

ERIC NELSON

**The Harman Kardon
Model hk 505**

Integrated Amplifier

Technical Manual

harman/kardon

PRECAUTIONS

1. Always disconnect the chassis from power line when soldering. Turning the power switch OFF is not enough. Power line leakage passing through the heating element may destroy the transistors.
2. Never attempt to do any work on the transistor amplifiers without first disconnecting the AC line cord and waiting until the power supply filter capacitors have discharged.
3. Replacement for output and driver transistors, if necessary, must be made from the same beta group as the original type.
4. If one output transistor burns out (open or short) always remove all the output transistors in that channel and check the bias adjustment, the control and other parts in the network with an ohmmeter before inserting a new transistor. All transistors in one channel will be destroyed if the base biasing circuit is open on the emitter end.
5. When mounting a replacement power transistor, be sure that the bottom of the flange, the mica insulators and the surface of the heat sink are free of foreign matter, for they may cause transistor failure.
6. Silicon grease must be applied between the transistor and the mica insulator, and between the mica insulator and the heat sink for better heat conduction.
7. Fuses must be replaced with size and type indicated. Use of other types can expose components to destructive current levels.

ALIGNMENT PROCEDURES

POWER AMPLIFIER IDLING ADJUSTMENT

INSTRUMENT 1. D. C. V. T. V. M.

NOTE 1. Set volume control to minimum position.
2. Connect 8 ohm (50W) resistors to left and ground, right and ground speaker terminals.

| STEP | CONNECT OUTPUT METER TO | ADJUST | ADJUST FOR |
|------|--|--------|--------------------|
| 1 | D. C. V. T. V. M. to TP1 (+) and TP2 (-) | VR403 | 33 mV \pm 1.6 mV |
| 2 | D. C. V. T. V. M. to TP3(+) and TP4 (-) | VR404 | Same as above |

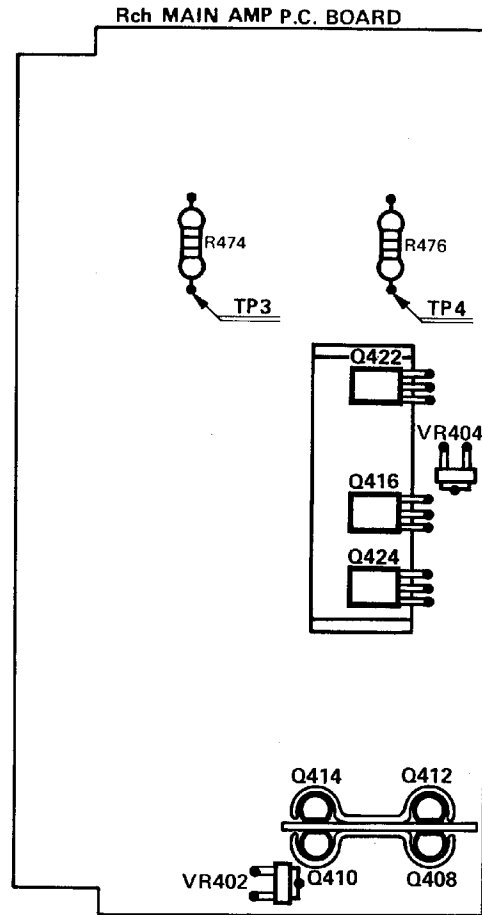
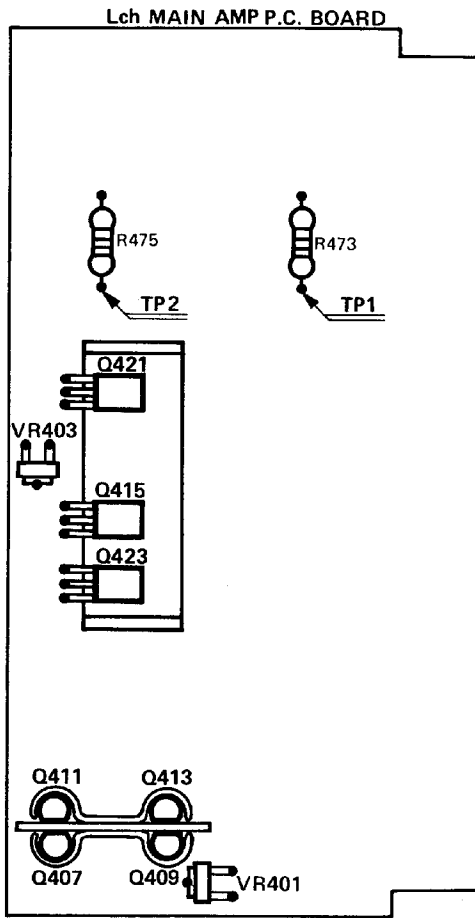
OUTPUT DC VOLTAGE ZERO ADJUSTMENT

INSTRUMENT 1. D. C. V. T. V. M.

NOTE 1. Set volume control to minimum position.
2. Press in speaker 1 push button to ON (button in) position.

| STEP | CONNECT OUTPUT METER TO | ADJUST | ADJUST FOR |
|------|--|--------|----------------|
| 1 | D. C. V. T. V. M. to L CH terminal of speaker system 1 | VR401 | 0V \pm 20 mV |
| 2 | D. C. V. T. V. M. R CH terminal of speaker system 1 | VR402 | Same as above |

ALIGNMENT POINTS



SCHEMATIC NOTES AND DIAGRAMS

1. All resistors are 1/4 watt, $\pm 5\%$, unless otherwise noted. Values are in ohms.
K = 1000 M = 1000 K.
2. All capacitance values are in MF unless noted otherwise. PF = MMF.
3. Function selector switch (SW2) is in PHONO position.

VOLTAGE CHART

AC120V
No Signal
Chassis Ground

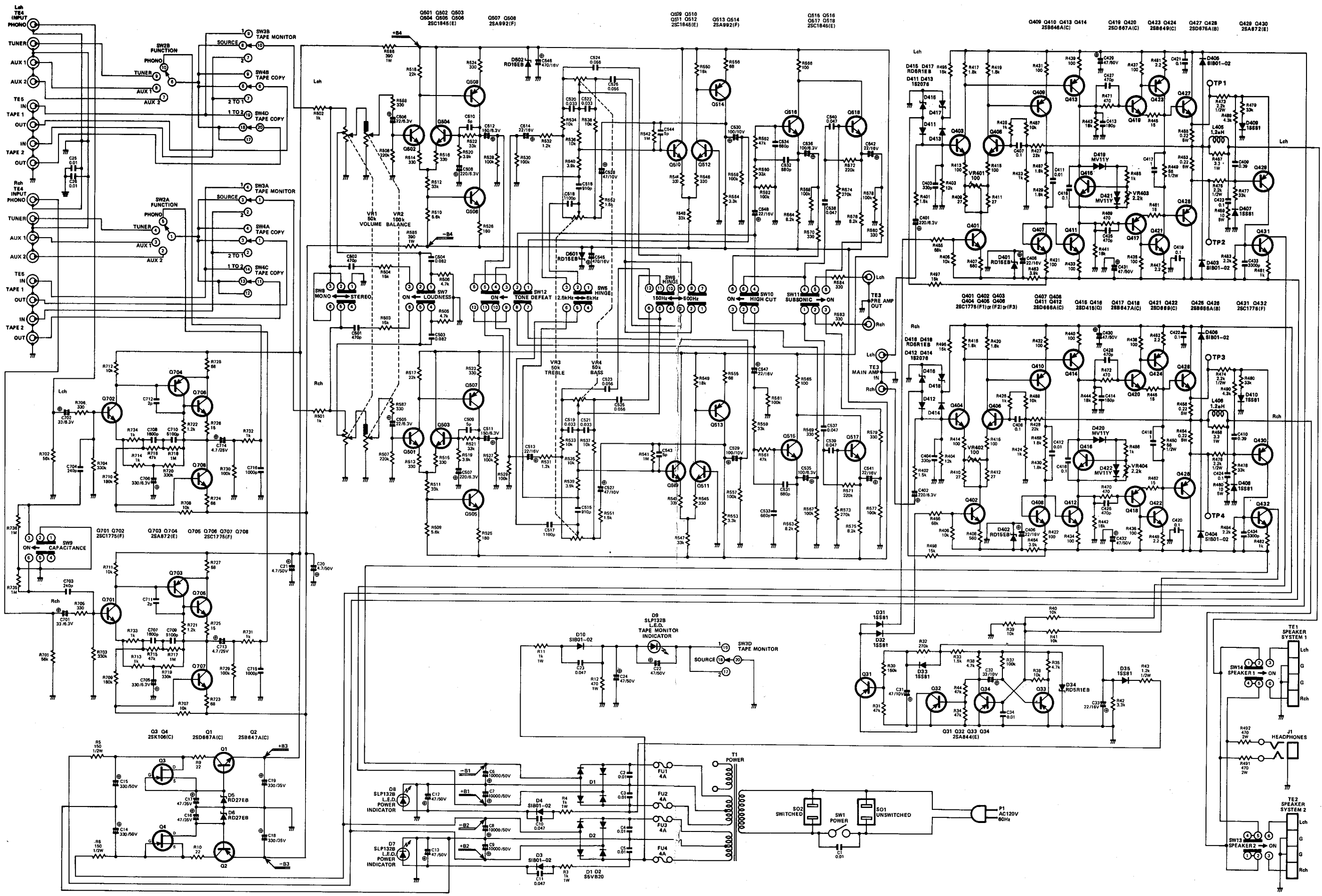
Volume Control at Minimum
Tone Controls at Mechanical Center

| | |
|-------------------|-------------------|
| +B1 +44.80V | -B1 -44.80V |
| +B2 +44.80V | -B2 -44.80V |
| +B3 +27.20V | -B3 -27.20V |
| +B4 +13.80V | -B4 -13.80V |

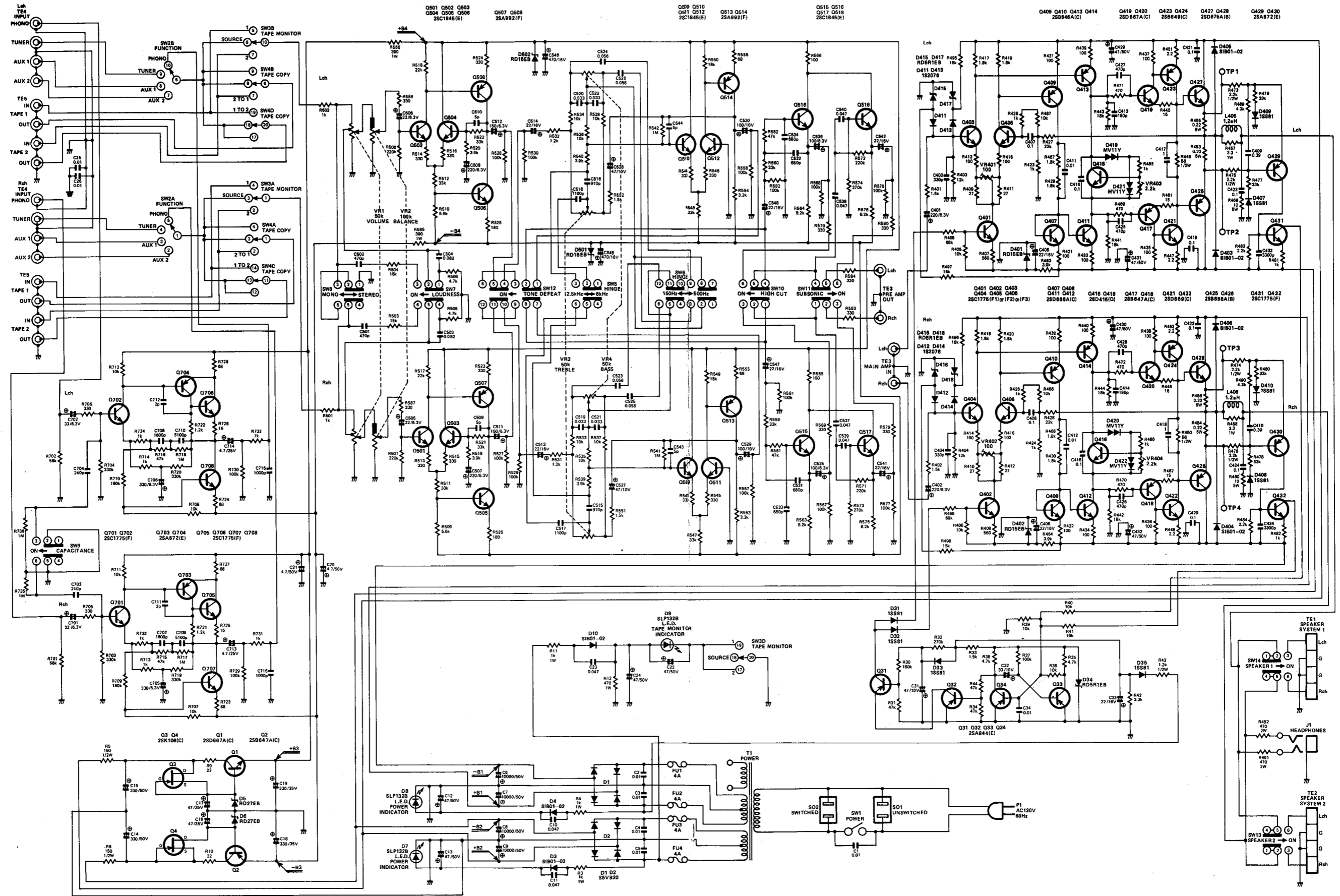
| | BASE | EMITTER | COLLECTOR |
|-----------|---------|---------|-----------|
| Q1 | +27.90V | +27.20V | +37.00V |
| Q2 | -27.80V | -27.20V | -36.70V |
| Q31 | - 0.67V | - 0.07V | - 0.17V |
| Q32 | - 0.62V | 0.0V | - 0.07V |
| Q33 | - 0.55V | 0.0V | - 0.07V |
| Q34 | - 0.06V | 0.0V | - 0.11V |
| Q401, 402 | -12.38V | -13.01V | - 0.71V |
| Q403, 404 | - 0.01V | - 0.60V | +43.30V |
| Q405, 406 | - 0.01V | - 0.60V | +43.30V |
| Q407, 408 | -43.70V | -44.20V | -43.70V |
| Q409, 410 | +43.30V | +43.80V | -11.50V |
| Q411, 412 | -43.70V | -43.90V | - 1.28V |
| Q413, 414 | +43.30V | +44.00V | + 1.28V |
| Q415, 416 | - 0.67V | - 1.28V | + 1.28V |
| Q417, 418 | - 1.26V | - 0.71V | -44.10V |
| Q419, 420 | + 1.20V | + 0.69V | +44.10V |
| Q421, 422 | -44.10V | -44.20V | - 0.61V |
| Q423, 424 | +44.10V | +44.20V | + 0.61V |
| Q425, 426 | - 0.61V | - 0.02V | -44.80V |
| Q427, 428 | + 0.61V | + 0.02V | +44.80V |
| Q429, 430 | - 0.01V | + 0.02V | -44.80V |
| Q431, 432 | -44.80V | -44.80V | - 0.05V |
| Q501, 502 | - 0.06V | - 0.6V | +10.92V |
| Q503, 504 | - 0.04V | - 0.6V | +13.80V |
| Q505, 506 | -12.05V | -12.52V | - 0.03V |
| Q507, 508 | +10.92V | +11.56V | - 0.03V |
| Q509, 510 | + 0.13V | - 0.43V | +13.80V |
| Q511, 512 | 0.0V | - 0.52V | +12.88V |
| Q513, 514 | +12.88V | +13.79V | + 0.67V |
| Q515, 516 | - 0.44V | - 1.04V | +13.50V |
| Q517, 518 | - 0.65V | - 1.25V | +13.50V |
| Q701, 702 | - 0.05V | - 0.62V | +25.87V |
| Q703, 704 | +25.87V | +26.57V | + 1.67V |
| Q705, 706 | + 1.67V | + 1.13V | +26.57V |
| Q707, 708 | -25.87V | -26.49V | + 1.13V |

| | GATE | SOURCE | DRAIN |
|----|---------|---------|---------|
| Q3 | +27.90V | +27.90V | +38.10V |
| Q4 | -37.80V | -37.80V | -27.80V |

SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM



Q509 Q510
Q511 Q512
2S1845(E)

Q513 Q514
2SA992(F)

Q515 Q516
Q517 Q518
2SC1845(E)

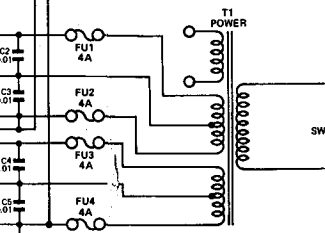
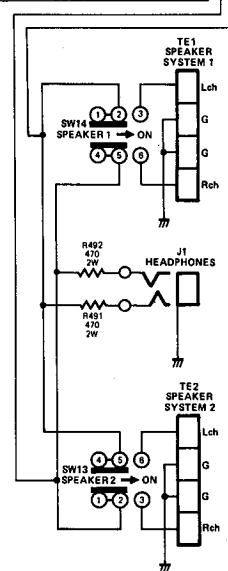
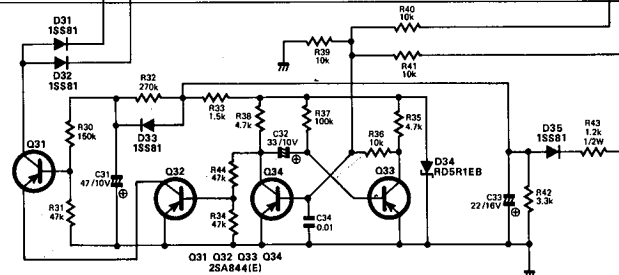
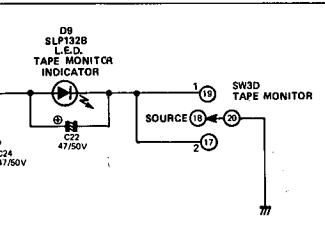
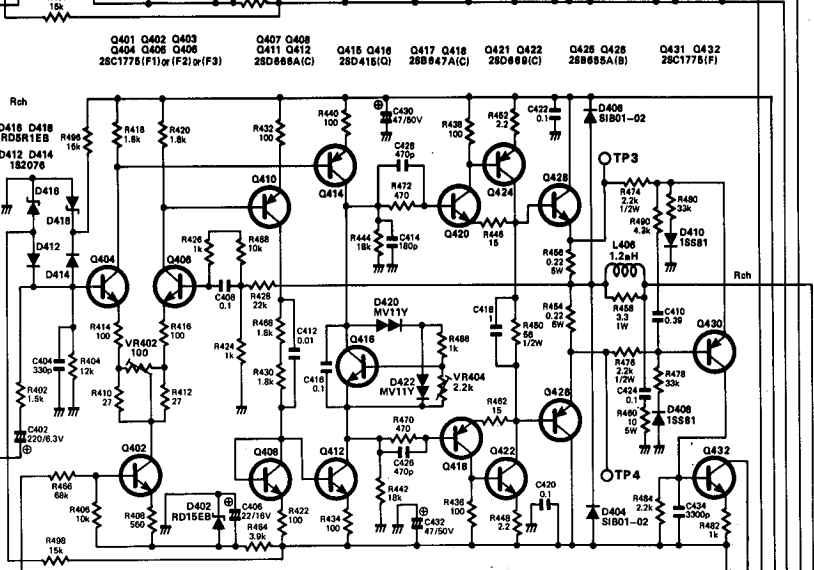
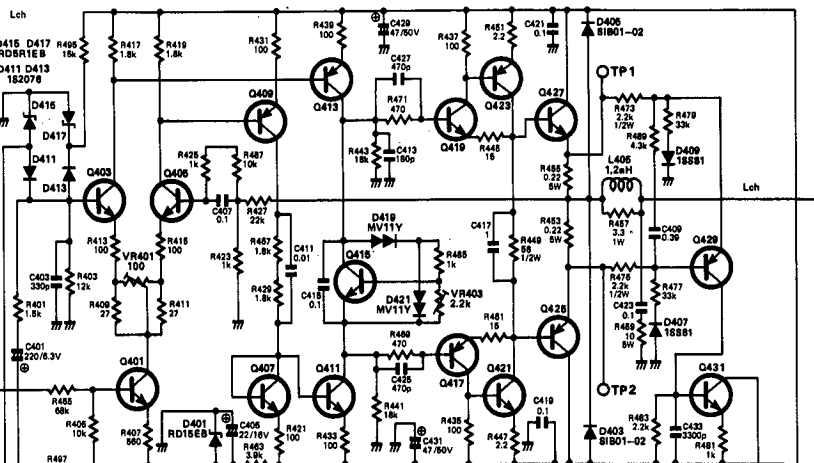
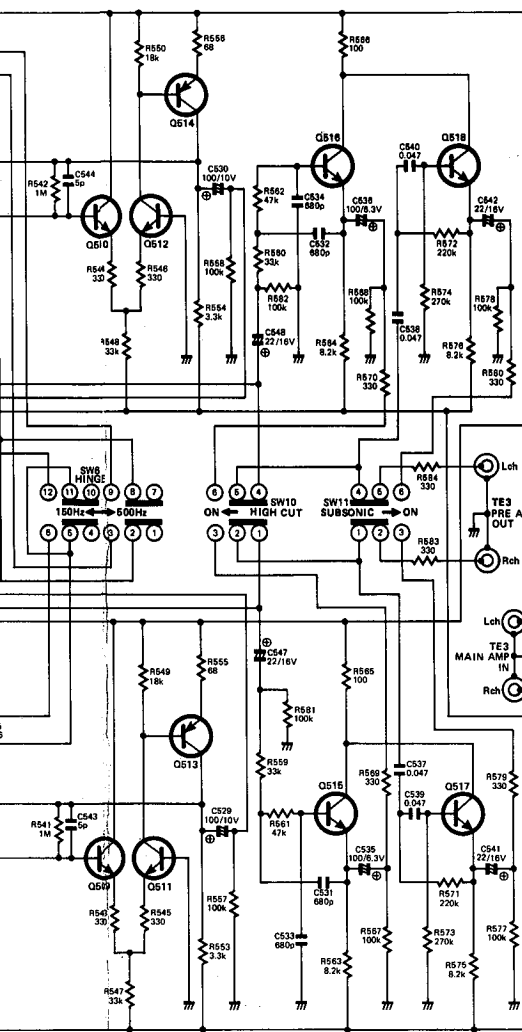
Q409 Q410 Q413 Q414
2SD864A(C)

Q419 Q420
2SD667A(C)

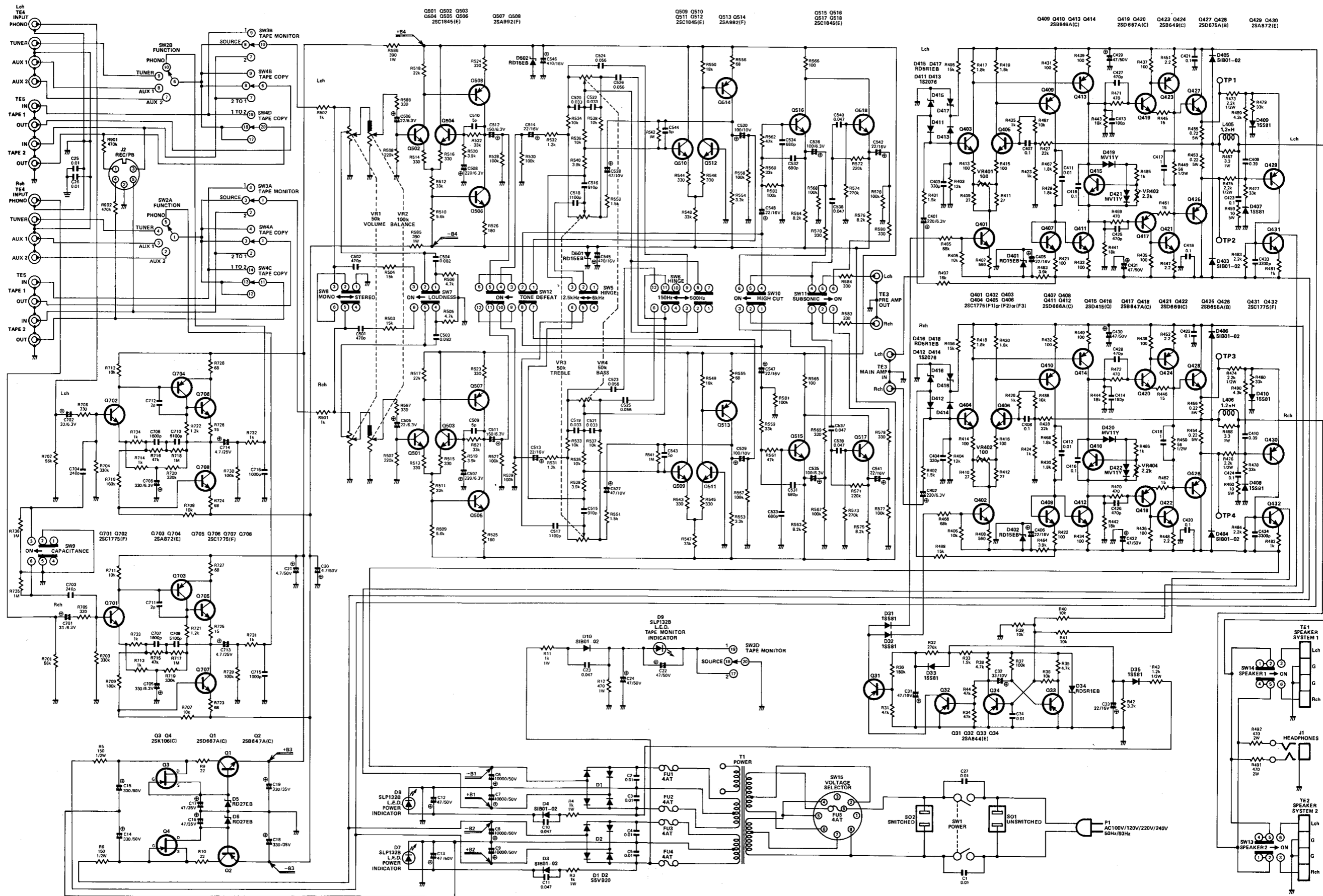
Q423 Q424
2B9849(C)

Q427 Q428
2SD675A(B)

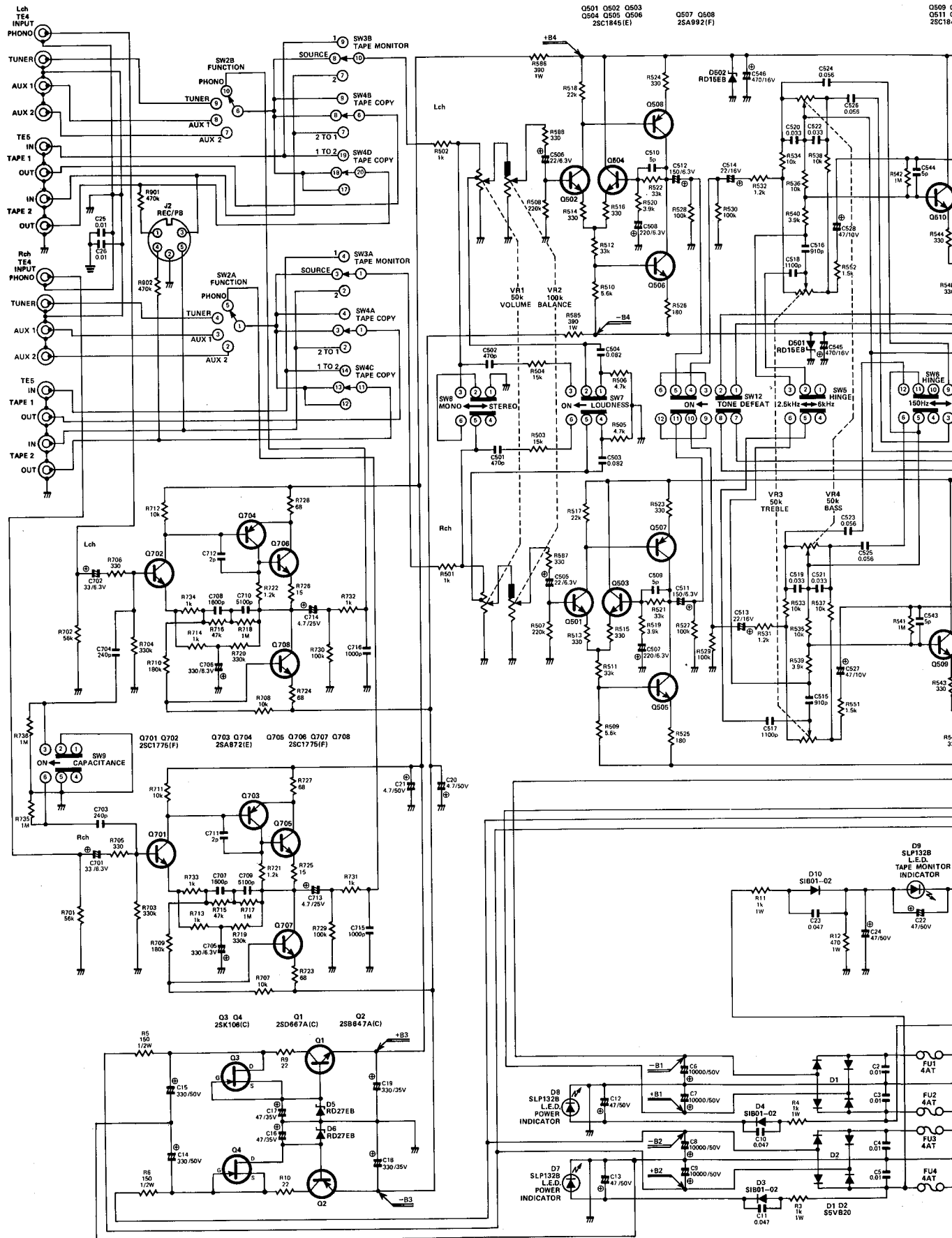
Q429 Q430
2SA872(E)



SCHEMATIC DIAGRAM - MULTI VOLTAGE



SCHEMATIC DIAGRAM – MULTI VOLTAGE



Q509 Q510
Q511 Q512
2SC1945(E)

Q515 Q516
Q517 Q518
2SC1945(E)

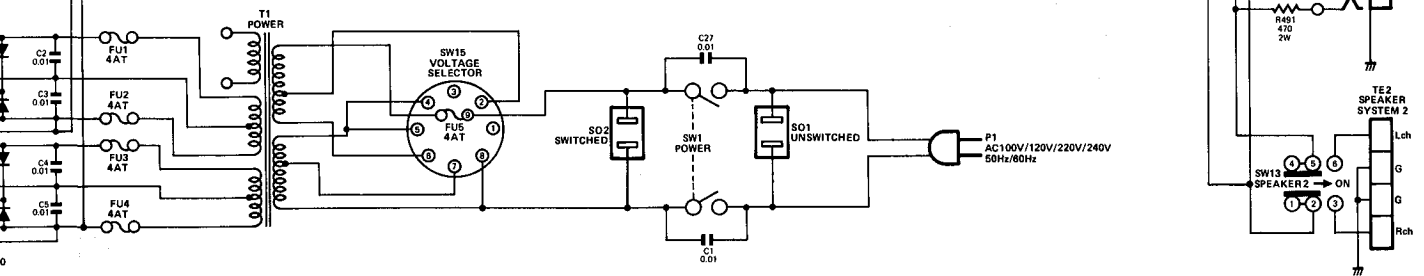
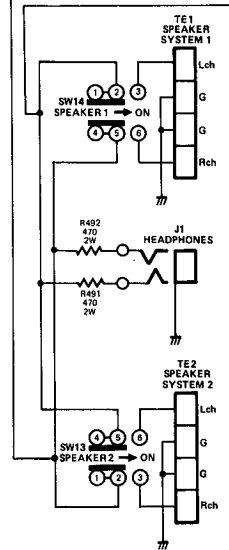
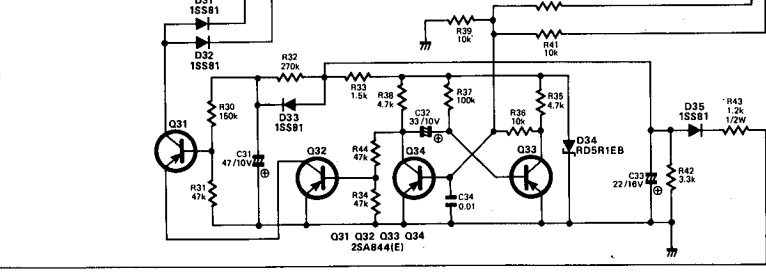
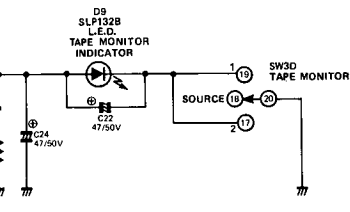
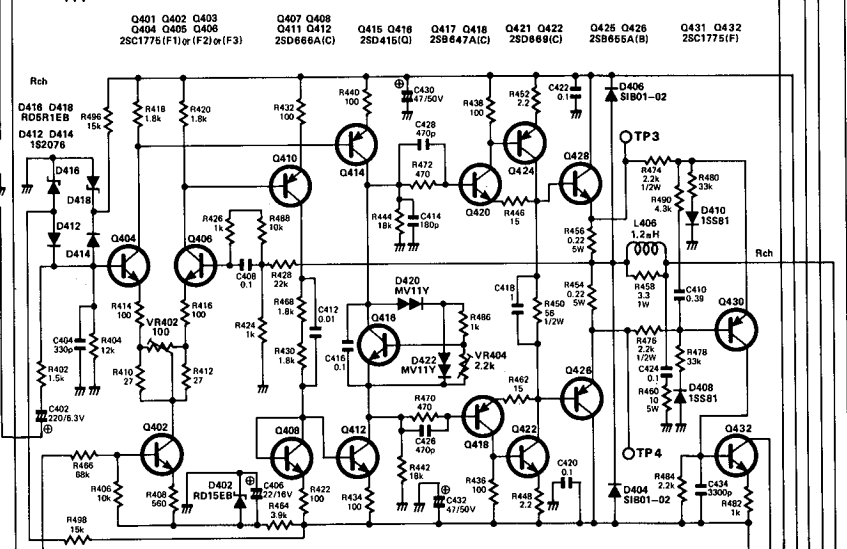
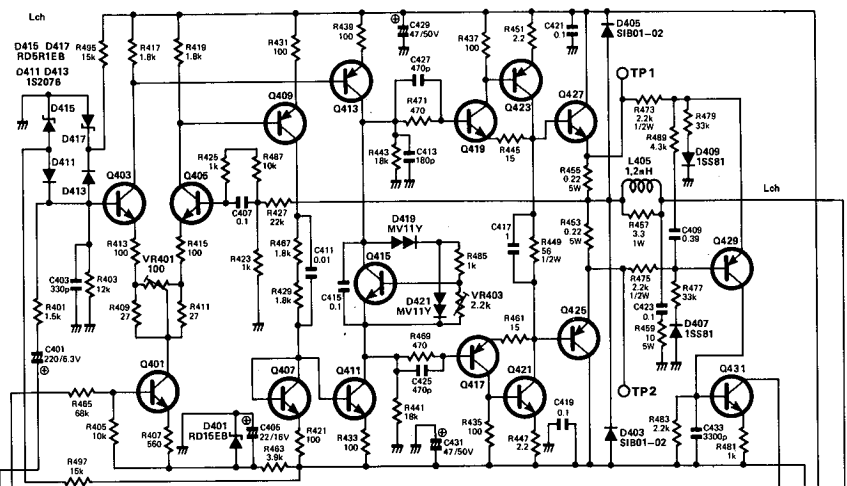
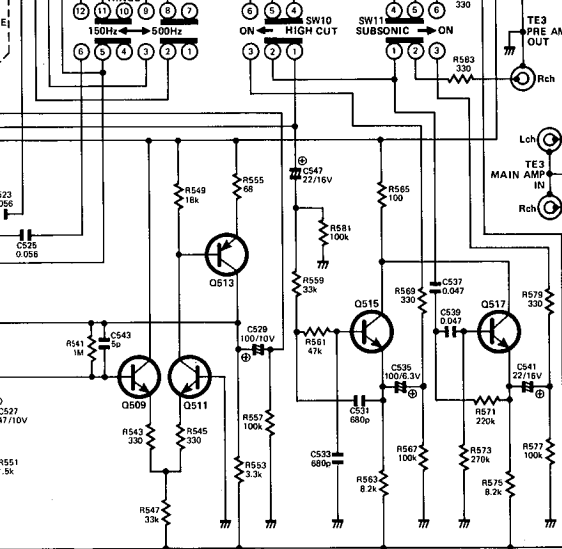
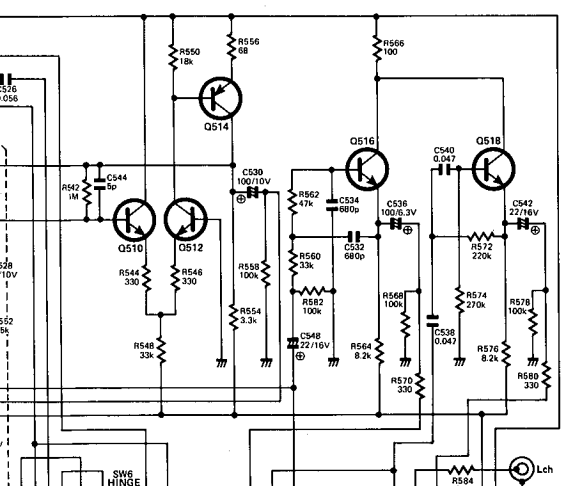
Q409 Q410 Q413 Q414
2SB648(A,C)

Q419 Q420
2SD867(A,C)

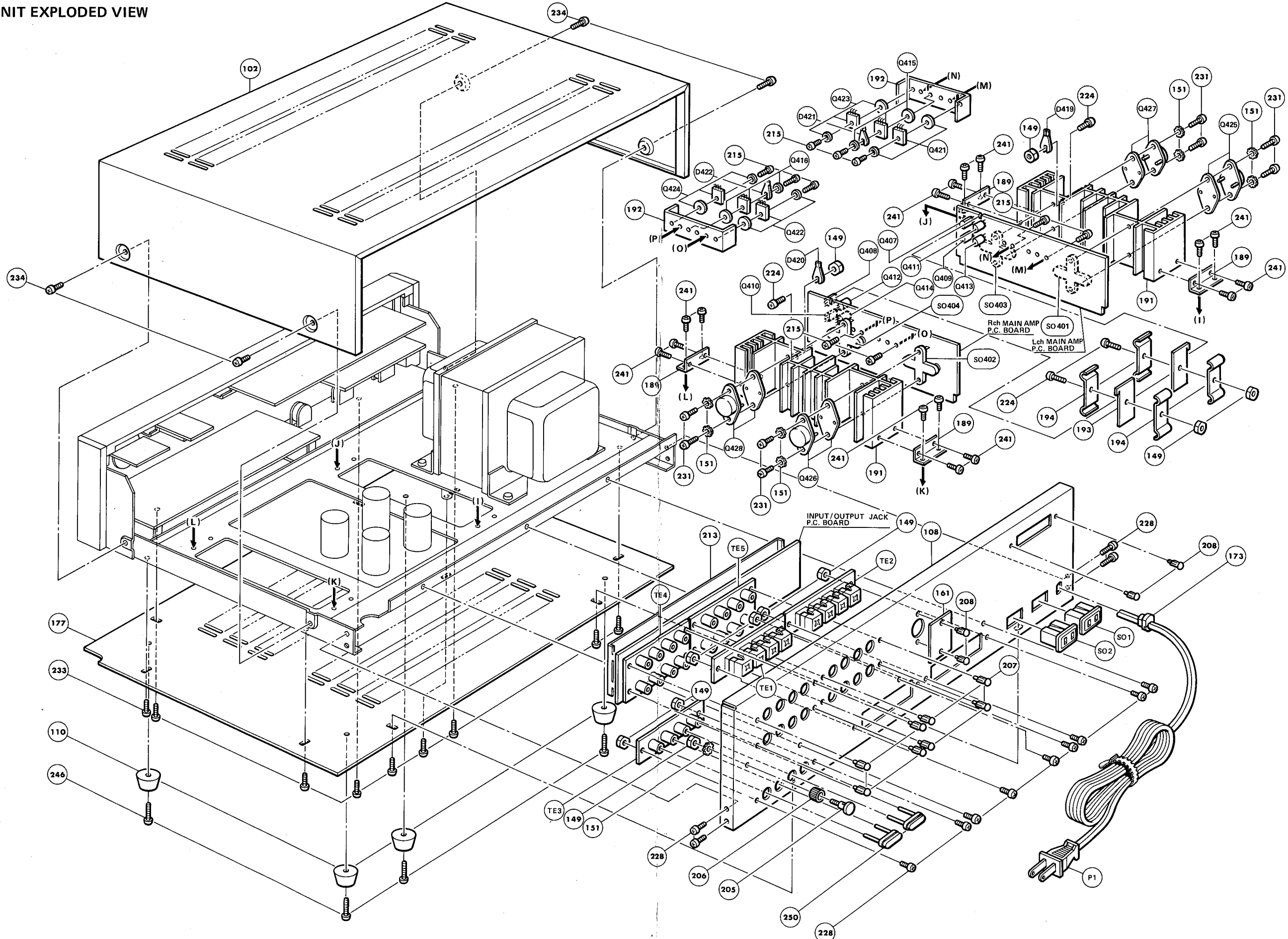
Q423 Q424
2SB649(C)

Q427 Q428
2SD875(A,B)

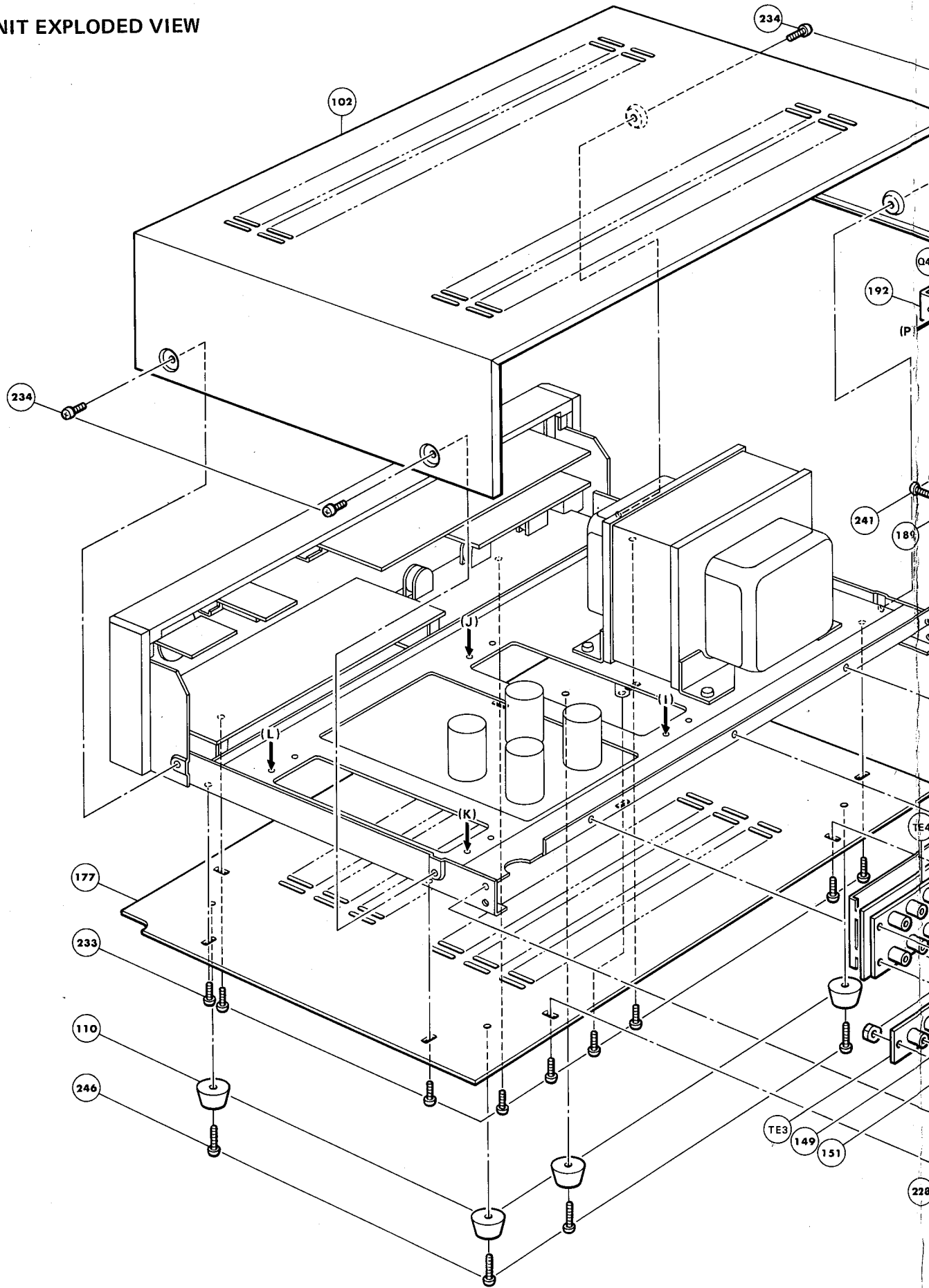
Q429 Q430
2SA872(E)

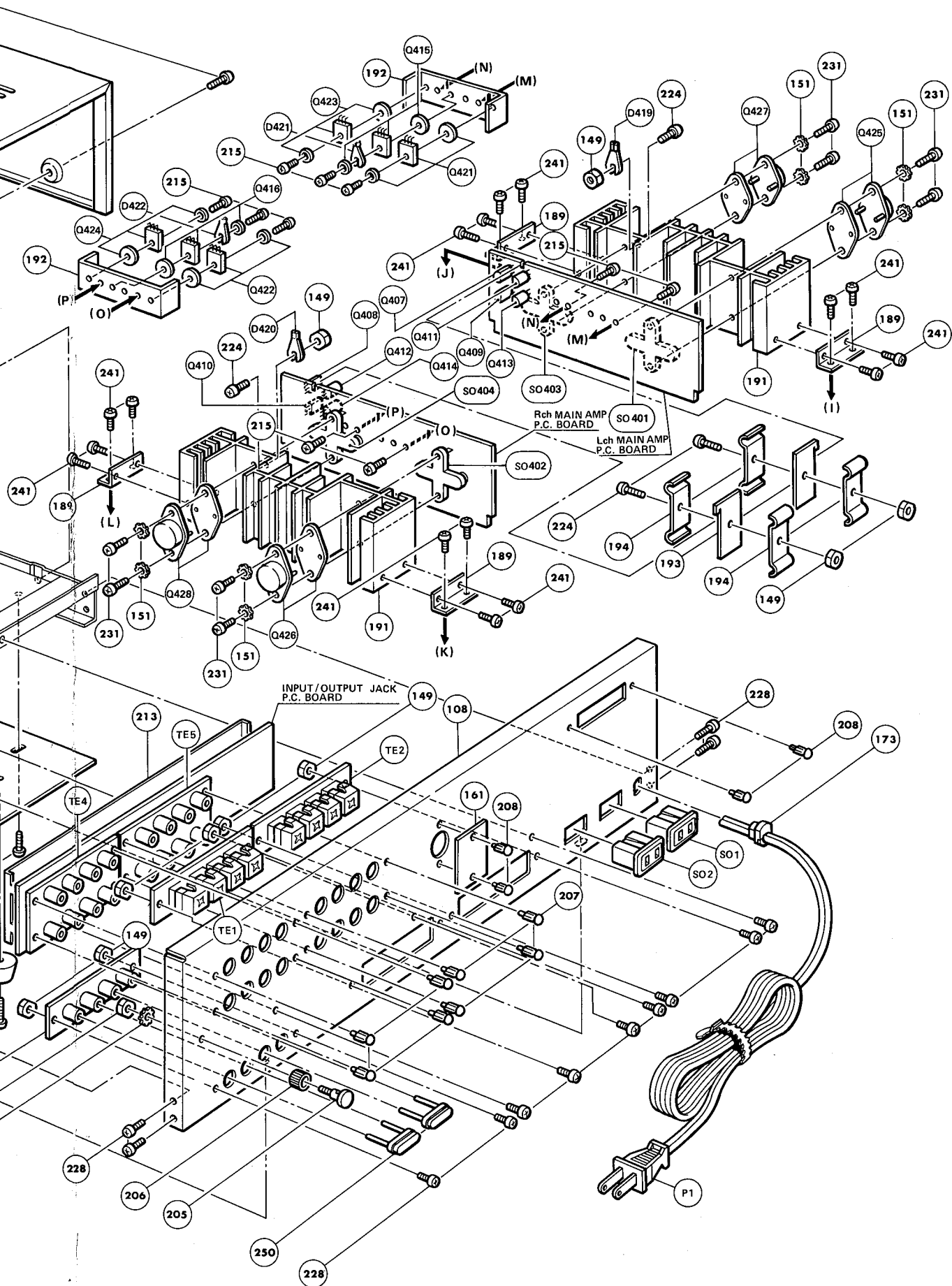


GENERAL UNIT EXPLODED VIEW

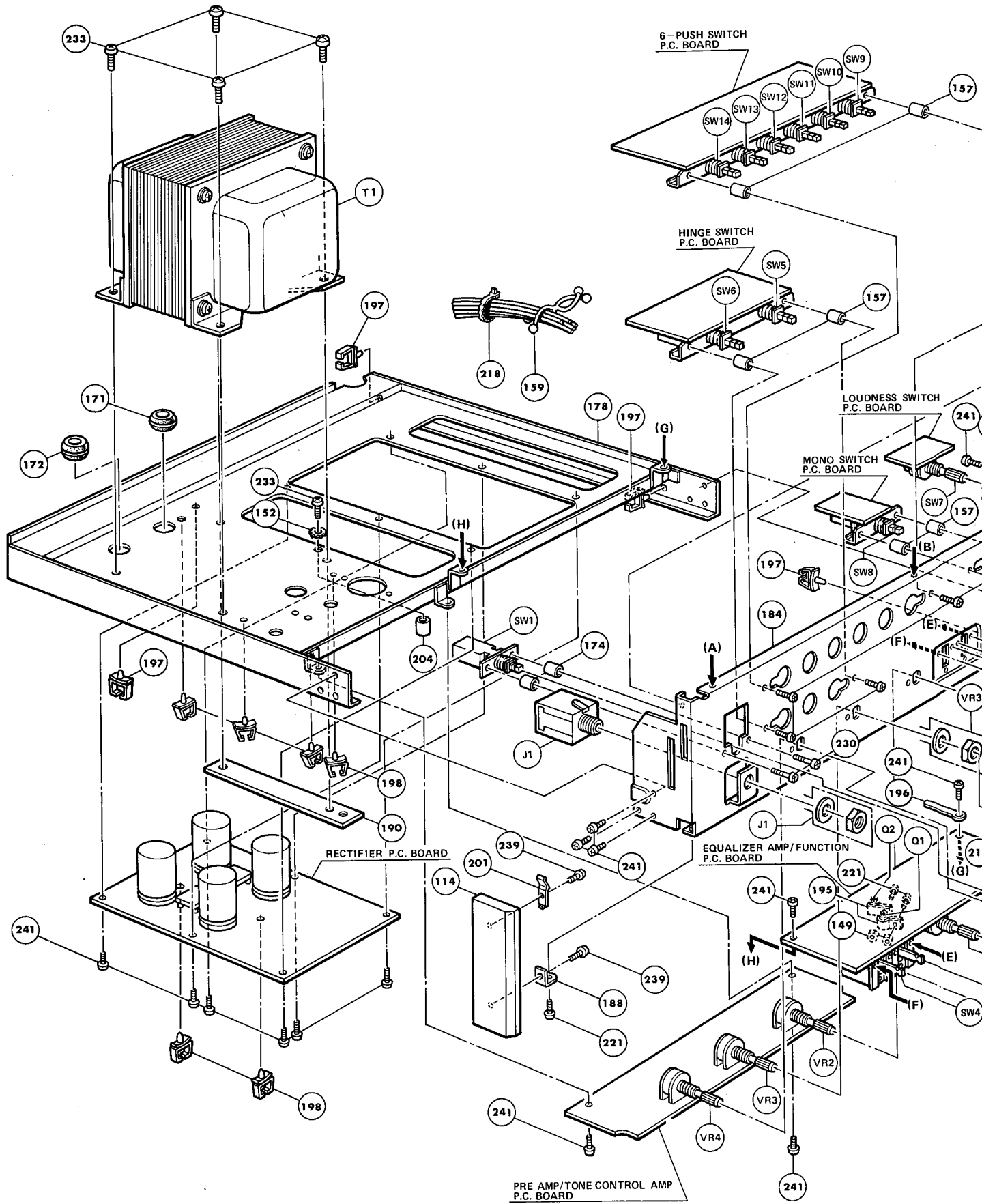


GENERAL UNIT EXPLODED VIEW

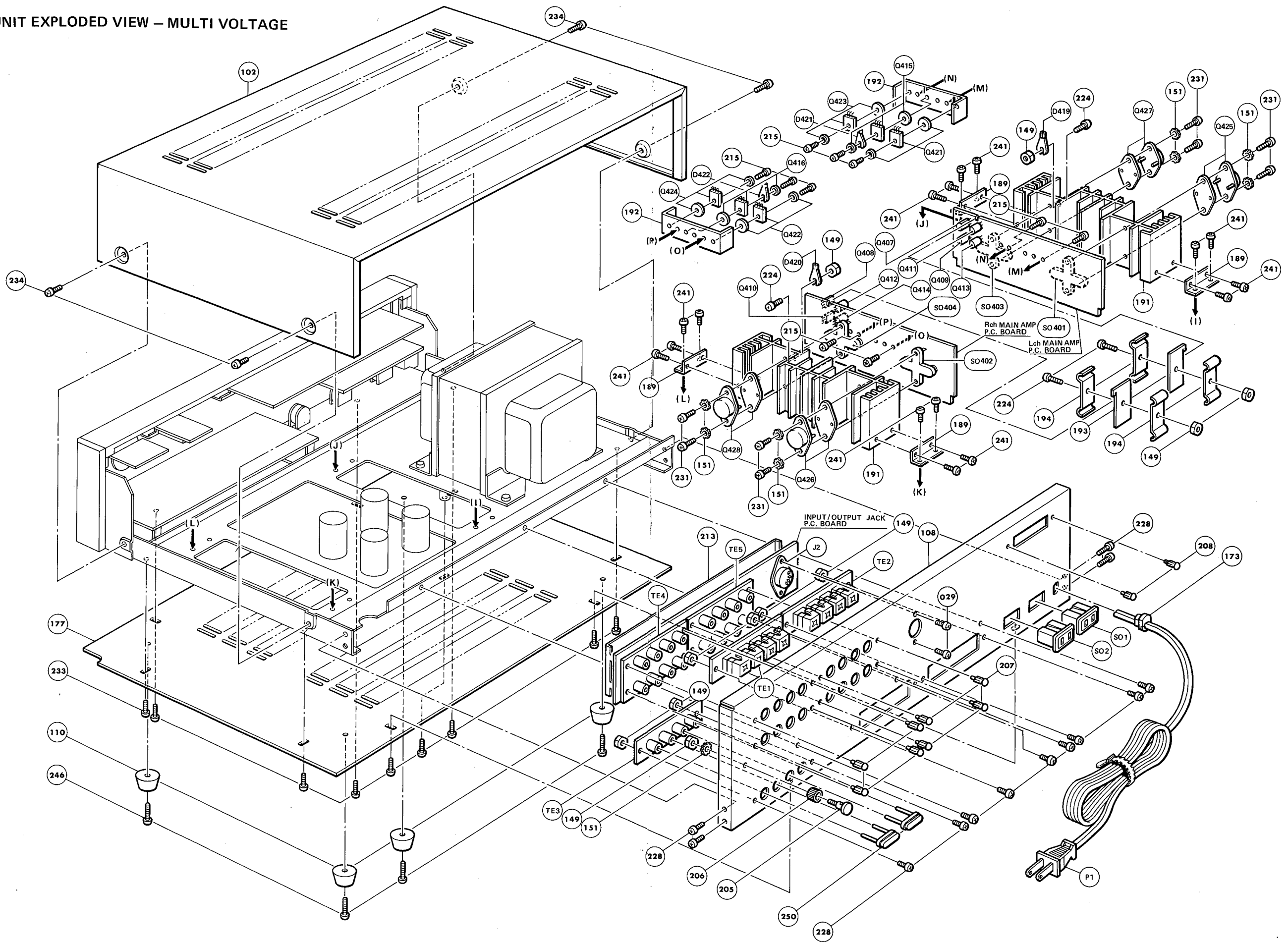




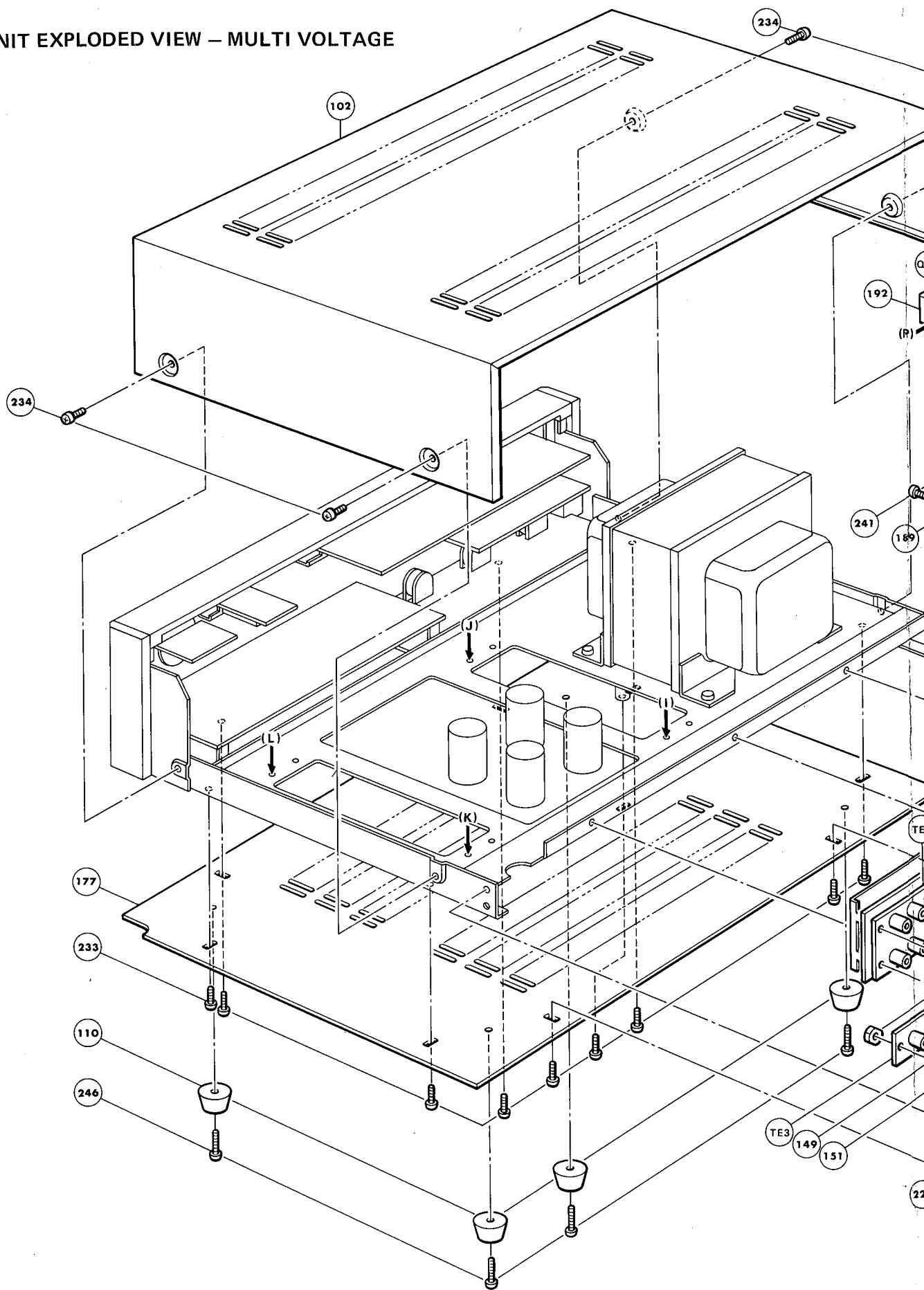
GENERAL UNIT EXPLODED VIEW

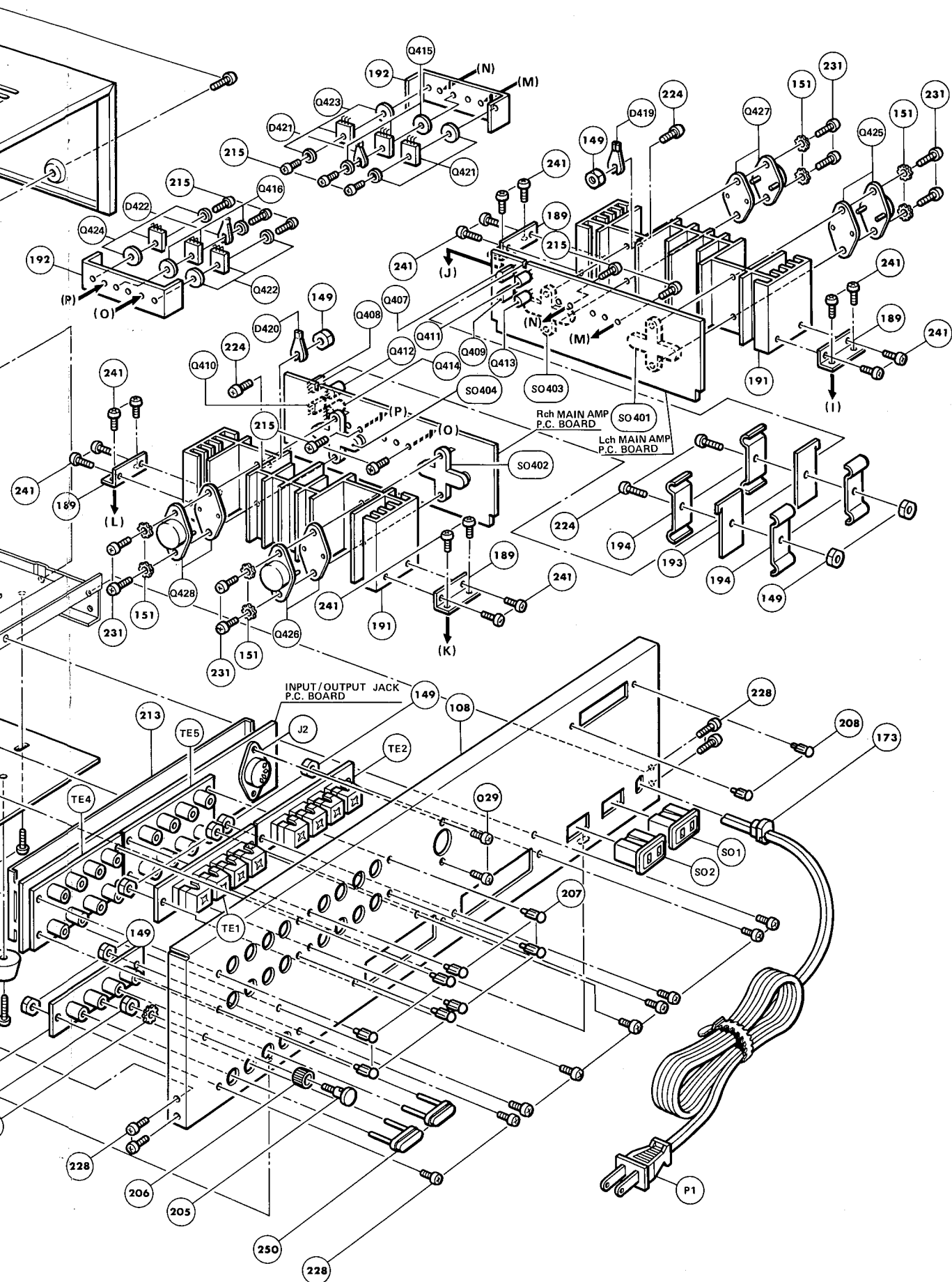


GENERAL UNIT EXPLODED VIEW – MULTI VOLTAGE

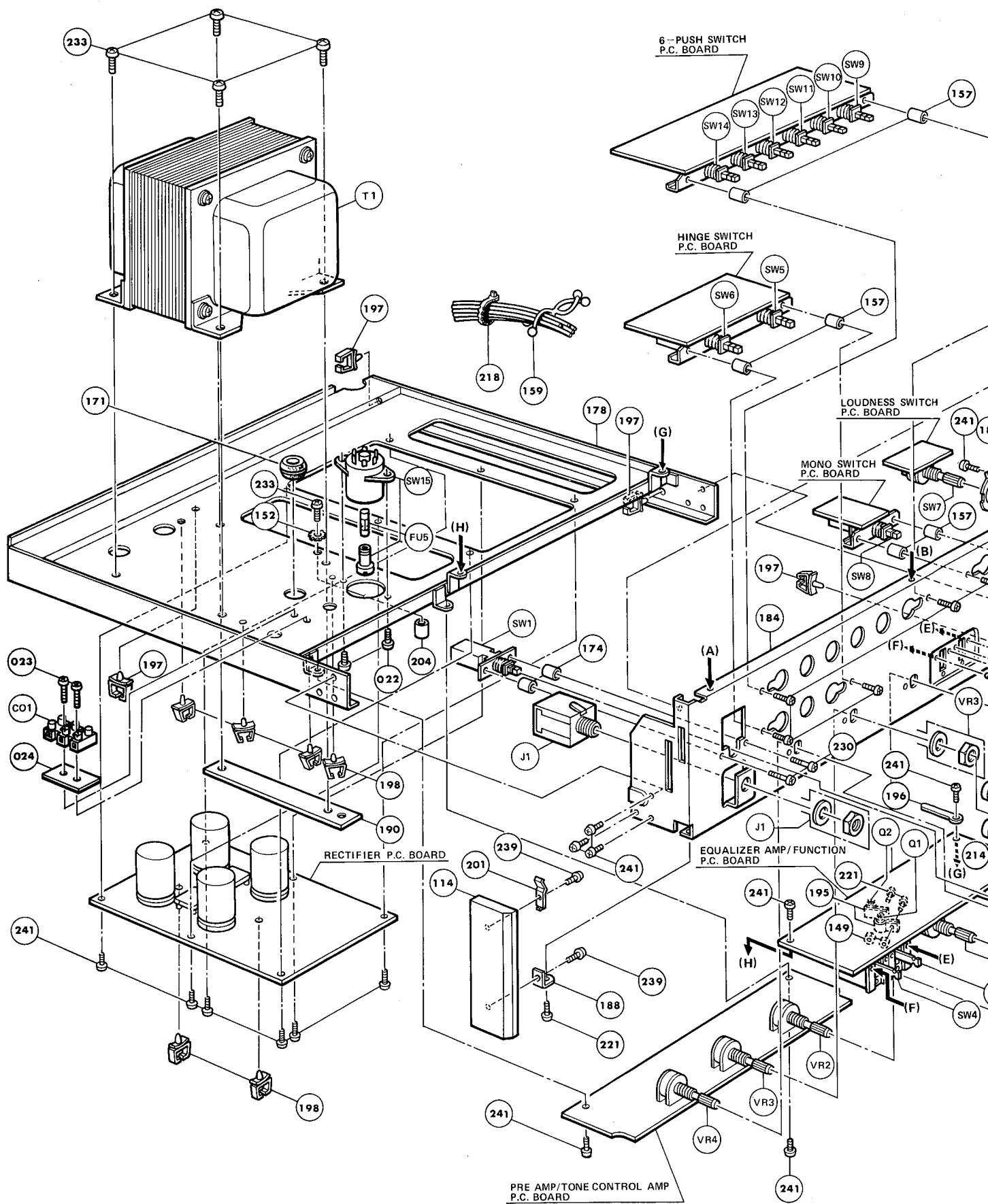


GENERAL UNIT EXPLODED VIEW – MULTI VOLTAGE



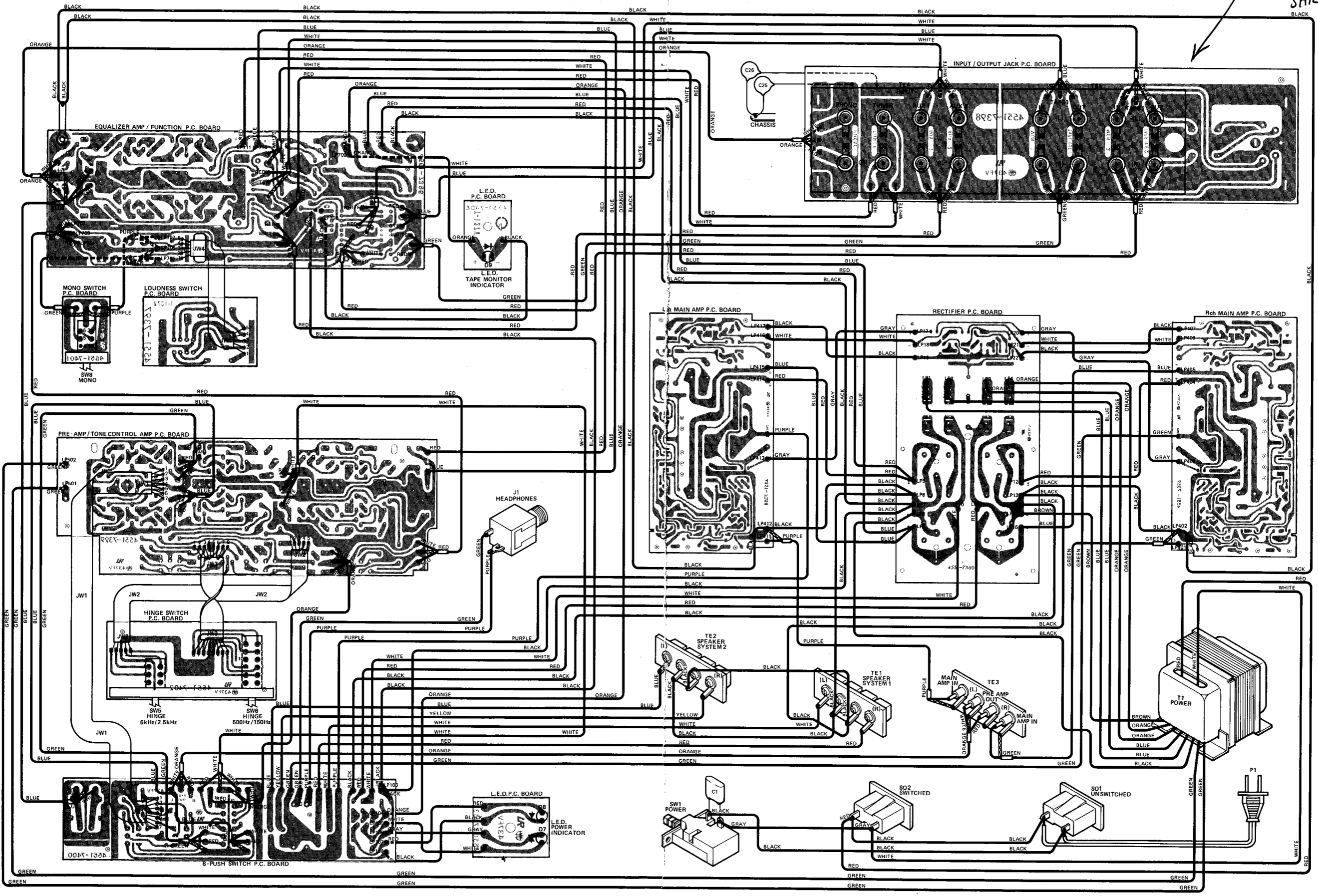


GENERAL UNIT EXPLODED VIEW – MULTI VOLTAGE

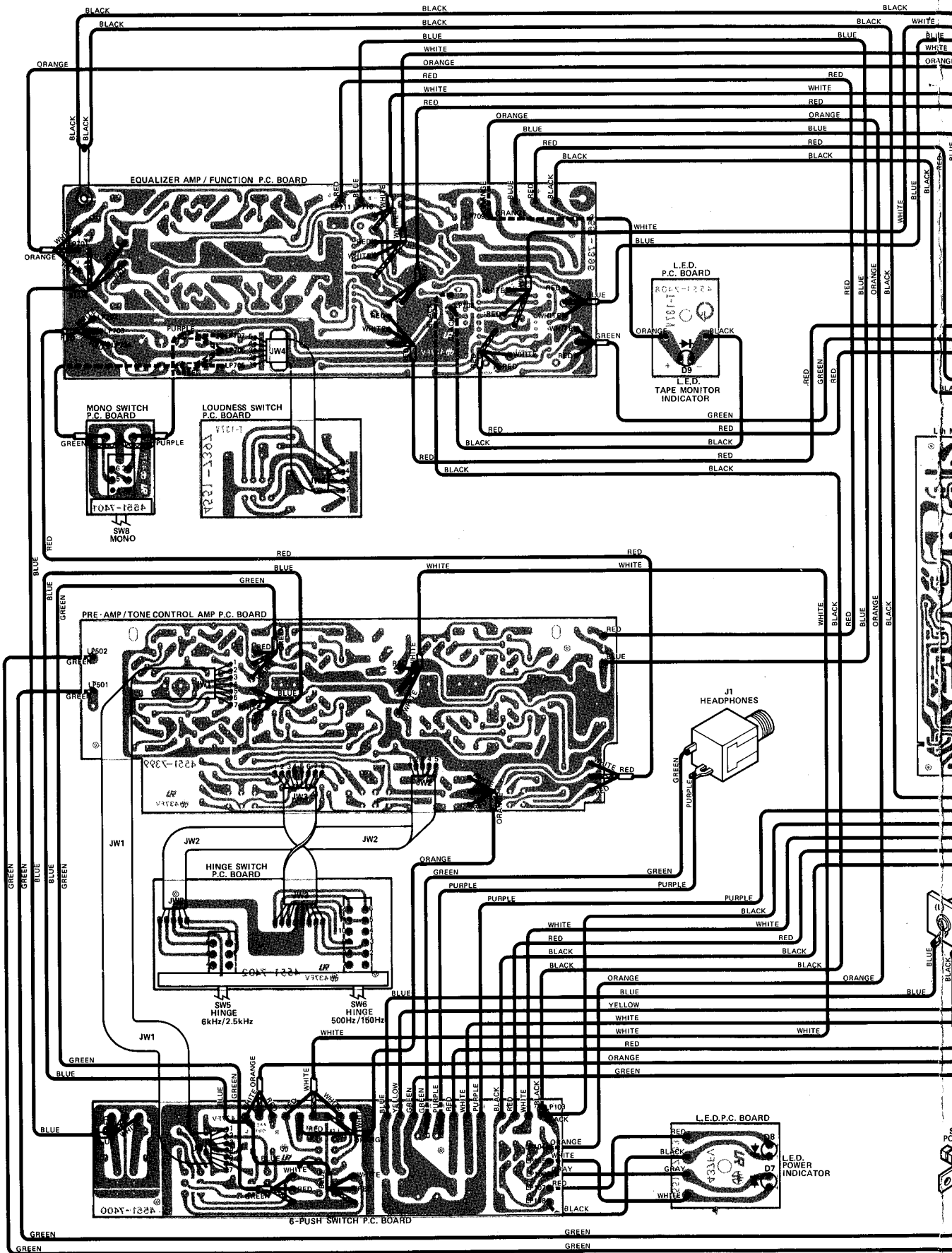


WIRING DIAGRAM

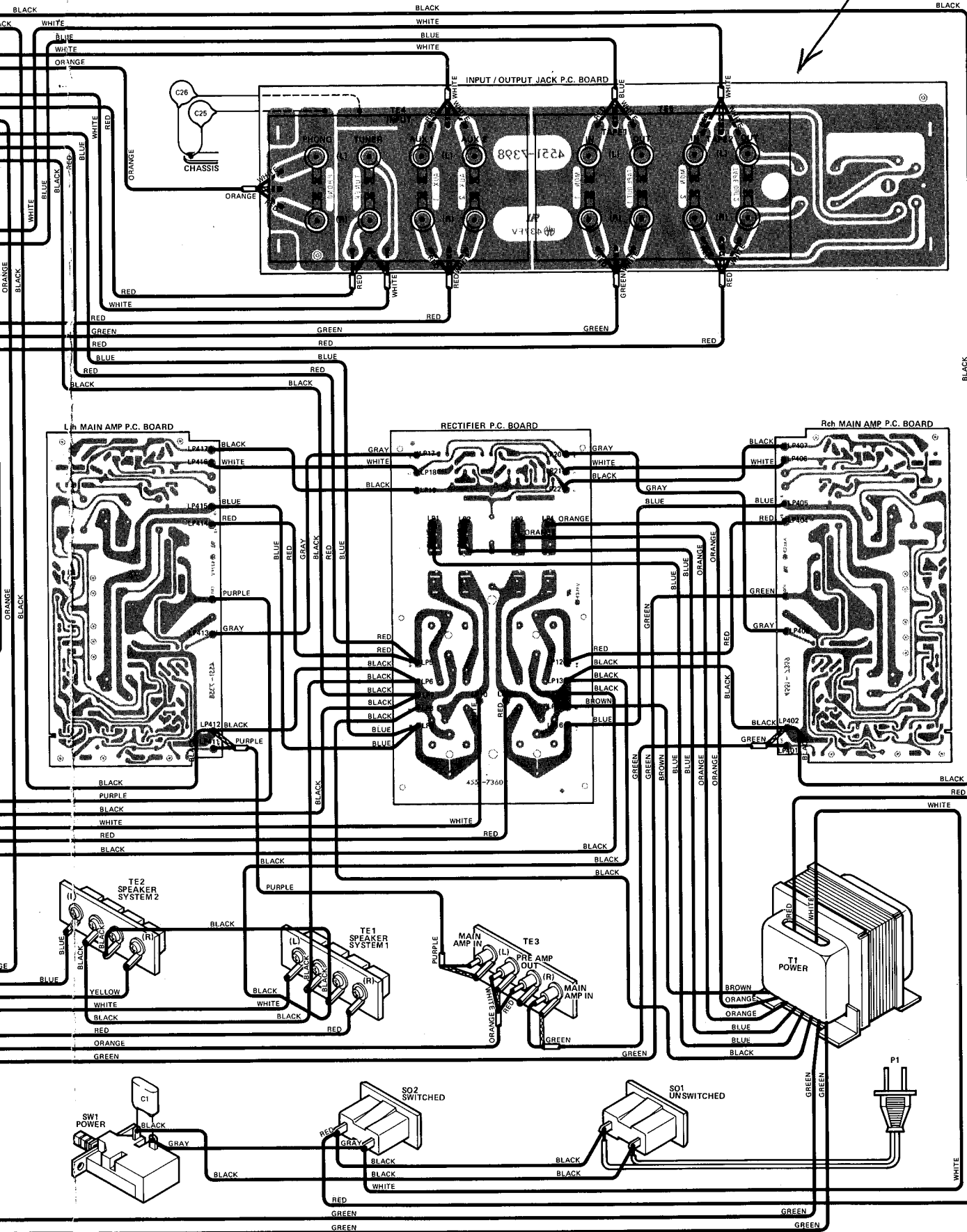
IF UNIT OSCILLATES WHEN FIRST
TURNED ON W/FUNCT. SW. IN
PHONO MODE, ADD .01 ufd diamp
FROM INPUT JACK BRD.
SHIELD TO CHASSIS
GND TAB
NEAR TOP
REAR.



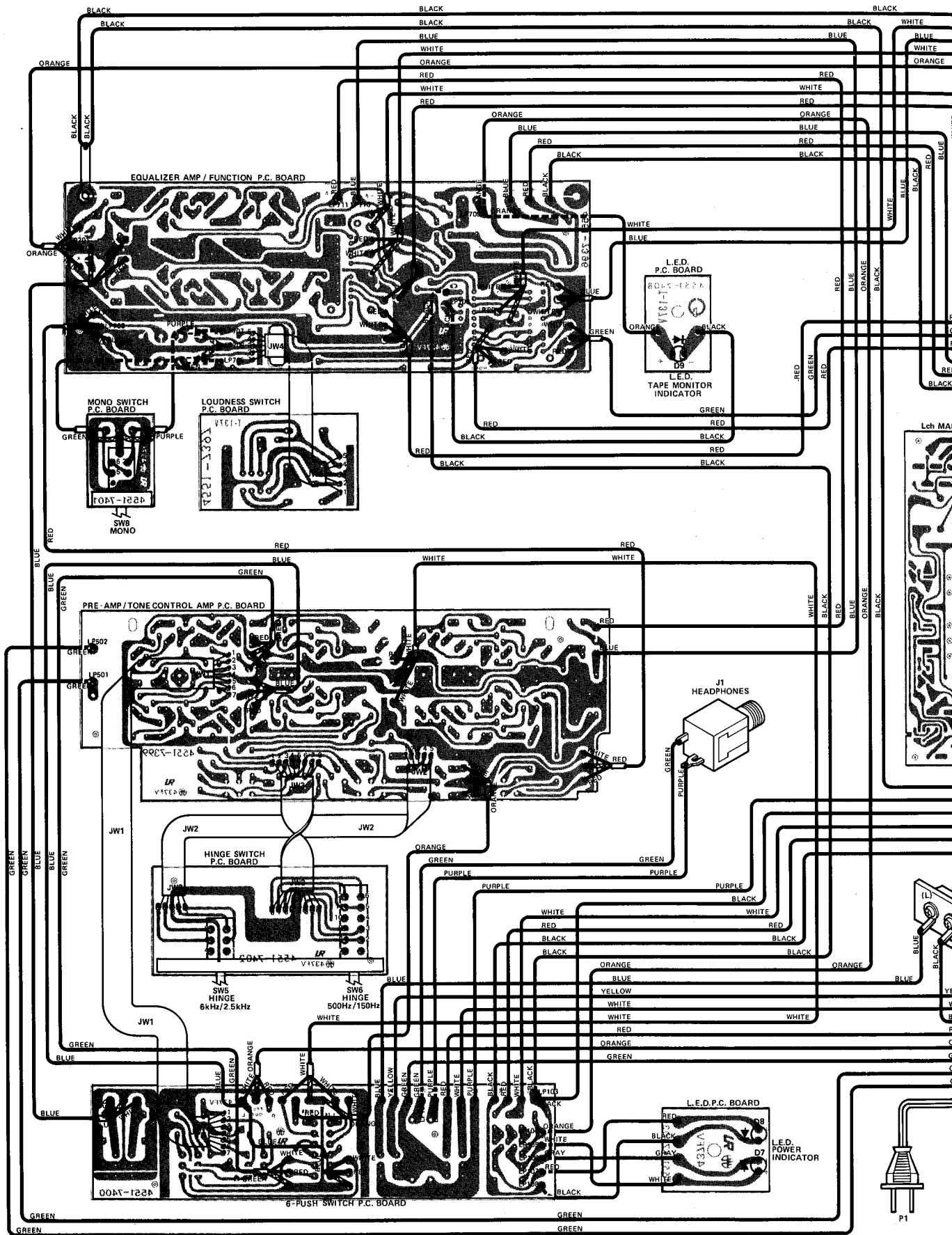
WIRING DIAGRAM

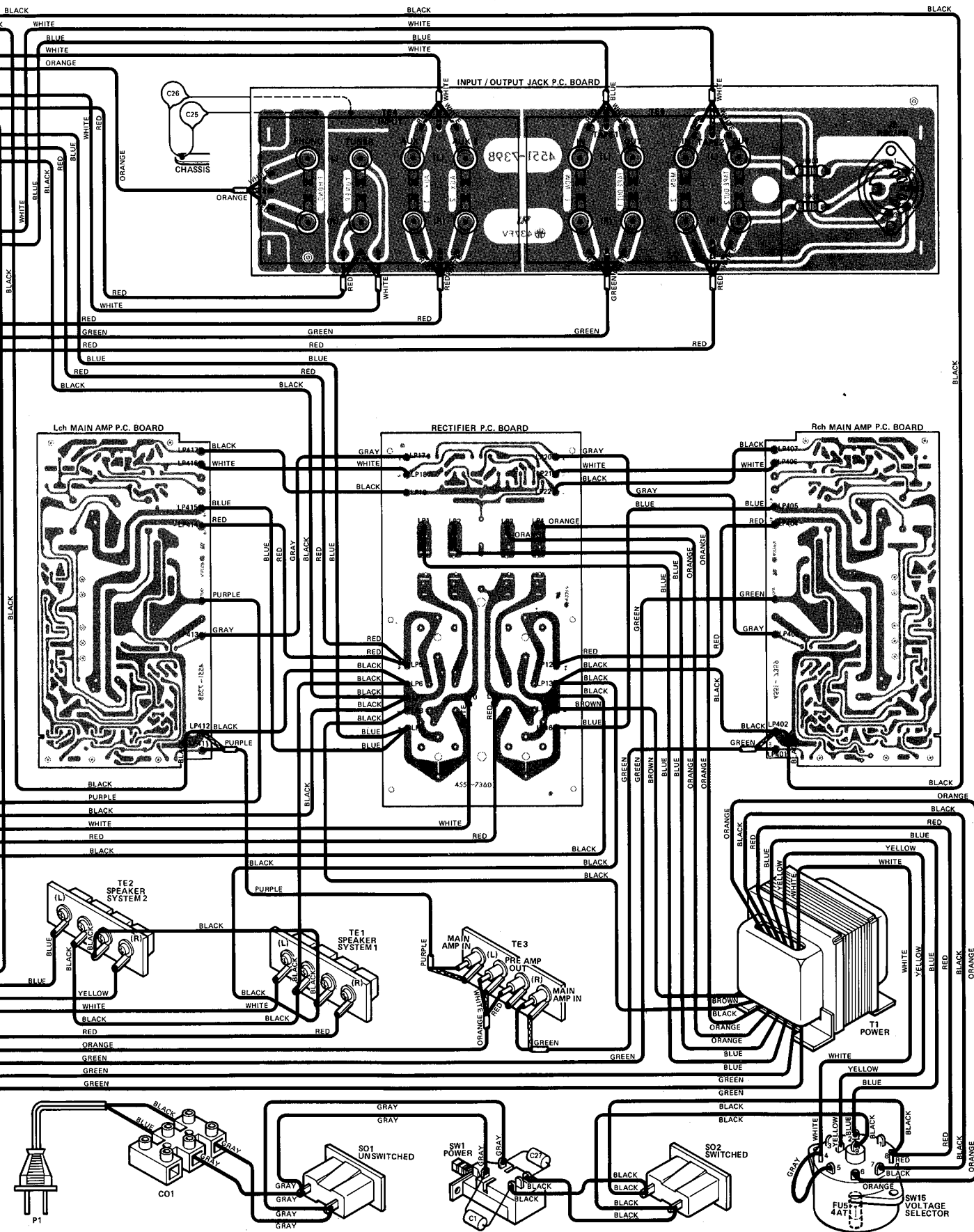


IF UNIT OSCILLATES WHEN FIRST
 TURNED ON W/ FUNCT. SW. IN
 PHONO MODE, ADD .01 ufd diamp
 FROM INPUT JACK BRD.
 SHIELD TO CHASSIS
 GND TAB
 NEAR TOP
 REAR.



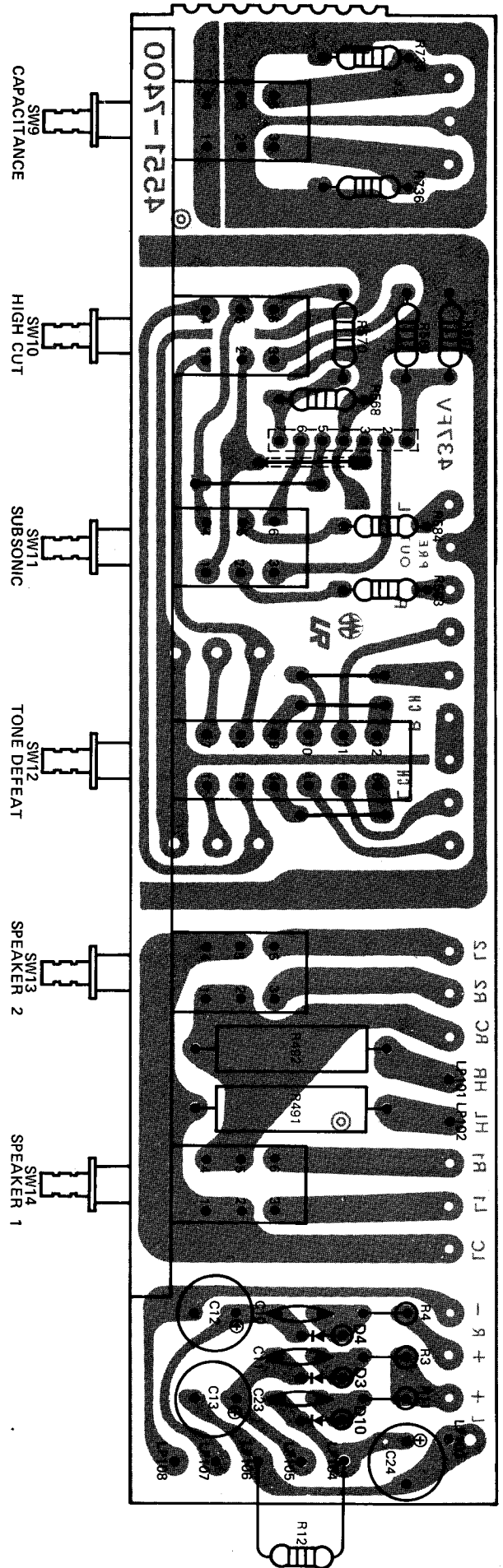
WIRING DIAGRAM – MULTI VOLTAGE



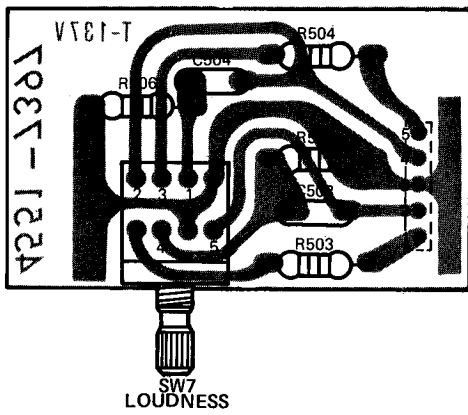


6-PUSH SWITCH PC BOARD

| REF NO. | H/K PART NO. | DESCRIPTION |
|---------------------------|--------------|--|
| C12, 13, 24 | 31835985 | Capacitor, 47MF +50% -10% 50V |
| D3, 4, 10 | 41631295 | Diode, SIB01-02 |
| SW9, 10, 11, 12 13, 14 | 25035986 | Push Switch, Capacitance/ High Cut/Subsonic/ Tone Defeat/Speaker 2/ Speaker 1 |

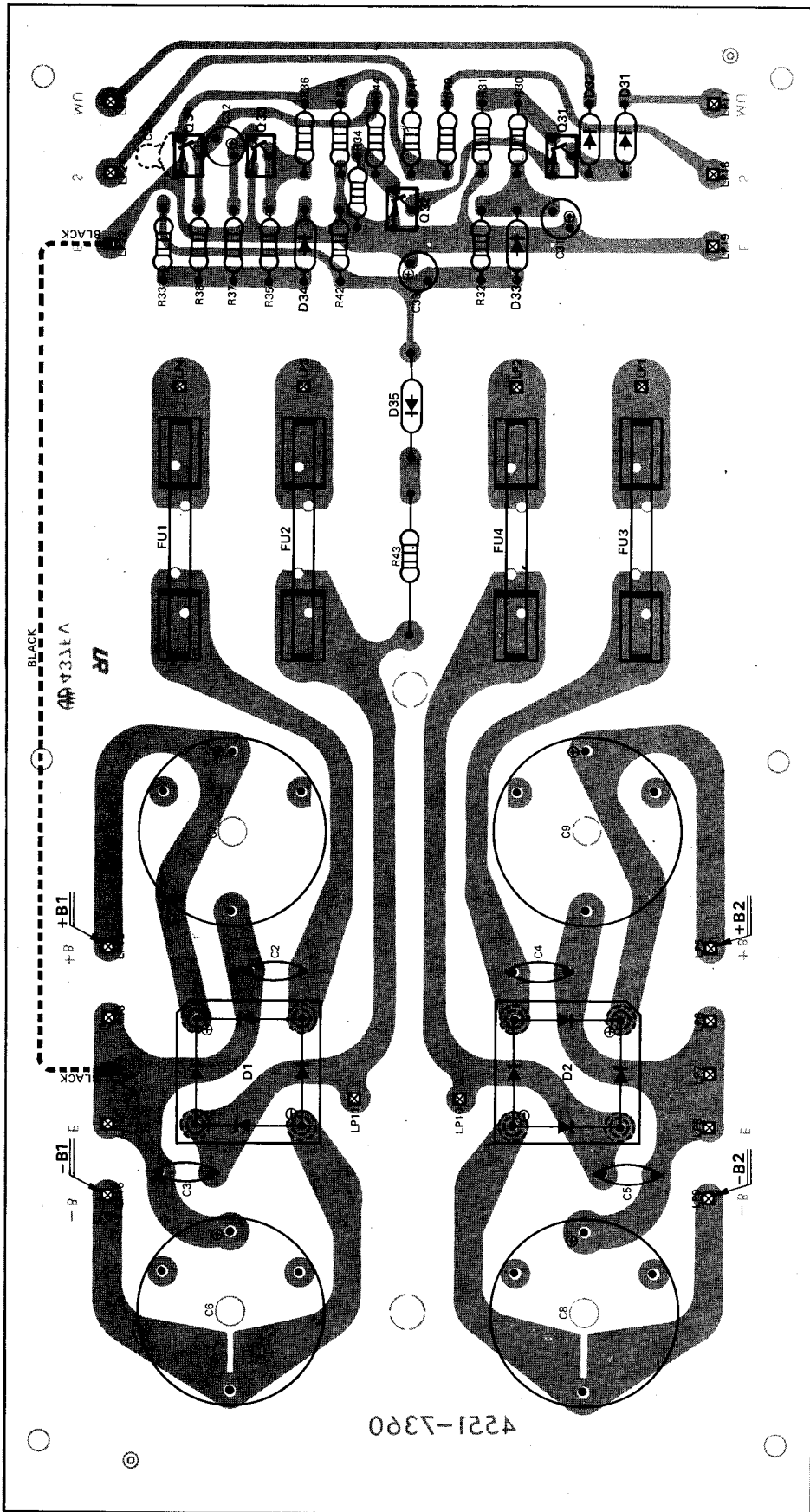


LOUDNESS SWITCH PC BOARD



| REF NO. | H/K PART NO. | DESCRIPTION |
|---------|--------------|----------------------------|
| SW7 | 24035884 | Rotary Switch, Loudness |

RECTIFIER PC BOARD



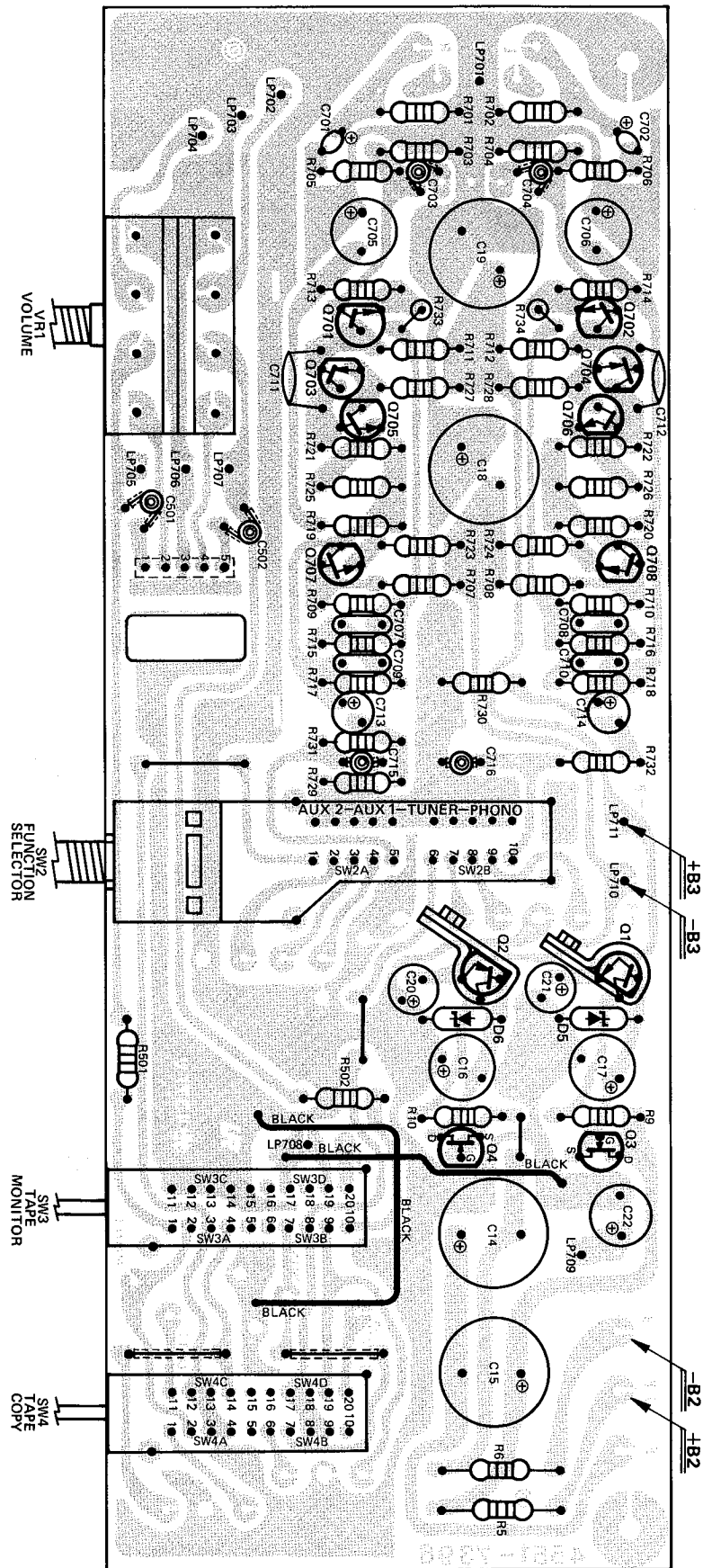
RECTIFIER PC BOARD

| REF. NO. | H/K PART NO. | DESCRIPTION |
|---------------------------------|--------------|--|
| CAPACITORS, ELECTROLYTIC | | |
| C6, 7, 8, 9 | 31835970 | 10000MF \pm 20% 50V |
| C31 | 31835662 | 47MF \pm 20% 10V |
| C32 | 31835941 | 33MF +50% -10% 10V |
| C33 | 31835572 | 22MF +50% -10% 16V |
| TRANSISTORS | | |
| Q31 | 43031312 | 2SA844(E) Audio Muting |
| Q32, 33, 34 | 43031312 | 2SA844(E) Overload Protection Circuit |
| DIODE | | |
| D1, 2 | 41035971 | Bridge Silicon, S5VB20 |
| D31, 32, 33, 35 | 41035628 | 1SS81 |
| D34 | 42035972 | Zener Diode, RD5R1EB 5.1V \pm 0.3V |
| FUSE | | |
| FU1, 2, 3, 4 | 45035559 | 4A 125V |

EQUALIZER AMP/FUNCTION PC BOARD

| REF. NO. | H/K PART NO. | DESCRIPTION |
|---------------------------------|--------------|---|
| RESISTORS | | |
| VR1 | 23535871 | Variable Resistor, 50 k ohm, Volume Control |
| CAPACITORS, ELECTROLYTIC | | |
| C14, 15 | 31835888 | 330MF +50% -10% 50V |
| C16, 17 | 31835973 | 47MF +50% -10% 35V |
| C18, 19 | 31835974 | 330MF +50% -10% 35V |
| C20, 21 | 31835975 | 4.7MF +50% -10% 50V |
| C22 | 31835976 | 47MF +50% -10% 50V |
| C701, 702 | 31835586 | 33MF ± 20% 6.3V Tantalum |
| C705, 706 | 31835587 | 330MF +50% -10% 6.3V |
| C713, 714 | 31835588 | 4.7MF ± 20% 25V |
| TRANSISTORS | | |
| Q1 | 43035624 | 2SD667A (C) Voltage Regulator |
| Q2 | 43035625 | 2SB647A (C) Voltage Regulator |
| Q3, 4 | 43035874 | F. E. T., 2SK106 (C) Voltage Regulator |
| Q701, 702, 705 706, 707, 708 | 43035592 | 2SC1775 (F) Equalizer Amp. |
| Q703, 704 | 43032151 | 2SA872 (E) Equalizer Amp. |
| D5, 6 | 42035977 | Zener Diode, RD27EB 27V ± 1.9V |
| MISCELLANEOUS | | |
| SW2 | 24035978 | Rotary Slide Switch, Function Selector |
| SW3, 4 | 26535669 | Lever Switch, Tape Monitor/Tape Copy |

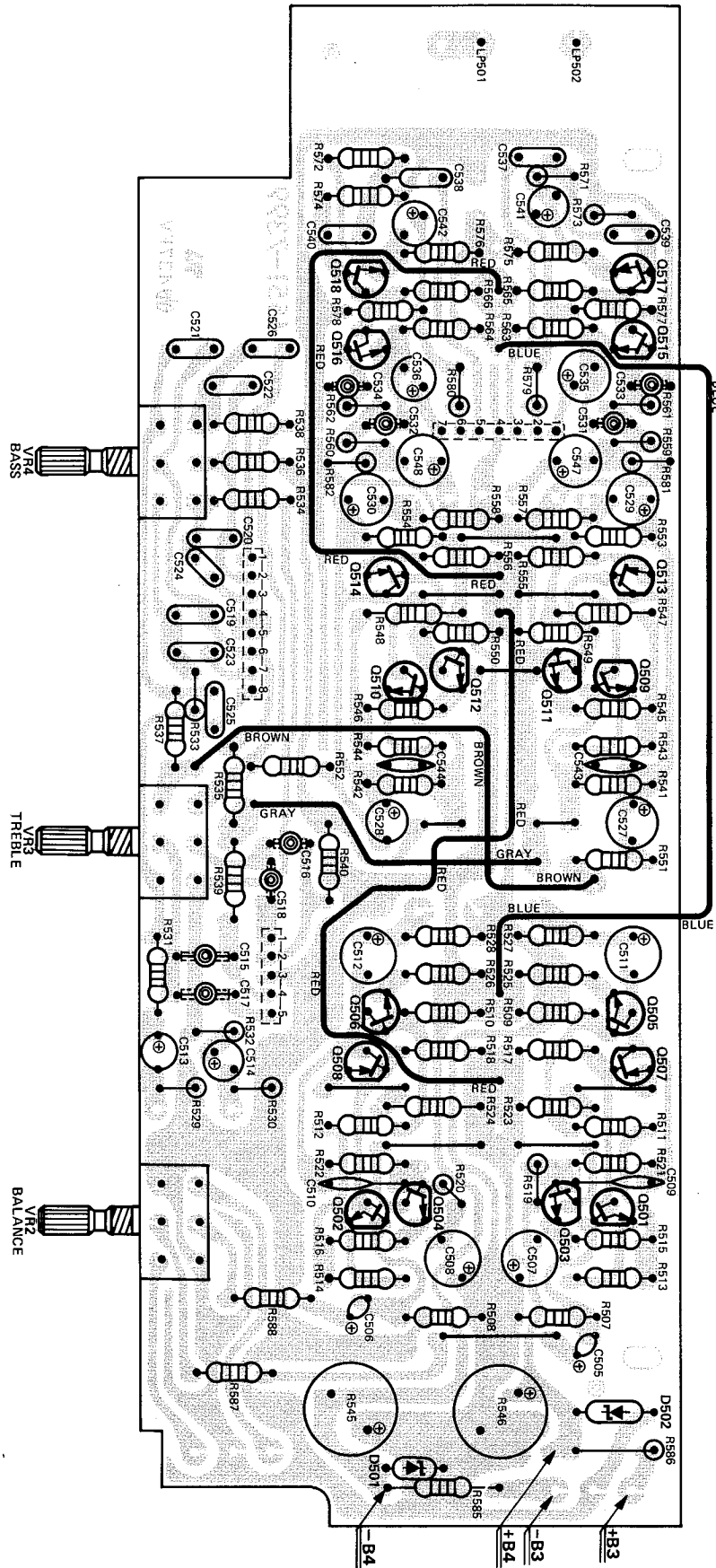
EQUALIZER AMP/FUNCTION PC BOARD



PRE-AMP/TONE CONTROL AMP PC BOARD

| REF. NO. | H/K PART NO. | DESCRIPTION |
|---------------------------------|--------------|--|
| RESISTORS | | |
| VR2 | 23535979 | Variable Resistor, 100 k ohm, Balance Control |
| VR3, 4 | 23535980 | Variable Resistor, 50 k ohm, Treble and Bass Control |
| CAPACITORS, ELECTROLYTIC | | |
| C505, 506 | 30735981 | 22MF \pm 20% 6.3V Tantalum |
| C507, 508 | 31835982 | 220MF +50% -10% 6.3V |
| C511, 512 | 31835984 | 150MF \pm 20% 6.3V |
| C513, 514 | 31835880 | 22MF \pm 20% 16V |
| C527, 528 | 31835662 | 47MF \pm 20% 10V |
| C529, 530 | 31835879 | 100MF \pm 20% 10V |
| C535, 536 | 31835879 | 100MF \pm 20% 10V |
| C541, 542, 547 548 | 31835880 | 22MF \pm 20% 16V |
| C545, 546 | 31835720 | 470MF +50% -10% 16V |
| TRANSISTORS | | |
| Q501, 503, 505 | 43035883 | 2SC1845 (E) } Pre Amp 2SA992 (F) } |
| Q507 | 43035882 | |
| Q502, 504, 506 | 43035883 | 2SC1845 (E) } Pre Amp 2SA992 (F) } |
| Q508 | 43035882 | |
| Q509, 511 | 43035883 | 2SC1845 (E) } Tone Control Amp 2SA992 (F) } |
| Q513 | 43035882 | |
| Q510, 512 | 43035883 | 2SC1845 (E) } Tone Control Amp 2SA992 (F) } |
| Q514 | 43035882 | |
| Q515, 516 517, 518 | 53035883 | 2SC1845 (E) High-Cut Filter, Subsonic Filter |
| D501, 502 | 42032757 | Zener Diode, RD15EB 14.7V \pm 0.9V |

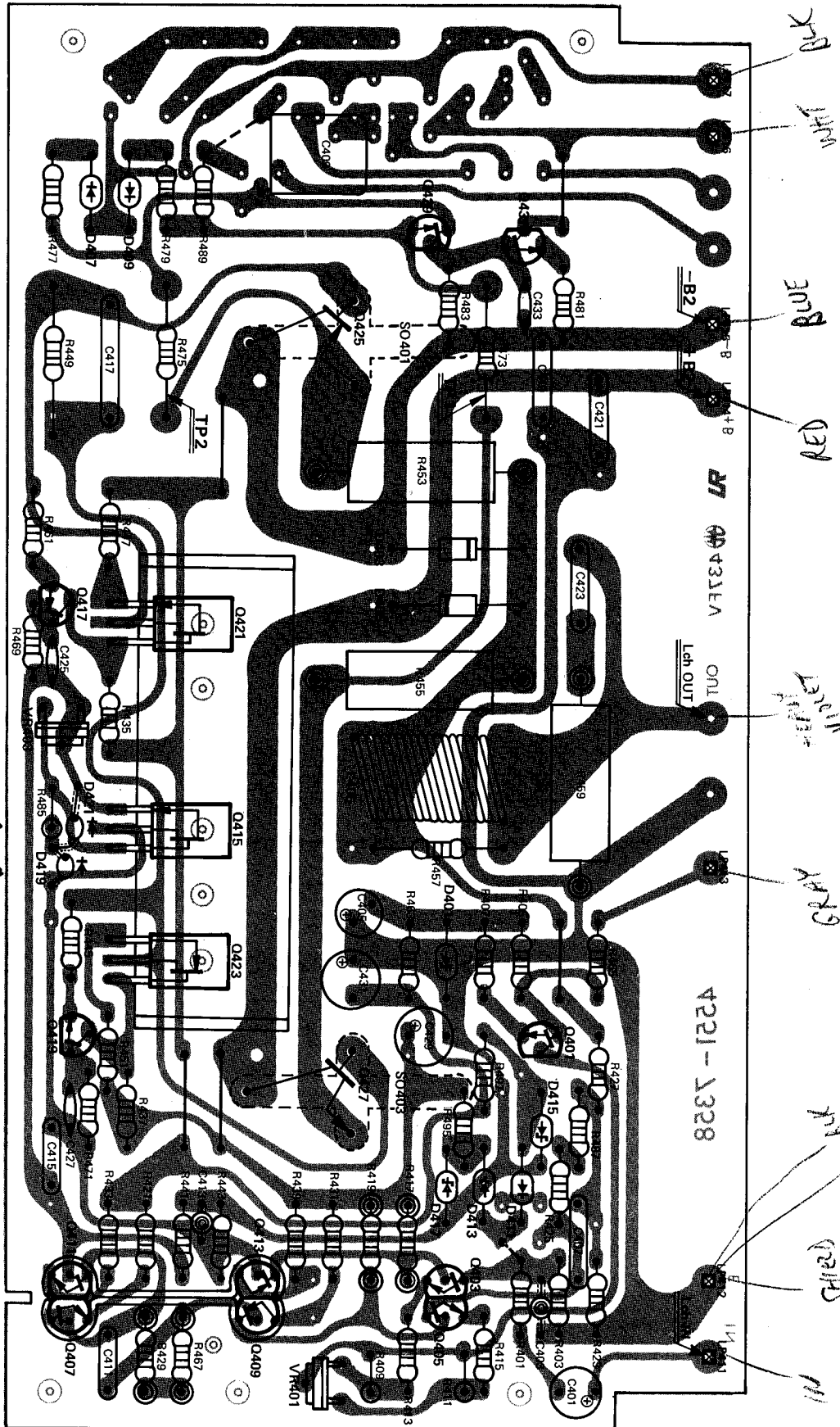
PRE-AMP/TONE CONTROL AMP PC BOARD



L CH MAIN AMP PC BOARD

| REF. NO. | H/K PART NO. | DESCRIPTION |
|---------------------------------|--------------|--|
| RESISTORS | | |
| VR401 | 23535987 | Variable Resistor, 100 ohm |
| VR403 | 23535988 | Variable Resistor, 2.2 k ohm |
| CAPACITORS, ELECTROLYTIC | | |
| C401 | 31835982 | 220MF +50% -10% 6.3V |
| C405 | 31835572 | 22MF +50% -10% 16V |
| C429, 431 | 31835985 | 47MF +50% -10% 50V |
| TRANSISTORS | | |
| Q401, 403 405 | 43035592 | 2SC1775 (F1) or (F2) or (F3) Current Regulator, Differential Amp. |
| Q407, 411 | 43035989 | 2SD666A (C) } Pre-Driver |
| Q409, 413 | 43035990 | 2SB646A (C) } |
| Q415 | 43035991 | 2SD415 (Q) Bias Stabilization |
| Q417 | 43035625 | 2SB647A (C) } Driver |
| Q421 | 43035992 | 2SD669 (C) } |
| Q419 | 43035624 | 2SD667 (C) } Driver |
| Q423 | 43035993 | 2SB649 (C) } |
| Q425 | 43035994 | 2SB655A (B) Power Output |
| Q427 | 43035995 | 2SD675A (B) Power Output |
| Q429 | 43032151 | 2SA872 (E) Overload Protection Circuit |
| Q431 | 43035592 | 2SC1775 (F) Overload Protection Circuit |
| DIODE | | |
| D401 | 42032757 | Zener, RD15EB 14.7V ± 0.9V |
| D403, 405 | 41631295 | SIB01-02 |
| D407, 409 | 41035628 | 1SS81 |
| D411, 413 | 41028593 | 1S2076 |
| D415, 417 | 42035972 | Zener, RD5R1EB 5.1V ± 0.3V |
| D419, 421 | 41631466 | Varistor, MV11Y |
| COIL | | |
| L405 | 12035996 | RF Choke |

L CH MAIN AMP PC BOARD



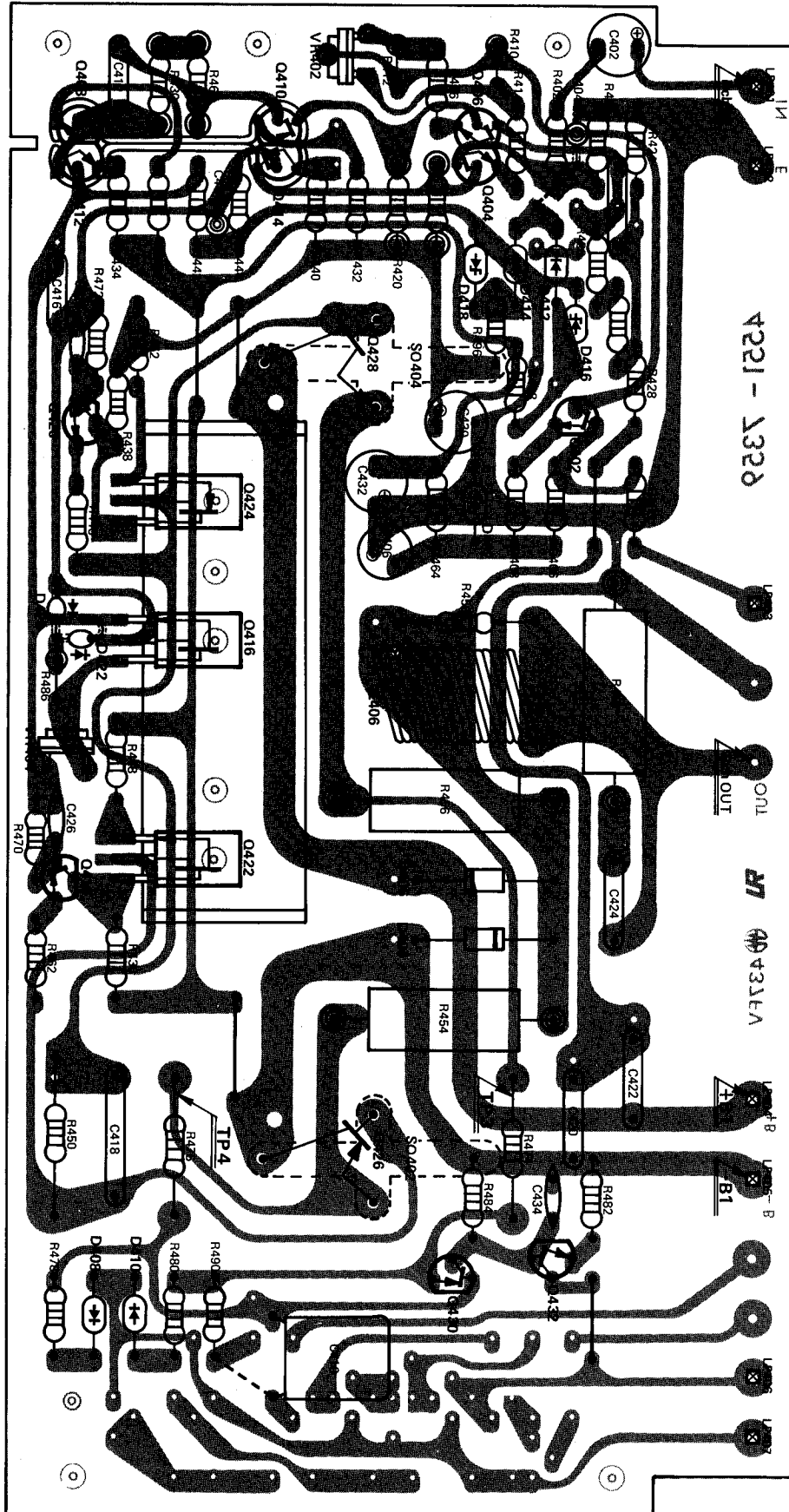
VAXISTOR
 POLARITY
 IN-CORRECTLY
 MARKED ON
 P.C.B.
 CORRECT POLARITY
 ON THIS
 FACTORIAL



R CH MAIN AMP PC BOARD

| REF. NO. | H/K PART NO. | DESCRIPTION |
|---------------------------------|--------------|--|
| RESISTORS | | |
| VR402 | 23535987 | Variable Resistor, 100 ohm |
| VR404 | 23535988 | Variable Resistor, 2.2 k ohm |
| CAPACITORS, ELECTROLYTIC | | |
| C402 | 31835982 | 220MF +50% -10% 6.3V |
| C406 | 31835572 | 22MF +50% -10% 16V |
| C430, 432 | 31835985 | 47MF +50% -10% 50V |
| TRANSISTORS | | |
| Q402, 404, 406 | 43035592 | 2SC1775 (F1) or (F2) or (F3) Current Regulator, Differential Amp. |
| Q408, 412 | 43035989 | 2SD666A (C) } Pre-Driver |
| Q410, 414 | 43035990 | 2SB646A (C) } |
| Q416 | 43035991 | 2SD415 (Q) Bias Stabilization |
| Q418 | 43035625 | 2SB647A (C) } Driver |
| Q422 | 43035992 | 2SD669 (C) } |
| Q420 | 43035624 | 2SD667A (C) } Driver |
| Q424 | 43035993 | 2SB649 (C) } |
| Q426 | 43035994 | 2SB655A (B) Power Output |
| Q428 | 43035995 | 2SD675A (B) Power Output |
| Q430 | 43032151 | 2SA872 (E) Overload Protection Circuit |
| Q432 | 43035592 | 2SC1775 (F) Overload Protection Circuit |
| DIODE | | |
| D402 | 42032757 | Zener, RD15EB 14.7V \pm 0.9V |
| D404, 406 | 41631295 | SIB01-02 |
| D408, 410 | 41035628 | 1SS81 |
| D412, 411 | 41028593 | 1S2076 |
| D416, 418 | 42035972 | Zener, RD5R1EB 5.1V \pm 0.3V |
| D420, 422 | 41631466 | Varistor, MV11Y |
| COIL | | |
| L406 | 12035996 | RF Choke |

R CH MAIN AMP PC BOARD



- IN
- IN GND.

(JUMP TO GND FOR TEST)

OUT

B+
B-

CHASSIS PARTS LIST

| REF. NO. | H/K PART NO. | DESCRIPTION |
|--------------------------------|--------------|---|
| GENERAL UNIT | | |
| 101 | 00235856 | Front Panel Assembly |
| 102 | 60135865 | Cabinet Top Assembly |
| 108 | 60135866 | Cabinet Back |
| 110 | 62035544 | Feet, Cabinet Bottom (X4) |
| 113 | 60135756 | Bracket, Front Right Side |
| 114 | 60135757 | Bracket, Front Left Side |
| 115 | 60135758 | Knob, Volume/Function (X2) |
| 118 | 60135760 | Knob, Balance/Treble/Bass (X3) |
| 121 | 60135552 | Knob, Tape Monitor/Tape Copy (X2) |
| 125 | 00235861 | Bracket, Front Top |
| 126 | 63235933 | Push Button, Speaker 1, 2/Tone Defeat/ Subsonic/High Cut/Capacitance/Hinge/ Mono (X9) |
| 143 | 63235932 | Knob Base, Volume/Balance/Treble/Bass/ Function (X5) |
| 162 | 63235863 | Knob, Loudness |
| 163 | 63233663 | Push Button, Power |
| ELECTRICAL | | |
| T1 | 10135867 | Power Transformer |
| SW1 | 25035554 | Push Switch, Power |
| SW5, 6 | 25035868 | Push Switch, Hinge 6kHz/2.5kHz, 500Hz/150Hz |
| SW8 | 25035869 | Push Switch, Mono/Stereo |
| J1 | 65432119 | Headphones Jack |
| SO1, 2 | 65435870 | External AC Socket, Unswitched, Switched |
| TE1, 2 | 65434823A | Speaker Output Terminal |
| TE3 | 65435872 | 4-Pin Jack, Pre-Amp. Output/Main Amp. Input |
| TE4, 5 | 65435873 | 8-Pin Jack, Phono/Tuner/AUX 1/AUX 2 Input, Tape 1 and Tape 2 Input/Output |
| D7, 8 | 46735560 | Light Emitting Diode, SLP132B Power Indicator |
| D9 | 46735560 | Light Emitting Diode, SLP132B Tape Monitor Indicator |
| | 51032067 | |
| MULTI VOLTAGE AMPLIFIER | | |
| T1 | 10135997 | Power Transformer |
| SW1 | 25035635 | Push Switch, Power |
| FU1, 2, 3, 4 | 45035637 | Fuse, 4AT 250V |
| SW15 | 24035639 | Power Source Voltage Selector |
| FU5 | 45035637 | Fuse, 4AT 250V |
| J2 | 65432127 | 5-Pin DIN Jack, REC/PB |

NOTE: To speed handling of your order be sure to include both the model and serial numbers, in addition to the quantity, part number and part description of the items ordered. Orders from independent dealers, independent servicemen, and retail customers will be shipped on a cash in advance basis. Harman/Kardon reserves the right to substitute equivalent parts for those originally installed in this chassis. All parts should be ordered from Harman/Kardon, 55 Ames Court, Plainview, L.I., N.Y. 11803, Att: Parts Department.