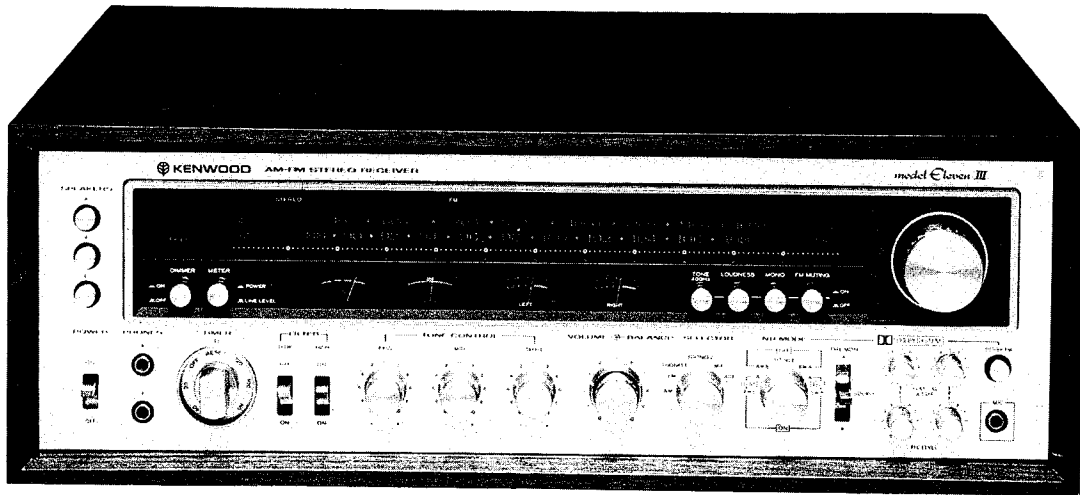


**KENWOOD**  
HI/FI STEREO COMPONENTS

# SERVICE MANUAL

## MODEL ELEVEN III (KR-10000 III)

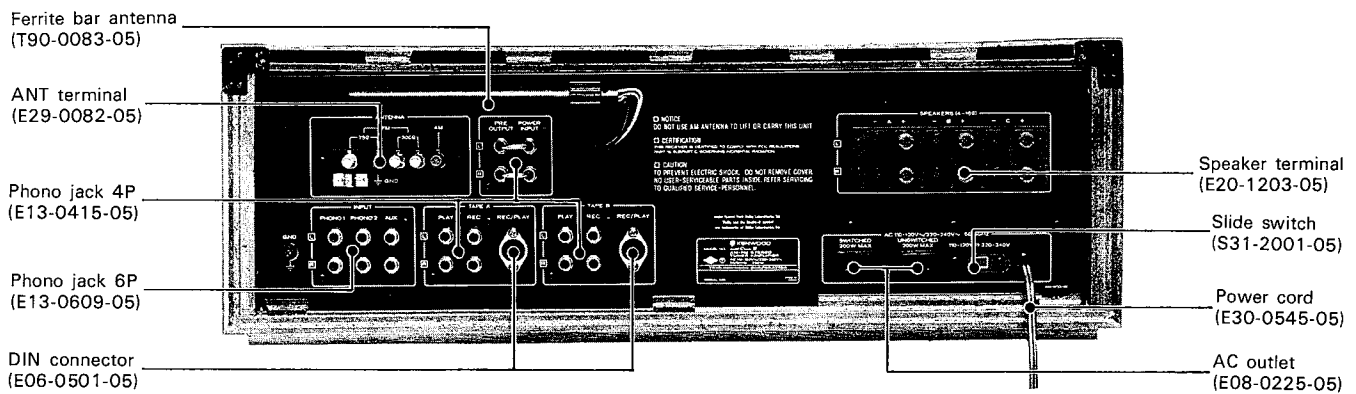
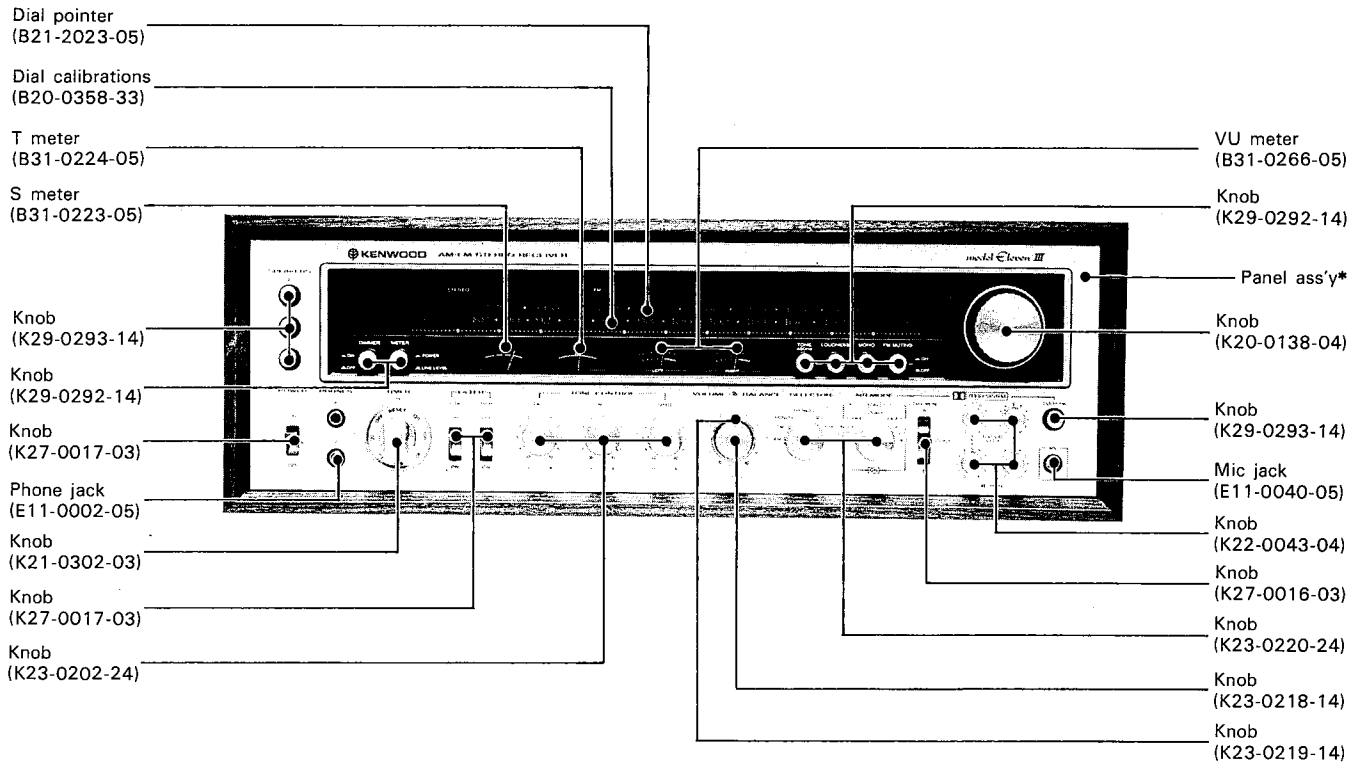


**AM-FM STEREO RECEIVER**

**CONTENTS**

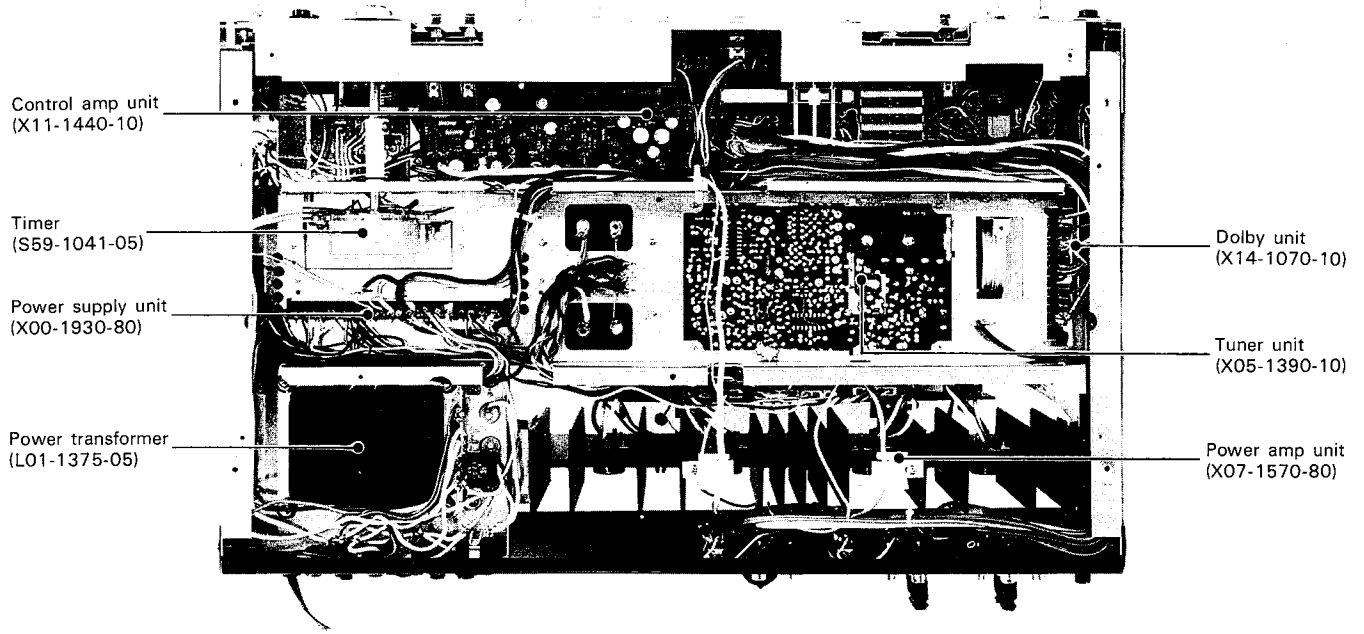
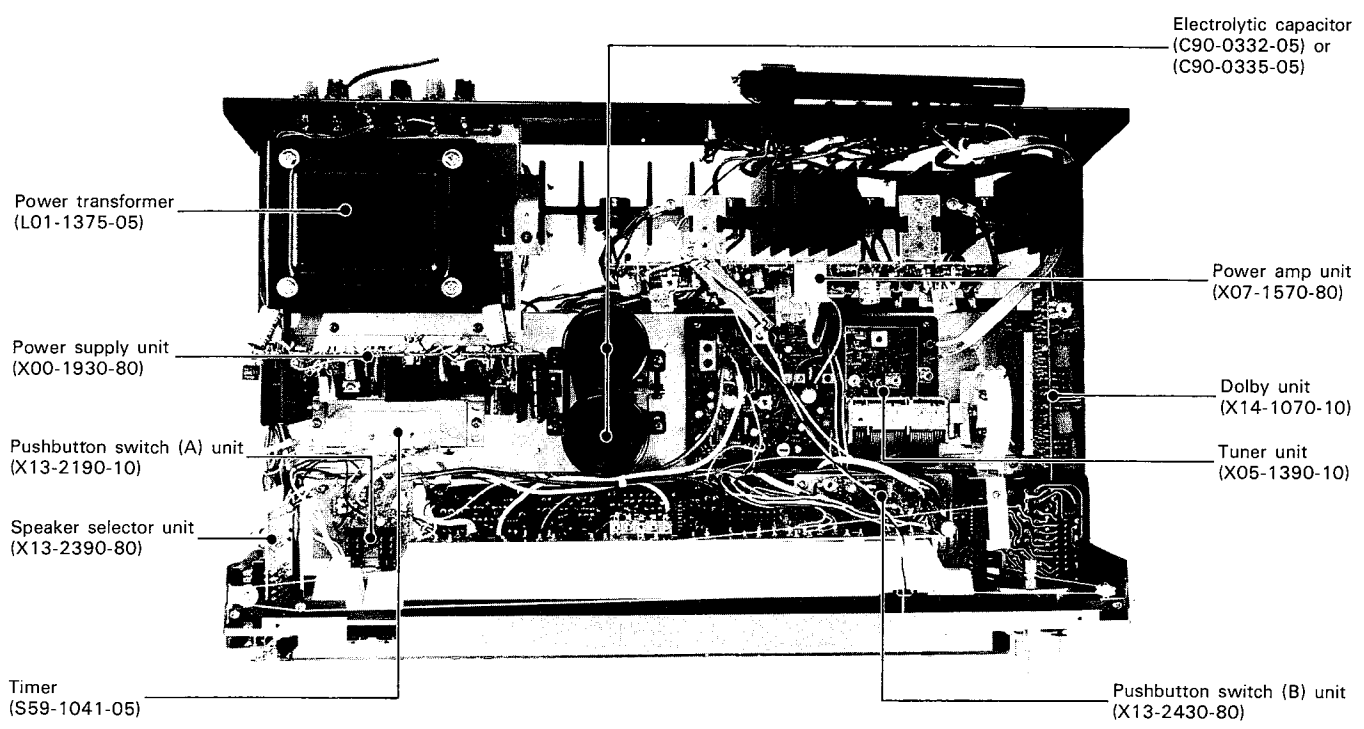
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## EXTERNAL VIEW



\*Refer to Parts List.

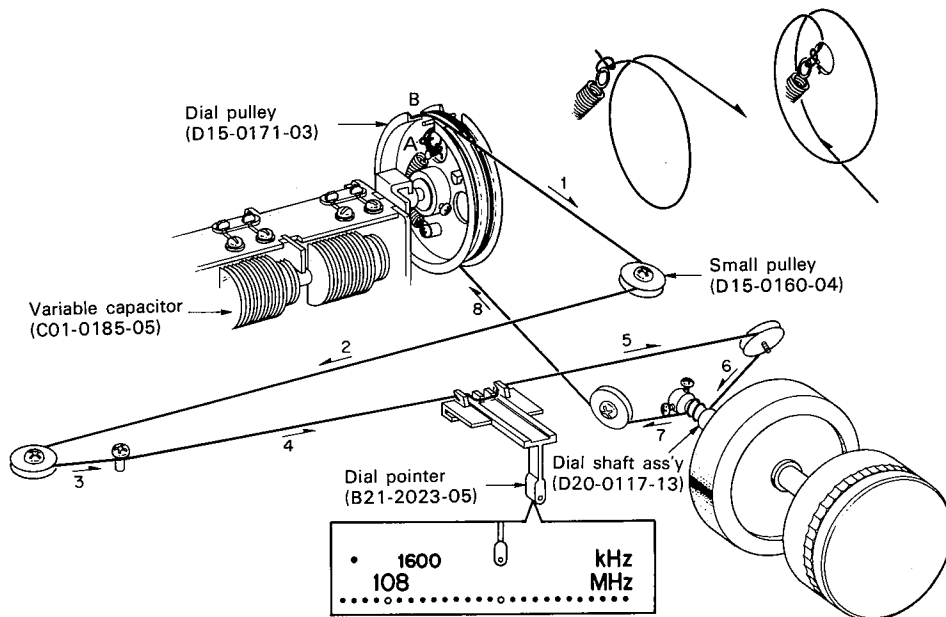
## INTERNAL VIEW



## DIAL CORD STRINGING/DISASSEMBLY FOR REPAIR

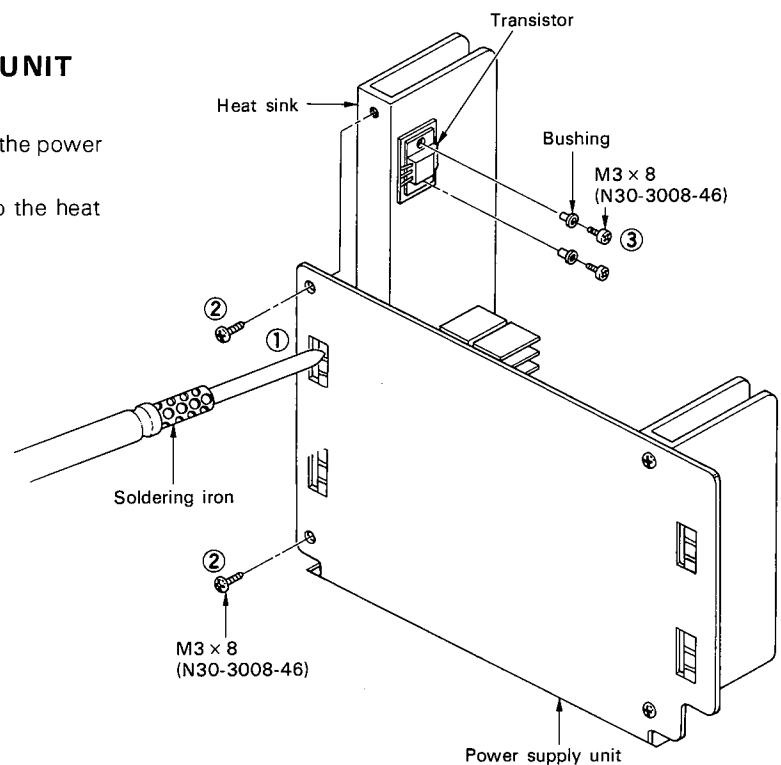
### DIAL CORD STRINGING

1. Fully open the variable capacitor.
2. Fix the dial pulley to the shaft of the variable capacitor using the two screws as shown.
3. Tie the dial cord to the dial spring A leaving a 10 cm length part of it.
4. Hook the dial spring A on the boss B and wind it 1 turn clockwise around the dial pulley.
5. Dress the dial cord in the direction of "1" through "6".
6. Wind the dial cord 2 turns around the dial shaft starting from its lower side, then dress it in the direction of "7" to "8".
7. Wind the dial cord one and a half turns around the dial pulley starting from its lower side and tie the end of it tightly with remaining a 10 cm dial cord.
8. Remove the dial spring A from the boss B.
9. Mount the dial pointer as shown in the illustration.



### TRANSISTORS OF POWER SUPPLY UNIT

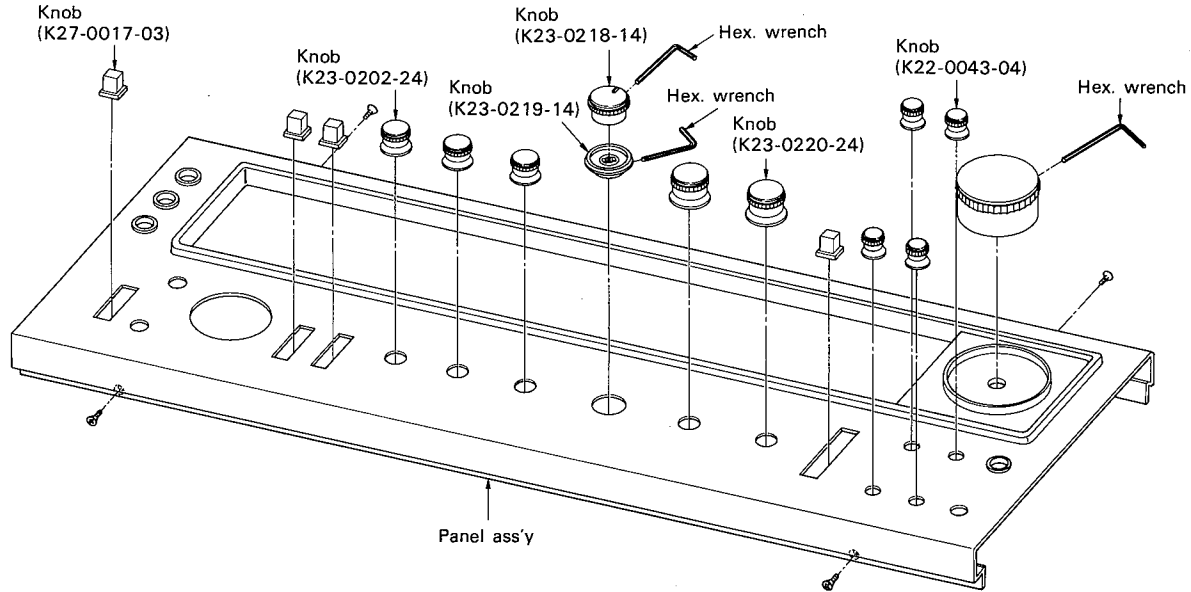
1. Unsolder the transistor's lead. ①
2. Remove the two screws fixing the heat sink to the power supply unit. ②
3. Remove the two screws fixing the transistor to the heat sink. ③



## DISASSEMBLY FOR REPAIR

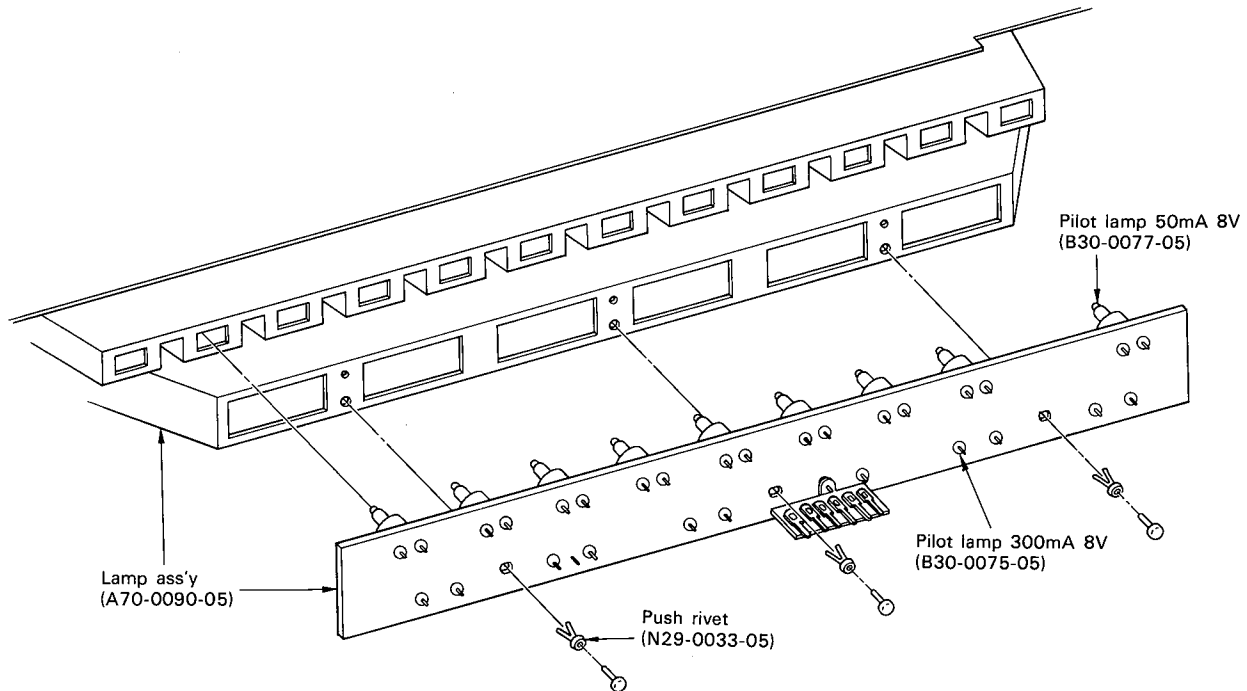
### PANEL ASS'Y

1. Remove the screws fixing the panel to the chassis.
2. Pull out the knobs from the shafts, if necessary, using the hex. wrench.



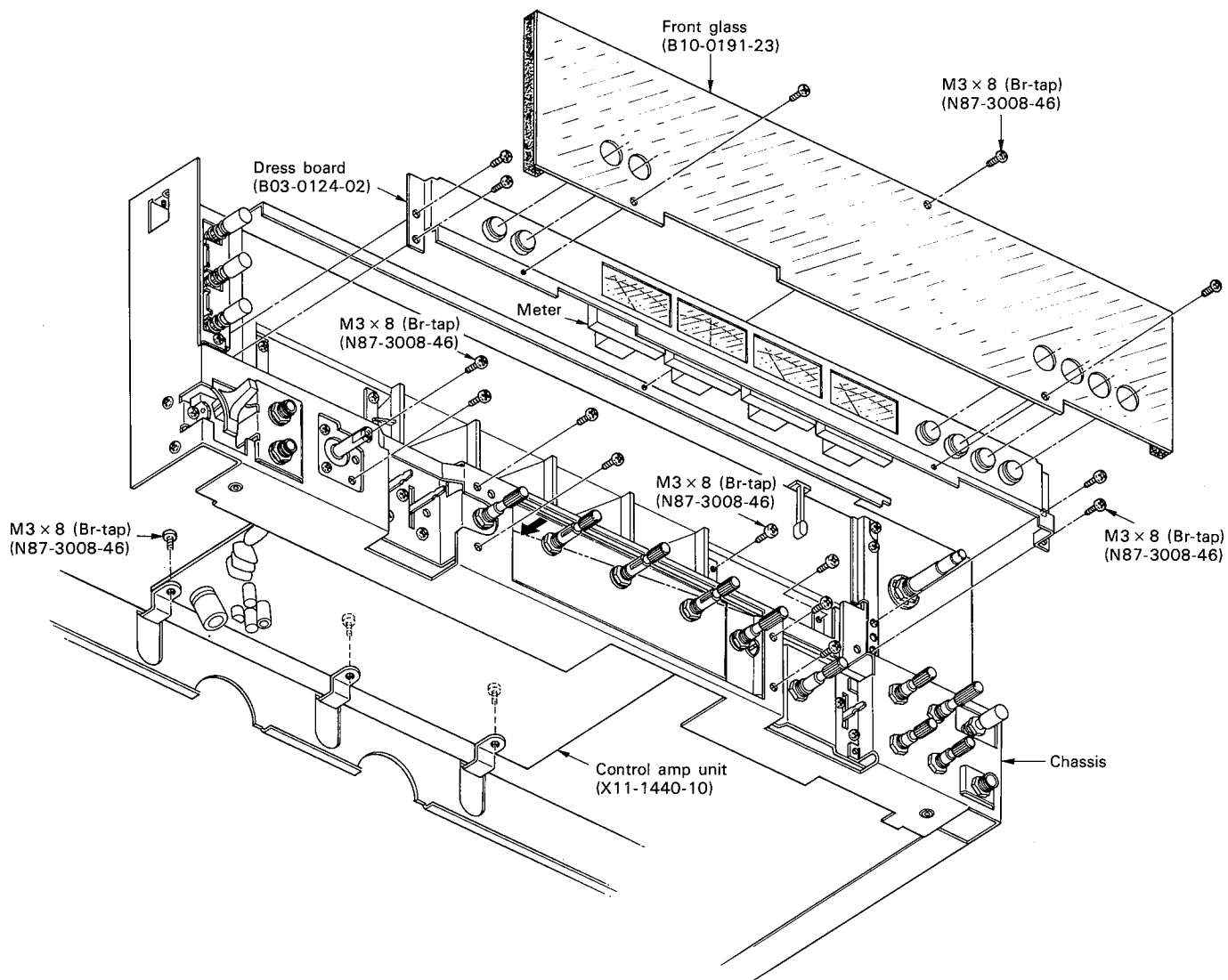
### LAMP ASS'Y

1. Disassemble the lamp ass'y by pulling out the push rivets.
2. Pilot lamp can be replaced.



**DISASSEMBLY FOR REPAIR****CONTROL AMP UNIT**

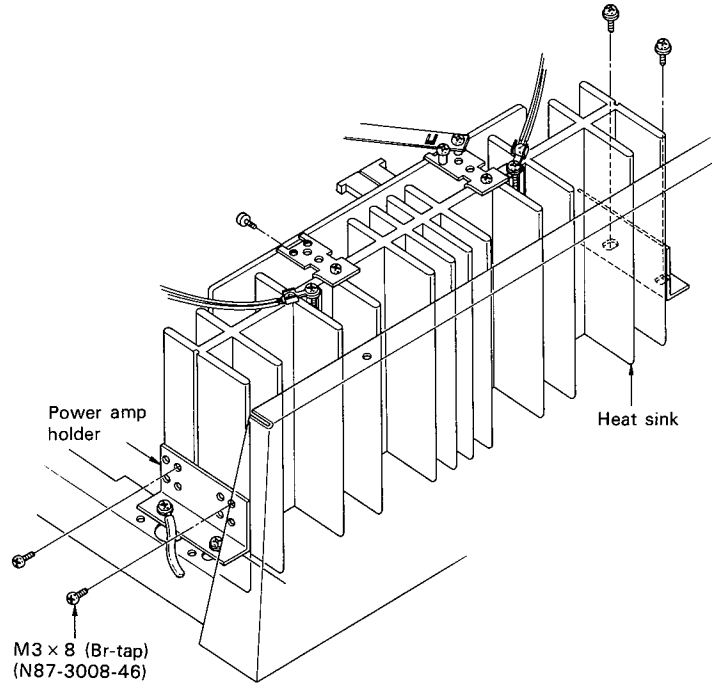
1. Remove the screws fixing the control amp unit to the chassis.
2. Push the control unit according as a black allow.
3. The control amp unit can be repaired.



## DISASSEMBLY FOR REPAIR

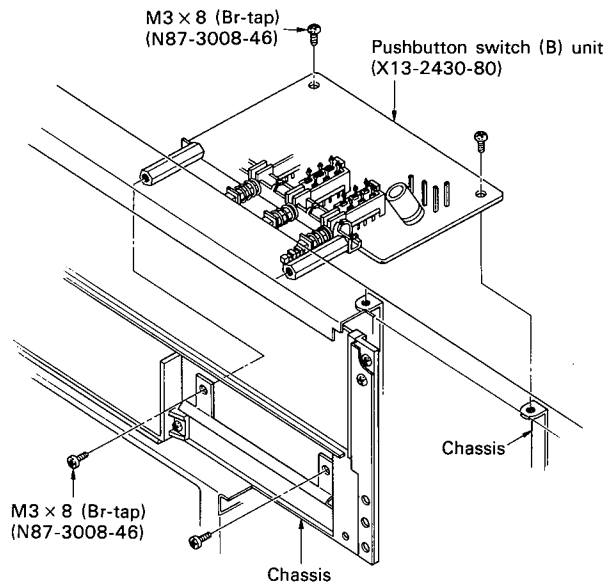
### POWER AMP UNIT

1. Remove the screws fixing the heat sink to the chassis.
2. The power amp unit can be pulled up.



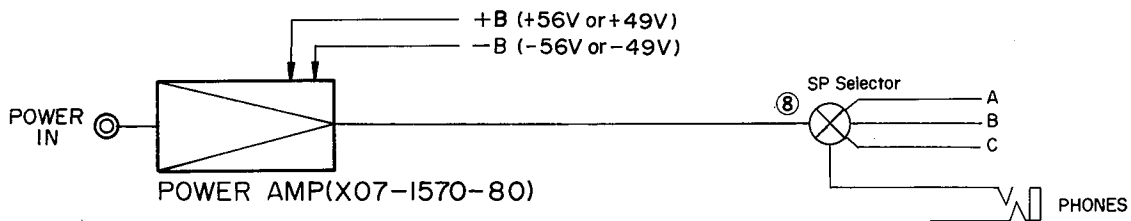
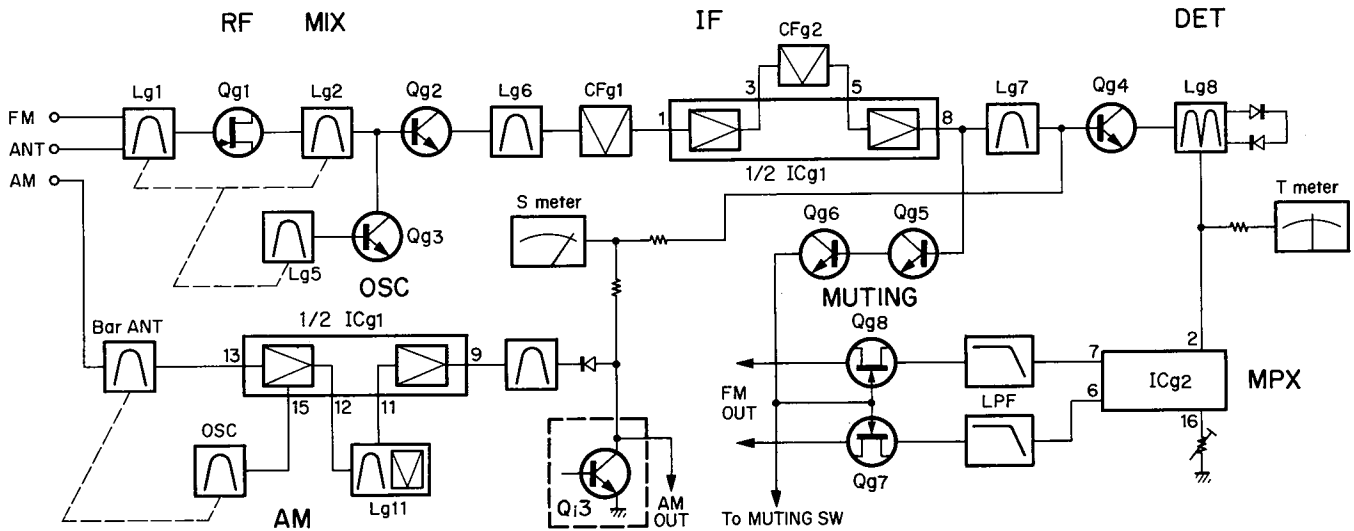
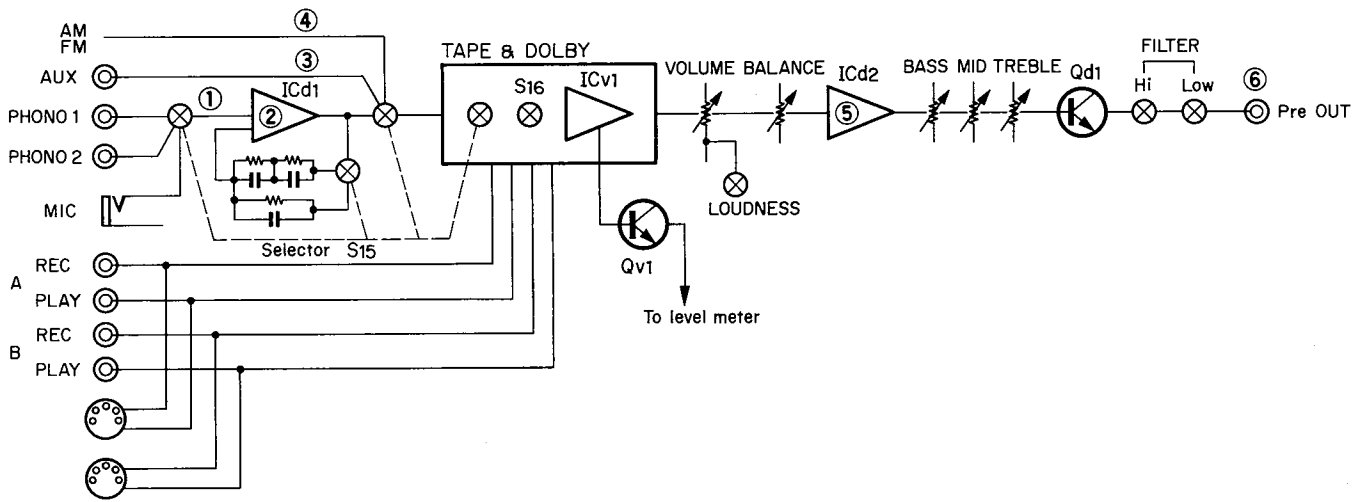
### PUSH SWITCH (B) UNIT

1. Remove the screws fixing the pushbutton switch (B) unit to the chassis.
2. The pushbutton switch (B) unit can be pulled up.

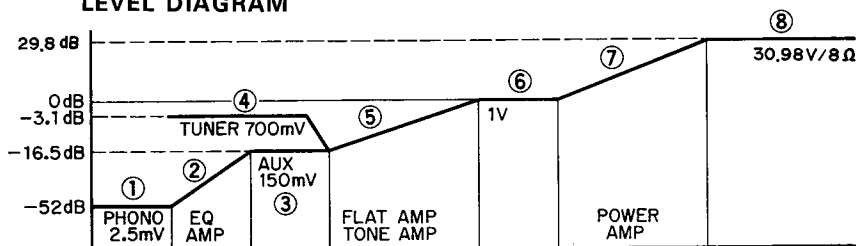




## BLOCK DIAGRAM/LEVEL DIAGRAM



### LEVEL DIAGRAM



## CIRCUIT DESCRIPTION

### GENERAL

The Model Eleven III is a modification of the Model Eleven II. The principal point of the modification is found in the output circuit which delivers a higher output power as shown below.

Model \ Output*	Load 8Ω	Load 4Ω
Model Eleven II	80W	110W ~ 120W
Model Eleven III	120W	120W ~ 130W

\* Output: at 20 Hz to 20,000 Hz

In the Model Eleven III, the output power has been increased to 120W at 8Ω load impedance, while that at 4Ω load impedance remains almost the same. Although it is possible for the Model Eleven III to deliver 1.3 to 1.4 times (theoretically 2 times) the output at 8Ω, if it is driven with 4Ω load impedance. In this case, the output power will be increased to 156 ~ 168W. However, this requires higher grade transistors and large sized heat sinks which would reflect on the cost.

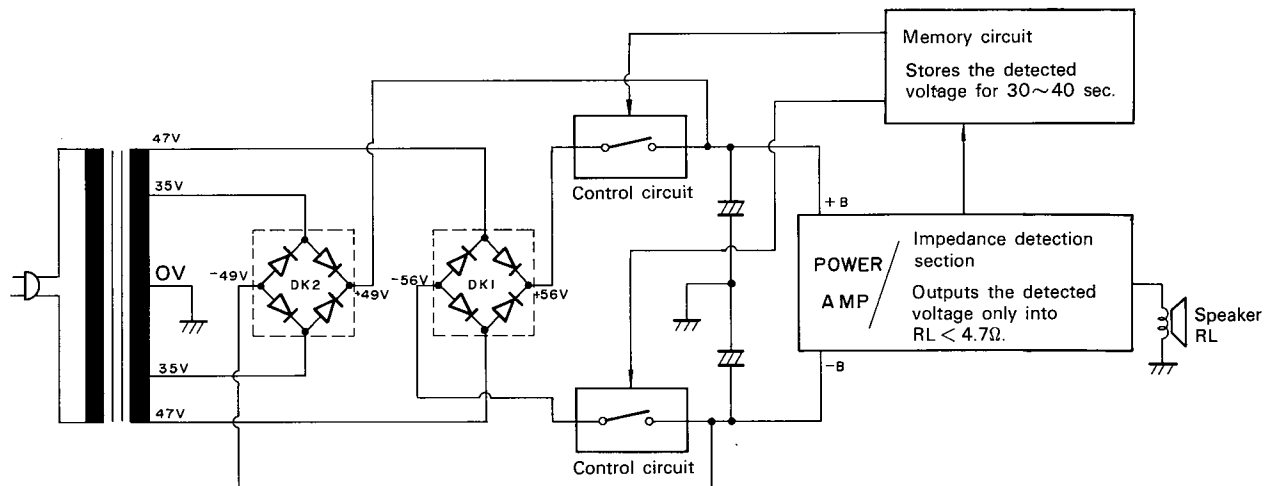
The Model Eleven III has a provision for detecting the impedance of speaker so that the maximum output at 8Ω or 4Ω impedance can be obtained by changing the taps of the power transformer and minimizing the difference of thermal loss caused by the load impedance.

### PRINCIPLES OF OPERATION

1. The impedance detecting circuit is contained in the power amplifier section. It detects the impedance  $R_L$  of speaker and produces an output voltage when  $R_L$  is below 4.7Ω.
2. When  $R_L$  is 8Ω, no output voltage is produced and the control circuit connected to the high voltage side of the power transformer turns to ON, thus the power is supplied from the high voltage tap of the transformer. The power voltage is stabilized by the voltage regulating circuit in the control circuit.
3. When  $R_L$  is 4Ω, the output voltage of the detecting circuit is fed to the memory circuit, turning off the control circuit for 30 to 40 seconds to step down the tap of the power transformer.
4. The control circuit being OFF turns to ON again when the output of the power amplifier is increased, and the power is supplied from the high voltage tap of the transformer so that the variation of the power voltage can be minimized. This increases the output power at 4Ω load impedance.

As described above, the impedance detecting circuit selects the tap of the power transformer by detecting the speaker impedance, minimizing the voltage variation with resultant reduction of  $P_c$  of transistors to deliver a maximum output at 4Ω or 8Ω impedance.

Since the transformer tap is selected according to the level of the output during the operation at 4Ω impedance, the power transformer can be designed in a small size.

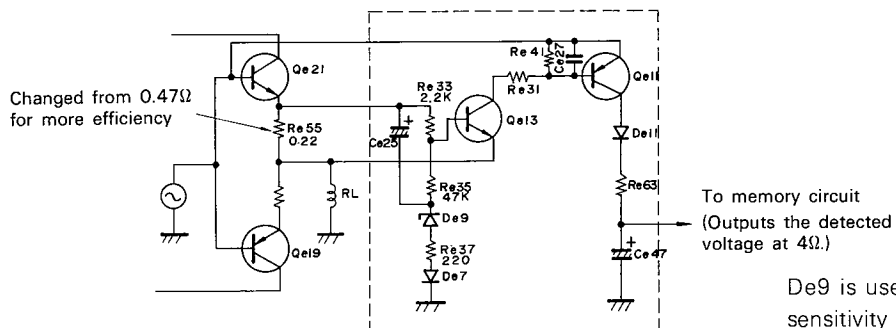


## CIRCUIT DESCRIPTION

### SPEAKER IMPEDANCE DETECTING CIRCUIT

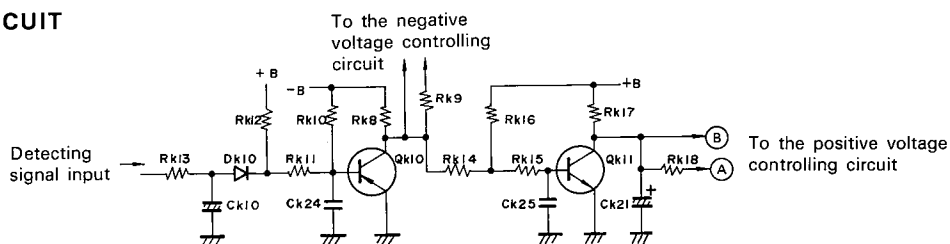
This circuit is a Wheatstone bridge type consisting of Re55 0.22Ω, Re33 2.2kΩ, Re35 47kΩ and speaker impedance (RL). When RL is larger than 4.7Ω, most of the current in the final transistors flows into RL and hence Qe13

turns to OFF. In contrast with this, when RL is smaller than 4.7Ω, most of the current in the final transistors flows into Re33 and Re35, turning Qe13 and Qe11 to ON; at this time, DC voltage is fed to the memory circuit through Re63.



De9 is used to increase the sensitivity of the bridge circuit.

### MEMORY CIRCUIT



This circuit functions to store the input from the detecting circuit for 30 to 40 seconds and then feed it to the plus and minus control circuits.

When the input is absent, Qk10 and Qk11 are ON in which each collector is held at about earth voltage. When the out-

put of the detecting circuit is applied, Ck10 is charged (plus) where Qk10 and Qk11 are reversely biased simultaneously to set in OFF state. This condition is held until Ck10 is discharged through Rk10 and Rk11.

### CONTROL CIRCUIT

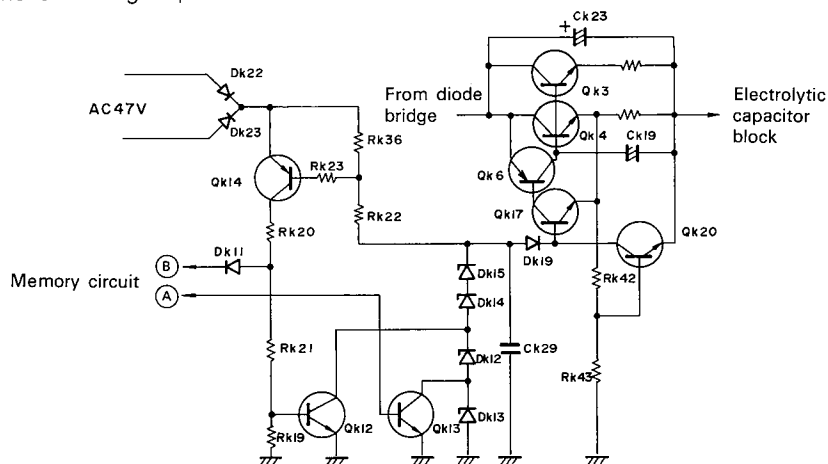
The detection output from the memory circuit (A) controls the base of Qk13 to turn on and off Qk3. When the load impedance RL is 8Ω, the voltage potential at the memory circuit (A) is low and Qk13 is OFF, thus the control circuit functions at the reference voltage 56.1V (Dk12 ~ 15:  $14.7 \times 3 + 12 = 56.1$ ).

When the load impedance is 4Ω, the voltage potential of the memory circuit (A) is high and Qk13 turns to ON where Dk13 is shorted and the reference voltage becomes 44.1V (Dk12, 14, 15:  $14.7 \times 3 = 44.1$ ). Since this voltage is lower than 49V at the low voltage tap of the transformer, the

control circuit turns to OFF.

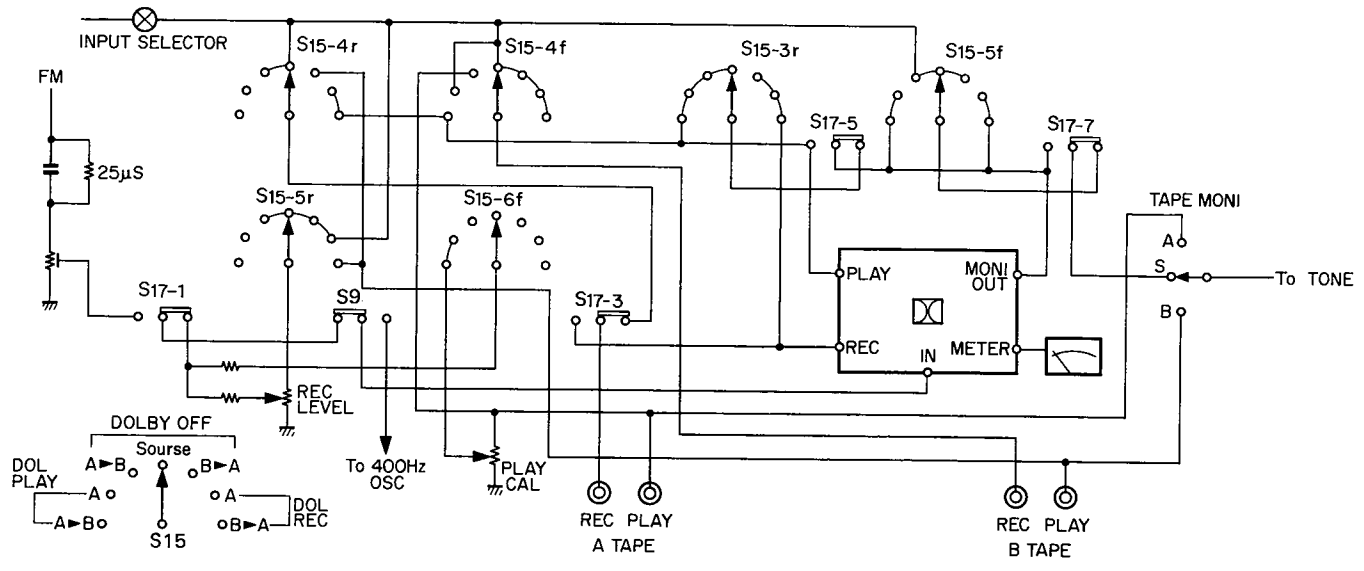
However, in the case where the power voltage is lowered, the control circuit turns to ON again to supply the power from the high voltage tap of the transformer, preventing the voltage drop. Qk20 is used for protection against over-current. It deenergizes the control circuit when the output current exceeds 8A.

Qk14 and Qk12 form a circuit to prevent the thermal loss. This circuit turns off the control circuit as the voltage between collector and emitter of the control transistor increases to a certain level.

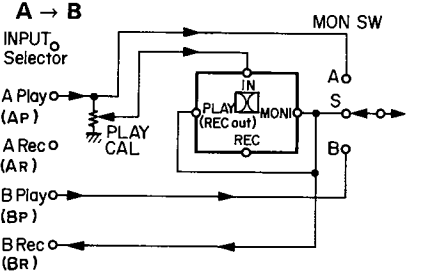


## CIRCUIT DESCRIPTIONS

DOLBY NR CIRCUIT CONNECTION DIAGRAM SELECTED BY S15.

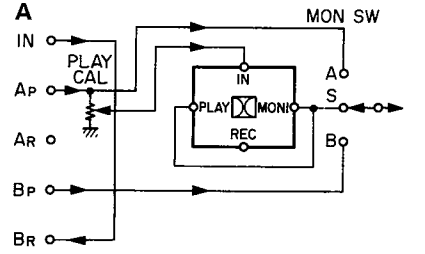


**① DOLBY on**



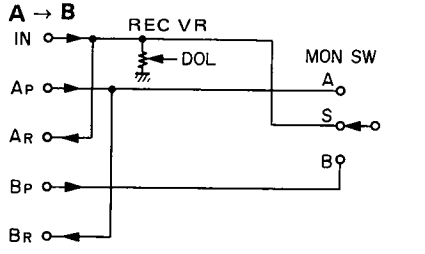
- Dolbized signal from Ap is decoded and fed to Br.
- No output at Ar

**② DOLBY ON**



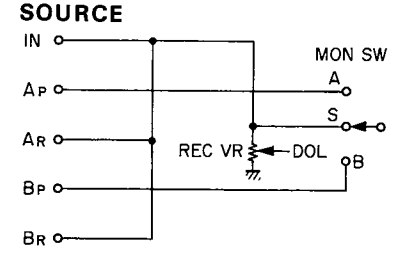
- Dolbized signal from AP is decoded.
- No output at Ar.
- The signal selected by INPUT SELECTOR comes out at Br.

**③ DOLBY off**



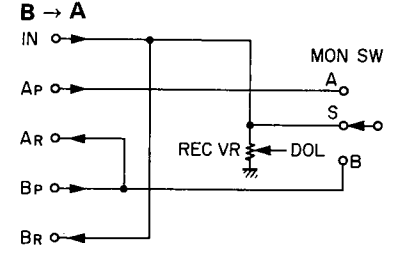
- Dubbing (AP → BR)
- DOL operation is only VU meter.

**④ DOLBY off**



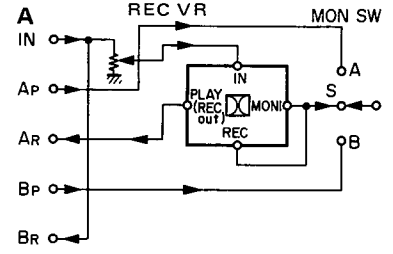
- Normal TAPE circuit
- DOL operation is only VU meter.

**⑤ DOLBY off**



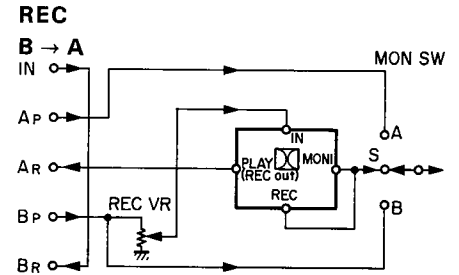
- Dubbing (BP → AR)
- DOL operation is only VU meter.

**DOLBY on**



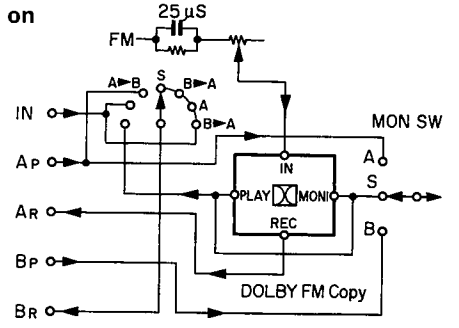
- Signal from INPUT SELECTOR is dolbized and fed to Ar.
- The signal at Br is not dolbized.
- When MON SW is at S position, non-dolbized signal comes out from the circuit.

**⑦ DOLBY on**



- Signal from BP is dolbized and fed to AR.
- Signal from INPUT SELECTOR comes out at Br.
- When MON SW is S position, signal from Bp comes out from the circuit.

**⑧ DOLBY FM SW**



- The circuit is for DOLBY FM reproduction.
- DOLBY FM copy signal comes out at Ar.

	Signal at Br
DOLBY ON A→B	FM dolbized signal
DOLBY OFF A→B	Input signal of Ap
OTHER POSITION	Signal selected by INPUT SELECTOR except AM

## PARTS LIST

MODEL ELEVEN III: U-type (PX), M-type (Other area)  
 KR-10000 III: M<sub>2</sub>-type (Audio club)

### TOTAL

☆ : New parts

Ref. No.	Parts No.	Description	Re- marks
<b>CAPACITOR</b>			
C2~5	CK45F1H103Z	Ceramic 0.01μF +80%—20%	
<b>SWITCH</b>			
S3	S31-2001-05	Slide, POWER VOLTAGE SELECTOR	
<b>MISCELLANEOUS</b>			
—	A03-0227-02	Cabinet	☆
—	A20-1181-03	Panel ass'y	☆ U,M
—	A20-1183-03	Panel ass'y	☆ M <sub>2</sub>
—	B03-0124-02	Dress board	
—	B07-0111-04	Push switch ring × 4	
—	B07-0154-25	Escutcheon	
—	B07-0200-03	Multi-switch ring, four switches	
—	B07-0201-03	Multi-switch ring, two switches	
—	B07-0216-04	Ring	☆
—	B10-0191-23	Front glass	
—	B20-0358-33	Dial calibrations	
—	B21-2023-05	Dial pointer (LED)	
—	B31-0223-05	S meter	
—	B31-0224-05	T meter	
—	B31-0266-05	VU meter × 2	☆
—	B42-0009-04	Passed sticker	
—	B46-0051-00	Warranty card	U
—	B46-0062-10	Warranty card	U
—	B50-1644-00	Instruction manual	☆ U,M
—	B50-1646-00	Instruction manual	☆ M <sub>2</sub>
—	B59-0018-00	Kenwood service stations' list	
—	D15-0171-13	Dial pulley	
—	D19-0050-14	Holding plate × 6	
—	D32-0075-04	Switch stopper	
—	E06-0501-05	DIN connector × 2	
—	E08-0225-05	AC outlet × 2	
—	E13-0415-05	Phono jack 4P (TAPE A, B, PRE ↔ POWER) × 3	
—	E13-0609-05	Phono jack 6P (INPUT)	
—	E14-0107-05	Short-circuit pin plug × 2	
—	E20-1203-05	Speaker terminal board 12P	
—	E22-0421-05	Lug-type terminal strip (040)	
—	E29-0082-05	Antenna terminal board 4P	
—	E30-0222-05	Feeder cord with terminal	
—	E31-0061-05	Mini-connector ass'y 6P with protector against reverse connection for speaker	
—	E31-0104-05	Mini-connector ass'y 3P for power amp input	☆
—	E31-0105-05	Mini-connector ass'y 4P for power amp (L)	☆
—	E31-0106-05	Mini-connector ass'y 4P for power amp (R)	☆
—	E31-0107-05	Mini-connector ass'y 4P for relay A	☆
—	E31-0108-05	Mini-connector ass'y 3P for relay B	☆
—	E31-0113-05	Mini-connector ass'y for speaker	☆
F1.2	F05-3523-05	Fuse 3.5A	

Ref. No.	Parts No.	Description	Re- marks
—	G01-0045-24	Dial spring	
—	G01-0312-04	Spring for push sw knob × 6	
—	G01-0356-04	Spring for dial pointer	
—	H01-1728-04	Carton case	☆ U
—	H01-1729-04	Carton case	☆ M
—	H01-1730-04	Carton case	☆ M <sub>2</sub>
—	H10-1478-02	Polystyrene foamed fixture × 2	
—	H20-0373-14	Polyethylene cover	U, M <sub>2</sub>
—	H20-0429-04	Polyethylene cover	M
—	H25-0029-04	Polyethylene bag	
—	H25-0078-00	Instruction bag	
—	H40-0004-04	Anti-rust paper	
—	J12-0010-04	Short-circuit pin (18 mm) × 2	
—	J13-0040-05	Fuse holder × 2	
—	J19-0306-05	Lead holder	
—	J19-0507-05	Antenna holder	
—	J30-0028-04	PC board holder × 2	
—	J41-0034-05	Power cord bushing	
—	J42-0075-04	Small bushing for dial pointer	
—	K20-0138-04	Knob (TUNING)	
—	K21-0302-03	Knob (TIMER)	
—	K22-0043-04	Knob (DOLBY VOLUME) × 4	
—	K23-0202-24	Knob (TONE) × 3	
—	K23-0218-14	Knob (VOLUME)	
—	K23-0219-14	Knob (BALANCE)	
—	K23-0220-24	Knob (SELECTOR) × 2	
—	K27-0016-03	Knob (TAPE MON)	
—	K27-0017-03	Knob (POWER, FILTER) × 3	
—	K29-0292-14	Knob (PUSH φ12) × 6	
—	K29-0293-14	Knob (PUSH φ11) × 4	
—	L01-1375-05	Power transformer	☆
—	N08-0128-25	GND screw	
CR1	R90-0097-05	Spark killer 0.1μF + 120Ω	
—	T90-0083-05	Ferrite bar antenna	
—	T90-0202-05	FM indoor antenna	
—	X07-1570-80	Power amp unit	☆
—	X13-2390-80	Speaker selector unit	
—	X90-1350-80	Tuner ass'y	☆
—	351-0003-14	Dial string	

### TUNER ASS'Y (X90-1350-80)

Ref. No.	Parts No.	Description	Re- marks
<b>CAPACITOR</b>			
C1	C91-0023-05	Ceramic 0.01μF 250WV	
C6.7	C90-0332-05 or C90-0335-05	Pair-electrolytic 12000μF 63WV	

## PARTS LIST

Ref. No.	Parts No.	Description	Re- marks
<b>POTENTIOMETER</b>			
VR1~4	R01-5013-05	Variable resistor 100kΩ (A) REC LEVEL, PLAY CAL	
<b>SWITCH</b>			
S1	S59-1041-05	Timer	
S2	S37-2002-15	Lever (POWER)	
<b>MISCELLANEOUS</b>			
—	A30-0103-15	Dial board	
—	A70-0090-05	Lamp ass'y	
—	B30-0064-15	Pilot lamp 8V 50 mA × 3, INDICATION	
—	B30-0068-05	Pilot lamp 8V 200 mA × 4, METER	
—	D15-0160-04	Small pulley × 4	
—	D20-0117-03	Dial shaft ass'y	
—	D21-0436-03	Timer shaft	
—	D22-0032-04	Coupling	
—	E11-0002-05	Phono jack × 2	
—	E11-0040-05	Mic jack	
—	E22-0416-05	Lug-type terminal strip (202)	
—	J19-0306-05	Lead holder	
—	J42-0071-04	Small bushing	
—	J61-0023-05	Cord clip	
—	J61-0033-05	Cord clip × 2	
—	J90-0073-03	Dial pointer rail	
—	X00-1930-80	Power supply unit	☆
—	X05-1390-10	Tuner unit	
—	X11-1440-10	Control amp unit	☆
—	X13-2190-10	Pushbutton switch (A) unit	
—	X13-2310-10	Tape monitor unit	
—	X13-2430-80	Pushbutton switch (B) unit	
—	X14-1070-10	Dolby unit	

### POWER SUPPLY (X00-1930-80)

Ref. No.	Parts No.	Description	Re- marks
<b>CAPACITOR</b>			
Ck1~8	CK45E2H103P	Ceramic 0.01μF +100%—0%	
Ck9	CE04W1K331	Electrolytic 330μF 80WV	
Ck10	CE04W1J101	Electrolytic 100μF 63WV	
Ck11	CE04W1H221	Electrolytic 220μF 50WV	
Ck12	CE04W1C101	Electrolytic 100μF 16WV	
Ck13	CE04W1H010	Electrolytic 1μF 50WV	
Ck14	CE04W1V221	Electrolytic 220μF 35WV	
Ck15	CE04W1H010	Electrolytic 1μF 50WV	
Ck16	CK45H1F473Z	Ceramic 0.047μF +80%—20%	
Ck17	CE04W1A222	Electrolytic 2200μF 10WV	
Ck18,19	CE04W1C470	Electrolytic 47μF 16WV	
Ck21	CE04W1H010	Electrolytic 1μF 50WV	
Ck22,23	CE04W1J470	Electrolytic 47μF 63WV	
Ck24,25	CK45F1H103Z	Ceramic 0.01μF +80%—20%	
Ck26~29	CK45E2H103P	Ceramic 0.01μF +100%—0%	

Ref. No.	Parts No.	Description	Re- marks
<b>RESISTOR</b>			
Rk6,7	R92-0166-05	Metal plate 0.22Ω ±5% 1W	
Rk13	RD14GY2E681J	Flame-proof carbon 680Ω ±5% 1/4W	
Rk24	RS14GB3D471J	Flame-proof metal film 470Ω ±5% 2W	
Rk25	RC05GF2H182K	Carbon 1.8kΩ ±10% 1/2W	
Rk26	RC05GF2H561K	Carbon 560Ω ±10% 1/2W	
Rk28	RS14GB3A271J	Flame-proof metal film 270Ω ±5% 1W	
Rk29	RS14GB3D301J	Flame-proof metal film 300Ω ±5% 2W	
Rk32,33	R92-0111-05	Metal plate 0.47Ω ±5% 3W	
Rk35	RC05GF2H391K	Carbon 390Ω ±10% 1/2W	
Rk37,38	R92-0166-05	Metal plate 0.22Ω ±5% 1W	
44~47			
<b>SEMICONDUCTOR</b>			
Qk1,2	V02-0060-05	Transistor 2SB616(Q), (R) or (S)	
Qk3,4	V04-0079-05	Transistor 2SD586(Q), (R) or (S)	
Qk5	V01-0893-10	Transistor 2SA893 (D), (E) or (F) or 2SA750(I) (E) or (U)	
Qk6	V02-0569-10	Transistor 2SB596(R), (O) or (Y)	
Qk7	V03-1890-10	Transistor 2SC1890(D), (E) or (F) or 2SC1400(E) or (U)	
Qk8,9	V01-0084-05	Transistor 2SA733(Q) or (R) or 2SA564A(Q) or (R)	
Qk10	V01-0893-10	Transistor 2SA893(D), (E) or (F) or 2SA750(I) (E) or (U)	
Qk11	V03-1890-10	Transistor 2SC1890(D), (E) or (F) or 2SC1400(E) or (U)	
Qk12,13	V03-0270-05	Transistor 2SC945(Q) or (R) or 2SC828A(Q) or (R)	
Qk14	V01-0893-10	Transistor 2SA893(D), (E) or (F) or 2SA750(I) (E) or (U)	
Qk15	V04-0330-10	Transistor 2SD330(D), (E) or (F) or 2SC1419(B) or (C)	
Qk16,17	V03-1890-10	Transistor 2SC1890(D), (E) or (F) or 2SC1400(E) or (U)	
Qk18	V04-0526-10	Transistor 2SD526(R), (O) or (Y)	
Qk19	V01-0893-10	Transistor 2SA893(D), (E) or (F) or 2SA750(I) (E) or (U)	
Qk20	V03-1890-10	Transistor 2SC1890(D), (E) or (F) or 2SC1400(E) or (U)	
Dk1,2	V11-0415-05	Diode M4C-5(S)	
Dk3	V11-0273-05	Diode 1S2076A	
Dk4	V11-4100-50	Zener diode XZ-147 14.7V, 500mW	☆
Dk5	V11-0273-05	Diode 1S2076A	
Dk6,7	V11-4100-50	Zener diode XZ-147 14.7V, 500 mW	☆
Dk8	V11-0249-05	Zener diode WZ-120 12V, 500 mW	
Dk9	V11-0295-05	Diode W06B	
Dk10,11	V11-0273-05	Diode 1S2076A	
Dk12	V11-4100-50	Zener diode XZ-147 14.7V, 500 mW	☆
Dk13	V11-0249-05	Zener diode WZ-120 12V, 500 mW	
Dk14,15	V11-4100-50	Zener diode XZ-147 14.7V, 500 mW	☆
Dk16	V11-0344-05	Zener diode WZ-140 14V, 500 mW	
Dk17	V11-0273-05	Diode 1S2076A	
Dk18	V11-0295-05	Diode W06B	
Dk19	V11-0273-05	Diode 1S2076A	
Dk20~23	V11-0200-05	Diode V06C	
<b>MISCELLANEOUS</b>			
Fk1	F05-4022-05	Fuse 4A	
—	F20-0114-05	Mica plate × 4	

## PARTS LIST

Ref. No.	Parts No.	Description	Re- marks
—	J13-0041-05	Fuse clip	

### TUNER (X05-1390-10)

Ref. No.	Parts No.	Description	Re- marks
<b>CAPACITOR</b>			
Cg1	CC45SL1H150K	Ceramic 15pF ±10%	
Cg2	CK45F1H103Z	Ceramic 0.01μF +80%—20%	
Cg3	CC45SL1H150K	Ceramic 15pF ±10%	
Cg4	CC45SL1H050D	Ceramic 5pF ±0.5pF	
Cg5	CC45TH1H020C	Ceramic 2pF ±0.25pF	
Cg6	CC45SL1H221K	Ceramic 220pF ±10%	
Cg7	CK45F1H223Z	Ceramic 0.022μF +80%—20%	
Cg8	CC45RG1H180K	Ceramic 18pF ±10%	
Cg9	CC45PG1H150K	Ceramic 15pF ±10%	
Cg10	CC45SH1H470K	Ceramic 47pF ±10%	
Cg11	CC45SH1H220K	Ceramic 22pF ±10%	
Cg12,13	CK45F1H223Z	Ceramic 0.022μF +80%—20%	
Cg14	CK45F1H103Z	Ceramic 0.01μF +80%—20%	
Cg15	CC45SL1H180K	Ceramic 18pF ±10%	
Cg16,17	CK45F1H223Z	Ceramic 0.022μF +80%—20%	
Cg18	CC45SL1H180K	Ceramic 18pF ±10%	
Cg19	CC45SL1H221K	Ceramic 220pF ±10%	
Cg20	CK45F1H223Z	Ceramic 0.022μF +80%—20%	
Cg21	CC45SL1H331K	Ceramic 330pF ±10%	
Cg22	CQ93M1H122M	Mylar 0.0012μF ±20%	
Cg23~25	CK45F1H223Z	Ceramic 0.022μF +80%—20%	
Cg26	CE04W1E100	Electrolytic 10μF 25WV	
Cg27,28	CC45SL1H331K	Ceramic 330pF ±10%	
Cg29	CC45SL1H221K	Ceramic 220pF ±10%	
Cg30	CE04W1C221	Electrolytic 220μF 16WV	
Cg41	CC45SL1H180K	Ceramic 18pF ±10%	
Cg42	CQ09S1H361J	Polystyrene 360pF ±5%	
Cg43	CK45F1H223Z	Ceramic 0.022μF +80%—20%	
Cg44	CQ93M1H223M	Mylar 0.022μF ±20%	
Cg45	CQ93M1H103M	Mylar 0.01μF ±20%	
Cg46	CQ93M1H223M	Mylar 0.022μF ±20%	
Cg47	CK45F1H223Z	Ceramic 0.022μF +80%—20%	
Cg48,49	CE04W1H010	Electrolytic 1μF 50WV	
Cg50	C90-0269-05	Ceramic 1μF ±20%	
Cg51	CE04W0J221	Electrolytic 220μF 6.3WV	
Cg60	CK45F1H103Z	Ceramic 0.01μF +80%—20%	
Cg61	CQ93M1H122M	Mylar 0.0012μF ±20%	
Cg62	CE04W1C221	Electrolytic 220μF 16WV	
Cg63	CQ93M1H473M	Mylar 0.047μF ±20%	
Cg64	CQ09S1H361J	Polystyrene 360pF ±5%	
Cg65,66	CE04W1E100	Electrolytic 10μF 25WV	
Cg67	CS15E1E1R5M	Tantalum 1.5μF 25WV	
Cg68	CS15E1E3R3M	Tantalum 3.3μF 25WV	
Cg69	CE04AW1HR33CC	Electrolytic 0.33μF 50WV	
Cg70,71	CQ93M1H152J	Mylar 0.0015μF ±5%	
Cg72	CE04W1C4R7	Electrolytic 4.7μF 16WV	
Cg75~78	CE04W1H3R3	Electrolytic 3.3μF 50WV	
Cg79	CE04W1E4R7	Electrolytic 4.7μF 25WV	
Cg80,81	CQ93M1H392J	Mylar 0.0039μF ±5%	
<b>SEMICONDUCTOR</b>			
Qg1	V09-0071-05	FET 2SK55(D) or (E)	
Qg2	V03-0092-05	Transistor 2SC381(O)	
Qg3	V03-0357-05	Transistor 2SC1342(A)	
Qg4	V03-0091-05	Transistor 2SC381(R)	

Ref. No.	Parts No.	Description	Re- marks
Qg5,6	V03-0270-05	Transistor 2SC945	
Qg7,8	V09-0110-05	Transistor 2SK68(L) or (M)	
	V09-0058-05	or 2SK30A(Y) or (G)	
ICg1	V30-0093-05	IC AN217BB	
ICg2	V30-0155-05	IC HA1196	
Dg1~4	V11-0051-05	Diode 1N60	
Dg5,6	V11-0271-05	Diode 1S2076 or 1S1555	
Dg7	V11-4100-70	Zener diode XZ-137	
Dg8	V11-0051-05	Diode 1N60	
Dg9,12	V11-0271-05	Diode 1S2076 or 1S1555	
<b>COIL/TRANS/FILTER/INDUCTOR</b>			
Lg1	L31-0361-05	FM ANT coil	
Lg2	L31-0359-05	FM RF coil	
Lg3	L40-1091-41	Ferri-inductor 1μH (K)	
Lg4	L40-1092-03	Ferri-inductor 1μH (M)	
Lg5	L32-0187-05	FM OSC coil	
Lg6	L30-0282-05	FM IFT	
Lg7	L30-0274-05	FM IFT	
Lg8	L30-0260-15	FM DISCRI coil	
Lg9	L40-1092-03	Ferri-inductor 1μH (M)	
Lg10	L32-0186-05	AM OSC coil	
Lg11	L72-0035-05	AM ceramic filter	
Lg12	L30-0283-05	AM DETECT coil	
Lg13	L40-1022-03	Ferri-inductor 1mH (M)	
Lg14	L79-0052-05	Low pass filter	☆
Lg15	L79-0053-05	Low pass filter	☆
CFg1,2	L72-0034-05	FM ceramic filter	
<b>POTENTIOMETER</b>			
VRg1	R12-3030-05	Semi-fixed resistor 10kΩ VCO	
VRg2	R12-7006-05 or R12-7007-05	Semi-fixed resistor 500kΩ SEPARATION	
<b>MISCELLANEOUS</b>			
—	C01-0185-05	Variable capacitor	
CTg1	C05-0055-05	Ceramic trimmer	
CRg1	R90-0104-05	CR parts	

### POWER AMP (X07-1570-80)

Ref. No.	Parts No.	Description	Re- marks
<b>CAPACITOR</b>			
Ce1,2	CC45SL1H101K	Ceramic 100pF ±10%	
Ce3~6	CE04AW1E3R3M	Electrolytic 3.3μF 25WV	
Ce7,8	CE04W1A470	Electrolytic 47μF 10WV	
Ce9,10	CC45SL1H010D	Ceramic 1pF ±0.5pF	
Ce11,12	CE04W1H010	Electrolytic 1μF 50WV	
Ce13,14	CC45SL1H101K	Ceramic 100pF ±10%	
Ce15,16	CE04W1H470	Electrolytic 47μF 50WV	
Ce17,18	CC45SL1H180K	Ceramic 18pF ±10%	
Ce19,20	CE04W1A101	Electrolytic 100μF 10WV	
Ce21,22	CE04W2A470	Electrolytic 47μF 100WV	
Ce23,24	CE04W1J010	Electrolytic 1μF 63WV	
Ce25,26	CE04W1H010	Electrolytic 1μF 50WV	
Ce27,28	CQ93M1H104M	Mylar 0.1μF ±20%	
Ce29~32	CC45SL1H101K	Ceramic 100pF ±10%	
Ce41,42	CQ93M1H104M	Mylar 0.1μF ±20%	
Ce43	CE04BW1A470M	Non-pole electrolytic 47μF 10WV	

## PARTS LIST

Ref. No.	Parts No.	Description	Re- marks
Ce44	CE04AW1C470M	Electrolytic 4.7 $\mu$ F 16WV	
Ce45	CQ93M1H104M	Mylar 0.1 $\mu$ F $\pm$ 20%	
Ce46	CK45F1H103Z	Ceramic 0.01 $\mu$ F +80%—20%	
Ce47	CE04W1J010	Electrolytic 1 $\mu$ F 63WV	
<b>RESISTOR</b>			
Re15,16	RC05GF2H472K	Carbon 4.7k $\Omega$ $\pm$ 10% 1/2W	
Re29,30	RD14GY2E221J	Flame-proof carbon	
37,38		220 $\Omega$ $\pm$ 5% 1/4W	
Re39,40	RD14GY2E121J	Flame-proof carbon	
43,44		120 $\Omega$ $\pm$ 5% 1/4W	
Re45,46	RC05GF2H222K	Carbon 2.2k $\Omega$ $\pm$ 10% 1/2W	
Re47,48	RC05GF2H332K	Carbon 3.3k $\Omega$ $\pm$ 10% 1/2W	
Re49~52	RD14GY2E181J	Flame-proof carbon	
		180 $\Omega$ $\pm$ 5% 1/4W	
Re53~56	R92-0167-05	Metal plate 0.22 $\Omega$ $\pm$ 5% 3W	☆
Re57,58	RD14GY2E181J	Flame-proof carbon	
		180 $\Omega$ $\pm$ 5% 1/4W	
Re59~62	RD14GY2E4R7J	Flame-proof carbon	
		4.7 $\Omega$ $\pm$ 5% 1/4W	
Re71,72	RS14GB3F100J	Flame-proof metal film	
		10 $\Omega$ $\pm$ 5% 3W	
Re76	RS14GB3D821J	Flame-proof metal film	
		820 $\Omega$ $\pm$ 5% 2W	
<b>SEMICONDUCTOR</b>			
Qe1~4	V01-0191-05	Transistor 2SA872 (D) or (E)	
Qe5,6	V03-0439-05	Transistor 2SC1885 (D) or (R)	
Qe7,8	V03-1890-10	Transistor 2SC1890 (D), (E) or (F)	
	V03-0447-05	or 2SC1681 (GR) or (BL)	
Qe9,10	V03-1890-30	Transistor 2SC1890A (D), (E) or (F)	
Qe11,12	V01-0893-10	Transistor 2SA893 (D), (E) or (F)	
	V01-0152-05	or 2SA750 (I) (E) or (U)	
Qe13,14	V03-0270-05	Transistor 2SC945 (Q) or (R)	
	V03-0504-05	or 2SC828A (Q) or (R)	
Qe15,16	V01-0188-05	Transistor 2SA913 (Q) or (R)	
Qe17,18	V03-0468-05	Transistor 2SC1913 (Q) or (R)	
Qe19,20	V01-0176-05	Transistor 2SA747 (O) or (Y)	
Qe21,22	V03-0455-05	Transistor 2SC1116 (O) or (Y)	
Qe23	V01-0084-05	Transistor 2SA733 (Q) or (R)	
	V01-0163-05	or 2SA564A (D) or (R)	
Qe24,25	V03-0270-05	Transistor 2SC945 (Q) or (R)	
	V03-0504-05	or 2SC828 (Q) or (R)	
Qe26	V03-1890-10	Transistor 2SC1890 (D), (E) or (F)	
	V03-0447-05	or 2SC1681 (GR) or (BL)	
Qe27	V04-0438-10	Transistor 2SD438MP (D) or (E)	
	V03-0452-05	or 2SC1735 (D) or (E)	
Qe28	V01-0893-10	Transistor 2SA893 (D), (E) or (F)	
	V01-0152-05	or 2SA750 (I) (E) or (U)	
De1,2	V11-4100-20	Zener diode WZ-300 30V	☆
De3,4	V11-0271-05	Diode 1S2076	
De5~8	V11-0273-05	Diode 1S2076A	
De9,10	V11-0344-05	Zener diode WZ-140 14V	
De11,12	V11-0273-05	Diode 1S2076A	
De13	V11-0295-05	Diode W06B	
De14	V11-0271-05	Diode 1S2076	
THe1,2	V22-0027-05	Thermistor 5TP-41L	
<b>POTENTIOMETER</b>			
VRe1,2	R12-1007-05	Semi-fixed resistor 1k $\Omega$ BIAS	
<b>MISCELLANEOUS</b>			
—	E02-0209-05	Transistor socket $\times$ 4	
—	E40-0380-05	Mini-connector ass'y 3P	

Ref. No.	Parts No.	Description	Re- marks
—	E40-0381-05	Mini-connector ass'y 3P (L-shaped, right)	☆
—	E40-0481-05	Mini-connector ass'y 4P (L-shaped, right)	☆
—	E40-0482-05	Mini-connector ass'y 4P (L-shaped, left) $\times$ 2	☆
—	F20-0066-05	Mica plate $\times$ 4	
Le1,2	L39-0080-15	Phase compensation coil	
—	S51-4030-05 or S51-4033-05	Relay	

## CONTROL AMP (X11-1440-10)

Ref. No.	Parts No.	Description	Re- marks
<b>CAPACITOR</b>			
Ci1,2	CS15E1A3R3M	Tantalum 3.3 $\mu$ F 10WV	
Ci3,4	CE04W1A101	Electrolytic 100 $\mu$ F 10WV	
Ci5,6	CC45SL1H101K	Ceramic 100pF $\pm$ 10%	
Ci7,8	CE04W1E100	Electrolytic 10 $\mu$ F 25WV	
Ci9,10	CQ93M1H822J	Mylar 0.0082 $\mu$ F $\pm$ 5%	
Ci11,12	CQ93M1H272J	Mylar 0.0027 $\mu$ F $\pm$ 5%	
Ci13,14	CK45B1H391K	Ceramic 390pF $\pm$ 10%	
Ci15,16	CS15E1A3R3M	Tantalum 3.3 $\mu$ F 10WV	
Ci17,18	CE04W1A101	Electrolytic 100 $\mu$ F 10WV	
Ci19,20	CC45SL1H100D	Ceramic 10pF $\pm$ 0.5pF	
Ci21,22	CE04W1E100	Electrolytic 10 $\mu$ F 25WV	
Ci23,24	CK45B1H391K	Ceramic 390pF $\pm$ 10%	
Ci25,26	CQ93M1H682K	Mylar 0.0068 $\mu$ F $\pm$ 10%	
Ci27,28	CQ93M1H103K	Mylar 0.01 $\mu$ F $\pm$ 10%	
Ci29,30	CQ93M1H272K	Mylar 0.0027 $\mu$ F $\pm$ 10%	
Ci31~34	CQ93M1H183K	Mylar 0.018 $\mu$ F $\pm$ 10%	
Ci35,36	CE04W1E100	Electrolytic 10 $\mu$ F 25WV	
Ci37,38	CE04AW1H010M	Electrolytic 1 $\mu$ F 50WV	
Ci39,40	CE04AW1E4R7M	Electrolytic 4.7 $\mu$ F 25WV	
Ci41,42	CE04W1A101	Electrolytic 100 $\mu$ F 10WV	
Ci43,44	CQ93M1H123K	Mylar 0.012 $\mu$ F $\pm$ 10%	
Ci45,46	CQ93M1H393K	Mylar 0.039 $\mu$ F $\pm$ 10%	
Ci47	CE04W1E100	Electrolytic 10 $\mu$ F 25WV	
Ci48	CS15E1V0R1M	Tantalum 0.1 $\mu$ F 35WV	
Ci49~52	CK45B1H561K	Ceramic 560pF $\pm$ 10%	
Ci53~56	CQ93M1H224K	Mylar 0.22 $\mu$ F $\pm$ 10%	
<b>SEMICONDUCTOR</b>			
Qi1,2	V03-0408-05 V03-0271-05	Transistor 2SC1222 (U) or 2SC1345 (E)	
Qi3	V03-0270-05 V03-0504-05	Transistor 2SC945 (P), (Q) or (R) or 2SC828A (P), (Q) or (R)	
Qi4	V01-0084-05 V01-0163-05	Transistor 2SA733 (P), (Q) or (R) or 2SA564A (P), (Q) or (R)	
ICi1~4	V30-0140-05	IC TA7129P	
<b>POTENTIOMETER</b>			
VRI1	R11-9005-05	Variable resistor 100k $\Omega$ (B) $\times$ 2, 200k $\Omega$ (W), VOLUME, BALANCE	
VRI2~4	R06-5013-05	Variable resistor 10k $\Omega$ (B) $\times$ 2 BASS, MID, TREBLE	



## PARTS LIST

Ref. No.	Parts No.	Description	Re- marks
<b>SWITCH</b>			
S13,14 S20	S31-2039-05 S29-2018-05	Lever LOW-FIL, HIGH-FIL Rotary, INPUT SELECTOR	

### PUSH SWITCH (A) (X13-2190-10)

Ref. No.	Parts No.	Description	Re- marks
<b>CAPACITOR</b>			
Cp1,2	CE04AW1H2R2MEL	Electrolytic 2.2 $\mu$ F 50WV	
<b>SEMICONDUCTOR</b>			
Dp1,2 Dp3,4 Dp5,6	V11-0051-05 V11-0076-05 V11-0051-05	Diode 1N60 Diode 1S1555 Diode 1N60	
<b>POTENTIOMETER</b>			
VRp1,2	R12-3028-05	Semi-fixed resistor 10k $\Omega$ (B) METER LEVEL	
<b>SWITCH</b>			
S7,8	S40-2062-15	Pushbutton, DIMMER, METER	

### TAPE MONITOR (X13-2310-10)

Ref. No.	Parts No.	Description	Re- marks
<b>CAPACITOR</b>			
Cr1,2	CQ93M1H182J	Mylar 0.0018 $\mu$ F $\pm$ 5%	
<b>POTENTIOMETER</b>			
VRr1,2	R12-3014-05	Semi-fixed resistor 20k $\Omega$ (B) DOLBY FM	
<b>SWITCH</b>			
S15 S16 S17	S01-6004-05 S32-4007-05 S40-0002-05	Rotary, TAPE MONITOR Lever, TAPE MONITOR Pushbutton, DOLBY FM	

### SPEAKER SELECTOR (X13-2390-80)

Ref. No.	Parts No.	Description	Re- marks
<b>RESISTOR</b>			
Rh1,2	RC05GF2H271K	Carbon 270 $\Omega$ $\pm$ 10% 1/2W	
<b>SWITCH</b>			
S4~6 — —	S42-3017-05 E40-0639-05 E40-0640-05	Pushbutton, SPEAKERS Pin connector (symmetry) Pin connector (non-symmetry)	

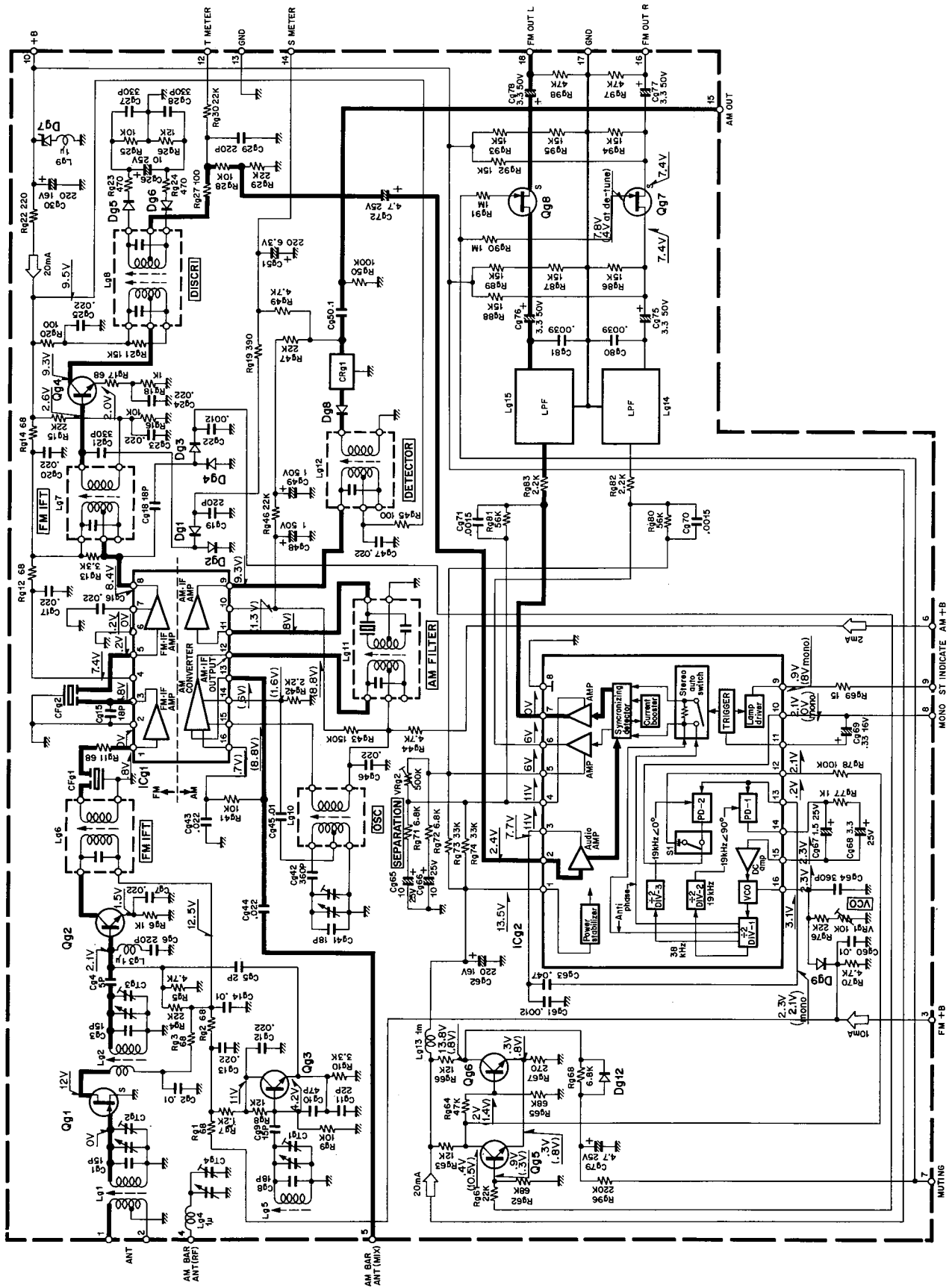
### PUSH SWITCH (B) (X13-2430-80)

Ref. No.	Parts No.	Description	Re- marks
<b>CAPACITOR</b>			
Cq1 Cq2 Cq3 Cq4 Cq5 Cq6,7 Cq8,9 Cq10	CE04W1E101 CQ93M1H104J CQ93M1H153J CQ93M1H273J CQ93M1H153J CQ93M1H273J CK45B1H471M CE04W1C100	Electrolytic 100 $\mu$ F 25WV Mylar 0.1 $\mu$ F $\pm$ 5% Mylar 0.015 $\mu$ F $\pm$ 5% Mylar 0.027 $\mu$ F $\pm$ 5% Mylar 0.015 $\mu$ F $\pm$ 5% Mylar 0.027 $\mu$ F $\pm$ 5% Ceramic 470 $\mu$ F $\pm$ 20% Electrolytic 10 $\mu$ F 16WV	
<b>RESISTOR</b>			
Rq9	RC05GF125M	Carbon 1.2M $\Omega$ $\pm$ 20%	1/2W
<b>SEMICONDUCTOR</b>			
Qq1,2	V03-0271-05	Transistor 2SC1345 (E) or (F)	
<b>POTENTIOMETER</b>			
VRq1	R12-1027-05	Semi-fixed resistor 2k $\Omega$ (B) 400 Hz, LEVEL	
<b>SWITCH</b>			
S9~12	S40-4019-15	Pushbutton	

### DOLBY (X14-1070-10)

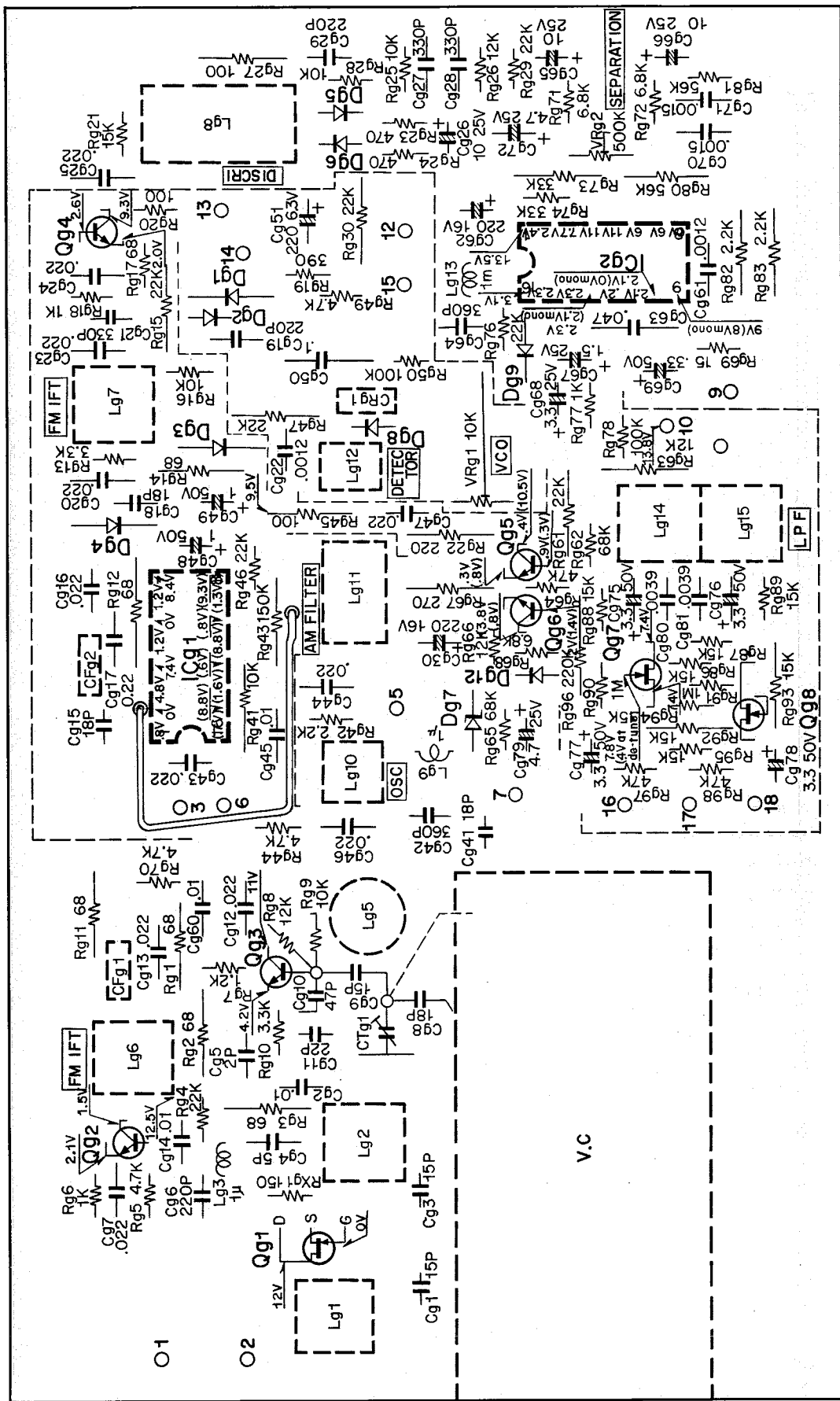
Ref. No.	Parts No.	Description	Re- marks
<b>CAPACITOR</b>			
Cv1,2 Cv3,4 Cv5,6 Cv7~10 Cv11,12 Cv13,14 Cv15,16 Cv17,18 Cv19,20 Cv21,22 Cv23,24 Cv25,26 Cv27,28 C29,30 Cv31,32 Cv33,34 Cv35	CS15E1E010M CQ93N1H272J CQ93M1H102J CE04W1E100 CQ93M1H562G CE04W1E100 CQ93M1H334J CQ93M1H104J CQ93M1H473J CE04W1E100 CQ93M1H472G CE04W1E100 CE04W1C221 CQ93M1H273G CE04W1H010 CE04W1E100 CE04W1E101	Tantalum 1 $\mu$ F 25WV Mylar 0.0027 $\mu$ F $\pm$ 5% Mylar 0.001 $\mu$ F $\pm$ 5% Electrolytic 10 $\mu$ F 25WV Polyester 0.0056 $\mu$ F $\pm$ 2% Electrolytic 10 $\mu$ F 25WV Mylar 0.33 $\mu$ F $\pm$ 5% Mylar 0.1 $\mu$ F $\pm$ 5% Mylar 0.047 $\mu$ F $\pm$ 5% Electrolytic 10 $\mu$ F 25WV Polyester 0.0047 $\mu$ F $\pm$ 2% Electrolytic 10 $\mu$ F 25WV Electrolytic 220 $\mu$ F 16WV Polyester 0.027 $\mu$ F $\pm$ 2% Electrolytic 1 $\mu$ F 50WV Electrolytic 10 $\mu$ F 25WV Electrolytic 100 $\mu$ F 25WV	
<b>RESISTOR</b>			
Rv31	RC05GF2H151K	Carbon 150 $\Omega$ $\pm$ 10% 1/2W	
<b>SEMICONDUCTOR</b>			
Qv1,2 ICv1,2 Dv1~4	V03-0270-05 V30-0139-05 V11-0051-05	Transistor 2SC945 (R) or (Q) IC NE545B Diode 1N60	
<b>POTENTIOMETER</b>			
VRv1,2	R12-1007-05	Semi-fixed resistor 1k $\Omega$ (B) METER, CAL	
<b>INDUCTOR</b>			
Lv1,2	L39-0041-05	Variable	

## TUNER (X05-1390-10)



DC voltages are measured with 20kΩ/V meter at stereo signal reception except ( ) voltages are measured at AM reception.

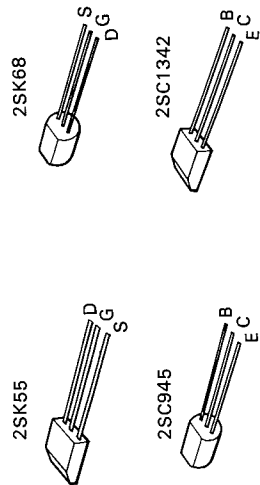
## TUNER (X05-1390-10)



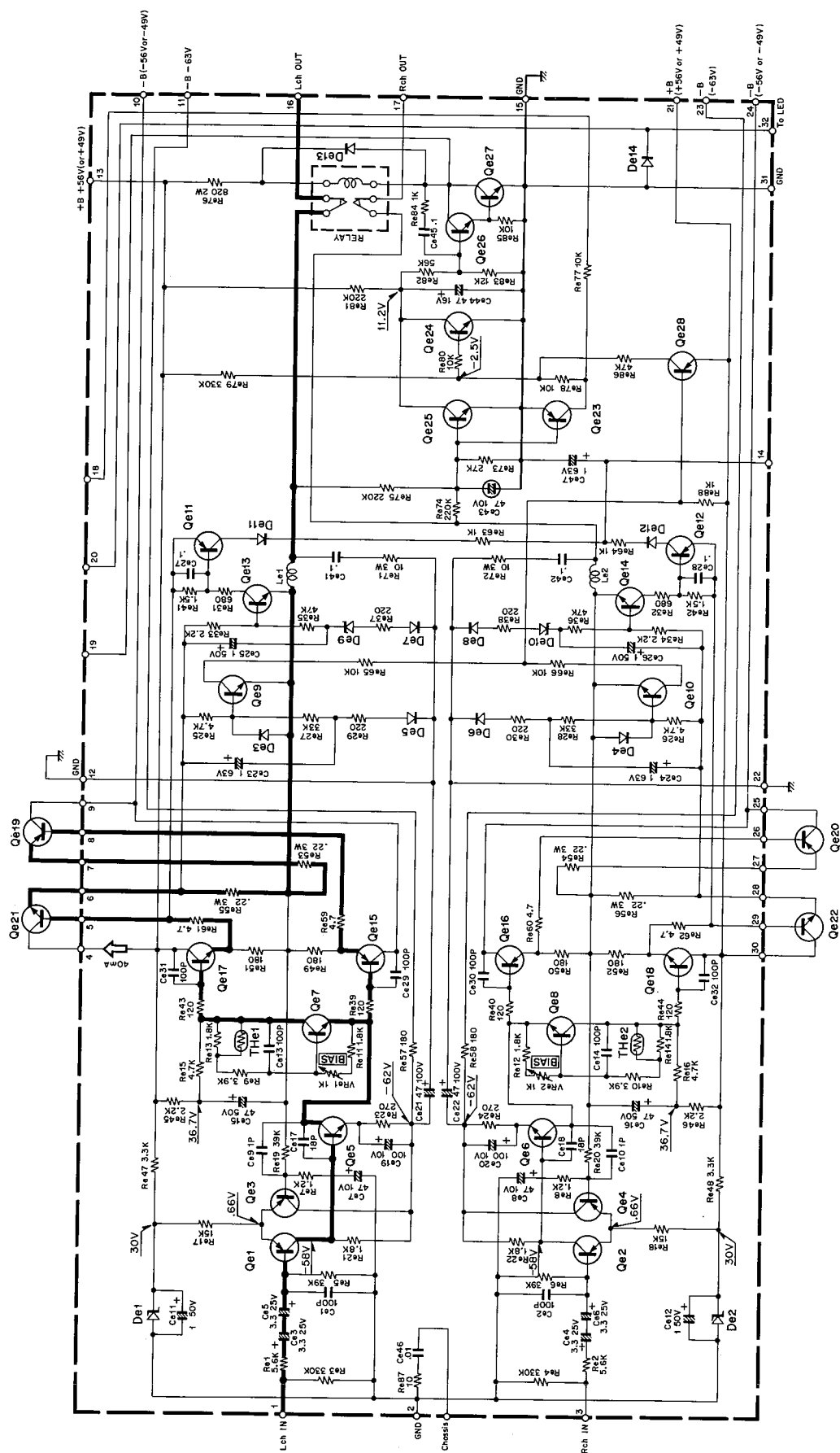
Qg1 : 2SK55 (D) or (E), Qg2 : 2SC381 (O), Qg3 : 2SC1342 (A), Qg4 : 2SC381 (R), Qg5, 6 : 2SC945,

Qg7, 8 : 2SK68 (L) or (M) or 2SK30A (Y) or (Gr), ICg1 : AN-217BB, ICg2 : HA-1196,

Dg1 ~ 4, 8 : 1N60, Dg5, 6, 9, 12 : 1S2076 or 1S1555, Dg7 : XZ-137

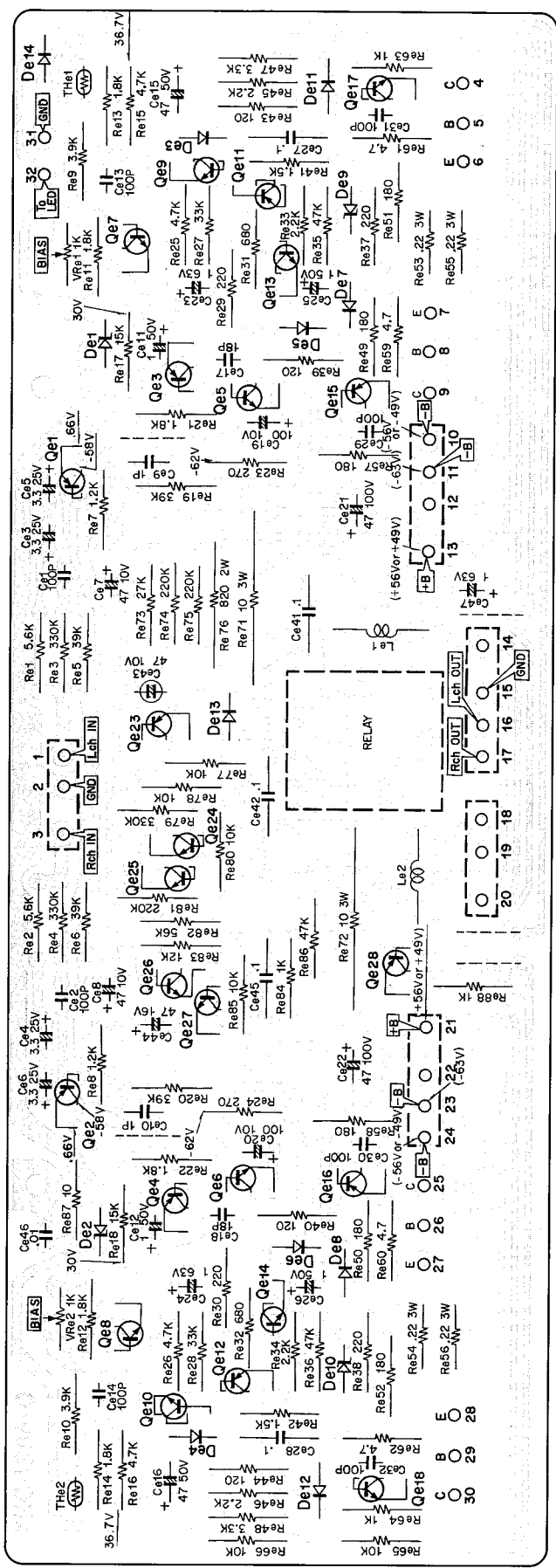


## POWER AMP (X07-1570-80)



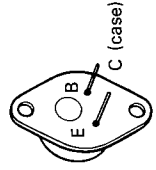
DC voltages are measured with 20kΩ/V meter at no signal fed condition.

## POWER AMP (X07-1570-80)

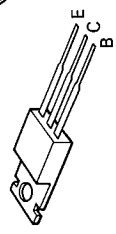


Qe1 ~ 4 : 2SA872 (D) or (E), Qe5, 6 : 2SC1885 (Q) or (R), Qe7, 8, 26 : 2SC1890 (D), (E) or (F) or 2SC1681 (GR) or (BL), Qe9, 10 : 2SC1890A (D), (E) or (F), Qe11, 12, 28 : 2SA893 (D), (E) or (F), or 2SA750 (E) or (U), Qe13, 14, 24, 25 : 2SC945 (Q) or (R) or 2SC828A (Q) or (R), Qe15, 16 : 2SA913 (Q) or (R), Qe17, 18 : 2SC1913 (Q) or (R), Qe19, 20 : 2SA747 (O) or (Y), Qe21, 22 : 2SC1116 (O) or (Y), Qe23 : 2SA733 (Q) or (R) or 2SA564A (Q) or (R), Qe27 : 2SD438MP (D) or (E) or 2SC1735 (D) or (E), De1, 2 : WZ-300, De3, 4, 14 : 1S2076, De5 ~ 8, 11, 12 : 1S2076A, De9, 10 : WZ-140, De13 : W06B, The1, 2 : 5TP-411

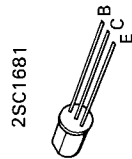
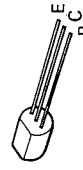
2SA747  
2SC1116



2SA913  
2SC1913

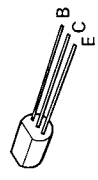


2SC1735

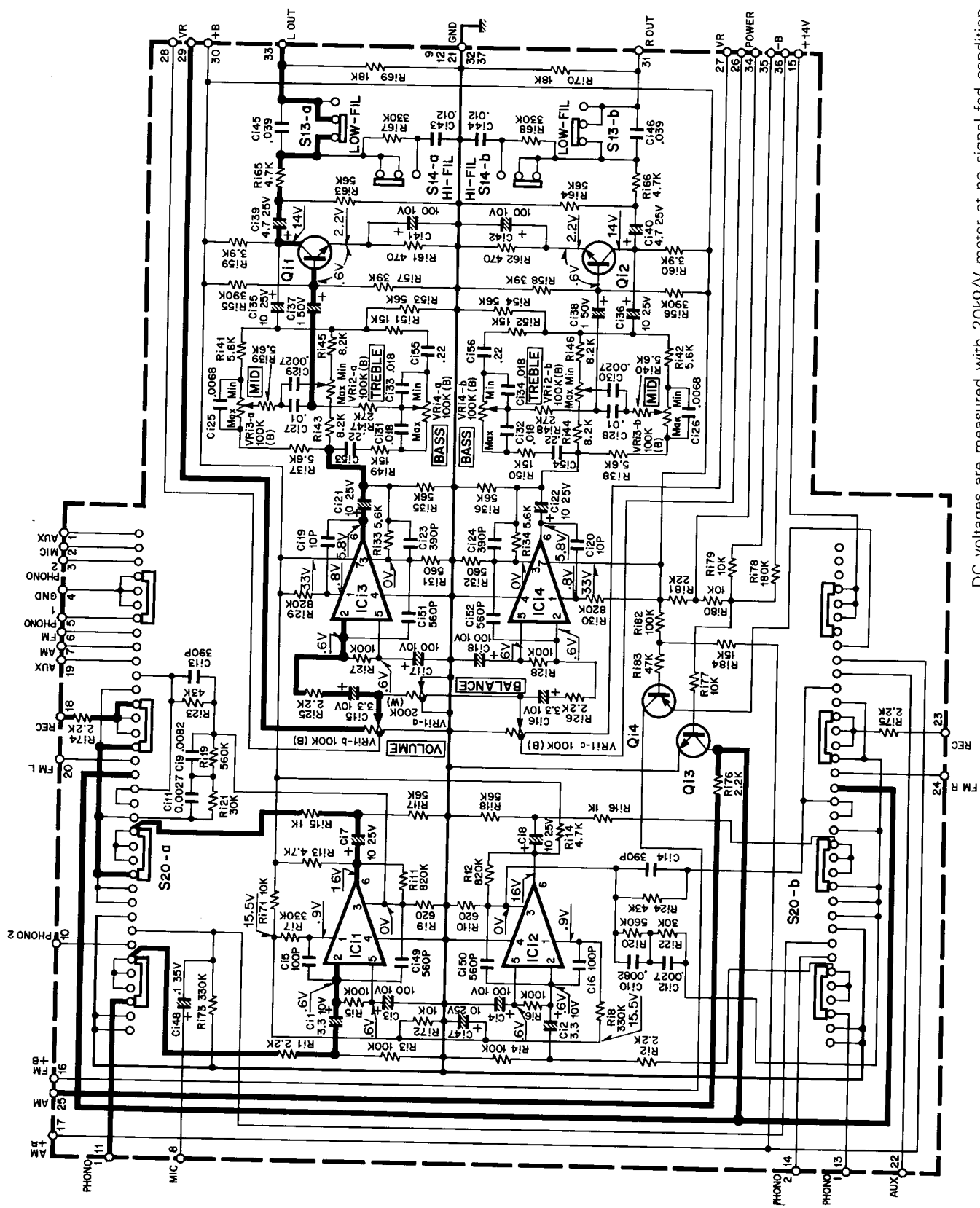


2SC1681

2SA564A 2SC945  
2SA733 2SC1885  
2SA750 2SC1890  
2SA872 2SC1890A  
2SA893 2SD438MP  
2SC828A

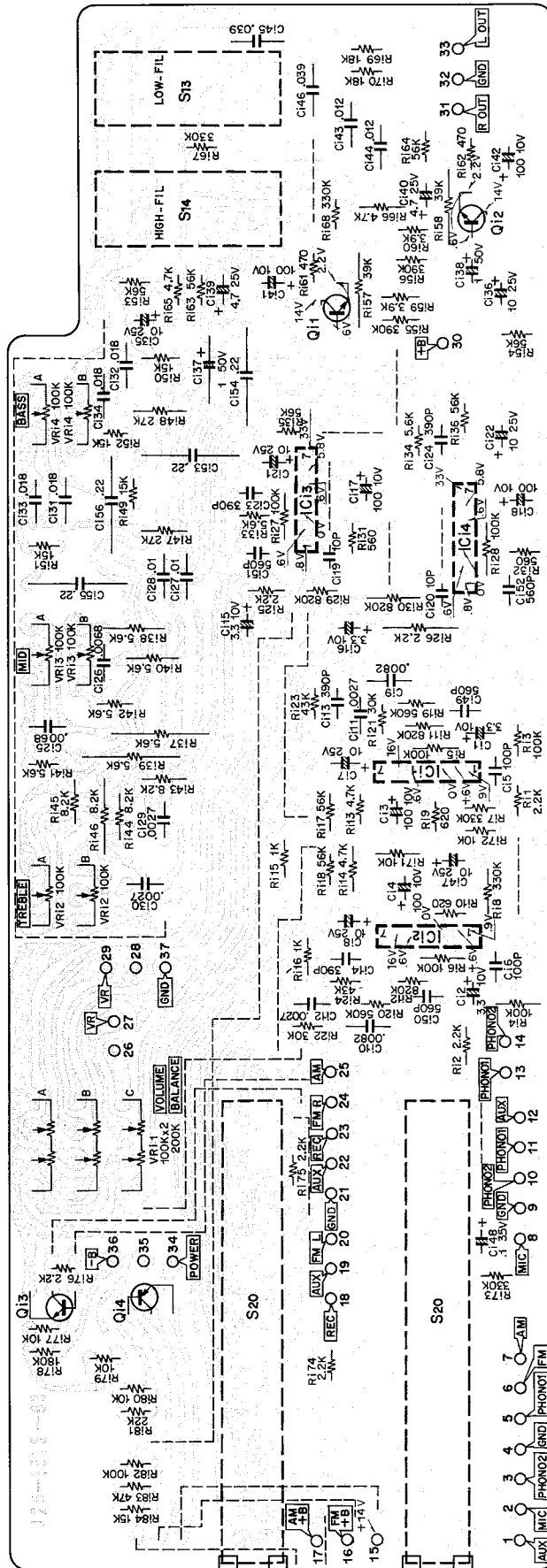


## CONTROL AMP (X11-1440-10)



DC voltages are measured with 20kΩ/V meter at no signal fed condition.

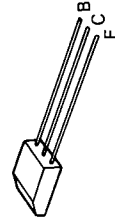
## CONTROL AMP (X11-1440-10)



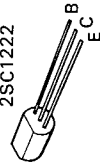
IC1 ~ 4 : TA7129P, Q11, 2 : 2SC1222 (U) or 2SC1345 (E), Q13 : 2SC945 (P) or (Q) or (R) or 2SC828A (P) or (Q) or (R),

Q14 : 2SA733 (P) or (Q) or (R) or 2SA564A (P) or (Q) or (R)

2SC1345

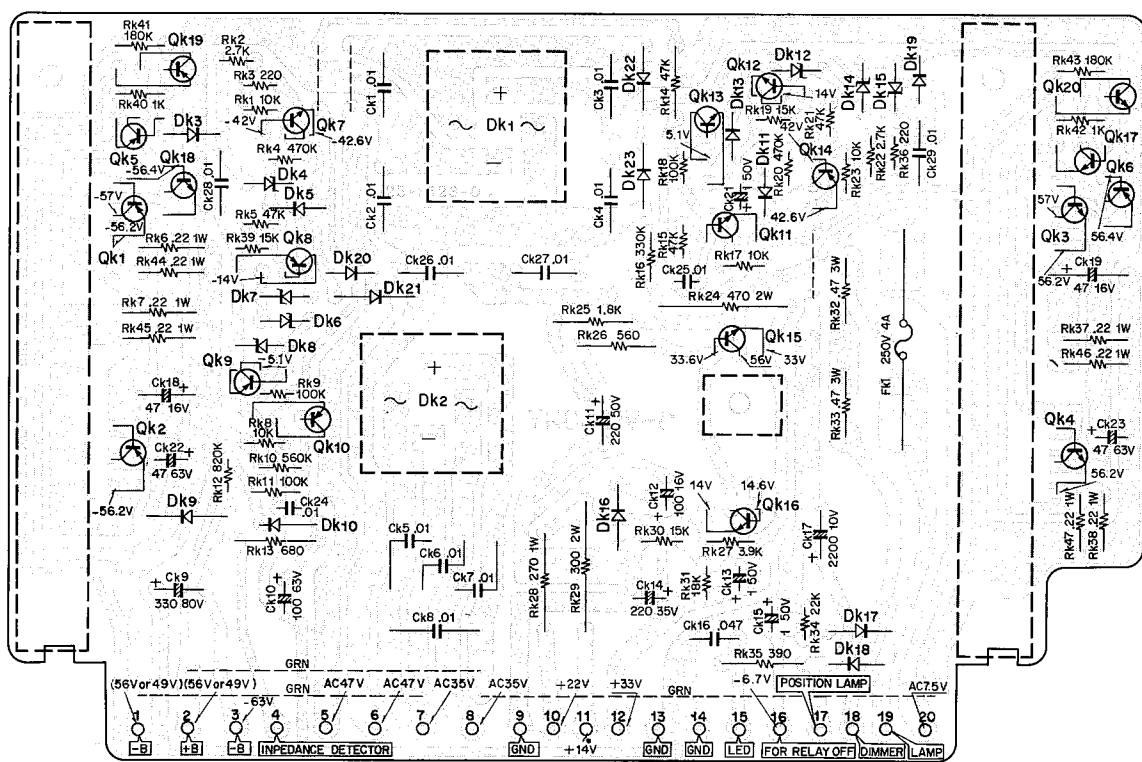
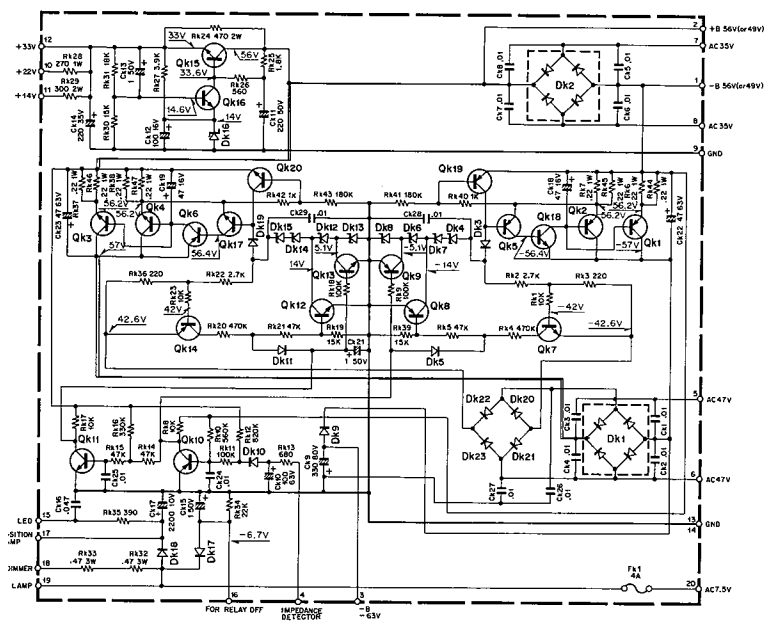


2SA564A  
2SA733  
2SC828A  
2SC945  
2SC1222

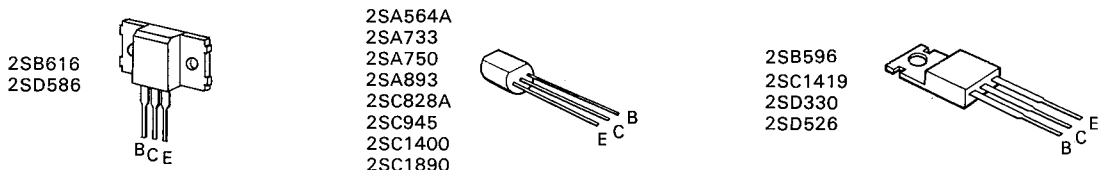


## POWER SUPPLY (X00-1930-80)

DC voltages are measured with 20kΩ/V meter at no signal fed condition.



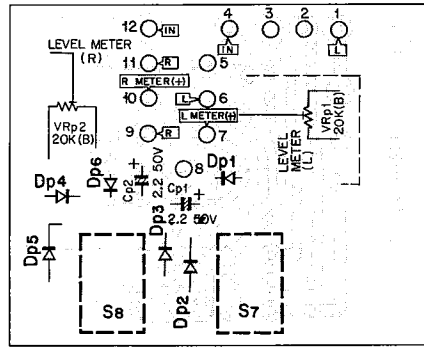
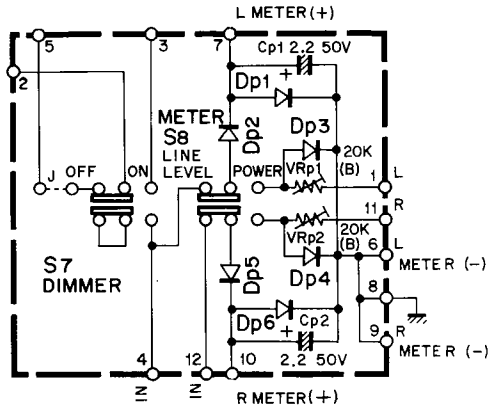
Qk1, 2 : 2SB616 (Q), (R) or (S), Qk3, 4 : 2SC586 (Q), (R) or (S), Qk5, 10, 14, 19 : 2SA893 (D), (E) or (F) or 2SA750 (1) (E) or (U), Qk6 : 2SB596 (R), (O) or (Y), Qk7, 11, 16, 17, 20 : 2SC1890 (D), (E) or (F) or 2SC1400 (E) or (U), Qk8, 9 : 2SA733 (Q) or (R) or 2SA564A (Q) or (R), Qk12, 13 : 2SC945 (Q) or (R) or 2SC828A (Q) or (R), Qk15 : 2SD330 (D), (E) or (F) or 2SC1419 (B) or (C), Qk18 : 2SD526 (R), (O) or (Y), Dk1, 2 : M4C-5 (S), Dk3, 5, 10, 11, 17, 19 : 1S2076A, Dk4, 6, 7, 12, 14, 15 : XZ-147, Dk8, 13 : WZ-120, Dk9, 18 : W06B, Dk16 : WZ-140, Dk20 ~ 23 : V06C





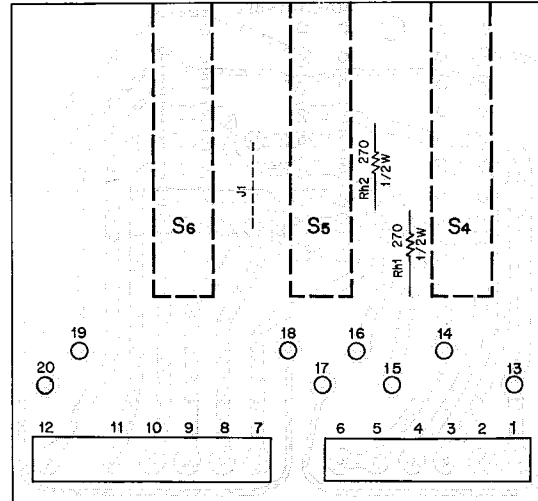
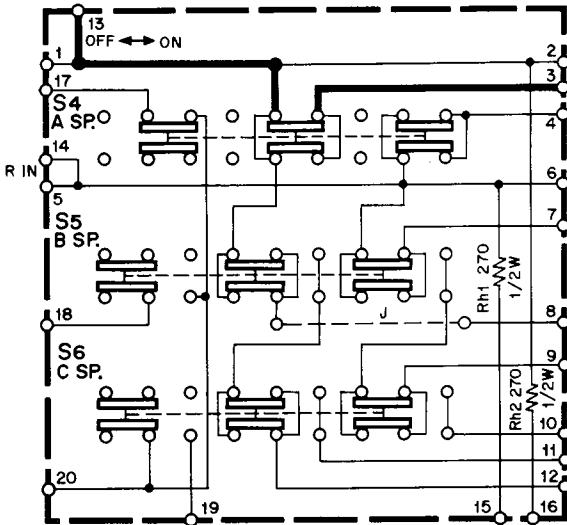
## PUSH SWITCH(A)/SPEAKER SELECTOR/TAPE MONITOR

### PUSH SWITCH (A) (X13-2190-10)

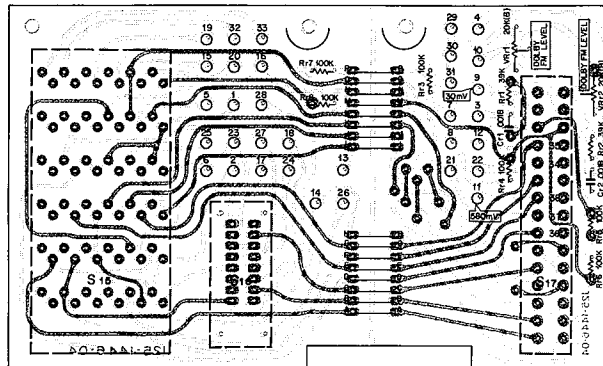
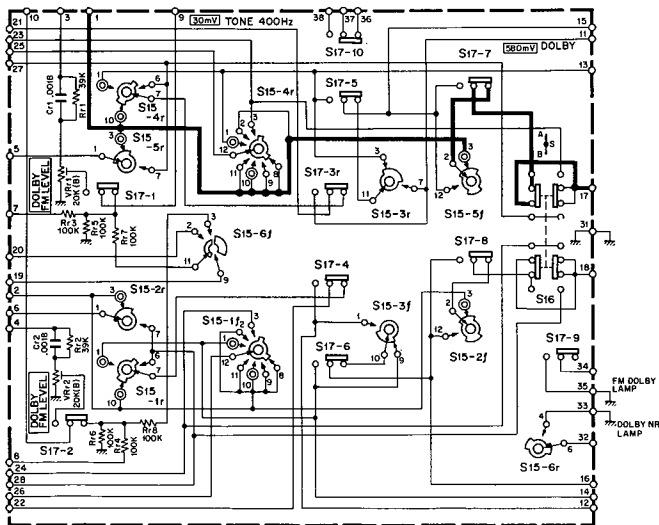


Dp1, 2, 5, 6 : 1N60, Dp3, 4 : 1S1555

### SPEAKER SELECTOR (X13-2390-80)

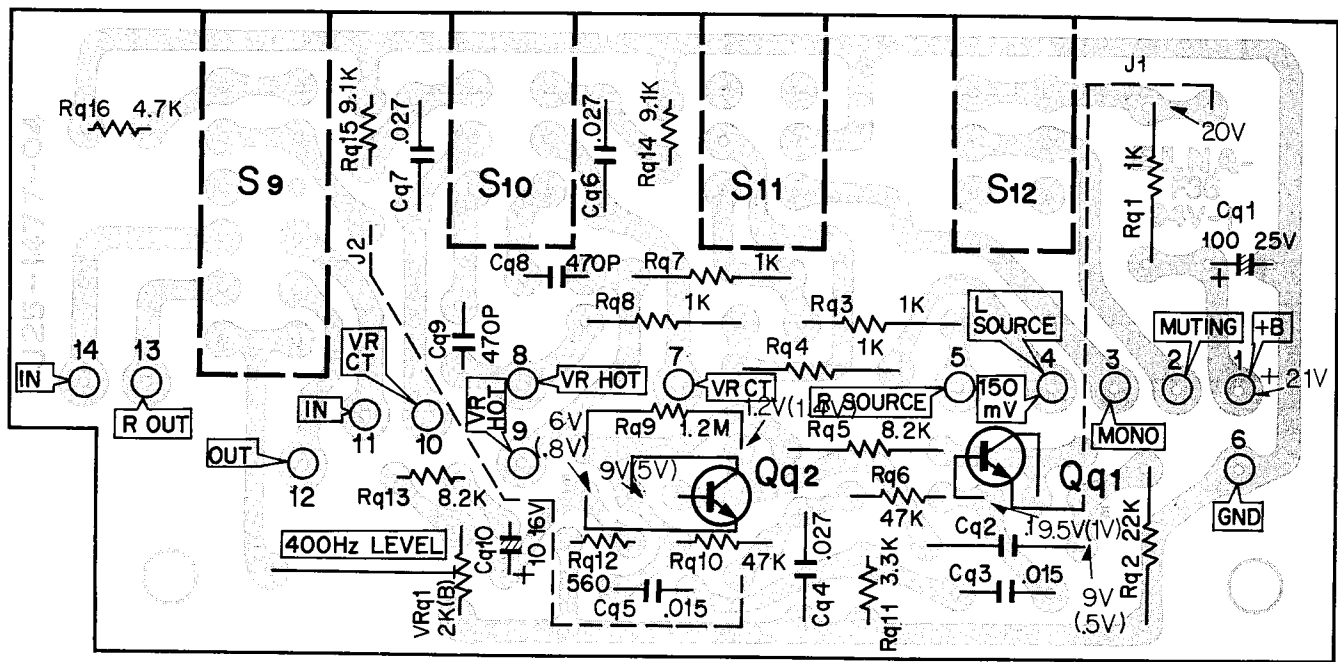
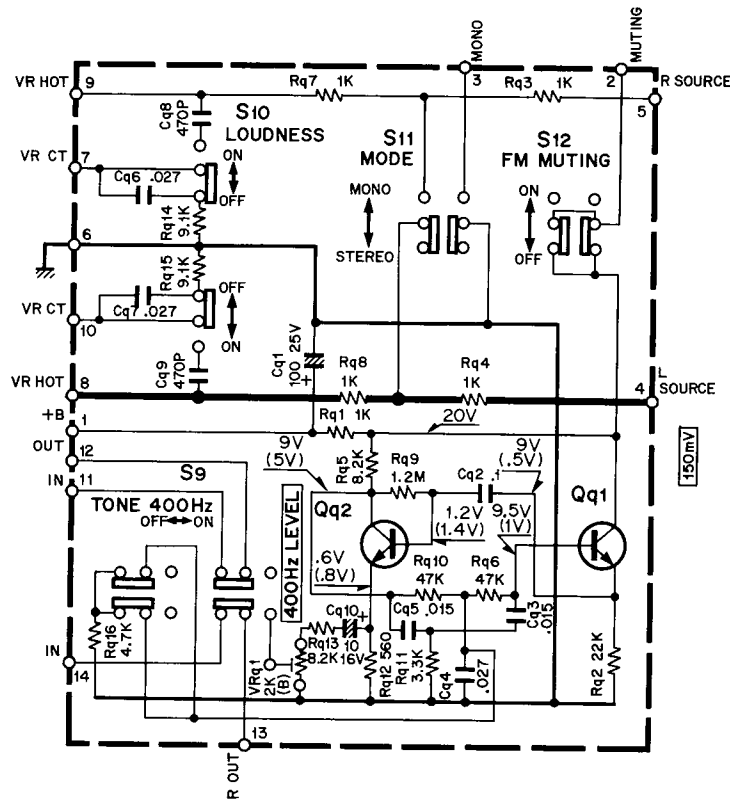


### TAPE MONITOR (X13-2310-10)



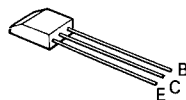
## PUSH SWITCH(B) (X13-2430-80)

DC voltages are measured with 20kΩ/V meter at no signal fed condition.



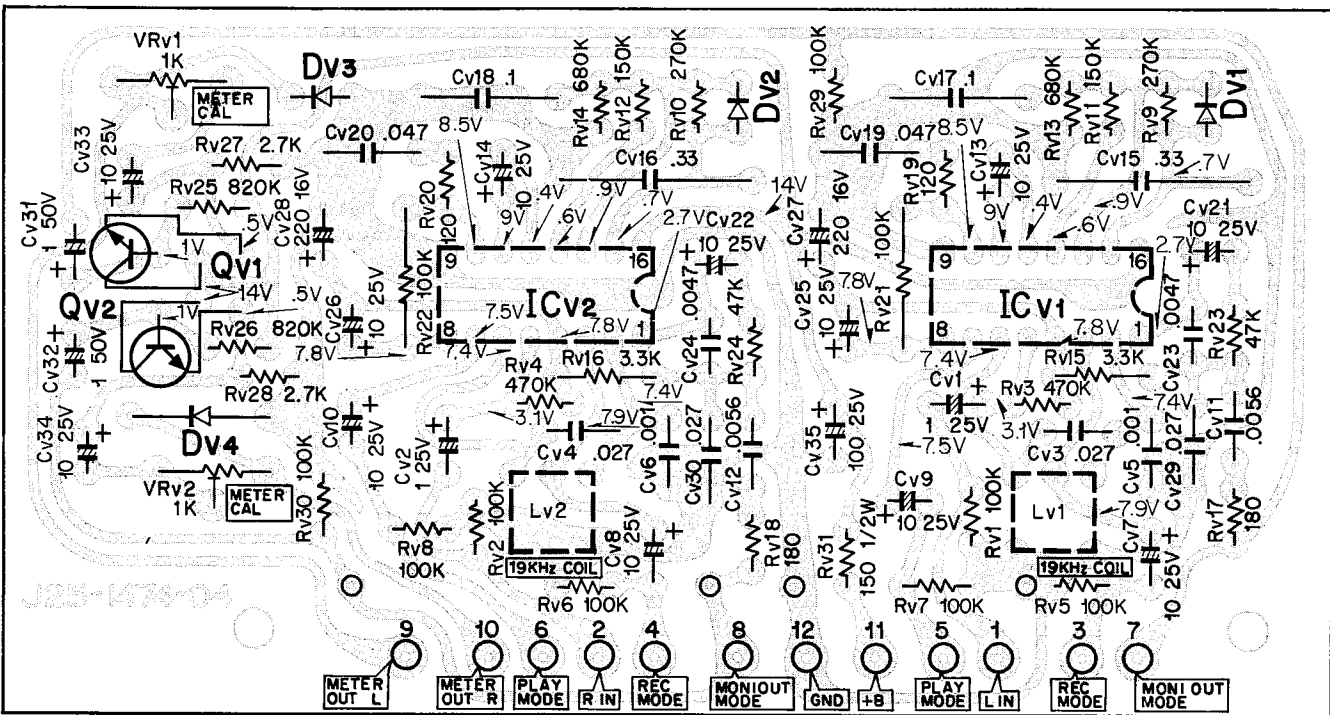
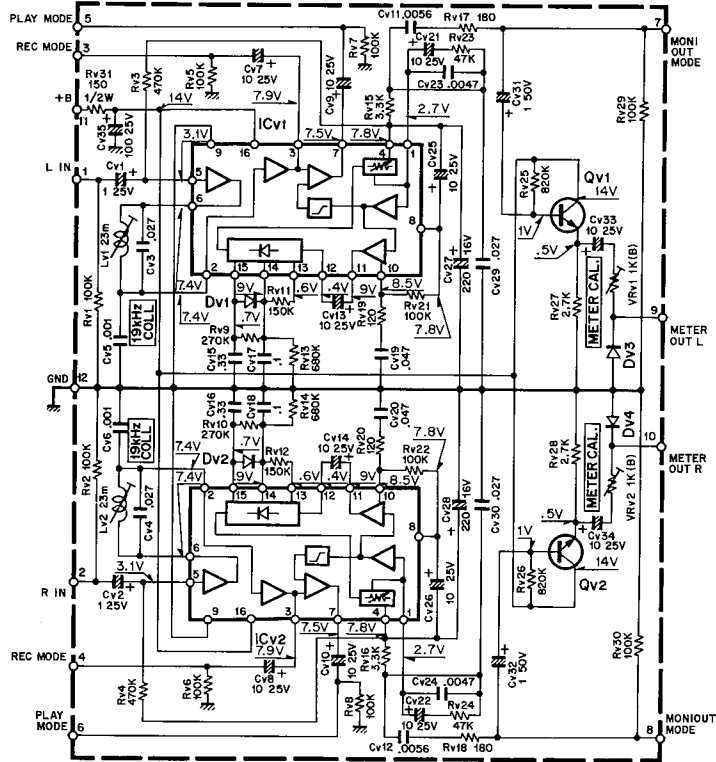
Qq1, 2 : 2SC1345 (E) or (F)

2SC1345



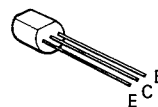
## DOLBY (X14-1070-10)

DC voltages are measured with 20kΩ/V meter at no signal fed condition.



Qv1, 2 : 2SC945 (R) or (Q), ICv1, 2 : NE545B

2SC945



## ADJUSTMENTS

No.	ALIGN	TEST EQUIPMENTS		RECEIVER SETTING	OUTPUT INDICATOR	ADJUSTMENT POINTS	REMARKS
		CONNECTION	SETTING				
<b>FM SECTION</b>							
1	IF	(A) and (B)	95 MHz (60 dB) 1 kHz (Mod) 75 kHz (Dev)	95 MHz	SSVM & scope to REC jack	Lg6, 7	Maximum deflection
2		—	—	—	T meter	Lg8 (primary)	Make the pointer position in the center of the meter
3		(A) and (B)	95 MHz (60 dB) 1 kHz (Mod) 75 kHz (Dev)	95 MHz	SSVM, scope & distortion meter to REC jack (L)	Lg8 (secondary)	Maximum deflection and minimum distortion
4	OUTPUT	ditto	95 MHz 1 kHz (Mod) 75 kHz (Dev) 60 dB (input)	95 MHz	ditto	—	Confirm output voltage is 700 mV
5	TRACKING	ditto	90 MHz 1 kHz (Mod) 75 kHz (Dev)	90 MHz	ditto	Lg1, 2, 5	Maximum deflection
6			108 MHz 1 kHz (Mod) 75 kHz (Dev)	108 MHz		CTg1~3	
7	VCO	(A)	95 MHz 0 (Dev) 60 dB (Input)	95 MHz	Freq. counter via 20~30 dB amp*1 or SSVM to TP1	VRg1	Counter indicates 76 kHz
8	DISTORTION	(B) and (C)	95 MHz 1 kHz (Mod) 68.25 kHz (Dev) L (Select) 60 dB (Input)	98 MHz	SSVM, scope & distortion meter to REC jack (L)	Lg6, 7	Minimum distortion
<b>AM SECTION</b>							
1	IF	(B) and (D)	1000 kHz 400 Hz, 30% (Mod) 100 dB	1000 kHz	SSVM & scope to REC jack (L)	Lg11, 12	Maximum deflection
2	TRACKING	ditto	600 kHz 400 Hz, 30% (Mod) 100 dB	600 kHz	ditto	Lg10 Bar antenna	ditto
3			1400 kHz 400 Hz, 30% (Mod)	1400 kHz		CTg4, 5	
<b>AUDIO SECTION</b>							
1	BIAS	—	—	VOLUME is its min.	DC volt meter or BIAS current meter (B31-0125-05)	VRe1, 2	Meter indicates*2 90 mV
2	POWER METER	(E) and (F)	1 kHz	RMS output voltage is 2.8V/8Ω METER POWER	POWER/LINE LEVEL METER	VRp1, 2	Meter indicates*3 1W
<b>DOLBY NR SECTION</b>							
1	400 Hz OSC. CAL.	—	—	S9: ON S15: PLAY A▶B PLAY CAL VR: MAX REC LEVEL VR: MAX METER: LEVEL	SSVM to B REC jack (G)	VRq1	Output is 580 mV
2	METER CAL.	—	—	Same	POWER/LINE LEVEL METER	VRv1, 2	Meter points*4 Cal.
3	19 kHz COIL	(H) and (G)	19 kHz 1V	S9: OFF S15: PLAY A▶B PLAY CAL VR: MAX REC LEVEL VR: MAX	SSVM to B REC jack	Lv1, 2	Output is min.
4	DOLBY FM	(A) and (G)	95 MHz 37.5 kHz (Dev) 1 kHz (Mod) 1mV (60 dB input)	S9: OFF S17: ON S15: PLAY A▶B	Same	VRr1, 2	Output is 580 mV

**ADJUSTMENTS**

**TEST EQUIPMENT and its SPECIFICATIONS**

**STANDARD SIGNAL GENERATOR (RF-SG)**

Ranges: 90 MHz~108 MHz (FM)  
500 KHz~1600 KHz (AM)

Modulation frequency: 1 KHz, 400 Hz or external input (input level 2V or less)

Deviation: 0~7.5 KHz (FM)

Modulation: 0~30% (AM)

Output: 100 mV or more

Distortion: 0.5% or less

**SOLID STATE VOLT METER (SSVM)**

Ranges: 0.3 mV~300V (full scale)

Frequency response: 5 Hz~500 KHz

Impedance: 1MΩ or more

**OSCILLOSCOPE (SCOPE)**

Ranges: DC~10 MHz

Sensitivity: 20 mV/cm

Impedance: 1MΩ or more

**DISTORTION METER**

Ranges: 0.1% (full scale)

Sensitivity: 100 mV or more

**FREQUENCY COUNTER (COUNTER)**

Frequency response: 10 Hz~1 MHz

Sensitivity: 50 mV or more

Impedance: 1MΩ or more

**AUDIO SIGNAL GENERATOR (AG)**

Ranges: 5 Hz~500 KHz

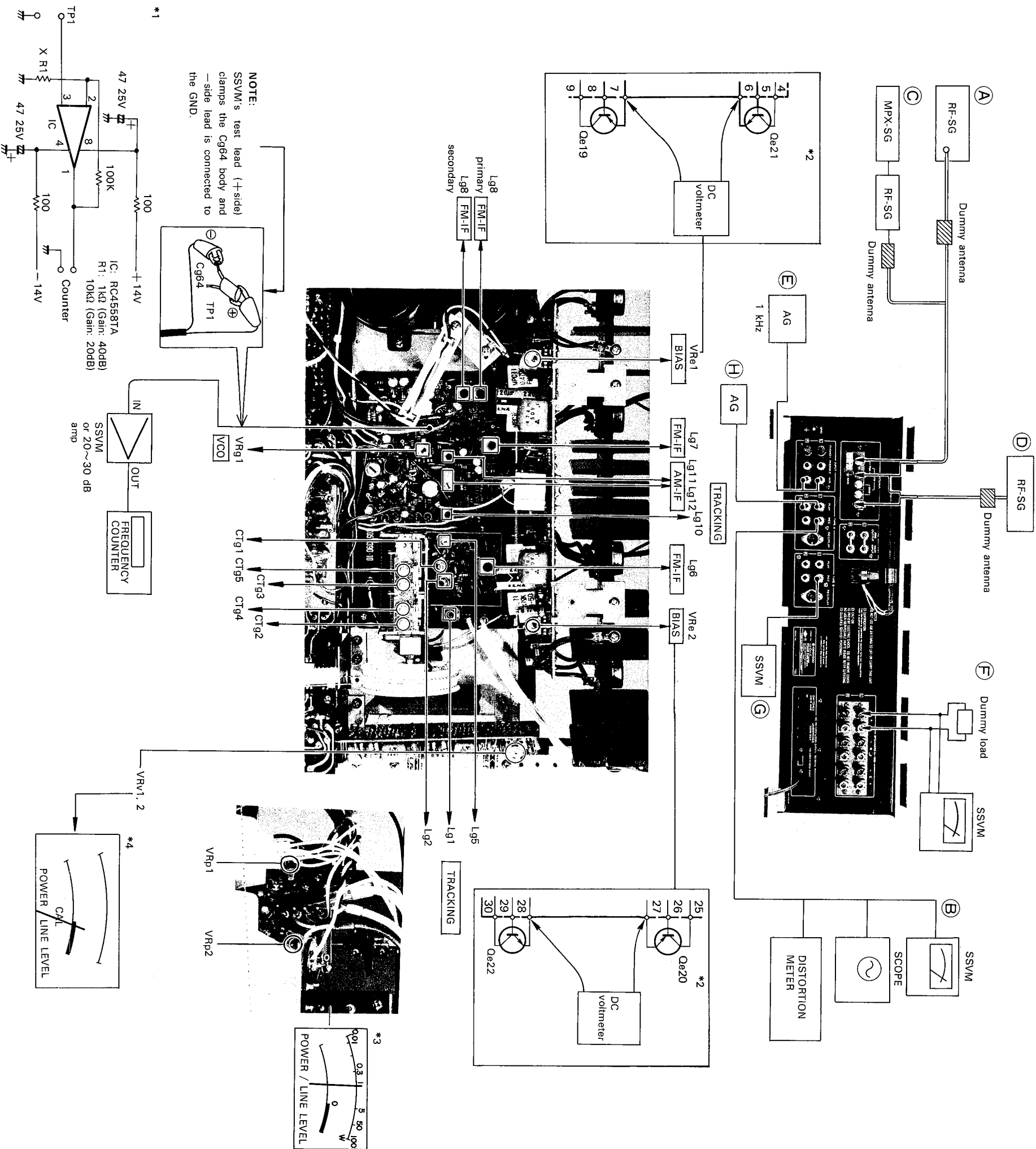
Waveform: Sine wave

Output: 10V r.m.s.

Distortion: 0.3% or less

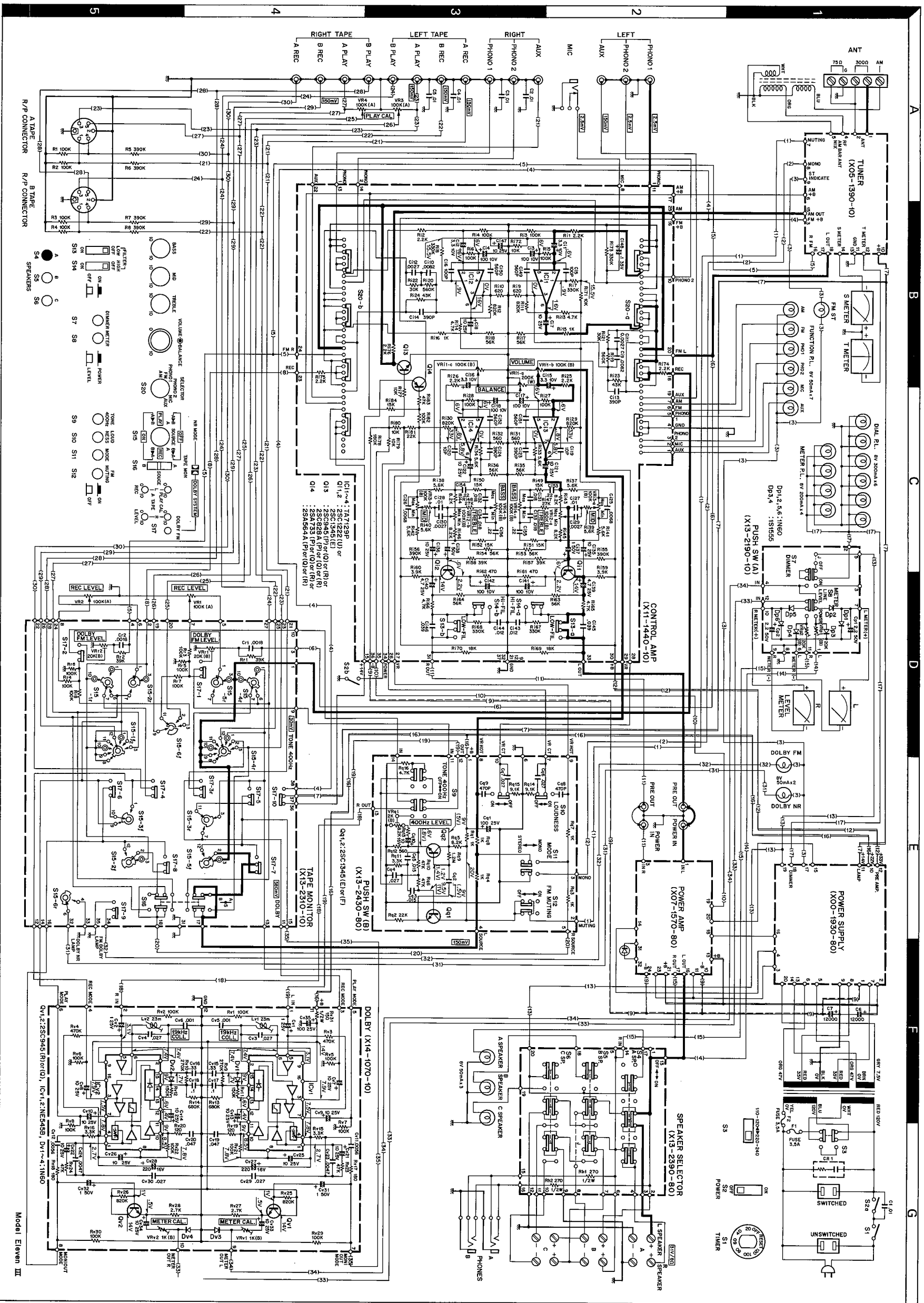
**NOTE:**

- \* RF-SG is set to the lowest response possible on oscilloscope.
- \* The output level of RF-SG is made a loss by the dummy antenna. The loss is different from the dummy antenna, so you should take into consideration the value of the loss applicable to your case.
- \* Repeat TRACKING adjustment several times and confirm the reception of broadcasting.
- \* Test point is shown in the schematic diagram.





SCHEMATIC DIAGRAM (2)



DC voltages are measured with 20k $\Omega$ /V meter at no signal.

## SPECIFICATIONS

### POWER AMPLIFIER SECTION

**120 watts per channel minimum RMS at 8 ohms, from 20 Hz to 20,000 Hz with no more than 0.1% total harmonic distortion.**

Both Channel Driven ..... 135 + 135 watts into 4 ohms at 1,000 Hz  
 Dynamic Power Output ..... 320 watts into 8 ohms  
 Total Harmonic Distortion ..... 0.1% at rated power into 8 ohms (from AUX)  
 0.05% at 1 watt into 8 ohms at 1,000 Hz  
 Inter Modulation Distortion ..... 0.1% at rated power into 8 ohms (60 Hz, 7,000 Hz = 4:1)  
 0.05% at 1 watt into 8 ohms  
 Power Band Width ..... 10 Hz to 50,000 Hz  
 Frequency Response ..... 10 Hz to 100,000 Hz — 1.0 dB  
 Damping Factor ..... 60 at 8 ohms  
 Speaker Impedance ..... Accept 4 ohms to 16 ohms  
 Input Impedance ..... 50k ohms  
 Input Sensitivity ..... 1V

### PRE-AMPLIFIER SECTION

Input Sensitivity, Impedance and S/N (IHF A curve)  
 Phono 1 ..... 2.5 mV, 50k ohms, 80 dB  
 Phono 2 ..... 2.5 mV, 50k ohms, 80 dB  
 AUX ..... 150 mV, 50k ohms, 100 dB  
 Tape Play A, B ..... 150 mV, 50k ohms, 100 dB  
 Mic ..... 2.5 mV, 50k ohms, 75 dB  
 Output Voltage and Impedance  
 Tape Rec. (Pin) ..... A: 150 mV, 100 ohms,  
 B: 150 mV, 100 ohms  
 (DIN) ..... A: 30 mV, 80k ohms,  
 B: 120 mV, 80k ohms  
 Pre Out ..... 1V 1k ohms

### Frequency Response

Phono 1, 2 ..... RIAA Standard curve  $\pm 0.5$  dB  
 AUX, Tape Play ..... 20 Hz to 40,000 Hz — 1.0 dB

### Tone Controls

Bass .....  $\pm 10$  dB at 100 Hz  
 MID .....  $\pm 10$  dB at 800 Hz  
 Treble .....  $\pm 10$  dB at 10 KHz  
 Loudness (—30dB) .....  $\pm 10$  dB at 100 Hz  
 + 5 dB at 10 KHz  
 Low Filter ..... — 9 dB at 100 Hz  
 High Filter ..... — 9 dB at 10 KHz

### FM TUNER SECTION (IHF)

Usable Sensitivity ..... 10.3 dBf (1.8 $\mu$ V)  
 50 dB Quieting ..... 17.3 dBf (4.0 $\mu$ V)  
 Signal to Noise Ratio at 65 dBf ..... 75 dB  
 Harmonic Distortion at 65 dBf ..... 0.2% (MONO)  
 0.4% (STEREO)

Image Response Ratio ..... 60 dB  
 Alternate Channel Selectivity ..... 60 dB  
 IF Response Ratio ..... 100 dB  
 Capture Ratio ..... 1.5 dB  
 Spurious Response Ratio ..... 80 dB  
 AM Suppression Ratio ..... 55 dB

Stereo Separation ..... 40 dB at 1,000 Hz

Antenna Impedance ..... 35 dB at 50 Hz to 10,000 Hz  
 300 ohms Balanced and  
 75 ohms Unbalanced

### AM TUNER SECTION

Usable Sensitivity ..... 20 $\mu$ V  
 Signal to Noise Ratio ..... 50 dB at 1 mV input  
 Image Rejection ..... 50 dB  
 Selectivity ..... 30 dB  
 IF Rejection ..... 35 dB  
 Antenna ..... Built-in ferrite bar antenna. External antenna terminal

### GENERAL

#### Switches

Speaker Selector ..... A, B, C, A+B, A+CB, C+A+B+C  
 Input Selector ..... AM—FM—PHONO 1—PHONO 2  
 —MIC—AUX

Input Selector ..... Tape Selector  
 (Tape A—Source—Tape B)

Mode ..... MONO—STEREO

Meter ..... Power—Line Level (Dolby NR Cal.)

Tape Monitor ..... A—Source—B

Dolby NR Mode ..... Play—Off—Rec.

Other Switches ..... Dolby FM, 400 Hz Tone, FM Muting,  
 Loudness, High Filtr, Low Filter,  
 Dimmer, Power

#### Special Functions

2-Hour Shut-off Timer, Dolby NR System, 2 Power Meters,  
 Triple Tone Controls, 2 Headphones, Selector Indicator

AC Outlet ..... Switched 1, Unswitched 1

Power Consumption ..... 590 watts at full power

Power Requirement ..... 50/60 Hz 110—120, 220—240V

Dimensions ..... W: 22-19/32" (57.4 mm)  
 H: 7-3/4" (198 mm)  
 D: 14-3/4" (375 mm)

Weight (Net) ..... 39.7 lbs. (18 kg)

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