



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).

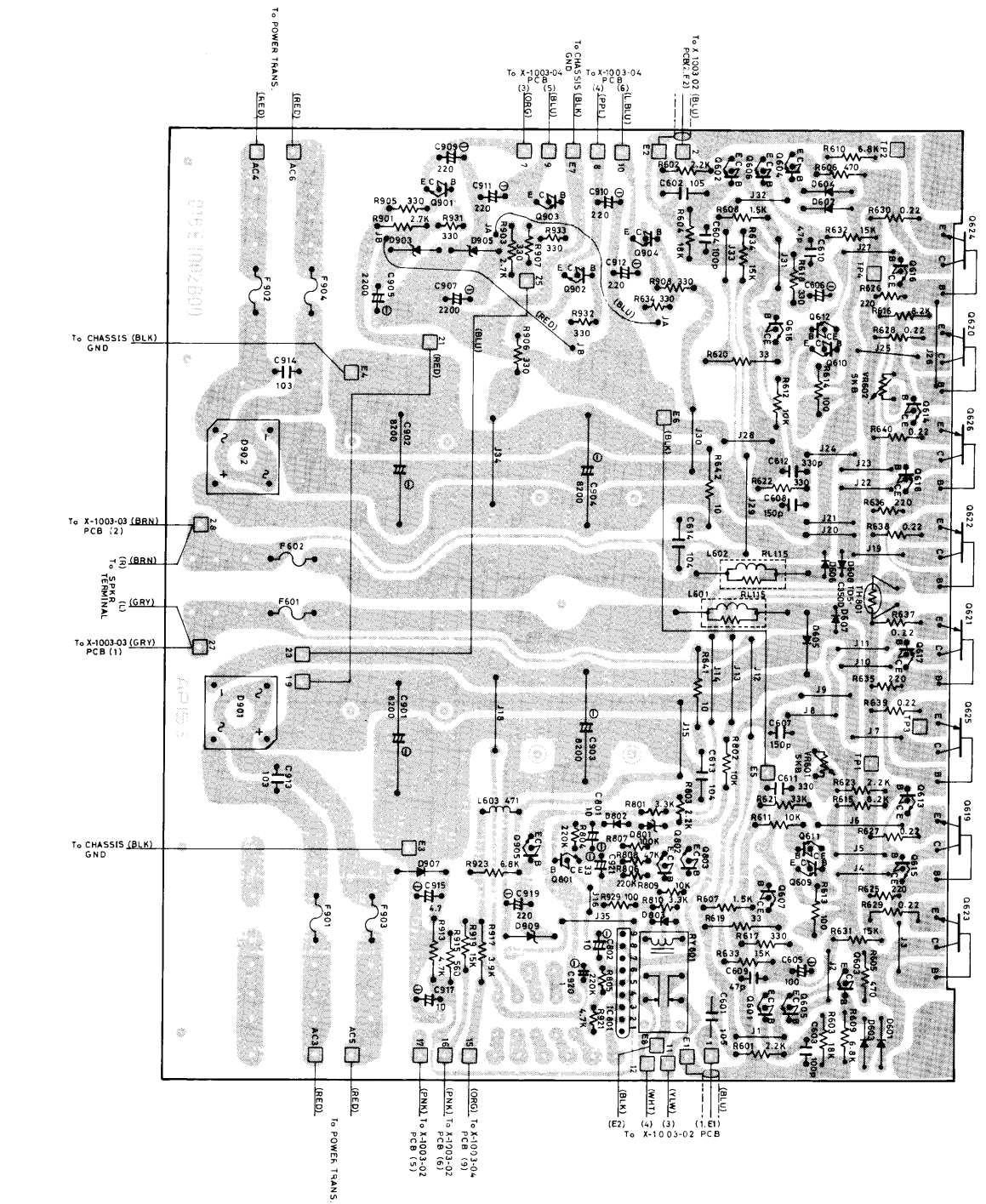
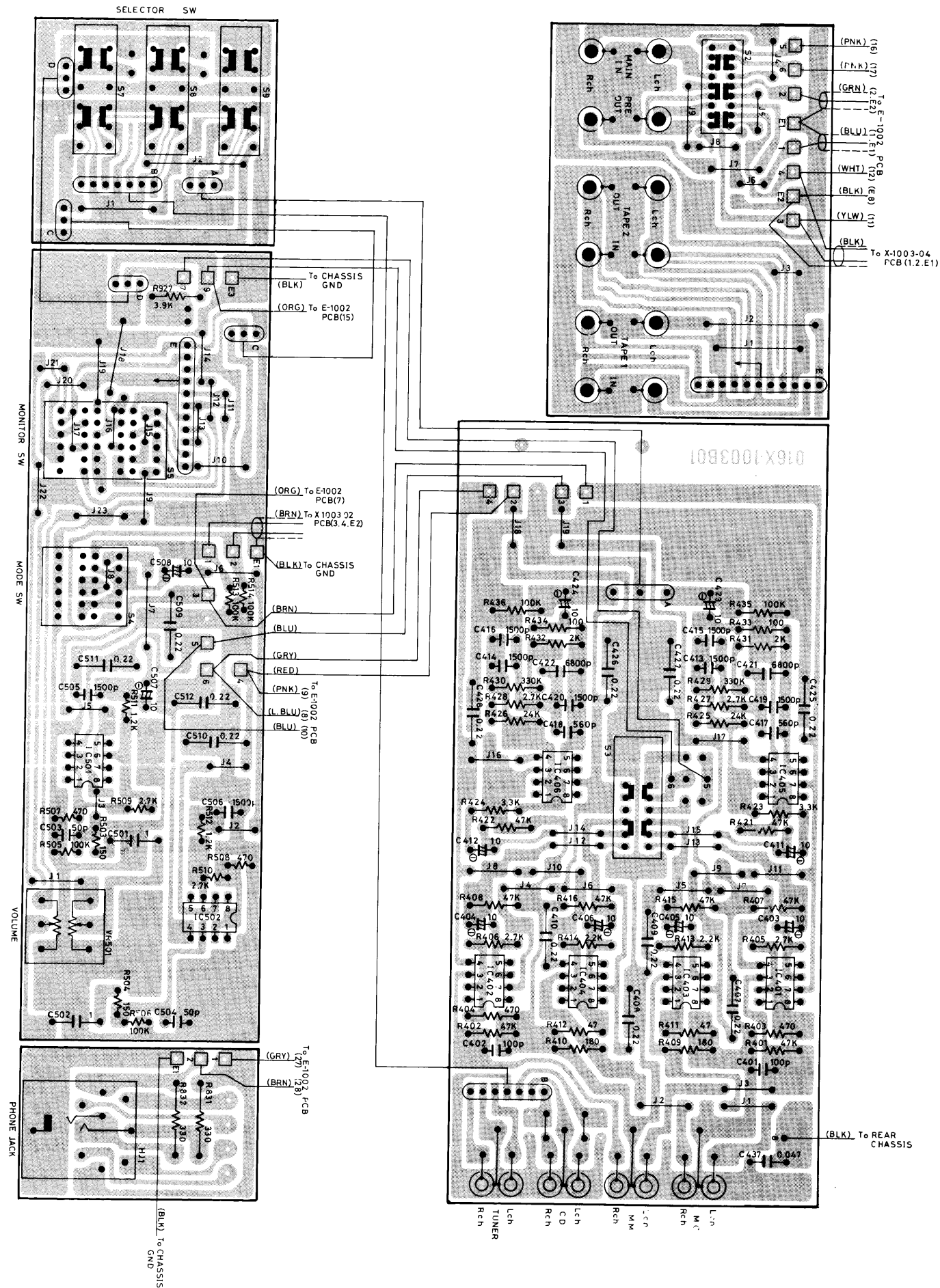
**Serial No.
Beginning**

Parts List

| Schematic Location | Computer No. | Description |
|-------------------------------------|----------------|-------------|
| TRANSISTORS, DIODES AND IC'S | | |
| 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 |
|-------------------------------------|----------------|--|
| COILS AND VARIABLE RESISTORS | | |
| L601 | 021 RL-115 | SPKR Coil |
| L602 | 021 RL-115 | SPKR Coil |
| | | |
| VR501 | 051C-4109 | K27BA-50KAX2 Volume |
| VR601 | 051EVNJOA5K | |
| VR602 | 051EVNJOA5K | |
| | | |
| SWITCHES AND OTHERS | | |
| 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

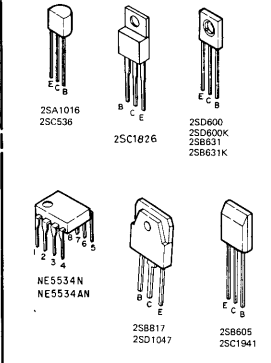
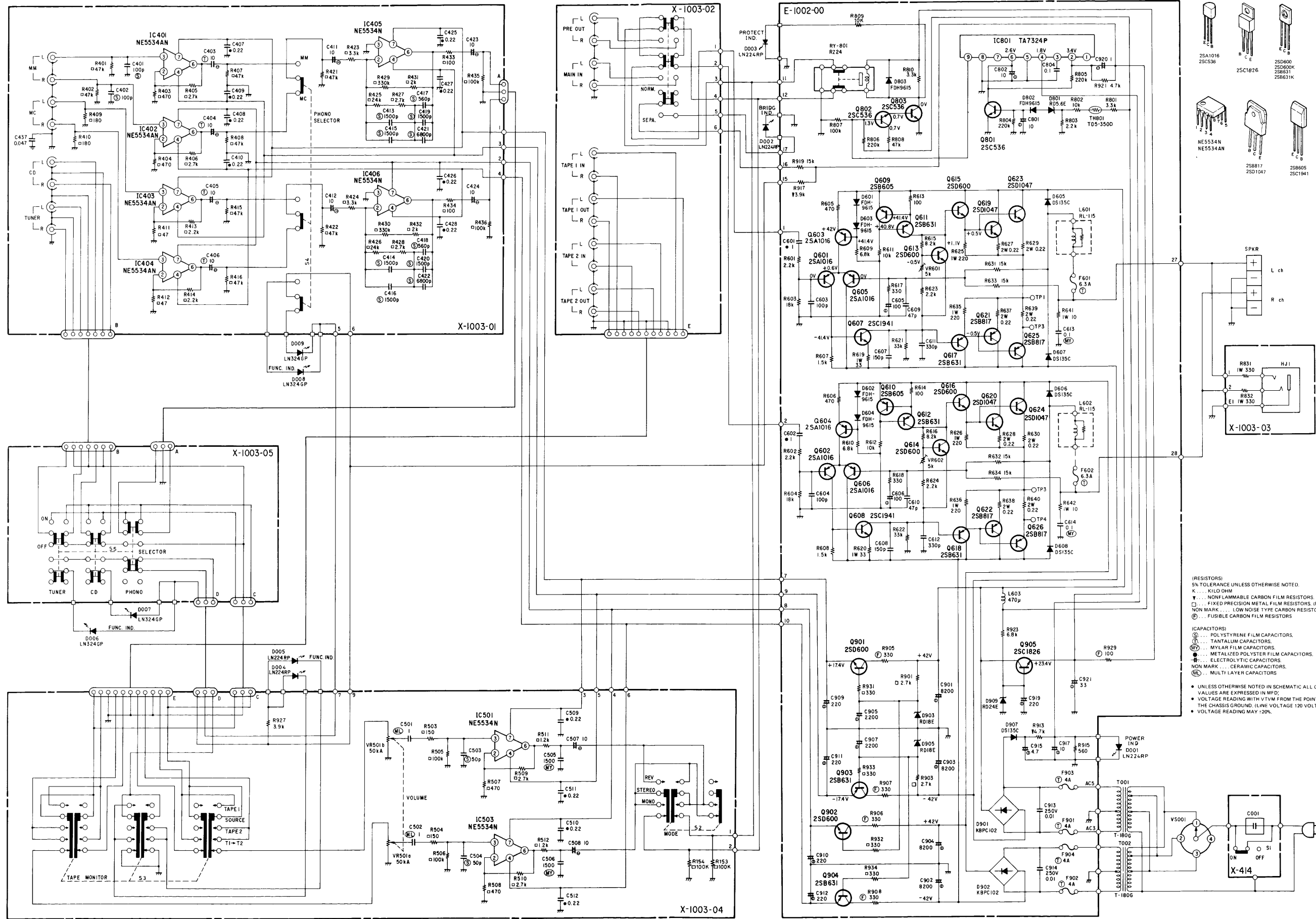


Power Amplifier Bias Adjustment

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%.