



# Technical Manual

# STEREO PRE-MAIN AMPLIFIER RA-870

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### Specifications

Continuous Power Output . . . . . 60 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 . . . . . 118 watts per channel (1 kHz,  
4 ohms, 1% THD)

Power Output (BTL) . . . . . 120 watts (mono) min. RMS  
(When used with RB-870  
power amp.)  
driven into 8 ohms from 20 to  
20,000 Hz with no more than  
0.03% total harmonic distortion

Total Harmonic Distortion . . . . . No more than 0.03% (continuous  
(20 to 20,000 Hz, from  
TUNER)  
No more than 0.03% (continuous  
1/2 rated power output)  
No more than 0.05% (1 watt per  
channel power output, 8 ohms)

Intermodulation Distortion . . . . . No more than 0.05% (continuous  
(60 Hz : 7 kHz = 4 : 1)  
No more than 0.05% (continuous  
1/2 rated power output)  
No more than 0.05% (1 watt per  
channel power output, 8 ohms)

Output: Speaker . . . . . 8-16 ohms  
Headphone . . . . . 4-16 ohms

Damping Factor . . . . . 280 (20 to 20,000 Hz, 8 ohms)

Input Sensitivity/Impedance:

- PHONO (MC) . . . . . 0.2 mV/200 ohms
- PHONO (MM) . . . . . 2.5 mV/47 kohms
- CD . . . . . 150 mV/47 kohms
- TUNER . . . . . 150 mV/47 kohms
- TAPE MONITOR 1, 2 . . . . . 150 mV/47 kohms

Overload Level (T.H.D. 0.01%, 1 kHz):

- PHONO (MC) . . . . . 27 mV
- PHONO (MM) . . . . . 300 mV
- CD, TUNER, TAPE . . . . . 5V

Frequency Response:

- PHONO . . . . . 20 to 20,000 Hz, ±0.2 dB (RIAA STD)
- CD, TUNER, TAPE . . . . . 20 to 30,000 Hz, +0 dB, -1.0 dB

Signal-to-Noise Ratio (IHF, A network):

- PHONO (MC) . . . . . 70 dB
- PHONO (MM) . . . . . 80 dB
- CD, TUNER, TAPE . . . . . 102 dB

**MISCELLANEOUS**

Power Requirement . . . . . 120V/60 Hz, 220V/50 Hz, 240V/50 Hz,  
or 120, 220, 240V/50-60 Hz (switchable)  
(depending on destinations)

Power Consumption . . . . . 500 watts

Dimensions (overall) . . . . . 430 (W) x 91 (H) x 317 (D) mm  
16-15/16" x 3-9/16" x 12-15/32"

Weight (net) . . . . . 9.8 kg/21.56 lbs.

- Specifications and design subject to possible modification without notice.
- \* Measured pursuant to the Federal Trade Commission's Trade Regulation Rule on Power Claims for Amplifiers (applicable to the U.S.A. only).

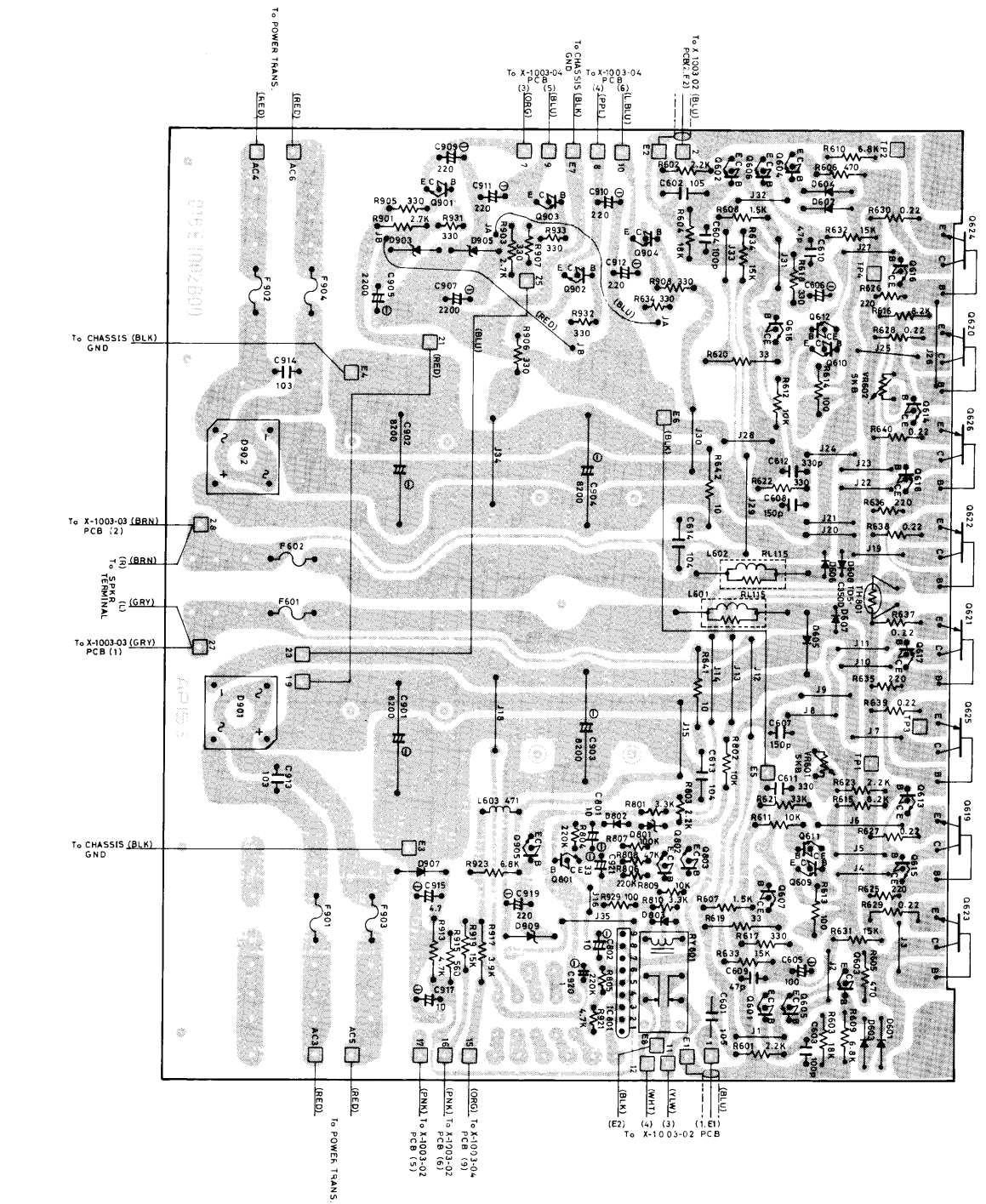
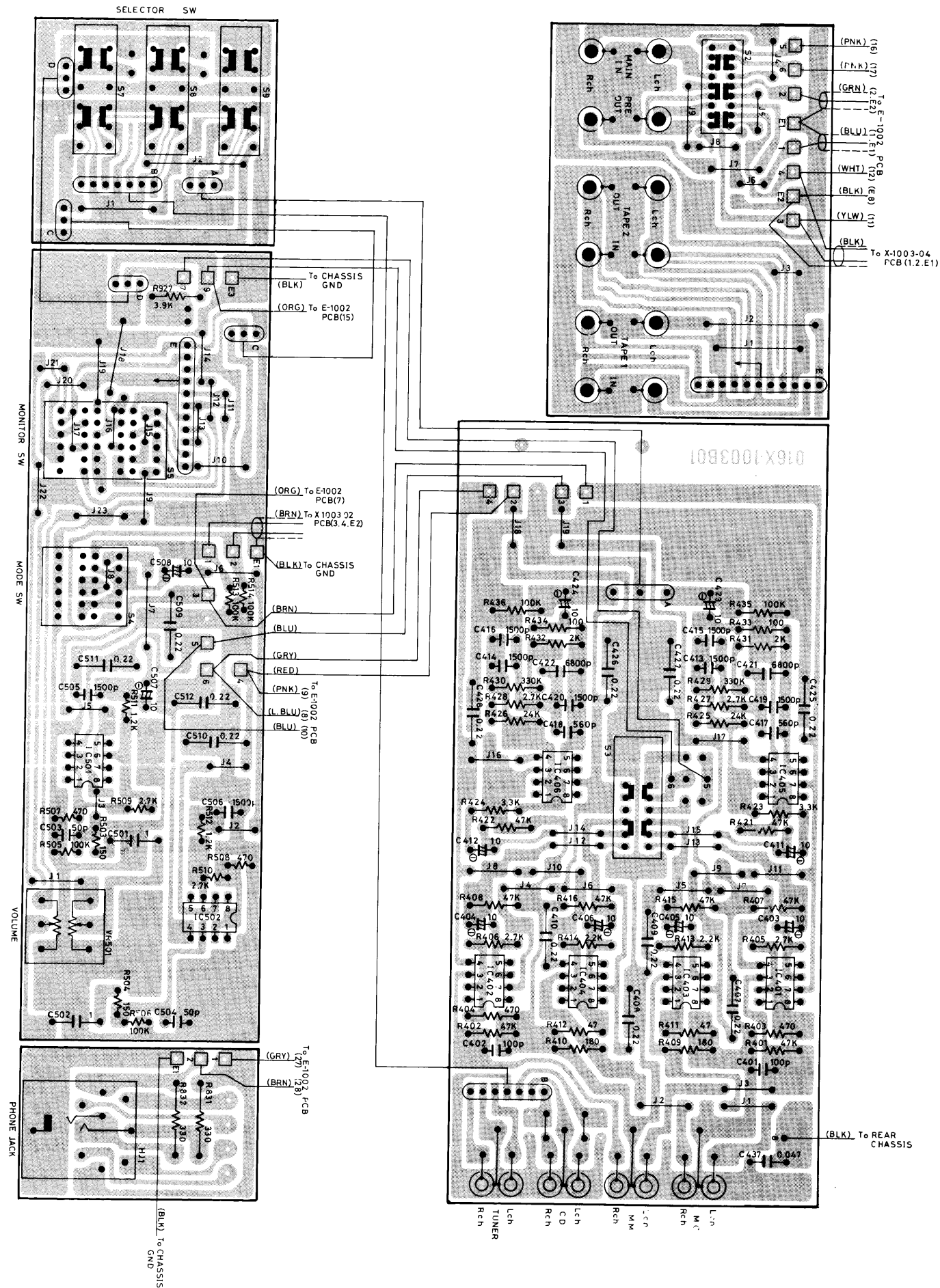
**Serial No.  
Beginning**

# Parts List

Schematic Location	Computer No.	Description
<b>TRANSISTORS, DIODES AND IC'S</b>		
Q601	0322SA1016-FG	
Q602	0322SA1016-FG	
Q603	0322SA1016-FG	
Q604	0322SA1016-FG	
Q605	0322SA1016-FG	
Q606	0322SA1016-FG	
Q607	0322SC1941-KL	
Q608	0322SC1941-KL	
Q609	0322SB605-KL	
Q610	0322SB605-KL	
Q611	0322SB631-EF	
Q612	0322SB631-EF	
Q613	0322SD600-EF	
Q614	0322SD600-EF	
Q615	0332SD600-EF	
Q616	0332SD600-EF	
Q617	0332SB631-EF	
Q618	0332SB631-EF	
Q619	0332SD1047-DE	
Q620	0332SD1047-DE	
Q621	0332SB817-DE	
Q622	0332SB817-DE	
Q623	0332SD1047-DE	
Q624	0332SD1047-DE	
Q625	0332SB817-DE	
Q626	0332SB817-DE	
Q801	0322SC536SP-F	
Q802	0322SC536SP-FG	
Q803	0322SC536-FG	
Q901	0322SD600-EF	
Q902	0322SD600-EF	
Q903	0322SB631-EF	
Q904	0322SB631-EF	
Q905	0322SC1826-OY	
D601	034FDH9615F	
D602	034FDH9615F	
D603	034FDH9615F	
D604	034FDH9615F	
D605	034DS135C	
D606	034DS135C	
D607	034DS135C	
D608	034DS135C	
D801	034RD5.6EB	
D802	034FDH9615	
D803	034FDH9615	
D901	034KBPC102	
D902	034KBPC102	
D903	034RD18EB	
D905	034RD18EB	
D907	034DS135C	
D909	034RD24EB	
IC401	031NE5534AN	
IC402	031NE5534AN	
IC403	031NE5534AN	
IC404	031NE5534AN	
IC405	031NE5534N	
IC406	031NE5534N	
IC501	031NE5534N	
IC502	031NE5534N	
IC801	031TA7324P	

Schematic Location	Computer No.	Description
<b>COILS AND VARIABLE RESISTORS</b>		
L601	021 RL-115	SPKR Coil
L602	021 RL-115	SPKR Coil
VR501	051C-4109	K27BA-50KAX2 Volume
VR601	051EVNJOA5K	
VR602	051EVNJOA5K	
<b>SWITCHES AND OTHERS</b>		
S1	061C-3600B	SDL 1P Power SW
S2	061C-4106	SBU2043 Mode SW
S3	061C-4105	SBU3064 Tape Monitor SW
S4	061C-4175A53	SSR242 Phono Selection SW
S4	061C-4175A01	SBU0002F
S5	061C-4103	SUN321A Selection SW
T001	022T-180G	Power Trans.
T002	022T-180G	Power Trans.
C001	044NSK135	Spark Killer For STD
	044PME265MB522	Spark Killer For CEE
	044NSK132	Spark Killer For HYDRO
RY801	063RZ24W	Relav, Protection
HJ1	062C-3399#1	M-1658AYCA Phone Jack
F601	036L250V 6A	Long Fuse For STD
~ 602	036(S) T6.3A	Mini Fuse For CEE
	036GGL125V 7A	Long Fuse For HYDRO
F901	036L250V 4A	Long Fuse For STD
~ 904	036(S) T4A	Mini Fuse For CEE
	036ASG250V4.5A	Long Fuse For HYDRO
D001	034LN224RP	LED IND. Power
D002	034LN224RP	LED IND. Bridged
D003	034LN224RP	LED IND. Protection
D004	034LN224RP	LED IND. Tape 1
D005	034LN224RP	LED IND. Tape 2
D006	034LN324GP	LED IND. Tuner
D007	034LN324GP	LED IND. CD
D008	034LN324GP	LED IND. MM
D009	034LN324GP	LED IND. MC
	062C-4102#2	Pin Jack 4P Tape Monitor, Pri. Out. Main In
	062C-3923#2	Pin Jack 4P CD. Tuner
	062C-3923#3	Pin Jack 4P MC. MM
	062C-3273	Voltage Selector
	062C-3909	AC Outlet
	062C-4110	SPKR Terminal 4P
	1112NN-1#1	Front Panel
	012C-4097#1	Knob Volume Lch
	012C-4098#1	Knob Volume Rch
	012C-3187#2	Knob Mode etc.
	012C-3982#2	Button Power
	012C-3188#2	Button Selector
	014NN4-06A01	Upper Cover

# Wiring Diagram

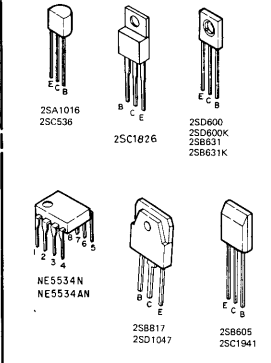
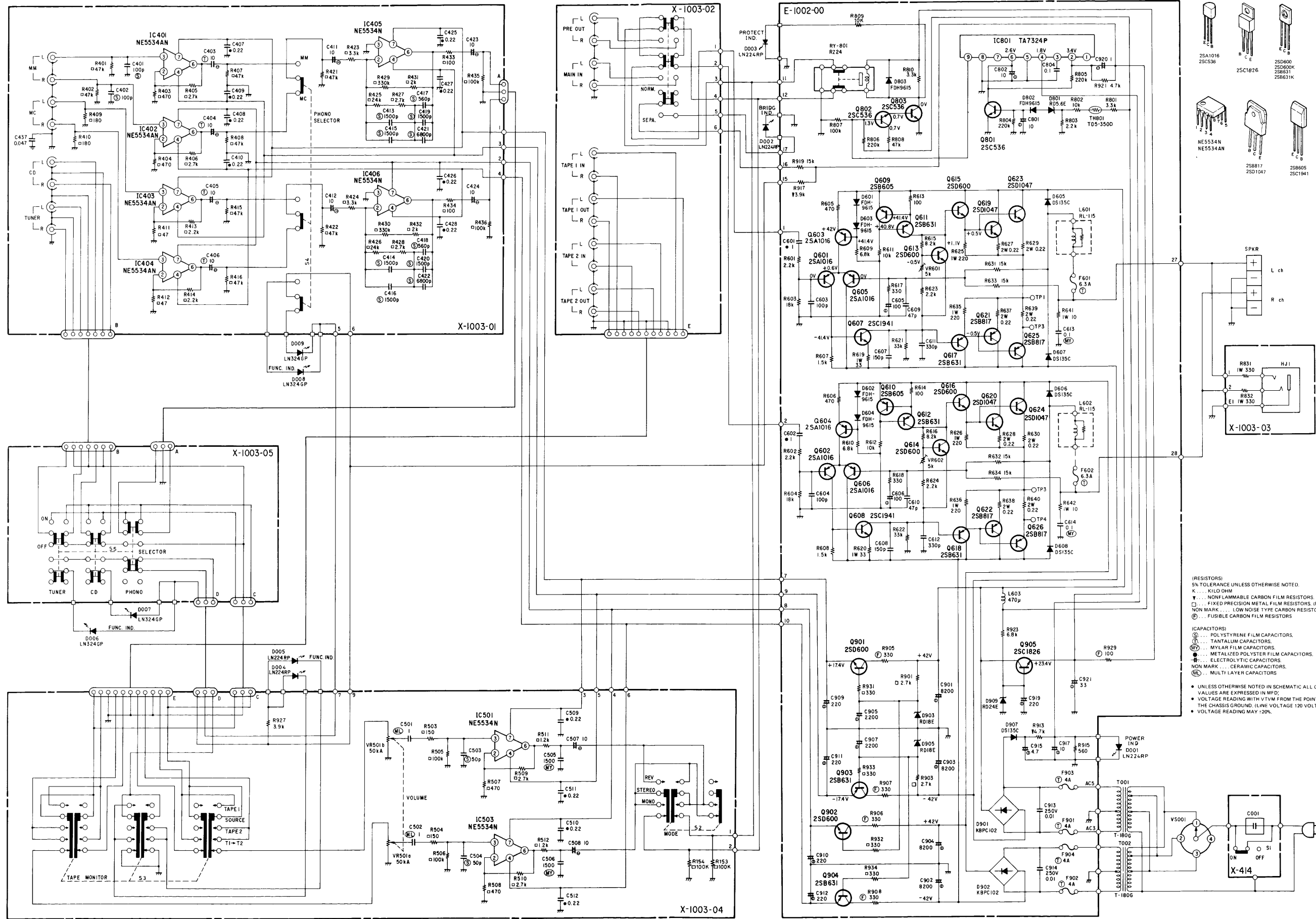


## Power Amplifier Bias Adjustment

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 5mV.
2	TP2	TP4	VR602	

# Schematic Diagram



- (RESISTORS)  
 5% TOLERANCE UNLESS OTHERWISE NOTED.  
 K... KILO OHM  
 M... MEG OHM  
 \*... NON-FLAMMABLE CARBON FILM RESISTORS, 1/2 WATT  
 □... FIXED PRECISION METAL FILM RESISTORS, 1% (G), 2% (NON MARK)... LOW NOISE TYPE CARBON RESISTORS, 1/4 WATT  
 ⊙... FUSIBLE CARBON FILM RESISTORS
- (CAPACITORS)  
 ⊙... POLYSTYRENE FILM CAPACITORS.  
 ⊙... TANTALUM CAPACITORS.  
 ⊙... MYLAR FILM CAPACITORS.  
 ⊙... METALIZED POLYESTER FILM CAPACITORS.  
 ⊙... ELECTROLYTIC CAPACITORS.  
 NON MARK... CERAMIC CAPACITORS.  
 ⊙... MULTI LAYER CAPACITORS
- UNLESS OTHERWISE NOTED IN SCHEMATIC ALL CAPACITANCE VALUES ARE EXPRESSED IN MF.  
 • VOLTAGE READING WITH VTM FROM THE POINT SHOWN TO THE CHASSIS GROUND. (LINE VOLTAGE 120 VOLTS)  
 • VOLTAGE READING MAY ±20%.