

# ROTEL *hifi*

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STEREO INTEGRATED AMPLIFIER

# RA-930AX

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# TECHNICAL MANUAL

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**THE ROTEL CO., LTD.**

1-36-8, OHOKAYAMA, MEGURO-KU, TOKYO 152, JAPAN

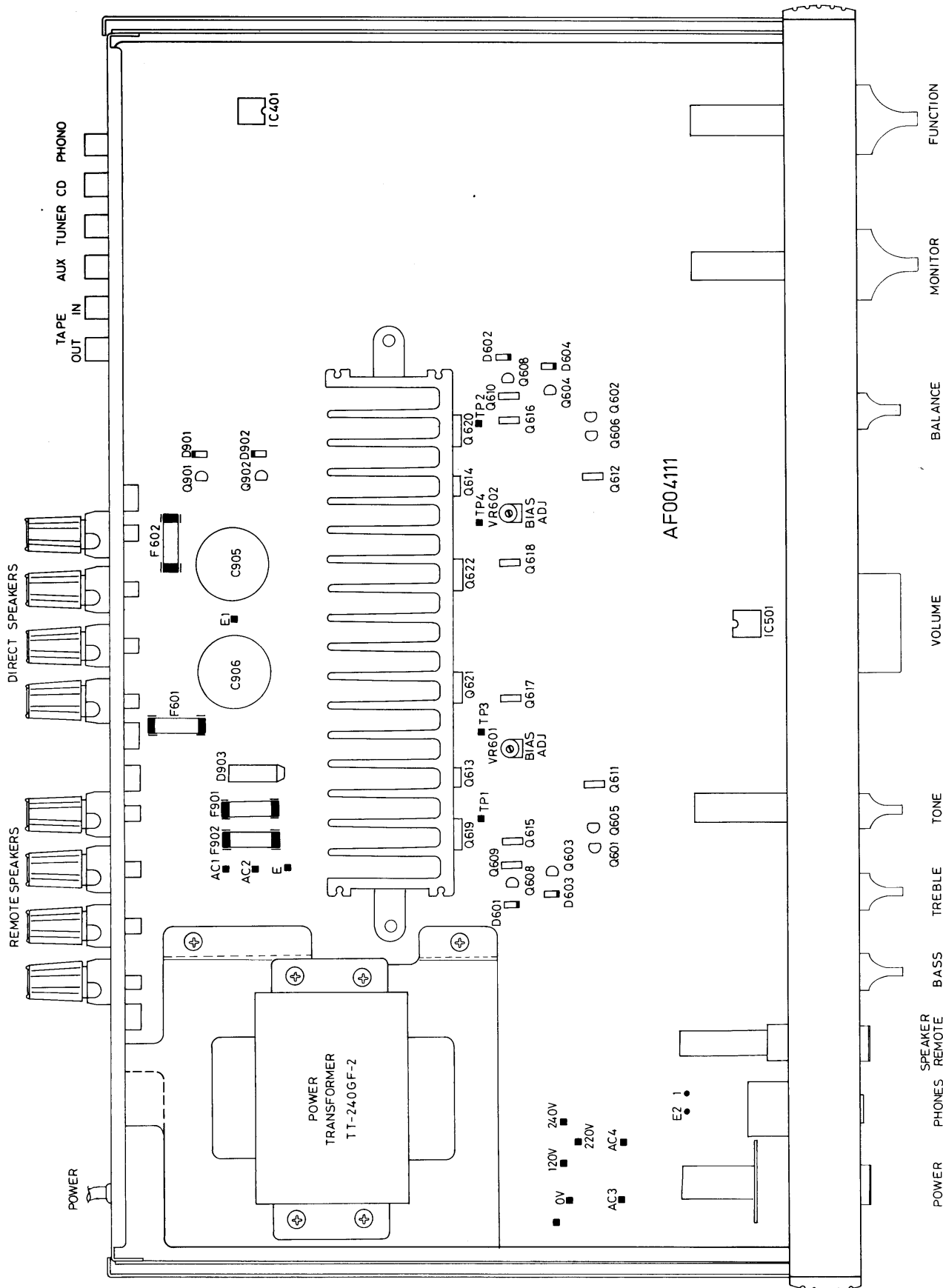
**ROTEL ELECTRONICS CO., LTD.**

3F-2, NO.35, FU HSING NORTH ROAD, TAIPEI, TAIWAN, REPUBLIC OF CHINA

OCT 14 1991

MN20001871

# Chassis Layout



# Specifications

## SPECIFICATIONS RA-930AX

Continuous Power Output...30 watts\* per channel, min.  
RMS both channels driven into  
8 ohms from 20 to 20,000 Hz  
with no more than 0.03% total  
harmonic distortion.

DIN Output.....50 watts per channel (1 kHz, 4  
ohms, 1% THD)

Music Power.....110 watts

Total Harmonic Distortion...No more than 0.03% (contin-  
(20 to 20kHz from AUX) uous rated power output) No  
more than 0.03% (continuous  
1/2 rated power output) No  
more than 0.03% (1 watt per  
channel power output, 8 ohms)

Intermodulation Distortion...No more than 0.03% (contin-  
(60 Hz: 7 kHz = 4:1) uous rated power output) No  
more than 0.03% (continuous  
1/2 rated power output) No  
more than 0.03% (1 watt per  
channel power output, 8 ohms)

Output: Speaker.....4 ohms minimum

Headphone.....8 - 2,000 ohms

Damping Factor.....180 (20 to 20,000 Hz, 8 ohms)

Input Sensitivity/ Impedance:

PHONO.....2.5 mV/ 47 kohms

CD, TUNER.....150 mV/ 20 kohms

TAPE, AUX.....150 mV/ 20 kohms

Overload Level (THD 0.5% 1 kHz):

PHONO.....180 mV

CD, TUNER.....5 V

TAPE, AUX.....5 V

Frequency Response:

PHONO.....20 to 15,000 Hz, +/- 0.3 dB  
(RIAA STD)

CD, TUNER.....10 to 40,000 Hz, +/- 1.0 dB

TAPE, AUX.....10 to 40,000 Hz, +/- 1.0 dB

Tone control:

BASS..... +/- 6.0 dB (100 Hz)

TREBLE..... +/- 6.0 dB (10 kHz)

Signal to Noise Ratio (IHF, A network):

PHONO.....80 dB

CD, TUNER.....100 dB

TAPE, AUX.....100 dB

### MISCELLANEOUS

Power Requirement.....120 V/ 60 Hz, 220 V/ 50 Hz,  
240 V/ 50 Hz (dependinh on  
destinations)

Power Consumption.....180 watts

Dimension (overall).....440 (W) x 92 (H) x 304 (D)mm  
17-3/8" x 3-5/8" x 12"

Weight (net).....5.9 kg/ 13.0 lbs

● Specifications and design subject to possible modifica-  
tion without notice.

● \*Measured pursuant to the Federal Trade Commis-  
sion's Trade Regulation Rule or, Power Claims for  
Amplifiers (applicable to the U.S.A. only).

## Power Amplifier Bias Adjustment

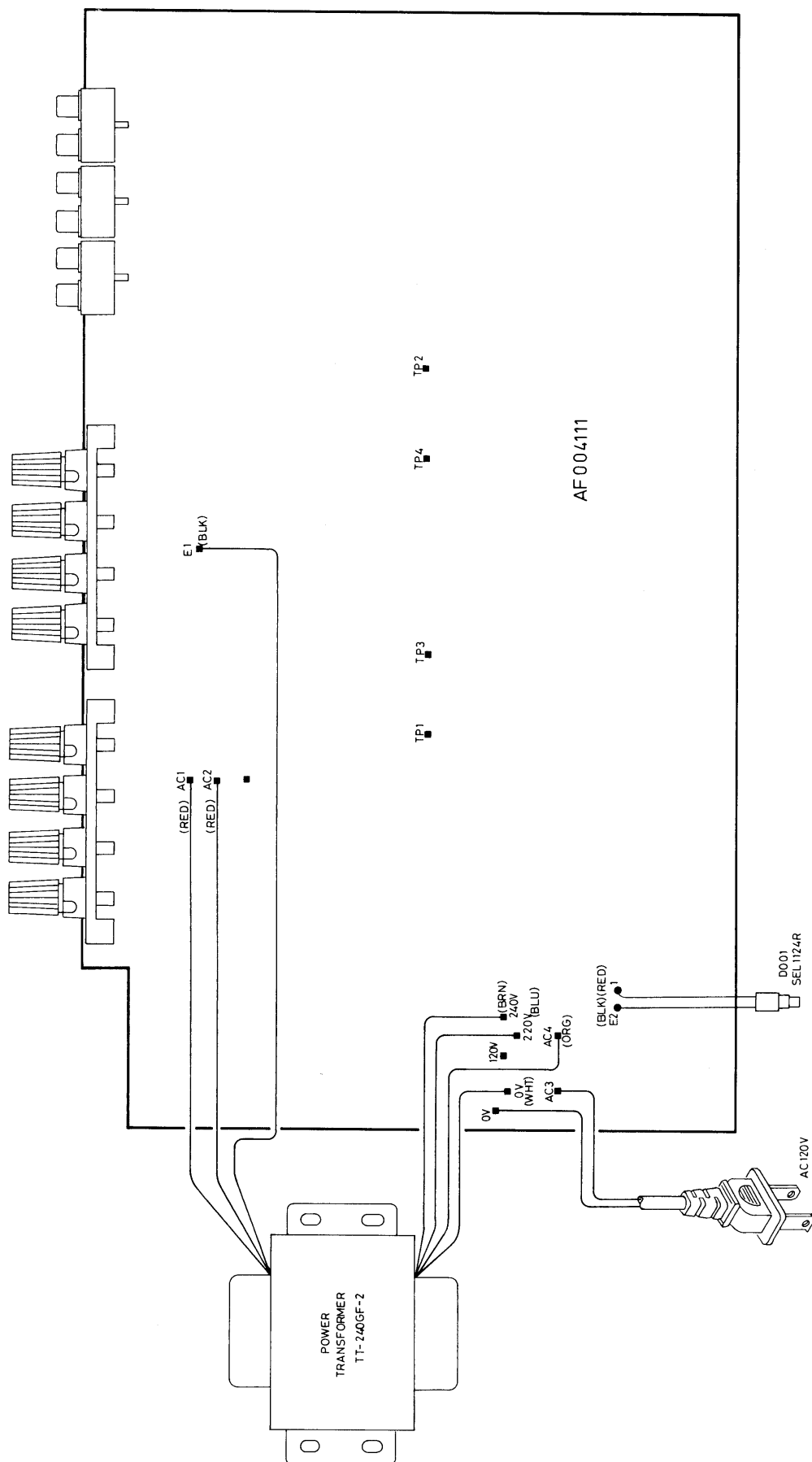
Instruments: DC milli-voltmeter

Notes: Prior to Bias Adjustment, run about 5 minutes with rated output (8 ohm)  
and warm up power Transistor and Heat Sink.

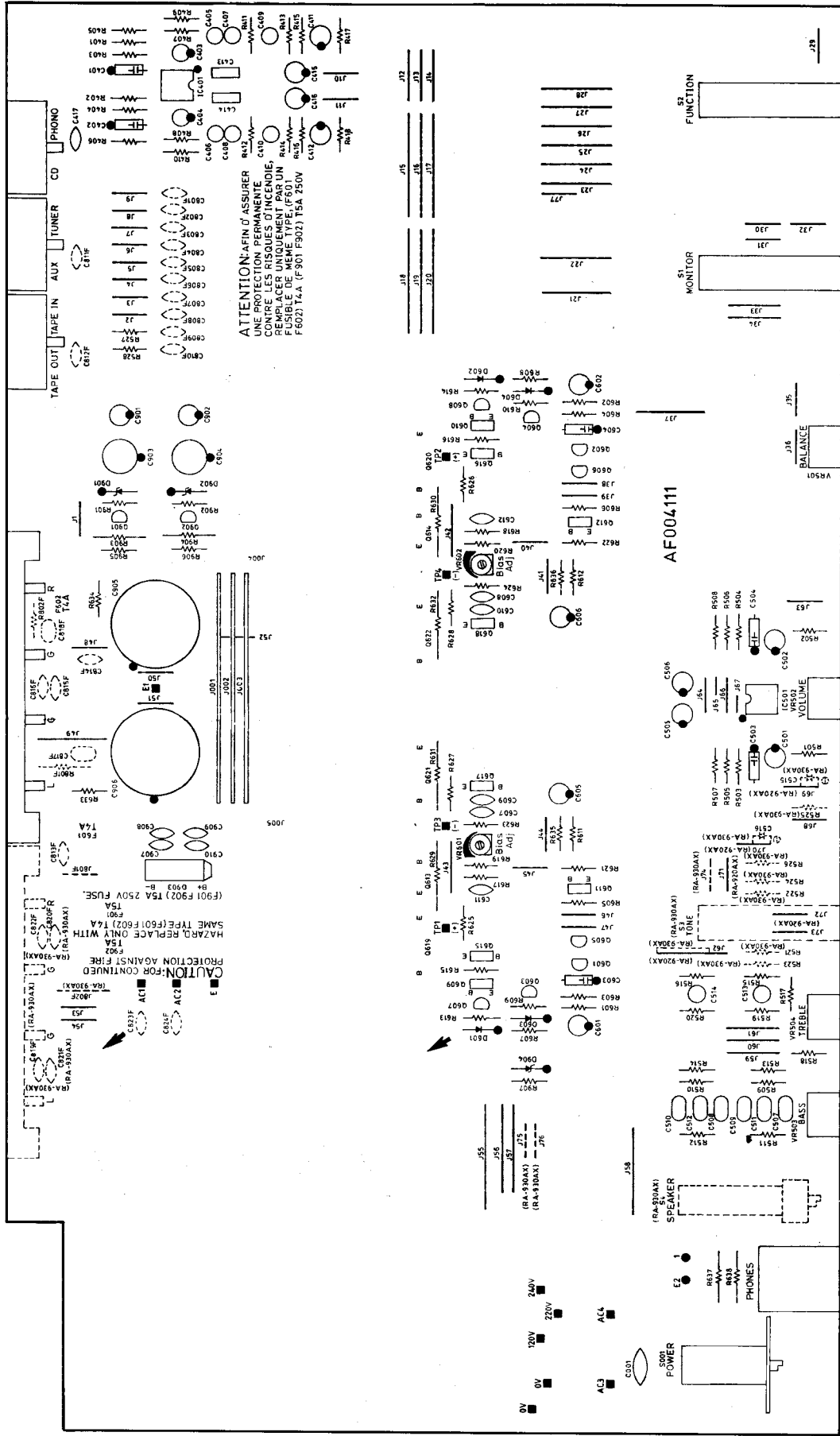
Set Volume Control to minimum.

Step	Coupling		Adjust	Adjust for
	Plus Lead	Minus Lead		
1	TP1	TP3	VR601	DC milli-voltmeter reads 4 mV
2	TP2	TP4	VR602	

# Wiring Diagram



# Printed Circuit Boards



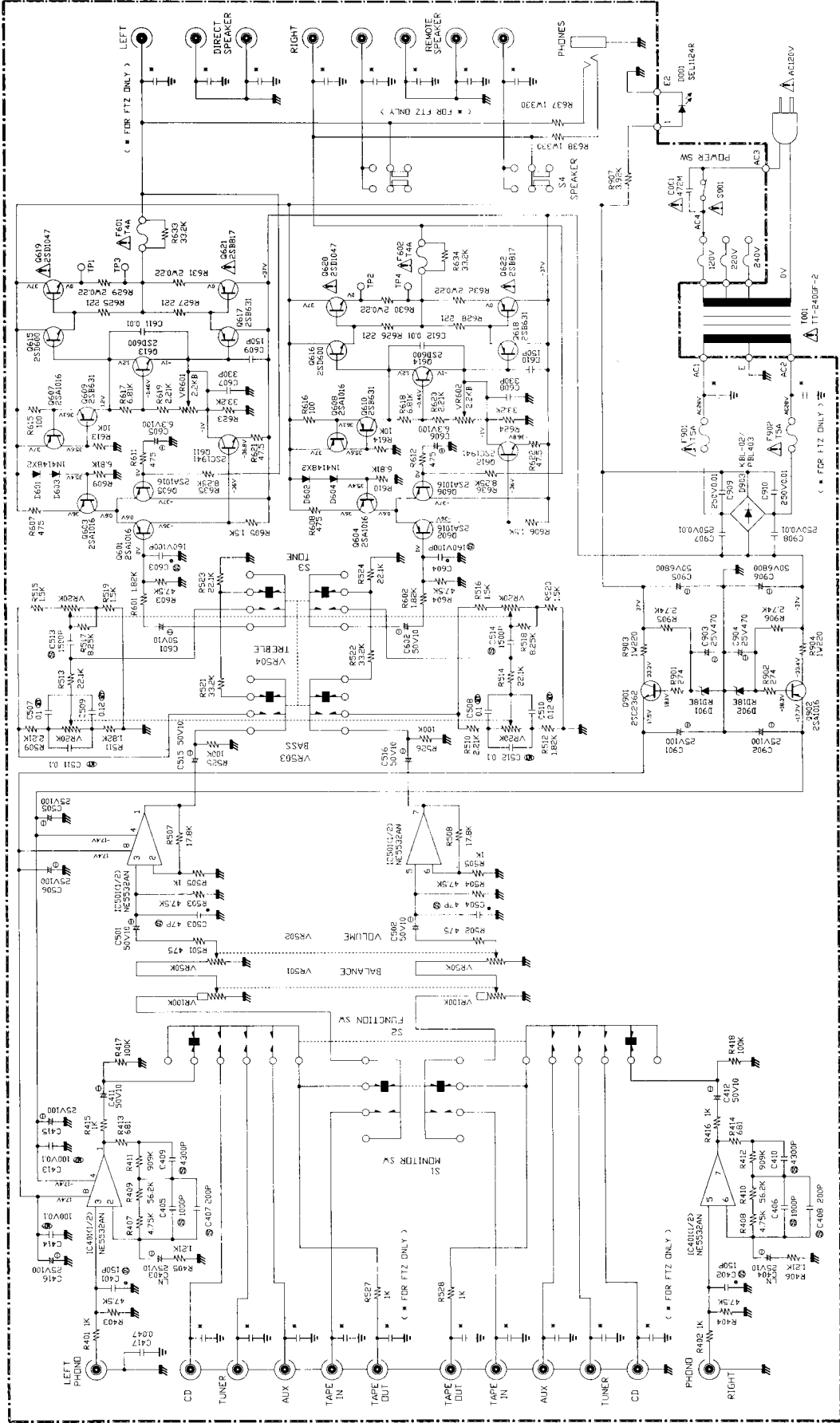
ATTENTION: AFIN D'ASSURER  
 UNE PROTECTION PERMANENTE  
 CONTRE LES RISQUES D'INCENDIE,  
 REMPLACER UNIQUEMENT PAR UN  
 FUSIBLE DE MEME TYPE, (F601  
 F602) T4A (F901 F902) TSA 250V

CAUTION: FOR CONTINUED  
 PROTECTION AGAINST FIRE  
 HAZARD, REPLACE ONLY WITH  
 SAME TYPE (F601 F602) T4A  
 (F901 F902) TSA  
 (F901 F902) TSA 250V FUSE.

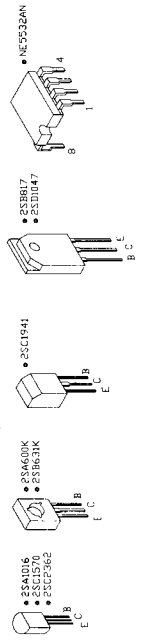
# Schematic Diagram

MODEL RA-930AX

( NOTE : PARTS AND CIRCUIT SUBJECT TO CHANGES FOR IMPROVEMENTS WITHOUT PRIOR NOTICE )



**INSTRUCTION FOR SERVICING PERSONNEL:**  
 1. USE ONLY REPLACEMENT PARTS THAT HAVE THE CRITICAL  
 PART NUMBER AND TOLERANCE SPECIFICATIONS.  
 2. MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS  
 TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY  
 INSULATED FROM THE AC SUPPLY CIRCUIT BEFORE RETURNING  
 THE UNIT TO THE CUSTOMER.



# Parts List

NOTE: THE COMPONENTS IDENTIFIED BY  $\Delta$  MARK ARE FOR SAFETY. REPLACE ONLY WITH ORIGINAL PARTS. DO NOT SUBSTITUTE.

SYMBOL	PARTS NO.	DESCRIPTION	SYMBOL	PARTS NO.	DESCRIPTION
AF104111 PCB ASSEMBLY					
R401,402	RM81001612	R, STANDARD METAL MK2001KFECZ.	C611,612	CC31009465	CAP, CERAMIC 50V 0.01uF
R403,404	RM84752616	R, STANDARD METAL MK247K5FECZ.	Q601-608	TR10000023	TRANSISTOR 2SA1016 (F,G)
R405,406	RM81211618	R, STANDARD METAL MK21K21FECZ.	Q609,610	TR10000047	TRANSISTOR 2SB631 (E,F)
R407,408	RM84751612	R, STANDARD METAL MK24K75FECZ.	Q611,612	TR30000169	TRANSISTOR 2SC1941 (K,L)
R409,410	RM85622613	R, STANDARD METAL MK256K2FECZ.	Q613-616	TR40000069	TRANSISTOR 2SD600K (E,F)
R411,412	RM89093611	R, STANDARD METAL MK2909KFECZ.	Q617,618	TR10000047	TRANSISTOR 2SB631 (E,F)
R413,414	RM86810619	R, STANDARD METAL MK2681RFECZ.	Q619,620	TR40000045	POWER TRANSISTOR 2SD1047 $\Delta$
R415,416	RM81001612	R, STANDARD METAL MK2001KFECZ.			(D,E)
R417,418	RM81003610	R, STANDARD METAL MK2100KFECZ.	Q621,622	TR20000040	POWER TRANSISTOR 2SB817 $\Delta$
IC401	IC00001693	IC NE5532AN			(D,E)
C401,402	CS31511318	CAP, POLYSTYRENE 160V 150PF	VR601,602	RV40000022	R, SEMI-FIXED VM6CKPV-1S-B 2.2K
C403,404	CL31006258	CAP, LOW NOISE 25V 10uF	F601,602	FU25000028	FUSE (BEL 5ST) 125V 4A $\Delta$
C405,406	CS41010417	CAP, STYROL 50V 1000PF		FU23000190	FUSE (BEL 5ST) 250V T4A S $\Delta$
C407,408	CS42011417	CAP, STYROL 50V 200PF	D601-604	DD80000021	DIODE IN4148-86
C409,410	CS44310412	CAP, STYROL 50V 4300PF	R901,902	RM52740815	R, METAL 274 F 1/4W
C411,412	CE51006507	CAP, ELEC. U50V10RC2	R903,904	RM92200121	R, METAL 1W 220 J
C413,414	CP61008321	CAP, M.P. MKT18-100V104K	R905,906	RM52741819	R, METAL 2.74K F 1/4W
C415,416	CE01005258	CAP, ELEC. 25V 100uF	R907	RM53921817	R, METAL 3.92K F 1/4W
C417	CC05009457	CAP, CERAMIC 50V 0.047uF	C901,902	CE01005258	CAP, ELEC. 25V 100uF
R501,502	RM84750619	R, STANDARD METAL MK2475RFECZ.	C903,904	CE04705255	CAP, ELEC. 25V 470uF
R503,504	RM84752616	R, STANDARD METAL MK247K5FECZ.	C905,906	CE56804451	CAP, ELEC. 50LPSS6800uF
R505,506	RM51001816	R, METAL 1K F 1/4W	C907-910	CC01009956	CAP, CERAMIC 250V 0.01uF
R507,508	RM51782614	R, METAL 17.8K F 1/4W	D901,902	DD20000041	DIODE RD-18E
R509,510	RM52211818	R, METAL 2.21K F 1/4W	D903	DD10000020	DIODE KBL-02
R511,512	RM51821819	R, METAL 1.82K F 1/4W	Q901	TR30000212	TRANSISTOR 2SC2362 (F,G)
R513,514	RM52212811	R, METAL 22.1K F 1/4W	Q902	TR30000023	TRANSISTOR 2SA1016 (F,G)
R515,516	RM51501813	R, METAL 1.5K F 1/4W	F901,902	FU25000030	FUSE (BEL 5ST) 125V 5A $\Delta$
R517,518	RM58251814	R, METAL 8.25K F 1/4W		FU23000141	FUSE (BEL 5ST) 250V T5A S $\Delta$
R519,520	RM51501813	R, METAL 1.5K F 1/4W	C001	CK00000035	SPARK KILLER DE7150F472M $\Delta$
R521,522	RM83322614	R, STANDARD METAL MK233K2FECZ.	S001	SH40000120	POWER SWITCH C-3600B-T $\Delta$
R523,524	RM82212618	R, STANDARD METAL MK222K1FECZ.	S1	SH30000470	FUNCTION SW 4TR-2777
R525,526	RM81003610	R, STANDARD METAL MK2100KFECZ.	S2	SH30000481	FUNCTION SW 4TR-2778
R527,528	RM51001816	R, METAL 1K F 1/4W	S3	SH20000500	FUNCTION SW 4TR-2280
C501,502	CE51006507	CAP, ELEC. U50V10RC2	S4	SH11000379	1 KEY PUSH SW 4TR-2806
C503,504	CS34712311	CAP, POLYSTYRENE 160V 47PF	D001	DD40000095	LED SEL1124R
C505,506	CE01005253	CAP, ELEC. 25V 100uF	OTHERS		
C507,508	CM01008423	CAP, MYLAR 50V 104J	AB00000559	BOTTOM BOARD 2TQG-2	
C509,510	CM01208424	CAP, MYLAR 50V 124J	AF20000258	FRONT CHASSIS 2TQF-2	
C511,512	CM01008423	CAP, MYLAR 50V 104J	AR20000565	PRINTED REAR CHASSIS TFP-580	
C513,514	CS41510414	CAP, STYROL 50V 1500P	AS01000350	SIDE CHASSIS 3TQG-1B#2	
C515,516	CE51006507	CAP, ELEC. U50V10RC2	PT24027122	POWER TRANSFORMER TT-240GF-2 $\Delta$	
IC501	IC00001693	IC NE5532AN	FT00000217	PLASTIC FOOT CAP 4TR-2807	
VR501	RV10001565	R, VARIABLE 4TR-2776 100KMN	SP10004676	L SUPPORT 4TR-2235	
VR502	RV10001553	R, VARIABLE 4TR-2775 50KAx2	SP10006624	P.T SUPPORT 3TQG-7	
VR503,504	RV10001541	R, VARIABLE 4TR-2774 20KBx2	NP00001949	NAME STICKER ROTEL-120V 4TR-2826#1 TNP-382(U,A)	
R601,602	RM81821615	R, STANDARD METAL MK21K82FECZ.	NP00001974	NAME STICKER ROTEL-120V 4TR-2826#4 TNP-385(C)	
R603,604	RM84752616	R, STANDARD METAL MK247K5FECZ.	NP00001962	NAME STICKER ROTEL-240V 4TR-2826#3 TNP-384(H3,H4,E6, K1,G)	
R605,606	RM51501813	R, METAL 1.5K F 1/4W	NP00001950	NAME STICKER ROTEL-220V 4TR-2826#2 TNP-383	
R607,608	RM54750812	R, METAL 475 F 1/4W	CD00000218	AC CORD SPT-2 AWG#18 $\Delta$	
R609,610	RM56811816	R, METAL 6.81K F 1/4W	CD00000292	AC POWER CORD UP-401F $\Delta$	
R611,612	RM84750619	R, STANDARD METAL MK2475RFECZ.		4TR-2631#1 H05VV-F (D)	
R613,614	RM51002810	R, METAL 10K F 1/4W	CD00000048	AC POWER CORD 4TR-1037 $\Delta$	
R615,616	RM51000812	R, METAL 100 F 1/4W		4TR-815 (H,E,K2)	
R617,618	RM56811816	R, METAL 6.81K F 1/4W	CD00000085	AC POWER CORD C-2504A (K1) $\Delta$	
R619,620	RM52211818	R, METAL 2.21K F 1/4W	CD00000115	AC POWER CORD C-3763-T (G) $\Delta$	
R621,622	RM54759815	R, METAL 47.5 F 1/4W	SB00000601	P.V.C SHIELD PLATE (A)	
R623,624	RM53322818	R, METAL 33.2K F 1/4W		4TR-2824	
R625-628	RM52210814	R, METAL 221 F 1/4W	SB00000637	P.V.C SHILED PLATE (B)	
R629-632	RM90228220	R, METAL 2W 0.22 J		4TR-2825	
R633,634	RM53322818	R, METAL 33.2K F 1/4W			
R635,636	RM88251610	R, STANDARD METAL MK28K25FECZ.			
R637,638	RM93300123	R, METAL 1W 330 J			
C601,602	CE51006507	CAP, ELEC. 50V 10uF			
C603,604	CS31011310	CAP, POLYSTYRENE 160V 100P			
C605,606	CE51005904	CAP, ELEC. U6.3V100RC2			
C607,608	CC33311434	CAP, CERAMIC 50V 330PF			
C609,610	CC31511432	CAP, CERAMIC 50V 150PF			

SYMBOL	PARTS NO.	DESCRIPTION
	SC00000131	AC CORD STOPPER SR-5N-4 (K1) $\triangle$
	SC00000039	AC CORD STOPPER SR-6W-1 (D) $\triangle$
	SC00000027	AC CORD STOPPER SR-4N-4 $\triangle$
	AH20000825	HEAT SINKER BOARD 4TQG-5#1
	AA20000609	FRONT PANEL 2TQF-1#3 TFP-619
	BU00001145	POWER RING W/LED 4TQF-13 14x14
	BU00001157	PUSH BUTTON RING 4TQF-14 5x10
	BU00001169	KNOB RING 4TQF-17 39F
	KB20002681	POWER BUTTON 4TQF-15 14x14
	KB20002693	PUSH BUTTON 4TQF-16 5x10
	OM10001272	ORNAMENTAL SIDE 4TR-2797#2
	OM70000065	PUSH BUTTON CONNECTOR 4TTL-15
	SN00000179	BUTTON SPRING 4TR-1988A#2 10F
	SR00000870	ORNAMENTAL PLATE SPACER 4TR-2411
	AU00001195	TOP COVER POLY 3TTF-5#6 H=80MM
	KB10001722	KNOB 4TQF-18 13F
	KB10001734	KNOB 4TQF-19 24F
	KB10001760	KNOB 4TQG-6 33F
	PL00001105	STYROL SIDE MOULDING 4TTH-13A32 TZ-166-1
	TN10003707	INSIDE CARTON 3TR-2788#2