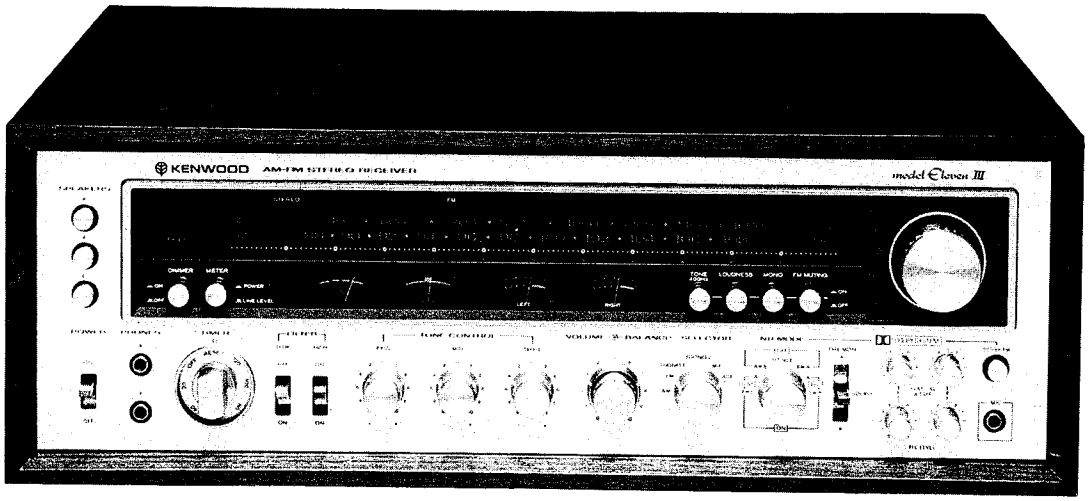
105

KENWOOD

HI/FI STEREO COMPONENTS

# SERVICE MANUAL

## MODEL ELEVEN III
## (KR-10000III)




## AM-FM STEREO RECEIVER

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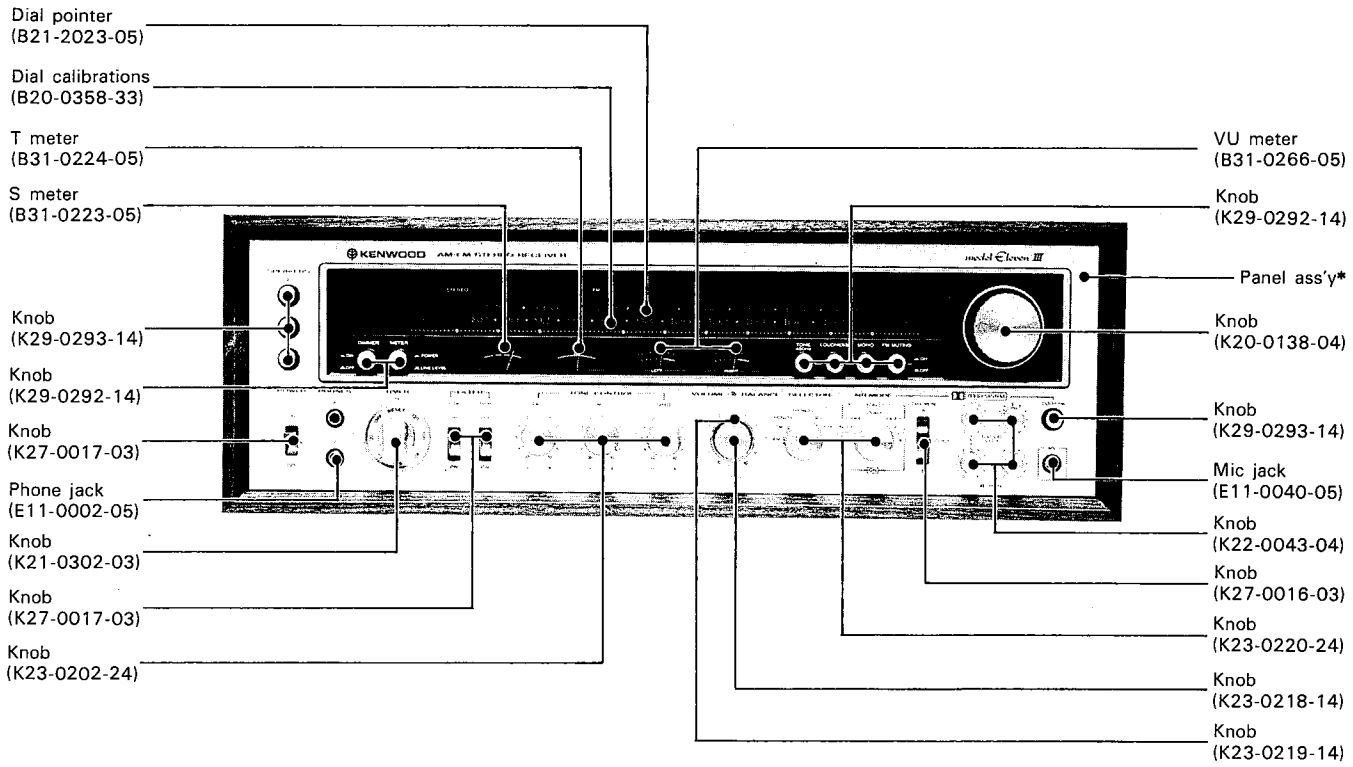
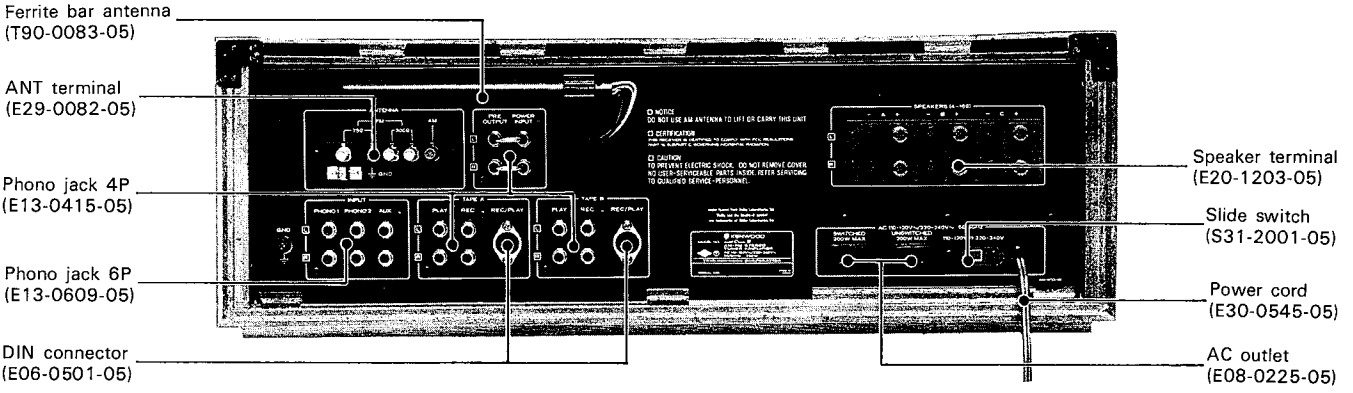
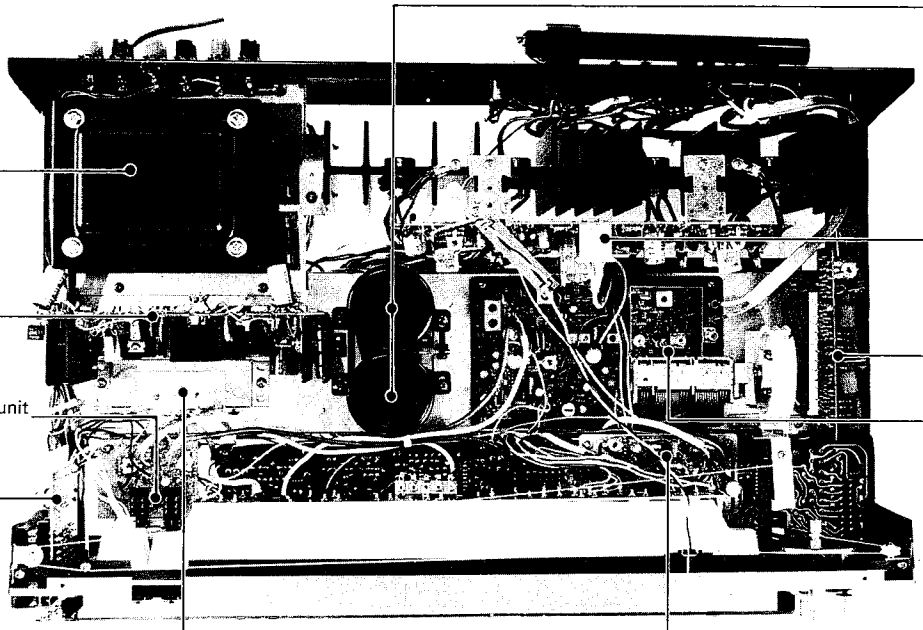
# EXTERNAL VIEW

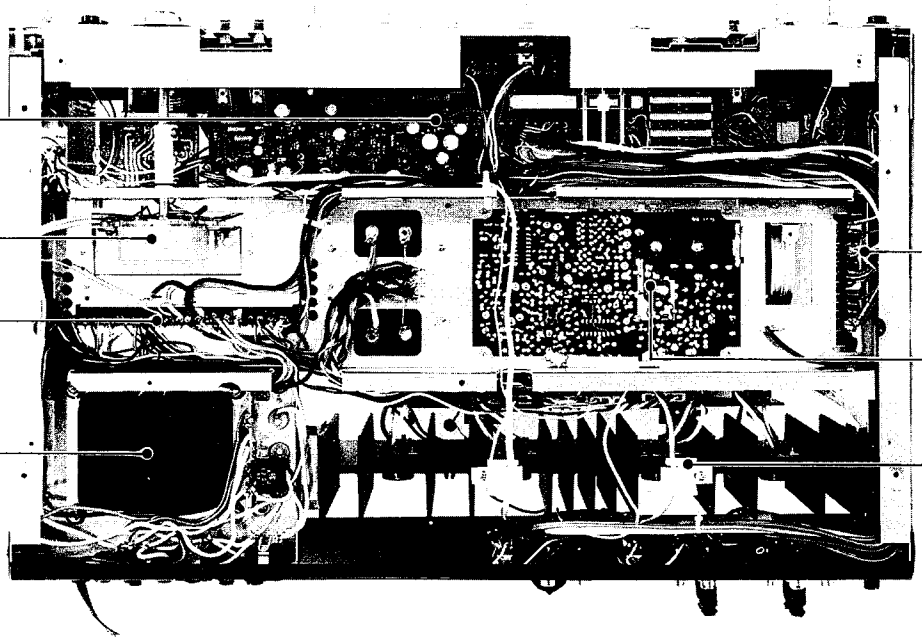



*Refer to Parts List.

# INTERNAL VIEW

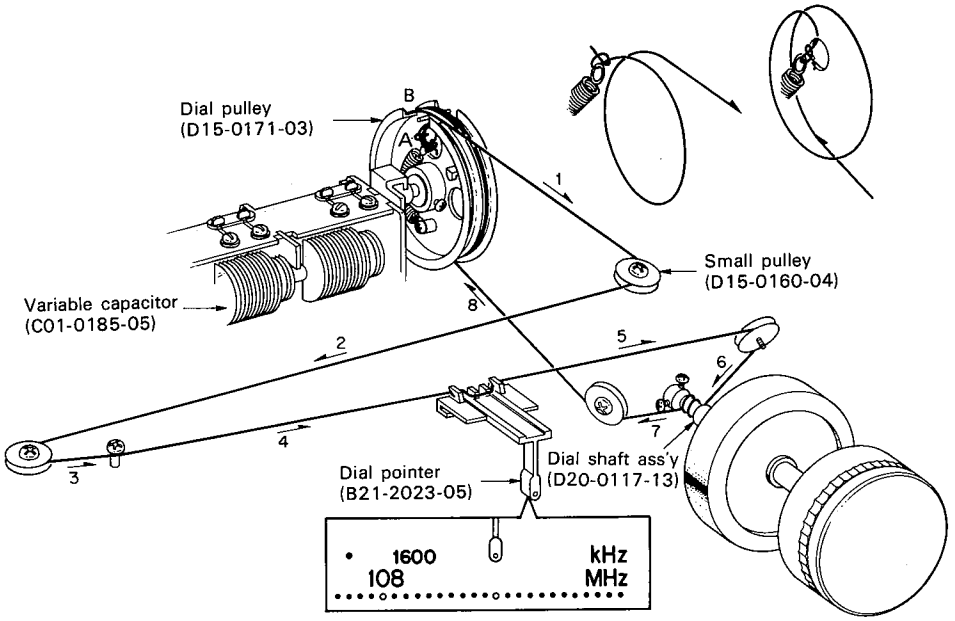


# DIAL CORD STRINGING/DISASSEMBLY FOR REPAIR

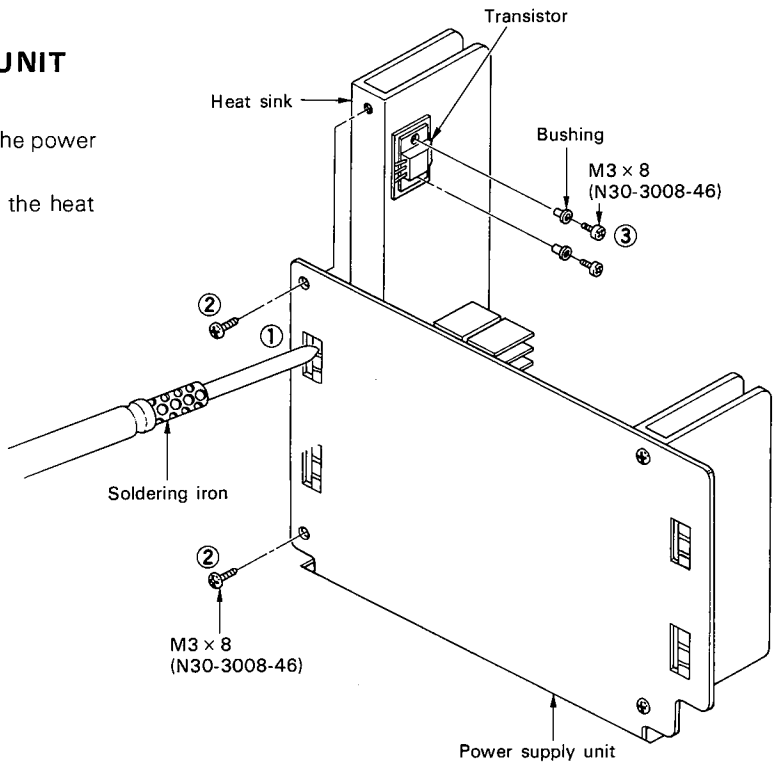
## DIAL CORD STRINGING

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. Fook 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

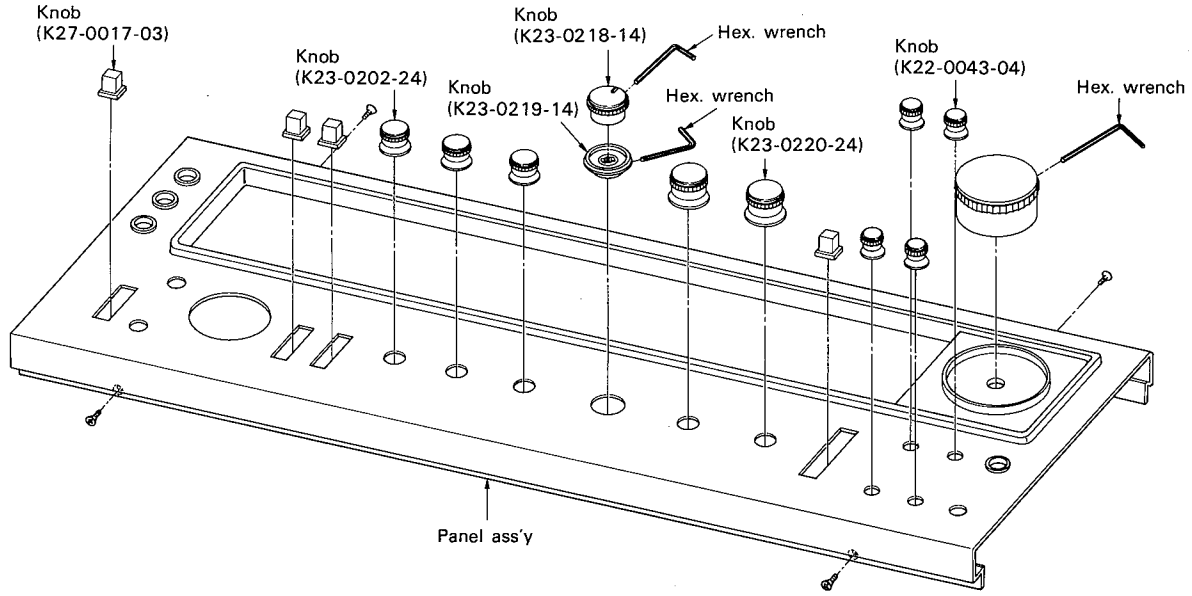
1. Unsolder the transistor's lead. ①
2. Remove the two screws fixing the heat sink to the power supply unit. ②
3. Remove the two screws fixing the transistor to the heat sink. ③



# DISASSEMBLY FOR REPAIR

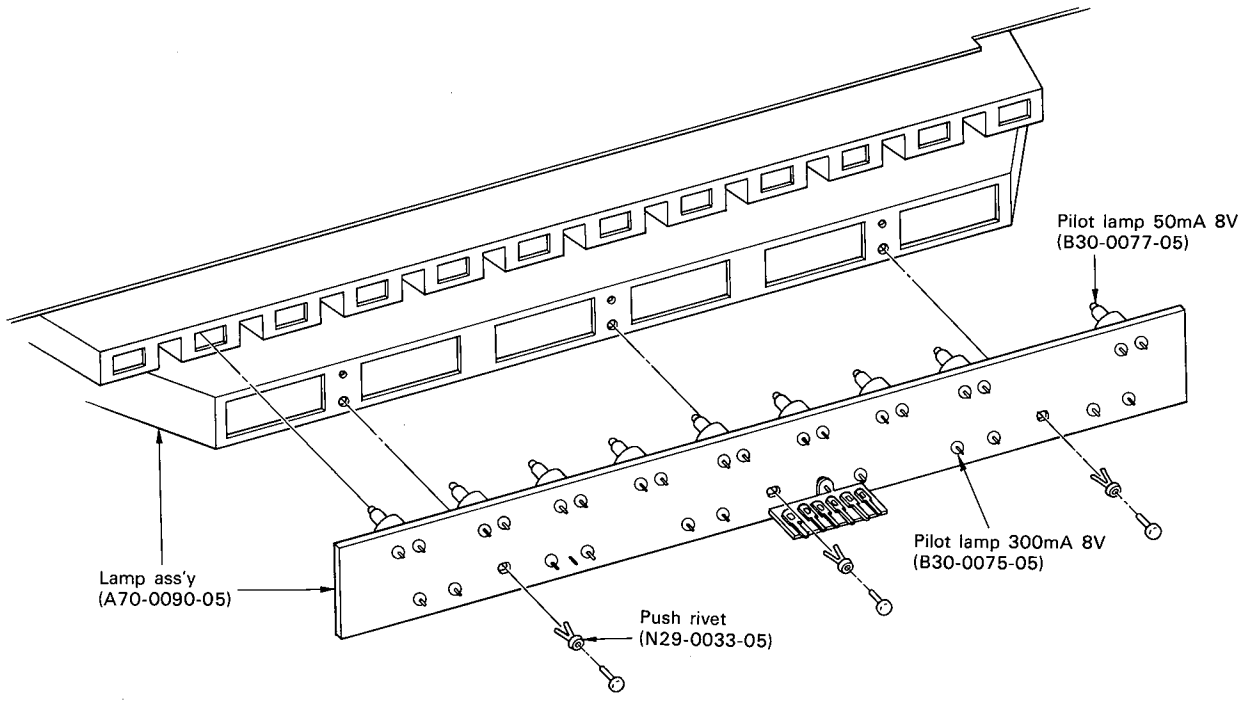
## PANEL ASS'Y

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

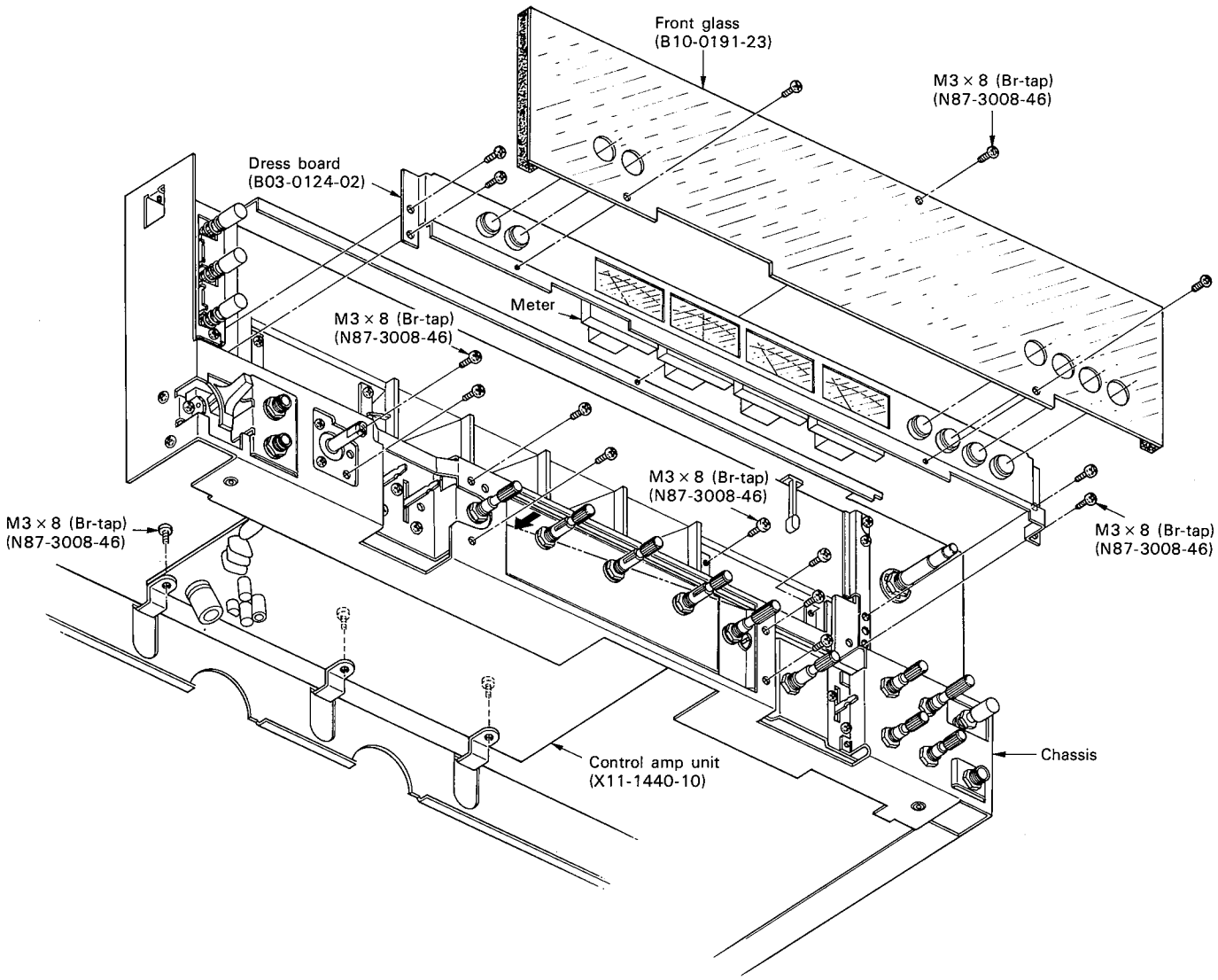
1. Disassemble the lamp ass'y by pulling out the push rivets.
2. Pilot lamp can be replaced.



# DISASSEMBLY FOR REPAIR

## CONTROL AMP UNIT

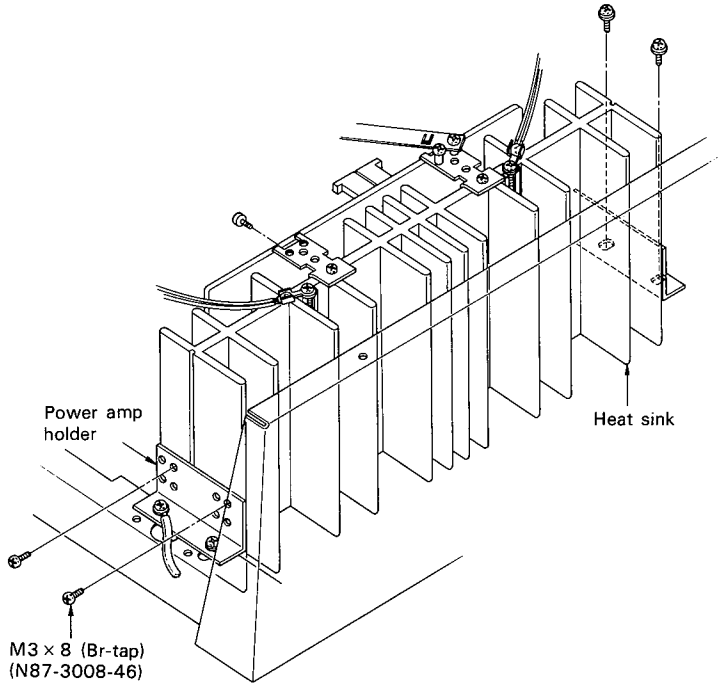
1. Remove the screws fixing the control amp unit to the chassis.
2. Push the control unit according as a black allow.
3. The control amp unit can be repaired.



# DISASSEMBLY FOR REPAIR

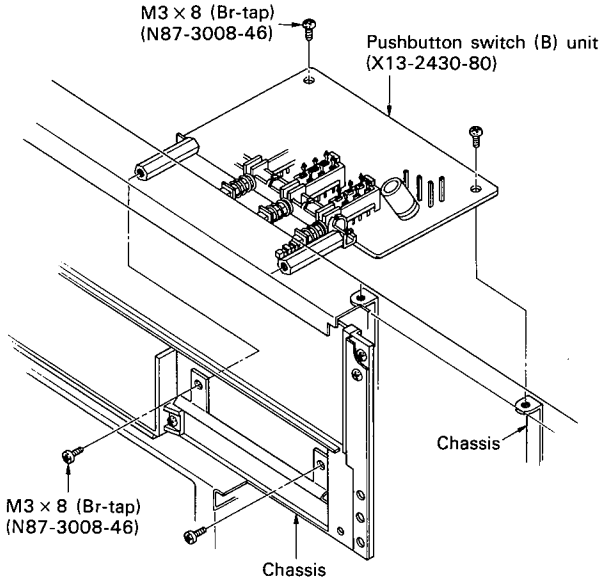
## POWER AMP UNIT

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

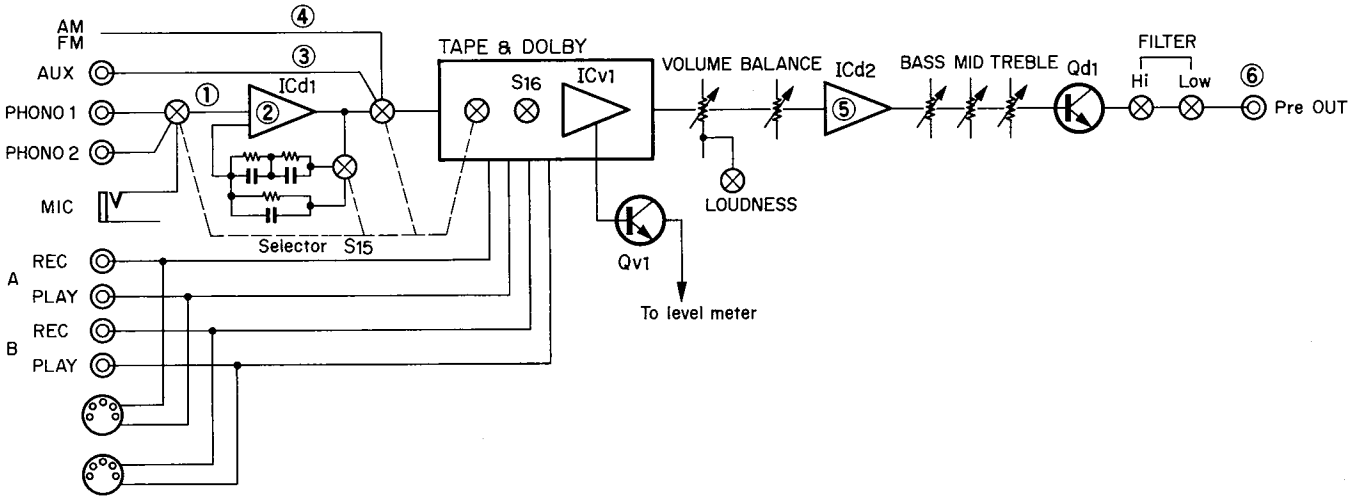


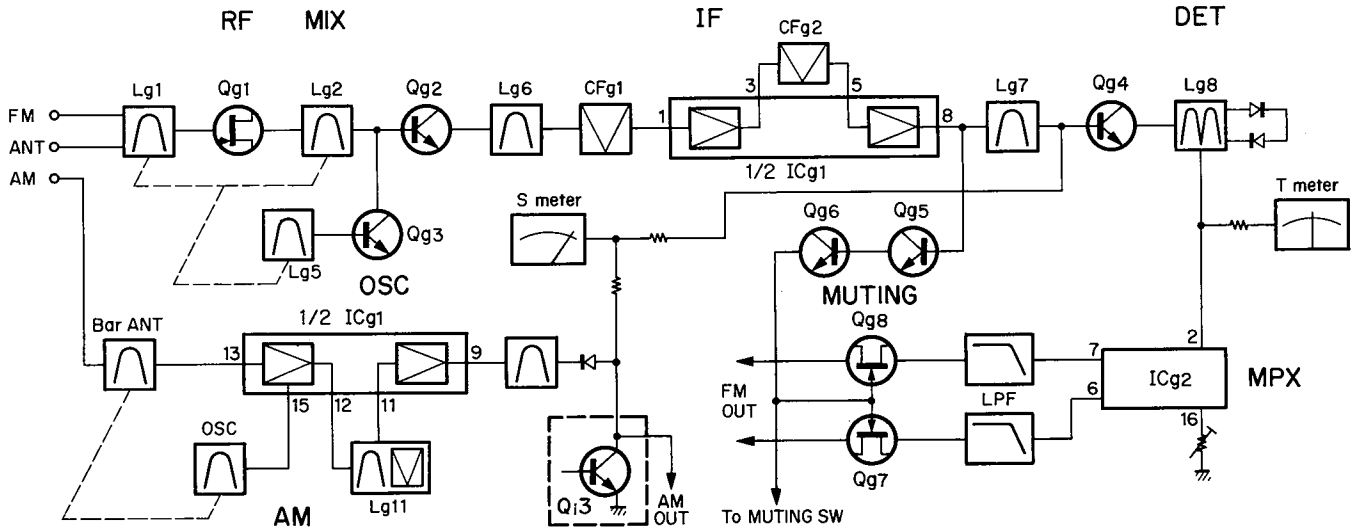

## PUSH SWITCH (B) UNIT

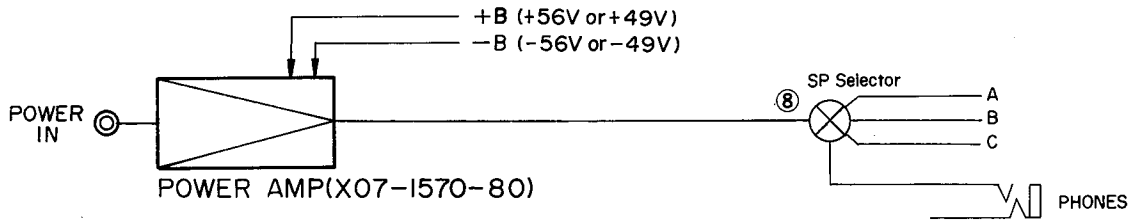
1. Remove the screws fixing the pushbutton switch (B) unit to the chassis.
2. The pushbutton switch (B) unit can be pulled up.



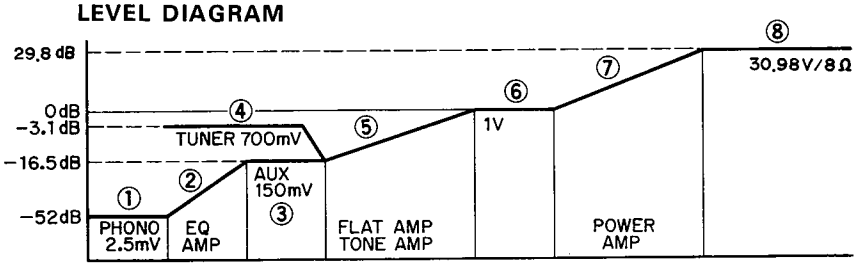
# BLOCK DIAGRAM/LEVEL DIAGRAM




## 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.

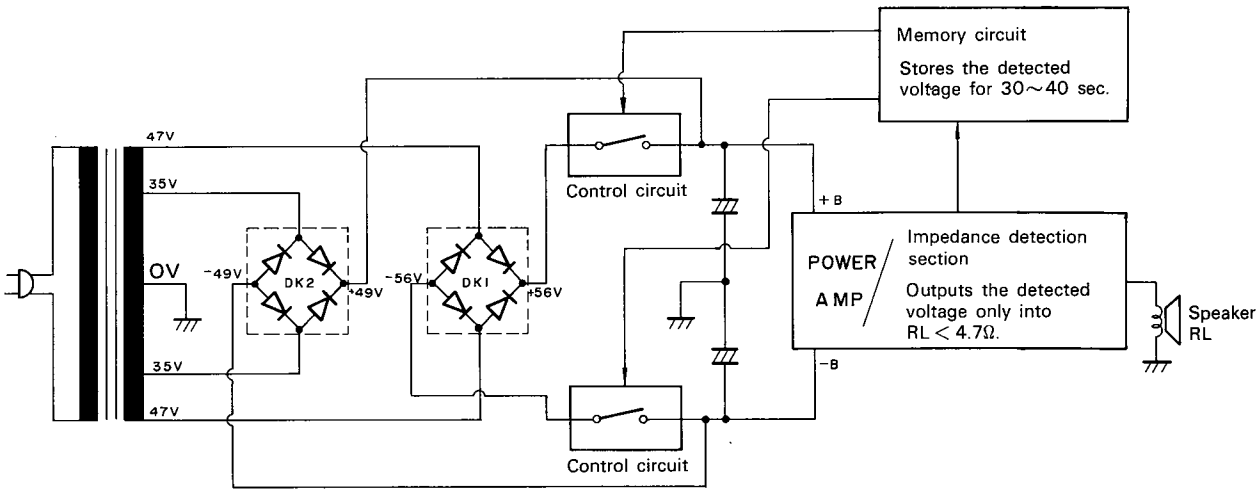
The Model Eleven III has a provision for detecting the impedance of speaker so that the maximum output at 8Ω or 4Ω impedance can be obtained by changing the taps of the power transformer and minimizing the difference of thermal loss caused by the load impedance.

## PRINCIPLES OF OPERATION

1. The impedance detecting circuit is contained in the power amplifier section. It detects the impedance RL of speaker and produces an output voltage when RL is below 4.7Ω.
2. When RL 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 RL 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 Pc of transistors to deliver a maximum output at 4Ω or 8Ω impedance.

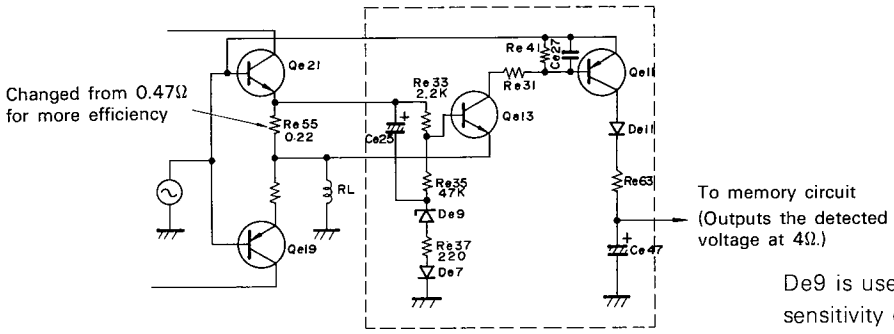
Since the transformer tap is selected according to the level of the output during the operation at 4Ω impedance, the power transformer can be designed in a small size.



# CIRCUIT DESCRIPTION

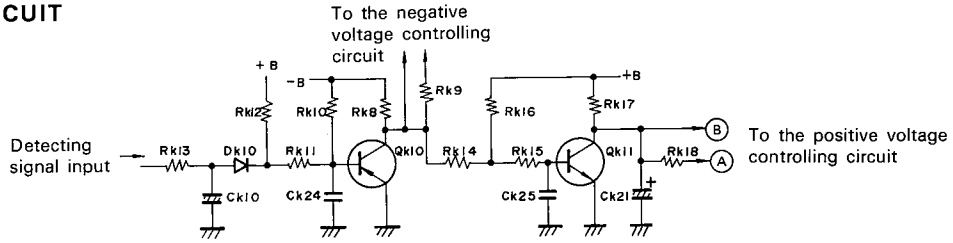
## SPEAKER IMPEDANCE DETECTING CIRCUIT

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 output 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.

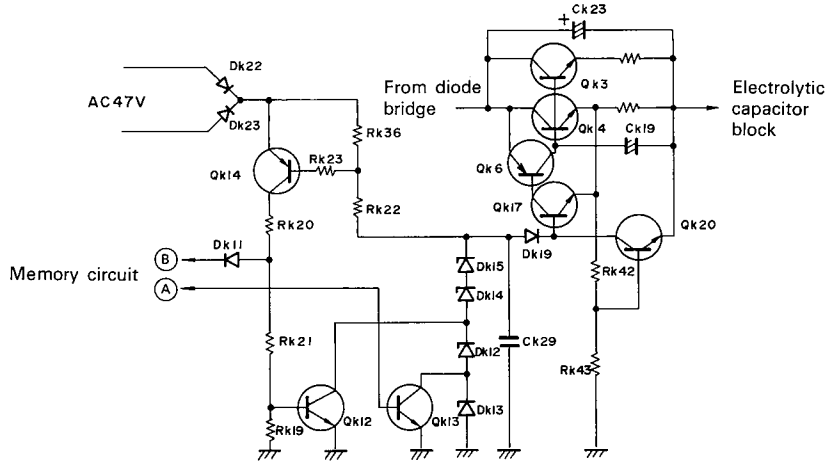
## CONTROL CIRCUIT

The detection output from the memory circuit Ⓐ 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 Ⓐ 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 Ⓐ 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.

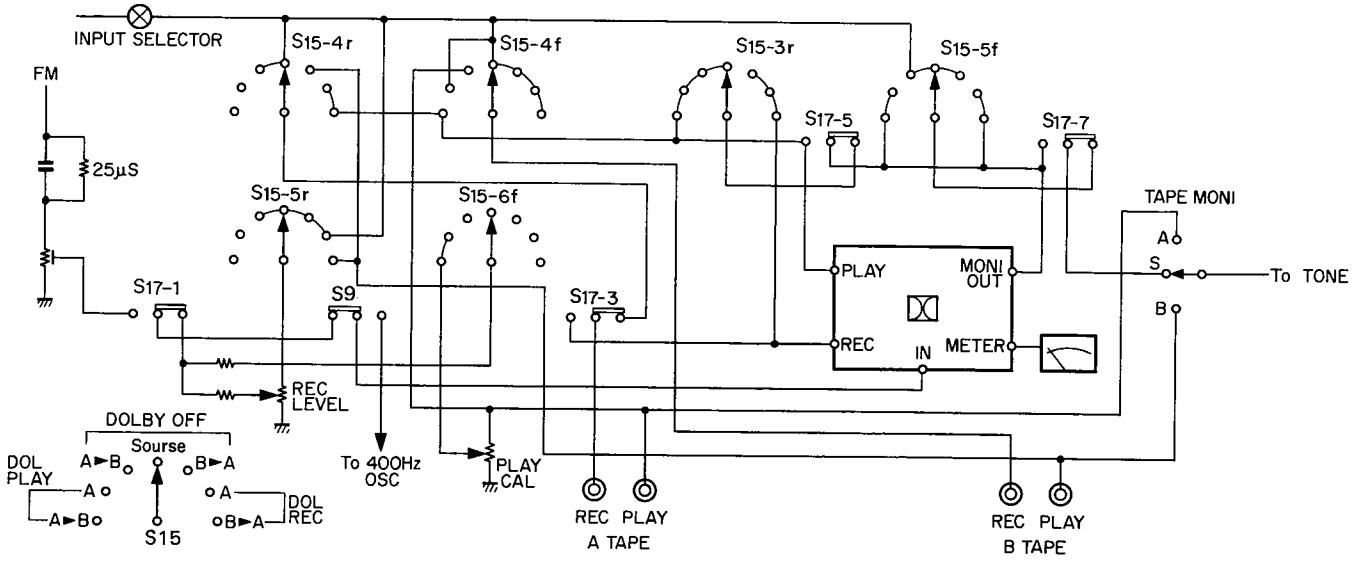
However, in the case where the power voltage is lowered, the control circuit turns to ON again to supply the power from the high voltage tap of the transformer, preventing the voltage drop. Qk20 is used for protection against overcurrent. It deenergizes the control circuit when the output current exceeds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



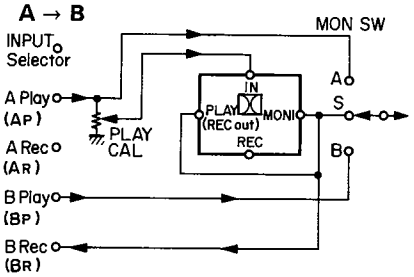
# CIRCUIT DESCRIPTONS

## DOLBY NR CIRCUIT CONNECTION DIAGRAM SELECTED BY S15.




### ① DOLBY on

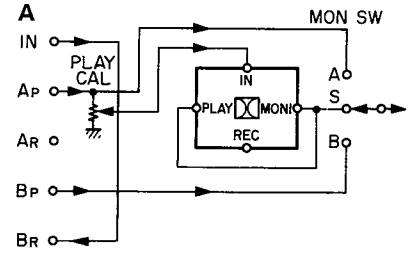
**A → B**




- Dolbyized signal from AP is decoded and fed to BR.
- No output at AR

### ② DOLBY ON

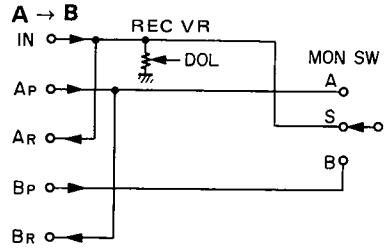
**A**




- Dolbyized signal from AP is decoded.
- No output at AR.
- The signal selected by INPUT SELECTOR comes out at BR.

### ③ DOLBY off

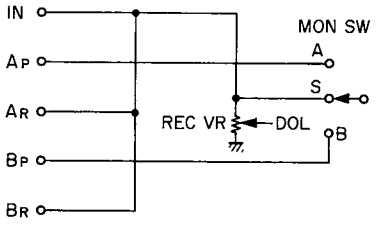
**A → B**




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

### ④ DOLBY off

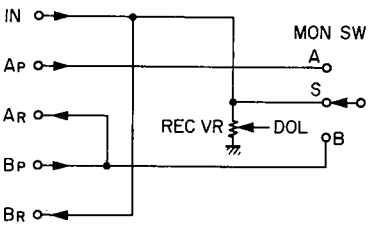
**SOURCE**




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

### ⑤ DOLBY off

**B → A**

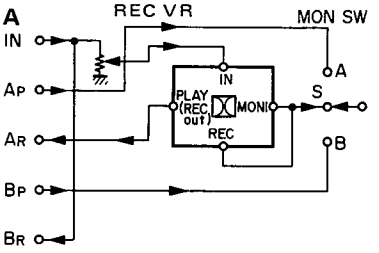



- Dubbing (BP → AR)
- DOL operation is only VU meter.

### DOLBY on

**REC**

**A**

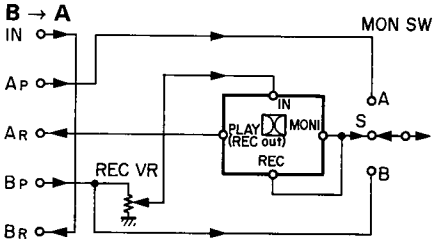



- Signal from INPUT SELECTOR is dolbyized and fed to AR.
- The signal at BR is not dolbyized.
- When MON SW is at S position, non-dolbyized signal comes out from the circuit.

### ⑦ DOLBY on

**REC**

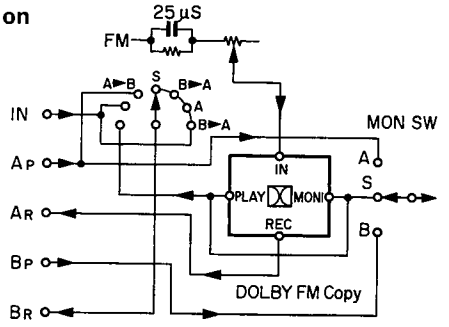
**B → A**




- Signal from BP is dolbyized 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

**on**




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

| | Signal at BR |
|---|---|
| DOLBY ON A→B | FM dolbyized 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: $M_2$-type (Audio club)

## TOTAL

☆ : New parts

| Ref. No. | Parts No. | Description | Remarks |
|---|---|---|---|
| | | **CAPACITOR** | |
| C2～5 | CK45F1H103Z | Ceramic 0.01μF +80%−20% | |
| | | **SWITCH** | |
| S3 | S31-2001-05 | Slide, POWER VOLTAGE SELECTOR | |
| | | **MISCELLANEOUS** | |
| — | A03-0227-02 | Cabinet | ☆ |
| — | A20-1181-03 | Panel ass'y | ☆ U,M |
| — | A20-1183-03 | Panel ass'y | ☆ $M_2$ |
| — | 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 | ☆ $M_2$ |
| — | 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 | |
| — | 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 | ☆ $M_2$ |
| — | H10-1478-02 | Polystyrene foamed fixture × 2 | |
| — | H20-0373-14 | Polyethylene cover | U,$M_2$ |
| — | 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 | Remarks |
|---|---|---|---|
| | | **CAPACITOR** | |
| 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 |
|---|---|---|---|
| | | **POTENTIOMETER** | |
| VR1～4 | R01-5013-05 | Variable resistor 100kΩ(A) REC LEVEL, PLAY CAL | |
| | | **SWITCH** | |
| S1 | S59-1041-05 | Timer | |
| S2 | S37-2002-15 | Lever (POWER) | |
| | | **MISCELLANEOUS** | |
| — | 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 |
|---|---|---|---|
| | | **CAPACITOR** | |
| 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 |
|---|---|---|---|
| | | **RESISTOR** | |
| 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 44～47 | R92-0166-05 | Metal plate 0.22Ω ±5% 1W | |
| | | **SEMICONDUCTOR** | |
| 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) | |
| | V01-0152-05 | 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) | |
| | V03-0424-05 | or 2SC1400(E) or (U) | |
| Qk8,9 | V01-0084-05 | Transistor 2SA733(Q) or (R) | |
| | V01-0163-05 | or 2SA564A(Q) or (R) | |
| Qk10 | V01-0893-10 | Transistor 2SA893(D),(E) or (F) | |
| | V01-0152-05 | or 2SA750(I) (E) or (U) | |
| Qk11 | V03-1890-10 | Transistor 2SC1890(D),(E) or (F) | |
| | V03-0424-05 | or 2SC1400(E) or (U) | |
| Qk12,13 | V03-0270-05 | Transistor 2SC945(Q) or (R) | |
| | V03-0504-05 | or 2SC828A(Q) or (R) | |
| Qk14 | V01-0893-10 | Transistor 2SA893(D), (E) or (F) | |
| | V01-0152-05 | or 2SA750(I) (E) or (U) | |
| Qk15 | V04-0330-10 | Transistor 2SD330(D),(E) or (F) | |
| | V03-0343-05 | or 2SC1419(B) or (C) | |
| Qk16,17 | V03-1890-10 | Transistor 2SC1890(D),(E) or (F) | |
| | V03-0424-05 | 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) | |
| | V01-0152-05 | or 2SA750(I) (E) or (U) | |
| Qk20 | V03-1890-10 | Transistor 2SC1890(D),(E) or (F) | |
| | V03-0424-05 | 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 | |
| | | **MISCELLANEOUS** | |
| Fk1 | F05-4022-05 | Fuse 4A | |
| — | F20-0114-05 | Mica plate × 4 | |

# PARTS LIST

| Ref. No. | Parts No. | Description | Remarks |
|---|---|---|---|
| — | J13-0041-05 | Fuse clip | |

## TUNER (X05-1390-10)

| Ref. No. | Parts No. | Description | Remarks |
|---|---|---|---|
| **CAPACITOR** | | | |
| 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 | Polysthyrene 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% | |
| **SEMICONDUCTOR** | | | |
| 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) | |
| 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 | |
| **COIL/TRANS/FILTER/INDUCTOR** | | | |
| 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 | |
| **POTENTIOMETER** | | | |
| VRg1 | R12-3030-05 | Semi-fixed resistor 10kΩ VCO | |
| VRg2 | R12-7006-05 | Semi-fixed resistor 500kΩ | |
| | or R12-7007-05 | SEPARATION | |
| **MISCELLANEOUS** | | | |
| — | 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 | Remarks |
|---|---|---|---|
| **CAPACITOR** | | | |
| 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 47μF 16WV | |
| Ce45 | CQ93M1H104M | Mylar 0.1μF ±20% | |
| Ce46 | CK45F1H103Z | Ceramic 0.01μF +80%−20% | |
| Ce47 | CE04W1J010 | Electrolytic 1μF 63WV | |
| | | **RESISTOR** | |
| Re15,16 | RC05GF2H472K | Carbon 4.7kΩ ±10% 1/2W | |
| Re29,30 37,38 | RD14GY2E221J | Flame-proof carbon 220Ω ±5% 1/4W | |
| Re39,40 43,44 | RD14GY2E121J | Flame-proof carbon 120Ω ±5% 1/4W | |
| Re45,46 | RC05GF2H222K | Carbon 2.2kΩ ±10% 1/2W | |
| Re47,48 | RC05GF2H332K | Carbon 3.3kΩ ±10% 1/2W | |
| Re49～52 | RD14GY2E181J | Flame-proof carbon 180Ω ±5% 1/4W | |
| Re53～56 | R92-0167-05 | Metal plate 0.22Ω ±5% 3W | ☆ |
| Re57,58 | RD14GY2E181J | Flame-proof carbon 180Ω ±5% 1/4W | |
| Re59～62 | RD14GY2E4R7J | Flame-proof carbon 4.7Ω ±5% 1/4W | |
| Re71,72 | RS14GB3F100J | Flame-proof metal film 10Ω ±5% 3W | |
| Re76 | RS14GB3D821J | Flame-proof metal film 820Ω ±5% 2W | |
| | | **SEMICONDUCTOR** | |
| 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 | |
| | | **POTENTIOMETER** | |
| VRe1,2 | R12-1007-05 | Semi-fixed resistor 1kΩ BIAS | |
| | | **MISCELLANEOUS** | |
| — | E02-0209-05 | Transistor socket × 4 | |
| — | E40-0380-05 | Mini-connector ass'y 3P | |
| — | 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) × 2 | ☆ |
| — | F20-0066-05 | Mica plate × 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 |
|---|---|---|---|
| | | **CAPACITOR** | |
| Ci1,2 | CS15E1A3R3M | Tantalum 3.3μF 10WV | |
| Ci3,4 | CE04W1A101 | Electrolytic 100μF 10WV | |
| Ci5,6 | CC45SL1H101K | Ceramic 100pF ±10% | |
| Ci7,8 | CE04W1E100 | Electrolytic 10μF 25WV | |
| Ci9,10 | CQ93M1H822J | Mylar 0.0082μF ±5% | |
| Ci11,12 | CQ93M1H272J | Mylar 0.0027μF ±5% | |
| Ci13,14 | CK45B1H391K | Ceramic 390pF ±10% | |
| Ci15,16 | CS15E1A3R3M | Tantalum 3.3μF 10WV | |
| Ci17,18 | CE04W1A101 | Electrolytic 100μF 10WV | |
| Ci19,20 | CC45SL1H100D | Ceramic 10pF ±0.5pF | |
| Ci21,22 | CE04W1E100 | Electrolytic 10μF 25WV | |
| Ci23,24 | CK45B1H391K | Ceramic 390pF ±10% | |
| Ci25,26 | CQ93M1H682K | Mylar 0.0068μF ±10% | |
| Ci27,28 | CQ93M1H103K | Mylar 0.01μF ±10% | |
| Ci29,30 | CQ93M1H272K | Mylar 0.0027μF ±10% | |
| Ci31～34 | CQ93M1H183K | Mylar 0.018μF ±10% | |
| Ci35,36 | CE04W1E100 | Electrolytic 10μF 25WV | |
| Ci37,38 | CE04AW1H010M | Electrolytic 1μF 50WV | |
| Ci39,40 | CE04AW1E4R7M | Electrolytic 4.7μF 25WV | |
| Ci41,42 | CE04W1A101 | Electrolytic 100μF 10WV | |
| Ci43,44 | CQ93M1H123K | Mylar 0.012μF ±10% | |
| Ci45,46 | CQ93M1H393K | Mylar 0.039μF ±10% | |
| Ci47 | CE04W1E100 | Electrolytic 10μF 25WV | |
| Ci48 | CS15E1V0R1M | Tantalum 0.1μF 35WV | |
| Ci49～52 | CK45B1H561K | Ceramic 560pF ±10% | |
| Ci53～56 | CQ93M1H224K | Mylar 0.22μF ±10% | |
| | | **SEMICONDUCTOR** | |
| Qi1,2 | V03-0408-05 | Transistor 2SC1222(U) | |
| | V03-0271-05 | or 2SC1345(E) | |
| Qi3 | V03-0270-05 | Transistor 2SC945(P),(Q) or (R) | |
| | V03-0504-05 | or 2SC828A(P),(Q) or (R) | |
| Qi4 | V01-0084-05 | Transistor 2SA733(P),(Q) or (R) | |
| | V01-0163-05 | or 2SA564A(P),(Q) or (R) | |
| ICi1～4 | V30-0140-05 | IC TA7129P | |
| | | **POTENTIOMETER** | |
| VRi1 | R11-9005-05 | Variable resistor 100kΩ(B) × 2, 200kΩ(W), VOLUME, BALANCE | |
| VRi2～4 | R06-5013-05 | Variable resistor 10kΩ(B) × 2 BASS, MID, TREBLE | |

# PARTS LIST

| Ref. No. | Parts No. | Description | Remarks |
|---|---|---|---|
| | | **SWITCH** | |
| S13,14 | S31-2039-05 | Lever LOW-FIL, HIGH-FIL | |
| S20 | S29-2018-05 | Rotary, INPUT SELECTOR | |

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

| Ref. No. | Parts No. | Description | Remarks |
|---|---|---|---|
| | | **CAPACITOR** | |
| Cp1,2 | CE04AW1H2R2MEL | Electrolytic 2.2μF 50WV | |
| | | **SEMICONDUCTOR** | |
| Dp1,2 | V11-0051-05 | Diode 1N60 | |
| Dp3,4 | V11-0076-05 | Diode 1S1555 | |
| Dp5,6 | V11-0051-05 | Diode 1N60 | |
| | | **POTENTIOMETER** | |
| VRp1,2 | R12-3028-05 | Semi-fixed resistor 10kΩ(B) METER LEVEL | |
| | | **SWITCH** | |
| S7,8 | S40-2062-15 | Pushbutton, DIMMER, METER | |

## TAPE MONITOR (X13-2310-10)

| Ref. No. | Parts No. | Description | Remarks |
|---|---|---|---|
| | | **CAPACITOR** | |
| Cr1,2 | CQ93M1H182J | Mylar 0.0018μF ±5% | |
| | | **POTENTIOMETER** | |
| VRr1,2 | R12-3014-05 | Semi-fixed resistor 20kΩ(B) DOLBY FM | |
| | | **SWITCH** | |
| S15 | S01-6004-05 | Rotary, TAPE MONITOR | |
| S16 | S32-4007-05 | Lever, TAPE MONITOR | |
| S17 | S40-0002-05 | Pushbutton, DOLBY FM | |

## SPEAKER SELECTOR (X13-2390-80)

| Ref. No. | Parts No. | Description | Remarks |
|---|---|---|---|
| | | **RESISTOR** | |
| Rh1,2 | RC05GF2H271K | Carbon 270Ω ±10% 1/2W | |
| | | **SWITCH** | |
| S4～6 | S42-3017-05 | Pushbutton, SPEAKERS | |
| — | E40-0639-05 | Pin connector (symmetry) | |
| — | E40-0640-05 | Pin connector (non-symmetry) | |

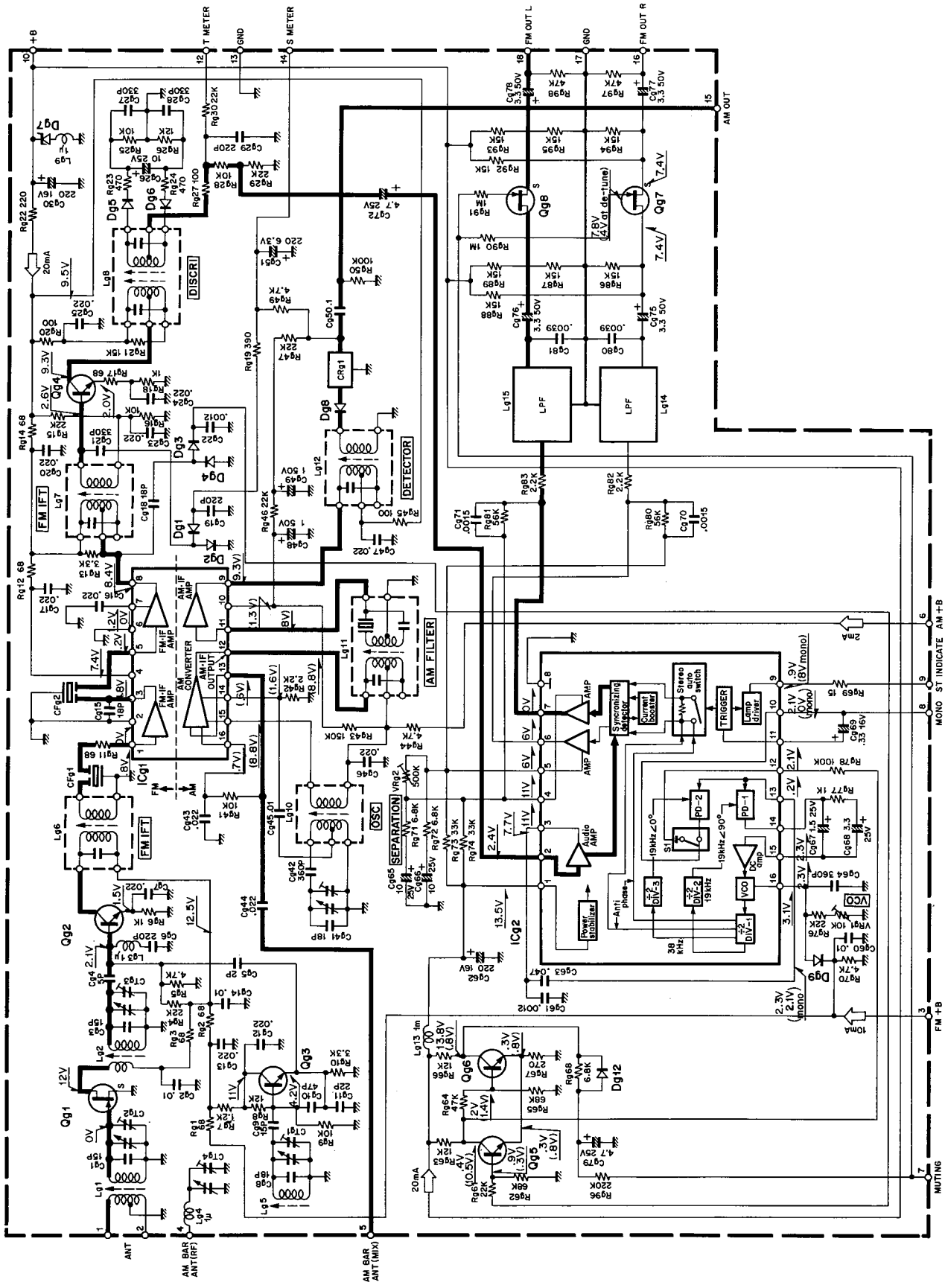
## PUSH SWITCH (B) (X13-2430-80)

| Ref. No. | Parts No. | Description | Remarks |
|---|---|---|---|
| | | **CAPACITOR** | |
| Cq1 | CE04W1E101 | Electrolytic 100μF 25WV | |
| Cq2 | CQ93M1H104J | Mylar 0.1μF ±5% | |
| Cq3 | CQ93M1H153J | Mylar 0.015μF ±5% | |
| Cq4 | CQ93M1H273J | Mylar 0.027μF ±5% | |
| Cq5 | CQ93M1H153J | Mylar 0.015μF ±5% | |
| Cq6,7 | CQ93M1H273J | Mylar 0.027μF ±5% | |
| Cq8,9 | CK45B1H471M | Ceramic 470μF ±20% | |
| Cq10 | CE04W1C100 | Electrolitic 10μF 16WV | |
| | | **RESISTOR** | |
| Rq9 | RC05GF125M | Carbon 1.2MΩ ±20% | 1/2W |
| | | **SEMICONDUCTOR** | |
| Qq1,2 | V03-0271-05 | Transistor 2SC1345(E) or (F) | |
| | | **POTENTIOMETER** | |
| VRq1 | R12-1027-05 | Semi-fixed resistor 2kΩ(B) 400 Hz, LEVEL | |
| | | **SWITCH** | |
| S9～12 | S40-4019-15 | Pushbutton | |

## DOLBY (X14-1070-10)

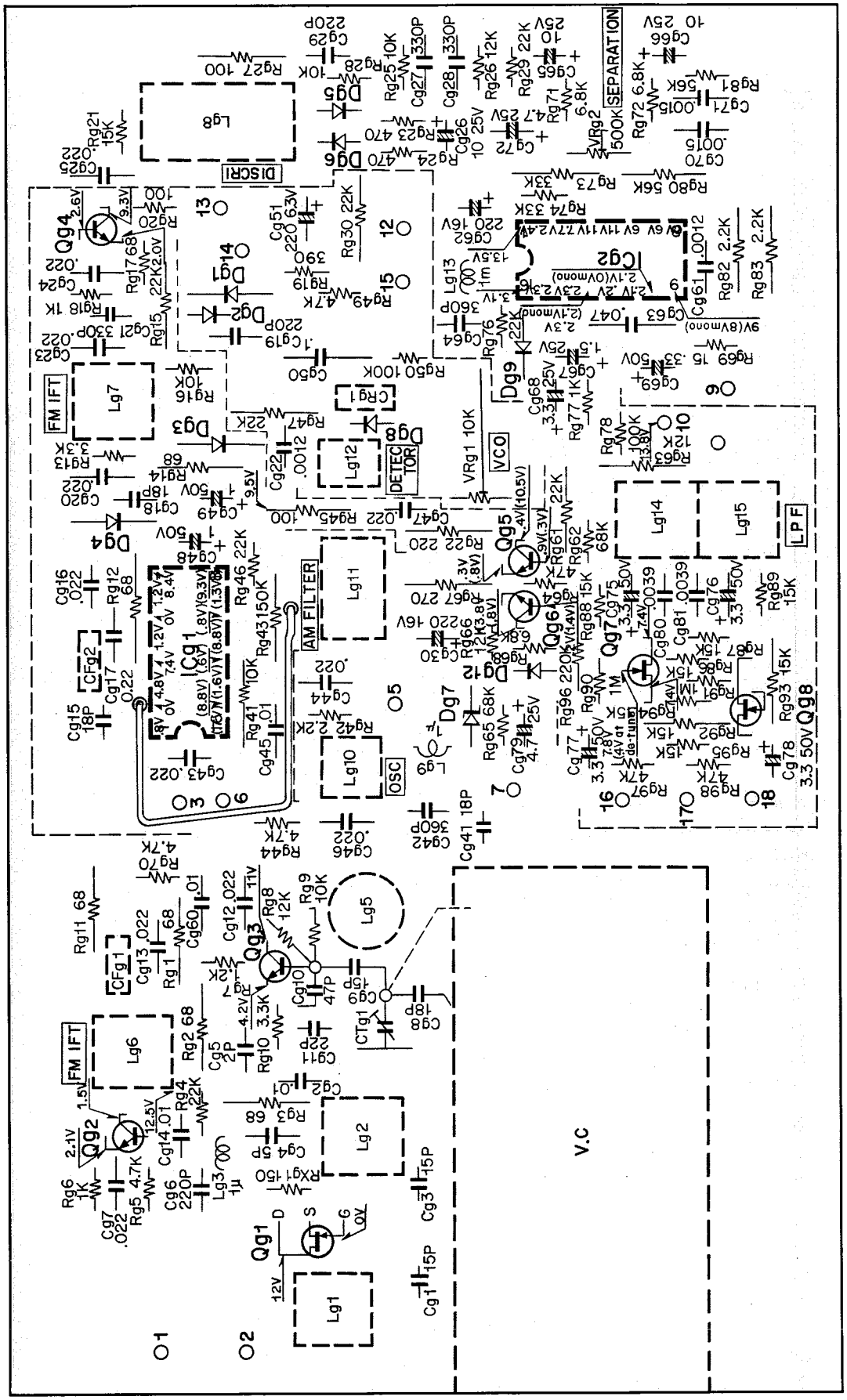
| Ref. No. | Parts No. | Description | Remarks |
|---|---|---|---|
| | | **CAPACITOR** | |
| Cv1,2 | CS15E1E010M | Tantalum 1μF 25WV | |
| Cv3,4 | CQ93N1H272J | Mylar 0.0027μF ±5% | |
| Cv5,6 | CQ93M1H102J | Mylar 0.001μF ±5% | |
| Cv7～10 | CE04W1E100 | Electrolytic 10μF 25WV | |
| Cv11,12 | CQ93M1H562G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

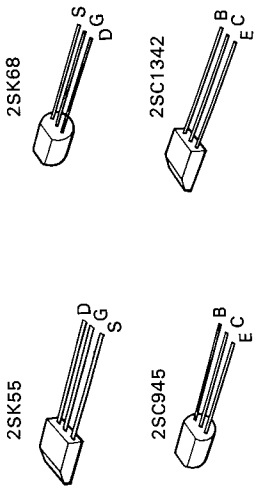
# TUNER (X05-1390-10)




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

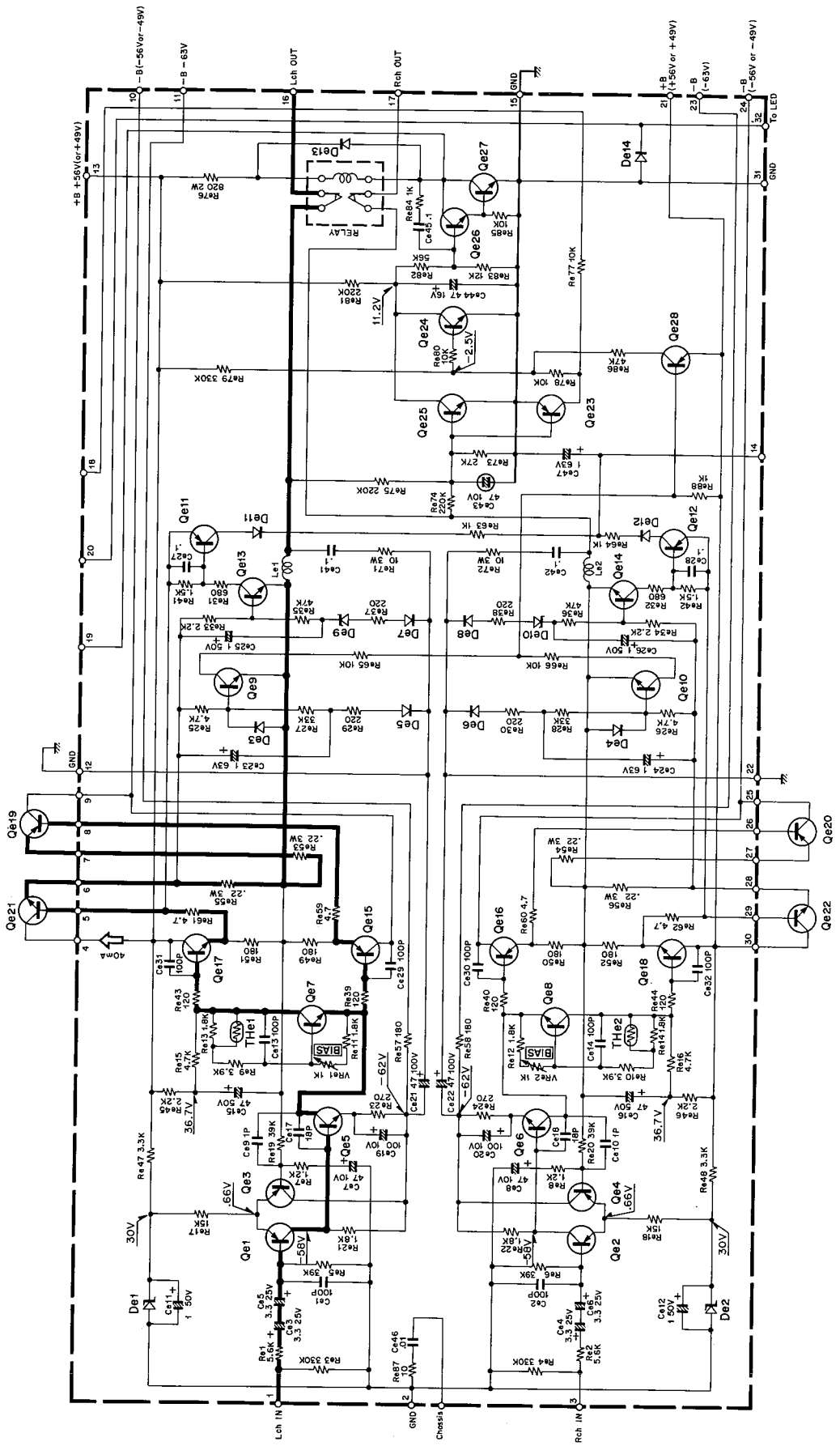
# TUNER (X05-1390-10)



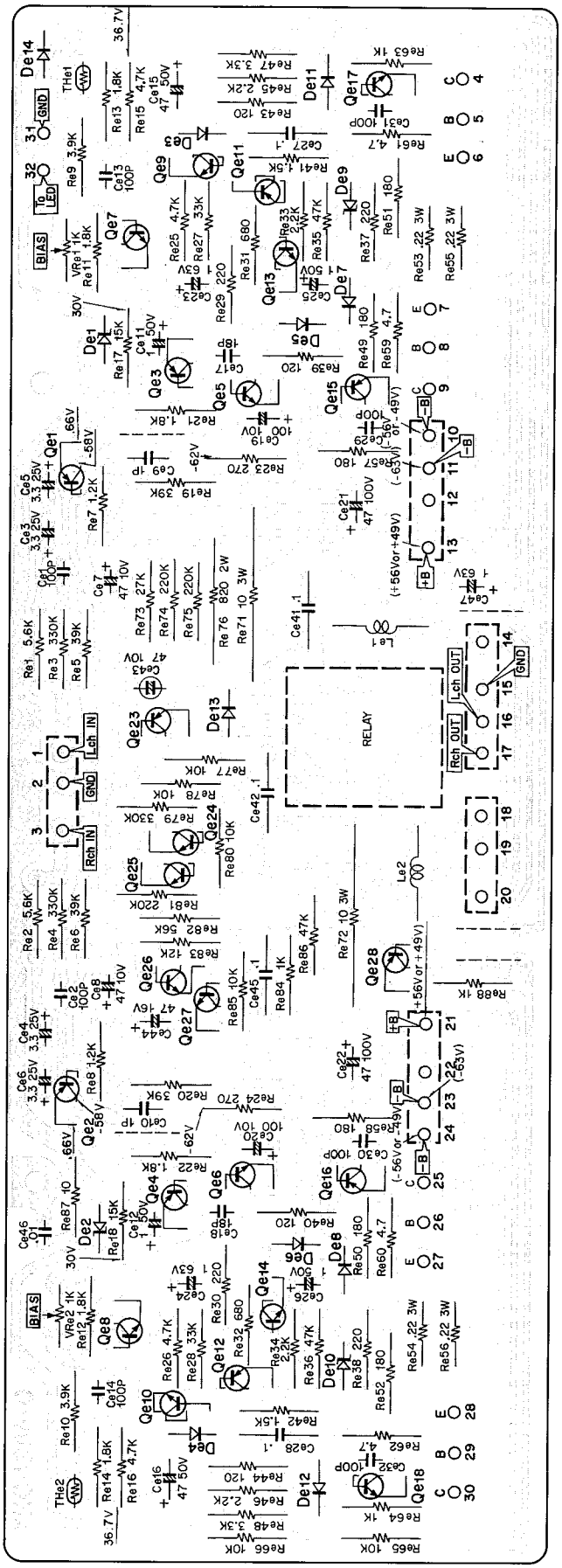

Qg1 : 2SK55 (D) or (E), Qg2 : 2SC381 (O), Qg3 : 2SC1342 (A), Qg4 : 2SC381 (R), Qg5, 6 : 2SC945, Qg7, 8 : 2SK68 (L) or (M) or 2SK30A (Y) or (Gr), ICg1 : AN-217BB, ICg2 : HA-1196, Dg1 ~ 4, 8 : 1N60, Dg5, 6, 9, 12 : 1S2076 or 1S1555, Dg7 : XZ-137

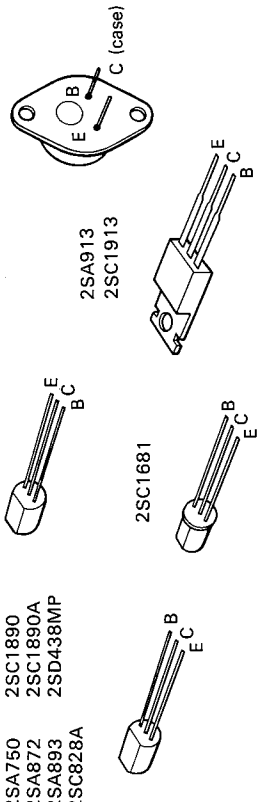
# POWER AMP (X07-1570-80)



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

# POWER AMP (X07-1570-80)

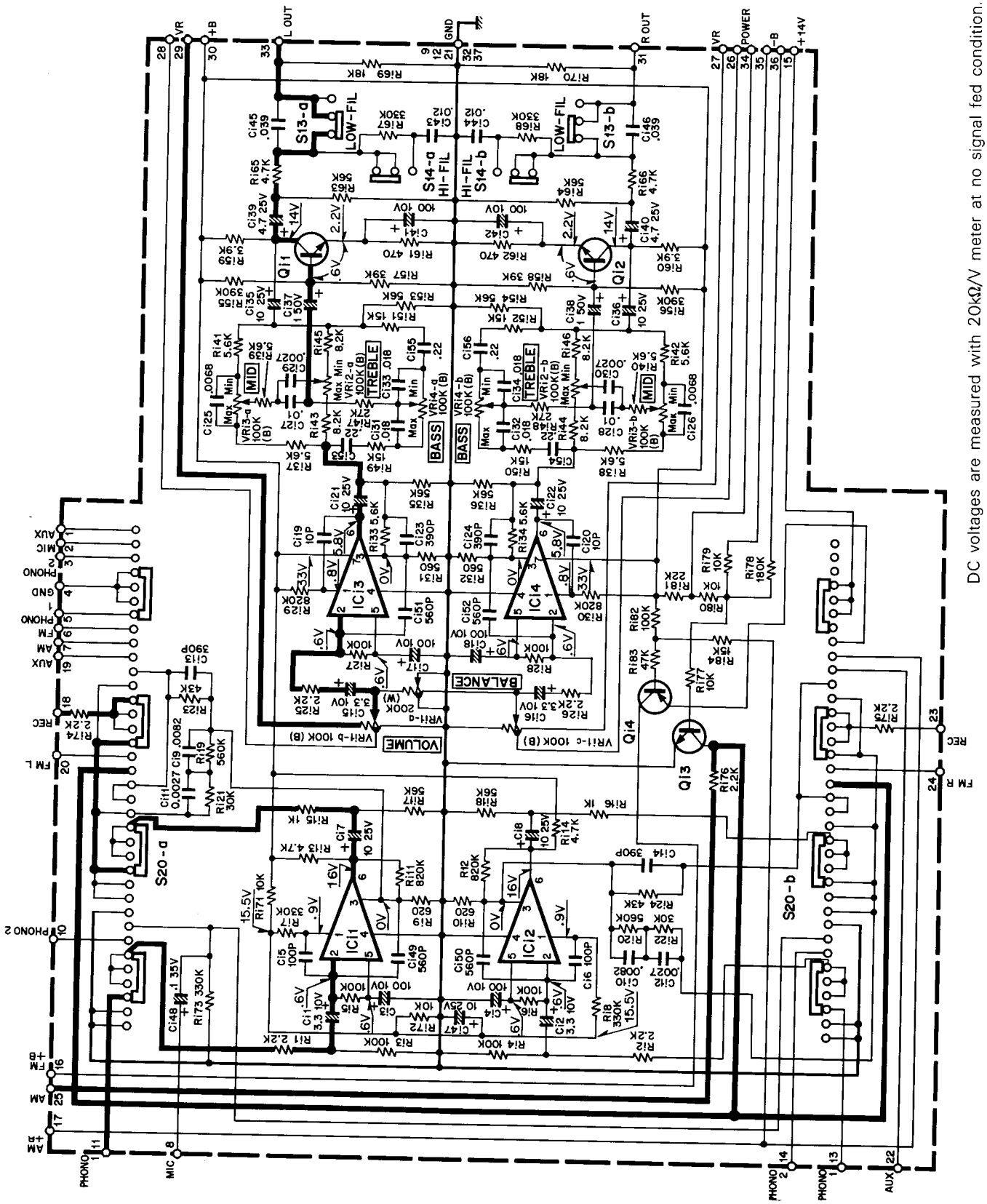



| | | |
|---|---|---|
| 2SA564A | 2SC945 | |
| 2SA733 | 2SC1885 | |
| 2SA750 | 2SC1890 | |
| 2SA872 | 2SC1890A | |
| 2SA893 | 2SD438MP | |
| 2SC828A | | |

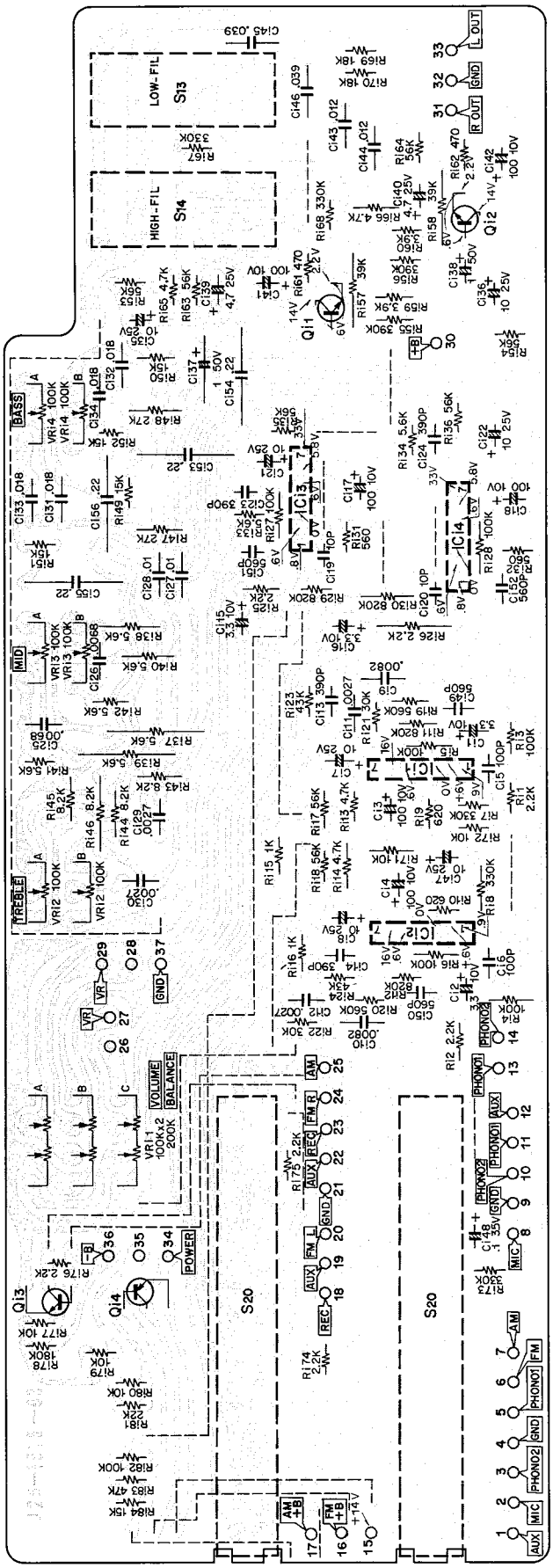
Qe1 ~ 4 : 2SA872 (D) or (E), Qe5, 6 : 2SC1885 (Q) or (R), Qe7, 8, 26 : 2SC1890 (D), (E) or (F) or 2SC1681 (GR) or (BL), Qe9, 10 : 2SC1890A (D), (E) or (F), Qe11, 12, 28 : 2SA893 (D), (E) or (F), or 2SA750 (E) or (U), Qe13, 14, 24, 25 : 2SC945 (Q) or (R) or 2SC828A (Q) or (R), Qe15, 16 : 2SA913 (Q) or (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-41L

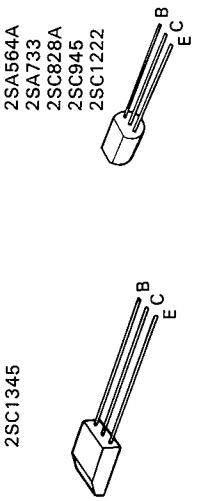
# CONTROL AMP (X11-1440-10 )




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

# CONTROL AMP (X11-1440-10)

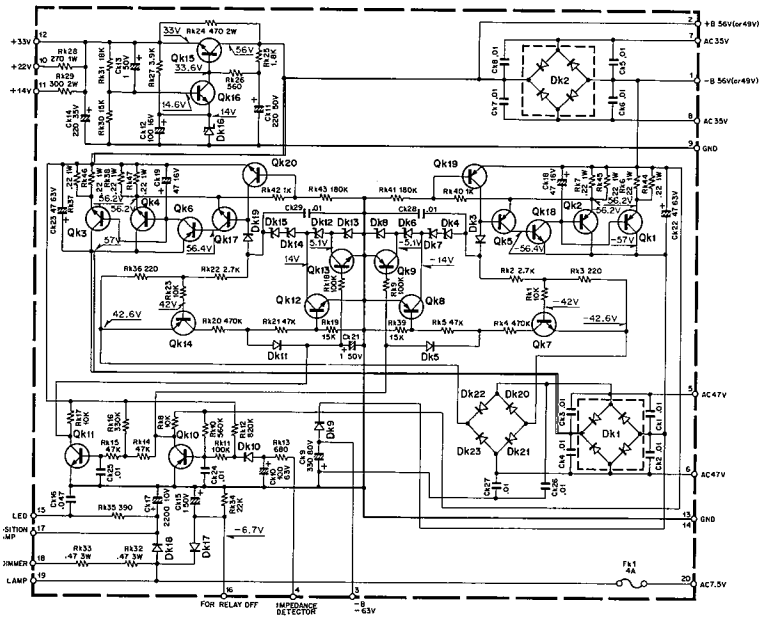


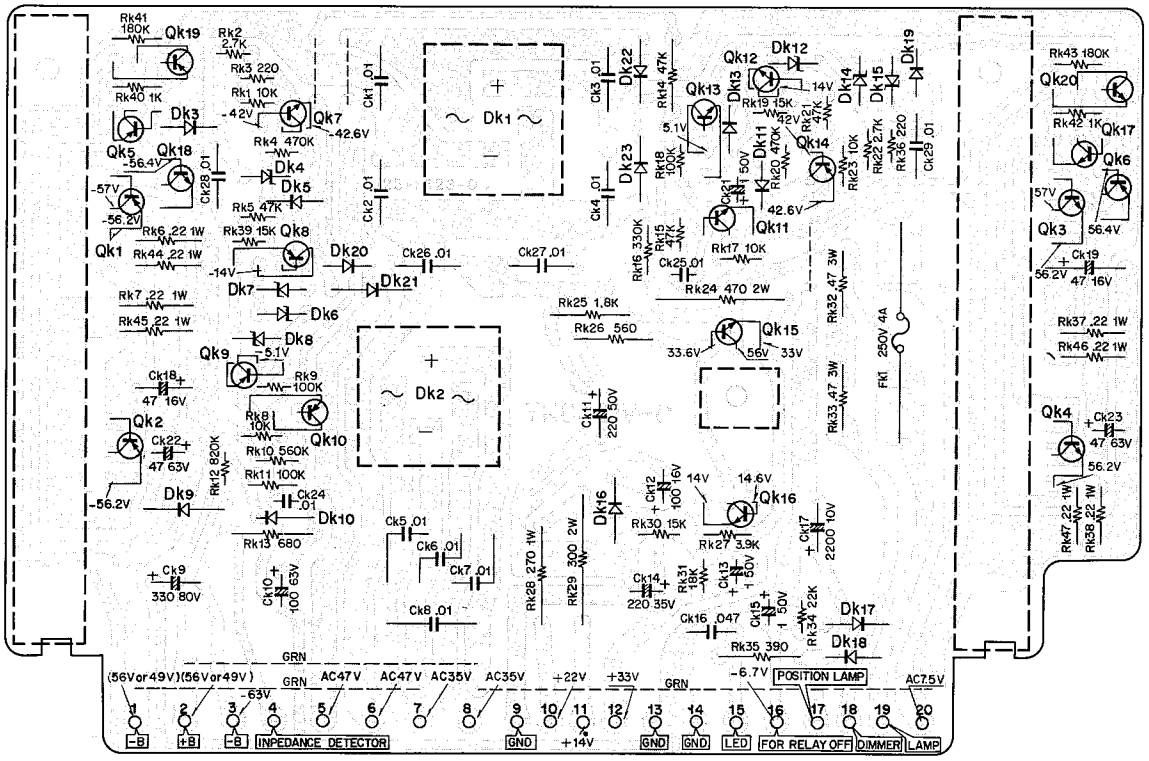



ICi1 ~ 4 : TA7129P, Qi1, 2 : 2SC1222 (U) or 2SC1345 (E), Qi3 : 2SC945 (P) or (Q) or (R) or 2SC828A (P) or (Q) or (R).
Qi4 : 2SA733 (P) or (Q) or (R) or 2SA564A (P) or (Q) or (R)

# POWER SUPPLY (X00-1930-80)

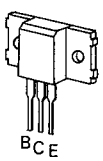
DC voltages are measured with 20kΩ/V meter at no signal fed condition.



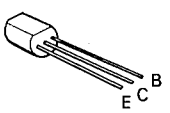



Qk1, 2 : 2SB616 (Q), (R) or (S), Qk3, 4 : 2SC586 (Q), (R) or (S), Qk5, 10, 14, 19 : 2SA893 (D), (E) or (F) or 2SA750 (1) (E) or (U), Qk6 : 2SB596 (R), (O) or (Y), Qk7, 11, 16, 17, 20 : 2SC1890 (D), (E) or (F) or 2SC1400 (E) or (U), Qk8, 9 : 2SA733 (Q) or (R) or 2SA564A (Q) or (R), Qk12, 13 : 2SC945 (Q) 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

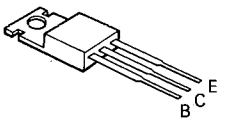
2SB616
2SD586




2SA564A
2SA733
2SA750
2SA893
2SC828A
2SC945
2SC1400
2SC1890

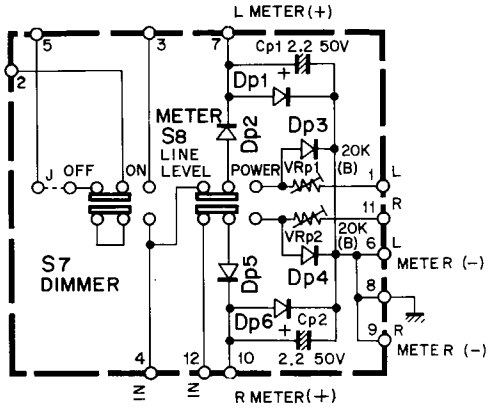


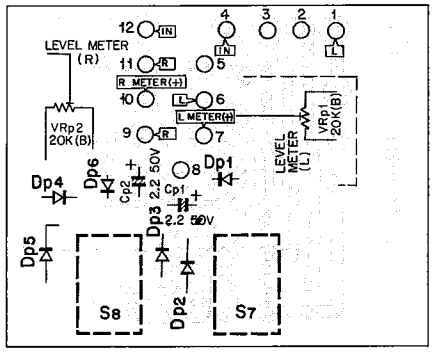

2SB596
2SC1419
2SD330
2SD526



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

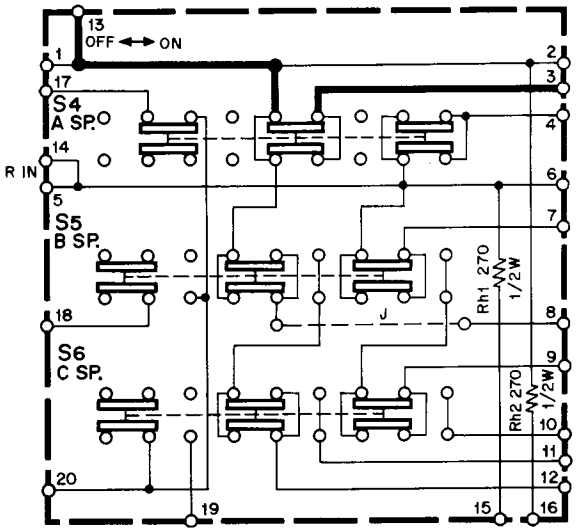
## PUSH SWITCH (A) (X13-2190-10)

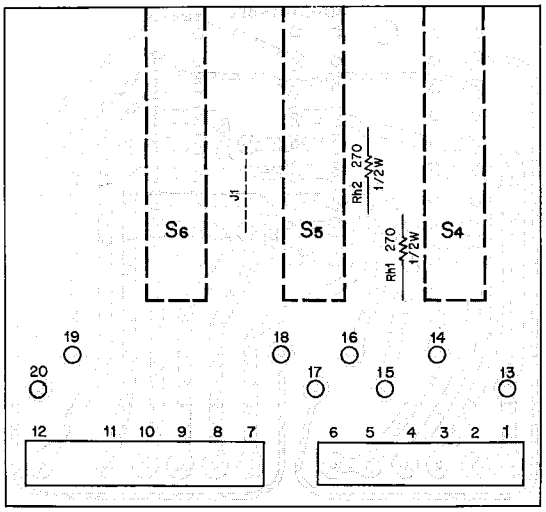


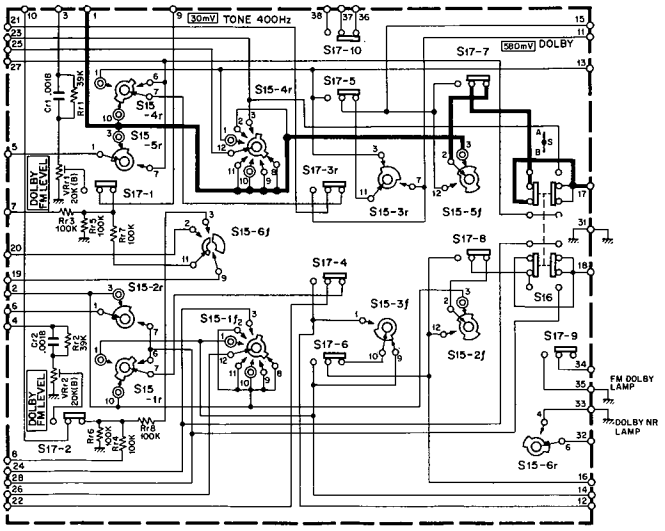

Dp1, 2, 5, 6 : 1N60, Dp3, 4 : 1S1555

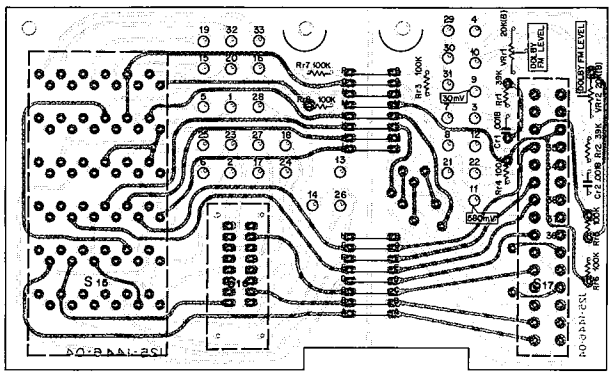
## SPEAKER SELECTOR (X13-2390-80)



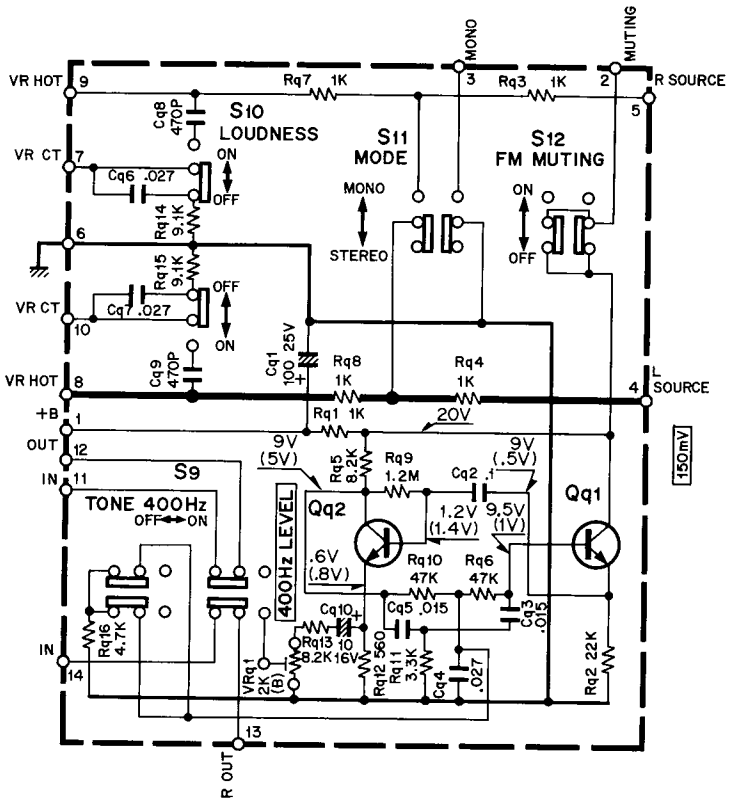

## TAPE MONITOR (X13-2310-10)

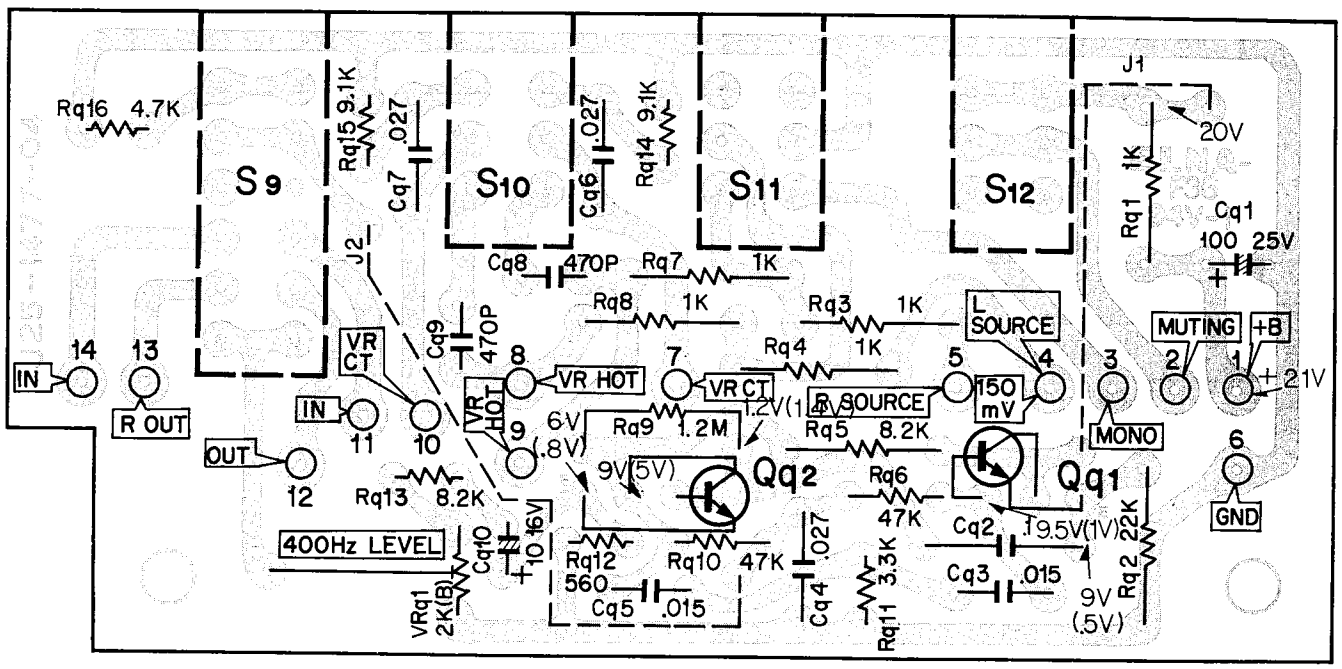


# PUSH SWITCH(B) (X13-2430-80)

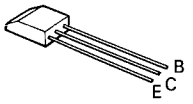
DC voltages are measured with 20kΩ/V meter at no signal fed condition.



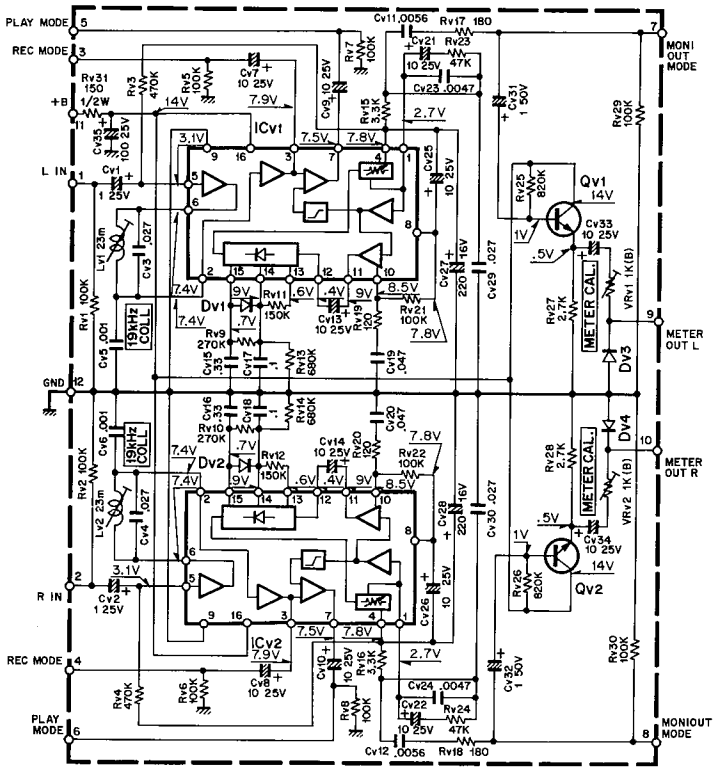

Qq1, 2 : 2SC1345 (E) or (F)

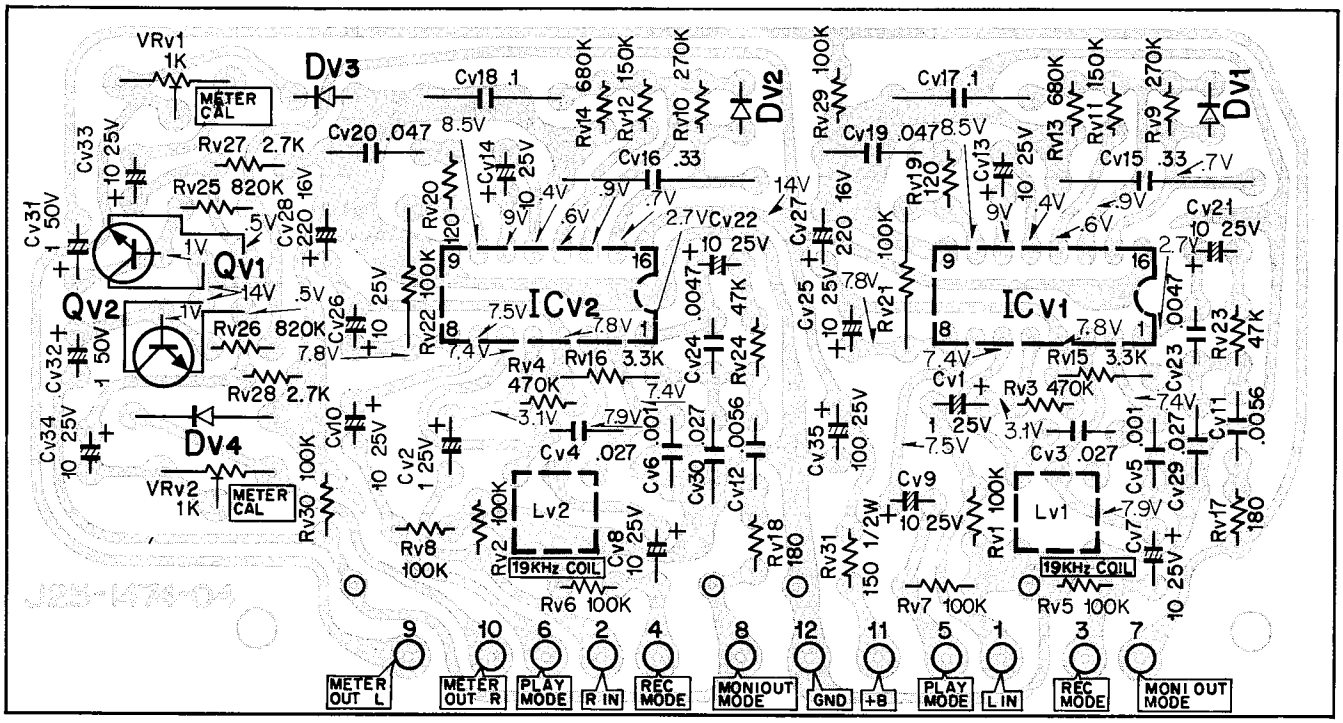
2SC1345



# DOLBY (X14-1070-10)

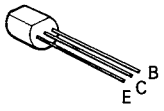
DC voltages are measured with 20kΩ/V meter at no signal fed condition.




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

2SC945



# ADJUSTMENTS

| No. | ALIGN | TEST EQUIPMENTS | | RECEIVER SETTING | OUTPUT INDICATOR | ADJUSTMENT POINTS | REMARKS |
|---|---|---|---|---|---|---|---|
| | | CONNECTION | SETTING | | | | |
| **FM SECTION** | | | | | | | |
| 1 | IF | Ⓐ and Ⓑ | 95 MHz (60 dB)<br>1 kHz (Mod)<br>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 | | Ⓐ and Ⓑ | 95 MHz (60 dB)<br>1 kHz (Mod)<br>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<br>1 kHz (Mod)<br>75 kHz (Dev)<br>60 dB (input) | 95 MHz | ditto | — | Confirm output voltage is 700 mV |
| 5 | TRACKING | ditto | 90 MHz<br>1 kHz (Mod)<br>75 kHz (Dev) | 90 MHz | ditto | Lg1, 2, 5 | Maximum deflection |
| 6 | | | 108 MHz<br>1 kHz (Mod)<br>75 kHz (Dev) | 108 MHz | | CTg1～3 | |
| 7 | VCO | Ⓐ | 95 MHz<br>0 (Dev)<br>60 dB (Input) | 95 MHz | Freq. counter via 20～30 dB amp*1 or SSVM to TP1 | VRg1 | Counter indicates 76 kHz |
| 8 | DISTORTION | Ⓑ and Ⓒ | 95 MHz<br>1 kHz (Mod)<br>68.25 kHz (Dev)<br>L (Select)<br>60 dB (Input) | 98 MHz | SSVM, scope & distortion meter to REC jack (L) | Lg6, 7 | Minimum distortion |
| **AM SECTION** | | | | | | | |
| 1 | IF | Ⓑ and Ⓓ | 1000 kHz<br>400 Hz, 30% (Mod)<br>100 dB | 1000 kHz | SSVM & scope to REC jack (L) | Lg11, 12 | Maximum deflection |
| 2 | TRACKING | ditto | 600 kHz<br>400 Hz, 30% (Mod)<br>100 dB | 600 kHz | ditto | Lg10 Bar antenna | ditto |
| 3 | | | 1400 kHz<br>400 Hz, 30% (Mod) | 1400 kHz | | CTg4, 5 | |
| **AUDIO SECTION** | | | | | | | |
| 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 | Ⓔ and Ⓕ | 1 kHz | RMS output voltage is 2.8V/8Ω METER POWER | POWER/ LINE LEVEL METER | VRp1, 2 | Meter indicates*3 1W |
| **DOLBY NR SECTION** | | | | | | | |
| 1 | 400 Hz OSC. CAL. | — | — | S9: ON<br>S15: PLAY A▶B<br>PLAY CAL VR: MAX<br>REC LEVEL VR: MAX<br>METER: LEVEL | SSVM to B REC jack Ⓖ | VRq1 | Output is 580 mV |
| 2 | METER CAL. | — | — | Same | POWER/ LINE LEVEL METER | VRv1, 2 | Meter points*4 Cal. |
| 3 | 19 kHz COIL | Ⓗ and Ⓖ | 19 kHz<br>1V | S9: OFF<br>S15: PLAY A▶B<br>PLAY CAL VR: MAX<br>REC LEVEL VR: MAX | SSVM to B REC jack | Lv1, 2 | Output is min. |
| 4 | DOLBY FM | Ⓐ and Ⓖ | 95 MHz<br>37.5 kHz (Dev)<br>1 kHz (Mod)<br>1mV (60 dB input) | S9: OFF<br>S17: ON<br>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)<br>500 kHz～1600 kHz (AM) |
| **Modulation frequency:** | 1 kHz, 400 Hz or external input (input level 2V or less) |
| **Deviation:** | 0～75 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)**

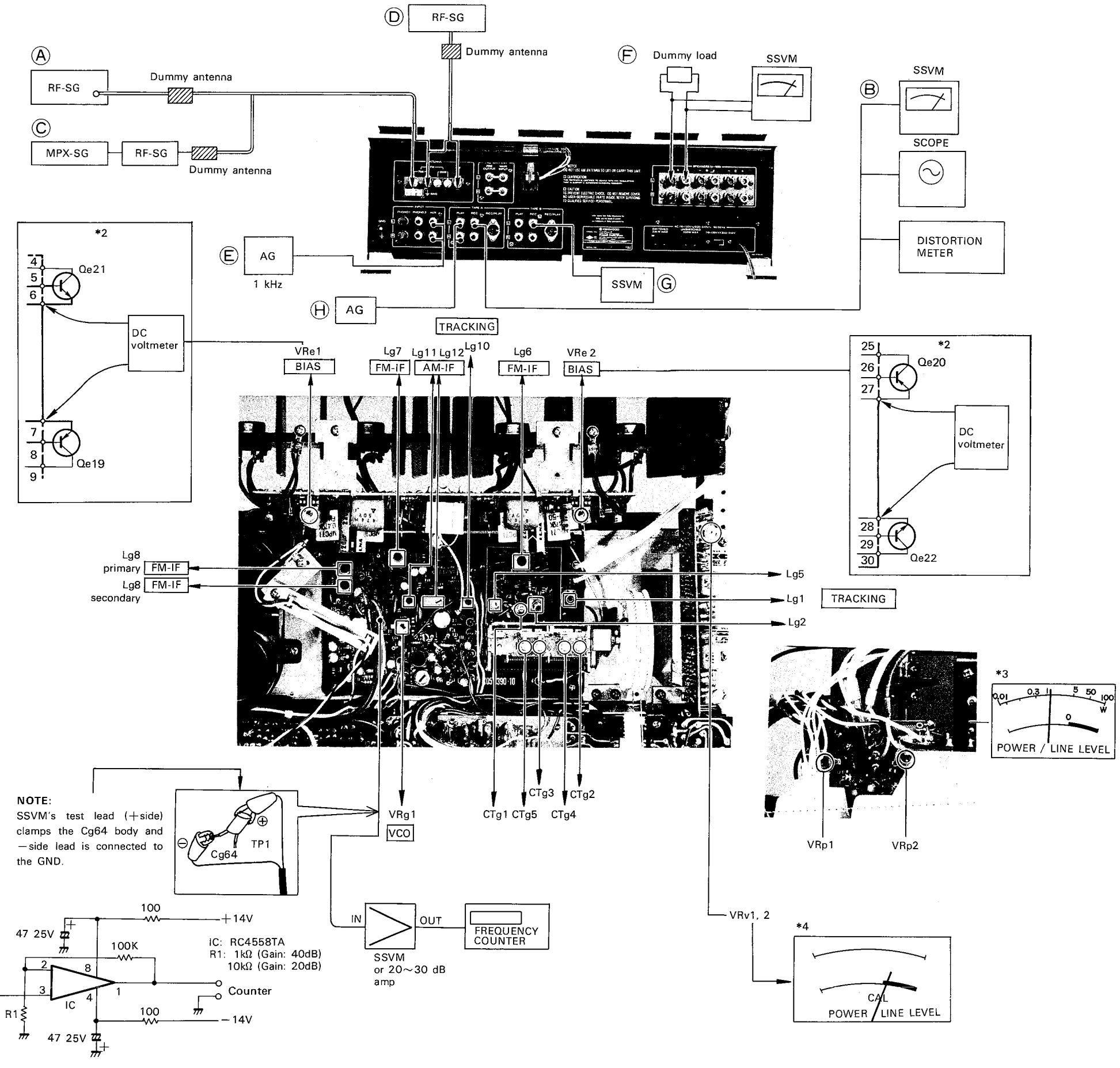
| | |
|---|---|
| **Frequency response:** | 10 Hz～1 MHz |
| **Sensitivity:** | 50 mV or more |
| **Impedance:** | 1MΩ or more |

**AUDIO SIGNAL GENERATOR (AG)**

| | |
|---|---|
| **Ranges:** | 5 Hz～500 kHz |
| **Waveform:** | Sine wave |
| **Output:** | 10V r.m.s. |
| **Distortion:** | 0.3% or less |

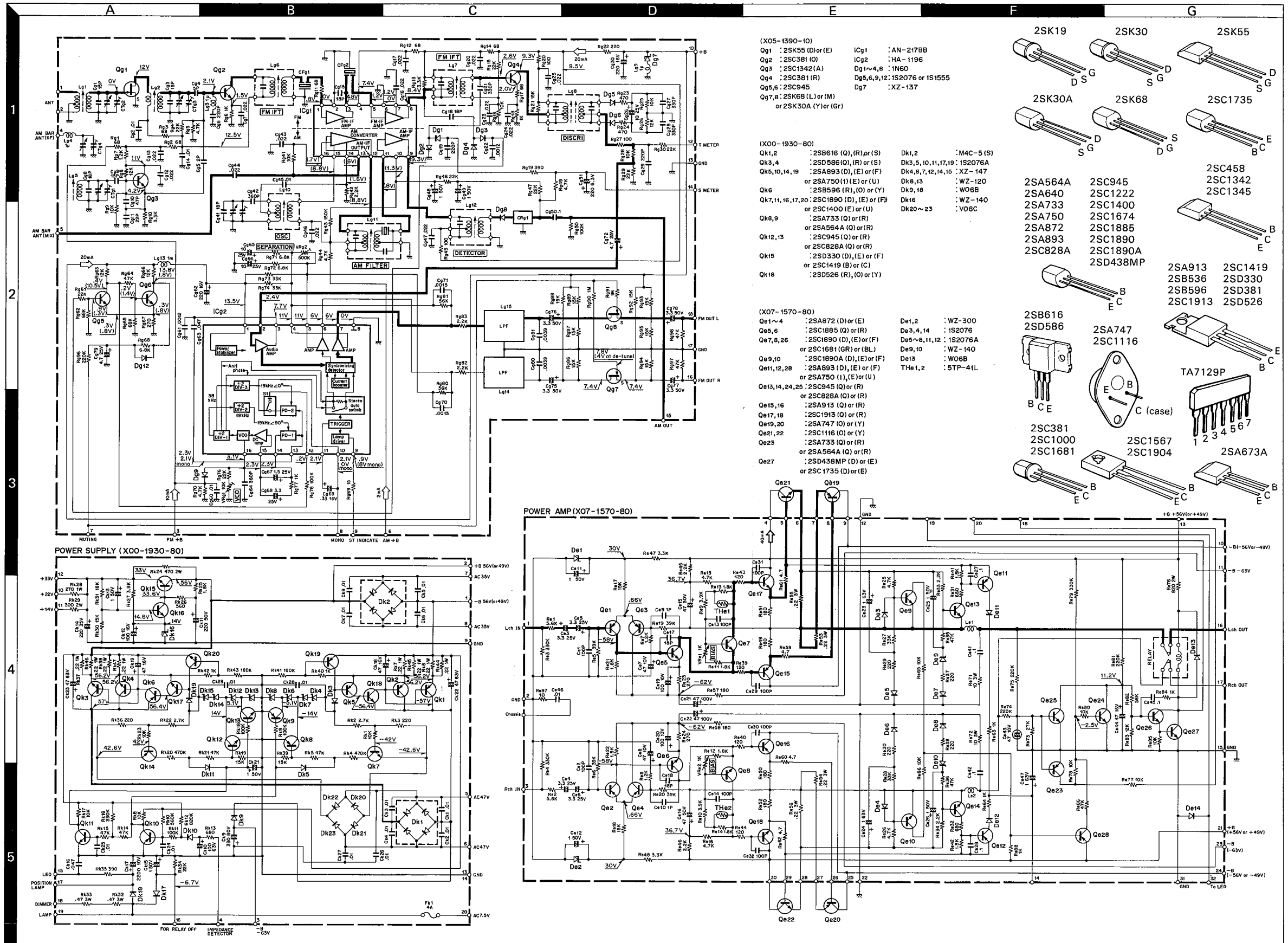
**NOTE:**

* 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.



MODEL ELEVEN III MODEL ELEVEN III

# SCHEMATIC DIAGRAM (1)




(X05-1390-10)

| | | | |
|---|---|---|---|
| Qg1 | : 2SK55 (D) or (E) | ICg1 | : AN-2178B |
| Qg2 | : 2SC381 (O) | ICg2 | : HA-1196 |
| Qg3 | : 2SC1342 (A) | Dg1~4,8 | : 1N60 |
| Qg4 | : 2SC381 (R) | Dg5,6,9,12 | : 1S2076 or 1S1555 |
| Qg5,6 | : 2SC945 | Dg7 | : XZ-137 |
| Qg7,8 | : 2SK68 (L) or (M) or 2SK30A (Y) or (Gr) | | |

(X00-1930-80)

| | | | |
|---|---|---|---|
| Qk1,2 | : 2SB616 (Q),(R) or (S) | Dk1,2 | : M4C-5 (S) |
| Qk3,4 | : 2SD586 (Q),(R) or (S) | Dk3,5,10,11,17,19 | : 1S2076A |
| Qk5,10,14,19 | : 2SA893 (D),(E) or (F) or 2SA750 (1) (E) or (U) | Dk4,6,7,12,14,15 | : XZ-147 |
| | | Dk8,13 | : WZ-120 |
| Qk6 | : 2SB596 (R),(O) or (Y) | Dk9,18 | : W06B |
| Qk7,11,16,17,20 | : 2SC1890 (D),(E) or (F) or 2SC1400 (E) or (U) | Dk16 | : WZ-140 |
| | | Dk20~23 | : V06C |
| 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) | | |

(X07-1570-80)

| | | | |
|---|---|---|---|
| Qe1~4 | : 2SA872 (D) or (E) | De1,2 | : WZ-300 |
| Qe5,6 | : 2SC1885 (Q) or (R) | De3,4,14 | : 1S2076 |
| Qe7,8,26 | : 2SC1890 (D),(E) or (F) or 2SC1681 (GR) or (BL) | De5~8,11,12 | : 1S2076A |
| | | De9,10 | : WZ-140 |
| Qe9,10 | : 2SC1890A (D),(E) or (F) | De13 | : W06B |
| Qe11,12,28 | : 2SA893 (D),(E) or (F) or 2SA750 (1),(E) or (U) | THe1,2 | : 5TP-41L |
| 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) | | |

2SK19 2SK30 2SK55

2SK30A 2SK68 2SC1735

2SA564A 2SC945 2SC458
2SA640 2SC1222 2SC1342
2SA733 2SC1400 2SC1345
2SA750 2SC1674
2SA872 2SC1885
2SA893 2SC1890
2SC828A 2SC1890A
2SD438MP

2SA913 2SC1419
2SB536 2SD330
2SB596 2SD381
2SC1913 2SD526

2SB616
2SD586

2SA747
2SC1116

TA7129P

2SC381
2SC1000
2SC1681

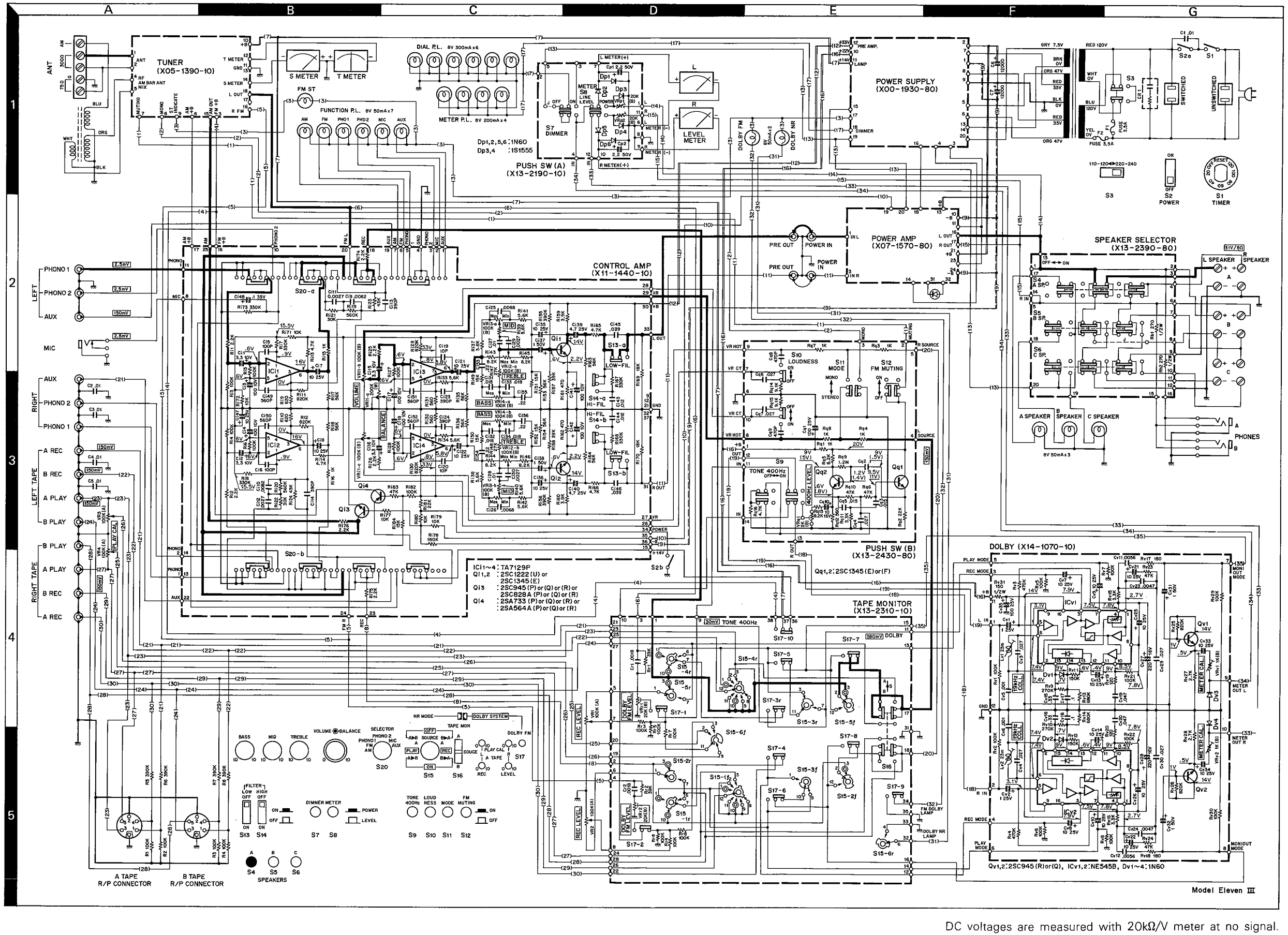
2SC1567
2SC1904

2SA673A

| SEMICONDUCTOR NAME | SUBSTITUTIONS |
|---|---|
| **POWER SUPPLY (X00-1930-80)** | |
| 2SA733 | 2SA564A, 2SA640 |
| 2SA893 | 2SA750, 2SA893A |
| 2SB596 | 2SB595 |
| 2SB616 | 2SB618 |
| 2SC945 | 2SC828A, 2SC458 |
| 2SC1890 | 2SC1400, 2SC1890A |
| 2SD330 | 2SC1419, 2SC1061 |
| 2SD526 | 2SD525 |
| 2SD586 | 2SD588 |
| **TUNER (X05-1390-10)** | |
| 2SC381 | 2SC1674 |
| 2SC945 | 2SC458, 2SC828 |
| 2SC1342 | — |
| 2SK55 | 2SK19 |
| 2SK68 | 2SK30 |
| AN217BB | — |
| HA1196 | — |
| **POWER AMP (X07-1570-80)** | |
| 2SA733 | 2SA564A, 2SA640 |
| 2SA747 | 2SA747A |
| 2SA872 | 2SA872A |
| 2SA893 | 2SA750, 2SA893A |
| 2SA913 | 2SB536 (2) |
| 2SC945 | 2SC828A, 2SC1000, 2SC1345 |
| 2SC1116 | 2SC1116A |
| 2SC1885 | 2SC1904 |
| 2SC1890 | 2SC1681, 2SC1890A |
| 2SC1890A | — |
| 2SC1913 | 2SD381 (2) |
| 2SD438MP | 2SC1735 |
| **CONTROL AMP** | |
| 2SA733 | 2SA640, 2SA673, 2SA564A |
| 2SC945 | 2SC828A, 2SC458 |
| 2SC1222 | 2SC1345, 2SC1400 |
| **PUSH SWITCH (B) (X13-2430-80)** | |
| 2SC1345 | 2SC1000 |
| **DOLBY (X14-1070-10)** | |
| 2SC945 NE545B | 2SC458, 2SC828 — |

* DC voltages are measured with 20kΩ/V meter at no signal except tuner section.
* For tuner section, DC voltages are measured with 20kΩ/V meter at FM reception except ( ).
* ( ) voltages are measured at AM reception.

# SCHEMATIC DIAGRAM (2)




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

# MODEL ELEVEN III

## 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 ±0.5 dB |
| **AUX, Tape Play** | 20 Hz to 40,000 Hz −1.0 dB |
| **Tone Controls** | |
| **Bass** | ±10dB at 100 Hz |
| **MID** | ±10 dB at 800 Hz |
| **Treble** | ±10 dB at 10 kHz |
| **Loudness (−30dB)** | +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 (1.8μV) |
| **50 dB Quieting** | 17.3 dBf (4.0μV) |
| **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, 35 dB at 50 Hz to 10,000 Hz |
| **Antenna Impedance** | 300 ohms Balanced and 75 ohms Unbalanced |

### AM TUNER SECTION

| | |
|---|---|
| **Usable Sensitivity** | 20μV |
| **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+C,B+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 Flit, 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" (574 mm) H: 7-3/4" (198 mm) D: 14-3/4" (375 mm) |
| **Weight (Net)** | 39.7 lbs. (18 kg) |



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