

Service Manual

Technics
by Panasonic

HI-FI COMPONENTS
Technics
by Panasonic

CD-4 FM/AM
4 CHANNEL/2 CHANNEL RECEIVER MODEL SA-8500X
TECHNICAL SPECIFICATIONS (Specifications are subject to change without notice for further improvement)

AMPLIFIER SECTION

Music power (IHF):		
4 CH operation	260W (4Ω), 180W (8Ω)	
2 CH Balanced Transformerless operation	250W (8Ω)	
1 kHz RMS (continuous) power:		
4 CH operation		
All ch. driven	40W/40W/40W/40W (4Ω)	
	34W/34W/34W/34W (8Ω)	
2 CH Balanced Transformerless operation		
Both ch. driven	85W/85W (8Ω)	
20 Hz~20kHz RMS (continuous) power:		
4 CH operation		
All ch. driven	28W+28W+28W+28W (4Ω)	
	26W+26W+26W+26W (8Ω)	
2 CH Balanced Transformerless operation		
Both ch. driven	80W+80W (8Ω)	
Total harmonic distortion:		0.5%
Intermodulation distortion (60 Hz : 7 kHz=4 : 1, SMPTE):		0.7%
Power bandwidth (all ch. driven at 8Ω):	5Hz~40kHz,	-3dB
Frequency response:	PHONO	RIAA standard curve ±1 dB
	AUX	7Hz~70kHz, +0dB -3dB
Residual hum & noise:		1.5mV
Input sensitivity & impedance:	PHONO	2mV/50kΩ
	AUX	180mV/30kΩ
	PLAYBACK	180mV/30kΩ
S/N (IHF, A):	PHONO	70dB
	AUX	90dB
Tone controls:	BASS	50Hz, +11dB~-11dB
	TREBLE	10kHz, +10dB~-10dB
Loudness control (volume at -30dB):		50Hz, +10dB
Filters:	LOW	200Hz, -6dB/oct
	High	7kHz, -6dB/oct

Audio muting:	-20dB
REC OUT:	180mV
Damping factor:	10 (4Ω), 20 (8Ω)
Load impedance:	MAIN or REMOTE 4~16Ω
	MAIN+REMOTE (or Balanced Transformerless) 8~16Ω

FM TUNER SECTION

Frequency range:	88~108MHz
FM sensitivity (IHF):	1.9μV
Alternate channel selectivity:	65dB
Harmonic distortion:	MONO 0.3%
	STEREO 0.4%
S/N:	65dB
Frequency response:	20Hz~13kHz, ±1dB
Image rejection (at 98 MHz):	55dB
IF rejection (at 98 MHz):	60dB
Spurious response rejection (at 98 MHz):	60dB
Capture ratio:	1.5dB
AM suppression:	50dB
Stereo separation (at 1 kHz):	40dB
Leak carrier (19 kHz, 38 kHz):	50dB

AM TUNER SECTION

Frequency range:	520~1610kHz
Sensitivity:	20μV
Selectivity:	25dB
Image rejection (at 1000 kHz):	40dB
IF rejection (at 1000 kHz):	40dB

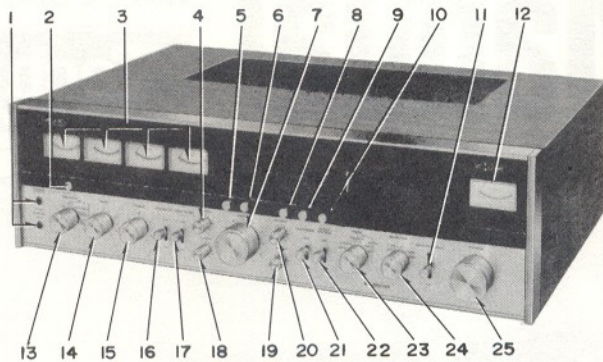
GENERAL

Power consumption:	360W
Power supply:	AC120V 60Hz
Dimensions (W x H x D):	21-11/32" x 6-3/32" x 15-9/16"
Weight:	37.3 lb.

Matsushita Electric Corp. of America
Matsushita Electric Corp. of Hawaii, Inc.
Matsushita Electric of Canada Ltd.

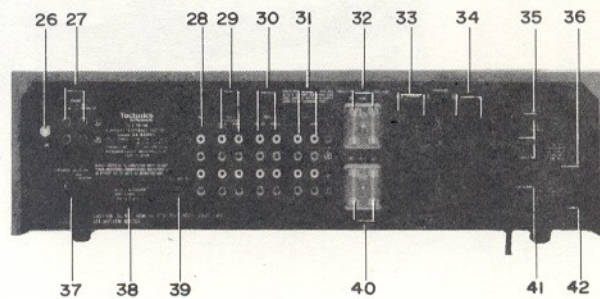
Pan Am Bldg., 200 Park Ave., New York, N. Y. 10017
320, Waiakamilo Road Honolulu, Hawaii 96817
40 Ronson Drive, Rexdale, Ont.

LOCATION OF CONTROLS

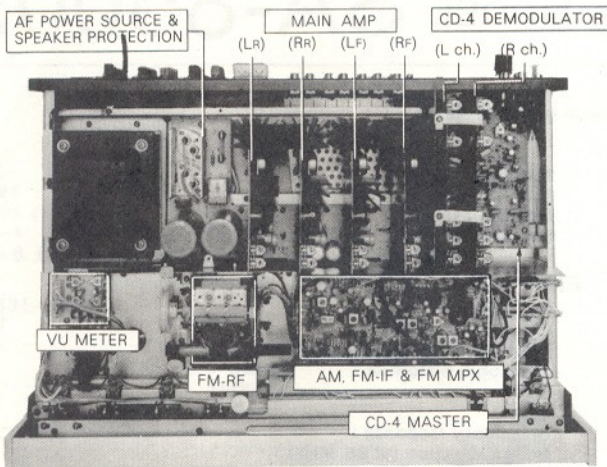


1. HEADPHONES JACK
2. POWER SOURCE SWITCH (S13)
3. VU [OUTPUT LEVEL] METERS
4. LEFT-FRONT CH. LEVEL CONTROL
5. VU METER RANGE SWITCH (S3)
6. FM MUTING SWITCH (S4)
7. VOLUME CONTROL
8. 4CH. TAPE MONITOR 1 SWITCH (S5)
9. 4CH. TAPE MONITOR 2 SWITCH (S6)
10. 4CH. TAPE MONITOR 3 SWITCH (S7)
11. CD-4 HI-BLEND SWITCH (S14)
12. SIGNAL METER
13. SPEAKERS SELECTOR SWITCH (S12)
14. BASS CONTROL
15. TREBLE CONTROL
16. LOW FILTER SWITCH (S11)
17. HIGH FILTER SWITCH (S10)
18. LEFT-REAR CH. LEVEL CONTROL
19. RIGHT-REAR CH. LEVEL CONTROL
20. RIGHT-FRONT CH. LEVEL CONTROL
21. LOUDNESS SWITCH (S8)
22. AUDIO MUTING SWITCH (S9)
23. MODE SWITCH (S2)
24. SELECTOR SWITCH (S1)
25. TUNING CONTROL

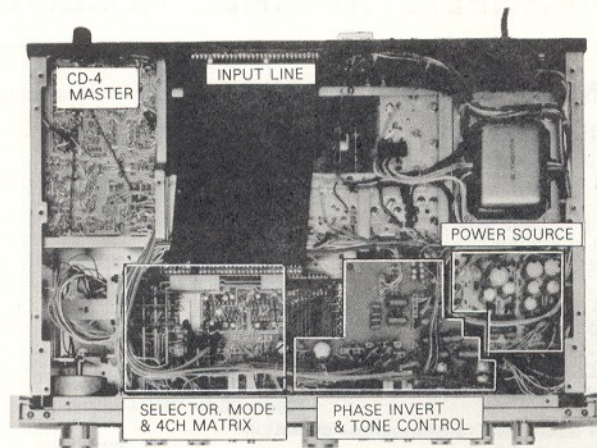
26. GROUND TERMINAL
27. PHONO INPUT [MM AND SC] TERMINALS
28. AUX INPUT TERMINALS
29. 4CH. TAPE MONITOR 3 TERMINALS
30. 4CH. TAPE MONITOR 2 TERMINALS
31. 4CH. TAPE MONITOR 1 TERMINALS
32. CIRCUIT PROTECTION FUSES.....Front Channel
33. 4CH. MAIN SPEAKER TERMINALS
34. 4CH. REMOTE SPEAKER TERMINALS
35. FM EXT. ANTENNA TERMINALS
36. AC OUTLET.....Switched
37. CARTRIDGE SELECTOR SWITCH (S16)
38. 30kHz COMPENSATOR SWITCH (S15)
39. 4CH. MPX OUTPUT TERMINAL
40. CIRCUIT PROTECTION FUSES.....Rear Channel
41. AM EXT. ANTENNA TERMINAL
42. AC OUTLET.....Unswitched



LOCATION OF CIRCUIT BOARDS



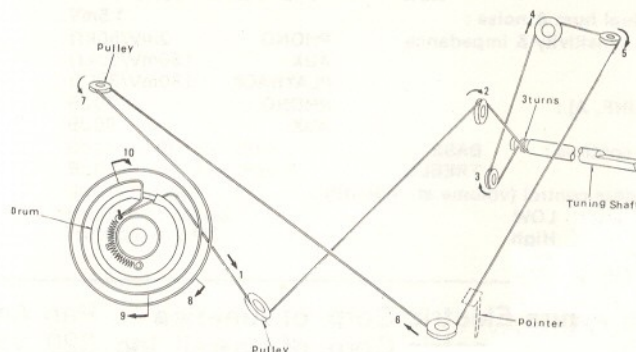
Top View



Bottom View

DIAL CORD INSTALLATION GUIDE

1. Dial cord length is 66-7/8" (170cm).
2. Tuning gang is positioned at maximum capacity.
(Frequency is minimum.)
3. Arrow marks (1~10) indicate correct order and direction of stringing dial cord.



■ TO REMOVE TUNER CIRCUIT

1. Remove four (4) cabinet mounting screws.
2. Remove cabinet from chassis.
3. Remove control knobs from front panel as shown Cabinet and Chassis Parts Location.
4. Remove six (6) front panel mounting black screws, nos. 1~6, as figure 2.
5. Remove front panel from chassis.
6. Remove ten (10) tuner circuit mounting black screws, no. 7~16, as figure 2 and 3.
7. Then tuner circuit can be moved in front of chassis as figure 1, and remove tuner circuit from chassis.

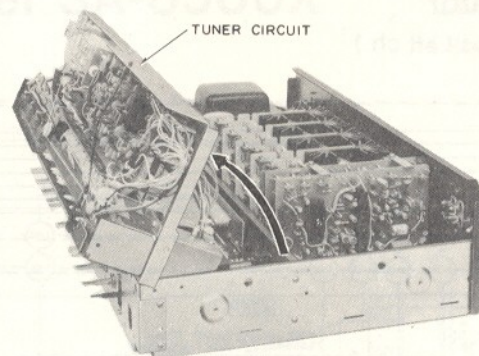


Fig. 1

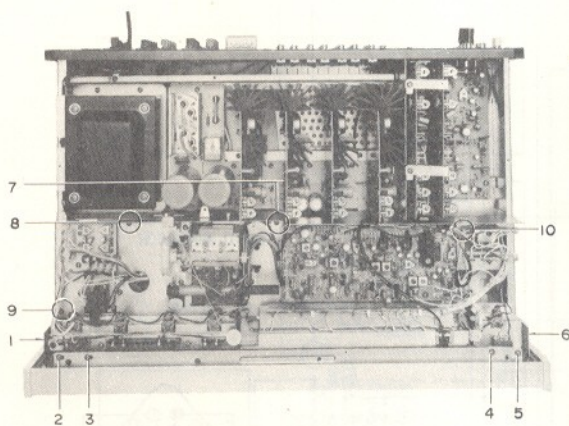


Fig. 2

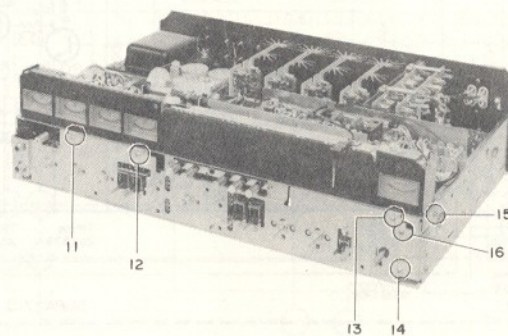


Fig. 3

■ SERVICE AID

How to install and remove the connection socket

1. Insert the lead wire into the lead wire pin clamp. (See fig. 1-①)
2. Bend the tabs of the lead wire pin clamp using radio pliers to attach the lead wire. (See fig. 1-② and ③)
3. Insert the lead wire pin clamp, to which the lead wire has been attached, into the connection socket. (See fig. 2)
4. In order to remove the lead wire pin clamp from the connection socket, insert an eyeletter into the socket hole and touch it to the lead wire pin clamp stop. (See fig. 3-①)
5. Bend the stop inward toward the lead wire pin clamp and pull out the lead wire pin clamp. (See fig. 3-②)

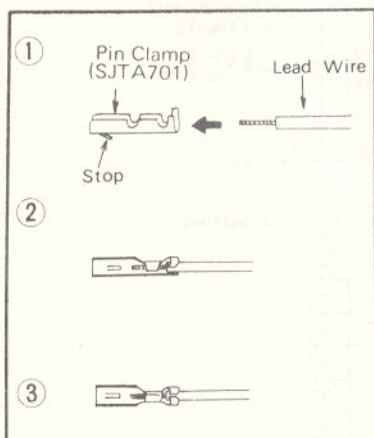


Fig. 1

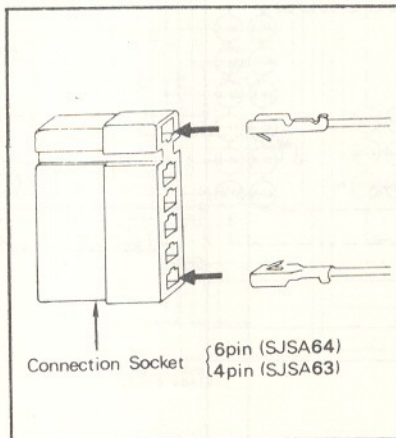


Fig. 2

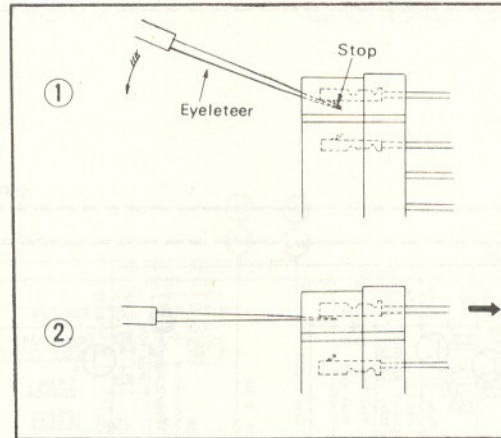
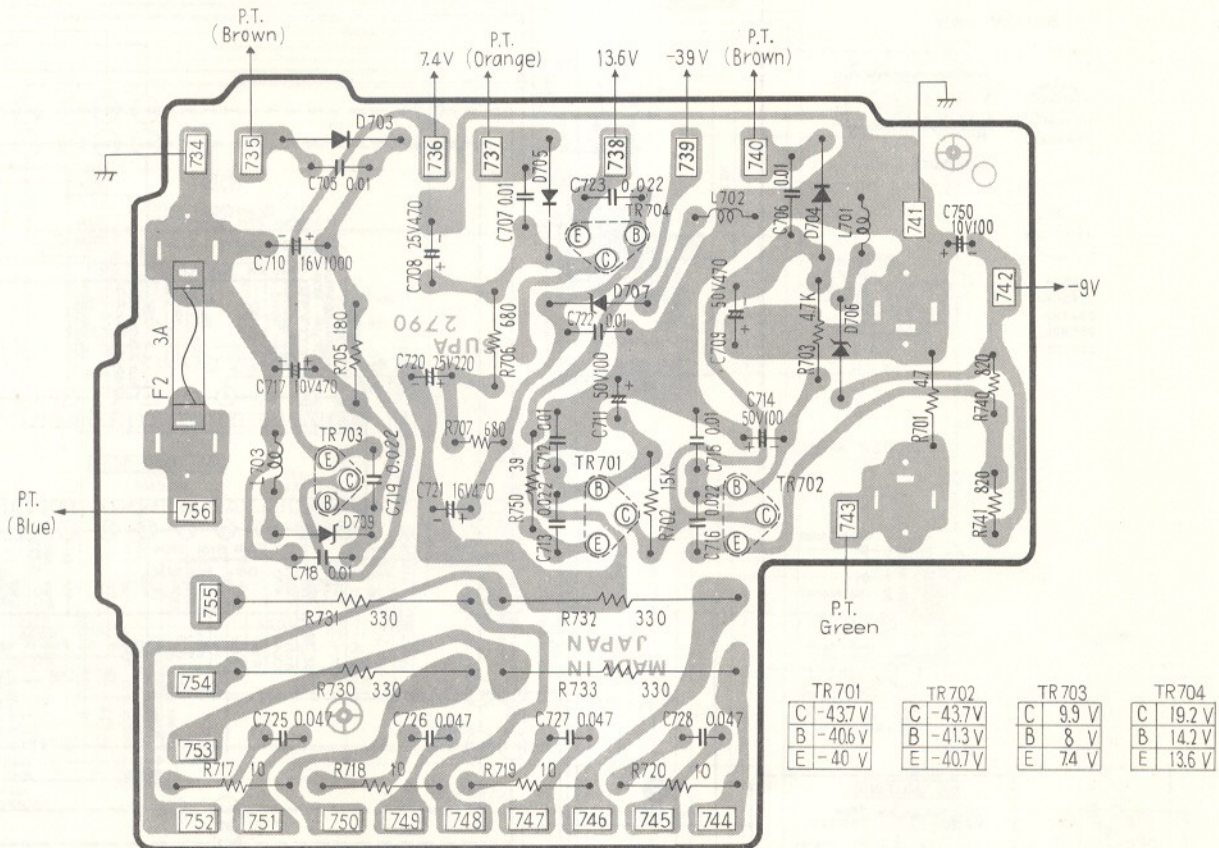
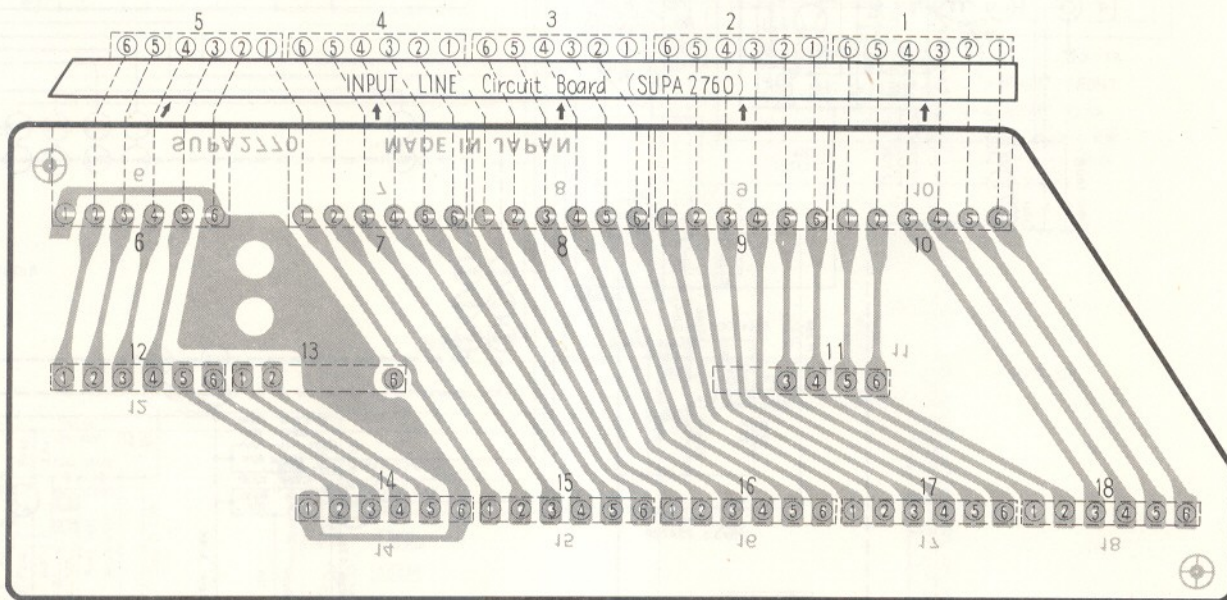


Fig. 3

POWER SOURCE Circuit Board

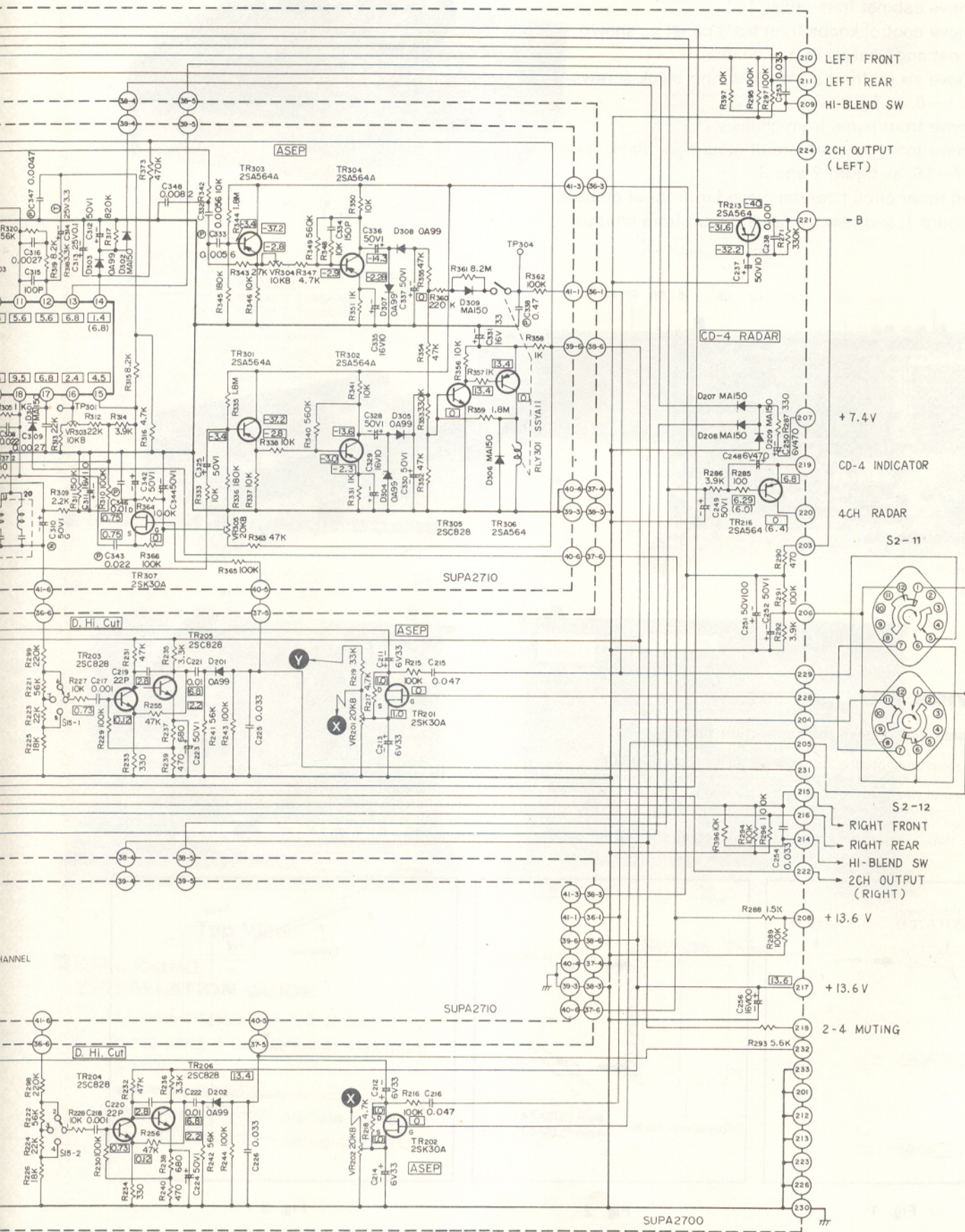


INPUT LINE CONNECTION Circuit Board



4 Demodulator

(Right ch. is same as Left ch.)



ALIGNMENT INSTRUCTIONS- ---READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Notes :

- | | |
|--|---|
| <p>1. Volume control Minimum (Main Amp Alignment)
Variable (VU Meter Alignment)</p> <p>2. Speakers switch Main</p> <p>3. Selector switch Aux</p> <p>4. Mode switch 4ch. Discrete</p> <p>5. VU meter switch Normal (OFF)</p> <p>6. Maintain line voltage 120V</p> | <p>7. The I_{cq} adjustment should be started 1~3 minutes after setting the power switch to the ON position.</p> <p>8. Before adjusting, I_{cq} adjusting volumes (VR602 ×4) should be turned to the left side completely.</p> <p>9. Adjust all channel (Left-Front, Left-Rear, Right-Front and Right-Rear) by following adjustment method.</p> |
|--|---|

MAIN AMPLIFIER ALIGNMENT

CIRCUIT	DC VTVM CONNECTION	ADJUSTMENT POINTS	REMARKS
1	DC Unbalance	Connect DC VTVM between TEST POINT ⊗ and TEST POINT ⊙	VR601 Make sure that DC VTVM becomes 0mV
2	I _{cq}	Connect DC VTVM between TEST POINT ⊙ and TEST POINT ⊚	VR602 Make adjustment so that the indication on DC VTVM becomes 4mV.

VU METER ALIGNMENT

INPUT	OUTPUT	ADJUSTMENT POINTS	REMARKS
Connect oscillator and VTVM to AUX terminal of set rear panel. (Input 300mV 1kHz)	Connect VTVM to speaker terminals. Output level ... 16V, 8Ω	VR51 (L-Front) VR52 (R-Front) VR53 (L-Rear) VR54 (R-Rear)	Make adjustments so that the indication on VU meter of set becomes 0dB.

Notes :

- | | |
|---|--|
| <p>1. Volume control Maximum (AM-RF)
Minimum (AM-IF, FM-IF)
Variable (FM-RF)</p> <p>2. Bass and treble control Center</p> <p>3. Selector switch AM
FM-Auto (FM-RF, FM-IF)</p> <p>4. Loudness switch OFF</p> | <p>5. Muting switch OFF</p> <p>6. Speakers switch Main</p> <p>7. Tape-monitor switch Source</p> <p>8. Mode switch Stereo</p> <p>9. Maintain line voltage at 120 volts.</p> <p>10. Output of signal generator should be no higher than necessary to obtain an output reading.</p> |
|---|--|

SIGNAL GENERATOR or SWEEP GENERATOR	RECEIVER DIAL SETTING [DISTANCE]	INDICATOR (VTVM or SCOPE)	ADJUSTMENT POINTS	REMARKS
CONNECTION	FREQUENCY			

AM ALIGNMENT

4	High side through 0.001μF to antenna terminal. Common to chassis.	455kHz (20kHz Sweep)	Point of non-interference	Connect vert. amp. of scope to TP2.	T1 (1st IFT) T2 (2nd IFT)	Adjust for maximum output.
5	Fashion loop of several turns of wire and radiate signal into loop of receiver.	550kHz (30% Mod. with 400Hz)	550kHz [5.5mm (3/16")]	Connect meter to speakers terminal of set.	L9 (OSC Coil) L201 (ANT Coil)	Adjust for maximum output. Adjust L201 by moving coil bobbin along ferrite core.
6	Fashion loop of several turns of wire and radiate signal into loop of receiver.	1500kHz (30% Mod. with 400Hz)	1500kHz [157.2mm (6 3/16")]	Connect meter to speakers terminal of set.	CT5 (OSC Trimmer) CT4 (ANT Trimmer)	Adjust for maximum output. Repeat steps (5) and (6)

FM-IF ALIGNMENT

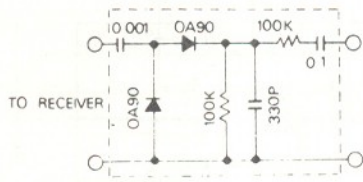
7			Point of non-interference.	Connect DC VTVM between TP104 and TP105.	T102 (FM DISCRI IFT)(S)	Make sure that VTVM becomes 0V.
8	High side through 0.001μF to TP1. Common to chassis.	10.7MHz (400kHz Sweep)	Point of non-interference.	Connect vert. amp. of scope through detector to TP101. Refer to figure 1.		Confirm center frequency.
9	High side through 0.001μF to TP1. Common to chassis.	10.7MHz (400kHz Sweep)	Point of non-interference.	Connect vert. amp. of scope to TP102.	T103 (Muting IFT) (P) T104 (Muting IFT) (S)	Adjust for maximum sharp and proper linearity. Adjust to center frequency as step-(8) Refer to figure 2.

FM-RF ALIGNMENT

10	Connect to FM antenna terminal through FM dummy antenna. (Refer to fig. 3)	90MHz (100% Mod. with 400Hz)	90MHz [20.7mm (3/32")]	Output meter across speaker terminals.	L6 (FM OSC Coil) * L4 (FM DET Coil) L2 (FM ANT Coil)	Adjust for maximum output.
11	Connect to FM antenna terminal through FM dummy antenna. (Refer to fig. 3)	106MHz (100% Mod. with 400Hz)	106MHz [147.2mm (5 7/32")]	Output meter across speaker terminals.	CT3 (FM OSC Trimmer) CT2 (FM DET Trimmer) CT1 (FM ANT Trimmer)	Adjust for maximum output. Repeat steps (10) and (11)

* Use six cornered alignment tool for aligning FM OSC coil (L6)

SIGNAL GENERATOR		RECEIVER DIAL SETTING	INDICATOR (DISTORTION METER and SIGNAL METER)	ADJUSTMENT POINTS	REMARKS
CONNECTION	FREQUENCY				
MUTING LEVEL ALIGNMENT					
Note : Muting switch.....ON					
12	Connect to FM antenna terminal through FM dummy antenna.	98 MHz (100% Mod. with 400 Hz) Output 28 dB (IHF)	98 MHz (Input Level 16dB)	Output meter or speaker across speaker terminals.	VR102 (Muting Level) Adjust so that output can be obtained.
FM-MONO DISTORTION ALIGNMENT					
Note : Muting switch OFF					
13	Connect to FM antenna terminal through FM dummy antenna.	98 MHz (100% Mod. with 400 Hz) Output 72 dB	98 MHz	Connect distortion meter to speaker terminals.	T101 (FM DISCRI IFT) (P) Adjust for minimum distortion.
SIGNAL METER ALIGNMENT					
14	Connect to FM antenna terminal through FM dummy antenna.	98 MHz (30% Mod. with 400 Hz) Output 72 dB	98 MHz	Signal meter of set.	VR101 (Indicated Position) Adjust for about 4.8 point of signal meter indication.
Notes : Stereo-modulator Connect stereo-modulator output to EXT. MOD. terminal of signal generator. Internal OSC 1kHz. Pilot signal modulation 10%. Signal generator Frequency approximately 98 MHz. Output level 72 dB. Modulation mode to FM. 1. Selector FM-Auto 2. Bass and treble control Center 3. Speakers switch Main 4. Mode switch Stereo 5. Maintain line voltage at 120 volts. 6. Muting switch OFF 7. Loudness switch OFF 8. Tape monitor switch Source 9. Dummy load 8 Ω					
19kHz, 38kHz COIL and PHASE ALIGNMENT					
SIGNAL GENERATOR CONNECTION		STEREO MODULATOR MODE and MOD. RATE	INDICATOR (VTVM or SCOPE)	ADJUSTMENT POINTS	REMARKS
15	FM antenna terminal through dummy antenna.	Pilot signal to ON.	Connect scope to TP103. Common to chassis.	T105 (19kHz Coil)	Adjust for maximum output.
16	"	L (or R) 30% Mod.	Connect scope to speaker terminals.	T106 (38 kHz Coil)	Adjust for minimum right (or left) output.
SEPARATION ALIGNMENT					
17	FM antenna terminal through dummy antenna.	L (and R) 30% Mod.	Output meter across speaker terminals through low pass filter. (Low Pass Filter fc=15kHz~19kHz)	VR103 (Separation)	Adjust for minimum right (and left) output.



DETECTOR
Fig. 1

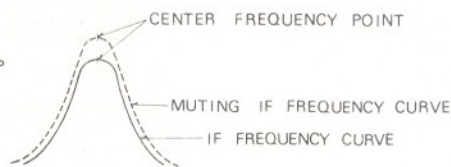
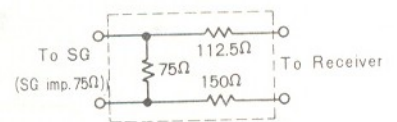
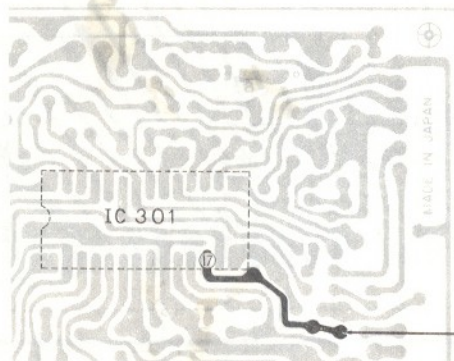


Fig. 2



300Ω FM Dummy Antenna

Fig. 3



CD-4 Demodulator
Printed Circuit Board

Fig. 4

CD-4 DEMODULATOR ALIGNMENT INSTRUCTIONS

Notes :

- | | |
|--|---|
| 1. Volume control Minimum
(When separation alignment is variable)
2. Channel level control Maximum
3. Selector switch PHONO
4. Mode switch DISCRETE (CD-4) | 5. 30kHz compensator switch NORMAL
6. Cartridge selector switch MM
7. Other controls Optional position
8. Maintain line voltage at rated voltage.
9. Adjust left channel and right channel by following adjustment method |
|--|---|

AF OSCILLATOR or 4CH PLAYER CONNECTION	INPUT FREQUENCY & INPUT LEVEL	INDICATOR CONNECTION	ADJUSTMENT POINTS	REMARKS
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PLL FREE RUNNING FREQUENCY ALIGNMENT

1		Connect frequency counter to No. 17 pin of IC301 (Refer to fig. 4)	VR303	1. TP302 connect to chassis through electrolytic capacitor (Refer to fig 5) 2. Make adjustment so that the indication on frequency counter becomes 30kHz \pm 250Hz.
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AUTOMATIC NOISE REDUCTION SYSTEM (ANRS) ALIGNMENT

2	Connect OSC to No. 15 pin of IC301 through electrolytic capacitor. (Refer to fig. 7)	600Hz (40mV)	Connect VTVM to REC OUT terminal. (left and right front rec. output)	1. TP304 connect to chassis. (Refer to fig. 6) 2. Resistor connect between No. 14 pin of IC301 and +B voltage line. (Refer to fig. 7) 3. This output voltage is defined as the specified voltage. [about 100mV]
3	Connect OSC to No. 15 pin of IC301 through electrolytic capacitor. (Refer to fig. 7)	600Hz (4mV)	Connect VTVM to REC OUT terminal. (left and right front rec. output)	VR301 VR302 4. Adjust VR301 and VR302 until 1/30 (-30dB) the specified voltage level, which was measured at step 2 is reached.

MAIN CHANNEL GAIN ALIGNMENT

4	Connect OSC to PHONO (MM) terminal. (Left and Right)	600Hz (1.6mV)	Connect VTVM to REC OUT terminal. (Left and right front rec. output)	VR201 (Left) VR202 (Right) 1. TP304 connect to chassis. (Refer to fig. 6) 2. Make adjustment so that the indication on VTVM becomes 100mV. (Left and Right)
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DYNAMIC HIGH CUT ALIGNMENT

Note : Adjust when replacing transistor TR307 (2SK30A).

5	Connect OSC to PHONO (MM) terminal. (Left and Right)	30kHz (2.2mV)	Connect circuit tester to TR307. (between Drain and Source) Refer to fig. 8.	VR305 Make adjustment so that the indication on circuit tester becomes 5k Ω .
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SEPARATION ALIGNMENT

Notes :

1. Cartridge selector switch Semi Conductor
2. Separation alignment record SPR123 (Accessory of Model SH-400)
3. Use a 4CH player and SC 4CH cartridge. (Cartridge No. EPC-450C-II)

6	Connect 4CH player to PHONO (SC) terminal and play CD-4 alignment record.	Separation Alignment Band (Left Side)	VU (output level) meter of set front panel.	VR304 (Left) Adjust for minimum left rear VU meter indication.
7	Connect 4CH player to PHONO (SC) terminal and play CD-4 alignment record.	Separation Alignment Band (Right Side)	VU (output level) meter of set front panel.	VR304 (Right) Adjust for minimum right rear VU meter indication.

Note :

If you removed the CD-4 demodulator p.c.b. assembly that are used at left channel (right channel) side, please do not install it at right channel (left channel) side. Also, if you changed the CD-4 demodulator p.c.b. assembly, it becomes necessary to make re-adjustment.

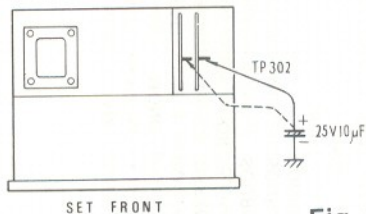


Fig. 5

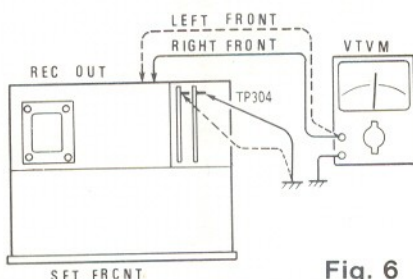


Fig. 6

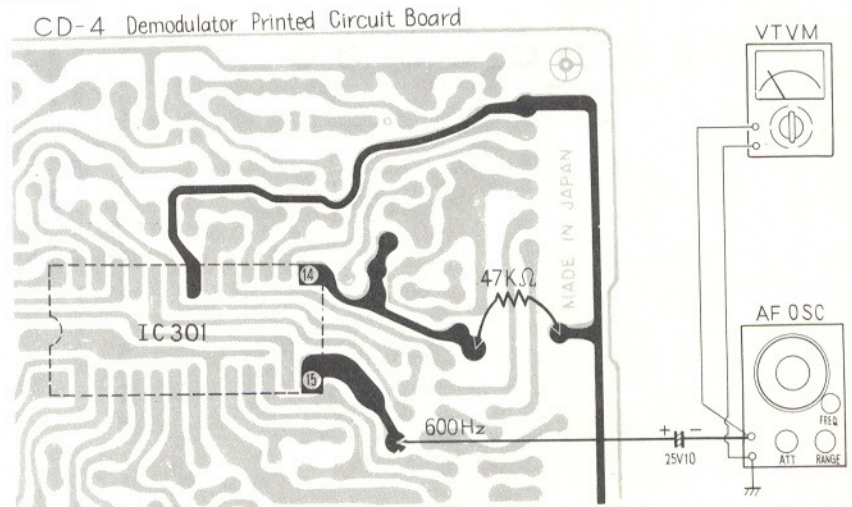


Fig. 7

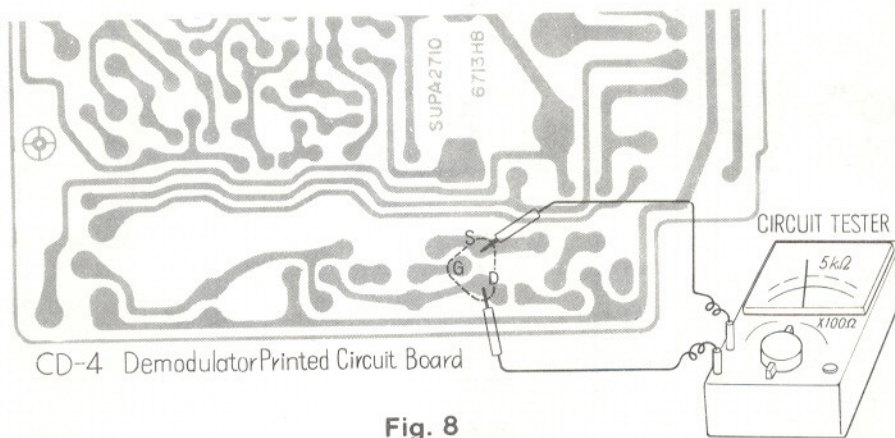
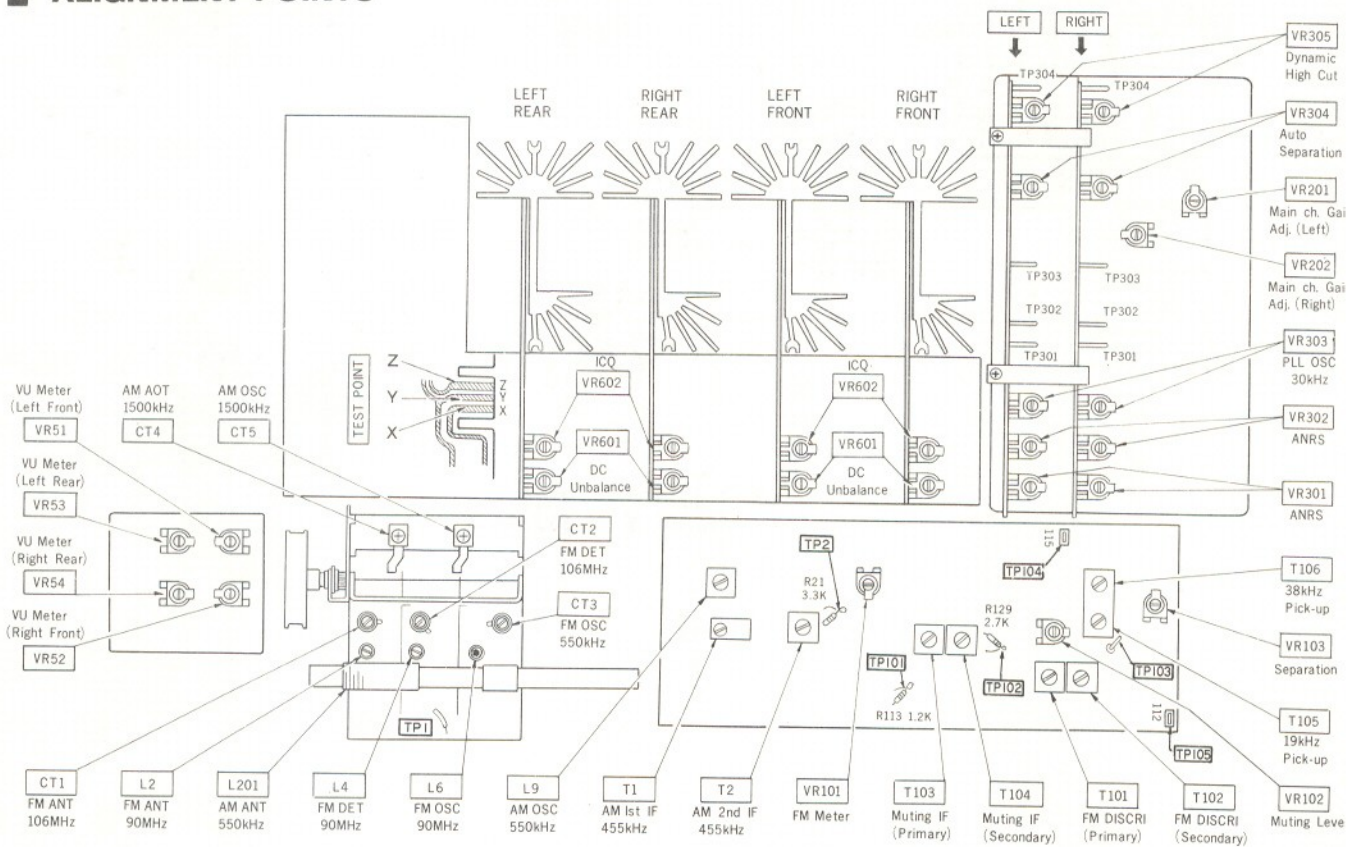


Fig. 8

ALIGNMENT POINTS



TO REMOVE IC OF CD-4 DEMODULATOR

1. Remove CD-4 demodulator p.c.b. of set.
2. Insert screw driver between IC301 and IC socket. (As shown fig. 9)
3. Turn screw driver (Left or Right side) 90 degrees. (As shown fig. 10)
4. Remove IC301 from IC socket.

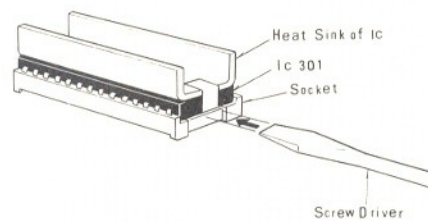


Fig. 9

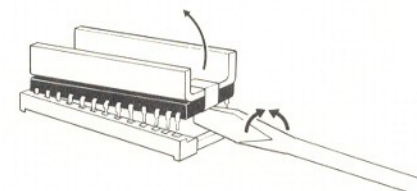
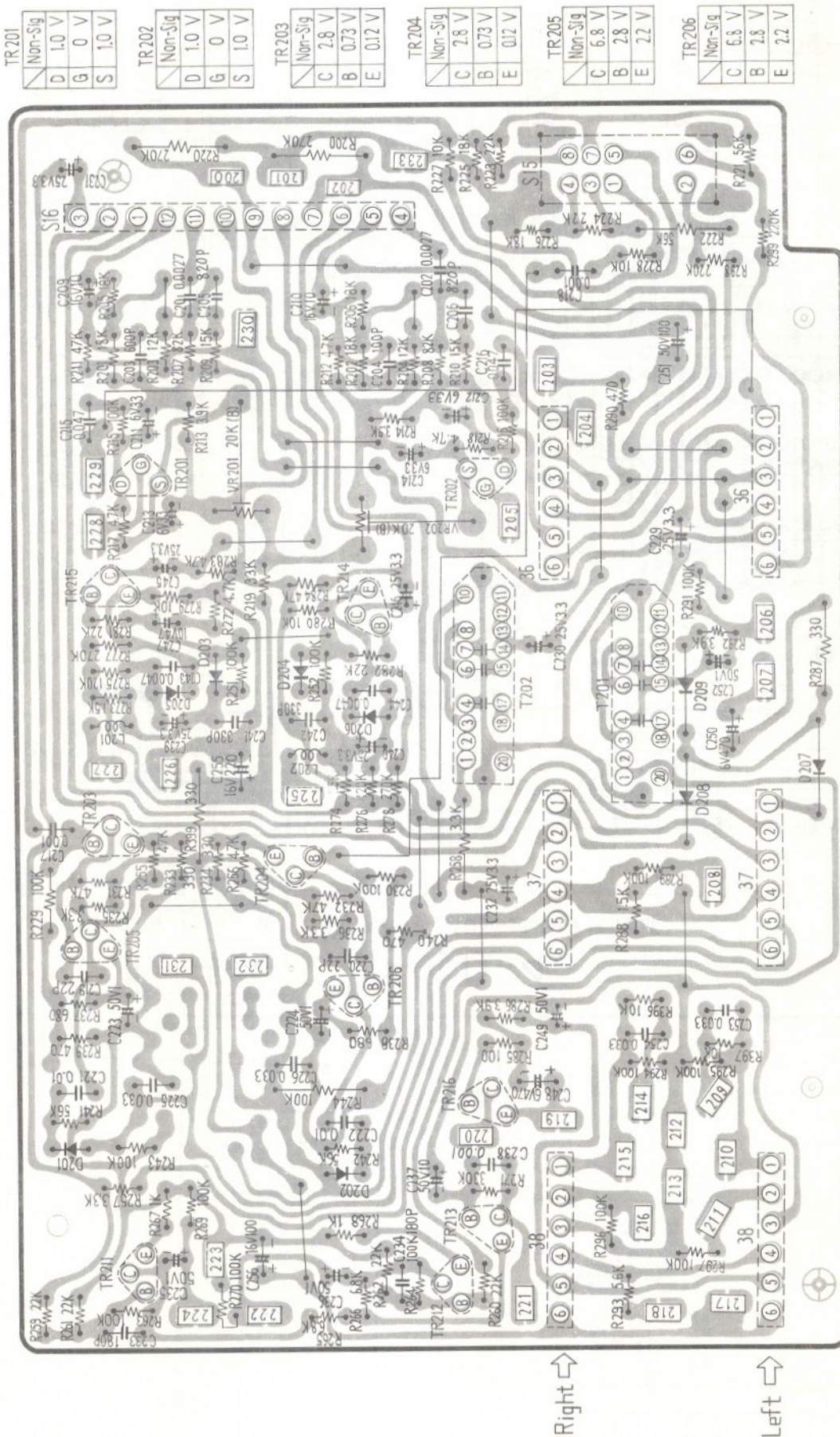


Fig. 10

CD-4 MASTER Circuit Board



TR201

Non-Sig
D 1.0 V
G 0 V
S 1.0 V

TR202

Non-Sig
D 1.0 V
G 0 V
S 1.0 V

TR203

Non-Sig
C 2.8 V
B 0.73 V
E 0.12 V

TR204

Non-Sig
C 2.8 V
B 0.73 V
E 0.12 V

TR205

Non-Sig
C 6.8 V
B 2.8 V
E 2.2 V

TR206

Non-Sig
C 6.8 V
B 2.8 V
E 2.2 V

TR216

Non-Sig
CD - 4
C 0 V
B 6.29 V
E 6.8 V

TR215

Non-Sig
C 2.2 V
B 2.8 V
E 2.2 V

TR214

Non-Sig
C 2.2 V
B 2.8 V
E 2.2 V

TR213

Non-Sig
C -40 V
B -32.2 V
E -31.6 V

TR212

Non-Sig
C -15.9 V
B -2.8 V
E -2.2 V

TR211

Non-Sig
C -15.9 V
B -2.8 V
E -2.2 V

CD-4 DEMODULATOR (Left or Right) Circuit Board

TP 304	VR305 - 20K(B)
TR307	Non-Sig
	D 0.75 V
	G 0 V
	S 0.75 V

TR306	Non-Sig
	C 0 V
	B 134 V
	E 134 V

TR305	Non-Sig
	C 134 V
	B 0 V
	E 0 V

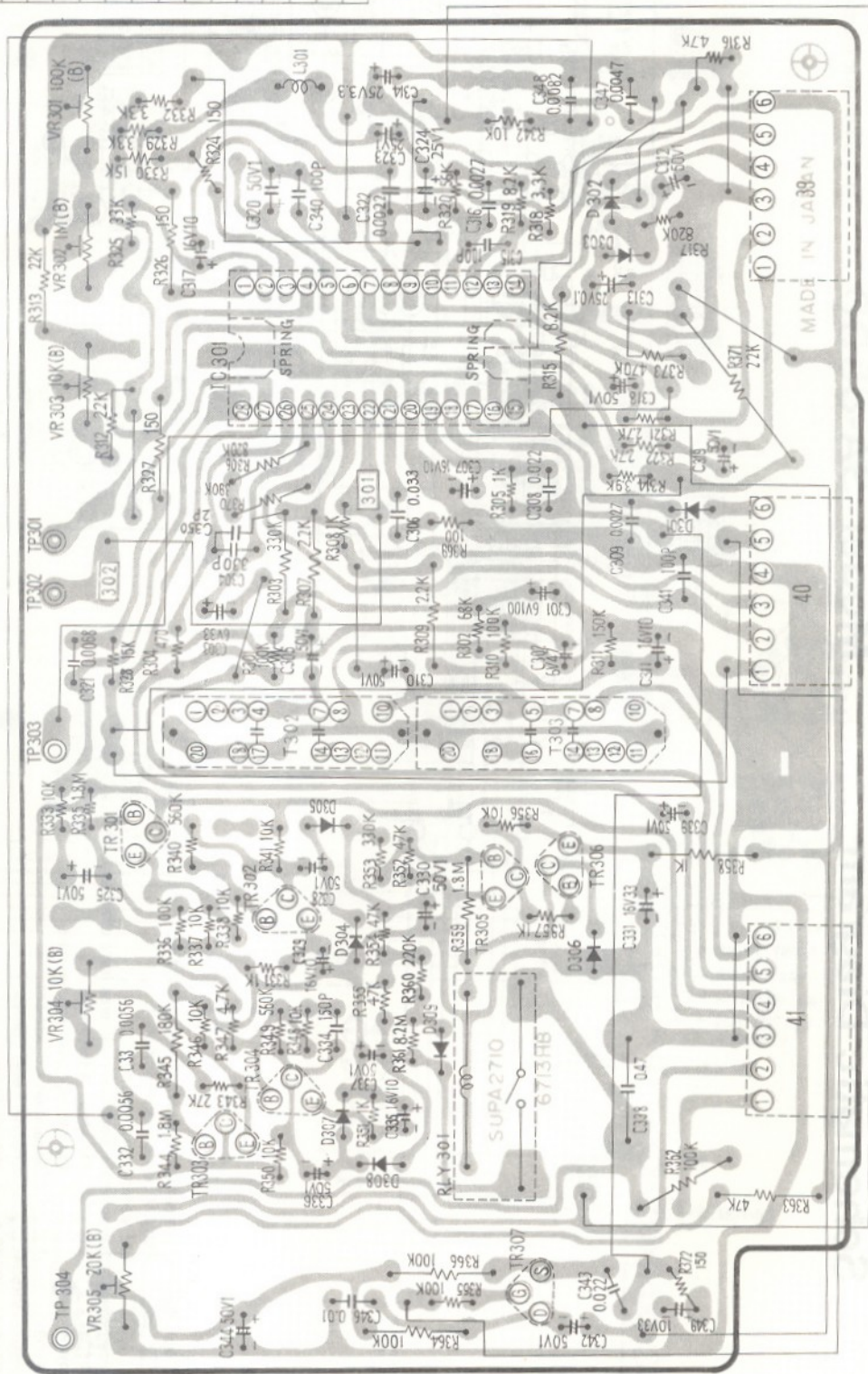
TR304	Non-Sig
	C -14.3V
	B -29 V
	E -228 V

TR303	Non-Sig
	C -37.2 V
	B -34 V
	E -28 V

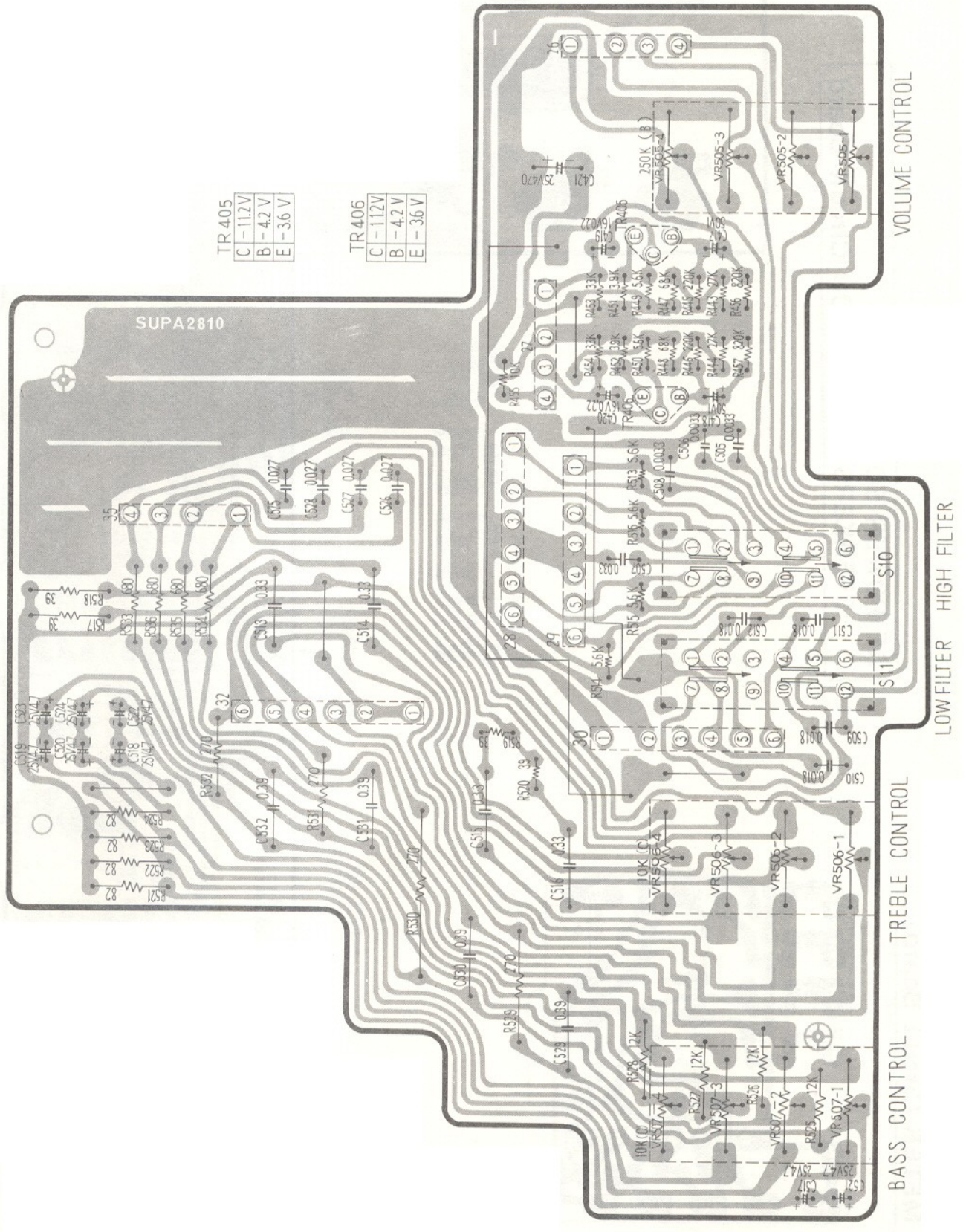
TR302	Non-Sig
	C -13.6 V
	B -3 V
	E -2.3 V

TR301	Non-Sig
	C -37.2 V
	B -34 V
	E -28 V

IC 301	
Non-Sig	Reception
1	5.6 V 15 4.5 V
2	21 V 16 24 V
3	5.6 V 17 68 V
4	5.6 V 18 95 V
5	21 V 19 95 V
6	5.7 V 20 0 V
7	61 V 21 3.4 V
8	131 V 22 3.4 V
9	5.6 V 23 6.1 V
10	1.4 V 24 5.5 V
11	5.6 V 25 0.6 V
12	5.6 V 26 1.1 V
13	68 V 27 5.7 V
14	1.4 V 28 4.8 V
CD-4	
14	6.8 V



VOLUME, TONE CONTROL & PHASE INVERTER Circuit Board



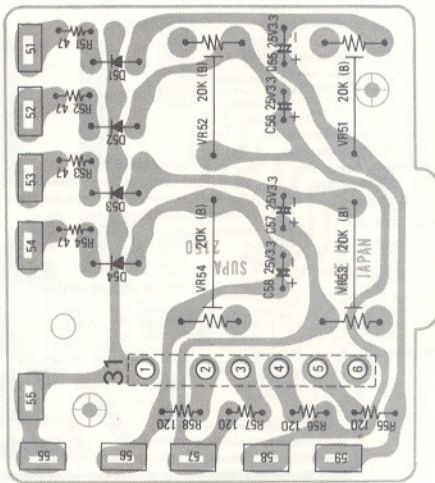
TR 405

C	-112V
B	-4.2 V
E	-3.6 V

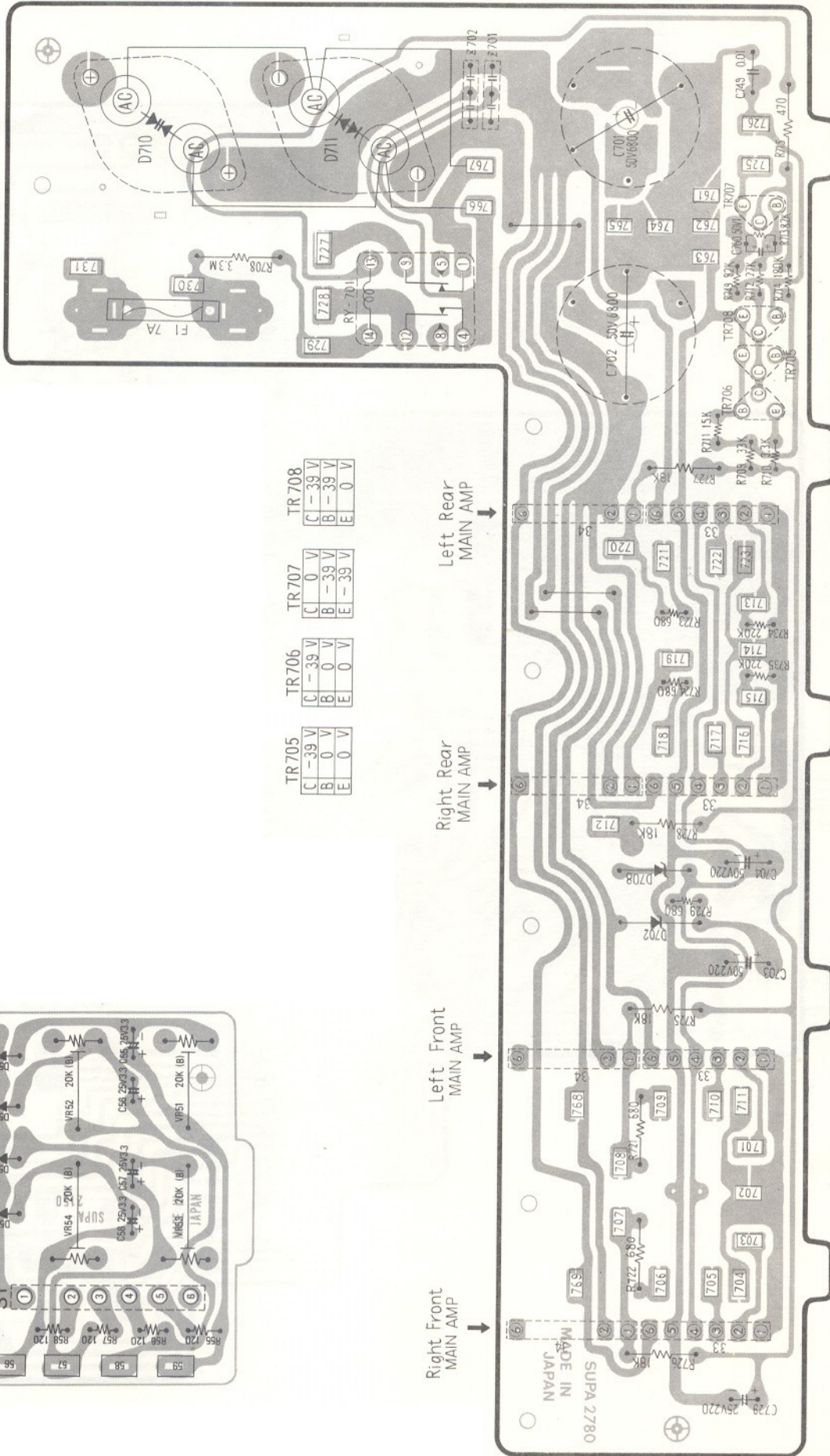
TR 406

C	-112V
B	-4.2 V
E	-3.6 V

VU METER Circuit Board

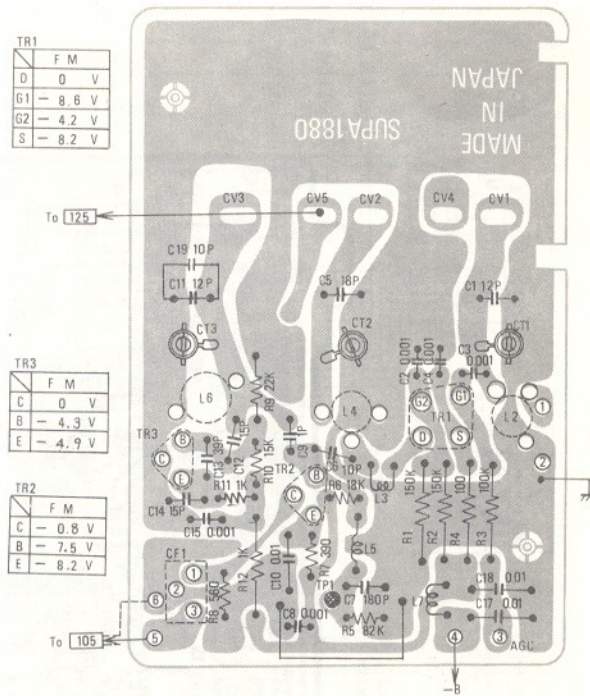


AF POWER SOURCE & SPEAKERS PROTECTION Circuit Board



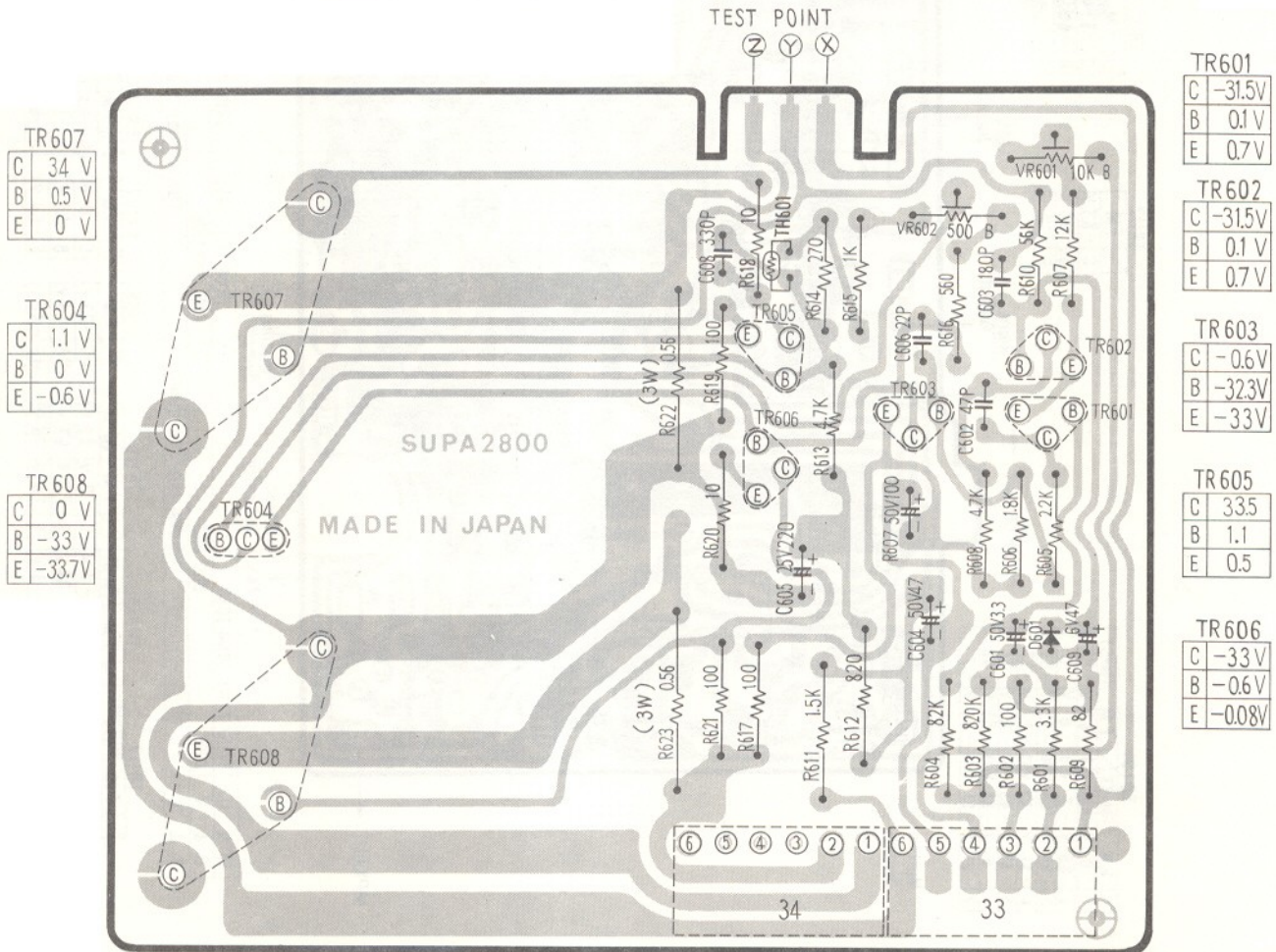
TR705	TR706	TR707	TR708
C -39 V	C -39 V	C 0 V	C -39 V
B 0 V	B 0 V	B -39 V	B -39 V
E 0 V	E 0 V	E -39 V	E 0 V

FM-RF Circuit Board



MAIN AMPLIFIER Circuit Board (Left-Front Channel)

Other channels (Right-Front, Left-Rear and Right-Rear) is same as Left-Front channel.



SELECTOR/MODE SWITCH & 4CH MATRIX Circuit Board

Circuit View on Top of p.c.b.

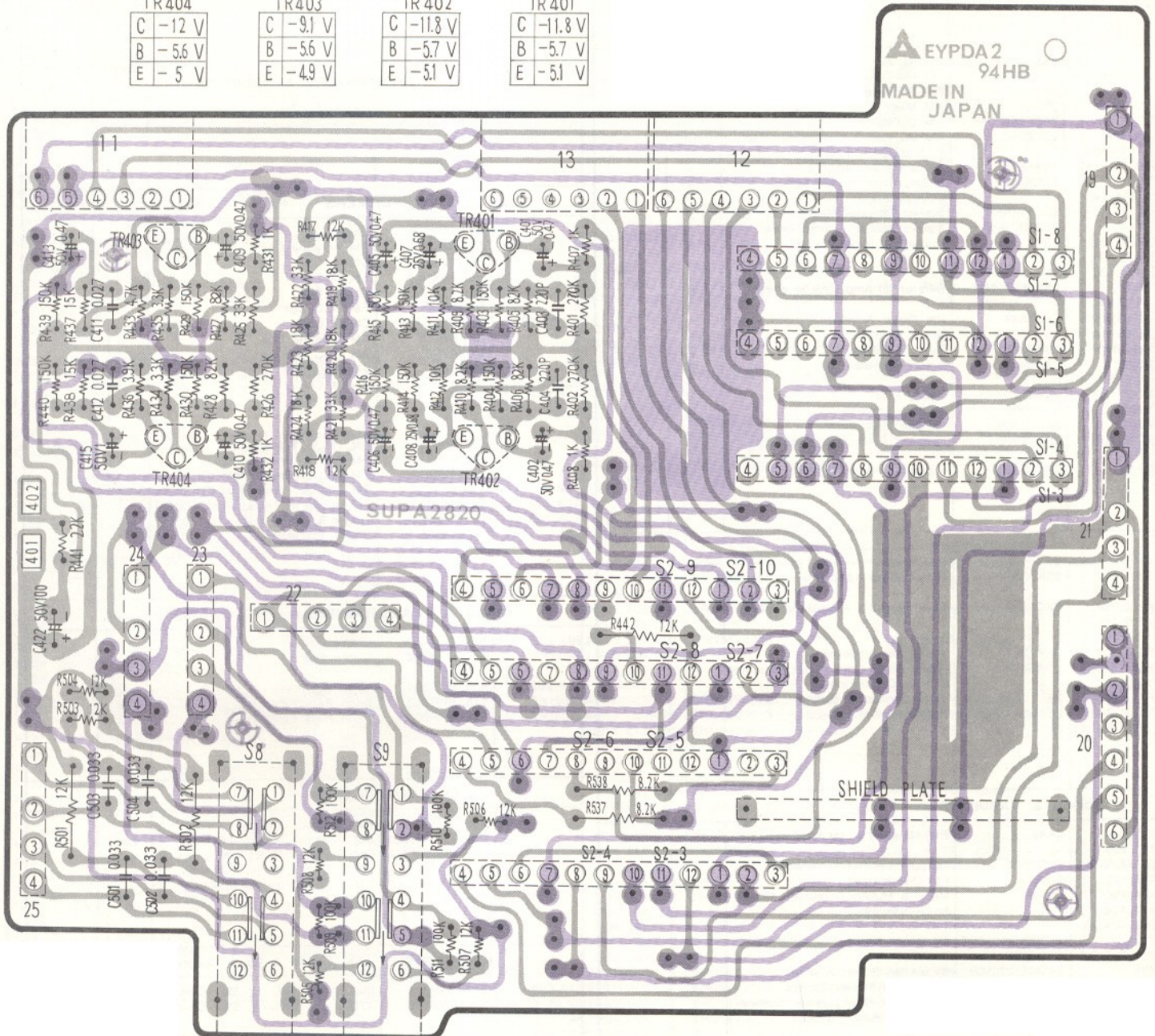
Circuit View on Bottom of p.c.b.

TR404	
C	-12 V
B	-5.6 V
E	-5 V

TR403	
C	-9.1 V
B	-5.6 V
E	-4.9 V

TR402	
C	-11.8 V
B	-5.7 V
E	-5.1 V

TR401	
C	-11.8 V
B	-5.7 V
E	-5.1 V



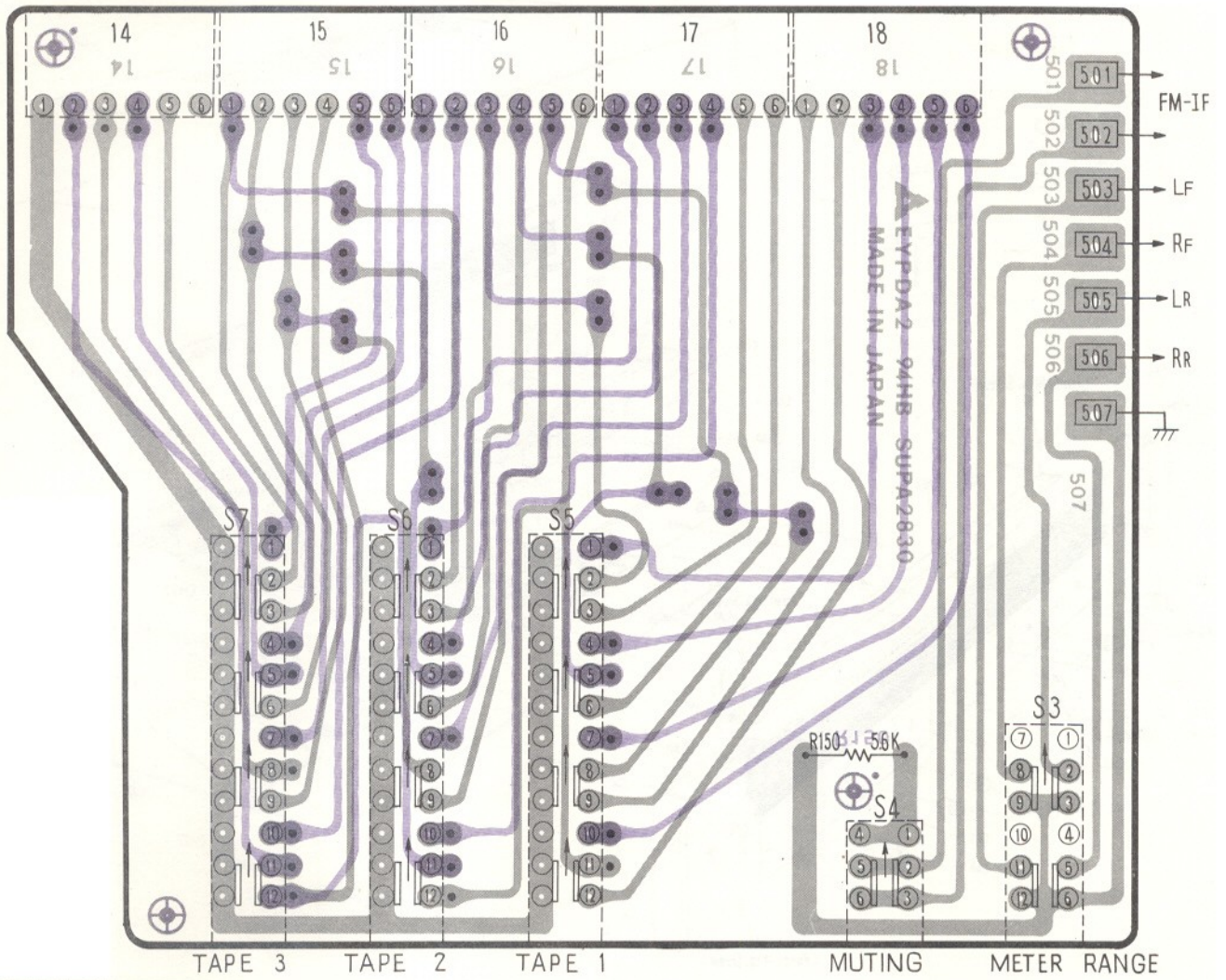
LOUDNESS
(S8)

AUDIO
MUTING
(S9)

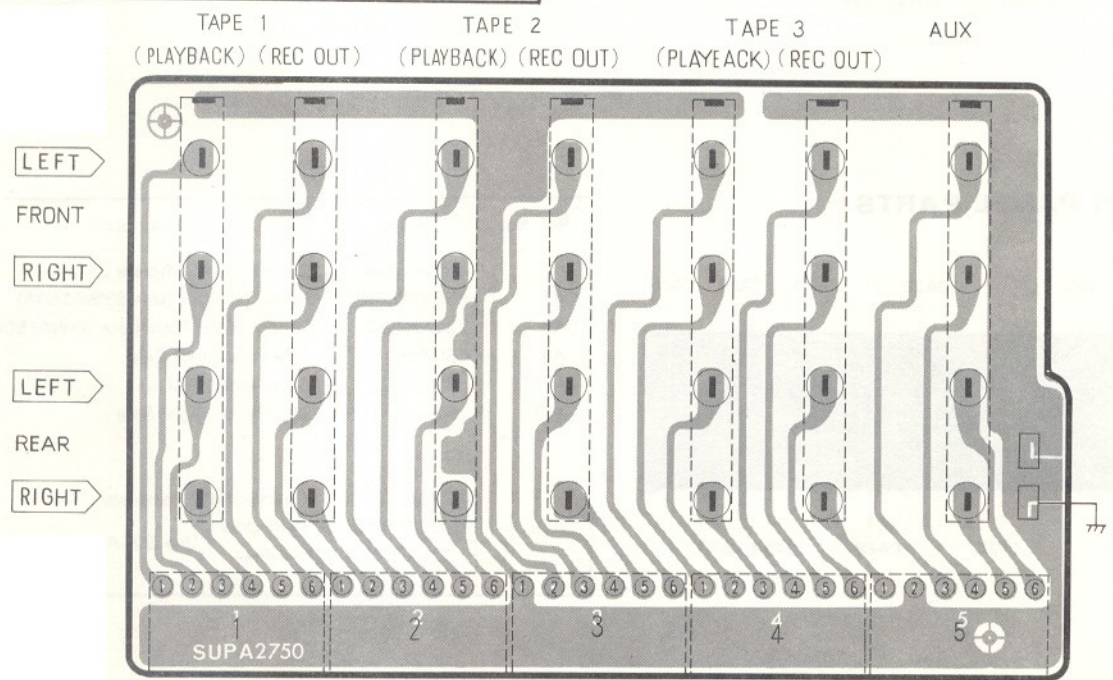
MODE SWITCH
(S2)

SELECTOR SWITCH
(S1)

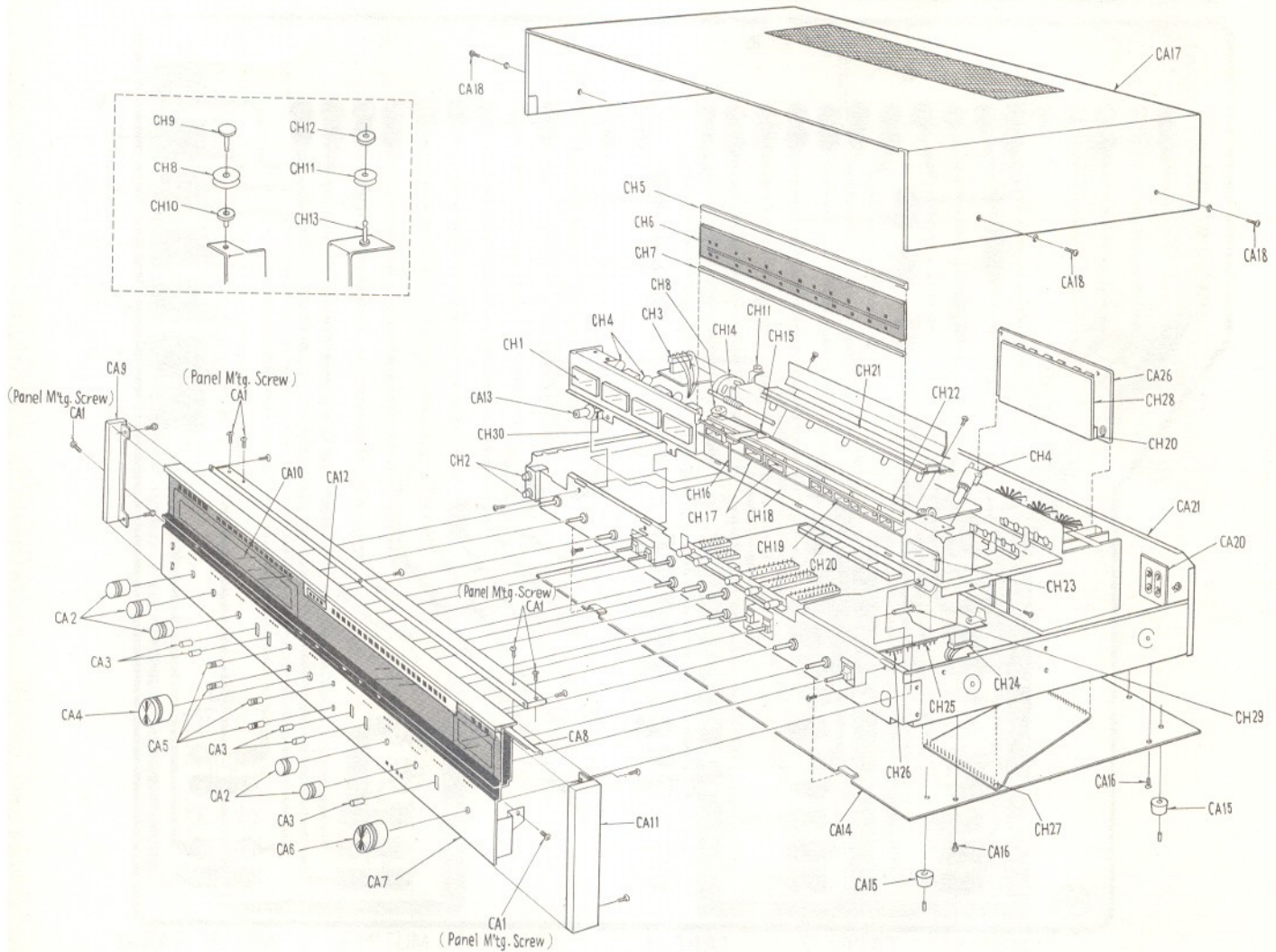
TAPE MONITOR SWITCH Circuit Board



INPUT TERMINAL Circuit Board

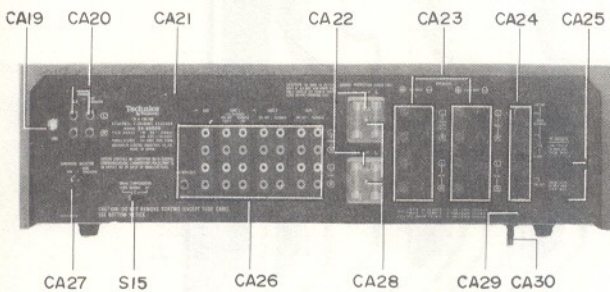


CABINET & CHASSIS PARTS LOCATION



CA1 (6 pcs.) -----Panel M'tg. Screws, Black
 CA18 (4 pcs.) -----Cabinet M'tg. Screws
 CA16 (8 pcs.) -----Bottom Board M'tg. Screws, Red

REAR PANEL PARTS



Ref. No.	Part No.	Description	Per Set (Pcs.)
	SYWA150A	Front Panel, Complete	1
CA7	SGWA1230	Panel Indicator (Use SYWA150A)	(1)
CA8	SUSA42-2	Spring, Glass Plate (Use SYWA150A)	(2)
CA9	SGXA61	Side Panel, Left Side	1
CA10	SGUA22	Glass Plate, Dial	1
CA11	SGXA60	Side Panel, Right Side	1
	SDTA5-1S	Tuning Shaft, Complete	1
CH29	SDTA6005	Shaft Only	(1)
	SDXA705S	Flywheel } Use SDTA5-1S	(1)

REPLACEMENT PARTS LIST

NOTES

1. Part numbers are indicated on most mechanical parts.
Please use this part number for parts orders.

Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks	Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks
INTEGRATED CIRCUIT FM Circuit					DIODES CD-4 Demodulator Circuit				
IC101	SVIALA3300	FM MPX Circuit	1		D201, 202, (303, 304, 305, 307, 308)×2	0A99	Lock Range Control, 2ch, 4ch. Muting & Auto Separation	12	
INTEGRATED CIRCUIT CD-4 Demodulator Circuit					THERMISTORS & POSISTOR				
IC(301)×2	SVIQSI5022	CD-4 Demodulator	2		D203, 204, 205, 206, 207, 208, 209, (301, 302, 306, 309)×2	MA150	Semi Conductor Muting & Noise Cancel, VCO Stop, 2ch. 4ch. Muting & Auto Separation	15	
TRANSISTORS FM, AM, AF & Power Source Circuit					COILS & TRANSFORMERS FM, AM & Power Source Circuit				
TR1	3SK39Q	FM RF Amplifier	1		L1	SLAA4W1-3	Balun Coil	1	
TR2	2SC922M	FM Mixer	1		L2	SLAA4N9	FM Antenna Coil	1	
TR3	2SC839H	FM Oscillator	1		L3	RLQY25S5	Choke Coil	1	
TR4, 5, 6, 101~109	2SC829C	AM Mix, Osc & IF Amplifier, FM IF & Muting Amplifier	12		L4	SLDA4N18	FM DET Coil	1	
TR7, 111, 112	2SA666Q	AM & FM AF Amplifier	3		L5	RLQY15G5	Choke Coil	1	
TR110, (604)×4	2SC828R	Muting Switching & Thermo Compensation	5		L6	SLOA4N9	FM OSC Coil	1	
TR113	2SC1318R	Stereo Indicator Switching	1		L7, 10, 106	SLQX151-1Y	Choke Coil	3	
TR114	2SA733MAP	Stereo Indicator Lamp Driver	1		L8	SLFA2E15	AM Antenna Coil	1	
TR401, 402, 403, 404, 405, 406	2SA722T	4 channel Matrix Circuit	6		L9	SLOA2C6	AM OSC Coil	1	
TR(601, 602)×4	2SA666A-AD3	Differential Amp. (Use in pairs)	8		L101	SLIA4B1	FM AGC Coil	1	
TR(603)×4	2SC983Y	Pre Driver Amplifier	4		L102, 103, 104, 105, 701, 702, 703	SLQX101-2D	Choke Coil	7	
TR(605)×4	2SC1567R	Driver Amplifier	4		T1	RLI7W105S-T	AM 1st IF Transformer	1	
TR(606)×4	2SA794R	Driver Amplifier	4		T2	RLI2C450	AM 2nd IF Transformer	1	
TR(607, 608)×4	2SC793Y	Power Amplifier	8		T101	SLIA4C541	FM DISCRI Transformer (P)	1	
TR701, 702	2SA684Q	Ripple Filter	2		T102	SLIA4C56	FM DISCRI Transformer (S)	1	
TR703	2SD330D	Voltage Stabilizer	1		T103, 104	SLIA4C241	FM Muting IF Transformer, (P)&(S)	2	
TR704	2SC1383R	Voltage Stabilizer	1		T105, 106	SLMA1Z2-K	19kHz & 38kHz Coil	1	
TR705, 706, 708	2SA720R	Speaker Protection Switching	3		T701	SLTA5S5S	Power Transformer	1	○
TR707	2SC1384Q	Protection Relay Driver	1		COILS & TRANSFORMERS CD-4 Demodulator Circuit				
TRANSISTORS CD-4 Demodulator Circuit					CERAMIC FILTERS				
TR201, 202, (307)×2	2SK30A-Y	Gain Control & Lock Range Control	4		CF1, 101, 102	RVFCF10M12CG	FM IF Circuit, Green(10.6MHz)	each 3	
TR203, 204, 205, 206, (305)×2	2SC828R	Lock Range & Auto Separation	6			RVFCF10M12CB	FM IF Circuit, Black(10.65MHz)		
TR211, 212	2SA722T	2 channel Amplifier	2			RVFCF10M12CR	FM IF Circuit, Red(10.7MHz)		
TR213, 216, (306)×2	2SA564R	Ripple Filter, CD-4 Radar Switching & Auto Separation	4			RVFCF10M12CW	FM IF Circuit, White(10.75MHz)		
TR214, 215	2SC1327T	Semi Conductor Muting	2			RVFCF10M12CY	FM IF Circuit, Yellow(10.8MHz)		
TR(301, 302, 303, 304)×2	2SA564A-R	Auto Separation	8		RESISTORS FM, AM, AF & Power Source Circuit				
DIODES & VARIATITE FM, AM, AF & Power Source Circuit					R519, 520	ERD14VJ390	39Ω, 1/4W, ± 5%, Carbon	2	
D1, 2, 3, 4, 101, 109	0A99	FM/AM AGC & AM Detector	6		R32, 51, 52, 53, 54	ERD14VJ470	47Ω, 1/4W, ± 5%, Carbon	5	
D51, 52, 53, 54	RVD10D1	Output Level Meter Detector	4		R122, 127	ERD14VJ820	82Ω, 1/4W, ± 5%, Carbon	2	
D102, 103	2-0A99	FM Discriminator	1pair		R18	ERD14VJ101	100Ω, 1/4W, ± 5%, Carbon	1	
D104, 105, 106, 107, 108, 110, (601)×4	MA150	Meter & Muting Detector, Shock Noise Silencer	10		R55, 56, 57, 58	ERD14VJ181	180Ω, 1/4W, ± 5%, Carbon	4	
D702	SVDAEQA0105T	5V Zener, Shock Noise Silencer	1	○	R126	ERD14VJ221	220Ω, 1/4W, ± 5%, Carbon	1	
D703, 704, 705	SVDA10D1M	Rectifier	3		R116, 151	ERD14VJ271	270Ω, 1/4W, ± 5%, Carbon	2	
D706	SVDAEQB0109	9V Zener, Power Source	1		R146, 147	ERD14VJ331	330Ω, 1/4W, ± 5%, Carbon	2	
D707	SVDAEQA0114R	14V Zener, Power Source	1		R7, 109	ERD14VJ391	390Ω, 1/4W, ± 5%, Carbon	2	
D708	SVDAEQA0115R	15V Zener, Shock Noise Silencer	1		R8, 27, 107	ERD14VJ561	560Ω, 1/4W, ± 5%, Carbon	3	
D709	SVDAEQA0108R	8V Zener, Power Source	1		R137, 707	ERD14VJ681	680Ω, 1/4W, ± 5%, Carbon	2	
D710	RVDSG5TS	Rectifier	1						
D711	RVDSG5TR	Rectifier	1						
V1	EYV320D1R2J3	Variatite, AOC	1						

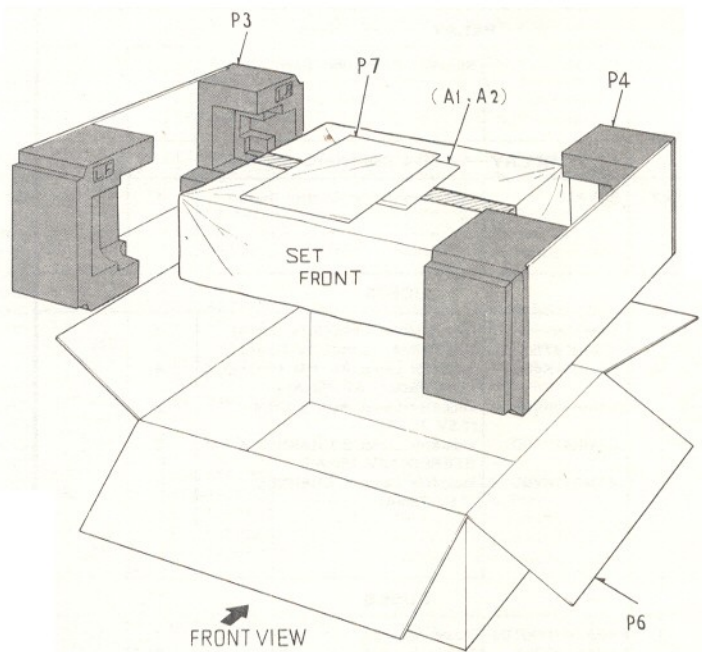
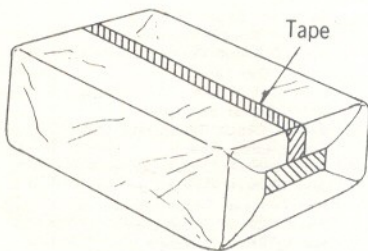
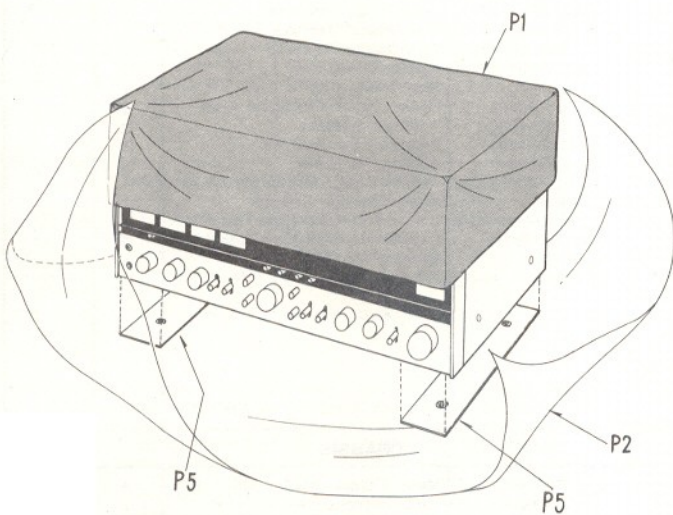
Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks	Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks
R11, 13, 117, 119, 123, 124, 431, 432, 407, 408	ERD14VJ102	1kΩ, 1/4W, ± 5%, Carbon	10		R138	ERD14TJ224	220kΩ, 1/4W, ± 5%, Carbon	1	
R14	ERD14VJ122	1.2kΩ, 1/4W, ± 5%, Carbon	1		R(603)×4	ERD14TJ824	820kΩ, 1/4W, ± 5%, Carbon	4	
R441	ERD14VJ222	2.2kΩ, 1/4W, ± 5%, Carbon	1		R701	ERD18FJ4R7	4.7Ω, 1/8W, ± 5%, Carbon	1	
R148	ERD14VJ272	2.7kΩ, 1/4W, ± 5%, Carbon	1		R717, 718, 719, 720	ERD12TJ100	10Ω, 1/2W, ± 5%, Carbon	4	
R125, 132, 135, 136, 434, 435, 710	ERD14VJ332	3.3kΩ, 1/4W, ± 5%, Carbon	7		R715	ERD12TJ471	470Ω, 1/2W, ± 5%, Carbon	1	
R436, 451, 452	ERD14VJ392	3.9kΩ, 1/4W, ± 5%, Carbon	3		R(612)×4	ERD12TJ821	820Ω, 1/2W, ± 5%, Carbon	4	
R19, 24, 128, 144, 145, 433	ERD14VJ472	4.7kΩ, 1/4W, ± 5%, Carbon	6		R(611)×4	ERD12TJ152	1.5kΩ, 1/2W, ± 5%, Carbon	4	
R20, 134, 449, 450, 513, 514, 515, 516	ERD14VJ562	5.6kΩ, 1/4W, ± 5%, Carbon	8		R31	ERD12TJ184	180kΩ, 1/2W, ± 5%, Carbon	1	
R28, 133	ERD14VJ682	6.8kΩ, 1/4W, ± 5%, Carbon	2		R(622, 623)×4	ERX3ANJR56	0.56Ω, 3W, ± 5%, Metallic	8	○
R409, 410, 713	ERD14VJ822	8.2kΩ, 1/4W, ± 5%, Carbon	3		R742	ERX3ANJ100	10Ω, 3W, ± 5%, Metallic	1	○
R17, 131, 142, 143, 411, 412, 455	ERD14VJ103	10kΩ, 1/4W, ± 5%, Carbon	7		R730, 731, 732, 733	ERG3ANJ331	330Ω, 3W, ± 5%, Metallic	4	○
R149, 417, 418, 502, 503, 504, 505, 506, 507, 508	ERD14VJ123	12kΩ, 1/4W, ± 5%, Carbon	10		R740, 741	ERG2ANJ821	820Ω, 2W, ± 5%, Metallic	2	○
R10, 26, 437, 438, 711	ERD14VJ153	15kΩ, 1/4W, ± 5%, Carbon	5		R708	ERC12GK335Z	3.3MΩ, 1/2W, ± 10%, Solid	1	
R6, 419, 420, 423, 424	ERD14VJ183	18kΩ, 1/4W, ± 5%, Carbon	5		RESISTORS CD-4 Demodulator Circuit				
R9	ERD14VJ223	22kΩ, 1/4W, ± 5%, Carbon	1		R285, (369) × 2	ERD14VJ101	100Ω, 1/4W, ± 5%, Carbon	3	
R443, 444, 712	ERD14VJ273	27kΩ, 1/4W, ± 5%, Carbon	3		R(324, 372) × 2	ERD14VJ151	150Ω, 1/4W, ± 5%, Carbon	4	
R421, 422, 425, 453, 454, 709	ERD14VJ333	33kΩ, 1/4W, ± 5%, Carbon	6		R233, 234	ERD14VJ331	330Ω, 1/4W, ± 5%, Carbon	2	
R447, 448	ERD14VJ683	68kΩ, 1/4W, ± 5%, Carbon	2		R239, 240, 290, (304) × 2	ERD14VJ471	470Ω, 1/4W, ± 5%, Carbon	5	
R5, 405, 406, 427, 428, 749	ERD14VJ823	82kΩ, 1/4W, ± 5%, Carbon	6		R237, 238	ERD14VJ681	680Ω, 1/4W, ± 5%, Carbon	2	
R29, 509, 510, 511, 512	ERD14VJ104	100kΩ, 1/4W, ± 5%, Carbon	5		R267, 268, (305, 308, 331, 351, 357) × 2	ERD14VJ102	1kΩ, 1/4W, ± 5%, Carbon	12	
R30, 140, 141	ERD14VJ124	120kΩ, 1/4W, ± 5%, Carbon	3		R273, 274, 288	ERD14VJ152	1.5kΩ, 1/4W, ± 5%, Carbon	3	
R403, 404, 413, 414, 415, 416, 429, 430, 439, 440	ERD14VJ154	150kΩ, 1/4W, ± 5%, Carbon	10		R(321, 322) × 2	ERD14VJ272	2.7kΩ, 1/4W, ± 5%, Carbon	4	
R25, 714	ERD14VJ184	180kΩ, 1/4W, ± 5%, Carbon	2		R235, 236, 257, (318, 329, 332) × 2	ERD14VJ332	3.3kΩ, 1/4W, ± 5%, Carbon	9	
R22, 445, 446, 734, 735	ERD14VJ224	220kΩ, 1/4W, ± 5%, Carbon	5		R213, 214, 286, 292, (314) × 2	ERD14VJ392	3.9kΩ, 1/4W, ± 5%, Carbon	6	
R401, 402, 426	ERD14VJ274	270kΩ, 1/4W, ± 5%, Carbon	3		R217, 218, 272, 283, 284, (316, 347) × 2	ERD14VJ472	4.7kΩ, 1/4W, ± 5%, Carbon	9	
R456, 457	ERD14VJ824	820kΩ, 1/4W, ± 5%, Carbon	2		R293	ERD14VJ562	5.6kΩ, 1/4W, ± 5%, Carbon	1	
R(618, 620) × 4	ERD14FJ100	10Ω, 1/4W, ± 5%, Carbon	8		R265, 266	ERD14VJ682	6.8kΩ, 1/4W, ± 5%, Carbon	2	
R750	ERD14FJ390	39Ω, 1/4W, ± 5%, Carbon	1		R(319) × 2	ERD14VJ822	8.2kΩ, 1/4W, ± 5%, Carbon	2	
R517, 518	ERD14TJ390	39Ω, 1/4W, ± 5%, Carbon	2		R227, 228, 279, 280, 396, 397, (333, 337, 338, 341, 342, 346, 348, 350, 356) × 2	ERD14VJ103	10kΩ, 1/4W, ± 5%, Carbon	24	
R521, 522, 523, 524, (609) × 4	ERD14TJ820	82Ω, 1/4W, ± 5%, Carbon	8		R203, 204	ERD14VJ123	12kΩ, 1/4W, ± 5%, Carbon	2	
R4, 103, (602) × 4	ERD14TJ101	100Ω, 1/4W, ± 5%, Carbon	6		R209, 210, (328, 330) × 2	ERD14VJ153	15kΩ, 1/4W, ± 5%, Carbon	6	
R(617, 619, 621) × 4	ERD14FJ101	100Ω, 1/4W, ± 5%, Carbon	12		R201, 202, 205, 206, 225, 226	ERD14VJ183	18kΩ, 1/4W, ± 5%, Carbon	6	
R705	ERD14TJ181	180Ω, 1/4W, ± 5%, Carbon	1		R223, 224, 259, 260, 261, 262, 281, 282, (312) × 2	ERD14VJ223	22kΩ, 1/4W, ± 5%, Carbon	10	
R529, 530, 531, 532, (614) × 4	ERD14TJ271	270Ω, 1/4W, ± 5%, Carbon	8		R(343) × 2	ERD14VJ273	27kΩ, 1/4W, ± 5%, Carbon	2	
R120, (616) × 4	ERD14TJ561	560Ω, 1/4W, ± 5%, Carbon	5		R219, (325) × 2	ERD14VJ333	33kΩ, 1/4W, ± 5%, Carbon	3	
R533, 534, 535, 536, 706	ERD14TJ681	680Ω, 1/4W, ± 5%, Carbon	5		R211, 212, 231, 232, 255, 256, (352, 354, 355) × 2	ERD14VJ473	47kΩ, 1/4W, ± 5%, Carbon	12	
R721, 722, 723, 724, 729	ERD14FJ681	680Ω, 1/4W, ± 5%, Carbon	5		R221, 241, 242, (320) × 2	ERD14VJ563	56kΩ, 1/4W, ± 5%, Carbon	5	
R106, 111, 115	ERD14TJ821	820Ω, 1/4W, ± 5%, Carbon	3		R(302) × 2	ERD14VJ683	68kΩ, 1/4W, ± 5%, Carbon	2	
R12, (615) × 4	ERD14TJ102	1kΩ, 1/4W, ± 5%, Carbon	5		R207, 208	ERD14VJ823	82kΩ, 1/4W, ± 5%, Carbon	2	
R113	ERD14TJ122	1.2kΩ, 1/4W, ± 5%, Carbon	1		R215, 216, 229, 230, 243, 251, 252, 263, 264, 269, 270, 289, 291, 294, 295, 296, 297, (301, 310, 362, 365) × 2	ERD14VJ104	100kΩ, 1/4W, ± 5%, Carbon	25	
R(606) × 4	ERD14TJ182	1.8kΩ, 1/4W, ± 5%, Carbon	4		R275, 276	ERD14VJ124	120kΩ, 1/4W, ± 5%, Carbon	2	
R(605) × 4	ERD14TJ222	2.2kΩ, 1/4W, ± 5%, Carbon	4		R(311) × 2	ERD14VJ154	150kΩ, 1/4W, ± 5%, Carbon	2	
R129	ERD14TJ272	2.7kΩ, 1/4W, ± 5%, Carbon	1		R(336) × 2	ERD14VJ184	180kΩ, 1/4W, ± 5%, Carbon	2	
R16, 21, (601) × 4	ERD14TJ332	3.3kΩ, 1/4W, ± 5%, Carbon	6		R298, 299, (360) × 2	ERD14VJ224	220kΩ, 1/4W, ± 5%, Carbon	4	
R105	ERD14TJ392	3.9kΩ, 1/4W, ± 5%, Carbon	1		R277, 278	ERD14VJ274	270kΩ, 1/4W, ± 5%, Carbon	2	
R(608, 613) × 4, 703	ERD14TJ472	4.7kΩ, 1/4W, ± 5%, Carbon	9		R271, (353) × 2	ERD14VJ334	330kΩ, 1/4W, ± 5%, Carbon	3	
R15, 130, 150	ERD14TJ562	5.6kΩ, 1/4W, ± 5%, Carbon	3		R(370) × 2	ERD14VJ394	390kΩ, 1/4W, ± 5%, Carbon	2	
R102, 104, 114	ERD14TJ682	6.8kΩ, 1/4W, ± 5%, Carbon	3		R(340, 349) × 2	ERD14VJ564	560kΩ, 1/4W, ± 5%, Carbon	4	
R23, 139, 537, 538	ERD14TJ822	8.2kΩ, 1/4W, ± 5%, Carbon	4		R(306, 317) × 2	ERD14VJ824	820kΩ, 1/4W, ± 5%, Carbon	4	
R108, 110, 112, 442, 501, 525, 526, 527, 528, (607) × 4	ERD14TJ123	12kΩ, 1/4W, ± 5%, Carbon	13		R(326, 327) × 2	ERD14TJ151	150Ω, 1/4W, ± 5%, Carbon	4	
R702	ERD14TJ153	15kΩ, 1/4W, ± 5%, Carbon	1		R287, 399	ERD14TJ331	330Ω, 1/4W, ± 5%, Carbon	2	
R725, 726, 727, 728	ERD14TJ183	18kΩ, 1/4W, ± 5%, Carbon	4		R(358) × 2	ERD14TJ102	1kΩ, 1/4W, ± 5%, Carbon	2	
R121	ERD14 J273	27kΩ, 1/4W, ± 5%, Carbon	1		R(307, 309) × 2	ERD14TJ222	2.2kΩ, 1/4W, ± 5%, Carbon	4	
R118	ERD14 J333	33kΩ, 1/4W, ± 5%, Carbon	1		R258	ERD14TJ332	3.3kΩ, 1/4W, ± 5%, Carbon	1	
R101	ERD14 J473	47kΩ, 1/4W, ± 5%, Carbon	1		R(315) × 2	ERD14TJ822	8.2kΩ, 1/4W, ± 5%, Carbon	2	
R(610) × 4	ERD14 J563	56kΩ, 1/4W, ± 5%, Carbon	4						
R(604) × 4	ERD14VJ823	82kΩ, 1/4W, ± 5%, Carbon	6						
1010, 1011	ERD14VJ104	100kΩ, 1/4W, ± 5%, Carbon	1						
R3	ERD14VJ154	150kΩ, 1/4W, ± 5%, Carbon	2						
R1, 2									

Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks	Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks
R(313, 371)×2	ERD14TJ223	22kΩ, 1/4W, ± 5%, Carbon	4		C725, 726, 727, 728	ECQM05473KZ	0.047μF, 50WV, ±10%, Polyester	4	
R(363)×2	ERD14TJ473	47kΩ, 1/4W, ± 5%, Carbon	2		C513, 514, 515, 516	ECQM05334KZ	0.33μF, 50WV, ±10%, Polyester	4	
R222	ERD14TJ563	56kΩ, 1/4W, ± 5%, Carbon	1		C529, 530, 531, 532	ECQM05394KZ	0.39μF, 50WV, ±10%, Polyester	4	
R244, (364, 366)×2	ERD14TJ104	100kΩ, 1/4W, ± 5%, Carbon	5		C748	ECQH2105MZ	1μF, 250WV, ±20%, Polyester	1	
R(345)×2	ERD14TJ184	180kΩ, 1/4W, ± 5%, Carbon	2		C730, 731	ECQU2A103MD	0.01μF, 250VAC, ±20%, Polyester	2	
R200, 220	ERD14TJ274	270kΩ, 1/4W, ± 5%, Carbon	2		C(609)×4	ECEA6V47	47μF, 6.3WV, Electrolytic	4	
R(303)×2	ERD14TJ334	330kΩ, 1/4W, ± 5%, Carbon	2		C142	ECEA6V100	100μF, 6.3WV, Electrolytic	1	
R(335, 344, 359)×2	ERC14GK185	1.8MΩ, 1/4W, ±10%, Solid	6		C27, 134, 750	ECEA10V100	100μF, 10WV, Electrolytic	3	
R(361)×2	ERC14GK825	8.2MΩ, 1/4W, ±10%, Solid	2		C717	ECEA10V470	470μF, 10WV, Electrolytic	1	
R(373)×2	ERD14VJ474	470kΩ, 1/4W, ± 5%, Carbon	2		C25, 51, 52, 53, 54, 131	ECEA16V10	10μF, 16WV, Electrolytic	6	
VARIABLE RESISTORS FM, AM & AF Circuit									
VR101	EVLS3AA00B24	20kΩ(B), Signal Meter Adjustment	1		C721	ECEA16V470	470μF, 16WV, Electrolytic	1	
VR102, 51, 52, 53, 54	EVLS3AA00B54	50kΩ(B), VU Meter & Muting Adj.	5		C710	ECEA16V1000	1000μF, 16WV, Electrolytic	1	
VR103	EVLS3AA00B13	1kΩ(B), Separation Adjustment	1		C419, 420	ECAF25ER22X	0.22μF, 25WV, Electrolytic	2	
VR501, 502, 503, 504	EVH56A037BF5	250kΩ(B), Channel Level Control	4	○	C130	ECAF25ER33S	0.33μF, 25WV, Electrolytic	1	
VR505	EWINXA030BF5	250kΩ(B), Volume Control	1		C407, 408	ECAF25ER68S	0.68μF, 25WV, Electrolytic	2	
VR506, 507	EWI43A030C14	10kΩ(C), Bass & Treble Control	2	○	C24, 55, 56, 57, 58, 132, 135	ECEA25V3R3	3.3μF, 25WV, Electrolytic	7	
VR(601)×4	EVLS0AA00B14	10kΩ(B), DC Unbalance Adjustment	4		C32, 119	ECEA25V4R7	4.7μF, 25WV, Electrolytic	2	
VR(602)×4	EVLS0AA00B52	500Ω(B), ICQ Adjustment	4		C517-524	ECEA25V4R7LM	4.7μF, 25WV, Electrolytic	8	
VARIABLE RESISTORS CD-4 Demodulator Circuit									
VR201, 202	EVLS3AA00B24	20kΩ(B), CD-4 Gain Adjustment	2		C141	ECEA25V100	100μF, 25WV, Electrolytic	1	
VR(301)×2	EVLS0AA00B15	100kΩ(B), ANRS	2		C720, 729	ECEA25V220	220μF, 25WV, Electrolytic	2	
VR(302)×2	EVLS0AA00B16	1MΩ(B), ANRS	2		C421, 708	ECEA25V470	470μF, 25WV, Electrolytic	2	
VR(303, 304)×2	EVLS0AA00B14	10kΩ(B), VCO, Auto Separation	4		C(605)×4	ECEA25G220	220μF, 25WV, Electrolytic	4	○
VR(305)×2	EVLS0AA00B24	20kΩ(B), Lock Range	2		C29, 30, 401, 402, 405, 406, 409, 410, 413	ECEA50VR47G	0.47μF, 50WV, Electrolytic	9	○
CAPACITORS FM, AM, AF & Power Source Circuit									
C9	ECDD1H010CC	1pF, 50WV, ±0.25pF, Ceramic	1		C150	ECEA50V1	1μF, 50WV, Electrolytic	1	
C33, 127	ECDD1H050CC	5pF, 50WV, ±0.25pF, Ceramic	2		C112, 133, 137, 138, 139, 140, 415, 417, 418, 760	ECEA50V1G	1μF, 50WV, Electrolytic	10	
C124	ECDD1H070DC	7pF, 50WV, ±0.5pF, Ceramic	1		C(601)×4	ECEA50V3R3	3.3μF, 50WV, Electrolytic	4	
C19	ECDD1H100KT	10pF, 50WV, ±10%, Ceramic	1		C(604)×4	ECEA50V47	47μF, 50WV, Electrolytic	4	
C6	ECDD1H100KC	10pF, 50WV, ±10%, Ceramic	1		C422, (607)×4, 711, 714	ECEA50V100	100μF, 50WV, Electrolytic	7	
C11	ECDD1H120KT	12pF, 50WV, ±10%, Ceramic	1		C703, 704	ECEA50V220	220μF, 50WV, Electrolytic	2	
C1, 122	ECDD1H120KC	12pF, 50WV, ±10%, Ceramic	2		C709	ECEA50V470	470μF, 50WV, Electrolytic	1	
C12, 14	ECDD1H150KC	15pF, 50WV, ±10%, Ceramic	2		C701, 702	ECET50R6800Y	6800μF, 50WV, Electrolytic	2	○
C5, 120	ECDD1H180KC	18pF, 50WV, ±10%, Ceramic	2		CAPACITORS CD-4 Demodulator Circuit				
C(606)×4	ECDD1H220K	22pF, 50WV, ±10%, Ceramic	4		C219, 220	ECDD1H220K	22pF, 50WV, ±10%, Ceramic	2	
C13	ECDD1H390KC	39pF, 50WV, ±10%, Ceramic	1		C203, 204, (315, 340, 341)×2	ECDD1H101K	100pF, 50WV, ±10%, Ceramic	8	
C115	ECDD1H470KR	47pF, 50WV, ±10%, Ceramic	1		C(334)×2	ECDD1H151K	150pF, 50WV, ±10%, Ceramic	2	
C(602)×4	ECDD1H470K	47pF, 50WV, ±10%, Ceramic	4		C233, 234	ECDD1H181K	180pF, 50WV, ±10%, Ceramic	2	
C116, 117	ECDD1H101K	100pF, 50WV, ±10%, Ceramic	2		C241, 242	ECDD1H331K	330pF, 50WV, ±10%, Ceramic	2	
C7, (603)×4	ECDD1H181K	180pF, 50WV, ±10%, Ceramic	5		C238,	ECKE1H102MY	0.001μF, 50WV, ±20%, Ceramic	1	
C128, 129, 403, 404	ECDD1H221K	220pF, 50WV, ±10%, Ceramic	4		C217, 218, C205, 206	ECQM05102KZ	0.001μF, 50WV, ±10%, Polyester	2	
C2, 3, 4, 8, 15	ECKD1H102PF	0.001μF, 50WV, ±100%, Ceramic	5		C(322)×2	ECQM05222KZ	0.0022μF, 50WV, ±10%, Polyester	2	
C10, 17, 18, 103, 104, 108, 111, 705, 707, 712, 715, 718, 722, 749	ECKE1H103PF	0.01μF, 50WV, ±100%, Ceramic	14		C201, 202	ECQM05272JZ	0.0027μF, 50WV, ±5%, Polyester	2	
C28	ECKE1H103MD	0.01μF, 50WV, ±20%, Ceramic	1		C(309, 316)×2	ECQM05272KZ	0.0027μF, 50WV, ±10%, Polyester	4	
C26, 107, 118, 121, 123, 125, 126, 143, 713, 716, 719, 723	ECKE1H223PF	0.022μF, 50WV, ±100%, Ceramic	12		C243, 244, (347)×2	ECQM05472KZ	0.0047μF, 50WV, ±10%, Polyester	4	
C(608)×4	ECKD2H331KB	330pF, 500WV, ±10%, Ceramic	4		C(332, 333)×2	ECQM05562KZ	0.0056μF, 50WV, ±10%, Polyester	4	
C706	ECKD2H103PF	0.01μF, 500WV, ±100%, Ceramic	1		C(321)×2	ECQM05682KZ	0.0068μF, 50WV, ±10%, Polyester	2	
C136	ECQM05152KZ	0.0015μF, 50WV, ±10%, Polyester	1		C(348)×2	ECQM05822KZ	0.0082μF, 50WV, ±10%, Polyester	2	
C505, 506, 507, 508	ECQM05332KZ	0.0033μF, 50WV, ±10%, Polyester	4		C221, 222, 346×2	ECQM05103KZ	0.01μF, 50WV, ±10%, Polyester	4	
C31	ECQM05392KZ	0.0039μF, 50WV, ±10%, Polyester	1		C(308, 343)×2	ECQM05223KZ	0.022μF, 50WV, ±10%, Polyester	4	
C21	ECQM05103KZ	0.01μF, 50WV, ±10%, Polyester	1		C225, 226, 253, 254, (306)×2	ECQM05333KZ	0.033μF, 50WV, ±10%, Polyester	6	
C509, 510, 511, 512	ECQM05183KZ	0.018μF, 50WV, ±10%, Polyester	4		C215, 216	ECQM05473KZ	0.047μF, 50WV, ±10%, Polyester	2	
C22, 101, 102, 105, 106, 109, 110, 113, 114, 144	ECQM05223KZ	0.022μF, 50WV, ±10%, Polyester	10		C(338)×2	ECQM05474KZ	0.47μF, 50WV, ±10%, Polyester	2	
C412, 525, 526, 527, 528	ECQM05273KZ	0.027μF, 50WV, ±10%, Polyester	5		C211, 212, 213, 214, (303)×2	ECEA6V33	33μF, 6.3WV, Electrolytic	6	
C20, 23, 411, 501, 502, 503, 504	ECQM05333KZ	0.033μF, 50WV, ±10%, Polyester	7		C(302)×2	ECEA6V47	47μF, 6.3WV, Electrolytic	2	
					C(301)×2	ECEA6V100	100μF, 6.3WV, Electrolytic	2	
					C248, 250	ECEA6V470	470μF, 6.3WV, Electrolytic	2	
					C(349)×2	ECEA10V33	33μF, 10WV, Electrolytic	2	
					C247	ECEA10V47	47μF, 10WV, Electrolytic	1	
					C209, 210, (307, 311, 329, 317, 335)×2	ECEA16V10	10μF, 16WV, Electrolytic	12	
					C(331)×2	ECEA16V33	33μF, 16WV, Electrolytic	2	
					C256	ECEA16V100	100μF, 16WV, Electrolytic	1	
					C255	ECEA16V220	220μF, 16WV, Electrolytic	1	
					C(314)×2	ECEA25V3R3	3.3μF, 25WV, Electrolytic	2	
					C229, 230, 231, 232, 239, 240, 245, 246	ECSZ25EF3R3	3.3μF, 25WV, Electrolytic	8	
					C(323, 324)×2	ECSZ25EF1	1μF, 25WV, Electrolytic	4	
					C223, 224, 249, 252, (312, 325, 328, 330, 336, 337, 342, 344)×2	ECEA50V1	1μF, 50WV, Electrolytic	20	

Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks	Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks
C235,236, (305, 310, 318, 319, 320 339)×2	ECEA50V1G	1μF, 50WV, Electrolytic	14		CABINET PARTS				
C237	ECEA50V10	10μF, 50WV, Electrolytic	1		CA1	XTV3+8CK	Black Screw, Front Panel M'tg.	6	
C251	ECEA50V100	100μF, 50WV, Electrolytic	1		CA2	SBNA103	Knob, Speaker, Mode, Selector Switch & Bass, Treble Control	5	
C(313)×2	ECAG25ER1K	0.1μF, 25WV, Electrolytic	2		CA3	SBLA2	Knob, Lever Switch	5	
C(350)×2	ECCD1H020CC	2pF, 50WV, ±0.25pF, Ceramic	2		CA4	SBNA102	Knob, Volume Control	1	
C(304)×2	ECCD1H331K	330pF, 50WV, ±10%, Ceramic	2		CA5	SBNA101	Knob, Channel Level Control	4	
VARIABLE CAPACITORS					CA6	SBNA111	Knob, Tuning Control	1	
CV1,2,3,4,5 (CT4,5)	ECV5MX25X14G	Tuning Gang, FM & AM (Trimmer, AM ANT & OSC)	1		CA9	SYWA150A	Front Panel, Complete	1	○
CT1, 2	ECV1ZW10P32	Trimmer, FM ANT & DET, 10pF	2		CA10	SGXA61	Side Panel, Left Side	1	○
CT3	ECV1ZW06P35	Trimmer, FM OSC, 6pF	1		CA11	SGUA22	Glass Plate, Dial	1	○
COMPONENT COMBINATIONS					CA12	SGXA60	Side Panel, Right Side	1	
Z1	EXAF203Z471	AM Detector Circuit	1		CA13	SQXA4102	Sticker	1	○
Z101	EXA5DL04C	FM Detector Circuit	1		CA14	SBCA47	Button, Power Source Switch	1	○
Z102, 103	SXAM675F	Compensation, FM Character	2		CA15	SYUA90A	Bottom Board, Complete	1	○
Z104, 105	SXAA1HHE001	Low Pass Filter, 19kHz & 38kHz	2		CA16	SKUA360	Bottom Board Only	1	○
Z701, 702	RXAF103P22HD	Hum Cancel, 0.01μF(×2), 500WV	2		CA17	SKLA2-1	Leg, Bottom Board	4	
SWITCHES FM, AM, AF & Power Source Circuit					CA18	SHGA629	Rubber Cushion, Bottom Board	1	
S1	SSRA66	Selector Switch	1		CA19	XTV3+8CR	Red Screw, Bottom Board M'tg.	8	
S2	SSRA67	Mode Switch	1		CA20	SKA4730	Cabinet	1	○
S3, 4, 5, 6, 7	SSHA46S	Push Switch, VU Meter Range, Tape Monitor 1, 2, 3 & FM Muting	1	○	CA21	XSB4+16BVCS	Screw, Cabinet M'tg.	4	
S8, 9, 10, 11	SSLA19S	Lever Switch, Loudness, Audio Muting, Low & High Filter	4		CA22	SYPA290AS	Rear Panel, Complete	1	○
S12	ESRC3A5F30AE	Speakers Switch	1	○	CA23	SNEA404	Nut, Ground Terminal	1	
S13	ESB701T	Power Source Switch	1	○	CA24	SNEA204-2S	Bolt, Ground Terminal	1	
S14	SSLA36S	CD-4 Hi-Blend Switch	1	○	CA25	SJFA3417	Terminal, PHONO	1	
SWITCHES CD-4 Demodulator Circuit					CA26	SGPA450A	Rear Panel Only	1	○
S15	QSS-1093	30kHz Compensator Switch	1		CA27	SJFA5201-1	Holder, Circuit Protection Fuse	2	
S16	SSRA68	Cartridge Selector Switch	1		CA28	SJFA4806-1	Terminal, Speaker	2	
RELAY AF Circuit					CA29	SJFA4401	Terminal, Ext. Antenna	1	
RLY701	SSYA1	Speaker Protection Relay	1		CA30	SJSA66-1	Socket, AC Outlet	2	
RELAY CD-4 Demodulator Circuit					CH1	SBSA7	Terminal, Tape Monitor, AUX	1	○
RLY(301)×2	SSYA11	Auto Separation Control Switch	1		CH2	XSN26+12	Knob, Cartridge Selector	1	
LIGHTS					CH3	SJFA5202-1	Screw, Protection Fuse Cap M'tg.	2	
PL1~10	XAM35K	Dial & Meter Lamp(6.3V 0.25A)	10		CH4	RHR111	Cap, Circuit Protection Fuses	2	
PL11	XAMR18T500A	Dial Pointer Lamp(6.3V 70mA)	1	○	CH5	RJA34	Bushing, AC Cord	1	
PL12, 13, 14, 19	XAMR41K40B	Indicator Lamp, AM, FM, PHONO & CD-4 Radar(7.5V 75mA)	4		CH6	SSMA29	Meter, Output Level [VU]	4	○
PL15, 18	XAMR41K40A	Indicator Lamp, AUX & CD-4 (7.5V 75mA)	2		CH7	SJJA9-2	Jack, Headphones	2	
PL16, 20	XAMR41K40D	Indicator Lamp, 2 CHANNEL & FM STEREO(7.5V 75mA)	2	○	CH8	SJJA9-2	Socket, Circuit Connection, 6pin	6	
PL17	XAMR41K40C	Indicator Lamp, 4 CHANNEL (7.5V 75mA)	1		CH9	SJSA64	Holder, Meter Lamp	5	
FUSES					CH10	RJV1A	Mounting, Dial Scale	1	○
F1	XBA1M70NU100	Power Source (7A)	1	○	CH11	SUMA10	Scale, Dial	1	○
F2	XBAS1B3003	Power Source (3A)	1		CH12	SKDA430	Rubber, Dial Scale	1	○
F3, 4, 5, 6	XBAS1A4001	Circuit Protection (4A)	4		CH13	SHGA649	Pulley Dial Cord	4	
CABINET PARTS					CH14	SDY11	Shaft, Pulley Lock	4	
CA1	XTV3+8CK	Black Screw, Front Panel M'tg.	6		CH15	SDY9	Bracket, Pulley & Pulley Shaft	4	
CA2	SBNA103	Knob, Speaker, Mode, Selector Switch & Bass, Treble Control	5		CH16	RDR20	Pulley, Dial Cord	3	
CA3	SBLA2	Knob, Lever Switch	5		CH17	RNW150-2	Lock Washer, Pulley	3	
CA4	SBNA102	Knob, Volume Control	1		CH18	RDY34	Shaft, Pulley	3	
CA5	SBNA101	Knob, Channel Level Control	4		CH19	SDDA391S	Drum, Tuning	1	
CA6	SBNA111	Knob, Tuning Control	1		CH20	SDSA4121	Spring, Dial Cord	1	
CA9	SYWA150A	Front Panel, Complete	1	○	CH21	XXAR3H6S	Screw, Drum M'tg.	2	
CA10	SGXA61	Side Panel, Left Side	1	○	CH22	SDAA8	Mounting, Dial Pointer	1	
CA11	SGUA22	Glass Plate, Dial	1	○	CH23	SDPA5022	Pointer, Dial	1	
CA12	SGXA60	Side Panel, Right Side	1		CH24	SHGA202	Bracket, STEREO, 2CH. & 4CH. Indicator	3	
CA13	SQXA4102	Sticker	1	○	CH18	SHPA522	Reflection Paper, Dial Light	1	○
CA14	SBCA47	Button, Power Source Switch	1	○	CH19	SHGA205	Bracket, Input Source Indicator	1	○
CA15	SYUA90A	Bottom Board, Complete	1	○	CH20	SJSA65	Socket, Circuit Connection	26	
CA16	SKUA360	Bottom Board Only	1	○	CH21	SJSA201-1	Holder, Dial Lamp	1	
CA17	SKLA2-1	Leg, Bottom Board	4		CH22	RDZ05C	Cord, Dial, 170cm [66 7/8"]	1 roll	
CA18	SHGA629	Rubber Cushion, Bottom Board	1		CH23	SSMA19-2	Meter, Signal Strength	1	
CA19	XTV3+8CR	Red Screw, Bottom Board M'tg.	8		CH24	SJSA63	Socket, Circuit Connection, 4pin	9	
CA20	SKA4730	Cabinet	1	○	CH25	SJTA701-1	Crimp, Lead Wire	68	
CA21	XSB4+16BVCS	Screw, Cabinet M'tg.	4		CH26	SJTA308	4pin Terminal, Circuit Connection	9	
CA22	SYPA290AS	Rear Panel, Complete	1	○	CH27	SJTA309	6pin Terminal, Circuit Connection	5	
CA23	SNEA404	Nut, Ground Terminal	1		CH28	SJTA307	1pin Terminal, Circuit Connection	146	
CA24	SNEA204-2S	Bolt, Ground Terminal	1		CH29	SUPA2750	Printed Circuit Board Only	1	○
CA25	SJFA3417	Terminal, PHONO	1		CH30	SDTA5-1S	Tuning Shaft, Complete	1	
CA26	SGPA450A	Rear Panel Only	1	○		SHEA7	Coupling Rod, Power Switch & Button	1	
CA27	SJFA5201-1	Holder, Circuit Protection Fuse	2			SJSA302	Socket, CD-4 Demodulator IC	2	
CA28	SJFA4806-1	Terminal, Speaker	2						
CA29	SJFA4401	Terminal, Ext. Antenna	1						
CA30	SJSA66-1	Socket, AC Outlet	2						

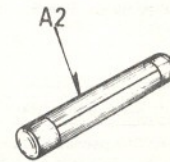
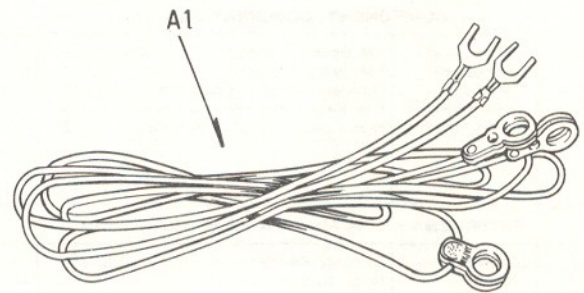
Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks	Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks
ACCESSORIES					P2	SPHA6008	Polyethylene Sheet	1	
A1	SSAA3	FM Antenna Cord	1		P3	SPSA103	Pad, Left Side	1	
A2	XBAS1A4001	Circuit Protection Fuse(4A)	2		P4	SPSA104-1	Pad, Right Side	1	○
					P5	SPSA97	Pad, Leg	2	
					P6	SPGA560A	Carton Box	1	○
					P7	SQFA183	Printed Matter, Complete	1	○
PACKING PARTS									
P1	SPPA38	Soft Cover	1	○					

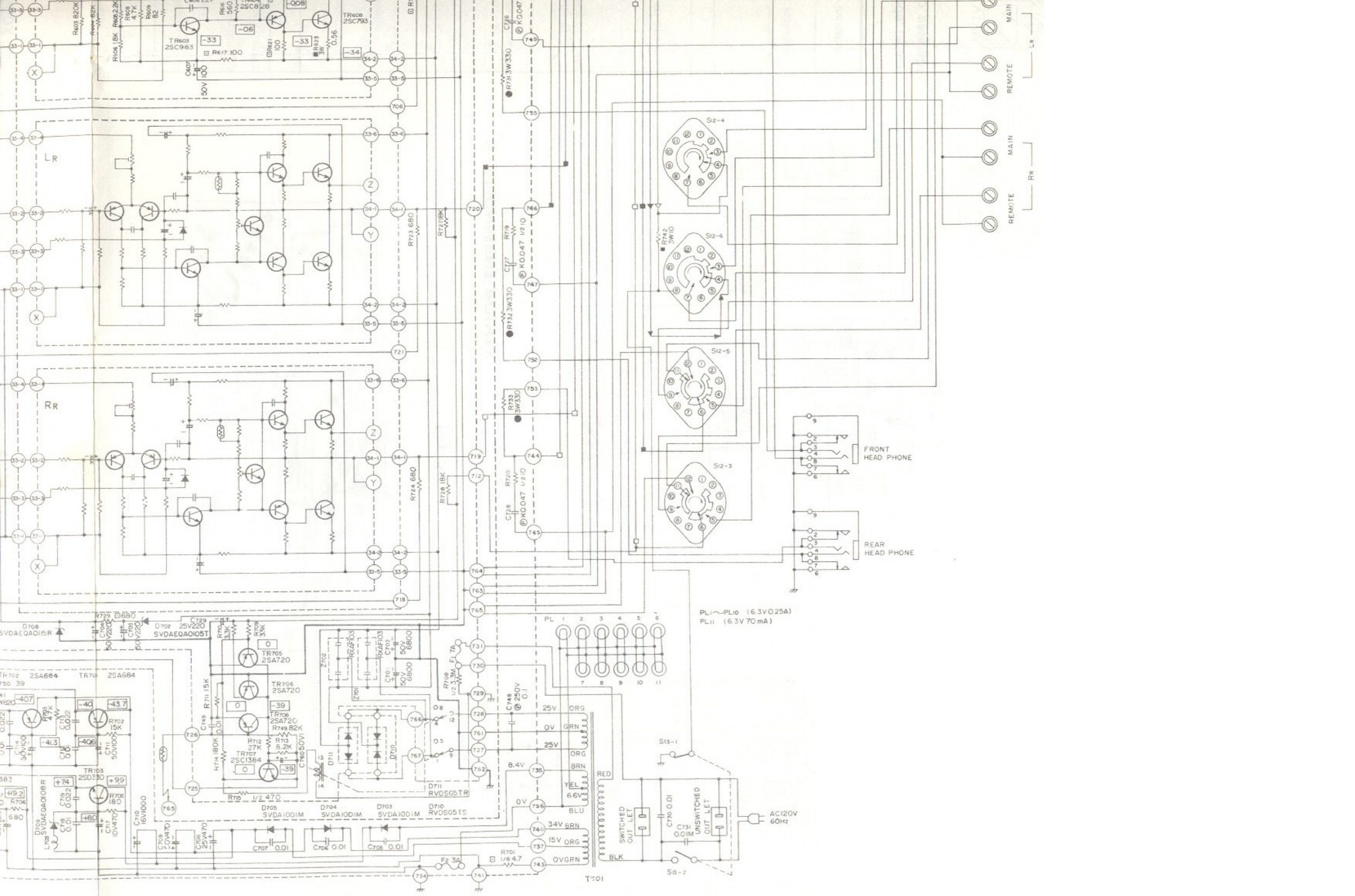
■ PACKING

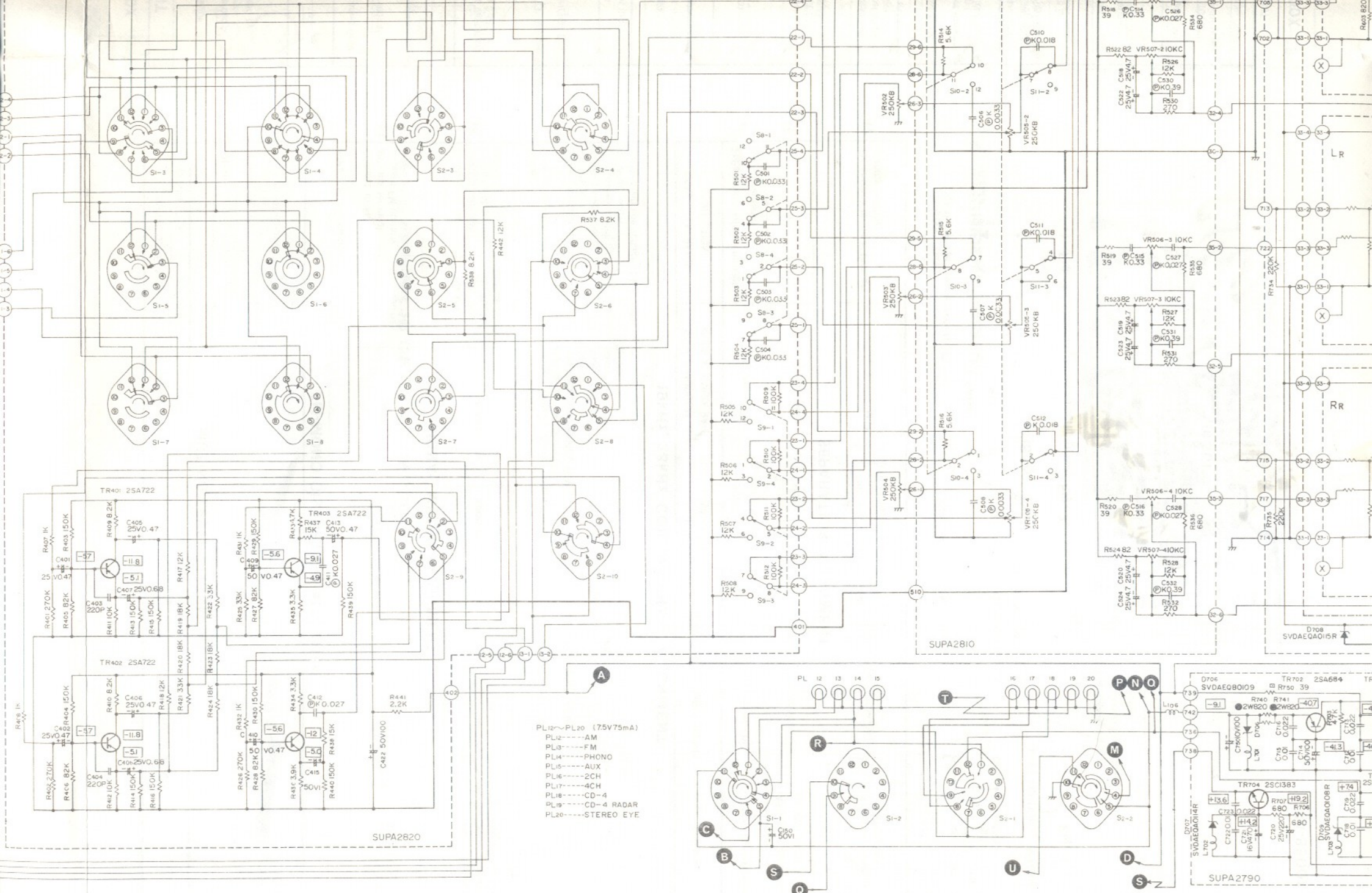


FRONT VIEW

■ ACCESSORIES







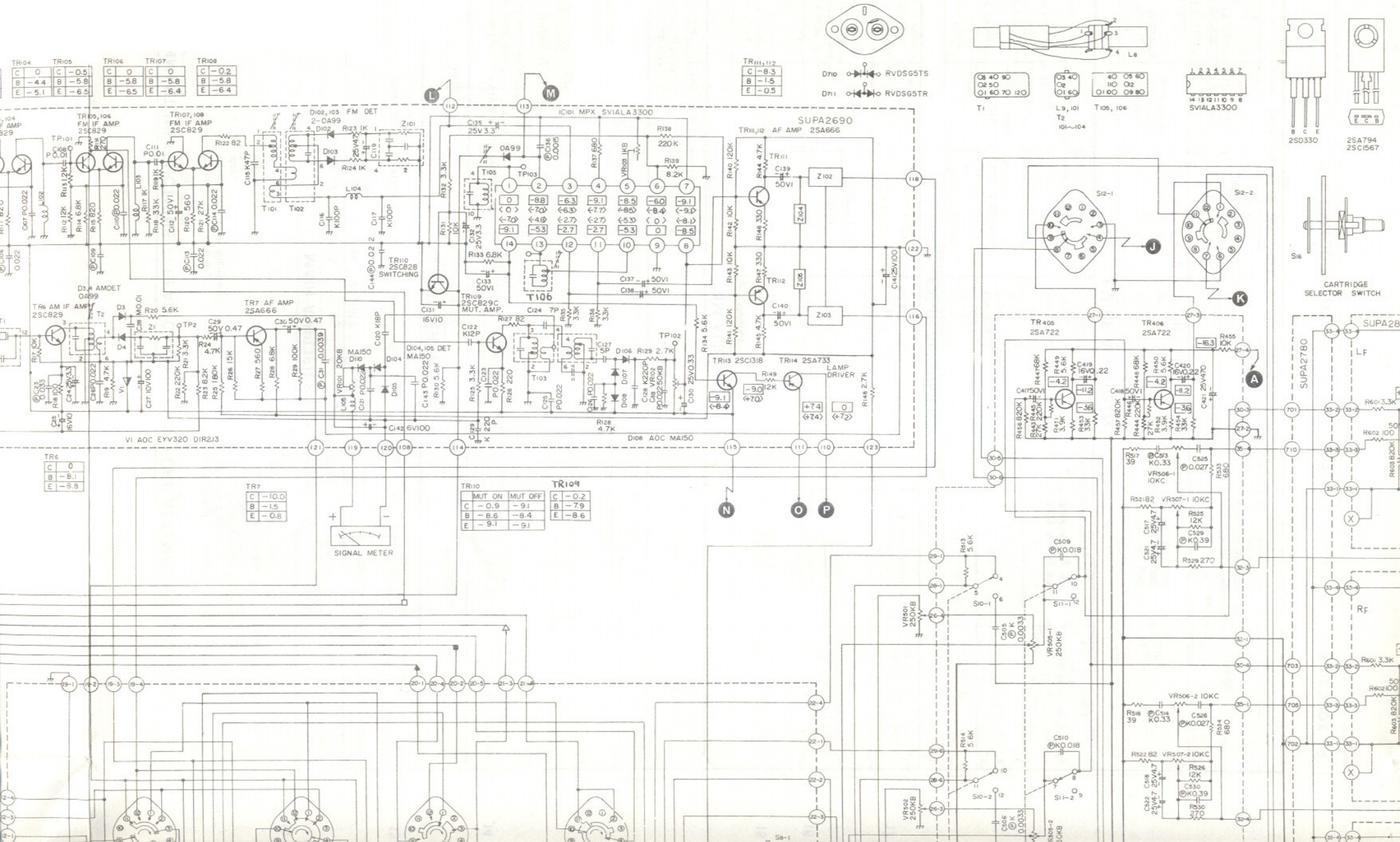
PL12~PL20 (75V75mA)
 PL12---AM
 PL13---FM
 PL14---PHONO
 PL15---AUX
 PL16---2CH
 PL17---4CH
 PL18---CD-4
 PL19---CD-4 RADAR
 PL20---STEREO EYE

SUPA2810

SUPA2820

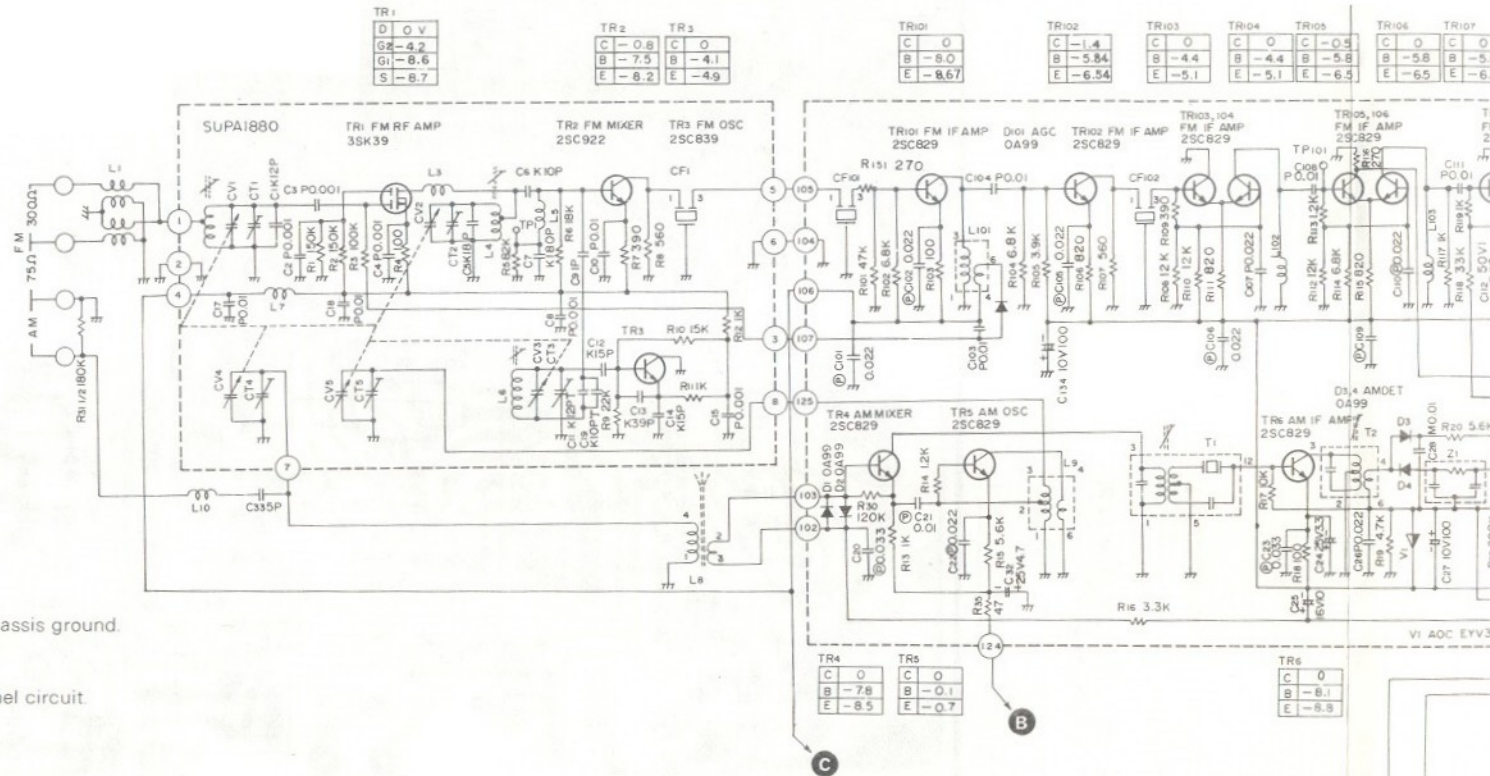
SUPA2790

at any time with the development of new technology.)



Schematic Diagram Model SA-8500

(This schematic diagram may be modified at any time with the development of new products.)



Notes 1:

- DC voltage measurements are taken with DC VTVM from chassis ground.
 - FM/AM non-signal condition
 - { } FM stereo signal reception.
- Circuit of rear channel main amplifier is same as front channel circuit.
- VR101 FM Meter Adjustment
- VR102 FM Muting Level Adjustment.
- VR103 Separation Adjustment.
- VR501 ~ VR504 Channel Level Control.
- VR505-1 ~ VR505-4 Volume Control
- VR506-1 ~ VR506-4 Treble Control
- VR507-1 ~ VR507-4 Bass Control

Schematic Diagram Model SA-8500X

CD-4 Demodulator (Right ch. is same as Left ch.)

