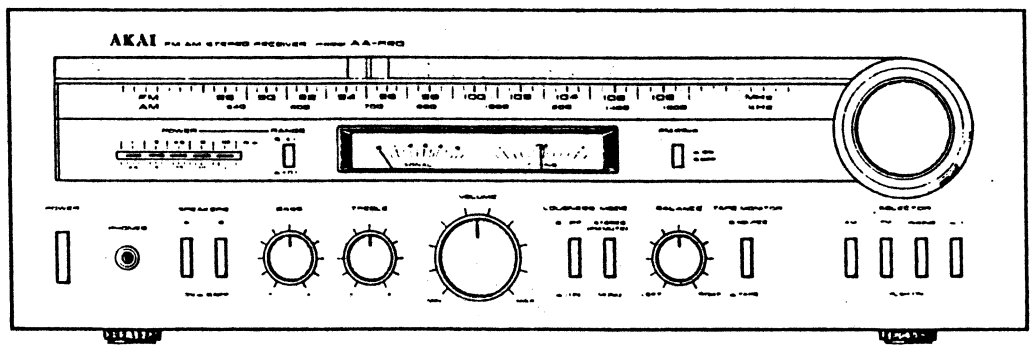
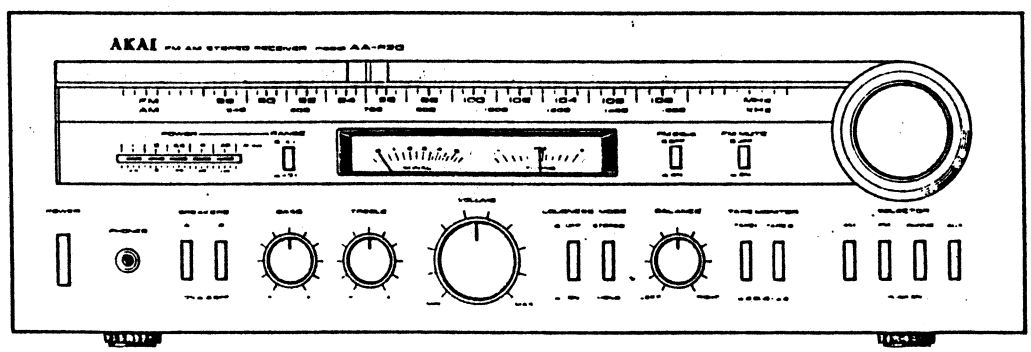
AA-R20/R30

AKAI SERVICE MANUAL



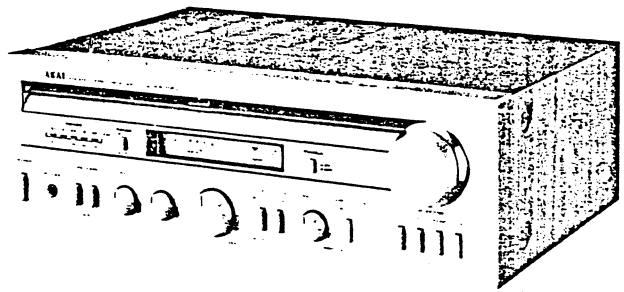


FM AM STEREO RECEIVER

MODEL **AA-R20**

FM AM STEREO RECEIVER

MODEL **AA-R30**



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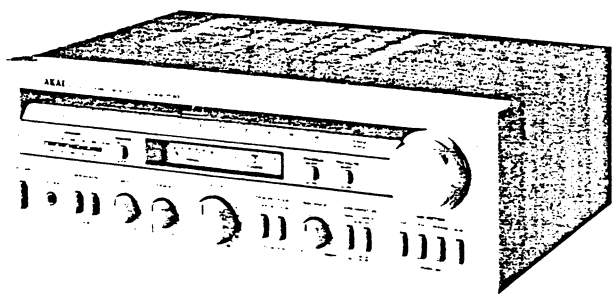


AA-R30

FM AM STEREO RECEIVER

MODEL AA-R20
MODEL AA-R30

SECTION 1

SERVICE MANUAL

TABLE OF CONTENTS

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

I. 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
TONE CONTROL	BASS	±9 dB at 100 Hz
	TREBLE	±10 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 μV
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% moduration)
	STEREO	Less than 0.5% (100% moduration)
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 μV/m (Bar Antenna) 20 μV (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
TONE CONTROL	BASS	±9 dB at 100 Hz
	TREBLE	±10 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 μV
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 μV/m (Bar Antenna) 20 μV (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

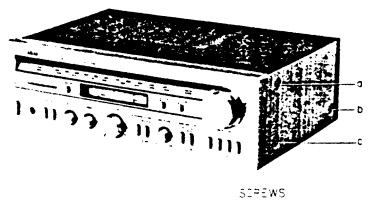
SEMICONDUCTORS	Transistors: 28, Diodes: 21, FET: 1, ICs: 4
POWER REQUIREMENTS	U.S.A. model: 120 V, 60 Hz
DIMENSIONS	440 (W) x 142 (H) x 310 (D) mm (17.3" x 5.6" x 12.2")
WEIGHT	9 kg (19.8 lbs)

* 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.

1



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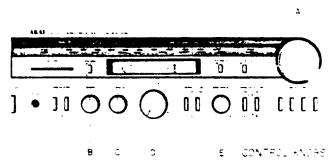

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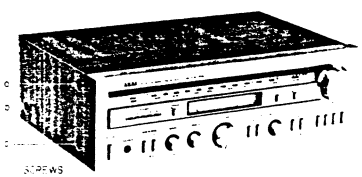

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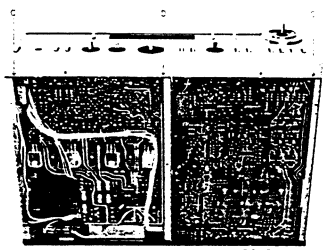

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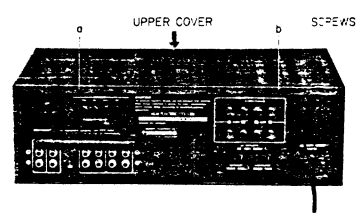

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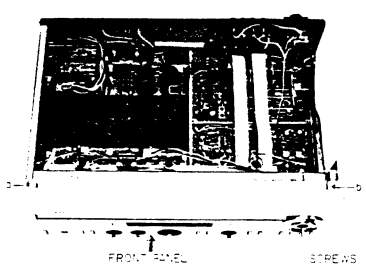

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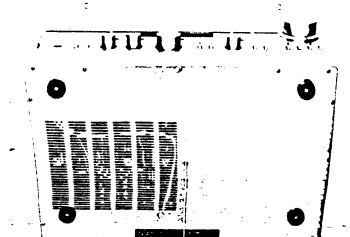

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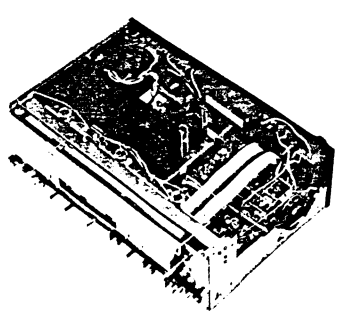


III. CONTROLS

1. MODEL AA-R20

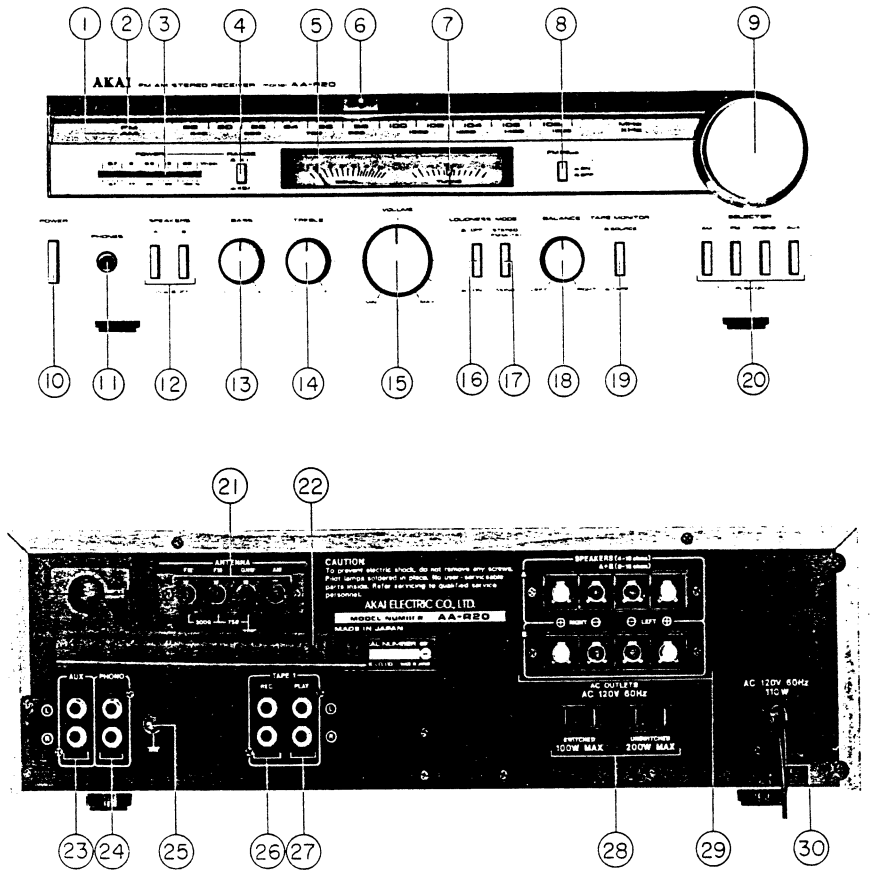


Fig. 1 Controls (AA-R20)

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

2. MODEL AA-R30

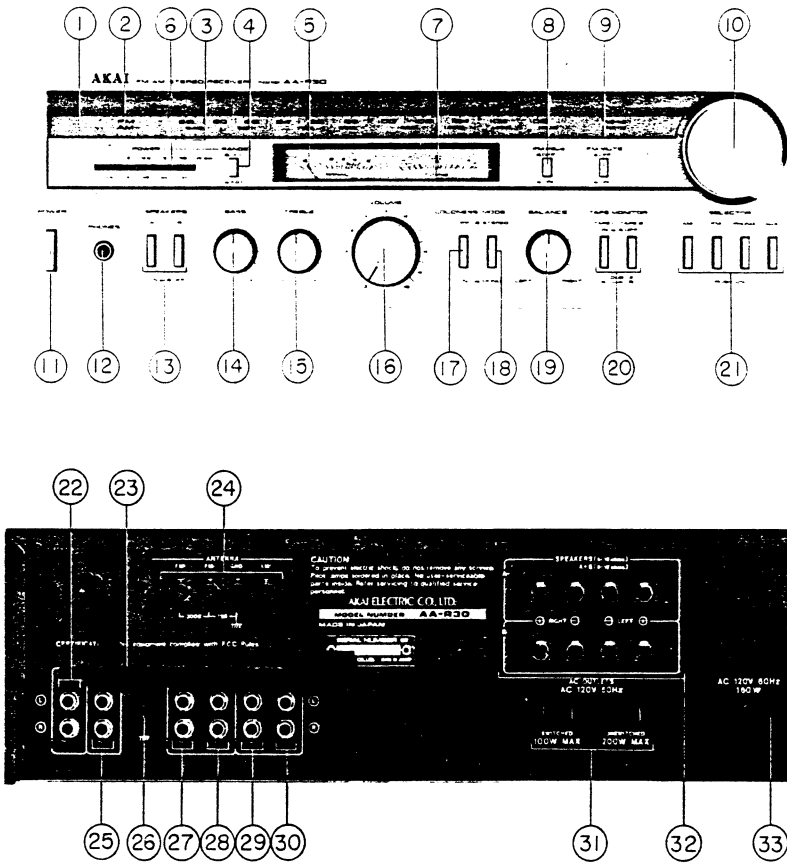


Fig. 2 Controls (AA-R30)

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

IV. PRINCIPAL PARTS LOCATION

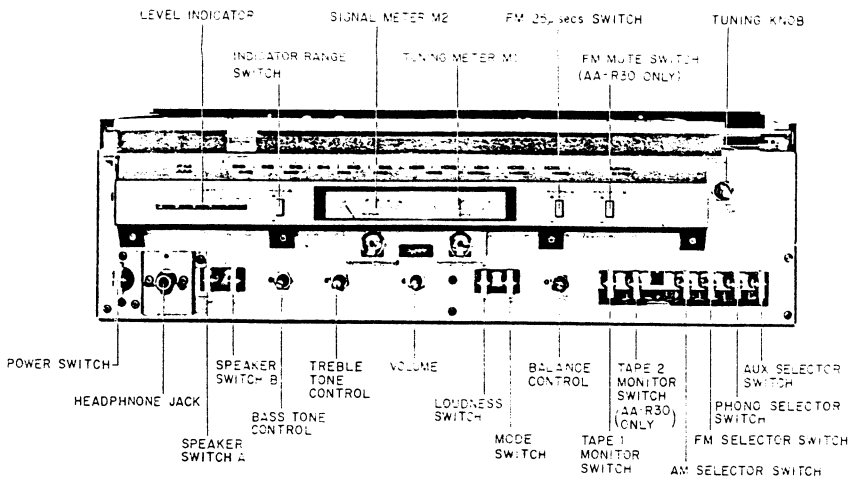


Fig. 3 Front View

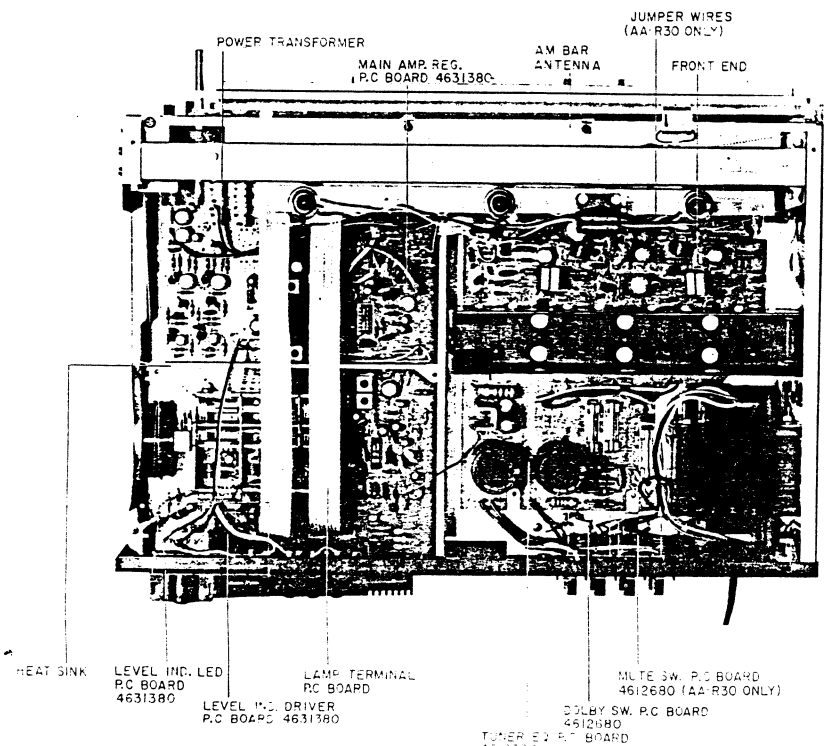


Fig. 4 Top View

V. BLOCK DIAGRAM

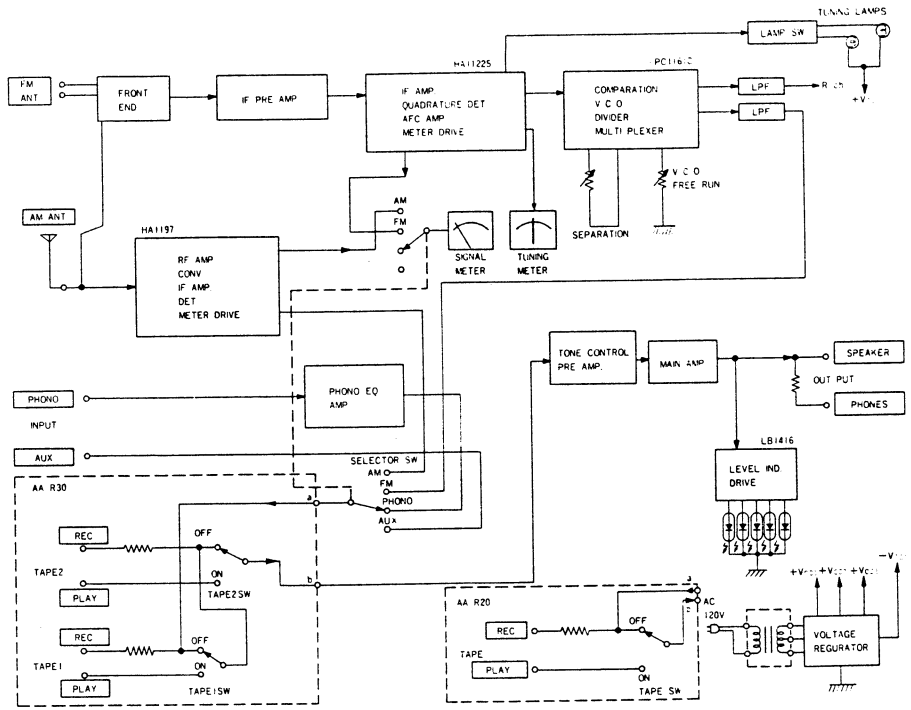


Fig. 5 Block Diagram

VI. AMPLIFIER ADJUSTMENT

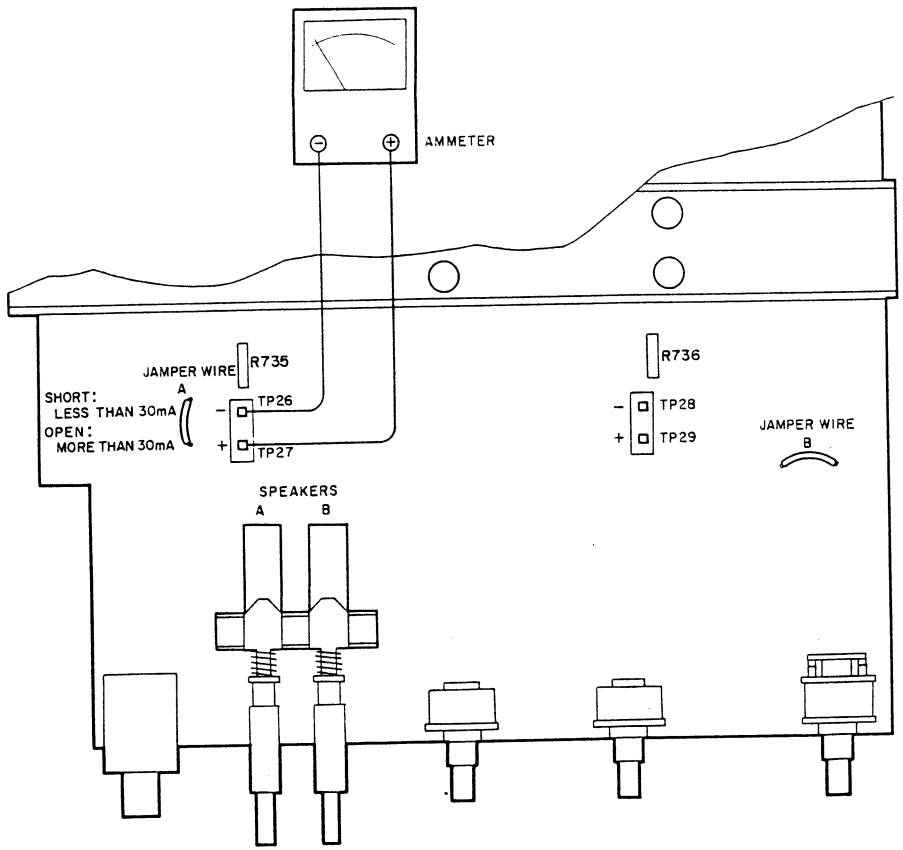


Fig. 6 Main Amp. Reg. P.C Board 4631380

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.

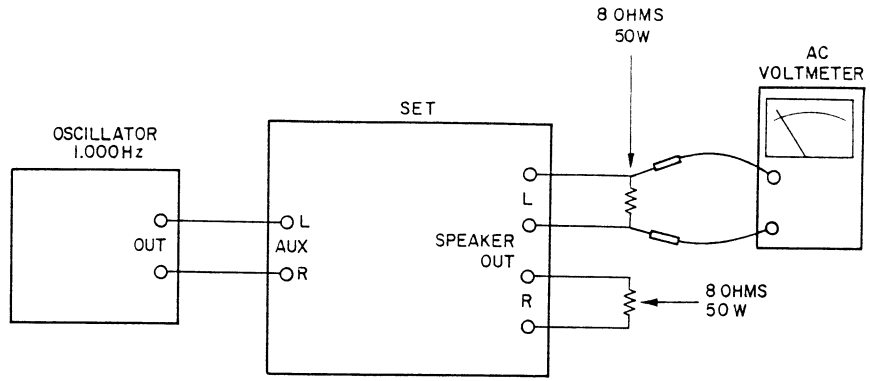


Fig. 7 Instrument Connections

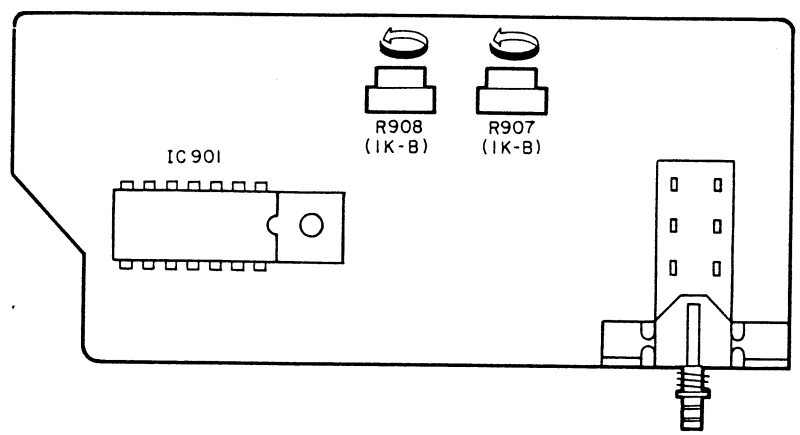


Fig. 8 LED Ind. Driver P.C Board

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

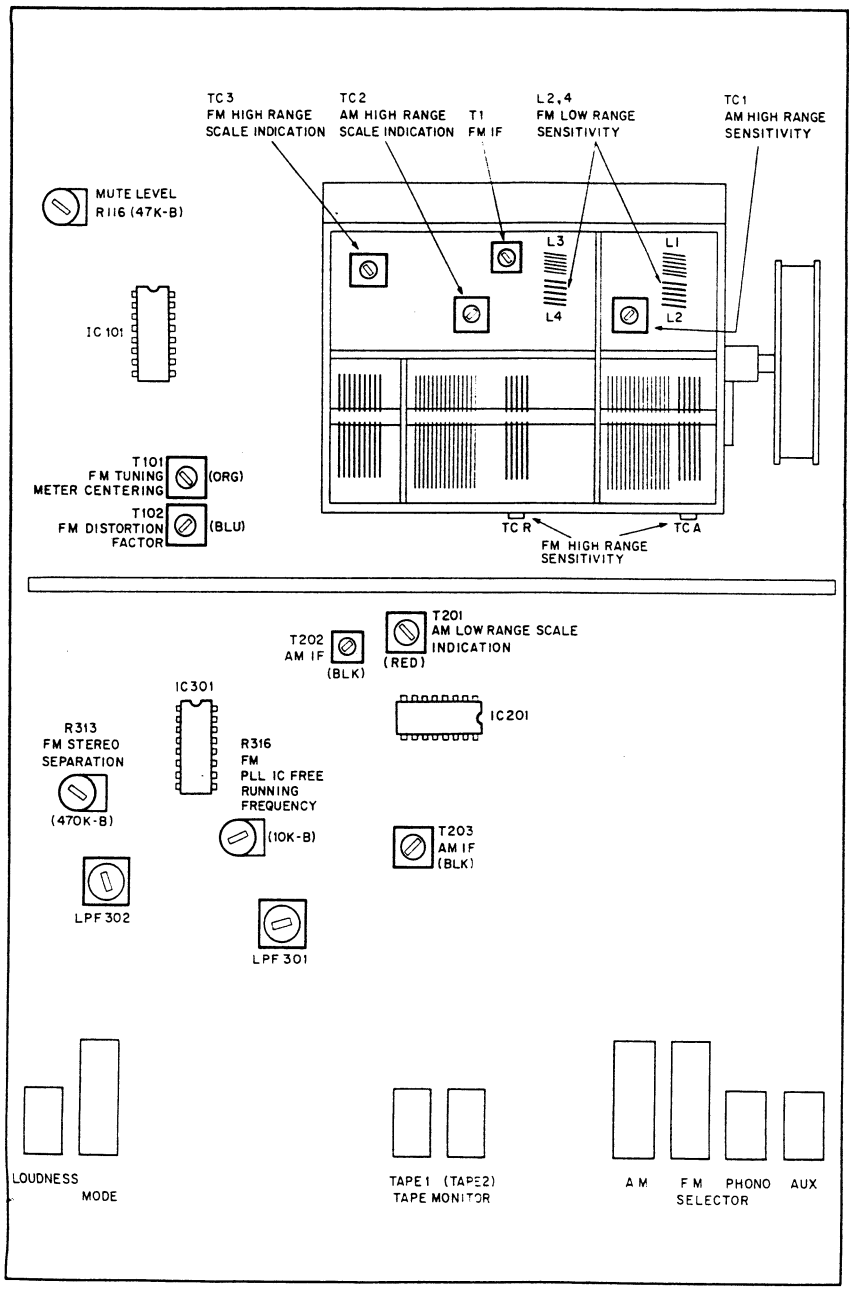


Fig. 9 Tuner EQ P.C Board

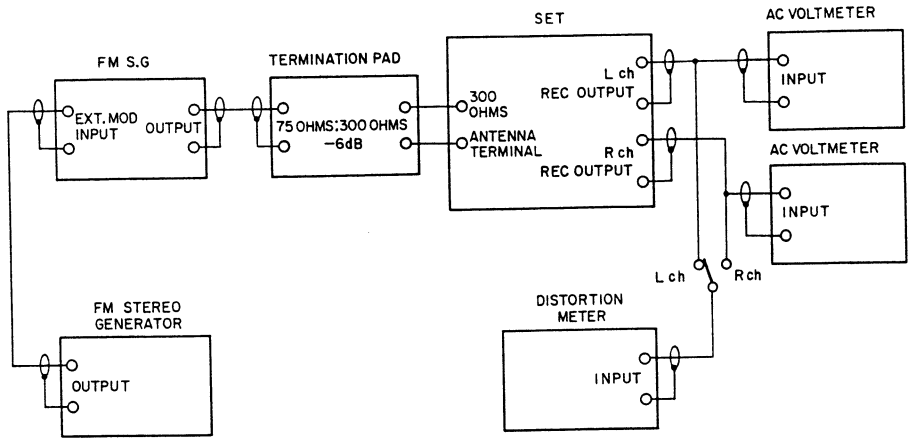


Fig. 10 Instrument Connections

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 ±250 kHz
6	Confirmation of Low Range Scale Indication		Maximum Output	88 MHz, 60 dB (mono) input. TUNING INDICATOR to 88 MHz, Error: Within ±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 kB)	No signal emitted from output	MUTE SW to ON 98 MHz, 30 dB (mono) input.
10	PLL IC Free Running Frequency	R316 (10 kB)	76 kHz ±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→Right)	R313 (470 kB)	More than 40 dB	98 MHz, 60 dB (stereo), L ch input. Minimum output of R ch.
13	Stereo Separation (Right→Left)	R313 (470 kB)	More than 40 dB	98 MHz, 60 dB (stereo), R ch input. Maximum output of L ch.

Chart-1

NOTES:
1. 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.
2. 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.
3. The free Running Frequency of the PLL IC must be exactly 76.00 kHz.

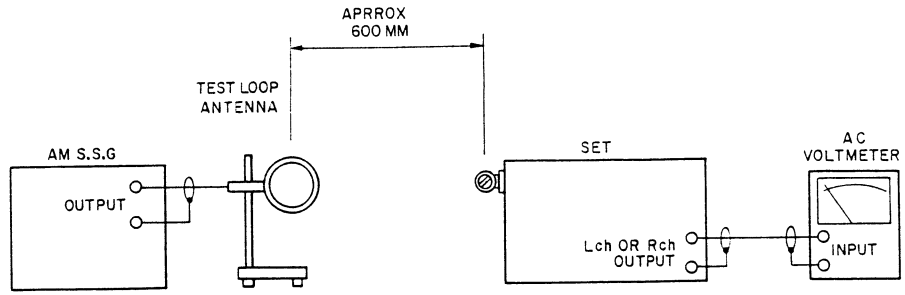


Fig. 11 Instrument Connections

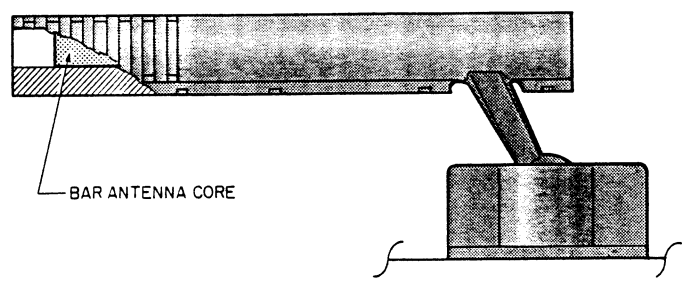


Fig. 12 Bar Antenna

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

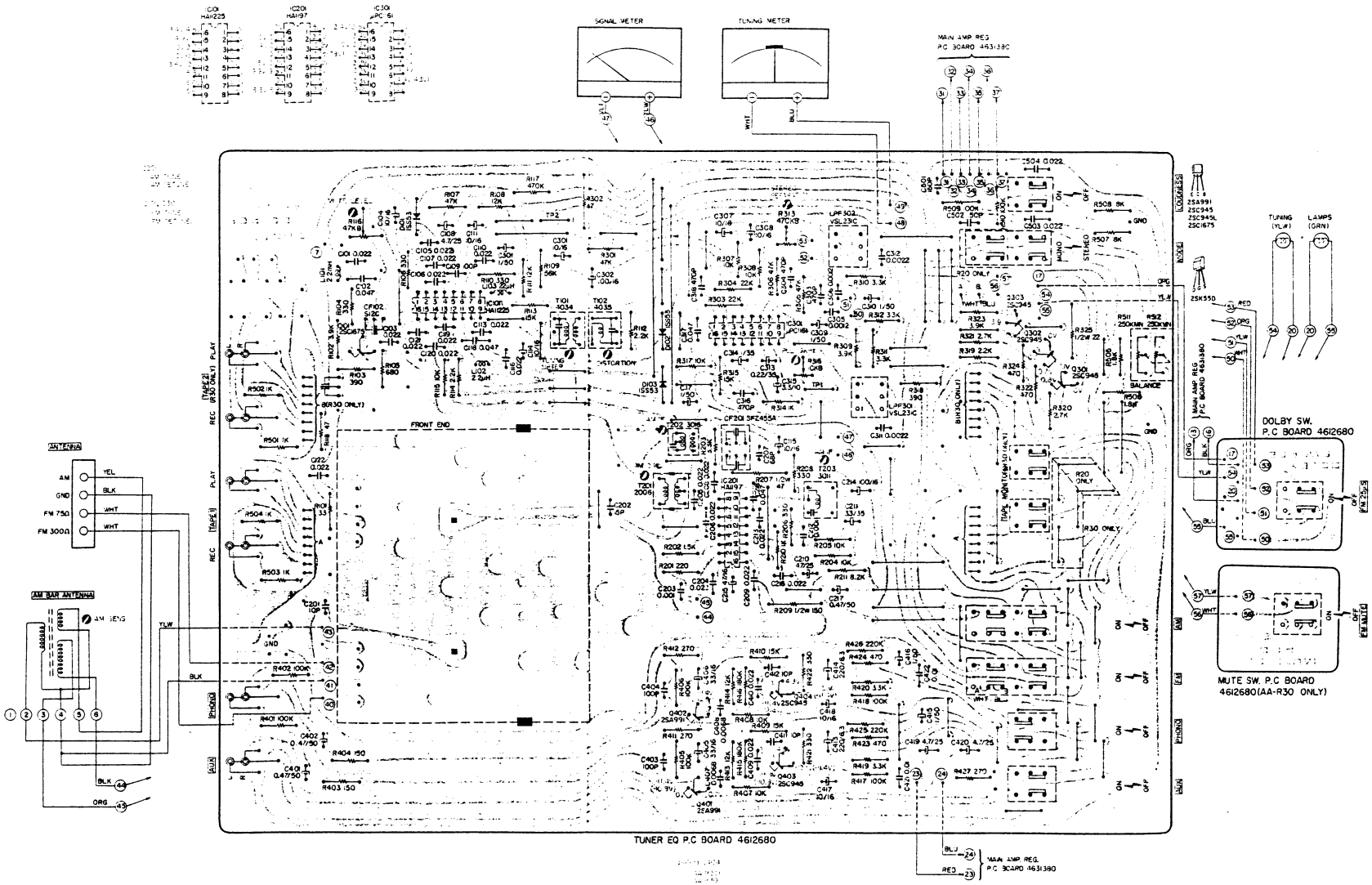
1. P.C BOARD TITLES AND IDENTIFICATION NUMBERS

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

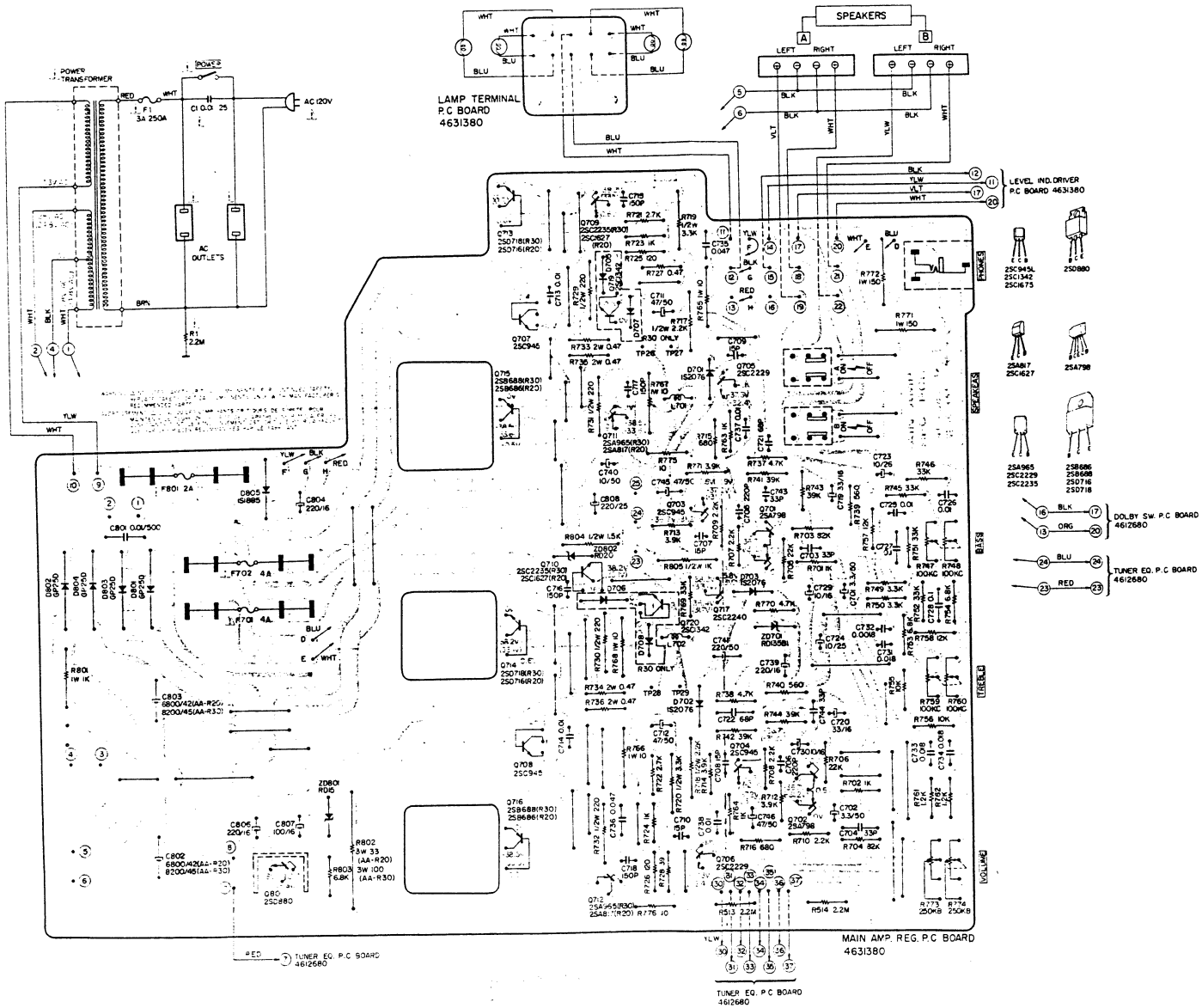
Chart-3

2. COMPOSITION OF VARIOUS P.C BOARDS

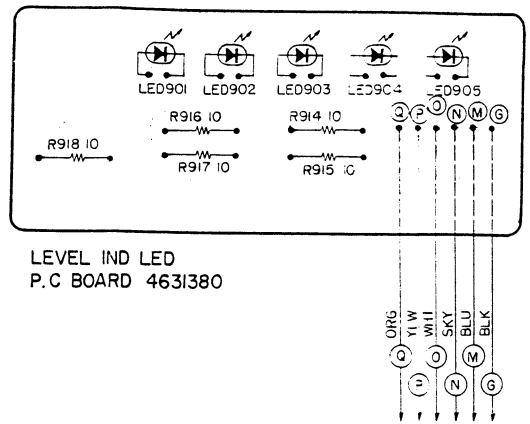
1) Tuner EQ P.C Board 4612680



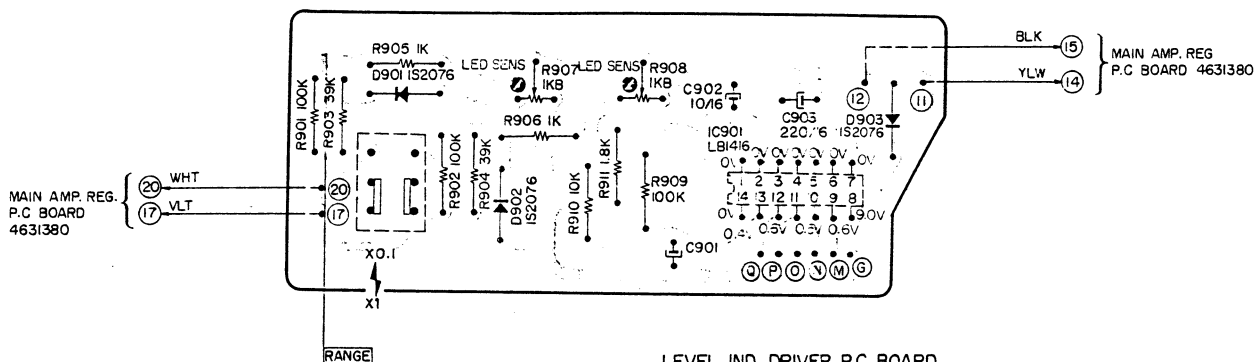
2) Main Amp. Reg. P.C Board 4631380



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

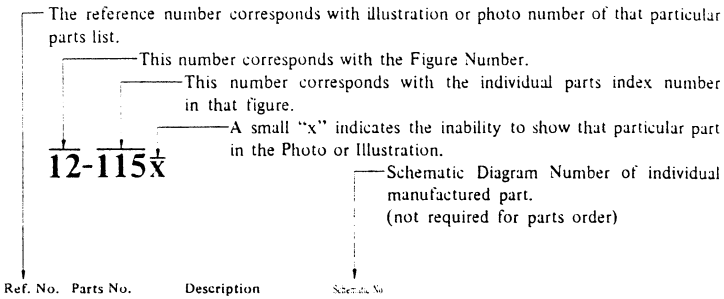
PARTS LIST

TABLE OF CONTENTS

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.



		FLYWHEEL BLOCK #13	
12-115x	800425	Flywheel Block Assy. Comp.	BD #13
12-116	244506	Flywheel Only	BD 203
12-117x	244754	Felt, Flywheel	BD 175
12-118	251324	Main Metal Case	BD 156
12-119	253080	Main Metal	BD 157

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.

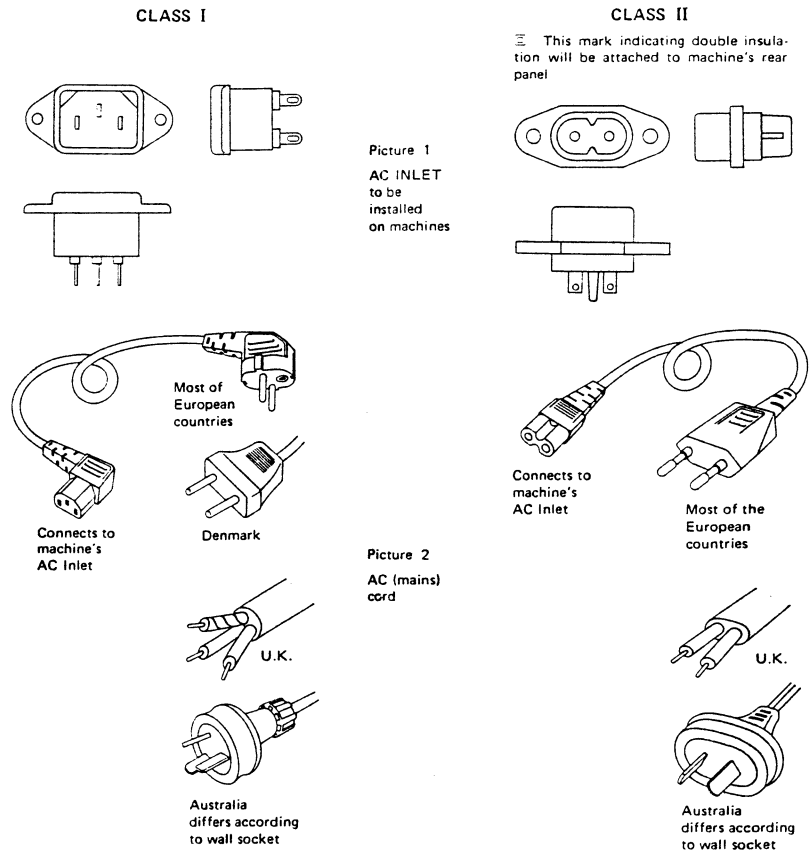
WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMEMNDED PARTS.

AVERTISSEMENT: ⚠ IL INDIQU 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



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

1. 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 LN324GP
ED703882	Zener Diode RD-13EB1
ED703882	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-1-359 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 2SC1627
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	9460130
2-2	BA703915	Tuner PCB Comp. AA-R30	9460140
2-IC101	EI703843	IC HA11225	518070S
2-IC201	EI299700	IC HA1197	45-3-218
2-IC301	EI307200	IC μPC1161C	45-3-269
2-Q101	ET703844	Transistor 2SC1675	515082S
2-Q301to303	ET703854	Transistor 2SC945 (L)	515077S
2-Q401,402	ET703865	Transistor 2SA991	510104S
2-Q403,404	ET703854	Transistor 2SC945 (L)	515077S
2D101to103	ED302379	Silicon Diode 1SS53	45-3-43
2-T101	EO703846	FM DET Coil (1) AA-R20	1240340
2-T102	EO703847	FM DET Coil (2) AA-R20	1240350
2-T201	EO703808	AM OSC Coil AA-R20	1220060
2-T202	EO703932	AM IFT Coil AA-R20	1230160
2-T203	EO703931	AM DET Coil AA-R20	1230110
2-L101,102	EO703849	Inductor RC-855 2.2μH(M)	1210860
2-L103	EO703848	Inductor 22μH	1210930
2-CF101,102	ER703850	Ceramic Filter CFM107S12C (Red)	128056A
2-CF201	ER704333	Ceramic Filter CFM107S12C	128061A
2-LPF301,302	ER703856	Low Pass Filter VSL-231C	1280590
2-R116	EV483377	Semi-Fixed/Vol. (Solid Type) SR19R 47kB	36-19-10
2-R313	EV310090	Semi-Fixed/Vol. (Solid Type) SR19R 470kB	36-19-10
2-R316	EV483388	Semi-Fixed/Vol. (Solid Type) SR19R 10kB	36-19-10
2-R511,512	EV703841	Vol. GM70E 674C 250KMN	4321010
2-C313	EC703859	Tantalum/C. 0.22μF 35WV	252402M
2-C314	EC703860	Tantalum/C. 1μF 35WV	252410M
2-C315	EC703858	Tantalum/C. 3.3μF 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)	4041230
2-6	ES703839	Push SW. (B) SUF22 (AA-R30)	4041240
2-7	ES704116	Push SW. SUF12 (AA-R20)	4041260
2-8	ES703840	Push SW. (C) SUF22 (AA-R30)	4041270
2-9	EJ703842	Pin Jack AA-R20	4444070
2-10	EE703845	Front End FF111U	4910150

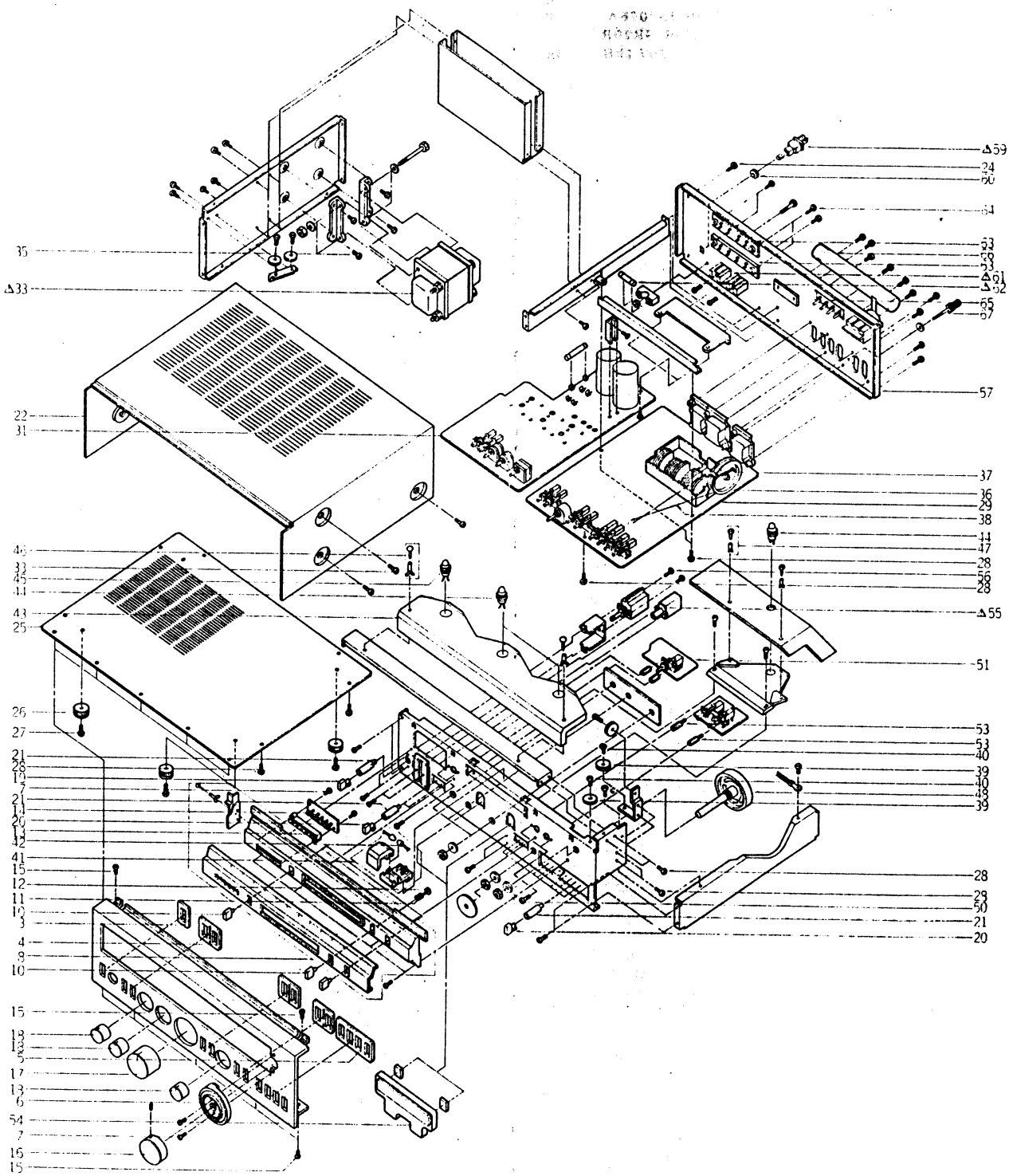
3. MAIN AMP P.C BOARD BLOCK

Symbol No.	Parts No.	Description	Schematic No.
3-1	BA703912	Main Amp PCB Comp. AA-R30	9430870
3-2	BA703913	Main Amp PCB Comp. AA-R20	9430860
3-Q701,702	ET703875	Transistor 2SA798	514086S
3-Q703,704	ET703854	Transistor 2SC945 (L)	515077S
3-Q705,706	ET703881	Transistor 2SC2229	512108S
3-Q707,708	ET703854	Transistor 2SC945 (L)	515077S
3-Q709,710	ET703874	Transistor 2SC1627 (AA-R20)	511017S
3-Q709,710	ET703884	Transistor 2SC2235 (AA-R30)	512109S
3-Q711,712	ET703878	Transistor 2SA817 (AA-R20)	510047S
3-Q711,712	ET703887	Transistor 2SA965 (AA-R30)	510105S
3-Q713,714	ET703867	Transistor 2SD716 (AA-R20)	513114S
3-Q713,714	ET703872	Transistor 2SD718 (AA-R30)	513105S
3-Q715,716	ET703873	Transistor 2SB686 (AA-R20)	511113S
3-Q715,716	ET703879	Transistor 2SB688 (AA-R30)	511105S
3-Q717	ET307195	Transistor 2SC2240 (GR)(BL)	45-1-302
3-Q719,720	ET704334	Transistor 2SC1342 (AA-R30)	515070S
3-Q801	ET703894	Transistor 2SD880	513106S
3-R733to736	ER703891	Cement/R. 5W 0.47 ohms (AA-R20)	384479W
3-R733to736	ER703893	Cement/R. 5W 0.27 ohm (AA-R30)	384279W
3-R747,748	EV703880	Vol. GM70E 666C-100kC	4321000
3-R759,760	EV703880	Vol. GM70E 666C-100kC	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	501020S
3-D801to804	ED703896	LED GP25D-1	560062S
3-D805	ED703904	Silicon Diode 1S1885	560032S
3-D903	ED703904	Silicon Diode 1S1885	560032S
3-ZD701	ED703882	Zener Diode RD-13EB1	502049S
3-ZD801	ED703882	Zener Diode RD-13EB1	502049S
3-ZD802	ED703883	Zener Diode RD-20EB3	502069S
3-L701,702	EO703892	Choke Coil AA-R20	1210830
3-F701,702	EF703906	⚠ Fuse 4A 250V U/L	4700550
3-F801	EF703900	⚠ Fuse 2A 250V U/L	4700620
3-C801	EC703905	Ceramic/C. 0.01μF 500WV	238103P
3-C802,803	EC703902	Elect./C. 6800μF 42WV (AA-R20)	217947Q
3-C802,803	EC703898	Elect./C. 8200μF 45WV (AA-R30)	2100090
3-2	ES703886	Push SW. (D) SUF22	4041250
3-3	EJ703868	Headphone Jack AA-R20	4550260

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-IC901	EI703907	IC LB1416	518075S
4-D901,902	ED703876	Silicon Diode 1S2076A	501020S
4-R907,908	EV703909	Semi-Fixed/Vol. SR29R 207 1kB	4300620

5. FINAL ASSEMBLY BLOCK



FINAL ASSEMBLY BLOCK

Ref. No.	Parts No.	Description	Schematic No.
		FRONT PANEL BLOCK	
5-1x	BD703920	Front Panel BLK AA-R30	7884670
5-2x	BD703921	Front Panel BLK AA-R20	7884660
5-3	MS703786	Button Guide AA-R20	7401920
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	7401980
5-7	ZS666336	Tapping Screw, #2 pan 3x8	
		DIAL SCALE BLOCK	
5-8	TA703917	Dial Scale Assy AA-R30	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
		FINAL ASSEMBLY BLOCK	
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-20D AA-R20	7841350
5-19	SB703794	Button (A) AA-R20	7852120
5-20	SB703795	Button (B) AA-R20	7852110
5-21	MS703796	Button Shaft AA-R20	7401890
5-22	BC703797	Upper Cover AA-R20	7821000
5-23	ZS537006	Screw, bind 4x8 (Black)	
5-24x	ZS609197	Tapping Screw #2, pan 3x6	
5-25	SP703799	Bottom Plate AA-R20	7325830
5-26	SA703922	Foot AA-R20	7402080
5-27	ZS565942	Tapping Screw, #2 pan 4x8	
5-28	ZS609120	Tapping Screw, #2 pan 3x6	
5-29	BA703915	Tuner PCB Comp. AA-R30	9460140
5-30x	BA703914	Tuner PCB Comp. AA-R20	9460130
5-31	BA703912	Main Amp PCB Comp. AA-R30	9430870
5-32x	BA703913	Main Amp PCB Comp. AA-R20	9430860
5-33	ET703802	⚠ Power Trans. T-1-360 AA-R30	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	7440300
5-38	TA207347	Thread D05	
5-39	MR703805	Pulley D=9 AA-R20	7400790
5-40	MS703806	Pulley Shaft AA-R20	7121120
5-41	TA703919	Pointer Part AA-R20	7860570
5-42	EL703807	Lamp 5V 75mA (WHT)	5805080
5-43	TA703809	Illumination Plate AA-R20	7402030
5-44	EL703810	Lamp (Cord Type) 8V 0.3A L-190	5808170
5-45	EL703812	Lamp (Cord Type) 8V 0.3A L-70	5808180
5-46	ZW703813	Nylon Rivet 3x8	7401430
5-47	ZW703815	Nylon Rivet 3x5.5	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	4582550
5-55	ES703825	⚠ Push SW. SDV-1P 901 TV-5	4041140
5-56	ZS379350	Screw, pan 3x6	
5-57	SP703827	Rear Panel AA-R30	7325560
5-58x	SP703826	Rear Panel AA-R20	7325570
5-59	EW703828	⚠ AC Cord (BLK) AA-R20	606007A
5-60	EZ703829	Strain Relief SR-3P-4	7400620
5-61	EJ703831	⚠ AC Socket AA-R20	4500150
5-62	EF703830	⚠ Fuse 3A 250V U/L	4700630
5-63	EJ703832	AP Terminal AA-R20	4450470
5-64	ZS609208	Tapping Screw, #2 pan 3x8	
5-65	EJ703834	Ant Terminal AA-R20	4450440
5-66	EE703864	AM Bar Ant AA-R20	1200410
5-67	EJ306940	Earth Terminal	32-1-57

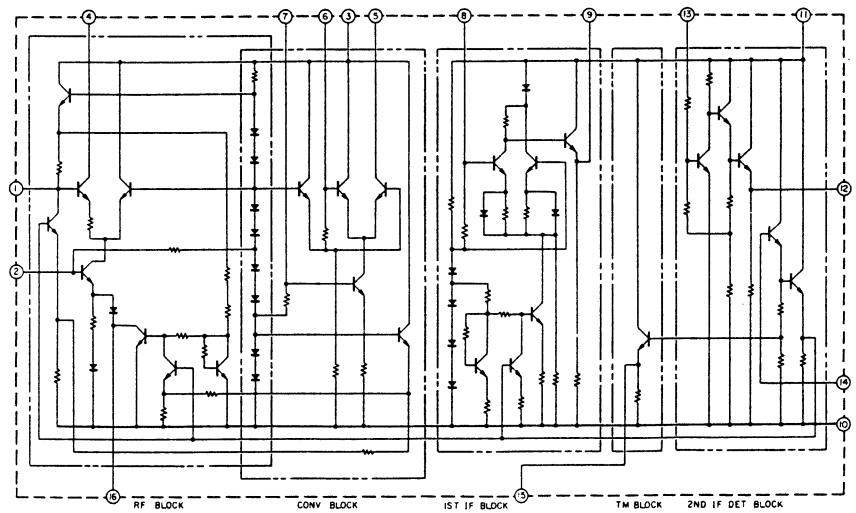
INDEX

SECTION 3

SCHEMATIC DIAGRAM

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

HA1197



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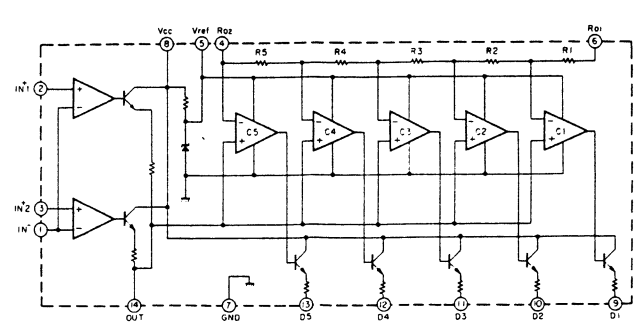

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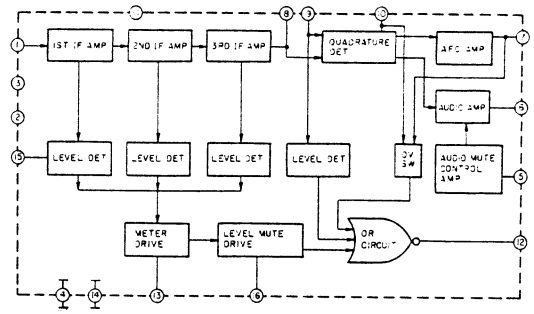
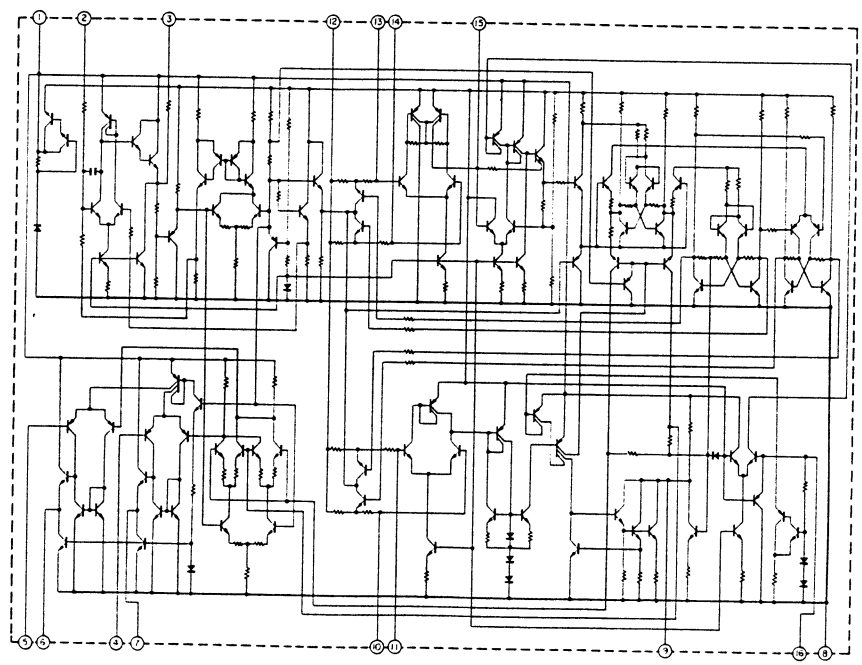


μPC1161C



AA-R20/R30

TUNER EQ P.C BOARD

MAIN AMP. REG. P.C BOARD

MUTE SW P.C BOARD

FRONT END

IC 101 HA11225

IC 201 HA1197

Q101 2SC1675

Q401 2SA991

Q402 2SA991

Q403 2SC945L

Q404 2SC945L

Q701 2SA798

Q702 2SA798

Q703 2SC945L

Q704 2SC945L

SELECTOR

MODE

MUTE

R30

R20

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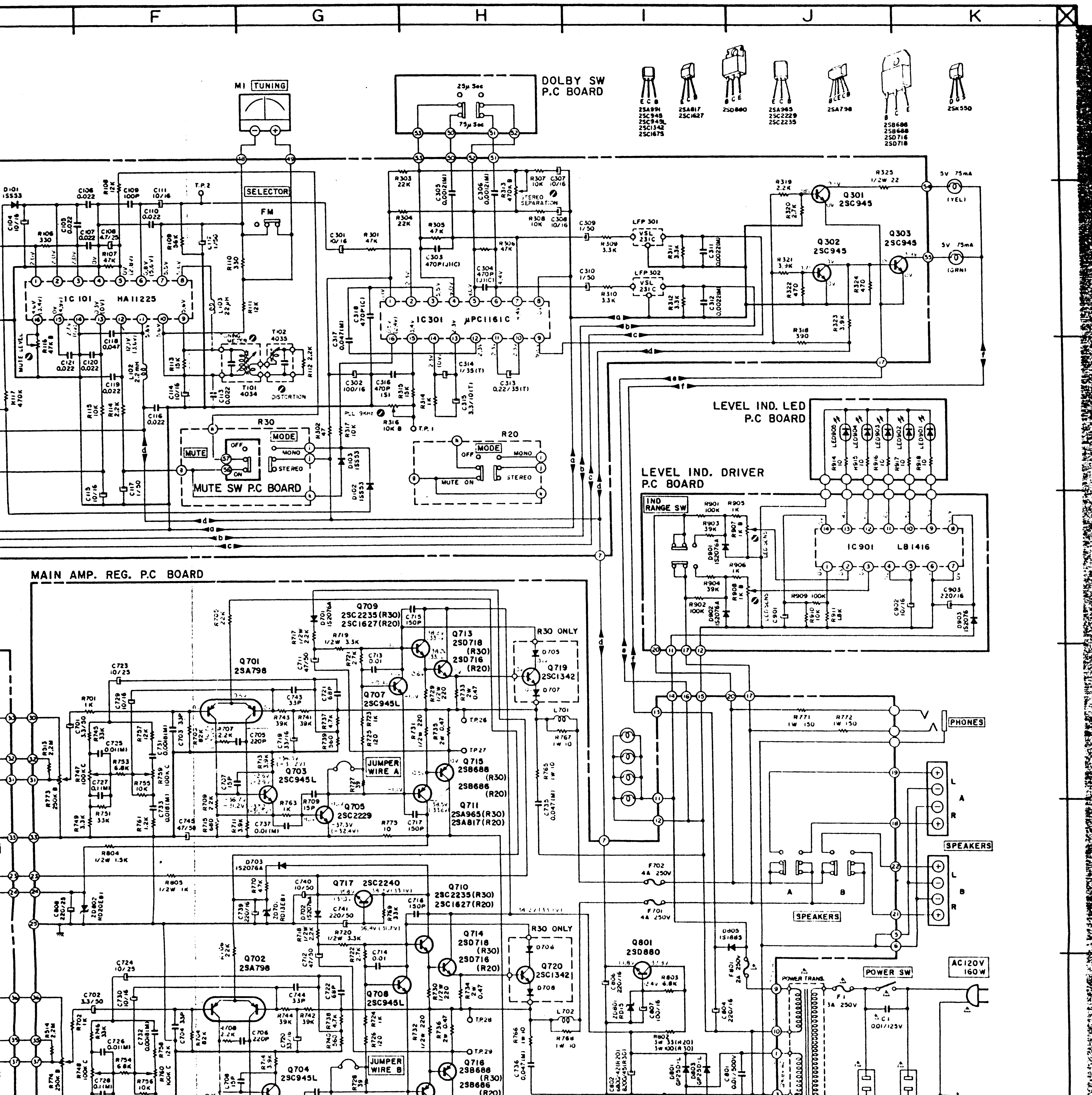
AVERTISSEMENT: INDIQUE LES COMPOSANTS CRITIQUES DE SURETE. POUR MAINTENIR LE NIVEAU DE SECURITE DE L'APPAREIL NE REMPLACER LES COMPOSANTS QUANT LE FONCTIONNEMENT EST CRITIQUE POUR LA SECURITE QUE PAR DES PIECES RECOMMANDEES PAR LE FABRICANT.



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

AVERTISSEMENT: ⚠ 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

NOTE
1. UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/4W(J)
ALL CAPACITORS IN μF 50WV (J)
2. MARK INDICATES NON POLAR CAPACITORS

PHONO AND MAIN AMP. SECTION
AA R20
AA R30

AA-R20/R30
SCHEMATIC DIAGRAM
NO. 1581842A