

OVERHAUL MANUAL

001 - 0002 - 001

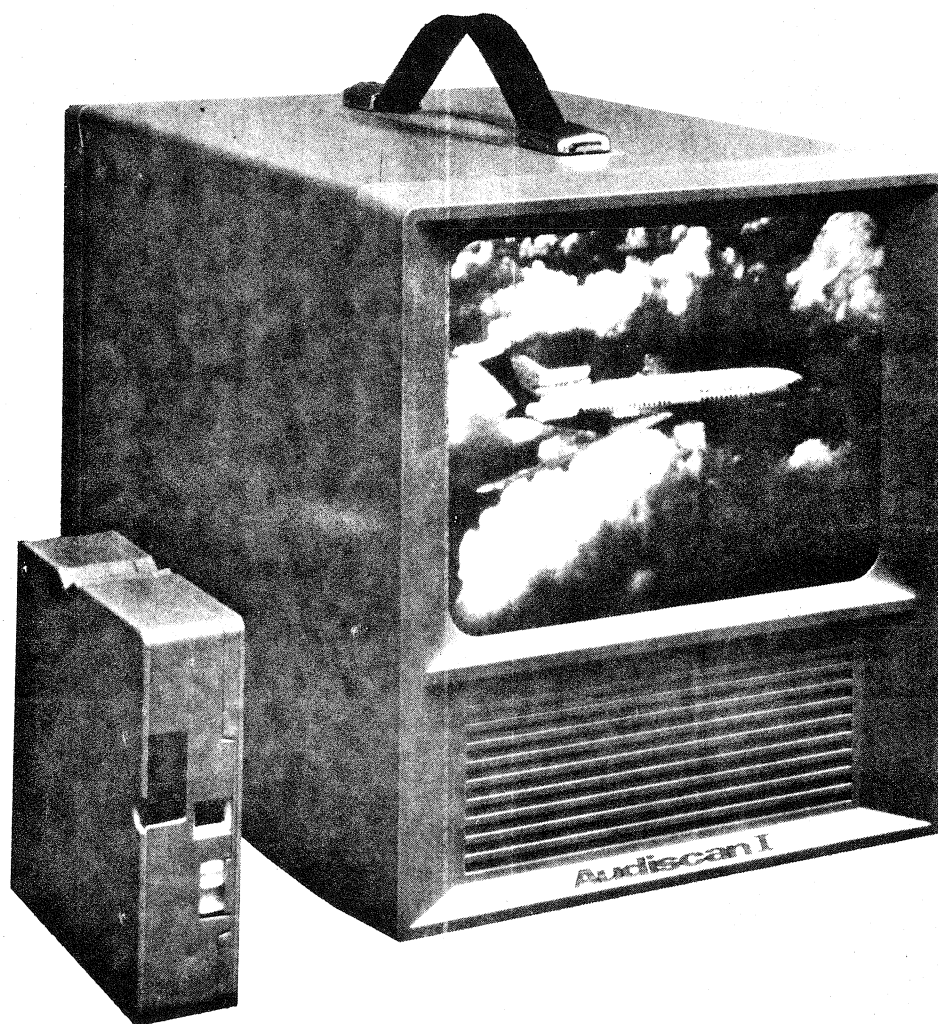
WITH

ILLUSTRATED PARTS LISTS

AND

STANDARD REPAIR TIMES

FOR



Audiscan® I

AUDISCAN, INC.
1414 130TH AVENUE N.E.
BELLEVUE, WASHINGTON, 98004

TABLE OF CONTENTS

SECTION	DESCRIPTION	PAGE NUMBER
I	INTRODUCTION AND THEORY OF OPERATION	1-1
	Electrical System	1-2
	Electronic System	1-2
	Optical System	1-3
	Cartridge Assembly	1-4
II	OPERATING INSTRUCTIONS	2-1
	Pre-Operational Instructions	2-1
	Synchronization	2-2
	Picture Focus	2-2
III	TROUBLESHOOTING	3-1
IV	REPLACEMENTS AND ADJUSTMENTS	4-1
	General	4-1
	Audio and Switch Cards	4-1
	Power Relay	4-2
	Power Transformer	4-2
	Speaker	4-2
	Tape Head	4-3
	Azimuth Adjustment	4-4
	Drive Belt	4-6
	Flywheel and Bearing Assembly	4-6
	Blower Motor	4-7
	Lensscreen	4-7
	Power Cord Reel	4-7
	Film Actuator Assembly	4-8
	Tape Drive Motor	4-9
	Heat Filter	4-10
	Variable Focus Assembly	4-11
	Non-Quadrant Focusing	4-13
	Projector Mirrors	4-13
V	ILLUSTRATED PARTS LIST	5-1
	Introduction	5-1
	Ordering Parts From Factory	5-1
VI	STANDARD REPAIR TIMES	6-1
	Introduction	6-1
	Electrical/Electronic Repair Times	6-1
	Optical Repair Times	6-2
	Mechanical Repair Times	6-2
	Miscellaneous Repair Times	6-2

SECTION	DESCRIPTION	PAGE NUMBER
VII	TEST EQUIPMENT	7-1
	General	7-1
	Test Cartridge	7-1
	Variable AC Power Supply	7-1
	Lens Holder Centering Jig	7-2
	Actuator Tab Bender	7-2

LIST OF ILLUSTRATIONS

FIGURE	TITLE	PAGE NUMBER
1-1	Audiscan I Projector Schematic	1-6
1-2	Switch Card Schematic Diagram	1-7
1-3	Audio Card Schematic Diagram	1-8
1-4	Cartridge Assembly, Tape Side	1-9
1-5	Cartridge Assembly, Film Side	1-9
2-1	Operating Controls	2-2
4-1	Tape Head Adjustments	4-4
4-2	Film Actuator Alignment	4-8
4-3	Optical Assembly	4-10
4-4	Variable Focus Assembly	4-11
5-1	Audiscan I, Exploded View	5-3
5-2	Audiscan I, Exploded View	5-6

SECTION I

INTRODUCTION AND THEORY OF OPERATION

1.0 INTRODUCTION

1.1 This manual contains the theory of operation, operating instructions, troubleshooting, replacement and adjustments, an illustrated parts lists, and standard repair times for the Audiscan I.

1.2 THEORY OF OPERATION

1.3 The Audiscan I combines sight and sound in a single package. The unit consists of the electrical/electronic assemblies, optical system, and mechanical assemblies. Specifications for the Audiscan I are outlined in Table I.

TABLE I
SPECIFICATIONS

Power consumption.....	200Watts, 115 vac, 60 Hz
Projector Lens.....	f1.4, 12mm, wide angle
Projector Lamp.....	150 Watts, 125 vac (BEH)
Cooling.....	30 cfm (Forced air)
Screen.....	5 9/16 x 7 x 1/2 inches. No glare Polacoat Inc. Lenscreen [®]
Film capacity.....	225 frames, 16mm.
Tape size.....	Two track, 1/4 inch
Tape length.....	25 minutes Max imum
Tape drive motor.....	115 vac, 4 pole
Tape speed.....	3.75 ips.
Audio output.....	1 Watt
Size.....	9 x 19 x 14 inches
Weight.....	12.5 pounds (Approximate)

- 1.4 Electrical System; Theory of Operation (Refer to Figure 1-1).
- 1.5 The electrical system consists of the input power line cord, mounted within a cord reel, power transformer, power relay, solenoid, projection lamp, blower motor, tape drive motor, and wiring harness. With the PROGRAM switch set to NORMAL position, and when the ON switch is momentarily pressed, power is momentarily applied to the primary of transformer T1 and diodes D10 and D11, through the secondary of transformer T1. The dc voltage developed across diodes D10 and D11 and resistor R17 is applied to one side of power relay K1 coil. The return circuit for relay K1 is to ground, as is the center tap of transformer T1 secondary. When relay K1 operates, its contacts close and apply power to operate the tape drive motor, projector lamp, and blower motor. Setting the PROGRAM switch to the HOLD position will remove power to the tape drive motor. When the OFF switch is momentarily pressed, it momentarily places a ground on the power side of relay K1 coil causing its contacts to open, removing power to the tape drive motor, projector lamp, and blower motor.
- 1.6 Electronic System; Theory of Operation (Refer to Figures 1-2 and 1-3).
- 1.7 The electronic system consists of the Audio Card, Switch Card, tape head, PROGRAM switch, PICTURE ADVANCE/HOLD switch, speaker, ON and OFF switches. When the ON switch is momentarily pressed, power is applied to the power supply on the Switch Card. The power supply provides dc operating voltages for the picture advance amplifier, advance solenoid, filter, trigger circuits, and Audio Card components. The tape head is a stacked dual-track type, with one track providing the low frequency advance

signal, or high frequency shut-off signal, as recorded on the magnetic tape. Placing the PROGRAM switch in the HOLD position removes power to the tape drive motor and Audio Card permitting picture program frame advance circuits to operate independently of the program frame advance signal on the magnetic tape. When the PROGRAM switch is set in the NORMAL position, power is applied to the tape drive motor and Audio Card permitting normal operation of both audio and control signals from the magnetic tape to operate the unit. One of the purposes of the PROGRAM switch is to provide a means for synchronizing audio program to picture program. Momentarily pressing the PICTURE ADVANCE switch will activate the Advance Trigger circuit on the Switch Card. When the Advance Trigger circuit is activated, its advance solenoid is operated, and it mechanically advances the picture program, in the cartridge, by one frame. Continued momentary pressing of the PICTURE ADVANCE switch will result in additional picture program advancement. When the PICTURE HOLD switch is held in the HOLD position, the picture program advance signal (low frequency) from the magnetic tape is bypassed to ground and picture programming advance will not take place. The purpose of the PICTURE HOLD switch is to permit synchronization of picture program to audio program. Circuit theory of the Switch and Audio Cards will not be discussed since field repairs to these items is not recommended. Schematics for these cards are given in Figure 1-2 for information only.

- 1.8 Optical System; Theory of Operation (Refer to Figures 4-3, 4-4, and 5-2).

- 1.9 The optical system consists of a reflector, lamp heat filter, condenser lens with additional heat reflector, projector lamp, three mirrors, lenscreen, and a variable focus assembly. Light generated by the projector lamp is concentrated by the reflector and directed through the heat filter and condenser (which is coated with an additional heat reflecting layer), onto a mirror within the cartridge assembly. Light from the cartridge assembly mirror is transmitted through a frame of the picture program film into the projector lens. Light from the projector lens is transmitted onto the two parallel mirrors. From these parallel mirrors the program picture is reflected onto the lenscreen. The variable focus assembly consists of a drive gear (fine focus knob), quadrant, and lens mount. Rotating the fine focus knob will drive the quadrant and adjust the projector lens.

NOTE

Older Audiscan I units are not equipped with external variable focus control.

Modification kits are available from the factory.

- 1.10 Cartridge Assembly; Theory of Operation (Refer to Figures 1-4 and 1-5).
- 1.11 The cartridge assembly consists of a continuous spool of magnetic tape, continuous loop of 16mm film, film frame advance gates, and tape pressure roller. When the cartridge is properly, and firmly seated in the forward position, its mirror is then aligned with the projector light source and the magnetic (audio program) tape pressure roller is firmly

pressed against the tape drive capstan shaft. When the tape drive motor operates, its pulley drives a belt to drive the flywheel capstan and cartridge tape at 3.75 ips across the face of the tape head. As the magnetic tape passes across the tape head, the recorded signals are transmitted to the Switch and Audio Cards. When a picture program (low frequency) advance signal is transmitted, it electronically actuates the picture program advance solenoid which mechanically operates the film frame gate mechanism in the cartridge, advancing the picture program by one frame. When a shut-off (high frequency) signal is transmitted, it actuates an electronic shunt across power relay K1 coil, causing its contacts to open which removes power to the tape drive motor, projector lamp, and blower motor. Momentarily pressing the ON switch restores power to the tape drive motor, projector lamp, and blower motor.

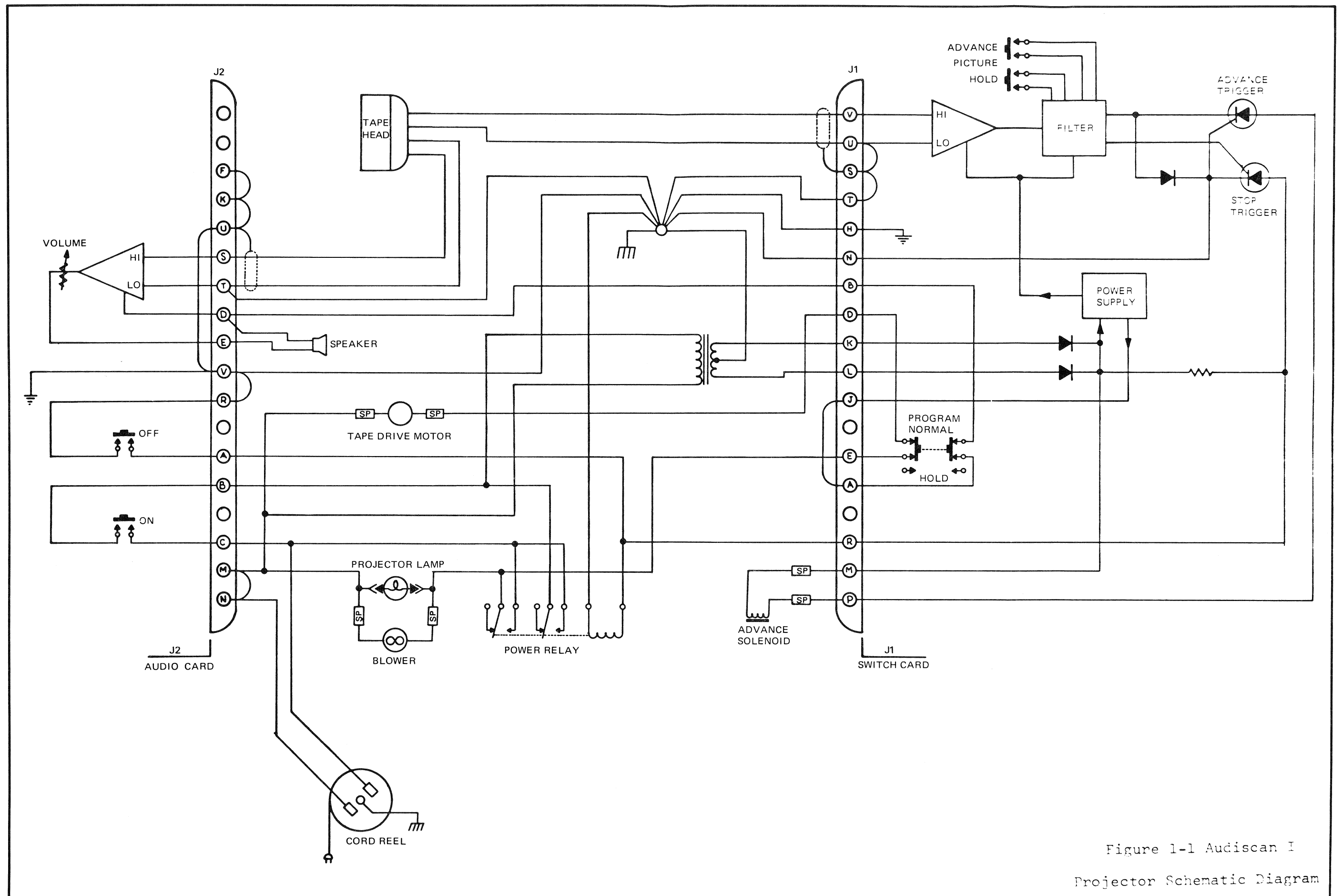


Figure 1-1 Audiscan I
Projector Schematic Diagram

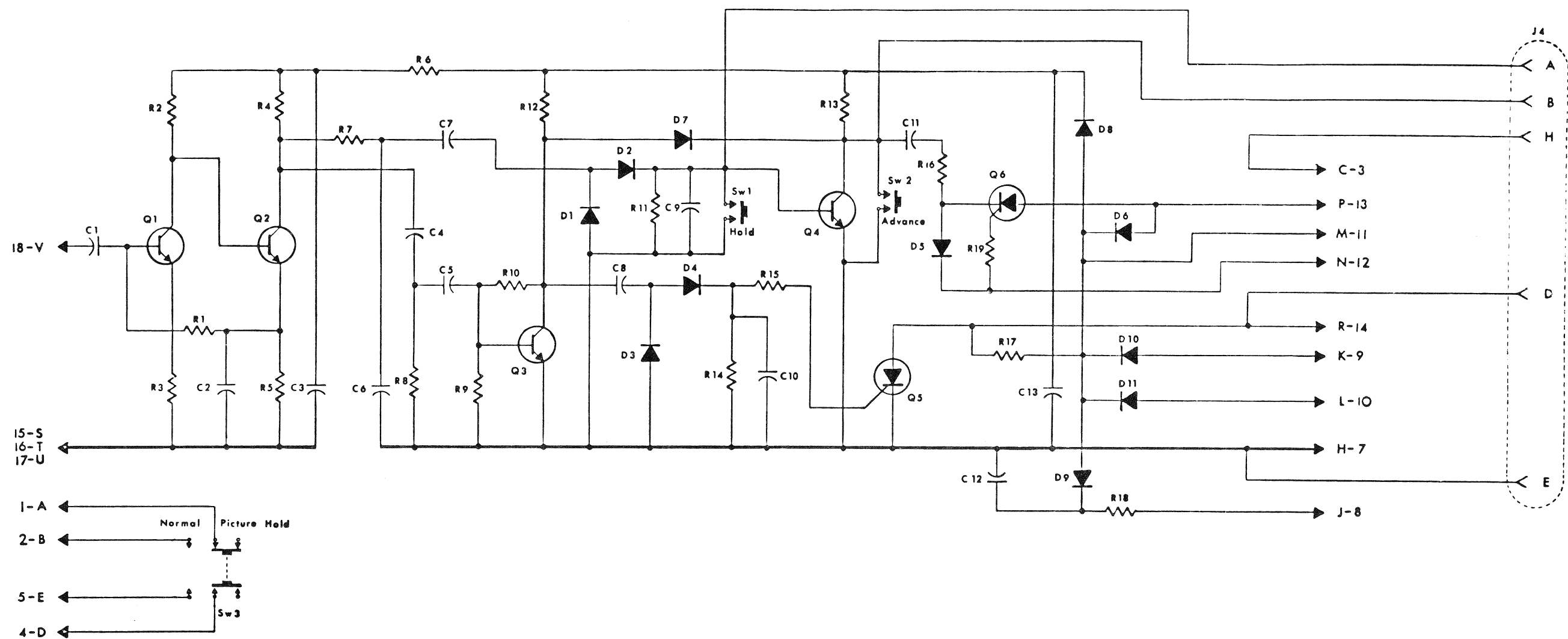


Figure 1-2 Switch Card
Schematic Diagram

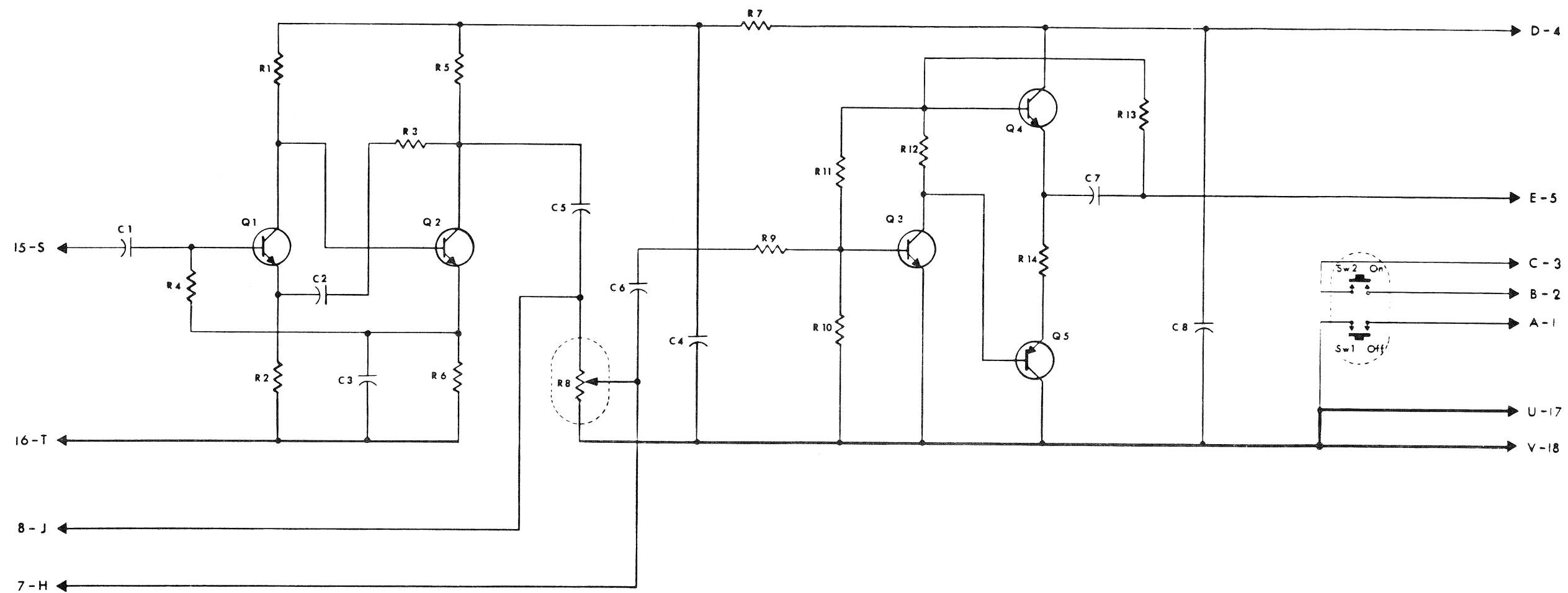


Figure 1-3 Audio Card
Schematic Diagram

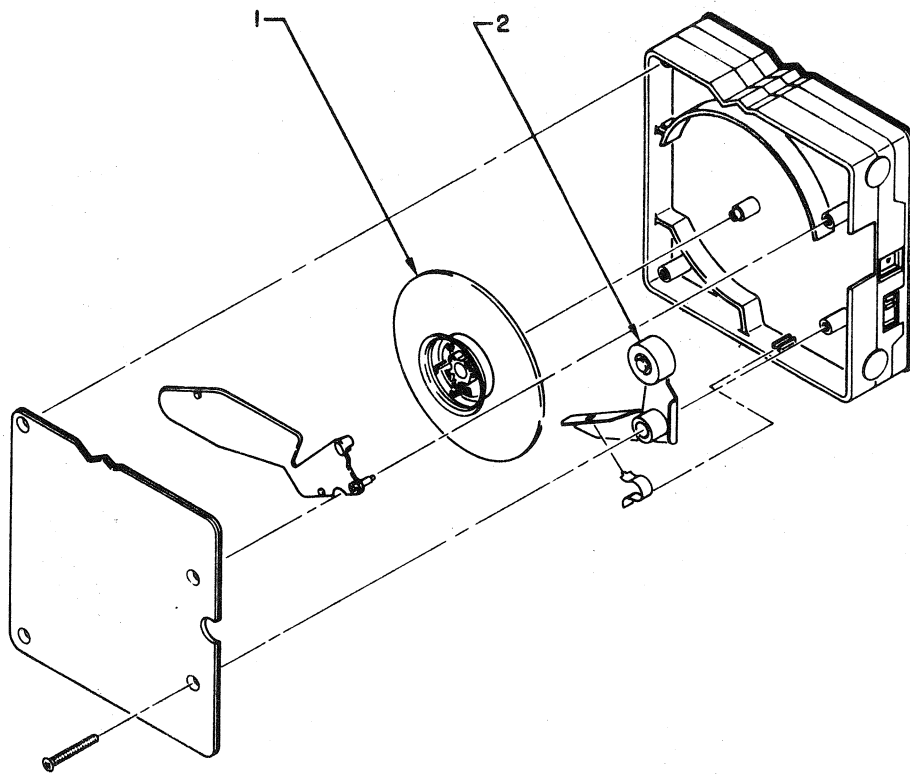


Figure 1-4 Cartridge Assembly, Tape Side

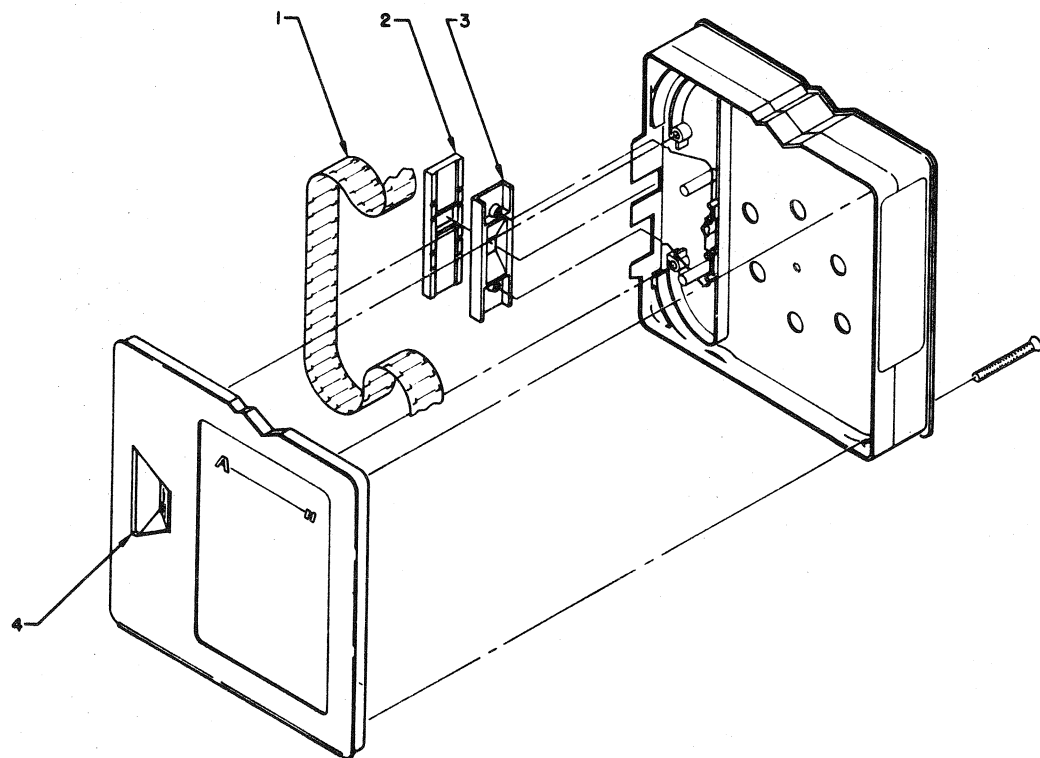


Figure 1-5 Cartridge Assembly, Film Side

SECTION II

OPERATING INSTRUCTIONS

2.0 PRE-OPERATING INSTRUCTIONS

2.1 The Audiscan I, rear screen projector, is a precision device, and will give years of reliable service providing the following pre-operational steps are taken to ensure the unit has not been damaged.

- a. Unsnap and remove cover. Check that the projector lamp is firmly seated in its socket.
- b. Check that tape drive belt is properly engaged with tape drive motor pulley and flywheel.
- c. Replace cover and connect power cord to 115 vac source.
- d. Check that cartridge film gate is in the open position.
- e. With cartridge film and tape openings forward, and double notches on cartridge body in the UP position, FIRMLY insert cartridge into rear opening. Continue pushing cartridge forward until locking mechanism engages the larger cartridge notch.

2.2 OPERATING INSTRUCTIONS (Refer to Figure 2-1)

2.3 Set PROGRAM switch to NORMAL position and momentarily press the ON switch. Adjust audio output level (volume control) as desired.

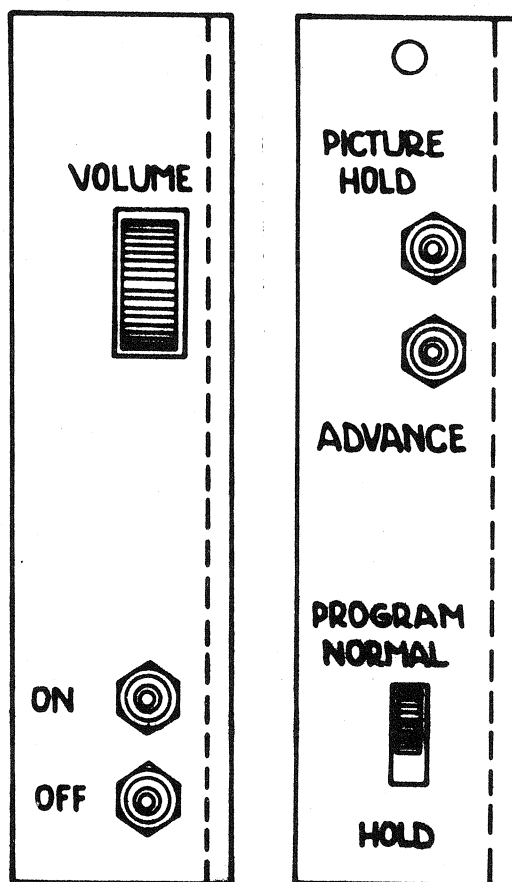


Figure 2-1 Operating Controls

2.4 Synchronization.

2.5 If program picture and audio program are not synchronized, use either of the following methods to bring them into synchronization.

- a. Alternately press and release the PICTURE ADVANCE switch enabling the picture program to catch the audio program.
- b. Press and hold the PICTURE HOLD switch until audio program catches the picture program.

2.6 Picture Focus.

2.7 Place the PROGRAM switch in the HOLD position, turn unit on, and manually operate the white knurled drive gear, extending

through the righthand side of the unit, until a clear sharp picture is displayed on the lenscreen. For Audiscan I units not equipped with external focusing, focus is pre-set, and it is necessary to remove the cover and adjust the lens barrel position in the lens holder to change it. Refer to paragraph 4.36, Section IV.

SECTION III
TROUBLESHOOTING

3.0 INTRODUCTION

3.1 The troubleshooting section is designed to aid the technician in locating a defective component or assembly by reference to SYMPTOM, POSSIBLE CAUSE, and REMEDY. In addition, reference to applicable paragraphs in Section IV are listed in the REMEDY column for removal, replacement, and adjustment procedures. Before attempting to clear any difficult malfunction, perform the continuity checks given in Table II to ensure internal wiring is in good order. Any type of reliable ohmmeter may be used. When making continuity checks, refer to Figures 1-1 and 1-2.

WARNING

BEFORE REMOVING COVER OF ANY UNIT AND
BEFORE PERFORMING CONTINUITY CHECKS,
ENSURE THAT POWER HAS BEEN REMOVED FROM
THE UNIT.

TABLE II
CONTINUITY CHECKS

Connector J1 Pin		Connector J2 Pin	Meter Indications	Special Conditions
N	to	A	150 ohms	Remove Audio and Switch Cards.
B	to	D	Continuity	Refer to paragraph 4.3.

Connector J1 Pin		Connector J2 Pin	Meter Indications	Special Conditions
N	to	T	Continuity	CAUTION: <u>DO NOT</u> PLACE OHMMETER ACROSS TAPE HEAD LEADS S AND T ON CONNECTOR J2 OR, U AND L ON CONNECTOR J1.
N	to	V	Continuity	
H to N			Continuity	
N to T			Continuity	
		B to N	25-30 ohms	
		B to M	25-30 ohms	
		D to E	7 ohms	Click in speaker.
A to J			Continuity	
M to P			8 ohms	
R	to	A	Continuity	
K to N			2 ohms	
L to N			2 ohms	
				Insert and and secure Audio and Switch Cards. See para- graph 4.3, Section IV.
E	to	M	6 ohms	Set PROGRAM switch to NORMAL pos- ition.

Connector J1 Pin		Connector J2 Pin	Meter Indications	Special Conditions
A to B	to	C	Continuity	Set PROGRAM switch to NORMAL position.
A to B			Open	Set PROGRAM switch to HOLD position.
D to E			75 ohms	Set PROGRAM switch to HOLD position.
D to E			Continuity	Set PROGRAM switch to NORMAL position.
E			Continuity	Set PROGRAM switch to NORMAL position and manually operate relay K1.
		B to C	Open	
		B to C	Continuity	Press and hold ON switch.
		A to V	150 ohms	
		C to B	Continuity	Manually close relay K1.
N to chassis			Continuity	NOTE: Some chassis are anodized. In such instances, use snap stud for ground point.

3.2 Before locating symptom in Table III, determine whether malfunction exists in the projector or in the cartridge by in-

serting the known good test cartridge and operating the unit as outlined in Section II.

TABLE III
TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	REMEDY
1. Unit does not operate with power cord connected and ON switch is pressed	a. Power source	a. Check power source.
	b. Switch Card	b. Remove and replace card. See paragraph 4.3, Section IV.
	c. Audio Card	c. Remove and replace card. See paragraph 4.3, Section IV.
	d. Power relay K1.	d. Remove and replace relay. See paragraph 4.5, Section IV.
	e. Cord reel	e. Remove and replace reel. See paragraph 4.23, Section IV.
	f. Transformer T1	f. Remove and replace transformer. See paragraph 4.7, Section IV.
2. Audio but no picture with cartridge inserted. Advance OK	a. Cartridge film gate	a. Remove cartridge and ensure gate is in open position.
	b. Projector lamp	b. Ensure lamp is properly seated. If malfunction not corrected, remove and replace lamp.

SYMPTOM	POSSIBLE CAUSE	REMEDY
3. Picture program but no audio program	c. Power relay K1	c. Remove and replace relay. See paragraph 4.5, Section IV.
	a. PROGRAM switch	a. Set PROGRAM switch to NORMAL position.
	b. Audio Card	b. Remove and replace card. See paragraph 4.3, Section IV.
	c. Switch Card	c. Remove and replace card. See paragraph 4.3, Section IV.
	d. Drive belt	d. Ensure belt is properly installed. If oily or worn, replace belt. See paragraph 4.15, Section IV.
	e. Tape drive motor jammed	e. Inspect and clear foreign matter from motor.
	f. Flywheel binding	f. Check flywheel movement. It should rotate freely. If not, replace flywheel assembly. See paragraph 4.17, Section IV.
	g. Speaker	f. Remove and replace speaker. See paragraph 4.9, Section IV.

SYMPTOM	POSSIBLE CAUSE	REMEDY
4. Picture program does not advance	h. Tape head cable assembly	h. Remove and replace cable assembly.
	i. Tape head	i. Remove and replace tape head. See paragraph 4.11, Section IV.
	a. Switch card	a. Remove and replace card. See paragraph 4.3, Section IV.
	b. Tape head cable	b. Remove and replace cable assembly.
5. Audio distorted	c. Tape head	c. Clean tape head with methyl alcohol. If malfunction not corrected, remove and replace tape head. See paragraph 4.11, Section IV.
	a. Audio card	a. Remove and replace card. See paragraph 4.3, Section IV.
	b. Tape head	b. Clean tape head with methyl alcohol. If malfunction not corrected, replace tape head. See paragraph 4.11, Section IV.

SYMPTOM	POSSIBLE CAUSE	REMEDY
	c. Speaker connections	c. Check soldered connections at speaker. Resolder as necessary.
	d. Speaker	d. Remove and replace speaker. See paragraph 4.9, Section IV.
	e. Drive belt	e. Ensure belt is properly aligned in pulley groove. If belt is worn, replace belt.
6. Picture program out of focus	a. Projection lens out of adjustment	a. Adjust focus as outlined in paragraph 2.7, Section II. If malfunction not corrected, adjust lens. See paragraphs 4.35 or 4.37, Section IV.
7. Film popping (Normally popping of film indicates it has been improperly processed. Return to producer)	a. Heat filter	a. Remove and replace filter. See paragraph 4.31, Section IV.
	b. Blower motor	b. Remove and replace motor. See paragraph 4.19, Section IV.
	c. Line voltage	c. Measure line voltage. If above 130 vac, connect unit to known 115 vac source.

SYMPTOM	POSSIBLE CAUSE	REMEDY
8. Picture program not centered on lenscreen	a. Centering mirror b. Lens mount	a. Adjust mirror. See paragraph 4.39, Section IV. b. Adjust mount. See paragraph 4.35, Section IV.
9. Power cord will not rewind	a. Cord reel	a. Ensure that power cord guides do not bind and are properly aligned. Be sure cord reel mounting screw is tight. If malfunction not corrected, replace reel. See paragraph 4.28, Section IV.
10. No manual ADVANCE or HOLD	a. Switch Card	a. Remove and replace card. See paragraph 4.3, Section IV.

SECTION IV
REPLACEMENTS AND ADJUSTMENTS

4.0 GENERAL

4.1 Although the removal, replacement, and adjustment of components and assemblies may appear to be simple, it is recommended that the technician carefully read the following procedures before attempting to remove, replace, or adjust components and assemblies. Exercise care at all times to prevent damage to adjacent components and assemblies such as mirrors, wiring harness, and tape head surface. Wiring should be cut close to the soldering point to avoid the replacement of a wire in the wiring harness. When soldering, use only non-corrosive type solder. Ensure leads have been tinned and that re-newed wiring is mechanically secure before soldering. Where a screw or nut has been previously sealed with lacquer, ensure they are re-lacquered after replacement or adjustment. All screws and nuts should be cinched down snug. Excessive torques on screws and nuts may strip their threads.

4.2 AUDIO AND SWITCH CARDS (Refer to Figure 5-1)

4.3 Unsnap cover (3) and remove screws (31). With righthand finger tips, firmly push card toward rear of unit until metal frame of card is exposed sufficiently to permit pulling card from its guides. Replace cards in the reverse order of removal. Ensure cards are properly aligned in guides, then firmly insert into connector.

- 4.4 POWER RELAY K1 (Refer to Figure 5-1)
- 4.5 Remove cover, three top screws (20), three bottom screws (32), and carefully pull front bezel (2) from frame. Lay front bezel down in front of unit while exercising care not to break speaker leads from speaker. Cut relay leads approximately 1/4 inch from soldered terminals. Remove nut (20) and lockwasher (21). Remove and discard defective relay (19). Solder leads on new relay, paying attention to wire color coding. Replace lockwasher and nut, and front bezel in the reverse order of disassembly.
- 4.6 POWER TRANSFORMER T1 (Refer to Figure 5-1)
- 4.7 Remove cover and front bezel as outlined in paragraph 4.5. Unsolder transformer leads from connectors J1 and J2, and relay K1 contacts. Drill out pop rivets (28), remove screw (29), nut (30), and lockwasher (26). Remove transformer (5) from chassis. Solder new transformer leads to connectors J1 and J2, and relay K1 contacts. Install transformer and front bezel in the reverse order of disassembly.
- 4.8 SPEAKER (Refer to Figure 5-2)
- 4.9 Remove cover and front bezel as outlined in paragraph 4.5. Unsolder speaker leads and lay front bezel down on a clean, flat surface.

NOTE

Lenscreen is fragile and easily scratched.

Place a clean, lint free cloth over its surface.

Carefully remove the four nuts (4) securing speaker (3) to front bezel and pull speaker free from bezel. Install new

speaker and secure with the four nuts to front bezel.

Solder speaker leads to speaker terminals and install front bezel in the reverse order of disassembly.

NOTE

Exercise care when soldering leads to speaker terminals. Excessive heat may damage speaker coil.

- 4.10 TAPE HEAD (Refer to Figures 4-1 and 5-2)
- 4.11 Remove cover and lay unit on its side to expose optical assembly. Remove projector lamp and drill out pop rivets (Item 22, Figure 5-2 with a No. 30 drill, and lift optical assembly from chassis. Loosen tape head clamp screw (Item 6, Figure 4-1) and carefully pull tape head out of clamp toward rear of unit. With tape head held firmly in fingers, carefully pull black plastic connector from tape head, noting that notch on connector faces outward.

CAUTION

DO NOT TUG ON CONNECTOR WIRES OR PINCH RUBBER INSULATION, AS YOU MIGHT BREAK WIRES IN CONNECTOR.

With tape head connector passing through tape head clamp, press connector into new tape head with notch outward. Tape head may be installed with either side outward. Push tape head and connector through tape head clamp until back of tape head is even with tape head clamp. Tighten tape head clamp screw to where tape head may be moved with some difficulty.

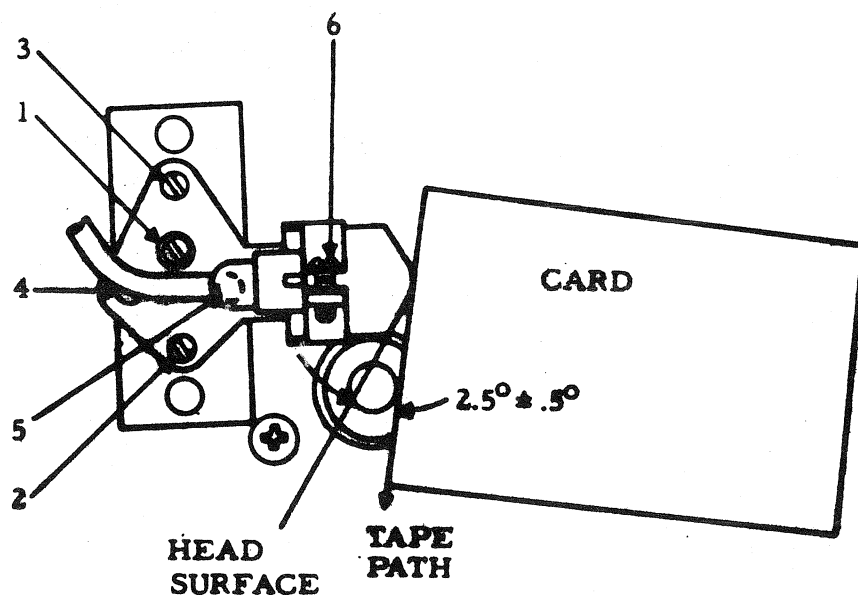


Figure 4-1 Tape Head Adjustment

With a piece of soft plastic straight edge or business card, placed as indicated in Figure 4-1, move tape head until required angle, $2.5^{\circ} \pm 0.5^{\circ}$, is attained.

CAUTION

DO NOT USE SCREWDRIVER OR METALIC INSTRUMENTS WHICH MAY BE MAGNETIZED NEAR TAPE HEAD SURFACE.

The correct angle may be estimated by the gap between the straight edge and the lower face of the tape head which should be 0.015 inch. Tighten tape head clamp screw and coat it with lacquer.

4.12 Azimuth Adjustment (Refer to Figure 4-1).

4.13 Loosen screw (1) to permit movement of tape head mounting assembly. Place test cartridge firmly in unit and observe tape head position relative to cartridge tape slot. It should be centered laterally, i.e., gaps between left and

Right sides of cartridge opening and tape head should be equal. If not, adjust set screws (4 and 5) until tape head is centered laterally with cartridge tape slot and is vertical to tape. With soft plastic straight edge or business card, recheck and adjust as necessary to ensure tape head is perpendicular to the adjacent vertical frame. Connect an AC Voltmeter across speaker terminals.

CAUTION

ISOLATE VOLTMETER FROM UNIT CHASSIS AS
12 VDC APPEARS ACROSS SPEAKER COIL. TAKE
CARE NOT TO TOUCH LAMP TERMINALS OR 115
VAC LEADS WITH VOLTMETER PROBES.

Set voltmeter to 2.5 vac scale, connect unit to power source, adjust volume control fully clockwise, and turn unit ON. Adjust screw (3) for maximum voltmeter indication (about 1.5 vac). Tighten screw (1) while observing voltmeter indications. There may be a slight decrease in output due to distortion of the tape head mounting bracket as screw (1) is tightened. Readjust screw (3) for maximum voltmeter indication. Remove and re-insert test cartridge and check for maximum voltmeter indication. Momentarily press OFF switch, remove power source, voltmeter leads, and test cartridge. Apply a coating of lacquer to all tape head mounting and adjustment screws. Lay unit on its side and install optical assembly with new pop rivets. Insert projector lamp firmly into lamp socket and replace cover.

NOTE

With practice and experience, removal of optical assembly may become unnecessary.

- 4.14 DRIVE BELT (Refer to Figure 5-1)
- 4.15 Remove cover. Remove Audio and Switch Cards as outlined in paragraph 4.3. Remove defective drive belt (Item 8, Figure 5-1) and install new belt. Install Switch and Audio Cards in the reverse order of removal.
- 4.16 FLYWHEEL AND BEARING ASSEMBLY (Refer to Figures 5-1 and 5-2)
- 4.17 Remove cover. Remove Audio and Switch Cards as outlined in paragraph 4.3. Remove optical assembly and tape head as outlined in paragraph 4.11. Remove three screws (Item 10, Figure 5-2) and remove flywheel and bearing assembly (Item 12, Figure 5-1). Install new flywheel and bearing assembly in its same position and tighten mounting screws finger tight. Insert test cartridge, lay projector on right side, and position capstan shaft as low as possible while allowing no more than 0.020 inch of it to be seen when viewed vertically. The assembly mounting holes will allow up and down positioning of the capstan shaft. Reassemble Audio and Switch Cards in the reverse order of disassembly.

NOTE

Adjust tape head alignment as outlined in paragraph 4.12.

Install optical assembly in the reverse order of disassembly.

- 4.18 BLOWER MOTOR (Refer to Figure 5-2)
- 4.19 Remove cover. Remove six screws (2), screws (30), washers (31), and feet (32) securing bezel (1) to frame. Carefully pull rear bezel from frame until blower motor (5) is accessible. Cut motor leads approximately 1/2 inch from motor frame. Remove four screws (6) and remove blower motor from rear bezel. Connect new motor leads to wiring harness with mechanical splices. Reassemble blower motor to rear bezel and secure rear bezel to frame.
- 4.20 LENSSCREEN (Refer to Figure 5-2)
- 4.21 Remove cover. Remove front bezel as outlined in paragraph 4.5. Loosen two nuts (7) at top of lenscreen (8). Remove two bottom and two side nuts holding lenscreen. Remove and discard defective lenscreen. While holding new lenscreen in place, tighten all holding nuts. If nuts are not secure, the lenscreen will rattle when speaker is operating.

CAUTION

DO NOT OVER-TIGHTEN NUTS SECURING LENS-
SCREEN. NUTS MUST BE PRESSED FIRMLY TO-
WARD LENSSCREEN AND GIVEN ONE-HALF TURN TO
PROPERLY SECURE THEM.

- 4.22 POWER CORD REEL (Refer to Figure 5-2)
- 4.23 Remove cover. Carefully pull both yellow power cord clips from tabs. Remove large flat screw (16) and flat washer (17). Lift cord reel (15) upward and out of unit while guiding power cord through rear of bezel. Install new power cord reel in the reverse order of disassembly. After installation, cord reel must be rotated four times to set spring tension.

CAUTION

DO NOT ATTEMPT TO SET SPRING TENSION
OF CORD REEL UNTIL IT IS INSTALLED.

REEL SPRING MAY BECOME UNWOUND.

Pull and release power cord several times to ensure reel
spring tension is adjusted properly.

- 4.24 FILM ACTUATOR ASSEMBLY (Refer to Figure 5-2)
- 4.25 Remove cover. Remove two screws (11) and lift actuator (12)
assembly from chassis. Remove existing splice and connect
new actuator solenoid leads to wiring harness with crimpers
and secure assembly to chassis in the reverse order of
disassembly.
- 4.26 Film Actuator Assembly Alignment (Refer to Figure 4-2).
- 4.27 Insert test cartridge and note position of actuator drive
pin (1). It must engage upper surface of the cartridge gate
notch (5) and be approximately halfway in the gate notch.

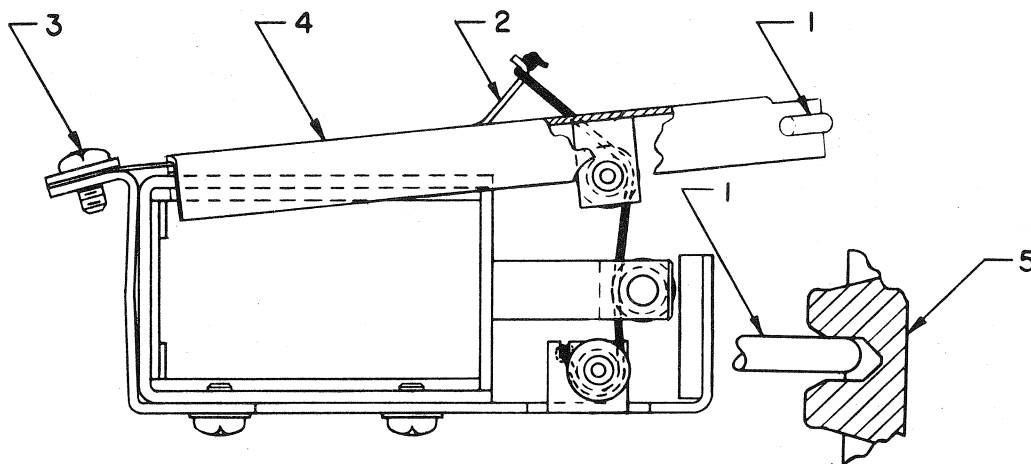


Figure 4-2 Film Actuator Alignment

NOTE

If actuator drive pin height is not properly positioned, picture program will flutter after each frame advance. If pin depth is too deep, it will push on cartridge gates which will cause loss of focus.

Adjust height of actuator drive pin by bending the upper spring tab as necessary. Adjust depth by loosening the two screws (3) securing the actuator arm (4) to body of actuator solenoid and moving it about as necessary. After alignment has been achieved, unit must be tested for picture program advance operation at both 100 and 130 vac line input. Be sure actuator arm does not rub against body as it advances.

4.28 TAPE DRIVE MOTOR (Refer to Figure 5-2)

4.29 Remove cover and cut motor leads close to motor frame, and slip drive belt (18) from pulley (19). Remove three mounting screws (21), six large washers (23), and lift motor from chassis. Remove and inspect all spacers (24) and shock mounts (25) for deterioration. Replace spacers and shock mounts as necessary. Install new motor in the reverse order of disassembly. Tighten mounting screws finger tight. Check that pulley is centered in the frame mounting hole. Tighten mounting screws and replace pulley belt. Connect motor leads to wiring harness with mechanical splices.

NOTE

If pulley belt has slipped from flywheel groove, both Audio and Switch Cards must be removed to re-install pulley belt.

4.30 HEAT FILTER (Refer to Figure 4-3)

4.31 Remove cover. Remove screw (9) and carefully pull heat filter bracket (2), with heat filter (6), from optical assembly. Remove heat filter from bracket and install new heat filter in bracket.

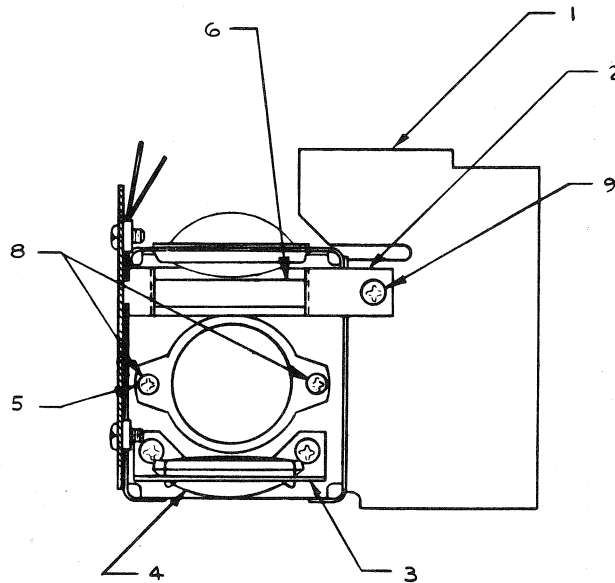


Figure 4-3 Optical Assembly

CAUTION

HEAT FILTER MUST NOT BE TIGHTLY SECURED
IN BRACKET OR IT WILL FRACTURE FROM
EXPANSION. FILTER SHOULD MOVE FREELY
IN THE BRACKET.

Install heat filter bracket in optical assembly in the
reverse order of disassembly.

NOTE

Ensure tab on heat filter bracket is in its
slot on optical assembly before tightening
mounting screw (9).

4.32 VARIABLE FOCUS ASSEMBLY (Refer to Figure 4-4)

4.33 To replace, remove cover and front bezel as outlined in paragraph 4.5. Remove small surface mirror as outlined in paragraph 4.39. Remove nut (1), lockwasher (2), screw (3), brass eylet (4), and drive gear (5). Loosen lens lock-set screw (6) and carefully pull lens barrel (7) forward and out of unit. Set lens aside. Remove three nuts (12), three lockwashers (13), lens holder (10), quadrant (11), and two backup plates (15). Discard defective parts. Reassemble by installing lens holder, quadrant, two backup plates, three lockwashers, and finger tighten three nuts. Proceed to alignment procedures.

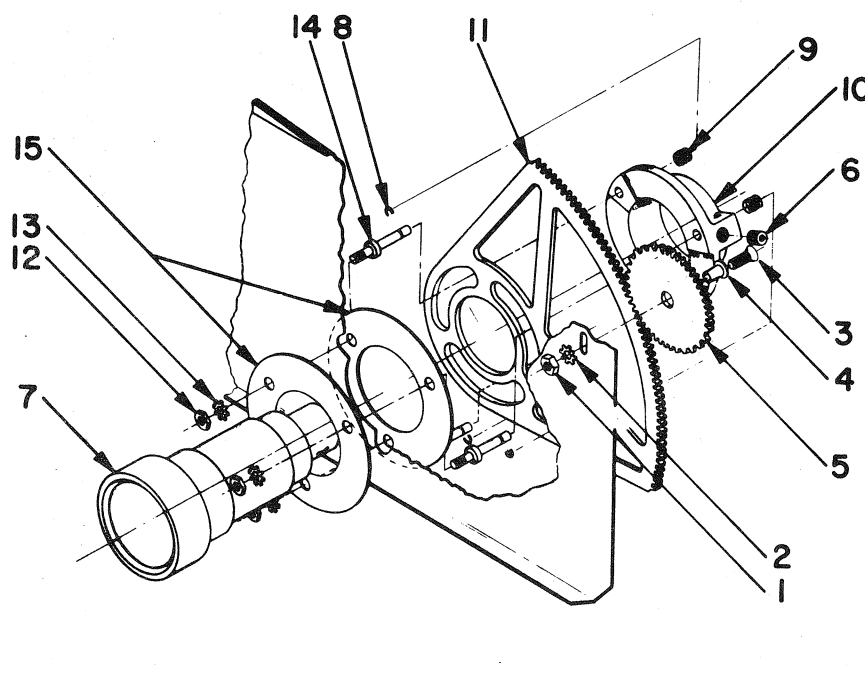


Figure 4-4 Variable Focus Assembly

4.34 Alignment.

4.35 Center alignment of lens is fairly critical. Therefore, carefully read alignment procedures before attempting to center the lens holder assembly. Insert projection lens

with hooded part of cap up and push all the way towards back of projector. Put centering jig on small mirror mounting bracket. Insert test cartridge, turn projector ON, and advance film one or two times. Adjust lens such that image is focused on jig and lightly tighten lens lock-set screw. Set lens and holder such that upper edge of image is even with upper line on jig and sides of image are equidistant from corresponding lines on jig by moving lens and holder as necessary. Do not be concerned with lower edge of image as long as it is even with, or above lower line of jig. Remove jig and lens, tighten bottom nut of lens holder, re-install lens and centering jig, focus on jig and recheck centering. Remove power and jig, install small mirror and front bezel, and re-apply power. Set quadrant such that lower edge is even with top of actuator and tighten lens holder set screw such that picture is in focus and advance film one or two times. Re-set focus if necessary. Center picture such that appropriate grid lines are parallel to screen edges, and then move picture to left or right by tapping edge of front backup plate with a small hammer and long punch until proper centering is achieved. Tighten two remaining nuts and check that lens holder moves freely by pushing lens barrel toward rear of projector with both thumbs and releasing.

NOTE

Be sure there is some back-lash between quadrant and drive gear, but not so much they can lose their mesh. Do not over tighten fine focus knob or it will bind.

Run fine focus from one end to the other,
noting that travel should be free, and
lens holder should move in and out smoothly.

NOTE

Picture program should be out of focus by
an equal amount at either end of quadrant
travel.

- 4.36 Non-Quadrant Focusing (Refer to Figure 4-4).
- 4.37 Remove cover and insert owners cartridge, if available,
(otherwise use test cartridge). Advance film one or two
times, loosen lens lock-set screw (6), and slide lens
barrel (7) in or out as necessary until focus is attained.
Carefully tighten set screw, remove and re-insert cartridge,
advance film one or two times, and check focus. Re-set if
necessary.
- 4.38 PROJECTOR MIRRORS (Refer to Figures 5-1 and 5-2)
- 4.39 Remove cover and front bezel as outlined in paragraph 4.5.
Remove small mirror by holding in place with one hand, while
with other hand removing three screws (Items 24 and 25,
Figure 5-1) (noting lower one is shorter), and three springs
(Item 22, Figure 5-1), securing mirror to bracket. Remove
mirror (Item 23, Figure 5-1), and carefully set aside with
its screws and springs. Install small mirror in the
reverse order of disassembly. Install front bezel and insert
test cartridge. Turn unit ON and focus picture by adjusting
focus drive gear. Refer to paragraph 4.37 for non-quadrant
focusing.

Center picture by turning small mirror adjusting screws as necessary. Install cover, remove and re-insert test cartridge, and check centering. Remove large mirror by removing four screws (Item 44, Figure 5-2), four nuts (Item 47, Figure 5-2), four lockwashers (Item 46, Figure 5-2), and four clips (Item 45, Figure 5-2). Install large mirror in the reverse order of disassembly.

NOTE

Mirrors have front surfaces and should be cleaned with care. Use Windex glass cleaner, exert light pressure, and wipe with clean, lint free cloth or tissue.

SECTION V

ILLUSTRATED PARTS LIST

5.0 INTRODUCTION

5.1 Illustrations in Section V are preceeded with a list of parts keyed by index numbers to that illustration. To locate the part number, first locate the appropriate illustration.

Identify the part on the illustration, noting the assigned index number. Locate the index number on the adjacent parts list and read off the part number.

5.2 ORDERING PARTS FROM FACTORY

5.3 When ordering parts, address correspondence and orders attention SERVICE DEPARTMENT. Order should include part number (ten digit number), description, and quantity desired.

PARTS LIST FOR

FIGURE 5-1

ITEM NO.	PART NUMBER	DESCRIPTION	QUANTITY
1	020-1019-001	Chassis Subassembly	1
2	011-1031-001	Front bezel	1
3	015-1001-001	Dust cover (specify with without slot for fine focus knob)	1
4	015-1000-001	Lens cover, modified	1
5	529-0002-001	Transformer	1
6	020-1036-001	Audio Card	1
7	020-1037-001	Switch Card	1
8	210-0001-001	Drive belt	1
9	205-1001-002	Tinnerman nut	2
10	207-0004-002	Washer, reel guide	2
11	200-1000-012	Screw, 6-32 x 1 5/8, P.H.	2
12	020-1118-001	Flywheel and bearing assy.	1
13	012-1092-001	Standoff	2
14	205-0001-002	Hex nut, 6-32	2
15	212-2000-001	Card guide	4
16	211-9001-001	Spare lamp clip	1
17	214-0003-001	Snap stud	2
18	205-1000-001	Tinnerman nut	6
19	526-0001-001	Relay	1
20	205-0001-002	Hex nut, 6-32	1
21	207-4000-002	Lockwasher, No.6, External teeth	1
22	208-0002-001	Spring	3
23	020-1007-001	Small mirror Assembly	1
24	200-1000-006	Screw, 6-32 x 5/8, P.H.	2
25	200-1000-005	Screw, 6-32 x 1/2, P.H.	1
26	207-4000-002	Lockwasher, No.6, External teeth	1
27	200-1000-003	Screw, 6-32 x 5/16, P.H.	1
28	206-3000-001	Pop rivet	1
29	200-6000-002	Screw, 6-32 x 3/8, P.H.	3
30	205-0001-002	Hex nut, 6-32	1
31	200-1000-003	Screw, 6-32 x 5/16, P.H.	2
32	200-1000-004	Screw, 6-32 x 5/16, P.H., black	3
33	025-1090-001	Large mirror	1
34	014-1027-001	Rubber mounting channel	2
35	542-0001-001	Receptacle, 18 contacts	2

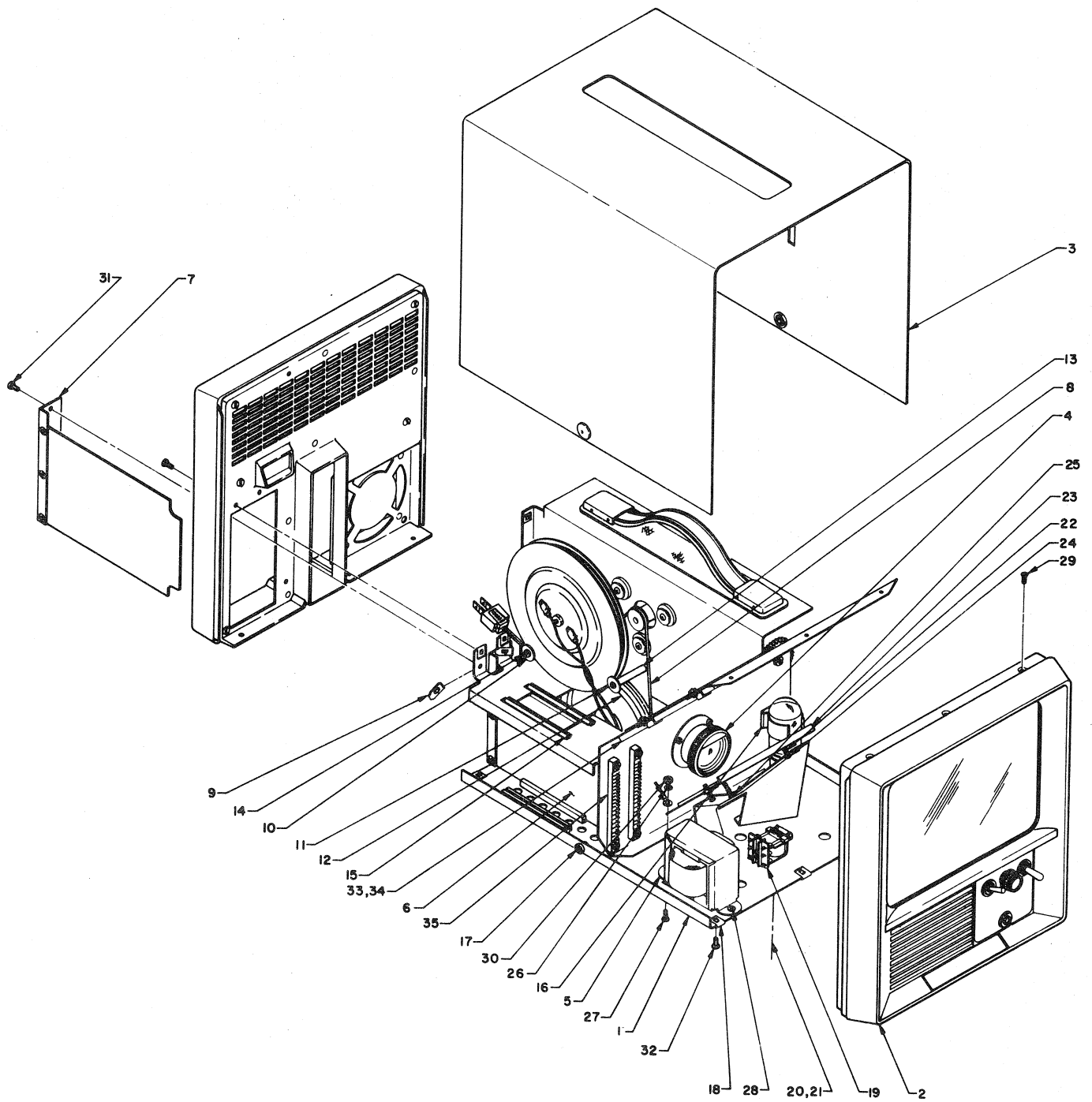


FIGURE 5-1 Audiscan I, Exploded View

PARTS LIST FOR

FIGURE 5-2

ITEM NO.	PART NUMBER	DESCRIPTION	QUANTITY
1	011-1032-001	Rear bezel	1
2	200-1000-004	Screw, 6-32 x 5/16, P.H., Black	6
3	535-0001-001	Speaker	1
4	205-1003-001	Pal nut	4
5	522-0001-001	Blower motor	1
6	200-1000-008	Screw, 10-24 x 5/16, P.H., Black	4
7	205-1008-001	Pal nut	6
8	025-4000-001	Lensscreen	1
9	201-1000-001	Screw, 6-32 x 1/4, Self tapping, P.H.	1
10	201-1000-001	Screw, 6-32 x 1/4, Self tapping, P.H.	3
11	201-1000-003	Screw, 6-32 x 5/8, Self tapping, P.H.	2
12	020-1006-001	Actuator assembly	1
13	010-1064-001	Heat filter bracket	1
14	532-0001-002	Cord reel assembly (3 wire)	1
15	532-0001-001	Cord reel assembly (2 wire)	1
16	PART OF CORD REEL...SPECIAL SCREW		1
17	207-0007-001	Washer	1
18	210-0001-001	Drive belt	1
19	012-1028-001	Pulley, 60 cycle	1
20	012-1028-002	Pulley, 50 cycle	1
21	200-1000-006	Screw, 6-32 x 5/8, P.H.	3
22	206-3000-001	Pop rivet	3
23	207-0004-002	Washer	6
24	012-1142-002	Spacer	3
25	210-6002-001	Grommet, motor mounting	3
26	025-3000-001	Heat filter	1
27	025-2001-001	Condenser lens	1
28	523-0001-001	Tape motor	1
29	212-8001-001	Fan	1
30	200-1000-005	Screw, 6-32 x 1/2, P.H.	2
31	207-0004-003	Washer, No.6	2
32	210-1000-001	Rubber foot, rear	2
33	010-1067-001	Optics hood	1
34	528-0001-001	Tape head	1
35	533-0001-001	Jack and Cable Assembly (Tape head)	1
36	536-1000-001	Lamp BEH 15hr.	1
37	536-1001-001	Lamp CSH 500hr.	1
38	016-1021-001	Lens holder	1
39	011-1130-001	Quadrant	1
40	010-1132-001	Backup plate	2
41	207-4000-002	Lockwasher, No.6, External teeth	
42	205-0001-002	Hex nut, 6-32	3

ITEM NO.	PART NUMBER	DESCRIPTION	QUANTITY
43	014-1038-001	Front rubber foot	1
44	200-1000-003	Screw, 6-32 x 5/16, P.H.	4
45	211-9002-001	Clip	4
46	207-4000-002	Lockwasher, No.6, External teeth	4
47	205-0001-002	Hex nut, No.6	4
48	211-8001-001	Handle Assembly	1
49	011-1068-002	Handle plug	1
50	200-6000-004	Screw, 6-32 x 5/8, L.O.	2
51	207-4000-002	Lockwasher, No.6, External teeth	2
52	205-0001 002	Hex nut, No.6	2
53	211-0001-001	Tape head mounting bracket	1
54	020-1105-001	Detent spring Assembly	1
55	011-1071-001	Upper cartridge guide	1
56	011-1084-001	Lower cartridge guide	1
57	010-1088-001	Detent spring support	1
58	213-0001-001	Fine focus knob	1
59	200-6000-003	Screw, 6-32 x 1/2, P.H.	1
60	206-5000-003	Eyelet	1
61	025-2000-001	Projection lens	1
62	202-0001-002	Set screw, 10-32 x 3/8	1
63		Handle cap (Part of handle assembly)	2
64	800-0001-xxx	Test cartridge (Each test cartridge has different number)	1
65	025-0001-001	Reflector	1
66	020-1094-001	Optical subassembly (Complete)	1
67	205-0001-002	Hex nut, 6-32	2
68	207-0004-002	Washer, reel guide	2
69	012-1092-001	Standoff	2
70	200-1000-012	Screw, 6-32 x 1 5/8, P.H.	2
71	536-2000-001	Lamp socket	1

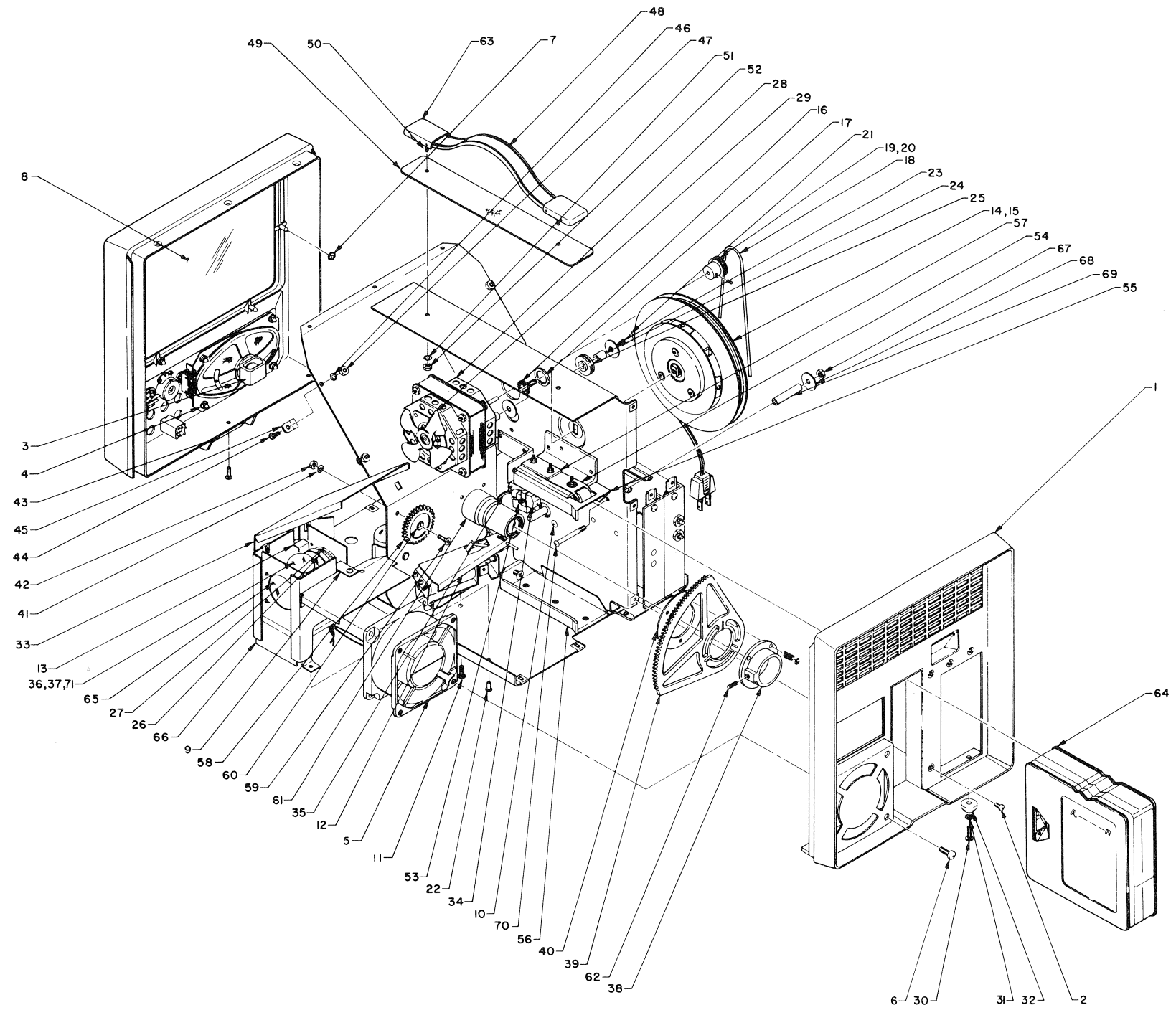


Figure 5-2
Audiscan I,
Exploded View

SECTION VI
STANDARD REPAIR TIMES

6.0 INTRODUCTION

6.1 The schedule of Standard Repair Times is to be used when invoicing Audiscan Incorporated, for warranty repairs. Audiscan will allow a minimum billing on warranty repairs of one-half hour shop time at your established rate.

TABLE IV
STANDARD REPAIR TIMES

ITEM	WORK PERFORMED	ALLOTTED TIME
Complete continuity check per Table II	Point-to-point continuity check	15 minutes
Actuator	Adjust	10 minutes
Actuator	Replace	5 minutes
Relay	Replace	25 minutes
Speaker	Replace	10 minutes
Cord reel Assembly	Replace	10 minutes
Blower motor	Replace	20 minutes
Tape motor	Replace	15 minutes
Lamp socket	Replace	15 minutes
Switch or potentiometer	Replace	10 minutes
Audio Card	Replace	3 minutes
Switch Card	Replace	2 minutes
Tape head	Replace and adjust	30 minutes
Tape head cable	Replace	20 minutes

ITEM	WORK PERFORMED	ALLOTTED TIME
	<u>Optical Repairs</u>	
Focus	Adjust	5 minutes
Centering	Adjust	10 minutes
Lens	Replace and adjust	20 minutes
Small mirror Assy.	Replace and adjust	20 minutes
Lensscreen	Replace	15 minutes
Heat filter	Replace	10 minutes
Optical Assembly	Replace	15 minutes
Large mirror	Replace	10 minutes
Lens holder and quadrant	Replace and adjust	45 minutes
	<u>Mechanical Repairs</u>	
Capstan and fly-wheel Assembly	Replace	40 minutes
Cartridge detent spring Assembly	Replace	20 minutes
Motor grommetts	Replace	10 minutes
Actuator grommetts	Replace	10 minutes
	<u>Miscellaneous Repairs</u>	
Front bezel	Replace	20 minutes
Rear bezel	Replace	15 minutes
Handle Assembly	Repalce and adjust	15 minutes
Handle plug	Replace, repair or adjust	15 minutes

SECTION VII
TEST EQUIPMENT

7.0 GENERAL

7.1 The Audiscan I projector requires very little test equipment and time to perform a thorough operational check. A test cartridge is supplied by Audiscan, and when it is used in conjunction with a variable AC power supply, the technician can perform a complete functional check. Continuity checks can be performed with a VOM.

7.2 TEST CARTRIDGE

7.3 The test cartridge has, on the tape side, ten advance and two shut-off signals along with a one minute section of high frequency audio for tape head alignment. The film side contains a series of targets for checking focus and centering. The cartridge should be used to check all Audiscans serviced at both 100 and 130 vac.

CAUTION

DISASSEMBLY OF THE TEST CARTRIDGE IS DIS-
COURGED. IF FOR ANY REASON THIS CARTRIDGE
SHOULD FAIL, RETURN IT TO THE FACTORY FOR
REPLACEMENT OR REPAIR. THERE WILL BE NO
CHARGE FOR THIS PROVIDED THE CARTRIDGE
HAS NOT BEEN UNECESSARILY TAMPERED WITH.

7.4 VARIABLE AC POWER SUPPLY

7.5 A variable AC power supply should be used in conjunction with the test cartridge to check the projector for proper start, advancing, and shut-off at line voltages of both 100 and 130 vac. Tape head alignment should be made at 120 vac.

7.6 LENS HOLDER CENTERING JIG

7.7 A jig has been provided as part of the service kit to aid the technician in proper alignment of the lens holder assembly. Refer to paragraph 4.35 for instructions about its use.

7.8 ACTUATOR TAB BENDER

7.9 An allen wrench with a slotted end has been provided as a tool for adjusting the actuator pin height by bending the tab up or down as necessary. Refer to paragraph 4.27

SUPPLEMENT I

001-0004-001

TO THE

OVERHAUL MANUAL

FOR

Audiscan®

MODEL A

MODEL B

MODEL C

PROJECTORS

THROUGH

S/N 6419

AUDISCAN, INC.

1414 130th AVENUE N.E.

BELLEVUE, WASH. 98005

TABLE OF CONTENTS

SECTION	DESCRIPTION	PAGE NO.
I	INTRODUCTION AND THEORY OF OPERATION	1-1
	Model A Electrical System	1-1
	Model A Electronic System	1-2
	Model B Electrical System	1-3
	Model B Electronic System	1-3
	Model C Electrical System	1-8
	Model C Electronic System	1-8
II	OPERATING INSTRUCTIONS	2-1
	Model A Operating Instructions	2-1
	Model B Operating Instructions	2-1
	Model C Operating Instructions	2-1
III	TROUBLESHOOTING	3-1
	Model A Troubleshooting	3-2
	Model B Troubleshooting	3-6
IV	REPLACEMENTS AND ADJUSTMENTS	4-1
	General	4-1
	Front Controls	4-1
	Indicator Light	4-1
V	SUPPLEMENT PARTS LIST	5-1

LIST OF ILLUSTRATIONS

FIGURE	TITLE	PAGE NO.
1-1	Model A Projector Schematic Diagram	1-4
1-2	Models A & B Switch Card Schematic Diagram	1-5
1-3	Models A & B Audio Card Schematic Diagram	1-6
1-4	Model B Projector Schematic Diagram	1-7
5-1	Model A Front Bezel Assembly	5-2
5-2	Model B Front Bezel Assembly	5-3
5-3	Model C Front Bezel Assembly	5-4

1.0 INTRODUCTION

1.1 This manual is a supplement and covers matters not covered or applicable in the Overhaul Manual (Audiscan P/N 001-0002-001). After checking this manual for desired information on a Model A, B, or C projector before S/N 6420, refer to the Overhaul Manual for additional information.

1.2 THEORY OF OPERATION

1.3 Specifications and general theory of operation are given in paragraph 1.3 of the Overhaul Manual and directly apply to Models A, B and C. Detailed electrical and electronic theory of operation for Models A, B and C is discussed in the following paragraphs.

1.4 Model A Electrical System; Theory of Operation. (Refer to Figure 1-1).

1.5 The electrical system consists of the input power line cord, projection lamp, blower motor, power transformer, power relay, tape drive motor, indicator lamp, power switch, RE-START switch and wiring harness. When the power switch is turned on, AC power is applied to the projection lamp, blower motor, and indicator lamp. When the RE-START switch is momentarily depressed, power is applied to the primary of the power transformer. The secondary voltage of the power transformer is rectified by diodes D10 and D11 on the switch card and applied to the coil of the power relay, causing it to close. The relay is latched by one set of contacts which maintain the transformer primary circuit originally created by the RE-START switch. The other set of contacts complete the circuit for the tape drive motor and at the same time, remove power to the indicator lamp.

- 1.6 Model A Electronic System; Theory of Operation. (Refer to Figures 1-1, 1-2, and 1-3)
- 1.7 The electronic system consists of the audio card, switch card, tape head, PICTURE ADVANCE/HOLD switch, and speaker. When the RE-START switch is momentarily pressed, power is applied to the switch card, which provides DC operating voltages for the switching amplifier and trigger circuits, advance solenoid (actuator), relay, and audio card. The stacked, dual-track tape head reads the switching signals on one track and the audio on the other. When a low frequency advance signal passes the tape head, it goes into the switch card amplifier and then to the advance trigger circuit, where it is rectified and used to turn on a silicon controlled rectifier which is used to provide a DC path for the advance solenoid. When a high frequency shut-off signal passes the tape head, it goes to the switch card amplifier and then to the shut-off trigger circuit where it is rectified and used to turn on a silicon controlled rectifier which is used as an electronic shunt. The supply side of the relay coil is momentarily shorted to ground which removes power to the tape motor, switch card and audio card. When the PICTURE ADVANCE switch is momentarily depressed it activates the advance solenoid via the advance trigger circuit independent of signals on the tape. When the PICTURE HOLD switch is held in, it disables the advance trigger circuit so the picture program cannot advance.

NOTE

The picture program cannot be advanced if the indicator lamp is on as there will be no power supplied to the switch card.

- 1.8 Model B Electrical System; Theory of Operation (Refer to Figure 1-4.)
- 1.9 The electrical system consists of the input power line cord, ON-OFF switch, power transformer, power relay, advance solenoid (actuator), projection lamp, blower motor, tape drive motor, and wiring harness. When the ON-OFF switch is momentarily switched ON, AC power is applied to the primary of the power transformer. The secondary voltage of the transformer is rectified on the switch card and applied to the relay coil. One set of relay contacts then latches the relay in the ON position by maintaining the transformer primary circuit. The other set of contacts complete the circuits for the projection lamp, blower motor and tape motor. The tape motor has a GO-HOLD switch which allows the program to be stopped while the picture remains on the screen. The projector is turned off by momentarily switching the ON-OFF switch to the OFF position, causing the supply side of the relay to be shorted to ground; thus the relay is unlatched and removes power from the transformer primary, projection lamp, blower motor, and tape motor.
- 1.10 Model B Electronic System; Theory of Operation.
- 1.11 The Model B electronic system employs the same switch card and audio card as the Model A, and their operation is identical. Refer to paragraph 1.7 of this supplement.

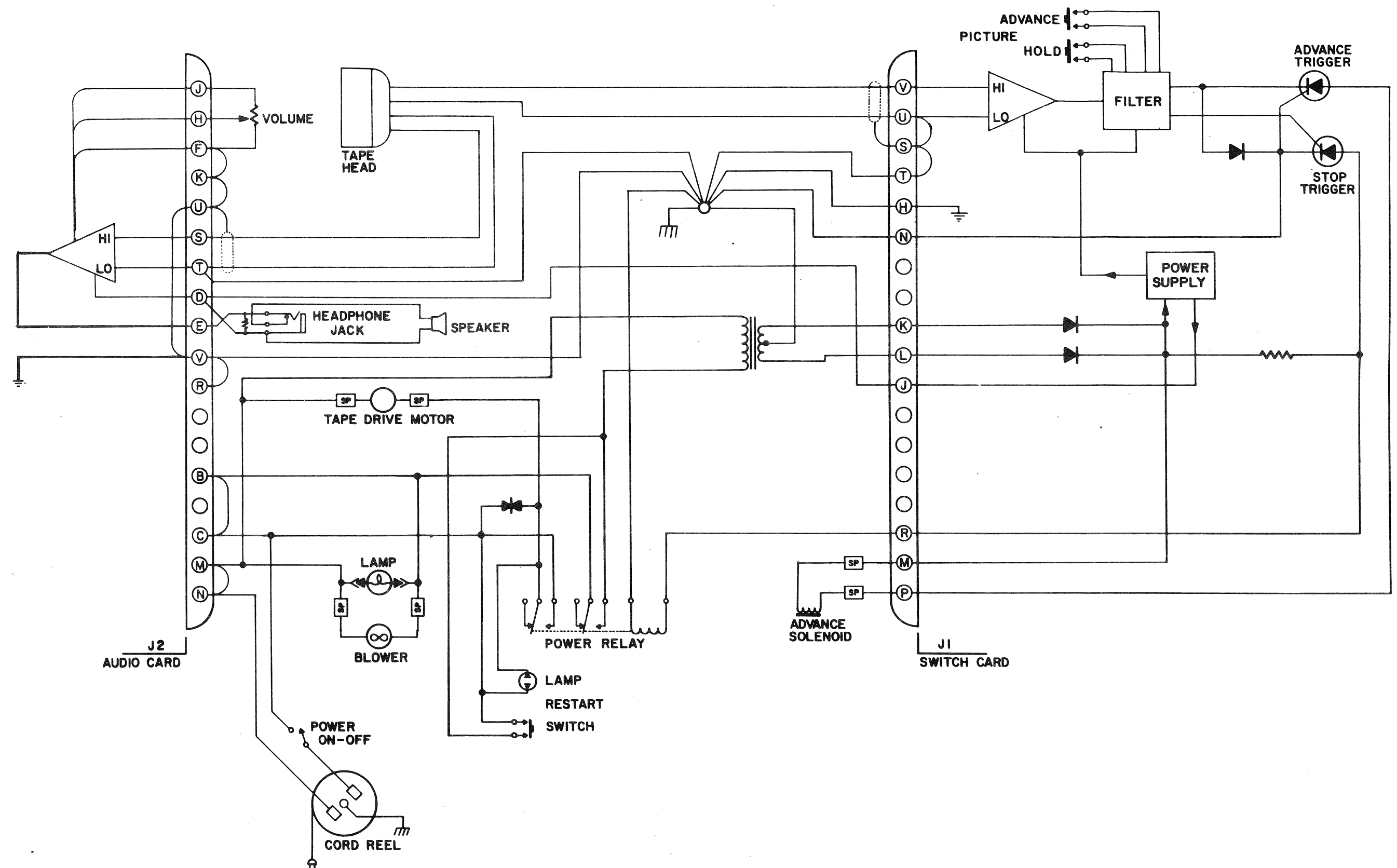


Fig. I-1 PROJECTOR
SCHEMATIC DIAGRAM
MODEL A

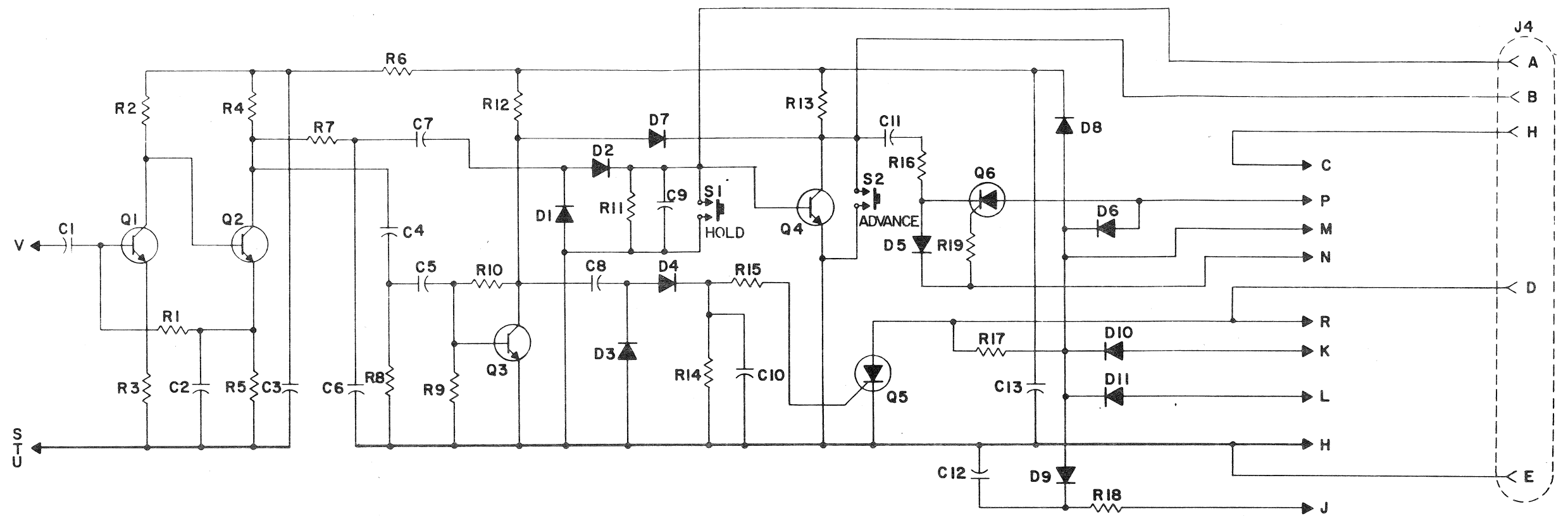


Fig. I-2 SWITCH CARD
SCHEMATIC DIAGRAM
MODELS A & B

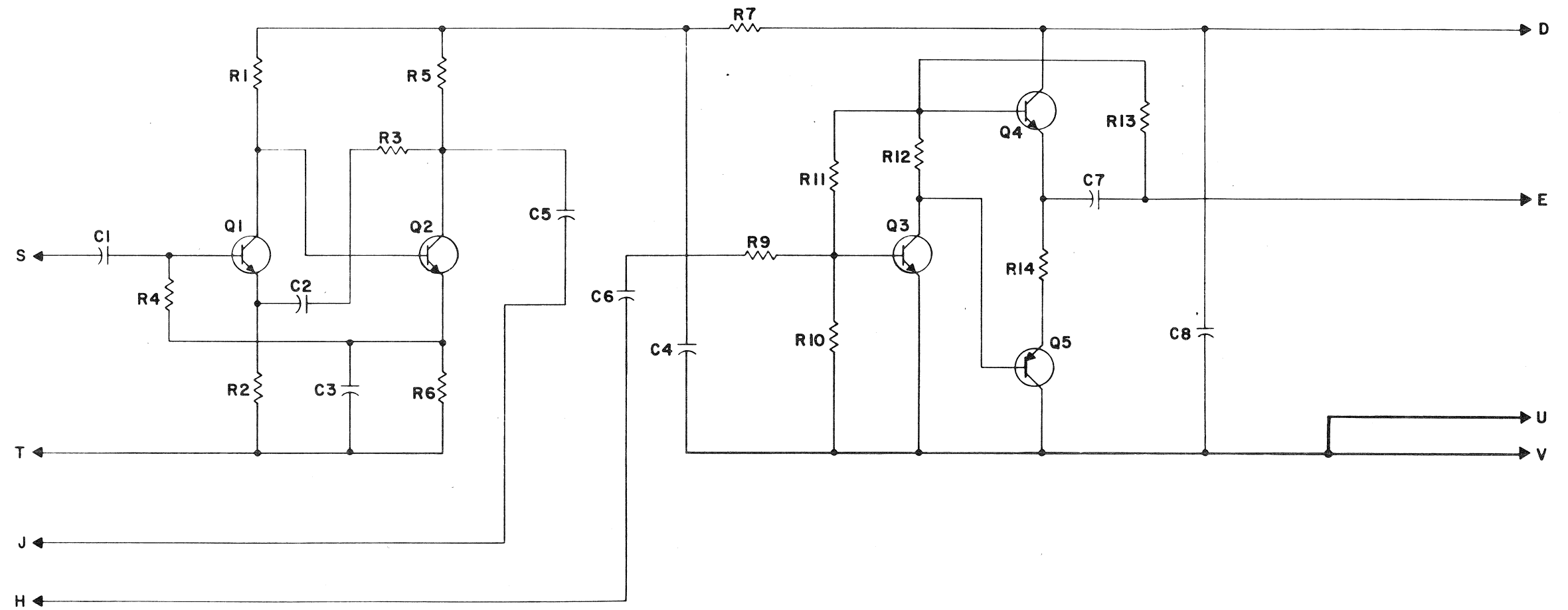


Fig. 1-3 AUDIO CARD
SCHEMATIC DIAGRAM
MODELS A & B

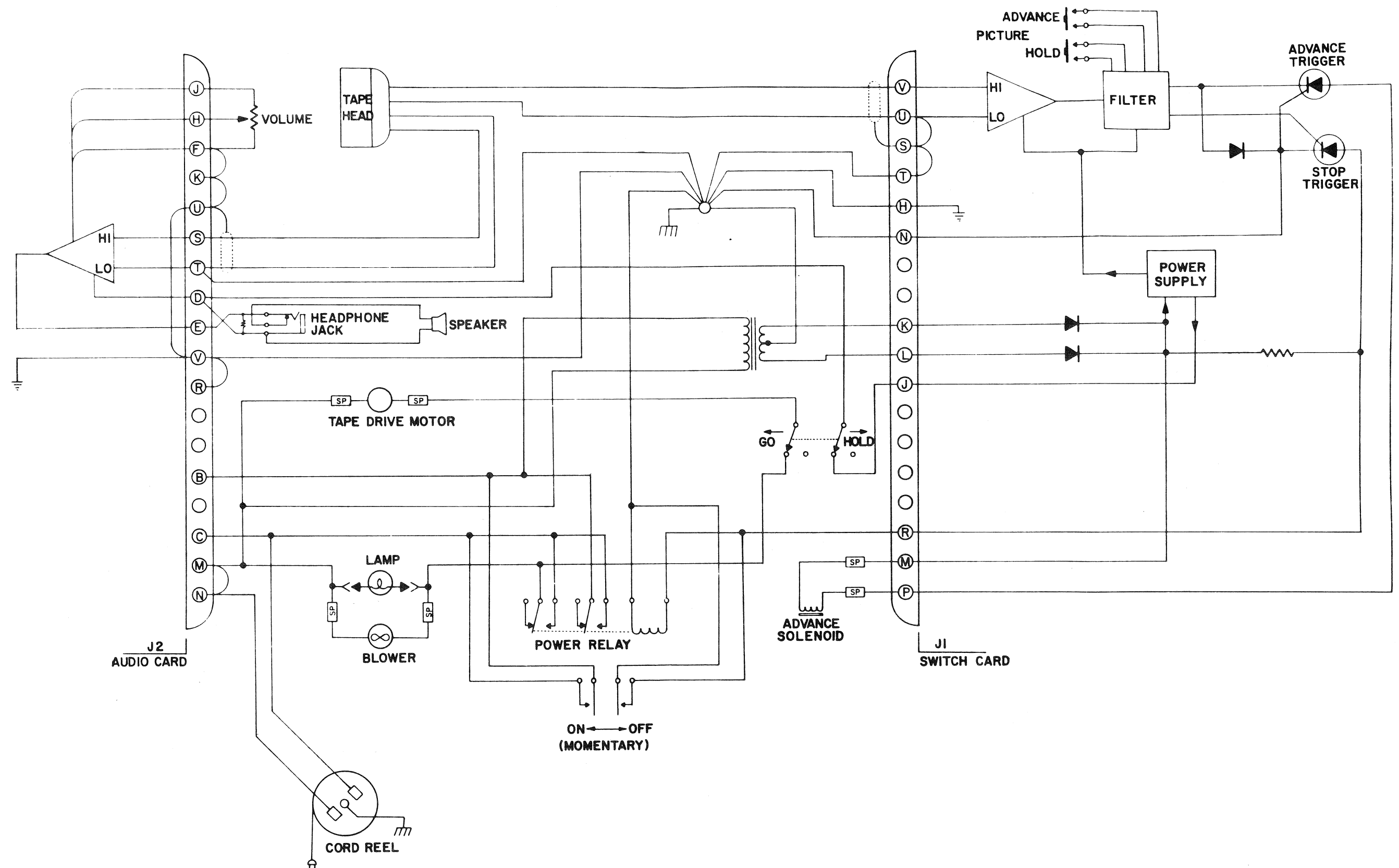


Fig.1-4 PROJECTOR
SCHEMATIC DIAGRAM
MODEL B

1.12 Model C Electrical System; Theory of Operation.

1.13 The Model C electrical system is identical in operation to the Audiscan I, except it employs an additional START switch on the front bezel which is electrically parallel to the ON switch located on the audio card. Refer to paragraph 1.5 of the Overhaul Manual.

1.14 Model C Electronic System; Theory of Operation.

The Model C electronic system employs the same switch card and audio card as the Audiscan I, and their operation is identical. Refer to paragraph 1.7 of the Overhaul Manual.

SECTION II
OPERATING INSTRUCTIONS

- 2.0 Pre-operating Instructions. (Refer to paragraph 2.1, Overhaul Manual)
- 2.1 Model A Operating Instructions.
- 2.2 Turn the power switch ON and insert a cartridge. Momentarily depress the RE-START switch and adjust the volume to desired level.
- 2.3 Model B Operating Instructions.
- 2.4 Insert a cartridge, place the GO-HOLD switch in the GO position, and momentarily hold the power switch in the ON position. Adjust the volume to desired level.
- 2.5 Model C Operating Instructions.
- 2.6 Insert a cartridge and momentarily depress either the START switch on the front bezel or the ON switch on the audio card. Be sure the PROGRAM NORMAL-HOLD switch on the switch card is in the NORMAL position and adjust volume to desired level.
- 2.7 Synchronization. (Refer to paragraph 2.5, Overhaul Manual.)
- 2.8 Picture Focus. (Refer to paragraph 2.7, Overhaul Manual.)

SECTION III TROUBLESHOOTING

3.0 INTRODUCTION

3.1 This section contains troubleshooting tables for Models A and B. To make continuity checks on either the Model A or Model B, refer to the appropriate projector schematic diagram in this manual. The continuity checks and troubleshooting for the Model C are identical to the Audiscan I and can be found in Section III of the Overhaul Manual. The REMEDY columns of Table I and Table II contain references to applicable paragraphs in the Overhaul Manual for repairs and adjustments on the Model being serviced. Refer to Table I when troubleshooting a Model A projector, and Table II when troubleshooting a Model B.

TABLE I
MODEL A
TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	REMEDY
1. Unit does not operate with power cord connected and power switch turned ON (Blower motor & lamp will not operate.)	a. Power source b. Cord reel c. Power switch	a. Check power source b. Replace reel. See para.4.23, Overhaul Manual. c. Replace switch.
2. Audio but no picture with cartridge inserted.	a. Cartridge film gate b. Projector lamp	a. Remove cartridge & ensure gate is in open position. b. Ensure lamp is properly seated, If malfunction not corrected, replace lamp.
3. Relay will not close or will not latch when RE-START switch is depressed.	a. Switch card b. Audio card c. Relay d. RE-START switch e. Transformer	a. Replace card. See para. 4.3, Overhaul Manual. b. Replace card. See para.4.3, Overhaul Manual. c. Replace relay. See para. 4.5, Overhaul Manual. d. Replace switch e. Replace transformer. See para. 4.7, Overhaul Manual.
4. Relay closed & latched but no audio <u>and</u> no automatic advance. Manual advance O.K.	a. Open tape motor circuit b. Dirty relay contacts. c. Bent relay or relay contacts.	a. Check & repair connections. b. Clean contacts c. Replace relay. See para. 4.5, Overhaul Manual.

SYMPTOM	POSSIBLE CAUSE	REMEDY
	d. Drive belt	d. Correct installation or replace. See para. 4.15, Overhaul Manual.
	e. Capstan & fly-wheel assy. frozen or capstan loose in flywheel	e. Repair or replace. See para. 4.17, Overhaul Manual.
5. Picture program advances but no audio program	a. Audio card	a. Replace card. See para. 4.3, Overhaul Manual.
	b. Switch card	b. Replace card. See para. 4.3, Overhaul Manual.
	c. Speaker	c. Replace speaker. See para. 4.9, Overhaul Manual.
	d. Tape head cable assembly	d. Remove & replace cable assembly.
	e. Tape head	e. Remove & replace tape head. See para. 4.11, Overhaul Manual
6. Picture program does not advance. Audio O.K.	a. Switch card	a. Replace card. See para. 4.3, Overhaul Manual.
	b. Tape head cable	b. Replace cable assy.
	c. Tape head	c. Clean tape head with methyl alcohol. If malfunction not corrected, replace tape head. See Para. 4.11, Overhaul Manual.
7. No manual ADVANCE	a. Relay not closed (indicator light on)	a. Relay must be closed to achieve manual ADVANCE. Depress RE-START switch.
	b. Switch card.	b. Replace card. See para. 4.3, Overhaul Manual.
8. Picture program will not HOLD.	a. Switch card.	a. Replace card. See para. 4.3, Overhaul Manual.

SYMPTOM	POSSIBLE CAUSE	REMEDY
9. Audio quality is poor.	a. Drive belt	a. Ensure belt is properly aligned in pulley groove. If belt is worn, replace belt.
	b. Audio card	b. Replace card. See para. 4.3, Overhaul Manual.
	c. Tape head	c. Clean tape head with methyl alcohol. If malfunction not corrected, replace tape head. See para. 4.11, Overhaul Manual.
	d. Speaker connections	d. Check soldered connections at speaker. Resolder as necessary.
	e. Speaker	e. Replace speaker. See para. 4.9, Overhaul Manual.
10. Picture program out of focus	a. Projection lens out of adjustment.	a. Adjust focus as outlined in para. 2.7, Overhaul Manual. If malfunction not corrected, adjust lens. See para. 4.35 or 4.37, Overhaul Manual.
11. Film popping	a. Heat filter	a. Replace filter. See para. 4.31, Overhaul Manual.
	b. Blower motor	b. Replace motor. See para. 4.19, Overhaul Manual.
	c. Line voltage	c. Measure line voltage. If above 130 vac, connect unit to known 115 vac source.
	d. Untreated film	d. Return cartridge to producer.
12. Picture program not centered on lenscreen	a. Centering mirror	a. Adjust mirror. See para. 4.39, Overhaul Manual.
	b. Lens mount	b. Adjust mount. See para. 4.35, Overhaul Manual.

SYMPTOM	POSSIBLE CAUSE	REMEDY
13. Power cord will not rewind	a. Cord reel	a. Ensure that cord reel guides do not bind and are properly aligned. Be sure cord reel mounting screw is tight. If malfunction not corrected, replace reel. See para. 4.28 Overhaul Man.

TABLE II
MODEL B
TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	REMEDY
1. Unit does not operate with power cord connected and power switch momentarily switched ON.	a. Power source	a. Check power source.
	b. Switch card	b. Replace card. See para. 4.3, Overhaul Manual.
	c. Audio card	c. Replace card. See para. 4.3, Overhaul Manual.
	d. Power relay	d. Replace relay. See para. 4.5, Overhaul Manual.
	e. Cord reel	e. Replace reel. See para. 4.23, Overhaul Manual.
	f. Transformer	f. Replace transformer. See para. 4.7, Overhaul Manual.
2. Audio but no picture with cartridge inserted.	a. Cartridge film gate.	a. Remove cartridge and ensure gate is in open position.
	b. Projector lamp.	b. Ensure lamp is properly seated. If malfunction not corrected, replace lamp.
	c. Power relay	c. Replace relay. See para. 4.5, Overhaul Manual.
3. Picture on screen, but no audio program.	a. GO-HOLD switch	a. Place GO-HOLD switch in GO position.
	b. Audio card	b. Replace card. See para. 4.3, Overhaul Manual
	c. Switch card	c. Replace card. See para. 4.3, Overhaul Manual.
	d. Speaker	d. Replace speaker. See para. 4.9 Overhaul Manual.

SYMPTOM	POSSIBLE CAUSE	REMEDY
4. No audio <u>and</u> no automatic advance	a. Drive belt	a. Correct installation or replace. See para. 4.15, Overhaul Manual.
	b. Flywheel frozen or capstan loose in flywheel	b. Replace. See para. 4.17, Overhaul Manual.
	c. Tape head cable assy. discon- nected at tape head.	c. Re-connect
	d. Defective cart- ridge	d. Compare with test cart- ridge.
5. No automatic advance	a. Switch card	a. Replace card. See para. 4.3, Overhaul Manual.
	b. Tape head cable	b. Replace cable assy.
	c. Tape head	c. Clean tape head with methyl alcohol. If malfunction not cor- rected, replace tape head. See para. 4.11, Overhaul Manual.
6. Audio quality is poor.	a. Audio card	a. Replace card. See para. 4.3, Overhaul Manual.
	b. Tape head	b. Clean tape head with methyl alcohol. If malfunction not cor- rected, replace tape head. See para. 4.11, Overhaul Manual.
	c. Speaker connec- tions	c. Check soldered connec- tions at speaker. Re- solder as necessary.
	d. Speaker	d. Replace speaker, See para. 4.9, Overhaul Manual.
	e. Drive belt	e. Ensure belt is properly aligned in pulley groove.

SYMPTOM	POSSIBLE CAUSE	REMEDY
7. Picture program out of focus.	a. Projection lens out of adjustment.	a. Adjust focus as outlined in para. 2.7, Overhaul Manual. If malfunction not corrected, adjust lens. See para. 4.35 or 4.37, Overhaul Manual.
8. Film popping	a. Heat filter	a. Replace filter. See para. 4.31, Overhaul Manual.
9. Picture program not centered on lenscreen.	a. Centering mirror	a. Adjust mirror. See para. 4.39, Overhaul Manual.
	b. Lens mount	b. Adjust mount. See para. 4.35, Overhaul Manual.
10. Power cord will not rewind	a. Cord reel	a. Ensure that cord reel guides do not bind and are properly aligned. Be sure cord reel mounting screw is tight. If malfunction not corrected, replace reel. See para. 4.28, Overhaul Manual.
11. No manual ADVANCE or no HOLD, automatic advance o.k.	a. Switch card	a. Replace card. See para. 4.3, Overhaul Manual.

SECTION IV

REPLACEMENTS AND ADJUSTMENTS

4.0 GENERAL

4.1 All repairs and adjustments in Section IV of the Overhaul Manual directly apply to Audiscan I, Models A, B, and C. Only additional items that may need replacement will be discussed in this supplement.

4.2 FRONT CONTROLS (Models A, B, C).

4.3 Any control located on the front bezel can be removed and replaced without removing the front bezel.

4.4 INDICATOR LIGHT (Model A)

Remove the front bezel and lay it on a clean, flat surface immediately in front of the projector. Disconnect the two wires of the indicator light and remove the clip holding it to the bezel. Install the replacement light in the reverse order of disassembly.

SUPPLEMENT
PARTS LIST FOR
MODEL A
FIGURE 5-1

ITEM NO.	PART NUMBER	DESCRIPTION
1	521-2000-001	Switch
2	516-0004-001	Volume control potentiometer
3	536-0001-001	Indicator light
4	212-5001-001	Knob
5	545-0007-001	Earphone jack
6	019-1095-001	Decal
7	521-0002-001	Switch
8	011-1031-002	Front bezel

SUPPLEMENT
PARTS LIST FOR
MODEL B
FIGURE 5-1

1	521-2004-001	Switch
2	516-0004-001	Volume control potentiometer
3	212-5001-001	Knob
4	545-0007-001	Earphone jack
5	019-1095-002	Decal
6	521-2000-002	Switch
7	011-1031-002	Front bezel

SUPPLEMENT
PARTS LIST FOR
MODEL C
FIGURE 5-1

1	521-0002-001	Switch
2	019-1095-003	Decal
3	011-1031-002	Front bezel

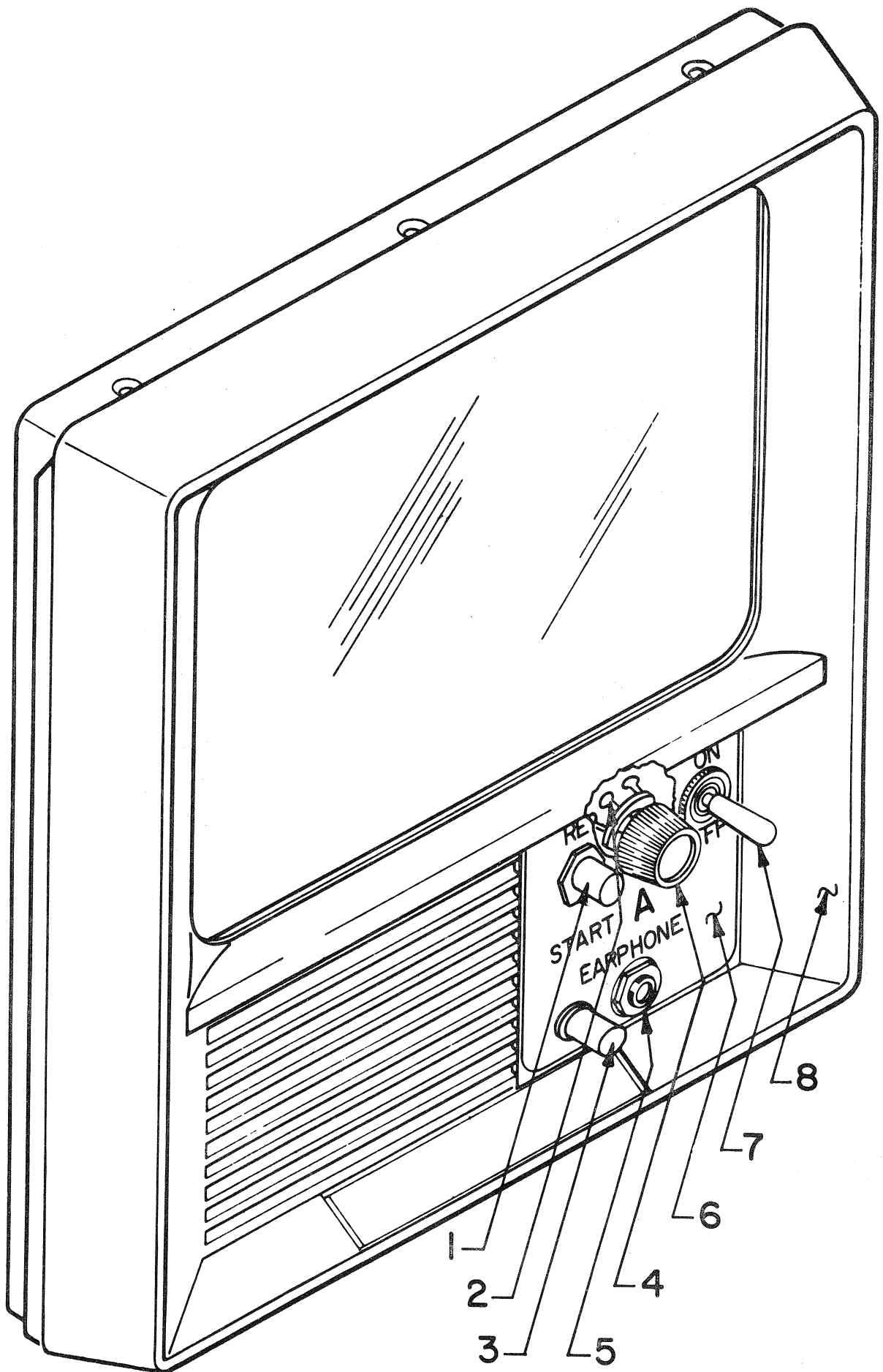


Figure 5-1
Model A Front Bezel Assembly

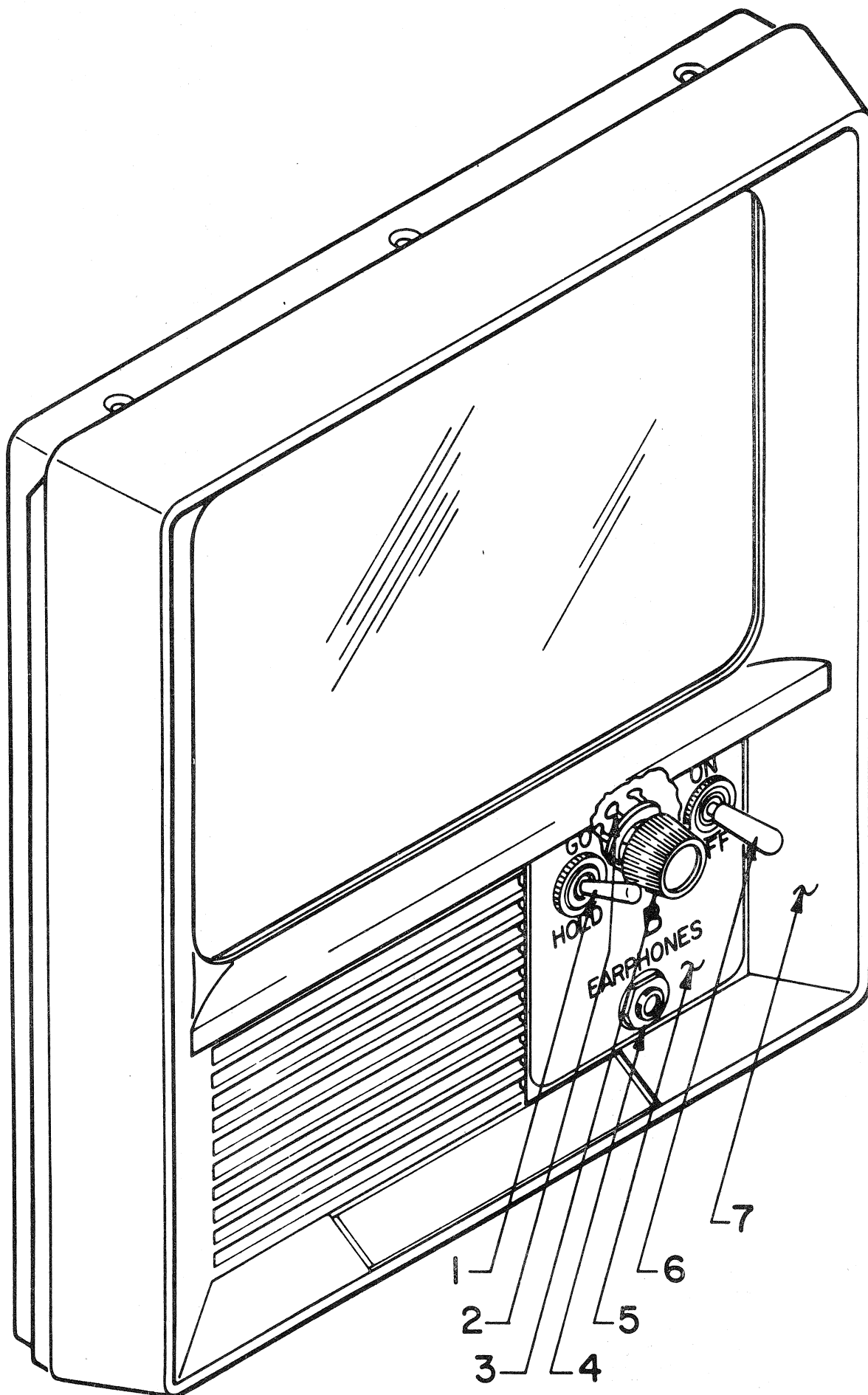


Figure 5-2
Model B Front Bezel Assembly

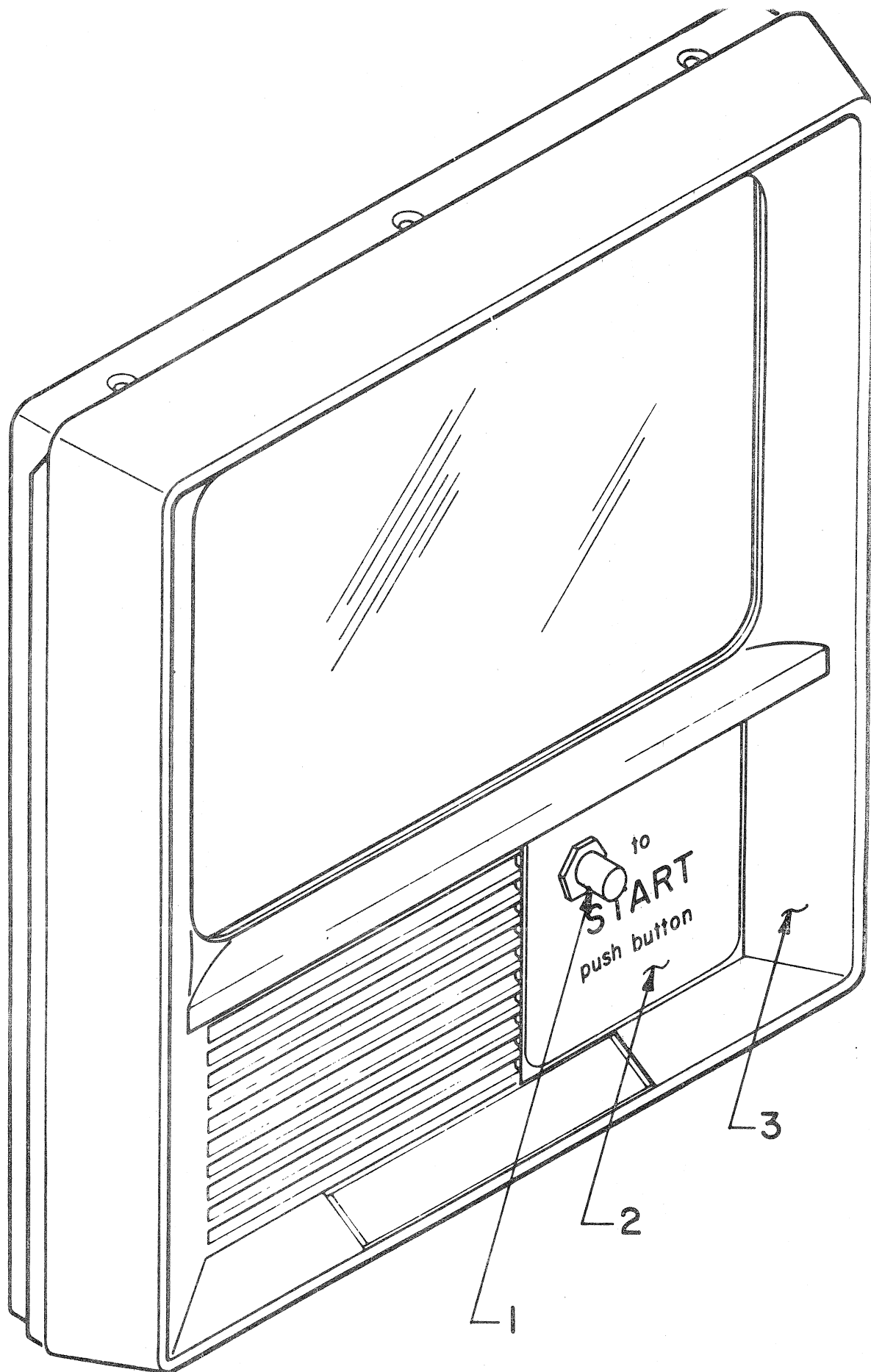


Figure 5-3
Model C Front Bezel Assembly

SUPPLEMENT II

001-0005-001

TO THE

OVERHAUL MANUAL

FOR ALL

Audiscan®

PROJECTORS

S/N 6420

THROUGH

S/N 11654

AUDISCAN, INC.

1414 130th AVENUE N.E.

BELLEVUE, WASH. 98005

TABLE OF CONTENTS

SECTION	DESCRIPTION	PAGE NO.
I	INTRODUCTION AND THEORY OF OPERATION	1-1
	Audiscan I Electrical System	1-1
	Audiscan I Electronic System	1-2
	Model A Electrical System	1-2
	Model A Electronic System	1-3
	Model B Electrical System	1-3
	Model B Electronic System	1-4
	Model C Electrical System	1-4
	Model C Electronic System	1-5
II	OPERATING INSTRUCTIONS	
	Pre-operating Instructions	2-1
	Operating Instructions	2-1
	Synchronization	2-1
	Picture Focus	2-1
III	TROUBLESHOOTING	
	Fused AC Supply	3-1
	Audiscan I Troubleshooting	3-1
	Model A Troubleshooting	3-1
	Model B Troubleshooting	3-1
	Model C Troubleshooting	3-1

LIST OF ILLUSTRATIONS

FIGURE	TITLE	PAGE NO.
1-1	Projector Schematic Diagram, Audiscan I and Model C	1-6
1-2	Projector Schematic Diagram, Model A	1-7
1-3	Switch Card Schematic Diagram, Models A & B	1-8
1-4	Projector Schematic Diagram, Model B	1-9

SECTION I

INTRODUCTION AND THEORIES OF OPERATION

1.0 INTRODUCTION

- 1.1 This Supplement is designed to explain the electrical changes made to all Audiscan projectors after S/N 6419. It covers the theory of operation for each model and refers the technician to appropriate information in the Overhaul Manual and Supplement I. Replacements, adjustments, parts, repair times, tools and test equipment directly apply to the current projectors and can be found in the Overhaul Manual or Supplement I. In addition, appropriate references are given to aid the technician in finding operating and troubleshooting information in either the Overhaul Manual or Supplement I.
- 1.2 Audiscan I Electrical System Theory of Operation. (Refer to Figure 1-1)
- 1.3 The electrical system utilizes the same components as described in paragraph 1.5 of the Overhaul Manual, but with different electrical connections and operations. With AC power applied, there will be voltage across the power transformer primary only. When the ON switch is momentarily depressed, the center tap of the power transformer secondary is momentarily grounded, causing a complete circuit for a long enough time to develop a DC voltage across diodes D10 and D11 on the switch card which energizes the relay coil. The relay is latched in the energized position by one set of contacts which maintain the transformer center tap ground originally created by momentarily pressing the ON switch.

The two other sets of relay contacts complete circuits for the projector lamp and blower motor. The tape motor is controlled by the PROGRAM NORMAL/HOLD switch on the switch card. When the OFF switch is momentarily depressed, the DC supply to the relay coil is momentarily shorted to ground causing the relay to de-energize, thus opening the transformer center tap ground and removing power from the projector lamp, blower motor, and electronic circuits.

- 1.4 Audiscan I Electronic System; Theory of Operation.
- 1.5 The electronic system of the newer Audiscan I employs Audio and Switch cards identical to those used in older models and their operation is similar.
- 1.6 Model A Electrical System; Theory of Operation. (Refer to Figure 1-2.)
- 1.7 The electrical system consists of the same components as described in paragraph 1.5 of Supplement I, but with somewhat different electrical connections and operations. When the power switch is turned on, power is applied to the transformer primary, blower motor, and projection lamp. The front panel indicator light also receives power via the normally closed portion of one set of relay contacts. The transformer secondary voltage is rectified by diodes D10 and D11 on the switch card and is used to supply all DC operating voltages. When the restart switch is momentarily depressed, it temporarily provides a complete circuit for the relay coil. One set of relay contacts then maintains the relay coil circuit, causing the relay to be latched in the energized position. The

other set of contacts simultaneously open the indicator light circuit and complete the tape motor circuit. When an automatic hold (stop) signal goes through the switch card it causes the relay voltage to be electronically shunted to ground and the relay is de-energized. The set of contacts used to latch the relay is then used to short the audio signal to ground, so the audio program cannot be heard as the tape coasts to a stop.

1.8 Model A Electronic System; Theory of Operation. (Refer to Figure 1-3)

1.9 The current Model A electronic system is essentially the same as older models except the switch card now receives power whenever power is applied to the projector. Consequently, the picture program may be manually advanced, utilizing the ADVANCE button when the projector is in the hold condition, i.e. when the indicator light is on. In addition, the switch card for this unit has a remote control jack, allowing remote stop, start, advance and hold functions.

1.10 Model B Electrical System; Theory of Operation. (Refer to Figure 1-4)

1.11 The Model B electrical system utilizes the same components as described in paragraph 1.9 of Supplement I, but with different electrical connections and operations. When the projector line cord receives AC power there is voltage on the transformer primary and when the power switch is momentarily switched on, the transformer secondary circuit is completed. The secondary AC voltage is rectified by diodes

D10 and D11 on the switch card and used to energize the relay. One set of relay contacts latches the relay in the energized position by maintaining the ground circuit for the transformer center tap which was originally created by momentarily switching the on-off switch to on. When the relay is energized, two separate sets of contacts complete the AC circuits for the projection lamp and blower motor. The relay contacts providing the path for the blower motor also provide a path for the tape motor when the go-hold switch is in the go position. When this switch is in the hold position the audio signal is shorted to ground and the tape motor circuit is opened allowing the cartridge tape to coast to a stop without being heard. When the on-off switch is momentarily switched off, the relay coil voltage is shorted to ground causing the relay to de-energize and open the transformer center tap, projection lamp, blower motor, and tape motor circuits.

- 1.12 Model B Electronic System; Theory of Operation. (Refer to Figure 1-3)
- 1.13 The Model B employs switch and audio cards identical to those of the Model A and their operation is similar.
- 1.14 Model C Electrical System; Theory of Operation. (Refer to Figure 1-1)
- 1.15 The current Model C is identical in operation to the current Audiscan I except it employs an additional start switch on the front bezel which is electrically parallel to the on switch of the switch card. Refer to paragraph 1.3 of this manual.

1.16 Model C Electronic System; Theory of Operation.

1.17 The current Model C projector requires switch and audio cards identical to those of the current Audiscan I and their operation is identical. Moreover, these same electronic components are used in older Model C and Audiscan I projectors, and all perform essentially the same functions. Refer to paragraph 1.7 of the Overhaul Manual for further information about their operations.

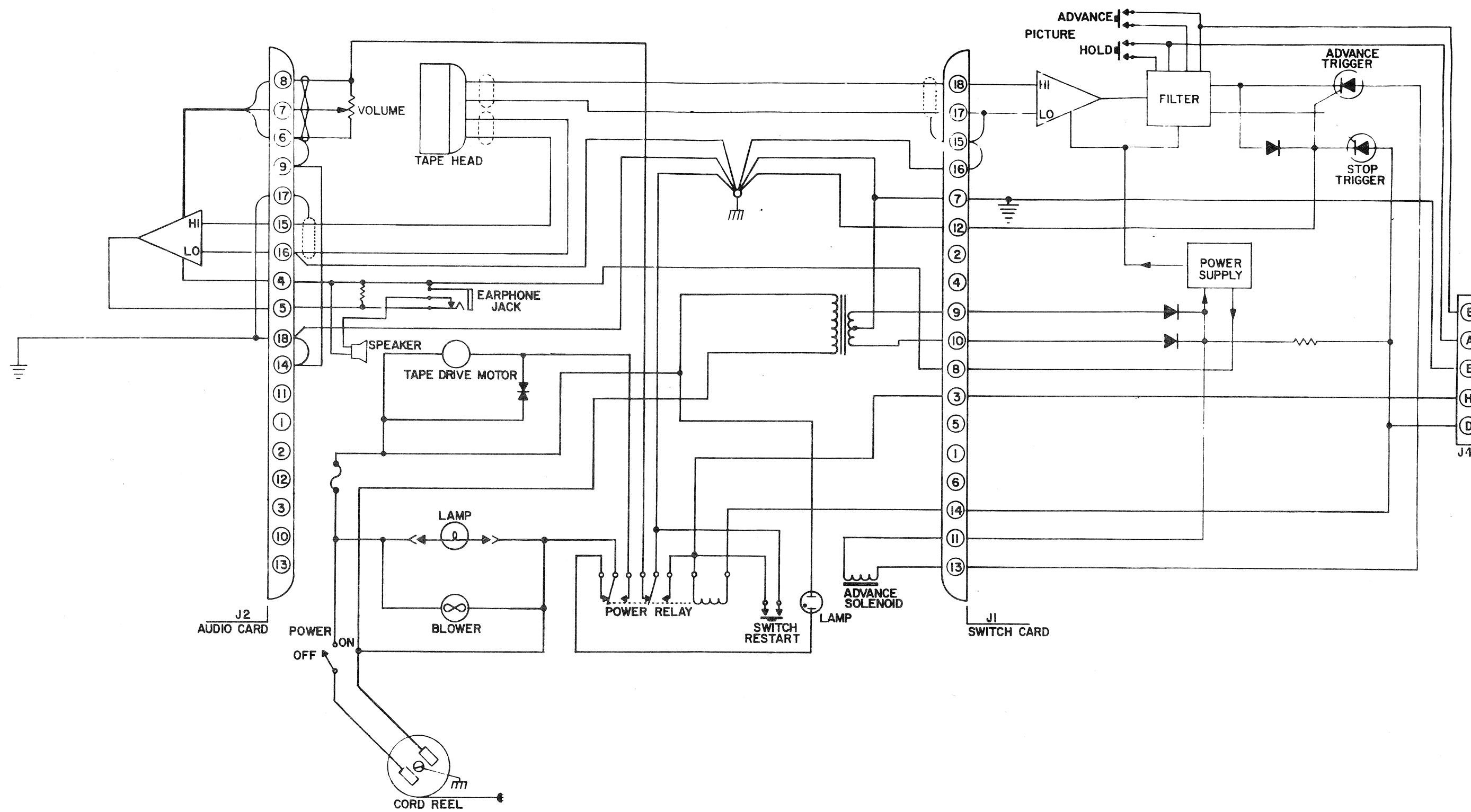


Fig. I-2 PROJECTOR
SCHEMATIC DIAGRAM
MODEL A
SN 6420 thru 11654

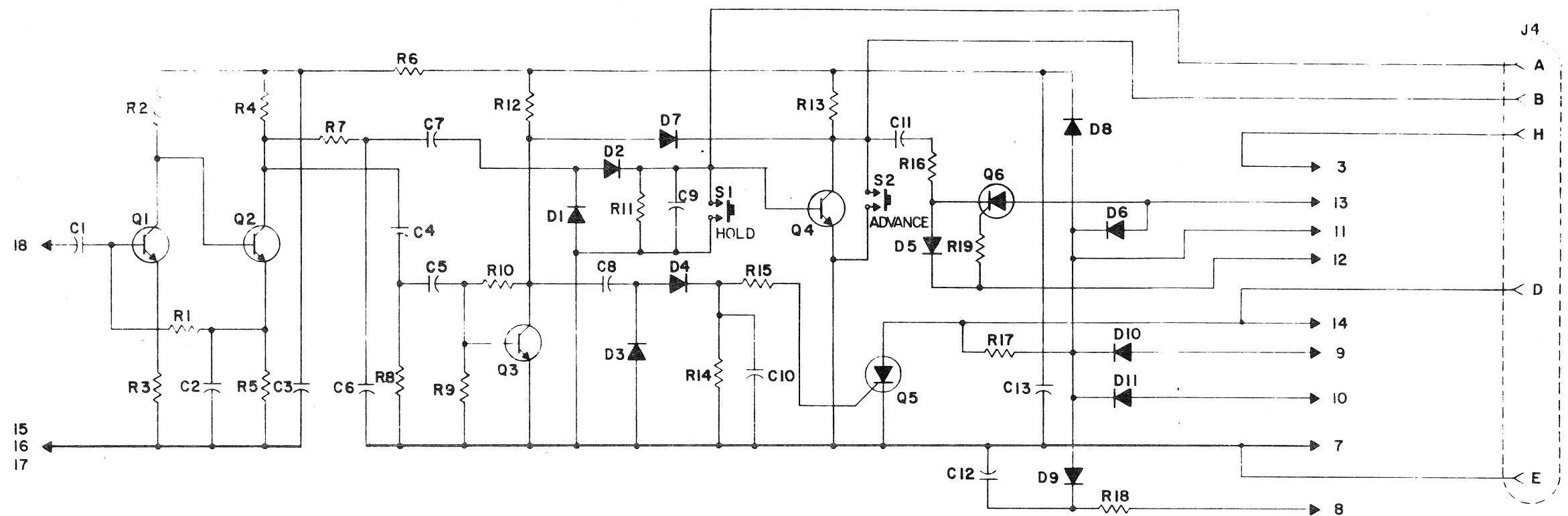


Fig.1-3 SWITCH CARD
SCHEMATIC DIAGRAM
MODELS A & B

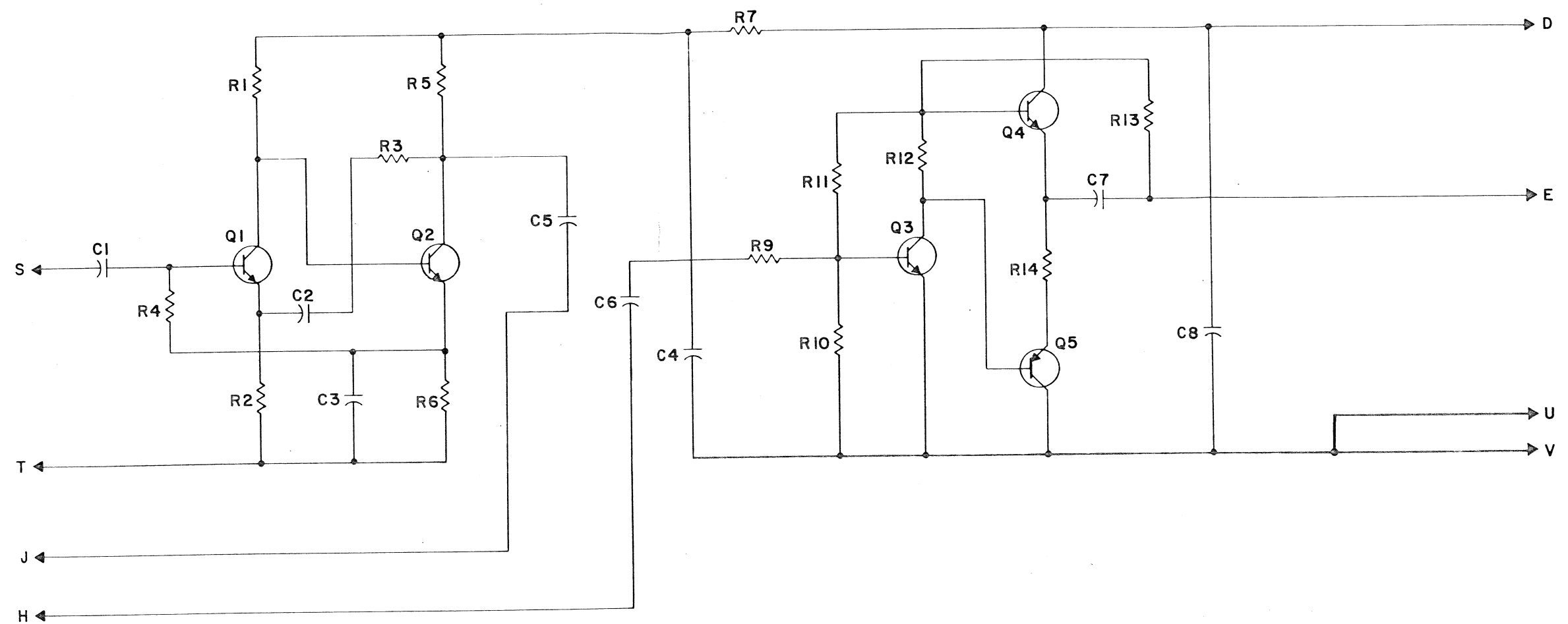


Fig. 1-3 AUDIO CARD
SCHEMATIC DIAGRAM
MODELS A & B 1-6

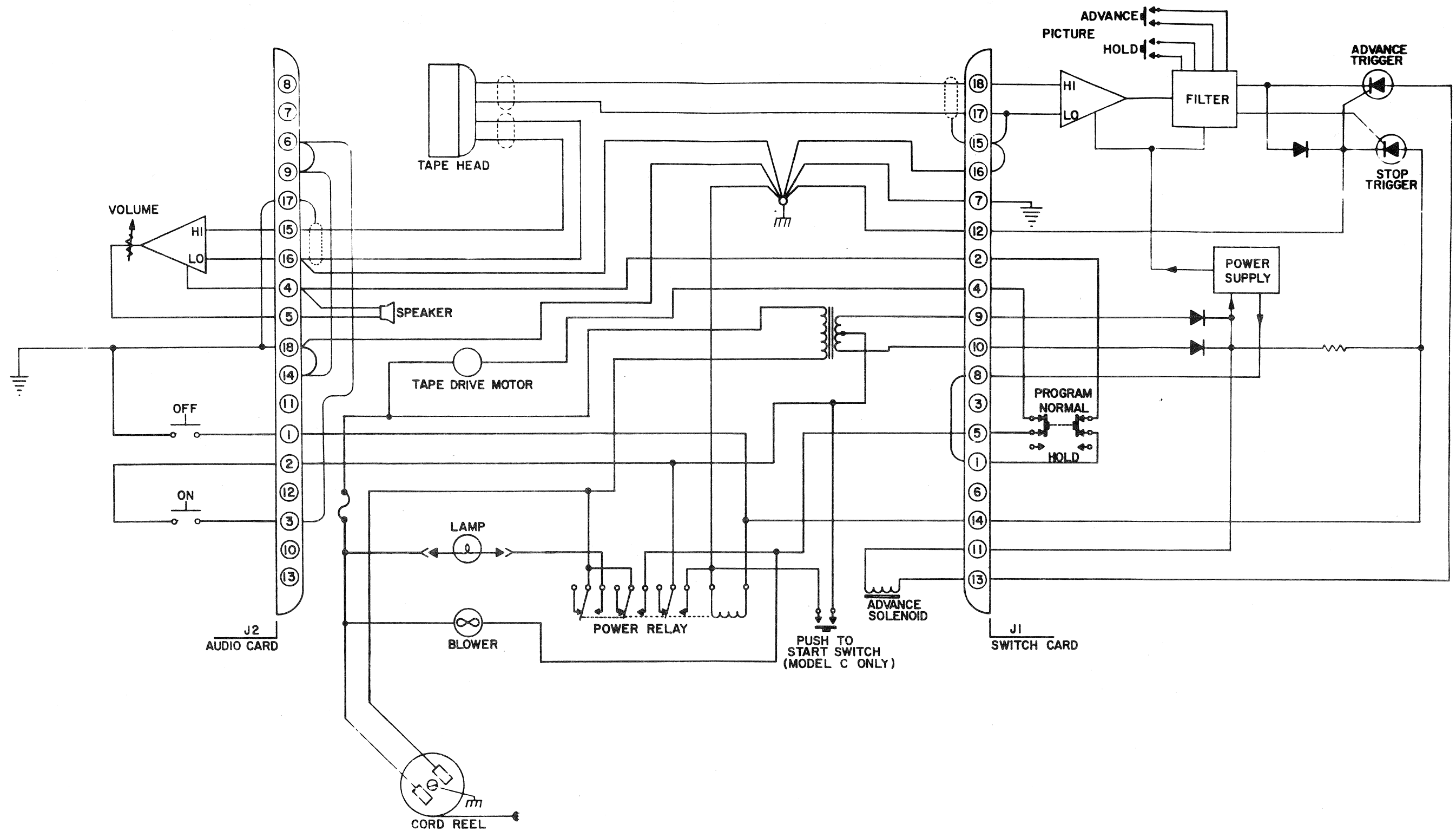


Fig. I-1 PROJECTOR
SCHEMATIC DIAGRAM
AUDISCAN I & MOD. C
SN 6620 thru 11654

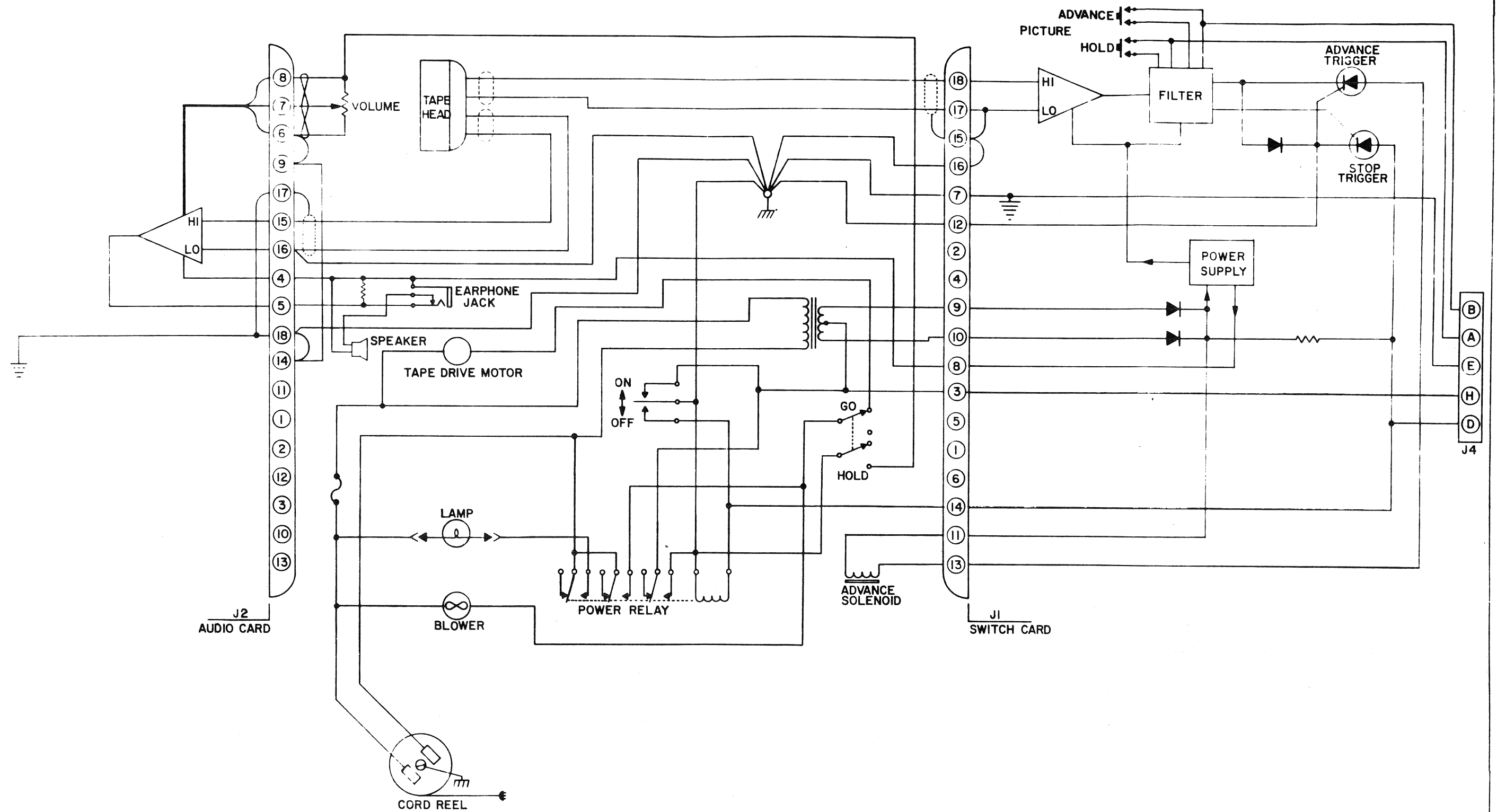


Fig. I-4 PROJECTOR
SCHEMATIC DIAGRAM
MODEL B
SN 6420 thru 11654

SECTION II
OPERATING INSTRUCTIONS

- 2.0 Pre-operating Instructions. (Refer to paragraph 2.1, Overhaul Manual)
- 2.1 Operating Instructions
- 2.2 Audiscan I (Refer to paragraph 2.3, Overhaul Manual)
- 2.3 Model A (Refer to paragraph 2.1, Supplement I)
- 2.4 Model B (Refer to paragraph 2.3, Supplement I)
- 2.5 Model C (Refer to paragraph 2.5, Supplement I)
- 2.6 Synchronization - All Models (Refer to paragraph 2.5, Overhaul Manual)
- 2.7 Picture Focus - All Models (Refer to paragraph 2.7, Overhaul Manual)

SECTION III
TROUBLESHOOTING

- 3.0 Fused AC supply.
- 3.1 All Audiscan projectors manufactured after S/N 6419 have a fuse in one side of the AC line. If an Audiscan I, Model B or Model C projector will not turn on or if the relay chatters, but will not latch, check for an open fuse. If a Model A projector will not re-start, the fuse may be open.
- 3.2 Audiscan I Troubleshooting (Refer to TABLE III, Overhaul Manual).
- 3.3 Model A Troubleshooting (Refer to TABLE I, Supplement I).

NOTE

Item 7a does not apply as the current Model A may be manually advanced, whether the relay is energized or de-energized.

- 3.4 Model B Troubleshooting (Refer to TABLE II, Supplement I).
- 3.5 Model C Troubleshooting (Refer to TABLE III, Overhaul Manual).

SERVICE BULLETIN #1

April 1, 1970

ACTUATOR PROBLEMS

On some older model Audiscan I projectors the actuator assembly rests on two solid rubber bumpers and two hollow grommets with eyelets inserted through washers and the grommets. Later models utilize the hollow grommets, eyelets, and washers in all four locations. This has proved to be a more solid mounting and could cure inconsistent mechanical movement of the actuator. The necessary parts were supplied in the service kit.

In paragraph 4.27 of the Audiscan I Overhaul Manual it states the actuator drive pin "must engage upper surface of the cartridge gate notch". A good way to check for proper height is to push the PICTURE ADVANCE switch once with no cartridge in the projector. Then slowly push the cartridge in, make sure bottom of cartridge maintains intimate contact with lower cartridge guide, and watch the actuator arm as the pin engages the gate. If the height is correct the actuator pin and arm will barely move down as the pin goes into the gate notch. If the pin hits the top of the gate notch and moves back or pushes the gate back before it goes into place it is too high. If the pin makes no noticeable downward movement as it engages the gate, it is too low. After each adjustment, be sure to push the PICTURE ADVANCE at least once with the cartridge out in order to be sure the actuator is in its normal de-energized position when checking height.

Of course, a final check of the actuator is to see how it actually advances the film. The picture should remain steady after each advance and the actuator should work properly when the projector is operating from a 100 volt line.

SERVICE BULLETIN #2

April 1, 1970

TAPE MOTOR ALIGNMENT

The tape motor pulley should line up such that it is in the same plane as the groove in the flywheel and capstan assembly. If this condition is not met the drive belt will tend to move around in the pulley groove which will cause "wow" in the audio.

Often times one or more tape motor mounting grommets will actually be pulled through the bulkhead to which they are mounted. This is due to rough handling of the projector and it will be necessary to replace those grommets which have pulled through. The rest of the mounting hardware should be re-useable.

If the tape motor is slightly tilted it can be shimmed by installing two additional washers along with the one already used on the lower mounting screw at the tape motor side of the bulkhead. This will push the bottom of the motor out and alignment will be achieved. It will be necessary to use a longer screw at this mounting point if washers are added. The correct screw is a # 6-32 X 3/4 P.H., Audiscan part Number 200-1000-013.

WARNING: A screw that is too long will go through the threaded bushing in the motor frame and damage the field windings. If the screw is left in this position it will also make the projector chassis "hot", which can be a very serious shock hazard!

SERVICE BULLETIN #3

April 1, 1970

BLOWER MOTOR RUBBING REAR BEZEL

If on older Audiscan projectors, the blower motor rubs the rear bezel during operation, it is probably due to slightly too much end play in the armature. A possible solution is to remove the rear bezel and blower motor as described in the Overhaul Manual and shim the motor away from the bezel about .010 inches with a washer between the motor and bezel at each screw hole.

SERVICE BULLETIN #4

April 1, 1970

CORD REEL PROBLEMS

If the cord reel does not rewind properly check the two guides and the cord reel mounting screw before replacing the cord reel itself. The guides (two flat washers at the end of two standoffs) should be outside the cord reel assembly. Rough handling can cause the cord reel to jump over one or both of these washers and it will bind. To correct simply loosen screws that hold the washers, re-position them, and tighten. The cord reel mounting screw is sealed with lacquer and should not loosen, but in the event it does, it could allow the cord reel to lose its rewind tension. There is no fixed procedure for re-setting rewind tension, but it can be done without too much effort. The objective is to set the tension such that all of the power cord can be unreeled and the cord rewinds fully.

SERVICE BULLETIN NO. 5

May 5, 1970

RELAY REPLACEMENT

On some older Audiscan projectors that use a two pole relay, the connections have been soldered. The two pole relay that replaces it has spade lugs on it. Therefore, it will be necessary to install the appropriate connectors on the wire ends or scrape the coating from the relay lugs before soldering. If the coating is not scraped away, the solder will not form a good joint.

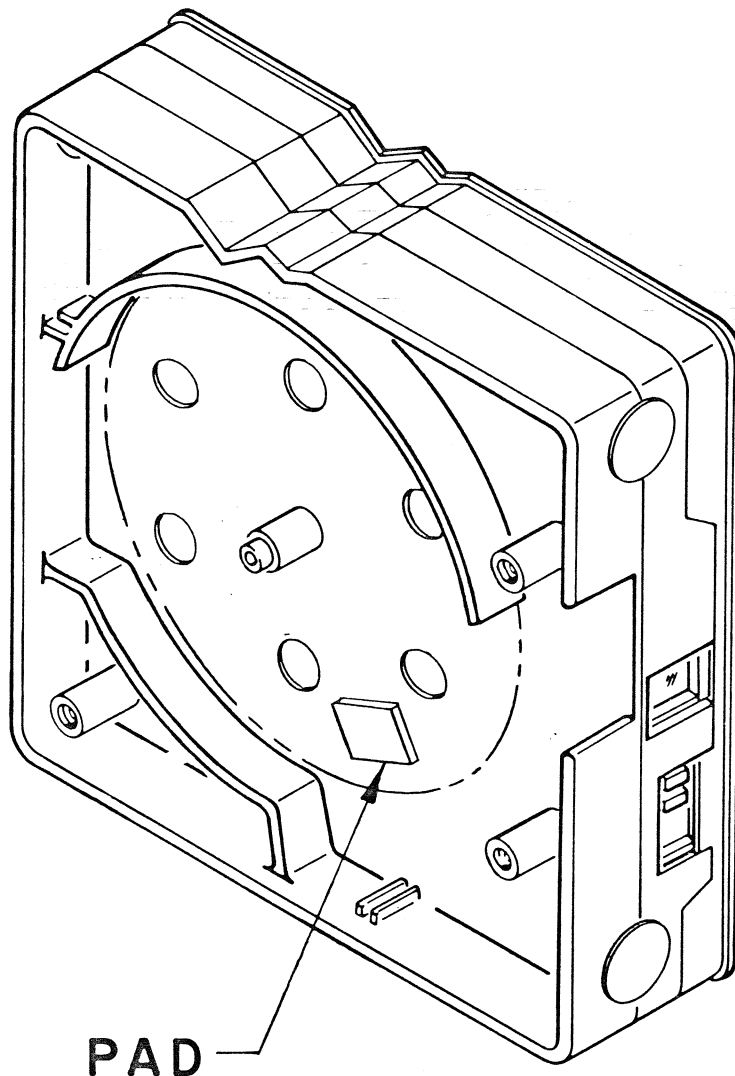
SERVICE BULLETIN #6

May 27, 1970

CARTRIDGE: TAPE WRAPPING AROUND PINCH ROLLER

If the cartridge is subjected to a fairly hard blow from the tape side, it is possible for the roller arm to move towards the tape side cover in such a way that it jumps over the edge of the tape reel. This allows the pinch roller to rest against the edge of the tape opening and the tape is then pinched between the edge and the roller. If this condition is allowed to exist for a few hours the tape can adhere to the pinch roller and when the cartridge is used, the tape will wrap around the roller.

A solution to this problem is to place a 1/2 x 1/2 inch piece of Mac Mount No. IS 0916 tape (Audiscan P/N 700-1001-001) under the tape reel as shown in the attached drawing. Do not remove the separation liner from the Mac Mount tape as this would allow it to stick to the tape reel. The location of the tape is not critical as long as it does not protrude beyond the edge of the tape reel or rub the tape reel during operation.



SERVICE BULLETIN #7

June 22, 1970

CAPSTAN AND FLYWHEEL ASSEMBLY

A possible cause for a complaint of no tape drive, intermittent drive, or wow in the audio program is a capstan shaft that has become loose in the flywheel. Use the following method to check for this condition: Remove AC power and the projector cover. Insert a sturdy pair of longnose pliers through the cartridge opening and, being careful not to touch the tape head and lens or mar the capstan shaft, grasp the shaft with the pliers. Rotate the flywheel with the right hand and observe whether the capstan also rotates. If the capstan slips it will be necessary to replace the entire capstan and flywheel assembly. Refer to paragraph 4.17, Overhaul Manual for replacement instructions.

SERVICE BULLETIN #8

June 25, 1970

EARPHONE OUTPUT

The Model A and Model B projectors have an earphone output originally designed to drive inexpensive earphones or speakers with response no lower than 150 hz. Since the 120 hz hum of the Audio Card DC power supply appears at the earphone output, high quality or efficient earphones are not desirable as they will transmit this 120 hz hum to the listener.

The earphone output can be modified to work with any monaural earphones having a standard telephone plug quite simply and inexpensively. However, with this modification the earphone output will no longer drive an external speaker.

To make this modification refer to Figure 1 and follow this procedure:

- 1) Remove and discard the 27 ohm resistor currently connected to terminals 1 and 3 of the earphone jack.
- 2) Remove the two green wires from terminal 1.
- 3) Install a 2.2 ohm, 1/2 watt resistor by connecting one lead to terminal 1 and the other lead to terminal 3.
Do not solder.
- 4) Connect one end of a 47 ohm, 1/2 watt resistor to terminal 1. Solder the connections at terminals 1 and 3.
- 5) Connect and solder the other end of the 47 ohm resistor with the two previously mentioned green wires.
- 6) Check the earphone output for normal operation.

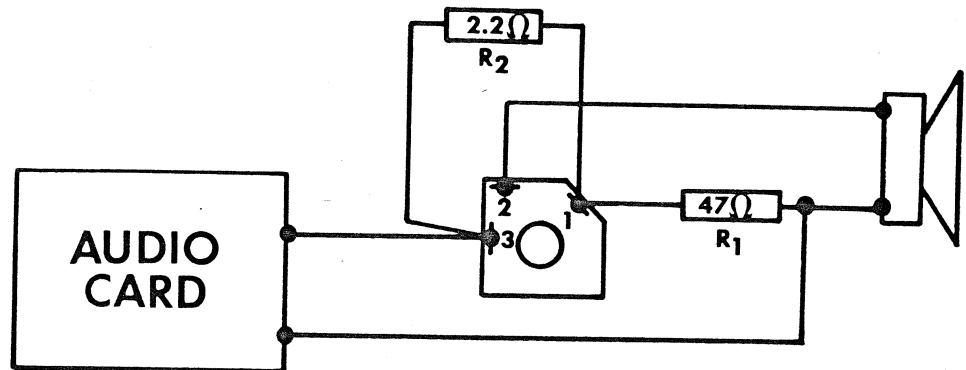


Figure 1 Wire Connections To Earphone Jack (Terminal View)

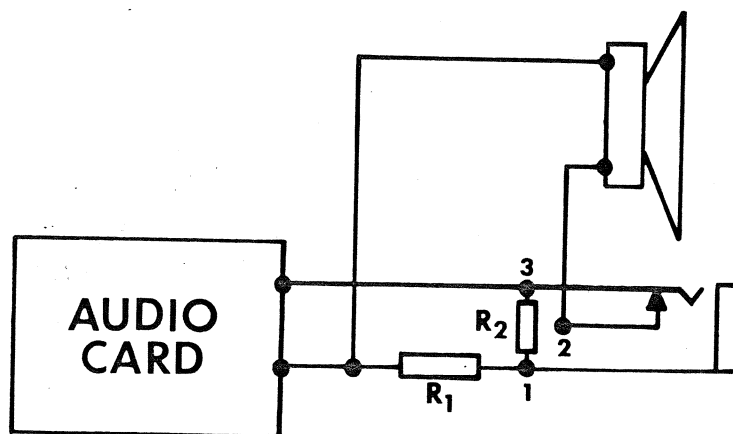


Figure 2 Schematic Diagram

SERVICE BULLETIN #9

June 30, 1970

ACTUATOR REPLACEMENT

The actuator assembly now used in all Audiscan projectors has been re-designed, resulting in a more sensitive and powerful actuator. However, this new actuator may cause problems when substituted for an old one. Therefore, it is highly adviseable to repair or adjust a malfunctioning old style actuator rather than to replace it. Refer to paragraph 4.27, Overhaul Manual for film actuator assembly alignment instructions.

The old style actuator has two insulated wire leads attached to the solenoid coil where the new version has two quick connect tabs attached to the coil. All actuators in Service Kits and all available from Audiscan are of the new type. In the event an old style actuator must be replaced, it may be necessary to perform additional changes in order to achieve satisfactory operation.

After installing and aligning a new actuator in place of an old style actuator and before making any other changes, make the following checks at both 100 and 130 VAC.

I. Model A

- A. Turn the power switch on and watch for a false advance, i.e. actuator movement without a program advance signal.
- B. Depress the RE-START switch
 - 1. Watch for a false advance.
 - 2. Watch for a relay chatter.

- C. Insert the Test Cartridge and watch the actuator as the projector receives a stop signal. Be sure the actuator does not try to advance on a stop signal.

II. All other models

- A. Turn the projector ON and watch for a false advance.
- B. Place the GO-HOLD switch or PROGRAM NORMAL-HOLD switch in the HOLD position and watch for a false advance.
- C. Place the GO-HOLD or PROGRAM NORMAL-HOLD switch in the GO or NORMAL position.
 - 1. Watch for a false advance.
 - 2. Watch for relay chatter.

If the projector doesn't have relay chatter or false advance problems, no further changes will be necessary. Further changes will be necessary if a false advance and/or relay chatter occurs.

In the event the projector fails any of the above tests, use the following correction procedure.

- I. If the unit does not already have one, install a suppressor (Audiscan P/N 510-0001-001) across the tape motor at the place where the motor leads are spliced. Polarity need not be observed, but be sure the suppressor does not mechanically interfere with the operation of the fine focus quadrant. Re-check the projector. If it now passes all tests, no further changes are necessary. If it fails any of the listed tests, refer to the following paragraph.

- II. Install a 1N4001 or equivalent diode (Audiscan P/N 505-0003-001) across the relay coil. IMPORTANT: The cathode, i.e. banded end of the diode must be connected to the red coil lead. Solder the diode leads to the quick connect receptacles on the two wires at the relay coil. If the relay coil has solder connections simply connect the diode and solder its leads to the existing connections. Re-check the projector for proper operation according to the tests listed above. If it passes all tests, no further changes are necessary. If it fails any of the listed tests, refer to the following paragraph.
- III. Replace the switch card with an updated one. The switch cards in the Service Kit are updated. The projector should now operate properly.

SERVICE BULLETIN No. 10

January 25, 1971

TSM AND CSM MODEL PROJECTORS

Audiscan, Inc., has produced two new projectors labeled the TSM and CSM models. They utilize the same chassis as previous units but employ plug-in modules which contain most of the electro-mechanical devices used in the system. Replacement modules can be obtained on an exchange basis as indicated in the price lists. The new models also contain hardware changes. The new parts and part numbers are shown on the enclosed lists.

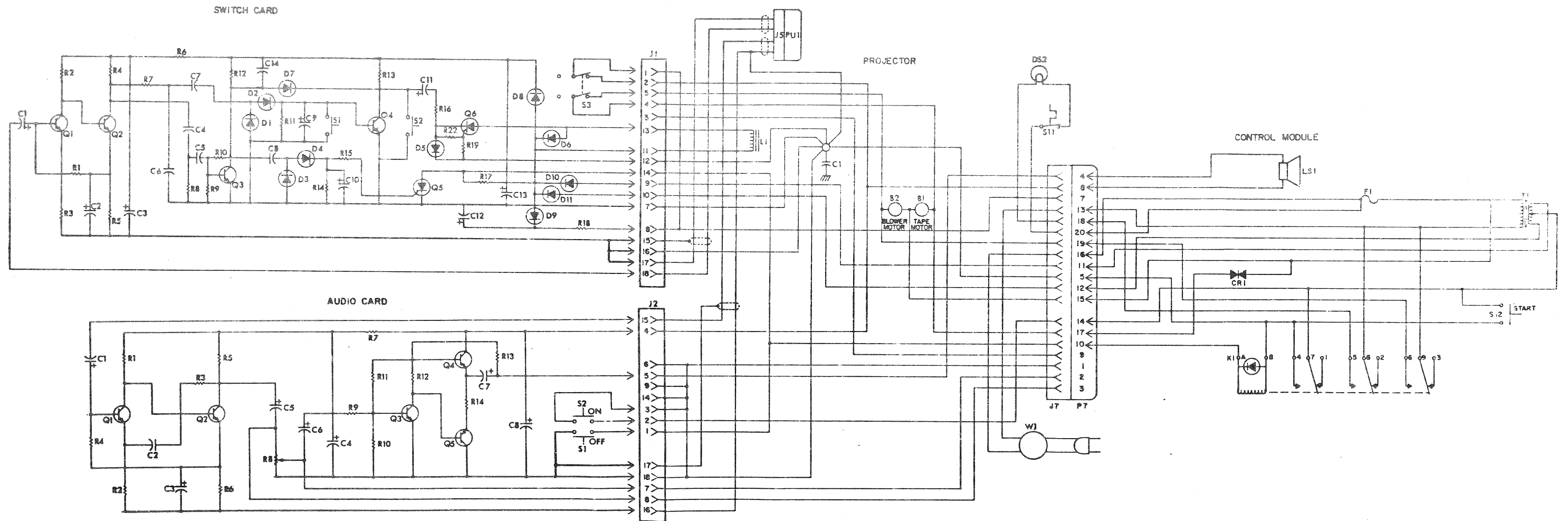
The principles of operation, troubleshooting, and repair of these units is basically the same as previous models. The Overhaul Manual (Audiscan P/N 001-0002-001) should be consulted as a general reference source when servicing these projectors. However, one of the enclosed schematic diagrams must be used for a CSM or TSM model rather than any shown in the Overhaul Manual or its supplements.

The control module may be removed by removing the two cadmium plated hex head screws located nearest the front bezel on the bottom of the projector chassis. Slide the module out far enough to disconnect the connector and remove the module from the projector.

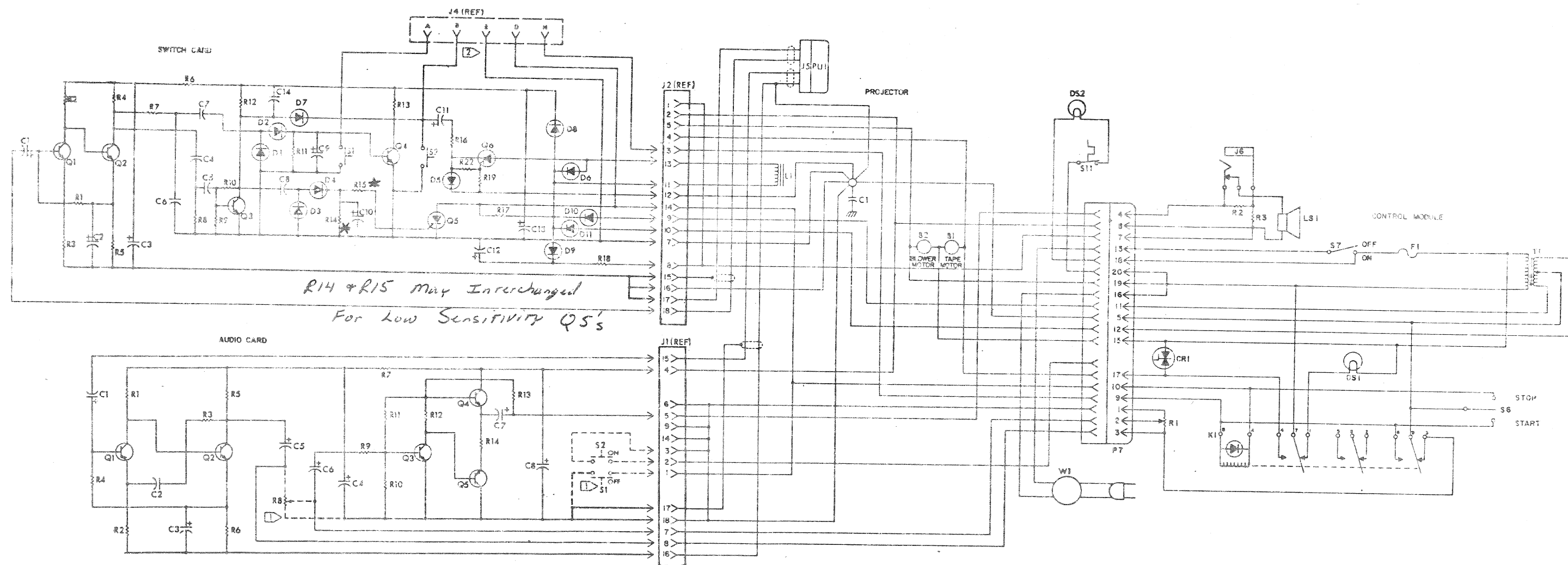
It will often be necessary to remove one or both of the black side panels from a projector in order to gain access to internal parts. When replacing these panels, be sure to install all screws and properly position a panel before tightening the screws.

Switch and Audio Cards may be removed without removing a side panel. After removing its securing screw, simply place the end of a screw-driver against the exposed portion of a card's aluminum plate inside the projector and push the card until it slides out of its receptacle.

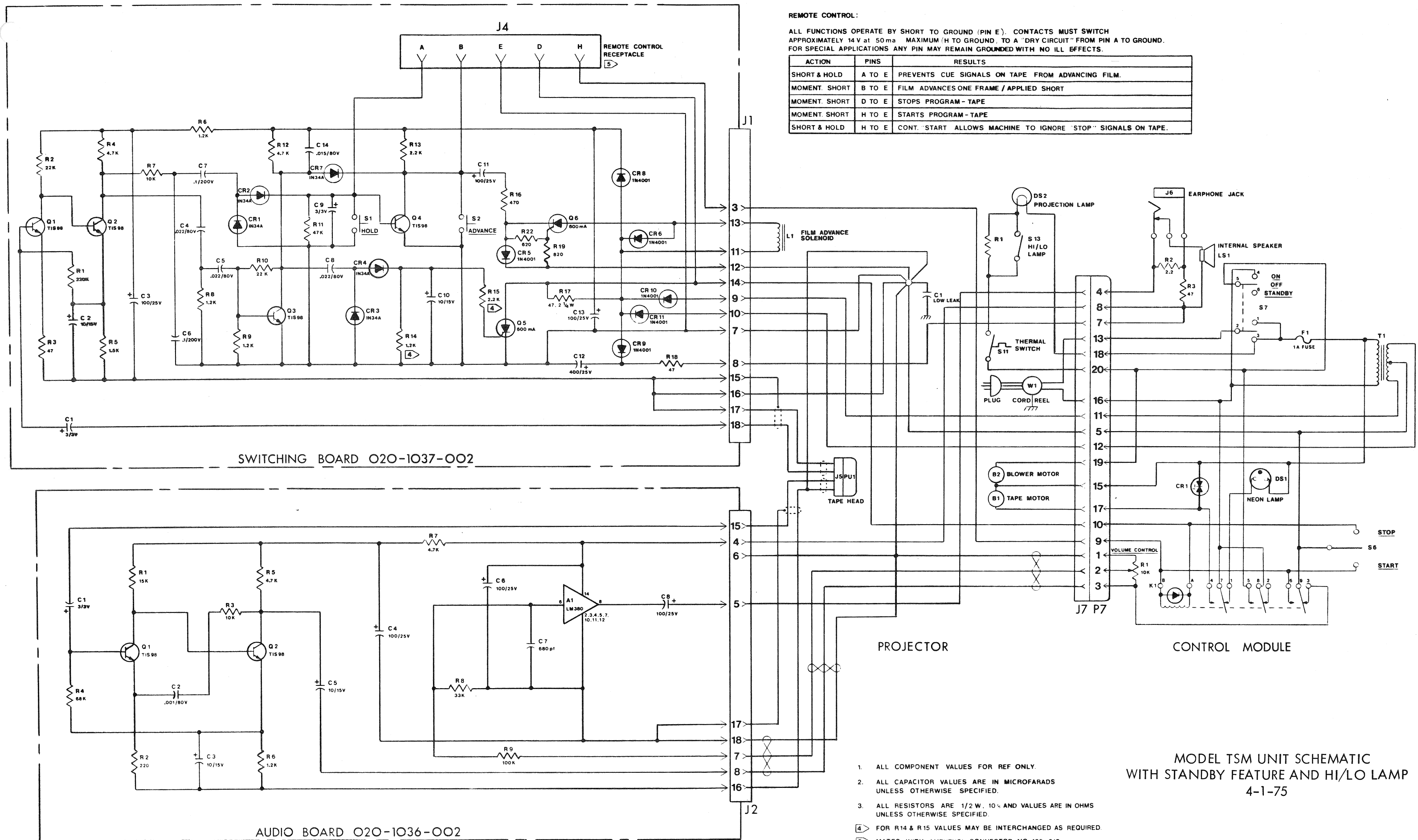
The TSM unit uses Switch and Audio Cards identical to those of the Model A and Model B units. The CSM unit uses Switch and Audio Cards identical to those of the Model I and Model C units.



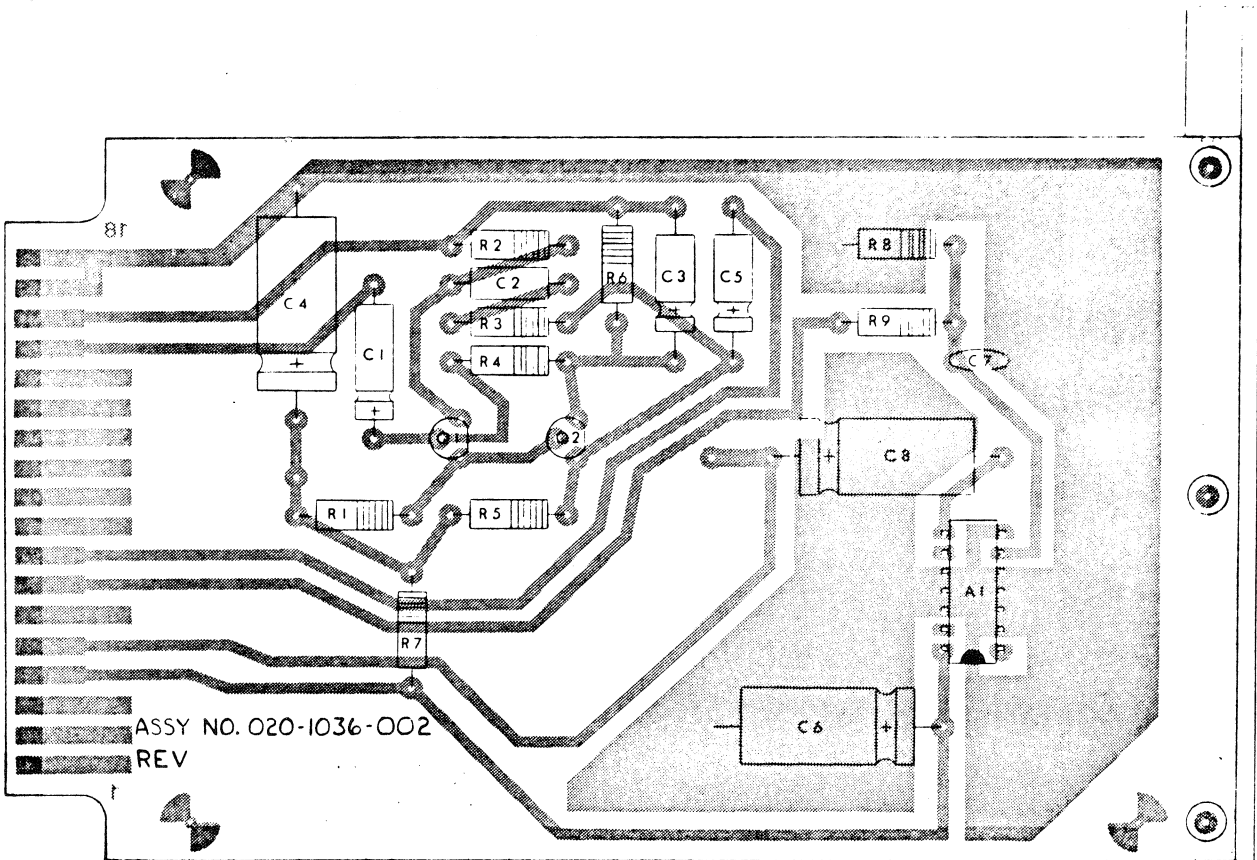
AUDISCAN CSM PROJECTOR
SCHEMATIC DIAGRAM



AUDISCAN TSM PROJECTOR
SCHEMATIC DIAGRAM



- ALL COMPONENT VALUES FOR REF ONLY.
- ALL CAPACITOR VALUES ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
- ALL RESISTORS ARE 1/2 W. 10% AND VALUES ARE IN OHMS UNLESS OTHERWISE SPECIFIED.
- FOR R14 & R15 VALUES MAY BE INTERCHANGED AS REQUIRED.
- MATES WITH AMPHENOL CONNECTOR NO 126-217.

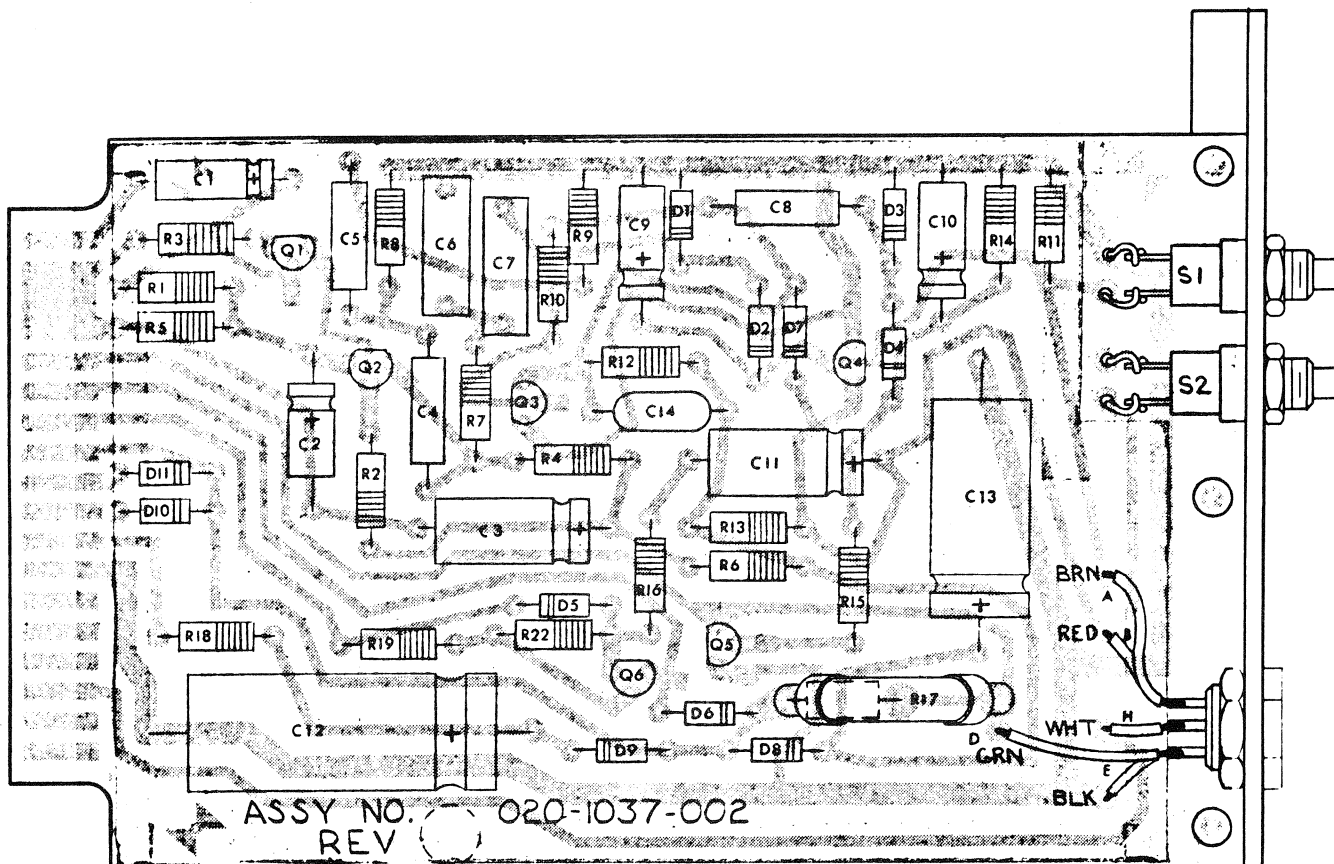


MODEL TSM AUDIO ELECTRONICS

P.C.B. ASSY#020-1036-002

Date _____
Sheet 1 of 1

[illegible]



MODEL TSM SWITCHING ELECTRONICS

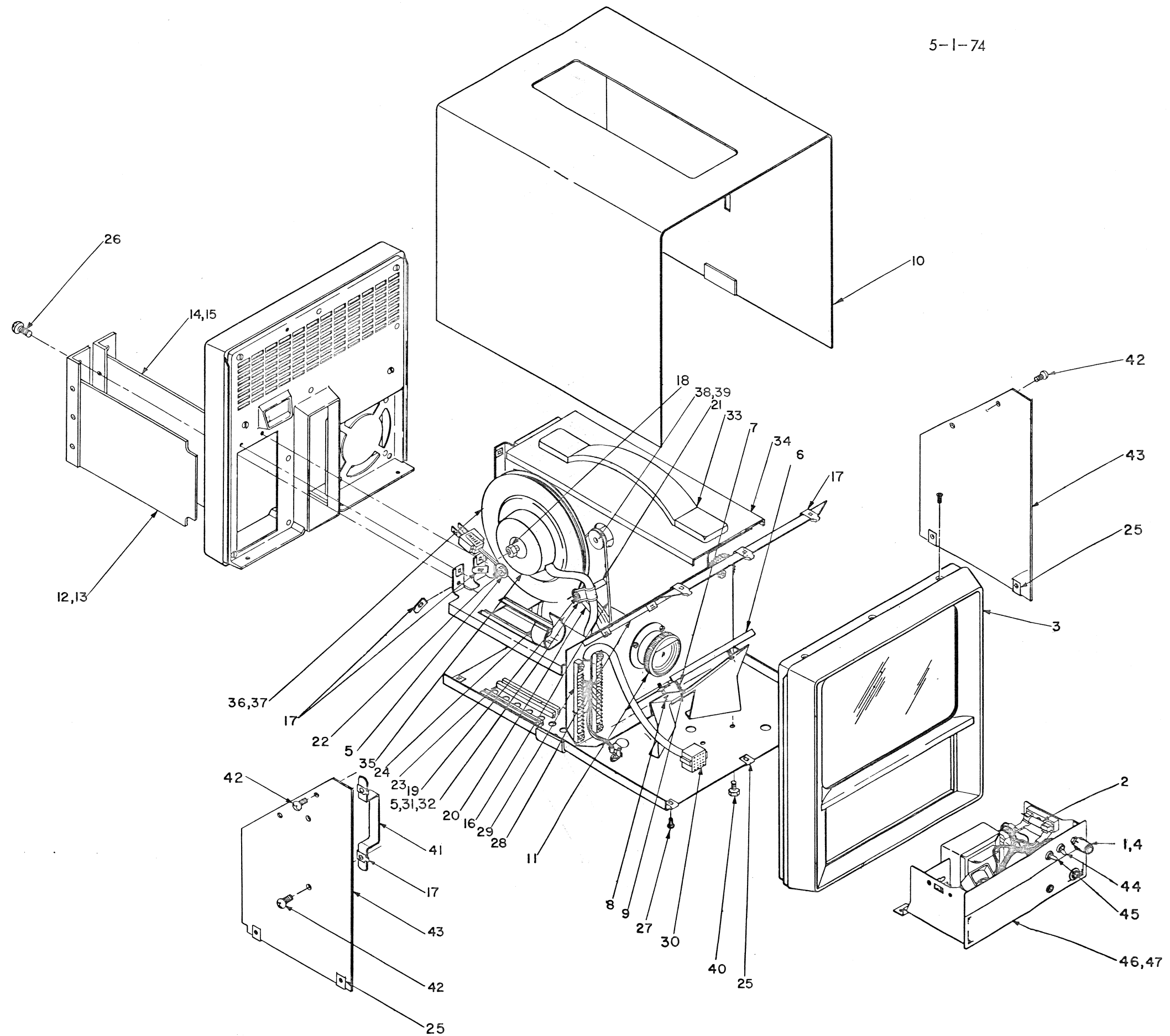
P.C.B. ASSY#020-1037-002

PARTS LIST
MODEL TSM SWITCHING ELECTRONICS
P.C.B. ASSY. #020-1037-002

Date _____
Sheet 1 of 1

ITEM NO.	PART NO.	DESCRIPTION	REFERENCE DESIGNATION	NET PRICE	LIST PRICE
1	500-0029-001	Capacitor, Elect.	C2, 10		\$1.44
2	501-0002-001	Capacitor, Mylar	C4, 5, 8		.60
3	501-0004-002	Capacitor, Mylar	C6, 7		.52
4	501-0004-001	Capacitor, Mylar	C14		.66
5	500-0009-001	Capacitor, Elect.	C12		1.92
6	500-0027-001	Capacitor, Elect.	C3, 11, 13		1.62
7	505-0001-001	Diode (IN34A)	CR1, 2, 3, 4, 7		.30
8	505-0003-001	Diode, 1A	CR5,6,8,9,10,11		1.62
9	515-0001-023	Resistor	R1		.22
10	515-0001-016	Resistor	R2, 10		.22
11	515-0001-002	Resistor	R3, 18		.22
12	515-0001-013	Resistor	R4, 12		.22
13	515-0001-010	Resistor	R5		.22
14	515-0001-009	Resistor	R6, 8, 9, 14		.22
15	515-0001-014	Resistor	R7		.22
16	515-0001-011	Resistor	R13, 15		.22
17	500-0011-001	Capacitor	C9, 1		.84
18	515-0001-008	Resistor	R19		.22
19	521-0001-001	Switch, P.B. (Red)	S1		1.80
20	521-0001-002	Switch, P.B. (Blk)	S2		1.80
21	506-0002-004	SCR	Q5, 6		1.36
22	508-0008-001	Transistor, Silicon, NPN	Q1, 2, 3, 4		.58
23	540-0001-001	Conn. Assy., Female	J4		2.32
24	518-0001-001	Resistor	R17		.28
25	515-0002-002	Resistor	R22		.22
26	515-0001-025	Resistor	R16		.22
27	515-0001-019	Resistor	R11		.22

5-1-74



MINIMUM BILLING \$5.00

MODEL TSM/CSM

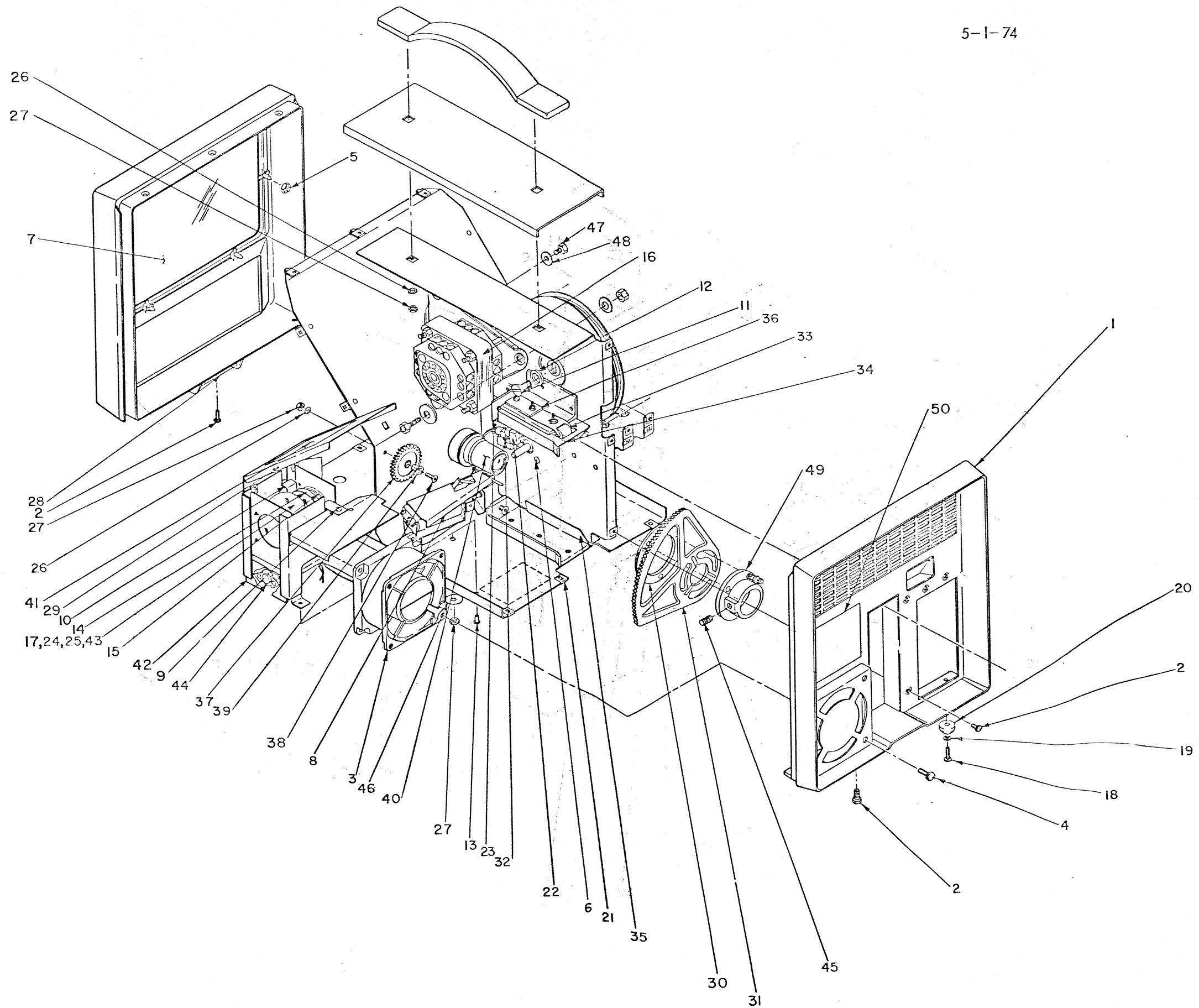
PARTS AND PRICE LIST

<u>ITEM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>LIST PRICE</u>
1.	212-5003-001	Volume Control Knob	\$ 2.00
2.	531-0001-001	Fuse	.25
3.	011-1031-010	Front Bezel	9.00
4.	516-0005-001	Volume Control Pot	2.40
5.	207-0004-002	Washer	N/C
6.	020-1007-001	Small Mirror Assembly	4.50
7.	210-6004-001	Grommet	N/C
8.	200-1000-005	Screw	N/C
9.	200-1000-006	Screw	N/C
10.	020-1113-001	Cover	12.00
11.	015-1000-001	Lens Hood	N/C
12.	020-1037-002	TSM Switch Card	49.00
13.	020-1037-001	CSM Switch Card	49.00
14.	020-1036-002	TSM Audio Card	24.00
15.	020-1036-001	CSM Audio Card	24.00
16.	210-0001-001	Drive Belt	.60
17.	205-1001-001	Speed Nut	N/C
18.	300-1000-010	Nut (part of Cord Reel assembly)	N/C
19.	200-1000-015	Screw	N/C
20.	020-1118-001	Flywheel and Bearing Assembly	8.00
21.	212-4006-002	Spacer	N/C
22.	205-0001-002	Hex Nut	N/C
23.	212-2000-001	Card Guide	N/C
24.	211-9003-001	Spare Lamp Clip	N/C
25.	205-1000-001	Speed Nut	N/C
26.	200-1000-003	Screw	N/C
27.	200-4000-003	Screw	N/C
28.	025-1090-001	Large Mirror	9.50
29.	542-0001-001	Connector P.C.B.	N/C
30.	543-0001-001	Connector	N/C
31.	207-0001-001	Washer #6	N/C
32.	211-9012-001	Cable Clamp	N/C
33.	211-8001-001	Handle Assembly	5.00
34.	010-1007-002	Handle Overlay	3.00
35.	011-1000-001	Cord Reel Terminal Cover	N/C
36.	532-0001-001	Cord Reel Assembly (2-wire)	10.00
37.	532-0001-002	Cord Reel Assembly (3-wire)	14.00
38.	012-1028-001	Pulley 60 Hz	2.00
39.	012-1028-002	Pulley 50 Hz	2.00
40.	200-4100-001	Screw	N/C
41.	211-9004-001	Cable Clamp	N/C
42.	200-1000-002	Screw	N/C
43.	015-1010-001	Side Panel	2.00
44.	521-2003-004	On/Off Switch	2.60
45.	521-2003-003	Start/Stop Switch	3.40
46.	020-1047-001	Control Module (Domestic)	76.00
47.	020-1047-002	Control Module (International)	84.00

MODEL TSM
PARTS AND PRICE LIST

MINIMUM BILLING \$5.00

ITEM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1.	011-1032-010	Rear Bezel	\$ 9.00
2.	200-4000-003	Screw	N/C
3.	020-1049-900	Blower Motor Assembly	27.50
4.	200-4000-005	Screw	N/C
5.	205-1003-001	Speed Nut	N/C
6.	201-1000-001	Screw	N/C
7.	025-4000-002	Lensscreen	12.00
8.	020-1006-001	Actuator Assembly	18.00
9.	201-1000-001	Screw	N/C
10.	010-1064-001	Heat Filter Bracket	2.00
11.		Screw (Part of Cord Reel Assembly)	
12.	207-0007-001	Washer	N/C
13.	206-3000-001	Rivet	N/C
14.	025-3000-002	Heat Filter	Sold as set
15.	025-2003-002	Condenser Lens	
16.	523-0001-001	Tape Motor	14.00
17.	536-1000-001	BEH Lamp (Before Serial Number 22768)	(For prices see Accessory Price List)
18.	200-1000-005	Screw	N/C
19.	207-0004-003	Washer	N/C
20.	210-1000-001	Rear Foot	N/C
21.	205-1000-001	Speednut	N/C
22.	528-0001-001	Tape Head	26.00
23.	533-0004-001	Cable Assembly	Sold as set
	533-0004-002	Cable Assembly	
24.	536-1004-001	CAR Lamp (After Serial Number 22768)	(For prices see Accessory Price List)
25.	536-1002-001	CTD Lamp 230V International	
26.	207-4000-002	Lockwasher	N/C
27.	205-0001-002	Hex Nut	N/C
28.	700-2000-001	Front Foot	N/C
29.	010-1067-001	Optics Hood	2.00
30.	010-1132-001	Backup Plate	Sold as set
31.	011-1130-001	Quadrant Gear	
32.	211-0001-001	Tape Head Mounting Bracket	7.00
33.	020-1105-001	Detent Spring Assembly	3.00
34.	011-1071-001	Upper Cartridge Guide	Sold as set
35.	011-1084-001	Lower Cartridge Guide	
36.	010-1088-001	Detent Spring Support	N/C
37.	213-0001-001	Focus Knob	Sold as set
38.	200-6000-003	Screw	
39.	206-5000-003	Eyelet	
40.	025-2000-001	Projection Lens	96.00
41.	019-1102-001	Label	N/C
42.	020-1094-003	Optical Assembly	42.00
43.	536-2000-001	Lamp Socket	2.00
44.	521-3000-001	Thermal Switch	4.00
45.	202-0001-002	Set Screw	N/C
46.	207-0001-002	Washer	N/C
47.	200-4000-004	Screw	N/C
48.	207-3000-001	Lockwasher	N/C
49.	020-1048-901	Lens Holder Assembly	7.00
50.	019-1089-001	Label	N/C



SERVICE BULLETIN No. 11

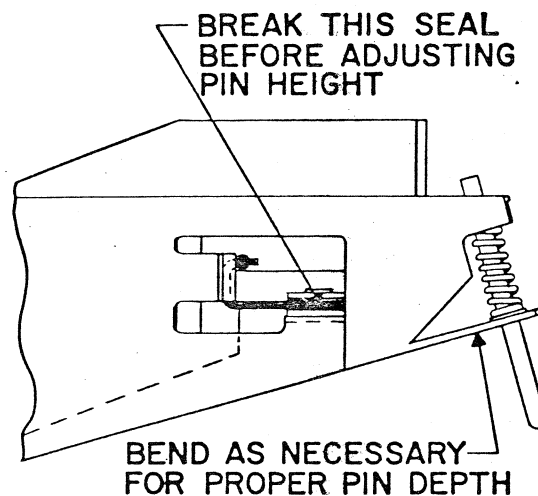
April 21, 1971

TSM AND CSM MODEL PROJECTORS ACTUATOR ADJUSTMENTS

Most Audiscan TSM and CSM model projectors utilize an actuator which has two improvements over those of the past. The newer actuator has the cord sealed to the pulleys to prevent it from coming off during shipping and handling. This actuator also has a "V" shaped notch, as shown in the illustration, which facilitates easier and more accurate depth adjustment.

In order to adjust the newer actuator for proper pin height, it will be necessary to break the seal at the top pulley. The pin height may be adjusted as in the past. Re-seal the cord to the top pulley after any pin height adjustment.

Pin depth adjustment may be made by simply bending the arm, as illustrated.



SERVICE BULLETIN #12

January 20, 1972

Cartridge Compatibility

Since the release of Audiscan's new "Synchro-lock" cartridge, with its locking gates, and larger storage capacity, a great deal of concern has been voiced over its compatibility with older style projectors. This new cartridge, also referred to as the black cartridge, because of its color, has been designed to be compatible with any Audiscan projector in proper working order, and is different from the older blue cartridge in only a limited number of ways. These changes were made to greatly improve the overall performance of the Audiscan system, but with the fore-knowledge that they would cause the black cartridge to be much less "forgiving" when used with the older model projectors. Below, is a list of basic differences, and problems presented by these differences as well as steps to take to assure proper operation of both cartridge types.

Gate Lock:

This feature causes the film gates to lock when the cartridge is removed from a projector, thus preventing accidental advance of the film and loss of synchronization. However, the lock depends upon the position of the tape pressure roller with respect to the two cartridge stops. Most of this variation is associated with the depth at which the cartridge rests in the projector. This depth can vary over a range of .050" for a given cartridge. Stating it somewhat differently, the cartridge can sit .025" deeper or shallower than an ideal nominal position and still function properly in so far as the gate locking mechanism is concerned. To assure that the cartridge rests within these limits, the cartridge stops must be correctly adjusted with respect to the capstan shaft.

This adjustment can usually be easily accomplished using a "Synchro-lock" cartridge as a reference. One black cartridge has been issued to you for that purpose. It is loaded with a film loop, but contains no magnetic tape, and therefore must be advanced manually.

Place a black cartridge in the projector. Manually advance the program a few times by alternately depressing and releasing the picture advance button. If the film advances smoothly, and the focus range allows clear focusing of both the black cartridge, and the older blue cartridge, no adjustment is necessary.

If this is not the case, then proceed with the following steps:

1. Look into the cartridge slot at the rear of the machine, and locate the upper and lower stop screws, and the capstan shaft. These three parts are important in obtaining the correct alignment. (See Figure A)

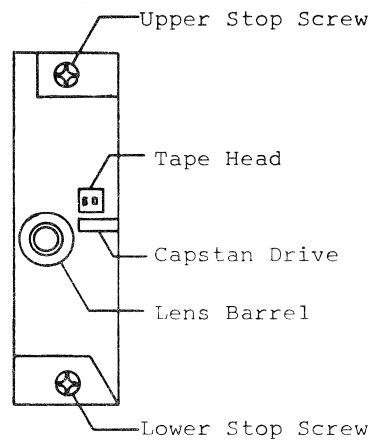


Figure A

2. Remove the machine cover. While looking into the right side of the projector, again locate the two stop screws and the capstan shaft. (See Figure B) Note: the lower stop screw and the capstan shaft are partially hidden behind the projector lamp housing and shield.

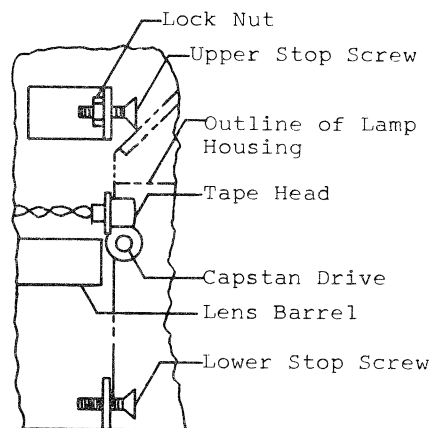


Figure B

3. Place a "Synchro-lock" cartridge in the cartridge slot and push it all the way forward. Check the stop screw alignment visually. If what you see resembles either figure C1 or C2, this is incorrect and you must proceed to the next step. If the alignment appears as in figure C3, complete alignment is necessary if the cartridge fails to operate properly. This will be covered at a later time.

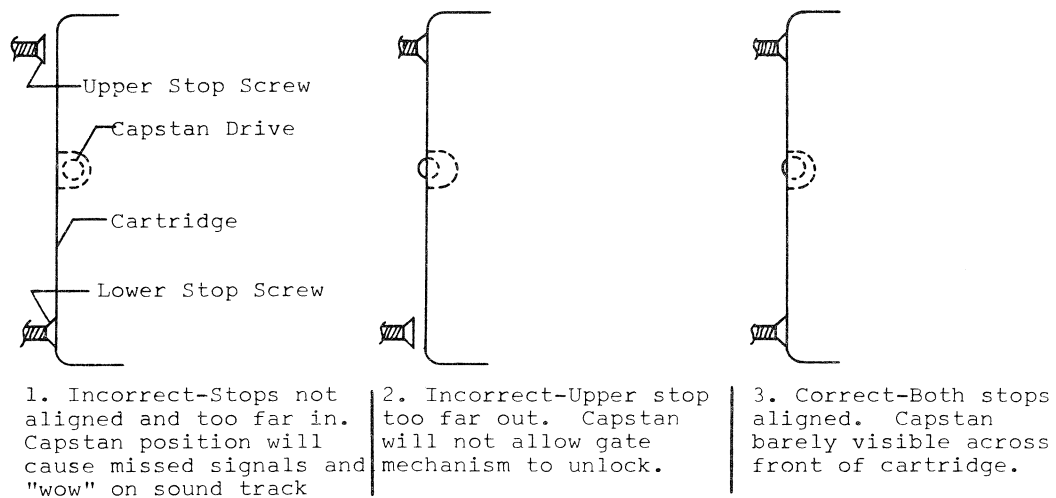


FIGURE C
Incorrect and Correct Stop Alignment

4. Using a small wrench, loosen the lock nut on the upper stop screw and back it off several turns.

5. With a phillips head screwdriver, turn either the upper or lower stop screw in or out $\frac{1}{4}$ turn at a time as required to achieve proper alignment. When proper alignment is obtained, both stop screws will touch bosses on the cartridge, and the capstan shaft will be barely visible across (or flush with) the front of the cartridge. (See Figure C3)

6. When both stop screws are properly adjusted, tighten the lock nut on the upper stop screw. Note: If it was necessary to move either stop screw more than one full turn, it will probably be necessary to reset the focus range of the projector. Refer to paragraph 4.36 and 4.37 on page 4-13 of your overhaul manual. Note: After adjusting the focus range, be certain to check the projector with a blue cartridge. The focus control must provide adequate range for focusing of both types of cartridges.

If proper stop alignment could not be obtained utilizing the method detailed above, then complete alignment is necessary. This is performed with the aid of a special jig which has also been sent for your use.

To perform a complete alignment, it will be necessary to drill and remove the three rivets holding the optics assembly, and remove that assembly. A #30 drill works well for this job. Note: This assembly can be easily reinstalled with a pop-riveter.

After removing the optics assembly, unplug the tape head connector, loosen the mounting strap, and remove the tape head.

Loosen the lens retaining screw (allen head), and slide the lens barrel forward far enough to gain access to the three screws that hold the capstan flywheel assembly in place.

Loosen, but do not remove these three screws. This will allow the capstan position to be adjusted.

The special cartridge stop alignment jig has notches molded into it for the tape head, the capstan shaft, and the actuator pin. Place the jig in the cartridge slot with these notches forward, and the slot for the actuator pin in the lowest position. Push the jig all the way forward as you would a cartridge, until it comes to rest against the lower stop screw. Note: Be sure the jig remains flat against the lower cartridge guide at all times. This is extremely important. If this is not done, any adjustments will be meaningless. It may be necessary to set the upper stop screw in slightly to allow the jig to rest against the lower stop.

Position the capstan shaft until it settles into the notch provided in the jig. Make sure that the capstan remains firmly seated against the back surface of its notch in the jig, while the jig itself is resting flat on the lower cartridge guide against the lower stop, and tighten the screws holding the capstan assembly. This adjustment is quite critical, so try to make it carefully. Be certain that this adjustment is checked after the capstan assembly has been tightened in place and readjusted if necessary. If the stop screws have been previously tampered with, it may be necessary to set the lower stop screw in slightly to make the capstan alignment possible.

After the capstan has been set in reference to the lower stop screw, the upper stop screw may be adjusted. After loosening its lock nut, turn it approximately $\frac{1}{4}$ turn at a time, check its position each time with the jig, and readjust if necessary. When properly adjusted, it will just touch (or be slightly set in from) its corresponding pad on the jig, but will not hold the jig from resting flat on the lower cartridge guide against the lower stop screw.

Once the above adjustments are complete, remove the and insert the tape head in the proper direction in its mounting strap. Reinsert the jig, make certain that it is firmly seated against both stops, and that the capstan shaft is still properly aligned. Move the tape head toward the rear of the machine until it rests against the back surface of the notch provided for it in the jig, tighten it in this position, and plug in the head connector. Note: It will be necessary to align the tape head for maximum output, but this can be done using your alignment cartridge. (Reference paragraph 4.13 on page 4-4 in your overhaul manual)

Remove the jig from the cartridge slot, and reinstall the optics assembly using a pop-riveter. After turning the machine on, insert first a synchro-lock cartridge and then a blue cartridge in the machine and reset the focus range. Alignment should now be complete. Check to make sure that the cartridge rests in the proper position against both stops and that the advance mechanism operates properly in both types of cartridges. If the unit still fails to operate properly after checking with several cartridges, recheck the alignment and perform the procedure again if necessary.

Advance and Return Pressures of the Cartridge Gates:

The older style blue cartridge had force requirements of between 75 and 190 grams for both gate pull-down and return. The new black cartridges range between 175 and 200 grams initially before lubricant is applied. This lubricant, which is a silicone mist oil applied to the gates, reduces these forces by approximately 20 grams. Wear and higher temperatures cause them to drop even further.

Due to the somewhat greater force requirements of the black cartridge, some adjustment, or even replacement of the actuator may be necessary. This condition is indicated by sluggishness of the actuator on either its pull-down or return stroke or failure of the actuator to complete its stroke to the necessary extreme positions. Failure of the actuator to complete its stroke will result in failure of the film to advance.

The actuator return spring is held in place by two phillips or hex head screws which are clearly visible when the projector cover is removed. By bending the spring mounting flange (flange into which the screws are threaded) up or down, the return force of the actuator will decrease or increase respectively. Caution: The pull-down force of the solenoid is fixed. If the return force is increased to too high a level, the pull-down force may be insufficient for the actuator to complete its downward stroke. A happy medium must be obtained if adjustment is performed. If satisfactory adjustment of the actuator is not possible, replacement is called for. (Refer to paragraphs 4.24 and 4.25 on page 4-8 of your overhaul manual.)

One other possible symptom results from a combination of a marginal actuator, and a marginal cartridge (one whose gate pressures are just at the maximum point) which is fully loaded with film (over 250 frames). This combination may cause enough additional drag on the gates to cause a missed advance only once or twice in each run of the program or maybe only once in several runs. This is because the film storage is random and completely unpredictable. A solution to a problem of this nature is either reduction of the gate pressure if possible, or adjustment (replacement if necessary) of the actuator.

Pinch Roller Force:

The old blue style cartridges had a pinch roller force of 750 grams, while the new black cartridge has a force of 1000 grams. The greater force permits pulling of a greater amount of tape as well as the use of a "hard" pinch roller. This hard roller eliminates set and adhesion of tape to the roller when the cartridge is left in a projector without running for long periods of time. However, forces from the detent spring which hold the cartridge in the projector must be greater than this pinch roller force. If through use and age, the force of the detent spring decreases to a point below that of the pressure roller, the cartridge will push its way slightly out of the projector. It is easily determined whether the detent spring

is in good condition.

Remove the projector cover and look at the detent spring assembly from the right side of the machine. The shaft of the detent roller must be below the imaginary extension of the lower surface (shown in dotted lines) of the upper cartridge holder bracket. (Refer to figure D) This must be checked with no cartridge in the projector.

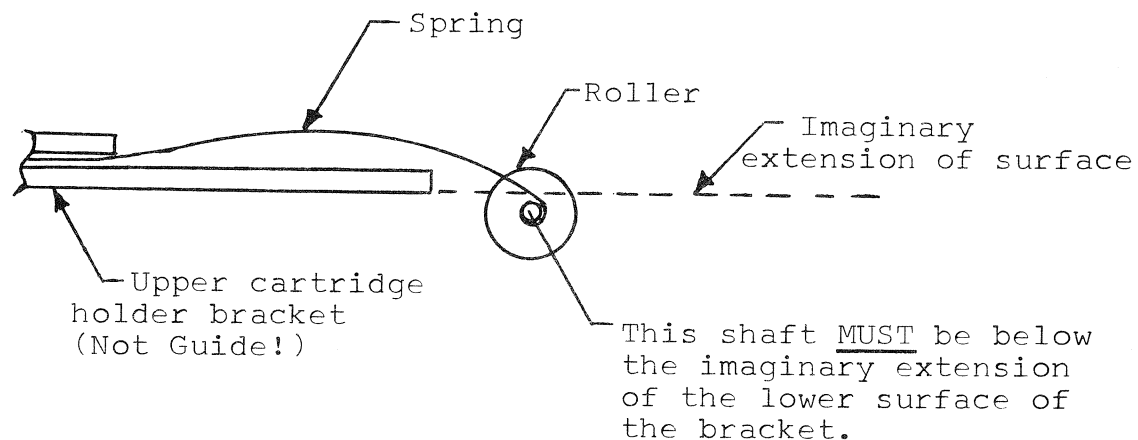


Figure D

If the shaft of the detent roller is not in the position shown, the detent spring assembly must be replaced. This is easily done by removing the two bolts that hold it in place, and substituting a new unit. The Audiscan part number for the replacement assembly is 020-1105-001, and is available from the factory as a stock item for a charge of \$1.25 net or \$2.00 list. Caution: When the spring is replaced, the upper cartridge guide is loosened, and can go out of adjustment. The best procedure is to set it to the position it was in originally. Fortunately, this is not a critical adjustment, but examine carefully before disassembly. If the guide is not in its proper position, the horizontal picture location is affected. Note: Do not attempt to center the picture by using the upper cartridge guide as an adjustment. This may result in the cartridge center section dragging on the end of the capstan shaft. Return the guide to its original position and no further if replacement of the detent spring assembly is necessary.

Service Bulletin No. 13

June 14, 1972

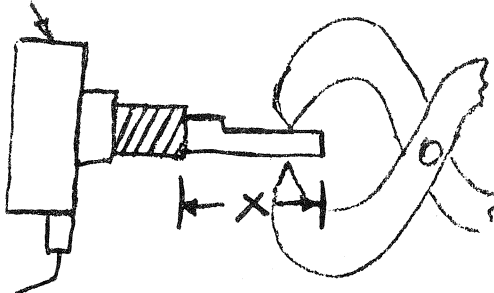
TSM Projectors

Volume Control Potentiometer

Most TSM Projectors above serial number 016000 have a new style volume control potentiometer that is designed so that it won't break-off as easily when hit by accident or during shipment. Because of the new stronger shaft some potentiometers are being pushed straight back into the Module breaking the internal parts of the volume potentiometer. To eliminate this, shorten the shaft of the volume pot as shown in the drawing $3/16" \pm 1/6"$ so that the volume knob rests on the threaded bushing of the pot.

DESCRIPTION OF CHANGE

516-0005-001
EXISTING

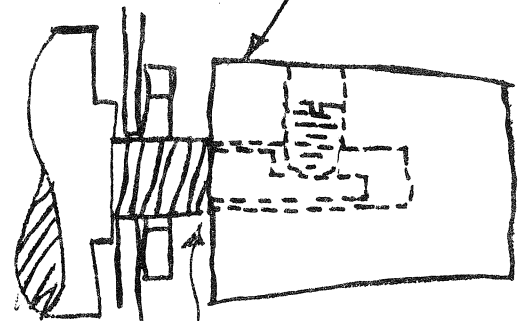


"CIT" Vol.
Pot.

SHORTEN X DIM. TO
ALLOW Vol. Control
KNOB TO REST ON
THREADED BUSHING
WHEN INSTALLING.

CUT OFF APPROX $\frac{1}{8}$ inch
($\frac{3}{16} \pm \frac{1}{16}$)

CHANGED TO 212-5003-001



WHEN INSTALLING
MAKE SURE KNOB
BOTTOMS OUT ON
BUSHING.



Audiscan®

PRODUCTS CORPORATION

P.O. BOX NO. 1456
1414 130 N.E.
BELLEVUE, WA. 98009

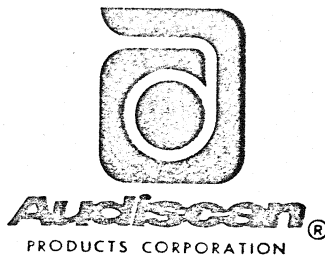
April 3, 1973

SERVICE BULLETIN #14 TSM SERIES

All Audiscan Model TSM projectors produced after February 28, 1973 (Serial Number 022768), have a different projection lamp. The new lamp is a Sylvania CAR lamp and is more efficient, as it has its own reflector, eliminating the possibility of having to realign the optics when a lamp is changed.

These new lamps are not compatible with TSMs before Serial Number 022768 and cannot be used in these projectors.

Also, all International TSMs will remain the same, using BEH lamps to be compatible with the CTD lamps.



P. O. BOX 1456 • 1414 - 130TH AVENUE N. E. • BELLEVUE, WASHINGTON 98009 • (206) 454-0694

SERVICE BULLETIN #15

Audiscan Model TSM Projectors produced after September 27, 1974 (Serial Number 032509) may have a different On/Off switch. The new switch is a three position On/Off/Standby. This standby feature is to conserve lamp life. With the switch in "standby" mode, the lamp will shut off at stop signals.

All Audiscan Model TSM Projectors produced after December 30, 1974 (Serial Number 033487) have the new standby feature and a new Hi/Lo lamp switch located on the optical assembly.

New Parts and Prices:

<u>Part Number</u>	<u>Description</u>	<u>Net Price</u>	<u>List Price</u>
521-2003-007	On/Off/Standby switch	\$2.60	\$5.20
521-2003-004	Hi/Lo switch	1.30	2.60
518-0002-001	Resistor	.90	1.80