# 210

GENERAL INFORMATION
SCHEMATIC DIAGRAM
PARTS LIST
ALIGNMENT MANUAL

**NIKKO**

## *stereo pre-amp/amplifier model trm - 210*


NIKKO ELECTRIC MFG. CO., LTD. 4-1, 3-CHOME, TAMAGAWA OKUSAWA-CHO, SETAGAYA-KU, TOKYO, JAPAN.
NIKKO ELECTRIC CORPORATION OF AMERICA 16270 RAYMER STREET VAN NUYS CARIF. 91406 U.S.A

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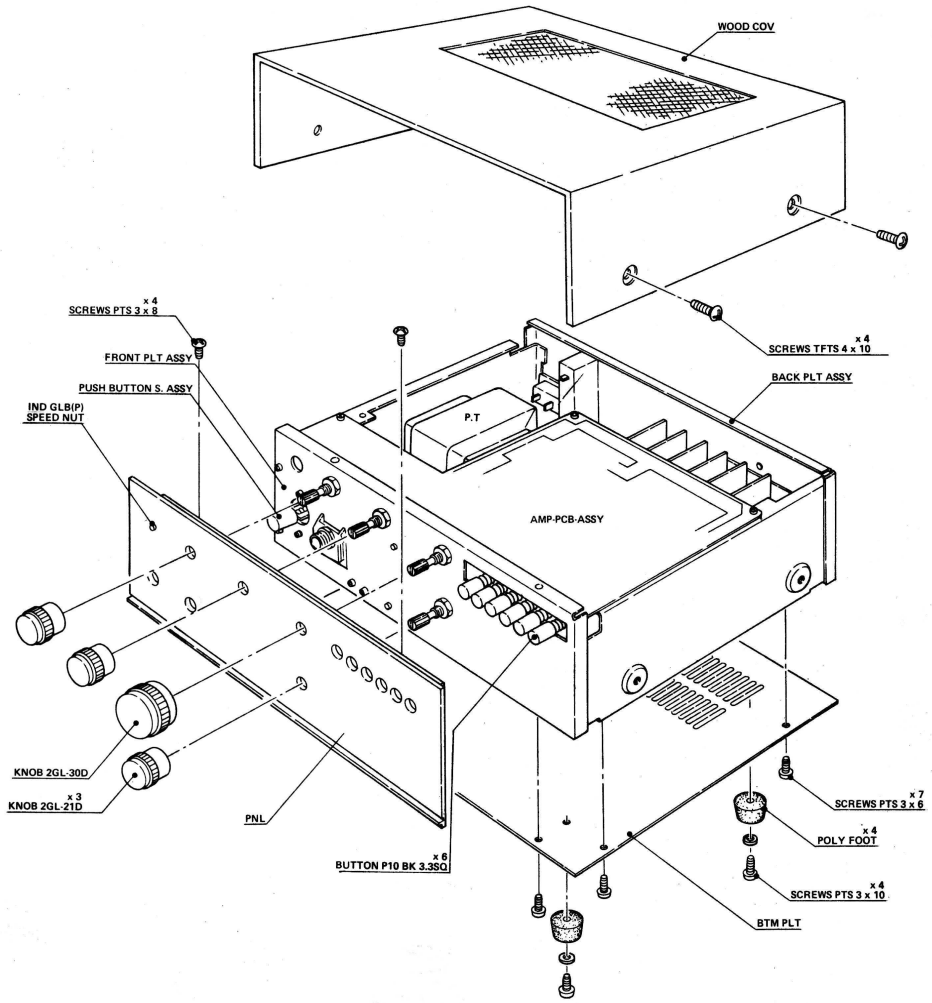
## 1. SPECIFICATIONS

| TRM-210 | | NOMINAL | LIMIT |
|---|---|---|---|
| Imput senisitivity | PHONO | 2.7mV | ±3dB |
| (at 1000Hz | TAPE | 185mV | ±3dB |
| rated output) | TUNER | 185mV | ±3dB |
| | AUX. | 185mV | ±3dB |
| S/N PHONO | PHONO | 60dB | 54dB |
| | Other | 75dB | 70dB |
| Output | single ch. driven | 16W | 14W |
| (8 ohm | both ch. driven | 12W | 10W |
| 1% T.H.D.) | REC. out | 170mV | ±3dB |
| Distortion | at 1W | 0.2% | 0.5% |
| Frequency response | | 20~20KHz | ±2dB |
| Equalizer | RIAA | at 10Hz, 10KHz | ±2dB |
| Bass control | at 70Hz | +12dB | ±3dB |
| | | −10dB | ±3dB |
| Loudness control | at 10KHz | +10dB | ±3dB |
| | | −10dB | ±3dB |
| Loudness control | at 70Hz | +10dB | |
| (−30dB) | at 10KHz | +6dB | |
| Gain unbalance (at volume maximum) | | | 2dB |
| Residual output voltage (at volume minimum) | | 0.8mV | 1.5mV |

## 2.1 DISASSEMBLY DETAILS




## FINAL ASSEMBLY

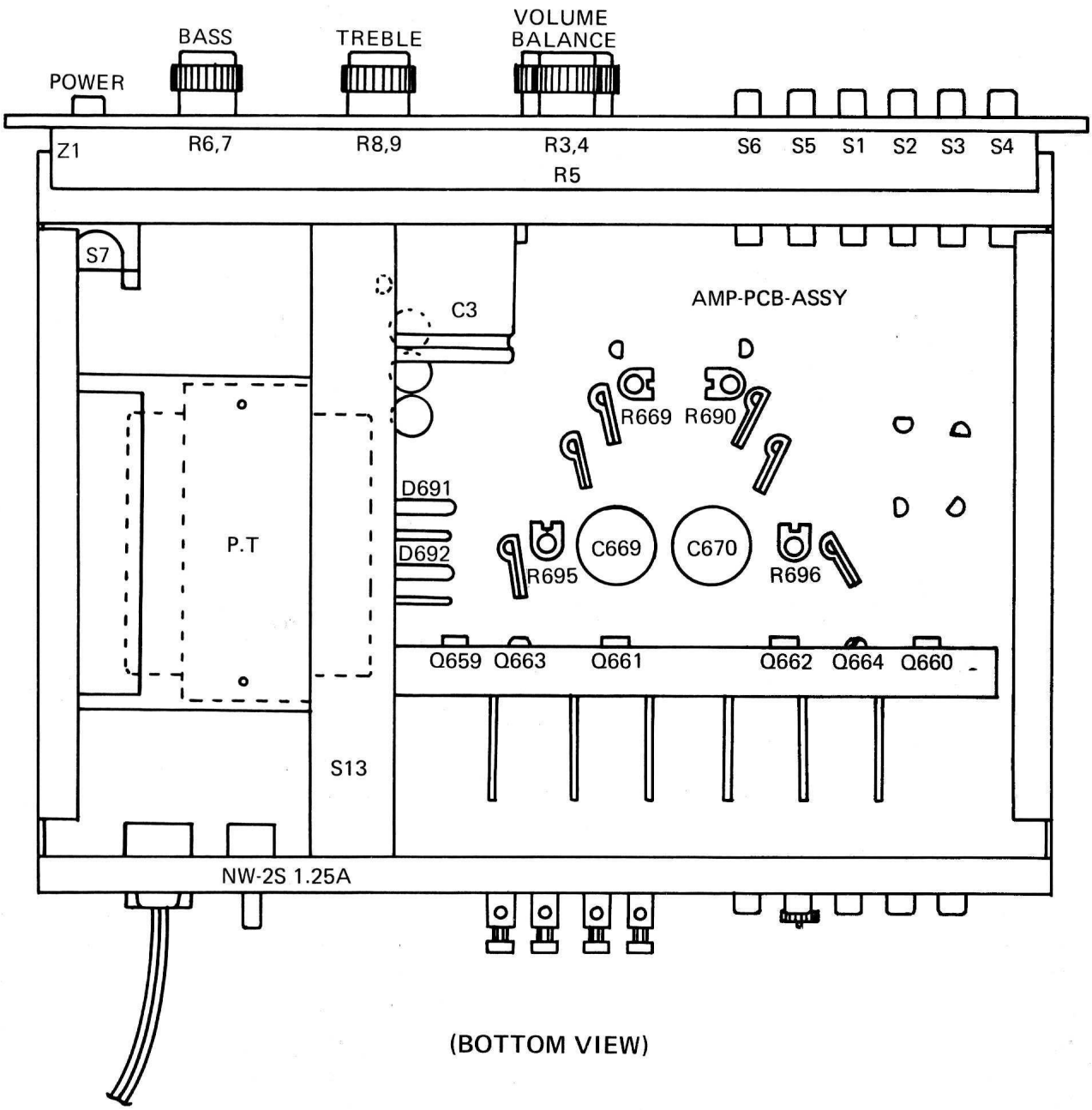
| Parts No. | Description | Symbol | Parts No. | Description | Symbol |
|---|---|---|---|---|---|
| 982442 O | CARTON BOX | | 740046 O | IND GLB (P) | |
| 982446 O | PAD | | 892483 U | SPEED NUT | |
| 960109 E | OWNS MANUAL | | *783077 O | WOOD COV | |
| *960110 E | OWNS MANUAL | DIN TYPE | 783082 O | WOOD COV | |
| 961086 E | DIAGRAM | | 732244 O | BTM PLT | |
| 788256 O | PNL TRM-210 | | 790289 O | POLY FOOT | |
| 785066 O | KNOB 2GL-30D | VOLUME | 110148 O | P.T T-1-148 | |
| 785068 O | KNOB 2GL-21D | | 402035 O | SLD SW ESD-275DU | S13 |
| 785061 O | BUTTON P10BK-3.3SQ | PUSH SW | 444012 O | PIN PLUG | |

* DIN TYPE

## FRONT PLT ASSEMBLY

| Parts No. | Description | Symbol | Parts No. | Description | Symbol |
|---|---|---|---|---|---|
| 455001 O | EAR JACK 3P | PHONES | 404037 O | PUSH SW TV-3 S-J4955 | S7 |
| 874331 M | M-RES 330 OHM 2W | R11, 12 | 580810 O | PL-8 8V 50mA | Z1 |
| 740059 O | PUSH BUTTON S. ASS | POWER SW | 431033 O | VR24L25N4BM50K | R5 |
| 248103 Z | C-CAP 0.01MF 1.4KV | C4 | 205338 U | E-CAP 50V 3300MF | C3 |

## 2.2 COMPONWNT LAYOOT



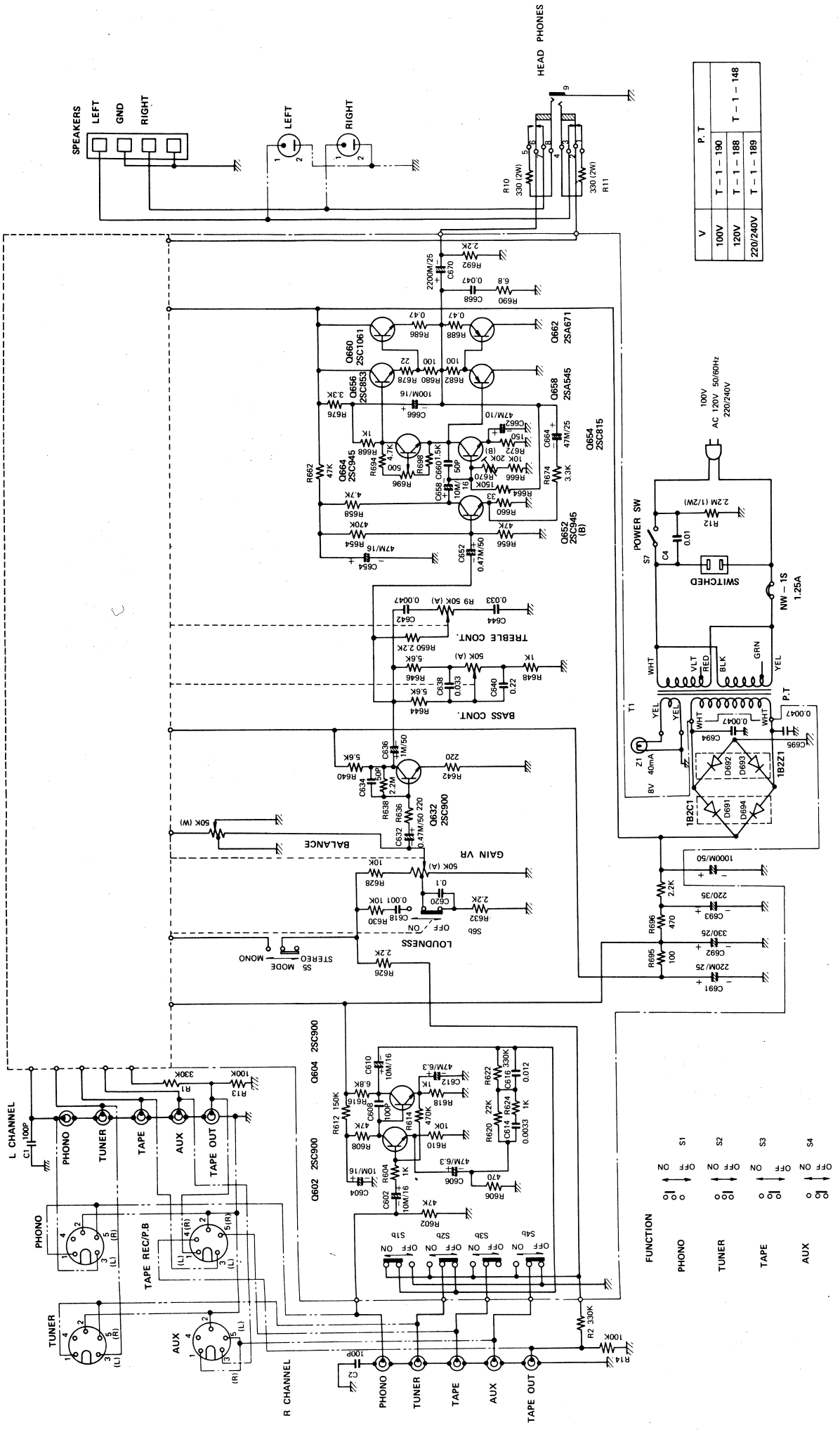

(BOTTOM VIEW)

## PACK PLT ASSEMBLY

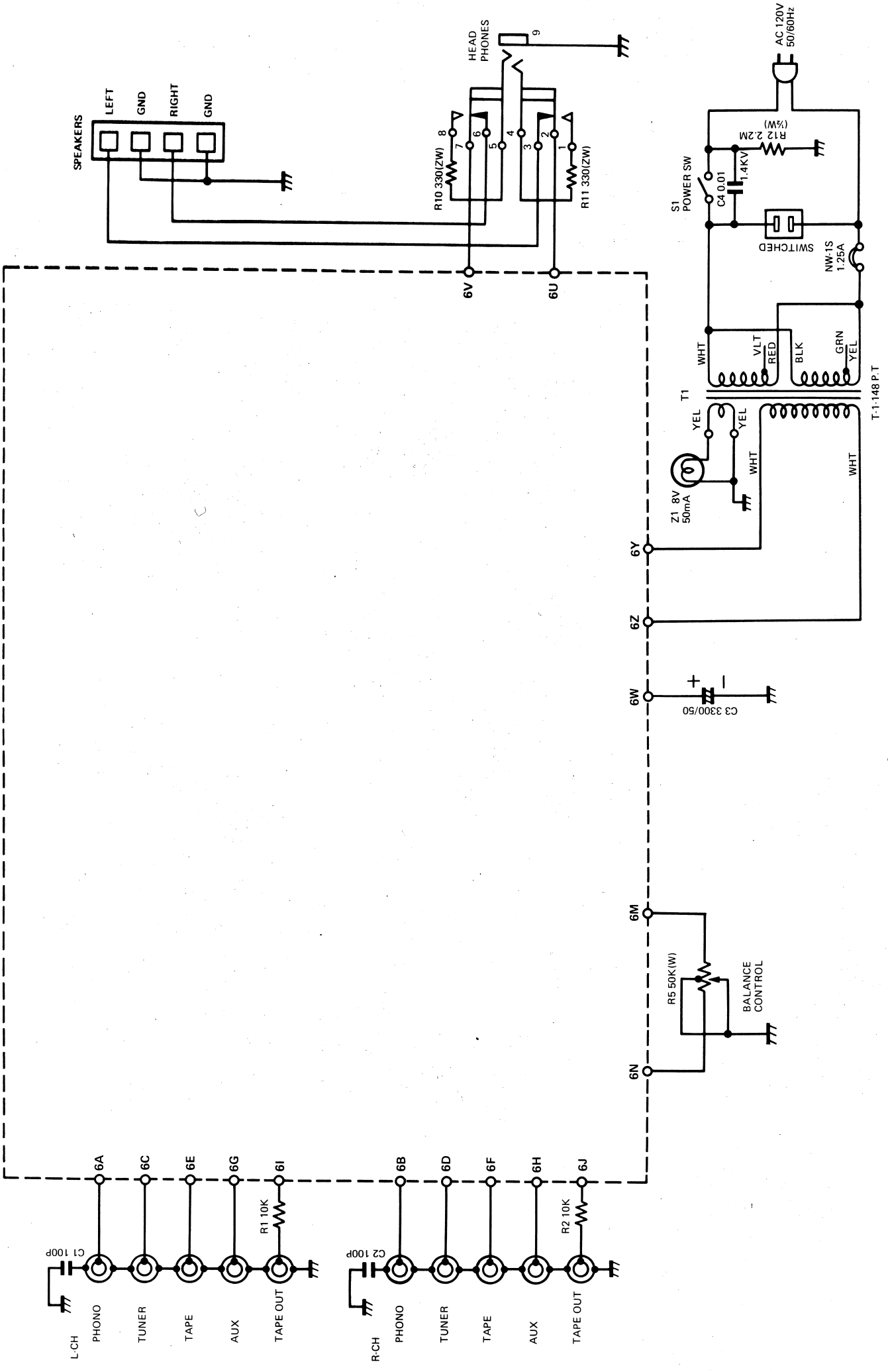
| Parts No. | Description | Symbol | Parts No. | Description | Symbol |
|---|---|---|---|---|---|
| 606002 J | PLUG CORD | | 311103 J | RES 10K OHM 1/4P | R1, 2 |
| 740062 O | CORD STP SR-3P-4 (HEYCO) | | 245101 M | C-CAP 100PF | C1, 2 |
| 450006 O | UL SKT | AC OUTLET | *453022 O | DIN CONCT 5P | INPUT/TAPE PB/REC. |
| 312225 K | RES 2.2M OHM 1/2P | R12 | | | |
| 490065 O | NW-2S 1.25A | | *311334 J | RES 330K OHM 1/4P | |
| 440005 O | GND TER NUT | | *311104 J | RES 100K OHM 1/4P | |
| 444053 O | US PIN TER 5P | INPUT/ TAPE OUT | *453034 O | DIN CONCT 2P | SPEAKERS |
| | | | 446041 O | PUSH TER 4P | SPEAKERS |

* DIN TYPE

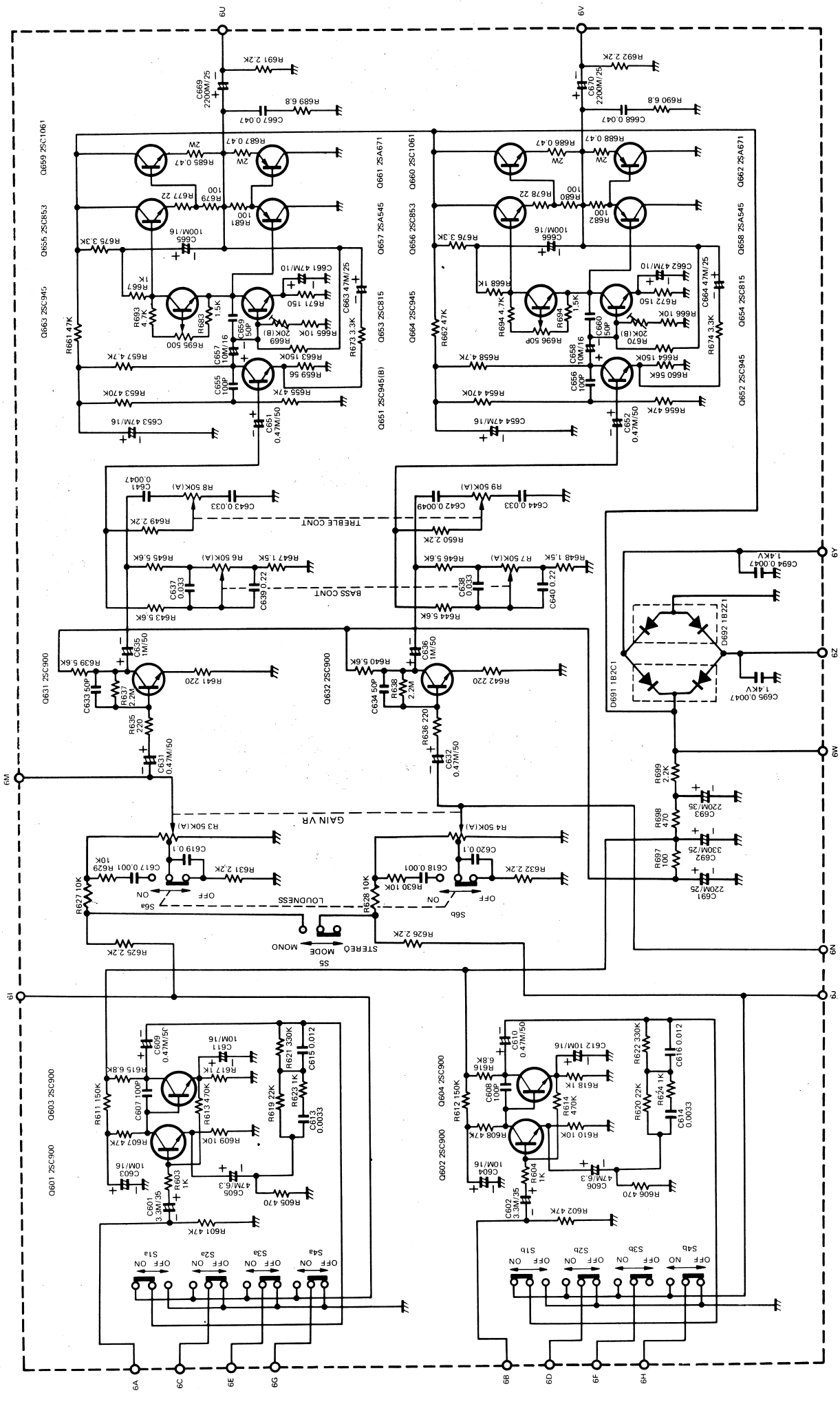
## 2.3 SCHEMATIL DIAGRAM, OVERALL

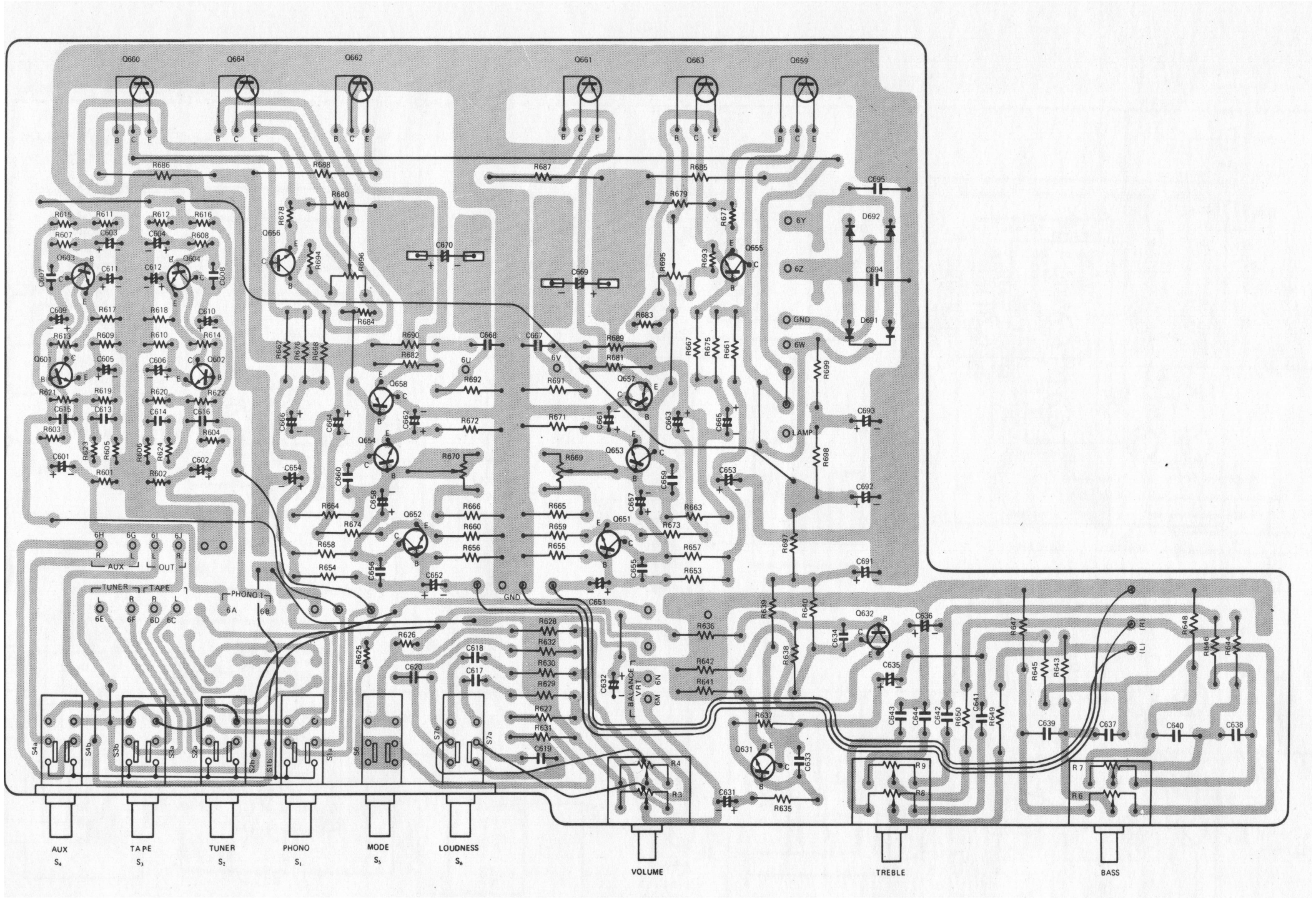


## 2.4 BLOCK DIAGRAM



## 2.5 AMP. ASSEMBLY (SCHEMATIC)




Q660
Q664
Q662
Q661
Q663
Q659
R686
R688
R687
R685
C695
R680
R679
D692
R678
R677
6Y
Q656
Q655
6Z
C670
C669
C694
R694
R696
R695
R693
R615
R611
R612
R616
R607
C603
C604
R608
Q603
Q604
C607
C611
C612
C608
R683
C669
C610
R617
R618
D691
GND
R613
R609
R610
R614
R684
R690
C668
C667
R689
6W
R682
R676
R688
6V
6U
R681
R667
R675
R651
R699
Q601
Q602
C605
C606
R621
R619
R620
R622
R692
R691
Q657
Q658
LAMP
C615
C613
C614
C616
C666
C664
C662
C663
C665
C693
R603
R604
R671
R698
C661
C654
Q654
Q653
R672
R669
R670
C660
C659
C653
C658
C657
C692
R664
R666
R665
R663
R674
Q652
Q651
R673
R658
R660
R659
R657
R654
C656
C655
R653
C691
R697
C652
C651
GND
6H
6G
6I
6J
R
L
L
R
AUX
OUT
TUNER
TAPE
PHONO 1
6E
6F
6D
6C
6A
6B
R636
R639
R640
Q632
C636
R628
R632
R630
R629
R638
C634
R647
R626
R625
C618
C620
C617
R642
C635
R645
R643
R648
R646
R644
R627
R631
C619
C632
BALANCE
VR1
6M
6N
R641
R637
C643
C644
C642
R650
C641
R649
C639
C637
C640
C638
Q631
C633
R4
R9
R7
R3
R8
R6
C631
R635
S4a
S4b
S3b
S3a
S2b
S2a
S1b
S1a
96
S7b
S7a
AUX
S4
TAPE
S3
TUNER
S2
PHONO
S1
MODE
S5
LOUDNESS
S6
VOLUME
TREBLE
BASS

# AMP. PCB ASSEMBLY

| Parts No. | Description | Symbol |
|---|---|---|
| 463032 A | AMP PCB | |
| | **MAIN AMP SECTION** | |
| 728020 O | H-SINK | |
| 513033 S | TR 2SC1061 | Q659, 660 |
| 513048 S | TR 2SA671 | Q661, 662 |
| 515057 S | TR 2SC853 | Q655, 656 |
| 514075 S | TR 2SA545 | Q657, 658 |
| 515006 S | TR 2SC815 | Q653, 654 |
| 515045 S | TR 2SC945 | Q651, 652 |
| | | Q663, 664 |
| 430033 O | KVSF 10-7 ANF B20K | R669, 670 |
| 430040 O | KVSF 10-7 SNF B500 | R695, 696 |
| 311688 J | RES 6.8 OHM 1/4P | R689, 690 |
| 321220 J | RES 22 OHM ELR 1/4 | R677, 678 |
| 311560 J | RES 56 OHM 1/4P | R659, 660 |
| 311101 J | RES 100 OHM 1/4P | R679, 680, 681, R682 |
| 311151 J | RES 150 OHM 1/4P | R671, 672 |
| 321152 J | RES 1.5K OHM ELR 1/4 | R683, 684 |
| 311102 J | RES 1K OHM 1/4P | R667, 668 |
| 311222 J | RES 2.2K OHM 1/4P | R691, 692 |
| 311332 J | RES 3.3K OHM 1/4P | R673, 674, 675, R676 |
| 311472 J | RES 4.7K OHM 1/4P | R657, 658 |
| 311103 J | RES 10K OHM 1/4P | R665, 666 |
| 311473 J | RES 47K OHM 1/4P | R655, 656, 661, R662 |
| 321472 J | RES 4.7K OHM ELR 1/4 | R693, 694 |
| 311154 J | RES 150K OHM 1/4P | R663, 664 |
| 311474 J | RES 470K OHM 1/4P | R653, 654 |
| 374479 K | M-RES 0.47 OHM 2P | R685, 686, 687, R688 |
| 245101 M | C-CAP 100PF SL 50V | C655, 656 |
| 245500 M | C-CAP 50PF SL 50V | C659, 660 |
| 225473 M | M-CAP 0.047MF | C667, 668 |
| 205474 W | E-CAP 50R0.47 MF | C651, 652 |
| 202106 W | E-CAP 16R10 MF | C657, 658 |
| 200476 W | E-CAP 6.3R47 MF | C661, 662 |
| 202476 W | E-CAP 16R47 MF | C653, 654 |
| 203476 W | E-CAP 25R47 MF | C663, 664 |
| 202107 W | E-CAP 16R100 MF | C665, 666 |
| 203228 R | E-CAP 25L2200 MF | C669, 670 |
| | **TONE AMP SECTION** | |
| 432043 O | V16L4G3N25KC A50kx2 C.T. | R3, 4 |
| 432042 O | V16L4G3N25KC A50x2 | R6, 7, 8, 9 |
| 515069 S | TR 2SC900 | Q631, 632 |
| 311221 J | RES 220 OHM 1/4P | R635, 636, 641, R642 |
| 311222 J | RES 2.2K OHM 1/4P | R649, 650 |
| 311152 J | RES 1.5K OHM 1/4P | R647, 648 |
| 311562 J | RES 5.6K OHM 1/4P | R639, 640, 643, R644, 654, 646 |
| 311225 J | RES 2.2M OHM 1/4P | R637, 638 |
| 245500 M | C-CAP 50PF SL 50V | C633, 634 |
| 225472 K | M-CAP 0.0047MF | C641, 642 |
| 225333 K | M-CAP 0.033MF | C643, 644, 637, C638 |
| 225223 K | M-CAP 0.022MF | |
| 225224 K | M-CAP 0.22MF | C639, 640 |
| 205474 W | E-CAP 50R0.47 MF | C631, 632 |
| 205105 W | E-CAP 50R1MF | C635, 636 |
| | **EQ AMP SECTION** | |
| 404046 O | HEXA PUSH SW SUB63 | S1, 2, 3, 4, 5, 6 |
| 515069 S | TR 2SC900 | Q601, 602, 603, Q604 |
| 311222 J | RES 2.2K OHM 1/4P | R631, 632 |
| 321471 J | RES 470 OHM ELR 1/4 | R605, 606 |
| 321102 J | RES 1K OHM ELR 1/4 | R603, 604, 617, R618, 623, 624 |
| 321222 J | RES 2.2K OHM ELR 1/4 | R625, 626 |
| 321682 J | RES 6.8K OHM ELR 1/4 | R615, 616 |
| 311103 J | RES 10K OHM 1/4P | R627, 628, 629, R630 |
| 321103 J | RES 10K OHM ELR 1/4 | R609, 610 |
| 321223 J | RES 22K OHM ELR 1/4 | R619, 620 |
| 321473 J | RES 47K OHM ELR 1/4 | R601, 602, 607, R608 |
| 321154 J | RES 150K OHM ELR 1/4 | R611, 612 |
| 321334 J | RES 330K OHM ELR 1/4 | R621, 622 |
| 321474 J | RES 470K OHM ELR 1/4 | R613, 614 |
| 245101 M | C-CAP 100PF SL 50V | C607, 608 |
| 225102 K | M-CAP 0.001MF | C617, 618 |
| 225332 K | M-CAP 0.0033MF | C613, 614 |
| 225123 K | M-CAP 0.012MF | C615, 616 |
| 225104 K | M-CAP 0.1MF | C619, 620 |
| 205474 W | E-CAP 50R0.47 MF | C609, 610 |
| 204335 W | E-CAP 35R3.3 MF | C601, 602 |
| 202106 W | E-CAP 16R10 MF | C603, 604, 611, C612 |
| 200476 W | E-CAP 6.3R47 MF | C605, 606 |
| | **REG SECTION** | |
| 560028 S | D 1B2C1 | D691 |
| 560029 S | D 1B2Z1 | D692 |
| 311101 J | RES 100 OHM 1/4P | R697 |
| 311471 J | RES 470 OHM 1/4P | R698 |
| 311222 J | RES 2.2K OHM 1/4P | R699 |
| 203227 W | E-CAP 25R220 MF | C691 |
| 204227 W | E-CAP 35R220 MF | C693 |
| 203337 W | E-CAP 25R330 MF | C692 |
| 248472 Z | C-CAP 0.0047MF | C694, 695 |
| 458127 O | PIN 1.2SQ-20 | |

# 3. TRANSISTOR SPECIFICATIONS

## 3.1 TRANSISTOR COMPLEMENT

| Type | Description | Class of Service | Maximum Ratings ($T_A$=25°C) (Absolute Values) | | | | | | Electrical Characteristics (Typical Value) $T_A$=25°C | | | | | | | | | | Manufacture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Collector to Base Voltage $V_{CBO}$ | Emitter to Base Voltage $V_{EBO}$ | Collector Current $I_C$ | Emitter Current $I_E$ | Collector Dissipation PC | Junction Temperature | Condition of Measurement $V_{CE}$ | Condition of Measurement $I_E$ | hfe (hFE) | NF | fαb (fT) | Cob | hie (real) | Collector Cut-off Current $I_{CBO}$ (max.) | Collector Cut-off Current $V_{CB}$ | Emitter Cut-off Current $I_{EBO}$ (max.) | Emitter Cut-off Current $V_{EB}$ | |
| | | | (V) | (V) | (mA) | (mA) | (mw) | (°C) | (V) | (μA) | | dB | MHz | pF | Ω | (μA) | | (μA) | (V) | |
| 2SA539 | PNP Si E-P | Medium Amp | − 60 | −5 | −200 | | 250 | 125 | − 1 | −50 | 80 | | 200 | | | 0.1 | − 45 | 0.1 | −3 | NEC |
| 2SA545 | PNP Si E-P | Medium Amp | − 70 | −5 | −200 | | 400 | 125 | − 1 | −50 | 80 | | 200 | | | 0.1 | − 45 | 0.1 | −3 | NEC |
| 2SA640 | PNP Si E-P Al-P | Low Noise Amp | − 50 | −5 | − 30 | | 250 | 125 | − 3 | − 0.5 | 300 | 27mV | 100 | 8 | | 100nA | − 40 | 100nA | −3 | NEC |
| 2SC710 | NPN Si E-P | RF Amp | 30 | 4 | 30 | | 200 | 125 | 6 | 1 | 100 | 3 | 200 | 2.0 | | 1 | 25 | 5 | 2 | MITSUBISHI |
| 2SC815 | NPN Si E-P | Medium Amp | 60 | 5 | 200 | | 250 | 125 | 6 | 10 | 150 | | 200 | 5.5 | 25 | 0.1 | 45 | 0.1 | 3 | NEC |
| 2SC839 | NPN Si E-P | RF Amp | 50 | 5 | 50 | | 250 | 125 | 3 | 0.5 | 100 | 2.5 | 250 | 2.0 | | 0.1 | 15 | 0.1 | 3 | NEC |
| 2SC853 | NPN Si E-P | Medium Amp | 70 | | 200 | | 400 | 125 | 10 | 10 | 110 | | 90 | 7.5 | 40 | 0.1 | 60 | 0.1 | 8 | NEC |
| 2SC900 | NPN Si E-P Al-P | Low Noise Amp | 30 | 5 | 30 | | 250 | 125 | 3 | 0.5 | 400 | 30mV | 100 | | | 50nA | 25 | 100nA | 3 | NEC |
| 2SC945 | NPN Si E-P | Small Signal Amp | 50 | 5 | 100 | | 250 | 125 | 6 | 1 | 180 | 4 | 300 | 4.5 | | 0.1 | 40 | 0.1 | 3 | NEC |
| 2SC1222 | NPN Si E-P Al-P | Low Noise Amp | 50 | 5 | 30 | | 250 | 125 | 3 | 0.5 | 400 | 27mV | 100 | | | 50nA | 25 | 100nA | 3 | NEC |
| 2SC1335 | NPN Si E-P LTP | Low Noise Amp | 30 | 5 | 100 | | 200 | 125 | 12 | 2 | 500 | 3 | 230 | 1.8 | | 0.5 | 18 | 0.5 | 2 | HITACHI |
| 2SC1507 | NPN Si Triple Diffused | High Voltage Power | 300 | 7 | 200 | | 15W | 150 | 10 | 10 | 80 | | 80 | 4.5 | | 100nA | 200 | 100nA | 5 | NEC |
| 2SD361 | NPN Si E-P | Power Output | 60 | 5 | 1.5A | | 10W | 150 | 4 | 0.5A | 110 | | | | | 1 | 25 | 1 | 5 | MITSUBISHI |
| 2SA671 | PNP Si Triple Diffused | Power Output | − 50 | −4 | −3A | | 25W | 150 | − 4 | −1A | 100 | | 32 | | | 100 | − 20 | | | HITACHI |
| 2SC1061 | NPN Si Triple Diffused | Power Output | 50 | 4 | 3A | | 25W | 150 | 4 | 1A | 100 | | 8 | | | 100 | 20 | | | HITACHI |
| 2SA489 | PNP Si E-P Messa | Power Output | − 70 | −5 | −4A | | 30W | 150 | − 5 | −0.5A | 100 | | 3 min. | 230 | | 30 | − 50 | 100 | −5 | TOSHIBA |
| 2SC789 | NPN Si Triple Diffused | Power Output | 70 | 5 | 4A | | 30W | 150 | 5 | 0.5A | 100 | | 3 min. | 150 | | 30 | 50 | 100 | 5 | TOSHIBA |
| 2SB536 | PNP Si E-P | Power Output | −130 | −5 | −1.5A | | 20W | 150 | − 5 | −0.3A | 100 | | | | | 1 | −120 | 1 | −3 | NEC |
| 2SD381 | NPN Si E-P | Power Output | 130 | 5 | 1.5A | | 20W | 150 | 5 | 0.3A | 100 | | | | | 1 | 120 | 1 | 3 | NEC |
| 2SB539 | PNP Si Triple Diffused | Power Output | −130 | 6 | −10A | | 100W | 150 | − 5 | −2A | 100 | | | | | 0.1 | −120 | 0.1 | −5 | NEC |
| 2SD287 | NPN Si Triple Diffused | Power Output | 200 | 7 | 10A | | 100W | 150 | 5 | 2A | 100 | | | | | 0.3 | 100 | 0.3 | 5 | NEC |

## RECTIFIER, DIODE, ZENER-DIODE, THERMISTOR

| Type | Description | Maximum Ratings ($T_A$=25°C) | | | | | | Electrical Characteristics (Typical Value) $T_A$=25°C | | | | | | Manufacture |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Peak Inverse Voltage (V) | Dissipation (mw) | Output current (mA) | Inverse current (A) | Surge current (A) | Junction Temperature (°C) | Condition | | Condition | | Condition | | |
| 1S188 (1N60) | Ge Diode Point contact | Peak 40 35 | | 50mA | $V_R$=10V 75μA | 0.5A | 70 | γ 40MHz | min. 50% | C $V_R$=1V | 0.8pF | | | KURAKE |
| V06B | Si Varistor | (Yellow) 100 | | 1.1A | | 25A | 165 | | | | | | | HITACHI |
| KB-265 | Si Varistor | 6 | | 30mA | $V_R$=6V 10μA | | 110 | $V_F$ $I_F$=3mA | 1.24~ 1.38V | γF $I_F$=3mA | −4 mV/°C | | | KURAKE |
| 5D-21 | Thermistor | | | | | | -10 85 | R25°C | 100Ω ±15% | K 50°C/25°C | 2.24 ±8% | | | NEC |
| XZ-122 | Si Zener Diode | | 500 | | $V_R$=10V 1μA | | 175 | $V_Z$ $I_Z$=5mA | 11.9~ 12.6V | Rd $I_Z$=5mA | max. 15Ω | | | JRC |
| WZ-081 | Si Zener Diode | | 500 | | $V_R$=4V 1μA | | 175 | $V_Z$ $I_Z$=10mA | 7.7~ 8.5V | Rd $I_Z$=10mA | max. 10Ω | | | JRC |
| 1B2C1 | Si Rectifier unite | 100 | | +2A | $V_R$=100V 0.4mA | 60A | 150 | $V_F$ $I_F$=2A | max. 1.2V | | | | | TOSHIBA |
| 1B2Z1 | Si Rectifier unite | 100 | | −2A | 0.4mA | 60A | 150 | $V_F$ $I_F$=2A | max. 1.2V | | | | | TOSHIBA |
| S2HB20 | Si Rectifier unite | 200 | | 8A | 10μA | 80A | 150 | $V_F$ $I_F$=4A | max. 1.2V | | | | | SHINDENGEN |

# 4. ALIGNMENT PROCEDURE

## 4.1 D.C. BALANCE ALIGNMENT

Adjust of R669,R670 so that output signal makes simulatanous clipping at 8 ohms both channels driven.

## 4.2 IDLING CURRENT ALIGNMENT

Adjust R695,R696 and align idling current in the limits 20mA ±10mA when Q659,661 and Q660,662 are showing no signal. (or termminal D.C voltage 10mV ±5mV at R685,687,686,688)