



Technical Manual

STEREO INTEGRATED AMPLIFIER RA-1060

Table of Contents

- Specification..... 1
- Parts List 2~3
- Adjustment..... 4
- Safety Caution..... 4
- Case Outlines..... 5
- PCB Assembly..... 7~8
- Schematic Diagram 9~12

Specification

Continuous Power Output	60 watts/channel (20 - 20 kHz, < 0.03%, 8 ohms)
Total Harmonic Distortion (20 Hz - 20 kHz)	< 0.03% at rated power, 1/2 power, or 1 watt
Intermodulation Distortion(60 Hz : 7 kHz, 4:1)	< 0.03% at rated power, 1/2 power or 1 watt
Frequency Response (all inputs)	10 Hz - 100 kHz, +I, -3dB
Damping Factor (20 - 20,000 Hz. 8 ohms)	150
Input Sensitivity / impedance	160 mV / 33 kOhms
Input Overload	5 v
Preamplifier Output / Impedance	1 V / 470 ohms
Signal to Noise Ratio (IHF " A" weighted)	>95 dB
Power Requirements	USA: 115 Volts, 60 Hz EC: 230 Volts, 50 Hz
Power Consumption	300 Watts
Dimensions (W x H x D)	430 x 92 x 355 mm 17 x55/8 x 14 inches
Weight (net)	7.8 kg, 17.2 lbs.

THE ROTEL CO., LTD

SHINSEN-BLD. 4F 10-10 SHINSEN-CHO, SHIBUYA-KU,
TOKYO 150-0045, JAPAN

Serial. NO.
Beginning

Y-332A-00115C/S-S

Parts List-1

SYMBOL	PARTS NO.	DESCRIPTION	SYMBOL	PARTS NO.	DESCRIPTION
	X-1294-01 PCB ASSEMBLY				
C401	041 UTES1J220-FB	CAPACITOR ELEC.63V22UF	Q401-406	032 TA1345	TRANSISTOR(2SA1345)
C501.502	041 50BGF10M	CAPACITOR ELEC.50V10UF	Q407-412	032 TC3399	TRANSISTOR(2SC3399)
C503.504	044 FSC160V470H	CAPACITOR STYROL 160V47PF	Q619.620	033 TC3478A-LKU	TRANSISTOR(2SC3478A-LKU)
C505.506	041 50BGF10M	CAPACITOR ELEC.50V10UF	Q621.622	033 TA1376A-LKU	TRANSISTOR(2SA1376A-LKU)
C507-510	041 ECEA1EFS221	CAPACITOR ELEC.25V220UF	Q639	032 TC536-FG	TRANSISTOR(2SC536K-FG)
C511.512	044 50MSAN824J	CAPACITOR FILM 50V0.82UF	Q901	033 D600-EF	TRANSISTOR(2SD600K-EF)
C513.514	044 50MSAN154J	CAPACITOR FILM 50V0.15UF	Q902	033 B631-EF	TRANSISTOR(2SB631K-EF)
C515.516	044 S50V560PJ	CAPACITOR STYROL 50V560PF	Q903	033 D600-EF	TRANSISTOR(2SD600K-EF)
C517.518	044 50MSAN824J	CAPACITOR FILM 50V0.82UF	Q904	032 TD863-EF	TRANSISTOR(2SD863-EF)
C519.520	044 S50V1000PG	CAPACITOR STYROL 50V1000PF	Q905	032 TC536-FG	TRANSISTOR(2SC536K-FG)
C521.522	044 50MSAN104J	CAPACITOR FILM 50V0.1UF	Q906	033 TA1016-FG	TRANSISTOR(2SA1016K-FG)
C523.524	041 ECEA1EFS221	CAPACITOR ELEC.25V220UF	Q907.908	032 TC3708-ST	TRANSISTOR(2SC3708-ST)
C525-529	044 50MSAN104J	CAPACITOR FILM 50V0.1UF	Q909	032 TC536-FG	TRANSISTOR(2SC536K-FG)
C530-533	044 S50V22PJ	CAPACITOR STYROL 50V22PF	R401-404	054 TMFR4001K	RESISTOR METAL 1% 1K
C534.535	044 S50V47PJ	CAPACITOR STYROL 50V47PF	R405	053 CR14-332J-A	RESISTOR CARBON 3.3K
C613-616	044 FSC160V561H	CAPACITOR STYROL 160V560PF	R501.502	054 EE10-151	RESISTOR METAL 150R
C617.618	044 KT18-2A104K	CAPACITOR FILM 100V0.1UF	R503.504	054 EE10-104	RESISTOR METAL 100K
C701.702	043 TC50VCH330	CAPACITOR CERA.50V33PF	R505.506	054 TMFR4680R	RESISTOR METAL 1% 680R
C703	041 UTES1H4R7-FB	CAPACITOR ELEC.50V4.7UF	R507.508	054 TMFR403K9	RESISTOR METAL 1% 3.9K
C704	044 KT18-2A104K	CAPACITOR FILM 100V0.1UF	R509.510	054 TMFR4100K	RESISTOR METAL 1% 100K
C705	041 UTES0J222	CAPACITOR ELEC.6.3V2200UF	R511.512	054 TMFR409K1	RESISTOR METAL 1% 9.1K
C707-709	043 TC50V103	CAPACITOR CERA.50V0.01UF	R513.514	054 TMFR405K6	RESISTOR METAL 1% 5.6K
C710	041 UTES1E470-FB	CAPACITOR ELEC.25V47UF	R515.516	054 TMFR4027K	RESISTOR METAL 1% 27K
C711	041 UTES1H2R2-FB	CAPACITOR ELEC.50V2.2UF	R517-520	054 MF16-2202-A	RESISTOR METAL 22K
C901-904	043 TC500V103	CAPACITOR CERA.500V0.01UF	R521	054 TMF1001	RESISTOR METAL 1K
C905.906	041 ALN20S1073DD	CAPACITOR ELEC.50V10000UF	R522	054 MF16-1001-A	RESISTOR METAL 1K
C907.908	041 ECEA1EFS101	CAPACITOR ELEC.25V100UF	R523.524	054 MF16-2202-A	RESISTOR METAL 22K
C909.910	041 ECEA1EFS471	CAPACITOR ELEC.25V470UF	R525.526	054 MF16-1002-A	RESISTOR METAL 10K
C914.915	043 TC500V103	CAPACITOR CERA.500V0.01UF	R527.528	054 MF16-2202-A	RESISTOR METAL 22K
C916.917	041 UTES1J471	CAPACITOR ELEC.63V470UF	R529-538	054 MF16-1002-A	RESISTOR METAL 10K
C918.919	041 UTES1V101-FB	CAPACITOR ELEC.35V100UF	R539.540	054 TMFR4047K	RESISTOR METAL 1% 47K
C920	041 UTES1A101-FB	CAPACITOR ELEC.10V100UF	R541.542	054 TMFR4056K	RESISTOR METAL 1% 56K
C921.922	041 UTES1E101-FB	CAPACITOR ELEC.25V100UF	R543.544	054 TMFR405K6	RESISTOR METAL 1% 5.6K
D401-406	034 T1N4148-86	DIODE	R545.546	054 TMFR4100R	RESISTOR METAL 1% 100R
D609-612	034 T1N4003-TB	DIODE	R547	054 TMFR4010R	RESISTOR METAL 1% 10R
D615-617	034 T1N4148-86	DIODE	R631.632	054 TMFR4001K	RESISTOR METAL 1% 1K
D722	034 T1N4148-86	DIODE	R633.634	054 TMFR4047R	RESISTOR METAL 1% 47R
D723	034 TRD5.6JST1	ZENER DIODE	R637-644	054 NIR2-0.22JF	RESISTOR METAL 2W 0.22R
D724	034 T1N4148-86	DIODE	R645.646	054 2WS10JF	RESISTOR METAL 2W 10R
D726-730	034 T1N4148-86	DIODE	R653-656	054 TMFR4220R	RESISTOR METAL 1% 220R
D901	034 BR84	BRIDGED DIODE	R678	053 CR14-332J-A	RESISTOR CARBON 3.3K
D902.903	034 T1N4003-TB	DIODE	R680	053 CR14-104J-A	RESISTOR CARBON 100K
D904-906	034 T1N4148-86	DIODE	R701.702	053 CR14-472J-A	RESISTOR CARBON 4.7K
D907.908	034 TRD16JST1	ZENER DIODE	R703.704	053 CR14-104J-A	RESISTOR CARBON 100K
D909	034 TRD12JST1	ZENER DIODE	R705	053 CR14-124J-A	RESISTOR CARBON 120K
F601-604	036 5ST6.3	MINI FUSE 250VT6.3A	R706	053 CR14-473J-A	RESISTOR CARBON 47K
IC501	031 OPA2604AP	IC(OPE DUAL)	R707	053 CR14-102J-A	RESISTOR CARBON 1K
IC502.503	031 NJM2114D	IC(OPE DUAL)	R709	053 CR16-100J-A	RESISTOR CARBON 10R
IC701	031 TMP47C400BN-1	IC(TMP47C400BN-1A57)	R711.712	053 CR16-104J-A	RESISTOR CARBON 100K
IC702	031 TC74HC595AP	IC(8BIT SHIFT REGISTER)	R713.714	053 CR14-104J-A	RESISTOR CARBON 100K
IC703	031 LB1641	IC(MOTOR DRIVE)	R715	053 CR14-472J-A	RESISTOR CARBON 4.7K
IC901	031 NJM7805FA	IC(REGULATOR +5VDC)	R716	053 CR16-104J-A	RESISTOR CARBON 100K
J83.84	054 TMFR4100R	RESISTOR METAL 1% 100R	R901.902	054 TMFR403K3	RESISTOR METAL 1% 3.3K
PJ1-4	066 4TR-2408#3	4P PINJACK	R903	054 1WS1KJF	RESISTOR METAL 1W 1K
PJ5	066 4TR-2166#4	2P PINJACK	R904	054 1WS1.5KJF	RESISTOR METAL 1W 1.5K

Parts List-2

SYMBOL	PARTS NO.	DESCRIPTION	SYMBOL	PARTS NO.	DESCRIPTION
R905	053 CR14-472J-A	RESISTOR CARBON 4.7K	VR601.602	051 SFR001-222	SEMI-FIXED RESISTOR 2.2K
R906	053 CR14-103J-A	RESISTOR CARBON 10K	X-1294-04 PCB ASSEMBLY		
R907	054 1WS820JF	RESISTOR METAL 1W 820R	D707-712	034 T1N4148-86	DIODE
R908	054 1WS68JF	RESISTOR METAL 1W 68R	D714-720	034 T1N4148-86	DIODE
R909	053 CR14-333J-A	RESISTOR CARBON 33K	S701	062 C-4174A13	ROTARY SWITCH(LISTENING)
R910	053 CR14-223J-A	RESISTOR CARBON 22K	X-1294-05 PCB ASSEMBLY		
R911	053 CR14-104J-A	RESISTOR CARBON 100K	D701-706	034 LN38GCPP	LED
R912	054 1WS10KJF	RESISTOR METAL 1W 10K	R710	053 CR16-102J-A	RESISTOR CARBON 1K
R913	053 CR14-473J-A	RESISTOR CARBON 47K	X-1294-06 PCB ASSEMBLY		
R914	053 CR14-683J-A	RESISTOR CARBON 68K	HJ1	065 C-3399#1	PHONE JACK
R915.916	053 CR14-223J-A	RESISTOR CARBON 22K	R647-650	054 TMFR4680R	RESISTOR METAL 1% 680R
R917	053 CR14-332J-A	RESISTOR CARBON 3.3K	R667.668	054 1WS1.5KJF	RESISTOR METAL 1W 1.5K
R918	053 CR14-103J-A	RESISTOR CARBON 10K	S601	062 4TR-3089	ROTARY SWITCH(SPEAKERS)
R919	053 CR14-562J-A	RESISTOR CARBON 5.6K	X-1294-07 PCB ASSEMBLY		
R920	053 CR14-154J-A	RESISTOR CARBON 150K	C706	041 UTES1E470-FB	CAPACITOR ELEC.25V47UF
R921	053 CR14-104J-A	RESISTOR CARBON 100K	IC704	031 SBX1810-52	IC(REMOTE EYE)
RY401-406	063 V23106-24	RELAY (FUNCTION)	R708	053 CR16-101J-A	RESISTOR CARBON 100R
RY601.602	063 DH2TU-24	RELAY (SPEAKER)	C-1294-09 PCB ASSEMBLY		
RY603	063 V23106-24	RELAY (MUTE)	C911	044 DE1307E472M	SPARK KILLER
RY901	063 DG1U-24	RELAY (AC OUTLET)	S901	061 C-4176A08	POWER SWITCH
RY902	063 DH2U-24	RELAY (POWER)	X-1294-10~13 PCB ASSY		
S401	062 C-4174A17	ROTARY SWITCH(RECORDING)	Q623.624	033 C3902-RS	TRANSISTOR(2SC3902-RS)
S501	062 C-4174A20	ROTARY SWITCH(CONTOUR)	Q625.626	033 A1507-RS	TRANSISTOR(2SA1507-RS)
SP1.2	067 C-4493A00	SPEAKER TERMINAL	HEAT SINKER ASSEMBLY		
TH901	034 TTC-503	THERMISTOR	Q617.618	032 D600-EF	TRANSISTOR(2SD600K-EF)
VR501	051 C-4170A32	VARIABLE RESISTOR(VOLUME)	Q627-630	033 D1047-DE	TRANSISTOR(2SD1047-DE)
X701	023 CSA4.19MHZ	CERAMIC RESONATOR	Q631-634	033 B817-DE	TRANSISTOR(2SB817-DE)
	068 DM-2GM-O	MINI JUMPER		017 SZ4-07A00	HEAT SINKER BOARD
	069 C-3417A	FUSE CLIP		019 TO-3P	INSULATION SHEET
	X-1294-02.03 PCB ASSY		OTHERS		
C601.602	041 50BGF4R7M	CAPACITOR ELEC.50V4.7UF	011 FP-531		SUB PANEL ASSY
C603.604	044 FSC160V331H	CAPACITOR STYROL 160V330PF	011 TF3-01A00		H/S PANEL
C605.606	044 FSC160V471H	CAPACITOR STYROL 160V470PF	012 C-4710A01		KNOB 25F(RECORDING)
C607.608	041 25BGF100M	CAPACITOR ELEC.25V100UF			
C609.610	044 FSC160V331H	CAPACITOR STYROL 160V330PF	012 C-4710A02		KNOB 25F(FUNCTION)
C611.612	041 50BGF10M	CAPACITOR ELEC.50V10UF	012 C-4711A02		KNOB ASSY 43F(VOLUME)
C619.620	044 FSC160V221H	CAPACITOR STYROL 160V220PF	012 C-4712A01		KNOB 13F(CONTOUR,SPEAKERS)
D601-608	034 T1N4148-86	DIODE	012 RV4-09A00		PUSH KNOB 14F
Q601-604	033 TC2362-FG	TRANSISTOR(2SC2362K-GF)	014 C-4713A01		UPPER COVER
Q605-610	033 TA1016-FG	TRANSISTOR(2SA1016K-FG)			
Q611.612	033 TC2362-FG	TRANSISTOR(2SC2362K-FG)	014 SZ3-08A00		BOTTOM BOARD
Q613.614	033 TA1208-ST	TRANSISTOR(2SA1208-ST)	015 RP-382		REAR CHASSIS
Q615.616	033 TC2910-ST	TRANSISTOR(2SC2910-ST)	019 4TSH-19#2		PLASTIC FOOT 50F
R601.602	054 TMFR4560R	RESISTOR METAL 1% 560R	022 TT-311-UR		POWER TRANSFORMER
R603.604	054 TMFR4047K	RESISTOR METAL 1% 47K	034 SEL1124R		LED 1X5
R605-612	054 TMFR401K5	RESISTOR METAL 1% 1.5K	065 YKB21-5103A		MINI JACK
R613-616	054 TMFR4220R	RESISTOR METAL 1% 220R	069 C-4497A00		AC OUTLET for STD
R617.618	054 TMF1/4-5600F	RESISTOR MRS25 560R	069 C-4629A01		AC INLET
R619.620	054 TMFR4047K	RESISTOR METAL 1% 47K	072 C-4620A01		AC CORD SET for STD
R621-624	054 TMFR4100R	RESISTOR METAL 1% 100R	072 C-4622A01		AC CORD SET for AUSTRALIA
R625.626	054 TMF1/4-6801F	RESISTOR MRS25 6.8K	072 C-4623A01		AC CORD SET for UK
R627.628	054 TMF1/4-1001F	RESISTOR MRS25 1K	072 C-4624A01		AC CORD SET for CEE
R629.630	054 TMF1/4-3302F	RESISTOR MRS25 33K	081 TF4-06A00		INSIDE CARTON
R635.636	054 TMFR4012K	RESISTOR METAL 1% 12K	081 Z-204		STYROL MOULDING
R651.652	054 TMF3300	RESISTOR METAL 330R	092 RR-AT92		REMOTE UNIT

NOTE ON SAFTY : Symbol Fire or electrical shock hazard. Only original parts should be used to replaced any part marked with symbol .
Any other component substitution (other than original type), may inceased risk of fire or electrical shock hazard.

Adjustment

Instruments : DC milli-meter

Notes : Prior to Bias Adjustment, run about 5minutes with rated output (8 ohms)
And warm up Power Transistor and Heat Sink.Set input off.

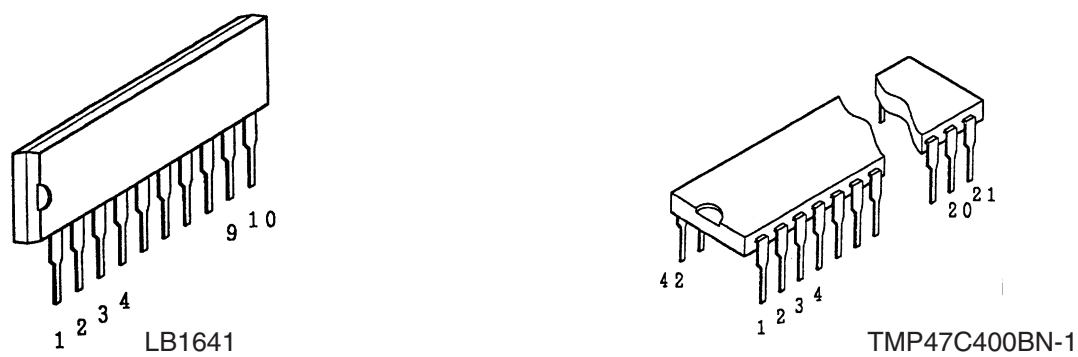
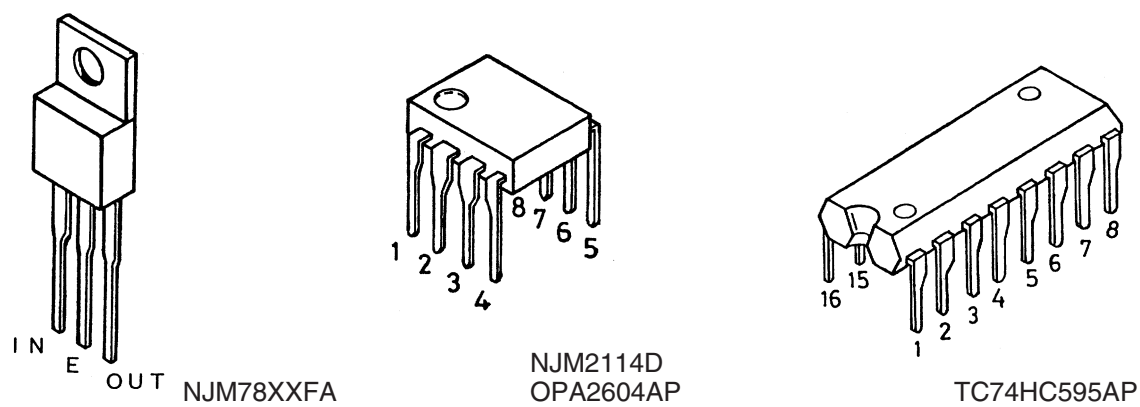
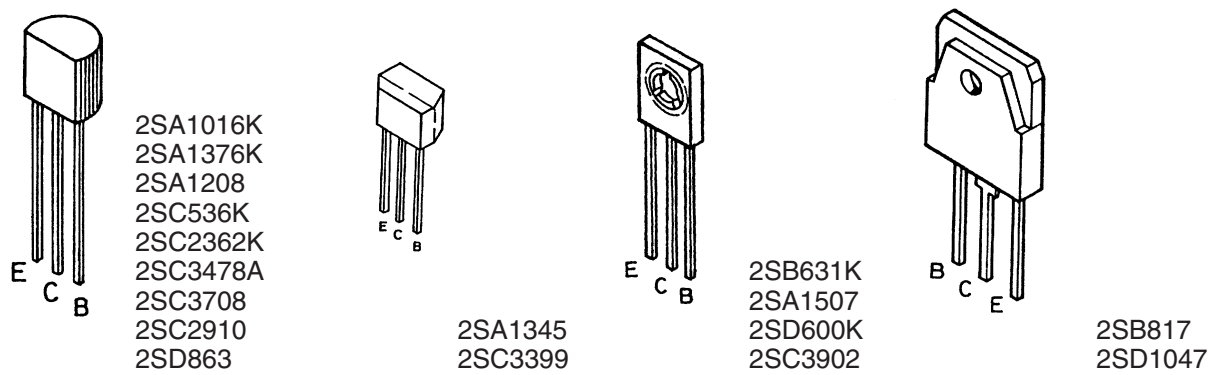
Step	Coupling	Adjust	Adjust for
1	X-1294-01 PCB R639	X-1294-03 PCB VR601	DC milli-voltmeter Reads 5mV
2	X-1294-01 PCB R640	X-1294-02 PCB VR602	

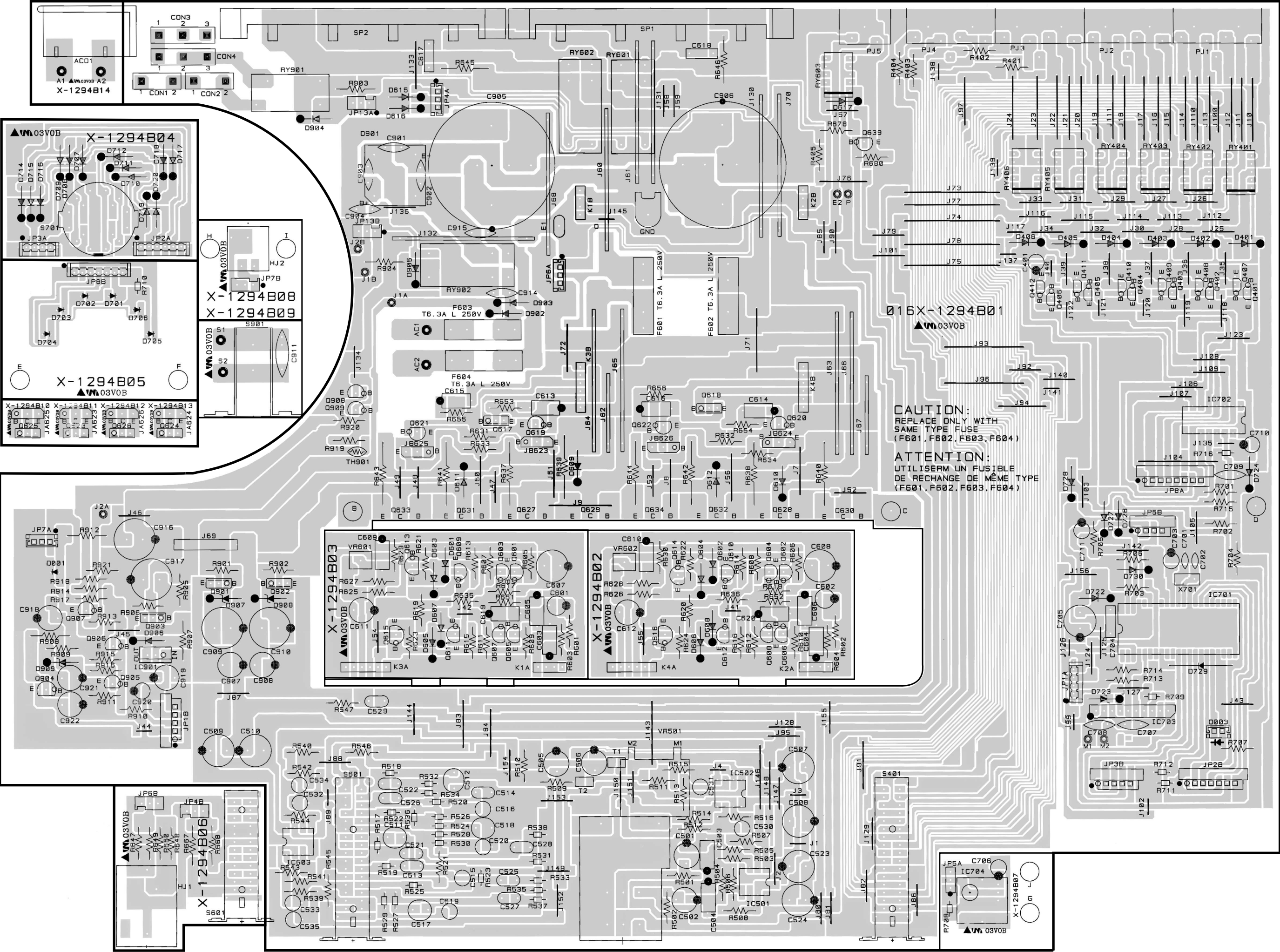
Service Note

Cautions during Inspection and Repair

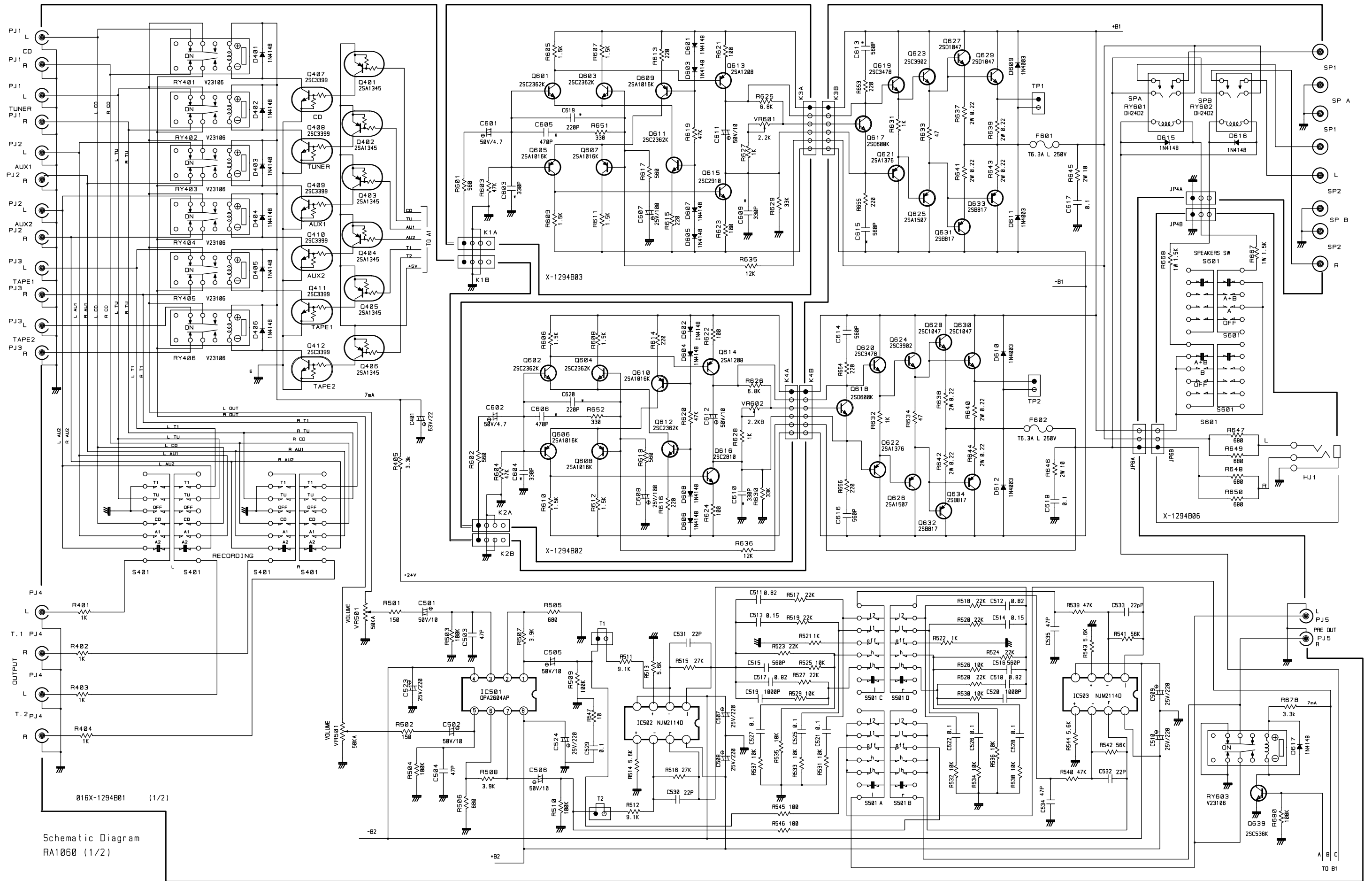
1. Keep in mind the safety warnings
The safety instructions are shown as the labels or printings on the exterior, the inside chassis or the parts, etc. Refer to the instructions when proceeding with inspection or repair.
2. Use only the specified parts for replacement
The selected parts are used at critical area to reduce fire hazard or electrical shock. So when replacing these parts where designaged with  **marks or marks on the schematic diagram or the parts list**, ensure to use only the same parts.
3. Ensure to dress back the AC (Mains) cord to the original position
If for some reason, the AC cord is moved or partially disassembled, ensure to re-route or assemble back to the original position. The AC cord area is protected and secured by tubing and insulation materials for the sake of safety, so that no loose wire will touch and cause fire hazard and electrical shock.
4. Check for safety aspects after inspection or repair
Ensure all parts, such as screws or wires, removed during inspection or repair are secured back to the original positions, and check visually for any anomaly. Also check for any electrical leakage or resistance to maintain the safety.

Case Outline

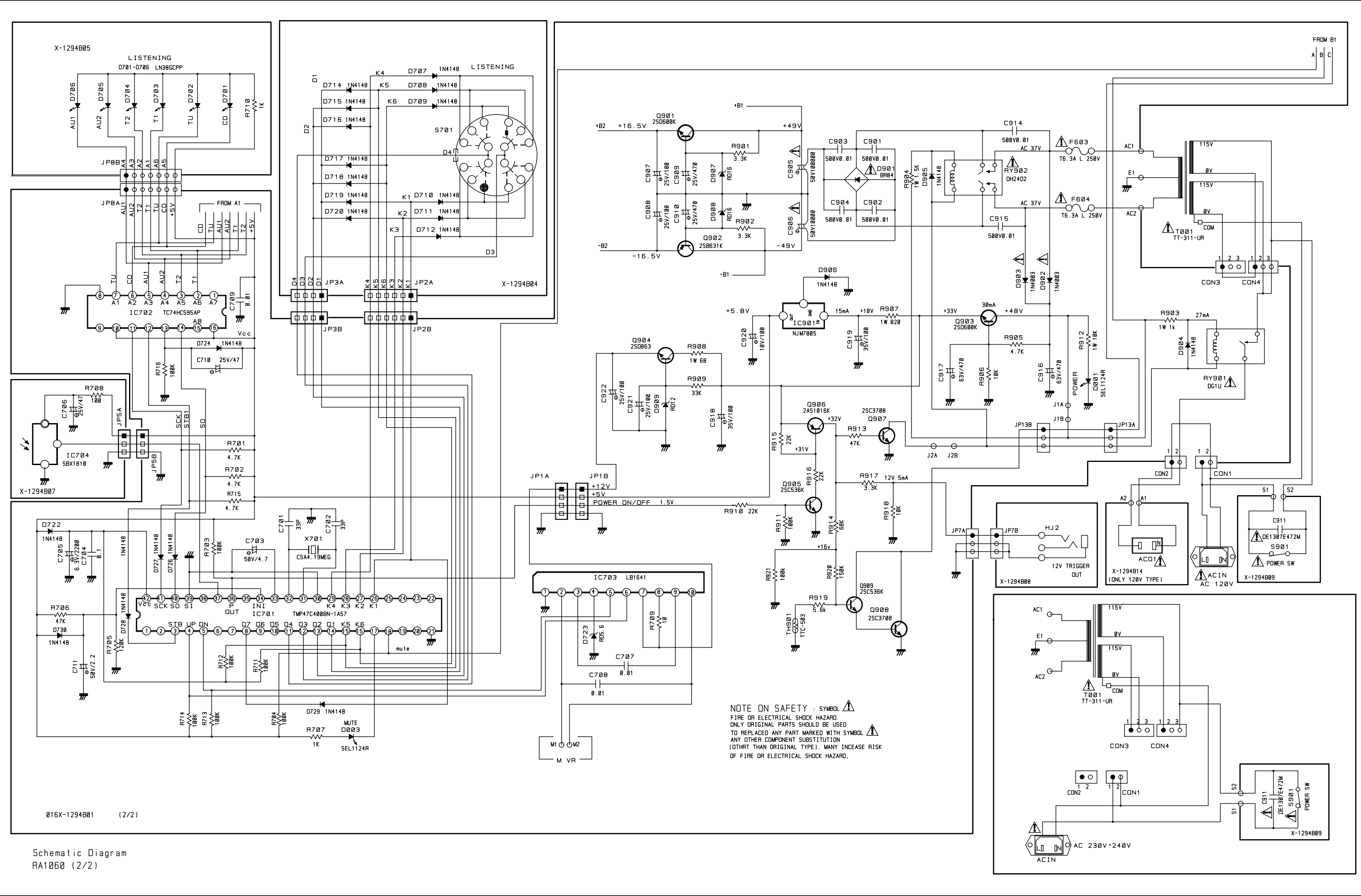




Schematic Diagram



Schematic Diagram



016X-1294B01 (2/2)

Schematic Diagram
RA1060 (2/2)