

# *Electro-Voice*®

## **ELECTRONICS SERVICE MANUAL**



**STEREO RECEIVERS:** MODEL E-V 1181  
MODEL E-V 1182  
MODEL E-V 1281  
MODEL E-V 1282

## TABLE OF CONTENTS

	PAGE NO.
CHASSIS PARTS . . . . .	7-10
COMPONENT LEAD LOCATIONS . . . . .	44
DISASSEMBLY INSTRUCTIONS . . . . .	4-6
INTRODUCTION . . . . .	3-4
Specifications . . . . .	4
PRINTED CIRCUIT ASSEMBLIES	
AM Tuner (1182/1282) . . . . .	37
Output Amplifier (1181/1182) . . . . .	29-30
Output Amplifier (1281/1282) . . . . .	31-32
FM Tuner . . . . .	33-34
Mag Phono (1181/1182) . . . . .	23-24
Mag Phono (1281/1282) . . . . .	25-26
Mother Board . . . . .	22
Multiplex . . . . .	35-36
Power Supply (1181/1182) . . . . .	38
Power Supply (1281/1282) . . . . .	39
Tone . . . . .	<del>33-34</del>
SCHEMATIC (1181/1182) . . . . .	40-41
SCHEMATIC (1281/1282) . . . . .	42-43
SERVICING PROCEDURE	
AM Alignment . . . . .	16
Amplifier Checks . . . . .	11-12
Dial Cord . . . . .	13
FM Alignment . . . . .	13-15
Multiplex Alignment . . . . .	16
SYSTEM PICTORIALS . . . . .	45
TROUBLE SHOOTING . . . . .	17-21
Chart . . . . .	18-19
General . . . . .	20-21
Hints . . . . .	17

## SUBASSEMBLY CHART

MODEL	1181	1182	1281	1282
MAG PHONO PCB	85683	85683	85898	85898
TONE PCB	86354	86354	86354	86354
AMPLIFIER PCB	85685	85685	85914	85914
FM TUNER PCB	85697	85697	85697	85697
MULTIPLEX PCB	85915	85915	85915	85915
AM TUNER PCB	—	77346	—	77346
POWER SUPPLY PCB	85686	85686	85916	85916

# INTRODUCTION

This service manual was designed with the experienced technician in mind. It has been kept brief without over simplification. All procedures are presented in a clear step-by-step manner. Although we have tried to anticipate all of your problems and questions, in special instances you may need additional guidance. Address any such inquiries to our Technical Service Department.

The pages of this manual are punched to fit a three-ring binder so that any production changes and additional service information can be easily added. This will keep your Electro-Voice Electronic Service Data as up-to-date as possible.

An Engineering Data Sheet is shipped with each receiver: E-V 1181/1182 # 534879, E-V 1281/1282 # 534878. This data sheet contains instructions for installation and

operation.

The following abbreviations are used in this service manual:

Assy.	Subassembly
Bd	Board
FET	Field Effect Transistor
IC	Integrated Circuit
IF	Intermediate Frequency
IHF	Institute of High Fidelity
MPX	Multiplex
Mtg.	Mounting
PC	Printed Circuit
PEC	Packaged Electronic Circuit
Sw.	Switch
X	Trans. (Transformer)

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## DESCRIPTION

E-V stereo receiver models 1181, 1182, 1281 and 1282 each incorporate a master printed circuit board (Mother board) and plug-in circuit packages to assure uniform performance, reliability and ease of servicing. Solid state circuitry gives dependable high fidelity reproduction from all stereo program sources.

Standard external inputs provided are Magnetic Phono-Auxiliary sockets and a 300 balanced FM Antenna Terminal. Models 1281/1282 also provide a Tape In socket (Tape Monitor).

Standard output connectors include Tape Out sockets, Speaker Terminals and a Headphone Jack. Tape output is available from any program source except tape input. Models 1281/1282 have switch controlled Main and Remote speaker terminals which connect speakers in *shunt*. Speaker impedance should never be less than 8 *ohms* on these models for this reason.

A 9½-inch tuning shaft riding on nylon and brass bearings tunes with smooth flywheel action. Program lights indicate input source through the operation of the selector switch. Bass and treble controls vary the response of both channels simultaneously. Flat response is obtained with both controls set to center positions.

A front panel center-tune meter indicates zero tuning at the exact center frequency of a FM station.

A mono switch located on the balance control combines signals from both channels. This control can be used to balance stereo programs but does not kill multiplex circuits.

The magnetic phono preamps are Thick-Film Hybrid Packaged circuits complete with transistors. These PEC's

are located at the input sockets, improving signal to noise ratio by keeping hum to a minimum.

The FM tuner circuits incorporate a field-effect transistor (FET) and integrated circuits (IC) for excellent sensitivity and selectivity. The IF bandwidth remains constant for minimum distortion even with widely varying signal strength.

A non-switch AFC action is employed to hold stations on frequency.

Multiplex switching is automatic and is controlled by the pilot signal.

In addition model:

E-V 1181 FM stereo receiver employs a 42 watt @ 8 ohm (IHF) stereo power amplifier — circuitry is all-silicon direct coupled.

E-V 1182 AM/FM Stereo receiver employs the same stereo amplifier as the E-V 1181 with the added feature of an AM tuner and ferrite antenna.

E-V 1281 FM stereo receiver employs a 80 watt @ 8 ohm (IHF) stereo power amplifier — circuitry is all-silicon direct coupled; a loudness switch which compensates for loss of frequency extremes at low volume levels; speaker selector switches which provide independent control of Main and Remote speakers; a Tape Monitor switch provides playback from a tape recorder or "tape quality to material being recorded" when used with a tape recorder providing off-the-tape monitoring.

E-V 1282 AM/FM stereo receiver employs the same features as the E-V 1281 plus an AM tuner and ferrite antenna.

# INTRODUCTION

## SPECIFICATIONS

### GENERAL

POWER REQUIREMENTS:	110-120 volts, 60 Hz AC
POWER CONSUMPTION:	
E-V 1181-1182	70 watts maximum
E-V 1281-1282	130 watts maximum
DIMENSIONS:	3¼" h x 14¼" w x 10½" d (E-V 1182, 11" deep) (E-V 1282, 11½" deep)
WEIGHT:	E-V 1181, 13 pounds E-V 1182, 14 pounds E-V 1281, 15 pounds E-V 1282, 16 pounds

### AMPLIFIER SECTION

POWER BANDWIDTH:	20-20,000 Hz $\pm$ 1 dB
FREQUENCY RESPONSE:	$\pm$ 1.5 dB 20-20,000 Hz
CHANNEL SEPARATION:	40 dB at 1,000 Hz
HUM AND NOISE:	
Mag. Phono Input	-50 dB
Auxiliary Input	-70 dB
INPUT SENSITIVITY:	
Mag. Phono (RIAA)	3 mV
Auxiliary	200 mV
TONE CONTROL VARIATION:	
Bass	Total variation 24 dB at 50 Hz
Treble	Total variation 24 dB at 10 kHz
SPEAKER OUTPUT IMPEDANCE:	4-16 ohms

### E-V 1181 and E-V 1182

POWER OUTPUT:	
MUSIC POWER $\pm$ 1 dB:	64 watts
IHF MUSIC POWER (total):	42 watts @ 8 ohms
RMS POWER (total):	36 watts @ 8 ohms
RMS Driving One Channel:	19 watts @ 8 ohms
TOTAL HARMONIC DISTORTION:	1.0% at rated output

### E-V 1281 and E-V 1282

POWER OUTPUT:	
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MUSIC POWER $\pm$ 1 dB:	130 watts
IHF MUSIC POWER (Total):	80 watts at 8 ohms
RMS POWER (Total):	60 watts at 8 ohms
RMS Driving One Channel:	32 watts at 8 ohms
TOTAL HARMONIC DISTORTION:	1.0% at rated output

### FM SECTION

TUNING RANGE:	88 to 108 MHz
ANTENNA:	Input Impedance 300 $\Omega$ - Balanced
INTERMEDIATE FREQUENCY:	10.7 MHz
SENSITIVITY:	2.5 $\mu$ V IHF
SELECTIVITY:	50 dB
IMAGE REJECTION:	50 dB
IF REJECTION:	75 dB
DRIFT:	Less than .02%
CAPTURE RATIO:	2 dB
AM REJECTION:	35 dB
HUM and NOISE:	Greater than 50 dB
SPURIOUS REJECTION:	Greater than 75 dB
CHANNEL SEPARATION:	25 dB at 400 Hz
FREQUENCY RESPONSE:	$\pm$ 1 dB 30-15,000 Hz (IHF limit)
HARMONIC DISTORTION:	0.8% at 100% modulation
SCA REJECTION	60 dB
SUBCARRIER REJECTION:	40 dB
AFC:	Non-switched

### AM SECTION (Assembly #77346) (E-V 1182 & E-V 1282)

TUNING RANGE:	535 to 1610 kHz
SENSITIVITY:	150 $\mu$ V/m for 15 dB signal to noise
IMAGE REJECTION:	40 dB at 600 kHz 35 dB at 1400 kHz
INTERMEDIATE FREQUENCY:	455 kHz
AM ANTENNA:	Built-in ferrite rod

## DISASSEMBLY INSTRUCTIONS

When disassembling unit, place all hardware and other parts together in a small box or container for this purpose.

Use the proper size tools where indicated for hardware removal.

All routine service work requires that the cabinet be removed from the chassis. In replacing parts, it may be necessary to remove pc (printed circuit) boards from the chassis. The pc boards are designed for easy disconnection from the large Mother pc board through push-on receptacles. In some instances it will be necessary to remove other assemblies and/or unsolder leads to remove pc

boards.

When installing individual pc boards on the Mother board, MAKE SURE that the Pin Posts mate properly with the Contact Receptacles. A Pin Post can easily be bent, or in the case of the phono preamp, completely miss the Receptacle.

In some instances, the tool called for may not be the one required due to later model changes: a ¼-inch spintite might be stated but the unit may have Phillips screws instead of hex head screws. Use the tool necessary.

# DISASSEMBLY INSTRUCTIONS

## REMOVING CABINET (CWR-1 Walnut)

1. Place unit upside down on a clean soft cloth or towel.
2. Use a ¼-inch spintite and remove two (2) Hex Head Screws securing cabinet to chassis.
3. Carefully work chassis out front of cabinet along with AC line cord.

NOTE: When replacing cabinet make sure that AC line cord, attached to rear of chassis, does not jam between chassis and inside of cabinet.

NOTE: On some units with the CWR-1 wood cabinet, the metal case (1) may still be installed on the chassis. This situation results in the unit running quite warm because heat cannot escape as readily. If this is the situation, do not install the metal case on the repaired unit. Return the metal case with securing hardware to the customer.

## REMOVING METAL CASE (1)

(Refer to Figure 2)

1. Using a ¼-inch spintite, remove six (6) Self-Tapping Screws (43) securing the case (1) to chassis (26).
2. Carefully remove case.

NOTE: When replacing case, work front edge into front panel groove.

NOTE: When replacing metal case or wood cabinet on chassis, dress FM twin lead to a position where case will not force it into tuner dial cord.

## REMOVING FRONT PANEL (25)

(Refer to Figure 2)

1. Remove the six (6) Control Knobs (40 & 41) from unit.
2. Remove the following Knurled Thumb Nuts securing the front panel to the chassis. Take care not to scratch front panel.
  - a. Four (4) securing tone controls (50).
  - b. Two (2) securing selector switch and tuning shaft bearing (49).
3. Remove Front Panel (25). Remove (4) large Flatwashers (53) from tone control shafts.

## REMOVING POWER AMPLIFIER (17)

Assembly #85914 (E-V 1281/1282)

1. Remove four (4) Phillips Screws (56) with Lockwashers and Nuts securing pc board Heat Sink to chassis.
2. Unclip and remove Dial Lamp Socket (30) from right end of dial scale.
3. (This step is not necessary but will allow for easier removal of pc assembly) Using a flat blade screwdriver, remove the two piece Nylon Bearing (24), securing the tuning shaft, from groove on rear of chassis and move it up slightly.
4. Carefully work pc assembly straight up to clear pin posts, forward to clear speaker terminals, around tuning shaft and remove from chassis.

Assembly #85686 (E-V 1181/1182)

1. Remove two (2) Phillips Screws (56) with Lockwasher and Nuts securing pc board Heat Sink to chassis.
2. Carefully work pc assembly straight up to clear pin posts, around tuning shaft and remove from chassis.

## REPLACING AUDIO OUTPUT TRANSISTORS

Audio output transistors are mounted on the heat sink of the power amplifier pc board. Remove transistors as follows:

1. Perform "Removing Power Amplifier."
2. Using a ¼-inch spintite remove the Hex Nuts and Lockwashers on the transistor mounting bolt (8). Do not attempt to remove the bolt from the board which is soldered on the foil side.
3. Carefully remove the two transistor leads soldered to the pc board and remove the transistor.

NOTE: When replacing an output transistor, inspect the contact surfaces of the transistor and the heat sink to make sure they are free of foreign matter. Rub a coat of silicone grease (Dow Corning #340, or equivalent) on both surfaces of the mica insulator and transistor; then secure the transistor with the hex nut and washer. Clip the transistor leads on foil side of the board.

## REMOVING FM-IF PC BOARD ASSEMBLY (13)

1. Completely mesh the Variable Capacitor VC. (Dial pointer extreme left end of tuning scale.)
2. Using thin masking tape, secure the dial cord to Dial Drum and to Dial Pulleys.
3. Unsolder Black Lead from pin "E" at right rear corner of pc board.
4. Unsolder FM twin lead from Terminal Strip (33) rear of chassis.
5. E-V 1182 and E-V 1282 only: Unsolder White wire lead from TR3 and Yellow wire lead from TR4.
6. Remove four (4) Phillips Screws (44) securing pc board assembly (13) and bracket (15) to chassis.
7. Partially remove pc board assembly to point where dial drum (60) will clear transformer on multiplex board. Remove dial drum with flat blade tool and remove tuning assembly completely from unit.

## REMOVING AM PC BOARD ASSEMBLY (16)

Assembly #77346

1. Unsolder the following leads from the AM antenna. Use care not to over heat and damage the antenna terminals. (Figure 1)
  - a. Black lead terminal #1.
  - b. Brown lead terminal #2.
  - c. Orange lead terminal #4.
2. Unsolder Yellow lead from TR4.
3. Unsolder Orange lead from common ground point on fuse holder.

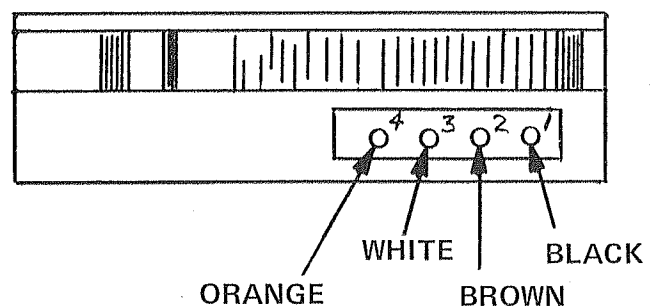


FIGURE 1

# DISASSEMBLY INSTRUCTIONS

4. Remove two (2) Phillips Screws (44) securing pc board to chassis. Remove pc board.
5. Unsolder following leads from pc board:
  - a. Red lead from P6.
  - b. Black lead from P4.

## REMOVING AM ANTENNA ASSEMBLY (39) (Figure 1)

1. Unsolder the following leads from the antenna. Use care not to overheat and damage the terminals.
  - a. Black lead terminal #1.
  - b. Brown lead terminal #2.
  - c. White lead terminal #3.
  - d. Orange lead terminal #4.
2. Remove two (2) Phillips Screws (57) with Nut and Lockwasher securing antenna. Remove antenna assembly.

## REMOVING MULTIPLEX PC BOARD ASSEMBLY (11)

1. Remove four (4) Phillips Screws (44) securing the MPX pc board to chassis.
2. Remove MPX pc board assembly.

## REMOVING TONE CONTROL PREAMP PC BOARD ASSEMBLY (10)

1. Perform "Removing Front Panel."
2. Perform "Removing Multiplex PC Board."
3. Using a ¼-inch spintite, remove Hex Head Screw securing left dial lamp socket (29) and remove socket out of the way.
4. Unsolder heavy leads at Off/On switch (S1).
5. Check and dress any leads away from pc board assembly.
6. Remove Control Locknut (51) and Lockwasher (52) from selector switch shaft. Move front portion of selector switch (6) up to clear volume control.
7. Carefully remove Tone-Preamp PC Board Assembly by working straight up to clear contact pins and then to the rear.

## REMOVING POWER SUPPLY PC BOARD ASSEMBLY (12)

### #85686 (E-V 1181/1182)

1. Remove two (2) Phillips Screws (44) securing pc board to chassis.
2. Lift pc board up to clear contact posts and carefully remove from unit. To completely remove assembly, unsolder red transformer leads.

### #85916 (E-V 1281/1282) (Figure 2)

1. Unsolder black ground lead (16) from pc board to filter capacitor (2000 µF/60 V) at capacitor.
2. Remove capacitor from securing brackets and move up to clear pc board.
3. Remove two (2) Phillips screws (44) securing pc board to chassis.
4. Lift pc board up to clear contact posts and carefully remove from unit. To completely remove assembly, note color coding of wire leads and unsolder them.

## REMOVING MAGNETIC PHONO PREAMP PC BOARD ASSEMBLY (3)

NOTE: When replacing this assembly, MAKE SURE Selector Switch Wafer (S2B) has flat sides of hole setting horizontal. The indent must be on top to match contacts properly.

1. Perform "Removing Front Panel."
2. Remove Control Locknut (51) and Lockwasher (52) from selector switch shaft. Move front portion of selector switch up and remove rear of shaft from rear switch wafer.
3. Using a ¼-inch spintite, remove two (2) Hex Head Screws (48) from rear of chassis securing the shield bracket (5).
4. Remove four (4) small Phillips Screws (44) with Lockwashers securing phono pc board to rear of chassis.

NOTE: On models E-V 1182 and E-V 1282 output and power supply leads from the AM tuner are connected to Terminal Posts "L" and "M" respectively. Remove these two leads from terminal posts. Resolder these leads when replacing pc assembly.

5. Carefully work pc board slightly forward to clear phono sockets. Remove assembly by pulling straight up. Note paper insulator (2) between assembly and chassis.

## REMOVING MOTHER PC BOARD ASSEMBLY (18)

If it becomes necessary to remove the Mother PC Board Assembly, proceed as follows:

1. Remove all printed circuit assemblies as described for each assembly.
2. Remove Heyco Bushing (22) securing power cord.
3. Unsolder connecting leads to selector lamp sockets and AC outlet socket.
4. Completely remove Shield Bracket (5) at rear of chassis along with the Power Transformer (14) and Selector Switch and Shaft (6 & 7).
5. Loosen Fuse Holder (32).
6. Make a diagram of wire leads connecting to Terminal Posts on pc board with color coding. Carefully remove these leads. When replacing leads, carefully solder them to pins if no wire wrap tool is available.
7. Note location of Nylon Screws (45) securing pc board to chassis. When installing pc board return nylon screws to these same positions.
8. Remove all screws securing pc board to chassis. Remove pc board by working out at left end of chassis.

## REMOVING RIVETED ASSEMBLIES

If one of the riveted parts must be replaced, remove the rivet(s) with a 1/8-inch tap and drill. Take care when drilling not to drop metal chips into unit which can cause electrical shorts. Secure the new part with #6-32 hardware or with pop-rivets if available.

## REMOVING TUNING METER (62)

The tuning meter is secured in place by a spring retainer.

1. Unsolder the two leads from meter terminals. Note the color coding of leads.

WARNING: Excessive heat on meter terminals may result in damage to the meter. Use a pair of pliers as a heat sink on each terminal. Take care not to burn tuner dial cord.
2. Gently pull the retainer away from the rear of the meter and work the meter out of its mounted position.

# CHASSIS PARTS

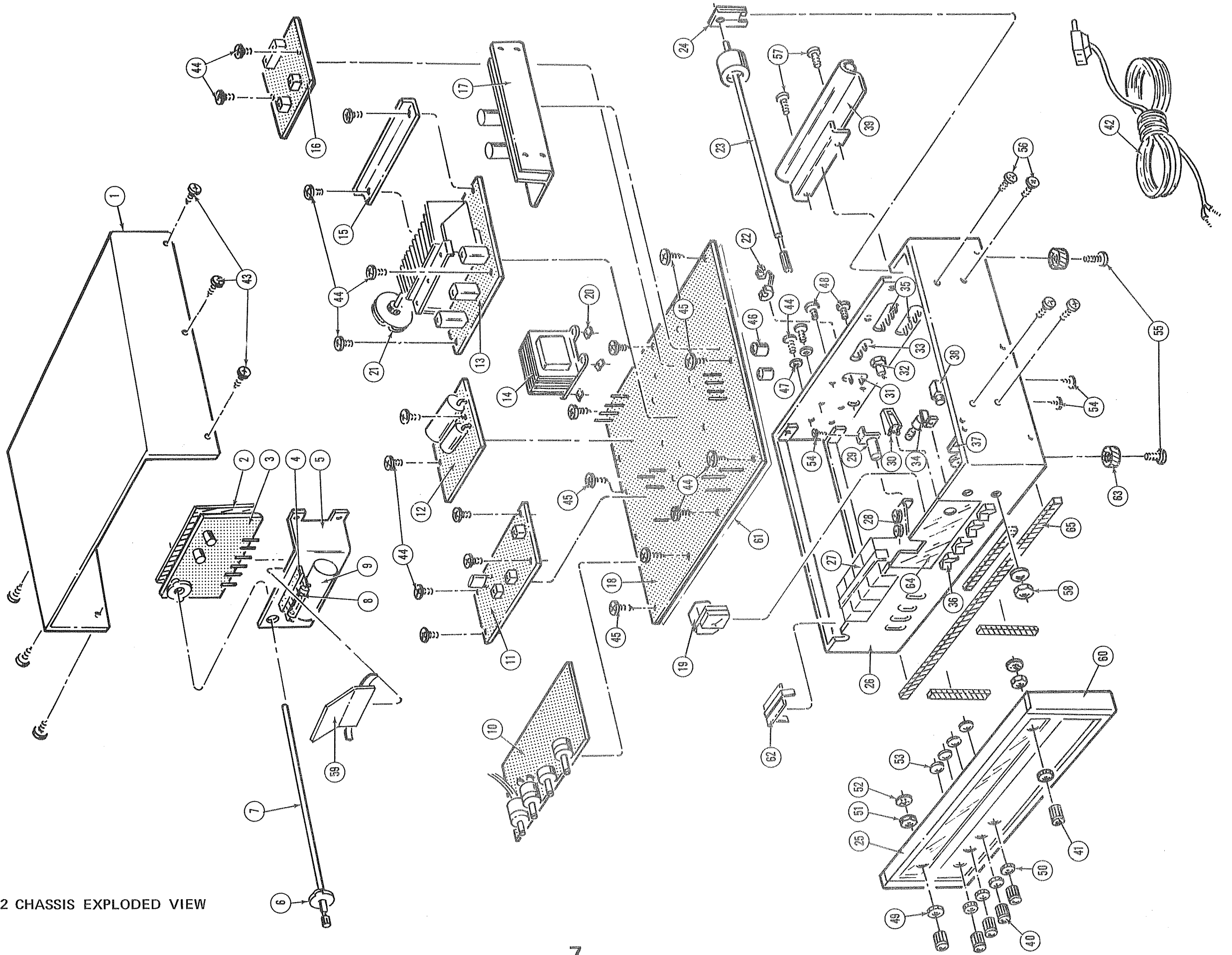


FIGURE 2 CHASSIS EXPLODED VIEW

# CHASSIS PARTS

REF. No.	PART No.	DESCRIPTION	REF. No.	PART No.	DESCRIPTION	REF. No.	PART No.	DESCRIPTION
1	78056-EP	Case — Metal (Gold)	<b>HARDWARE</b>			<b>PACKING PARTS</b>		
2	77796	Insulator — Phono Amp	43	62779-BX	Screw - Case			
3	85683	Magnetic Phono Preamp PC Assy. (1181/1182)	44	L60323-AD	Screw (4—40 x 3/16 Phillips)	96893		Carton & Fillers (1181/1182)
3	85898	Magnetic Phono Preamp PC Assy. (1281/1282)	45	62770	Screw - Nylon	96894		Carton & Fillers (1281/1282)
4	27036	Terminal Strip	46	77826	Spacer - Transformer	78000		Bag - Polyethylene
5	85940	Shield Sub Assy. (1181/1182)	47	3843-AD	Lockwasher (#4)	534878		Engineering Data Sheet (1281/1282)
5	85912	Shield Sub Assy. (1281/1282)	48	62771	Screw (6—32 x 3/8 Hex)	534879		Engineering Data Sheet (1181/1182)
6	56102	Selector Switch Assy. (1181/1281)	49	20972	Nut - Knurled	37208		AC Tag
6	56101	Selector Switch Assy. (1182/1282)	50	20827-AP	Nut - Knurled	37209		Output Caution Tag
7	77791	Shaft - Switch	51	2080-AD	Control Nut (3/8—32)	531499		Warranty Card
8	20676	Fuse (1A3AG) Pigtail	52	38361-AD	Lockwasher - Control	534876		Label - Carton (1181)
9	42488	Capacitor - Elect. 2000 $\mu$ F/65V (1281/1282)	53	38451	Flatwasher	534877		Label - Carton (1182)
			54	62821	Screw - Hex (6 x 5/8) (Xformer - Socket mtg.)	534874		Label - Carton (1281)
						534875		Label - Carton (1282)
10	86354	Tone - Preamp PC Assy.	55	62759	Screw - Foot (6—32 x 3/8)	<b>ACCESSORIES</b>		
11	85915	Multiplex PC Assy.	56	L60325-AD	Screw - Flathead (1181/1182)			
12	87074-XX	Power Supply PC Assy. (1181/1182)	56	62793-AD	Screw - Flathead (1281/1282)	CWR-1		Walnut Case Assembly
12	85916	Power Supply PC Assy. (1281/1282)	57	L60326AD	Screw - Antenna Mtg. (4—40 x 3/8)	534666		Instruction Sheet
13	85697	FM Tuning Assy. - IF PC Assy.	58	20962	Nut - Phone Jack (1181/1182)			
14	15223	Transformer — Power (1181/1182)	58	2080-AD	Nut - Phone Jack (1281/1282)			
14	15227	Transformer - Power (1281/1282)		3843-AD	Lockwasher (#4)			
15	78065-AD	Bracket - Reinforcing		20261-AD	Nut (4—40)			
16	77346	AM Tuner PC Assy. (1182/1282)		20048	Speed nut - Power Amp Mtg.			
17	85685	Power Amp PC Assy. (1181/1182)		77862	Bushing - Tuning Shaft			
17	85914	Power Amp PC Assy. (1281/1282)	<b>MISCELLANEOUS PARTS</b>					
18	85682	Mother PC Assy. (1181/1182)						
18	85905	Mother PC Board Assy. (1281/1282)						
19	3219	Meter — FM Tuning	59	78402	Insulator — Fuse			
20	20831	Speednut (Xformer & Lamp)	60	77961-LX	End Cap - Front Panel			
21	85710	Dial Drum Assy. — Tuning	61	77904	Insulator — Mother PC Bd.			
22	20989	Heyco Strain Relief	62	78398	Insulator — Selector Swt.			
23	87075-XX	Dial Shaft & Flywheel Assy.	63	28213	Foot - Rubber			
24	76477-TV	Bearing (two required)	64	77977	Dial Mask (Black)			
25	85907	Front Panel Assy. (1181)	65	28219	Tape - Poly. (Specify total length)			
25	85908	Front Panel Assy. (1182)		77860-PK	Lens - Stereo (Red)			
25	85909	Front Panel Assy. (1281)		77161-PJ	Lens - Selector (Amber)			
25	85910	Front Panel Assy. (1282)		77161-PK	Lens - Selector (Red)			
26	86705	Chassis Assembly (1181/1182)		77161-PH	Lens - Selector (Green)			
26	86707	Chassis Assembly (1281/1282)		77161-SJ	Lens - Selector (White)			
27	85698	Pilot Light Socket Assy.		77976	Clip - Tuning Meter			
27	78139	Insulator - Pilot Lamps		20988	Clamp - Capacitor Mtg. (1281/1282)			
28	85695	Pulley Bracket Assy. (Left)						
29	4482	Socket — Dial Light (Speednut)		A66027	Tubing (1/2 inch)			
30	20987	Lampholder — Dial Light		A66039	Tubing (1 1/2 inch)			
31	4487	Receptacle — AC		77603	FM Antenna (Twin lead)			
32	20911	Fuseholder	<b>DIAL CORD</b>					
32	20519	Fuse (1.5 amp 3AG)	66	3088-05	Dial Cord (36 inch)			
32	20139	Fuse (2 amp 3AG)	67	19040	Spring - Dial Cord			
32	20046	Fuse (2.5 amp 3AG)	68	78323	Dial Pointer			
32	20076	Fuse (3 amp 3AG)	<b>LAMPS</b>					
33	27316	Terminal Strip - Antenna						
34	4482	Socket - Dial Light		4329	Lamp - Dial (#1847)			
35	27315	Terminal Strip - Speaker		4348	Lamp - Dial (#51) (Right)			
36	56105	Switch - Rocker		43041	Lamp - Stereo (#1819)			
37	85694	Pulley Bracket Assy. (Right)	<b>COMPONENTS</b>					
38	17161	Phone Jack (1181/1182)						
38	17139	Phone Jack (1281/1282)						
39	86094	Antenna & Bracket Assy. (1182/1282)		46119	Resistor — 560 $\Omega$ 1/2W (10%)			
40	77857	Knob (Index)		46033	Resistor - 3.3 Meg 1/2W (10%)			
41	77858	Knob (Plain)		42343	Capacitor - Disc .0025 $\mu$ F/500V			
42	16412	Line Cord - AC						



# SERVICING PROCEDURE

This part of the service manual is intended to provide information to completely check out the unit, align it and detect any possible trouble which might exist. If at any point in the procedure the proper results cannot be obtained, stop and attempt to correct the problem. The trouble shooting section may be of assistance in correcting any such problems. When repairing the receiver be sure the cause as well as the effect of the trouble has been eliminated.

The following procedure sequence is recommended for servicing and aligning.

1. Amplifier Checks
2. FM Alignment
3. Multiplex Alignment
4. AM Alignment

This procedure contains information for servicing four models. Use the servicing and alignment sections which pertain to any one particular model.

**NOTE** – DO NOT attempt realignment unless the required test equipment is available and the alignment procedure is understood.

## REQUIRED TEST EQUIPMENT

DC Volt-ohm-meter (Simpson 250 or equivalent)  
(capable of measuring 10 mV)  
Audio VTVM  
Oscilloscope (Flat to 100 kHz)  
(with detector probe)  
Audio Generator (Low Distortion)  
Harmonic Distortion Analyzer  
Two – 8 ohm non-inductive Load Resistors  
50 watt rating (Minimum)  
AM-FM Signal Generator  
(with calibrated RF and v modulation)  
10.7 MHz Sweep Generator  
(with Markers)  
Multiplex Generator (98 MHz carrier or equivalent)  
(with calibrated RF level and modulation)  
AM Test Loop Antenna  
Alignment Tool – Non-metallic general Hex

Alignment Tool (.075 Hex)  
(General Cement # 9300 or equivalent)  
Alignment Tool – Flat blade

## PRECAUTIONS FOR BENCH CHECKING

A clean working area, free of metal particles, screws, etc., is an important preventative in avoiding servicing problems. Screws, removed from the unit during servicing, should be stored in a box until needed.

**CAUTION** – End Caps (60) on the front panel assembly may be broken or pulled off if the unit is pulled or scraped across a work bench.

Make sure the power switch (on volume control) is “off” before plugging the line cord into AC outlet supplying 115-120 volts AC.

Always remove line cord out of AC outlet when connecting or disconnecting; speaker hook-up leads, soldered interconnecting wire leads or printed circuit assemblies from unit.

**CAUTION:** The full AC line voltage is present at several points in the receiver. Be careful to avoid personal shock when performing the checks described.

## STANDARD TEST CONDITIONS:

Line Voltage: 117 Volts AC

Speaker terminals each terminated into 8 ohm non-inductive load resistors of at least 50 watt rating.

Balance and Tone controls mechanically centered.

Mono-Stereo switch in “stereo” position.

Make output measurements where indicated with an audio VTVM across load resistors.

Loudness switch “off” (E-V 1281/1282).

Limit full power output measurement periods to five minutes.

Standard audio signal generator reference input: 600  $\Omega$  generator @ 1 kHz into AUX jacks.

Tape monitor switch “off” (E-V 1281/1282).

## POWER OUTPUT AND HARMONIC DISTORTION MEASUREMENTS

Refer to the schematics and individual pc board assemblies and schematic for test points and component locations.

### AMPLIFIER ASSEMBLY # 85685 (E-V 1181 and E-V 1182)

- (1) In parallel with the LEFT channel load resistor, connect an accurately calibrated AC VTVM and a HD analyzer.
- (2) Connect an audio sine-wave generator to left AUX. input jack.
- (3) Apply AC power and rotate VOLUME control to maximum.
- (4) Adjust audio generator level for 19 watts output (12.5 V RMS @ 8 ohms). HD analyzer should read 1.0% or less. Audio generator level should be 200 mV or less.
- (5) Repeat preceding steps for RIGHT channel.

**NOTE** – On models with speaker fuse in B+ line or speaker common line, driving both channels to full output simultaneously may cause fuse to blow.

### AMPLIFIER ASSEMBLY # 85914 (E-V 1281 and E-V 1282)

**NOTE:** The power amplifier idling current (bias) and output balance controls must be checked and adjusted before final tests can be completed. The bias adjustment is made with the unit cool.

- (1) Connect a DC volt meter (observe correct polarity) across a 1.0 ohm emitter resistor\* (4) in the left channel output circuit. (Front of chassis)
- (2) Apply AC power to unit. Meter should read between 8 mV and 14 mV. If necessary adjust the output bias control (15 front) on output amplifier printed circuit for a reading between 8 mV and 14 mV. Optimum performance will be achieved with 10 mV setting.
- (3) Connect DC volt meter across a 1.0 ohm resistor (4) in the right channel output circuit (rear of chassis). Check and adjust if necessary (15 rear) for reading between 8 mV and 14 mV.
- (4) In parallel with LEFT channel load resistor, connect an accurately calibrated AC VTVM, oscilloscope and HD analyzer.

# SERVICING PROCEDURE

- (5) Connect an audio sine-wave generator to left AUX input jack.
- (6) Apply AC power and rotate VOLUME control to maximum.
- (7) Adjust audio generator level for 32 watts output (16 V @ 8 ohms). Drive output to clipping on positive and negative portions of sine-wave. Adjust 50 k $\Omega$  BALANCE control (31 front) for equal clipping if necessary.
- (8) Re-adjust input level to 32 watts output (16 V @ 8 ohms). Adjust HD analyzer – THD should be 1.0% or less. Audio generator input level should be 200 mV or less.
- (9) Repeat steps 4, 6, 7 and 8 for right channel. Adjust 50 k $\Omega$  BALANCE control (31 rear) for equal clipping if necessary.

NOTE – On models with speaker fuse in B+ line or speaker common line, driving both channels to full output simultaneously may cause fuse to blow.

## HUM AND NOISE

Hum and noise measurements are made under the following conditions:

1. Selector switch to AUX or Mag Phono.
2. Volume control set full counter-clockwise (CCW) or full clockwise (CW).
3. Input terminals either short-circuited or open circuited as noted.
4. AC VTVM across load resistors.

### E-V 1181/E-V 1182

Selector switch – Aux Input (Open-circuited)  
 Volume control CCW . . . . . 3.0 mV maximum  
 Volume control CW . . . . . 3.0 mV maximum  
 Selector switch – Mag Phono (Short-circuited)  
 Volume Control CW . . . . . 45 mV maximum

### E-V 1281/E-V 1282

Selector switch – Aux Input (Open-circuited)  
 Volume control CCW . . . . . 3.0 mV maximum  
 Volume control CW . . . . . 3.0 mV maximum  
 Selector switch – Mag Phono (Short-circuited)  
 Volume control CW . . . . . 50.0 mV maximum

## TONE CONTROL RESPONSE

The bass and treble controls have the following frequency response. Reference – Bass and Treble centered, AUX input 1000 Hz @ ½ watt (2.0 volts @ 8 ohms) output.

Bass & Treble control full clockwise (CW).  
 @ 100 Hz +12 dB  $\pm$  1 dB  
 @ 10 kHz +10 dB  $\pm$  1 dB

Bass & Treble control full counter-clockwise (CCW).  
 @100 Hz –11 dB  $\pm$  1 dB  
 @10 kHz –12 dB  $\pm$  1 dB.

## MAGNETIC PHONO RIAA\*

The magnetic phono amplifier has the following RIAA frequency response for both channels. Reference – Monitor TAPE OUTPUT, Input level 3.0 mV for all frequencies:

Frequency	Response
1 KHz	0 dB (reference)
500 Hz	+3 dB $\pm$ 1 dB
200 Hz	+8.5 dB $\pm$ 1 dB
100 Hz	+13.5 dB $\pm$ 1 dB
50 Hz	+16.0 dB $\pm$ 1 dB
2 KHz	-2.5 dB $\pm$ 1 dB
5 KHz	-8.0 dB $\pm$ 1 dB
10 KHz	-13.5 dB $\pm$ 1 dB
20 KHz	-19.5 dB $\pm$ 1 dB

Gain: 35 dB  $\pm$  1.5 dB @ 1 kHz

Hum & Noise: See "Hum and Noise"

## LOUDNESS SWITCH (E-V 1281/E-V 1282)

1. Generator to AUX input @ 1 kHz.
2. Adjust volume level to Tap (flat spot in rotation).
3. Set generator to 100 Hz.
4. Place Loudness Switch to "on" position. Output to read 4 dB above Tap reading. Check both channels.

## TAPE MONITOR SWITCH (E-V 1281/E-V 1282)

1. Generator to TAPE input, 1 kHz @ 170 mV.
2. Place TAPE MONITOR SWITCH to "on" position.
3. Adjust VOLUME control to obtain full output level.

## OUTPUT TERMINALS

Check the TAPE OUTPUT sockets for proper operation. On E-V 1281/1282 models check operation of MAIN and REMOTE speaker switches.

Check HEADPHONE JACK for proper operation.

## CLEANING

WARNING: Use only plain lukewarm water for moistening a freshly laundered, lint-free cloth to clean the front panel. Wipe dry with a dry, soft lint-free cloth.

\*RIAA (Record Industry Association of America)

# SERVICING PROCEDURE

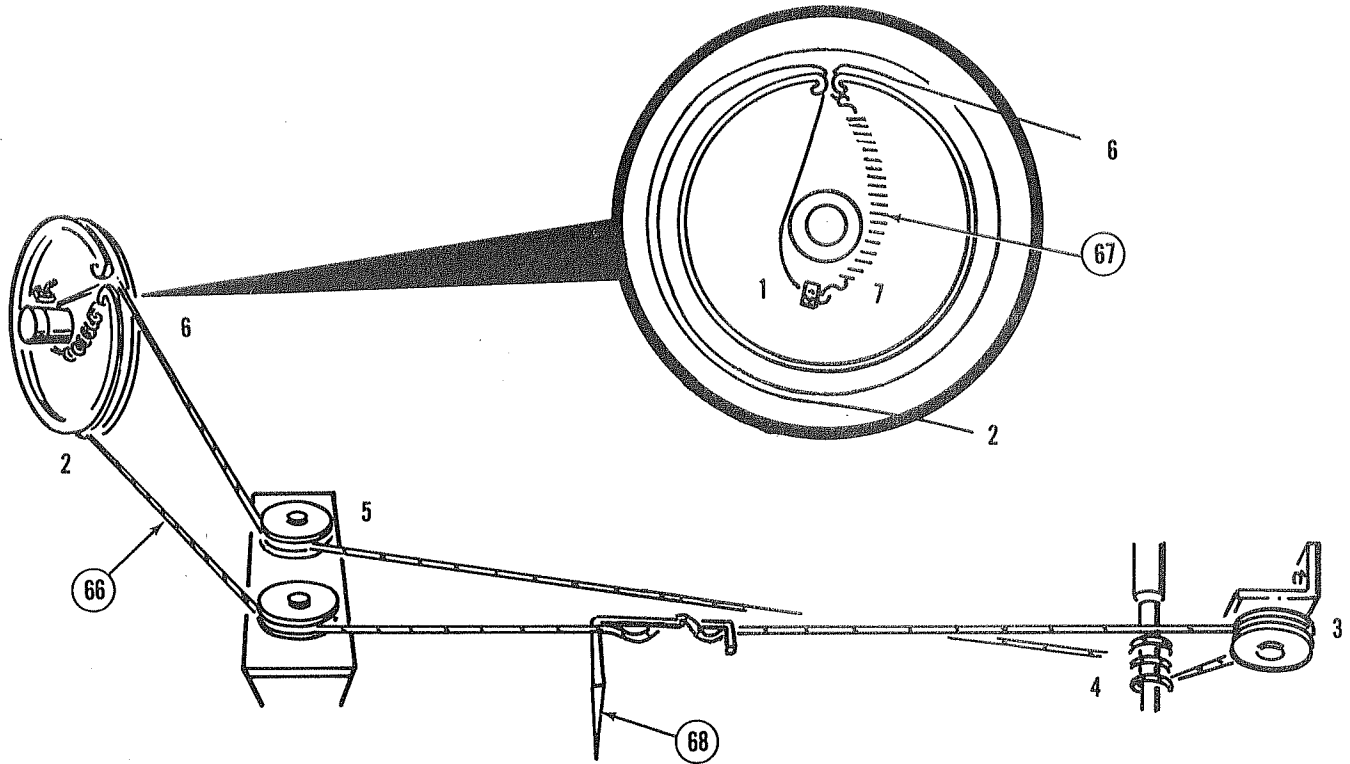


FIGURE 3

## DIAL CORD STRINGING

If it becomes necessary to restring and calibrate the dial cord and pointer proceed as follows:

1. Prepare dial cord to a length of 36 inches. (E-V #3088-05).
2. Close tuning capacitor VC (completely meshed).
3. String dial cord as illustrated above in Figure 3. Start at (1) and loop cord  $1\frac{1}{2}$  turns counter-clockwise around dial drum. Follow sequence with three turns around tuning shaft (4). Connect spring to tab on dial drum (7). Cut off excess dial cord.
4. Install dial pointer (68) as illustrated and reference to left end of dial scale at 88 MHz.
5. Place the unit in operation. Using a signal generator or broadcast station (of known frequency) tune the receiver to a frequency near 90 MHz. Adjust the dial pointer to the proper frequency.
6. Dial pointer tolerance is  $\pm 1$  pointer width. If unit does not track with this tolerance align FM and AM tracking.
7. Use an adhesive or lacquer and secure dial pointer to dial cord.

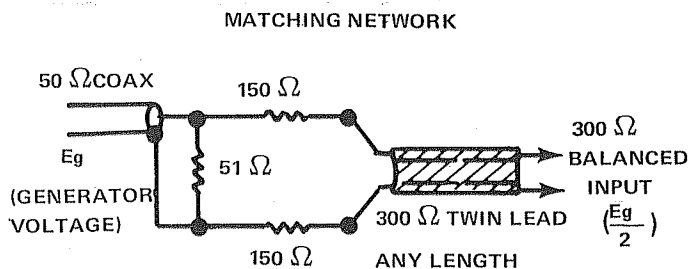


FIGURE 4

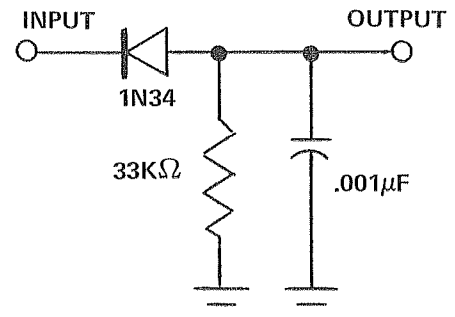


FIGURE 5

# SERVICING PROCEDURE

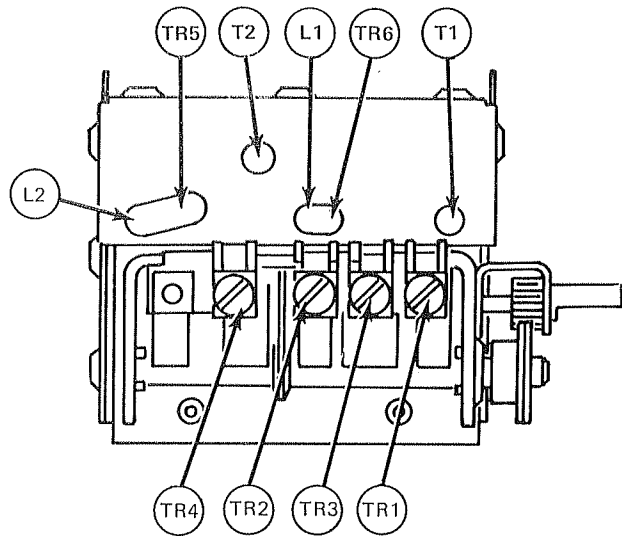


FIGURE 6

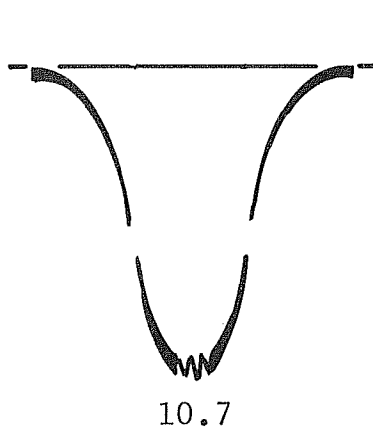


FIGURE 7

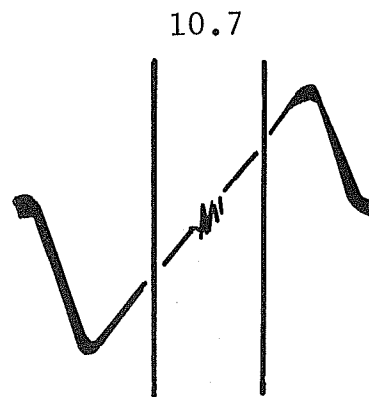


FIGURE 8

## FM ALIGNMENT

FM alignment is made under the following conditions:

1. Check dial pointer reference at  $90 \text{ MHz} \pm$  one pointer width. Refer to Dial Cord Stringing to calibrate.
2. Align unit in sequence indicated. Accurate adjustment can only be obtained by first sweep aligning unit and then fine aligning with signal generator.
3. Match signal generator impedance to FM 300 ohm balanced input impedance by using a balun match or matching network of Figure 4.
4. In signal generator alignment portion of procedure, generator carrier level can be adjusted  $2\text{--}5 \mu\text{V}$ . Final adjustment is made at  $2.5 \mu\text{V}$ , which is the "usable IHF sensitivity" of the tuner. Allow for the signal level ratio of impedance matching devices.
5. Ground test equipment to unit at points indicated.
6. Refer to schematics and pictorials on Pages 33-34 and Figure 6 for test points and other location information.
7. Selector switch (S2) to "FM"

# SERVICING PROCEDURE

## FM CHART

STEP	ALIGN	CONNECT		GENERATOR FREQUENCY	DIAL SETTING	ADJUST	ADJUST FOR
		INPUT	OUTPUT				
1A	Ratio detector	None	Observe tuning meter	None	Low end of dial at position with no received signal.	Rough tune TOP slug of T5	Center reading on tuning meter (on white noise)
1B	Ratio detector		DC VTVM to test point (TP3)				Maximum output (on white noise)
2	IF response	Connect sweep generator to test point (TP1) through .05 $\mu$ F capacitor. Ground on body of VC.	Connect oscilloscope to test point (TP2) through scope detector probe or network of Fig. 5. Connect ground lead to Point A.	10.7 MHz sweep with 10-7 MHz marker (decrease output level as you proceed)	Same as Step 1	TOP and BOTTOM slugs of T2, T3, & T4	Maximum gain & symmetry of Figure 7
3	"S" Curve	Same as Step 2	Connect oscilloscope to test point TP4.	Same as Step 2	Same as Step 1	TOP and BOTTOM slug of T5	maximum gain & symmetry of Fig. 8.
4	IF	Connect signal generator to 300 ohm FM input terminals. Use balun match or matching network of Figure 4.	Connect audio VTVM oscilloscope and HD analyzer (if available) to either TAPE OUTPUT jacks.	90 MHz 2.5 $\mu$ V 400 Hz modulation $\pm$ 75 kHz deviation	90 MHz tune for center of tuning meter.	TOP and BOTTOM slug of T2. * See NOTE	Maximum gain of audio output or minimum THD if HD analyzer is used.
5	Check meter center setting with no signal applied to unit. If necessary, repeat Step 1A.						
Attempt the following front end adjustment only if unit indicates to be weak and tuner tracking does not fall within the specified limits.							
6	RF tracking	Same as Step 4	Same as Step 4	106 MHz 2.5 $\mu$ V 400 Hz modulation $\pm$ 75 kHz deviation	Set to 106 MHz on dial scale	TR5	Maximum gain of audio output or minimum THD
7	RF tracking	Same as Step 4	Same as Step 4	90 MHz 2.5 $\mu$ V 400 Hz modulation $\pm$ 75 kHz deviation	Set to 90 MHz on dial scale	L2 - Squeeze or spread	Maximum gain of audio output or minimum THD
8	Repeat Steps 6 & 7 until both ends of dial fall into calibration						
9	RF	Same as Step 4	Same as Step 4	90 MHz 2.5 $\mu$ V 400 Hz modulation $\pm$ 75 kHz deviation	90 MHz tune for center of tuning meter.	T1 & L1	Maximum gain of audio output or minimum THD
10	RF	Same as Step 4	Same as Step 4	106 MHz 2.5 $\mu$ V 400 Hz modulation $\pm$ 75 kHz	106 MHz tune for center of tuning meter.	TR1 & TR2	Maximum gain of audio output or minimum THD
11	Repeat Steps 9 & 10 until no further improvement is obtained						

\* NOTE— It may be necessary to slightly readjust T3 BOTTOM and TOP slugs only if they show indication of being off adjustment.

# SERVICING PROCEDURE

## FM MULTIPLEX ALIGNMENT

Alignment of the FM multiplex circuit is made under the following conditions:

1. Check alignment of the FM IF circuits before attempting multiplex alignment. Improper IF alignment will make proper MPX alignment impossible.
2. Connect test equipment to points indicated.
3. Adjust the multiplex generator to the following carrier strength and modulation levels.
  - a. RF carrier level 100  $\mu$ V @ 98 MHz.
  - b. Pilot carrier (19 kHz) 8 %
  - c. Main carrier (R + L) 40%
  - d. Sub carrier (R - L) 40%.
  - e. Modulate left or right channel with 1000 Hz where indicated.
4. Refer to schematics and pictorials on Pages 35, and 36 for test points and other location information.
5. Selector switch (S2) to "FM"

STEP	ALIGN	CONNECT		DIAL SETTING	ADJUST	V.T.V.M.
		INPUT	OUTPUT			
1	SCA filter (67 KHz)	67 KHz signal input point "A" on MPX pc board	Connect V.T.V.M. to test point TP5	No received signal	L4 (SCA coil)	Minimum
2	FM Stereo signal separation	Connect stereo generator to FM 300 ohm input. Use balun match or matching network of Figure  Adjust generator modulation to percentages stated above using right channel modulation (1000 Hz)	Connect V.T.V.M. to point "C" on MPX pc board (Right)	98 MHz (or carrier frequency)	T11 (19 KHz coil)	Maximum output
3			Connect V.T.V.M. to point "D" on MPX pc board (Left)		T12 (38 KHz coil)	Minimum output (null)
4			Connect V.T.V.M. to point "C" on MPX pc board (Right)		50 K $\Omega$ phase phase control (27)	Maximum separation between left and right
5	Repeat Steps 2, 3 and 4 until a separation of 20 dB or better is obtained.					
6	Apply LEFT channel modulation and check output balance.					
7	Turn pilot carrier off. Stereo light should go off.					

## AM ALIGNMENT E-V Models 1182 and 1282 only

AM alignment is made under the following conditions:

1. Use a radiating loop connected to signal generator output to radiate test signals to the AM ferrite rod antenna. The radiating loop should consist of three turns of insulated wire (12 inch diameter) orientated perpendicular to the length dimension of the ferrite rod.
2. During alignment keep generator output at lowest usable level.
3. Modulate AM signal 400 Hz at 30%.
4. Refer to schematics and pictorials on Pages 14, 37, and 40 for test points and other location information.
5. Selector switch (S2) to "AM"

STEP	CONNECT		DIAL SETTING	ADJUSTMENT
	INPUT	OUTPUT		
1	600 KHz Modulated 400 Z 30%	Meter and scope TAPE output	600 KHz	Adjust oscillator coil (T2) for maximum signal.
2	1400 KHz Modulated 400 Hz 30%	Same as Step 1	1400 KHz	Adjust oscillator trimmer (TR4) for maximum signal.
3	Repeat Steps 2 & 3 until the dial pointer tracks properly at both ends of dial scale.			
4	1400 KHz Modulated 400 Hz 30% (Use weak generator signal)	Same as Step 1	1400 KHz	Adjust RF Trimmer (TR3) for maximum signal.
5	1400 KHz Modulated 400 Hz 30% (Use weak generator signal)	Same as Step 1	1400 KHz	Adjust IF transformer (T1) primary and secondary (T3) and (T4) for maximum signal.
6	1400 KHz Modulated 10 KHz 30%	Same as Step 1	1400 KHz	Adjust whistle filter coil (L1) for minimum signal. (See NOTE*)
7	Adjust AM output level control (R16) as follows: Place selector switch to FM. Tune in station and observe output level. Place selector switch to AM and adjust (R16) to give AM output a proportional level to FM.			

\* NOTE - If AM signal generator cannot be modulated at 10 KHz, inject 10 KHz audio signal at test point (TP6).

# TROUBLE SHOOTING

This part of the service manual is intended to provide information to help locate and correct difficulties which might occur. This service manual provides overall schematics on both the E-V 1181/1182 series and the E-V 1281/1282 series. In addition the printed circuit assemblies are further detailed in individual schematics and pictorials as trouble shooting aids. The pictorials are component-side views of the printed circuit board assembly with a x-ray view of the foil pattern.

Always be sure you are using the correct service material when trouble shooting. The Mag Phono-Input, Power Supply, Mother and Power Amp printed circuit assemblies have different configurations between the E-V 1181/1182 and E-V 1281/1282 series.

Trouble shooting information is divided into three sections. The first section "HINTS" contains information of a general nature and engineering changes which have been incorporated.

The second section consists of the trouble shooting charts which call out specific problems that may occur and lists one or more conditions or components which could cause the difficulty. In many cases the information given in the trouble shooting chart will be sufficient for you to pin-point the defective component or assembly and correct it without further trouble shooting. Occasionally, however, especially when more than one sub-assembly can cause the same symptoms you must make further checks to determine which component is at fault. In all cases, check for damaged or poor; solder connections, wire-wrap connections and other obvious troubles.

The third section "General Problems" lists problems which occur but are not necessarily the fault of the unit. Generally these problems are a result of natural phenomena, age, wear, or charge build-up conditions from external sources.

## TROUBLE SHOOTING HINTS

**CAUTION** It takes only an instant for an accidental short to destroy one or more semiconductors. Be careful not to drop metallic objects into the set while the power is on. Pull the line cord out of the AC outlet before removing assemblies or components.

### LINE FUSE

The primary side of the 120 volt AC power transformer (T13) has a 1 amp slow-blow Line Fuse. If this fuse opens, the receiver and auxiliary socket will be dead. This fuse should never open unless component failure has occurred and the unit requires servicing.

### SPEAKER FUSE(S)

The speaker fuses protect the output stage and the speaker voice coil from excessive current. Never use a fuse larger than the specified amperage rating. Do not use "slow-blow" fuses.

There are three (3) versions of wiring on the speaker fuse(s).

Fuse Location	E-V 1181/1182 Rating	E-V 1281/1282 Rating
B+ Line	1.5A	2A
Speaker Gnd Return	2A	3A
Output Line (2 fuses)	1.5A	2.5A

### RESISTANCE CHECKS

The following resistance checks are provided to help determine if a defect is present in the B+ path. Other than the proper readings indicate serious damage to the power amplifier, power supply, etc. These readings must be within  $\pm 20\%$  of the figures in the charts.

The checks are made with the ohmmeter range switch on Rx100. Connect the negative ohmmeter lead to chassis ground and connect the positive lead to test points indicated in the table on the power supply pc assembly. Set the receiver selector switch to the positions indicated.

Use the highest obtainable ohmmeter reading (the reading after the meter indication stops increasing).

#### E-V 1181/1182

TEST POINT	AUX	FM	AM
C	13 K $\Omega$	---	---
D	12 K $\Omega$	500 $\Omega$	3.3 K $\Omega$
E	6.5 K $\Omega$	---	---
F	11 K $\Omega$	1.2 K $\Omega$	3.6 K $\Omega$

#### E-V 1281/1282

TEST POINT	AUX	FM	AM
C	20 K $\Omega$	---	---
D	17 K $\Omega$	530 $\Omega$	3.3 K $\Omega$
E	6.5 K $\Omega$	---	---
F	15 K $\Omega$	1.7 K $\Omega$	4.5 K $\Omega$

### LOOSE HARDWARE

Check all hardware in the unit to make sure it is secure. Loose hardware may otherwise drop out and cause problems in the unit. Screws securing printed circuit boards should be snug but not tight.

### SOLID STATE DEVICES

If an output or driver transistor becomes defective (open or shorts), always check ALL direct-coupled transistors and diodes in that channel. In addition, check the bias control (E-V 1281/1282), and other components in the bias network, before installing replacement transistors. All output and driver transistors in one channel may be destroyed if the bias network is defective. On E-V models 1281/1282 after parts replacement, always check the bias control adjustment for specific idling current.

Integrated circuits (IC) contain the equivalent of many circuit components. The preferred trouble shooting procedure requires isolating the trouble to one stage using AC signal tracing methods. Once the suspected stage is located, the DC voltages at the input and output leads of the IC can be measured to give an accurate indication of the operating conditions. DO NOT use an ohmmeter to check continuity with the IC mounted on the printed circuit board. Forward biasing the internal junctions within the IC may burn out the transistors. Do not replace a defective IC until all external resistors, capacitors and transformers are checked first, to prevent the replacement IC from failing immediately due to a defect in the connecting components. Solder and unsolder each lead separately using pliers or other heat sink device on the leads to prevent damage from excessive heat. Check that the leads are connected to the correct locations on the printed circuit board.

A transistor tester should be used to determine the condition of the transistors and diodes. Ohmmeter checks do not provide conclusive data and may even destroy the junction(s) within the smaller devices.

# TROUBLE SHOOTING

In some applications, replacement transistors must be made from the same beta group as the original type. Where this condition exists E-V has assigned special part numbers to these transistors and they are indicated by a double asterisk (\*) in the part lists and component lead location charts. Be sure to note this information when replacing these transistors.

## PIN POST - POST RECEPTACLE

Intermittent contact can result between Pin Posts and Post Receptacles. If this condition is found, remove the PC assembly to a point where the sliding spring contact on the post receptacle can be adjusted.

## CEMENTED ITEMS

If a cemented item should become loose, replace it with a general radio cement.

## ADHESIVES

Larger capacitors have an adhesive to help secure them to PC boards. If one of these capacitors is replaced, it is suggested that a commercial adhesive, such as rubber cement, be used to help secure it.

## OVERHEATING

If a unit tends to overheat under normal operating conditions check bias control adjustments and/or voltages on driver and output transistors. The bias adjustment can easily cause output transistors to run away and destroy themselves. This adjustment is to be made with the amplifier board fairly cool. If the output transistors are fairly warm adjustment will result in a higher than normal current.

## EXTERNAL AM ANTENNA

In some custom installations, particularly in buildings constructed of steel, the built-in AM ferrite loopstick antenna used on either the E-V 1182 or E-V 1282 Receiver may not provide adequate AM reception. In such cases, a long wire AM antenna (30' for best results) can be connected to the antenna terminal with black lead (normally pin #1) The wire should be installed outdoors as high as possible. The lead may be passed through a window or other available opening near the Receiver.

## TROUBLE SHOOTING CHART

TROUBLE	CAUSE	TROUBLE	CAUSE
<b>AMPLIFIER</b>			
Unit completely dead.	Open line fuse. Defective switch. Defective power cord. defective power transformer.	Unbalanced output with all inputs.	Defective balance control. Defect in tone or amplifier pc board.
Selector lamps light but no sound or output.	Open speaker fuse(s). Open power supply diode(s). Defective tone pc board. Defective power transformer. Speaker switch(es) turned "off". Defective speaker switch. Monitor switch "on".	Distortion in output at high levels either channel.	Output transistor. Driver transistor. Pre-driver transistor. 1 $\Omega$ resistor. 150 $\Omega$ bias control. Defective bias diode. Defective electrolytic coupling capacitor.
Left channel dead or right channel dead	Check speaker wiring. Open speaker fuse. Defective tone pc board. Defective amplifier pc board. Defective electrolytic coupling capacitor. Defective speaker switch. Defective post-receptacle. Defective S2B wafer.	Open speaker fuse(s).	Check right channel speaker wiring. Shorted output transistor. Shorted driver transistor.
One or more selector or dial lights inoperative.	Lamp not making contact. Defective lamp. Defective socket. Poor contact on S2A or S2C wafer.	Unbalanced output with magnetic phono only.	Unbalanced phonograph cartridge. Defective phono PEC. Defective 5 $\mu$ F/15V coupling capacitor.
No output from headphones. Speakers okay.	Check wiring at headphone jack. Defective 560 $\Omega$ resistor. Defective headphone jack.	Distorted output from both channels in all selector switch positions.	Low Voltages. Check voltages at points C, D, E, & F in power amplifier and tone preamp.
		<b>HUM</b>	
		Both channels - all volume settings - all inputs.	Defective power supply diodes or filter capacitors. Loose hardware. Broken wire lead or loose solder connection. Defective pin-post receptacle.



# TROUBLE SHOOTING

Right or left channel - all inputs - all volume settings.

Defective amplifier - output transistor, driver transistor, predriver transistor.  
Broken wire lead or loose solder connection.  
Defect in tone-preamp board.

FM reception normal, FM STEREO lamp lights, but no stereo separation.

Multiplex circuit not properly aligned.  
Stereo-Mono switch in "MONO" position.  
Poor FM IF alignment.

Either channel or both channels.

Source not properly grounded.  
Defect in tone-preamp board.

Stereo indicator does not light on stereo broadcasts.

Defective indicator #GE 1819.  
Defective \*\*2N3568 transistor.

Will not meet specifications.

Reverse line cord.  
Tape monitor switch lead dress.  
Poor shielding.  
Poor pin-post connection.  
Tone-Preamp board mounting.

Tuning meter inoperative.

Tuning meter defective.  
Ratio detector transformer improperly adjusted.  
Poor FM IF alignment.

Tone control(s) does not operate properly.

Check components which effect tone circuits.  
Dirty control.

FM reception weak and noisy

FM tuning unit not aligned properly.  
Defective FM tuner.  
Defective 12V Zener diode.

No magnetic phono equalization or poor equalization.

PEC.  
Power supply filter capacitor.

FM STEREO lamp lights on white noise.

Normal condition.

## NOISE

Noise in amplifier varying with volume control.

SE4002 Transistor

FM STEREO lamp lights on all FM stations.

Defect in multiplex circuit.

Noise in magnetic phono varying with volume control.

PEC

Stations not appearing at proper place on dial (within one pointer width).

Poor dial calibration and tracking (See Alignment).

## FM TUNER

Dial and meter lamps light but no output.  
Tune meter does not operate.

Defective 12V Zener diode.  
Defective 12V filter capacitor.  
Defective 1.2 k $\Omega$  2W resistor.  
\*See note for 1281/1282.  
Defect in FM tuner or IF amplifier assembly: IC, transformer, PEC.  
Check voltages.

Dial and meter lamps light but no output.  
Tune meter operates.

Defect in multiplex assembly: transistor, coupling capacitor, Transformer, etc. Check voltages.

Output from just one FM channel.

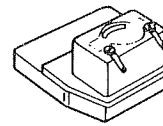
Defect in multiplex assembly: PEC, 5  $\mu$ F/15V coupling capacitor, 1N542 diode. Defective pin-post receptacle.  
Defect in tone-preamp board: Transistor, coupling capacitor. Defect in S2B wafer.

FM reception normal, FM STEREO lamp does not light and no stereo reproduction. Lamp good.

Multiplex circuit not properly aligned.  
Defect in multiplex circuit: Transistor push-push circuit, T11, T12, etc.

## TUNING METER

Tune meter does not read zero (center) when unit is "OFF".



Remove the meter from its mounting clip.

Remove tape over small hole.  
Take care not to damage the movement in any way.

Use a small non-magnetized tool. Adjust lever one way or the other for a center reading.

## AM TUNER

No sound or weak sound on AM only.

Open or broken rod antenna.  
Incorrect AM alignment.  
Defective transistor, IC, transformer, diode, etc.

Noise but no stations heard on AM only.

Defective oscillator circuit.  
Open rod antenna.  
Broken or loose antenna lead.

Distorted output on AM only.

Incorrect AM alignment.  
Diode D1.

\*The 1.2 K 2W resistor is operating near wattage rating and may be heat discolored. (Models E-V 1281/1282).

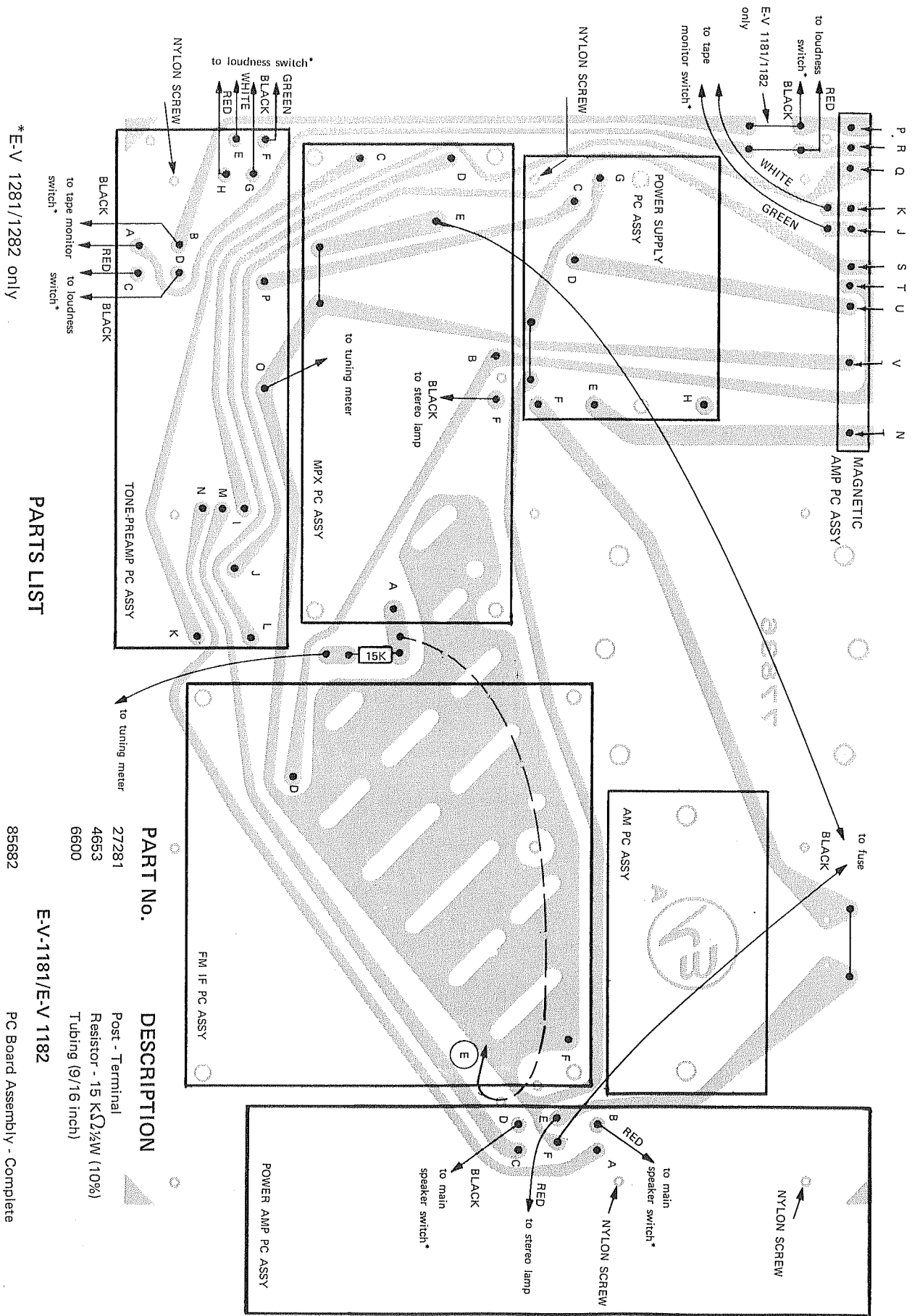
**GENERAL PROBLEM SECTION**

If the unit is otherwise operating satisfactorily, the more common causes of trouble may generally be attributed to the following:

PROGRAM	SYMPTOM	PROBABLE CAUSE	WHAT TO DO
AM, FM or MPX reception	A. Constant or intermittent noise heard at certain times or in a certain area.	<p>Discharge or oscillation caused by electrical appliances, such as fluorescent lamps, TV sets, DC motors, rectifier and oscillator.</p> <p>Natural phenomena, such as atmospheric static and thunderstorms.</p> <p>Insufficient antenna input due to reinforced concrete walls or long distance from the station.</p> <p>Wave interference from other electrical appliances.</p>	<p>Attach a noise limiter to the electrical appliance that causes the noise, or attach it to the power source of the amplifier.</p> <p>Install an outdoor antenna and ground the amplifier to raise the signal-to-noise ratio.</p> <p>Reverse the power cord plug-receptacle connections.</p> <p>If the noise occurs at a certain frequency, attach a wave trap to the ANT input.</p> <p>Place the set away from other electrical appliances.</p>
AM reception	<p>A. Noise heard at a particular time of day, in a certain area or over part of the dial.</p> <p>B. High-frequency noise.</p>	<p>Natural AM reception phenomenon.</p> <p>Adjacent-channel interference or beat interference.</p> <p>TV set is too close to the audio system.</p>	<p>In some cases, the noise can be eliminated by grounding the amplifier or reversing the power cord plug-receptacle connections.</p> <p>Tuners with AM pc board assembly, #77346 have a 10 kHz beat filter. See AM alignment.</p> <p>Place the TV set away from the audio system.</p>
FM reception	<p>A. Noisy</p> <p>B. Intermittent noise.</p> <p>C. "Scratch-like" noise is heard.</p> <p>D. Tuning noise between stations.</p>	<p>Poor noise limiter effect or too low S/N ratio due to insufficient antenna input.</p> <p>NOTE: FM reception is affected considerably by the conditions of the transmitting stations power, antenna efficiency and antenna location and height. As a result, you may receive one station quite well while having difficulty receiving another station.</p> <p>FM signals from distant stations may be reflected off of aircraft and arrive at the antenna along with the normal transmitted signal. These two signals can add and subtract from each other causing an intermittent strong and weak signal.</p> <p>Ignition noise caused by the starting of an automobile.</p> <p>This noise results from the nature of FM reception. As the station signal becomes weak, the noise limiter effect is decreased. The amplification of the limiter, in turn, is enlarged and a noise is generated.</p>	<p>Adjust the antenna provided for maximum signal strength. If this is not effective, use an outdoor antenna designed exclusively for FM. If a TV antenna is used for both TV and FM, use a signal divider to make sure TV reception is not affected.</p> <p>General FM reception will vary with distant stations. It is not uncommon for a distant station with a strong signal to fade out to nothing.</p> <p>An excessively long antenna may cause noise.</p> <p>Aircraft will leave area.</p> <p>Install the antenna and its lead-in wire away from the road or raise the antenna input as previously described.</p> <p>Increase the volume.</p>

PROGRAM	SYMPTOM	PROBABLE CAUSE	WHAT TO DO
FM-MPX reception	<p>A. Noise heard during FM-MPX reception while not heard during FM mono reception.</p> <p>B. Clearness of channel separation is decreased during reception.</p> <p>C. The stereo indicator goes on and off.</p> <p>D. The stereo indicator lights but no station.</p> <p>E. Noise on one or more stereo stations but not all stereo stations.</p>	<p>The primary service area of the FM-MPX broadcast is only half that of the FM mono broadcast.</p> <p>Excess heat.</p> <p>Interference.</p> <p>Tuner white noise contains many different frequencies of which 19 kHz is one. This noise generated at 19 kHz (pilot frequency) is sufficient to light the stereo indicator.</p> <p>Station transmitting noise. All stations do not hold specs close and some can be noisy.</p>	<p>Install the antenna for maximum antenna input.</p> <p>Make sure that air can flow underneath the amplifier.</p> <p>The indicator is not at fault. See "Intermittent noise" under FM reception.</p> <p>Normal condition.</p>
Record playing or tape playback	<p>A. Hum or howling.</p> <p>B. Surface noise.</p>	<p>Record player placed directly on the speaker box.</p> <p>Connecting cables not properly shielded.</p> <p>Shielded wire too close to line cord, fluorescent lamp or other electrical appliances.</p> <p>Nearby amateur radio station or TV transmission antenna.</p> <p>Worn or old record.</p> <p>Worn pickup needle.</p> <p>Dusty needle.</p> <p>Improper needle pressure.</p> <p>Dirty and/or static playback head.</p>	<p>Put a cushion between the player and the speaker box or separate them.</p> <p>Use shielded cables which should be as short as possible.</p> <p>Check soldering and connections. Make sure plug is properly in socket.</p> <p>Turn the BASS control from midpoint to left.</p> <p>Consult the nearest Radio Regulatory Bureau.</p> <p>Turn the TREBLE control properly from midpoint to left.</p> <p>Replace worn pickup needle.</p> <p>Adjust needle pressure in accordance with manufacturer's recommendations.</p> <p>Clean and demagnetise tape recorder heads in accordance with manufacturer's recommendations.</p>
Overall stereo programs	<p>A. The BALANCE control is not at midpoint when equal sound comes from left and right channels.</p> <p>B. No sound from either speaker.</p>	<p>It is important to adjust the control for equal sound from both channels. It should not always be set to midpoint.</p> <p>Tape monitor switch is "on."</p> <p>Either speaker switch is "off."</p>	<p>Set the MODE switch to the MONO position and then set the BALANCE control to the position where equal sound comes from both channels.</p>

# MOTHER PC BOARD ASSEMBLY



\* E-V 1281/1282 only

## PARTS LIST

PART NO.	DESCRIPTION
27281	Post - Terminal
4653	Resistor - 15 K $\Omega$ 1/4W (10%)
6600	Tubing (9/16 inch)

85682

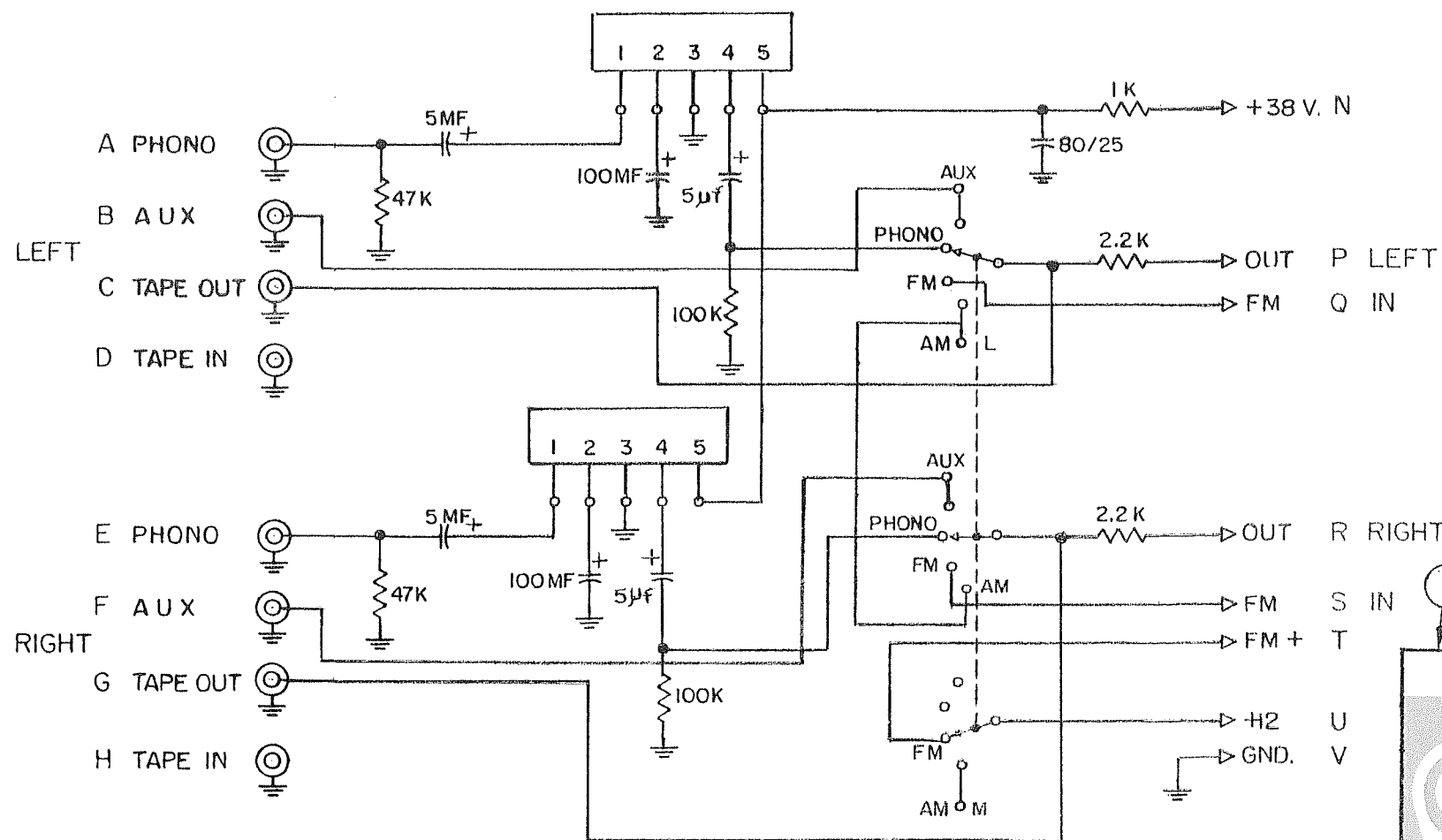
PC Board Assembly - Complete

E-V 1281/E-V 1282

85905

PC Board Assembly - Complete

# MAGNETIC PHONO PC BOARD ASSEMBLY

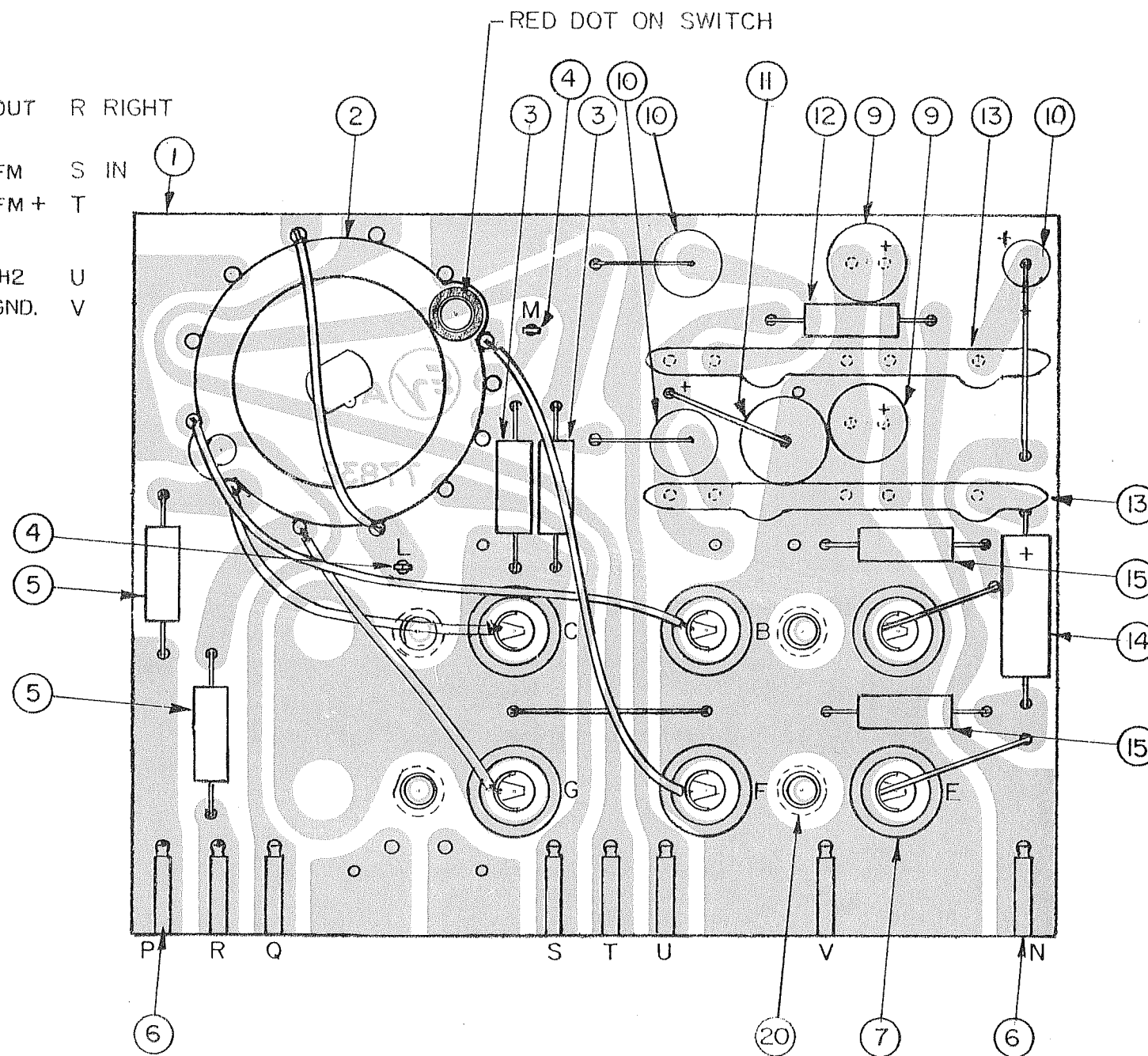


SCHEMATIC

## PARTS LIST

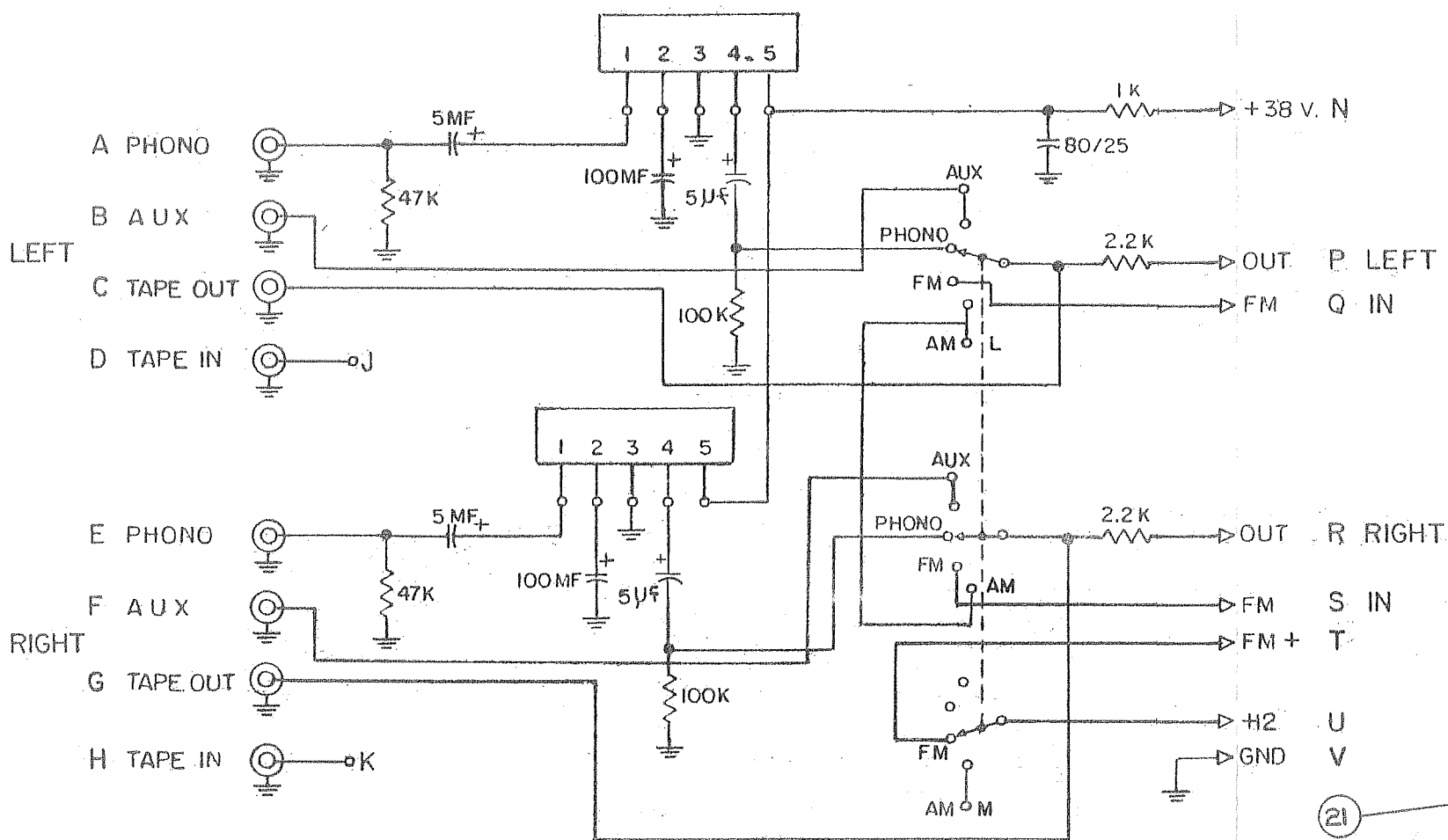
(E-V 1181/E-V 1182)

REF. No.	PART No.	DESCRIPTION
1	85683	PC Board Assembly - Complete
2	56096	Wafer - Switch (S2B)
3	4695	Resistor - 100 kΩ ½W (10%)
4	27281	Post - Terminal
5	4676	Resistor - 2.2 kΩ ½W (10%)
6	27283	Receptacle - Terminal
7	17184	Phono Socket
9	42439	Capacitor - Electrolytic 100 µF/3V
10	42365	Capacitor - Electrolytic 5 µF/15V
11	42431	Capacitor - Electrolytic 80 µF/25V
12	4693	Resistor - 1 kΩ ½W (10%)
13	77864	P.E.C. - Mag Phono
14	42365	Capacitor - Electrolytic 5 µF/15V
15	4668	Resistor - 47 kΩ ½W (10%)
20	20825	Standoff



X-RAY SIDE - COMPONENT SIDE

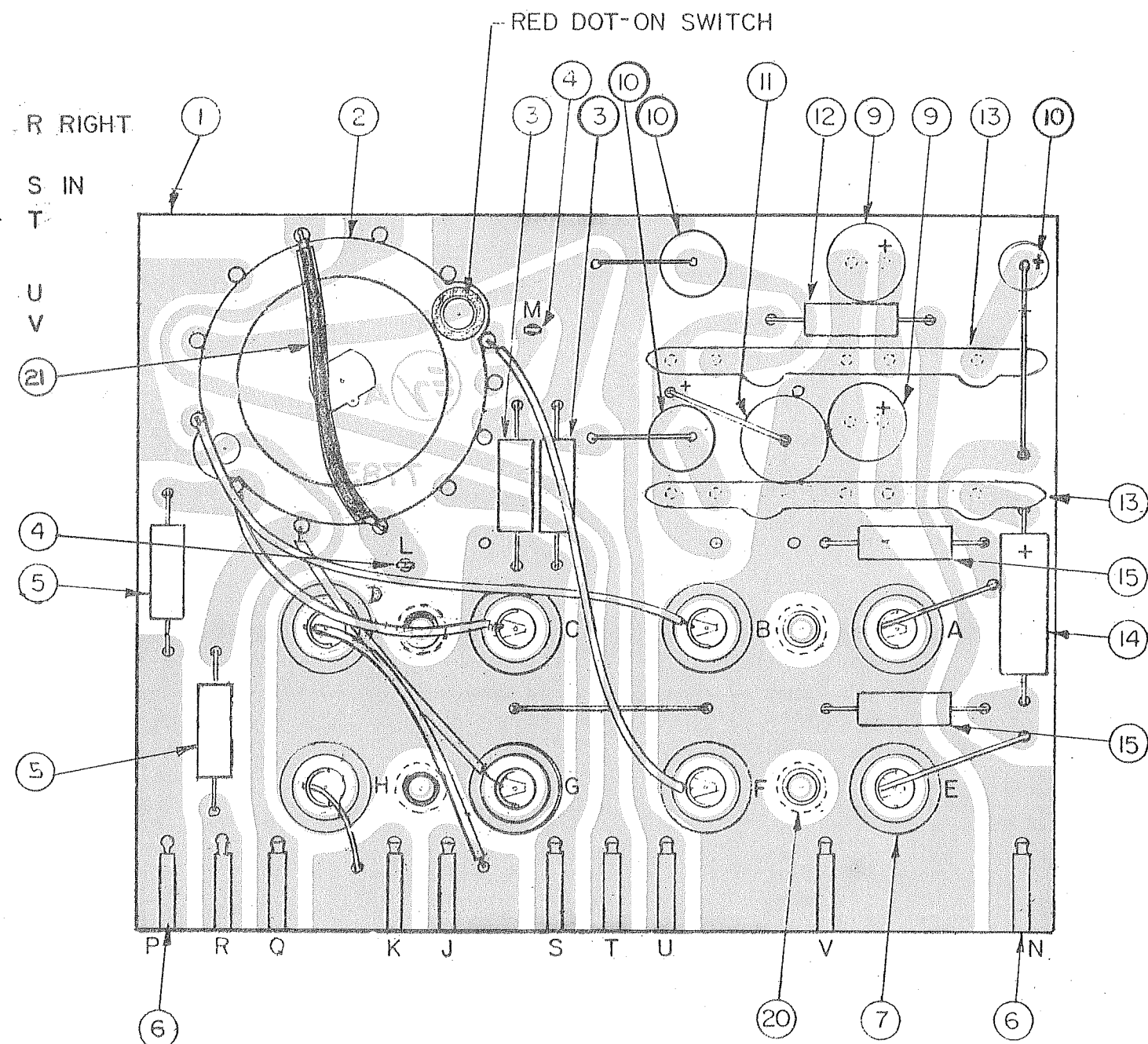
# MAGNETIC PHONO PC BOARD ASSEMBLY



## SCHEMATIC

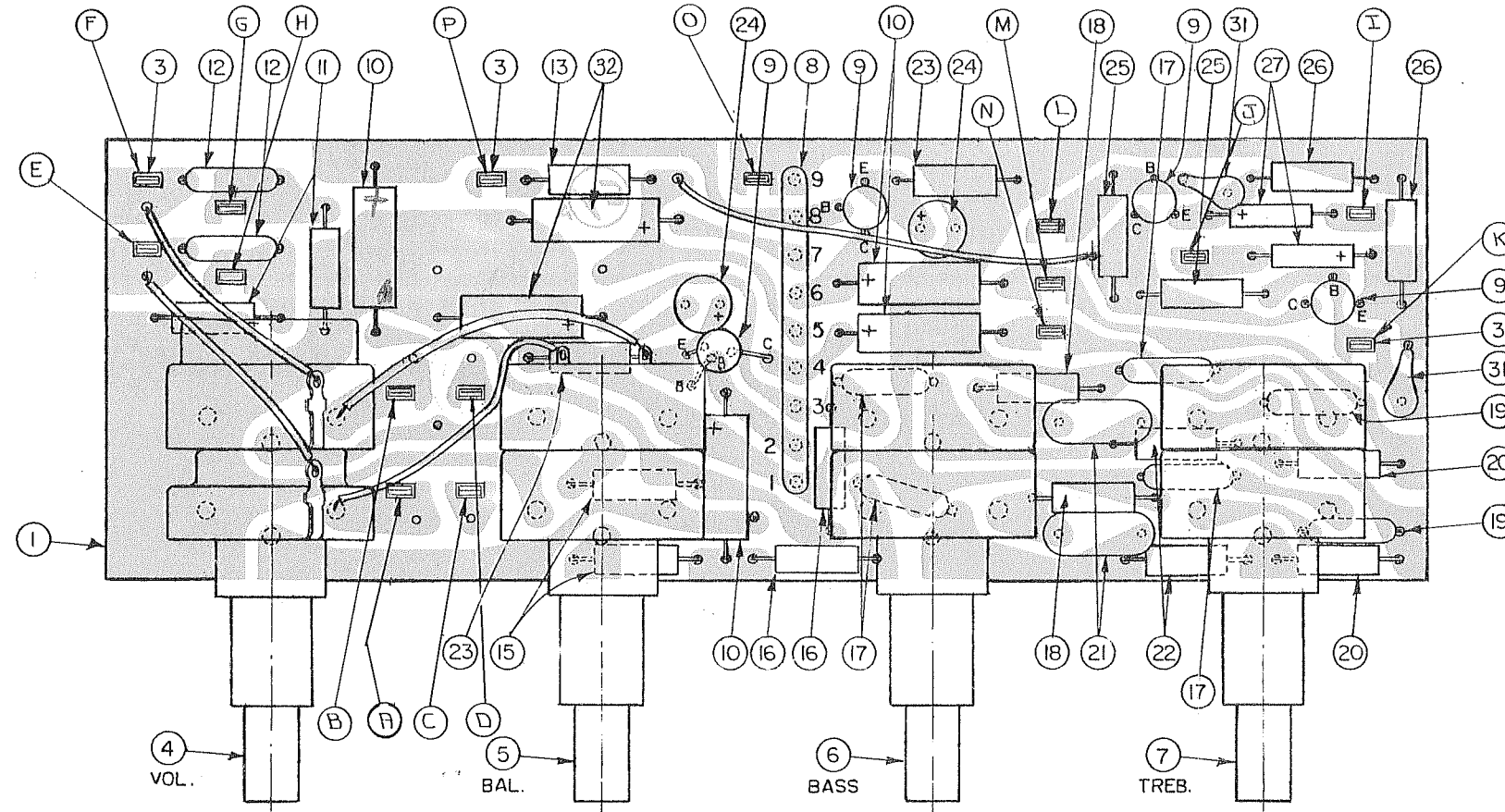
### PARTS LIST (E-V 1281/E-V 1282)

REF No.	PART No.	DESCRIPTION
1	85898	P C Board Assembly - Complete
2	56096	Wafer - Switch (S2B)
3	4695	Resistor - 100 kΩ ½W (10%)
4	27281	Post - Terminal
5	4676	Resistor - 2.2 kΩ ½W (10%)
6	27283	Receptacle - Terminal
7	17184	Phono Socket
9	42439	Capacitor - Electrolytic 100 µF/3V
10	42365	Capacitor - Electrolytic 5 µF/15V
11	42431	Capacitor - Electrolytic 80 µF/25V
12	4693	Resistor - 1 kΩ ½W (10%)
13	77864	P.E.C. - Mag Phono
14	42365	Capacitor - Electrolytic 5 µF/15V
15	4668	Resistor - 47 kΩ ½W (10%)
20	20825	Standoff
21	6606	Tubing (1 inch)

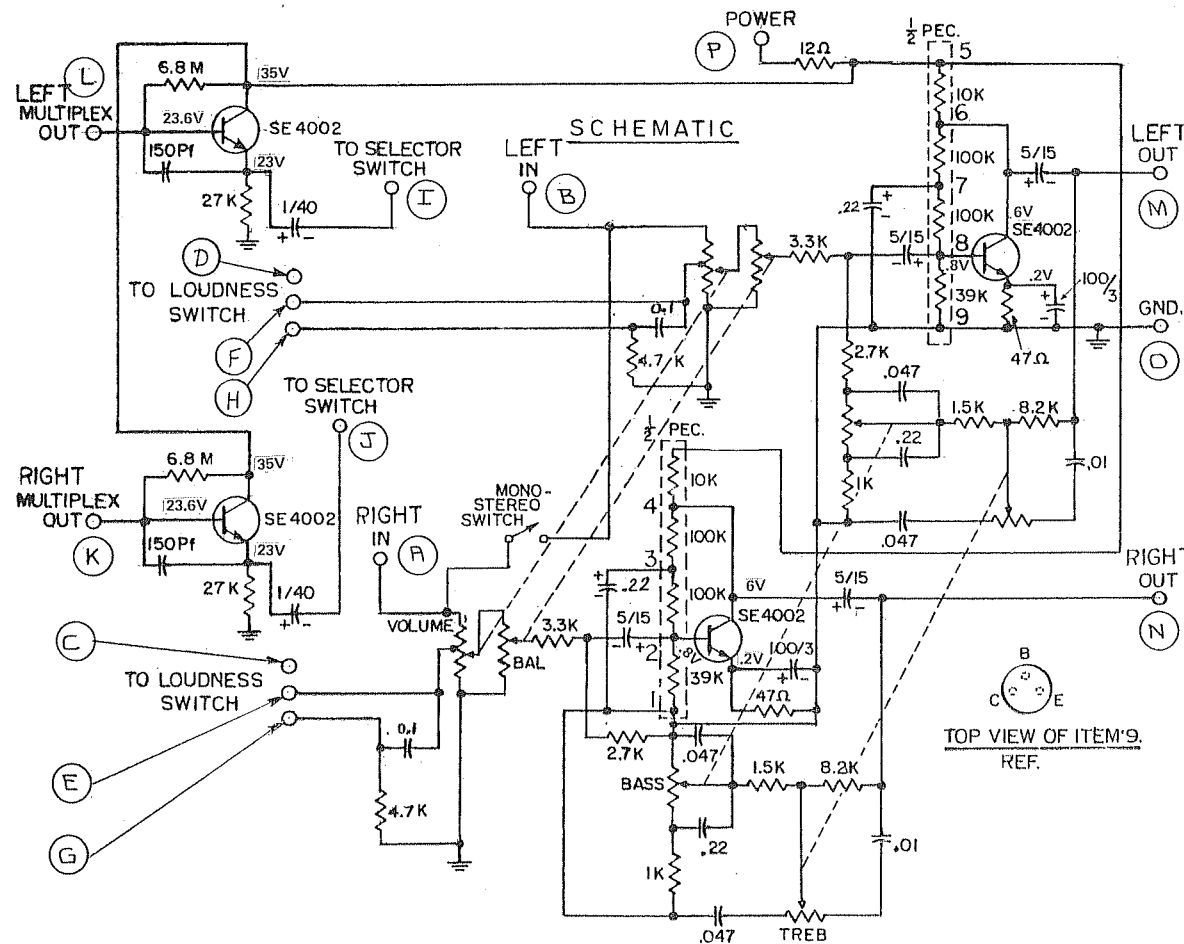


X-RAY VIEW - COMPONENT SIDE

# STONE PC BOARD ASSEMBLY



X-RAY VIEW - COMPONENT SIDE



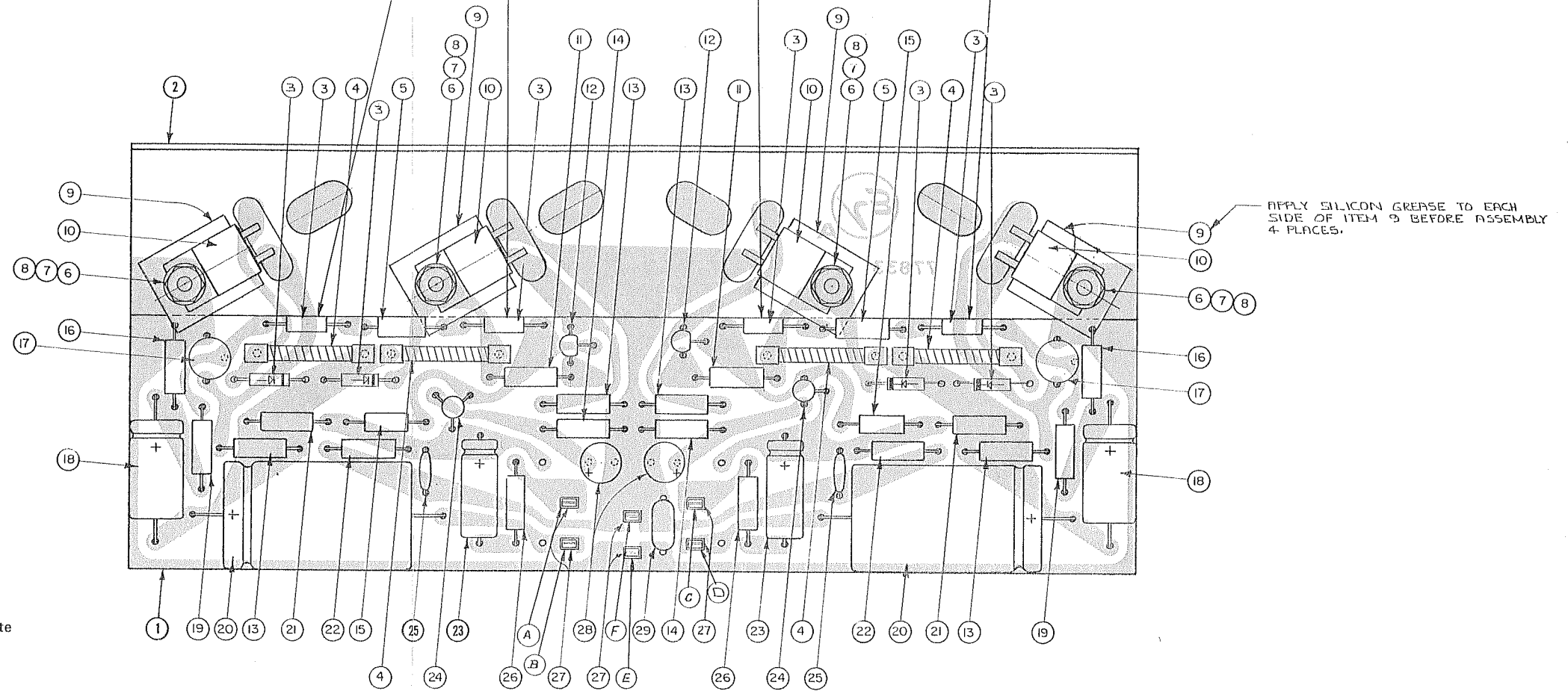
## PARTS LIST

REF. No.	PART No.	DESCRIPTION
1	86354	PC Board Assembly - Complete
3	27282	Receptacle - Terminal
4	46565	Control - Volume 25 kΩ
5	46411	Control - Balance 25 kΩ
6	46413	Control - Bass 100 kΩ
7	46414	Control - Treble 50 kΩ
8	77865	P.E.C. - Bias Network
9	43045	Transistor (SE4002)
10	42365	Capacitor - Electrolytic 5 μF/15V
11	4675	Resistor - 4.7 kΩ 1/2W (10%)
12	42363	Capacitor - Foil .1 μF
13	46328	Resistor - 12 Ω 1/2W (10%)
15	46017	Resistor - 3.3 kΩ 1/2W (10%)
16	46036	Resistor - 2.7 kΩ 1/2W (10%)
17	42371	Capacitor - Foil .047 μF
18	4693	Resistor - 1 kΩ 1/2W (10%)
19	42367	Capacitor - Foil .01 μF
20	46031	Resistor - 8.2 kΩ 1/2W (10%)
21	42442	Capacitor - Mylar .22 μF
22	46046	Resistor - 1.5 kΩ 1/2W (10%)
23	46035	Resistor - 47 Ω 1/2W (10%)
24	42439	Capacitor - Electrolytic 100 μF/3V
25	46239	Resistor - 6.8 kΩ 1/2W (10%)
26	4651	Resistor - 27 kΩ 1/2W (10%)
27	42525	Capacitor - Electrolytic 1.5 μF/35V
31	42454	Capacitor - Disc 150 pF
32	42470	Capacitor - Mylar .22 μF

# AMPLIFIER PC BOARD ASSEMBLY

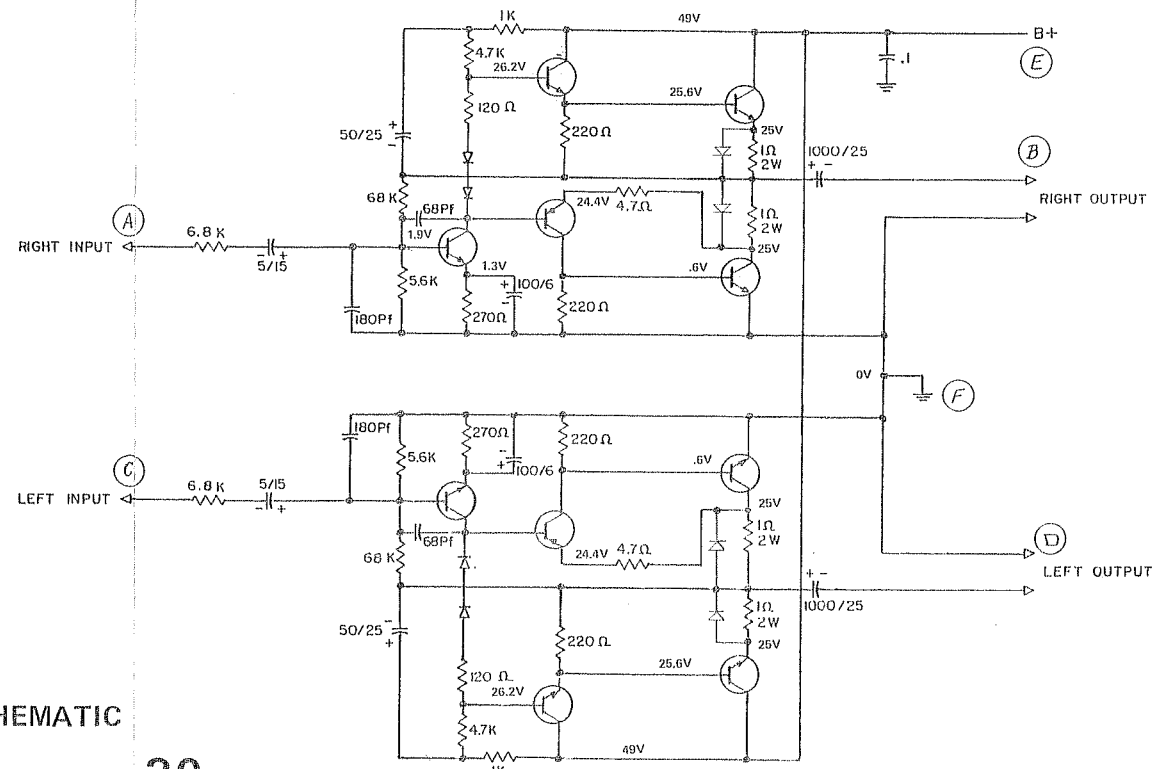
APPLY SILICON GREASE BETWEEN  
ITEMS 3 AND HEAT SINK BEFORE  
ASSEMBLY 4 PLACES.

X-RAY VIEW - COMPONENT SIDE



PARTS LIST  
(E-V 1181/E-V 1182)

REF. No.	PART No.	DESCRIPTION
1	85685	P C Board Assembly - Complete
2	77785	Mtg. Bracket - Heat Sink
3	43067	Diode (SD-1)
4	46427	Resistor - 1 $\Omega$ 2W
5	46250	Resistor - 120 $\Omega$ 1/2W (10%)
6	20261-AD	Nut - Hex (4-40)
7	3843-AD	Lockwasher (#4)
8	L60328-BP	Screw - Phillips (4-40 x 1/2)
9	20959	Insulator
10	43078	Transistor - Power (2N5493)
11	46424	Resistor - 4.7 $\Omega$ 1/2W (10%)
12	43089	Transistor - Driver (2N4143)
13	4664	Resistor - 220 $\Omega$ 1/2W (10%)
14	46034	Resistor - 270 $\Omega$ 1/2W (10%)
15	42453	Capacitor 68 pf
16	4693	Resistor - 1 k $\Omega$ 1/2W (10%)
17	43088	Transistor - Driver (2N3252)
18	42455	Capacitor - Electrolytic 50 mF/25V
19	4675	Resistor - 4.7 k $\Omega$ 1/2W (10%)
20	42449	Capacitor - Electrolytic 1000 mF/25V
21	46019	Resistor - 68 k $\Omega$ 1/2W (10%)
22	46054	Resistor - 5.6 k $\Omega$ 1/2W (10%)
23	42365	Capacitor - Electrolytic 5 $\mu$ F/15V
24	43110	Transistor - Pre-driver (RCA40360)
25	42454	Capacitor - Disc 150 pF
26	46050	Resistor - 6.8 k $\Omega$ 1/2W (10%)
27	27282	Receptacle - Terminal
28	42439	Capacitor - Electrolytic 100 mF/3V
29	42363	Capacitor
	38415	Washer - Fiber

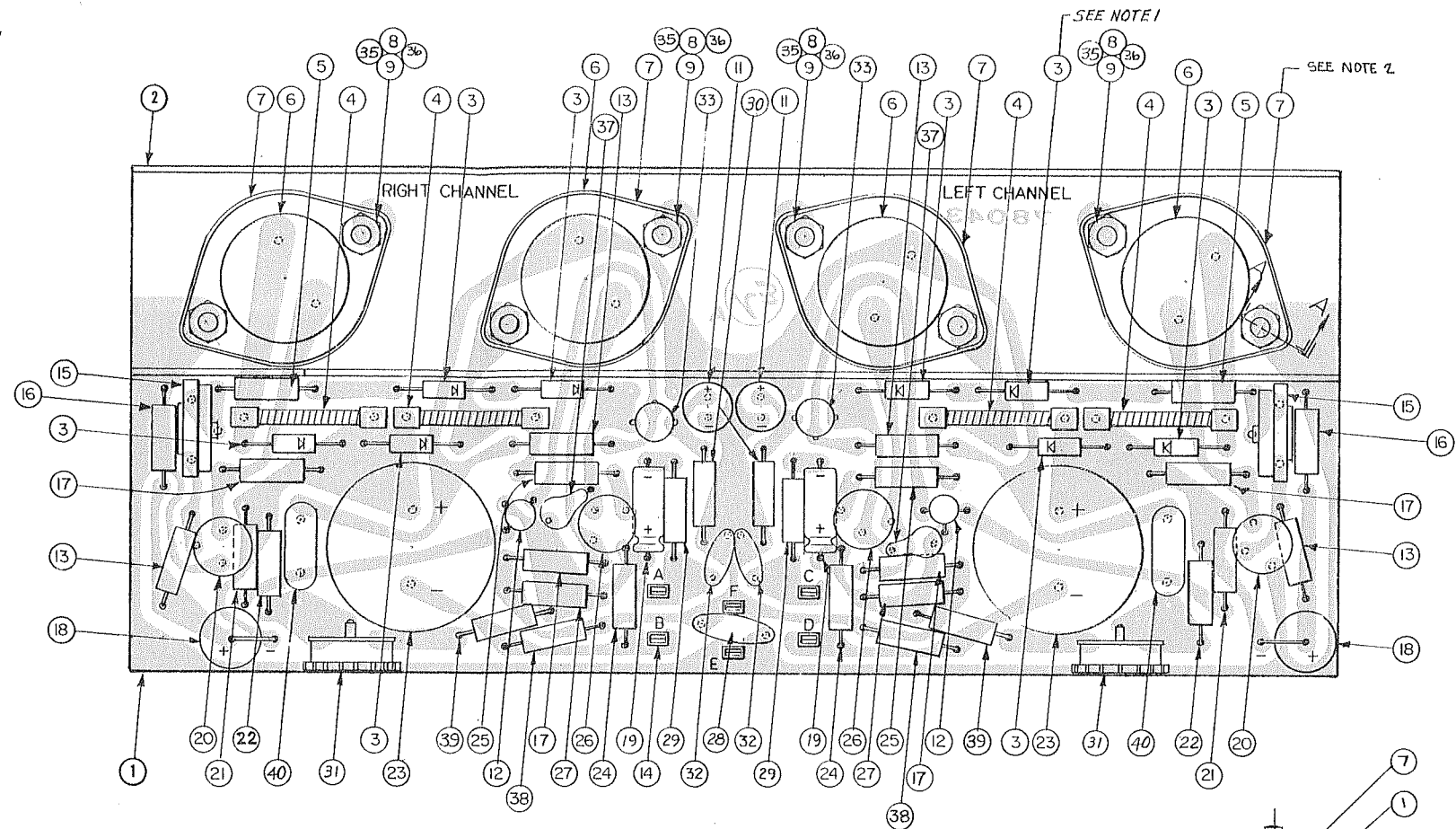


SCHEMATIC



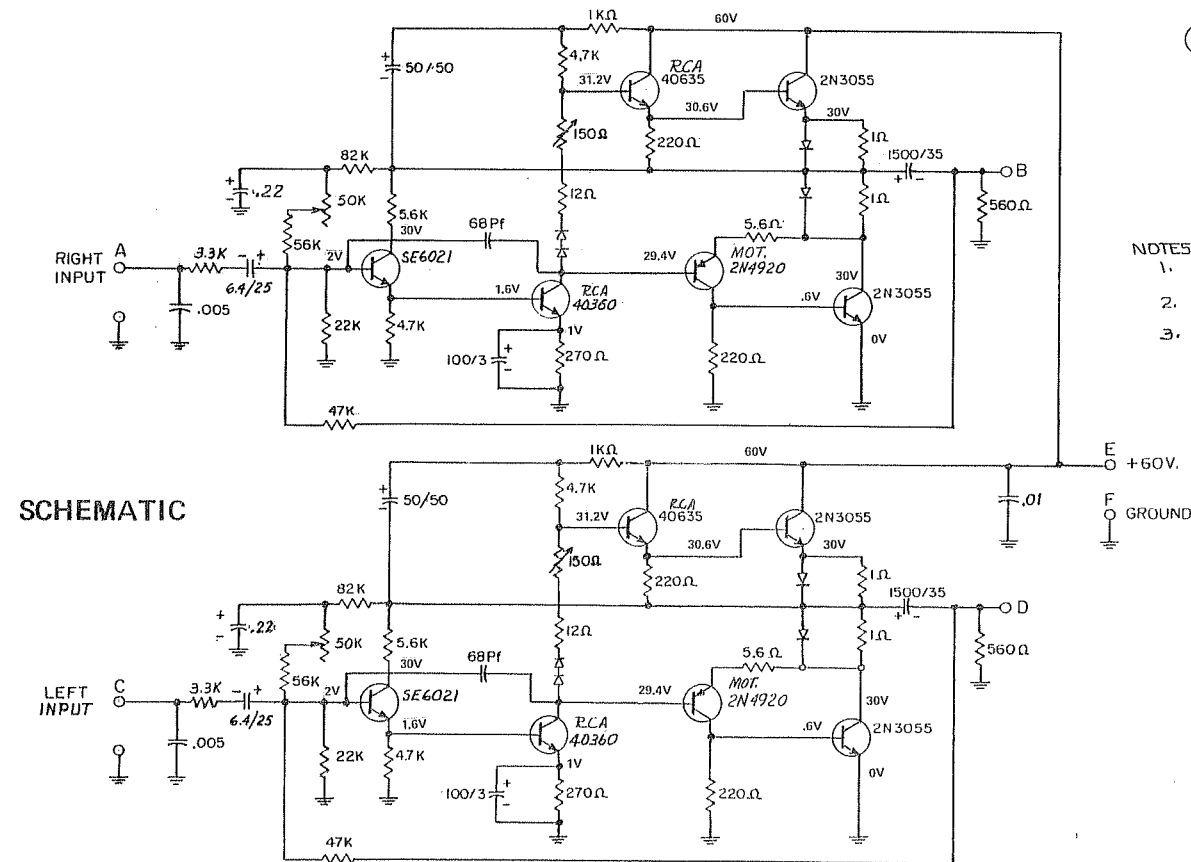
# AMPLIFIER PC BOARD ASSEMBLY

X-RAY VIEW - COMPONENT SIDE



PARTS LIST  
(E-V 1281/E-V 1282)

REF. No.	PART No.	DESCRIPTION
1	85914	PC Board Assembly - Complete
2	78044-JD	Mtg. Bracket - Heat Sink
3	43067	Diode (SD-1)
4	46427	Resistor - 1 $\Omega$ 2W (10%)
5	46328	Resistor - 12 $\Omega$ 1/2W (10%)
6	43168	Transistor - Power (2N3055)
7	20747	Insulator - Mica
8	L60328-BP	Screw - Phillips (4-40 x 1/2)
9	20261-AD	Nut (4-40)
11	42439	Capacitor - Electrolytic 100 $\mu$ F/3V
12	43169	Transistor - Input (SE6021)
13	4675	Resistor - 4.7 k $\Omega$ 1/2W (10%)
14	27282	Receptacle - Terminal
15	46522	Control - Bias 150 $\Omega$
16	4693	Resistor - 1 k $\Omega$ 1/2W (10%)
17	4664	Resistor - 220 $\Omega$ 1/2W (10%)
18	42492	Capacitor - Electrolytic 50 $\mu$ F/50V
19	42478	Capacitor - Electrolytic 6.4 $\mu$ F/25V
20	43166	Transistor - Driver (RCA 40635)
21	46054	Resistor - 5.6 k $\Omega$ 1/2W (10%)
22	4696	Resistor - 82 k $\Omega$ 1/2W (10%)
23	42486	Capacitor - Electrolytic 1500 $\mu$ F/35V
24	4668	Resistor - 47 k $\Omega$ 1/2W (10%)
25	46521	Resistor - 5.6 $\Omega$ 1/2W (10%)
26	43179	Transistor - Driver (2N4920) 4)
27	46269	Resistor - 22 k $\Omega$ 1/2W (10%)
28	42452	Capacitor - Disc .01 $\mu$ F/100V
29	46017	Resistor - 3.3 k $\Omega$ 1/2W (10%)
30	46034	Resistor - 270 $\Omega$ 1/2W (10%)
31	46426	Control - Balance 50 k $\Omega$
32	42491	Capacitor - Disc .005 $\mu$ F/100V
33	43165	Transistor - Predriver (RCA 40360)
35	38415	Washer - Fiber
36	3843-AD	Lockwasher (#4)
37	42453	Capacitor - Ceramic 68 pf
38	46119	Resistor - 560 $\Omega$ 1/2W (10%)
39	4652	Resistor - 56 k $\Omega$ 1/2W (10%)
40	42470	Capacitor - Mylar .22 $\mu$ F

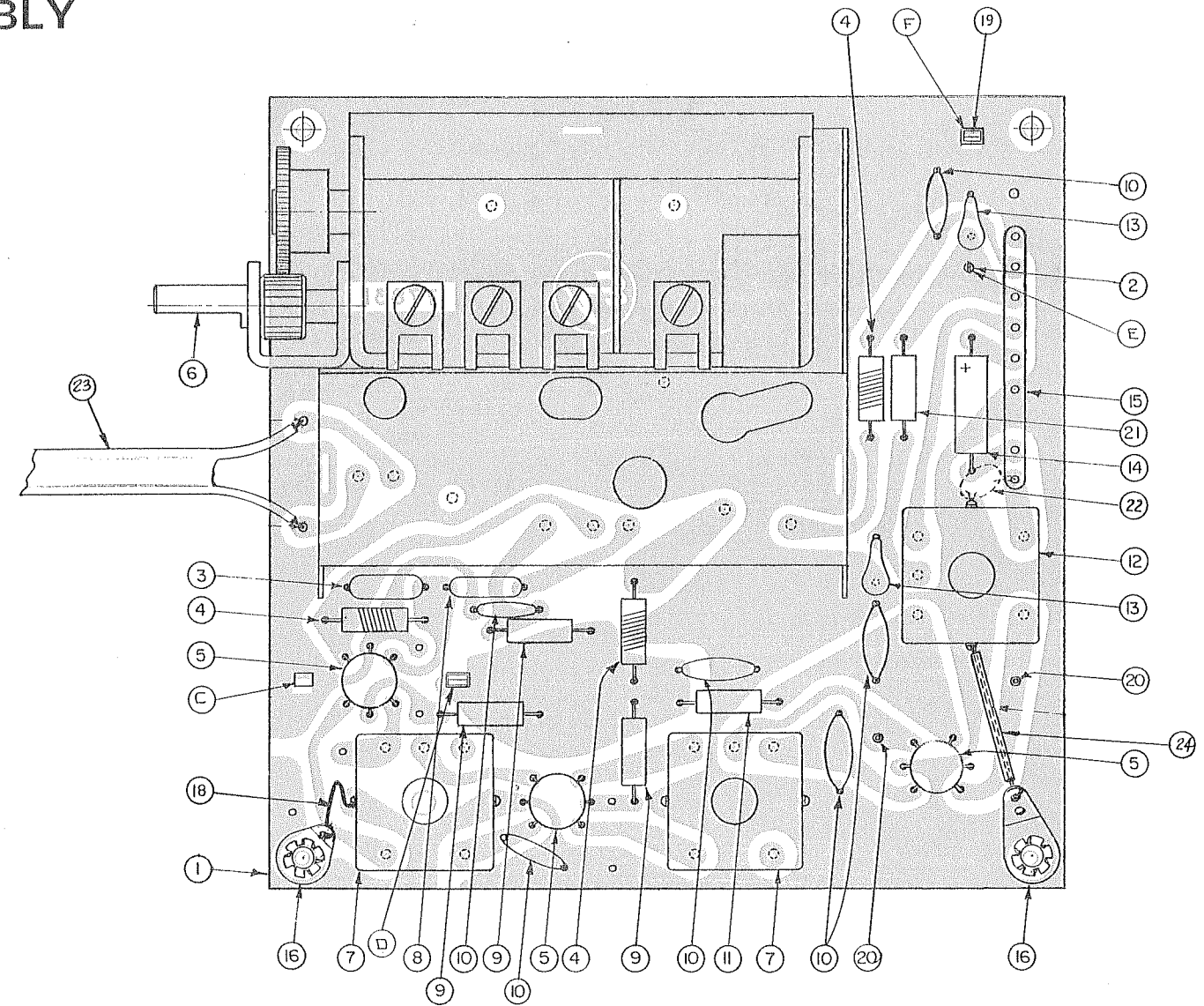


- NOTES:
1. APPLY SILICON GREASE BETWEEN ITEM 3 AND ITEM 1 4 PLACES.
  2. APPLY SILICON GREASE TO ITEM 7 BOTH SIDES, 4 PLACES BEFORE ASSEMBLY.
  3. ITEM 23 TO BE GLUED TO ITEM 1 WITH E.V.N. 97019.

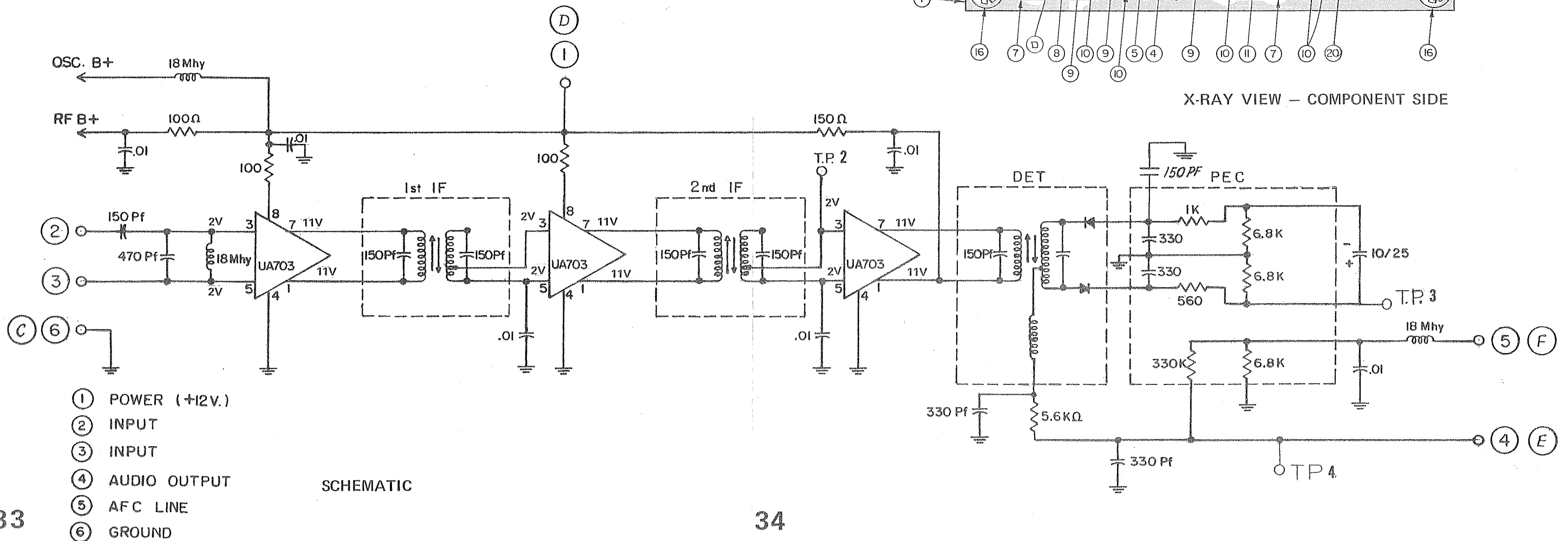
# FM PC BOARD ASSEMBLY

## PARTS LIST

REF. No.	PART No.	DESCRIPTION
1	85697	PC Board Assembly - Complete
2	27281	Terminal Post
3	42398	Capacitor - Poly 470 pF
4	15218	Choke 18 mH
5	77511	Integrated Circuit (UA703)
6	85604	FM Tuning Assembly - Complete
7	15214	IF Transformer
8	42399	Capacitor - Poly 150 pF
9	46140	Resistor - 100 $\Omega$ 1/2W (10%)
10	42452	Capacitor - Disc .01 $\mu$ F/100V
11	46149	Resistor - 150 $\Omega$ 1/2W (10%)
12	15215	Detector Transformer
13	42396	Capacitor - 330 pF Ceramic
14	42394	Capacitor - 10 $\mu$ F/14V Electrolytic
15	77866	P.E.C. - Detector
16	27057	Lug - Solder
19	27282	Receptacle - Terminal
20	27259	Post - Terminal
21	46054	Resistor - 5.6 k $\Omega$ 1/2W (10%)
22	42454	Capacitor - Ceramic 150 pF
23	16031-04	Twin Lead - RF (300 $\Omega$ )
24	6606	Tubing (1 inch)



X-RAY VIEW - COMPONENT SIDE



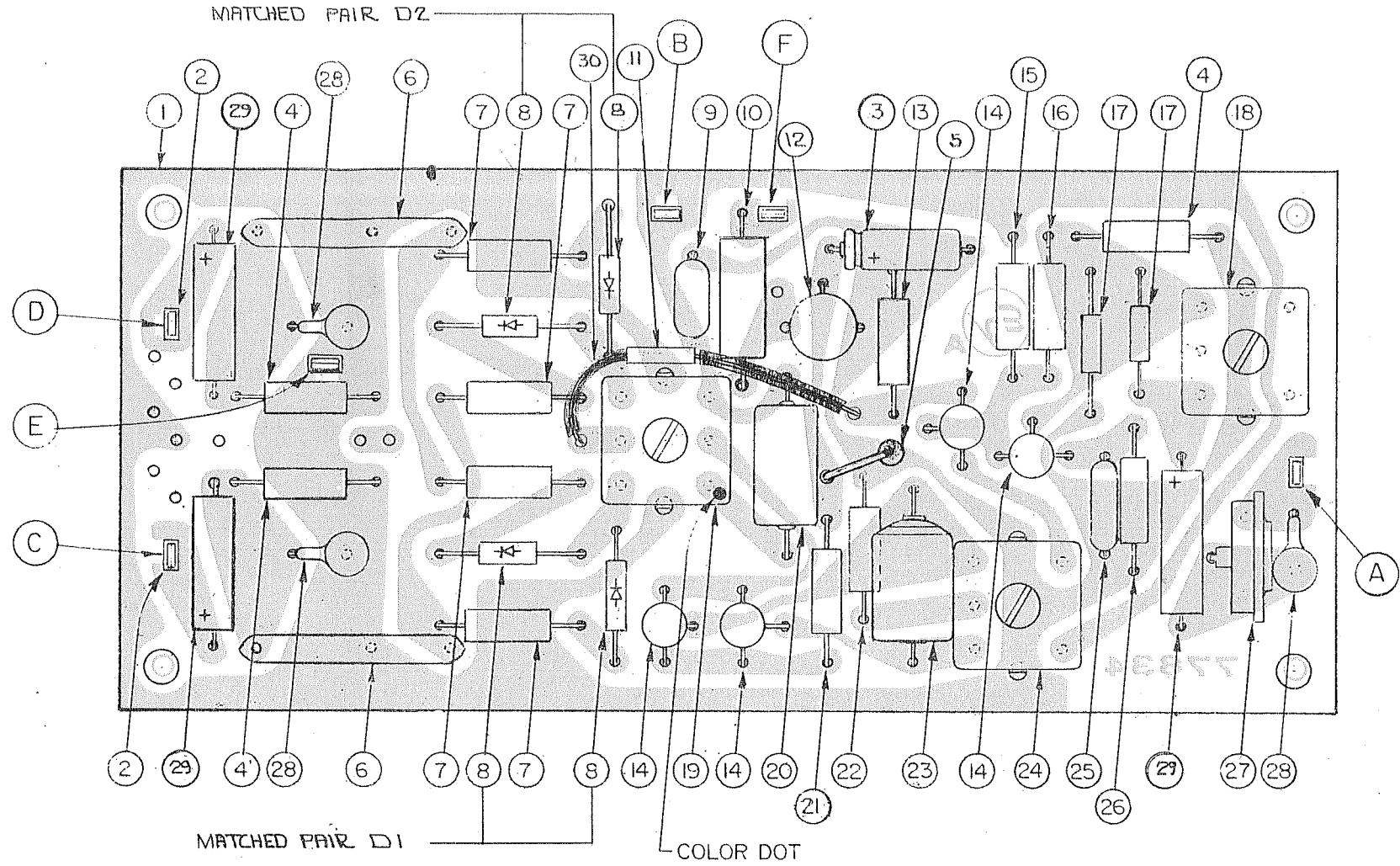
SCHEMATIC

# MULTIPLEX PC BOARD ASSEMBLY

## PARTS LIST

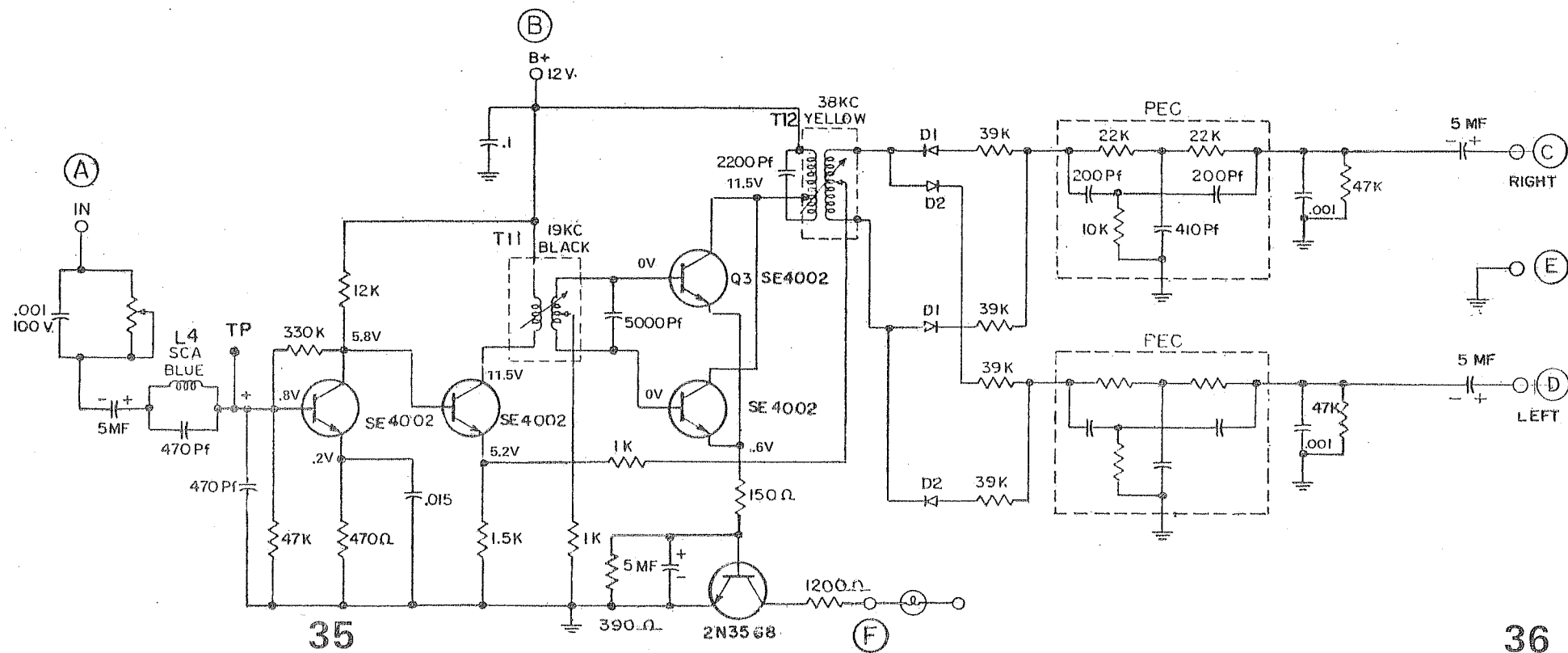
REF. No.	PART No.	DESCRIPTION
1	85915	P C Board Complete - Complete
2	27282	Receptacle - Terminal
3	42363	Capacitor - Electrolytic 5 $\mu$ F/15V
4	4668	Resistor - 47 k $\Omega$ 1/2W (10%)
5	46334	Resistor - 390 $\Omega$ 1/2W (10%)
6	15194	P.E.C. - 38 kHz Filter
7	4697	Resistor - 39 k $\Omega$ 1/2W (10%)
8	43069	Diode - Matched Pair (1N542)
9	42363	Capacitor - Foil .22 $\mu$ F
10	46523	Resistor - 1200 $\Omega$ 2W (10%)
11	4693	Resistor - 1 k $\Omega$ 1/2W (10%)
12	43113*	Transistor (2N3568)
13	46046	Resistor - 1.5 k $\Omega$ (10%)
14	43045	Transistor (SE4002)
15	4649	Resistor - 12 k $\Omega$ 1/2W (10%)
16	4685	Resistor - 330 k $\Omega$ 1/2W (10%)
17	42398	Capacitor - Poly 470 pF
18	15206	Coil-SCA Filter
19	15207	Transformer (38 kHz)
20	42441	Capacitor - Poly 2200 pF
21	46149	Resistor - 150 $\Omega$ 1/2W (10%)
22	4693	Resistor - 1 k $\Omega$ 1/2W (10%)
23	42440	Capacitor - Poly 5000 pF
24	15205	Transformer (19 kHz)
25	42367	Capacitor - Foil .01 $\mu$ F
26	4654	Resistor - 470 $\Omega$ 1/2W (10%)
27	46426	Control - Phase 50 k $\Omega$
28	42402	Capacitor - Ceramic 1000 pF
29	42365	Capacitor - Electrolytic 5 $\mu$ F/15V
30	6606	Tubing (1 inch)

X-RAY VIEW - COMPONENT SIDE



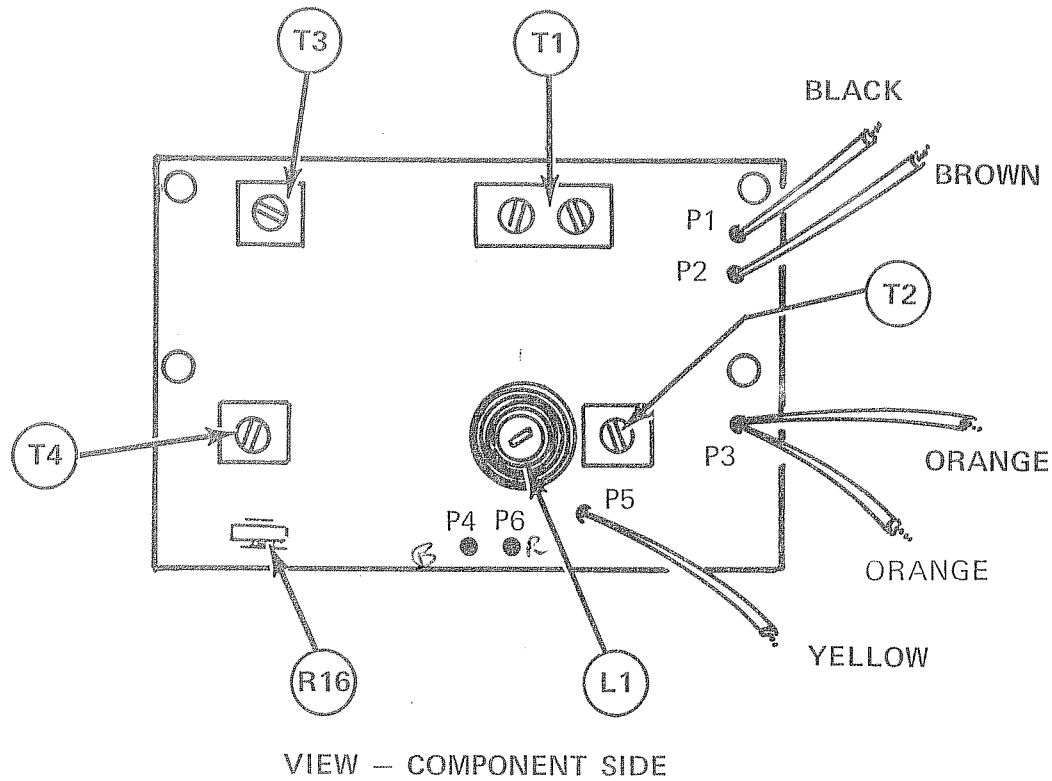
\* See Trouble Shooting Hints

SCHEMATIC

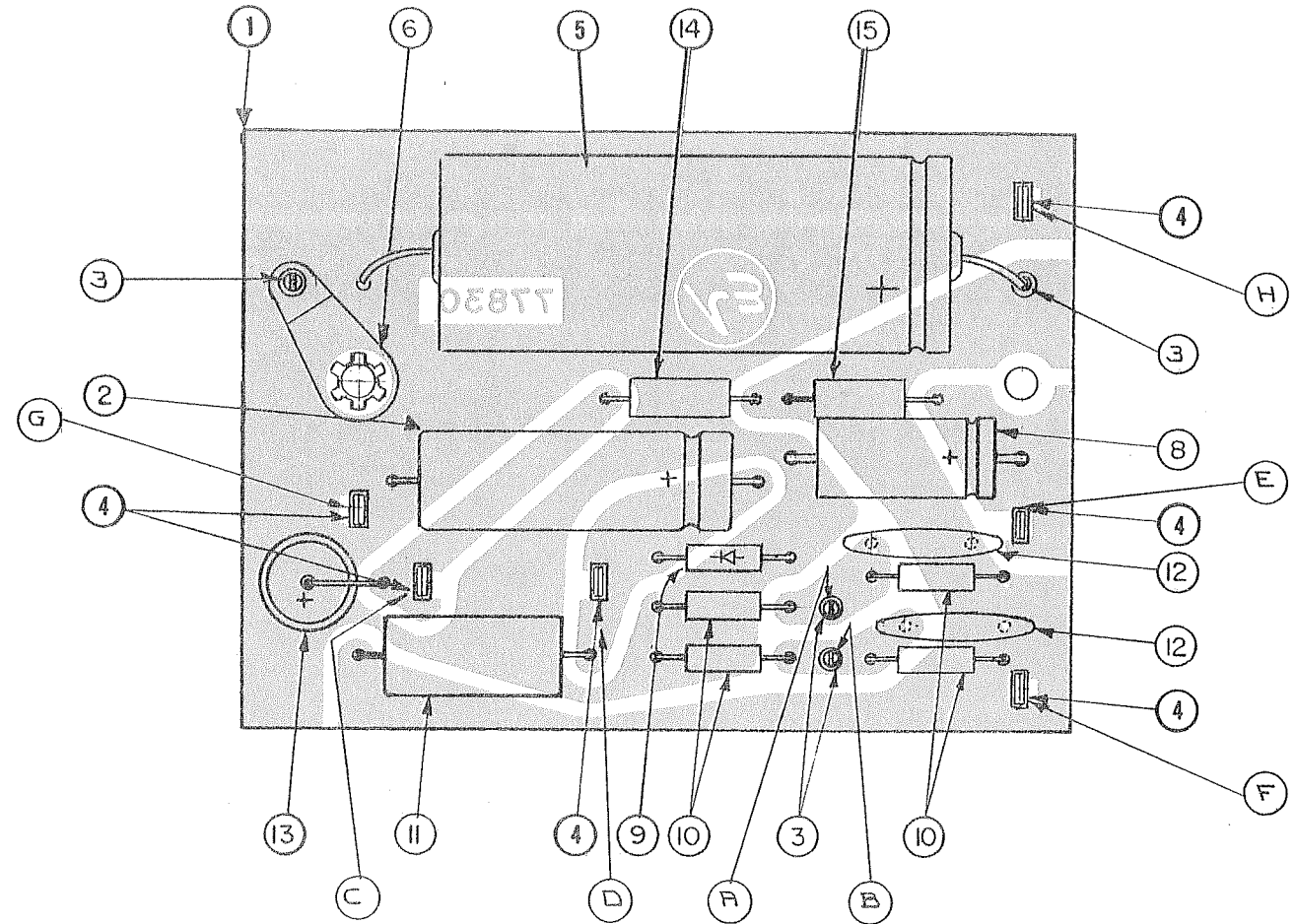


# AM PC BOARD ASSEMBLY

E-V No. 77346 AM Printed Circuit Board Assembly Complete.



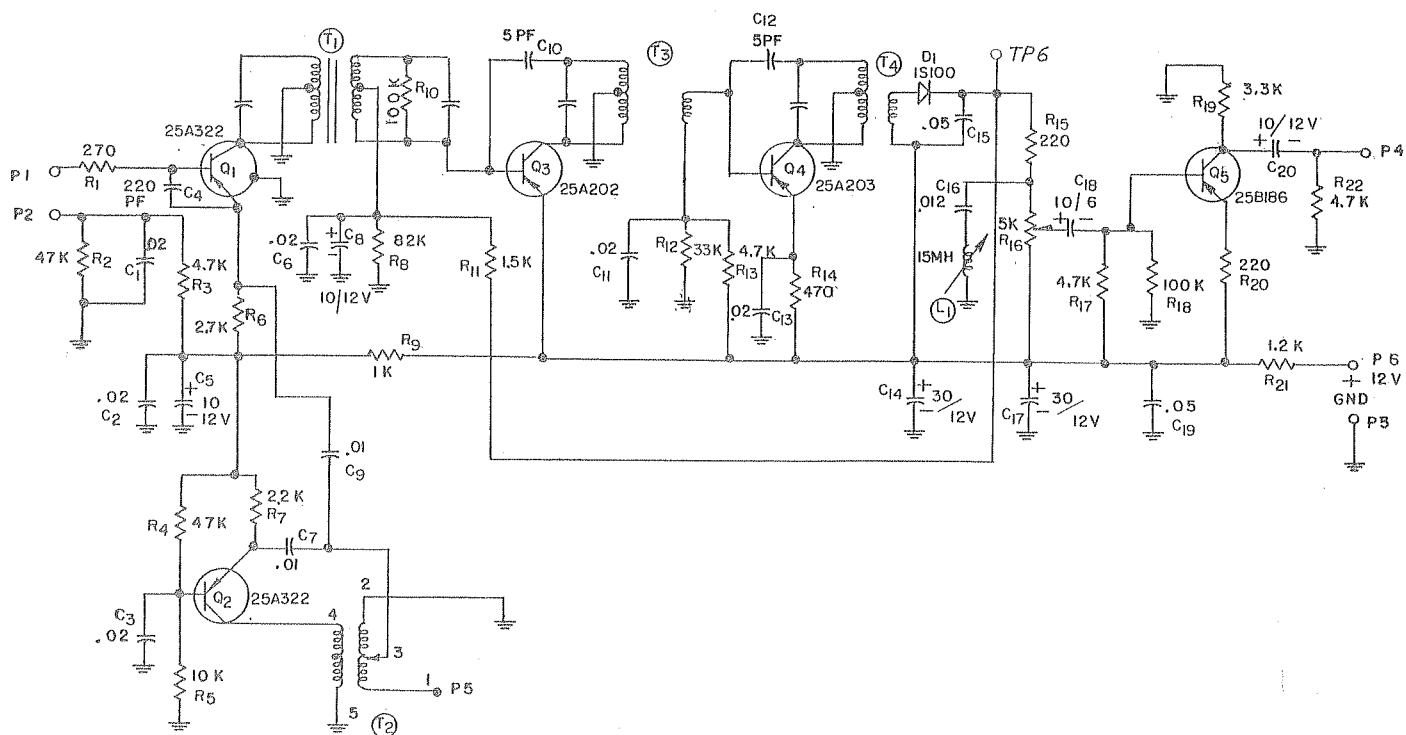
# POWER SUPPLY PC BOARD ASSEMBLY



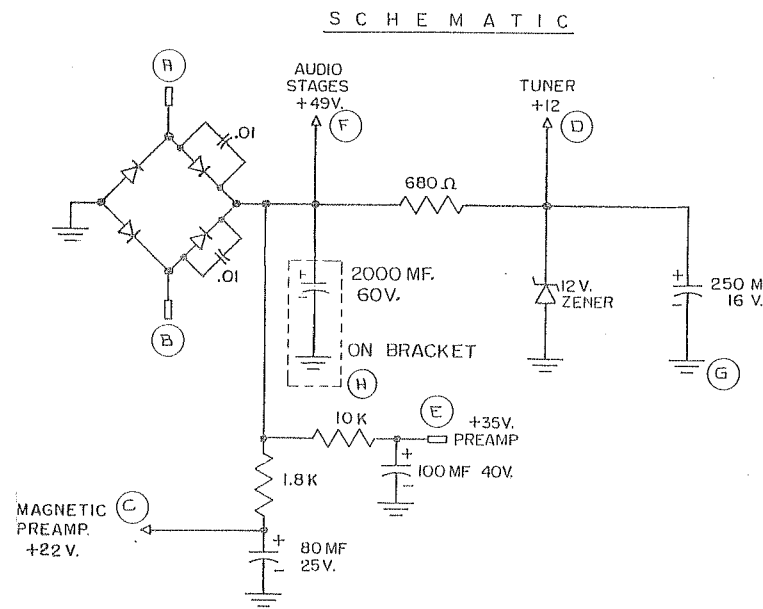
## PARTS LIST

(E-V 1181/E-V 1182)

REF. No.	PART No.	DESCRIPTION
1	87074-XX	P C Board Assembly - Complete
2	42451	Capacitor - Electrolytic 250 $\mu$ F/15V
3	27259	Terminal Pin
4	27282	Receptacle - Terminal
5	42493	Capacitor - Electrolytic 2000 $\mu$ F/50V
6	27057	Lug - Solder
8	42431	Capacitor - Electrolytic 80 $\mu$ F/25V
9	43073	Diode - Zenor (12V)
10	43067	Diode (SD-1)
11	46320	Resistor - 680 $\Omega$ 2W (10%)
12	42452	Capacitor - Disc .01 $\mu$ F/100V
13	42418	Capacitor - Electrolytic 100 $\mu$ F/40V
14	4677	Resistor - 1.8 k $\Omega$ 1/2W (10%)
15	4691	Resistor - 10 k $\Omega$ 1/2W (10%)



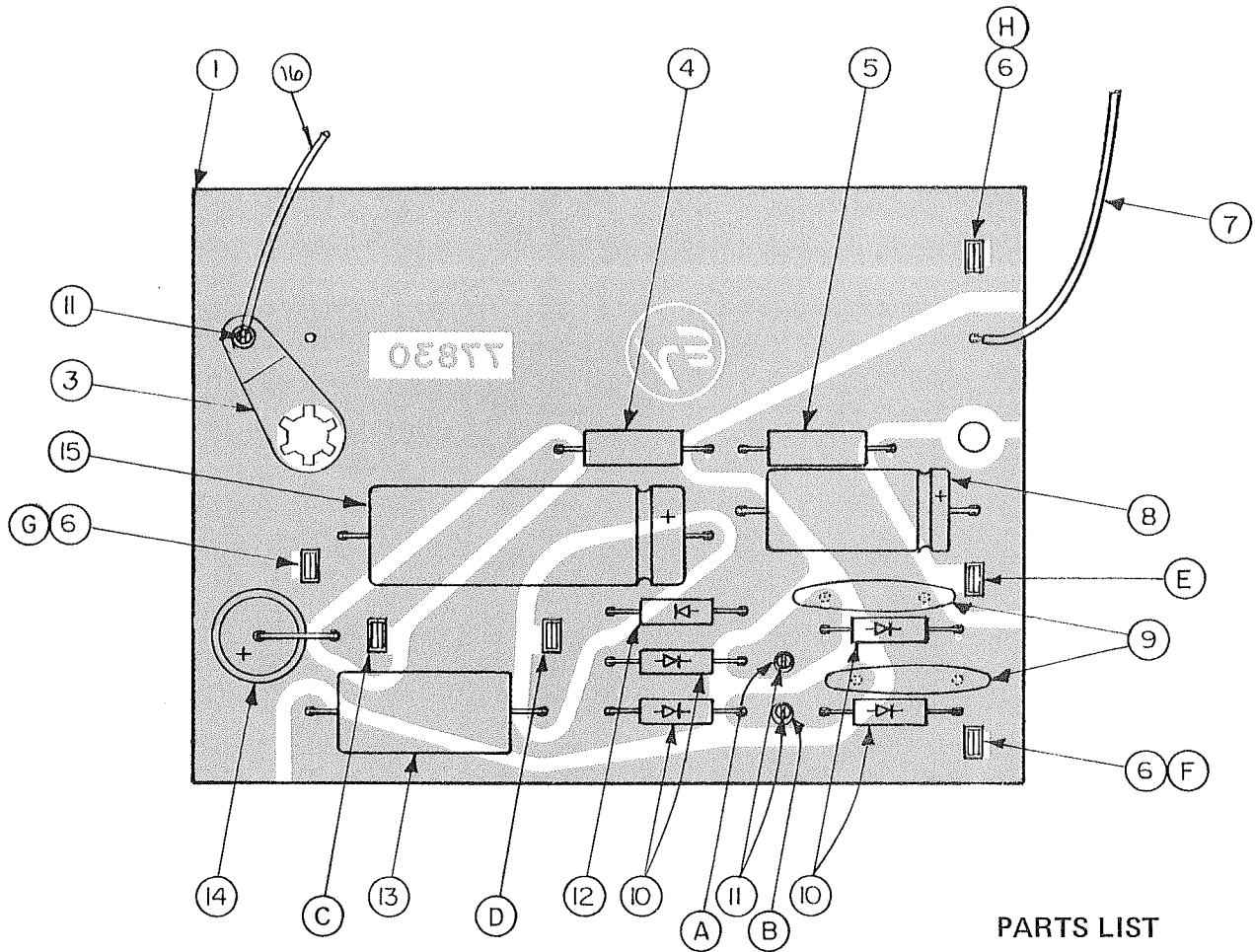
SCHMATIC



MAGNETIC  
PREAMP.  
+22 V.

38

# POWER SUPPLY PC BOARD ASSEMBLY

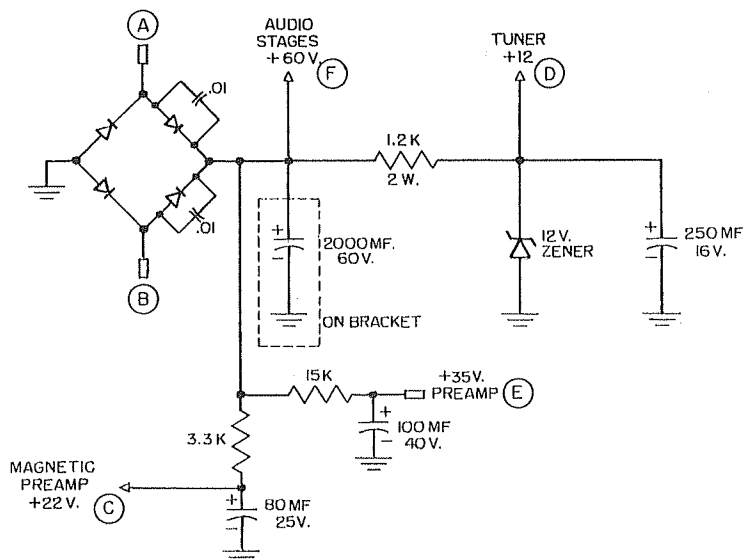


## PARTS LIST

(E-V 1281/E-V 1282)

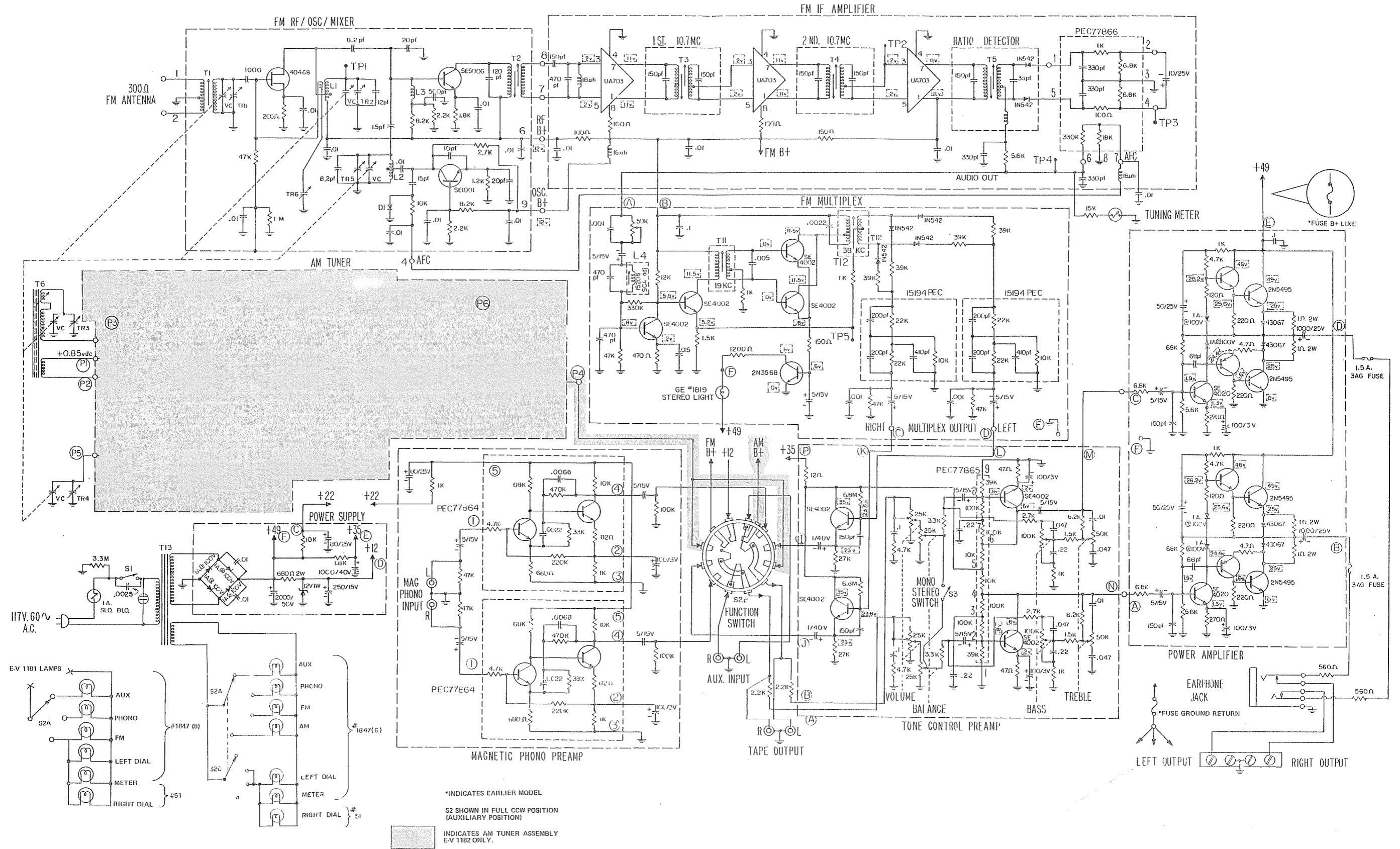
REF. No.	PART No.	DESCRIPTION
1	85916	P C Board Assembly - Complete
3	27057	Lug - Solder
4	46017	Resistor - $3.3\text{ k}\Omega$ $\frac{1}{2}\text{W}$ (10%)
5	4653	Resistor - $15\text{ k}\Omega$ $\frac{1}{2}\text{W}$ (10%)
6	27282	Receptacle - Terminal
8	42431	Capacitor - Electrolytic $80\ \mu\text{F}/25\text{V}$
9	42452	Capacitor - Disc $.01\ \mu\text{F}/100\text{V}$
10	43101	Diode (2 amp)
11	27259	Terminal Pin
12	43073	Diode - Zener (12V)
13	46523	Resistor - $1.2\text{ k}\Omega$ $\frac{1}{2}\text{W}$ (10%)
14	42418	Capacitor - Electrolytic $100\ \mu\text{F}/40\text{V}$
15	42451	Capacitor - Electrolytic $250\ \mu\text{F}/15\text{V}$

## SCHEMATIC



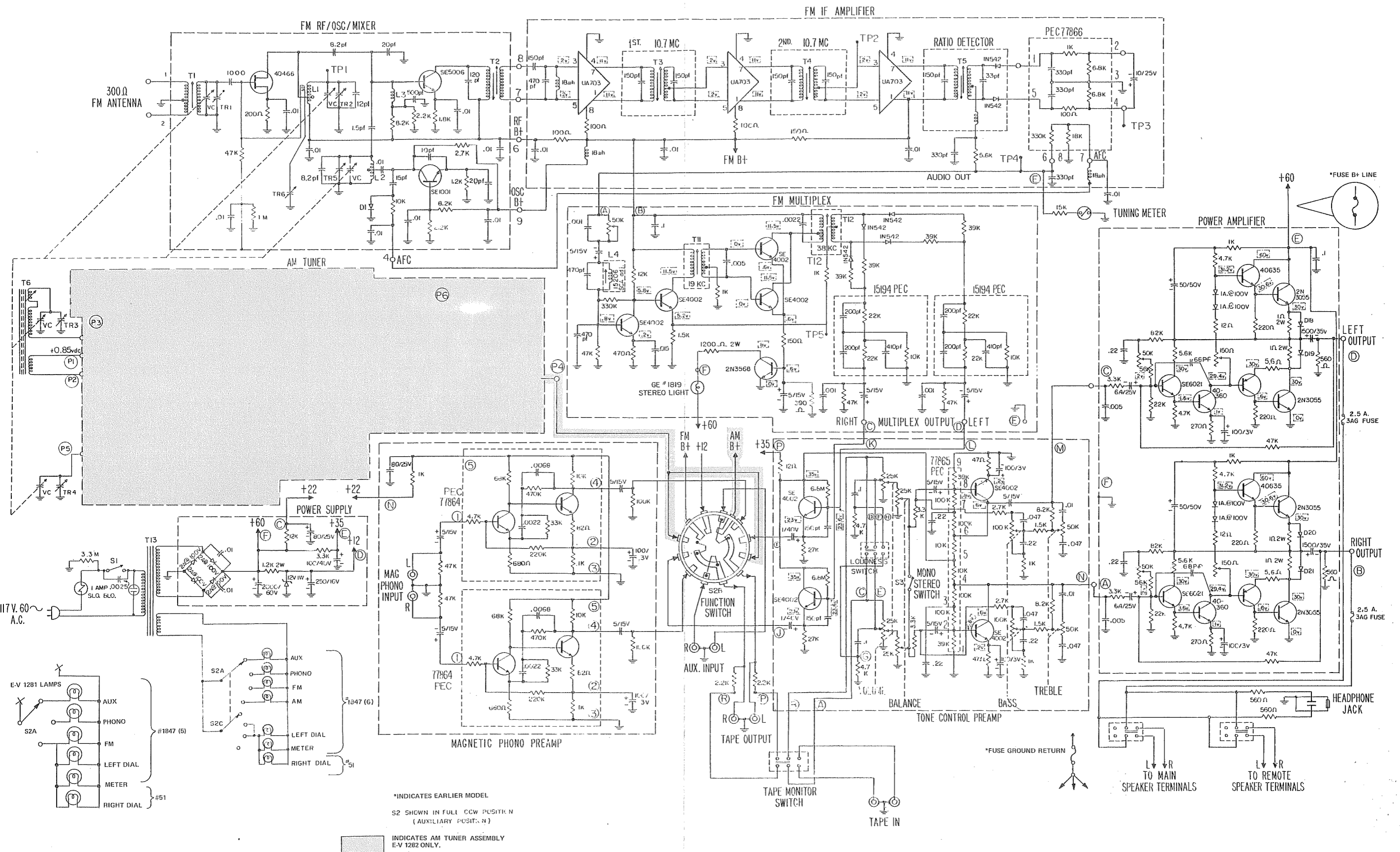
# SCHEMATIC

E-V 1181/E-V 1182

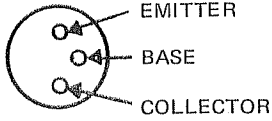
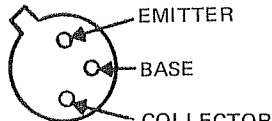
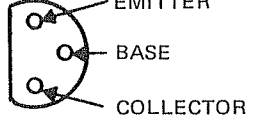


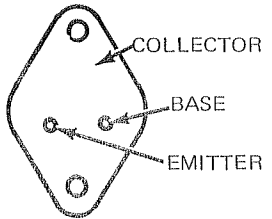
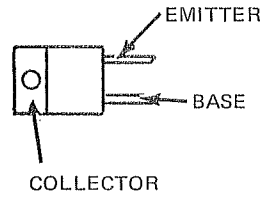
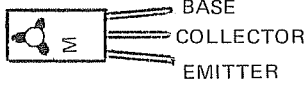
# SCHEMATIC

E-V 1281/E-V 1282



# COMPONENT LEAD LOCATIONS

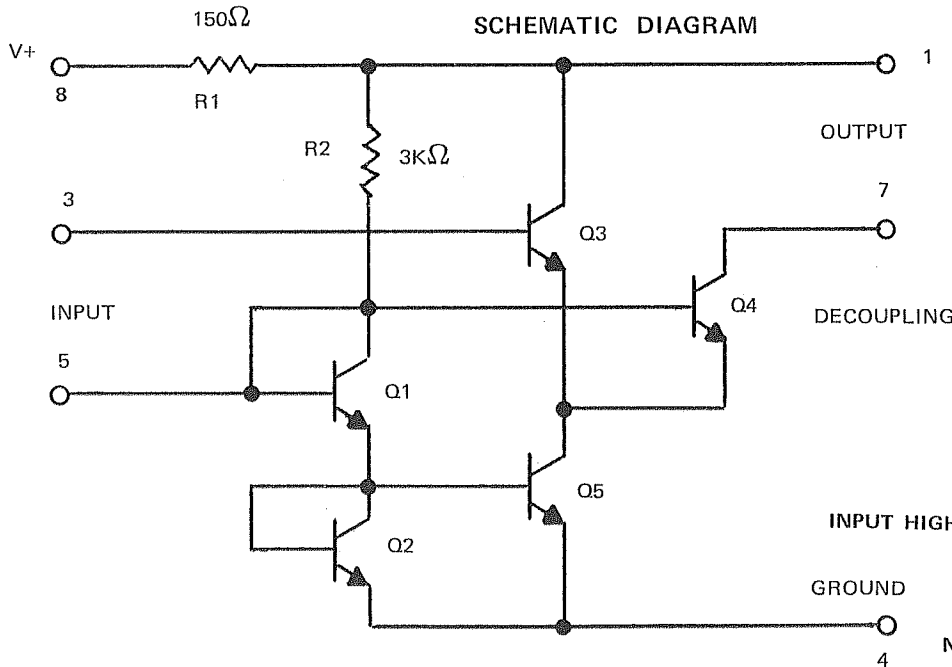
E-V PART NUMBER	MANUFACTURER'S NUMBER	BASING
43045 43045 43113 43169 43165	2N3900 SE4002 2N3568 2N4410 RCA 40360	
43166 43167 * 43082 * 43107 * 43088 43089	RCA 40635 RCA 40634 40361 40362 2N3252 2N4143	
43110	RCA 40360	

E-V PART NUMBER	MANUFACTURER'S PART NUMBER	BASING
43168	2N3055	
43078	2N5495	
43179	2N4920	

\*Indicates obsolete transistors

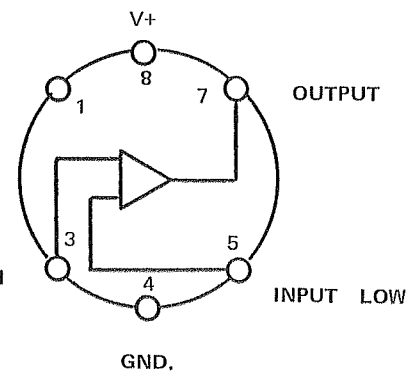
## INTEGRATED CIRCUIT UA703

FM IF AMPLIFIER



CONNECTION DIAGRAM

(TOP VIEW)

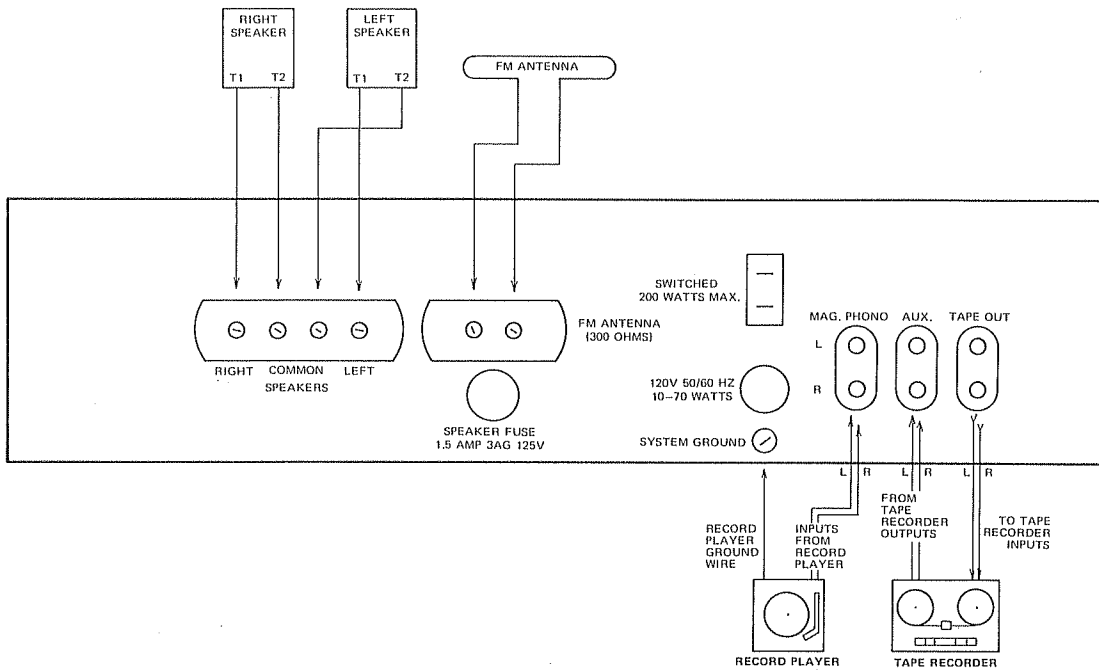


NOTES:

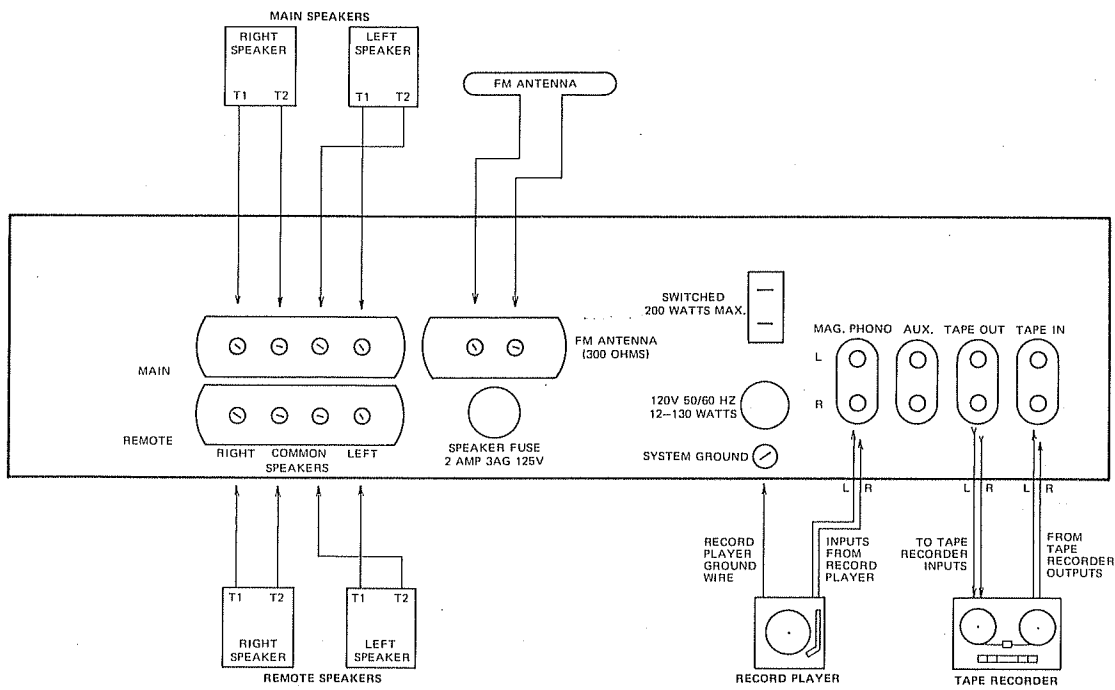
1. LOCATION OF PIN 8 TO BE IDENTIFIED BY A FLAT EDGE, TAB, OR WHITE DOT ON CASE.



# SYSTEM PICTORIALS



E-V 1181/1182 SYSTEM CONNECTIONS



E-V 1281/1282 SYSTEM CONNECTIONS



**ELECTRO-VOICE, INC. / Buchanan, Michigan**

*A Subsidiary of Gulton Industries, Inc.*