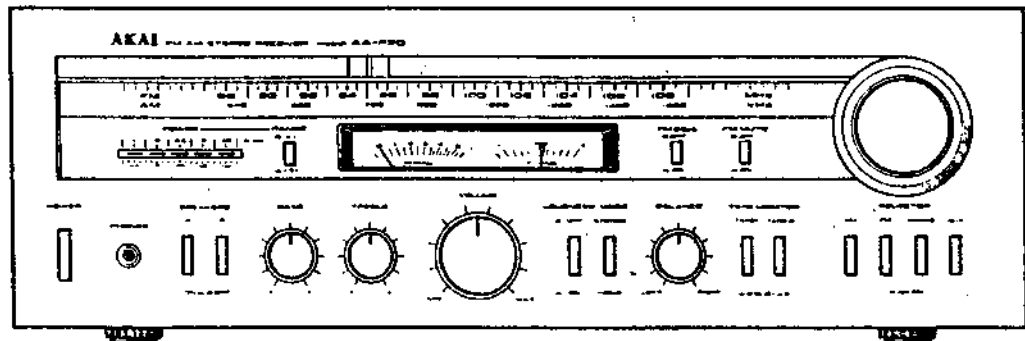
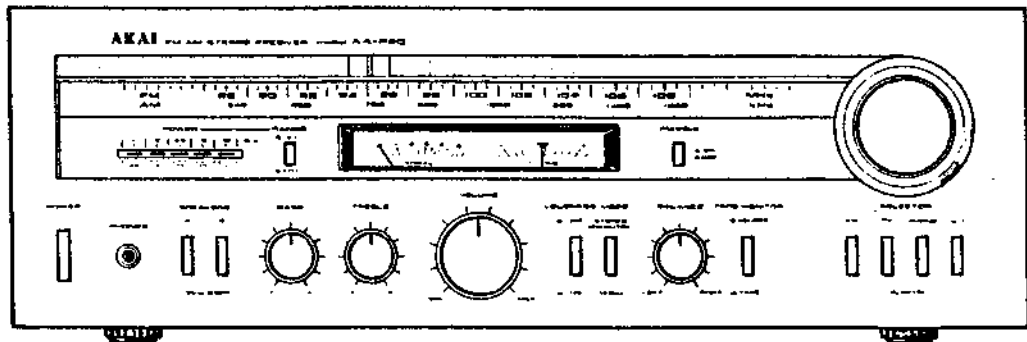


AA-R20/R30

# AKAI SERVICE MANUAL

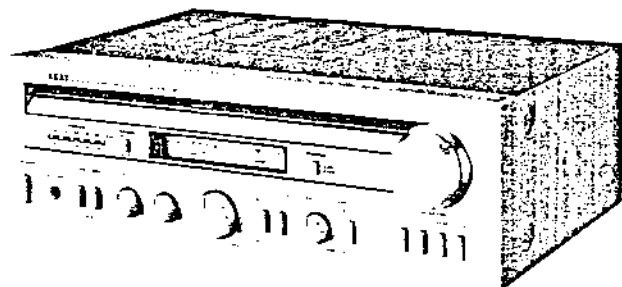


FM AM STEREO RECEIVER

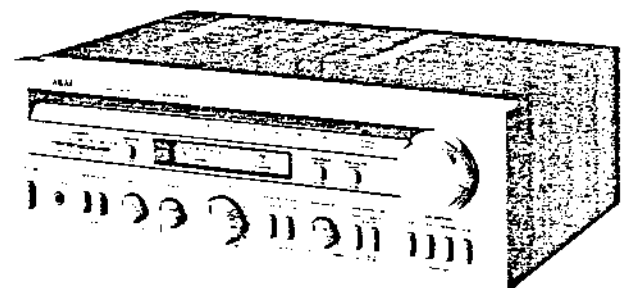
MODEL **AA-R20**

FM AM STEREO RECEIVER

MODEL **AA-R30**



AA-R20



AA-R30

**FM AM STEREO RECEIVER**

**MODEL AA-R20**  
**MODEL AA-R30**

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SECTION 1

**SERVICE MANUAL**

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For basic adjustments, measuring methods, and operating principles, refer to GENERAL TECHNICAL MANUAL.

# 1. TECHNICAL DATA

## 1. MODEL AA-R20

### POWER AMPLIFIER SECTION

RATED POWER OUTPUT		2-CHANNEL DRIVEN	26 watts per channel, minimum RMS, at 8 ohms from 20 to 20,000 Hz with no more than 0.05% total harmonic distortion.
POWER BANDWIDTH (IHF)			10 Hz to 30 kHz/8 ohms (Total harmonic distortion: 0.05%)
SIGNAL TO NOISE RATIO (IHF)	PHONO		Better than 75 dB
	AUX		Better than 90 dB
RESIDUAL NOISE			Less than 0.8 mV at 8 ohms
CHANNEL SEPARATION (IHF)	PHONO		Better than 50 dB at 1,000 Hz
	AUX		Better than 50 dB at 1,000 Hz
DAMPING FACTOR			More than 40 (1 kHz, 8 ohms)
OUTPUT	SPEAKERS		A, B (4 to 16 ohms)/A+B (8 to 16 ohms)
	HEADPHONE		4 to 16 ohms
INPUT SENSITIVITY/IMPEDANCE	PHONO		2.5 mV/47 kohms
	AUX		150 mV/47 kohms
	TUNER		150 mV/47 kohms
	TAPE		PIN: 150 mV/47 kohms
OUTPUT LEVEL/FREQUENCY RESPONSE	TAPE REC		PIN: 150 mV/3 kohms
	PHONO		30 Hz to 15 kHz +1 dB, -1 dB (RIAA)
	AUX		10 Hz to 50 kHz +1 dB, -2 dB
	BASS		+9 dB at 100 Hz
TONE CONTROL	TREBLE		+10 dB at 10 kHz
			+10 dB at 100 Hz, +6 dB at 10 kHz
LOUDNESS CONTROL			+10 dB at 100 Hz, +6 dB at 10 kHz

### FM TUNER SECTION

FREQUENCY RANGE		88 MHz to 108 MHz
SENSITIVITY (IHF)		1.9 $\mu$ V
CAPTURE RATIO		More than 1.5 dB
SELECTIVITY (IHF)		More than 60 dB
IMAGE REJECTION		More than 50 dB
IF REJECTION		More than 90 dB
SPURIOUS REJECTION		More than 70 dB
AM SUPPRESSION		50 dB
SIGNAL TO NOISE RATIO		65 dB
HARMONIC DISTORTION	MONO	Less than 0.3% (100% modulation)
	STEREO	Less than 0.5% (100% modulation)
MUTING		Switchable to ON-OFF
STEREO SEPARATION		More than 40 dB (1 kHz)
PILOT SIGNAL SUPPRESSION		More than 45 dB
SUB CARRIER SUPPRESSION		More than 45 dB
ANTENNA INPUT IMPEDANCE		300 ohms balanced, 75 ohms unbalanced

### AM TUNER SECTION

FREQUENCY RANGE		525 kHz to 1,605 kHz
SENSITIVITY (IHF)		300 $\mu$ V/m (Bar Antenna) 20 $\mu$ V (External Antenna)
SELECTIVITY (IHF)		More than 30 dB
IMAGE REJECTION		More than 55 dB
IF REJECTION		More than 40 dB
ANTENNA		Built in ferrite bar antenna
SIGNAL-TO-NOISE RATIO		More than 40 dB

### MISCELLANEOUS

SEMICONDUCTORS		Transistors: 28, Diodes: 21, FET: 1, ICs: 4
POWER REQUIREMENTS		U.S.A. model: 120 V, 60 Hz
DIMENSIONS		440 (W) x 142 (H) x 310 (D) mm (17.3" x 5.6" x 12.2")
WEIGHT		8.5 kg (18.7 lbs)

\* For improvement purposes, specifications and design are subject to change without notice.

## 2. MODEL AA-R30

### POWER AMPLIFIER SECTION

RATED POWER OUTPUT		2-CHANNEL DRIVEN	38 watts per channel, minimum RMS, at 8 ohms from 20 to 20,000 Hz with no more than 0.05% total harmonic distortion.
POWER BANDWIDTH (IHF)			10 Hz to 30 kHz/8 ohms (Total harmonic distortion: 0.05%)
SIGNAL TO NOISE RATIO (IHF)	PHONO		Better than 75 dB
	AUX		Better than 90 dB
RESIDUAL NOISE			Less than 0.7 mV at 8 ohms
CHANNEL SEPARATION (IHF)	PHONO		Better than 50 dB at 1,000 Hz
	AUX		Better than 50 dB at 1,000 Hz
DAMPING FACTOR			More than 40 (1 kHz, 8 ohms)
OUTPUT	SPEAKERS		A, B (4 to 16 ohms)/A+B (8 to 16 ohms)
	HEADPHONE		4 to 16 ohms
INPUT SENSITIVITY/IMPEDANCE	PHONO		2.5 mV/47 kohms
	AUX		150 mV/47 kohms
	TUNER		150 mV/47 kohms
	TAPE		PIN: 150 mV/47 kohms
OUTPUT LEVEL/FREQUENCY RESPONSE	TAPE REC		PIN: 150 mV/3 kohms
	PHONO		30 Hz to 15 kHz +1 dB, -1 dB (RIAA)
	AUX		10 Hz to 50 kHz +1 dB, -2 dB
	BASS		+9 dB at 100 Hz
TONE CONTROL	TREBLE		+10 dB at 10 kHz
			+10 dB at 100 Hz, +6 dB at 10 kHz
LOUDNESS CONTROL			+10 dB at 100 Hz, +6 dB at 10 kHz

### FM TUNER SECTION

FREQUENCY RANGE		88 MHz to 108 MHz
SENSITIVITY (IHF)		1.8 $\mu$ V
CAPTURE RATIO		More than 1.3 dB
SELECTIVITY (IHF)		More than 60 dB
IMAGE REJECTION		More than 50 dB
IF REJECTION		More than 90 dB
SPURIOUS REJECTION		More than 70 dB
AM SUPPRESSION		50 dB
SIGNAL TO NOISE RATIO		65 dB
HARMONIC DISTORTION	MONO	Less than 0.2% (100% modulation)
	STEREO	Less than 0.4% (100% modulation)
MUTING		Switchable to ON-OFF
STEREO SEPARATION		More than 40 dB (1 kHz)
PILOT SIGNAL SUPPRESSION		More than 45 dB
SUB CARRIER SUPPRESSION		More than 45 dB
ANTENNA INPUT IMPEDANCE		300 ohms balanced, 75 ohms unbalanced

### AM TUNER SECTION

FREQUENCY RANGE		525 kHz to 1,605 kHz
SENSITIVITY (IHF)		300 $\mu$ V/m (Bar Antenna) 20 $\mu$ V (External Antenna)
SELECTIVITY (IHF)		More than 30 dB
IMAGE REJECTION		More than 55 dB
IF REJECTION		More than 40 dB
ANTENNA		Built in ferrite bar antenna
SIGNAL-TO-NOISE RATIO		More than 40 dB

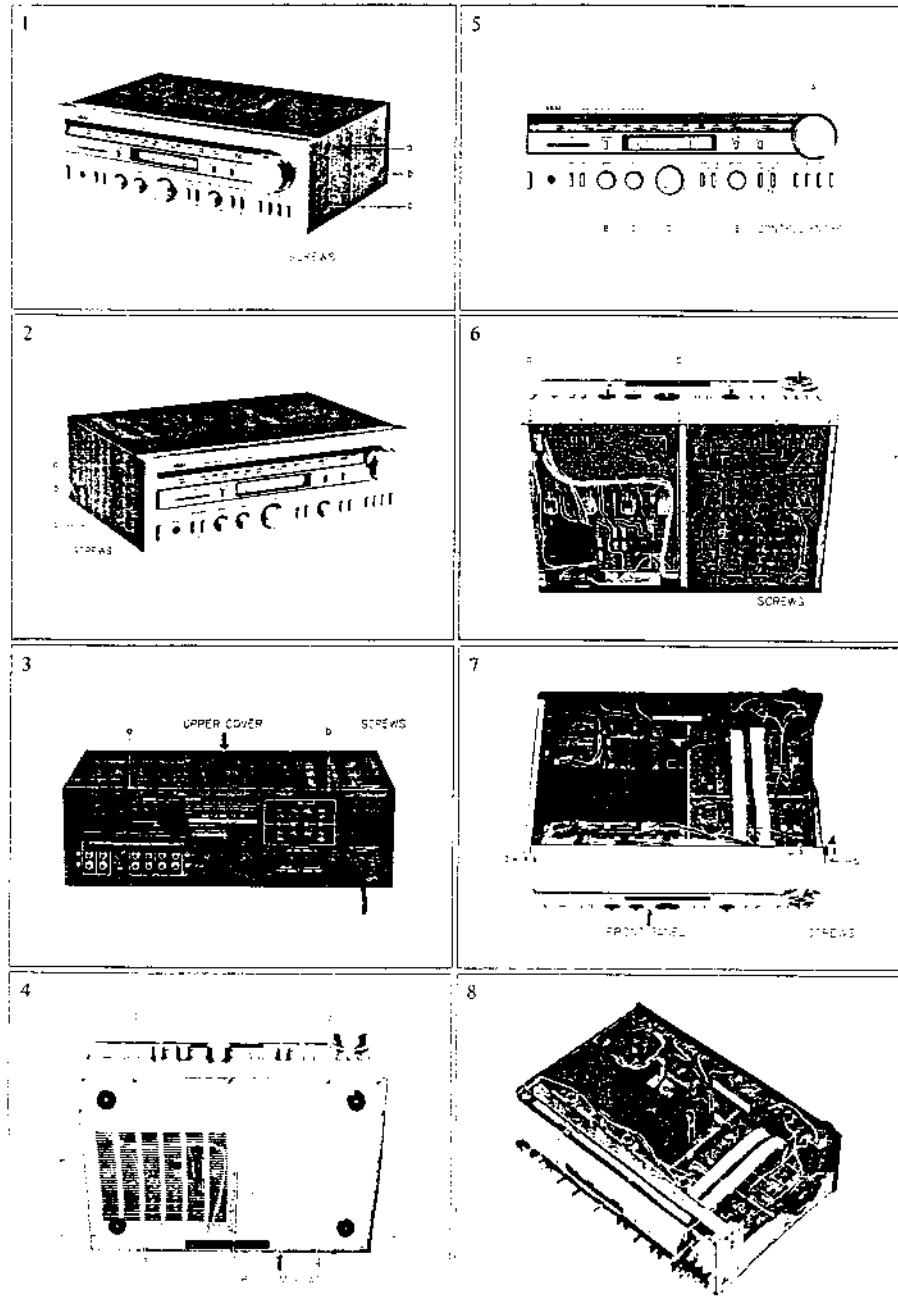
### MISCELLANEOUS

SEMICONDUCTORS		Transistors: 28, Diodes: 21, FET: 1, ICs: 4
POWER REQUIREMENTS		U.S.A. model: 120 V, 60 Hz
DIMENSIONS		440 (W) x 142 (H) x 310 (D) mm (17.3" x 5.6" x 12.2")
WEIGHT		9 kg (19.8 lbs)

\* For improvement purposes, specifications and design are subject to change without notice.

## II. DISMANTLING OF UNIT

In case of trouble, etc. necessitating dismantling, please dismantle in the order shown in the photographs. Reassemble in reverse order.



## III. CONTROLS

### I. MODEL AA-R20

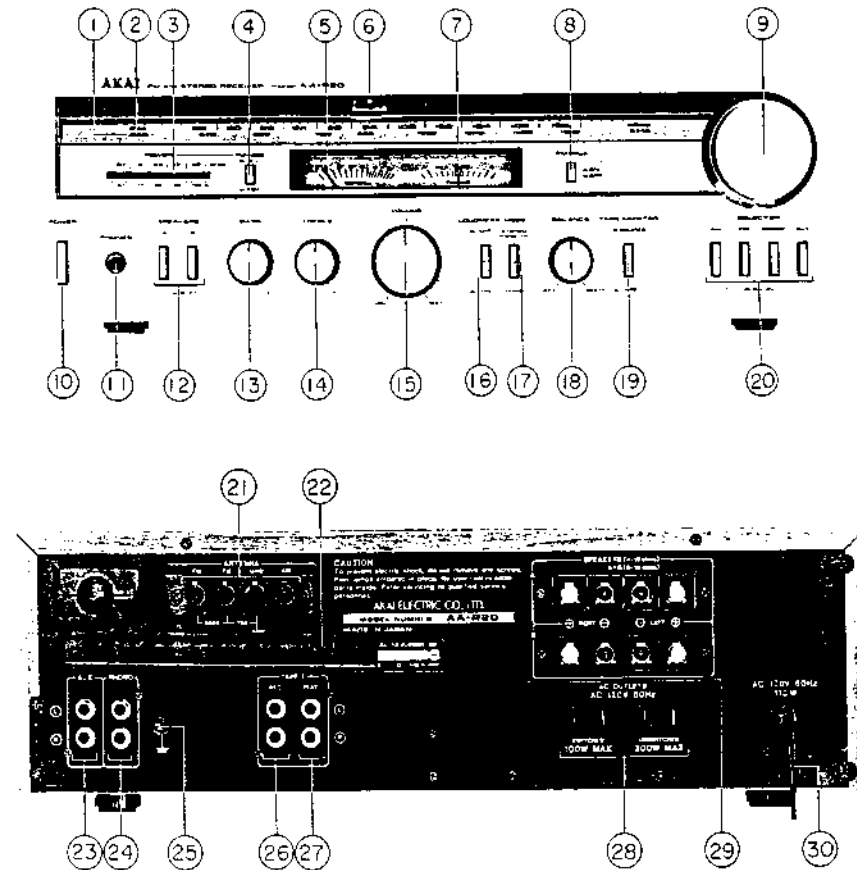


Fig. 1 Controls (AA-R20)

- |  |                                      |
|--|--------------------------------------|
| 1. AM DIAL SCALE                         | 16. LOUDNESS SWITCH                  |
| 2. FM DIAL SCALE                         | 17. MODE SELECTOR                    |
| 3. OUTPUT POWER INDICATOR                | 18. STEREO BALANCE CONTROL           |
| 4. RANGE SWITCH                          | 19. TAPE MONITOR SWITCH              |
| 5. SIGNAL STRENGTH METER                 | 20. SOURCE SELECTOR                  |
| 6. DIAL SCALE NEEDLE/FM STEREO INDICATOR | 21. FM AND AM ANTENNA TERMINALS      |
| 7. FM TUNING METER                       | 22. AM FERRITE BAR ANTENNA           |
| 8. FM 25-SECS SWITCH                     | 23. AUX TERMINALS                    |
| 9. TUNING KNOB                           | 24. PHONO JACKS                      |
| 10. POWER SWITCH                         | 25. GROUND TERMINAL                  |
| 11. HEADPHONE JACK                       | 26. TAPE SYSTEM REC JACKS            |
| 12. SPEAKER SWITCHES                     | 27. TAPE SYSTEM PLAY JACKS           |
| 13. BASS CONTROL KNOB                    | 28. AC OUTLETS                       |
| 14. TREBLE CONTROL KNOB                  | 29. A AND B SYSTEM SPEAKER TERMINALS |
| 15. VOLUME CONTROL                       | 30. AC CORD                          |

2. MODEL AA-R30

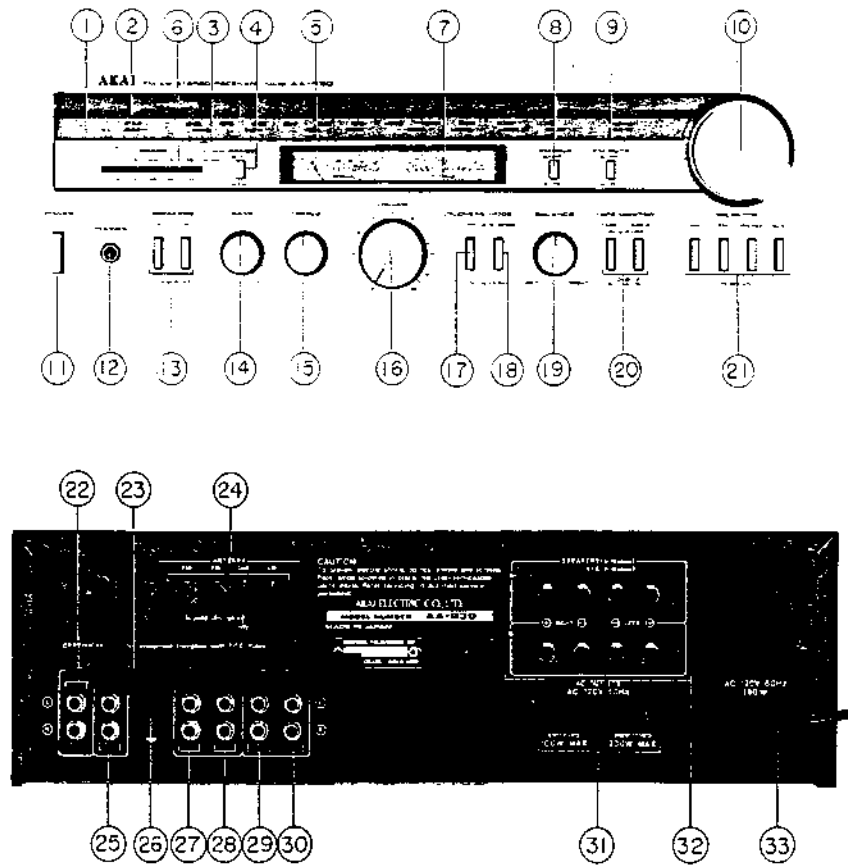


Fig. 2 Controls (AA-R30)

- |  |                                      |
|--|--------------------------------------|
| 1. AM DIAL SCALE                         | 18. MODE SELECTOR                    |
| 2. FM DIAL SCALE                         | 19. STEREO BALANCE CONTROL           |
| 3. OUTPUT POWER INDICATOR                | 20. TAPE MONITOR SWITCHES            |
| 4. RANGE SWITCH                          | 21. SOURCE SELECTOR                  |
| 5. SIGNAL STRENGTH METER                 | 22. AUX TERMINALS                    |
| 6. DIAL SCALE NEEDLE/FM STEREO INDICATOR | 23. AM FERRITE ANTENNA               |
| 7. FM TUNING METER                       | 24. FM AND AM ANTENNA TERMINALS      |
| 8. FM 25SECS SWITCH                      | 25. PHONO JACKS                      |
| 9. FM MUTE SWITCH                        | 26. GROUND TERMINAL                  |
| 10. TUNING KNOB                          | 27. TAPE 2 SYSTEM REC JACKS          |
| 11. POWER SWITCH                         | 28. TAPE 2 SYSTEM PLAY JACKS         |
| 12. HEADPHONE JACK                       | 29. TAPE 1 SYSTEM REC JACKS          |
| 13. SPEAKER SWITCHES                     | 30. TAPE 1 SYSTEM PLAY JACKS         |
| 14. BASS CONTROL                         | 31. AC OUTLETS                       |
| 15. TREBLE CONTROL                       | 32. A AND B SYSTEM SPEAKER TERMINALS |
| 16. VOLUME CONTROL                       | 33. AC CORD                          |
| 17. LOUDNESS SWITCH                      |                                      |

## IV. PRINCIPAL PARTS LOCATION

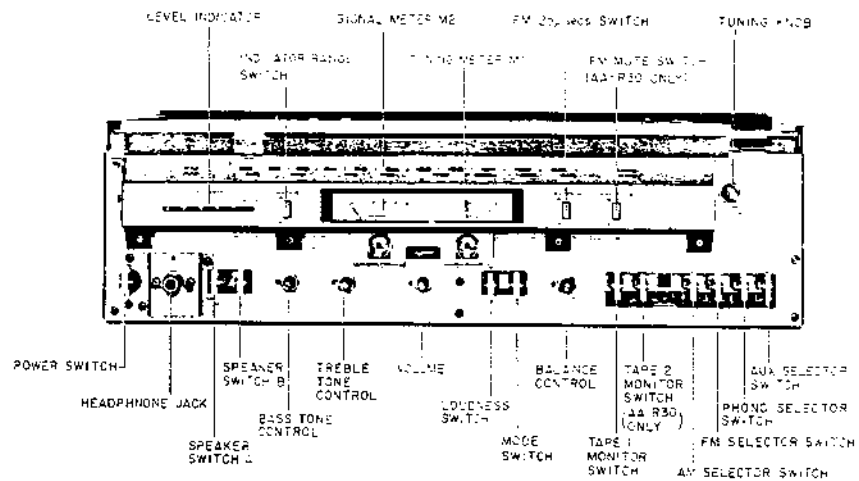


Fig. 3 Front View

## V. BLOCK DIAGRAM

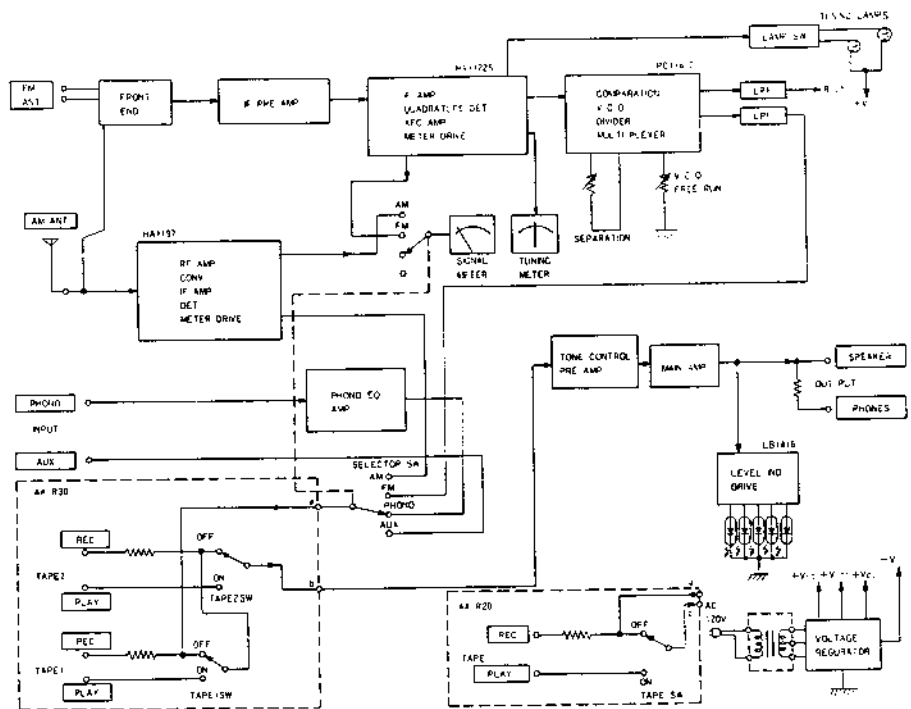


Fig. 5 Block Diagram

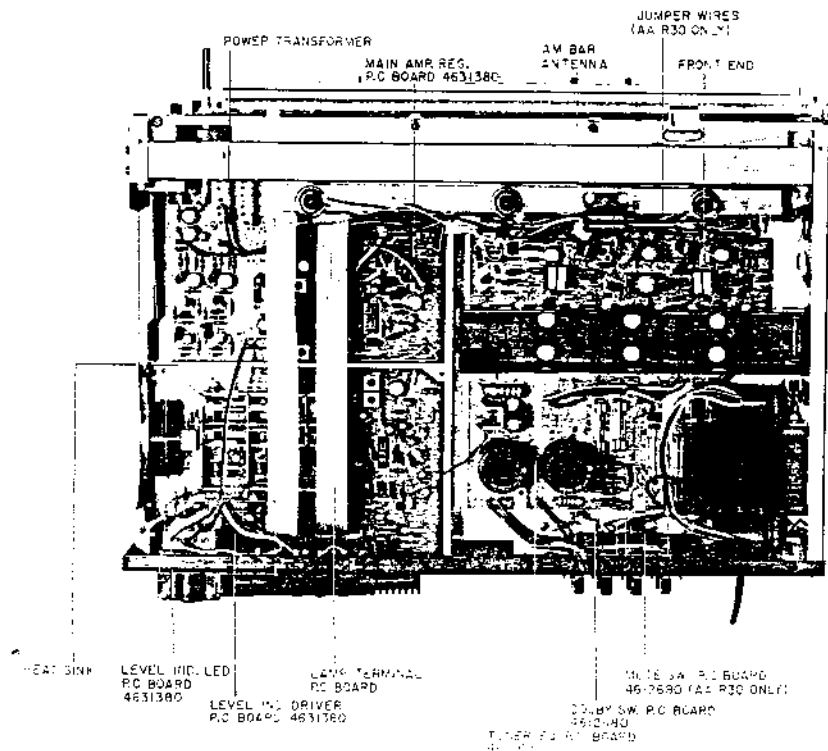


Fig. 4 Top View

## VI. AMPLIFIER ADJUSTMENT

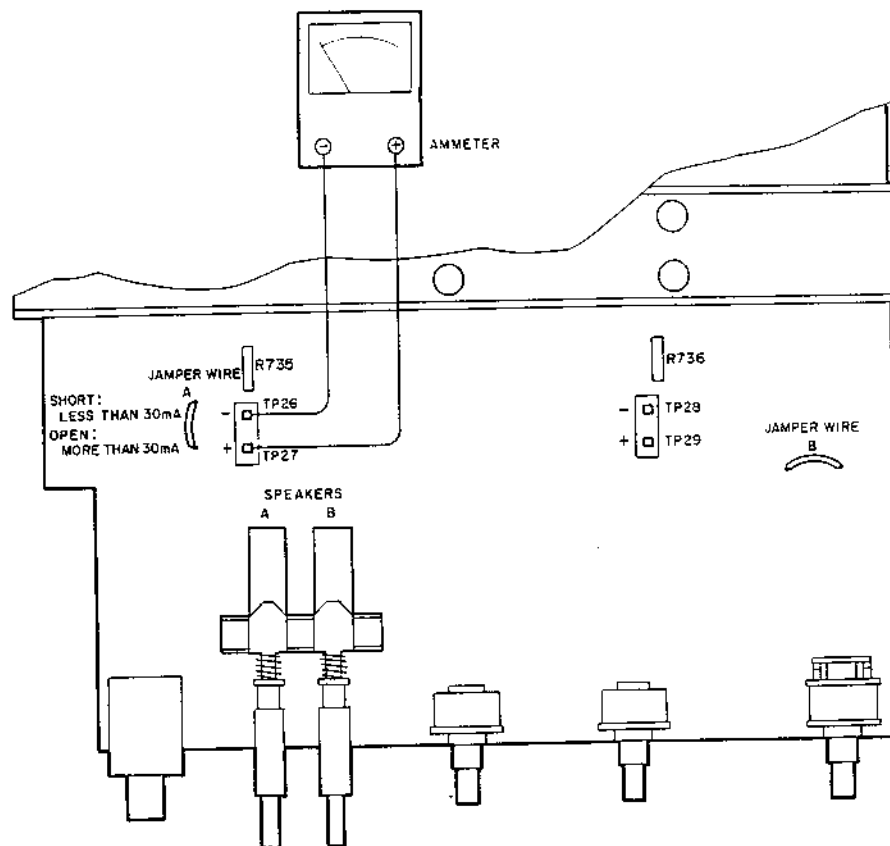


Fig. 6 Main Amp. Reg. P.C Board 4631380

### 1. IDLING CURRENT ADJUSTMENT (Refer to Fig. 6)

Connect a high-sensitivity ammeter between T.P 26, T.P 27 (left channel), T.P 28, T.P 29 (right channel). Then, cut the resistor R735 (0.47 ohms 2W, left channel), R736 (0.47 ohms 2W, right channel).

At non-signal input, if measured current is more than 30 mA, cut the jumper wire A (left channel), B (right channel). If it is less than 30 mA, do not cut the jumper wire, then confirm it is within the range of 7 mA to 60 mA.

NOTES: 1. After this adjustment, re-connect the resistor R735, R736.

2. It takes about 5 minutes for the idling current to stabilize.

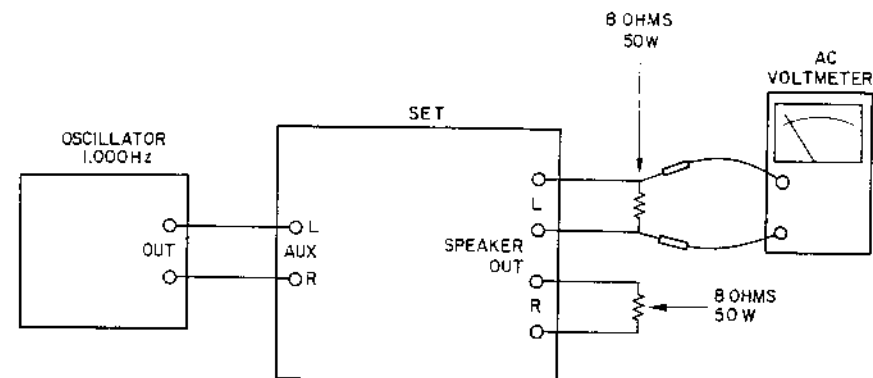


Fig. 7 Instrument Connections

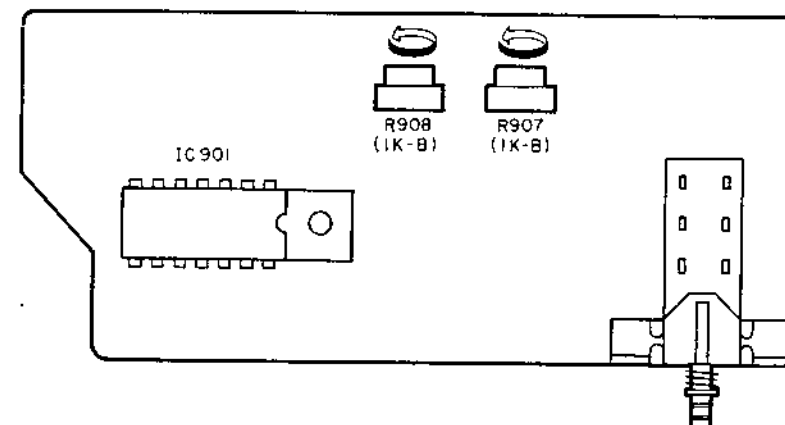


Fig. 8 LED Ind. Driver P.C Board

### 2. POWER INDICATOR LED SENSITIVITY ADJUSTMENT (Refer to Figs. 7, 8)

Connect the resistor, RL (8Ω) to SPEAKER OUT. feed a signal of 1 kHz to AUX input. Turn the BALANCE volume to LEFT to the end, using the VOLUME, set the output of the main amp's left channel side to the rated output voltage.

(AA-R20: 14.42V, AA-R30: 17.43V)  
Adjust the R907 on Ind. P.C Board, so that the fifth LED will light up. Likewise, turn the BALANCE volume to RIGHT to the end, try the same adjustment used R908 for right channel.

## VII. TUNER ADJUSTMENT

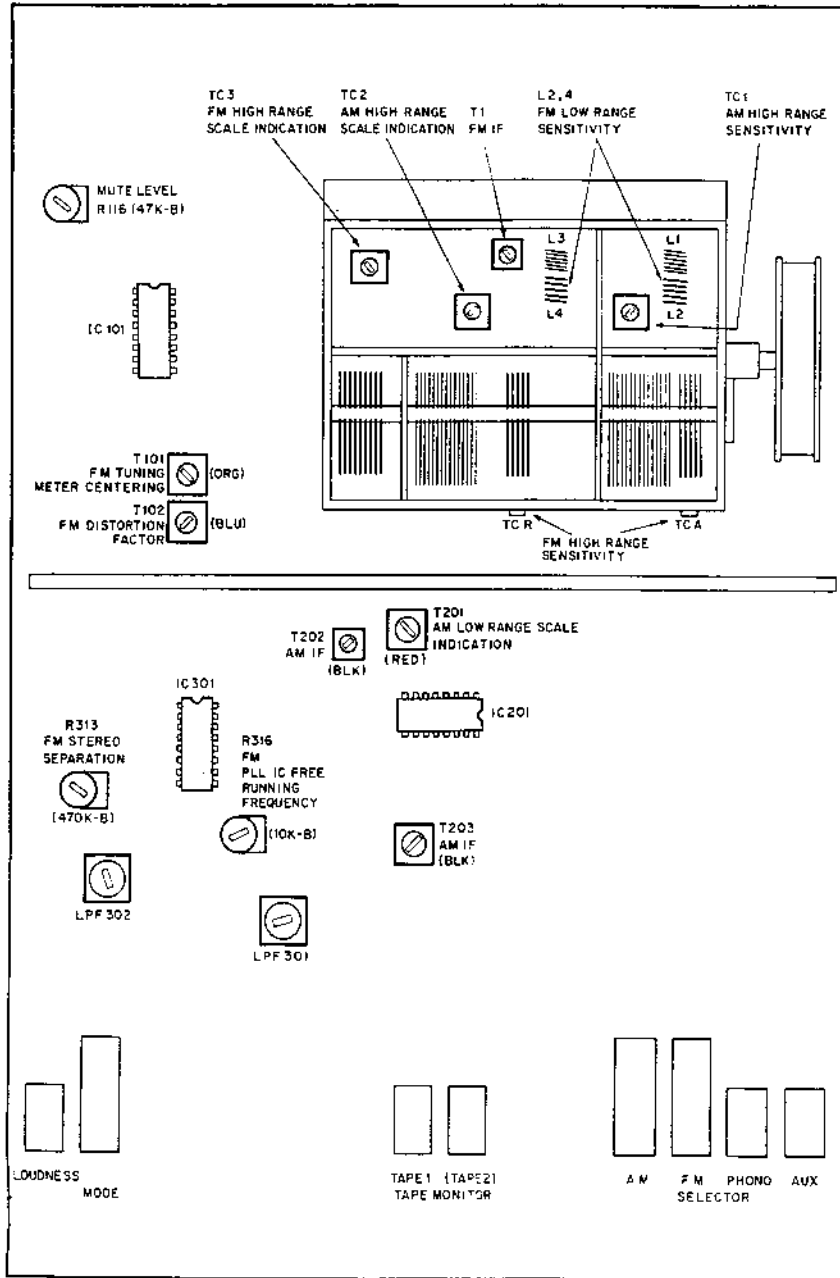


Fig. 9 Tuner EQ P.C Board

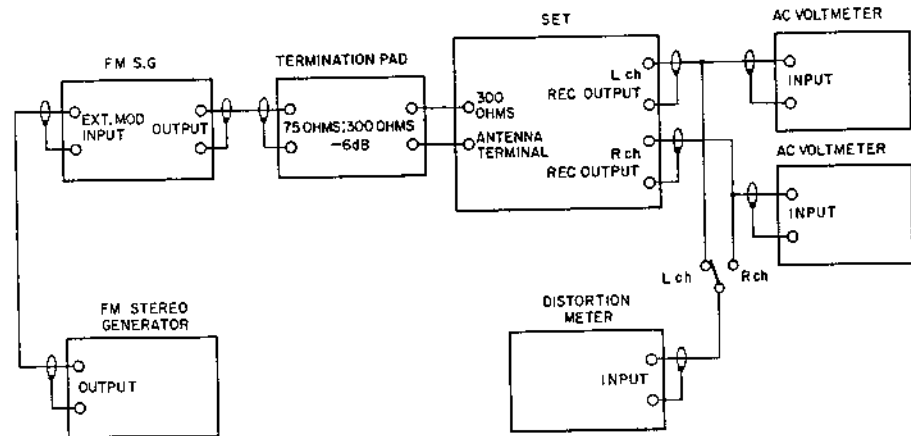


Fig. 10 Instrument Connections



### 1. FM ADJUSTMENT (Refer to Figs. 9, 10)

Step	Adjustment Item	Adjustment Point	Result	Remarks
1	Front End IF Coil	T1 (Front End)	Maximum Noise Level	SELECTOR to FM. Turns only noise without interference from broadcasting.
2	Tuning Meter Centering	T101 (ORG)	Centered Tuning Meter Indication	Same as above.
3	Distortion Factor	T102 (BLU)	Less than 0.3% Distortion Factor	98 MHz, 60 dB (mono) input. Less than 0.3% on both channels.
4	Confirmation of Tuning Meter Indication			If Tuning Meter Indication is not centered, re-adjust STEP 2 and 3 above.
5	High Range Scale Indication	TC-3 (Front End)	Maximum Output	108 MHz, 60 dB (mono) input. TUNING INDICATOR to 108 MHz Error: Within $\pm 250$ kHz
6	Confirmation of Low Range Scale Indication		Maximum Output	88 MHz, 60 dB (mono) input. TUNING INDICATOR to 88 MHz, Error: Within $\pm 250$ kHz.
7	High Range Sensitivity	TC-R, TC-A (Front End)	Less than 3% Distortion Factor	108 MHz, Less than 6 dB (mono) input.
8	Low Range Sensitivity	L2, L4 (Front End)	Less than 3% Distortion Factor	88 MHz, Less than 6 dB (mono) input. See-NOTE 1, 2.
9	Mute Level	R116 (47 k $\Omega$ )	No signal emitted from output	MUTE SW to ON 98 MHz, 30 dB (mono) input.
10	PLL IC Free Running Frequency	R316 (10 k $\Omega$ )	76 kHz $\pm 0.1$ kHz	Frequency Counter to Test Point 1. See NOTE 3.
11	Stereo Indicator Lighting Confirmation			Stereo Indicator must be light.
12	Stereo Separation (Left $\rightarrow$ Right)	R313 (470 k $\Omega$ )	More than 40 dB	98 MHz, 60 dB (stereo), L ch input. Minimum output of R ch.
13	Stereo Separation (Right $\rightarrow$ Left)	R313 (470 k $\Omega$ )	More than 40 dB	98 MHz, 60 dB (stereo), R ch input. Maximum output of L ch.

Chart-1

- NOTES:
- When the specified sensitivity of 6 dB cannot be obtained at the two frequency points, 88 MHz and 108 MHz repeat adjustment as in Step 7.
  - When the distortion factor of the sensitivity still does not comply with the data specifications, adjust by turning the Front End FM IF coil core but not ny more than 1/2 turn.
  - The free Running Frequency of the PLL IC must be exactly 76.00 kHz.

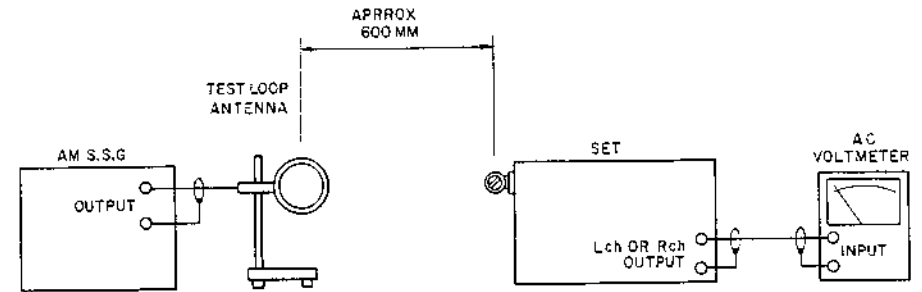


Fig. 11 Instrument Connections

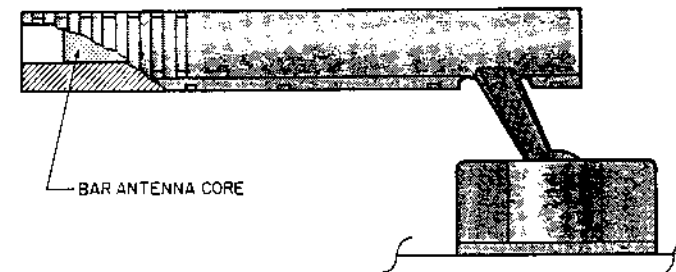


Fig. 12 Bar Antenna

### 2. AM ADJUSTMENT (Refer to Figs. 9, 11, 12)

Step	Adjustment Item	Adjustment Point	Result	Remarks
1	AM IF Coil	T202 (BLK) T203 (BLK)	Maximum Output	1,400 kHz, 50 dB input
2	Low Range Scale Indication	T201 (RED)	Maximum Output	SELECTOR to AM 520 kHz, 50 dB input. TUNING INDICATOR to 520 kHz. Error: Within 2%
3	High Range Scale Indication	TC2 (Front End)	Maximum Output	1,400 kHz, 50 dB input. TUNING INDICATOR to 1,400 kHz. Error: Within 2%
4	Low Range Sensitivity	Bar Antenna core	Maximum Output Minimum Distortion Factor	520 kHz, 50 dB input. Less than 10% Distortion Factor.
5	High Range Sensitivity	TC1 (Front End)	Maximum Output Minimum Distortion Factor	1,400 kHz, 50 dB input. Less than 10% Distortion Factor.

Chart-2

NOTE: For best result, repeat STEPS 1 through 5 two or three times.

## VIII. CLASSIFICATION OF VARIOUS P.C BOARDS

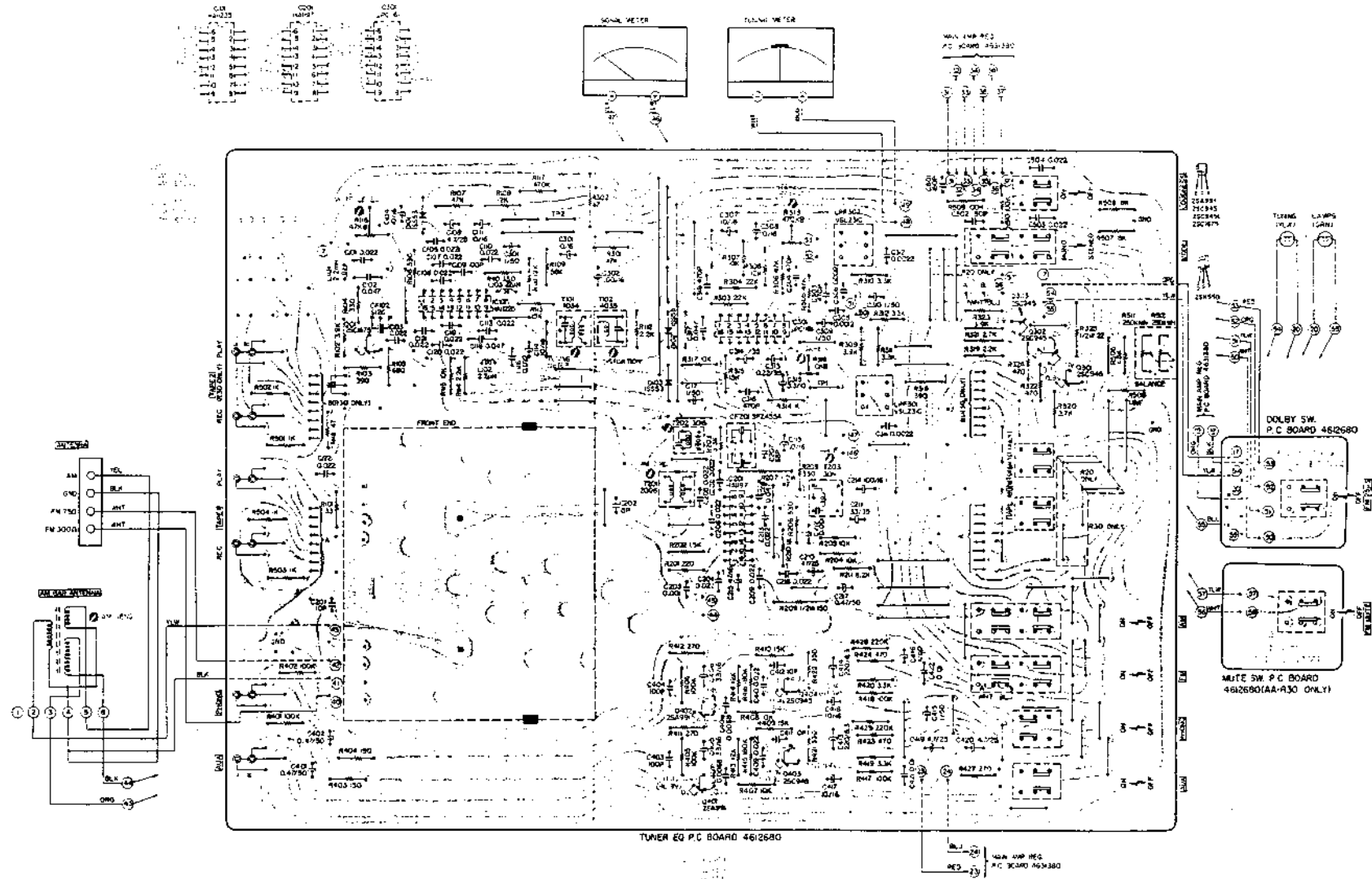
### I. P.C BOARD TITLES AND IDENTIFICATION NUMBERS

P.C Board Title	P.C Board Number
Main Amp. Reg. P.C Board A	4631380
Level Ind. Driver P.C Board B	4631380
Level Ind. LED P.C Board	4631380
Tuner EQ P.C Board	4612680
Dolby Switch P.C Board	4612680
Mute Switch P.C Board (AA-R30 Only)	4612680

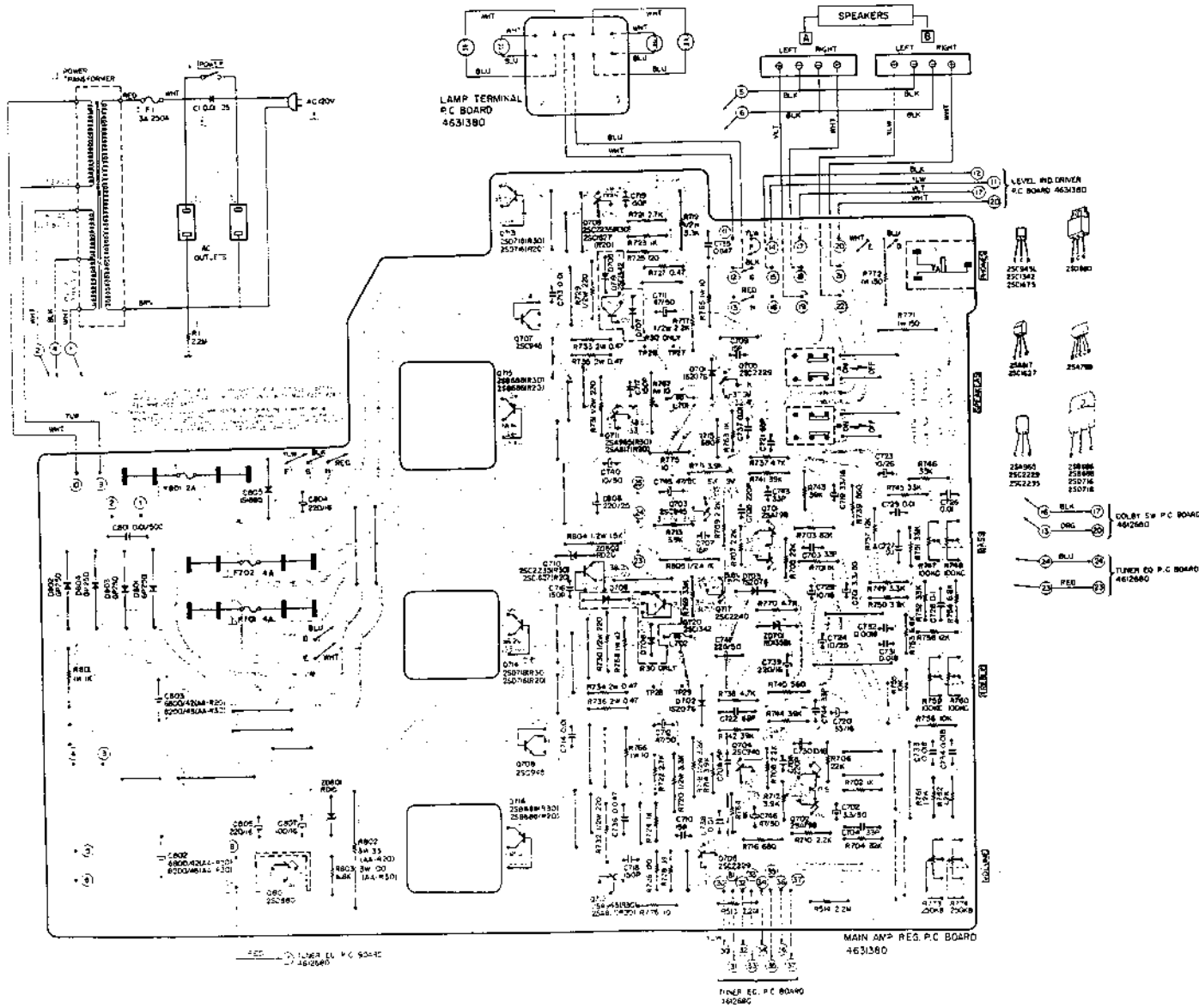
Chart-3

## 2. COMPOSITION OF VARIOUS P.C BOARDS

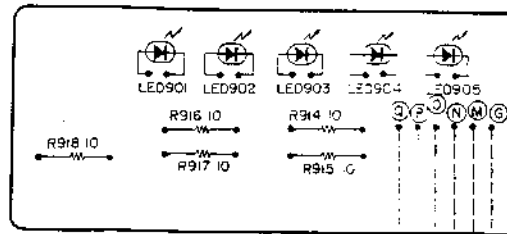
### 1) Tuner EQ P.C Board 4612680



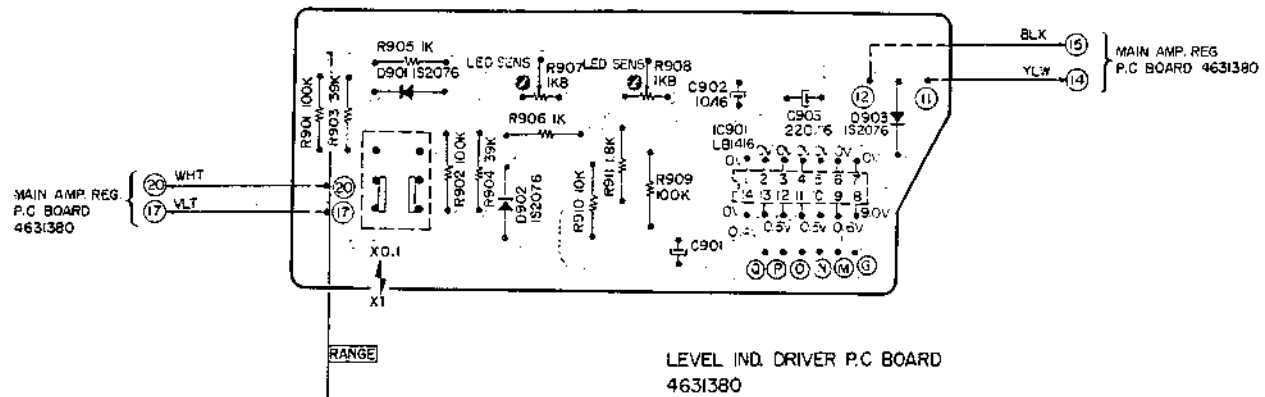
2) Main Amp. Reg. P.C Board 4631380



3) Level Ind. LED P.C Board 4631380 and Level Ind. Driver P.C Board 4631380



LEVEL IND LED  
P.C BOARD 4631380



LEVEL IND. DRIVER P.C BOARD  
4631380

---

SECTION 2

**PARTS LIST**

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2. TUNER P.C BOARD BLOCK .....	30
3. MAIN AMP P.C BOARD BLOCK .....	30
4. POWER RANGE P.C BOARD BLOCK .....	31
5. FINAL ASSEMBLY BLOCK .....	32
INDEX .....	34

Resistor and Capacitor which is not listed in this parts list, please refer to COMMON LIST FOR SERVICE PARTS.

## HOW TO USE THIS PARTS LIST

1. This parts list is compiled by various individual blocks based on assembly process.
2. When ordering parts, please describe parts number, serial number, and model number in detail.
3. How to read list.

— The reference number corresponds with illustration or photo number of that particular parts list.

— This number corresponds with the Figure Number.

— This number corresponds with the individual parts index number in that figure.

— A small "x" indicates the inability to show that particular part in the Photo or Illustration.

12-115x

— Schematic Diagram Number of individual manufactured part.

(not required for parts order)

Ref. No.	Parts No.	Description	Quantity
<b>FLYWHEEL BLOCK #13</b>			
12-115x	800425	Flywheel Block Assy. Comp.	800425
12-116	244506	Flywheel Only	7026
12-117x	244754	Felt, Flywheel	8025
12-118	251324	Main Metal Case	8026
12-119	253080	Main Metal	8027

4. The symbol numbers shown on the P.C. Board list can be matched with the Composite Views of components of the Schematic Diagram or Service Manual.
5. The indications of Resistors and Capacitors in the photos of P.C. Board are being eliminated.
6. The shape of the parts and parts name, etc. can be confirmed by comparing them with the parts shown on the Electrical Parts Table of P.C. Board.
7. Both the kind of part and installation position can be determined by the Parts Number. To determine where a parts number is listed, utilize Parts Index at end of Parts List.

It is necessary first of all to find the Parts Number. This can be accomplished by using the Reference Number listed at right of parts number in the Parts Index. (meaning of ref. no. outlined in Item 3 above).

8. Utilize separate "Price List for Parts" to determine unit price. The most simple method of finding parts Price is to utilize the reference number.

### CAUTION:

1. When placing an order for parts, be sure to list the parts no., model no., and description. There are instances in which if any of this information is omitted, parts cannot be shipped or the wrong parts will be delivered.
2. Please be careful not to make a mistake in the parts no. If the parts no. is in error, a part different from the one ordered may be delivered.
3. Because parts number and parts unit supply in the Preliminary Service Manual (Basic Parts List) may be partially changed, please use this parts list for all future reference.

**WARNING:** X INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

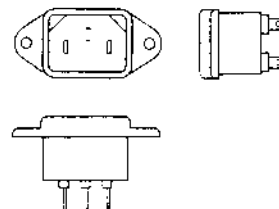
**AVERTISSEMENT:** X IL INDIQUE LES COMPOSANTS CRITIQUES DE SURETE. POUR MAINTENIR LE DEGRE DE SECURITE DE L'APPAREIL, NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.

## AC INLET SYSTEM

This model is equipped with an AC INLET SYSTEM. Please refer to the AC INLET SYSTEM CHART below for the specific type. By the AC INLET SYSTEM, AC (mains) cord can be connected to and disconnected from the model because the model is provided with socket exclusively for AC (mains) cord on its main body. Please note, however, that certain models are not equipped with this system and has a built-in AC (mains) cord as before.

### AC INLET SYSTEM CHART

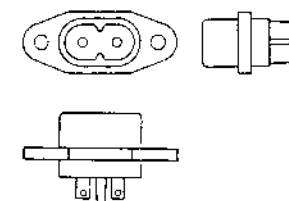
#### CLASS I



Picture 1  
AC INLET  
to be  
installed  
on machines

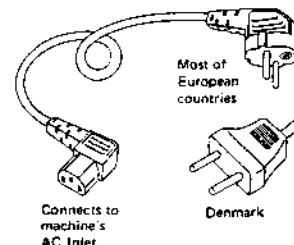
#### CLASS II

⊞ This mark indicating double insulation will be attached to machine's rear panel



Connects to  
machine's  
AC Inlet

Most of the  
European  
countries



Most of  
European  
countries

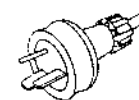
Connects to  
machine's  
AC Inlet

Denmark

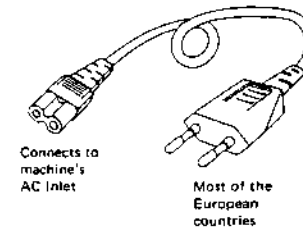
Picture 2  
AC (mains)  
cord



U.K.



Australia  
differs according  
to wall socket



U.K.



Australia  
differs according  
to wall socket

#### Parts List for AC (mains) Cord Set

	Standard	Description	Type of AC Inlet	Parts No.
Class I	CEE	Cord Set CEE (3 cores)	3P	EW302993
	BEAB	Cord Set BEAB (3 cores)	3P	EW302994
	SAA	Cord Set SAA (3 cores)	3P	EW302996
	U/T	Cord Set U/T (3 cores)	3P	EW302646
Class II	CEE	Cord Set CEE (2 cores)	2P	EW638144
	BEAB	Cord Set BEAB (2 cores)	2P	EW302995
	SAA	Cord Set SAA (2 cores)	2P	EW302991
	U/T	Cord Set U/T (2 cores)	2P	EW302899

## I. RECOMMENDED SPARE PARTS LIST

Because, if the parts listed below are on hand, almost any repair can be accomplished, we suggest that you stock these Recommended Spare Parts Items.

Parts No.	Description
BA703913	Main Amp PCB Comp. AA-R20
BA703912	Main Amp PCB Comp. AA-R30
BA703916	Power Range PCB Comp. AA-R20
BA703914	Tuner PCB Comp. AA-R20
BA703915	Tuner PCB Comp. AA-R30
ED703896	LED GP25D-L
ED703821	LED LN324CP
ED703882	Zener Diode RD-13EB1
ED703881	Zener Diode RD-13EB1
ED703883	Zener Diode RD-20EB3
EE703864	AM Bar Ant AA-R20
EE703845	Front End FF111U
EF703830	△ Fuse 3A 250V U/L
EF703900	Fuse 2A 250V U/L
EF703906	Fuse 4A 250V U/L
EI703843	IC HA11225
EI299700	IC HA1197
EI703907	IC LB1416
EI307200	IC μPC1161C
EL703807	Lamp 5V 75mA (WHT)
EL703810	Lamp (Cord Type) 8V 0.3A L-190
EM703824	Meter AA-R20
ER703893	Cement/R. 5W 0.27 ohm
ER703891	Cement/R. 5W 0.47 ohms
ES703825	△ Push SW. SDV-1P 901 TV-5
ES704116	Push SW. SUF12
ES703837	Push SW. SUF22
ES703835	Push SW. SUF52
ES703836	Push SW. SUF62
ES703839	Push SW. (B) SUF22
ES703840	Push SW. (C) SUF22
ET703801	△ Power Trans. T-1-354 AA-R20
ET703802	△ Power Trans. T-1-360 AA-R30
ET703875	Transistor 2SA798
ET703878	Transistor 2SA817
ET703887	Transistor 2SA965
ET703865	Transistor 2SA991
ET703873	Transistor 2SB686
ET703879	Transistor 2SB688
ET704334	Transistor 2SC1342
ET703874	Transistor 2SC1e-27

Parts No.	Description
ET703844	Transistor 2SC1675
ET703881	Transistor 2SC2229
ET703884	Transistor 2SC2235
ET307195	Transistor 2SC2240 (GR)(BL)
ET703854	Transistor 2SC945 (L)
ET703854	Transistor 2SC945 (L)
ET703867	Transistor 2SD716
ET703872	Transistor 2SD718
ET703894	Transistor 2SD880



## 2. TUNER P.C BOARD BLOCK

Symbol No.	Parts No.	Description	Schematic No.
2-1	BA703914	Tuner PCB Comp. AA-R20	9460139
2-2	BA703915	Tuner PCB Comp. AA-R30	9460140
2-4C101	E1703843	IC HAL1225	5100725
2-4C201	E1299700	IC HAL1197	45 4-225
2-4C301	E1307200	IC $\mu$ PC1161C	45-3-169
2-Q101	ET703844	Transistor 2SC1615	5120425
2-Q301 to 303	ET703854	Transistor 2SC945 (L)	5150775
2-Q401,402	ET703865	Transistor 2SA991	5101043
2-Q403,404	ET703854	Transistor 2SC945 (L)	5150775
2-D10 to 103	ED302379	Silicon Diode 1SS53	45-3-43
2-T101	EO703846	FM DET Coil (1) AA-R20	1240349
2-T102	EO703847	FM DET Coil (2) AA-R20	1240350
2-T201	EO703808	AM OSC Coil AA-R20	1220060
2-T202	EO703922	AM 1FT Coil AA-R20	1230160
2-T203	EO703931	AM DET Coil AA-R20	1230139
2-L101,102	EO703849	Inductor RC-855 2.2 $\mu$ H(M)	1210860
2-L103	EO703848	Inductor 22 $\mu$ H	1210950
2-CF101,102	ER703850	Ceramic Filter CFM107S12C (Red)	1280561
2-CF201	ER704333	Ceramic Filter CFM107S12C	1280611
2-LPF301,302	ER703856	Low Pass Filter VSL-231C	1280590
2-R116	EV483377	Semi-Fixed/Vol. (Solid Type) SR19R 47k $\Omega$	36-19-10
2-R113	EV310090	Semi-Fixed/Vol. (Solid Type) SR19R 470k $\Omega$	36-19-10
2-R116	EV483388	Semi-Fixed/Vol. (Solid Type) SR19R 10k $\Omega$	36-19-10
2-R511,512	EV703841	Vol. GM70E 674C 250KMN	4321020
2-C313	EC703859	Tantalum/C. 0.22 $\mu$ F 35WV	252402M
2-C314	EC703860	Tantalum/C. 1 $\mu$ F 35WV	252410M
2-C315	EC703858	Tantalum/C. 3.3 $\mu$ F 10WV	252113M
2-C316	EC703861	Styrol/C. 470PF (J) 50WV	223471V
2-3	ES703835	Push SW. SUF52 (AA-R20)	4041210
2-4	ES703836	Push SW. SUF62 (AA-R30)	4041220
2-5	ES703837	Push SW. SUF22 (AA-R20)	4041210
2-6	ES703839	Push SW. (B) SUF22 (AA-R30)	4041210
2-7	ES704116	Push SW. SUF12 (AA-R20)	4041260
2-8	ES703840	Push SW. (C) SUF22 (AA-R30)	4041210
2-9	EJ703842	Pin Jack AA-R20	4444070
2-10	EE703845	Front End FF111U	4910130

## 3. MAIN AMP P.C BOARD BLOCK

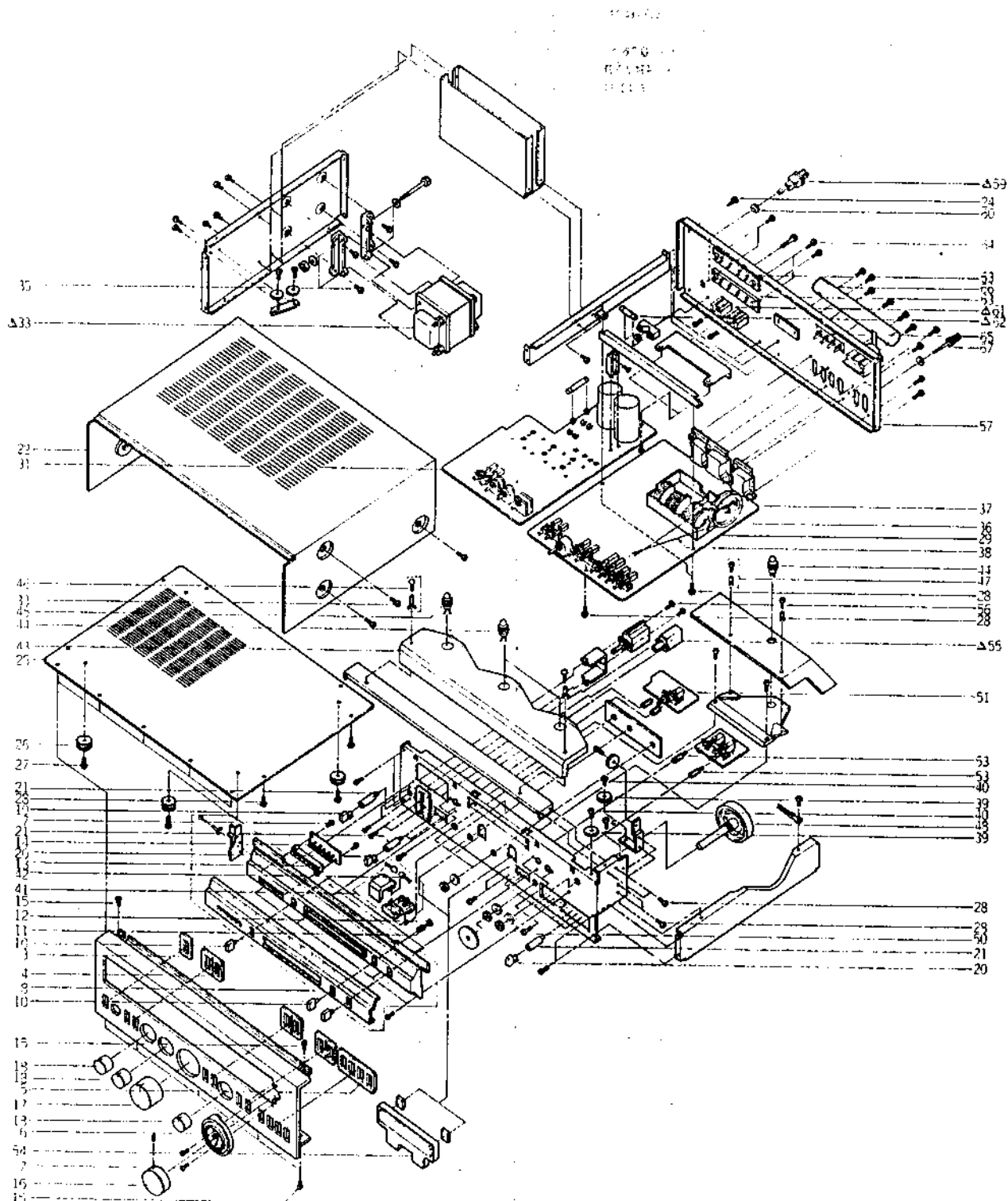
Symbol No.	Parts No.	Description	Schematic No.
3-1	BA703912	Main Amp PCB Comp. AA-R30	9400370
3-2	BA703913	Main Amp PCB Comp. AA-R20	9400360
3-Q701,702	ET703875	Transistor 2SA798	5108955
3-Q703,704	ET703854	Transistor 2SC945 (L)	5150775
3-Q705,706	ET703881	Transistor 2SC2229	5121025
3-Q707,708	ET703854	Transistor 2SC945 (L)	5150775
3-Q709,710	ET703874	Transistor 2SC1627 (AA-R20)	5151075
3-Q709,710	ET703884	Transistor 2SC2225 (AA-R30)	5127095
3-Q711,712	ET703878	Transistor 2SA317 (AA-R20)	5100475
3-Q711,712	ET703887	Transistor 2SA965 (AA-R30)	5101055
3-Q713,714	ET703867	Transistor 2SD716 (AA-R20)	5131115
3-Q713,714	ET703872	Transistor 2SD713 (AA-R30)	5131015
3-Q715,716	ET703873	Transistor 2SB686 (AA-R20)	5111135
3-Q715,716	ET703879	Transistor 2SB688 (AA-R30)	5111035
3-Q717	ET307195	Transistor 2SC2240 (GR)(BL)	45-1-202
3-Q719,720	ET704334	Transistor 2SC1342 (AA-R30)	5150705
3-Q801	ET703894	Transistor 2SD880	5131065
3-R733to736	ER703891	Cement/R. 5W 0.47 ohms (AA-R20)	384175W
3-R733to736	ER703893	Cement/R. 5W 0.27 ohm (AA-R30)	384279W
3-R747,748	EV703880	Vol. GM70E 666C-100K	4321000
3-R759,760	EV703880	Vol. GM70E 666C-100K	4321000
3-R765to768	ER703895	Metal Oxide Film/R. 1W 10 ohms	361100L
3-R771,772	ER703871	Metal Oxide Film/R. 1W 150 ohms	361151L
3-R773,774	EV703885	Vol. GM80E 775A-250KB	4320990
3-R801	ER704331	Metal Oxide Film/R. 2W 1k	362102L
3-R802	ER703910	Metal Oxide Film/R. 3W 120 ohms (AA-R20)	363121L
3-R802	ER704332	Metal Oxide Film/R. 3W 1ohm (AA-R30)	363101L
3-D701to703	ED703876	Silicon Diode 1S2076A	5010795
3-D801to804	ED703896	LED GP15D-t	5600925
3-D805	ED703904	Silicon Diode 1S1885	5600375
3-D903	ED703904	Silicon Diode 1S1885	5600325
3-ZD701	ED703882	Zener Diode RD-13EB1	5020495
3-ZD801	ED703882	Zener Diode RD-13EB1	5020495
3-ZD802	ED703883	Zener Diode RD-10EB3	5020695
3-L701,702	EO703892	Choke Coil AA-R20	1210830
3-F701,702	EF703906	$\Delta$ Fuse 4A 250V U/L	4700650
3-F801	EF703900	$\Delta$ Fuse 2A 250V U/L	4700670
3-C801	EC703905	Ceramic/C. 0.01 $\mu$ F 500WV	231013P
3-C802,803	EC703902	Elect./C. 6800 $\mu$ F 42WV (AA-R20)	317947Q
3-C802,803	EC703898	Elect./C. 8200 $\mu$ F 45WV (AA-R30)	2200090
3-2	ES703886	Push SW. (D) SUF22	4041250
3-J	EJ703868	Headphone Jack AA-R20	4550200

## 4. POWER RANGE P.C BOARD BLOCK

Symbol No.	Parts No.	Description	Schematic No.
4-1	BA703916	Power Range PCB Comp. AA-R20	9492500
4-4C901	E1703907	IC LB1416	5130755
4-D901,902	ED703876	Silicon Diode 1S2076A	5010795
4-R907,908	EV703909	Semi-Fixed/Vol. SR29R 207 1KB	4300620

# 5. FINAL ASSEMBLY BLOCK

5. FINAL ASSEMBLY BLOCK



**FINAL ASSEMBLY BLOCK**

Ref. No.	Parts No.	Description	Schematic No.	Ref. No.	Parts No.	Description	Schematic No.
<b>FRONT PANEL BLOCK</b>							
5-1x	BD703920	Front Panel BLK AA-R20	7844670	5-65	EJ703834	Ant Terminal AA-R20	1430110
5-2x	BD703921	Front Panel BLK AA-R20	7844680	5-66	EE703864	AM Bar Ant AA-R20	1360410
5-3	MS703786	Button Guide AA-R20	7401920	5-67	EJ306940	Earth Terminal	32-1-57
5-4	MS703788	Button Guide (2) AA-R20	7401940				
5-5	MS703789	Button Guide (4) AA-R20	7401930				
5-6	TA703790	Tuning Ring AA-R20	7401900				
5-7	ZS666336	Tapping Screw, #2 pan 3x8					
<b>DIAL SCALE BLOCK</b>							
5-8	TA703917	Dial Scale Assy AA-R20	7802510				
5-9x	TA703918	Dial Scale Assy AA-R20	7802500				
5-10	SB703817	Button (C) AA-R20	7852130				
5-11	ZG703818	Spring (V) AA-R20	7440400				
5-12	ZW703819	Button Stopper AA-R20	7401460				
5-13	SZ703820	LED Holder AA-R20	7401970				
5-14	ED703821	LED LN324GP	5060220				
<b>FINAL ASSEMBLY BLOCK</b>							
5-15	ZS609120	Tapping Screw, #2 pan 3x6					
5-16	SK703791	Knob RSL-50D AA-R20	7841320				
5-17	SK703792	Knob RSL-33D AA-R20	7841340				
5-18	SK703793	Knob RSL-10D AA-R20	7841350				
5-19	SB703794	Button (A) AA-R20	7852130				
5-20	SB703795	Button (B) AA-R20	7852110				
5-21	MS703796	Button Shaft AA-R20	7401850				
5-22	BC703797	Upper Cover AA-R20	7821000				
5-23	ZS537006	Screw, bind 4x8 (Black)					
5-23x	ZS609197	Tapping Screw #2, pan 3x6					
5-25	SP703799	Bottom Plate AA-R20	7325830				
5-26	SA703922	Foot AA-R20	7402080				
5-27	ZS665942	Tapping Screw, #2 pan 4x8					
5-28	ZS609120	Tapping Screw, #2 pan 3x6					
5-29	BA703915	Tuner PCB Comp. AA-R20	9466140				
5-30x	BA703914	Tuner PCB Comp. AA-R20	9466120				
5-31	BA703912	Main Amp PCB Comp. AA-R20	9430870				
5-32x	BA703913	Main Amp PCB Comp. AA-R20	9430860				
5-33	ET703802	△ Power Trans. T-1-360 AA-R20	1103600				
5-34x	ET703801	△ Power Trans. T-1-359 AA-R20	1103590				
5-35	ZS313796	S-Tight Screw, bind 4x6					
5-36	TA703803	Dial Drum AA-R20	7401790				
5-37	ZG703804	Spring (K) AA-R20	7400300				
5-38	TA207347	Thread D05					
5-39	MR703805	Pulley D=9 AA-R20	7400750				
5-40	MS703806	Pulley Shaft AA-R20	7212120				
5-41	TA703919	Pointer Part AA-R20	7860570				
5-42	EL703807	Lamp SV 75mA (WHT)	5005080				
5-43	TA703809	Illumination Plate AA-R20	7402030				
5-44	EL703810	Lamp (Cord Type) 8V 0.3A L-190	5008170				
5-45	EL703812	Lamp (Cord Type) 8V 0.3A L-70	5008180				
5-46	ZW703813	Nylon Rivet Jx8	7401430				
5-47	ZW703815	Nylon Rivet Jx5.5	7400840				
5-48	TA703816	Dial Wheel AA-R20	7152450				
5-49x	ZW272722	Toothed Lock Washer M9 D9.3x13x0.5t					
5-50	ZW436026	Washer (SPC) D9.2x15x0.5t					
5-51	BA703916	Power Range PCB Comp. AA-R20	9492500				
5-52x	ZS379350	Screw, pan 3x6					
5-53	ZS703823	Stud AA-R20	7121030				
5-54	EM703824	Meter AA-R20	1582550				
5-55	ES703825	△ Push SW. SDV-1P 901 TV-5	1041140				
5-56	ZS379350	Screw, pan 3x6					
5-57	SP703827	Rear Panel AA-R20	7325360				
5-58x	SP703826	Rear Panel AA-R20	7325370				
5-59	EW703828	△ AC Cord (BLK) AA-R20	6000070				
5-60	EZ703829	Strain Relief SR-3P-4	7400620				
5-61	EJ703831	△ AC Socket AA-R20	4500150				
5-62	EF703830	△ Fuse 3A 150V U/L	1700620				
5-63	EJ703832	AP Terminal AA-R20	1430170				
5-64	ZS609208	Tapping Screw, #2 pan 3x8					

When ordering parts, please quote Parts Number, Description and Model Number.

# INDEX

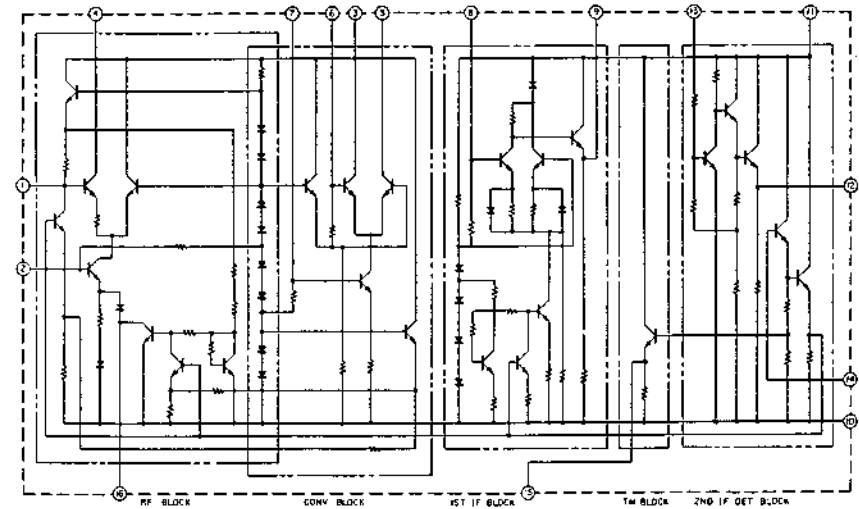
Parts No.	Ref. No. & Symbol No.	Parts No.	Ref. No. & Symbol No.	Parts No.	Ref. No. & Symbol No.	Parts No.	Ref. No. & Symbol No.	Parts No.	Ref. No. & Symbol No.
BA703912	3-1	ET703854	2-Q403,404						
BA703912	5-31	ET703854	3-Q703,704						
BA703913	3-2	ET703854	3-Q707,708						
BA703913	5-32x	ET703865	2-Q401,402						
BA703914	2-1	ET703867	3-Q713,714						
BA703914	5-30x	ET703872	3-Q713,714						
BA703915	2-2	ET703873	3-Q715,716						
BA703915	5-29	ET703874	3-Q709,710						
BA703916	4-1	ET703875	3-Q701,702						
BA703916	5-51	ET703878	3-Q711,712						
BC703797	5-22	ET703879	3-Q715,716						
BD703920	5-1x	ET703881	3-Q705,706						
BD703921	5-2x	ET703884	3-Q709,710						
EC703858	2-C315	ET703887	3-Q711,712						
EC703859	2-C313	ET703894	3-Q801						
EC703860	2-C314	ET704334	3-Q719,720						
EC703861	2-C316	EV310090	2-R313						
EC703898	3-C802,803	EV483377	2-R116						
EC703902	3-C802,803	EV483388	2-R316						
EC703905	3-C801	EV7038412	2-R511,512						
ED302379	2-D101to103	EV703880	3-R747,748						
ED703821	5-14	EV703880	3-R759,760						
ED703876	3-D701to703	EV703885	3-R773,774						
ED703876	4-D901,902	EV703909	4-R907,908						
ED703882	3-ZD701	EW703828	5-59						
ED703882	3-ZD801	EZ703899	5-60						
ED703883	3-ZD802	MR703805	5-59						
ED703896	3-D801to804	MS703786	5-3						
ED703904	3-D805	MS703788	5-4						
ED703904	3-D903	MS703789	5-5						
EE703845	2-10	MS703796	5-21						
EE703864	5-66	MS703806	5-40						
EF703830	5-62	SA703922	5-26						
EF703900	3-F801	SB703794	5-19						
EF703906	3-F701,702	SB703795	5-20						
EI299700	2-IC201	SB703817	5-10						
EI307200	2-IC301	SK703791	5-16						
EI703843	2-IC101	SK703792	5-17						
EI703907	4-IC901	SK703793	5-18						
EJ306940	5-67	SP703799	5-25						
EJ703831	5-61	SP703826	5-58x						
EJ703832	5-63	SP703827	5-57						
EJ703834	5-65	SZ703820	5-13						
EJ703842	2-9	TA707347	5-36						
EJ703868	3-3	TA703790	5-6						
EL703807	5-42	TA703803	5-36						
EL703810	5-44	TA703809	5-43						
EL703812	5-45	TA703816	5-48						
EM703824	5-54	TA703917	5-8						
EO703808	2-T201	TA703918	5-9x						
EO703846	2-T101	TA703919	5-41						
EO703847	2-T102	ZG703804	5-37						
EO703848	2-L103	ZG703818	5-11						
EO703849	2-L101,102	ZS313796	5-35						
EO703892	3-L701,702	ZS379350	5-52x						
EO703931	2-T203	ZS379350	5-56						
EO703932	2-T202	ZS537006	5-23						
ER703850	2-CF101,102	ZS565942	5-27						
ER703856	2-LPF301,302	ZS609120	5-15						
ER703871	3-R771,772	ZS609120	5-28						
ER703891	3-R733to736	ZS609197	5-24x						
ER703893	3-R733to736	ZS609208	5-64						
ER703895	3-R765to768	ZS666336	5-7						
ER703910	3-R802	ZS703873	5-53						
ER704331	3-R801	ZW272722	5-49x						
ER704332	3-R802	ZW436026	5-50						
ER704333	2-CF201	ZW703813	5-46						
ES703825	5-55	ZW703815	5-47						
ES703835	2-3	ZW703819	5-12						
ES703836	2-4								
ES703837	2-5								
ES703839	2-6								
ES703840	2-8								
ES703886	3-2								
ES704116	2-7								
ET307195	3-Q717								
ET703801	5-34x								
ET703802	5-33								
ET703844	2-Q101								
ET703854	2-Q301to303								

## SECTION 3

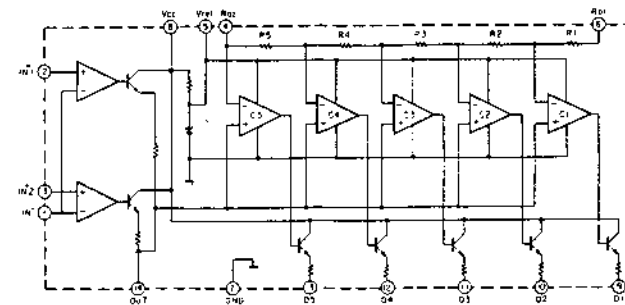
# SCHEMATIC DIAGRAM

1. SCHEMATIC DIAGRAM OF ICs
2. AA-R20/R30 NO. 1581842A SCHEMATIC DIAGRAM

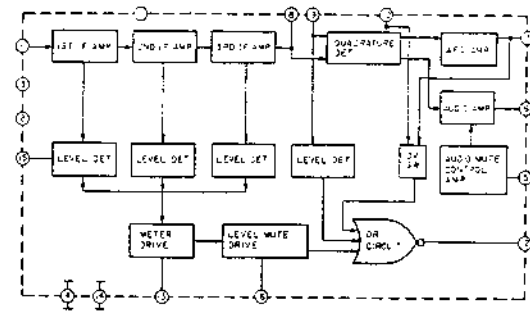
HA1197



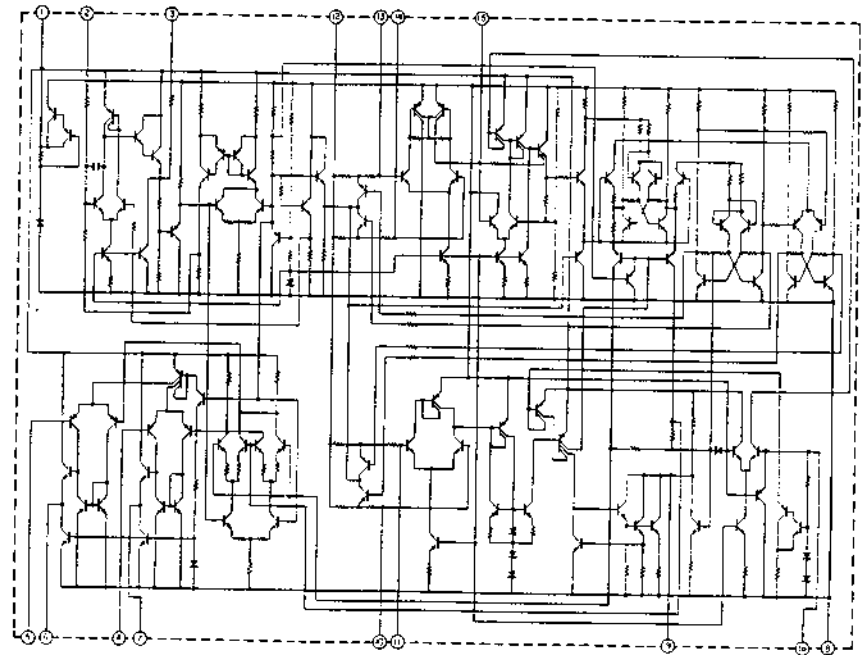
LB1416



HA11225

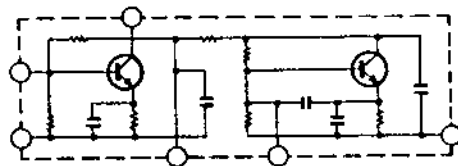


μPC1161C

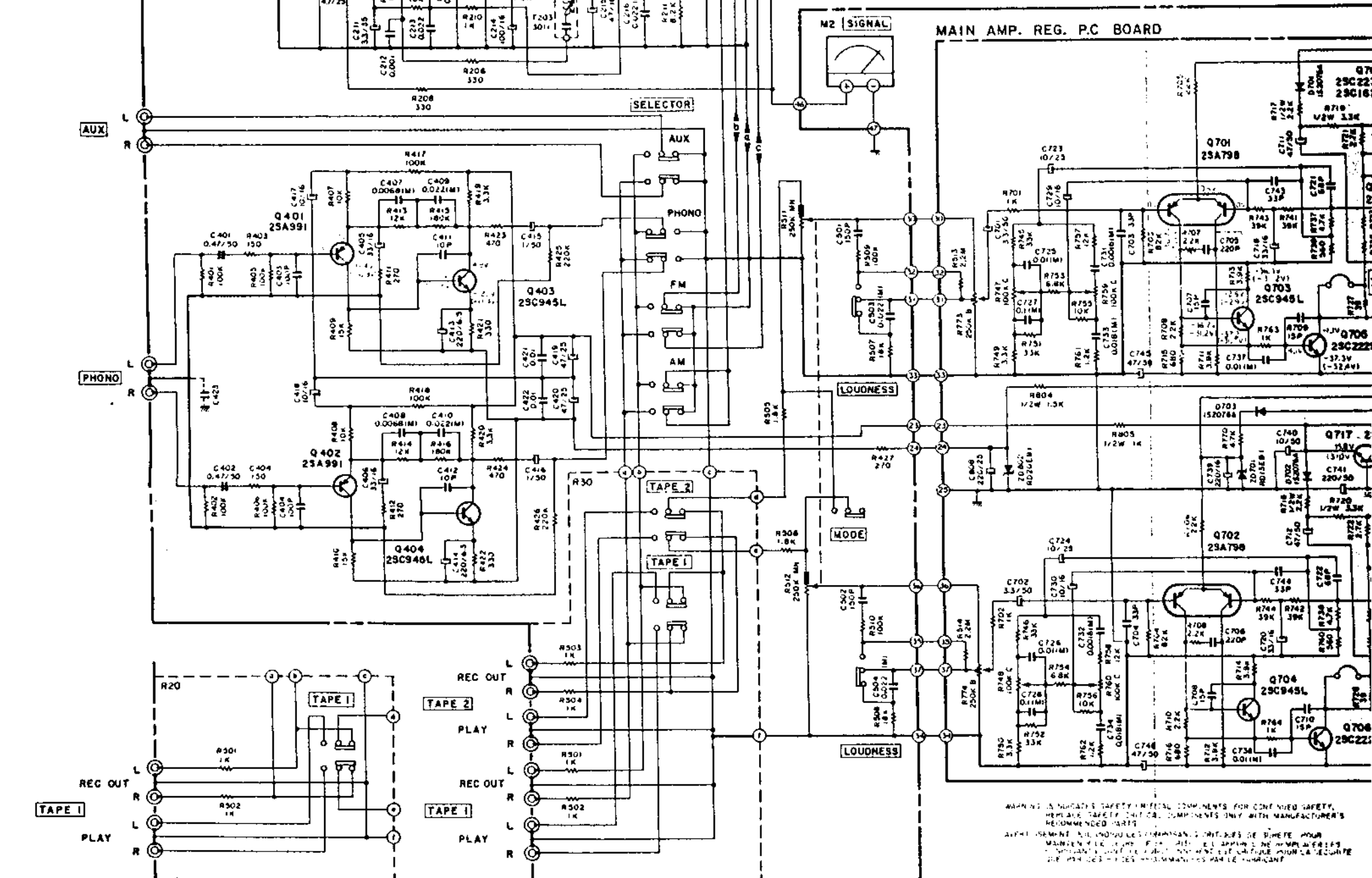
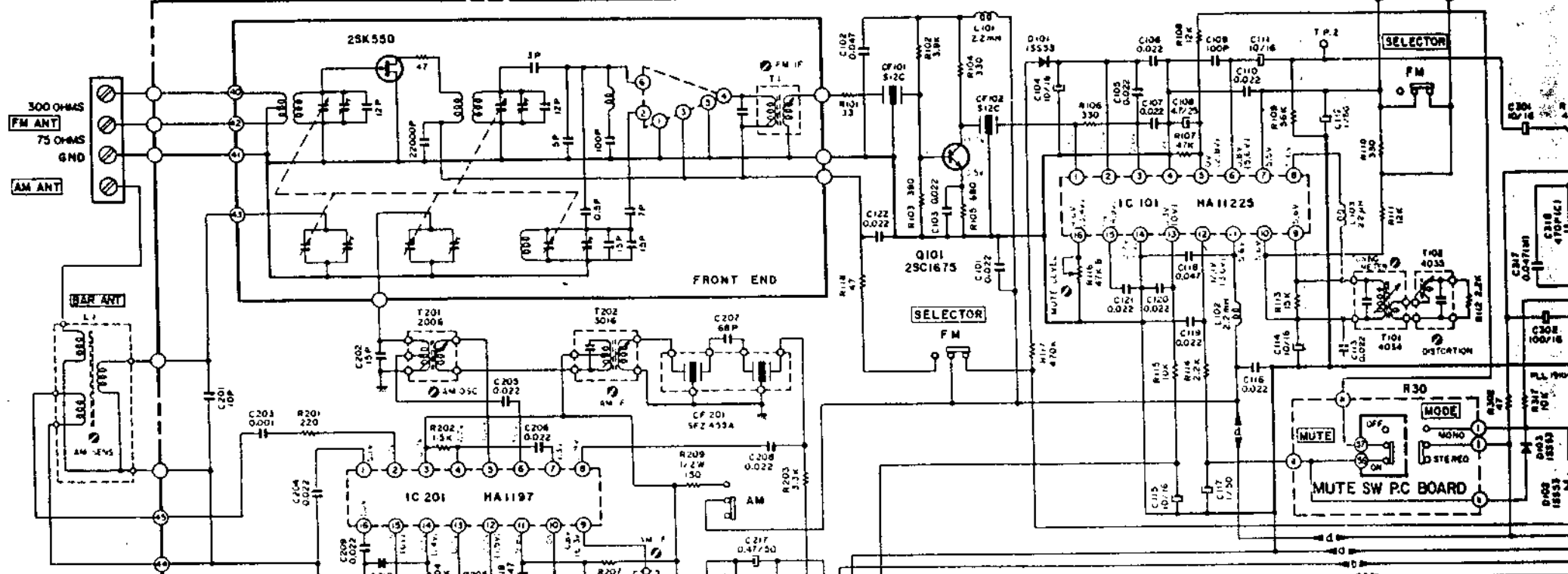


AA-R20/R30

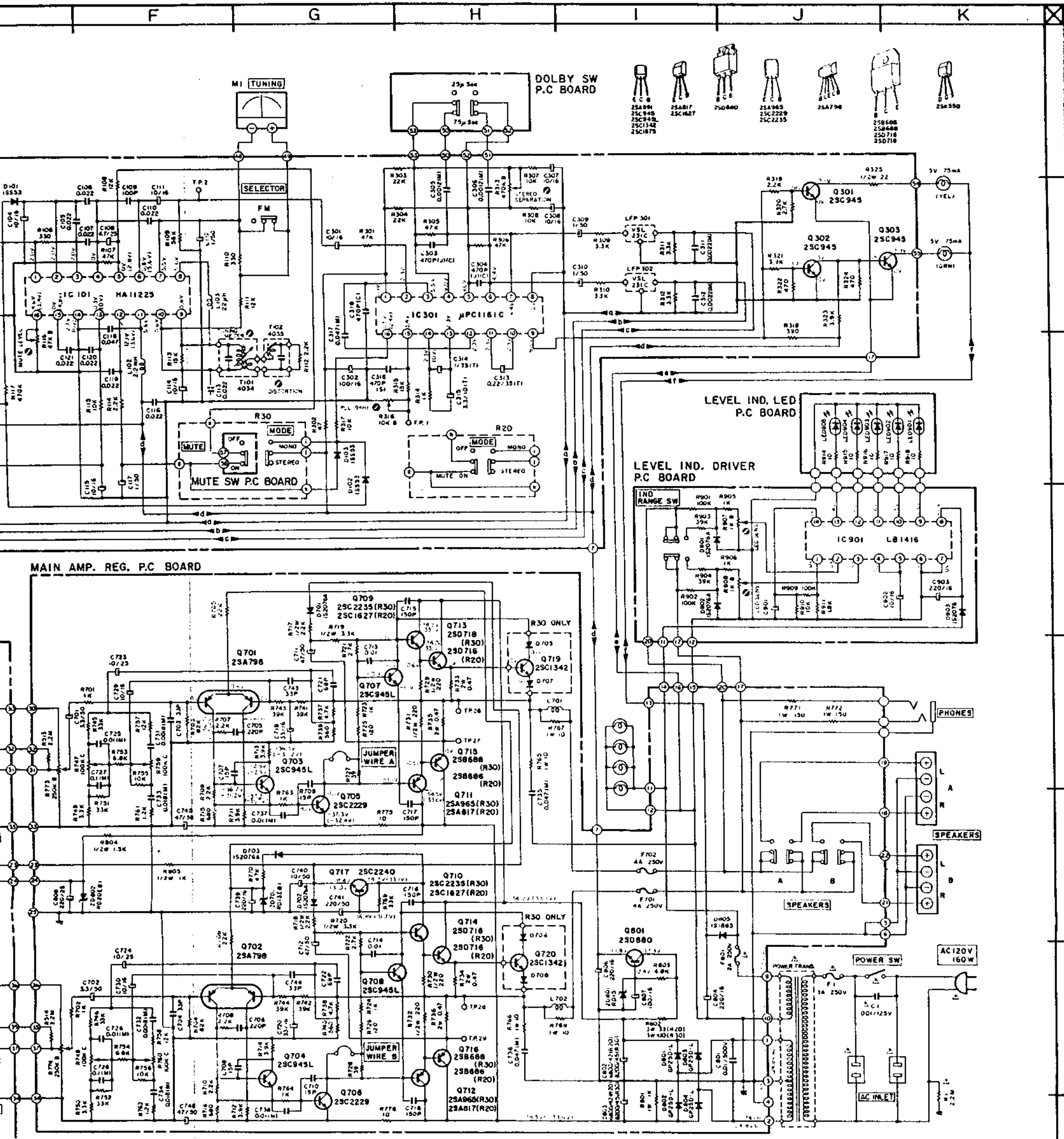
TUNER EQ P.C BOARD



IC101: AM TUNE  
IC101: FM TUNE  
IC101: FM DETUNE



WARNING: INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY.  
REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S  
EQUIVALENTS AND FOLLOW THE REPAIR INSTRUCTIONS TO BE SHOWN YOUR  
MANUAL FOR THE UNIT. FOR THE REPAIR OF THE UNIT, PLEASE REFER TO THE  
REPAIR MANUAL FOR THE UNIT. THE REPAIR MANUAL IS AVAILABLE FROM THE  
MANUFACTURER'S REPRESENTATIVE.



- 25A99H
- 25C94B
- 25C94L
- 25C1142
- 25C1875
- 25A817
- 25C827
- 250440
- 25A965
- 25C2229
- 25C2235
- 25A796
- 25B686
- 25B688
- 250716
- 250718

ADAPTS INDICATED SAFETY CRITICAL COMPONENTS ONLY WITH WAVE SHIELDING  
 REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S  
 RECOMMENDED PARTS  
 Avertissement: Les composants indiqués par des triangles sont des  
 composants critiques. Remplacez-les uniquement par des composants  
 recommandés par le fabricant. Ne remplacez pas les composants critiques  
 par des pièces non recommandées par le fabricant.

NOTE  
 1. UNLESS OTHERWISE SPECIFIED  
 ALL RESISTORS IN OHMS 1/4W/1%  
 ALL CAPACITORS IN  $\mu$ F 50V/5%  
 2.  $\square$  MARK INDICATES NON POLAR CAPACITORS

PHONES 4A 250V  
 SPEAKERS 4A 250V  
 AC 120V 160W

AA-R20/R30  
 SCHEMATIC DIAGRAM  
 No. 1581842A