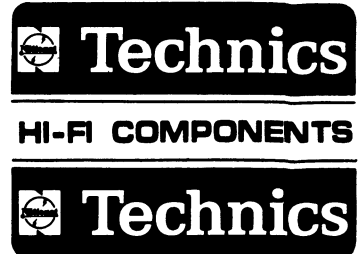


Service Manual



CD-4 FM/AM
4 CHANNEL/2 CHANNEL RECEIVER



MODEL SA-8000X

TECHNICAL SPECIFICATIONS (IHF) Specifications are subject to change without notice for further improvement.

AUDIO SECTION

Music power:		
4 CH operation	160W (4Ω)	
2 CH Balanced Transformerless operation	160W (8Ω)	
1 kHz RMS (continuous) power:		
4 CH operation (Each ch. driven)	30W/30W/30W/30W (4Ω)	
(All ch. driven)	22W/22W/22W/22W (8Ω)	
2 CH Balanced Transformerless (Each ch. driven)	18W+18W+18W+18W (4Ω)	
(Both ch. driven)	16W+16W+16W+16W (8Ω)	
20 Hz~20 kHz RMS (continuous) power:	57W/57W (8Ω)	
4 CH operation all ch. driven	42W+42W (8Ω)	
2 CH Balanced Transformerless operation Both ch. driven	13W+13W+13W+13W (8Ω)	
Power bandwidth (all ch. driven 8Ω):	36W+36W (8Ω)	
Frequency response:	5 Hz~40 kHz, -3 dB	
Residual hum & noise:	RIAA standard curve ±1 dB	
Input sensitivity & impedance:	10 Hz~50 kHz, +0 dB -3 dB	
S/N (IHF, A):	1.5 mV	
Tone control:	PHONO MM 1.5 mV/50 kΩ	
Loudness control: (Volume at -30 dB)	AUX. PLAYBACK 150 mV/60 kΩ	
REC OUT:	MIC 2 mV/50 kΩ	
Damping factor:	PHONO 70 dB	
Load impedance:	AUX 90 dB	
	BASS 50 Hz, +13 dB -13 dB	
	TREBLE 10 kHz, +10 dB -10 dB	
	50 Hz, +10 dB	
	150 mV	
	30 (8Ω)	
	4~16Ω	
	Balanced Transformerless (8~16Ω)	

Total harmonic distortion:	0.5%
Intermodulation distortion: (60 Hz : 7 kHz = 4 : 1, SMPTE)	0.7%
FM TUNER SECTION	
Frequency range:	88~108 MHz
FM sensitivity (IHF):	1.9 μV
Alternate channel selectivity:	65 dB
Harmonic distortion:	0.3% MONO 0.4% STEREO
S/N:	65 dB
Frequency response:	20 Hz~13 kHz, ±1 dB
Image rejection (at 98 MHz):	55 dB
IF rejection (at 98 MHz):	60 dB
Spurious response rejection (at 98 MHz):	60 dB
Capture ratio:	1.8 dB
AM suppression:	50 dB
Stereo separation (at 1 kHz):	40 dB
Leak carrier (19 kHz, 38 kHz):	50 dB
AM TUNER SECTION	
Frequency range:	520~1610 kHz
Sensitivity:	20 μV
Selectivity:	25 dB
Image rejection (at 1000 kHz):	40 dB
IF rejection (at 1000 kHz):	40 dB
GENERAL	
Power consumption:	345 W
Power supply:	50/60 Hz 110/120/220/240 V
Dimensions (W x H x D):	495 x 160 x 400 mm (19 3/4" x 6 3/8" x 15 3/4")
Weight:	13.5 kg (29.8 lb.)

TECHNISCHE DATEN (DIN 45 500) Spezifikationen können infolge von Verbesserungen ohne Ankündigung geändert werden.

VERSTÄRKERTEIL

Musikleistung:	4-Kanal Betrieb	4 x 40W (4Ω)
	Transformatorlos Ausgeglichen Betrieb	2 x 80W (8Ω)
Nennleistung 1 kHz:		
4-Kanal Betrieb Alle Kanäle in Betrieb	4 x 18W (4Ω)	4 x 16W (8Ω)
Transformatorlos Ausgeglichen Betrieb Beide Kanäle in Betrieb	2 x 42W (8Ω)	
Nennleistung 20 Hz~20 kHz:		
4-Kanal Betrieb Alle Kanäle in Betrieb	4 x 15W (4Ω)	4 x 13W (8Ω)
Transformatorlos Ausgeglichen Betrieb Beide Kanäle in Betrieb	2 x 36W (8Ω)	
Harmonische Verzerrung: Nennleistung, bei 1000 Hz 4Ω		0.5%
Intermodulations Verzerrung: Nennleistung, bei 250 Hz : 8000 Hz = 4 : 1		0.7%
Leistungsbandbreite (Alle Kanäle in Betrieb 4Ω):	5 Hz~40 kHz -3 dB	
Frequenzgang:	10 Hz~50 kHz, -3 dB	
Eingangs-Empfindlichkeit und-Impedanz: PHONO MM	1.5 mV/50 kΩ	
	AUX 150 mV/60 kΩ	
	MIC 2 mV/50 kΩ	
Tonband-Cinchbuchse:	PLAYBACK 150 mV/60 kΩ	
	REC OUT 150 mV	
Fremdspannungsabstand:		
bei Nennleistung	PHONO 60 dB	
	AUX 78 dB	
bei 50 mW Ausgangsleistung	PHONO 50 dB	
	AUX 56 dB	
Klangregler:		
Tiefen-Bereich	+13 dB, -13 dB bei 50 Hz	
Höhen-Bereich	+10 dB, -10 dB bei 10 kHz	
Loudness-Regler:	50 Hz +10 dB	
Dämpfungsfaktor:	15 bei 4Ω, 30 bei 8Ω	
Ausgänge Lautsprecher:	4-Kanal Betrieb	4~16Ω
	Transformatorlos Ausgeglichen Betrieb	8~16Ω

UKW-TUNERTEIL

Empfangsbereich:	88~108 MHz
Antennenanschluß:	300 Ω (symmetrisch) 75 Ω (unsymmetrisch)
Empfindlichkeit (bei ±40 kHz Hub):	1.8 μV, 30 dB Fremdspannungsabstand 300 Ω
	1.5 μV, 20 dB Fremdspannungsabstand 300 Ω
	1.0 μV, 20 dB Fremdspannungsabstand 75 Ω
Klirrfaktor (bei ±40 kHz Hub):	MONO 0.3% STEREO 0.7%
Fremdspannungsabstand:	MONO 52 dB STEREO 50 dB
Selektivität bei 400 kHz:	65 dB
Spiegelselektion (bei 98 MHz):	55 dB
ZF-Festigkeit (bei 98 MHz):	60 dB
Verzerrungsfestigkeit (bei 98 MHz):	60 dB
Gleich wellen-Selektion:	1.8 dB
AM-Unterdrückung:	50 dB
Stereo-Übersprechdämpfung:	40 dB bei 1 kHz
Pilotton-Unterdrückung:	48 dB bei 19 kHz, 58 dB bei 38 kHz
Begrenzung, Einsatzzpunkt:	1.2 μV
Bandbreite:	ZF-Verstärker 350 kHz
	UKW-Demodulator 700 kHz

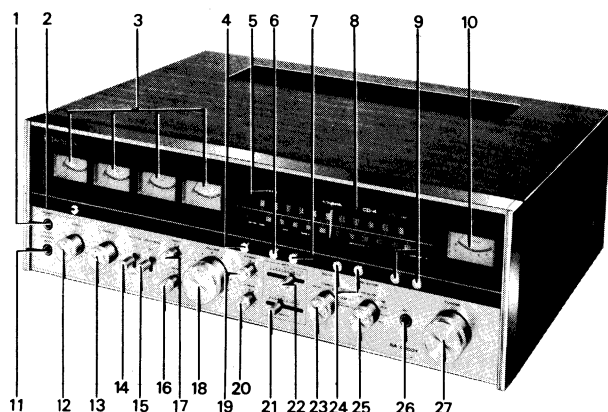
MW-TUNERTEIL

Empfangsbereich:	520~1610 kHz
Empfindlichkeit:	20 μV
Selektivität:	25 dB
Spiegelselektion:	40 dB
ZF-Festigkeit:	40 dB

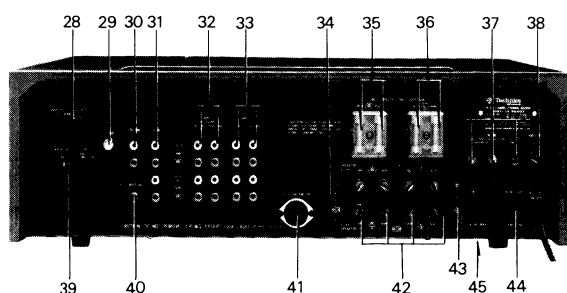
ALLGEMEINE DATEN

Leistungsaufnahme:	345 W
Netzspannung umschaltbar:	50/60 Hz, 110/120/220/240 V
Abmessungen (B x H x T):	495 x 160 x 400 mm
Gewicht:	13.5 kg

■ LOCATION OF CONTROLS

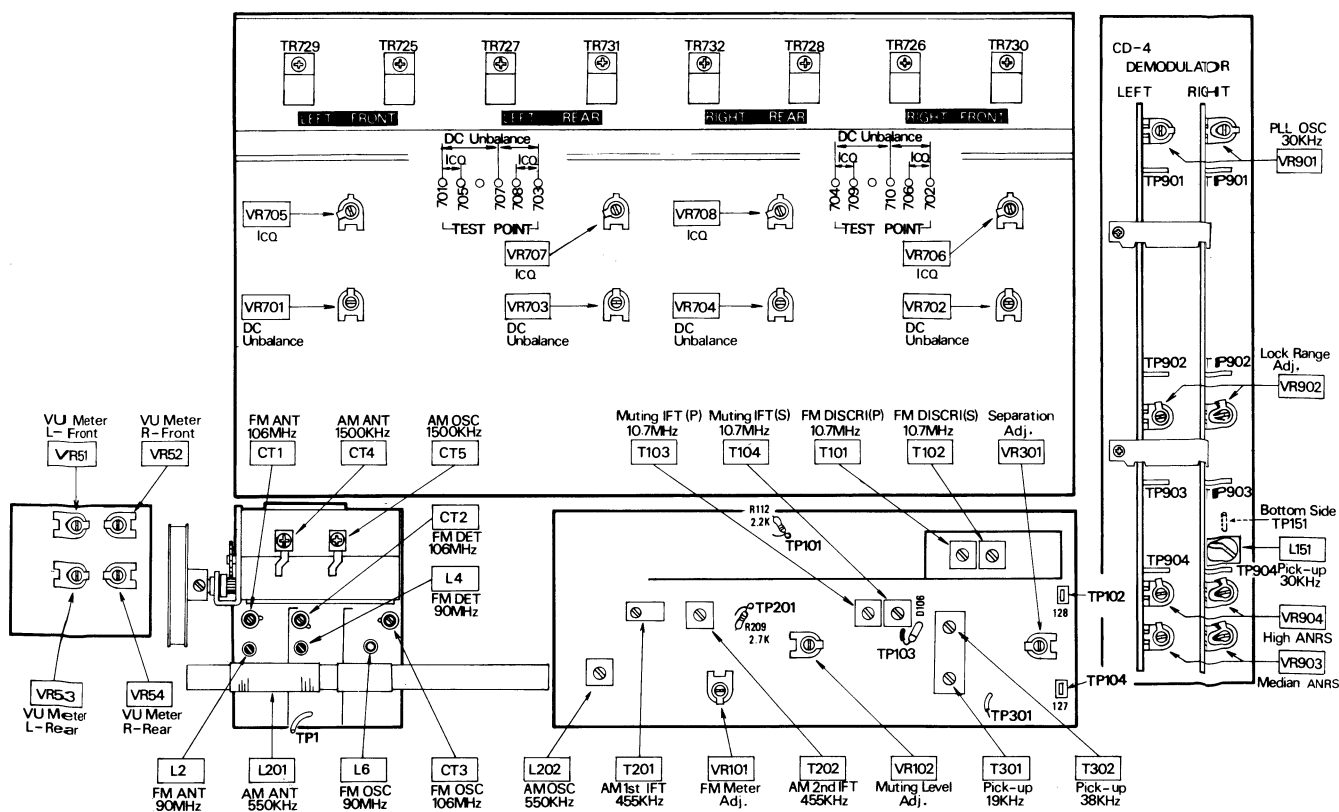


1. HEADPHONES JACK Front Channel
2. POWER SOURCE SWITCH (S8)
3. V.U. [OUTPUT LEVEL] METER
4. V.U. METER RANGE SWITCH (S11)
5. FM STEREO INDICATOR
6. TAPE MONITOR SWITCH TAPE 1 (S3)
7. TAPE MONITOR SWITCH TAPE 2 (S4)
8. CD-4 4 CHANNEL RADAR
9. CD-4 CARRIER LEVEL ADJUSTMENT [Left and Right] (VR7, 8)
10. SIGNAL STRENGTH METER
11. HEADPHONES JACK Rear Channel
12. BASS CONTROL (VR602)
13. TREBLE CONTROL (VR603)
14. MUTING SWITCH (S5)
15. LOUDNESS SWITCH (S6)
16. LEFT REAR LEVEL CONTROL (VR4)
17. LEFT FRONT LEVEL CONTROL (VR3)
18. MAIN VOLUME CONTROL (VR601)
19. RIGHT FRONT LEVEL CONTROL (VR5)
20. RIGHT REAR LEVEL CONTROL (VR6)
21. AFD [DEPTH] CONTROL (VR2)
22. AFD [WIDTH] CONTROL (VR1)
23. MODE SWITCH (S2)
24. CD-4 SEPARATION ADJUSTMENT [Left and Right] (VR9, 10)
25. SELECTOR SWITCH (S1)
26. MICROPHONE JACK
27. TUNING CONTROL



28. CARRIER LEVEL ADJUSTMENT SWITCH (S9)
29. GROUND TERMINAL
30. PHONO INPUT TERMINALS
31. AUX INPUT TERMINALS
32. TAPE MONITOR TERMINALS TAPE 1
33. TAPE MONITOR TERMINALS TAPE 2
34. BALANCED TRANSFORMER LESS SWITCH (S7)
35. RIGHT CHANNEL CIRCUIT PROTECTION FUSES
36. LEFT CHANNEL CIRCUIT PROTECTION FUSES
37. EXT FM ANTENNA TERMINALS
38. EXT AM ANTENNA TERMINAL
39. CARTRIDGE SELECTOR SWITCH (S10)
40. 4CH MPX OUTPUT TERMINAL
41. 4CH REMOTE BALANCER CONNECTION SOCKET
42. SPEAKER TERMINALS
43. AC POWER OUTLET Switched
44. AC POWER OUTLET Unswitched
45. VOLTAGE SELECTOR SWITCH (S12).....(Set Bottom Side)

■ ALIGNMENT POINTS



■ CD-4 RECORD PLAY

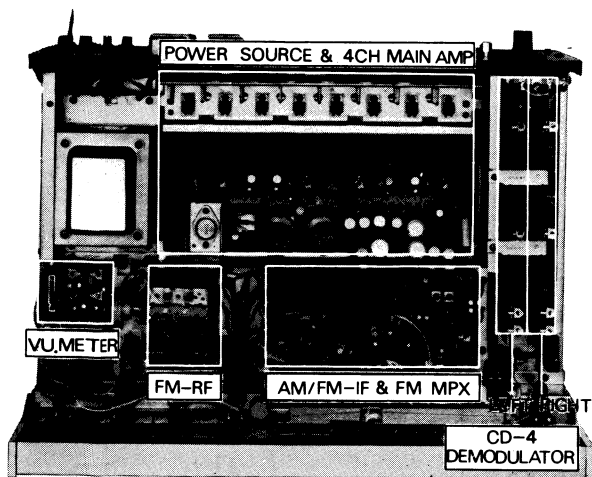
Before playing

1. Connect all of the equipment required for CD-4 play. (Refer to the instruction booklets.)
2. According to the cartridge to be used, set the CARTRIDGE SELECTOR switch of the unit to the proper position.
3. Set the MODE switch to the 4CH DISCRETE position.
4. Set the SELECTOR switch to the CD-4 position.
5. While playing the included CD-4 test record (No. SPR111-1), assure that the sounds are emitted from the speakers of each channel.

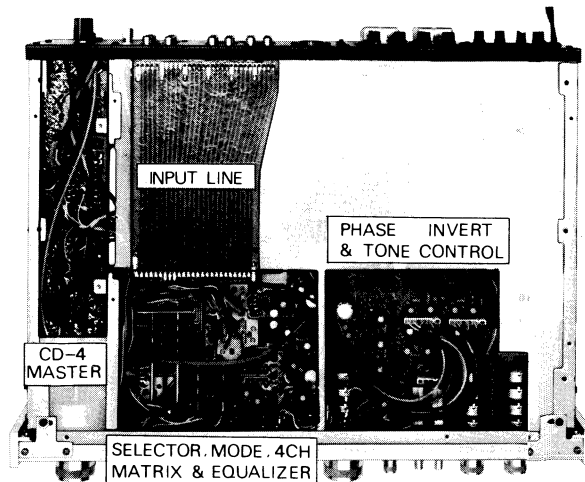
MAIN VOLUME (VR601) CHANNEL LEVEL (VR3, 4, 5, 6)	CARRIER LEVEL CONTROL L(VR7), R(VR8)	SEPARATION CONTROL L(VR9), R(VR10)	CARRIER LEVEL ADJUST SWITCH (S9)	PORTION OF THE INCLUDED TEST RECORD TO BE PLAYED	REMARKS
CARRIER LEVEL ALIGNMENT					
Minimum	Turn completely counterclockwise (to minimum)	Optional Position	L	SIDE A BAND 1	Slowly turn the(L) carrier level control clockwise until the 4 CH RADAR light just illuminates.
			R	SIDE A BAND 1	Slowly turn the(R) carrier level control clockwise until the 4 CH RADAR light just illuminates.
Notes : 1. If the carrier level controls (VR7, VR8) are turned too far, return them to the minimum position and carefully repeat the carrier level control adjustment from the beginning. 2. After the carrier level control adjustment has been completed, set the carrier level adjust switch (S9) to the NORMAL position.					
SEPARATION ALIGNMENT					
Turn VR601 to the max. position. Turn only L _F (VR3) & R _F (VR4) to their min. positions.	Remaining at the position where the carrier level was adjusted.	Variable	NORMAL	SIDE A BAND 2	Turn the left side separation control until the left rear sound becomes minimum.
				SIDE A BAND 3	Turn the right side separation control until the right rear sound becomes minimum.

Note : When the adjustment procedure is completed, set L_F, R_F, L_R, R_R, and the main volume controls back to their original positions.

■ LOCATION OF CIRCUIT BOARDS



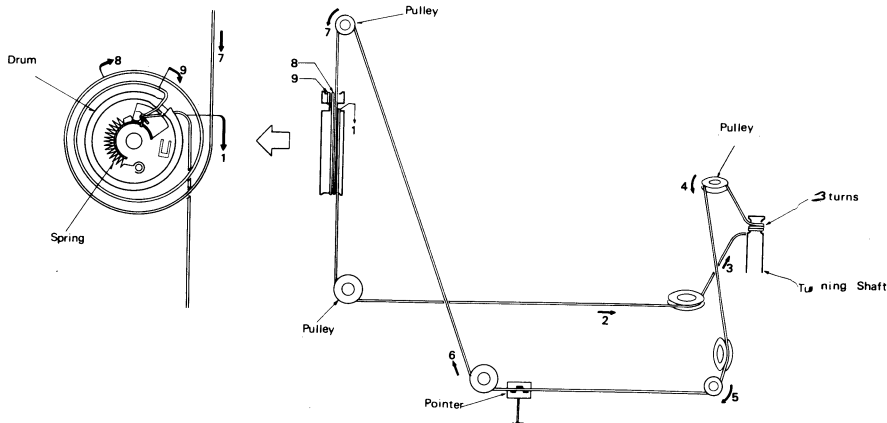
Top View



Bottom View

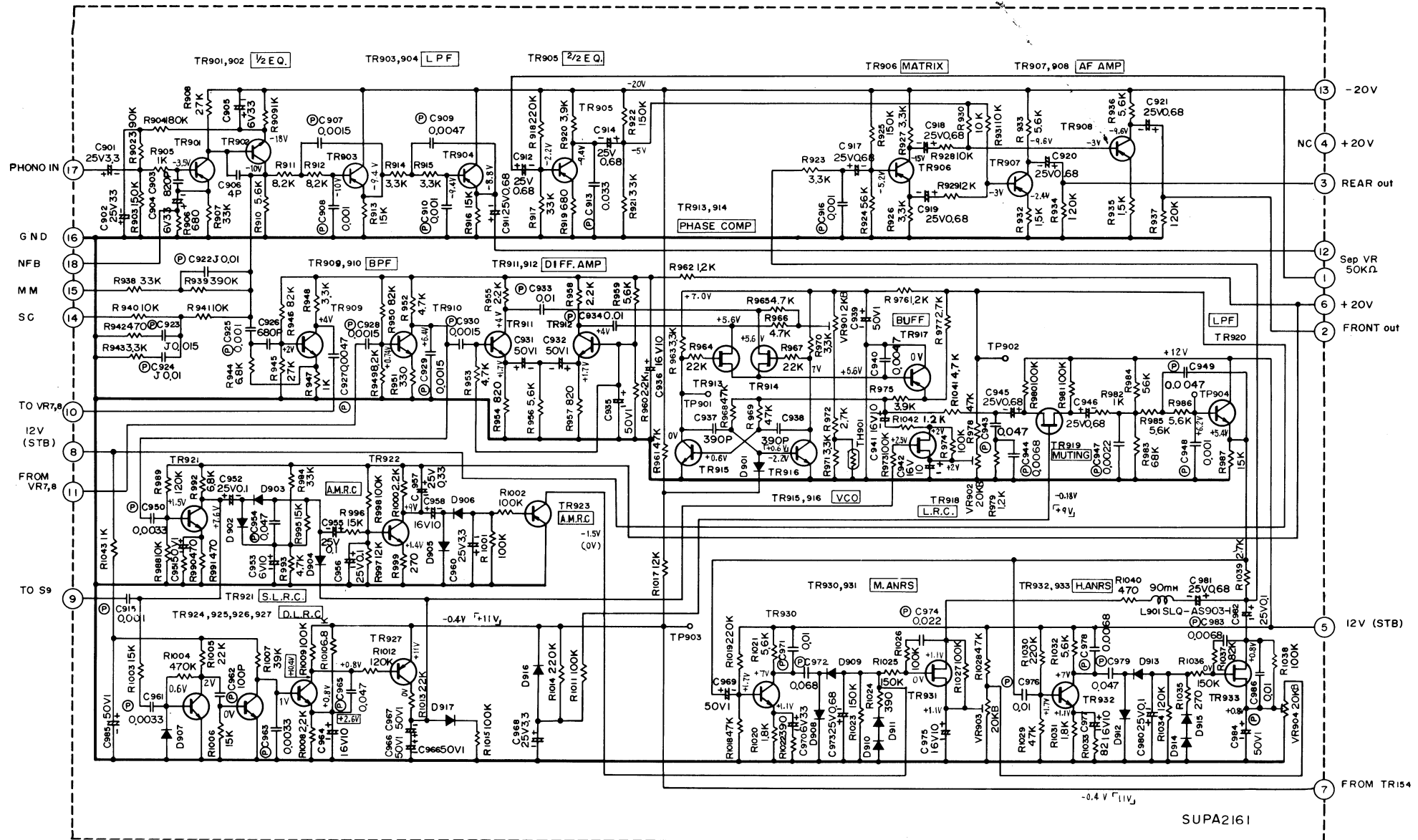
■ DIAL CORD INSTALLATION GUIDE

1. Dial cord length is 63 1/2" (160cm)
2. Tuning gang is positioned at maximum capacity. (Frequency is minimum)
3. Arrow marks (1 ~ 9) indicate correct order and direction of stringing dial cord.



Schematic Diagram Model SA-8000X

CD-4 Demodulator



TR 917, 923, 927 2SA 564
 TR 901, 903, 904, 905 2SA 721
 906, 907, 908 2SA 721
 TR 909, 910, 911, 912, 915, 916, 921 2SC 828
 922, 924, 925, 926, 930, 932 2SC 828
 TR 902, 920 2SC 1327

TR 913, 914, 918, 919, 931, 933 2SK 30
 D 910, 911, 914, 915 MA 26-1
 D 901, 917 MA 150
 D 902, 903, 904, 905, 906 OA 99
 907, 908, 909, 912, 913, 916 OA 99

TH 901 RRT 202-2

STANDARD VOLTAGE
 CD 4 Operation
 DLRC Operation
 AMRC Operation

ALIGNMENT INSTRUCTIONS.....READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Notes :

1. Volume control Minimum
2. Balanced transformer less switch..... 4CH
3. Other controls Optional position
4. Maintain line voltage at rated voltage.
5. The adjustment should be started 1~2 minutes after setting the power switch to the ON position.
6. Before adjusting, I_{CO} adjusting volumes (VR805, VR806, VR807 and VR808) as shown in Alignment Point Location. Refer to page 2.

CIRCUIT	VTVM CONNECTION	ADJUSTMENT POINTS	REMARKS
MAIN AMP ALIGNMENT			
DC Unbalance	Connect DC VTVM to TP702 and TP710 (R-Front) , TP701 and TP707 (L-Front) terminal. ----- Connect DC VTVM to TP704 and TP710 (R-Rear) , TP703 and TP707 (L-Rear) terminal.	VR702 (R-Front) VR701 (L-Front) ----- VR704 (R-Rear) VR703 (L-Rear)	Make sure that DC VTVM becomes 0mV.
Icq	Connect DC VTVM to TP702 and TP706 (R-Front) , TP701 and TP705 (L-Front) terminal. ----- Connect DC VTVM to TP704 and TP709 (R-Rear) , TP703 and TP708 (L-Rear) terminal.	VR706 (R-Front) VR705 (L-Front) ----- VR708 (R-Rear) VR707 (L-Rear)	Make adjustments so that the indication on DC VTVM becomes 4 mV.

Notes :

- | | | | |
|----------------------------------|---|--|--------|
| 1. Volume control | Maximum (AM-RF)
Minimum (AM-IF, FM-IF)
Variable (FM-RF) | 5. Muting switch | OFF |
| 2. Bass and treble control | Center | 6. Balanced transformer less switch | 4CH |
| 3. Band selector switch | AM | 7. Tape-monitor switch | Source |
| | FM-Auto (FM-RF, FM-IF) | 8. Mode switch | Stereo |
| 4. Loudness switch | OFF | 9. Maintain line voltage at rated voltage. | |
| | | 10. Output of signal generator should be no higher than necessary to obtain an output reading. | |

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

AM ALIGNMENT

3	High side through 0.001 μ F to antenna terminal. Common to chassis.	455 kHz (20 kHz Sweep)	Point of non-interference	Connect vert. amp. of scope to TP201.	T201 (1st IFT) T202 (2nd IFT)	Adjust for maximum output.
4	Fashion loop of several turns of wire and radiate signal into loop of receiver.	550 kHz (30% Mod. with 400Hz)	550 kHz [4.6mm (3/16")]	Connect meter to speakers terminal of set.	L202 (OSC Coil) L201 (ANT Coil)	Adjust for maximum output. Adjust L201 by moving coil bobbin along ferrite core.
5	Fashion loop of several turns of wire and radiate signal into loop of receiver.	1500 kHz (30% Mod. with 400 Hz)	1500 kHz [131mm (5 1/8")]	Connect meter to speakers terminal of set.	CT5 (OSC Trimmer) CT4 (ANT Trimmer)	Adjust for maximum output. Repeat steps (4) and (5).

FM-IF ALIGNMENT

6			Point of non-interference.	Connect DC VTVM between TP102 and TP104 .	T102 (FM DISCRI IFT) (S)	Make sure that VTVM becomes 0V.
7	High side through 0.001 μ F to TP1 . Common to chassis.	10.7 MHz (400kHz Sweep)	Point of non-interference.	Connect vert. amp. of scope through detector to TP101 . Refer to figure 1.		Confirm center frequency.
8	High side through 0.001 μ F to TP1 . Common to chassis.	10.7 MHz (400kHz Sweep)	Point of non-interference.	Connect vert. amp. of scope to TP103 .	T103 (Muting IFT) (P) T104 (Muting IFT) (S)	Adjust for maximum sharp and proper linearity. Adjust to center frequency as step 7. Refer to figure 2.

FM-RF ALIGNMENT

9	Connect to FM antenna terminal through FM dummy antenna. (Refer to fig. 3)	90 MHz (100% Mod. with 400 Hz)	90 MHz { 17.3mm ($\frac{9}{32}$ ") }	Output meter across speaker terminals.	L6 (FM OSC Coil) * L4 (FM DET Coil) L2 (FM ANT Coil)	Adjust for maximum output.
10	Connect to FM antenna terminal through FM dummy antenna. (Refer to fig. 3)	106 MHz (100% Mod. with 400 Hz)	106 MHz { 122.7mm ($4\frac{27}{32}$ ") }	Output meter across speaker terminals.	CT3 (FM OSC Trimmer) CT2 (FM DET Trimmer) CT1 (FM ANT Trimmer)	Adjust for maximum output. Repeat steps (9) and (10).

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

MUTING LEVEL ALIGNMENT

Note : Muting switch.....ON

11	Connect to FM antenna terminal through FM dummy antenna.	98 MHz (100% Mod. with 400 Hz) Output 28 dB	98 MHz	Output meter or speaker across speaker terminals.	VR102 (Muting Level)	Adjust so that output can be obtained.
----	--	---	--------	---	----------------------	--

SIGNAL GENERATOR		RECEIVER DIAL SETTING	INDICATOR (DISTORTION METER and SIGNAL METER)	ADJUSTMENT POINTS	REMARKS
CONNECTION	FREQUENCY				
FM-MONO DISTORTION ALIGNMENT					
Note : Muting switch OFF					
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 DISCR IFT) (P)	Adjust for minimum distortion.
SIGNAL METER ALIGNMENT					
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 4.6 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. Band selector FM-Auto 2. Bass and treble control Center 3. Balanced transformer less switch 4CH 4. Mode switch Stereo 5. Maintain line voltage at rated voltage 6. Muting switch OFF 7. Loudness-switch OFF 8. Tape monitor switch Source 9. Dummy load Source					
19kHz COIL and PHASE ALIGNMENT					
SIGNAL GENERATOR CONNECTION	STEREO MODULATOR MODE and MOD. RATE	INDICATOR (VTVM or SCOPE)	ADJUSTMENT POINTS	REMARKS	
FM antenna terminal through dummy antenna.	Pilot signal to ON.	Connect scope to TP ₃₀₁ , Common to chassis.	T ₃₀₁ (19 kHz Coil)	Adjust for maximum output.	
"	" L (or R) 30% Mod.	Connect scope to speaker terminals.	T ₃₀₂ (38 kHz Coil) (Phase Alignment)	Adjust for minimum right (or left) output.	
SEPARATION ALIGNMENT					
FM antenna terminal through dummy antenna.	L (and R) 30% Mod.	Output meter across speaker terminals through low pass filter. (Refer to fig. 4)	VR ₃₀₁ (Separation)	Adjust for minimum right (and left) output.	

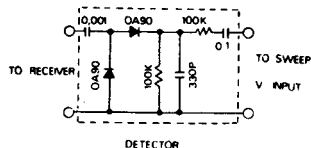


Fig. 1

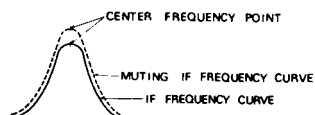
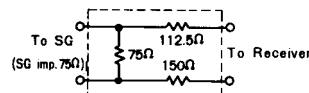


Fig. 2



300Ω FM Dummy Antenna

Fig. 3

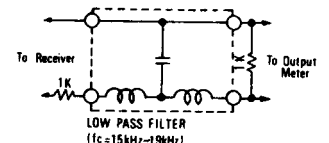


Fig. 4

■ FM-RF ALIGNMENT INSTRUCTIONS Only set for Germany

ABGLEICHANWEISUNGEN.....VOR DEM ABGLEICH SORGFÄLTIG DURCHLESEN					
MESSENDER		SKALENZEIGER- EINSTELLUNG DES EMPFANGERS [ABSTAND]	ANGEIGE (RÖHRENVOLTMETER ODER OSZILLOGRAPH)	ABGLEICH	BEMERKUNGEN
SCHALTUNG	FREQUENZ				
FM HF-ABGLEICH					
Anschluß an den FM Antennenanschluß über die künstliche FM Antenne	87.5MHz (100% Mod bei 400Hz)	87.5MHz [0mm]	Output meter über Lautsprecher- schwingspule anschließen	L ₆ (Oszillatorspule)	Auf max. Ausgang abgleichen
"	90MHz (")	90MHz	"	L ₄ (Zwischenkreis) L ₂ (Antennenspule)	"
"	106MHz (")	106MHz [122.7mm]	"	CT ₃ (OSZ. Trimmer) CT ₂ (DET. Trimmer) CT ₁ (ANT. Trimmer)	"

CD-4 DEMODULATOR ALIGNMENT INSTRUCTIONS

Notes :

- | | |
|--|---|
| 1. Volume control..... Minimum (ANRS, MUTING)
2. Channel level control Maximum
3. Balanced transformer less switch..... 4 CH
4. Cartridge selector switch MM (or SC)
5. Carrier level adjustment switch..... NORMAL
6. Selector switch..... CD-4
7. Mode switch 4 CH DISCRETE
8. Tape monitor switch 1 & 2 Source | 9. Bass & treble control..... Flat
10. Loudness switch..... OFF
11. Separation control (L & R) Minimum
12. Maintain line voltage at rated voltage.
13. Before adjusting, turn volume control VR901, VR902, VR903 and VR904 as shown in the Alignment Points Location. Refer to pag 2.
14. CD-4 demodulator alignment record No. RG-1256, RG-1257
15. Use a player and MM (or SC) cartridge for CD-4 play. |
|--|---|

OSCILLATOR (or CD-4 ALIGN- MENT RECORD) CONNECTION	INPUT FREQUENCY & INPUT LEVEL	INDICATOR (VTVM & SCOPE)	ADJUSTMENT POINTS	REMARKS
---	----------------------------------	-----------------------------	----------------------	---------

AUTOMATIC NOISE REDUCTION SYSTEM (ANRS) ALIGNMENT

1	Connect oscillator to TP904 (Right & Left) through electrolytic capacitor (25V, 10 μ F). Refer to fig. 1.	1 kHz (92 mV)	Connect VTVM to R _F & L _F REC OUT terminals through ATT 2. Refer to fig. 1.	ATT 2 (Attenuator)	Adjust ATT 2 until the output of R _F becomes 0dB when the right input is applied, and until the output of L _F becomes 0dB when the left input is applied.
2	Connect oscillator to TP904 (Right & Left) through electrolytic capacitor (25V, 10 μ F). Refer to fig. 1.	6.3 kHz (-10dB from Step 1)	Connect VTVM to R _F & L _F REC OUT terminals through ATT 2. Refer to fig. 1.	VR904 (High ANRS)	Adjust VR904 until the output becomes -15dB (right & left sides).
3	Connect oscillator to TP904 (Right & Left) through electrolytic capacitor (25V, 10 μ F). Refer to fig. 1.	630 Hz (-10dB from Step 1)	Connect VTVM to R _F & L _F REC OUT terminals through ATT 2. Refer to fig. 1.	VR903 (Median ANRS)	Adjust VR903 until the output becomes -16.4dB (right & left sides).

MUTING COIL ALIGNMENT

4	Connect oscillator to PHONO input of set's left terminal. Or play CD-4 alignment record (RG-1256 BAND 9). Refer to fig. 2.	30 kHz $\pm$ 50 Hz (1 mV)	Connect scope to TP151 *	VR7 (Left Carrier Level)	Adjust VR7 until a sine wave with the best appearance can be obtained.
5	Connect oscillator to PHONO input of set's left terminal. Or play CD-4 alignment record (RG-1256 BAND 9). Refer to fig. 2.	30 kHz $\pm$ 50 Hz (1 mV)	Connect scope to TP151 *	L151 ** (Muting Coil)	Adjust for maximum proper linearity.

* TP151 is on the rear side of the CD-4 MASTER P.C.B.

** L151 can be easily adjusted if the right side of the CD-4 DEMODULATOR is pulled out.

PLL FREE RUNNING FREQUENCY ALIGNMENT

Notes :

- Be sure to connect the right side demodulator **TP902** with **TP903***, and that the CD-4, 4 CH RADAR light is illuminated. Adjust the left side in the same manner as described above.
- Correctly adjust the rotational speed of the player to 33-1/3 rpm.
- Set the CARRIER LEVEL ADJUST switch (S9) to the NORMAL position.
- Connect the probe (Impedance more than 1M Ω , less than 30 pF) to scope.

	SCOPE or SPEAKER CONNECTION	CD-4 ALIGNMENT RECORD	ADJUSTMENT POINTS	REMARKS
6	Connect scope to POINT A of S9 through probe. Refer to fig. 3.	RG-1256 BAND 9	VR8 (Right Carrier Level Control)	Adjust VR8 until a 50 mV P-P wave is measured using the scope.
7	Connect speaker or scope to R _R (or R _F) speaker terminals.	RG-1256 BAND 9	VR901 (Right PLL Free Running)	Listening to the beat sound from speakers, or by observing the beat wave form, adjust VR901 until the beat frequency disappears.
8	Connect scope to POINT B of S9 through probe. Refer to fig. 3.	RG-1256 BAND 9	VR7 (Left Carrier Level Control)	Adjust VR7 until a 50 mV P-P wave is measured using the scope.
9	Connect speaker or scope to L _P (or L _F) speaker terminals.	RG-1256 BAND 9	VR901 (Left PLL Free Running)	Listening to the beat sound from speakers, or by observing the beat wave form, adjust VR901 until the beat frequency disappears.

* Disconnect **TP902** from **TP903** after the adjustment has been completed.

SCOPE or SPEAKER CONNECTION	CD-4 ALIGNMENT RECORD	ADJUSTMENT POINTS	REMARKS
STATIC LOCK RANGE CONTROL ALIGNMENT			
Note : Adjust the carrier level using the included CD-4 test record (SPR111-1). (Refer to "CD-4 RECORD PLAY" for the adjusting method.) Set the CARRIER LEVEL ADJUST switch to the NORMAL position after adjustment has been made.			
10	Connect scope to POINT [A] of S9 through probe. Refer to fig. 3.	RG-1257 BAND 4 (The second from the inner side)	Measure the voltage level of the wave using the scope. This is defined as the specified voltage. Refer to fig. 4.
11	Connect scope to POINT [A] of S9 through probe. Refer to fig. 3.	RG-1257 BAND 4 (The second from the inner side)	VR8 (Right Carrier Level Control)
12	Connect scope to R _R (or R _F) speaker terminals.	RG-1257 BAND 4 (The second from the inner side)	VR902 (Right Static Lock Range)
13	Connect scope to POINT [B] of S9 through probe. Refer to fig. 3.	RG-1257 BAND 4 (The second from the inner side)	Measure the voltage level of the wave using the scope. This is defined as the specified voltage. Refer to fig. 4.
14	Connect scope to POINT [B] of S9 through probe. Refer to fig. 3.	RG-1257 BAND 4 (The second from the inner side)	VR7 (Left Carrier Level Control)
15	Connect scope to L _R (or L _F) speaker terminals.	RG-1257 BAND 4 (The second from the inner side)	VR902 (Left Static Lock Range)

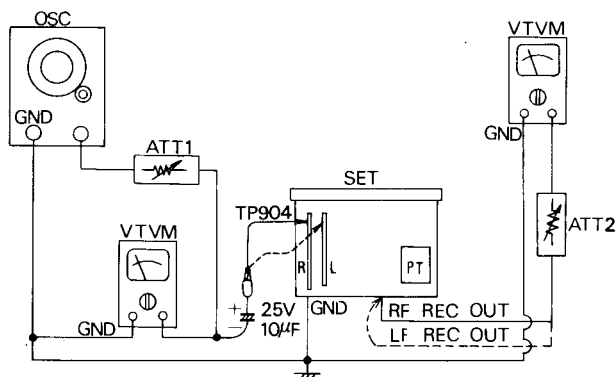


Fig. 1

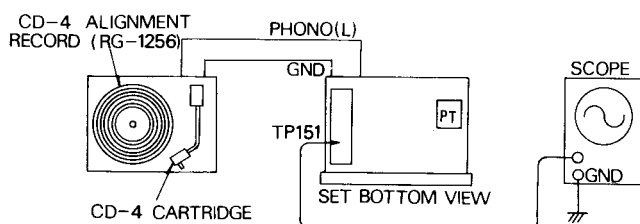


Fig. 2

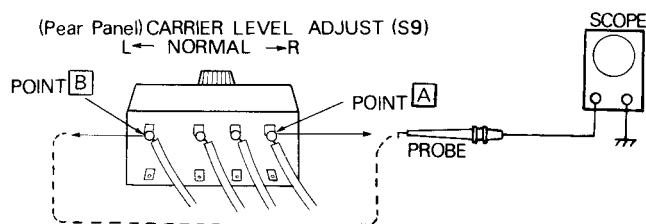


Fig. 3



Fig. 6

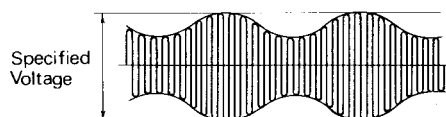


Fig. 4

-3dB

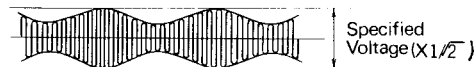
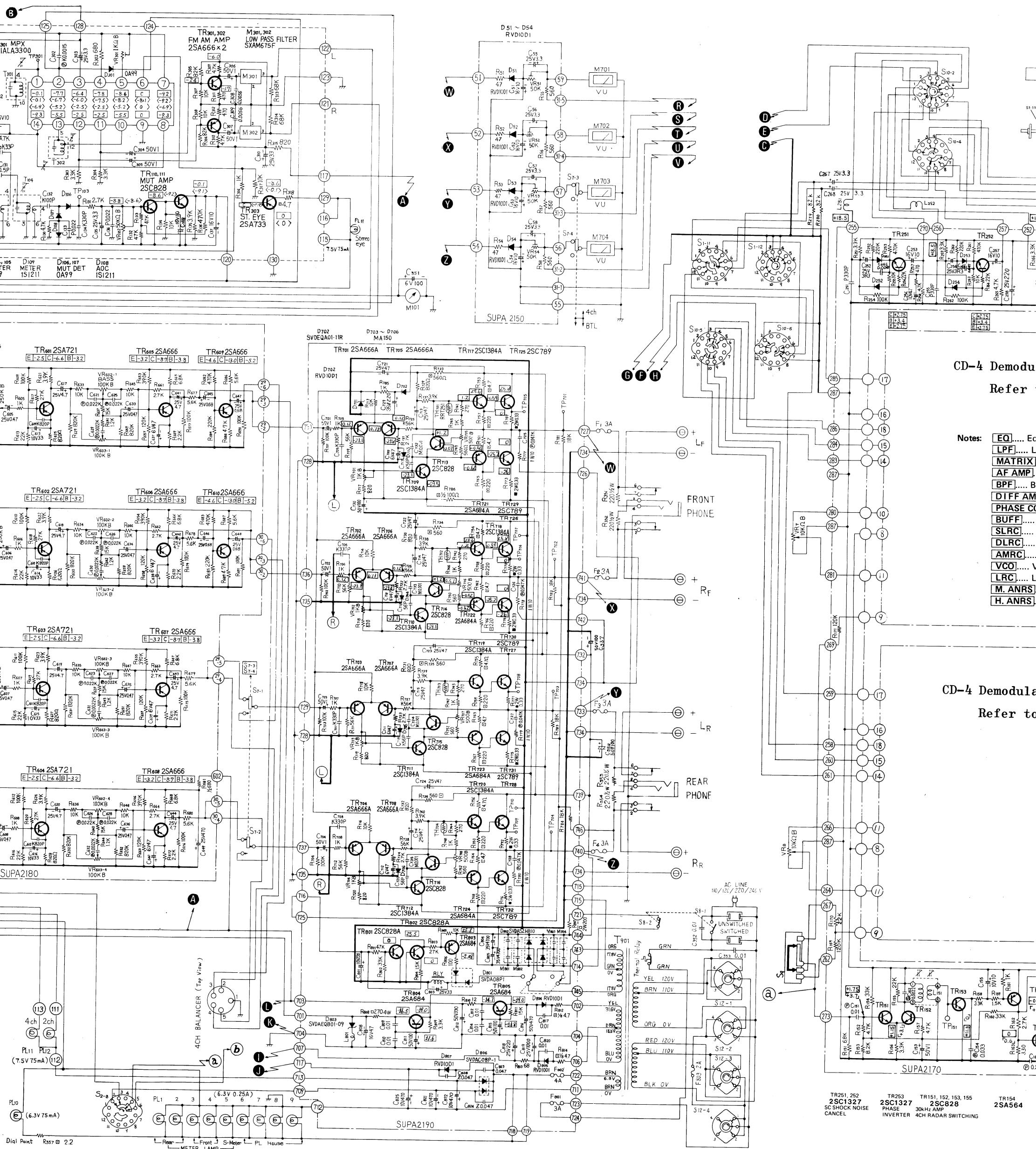


Fig. 5

(This schematic diagram may be



Program may be modified at any time with the development of new technology.)



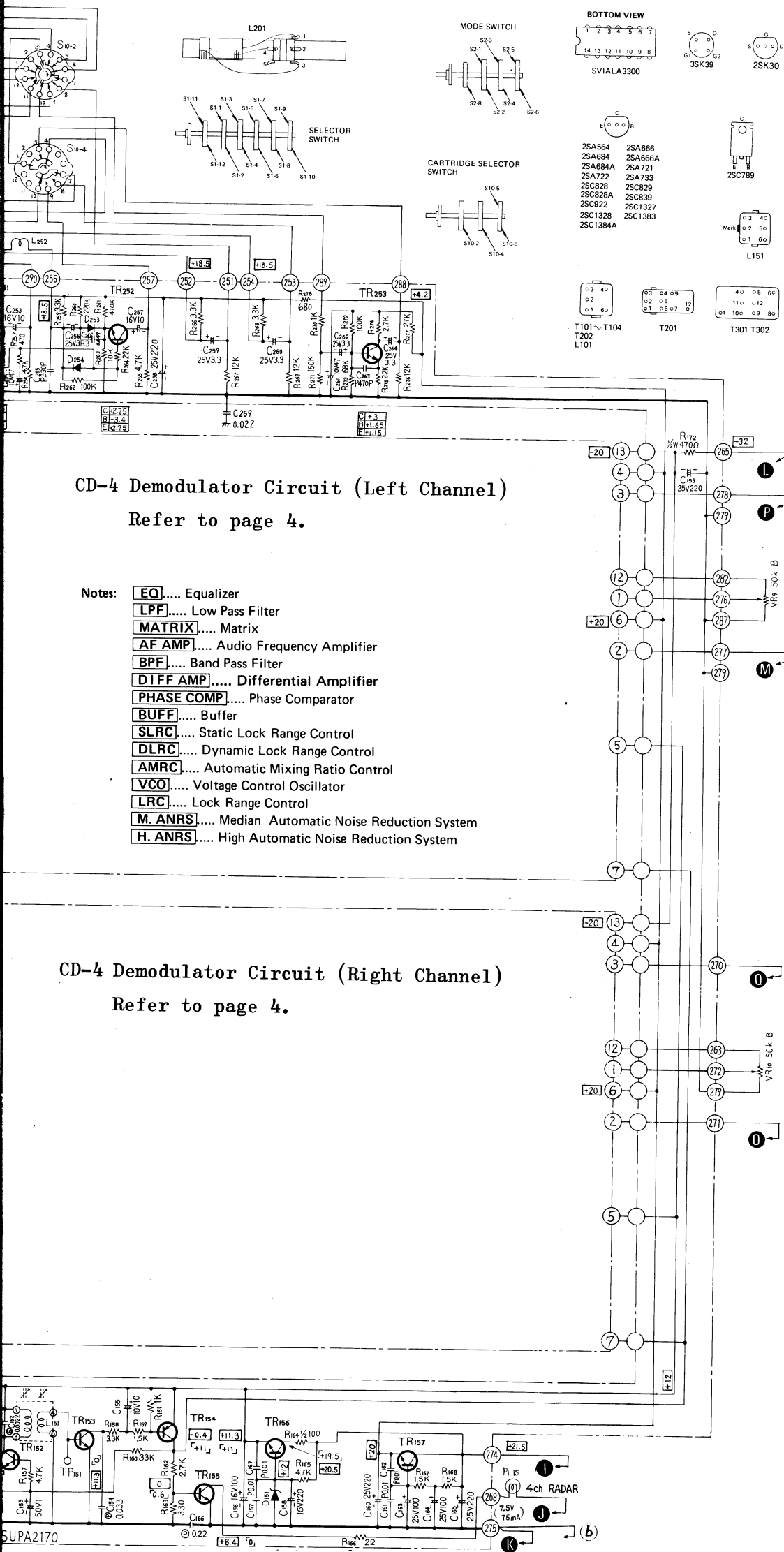
CD-4 Demodu
Refer

Notes:

EQ.....	EQ
LPF.....	LPF
MATRIX.....	MATRIX
AF AMP.....	AF AMP
BPF.....	BPF
DIFF AMP.....	DIFF AMP
PHASE CO.....	PHASE CO
BUFF.....	BUFF
SLRC.....	SLRC
DLRC.....	DLRC
AMRC.....	AMRC
VCO.....	VCO
LRC.....	LRC
M. ANRS.....	M. ANRS
H. ANRS.....	H. ANRS

CD-4 Demodulation
Refer to

TR251, 252	TR253	TR151, 152, 153, 155	TR154
2SC1327	2SC1327	2SC828	2SA564
SC SHOCK NOISE	PHASE	30kHz AMP	
CANCEL	INVERTER	4CH RADAR SWITCHING	



CD-4 Demodulator Circuit (Left Channel)
Refer to page 4.

- Notes:
- EQ..... Equalizer
 - LPF..... Low Pass Filter
 - MATRIX..... Matrix
 - AF AMP..... Audio Frequency Amplifier
 - BPF..... Band Pass Filter
 - DIFF AMP..... Differential Amplifier
 - PHASE COMP..... Phase Comparator
 - BUFF..... Buffer
 - SLRC..... Static Lock Range Control
 - DLRC..... Dynamic Lock Range Control
 - AMRC..... Automatic Mixing Ratio Control
 - VCO..... Voltage Control Oscillator
 - LRC..... Lock Range Control
 - M. ANRS..... Median Automatic Noise Reduction System
 - H. ANRS..... High Automatic Noise Reduction System

CD-4 Demodulator Circuit (Right Channel)
Refer to page 4.

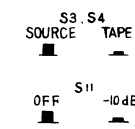
TR151, 152, 153, 155
2SC828
30kHz AMP
4CH RADAR SWITCHING

TR154
2SA564

TR156, 157
2SC1383
RIPPLE FILTER

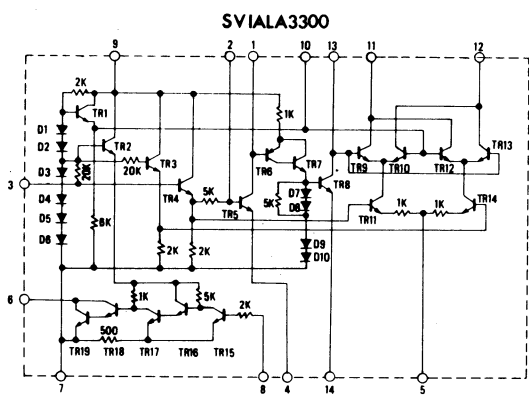
2SC1383
MA150

D151
SVDAEQAO112R



- Notes:
- S1-1 ~ S1-12: Selector switch in "AM" position
AM ↔ FM AUTO ↔ PHONO ↔ CD-4 ↔ AUX ↔ MIC
 - S2-1 ~ S2-8: Mode switch in "MONO" position.
MONO ↔ STEREO ↔ PHASE 90° ↔ PHASE 0° ↔ 4CH DISCRETE
 - S3-1 ~ S3-4: Tape monitor (TAPE 1) switch in "SOURCE" position.
 - S4-1 ~ S4-4: Tape monitor (TAPE 2) switch in "SOURCE" position.
 - S5: Muting switch in "OFF" position.
 - S6-1 ~ S6-4: Loudness switch in "OFF" position.
 - S7-1 ~ S7-4: Balanced transformerless switch in "4CH" position.
 - S8-1, S8-2: Power source switch in "OFF" position.
 - S9: Carrier level adjustment switch in "NORMAL" position.
L ↔ NORMAL ↔ R
 - S10-1 ~ S10-4: Cartridge selector switch in "MM" position.
MM ↔ SEMI CONDUCTOR A ↔ SEMI CONDUCTOR B
 - S11-1 ~ S11-4: VU meter range switch in "OFF" position.
 - S12-1 ~ S12-4: Voltage selector switch in "110V" position
MARK 110V ↔ 120V ↔ 220V ↔ 240V
 - RLY: Speakers protection relay in "OFF" position.
 - DC voltage measurements are taken with DC voltmeter from chassis ground.
 - FM/AM No signal condition.
 - < >..... FM stereo signal reception or FM muting to "ON" position.
 - CD-4 operation

- VR1: AFD control WIDTH
VR2-1, VR2-2: AFD control DEPTH
VR3 ~ VR6: Channel level control
VR7, VR8: Carrier level control
VR9, VR10: Separation control
VR101: FM meter adjustment
VR102: FM muting level adjustment
VR301: FM separation adjustment
VR601-1 ~ VR601-4: Main volume control
VR602-1 ~ VR602-4: Bass control
VR603-1 ~ VR603-4: Treble control
VR701 ~ VR704: DC unbalance adjustment
VR705 ~ VR708: ICQ adjustment
VR901 (Left & Right): PLL free running frequency adjustment
VR902 (Left & Right): Lock range control adjustment
VR903 (Left & Right): Median automatic noise reduction system adjustment
VR904 (Left & Right): High automatic noise reduction system adjustment



■ TO REMOVE TUNER

1. Remove four (4) cabinet mounting screws.
(Refer to Cabinet and Chassis Parts Location on page 19.)
2. Remove cabinet from chassis.
3. Remove fourteen (14) control knobs from front panel.
4. Remove six (6) front panel mounting black screws.
(Refer to Cabinet and Chassis Parts Location on page 19.)
5. Remove front panel from chassis.
6. Remove ten (10) tuner mounting black screws.
nos. 1 ~ 10 as figure 1 and 2.
7. Loosen power switch mounting screws, nos. 11, 12 and slide power switch as figure 1.
8. Then tuner can be moved in front of chassis as figure 3.

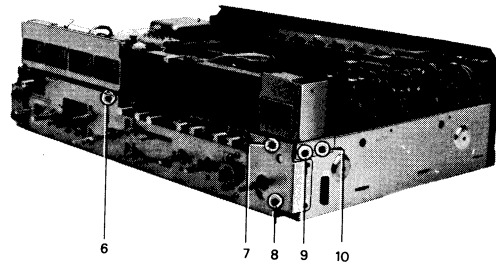


Fig. 2

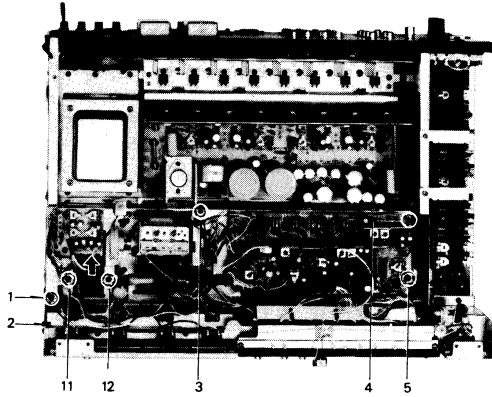


Fig. 1

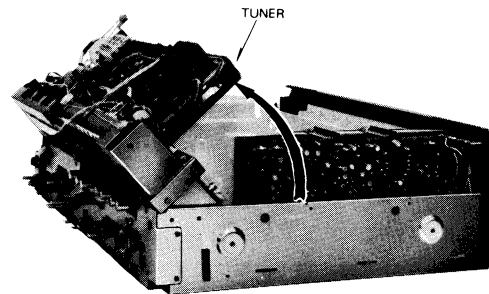
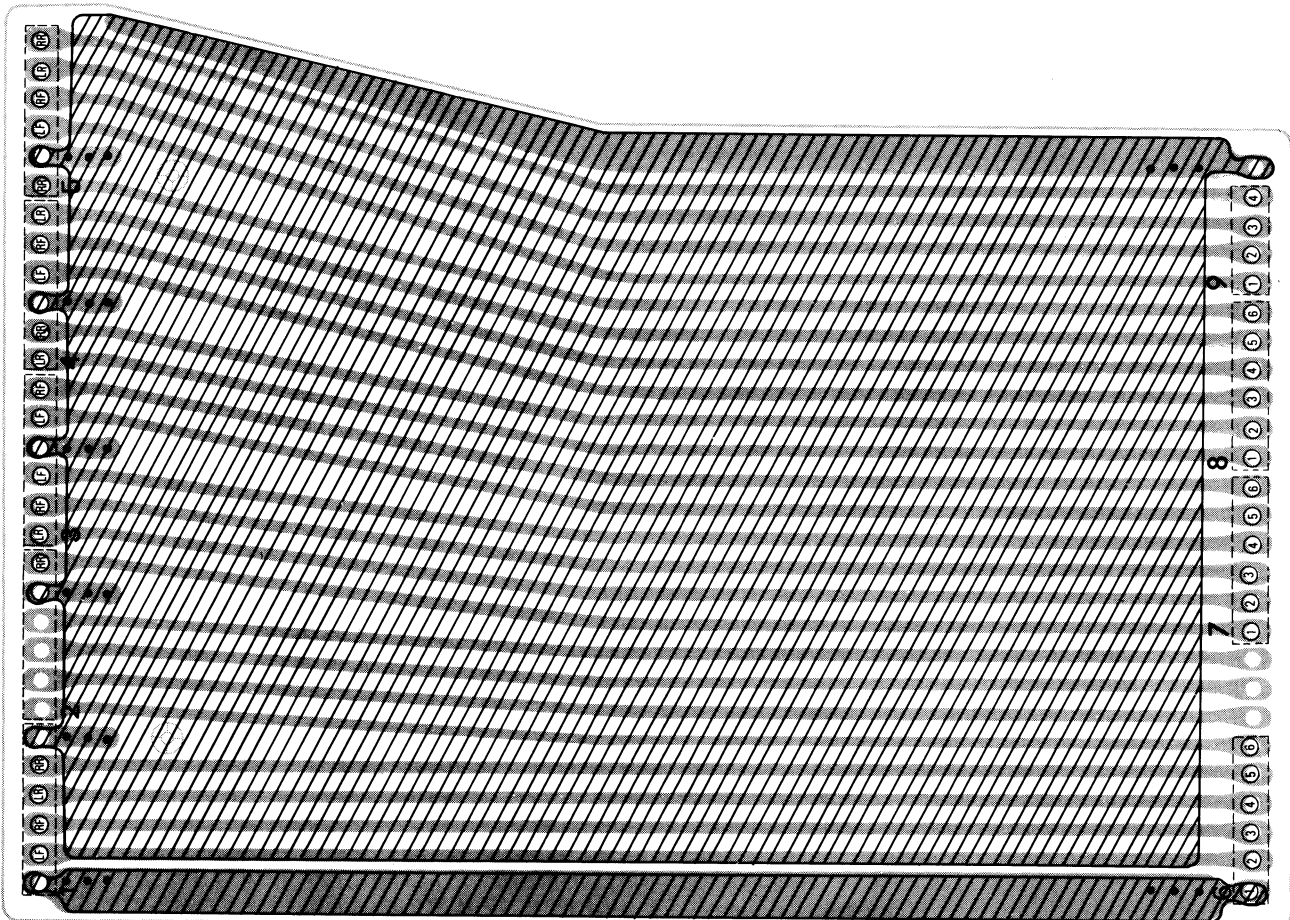


Fig. 3

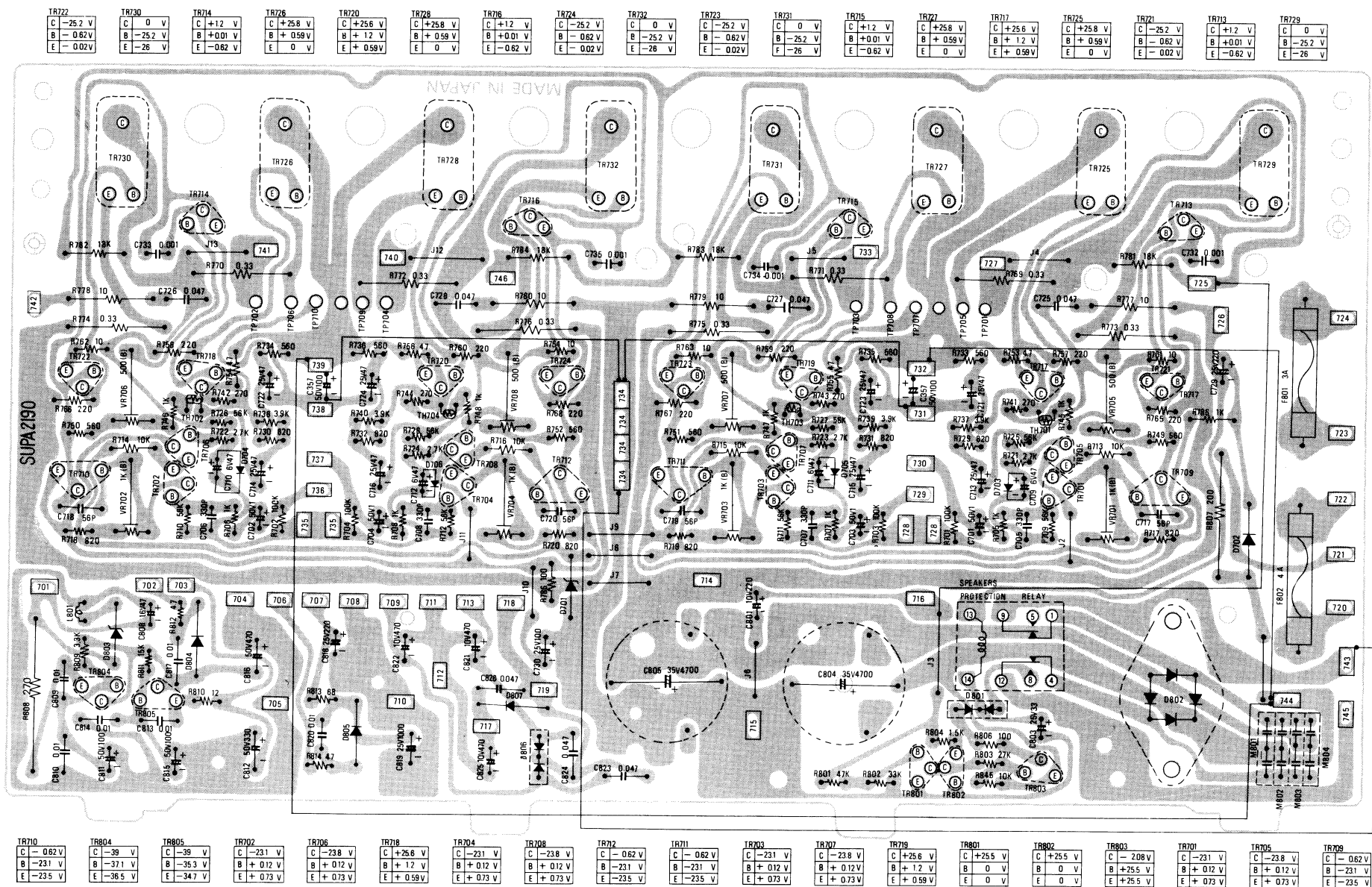
INPUT LINE Circuit Board

 Printed Circuit View on Top of p.c.b.

 Printed Circuit View on Bottom of p.c.b.



POWER SOURCE & 4CH MAIN AMPLIFIER Circuit Board



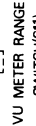
Bottom View



Bottom View



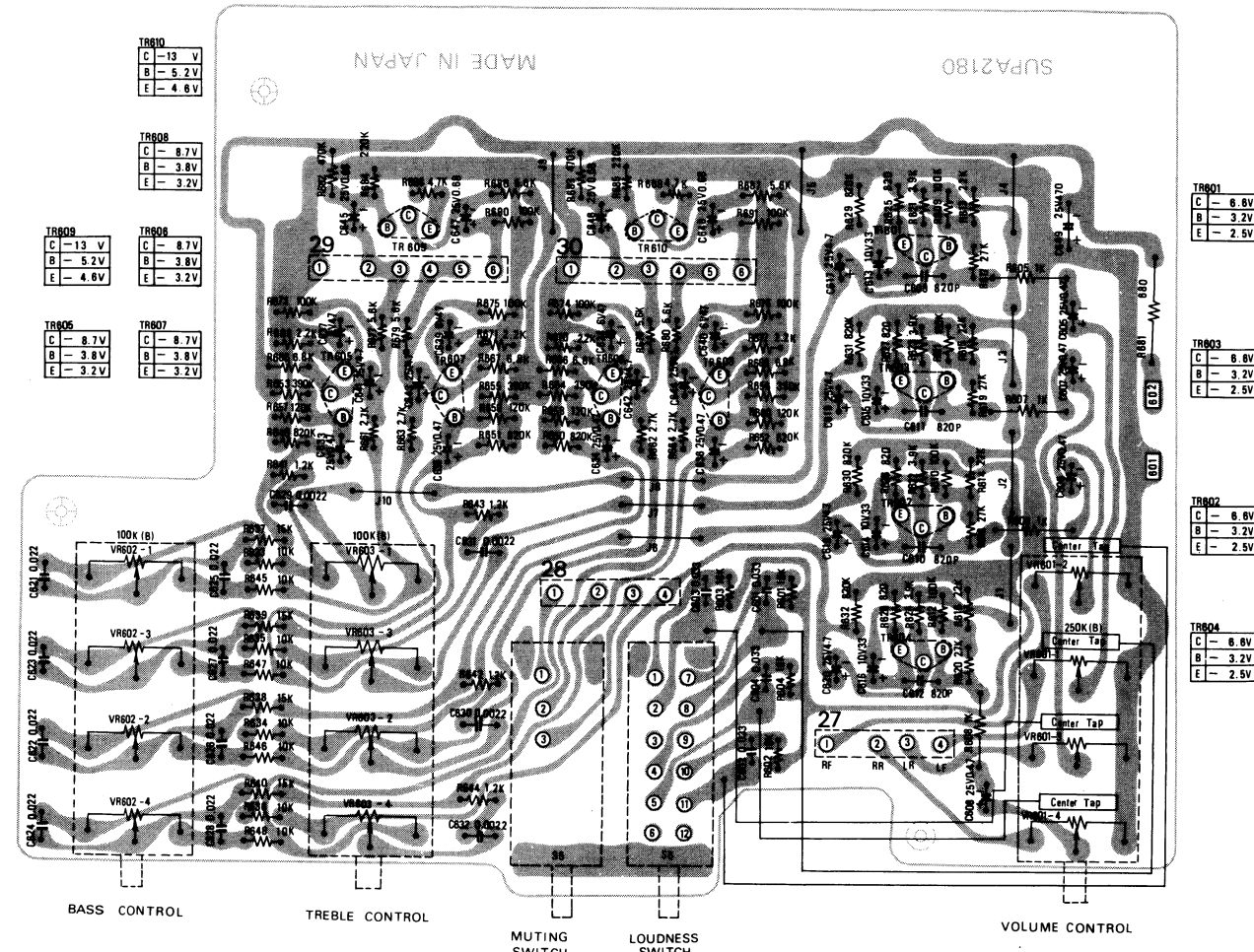
Top View



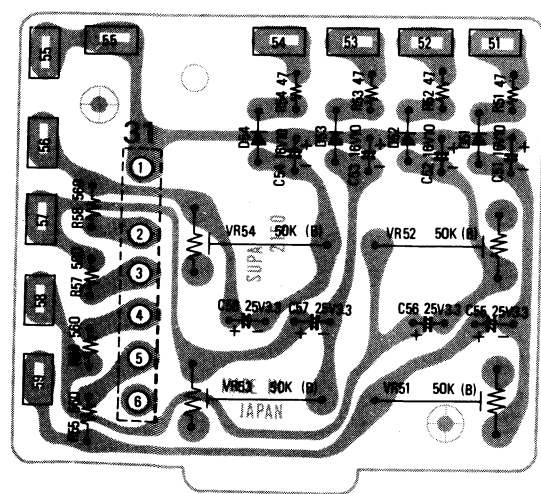
SA-800X



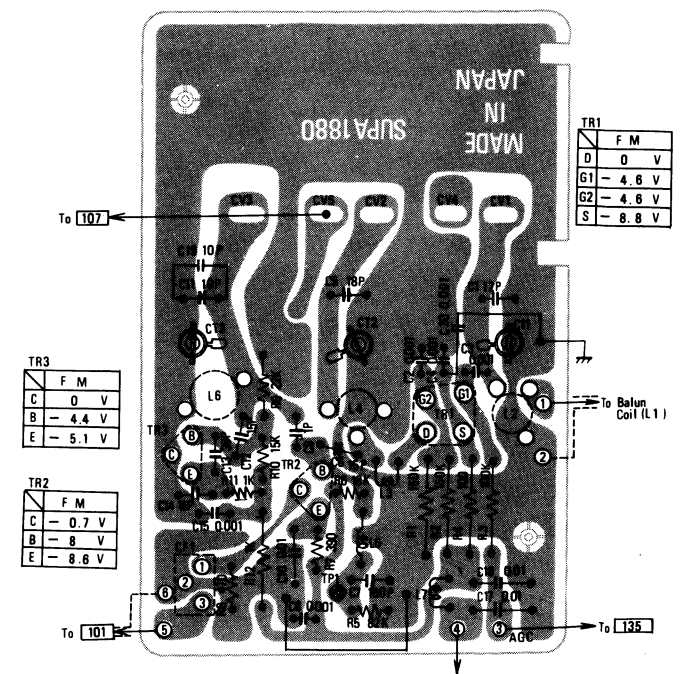
PHASE INVERT & TONE CONTROL Circuit Board



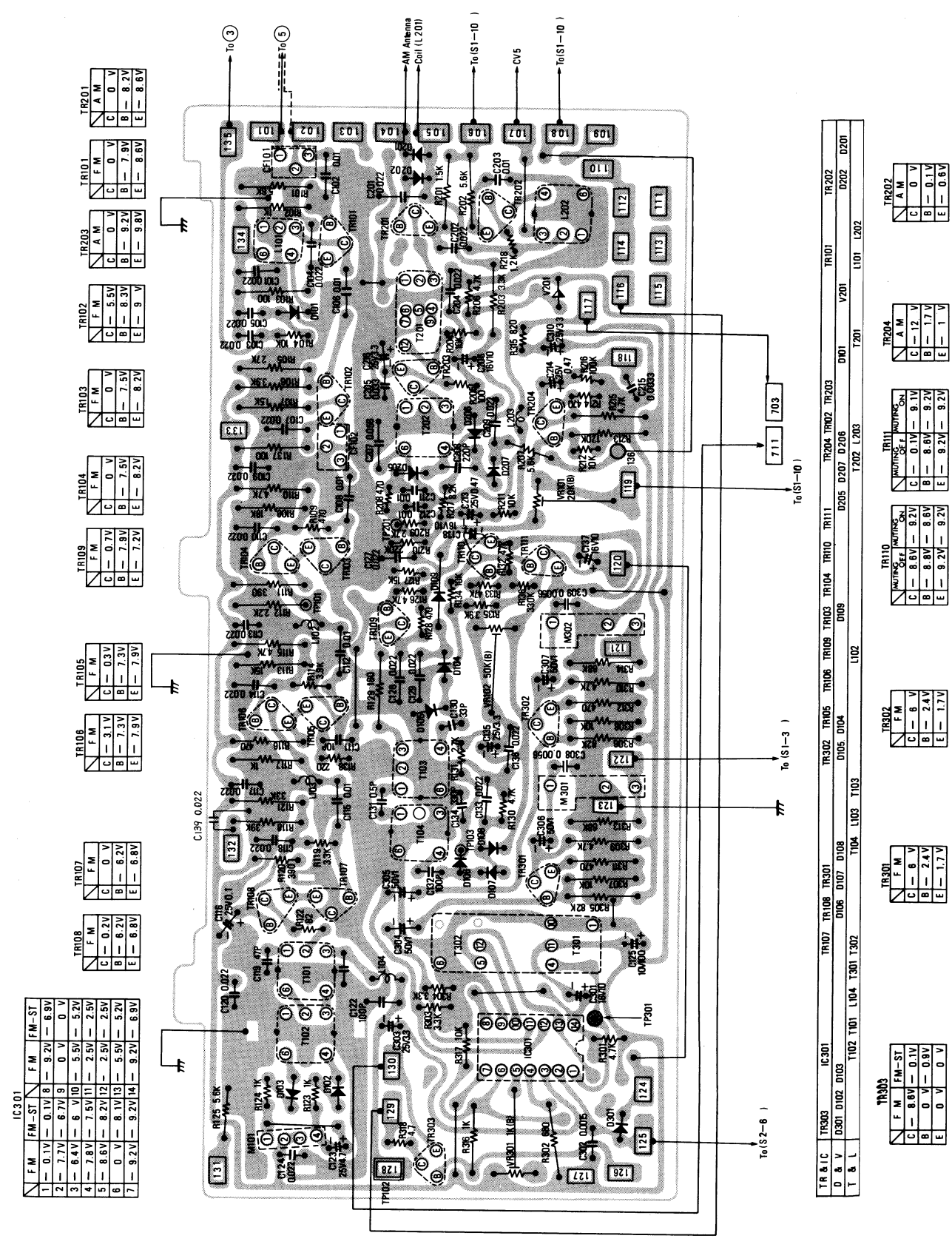
VU METER Circuit Board



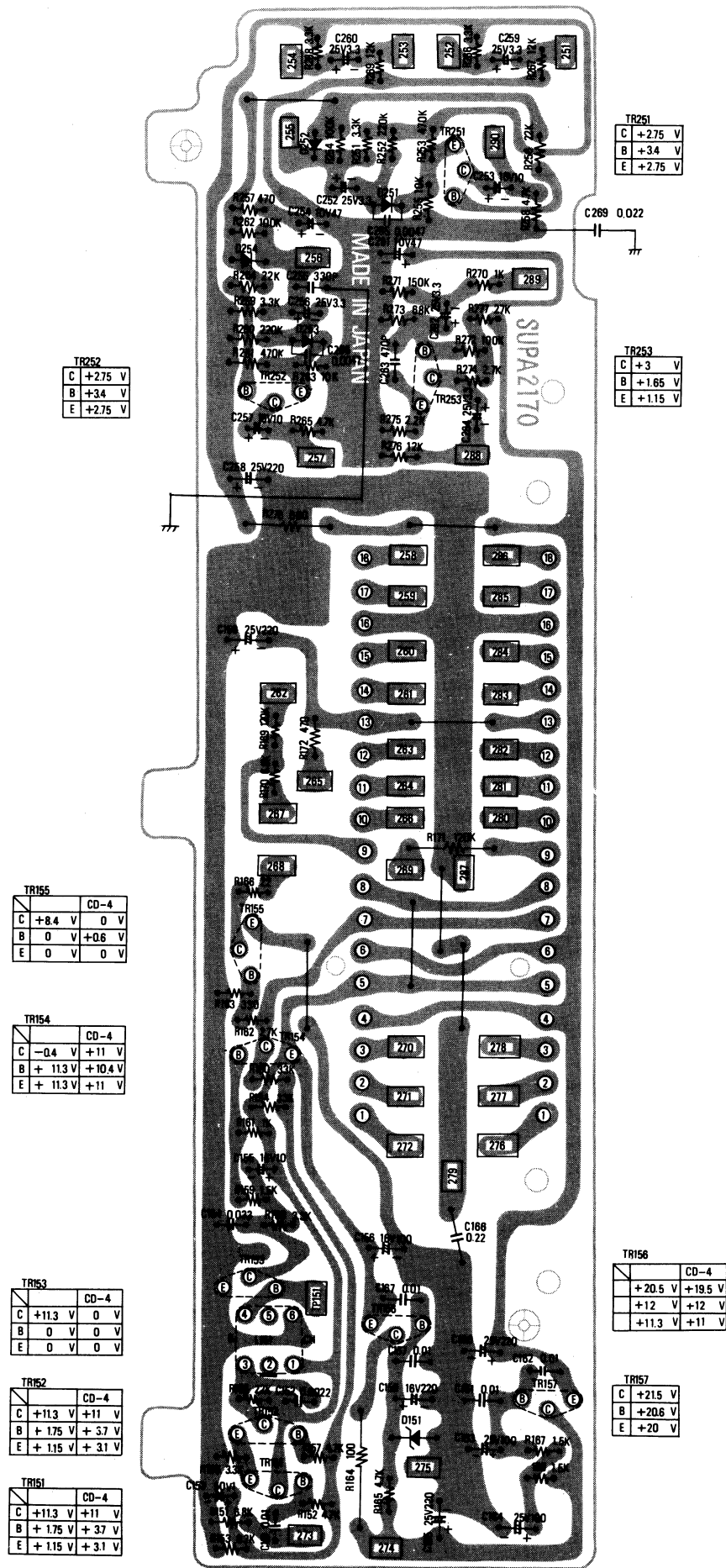
FM-RF Circuit Board



AM, FM-IF & FM MPX Circuit Board

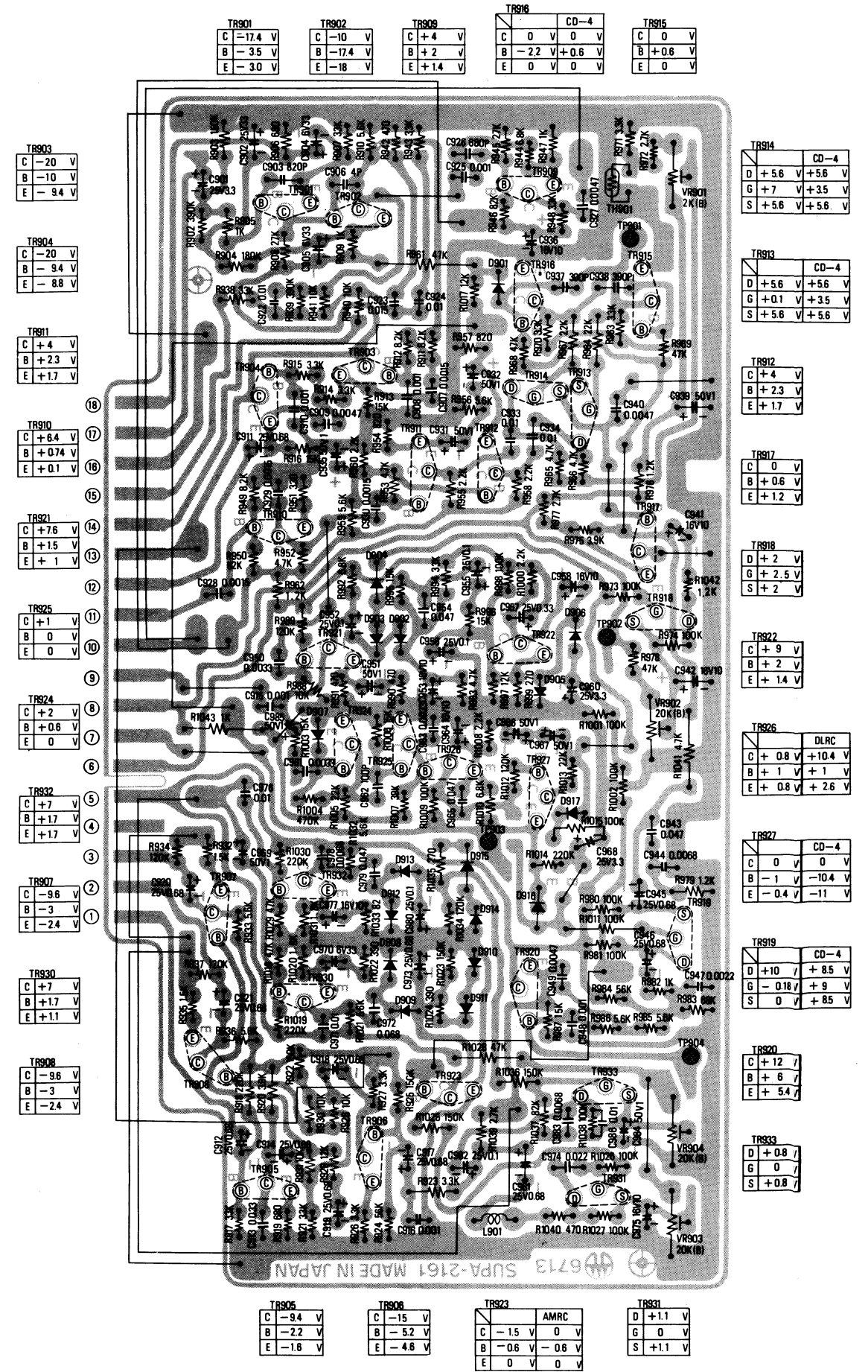


CD-4 MASTER Circuit Board

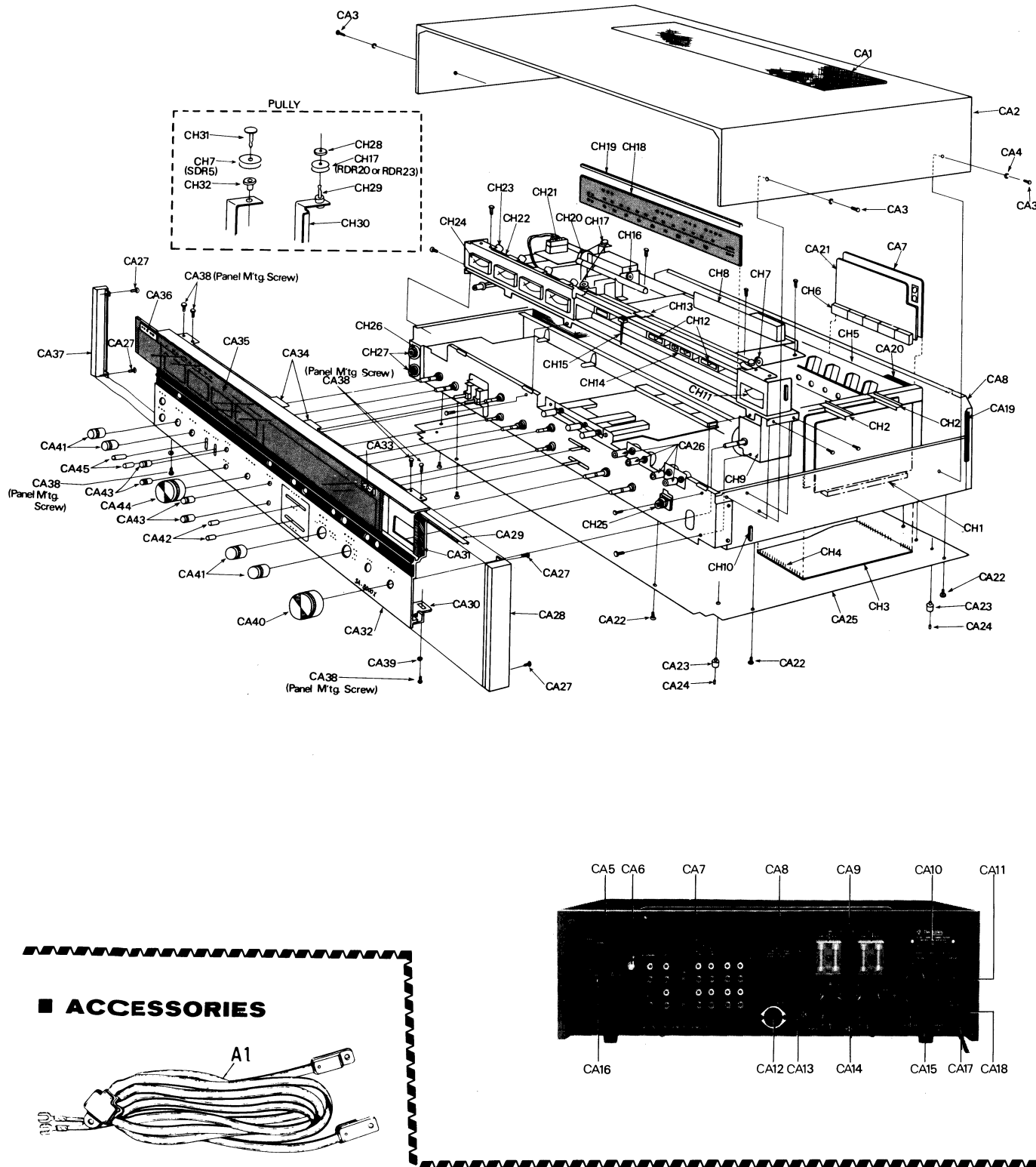


CD-4 DEMODULATOR (Left or Right) Circuit Board

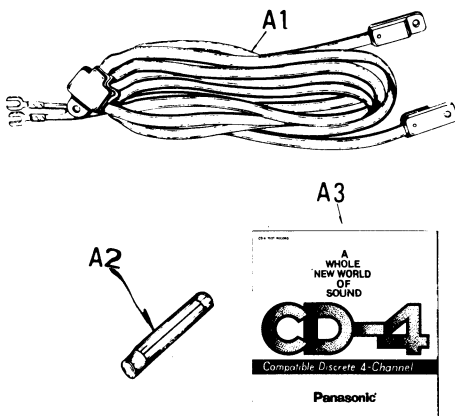
Left channel is same as Right channel



CABINET & CHASSIS PARTS LOCATION



ACCESSORIES



REPLACEMENT PARTS LIST

NOTES:

- 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
- 2. N indicates the New Parts
- 3. X-Z rank: X rank parts will cover 80% of repair needs. X+Y rank parts will cover 95% of repair needs. Z rank parts are less necessary.

Bemerkungen:

- 1. Die meisten mechanischen Teile sind mit Teilnummern versehen. Bitte geben Sie diese Nummern an, sofern die Teile keine Bezugsnummern haben.
- 2. N bedeutet: Neue Teile
- 3. Gruppen X-Z: Teile der Gruppe X machen 80% des Ersatzteilbedarfes aus. Teile der Gruppen X und Y machen 95% des Ersatzteilbedarfes aus. Teile der Gruppe Z werden seltener benötigt.

Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks	Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks
INTEGRATED CIRCUIT					D102,103	2-OA99	FM Discriminator	1 pair	X
					D108,109	1S1211	AOC, Meter Detector	2	X
					D151	SVDAEQA0112R	Zener, 12V, Voltage Stabilizer	1	X
					D251,252,253,254,703,704,705,706,(901,917) x 2	MA150	30kHz Rectifier	12	X
TRANSISTORS					D701	SVDEQA01-11R	Zener, 11V, Noise Cancel	1	X
					D801,806	SVDAC08P-1	Rectifier	2	X
					D802	SVDAS2HB10	Rectifier	1	X
					D803	SVDAEQB01-09	Zener, 9V, Voltage Stabilizer	1	X
					D(910,911,914,915) x 2	MA26-1	Thermal Compensation	8	X
					V201	EYV320D1R2J3	Variatite, AOC	1	X
COILS and TRANSFORMERS					L1	SLAA4W1-1	Balun Coil	1	X
					L2	SLAA4N9	FM Antenna Coil	1	X
					L3	RLQY25S5	Choke Coil	1	Y
					L4	SLDA4N18	FM DET Coil	1	X
					L5	RLQY15G5	Choke Coil	1	Y
					L6	SLQA4N9	FM OSC Coil	1	X
					L7,8,102,103,104,203,251,252,801	SLQX151-1Y	Choke Coil	9	Y
					L101	SLIA4B1	FM AGC Coil	1	X
					L151	SLMIC3T-1	30kHz Coil	1	X
					L201	SLFA2E15	AM Antenna Coil	1	X
					L202	SLQA2C6	AM OSC Coil	1	X
					L(901) x 2	SLQA5903-1	Choke Coil	2	Y
					T101	SLIA4C54	FM DISCRI IF Transformer (P)	1	X
					T102	SLIA4C56	FM DISCRI IF Transformer (S)	1	X
					T103,104	SLIA4C24	FM Muting IF Transformer (P),(S)	2	X
					T201	RLI7W105S-T	AM 1st IF Transformer	1	X
					T202	RLI2C450	AM 2nd IF Transformer	1	X
					T301,(T302)	SLMAI2Z-K	19kHz, 38kHz Pick-up Transformer	1	X
					T901	SLTA5Q16S	Power Transformer	1	X
CERAMIC FILTERS					CF1,101,102	RVFCF10M12CG	FM IF Circuit, Green (10.6MHz)	each	X
						RVFCF10M12CB	FM IF Circuit, Black (10.65MHz)	3	X
						RVFCF10M12CR	FM IF Circuit, Red (10.7MHz)		
						RVFCF10M12CW	FM IF Circuit, White (10.75MHz)		
						RVFCF10M12CY	FM IF Circuit, Yellow (10.8MHz)		
RESISTORS					R4,103,137	ERD14TJ101	100Ω, ¼W ±5% Carbon	3	Y
					R129	ERD14TJ181	180Ω, ¼W ±5% Carbon	1	Y
					R111	ERD14TJ391	390Ω, ¼W ±5% Carbon	1	Y
					R116,311,312	ERD14TJ471	470Ω, ¼W ±5% Carbon	3	Y
					R278,302	ERD14TJ681	680Ω, ¼W ±5% Carbon	2	Y
					R12,102,117,316,605,606,607,608,(1043) x 2	ERD14TJ102	1kΩ, ¼W ±5% Carbon	10	Y
					R107,201	ERD14TJ152	1.5kΩ, ¼W ±5% Carbon	2	Y
					R112	ERD14TJ222	2.2kΩ, ¼W ±5% Carbon	1	Y
					R209	ERD14TJ272	2.7kΩ, ¼W ±5% Carbon	1	Y
					R203	ERD14TJ332	3.3kΩ, ¼W ±5% Carbon	1	Y
					R106	ERD14TJ392	3.9kΩ, ¼W ±5% Carbon	1	Y
					R110,115,215,309,310,(1041) x 2	ERD14TJ472	4.7kΩ, ¼W ±5% Carbon	7	Y
					R101,125,202,534,535	ERD14TJ562	5.6kΩ, ¼W ±5% Carbon	5	Y
					R307,308	ERD14TJ103	10kΩ, ¼W ±5% Carbon	2	Y
					R113	ERD14TJ153	15kΩ, ¼W ±5% Carbon	1	Y
					R108,781,782,783,784	ERD14TJ183	18kΩ, ¼W ±5% Carbon	5	Y
					R105,417	ERD14TJ273	27kΩ, ¼W ±5% Carbon	2	Y
					R121,428	ERD14TJ333	33kΩ, ¼W ±5% Carbon	2	Y
					R118	ERD14TJ393	39kΩ, ¼W ±5% Carbon	1	Y
					R(961,1028)x2	ERD14TJ473	47kΩ, ¼W ±5% Carbon	4	Y
					R313,314	ERD14TJ683	68kΩ, ¼W ±5% Carbon	2	Y
					R305,306,279,280	ERD14TJ823	82kΩ, ¼W ±5% Carbon	4	Y
					R3,(1011,1015) x 2	ERD14TJ104	100kΩ, ¼W ±5% Carbon	5	Y
					R171,213	ERD14TJ124	120kΩ, ¼W ±5% Carbon	2	Y
					R1,2	ERD14TJ154	150kΩ, ¼W ±5% Carbon	2	Y
DIODES and VARIATITE					D51,52,53,54,702,804,805,807	RVD1001	VU Meter Detector, Shock Noise Cancel & Rectifier	8	X
					D101,104,105,106,107,201,202,205,206,207,301,(902,903,904,905,906,907,908,909,912,913,916) x 2	OA99	AGC, AOC, AM Detector, Meter Detector & 30 kHz Rectifier	33	X

Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks	Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks
R419 R356 R318,753,754, 755,756,761, 762,763,764	ERD14TJ394 ERD14FJ2R2 ERD14FJ4R7	390kΩ, ¼W ±5% Carbon 2.2Ω, ¼W ±5% Carbon 4.7Ω, ¼W ±5% Carbon	1 1 9	Y Y Y	R207,677,678, 679,680,686, 687,691,933, 936,956,959, 985,986,1021, 1032)x2	ERD14VJ562	5.6kΩ, ¼W ±5% Carbon	25	Y
R757,758,759, 760,765,766, 767,768	ERD14FJ221	220Ω, ¼W ±5% Carbon	8	Y	R151,170,423, 424,665,666, 667,668,944, 992,1010)x2	ERD14VJ682	6.8kΩ, ¼W ±5% Carbon	14	Y
R733,734,735, 736	ERD14FJ561	560Ω, ¼W ±5% Carbon	4	Y	R153,217,510, 511,911,912, 949)x2	ERD14VJ822	8.2kΩ, ¼W ±5% Carbon	10	Y
R812,814 R786	ERD18FJ4R7 ERD12FJ101	4.7Ω, ¼W ±5% Carbon 100Ω, ¼W ±5% Carbon	2 1	Y Y	R104,134,204, 211,212,255, 263,317,512, 513,526,528, 529,633,634, 635,636,645, 646,647,648, 713,714,715, 716,845, (928,930,931, 940,941,988) x2	ERD14VJ103	10kΩ, ¼W ±5% Carbon	38	Y
R164 R351,352,353, 354	ERD12TJ101 ERD12TJ221	100Ω, ¼W ±5% Carbon 220Ω, ¼W ±5% Carbon	1 4	Y Y	R267,269,276, (929,997, 1017)x2	ERD14VJ123	12kΩ, ¼W ±5% Carbon	9	Y
R172 R681	ERD12TJ471 ERD12TJ681	470Ω, ¼W ±5% Carbon 680Ω, ¼W ±5% Carbon	1 1	Y Y	R9,127,530, 637,638,639, 640,811, (913,916,987, 995,996,1003, 1006)x2	ERD14VJ153	15kΩ, ¼W ±5% Carbon	22	Y
R810 R166 R51,52,53,54 R813 R122, (1033) x 2	ERD14FJ120 ERD14VJ220 ERD14VJ470 ERD14FJ680 ERD14VJ820	12Ω, ¼W ±5% Carbon 22Ω, ¼W ±5% Carbon 47Ω, ¼W ±5% Carbon 68Ω, ¼W ±5% Carbon 82Ω, ¼W ±5% Carbon	1 1 4 1 3	Y Y Y Y Y	R6,514,515, 601,602,603, 604 R10,155,170, 256,264,964 967,1005 1013)x2	ERD14VJ183 ERD14VJ223	18kΩ, ¼W ±5% Carbon 22kΩ, ¼W ±5% Carbon	7 13	Y Y
R205,806 R138 R741,742,743, 744, (999, 1035) x 2	ERD14VJ101 ERD14VJ221 ERD14VJ271	100Ω, ¼W ±5% Carbon 220Ω, ¼W ±5% Carbon 270Ω, ¼W ±5% Carbon	2 1 8	Y Y Y	R613,614,615, 616 R617,618,619, 620 R277,418,803, (908,945)x2	ERD14VSJ223 ERD14VSJ273 ERD14VJ273	22kΩ, ¼W ±5% Carbon 27kΩ, ¼W ±5% Carbon 27kΩ, ¼W ±5% Carbon	4 4 7	Y Y Y
R163,(951)x2 R7,120,415, 416,(1022, 1024) x 2	ERD14VJ331 ERD14VJ391	330Ω, ¼W ±5% Carbon 390Ω, ¼W ±5% Carbon	3 8	Y Y	R154,160,411, 412,802,907, 938,994)x2	ERD14VJ333	33kΩ, ¼W ±5% Carbon	11	Y
R8,109,128, 208,214,257, (942,990,991, 1040)x2	ERD14VJ471	470Ω, ¼W ±5% Carbon	14	Y	R(917,921)x2 R132,133,409, 410,801,968, 969,978,1018 1029)x2	ERD14VSJ333 ERD14VJ473	33kΩ, ¼W ±5% Carbon 47kΩ, ¼W ±5% Carbon	4 15	Y Y
R55,56,57,58, 749,750,751, 752	ERD14VJ561	560Ω, ¼W ±5% Carbon	8	Y	R520,536,709, 710,711,712, 725,726,727, 728,924, 984)x2	ERD14VJ563	56kΩ, ¼W ±5% Carbon	14	Y
R429,501, (906,919)x2 R315,625,626, 627,628,717, 718,719,720, 729,730,731, 732 (954, 957)x2	ERD14VJ681 ERD14VJ821	680Ω, ¼W ±5% Carbon 820Ω, ¼W ±5% Carbon	6 17	Y Y	R273,(983)x2 R5,(946, 950, 1037)x2	ERD14VJ683 ERD14VJ823	68kΩ, ¼W ±5% Carbon 82kΩ, ¼W ±5% Carbon	3 7	Y Y
R11,123,124, 161,270,421, 422,504,505, 705,706,707, 708,745,746, 747,748,785, (905,909,947, 982)x2	ERD14VJ102	1kΩ, ¼W ±5% Carbon	26	Y	R216,254,262, 272,427,637, 674,675,676, 690,691,701, 702,703,704 (973,974,980, 981,998,1001, 1002,1009, 1026,1027 1038)x2	ERD14VJ104	100kΩ, ¼W ±5% Carbon	37	Y
R218,407,408, 641,642,643, 644,(962,976, 979,1042)x2	ERD14VJ122	1.2kΩ, ¼W ±5% Carbon	15	Y	R405,406,657, 658,659,660 R169,425,426, (934,937,989, 1012,1034)x2	ERD14VSJ104 ERD14VSJ124	100kΩ, ¼W ±5% Carbon 120kΩ, ¼W ±5% Carbon	6 6	Y Y
R159,167,168, 804,(932, 935)x2	ERD14VJ152	1.5kΩ, ¼W ±5% Carbon	8	Y	R271,516,517, 518,519,531, 532,537,(925, 1023,1025, 1036)x2	ERD14VJ124 ERD14VJ154	120kΩ, ¼W ±5% Carbon 150kΩ, ¼W ±5% Carbon	13 16	Y Y
R1020, (1031)x2 R275,669,670, 671,672,(955, 958,960,1000 1008)x2	ERD14VJ182 ERD14VJ222	1.8kΩ, ¼W ±5% Carbon 2.2kΩ, ¼W ±5% Carbon	4 15	Y Y	R(903,922)x2 R506,507,523, 524,(904)x2	ERD14VSJ154 ERD14VSJ184	150kΩ, ¼W ±5% Carbon 180kΩ, ¼W ±5% Carbon	4 6	Y Y
R131,162,274, 661,662,663, 664,721,722, 723,724, (972,977, 1039)x2	ERD14VJ272	2.7kΩ, ¼W ±5% Carbon	17	Y	R684,685, (918)x2 R210,252,260, (1014,1019, 1030)x2	ERD14VJ272 ERD14VJ224	220kΩ, ¼W ±5% Carbon 220kΩ, ¼W ±5% Carbon	4 9	Y Y
R119,156,158, 251,259,266, 268,303,304, 809,(914,915, 923,926,927, 943,948,963, 970,971)x2	ERD14VJ332	3.3kΩ, ¼W ±5% Carbon	30	Y	R502,503 R413,414 R(1007)x2	ERD14VJ274 ERD14VSJ274 ERD14VJ393	270kΩ, ¼W ±5% Carbon 270kΩ, ¼W ±5% Carbon 39kΩ, ¼W, ±5% Carbon	2 2 2	Y Y Y
R114,135,527, 621,622,623, 624,737,738, 739,740, (920,975)x2	ERD14VJ392	3.9kΩ, ¼W ±5% Carbon	15	Y					
R126,130,152, 157,165,206, 258,265,301, 525,688,689, (952,953,965, 966,993)x2	ERD14VJ472	4.7kΩ, ¼W ±5% Carbon	22	Y					

Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks	Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks
R521,522,653,654,655,656,(902)x2	ERD14VSJ394	390kΩ, ¼W ±5% Carbon	8	Y	C10,17,18,102,106,108,112,115,157,161,162,167,809,810,813,814,820	ECKE1H103PF	0.01μF, 50WV, ±100%, Ceramic	17	Z
R420,(939)x2	ERD14VJ394	390kΩ, ¼W ±5% Carbon	3	Y	C817	ECKD2H103PF	0.01μF, 500WV, ±100%, Ceramic	1	Z
R136,253,261,533,(1004)x2	ERD14VJ474	470kΩ, ¼W ±5% Carbon	6	Y	C104,107,110,114,120,126,129,133,136,201,204,209,269	ECKE1H223PF	0.022μF, 50WV, ±100%, Ceramic	13	Z
R682,683	ERD14VSJ474	470kΩ, ¼W ±5% Carbon	2	Y					
R403,404	ERD14VSJ824	820kΩ, ¼W ±5% Carbon	2	Y					
R629,630,631,632,649,650,651,652	ERD14VJ824	820kΩ, ¼W ±5% Carbon	8	Y					
R769,770,771,772,773,774,775,776	ERX2ANKR33	0.33Ω, 2W ±10% Metallic	8	Y	C823,824,826	ECKD1H473ZF	0.047μF, 50WV, ±80%, Ceramic	3	Z
R777,778,779	ERX1ANJ100	10Ω, 1W, ±5%, Metallic	4	Y	C(908,910,915,916,925,948)x2	ECQG05102KZN	0.001μF, 50WV, ±10%, Polyester	12	Z
R807	ERM2P201	200Ω, 2W, ±5% Wire	1	Z	C302,(907,928,929,930)x2	ECQG05152KZN	0.0015μF, 50WV, ±10%, Polyester	9	Z
R808	ERM4P271	270Ω, 4W, ±5% Wire	1	Z	C629,630,631,632,(947)x2	ECQG05222KZN	0.0022μF, 50WV, ±10%, Polyester	6	Z
VARIABLE RESISTORS					C411,412	ECQG05272JZN	0.0027μF, 50WV, ±5%, Polyester	2	Z
VR1	EVB17AA1654U	50kΩ (ZU), AFD Control (WIDTH)	1	X	C215,(950,961,963)x2	ECQG05332KZN	0.0033μF, 50WV, ±10%, Polyester	7	Z
VR2-1,2-2	EVA77AA16D55	500kΩ (D), AFD Control (DEPTH)	1	X	C265,266,(909,927,940,949)x2	ECQG05472KZN	0.0047μF, 50WV, ±10%, Polyester	10	Z
VR3,4,5,6	EVHB8A034BF5	250kΩ (B), Channel Level Control	4	X	C308,309	ECQG05562JZN	0.0056μF, 50WV, ±5%, Polyester	2	Z
VR7,8	EVHB8A018B14	10kΩ (B), Carrier Level Control	2	X	C(944,978,983)x2	ECQG05682KZN	0.0068μF, 50WV, ±10%, Polyester	6	Z
VR9,10	EVHB8A018B54	50kΩ (B), CD-4 Separation Control	2	X	C413,414	ECQG05822JZN	0.0082μF, 50WV, ±5%, Polyester	2	Z
VR51,52,53,54,102	EVLS3AA00B54	50kΩ (B), VU Meter & Muting Level Adj.	5	X	C151,203,211,212,515,(933,934,971,976,986)x2	ECQG05103KZN	0.01μF, 50WV, ±10%, Polyester	13	Z
VR101	EVLS3AA00B24	20kΩ (B), Signal Meter Adjustment	1	X	C(922,924)x2	ECQG05103JZN	0.01μF, 50WV, ±5%, Polyester	4	Z
VR601-1~6014	EVB83A030BF5	250kΩ (B), Main Volume Control	1	X	C(923)x2	ECQG05153JZN	0.015μF, 50WV, ±5%, Polyester	2	Z
VR602-1~6024	EVB84A030B15	100kΩ (B) Bass & Treble Control	2	X	C101,103,105,109,113,117,118,124,127,139,202,621,622,623,624,625,626,627,628,(974)x2	ECQG05223KZN	0.022μF, 50WV, ±10%, Polyester	21	Z
VR603-1~6034									
VR301,701,702,703,704	EVLS3AA00B13	1kΩ (B), FM Separation & DC Balance Adjustment	5	X	C154,205,601,602,603,604(913)x2	ECQG05333KZN	0.033μF, 50WV, ±10%, Polyester	8	Z
VR705,706,707,708	EVLS3AA00B52	500Ω (B), ICQ Adjustment	4	X	C513,514,(943,954,965,979)x2	ECQG05473KZN	0.047μF, 50WV, ±10%, Polyester	10	Z
VR(901)x2	EVLS0AA00B23	2kΩ (B), Free Running Frequency Adjustment	2	X	C725,726,727,728	ECQM05473KZ	0.047μF, 50WV, ±10%, Polyester	4	Z
VR(902,903,904)x2	EVLS0AA00B24	20kΩ (B), Lock Range Control & Automatic Noise Reduction System Adj.	6	X	C207	ECQG05563KZN	0.056μF, 50WV, ±10%, Polyester	1	Z
THERMISTORS					C(972)x2	ECQG05683KZN	0.068μF, 50WV, ±10%, Polyester	2	Z
TH701,702,703,704	RRT251	Driver Circuit	4	Y	C166	ECQG05224KZN	0.22μF, 50WV, ±10%, Polyester	1	Z
TH(901)x2	RRTA202-2	Phase Locked Loop Circuit	2	Y	C352,353	ECQU2A103MD	0.01μF, 250VAC, ±20%, Polyester	2	Z
CAPACITORS					C(937,938)x2	ECQS1391KZ-K	390pF, 125WV, ±10%, Styro	4	N Z
C131	ECCD1HOR5CC	0.5pF, 50WV, ±0.25pF, Ceramic	1	Z	C152	ECQS1222JZ	2200pF, 125WV, ±5%, Styro	1	Z
C9	ECCD1H010CC	1pF, 50WV, ±0.25pF, Ceramic	1	Z	C252,256,259,260,262,264,267,268,403,404,506,507,(901)x2	ECSZ25EF3R3	3.3μF, 25WV, Electrolytic	14	Y
C(906)x2	ECCD1H040CC	4pF, 50WV, ±0.25pF, Ceramic	2	Z					
C217	ECCD1H050CC	5pF, 50WV, ±0.25pF, Ceramic	1	Z					
C111	ECCD1H100KC	10pF, 50WV, ±10%, Ceramic	1	Z	C419,617,618,619,620,641,642,643,644,647,418	ECSZ25EF4R7	4.7μF, 25WV, Electrolytic	9	Y
C11	ECCD1H100KU	10pF, 50WV, ±10%, Ceramic	1	Z					
C19	ECCD1H100KT	10pF, 50WV, ±10%, Ceramic	1	Z	C417,418	ECSZ35EFR47	0.47μF, 35WV, Electrolytic	2	Y
C1	ECCD1H120KC	12pF, 50WV, ±10%, Ceramic	1	Z	C116,213,214,(952,955,956,980,982)x2	ECAG25ER1X	0.1μF, 25WV, Electrolytic	13	Y
C6,12,14	ECCD1H150KC	15pF, 50WV, ±10%, Ceramic	3	Z	C(957)x2	ECAG25ER33X	0.33μF, 25WV, Electrolytic	2	Y
C5	ECCD1H180KC	18pF, 50WV, ±10%, Ceramic	1	Z	C504,505,508,509,510,511,512,605,606,607,608,633,634,635,636	ECAG25ER47X	0.47μF, 25WV, Electrolytic	15	Y
C130	ECCD1H330KC	33pF, 50WV, ±10%, Ceramic	1	Z					
C13	ECCD1H390KC	39pF, 50WV, ±10%, Ceramic	1	Z	C502,503,645,646,647,648,(911,912,914,917,918,919,920,921,945,946,973,981)x2	ECAG25ER68X	0.68μF, 25WV, Electrolytic	30	Y
C119	ECCD1H470KU	47pF, 50WV, ±10%, Ceramic	1	Z					
C717,718,719,720	ECCD1H560K	56pF, 50WV, ±10%, Ceramic	4	Z					
C121,122,132,(962)x2	ECCD1H101K	100pF, 50WV, ±10%, Ceramic	5	Z					
C420	ECCD1H121K	121pF, 50WV, ±10%, Ceramic	1	Z					
C405,406	ECCD1H151K	150pF, 50WV, ±10%, Ceramic	2	Z					
C7	ECCD1H181K	180pF, 50WV, ±10%, Ceramic	1	Z					
C208	ECCD1H221K	220pF, 50WV, ±10%, Ceramic	1	Z					
C134,251,255,421,705,706,707,708	ECCD1H331K	330pF, 50WV, ±10%, Ceramic	8	Z					
C263,356	ECKD1H471KB	470pF, 50WV, ±10%, Ceramic	2	Z					
C(926)x2	ECKD1H681KB	680pF, 50WV, ±10%, Ceramic	2	Z					
C407,408,609,610,611,612,(903)x2	ECKD1H821KB	820pF, 50WV, ±10%, Ceramic	8	Z					
C2,3,48,15,20	ECKD1H102PF	0.001μF, 50WV, ±100%, Ceramic	6	Z	C(904,905,970)x2	ECEA6V33	33μF, 6.3WV, Electrolytic	6	Y
C732,733,734,735	ECKE1H102MD	0.001μF, 50WV, ±20%, Ceramic	4	Z	C409,410,637,638,639,640,709,710,711,712	ECEA6V47	47μF, 6.3WV, Electrolytic	10	Y
					C351	ECEA6V100	100μF, 6.3WV, Electrolytic	1	Y
					C415,416,613,614,615,616	ECEA10V33	33μF, 10WV, Electrolytic	6	Y

Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks	Ref. No.	Part No.	Description	Per Set (Pcs.)	Remarks
CH13	SDPA1009	Slider, Dial Pointer	1	Y	ACCESSORIES				
CH14	SHGA203	Bracket, CD-4 Eye & CD-4 Indicator	1	Y	A1	SSAA1	Cord, FM Antenna	1	Y
CH15	SDPA5018	Pointer Only, Dial	1	Y	A2	XBAS1A3001	Fuse, Circuit Protection [3A]	4	X
CH16	RHG5-1	Rubber Cushion, Variable Capacitor	1	Y	A3	SPR111-1	Record, CD-4 Test	1	Y
CH17	RDR20	Pulley, Dial Cord, Small Size	2	Z	A4	RJP16AS	Plug, AC Power Source	1	Y
	RDR23	Pulley, Dial Cord, Large Size	1	Z	A5	RJP17AS	Plug, AC Power Source	1	Y
CH18	SKDA360	Scale, Dial	1	Y	A6	RJP5	Pin Plug	8	Y
CH19	SUMA7	Mounting, Dial Scale	1	Y	PACKING PARTS				
CH20	SDDA321S	Drum, Dial Cord	2	Z	P1	SPPA30	Soft Cover	1	Y
	SDSA4141	Spring, Dial Cord	1	Z		SPEA3	Cover, AC Plug	1	Z
	XXAR3H6S	Screw, Durm M'tg.	1	Z	P2	SPHA6008	Polyethylene Sheet	1	Z
	RDZ05-5	Cord, Dial, 160cm (63-1/8")	1 roll	Z	P3	SPSA63	Pad, Upper & Lower	2	Y
CH21	SJSA64	Socket, Circuit Connection, 6 pin	3	Z	P4	SPSA61	Pad, Inside	1	Y
	SJSA63	Socket, Circuit Connection, 4 pin	10	Z	P5	SPSA62	Pad, Right & Left Side	2	Y
CH22	SHGA635	Rubber Cushion, VU Meter	1	Z	P6	SPNA150A	Carton Box [Inner]	1	Y
CH23	RJV1A	Holder, Meter Light	5	Z	P7	SQFA160	Printed Matter, Complete	1	Y
CH24	SSMA21	Volume Unit (Output Level) Meter	4	X		SQXA5102	Instructions Book (Order SQFA160)	(1)	Y
CH25	SJJA13	Jack, Microphone	1	Z	P8	SPSA71	Pad, Carton Box	1	Z
CH26	SNWA121	Nylon Sheet, Mic & Headphone Jack	3	Z	P9	SPGA232A	Carton Box [Outer]	1	Z
CH27	SJJA14	Jack, Headphones	2	Z					
CH28	RNW150-2	Lock Washer, Pulley	3	Z					
CH29	RDY34	Shaft, Small Pulley	2	Z					
	RDY32	Shaft, Large Pulley	1	Z					
CH30	SURA6	Mounting, Pulley	1	Z					
CH31	SDY11	Shaft, Pulley Lock	4	Z					
CH32	SDY9	Bracket, Pulley & Pulley Shaft	4	Z					
	SJSA202	Holder, Dial Light	1	Z					

■ PACKINGS

