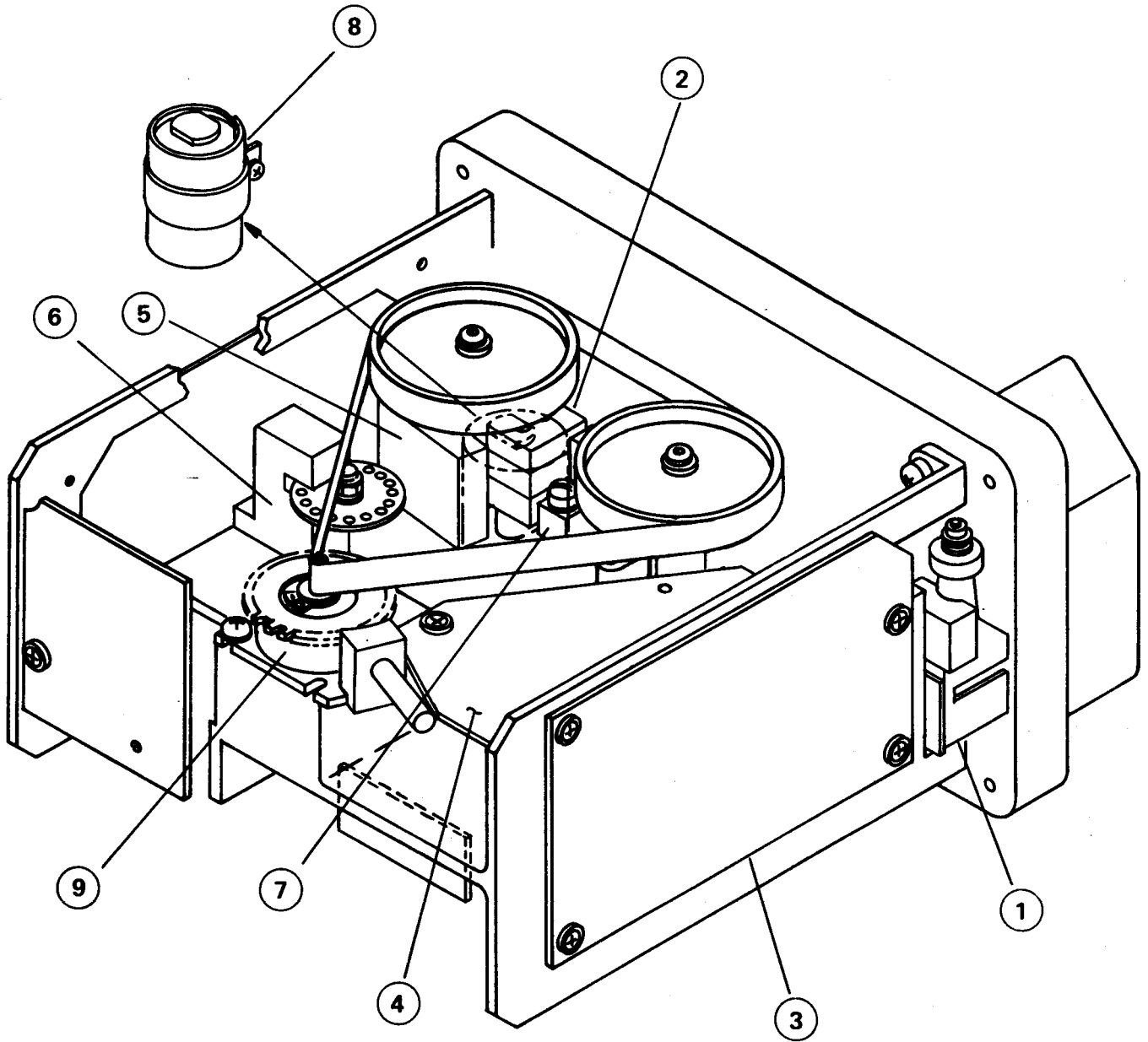
TM 32-5835-001-24 & P

Item	Action	Remarks
REPAIR		
Mag transport 3A4	Repair by replacing or repairing subassemblies and piece-parts as authorized.	
TEST		
Mag transport 3A4	Perform final test, paragraph 3-49.	



- 1. Slide plate (3A4A1)
- 2. Ejector (3A4A3)
- 3. Amplifier (3A4A5)
- 4. Circuit card (3A4A8)
- 5. Resistor (3A4A11)
- 6. C Filter (3A4A9)
- 7. Disk reel (3A4A14)
- 8. Disk reel (3A4A16)

Figure 3-32. Mag Transport (3A4), Top View



- | | |
|----------------------------|---------------------------|
| 1. Counter (3A4A2) | 6. Sensor (3A4A12) |
| 2. Mode selector (3A4A4) | 7. Actuator (3A4A13) |
| 3. Motor-bias card (3A4A6) | 8. Reel motor (3A4A17) |
| 4. Sensor (3A4A7) | 9. Capstan motor (3A4A18) |
| 5. R filter (3A4A10) | |

Figure 3-33. Mag Transport (3A4), Bottom View

TM 32-5835-001-24 & P

3-29. Slide Plate (3A4A1) Maintenance Instructions

This task covers:

- | | |
|------------|-----------|
| a. Inspect | d. Adjust |
| b. Service | e. Test |
| c. Repair | |

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material /Parts

Cleaning Compound,
NSN 6850-00-597-9765

Troubleshooting Reference

Paragraph 3-7

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Equipment Conditions

Paragraph 3-25, 3-26

Condition Description

Housing removed, and front panel
moved away.

Approximate Time Required (minutes)

Inspect	6
Service	6
Repair	60
Adjust	18
Test	<u>60</u>
	150

Item

Action

Remarks

INSPECT

- | | | |
|---|--------|--------|
| 1. Socket screw (1) | Remove | Retain |
| 2. Cassette stop (2) | Remove | Retain |
| 3. 3 screws (3), lock washers (4), and flat washers (5) securing cartridge plate (6) to recorder. | Remove | Retain |
| 4. Cartridge plate (6) | Remove | Retain |

Item	Action	Remarks
5. 4 shoulder screws (14) and washers (13)	Remove	For ease of access to shoulder screw nearest erase head, push mode selector in and push roller forward.
6. Terminal board (11)	Unplug from socket (10).	
7. 2 screws (7), 2 spacers (8), and 2 flat washers (9)	Remove	Retain
8. Harness	Move clear of slide plate.	
9. Slide plate 3A4A1 (12)	Remove from recorder. Check for accumulation of grease or dirt. Check for physical damage to components.	Clean using cleaning compound, lint-free rags, ad a soft small brush.

SERVICE

Slide plate 3A4A1 (12)

Clean using cleaning compound, lint-free rags, and a soft brush.

REPAIR

1. Slide plate 3A4A1 (12)

Repair by replacing defective parts. Refer to paras. 3-30, 3-31, 3-32, 3-33, and 3-34.

2. 4 washers (13)

Position over screw holes in recorder frame.

3. Slide plate 3A4A1 (12)

Position over washers (9) and screw holes in frame,

4. 4 shoulder screws (14)

Install

5. Harness

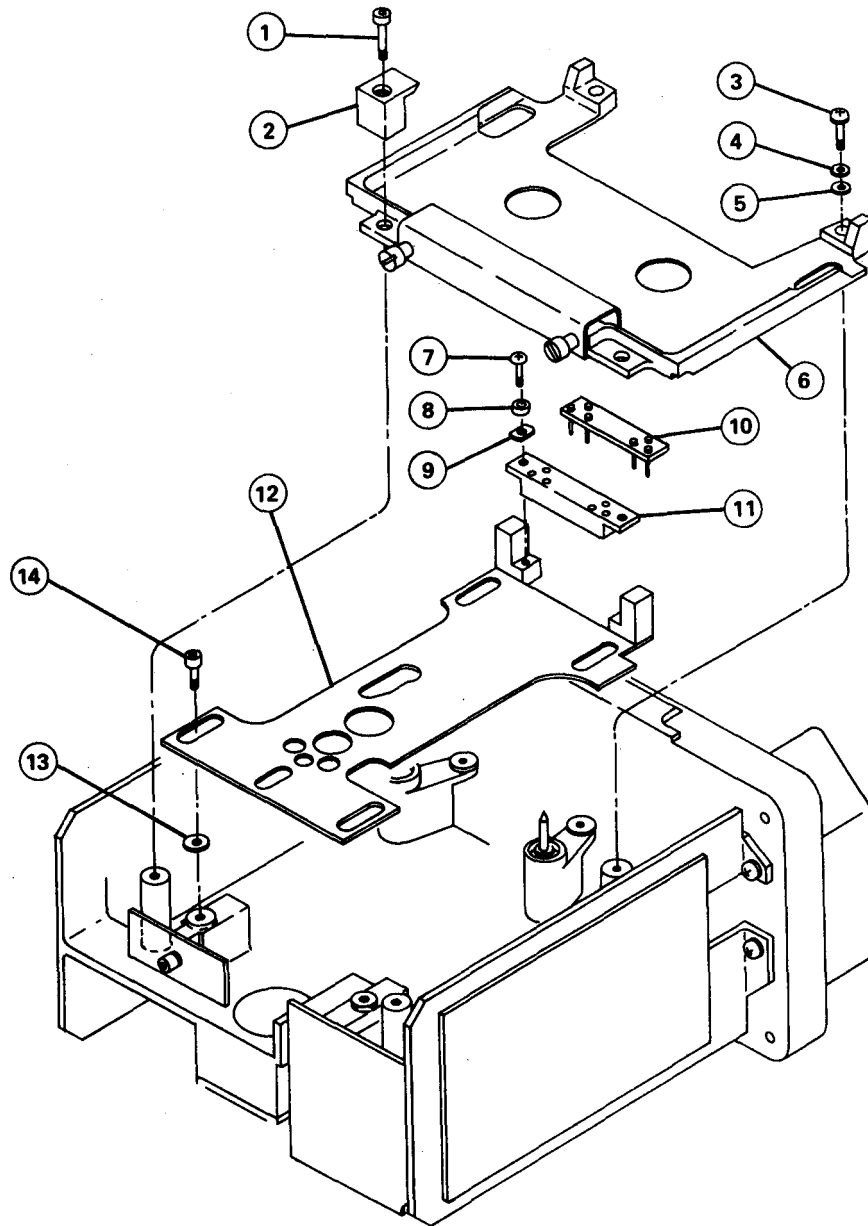
Move into mounting position.

6. 2 screws (7), 2 spacers (8), and 2 flat washers (9)

Install

TM 32-5835-001-24 & P

Item	Action	Remarks
7. Housing	Install	Paragraph 3-25
ADJUST		
Brake shoe	Mode selector switch in REPRO position. Loosen screw on supply brake (figure 3-35). Engage supply brake with supply reel and apply a 1-pound force. Tighten screw and apply thread locking compound (MIL-S-22743) to screw and tighten.	
TEST		
Slide plate 3A4A1 (12)	Perform final test, paragraph 3-49.	



- | | | |
|--------------------|--------------------|------------------------|
| 1. Socket screw | 6. Cartridge plate | 11. Harness |
| 2. Cassette stop | 7. Screw (2) | 12. Slide plate |
| 3. Screw (3) | 8. Standoff (2) | 13. Washer (4) |
| 4. Lock washer (3) | 9. Spacer (2) | 14. Shoulder screw (4) |
| 5. Flat washer (3) | 10. Terminal board | |

Figure 3-34. Slide Plate (3A4A1), Remove/Replace

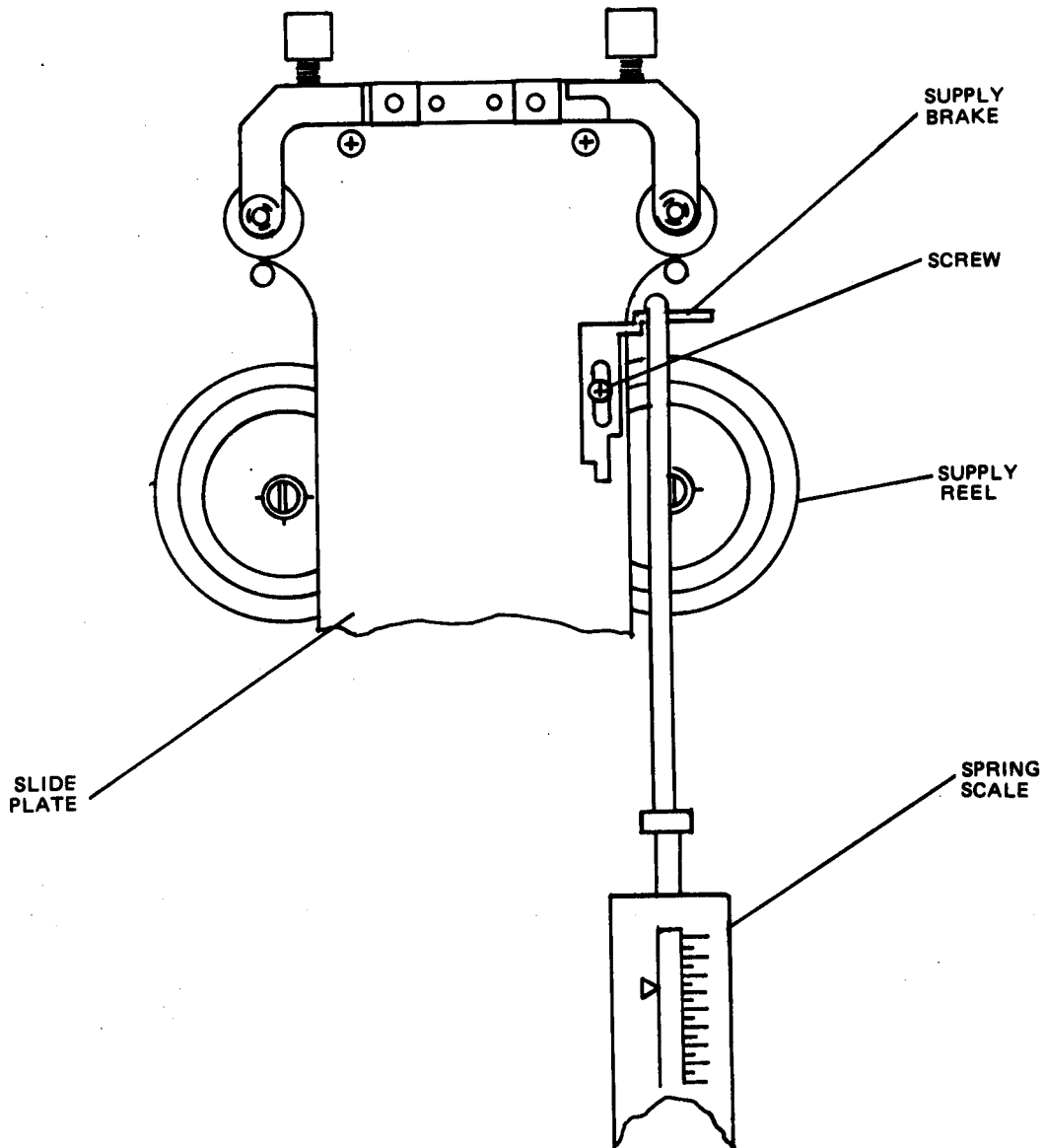


Figure 3-35. Supply Brake Adjustment

3-30. Audio Head Assembly (3A4A1A1) Maintenance Instructions

This task covers:

- | | |
|------------|-----------|
| a. Inspect | d. Adjust |
| b. Service | e. Test |
| c. Repair | |

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material/Parts

Cleaning Compound,
NSN 6850-00-597-9765
Xylene, FE D-SPEC-
TT-X-916B
Solder, SN-60

Troubleshooting Reference

Paragraph 3-9

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Equip ment Condition

Paragraph 3-25

Condition Description

Housing removed.

Approximate Time Required (minutes)

Inspect	6
Service	6
Repair	60
Adjust	12
Test	<u>60</u>
	144

Item

Action

Remarks

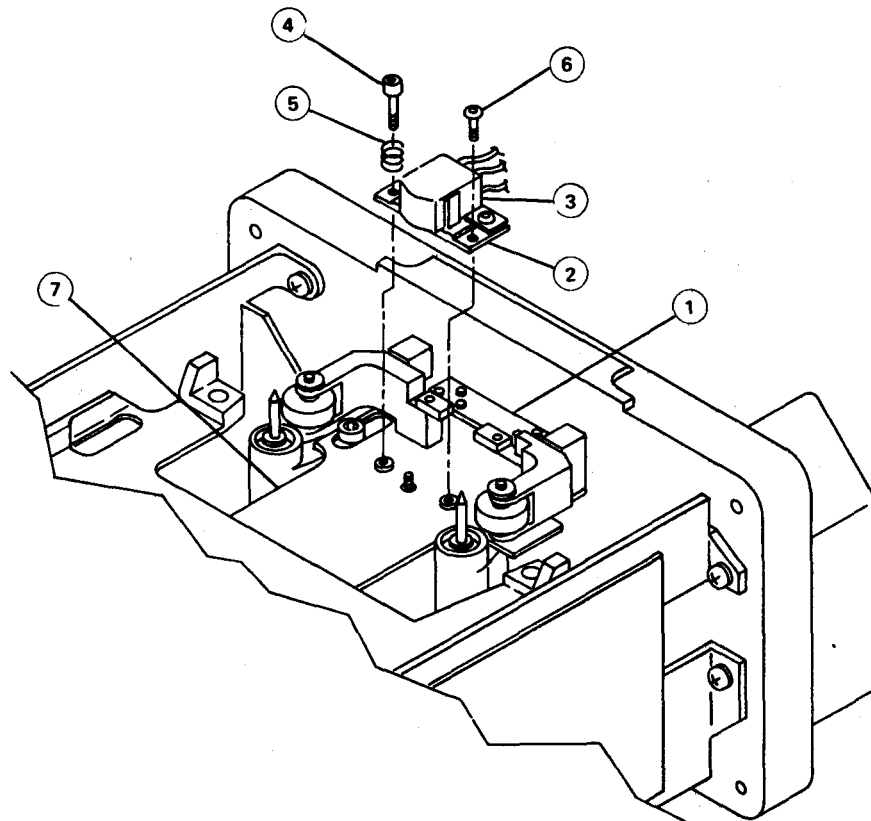
INSPECT

- | | |
|---------------------------|---|
| 1. Audio head 3A4A1A1 (2) | Check for physical damage and accumulation of dirt and grease. |
| 2. Audio head (3) | Check for accumulation of tape oxide on tape-contact surface. Check for cracks and scratches on tape-contact surface. |

TM 32-5835-001-24 & P

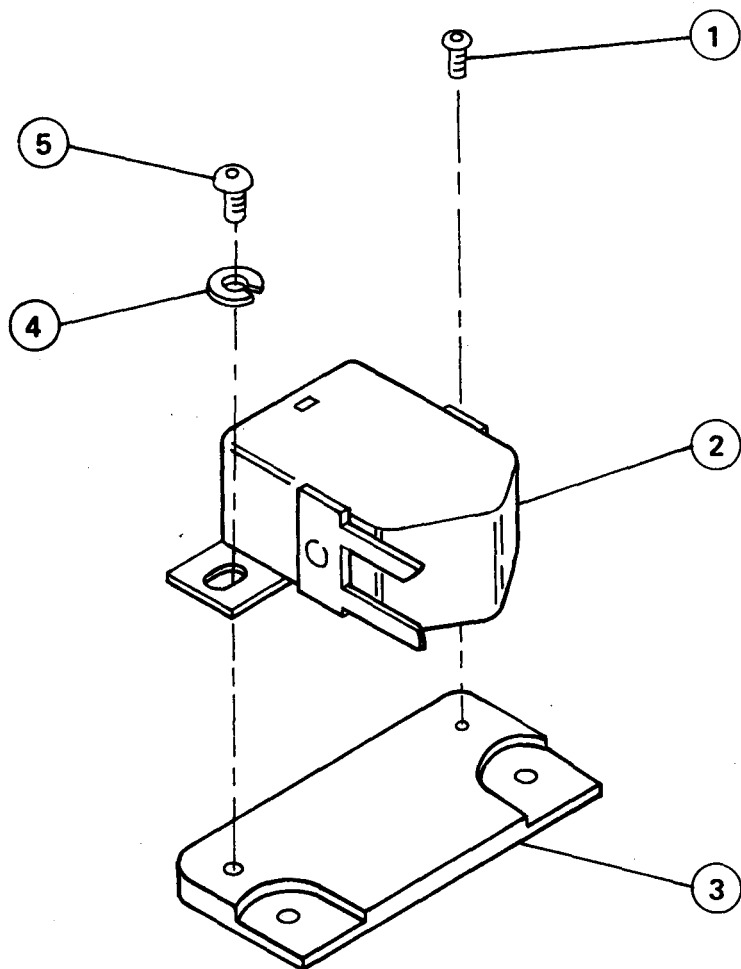
Item	Action	Remarks
SERVICE		
1. Audio head 3A4AlA1 (2)	Clean using cleaning compound, lint-free rags, and a soft brush.	
2. Audio head (3)	Clean tape-contact surface using xylene and cotton swabs.	
REPAIR		
1. Audio head 3A4AlA1 (2)	Repair by replacing defective parts.	
2. Audio head 3A4AlA1 (2) wires	Tag and unsolder from terminal board (11).	
3. Socket screw (4) and spring (5)	Remove	
4. Socket screw (6)	Remove	
5. Audio head 3A4AlA1 (2)	Remove	
6. New audio head 3A4AlA1 (2)	Position onto slide plate 3A4A1 (7)	
7. Socket screw (4) and spring (5)	Install	
8. Socket screw (6)	Install	
9. Audio head 3A4AlA1 (2) wires	Solder to proper terminals on terminal board (1).	Use tags to identify wires.
10. Housing	Install	Paragraph 3-25
ADJUST		
	Connect equipment as in figure 3-7, connection A.	
1. Recorder	Install 3 kHz Test Tape. Channel selector: 1 GAIN 1 and 2: FULL CW AGC /MAN 1 and 2: MAN Mode selector: REPRO Adjust screws (4) and (6).	Figure 3-36

Item	Action	Remarks
2. Voltmeter	Observe output level of channel 1 for peak output level. It may be necessary to adjust these screws several times for best peak level. Note peak level.	
3. Recorder	Channel selector: 2	
4. Voltmeter	Peak level should be same as channel 1.	
TEST		
Audio head 3A4AlA1 (2)	Perform final test, paragraph 3-49.	



- | | |
|------------------------|----------------|
| 1. Terminal board | 5. Spring |
| 2. Audio head assembly | 6. Screw |
| 3. Audio head | 7. Slide plate |
| 4. Screw | |

Figure 3-36. Audio Head (3A4AlA1), Remove/Replace



- 1. Screw
- 2. Audio head
- 3. Plate
- 4. Washer (3)
- 5. Screw

Figure 3-37. Audio Head (3A4A1A1), Assemble/Disassemble

3-31. Rollers (3A4A1A2 and 3A4A1A3) Maintenance Instructions

This task covers:

- a. Inspect
 - b. Service
 - c. Replace
 - d. Adjust
-

INITIAL SETUP

Applicable Configurations

All

Test Equipment

Pressure Gage

Special Tools

None

Material /Parts

Cleaning Compound,
NSN 6850-00-597-9765

Troubleshooting Reference

Paragraph 3-7

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraphs 3-25 and 3-29

Condition Description

Housing, cartridge plate, and slide plate,
removed.

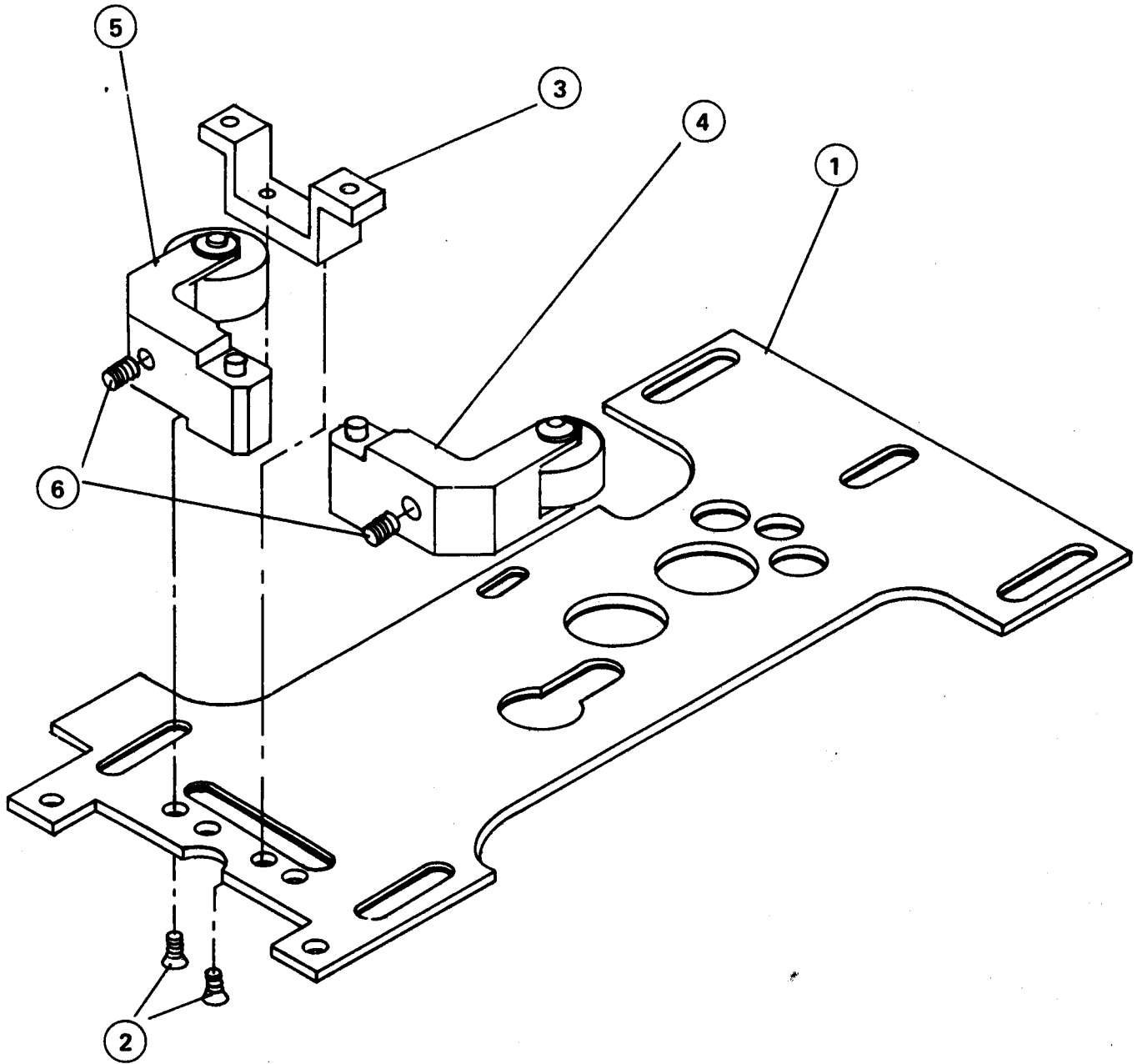
Approximate Time Required (minutes)

Inspect	6
Service	12
Replace	6
Adjust	<u>20</u>
	44

Item	Action	Remarks
Roller 3A4A1A2 (4) and roller 3A4A1A3 (5)	Check for accumulation of dirt and grease. Make sure roller wheel is free of cuts, nicks, dents, and also can spin freely.	
Roller 3A4A1A2 (4) and roller 3A4A1A3 (5)	Clean using cleaning com- pound, lint-free rags, and a soft brush.	

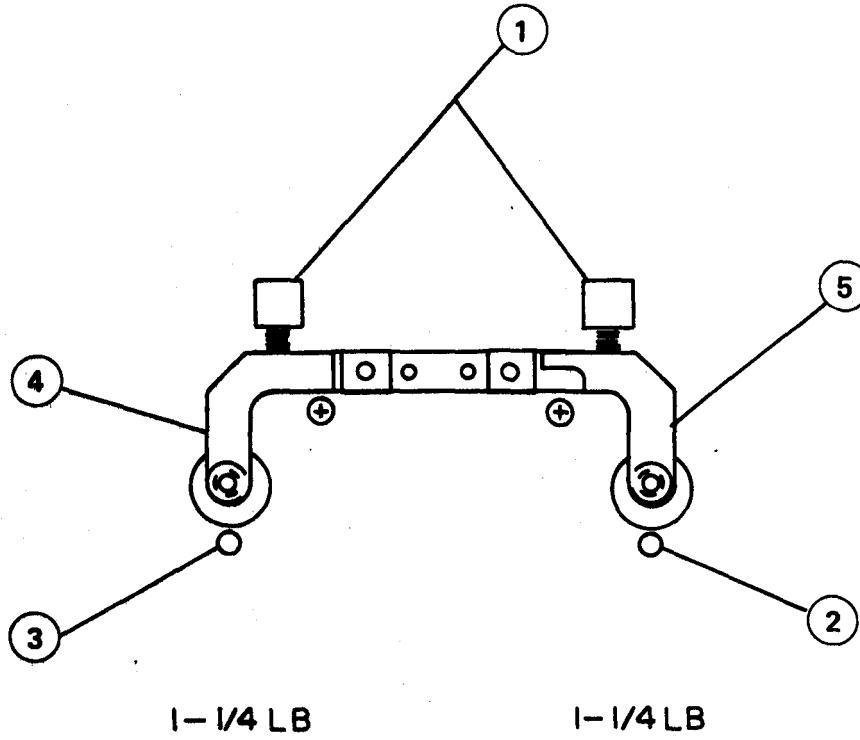
TM 32-5835-001-24 & P

Item	Action	Remarks
REPLACE		
1. 2 screws (2)	Remove	Retain
2. Roller shaft support (3)	Remove	
3. Roller 3A4A1A2 (4) and roller 3A4A1A3 (5)	Remove	
4. 2 springs (6)	Remove	Retain
5. Roller 3A4A1A2 (4) and roller 3A4A1A3 (5)	Place onto slide plate (1).	
6. 2 springs (6)	Install	
7. Roller shaft support (3)	Install	
8. 2 screws (2)	Install	
9. Slide plate	Install	Paragraph 3-29
10. Housing	Install	Paragraph 3-25
Push scale	Push on roller wheel with push scale and check force required to move roller wheel away from cap- stan against spring tension. Force must be 1.25 pounds. Turn adjustment screw (item 1, figure 3-39) un- til correct force is obtained.	Both rollers must be adjusted.



- 1. Slide plate (3A4A1)
- 2. Screw (2)
- 3. Roller shaft support
- 4. Roller (3A4A1A2)
- 5. Roller (3A4A1A3)
- 6. Spring (2)

Figure 3-38. Rollers (3A4A1A2 and 3A4A1A3), Remove/Replace



- 1. Adjustment screw
- 2. Capstan
- 3. Capstan
- 4. Roller (3A4A1A2)
- 5. Roller (3A4A1A3)

Figure 3-39. Rollers (3A4A1A2 and 3A4A1A3), Adjustment

3-32. Drive Wheel (3A4A1A4) Maintenance Instructions

This task covers:

- a. Inspect
- b. Service
- c. Replace
- d. Repair

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material/Parts

Cleaning Compound,
NSN 6850-00-597-9765

Troubleshooting Reference

Paragraph 3-7

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraphs 3-25 and 3-29

Condition Description

Housing and slide plate removed.

Approximate Time Required (minutes)

Inspect	6
Service	6
Replace	48
Repair	<u>24</u>
	84

Item

Action

Remarks

INSPECT

Drive Wheel 3A4A1A4 (3)

Check for accumulation of dirt and grease. Check for cuts, cracks, or out-of-round condition of drive wheel.

SERVICE

Drive wheel 3A4A1A4 (3)

Clean using cleaning compound, lint-free rags, and soft brush.

REPAIR

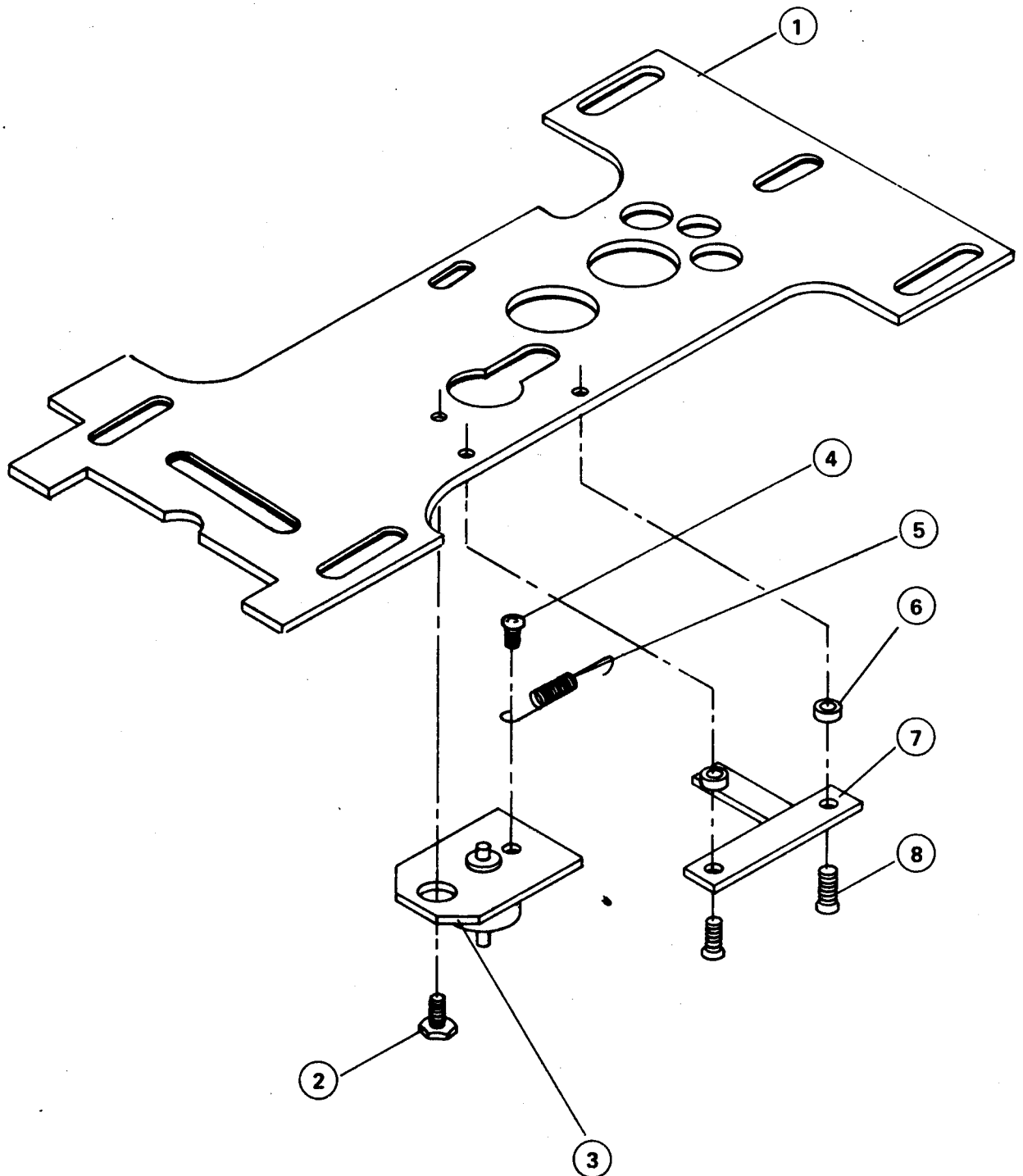
Drive wheel 3A4A1A4 (3)

Repair by replacing defective parts.

Figure 3-41

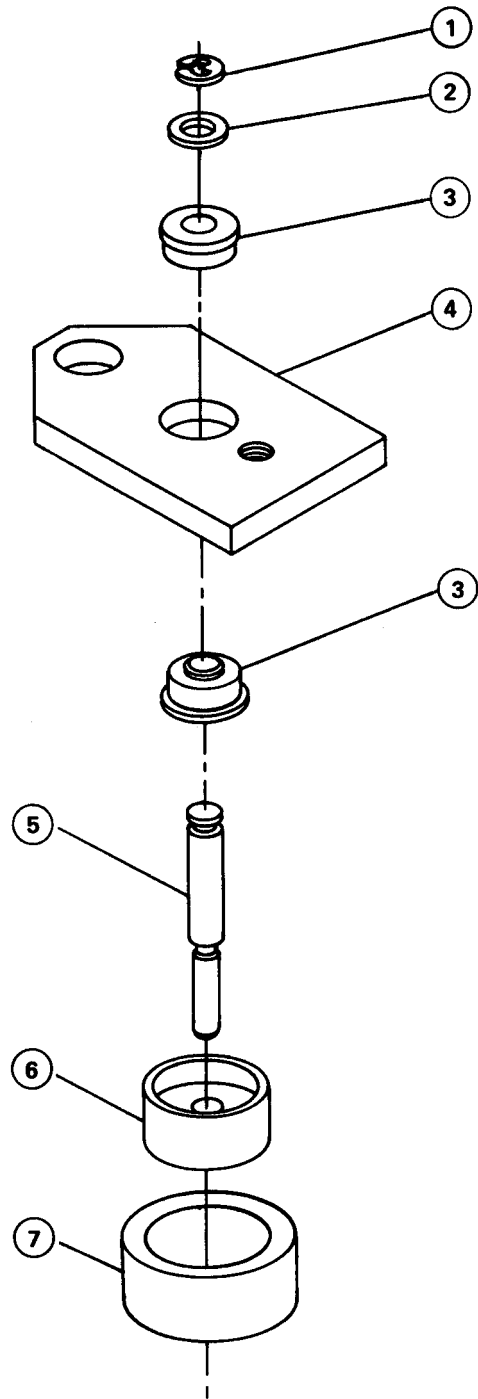
TM 32-5835-001-24 & P

Item	Action	Remarks
REPLACE		
1. Screw (2)	Remove	
2. Spring (5)	Unhook from slide plate (1).	Note hooking location on slide plate (1).
3. Screw (4) and spring (5)	Remove	
4. Drive wheel 3A4AlA4 (3)	Position to be installed.	
5. Spring (5)	Attach to drive wheel (3) with screw (4).	
6. Drive wheel 3A4AlA4 (3)	Position onto slide plate 3A4A1 (1).	
7* Screw (2)	Install	
8. Spring (5)	Hook loose end to slide plate (1).	
9. Slide plate 3A4A1 (1)	Install	Paragraph 3-29
10. Housing	Install	Paragraph 3-25



- | | |
|------------------------|---------------|
| 1. Slide plate (3A4A1) | 5. Spring |
| 2. Screw | 6. Spacer (2) |
| 3. Drive wheel assy | 7. Plate |
| 4. Screw | 8. Screw (2) |

Figure 3-40. Drive Wheel (3A4A1A4), Remove/Replace



- | | |
|----------------|----------|
| 1. Ring | 5. Shaft |
| 2. Shim | 6. Hub |
| 3. Bearing (2) | 7. Wheel |
| 4. Plate | |

Figure 3-41. Drive Wheel (3A4A1A4), Assemble/Disassemble

3-33. Idler Wheel (3A4A1A4A1) Maintenance Instructions

This task covers:

- a. Inspect
- b. Service
- c. Replace

INITIAL SETUP

<p><u>Applicable Configurations</u></p> <p>All</p> <p><u>Test Equipment</u></p> <p>None</p> <p><u>Special Tools</u></p> <p>None</p> <p><u>Material/Parts</u></p> <p>Cleaning Compound, NSN 6850-00-597-9765</p> <p><u>Troubleshooting Reference</u></p> <p>None</p>	<p><u>Personnel Required</u></p> <p>EW /Intercept Equipment Repairman MOS 33S20</p> <p><u>Equipment Condition</u></p> <p>Paragraphs 3-25, 3-29</p> <p><u>Condition Description</u></p> <p>Housing, cartridge plate, and slide plate removed,</p> <p><u>Approximate Time Required (minutes)</u></p> <table border="0"> <tr> <td>Inspect</td> <td style="text-align: right;">6</td> </tr> <tr> <td>Service</td> <td style="text-align: right;">6</td> </tr> <tr> <td>Replace</td> <td style="text-align: right;"><u>24</u></td> </tr> <tr> <td></td> <td style="text-align: right;">36</td> </tr> </table>	Inspect	6	Service	6	Replace	<u>24</u>		36
Inspect	6								
Service	6								
Replace	<u>24</u>								
	36								

Item	Action	Remarks
------	--------	---------

INSPECT

Idler wheel 3A4A14A1 (17)	Check for accumulations of dirt and grease, and excessive wear.	
---------------------------	---	--

SERVICE

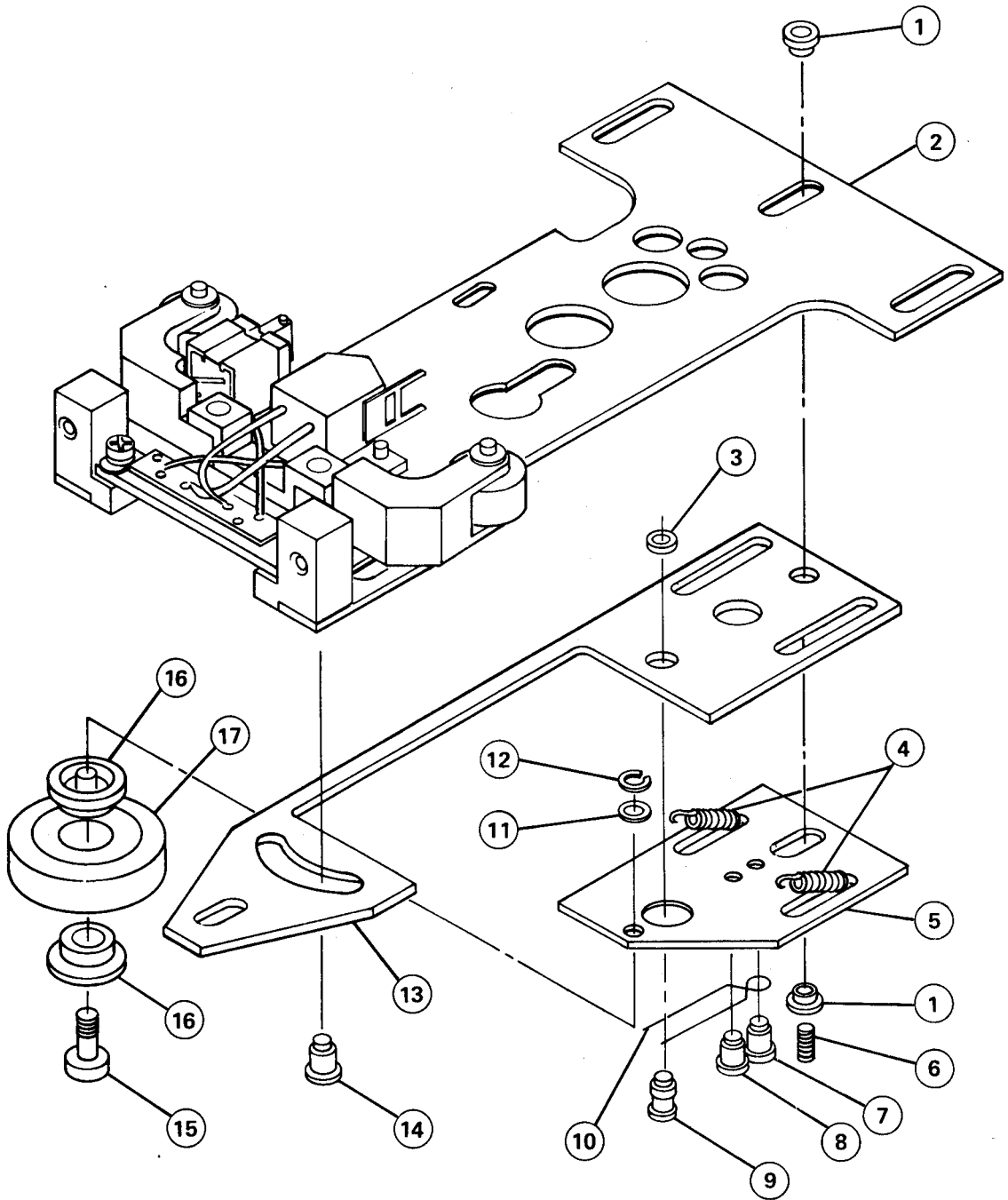
Idler wheel 3A4A14A1 (17)	Clean using cleaning compound, lint-free rags, and a soft brush.	
----------------------------	--	--

REPLACE

- | | | |
|-----------------------------------|--------|--|
| 1. Screw (14) | Remove | |
| 2. Set screw (6) and 2 pivots (1) | Remove | |

TM 32-5835-001-24 & P

Item	Action	Remarks
3. 2 springs (4)	Remove	
4. Nut (3), screw (9), and plate (5)	Remove	
5. Guide retainer (7) , spring (10), and set screw (8)	Remove	
6. Nut (12), 2 washers (11), screw (15), 2 bearings (16), wheel (17).	Remove from plate (5).	
7. Plate (5)	Position on slide plate 3A4A1A5 (2).	
8. Nut (12) , 2 washers (11), screw (15), 2 bearings (16), wheel (17)	Install	
9. Guide retainer (7), spring (10), and set screw (8)	Install	
10. Nut (3), screw (9), and plate (5)	Install	
11. 2 springs (4)	Install	
12. Set screw (6) and 2 pivots (1)	Install	
13. Slide plate 3A4A1A5 (32)	Install	Paragraph 3-29
14. Housing	Install	Paragraph 3-25



- | | | |
|------------------|-------------------|-----------------|
| 1. Pivot | 7. Guide retainer | 13. Plate |
| 2. Plate 3A4A1A5 | 8. Set screw | 14. Guide |
| 3. Nut | 9. Screw | 15. Retainer |
| 4. Spring (2) | 10. Spring | 16. Bearing (2) |
| 5. Plate | 11. Shim (2) | 17. Idler wheel |
| 6. Set screw | 12. Ring | |

Figure 3-42. Idler Wheel (3A4A14A1), Remove /Replace

TM 32-5835-001-24 & P

3-34. Erase Head (3A4A1PU2) Maintenance Instructions

This task covers:

- a. Inspect
- b. Service
- c. Replace
- d. Test

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material /Parts

Xylene, FED-SPEC-TT-X-916B
Solder, SN-60

Troubleshooting Reference

Paragraph 3-11

Personnel Required

EW/Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraphs 3-25 and 3-29

Condition Description

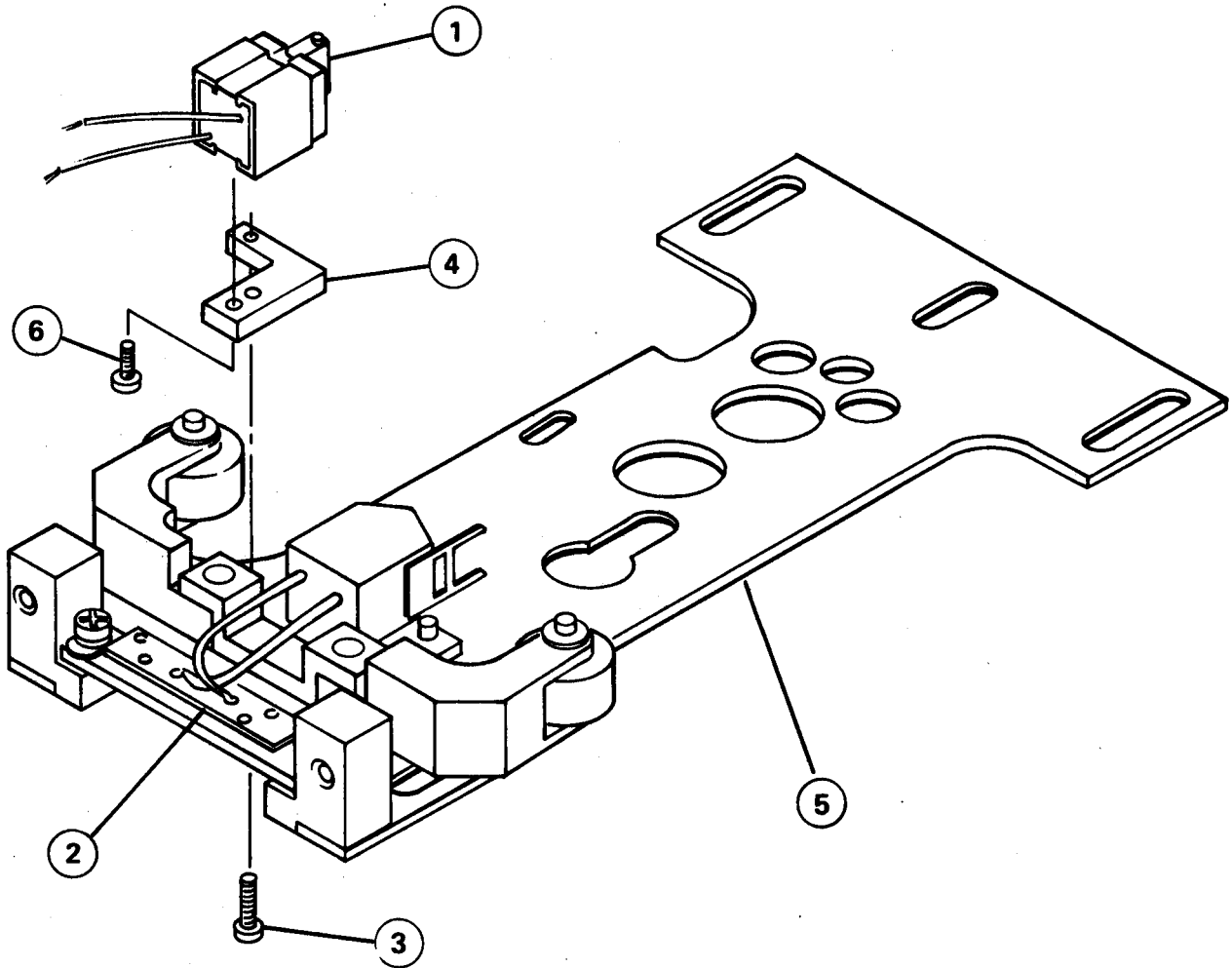
Housing, cartridge plate, and slide plate removed.

Approximate Time Required (minutes)

Inspect	6
Service	6
Replace	12
Test	<u>60</u>
	84

Item	Action	Remarks
Erase head 3A4A1PU2 (1)	Check tape contact surface for scratches, cracks, or buildup of tape oxide.	
Erase head 3A4A1PU2 (1)	Clean tape contact surface using xylene and cotton swabs.	

Item	Action	Remarks
REPLACE		
1. Erase head 3A4A1PU2 (1) wires	Tag and unsolder from terminal board (2).	Figure 3-43
2. Screw (3) and erase head 3A4A1PU2 (1) with bracket (4)	Remove	
3. Screw (6)	Remove	
4. Erase head 3A4A1PU1 (1) and bracket (4)	Separate	
5. Bracket (4)	Attach to erase head (1) using screw (6).	
6. Erase head 3A4A1PU2 (1) with bracket (4)	Attach to slide plate (5) using screw (3).	
7. Erase head 3A4A1PU2 (1) wires	Solder to appropriate terminal board terminals.	
8. Slide plate (5)	Install	Paragraph 3-29
9. Housing	Install	Paragraph 3-25
TEST		
Erase head 3A4A1PU2 (1)	Perform final test, paragraph 3-49.	



1. Erase head
2. Terminal board
3. Screw
4. Bracket
5. Slide plate
6. Screw

Figure 3-43. Erase Head (3A4A1PU2), Remove/Replace

3-35. Counter (3A4A2) Maintenance Instructions

This task covers:

- | | |
|------------|-----------|
| a. Inspect | d. Repair |
| b. Service | e. Test |
| c. Adjust | |

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material/Parts

None

Troubleshooting Reference

Paragraph 3-7

Personnel Required

E W /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraphs 3-25, 3-26, and 3-36

Condition Description

Housing removed and front panel partially removed.

Ejector removed.

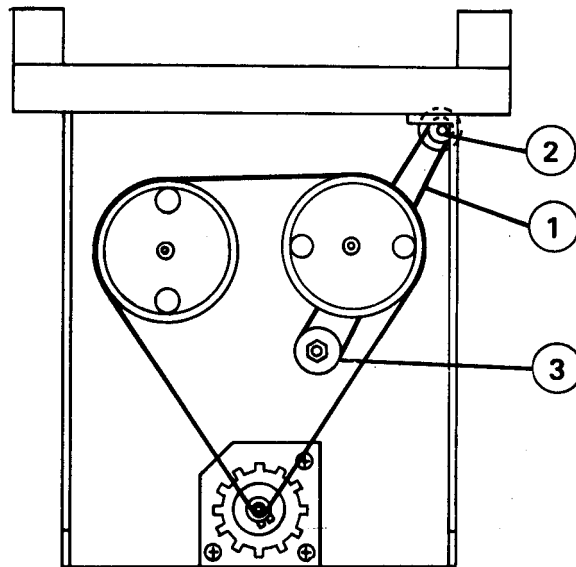
Approximate Time Required (minutes)

Inspect	6
Service	6
Repair	60
Adjust	6
Test	<u>18</u>
	96

Item	Action	Remarks
INSPECT		
Counter 3A4A2 (4)	Check for accumulation of dust and dirt. Turn pulley and verify smooth counter operation.	
SERVICE		
Counter 3A4A2 (4)	Clean using a soft brush or compressed air.	

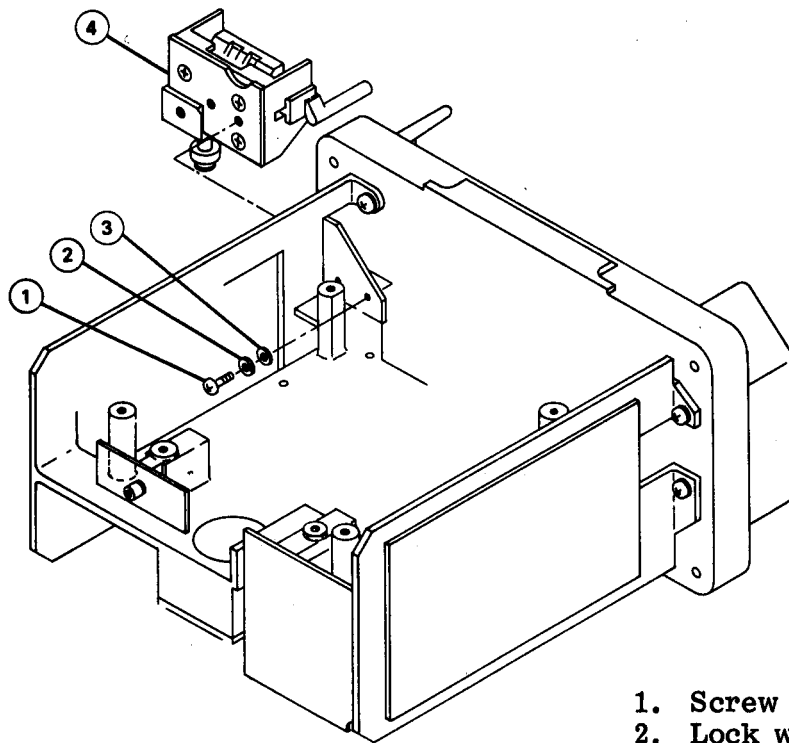
TM 32-5835-001-24 & P

Item	Action	Remarks
1. Counter drive belt (1)	Remove from counter 3A4A2 (2) and reel pulley (3).	Figure 3-44
2. 2 screws (1), lock washers (2) , and flat washers (3)	Remove	Figure 3-45
3. Counter 3A4A2 (4)	Remove	
4. Counter (3)	Repair by replacing defective parts.	Figure 3-46
5. Counter 3A4A2 (4)	Position in recorder.	Figure 3-45.
6. 2 screws (1) , lock washers (2), and flat washers (3)	Install	
7. Counter drive belt (1)	Install by sliding counter drive belt (1) over counter 3A4A2 (2) and reel pulley (3).	Figure 3-44
8. Ejector	Install	Paragraph 3-36
9. Front panel	Install	Paragraph 3-26
10. Housing	Install	Paragraph 3-25
ADJUST		
Counter 3A4A2 (2)	Remove boot from front panel.	Figure 3-30
	Adjust screw (6) until counter resets to 000 with boot in place.	Figure 3-46
TEST		
Counter 3A4A2 (2)	Install blank cassette. Mode selector to REPRO. Allow recorder to run to 100. Mode selector to OFF. Press RESET button. Counter returns to 000.	



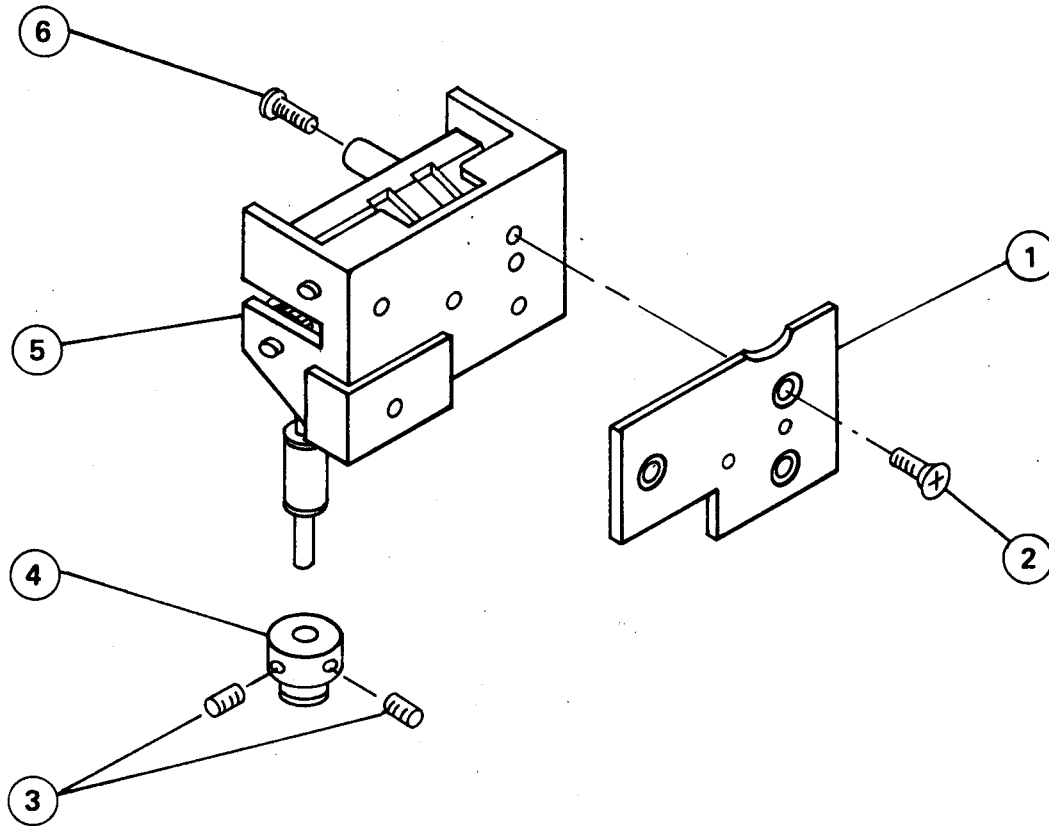
- 1. Counter drive belt
- 2. Counter (3A4A2)
- 3. Reel pulley

Figure 3-44. Counter Drive Belt, Remove/Replace



- 1. Screw (2)
- 2. Lock washer (2)
- 3. Flat washer (2)
- 4. Counter (3A4A2)(removed)

Figure 3-45. Counter (3A4A2), Remove/Replace



- 1. Plate
- 2. Screw (2)
- 3. Set screw (2)
- 4. Pulley
- 5. Counter
- 6. Screw

Figure 3-46. Counter (3A4A2), Assemble/Disassemble

3-36. Ejector (3A4A3) Maintenance Instructions

This task covers:

- a. Inspect
- b. Repair
- c. Adjust
- d. Test

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material/Parts

None

Material /Parts

Cleaning Compound,
NSN 6850-00-597-9765

Troubleshooting Reference

Paragraph 3-7

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraph 3-25 and 3-29 (cartridge
plate only)

Condition Description

Housing and cartridge plate removed.

Approximate Time Required (minutes)

Inspect	6
Repair	30
Adjust	6
Test	<u>6</u>
	48

Item

Action

Remarks

INSPECT

Ejector 3A4A3 (9)

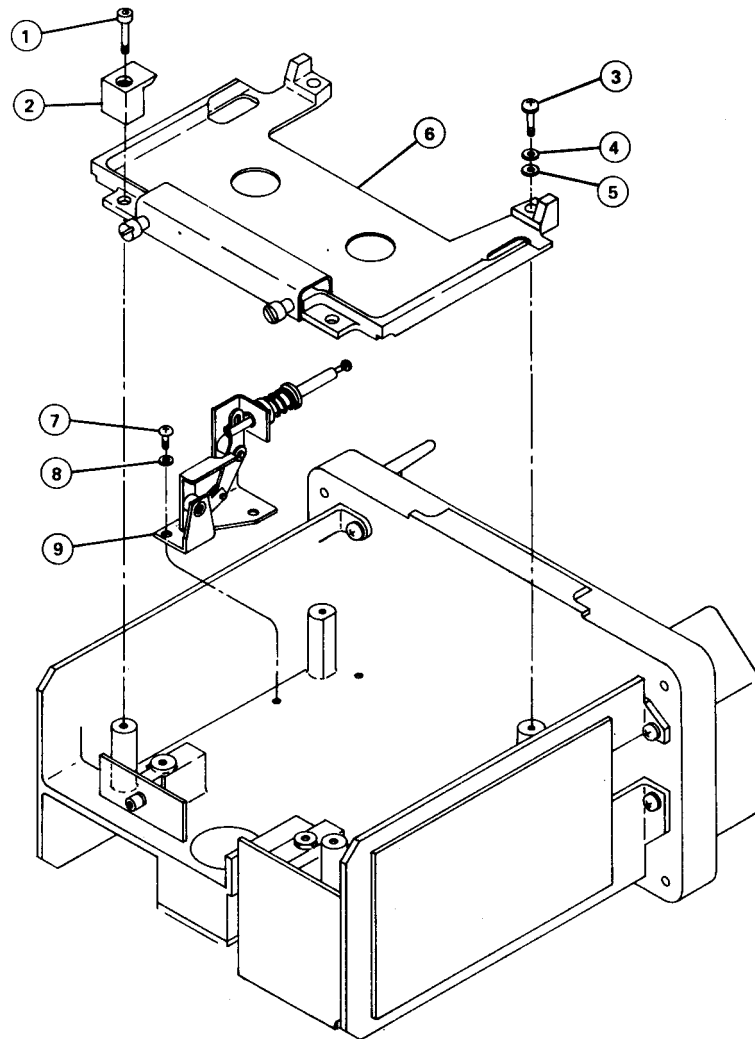
Check for accumulation of dirt and grease. Check for damaged or missing parts.

Ejector 3A4A3 (9)

Clean using cleaning compound and a soft brush.

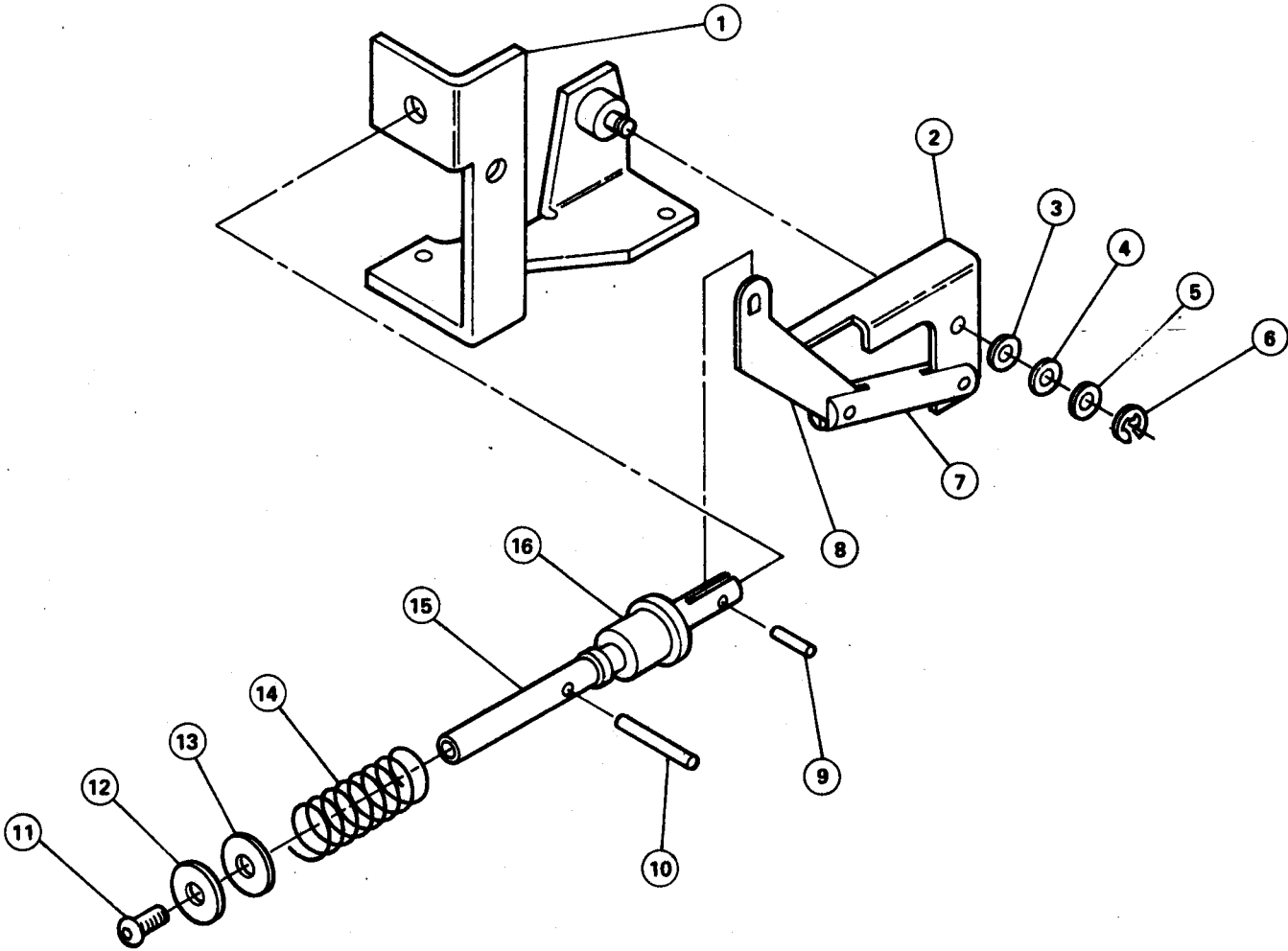
Item	Action	Remarks
REPAIR		
1. Screw (1)	Remove	Figure 3-47
2. Cassette stop (2)	Remove	
3. 3 screws (3), lock washers (4), and flat washers (5)	Remove	
4. Cartridge mounting plate (6)	Remove	
5. 2 screws (7) and lock washers (8)	Remove	
6. Ejector 3A4A3 (9)	Remove	
7. Ejector	Repair by replacing defective parts.	Figure 3-48
8. Ejector 3A4A3 (9)	Position in recorder.	Figure 3-47
9. 2 screws (7) and lock-washers (8)	Install	
10. Cartridge mounting plate (6)	Position in recorder.	
11. 3 screws (3), lock washers (4), and flat washers (5)	Install	
12. Cassette stop (2)	Position on cartridge mounting plate.	
13. Screw (1)	Install	
14. Housing	Install	Paragraph 3-25
ADJUST		
Ejector screw	Remove rubber boot from ejector (front panel).	Figure 3-30
	Adjust screw (11) counter-clockwise to increase lift of cassette.	Figure 3-48

Item	Action	Remarks
1. Tape cassette	Insert into recorder.	
2. Front panel EJECT button	Press	Verify that cassette is raised high enough to be removed without difficulty.



- | | |
|--------------------|-----------------------------|
| 1. Screw | 6. Cartridge mounting plate |
| 2. Cassette stop | 7. Screw (2) |
| 3. Screw (3) | 8. Lock washer (2) |
| 4. Lock washer (3) | 9. Ejector |
| 5. Flat washer (3) | |

Figure 3-47. Ejector (3A4A3), Remove/Replace



- | | |
|-------------|-------------|
| 1. Bracket | 9. Pin |
| 2. Linkage | 10. Pin |
| 3. Shim | 11. Screw |
| 4. Washer | 12. Washer |
| 5. Shim | 13. Washer |
| 6. Retainer | 14. Spring |
| 7. Linkage | 15. Linkage |
| 8. Linkage | 16. Bushing |

Figure 3-48. Ejector (3A4A3), Assemble/Disassemble

3-37. Mode Selector (3A4A4) Maintenance Instructions

This task covers:

- | | |
|------------|-----------|
| a. Inspect | d. Adjust |
| b. Service | e. Test |
| c. Repair | |

INITIAL SETUP

Applicable Configurations

All

Test Equipment

Multimeter

Special Tools

0.020 in. shims (2 reg)

Material/Parts

Cleaning Compound,
NSN 6850-00-597-9765
Solder, SN-60

Troubleshooting Reference

Paragraph 3-9

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraphs 3-25, 3-26, and 3-29

Condition Description

Housing, cartridge plate, and slide plate
removed and front panel partially removed.

Approximate Time Required (minutes)

Inspect	6
Service	6
Repair	60
Adjust	30
Test	<u>60</u>
	162

Item

Action

Remarks

INSPECT

- | | |
|------------------------|---|
| 1. Mode selector 3A4A4 | Check for accumulation
of grease and dirt. |
| 2. 8 switches (4) | Check for operability
using multimeter. |

SERVICE

- | | |
|---------------------|--|
| Mode selector 3A4A4 | Clean using cleaning
compound and a soft brush. |
|---------------------|--|

TM 32-5835-001-24 & P

Item	Action	Remarks
1. Belt (1)	Loosen three screws (14). Slide capstan motor (15) forward. Remove belt (1).	Figure 3-50
2. Cap screw (2), lock washer (3), flat washer (4), and capstan pulley (5)	Remove	
3. Cap screw (6), lock washer (7), flat washer (8), and capstan pulley (9)	Remove	
4. 2 screws (10), lock washers (11), and flat washers (12)	Remove	
5. Mode selector 3A4A4 (13)	Tag and unsolder wires from switch terminals.	
6. Mode selector 3A4A4 (13)	Repair by replacing defective parts.	Figure 3-51
7. Mode selector 3A4A4 (13)	Solder wires to switch terminals.	Use tags to identify wires.
8. Mode selector 3A4A4 (13)	Position on frame.	
9. 2 screws (10), lock washers (11), and flat washers (12)	Install, but do not tighten.	
10. 0.20 in. shims	Place at points "A" and "B".	Figure 3-49
11. Mode selector 3A4A4 (13)	Butt against "H" frame.	Figure 3-48
12. 2 screws (10)	Tighten.	Figure 3-49
13. 0.020 in. shims	Remove	Figure 3-49

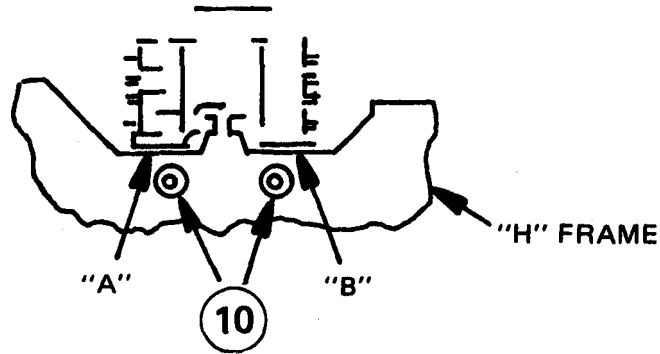
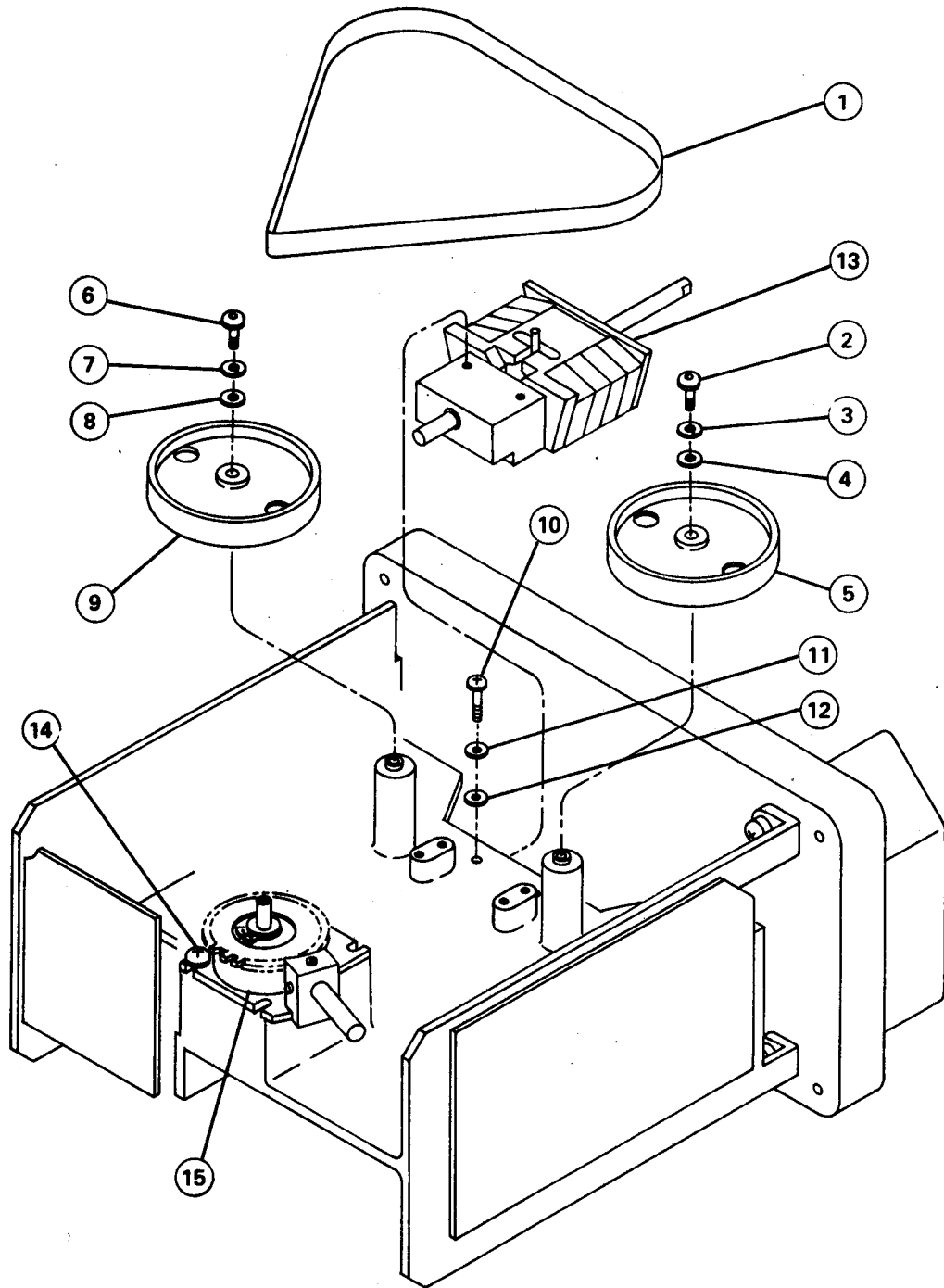


Figure 3-49. Mode Selector Alignment

Item	Action	Remarks										
14. Front panel knob (3A3A1), retainer, and screw	Install (temporarily)	Knob was removed in paragraph 3-26.										
15. Front panel knob (3A3A1)	Set to each operating position. Use multimeter to verify mode switch actuation for each mode.	Figure FO-10 switch position table.										
	<table border="0"> <tr> <td><u>Mode:</u></td> <td><u>Actuated Switches:</u></td> </tr> <tr> <td>FIR:</td> <td>S1A, S1C, S1E</td> </tr> <tr> <td>F/F:</td> <td>S1E, S1F, S1G</td> </tr> <tr> <td>REC :</td> <td>S1B, S1D, S1F, S1J, S1K, S1L</td> </tr> <tr> <td>REPRO :</td> <td>S1F, S1G, S1H, S1M, S1N, S1P</td> </tr> </table>	<u>Mode:</u>	<u>Actuated Switches:</u>	FIR:	S1A, S1C, S1E	F/F:	S1E, S1F, S1G	REC :	S1B, S1D, S1F, S1J, S1K, S1L	REPRO :	S1F, S1G, S1H, S1M, S1N, S1P	
<u>Mode:</u>	<u>Actuated Switches:</u>											
FIR:	S1A, S1C, S1E											
F/F:	S1E, S1F, S1G											
REC :	S1B, S1D, S1F, S1J, S1K, S1L											
REPRO :	S1F, S1G, S1H, S1M, S1N, S1P											
16. Camshaft (10)	Must spring back to center position from fast forward (F/F) and fast reverse (F/R) positions.											
17. Front panel knob (3A3A1), screw and retainer.	Remove											
18. Capstan pulley (9), flat washer (8), lock washer(7), and cap screw(6)	Install	Figure 3-50										

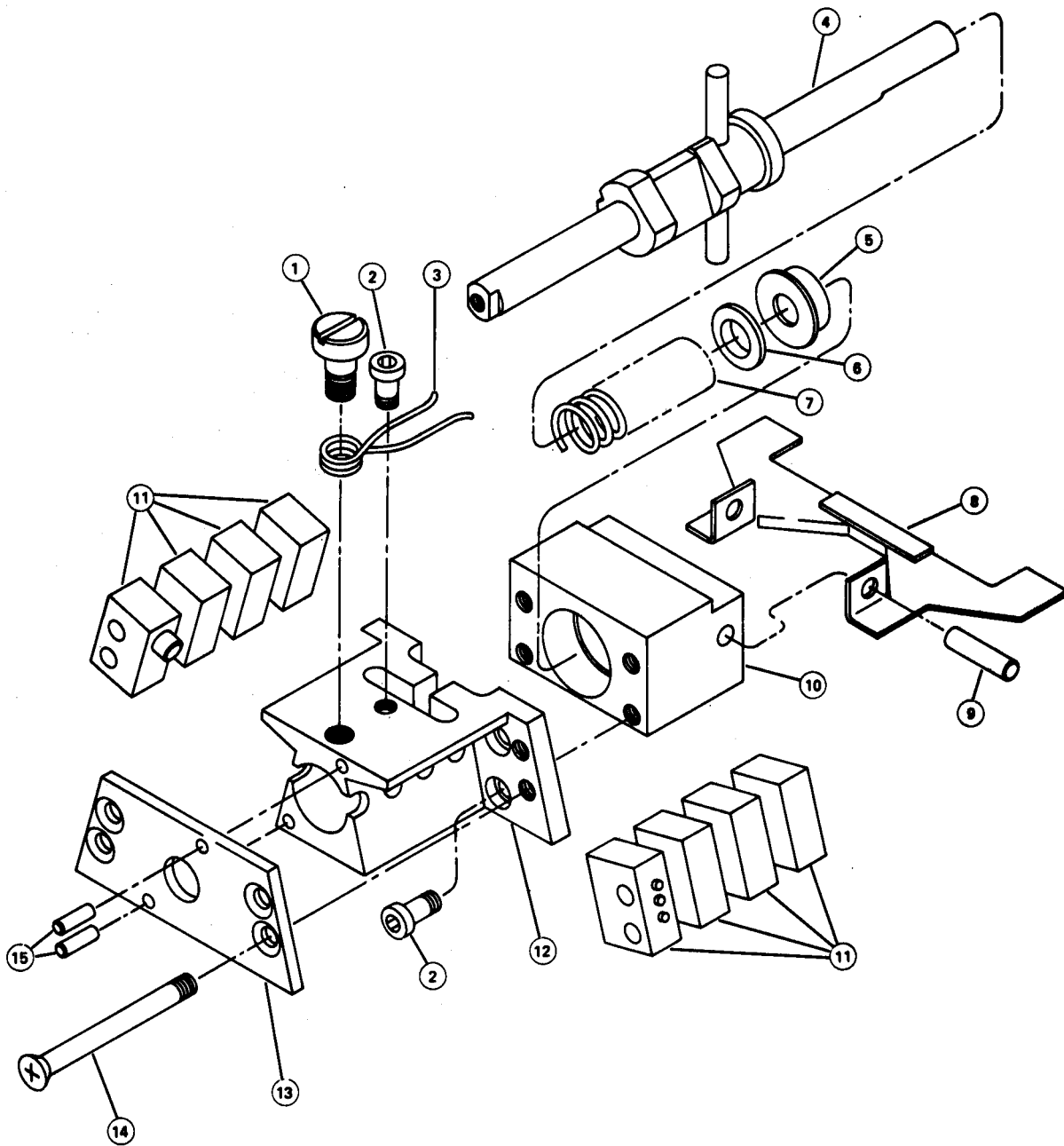
TM 32-5835-001-24 & P

Item	Action	Remarks
19. Capstan pulley (5), flat washer (4), lock washer (3), and cap-screw (2)	Install	
20. Belt (1)	Install belt (1). Slide capstan motor (15) to the rear to tighten belt (figure 3-52). Using spring scale (figure 3-52) apply a force to rotate the capstan pulley while keeping the capstan motor from turning. The spring scale reading will be 3.5 to 4-02. in. , before belt slips on motor shaft. Tighten screws (14).	
21. Front panel	Install	Paragraph 3-26.
22. Slide plate	Install	Paragraph 3-29.
23. Housing	Install	Paragraph 3-25.
TEST		
Mode selector 3A4A4 (13)	Perform final test, paragraph 3-49.	



- | | | |
|-----------|-----------|---------------------------|
| 1. Belt | 6. Screw | 11. Washer (2) |
| 2. Screw | 7. Washer | 12. Washer (2) |
| 3. Washer | 8. Washer | 13. Mode selector (3A4A4) |
| 4. Washer | 9. Pulley | 14. Screw (3) |
| 5. Pulley | 10. Screw | 15. Motor (15) |

Figure 3-50. Mode Selector (3A4A4), Remove/Replace



- | | | |
|--------------|-------------|----------------|
| 1. Screw | 6. Spacer | 11. Switch (8) |
| 2. Screw (5) | 7. Spring | 12. Block |
| 3. Spring | 8. Brake | 13. Cover |
| 4. Shaft | 9. Pin | 14. Screw |
| 5. Bearing | 10. Support | 15. Pin |

Figure 3-51. Mode Selector (3A4A4), Assemble/Disassemble

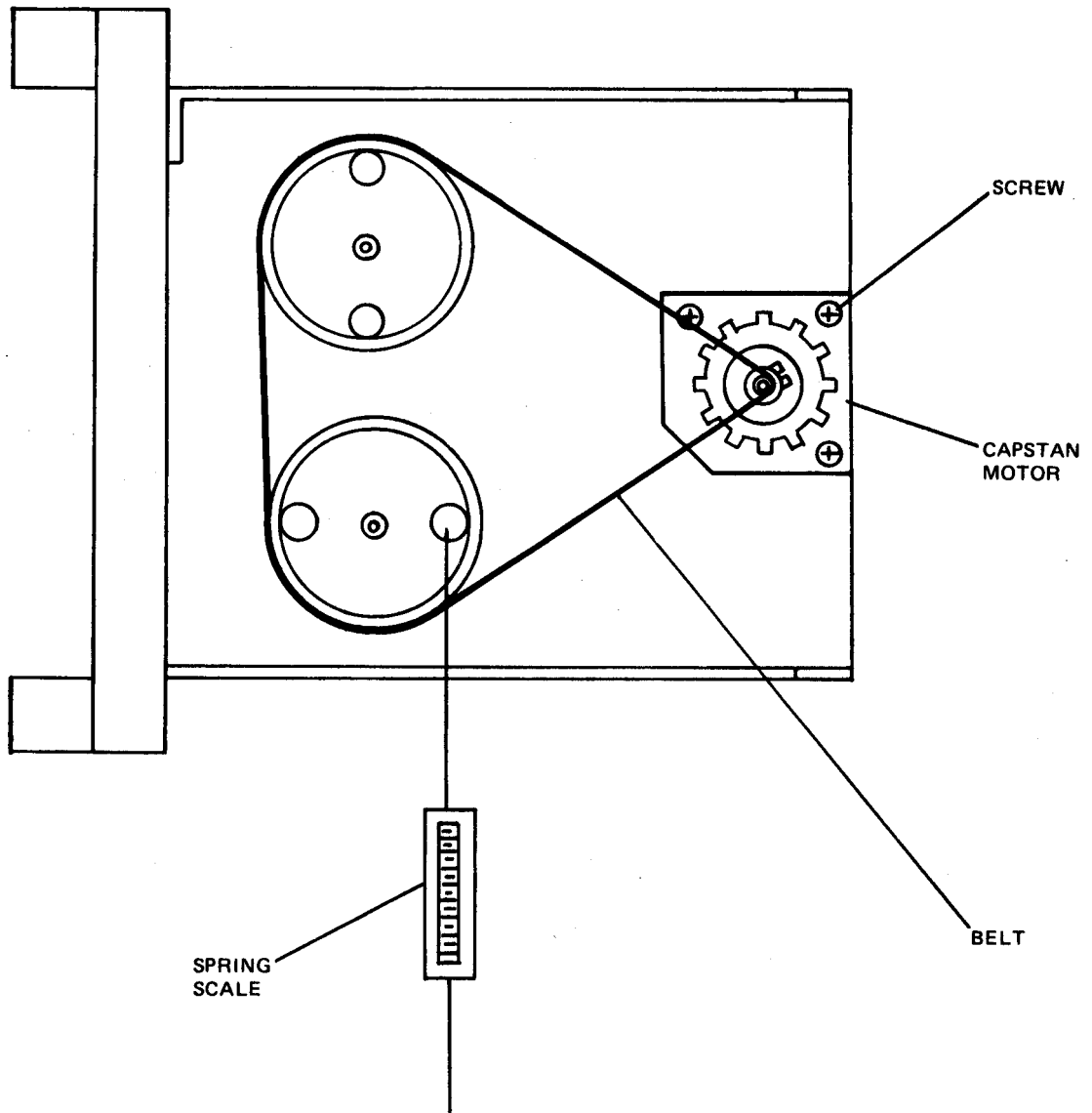


Figure 3-52. Drive Belt, Tension Adjustment

TM 32-5835-001-24 & P

3-38. Circuit Cards (3A4A5 and 3A4A6) Maintenance Instructions

This task covers:

- a. Inspect
- b. Service
- c. Replace
- d. Repair
- e. Test

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material /Parts

Solder, SN-10

Troubleshooting Reference

3A4A5, Paragraph 3-9
3A4A6, Paragraph 3-11 and 3-12

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraph 3-25

Condition Description

Housing Removed.

Approximate Time Required (minutes)
Per Card

Inspect	6
Service	6
Replace	30
Repair	0
Test	<u>60</u>
	102

Item

Action

Remarks

INSPECT

Circuit cards 3A4A5 and 3A4A6

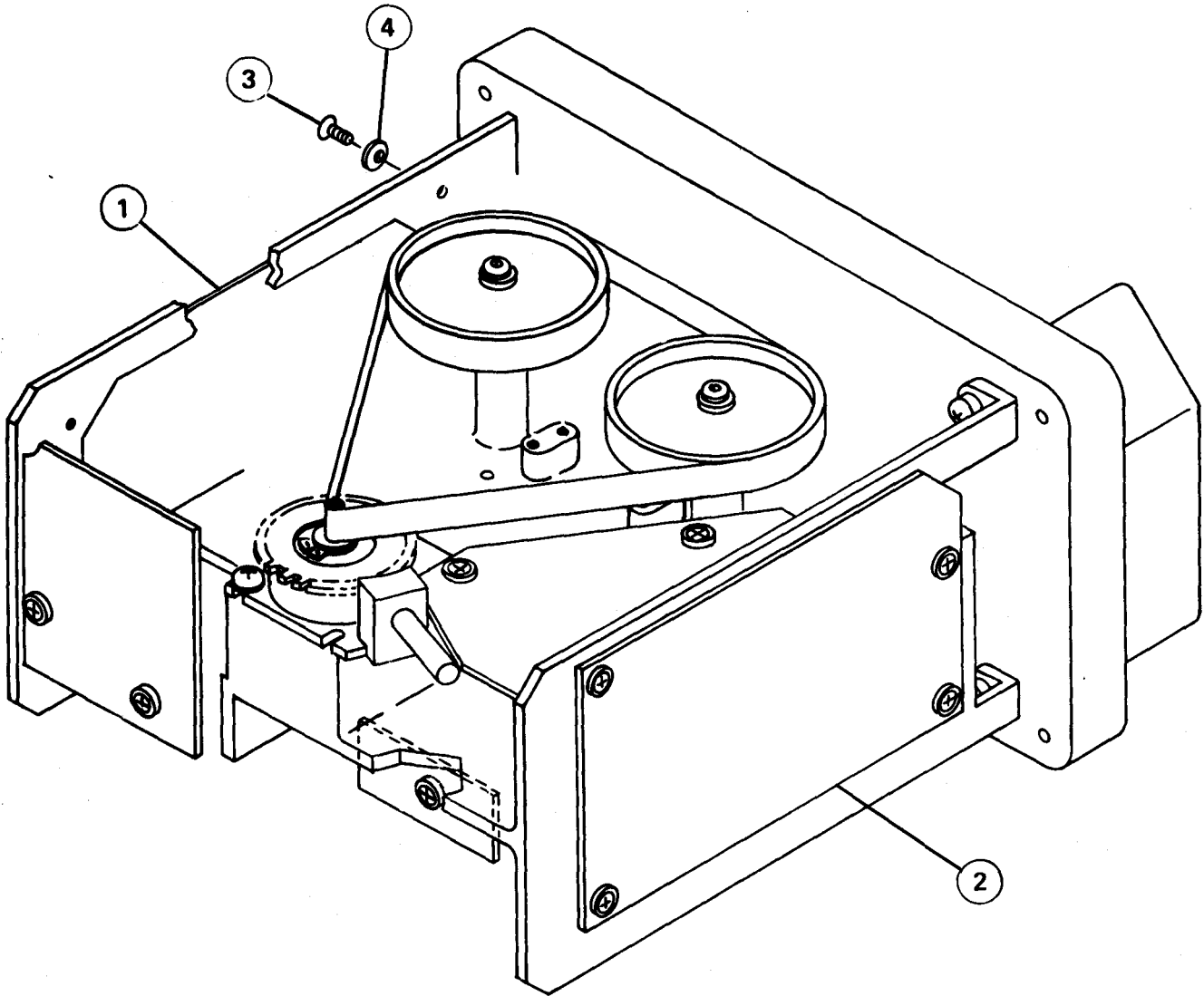
Check for evidence of over heating (charred components), physical damage such as fractured cards or open printed wiring, and for accumulation of dust and dirt.

SERVICE

Circuit cards 3A4A5 and 3A4A6

Clean using soft brush or compressed air.

Item	Action	Remarks
REPLACE		
1. 4 screws (3) and 4 washers (4)	Remove defective circuit card from recorder, by unplugging card.	It may be neces- sary to use a small screw driver to pry cards out of con- nectors. Pry card out evenly on both sides of connector.
2. New circuit card 3A4A5 or 3A4A6	Plug circuit card into connector.	
3. 4 screws (3) and 4 washers (4)	Install	
REPAIR		
Circuit cards 3A4A5 and 3A4A6	Not repairable at DS level; forward to depot.	
TEST		
Circuit cards 3A4A5 and 3A4A6	Perform final test, paragraph 3-49.	



- 1. Amplifier card (3A4A5)
- 2. Motor-bias card (3A4A6)
- 3. Screws (8)
- 4. Washers (8)

Figure 3-53. Circuit Cards (3A4A5 and 3A4A6), Remove/Replace

3-39. Circuit Cards (3A4A7 and 3A4A8) and C Filter (3A4A11) Maintenance Instructions

This task covers:

- a. Inspect
- b. Service
- c. Replace
- d. Repair
- e. Test

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material /Parts

Solder, SN-10

Troubleshooting Reference

3A4A7, Paragraph 3-13
 3A4A8, Paragraph 3-10
 3A4A11, Paragraph 3-12

Personnel Required

EW /Intercept Equipment
 Repairman MOS 33S20

Equipment Condition

Paragraph 3-25

Condition Description

Housing Removed.

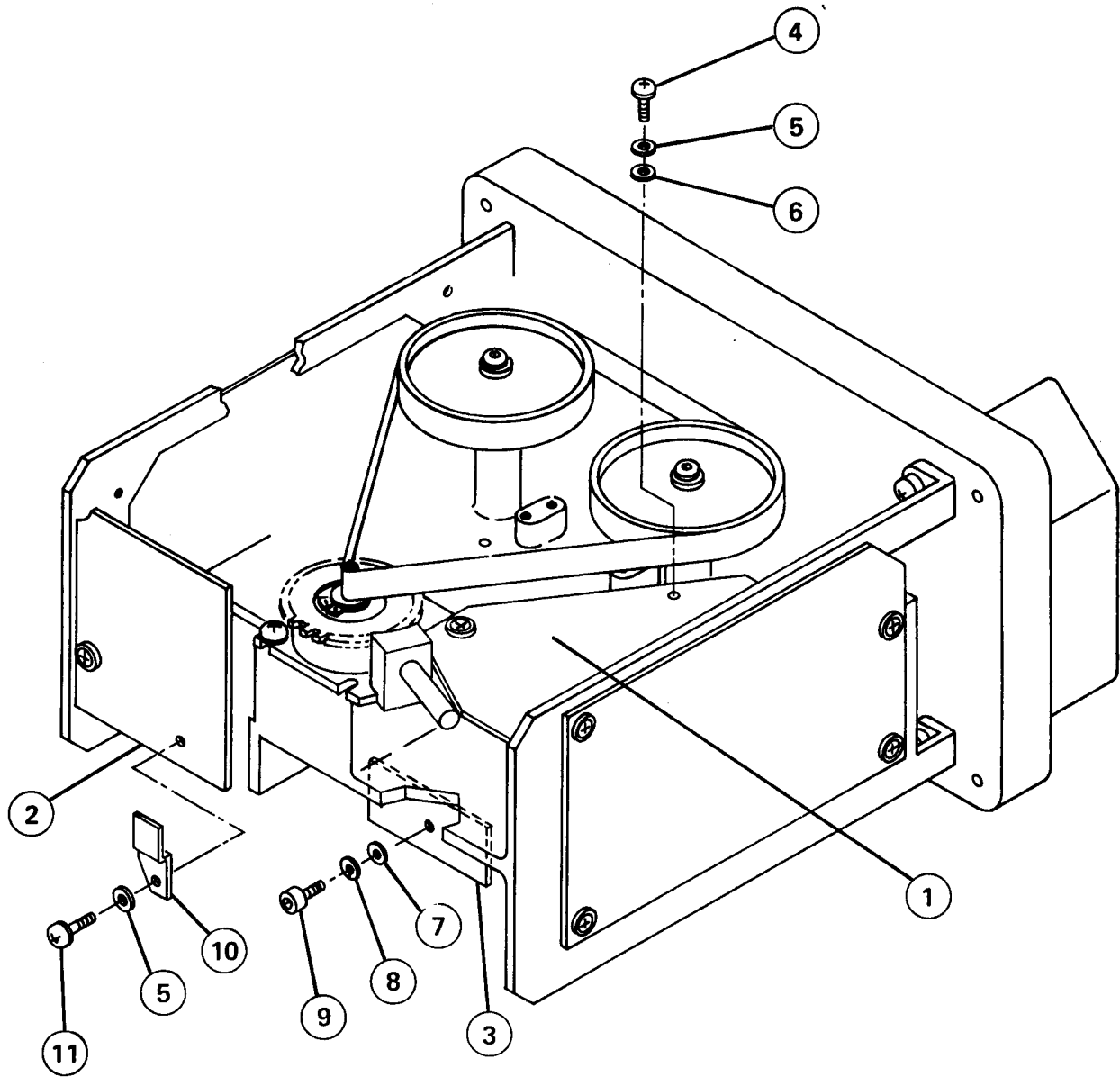
Approximate Time Required (minutes)
 Per Card

Inspect	6
Service	6
Replace	30
Repair	60
Test	<u>60</u>
	162

Item	Action	Remarks
INSPECT		
Circuit cards and C filter	Check for evidence of over-heating (charred components), physical damage such as fractured cards or open printed wiring, and for accumulation of dust and dirt.	
SERVICE	Clean using a soft brush or compressed air.	

TM 32-5835-001-24 & P

Item	Action	Remarks
1. Attaching wires	Tag and unsolder	
2. Attaching screws and washers	Remove	
3. Circuit card and filter	Remove	
4. New /repaired circuit card and filter	Position for installation.	
5. Attaching wires	Solder	Use tags to identify wires.
6. Attaching screws and washers.	Install	
Circuit cards and C filter	Repair by replacing defective parts.	3A4A7: figure FO-7 3A4A8: figure FO-4 3A4A11: figure FO-6
TEST		
Circuit cards and C filter.	Perform final test, paragraph 3-49.	



- | | |
|------------------------|-----------|
| 1. Sensor card (3A4A7) | 7. Washer |
| 2. Meter card (3A4A8) | 8. Washer |
| 3. C filter (3A4A11) | 9. Screw |
| 4. Screw (3) | 10. Clamp |
| 5. Washer (4) | 11. Screw |
| 6. Washer (3) | |

Figure 3-54. Circuit Cards (3A4A7, 3A4A8) and C Filter (3A4A11), Remove/Replace

TM 32-5835-001-24 & P

3-40. Resistor Card (3A4A9) Maintenance Instructions

This task covers:

- a. Inspect
- b. Service
- c. Replace
- d. Repair
- e. Test

INITIAL SETUP

Application Configuration

All

Special Tools

None

Test Equipment

None

Material /Parts

Solder, SN-60

Troubleshootin preference

Paragraph 3-9

Personnel Required

EW/Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraph 3-25

Condition Description

Housing Removed.

Approximate Time Required (minutes)

Inspect	6
Service	6
Replace	60
Repair	60
Test	60
	192

Item

Action

Remarks

INSPECT

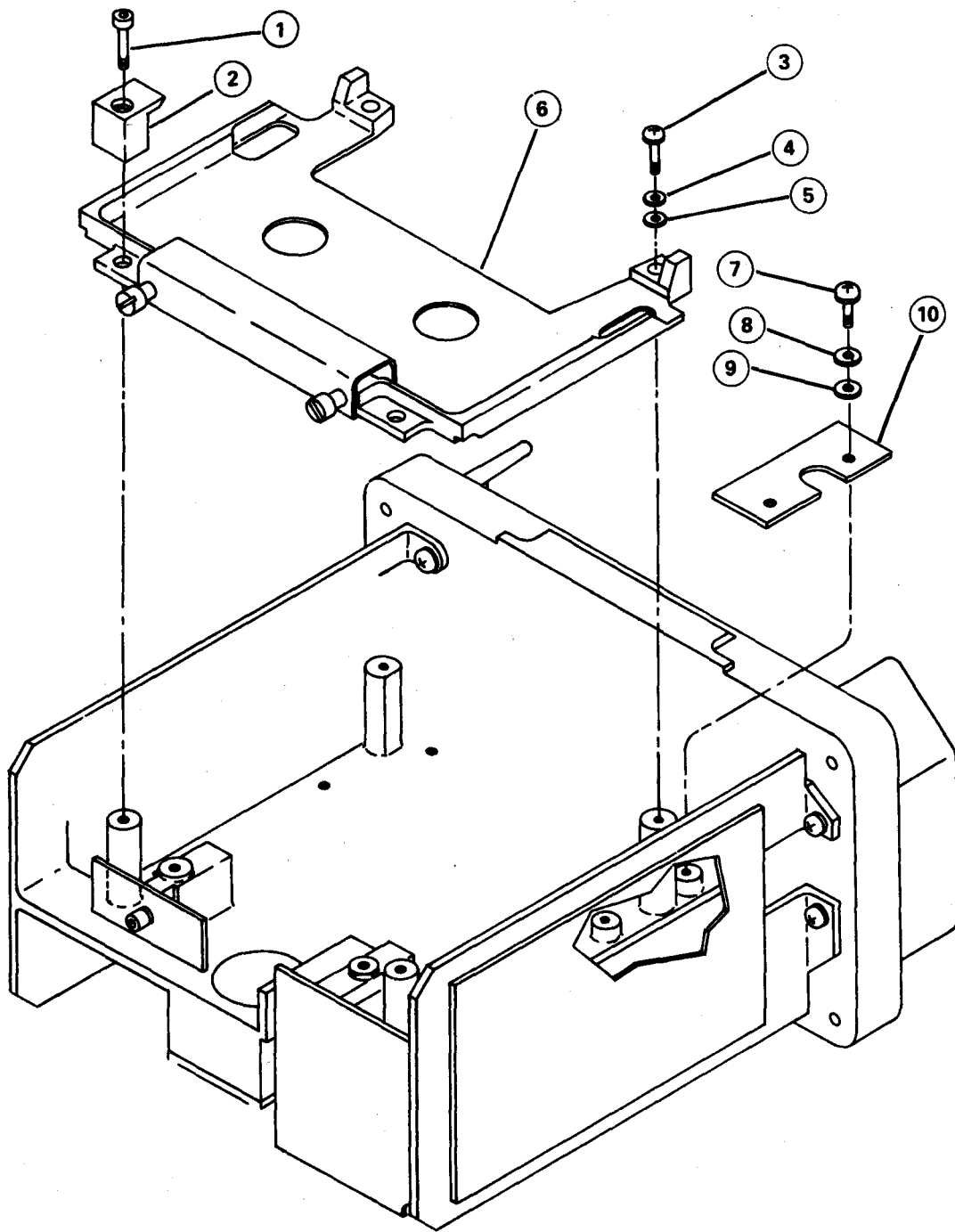
Resistor card 3A4A9 (10)

Check for evidence of over-heating (charred components) and physical damage such as fractured board and open printed wiring. Check for accumulation of dust and dirt.

Resistor card 3A4A9 (10)

Clean using compressed air or a soft brush.

	Action	Remarks
REPLACE		
1. Screw (1)	Remove	
2. Cassette stop (2)	Remove	
3. 3 screws (3), lock washers (4), and flat washers (5)	Remove	
4. Cartridge plate (6)	Remove	
5. 2 screws (7), lock washers (8), and flat washers (9)	Remove	
6. Resistor card 3A4A9 (10)	Tag and unsolder wires.	
7. Resistor card 3A4A9 (10)	Remove	
8. New /repaired resistor card 3A4A9 (10)	Install	
9. Resistor card 3A4A9 (10)	Solder wires to terminals.	Use tags to identify wires.
2 screws (7), lock washers (8), and flat washers (9)	Install	
Cartridge plate (6)	Position on chassis.	
3 screws (3), lock washers (4), and flat washers (5)	Install	
13. Cassette stop (2) and screw (1)	Install	
REPAIR		
Resistor card 3A4A9 (10)	Repair by replacing defective parts.	
TEST		
Resistor card 3A4A9 (10)	Perform final test, paragraph 3-47.	



- | | |
|--------------------|---------------------------|
| 1. Screw | 6. Cartridge plate |
| 2. Cassette stop | 7. Screw (2) |
| 3. Screw (3) | 8. Lock washer (2) |
| 4. Lock washer (3) | 9. Flat washer (2) |
| 5. Flat washer (3) | 10. Resistor card (3A4A9) |

Figure 3-55. Resistor Card (3A4A9), Remove/Replace

3-41. R Filter (3A4A10) Maintenance Instructions

This task consists of:

- | | |
|------------|-----------|
| a. Inspect | d. Repair |
| b. Service | e. Test |
| c. Replace | |

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material /Parts

Solder, SN-60

Troubleshooting Reference

Paragraph 3-14

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraphs 3-25, 3-29, and 3-45

Condition Description

Housing, slide plate, and disk reel
3A4A14 removed.

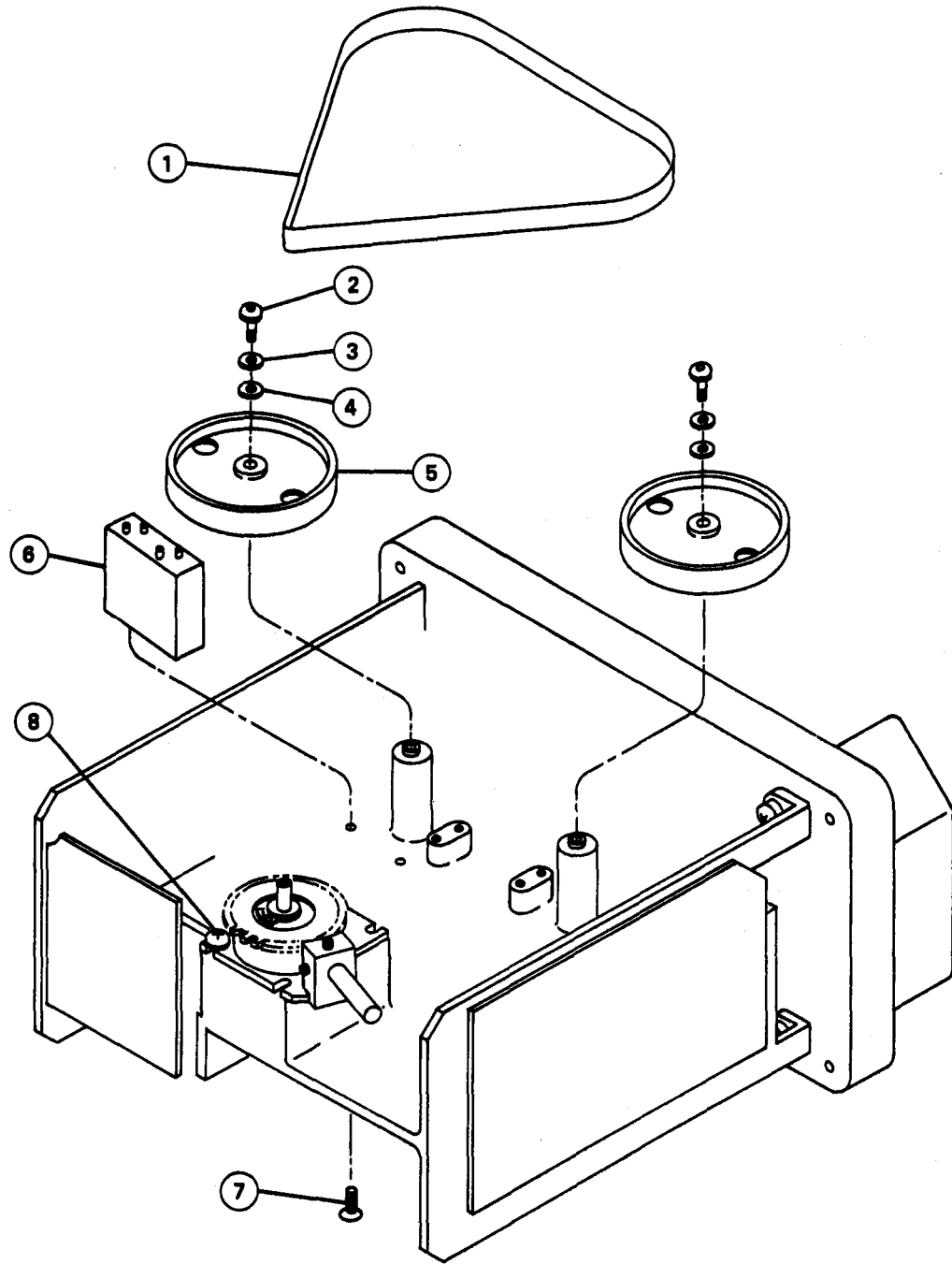
Approximate Time Required (minutes)

Inspect	6
Service	6
Replace	30
Repair	60
Test	<u>30</u>
	132

Item	Action	Remarks
R Filter 3A4A10 (6)		Check for evidence of over-heating (charred components) and physical damage such as fractured board and open printed wiring. Check for accumulation of dust and dirt.
R Filter 3A4A10 (6)		Clean using compressed air or a soft brush.

TM 32-5835-001-24 & P

Item	Action	Remarks
REPLACE		
1. Belt (1)	Remove Loosen three screws (8). Slide capstan motor forward.	Figure 3-50
2. Capscrew (2), lock washer (3), and flat washer (4)	Remove	
3. Capstan pulley (5)	Remove	
4. R filter 3A4A10 (6)	Tag and unsolder wires.	
5. 2 screws (7)	Remove	
6. R filter 3A4A10 (6)	Remove	
7. New/repaired R filter 3A4A10 (6)	Position onto frame.	
8. 2 screws (7)	Install	
9. Capstan pulley (5)	Install	
10. Cap screw (2), lock washer (3), and flat washer (4)	Install	
11. Belt (1)	Install and adjust	Paragraph 3-37
12. Disk reel 3A4A14	Install	Paragraph 3-43
13. Slide plate	Install	Paragraph 3-29
14. Housing	Install	Paragraph 3-25
REPAIR		
R Filter 3A4A10 (6)	Repair by replacing defective parts.	
TEST		
R Filter 3A4A10 (6)	Connect" power supply to recorder. Connect 117 Vac cable between power supply and 117 volt source. Insert blank tape into recorder set. Set mode selector to F /F. Cassette tape winds rapidly. Set mode selector to F/R. Cassette tape rewinds rapidly.	



- | | |
|----------------|----------------------|
| 1. Belt | 5. Capstan pulley |
| 2. Cap screw | 6. R filter (3A4A10) |
| 3. Lock washer | 7. Screw (2) |
| 4. Flat washer | 8. Screw (3) |

Figure 3-56. R Filter (3A4A10), Remove/Replace

TM 32-5835-001-24 & P

3-42. Sensor (3A4A12) Maintenance Instructions

This task covers:

- a. Inspect
- b. Service
- c. Repair
- d. Test

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material /Parts

Solder, SN-60

Troubleshooting Reference

Paragraph 3-13

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraphs 3-25 and 3-29

Condition Description

Housing and slide plate removed.

Approximate Time Required (minutes)

Inspect	6
Service	6
Repair	30
Test	<u>60</u>
	102

Item

Action

Remarks

INSPECT

Sensor 3A4A12 (8)

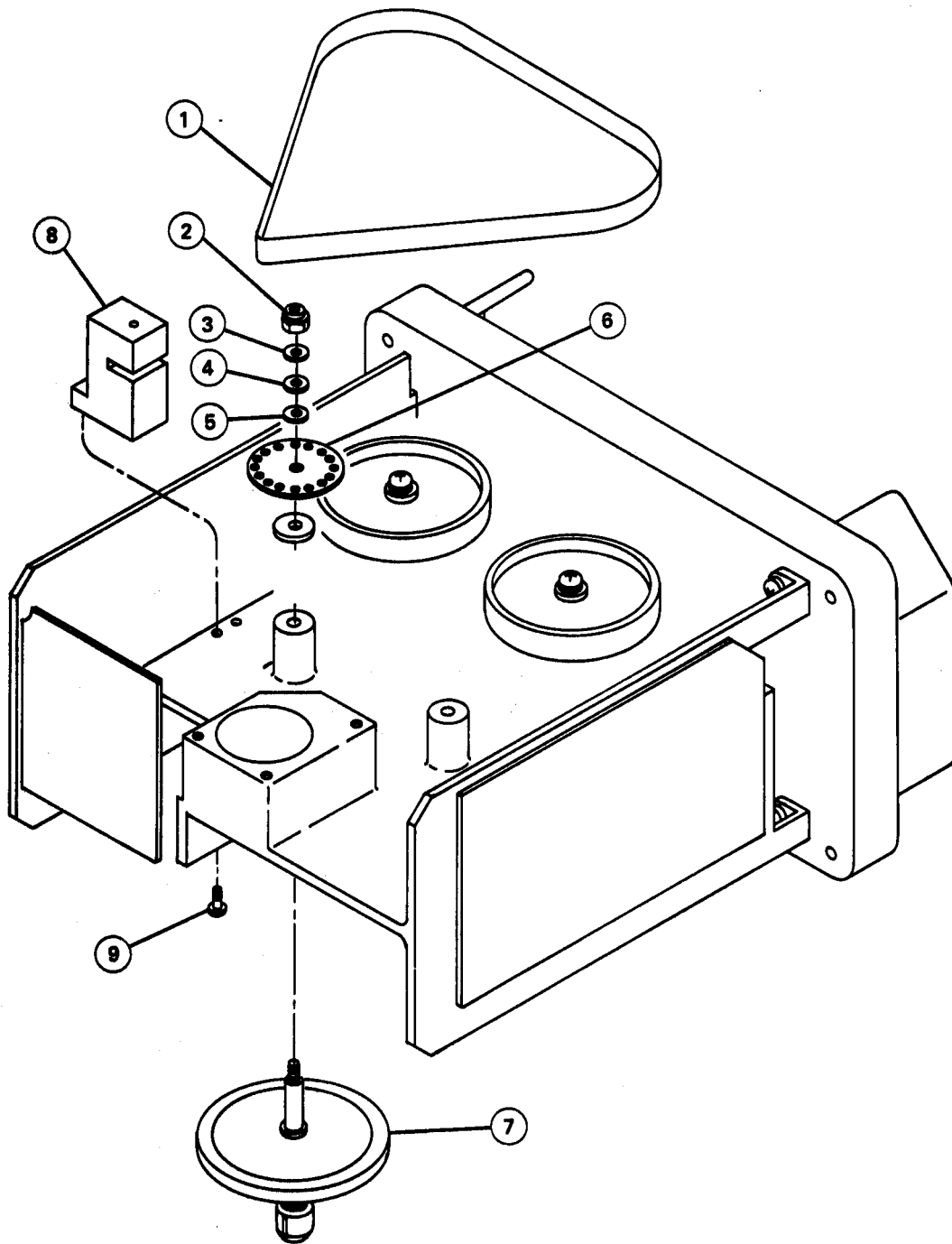
Check for evidence of physical damage such as broken terminal or wires. Check for accumulation of dust or dirt.

SERVICE

Sensor 3A4A12 (8)

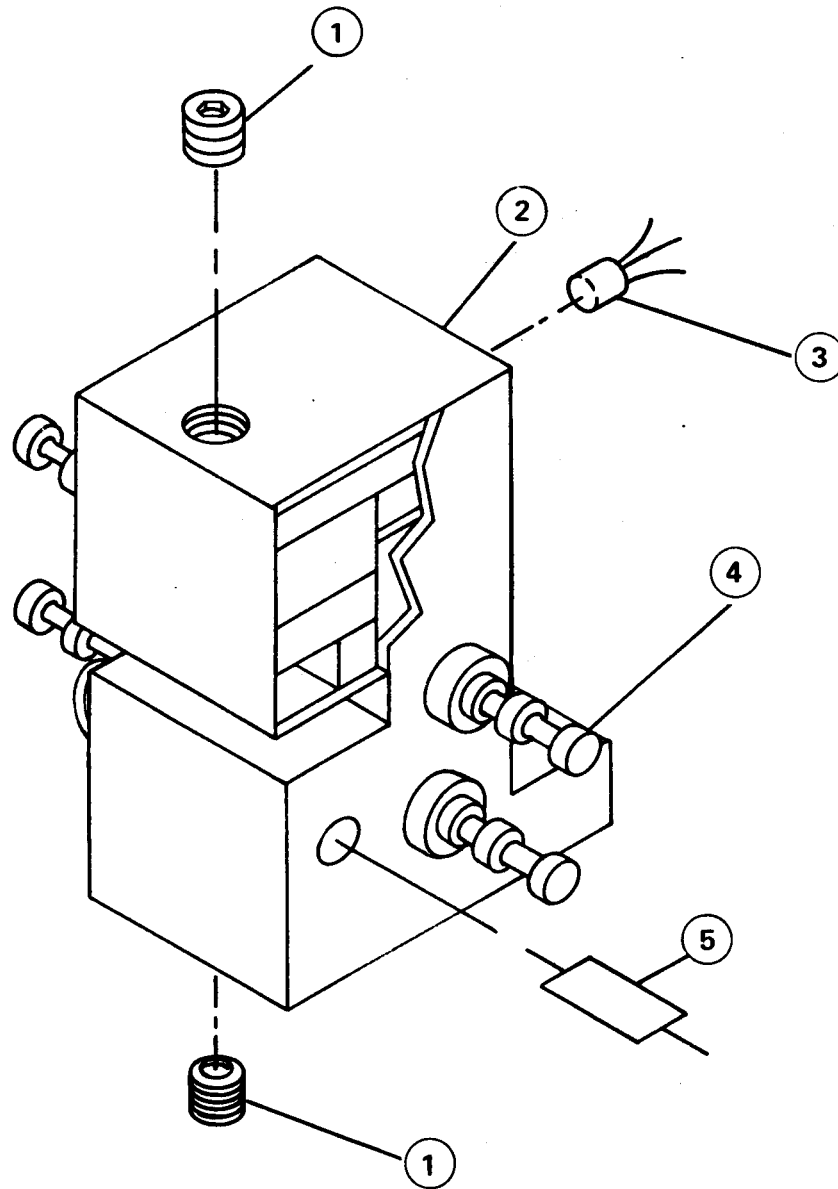
Clean using compressed air or a soft brush.

Item	Action	Remarks
REPAIR		
1. Belt (1)	Remove	Figure 3-57
2. Clinch nut (2), flat washer (3), spring tension washer (4), and guide (5)	Remove	
3. Disk reel 3A4A14 (7) and spacer plate (6)	Remove	
4. Sensor 3A4A12 (8)	Tag and unsolder wires.	
5. 2 screws (9) and sensor 3A4A12 (8)	Remove	
6. Sensor 3A4A12 (8)	Repair by replacing defective parts.	Figure 3-58
7. Sensor 3A4A12 (8)	Position onto chassis.	
8. 2 screws (9)	Install	
9. Disk reel 3A4A14 (7), and spacer plate (6)	Install	
10. Guide (5) spring tension washer (4), flat washer (3) , and clinch nut (2)	Install	Paragraph 3-45 for adjustment
11. Belt (1)	Install and adjust	Paragraph 3-37
12. Slide plate	Install	Paragraph 3-28
13. Housing	Install	Paragraph 3-24
TEST		
Sensor 3A4A12 (8)	Perform final test, paragraph 3-49.	



- | | |
|--------------------------|-----------------------|
| 1. Belt | 6. Motor controller |
| 2. Clinch nut | 7. Disk reel (3A4A14) |
| 3. Flat washer | 8. Sensor (3A4A12) |
| 4. Spring tension washer | 9. Screw (2) |
| 5. Guide | |

Figure 3-57. Sensor (3A4A12), Remove/Replace



1. Screw
2. Block
3. Transistor
4. Terminal (4)
5. Diode

Figure 3-58. Sensor (3A4A12), Assemble/Disassemble

TM 32-5835-001-24 & P

3-43. Actuator (3A4A13) Maintenance Instructions

This task covers:

- a. Inspect
- b. Service
- c. Repair
- d. Test

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material /Parts

Cleaning Compound,
NSN 6850-00-597-9765

Troubleshooting Reference

Paragraph 3-9

Personnel Required

EW / Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraphs 3-25 and **3-29**

Condition Description

Housing removed and front panel
partially removed

Approximate Time Required (minutes)

Inspect	6
Service	6
Repair	30
Test	60
	102

Item

Action

Remarks

INSPECT

Actuator 3A4A13 (12)

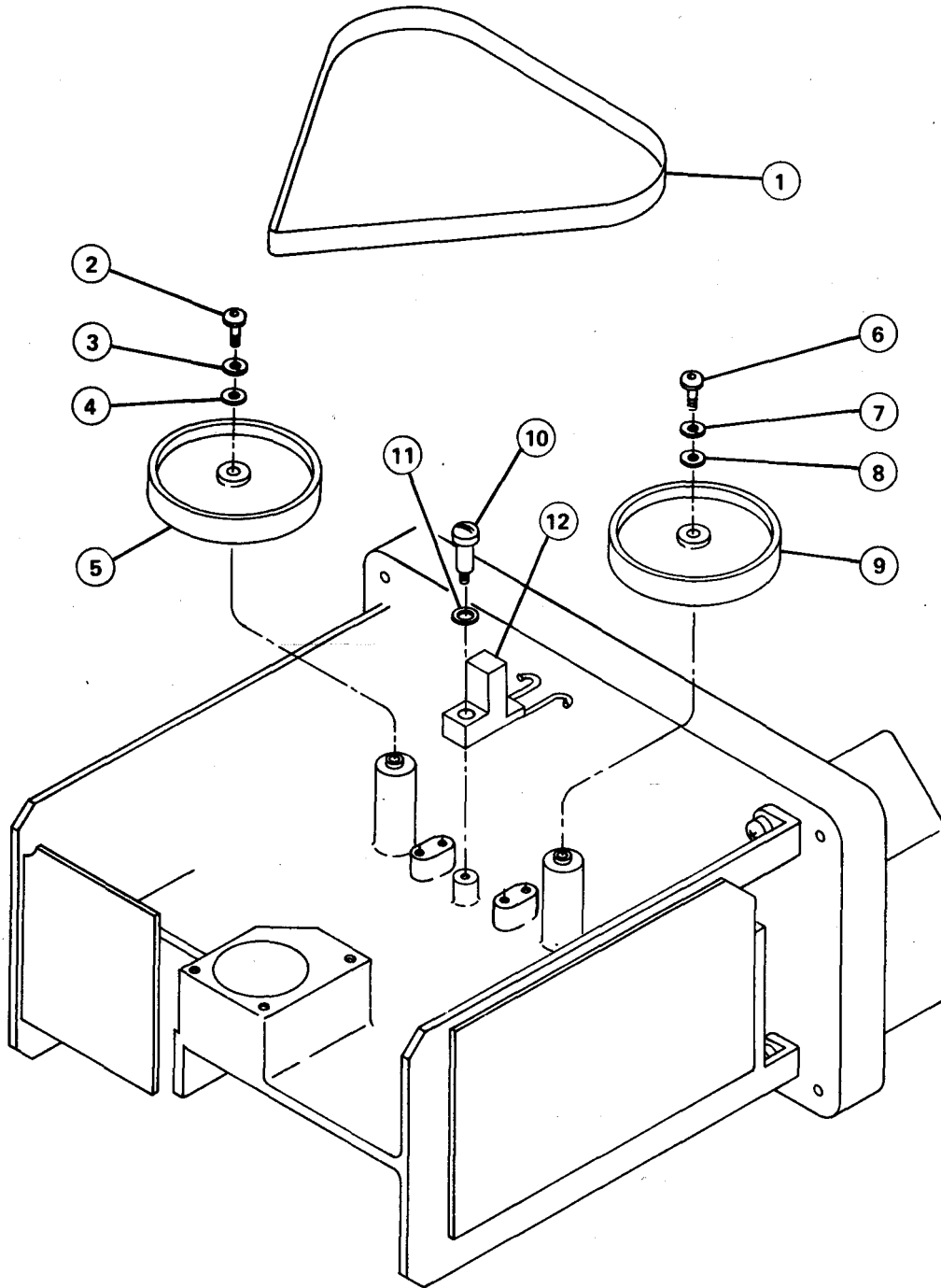
Check for accumulation
of grease and dirt. Check
torsion spring for damage.

SERVICE

Actuator 3A4A13 (12)

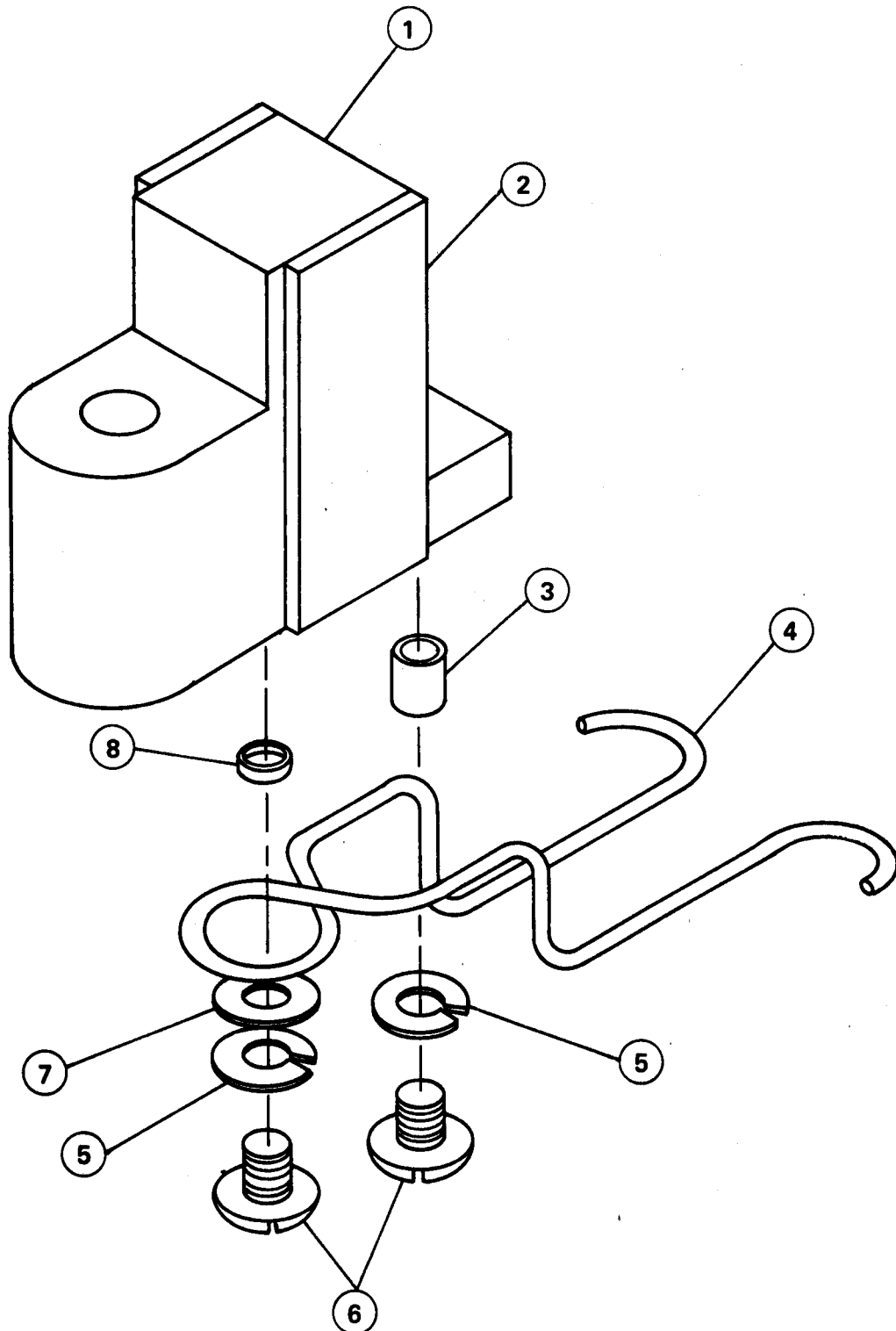
Clean using cleaning
compound and a soft brush.

Item	Action	Remarks
REPAIR		
1. Belt (1)	Remove	Paragraph 3-37
2. Cap screw (2), lock washer (3), and flat washer (4)	Remove	Figure 3-59
3. Capstan pulley (5)	Remove	
4. Cap screw (6), lock washer (7), and flat washer (8)	Remove	
5. Capstan pulley (9)	Remove	
6. Screw (10) and flat washer (11)	Remove	
7. Actuator 3A4A13 (12)	Remove	
8. Actuator 3A4A13 (12)	Repair by replacing defective parts.	Figure 3-60
9. Actuator 3A4A13 (12)	Position in chassis.	
10. Screw (10) and flat washer (11)	Install	
11. Capstan pulley (9)	Install	
12. Flat washer (8), lock washer (7), and cap screw (6)	Install	
13. Caps'tan pulley (5)	Install	
14. Flat washer (4), lock washer (3) , and cap screw (2)	Install	
15. Belt (1)	Install and adjust	Paragraph 3-37
16. Front panel	Install	Paragraph 3-26
17. Housing	Install	Paragraph 3-25
TEST		
Actuator 3A4A1 3 (12)	Perform final test, paragraph 3-49	



- | | |
|-------------------|-----------------------|
| 1. Belt | 7. Lock washer |
| 2. Cap screw | 8. Flat washer |
| 3. Lock washer | 9. Capstan pulley |
| 4. Flat washer | 10. Screw |
| 5. Capstan pulley | 11. Flat washer |
| 6. Cap screw | 12. Actuator (3A4A13) |

Figure 3-59. Actuator (3A4A13), Remove /Replace



- | | |
|-----------|-----------|
| 1. Switch | 5. Washer |
| 2. Lining | 6. Screw |
| 3. Spacer | 7. Washer |
| 4. Spring | 8. Spacer |

Figure 3-60. Actuator (3A4A13), Assemble/Disassemble

TM 32-5835-001-24 & P

3-44. Switches (3A4S1J through 3A4S1P) Maintenance Instructions

This task covers:

- | | |
|------------|---------|
| a. Inspect | d. Test |
| b. Service | |
| c. Repair | |

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

None

Material/Parts

Cleaning Compound,
NSN 6850-00-597-9765

Troubleshooting Reference

Paragraph 3-9

Personnel Requirement

EW /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraphs 3-25 and 3-26

Condition Description

Housing removed and front panel
partially removed.

Approximate Time Required (minutes)

Inspect	6
Service	12
Repair	12
Test	<u>60</u>
	90

Item

Action

Remarks

INSPECT

Switches (13 and 17)	Check for accumulation of dirt and grease. Check for breaks or cracks in switch cases.
----------------------	---

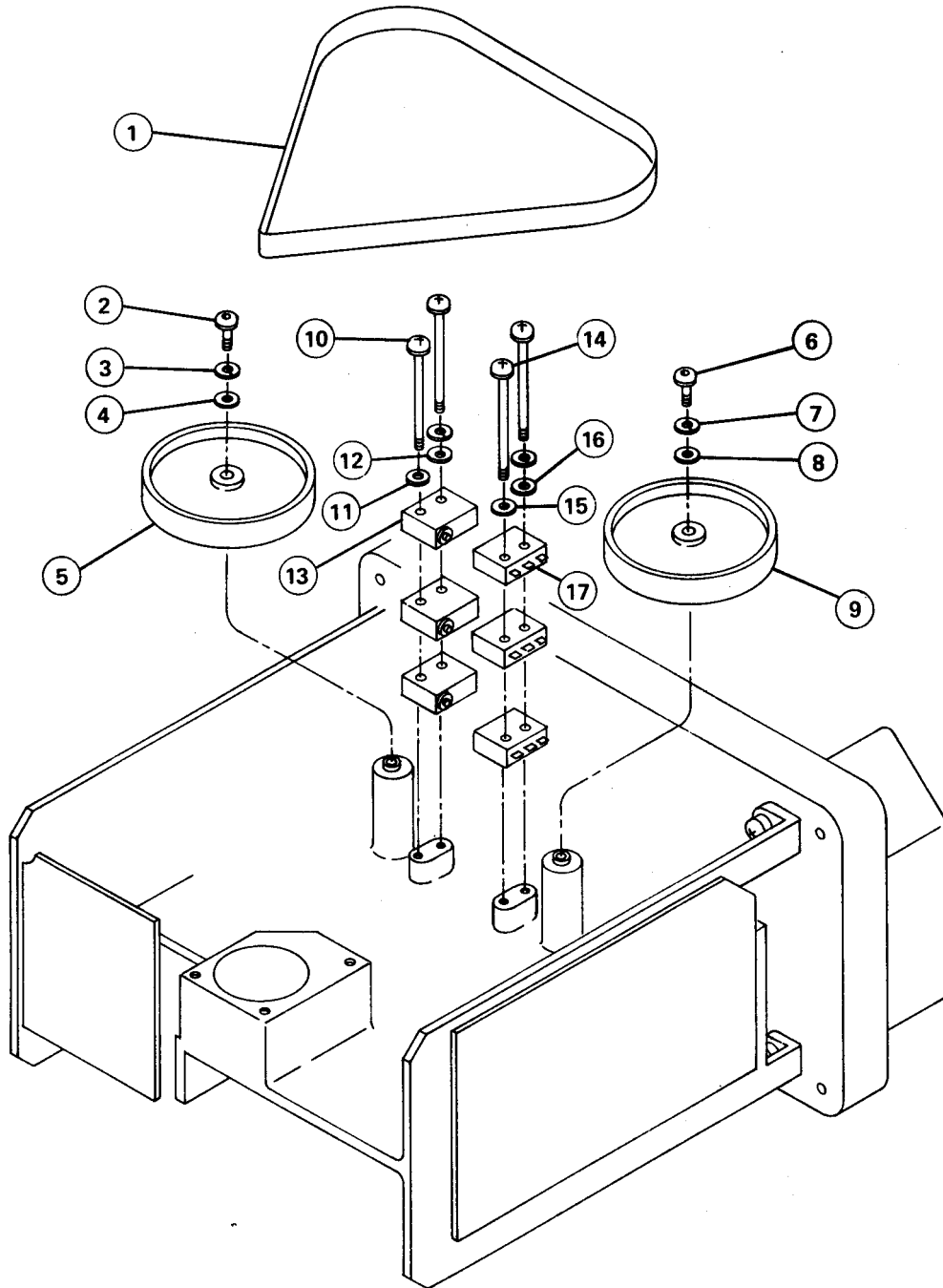
SERVICE

Switches (13 and 17)	Clean using cleaning compound and a soft brush.
----------------------	---

Item	Action	Remarks
1. Belt (1)	Remove	Paragraph 3-37
2. Cap screw (2), lock washer (3), flat washer (4), and capstan pulley (5)	Remove	Figure 3-61
3. Cap screw (6), lock washer (7), flat washer (8), and capstan pulley (9)	Remove	
4. 2 screws (10), lock washers (11), and flat washer (12)	Remove	
5. 2 screws (14), lock washers (15), and flat washer (16)	Remove	
6. Switches (13 and 17)	Tag and unsolder wires to switches that are to be removed.	
7. Switches (13 and 17)	Remove	
8. Switches (13 and 17)	Repair by replacing defective parts.	Figure 3-61
9. Switches (13 and 17)	Solder wires to switch and remove tags.	Use tags to identify wires.
10. 2 screws (14), lock washers (15) , and flat washer (16)	Install	
11. 2 screws (10) , lock washers (11), and flat washer (12)	Install	
12. Capstan pulley (9)	Install	
13. Cap screw (6), lock washer (7) , and flat washer (8)	Install	
14. Capstan pulley (5)	Install	

TM 32-5835-001-24 & P

Item	Action	Remarks
15. Cap screw (2), lock washer (3), flat washer (4)	Install	
16. Belt (1)	Install and adjust	Paragraph 3-37
17. Front panel	Install	Paragraph 3-26
18. Housing	Install	Paragraph 3-25
TEST		
Switches (13 and 17)	Perform final test, paragraph 3-49.	



- | | | |
|-------------------|---------------------|---------------------|
| 1. Belt | 7. Lock washer | 13. Switch (3) |
| 2. Cap screw | 8. Flat washer | 14. Screw |
| 3. Lock washer | 9. Capstan pulley | 15. Lock washer (2) |
| 4. Flat washer | 10. Screw (2) | 16. Flat washer |
| 5. Capstan pulley | 11. Lock washer (2) | 17. Switch (3) |
| 6. Cap screw | 12. Flat washer | |

Figure 3-61. Switches (3A4S1J through 3A4S1P), Assemble/Disassemble

TM 32-5835-001-24 & P

3-45. Disk Reel (3A4A14) Maintenance Instructions

This task covers:

- | | |
|------------|-----------|
| a. Inspect | d. Adjust |
| b. Service | e. Test |
| c. Repair | |

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Special Tools

Spring scale

Material /Parts

Cleaning Compound,
NSN 6850-00-597-9765

Troubleshooting Reference

Paragraph 3-7

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraphs 3-25 and 3-29

Condition Description

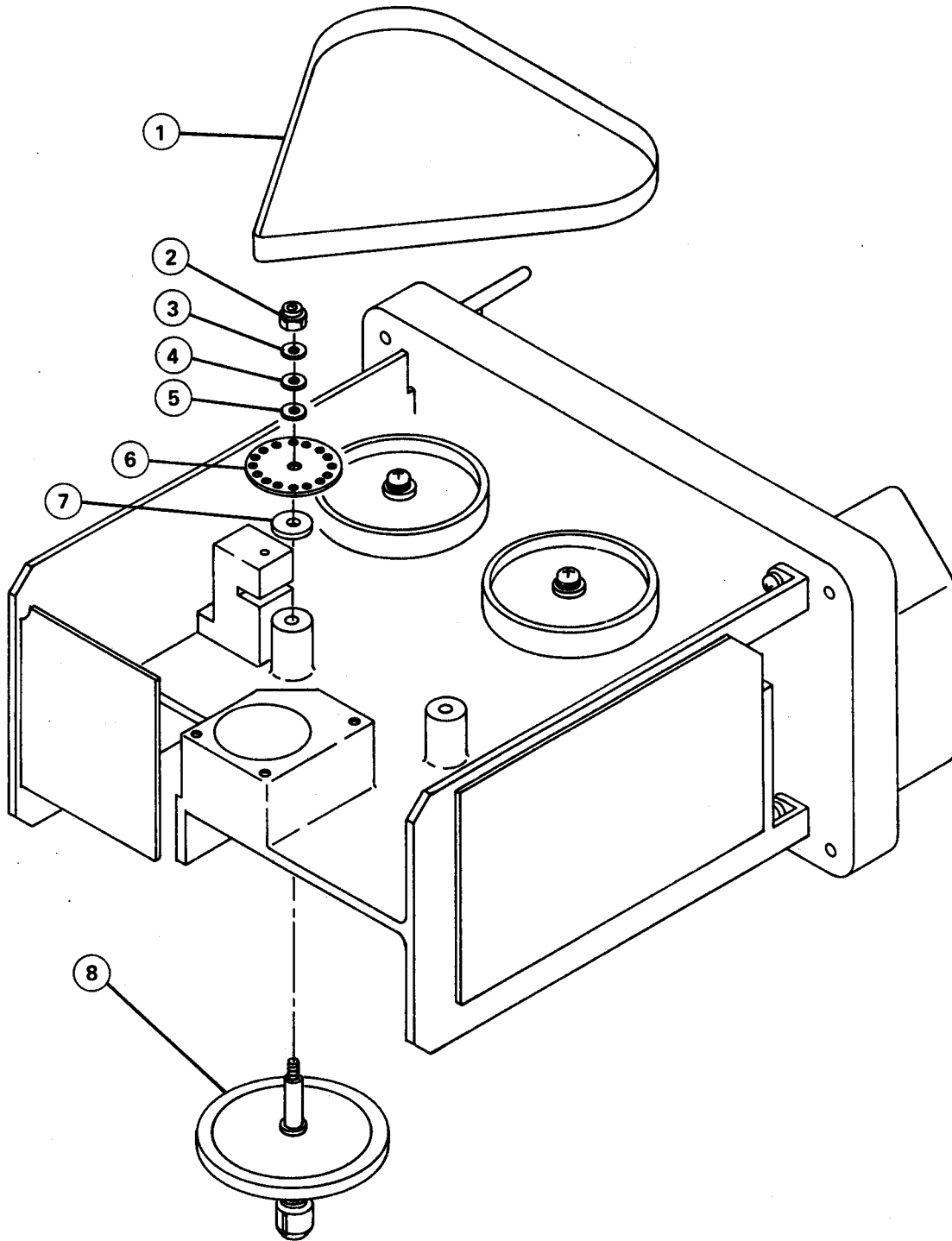
Housing and slide plate assembly
removed.

Approximate Time Required (minutes)

Inspect	6
Service	6
Repair	48
Adjust	30
Test	<u>60</u>
	150

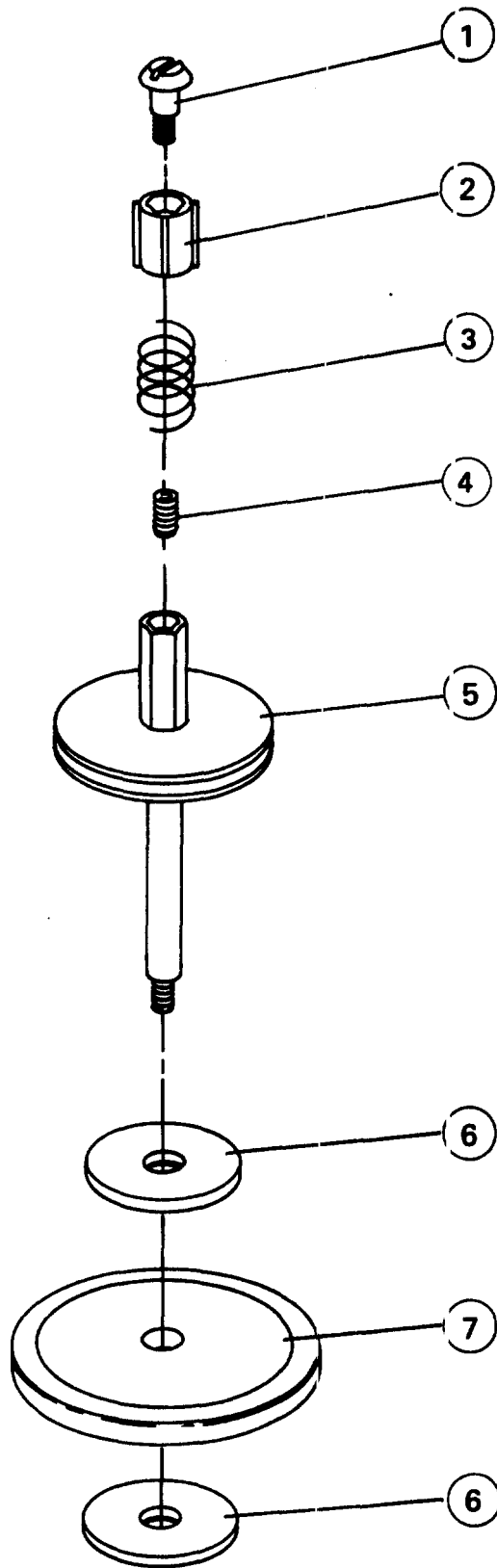
Item	Action	Remarks
INSPECT		
Disk reel 3A4A14 (8)	Check for accumulation of dirt and grease. Check for cracks or gouges in friction surfaces.	
SERVICE		
Disk reel 3A4A14 (8)	Clean using cleaning compound and a soft brush.	

Item	Action	Remarks
REPAIR		
1. Belt (1)	Remove	Paragraph 3-37
2. Clinch nut (2)	Remove	Figure 3-62
3. Flat washer (3), spring tension washer (4), and guide (5)	Remove	
4. Disk reel 3A4A14 (8), clutch (7), and motor controller (6)	Remove	
5. Disk reel 3A4A14 (8)	Repair by replacing defective parts.	Figure 3-63
6. Disk reel 3A4A14 (8), clutch (7), and motor controller (6)	Install into chassis.	
7. Guide (5), spring tension washer (4), flat washer (3), and clinch nut (2)	Install	
8. Belt (1)	Install and adjust	Paragraph 3-37
9. Slide plate 3A4A1	Install	Paragraph 3-29
10. Housing	Install	Paragraph 3-25
ADJUST		
Disk reel clutch (8)	Loosen clinch nut (item 2, figure 3-62) and adjust for 0.8 to 1.0 oz-inch of torque (product of scale reading and moment arm).	
TEST		
Disk reel 3A4A14 (8)	Perform final test, paragraph 3-49.	



- | | |
|--------------------------|-----------------------|
| 1. Belt | 5. Guide |
| 2. Clinch nut | 6. Motor controller |
| 3. Flat washer | 7. Clutch |
| 4. Spring tension washer | 8. Disk reel (3A4A14) |

Figure 3-62. Disk Reel (3A4A14), Remove /Replace



- 1. Cap
- 2. Guide
- 3. Spring
- 4. Set screw
- 5. Disk reel
- 6. Bearing
- 7. Disk

Figure 3-63. Disk Reel (3A4A14), Assemble/Disassemble

TM 32-5835-001-24 & P

3-46. Disk Reel (3A4A16) Maintenance Instructions

This task covers:

- a. Inspect
- b. Service
- c. Repair
- d. Adjust
- e. Test

INITIAL SETUP

Applicable Configurations

All

Test Equipment

None

Spring Tools

Spring scale

Material /Parts

Cleaning Compound,
NSN 6850-00-597-9765

Troubleshooting Reference

Paragraph 3-7

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraphs 3-25 and 3-29

Condition Description

Housing and slide plate removed.

Approximate Time Required (minutes)

Inspect	6
Service	6
Repair	48
Adjust	30
Test	<u>60</u>
	150

Item	Action	Remarks
INSPECT		
Disk reel 3A4A16 (7)	Check for accumulation of dirt and grease. Check for cracks or gouges in friction surfaces.	
SERVICE		
Disk reel 3A4A16 (7)	Clean using cleaning compound and a soft brush.	
REPAIR		
1. Belt (1)	Remove	Paragraph 3-37

Item	Action	Remarks
2. Clinch nut (2) flat washer (3), spring tension washer (4), and guide (5)	Remove	Figure 3-64
3. Pulley (6)	Remove	
4. Disk reel 3A4A16 (7)	Remove	
5. Disk reel 3A4A16 (7)	Repair by replacing defective parts.	Figure 3-65
6. New /repaired disk reel 3A4A14 (7)	Install into chassis.	
7. Pulley (6)	Install	
8. Guide (5), spring tension washer (4), flat washer (3), and clinch nut (2)	Install	
9. Belt (1)	Install and adjust	Paragraph 3-37
10. Slide plate	Install	Paragraph 3-29

ADJUST

Disk reel clutch

Loosen clinch nut (item 2, figure 3-64) and adjust for 0.8 to 1.0 oz-inch of torque (product of scale reading and moment arm).

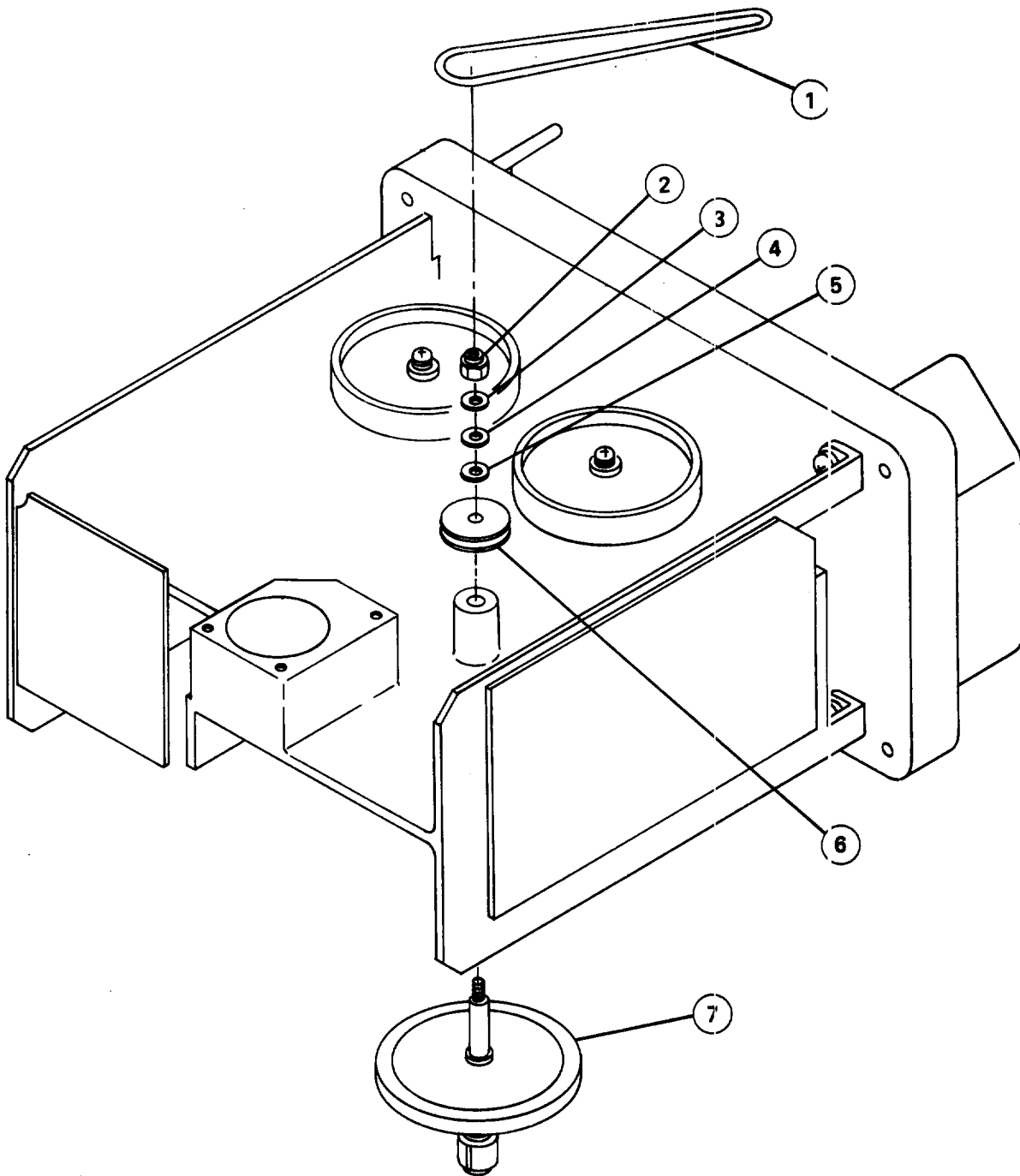
Install recorder into housing.

Paragraph 3-25

TEST

Disk reel 3A4A16 (7)

Perform final test, paragraph 3-49.



1. Belt
2. Clinch nut
3. Flat washer
4. Spring tension washer
5. Guide
6. Pulley
7. Disk reel (3A4A16)

Figure 3-64. Disk Reel (3A4A16), Remove/Replace

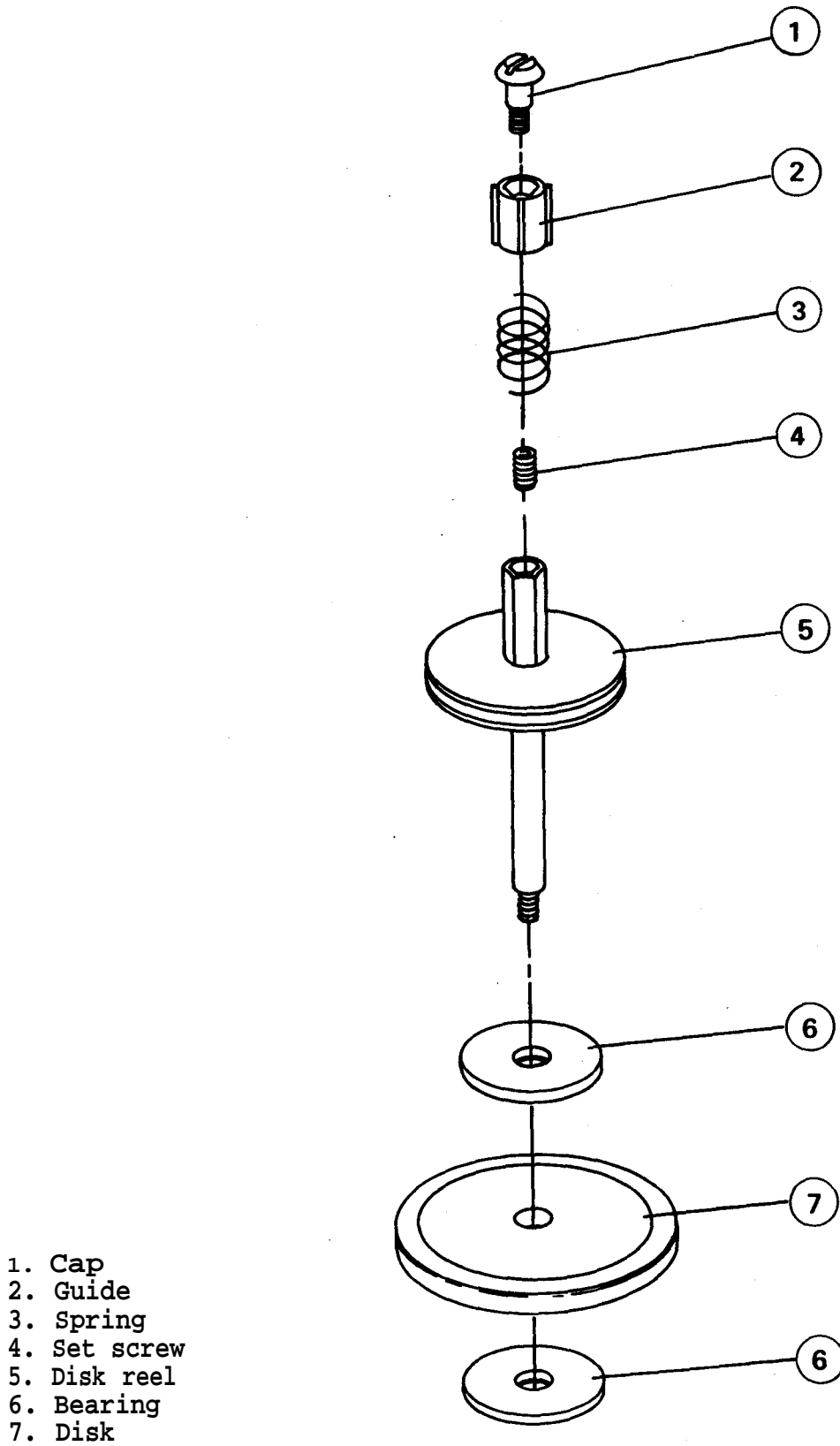


Figure 3-65. Disk Reel (3A4A16), Assemble/Disassemble

3-47. Reel Motor (3A4A17) Maintenance Instructions

This task consists of:

- a. Replace
- b. Test

INITIAL SETUP

Applicable Configurations

All

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Test Equipment

None

Equipment Condition

Paragraphs 3-25, 3-29, 3-45, and 3-46

Special Tools

None

Condition Description

Housing, slide plate, disk reel 3A4A14, and disk reel 3A4A16 removed.

Material /Parts

Solder, SN-60

Troubleshooting Reference

Paragraph 3-14

Approximate Time Required (minutes)

Replace	48
Test	<u>18</u>
	66

Item	Action	Remarks
REPLACE		
1. Reel motor 3A4A17 (5)	Tag and unsolder wires.	
2. 3 screws (1)	Remove	
3. Motor assembly (3,4, and 5)	Remove	
4. Clamp screw (2)	Loosen	
5. Clamp (3) with electrostatic shield (4)	Remove from reel motor 3A4A17 (5).	
6. New motor 3A4A17	Prepare to install.	
7. Clamp (3) with electrostatic shield (4)	Install onto reel motor 3A4A17 (5)	
8. Clamp screw (2)	Tighten	

Item	Action	Remarks
9. Motor assembly (3, 4, and 5)	Position in chassis.	
10. 3 screws (1)	Install	
11. Reel motor 3A4A17 (5)	Solder wires,	Use tags to identify wires.
12. Disk reel 3A4A16	Install	Paragraph 3-46.
13. Disk reel 3A4A14	Install	Paragraph 3-45.
14. Slide plate	Install	Paragraph 3-29.
15. Housing	Install	Paragraph 3-25.

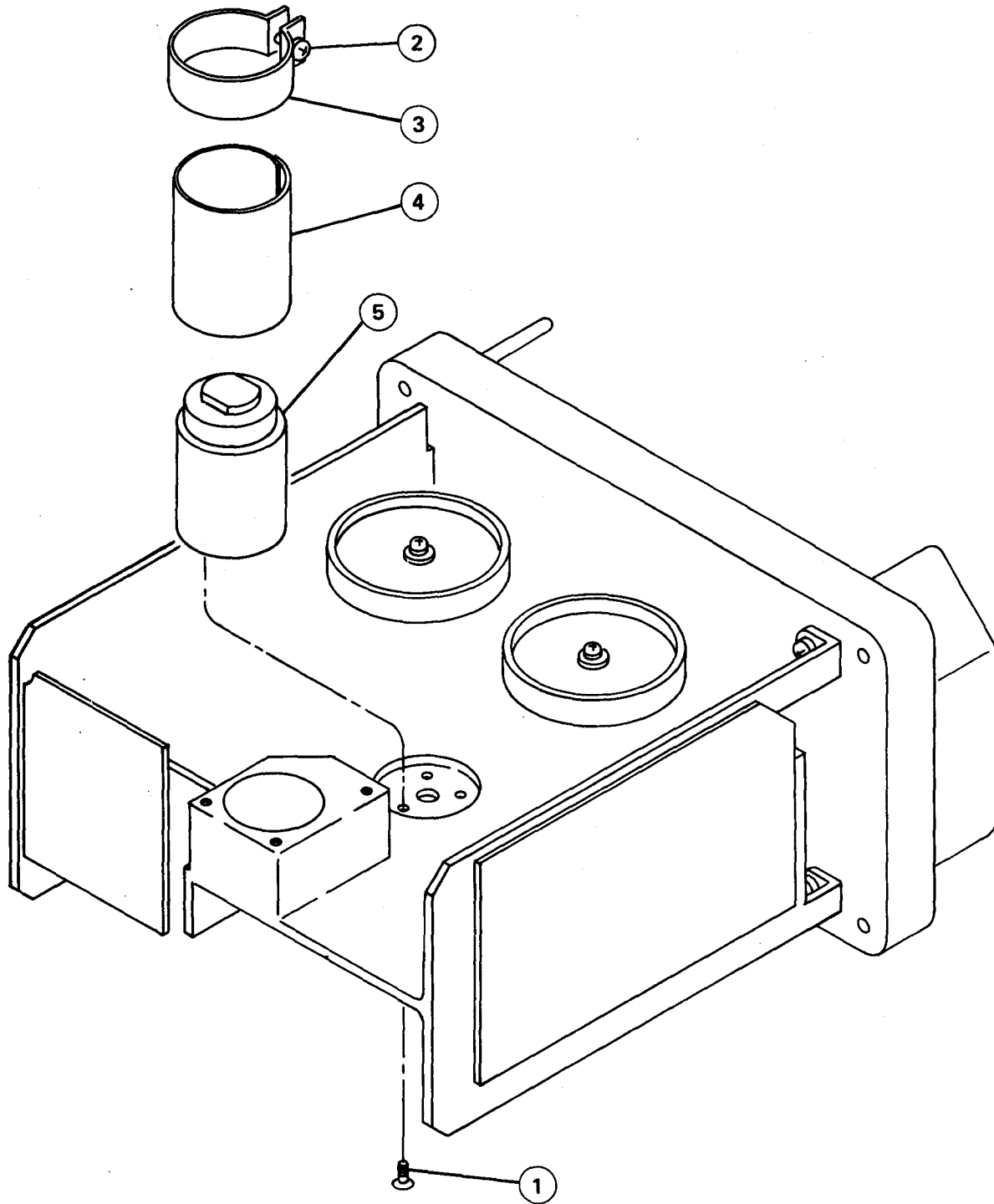
TEST

Reel motor 3A4A17 (5)

Attach power supply to recorder. Connect 117 Vac cable between power supply and 117 Vac source.

Recorder

Install blank cassette. Mode selector to F/F. Tape winds in forward direction. Mode selector to F/R. Tape rewinds in fast direction.



1. Screw (3)
2. Clamp screw
3. Clamp
4. Electrostatic shield
5. Reel motor (3A4A17)

Figure 3-66. Reel Motor (3A4A17), Remove/Replace

3-48. Capstan Motor (3A4A18) Maintenance Instructions

This task covers:

- a. Inspect
- b. Service
- c. Repair
- d. Adjust
- e. Test

INITIAL SETUP

Applicable Configuration

All

Test Equipment

None

Special Tools

Feeler Gage

Material /Parts

Solder, SN-60

Troubleshooting Reference

Paragraph 3-12

Personnel Required

EW /Intercept Equipment
Repairman MOS 33S20

Equipment Condition

Paragraph 3-25

Condition Description

Housing removed,

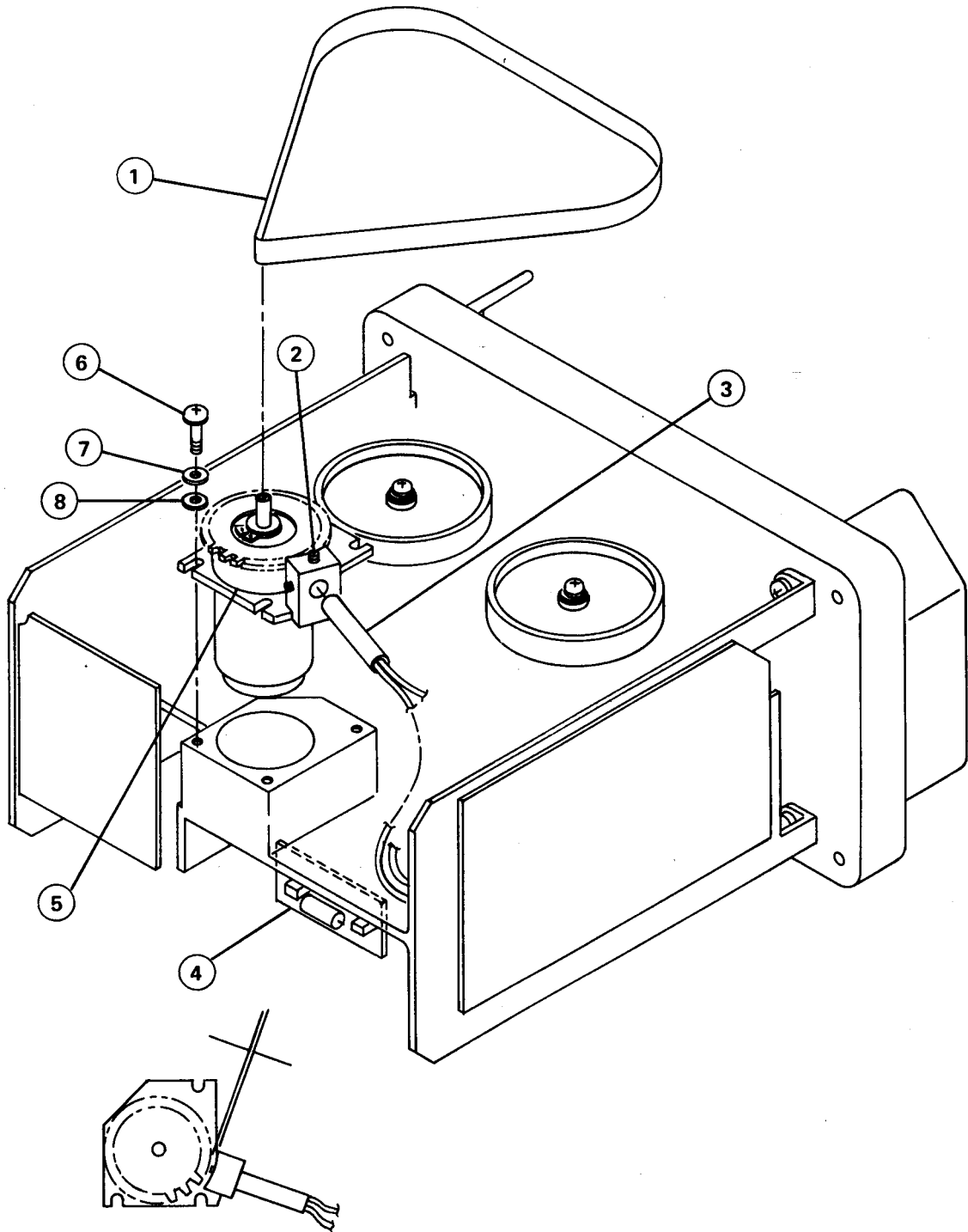
Approximate Time Required (minutes)

Inspect	6
Service	6
Repair	60
Adjust	12
Test	18
	102

Item	Action	Remarks
INSPECT		
Capstan motor 3A4A18	Check for accumulation of dirt and grease. Check for damaged terminals or wires.	
SERVICE		
Capstan motor 3A4A18	Clean using cleaning compound and a soft brush.	
REPAIR		
1. Belt (1)	Remove	Refer to paragraph 3-37 to remove belt.

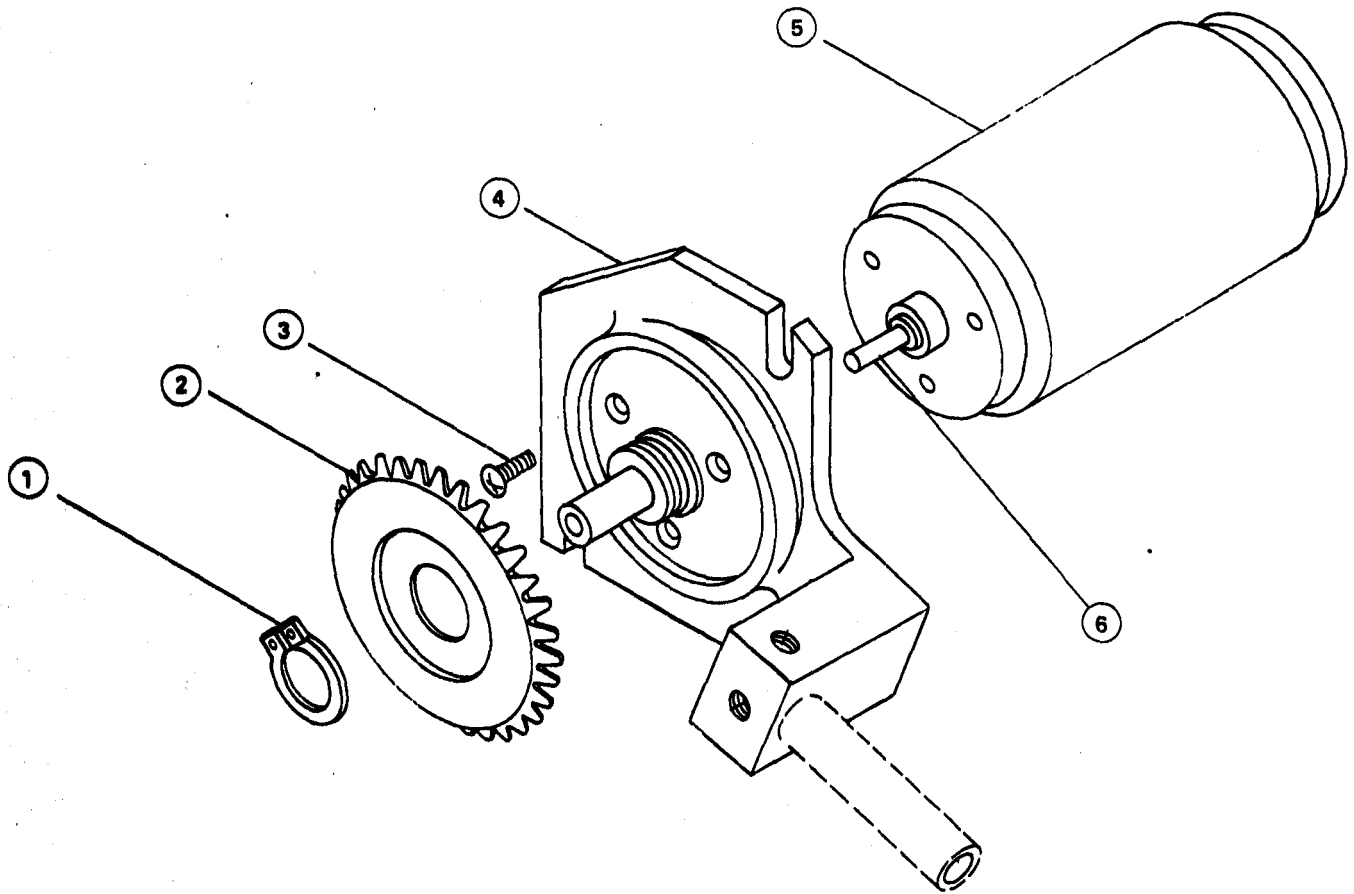
TM 32-5835-001-24 & P

Item	Action	Remarks
2. Setscrew (2)	Loosen	
3. Transducer (3)	Pull from mount.	
4. C filter (4)	Tag and unsolder wires leading to capstan motor 3A4A18 (5).	
5. 3 screws (6), lock washers (7), and flat washers (8)	Remove	
6. Capstan motor 3A4A18 (5)	Remove	
7. Capstan motor 3A4A18	Repair by replacing defective parts.	Refer to figure 3-68.
8. Capstan motor 3A4A18 (5)	Install in chassis.	
9. 3 screws (6), lock washers (7), and flat washers (8)	Install	
10. Transducer (3)	Insert into mount.	Do not tighten set-screw.
11. C filter (4)	Solder wires from capstan motor 3A4A18 (5) to appropriate terminals.	Figure F0-6.
12. Belt (1)	Install and adjust.	Paragraph 3-37
ADJUST		
Transducer (3)	Set gap between transducer and gear wheel to 0.015 inch.	figure 3-67
TEST		
Capstan motor 3A4A18 (5)	Perform final test, steps 3 through 13, paragraph 3-49.	



- | | |
|------------------|---------------------------|
| 1. Belt | 5. Capstan motor (3A4A18) |
| 2. Set screw (2) | 6. Screw (3) |
| 3. Transducer | 7. Lock washer (9) |
| 4. C filter | 8. Flat washer (3) |

Figure 3-67. Capstan Motor (3A4A18), Remove/Replace



1. Retainer
2. Gear
3. Screw
4. Mounting
5. Motor
6. Extension

Figure 3-68. Capstan Motor (3A4A18), Assemble/Disassemble

3-49. Recorder Final Test Procedure

a. Equipment.

- | | |
|--------------------------|------------------------|
| (1) Power Supply | (11) 3kHz Test Tape |
| (2) Multimeter | (12) 117 Vac Cable |
| (3) Oscilloscope | (13) 600 Ohm Load TX-1 |
| (4) Frequency Counter | (14) Test Cable TX-2 |
| (5) Flutter Meter | (15) Test Cable TX-4 |
| (6) Generator | (16) Test Cable TX-5 |
| (7) Distortion Indicator | (17) Test Cable TX-6 |
| (8) Voltmeter | (18) Adapter TX-7 |
| (9) Filter | (19) Adapter TX-8 |
| (10) Blank Cassette | (20) Test Cable TX-10 |

b. Test Procedure.

- (1) Connect equipment as shown in figure 3-68.
- (2) Insert blank cassette in recorder.
- (3) Do not close cassette loading door.
- (4) Perform test procedure listed in table 3-13.

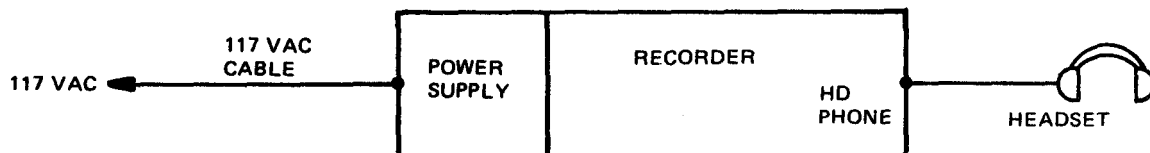


Figure 3-69. Recorder Mechanical, Equipment Setup

Table 3-13. Recorder Final Test

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
MECHANICAL						
1. Recorder	RESET button	Press	Recorder	Counter	Verify reading.	Para. 3-7
	Mode selector	F/F Allow cassette to run to near end of tape.				
2. Recorder	Mode selector	OFF	Recorder	Counter	Verify that counter is operating.	Para. 3-7
	Mode selector	REPRO Allow tape to reach end.		Headset	Tape stops and tone is heard.	Para. 3-13
	Mode selector	F/R		Cassette	Verify that tape rewinds to end.	Para. 3-7
	REJECT button	Press		Cassette	Verify that cassette is raised and remove cassette.	Para. 3-7
TAPE SPEED			EQUIPMENT SETUP: FIGURE 3-70 CONNECTION A (Use 117 Vac Cable and insert 3 kHz test tape.)			Para. 3-8

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
3. Recorder	Channel selector	1				
	Mode selector	F/F				
		Wind tape to approximately mid-point.				
4. Recorder	AGC/MAN 1 switch	MAN				
	Mode selector	REPRO				
	GAIN 1 control	Adjust	600 ohm load TX-1, R connection	Voltmeter	0 dBm	
			Same as above	Frequency counter	2850 to 3150 Hz	
5. Recorder	Mode selector	OFF				
			EQUIPMENT SETUP: FIGURE 3-70 CONNECTION B			
6. Dc source	OUTPUT control	12.0 Vdc				
7. Repeat step 4.			600 ohm load TX-1, R connection	Voltmeter	Greater than -3 dBm	
			Same as above	Frequency counter	2850 to 3150 Hz	

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
8. Recorder	Mode selector	OFF				
9. Recorder	EJECT button	Press Replace test tape with blank cassette.				
FLUTTER			EQUIPMENT SETUP: FIGURE 3-71			Para. 3-8
10. Recorder	Channel selector	1				
	AGC/MAN 1 switch	MAN				
	Mode selector	REC				
	GAIN 1 control	Adjust	Recorder	LEVEL meter	Red area	
	Counter	Note counter reading and make short recording.				
11. Recorder	Mode selector	OFF				
12. Recorder	Mode selector	F/R Rewind tape to reading noted in step 10.				

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
12. Recorder-continued	Mode selector	REPRO				
	GAIN 1 control	Adjust to give flutter reading.	600 ohm load TX-1, R connection	Flutter meter	Flutter does not exceed 1.5% RMS, 0.1 to 250 Hz	
13. Recorder	Mode selector	OFF				
ERASE EFFICIENCY			EQUIPMENT SETUP: FIGURE 3-72 (Use blank cassette.)			Para. 3-11
14. Recorder	Channel selector	1				
	AGC/MAN 1 switch	MAN				
15. Filter	LOW CUT-OFF FREQUENCY HZ dial	Adjust to cut off below 200 Hz.				
	HIGH CUT-OFF FREQUENCY HZ dial	Adjust to cut off above 800 Hz.				
16. Generator	Frequency dial	1 kHz				
	OUTPUT control	Adjust	Generator output	Voltmeter	0 dBm	

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
17. Recorder	Mode selector	REC				
	GAIN 1 control	Adjust	Recorder	LEVEL meter	Red area	
18. Generator	OUTPUT control	Adjust	Generator output	Voltmeter	+12 dBm	
			Recorder	LEVEL meter	Full scale	
19. Recorder	Counter	Note counter reading and make short recording.				
20. Recorder	Mode selector	OFF				
		Note counter reading.				
21. Recorder	Mode selector	F/R				
		Rewind tape to midpoint of recording made in step 19.				
22. Generator		Disconnect cable from generator.				
23. Recorder	RCVR jack	Short terminals together.				
	Mode selector	Allow counter to pass reading noted at end of step 20.				

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
24. Recorder	Mode selector	OFF				
25. Recorder	Mode selector	F/R				
		Rewind tape to counter reading of short recording in step 19.				
	Mode selector	REPRO				
	GAIN 1	Adjust	Connected to filter and filter connected to 600 ohm load TX-1, R connection	Voltmeter	+10 dBm	
26. Recorder	Mode	OFF		Voltmeter	-30 dBm when passing recording made in step 19.	
27.	Repeat steps 14 through 26 for channel 2, using channel 2 controls. Connect generator to MIC jack.		For channel 2, use 600 ohm load TX-1, T connection.			
FREQUENCY RESPONSE			EQUIPMENT SETUP: Figure 3-73			Para. 3-9
28. Generator	Frequency dial	1 kHz				
	OUTPUT control	Adjust	Generator output	Voltmeter	0 dBm	

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
29. Recorder	Channel selector	1				
	AGC/MAN 1 switch	MAN				
	Mode selector	REC				
	GAIN 1 control	Adjust	Recorder	LEVEL meter	Red area	
30. Recorder	Mode selector	OFF				
31. Generator	OUTPUT control	Adjust	Generator output	Voltmeter	-10 dBm	
32. Recorder	Mode selector	REC	Recorder	Counter	Note reading.	
33.	Continue recording, do not change recorder controls.					
34. Generator	Frequency dial	200 Hz	Generator output	Voltmeter	-10 dBm	
	Frequency dial	Slowly increase frequency to 4 kHz. Stop briefly at 200 Hz, 400 Hz, 800 Hz, 2 kHz, 3 kHz and 4 kHz.	Generator output	Voltmeter	-10 dBm over entire range.	

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
35. Recorder	Mode selector	OFF				
36. Recorder	Mode selector	F/R				
		Rewind tape to counter reading noted in step 32.				
37. Recorder	Mode selector	REPRO				
	GAIN 1 control	Adjust	600 ohm load TX-1, R connection	Voltmeter	0 dBm when 1 kHz signal is reproduced and from -3 dBm to +3 dBm as all other frequencies are reproduced.	
38. Recorder	Mode selector	OFF				
39.	Repeat steps 28 through 38 for channel 2, using channel 2 controls. Connect generator to RCVR jack.		For channel 2, use 600 ohm load TX-1, T connecti ..			
SIGNAL PLUS NOISE TO NOISE			EQUIPMENT SETUP: FIGURE 3-73 (Use blank cassette.)			Para. 3-9

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
40. Generator	Frequency dial	400 Hz				
	OUTPUT control	Adjust	Generator output	Voltmeter	0 dBm	
41. Recorder	Channel selector	1				
	AGC/MAN 1 switch	MAN				
	Mode selector	REC				
	GAIN 1 control	Adjust	Recorder	LEVEL meter	Red area	
42. Recorder	Mode selector	OFF				
43. Generator	OUTPUT control	Adjust	Generator output	Voltmeter	+10 dBm	
44. Recorder	Mode selector	REC	Recorder	LEVEL meter	Meter exceeds full scale.	
				Counter	Note counter reading and make short recording.	

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
45. Generator		Disconnect from RCVR jack.		Counter	Note counter reading and make short recording.	
46. Recorder	Mode selector	OFF				
47. Recorder	Mode selector	F/R				
		Rewind tape to reading noted in step 44.				
48. Recorder	Mode selector	REPRO	600 ohm load TX-1, R connection	Voltmeter	+10 dBm until generator is disconnected; reading then is less than -25 dBm.	
49. Recorder	Mode selector	OFF				
50.	Repeat steps 40 through 49 for channel 2, using channel 2 controls. Connect generator to RCVR jack.		For channel 2, use 600 ohm load TX-1, T connection.			
CROSS TALK			EQUIPMENT SETUP: FIGURE 3-74 (Use blank cassette.)			Para. 3-9
51. Generator	Frequency dial	400 Hz				
	OUTPUT control	Adjust	Generator output	Voltmeter	0 dBm	

Table 3-13. Recorder Final Test - Continued

3-190

TM 32-5835-001-24 & P

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
52. Recorder	Channel selector	1				
	AGC/MAN 1 and 2 switches	MAN				
	GAIN 2 control	Max CCW				
	Mode selector	REC				
	GAIN 1 control	Adjust	Recorder	LEVEL meter Counter	Red area Note reading and make short recording.	
53. Recorder	Mode selector	OFF		Counter	Note reading.	
54. Generator		Connect to channel 2 connector of test cable TX-4 and short channel 1 connection.				
55. Generator		Verify settings of step 51.				

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
56. Recorder	Channel selector	2	Recorder	LEVEL meter Counter	Red area Note reading and make short recording.	
	GAIN 1 control	Max CCW				
	Mode selector	REC				
	GAIN 2 control	Adjust				
57. Recorder	Mode selector	OFF				
58. Recorder	Mode selector	F/R				
		Rewind tape to reading noted in step 56.				
59. Filter	LOW CUT-OFF FREQUENCY Hz dial	Adjust to cutoff below 200 Hz.				
	HIGH CUT-OFF FREQUENCY dial	Adjust to cutoff below 800 Hz.				

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
60.	Filter	Connect to 600 ohm load TX-1, T connection.				
61.	Recorder	Mode selector REPRO				
		GAIN 2 control Adjust	Filter output	Voltmeter	0 dBm	
62.	Recorder	Mode selector OFF				
63.	Recorder	Mode selector F/R Rewind tape to reading noted in step 52.				
64.	Filter	Connect to channel 1 connector of test cable TX-4.				
65.	Recorder	Channel selector 1 Mode selector REPRO				
		GAIN 1 control Adjust	Filter output	Voltmeter	0 dBm	
66.	Recorder	Mode selector OFF				

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
67. Recorder	Mode selector	F/R Rewind tape to reading noted in step 52.				
68. Filter		Connect to channel 2 connector of test cable TX-4.				
69. Recorder	Channel selector	2				
	Mode selector	REPRO	Filter output	Voltmeter	-35 dBm or less	
	Mode selector	OFF				
	Mode selector	F/F Wind tape to reading noted in step 56.				
70. Filter		Connect to 600 ohm load TX-1, R connection.				
71. Recorder	Channel selector	1				
	Mode selector	REPRO	Filter output	Voltmeter	-35 dBm or less	

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
72. Recorder	Mode selector	OFF				
AUDIO OUTPUT AND DISTORTION			EQUIPMENT SETUP: FIGURE 3-75			Para. 3-9
73. Generator	Frequency dial	1 kHz				
	OUTPUT control	Adjust	Generator output	Voltmeter	0 dBm	
74. Recorder	Channel selector	1				
	Mode selector	REC				
	AGC/MAN 1 switch	MAN				
	GAIN 1 control	Adjust	Recorder	LEVEL meter	Red area	
				Counter	Note reading and make short 10 count recording.	
75. Recorder	Mode selector	OFF				

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
76. Recorder	Mode selector	F/R Rewind tape to reading noted in step 73.				
77. Recorder	Mode selector	REPRO	600 ohm load TX-1, R connection.	Voltmeter	Verify output is minimum +13 dBm.	
	GAIN 1 control	Adjust	Same as above	Voltmeter	0 dBm	
			Same as above	Analyzer	Measure distortion as 1000 Hz recording is reproduced. Distortion less than 5%.	
78. Recorder	Mode selector	OFF				
79.	Repeat steps 73 through 78 for channel 2, using channel 2 controls.		Connect generator to channel 2 connection of test cable TX-4. Connect analyzer to 600 ohm load TX-1, T connection.			
AGC			EQUIPMENT SETUP: FIGURE 3-73			Para. 3-9
80. Generator	Frequency dial	1 kHz				
	OUTPUT control	Adjust	Generator output	Voltmeter	0 dBm	

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
81. Recorder	Channel selector	1				
	AGC/MAN 1 switch	MAN				
	Mode selector	REC	Recorder	LEVEL meter	Red area	
				Counter	Note counter reading and make short recording.	
	AGC/MAN 1 switch	AGC	Recorder	LEVEL meter	Indicates in red area. Continue monitoring for short recording.	
82. Generator	OUTPUT control	Adjust	Generator output	Voltmeter	+15 dBm	
			Recorder	Counter	Note counter reading and make short recording.	
				LEVEL meter	Red area	
83. Recorder	Mode selector	OFF				

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
84. Recorder	Mode selector	F/R Rewind cassette to reading noted in step 81.				
85. Recorder	AGC/MAN 1 switch	MAN				
	Mode selector	REPRO				
	GAIN 1 control	Adjust	600 ohm load TX-1, R connection	Voltmeter	0 dBm for recording made in step 81 and remains between -3 dBm and +3 dBm for remainder of recording.	
86. Recorder	Mode selector	OFF				
87.	Repeat steps 80 through 85 for channel 2, using channel 2 controls.					
		Connect generator to channel 2 connection of test cable TX-4. Connect voltmeter to 600 ohm load TX-1, T connection.				

Table 3-13. Recorder Final Test - Continued

3-198

TM 32-5835-001-24 & P

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
MICROPHONE			EQUIPMENT SETUP: FIGURE 3-76			Para. 3-9
88. Generator	Frequency dial	1 kHz				
	OUTPUT control	Adjust	Generator output	Voltmeter	0.0005V	
89. Recorder	Channel selector	1				
	AGC/MAN 1 switch	MAN				
	Mode selector	REC				
	GAIN 1 control	Adjust	Recorder	LEVEL meter	Red area	
				Counter	Note reading and continue recording.	
	AGC/MAN 1 switch	AGC	Recorder	LEVEL meter	Indication remains in red area.	
				Counter	Note reading and make short recording.	
90. Recorder	Mode selector	OFF				

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
91. Recorder	Mode selector	F/R Rewind cassette to reading noted in step 89.				
	AGC/MAN 1 switch	MAN				
	Mode selector	REPRO				
	GAIN 1 control	Adjust	600 ohm load TX-1, R connection Same as above	Voltmeter Voltmeter	0 dBm -3 dBm to +3 dBm as recording made in step 89 is reproduced.	
92. Recorder	Mode selector	OFF				

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
93.	Repeat steps 88 through 92 for channel 2, using channel 2 controls.	<p>Connect generator to channel 2 connector of test cable TX-4.</p> <p>Connect voltmeter to 600 ohm load TX-1, T connection.</p>				
INPUT-OUTPUT SIGNAL			EQUIPMENT SETUP: FIGURE 3-77 (Use blank cassette.)			Para. 3-6
94.	Generator	Frequency dial				
		OUTPUT control	Generator output	Voltmeter	0.0005V	
95.	Generator					
		J1 pins 3 and 9.				
96.	Recorder	Channel selector				
		1				
		AGC/MAN 1 and 2 switches				
		AGC				
		Mode selector	Recorder	LEVEL meter	Red area	
		REC				

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
96. Recorder-continued				Counter	Note reading and make short recording.	
97. Recorder	Mode selector	OFF		Counter	Note reading.	
98. Generator	Frequency dial	400 Hz				
	OUTPUT control	Adjust	Generator output	Voltmeter	0 dBm	
99. Generator		J1, pins 1 and 2				
100. Recorder	Mode selector	REC	Recorder	LEVEL meter	Red area	
				Counter	Note reading and make short recording.	
101. Recorder	Mode selector	OFF				
102. Repeat step 98.						
103. Generator		J1, pins 10 and 2 Connect 600 ohm load TX-1 to RCVR jack.				

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
104. Recorder	Channel selector	2	Recorder			
	Mode selector	REC		LEVEL meter	Red area	
				Counter	Note reading and make short recording.	
105. Recorder	Mode selector	OFF		Counter	Note reading.	
106. Generator		J1, pins 8 and 9				
107. Generator	Frequency dial	1 kHz	Generator output			
	OUTPUT control	Adjust		Voltmeter	0.0005V	
108. Recorder	Mode selector	REC	Recorder	LEVEL meter	Red area. Make short recording.	
109. Recorder	Mode selector	OFF		Counter	Note reading.	
				NOTE		
			The cassette now contains sequential recordings of 1 kHz CH1, blank CH2; 400 Hz CH1, blank CH2; 400 Hz CH2, blank CH1; and 1 kHz CH2, blank CH1.			

Table 3-13. Recorder Final Test - Continued

Procedure			Normal Indication			Remarks
Location	Item	Action	Location	Indicator	Indication	
110. Recorder	Mode selector	F/R Rewind cassette to reading noted in step 96.				
111. Power supply		Remove all connections from J1 and RCVR jack.				
112. Recorder		Connect headset to HD PHONE jack.				
	AGC/MAN 1 and 2 switches	MAN				
	Mode selector	REPRO				
	GAIN 1 and 2 controls	Adjust	Recorder	Headset	Verify that tones and absence of tones are reproduced as channel selector is set to 1, 1 and 2, and 2 positions.	

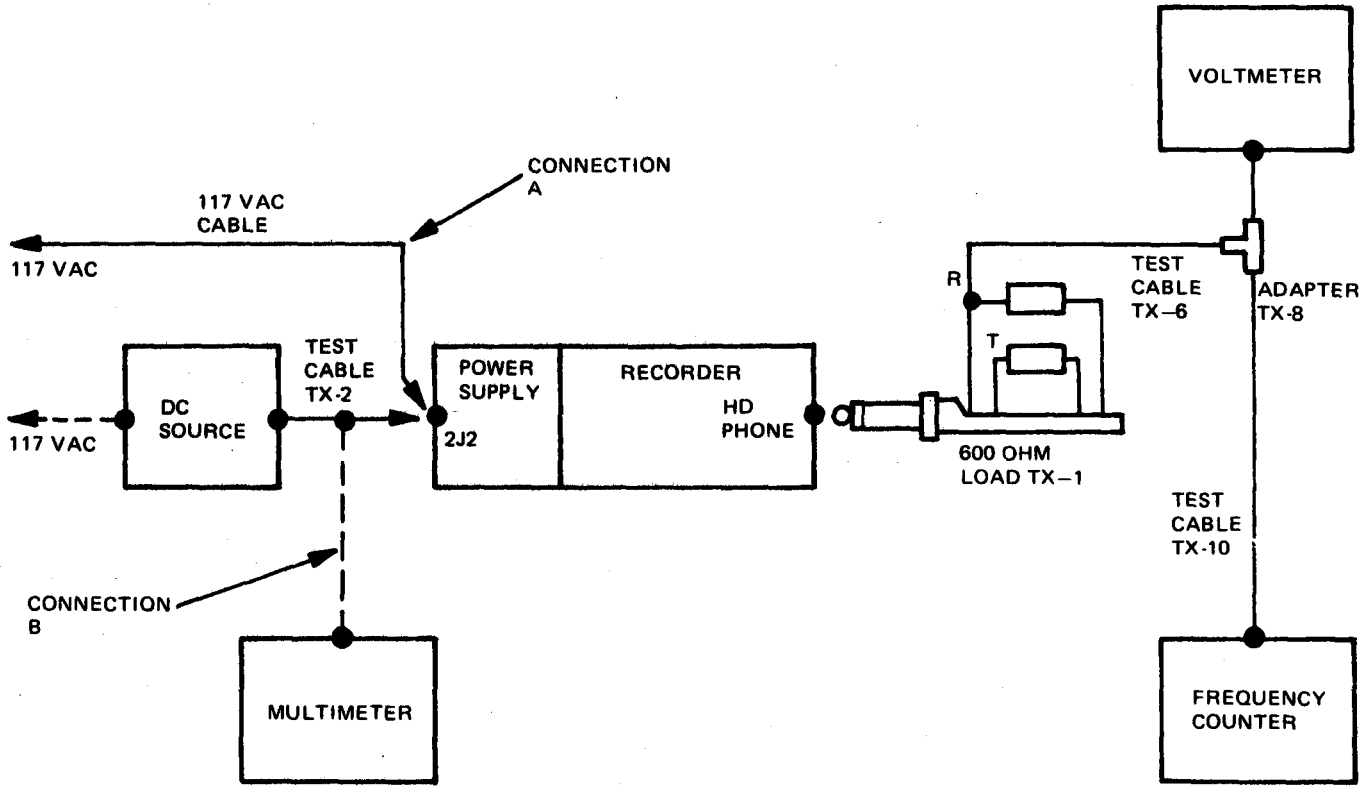


Figure 3-70. Tape Speed Final Test, Equipment Setup

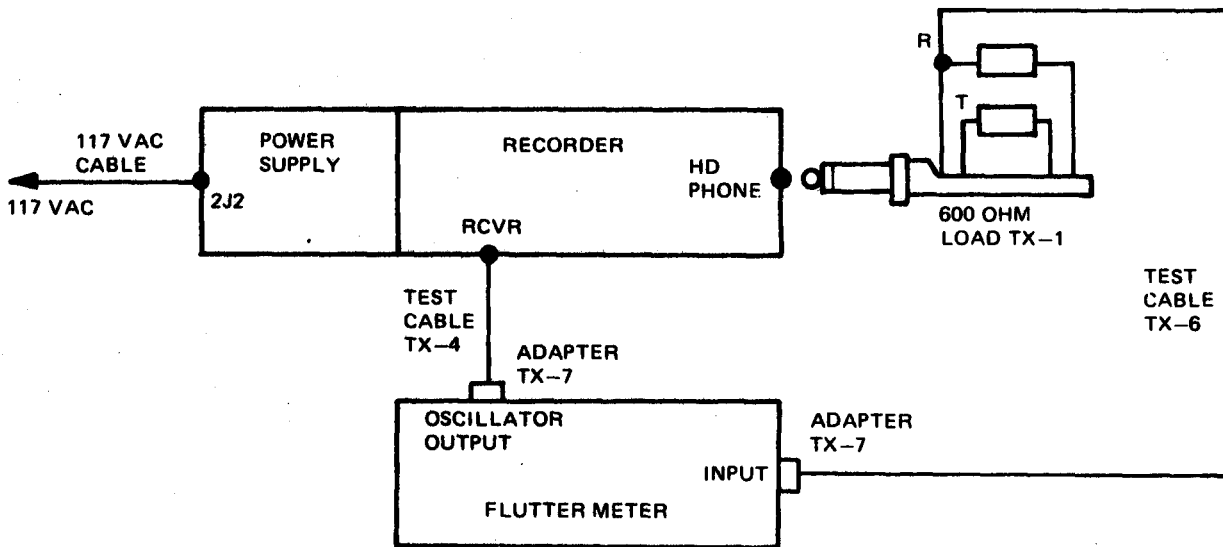


Figure 3-71. Flutter Final Test, Equipment Setup

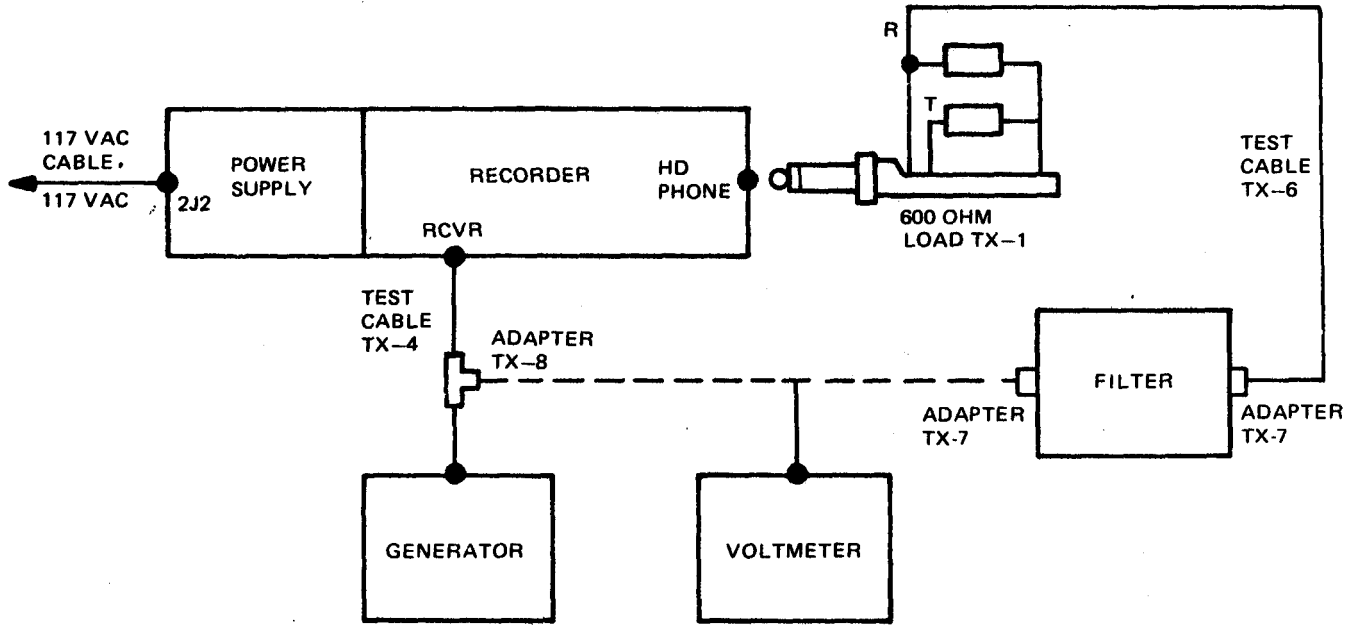


Figure 3-72. Erase Efficiency Final Test, Equipment Setup

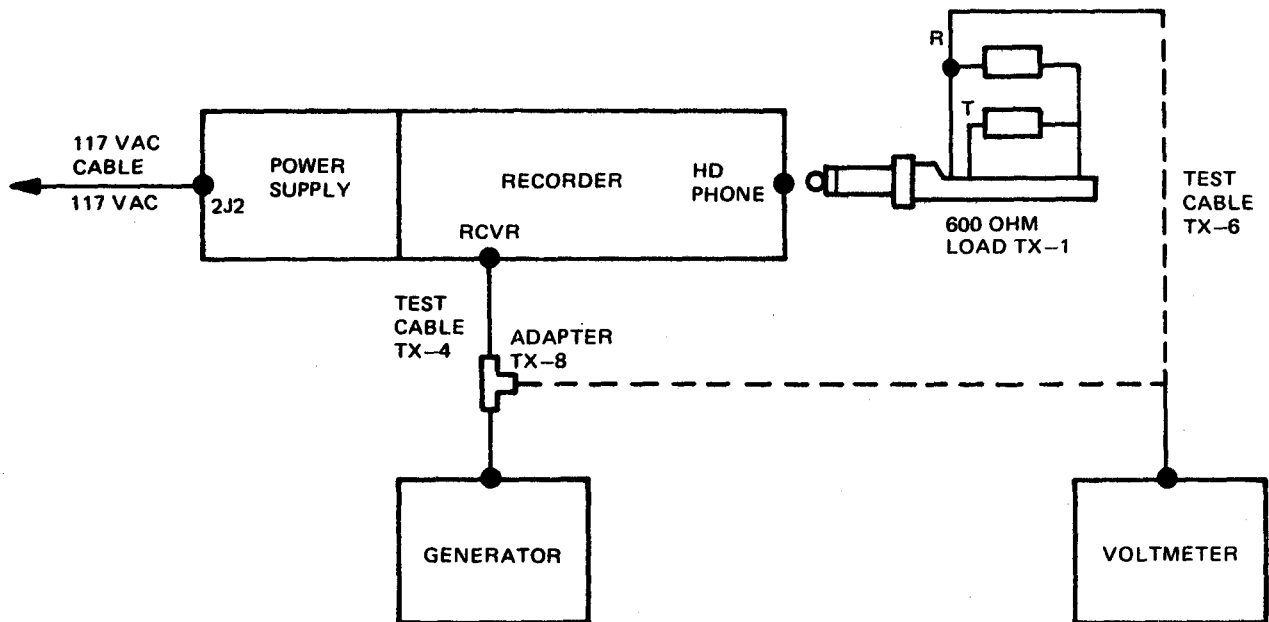


Figure 3-73. Frequency Response, Signal Plus Noise to Noise, and AGC Final Test, Equipment Setup

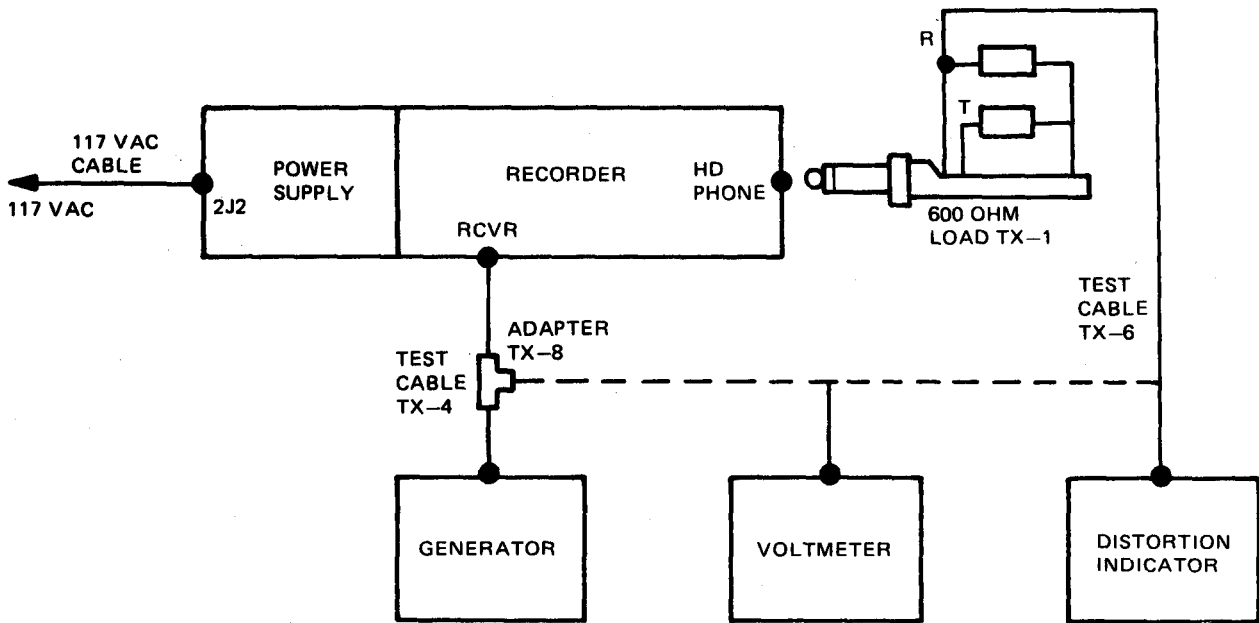


Figure 3-74. Crosstalk Final Test, Equipment Setup

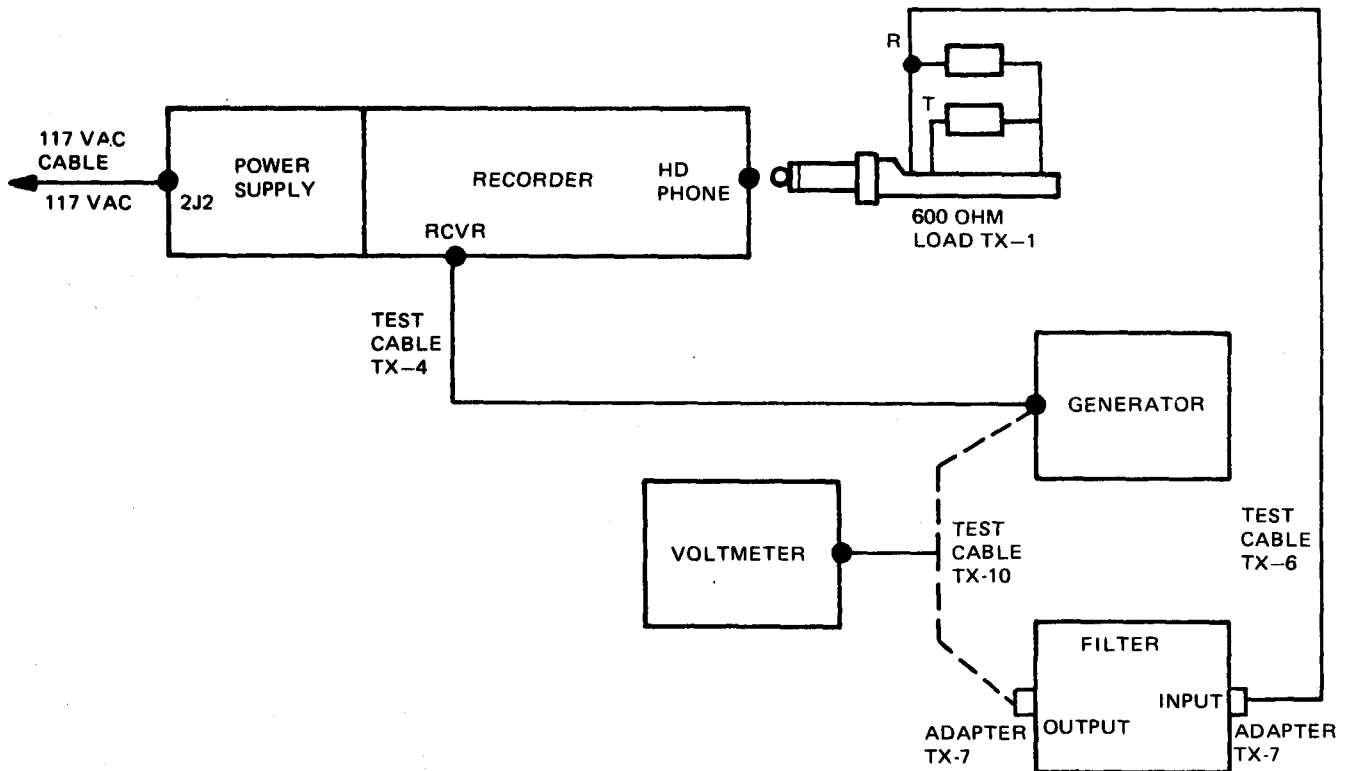


Figure 3-75. Audio Output and Distortion Final Test, Equipment Setup

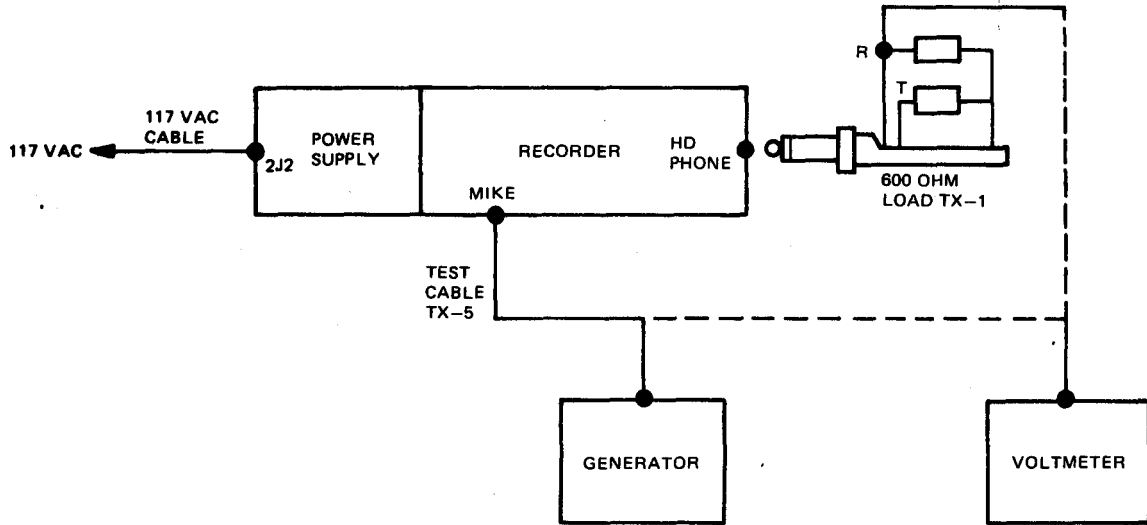


Figure 3-76. Microphone Final Test, Equipment Setup

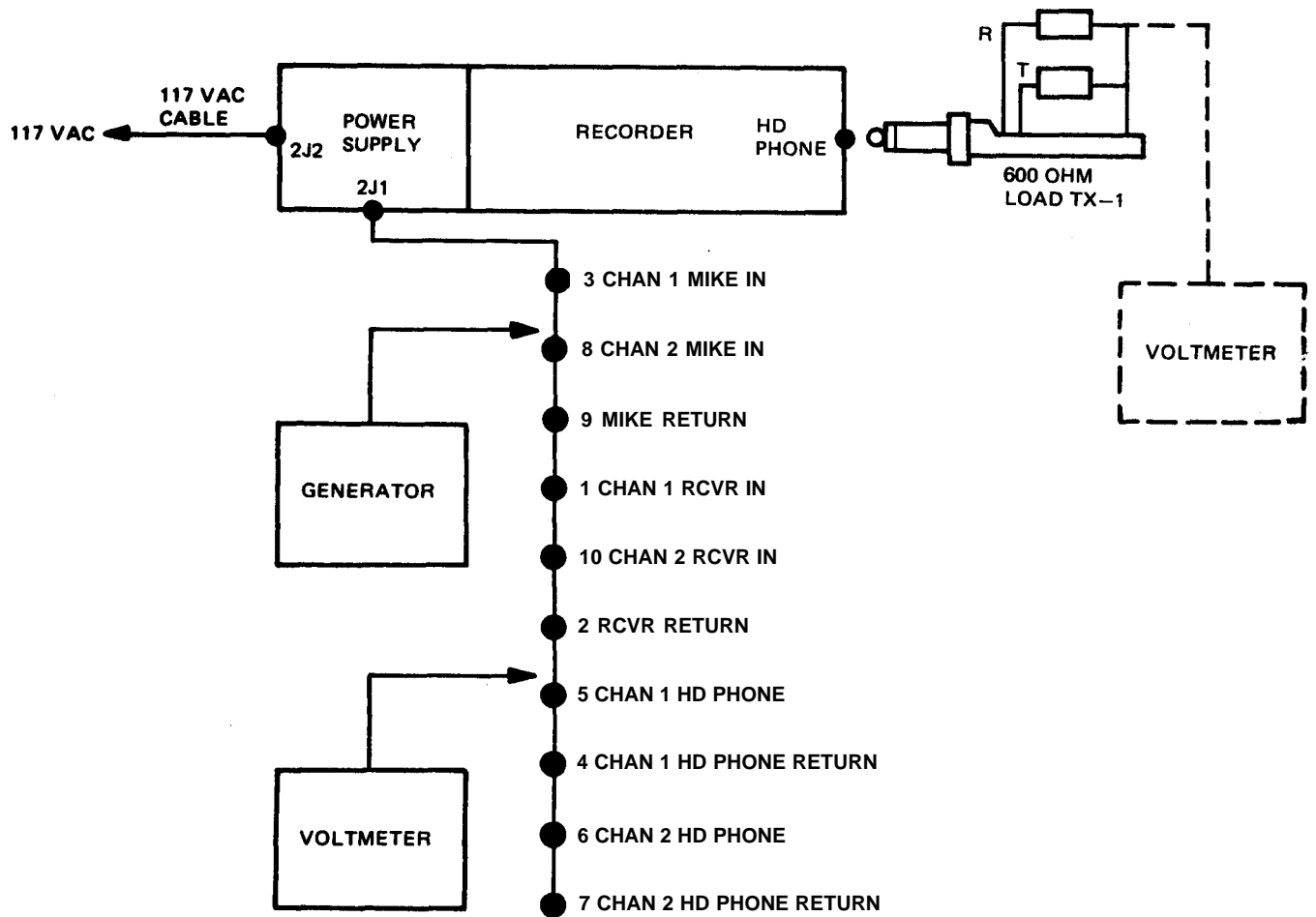


Figure 3-77. Input-Output Signal Final Test, Equipment Setup

APPENDIX A

REFERENCES

A-1. SCOPE

This, appendix lists all forms and publications that the technician may require.

A-2. FORMS

Recommended Changes to Publications and Blank Forms . . . DA Form 2028 and
DA Form 2028-2
Quality Deficiency Report SF 368

A-3. TECHNICAL MANUALS

Packaging of Materiel-
Preservation (Vol. I) TM 38-230-1
Preservation, Packaging, and Packing of
Military Supplies and Equipment,
Packing (Vol. II) TM 32-230-2
Preparation of Industrial Plant Equipment
for Storage or Shipment TM 38-260
The Army Maintenance Management System (TAMMS) TM 38-750
Administrative Storage of Equipment TM 740-90-1

A-4. MISCELLANEOUS PUBLICATIONS

Index of Technical Publications DA PAM 310-4
US Army Equipment Index of
Modification Work Orders DA PAM 310-7
Recording Techniques and Theory NASA 5038

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

B-1. General.

The maintenance allocation chart identifies the maintenance operations that must be performed. It assigns each of those operations to the lowest level of maintenance authorized to perform the complete task, or any part of the task, in terms of availability of time, tools, test and support equipment, skills and employment of the subsystem.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall responsibility for the performance of maintenance functions for the AN/UNH-16A.

c. Section III lists the special tools and test equipment required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions on explanatory notes for a particular maintenance function.

B-2. Maintenance Functions.

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

b. Test. To verify serviceability and detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

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

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

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

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

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

TM 32-5835-001-24 & P

h. Replace. The act of substituting a serviceable like type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services¹ or other maintenance actions² to restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly) , and items, or system.

j. Overhaul. The maintenance effort (services/actions) necessary to restore an item to a completely serviceable /operational condition as prescribed by maintenance standards (i. e. , DMWR) in appropriate technical publication. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

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

B-3. Column Entries Used in the MAC.

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

b. Column 2, Component /Assembly. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the functions to be performed on the item listed in column 2. (For detailed explanation of these functions, see para. B-2).

d. Column 4, Maintenance Category.

(1) Column 4 specifies, by the listing of a "work time" figure in the appropriate sub-column (s) , the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform the maintenance function, at the indicated level of maintenance.

(2) If the number or complexity of the tasks within the listed maintenance function vary at different maintenance, appropriate "work time" figures will be shown for each level. The number of man-hours specified by the "work time" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance /quality control time in addition to the time required to perform the specific

¹Services - inspect, test, service, adjust, align, calibrate, or replace.

²Action - welding, grinding, riveting, straightening, facing, remachining, or resurfacing.

tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance levels are as follows :

- C - Operator or crew.
- O - Organizational maintenance.
- F - Direct support maintenance.
- H - General support maintenance.
- D - Depot maintenance.

e. Column 5, Tools and Equipment. Column 5 specifies, by code, those common tool sets (not individual tools) and special tools, test, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains a letter code in alphabetical order which is keyed to the remarks contained in Section IV.

B-4. Column Entries Used in Tool and Test Equipment Requirements (Section III).

a. Column 1, Tool or Test Equipment Reference Code. The tool and test equipment reference code correlates with a maintenance function on the identified end item or component.

b. Column 2, Maintenance Category. The lowest level of maintenance authorized to use the tool or test equipment.

c. Column 3, Nomenclature. Name or identification of the tool or test equipment.

d. Column 4, National/NATO Stock Number. The National or NATO stock number of tool or test equipment.

e. Column 5, Tool Number. The manufacturer's part number.

B-5. Explanation of Columns in Section IV.

a. Reference Code. The code scheme recorded in Column 1, Section III.

b. Remarks. This column lists information pertinent to the maintenance function being performed as indicated on the MAC, Section II.

TM 32-5835-001-24 & P

SECTION II MAINTENANCE ALLOCATION CHART FOR AN/UHN-16A

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT	(6) REMARKS	
			C	O	F	H	D			
00	RECORDER/REPRODUCER SET, SOUND AN/UHN-16A	Inspect Test Service Install Repair	0.1 0.1 0.1	0.1				2.0	13 1-13	A B D H
01	SHOCK-MOUNT BASE ELECTRICAL EQUIPMENT MT-4032/G	Inspect Service Repair	0.1		0.1 0.2 0.2				1	
02	POWER SUPPLY PP-6875A/G (UNIT 2)	Inspect Test	0.1		0.2 0.2				1, 3, 6, 10, 12, 13	A
		Service Replace Repair Repair	0.1	0.1 0.2	0.2 0.1 2.0				1 1 1, 3, 6, 10, 12, 13	C
0201	SEMICONDUCTOR DEVICE-FUSE ASSEMBLY (2A1)	Inspect Replace Repair Test		0.1 0.2	0.1 0.5 1.0 0.2				1 1 1, 3, 4, 12	F
0202	CIRCUIT CARD ASSEMBLY (2A2)	Inspect Replace Repair Test		0.1	0.1 0.5 2.0 0.2				1 1, 3, 4, 12	F
03	RECORDER/REPRODUCER, SOUND RD-385A/UHN-16A (UNIT 3)	Inspect Test	0.1		0.2 1.0			1.0	1-13	
		Service Adjust	0.1		0.1 0.5				1 1-13	
		Replace Repair Repair		0.1	0.1 0.2			2.0	1-13 1-13	E
0301	RECORDER-REPRODUCER HOUSING (3A1)	Inspect Service Repair	0.1 0.1		0.1 0.1 0.8					A D
0303	RECORDER-REPRODUCER CONTROL (3A3)	Inspect Service Align Repair Test	0.1 0.2		0.1 0.2 0.3 0.5 1.0				1, 13 1	A D
030301	KNOB ASSEMBLY (3A3A1)	Inspect Service Repair	0.1 0.1		0.1 0.1 0.5					
0304	MAGNETIC TAPE TRANSPORT SUBASSEMBLY (3A4)	Inspect Service Repair Test			0.1 0.2 1.0 1.0			2.0	1, 13	
030401	SLIDE PLATE SUBASSEMBLY (3A4A1)	Inspect Adjust Service Repair Test			0.1 0.3 0.1 1.0 1.0				13 1, 13	
03040101	HEAD MOUNTING ASSEMBLY (3A4A1A1)	Inspect Service Adjust Repair Test			0.1 0.1 0.2 1.0 1.0				11 1 1	

SECTION II MAINTENANCE ALLOCATION CHART
FOR
AN/UNH-16A

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
03040104	DRIVE WHEEL SUBASSEMBLY (3A4A1A4)	Inspect Service Replace Repair			0.1 0.1 0.8 0.4			1 1	
030402	COUNTER PULLEY ASSEMBLY (3A4A2)	Inspect Service Adjust Repair Test			0.1 0.1 0.1 1.0 0.3			1 1	
030403	EJECTOR ASSEMBLY (3A4A3)	Inspect Adjust Repair Test			0.1 0.1 0.5 0.1			1	
030404	SWITCH ASSEMBLY (3A4A4)	Inspect Service Adjust Repair Test			0.1 0.1 0.5 1.0 1.0			1	
030405	CIRCUIT CARD ASSEMBLY (3A4A5)	Inspect Service Replace Repair Test			0.1 0.1 0.5 1.0		2.0	1	E G
030406	CIRCUIT CARD ASSEMBLY (3A4A6)	Inspect Service Replace Repair Test			0.1 0.1 0.5 1.0		2.0	1	E G
030407	CIRCUIT CARD ASSEMBLY (3A4A7)	Inspect Service Replace Repair Test			0.1 0.1 0.5 1.0 1.0			1 1	F
030408	CIRCUIT CARD ASSEMBLY (3A4A8)	Inspect Service Replace Repair Test			0.1 0.1 0.5 1.0 1.0			1 1	F
030409	RESISTOR ASSEMBLY (3A4A9)	Inspect Service Replace Repair Test			0.1 0.1 1.0 1.0 1.0			1 1	F
0304010	FILTER ASSEMBLY (3A4A10)	Inspect Service Replace Repair Test			0.1 0.1 0.5 1.0 0.5			1 1	F
0204011	CIRCUIT CARD ASSEMBLY (3A4A11)	Inspect Service Replace Repair Test			0.1 0.1 0.5 1.0 1.0			1 1	F
0304012	RECORDER-REPRODUCER SENSOR (3A4A12)	Inspect Service Repair Test			0.1 0.1 0.5			1	

TM 32-5835-001-24 & P

SECTION II MAINTENANCE ALLOCATION CHART
FOR
AN/UNH-16A

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY					(5) TOOLS AND EQUIPMENT	(6) REMARKS
			C	O	F	H	D		
0304013	CTUATOR ASSEMBLY (3A4A 13)	Inspect Service Repair Test			.1 .1 .5 .0			1	
0304014	ISK REEL ASSEMBLY (3A4A 14)	Inspect Service Repair Adjust Test			.1 .1 .8 .5 .0			1	
0304016	ISK REEL ASSEMBLY (3A4A 16)	Inspect Service Repair Adjust Test			.1 .1 .8 .5 .0			1	
0304018	C MOTOR ASSEMBLY (3A4A 18)	Inspect Service Adjust Repair Test			.1 .1 .2 .0 .3			1 1	

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
AN/UNH-16A

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER
1	O,F,D	TOOL KIT, ELECTRONIC EQUIPMENT EK-105/G	5180-00-610-8177	10650580
2	F,D	COUNTER, ELECTRONIC DIGITAL READOUT AN/USM-207A	6625-00-044-3228	
3	F,D	OSCILLOSCOPE - AN/USM-281C	6625-00-106-9622	
4	F,D	MULTIMETER - AN/USM-223	6625-00-999-7465	
5	F,D	GENERATOR, AUDIO - AN/URM-127A	6625-00-104-4587	
6	F,D	VOLTMETER, ELECTRONIC - AN/USM-224	6625-00-727-4706	10689618
7	F,D	INDICATOR, DISTORTION - AN/URM-184A	6625-00-802-8718	
8	F,D	FILTER, VARIABLE - KROHN HITE 3103-4	5915-00-138-0878	
9	F,D	FLUTTER, METER - MF-254A/U	6625-00-987-8527	
10	F,D	POWER SUPPLY, DC. PP6547/U	6130-00-480-5666	
11	O,F,D	DEMAGNETIZER	5905-00-625-7133	
12	F,D	TRANSFORMER, VARIABLE CN-16/U	5950-00-235-2086	
13	F,D	MAINTENANCE KIT, MK-1977/UNH-16A		

SECTION IV. REMARKS

REFERENCE CODE	REMARKS
A	External inspection only.
B	External self test only.
C	Replace fuses only.
D	Cleaning of external surfaces only.
E	Only boards 3A4A5 and 3A4A6 are replaceable.
F	Limited to board failures such as fractures, charring or open printed wiring.
G	Complete repair to be accomplished at a specialized repair activity to be designated by the commander USAEMRA, VHFS, Warrenton, VA.
H	Refer to paragraph 2-3 for installation instructions.

APPENDIX C

ORGANIZATIONAL, DIRECT SUPPORT, AND
GENERAL SUPPORT MAINTENANCE
REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

C-1. Scope.

This manual lists spares and repair parts; special tools; special test, measurement, and diagnostic equipment (TMDE), and other special support equipment required for performance of organizational, direct support, and general support maintenance of the Recorder-Reproducer Set, Sound AN /UN H-16A. It authorizes the requisitioning and issue of spares and repair parts as indicated by the source and maintenance codes.

C-2. General.

This Repair Parts and Special Tools List is divided into the following sections:

a. Section II. Repair Parts List. A list of spares and 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 numeric sequence, with the parts in each group listed in figure and item number sequence. Bulk materials are listed in NSN sequence.

b. Section III. Special Tools List. A list of special tools, special TMDE, and other special support equipment authorized for the performance of maintenance.

Section IV. National Stock Number and Part Number Index. A list, in National item identification number (NIIN) sequence, of all National stock numbers (NSN) 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. This index is followed by a cross-reference list of reference designators to figure and item numbers.

C-3. Explanation of Columns.

a. Illustration. This column is divided as follows:

(1) Figure Number. Indicates the figure of the illustration on which the item is shown.

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

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

(1) Source Code. Source codes 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:

TM 32-5835-001-24 & P

Code	Definition
PA	Item procured and stocked for anticipated or known usage.
PB	Item procured and stocked for insurance purpose because essentiality dictates that a minimum quantity be available in the supply system.
PC	Item procured and stocked and which otherwise would be coded. PA except that it is deteriorative in nature.
PD	Support item, excluding support equipment, procured for initial or outfitting and stocked only for subsequent or additional initial issues or outfittings. Not subject to automatic replenishment.
PE	Support equipment procured and stocked for initial issue or outfitting to specified maintenance repair activities.
PF	Support equipment which will not be stocked but which will be centrally procured on demand.
PG	Item procured and stocked to provide for sustained support for the life of the equipment. It is applied to an item peculiar to the equipment which, because of probable discontinuance or shutdown of production facilities, would prove uneconomical to reproduce at a later time.
KD	An item of a depot overhaul/repair kit and not purchased separately. Depot kit defined as a kit that provides items required at the time of overhaul or repair.
KF	An item of a maintenance kit and not purchased separately. Maintenance kit defined as a kit that provides an item that can be replaced at organizational or intermediate levels of maintenance.
KB	Item included in both a depot overhaul/repair kit and a maintenance kit.
MO	Item to be manufactured or fabricated at organizational level.
MF	Item to be manufactured or fabricated at the direct support maintenance level.
MH	Item to be manufactured or fabricated at the general support maintenance level.
MD	Item to be manufactured or fabricated at the depot maintenance level.
AO	Item to be assembled at organizational level.
AF	Item to be assembled at direct support maintenance level.
AH	Item to be assembled at general support maintenance level.

Code	Definition
AD	Item to be assembled at depot maintenance level.
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.
XC	Installation drawing, diagram, instruction sheet, field service drawing, that is identified by manufacturer's part number.
XD	A support item that is not stocked. When required, item will be procured through normal supply channels.

NOTE

Cannibalization or salvage may be used as a source of supply for any items coded above except those coded XA 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 fourth position will indicate one of the following levels of maintenance:

Code	Application/Explanation
C	Crew or operator maintenance performed within organizational maintenance.
O	Support item is removed, replaced, used at the organizational level.
F	Support item is removed, replaced, used at the direct support level.
H	Support item is removed, replaced, used at the general support level.
D	Support items that are removed, replaced, used at depot, mobile depot, or specialized repair activity only.

(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.

TM 32-5835-001-24 & P

Code	Application/Explanation
O	The lowest maintenance level capable of complete repair of the support item is the organizational level.
F	The lowest maintenance level capable of complete repair of the support item is the direct support level.
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.
L	Repair restricted to (enter applicable designated specialized repair activity) , Specialized Repair Activity.
Z	Nonreparable. No repair is authorized.
B	No repair is authorized. The item may be reconditioned by adjusting, lubricating, etc. , at the user level. No parts or special tools are procured for the maintenance of this item.

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

Recoverability Codes	Definition
Z	Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.
O	Reparable item. When uneconomically reparable, condemn and dispose at organizational level.
F	Reparable item. When uneconomically reparable, condemn and dispose at the direct support level.
H	Reparable item. When uneconomically 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.
L	Reparable item. Repair, condemnation, and disposal not authorized below depot/specialized repair activity level.
A	Item requires special handling or condemnation procedures because of specific reasons (i.e. , precious metal content, high dollar value, critical material or hazardous material). Refer to appropriate manuals/directives for specific instructions.

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

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

NOTE

When a stock numbered item is requisitioned, the item 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. The physical security classification of the item is indicated by the parenthetical entry (insert applicable physical security classification abbreviation, e.g., Phy Sec C1 (C)-Confidential, Phy Sec C1 (S)-Secret, Phy Sec C1 (T)-Top Secret). Items that are included in kits and sets are listed below the name of the kit or set with the quantity of each item in the kit or set indicated in the quantity incorporated in unit column. When the part to be used differs between serial numbers of the same model, the effective serial numbers are shown as the last line of the description. In the Special Tools List, the initial basis of issue (BOI) appears as the last line in the entry for each special tool, special TMDE, and other special support equipment. When density of equipments supported exceeds density spread indicated in the basis of issue, the total authorization is increased accordingly.

g. Unit of Measure (U/M). Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e. g., ea, in, pr, etc). When the unit of measure differs from 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. A "V" appearing in this column in lieu of a quantity indicates that no specific quantity is applicable, (e.g., shims, spacers, etc).

C-4. Special Information.

a. Usable on codes are shown in the description column. Uncoded items are applicable to all models. Identification of the usable codes used in this publication are:

Code	Used On
A	V1 (aircraft) Configuration
B	V2 (vehicle) Configuration
C	V3 (shelter) Configuration

TM 32-5835-001-24 & P

C-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 item belongs. This is necessary since illustrations are prepared for functional groups, and listings are divided into the same groups.

(2) Second. Find the illustration covering the functional group to which the item belongs.

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

(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 NIIN sequence followed by a list of part numbers in alphameric 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.

This page intentionally left blank.

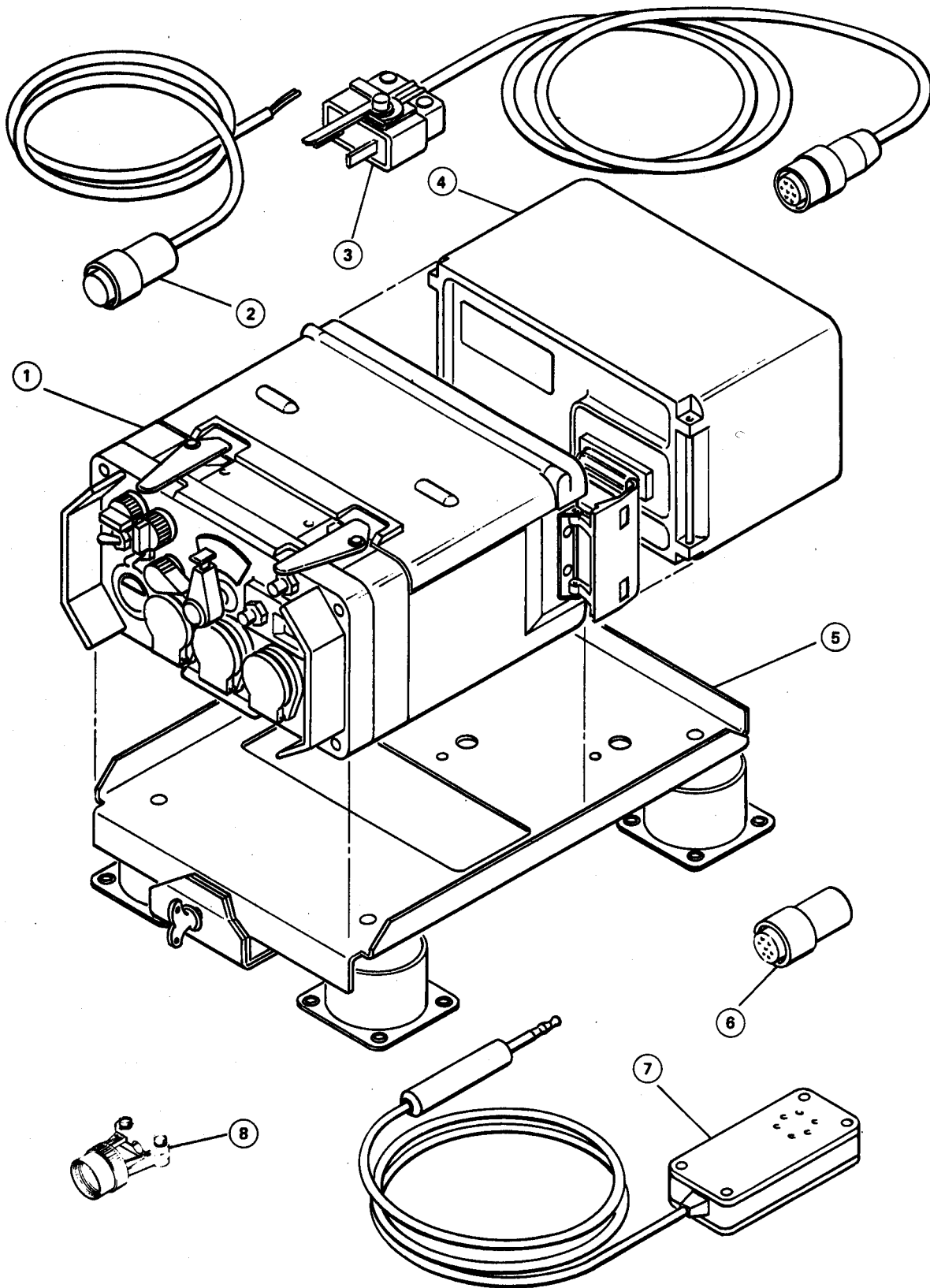


Figure C-1. Recorder-Reproducer Set, Sound AN/UNH-16A

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(6) FSCM DESCRIPTION	(7) U/M (USABLE ON CODE)	(8) QTY INC. IN UNIT
					GROUP 00 RECORDER-REPRODUCER SET, SOUND AN/UNH-16	A	
		XBFFD	5835-00-529-6291	0149-1-4014-2	15942 V1 CONFIGURATION (AIRCRAFT)		
		XBFFD	5835-00-529-6306	0149-1-4014-3	15942 V2 CONFIGURATION (VEHICLE)	B	
		XBFFD	5835-00-529-6307	0149-1-4014-4	15942 V3 CONFIGURATION (SHELTER)	C	
1	1	XBFFD	5835-00-311-5490	0149-1-4177	15942 RECORDER-REPRODUCER, SOUND RD-385A/UNH-16A (SEE FIGURE 6 FOR BREAK- DOWN)	ABC	EA 1
1	2	XBFFF	5995-00-097-8489	0149-1-2093	15942 CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-12894/A	A	EA 1
1	3	XBFFF	5995-00-091-9257	0149-1-2090	15942 CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL CX-12896/A	BC	EA 1
1	4	XBFFD		0149-1-4168	15942 POWER SUPPLY PP-6875A/ UNH-16A (SEE FIGURE 3 FOR BREAKDOWN)	ABC	EA 1
1	5	XBFFF		0149-1-4002	15942 BASE, MOUNT, ELECTRICAL EQUIPMENT MT-4032/G (SEE FIGURE 2 FOR BREAKDOWN)	ABC	EA 1
1	6	XBFFZ	5935-00-247-3108	M81511/06EB0P1	81349 CONNECTOR, ELECTRICAL	AB	EA 1
1	7	XBFFZ		0099-1-4240	15942 MICROPHONE ASSEMBLY, MAGNETIC M104/PNH-4 (MODIFIED)	BC	EA 1
1	8	XBFFZ	5935-00-275-0170	M81511-13-10A1	81349 CLAMP	AB	EA 1

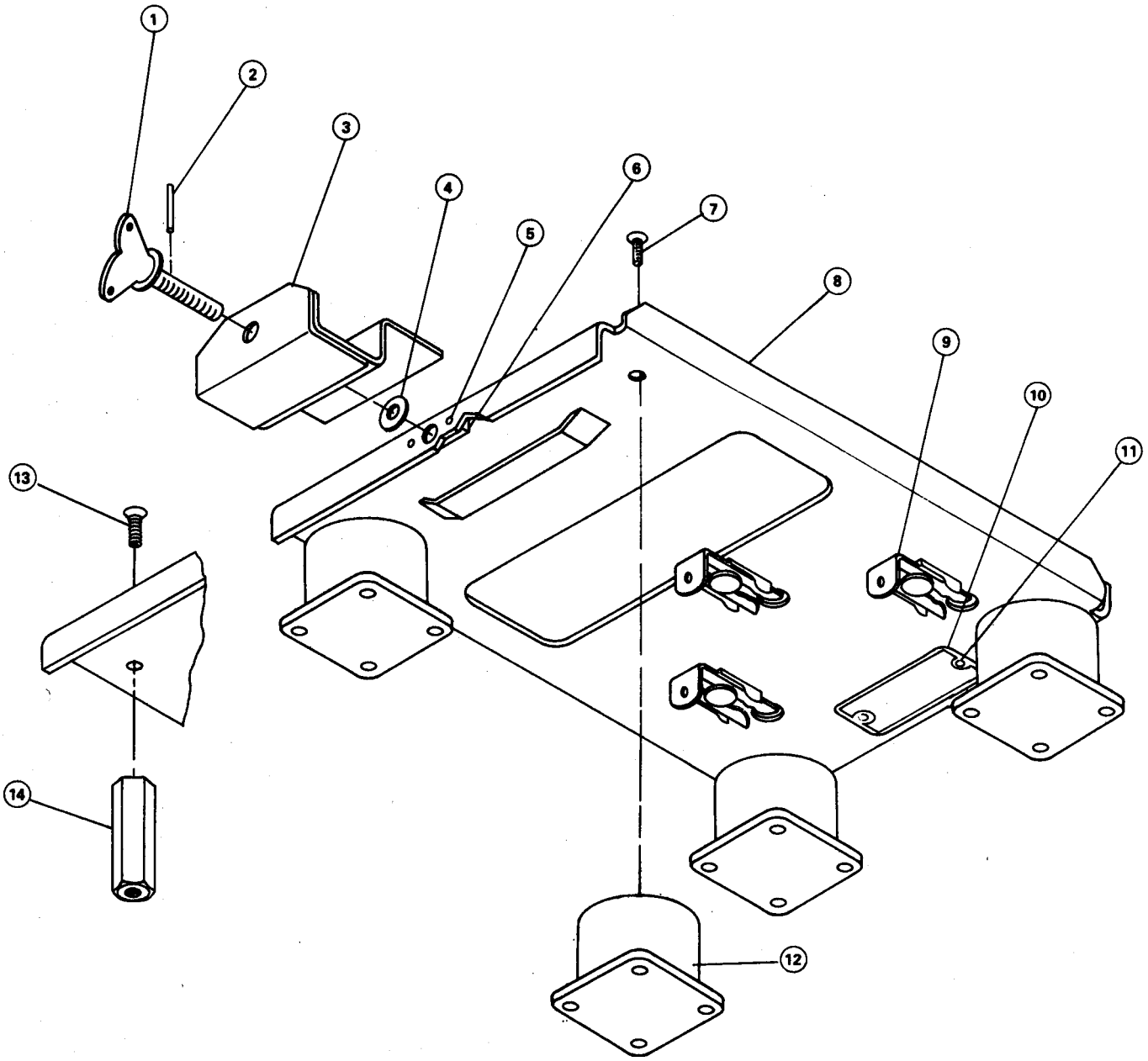


Figure C-2. Base, Mount, Electrical Equipment MT-4032/G

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(6) FSCM	TM32-5835-001-24&P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
						GROUP 01 BASE, MOUNT, ELEC- TRICAL EQUIPMENT MT-4032/G		
						0149-1-4002		
						(SEE FIGURE 1 FOR NHA)		
2	1	XBFZZ		0149-1-2078	15942	SCREW, WING	EA	1
2	2	XBFZZ	5315-00-290-7496	79-012-062-0406	72962	PIN, SPRING	EA	1
2	3	XBFZZ		0149-1-3083	15942	BRACKET, VEHICULAR MOUNT	EA	1
2	4	XBFZZ	5310-00-515-7449	AN960C416L	81350	WASHER, FLAT	EA	1
2	5	XBFZZ		H100 X 9/32 LG	57771	RIVET, TUBULAR	EA	2
2	6	XBFZZ		0149-1-2034	15942	BLOCK	EA	1
2	7	XBFZZ		MS24693-C47	96906	SCREW, FLAT HEAD	EA	4
2	8	XBFZZ		0149-1-4064	15942	BASE, VEHICULAR MOUNT	EA	1
2	9	XBFZZ	5325-00-290-4925	MS21332-3	96906	FASTENER, ANAP-SLIDE	EA	3
2	10	XBFZZ		0149-1-3203	15942	PLATE, IDENTIFICATION	EA	1
2	11	XBFZZ		H149.090DIAx5/32LG	57771	RIVET, TUBULAR	EA	2
2	12	XBFZZ		L44BA3	81860	MOUNT, RESILIENT	EA	4
2	13	XBFZZ	5305-00-079-5835	MS24693-C50	15942	SCREW, MACHINE	EA	4
2	14	XBFZZ		0099-1-2025	15942	STANDOFF	EA	4

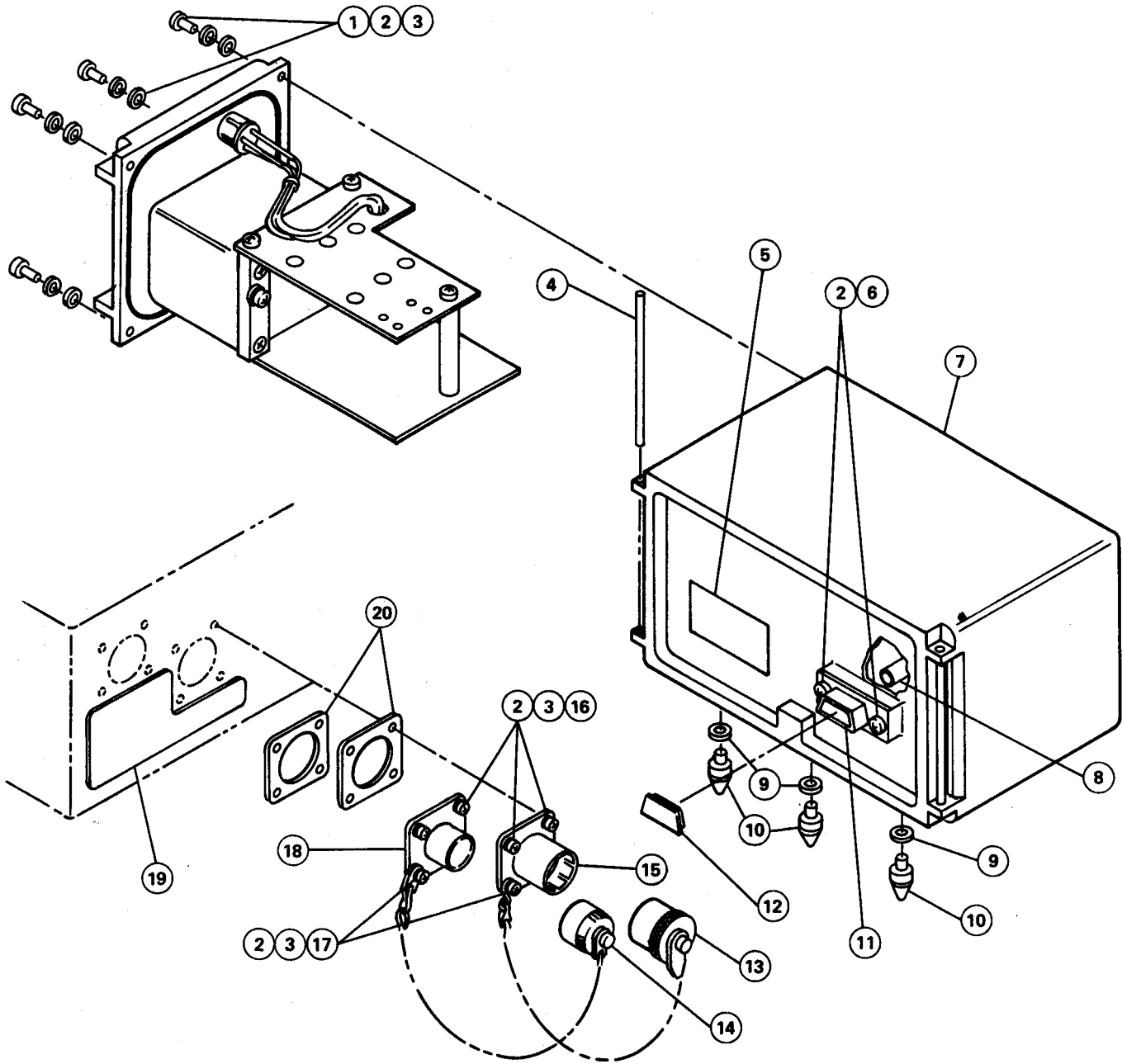


Figure C-3. Power Supply PP-6875A/UNH-16A (sheet 1 of 2)

(1) ILLUSTRATION (A) (B) FIG. ITEM NO. NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	TM32-5835-001-24&P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
					GROUP 02 POWER SUPPLY PP-6875A/UNH-16A		
					0149-1-4168 (15942) (SEE FIGURE 1 FOR NHA)		
3	1	XBFZZ 5305-00-054-5649	MS51957-15	96906	SCREW, MACHINE	EA	4
3	2	XBFZZ 5310-00-933-8118	MS35338-135	96906	WASHER, LOCK	EA	20
3	3	XBFZZ 5310-00-595-6211	MS15795-803	96906	WASHER, FLAT	EA	12
3	4	XBFZZ	0149-1-2024	15942	PIN, LATCH	EA	2
3	5	XBFZZ	0149-1-3204	15942	PLATE, IDENTIFICATION	EA	1
3	6	XBFZZ 5305-00-054-5646	MS51957-12	96906	SCREW, MACHINE	EA	2
3	7	XBFZZ	0149-1-4159	15942	CASE, POWER SUPPLY	EA	1
3	8	XBFZZ	0149-1-2366	15942	BUSING	EA	1
3	9	XBFZZ	NAS620C10L	80205	WASHER, FLAT	EA	3
3	10	XBFZZ	0123-1-2101	15942	LATCH, SNAP-SLIDE, FASTENER	EA	3
3	11	XBFZZ 5935-00-498-5785	DA-15S	71468	CONNECTOR, ELECTRICAL	EA	1
3	12	XBFZZ 5340-00-768-7827	DA59-20	71468	COVER, ELECTRICAL CONNECTOR	EA	1
3	13	XBFZZ 5935-00-359-4607	348-140-10001	02660	COVER, ELECTRICAL CONNECTOR	EA	1
3	14	XBFZZ 5935-00-959-2610	MS3181-10C	96906	COVER, ELECTRICAL CONNECTOR	EA	1
3	15	XBFZZ 5935-00-150-0646	348-40E10-12S1	02660	CONNECTOR, ELECTRICAL	EA	1
3	16	XBFZZ 5305-00-054-5647	MS51957-13	96906	SCREW, MACHINE	EA	6
3	17	XBFZZ 5305-00-054-5648	MS51957-14	96906	SCREW, MACHINE	EA	2
3	18	XBFZZ 5935-00-901-5782	MS3112E10-6P	96906	CONNECTOR, ELECTRICAL	EA	1
3	19	XBFZZ	0149-1-2026	15942	PLATE, DESIGNATION	EA	1
3	20	XBFZZ 5935-00-717-3750	10-101949-10	12143	GASKET	EA	2
3	21	XBFFF	0123-1-2097	15942	SEMICONDUCTOR DEVICE-FUSE ASSY (SEE FIGURE 4 FOR BREAKDOWN)	EA	1
3	22	XBFZZ	0149-1-2363	15942	WASHER, FLAT	EA	1
3	23	XBFZZ	TXB-050-037	71468	HEAT SINK, ELCTRONIC	EA	1
3	24	XBFZZ	013803 NYLON	73734	SETSCREW	EA	1
3	25	PAFZZ 5961-00-836-0377	2N1485	80131	TRANSISTOR	EA	1
3	26	XBFZZ	0149-1-2031-2	15942	MOUNTING, TRANSFORMER	EA	1
3	27	XBFZZ	0149-1-2086	16942	SCREW, FLAT HEAD	EA	4
3	28	XBFZZ	0149-1-2085	15942	POST, ELEC-MECH EQUIPMENT	EA	1
3	29	PAFFF 5835-00-391-8662	0149-1-3020	15942	CIRCUIT CARD ASSEMBLY (SEE FIGURE 5 FOR BREAKDOWN)	EA	1
3	30	PAFZZ 5910-00-838-9421	CK60AW102M	81349	CAPACITOR, FIXED, CERAMIC	EA	3
3	31	XBFZZ	0149-1-2031-1	15942	MOUNTING, TRANSFORMER	EA	1

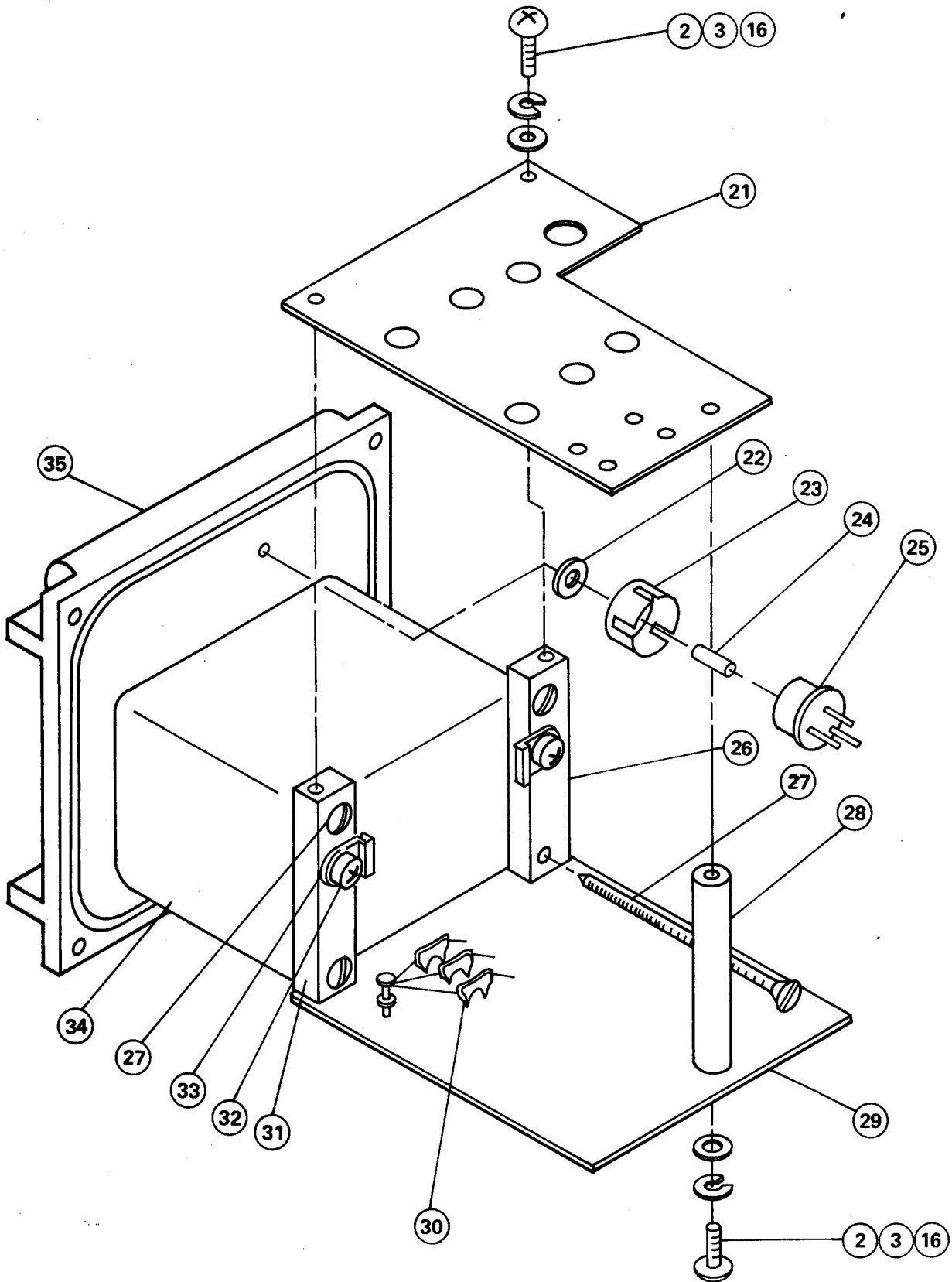


Figure C-3. Power Supply PP-6875A/UNH-16A (sheet 2 of 2)

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(5) FSCM	TM32-5835-001-24&P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
3	32	XBFZZ	5305-00-066-7326	AN507C632R4	81348	SCREW, FLAT HEAD	EA	2
3	33	XBFZZ	5340-00-060-9488	TC-104	59730	PLATE, CLAMP, MOUNT	EA	2
3	34	PAFZZ	5950-00-365-5943	EA112OT1	09349	TRANSFORMER	EA	1
3	35	XBFZZ		0419-1-4067	15942	COVER, POWER SUPPLY	EA	1

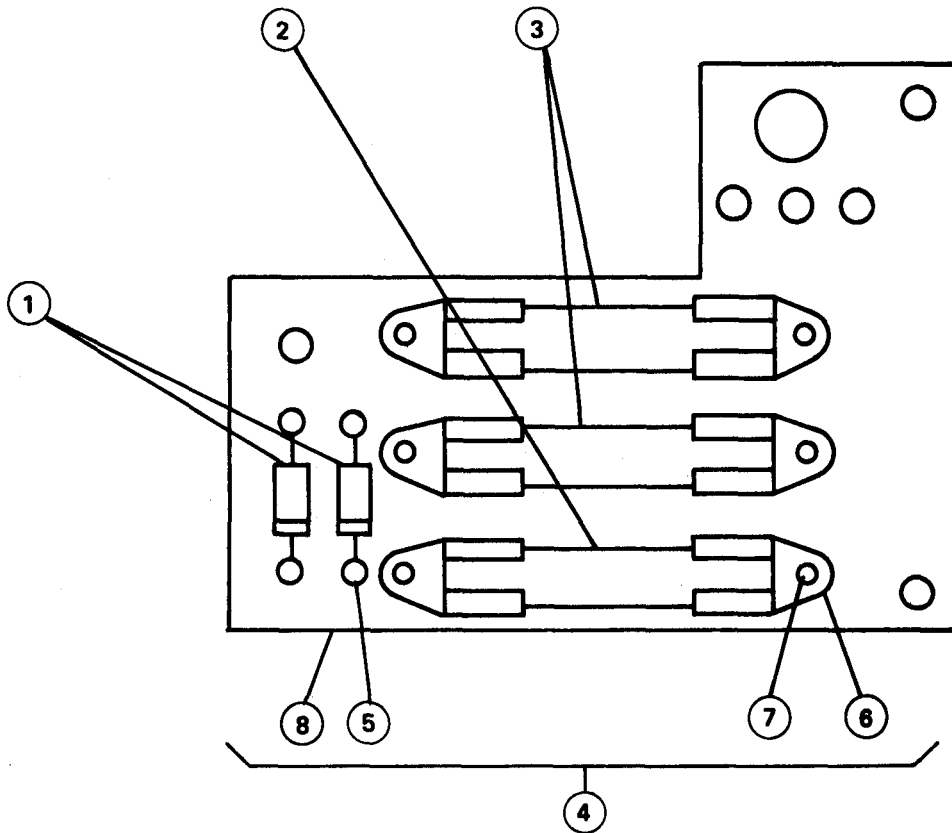


Figure C-4. Semiconductor device-fuse assembly

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG. NO.	(b) ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION		QTY. INC. IN UNIT
						GROUP 0201 SEMICONDUCTOR DEVICE-FUSE ASSEMBLY 0123-1-2097 (15942 (SEE FIGURE 3 FOR NHA)		
4	1	PAFZZ	5961-00-087-6047	N 645B	80131	SEMICONDUCTOR DEVICE , DIODE	EA	2
4	2	PAOZZ	5920-00-190-3348	M06-250V 1/4A	81349	FUSE , CARTRIDGE	EA	1
4	3	PAOZZ	5920-00-366-0113	M03-250V 1/2A	81349	FUSE , CARTRIDGE	EA	2
4	4	XBFZZ		149-1-4068	15942	TERMINAL BOARD	EA	1
4	5	XA		500-105-14	06540	TERMINAL, STUD	EA	7
4	6	XA	5999-00-636-5928	21004	75913	CLIP, ELECTRICAL	EA	6
4	7	XA	5320-00-879-6606	IS16535-154	96906	RIVET, TUBULAR	EA	6
4	8	XA		149-1-4068-1	15942	BOARD, TERMINAL	EA	1

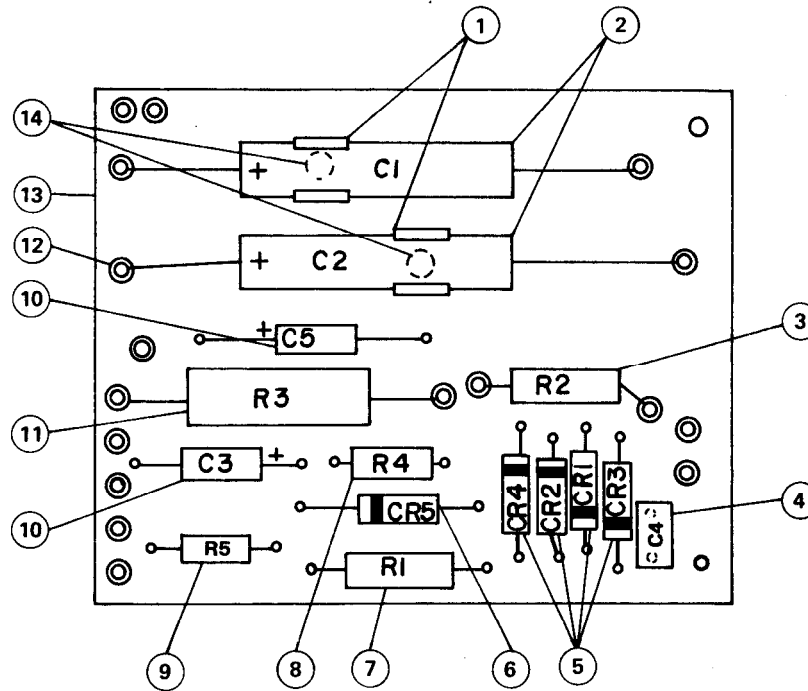


Figure C-5. Circuit card assembly

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG. NO.	(b) ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION	U/M	QTY. INC. IN UNIT
						GROUP 0202 CIRCUIT CARD ASSEMBLY		
						0149-1-3020 (15942)		
						(SEE FIGURE 3 FOR NHA)		
5	1	XBFZZ	5340-00-968-2691	6010-9A	91506	CLIP, SPRING TENSION	EA	2
5	2	PAFZZ	5910-00-438-6426	600D147G040DJ4	56289	CAPACITOR, FIXED, ELECTROLYTIC	EA	2
5	3	PAFZZ	5905-00-889-0010	RW69V100	81349	RESISTOR, WIREWOUND	EA	1
5	4	PAFZZ	5910-00-022-5659	CKR06BX104KM	81349	CAPACITOR, FIXED, CERAMIC	EA	1
5	5	PAFZZ	5961-00-087-6047	1N645	81349	SEMICONDUCTOR DEVICE, DIODE	EA	4
5	6	PAFZZ	5961-00-836-0382	1N3022B	81349	SEMICONDUCTOR DEVICE, DIODE	EA	1
5	7	PAFZZ	5905-00-104-8343	RC32GF100J	81349	RESISTOR, FIXED, COMPOSITION	EA	1
5	8	PAFZZ	5905-00-110-7620	RCR07G102JM	81349	RESISTOR, FIXED, COMPOSITION	EA	1
5	9	PAFZZ	5905-00-241-3008	RW70U2R00F	81349	RESISTOR, WIREWOUND	EA	1
5	10	PAFZZ	5910-00-490-0242	CSR13E106KL	81349	CAPACITOR, FIXED, ELECTROLYTIC	EA	2
5	11	PAFZZ	5905-00-975-1145	RW67V501	81349	RESISTOR, WIREWOUND	EA	1
5	12	XA		6500-105-14	06540	TERMINAL, STUD	EA	16
5	13	XA		0149-1-3005	15942	PRINTED WIRING BOARD	EA	1
5	14	XBFZZ		H-149NI PLATE	57771	RIVET, TUBULAR	EA	2

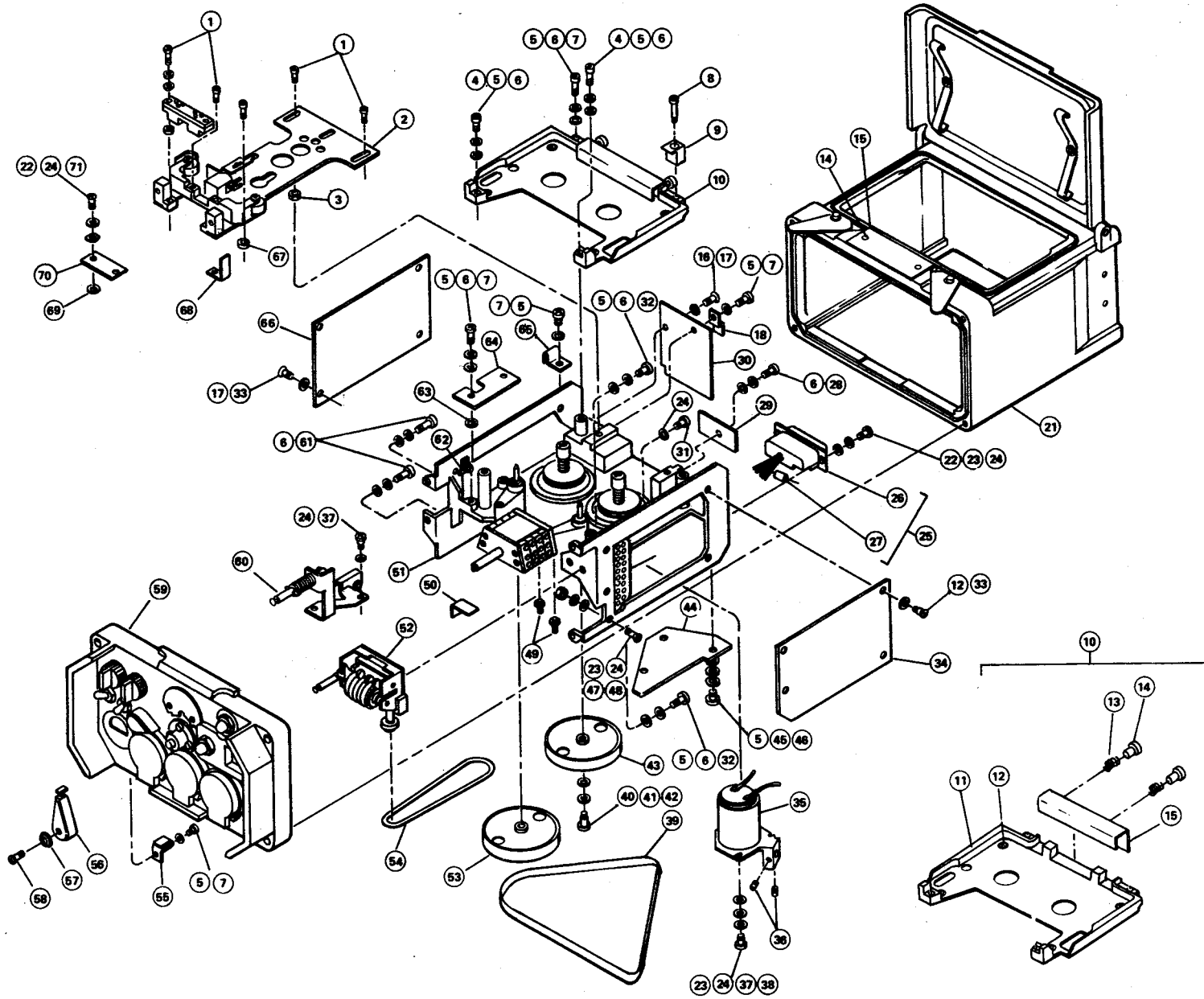


Figure C-6. Recorder-reproducer, Sound RD-385A/UNH-16A

(1) ILLUSTRATION (A) (B) FIG. ITEM NO. NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	TM32-5835-001-24&P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
					GROUP 03 RECORDER-REPRODUCER, SOUND RD-385A/UNH-16A		
					0149-1-4177 (15942)		
					(SEE FIGURE 1 FOR NHA) ABC		
6	1	XBFZZ	5305-01-041-3847	0149-1-2027	15942	SCREW, SHOULDER	EA 1
6	2	XBFFD		0149-1-4165	15942	SLIDE PLATE SUBASSEMBLY (SEE FIGURE 11 FOR BREAKDOWN)	EA 1
6	3	XBFZZ	3120-01-041-4627	0123-1-3006-2	15942	BUSING, SLEEVE	EA 2
6	4	XBFZZ	5305-00-054-5649	MS51957-15	96906	SCREW, MACHINE	EA 2
6	5	XBFZZ	5310-00-933-8118	MS35338-135	96906	WASHER, LOCK	EA 14
6	6	XBFZZ	5310-00-595-6211	MS15795-803	96906	WASHER, FLAT	EA 11
6	7	XBFZZ	5305-00-054-5647	MS51957-13	96906	SCREW, MACHINE	EA 6
6	8	XBFZZ	5305-00-068-5414	MS16995-11	96906	SCREW, MACHINE	EA 1
6	9	XBFZZ		0149-1-3109	15942	STOP, CASSETTE	EA 1
6	10	XBFZZ		0149-1-4180	15942	PLATE, MOUNTING, CARTRIDGE	EA 1
6	11	XA		0149-1-4173	15942	PLATE, MOUNTING	EA 1
6	12	XA		2-56X3/16LG.CRES	70318	SCREW, BUTTON HEAD	EA 4
6	13	XA	6710-00-063-0509	LC-016B-1	84830	SPRING, HELICAL	EA 2
6	14	XA	5305-00-841-2682	4311	00141	SCREW, SHOULDER	EA 2
6	15	XA		0149-1-3027	15942	BRACKET, BOUBLE ANGLE	EA 1
6	16	XBFZZ	5305-00-770-2533	MS51959-13	96906	SCREW, MACHINE	EA 1
6	17	XBFZZ	5310-00-716-5612	MS51859-2	96906	WASHER, NON-METALLIC	EA 9
6	18	XBFZZ		0149-1-2371	15942	CLAMP, CABLE	EA 1
6	19	XBFZZ		NO.2X3/16LG.CRES	70318	SCREW, MACHINE	EA 2
6	20	XBFZZ		0149-1-3205	15942	PLATE, IDENTIFICATION	EA 1
6	21	XBFFD		0123-1-4011	15942	HUSING, RECORDER-REPRODUCER (SEE FIGURE 7 FOR BREAKDOWN)	EA 1
6	22	XBFZZ	5305-00-054-5638	MS51957-4	15942	SCREW, MACHINE	EA 2
6	23	XBFZZ	5310-00-595-6761	MS15795-802	96906	WASHER, FLAT	EA 13
6	24	XBFZZ	5310-00-928-2690	MS35338-134	96906	WASHER, LOCK	EA 21
6	25	PAFZZ		0149-1-4187	15942	HARNES, J1 CONNECTOR	EA 1
6	26	XA	5935-00-933-2401	DAF-15P	71468	CONNECTOR, RECEPTACLE, ELECTRICAL	EA 1
6	27	XA	5910-00-143-0501	CKR06BX472KM	81349	CAPACITOR, FIXED, CERAMINC	EA 1
6	28	XBFZZ		MS16995-8	96906	SCREW, MACHINE	EA 1
6	29	PAFFF	5835-00-398-9681	0149-1-3088	15942	CIRCUIT CARD ASSEMBLY (SEE FIGURE 21 FOR BREAKDOWN)	EA 1

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(6) FSCM	TM32-5835-001-24&P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
6	30	PAFFF	5835-01-048-8583	0149-1-4029	15942	CIRCUIT CARD ASSEMBLY (SEE FIGURE 18 FOR BREAKDOWN)	EA	1
6	31	XBFZZ	5305-00-068-5409	MS16995-1	96906	SCREW, MACHINE	EA	2
6	32	XBFZZ	5305-00-959-0379	MS16995-10	96906	SCREW, MACHINE	EA	2
6	33	XBFZZ	5305-00-777-6039	MS51959-12	96906	SCREW, MACHINE	EA	8
6	34	PAFDD	5835-01-049-2701	0149-1-4027	15942	CONTROL, MOTOR-OSCILLATOR	EA	1
6	35	PAFFF	6105-00-394-3376	0123-1-4060	15942	MOTOR ASSEMBLY (SEE FIGURE 25 FOR BREAKDOWN)	EA	1
6	36	PAFZZ	5305-00-841-9422	CS-8	00141	SETSCREW	EA	2
6	37	XBFZZ	5305-00-054-5636	MS51957-2	96906	SCREW, MACHINE	EA	7
6	38	XBFZZ	5365-00-052-8847	B6-16	00141	SPACER	EA	AR
6	39	PAFZZ	3030-00-427-1730	0149-1-2014	15492	BELT, FLAT	EA	1
6	40	XBFZZ		NO.1-72X5/32LGCRES	70318	SCREW, MACHINE	EA	2
6	41	XBFZZ		NO.1 CRES	70318	WASHER, LOCK	EA	2
6	42	XBFZZ	5310-00-805-3214	B6-22	00141	SPACER	EA	2
6	43	XBFZZ		0149-1-3070-2	15942	PULLEY (SUPPLY SIDE)	EA	1
6	44	PAFFF	5835-01-048-9684	0149-1-4028	15942	CIRCUIT CARD ASSEMBLY (SEE FIGURE 17 FOR BREAKDOWN)	EA	1
6	45	XBFZZ	5305-00-054-5637	MS51957-3	96906	SCREW, MACHINE	EA	3
6	46	XBFZZ		NAS620C2	80205	WASHER, FLAT	EA	3
6	47	XBFFF	5305-00-764-2964	MS51959-4	96906	SCREW, MACHINE	EA	6
6	48	XBFZZ	5310-00-938-2013	MS35649-224	96906	NUT, PLAIN	EA	6
6	49	XBFZZ		STSM1TURCA	98291	TERMINAL, STUD	EA	2
6	50	XBFZZ		0149-1-2373	15942	CLAMP, CABLE	EA	1
6	51	XBFFD		0149-1-4169	15942	TRANSPORT, MAGNETIC TAPE SUBASSEMBLY (SEE FIGURE 10 FOR BREAKDOWN)	EA	1
6	52	PAFFF	5835-00-391-8655	0123-1-3005	15942	COUNTER-PULLEY ASSEMBLY (SEE FIGURE 14 FOR BREAKDOWN)	EA	1
6	53	XBFZZ	5835-00-434-9068	0149-1-3070-1	15942	PULLY, CROWN	EA	1
6	54	PAFZZ	3030-00-394-3341	0149-1-2112	15942	BELT, ROUND	EA	1
6	55	XBFZZ		0149-1-2374	15942	CLAMP, CABLE	EA	1
6	56	XBFFF	5835-00-412-4663	0149-1-3024	15942	KNOB ASSEMBLY (SEE FIGURE 9 FOR BREAKDOWN)	EA	1
6	57	XBFZZ	5310-00-475-9135	0149-1-3102	15942	RETAINER, KNOB	EA	1
6	58	XBFZZ	5305-00-056-9961	AN507C440R6	81350	SCREW, MACHINE	EA	1
6	59	XBFFD		0149-1-4170	15942	CONTROL, RECORDER-REPRODUCER (SEE FIGURE 8 FOR BREAKDOWN)	EA	1

(1) ILLUSTRATION (A) FIG. NO.	(B) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	TM32-5835-001-24&P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
6	60	XBFFF	5835-00-364-0816	0149-1-4041	15942	EJECTOR, SUBASSEMBLY (SEE FIGURE 15 FOR BREAKDOWN)	EA	1
6	61	XBFFZ	5305-00-068-5276	MS16995-9	96906	SCREW, MACHINE	EA	7
6	62	XBFZZ		NO. 75 (.093 HOLE)	79963	TERMINAL, LUG	EA	2
6	63	XBFZZ	5310-00-171-8727	2161	83330	WASHER, NON-METALLIC	EA	2
6	64	PAFFF	5905-01-053-7275	0149-1-3067	15942	RESISTOR ASSEMBLY (SEE FIGURE 19 FOR BREAKDOWN)	EA	1
6	65	XBFZZ		0149-1-2375	15942	CLAMP, CABLE	EA	1
6	66	PAFDD	5835-01-049-2702	0149-1-4018	15942	AMPLIFIER, RECORDER-REPRODUCER	EA	1
6	67	XBFZZ	3120-01-041-4626	0123-1-3006-1	15942	BUSHING, SLEEVE	EA	1
6	68	XBFZZ		0149-1-2372	15942	CLAMP, CABLE	EA	1
6	69	XBFZZ		0149-1-2054	16942	SPACER, RING	EA	2
6	70	XBFZZ		0149-1-4186	15942	HARNES, FRONT PANEL	EA	1
6	71	XBFZZ		0149-1-2109	15942	WASHER, FLAT	EA	2

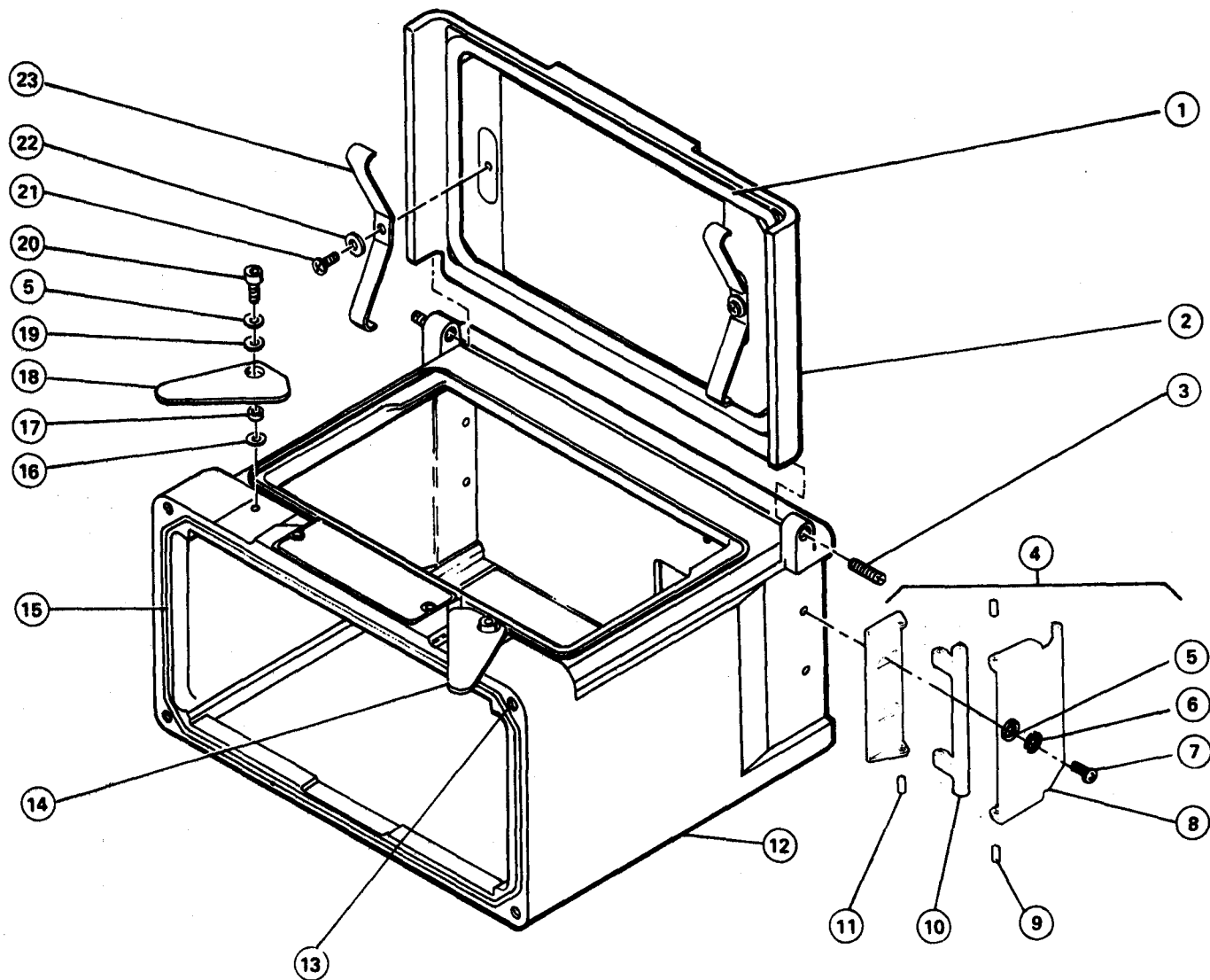


Figure C-7. Housing, recorder-reproducer

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	TM32-5835-001-24&P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
					GROUP 0301 HOUSING, RECORDER- REPRODUCER		
					0123-1-4011 (15942) (SEE FIGURE 6 FOR NHA)		
7	1	XBFZZ 5999-00-345-9527	0149-1-3078	15942	SHIELDING GASKET, ELECTRONIC	EA	1
7	2	XBFZZ	0149-1-4062	15942	COVER, ACCESS	EA	1
7	3	XBFZZ	0123-1-2072	15942	PIN, STRAIGHT	EA	2
7	4	XBFZZ 5835-00-398-9678	0149-1-3073	45942	LATCH, RECORDER HOUSING	EA	2
7	5	XBFZZ 5310-00-595-6211	MS15795-803	96906	WASHER, FLAT	EA	6
7	6	XBFZZ 5310-00-058-3599	MS35335-57	96906	WASHER, LOCK	EA	4
7	7	XBFZZ 5305-00-054-5647	MS51957-13	96906	SCREW, MACHINE	EA	4
7	8	XA	0149-1-3074	15942	LATCH	EA	2
7	9	XA	GP24-062-312-50	73957	PIN, GROOVE	EA	8
7	10	XA	0149-1-3075	15942	PLATE, MOUNTING, LATCH	EA	2
7	11	XA	0149-1-3076	15942	BRACKET, MOUNTING, LATCH	EA	2
7	12	XBFZZ	0123-1-4010	15942	HOUSING, RECORDER-REPRODUCER	EA	1
7	13	XA 5340-00-842-5920	MS21208-C0415	96906	INSERT, SCREW, THREAD	EA	4
7	14	XBFZZ 5835-00-364-0813	0149-1-3072-1	15942	LATCH, ACCESS COVER	EA	1
7	15	XBFZZ	10-05-1362-1250	18565	SHIELDING GASKET, ELECTRONIC	EA	AR
7	16	XBFZZ 5340-00-685-7023	B2-1	00141	SHIM	EA	2
7	17	XBFZZ	0149-1-2367	15942	SPACER	EA	2
7	18	XBFZZ 5835-00-364-0814	0149-1-3072-2	15942	LATCH, ACCESS COVER	EA	1
7	19	XBFZZ 5365-00-845-7667	B6-1	12139	SPACER, PLATE	EA	AR
7	20	XBFZZ 5305-00-068-5276	MS16995-9	96906	SCREW, CAP	EA	2
7	21	XBFZZ 5305-00-054-5635	MS51957-1	96906	SCREW, MACHINE	EA	2
7	22	XBFZZ 5310-00-595-6761	MS15795-802	96906	WASHER, FLAT	EA	2
7	23	XBFZZ 5835-00-364-0815	0149-1-3079	15942	RETAINER, CARTRIDGE	EA	2

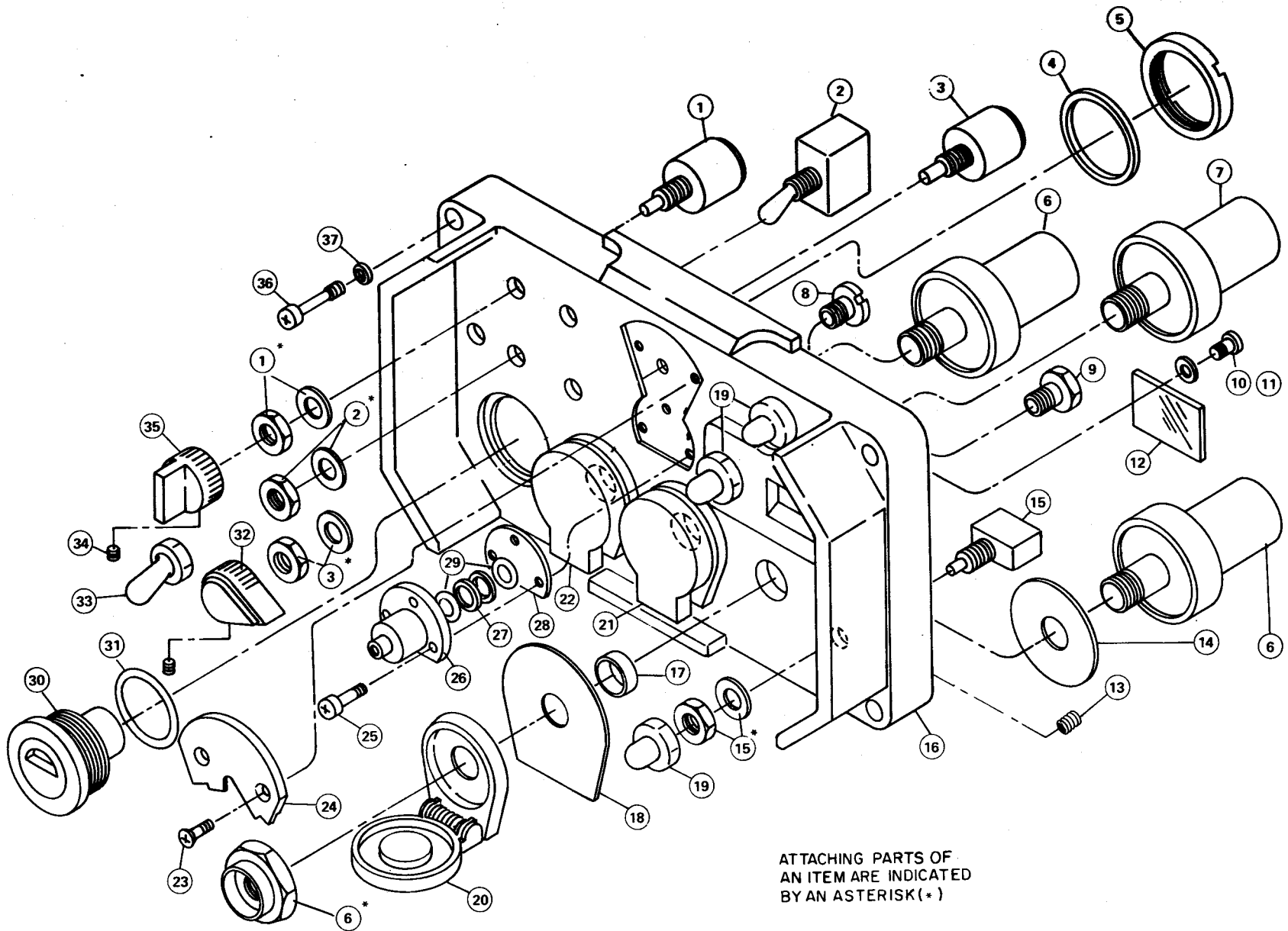


Figure C-8. Control, recorder-reproducer

(1) ILLUSTRATION (A) (B) FIG. ITEM NO. NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	TM32-5835-001-24&P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
					GROUP 0303 CONTROL, RECORDER- REPRODUCER		
					0149-1-4170 (15942) (SEE FIGURE 6 FOR NHA)		
8	1	PAFZZ 5905-00-433-7383	0149-1-2269	15942	RESISTOR, VARIABLE	EA	2
8	2	PAFZZ 5930-00-225-7111	MS24655-231	96906	SWITCH, TOGGLE	EA	2
8	3	PAFZZ 5930-00-174-9833	51M30-01-4-3N	81073	SWITCH, ROTARY	EA	1
8	4	XBFZZ	0149-1-2070	15942	WASHER, FLAT	EA	1
8	5	XBFZZ	0149-1-2071	15942	RETAINER, ELECTRICAL METER	EA	1
8	6	XBFZZ 5935-01-015-8243	M112B	82389	JACK, TELEPHONE	EA	2
8	7	XBFZZ 5935-00-192-4729	M641-5-1	81349	JACK, TELEPHONE	EA	1
8	8	XBFZZ	0149-1-2047	15942	BUSHING	EA	1
8	9	XBFZZ	0149-1-2042	15942	BUSHING	EA	1
8	10	XBFZZ 5305-00-054-5635	MS51957-1	96906	SCREW, MACHINE	EA	2
8	11	XBFZZ 5310-00-595-6761	MS15795-802	96906	WASHER, FLAT	EA	2
8	12	XBFZZ 5835-00-433-7369	0123-1-2002	15942	WINDOW, COUNTER	EA	1
8	13	XA 5340-00-631-7894	MS21209-C0415	96906	INSERT, THREADED	EA	4
8	14	XBFZZ	0149-1-2044	15942	INSULATOR, WASHER	EA	1
8	15	PAFZZ 5930-00-393-0623	0123-1-2055	15942	SWITCH, PUSH	EA	1
8	16	XBFZZ	0149-1-4151	15942	PANEL, CONTROL	EA	1
8	17	XBFZZ	0149-1-2046	15942	INSULATOR, WASHER	EA	1
8	18	XBFZZ	0149-1-2045	15942	INSULATOR, WHASHER	EA	1
8	19	XBGZZ 5930-00-893-1928	N5040R	97539	BOOT, DUST AND MOISTURE SEAL	EA	3
8	20	XBFZZ	0149-1-3014-3	15942	COVER, JACK	EA	1
8	21	XBFZZ	0149-1-3014-2	15942	COVER, JACK	EA	1
8	22	XBFZZ	0149-1-3014-1	15942	COVER, JACK	EA	1
8	23	XBFZZ	1-72X1/8LG. CRES	70318	SCREW, FLAT HEAD	EA	2
8	24	XBFZZ	0149-1-3049	15942	PLATE, LATCH	EA	1
8	25	XBFZZ	0149-1-2369	15942	SCREW, CAP	EA	3
8	26	XBFZZ	0149-1-3044	15942	HOUSING, SEAL	EA	1
8	27	XBFZZ 5330-00-052-7533	MS9068-008	96906	PACKING, PREFORMED	EA	2
8	28	XBFZZ 5330-01-049-4410	0149-1-2040	15942	GASKET, HOUSING	EA	1
8	29	XBFZZ 5330-01-051-4105	0149-1-2041	15942	WASHER, NON-METALLIC	EA	2
8	30	PAFZZ 6625-00-501-7361	0149-1-2013	15942	METER ASSEMBLY	EA	1
8	31	XBFZZ	2-018	02967	PACKING, PREFORMED	EA	1

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(5) FSCM	TM32-5835-001-24&P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
8	32	XBFZZ	5355-00-990-3173	MS91528-OP1B	96906	KNOB	EA	1
8	33	XBFZZ	5930-01-018-9367	N5030L	97539	BOOT, DUST AND MOISTURE SEAL	EA	2
8	34	PAFZZ	5305-00-717-6954	MS51963-2	96906	SETSCREW	EA	4
8	35	PAFZZ	5355-01-049-2697	0149-1-2048	15942	KNOB	EA	2
8	36	XBFZZ		0149-1-2043	15942	SCREW, EXTERNALLY RELIEVED BODY	EA	4
8	37	XBFZZ	5310-00-033-8118	MS35338-135	96906	WASHER, LOCK	EA	4

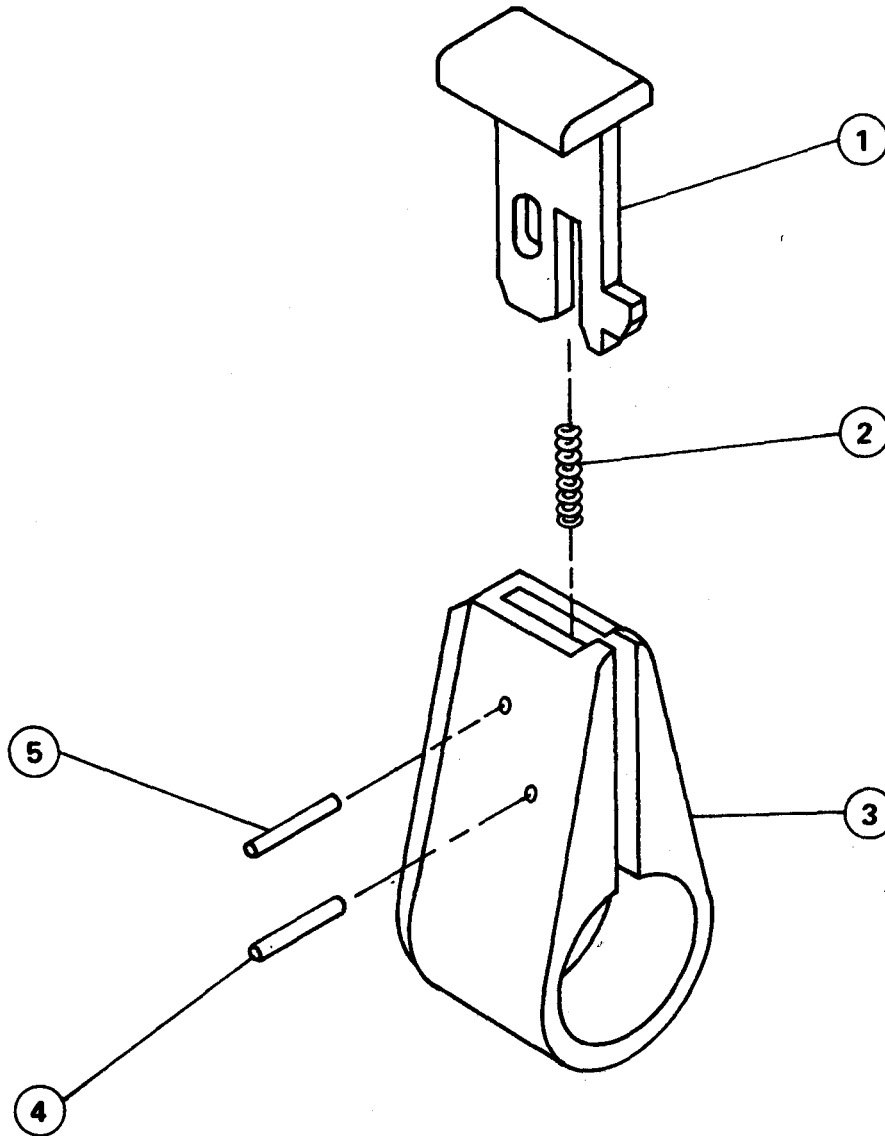


Figure C-9. Knob assembly

ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG. NO.	(b) ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION	U/M	QTY. INC. IN UNIT
						GROUP 030301 KNOB ASSEMBLY 0149-1-3024 (15942) (SEE FIGURE 6 FOR NHA)		
9	1	XBFZZ		0149-1-3026	15942	LATCH, SNAP-SLIDE FASTENER	EA	1
9	2	XBFZZ		C1-008A-6	84830	SPRING, HELICAL	EA	1
9	3	XBFZZ		0149-1-3025	15942	KNOB	EA	1
9	4	XBFZZ	5315-00-815-3250	MS39086-101	96906	PIN, SPRING	EA	1
9	5	XBFZZ	5315-00-893-6180	MS39086-100	96906	PIN, SPRING	EA	1

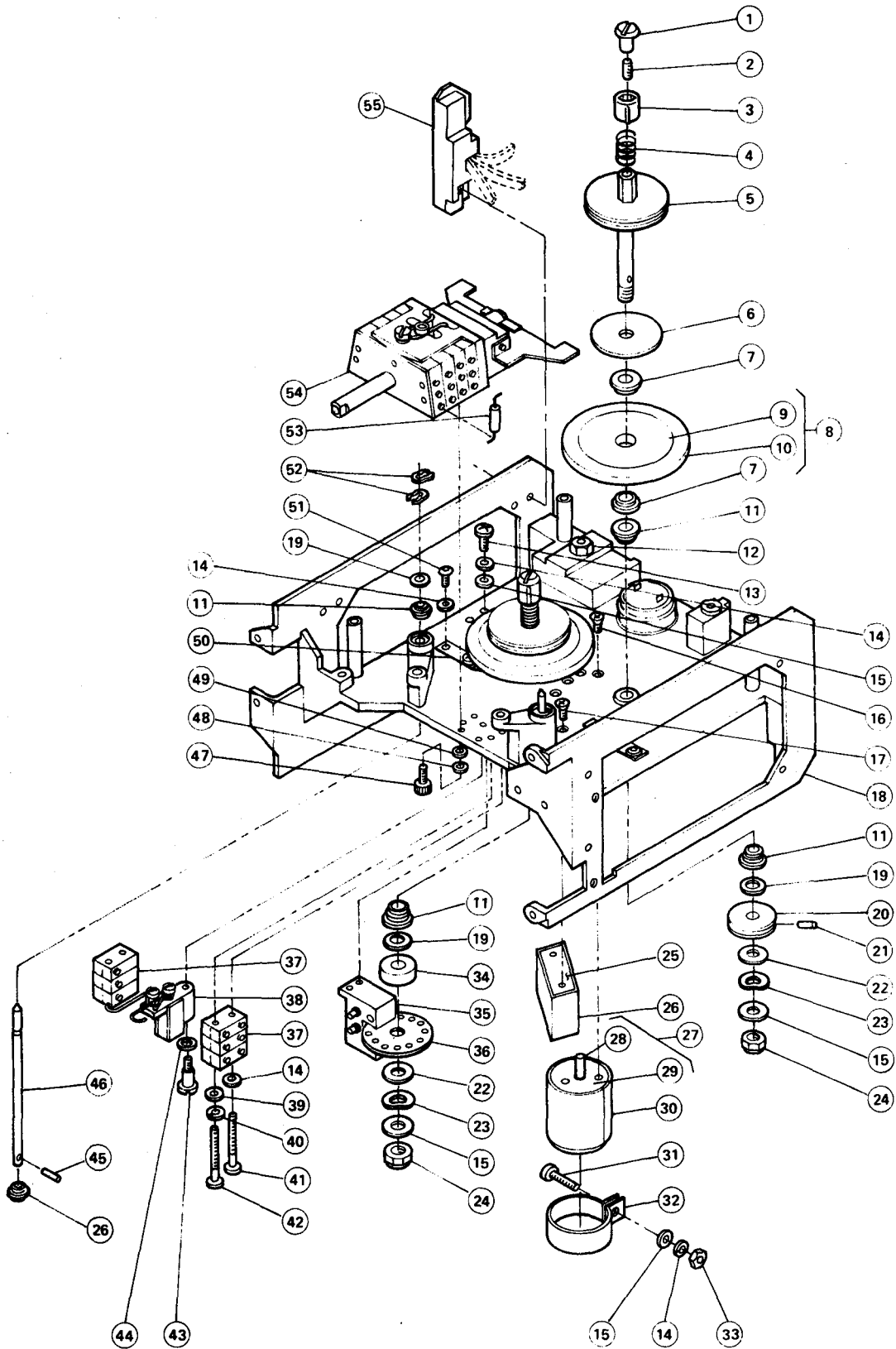


Figure C-10. Magnetic tape transport subassembly (sheet 1 of 2)

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(6) FSCM DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
					TM32-5835-001-24&P GROUP 0304 MAGNETIC TAPE TRANSPORT SUB- ASSEMBLY		
					0149-1-4169 (15942) (SEE FIGURE 6 FOR NHA)		
10	1	XBFZZ	5310-00-499-4575	0149-1-3041	15942 NUT, SLEEVE	EA	2
10	2	XBFZZ	5305-00-817-1310	AN565AC2H5	81350 SETSCREW	EA	2
10	3	XBFZZ		FVD6-F2	89781 GUIDE, COMPRESSION SPRING	EA	2
10	4	XBFZZ	5360-00-342-9588	0123-1-2095	15942 SPRING, COMPRESSION	EA	2
10	5	XBFZZ		0149-1-3023-1	15942 DISK, REEL (SEE FIGURE 24 FOR BREAKDOWN)	EA	2
10	6	CBFZZ	5310-00-376-0341	0149-1-2030	15942 WASHER, FLAT	EA	2
10	7	XBFZZ		SFR133DK24	83086 BEARING, BALL, ANNULAR	EA	4
10	8	XBFZZ	5835-00-345-9516	0149-1-4044	15942 WHEEL, DRIVE, UNIT	EA	2
10	9	XA		0149-1-4044-2	15942 WHEEL	EA	1
10	10	XA		0149-1-4044-1	15942 HUB	EA	1
10	11	XBFZZ	3110-01-049-4144	SFR1335PPEEK24	83086 BEARING, BALL, ANNULAR	EA	8
10	12	XBFZZ	5340-01-041-3952	0149-1-2292	15942 INSERT, MACHINE THREAD	EA	1
10	13	XBFZZ	5310-00-054-5638	MS51957-4	96906 SCREW, MACHINE	EA	2
10	14	XBFZZ	5310-00-928-2690	MS35338-134	96906 WASHER, LOCK-SPRING	EA	7
10	15	XBFZZ	5310-00-595-6761	MS15795-802	96906 WASHER, FLAT	EA	9
10	16	XBFZZ		NO.1-72X1/8LG.CRES	70318 SCREW, FLAT HEAD	EA	3
10	17	XBFZZ		2-56X.25 LG 100 °	70318 SCREW, FLAT HEAD	EA	2
10	18	XBFZZ		0149-1-4150	15942 CHASSIS, LELECTRICAL EQUIPMENT	EA	1
10	19	XBFZZ	5310-00-805-3214	B6-22	00141 SHIM	EA	4
10	20	XBFZZ	3020-00-332-2584	0149-1-3043	15942 PULLEY, GROOVE	EA	1
10	21	XBFZZ	5315-00-376-0340	0149-1-2035	15942 PIN, STRAIGHT, HEADLESS	EA	2
10	22	XBFZZ		0149-1-2033	15942 GUIDE, MOTOR CONTROLLER	EA	2
10	23	XBFZZ	5310-00-401-0857	U125-0060	70472 WASHER, SPRING TENSION	EA	2
10	24	XBFZZ	5310-00-815-0653	79NM-26	72692 NUT, SELF-LOCKING	EA	2
10	25	PAFFF	5915-01-079-8884	0149-1-3275	15942 FILTER ASSEMBLY (SEE FIGURE 20 FOR BREAKDOWN)	EA	1
10	26	XBFZZ		0123-1-2069	15942 SHIELD, ELECTROSTATIC	EA	1
10	27	PAFZZ	6105-00-361-1113	0123-1-3080	15942 MOTOR ASSEMBLY	EA	1
10	28	XA		0123-1-2077	15942 EXTENSION, SHAFT	EA	1
10	29	XA		0123-1-3091	15942 MOTOR, DC	EA	1
10	30	XBFZZ	5835-00-334-6556	0123-1-2052	15942 SHIELD, ELECTROSTATIC	EA	1

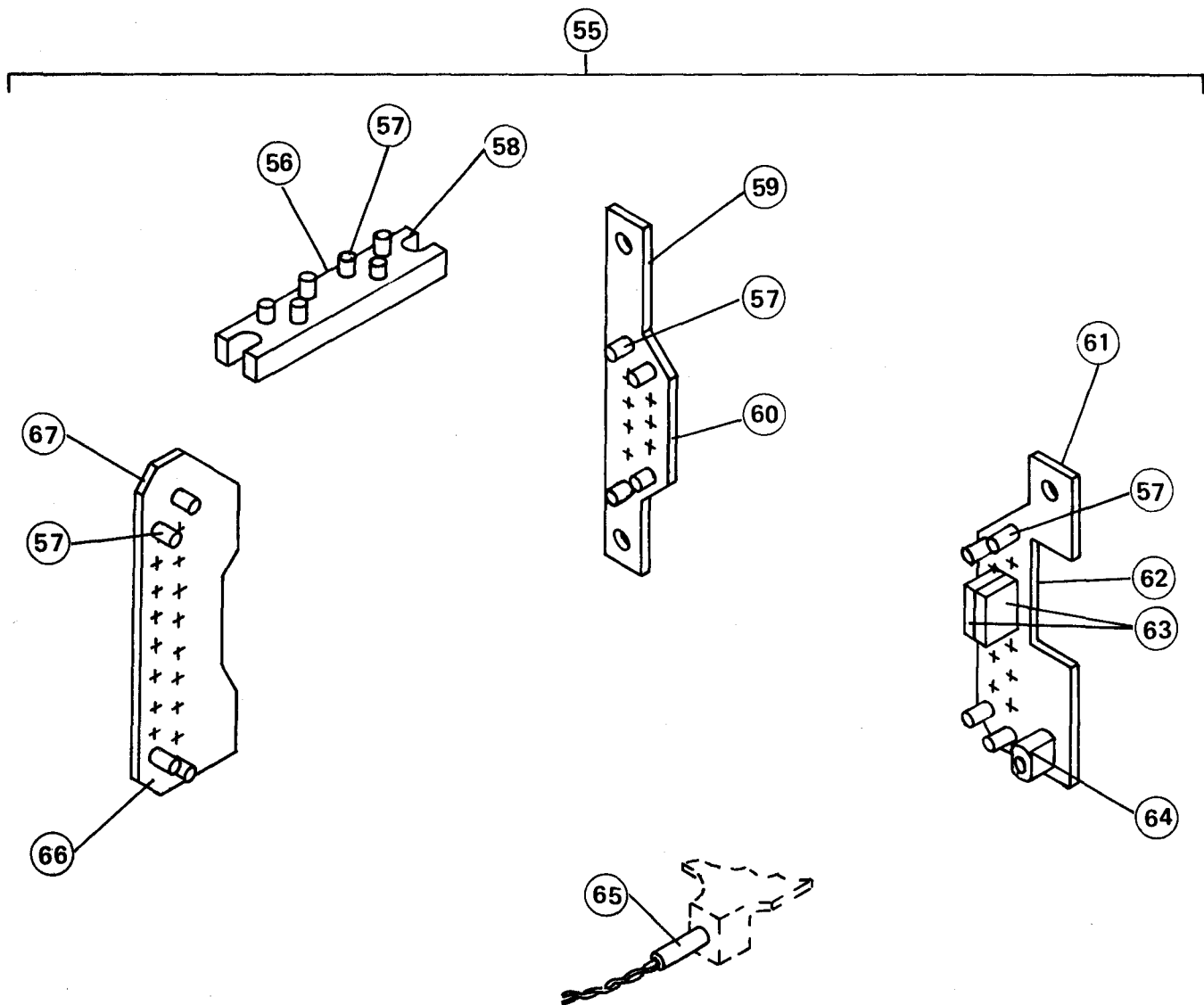


Figure C-10. Magnetic tape transport subassembly (sheet 2 of 2)

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(6) FSCM DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
10	31	XBFZZ	5305-00-054-5640	MS51957-6	15942 SCREW, MACHINE	EA	1
10	32	XBFZZ		0123-1-2053	15942 CLAMP	EA	1
10	33	XBFZZ	5310-00-938-2013	MS35649-224	96906 NUT, PLAIN	EA	1
10	34	PAFFFF		0149-1-2021	15942 CLUTCH, MOTOR CONTROLLER	EA	1
10	35	PAFFFF	5835-00-510-0890	0149-1-3040	15942 SENSOR, RECORDER-REPRODUCER (SEE FIGURE 22 FOR BREAKDOWN)	EA	1
10	36	XBFZZ	5365-00-499-4578	0149-1-2032	15942 CONTROLLER, MOTOR	EA	1
10	37	PAFZZ	5930-00-803-4570	MS24547-1	96906 SWITCH, SENSITIVE	EA	6
10	38	PAFFFF		0149-1-3184	15942 ACTUATOR ASSEMBLY (SEE FIGURE 23 FOR BREAKDOWN)	EA	1
10	39	XBFZZ	5310-00-804-0141	MS15795-801	96906 WASHER, FLAT	EA	2
10	40	XBFZZ		TYPE 18-8 CRES	70318 WASHER, LOCK	EA	2
10	41	XBFZZ	5305-00-054-5643	MS51957-9	96906 SCREW, MACHINE	EA	2
10	42	XBFZZ		NO.1-64X3/4LG.CRES	70318 SCREW, MACHINE	EA	2
10	43	XBFZZ	5305-00-841-2860	4314	00141 SCREW, SHOULDER	EA	1
10	44	XBFZZ		.128 ID X .250 OD X .15 THK NYLON	12096 WASHER, NON-METALLIC	EA	1
10	45	XBFZZ		0149-1-2072	15942 PIN, STRAIGHT, HEADLESS	EA	2
10	46	XBFZZ	5835-00-357-6759	0149-1-2029	15942 SHAFT, STRAIGHT	EA	2
10	47	XBFZZ	5305-00-068-5276	MS16995-9	96906 SCREW, MACHINE	EA	2
10	48	XBFZZ	5310-00-933-8118	MS35338-135	96906 WASHER, LOCK	EA	2
10	49	XBFZZ	5310-00-595-6211	MS15795-803	96906 WASHER, FLAT	EA	2
10	50	XBFZZ	5360-00-342-9589	0149-1-2106	15942 SPRING, BRAKE	EA	2
10	51	XBFZZ		2-56X3/16 LG	70318 SCREW, MACHINE	EA	4
10	52	XBFZZ	5365-00-341-6848	G5555-9H	79136 RING, RETAINING	EA	4
10	53	PAFZZ	5961-00-842-9864	JAN1N914	81349 SEMICONDUCTOR DEVICE, DIODE	EA	1
10	54	PAFFD	5835-00-341-5441	0123-1-4030	15942 SWITCH ASSEMBLY (SEE FIGURE 16 FOR BREAKDOWN)	EA	1
10	55	XA		0149-1-4188	15942 MAIN HARNESS	EA	1
10	56	XA	5935-00-394-9902	0149-1-2001	15942 CONNECTOR, RECEPTACLE, ELECTRICAL	EA	1
10	57	XA		LSG-2DG8-1	01506 SOCKET	EA	49
10	58	XA		0149-1-2001-1	15942 CONNECTOR	EA	1
10	59	XA		0149-1-2006	15942 CONNECTOR, RCEPTACLE, ELECTRICAL	EA	1
10	60	XA		0149-1-2006-1	15942 CONNECTOR	EA	1
10	61	XA		0149-1-2008	15942 CONNECTOR, RECEPTACLE, ELECTRICAL	EA	1

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(5) FSCM	TM32-5835-001-24&P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
10	62	XA		0149-1-2008-1	15942	CONNECTOR	EA	1
10	63	XA	5910-00-010-8666	CKR05BX102KM	81349	CAPACITOR, FIXED, CERAMIC	EA	2
10	64	XA		0149-1-2370	15942	INSERT, THREAD	EA	1
10	65	XA	5835-00-387-4143	923	17613	PICKUP, MAGNETIC	EA	1
10	66	XA		0149-1-2007	15942	CONNECTOR, RCEPTACLE, ELECTRICAL	EA	1
10	67	XA		0149-1-2007-1	15942	CONNECTOR	EA	1

This page intentionally left blank.

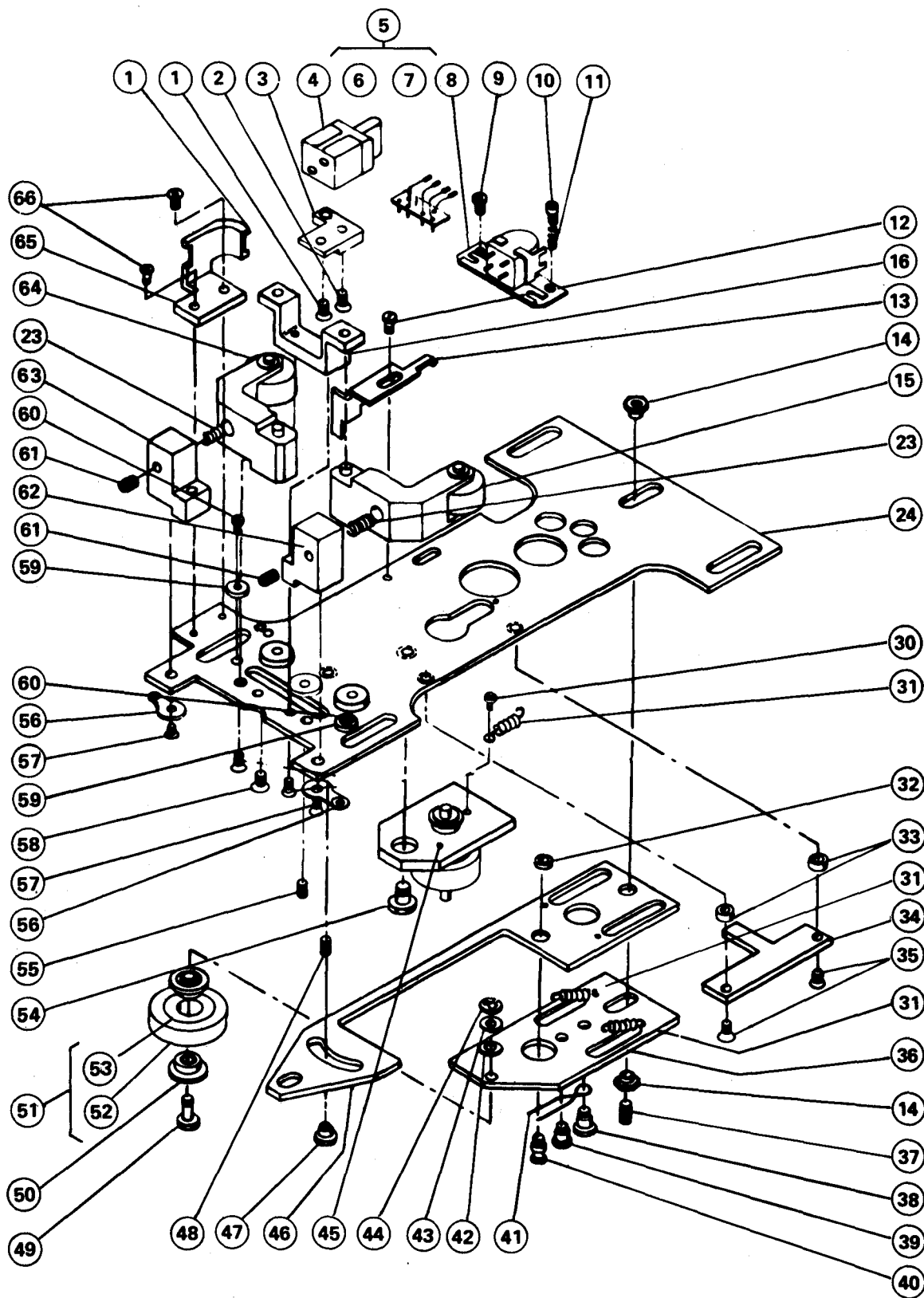


Figure C-11. Slide plate subassembly (sheet 1 of 2)

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(6) FSCM DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
					TM32-5835-001-246P GROUP 030101 SLIDE PLATE SUBASSEMBLY		
					0149-1-4165 (15942) (SEE FIGURE 6 FOR NHA)		
11	1	XBFZZ		08-80X1/8 LG. CRES	70318 SCREW, MACHINE	EA	1
11	2	XBFZZ		08.X3/16 LG. CRES	70318 SCREW, MACHINE	EA	1
11	3	XBFZZ		0149-1-2262	15942 BLOCK, ERASE HEAD MOUNTING	EA	1
11	4	PAFZZ	5835-01-042-9943	0149-1-3202	15942 ERASE HEAD	EA	1
11	5	XBFZZ		0149-1-2306	15942 TERMINAL BOARD	EA	1
11	6	XA		0149-1-2000-1	15942 BOARD, PRINTED WIRING	EA	1
11	7	XA	5940-00-168-8180	7713-7	88245 TERMINAL, STUD	EA	6
11	8	XBFZZ		0149-1-3181	15942 HEAD MOUNTING ASSEMBLY (SEE FIGURE 12 FOR BREAKDOWN)	EA	1
11	9	XBFZZ	5305-01-042-1410	0149-1-2286	15942 SCREW, MACHINE	EA	1
11	10	XBFZZ	5303-00-068-5410	MS16995-2	96906 SCREW, MACHINE	EA	1
11	11	XBFZZ	5360-00-423-6399	0123-1-2104	15942 SPRING, COMPRESSION	EA	1
11	12	XBFZZ		0-80X1/16 LG.CRES	70318 SCREW, MACHINE	EA	1
11	13	XBFZZ		0149-1-3047	15942 BRAKE SHOE, SUPPLY REEL	EA	1
11	14	XBFZZ	5999-01-047-0651	0149-1-2082	15942 PIVOT, SLIDE PLATE	EA	2
11	15	PAFZZ	5835-00-364-0810	0149-1-3060-2	15942 ROLLER, LOUND RECORDER	EA	1
11	16	XA		0149-1-4053-1	15942 YOKE, ROLLER	EA	1
11	17	XA		0149-1-2053	15942 SHAFT, STRAIGHT	EA	1
11	18	XA		0149-1-2054	15942 SPACER, RING	EA	2
11	19	XA	5835-01-038-8459	0149-1-3061	15942 ROLLER, SOUND RECORDER	EA	1
11	20	XA	3110-01-049-4144	SR1335PPEEK24	83086 BEARING, BALL	EA	1
11	21	XA	5365-00-052-8847	B6-16	00141 SHIM	EA	AR
11	22	XA	5365-00-543-3981	MS16633-4009	96906 RING, RETAINING	EA	1
11	23	XBFZZ	5360-01-040-3755	0123-1-2059	15942 SPRING, COMPRESSION	EA	2
11	24	XBFZZ		0149-1-4155	15942 PLATE SUBASSEMBLY	EA	1
11	25	XA		0149-1-3062	15942 SUPPORT, ROLLER SHAFT	EA	1
11	26	XA		0149-1-4154	15942 PLATE, SLIDE	EA	1
11	27	XA		0123-1-2040	15942 ADAPTER, HEAD MOUNTING	EA	3
11	28	XA	5305-00-764-2966	MS51959-2	96906 SCREW, MACHINE	EA	2
11	29	XA	5315-00-817-0889	MS16555-601	96906 PIN, STRAIGHT, HEADLESS	EA	1
11	30	XBFZZ		0-80X3/16 LG.	70318 SCREW, MACHINE	EA	1
11	31	XBFZZ		E1-008A-1	84830 SPRING	EA	1

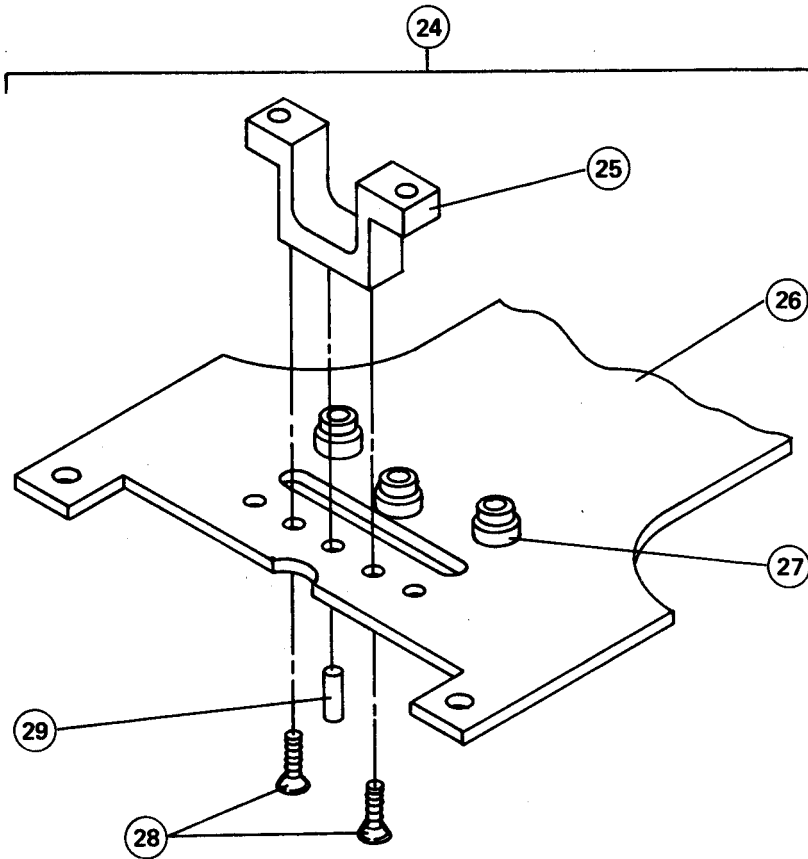
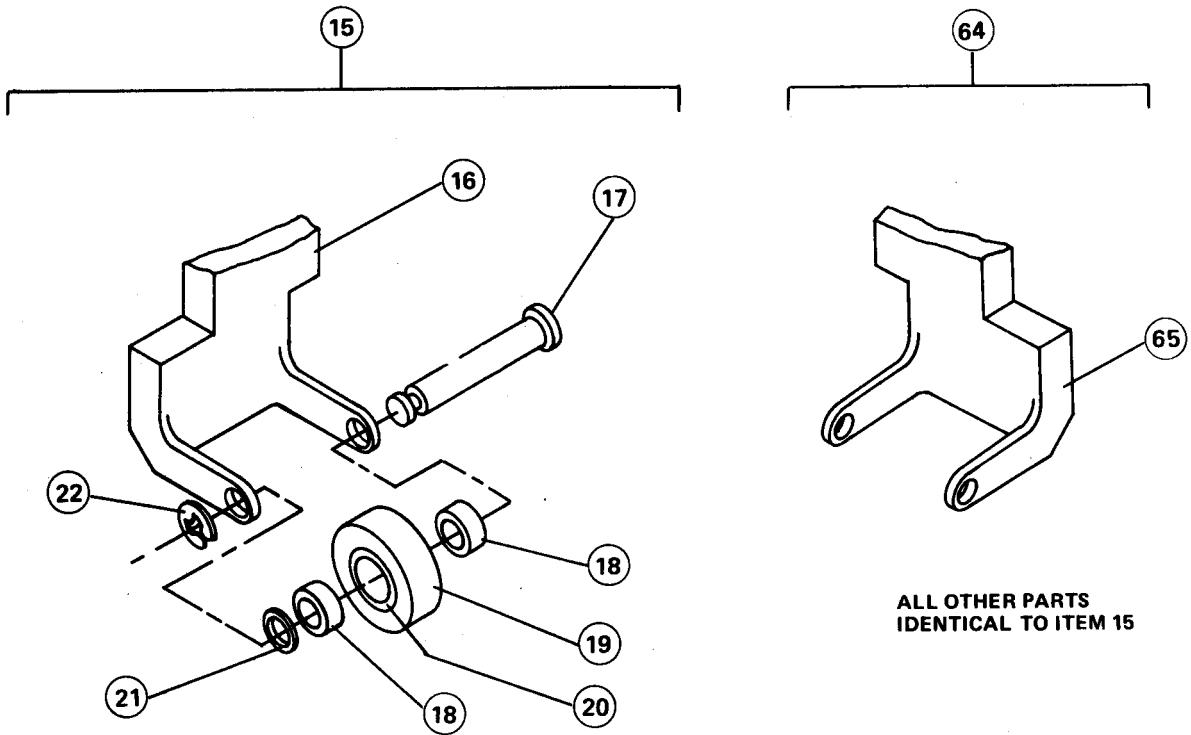


Figure C-11. Slide plate subassembly (sheet 2 of 2)

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(6) FSCM DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
11	32	XBFZZ	5310-00-938-2013	MS35649-224	96906 NUT, PLAIN	EA	1
11	33	XBFZZ		0149-1-2050	15942 SPACER, SLEEVE	EA	2
11	34	XBFZZ		0149-1-2080	16942 PLATE, RETAINER	EA	1
11	35	XBFZZ	5305-00-764-2966	MS51959-2	96906 SCREW, MACHINE	EA	1
11	36	XBFZZ		0149-1-3050	15942 PLATE, MOUNTING, REWIND WHEEL	EA	1
11	37	XBFZZ	5305-00-543-5832	MS51021-11	96906 SETSCREW	EA	1
11	38	XBFZZ		0149-1-2087	15942 RETAINER, SLIDE PLATE	EA	1
11	39	XBFZZ		0149-1-2083	15942 SCREW, EXTERNALLY-RELIEVED BODY	EA	1
11	40	XBFZZ		0149-1-2081	15942 SCREW, EXTERNALLY-RELIEVED BODY	EA	1
11	41	XBFZZ	5360-01-050-2837	0149-1-3059	15942 SPRING, TORSION	EA	1
11	42	XA	5310-00-027-0795	B6-18	00141 SHIM	EA	AR
11	43	XA	5365-00-052-8847	B6-16	00141 SHIM	EA	AR
11	44	XA	5365-00-543-3981	MS16633-4009	96906 RING, RETAINING	EA	1
11	45	XBFFF		0149-1-3063-2	15942 DRIVE WHEEL, SUBASSEMBLY (SEE FIGURE 13 FOR BREAKDOWN)	EA	1
11	46	XBFZZ		0123-1-4012	15942 PLATE, MONTING, WHEEL	EA	1
11	47	XBFZZ		0123-1-2041	15942 GUIDE, SLIDE PLATE	EA	1
11	48	XBFZZ		2-56X1/8 LG.CRES	70318 SETSCREW	EA	1
11	49	XA		0149-1-2079	15942 RETAINER, WHEEL	EA	1
11	56	XA	3110-00-049-4144	SFR1335EEK24	83086 BEARING, BALL, ANNULAR	EA	2
11	51	XBFZZ		0149-1-3046	15942 IDLER ASSEMBLY, WHEEL	EA	1
11	52	XA		0149-1-3046-2	15942 WHEEL	EA	1
11	53	XA		0149-1-3046-1	15942 HUB	EA	1
11	54	XBFZZ		0149-1-2088	15942 SCREW, EXTERNALLY-RELIEVED BODY	EA	1
11	55	CBFZZ		2-56X3/16 LG.CRES	70318 SETSCREW	EA	1
11	56	XBFZZ		#341-.093H	79963 TERMINAL, LUG	EA	2
11	57	XBFZZ	5305-00-054-5636	MS51957-2	96906 SCREW, MACHINE	EA	2
11	58	XBFZZ		1-72X1/8 LG.CRES	70318 SCREW, MACHINE	EA	1
11	59	XBFZZ	5835-00-504-9794	0149-1-2049	15942 STOP, ADJUSTABLE	EA	2
11	60	XBFZZ		0123-1-2039	15942 SCREW, CAP	EA	2
11	61	XBFZZ		MS51021-10	96906 SCREW, MACHINE	EA	2
11	62	XBFZZ	5811-01-004-4300	0149-1-3048-2	15942 BRACKET, SPRING STOP	EA	1
11	63	XBFZZ		0149-1-3048-1	15942 BRACKET, SPRING STOP	EA	1
11	64	XBFZZ	5835-00-364-0811	0149-1-3060-1	15942 ROLLER, SOUND RECORDER	EA	1

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(5) FSCM	TM32-5835-001-24&P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
11	65	XA		0149-1-4053-2	15942	YOKE, ROLLER	EA	1
11	66	XBFZZ	5835-00-466-8544	0149-1-3093	15942	GUIDE, TAPE	EA	1
11	67	XBFZZ		2-56X1/8 LG.CRES	70318	SCREW, CAP	EA	2

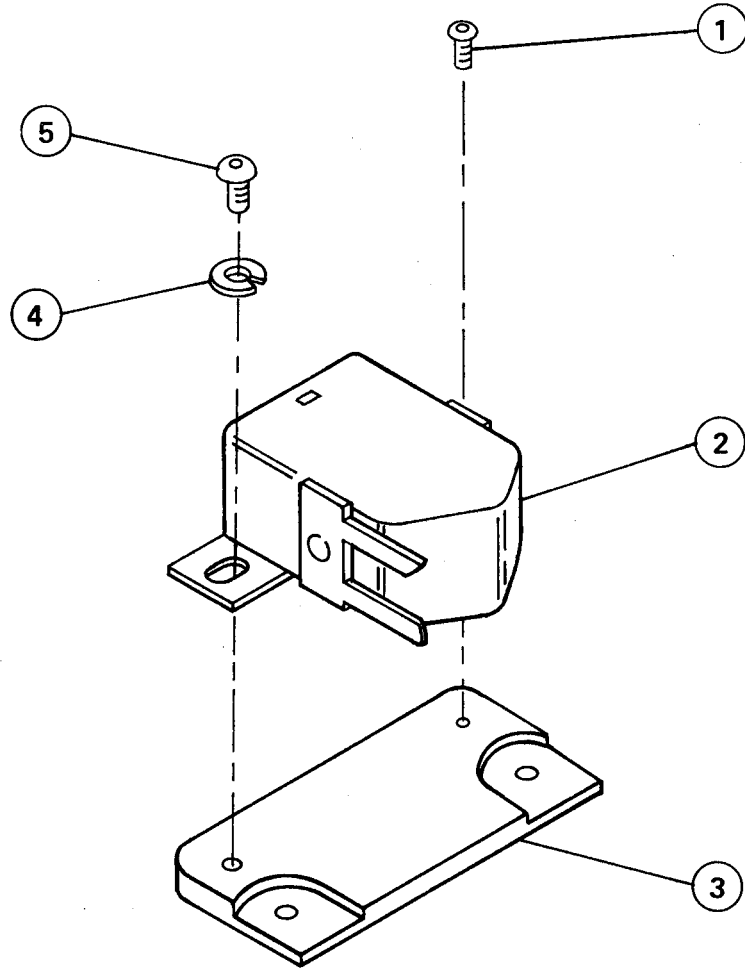


Figure C-12. Head mounting assembly

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG. NO.	(b) TEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION	U/M	QTY. INC. IN UNIT
						GROUP 03040101 HEAD MOUNTING ASSEMBLY		
						0149-1-3181 (15942) (SEE FIGURE 6 FOR NHA)		
12	1	XBFZZ	5305-01-042-1410	0149-1-2286	15942	SCREW, CAP	EA	1
12	2	PAFZZ	5835-01-078-4915	0149-1-2361	15942	HEAD, SOUND, RECORDER- REPRODUCER	EA	1
12	3	XBFZZ		0123-1-3036	15942	PLATE, HEAD MOUNTING	EA	1
12	4	XBFZZ	5310-00-928-2690	MS35338-134	96906	WASHER, LOCK, SPRING	EA	1
12	5	XBFZZ		2-56x1/8 CRES	70318	SCREW, MACHINE	EA	1

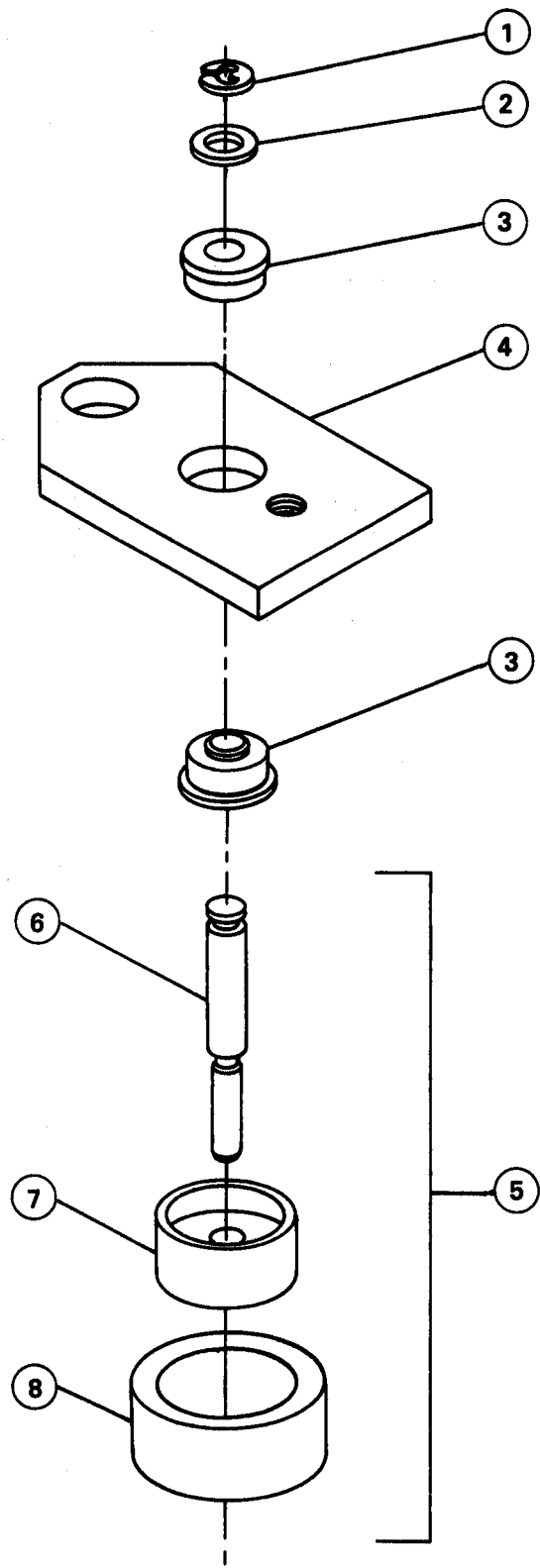


Figure C-13. Drive wheel subassembly

(1) ILLUSTRATION (A) (B) FIG. ITEM NO. NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	TM32-5835-001-24&P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
					GROUP 03040104 DRIVE WHEEL SUB- ASSEMBLY		
					0149-1-3063 (15942) (SEE FIGURE 6 FOR NHA)		
13	1	XBFZZ 5365-00-543-3981	MS16633-4009	96906	RING, RETAINING	EA	1
13	2	XBFZZ 5365-00-052-8847	B6-16	00141	SHIM	EA	AR
13	3	XBFZZ	SFR1335PPEEK24	83086	BEARING, BALL, ANNULAR	EA	2
13	4	XBFZZ	0149-1-3064-2	15942	PLATE, IDLER WHEEL	EA	1
13	5	XBFZZ	0149-1-3065	15942	IDLER ASSEMBLY WHEEL	EA	1
13	6	XA	0149-1-3065-3	15942	SHAFT	EA	1
13	7	XA3	0149-1-3065-1	15942	HUB	EA	1
13	8	XA	0149-1-3065-2	15942	WHEEL, IDLER	EA	1

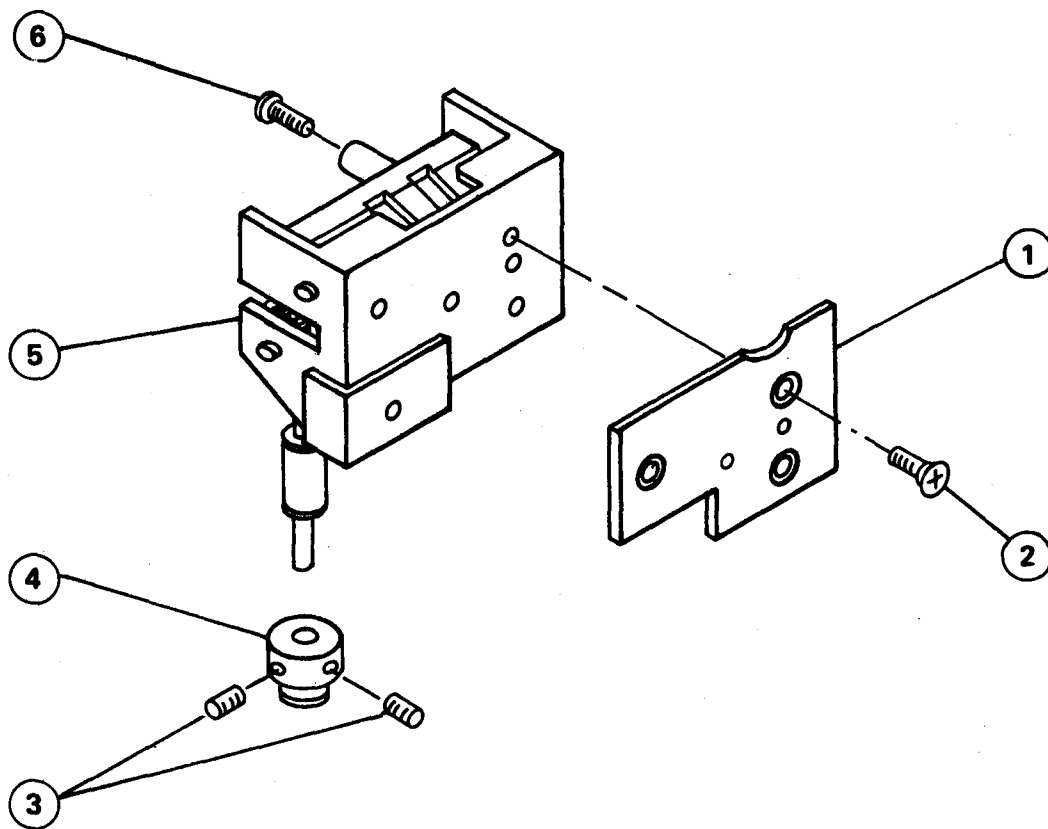


Figure C-14. Counter-pulley assembly

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(5) FSCM	TM32-5835-001-24&P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
						GROUP 030402 COUNTER-PULLEY ASSEMBLY		
						0123-1-3005 (15942) (SEE FIGURE 6 FOR NHA)		
14	1	XBFZZ		0123-1-2001	15942	PLATE, MOUNTING, COUNTER	EA	1
14	2	XBFZZ	5305-00-777-6039	MS51959-12	96906	SCREW, FLAT HEAD	EA	3
14	3	PAFZZ		AN656DC2H2	81350	SETSCREW	EA	2
14	4	PAFZZ		0123-1-3004	15942	PULLEY	EA	1
14	5	PAFZZ	6680-01-079-8879	0123-1-4006	15942	COUNTER, MODIFICATION	EA	1
14	6	XBFZZ		1-72X3/8 LG.CRES	70318	SCREW, BUTTON HEAD	EA	1

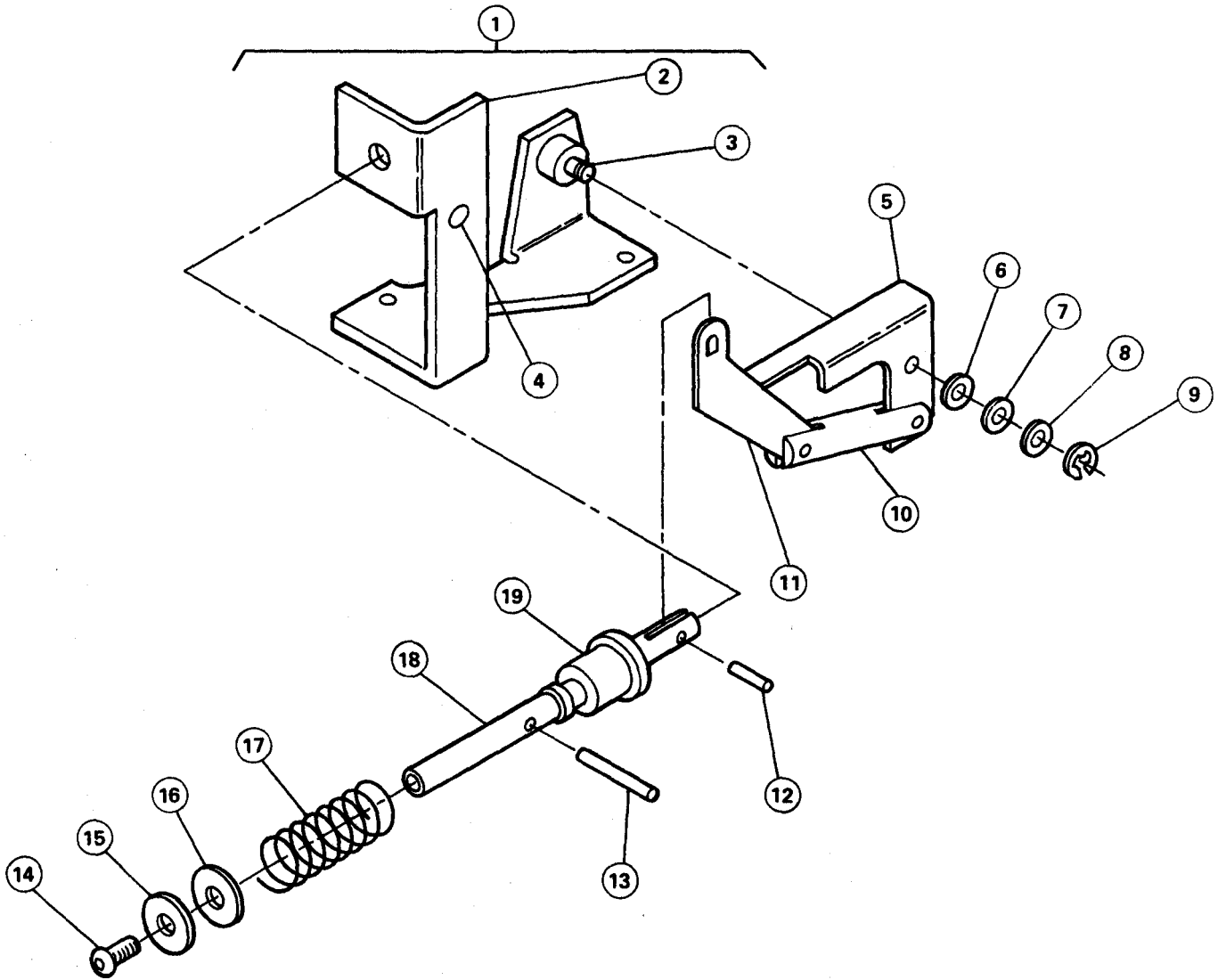


Figure C-15. Ejector subassembly

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(6) FSCM DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
					TM32-5835-001-24&P		
					GROUP 030403 EJECTOR SUB- ASSEMBLY		
					0149-1-4041 (15942) (SEE FIGURE 6 FOR NHA)		
15	1	XBFZZ		0149-1-3028	15942 BRACKET, MOUNTING, EJECTOR	EA	1
15	2	XA		0149-1-3028-1	15942 BRACKET	EA	1
15	3	XA		0149-1-3029-1	15942 PIN, PIVOT, EJECTOR	EA	1
15	4	XA		0149-1-3029-2	15942 PIN, PIVOT, EJECTOR	EA	1
15	5	XBFZZ		0149-1-3030	15942 LINKAGE, EJECTOR	EA	1
15	6	XBFZZ	5365-00-052-8847	B6-16	0141 SHIM	EA	AR
15	7	XBFZZ	5310-00-095-6761	MS15795-802	96906 WASHER, FLAT	EA	AR
15	8	XBFZZ	5310-00-027-0795	B6-18	00141 SHIM	EA	AR
15	9	XBFZZ	5365-00-543-3981	MS16633-4009	96906 RING, RETAINING	EA	2
15	10	XBFZZ		0149-1-3032	15942 LINKAGE, EJECTOR	EA	1
15	11	XBFZZ		0149-1-3031	15942 LINKAGE, EJECTOR	EA	1
15	12	XBFZZ	5315-00-291-5471	MS16562-189	96906 PIN, SPRING	EA	3
15	13	XBFZZ	5315-00-882-1438	MS16562-193	96906 PIN, SPRING	EA	1
15	14	XBFZZ		NO.1-72X3/8 CRES	70318 SCREW, MACHINE	EA	1
15	15	XBFZZ		.128 ID X.250 OD X .015 THK	86445 WASHER, FLAT	EA	AR
15	16	XBFZZ		0123-1-2105	15942 WASHER, SHOULDERED	EA	1
15	17	XBFZZ		0149-1-3036-1	15942 SPRING, HELICAL	EA	1
15	18	XBFZZ		0149-1-3035	15942 LINKAGE, EJECTOR	EA	1
15	19	XBFZZ		0149-1-3034	15942 BUSHING, CARTRIDGE, EJECTOR	EA	1

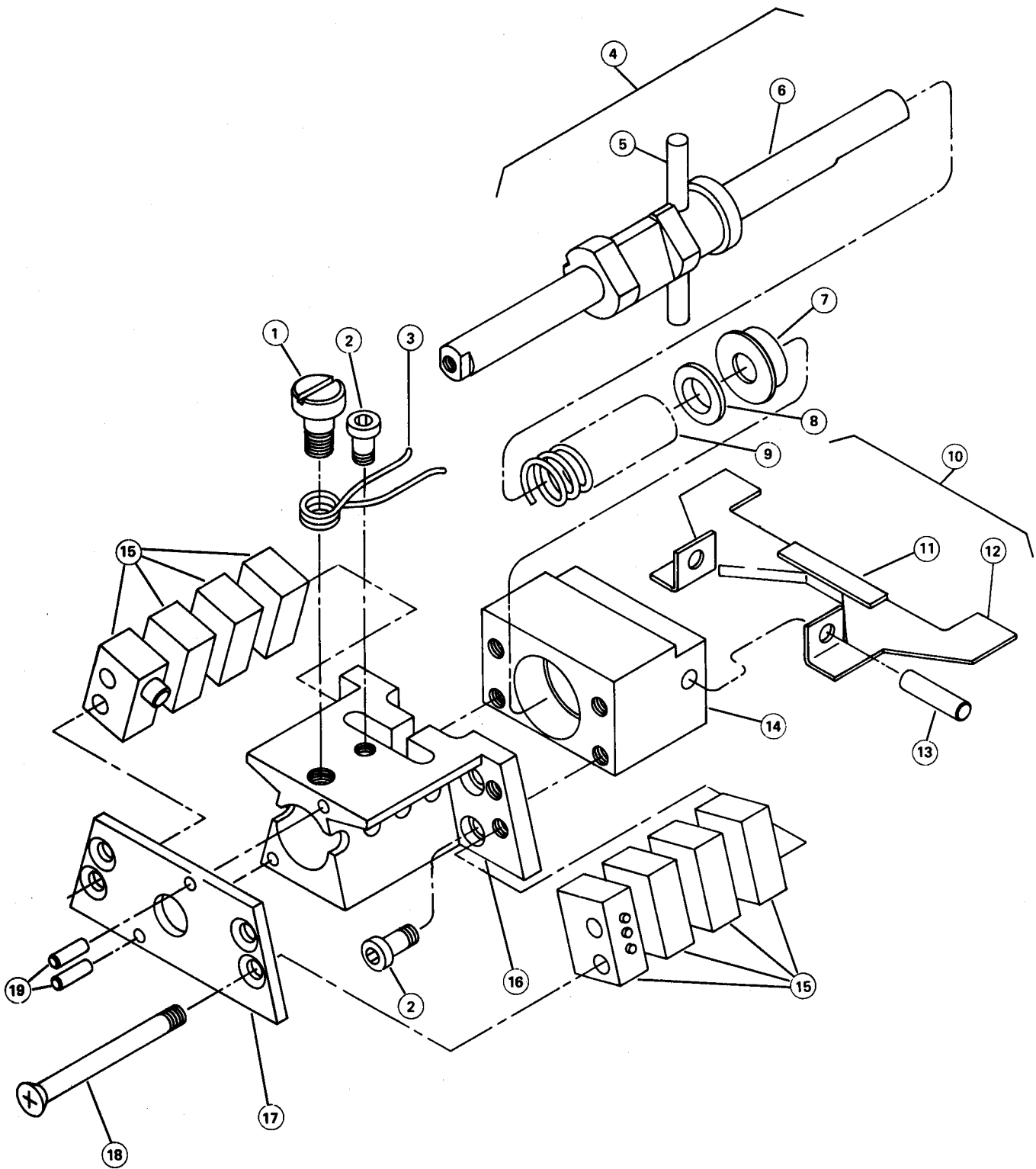


Figure C-16. Switch assembly

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(6) FSCM	TM 32-5835-001-24 & P DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
GROUP 030404 SWITCH ASSEMBLY								
0123-1-4030 (15942) (SEE FIGURE 10 FOR NHA)								
16	1	XBFZZ	5305-01-049-9577	0149-1-2077	15942	SCREW, SHOULDER	EA	1
16	2	XBFZZ		2-56X3/16 CRES	70318	SCREW, MACHINE	EA	5
16	3	XBFZZ	5360-01-050-2550	0149-1-3022	15942	SPRING, HELICAL, COMPRESSION	EA	1
16	4	XBFZZ	3040-01-051-9856	0149-1-4039	15942	SHAFT, SHOULDERED	EA	1
16	5	XA		0149-1-2019	15942	PIN, STRAIGHT, HEADLESS	EA	1
16	6	XA		0149-1-4039-1	15942	SHAFT, CAM	EA	1
16	7	XBFZZ		SFR1565PPEEDC34K24	83086	BEARING, BALL, ANNULAR	EA	1
16	8	XBFZZ	3120-00-713-4651	B6-7	00141	SPACER, SLEEVE	EA	1
16	9	XBFZZ		HP8984081	84685	SPRING, HELICAL	EA	1
16	10	XBFZZ		0149-1-4075	15942	BRAKE, REEL	EA	1
16	11	XA		0149-1-4075-1	15942	STRIP, REINFORCEMENT	EA	1
16	12	XA		0149-1-4075-2	15942	PLATE, BRAKE	EA	1
16	13	XBFZZ	5315-00-058-9727	MS16562-209	96906	PIN, SPRING	EA	2
16	14	XBFZZ		0123-1-4039	15942	SUPPORT, MOUNTING, BLOCK	EA	1
16	15	PAFZZ	5930-00-803-4570	MS2454A7-1	96906	SWITCH, SENSITIVE	EA	8
16	16	XBFZZ		0149-1-4037	15942	BLOCK, SWITCH	EA	1
16	17	XBFZZ		0149-1-3021	15942	COVER, SWITCH ASSEMBLY	EA	1
16	18	XBFZZ		1-72X1 CRES	70318	SCREW, MACHINE	EA	4
16	19	XBFZZ	5315-00-848-7829	MS16556-602	96906	PIN, STRAIGHT, HEADLESS	EA	2

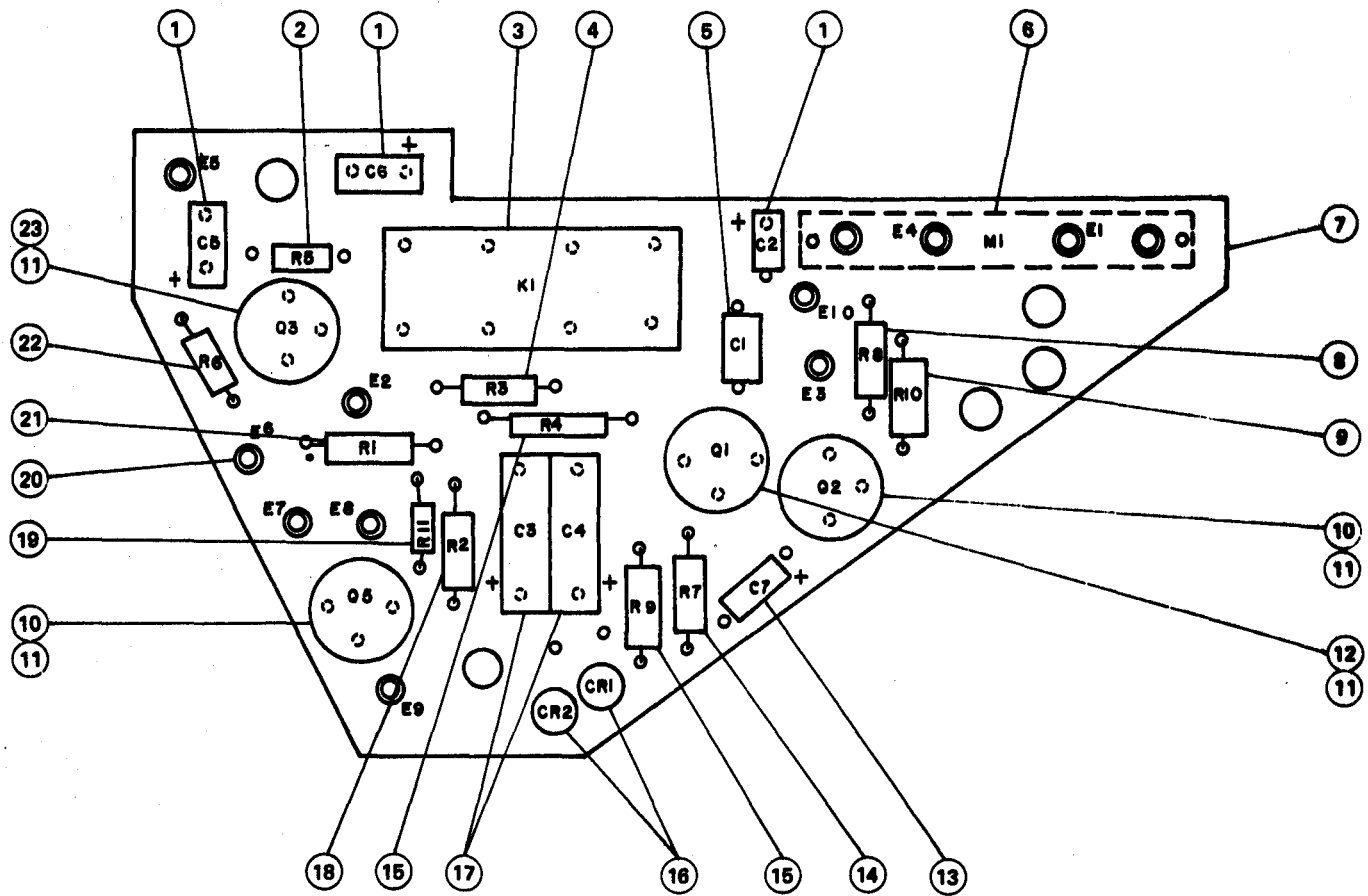


Figure C-17. Amplifier assembly

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(5) FSCM	TM 32-5835-001-24 & P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
						GROUP 030407 AMPLIFIER ASSEMBLY		
						0149-1-4028 (15942) (SEE FIGURE 6 FOR NHA)		
17	1	PAFZZ	5910-00-506-7008	F683R-10	17554	CAPACITOR, FIXED, ELECTROLYTIC	EA	3
17	2	PAFZZ	5905-00-617-5089	RCR05G153JM	81349	RESISTOR, FIXED, COMPOSITION	EA	1
17	3	PAFZZ	5945-01-054-6752	M5757/9-035	81349	RELAY	EA	1
17	4	PAFZZ	5905-00-401-7427	RCR05G332JM	81349	RESISTOR, FIXED, COMPOSITION	EA	1
17	5	PAFZZ	5910-00-476-4749	S226R-10	17554	CAPACITOR, FIXED, ELECTROLYTIC	EA	1
17	6	PAFZZ	6645-01-005-1885	120 PC	18583	METER, ELAPSED TIME	EA	1
17	7	XA		0149-1-3189	15942	PRINTED WIRING BOARD	EA	1
17	8	PAFZZ	5905-00-617-5090	RCR05G333JM	81349	RESISTOR, FIXED, COMPOSITION	EA	1
17	9	PAFZZ	5905-00-470-0370	RCR05G205JM	81349	RESISTOR, FIXED, COMPOSITION	EA	1
17	10	PAFZZ	5961-00-951-8757	JAN2N2222A	81349	TRANSISTOR	EA	2
17	11	PAFZZ	5999-00-992-2598	7717-7	13103	INSULATOR, DISK	EA	4
17	12	PAFZZ	5961-00-911-6015	JAN2N3251A	81349	TRANSISTOR	EA	1
17	13	PAFZZ	5910-00-357-3709	M685R-20	17554	CAPACITOR, FIXED, ELECTROLYTIC	EA	1
17	14	PAFZZ	5905-00-180-8315	RCR05G681JM	81349	RESISTOR, FIXED, COMPOSITION	EA	1
17	16	PAFZZ	5961-00-892-0734	JAN1N483B	81349	SEMICONDUCTOR DEVICE, DIODE	EA	2
17	17	PAFZZ	5910-00-121-9876	J476R-10	17554	CAPACITOR, FIXED, ELECTROLYTIC	EA	2
17	18	PAFZZ	5905-00-433-6483	RCR05G392JM	81349	RESISTOR, FIXED, COMPOSITION	EA	1
17	19	PAFZZ	5905-00-406-1218	RCR05G822JM	81349	RESISTOR, FIXED, COMPOSITION	EA	1
17	20	XBFZZ	5940-00-913-8093	2085-2	71279	TERMINAL, STUD	EA	12
17	21	PAFZZ	5905-00-114-0710	RCR07GF331JM	81349	RESISTOR, FIXED, COMPOSITION	EA	1
17	22	PAFZZ	5905-00-761-5758	RCR05G471JM	81349	RESISTOR, FIXED, COMPOSITION	EA	1
17	23	PAFZZ	5961-00-490-0318	JAN2N4948	81349	TRANSISTOR	EA	1

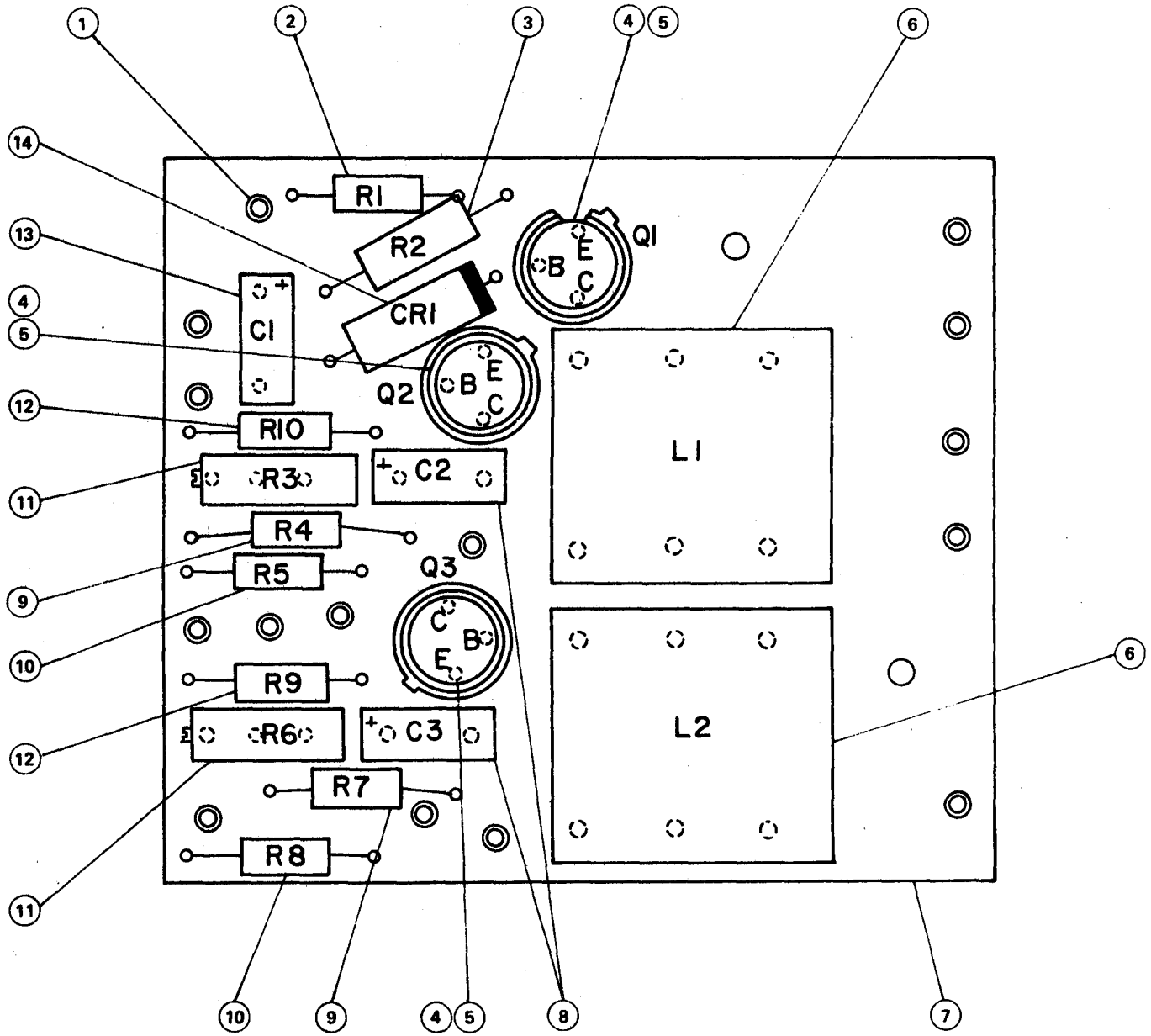


Figure C-18. Circuit card assembly

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(5) FSCM	TM 32-5835-001-24 & P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
						GROUP 030408 CIRCUIT CARD ASSEMBLY		
						0149-1-4029 (15942) (SEE FIGURE 6 FOR NHA)		
18	1	XBFZZ	5940-00-913-8093	2085-2	71279	TERMINAL, STUD	EA	15
18	2	PAFZZ	5905-00-412-3776	RCR05G183JM	81349	RESISTOR, FIXED, COMPOSITION	EA	1
18	3	PAFZZ	5905-00-734-1036	RCR07G332JM	81349	RESISTOR, FIXED, COMPOSITION	EA	1
18	4	PAFZZ	5961-00-951-8757	JAN2N2222A	81349	TRANSISTOR	EA	3
18	5	PAFZZ	5999-00-929-3086	7717-18	13103	INSULATOR, DISK	EA	3
18	6	PAFZZ		124-5K	04072	REACTOR	EA	2
18	7	XA		0149-1-3001	15942	PRINTED WIRING BOARD	EA	1
18	8	PAFZZ	5910-00-872-5152	L106R20	17554	CAPACITOR, FIXED, ELECTROLYTIC	EA	2
18	9	PAFZZ	5905-00-180-8303	RCR05G152JM	81349	RESISTOR, FIXED, COMPOSITION	EA	2
18	10	PAFZZ	5905-00-617-5096	RCR05G682JM	81349	RESISTOR, FIXED, COMPOSITION	EA	2
18	11	PAFZZ	5905-00-432-0078	RT24C2X103	81349	RESISTOR, VARIABLE	EA	2
18	12	PAFZZ	5905-00-617-5093	RCR05G473KM	81349	RESISTOR, FIXED, COMPOSITION	EA	2
18	13	PAFZZ	5910-01-061-9706	S336R20	17554	CAPACITOR, FIXED, ELECTROLYTIC	EA	1
18	14	PAFZZ	5961-00-894-0684	JAN1N758A	81349	SEMICONDUCTOR DEVICE, DIODE	EA	1

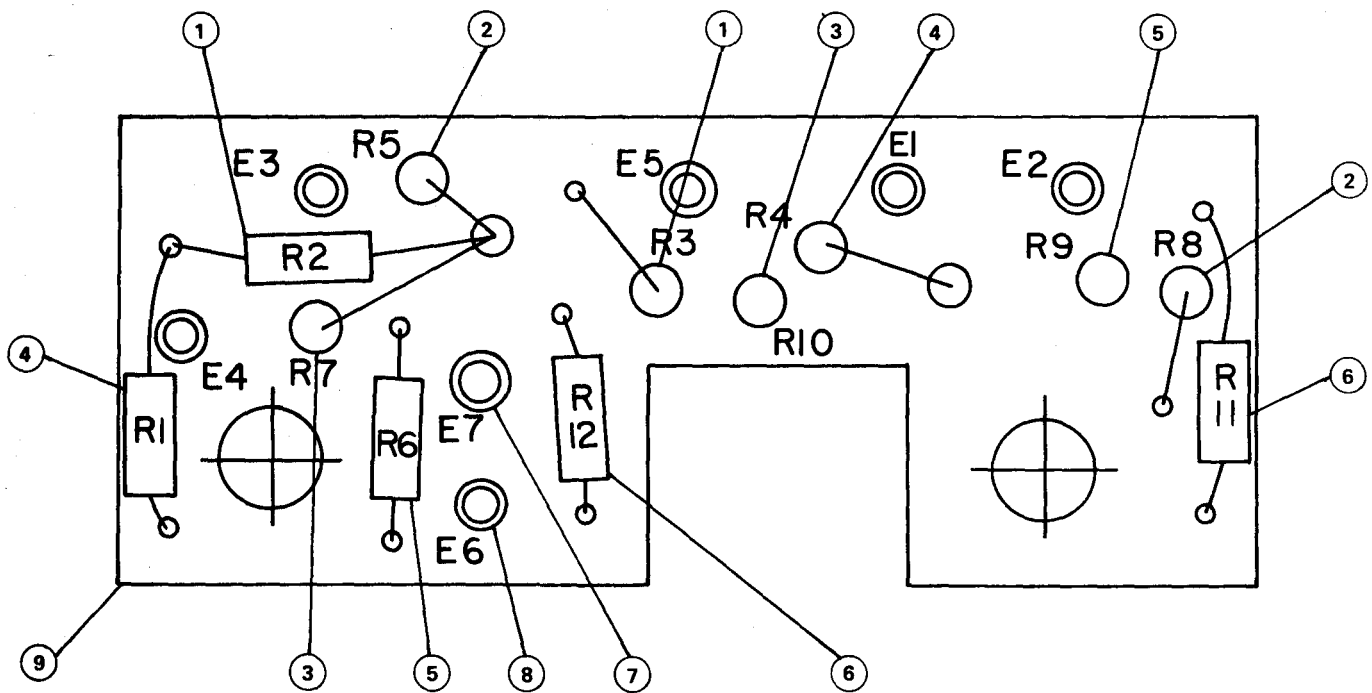


Figure C-19. Resistor assembly

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(6) FSCM	TM 32-5835-001-24 & P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
						GROUP 030409 RESISTOR ASSEMBLY		
						0149-1-3067 (15942) (SEE FIGURE 6 FOR NHA)		
19	1	PAFZZ	5905-00-480-0013	RCR05G241JM	81349	RESISTOR, FIXED, COMPOSITION	EA	2
19	2	PAFZZ	5905-00-617-5091	RCR05G472KM	81349	RESISTOR, FIXED, COMPOSITION	EA	2
19	3	PAFZZ	5901-00-458-9500	RCR05G102KM	81349	RESISTOR, FIXED, COMPOSITION	EA	2
19	4	PAFZZ	5905-01-035-5065	RCR05G103JM	81349	RESISTOR, FIXED, COMPOSITION	EA	2
19	5	PAFZZ	5905-00-412-4044	RCR05G224KM	81349	RESISTOR, FIXED, COMPOSITION	EA	2
19	6	PAFZZ	5905-00-180-8301	RCR05G101KM	81349	RESISTOR, FIXED, COMPOSITION	EA	2
19	7	XBFZZ	5940-00-082-4869	2520B-1	88245	TERMINAL, STUD	EA	1
19	8	XBFZZ	5940-00-913-8093	2085-2	71279	TERMINAL, PIN	EA	6
19	9	XA		0149-1-3003	15942	PRINTED WIRING BOARD	EA	1

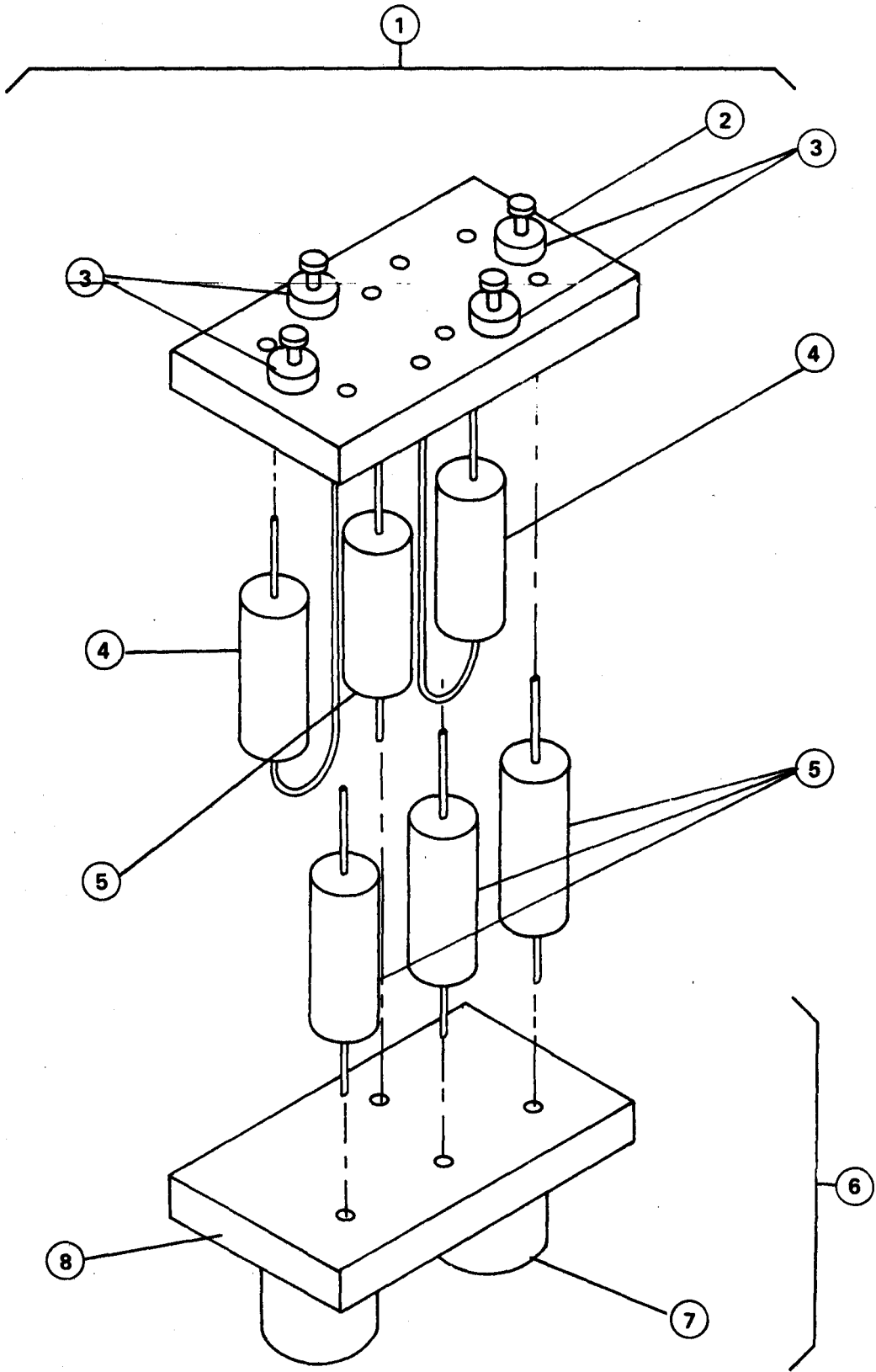


Figure C-20. Filter assembly

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(5) FSCM	TM 32-5835-001-24 & P (6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
						GROUP 0304010 FILTER ASSEMBLY		
						0149-1-3275 (15942) (SEE FIGURE 10 FOR NHA)		
20	1	XBFZZ		0149-1-2004	15942	PRINTED WIRING BOARD	EA	1
20	2	XA		0149-1-2004-1	15942	BOARD	EA	1
20	3	XA		2061B1	88245	TERMINAL, STUD	EA	4
20	4	PAFZZ	5950-00-927-5053	WEEWEE-150	83125	INDUCTOR	EA	2
20	5	PAFZZ	5910-00-099-0541	M39014-05-2261	81349	CAPACITOR, FIXED, CERAMIC	EA	4
20	6	XBFZZ		0149-1-2005	15942	PRINTED WIRING BOARD	EA	1
20	7	XA		0149-1-2059	15942	SPACER, FILTER	EA	2
20	8	XA		0149-1-2005-1	15942	BOARD	EA	1

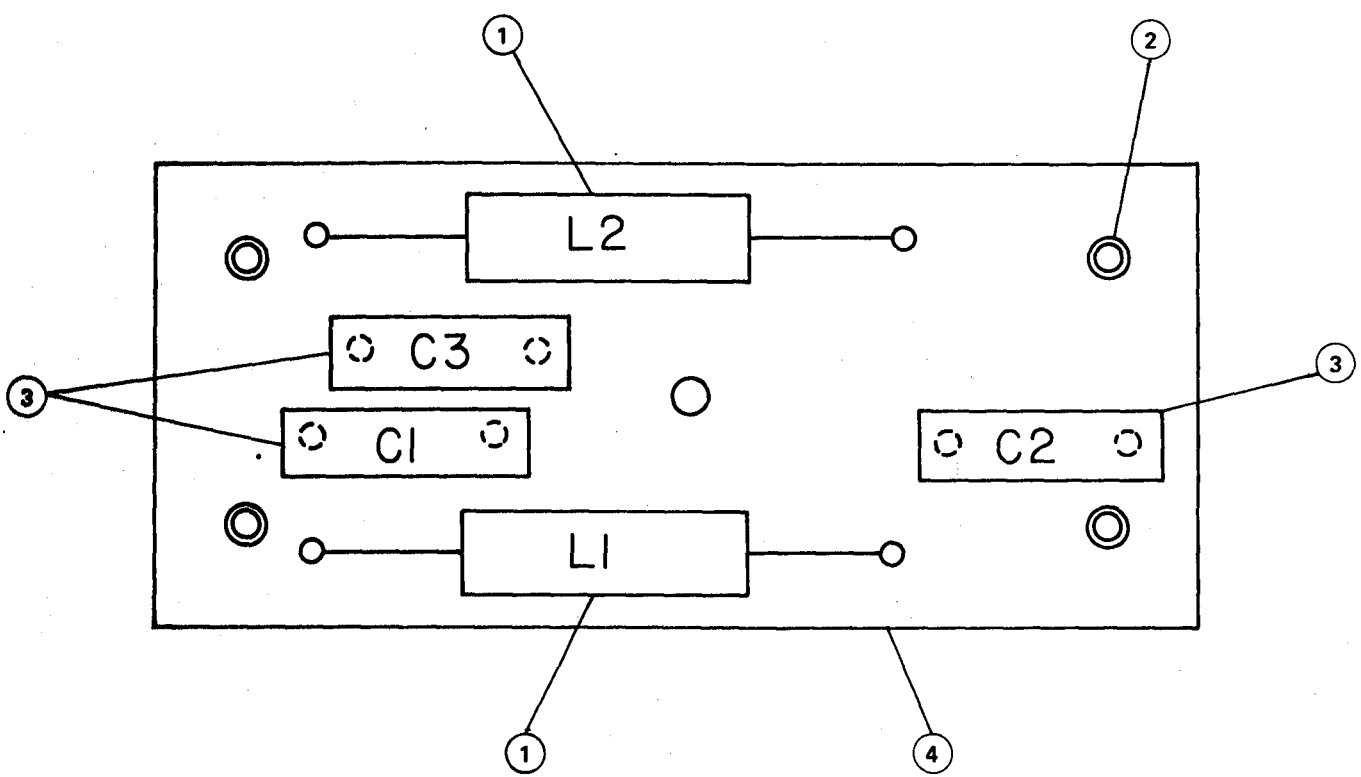


Figure C-21. Circuit card assembly

(1) ILLUSTRATION		(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) U/M	(8) QTY. INC. IN UNIT
(a) FIG. NO.	(b) ITEM NO.							
						GROUP 0304011 CIRCUIT CARD ASSEMBLY		
						0149-1-3088 (15942) (SEE FIGURE 6 FOR NHA)		
21	1	PAFZZ	5950-00-583-8894	MR-47	24759	INDUCTOR	EA	2
21	2	XBZZ	5940-00-913-8093	2085-2	71279	TERMINAL, STUD	EA	4
21	3	PAFZZ	5910-00-124-0659	CK05CW103K	81349	CAPACITOR, FIXED, CERAMIC	EA	3
21	4	XA		0149-1-2003	15942	PRINTED WIRING BOARD	EA	1

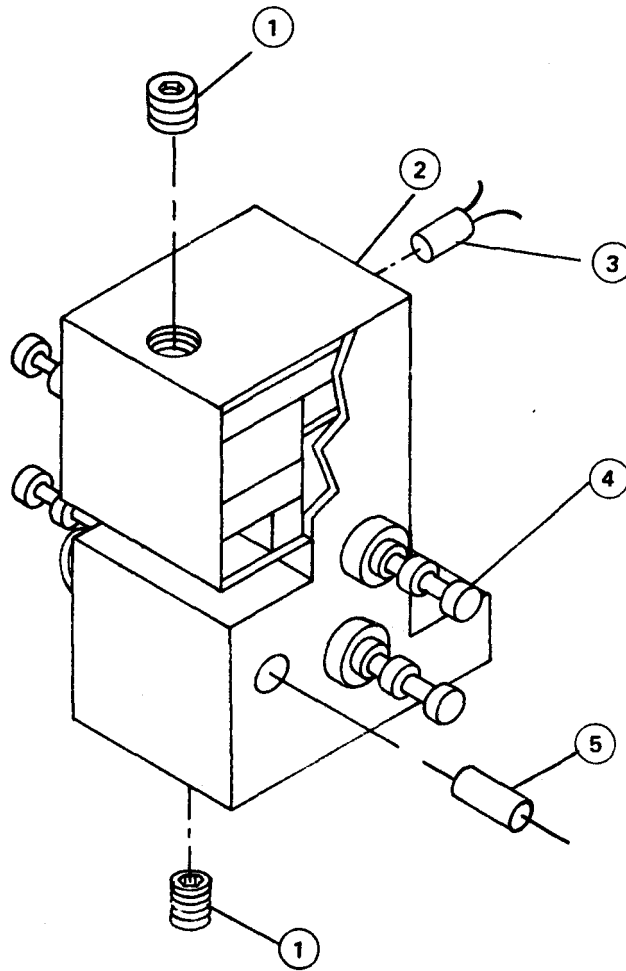


Figure C-22. Sensor, recorder-reproducer

(1) ILLUSTRATION		(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) U/A	(8) QTY. INC. IN UNIT
(a) FIG. NO.	(b) ITEM NO.							
						GROUP 0304012 SENSOR, RECORDER REPRODUCER		
						0149-1-3040 (15942) (SEE FIGURE 10 FOR NHA)		
22	1	PAFZZ	5305-00-821-9422	CS8	00141	SETScrew	EA	2
22	2	XBFZZ	5835-00-466-8491	0149-1-4074	15942	BLOCK, SENSOR MOUNTING	EA	1
22	3	PAFZZ	5961-00-163-5487	2N5777	04713	TRANSISTOR	EA	1
22	4	XBFZZ		013-2004	91506	TERMINAL, STUD	EA	4
22	5	PAFZZ		ME60	26483	SEMICONDUCTOR DEVICE, DIODE	EA	1

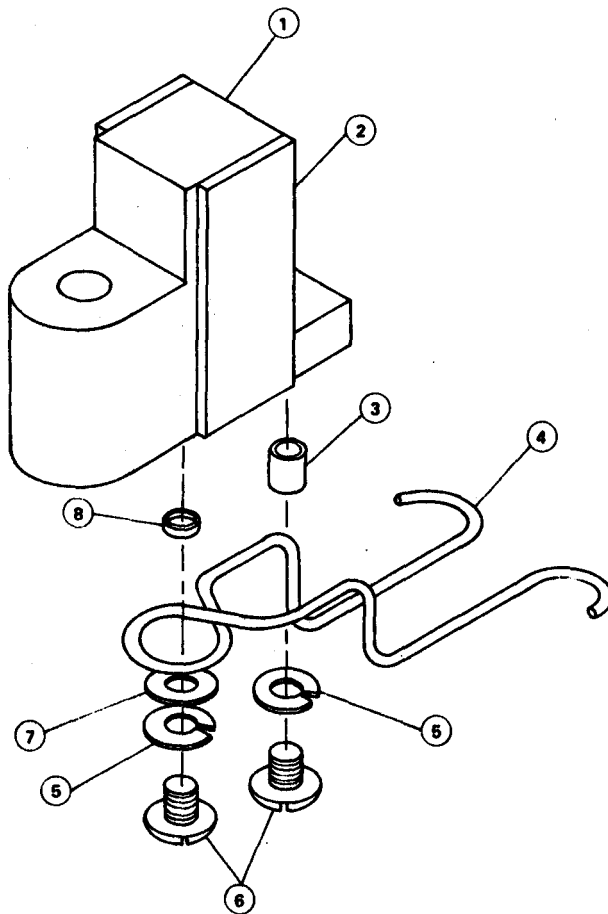


Figure C-23. Actuator assembly

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG. NO.	(b) ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION	U/M	QTY. INC. IN UNIT
						GROUP 0304013 ACTUATOR ASSEMBLY 0149-1-3184 (15942) (SEE FIGURE 10 FOR NHA)		
23	1	PAFZZ		0149-1-3180	15942	ACTUATOR, SWITCH	EA	1
23	2	XBFZZ		0149-1-2287	15942	LINING, SWITCH ACTUATOR	EA	2
23	3	XBFZZ		0149-1-2110-1	15942	SPACER, SLEEVE	EA	1
23	4	PAFZZ		0123-1-2008	15942	SPRING, TORSION	EA	1
23	5	XBFZZ	5310-00-928-2690	MS 35338-134	96906	WASHER, LOCK	EA	2
23	6	XBFZZ	5305-00-054-5637	MS51957-3	96906	SCREW, MACHINE	EA	2
23	7	XBFZZ		0149-1-2109	15942	WASHER, FLAT, MODIFIED	EA	1
23	8	XBFZZ		0149-1-2110-2	15942	SPACER, SLEEVE	EA	1

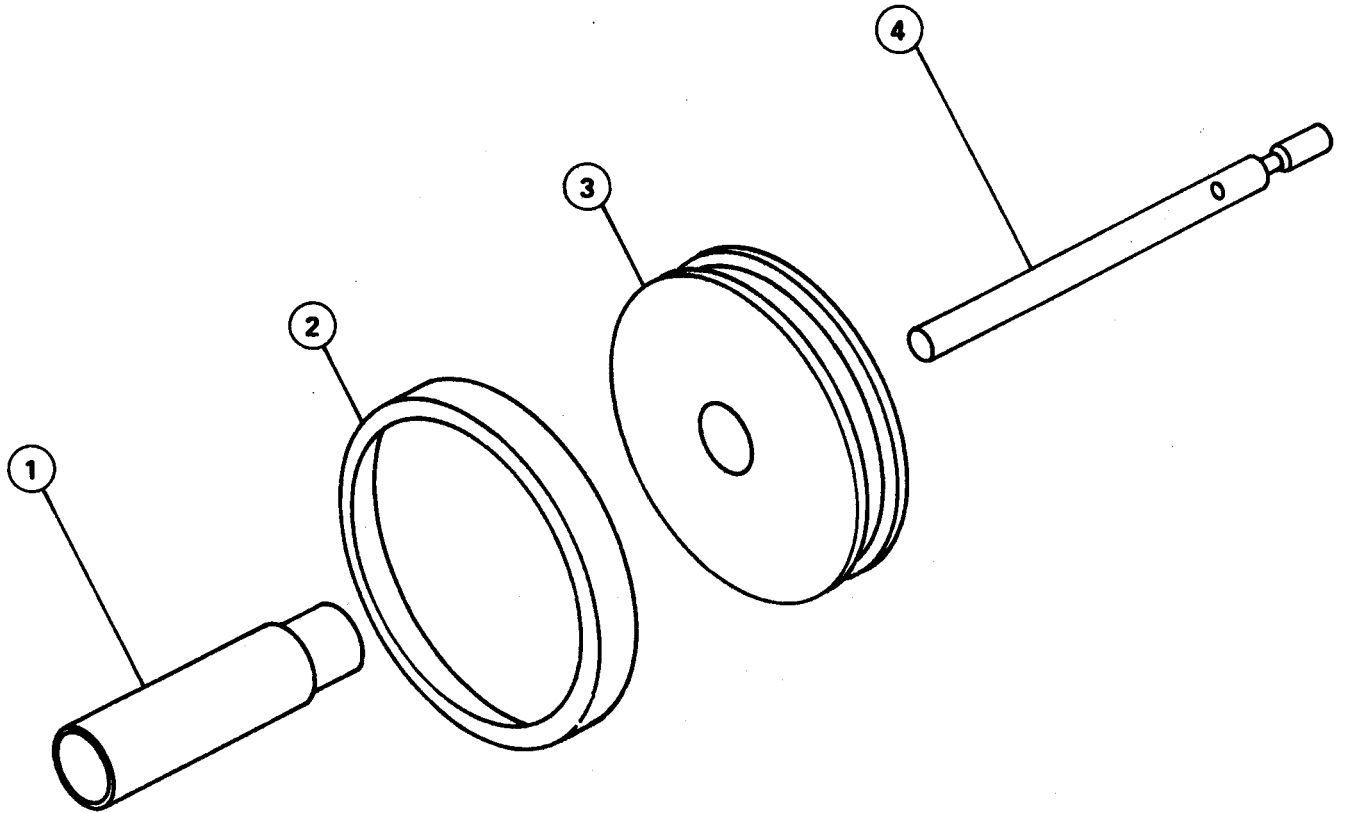


Figure C-24. Disk, reel

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG. NO.	(b) ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION	U/M	INC. IN UNIT
						GROUP 0304016 DISK, REEL 0149-1-3023 (15942) (SEE FIGURE 6 FOR NHA)		
24	1	XBFZZ		0149-1-3039	15942	SHAFT, STRAIGHT	EA	1
24	2	XBFZZ		7-800X130B	02697	PACKING, PREFORMED	EA	1
24	3	XBFZZ		0149-1-3037	15942	PULLEY	EA	1
24	4	XBFZZ		0149-1-2028	15942	SHAFT, STRAIGHT	EA	1

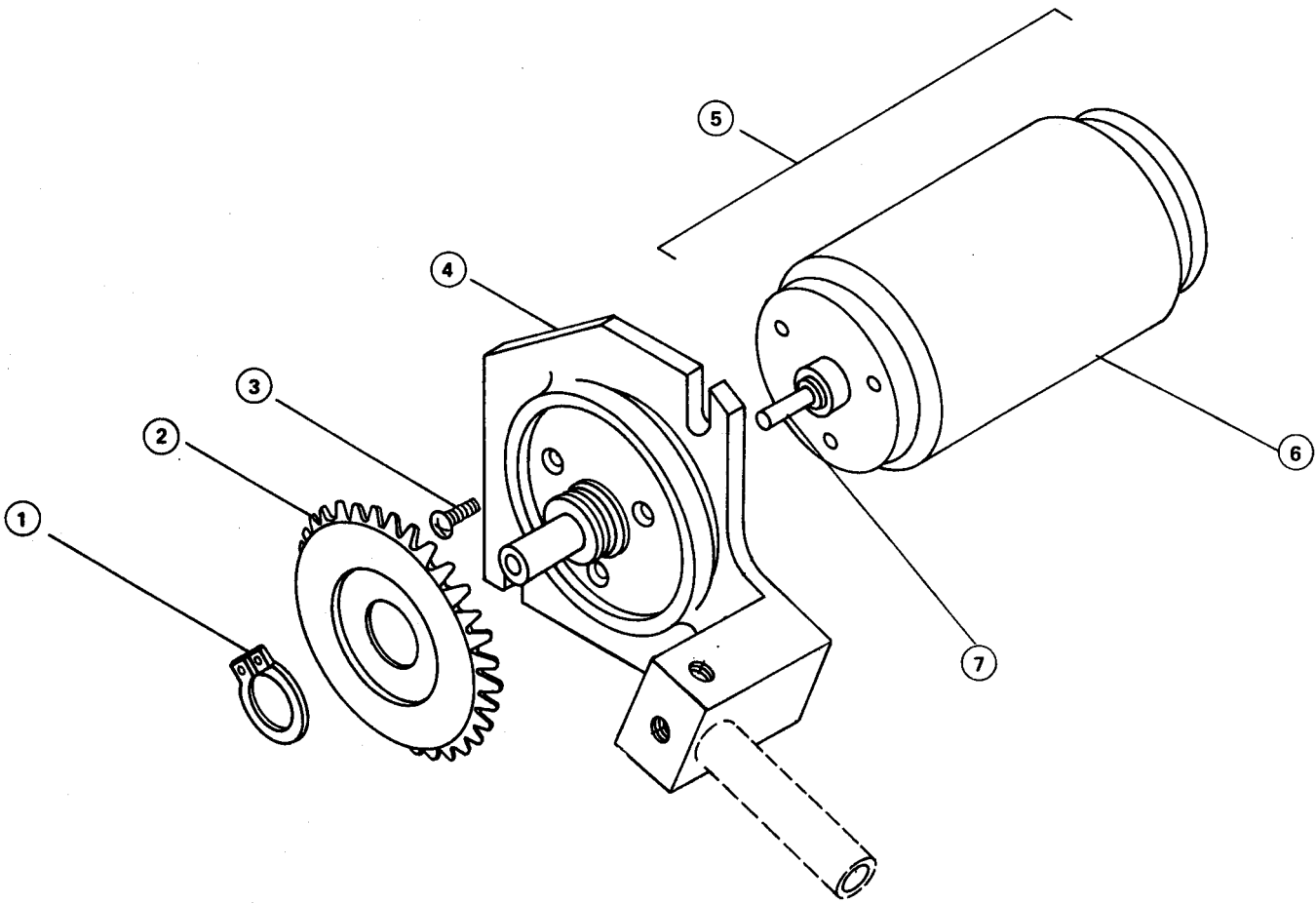


Figure C-25. Motor, Assembly

(1) ILLUSTRATION		(2)	(3)	(4)	(5)	(6)	(7)	(8)
(a) FIG. NO.	(b) ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	DESCRIPTION	U/M	QTY. INC IN UNIT
					GROUP 0304018 MOTOR ASSEMBLY			
					0123-1-4060 (15942) (SEE FIGURE 6 FOR NHA)			
25		XBFZZ	5365-00-804-9670	5101-28C	79136	RING, RETAINING	EA	1
25	2	PAFZZ		0123-1-3002	15942	GEAR, SPUR	EA	1
25	3	XBFZZ		1-72x1/8 LG	70318	SCREW, MACHINE	EA	3
25	4	XBFZZ		0123-1-4002	15942	MOUNTING, MOTOR	EA	1
25	5	PAFZZ		0123-1-3086	15942	DC MOTOR AS SEMBLY	EA	1
25	6	XA		0123-1-3091	15942	MOTOR, DC	EA	1
25		XA		0123-1-2000	15942	EXTENSION, SHAFT	EA	1

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR NATIONAL STOCK CODE NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
					GROUP 9900 BULK MATERIAL		
BULK	XBFZZ		A-40	97297	ADHESIVE		AR
BULK	XBFZZ		B-39, MIL-G-4343	81349	GREASE, PNEUMATIC		AR
BULK	XBFZZ	8040-00-993-5813	EC1099	94959	ADHESIVE	PT	AR
BULK	XBFZZ		FIT-221, 3/16 DIA, BLACK	92914	SLEEVING, INSULATED, ELECTRICAL		AR
BULK	XBFZZ		MIL-C-3432D	81349	CABLE, ELECTRICAL		AR
BULK	XBFZZ		MIL-S-22473 GRADE C	81349	COMPOUND, SEALING		AR
BULK	XBFZZ		NO. 49	05972	COMPOUND, SEALING		AR
BULK	XBFZZ	8030-00-180-6222	NO. 75	05972	COMPOUND, SEALING		AR
BULK	XBFZZ		NO. 75 GRADE B	05972	COMPOUND, SEALING		AR
BULK	XBFZZ		NO. 75 GRADE C	05972	COMPOUND, SEALING		R
BULK	XBFZZ		NO. 84 GRADE C	05972	COMPOUND, SEALING		AR
BULK	XBFZZ		NO. 848	79954	ADHESIVE, COATING		AR
BULK	XBFZZ		RTV-11	01339	COMPOUND, SEALING		AR
BULK	XBFZZ		SS-4004	01139	PRIMER, ADHESIVE		AR
BULK	XBFZZ		FT-200-22AWG	92194	SLEEVING, INSULATED		AR
BULK	XBFZZ		TFT250-22AWG	92194	SLEEVING, INSULATED		AR
BULK	XBFZZ		TYPE II, MIL-A-8623	81349	ADHESIVE		AR
BULK	XBFZZ		1362	18565	SHIELDING, GASKET		AR
BULK	XBFZZ	6850-00-927-9461	340	71948	COMPOUND, SILICONE	TU	AR
BULK	XBFZZ		50-01-1029-0000	18565	ADHESIVE		AR
BULK	XBFZZ	8040-00-938-6860	77	04963	ADHESIVE	CN	AR

SECTION III. SPECIAL TOOLS

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(6) FSCM	(6) DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
GROUP 5500 SPECIAL TOOLS								
1			6625-00-044-3208	N/A	80058	COUNTER, ELECTRONIC AN/USM-207A	EA	1
2			6625-00-106-9622	7603N-11S	80009	OSCILLOSCOPE AN/USM-281C	EA	1
3			6625-00-999-7465	N/A	80058	MULTIMETER AN/USM-223	EA	1
4			6625-01-014-4587	N/A	51865	GENERATOR, SIGNAL AN/URM-127A	EA	1
5			6625-00-727-4706	3400	28480	VOLTMETER, ELECTRONIC AN/USM-224	EA	1
6			6625-00-802-8718	C10-334A.01	28480	INDICATOR, DISTORTION AN/URM-184A	EA	1
7			6625-00-987-8527	N/A	80058	METER, FLUTTER ME-254A/U	EA	1
8			6130-00-480-5666	6206B	28480	POWER SUPPLY PP-6547/U	EA	1
9			5950-00-235-2086	N/A	80058	TRANSFORMER, VARIABLE CN-16/U	EA	1
10			5915-00-138-0878	3103-4	88865	FILTER, VARIABLE	EA	1
11			5950-00-625-7133	A704	92739	DEMAGNETIZER	EA	1
12			5180-00-610-8177	N/A	80058	TOOL KIT, ELECTRONICS TK-105/G	EA	1
13				0149-1-3250	15942	KIT, MAINTENANCE, ELECTRONIC EQUIPMENT MK-1977/UNH-16A	EA	1

(SEE FIGURE 26 FOR BREAKDOWN)

This page intentionally left blank.

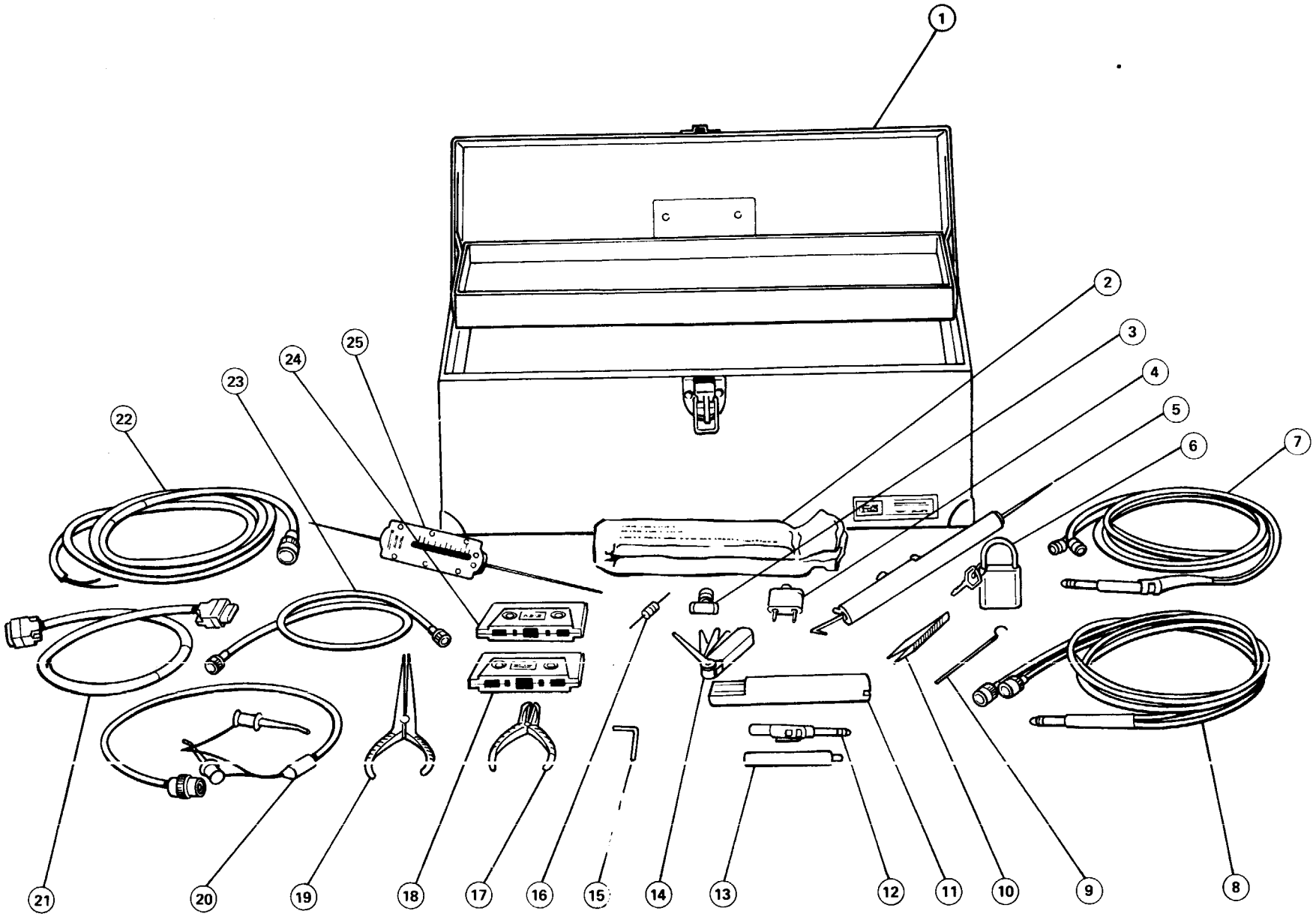


Figure C-26. Kit, Maintenance, Electronic Equipment MK-1977/UNH-16A

(1) ILLUSTRATION (A) FIG. NO.	(2) (B) ITEM NO.	(3) SMR CODE	(4) NATIONAL STOCK NUMBER	(5) PART NUMBER	(6) FSCM DESCRIPTION	(7) U/M	(8) QTY INC. IN UNIT
26				0149-1-3250	15942 KIT, MAINTENANCE, ELECTRONIC EQUIPMENT MK-1977/UNH-16A		
26	1	XBFZZ	5140-00-331-5496	GGG-T-558	81348 TOOL BOX, STEEL	EA	1
26	2	XBFZZ	6515-00-303-8259	GG-A-616	81348 APPLICATOR, WOOD (COTTON TIP)	EA	3
26	3	XBFZZ	5935-00-926-7523	UG-274C/U	80058 ADAPTER, TEE, BNC (TX-8)	EA	1
26	4	XBFZZ	5935-00-053-9454	1269	05276 RECEPTACLE, BNC (TX-7)	EA	2
26	5	XBFZZ	6635-00-791-5915	G16-1000	11710 SCALE, SPRING, 2 LB	EA	1
26	6	XBFZZ	5340-00-664-1319	FF-P-101	81348 PADLOCK, W/KEY	EA	1
26	7	XBFZZ		0149-1-2406	15942 CABLE, SPECIAL PURPOSE (TX-4)	EA	1
26	8	XBFZZ		0149-1-2407	15942 CABLE, SPECIAL PURPOSE (TX-5)	EA	1
26	9	XBFZZ	6520-00-528-1000	GG-E-00916	81348 EXPLORER, DENTAL	EA	1
26	10	XBFZZ	5120-00-247-0867	GGG-T-870	81348 TWEEZERS, CRAFTSMAN (TYPE ICU)	EA	1
26	11	XBFZZ		0149-1-2405	15942 WRENCH, SPECIAL PURPOSE	EA	1
26	12	XBFZZ		0149-1-2402	15942 ADAPTER, SPECIAL PURPOSE (TX-1)	EA	1
26	13	XBFZZ		0149-1-2404	15942 TOOL, BUSHING, ALIGNMENT	EA	1
26	14	XBFZZ	5210-00-221-1999	GGG-G-17	81348 GAGE, GENERAL PURPOSE	EA	1
26	15	XBFZZ	5120-00-198-5400	GGG-K-275	81348 KEY, SOCKET HEAD SCREW	EA	2
26	16	XBFZZ		1149314	23677 RESISTOR, 56 OHM, 5%, 1/2W (TX-9)	EA	1
26	17	XBFZZ		57EHL	27246 CUTTERS, TIP-O-DYKE	EA	1
26	18	XBFZZ	5835-01-053-1236	0099-1-1044	15942 TAPE, TEST/ALIGNMENT, PRE- RECORDED, 3KHZ	EA	1
26	19	XBFZZ		21HL	27246 PLIERS, 60°, CURVED TIP	EA	1
26	20	XBFZZ	6625-01-022-8217	3787-C-36	05276 TEST CLIP, MINIATURE (TX-6)	EA	1
26	21	XBFZZ		0149-1-2401	15942 CABLE, SPECIAL PURPOSE (TX-3)	EA	1
26	22	XBFZZ		0149-1-2400	15942 CABLE, SPECIAL PURPOSE (TX-2)	EA	1
26	23	XBFZZ		0149-1-2408	15942 CABLE, SPECIAL PURPOSE (TX-10)	EA	1
26	24	XBFZZ	5835-01-053-1235	0099-1-1045	15942 TAPE, TROUBLESHOOTING, PRE- RECORDED, 333HZ	EA	1
26	25	XBFZZ	6635-00-717-1307	516-500MCP	11710 SCALE, SPRING, 1LB	EA	1

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

NATIONAL STOCK NUMBER	FIG. NO.	ITEM NO.	NATIONAL STOCK NUMBER	FIG. NO.	ITEM NO.	NATIONAL STOCK NUMBER	FIG. NO.	ITEM NO.
5910-00-010-8666	10	63	5935-00-150-0646	3	15	5835-00-398-9681	6	29
5910-00-022-5659	5	4	5961-00-163-5487	22	3	5310-00-401-0857	10	23
5310-00-027-0795	11	42	5940-00-168-8180	11	7	5905-00-401-7427	17	4
5310-00-027-0795	15	8	5310-00-171-8727	7	73	5905-00-406-1218	17	19
5310-00-033-8118	8	37	5930-00-174-9833	8	3	5905-00-412-3776	18	2
3110-00-029-4144	11	50	5905-00-180-8301	19	6	5905-00-412-4044	19	5
5330-00-052-7533	8	27	5905-00-180-8303	18	9	5835-00-412-4663	6	56
5365-00-052-8847	6	38	5905-00-180-8315	17	14	5360-00-423-6399	11	11
5365-00-052-8847	11	21	5920-00-190-3348	4	2	3030-00-427-1730	6	39
5365-00-052-8847	13	2	5935-00-192-4729	8	7	5905-00-432-0078	18	11
5365-00-052-8847	15	6	5120-00-198-5400	26	5	5905-00-433-6483	17	18
5935-00-053-9454	26	4	5210-00-221-1999	26	14	5835-00-433-7369	8	12
5305-00-054-5635	7	21	5930-00-225-7111	8	2	5905-00-433-7383	8	1
5305-00-054-5635	8	10	5905-00-241-3008	5	9	5835-00-434-9068	6	53
5305-00-054-5636	6	37	5120-00-247-0867	26	10	5910-00-438-6426	5	2
5305-00-054-5636	11	55	5935-00-247-3108	1	5	5905-00-458-9500	19	3
5305-00-054-5637	7	45	5935-00-275-0170	1	8	5835-00-466-8491	22	2
5305-00-054-5637	23	6	5325-00-290-4925	2	9	5835-00-466-8544	11	65
5305-00-054-5638	6	22	5315-00-290-7496	2	2	5905-00-470-0379	17	9
5305-00-054-5638	10	13	5315-00-291-5471	15	12	5310-00-475-9135	6	57
5305-00-054-5640	10	31	6515-00-303-8250	26	2	5910-00-476-4749	17	5
5305-00-054-5643	10	41	5835-00-311-5490	1	1	5905-00-480-0013	19	1
5305-00-054-5646	3	6	5140-00-331-5496	26	1	5910-00-490-0242	5	10
5305-00-054-5647	3	16	3020-00-332-2584	10	20	5961-00-490-0318	17	23
5305-00-054-5647	6	7	5835-00-334-6556	10	30	5935-00-498-5785	3	11
5305-00-054-5647	7	7	5835-00-341-5441	10	54	5310-00-499-4575	10	1
5305-00-054-5648	3	17	5356-00-341-6848	10	52	5365-00-499-4578	10	36
5305-00-054-5649	3	1	5360-00-342-9588	10	4	6625-00-501-7361	8	30
5305-00-054-5649	6	4	5360-00-342-9589	10	49	5835-00-504-9794	11	57
5305-00-056-9961	6	58	5835-00-345-9516	10	8	5910-00-506-7008	17	1
5310-00-058-3599	7	6	5990-00-345-9527	7	1	5835-00-510-0890	10	35
5315-00-058-9727	16	13	5910-00-357-3709	17	13	5310-00-515-7449	2	4
5340-00-060-9488	3	33	5835-00-357-6759	10	46	5950-00-523-8894	21	1
6710-00-063-0509	6	13	5935-00-359-4607	3	13	6520-00-528-1000	26	9
5305-00-066-7326	3	32	6105-00-361-1113	10	27	5835-00-529-6191	1	
5305-00-068-5276	6	61	5835-00-364-0810	11	15	5835-00-529-6306	1	
5305-00-068-5276	7	20	5835-00-364-0811	11	63	5835-00-529-6307	1	
5305-00-068-5276	10	47	5835-00-364-0813	7	14	5356-00-543-3981	11	44
5305-00-068-5409	6	31	5835-00-364-0814	7	18	5365-00-543-3981	13	1
5305-00-068-5410	11	10	5835-00-364-0815	7	23	5365-00-543-3981	15	9
5305-00-068-5414	6	8	5835-00-364-0816	6	60	5305-00-543-5832	11	37
5305-00-079-5835	2	13	5950-00-365-5943	3	34	5310-00-595-6211	3	3
5940-00-082-4869	19	7	5920-00-366-0113	4	3	5310-00-595-6211	6	6
5961-00-087-6047	4	1	5315-00-376-0340	10	21	5310-00-595-6211	7	5
5961-00-087-6047	5	5	5310-00-376-0341	10	6	5310-00-595-6211	10	49
5995-00-091-9257	1	3	5835-00-387-4143	10	65	5310-00-595-6761	6	23
5995-00-097-8489	1	2	5835-00-391-8655	6	52	5310-00-595-6761	7	22
5910-00-099-0541	20	5	5835-00-391-8662	3	29	5310-00-595-6761	8	11
5905-00-104-8343	5	7	5930-00-393-0623	8	15	5310-00-595-6761	10	15
5905-00-110-7620	5	8	3030-00-394-3341	6	54	5310-00-595-6761	15	7
5905-00-114-0710	17	21	5935-00-394-9902	10	56	5905-00-617-5089	17	2
5910-00-121-9876	17	17	6105-00-394-5376	6	35	5905-00-617-5090	17	8
5910-00-124-0659	21	3	5835-00-398-9678	7	4	5905-00-617-5091	19	2

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

NATIONAL STOCK NUMBER	FIG. NO.	ITEM NO.	NATIONAL STOCK NUMBER	FIG. NO.	ITEM NO.	NATIONAL STOCK NUMBER	FIG. NO.	ITEM NO.
5905-00-617-5093	17	15	5940-00-913-8093	18	1	5360-01-050-2837	11	41
5905-00-617-5093	18	12	5940-00-913-8093	19	8	5330-01-051-4105	8	29
5905-00-617-5096	18	10	5940-00-913-8093	21	2	3040-02-051-9856	16	4
5340-00-631-7894	8	13	5935-00-926-7523	26	3	5835-01-053-1235	26	24
5999-00-636-5928	4	6	5950-00-927-5053	20	4	5835-01-053-1236	26	18
5340-00-664-1319	26	6	5310-00-928-2690	6	24	5905-01-053-7275	6	64
5340-00-685-7023	7	16	5310-00-928-2690	10	14	5945-01-054-6752	17	3
3120-00-713-4651	16	8	5310-00-928-2690	12	4	5910-01-061-9706	18	13
5310-00-716-5612	6	17	5310-00-928-2690	23	5	5835-01-078-4915	12	2
6635-00-717-1307	26	25	5999-00-929-3086	18	5	5915-01-079-8884	10	25
5935-00-717-3750	3	20	5310-00-933-8118	3	2	6680-01-079-8879	14	5
5305-00-717-6954	8	34	5310-00-933-8118	6	5			
5905-00-734-1036	18	3	5310-00-933-8118	8	36			
5905-00-761-5758	17	22	5310-00-933-8118	10	48			
5305-00-764-2964	6	47	5310-00-938-2013	6	48			
5305-00-764-2966	11	28	5310-00-938-2013	10	33			
5340-00-768-7827	3	12	5310-00-938-2013	11	32			
5305-00-770-2533	6	16	5961-00-951-8757	17	10			
5305-00-777-6039	6	33	5961-00-951-8757	18	4			
5305-00-777-6039	14	2	5305-00-959-0379	6	32			
6635-00-791-5915	26	5	5935-00-959-2610	3	14			
5930-00-803-4570	10	37	5340-00-968-2691	5	1			
5930-00-803-4570	16	15	5905-00-975-1145	5	11			
5310-00-804-0141	10	39	5355-00-990-3173	8	32			
5365-00-804-9670	25	1	5999-00-992-2598	17	11			
5310-00-805-3214	6	42	8040-00-993-5813	BULK				
5310-00-805-3214	10	19	5811-01-004-4300	11	60			
5310-00-815-0653	10	24	6645-01-005-1885	17	6			
5315-00-815-3250	9	4	5935-01-015-8243	8	6			
5315-00-817-0889	11	29	5930-01-018-9367	8	33			
5305-00-817-1310	10	2	6625-01-022-8217	26	20			
5961-00-836-0377	3	25	5905-01-035-5065	19	4			
5961-00-836-0382	5	6	5835-01-038-8459	11	19			
5910-00-838-9421	3	30	5360-01-040-3755	11	23			
5305-00-841-2682	6	14	5305-01-041-3847	6	1			
5305-00-841-2860	10	43	5340-01-041-3952	10	12			
5305-00-841-9422	6	36	3120-01-041-4626	6	67			
5305-00-841-9422	22	1	3120-01-041-4627	6	3			
5340-00-842-5920	7	13	5305-01-042-1410	11	9			
5961-00-842-9864	10	53	5305-01-042-1410	12	1			
5365-00-845-7667	7	19	5835-01-042-9943	11	4			
5315-00-848-7829	16	19	5999-01-047-0651	11	14			
5910-00-872-5152	18	8	5835-01-048-8583	6	30			
5320-00-879-6606	4	7	5835-01-048-9684	6	44			
5315-00-882-1438	15	13	5355-01-049-2697	8	35			
5905-00-889-0010	5	3	5835-01-049-2701	6	34			
5961-00-892-0734	17	16	5835-01-049-2702	6	66			
5930-00-893-1928	8	19	3110-01-049-4144	10	11			
5315-00-893-6180	9	5	3110-01-049-4144	11	20			
5961-00-894-0684	18	14	3110-01-049-4144	13	3			
5935-00-901-5782	3	18	5330-01-049-4410	8	28			
5961-00-911-6015	17	12	5305-01-049-9577	16	1			
5940-00-913-8093	17	20	5360-01-050-2550	16	3			

PART NUMBER	FSCM	FIG. NO.	ITEM NO.	PART NUMBER	FSCM	FIG. NO.	ITEM NO.
AN507C440R6	81350	6	58	JAN2N4948	81349	17	23
AN507C632R4	81348	3	32	J476R-10	17554	17	17
AN565AC2H5	81350	10	2	LC-016B3-1	84830	6	13
AN656DC2H2	81350	14	3	LSG-2DG8-1	01506	10	57
AN960C416L	81350	2	4	L106R20	17554	18	8
B2-1	00141	7	16	L44BA3	81860	2	12
B6-1	12139	7	19	ME60	26483	22	5
B6-7	00141	16	8	MR-47	24759	21	1
B6-16	00141	6	38	MS15795-801	96906	10	39
B6-16	00141	11	21	MS15795-802	96906	6	23
B6-16	00141	13	2	MS15795-802	96906	7	22
B6-16	00141	15	6	MS15795-802	96906	8	11
B6-18	00141	11	42	MS15795-802	96906	10	15
B6-18	00141	15	8	MS15795-802	96906	15	7
B6-22	00141	6	42	MS15795-803	96906	3	3
B6-22	00141	10	19	MS15795-803	96906	6	6
CKR05BX102KM	81349	10	63	MS15795-803	96906	7	5
CKR06BX104KM	81349	5	4	MS15795-803	96906	10	49
CK05CW103K	81349	21	3	MS16535-154	96906	4	7
CK60AW102M	81349	3	30	MS16555-601	96906	11	29
CSR13E106KL	81349	5	10	MS16556-602	96906	16	19
CS-8	00141	6	36	MS16562-189	96906	15	12
CS-8	00141	22	1	MS16562-193	96906	15	13
C1-008A-6	84830	9	2	MS16562-209	96906	16	13
DA59-20	71468	3	12	MS16633-4009	96906	11	44
DA-15S	71468	3	11	MS16633-4009	96906	13	1
EA1120T1	09349	3	34	MS16633-4009	96906	15	9
E1-008A-1	84830	11	31	MS16995-1	96906	6	31
FF-P-101	81348	26	6	MS16995-10	96906	6	32
FM03-250V1/2A	81349	4	3	MS16995-11	96906	6	8
FM06-250V1/4A	81349	4	2	MS16995-2	96906	11	10
FVD6-F2	89781	10	3	MS16995-8	96906	6	28
F683R-10	17554	17	1	MS16995-9	96906	6	61
GG-A-616	81348	26	2	MS16995-9	96906	7	20
GG-E-00916	81348	26	9	MS16995-9	96906	10	47
GGG-G-17	81348	26	14	MS21208-C0415	96906	7	13
GGG-K-275	81348	26	15	MS21209-C0415	96906	8	13
GGG-T-558	81348	26	1	MS21332-3	96906	2	9
GGG-T-870	81348	26	10	MS24547-1	96906	10	37
G16-1000	11710	26	5	MS24547-1	96906	16	15
G5555-9H	79136	10	52	MS24655-231	96906	8	2
GP24062-312-50	73957	7	9	MS24693-C47	96906	2	7
HP8984081	84685	16	9	MS24693-C50	15942	2	13
H100X9/32LG	57771	2	5	MS3112E10-6P	96906	3	18
H-149 NI PLATE	57771	5	14	MS3181-10C	96906	3	14
H149.090DIAX5/32LG	57771	2	11	MS35335-57	96906	7	6
JAN1N483B	81349	17	16	MS35338-134	96906	6	24
JAN1N758A	81349	18	14	MS35338-134	96906	10	14
JAN1N914	81349	10	53	MS35338-134	96906	12	4
JAN2N2222A	81349	17	10	MS35338-134	96906	23	5
JAN2N2222A	81349	18	4	MS35338-135	96906	3	2
JAN2N3251A	81349	17	12	MS35338-135	96906	6	5

PART NUMBER INDEX				TM 32-5835-001-24 & P			
PART NUMBER	FSCM	FIG.	ITEM	PART NUMBER	FSCM	FIG.	ITEM
		NO.	NO.			NO.	NO.
MS35338-135	96906	8	37	N 5040R	97539	8	19
MS35338-135	96906	10	48	RCR05G101KM	81349	19	6
MS35649-224	96906	6	48	RCR05G102KM	81349	19	3
MS35649-224	96906	10	33	RCR05G103JM	81349	19	4
MS35649-224	96906	11	32	RCR05G152JM	81349	18	9
MS39086-100	96906	9	5	RCR05G153JM	81349	17	2
MS39086-101	96906	9	4	RCR05G183JM	81349	18	2
MS51021-10	96906	11	59	RCR05G205JM	81349	17	9
MS51021-11	96906	11	37	RCR05G224KM	81349	19	5
MS51859-2	96906	6	17	RCR05G241JM	81349	19	1
MS51957-1	96906	8	10	RCR05G332JM	81349	17	4
MS51957-1	96906	7	21	RCR05G333JM	81349	17	8
MS51957-12	96906	3	6	RCR05G392JM	81349	17	18
MS51957-13	96906	3	16	RCR05G471JM	81349	17	22
MS51957-13	96906	6	7	RCR05G472KM	81349	19	2
MS51957-13	96906	7	7	RCR05G473JM	81349	17	15
MS51957-14	96906	3	17	RCR05G473JM	81349	18	12
MS51957-15	96906	3	1	RCR05G681JM	81349	17	14
MS51957-15	96906	6	4	RCR05G682JM	81349	18	10
MS51957-2	96906	6	37	RCR05G822JM	81349	17	19
MS51957-2	96906	11	55	RCR07GF331JM	81349	17	21
MS51957-3	96906	6	45	RCR07G102JM	81349	5	8
MS51957-3	96906	23	6	RCR07G332JM	81349	18	3
MS51957-4	15942	6	22	RC32GF100J	81349	5	7
MS51957-4	15942	10	13	RT24C2X103	81349	18	11
MS51957-6	15942	10	31	RW67V501	81349	5	11
MS51957-9	96906	10	41	RW69V100	81349	5	3
MS51959-12	96906	6	33	RW70U2R00F	81349	5	9
MS51959-12	96906	14	2	SFR1335DK24	83086	10	7
MS51959-13	96906	6	16	SFR1335EEK24	83086	11	50
MS51959-2	96906	11	28	SFR1335PPEEK24	83086	10	11
MS51959-4	96906	6	47	SFR1335PPEEK24	83086	11	20
MS51963-2	96906	8	34	SFR1335PPEEK24	83086	13	3
MS9068-008	96906	8	27	SFR1565PPEEDC34K24	83086	16	7
MS91528-0P1B	96906	8	32	STSM1TURCA	98291	6	49
M112B	82389	8	6	S 226-R10	17554	17	5
M39014-05-2261	81349	20	5	S336R20	17554	18	13
M5757/9-035	81349	17	3	TC-104	59730	3	33
M641-5-1	81349	8	7	TXB-050-037	71468	3	23
M685R-20	17554	17	13	TYPE18-8CRES	70318	10	40
M81511/06EB0P1	81349	1	6	U125-0060	70472	10	23
M81511-13-10A1	81349	1	8	UG-274C/U	80058	26	3
NAS620C10L	80205	3	9	WEWEEB-150	83125	20	4
NAS620C2	80205	6	46	.128IDX.250ODX			
NO. 1CRES	70318	6	41	.015THK	86445	15	15
NO.1-64X3/4LG.CRES	70318	10	42	.128IDX.250ODX			
NO.1-72X1/8LG.CRES	70318	10	16	.015THK NYLON	12096	10	44
NO.1-72X3/8, CRES	70318	15	14	#341-.093H	79963	11	54
NO.1-72X5/32LG.CRES	70318	6	40	0-80X1/16LG.CRES	70318	11	12
NO.2X3/16LG.CRES	70318	6	19	0-80X1/8LG.CRES	70318	11	1
NO.75(.093HOLE)	79963	6	62	0-80X3/16LG.CRES	70318	11	2
N 5030L	97539	8	33	0099-1-1044	15942	26	18

PART NUMBER	FSCM	FIG.		PART NUMBER	FSCM	FIG.	
		NO.	ITEM NO.			NO.	ITEM NO.
0099-1-1045	15942	26	24	0149-1-2007	15942	10	66
0099-1-2025	15942	2	14	0149-1-2007-1	15942	10	67
0099-1-4240	15942	1	7	0149-1-2008	15942	10	61
013803 NYLON	73734	3	24	0149-1-2008-1	15942	10	62
013-2004	91506	22	4	0149-1-2013	15942	8	30
0123-1-2000	15942	25	7	0149-1-2014	15942	6	39
0123-1-2001	15942	14	1	0149-1-2019	15942	16	5
0123-1-2002	15942	8	12	0149-1-2021	15942	10	33
0123-1-2008	15942	23	4	0149-1-2024	15942	3	4
0123-1-2039	15942	11	58	0149-1-2026	15942	3	19
0123-1-2040	15942	11	27	0149-1-2027	15942	6	1
0123-1-2041	15942	11	47	0149-1-2028	15942	24	4
0123-1-2052	15942	10	30	0149-1-2029	15942	10	46
0123-1-2053	15942	10	32	0149-1-2030	15942	10	6
0123-1-2055	15942	8	15	0149-1-2031-1	15942	3	31
0123-1-2059	15942	11	23	0149-1-2031-2	15942	3	26
0123-1-2069	15942	10	26	0149-1-2032	15942	10	36
0123-1-2072	15942	7	3	0149-1-2033	15942	10	22
0123-1-2077	15942	10	28	0149-1-2034	15942	2	6
0123-1-2095	15942	10	4	0149-1-2035	15942	10	21
0123-1-2097	15942	3	21	0149-1-2040	15942	8	28
0123-1-2101	15942	3	10	0149-1-2041	15942	8	29
0123-1-2104	15942	11	11	0149-1-2042	15942	8	9
0123-1-2105	15942	15	16	0149-1-2043	15942	8	36
0123-1-3002	15942	25	2	0149-1-2044	15942	8	14
0123-1-3004	15942	14	4	0149-1-2045	15942	8	18
0123-1-3005	15942	6	52	0149-1-2046	15942	8	17
0123-1-3006-1	15942	6	67	0149-1-2047	15942	8	8
0123-1-3006-2	15942	6	3	0149-1-2048	15942	8	35
0123-1-3036	15942	12	3	0149-1-2049	15942	11	57
0123-1-3080	15942	10	27	0149-1-2050	15942	11	33
0123-1-3086	15942	25	5	0149-1-2053	15942	11	17
0123-1-3091	15942	25	6	0149-1-2054	15942	6	69
0123-1-3091	15942	10	9	0149-1-2054	15942	11	18
0123-1-4002	15942	25	4	0149-1-2059	15942	20	7
0123-1-4006	15942	14	5	0149-1-2070	15942	8	4
0123-1-4010	15942	7	12	0149-1-2071	17942	8	5
0123-1-4011	15942	6	1	0149-1-2072	15942	10	45
0123-1-4012	15942	11	46	0149-1-2077	15942	16	1
0123-1-4030	15942	10	54	0149-1-2078	15942	2	1
0123-1-4039	15942	16	14	0149-1-2079	15942	11	49
0123-1-4060	15942	6	35	0149-1-2080	15942	11	34
0149-1-2000-1	15942	11	6	0149-1-2081	15942	11	40
0149-1-2001	15942	10	56	0149-1-2082	15942	11	14
0149-1-2001-1	15942	10	58	0149-1-2083	15942	11	39
0149-1-2003	15942	21	4	0149-1-2085	15942	3	28
0149-1-2004	15942	20	1	0149-1-2086	15942	3	27
0149-1-2004-1	15942	20	2	0149-1-2087	15942	11	38
0149-1-2005	15942	20	6	0149-1-2088	15942	11	52
0149-1-2005-1	15942	20	8	0149-1-2090	15942	1	3
0149-1-2006	15942	10	59	0149-1-2093	15942	1	2
0149-1-2006-1	15942	10	60	0149-1-2106	15942	10	50

PART NUMBER	FSCM	FIG.		PART NUMBER	FSCM	FIG.	
		NO.	ITEM NO.			NO.	ITEM NO.
0149-1-2109	15942	6	71	0149-1-3035	15942	15	18
0149-1-2109	15942	23	7	0149-1-3036-1	15942	15	17
0149-1-2110-1	15942	23	3	0149-1-3037	15942	24	3
0149-1-2110-2	15942	23	8	0149-1-3039	15942	24	1
0149-1-2112	15942	6	54	0149-1-3040	15942	10	34
0149-1-2262	15942	11	3	0149-1-3041	15942	10	1
0149-1-2269	15942	8		0149-1-3043	15942	10	20
0149-1-2286	15942	11	9	0149-1-3044	15942	8	26
0149-1-2286	15942	12	1	0149-1-3046	15942	11	51
0149-1-2287	15942	23	2	0149-1-3046-1	15942	11	53
0149-1-2292	15942	10	12	0149-1-3046-2	15942	11	52
0149-1-2306	15942	11	5	0149-1-3047	15942	11	13
0149-1-2361	15942	12	2	0149-1-3048-1	15942	11	61
0149-1-2363	15942	3	22	0149-1-3048-2	15942	11	60
0149-1-2366	15942	3	8	0149-1-3049	15942	8	24
0149-1-2367	15942	7	17	0149-1-3050	15942	11	36
0149-1-2369	15942	8	25	0149-1-3059	15942	11	41
0149-1-2370	15942	10	64	0149-1-3060-1	15942	11	63
0149-1-2371	15942	6	18	0149-1-3060-2	15942	11	15
0149-1-2372	15942	6	68	0149-1-3061	15942	11	19
0149-1-2373	15942	6	50	0149-1-3062	15942	11	25
0149-1-2374	15942	6	55	0149-1-3063-2	15942	11	45
0149-1-2375	15942	6	65	0139-1-3064-2	15942	13	4
0149-1-2400	15942	26	22	0149-1-3065	15942	13	5
0149-1-2401	15942	26	21	0149-1-3065-1	15942	13	7
0149-1-2402	15942	26	12	0149-1-3065-2	15942	13	8
0149-1-2404	15942	26	13	0149-1-3065-3	15942	13	6
0149-1-2405	15942	26	11	0149-1-3067	15942	6	64
0149-1-2406	15942	26	7	0149-1-3070-1	15942	6	53
0149-1-2407	15942	26	8	0149-1-3070-2	15942	6	43
0149-1-2408	15942	26	23	0149-1-3072-1	15942	7	14
0149-1-3001	15942	18	7	0149-1-3072-2	15942	7	18
0149-1-3003	15942	19	9	0149-1-3073	15942	7	4
0149-1-3005	15942	5	13	0149-1-3074	15942	7	8
0149-1-3014-1	15942	8	22	0149-1-3075	15942	7	10
0149-1-3014-2	15942	8	21	0149-1-3076	15942	7	11
0149-1-3014-3	15942	8	20	0149-1-3078	15942	7	1
0149-1-3020	15942	3	29	0149-1-3079	15942	7	23
0149-1-3021	15942	16	17	0149-1-3083	15942	2	3
0149-1-3022	15942	16	3	0149-1-3088	15942	6	29
0149-1-3023-1	15942	10	5	0149-1-3093	15942	11	65
0149-1-3024	15942	6	56	0149-1-3102	15942	6	57
0149-1-3025	15942	9	3	0149-1-3109	15942	6	9
0149-1-3026	15942	9		0149-1-3180	15942	23	1
0149-1-3027	15942	6	15	0149-1-3181	15942	11	8
0149-1-3028	15942	15	1	0149-1-3184	15942	10	38
0149-1-3028-1	15942	15	2	0149-1-3189	15942	17	7
0149-1-3029-1	15942	15	3	0149-1-3202	15942	11	4
0149-1-3029-2	15942	15	4	0149-1-3203	15942	2	10
0149-1-3030	15942	15	5	0149-1-3204	15942	3	5
0149-1-3031	15942	15	11	0149-1-3205	15942	6	20
0149-1-3032	15942	15	10	0149-1-3275	15942	10	25
0149-1-3034	15942	15	19	0149-1-4002	15942	1	5

PART NUMBER	FIG.		ITEM NO.	PART NUMBER	FIG.		ITEM NO.
	FSCM	NO.			FSCM	NO.	
0149-1-4014-2	15942	1		124-5K	04072	18	6
0149-1-4014-3	15942	1		1269	05276	26	4
0149-1-4014-4	15942	1		2-018	02967	8	31
0149-1-4018	15942	6	66	2-56X1/8CRES	70318	11	48
0149-1-4027	15942	6	34	2-56X1/8CRES	70318	12	5
0149-1-4028	15942	6	44	2-56X. 25LG100 °	70318	10	17
0149-1-4029	15942	6	30	2-56X3/16LG.CRES	70318	10	51
0149-1-4037	15942	16	16	2-56X3/16LG.CRES	70318	11	53
0149-1-4039	15942	16	4	2- X3/16LG.CRES	70318	16	2
0149-1-4039-1	15942	16	6	2 X3/16LG.CRES	70318	6	12
0149-1-4041	15942	6	60	85	80131	3	25
0149-1-4044	15942	10	8	77	04713	22	3
0149-1-4044-1	15942	10	10	2061B1	88245	20	3
0149-1-4044-2	15942	10	9	2085-2	71279	17	20
0149-1-4053-1	15942	11	16	2085-2	71279	18	1
0149-1-4053-2	15942	11	64	2085-2	71279	19	8
0149-1-4062	15942	7	2	2085-2	71279	21	2
0149-1-4064	15942	2	8	21HL	27246	26	19
0149-1-4067	15942	3	35	2161	83330	6	63
0149-1-4068	15942	4	4	2520B-1	88245	19	7
0149-1-4068-1	15942	4	8	348-140-10001	02660	3	13
0149-1-4074	15942	22	2	348-40E10-12S1	02660	3	15
0149-1-4075	15942	16	10	3787-C-36	05276	26	20
0149-1-4075-1	15942	16	11	4311	00141	6	14
0149-1-4075-2	15942	16	12	4314	00141	10	43
0149-1-4150	15942	10	18	51M30-01-4-3N	81073	8	3
0149-1-4151	15942	8	16	5101-28C	79136	25	1
0149-1-4154	15942	11	26	57EHL	27246	26	17
0149-1-4155	15942	11	24	516-500MCP	11710	26	25
0149-1-4159	15942	3	7	600D147G04DJ4	56289	5	2
0149-1-4165	15942	6	2	6010-9A	91506	5	1
0149-1-4168	15942	1	4	6500-105-14	06540	4	5
0149-1-4169	15942	6	51	6500-105-14	06540	5	12
0149-1-4170	15942	6	59	7-800X130B	02697	24	2
0149-1-4173	15942	6	11	7713-7	88245	11	7
0149-1-4177	15942	1	1	7717-18	13103	18	5
0149-1-4180	15942	6	10	7717-7	13103	17	11
0149-1-4186	15942	6	70	79NM-26	72962	10	24
0149-1-4187	15942	6	25	79-012-062-0406	72962	2	2
0149-1-4188	15942	10	55	923	17613	10	65
1-72X1CRES	70318	16	18				
1-72X1/8LG.CRES	70318	8	23				
1-72X1/8LG.CRES	70318	11	56				
1-72X1/8LG.CRES	70318	25	3				
1-72X3/8LG.CRES	70318	14	6				
IN3022B	81349	5	6				
IN645B	80131	4	1				
IN645B	80131	5	5				
10-05-1362-1250	18565	7	15				
10-101949-10	12143	3	20				
1149314	23677	26	16				
120PC	18583	17	6				
121004	75913	4	6				

APPENDIX D

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

D-1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the recorder set. These items are authorized to you by the Common Table of Allowances (CTA) 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items) ,

D-2. EXPLANATION OF COLUMNS

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

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

C - Operator/Crew
O - Organization Maintenance
F - Direct Support Maintenance
H - General S-upport Maintenance

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

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

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

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION PART NUMBER AND FSCM	(5) UNIT OF MEAS
1	C, O, F, D	6850-00-597-9765	CLEANING COMPOUND	GAL
2	C, O, F, D	8305-00-267-3015	CHEESE CLOTH	A/R
3	C, O, F, D		COTTON SWABS	A/R

ALPHABETICAL INDEX

Subject	Paragraph, Figure (F) , Table (T) , Number
A	
Actuator (3A4A13), Maintenance	3-43, F3-58, F3-59
Adjustments, Preliminary	2-5
AGC Test	F3-68, T3-13
Audio Head (3A4A1A1), Maintenance	3-30, F3-36
Audio Output and Distortion Test	F3-74, T3-13
B	
Base (Unit 1), Maintenance	3-17, F3-20
Battery Box	1-5
Bias Oscillator (3A4A6)	
Parts Location	FO-5
Principles of Operation	FO-5
Troubleshooting	3-11, T3-6
C	
Capstan Motor (3A4A18), Maintenance	3-48, F3-66, F3-67
Capstan Motor (3A4B2) Servo	
Parts Location	FO-6
Principles of Operation	FO-6
Troubleshooting	3-12, T3-7
Case, Accessories	1-5
Case, Recorder	1-5
Checking Unpacked Equipment	2-2
Circuit Cards (3A4A5 and 3A4A6) Maintenance	3-38, F3-53
Circuit Cards (3A4A7 and 3A4A8) and C Filter	3-39, F3-54
Configurations of Equipment	1-9
Connectors, J 1	1-5
Counter, Maintenance	3-35, F3-44, F3-46
Crosstalk Test	F3-74, T3-13
D	
Demagnetization	3-4
Description, Functional	2-7
Description of Equipment	1-7
Destruction of Army Material	1-3
Disk Reel (3A4A14), Maintenance	3-45, F3-62, F3-63
Disk Reel (3A4A16), Maintenance	3-46, F3-64, F3-65
Drive Wheel (3A4A1A4), Maintenance	3-32, F3-40
E	
Ejector (3A4A3), Maintenance	3-36, F3-47, F3-48
End of Tape Sensor (3A4A7)	
Parts Location	FO-7
Principles of Operation	FO-7

E - Continued

Equipment Differences	1-8
Equipment Improvement Recommendations	1-6
Equipment Setup	
AGC Final Test	F3-73
Audio Output and Distortion	F3-12
Audio Output and Distortion Final Test	F3-75
Bias Oscillator Circuit	F3-15
Capstan Motor Servo Circuit	F3-17
Channels	F3-9
Crosstalk	F3-11
Crosstalk Final Test	F3-74
Erase Efficiency	F3-16
Frequency Response	F3-10
Frequency Response Final Test	F3-73
Flutter	F3-8
Flutter Final Test	F3-71
Input-Output 2J1 Final Test	F3-77
Meter Drive Circuit	F3-14
Microphone	F3-13
Microphone Final Test	F3-76
Power Supply AC Input	F3-5
Power Supply DC Input	F3-4
Recorder Electromechanical	F3-6
Reel Motor Circuit	F3-19
Sensor Circuit	F3-18
Signal Plus Noise to Noise Final Test	F3-73
Tape Speed	F3-7
Erase Efficiency Test	F3-72, T3-13
Erase Head (3A4A1PU2), Maintenance	3-34, F3-43
Expendable Supplies and Materials List	D-1

F

Failure Symptoms	3-5
Final Test Procedure	
Power Supply (Unit 2)	3-22, F3-24-F3-25, T3-11
Recorder /Reproducer (Unit 3)	3-49, F3-69-F3-77, T3-13
Flutter Test	F3-71, T3-13
Forms and Records	1-2
Frequency Response Test	F3-73, T3-13
Front Panel (3A3), Maintenance	3-26, F3-29, F3-30
Fuse Card (2A1)	
Parts Location	FO-1
Maintenance	3-20, F3-22

G, H

Harness, Main	FC-26
Headset	1-5, 2-7.c, F2-6

I

Idler Wheel (3A4A1A4A1), Maintenance Installation	3-33, F3-42
Aircraft	2-3.a.(1), F2-2
Shelter	2-3.a.(3), F2-4
Vehicle	2-3.a.(2), F2-3

J, K

Knob (3A3A1), Maintenance	3-27, F3-31
---------------------------	-------------

L, M

MAC

Mag Transport (3A4), Maintenance	B-1
Main Harness	3-28, F3-32, F3-33
Maintenance	FC-26
Actuator (3A4A13)	3-43, F3-59, F3-60
Audio Head (3A4A1A1)	3-30, F3-36, F3-37
Capstan Motor (3A4A1B)	3-48, F3-66
Circuit Cards (3A4A5 and 3A4A6)	3-38, F3-53
Circuit Cards (3A4A7 and 3A4A8) and C Filter Counter	3-39, F3-54
Disk Reel (3A4A1A14)	3-35, F3-44-F3-46
Disk Reel (3A4A1A16)	3-45, F3-62, F3-63
Drive Wheel (3A4A1A4)	3-46, F3-64, F3-65
Ejector (3A4A3)	3-32, F3-40
Erase Head (3A4A1PU2)	3-36, F3-47, F3-48
Front Panel (3A3)	3-33, F3-40
Fuse Card (2A1)	3-26, F3-29, F3-30
Idler Wheel (3A4A1A4A1)	3-20, F3-22
Knob (3A3A1)	3-33, F3-42
Mag Transport (3A4)	3-27, F3-31
Mode Switch (3A4A4)	3-28, F3-32, F3-33
Power Card (2A2)	3-37, F3-49-F3-51
Power Supply (Unit 2)	3-21, F3-23
Recorder (Unit 3)	3-19, F3-21, T3-10
Recorder Housing	3-23, T3-12
Reel Motor (3A4A17)	3-25, F3-27, F3-28
Resistor Card (3A4A9)	3-47, F3-66
R Filter (3A4A10)	3-40, F3-55
Rollers (3A4A1A2, 3A4A1A3)	3-41, F3-56
Sensor (3A4A12)	3-31, F3-38, F3-39
Shock Mount (Unit 1)	3-42, F3-57
Slide Plate Ass'y (3A4A1)	3-17, F3-19
Switches (3A4S1J-3A4S1P)	3-29, F3-34, F3-35
Meter Drive Circuit (3A4A8)	3-44, F3-61
Parts Location	FO-4
Principles of Operation	FO-4
Schematic	FO-4
Troubleshooting	3-10, T3-5

L, M - Continued

Microphone	
Testing	F3-69, T3-13
Wiring	2-4, F2-5
Mode Switch (3A4A4), Maintenance	3-37, F3-49-F3-51

N, O

Nomenclatures	1-5
---------------	-----

P

Parts, Repair	1-12
PMCS	2-6
Power Card (2A2)	
Parts Location	FO-1
Maintenance	3-21, F3-23
Power Distribution	
Circuit Diagram	FO-9
Principles of Operation	FO-9
Troubleshooting	3-15, FO-9
Power Supply (Unit 2)	
Maintenance	3-19, F3-21, T3-10
Parts Location	FO-1
Principles of Operation	3-1.b, FO-1
Schematic	FO-1
Test Procedure	3-22, T3-11
Troubleshooting	3-6, T3-1
Principles of Operation	
Bias Oscillator (3A4A6)	FO-5
Capstan Motor (3A4B2) Servo	FO-6
End of Tape Sensor (3A4A7)	FO-7
Meter Drive (3A4A8)	FO-4
Power Distribution	FO-9
Power Supply (Unit 2)	3-1.b, FO-1
Record Amplifier (3A4A5)	FO-2
Recorder (Unit 3)	3-1.a
Reel Motor (3A4A17) Circuit	FO-8
Reproduce Amplifier (3A4A5)	FO-3

Q, R

Record Amplifier (3A4A5), Principles of Operation	FO-2
Recorder Housing, Maintenance	3-25, F3-27, F3-28
Recorder (Unit 3)	
Maintenance	3-23, T3-12
Principles of Operation	3-1.a
Troubleshooting, electrical	3-7, T3-2
Troubleshooting, electromechanical	3-8, T3-3
Record/Reproduce Circuit, Troubleshooting	3-9, T3-4
Reel Motor (3A4A17), Maintenance	3-47, F3-66

Q, R - Continued

Reel Motor Circuit	
Parts Location	FO-8
Principles of Operation	FO-8
Schematic	FO-8
Troubleshooting	3-14, T3-9
Removal of Equipment	2-9
Reproduce Amplifier (3A4A5)	
Parts Location	FO-3
Principles of Operation	FO-3
Schematic	FO-3
Troubleshooting	3-9, T3-4
Resistor Card (3A4A9)	
Maintenance	3-40, F3-55
Schematic	FO-2
R Filter (3A4A10)	
Maintenance	3-41, F3-56
Schematic	FO-8
Rollers (3A4A1A2, 3A4A1A3), Maintenance	3-31, F3-38, F3-39
RPSTL	C-1

S

Schematic Diagrams	
Bias Oscillator Circuit	FO-5
Capstan Motor Servo Circuit	FO-6
Meter Drive (3A4A8)	FO-4
Power Distribution	FO-9
Power Supply (Unit 2)	FO-1
Record Amplifier Circuit	FO-2
Recorder /Reproducer (Unit 3)	FO-10
Reel Motor Circuit	FO-8
Reproduce Amplifier Circuit	FO-3
Sensor Circuit	FO-7
Sensor (3A4A12), Maintenance	3-42, F3-57
Sensor Circuit	
Schematic Diagram	FO-7
Troubleshooting	3-13, T3-8
Service Upon Receipt of Material	2-1
Shock Mount (Unit 1), Maintenance	3-17, F3-20
Signal Generator J 1 Test	F3-77, T3-13
Signal Plus Noise to Noise Test	F3-73, T3-13
Slide Plate (3A4A1) , Maintenance	3-29, F3-34, F3-35
Storage	1-4, 2-13
Switches, Maintenance	
Mode	3-37, F3-49, F3-51
3A4S1J - 3A4S1P	3-44, F3-61

T-Z

Tape Speed Test	F3-70, T3-13
Test Procedures, Final	
Power Supply (Unit 2)	3-22, F3-24, F3-25, T3-11
Recorder/Reproducer (Unit 3)	3-49, F3-69-F3-77, T3-13
Tools	
Common	1-10
Special	1-11
Travel, Preparation for	2-12
Troubleshooting	
Bias Oscillator Circuit	3-11, T3-6
Capstan Motor Servo Circuit	3-12, T3-7
Direct Support	3-3
Meter Drive Circuit	3-10, T3-5
Organizational	2-8
Power Distribution Circuit	3-15, FO-9
Power Supply (Unit 2)	3-6, T3-1
Record /Reproduce Amplifier	3-9, T3-4
Recorder (Unit 3), Electrical	3-8, T3-3
Recorder (Unit 3), Electromechanical	3-7, T3-2
Reel Motor Circuit	3-14, T3-9
Sensor Circuit	3-13, T3-8

By Order of the Secretary of the Army:

Official:

J. C. PENNINGTON
Major General, United States Army
The Adjutant General

E. C. MEYER
General, United States Army
Chief of Staff

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

OPERATIONS SECTION
375th ASA Co,
FORT HOOD, TX 76544

DATE SENT

PUBLICATION NUMBER

TM 32-5895-215-ESC

PUBLICATION DATE

OCT 71

PUBLICATION TITLE

AN/MLQ-24

BE EXACT... PIN-POINT WHERE IT IS

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

6	2H		
6	2I		

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

THE RATING FOR THIS STEP DOES NOT ACCOUNT FOR THE OPERATIONAL CONDITION OF THE COUNTER ON THE IP-81A.

RECOMMEND THIS STEP RATE THE SYSTEM RED WHEN THE COUNTER IS INOPERATIVE SINCE THE EQUIPMENT CANNOT ACCOMPLISH ITS PRIMARY MISSION.

CHANGE INSTRUCTIONS TO READ "REPEAT STEP H FOR REMAINING TUNERS OF SYSTEM!"

SAMPLE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

BILL N. ERNEST SP/4

SIGN HERE:

Bill N. Ernest

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314



TEAR ALONG PERFORATED LINE

Commander
US Army Electronics Materiel Readiness Activity
ATTN: SELEM-ME-E
Vint Hill Farms Station
Warrenton, VA 22186

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS



THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT. FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER

TM 32-5835-001-24&P

PUBLICATION DATE

20 July 1980

PUBLICATION TITLE Recorder-Reproducer

Set, AN/UNH-16A

BE EXACT... PIN-POINT WHERE IT IS

PAGE NO.

PARA-GRAPH

FIGURE NO.

TABLE NO.

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

TEAR ALONG PERFORATED LINE

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE:

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314



Commander
US Army Electronics Materiel Readiness Activity
ATTN: SELEM-ME-E
Vint Hill Farms Station
Warrenton, VA 22186

TEAR ALONG PERFORATED LINE

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314



TEAR ALONG PERFORATED LINE

Commander
US Army Electronics Materiel Readiness Activity
ATTN: SELEM-ME-E
Vint Hill Farms Station
Warrenton, VA 22186

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

TEAR ALONG PERFORATED LINE

DEPARTMENT OF THE ARMY

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314



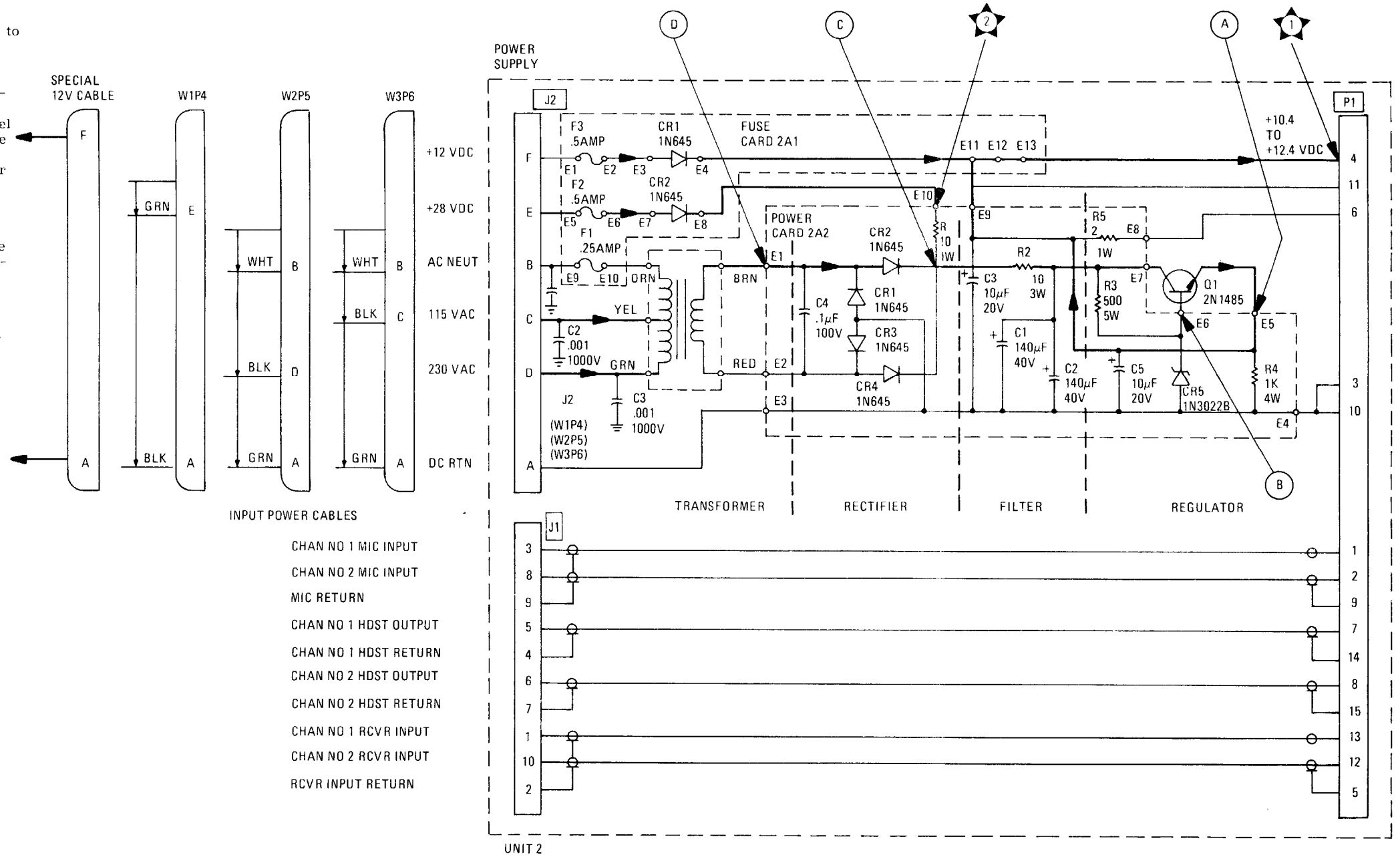
OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE \$300

Commander
US Army Electronics Materiel Readiness Activity
ATTN: SELEM-ME-E
Vint Hill Farms Station
Warrenton, VA 22186

POWER SUPPLY CIRCUIT

As shown on the schematic, the power supply will operate with any one of four inputs (+12 Vdc, +28 Vdc, 115 Vac, or 230 Vac) to provide the output power required for the transport. When +12 volts is applied to the input, it is passed straight through without further regulation to provide power to the transport. When +28 volts is applied to the input, a filter and voltage regulator are used to provide the proper output power to the transport. The input 28 Vdc is applied across filter A2R2 and parallel capacitors A2C1 and A2C2 which reduce the ripple content. The output of the filter is applied across A2R3 and 12-volt Zener diode A2CR5 to provide a stable voltage at the base of transistor 2Q1. Transistor 2Q1 functions as a dc-coupled emitter-follower with the voltage at the emitter varying only slightly more than that applied to the base.

With the base held at 12 volts by the Zener action of A2CR5, the output is a constant 11.4 volts. When the power supply is operated from 115 Vac or 230 Vac, a transformer, with a center-tapped primary (for 115 Vac input) driving a full-wave bridge rectifier, is used to provide operation power to the transport, through the same circuit, as previously described. Pressing 3A3S3 on the control panel permits a readout of the input power level on meter 3A3M1.



FO-1. Power Supply Circuit

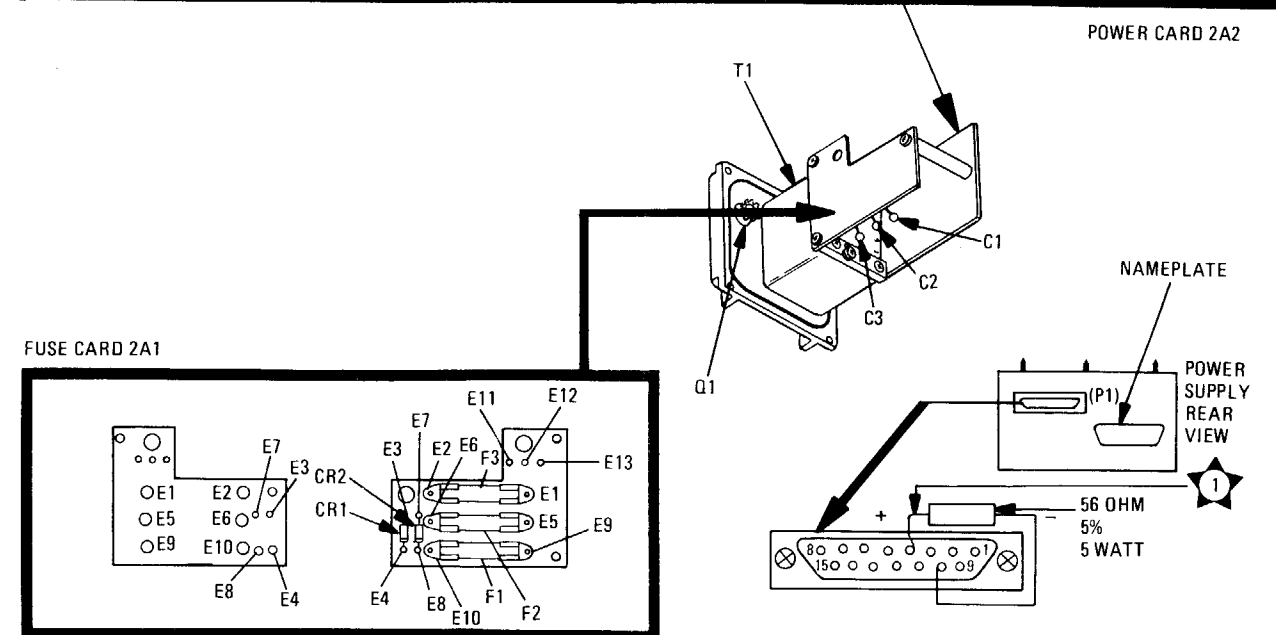
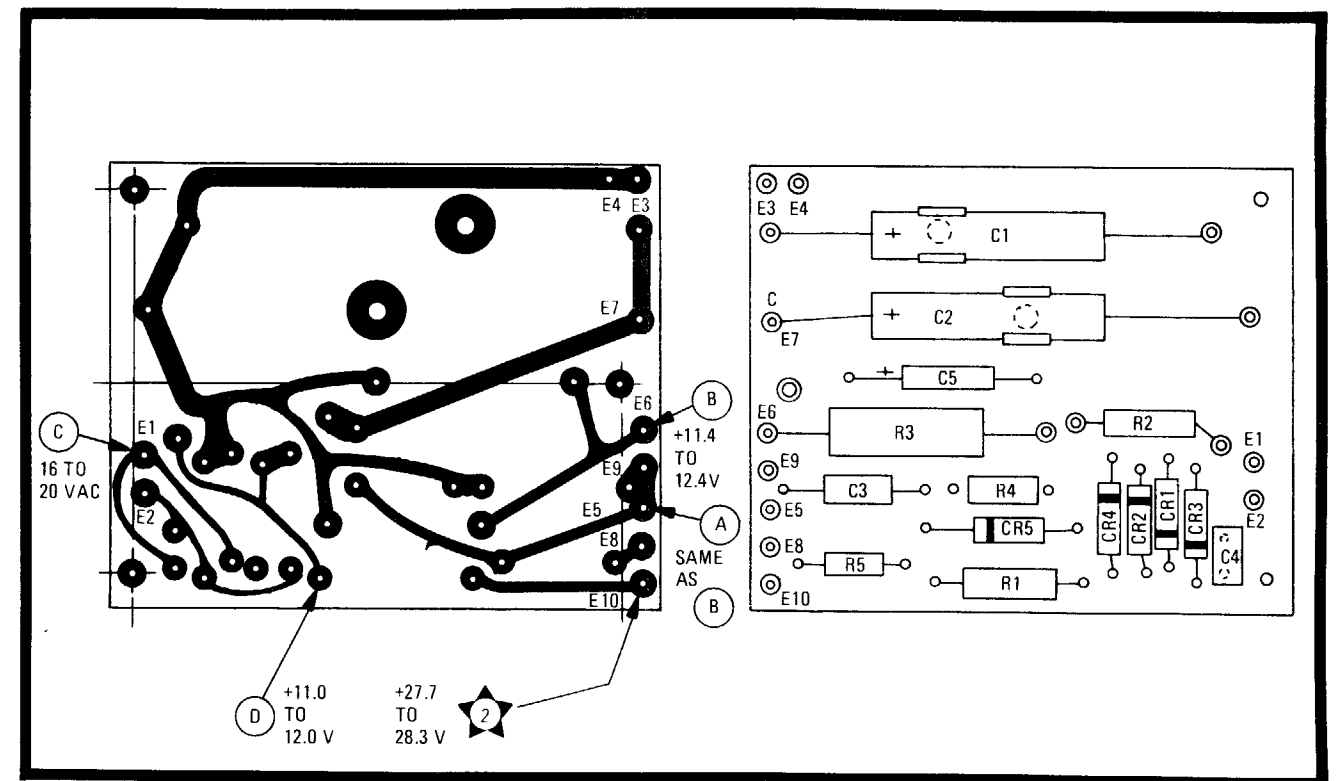
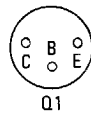
A. Schematic

DC VOLTAGE CHART

TEST POINT	VOLTAGE	POWER CARD TERMINAL
Q1-E	+11.0 TO +13.0 VDC	E5
B	+11.0 TO +13.0 VDC	E6
C	+10.4 TO +12.4 VDC	E7

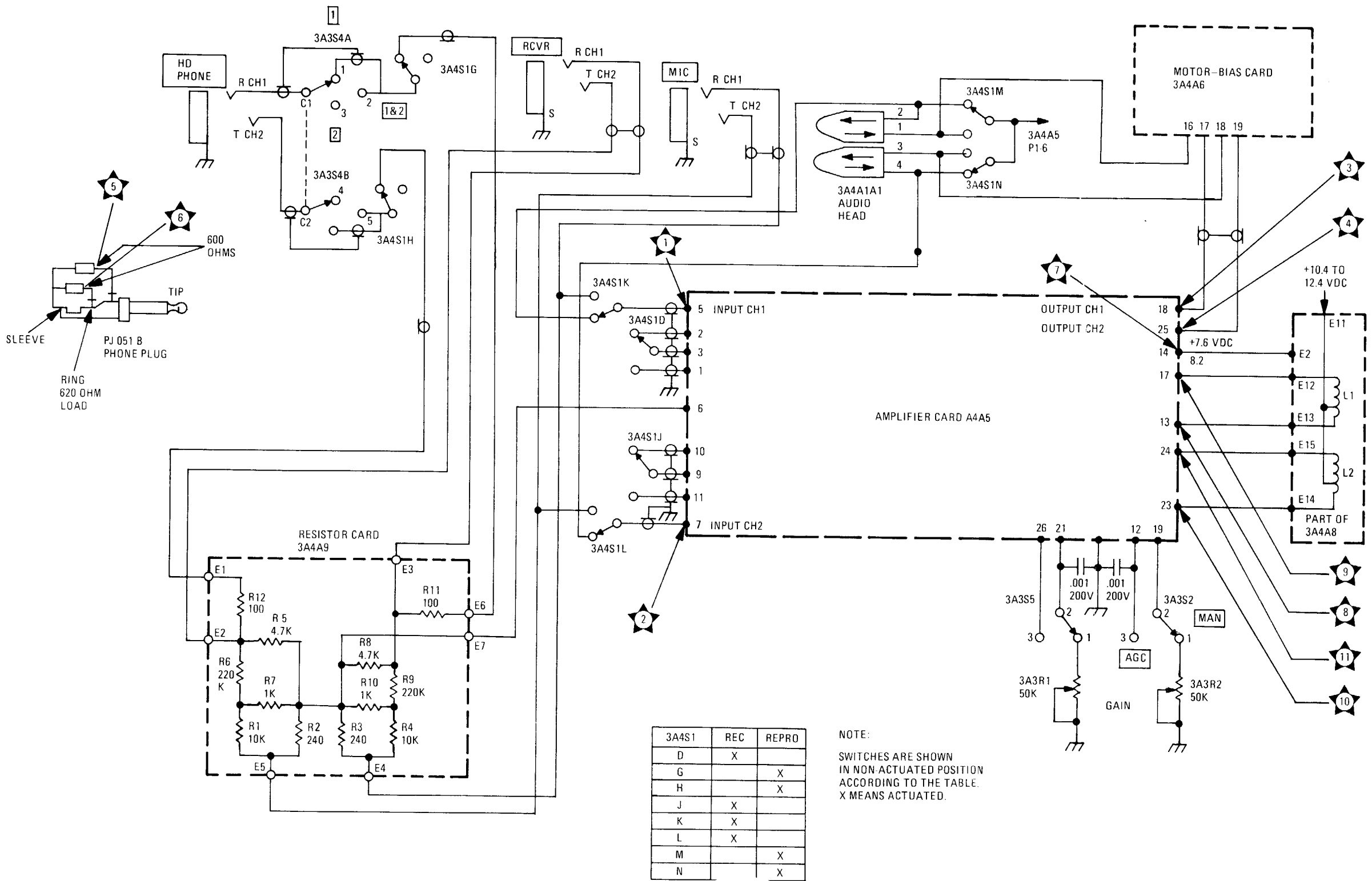
REMARKS

THE POWER SUPPLY MUST BE TESTED WITH EACH OF THE FOUR POWER CABLES AS SHOWN.



FO-1. Power Supply Circuit

B. Parts Location



FO-2. Record Amplifier Circuit

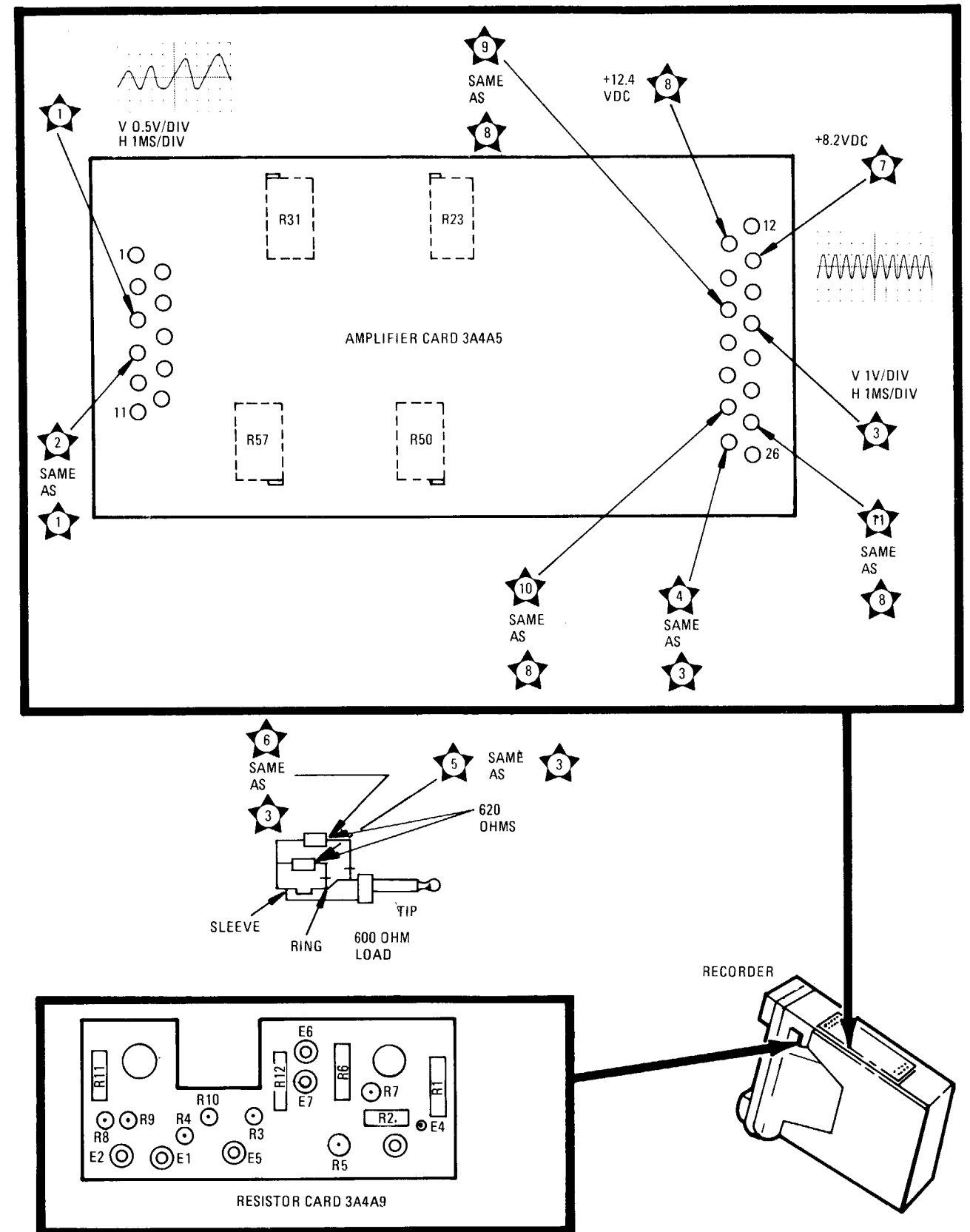
A. Schematic

TEST CONDITIONS

1. TEST POINTS ☆ AND ☆ ARE CHECKED WITH CHANNEL SELECTOR SWITCH IN POSITION 1.
2. TEST POINTS ☆ AND ☆ ARE CHECKED WITH CHANNEL SELECTOR SWITCH IN POSITION 2.

REMARKS

THE SPECIAL ADAPTER IS USED TO TEST SIGNALS AT HD PHONE JACK.



FO-2. Record Amplifier Circuit

B. Parts Location

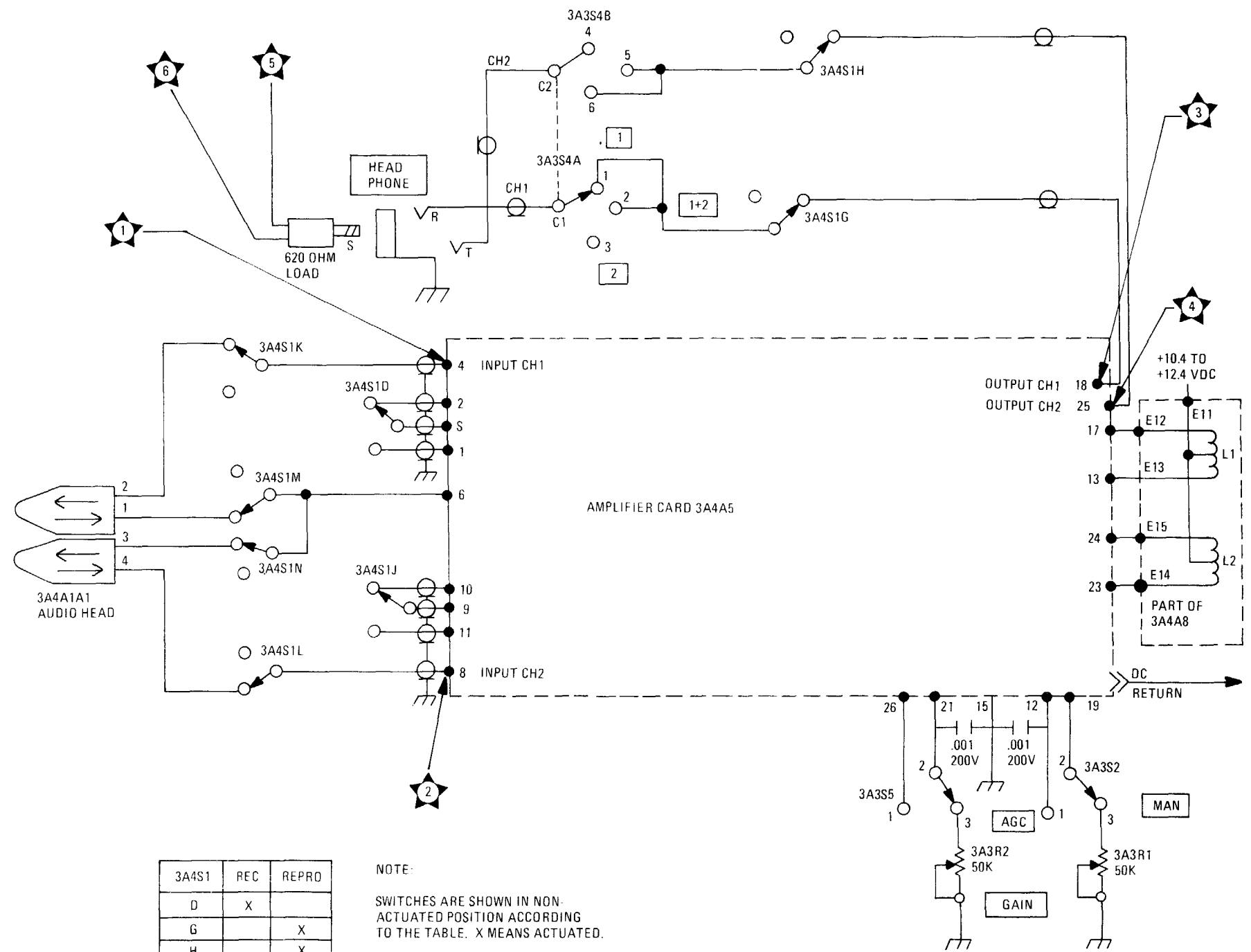
REPRODUCE AMPLIFIER CIRCUIT

When reproduce (REPRO) mode is selected, mode selector 3A4S1B (see FO-5) removes power from motor-bias card 3A4A6 thus removing the 38 kHz bias frequency. Switches 3A4S1K, L, M, and N then connect audio head 3A4A1 to function as a reproduce head. The tape signal is applied to amplifier card 3A4A5 through 3A4A5P1-5 (channel 1) and 3A4A5P1-7 (channel 2).

The amplifier card functions similar to the record mode with the channel 1 audio output on 3A4A5P2 18 and channel 2 on 3A4A5P2-25. Switch 3A4S1D connects an equalization network internal to the amplifier card, to provide the proper frequency response during reproduce mode.

The audio outputs are connected through 3A4S1G and 3A4S1H to channel selector switch 3A3S4 to provide selection of channel 1, channel 2, or both channels of audio to the HD PHONE jack.





The AGC/MAN switches and GAIN controls function as in the record mode as do inductors 3A4A8L1 and 3A4A8L2.



FO-3. Reproduce Amplifier Circuit

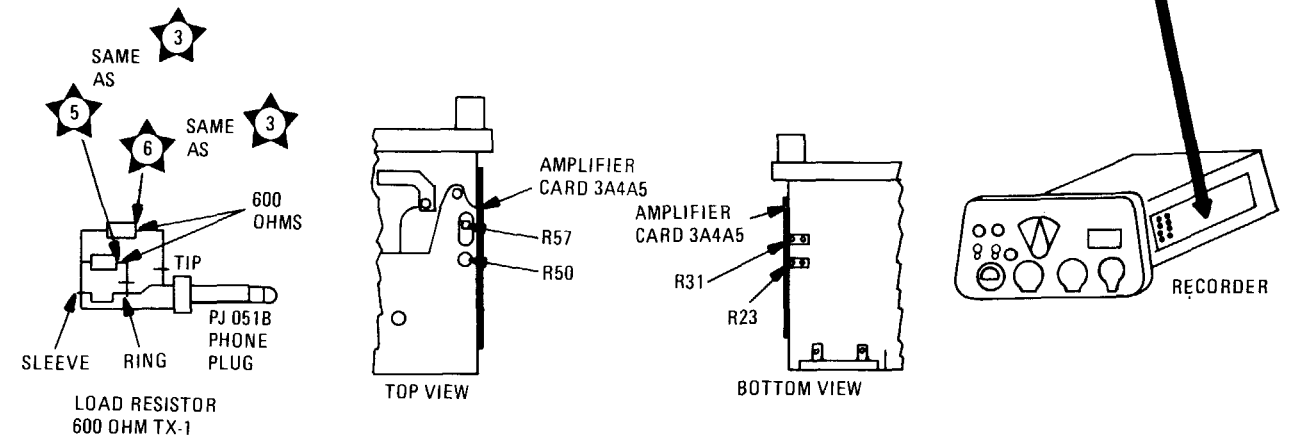
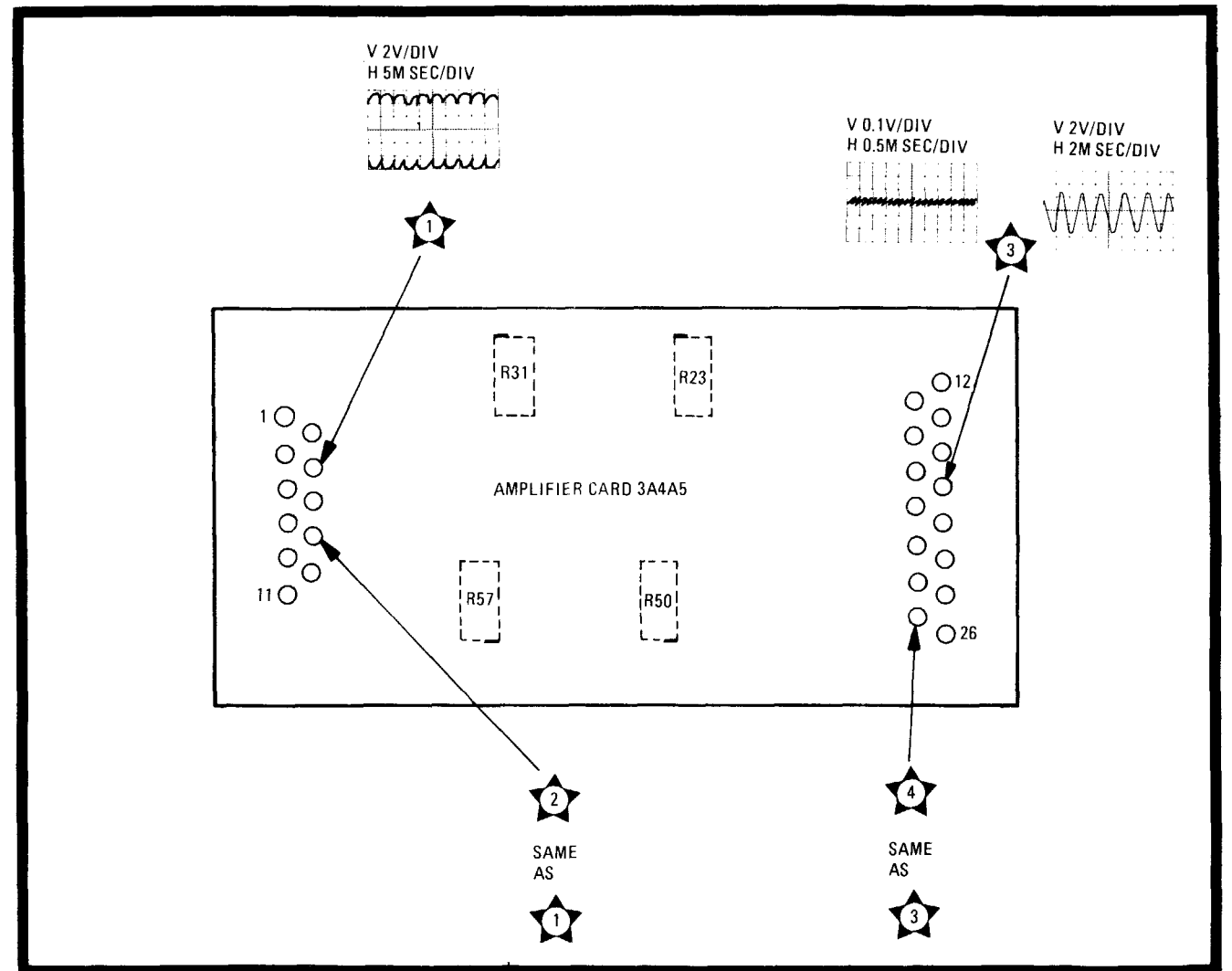
A. Schematic

TEST CONDITIONS

1. TEST POINTS  AND  ARE CHECKED WITH CHANNEL SELECTOR SWITCH IN POSITION 1.
2. TEST POINTS  AND  ARE CHECKED WITH CHANNEL SELECTOR SWITCH IN POSITION 2.

REMARKS

THE SPECIAL ADAPTER IS USED TO TEST SIGNALS AT HD PHONE CONNECTOR.



FO-3. Reproduce Amplifier Circuit

B. Parts Location

METER DRIVE CIRCUIT

The Meter card 3A4A8 provides two emitter follower circuits for driving front panel LEVEL meter (3A3M1). Both channel 1 (Q2) circuit and channel 2 circuit (Q3) are identical; channel 2 is discussed.

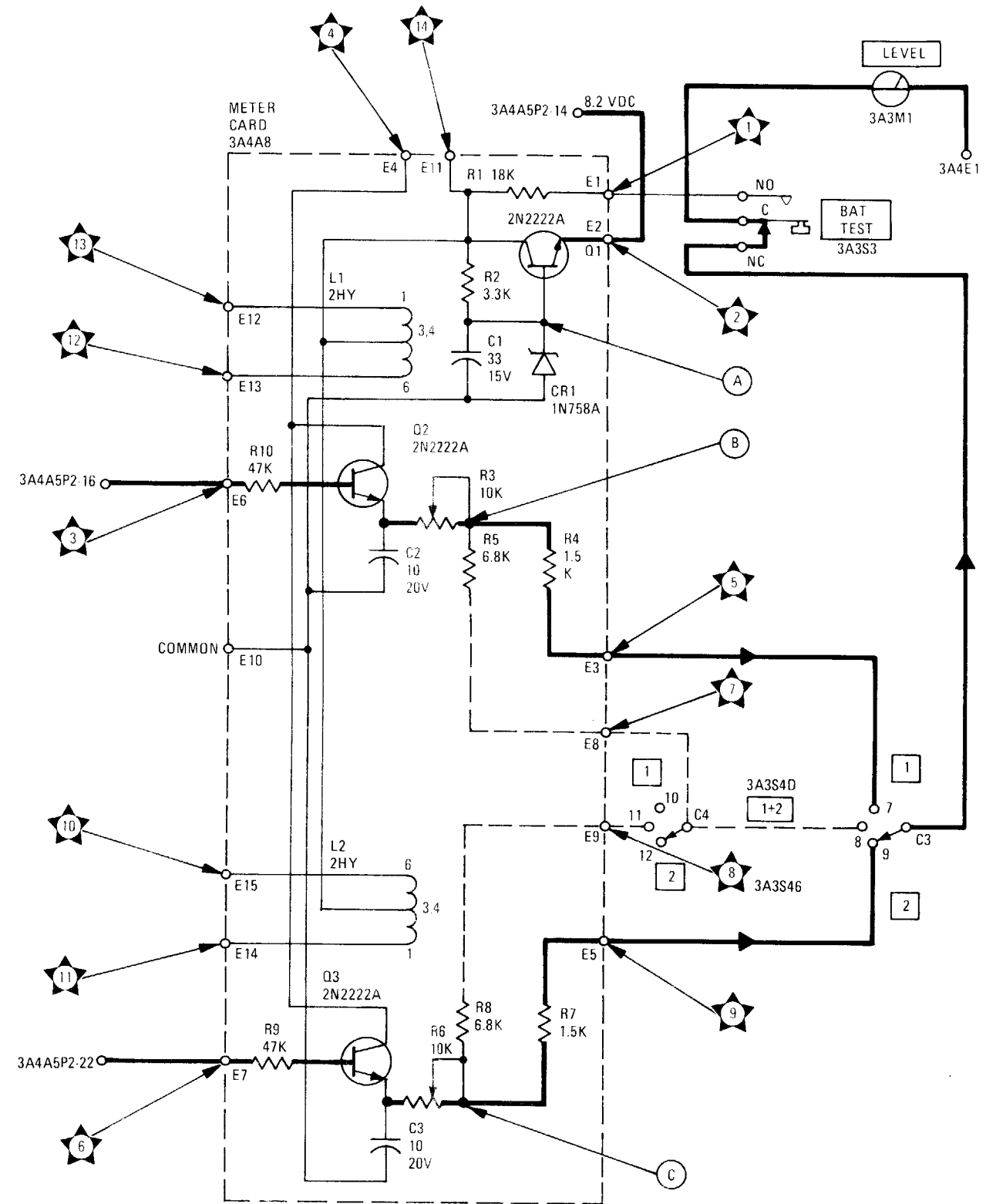
The channel 2 audio output, for either record or reproduce mode, is sampled at 3A4A5P2-22 and is applied to the base of transistor Q3 which functions as an emitter follower. Capacitor C3 charges toward the peak audio level to provide a relatively steady dc signal representative of the output level. This voltage passes through R6 and R7 for current limiting and is applied to the channel selector switch (3A3S4). When channel 2 is selected, the voltage passes through contacts 9 and C3 of 3A3S4C and is applied, through the NC contacts of BAT TEST switch 3A3S3, to the LEVEL meter. Return is through 3A4E1.

When channel 1 is selected, the circuit path is similar except contacts 7 and C3 of 3A3S4C are closed.

When channel 1 and 2 are selected, contacts 8 and C3 on 3A3S4C are closed; also contacts 11 and C4 on 3A3S4D are closed. This connects emitter followers Q1 and Q2 in parallel and substitutes R5 and R8 for R4 and R7 to keep the current through 3A3M1 at the same level as for a single channel.

The card also contains a voltage regulator (not part of meter drive circuit) consisting of Q1, CR1, C1, and R2. The regulator receives unregulated +10.4 to +12.4 Vdc at 3A4A8E11 and provides regulated +8.2 Vdc to 3A4A5P2-14.

Inductors L1 and L2 are used with the record amplifier circuit (fig. FO-2) and the reproduce amplifier circuit (fig. FO-3).



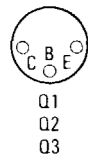
FO-4. Meter Drive Circuit

A. Schematic

DC VOLTAGE CHART

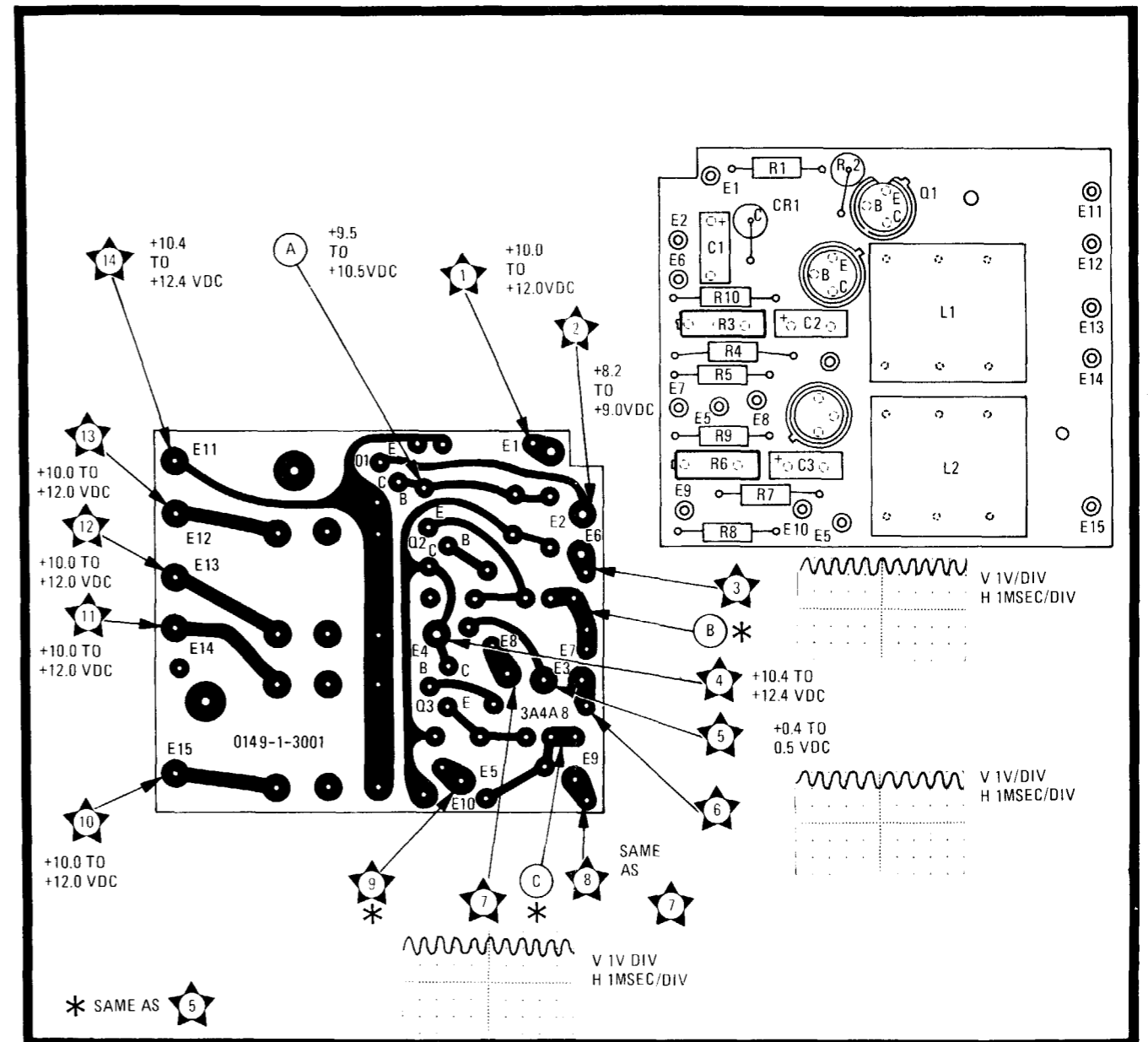
TEST POINT	VOLTAGE
Q1-E	+6.8 TO +8.4 VDC
B	+9.5 TO +10.5 VDC
C	+10.4 TO +12.4 VDC
Q2-E	+0.5 TO +2.0 VDC
B	+0.1 TO +0.5 VDC
C	+10.4 TO +12.4 VDC
Q3-E	+0.5 TO +2.0 VDC
B	+0.1 TO +0.5 VDC
C	+10.4 TO +12.4 VDC

PIN LOCATION

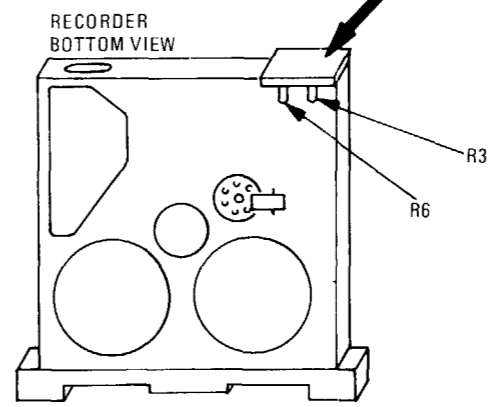


REMARKS

- CHECK ALL ☆ TEST POINTS FIRST.
- TEST POINTS ☆, ☆, ☆, ☆, ☆, ☆, AND (B) ARE CHECKED WITH CHANNEL SELECTOR SWITCH SET TO 1.
- TEST POINTS ☆, ☆, THROUGH ☆ AND (C) ARE CHECKED WITH CHANNEL SELECTOR SWITCH SET TO 2.



METER CARD 3A4A8



FO-4. Meter Drive Circuit

B. Parts Location

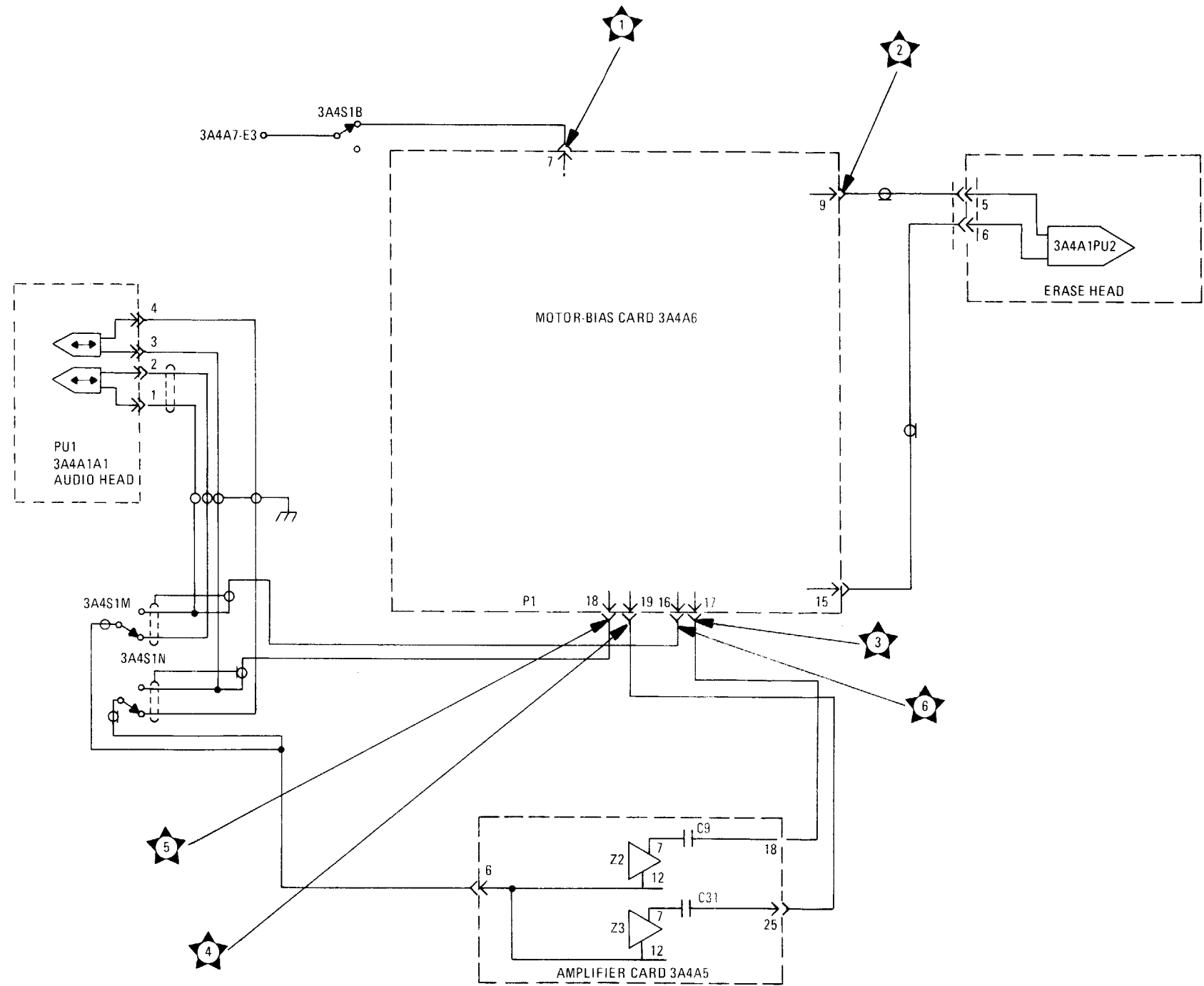
TM 32-5835-001-24 & P

BIAS OSCILLATOR CIRCUIT

The 3A4A6 motor-bias card contains a capstan motor servo circuit (fig. FO-6) and a bias/erase oscillator.

When in record mode, the motor-bias card receives +10.4 to +12.4 Vdc, through 3A4S1B, which activates a 38 kHz modified Colpitts oscillator. A 38 kHz output at 3A4A6P1-9 is applied to erase head 3A4A1PU2 to degauss the magnetic tape prior to the tape's arrival at the audio head.

The 38 kHz bias signal is also mixed within the motor-bias card with the record audio from the amplifier card (channel 1 on 3A4A5P2-18, channel 2 on 3A4A5P2-25). The mixed audio and bias is then output from the motor-bias card (channel 1 on 3A4A6P1-16, channel 2 on 3A4A6P1-18) for application to the 3A4A1A1 audio head. Also see figure FO-2.



3A4S1	REC	REPRO
M		X
N		X

NOTE:
SWITCHES ARE SHOWN IN NON-ACTUATED POSITION ACCORDING TO THE TABLE. X MEANS ACTUATED.

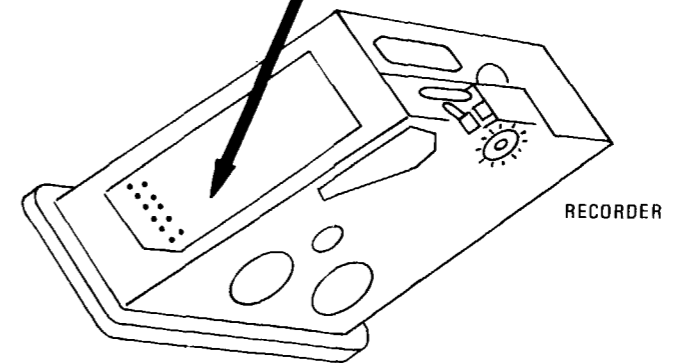
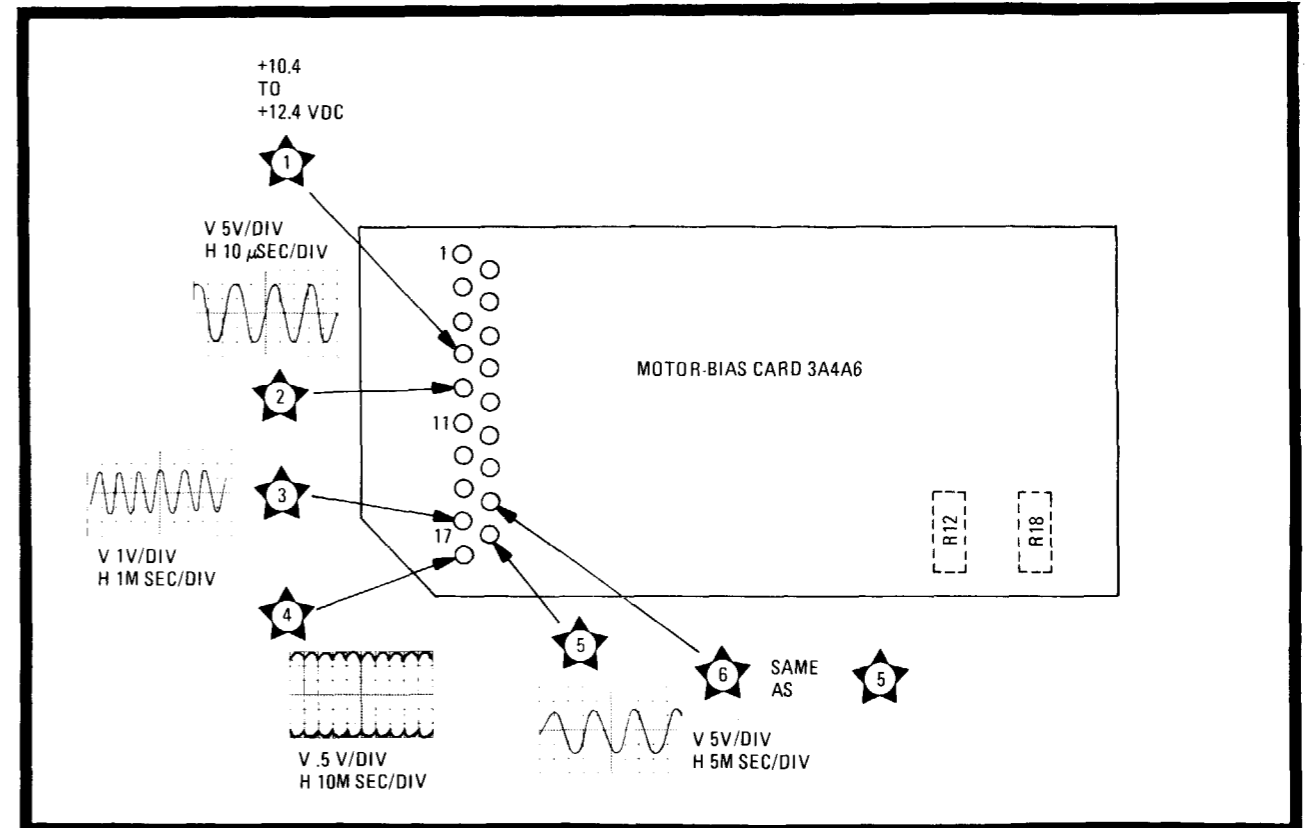
FO-5. Bias Oscillator Circuit

A. Schematic

TEST CONDITIONS

1. POWER APPLIED.
2. BLANK TAPE INSTALLED.
3. REC MODE.
4. CHANNEL SELECTOR TO 1 & 2.
5. AGC-MAN SWITCHES TO AGC.
6. 1 KHZ, 1 VAC, SIGNAL APPLIED TO RCVR 1 AND 2 INPUTS.

1. TAPE MUST BE RUNNING TO OBTAIN INDICATED TEST READINGS; OTHERWISE, END-OF-TAPE CIRCUIT WILL REMOVE POWER FROM BIAS OSCILLATOR.
2. READINGS ARE TO BE TAKEN IN INDICATED SEQUENCE: ☆ FIRST, THROUGH ☆



FO-5. Bias Oscillator Circuit

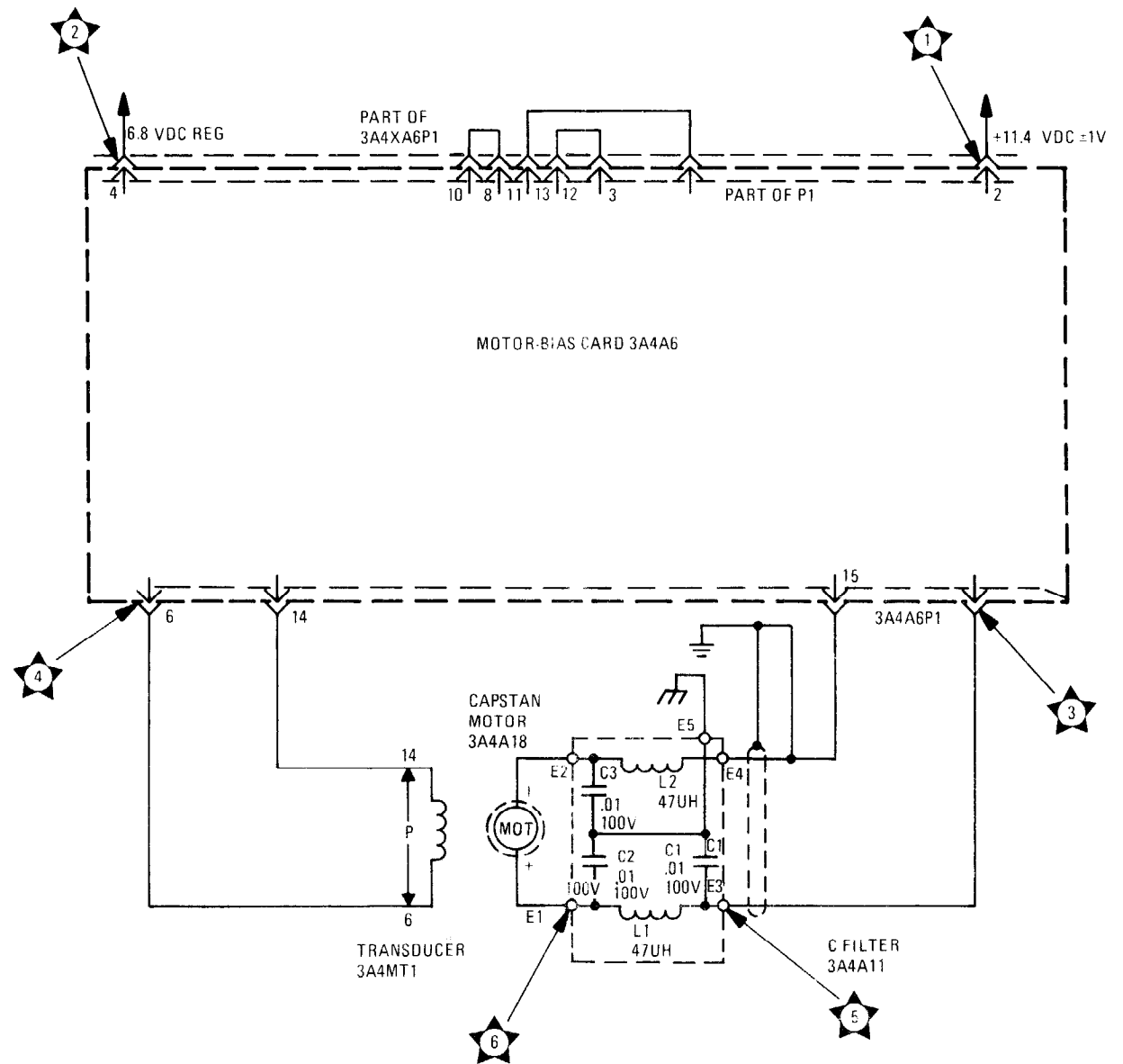
B. Parts Location

CAPSTAN MOTOR SERVO

Capstan speed control is provided by a closed loop, velocity servo system consisting of a transducer, the motor-bias card, and the capstan motor.

When the recorder is energized, +6.8 Vdc is applied to motor-bias card 3A4A6 which drives capstan motor 3A4A18. The capstan motor drives a toothed tachometer wheel adjacent to transducer 3A4MT1. As the motor turns, the tachometer wheel turns at the same speed and causes a series of pulses to be induced in the transducer. The induced signal frequency is proportional to motor speed and is applied via 3A4A6P1-6 and 3A4A6P1-14 to the motor-bias card.

Thus, if motor speed varies, the transducer output frequency changes resulting in the motor-bias card varying the drive voltages (at 3A4A6P1-11 and 3A4A6P1-15) to motor 3A4A18 to correct the motor's speed.



FO-6. Capstan Motor Servo Circuit

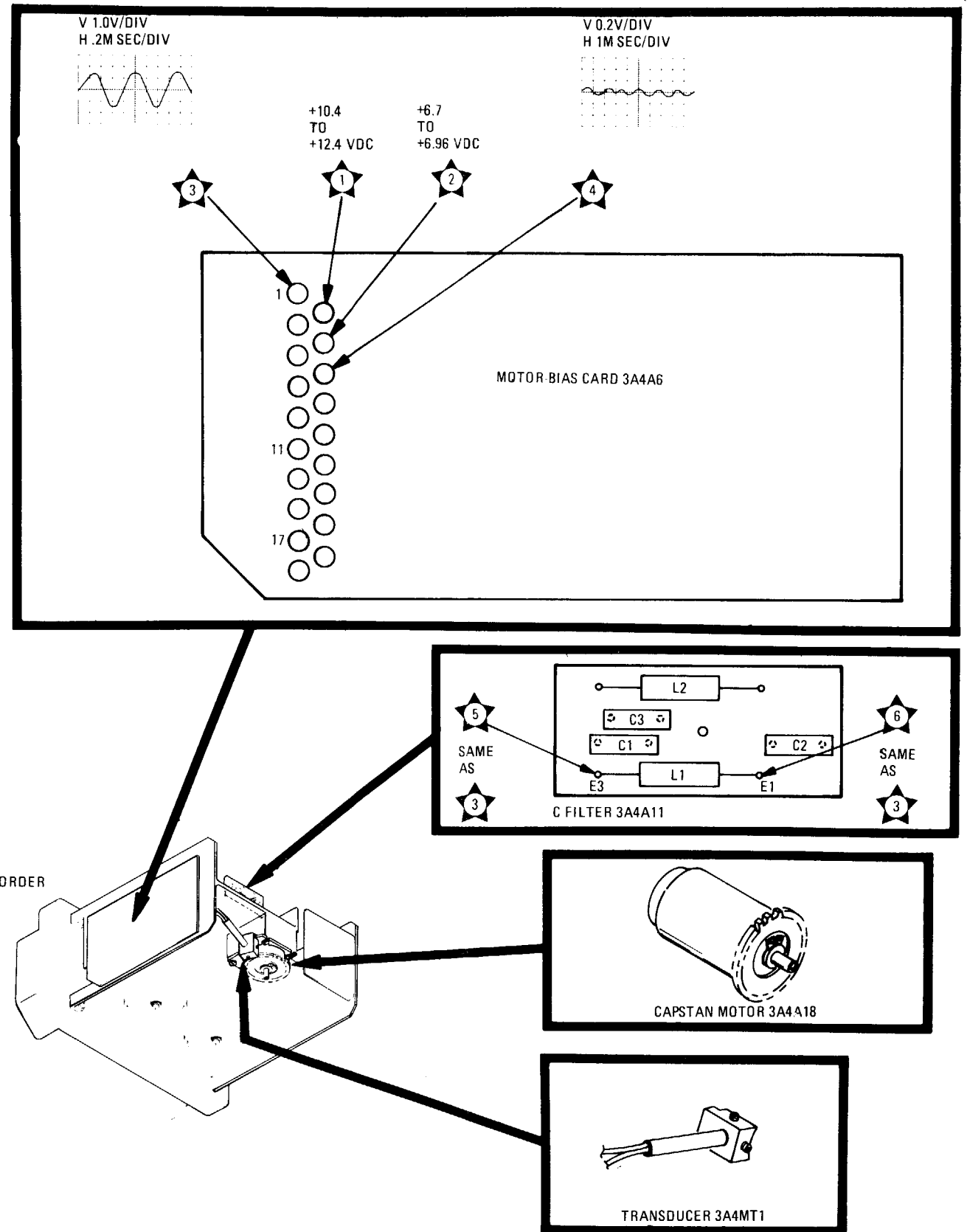
A. Schematic

TEST CONDITIONS

1. POWER APPLIED.
2. BLANK TAPE INSTALLED.
3. REPRO MODE.
4. REMAINING FRONT PANEL CONTROLS IN ANY POSITION.

REMARKS

1. TEST READINGS FOR REPRO MODE ALSO APPLY TO REC MODE.
2. TAPE MUST BE RUNNING; OTHERWISE END-OF-TAPE CIRCUIT WILL REMOVE POWER FROM CAPSTAN DRIVE AMPLIFIER.
3. TEST READINGS MUST BE MADE IN THE INDICATED SEQUENCE:
 ☆ FIRST, THROUGH
 ☆

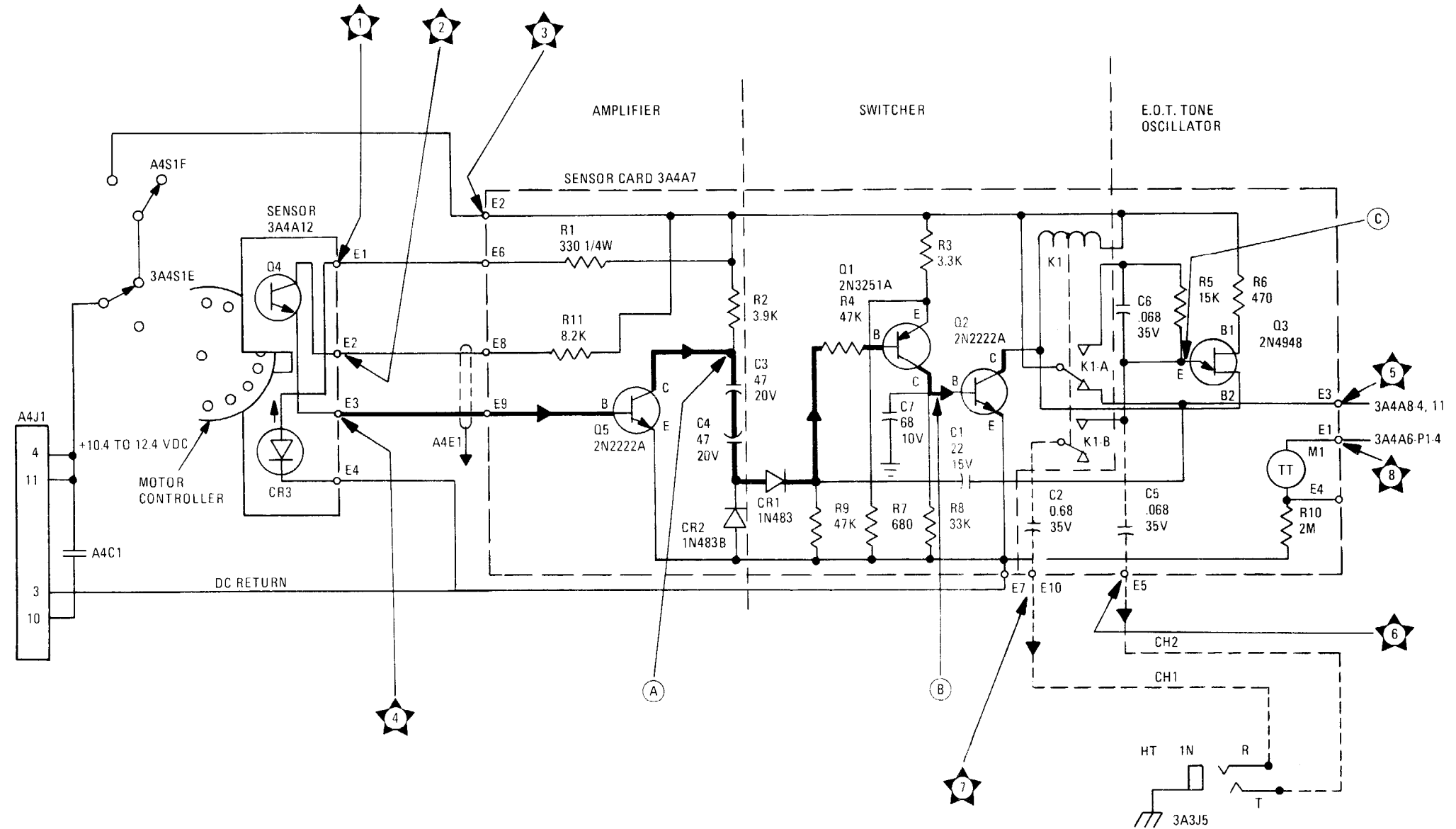


FO-6. Capstan Motor Servo Circuit

B. Parts Location

SENSOR CIRCUIT

The sensor circuit consists of optical motion sensor 3A4A12 and (sensor card) 3A4A7. A strobe wheel with aperture holes is attached to the supply reel shaft. When switch 3A4S1F is activated and the tape is in motion the strobe wheel rotates before a light emitting diode allowing light emission of the diode to intermittently reach a phototransistor in sensor 3A4A12. The output of the phototransistor is connected to terminal E9 of sensor card 3A4A7. The signal is amplified by transistor Q5. After rectification the dc voltage across capacitor C1 controls the electronic switch Q1 and Q2. Transistor Q2 in turn drives relay K1. When the strobe wheel is turning, relay K1 is de-energized and the +12 Vdc goes through the normally closed contact of K1 A to terminal E3. Whenever the strobe wheel stops (at end of tape or no tape condition) relay K1 is energized, removing power from the electronics and the meter. At the same time the normally open contact K1-S closed to energize the tone generator transistor Q3, the output of which is connected to HD PHONE jack 3A3J5, which alerts the operator that end of tape has been reached. Relay K1 remains energized until the mode selector knob is rotated to the OFF position, opening switch 3A41F. Operation of the end of tape sensor circuit is not dependent upon specially prepared tapes. The tone generator circuit (located on sensor card 3A4A7) is a relaxation oscillator which produces an output frequency between 500 Hz and 1000 Hz for monitoring on the headset. When end of tape is reached, contacts on K1-A are closed and current flowing through resistor R5 charges capacitor C6. When the voltage has built up sufficiently on C6, transistor Q3 starts to conduct. As Q3 conducts, capacitor C6 charges until it reaches the cutoff point of Q3. With Q3 turned off, C6 discharges and the cycle is repeated. The oscillator output is capacitor-coupled through C2 and C5 to the HD PHONE jack J5 to produce an audible tone which alerts the operator to the end-of-tape condition. An elapsed time indicator 3A4A7M1, located on sensor card 3A4A7, records total operating time of the unit and is energized when the capstan motor is activated. The indicator may be reset to zero by reversing the polarity of the applied voltage; a current limiting resistor, 2.2K ohms, must be placed in series with the indicator to prevent damage to the unit.



F/F	F/R	3F4S1	RFC	REP
X		F	X	X
X	X	E		

NOTES

- SWITCHES ARE SHOWN IN NONACTIVATED POSITION ACCORDING TO THE TABLE. X MEANS ACTUATED.
- DOTTED LINES AT E5 AND E10 REPRESENT THE HEADSET MONITORING SIGNAL PATH.
- K1 SHOWN IN DEENERGIZED POSITION.
- K1 ENERGIZED AT END OF TAPE.

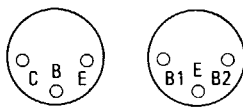
FO-7. Sensor Circuit

A. Schematic

DC VOLTAGE CHART

TEST POINT	VOLTAGE
Q1-E	+8.0 TO +10.0 VDC
B	+0.1 TO +0.5 VDC
C	+5.0 TO +7.0 VDC
Q2-E	+10.0 TO +12.0 VDC
B	+5.0 TO +7.0 VDC
C	-
Q3-B1	+10.0 TO +12.0 VDC
E	+8.0 TO +10.0 VDC
B2	-
Q5-E	+10.0 TO +12.0 VDC
B	-
C	-

PIN LOCATOR

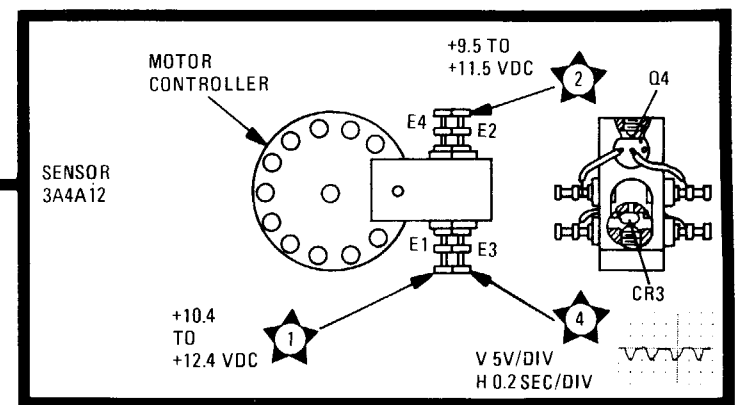
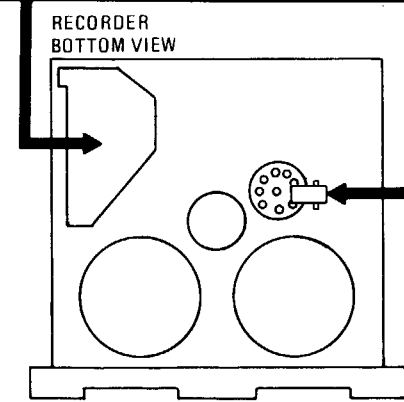
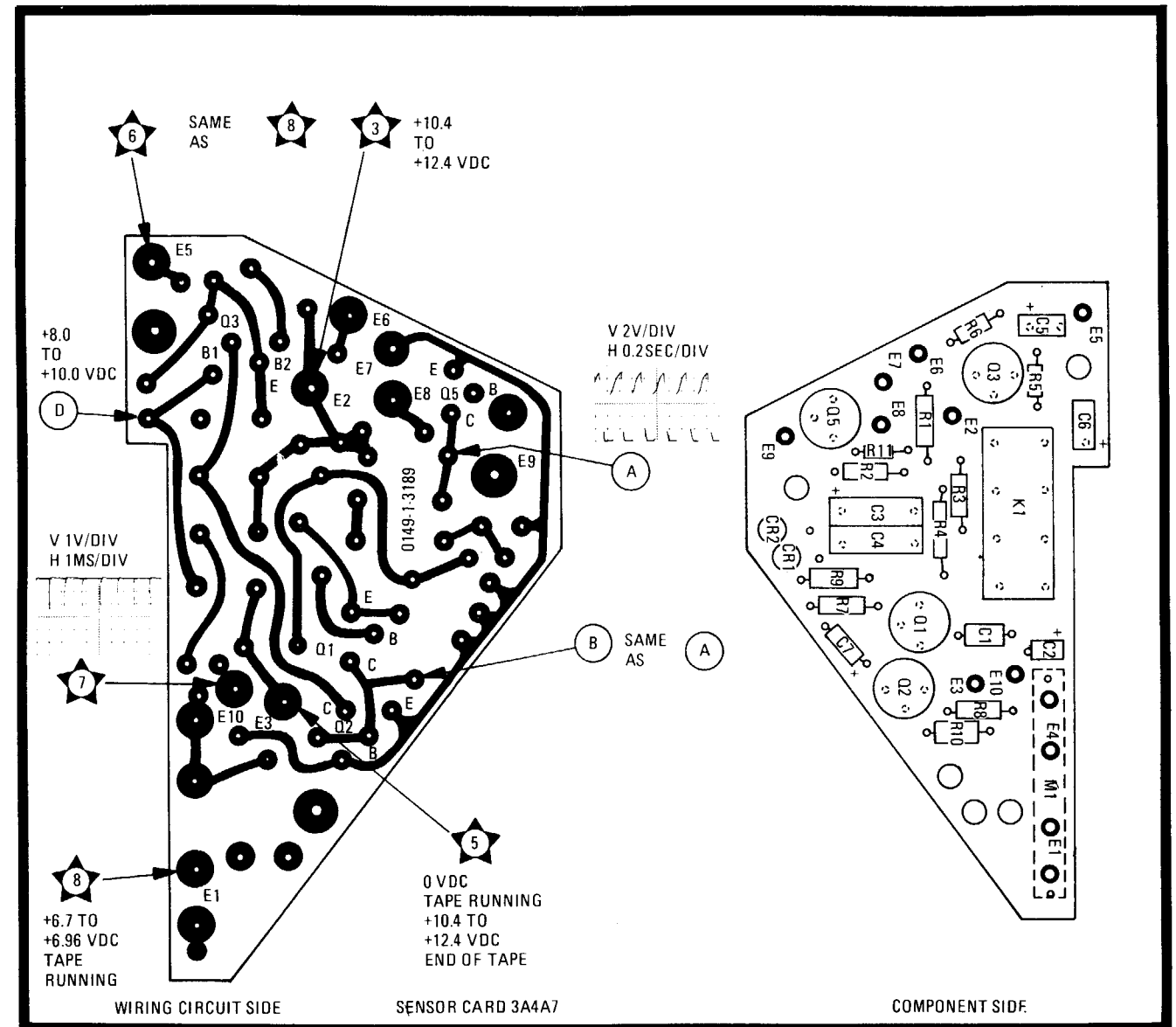


TEST CONDITIONS

BLANK TAPE MUST BE IN RECORDER SET

REMARKS

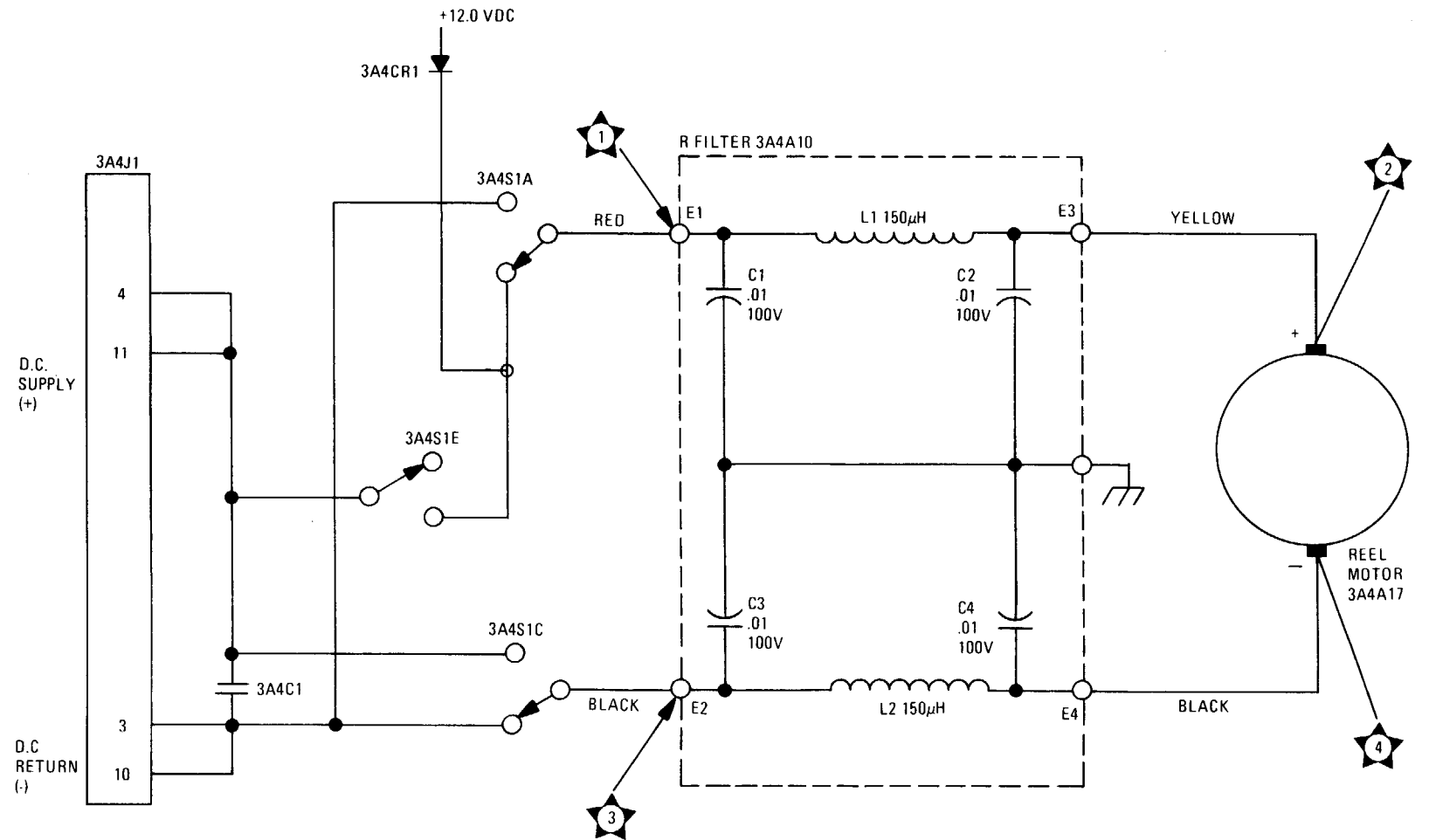
1. CHECK ALL ☆ FIRST.
2. TEST POINTS ☆ THROUGH ☆ AND (A) THROUGH (C) CHECKED IN NORMAL RECORD OPERATION.
3. TEST POINTS ☆ THROUGH ☆ CHECKED AT END OF TAPE.



FO-7. Sensor Circuit
B. Parts Location

REEL MOTOR CIRCUIT

When F/F mode is selected, switch 3A4S1E is activated, applying +12 Vdc to E1 of filter 3A4A10, through the filter to reel motor 3A4A17. The motor rotates in a direction to move the tape in a forward (from supply to take-up reel) direction. When F/R mode is selected switches 3A4S1A, 3A4S1C, and 3A4S1E are actuated, reversing the polarity of the voltage to the motor. The tape now moves from the take-up to the supply reel. In either the REC or REPRO modes, +12 Vdc is applied to the reel motor thru switch 3A4S1A through R filter 3A4A10.



3A4S1	F/F	F/R
A		X
C		X
E	X	X







NOTE:

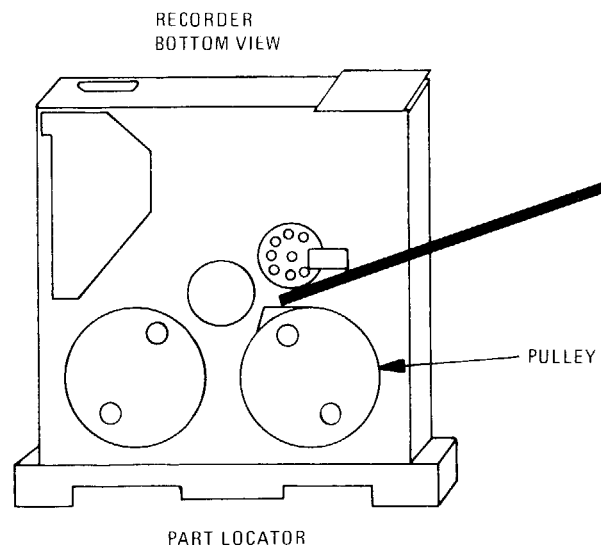
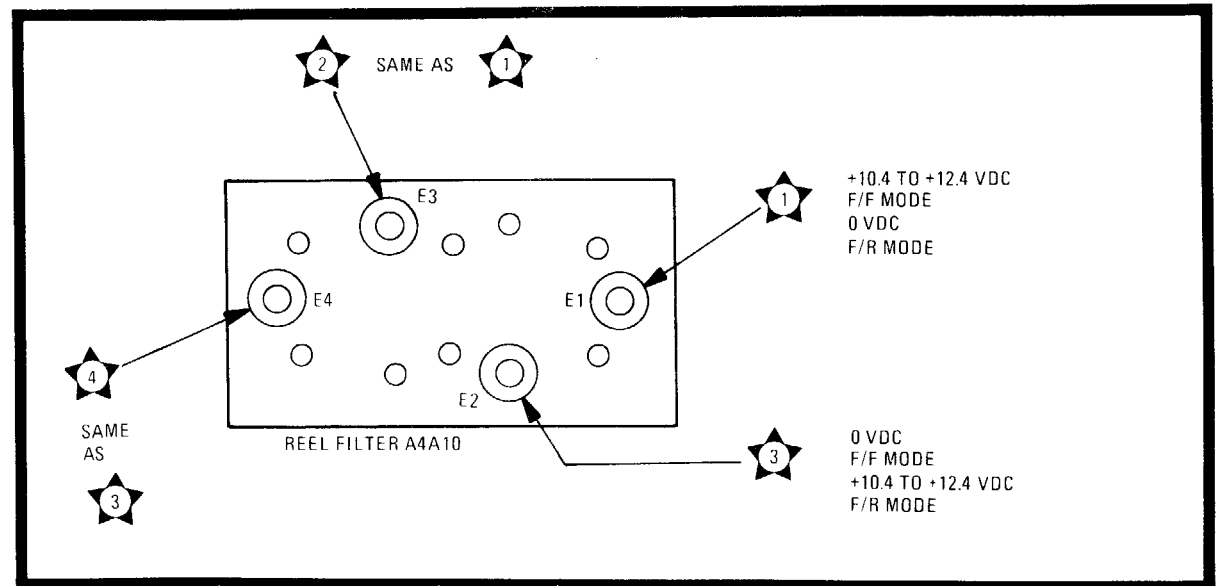
SWITCHES ARE SHOWN IN NON-ACTUATED POSITION. THESE SWITCHES ARE ACTUATED ACCORDING TO THE TABLE. X MEANS ACTUATION.

FO-8. Reel Motor Circuit

A. Schematic

REMARKS

1. TEST POINTS  AND  MEASURED IN F/F MODE.
2. TEST POINTS  AND  MEASURED IN F/R MODE.
3. ACCESS TO  THRU  IS THRU HOLE IN PULLEY. USE PROBE WITH INSULATED TIP.

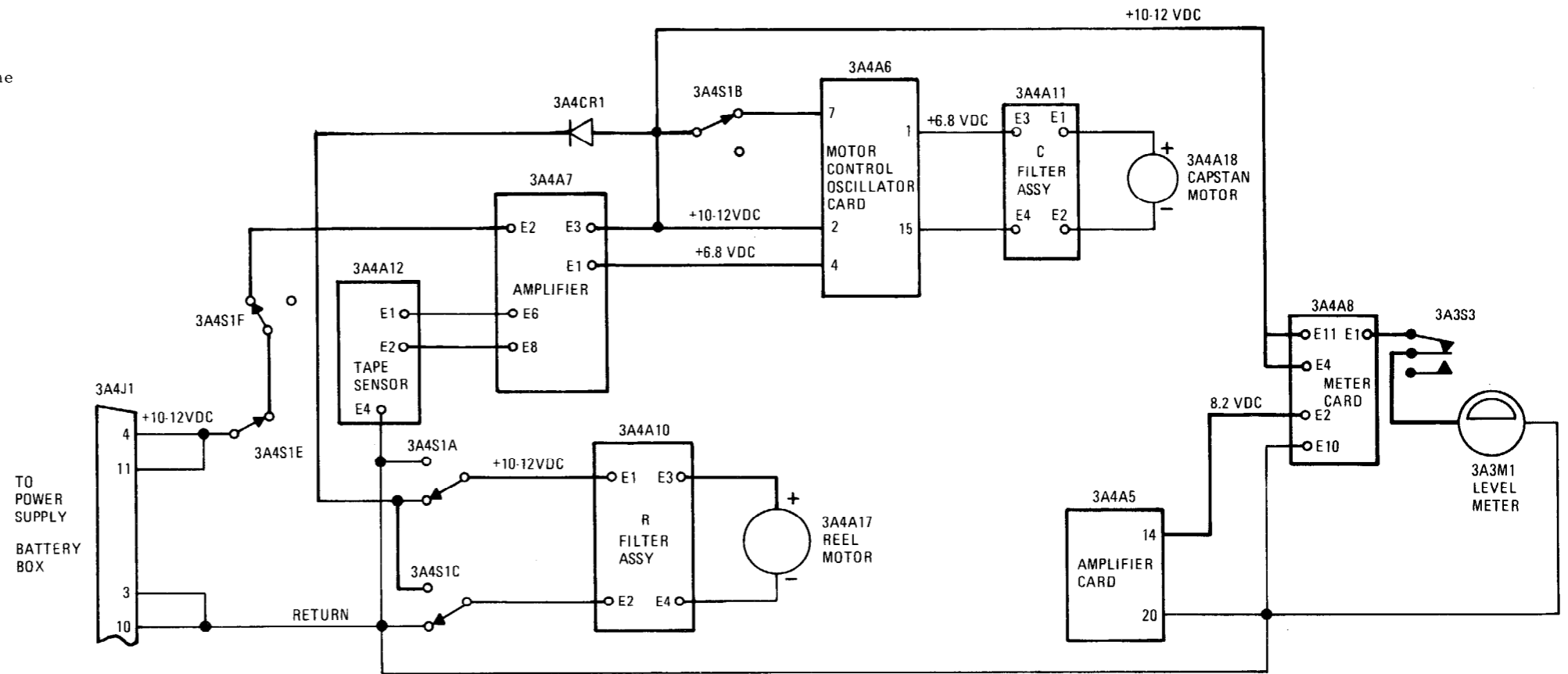


FO-8. Reel Motor Circuit

B. Parts Location

POWER DISTRIBUTION

When power is applied to 3A4J1, in either the record or reproduce modes, power to drive the reel motor is routed through 3A4S1E, S1F, 3A4A7K1-A, 3A4CR1, 3A4S1A, 3A4A10, 3A4A17, and 3A4S1C to ground. In the fast forward mode, full power is applied directly to 3A4A10 by 3A4S1E, S1A, and S1C. In fast reverse, the polarity of the input power is reversed by S1C (+) and S1A (-) to drive the motor at full speed in the reverse direction. In record and reproduce modes, 3A4A7D1-A provides power to the signal electronics and capstan motor control circuits. Power is applied to the bias oscillator only in the record mode by S1B. The record/reproduce amplifiers receiver power (+8 VDC) through voltage regulator 3A4A8Q1. The voltage regulator is located on meter card 3A4A8.



NOTE
SWITCHES 3A4S1B, AND
3A4S1F ARE SHOWN IN
THE RECORD MODE.
SWITCH 3A3S3 IS SHOWN
PRESSED.

VOLTAGE POINT LOCATION CHART	
ASSEMBLY	FIGURE
3A4A5	FO-2, 3
3A4A6	FO-5, 6
3A4A7	FO-7
3A4A8	FO-4
3A4A10	FO-8
3A4A11	FO-6
3A4A12	FO-7

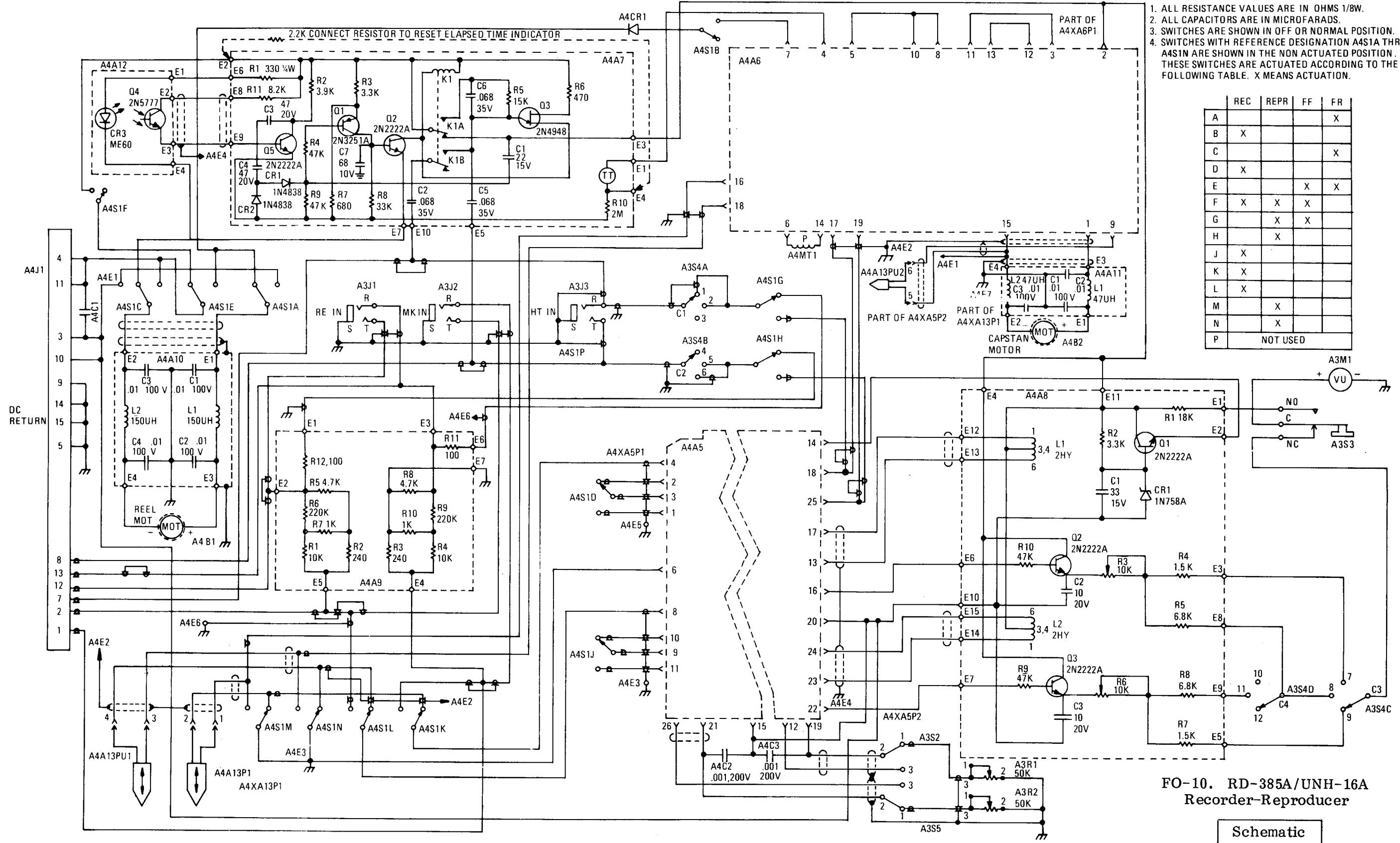
FO-9. Power Distribution Circuit

Schematic

NOTES: UNLESS OTHERWISE SPECIFIED

1. ALL RESISTANCE VALUES ARE IN OHMS 1/8W.
2. ALL CAPACITORS ARE IN MICROFARADS.
3. SWITCHES ARE SHOWN IN OFF OR NORMAL POSITION.
4. SWITCHES WITH REFERENCE DESIGNATION A4S1A THRU A4S1N ARE SHOWN IN THE NON ACTUATED POSITION. THESE SWITCHES ARE ACTUATED ACCORDING TO THE FOLLOWING TABLE. X MEANS ACTUATION.

	REC	REPR	FF	FR
A				X
B	X			
C				X
D	X			
E			X	X
F	X	X	X	
G		X	X	
H		X		
J	X			
K	X			
L	X			
M		X		
N		X		
P	NOT USED			



FO-10. RD-385A/UNH-16A Recorder-Reproducer

Schematic

