

SERVICE MANUAL

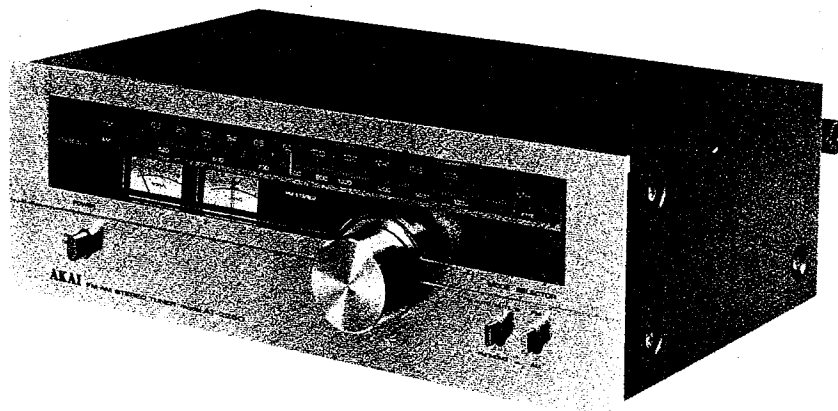
PARTS LIST

AT-2250
MODEL AM-2250

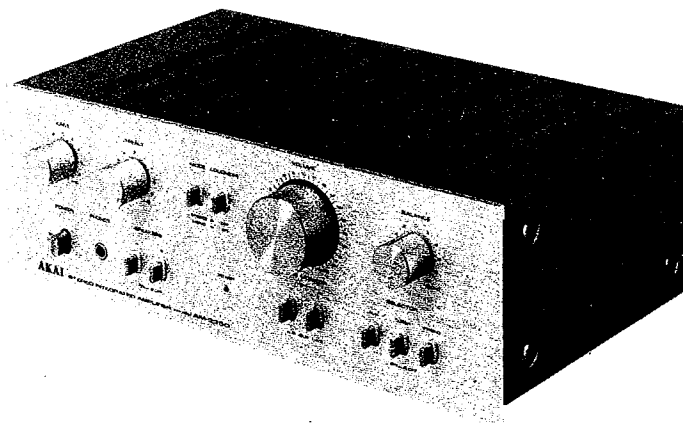
AKAI

ALSO APPLICABLE TO BLACK PANEL MODEL

AT-2250



AT-2250



AM-2250

**AKAI STEREO TUNER
AND
AKAI STEREO INTEGRATED AMPLIFIER**

MODEL AT-2250 AM-2250

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2. MODEL AM-2250

POWER AMPLIFIER SECTION

RATED OUTPUT POWER 2-CHANNELS DRIVEN	25 watts per channel, minimum RMS at 8 ohms from 20 to 20,000 Hz with no more than 0.2% total harmonic distortion.
POWER BANDWIDTH (IHF)	10 Hz to 40 kHz/8 ohms (Total Harmonic Distortion: 0.2%)
SIGNAL TO NOISE RATIO (IHF) PHONO AUX	Better than 75 dB Better than 95 dB
RESIDUAL NOISE	Less than 0.7 mV at 8 ohms
CHANNEL SEPARATION (IHF) PHONO	Better than 45 dB at 1,000 Hz
DAMPING FACTOR	More than 50 (1 kHz, 8 ohms)
OUTPUT SPEAKERS HEADPHONE	A, B (4 to 16 ohms)/A+B (8 to 16 ohms) 4 to 16 ohms

PREAMPLIFIER SECTION

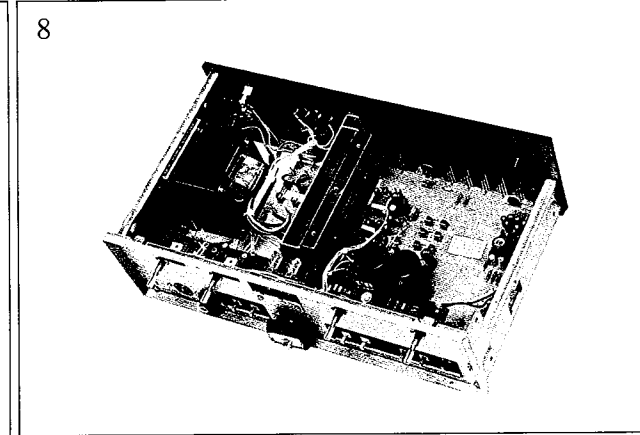
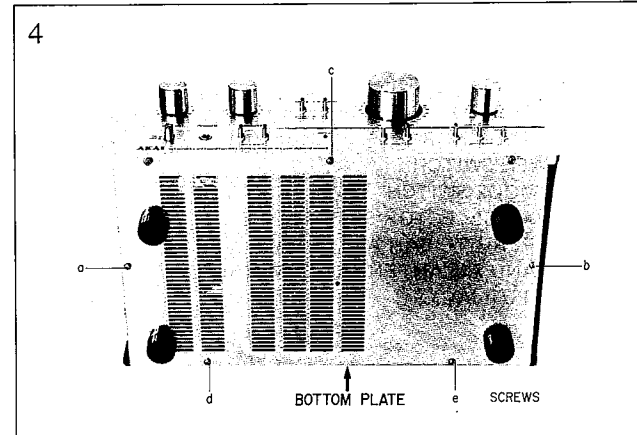
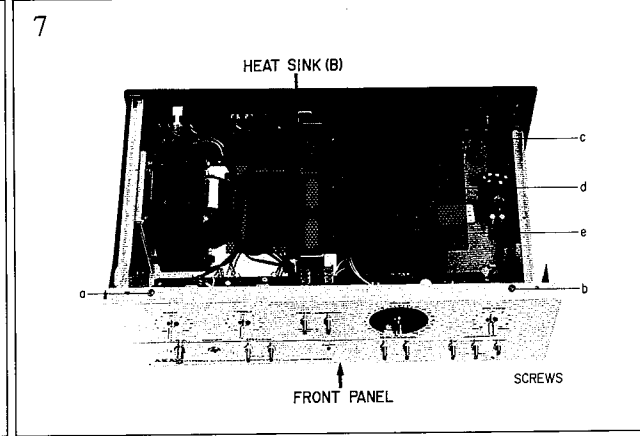
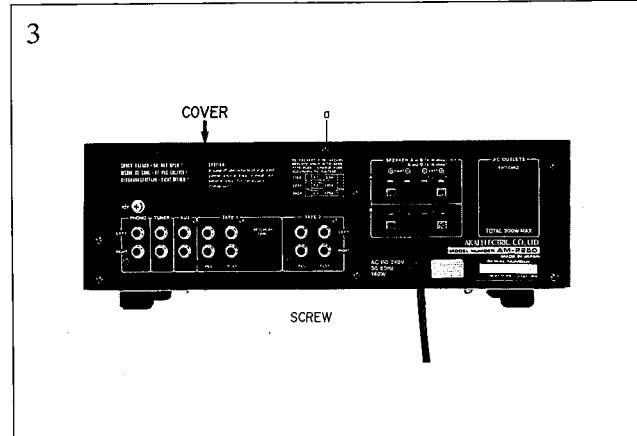
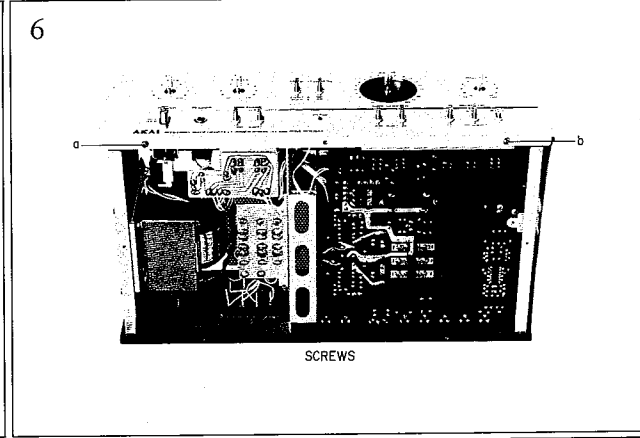
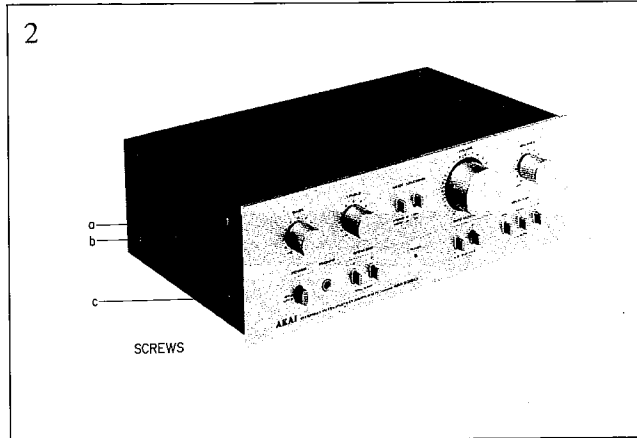
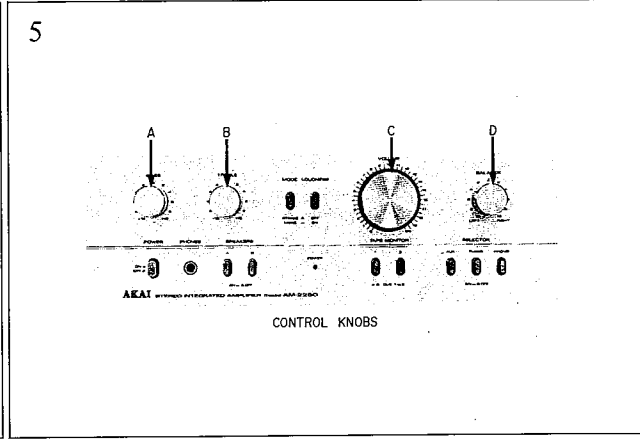
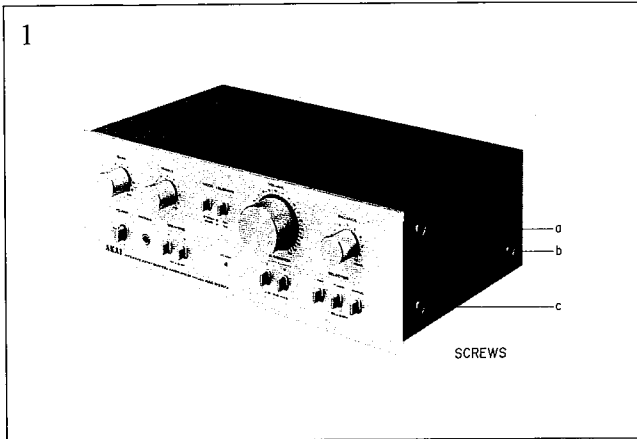
INPUT SENSITIVITY/IMPEDANCE PHONO AUX TUNER TAPE MONITOR	3 mV/47 kohms 150 mV/100 kohms 150 mV/100 kohms PIN: 150 mV/100 kohms DIN: 30 mV/80 kohms
OUTPUT LEVEL/IMPEDANCE TAPE REC	PIN: 150 mV/100 kohms DIN: 30 mV/80 kohms
FREQUENCY RESPONSE PHONO (RIAA EQUALIZATION) TUNER, AUX, TAPE MONITOR	30 Hz to 15 kHz +1 dB, -1 dB 10 Hz to 40 kHz +0 dB, -1 dB
TONE CONTROL BASS TREBLE LOUDNESS CONTROL	±8 dB at 100 Hz ±6 dB at 10 kHz +9 dB at 100 Hz, +4 dB at 10 kHz (Volume control set at -30 dB position)

MISCELLANEOUS

SEMICONDUCTORS	Transistors: 3, Diodes: 4, ICs: 2
POWER REQUIREMENTS	120V, 60 Hz for U.S.A. and Canada 220V, 50 Hz for Europe except U K. 240V, 50 Hz for U K. 110/220/240V, 50/60 Hz Switchable for other countries
DIMENSIONS	380 (W) x 130 (H) x 220 (D) mm (15 x 5.1 x 8.7) inches
WEIGHT	6.2 kg (13.6 lbs)

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

2. MODEL AM-2250



III. CONTROLS

1. MODEL AT-2250

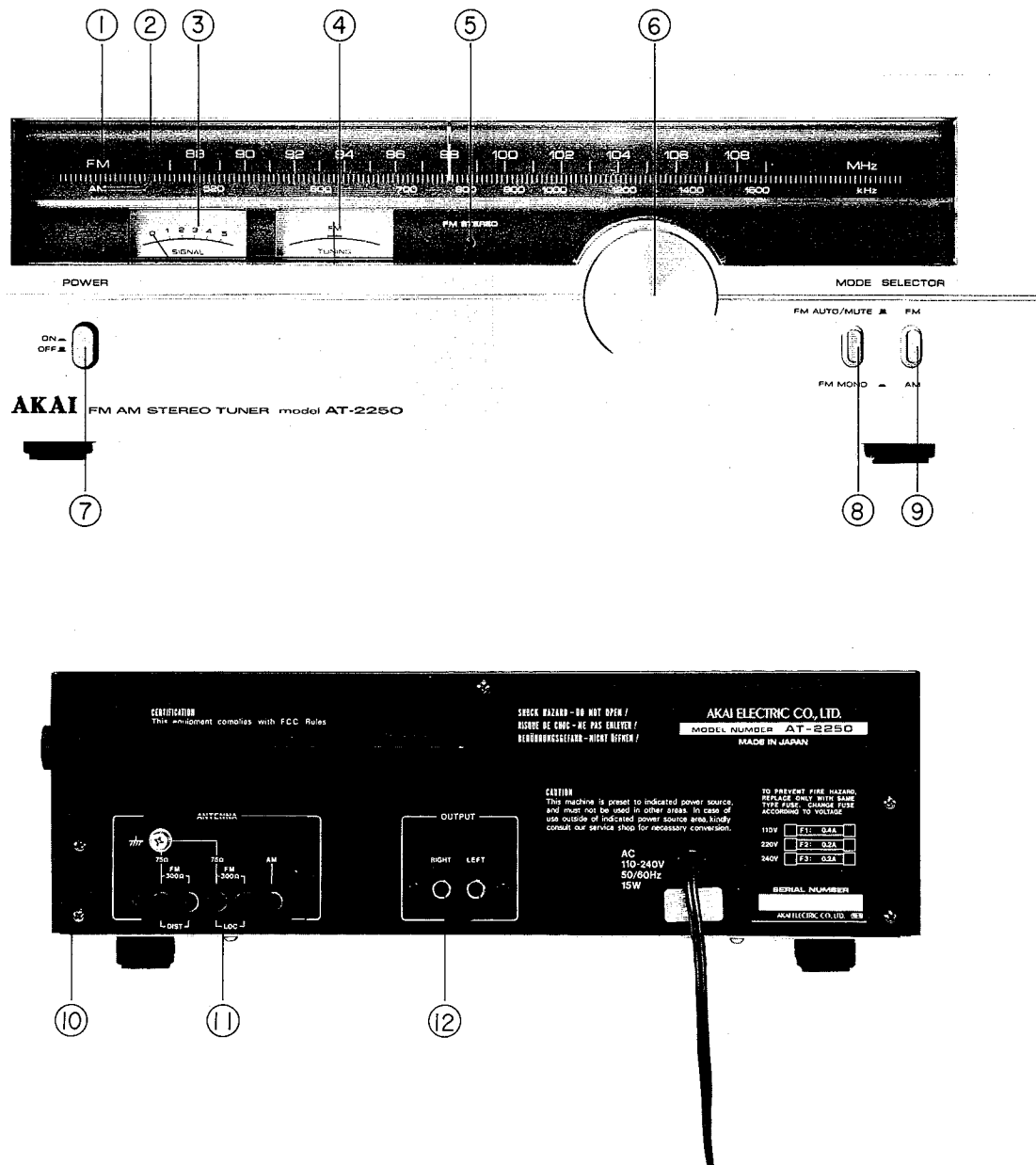


Fig. 1 Controls AT-2250

1. FM DIAL SCALE
2. AM DIAL SCALE
3. SIGNAL STRENGTH METER
4. FM CENTER TUNING METER
5. FM STEREO LAMP
6. TUNING KNOB
7. POWER SWITCH
8. FM MODE SWITCH
9. FM/AM SELECTOR SWITCH
10. AM FERRITE BAR ANTENNA
11. FM AND AM ANTENNA TERMINALS
12. OUTPUT JACKS

2. MODEL AM-2250

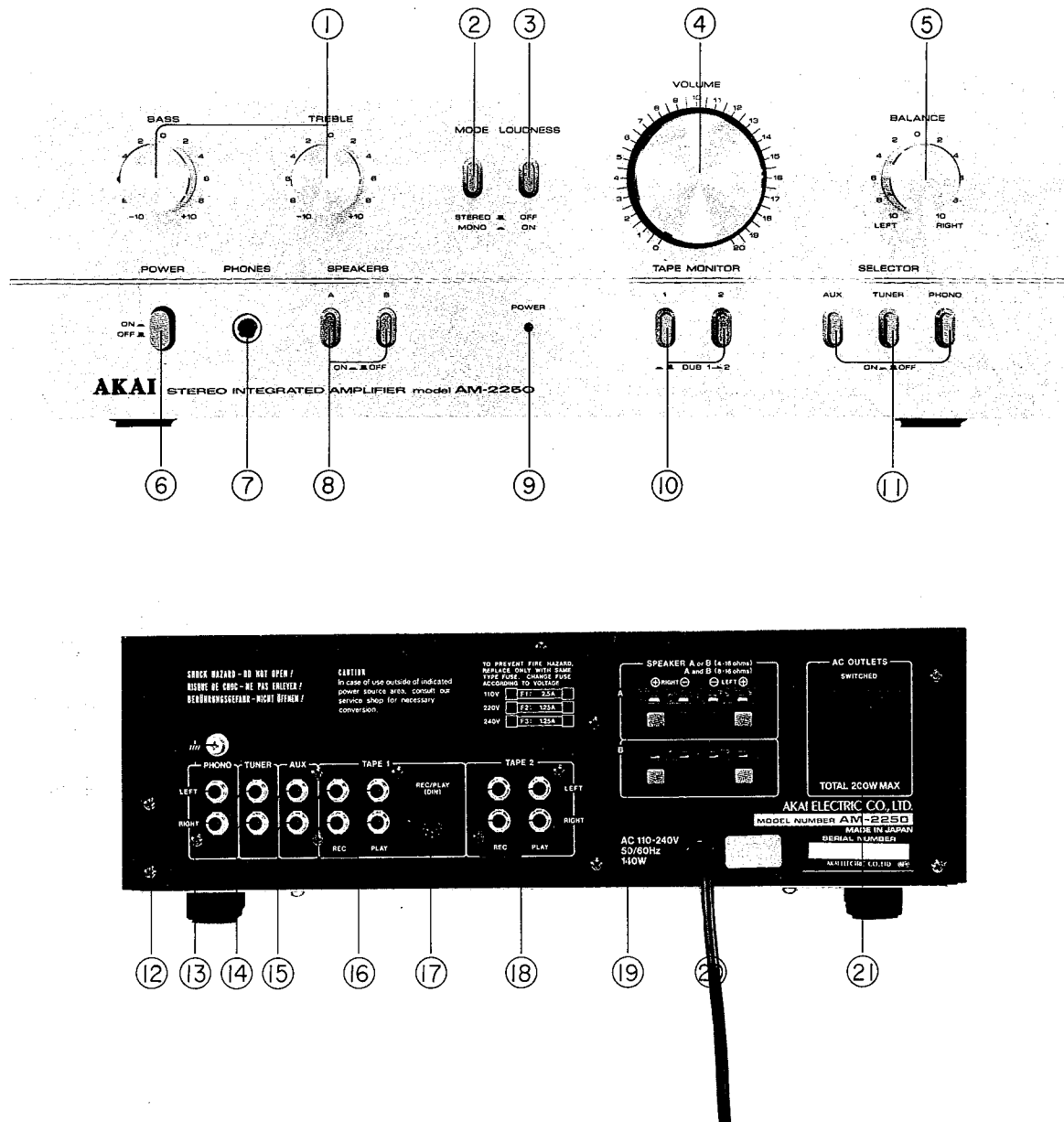


Fig. 2 Controls AM-2250

- | | |
|-----------------------------------|--------------------------------------|
| 1. TONE CONTROLS | 12. GROUND TERMINAL |
| 2. MODE SWITCH | 13. PHONO TERMINALS |
| 3. LOUDNESS SWITCH | 14. TUNER TERMINALS |
| 4. VOLUME CONTROL | 15. AUX TERMINALS |
| 5. STEREO BALANCE CONTROL | 16. TAPE 1 SYSTEM REC/PB TERMINALS |
| 6. POWER SWITCH | 17. TAPE 1 SYSTEM DIN JACK |
| 7. HEADPHONE JACK | 18. TAPE 2 SYSTEM REC/PB TERMINALS |
| 8. SPEAKER SYSTEM SELECTOR SWITCH | 19. A and B SYSTEM SPEAKER TERMINALS |
| 9. POWER INDICATOR LAMP | 20. AC CORD |
| 10. TAPE MONITOR SWITCHES | 21. EXTRA AC OUTLETS |
| 11. INPUT SELECTOR | |

IV. PRINCIPAL PARTS LOCATION

1. MODEL AT-2250

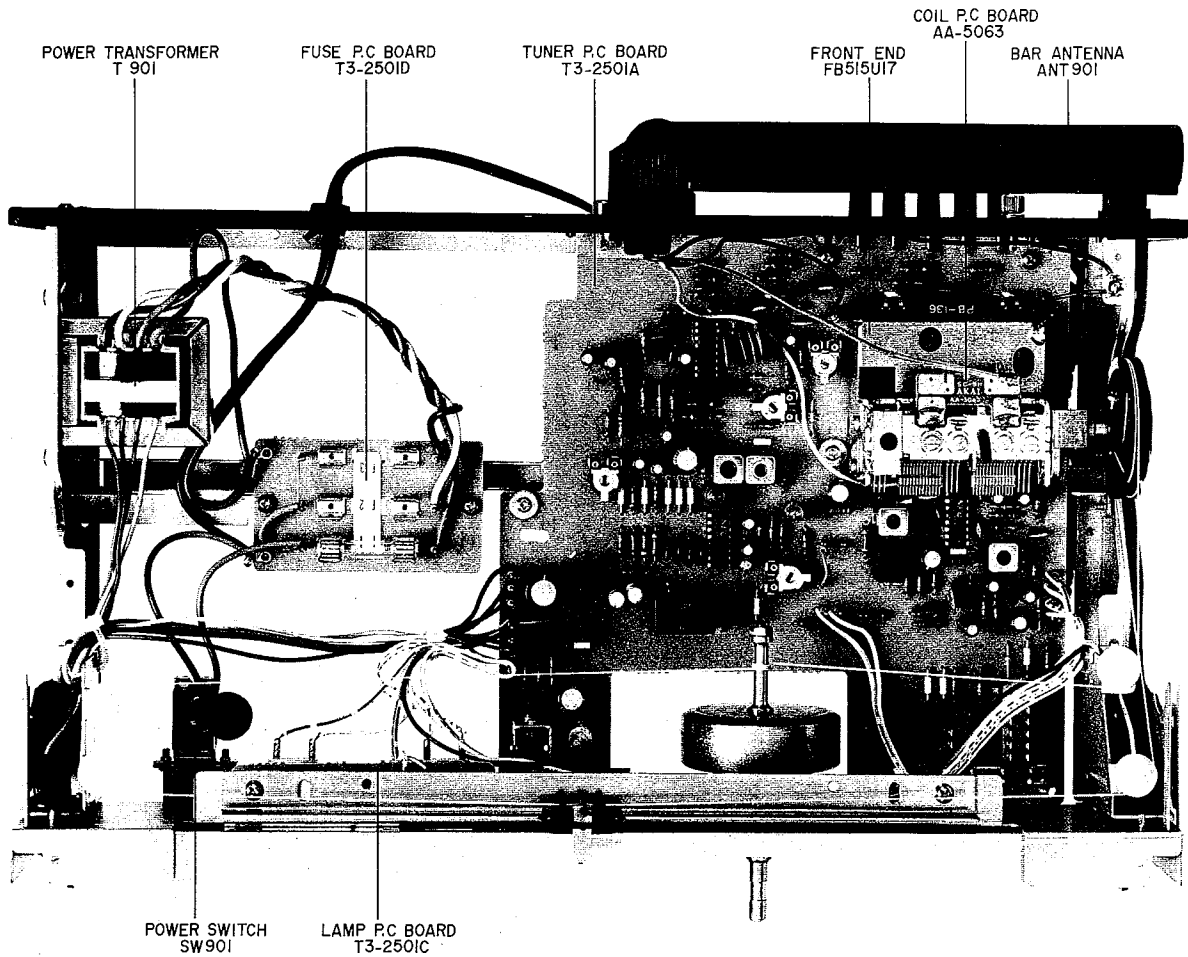


Fig. 3 Top View

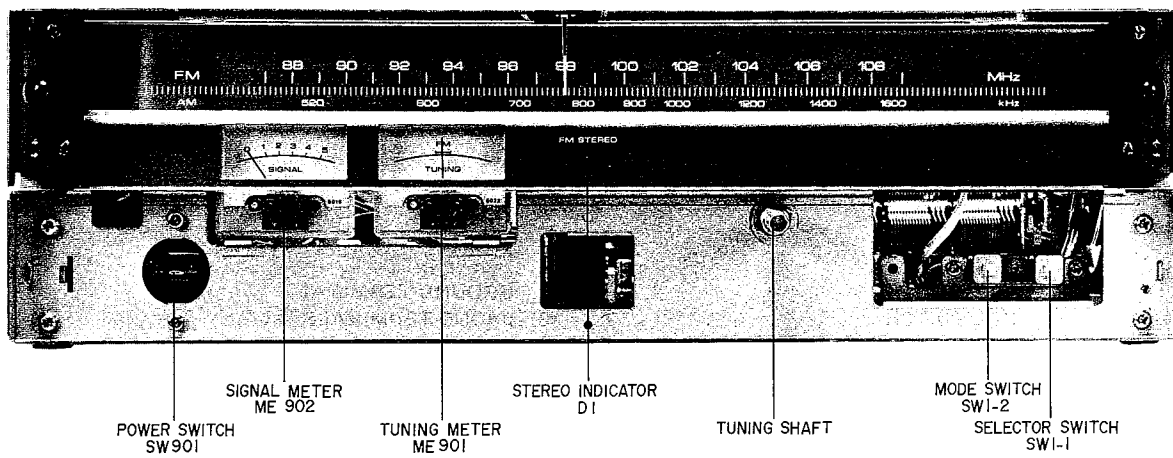


Fig. 4 Front View

2. MODEL AM-2250

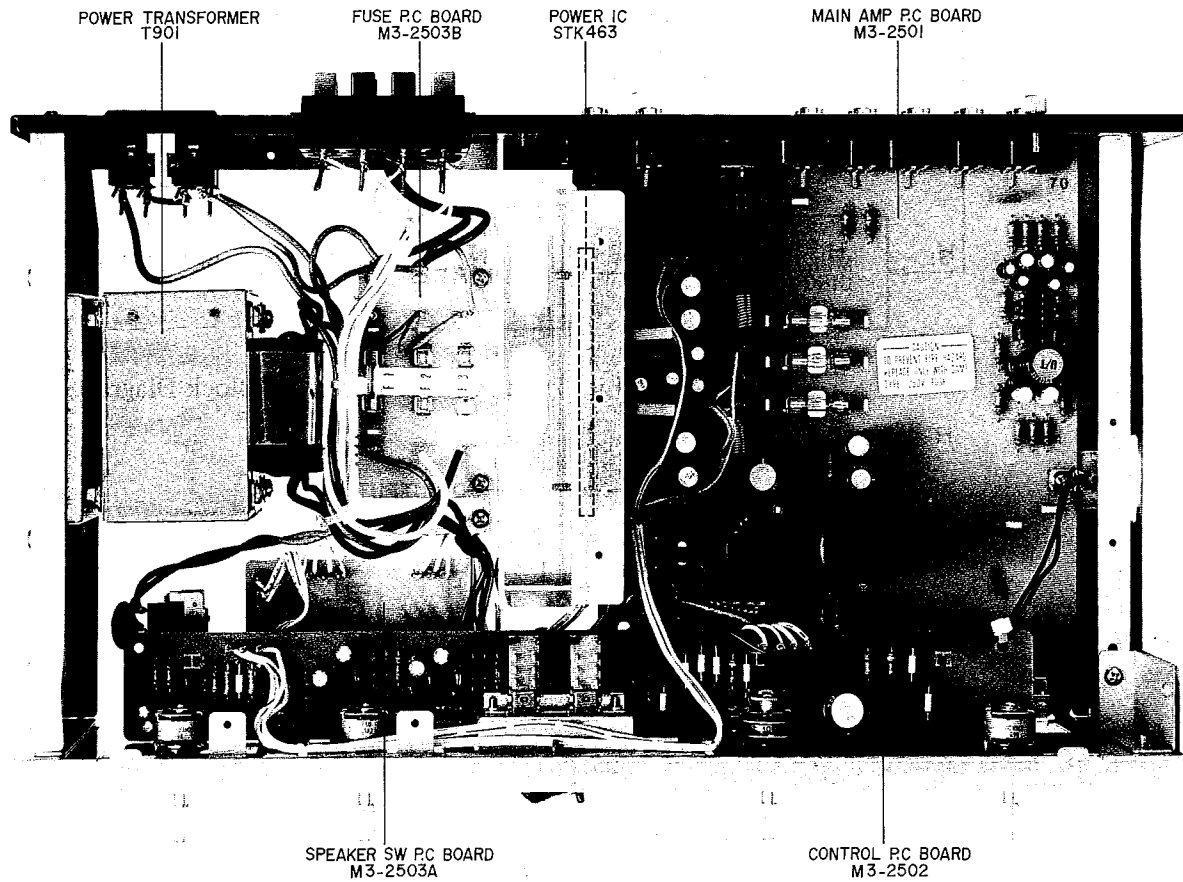


Fig. 5 Top View

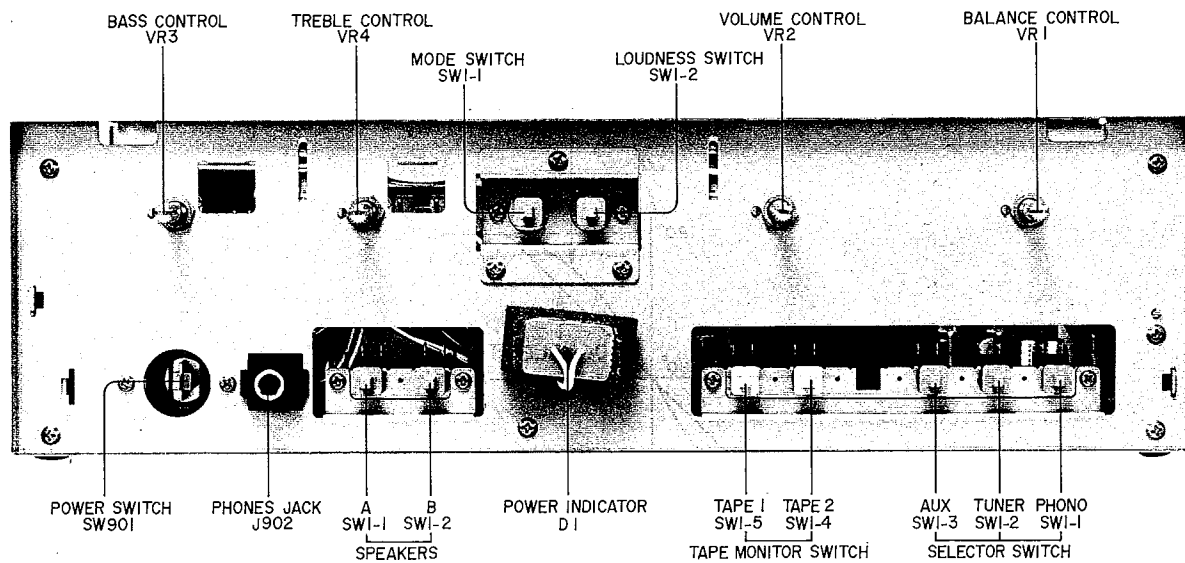


Fig. 6 Front View

V. OPERATING PRINCIPLES OF QUADRATURE DETECTION SYSTEM

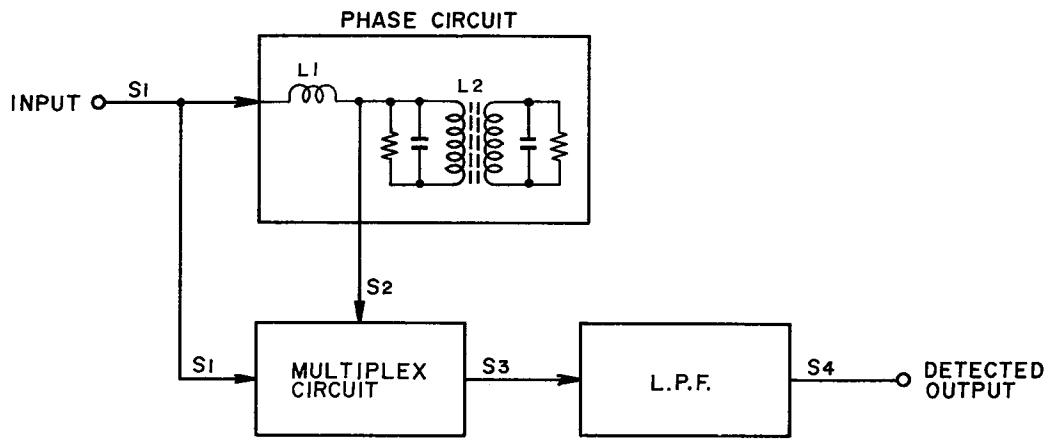


Fig. 7 Quadrature Detection Block Diagram

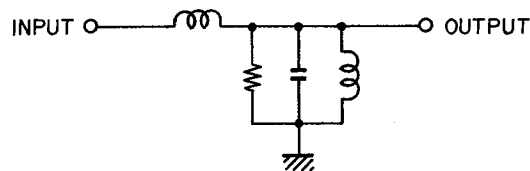


Fig. 8 Single Tuning Type

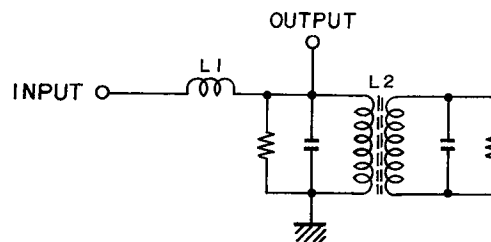


Fig. 9 Double Tuning Type

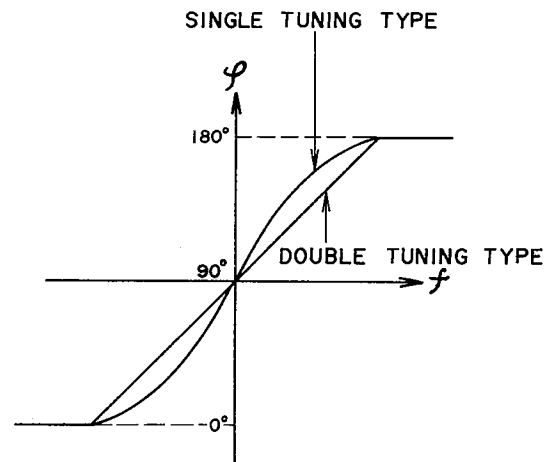


Fig. 10 Tuning Curve

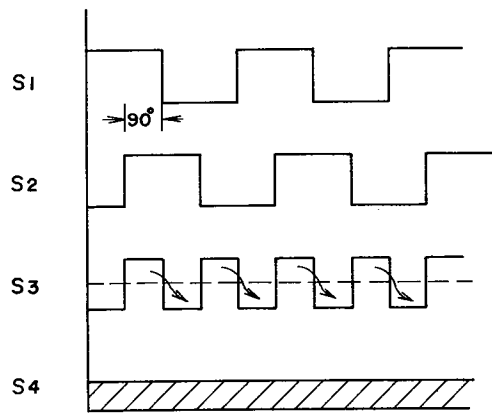


Fig. 11 Output at Non-modulation

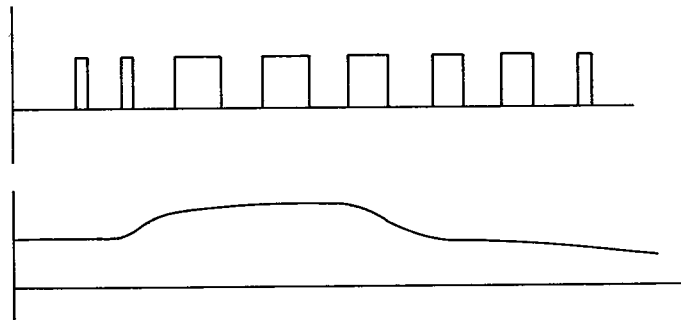


Fig. 12 Output at Modulation Time

The Quadrature Detection Circuit is comprised of a Phase Circuit, a Multiplier Circuit and a Low Pass Filter (L.P.F.) as shown in Fig. 7.

There are two types of Phase Circuits, the Single tuning type shown in Fig. 8 and the Double tuning type shown in Fig. 9. However, because with the double tuning type there is less frequency deviation in relation to carrier frequency, linearity is improved as shown in Fig. 10 and phase distortion is reduced, this type phase circuit is employed in the AT-2250.

Input signal S1 is divided into the part which enters the direct multiplier circuit and the part which passes the phase circuit and enters the multiplier circuit. The signal supplied to the phase circuit is always 90° phase delayed at L1. Also because at Non-modulation time, L2 is tuned to 10.7 MHz, if modulation is applied and S1 is changed from 10.7 MHz, phase deviation at L2 will take place proportionately in relation to this changed part and this becomes S2 signal which is delayed in relation to S1.

At Non-modulation, because as shown in Fig. 11, input signal S1 and 90° phase delayed (by means of L1) signal S2 are switched by means of the multiplier circuit, the output signal becomes S3.

Because this S3 passes the low pass filter and becomes S4 fixed direct current, the detector output is zero.

Then, when modulation is applied, because the switched output is varied according to the degree of modulation, and the output which passed the low pass filter becomes the pulsating current part as shown in Fig. 12 detector output is obtained.

VI. OPERATING PRINCIPLES OF PLL CIRCUIT EMPLOYED IN STEREO DEMODULATION CIRCUIT

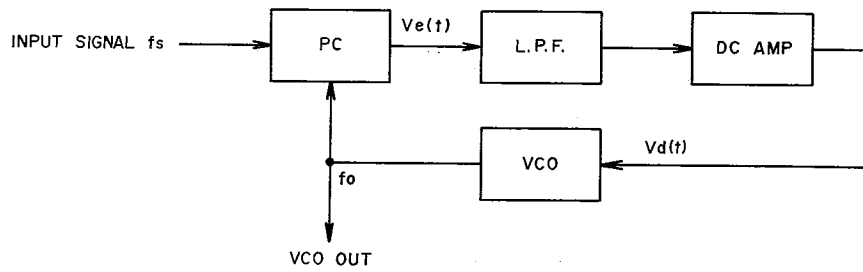


Fig. 13 PLL Circuit

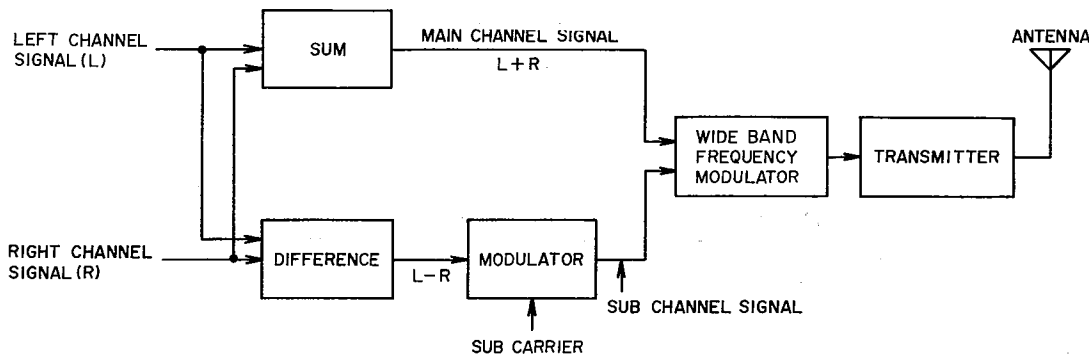


Fig. 14 FM Broadcasting System Diagram

To separate FM stereo broadcast signal received to date into left and right signals, a 19 kHz pilot signal was successively multiplier to form a 38 kHz signal and stereo separation was effected from this. However, with this multiplier system, change in coils due to wear occurred and adjustment points were numerous, etc. Therefore, this model employs a newly developed PLL circuit which produces an exceedingly accurate 38 kHz switching signal.

1. PLL CIRCUIT OPERATION

PLL circuit is a kind of feedback circuit and is comprised of a Phase Comparator (PC), a Low Pass Filter (LPF), a Direct Current Amplifier (DC Amp.), and a Voltage Control Oscillator (VCO) as shown in Fig. 13. The PC compares input signal F_s and VCO oscillator output and generates the difference in signal voltage $V_e(t)$ proportionately to this phase deviation. This $V_e(t)$ passes LPF and the DC Amp. and becomes control voltage. This control voltage supplied to VCO and VCO oscillation frequency is DC controlled. When there is no input signal F_s , because there is also no $V_e(t)$, control voltage $V_d(t)$ becomes zero, and VCO maintains a *Free-running oscillation frequency. When a signal enters, VCO oscillation frequency F_o is controlled to narrow the difference between F_s by means of feedback as described above, and the PLL circuit assumes a synchronous condition. This is referred to as input signal lock. (In case the difference between F_o and F_s is too large, the differential signal frequency becomes high and is reduced at the LPF. However, because the VCO control voltage does not change, PLL will not stay within the *lock range).

Because of the ability of the signal interference removing LPF to accumulate the previous voltage in case the PLL deviates from within the lock range due to certain interference, the original condition is quickly reinstated.

*Free running frequency: Oscillating frequency when there is no input signal.

*Lock range: At the condition in which the VCO oscillation frequency is locked to the input signal, the lock range is the oscillating frequency in which when the input signal changes, the PLL maintains it's input signal lock condition.

Accordingly, in case F_s is changed inside the PLL lock range, VCO oscillation frequency always follows this, and a no frequency deviation and no phase difference signal is obtained. In other words, VCO oscillation frequency can be locked to F_s .

2. STEREO DEMODULATION CIRCUIT

As shown in Fig. 14 for FM broadcasts, the sum signal (L+R) consists of left signal (L) and right signal (R) and the audio frequency band of this signal in its original form is frequency modulated.

On the other hand, the difference signal of both (L-R) is changed to high frequency through the use of the sub carrier, and is referred to as the sub channel signal. The carrier is further frequency modulated and sent to the FM stereo transmitter. Accordingly, for composite stereo signal demodulation, the sub carrier used for demodulation at the transmitter must be the same uniform 38 kHz signal as the frequency and phase. If the 38 kHz waveform is asymmetrical, channel separation will become poor.

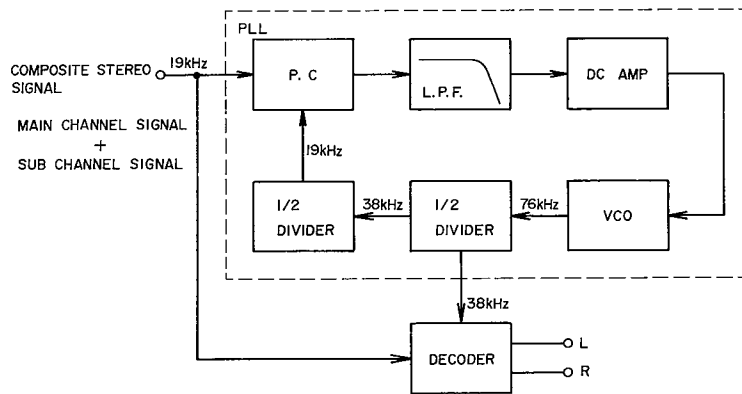


Fig. 15 MPX IC Function

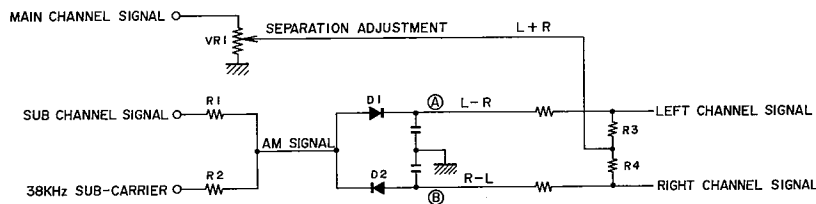


Fig. 16 Multiplex Decoder

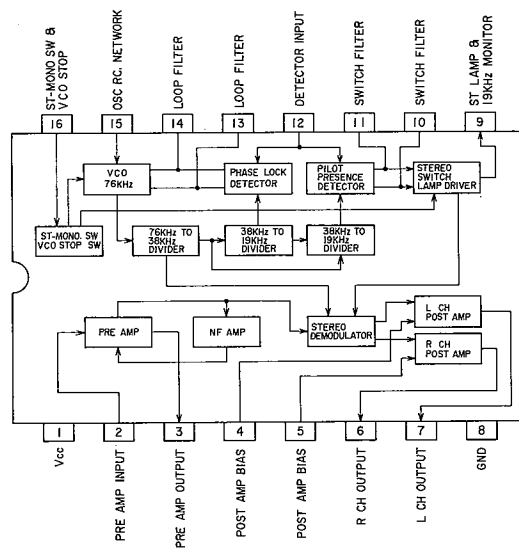


Fig. 17 μ PC1161C Block Diagram

At the PLL employed MPX stereo demodulator circuit, as shown in Fig. 15 first a 76 kHz signal is oscillated and when this passes the divider, a symmetrical 38 kHz signal is obtained.

This 38 kHz sub carrier is supplied to the multiplex decoder together with the sub channel of the composite stereo signal. At the multiplex decoder, left and right channel audio signals are separated in order as shown in Fig. 16.

The 38 kHz sub carrier composited with the sub channel signal of which the carrier part was removed when sub channel signal and sub carrier passed R1 R2 produces the regular AM wave. Then, because this envelop is

detected by mutually reverse polarity connected diodes D1 and D2, L-R signal is emitted at point A and R-L signal at point B.

Also, because main channel signal (L+R) is supplied to R3, R4 center point, A B point voltage is added and subtracted and becomes

$$(L+R) + (L-R) = 2L \text{ (left channel)}$$

$$(L+R) + (R-L) = 2R \text{ (right channel)}$$

The level of the main channel signal (L+R) can be adjusted by means of variable resistor VR (VR1) for optimum separation.

However, please refer to Fig. 17 for the Block Diagram of PLL IC μ PC1161C used in the model AT-2250.

VII. LEVEL DIAGRAM

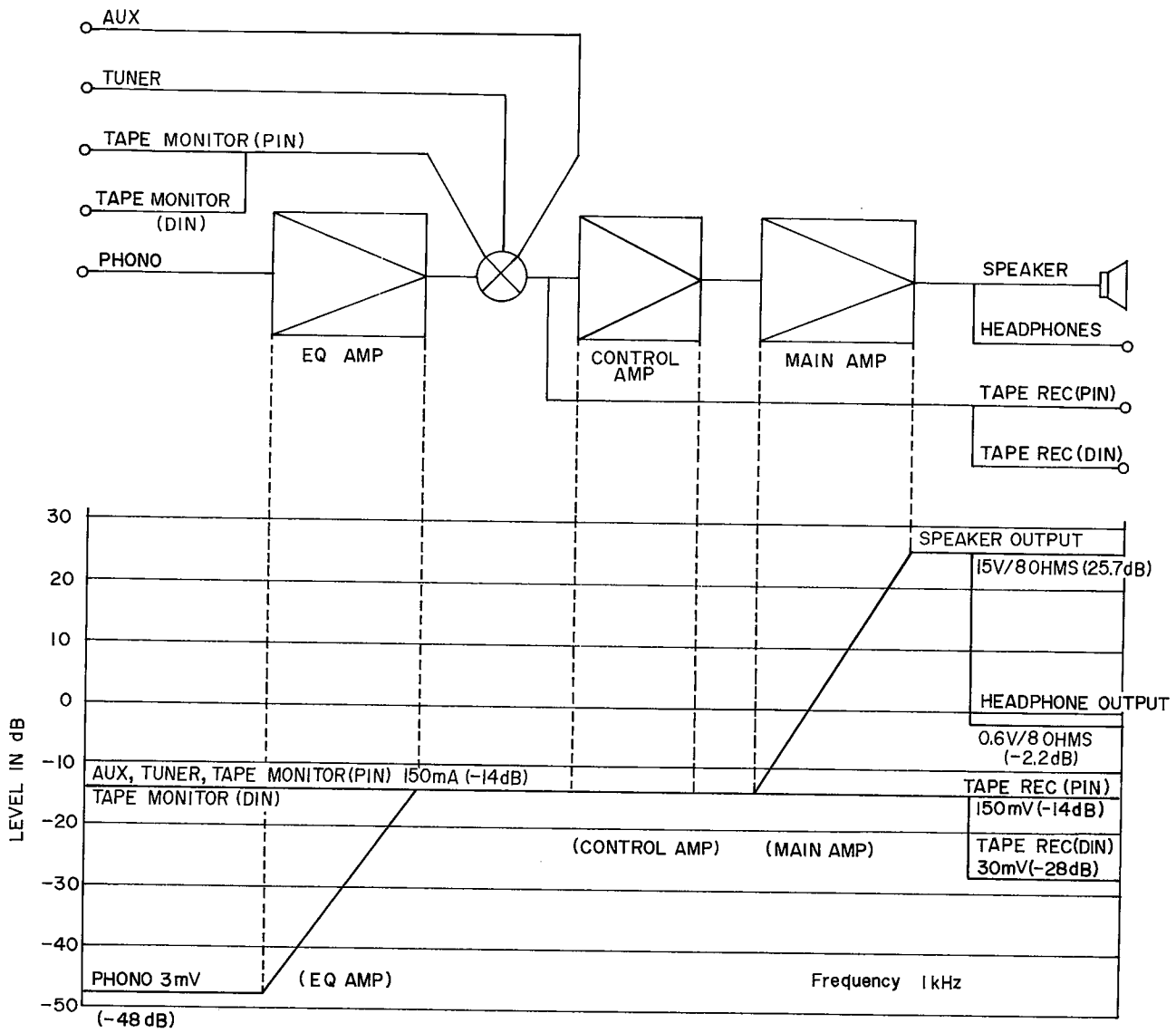


Fig. 18 Level Diagram AM-2250

VIII. TUNER ADJUSTMENT

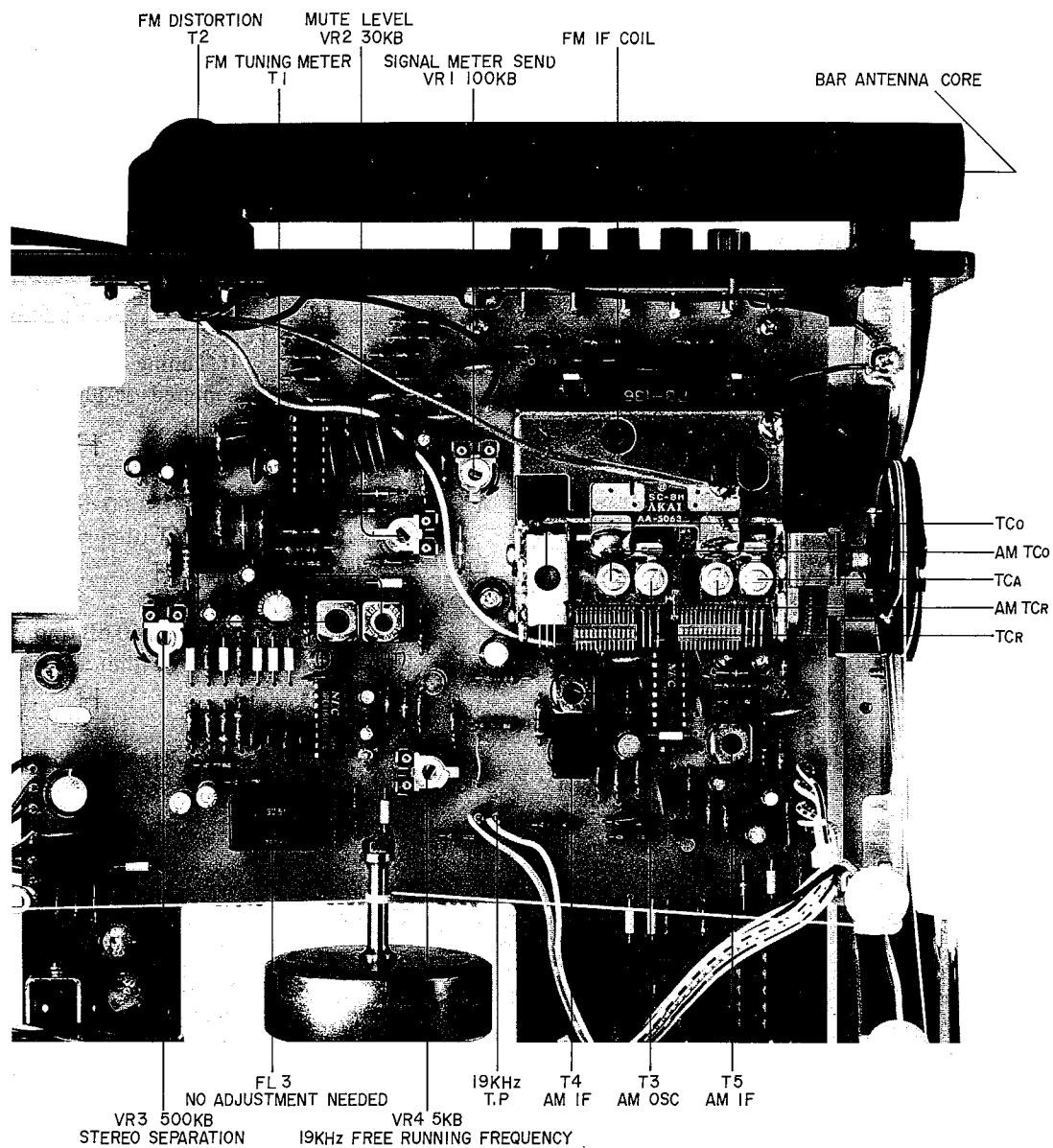


Fig. 19 Tuner P.C Board T3-2501A

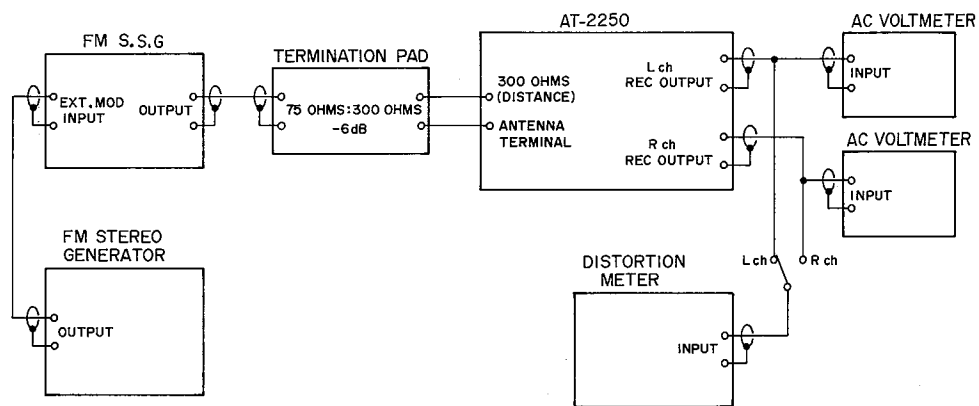


Fig. 20 Instrument Connections

1. FM TUNER SECTION ADJUSTMENT (Refer to Figs. 19, 20)

Step	Adjustment Item	Adjustment Point	Result	Remarks
1	Tuning Meter Centering	T1 (WHT) (Tuner P.C Board)	Centered Tuning Meter Indication	SELECTOR to FM MODE to FM MONO. Tunes only noise without interference from broadcasting.
2	Distortion Factor	T2 (BLU) (Tuner P.C Board)	Less than 0.1% Distortion Factor	98 MHz, 60 dB (mono) input. Less than 0.1% on both channels. See NOTE 1.
3	Confirmation of Tuning Meter Indication			If Tuning Meter Indication is not centered re-adjust Step 1 and 2 above.
4	High Range Scale Indication	TC _o (Front End)	Maximum Output	108 MHz, 60 dB (mono) input. Error: Within ±250 kHz.
5	Confirmation of Low Range Scale Indication		Maximum Output	88 MHz, 60 dB (mono) input. Error: Within ±250 kHz.
6	High Range Sensitivity	TCR, TCA (Front End)	Less than 3% Distortion Factor	108 MHz, Less than 6 dB (mono) input.
7	Confirmation of Low Range Sensitivity		Less than 3% Distortion Factor	88 MHz, Less than 6 dB (mono) input. See NOTE 2.
8	Confirmation of Mid Range Sensitivity		Less than 3% Distortion Factor	98 MHz, Less than 6 dB (mono) input. See NOTE 2.
9	Mute Level	VR2 30 kΩ (Tuner P.C Board)	No Signal emitted from Output	MODE to FM AUTO/MUTE. 98 MHz, 15 dB (mono) input.
10	PLL IC Free Running Frequency	VR4 5 kΩ (Tuner P.C Board)	19.00 kHz	Frequency Counter to Test Point. (Tuner P.C Board) See NOTE 3.
11	Confirmation of Stereo Indicator Lighting			98 MHz, 60 dB (stereo) input. Unlit stereo indicator indicates no stereo separation.
12	Stereo Separation (Left→Right)	VR3 500 kΩ (Tuner P.C Board)	More than 42 dB	98 MHz, 60 dB (stereo), Lch input. Minimum output of R ch.
13	Stereo Separation (Right→Left)	VR3 500 kΩ (Tuner P.C Board)	More than 42 dB	98 MHz, 60 dB (stereo), Rch input. Minimum output of L ch.
14	Signal Meter Sensitivity	VR1 100 kΩ (Tuner P.C Board)	Indicator at "4.5"	98 MHz 100 dB (mono) input.

Chart 1

- NOTES: 1. When the distortion factor is not less than 0.1% in Step 2, adjust by turning the Front End IF Coil core but not more than one turn.
2. In the event that distortion factors in Steps 7 and 8 are not less than 3%, readjust Front End Trimmer Condensers TCR and TCA to obtain a minimum average distortion factor at 88, 98 and 108 MHz (same distortion factor at all three points).
3. PLL IC free running frequency must be an exact 19.00 kHz.

2. AM TUNER SECTION ADJUSTMENT (Refer to Fig. 19)

Step	Adjustment Item	Adjustment Point	Result	Remarks
1	Low Range Scale Indication	T3 (RED) (Tuner P.C Board)	Maximum Output	SELECTOR to AM. 520 kHz 50 dB input. TUNING INDICATOR to 520 kHz. Error: Within 2%
2	High Range Scale Indication	AM TCo (Front End)	Maximum Output	1,400 kHz 50 dB input. TUNING INDICATOR to 1,400 kHz Error: Within 2%
3	Low Range Sensitivity	Bar Antenna core T4, T5 (BLK) (Tuner P.C Board)	Maximum Output Minimum Distortion Factor	520 kHz 50 dB input. Less than 10% Distortion Factor.
4	High Range Sensitivity	AM TCR (Front End)	Maximum Output Minimum Distortion Factor	1,400 kHz 50 dB input. Less than 10% Distortion Factor.

Chart-2

NOTE: For best results, repeat Steps 1 through 4 two or three times.

IX. TUNING CORD THREADING

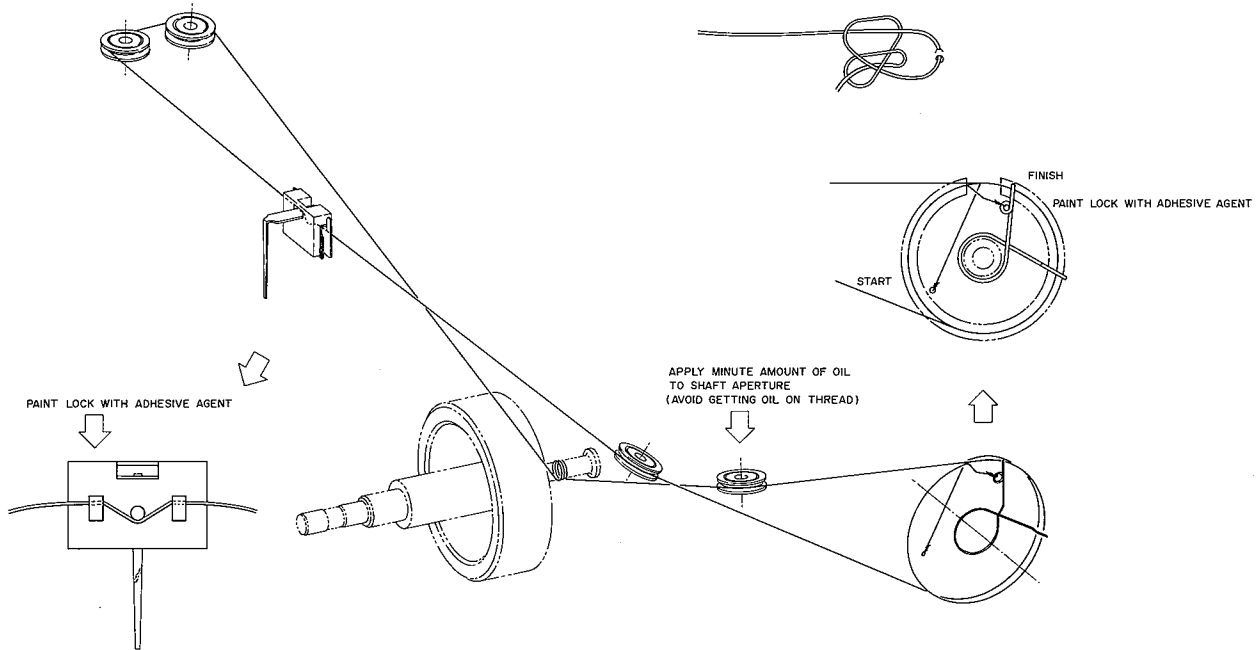


Fig. 21 Tuning Cord Threading

X. CLASSIFICATION OF VARIOUS P.C BOARDS

1. P.C BOARD TITLE AND IDENTIFICATION NUMBER

1) Model AT-2250

P.C Board	Number of P.C Board
Tuner P.C Board	T3-2501A
LED P.C Board	T3-2501B
Lamp P.C Board	T3-2501C
Fuse P.C Board	T3-2501D
Antenna P.C Board	AA-5063

Chart-3

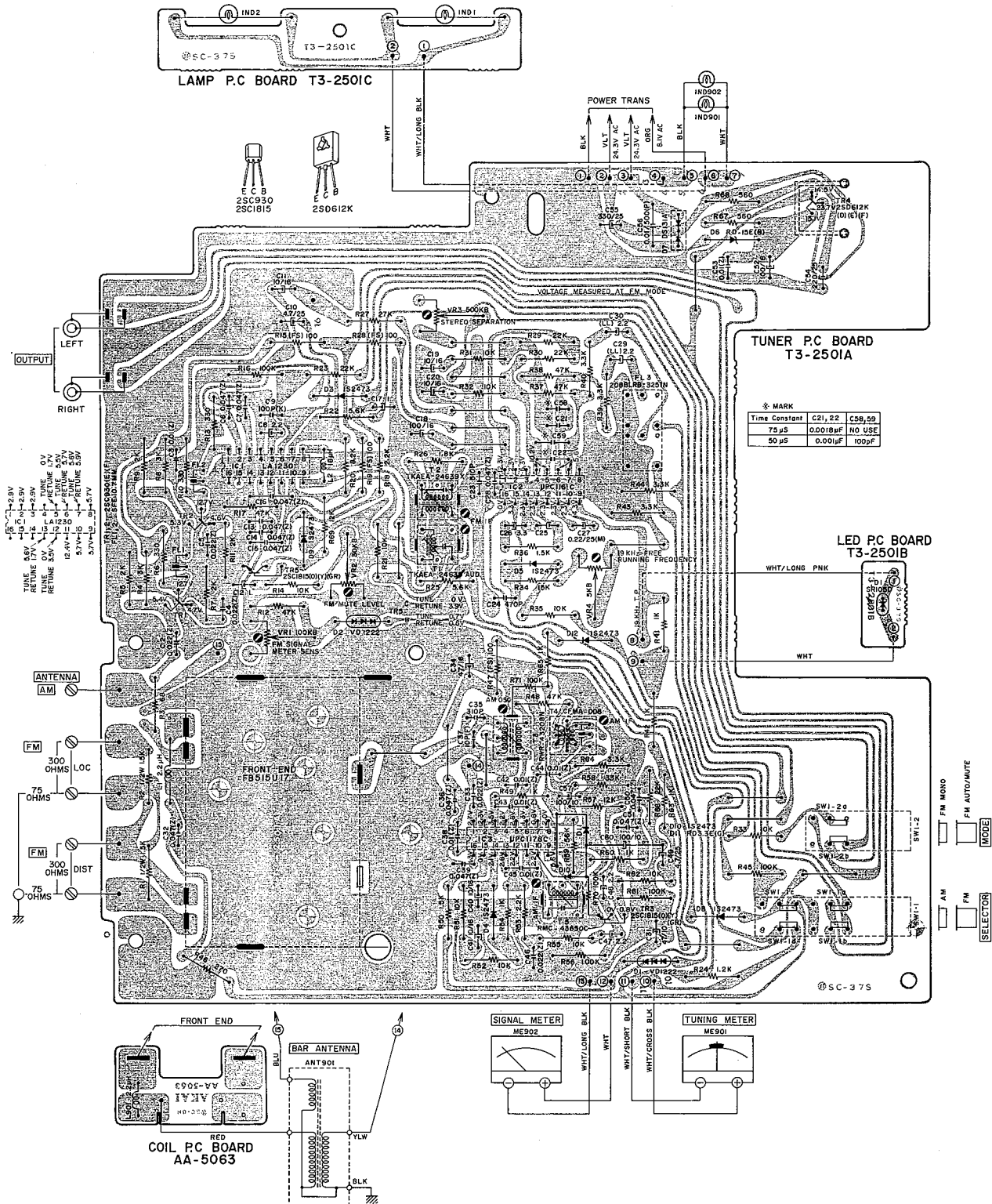
2) Model AM-2250

P.C Board	Number of P.C Board
Main Amp P.C Board	M3-2501
Control Amp P.C Board	M3-2502
Speaker SW P.C Board	M3-2503A
Fuse P.C Board	M3-2503B
LED P.C Board	M3-2503C

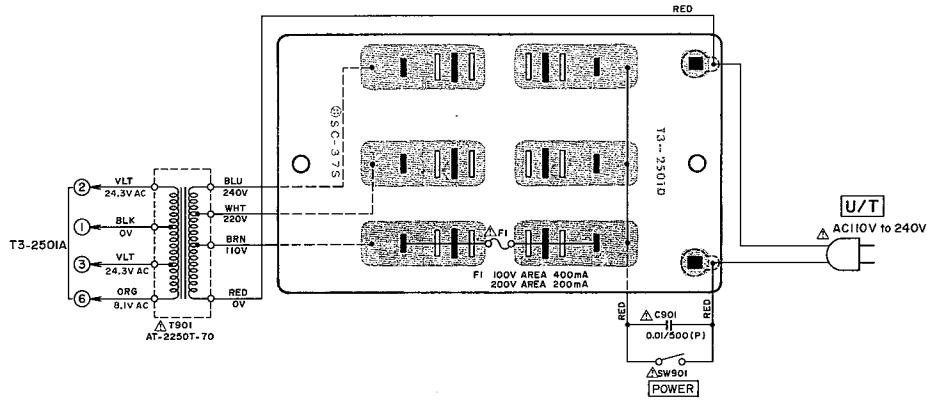
Chart-4

2. MODEL AT-2250 COMPOSITION OF VARIOUS P.C BOARDS

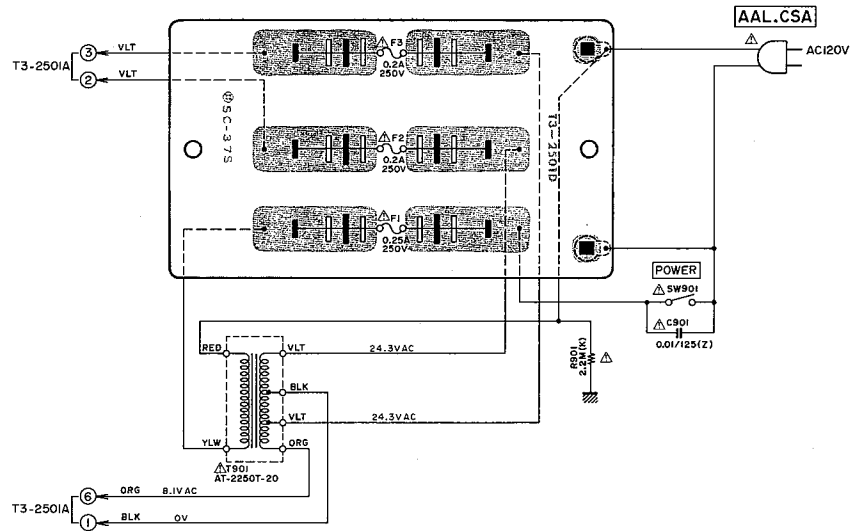
- 1) TUNER P.C BOARD T3-2501A, LED P.C BOARD T3-2501B, LAMP P.C BOARD T3-2501C and ANTENNA P.C BOARD AA-5063



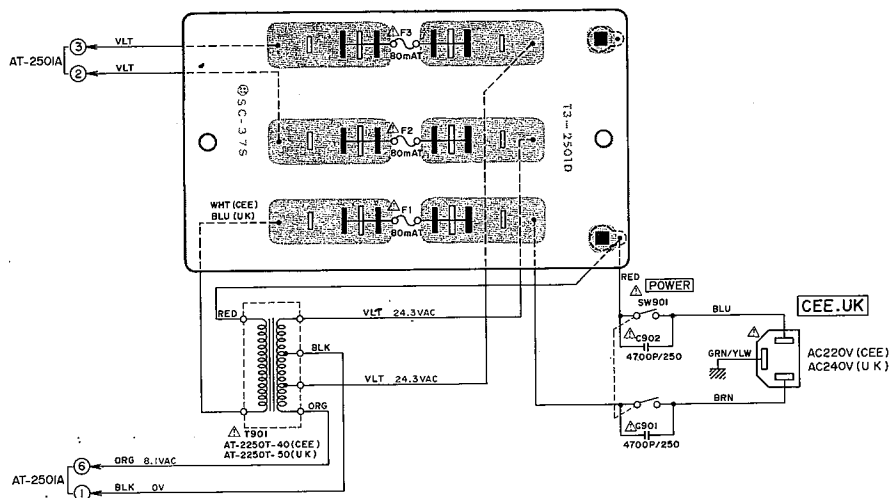
2) FUSE P.C BOARD T3-2501D (U/T)



3) FUSE P.C BOARD T3-2501D (AAL, CSA)



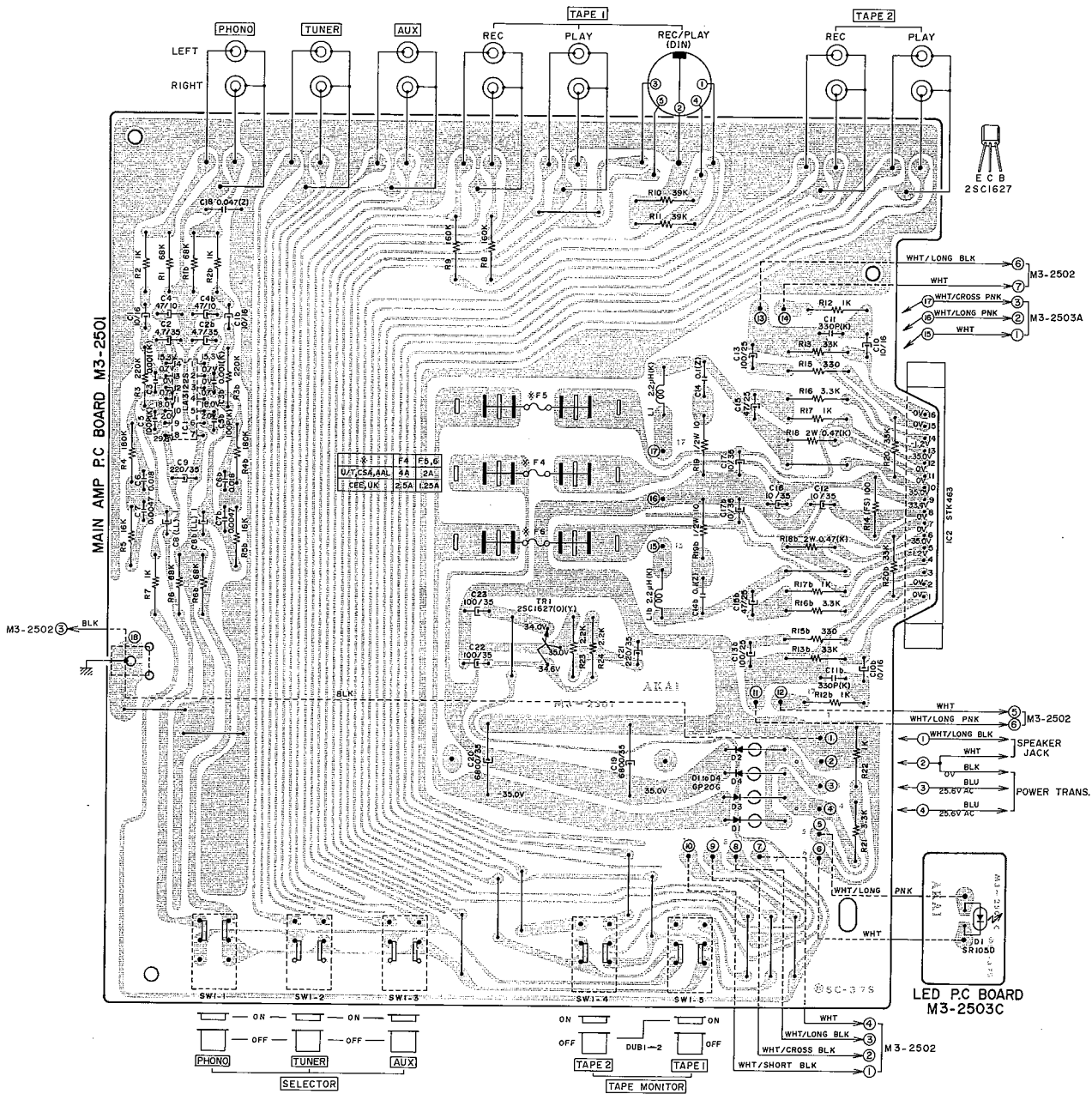
4) FUSE P.C BOARD T3-2501D (CEE, U K.)



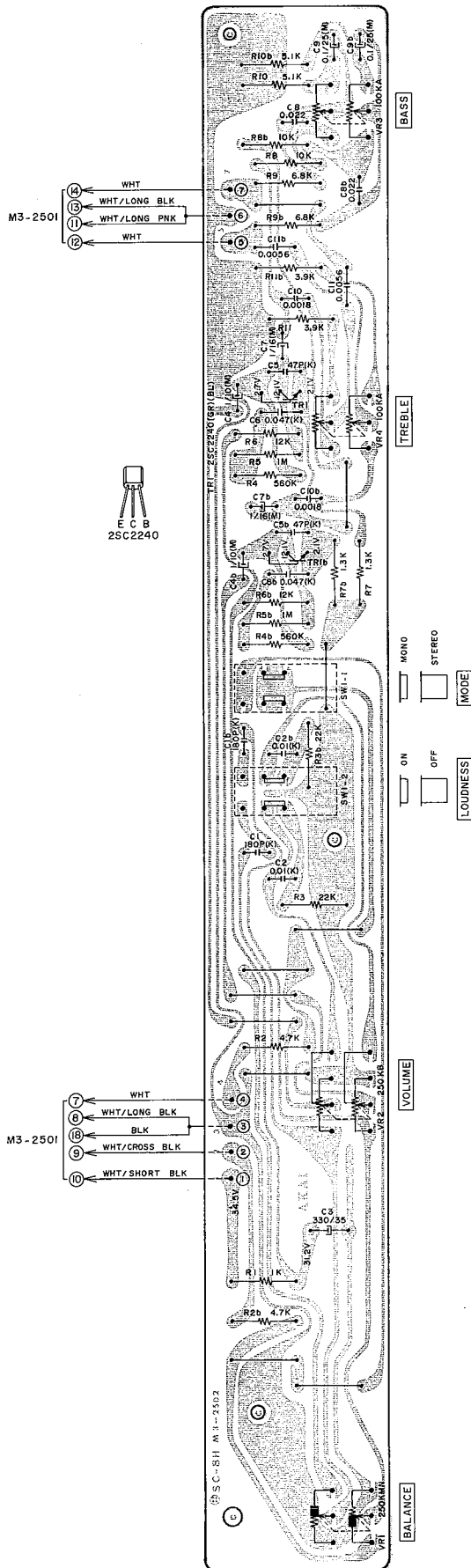
WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.
 AVERTISSEMENT: ⚠ IL INDIQU LES COMPOSANTS CRITIQUES DE SÛRETÉ. POUR MAINTENIR LE DEGRÉ DE SÛRETÉ DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SÛRETÉ QUE PAR DES PIÈCES RECOMMANDÉES PAR LE FABRICANT.

3. MODEL AM-2250 COMPOSITION OF VARIOUS P.C BOARDS

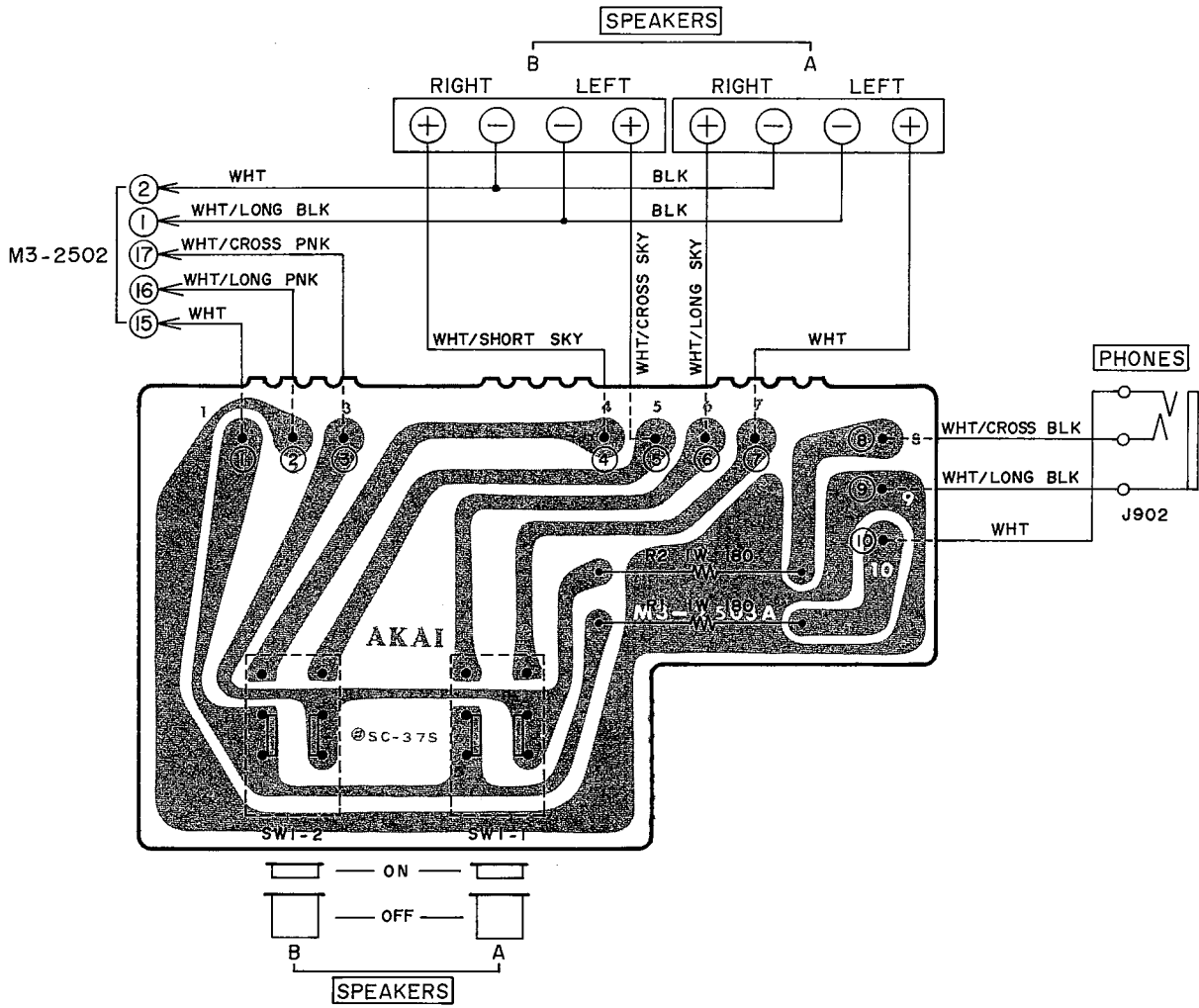
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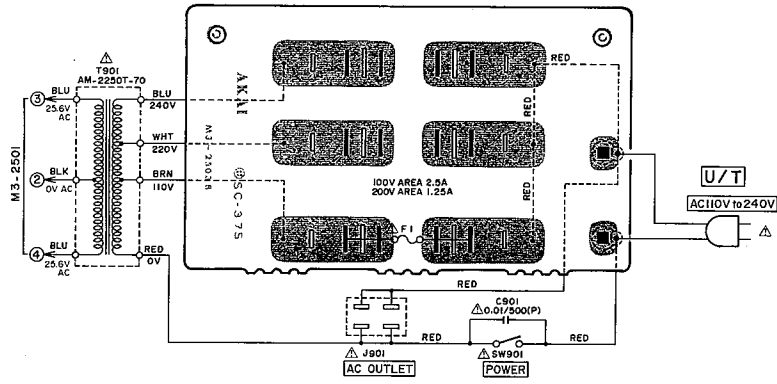
2) CONTROL AMP P.C BOARD M3-2502



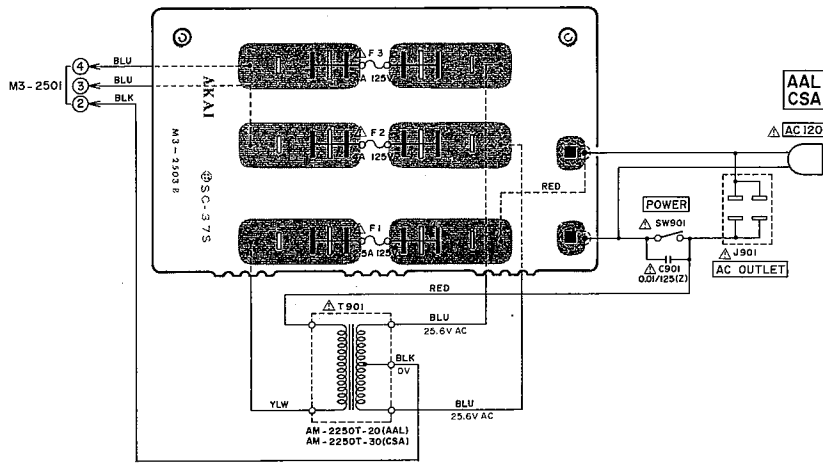
3) SPEAKER SW P.C BOARD M3-2503A



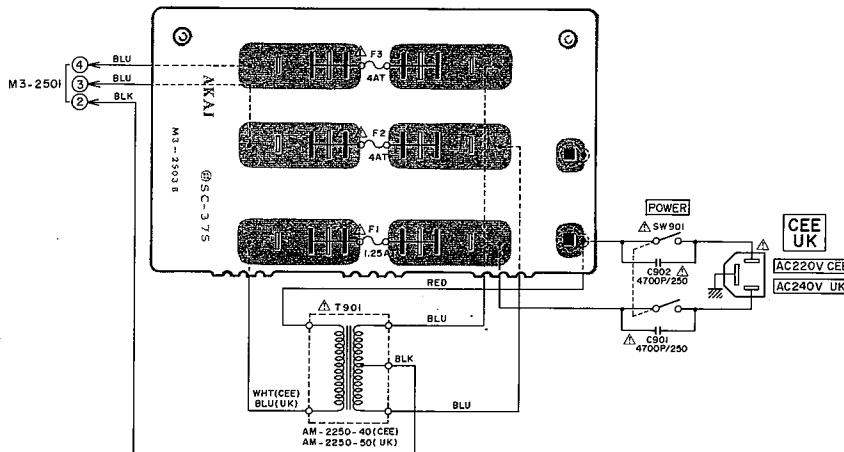
4) FUSE P.C BOARD M3-2503B (U/T)



5) FUSE P.C BOARD M3-2503B (AAL, CSA)



6) FUSE P.C BOARD M3-2503B (CEE, U.K.)



WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS
 AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÛRETÉ. POUR MAINTENIR LE DEGRÉ DE SÛRETÉ DE L'APPAREIL NE REMPLACER LES COMPOSANTS DONT LE FONCTIONNEMENT EST CRITIQUE POUR LA SÛRETÉ QUE PAR DES PIÈCES RECOMMANDÉES PAR LE FABRICANT

SECTION 2

PARTS LIST

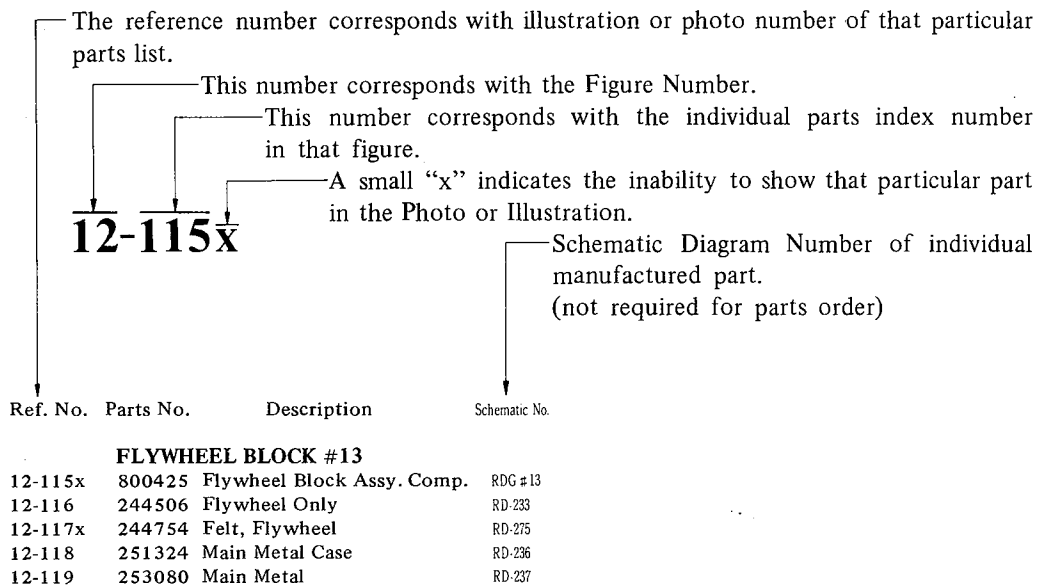
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[MODEL AM-2250]	
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Resistor and Capacitor which is not listed in this parts list, please refer to COMMON LIST FOR SERVICE PARTS.

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.



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 RECOMMENDED 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.

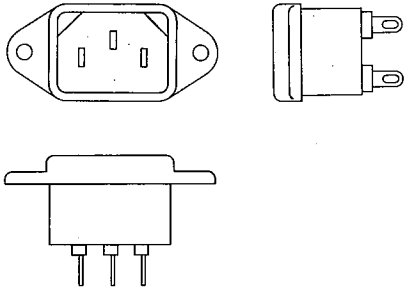
AC INLET SYSTEM

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

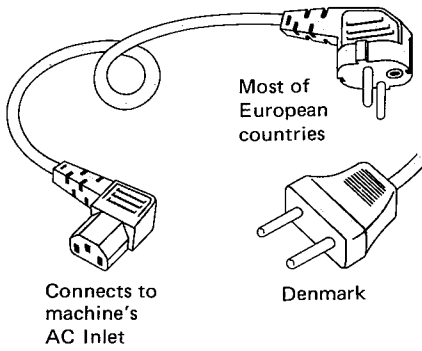
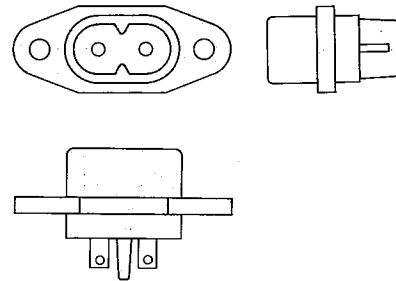
CLASS I



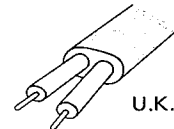
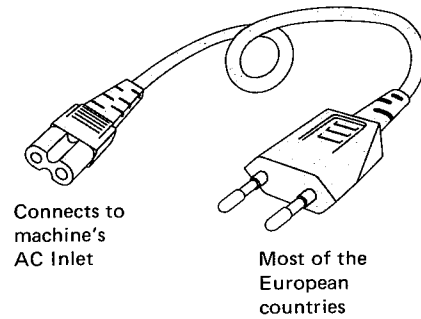
Picture 1
AC INLET
to be
installed
on machines

CLASS II

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



Picture 2
AC (mains)
cord



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.

MODEL AT-2250

Parts No.	Description	Note
BA307102	Tuner P.C Board Comp. AT-2250	
BT307169	△ Power Trans. AT-2250T-70	(U/T)
BT307162	△ Power Trans. AT-2250T-20	(CSA, AAL)
BT307164	△ Power Trans. AT-2250T-40	(CEE)
BT307165	△ Power Trans. AT-2250T-50	(UK)
ED490511	Varistor VD1222	
ED624903	Silicon Diode 1S2473	
ED306937	Zener Diode RD-15EB	
ED223547	Silicon Diode DS131A	
ED311864	Zener Diode RD-3.3E (C)	
ED698826	LED SR-105D	
EE306880	Bar Antenna	
EE307156	Front End FB515U14	
EI650586	IC LA-1230	
EI307200	IC μ PC1161C	
EI307199	IC μ PC1178C	
EL307155	Lamp (Fuse Type) 8V 100 mA	
EL307157	Lamp (Cord Type) 8V 300 mA (300mmx2)	
EL307172	Lamp (Cord Type) 8V 300 mA (400mmx2)	
EM306939	Tuning Meter KL-218U-29	
EM307159	Tuning Meter KL-218U-31	(BL)
EM306938	Signal Meter KL-218U-28	
EM307158	Signal Meter KL-218U-30	(BL)
ES307197	2 throw Push SW. 12T-7S138	
ES224436	△ Push SW. JP01 (U/T)	
ES239218	△ Push SW. JP01 (TV-4)	(CSA, AAL)
ES242346	△ Push SW. JP17	(CEE, UK)
ET618873	Transistor 2SC930 (E)(F)	
ET305221	Transistor 2SC1815 (O)(Y)(GR)	
ET307193	Transistor 2SD612K (D)(E)(F)	
EV305640	Semi-fixed/Vol. D10 Axial Type 100 kB	
EV307248	Semi-fixed/Vol. D10 Axial Type 30 kB	
EV306184	Semi-fixed/Vol. D10 Axial Type 500 kB	
EV307246	Semi-fixed/Vol. D10 Axial Type 5 kB	

MODEL AM-2250

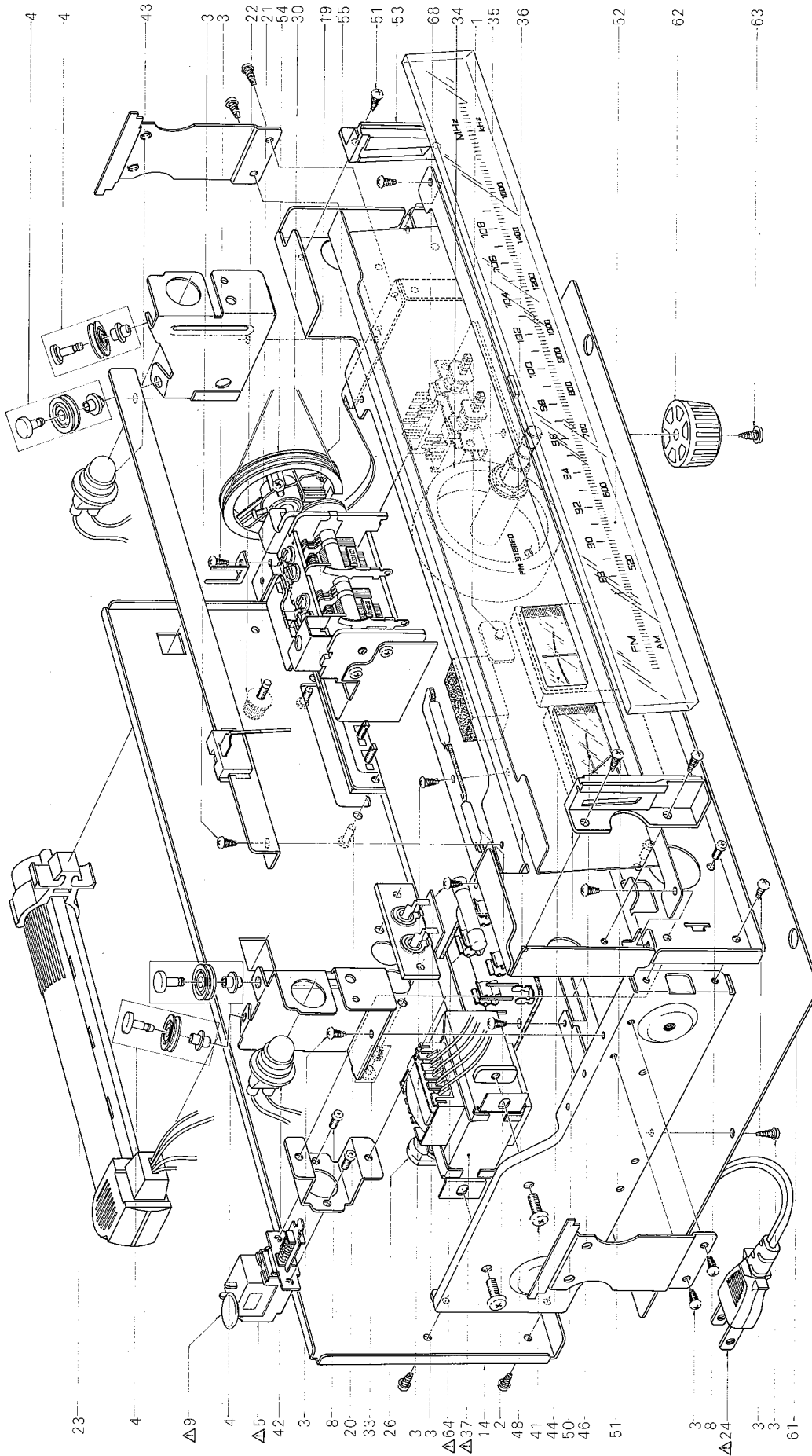
Parts No.	Description	Note
BA307369	Tone Control P.C Board Comp. AM-2250	
BA307371	Main Amp P.C Board Comp. AM-2250 (U/T)	(U/T)
BA311987	Main Amp P.C Board Comp. AM-2250 (CSA)	(CSA, AAL)
BA307373	Main Amp P.C Board Comp. AM-2250 (CEE)	(CEE, UK)
BT306948	△ Power Trans. AM-2250T-70	(U/T)
BT306945	△ Power Trans. AM-2250T-30	(CSA)
BT306943	△ Power Trans. AM-2250T-20	(AAL)
BT306946	△ Power Trans. AM-2250T-40	(CEE)
BT306947	△ Power Trans. AM-2250T-50	(UK)
ED245417	Silicon Diode GP20G	
ED698826	LED SR-105D	
EI697871	IC LA-3122S	
EI306941	IC STK463	
ES307187	2 Throw Push SW. 12T-7S137	
ES310452	5 Throw Push SW. SUE54	
ES301658	2 Throw Push SW. J-P7126#01	
ES224436	△ Push SW. JP01	(U/T)
ES280258	△ Push SW. SDV1P TV-5 (w/label)	(CSA)
ES239218	△ Push SW. JP01 (TV-4)	(AAL)
ES242346	△ Push SW. JP17	(CEE, UK)
ET307195	Transistor 2SC2240 (GR)(BL)	
ET293253	Transistor 2SC1627 (O)(Y)	
EV307189	Single axial 2 throw Vol. GM70E-250kMN	
EV307188	Single axial 2 throw Vol. GM80E-250kBx2	
EV307190	Single axial 2 throw Vol. GM70E-100kAx2	

[MODEL AT-2250]

2. TUNER P.C BOARD (T3-2501A) BLOCK

Symbol No.	Parts No.	Description	Schematic No.
2-1	BA307102	Tuner P.C Board Comp. AT-2250	
2-IC1	EI650586	IC LA-1230	45-8-152
2-IC2	EI307200	IC μ PC1161C	45-8-269
2-IC3	EI307199	IC μ PC1178C	45-8-268
2-TR1,2	ET618873	Transistor 2SC930(E)(F)	45-1-185
2-TR3	ET305221	Transistor 2SC1815(O)(Y)(GR)	45-1-299
2-TR4	ET307193	Transistor 2SD612K(D)(E)(F)	45-1-308
2-TR5	ET305221	Transistor 2SC1815(O)(Y)(GR)	45-1-299
2-D1,2	ED490511	Varistor VD1222	45-10-7
2-D3to5	ED624903	Silicon Diode 1S2473	45-3-28
2-D6	ED306937	Zener Diode RD-15EB	45-6-72
2-D7	ED223547	Silicon Diode DS131A	45-2-67
2-D8to10	ED624903	Silicon Diode 1S2473	45-3-28
2-D11	ED311864	Zener Diode RD-3.3E(C)	45-6-72
2-D12	ED624903	Silicon Diode 1S2473	45-3-28
2-FL1,2	ER307201	Ceramic Filter SFE10.7MM	53-1-132
2-FL3	ER307206	Block Filter 208BLRB-3251N	53-1-138
2-T1	EO307202	Detection Coil TKAEA-24638AUO	23-1-290
2-T2	EO307203	Detection Coil TKAEA-24639X	23-1-291
2-T3	EO307186	OSC Coil RWR-43208N	23-4-47
2-T4	BT307204	AM-IF Trans. CFMA-008	53-1-131
2-T5	EO307205	AM-IF Coil RMC-43650C	23-1-292
2-L1	EO539820	Peaking Coil 2.2 μ H(K)	23-1-187
2-L2	EO650610	Inductor 144LZ 18 μ H(J)	23-1-240
2-VR1	EV305640	Semi-fixed/Vol. D10 Axial Type 100 k Ω	36-10-274
2-VR2	EV307248	Semi-fixed/Vol. D10 Axial Type 30 k Ω	36-10-274
2-VR3	EV306184	Semi-fixed/Vol. D10 Axial Type 500 k Ω	36-10-274
2-VR4	EV307246	Semi-fixed/Vol. D10 Axial Type 5 k Ω	36-10-274
2-SW1	ES307197	2 throw Push SW. 12T-7S138	25-5-282
2-J1	EJ223457	2P Pin Jack	31-1-167
2-2	ZS325495	Tapping Screw #2, 3x6 (BR)	
2-C24	EC405898	Styrol/C. (Vert. Type) 470PF(J) 50WV	24-11-3
2-C27	EC522167	Solid Aluminum/C. (Vert. Type) 0.22 μ F(M) 25WV	24-19-2
2-C35	EC650406	Styrol/C. (Vert. Type) 310PF(J) 50WV	24-11-3

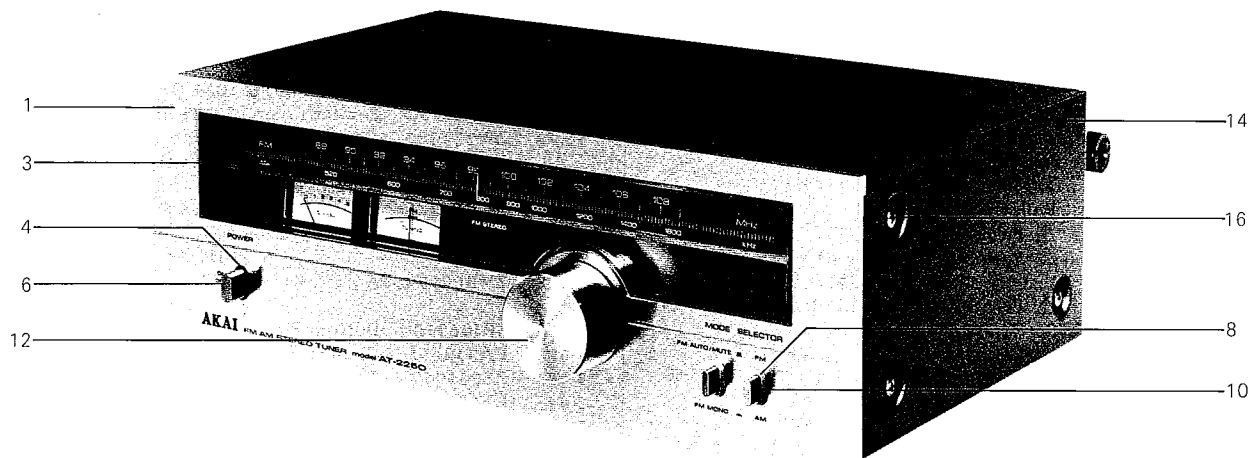
3. ILLUSTRATION OF ASSEMBLY BLOCK



3) ASSEMBLY BLOCK

Ref. No.	Parts No.	Description	Schematic No.	Ref. No.	Parts No.	Description	Schematic No.
LED P.C BOARD BLOCK							
3-1	ED698826	LED SR-105D	45-15-16	3-52	TA306909	Scale Plate (A)	T3-2516
LAMP P.C BOARD BLOCK							
3-2	EL307155	Lamp (Fuse Type) 8V 100 mA	28-2-69	3-53	TA306921	Scale Plate Holder (R)	T3-2525
ASSEMBLY BLOCK							
3-3	ZS325495	Tapping Screw #2, 3x6 (BR)		3-54	TA307154	Dial Wheel Comp. AT-2250	2-15-18
3-4	MZ307170	Pulley	13-2-39	3-55	TA307160	Dial String TK-1064 D0.5	8-2-1
3-5	ES224436	△ Push SW. JP01 (U/T)	25-5-221	3-56	TA307150	Pointer Comp. AT-2250	T3-2531
3-6x	ES239218	△ Push SW. JP01 (TV-4) (CSA, AAL)	25-5-222	3-57x	ZW224087	Adjust. Washer (U) D4.5x10x0.5t	
3-7x	ES242346	△ Push SW. JP17 (CEE, UK)	25-5-224	3-58x	ZW224144	Adjust. Washer (U) D4.5x10x0.4t	
3-8	ZS379350	Screw, pan head 3x6		3-59x	ZW307173	Adjust. Washer (U) D4.5x10x0.2t	
3-9	EC204671	△ Ceramic/C. DD31-6E 0.01μF(P) 500WV (U/T)	24-5-66	3-60x	ZW307174	Adjust. Washer (U) D4.5x10x0.3t	
3-10x	EC286198	△ Ceramic/C. AL-10 0.01μF(Z) 125WV (CSA, AAL)	24-5-69	3-61	SP306910	Bottom Plate	T3-2517
3-11x	EC301320	△ MP/C. 4700PF(M) 250WV (CEE, UK)	24-9-122	3-62	EA312465	Circular Foot (A) Part CA	CA-6014
3-12x	ZS434250	Screw, pan head 4x8, w/washer (CEE, UK)		3-63	ZS565942	Tapping Screw #2, 4x8 (Pan)	
3-13x	ZW413188	Nut M4, #1 (CEE, UK)		3-64	EF683324	△ Fuse SS-2 0.4A 250V	39-1-56
3-14	SP306890	Rear Panel (A) (U/T)	T3-2503	3-65x	EF214738	△ Fuse SS-2 0.25A 250V (CSA, AAL)	39-1-56
3-15x	SP306892	Rear Panel (C) (CSA)	T3-2504	3-66x	EF224155	△ Fuse SS-2 0.2A 250V (U/T, CSA, AAL)	39-1-56
3-16x	SP306891	Rear Panel (B) (AAL)	T3-2503	3-67x	EF307178	△ Fuse 80mAT (CEE, UK)	39-1-60
3-17x	SP306893	Rear Panel (D) (CEE)	T3-2504	3-68	ES307197	2 throw Push SW. 12T-7S138	25-5-282
3-18x	SP306894	Rear Panel (E) (UK)	T3-2505				
3-19	EZ655187	5P Antenna Terminal Plate	32-1-69				
3-20	ZS307171	S Tight Screw, 3x8 (Bind) (Oval Neck)	7-1-67				
3-21	EJ306940	Earth Terminal	32-1-87				
3-22	ZW651082	Washer (SPC) D3.2x10x1t					
3-23	EE306880	Bar Antenna	55-1-53				
3-24	EW306428	△ AC Cord (U/T)	26-3-64				
3-25x	EW305691	△ AC Cord CUL (CSA, AAL)	26-3-65				
3-26	EZ631945	Strain Relief SR-4N-4 (U/T, CSA, AAL)	2-7-49				
3-27x	EJ296853	△ 3P In-let CM-3 (CEE, UK)	31-1-199				
3-28x	ZS463353	Tapping Screw #2, 3x8 (BR) (Black) (CEE, UK)					
3-29x	ZS447761	Tapping Screw #2, 3x6 (BR) (Black)					
3-30	EE307156	Front End FB515U14	57-2-46				
3-31x	EO539820	Peaking Coil 2.2μH (K)	23-1-187				
3-32x	ZS302024	Tapping Screw #2, 3x8 (Pan) W=10					
3-33	ZW698308	Nylon Rivet (FNRP) 3x5.5 (BLACK)	2-7-54				
3-34	MI300419	Tuning Wheel Part	13-2-26				
3-35	ZW436026	Washer (SPC) D9.2x15x0.5t					
3-36	ZW302896	Nut D9x11x2t (P=0.75)					
3-37	BT307169	△ Power Trans. AT-2250T-70 (U/T)	38-4-601				
3-38x	BT307162	△ Power Trans. AT-2250T-20 (CSA, AAL)	38-4-599				
3-39x	BT307164	△ Power Trans. AT-2250T-40 (CEE)	38-4-600				
3-40x	BT307165	△ Power Trans. AT-2250T-50 (UK)	38-4-648				
3-41	ZS424056	Screw, pan head 4x10					
3-42	EL307157	Lamp (Cord Type) 8V 300 mA (300mmx2)	28-2-71				
3-43	EL307172	Lamp (Cord Type) 8V 300 mA (400mmx2)	28-2-71				
3-44	EM306939	Tuning Meter KL-218U-29	46-1-195				
3-45x	EM307159	Tuning Meter KL-218U-31 (BL)	46-1-197				
3-46	EM306938	Signal Meter KL-218U-28	46-1-194				
3-47x	EM307158	Signal Meter KL-218U-30 (BL)	46-1-196				
3-48	SP306907	Meter Panel	T3-2515				
3-49x	SP306908	Meter Panel (BL)	T3-2515				
3-50	TA306920	Scale Plate Holder (L)	T3-2524				
3-51	ZS447840	Tapping Screw #2, 3x8 (BR)					

4. PHOTO OF FINAL ASSEMBLY BLOCK



4) FINAL ASSEMBLY BLOCK

Ref. No.	Parts No.	Description	Schematic No.
FRONT PANEL BLOCK			
4-1	BD307100	Front Panel Block Comp. AT-2250	T3-2559
4-2x	BD307101	Front Panel Block Comp. AT-2250-BL	T3-2559
4-3	TA306898	Front Plate	T3-2509
4-4	SE306863	Button Escutcheon	M3-2522
4-5x	ZG306867	Taper Spring	M3-2524
4-6	SK306864	Push Button	M3-2523
4-7x	SK306866	Push Button (BL)	M3-2523
4-8	SE306143	Button Escutcheon (A)	CN-6308
4-9x	SE306144	Button Escutcheon (A-BL)	CN-6308
4-10	SK305653	Push Button (A)	CN-6309
4-11x	SK305656	Push Button (D) (BL)	CN-6309
FINAL ASSEMBLY BLOCK			
4-12	SK306927	Tuning Knob	T3-2532
4-13x	SK306928	Tuning Knob (BL)	T3-2532
4-14	BC306913	Upper Cover (A)	T3-2519
4-15x	BC306915	Upper Cover (B) (AAL)	T3-2519
4-16	ZS537006	Screw, binding head 4x8	

[MODEL AM-2250]

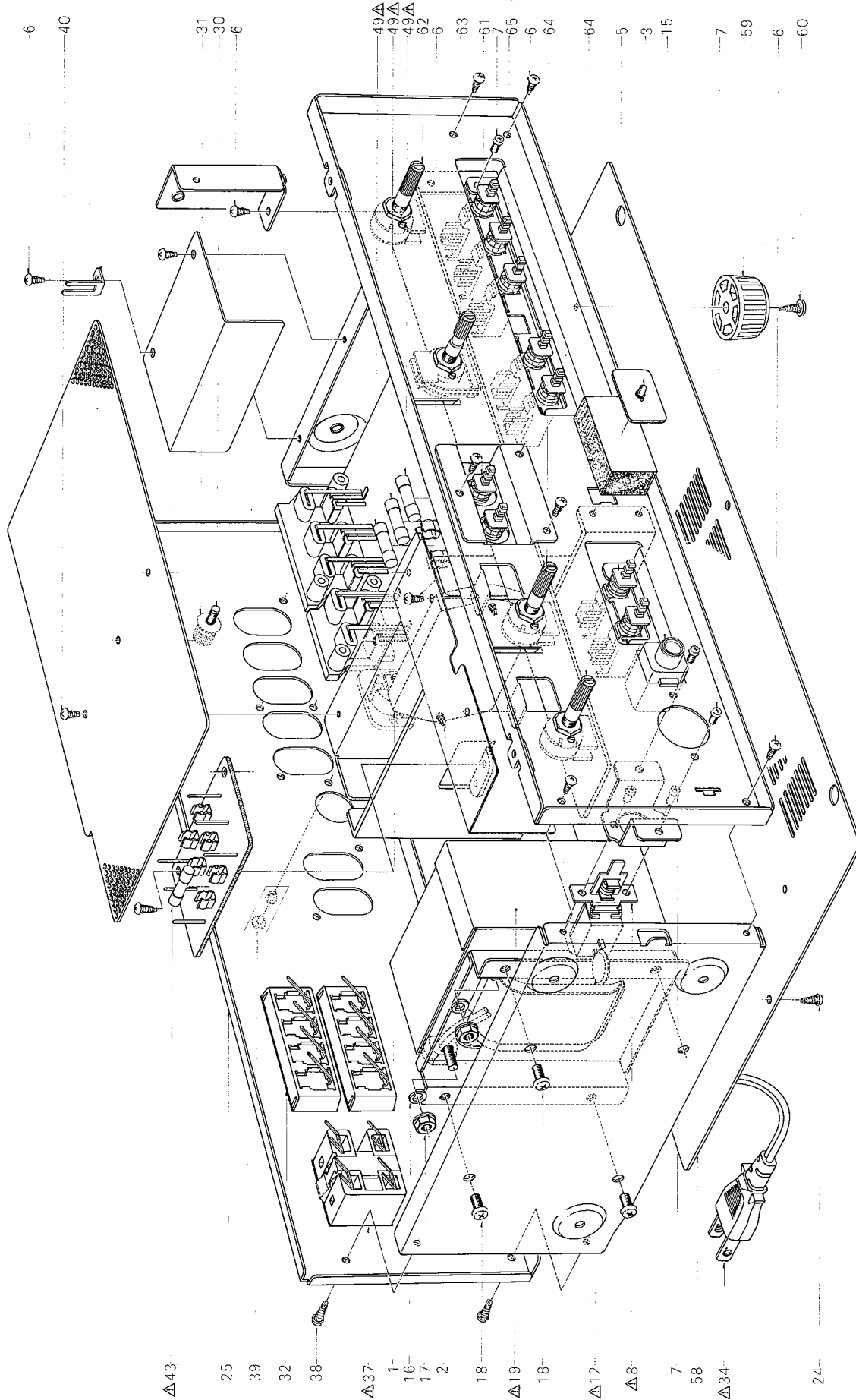
5. CONTROL P.C BOARD (M3-2502) BLOCK

Symbol No.	Parts No.	Description	Schematic No.
5-1	BA307369	Tone Control P.C Board Comp. AM-2250	M3-2536
5-TR1	ET307195	Transistor 2SC2240 (GR) (BL)	45-1-302
5-SW1	ES307187	2 Throw Push SW. 12T-7S137	25-5-283
5-VR1	EV307189	Single axial 2 throw Vol. GM70E-250kMN	36-22-36
5-VR2	EV307188	Single axial 2 throw Vol. GM80E-250kBx2	36-22-35
5-VR3,4	EV307190	Single axial throw Vol. GM70E-100kAx2	36-22-37
5-C4	EC557155	Solid Aluminum/C. 1 μ F(M) 10WV	24-19-2
5-C7	EC223413	Solid Aluminum/C. (Vert. Type) 1 μ F(M) 16WV	24-19-2
5-C9	EC523282	Solid Aluminum/C. (Vert. Type) 0.1 μ F(M) 25WV	24-19-2

6. MAIN AMP P.C BOARD (M3-2501) BLOCK

Symbol No.	Parts No.	Description	Schematic No.
6-1	BA307371	Main Amp P.C Board Comp. AM-2250 (U/T)	M3-2534
6-2	BA311987	Main Amp P.C Board Comp. AM-2250 (CSA) (AAL)	M3-2534
6-3	BA307373	Main Amp P.C Board Comp. AM-2250 (CEE) (UK)	M3-2534
6-IC1	EI697871	IC LA-3122S	45-8-185
6-TR1	ET293253	Transistor 2SC1627 (O)(Y)	45-1-263
6-D1to4	ED245417	Silicon Diode GP20G	45-2-70
6-L1	EO250143	Coil, Phase Equalizer 2.2 μ F (K)	23-1-260
6-SW1	ES310452	5 throw Push SW. SUES4	25-5-309
6-J1	EJ698051	DIN Jack	31-1-158
6-J2,3	EJ293365	4P PIN Jack	31-1-197
6-J4	EJ293376	6P PIN Jack	31-1-198
6-R18	ER306958	Metal Plate/R. 2W 0.47 ohms (J)	35-16-38
6-C11	EC516745	Styrol/C. (Vert. Type) 330PF(K) 50WV	24-11-3
6-C19,20	EC306959	Elect./C. (Vert. Type) 6800 μ F 35WV	24-10-127

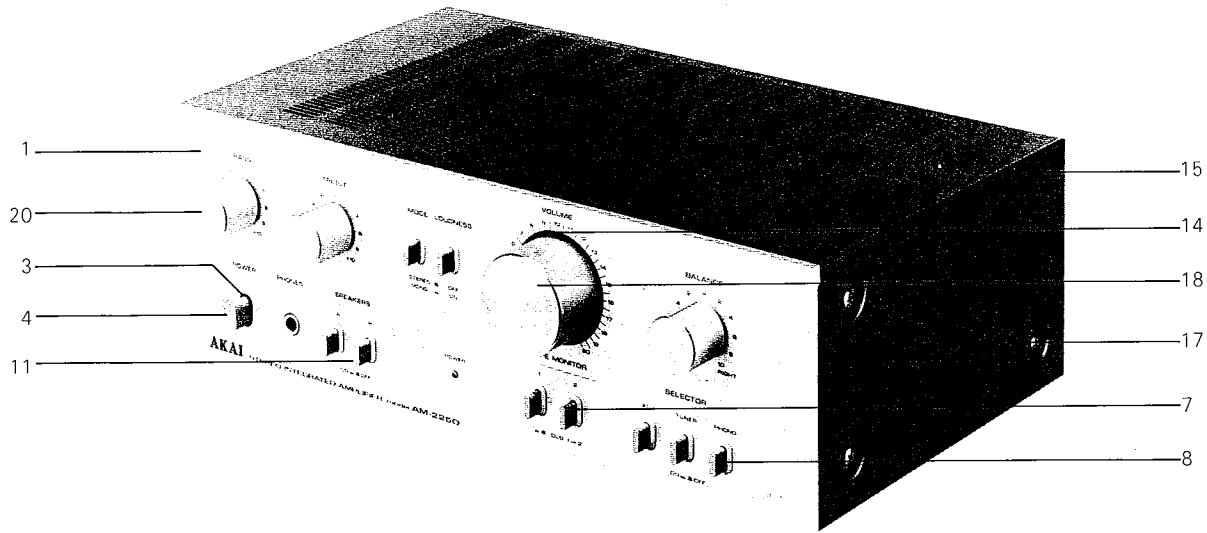
7. ILLUSTRATION OF ASSEMBLY BLOCK



7) ASSEMBLY BLOCK

Ref. No.	Parts No.	Description	Schematic No.	Ref. No.	Parts No.	Description	Schematic No.
HEAT-SINK BLOCK							
7-1	EI306941	IC STK463	45-8-271	7-48x	EF300578	△ Fuse (EAK) 4AT (CEE, UK)	39-1-59
7-2	ZS462802	Tapping Screw #2, 3x15 (BR)		7-49	EF306952	△ Fuse 4A 250V (U/T)	39-1-64
LED P.C BOARD BLOCK				7-50x	EF306950	△ Fuse 2A 250V (U/T)	39-1-64
7-3	ED698826	LED SR-105D	45-15-16	7-51x	EF306954	△ Fuse 2A 125V (CSA, AAL)	39-1-65
SPEAKER SW. P.C BOARD BLOCK				7-52x	EF300580	△ Fuse (EAK) 2.5AT (CEE, UK)	39-1-59
7-4x	ER558213	Metal Oxide Film/R. 1W 180 ohms (J)	35-15-10	7-53x	ZW330423	Adjust. Washer (U) D4x13x0.25t	
7-5	ES301658	2 Throw Push SW. J-P7126#01	25-5-271	7-54x	ZW603797	Adjust. Washer (U) D4x13x0.5t	
FINAL ASSEMBLY BLOCK				7-55x	ZW413190	Adjust. Washer (U) D4x13x0.8t	
7-6	ZS325495	Tapping Screw #2, 3x6 (BR)		7-56x	ZW330456	Adjust. Washer (U) D4x13x1t	
7-7	ZS422076	Screw, pan head 3x5		7-57x	ZW439547	Adjust. Washer (U) D4x13x1.5t	
7-8	ES224436	△ Push SW. JP01 (U/T)	25-5-221	7-58	SP306859	Bottom Plate	M3-2520
7-9x	ES280258	△ Push SW. SDV1P TV-5 (w/label) (CSA)	25-5-243	7-59	EA312465	Circular Foot (A) Part CA	CA-6014
7-10x	ES239218	△ Push SW. JP01 (TV-4) (AAL)	25-5-222	7-60	ZS565942	Tapping Screw #2, 4x8 (Pan)	
7-11x	ES242346	△ Push SW. JP17 (CEE, UK)	25-5-224	7-61	ES307187	2 Throw Push SW. 12T-7S137	25-5-283
7-12	EC204671	△ Ceramic/C. DD31-6E 0.01μF(P) 500WV (U/T)	24-5-66	7-62	EV307189	Single Axial 2 Throw Vol. GM70E-250KMN	36-22-36
7-13x	EC286198	△ Ceramic/C. AL-10 0.01μF(Z) 125WV (CSA,AAL)	24-5-69	7-63	EV307188	Single Axial 2 Throw Vol. GM80E-250KBx2	36-22-35
7-14x	EC301320	△ MP/C. 4700PF(M) 250WV (CEE, UK)	24-9-122	7-64	EV307190	Single Axial 2 Throw Vol. GM70E-100kAx2	36-22-37
7-15	EJ301199	Headphone Jack 3P64M	31-2-83	7-65	ES310452	5 Throw Push SW. SUE54 (U/T, CEE)	25-5-309
7-16	ZW273914	Spring Washer, M4					
7-17	ZW413267	Flange Nut M4					
7-18	ZS413201	Screw, pan head 4x8					
7-19	BT306948	△ Power Trans. AM-2250T-70 (U/T)	38-4-606				
7-20x	BT306945	△ Power Trans. AM-2250T-30 (CSA)	38-4-603				
7-21x	BT306943	△ Power Trans. AM-2250T-20 (AAL)	38-4-602				
7-22x	BT306946	△ Power Trans. AM-2250T-40 (CEE)	38-4-604				
7-23x	BT306947	△ Power Trans. AM-2250T-50 (UK)	38-4-605				
7-24	ZS447840	Tapping Screw #2, 3x8 (BR)					
7-25	SP306852	Rear Panel (A) (U/T)	M3-2517				
7-26x	SP306855	Rear Panel (C) (CSA)	M3-2518				
7-27x	SP306853	Rear Panel (B) (AAL)	M3-2517				
7-28x	SP306856	Rear Panel (D) (CEE)	M3-2518				
7-29x	SP306857	Rear Panel (E) (UK)	M3-2519				
7-30	EJ306940	Earth Terminal	32-1-87				
7-31	ZW651082	Washer (SPC) D3.2x10x1t					
7-32	EJ306942	4P Push Terminal S-Q2361	32-1-86				
7-33	EZ631945	Strain Relief SR-4N-4 (U/T, CSA, AAL)	2-7-49				
7-34	EW306428	△ AC Cord (U/T)	26-3-64				
7-35x	EW305691	△ AC Cord CUL (CSA, AAL)	26-3-65				
7-36x	EJ296853	△ 3P In-Let CM-3 (CEE, UK)	31-1-199				
7-37	EZ225145	△ 2-Throw AC Outlet (U/T, CSA, AAL)	31-1-166				
7-38	ZS522865	Tapping Screw #2, 3x12 (BR) (Black)					
7-39	ZW698308	Nylon Rivet (FNRP) 3x3.5 (Black)	2-7-54				
7-40	ZS463353	Tapping Screw #2, 3x8 (BR) (Black)					
7-41x	ZS447761	Tapping Screw #2, 3x6 (BR) (Black)					
7-42x	ZS434250	Screw, pan head 4x8 w/washer (CEE, UK)					
7-43	EF306951	△ Fuse 2.5A 250V (U/T)	39-1-64				
7-44x	EF306949	△ Fuse 1.25A 250V (U/T)	39-1-64				
7-45x	EF306956	△ Fuse 2.5A 125V (CSA, AAL)	39-1-65				
7-46x	EF306957	△ Fuse 4A 125V (CSA, AAL)	39-1-65				
7-47x	EF300583	△ Fuse (EAK) 1.25AT (CEE, UK)	39-1-59				

8. PHOTO OF FINAL ASSEMBLY BLOCK



8) FINAL ASSEMBLY BLOCK

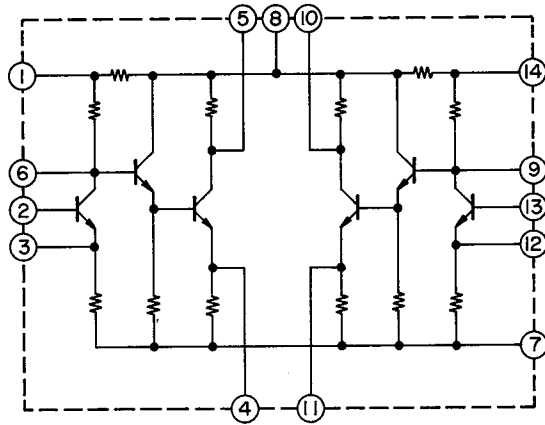
Ref. No.	Parts No.	Description	Schematic No.
FRONT PANEL BLOCK			
8-1	BD307377	Front Panel Block Comp. AM-2250	
8-2x	BD307378	Front Panel Block Comp. AM-2250-BL	
8-3	SE306863	Button Escutcheon	M3-2522
8-4	SK306864	Push Button	M3-2523
8-5x	SK306866	Push Button (BL)	M3-2523
8-6x	ZG306867	Taper Spring	M3-2524
8-7	SE306143	Button Escutcheon (A)	CN-6308
8-8	SE305651	Button Escutcheon (B)	CN-6352
8-9x	SE306144	Button Escutcheon (A-BL)	CN-6308
8-10x	SE306936	Button Escutcheon (B-BL)	CN-6352
8-11	SK305653	Push Button (A)	CN-6309
8-12x	SK305656	Push Button (D)	CN-6309
8-13x	ZG305657	Button Spring	CN-6310
8-14	MZ306840	Vol. Plate	M3-2506
FINAL ASSEMBLY BLOCK			
8-15	BC306860	Upper Cover (A)	M3-2521
8-16x	BC306862	Upper Cover (B) (AAL)	M3-2521
8-17	ZS537006	Screw, binding head 4x8	
8-18	SK306868	Volume Knob	M3-2525
8-19x	SK306869	Volume Knob (BL)	M3-2525
8-20	SK306870	Single Knob (B)	M3-2526
8-21x	SK306871	Single Knob (B-BL)	M3-2526

9. LIST OF INTERCHANGEABLE SEMICONDUCTORS

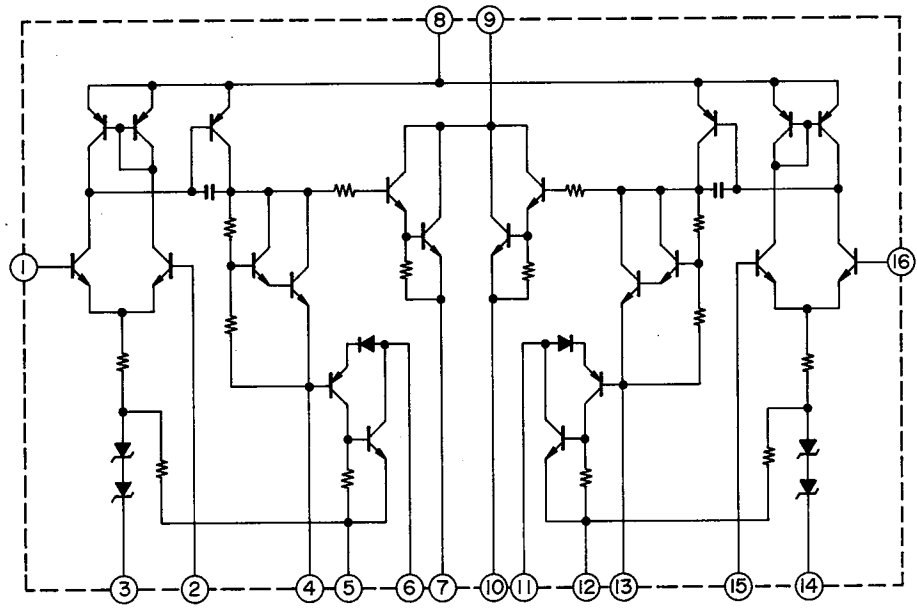
If, while servicing, the original parts cannot be obtained, the interchangeable parts listed below can be substituted.

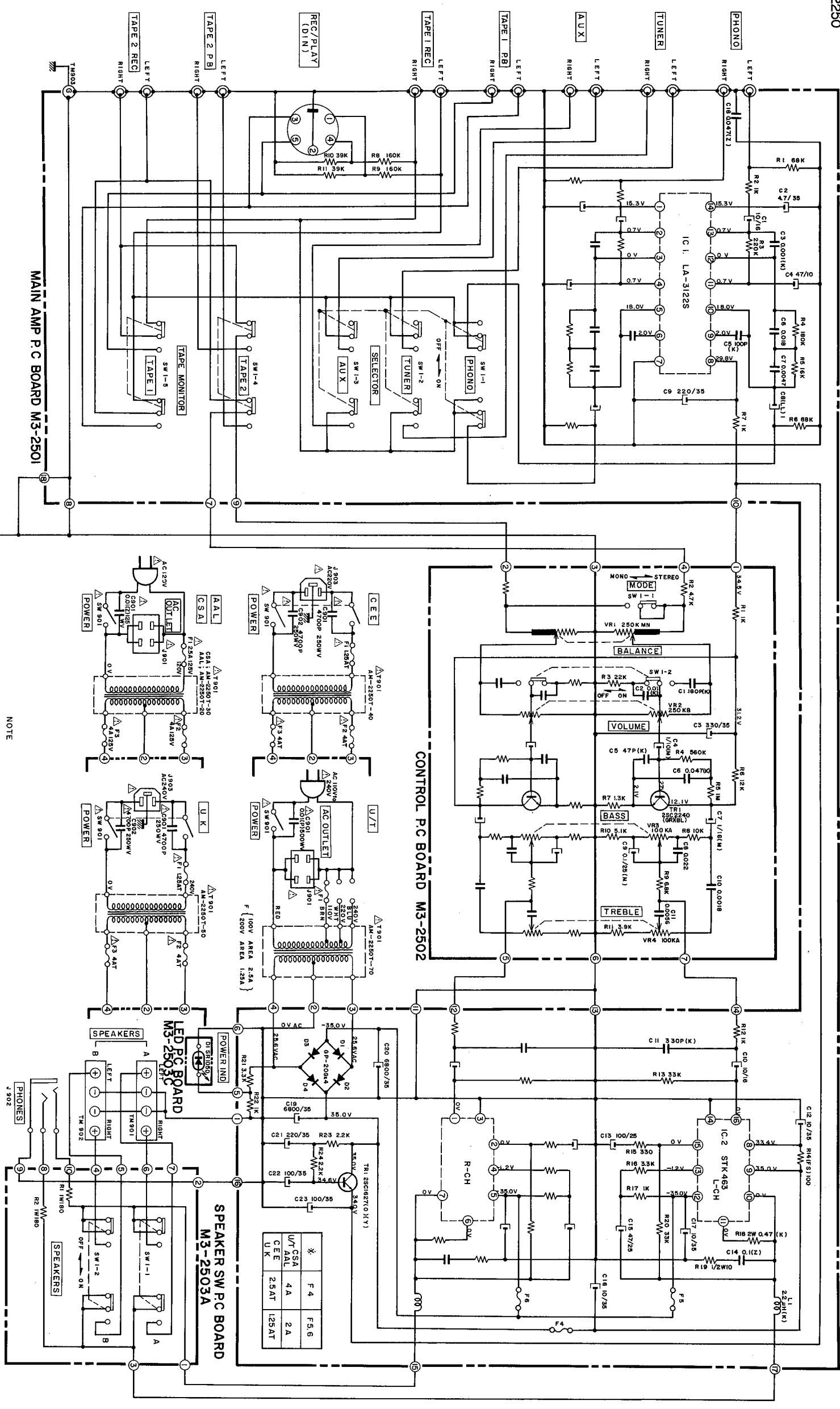
Original Parts			Interchangeable Parts	
Description	Parts No.	Utilizing P.C Board	Description	Parts No.
2SC930(E)(F)	ET618873	T3-2501A		
2SC1815(O)(Y)(GR)	ET305221	T3-2501A	2SC536(E)(F)(G)(H) 2SC945L(P)(Q)(R)	ET246846 ET515733
2SD612K(D)(E)(F)	ET307193	T3-2501A	2SC1449(K)(L)	ET649034
1S2473	ED624903	T3-2501A	1S1588	ED557447
RD-15E(B)	ED306937	T3-2501A		
DS131A	ED223547	T3-2501A		
SR105D	ED293523	T3-2501B		
2SC1627(O)(Y)	ET293253	M3-2501	2SD612K(D)(E)(F)	ET307193
2SC2240(GR)(BL)	ET307195	M3-2502	2SC1222(E)(F) 2SC1312R(G)(H)	ET459810 ET517263
GP-20G	ED245417	M3-2501	GP-15G HIFI SPECIAL 400V 3A	ED301695 ED558033

LA3122S



STK463





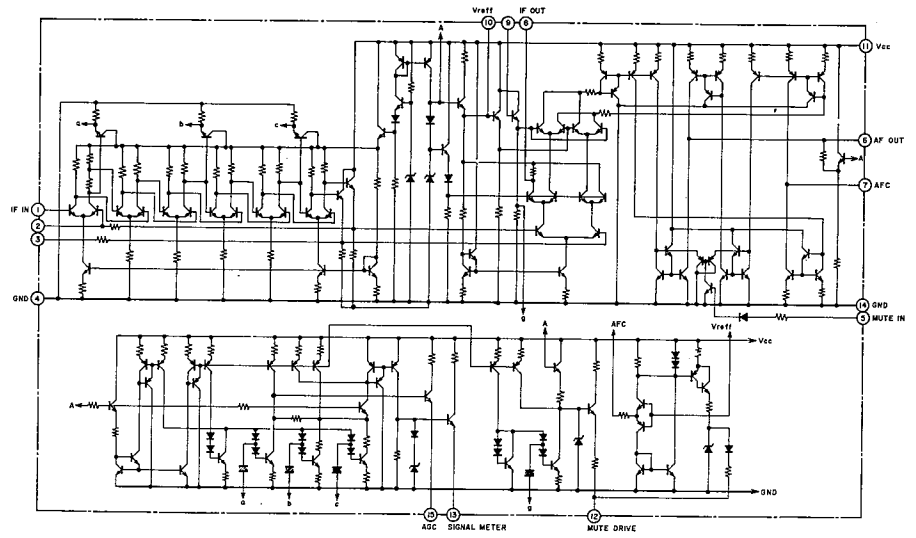
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS (AW/J)
ALL CAPACITORS IN UF (SW/Y/J)
POWER TRANSFORMER IS DIFFERENT
ACCORDING TO AREA
(F S) = FAIL SAFE RESISTOR
(L L) = LOW LEAKAGE CAPACITOR

WARNING: INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY,
REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S
RECOMMENDED PARTS
AVERTISSEMENT: ALL INDIQUÉ LES COMPOSANTS CRITIQUES DE SÛRETÉ. POUR
MAINTENIR LE DEGRÉ DE SÛRETÉ DE L'APPAREIL, NE REMPLACER LES
COMPOSANTS QU'UN LE FONCTIONNEMENT EST CRITIQUE POUR LA SÛRETÉ
QUE PAR DES PIÈCES RECOMMANDÉES PAR LE FABRICANT

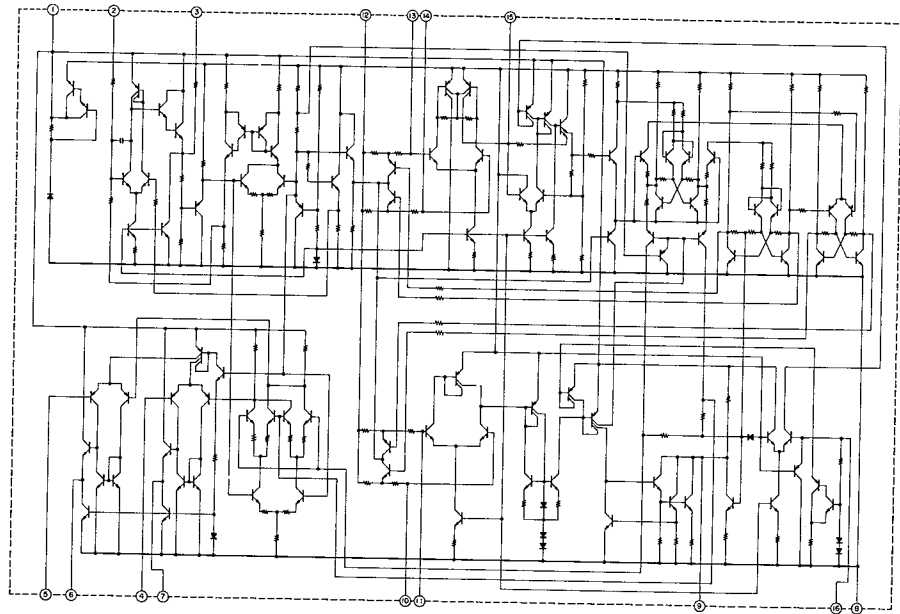
* U/T	F 4	F 5,6
CSA	4 A	2 A
CEE	2.5 AT	1.25 AT
U K		

AM-2250
SCHEMATIC DIAGRAM
NO.2-2 1561837A

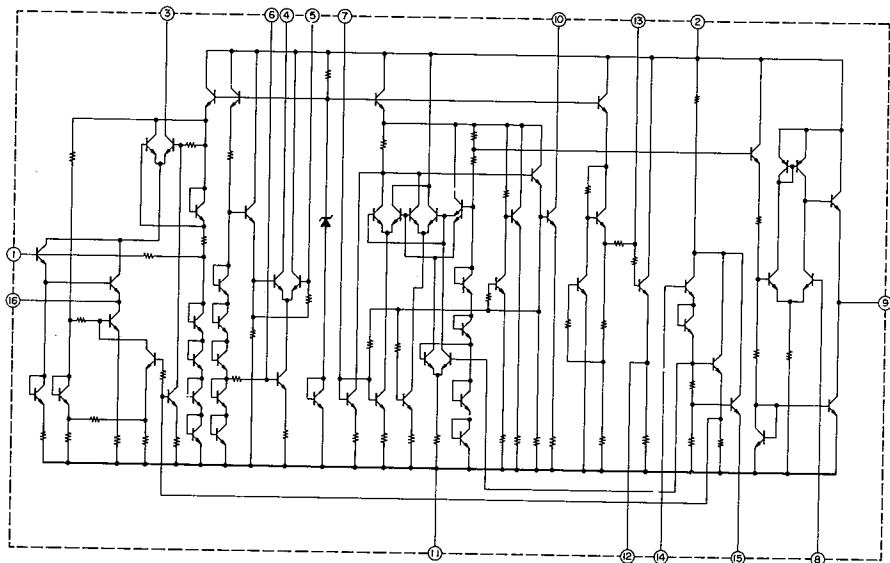
LA1230

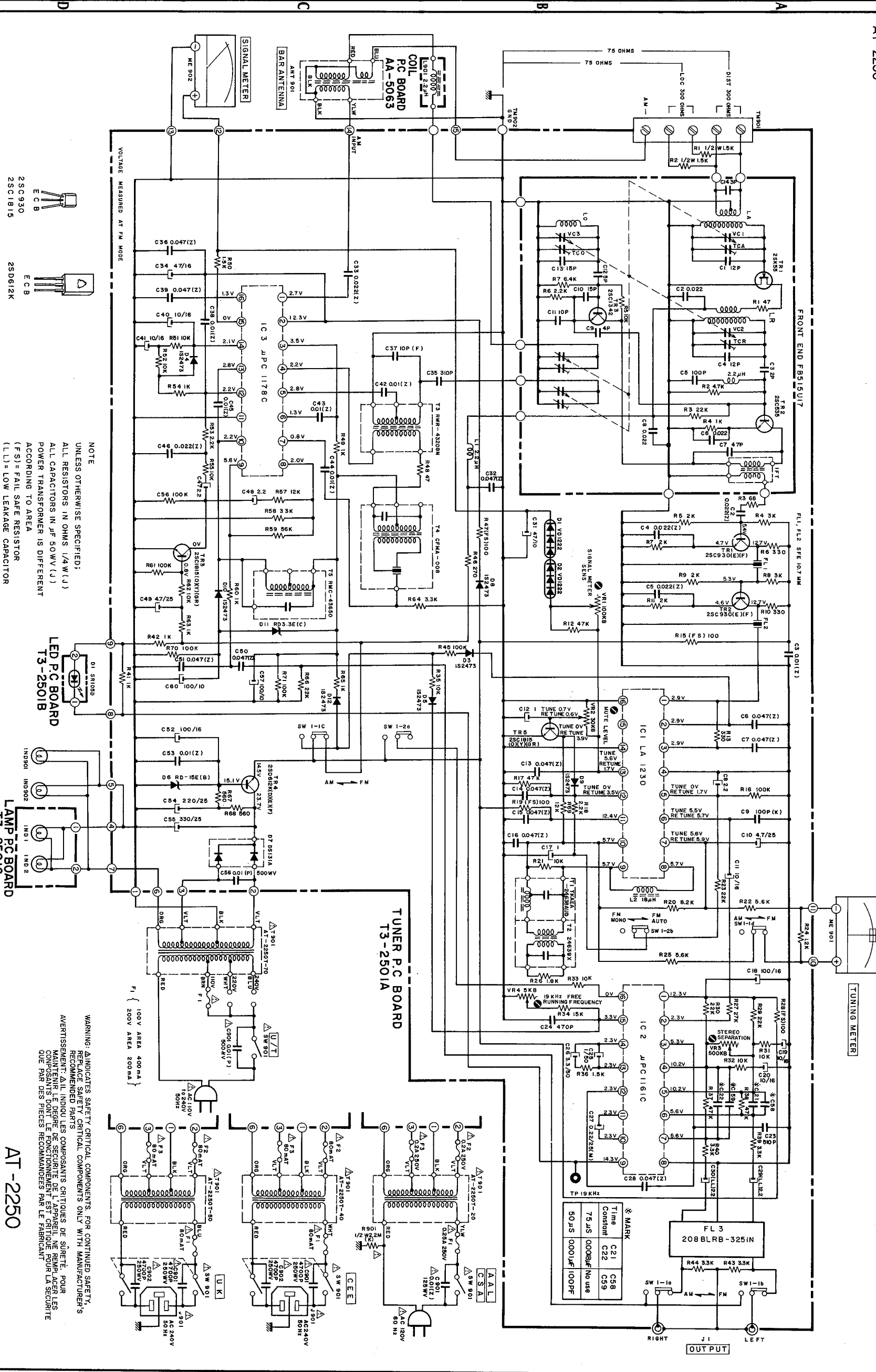


μ PC1161C



μ PC1178





AT-2250
SCHEMATIC DIAGRAM
No. 2-1 1561836A

AT-2250
AM-2250

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Printed No.1561828K 1ED. Printed Date October 6, 1978
Printed in Japan