Manual No. 18A

The Harman Kardon Model hk580i

Digital Synthesized Quartz-Locked Stereo Receiver

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

AM ALIGNMENT

Instruments: 1. AM Signal Generator modulated with 400Hz at 30%.
2. Oscilloscope
3. AC V.T.V.M.
4. DC Voltmeter

Notes: 1. Set function selector switch to AM position.
2. Connect signal source to a loop placed to radiate signals into AM antenna loop stick (L252).

Step	Signal Source	Connect Output Meter To	Station Display Setting	Adjust	Adjust For
1	450kHz	VTVM and oscilloscope to TP1 and ground	1610kHz	T251, T252, T253	Maximum output on VTVM and at the same time clean wave form on oscilloscope
2	450kHz	VTVM and oscilloscope to TP2 and ground	1610kHz	T254	Same as above
3	——	DC voltmeter to TP3 and ground	530kHz	L251	1.6V on DC voltmeter
4	——	Same as above	1610kHz	TC251	22.5V on DC voltmeter
5	600kHz	VTVM to Tape 1 Out jack	600kHz	L252	Maximum output on VTVM
6	1400kHz	Same as above	1400kHz	TC252	Same as above
7	Repeat steps 5 and 6 for optimum sensitivity.				
8	1000kHz 40dB/m(100μV/m)	Oscilloscope to Tape 1 Out jack	1000kHz	VR251	Clean wave form on oscilloscope

ALIGNMENT PROCEDURES

FM ALIGNMENT

Instruments:
1. FM Signal Generator modulated with 1000Hz at 100% (75kHz).
2. Oscilloscope
3. Frequency Counter
4. Distortion Meter
5. AC V.T.V.M.
6. DC Voltmeter

Notes:
1. Set function selector switch to FM position.
2. Set muting switch to OFF (button in) position.
3. Connect signal source to FM antenna terminals.

Step	Signal Source	Connect Output Meter To	Station Display Setting	Adjust	Adjust For
1	——	DC voltmeter to TP3 and ground	88.1MHz	Lo	3V on DC voltmeter
2	——	Same as above	107.9MHz	TCo	21V on DC voltmeter
3	90.1MHz 65dBf (970μV)	VTVM to Tape 1 Out jack	90.1MHz	L_A, L_R1, L_R2	Maximum output on VTVM
4	106.1MHz 65dBf (970μV)	Same as above	106.1MHz	TC_A, TC_R1, TC_R2	Same as above
5	Repeat steps 3 and 4 for optimum sensitivity.				
6	——	Frequency counter to TP4 and ground	98.3MHz	TC801	109MHz on frequency counter
7	Set Muting switch to ON position.				
8	98.15MHz 65dBf (970μV)	Oscilloscope to Tape 1 Out jack	98.1MHz	T201(A)	Clean wave on oscilloscope
9	98.05MHz 65dBf (970μV)	Same as above	98.1MHz	T202(A)	Same as above
10	Repeat steps 8 and 9 for optimum sensitivity.				
11	98.1MHz 65dBf (970μV)	Distortion meter to Tape 1 Out jack	98.1MHz	T201(B)	Minimum reading on distortion meter
12	Repeat steps 8, 9 and 11 for optimum alignment point of T201(A) and (B).				

QUARTZ LOCK INDICATOR ADJUSTMENT

Instrument: FM Signal Generator modulated with 1000Hz at 100% (75kHz).

Notes:
1. Set function selector switch to FM position.
2. Set muting switch to OFF (button in) position.
3. Connect signal source to FM antenna terminals.
4. Turn the VR351 to the center.

Signal Source	Station Display Setting	Adjust	Adjust For
98.1MHz 13dBf (2.4μV)	98.1MHz	VR201	Quartz indicator LED lights

ALIGNMENT PROCEDURES

SIGNAL STRENGTH DISPLAY ADJUSTMENT

Instruments: 1. AM Signal Generator modulated with 400Hz at 30%.
2. FM Signal Generator modulated with 1000Hz at 100% (75kHz).
3. DC Voltmeter

Notes: 1. Set muting switch to OFF (button in) position.
2. Set tuning switch to MANUAL position.
3. Turn the mute adjust control (rear panel) fully counterclockwise.
4. Turn the VR354 and VR351 to center.

Step	Connect Signal Source To	Set Signal Generator To	Connect Output Meter To	Station Display Setting	Adjust	Adjust For
1	Set Function selector switch to AM position.					
2	Place loop to radiate signals into AM antenna loop stick (L252).	1000kHz 74dB/m (2.8mV/m)	DC voltmeter to TP5 and ground	1000kHz	VR354	8V on DC voltmeter
3	Set Function selector switch to FM position.					
4	Place generator leads across FM antenna terminals.	98.1MHz 65dBf (970μV)	DC voltmeter to TP5 and ground	98.1MHz	VR351	9V on DC voltmeter

MPX ADJUSTMENT

Instruments: 1. FM Signal Generator modulated with 1000Hz at 100% (75kHz).
2. Frequency Counter

Notes: 1. Set function selector switch to AUTO FM position.
2. Connect signal source to FM antenna terminals.

Signal Source	Connect Output Meter To	Station Display Setting	Adjust	Adjust For
98.1MHz 65dBf (970μV)	Frequency Counter to TP6 and ground	98.1MHz	VR302	76kHz on frequency counter

STEREO FM INDICATOR ADJUSTMENT

Instrument: FM Stereo Signal Generator modulated with 1000Hz at 100% (75kHz).
(L+R=45% L−R=45% 19kHz=9%)

Notes: 1. Set function selector switch to AUTO FM position.
2. Connect signal source to FM antenna terminals.

Signal Source	Station Display Setting	Adjust	Adjust For
98.1MHz 36dBf (30μV)	98.1MHz	VR352	Stereo FM indicator LED lights

SEPARATION ADJUSTMENT

Instruments: 1. FM Stereo Signal Generator modulated with 1000Hz at 100% (75kHz).
(L+R=45% L−R=45% 19kHz=9%)
2. AC V.T.V.M.

Notes: 1. Set function selector switch to AUTO FM position.
2. Set blend control to STEREO position.
3. Connect signal source to FM antenna terminals.

Step	Signal Source	Connect Output Meter To	Station Display Setting	Adjust	Adjust For
1	Set Lch signal ON at FM stereo signal generator.				
2	98.1MHz 65dBf (970μV)	VTVM to Rch Tape 1 Out jack	98.1MHz	VR301, VR321	Minimum output on VTVM
3	Set Rch signal ON at FM stereo signal generator.				
4	98.1MHz 65dBf (970μV)	VTVM to Lch Tape 1 Out jack	98.1MHz	VR301, VR321	Minimum output on VTVM
5	Repeat steps 2 and 4 to obtain same level at left and right channels.				

IDLING CURRENT ADJUSTMENT

Instrument: DC Voltmeter

Notes: 1. Set function selector switch to AUX position.
2. Set volume control to minimum position.

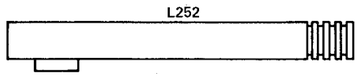
Step	Connect Output Meter To	Adjust	Adjust For
1	DC voltmeter to TP7 (+) and TP8 (−)	VR404	33mV on DC voltmeter
2	DC voltmeter to TP9 (+) and TP10 (−)	VR403	Same as above

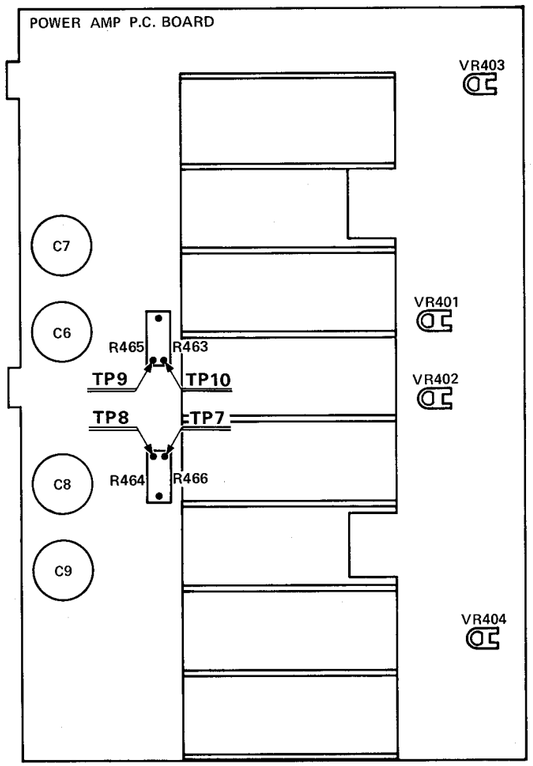
DC VOLTAGE BALANCE ADJUSTMENT

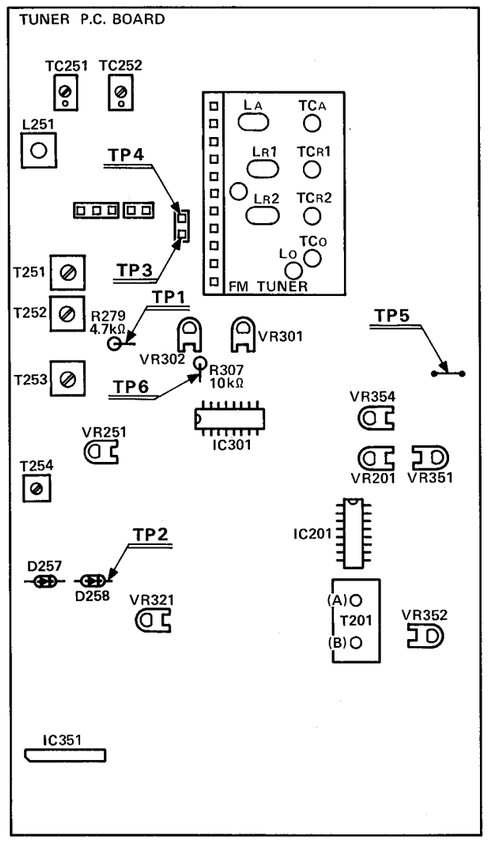
Instrument: DC Voltmeter

Notes: 1. Set function selector switch to AUX position.
2. Set volume control to minimum position.
3. Press in speakers 1 push button to ON (button in) position.

Step	Connect Output Meter To	Adjust	Adjust For
1	DC voltmeter to Lch terminal of Speaker System 1	VR402	OV±50mV on DC voltmeter
2	DC voltmeter to Rch terminal of Speaker System 1	VR401	Same as above







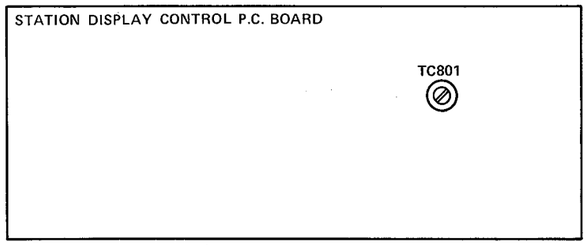


Fig. 1—Alignment Points Location

ALIGNMENT PROCEDURES

SEPARATION ADJUSTMENT

Instruments: 1. FM Stereo Signal Generator modulated with 1000Hz at 100% (75kHz).
(L+R=45% L−R=45% 19kHz=9%)
2. AC V.T.V.M.

Notes: 1. Set function selector switch to AUTO FM position.
2. Set blend control to STEREO position.
3. Connect signal source to FM antenna terminals.

Step	Signal Source	Connect Output Meter To	Station Display Setting	Adjust	Adjust For
1	Set Lch signal ON at FM stereo signal generator.				
2	98.1MHz 65dBf (970μV)	VTVM to Rch Tape 1 Out jack	98.1MHz	VR301, VR321	Minimum output on VTVM
3	Set Rch signal ON at FM stereo signal generator.				
4	98.1MHz 65dBf (970μV)	VTVM to Lch Tape 1 Out jack	98.1MHz	VR301, VR321	Minimum output on VTVM
5	Repeat steps 2 and 4 to obtain same level at left and right channels.				

IDLING CURRENT ADJUSTMENT

Instrument: DC Voltmeter

Notes: 1. Set function selector switch to AUX position.
2. Set volume control to minimum position.

Step	Connect Output Meter To	Adjust	Adjust For
1	DC voltmeter to TP7 (+) and TP8 (−)	VR404	33mV on DC voltmeter
2	DC voltmeter to TP9 (+) and TP10 (−)	VR403	Same as above

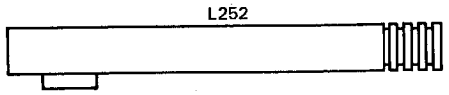
DC VOLTAGE BALANCE ADJUSTMENT

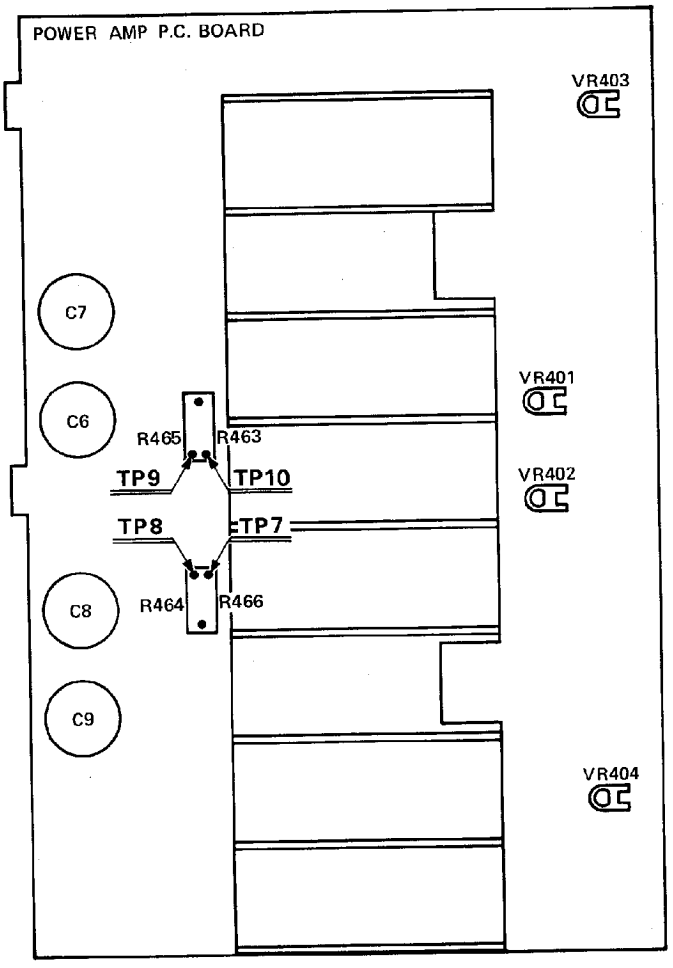
Instrument: DC Voltmeter

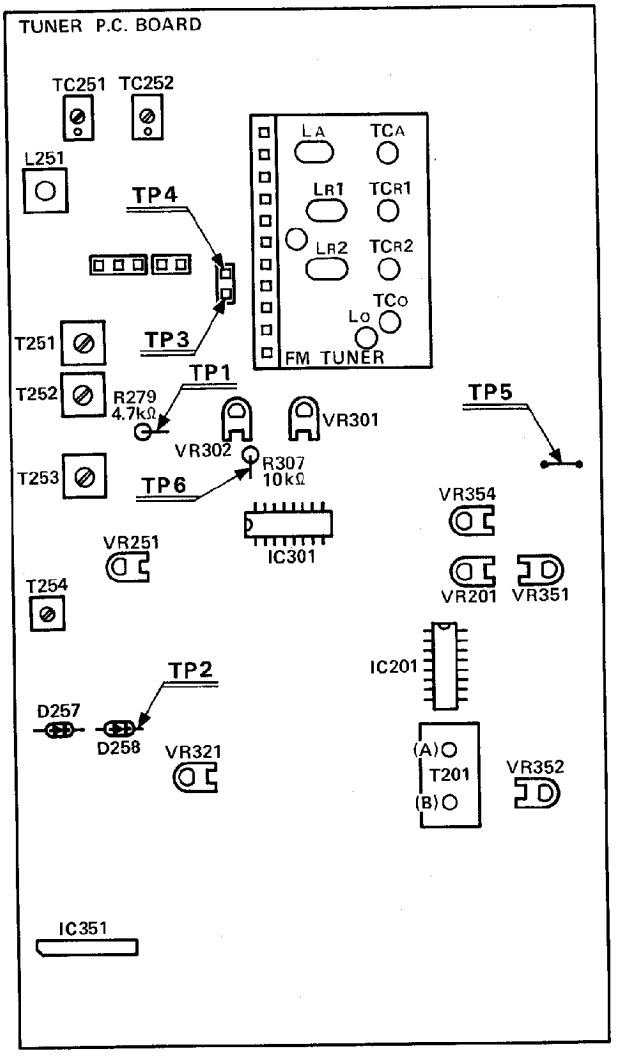
Notes: 1. Set function selector switch to AUX position.
2. Set volume control to minimum position.
3. Press in speakers 1 push button to ON (button in) position.

Step	Connect Output Meter To	Adjust	Adjust For
1	DC voltmeter to Lch terminal of Speaker System 1	VR402	0V ± 50mV on DC voltmeter
2	DC voltmeter to Rch terminal of Speaker System 1	VR401	Same as above

ALIGNMENT PROCEDURES







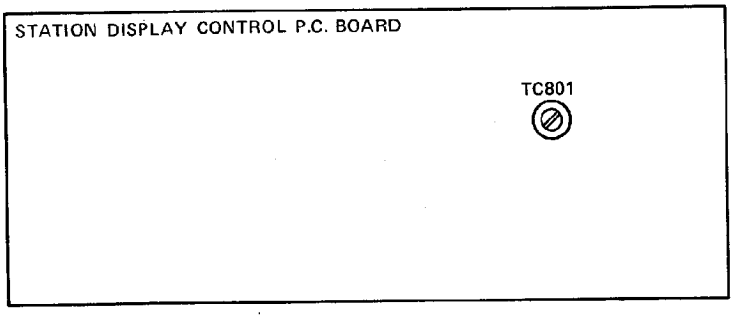
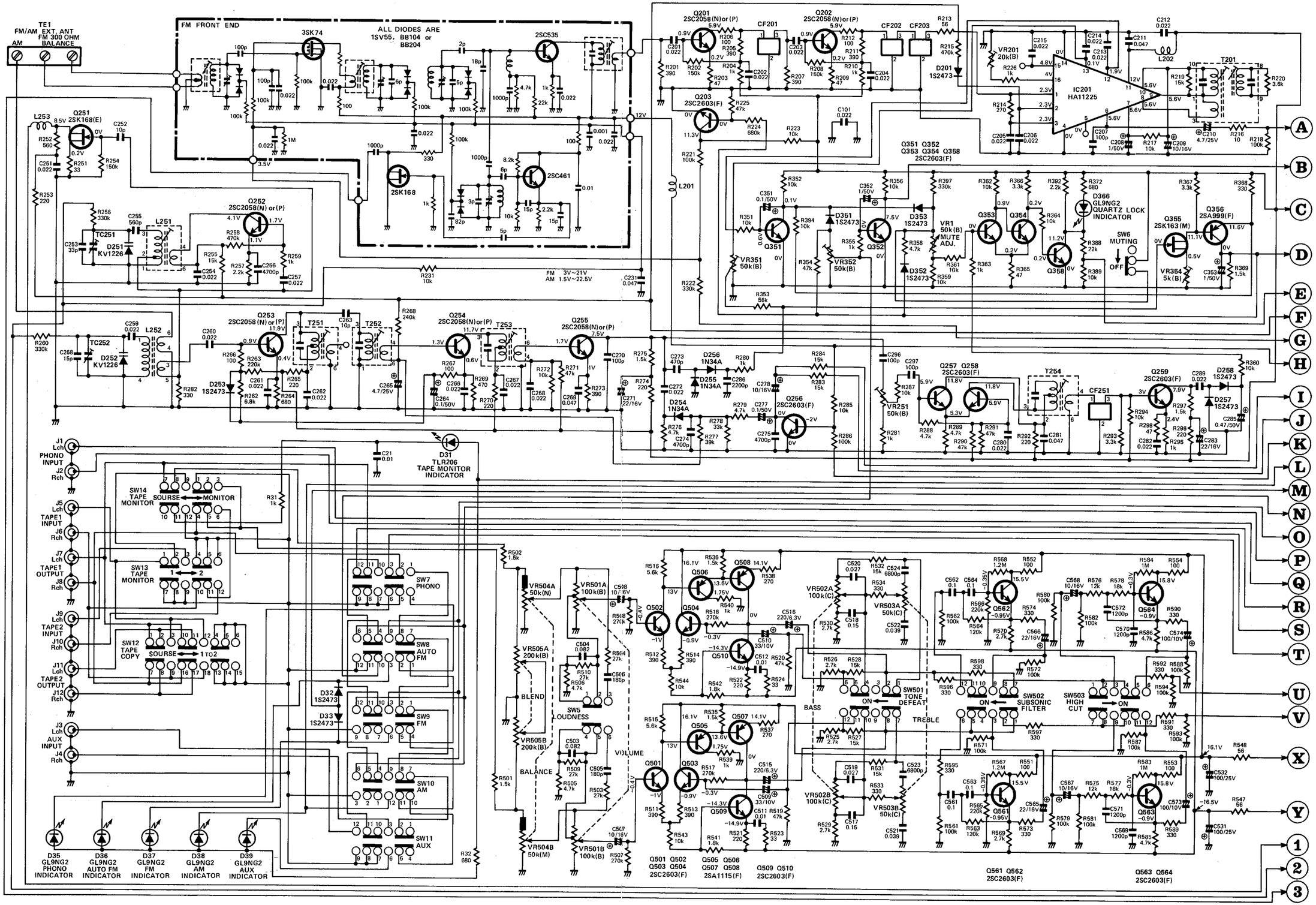


Fig. 1—Alignment Points Location

SCHEMATIC DIAGRAM



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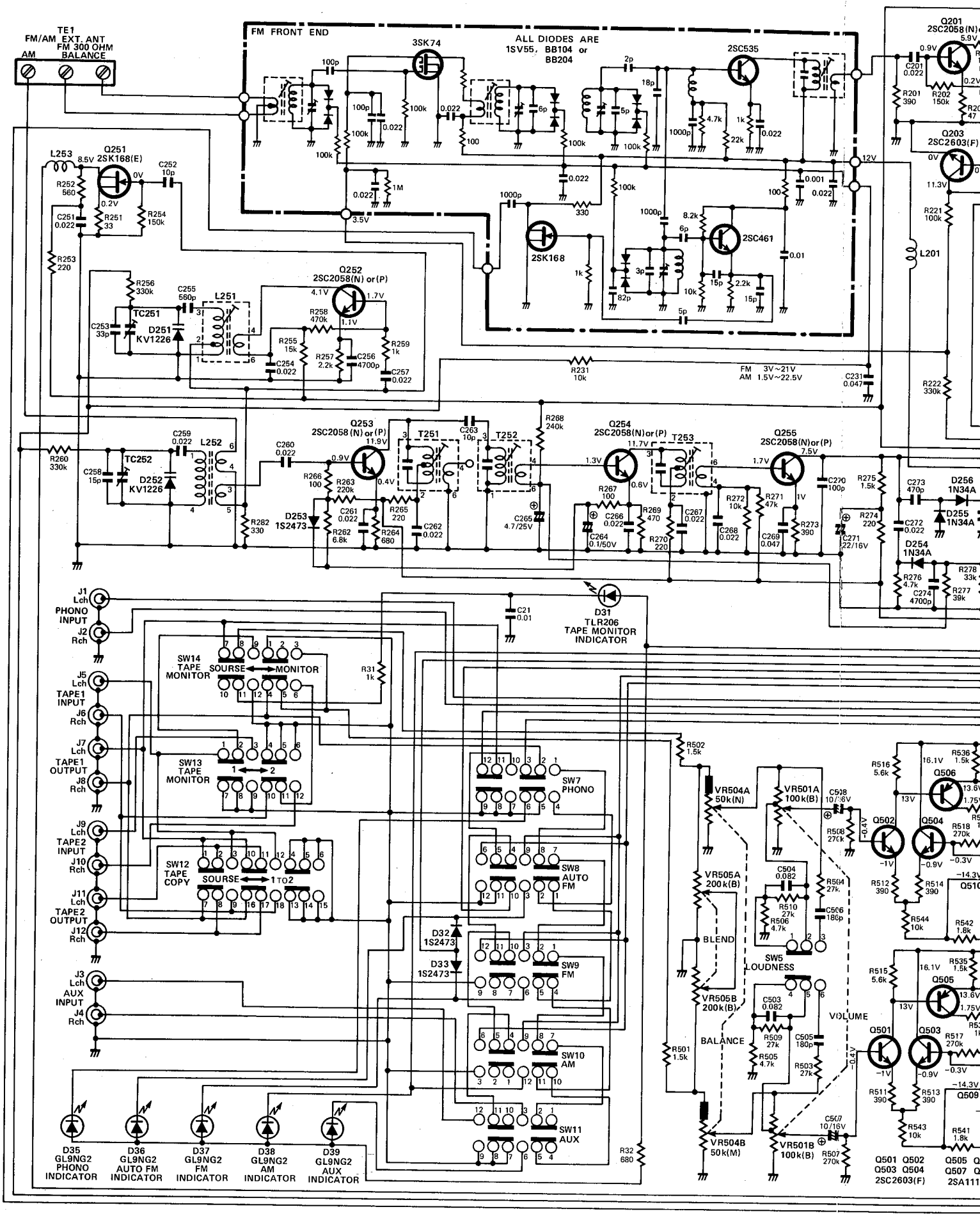

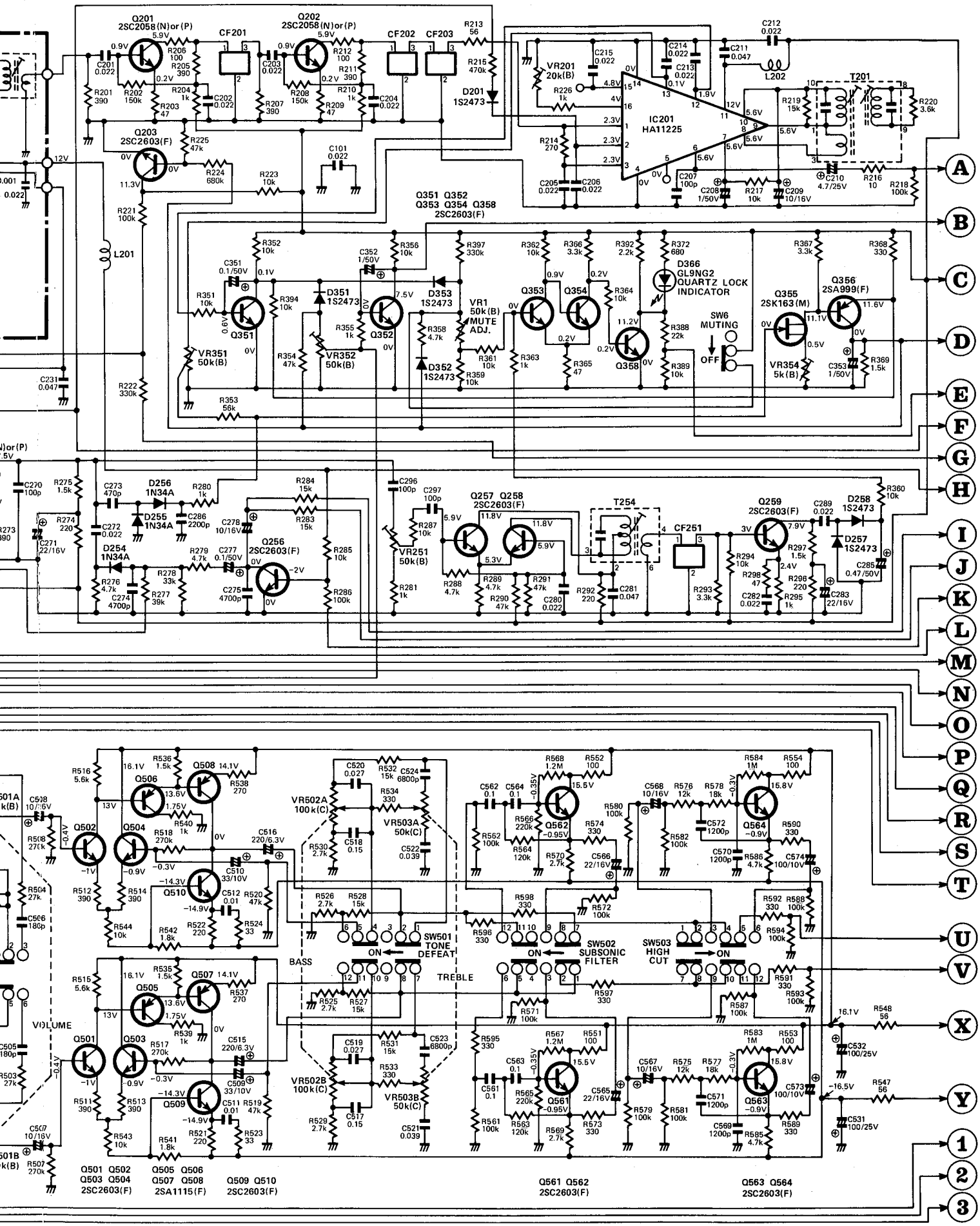
Q201 2SC2058(N)or(P)
CF201
Q202 2SC2058(N)or(P)
CF202
CF203
D201 1S2473
VR201 20k(B)
IC201 HA11225
T201
L202
L201
Q203 2SC2603(F)
Q351 Q352 Q353 Q354 Q358 2SC2603(F)
D366 GL9NG2 QUARTZ LOCK INDICATOR
SW6 MUTING
OFF
VR1 50k(B) MUTE ADJ.
VR351 50k(B)
VR352 50k(B)
Q355 2SK163(M)
Q356 2SA999(F)
VR354 5k(B)
D351 1S2473
D352 1S2473
D353 1S2473
Q257 Q258 2SC2603(F)
T254
CF251
VR251 50k(B)
Q259 2SC2603(F)
D256 1N34A
D255 1N34A
D254 1N34A
Q256 2SC2603(F)
D258 1S2473
D257 1S2473
Q506
Q508
Q502
Q504
Q510
Q505
Q507
Q501
Q503
Q509
VR502A 100k(C)
VR503A 50k(C)
VR502B 100k(C)
VR503B 50k(C)
SW501 TONE DEFEAT
SW502 SUBSONIC FILTER
SW503 HIGH CUT
BASS
TREBLE
VOLUME
Q562 -0.95V
Q564 -0.9V
Q561 -0.95V
Q563 -0.9V
Q501 Q502 Q503 Q504 2SC2603(F)
Q505 Q506 Q507 Q508 2SA1115(F)
Q509 Q510 2SC2603(F)
Q561 Q562 2SC2603(F)
Q563 Q564 2SC2603(F)
A
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C
D
E
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G
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K
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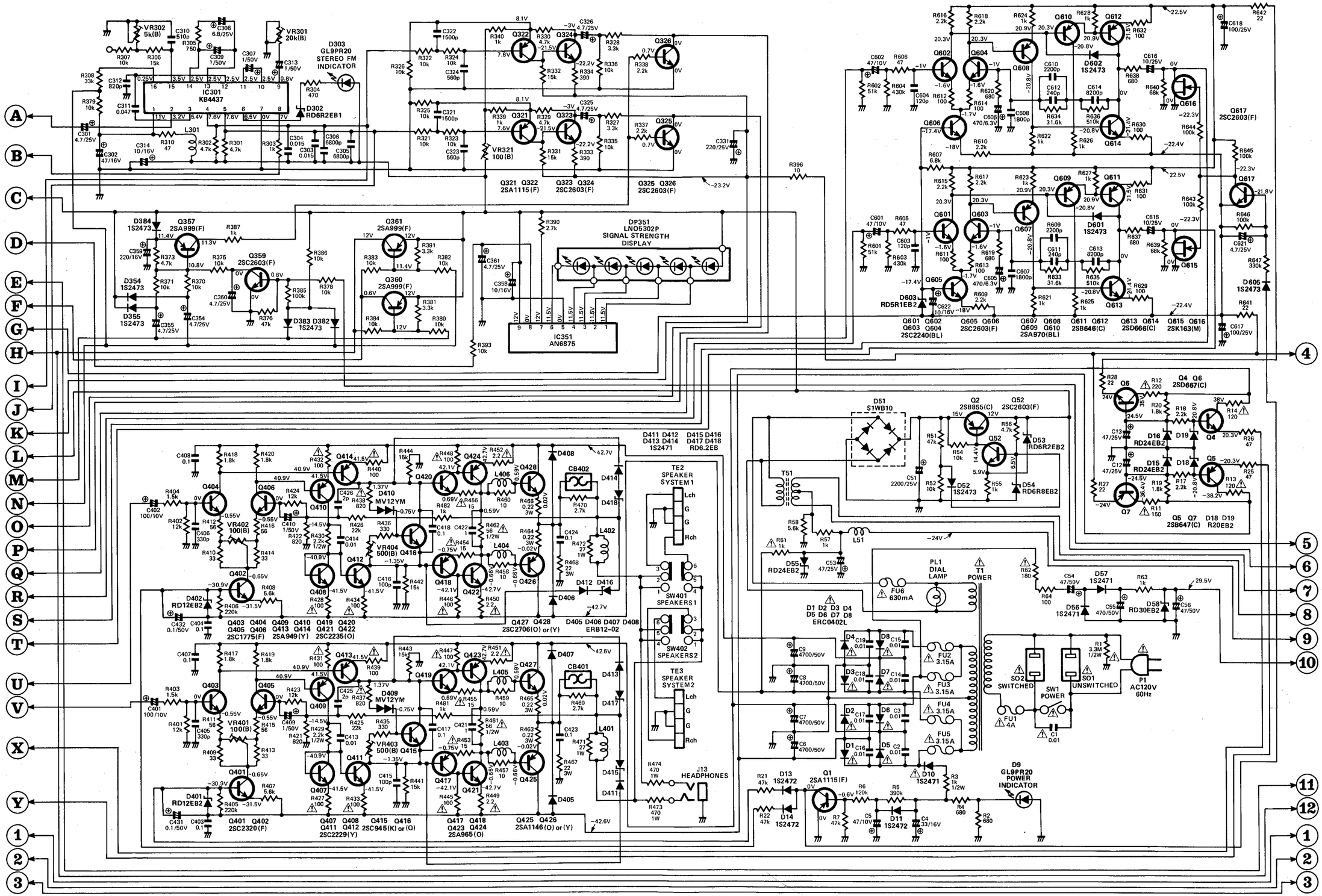
SCHEMATIC DIAGRAM



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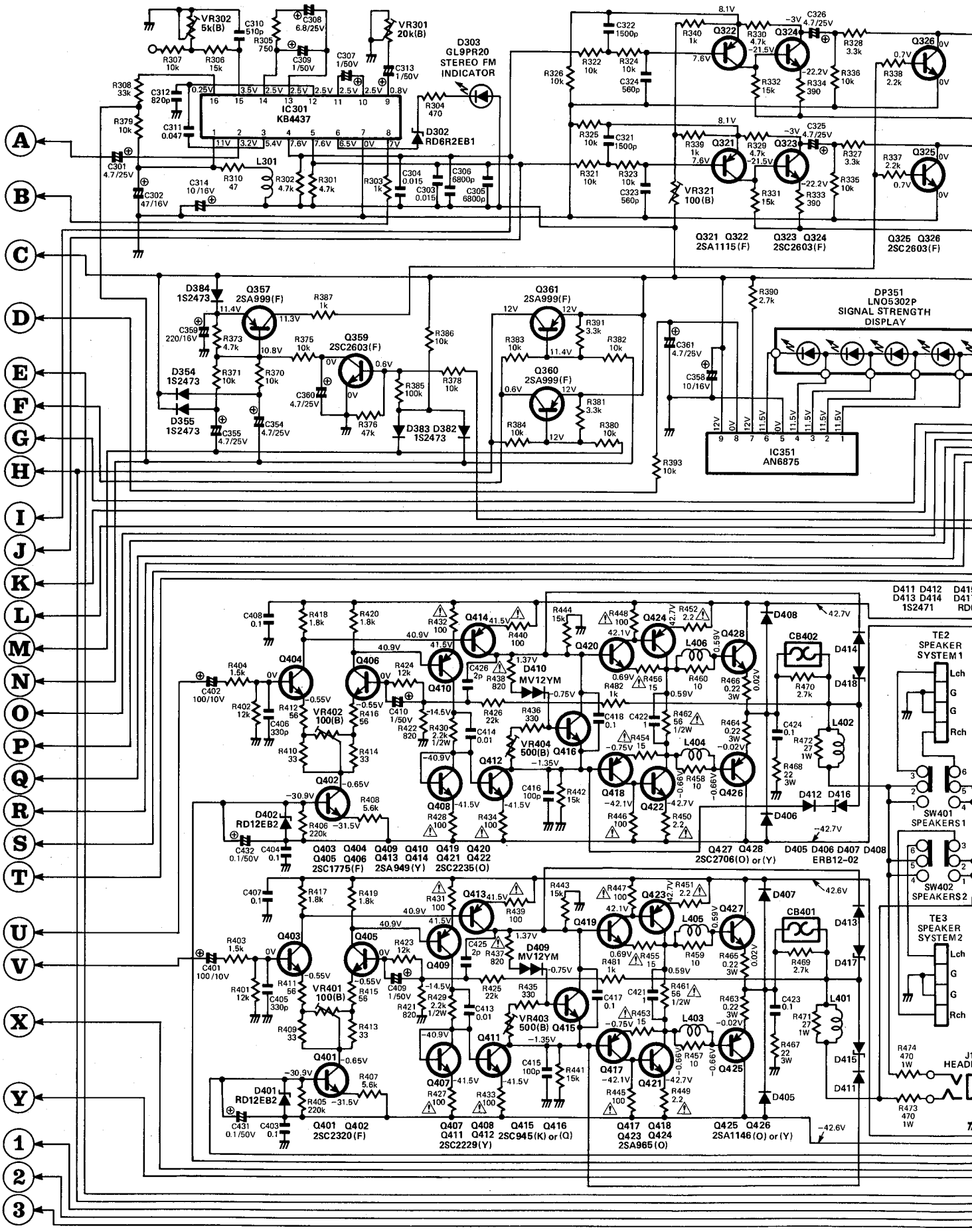

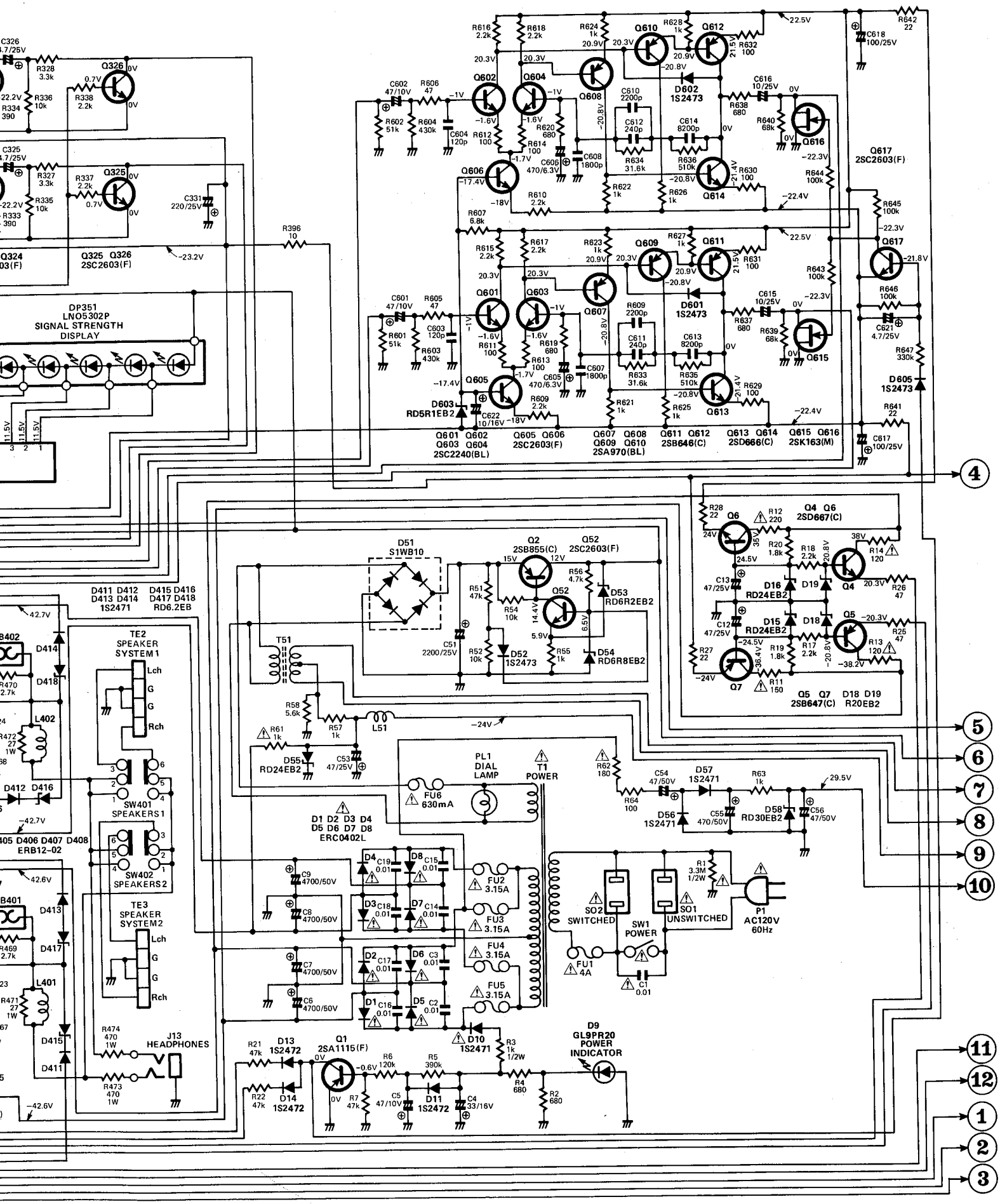
DP351
LNO5302P
SIGNAL STRENGTH
DISPLAY
Q324
Q325 Q326
2SC2603(F)
Q601 Q602
Q603 Q604
2SC2240(BL)
Q605 Q606
2SC2603(F)
Q607 Q608
Q609 Q610
2SA970(BL)
Q611 Q612
2SB646(C)
Q613 Q614
2SD666(C)
Q615 Q616
2SK163(M)
Q617
2SC2603(F)
D601
1S2473
D602
1S2473
D603
RD5R1EB2
D605
1S2473
Q4 Q6
2SD667(C)
Q5 Q7
2SB647(C)
D18 D19
R20EB2
D411 D412 D415 D416
D413 D414 D417 D418
1S2471 RD6.2EB
D1 D2 D3 D4
D5 D6 D7 D8
ERC0402L
D9
GL9PR20
POWER
INDICATOR
TE2
SPEAKER
SYSTEM1
TE3
SPEAKER
SYSTEM2
SW401
SPEAKERS1
SW402
SPEAKERS2
J13
HEADPHONES
T51
L51
PL1
DIAL
LAMP
T1
POWER
FU1
4A
FU2
3.15A
FU3
3.15A
FU4
3.15A
FU5
3.15A
FU6
630mA
SO2
SWITCHED
SW1
POWER
SO1
UNSWITCHED
P1
AC120V
60Hz
D51
S1WB10
D52
1S2473
D53
RD6R2EB2
D54
RD6R8EB2
D55
RD24EB2
D56
1S2471
D57
1S2471
D58
RD30EB2
D10
1S2471
D13
1S2472
D14
1S2472
D15
RD24EB2
D16
RD24EB2
Q1
2SA1115(F)
Q2
2SB855(C)
Q52
2SC2603(F)
Q6
Q7
Q4
Q5
-24V
-42.7V
-42.6V
42.7V
42.6V
29.5V
-23.2V
-22.4V
-22.5V
-21.8V
-20.8V
-20.3V
-18V
-17.4V
-24.5V
-38.2V
-36.4V
R396
10
C331
220/25V
C618
100/25V
C617
100/25V
C621
4.7/25V
C622
10/16V
C1
0.01
C2
0.01
C3
0.01
C4
33/16V
C5
47/10V
C6
4700/50V
C7
4700/50V
C8
4700/50V
C9
4700/50V
C53
47/25V
C54
47/50V
C55
470/50V
C56
47/50V
C58
2200/25V
C602
47/10V
C603
120p
C604
120p
C605
470/6.3V
C606
470/6.3V
C607
1800p
C608
1800p
C609
2200p
C610
2200p
C611
240p
C612
240p
C613
8200p
C614
8200p
C615
10/25V
C616
10/25V
C12
47/25V
C13
47/25V
R1
3.3M
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R2
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R3
1k
1/2W
R4
680
R5
390k
R6
120k
R7
47k
R11
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R12
220
R13
120
R14
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R17
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R18
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R57
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R58
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R62
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R63
1k
R64
100
R471
27
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R472
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1W
R473
470
1W
R474
470
1W
R601
51k
R602
51k
R603
430k
R604
430k
R605
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R606
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R607
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R608
R609
R610
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R611
100
R612
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R613
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R614
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R615
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R616
2.2k
R617
2.2k
R618
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R626
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R640
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R647
330k
L401
L402
B401
B402
D412 D416
D414
D415
D417
D418
11.5V
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Rch
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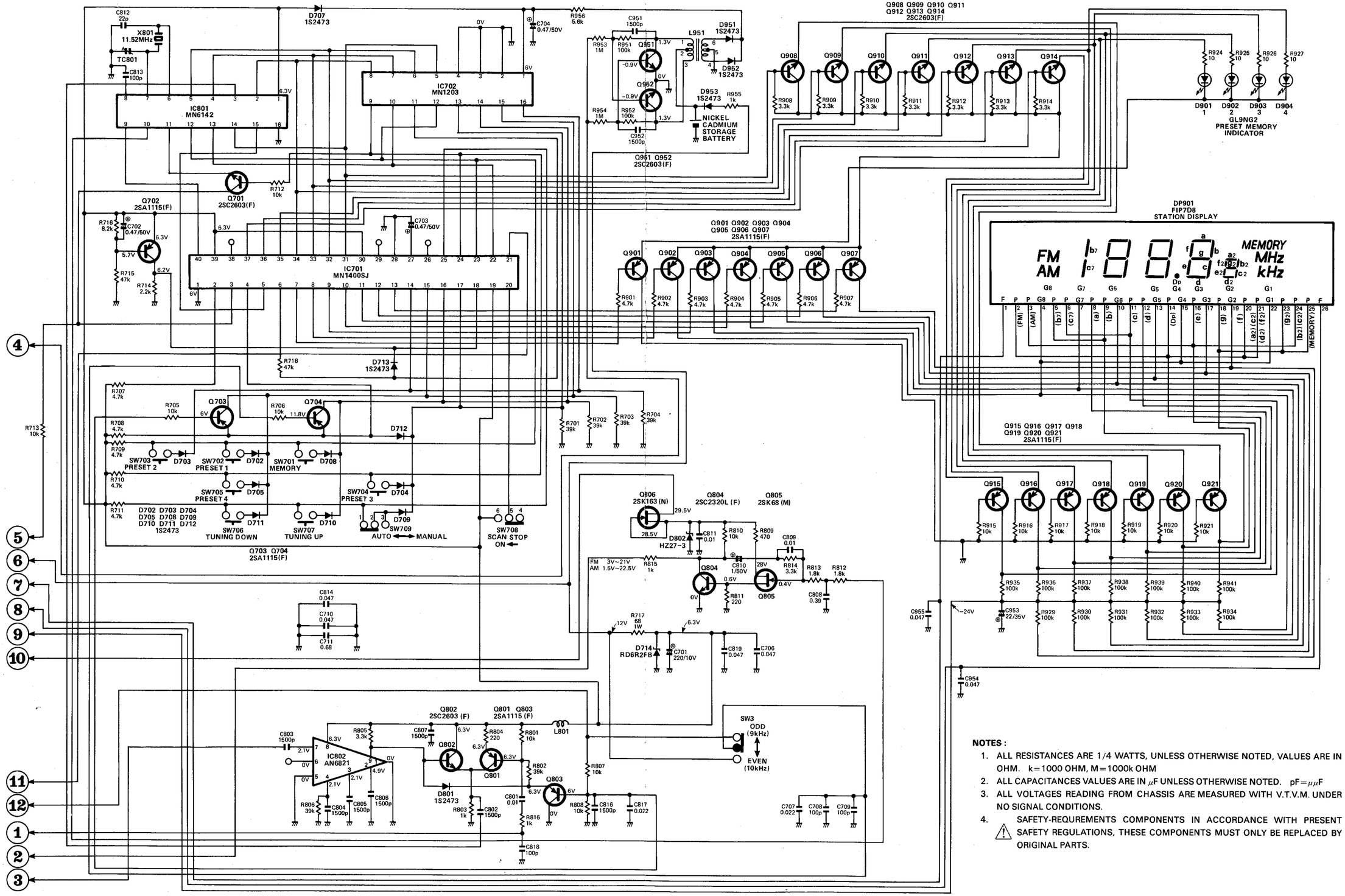
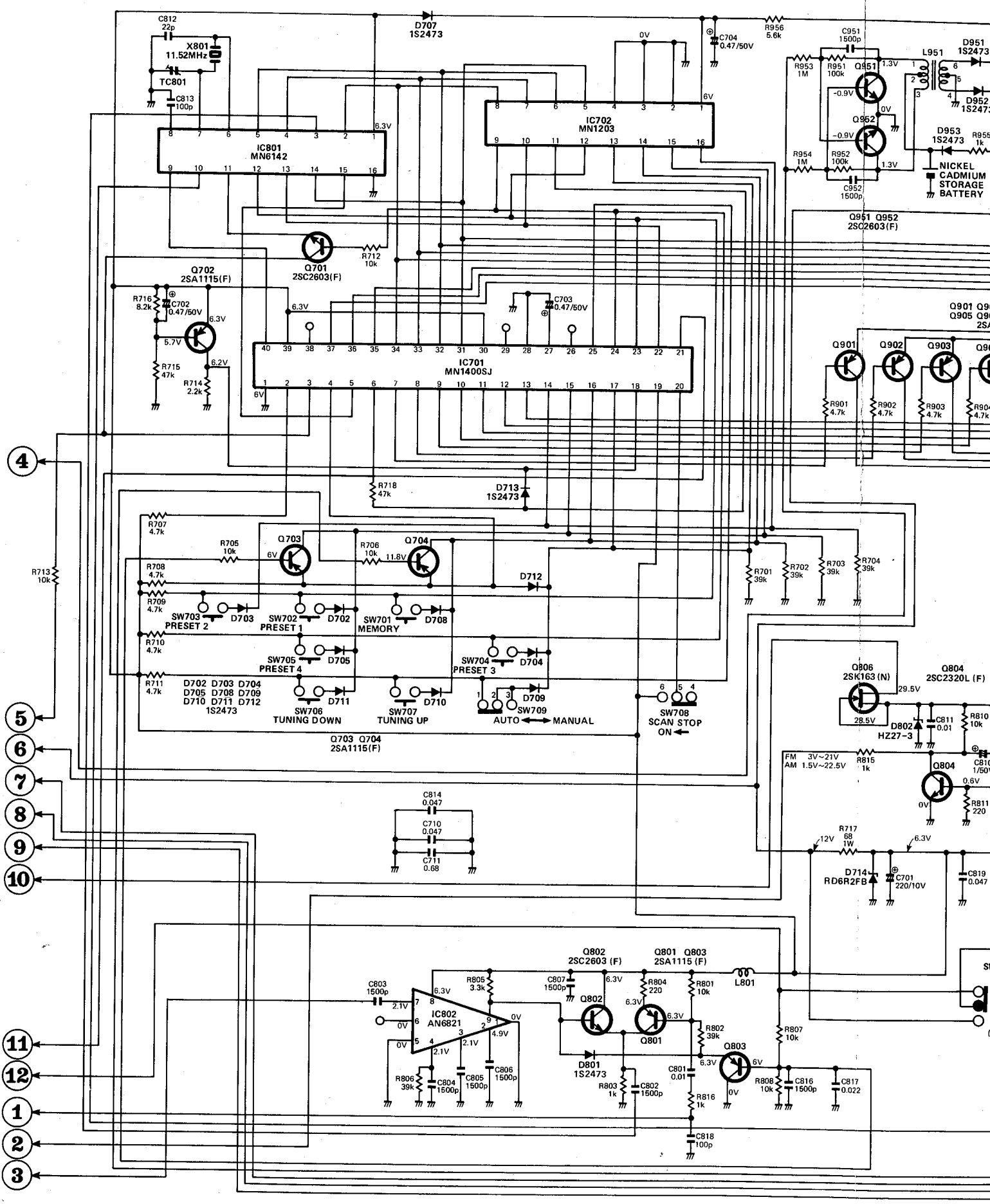
SCHEMATIC DIAGRAM

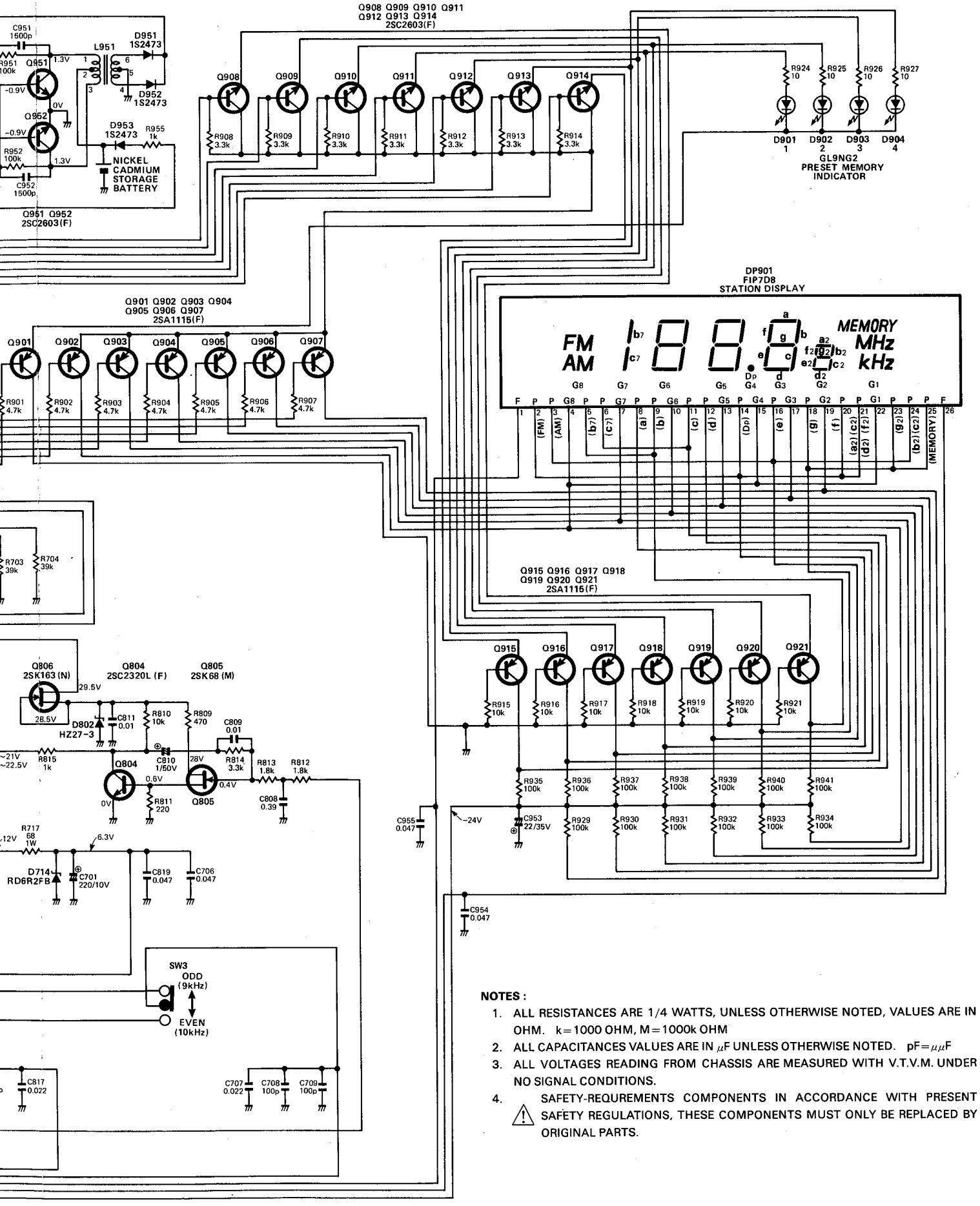


NOTES :

1. ALL RESISTANCES ARE 1/4 WATTS, UNLESS OTHERWISE NOTED, VALUES ARE IN OHM. k=1000 OHM, M=1000k OHM
2. ALL CAPACITANCES VALUES ARE IN μF UNLESS OTHERWISE NOTED. pF=$\mu\mu$F
3. ALL VOLTAGES READING FROM CHASSIS ARE MEASURED WITH V.T.V.M. UNDER NO SIGNAL CONDITIONS.
4. ⚠ SAFETY-REQUREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

SCHEMATIC DIAGRAM





NOTES :

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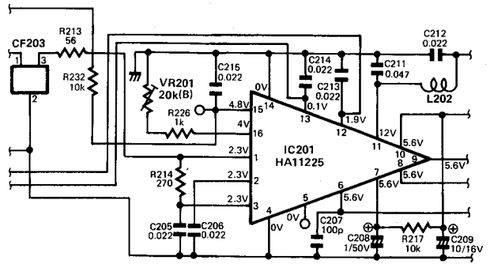
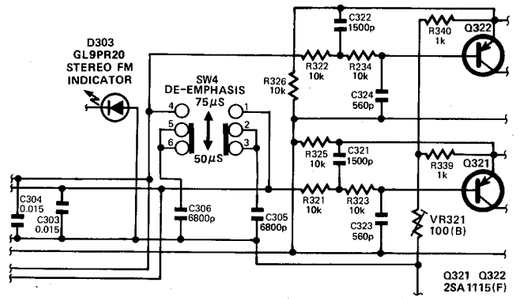
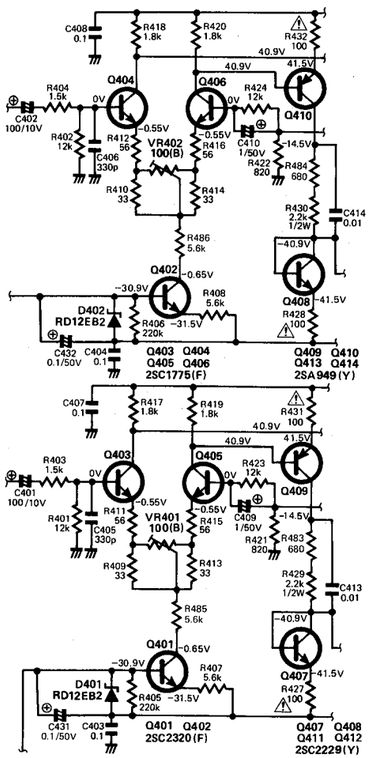
4. ⚠ SAFETY-REQUREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

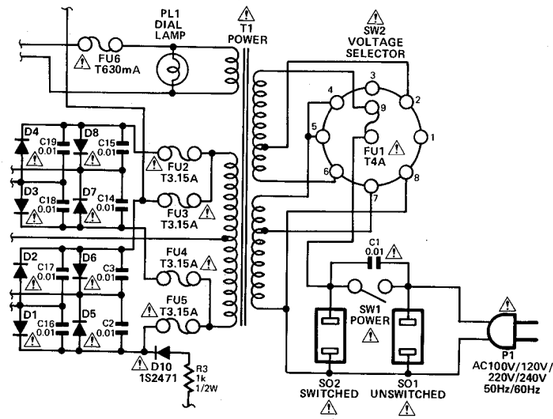
SCHEMATIC DIAGRAM

THE FOLLOWING SCHEMATIC DIAGRAM IS APPLIED TO MULTI VOLTAGE UNIT.

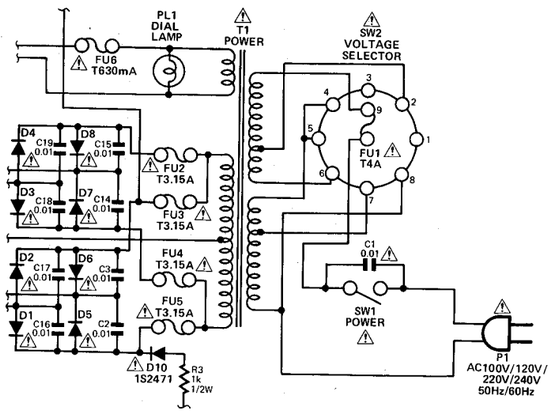




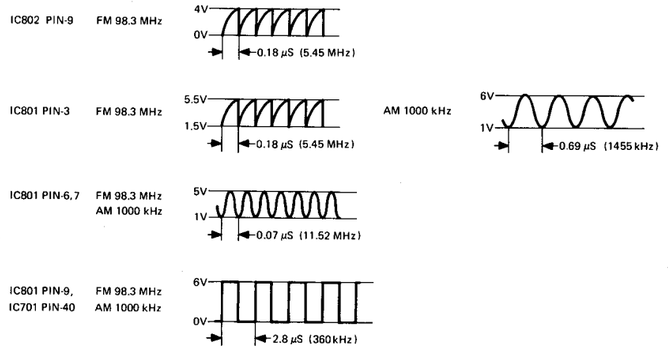




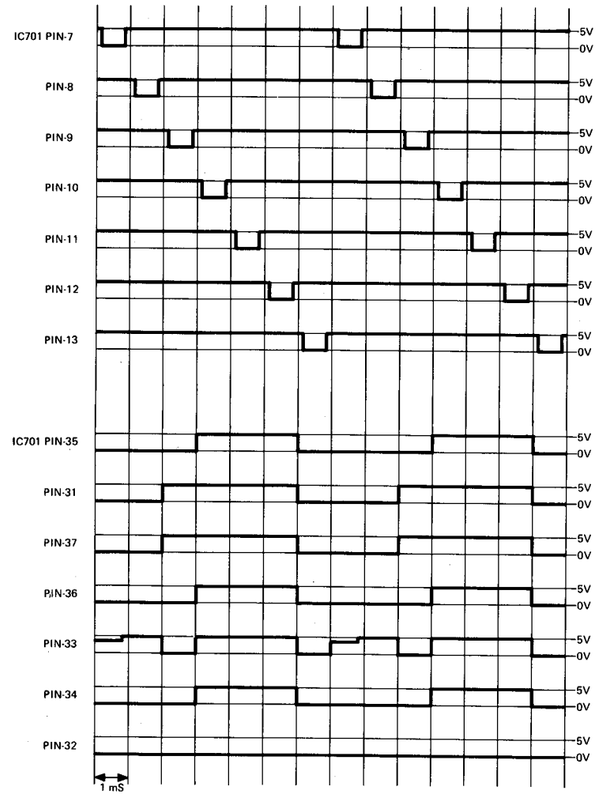
FOR EUROPE AND OCEANIA ONLY



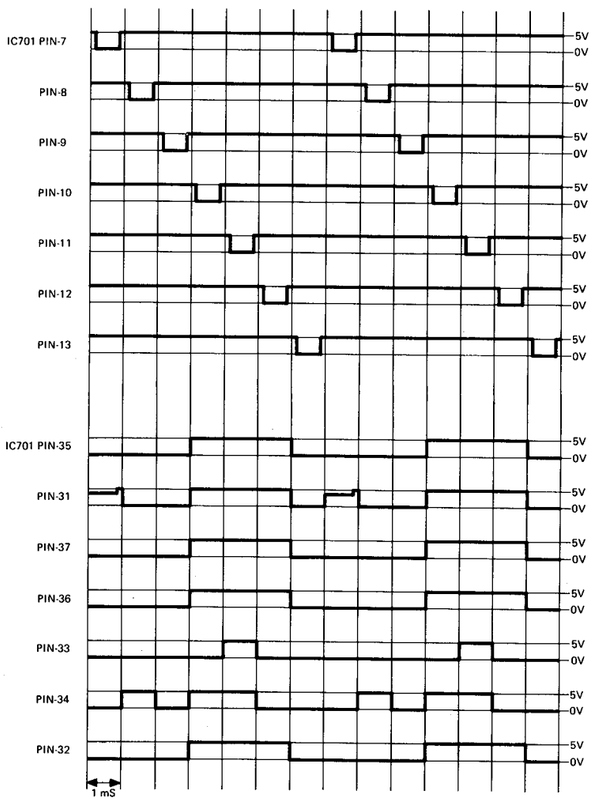
TIME/SEQUENCE CHART



AM 1000 kHz SIGNAL RECEIVED AT MEMORY 2



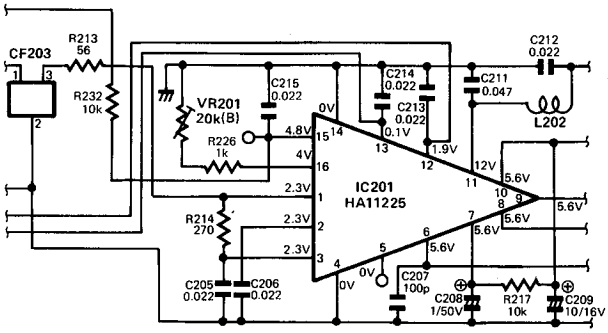
FM 98.3 MHz SIGNAL RECEIVED AT MEMORY 1

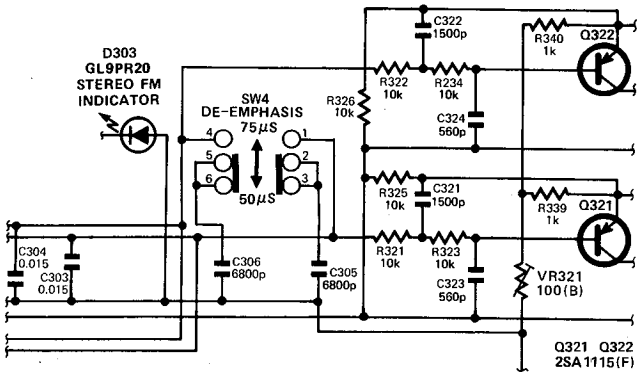


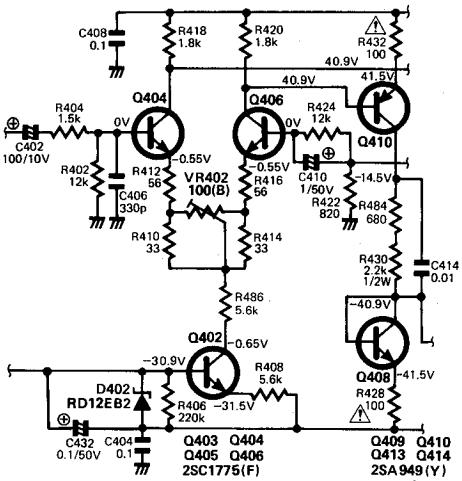
NOTE : The output signal from terminal number 7 in IC701 is applied to the oscillator trigger input.

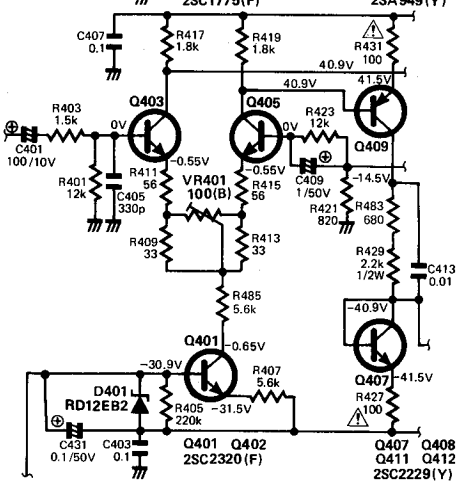
SCHEMATIC DIAGRAM

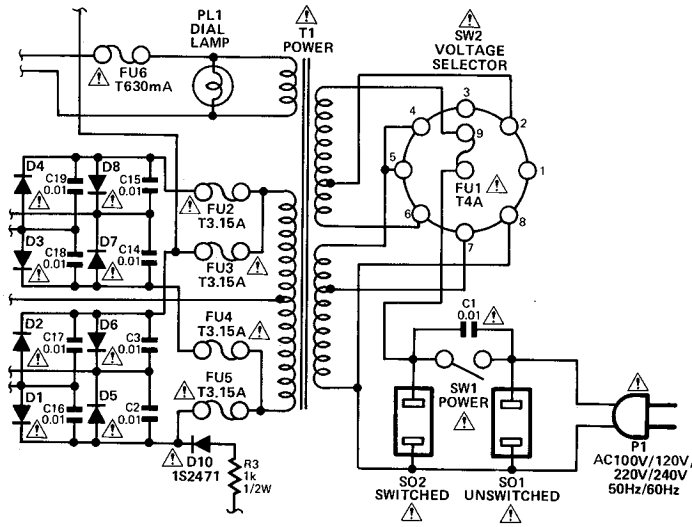
THE FOLLOWING SCHEMATIC DIAGRAM IS APPLIED TO MULTI VOLTAGE UNIT.



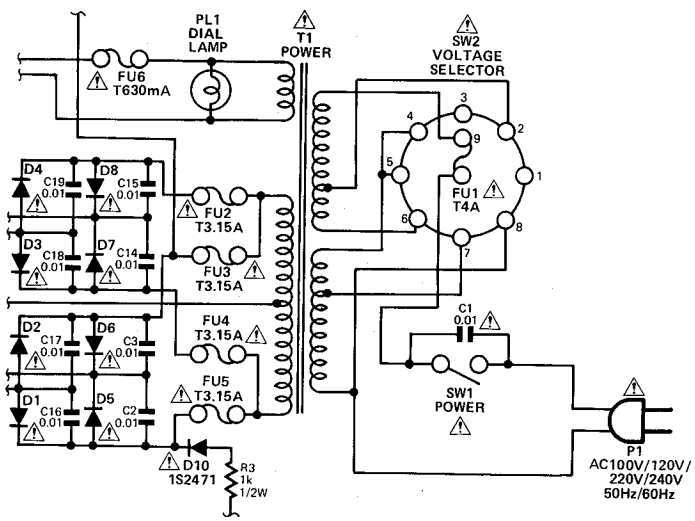


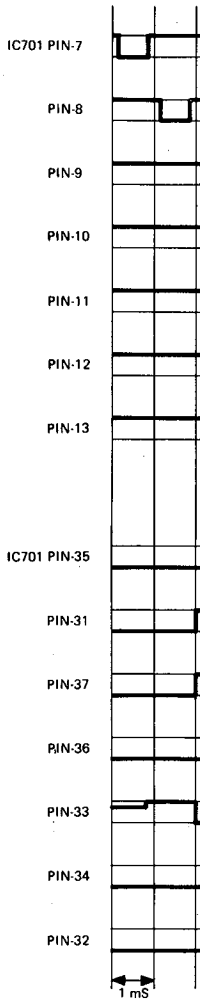






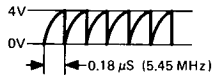
FOR EUROPE AND OCEANIA ONLY



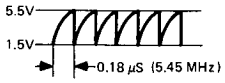


TIME/SEQUENCE CHART

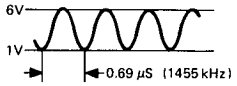
IC802 PIN-9 FM 98.3 MHz



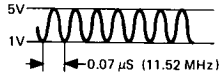
IC801 PIN-3 FM 98.3 MHz



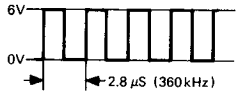
AM 1000 kHz



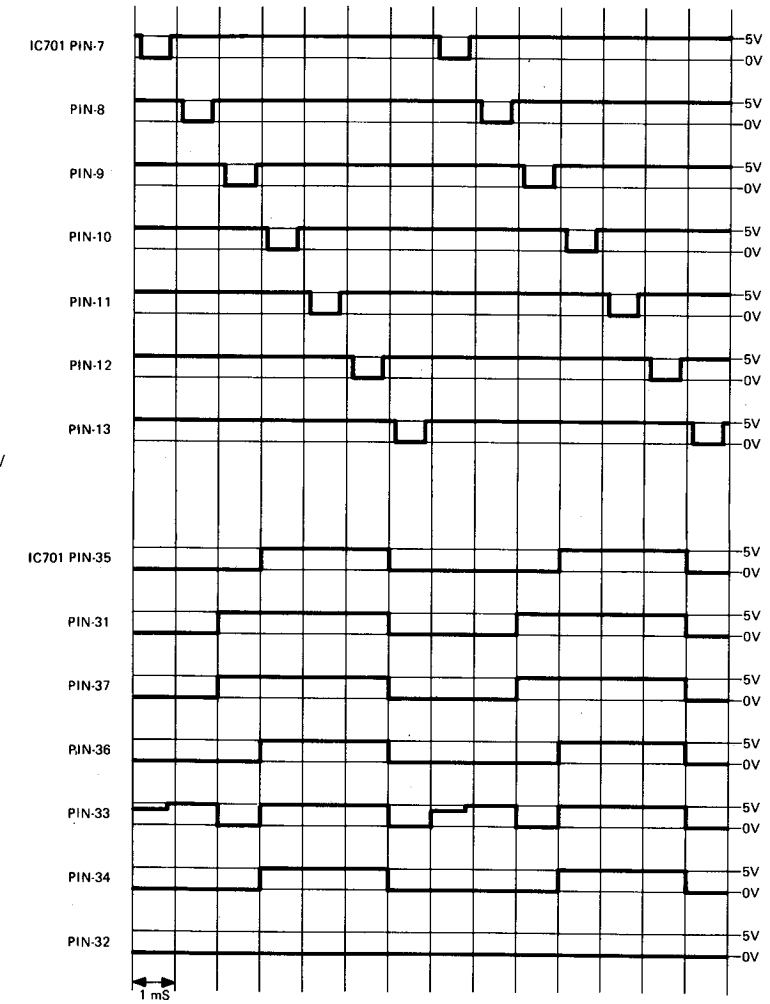
IC801 PIN-6,7 FM 98.3 MHz
AM 1000 kHz



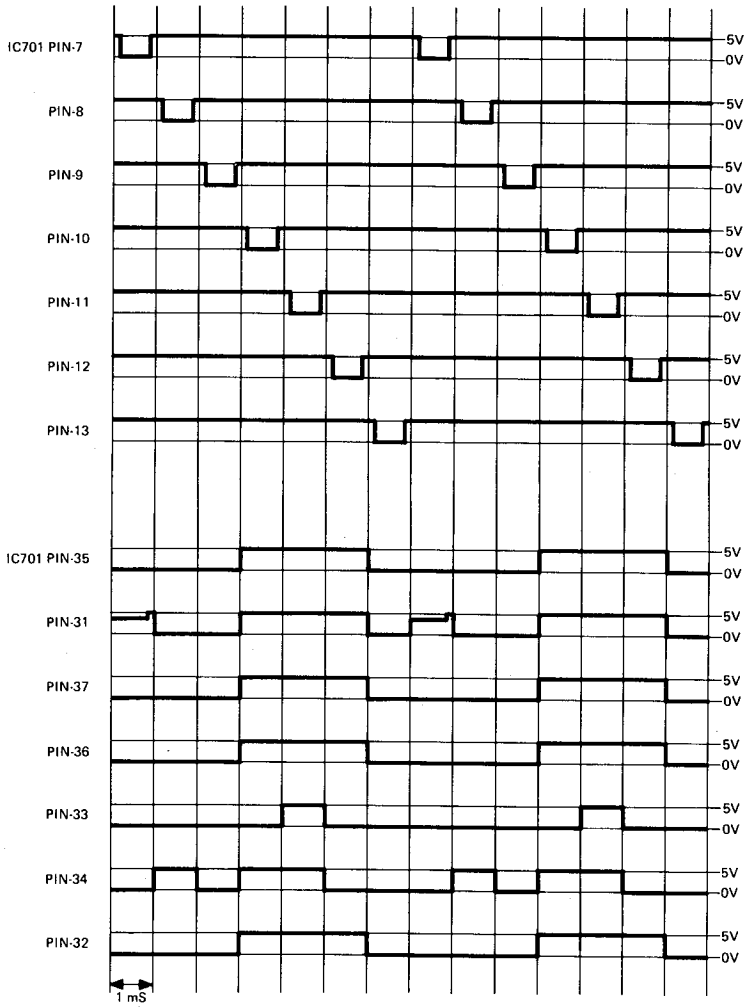
IC801 PIN-9, IC701 PIN-40 FM 98.3 MHz
AM 1000 kHz



AM 1000 kHz SIGNAL RECEIVED AT MEMORY 2

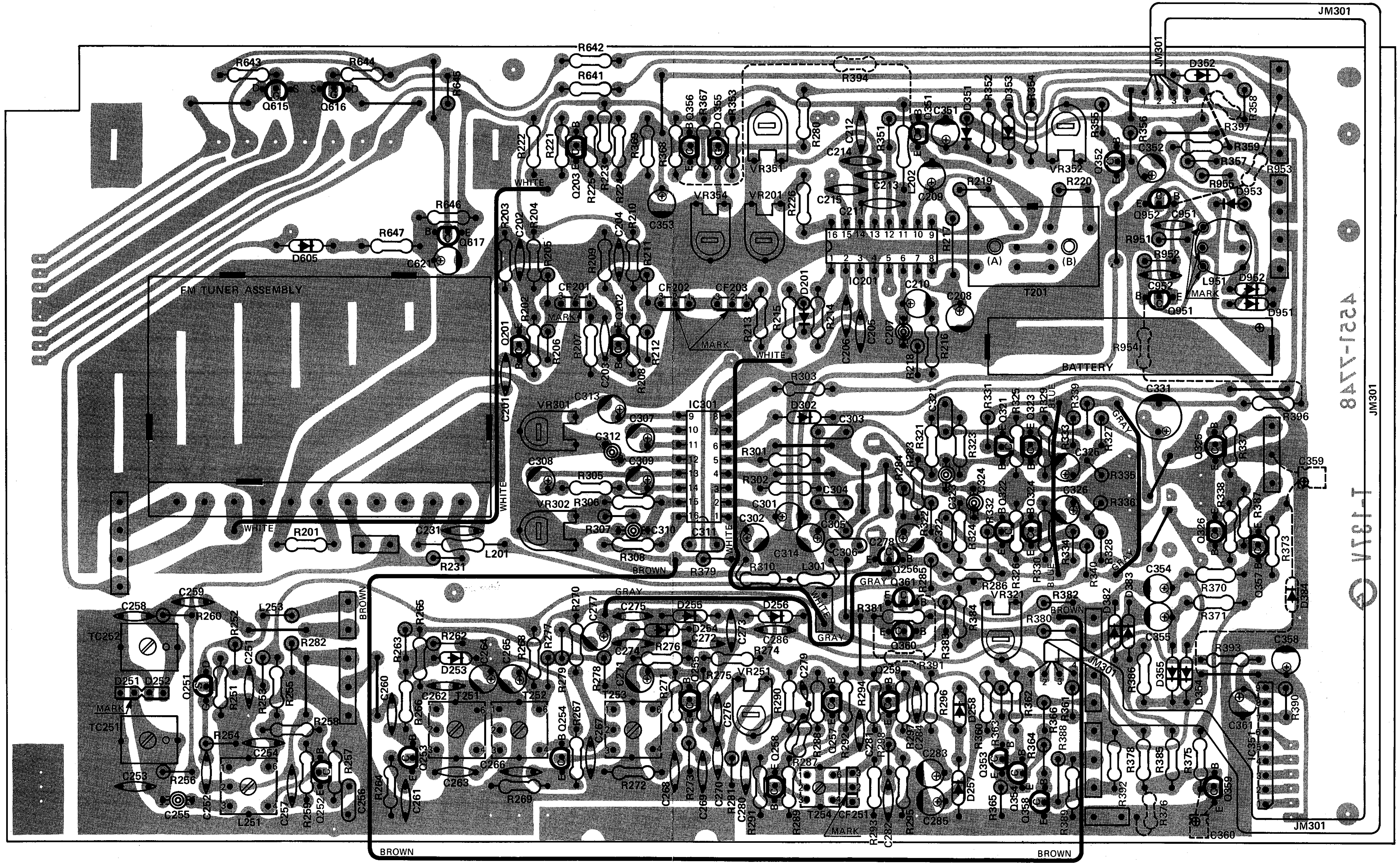


FM 98.3 MHz SIGNAL RECEIVED AT MEMORY 1

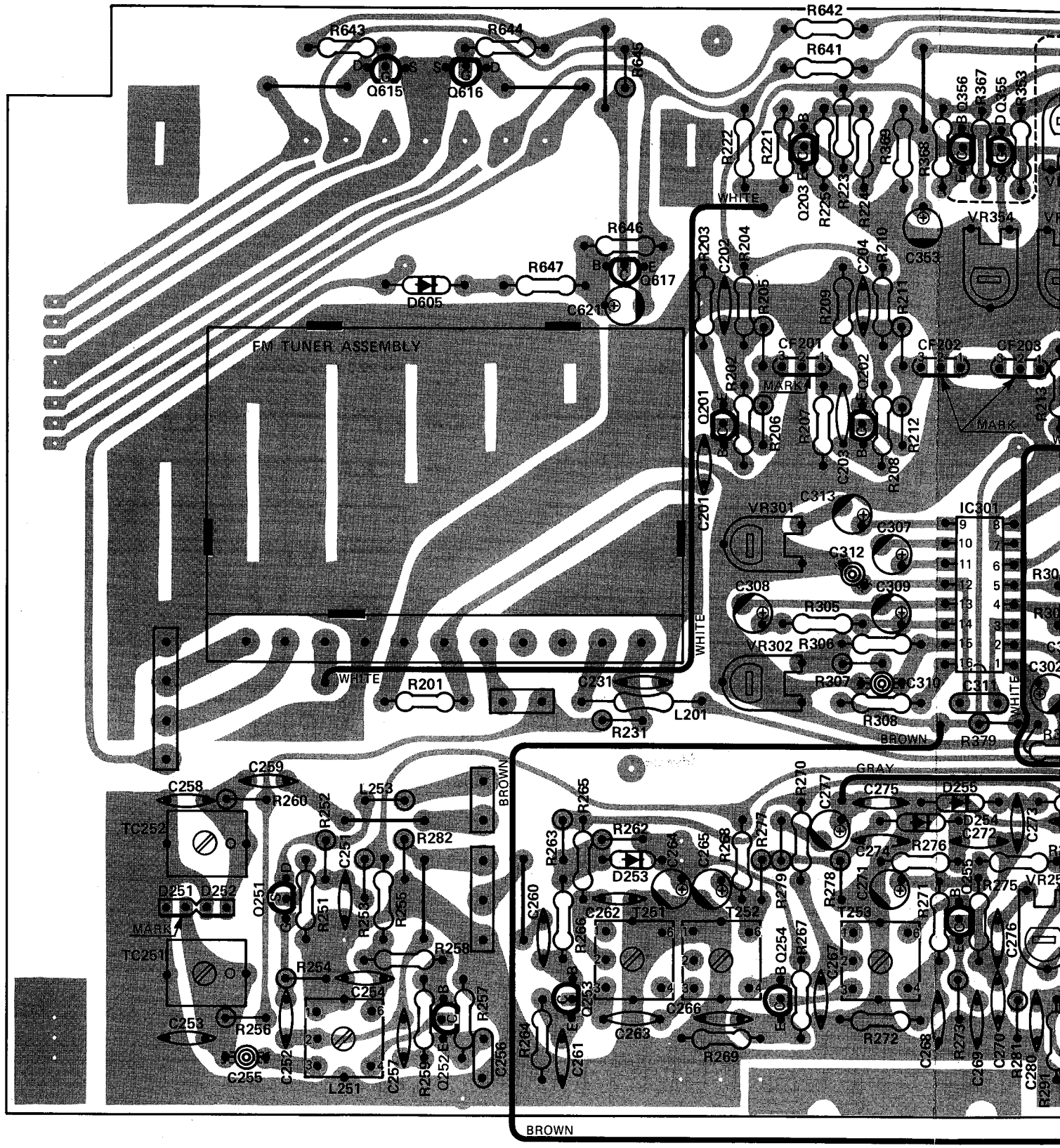


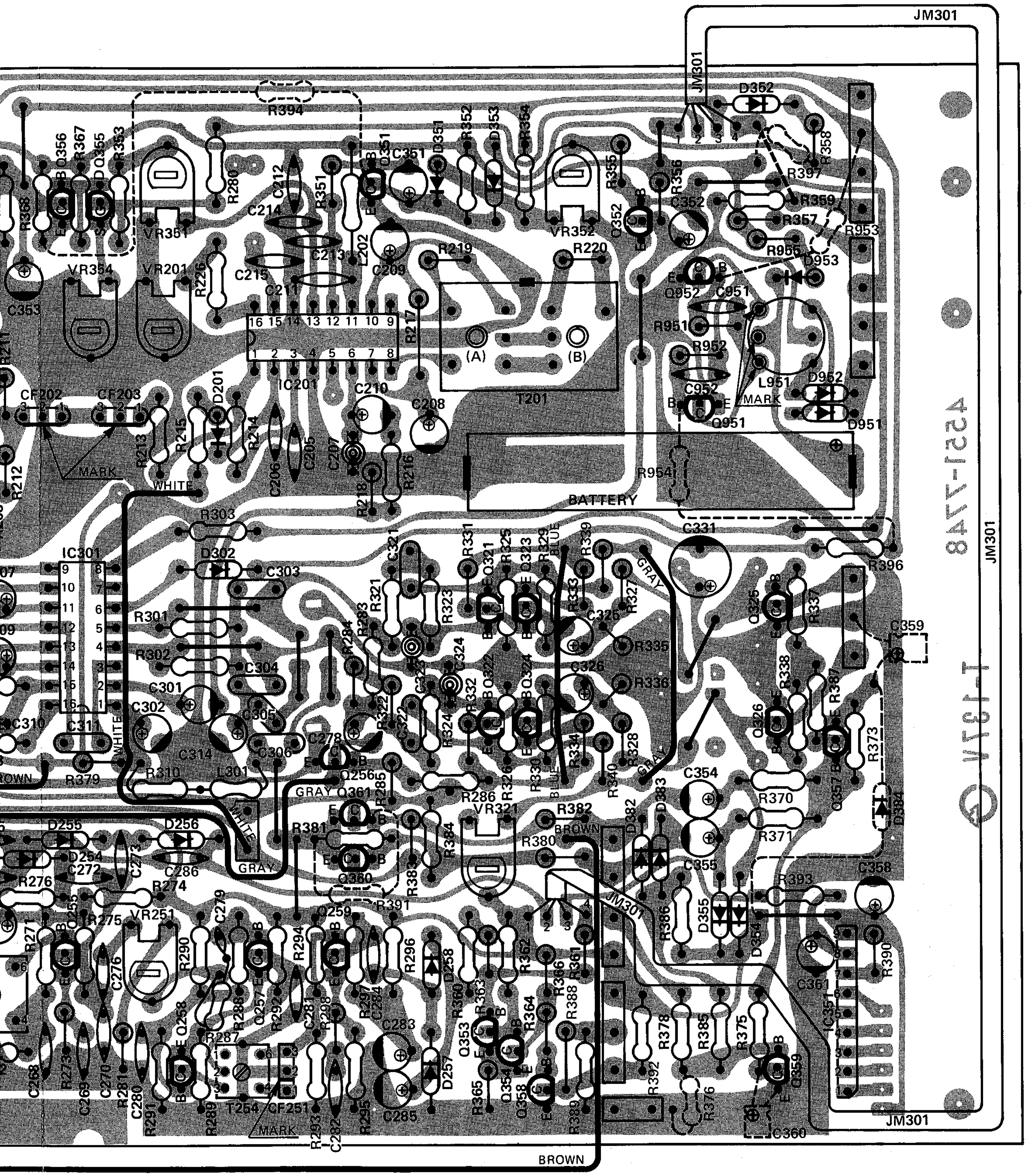
NOTE : The output signal from terminal number 7 in IC701 is applied to the oscillator trigger input.

TUNER P.C.BOARD



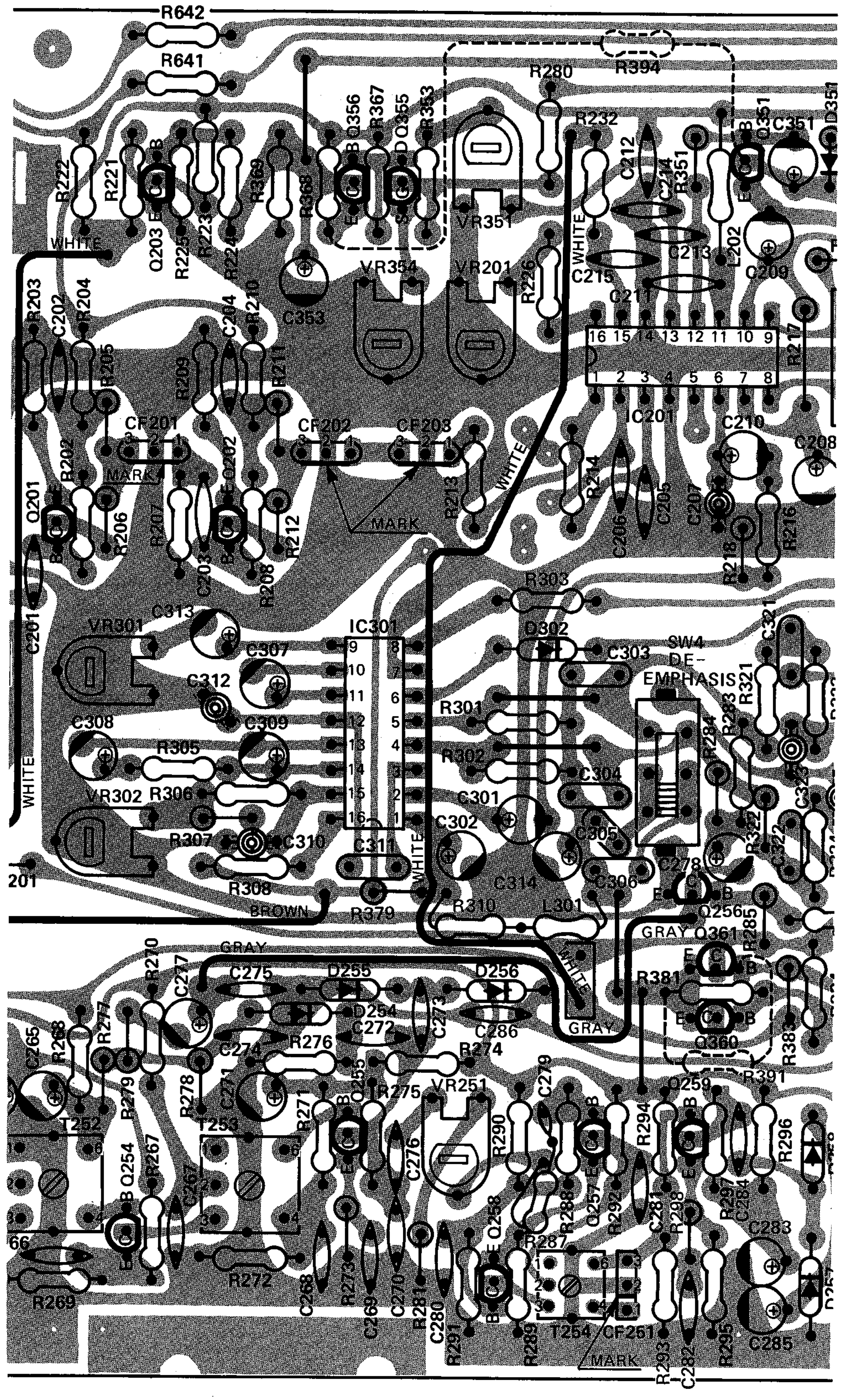
TUNER P.C.BOARD




JM301
R394
VR351
VR352
VR354
VR201
IC201
T201
(A)
(B)
CF202
CF203
MARK
WHITE
BATTERY
IC301
L301
GRAY
BROWN
BLUE
VR321
VR251
T254
CF251
IC351
L951
4551-7748
1-157V

TUNER P.C. BOARD

THE FOLLOWING P.C. BOARD IS APPLIED TO MULTI VOLTAGE UNIT.

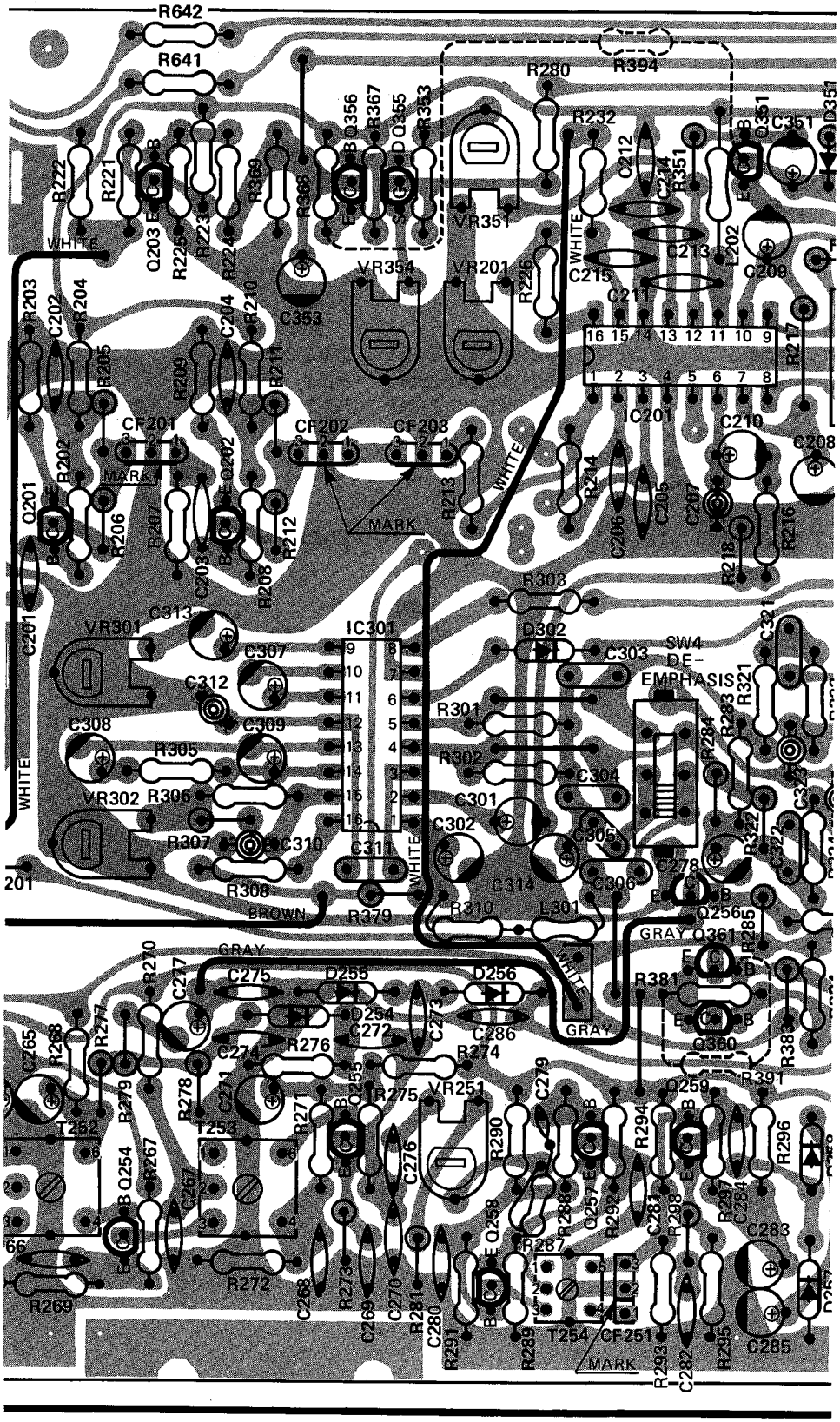


TUNER P.C. BOARD

Ref. No.	Part No.	Description
		RESISTORS
VR201, 301	5101-2037187	Variable Resistor, 20 k ohm
VR251, 351, 352	5101-5037187	Variable Resistor, 50 k ohm
VR302, 354	5101-5027187	Variable Resistor, 5 k ohm
VR321	5101-1017187	Variable Resistor, 100 ohm
		CAPACITORS
TC251, 252	5371-49	Trimmer Capacitor
		INTEGRATED CIRCUITS
IC201	5652-HA11225	HA11225 FM IF Amp./FM Det.
IC301	5652-KB4437	KB4437 FM Multiplex
IC351	5652-AN6875	AN6875 Signal Strength Display Driver
		TRANSISTORS
Q201, 202	5613-2058(N)	2SC2058(N)or(P) FM IF Amp.
Q203, 256, 352, 358	5613-2603(F)	2SC2603(F) FM AGC, AM Signal Switching, Mono/Stereo Switching, Quartz Lock Indicator Driver
Q251	5616-2SK168(E	F.E.T., 2SK168(E) AM Osc. Buffer
Q252	5613-2058(N)	2SC2058(N)or(P) AM Osc.
Q253, 254, 255	5613-2058(N)	2SC2058(N)or(P) AM IF Amp.
Q257, 258, 259	5613-2603(F)	2SC2603(F) Auto Scan Stop Control Amp.
Q321, 322	5611-1115(F)	2SA1115(F) } MPX Output Amp.
Q323, 324	5613-2603(F)	2SC2603(F) } MPX Output Amp.
Q325, 326, 359	5613-2603(F)	2SC2603(F) } FM Muting
Q357	5611-999(F)	2SA999(F) } FM Muting
Q351, 353, 354	5613-2603(F)	2SC2603(F) Synthesizer/Quartz Lock Switching
Q355	5616-2SK163(M	F.E.T., 2SK163(M) } Signal Strength Display Level Amp.
Q356	5611-999(F)	2SA999(F) } Signal Strength Display Level Amp.
Q360, 361	5611-999(F)	2SA999(F) AM Voltage Supply, FM Voltage Supply
Q615, 616	5616-2SK163(M	F.E.T., 2SK163(M) } Phono Muting
Q617	5613-2603(F)	2SC2603(F) } Phono Muting
Q951, 952	5613-2603(F)	2SC2603(F) Memory IC Back Up Osc.
		DIODES
D201, 253, 257, 258, 351, 352, 353, 354, 355, 382, 383, 384, 605, 951, 952, 953	5636-1S2473	1S2473
D251/252	5633-KV1226	KV1226
D254, 255, 256	5631-1N34A	1N34A
D302	5635-RD6R2EB1	RD6.2EB1
		COILS
L201, 253	5995-3R3254	RF Choke
L202	5995-101254	RF Choke
L251	5923-71020	AM Osc.
L301	5995-100254	RF Choke
L951	5933-70215	Back Up Osc.
		TRANSFORMERS
T201	5574-7023	Quadrature Det.
T251, 252	5553-70111	AM IF
T253	5553-70211	AM IF
T254	5552-7037	Filter
		MISCELLANEOUS
	6114-7121	FM Tuner Assembly
	4196-NR-AA	Nickel Cadmium Storage Battery
CF201, 202, 203	5671-7117A	Ceramic Filter, FM IF
CF251	5671-7129A	Ceramic Filter, Filter

TUNER P.C. BOARD

THE FOLLOWING P.C. BOARD IS APPLIED TO MULTI VOLTAGE UNIT.

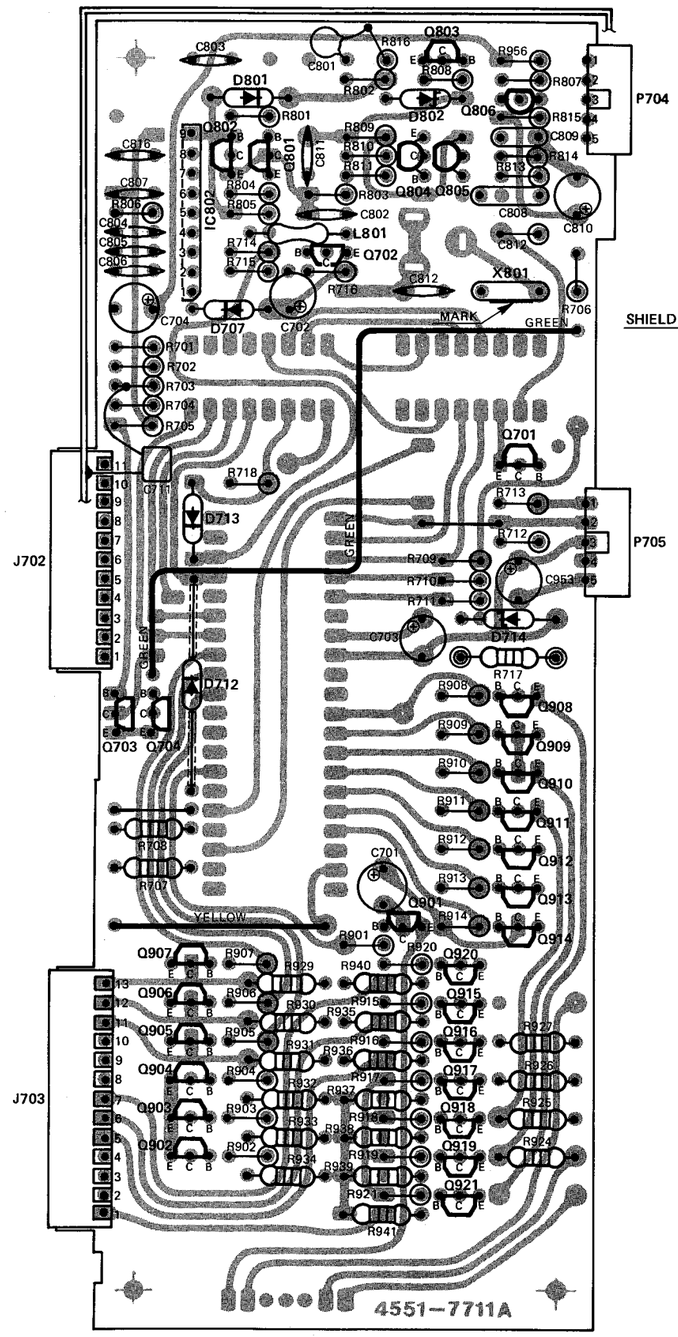


TUNER P.C. BOARD

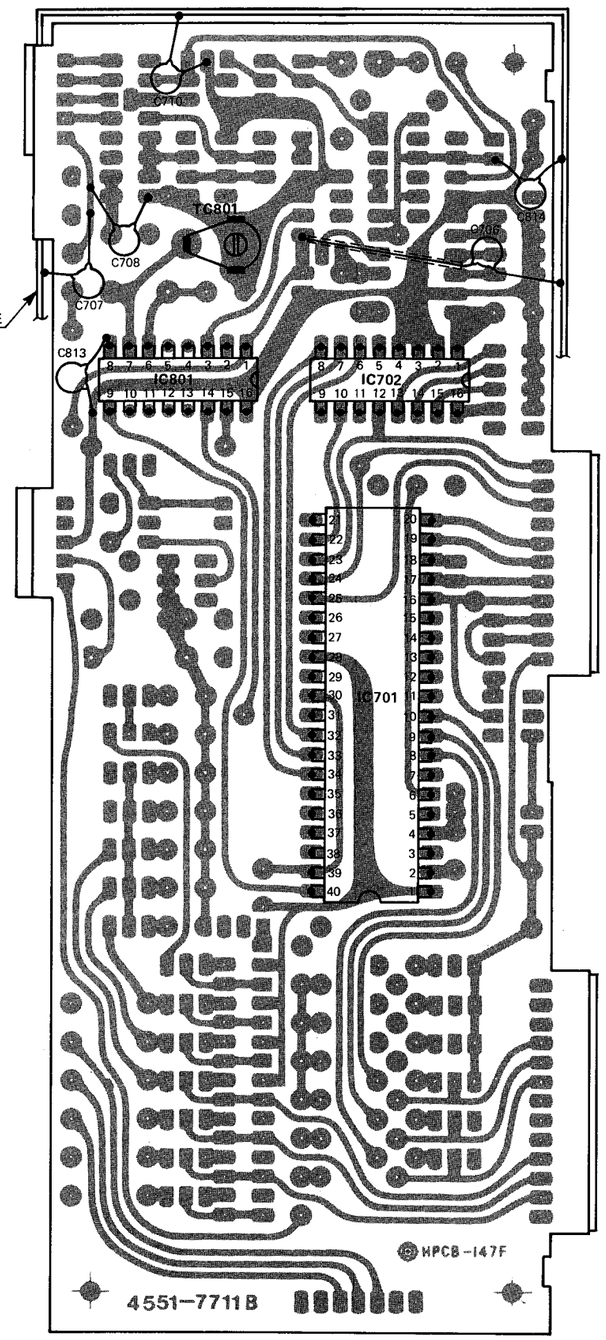
Ref. No.	Part No.	Description
	RESISTORS	
VR201, 301	5101-2037187	Variable Resistor, 20 k ohm
VR251, 351, 352	5101-5037187	Variable Resistor, 50 k ohm
VR302, 354	5101-5027187	Variable Resistor, 5 k ohm
VR321	5101-1017187	Variable Resistor, 100 ohm
	CAPACITORS	
TC251, 252	5371-49	Trimmer Capacitor
	INTEGRATED CIRCUITS	
IC201	5652-HA11225	HA11225 FM IF Amp./FM Det.
IC301	5652-KB4437	KB4437 FM Multiplex
IC351	5652-AN6875	AN6875 Signal Strength Display Driver
	TRANSISTORS	
Q201, 202	5613-2058(N)	2SC2058(N)or(P) FM IF Amp.
Q203, 256, 352, 358	5613-2603(F)	2SC2603(F) FM AGC, AM Signal Switching, Mono/Stereo Switching, Quartz Lock Indicator Driver
Q251	5616-2SK168(E	F.E.T., 2SK168(E) AM Osc. Buffer
Q252	5613-2058(N)	2SC2058(N)or(P) AM Osc.
Q253, 254, 255	5613-2058(N)	2SC2058(N)or(P) AM IF Amp.
Q257, 258, 259	5613-2603(F)	2SC2603(F) Auto Scan Stop Control Amp.
Q321, 322	5611-1115(F)	2SA1115(F) } MPX Output Amp.
Q323, 324	5613-2603(F)	2SC2603(F) }
Q325, 326, 359	5613-2603(F)	2SC2603(F) } FM Muting
Q357	5611-999(F)	2SA999(F) }
Q351, 353, 354	5613-2603(F)	2SC2603(F) Synthesizer/Quartz Lock Switching
Q355	5616-2SK163(M	F.E.T., 2SK163(M) } Signal Strength Display Level Amp.
Q356	5611-999(F)	2SA999(F) }
Q360, 361	5611-999(F)	2SA999(F) AM Voltage Supply, FM Voltage Supply
Q615, 616	5616-2SK163(M	F.E.T., 2SK163(M) } Phono Muting
Q617	5613-2603(F)	2SC2603(F) }
Q951, 952	5613-2603(F)	2SC2603(F) Memory IC Back Up Osc.
	DIODES	
D201, 253, 257, 258, 351, 352, 353, 354, 355, 382, 383, 384, 605, 951, 952, 953	5636-1S2473	1S2473
D251/252	5633-KV1226	KV1226
D254, 255, 256	5631-1N34A	1N34A
D302	5635-RD6R2EB1	RD6.2EB1
	COILS	
L201, 253	5995-3R3254	RF Choke
L202	5995-101254	RF Choke
L251	5923-71020	AM Osc.
L301	5995-100254	RF Choke
L951	5933-70215	Back Up Osc.
	TRANSFORMERS	
T201	5574-7023	Quadrature Det.
T251, 252	5553-70111	AM IF
T253	5553-70211	AM IF
T254	5552-7037	Filter
	MISCELLANEOUS	
	6114-7121	FM Tuner Assembly
	4196-NR-AA	Nickel Cadmium Storage Battery
CF201, 202, 203	5671-7117A	Ceramic Filter, FM IF
CF251	5671-7129A	Ceramic Filter, Filter

STATION DISPLAY CONTROL P.C. BOARD

SIDE A

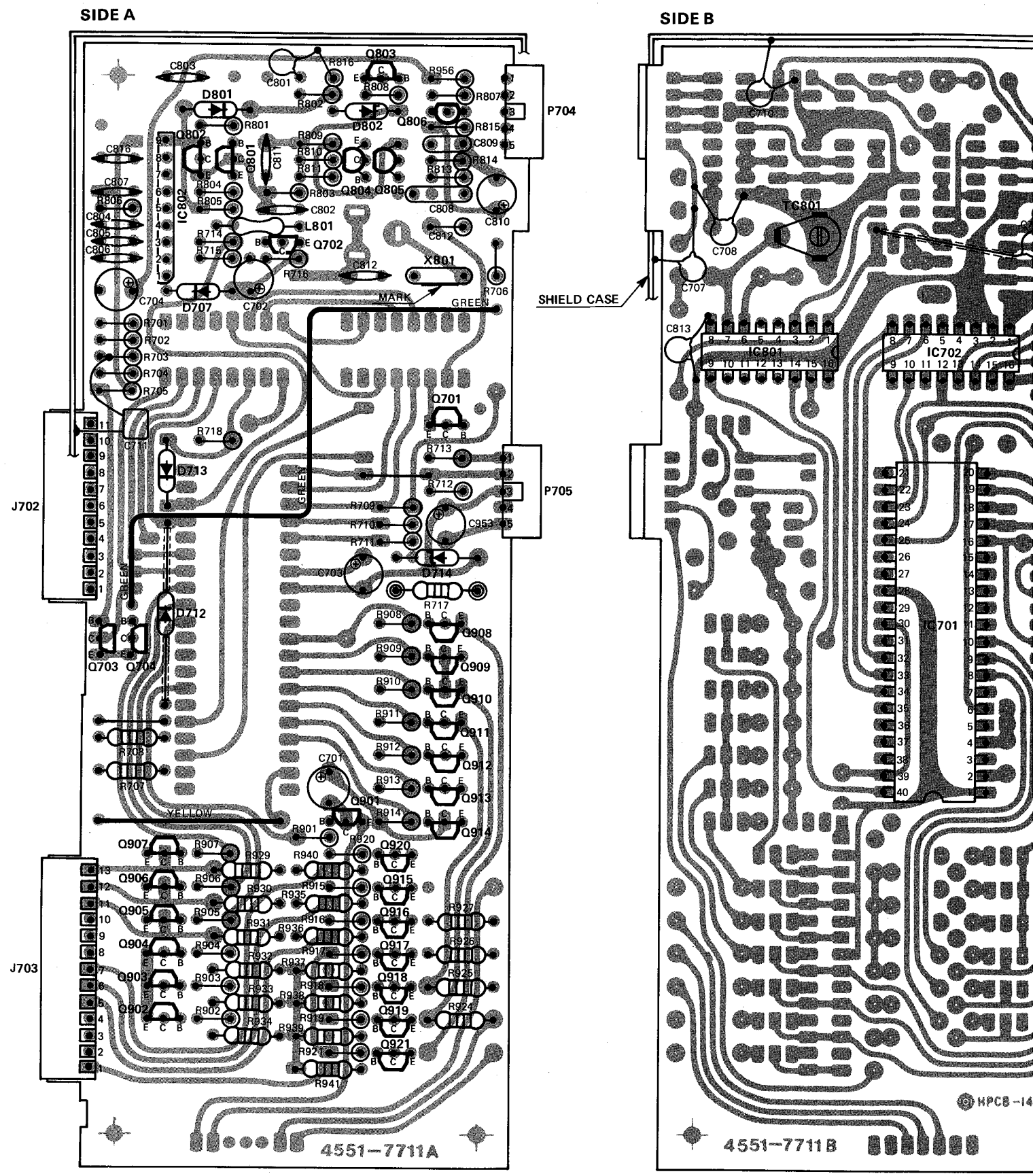


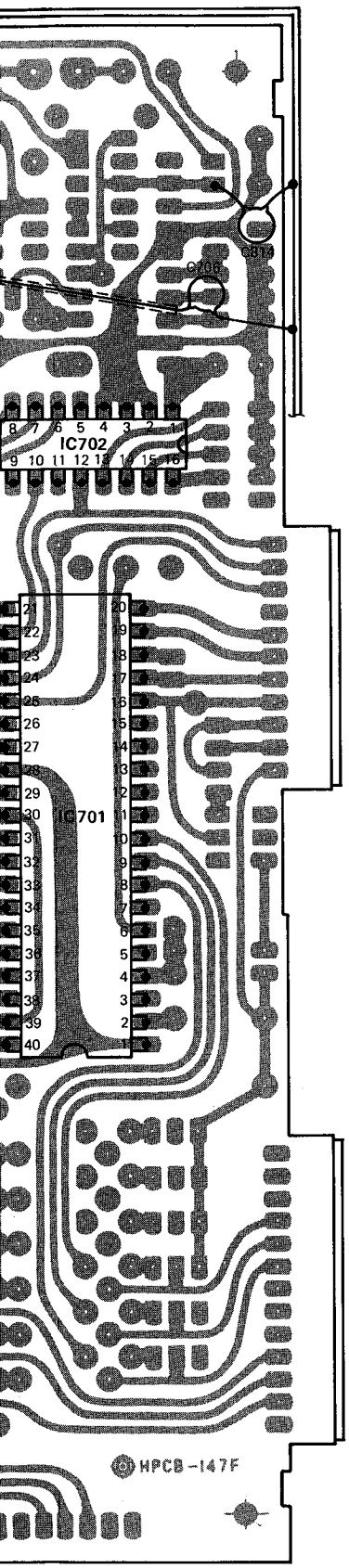
SIDE B



Ref. No.	Part No.	Description
	CAPACITORS	
TC801	5371-59	Trimmer Capacitor
	INTEGRATED CIRCUITS	
IC701	5654-MN1400SJ	MN1400SJ Synthesizer Controller
IC702	5654-MN1203	MN1203 Memory
IC801	5654-MN6142	MN6142 PLL
IC802	5654-AN6821	AN6821 Pre-Scaler
	TRANSISTORS	
Q701, 802	5613-2603(F)	2SC2603(F) Switching, Pre-Scaler Buffer
Q702, 703, 704, 801, 803	5611-1115(F)	2SA1115(F) Switching, AM Osc. Amp., Switching
Q804	5613-2320L(F)	2SC2320L(F) } Low Pass Filter
Q805	5616-2SK68(M)	F.E.T., 2SK68(M) } Low Pass Filter
Q806	5616-2SK163(N	F.E.T., 2SK163(N) Current Regulator
Q901, 902, 903, 904, 905, 906, 907, 915, 916, 917, 918, 919, 920, 921	5611-1115(F)	2SA1115(F) } Station Display/Preset Memory Indicator Driver
Q908, 909, 910, 911, 912, 913, 914	5613-2603(F)	2SC2603(F) } Station Display/Preset Memory Indicator Driver
	DIODES	
D707, 712, 713, 801	5631-1S2473	1S2473
D714	5635-RD6R2FB	Zener, RD6.2FB
D802	5635- HZ27-3	Zener, HZ27-3
	MISCELLANEOUS	
X801	5691-01152019	Crystal Osc., 11.52MHz
L801	5995-100325	Coil, Choke

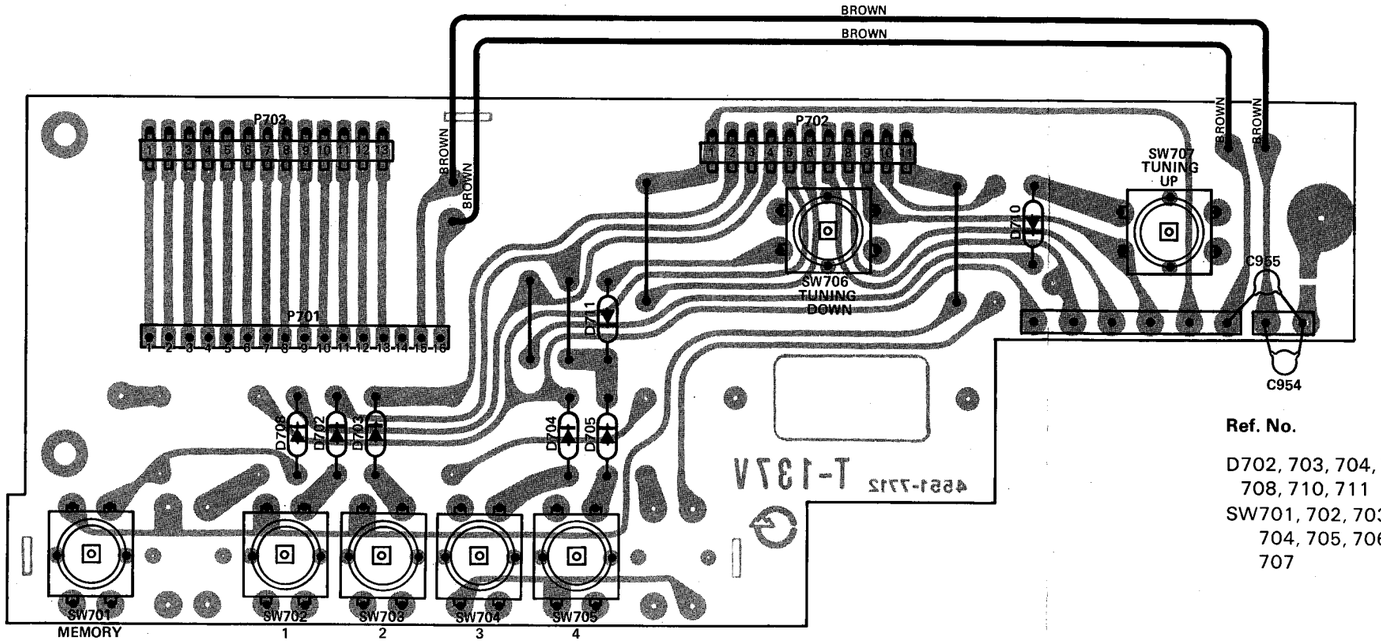
STATION DISPLAY CONTROL P.C. BOARD





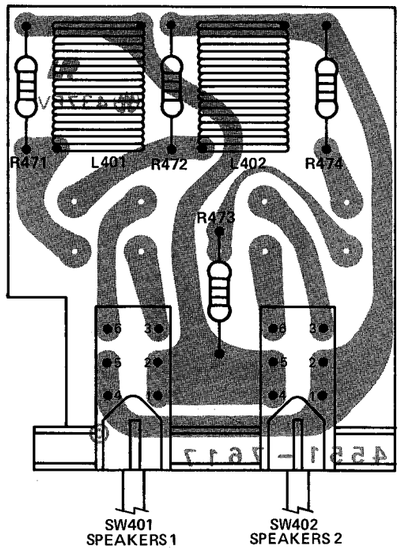
Ref. No.	Part No.	Description
	CAPACITORS	
TC801	5371-59	Trimmer Capacitor
	INTEGRATED CIRCUITS	
IC701	5654-MN1400SJ	MN1400SJ Synthesizer Controller
IC702	5654-MN1203	MN1203 Memory
IC801	5654-MN6142	MN6142 PLL
IC802	5654-AN6821	AN6821 Pre-Scaler
	TRANSISTORS	
Q701, 802	5613-2603(F)	2SC2603(F) Switching, Pre-Scaler Buffer
Q702, 703, 704, 801, 803	5611-1115(F)	2SA1115(F) Switching, AM Osc. Amp., Switching
Q804	5613-2320L(F)	2SC2320L(F) } Low Pass Filter
Q805	5616-2SK68(M)	F.E.T., 2SK68(M) } Low Pass Filter
Q806	5616-2SK163(N	F.E.T., 2SK163(N) Current Regulator
Q901, 902, 903, 904, 905, 906, 907, 915, 916, 917, 918, 919, 920, 921	5611-1115(F)	2SA1115(F) } Station Display/Preset Memory Indicator Driver
Q908, 909, 910, 911, 912, 913, 914	5613-2603(F)	2SC2603(F) } Station Display/Preset Memory Indicator Driver
	DIODES	
D707, 712, 713, 801	5631-1S2473	1S2473
D714	5635-RD6R2FB	Zener, RD6.2FB
D802	5635- HZ27-3	Zener, HZ27-3
	MISCELLANEOUS	
X801	5691-01152019	Crystal Osc., 11.52MHz
L801	5995-100325	Coil, Choke

PRESET MEMORY SWITCH P.C. BOARD



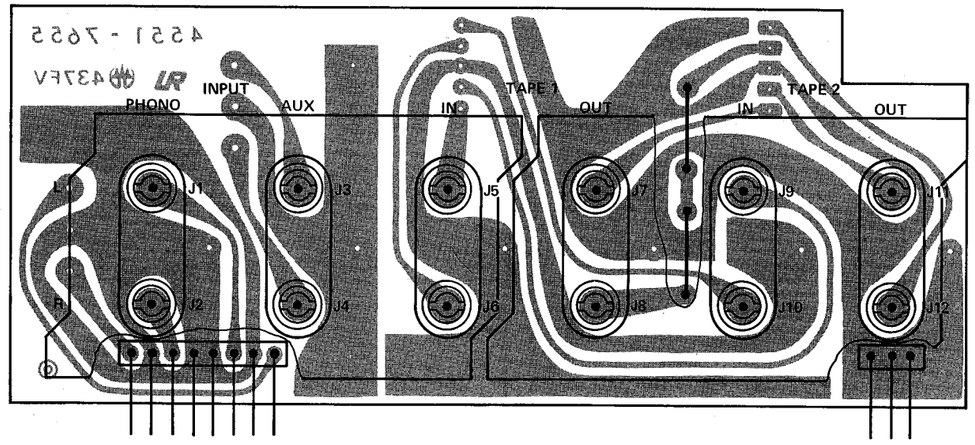
Ref. No.	Part No.	Description
D702, 703, 704, 705, 708, 710, 711	5631-1S2473	Diode, 1S2473
SW701, 702, 703, 704, 705, 706, 707	4431-01010170	Push Switch, FM/AM Preset Memory, Tuning Down, Tuning Up

SPEAKERS SWITCH P.C. BOARD



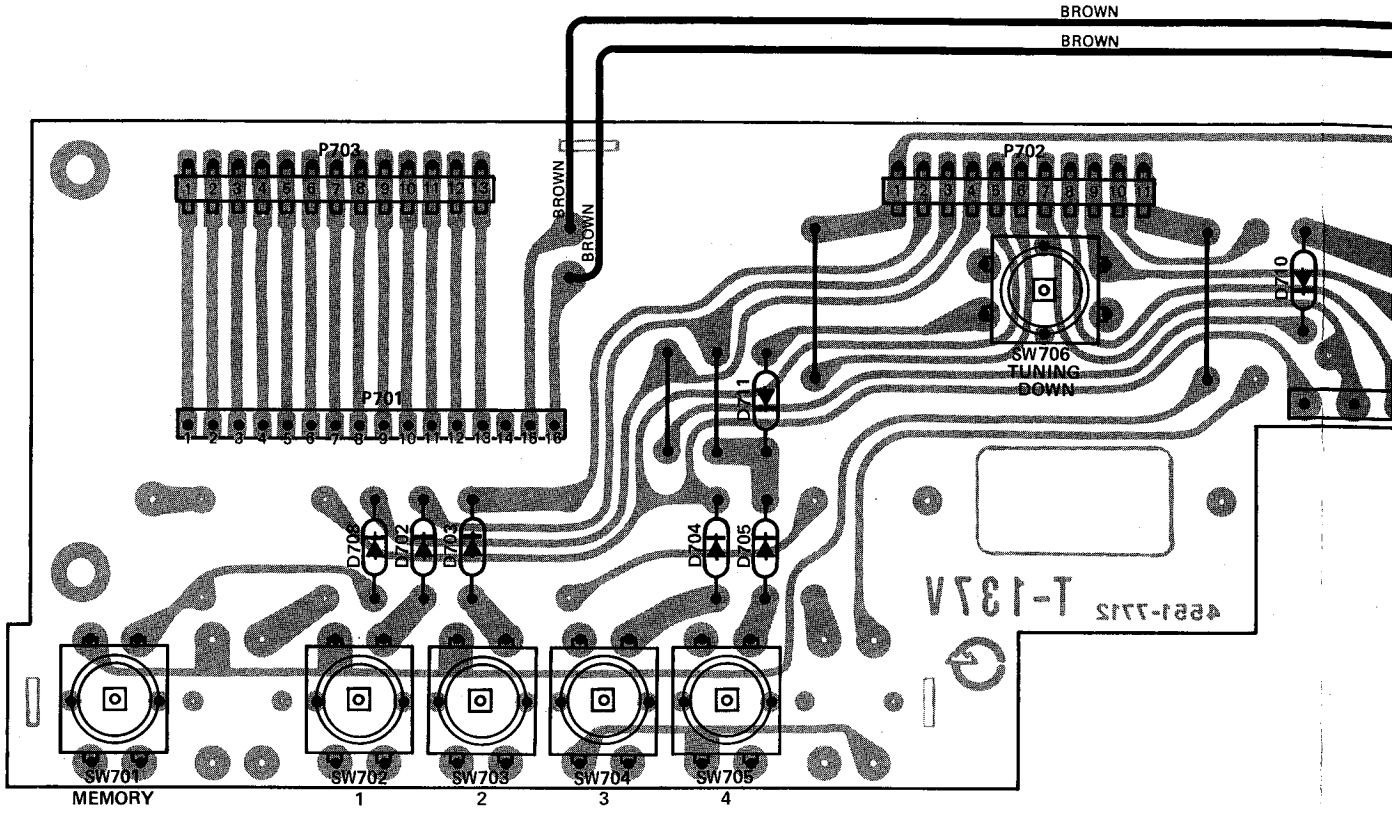
Ref. No.	Part No.	Description
L401, 402	5991-7125	Coil, RF Choke
SW401, 402	4431-02047451	Push Switch, Speakers 1, Speakers 2

JACK P.C. BOARD

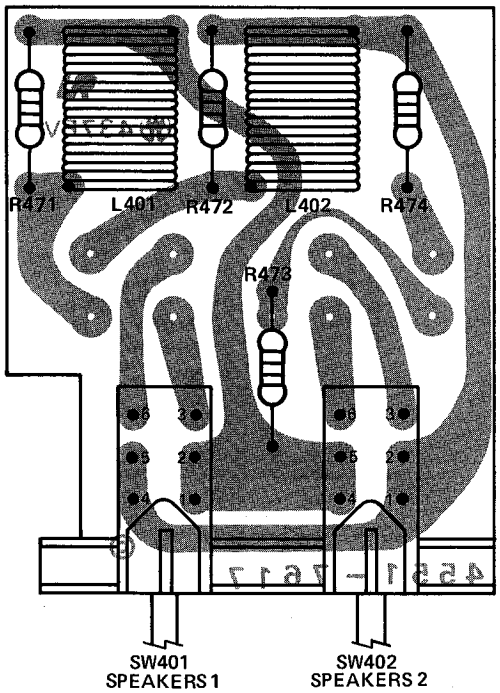


Ref. No.	Part No.	Description
J1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	4486-5	6-Pin Jack, Phono, AUX, Tape 1, Tape 2

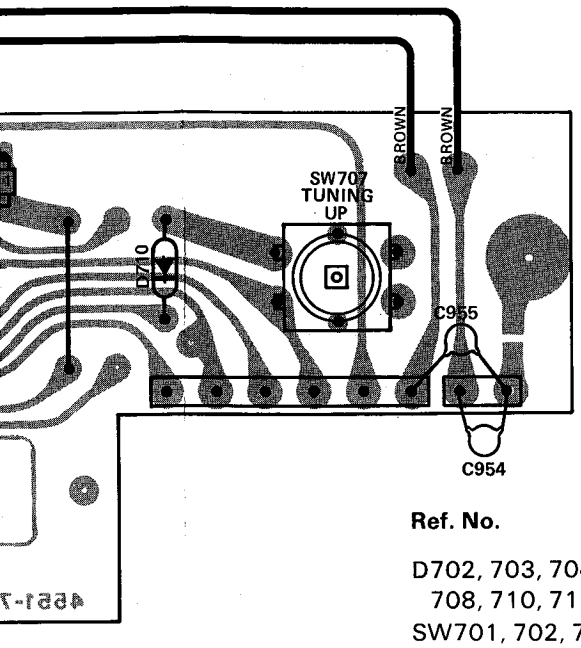
PRESET MEMORY SWITCH P.C. BOARD



SPEAKERS SWITCH P.C. BOARD

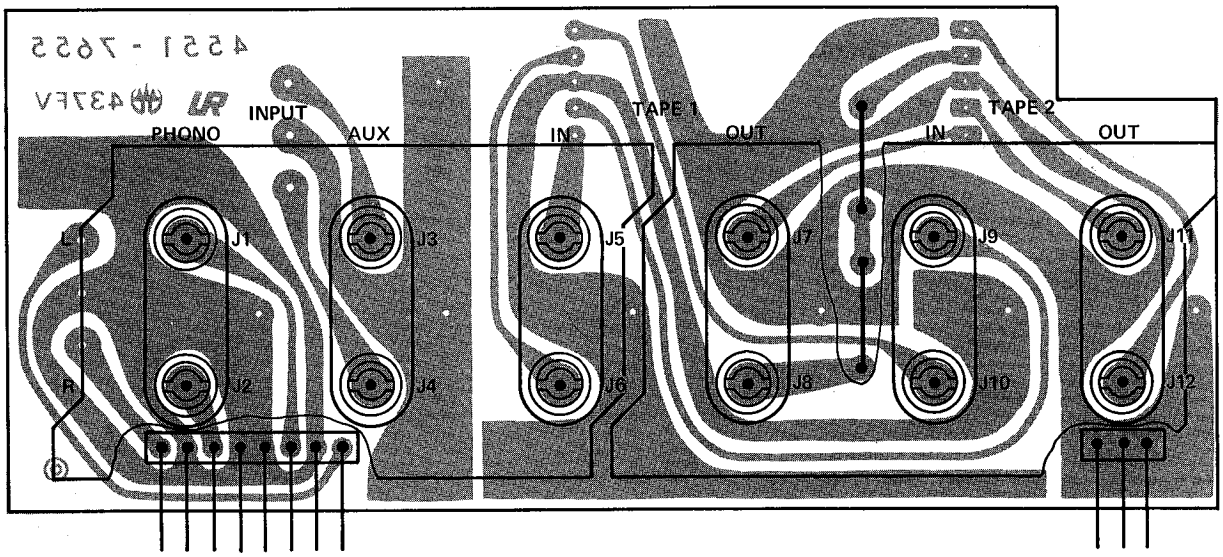


Ref. No.	Part No.	Description
L401, 402	5991-7125	Coil, RF Choke
SW401, 402	4431-02047451	Push Switch, Speakers 1, Speakers 2



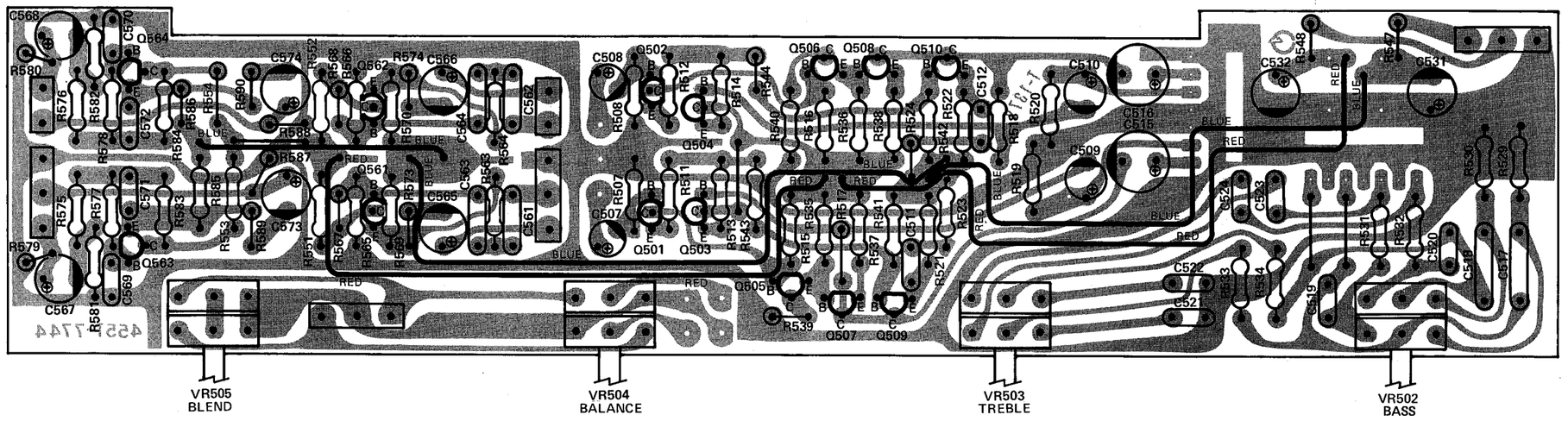
Ref. No.	Part No.	Description
D702, 703, 704, 705, 708, 710, 711	5631-1S2473	Diode, 1S2473
SW701, 702, 703, 704, 705, 706, 707	4431-01010170	Push Switch, FM/AM Preset Memory, Tuning Down, Tuning Up

JACK P.C. BOARD

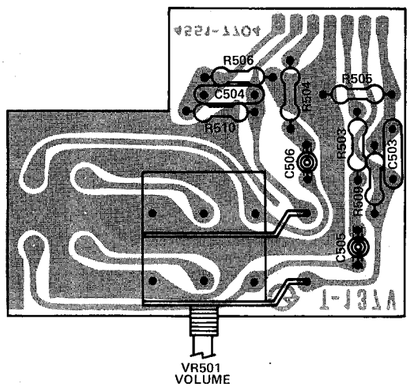


Ref. No.	Part No.	Description
J1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	4486-5	6-Pin Jack, Phono, AUX, Tape 1, Tape 2

TONE CONTROL P.C.BOARD

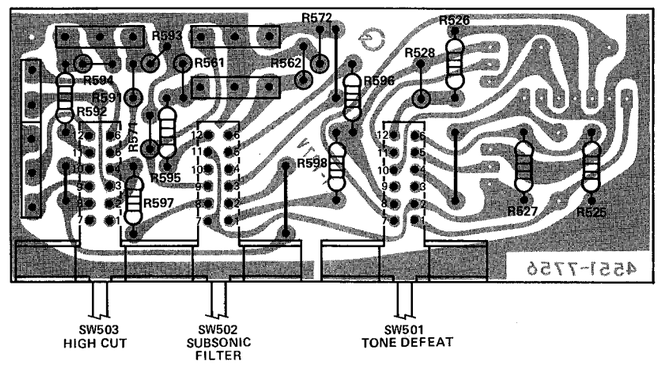


VOLUME CONTROL P.C. BOARD



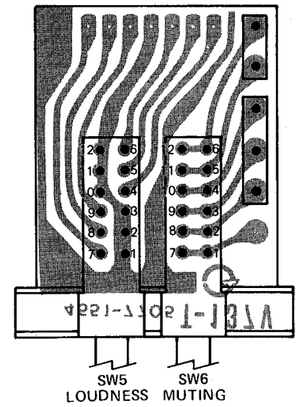
Ref. No.	Part No.	Description
VR501	5116-1047343	Variable Resistor, 100 k ohm Volume Control

FILTER SWITCH P.C. BOARD



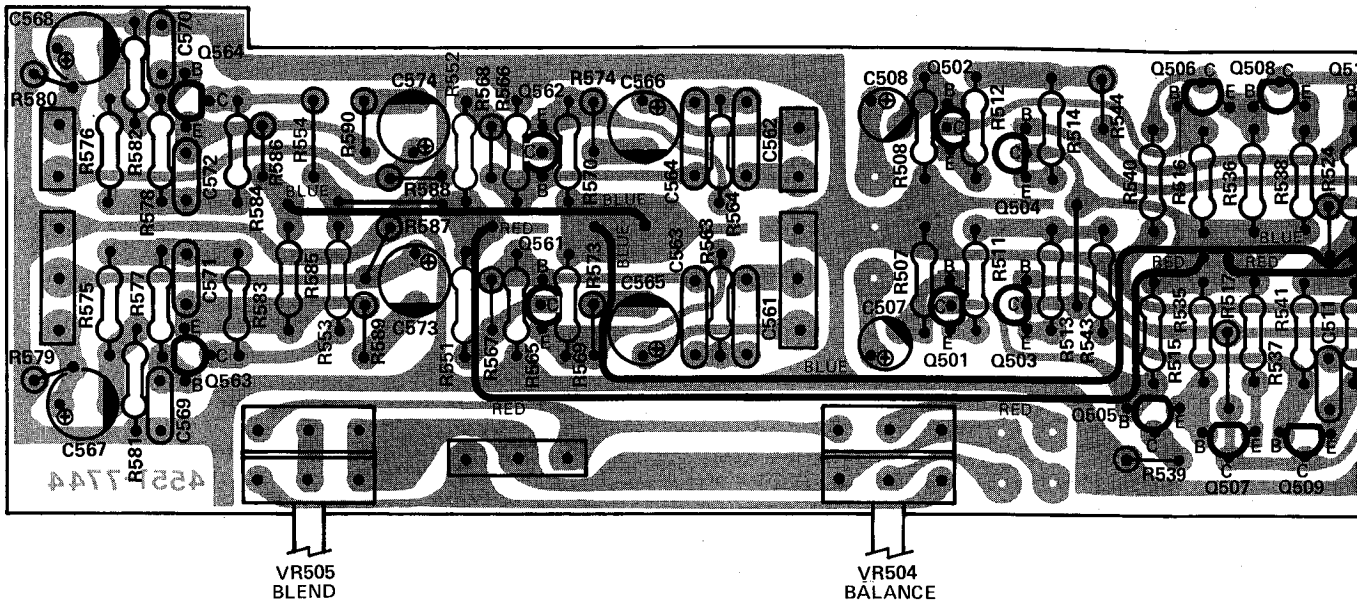
Ref. No.	Part No.	Description
SW501	4431-01047994	Push Switch, Tone Defeat
SW502, 503	4431-02087259	Push Switch, Subsonic Filter, High Cut

LOUDNESS/MUTING SWITCH P.C. BOARD

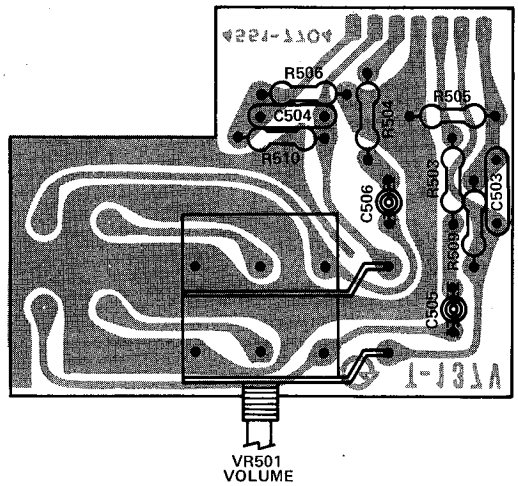


Ref. No.	Part No.	Description
SW5, 6	4431-02087160	Push Switch, Loudness, Muting

TONE CONTROL P.C.BOARD

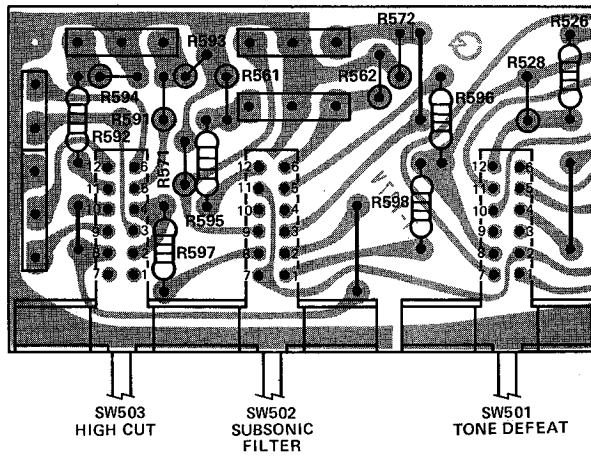


VOLUME CONTROL P.C. BOARD

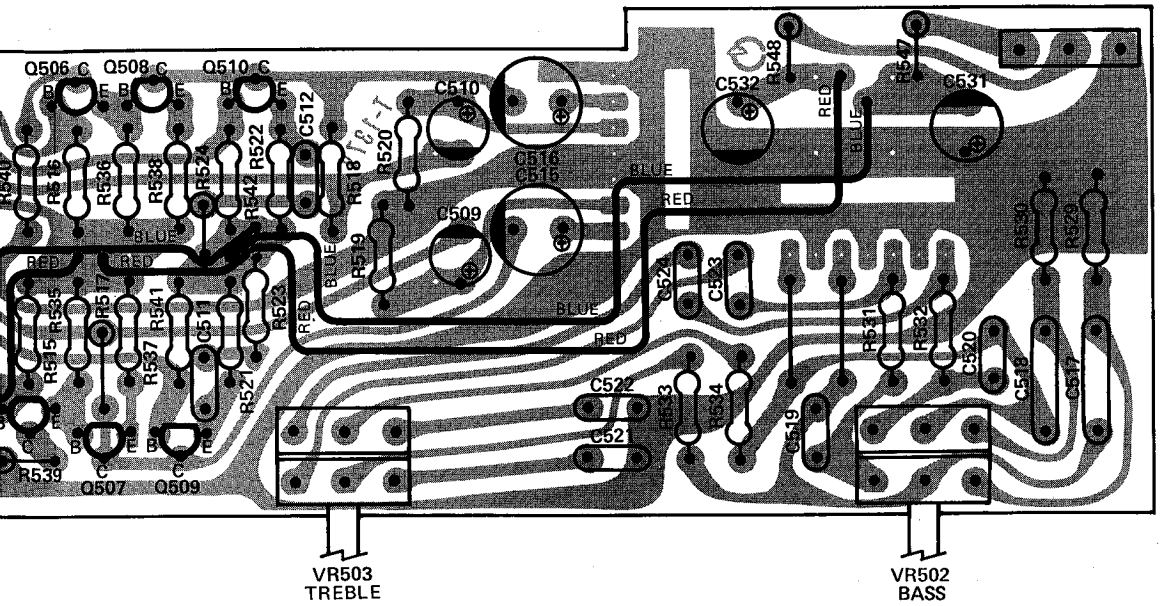


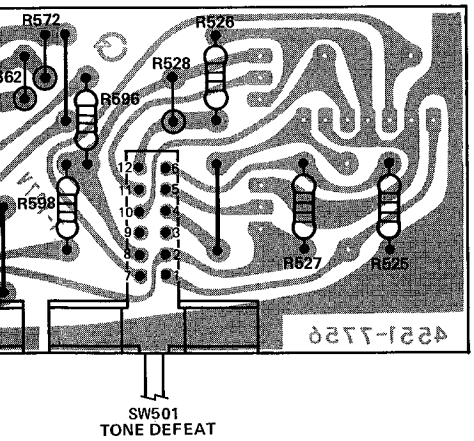
Ref. No.	Part No.	Description
VR501	5116-1047343	Variable Resistor, 100 k ohm Volume Control

FILTER SWITCH P.C. BOARD

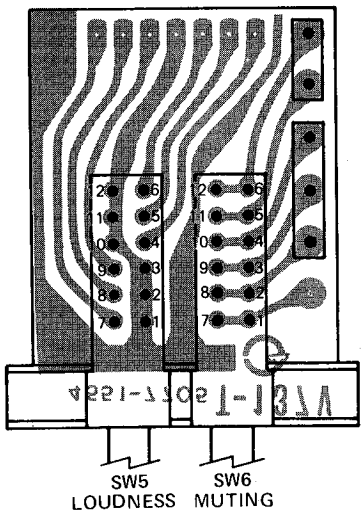


Ref. No.	Part No.	Description
SW501	4431-01047994	Push Switch
SW502, 503	4431-02087259	Push Switch





LOUDNESS/MUTING SWITCH P.C. BOARD



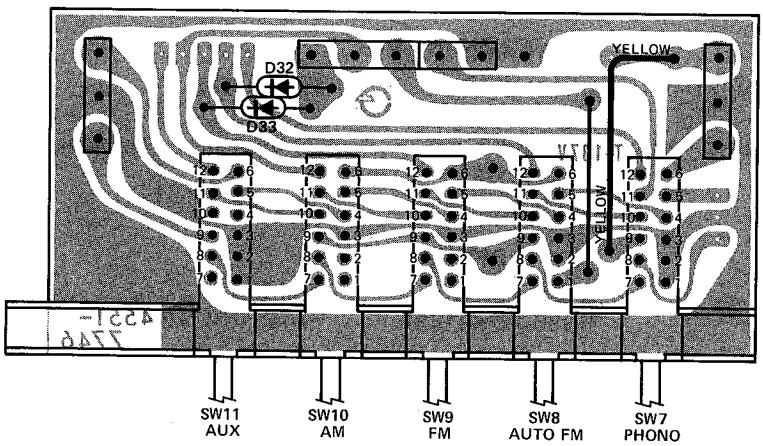
	Description
47994	Push Switch, Tone Defeat
87259	Push Switch, Subsonic Filter, High Cut

Ref. No.	Part No.	Description
SW5, 6	4431-02087160	Push Switch, Loudness, Muting

TONE CONTROL P.C. BOARD

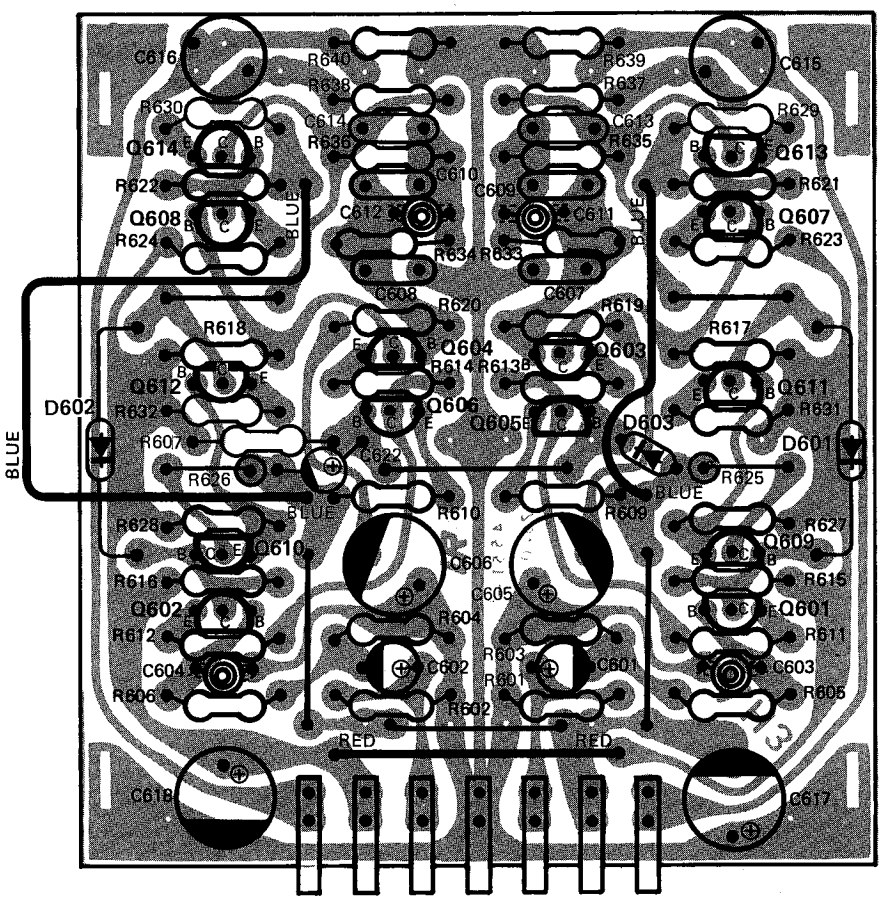
Ref. No.	Part No.	Description
	RESISTORS	
VR502	5113-1047877	Variable Resistor, 100 k ohm Bass Control
VR503	5113-5037977	Variable Resistor, 50 k ohm Treble Control
VR504	5113-50376100	Variable Resistor, 50 k ohm Balance Control
VR505	5113-2047140	Variable Resistor, 200 k ohm Blend Control
	TRANSISTORS	
Q501, 502, 503, 504, 509, 510	5613-2603(F)	2SC2603(F) } Flat/Tone Control Amp.
Q505, 506, 507, 508	5611-1115(F)	2SA1115(F) }
Q561, 562, 563, 564	5613-2603(F)	2SC2603(F) Subsonic Filter, High-Cut Filter

FUNCTION SWITCH P.C. BOARD



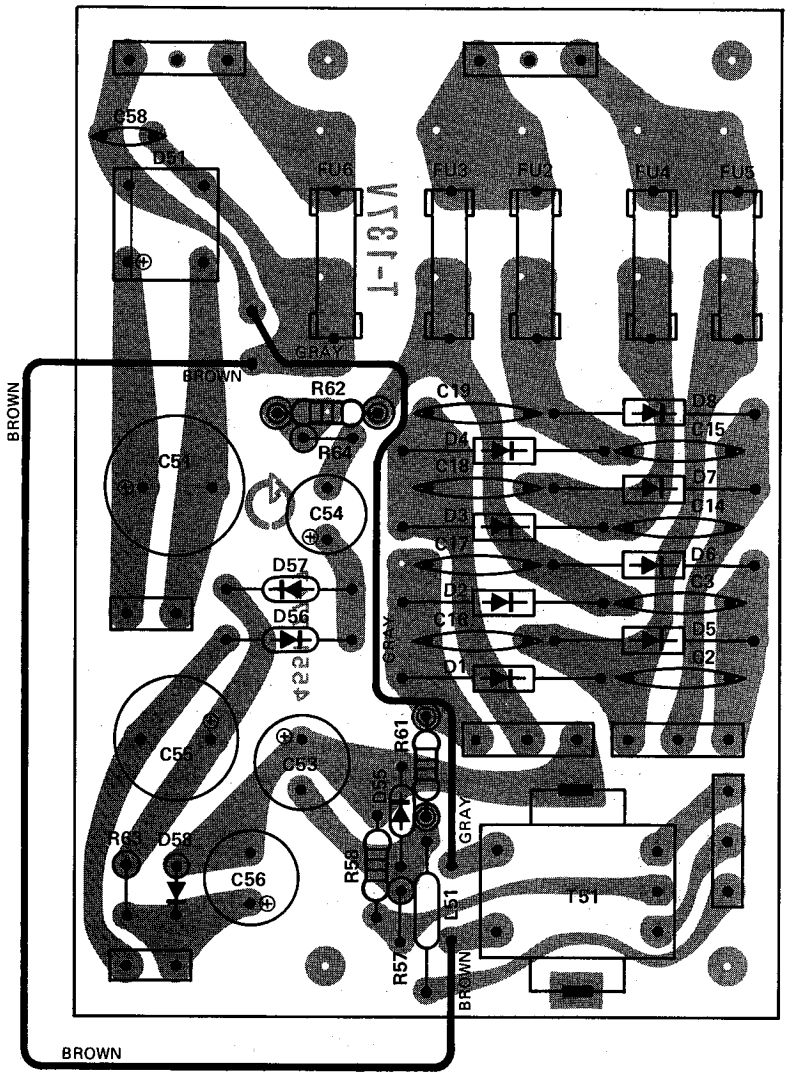
Ref. No.	Part No.	Description
D32, 33	5636-1S2473	Diode, 1S2473
SW7, 8, 9, 10, 11	4431-05207149	Push Switch, Function Selector

PHONO EQUALIZER P.C. BOARD



Ref. No.	Part No.	Description	
	TRANSISTORS		
Q601, 602, 603, 604	5613-2240(BL)	2SC2240(BL)	Equalizer Amp.
Q605, 606	5613-2603(F)	2SC2603(F)	
Q607, 608, 609, 610	5611-970(BL)	2SA970(BL)	
Q611, 612	5612-646(C)	2SB646(C)	
Q613, 614	5614-666(C)	2SD666(C)	
	DIODES		
D601, 602	5636-1S2473	1S2473	
D603	5635-RD5R1EB2	Zener, RD5.1EB2	

POWER SUPPLY P.C. BOARD

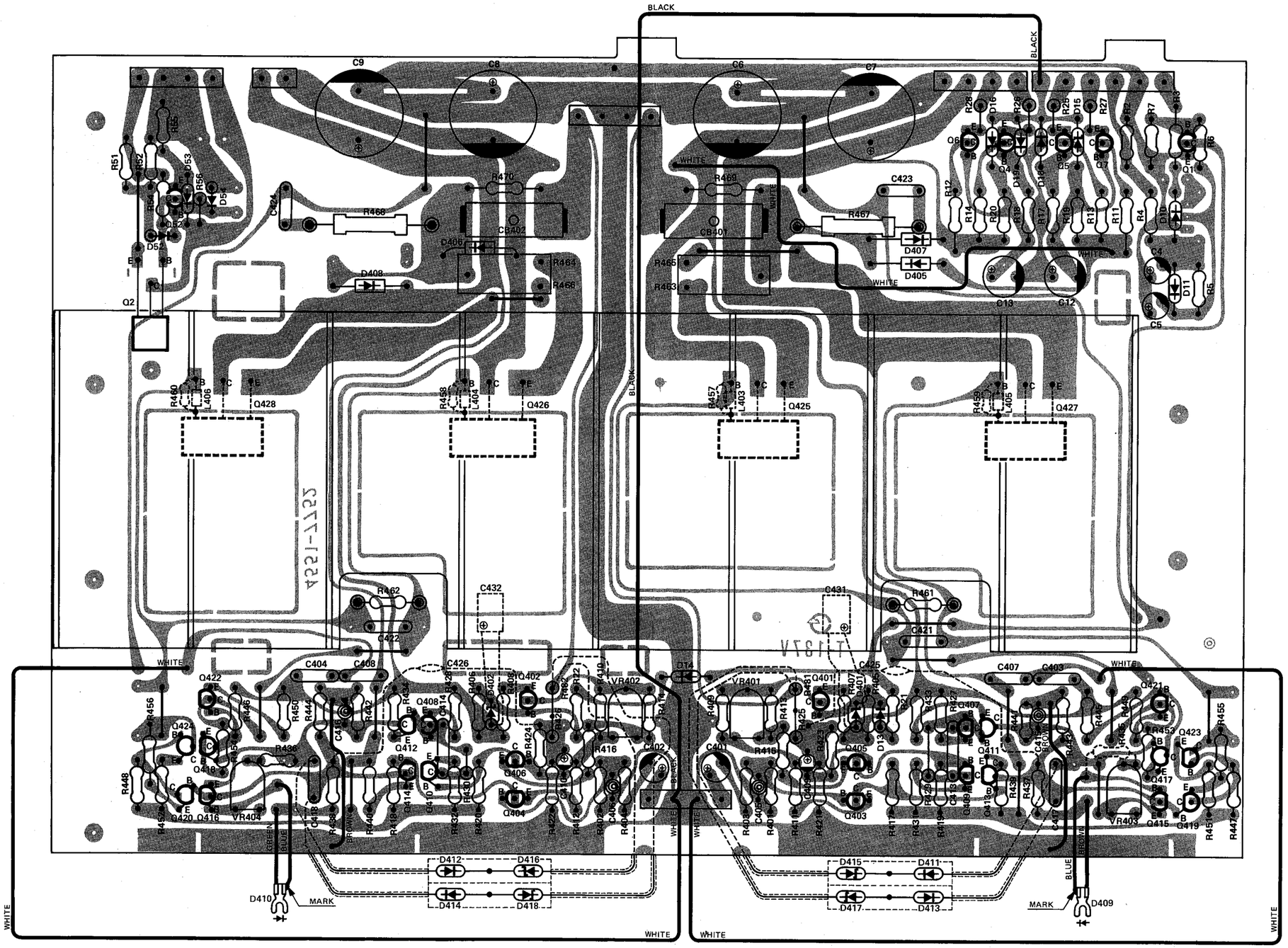


Ref. No.	Part No.	Description
	RESISTORS, FUSE	
R61	5102-1024713	1 k ohm ±2% 1/4W
R62	5102-1814713	180 ohm ±2% 1/4W
	CAPACITORS, ELECTROLYTIC	
C51	5345-228-25	2200uF +50%−10% 25V
C55	5345-477-50	470uF +50%−10% 50V
	DIODES	
D1, 2, 3, 4, 5, 6, 7, 8	5632-ERC0402L	ERC0402L
D51	5685-S1WB10	Bridge Silicon, S1WB10
D55	5635-RD24EB2	Zener, RD24EB2
D56, 57	5636-1S2471	1S2471
D58	5635-RD30EB2	Zener, RD30EB2
	MISCELLANEOUS	
L51	5995-101254	Coil, Choke
T51	5584-701345	Transformer, Station Display Filament
FU2, 3, 4, 5	5732-312031	Fuse, 3.15A 125V
FU6	5732-631031	Fuse, 630mA 125V

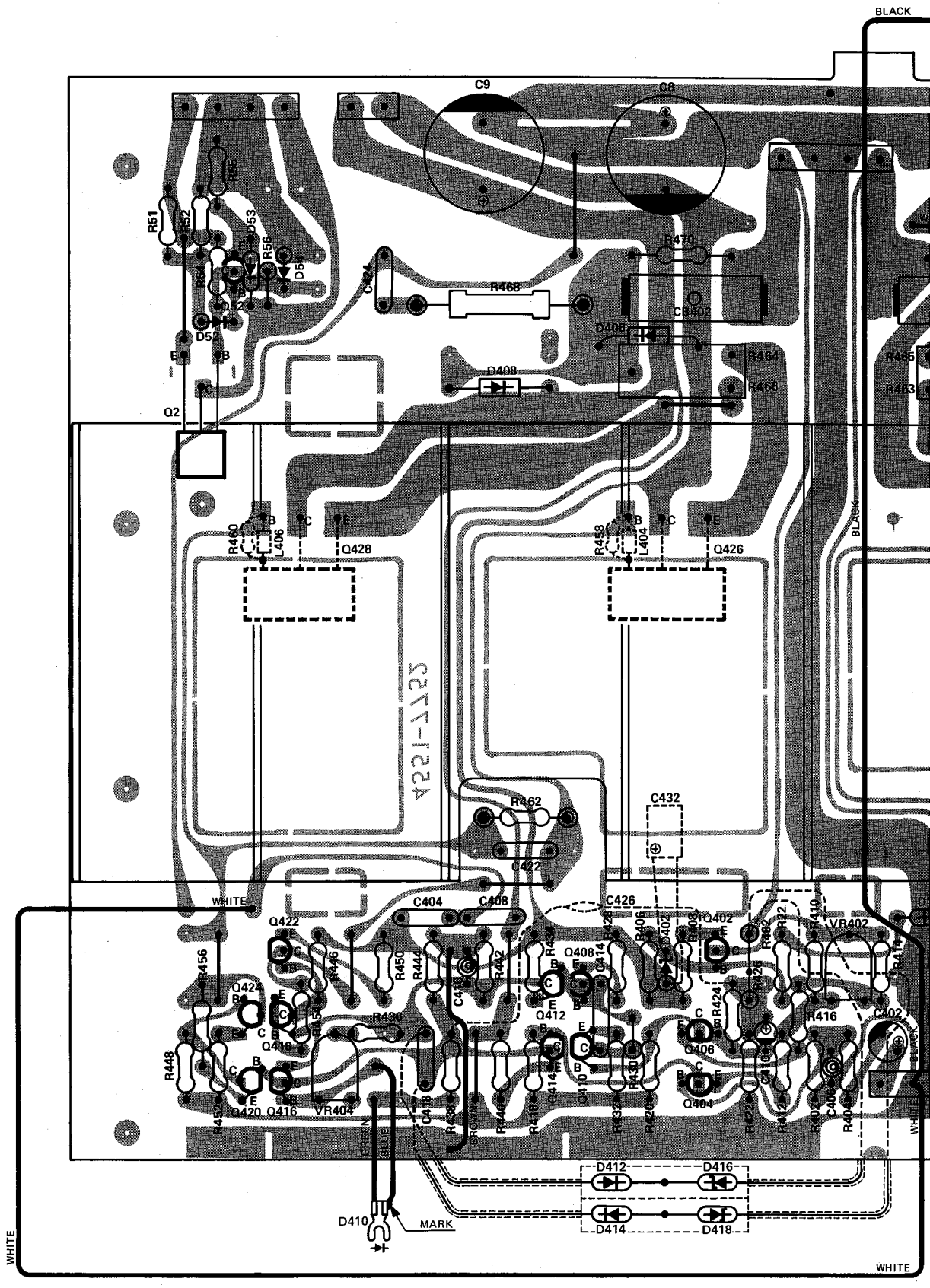
POWER AMP. P.C. BOARD

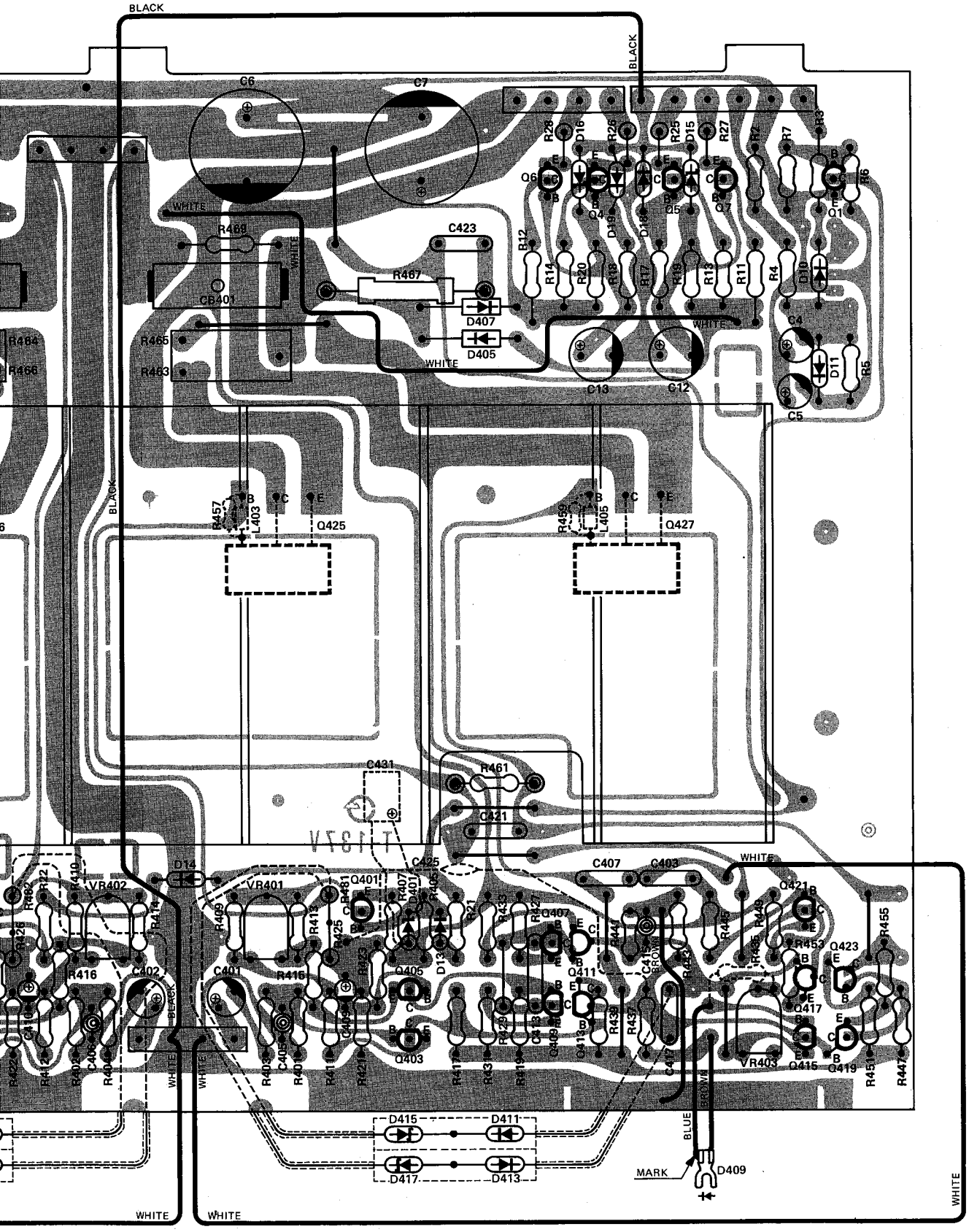
Ref. No.	Part No.	Description
	RESISTORS	
R11	5102-1514713	150 ohm ±2% 1/4W Fuse
R12	5102-2214713	220 ohm ±2% 1/4W Fuse
R13, 14	5102-1214713	120 ohm ±2% 1/4W Fuse
R427, 428, 431, 432, 433, 434, 439, 440, 445, 446, 447, 448	5102-1014713	100 ohm ±2% 1/4W Fuse
R437, 438	5102-8214713	820 ohm ±2% 1/4W Fuse
R449, 450, 451, 452	5102-2R2579	2.2 ohm ±5% 1/4W Fuse
R453, 454, 455, 456	5102-1504713	15 ohm ±2% 1/4W Fuse
R461, 462	5102-5605114	56 ohm ±5% 1/2W Fuse
R463/465, 464/466	5273-R22672	0.22 ohm ±10% 3W×2 Cement (Special Dual)
R467, 468	5175-220571	22 ohm ±5% 3W Metal
VR401, 402	5101-10171913	Variable Resistor, 100 ohm
VR403, 404	5101-50171913	Variable Resistor, 500 ohm
	CAPACITORS, ELECTROLYTIC	
C6, 7, 8, 9	5341-478F0955	4700uF ±20% 50V
	TRANSISTORS	
Q1	5611-1115(F)	2SA1115(F) Audio Muting
Q2	5612-855(C)	2SB855(C) Voltage Regulator
Q4, 6	5614-667(C)	2SD667(C) Voltage Regulator
Q5, 7	5612-647(C)	2SB647(C) Voltage Regulator
Q52	5613-2603(F)	2SC2603(F) Voltage Regulator
Q401, 402	5613-2320(F)	2SC2320(F)
Q403, 404, 405, 406	5613-1775(F)	2SC1775(F)
Q407, 408, 411, 412	5613-2229(Y)	2SC2229(Y)
Q409, 410, 413, 414	5611-949(Y)	2SA949(Y)
Q415, 416	5613-945(Q)	2SC945(Q)or(K) } Power Amp.
Q417, 418, 423, 424	5611-965(O)	2SA965(O)
Q419, 420, 421, 422	5613-2235(O)	2SC2235(O)
Q425, 426	5611-1146(O)	2SA1146(O)or(Y)
Q427, 428	5613-2706(O)	2SC2706(O)or(Y)
	DIODES	
D10, 411, 412, 413, 414	5636-1S2471	1S2471
D11, 13, 14	5636-1S2472	1S2472
D15, 16	5635-RD24EB2	Zener, RD24EB2
D18, 19	5635-RD20EB2	Zener, RD20EB2
D52	5636-1S2473	1S2473
D53	5635-RD6R2EB2	Zener, RD6.2EB2
D54	5635-RD6R8EB2	Zener, RD6.8EB2
D401, 402	5635-RD12EB2	Zener, RD12EB2
D405, 406, 407, 408	5632-ERB12-02	ERB12-02
D409, 410	5641-MV12YM	Varistor, MV12YM
D415, 416, 417, 418	5635-RD6R2EB	Zener, RD6.2EB
	MISCELLANEOUS	
CB401, 402	4361-252014	Speaker Protector
L403, 404, 405, 406	5597-35502	Ferrite Bead

POWER AMP. P.C.BOARD



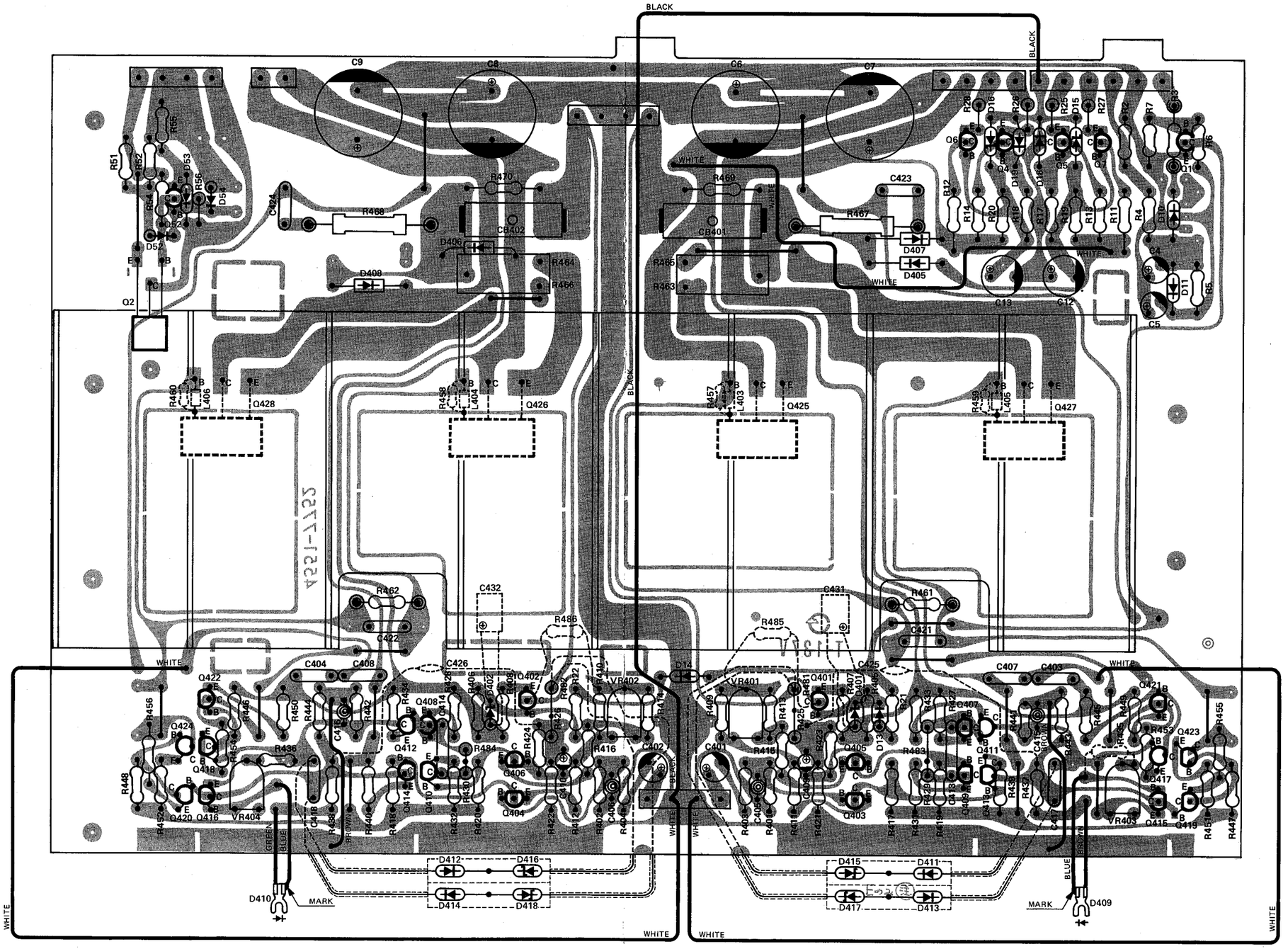
POWER AMP. P.C.BOARD




BLACK
C6
C7
WHITE
R469
CB401
R467
C423
D407
D405
R465
R463
R464
R466
C13
C12
C4
C5
D11
R5
Q425
Q427
L403
L405
R457
R459
C431
R461
C421
C425
C407
C403
VR402
VR401
D14
Q401
Q407
Q405
Q403
Q411
Q421
Q423
Q417
Q415
Q419
VR403
R416
C402
C401
C405
C409
R453
R455
R451
R447
D415
D411
D417
D413
BLUE
BROWN
MARK
D409
WHITE
WHITE
WHITE

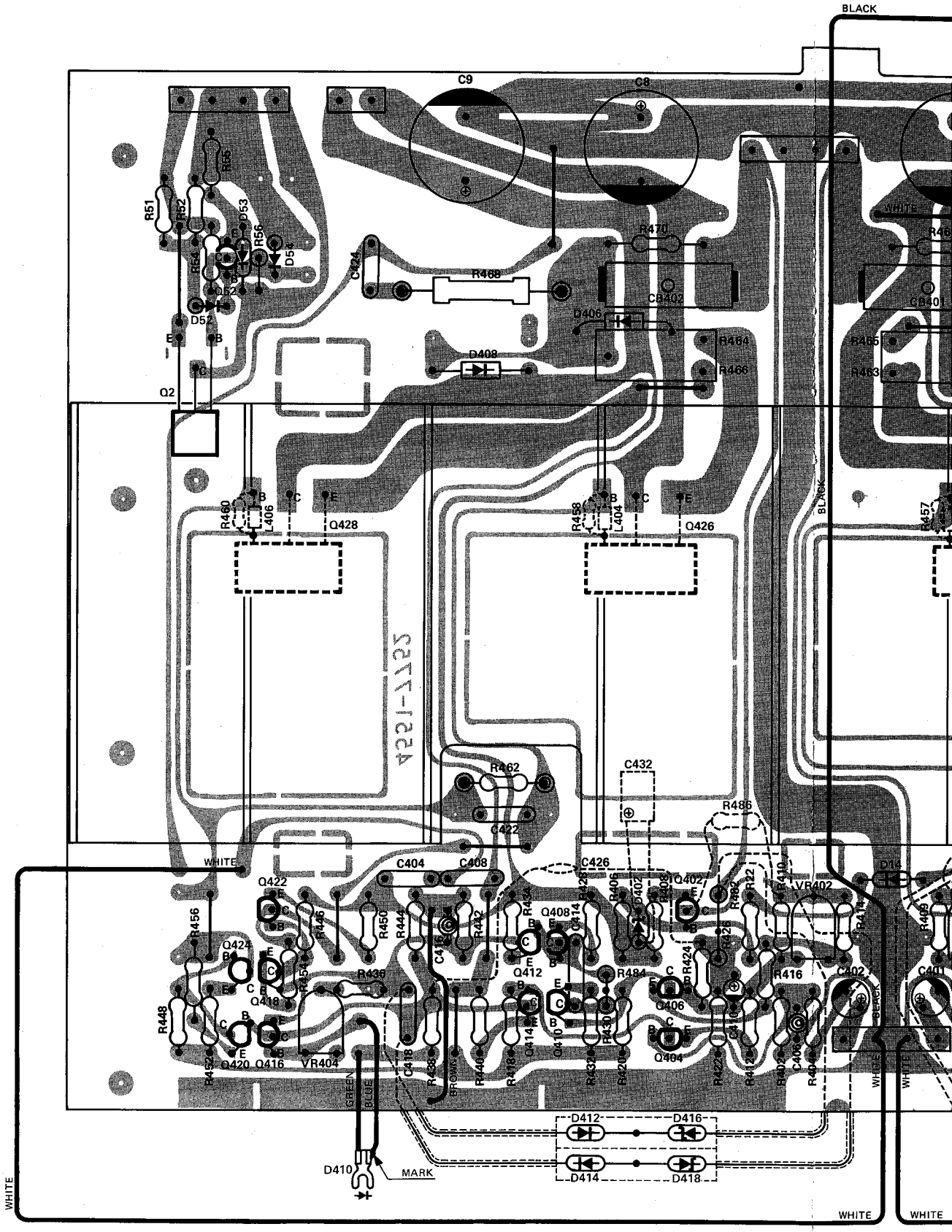
POWER AMP. P.C. BOARD

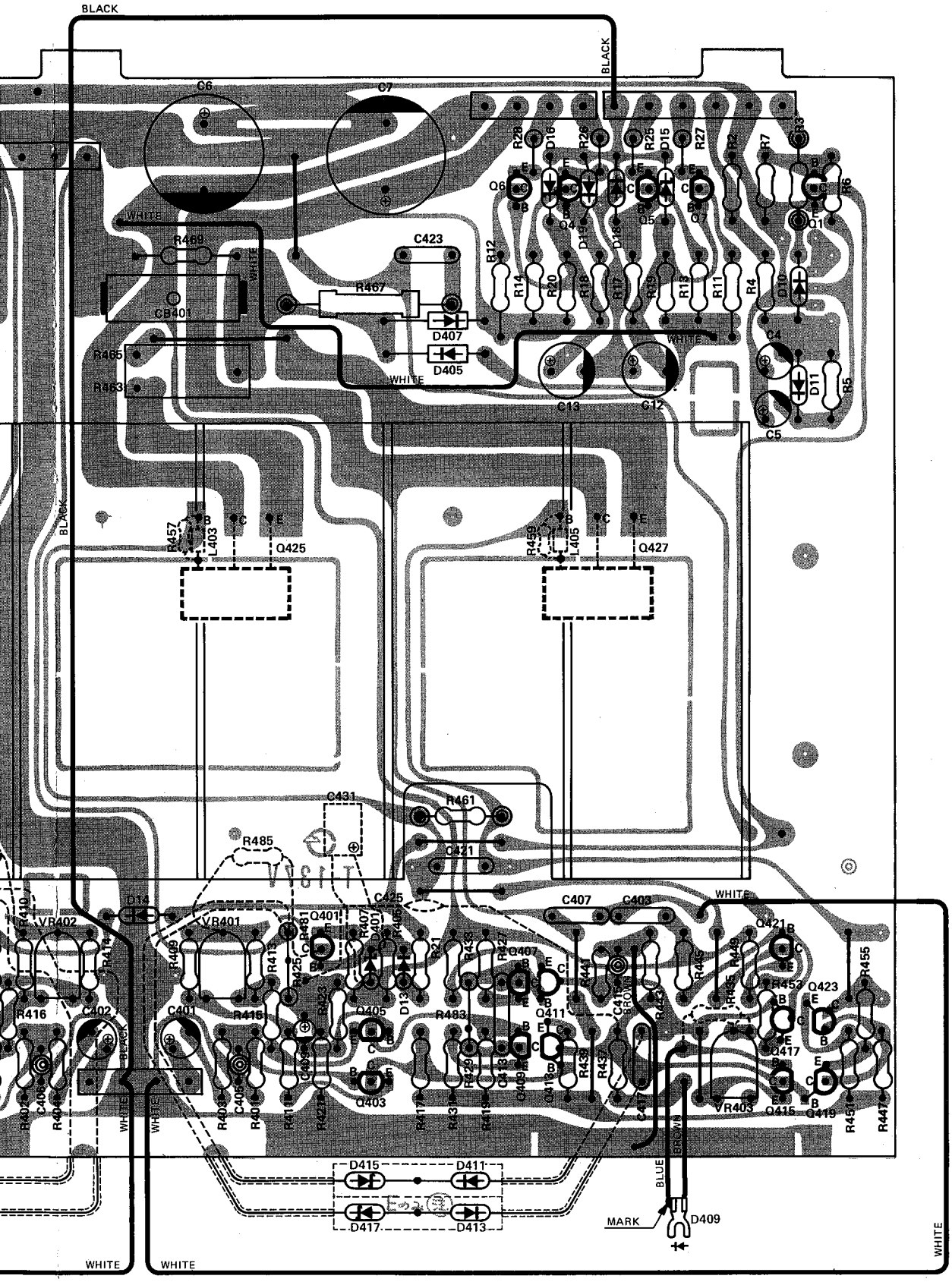
THE FOLLOWING P.C. BOARD IS APPLIED TO MULTI VOLTAGE UNIT.



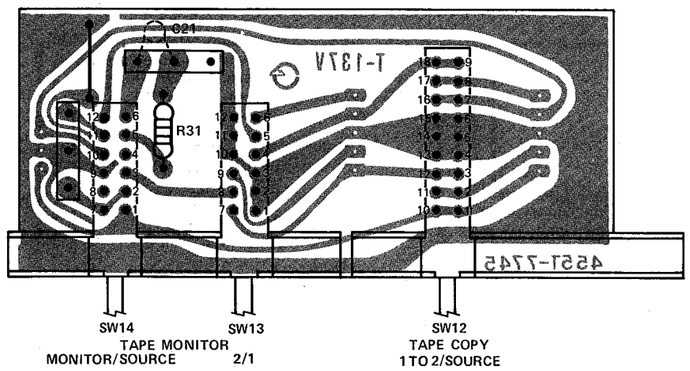
POWER AMP. P.C. BOARD

THE FOLLOWING P.C. BOARD IS APPLIED TO MULTI VOLTAGE UNIT.



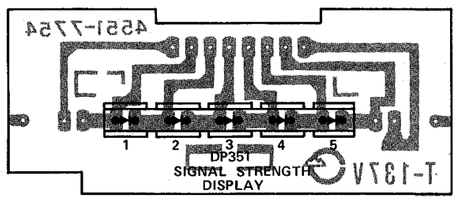

BLACK
C6
C7
WHITE
R469
CB401
R467
C423
D407
D405
R465
R463
WHITE
C13
C12
C4
C5
D11
R5
R457
L403
Q425
R459
L405
Q427
C431
R461
R485
C421
C407
C403
WHITE
C425
VR402
VR401
D14
Q401
Q405
Q403
R483
Q411
Q421
Q423
R453
R455
Q417
VR403
Q415
Q419
R451
R447
C402
C401
R416
D415
D411
D417
D413
BLUE
BROWN
MARK
D409
WHITE
WHITE
WHITE

TAPE SWITCH P.C. BOARD



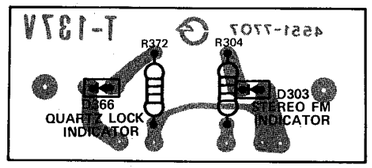
Ref. No.	Part No.	Description
SW12	4431-01068094	Push Switch, Tape Copy
SW13, 14	4431-02087159	Push Switch, Tape Monitor

SIGNAL STRENGTH DISPLAY P.C. BOARD



Ref. No.	Part No.	Description
DP351	5637-LN05302P	LED Display Assembly, LN05302P Signal Strength Display

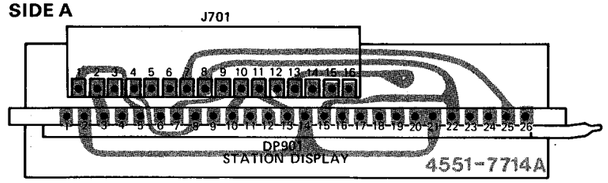
QUARTZ LOCK/STEREO INDICATOR P.C. BOARD



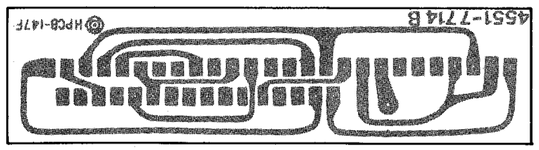
Ref. No.	Part No.	Description
D303	5637-GL9PR20	Light Emitting Diode, GL9PR20 Stereo FM Indicator
D366	5637-GL9NG2	Light Emitting Diode, GL9NG2 Quartz Lock Indicator

STATION DISPLAY P.C. BOARD

SIDE A



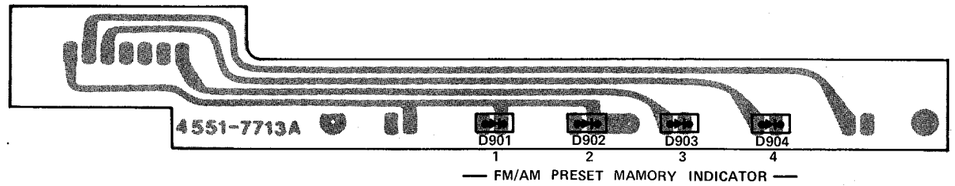
SIDE B



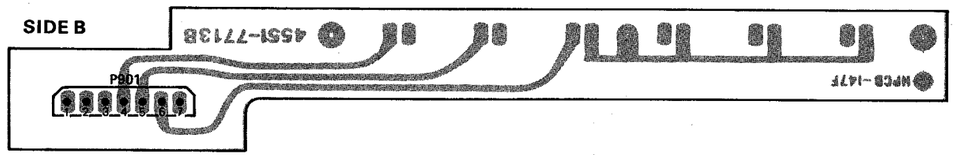
Ref. No.	Part No.	Description
DP901	5722-9	Tube Display Assembly, FIP7D8 Station Display

PRESET MEMORY INDICATOR P.C. BOARD

SIDE A

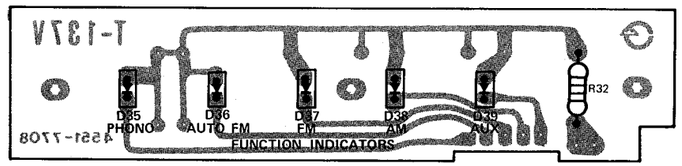


SIDE B



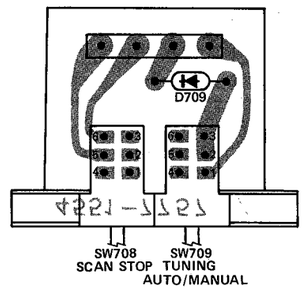
Ref. No.	Part No.	Description
D901, 902, 903, 904	5637-GL9NG2	Light Emitting Diode, GL9NG2 Preset Memory Indicator

FUNCTION INDICATOR P.C. BOARD



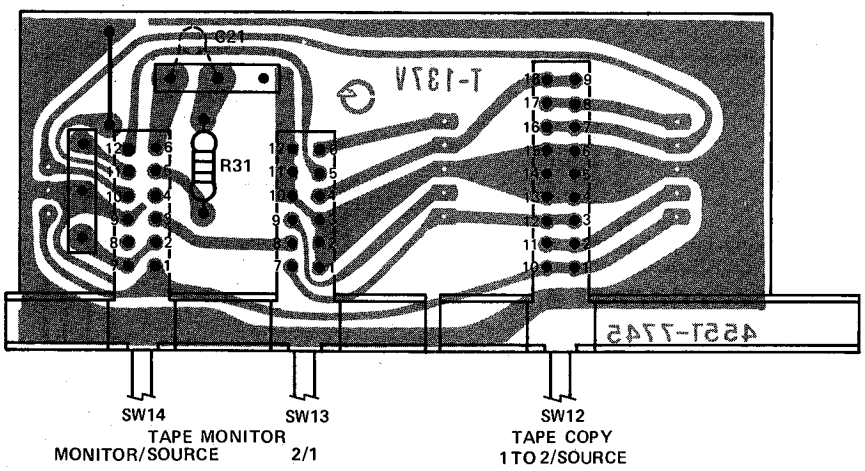
Ref. No.	Part No.	Description
D35, 36, 37, 38, 39	5637-GL9NG2	Light Emitting Diode, GL9NG2 Phono, Auto FM, FM, AM, AUX indicator

SCAN STOP/TUNING SWITCH P.C. BOARD



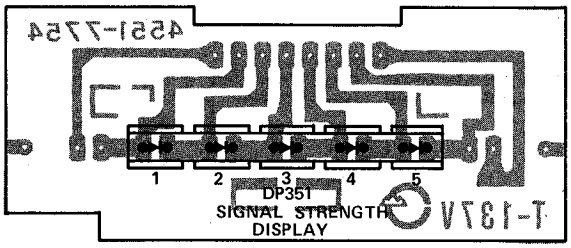
Ref. No.	Part No.	Description
D709	5636-1S2473	Diode, 1S2473
SW708, 709	4431-02047459	Push Switch, Scan Stop, Auto/Manual Tuning

TAPE SWITCH P.C. BOARD



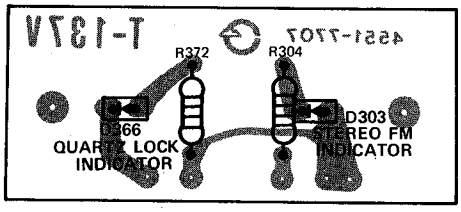
Ref. No.	Part No.	Description
SW12	4431-01068094	Push Switch, Tape Copy
SW13, 14	4431-02087159	Push Switch, Tape Monitor

SIGNAL STRENGTH DISPLAY P.C. BOARD



Ref. No.	Part No.	Description
DP351	5637-LN05302P	LED Display Assembly, LN05302P Signal Strength Display

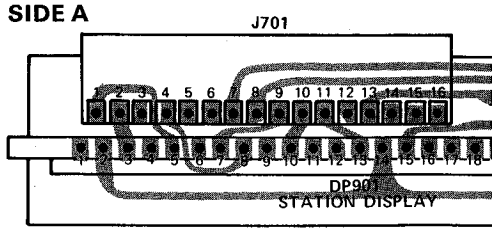
QUARTZ LOCK/STEREO INDICATOR P.C. BOARD



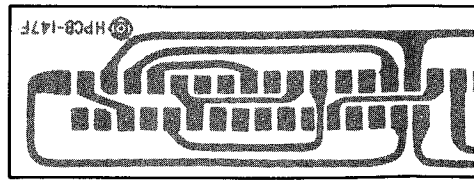
Ref. No.	Part No.	Description
D303	5637-GL9PR20	Light Emitting Diode, GL9PR20 Stereo FM Indicator
D366	5637-GL9NG2	Light Emitting Diode, GL9NG2 Quartz Lock Indicator

STATION DISPLAY P.C. BOARD

SIDE A



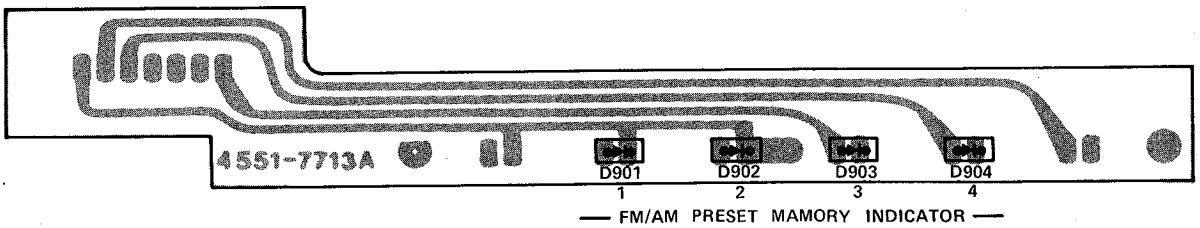
SIDE B



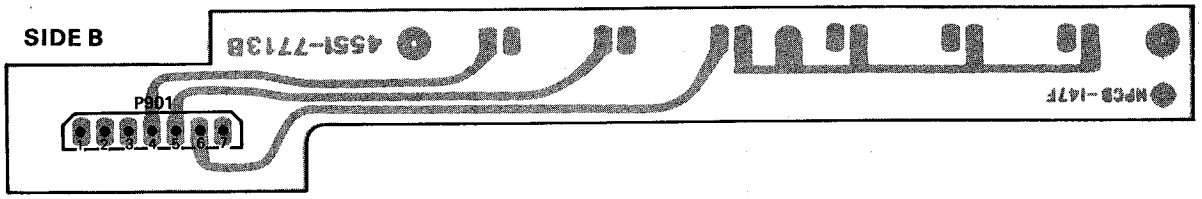
Ref. No.	Part No.	Description
DP901	5722-9	Tube Displa

PRESET MEMORY INDICATOR P.C. BOARD

SIDE A

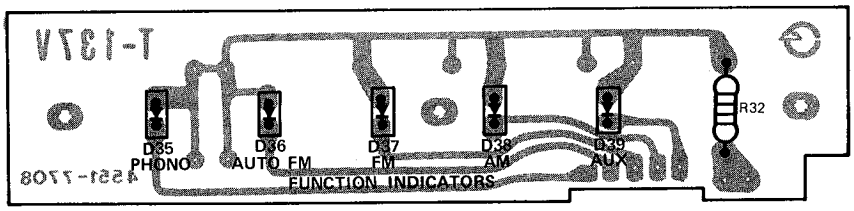


SIDE B



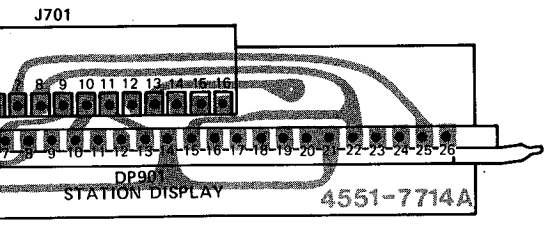
Ref. No.	Part No.	Description
D901, 902, 903, 904	5637-GL9NG2	Light Emitting Diode, GL9NG2 Preset Memory Indicator

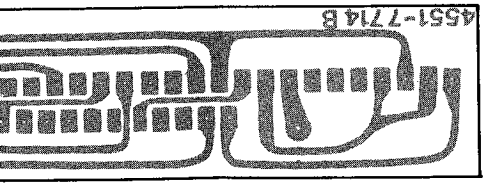
FUNCTION INDICATOR P.C. BOARD



Ref. No.	Part No.	Description
D35, 36, 37, 38, 39	5637-GL9NG2	Light Emitting Diode, GL9NG2 Phono, Auto FM, FM, AM, AUX indicator

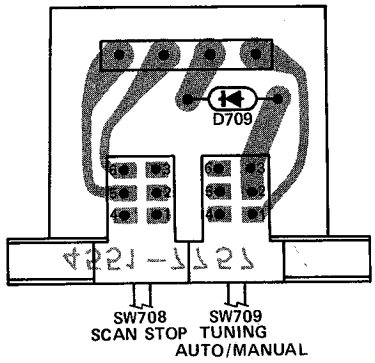
P.C. BOARD





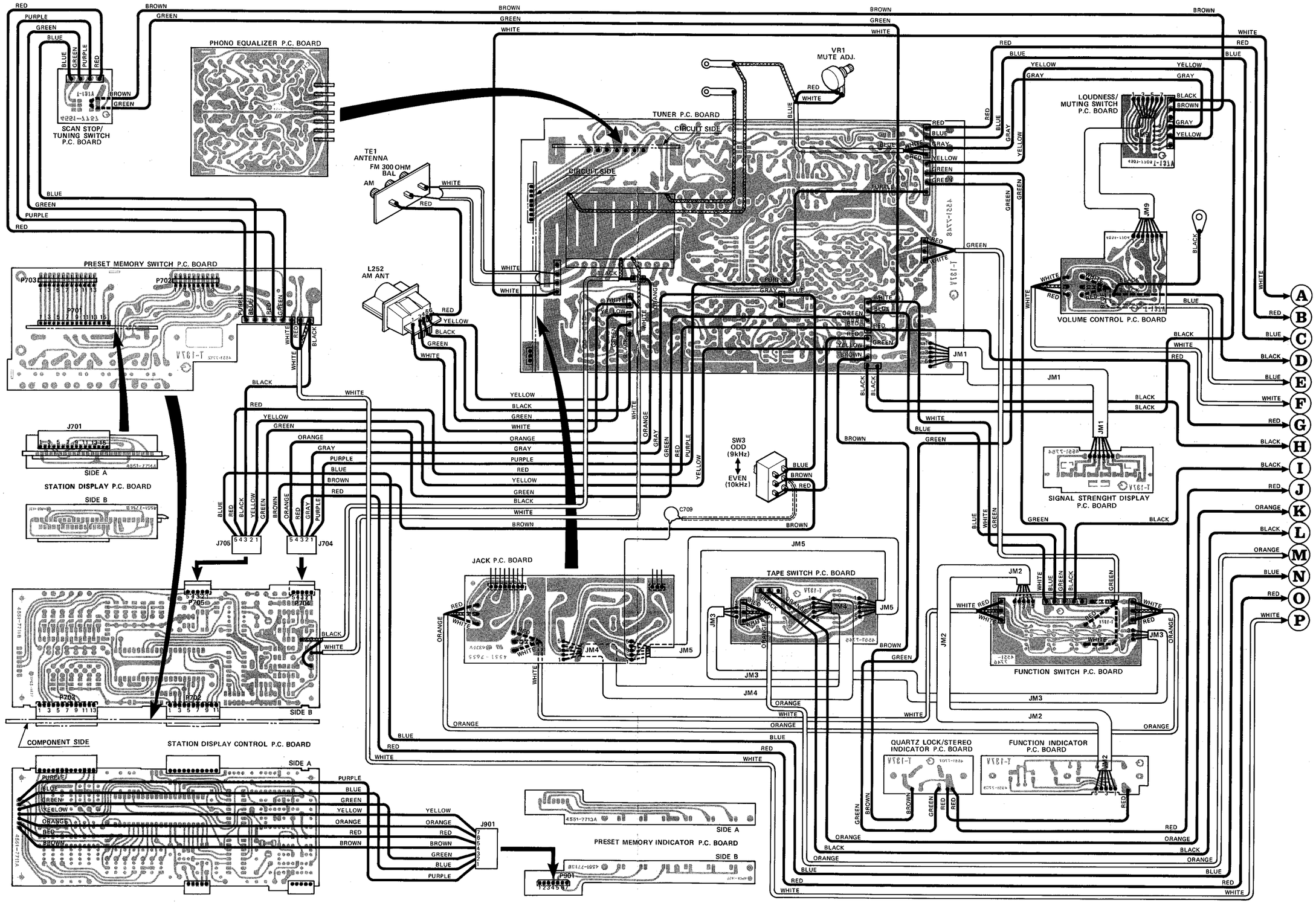
art No.	Description
722-9	Tube Display Assembly, FIP7D8 Station Display

SCAN STOP/TUNING SWITCH P.C. BOARD

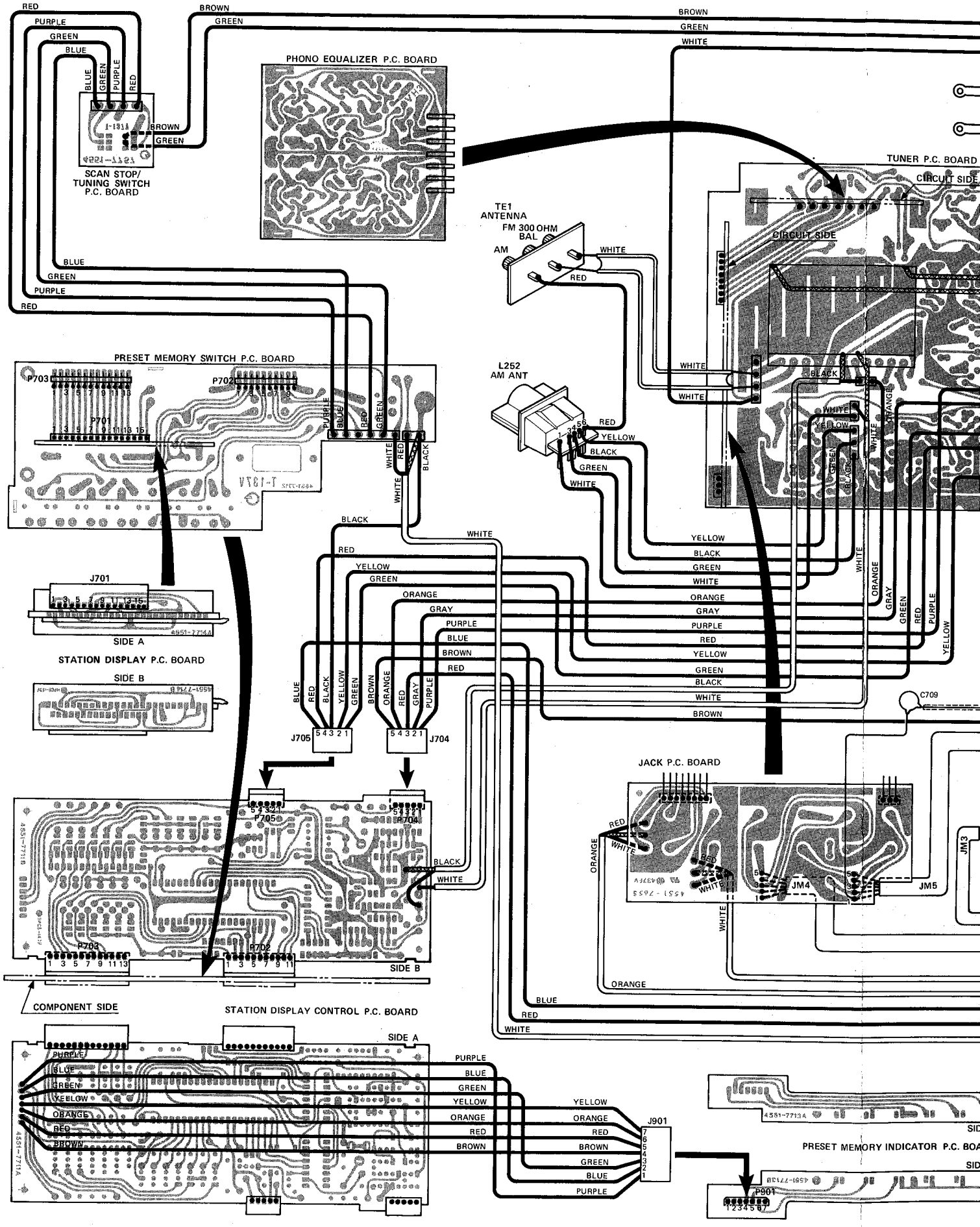


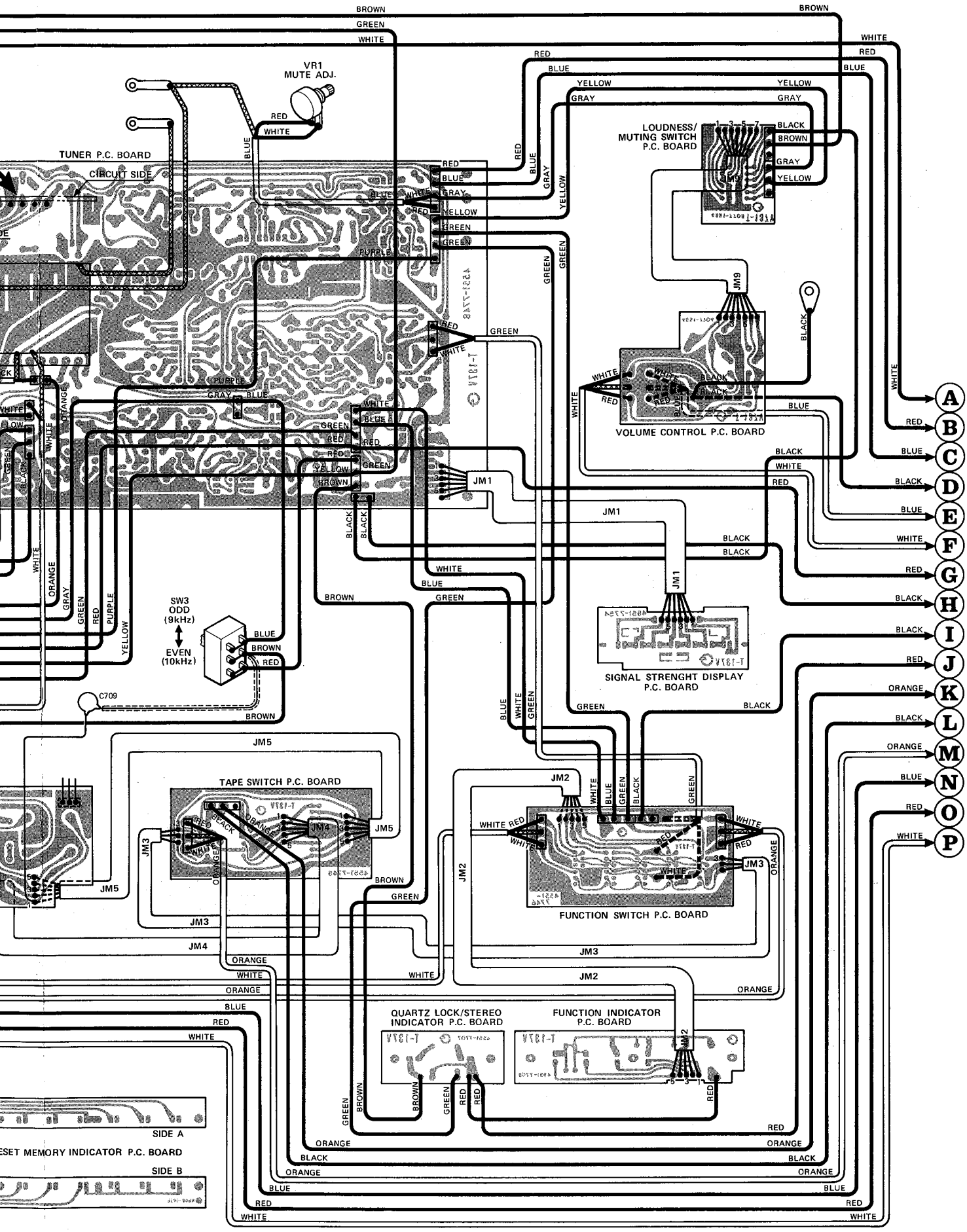
Ref. No.	Part No.	Description
D709	5636-1S2473	Diode, 1S2473
SW708, 709	4431-02047459	Push Switch, Scan Stop, Auto/Manual Tuning

WIRING DIAGRAM

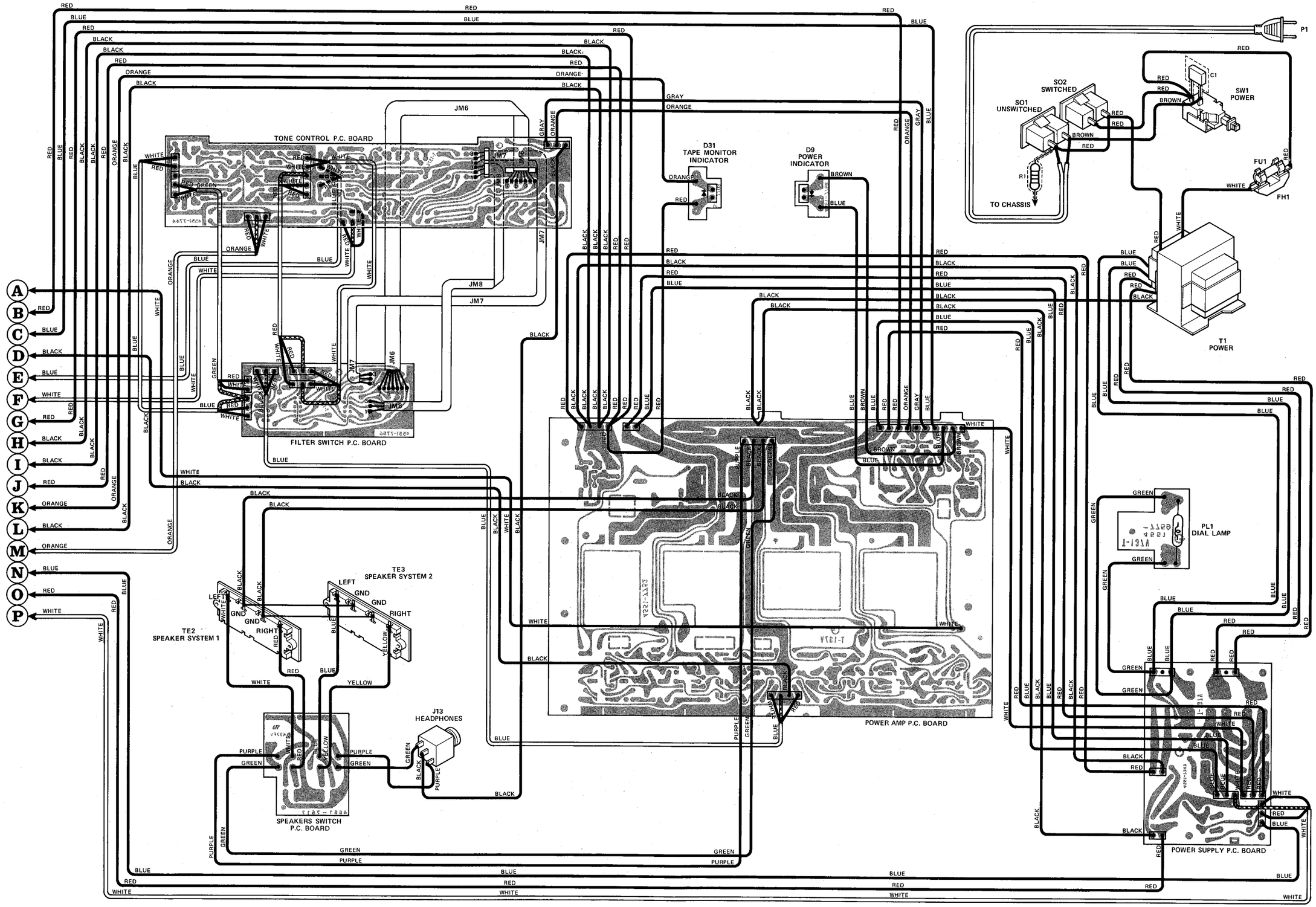


WIRING DIAGRAM

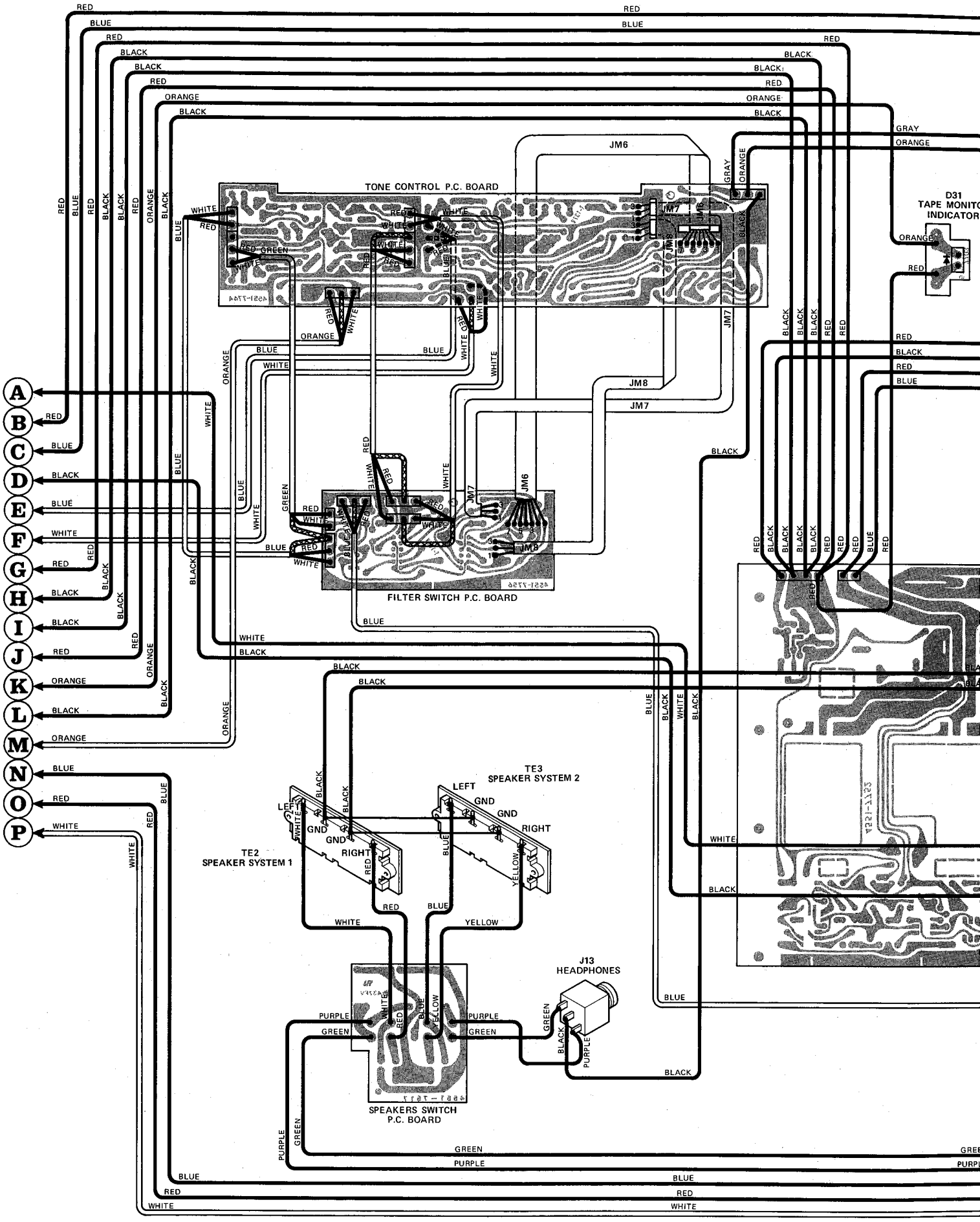


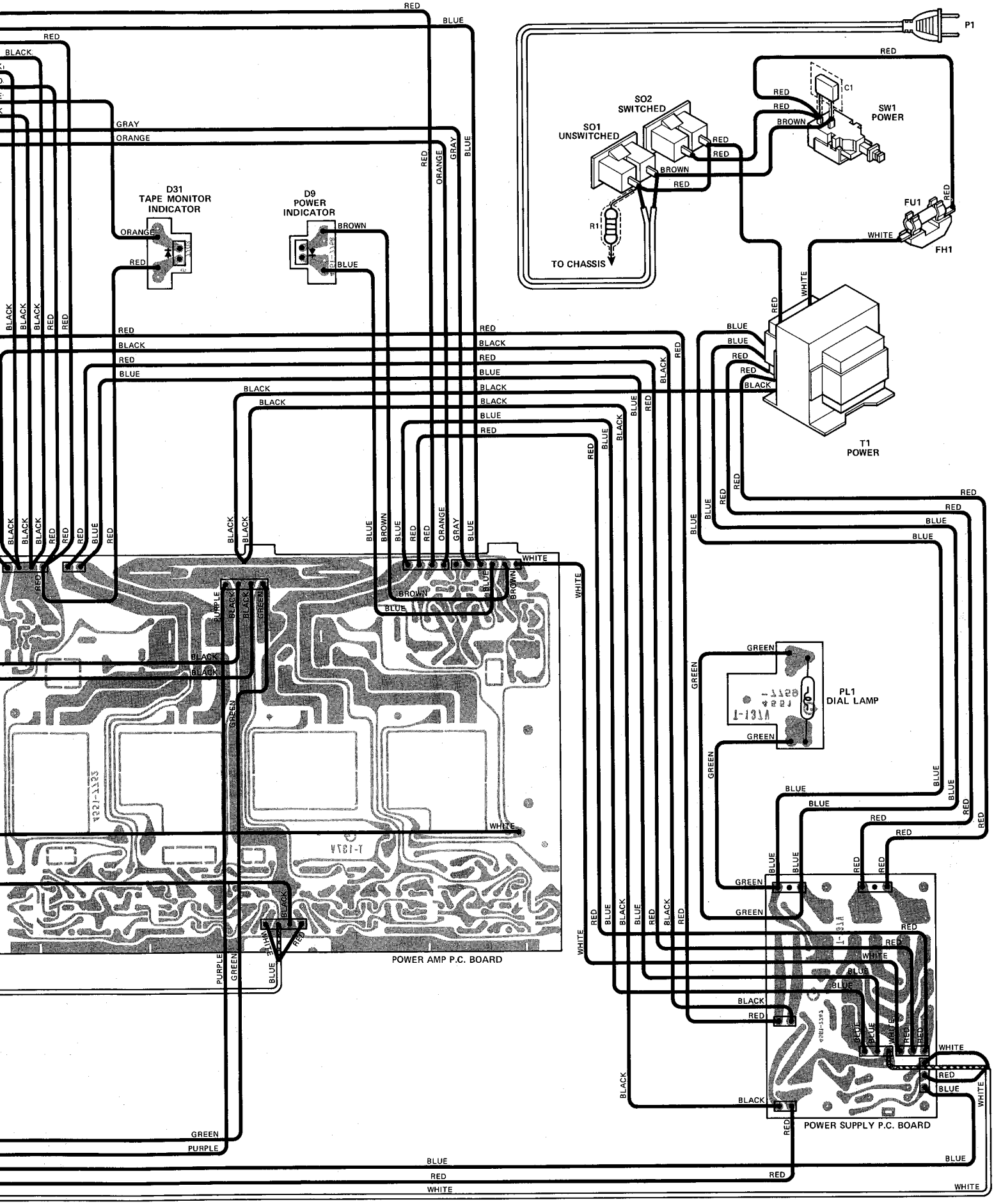

VR1
MUTE ADJ.
TUNER P.C. BOARD
CIRCUIT SIDE
LOUDNESS/
MUTING SWITCH
P.C. BOARD
VOLUME CONTROL P.C. BOARD
SIGNAL STRENGHT DISPLAY
P.C. BOARD
SW3
ODD
(9kHz)
EVEN
(10kHz)
C709
TAPE SWITCH P.C. BOARD
FUNCTION SWITCH P.C. BOARD
QUARTZ LOCK/STEREO
INDICATOR P.C. BOARD
FUNCTION INDICATOR
P.C. BOARD
SIDE A
SIDE B
ESET MEMORY INDICATOR P.C. BOARD
JM1
JM2
JM3
JM4
JM5
JM9
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P

WIRING DIAGRAM



WIRING DIAGRAM

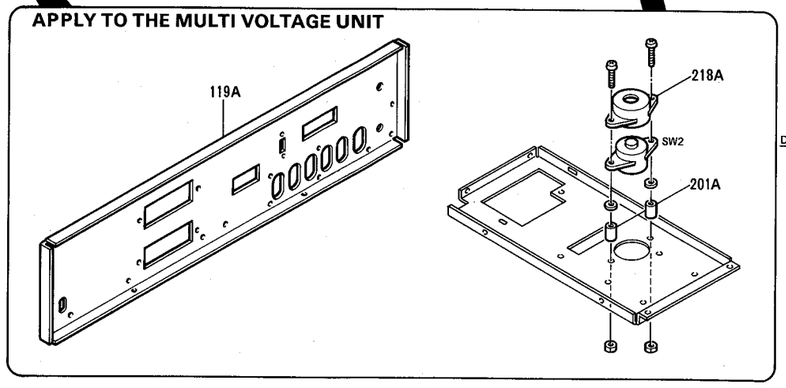



P1
SO2
SWITCHED
SO1
UNSWITCHED
C1
SW1
POWER
R1
TO CHASSIS
FU1
FH1
WHITE
D31
TAPE MONITOR
INDICATOR
D9
POWER
INDICATOR
T1
POWER
PL1
DIAL LAMP
POWER AMP P.C. BOARD
POWER SUPPLY P.C. BOARD
RED
BLUE
BLACK
GRAY
ORANGE
BROWN
GREEN
PURPLE
WHITE

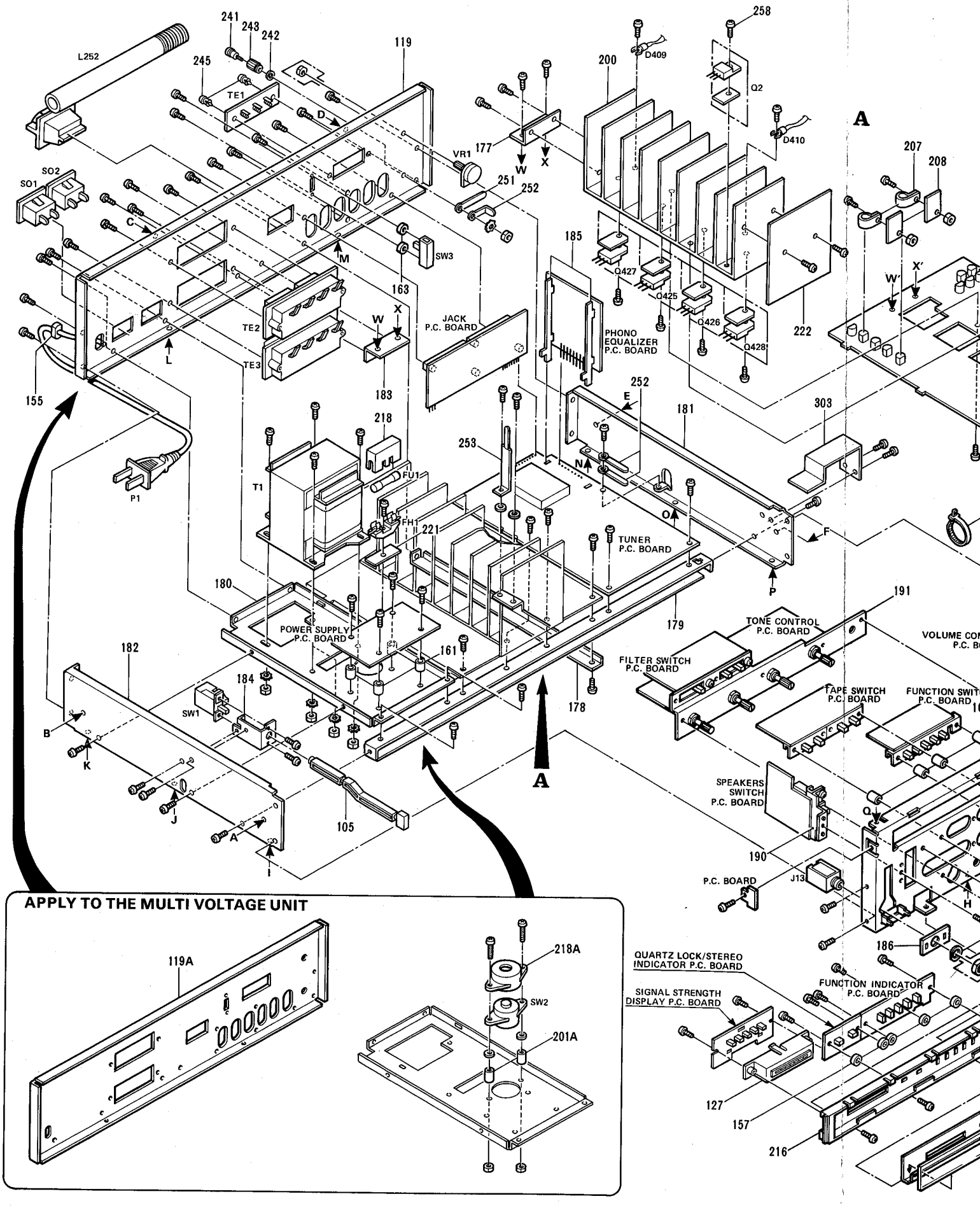
GENERAL UNIT EXPLODED VIEW

201- 2222-7100
203- 2222-7101
205- 2222-7103

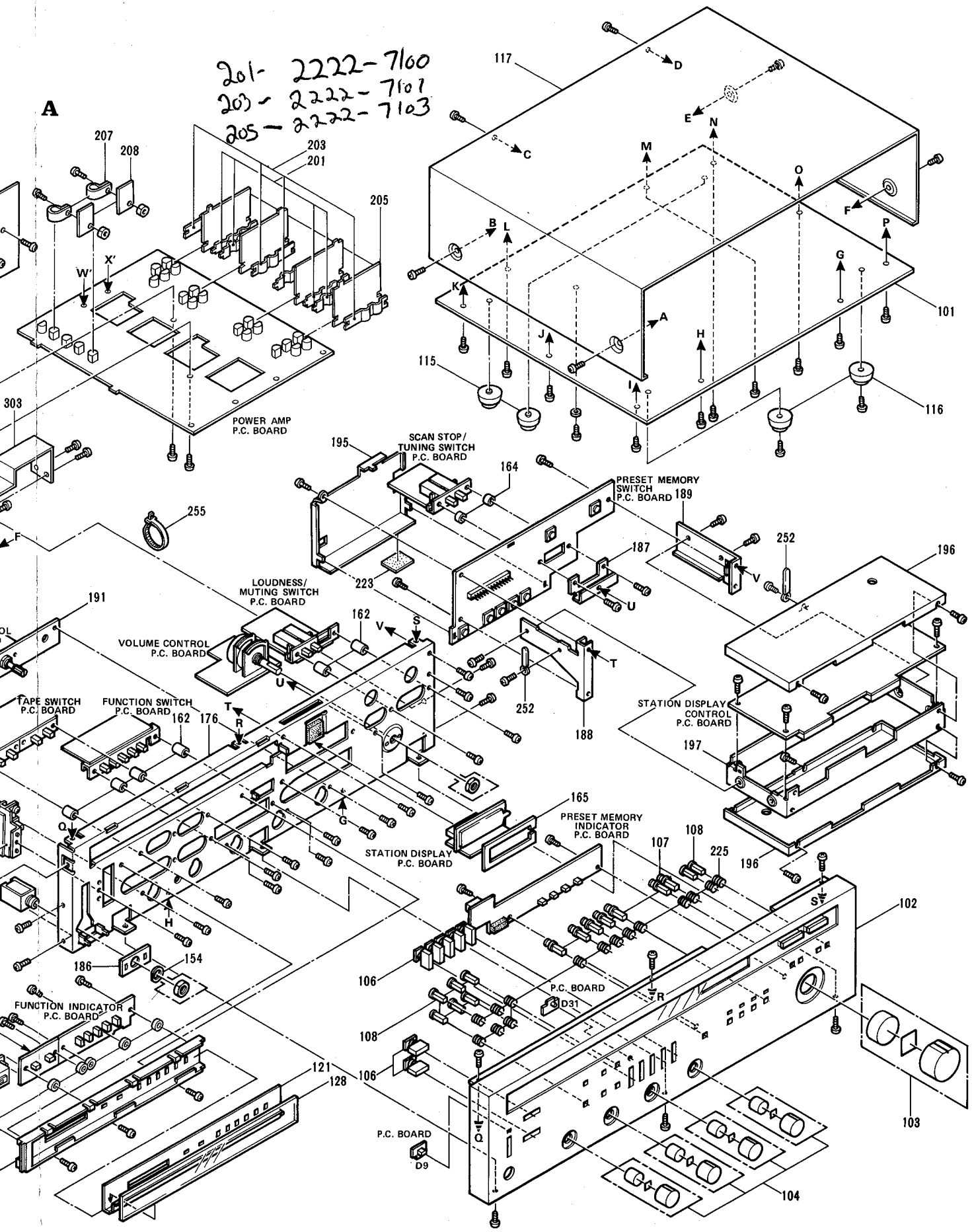
APPLY TO THE MULTI VOLTAGE UNIT



GENERAL UNIT EXPLODED VIEW

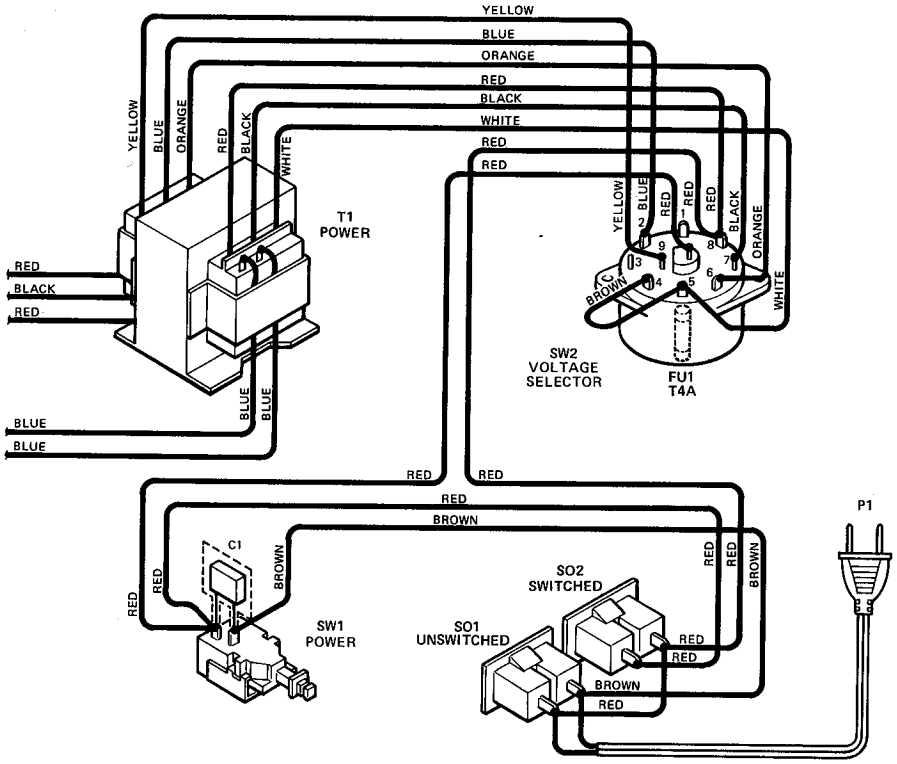


APPLY TO THE MULTI VOLTAGE UNIT

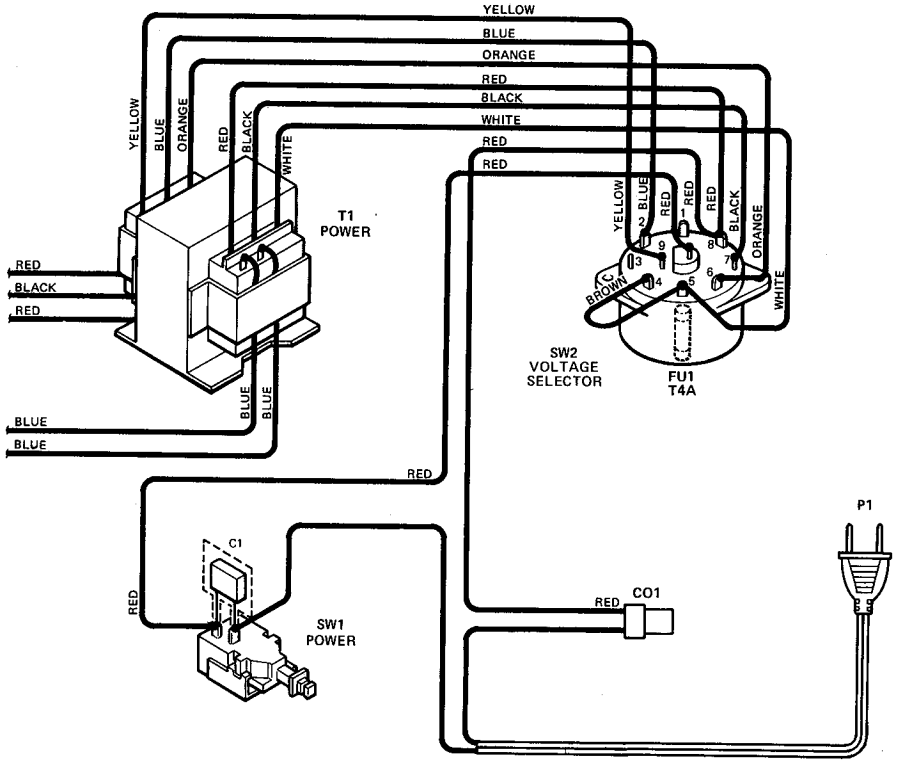

201- 2222-7100
203- 2222-7101
205- 2222-7103
A
POWER AMP P.C. BOARD
SCAN STOP/ TUNING SWITCH P.C. BOARD
PRESET MEMORY SWITCH P.C. BOARD
LOUDNESS/ MUTING SWITCH P.C. BOARD
VOLUME CONTROL P.C. BOARD
TAPE SWITCH P.C. BOARD
FUNCTION SWITCH P.C. BOARD
STATION DISPLAY CONTROL P.C. BOARD
STATION DISPLAY P.C. BOARD
PRESET MEMORY INDICATOR P.C. BOARD
FUNCTION INDICATOR P.C. BOARD
P.C. BOARD D31
P.C. BOARD D9
117
101
102
103
104
115
116
121
128
154
162
164
165
176
186
187
188
189
191
195
196
197
223
225
252
255
303

WIRING DIAGRAM

THE FOLLOWING WIRING DIAGRAM IS APPLIED TO MULTI VOLTAGE UNIT.



FOR EUROPE AND OCEANIA ONLY



CHASSIS PARTS LIST

Ref. No.	Part No.	Description
	GENERAL UNIT	
101	A423-HK580	Cabinet Bottom Assembly
102	A443-HK580	Front Panel Assembly
103	A634-HK580-A	Knob Assembly, Volume
104	A634-HK580-B	Knob Assembly, Bass, Treble, Balance, Blend
105	A662-HK580-A	Push Button Assembly, Power
106	A662-HK580-B	Push Button Assembly, Speakers 1, Speakers 2, Phono, Auto FM, FM, AM, AUX
107	A662-HK580-C	Push Button Assembly, Memory, FM/AM Preset Memory, Scan Stop, Tuning
108	A662-HK580-D	Push Button Assembly, Tape Copy, Tape Monitor, Tone Defeat, Subsonic Filter, High Cut, Loudness, Muting
115	1319-0139	Foot
116	1319-7138	Foot
117	1414-01101	Cabinet Top
119	1424-04601	Cabinet Back
121	1514-05001	Plate
128	1721-01003	Indication Plate
218	2240-7118	Holder
241	2310-7015	Special Screw
242	2410-7005	Special Washer
243	2440-7011	Special Nut
	ELECTRICAL	
P1	4161-7387	AC Line Cord
S01, 2	4474-108	External AC Socket, Unswitched, Switched
SW1	4431-01017358	Push Switch, Power
SW3	4421-0227131	Slide Switch, Frequency Interval Selector
T1	5584-701356	Power Transformer
FU1	5732-402031	Fuse, 4A 125V
FH1	4472-0125	Fuse Holder, FU1
TE1	4214-102	FM/AM External Antenna Terminal
TE2, 3	4214-7034	Speaker Terminal, Speaker System 1, 2
PL1	5731-1507245	Lamp, 15V 100mA Dial Illuminator
VR1	5113-5037221	Variable Resistor, 50 k ohm Muting Adj.
C1	5352-1030959	Capacitor, 0.01uF ±20% AC125V Metalized Polyester
D9	5637-GL9PR20	Light Emitting Diode, GL9PR20 Power Indicator
D31	5637-TLR206	Light Emitting Diode, TLR206 Tape Monitor Indicator
L252	5911-208	AM Ferrite Loopstick Antenna
J13	4451-00108	Jack, Headphones
	1397-6	Dipole Antenna

MULTI VOLTAGE VERSION PARTS LIST

AS FOR ALL OTHER PARTS EXCEPT THE FOLLOWING PARTS IN REF. NO., REFER TO REGULAR VOLTAGE UNIT (120V ONLY).

Ref. No.	Part No.	Description
	PART NO. CHANGE	
119	1424-04602	Cabinet Back
119A	1424-05601	Cabinet Back (for Europe and Oceania only, (SK) (SEV))
P1	4161-7256	AC Line Cord
SW1	4431-01017658	Push Switch, Power
T1	5584-701311	Power Transformer
FU1	5732-402030	Fuse, T4A 250V
FU2, 3, 4, 5	5732-312030	Fuse, T3.15A 250V
FU6	5732-631030	Fuse, T630mA 250V
IC201	5652-HA12412	Integrated Circuit, HA12412 FM IF Amp./FM Det.
R429, 430	5102-1524713	Resistor, 1.5 k ohm ±2% 1/4W Fuse
C1	5352-1030961	Capacitor, 0.01uF ±20% AC250V Metalized Polyester
C1	5352-1030958	Capacitor, 0.01uF ±20% AC250V Metalized Polyester (for Sweden only, (SEV))
	ADDITIONAL USAGE	
SW2	4467-1	Power Source Voltage Selector
SW4	4421-022110	Slide Switch, De-Emphasis
CO1	4443-712	Connector, AC Line Cord (for Europe and Oceania only, (SK) (SEV))