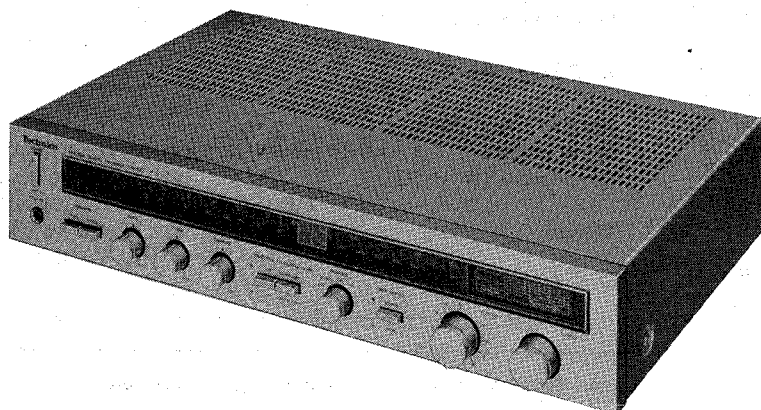


Service Manual



FM/AM Stereo Receiver

SA-103

[EX],[EH],[XA],[XL]

SA-103(K)

[EX],[EH]

*The cabinet and front panel are available in black color and silver types.

*The black type model is provided with (K) in the Service Manual.

Areas

- * [EX] is available in Switzerland and Scandinavia.
- * [EH] is available in Holland.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XL] is available in Australia.

English

Specifications (DIN 45 500)

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

■ AMPLIFIER SECTION

20 Hz~20 kHz continuous power output both channels driven	2 × 20W (4Ω) 2 × 20W (8Ω)
40 Hz~16 kHz continuous power output both channels driven	2 × 20W (4Ω) 2 × 20W (8Ω)
1 kHz continuous power output both channels driven	2 × 24W (4Ω) 2 × 22W (8Ω)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.08% (4Ω) 0.04% (8Ω)
rated power at 40 Hz~16 kHz	0.08% (4Ω) 0.04% (8Ω)
rated power at 1 kHz	0.04% (4Ω) 0.04% (8Ω)
half power at 20 Hz~20 kHz	0.025% (8Ω)
half power at 1 kHz	0.009% (8Ω)
-26 dB power at 1 kHz	0.1% (4Ω)
50 mW power at 1 kHz	0.12% (4Ω)
Intermodulation distortion	
rated power at 250 Hz: 8 kHz=4:1, 4Ω	0.08%
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.04%
Power bandwidth	
both channels driven, -3 dB	10 Hz~30 kHz (4Ω)
Damping factor	15 (4Ω), 30 (8Ω)
S/N	
rated power (4Ω)	
PHONO	70 dB (IHF, A: 80 dB)
AUX, TAPE	88 dB (IHF, A: 95 dB)
-26 dB power (4Ω)	
PHONO	64 dB
AUX, TAPE	66 dB
50 mW power (4Ω)	
PHONO	62 dB
AUX, TAPE	62 dB
PHONO maximum input voltage (1 kHz, RMS)	130 mV

Input sensitivity and impedance

PHONO	2.5 mV/47kΩ
AUX	150 mV/22kΩ
TAPE REC/PLAY	180 mV/22kΩ

Frequency response

PHONO	RIAA standard curve ±0.8 dB (30 Hz~15 kHz)
AUX, TAPE	5 Hz~70 kHz (-3 dB) ±0.2 dB (20 Hz~20 kHz)

Tone controls

BASS	50 Hz, +10 dB~-10 dB
TREBLE	20 kHz, +10 dB~-10 dB

Loudness control (volume at -30 dB)

50 Hz, +9 dB

Output voltage and impedance

TAPE, REC OUT	150 mV
TAPE REC/PLAY	30 mV/82kΩ

Channel balance, AUX 250 Hz~6,300 Hz

±1 dB

Channel separation, AUX 1 kHz

55 dB

Headphones output level and impedance

210 mV/330Ω

Load impedance

MAIN or REMOTE	4Ω~16Ω
MAIN and REMOTE	8Ω~16Ω

■ FM TUNER SECTION

Frequency range

87.5~108 MHz

Sensitivity

S/N 30 dB	1.9 μV (300Ω), 1.3 μV (75Ω)
S/N 26 dB	1.7 μV (300Ω), 1.2 μV (75Ω)
S/N 20 dB	1.5 μV (300Ω), 0.9 μV (75Ω)

IHF usable sensitivity

1.9 μV (IHF '58)

IHF 46 dB stereo quieting sensitivity

22 μV/75Ω

Total harmonic distortion

MONO	0.15%
STEREO	0.2%

S/N

MONO	60 dB (75 dB, IHF)
STEREO	58 dB (70 dB, IHF)

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Frequency response	20 Hz~15 kHz, +1 dB~ -2 dB
Alternate channel selectivity	75 dB
Capture ratio	1.2 dB
Image rejection at 98 MHz	55 dB
IF rejection at 98 MHz	75 dB
Spurious response rejection at 98 MHz	80 dB
AM suppression	50 dB
Stereo separation	
1 kHz	42 dB
10 kHz	32 dB
Carrier leak	
19 kHz	-30 dB (-35 dB, IHF)
38 kHz	-50 dB (-50 dB, IHF)
Channel balance (250 Hz~6,300 Hz)	±1.5 dB
Limiting point	1.2 μ V
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz

■ AM TUNER SECTION

Frequency range	525~1605 kHz
Sensitivity (S/N 20 dB)	30 μ V, 300 μ V/m
Selectivity	30 dB
Image rejection at 1,000 kHz	50 dB
IF rejection at 1,000 kHz	40 dB

■ GENERAL

Power consumption	200W
Power supply	AC 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (W · H · D)	430 × 86 × 297 mm (16-15/16" × 3-3/8" × 11-11/16")
Weight	5.5 kg (12.1 lb.)

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

■ VERSTÄRKERTEIL

Dauerton-Ausgangsleistung bei 20 Hz ~ 20 kHz	
beide Kanäle ausgesteuert	2 × 20W (4 Ω) 2 × 20W (8 Ω)
Dauerton-Ausgangsleistung bei 40 Hz ~ 16 kHz	
beide Kanäle ausgesteuert	2 × 20W (4 Ω) 2 × 20W (8 Ω)
Dauerton-Ausgangsleistung bei 1 kHz	
beide Kanäle ausgesteuert	2 × 24W (4 Ω) 2 × 22W (8 Ω)
Gesamtklirrfaktor	
Nennleistung bei 20 Hz ~ 20 kHz	0,08% (4 Ω) 0,04% (8 Ω)
Nennleistung bei 40 Hz ~ 16 kHz	0,08% (4 Ω) 0,04% (8 Ω)
Nennleistung bei 1 kHz	0,04% (4 Ω) 0,04% (8 Ω)
halbe Nennleistung bei 20 Hz ~ 20 kHz	0,025% (8 Ω)
halbe Nennleistung bei 1 kHz	0,009% (8 Ω)
-26 dB Leistung bei 1 kHz	0,1% (4 Ω)
50 mW Leistung bei 1 kHz	0,12% (4 Ω)
Intermodulationsfaktor	
Nennleistung bei 250 Hz: 8 kHz = 4:1, 4 Ω	0,08%
Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8 Ω	0,04%
Leistungsbandbreite	
beide Kanäle ausgesteuert bei -3 dB	10 Hz ~ 30 kHz (4 Ω) 15 (4 Ω), 30 (8 Ω)
Dämpfungsfaktor	
Eingangsempfindlichkeit und -impedanz	
Phono	2,5 mV/47 k Ω
Aux	150 mV/22 k Ω
Tape Aufnahme/Wiedergabe (TAPE REC/PLAY)	180 mV/22 k Ω
Maximale TA-Eingangsspannung (1 kHz, eff.)	130 mV
Geräuschabstand	
Nennleistung (4 Ω)	
Phono	70 dB (nach IHF, A: 80 dB)
Aux, Tape	88 dB (nach IHF, A: 95 dB)
-26 dB Leistung (4 Ω)	Phono 64 dB Aux, Tape 66 dB
50 mW Leistung (4 Ω)	Phono 62 dB Aux, Tape 62 dB
Frequenzgang	
Phono	RIAA-Standardkurve ±0,8 dB (30 Hz ~ 15 kHz)
Aux, Tape	5 Hz ~ 70 kHz (-3 dB) ±0,2 dB (20 Hz ~ 20 kHz)

Klangregler

Baßregler (BASS)	50 Hz, +10 dB ~ -10 dB
Höhenregler (TREBLE)	20 kHz, +10 dB ~ -10 dB
Gehörrichtige Lautstärkekorrektur (Loudness)	
(bei -30 dB Ausgangsleistung)	50 Hz, +9 dB
Ausgangsspannung und -impedanz	
Tape Aufnahme (TAPE REC OUT)	150 mV
Tape Aufnahme/Wiedergabe (TAPE REC/PLAY)	30 mV/82 k Ω

Kanalabweichung (Aux, 250 Hz ~ 6300 Hz)	±1 dB
Übersprechdämpfung (Aux, 1 kHz)	55 dB
Kopfhörerpegel und -impedanz	210 mV/330 Ω
Lautsprecherimpedanz	
MAIN oder REMOTE	4 Ω ~ 16 Ω
MAIN und REMOTE	8 Ω ~ 16 Ω

■ UKW-TUNERTEIL

Wellenbereich	87,5 ~ 108 MHz
Eingangsempfindlichkeit	
S/R 30 dB	1,9 μ V (300 Ω), 1,3 μ V (75 Ω)
S/R 26 dB	1,7 μ V (300 Ω), 1,2 μ V (75 Ω)
S/R 20 dB	1,5 μ V (300 Ω), 0,9 μ V (75 Ω)
Nutzempfindlichkeit nach IHF	1,9 μ V (nach IHF '58)
Stereoumschaltsschwelle bei 46 dB nach IHF	22 μ V/75 Ω
Gesamtklirrfaktor	Mono 0,15% Stereo 0,2%
Geräuschabstand	
Mono	60 dB (75 dB nach IHF)
Stereo	58 dB (70 dB nach IHF)
Frequenzgang	20 Hz ~ 15 kHz (+1 dB ~ -2 dB)
Trennschärfe bei Störsender	75 dB
Einfangverhältnis	1,2 dB
Spiegelfrequenz-Dämpfung bei 98 MHz	55 dB
ZF-Dämpfung bei 98 MHz	75 dB
Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	80 dB
AM-Unterdrückung	50 dB
Übersprechdämpfung	
1 kHz	42 dB
10 kHz	32 dB
Trägerrest	
19 kHz	-30 dB (-35 dB nach IHF)
38 kHz	-50 dB (-50 dB nach IHF)
Kanalabweichung (250 Hz ~ 6300 Hz)	±1,5 dB
Begrenzereinsatz	1,2 μ V
Bandbreite	
ZF-Verstärker	180 kHz
UKW-Demodulator	1000 kHz
Antennenanschluß	300 Ω (symmetrisch) 75 Ω (unsymmetrisch)

Deutsch

■ AM-TUNERTEIL		■ ALLGEMEINE DATEN	
Wellenbereiche	525 ~ 1605 kHz	Leistungsaufnahme	200 W
Eingangsempfindlichkeit (S/R 20 dB)	30 µV, 300 µV/m	Netzspannung	
Trennschärfe	30 dB	Wechselstrom 50 Hz/60 Hz, 110V/120V/220V/240V	
Spiegelfrequenz-Dämpfung bei 1000 kHz	50 dB	Abmessungen (B×H×T)	430 × 86 × 297 mm
ZF-Dämpfung bei 1000 kHz	40 dB	Gewicht	5,5 kg

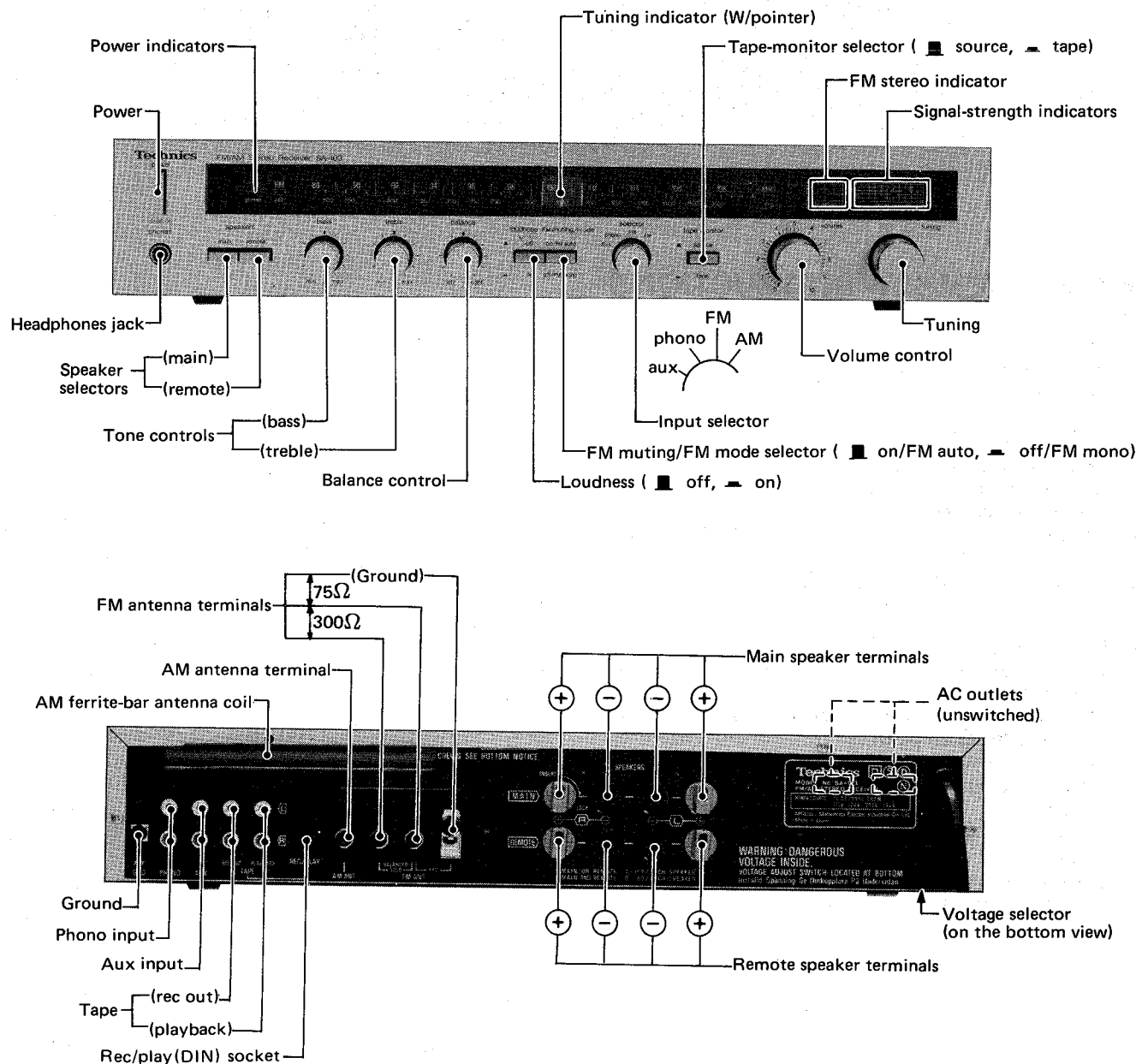
Français

CARACTERISTIQUES (Sujet à changement sans préavis.)	
■ SECTION AMPLIFICATEUR	
Puissance de sortie continue de 20 Hz~20 kHz, les deux canaux en circuit	2 × 20W (4Ω) 2 × 20W (8Ω)
Puissance de sortie continue de 40 Hz~16 kHz, les deux canaux en circuit	2 × 20W (4Ω) 2 × 20W (8Ω)
Puissance de sortie continue à 1 kHz, les deux canaux en circuit	2 × 24W (4Ω) 2 × 22W (8Ω)
Distorsion harmonique totale	
à puissance nominale (20 Hz~20 kHz)	0,08% (4Ω) 0,04% (8Ω)
à puissance nominale (40 Hz~16 kHz)	0,08% (4Ω) 0,04% (8Ω)
à puissance nominale (1 kHz)	0,04% (4Ω) 0,04% (8Ω)
à demi-puissance (20 Hz~20 kHz)	0,025% (8Ω)
à demi-puissance (1 kHz)	0,009% (8Ω)
puissance de -26 dB à 1 kHz	0,1% (4Ω)
puissance de 50 mW à 1 kHz	0,12% (4Ω)
Distorsion d'intermodulation	
à puissance nominale à 250 Hz: 8 kHz=4:1, 4Ω	0,08%
à puissance nominale à 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0,04%
Réponse de fréquences	
les deux canaux en circuit, -3 dB	10 Hz~30 kHz (4Ω)
Coefficient d'amortissement	
15 (4Ω), 30 (8Ω)	
Sensibilité et impédance d'entrée	
PHONO	2,5 mV/47kΩ
AUX (AUX)	150 mV/22kΩ
BANDE ENREGISTREMENT/LECTURE (TAPE REC/PLAY)	
PHONO (tension d'entrée maximum, 1 kHz RMS)	180 mV/22kΩ
Signal/Bruit	
à puissance nominale (4Ω)	
PHONO	70 dB (IHF, A: 80 dB)
AUX, BANDE (AUX, TAPE)	88 dB (IHF, A: 95 dB)
puissance de -26 dB (4Ω)	
PHONO	64 dB
AUX, BANDE (AUX, TAPE)	66 dB
puissance de 50 mW (4Ω)	
PHONO	62 dB
AUX, BANDE (AUX, TAPE)	62 dB
Réponse de fréquence	
PHONO	Courbe nominale RIAA
AUX, BANDE (AUX, TAPE)	±0,8 dB (30 Hz~15 kHz) 5 Hz~70 kHz (-3 dB) ±0,2 dB (20 Hz~20 kHz)
Réglage de la tonalité	
BASSES (BASS)	50 Hz, +10 dB~ -10 dB
AIGUS (TREBLE)	20 kHz, +10 dB~ -10 dB
Compensateur physiologique (volume à -30 dB)	
	50 Hz, +9 dB
Tension de sortie et impédance	
SORTIE ENREGISTREMENT/BANDE (TAPE REC OUT)	
	150 mV
ENREGISTREMENT/LECTURE BANDE (TAPE REC/PLAY)	
	30 mV/82kΩ
■ SECTION SYNTONISATEUR FM	
Equilibrage des canaux, AUX 250 Hz~6 300 Hz	
	±1 dB
Séparation des canaux, AUX 1 kHz	
	55 dB
Niveau de sortie des casques et impédance	
	210 mV/330Ω
Impédance de charge	
	4Ω~16Ω
PRINCIPALE ou AUXILIAIRE (MAIN or REMOTE)	
	8Ω~16Ω
■ SECTION SYNTONISATEUR FM	
Gamme de fréquence	
	87,5~108 MHz
Sensibilité	
S/B 30 dB	1,9 µV (300Ω), 1,3 µV (75Ω)
S/B 26 dB	1,7 µV (300Ω), 1,2 µV (75Ω)
S/B 20 dB	1,5 µV (300Ω), 0,9 µV (75Ω)
Sensibilité utilisable IHF	
	1,9 µV (IHF '58)
Sensibilité stéréo au seuil de 46 dB, IHF	
	22 µV/75Ω
Distorsion harmonique totale	
MONO	0,15%
STEREO	0,2%
Signal/Bruit	
MONO	60 dB (75 dB, IHF)
STEREO	58 dB (70 dB, IHF)
Réponse de fréquence	
	20 Hz~15 kHz, +1 dB~ -2 dB
Sélectivité alternée par canal	
	75 dB
Taux de capture	
	1,2 dB
Rejection d'image à 98 MHz	
	55 dB
Rejection FI à 98 MHz	
	75 dB
Rejection de réponse parasite à 98 MHz	
	80 dB
Suppression AM	
	50 dB
Séparation stéréophonique	
1 kHz	42 dB
10 kHz	32 dB
Fuite de porteuse	
19 kHz	-30 dB (-35 dB, IHF)
38 kHz	-50 dB (-50 dB, IHF)
Equilibrage de canaux (250 Hz~6,300 Hz)	
	±1,5 dB
Point de limite	
	1,2 µV
Largeur de bande	
Amplificateur FI	180 kHz
Démodulateur FM	1000 kHz
■ SECTION SYNTONISATEUR AM	
Gamme de fréquence	
	525~1605 kHz
Sensibilité (S/B 20 dB)	
	30 µV, 300 µV/m
Sélectivité	
	30 dB
Réjection d'image à 1,000 kHz	
	50 dB
Réjection FI à 1,000 kHz	
	40 dB
■ DIVERS	
Consommation	
	200W
Alimentation	
	CA 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (L×H×Pr)	
	430 × 86 × 297 mm
Poids	
	5,5 kg

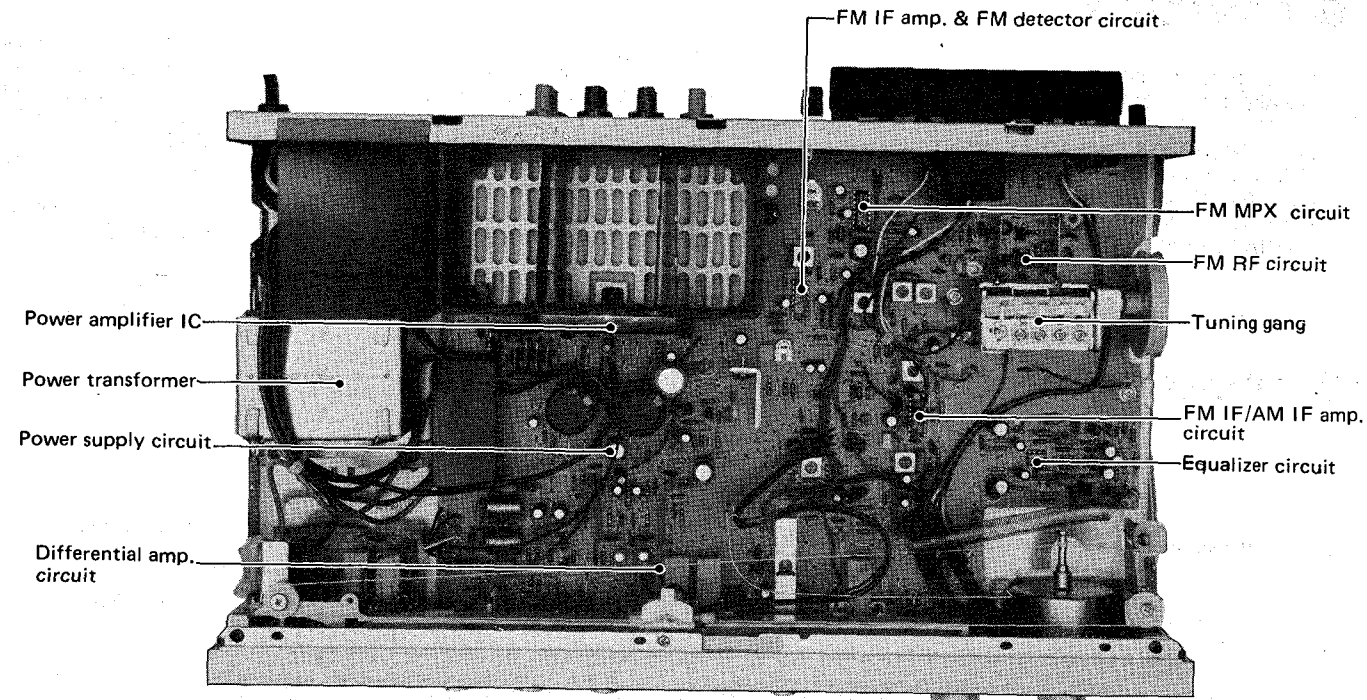
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VARIABLE RESISTORS	12		

LOCATION OF CONTROLS



* The product for destination [XA] is equipped with AC outlets.



DISASSEMBLY INSTRUCTIONS

How to remove the cabinet

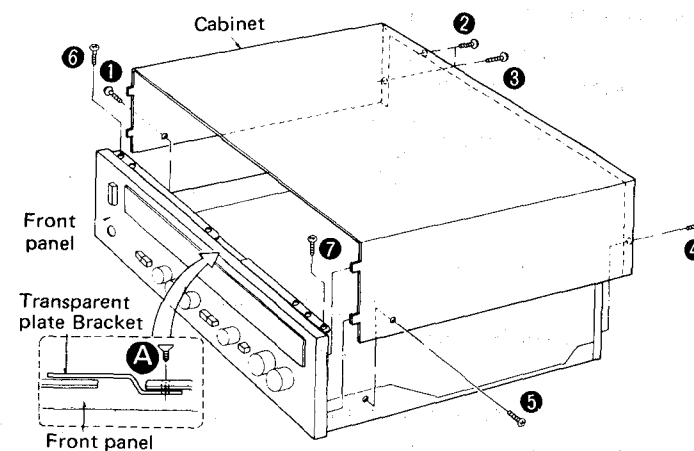
1. Remove the 5 setscrews (Fig. 1: ① ~ ⑤) of the cabinet.
2. Remove the cabinet.

How to remove the front panel

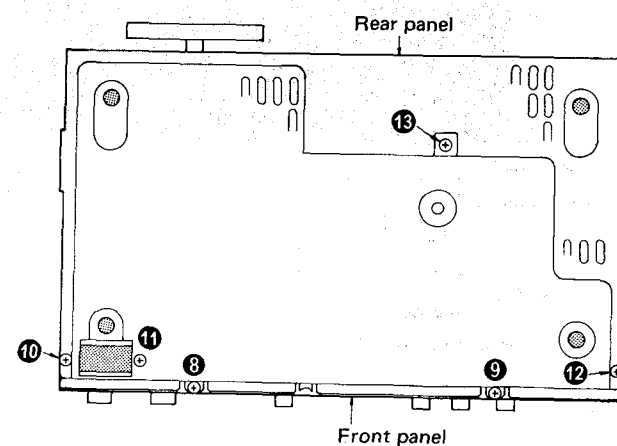
1. Remove the cabinet. (Refer to the section "How to remove the cabinet.")
2. Remove the 4 setscrews (Fig. 1: ⑥, ⑦ and Fig. 2: ⑧, ⑨) of the front panel.
3. Remove the 1 setscrew (Fig. 1: ①) of the transparent plate bracket, then remove the front panel.

How to remove the dial scale

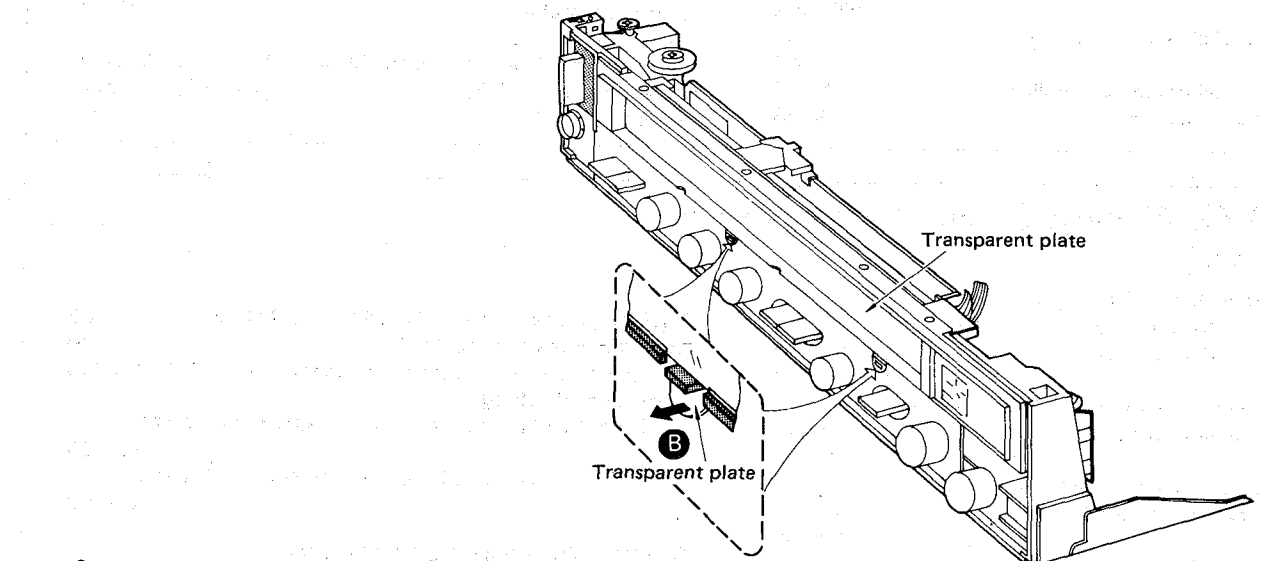
1. Remove the cabinet. (Refer to the section "How to remove the cabinet.")
2. Remove the front panel. (Refer to the section "How to remove the front panel.")
3. Pull up the two claws at the bottom of the transparent plate in the direction of the arrow B (Fig. 3).
4. Remove the 2 dial scale holders of the front chassis. (see Fig. 4)
5. Remove the power indicator P.C.B., remove the dial scale. (See Fig. 4)



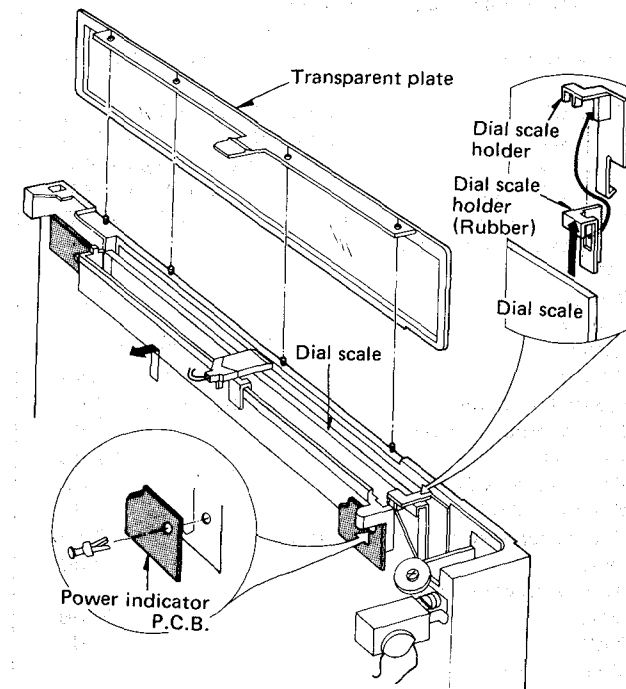
[Fig. 1]



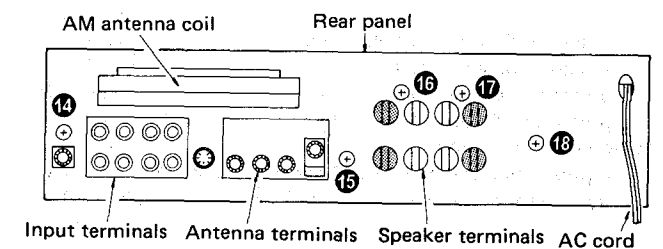
[Fig. 2]



[Fig. 3]



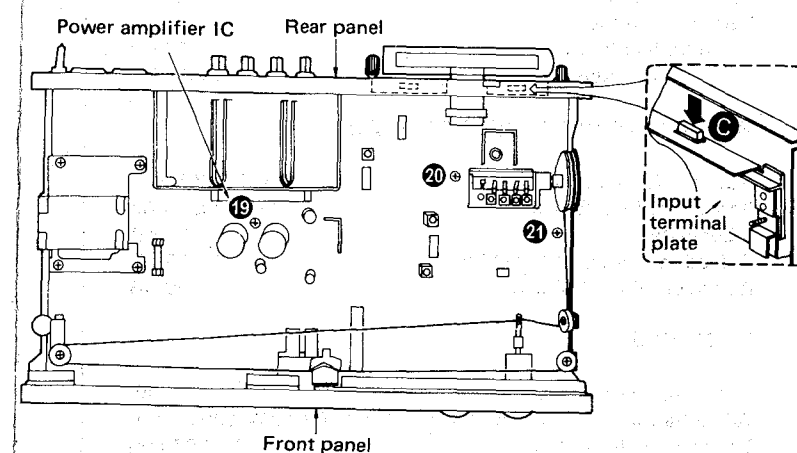
[Fig. 4]



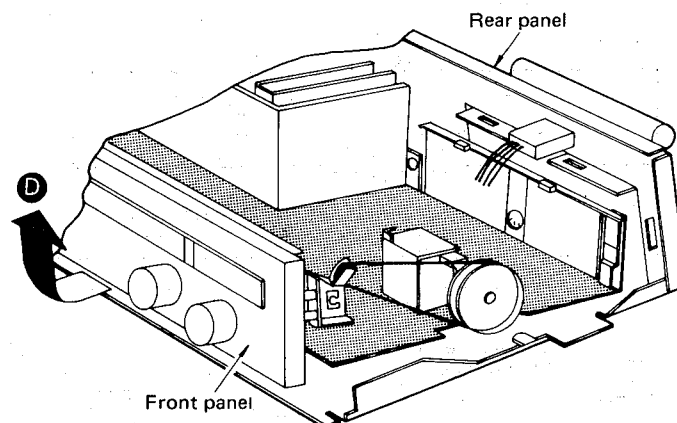
[Fig. 5]

How to remove the power amplifier IC

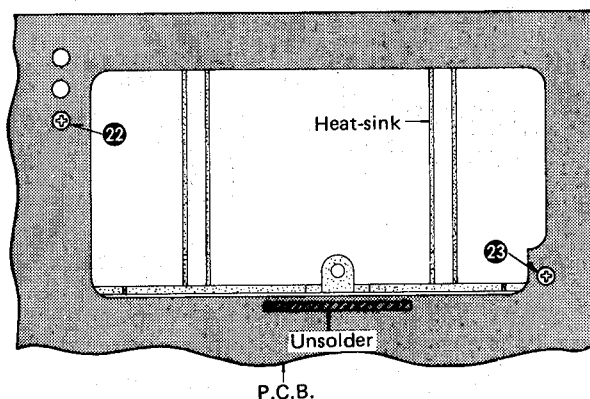
1. Remove the cabinet. (Refer to the section "How to remove the cabinet.")
2. Remove the 6 setscrews (Fig. 2: ⑧, ⑨ and ⑩ ~ ⑬) and 5 setscrews (Fig. 5: ⑭ ~ ⑰) of the rear panel.
3. Remove the 3 setscrews (Fig. 6: ⑱ ~ ⑳).
4. Pressing the claws of the input terminal plate and antenna terminal plate in the direction of arrow C (Fig. 6), lift up the front panel in the direction of arrow D (Fig. 7). Then, the front panel can be removed from the rear panel.
5. Remove the 2 setscrews (Fig. 8: ㉒, ㉓) of the heat-sink.
6. Unsolder the power amplifier IC. (Fig. 8).
7. Remove the 2 setscrews (Fig. 9: ㉔, ㉕) used to secure the power amplifier IC on the heat sink, and then pull the power amplifier IC.
8. When mounting the power amplifier IC, apply silicon compound (or equivalent heat diffuser) to the back of power amplifier IC.



[Fig. 6]

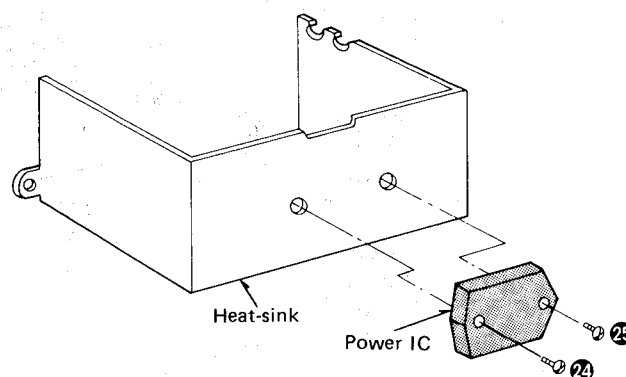


[Fig. 7]



Bottom view

[Fig. 8]

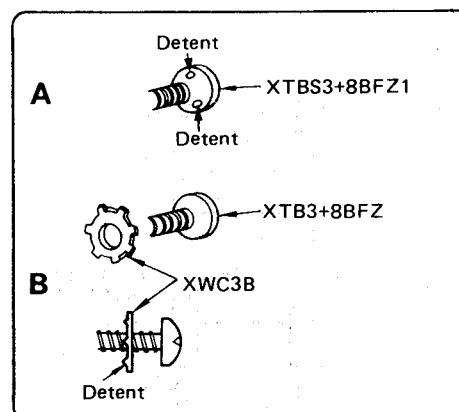


[Fig. 9]

Note 1: When checking or repairing, remove the speaker from the speaker terminal. If it is necessary to check or repair without removing the speaker from the terminal, short-circuit the phono input terminal beforehand.

Note 2: Setscrew 14 (Fig. 5) is screw with detents (Part No.: XTBS3+8BFZ1) as shown in Fig. 10-A in order to make the contact of electric circuit perfect.

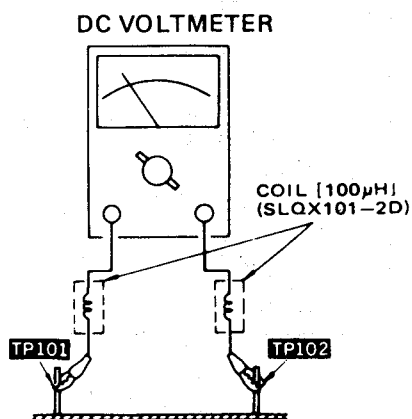
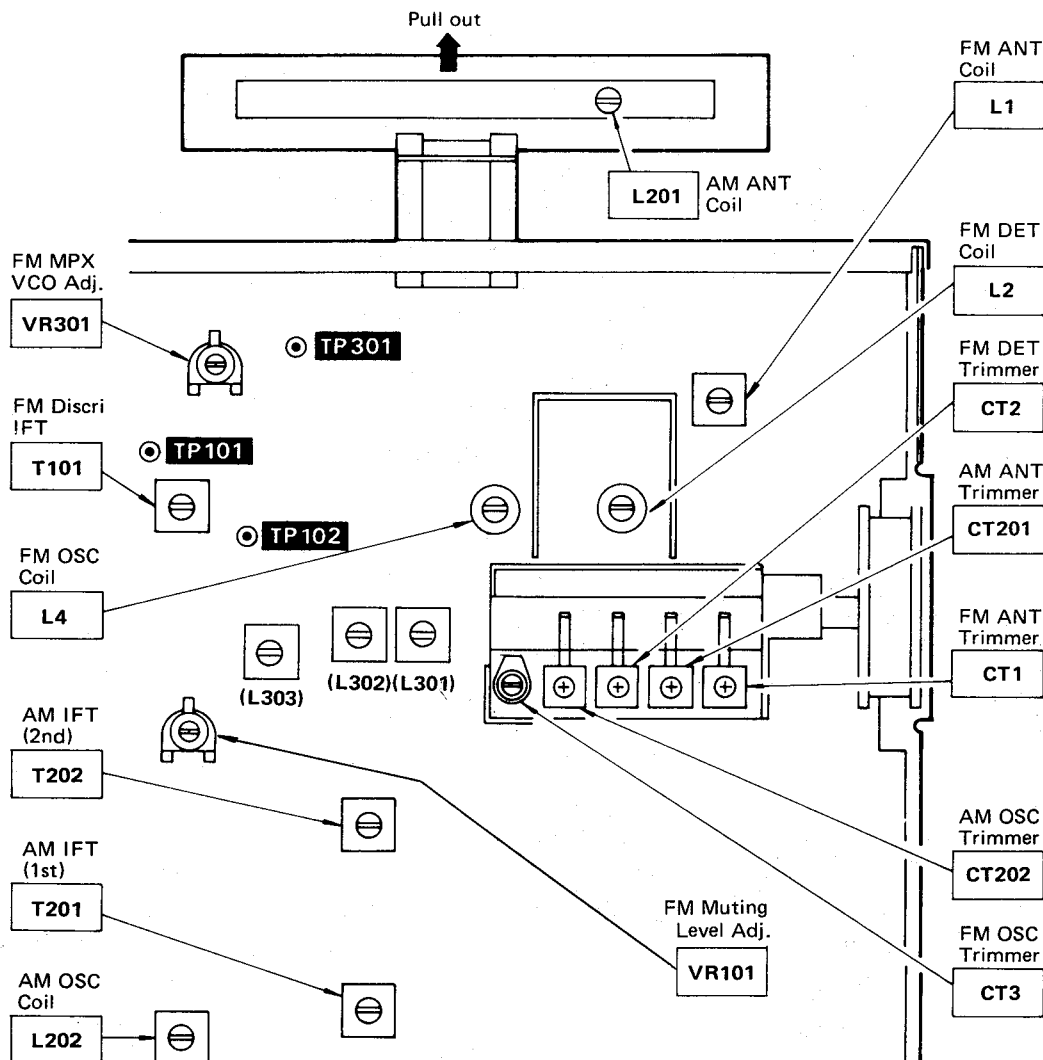
Take care not to mix up these screws with other screws. When substituting, use a 3 x 8mm tapping screw (Part No.: XTB3+8BFZ) and toothed lock washer (Part No.: XWC3B) as shown in Fig. 10-B. The teeth of the lock washer should be positioned on the chassis side.



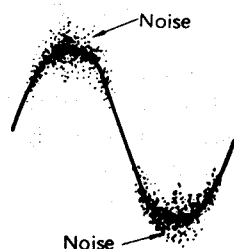
[Fig. 10]

ADJUSTMENT POINTS

Notes: L301, L302 and L303 have been already adjusted, so, do not turn the core.

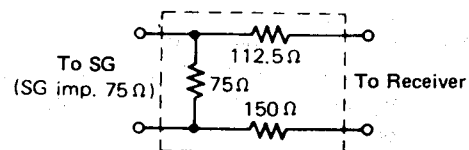


[Fig. 12]
(Abb. 12)

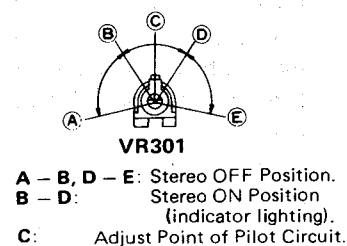


AF output wave form

[Fig. 13]
(Abb. 13)



300Ω FM dummy antenna
[Fig. 11] (Abb. 11)



[Fig. 14]
(Abb. 14)

MEASUREMENTS AND ADJUSTMENTS — English

	*Setting and Equipment used		5. Pull the AM ferrite-bar antenna (L201) outward.			
	1. AC electronic voltmeter (VTVM) 2. AM signal generator (AM-SG) 3. Maintain line voltage at rated voltage. 4. Output of signal generator should be no higher than necessary to obtain an output reading.		6. Set input selector to { "AM" (AM adjustment) "FM" (FM adjustment) 7. Use a non-metal screwdriver for the adjustment. 8. Set speaker selector to "main" position.			
	FM/AM SIGNAL GENERATOR		DIAL SETTING	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE
	CONNECTION	FREQUENCY				
Step No.	AM IF ADJUSTMENT					
	1	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Powerful input)	450kHz (30% Mod. with 400Hz)	Point of non-interference	Connect AC VTVM or scope to "SPEAKER" terminals.	T201 (1st IFT) T202 (2nd IFT)
	AM-RF ADJUSTMENT					
	2	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input)	600kHz (30% Mod. with 400Hz)	600kHz	Connect AC VTVM or scope to "SPEAKER" terminals.	L202 (OSC Coil) L201 (ANT Coil)
3	1500kHz (30% Mod. with 400Hz)		1500kHz	Connect AC VTVM or scope to "SPEAKER" terminals.	CT202 (OSC Trimmer) CT201 (ANT Trimmer)	Adjust for maximum output. Repeat steps 2 and 3.
	*Equipment used			*Preparation of FM signal generator (FM-SG)		
	1. FM signal generator (FM-SG) 2. Stereo modulator 3. Distortion analyser 4. Oscilloscope 5. DC electronic voltmeter (VTVM) 6. Frequency counter (19kHz and 108MHz measurable) 7. FM 300Ω dummy antenna (Fig. 11)			1. Connect stereo modulator to FM-SG 2. Apply SG output to antenna terminal of the set through 300Ω FM dummy antenna. 3. The standard input of the set is 60dB (1mV), 400Hz 100% modulation (Because of using dummy antenna, SG output must be 12dB plus (IHF). That is, when input is 60dB, SG output is to be 72dB.		
	FM IF ADJUSTMENT					
	4	No-Signal.	Point of non-interference	Connect DC VTVM to TP101, TP102 terminals through choke coil (Refer to fig. 12)	T101 (DISCRI IFT)	● Adjust T101 core so that voltage measured in signal mode is 0V in 300mV range.
	FM RF ADJUSTMENT					
	5	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna.	90MHz (100% Mod. with 400Hz) weak input	90MHz	Connect scope to "SPEAKER" terminals.	L4 (OSC Coil) L2 (RF DET Coil) L1 (ANT Coil)
6	106MHz (100% Mod. with 400Hz) weak input		106MHz	Connect scope to "SPEAKER" terminals.	CT3 (OSC Trimmer) CT2 (RF DET Trimmer) CT1 (ANT Trimmer)	
	FM MPX PILOT (VCO) ADJUSTMENT					
	USING FREQUENCY COUNTER			USING ALTERNATE SYSTEM		
7	1. 100MHz Non-modulated mono signal applied to set. 2. FM muting/mode switch to "on/FM auto". 3. Connect frequency counter to TP301 through resistor (100kΩ). 4. Adjust VR301 to 19kHz, ±30Hz.			1. Apply stereo signal from generator or stereo station to receiver. 2. Adjust VR301 until stereo indicator lights up. Cement arm of VR301 as shown in fig. 14.		
	FM MUTING LEVEL ADJUSTMENT					
	8	Connect FM-SG to FM antenna terminal through 300Ω FM dummy antenna. (Apply 16dB [product for [XA] only 12dB] to antenna terminal)	100 MHz (100% Mod. with 400Hz)	100 MHz	Connect AC VTVM or scope to "Speaker" terminals of the set.	VR101(Muting level)

MESSUNGEN UND JUSTIERUNGEN — Deutsch

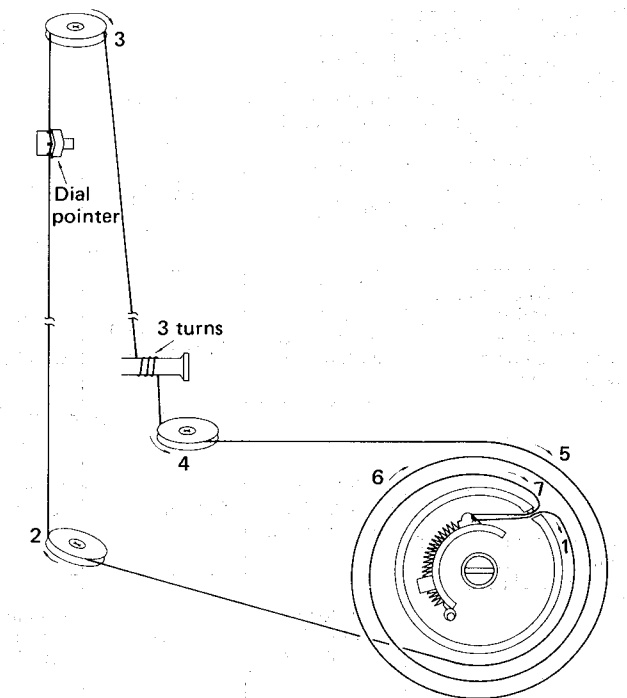
• Stellungen und zu benutzende Geräte 1. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM) 2. AM (MW)-Meßsender (AM-SG) 3. Netzspannung auf ihren Sollwerthalten. 4. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute Ablesung. 5. Die AM-Ferritstabantenne (L201) herausziehen. 6. Bereichsschalter { AM (AM abgleich) FM (FM abgleich) 7. Einen nichtmetallischen Schraubenzieher für die Einstellungen verwenden. 8. Wellenbereichsschalter main						
Nr.	FM/AM (MW)-MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHsverfahren
	ANSCHLUSS	FREQUENZ				
AM (MW)-ZF-ABGLEICH						
1	Einen MW-Signalgenerator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Starker Eingang)	450kHz (400Hz Modulat., 30%)	Kein Empfang	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	T201 (1. IFT) T202 (2. IFT)	Die Eingangsfrequenz und die Einstellungspunkte so adjustieren, daß der Ausgang den maximalen Wert erreicht.
AM (MW)-HF-ABGLEICH						
2	Einen MW-Signalgenerator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Schwacher Eingang)	600kHz (400Hz Modulat., 30%)	600kHz	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	L201 (MW Ant. Spule) L202 (MW Osc. Spule)	1. Auf max. Ausgang abgleichen. 2. Den Ferritkern von L201 mit einem Schraubendreher justieren.
3		1500kHz (400Hz Modulat., 30%)	1500kHz	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	CT201 (MW Ant. Trimmer) CT202 (MW Osc. Trimmer)	1. Auf max. Ausgang abgleichen. 2. Die schritte (2) une (3) wiederholen.
• Verwendete Einrichtungen 1. UKW-Meßsender (FM-SG) 2. Stereo-Modulator (oder Trennmesser) 3. Verzerrungsmesser 4. Oszilloskop 5. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM) 6. Signalfrequenzmesser (meßbar für 19kHz und 108MHz) 7. UKW300-Ohm Kunstantenne (Abb. 11) • Vorbereitung AM UKW-Messender (FM-SG) 1. Stereo-Modulator an FM-SG anschließen. 2. SG-Ausgang über 300-Ohm UKW Kunstantenne an den Antenneneingang des Gerätes schließen. 3. Der normale Eingang des Gerätes beträgt 60dB (1mV), 400Hz 100% Modulation. (Wegen Verwendung der Kunstantenne muß der Signalausgang 12dB plus (IHF) sein; d.h. beim Eingang von 60dB soll der Signalausgang 72dB sein.)						
UKW-ZF-ABGLEICH						
4		Kein Signal	100.0MHz	Ein Gleichstromröhren-voltmeter zwischen TP101 und TP102 über eine Drosselspule verbinden (Siehe Abb. 12)	T101 (Diskriminator FT)	Den Kern von T101 so justieren, daß die gemessene Spannung im signallosen Modus 0V im 300mV Bereich beträgt.
UKW-HF-ABGLEICH						
5	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	87.5MHz (400Hz Modulat., 100%)	87.5MHz (Frequenz min.)	Oszilloskop über den Lautsprecher schließen.	L4 (Osc. Spule)	1. Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird. 2. So einstellen, daß die Ausgangswellenform vertikal symmetrisch wird. (Abb. 13) 3. Die Einstellung von (5), (6) und (7) wieder holen, bis die Frequenz mit der Skala übereinstimmt.
6		90.0MHz (400Hz Modulat., 100%)	90.0MHz		L2 (HF Det. Spule) L1 (Ant. Spule)	
7		106MHz (400Hz Modulat., 100%)	106MHz		CT3 (Osc. Trimmer) CT2 (HF Dec. Trimmer) CT1 (Ant. Trimmer)	
UKW-STEREO-DEKODER-ABGLEICH						
UNTER VERWENDUNG EINES ZÄHLERS				ALTERNATIV-MEß METHODE		
8	1. Unmoduliertes Mono-Signal 100MHz in das Gerät speisen. 2. FM muting/mode-Schalter auf "on/auto" stellen. 3. Zähler über einen Widerstand 100K ohm an TP301 schließen. 4. VR301 auf 19kHz ± 30Hz einstellen.			1. Stereosignal entweder von einem Stereogenerator, oder einem Sender einspeisen. 2. VR301 so einstellen, bis die Stereolampe auf leuchtet. Schleifer von VR301 sichern, wie in Abb. 14 gezeigt.		
UKW-STUMMABSTIMMUNGS PEGELANZEIGER						
9	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (16dB in den Antenneneingang leiten.)	100MHz (400Hz Modulat., 100%)	100 MHz	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	VR101 (UKW-Muting)	1. "Muting" Schalter auf "on" stellen. VR101 so einstellen, daß der Ausgang unter Bewirken der Dämpfung gegeben wird.

MESURAGES ET RÉGLAGES

● Réglage et équipement utilisé 1. Voltmètre électronique de courant alternatif et de courant continu (VTVM). 2. Générateur de signal AM (AM-SG) 3. Conserve la tension du secteur à la tension nominale. 4. Le signal du générateur ne doit pas être plus élevé qu'il n'est nécessaire à obtenir une lecture en sortie. 5. Retirer l'antenne à tige de ferrite (L201) de la modulation d'amplitude. 6. Sélecteur de gamme } AM (Réglage de AM) } FM (Réglage de FM) 7. Utiliser un tournevis non-métallique pour le réglage. 8. Sélecteurs de gammes d'ondes . . . main						
No.	FM/AM GENERATEUR		FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
	BRANCHEMENT	FREQUENCE				
REGLAGE DE FI-AM						
1	Brancher le AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis. (Entrée sous puissante)	450kHz (modulé à 30% par 400Hz)	Point sans signal	Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	T201 (1 transfo FI) T202 (2 transfo FI)	Régler la fréquence d'entrée et les points de réglage de telle sorte que la sortie devienne maximale.
REGLAGE DE RF-AM						
2	Brancher la AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis. (Entrée faible)	600kHz (modulé à 30% par 400Hz)	600kHz	Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	L201 (Bobine Ant.) L202 (Bobine Osc.)	1. Régler au maximum de signal de sortie. 2. Régler la noyau ferrite de L201 à l'aide d'un tournevis.
3		1500kHz (modulé à 30% par 400Hz)	1500kHz	Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	CT201 (Trimmer Ant.) CT202 (Trimmer Osc.)	1. Régler au maximum de signal de sortie. 2. Répéter les étapes (2) et (3).
● Équipement utilisé 1. Générateur du signal FM (FM-SG) 2. Commande de réglage stéréophonique (ou vu-mètre de séparation). 3. Jauge de distorsion. 4. Oscilloscope. 5. Voltmètres électronique de courant alternatif et de courant continu (VTVM). 6. Compteur de fréquence (19kHz et 108MHz mesurable). 7. Antenne fictive FM, 300 ohms (Fig. 11) ● Préparation du générateur de signal FM (FM-SG) 1. Brancher la commande de réglage stéréophonique à FM-SG. 2. Alimenter la sortie SG à la borne de l'antenne de l'appareil, par l'antenne fictive FM, 300 ohms. 3. L'entrée standard de l'appareil est de 60dB (1mV), 400Hz, 100% de modulation (à cause de l'utilisation de l'antenna fictive, la sortie SG doit être de plus 12dB (IHF). Ca qui signifie que quand l'entrée est de 60dB, la sortie SG doit être de 72dB.						
REGLAGE DE FI-FM						
4		Sans Signal	100.0MHz	Brancher le voltmètre électronique à c.c. aux bornes TP101 et TP102 (Voir la Fig.12)	T101 (Transfo FI discri.)	Régler le noyau T101 de telle sorte que le voltage mesuré dans le mode sans signal, soit de 0V dans la gamme des 300mV.
REGLAGE DE RF-FM						
5	Brancher sur la prise d'antenne FM à travers une antenne fictive FM.	90.0MHz (modulé à 100% par 400Hz)	90.0MHz	Brancher un oscilloscope sur les bornes de hautparleur de l'amplifonneur.	L4 (Bobin Osc.) L2 (détecteur) L1 (Bobin Ant.)	1. Appliquer une entrée faible de telle sorte que le parasite soit compris dans la forme de l'onde de sortie. 2. Faire la réglage de telle sorte que la forme de l'onde de sortie soit verticalement symétrique. (Voir Fig. 13) 3. Refaire les réglages (5) et (6) jusqu'à ce que la fréquence corresponde correctement avec l'échells du cadran
6		106MHz (modulé à 100% par 400Hz)	106.0MHz		CT3 (Trimmer OSC) CT2 (détecteur) CT1 (Trimmer Ant.)	
ALIGNEMENT DU PILOTE MULTIPLEX FM						
AVEC UN ERÉQUENCEMENTRE				PAR UN OUTRE SYSTÈME		
7	1. Signal mono 100MHz non modulé appliqué à l'appareil. 2. Commutateur de silencieux sur "on/auto". 3. Branchez le fréquencesmètre sur TP301 à travers une résistance de 100kΩ. 4. Régler VR301 sur 19kHz ± 30Hz.			1. Appliquez à l'appareil un signal stéréo provenant d'un générateur ou de la réception d'un émetteur. 2. Régler VR301 jusqu'à ce que l'indicateur de stéréophonie s'allume. Collez le curseur le VR301 comme indiqué sur la fig. 14.		
REGLAGE DU SEUIL DU SILENCIEUX D'ACCORD						
8	Brancher sur la prise d'antenne FM à travers une antenne fictive FM. (Appliquer 16dB à la borne de l'antenne.)	100 MHz (modulé à 100% par 400Hz)	100 MHz	Brancher un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'amplifonneur.	VR101	1. Avec le commutateur de mode/réglage silencieux "on/auto", régler le VR101 de telle sorte que la sortie fournie avec le réglage silencieux en position déclenchée.

■ DIAL CORD INSTALLATION GUIDE

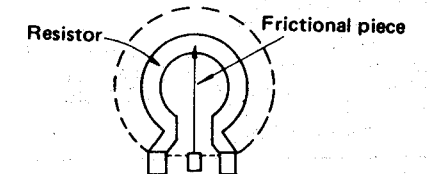
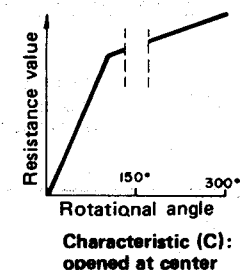
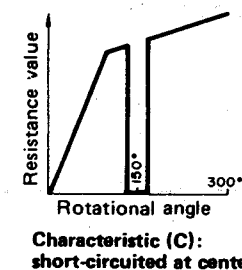
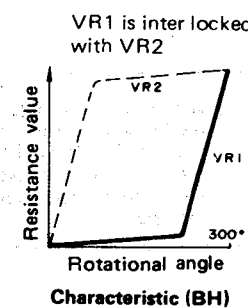
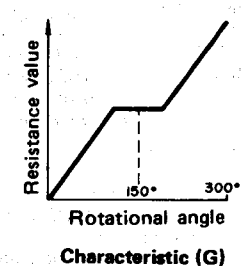
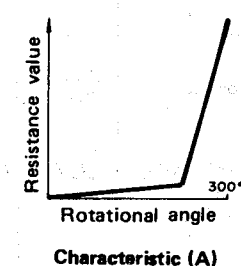
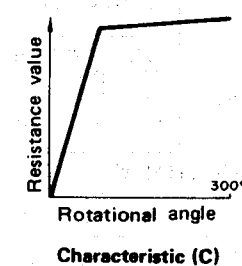
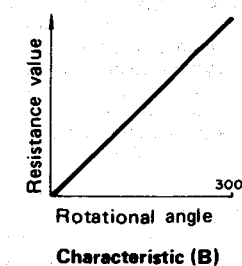
- * For threading a fresh cord, proceed as follows.
 1. Prepare a fresh cord more than 180cm (70-15/16") in length.
 2. Bring the variable capacitor into a state where the drum is completely turned to the right (maximum capacity and lowest frequency for the variable capacitor.)
 3. Direct the cord in the order from 1 to 7.
 4. Stretch the cord in such a tension as the spring length is elongated by 1.5 times that of the original state.
 5. Fix the knot of the cord with the adhesive.



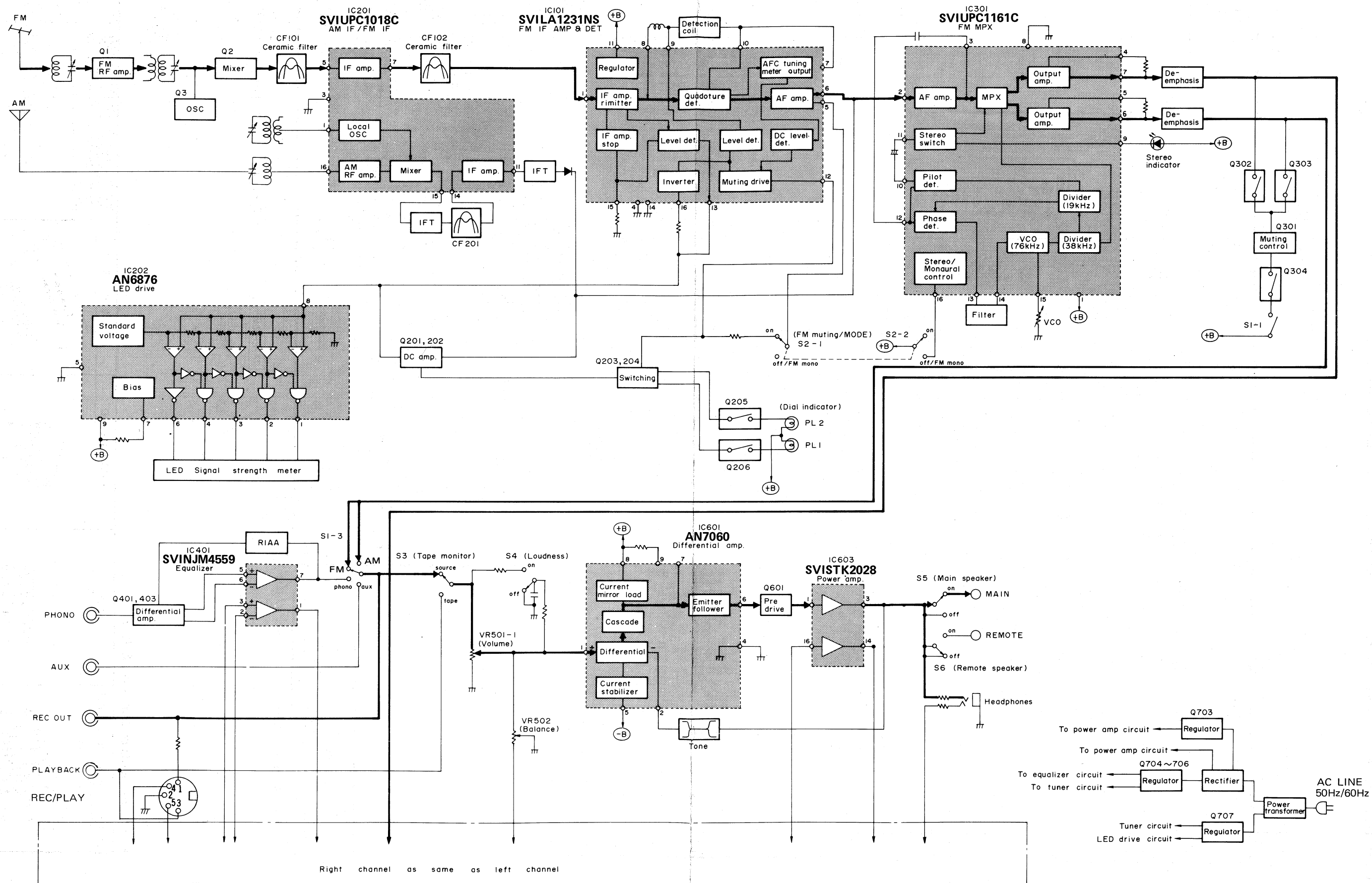
■ VARIABLE RESISTORS

- **Alteration of resistance values according to the rotational angles of variable resistors**

Alteration characteristics as shown below are often used for sets. All are intended to keep the frequency response of the set at optimum levels, and are used according to the types of circuits. For example, characteristic (B) is used for sound volume adjustment; (C) is for bass and treble sound quality adjustment; and (G) is for the adjustment of sound balance between the right and left.



■ BLOCK DIAGRAM



TECHNICAL GUIDE

The power amplifier IC (SVISTK2028) is provided with a protection circuit.

1. Muting (shock noise prevention) with power switch ON.

- (1) When power is supplied, negative voltage is applied to the emitter of switching transistor (Q703).
 - (2) Positive voltage flows from the regulator (Q707) to R709 and R708 to turn D705 and Q703 ON. (It takes a few seconds until Q703 turns ON due to time constant of C706).
 - (3) When Q703 turns ON, negative voltage is applied to the pin ⑤ of input amplifier IC (AN7060) causing the input amplifier to operate.
- * The signal is applied to the power amplifier a few seconds later so that shock noise can be prevented.

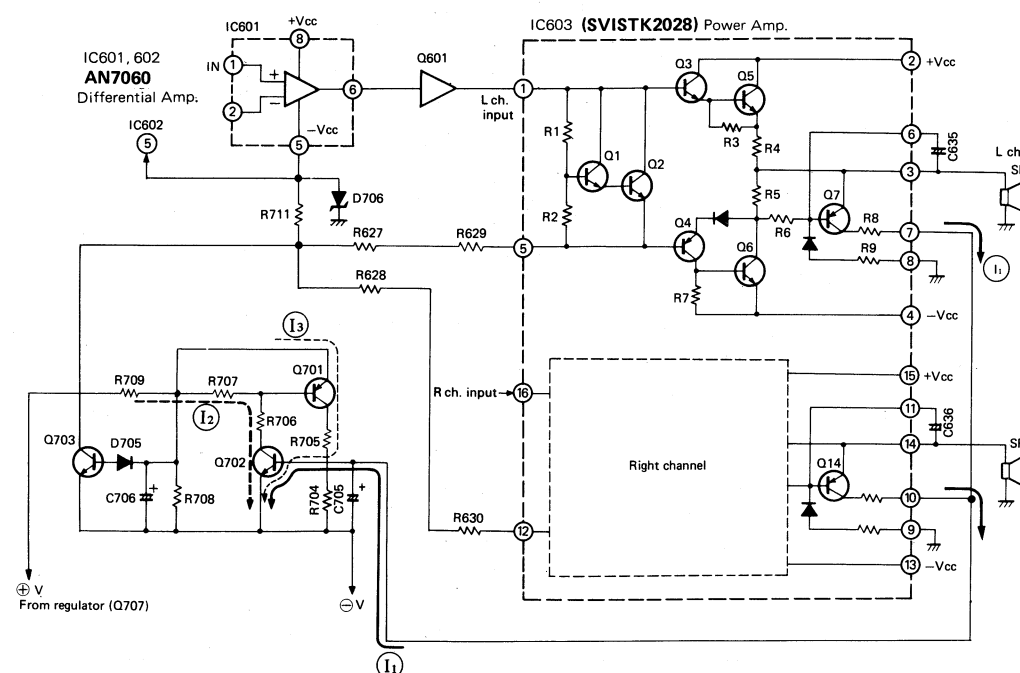
2. Muting (shock noise prevention) with power switch OFF.

- (1) When power supply is cut off, the voltage applied to Q703 drops at the base faster than the negative voltage at the emitter connected to the large capacity condenser, thus turning off D705 and Q703.
 - (2) Input amplifier is off with Q703 off.
- * The signal is cut off on the input side while the operation voltage of power amplifier still remains, thus preventing shock noise.

3. Operation of the protection circuit with speaker terminal short-circuited.

- (1) Transistor Q7 in the power amplifier IC (SVISTK2028) is usually OFF, but when the speaker terminal is short-circuited to the ground, a large amount of current flows to Q6, causing a voltage to be generated at R5.
 - (2) The voltage causes Q7 to turn ON, then ⑪ flows to raise the base potential of Q702. And Q702 turns ON.
 - (3) As Q702 is ON, ⑫ flows to generate a voltage at R707, and then Q701 turns ON.
 - (4) ⑬ flows with Q701 turned ON, ⑬ flows to hold Q702 ON.
 - (5) The current flowing in R709 increases due to ⑫, and the positive voltage from regulator (Q707) drops, causing D705 to turn off.
 - (6) In other words, Q703 turns OFF and the negative power supply to the input amplifier is discontinued.
- * This condition continues until power supply switch is set OFF.

A few minutes after the power switch is set to ON, if no sound is produced while the operation is normal, cut off the power supply and check the speaker connections and the input equipment.



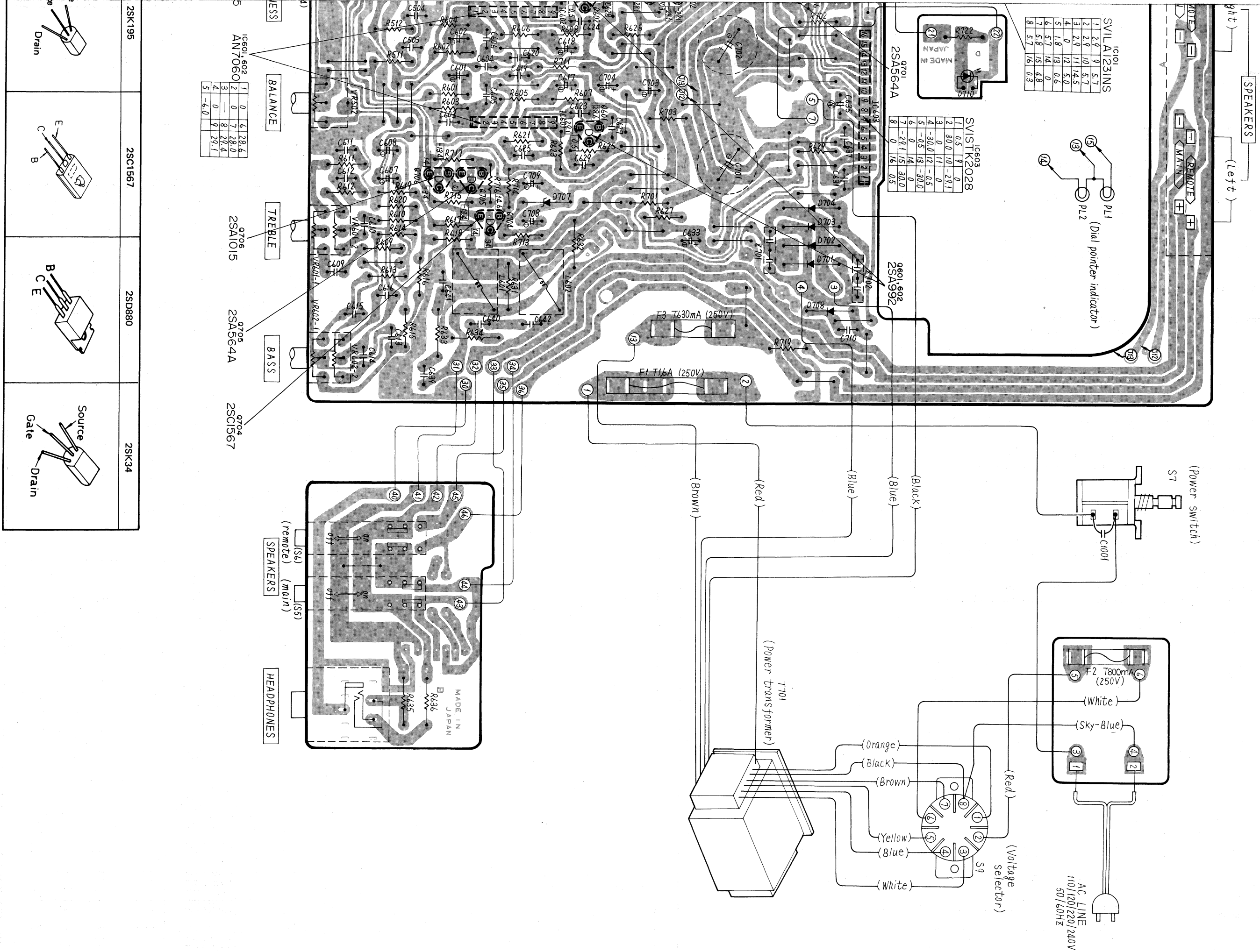
REPLACEMENT PARTS LIST (Electrical Parts)

- Notes:** 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 2. Important safety notice:
 Components identified by Δ mark have special characteristics important for safety.
 When replacing any of these components, use only manufacturer's specified parts.
 3. Bracketed indications in Ref. No. columns specify the area.
 Parts without these indications can be used for all areas.

Ref. No.	Part No.	Part Name & Description
INTEGRATED CIRCUITS		
IC101	SVILA1231NS	IC, FM IF Amplifier & Detector
IC201	RVIUPC1018CF	IC, AM Converter, FM IF Amplifier
IC202	AN6876	IC, LED Amplifier
IC301	SVIUPC1161C	IC, FM Stereo Decoder (MPX)
IC401	SVINJM4559DD	IC, Equalizer Amplifier
IC601, 602	AN7060F	IC, Differential Amplifier
IC603	SVISTK2028B	IC, Power Amplifier
TRANSISTORS		
Q1	2SK195-H1	Transistor, FM RF Amplifier
Q2	2SC1674-M	Transistor, FM Mixer
Q3	2SC1675-L	Transistor, FM Local Oscillator
Q201	2SC945-Q	Transistor, Switching
Q202	2SA733-P1	Transistor, Switching (Use in ranks P1 or P2)
Q203, 204	2SC945-Q	Transistor, Switching
Q205, 206	2SC1318-Q	Transistor, Switching (Use in ranks Q or R)
Q301	2SA733-P1	Transistor, Muting Control
Q302, 303	2SC945-Q	Transistor, Muting
Q304	2SA722-S	Transistor, Switching (Use in ranks R or S)
Q401, 402, 403, 404	2SC2320L-F	Transistor, Differential Amplifier (Use in ranks E, F or G)
Q601, 602	2SA992	Transistor, Pre Drive
Q701, 705	2SA564AQ	Transistor, Regulator (Use in ranks Q, R or S)
Q702	2SC828AQ	Transistor, Regulator (Use in ranks Q or R)
Q703	2SC1815-G	Transistor, Regulator (Use in ranks BG, GR or BL)
Q704	2SC1567-Q	Transistor, Regulator (Use in rank Q or R)
Q706	2SA1015-Y	Transistor, Regulator (Use in rank Q or Y)
Q707	2SD880-Y	Transistor, Regulator
Q708	2SK34-D1	Transistor, Hold (Use in ranks D1 or D2)
DIODES		
D101, 202, 301	MA161	Diode, Detector
D201	2-0A99	Diode, AM Detector
D208	SVDP5532K	Light Emitting Diode, Signal Strength Indicator (Red)
D203 ~ 207	SVDA2434D	Light Emitting Diode, Signal Strength Indicator (Yellow)
D701 ~ 704	SVDS2V20	Diode, Rectifier
D705	SVDMZL316A	Diode, 16V Zener
D706	SVDMZ306C	Diode, 6V Zener
D707	SVDMZL314C	Diode, 14V Zener
D708	SVDSR1K2	Diode, Rectifier
D709	SVDMZL314C3	Diode, 14V Zener
D710	SVDP5532K	Light Emitting Diode, Power (Red)
COILS and TRANSFORMERS		
L1	SLA4N15	Coil, FM Antenna
L2	SLD4P65-P	Coil, FM Detector
L3	ELQ5A77	Coil, Choke
L4	SLO4P95-P	Coil, FM Oscillator
L101	SLQX101-3M	Coil, FM Discr
L201	SLF2C39	Coil, FM Antenna
L202	SLO2C1-P	Coil, AM Oscillator
L299	RLQY15G5-0	Coil
L301, 302	SLM1C63-M	Coil, MPX Filter
L303	SLM1C61-P	Coil
L601, 602	SLQY15G-30	Coil, Choke
T101	SLI4C527-Z	Transformer, FM Detector
T201	SLI2C129R	Transformer, FM IFT (1st)
T202	SLI2C413R	Transformer, FM Oscillator
T701	SLT5M165	Transformer, Power Source
COMPONENT COMBINATIONS		
Z701, 702	SXRFS203ZSM	Component Combination, 0.01 μ F x 2
CERAMIC FILTERS		
CF101, 103	SVFE107MA8A	Ceramic Filter, Red, 10.7MHz
	SVFE107MA8B	Ceramic Filter, Blue, 10.67MHz
	SVFE107MA8C	Ceramic Filter, Orange, 10.73MHz
	SVFE107MA8D	Ceramic Filter, Black, 10.64MHz
	SVFE107MA8E	Ceramic Filter, White, 10.76MHz
CF102	SVFE107MM-A	Ceramic Filter, Red, 10.7MH
	SVFE107MM-B	Ceramic Filter, Blue, 10.68MHz
	SVFE107MM-C	Ceramic Filter, Orange, 10.72MHz
	SVFE107MM-D	Ceramic Filter, Brown, 10.66MHz
	SVFE107MM-E	Ceramic Filter, Gray, 10.74MHz

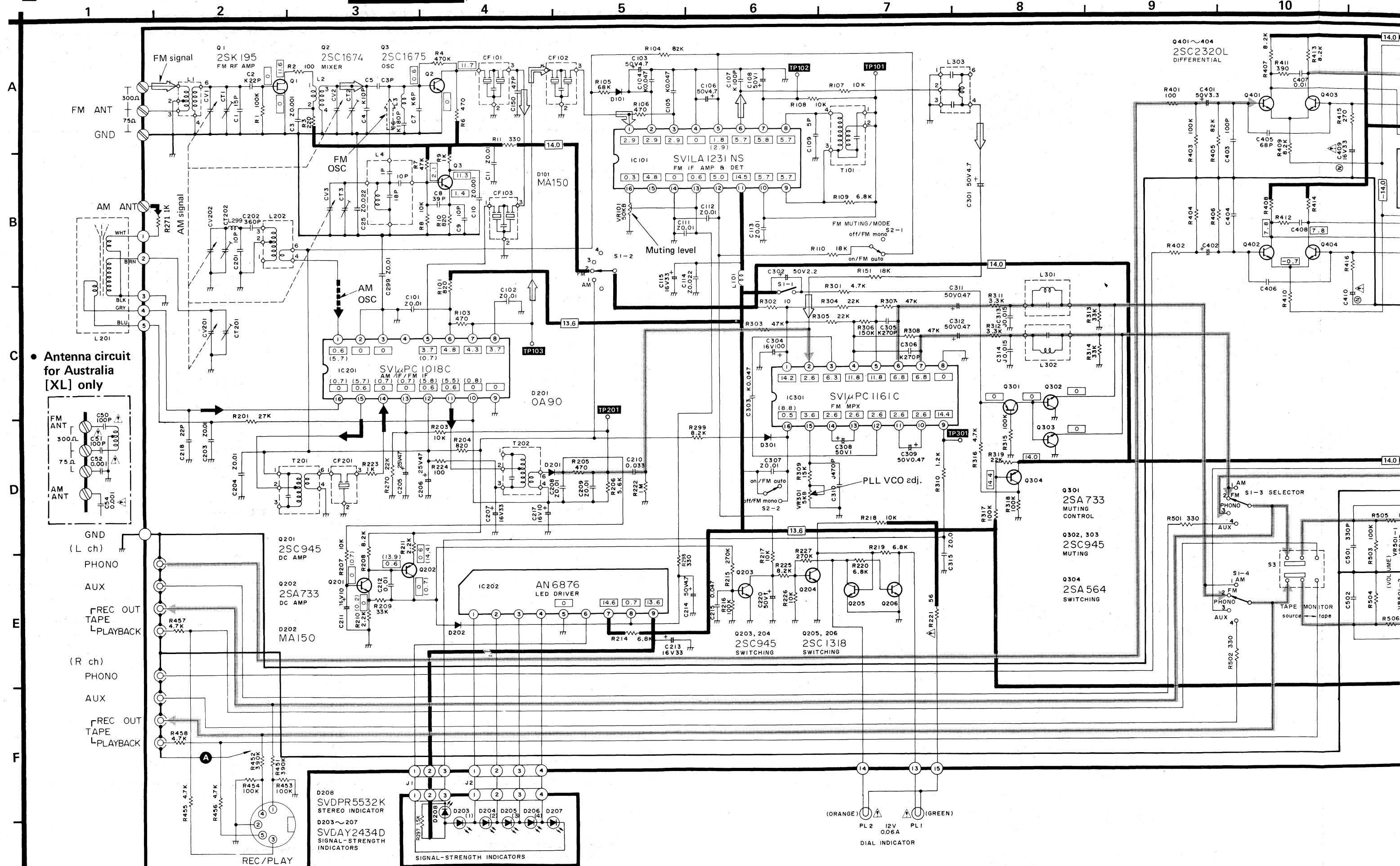
Ref. No.	Part No.	Part Name & Description
CF201	SVFSFU450B	Ceramic Filter, AM 450kHz
FUSES		
F1	Δ XBA2C16TRO	Fuse, T1.6A (250V)
F2	Δ XBA2C08TRO	Fuse, T800mA (250V)
F3	Δ XBA2C06TRO	Fuse, T630mA (250V)
LAMPS		
PL1	Δ XAMR86S300A	Lamp, Dial 12V 0.06A (Colour Green)
PL2	Δ XAMR86S300	Lamp, Dial 12V 0.06A (Colour Orange)
SWITCHES		
S1 ~ 1 ~ 3	SSR165	Switch, Function
S2 ~ 1 ~ 2 ~ 2	SSH2015	Switch, FM Muting, Loudness
S4	SSH165	Switch, Tape Monitor
S3	SSH2017	Switch, Speaker Selector
S5, 6	ESB90619S	Switch, Power Source
S7	Δ ESE37200	Switch, Voltage Adjuster
S8		
VARIABLE RESISTORS		
VR101	EVNMA4A00B54	Muting Level Adjustment 50k Ω (B)
VR301	EVT33MA00B53	PLL Voltage Adjustment, 5k Ω (B)
VR501	EWJGFA066B15	Volume Control, 100k Ω (B)
VR502	EWHHMA531G15	Balance Control, 100k Ω (G)
VR601	EWJFC0066C15	Treble Control, 100k Ω (C)
VR602	EWJFCY066530	Bass Control, 100k Ω (C)
VARIABLE CAPACITOR		
CV1, 2, 3, 201, 202	ECV5MD34X71G	Tuning Gang, FM & AM (with Trimmer)
[CT1, 2, 3, 201, 202]		
RESISTORS		
R1	ERD25TJ104	Carbon, 1/4W, 100k Ω , $\pm$ 5%
R2	ERD25FJ101	Carbon, 1/4W, 100 Ω , $\pm$ 5%
R3	ERD25FJ221	Carbon, 1/4W, 220 Ω , $\pm$ 5%
R4	ERD25TJ474	Carbon, 1/4W, 470k Ω , $\pm$ 5%
R6	ERD25FJ471	Carbon, 1/4W, 470 Ω , $\pm$ 5%
R7	ERD25TJ473	Carbon, 1/4W, 47k Ω , $\pm$ 5%
R8	ERD25FJ103	Carbon, 1/4W, 10k Ω , $\pm$ 5%
R9	ERD25FJ102	Carbon, 1/4W, 1k Ω , $\pm$ 5%
R10	ERD25FJ821	Carbon, 1/4W, 820 Ω , $\pm$ 5%
R11	ERD25FJ331	Carbon, 1/4W, 330 Ω , $\pm$ 5%
R101	ERD25FJ821	Carbon, 1/4W, 820 Ω , $\pm$ 5%
R103	ERD25FJ471	Carbon, 1/4W, 470 Ω , $\pm$ 5%
R104	ERD25TJ823	Carbon, 1/4W, 82k Ω , $\pm$ 5%
R105	ERD25TJ683	Carbon, 1/4W, 68k Ω , $\pm$ 5%
R106	ERD25FJ471	Carbon, 1/4W, 470 Ω , $\pm$ 5%
R107	ERD25TJ103	Carbon, 1/4W, 10k Ω , $\pm$ 5%
R108	ERD25FJ103	Carbon, 1/4W, 10k Ω , $\pm$ 5%
R109	ERD25FJ682	Carbon, 1/4W, 6.8k Ω , $\pm$ 5%
R110	ERD25TJ183	Carbon, 1/4W, 18k Ω , $\pm$ 5%
R151	ERD25TJ183	Carbon, 1/4W, 18k Ω , $\pm$ 5%
R201	ERD25TJ273	Carbon, 1/4W, 27k Ω , $\pm$ 5%
R203	ERD25TJ103	Carbon, 1/4W, 10k Ω , $\pm$ 5%
R204	ERD25FJ821	Carbon, 1/4W, 820 Ω , $\pm$ 5%
R205	ERD25FJ471	Carbon, 1/4W, 470 Ω , $\pm$ 5%
R206	ERD25FJ562	Carbon, 1/4W, 5.6k Ω , $\pm$ 5%
R207	ERD25FJ103	Carbon, 1/4W, 10k Ω , $\pm$ 5%
R208	ERD25FJ822	Carbon, 1/4W, 8.2k Ω , $\pm$ 5%
R209	ERD25TJ333	Carbon, 1/4W, 33k Ω , $\pm$ 5%
R210, 211	ERD25FJ222	Carbon, 1/4W, 2.2k Ω , $\pm$ 5%
R214	ERD25FJ682	Carbon, 1/4W, 6.8k Ω , $\pm$ 5%
R215	ERD25TJ274	Carbon, 1/4W, 270k Ω , $\pm$ 5%
R216	ERD25TJ104	Carbon, 1/4W, 100k Ω , $\pm$ 5%
R217, 218	ERD25FJ103	Carbon, 1/4W, 10k Ω , $\pm$ 5%
R219, 220	ERD25FJ682	Carbon, 1/4W, 6.8k Ω , $\pm$ 5%
R221	ERD25FJ560	Carbon, 1/4W, 56 Ω , $\pm$ 5%
R222	ERD25TJ105	Carbon, 1/4W, 1M Ω , $\pm$ 5%
R223	ERD25FJ102	Carbon, 1/4W, 1k Ω , $\pm$ 5%
R224	ERD25FJ101	Carbon, 1/4W, 100 Ω , $\pm$ 5%
R225	ERD25FJ822	Carbon, 1/4W, 8.2k Ω , $\pm$ 5%
R226	ERD25FJ103	Carbon, 1/4W, 10k Ω , $\pm$ 5%
R227	ERD25TJ274	Carbon, 1/4W, 270k Ω , $\pm$ 5%



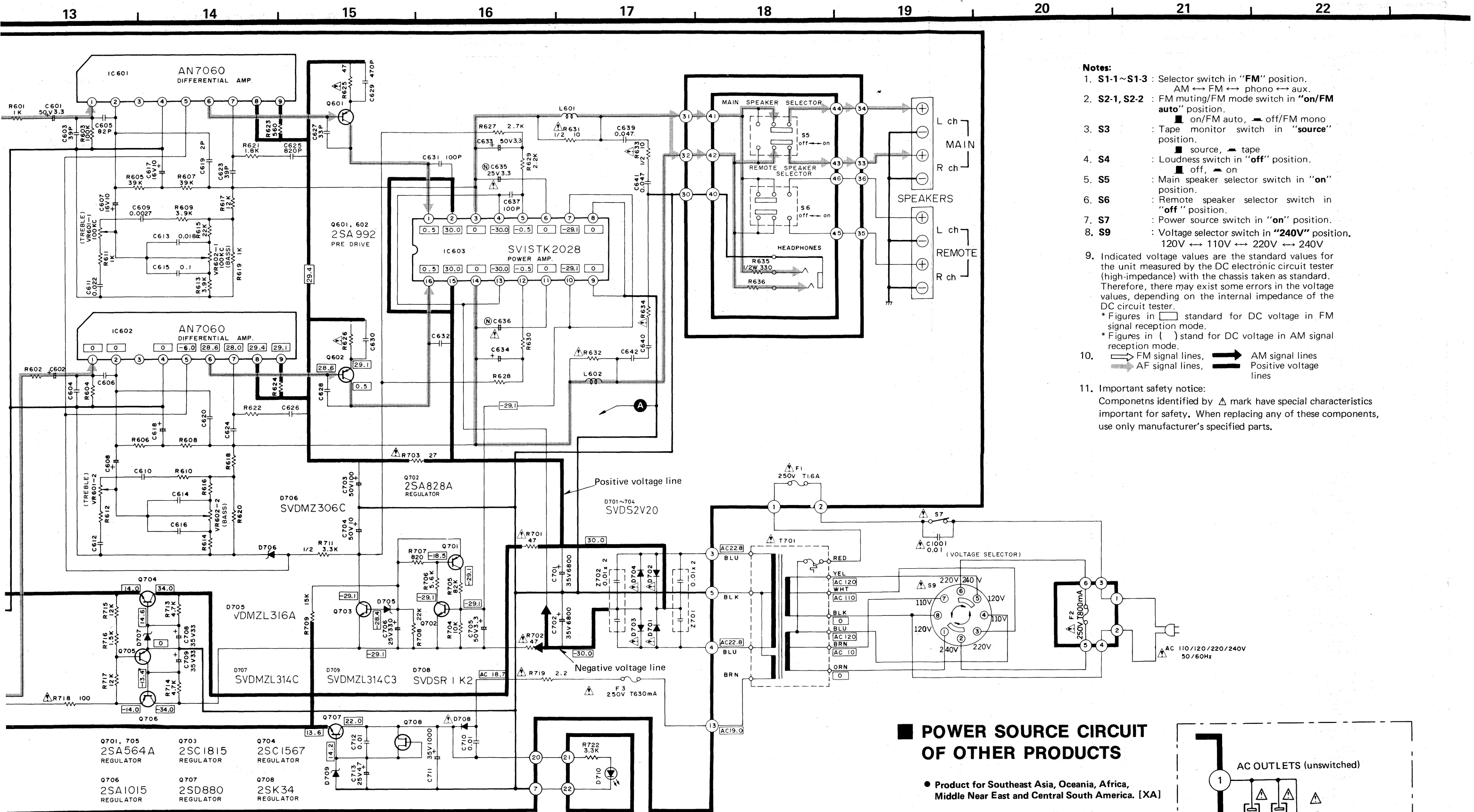


SCHEMATIC DIAGRAM.....MODEL SA-103

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







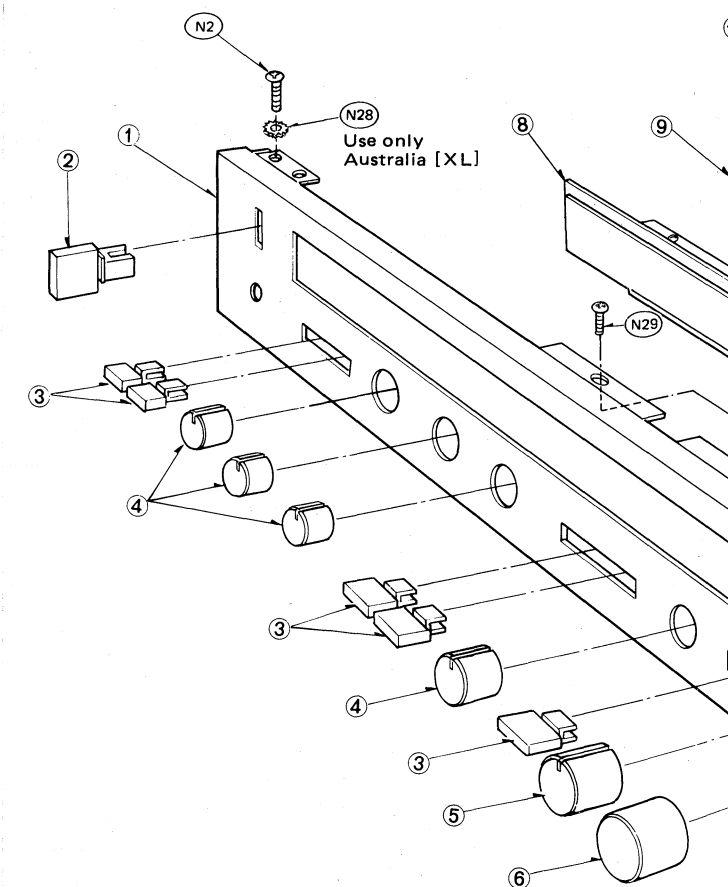
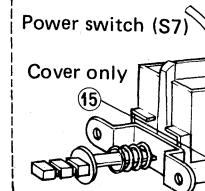
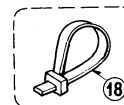
Notes:

- S1-1~S1-3** : Selector switch in "FM" position.
AM ↔ FM ↔ phono ↔ aux.
 - S2-1, S2-2** : FM muting/FM mode switch in "on/FM auto" position.
■ on/FM auto, ▬ off/FM mono
 - S3** : Tape monitor switch in "source" position.
■ source, ▬ tape
 - S4** : Loudness switch in "off" position.
■ off, ▬ on
 - S5** : Main speaker selector switch in "on" position.
 - S6** : Remote speaker selector switch in "off" position.
 - S7** : Power source switch in "on" position.
 - S9** : Voltage selector switch in "240V" position.
120V ↔ 110V ↔ 220V ↔ 240V
9. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
- * Figures in □ standard for DC voltage in FM signal reception mode.
- * Figures in () stand for DC voltage in AM signal reception mode.
10. FM signal lines, AM signal lines
 Positive voltage lines
11. Important safety notice:
Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

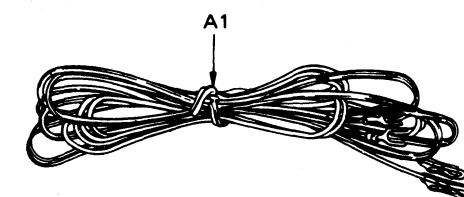
Ref. No.	Part No.	Part Name & Description				
R270	ERD25TJ223	Carbon,	1/4W,	22kΩ,	±5%	
R271	ERD25FJ102	Carbon,	1/4W,	1kΩ,	±5%	
R297	ERD25FJ152	Carbon,	1/4W,	1.5kΩ,	±5%	
R298	ERD25FJ331	Carbon,	1/4W,	330Ω,	±5%	
R299	ERD25FJ822	Carbon,	1/4W,	8.2kΩ,	±5%	
R301	ERD25FJ472	Carbon,	1/4W,	4.7kΩ,	±5%	
R302	ERD25FJ100	Carbon,	1/4W,	10Ω,	±5%	
R303	ERD25TJ473	Carbon,	1/4W,	47kΩ,	±5%	
R304, 305	ERD25TJ223	Carbon,	1/4W,	22kΩ,	±5%	
R306	ERD25TJ154	Carbon,	1/4W,	150kΩ,	±5%	
R307, 308	ERD25TJ473	Carbon,	1/4W,	47kΩ,	±5%	
R309	ERD25TJ153	Carbon,	1/4W,	15kΩ,	±5%	
R310	ERD25FJ122	Carbon,	1/4W,	1.2kΩ,	±5%	
R311, 312	ERD25FJ332	Carbon,	1/4W,	3.3kΩ,	±5%	
R313, 314	ERD25TJ333	Carbon,	1/4W,	33kΩ,	±5%	
R315	ERD25TJ104	Carbon,	1/4W,	100kΩ,	±5%	
R316	ERD25FJ472	Carbon,	1/4W,	4.7kΩ,	±5%	
R317, 318	ERD25TJ104	Carbon,	1/4W,	100kΩ,	±5%	
R319	ERD25TJ223	Carbon,	1/4W,	22kΩ,	±5%	
R401, 402	ERD25FJ101	Carbon,	1/4W,	100Ω,	±5%	
R403, 404	ERD25TJ104	Carbon,	1/4W,	100kΩ,	±5%	
R405, 406	ERD25TJ823	Carbon,	1/4W,	82kΩ,	±5%	
R407, 408	ERD25FJ822	Carbon,	1/4W,	8.2kΩ,	±5%	
R409, 410	ERD25FJ822	Carbon,	1/4W,	8.2kΩ,	±5%	
R411, 412	ERD25FJ391	Carbon,	1/4W,	390Ω,	±5%	
R413, 414	ERD25FJ822	Carbon,	1/4W,	8.2kΩ,	±5%	
R415, 416	ERD25FJ271	Carbon,	1/4W,	270Ω,	±5%	
R417, 418	ERD25TJ184	Carbon,	1/4W,	180kΩ,	±5%	
R419, 420	ERD25TJ123	Carbon,	1/4W,	12kΩ,	±5%	
R421, 422	ERD25FJ680	Carbon,	1/4W,	68Ω,	±5%	
R423, 424	ERD25TJ223	Carbon,	1/4W,	22kΩ,	±5%	
R425, 426	ERD25FJ221	Carbon,	1/4W,	220Ω,	±5%	
R451, 452	ERD25TJ394	Carbon,	1/4W,	390kΩ,	±5%	
R453, 454	ERD25TJ104	Carbon,	1/4W,	100kΩ,	±5%	
R455, 456	ERD25FJ472	Carbon,	1/4W,	4.7kΩ,	±5%	
R457	ERD25FJ472	Carbon,	1/4W,	4.7kΩ,	±5%	
R458	ERD25FJ472	Carbon,	1/4W,	4.7kΩ,	±5%	
R501, 502	ERD25FJ331	Carbon,	1/4W,	330Ω,	±5%	
R503, 504	ERD25TJ104	Carbon,	1/4W,	100kΩ,	±5%	
R505, 506	ERD25FJ102	Carbon,	1/4W,	1kΩ,	±5%	
R507, 508	ERD25TJ393	Carbon,	1/4W,	39kΩ,	±5%	
R511, 512	ERD25TJ333	Carbon,	1/4W,	33kΩ,	±5%	
R601, 602	ERD25FJ102	Carbon,	1/4W,	1kΩ,	±5%	
R603, 604	ERD25TJ104	Carbon,	1/4W,	100kΩ,	±5%	
R605, 606	ERD25TJ393	Carbon,	1/4W,	39kΩ,	±5%	
R607, 608	ERD25TJ393	Carbon,	1/4W,	39kΩ,	±5%	
R609, 610	ERD25FJ392	Carbon,	1/4W,	3.9kΩ,	±5%	
R611, 612	ERD25FJ102	Carbon,	1/4W,	1kΩ,	±5%	
R613, 614	ERD25FJ392	Carbon,	1/4W,	3.9kΩ,	±5%	
R615, 616	ERD25TJ223	Carbon,	1/4W,	22kΩ,	±5%	
R617, 618	ERD25TJ123	Carbon,	1/4W,	12kΩ,	±5%	
R619, 620	ERD25FJ102	Carbon,	1/4W,	1kΩ,	±5%	
R621, 622	ERD25FJ182	Carbon,	1/4W,	1.8kΩ,	±5%	
R623, 624	ERD25FJ561	Carbon,	1/4W,	560Ω,	±5%	
R625, 626	ERD25FJ470	Carbon,	1/4W,	47Ω,	±5%	
R627, 628	ERD25FJ272	Carbon,	1/4W,	2.7kΩ,	±5%	
R629, 630	ERD25FJ222	Carbon,	1/4W,	2.2kΩ,	±5%	
R631, 632	ERD50FJ100	Carbon,	1/2W,	10Ω,	±5%	
R633, 634	ERD50FJ100	Carbon,	1/2W,	10Ω,	±5%	
R635, 636	ERG1ANJ331	Metal Oxide,	1W,	330Ω,	±5%	
R701	ERD25FJ470	Carbon,	1/4W,	47Ω,	±5%	
R702, 703	ERD25FJ270	Carbon,	1/4W,	27Ω,	±5%	
R704	ERD25FJ103	Carbon,	1/4W,	10kΩ,	±5%	
R705	ERD25TJ823	Carbon,	1/4W,	82kΩ,	±5%	
R706	ERD25FJ562	Carbon,	1/4W,	5.6kΩ,	±5%	
R707	ERD25FJ821	Carbon,	1/4W,	820Ω,	±5%	
R708	ERD25TJ223	Carbon,	1/4W,	22kΩ,	±5%	
R709	ERD25TJ153	Carbon,	1/4W,	15kΩ,	±5%	
R711	ERD50FJ332	Carbon,	1/2W,	3.3kΩ,	±5%	
R713, 714	ERD25FJ472	Carbon,	1/4W,	4.7kΩ,	±5%	
R715	ERD25TJ123	Carbon,	1/4W,	12kΩ,	±5%	
R716	ERD25FJ152	Carbon,	1/4W,	1.5kΩ,	±5%	
R717	ERD25TJ123	Carbon,	1/4W,	12kΩ,	±5%	
R718	ERD25FJ101	Carbon,	1/4W,	100Ω,	±5%	
R719	ERD25FAJ2R2	Carbon,	1/4W,	2.2Ω,	±5%	
R722	ERD25FJ332	Carbon,	1/4W,	3.3kΩ,	±5%	

Ref. No.		Part No.	Part Name & Description			
CAPACITORS						
C1		ECCD1H150KC	Ceramic,	50V,	15pF,	±10%
C2		ECCD1H220K	Ceramic,	50V,	22pF,	±10%
C3		ECKD1H102ZF	Ceramic,	50V,	0.001μF,	±5%
C4		ECCD1H100KC	Ceramic,	50V,	10pF,	±10%
C5		ECCD1H030C	Ceramic,	50V,	3pF,	±0.25p
C6		ECCD1H181K	Ceramic,	50V,	180pF,	±10%
C7		ECCD1H060C	Ceramic,	50V,	6pF,	±0.25p
C8		ECCD1H390KC	Ceramic,	50V,	39pF,	±10%
C9		ECCD1H100K	Ceramic,	50V,	10pF,	±10%
C10		ECKD1H102ZF	Ceramic,	50V,	0.001μF,	±5%
C11		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C25		ECKD1H223ZF	Ceramic,	50V,	0.022μF,	±5%
C50, 51 [XL] only	△	ECKDHS101MB	Ceramic,	400VAC,	100pF,	±20%
C52, 54 [XL] only	△	ECKDHS102MD	Ceramic,	400VAC,	0.001μF,	±20%
C101, 102		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C103		ECEA50Z4R7	Electrolytic,	50V,	4.7μF	
C104, 105		ECQM1H473KC	Polyester,	50V,	0.047μF,	±10%
C106		ECEA50Z4R7	Electrolytic,	50V,	4.7μF	
C107		ECCD1H101K	Ceramic,	50V,	100pF,	±10%
C108		ECEA50Z1	Electrolytic,	50V,	1μF	
C109		ECCD1H050C	Ceramic,	50V,	5pF,	±0.25p
C111		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C112, 113		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C114		ECKD1H223ZF	Ceramic,	50V,	0.022μF,	±5%
C115		ECEA1CS330	Electrolytic,	16V,	33μF	
C150		ECCD1H470KC	Ceramic,	50V,	47pF,	±10%
C201		ECCD1H100K	Ceramic,	50V,	10pF,	±10%
C202		ECQP1361JZ	Polypropylene,	100V,	360pF,	±5%
C203, 204		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C205		ECEA1ES470	Electrolytic,	25V,	47μF	
C206		ECEA1ES470	Electrolytic,	25V,	47μF	
C207		ECEA1CS330	Electrolytic,	16V,	33μF	
C208, 209		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C210		ECQM1H333KZ	Polyester,	50V,	0.033μF,	±10%
C211		ECEA1HS100	Electrolytic,	50V,	10μF	
C212		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C213		ECEA1CS330	Electrolytic,	16V,	33μF	
C214		ECEA50Z4R7	Electrolytic,	50V,	4.7μF	
C215		ECQM1H473KZ	Polyester,	50V,	0.047μF,	±10%
C217		ECEA1HS100	Electrolytic,	50V,	10μF	
C218		ECCD1H220K	Ceramic,	50V,	22pF,	±10%
C220		ECEA50Z1	Electrolytic,	50V,	1μF	
C299		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C301		ECEA50Z4R7	Electrolytic,	50V,	4.7μF	
C302		ECEA1HS2R2	Electrolytic,	50V,	2.2μF	
C303		ECQM1H473KZ	Polyester,	50V,	0.047μF,	±10%
C304		ECEA1ES101	Electrolytic,	16V,	100μF	
C305, 306		ECKD1H271KB	Ceramic,	50V,	270pF,	±10%
C307		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C308		ECEA50Z1	Electrolytic,	50V,	1μF	
C309		ECEA50Z4R7	Electrolytic,	50V,	0.47μF	
C310		ECQP1471JZ	Polypropylene,	100V,	470pF,	±5%
C311, 312		ECEA50Z4R7	Electrolytic,	50V,	0.47μF	
C313, 314		ECQM1H153JZ	Polyester,	50V,	0.015μF,	±5%
C315		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C401, 402		ECEA50M3R3R	Electrolytic,	50V,	3.3μF	
C403, 404		ECCD1H101K	Ceramic,	50V,	100pF,	±10%
C405, 406		ECCD1H5680K	Ceramic,	50V,	68pF,	±10%
C407, 408		ECKD1H103MD	Ceramic,	50V,	0.01μF,	±20%
C409, 410		ECEA1CN330S	Non-polar Electrolytic,	50V,	33μF	
C411, 412		ECQM1H223JZ	Polyester,	50V,	0.022μF,	±5%
C413, 414		ECQM1H682JZ	Polyester,	50V,	0.0068μF,	±5%
C415, 416	△	ECEA1HN3R3S	Non-polar Electrolytic,	50V,	3.3μF	
C417, 418	△	ECEA1ES101	Electrolytic,	25V,	100μF	
C419		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C501, 502		ECKD1H331KB	Ceramic,	50V,	330pF,	±10%
C503, 504		ECQM1H563KZ	Polyester,	50V,	0.056μF,	±10%
C601, 602		ECEA50M3R3S	Electrolytic,	50V,	3.3μF,	
C603, 604		ECCD1H390KC	Ceramic,	50V,	39pF,	±10%
C605, 606		ECCD1H820KC	Ceramic,	50V,	82pF,	±10%
C607, 608		ECEA1HS100	Electrolytic,	50V,	10μF	
C609, 610		ECQM1H272JZ	Polyester,	50V,	0.0027μF,	±5%
C611, 612		ECQM1H223KZ	Polyester,	50V,	0.022μF,	±10%
C613, 614		ECQM1H183KZ	Polyester,	50V,	0.018μF,	±10%

EXPLODED VIEW



Accessories



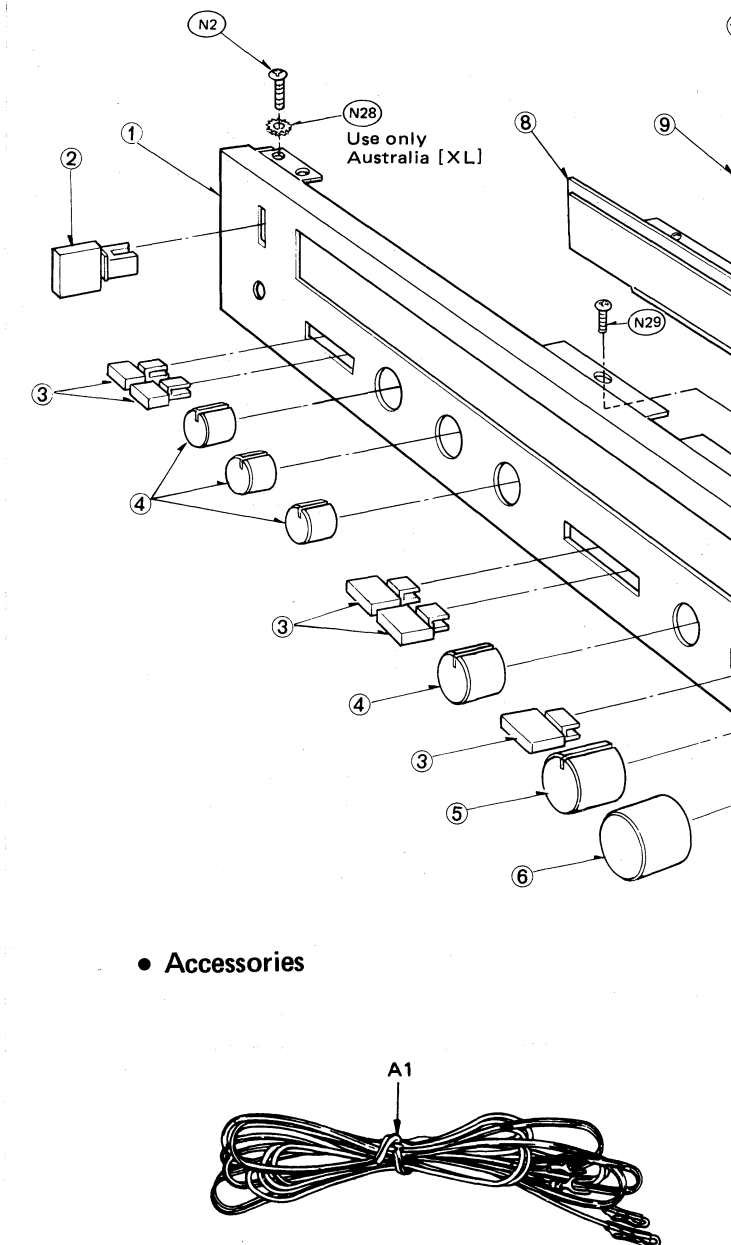
Continued from page 16

Ref. No.	Part No.	Part Name & Description				
R270	ERD25TJ223	Carbon,	1/4W,	22kΩ,	±5%	
R271	ERD25FJ102	Carbon,	1/4W,	1kΩ,	±5%	
R297	ERD25FJ152	Carbon,	1/4W,	1.5kΩ,	±5%	
R298	ERD25FJ331	Carbon,	1/4W,	330Ω,	±5%	
R299	ERD25FJ822	Carbon,	1/4W,	8.2kΩ,	±5%	
R301	ERD25FJ472	Carbon,	1/4W,	4.7kΩ,	±5%	
R302	ERD25FJ100	Carbon,	1/4W,	10Ω,	±5%	
R303	ERD25TJ473	Carbon,	1/4W,	47kΩ,	±5%	
R304, 305	ERD25TJ223	Carbon,	1/4W,	22kΩ,	±5%	
R306	ERD25TJ154	Carbon,	1/4W,	150kΩ,	±5%	
R307, 308	ERD25TJ473	Carbon,	1/4W,	47kΩ,	±5%	
R309	ERD25TJ153	Carbon,	1/4W,	15kΩ,	±5%	
R310	ERD25FJ122	Carbon,	1/4W,	1.2kΩ,	±5%	
R311, 312	ERD25FJ332	Carbon,	1/4W,	3.3kΩ,	±5%	
R313, 314	ERD25TJ333	Carbon,	1/4W,	33kΩ,	±5%	
R315	ERD25TJ104	Carbon,	1/4W,	100kΩ,	±5%	
R316	ERD25FJ472	Carbon,	1/4W,	4.7kΩ,	±5%	
R317, 318	ERD25TJ104	Carbon,	1/4W,	100kΩ,	±5%	
R319	ERD25TJ223	Carbon,	1/4W,	22kΩ,	±5%	
R401, 402	ERD25FJ101	Carbon,	1/4W,	100Ω,	±5%	
R403, 404	ERD25TJ104	Carbon,	1/4W,	100kΩ,	±5%	
R405, 406	ERD25TJ823	Carbon,	1/4W,	82kΩ,	±5%	
R407, 408	ERD25FJ822	Carbon,	1/4W,	8.2kΩ,	±5%	
R409, 410	ERD25FJ822	Carbon,	1/4W,	8.2kΩ,	±5%	
R411, 412	ERD25FJ391	Carbon,	1/4W,	390Ω,	±5%	
R413, 414	ERD25FJ822	Carbon,	1/4W,	8.2kΩ,	±5%	
R415, 416	ERD25FJ271	Carbon,	1/4W,	270Ω,	±5%	
R417, 418	ERD25TJ184	Carbon,	1/4W,	180kΩ,	±5%	
R419, 420	ERD25TJ123	Carbon,	1/4W,	12kΩ,	±5%	
R421, 422	ERD25FJ680	Carbon,	1/4W,	68Ω,	±5%	
R423, 424	ERD25TJ223	Carbon,	1/4W,	22kΩ,	±5%	
R425, 426	ERD25FJ221	Carbon,	1/4W,	220Ω,	±5%	
R451, 452	ERD25TJ394	Carbon,	1/4W,	390kΩ,	±5%	
R453, 454	ERD25TJ104	Carbon,	1/4W,	100kΩ,	±5%	
R455, 456	ERD25FJ472	Carbon,	1/4W,	4.7kΩ,	±5%	
R457	ERD25FJ472	Carbon,	1/4W,	4.7kΩ,	±5%	
R458	ERD25FJ472	Carbon,	1/4W,	4.7kΩ,	±5%	
R501, 502	ERD25FJ331	Carbon,	1/4W,	330Ω,	±5%	
R503, 504	ERD25TJ104	Carbon,	1/4W,	100kΩ,	±5%	
R505, 506	ERD25FJ102	Carbon,	1/4W,	1kΩ,	±5%	
R507, 508	ERD25TJ393	Carbon,	1/4W,	39kΩ,	±5%	
R511, 512	ERD25TJ333	Carbon,	1/4W,	33kΩ,	±5%	
R601, 602	ERD25FJ102	Carbon,	1/4W,	1kΩ,	±5%	
R603, 604	ERD25TJ104	Carbon,	1/4W,	100kΩ,	±5%	
R605, 606	ERD25TJ393	Carbon,	1/4W,	39kΩ,	±5%	
R607, 608	ERD25TJ393	Carbon,	1/4W,	39kΩ,	±5%	
R609, 610	ERD25FJ392	Carbon,	1/4W,	3.9kΩ,	±5%	
R611, 612	ERD25FJ102	Carbon,	1/4W,	1kΩ,	±5%	
R613, 614	ERD25FJ392	Carbon,	1/4W,	3.9kΩ,	±5%	
R615, 616	ERD25TJ223	Carbon,	1/4W,	22kΩ,	±5%	
R617, 618	ERD25TJ123	Carbon,	1/4W,	12kΩ,	±5%	
R619, 620	ERD25FJ102	Carbon,	1/4W,	1kΩ,	±5%	
R621, 622	ERD25FJ182	Carbon,	1/4W,	1.8kΩ,	±5%	
R623, 624	ERD25FJ561	Carbon,	1/4W,	560Ω,	±5%	
R625, 626	ERD25FJ470	Carbon,	1/4W,	47Ω,	±5%	
R627, 628	ERD25FJ272	Carbon,	1/4W,	2.7kΩ,	±5%	
R629, 630	ERD25FJ222	Carbon,	1/4W,	2.2kΩ,	±5%	
R631, 632	ERD50FJ100	Carbon,	1/2W,	10Ω,	±5%	
R633, 634	ERD50FJ100	Carbon,	1/2W,	10Ω,	±5%	
R635, 636	ERG1ANJ331	Metal Oxide,	1W,	330Ω,	±5%	
R701	ERD25FJ470	Carbon,	1/4W,	47Ω,	±5%	
R702, 703	ERD25FJ270	Carbon,	1/4W,	27Ω,	±5%	
R704	ERD25FJ103	Carbon,	1/4W,	10kΩ,	±5%	
R705	ERD25TJ823	Carbon,	1/4W,	82kΩ,	±5%	
R706	ERD25FJ562	Carbon,	1/4W,	5.6kΩ,	±5%	
R707	ERD25FJ821	Carbon,	1/4W,	820Ω,	±5%	
R708	ERD25TJ223	Carbon,	1/4W,	22kΩ,	±5%	
R709	ERD25TJ153	Carbon,	1/4W,	15kΩ,	±5%	
R711	ERD50FJ332	Carbon,	1/2W,	3.3kΩ,	±5%	
R713, 714	ERD25FJ472	Carbon,	1/4W,	4.7kΩ,	±5%	
R715	ERD25TJ123	Carbon,	1/4W,	12kΩ,	±5%	
R716	ERD25FJ152	Carbon,	1/4W,	1.5kΩ,	±5%	
R717	ERD25TJ123	Carbon,	1/4W,	12kΩ,	±5%	
R718	ERD25FJ101	Carbon,	1/4W,	100Ω,	±5%	
R719	ERD25FAJ2R2	Carbon,	1/4W,	2.2Ω,	±5%	
R722	ERD25FJ332	Carbon,	1/4W,	3.3kΩ,	±5%	

Ref. No.		Part No.	Part Name & Description			
CAPACITORS						
C1		ECCD1H150KC	Ceramic,	50V,	15pF,	±10%
C2		ECCD1H220K	Ceramic,	50V,	22pF,	±10%
C3		ECKD1H102ZF	Ceramic,	50V,	0.001μF,	±5%
C4		ECCD1H100KC	Ceramic,	50V,	10pF,	±10%
C5		ECCD1H030C	Ceramic,	50V,	3pF,	±0.25p
C6		ECCD1H181K	Ceramic,	50V,	180pF,	±10%
C7		ECCD1H060C	Ceramic,	50V,	6pF,	±0.25p
C8		ECCD1H390KC	Ceramic,	50V,	39pF,	±10%
C9		ECCD1H100K	Ceramic,	50V,	10pF,	±10%
C10		ECKD1H102ZF	Ceramic,	50V,	0.001μF,	±5%
C11		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C25		ECKD1H223ZF	Ceramic,	50V,	0.022μF,	±5%
C50, 51 [XL] only	△	ECKDHS101MB	Ceramic,	400VAC,	100pF,	±20%
C52, 54 [XL] only	△	ECKDHS102MD	Ceramic,	400VAC,	0.001μF,	±20%
C101, 102		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C103		ECEA50Z4R7	Electrolytic,	50V,	4.7μF	
C104, 105		ECQM1H473KC	Polyester,	50V,	0.047μF,	±10%
C106		ECEA50Z4R7	Electrolytic,	50V,	4.7μF	
C107		ECCD1H101K	Ceramic,	50V,	100pF,	±10%
C108		ECEA50Z1	Electrolytic,	50V,	1μF	
C109		ECCD1H050C	Ceramic,	50V,	5pF,	±0.25p
C111		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C112, 113		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C114		ECKD1H223ZF	Ceramic,	50V,	0.022μF,	±5%
C115		ECEA1CS330	Electrolytic,	16V,	33μF	
C150		ECCD1H470KC	Ceramic,	50V,	47pF,	±10%
C201		ECCD1H100K	Ceramic,	50V,	10pF,	±10%
C202		ECQP1361JZ	Polypropylene,	100V,	360pF,	±5%
C203, 204		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C205		ECEA1ES470	Electrolytic,	25V,	47μF	
C206		ECEA1ES470	Electrolytic,	25V,	47μF	
C207		ECEA1CS330	Electrolytic,	16V,	33μF	
C208, 209		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C210		ECQM1H333KZ	Polyester,	50V,	0.033μF,	±10%
C211		ECEA1HS100	Electrolytic,	50V,	10μF	
C212		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C213		ECEA1CS330	Electrolytic,	16V,	33μF	
C214		ECEA50Z4R7	Electrolytic,	50V,	4.7μF	
C215		ECQM1H473KZ	Polyester,	50V,	0.047μF,	±10%
C217		ECEA1HS100	Electrolytic,	50V,	10μF	
C218		ECCD1H220K	Ceramic,	50V,	22pF,	±10%
C220		ECEA50Z1	Electrolytic,	50V,	1μF	
C299		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C301		ECEA50Z4R7	Electrolytic,	50V,	4.7μF	
C302		ECEA1HS2R2	Electrolytic,	50V,	2.2μF	
C303		ECQM1H473KZ	Polyester,	50V,	0.047μF,	±10%
C304		ECEA1ES101	Electrolytic,	16V,	100μF	
C305, 306		ECKD1H271KB	Ceramic,	50V,	270pF,	±10%
C307		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C308		ECEA50Z1	Electrolytic,	50V,	1μF	
C309		ECEA50Z4R7	Electrolytic,	50V,	0.47μF	
C310		ECQP1471JZ	Polypropylene,	100V,	470pF,	±5%
C311, 312		ECEA50Z4R7	Electrolytic,	50V,	0.47μF	
C313, 314		ECQM1H153JZ	Polyester,	50V,	0.015μF,	±5%
C315		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C401, 402		ECEA50M3R3R	Electrolytic,	50V,	3.3μF	
C403, 404		ECCD1H101K	Ceramic,	50V,	100pF,	±10%
C405, 406		ECCD1H680K	Ceramic,	50V,	68pF,	±10%
C407, 408		ECKD1H103MD	Ceramic,	50V,	0.01μF,	±20%
C409, 410		ECEA1CN330S	Non-polar Electrolytic,	50V,	33μF	
C411, 412		ECQM1H223JZ	Polyester,	50V,	0.022μF,	±5%
C413, 414		ECQM1H682JZ	Polyester,	50V,	0.0068μF,	±5%
C415, 416	△	ECEA1HN3R3S	Non-polar Electrolytic,	50V,	3.3μF	
C417, 418	△	ECEA1ES101	Electrolytic,	25V,	100μF	
C419		ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%
C501, 502		ECKD1H331KB	Ceramic,	50V,	330pF,	±10%
C503, 504		ECQM1H563KZ	Polyester,	50V,	0.056μF,	±10%
C601, 602		ECEA50M3R3S	Electrolytic,	50V,	3.3μF,	
C603, 604		ECCD1H390KC	Ceramic,	50V,	39pF,	±10%
C605, 606		ECCD1H820KC	Ceramic,	50V,	82pF,	±10%
C607, 608		ECEA1HS100	Electrolytic,	50V,	10μF	
C609, 610		ECQM1H272JZ	Polyester,	50V,	0.0027μF,	±5%
C611, 612		ECQM1H223KZ	Polyester,	50V,	0.022μF,	±10%
C613, 614		ECQM1H183KZ	Polyester,	50V,	0.018μF,	±10%

Ref. No.	Part No.	Part Name & Description				
C615, 616	ECQM1H104KZ	Polyester,	50V,	0.1μF,	±10%	
C617, 618	ECEA1HS100	Electrolytic,	50V,	10μF,	±10%	
C619, 620	ECCD1H020C	Ceramic,	50V,	2pF,	±0.25pF	
C623, 624	ECCD1H390KC	Ceramic,	50V,	39pF,	±10%	
C625, 626	ECKD1H821KB	Ceramic,	50V,	820pF,	±10%	
C627, 628	ECCD1H330KC	Ceramic,	50V,	33pF,	±10%	
C629, 630	ECKD1H471KB	Ceramic,	50V,	470pF,	±10%	
C631, 632	ECCD1H101K	Ceramic,	50V,	100pF,	±10%	
C633, 634	ECEA50Z3R3	Electrolytic,	50V,	3.3μF,	±10%	
C635, 636	ECEA1EN3R3S	Non-Polar Electrolytic,	25V,	3.3μF	±10%	
C637	ECCD1H101K	Ceramic,	50V,	100pF,	±10%	
C639, 640	ECQM1H473KZ	Polyester,	50V,	0.047μF,	±10%	
C641, 642	ECQM1H473KZ	Polyester,	50V,	0.047μF,	±10%	
C701, 702	ECETS1VV682U	Electrolytic,	35V,	6800μF,	±10%	
C703	ECEA1HS101	Electrolytic,	50V,	100μF,	±10%	
C704	ECEA1HS100	Electrolytic,	50V,	10μF	±10%	
C705	ECEA50Z3R3	Electrolytic,	50V,	3.3μF	±10%	
C706	ECEA1ES331	Electrolytic,	25V,	330μF	±10%	
C708, 709	ECEA1VS330	Electrolytic,	35V,	33μF	±10%	
C710	ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%	
C711	ECEA1VS102	Electrolytic,	35V,	1000μF	±10%	
C712	ECKD1H103ZF	Ceramic,	50V,	0.01μF,	±5%	
C713	ECEA1ES470	Electrolytic,	25V,	47μF	±10%	
C1001	ECKDKC103PF	Ceramic,	400VAC,	0.01μF,	±10%	

EXPLODED VIEW

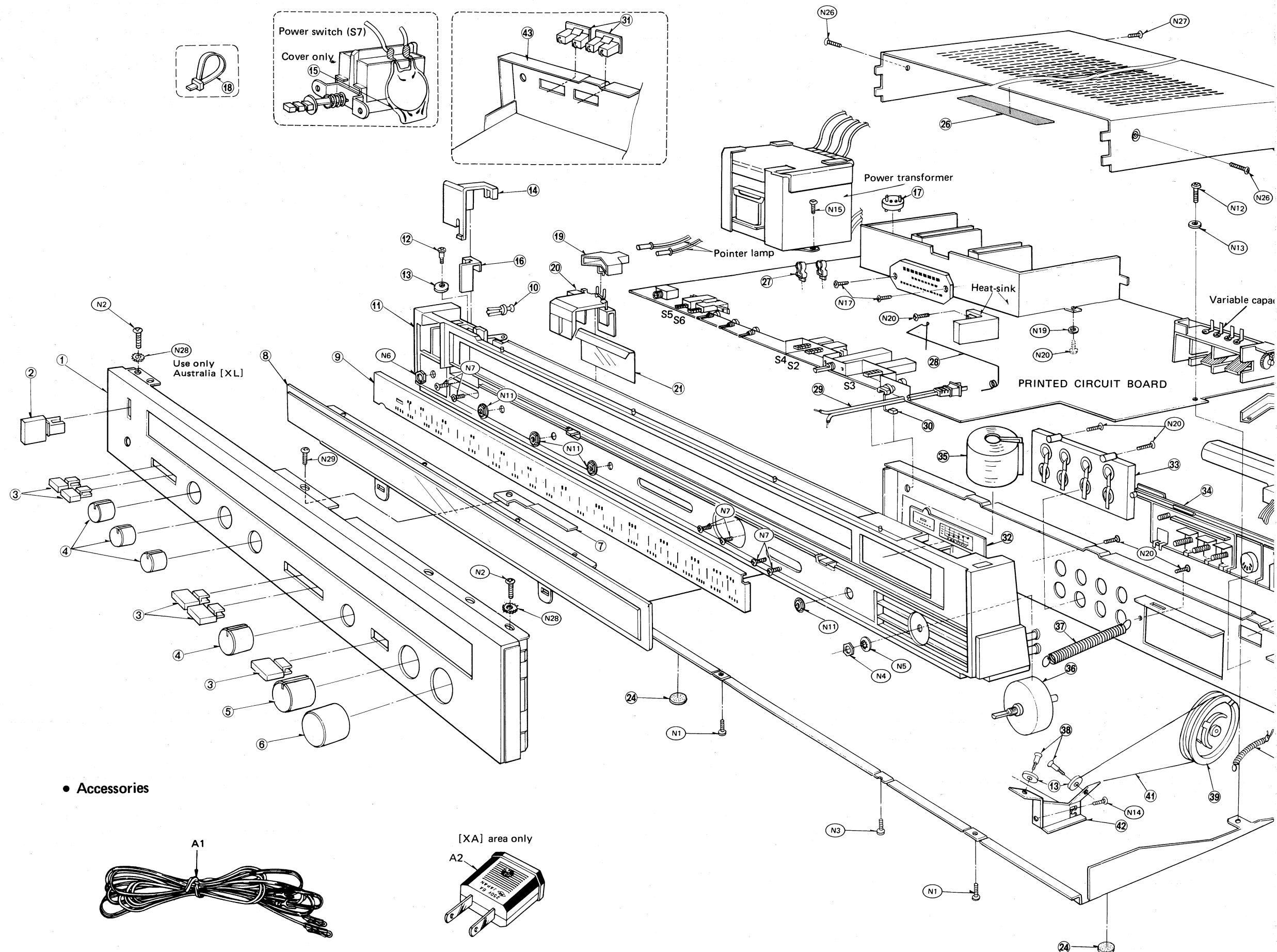


■ EXPLODED VIEW

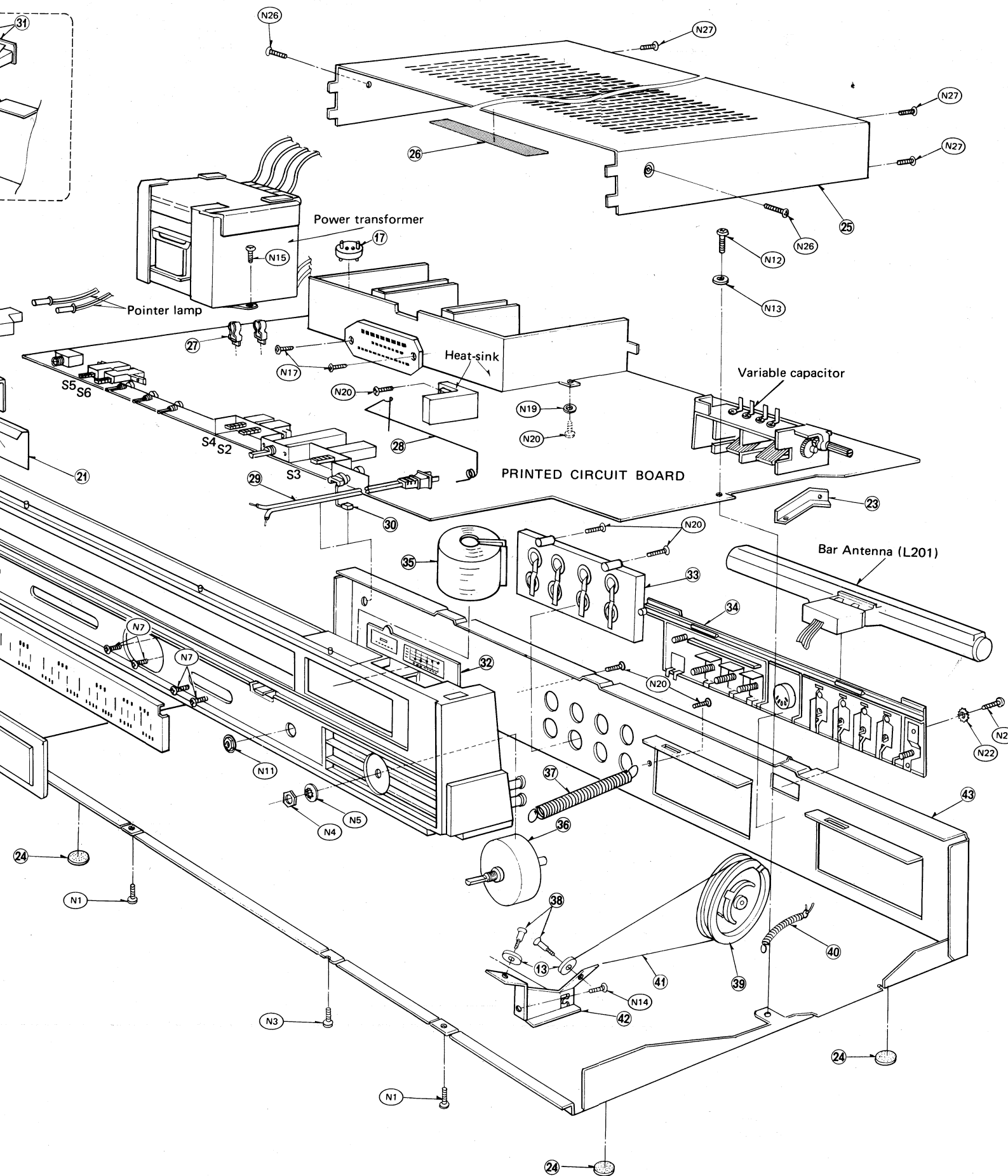
	Part No.	Part Name & Description
	ECQM1H104KZ ECEA1HS100 ECCD1H020C ECCD1H390KC ECKD1H821KB ECCD1H330KC ECKD1H471KB ECCD1H101K ECEA50Z3R3 ECEA1EN3R3S	Polyester, 50V, 0.1μF, ±10% Electrolytic, 50V, 10μF Ceramic, 50V, 2pF, ±0.25pF Ceramic, 50V, 39pF, ±10% Ceramic, 50V, 820pF, ±10% Ceramic, 50V, 33pF, ±10% Ceramic, 50V, 470pF, ±10% Ceramic, 50V, 100pF, ±10% Electrolytic, 50V, 3.3μF Non-Polar Electrolytic, 25V, 3.3μF
⚠	ECCD1H101K ECCM1H473KZ ECQM1H473KZ ECETS1VV682U ECEA1HS101 ECEA1HS100	Ceramic, 50V, 100pF, ±10% Polyester, 50V, 0.047μF, ±10% Polyester, 50V, 0.047μF, ±10% Electrolytic, 35V, 6800μF Electrolytic, 50V, 100μF Electrolytic, 50V, 10μF
	ECEA50Z3R3 ECEA1ES331 ECEA1VS330 ECKD1H103ZF ECEA1VS102 ECKD1H103ZF ECEA1ES470 ECKDKC103PF	Electrolytic, 50V, 3.3μF Electrolytic, 25V, 330μF Electrolytic, 35V, 33μF Ceramic, 50V, 0.01μF, ±80% Electrolytic, 35V, 1000μF Ceramic, 50V, 0.01μF, ±80% Electrolytic, 25V, 47μF Ceramic, 400VAC, 0.01μF, ±100%
⚠		

(Rear Panel and AC Outlet) . . . for [XA]

Available in Southeast Asia, Oceania, Africa,
Middle Near East and Central South America.



... for [XA]
 eania, Africa,
 outh America.



REPLACEMENT PARTS LIST (Cabinet and Chassis Parts)

- Notes:**
- Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
 - Important safety notice: Components identified by Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
 - $\blacksquare$ -marked parts are used for black only, while $\circ$ -marked parts are for silver type only.

- Parts other than $\blacksquare$ - and $\circ$ -marked are used for both black and silver types.
- Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Black type model No. : SA-103 (K)

Ref. No.	Part No.	Part Name & Description
CABINET and CHASSIS PARTS		
1	$\circ$ SYW405-1	Panel, Front (Silver Type)
1	$\blacksquare$ SYW405-5	Panel, Front (Black Type)
2	SBC301-5	Knob, Power
3	SBC369-2	Knob, Speaker Selector, Loudness Muting, Tape
4	SBN1019	Knob, Bass, Treble, Balance & Selector
5	SBN1049	Knob, Volume
6	SBN1051	Knob, Tuning
7	SUW1829	Bracket, Transparent Panel
8	SGU215-1	Panel, Transparent
9	$\circ$ SKD4110-3	Scale, Dial (Silver Type)
9	$\blacksquare$ SKD4110-1	Scale, Dial (Black Type)
10	SHR401-1	Latch, LED P.C.B.
11	$\circ$ SUF305	Panel, Front Plate (Silver Type)
11	$\blacksquare$ SUF305-2	Panel, Front Plate (Black Type)
12	SHD3X27	Shaft, Dial Pulley
13	RDR8-1	Pulley, Dial
14	SHR9557	Holder, Dial Scale
15	SMXA65	Cover, Line Capacitor
16	SHG1589	Rubber, Dial Holder
17	SHE113	Clamper, P.C.B.
18	SHR301	Clamper, Pointer
19	SHG1587	Rubber, Pointer
20	SDP5083	Pointer, Dial
21	SHF53-3	Slider, Pointer
22	XCJ6P21B-A1	Jack, Headphones
23	SUW1813	Bracket, Tuning Gang
24	SKL245	Foot, Set
25	$\circ$ SKC750S1	Cabinet (Silver Type)
25	$\blacksquare$ SKC750B1	Cabinet (Black Type)
26	SHS1009	Fiber, Cabinet
27	SJT347	Clip, Fuse
28	SUS233	Spring
29 [XA] Only	Δ SJA111	AC Cord, Power Source
29 [XL] Only	Δ QFC1207M	AC Cord, Power Source
29 [Other Areas]	Δ SJA88	AC Cord, Power Source
30 [XL] Only	SHR131	Bushing, AC Cord
30 [Other Areas]	SHR127	Bushing, AC Cord
31 [XA] only	Δ SJS9221	Socket, AC Outlet
32	$\circ$ SGX7045-1	Plate, Light Emitting Diode (Silver Type)
32	$\blacksquare$ SGX7045-2	Plate, Light Emitting Diode (Black Type)
33	SJF4813-1	Terminal, Speaker
34 [XL] Only	SJF8033-3N	Terminal, Input & Antenna
34 [Other Areas]	SJF8033-1N	Terminal, Input & Antenna
35	SUV453	Cover, Voltage Adjuster
36	SDT8081	Shaft, Tuning
37	SUS175	Spring, Dial Pointer
38	SHD3X1F-1	Shaft, Dial Pulley
39	SDD47-1	Drum, Variable Capacitor
40	SDSA4121	Spring, Drum
41	SDZ051-2	Cord, Dial (1.8m)
42	SUW1769	Bracket, Dial

Ref. No.	Part No.	Part Name & Description
43 [XL] only	JPN SGP2671-3B	Panel, Rear (Made in Japan)
43 [XA] only	JPN SGP2671-2B	Panel, Rear (Made in Japan)
43 [EH, K-EH] only	MSA SGP2671-1E	Panel, Rear (Made in Singapore)
43 [EX, K-EX]	JPN SGP2671-1B	Panel Rear (Made in Japan)
43 [EX, K-EX]	MSA SGP2671-1C	Panel Rear (Made in Singapore)
SCREWS, NUTS and WASHERS		
N1	XTB3+8BFZ	Screw, Front Panel (Under)
N2	XTB3+10BFZ	Screw, Front Panel (Top)
N3	XTB3+8BFZ	Screw, Front Plate (Front Chassis)
N4	XNS11	Nut, Tuning Shaft M'tg
N5	XWD11B	Washer, Tuning Shaft M'tg
N6	XNS12	Nut, Headphone Jack M'tg
N7	XSN3+8S	Screw, Powers Switch etc. M'tg
N8	XWA3B	Washer, Powers Switch etc. M'tg
N9	XSN3+8S	Screw, Speaker Selector Switch
N10	XWA3B	Washer, Speaker Selector Switch
N11	SNE4021	Nut, Selector Switch
N12	XSN3+8S	Screw, P.C.B.
N13	XWG3	Washer, P.C.B.
N14	XTB3+8BFN	Screw, Dial Pulley Bracket
N15	XTB4+8BFN	Screw, Power Transformer
N16	XNG6E	Nut, Power Transformer
N17	XTB3+14BFN	Screw, Power IC M'tg
N18	XTN3+8B	Screw, Heat Sink M'tg
N19	XWG3	Washer, Heat Sink M'tg
N20	XTB3+8BFZ	Screw, Speaker Terminals & Heat Sink M'tg
N21	XTB3+8BFN	Screw, Input Terminals & Variable Capacitor
N22	XWC3C	Washer, Input Terminals & Variable Capacitor
N23	XSN3+8S	Screw, Variable Capacitor
N24	XWA3B	Washer, Variable Capacitor
N25	XWG3	Washer, Variable Capacitor
N26	$\circ$ XTB4+8BFN	Screw, Side Cabinet (Silver Type)
N26	$\blacksquare$ XTB4+8BFZ	Screw, Side Cabinet (Black Type)
N27	$\circ$ XTB3+8BFN	Screw, Rear Cabinet (Silver Type)
N27	$\blacksquare$ XTB3+8BFZ	Screw, Rear Cabinet (Black Type)
N28 [XL] only	XWC3B	Washer, Front Panel (Top)
N29	XSS3+4S	Screw, Bracket
ACCESSORIES		
A1	SSA267	Cord, FM Indoor Antenna
A2 [XA] Only	Δ SJP5213-1	Plug Adaptor, Power Source
PACKING PARTS		
P1	SPP649	Polyethylene Bag
P2 [XL] Only	SPS3069-1	Pad, Left Side
P2 [Other Areas]	SPS3069-2	Pad, Left Side
P3 [XL] Only	SPS3071-1	Pad, Right Side
P3 [Other Areas]	SPS3071-2	Pad, Right Side
P4 [XL] only	JPN SPG3245	Carton Box (Made in Japan)
P4 [EX, K-EX, [EH, K-EH]	MSA SPG3293	Carton Box (Made in Singapore)
P4 [Other Areas]	JPN SPG3243	Carton Box (Made in Japan)
P5 [XA] only	SQF10907	Instruction Book, Printed Matter
P5 [Other Areas]	SQF10903	Instruction Book, Printed Matter

Areas

- * [EX] is available in Switzerland and Scandinavia.
- * [EH] is available in Holland.
- * [XA] is available in Southeast Asia, Oceania, Africa, Middle Near East and Central South America.
- * [XL] is available in Australia.

JPN: Made in Japan

MSA: Made in Singapore

Printed in Japan
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