

Service Manual

FM/AM Stereo Receiver

SA-424

[PA], [PE]

Areas

[PA] is available in far East PX.

[PE] is available in European Military.

Please use this manual together with the service manual for Model No. SA-424 [Silver Type: EX, EG, EH, XA, XL] Order No. SD81051901C8.

CHANGES

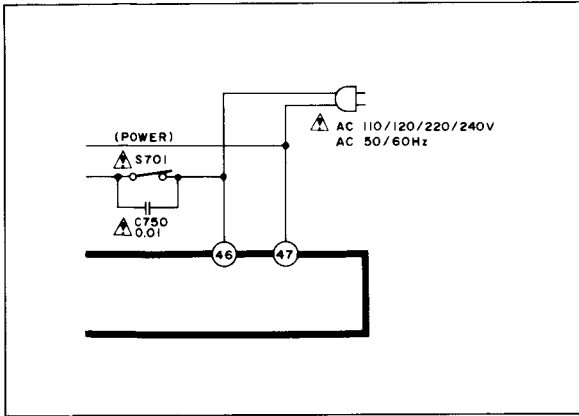
REPLACEMENT PARTS LIST

Ref. No.	Change of Part No.		Part Name & Description	Per Set (Pcs.)	Remarks
	SA-424 (Silver Type) (SD81051901C8)	→ SA-424 (PA, PE)			
TRANSISTORS					
Q150, 151	2SC829-C	Deletion	Transistor, FM IF Amplifier	0	
Q152	2SC1815-Y	Deletion	Transistor, Switching	0	
DIODES					
D150, 151	MA162A	Deletion	Diode, Switching	0	
D921 ~ 923	LN413YP	LN213RP	Light Emitting Diode, Red	3	
D924, 925	LN413YP	LN313GP	Light Emitting Diode, Green	2	
COIL					
L101	SLMIC61-P	Deletion	Coil	1	
CERAMIC FILTERS					
CF104	SVFE107MM-B	Deletion	Ceramic Filter, FM10.68MHz, Blue	0	
CF105	SVFE107MZ2-B	Deletion	Ceramic Filter, FM10.675MHz, Blue	0	
VARIABLE RESISTOR					
VR303	EVT33MA00B55	Deletion	Separation Adjustment, 500k Ω (B)	0	
SWITCH					
S15	SSH539	SSH437	Switch, Subsonic, FM Muting and Auto Scan	1	
RESISTORS					
R105	ERO25CKF1002	ERO25CKF2702	Metal Film, 27k Ω , 1/4W, \pm 1%	1	
R150	RRD18XK102	Deletion	Chip, 1k Ω , 1/8W, \pm 10%	0	
R151	RRD18XK392	Deletion	Chip, 3.9k Ω , 1/8W, \pm 10%	0	
R152	RRD18XK102	Deletion	Chip, 1k Ω , 1/8W, \pm 10%	0	
R153	RRD18XK681	Deletion	Chip, 680 Ω , 1/8W, \pm 10%	0	

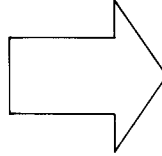
Ref. No.	Change of Part No.		Part Name & Description	Per Set (Pcs.)	Remarks
	SA-424 (Silver Type) (SD81051901C8)	SA-424 (PA, PE)			
R154	RRD18XK271	Deletion	Chip, 270Ω, 1/8W, ±10%	0	
R155, 156	RRD18XK221	Deletion	Chip, 220Ω, 1/8W, ±10%	0	
R157	RRD18XK221	Deletion	Chip, 220Ω, 1/8W, ±10%	0	
R158	RRD18XK681	Deletion	Chip, 680Ω, 1/8W, ±10%	0	
R159	RRD18XK332	Deletion	Chip, 3.3kΩ, 1/8W, ±10%	0	
R160	RRD18XK153	Deletion	Chip, 15kΩ, 1/8W, ±10%	0	
R161, 162	RRD18XK682	Deletion	Chip, 6.8kΩ, 1/8W, ±10%	0	
R197	ERO25CKF1502	Deletion	Metal Film, 15kΩ, 1/4W, ± 5%	0	
R390	RRD18XK103	Deletion	Chip, 10kΩ, 1/8W, ±10%	1	
CAPACITORS					
C50, 51	ECKDHS101MB [XL] only	Deletion	Ceramic, 100pF, 400VAC, ±20%	0	
C52	ECKDHS102MD [XL] only	Deletion	Ceramic, 0.001μF, 400VAC, ±20%	0	
C53	ECEA50Z1 [XL] only	Deletion	Electrolytic, 1μF, 50V	0	
C121	Addition	ECUX1H390KC	Chip, 39pF, 50V, ±10%	1	
C129	Addition	ECCD1H470K	Ceramic, 47pF, 50V, ±10%	1	
C150	ECKD1H103ZF	Deletion	Ceramic, 0.01μF, 50V, $\begin{matrix} +80\% \\ -20\% \end{matrix}$	0	
C151	ECUX1H103ZF	Deletion	Chip, 0.01μF, 50V, $\begin{matrix} +80\% \\ -20\% \end{matrix}$	0	
C152, 153	ECKD1H223ZF	Deletion	Ceramic, 0.022μF, 50V, $\begin{matrix} +80\% \\ -20\% \end{matrix}$	0	
C154	ECUX1H390KC	Deletion	Chip, 39pF, 50V, ±10%	0	
C190	ECCD1H121K	Deletion	Ceramic, 120pF, 50V, ±10%	0	
C191	ECEA50Z3R3	Deletion	Electrolytic, 3.3μF, 50V	0	
C250	ECKDHS102MD [XL] only	Deletion	Ceramic, 0.001μF, 400VAC, ±20%	0	
C301, 302	ECQM1H102JZ	ECQM1H122JZ	Polyester, 0.0012μF, 50V, ± 5%	2	
C305, 306	ECQM1H472KZ	ECQM1H682JZ	Polyester, 0.0068μF, 50V, ± 5%	2	
C320	ECCD1H121K	ECCD1H680K	Ceramic, 68pF, 50V, ±10%	1	
CABINET and CHASSIS PARTS					
2	SBC321-7	SBC321-6	Button, Power and Input Selector	4	
4	SGWA424E	SGWA424M	Front Panel, Ass'y	1	
4-3	SBC329-2	SBC329	Button, AM/FM Selector	1	
4-4	SBC327-1	SBC327	Button, Tuning	2	
4-5	SBC325-1	SBC325	Button, Preset	1	
16	SGP2510-1F [EX]	SGP2510-2B	Rear Panel	1	
	SGP2510-1D [EG, EH]				
	SGP2510-2B [XA]				
	SGP2510-3B [XL]				
17	SHR127	SHR127	Bushing, AC Cord	1	
	SHR131 [XL] only				
18	SJA88	RJA52Z	AC Cord	1	RD
	SJA111 [XA] only				
	QFC1207MA [XL] only				
25	SJF8029N	SJF8029N	Terminal Board, Input	1	
	SJF8029-2N [XL] only				
	SJF8029-6N [EG] only				
28	SJSA66-2 [XA] only	SJSA66-2	Socket, AC Outlet	2	
SCREWS, WASHERS and NUT					
N20	XTBS3+8BFZ1	XTBS3+8BFZ1	Screw, Tapping with Detent ⊕ 3 x 8	1	
	XSTS3+8Z [XL] only				
ACCESSORIES					
A2	SJP5213-1 [XA] only	RJP120ZBS	Plug Adaptor, AC Power	1	
A3	SQF10803 [EG] only	SQF10807	Instructions Book, Printed Matter	1	
	SQF10805 [XA] only				
	SQF10885				

SA-424

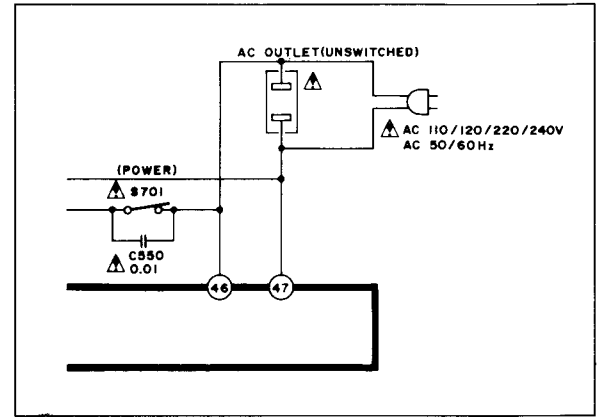
● Power circuit SA-424 [EX, EG, EH]



CHANGE



SA-424 [PA, PE]



■ REPLACEMENT PARTS LIST Cabinet, Chassis and Packing Parts

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

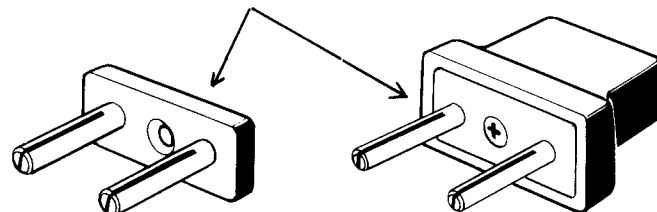
2. ⚠ indicates that only parts specified by the manufacturer
be use for safety.

Ref. No.	Part No.	Part Name & Description
SCREWS, WASHERS and NUT		
N1	XTBS3+8BFZ1	Screw, Tapping with Detent ⊕ 3 x 8
N2	XTB3+10B	Screw, Tapping ⊕ 3 x 10
N3	XSN3+6S	Screw, ⊕ 3 x 6
N4	XWA3B	Washer, Spring φ3
N5	SNE4021	Nut
N6	XTBS3+8BFZ1	Screw, Tapping with Detent + 3 x 8
N7	XWG3	Washer, Plain φ3
N8	XTN3+10B	Screw, Tapping ⊕ 3 x 10
N9	XTB4+8BFN	Screw, Tapping ⊕ 4 x 8
N10	XTB3+8BFN	Screw, Tapping ⊕ 3 x 8
N12	XWG4FZ	Washer, Plain φ4
N13	XWA4BFZ	Washer, Spring φ4
N14	XSN4+10BVS	Screw, ⊕ 4 x 10
N15	XTB3+16B	Screw, Tapping ⊕ 3 x 16
N16	XWA3BFZ	Washer, Spring φ3
N17	XSN3+6BVS	Screw, ⊕ 3 x 6
N18	XTB3+10BFZ	Screw, Tapping ⊕ 3 x 10
N19	XTBS3+8BFZ1	Screw, Tapping with Detent ⊕ 3 x 8
N20	XTBS3+8BFZ1	Screw, Tapping with Detent ⊕ 3 x 8
N21	XWA26BFZ	Washer, Spring φ2.6
N22	XSN26+5BV	Screw, ⊕ 2.6 x 5
N23	XWG3	Washer, Plain φ3
N24	XTN3+12BFZ	Screw, Tapping ⊕ 3 x 12
ACCESSORIES		
A1	SSA267	Cord, FM Indoor Antenna
A2	RJP120ZBS	Plug Adaptor, AC Power
A3	SQF10807	Instructions Book, Printed Matter
PACKING PARTS		
P1	SPP689	Polyethylen Bag
P2	SPS3015-2	Pad, Left Side
P3	SPS3017	Pad, Right Side
P4	SPG3107	Carton Box

Ref. No.	Part No.	Part Name & Description
CABINET and CHASSIS PARTS		
1	SGX6967	Ornament, Left Side
2	SBC321-6	Button, Power and Input Selector
3	SUS163	Spring, Button
4	SGWA424M	Front Panel Ass'y
4-1	SGU195	Transparent Cover
4-2	SGX6971-1	Ornament Plate
4-3	SBC329	Button, AM FM Selector
4-4	SBC327	Button, Tuning
4-5	SBC325	Button, Preset
4-6	SDU57	Guide, LED
4-7	LSUW1735-1	Bracket, PCB
5	SBN973	Knob, Tone and Balance Control
6	SBN971	Knob, Volume Control
7	SGX6969	Ornament, Right Side
8	SDU51	Plate, Ornament
9	SDU53-1	Tinted Plate
10	SHR9539	Holder, LED (Quart Lock)
11	SHR9537	Holder, LED (Signal)
12	SBC323-1	Button, Push Switch
13	SJJ61	Jack, Headphones
14	SMP301-1	Cover, Lamp
15	SKCA424E	Cabinet Cover
16	SGP2510-2B	Rear Panel
17	SHR127	Bushing, AC Cord
18	⚠ RJA52Z	AC Cord
19	SJF4813-1	Terminal Board, Speaker
20	SJB3005-1	Battery Case
21	SJC7	Battery Terminal
22	SJC9	Battery Terminal
23	SHR5025	Cover, Allocation Switch
24	RJT202B	Terminal
25	SJF8029N	Terminal Board, Input
26	SYU269E	Bottom Cover
27	SUV453	Cover, Voltage Adjuster Switch
28	⚠ SJSA66-2	Socket, AC Outlet

● Accessory

A2 (RJP120ZBS)



Service Manual

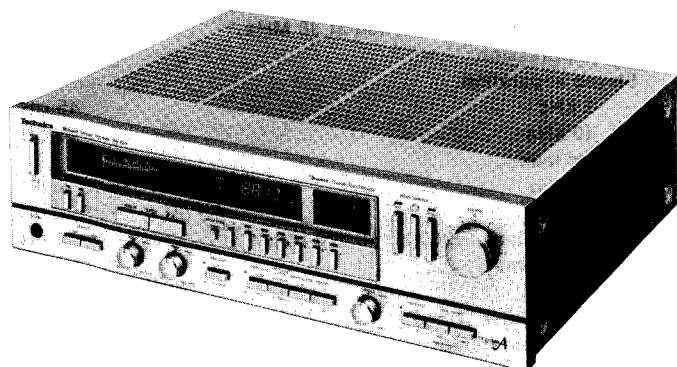
FM/AM Stereo Receiver

SA-424

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

SA-424(K)

[EG], [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.
- * [EG] is available in F.R. Germany.
- * [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.

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English

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

(DIN 45 500)

AMPLIFIER SECTION

20 Hz~20 kHz continuous power output both channels driven	2 × 50W (4Ω) 2 × 45W (8Ω)	half power at 20 Hz~20 kHz	0.007% (8Ω)
40 Hz~16 kHz continuous power output both channels driven	2 × 50W (4Ω) 2 × 45W (8Ω)	half power at 1 kHz	0.001% (8Ω)
1 kHz continuous power output both channels driven	2 × 55W (4Ω) 2 × 48W (8Ω)	-26 dB power at 1 kHz	0.07% (4Ω)
Total harmonic distortion		50 mW power at 1 kHz	0.12% (4Ω)
rated power at 20 Hz~20 kHz	0.015% (4Ω)	Intermodulation distortion	
rated power at 40 Hz~16 kHz	0.007% (8Ω)	rated power at 250 Hz: 8 kHz=4:1, 4Ω	0.015%
rated power at 1 kHz	0.007% (4Ω)	rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.01%
	0.001% (8Ω)	Power bandwidth	
		both channels driven, -3 dB	
		5 Hz~40 kHz (T.H.D. 0.04%, 4Ω)	
		5 Hz~40 kHz (T.H.D. 0.02%, 8Ω)	
		20 (4Ω), 40 (8Ω)	
		Damping factor	
		Input sensitivity and impedance	
		PHONO	2.5 mV/47kΩ
		AUX	150 mV/22kΩ
		TAPE 2	150 mV/22kΩ
		TAPE 1 REC/PLAY	180 mV/25kΩ
		PHONO maximum input voltage (1 kHz, RMS)	150 mV

Technics

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

S/N

rated power (4Ω)	
PHONO	74 dB (IHF, A: 82 dB)
AUX, TAPE	88 dB (IHF, A: 98 dB)
-26 dB power (4Ω)	
PHONO	63 dB
AUX, TAPE	65 dB
50 mW power (4Ω)	
PHONO	60 dB
AUX, TAPE	60 dB
Frequency response	
PHONO	RIAA standard curve ±0.5 dB (30 Hz~15 kHz)
AUX, TAPE	5 Hz~80 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
Subsonic filter	30 Hz, -6 dB/oct.
Loudness control (volume at -30 dB)	50 Hz, +9 dB
Output voltage and impedance	
TAPE 1, 2 REC OUT	150 mV
TAPE 1 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	450 mV/330Ω
Load impedance	
MAIN or REMOTE	4Ω~16Ω
MAIN and REMOTE	8Ω~16Ω

■ FM TUNER SECTION

Frequency range	87.50~108.00 MHz (0.05 MHz-step) 87.9~107.9 MHz (0.2 MHz-step)
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	65 dB (75 dB, IHF)

STEREO

Frequency response	60 dB (70 dB, IHF) 20 Hz~15 kHz, +1 dB~ -2 dB
Alternate channel selectivity	
wide	±400 kHz 75 dB
narrow	±300 kHz 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	82 dB
AM suppression	55 dB
Stereo separation	
1 kHz	45 dB
10 kHz	35 dB
Carrier leak	
19 kHz	-30 dB (-38 dB, IHF)
38 kHz	-50 dB (-50 dB, IHF)
Channel balance (250 Hz~6,300 Hz)	±1.5 dB
Limiting point	1.2 μV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz
Antenna terminals	300Ω (balanced) 75Ω (unbalanced)

■ AM TUNER SECTION

Frequency range	522~1611 kHz (9 kHz-step) 530~1620 kHz (10 kHz-step)
Sensitivity (S/N 20 dB)	30 μV, 300 μV/m
Selectivity	55 dB
Image rejection at 1,000 kHz	50 dB
IF rejection at 1,000 kHz	40 dB

■ GENERAL

Power consumption	420W
Power supply	AC 50 Hz/60 Hz, 110V/120V/220V/240V
Dimensions (W×H×D)	430 × 120 × 350 mm (16-15/16" × 4-23/32" × 13-25/32")
Weight	7.7 kg (17.0 lb.)

Note:

Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

Deutsch

TECHNISCHE DATEN

(Spezifikationen können infolge von Verbesserungen ohne Ankündigung geändert werden.)

(DIN 45 500)

■ VERSTÄRKERTEIL

Dauer-ton-Ausgangsleistung bei 20 Hz ~ 20 kHz	
beide Kanäle ausgesteuert	2 × 50W (4 Ω) 2 × 45W (8 Ω)
Dauer-ton-Ausgangsleistung bei 40 Hz ~ 16 kHz	
beide Kanäle ausgesteuert	2 × 50W (4 Ω) 2 × 45W (8 Ω)
Dauer-ton-Ausgangsleistung bei 1 kHz	
beide Kanäle ausgesteuert	2 × 55W (4 Ω) 2 × 48W (8 Ω)
Gesamtklirrfaktor	
Nennleistung bei 20 Hz ~ 20 kHz	0,015% (4 Ω) 0,007% (8 Ω)
Nennleistung bei 40 Hz ~ 16 kHz	0,015% (4 Ω) 0,007% (8 Ω)
Nennleistung bei 1 kHz	0,007% (4 Ω) 0,001% (8 Ω)
halbe Nennleistung bei 20 Hz ~ 20 kHz	0,007% (8 Ω)

halbe Nennleistung bei 1 kHz	0,001% (8 Ω)
-26 dB Leistung bei 1 kHz	0,07% (4 Ω)
50 mW Leistung bei 1 kHz	0,12% (4 Ω)
Intermodulationsfaktor	
Nennleistung bei 250 Hz: 8 kHz = 4:1, 4 Ω	0,015%
Nennleistung bei 60 Hz: 7 kHz = 4:1, nach SMPTE, 8 Ω	0,01%
Leistungsbandbreite	
beide Kanäle ausgesteuert bei -3 dB	
5 Hz ~ 40 kHz (T.H.D. 0,04%, 4 Ω)	
5 Hz ~ 40 kHz (T.H.D. 0,02%, 8 Ω)	
Dämpfungsfaktor	20 (4 Ω), 40 (8 Ω)
Eingangsempfindlichkeit und -impedanz	
Phono	2,5 mV/47 kΩ
Aux	150 mV/22 kΩ
Tape 2	150 mV/22 kΩ
Tape 1 Aufnahme/Wiedergabe (TAPE 1 REC/PLAY)	180 mV/25 kΩ
Maximale TA-Eingangsspannung (1 kHz, eff.)	150 mV

Geräuschabstand			Stereumschaltsschwelle bei 46 dB nach IHF	22 μ V/75 Ω
Nennleistung (4 Ω)			Gesamtklirrfaktor	
Phono	74 dB (nach IHF, A: 82 dB)		Mono	0,15%
Aux, Tape	88 dB (nach IHF, A: 98 dB)		Stereo	0,2%
-26 dB Leistung (4 Ω)			Geräuschabstand	
Phono		63 dB	Mono	65 dB (75 dB nach IHF)
Aux, Tape		65 dB	Stereo	60 dB (70 dB nach IHF)
50 mW Leistung (4 Ω)			Frequenzgang	20 Hz ~ 15 kHz (+1 dB ~ -2 dB)
Phono		60 dB	Trennschärfe bei Störsender	
Aux, Tape		60 dB	breit	\pm 400 kHz 75 dB
Frequenzgang			schmal	\pm 300 kHz 75 dB
Phono	RIAA-Standardkurve		Eingangsverhältnis	1,2 dB
	\pm 0,5 dB (30 Hz ~ 15 kHz)		Spiegelfrequenz-Dämpfung bei 98 MHz	55 dB
Aux, Tape	5 Hz ~ 80 kHz (-3 dB)		ZF-Dämpfung bei 98 MHz	75 dB
	\pm 0,2 dB (20 Hz ~ 20 kHz)		Ansprechdämpfung auf Nebenfrequenzen bei 98 MHz	82 dB
Klangregler			AM-Unterdrückung	55 dB
Baßregler (BASS)	50 Hz, +10 dB ~ -10 dB		Übersprechdämpfung	
Höhenregler (TREBLE)	20 kHz, +10 dB ~ -10 dB		1 kHz	45 dB
Tiefenfilter	30 Hz, -6 dB/Okt.		10 kHz	35 dB
Gehörriichtige Lautstärkekorrektur (Loudness)			Trägerrest	
(bei -30 dB Ausgangsleistung)	50 Hz, +9 dB		19 kHz	-30 dB (-38 dB nach IHF)
Ausgangsspannung und -impedanz			38 kHz	-50 dB (-50 dB nach IHF)
Tape 1/2 Aufnahme (TAPE 1, 2 REC OUT)	150 mV		Kanalabweichung (250 Hz ~ 6300 Hz)	\pm 1,5 dB
Tape 1 Aufnahme/Wiedergabe (TAPE 1 REC/PLAY)	30 mV/82 k Ω		Begrenzereinsatz	1,2 μ V
Kanalabweichung (Aux, 250 Hz ~ 6300 Hz)	\pm 1 dB		Bandbreite	
Übersprechdämpfung (Aux, 1 kHz)	55 dB		ZF-Verstärker	180 kHz
Kopfhörerpegel und -impedanz	450 mV/330 Ω		UKW-Demodulator	1000 kHz
Lautsprecherimpedanz			Antennenanschluß	
MAIN oder REMOTE	4 Ω ~ 16 Ω		75 Ω (unsymmetrisch) (Nur für Deutschland bestimmt)	
MAIN und REMOTE	8 Ω ~ 16 Ω		300 Ω (symmetrisch) (Für andere Länder)	
			75 Ω (unsymmetrisch) Für andere Länder	

■ UKW-TUNERTEIL

Wellenbereich	87,50 ~ 108,00 MHz (0,05-MHz-Schritte)
	87,9 ~ 107,9 MHz (0,2-MHz-Schritte)
Eingangsempfindlichkeit	
S/R 30 dB	1,3 μ V (75 Ω)
	(Nur für Deutschland bestimmt)
S/R 26 dB	1,2 μ V (75 Ω)
	(Nur für Deutschland bestimmt)
S/R 20 dB	0,9 μ V (75 Ω)
	(Nur für Deutschland bestimmt)
S/R 30 dB	1,9 μ V (300 Ω), 1,3 μ V (75 Ω)
	(Für andere Länder)
S/R 26 dB	1,7 μ V (300 Ω), 1,2 μ V (75 Ω)
	(Für andere Länder)
S/R 20 dB	1,5 μ V (300 Ω), 0,9 μ V (75 Ω)
	(Für andere Länder)
Nutzempfindlichkeit nach IHF	1,9 μ V (nach IHF '58)

■ AM-TUNERTEIL

Wellenbereiche	522 ~ 1611 kHz (9-kHz-Schritte)
	530 ~ 1620 kHz (10-kHz-Schritte)
Eingangsempfindlichkeit (S/R 20 dB)	30 μ V, 300 μ V/m
Trennschärfe	55 dB
Spiegelfrequenz-Dämpfung bei 1000 kHz	50 dB
ZF-Dämpfung bei 1000 kHz	40 dB

■ ALLGEMEINE DATEN

Leistungsaufnahme	420 W
Netzspannung	Wechselstrom 50 Hz/60 Hz, 110V/120V/220V/240V
Abmessungen (B×H×T)	430 × 120 × 350 mm
Gewicht	7,7 kg

Bemerkung:

Der Gesamtklirrfaktor wurde mit einem digitalen Rauschspektrometer (Anlage H.P. 3045) gemessen.

Français

CARACTERISTIQUES (Sujet à changement sans préavis.)

(DIN 45 500)

■ SECTION AMPLIFICATEUR

Puissance de sortie continue de 20 Hz~20 kHz, les deux canaux en circuit	2 × 50W (4 Ω) 2 × 45W (8 Ω)
Puissance de sortie continue de 40 Hz~16 kHz, les deux canaux en circuit	2 × 50W (4 Ω) 2 × 45W (8 Ω)
Puissance de sortie continue à 1 kHz les deux canaux en circuit	2 × 55W (4 Ω) 2 × 48W (8 Ω)

Distorsion harmonique totale	
à puissance nominale (20 Hz~20 kHz)	0,015% (4 Ω) 0,007% (8 Ω)
à puissance nominale (40 Hz~16 kHz)	0,015% (4 Ω) 0,007% (8 Ω)
à puissance nominale (1 kHz)	0,007% (4 Ω) 0,001% (8 Ω)
à demi-puissance (20 Hz~20 kHz)	0,007% (8 Ω)
à demi-puissance (1 kHz)	0,001% (8 Ω)
puissance de -26 dB à 1 kHz	0,07% (4 Ω)
puissance de 50 mW à 1 kHz	0,12% (4 Ω)
Distorsion d'intermodulation	
à puissance nominale à 250 Hz: 8 kHz=4:1, 4 Ω	0,015%
à puissance nominale à 60 Hz: 7 kHz=4:1, SMPTE, 8 Ω	0,01%

Réponse de fréquences

les deux canaux en circuit, -3 dB

5 Hz~40 kHz (T.H.D. 0,04%, 4Ω)
5 Hz~40 kHz (T.H.D. 0,02%, 8Ω)

Coefficient d'amortissement

20 (4Ω), 40 (8Ω)

Sensibilité et impédance d'entrée

PHONO 2,5 mV/47kΩ

AUX (AUX) 150 mV/22kΩ

BANDE 2 (TAPE 2) 150 mV/22kΩ

BANDE 1, ENREGISTREMENT/LECTURE
(TAPE 1 REC/PLAY) 180 mV/25kΩ

PHONO (tension d'entrée maximum, 1 kHz RMS) 150 mV

Signal/Bruit

à puissance nominale (4Ω)

PHONO 74 dB (IHF, A: 82 dB)

AUX, BANDE (AUX, TAPE) 88 dB (IHF, A: 98 dB)

puissance de -26 dB (4Ω)

PHONO 63 dB

AUX, BANDE (AUX, TAPE) 65 dB

puissance de 50 mW (4Ω)

PHONO 60 dB

AUX, BANDE (AUX, TAPE) 60 dB

Réponse de fréquence

PHONO Courbe nominale RIAA
±0,5 dB (30 Hz~15 kHz)

AUX, BANDE (AUX, TAPE)
5 Hz~80 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

Filtre subsonique

30 Hz, -6 dB/oct.

Compensateur physiologique (volume à -30 dB)

50 Hz, +9 dB

Tension de sortie et impédance

SORTIE ENREGISTREMENT/BANDE 1, 2
(TAPE 1, 2 REC OUT) 150 mV

ENREGISTREMENT/LECTURE BANDE 1
(TAPE 1 REC/PLAY) 30 mV/82kΩ

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 450 mV/330Ω

Impédance de charge

PRINCIPALE ou AUXILIAIRE (MAIN or REMOTE)
4Ω~16Ω

PRINCIPALE et AUXILIAIRE (MAIN and REMOTE)
8Ω~16Ω

SECTION SYNTONISATEUR FM

Gamme de fréquence

87,50~108,00 MHz (0,05 MHz par palier)

87,9~107,9 MHz (0,2 MHz par palier)

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 65 dB (75 dB, IHF)

STEREO 60 dB (70 dB, IHF)

Réponse de fréquence 20 Hz~15 kHz, +1 dB~-2 dB

Sélectivité alternée par canal

Large ±400 kHz 75 dB

Etroite ±300 kHz 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 82 dB

Suppression AM 55 dB

Séparation stéréophonique

1 kHz 45 dB

10 kHz 35 dB

Fuite de porteuse

19 kHz -30 dB (-38 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

Bornes d'antenne 300Ω (symétrique)

75Ω (asymétrique)

SECTION SYNTONISATEUR AM

Gamme de fréquence 522~1611 kHz (9 kHz par palier)
530~1620 kHz (10 kHz par palier)

Sensibilité (S/B 20 dB) 30 μV, 300 μV/m

Sélectivité 55 dB

Réjection d'image à 1,000 kHz 50 dB

Réjection FI à 1,000 kHz 40 dB

DIVERS

Consommation 420W

Alimentation CA 50 Hz/60 Hz, 110V/120V/220V/240V

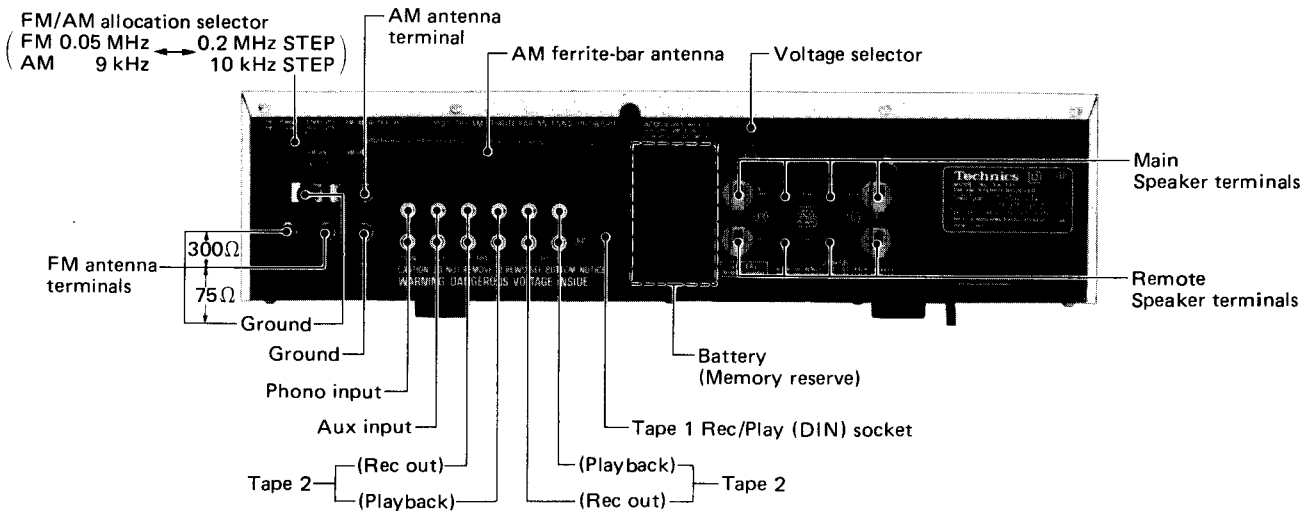
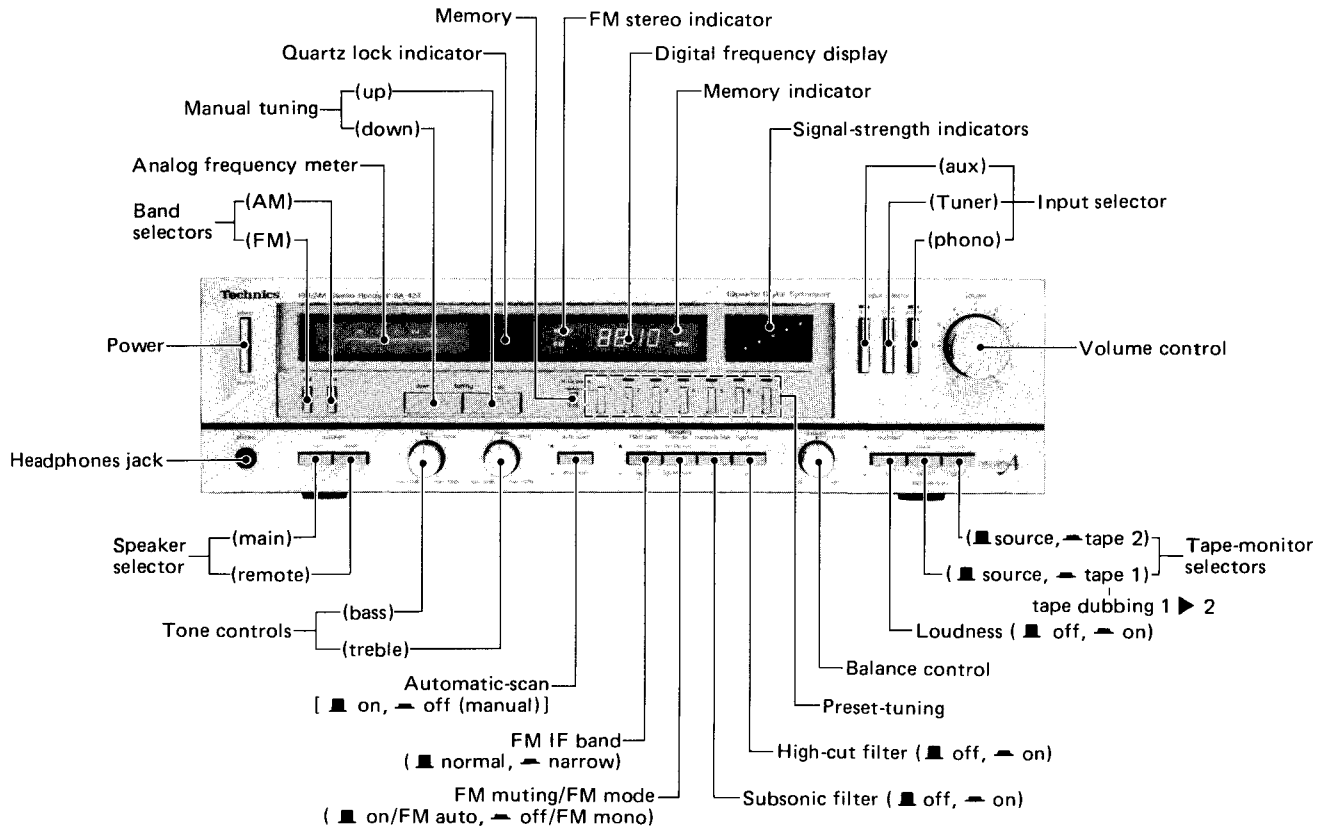
Dimensions (L×H×Pr) 430 × 120 × 350 mm

Poids 7,7 kg

Remarque:

On mesure la distorsion harmonique totale au moyen d'un analyseur de spectre digital (Système H.P. 3045).

LOCATION OF CONTROLS



FM Antenna

Note that the FM antenna terminals used on products for F.R. Germany [EG] are the 75Ω Type only.

DISASSEMBLY INSTRUCTIONS

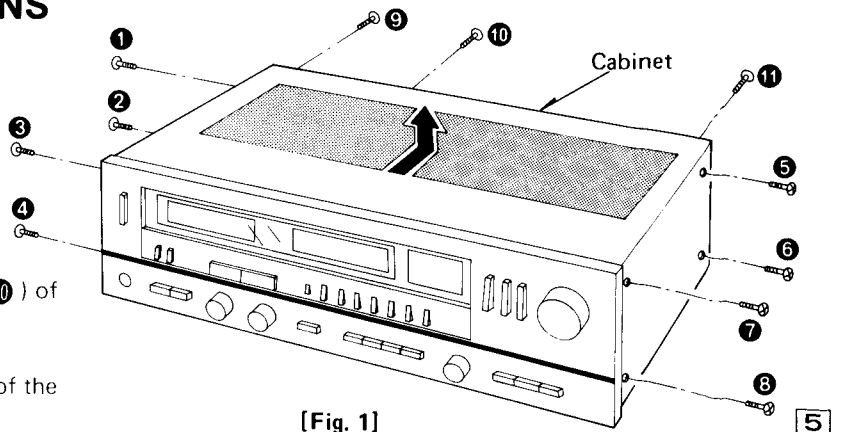
How to remove the cabinet

1. Remove the 8 setscrews (Fig. 1 : ① ~ ⑧) on the side and 3 setscrews (Fig. 1 : ⑨ ~ ⑪) on the back of the cabinet.
2. Remove the cabinet.

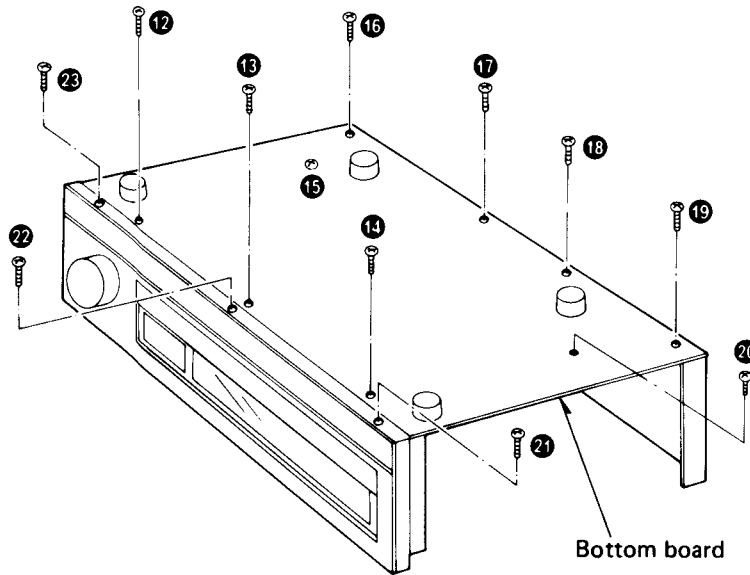
How to remove the bottom board

1. Remove the 8 setscrews (Fig. 2 : ⑫ ~ ⑭, ⑯ ~ ⑳) of the bottom board.
2. Remove the bottom board.

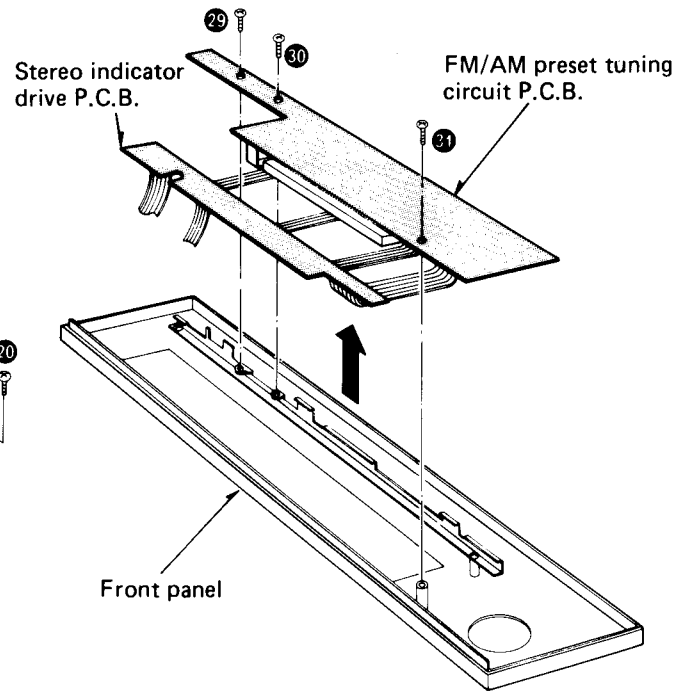
Note: Don't remove the 1 setscrew (Fig. 2 : ⑮) of the bottom board.



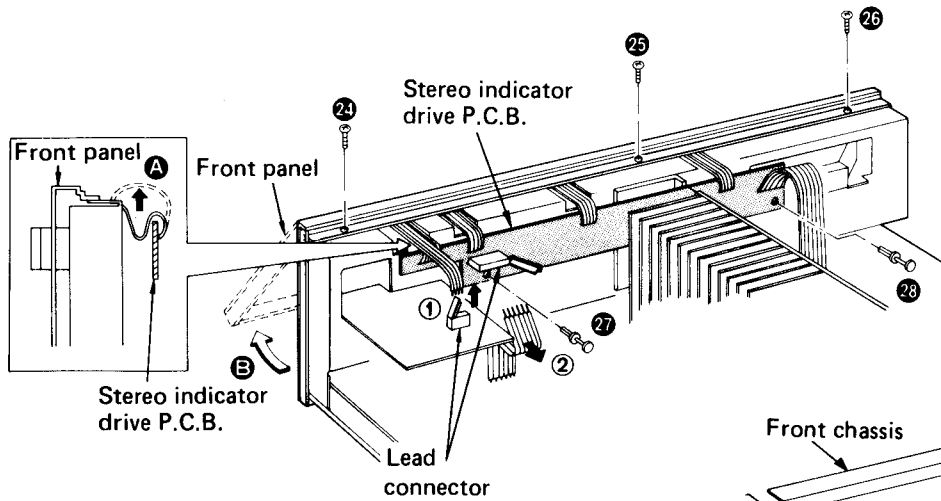
[Fig. 1]



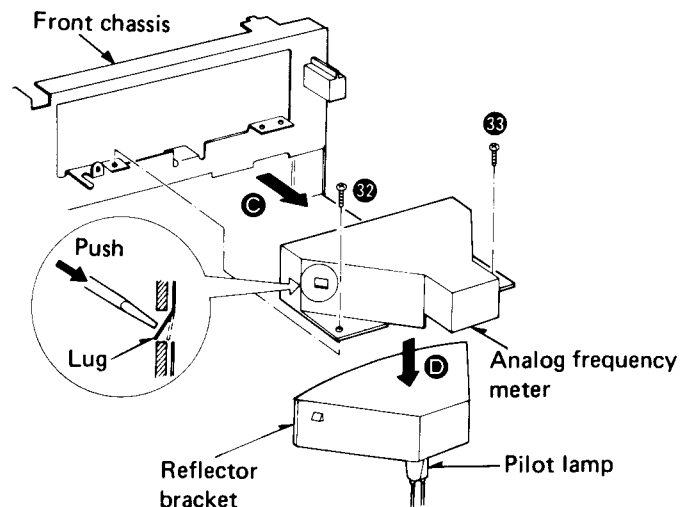
[Fig. 2]



[Fig. 4]



[Fig. 3]



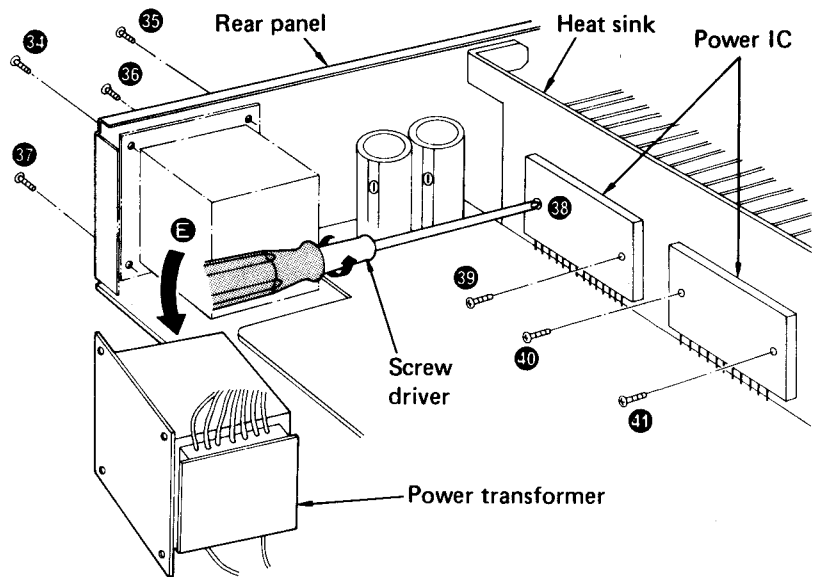
[Fig. 5]

● **How to remove the FM/AM preset tuning printed circuit board and the analog frequency meter**

1. Remove the cabinet.
2. Open the 2 "lead holders" of the lead connector (Fig. 3: ①, ②) and pull out the lead wires.
3. Remove the 2 lock pins (Fig. 3 : 27, 28) to detach the stereo indicator drive printed circuit board.
4. The lead wires are squeezed in between the front chassis and the stereo indicator drive printed circuit board. Pull them out in the direction of arrow A in Fig. 3.
5. Remove the 6 setscrews (Fig. 2 and 3 21 ~ 26) of the front panel.
6. Move the front panel in the direction of arrow B in Fig. 3.
7. Remove the 3 setscrews (Fig. 4 : 29 ~ 31) to detach the FM/AM preset tuning printed circuit board.
8. Remove the 2 setscrews (Fig. 5 : 32, 33) to detach the analog frequency meter in direction of the arrow C, and 2 lugs (Reflector bracket of left and right side) to detach the reflector bracket from the analog frequency meter in direction of the arrow D.

● How to remove the power IC

1. Remove the cabinet and bottom board. (Refer to "How to remove the cabinet," and "How to remove the bottom board.")
2. Remove the 4 setscrews (Fig. 6 : 34 ~ 37) to detach the power transformer from rear panel in the direction of the arrow **E**.
3. Unsolder of power IC.
4. Remove the 4 setscrews (Fig. 6 : 38 ~ 41) used to secure the power IC on the heat sink, and then pull the power IC.
5. When mounting the power IC, apply silicone compound (or equivalent heat diffuser) to the rear side of power IC, and then follow the steps 1 ~ 4 reversely.



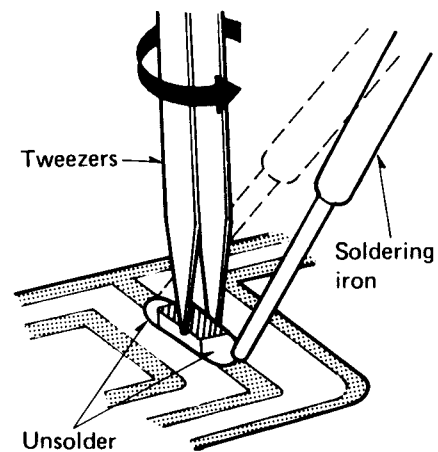
[Fig. 6]

● How to replace chips (resistor, capacitor and jumper)

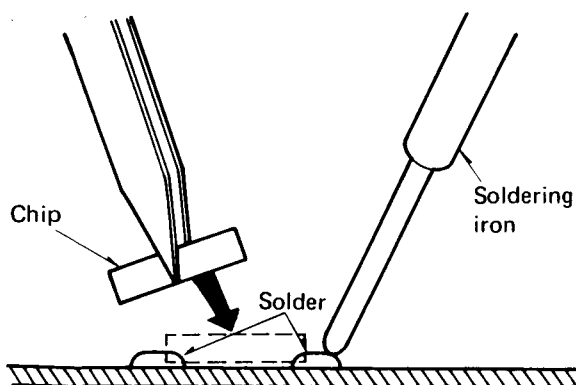
1. Unsolder from chip by using solder sucker.
2. Remove chip with tweezers by rotating it while removing solder as shown in Fig. 7.
3. Solder circuit board first and then solder chip in the direction of the arrow as shown in Fig. 8.

Notes:

1. Do not use chip again which is removed from printed circuit board.
2. Use lead wire with insulator for replacement instead of chip jumper.



[Fig. 7]



[Fig. 8]

● Note for replacing chips

1. Do not heat chips more than three (3) seconds.
2. Be careful not to damage the electrode of chips.
3. Use soldering iron (less than 60W) and tweezers for replacing chips.

● Precautions for repair

When frequency is not indicated, FL (display tube), FL driver, digit circuit, and micro-computer must be checked by oscilloscope.

In this case, take care not to allow short circuit between IC terminals or application of voltage from measuring instrument to IC terminals.

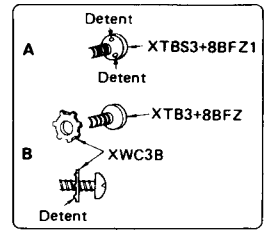
Note 1: Setscrews ⑳ to ㉔ and ㉖ are screws with detents (Part No. : XTBX3+8BFZ1) as shown in Fig. 9-A in order to make the contact of electric circuit perfect.

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. 9-B.

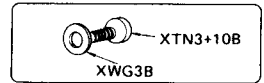
The teeth of the lock washer should be positioned on the chassis side.

Note 2: Setscrews ㉚ and ㉛ are plain washer-attached screws (Part No. : XTW3+10H).

When substituting, use a 3 x 10mm tapping screw (Part No. : XTN3+10B) and plain washer (Part No. : XWG3B) as shown in Fig. 10.



[Fig. 9]



[Fig. 10]

* Since standardized parts are mentioned in the parts list, they are sometimes different in Part No. and Color from the product parts.

Screw No.	Type	Color	Product Part No.	Figure No.
① ~ ⑧	⊕ 4 x 8 mm, Tapping	Silver	XTB4+8BFN (Silver type model)	Fig. 1
		Black	XTB4+8BFZ (Black type model)	
⑨ ~ ⑪	⊕ 3 x 10 mm, Tapping	Silver	XTB3+8BFN (Silver type model)	Fig. 1
		Black	XTB3+8BFZ (Black type model)	
⑫ ~ ⑭, ⑮ ~ ⑳	⊕ 3 x 12 mm, Tapping (With plain washer)	Red	XTW3+12HFYR	Fig. 2
㉑ ~ ㉔	⊕ 3 x 8 mm, Tapping	Black	XTBS3+8BFZ1	Fig. 2 and 3
㉕, ㉖	⊕ 3 x 10 mm, Tapping	Gold	XTB3+10B	Fig. 4
㉗	⊕ 3 x 8 mm, Tapping	Black	XTBS3+8BFZ1	Fig. 4
㉘, ㉙	⊕ 3 x 10 mm Tapping (With plain washer)	Gold	XTW3+10H	Fig. 5

MEASUREMENTS AND ADJUSTMENTS English

AMPLIFIER ADJUSTMENT

● Setting of controls and instruments to be used

* Before the adjustment, R657 and R658 should be turned to counter-clockwise direction.

1. Speaker switch Main
2. Sound volume. 0 (minimum)
3. DC voltmeter (capable to measure 5mV)

No.	ADJUSTMENTS	DC VOLT METER CONNECTION	PARTS ADJUSTED	ADJUSTING PROCEDURE
1	DC balance	Connect it to "Speaker" terminals of L and R channels.	R655 (L channel) R656 (R channel)	* Adjust it to zero (0) with as small measuring range as possible.
2	Ica	(L channel) Between TP601 and TP603 (minus probe) (R channel) Between TP602 and TP604 (minus probe)	R657 (L channel) R658 (R channel)	* Adjust R657 (L ch) and R658 (R ch) to approx. 5 ~ 6mV after ten minutes warm-up time.

TUNER ADJUSTMENT

Note: AM OSC Coil (L202) and AM 2nd IFT (T202) have been already adjusted, and require no adjustment.

* Equipment used

1. AC and DC electronic voltmeters (VTVM)
2. AM signal generator (AM-SG)
3. FM signal generator (FM-SG)
4. Distortion analyzer
5. Oscilloscope
6. Frequency counter (19 kHz and 108 MHz measurable)
7. FM 300Ω dummy antenna. (Fig. 11)

* Setting

1. Maintain line voltage at rated volts.
2. Output of signal generator should be no higher than necessary to obtain an output reading.
3. Pull the AM ferrite-bar antenna (L201) outward.
4. Use a non-metal screwdriver for the adjustment.
5. Set input selector to "tuner" position
6. Set band selector to { AM (AM adjustment) } position
7. Set FM muting/FM mode switch to "on/FM auto" position.
8. Set tape monitor switch to "source" position.
9. Set speaker selector to "main" position
10. Set automatic-scan switch to "off" position.
11. Set FM/AM allocation selector to "0.2 MHz/10 kHz" position.
12. Set FM IF band selector to "normal" position.

* Preparation of FM signal generator (FM-SG)						
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 60 dB (1mV), 400 Hz 100% modulation (Because of using dummy antenna, SG output must be 12 dB plus (IHF). That is, when input is 60 dB SG output is to be 72 dB.		
AM/FM SIGNAL GENERATOR		DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE	
CONNECTION	FREQUENCY					
AM-IF ADJUSTMENT						
1	Connect AM-SG to AM antenna terminal through 220pF capacitor. Common to chassis. (Powerful input)	450 kHz (30% Mod. with 400 Hz)	Frequency of non-interference	Connect AC VTVM or scope to "Speaker" terminals of the set.	T201 (1st IFT)	1. Adjust the input frequency and adjustment points so that the output becomes maximum.
FM-IF ADJUSTMENT						
2	—————	No-Signal	100.1MHz	Connect DC VTVM between TP102 and TP103 through choke coil. (Refer to Fig. 13)	T101 (Discr. IFT)	1. Adjust T101 core so that voltage measured in signal mode is 0V in 300mV range.
FM-RF AND FM ANALOG FREQUENCY METER ADJUSTMENT						
3	—————	No-Signal	90.1 MHz	Connect DC VTVM to TP1 terminal.	L4 (FM OSC Coil)	1. Adjust L4 so that voltage measured by DC voltmeter is $4.49 \pm 0.05V$.
4	Connect FM-SG to FM antenna terminal through 300 Ω FM dummy antenna.	90.1 MHz (100% Mod. with 400 Hz) Weak input	90.1 MHz	Connect scope to "Speaker" terminals of the set.	L1 (FM ANT Coil) L2 (FM DET Coil) T1 (FM IFT)	1. Add weak input so that noise is included in the output wave from. 2. Make the adjustment so that the output wave form is vertically symmetrical. (Refer to Fig. 14)
5	Connect FM-SG to FM antenna terminal through 300 Ω FM dummy antenna.	106.1 MHz (100% Mod. with 400 Hz) Weak input	106.1 MHz	Connect scope to "Speaker" terminals of the set.	CT1 (FM OSC Trimmer)	1. Add weak input so that noise is included in the output wave form. 2. Make the adjustment so that the output wave form is vertically symmetrical. (Refer to Fig. 14) 3. Check step (3) and if it is deflected readjust of L4.
6	—————	No-Signal	107.9 MHz	—————	VR102 (Frequency meter)	1. Adjust VR102 so that the frequency meter indicates 107.9 MHz. (Refer to Fig. 16)
AM-RF AND AM ANALOG FREQUENCY METER ADJUSTMENT						
7	—————	No-Signal	530 kHz	Connect DC VTVM to TP1 terminal.	L202 (AM OSC Coil)	1. Adjust L202 so that voltage measured by DC voltmeter is $1.25 \pm 0.05V$.
8	—————	No-Signal	1620 kHz	Connect DC VTVM to TP1 terminal.	CT202 (AM OSC Trimmer)	1. Adjust CT202 so that voltage measured by DC voltmeter is 25.0V.
9	Connect AM-SG to AM antenna terminal through 200pF capacitor. Common to chassis. (Weak input)	610 kHz (30% Mod. with 400 Hz)	610 kHz	Connect AC VTVM to scope to "Speaker" terminals of the set.	L201 (ANT Coil)	1. Adjust for maximum output. 2. Adjust ferrite core of L201 by screwdriver.
		1500 kHz (30% Mod. with 400 Hz)	1500 kHz	Connect AC VTVM to scope to "Speaker" terminals of the set.	CT201 (ANT Trimmer)	1. Adjust for maximum output. 2. Repeat step (9) until the frequency correctly matches the dial display.
10	—————	No-Signal	1500 kHz	—————	VR136 (Frequency meter)	1. Adjust VR136 so that the frequency meter indicates 1500 kHz. (Refer to Fig. 17)
FM MUTING LEVEL ADJUSTMENT						
11	Connect FM-SG to FM antenna terminal through 300 Ω FM dummy antenna. (Apply 16 dB to antenna terminal)	100.1 MHz (100% Mod. with 400 Hz)	100.1 MHz	Connect AC VTVM or scope to "Speaker" terminals of the set.	VR101 (Muting level)	1. Set the FM muting/FM mode switch to "off/mono". 2. With the FM muting/FM mode switch set to "on/FM auto" adjust VR101 so that the output is given with muting condition released.

AM/FM SIGNAL GENERATOR		DISPLAY FREQUENCY	PREPARATIONS	PARTS ADJUSTED	ADJUSTING PROCEDURE	
CONNECTION	FREQUENCY					
FM MPX PILOT (VCO) ADJUSTMENT						
12	Connect FM-SG to FM antenna terminal through 300 Ω FM dummy antenna.	100.1 MHz (Non-modulated)	100.1 MHz	Connect frequency counter to TP301 terminal through resistor (100kΩ).	VR301 (VCO)	<ol style="list-style-type: none"> 1. Set the FM muting/FM mode switch to "on/FM auto". 2. Adjust VR301 to 19 kHz ± 30 Hz.
STEREO DISTORTION ADJUSTMENT						
13	Connect FM-SG to FM antenna terminal through 300 Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1 MHz (100% Mod. with 400 Hz) (L mode)	100.1 MHz	Connect distortion analyser to "Speaker" terminals of the set.	T1 (IFT)	<ol style="list-style-type: none"> 1. Set the FM muting/FM mode switch to "on/FM auto". 2. Re-adjust the already adjusted T1 within ± 90° from the preset core position so that the distortion of L ch is minimized.
SEPARATION ADJUSTMENT						
14	Connect FM-SG to FM antenna terminal through 300 Ω FM dummy antenna. (Pilot 10% Mod. stereo signal)	100.1 MHz (100% Mod. with 1 kHz) (L or R mode)	100.1 MHz	Connect AC VTVM to "Speaker" terminal of the set.	VR302 (Normal IF separation)	<ol style="list-style-type: none"> 1. Set the IF band selector to "normal". 2. Set the FM muting/FM mode switch to "on/FM auto". 3. Adjust VR302 so that R output is minimized when stereo modulator is in L (L ch. modulation) mode and that L output is minimized in R mode.
					VR303 (Narrow IF separation)	<ol style="list-style-type: none"> 1. Set the IF band selector to "narrow". 2. Set the FM muting/FM mode switch to "on/FM auto". 3. Adjust VR303 so that R output is minimized when stereo modulator is in L (L ch. modulation) mode and that L output is minimized in R mode.

MESSUNGEN UND JUSTIERUNGEN Deutsch

- * Vor der Abstimmung R657 und R658 bis zum Anschlag entgegen dem Uhrzeigersinn drehen.
- * Einstellung der zu benutzenden Regler und Instrumente
 1. Lautsprecherschalter Hauptlautsprecher (main).
 2. Lautstärke "0" (Minimalstellung).
 3. Gleichstromvoltmeter 5mV Meßbereich erforderlich.

VERSTÄRKERJUSTIERUNG

Nr.	Einstellungen	Gleichstromvoltmeter-verbindungen	Einstellungspunkte	Einstellungsvorgang
1	Gleichstrom-Balance	An die Lautsprecheranschlüsse des linken und rechten Kanals anschließen.	R655 (L-Kanal) R656 (R-Kanal)	Mit Kleinstmöglichem Meßbereich auf Null (0) justieren.
2	Ica	L-Kanal Zwischen TP601 und TP603 (Minustest) R-Kanal. Zwischen TP602 und TP604 (Minustest)	R657 (L-Kanal) R658 (R-Kanal)	* R657 (L-Kanal) und R658 (R-Kanal) auf ungefähr 6mV, nach 10 Minuten Anwärmezeit, einstellen.

TUNER-JUSTIERUNG

Anmerkung: AM Osz.-Spule (L202) und AM 2. ZFT (T202) sind bereits justiert worden und benötigen keine Justierung.

* Verwendete Einrichtungen

1. Elektronische Voltmeter für Wechsel- und Gleichstrom (VTVM)
2. AM (MW)-Meßsender (AM-SG)
3. UKW-Meßsender (FG-SG)
4. Verzerrungsmesser
5. Oszilloskop
6. Signalfrequenzmesser (meßbar für 19 kHz und 108 MHz)
7. UKW 75-Ohm Kunstantenne (Abb. 5)

*** Zustand des Gerätes**

1. Netzspannung auf ihren Sollwert halten.
2. Der Ausgang des Meßsenders darf nicht höher sein als unbedingt notwendig für eine gute Ablesung.
3. Die AM-Ferritstabantenne (L201) herausziehen.
4. Einen nichtmetallischen Schraubenzieher für die Einstellungen verwenden.
5. Den Eingangswähler auf die "tuner"-Position stellen
6. Bereichsschalter {AM (MW Abgleich)
FM (UKW Abgleich)}
7. FM Muting/Mode Schalter on/FM auto
8. Monitorschalter source
9. Wellenbereichsschalter main
10. Sendersuchlauf-Schalter off
11. UKW/MW-Frequenzintervallschalter 0.2 MHz/10 kHz
12. FM-ZF-Bandbreitenschalter normal

*** Vorbereitung AM UKW-Messender (FG-SG)**

1. Stereo-Modulator an FM-SG anschließen.
2. SG-Ausgang über 75-Ohm UKW Kunstantenne an den Antenneneingang des Gerätes schließen.
3. Der normale Eingang des Gerätes beträgt 60 dB (1mV) 400 Hz 100% Modulation. (Wegen Verwendung der Kunstantenne muß der Signaloutput 12 dB plus (IHF) sein: d.h. beim Eingang von 60 dB soll der Signaloutput 72 dB sein.)

Nr.	AM (MW)/FM (UKW)-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)	450 kHz (400 Hz Modulat., 30%)	Kein Empfang	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	T201 (1. IFT)	Die Eingangsfrequenz und die Einstellungspunkte so adjustieren, daß der Ausgang den maximalen Wert erreicht.
UKW-ZF-ABGLEICH						
2	_____	Kein Signal	100.1 MHz	Ein Gleichstromröhrenvoltmeter zwischen TP102 und TP103 über eine Drosselspule verbinden (Siehe Abb. 2)	T101 (Diskriminator FT)	Den Kern von T101 so justieren, daß die gemessene Spannung im signallosen Modus 0V im 300mV Bereich beträgt.
UKW-HF UND ANALOG-FREQUENZMETERJUSTIERUNG						
3	_____	Kein Signal	90.1 MHz	Zwischen TP1 und Erdung Gleichstrom-Voltmeter schließen.	L4 (UKW Osc. Spule)	1. L4 so justieren, daß die mit Voltmeter gemessene Spannung $4.49 \pm 0.05V$ beträgt.
4	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	90.1 MHz (400 Hz Modulat., 100%)	90.1 MHz	Oszilloskop über den Lautsprecher schließen.	L1 (Ant. Spule) L2 (HF Det. Spule) T1 (IFT)	1. Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird. 2. So einstellen, daß die Ausgangswellenform vertikal symmetrisch wird. (Abb. 4)
5	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen.	106.1 MHz (400 Hz Modulat., 100%)	106.1 MHz	Oszilloskop über den Lautsprecher schließen.	CT1 (UKW Osc. Trimmer)	1. Einen schwachen Eingang geben, bei dem Geräusch in der Ausgangswellenform enthalten wird. 2. So einstellen, daß die Ausgangswellenform vertikal symmetrisch wird. (Abb. 4) 3. Schritt (3) überprüfen, falls Abweichung vorhanden, L4 erneut justieren.
6	_____	Kein Signal	107.9 MHz	_____	VR102 (Analogfrequenz-anzeiger)	1. VR102 so justieren, daß das Frequenzmeter 107.9 MHz anzeigt. (Siehe Abb. 5)
AM (MW)-HF ANALOG-FREQUENZMETERJUSTIERUNG						
7	_____	Kein Signal	530 kHz	Zwischen TP1 und Erdung Gleichstrom-Voltmeter schließen.	L202 (MW Osc. Spule)	1. L202 so justieren, daß die mit Voltmeter gemessene Spannung $1.25 \pm 0.05V$ beträgt.
8	_____	Kein Signal	1620 kHz	Zwischen TP1 und Erdung Gleichstrom-Voltmeter schließen.	CT202 (MW Osc. Trimmer)	1. CT202 so justieren, daß die mit Voltmeter gemessene Spannung 25.0V beträgt.

AM (MW)/FM (UKW)-MESSENDER		ANZEIGE-FREQUENZ DURCH VOR-EINSTELLUNG	VORBEREITUNG	ABGLEICHSPUNKTE	ABGLEICHsverFAHREN	
ANSCHLUSS	FREQUENZ					
9	Einen MW-Signal-generator über einen 200pF Kondensator mit dem MW-Antenneneingang verbinden. Die gemeinsame Leitung mit dem Chassis verbinden. (Schwacher Eingang)	610 kHz (400 Hz Modulat., 30%)	610 kHz	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	L201 (Ant. Spule)	1. Auf max. Ausgang abgleichen. 2. Den Ferritkern von L201 mit einem Schraubendreher justieren.
		1500 kHz (400 Hz Modulat., 30%)	1500 kHz	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	CT201 (Ant. Trimmer)	1. Auf max. Ausgang abgleichen. 2. Die Schritte (7) wiederholen, bis die Frequenz genau mit der Skalanzeige übereinstimmt.
10	—	Kein Signal	1500 kHz	—	VR136 (Analogfrequenz-anzeiger)	1. VR136 so justieren, daß das Frequenzmeter 1500 kHz anzeigt. (Siehe Abb. 6)
UKW-STUMMABSTIMMUNGS PEGELANZEIGER						
11	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (16 dB in den Antenneneingang leiten.)	100.1 MHz (400 Hz Modulat., 100%)	100.1 MHz	Oszilloskop oder Wechselstrom-Voltmeter über den Lautsprecher schließen.	VR101 (UKW-Muting)	1. Len UKW Muting/UKW-Betriebsartschalter auf "off/mono" einstellen. 2. "Muting" Schalter auf "on/FM auto" stellen. VR101 so einstellen, daß der Ausgang unter Bewirken der Dämpfung gegeben wird.
UKW-MPX-PILOTABGLEICH (VCO)						
12	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (Mono-Signal)	100.1 MHz (Unmodulierte Welle)	100.1 MHz	Den Signalfrequenzmesser durch 100kΩ Widerstand an Anschluß TP301 anschließen.	VR301 (VCO)	1. Den UKW Muting/UKW-Betriebsartschalter auf "on/stereo" einstellen. 2. VR301 so abgleichen, daß Ausgangsfrequenz von TP301 19 kHz ± 30 Hz.
STEREO-VERZERRUNGSABGLEICH						
13	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (Stereo-Pilotsignal 10% moduliert.)	100.1 MHz (400 Hz Modulat. 100%) L-Betriebsart	100.1 MHz	Klirrfaktor-Meßbrücke über den Lautsprecher schließen.	T1 (IFT)	1. Den UKW Muting/UKW-Betriebsartschalter auf "on/FM auto" einstellen. 2. Den schon eingestellten T1 erneut, innerhalb von ± 90° von der voreingestellten Kernposition einstellen, sodaß die Verzerrung des linken Kanals minimalisiert wird.
TRENNUNG-ABGLEICH						
14	Meßsender über eine Kunstantenne an den UKW-Antenneneingang schließen. (Stereo-Pilotsignal 10% moduliert.)	100.1 MHz (400 Hz Modulat., 100%) L- oder R-Betriebsart	100.1 MHz	Wechselstrom-Voltmeter über den Lautsprecher schließen.	VR302 (Normal IF Separation)	1. FM-ZF-Bandbreitenschalter normal. 2. Den UKW Muting/UKW-Betriebsartschalter auf "on/FM auto" einstellen. 3. VR302 auf minimale Anzeige des R-Ausgangs bei Stereo-modulator in L-(L-Kanal-modulation) Modus, und auf minimale Anzeige des L-Ausgangs in R-Modus abgleichen.
					VR303 (Narrow IF Separation)	1. FM-ZF-Bandbreitenschalter narrow. 2. Den UKW Muting/UKW-Betriebsartschalter auf "on/FM auto" einstellen. 3. VR303 auf minimale Anzeige des R-Ausgangs bei Stereo-modulator in L-(L-Kanal-modulation) Modus, und auf minimale Anzeige des L-Ausgangs in R-Modus abgleichen.

MESURAGES ET REGLAGES Français

RÉGLAGE DE L'AMPLIFICATEUR

* Avant la mise au point, R657 et R658 devront être tournés dans la direction on inverse des aiguilles d'une montre.

* Réglage des commandes et instruments à utiliser

1. Commutateur du haut-parleur Principal
2. Volume du son 0 (minimum)
3. Voltmètre CC (pouvant mesurer 5mV)

No.	Reglages	Connexions du voltmètre CC	Point de réglage	Procédé de réglage
1	Equilibrage C.C.	Le brancher aux bornes du "Speaker" (haut-parleur) des canaux de gauche et de droite.	R655 (Canal G) R656 (Canal D)	L'ajuster sur zéro (0) avec une plage de mesurage aussi petite que possible.
2	icq	Canal G. Entre TP601 et TP603 (sonde au moins) Canal D. Entre TP602 et TP604 (sonde au moins)	R657 (Canal G) R658 (Canal D)	Règle les R657 (canal gauche) et R658 (canal droit) sur env. 6mV après 10 mm, de préchauffage.

REGLAGE DU TUNER

Nota: La bobine oscillatrice de la modulation d'amplitude (L202) et la 2e transformateur de fréquence intermédiaire de la modulation d'amplitude (T202) ont été déjà réglés et ne nécessitent pas de mise au point.

* Equipment utilisé

1. Voltmètre électronique de courant alternatif et de courant continu (VTVM).
2. Générateur de signal AM (AM-SG)
3. Générateur de signal FM (FM-SG)
4. Jauge de distorsion.
5. Oscilloscope.
6. Compteur de fréquence (19 kHz et 108 MHz mesurable).
7. Antenne fictive FM, 300 ohms (Fig. 11)

* Conditions de l'appareil

1. Conservez la tension du secteur à la tension nominale.
2. Le signal du générateur ne doit pas être plus élevé qu'il n'est nécessaire à obtenir une lecture en sortie.
3. Retirer l'antenne à tige de ferrite (L201) de la modulation d'amplitude.
4. Utiliser un tournevis non-métallique pour le réglage.
5. Sélecteur d'entrée sur la position "tuner".
6. Sélecteur de gamme { AM (Alignment AM)
 { FM (Alignment FM)
7. Commutateur de silencieux/mode. on/FM auto
8. Sélecteurs de contrôle-pilote de la bande. source
9. Sélecteurs de gammes d'ondes main
10. Interrupteur de balayage automatique. off
11. Sélecteur de distribution FM/AM 0.2 MHz/10 kHz
12. Placer le sélecteur de l'antenna FM sur position normal

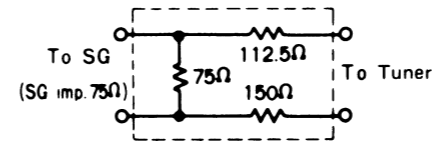
* Préparation du générateur de signal FM (FM-SG)

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 60 dB (1mV), 400Hz, 100% de modulation (à cause de l'utilisation de l'antenna fictive, la sortie SG doit être de plus 12 dB (IHF). Ca qui signifie que quand l'entrée est de 60 dB, la sortie SG doit être de 72 dB.)

No.	AM/FM 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)	450 kHz (modulé à 30% par 400 Hz)	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)	Régler la fréquence d'entrée et les points de réglage de telle sorte que la sortie devienne maximale.
REGLAGE DE RF-FM						
2	—	Sans Signal	100.1 MHz	Brancher le voltmètre électronique à c.c. aux bornes TP102 et TP103. (Voir la Fig. 13)	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 DU FREQUENCEMETRE ANALOGIQUE FM-RF ET FM.						
3	—	Sans Signal	90.1 MHz	Brancher le voltmètre à courant continu entre TP1 et le prise de terre.	L4 (Bobine Osc.)	1. Régler L4 de façon à ce que la tension mesurée par un voltmètre à C.C. soit de $4.49 \pm 0.05V$.
4	Branchez sur la prise d'antenne FM à travers une antenne fictive FM.	90.1 MHz (modulé à 100% par 400 Hz)	90.1 MHz	Branchez un oscilloscope sur les bornes de haut-parleur de l'amplifuner.	L1 (Bobin Ant.) L2 (détecteur) T1 (IFT)	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 londe de sortie soit verticalement symétrique. (Voir Fig. 14)

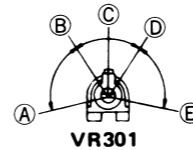
AM/FM GENERATEUR		FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE	
BRANCHEMENT	FREQUENCE					
5	Branchez sur la prise d'antenne FM à travers une antenne fictive FM.	106.1 MHz (modulé à 100% par 400 Hz)	106.1MHz	Branchez un oscilloscope sur les bornes de haut-parleur de l'amplifier.	CT1 (Trimmer Osc.)	<ol style="list-style-type: none"> 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. 14) 3. Vérifier l'étape (3) et si elle est déviée régler à nouveau L4.
6	_____	Sans Signal	107.9 MHz	_____	VR102 (Cadran analogique des fréquences)	<ol style="list-style-type: none"> 1. Régler VR102 de façon à ce que le fréquencemètre indique 107.9 MHz. (Se référer à la Fig. 16)
REGLAGE DU FREQUENCOMETRE ANALOGIQUE AM-RF ET AM.						
7	_____	Sans Signal	530 kHz	Brancher le voltmètre à courant continu entre TP1 et la prise de terre.	L202 (Bobine Osc.)	<ol style="list-style-type: none"> 1. Régler L202 de façon à ce que la tension mesurée par un voltmètre à c.c. soit de $1.25 \pm 0.05V$.
8	_____	Sans Signal	1620 kHz	Brancher le voltmètre à courant continu entre TP1 et la prise de terre.	CT202 (Trimmer Osc.)	<ol style="list-style-type: none"> 1. Régler CT202 de façon à ce que la tension mesurée par un voltmètre à c.c. soit de 25.0V.
9	Brancher la AM-SG à la borne de l'antenne AM par un condensateur de 200pF. Commun au châssis. (Entrée faible)	610 kHz (400 Hz Modul., 30%)	610 kHz	Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	L201 (Bobint Ant.)	<ol style="list-style-type: none"> 1. Régler au maximum de signal de sortie. 2. Régler la noyau ferrite de L201 à l'aide d'un tournevis.
		1500 kHz (400 Hz Modul., 30%)	1500 kHz	Branchez un c.a. voltmètre électronique ou un oscilloscope sur les bornes de haut-parleur de l'ampli-tuner.	CT201 (Trimmer Ant.)	<ol style="list-style-type: none"> 1. Régler au maximum de signal de sortie. 2. Refaire les étapes (9) jusqu'à ce que la fréquence s'aligne correctement avec l'affichage du cadran.
10	_____	Sans Signal	1500 kHz	_____	VR136 (Frequency meter)	<ol style="list-style-type: none"> 1. Régler VR136 de façon à ce que le fréquencemètre indique 1500 kHz. (Se référer à la Fig. 17)
REGLAGE DU SEUIL DU SILENCIEUX D'ACCORD						
11	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Appliquer 16 dB à la borne de l'antenne.)	100.1 MHz (modulé à 100% par 400 Hz)	100.1 MHz	Branchez un oscilloscope sur les bornes de haut-parleur de l'amplifier.	VR101	<ol style="list-style-type: none"> 1. Placer le commutateur de réglage silencieux de FM/ mode FM sur "off/mono". 2. Avec le commutateur de mode/réglage silencieux FM réglé sur la position "on/auto", régler le VR101 de telle sorte que la sortie fournie avec le réglage silencieux en position déclenchée.
REGLAGE (VCO) PILOTE MULTIPLEX FM						
12	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal monoscoustique).	100.1 MHz (Non modulé)	100.1 MHz	Brancher le compteur de fréquences à la borne TP301 par l'intermédiaire d'une résistance de 100kΩ	VR301 (VCO)	<ol style="list-style-type: none"> 1. Placer le commutateur de réglage silencieux de FM/ mode FM sur "on/stereo". 2. Régler VR301 de telle sorte que la fréquence de sortie de TP301 soit de $19 \text{ kHz} \pm 30 \text{ Hz}$.
REGLAGE DE LA DISTORSION STEREO						
13	Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal stéréo pilote à 10% de modulation)	100.1 MHz (modulé à 100% par 400 Hz) (Mode G)	100.1 MHz	Branchez un distorsion mètre sur les bornes de haut-parleur de appareil.	T1 (IFT)	<ol style="list-style-type: none"> 1. Placer le commutateur de réglage silencieux de FM/ mode FM sur "on/auto". 2. Rerégler le T1 déjà réglé, à $\pm 90^\circ$ de la position pré-réglée du noyau de telle sorte que la distorsion du canal gauche soit minimale.

FM GENERATEUR		FREQUENCE D'AFFICHAGE PAR PREREGLAGE	PREPARATIONS	ELEMENTS REGLES	PROCEDURE DE REGLAGE
BRANCHEMENT	FREQUENCE				
REGLAGE DE LA SEPARATION DES CANAUX					
14 Branchez sur la prise d'antenne FM à travers une antenne fictive FM. (Signal stéréo pilote à 10% de modulation)	100.1 MHz (modulé à 100% par 400 Hz) (Mode G ou D)	100.1 MHz	Branchez un oscilloscope sur les bornes de hautparleur de l'amplificateur.	VR302 (Normal IF Separation)	<ol style="list-style-type: none"> 1. Interrupteur de gamme FM-IF.....normal. 2. Placer le commutateur de réglage silencieux de FM/ mode FM sur "on/auto". 3. Régler VR302 de telle sorte que la sortie droite soit minimale quand la commande d'accord stéréophonique est dans le mode gauche (modulation du canal gauche) et que la sortie gauche soit minimale dans mode droit.
				VR303 (Narrow IF Separation)	<ol style="list-style-type: none"> 1. Interrupteur de gamme FM-IF.....narrow. 2. Placer le commutateur de réglage silencieux de FM/ mode FM sur "on/auto". 3. Régler VR303 de telle sorte que la sortie droite soit minimale quand la commande d'accord stéréophonique est dans le mode gauche (modulation du canal gauche) et que la sortie gauche soit minimale dans mode droit.



300Ω FM Dummy Antenna

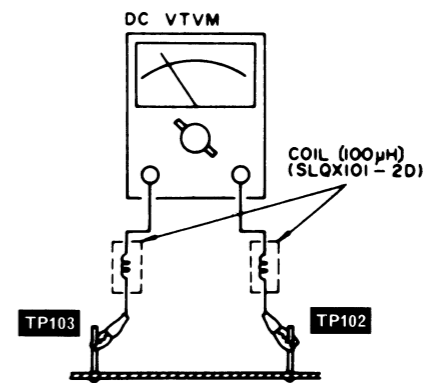
[Fig. 11] Abb. 1



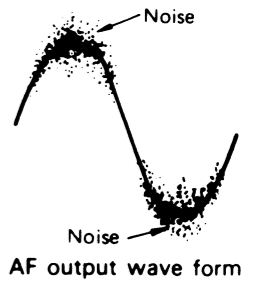
VR301

A - B, D - E Stereo OFF Position.
B - D Stereo ON Position (indicator Lighting).
C Adjust Point of Pilot Circuit.

[Fig. 12] Abb. 2

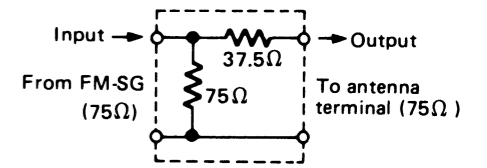


[Fig. 13] Abb. 3



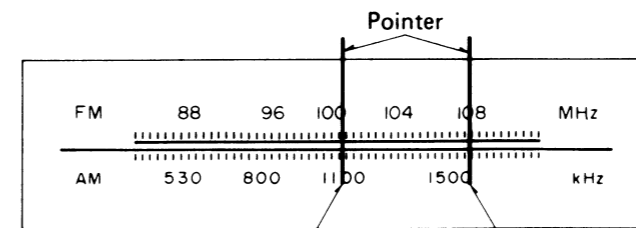
AF output wave form

[Fig. 14] Abb. 4



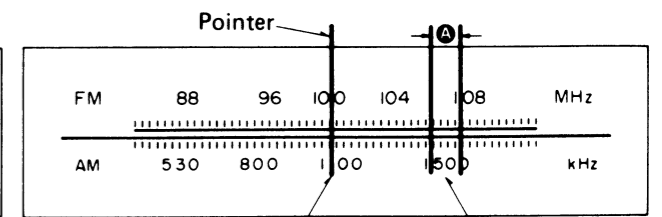
(75Ω FM dummy antenna)

[Fig. 15] Abb. 5



(When 1100kHz) (When 107.9MHz)

[Fig. 16] Abb. 6

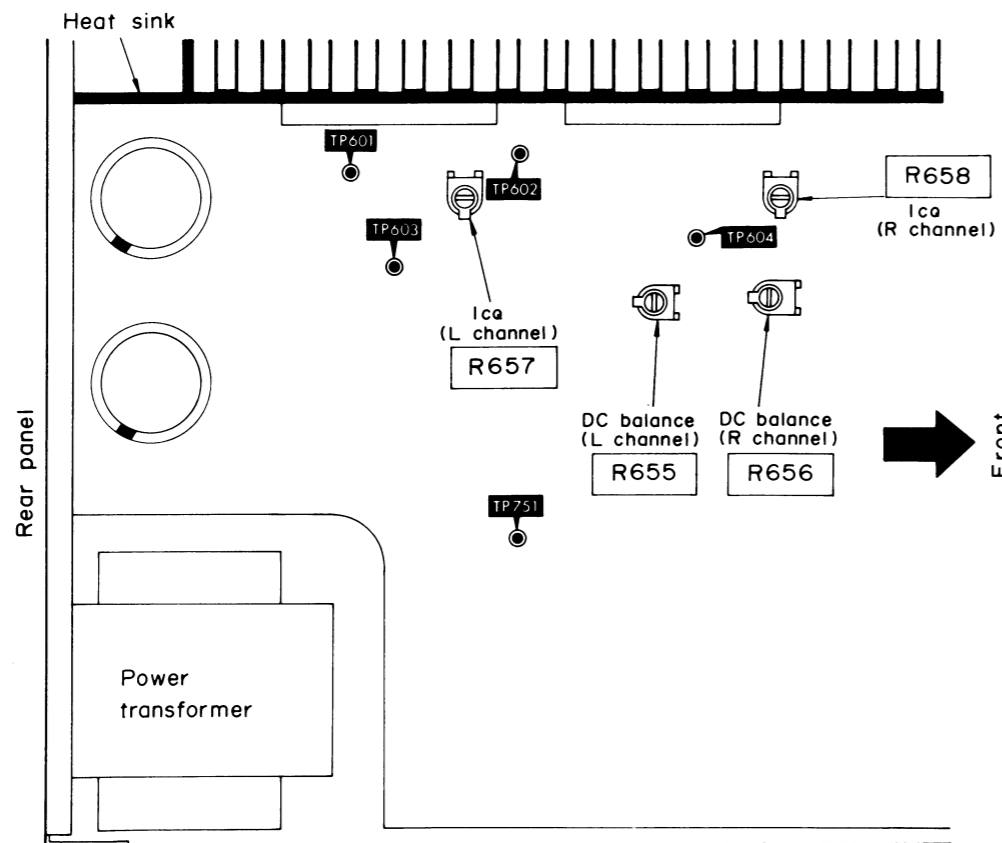


(When 100.1MHz) (When 1500kHz)

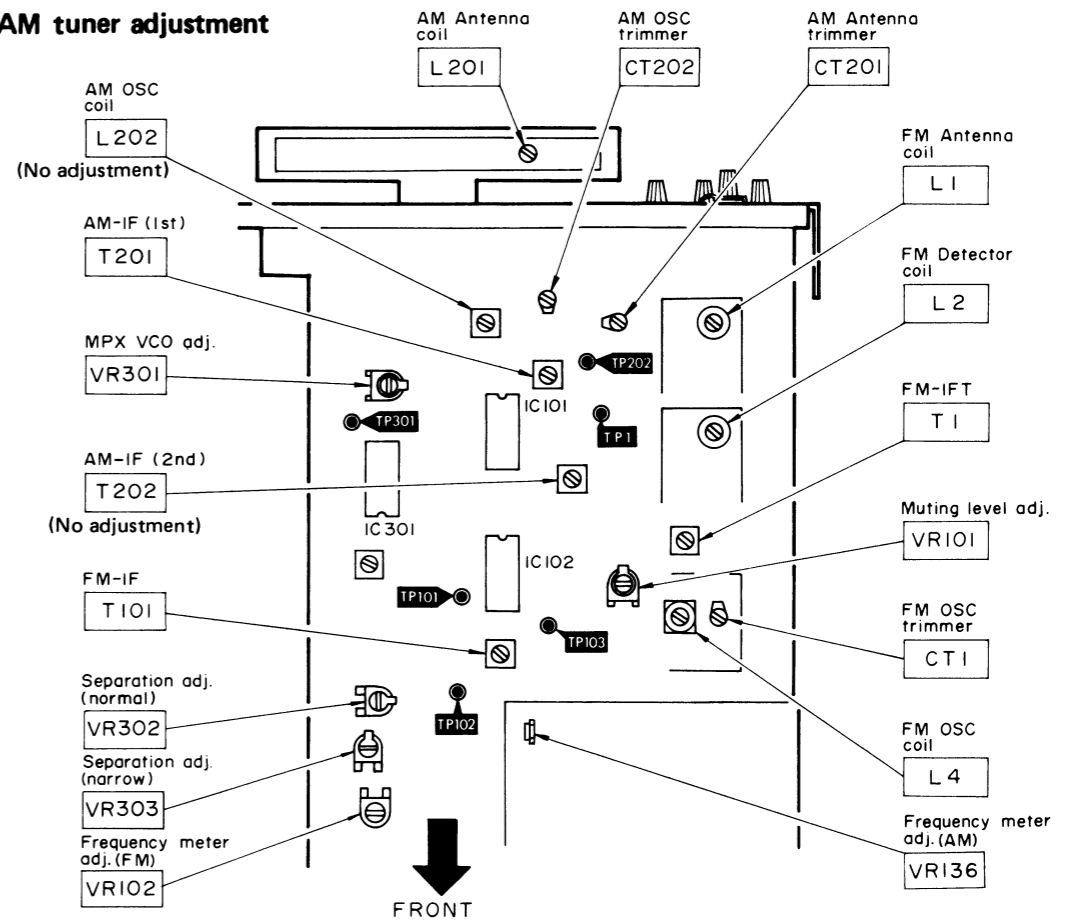
[Fig. 17] Abb. 7

ADJUSTMENT POINTS

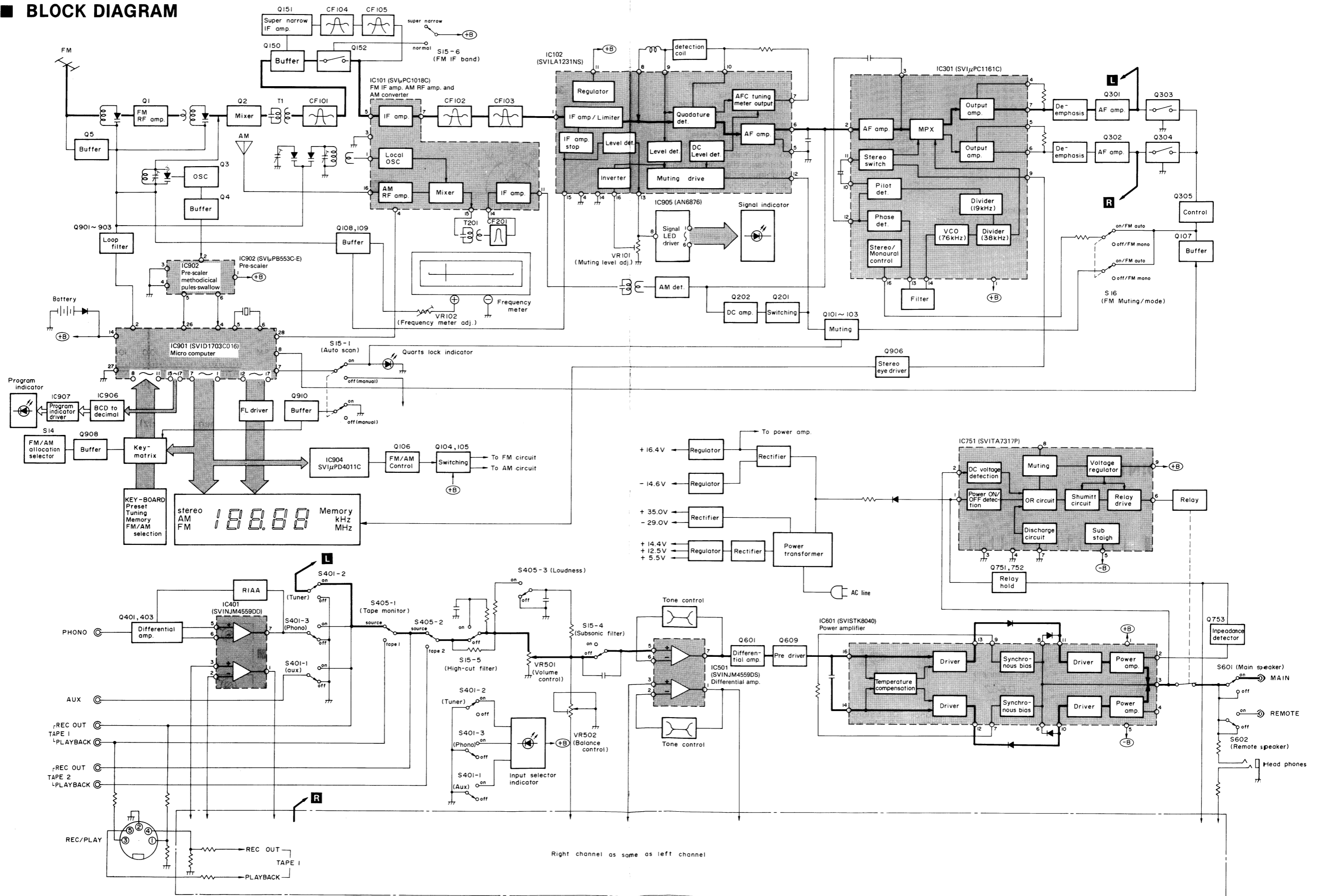
Amplifier adjustment



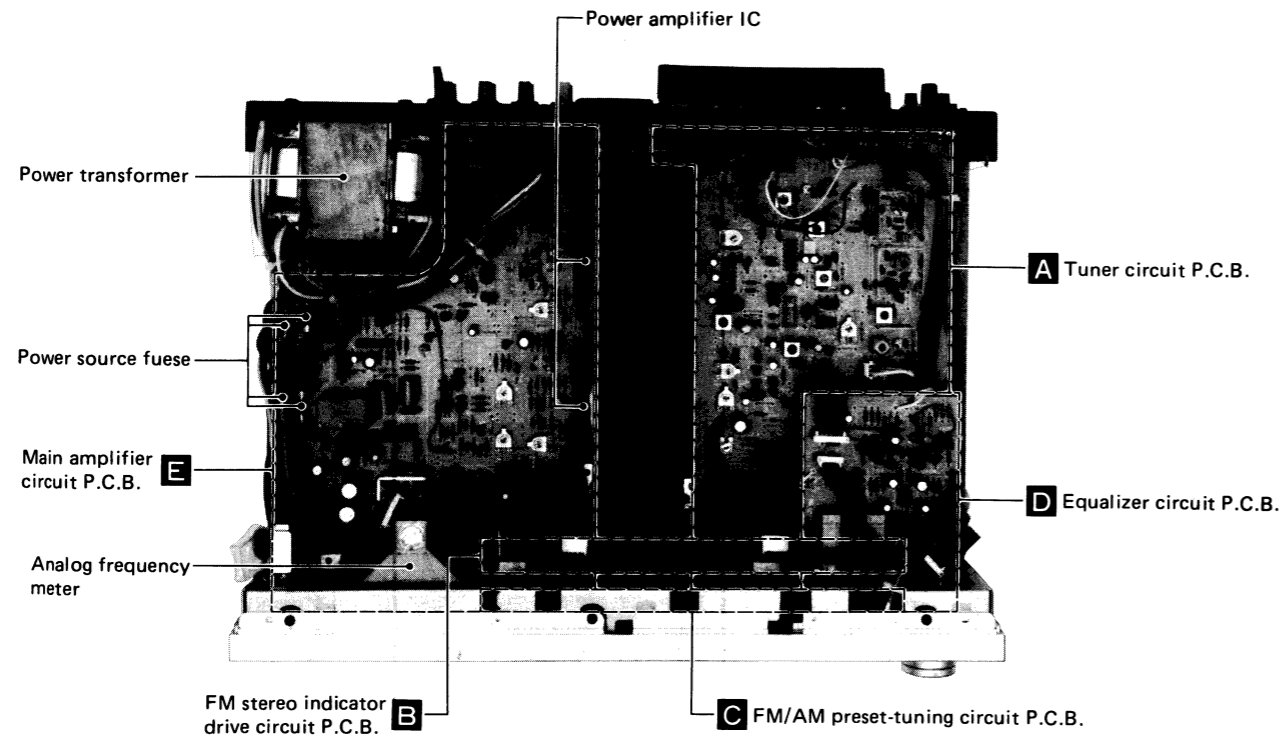
FM/AM tuner adjustment



■ BLOCK DIAGRAM



LOCATION OF PRINTED CIRCUIT BOARDS



REPLACEMENT PARTS LIST...Electric 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	RV1UPC1018CF	IC, FM IF Amp. AM RF Amp. and AM Converter
IC102	SVILA1231NS	IC, FM IF Detector
IC301	SVIUPC1161C	IC, FM Multiplex
IC401	SVINJM4559DD	IC, Equalizer Amplifier
IC501	SVINJM4559DS	IC, Differential Amplifier
IC601, 602	SVISTK8040	IC, Power Amplifier
IC751	SVITA7317P	IC, Relay Driver
IC901	SVID1703C016	IC, Micro-Computer
IC902	SVIUPB553C-E	IC, Pre-Scaler
IC903	SVITA57	IC, FL Driver
IC904	SVIUPD4011C	IC, NAND Gate
IC905	AN6876	IC, Signal L.E.D Driver
IC906	SVIUPD4035C	IC, Gate
IC907	SVIM74LS42P	IC, Decoder
TRANSISTORS		
Q1	2SK195-H1	Transistor, FM RF Amplifier
Q2	2SC1674-M	Transistor, FM Mixer
Q3, 4	2SC1675-L	Transistor, FM Oscillator and Buffer
Q5, [XL] except Q101, 102, 106 ~ 109, 152, 201 303, 304	2SC945-Q	Transistor, Muting
Q103 ~ 105, 202 301, 302, 305	2SC1815-Y	Transistor, Switching (Use in ranks Y or O)
Q150, 151	2SA1015-Y	Transistor, Switching (Use in ranks F or G)
Q401 ~ 404	2SC829-C	Transistor, Differential Amplifier (Use in ranks F or G)
Q601, 602	2SC2320L-F	Transistor, Differential Amplifier (Use in ranks F2 or G2)
Q603 ~ 606 704, 705	2SA798A-G2	Transistor, Current Mirror (Use in ranks Y or O)
Q607, 608, 752 753, 754	2SC1845-E	Transistor, Current Detector (Use in ranks E or F)

Ref. No.	Part No.	Part Name & Description
Q609, 610, 701 Q702	2SC2631-R 2SA1123-R	Transistor, Regulator (Use in ranks R, S or T) Transistor, Regulator (Use in ranks R, S or T)
Q703	2SD880-Y	Transistor, Regulator (Use in ranks Y or O)
Q751	2SA992-E	Transistor, Current Detector
Q901 ~ 903	2SC945-Q	Transistor, Loop Filter
Q904, 905	2SC1815-Y	Transistor, Switching
Q906 ~ 910	2SA1015-Y	Transistor, Switching FL Driver (Use in ranks Y or O)
DIODES		
D1 ~ 3	MA320G1-N MA162A	Diode, Variable Capacitor (for FM) Diode, Switching
D101 ~ 104, 150, 151, 202, 204 205, 752, 901 ~ 918, 933 ~ 936, 937, 938	LN313GP 20A90	Light Emitting Diode, Green Diode, Detector
D105, 203	SVDBB312E	Diode, Variable Capacitor (for AM)
D201	LN224RP	Light Emitting Diode, Red
D401 ~ 403	MA162A	Diode
D601, 602	MA27A2	Diode
D603, 604	MA162A	Diode
D605, 606	20A90	Diode, Detector
D607 ~ 614	SVDS3V40	Diode, Detector Rectifier
D701 ~ 704		
D705, 706	SVDMZL316A	Diode, 16V Zener Rectifier
D707, 708, 711 751	SVDSR1K2	Diode, 16V Zener Rectifier
D709	SVDMZ333B	Diode, 33V Zener
D710	SVDMZ327B	Diode, 27V Zener
D712	SVDMZ306C2	Diode, 6V Zener
D753 ~ 755	MA162A	Diode
D919	SVDMZ306B	Diode, 6V Zener
D920	LN220RP	Light Emitting Diode, Red
D921 ~ 925	LN413YP	Light Emitting Diode, Red
D926 ~ 932	LN831RP	Light Emitting Diode, Red

Ref. No.	Part No.	Part Name & Description
COILS and TRANSFORMERS		
L1	SLA4P55-P	Coil, FM Antenna
L2	SLD4P53-P	Coil, FM Detector
L3	RLQY15G5	Coil, Choke
L4	SLQ4N21	Coil, FM Local Oscillator
L5	RLQY25S2	Coil, Choke
L101	SLMIC61-P	Coil
L201	SLF2C33	Coil, AM Ferrite Bar Antenna
L202	SLQ2C29-P	Coil, AM Local Oscillator
L601, 602	SLQY15G-30	Coil, Choke
T1	SLI4C109	Transformer, FM IF
T101	SLI4C527-Z	Transformer, FM IF, Discriminator
T201	SLI2C127	Transformer, AM IF
T202	SLI2C413R	Transformer, AM IF
T701	SLT5P219-W	Transformer, Power Source
CERAMIC FILTERS		
CF101 ~ 104	SVFE107MM-B	Ceramic Filter, FM10.68MHz Blue
CF105	SVFE107MZ2-B	Ceramic Filter, FM10.675MHz Blue
CF201	SVFSP450HT	Ceramic Filter, AM 450kHz
VARIABLE RESISTORS		
VR101	EVTS3MA00B54	Muting Level Adjustment, 50k Ω (B)
VR102	EVNM4AA00B53	Frequency Meter Adjustment, 5k Ω (B)
VR136	EVNM0AA00B54	AM Frequency Meter Adjustment, 50k Ω (B)
VR301	EVTS3MA00B14	PLL MPX Adjustment, 10k Ω (B)
VR302, 303	EVTS3MA00B55	Separation Adjustment, 500k Ω (B)
VR501	EWJGFA066B15	Volume Control, 100k Ω (B)
VR502	EWHHMA551G15	Balance Control, 100k Ω (G)
VR503	EWJFCO066C15	Treble Control, 100k Ω (C)
VR504	EWJFCY066530	Bass Control, 100k Ω
R655, 656	EVTS3MA00B13	DC Adjustment, 1k Ω (B)
R657, 658	EVTS3MA00B14	ICQ Adjustment, 10k Ω (B)
VARIABLE CAPACITORS		
CT1	ECV1ZW06X53N	Trimmer, FM Local Oscillator
CT201, 202	ECV1ZW20X53N	Trimmer, AM Antenna
COMPONENT COMBINATIONS		
Z201	EXRF203Z471S	Component Combination 0.01 μ F, (X2), 470 Ω
Z601, 602	ECQJ0517	Component Combination, 0.047 μ F, 10 Ω
Z701 ~ 703	RXAF103P22HD	Component Combination, 0.01 μ F (X2)
Z901	EXFP7331MH	Component Combination, 330pF (X4)
Z902, 903	EXBP87104K	Component Combination, 100k Ω (X7)
Z904	EXBP83104M	Component Combination, 100k Ω (X3)
THERMISTERS		
TH601, 602	ERTD2ZHL103S	Thermister, Thermal Compensation, 10k Ω
CRYSTAL		
X901	SVQ43U452	Crystal, 4.5MHz Counter Oscillator
LAMP		
PL1	XAMR73S200A	Lamp, Frequency Meter, 6.3V, 0.25A
FUSES		
F1	XBA2C31TRO	Fuse, Power Source, T 315A (250V)
F2	XBA2C16TRO	Fuse, Power Source, T 1.6A (250V)
F3, 4	XBA2C06TRO	Fuse, Power Source, T 630mA (250V)
FLUORESCENT DISPLAY TUBE		
FL	SAD7MT29ZA	Fluorescent Display Tube
RELAY		
RLY751	SSY69	Relay, Speaker Output

Ref. No.	Part No.	Part Name & Description
METER		
	SSM173-1	Meter, Frequency
SWITCHES		
S1 ~ 12	SSG1	Switch, Memory/Presel/FM-AM/Manual
S14	SSS43	Switch, FM/AM Allocation
S15	SSH539	Switch, Subsonic, FM Muting Auto Scan
S401	SSH3009	Switch, Input Selector
S405	SSH3005	Switch, Tape Monitor & Loudnes
S601, 602	SSH2001	Switch, Speakers Selector
S701	ESB90159S	Switch, Power Source
S702	ESE37200	Switch, Voltage Adjuster
RESISTORS		
R1 except for [XL]	ERD50TJ823	Carbon, 82k Ω , 1/2W, \pm 5%
R2	RRD18XK472	Chip, 4.7k Ω , 1/8W, \pm 10%
R3	RRD18XK104	Chip, 100k Ω , 1/8W, \pm 10%
R4	RRD18XK100	Chip, 10 Ω , 1/8W, \pm 10%
R5	RRD18XK101	Chip, 100 Ω , 1/8W, \pm 10%
R6	RRD18XK472	Chip, 4.7k Ω , 1/8W, \pm 10%
R7	RRD18XK474	Chip, 470k Ω , 1/8W, \pm 10%
R8	RRD18XK102	Chip, 1k Ω , 1/8W, \pm 10%
R9	ERD25FJ331	Carbon, 330 Ω , 1/4W, \pm 5%
R10	RRD18XK331	Chip, 330 Ω , 1/8W, \pm 10%
R11	RRD18XK103	Chip, 10k Ω , 1/8W, \pm 10%
R12	RRD18XK333	Chip, 33k Ω , 1/8W, \pm 10%
R13	RRD18XK272	Chip, 2.7k Ω , 1/8W, \pm 10%
R14	RRD18XK104	Chip, 100k Ω , 1/8W, \pm 10%
R15	ERD25FJ102	Carbon, 1k Ω , 1/4W, \pm 5%
R16	RRD18XK332	Chip, 3.3k Ω , 1/8W, \pm 10%
R17	RRD18XK273	Chip, 27k Ω , 1/8W, \pm 10%
R18 except for [XL]	ERD50FJ472	Carbon, 4.7k Ω , 1/2W, \pm 5%
R101	RRD18XK102	Chip, 1k Ω , 1/8W, \pm 10%
R102	RRD18XK391	Chip, 390 Ω , 1/8W, \pm 10%
R103	RRD18XK561	Chip, 560 Ω , 1/8W, \pm 10%
R104	RRD18XK391	Chip, 390 Ω , 1/8W, \pm 10%
R105	ERD25CF1002	Metal Film, 10k Ω , 1/4W, \pm 1%
R108	RRD18XK273	Chip, 27k Ω , 1/8W, \pm 10%
R109	ERD25FJ470	Carbon, 47 Ω , 1/4W, \pm 5%
R110	RRD18XK103	Chip, 10k Ω , 1/8W, \pm 10%
R111	RRD18XK102	Chip, 1k Ω , 1/8W, \pm 10%
R112	RRD18XK153	Chip, 15k Ω , 1/8W, \pm 10%
R113	RRD18XK223	Chip, 22k Ω , 1/8W, \pm 10%
R114	RRD18XK103	Chip, 10k Ω , 1/8W, \pm 10%
R115	RRD18XK333	Chip, 33k Ω , 1/8W, \pm 10%
R116	RRD18XK103	Chip, 10k Ω , 1/8W, \pm 10%
R117	RRD18XK223	Chip, 22k Ω , 1/8W, \pm 10%
R118	RRD18XK561	Chip, 560 Ω , 1/8W, \pm 10%
R119	RRD18XK222	Chip, 2.2k Ω , 1/8W, \pm 10%
R120	RRD18XK561	Chip, 560 Ω , 1/8W, \pm 10%
R121	ERD25TJ473	Carbon, 47k Ω , 1/4W, \pm 5%
R122	RRD18XK103	Chip, 10k Ω , 1/8W, \pm 10%
R123	RRD18XK332	Chip, 3.3k Ω , 1/8W, \pm 10%
R124	ERD25TJ333	Carbon, 33k Ω , 1/4W, \pm 5%
R125, 126	ERD25FJ472	Carbon, 4.7k Ω , 1/4W, \pm 5%
R128	RRD18XK473	Chip, 47k Ω , 1/8W, \pm 10%
R130	RRD18XK472	Chip, 4.7k Ω , 1/8W, \pm 10%
R133	RRD18XK102	Chip, 1k Ω , 1/8W, \pm 10%
R134	RRD18XK153	Chip, 15k Ω , 1/8W, \pm 10%
R135	RRD18XK823	Chip, 82k Ω , 1/8W, \pm 10%
R137	RRD18XK104	Chip, 100k Ω , 1/8W, \pm 10%
R138	RRD18XK683	Chip, 68k Ω , 1/8W, \pm 10%
R139	RRD18XK272	Chip, 2.7k Ω , 1/8W, \pm 10%
R150	RRD18XK102	Chip, 1k Ω , 1/8W, \pm 10%
R151	RRD18XK392	Chip, 3.9k Ω , 1/8W, \pm 10%
R152	RRD18XK102	Chip, 1k Ω , 1/8W, \pm 10%
R153	RRD18XK681	Chip, 680 Ω , 1/8W, \pm 10%
R154	RRD18XK271	Chip, 270 Ω , 1/8W, \pm 10%
R155, 156	RRD18XK221	Chip, 220 Ω , 1/8W, \pm 10%
R157	RRD18XK221	Chip, 220 Ω , 1/8W, \pm 10%
R158	RRD18XK681	Chip, 680 Ω , 1/8W, \pm 10%
R159	RRD18XK332	Chip, 3.3k Ω , 1/8W, \pm 10%
R160	RRD18XK153	Chip, 15k Ω , 1/8W, \pm 10%
R161, 162	RRD18XK682	Chip, 6.8k Ω , 1/8W, \pm 10%
R197	ERD25CF1502	Metal Film, 15k Ω , 1/4W, \pm 5%
R201	ERD25FJ331	Carbon, 330 Ω , 1/4W, \pm 5%
R202	RRD18XK331	Chip, 330 Ω , 1/8W, \pm 10%

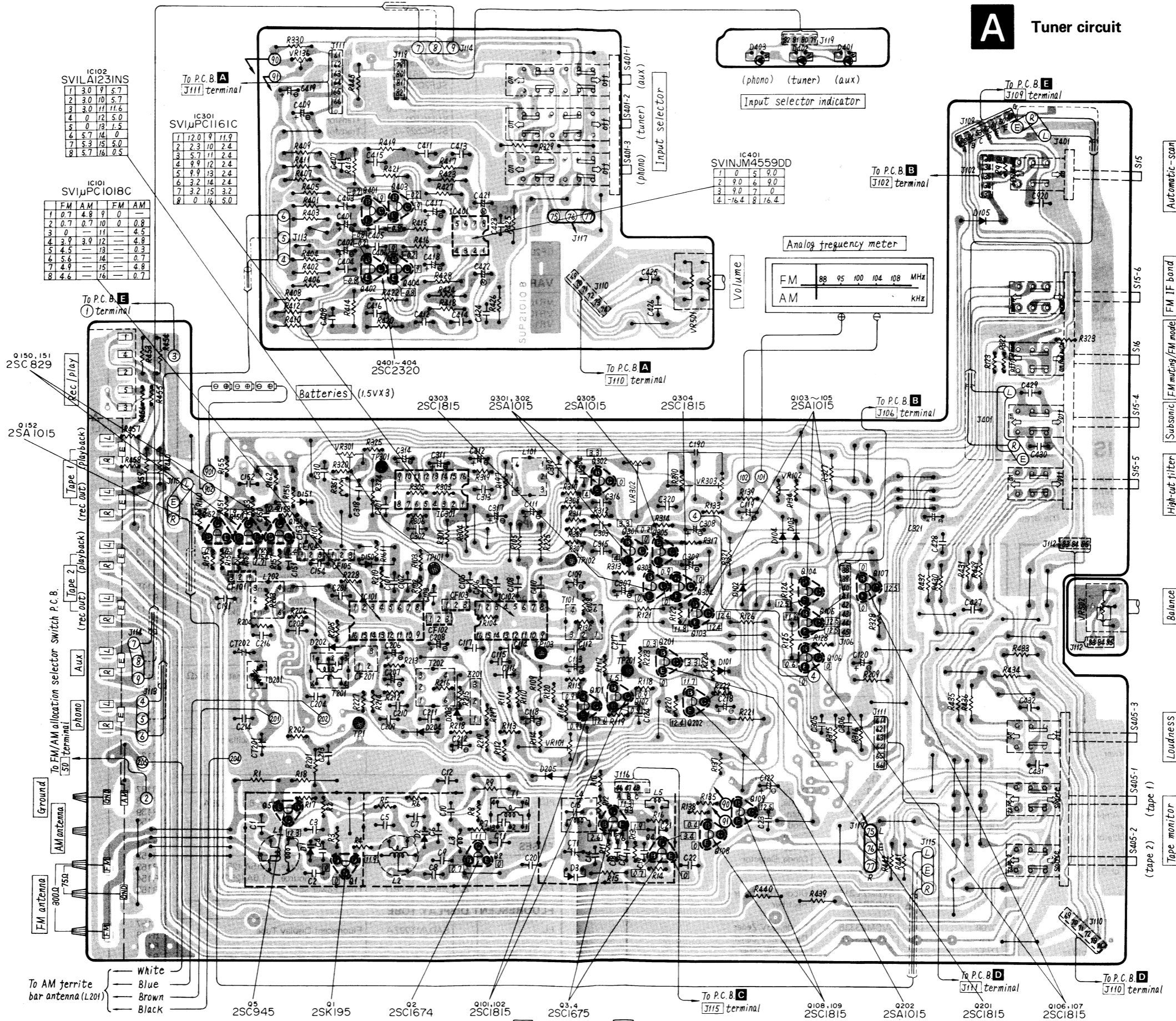
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CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

D Equalizer circuit

Ground (Earth) lines

A Tuner circuit



IC102 SV1A1231NS

1	3.0	9	5.7
2	3.0	10	5.7
3	3.0	11	11.6
4	0	12	5.0
5	0	13	1.5
6	5.7	14	0
7	5.3	15	5.0
8	5.7	16	0.5

IC101 SV1μPC1018C

	FM	AM	FM	AM
1	0.7	4.8	9	0
2	0.7	0.7	10	0
3	0	—	11	—
4	3.9	3.9	12	—
5	4.5	—	13	—
6	5.6	—	14	—
7	4.9	—	15	—
8	4.6	—	16	—

IC301 SV1μPC1161C

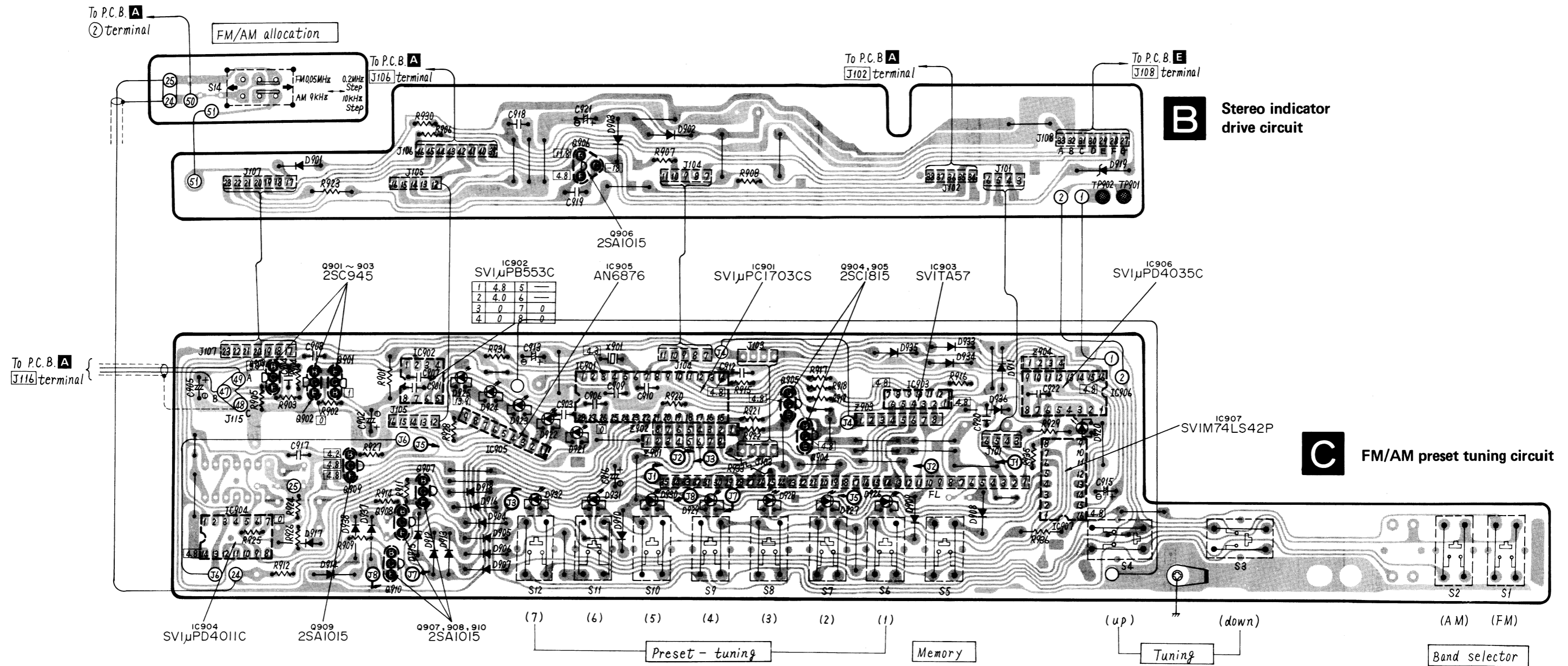
1	12.0	9	11.9
2	2.3	10	2.4
3	5.7	11	2.4
4	9.9	12	2.4
5	9.9	13	2.4
6	3.2	14	2.4
7	3.2	15	3.2
8	0	16	5.0

IC401 SV1NJM4559DD

1	0	5	9.0
2	9.0	6	9.0
3	9.0	7	0
4	-76.4	8	116.4

To AM ferrite bar antenna (L201)

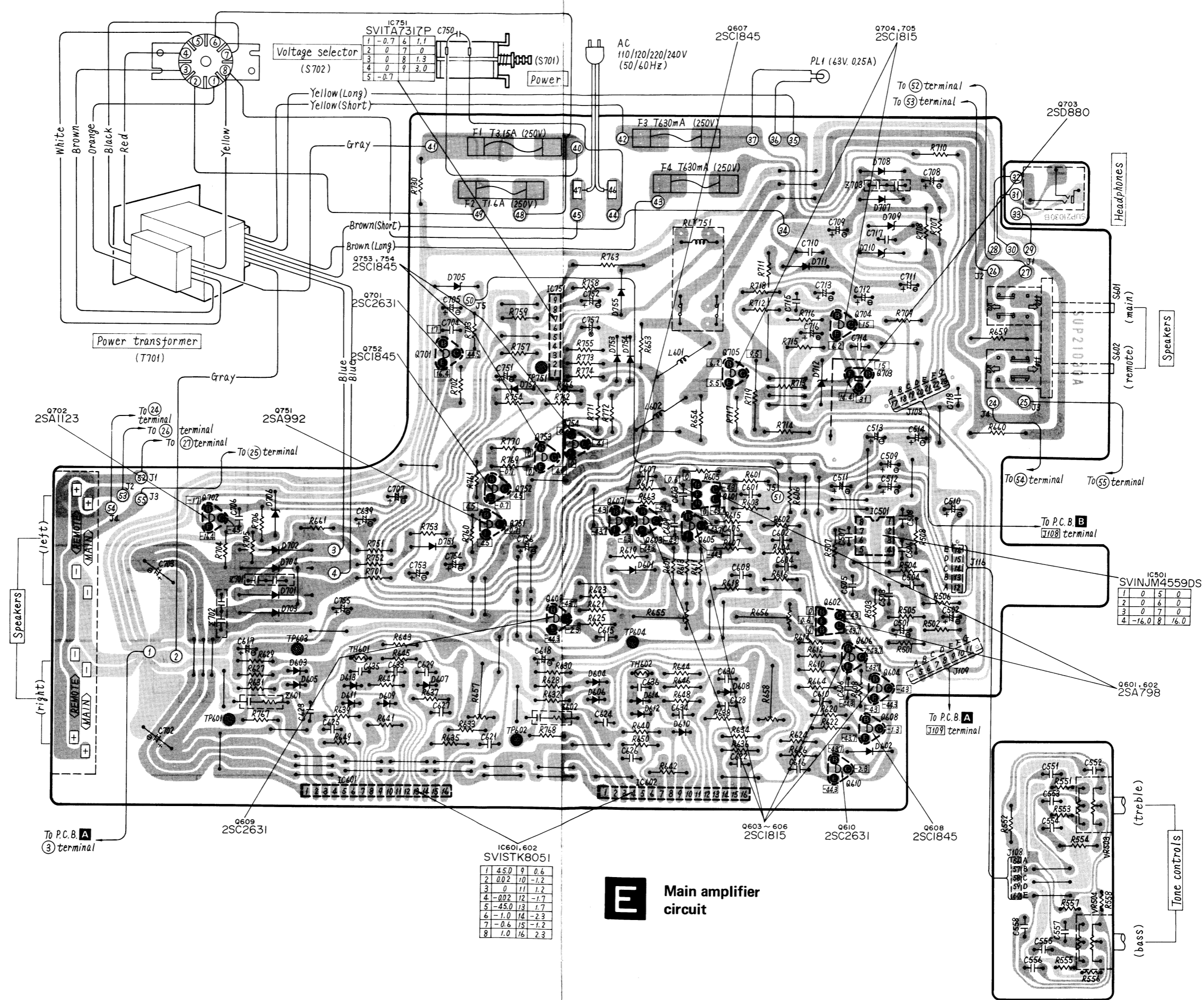
- White
- Blue
- Brown
- Black



• Terminal guide of transistors, diodes and IC's

SV1μPC1018C, SV1μPC1161C SV1LA1231NS, SV1M74LS42P	SV1NJM4559	SV1μPB553C-E	SV1TA57	AN6876	2SC1674, 2SC1675 2SC1815, 2SA1015 2SC945, 2SC2320 2SC1845, 2SC2631 2SA1123, 2SA992	2SD880	MA320GIN	SVDMZ□□□□□	LN220RP
SV1STK8040	SV1TA7317P	SV1μPD4011C, SV1μPD4035C	SV1DI703C016	2SK195		2SA798A	SV1DBB312	LN213RP, LN313GP, LN224RP	LN831RP

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Voltage selector (S702)

1	0.7	1.1
2	0	7
3	0	8
4	0	9
5	-0.7	3.0

IC501 SVINJM4559DS

1	0	5	0
2	0	6	0
3	0	7	0
4	-16.0	8	16.0

IC601, 602 SVISTK8051

1	4.50	9	0.6
2	0.02	10	-1.2
3	0	11	1.2
4	-0.02	12	-1.7
5	-4.50	13	1.7
6	-1.0	14	-2.3
7	-0.6	15	-1.2
8	1.0	16	2.3

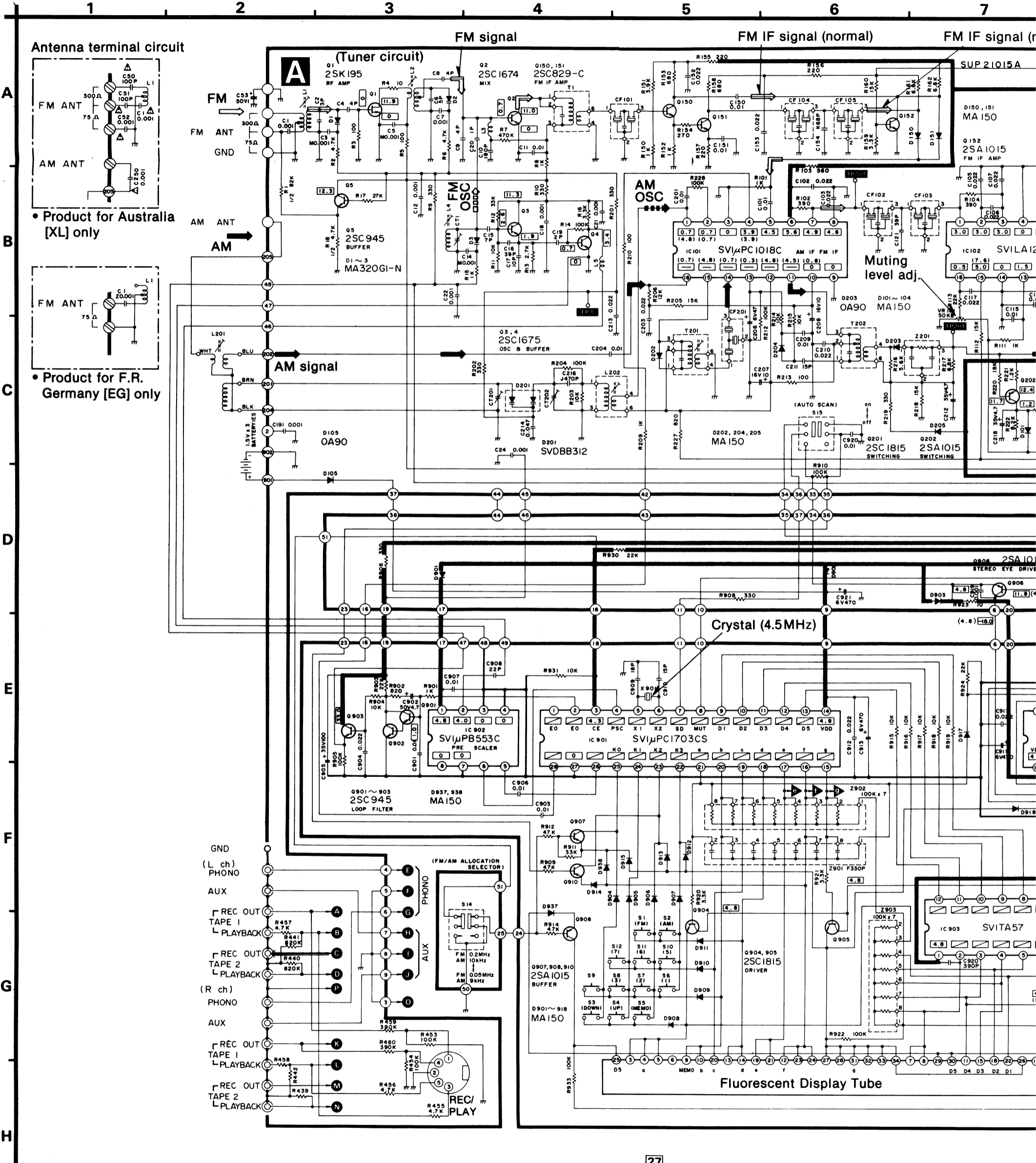
E Main amplifier circuit

SCHEMATIC DIAGRAM

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

- Notes:**
- S1, 2:** Band selectors switch.
[S1 - FM]
[S2 - AM]
 - S3, 4:** Tuning switch
[S3 - down]
[S4 - up]
 - S5:** Memory switch.
 - S6 ~ 12:** Preset-tuning switch.
[S6 - 1 ch, S7 - 2 ch, S8 - 3 ch, S9 - 4 ch,
S10 - 5 ch, S11 - 6 ch, S12 - 7 ch]
 - S14:** FM/AM allocation switch in "FM 0.2MHz/AM 10kHz step" position.
FM 0.05MHz/AM 9kHz step → FM 0.2MHz/AM 10kHz step
 - S15-1:** Automatic-scan switch in "on" position.
on → off (manual)

- S15-3:** FM muting on/FM
- S15-4:** Subsonic
- S15-5:** High-cut
- S15-6:** FM IF ba
- S401-1 ~ 401-3:** Input sele [S401
- S405-1, 405-2:** Tape-mor [S405
- S405-3:** Loudness
- S601, 602:** Speaker s [S601
- S701:** Power swi

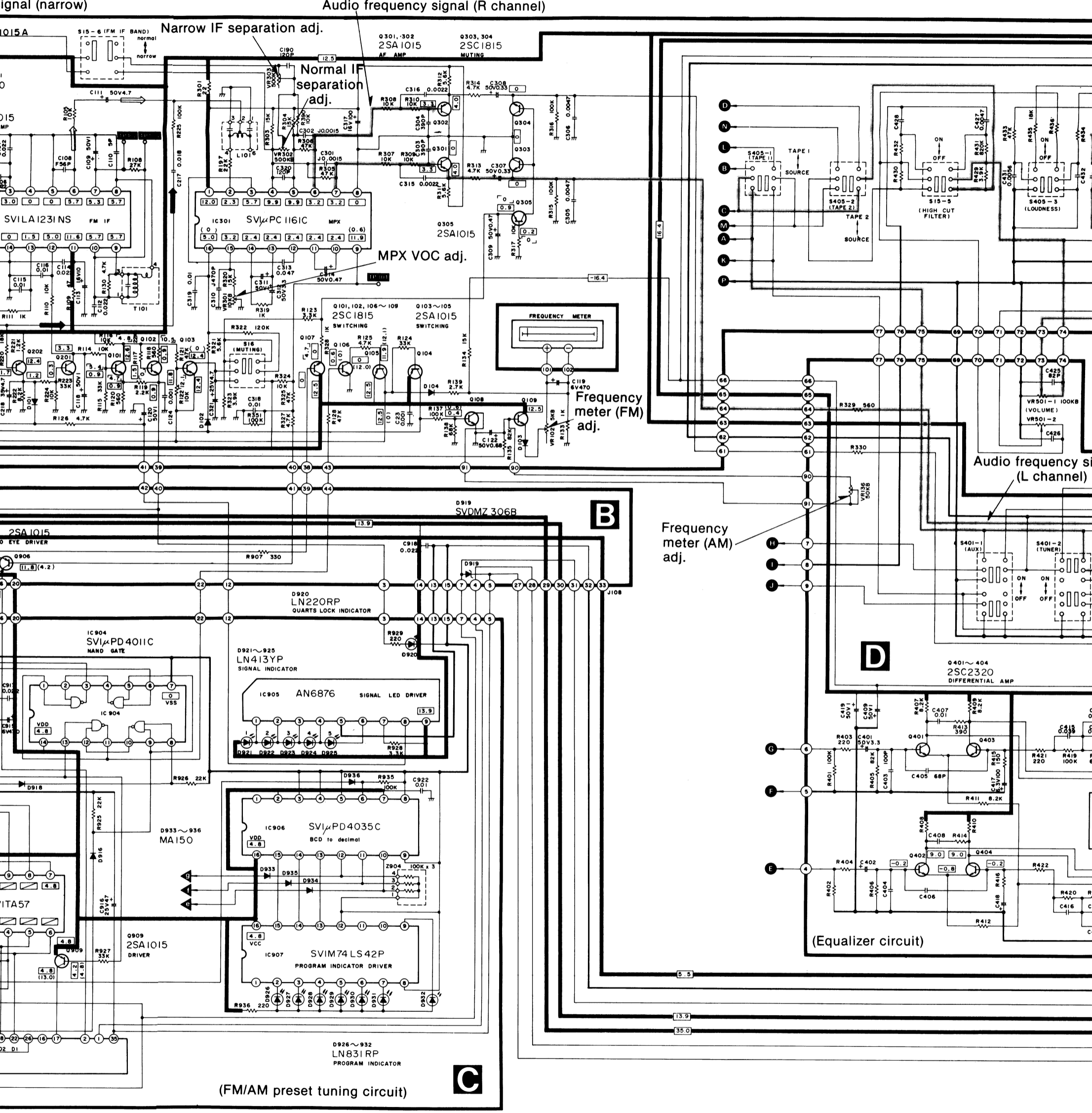


FM muting/FM mode switch in "on/FM auto" position.
 on/FM auto ← off/FM mono
 Subsonic filter switch in "off" position.
 High-cut filter switch in "off" position.
 FM IF band switch in "normal" position.
 Input selectors switch in "tuner" position.
 [S401-1 - aux, S401-2 - tuner, S401-3 - phono]
 Tape-monitor selectors switch in "source" position.
 [S405-1 - tape 1, S405-2 - tape 2]
 Loudness switch in "off" position.
 Speaker selectors switch in "main" position.
 [S601 - main, S602 - remote]
 Power switch in "on" position.

16. **S702** : Voltage selector switch in "240V" position.
 110V ↔ 120V ↔ 220V ↔ 240V
 17. 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 □ stand for DC voltage in FM/AM signal reception mode.
 * Figures in ◁ ▷ stand for DC voltage in FM stereo signal reception mode.
 * Figures in ▢ stand for DC voltage in FM (no signal) muting to on mode.
 * Figures in () stand for DC voltage with the band selectors circuit set at AM.
 * □ marked terminal : 5V or 0V output.
 18. Transistor and IC terminals which carry no voltage indication emit 5V pulse waveforms or are subject to change according to the frequency or input signal levels.

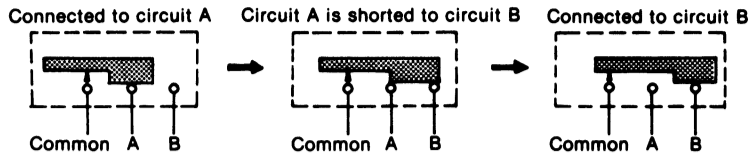
19. Signal lines
 → FM composite signal
 → Audio frequency signal
 → Positive voltage lines
 20. Important safety notice:
 Components identified by Δ make have special characteristics.
 When replacing any of these components, use only manufacturer's original parts.

8 9 10 11 12 13 14

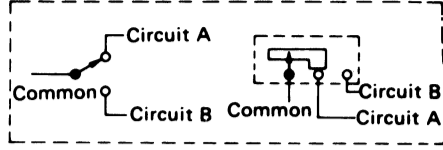


Shorting Switch

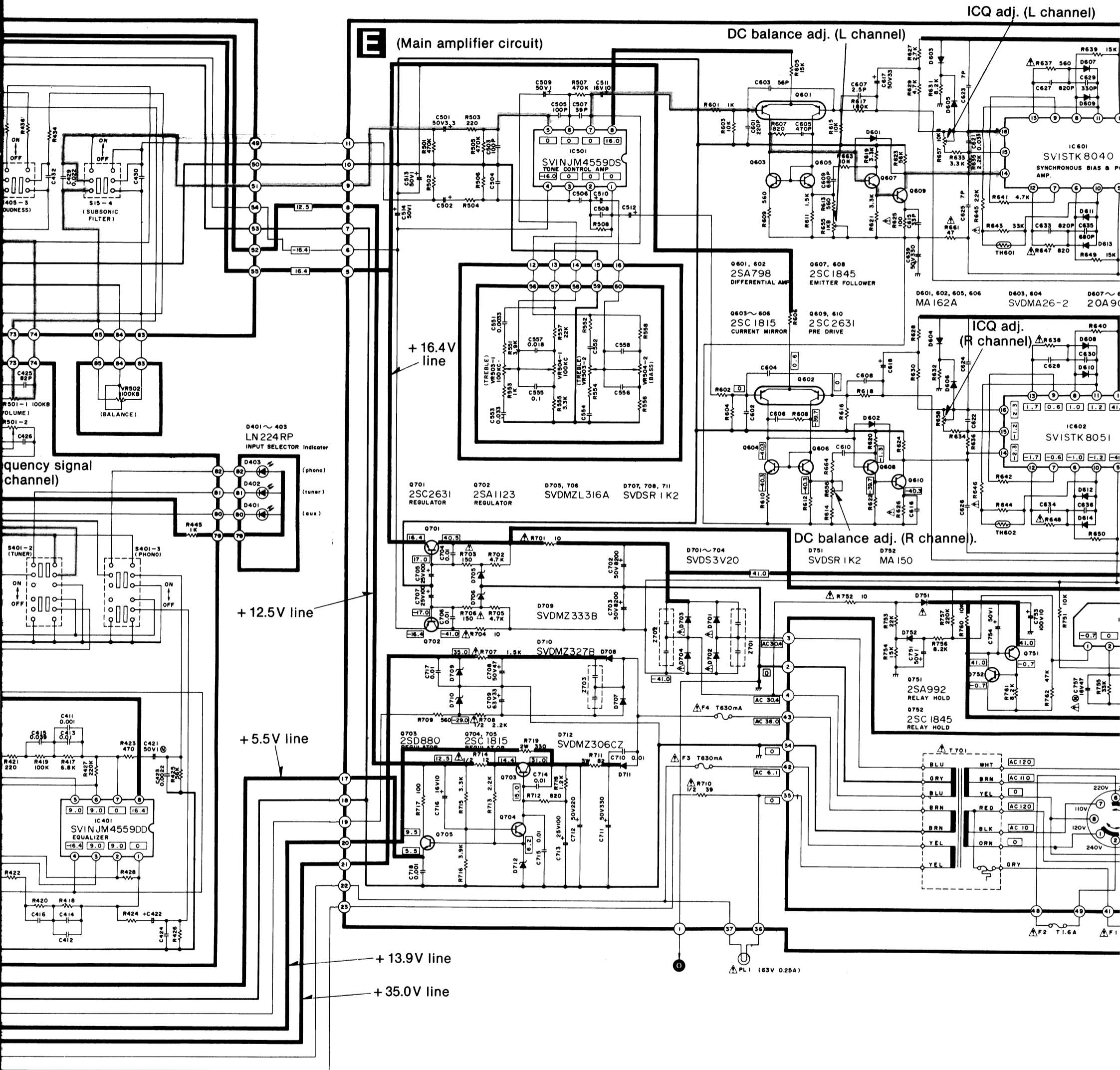
This unit uses a shorting switch. As illustrated below, the circuit is shorted to the next circuit without being opened. In the circuit diagram, the shaded area represents the common terminal.



An example of circuit diagram



14 15 16 17 18 19 20 21



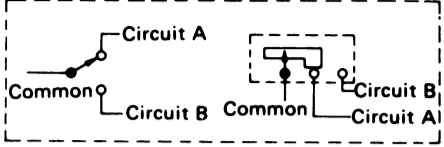
circuit is shorted

Common terminal.

connected to circuit B

Common A B

An example of circuit diagram



18

19

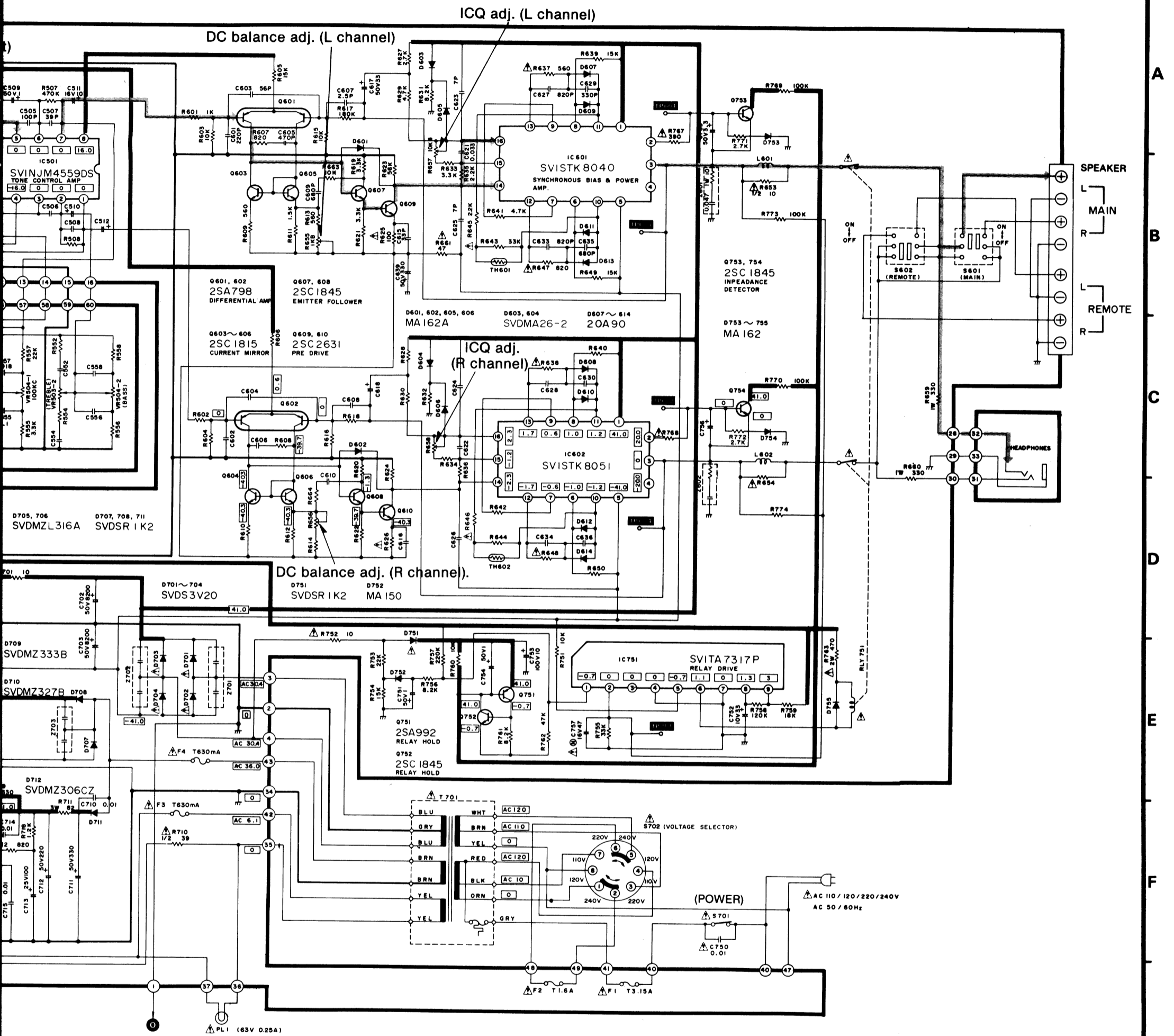
20

21

22

23

24



A

B

C

D

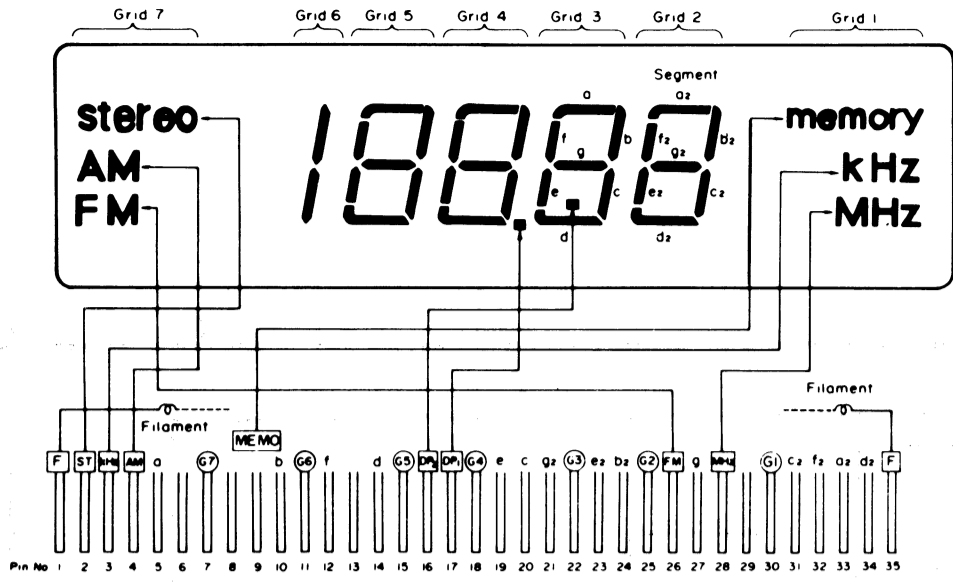
E

F

G

H

• Fluorescent Display Tube (FL)



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Continued from page 20

Ref. No.	Part No.	Part Name & Description
R203	RRD18XK103	Chip, 10kΩ, 1/8W, ± 10%
R204	RRD18XK104	Chip, 100kΩ, 1/8W, ± 10%
R205	RRD18XK153	Chip, 15kΩ, 1/8W, ± 10%
R206	RRD18XK123	Chip, 12kΩ, 1/8W, ± 10%
R209	ERD25FJ102	Carbon, 1kΩ, 1/4W, ± 5%
R210	RRD18XK101	Chip, 100kΩ, 1/8W, ± 10%
R212	RRD18XK104	Chip, 100kΩ, 1/8W, ± 10%
R213	RRD18XK101	Chip, 100kΩ, 1/8W, ± 10%
R214, 215	RRD18XK103	Chip, 10kΩ, 1/8W, ± 10%
R216	RRD18XK562	Chip, 5.6kΩ, 1/8W, ± 10%
R217	RRD18XK682	Chip, 6.8kΩ, 1/8W, ± 10%
R218	RRD18XK153	Chip, 15kΩ, 1/8W, ± 10%
R219	RRD18XK331	Chip, 330Ω, 1/8W, ± 10%
R220	RRD18XK183	Chip, 18kΩ, 1/8W, ± 10%
R221	ERD25FJ122	Carbon, 1.2kΩ, 1/4W, ± 5%
R222	RRD18XK822	Chip, 8.2kΩ, 1/8W, ± 10%
R223	RRD18XK333	Chip, 33kΩ, 1/8W, ± 10%
R224	RRD18XK103	Chip, 10kΩ, 1/8W, ± 10%
R225	ERO25CKF1003	Metal Film, 100kΩ, 1/4W, ± 1%
R227	RRD18XK821	Chip, 820Ω, 1/8W, ± 10%
R228	RRD18XK104	Chip, 100kΩ, 1/8W, ± 10%
R301	ERD25FJ220	Carbon, 22Ω, 1/4W, ± 5%
R303	RRD18XK223	Chip, 22kΩ, 1/8W, ± 10%
R304	ERD25TJ223	Carbon, 22kΩ, 1/4W, ± 5%
R305, 306	RRD18XK473	Chip, 47kΩ, 1/8W, ± 10%
R307, 308	RRD18XK103	Chip, 10kΩ, 1/8W, ± 10%
R309, 310	RRD18XK103	Chip, 10kΩ, 1/8W, ± 10%
R311, 312	RRD18XK562	Chip, 5.6kΩ, 1/8W, ± 10%
R313, 314	RRD18XK472	Chip, 4.7kΩ, 1/8W, ± 10%
R315, 316	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%
R317	RRD18XK103	Chip, 10kΩ, 1/8W, ± 10%
R319	RRD18XK102	Chip, 1kΩ, 1/8W, ± 10%
R320	RRD18XK153	Chip, 15kΩ, 1/8W, ± 10%
R321	ERD25FJ562	Carbon, 5.6kΩ, 1/8W, ± 10%
R322	RRD18XK124	Chip, 12kΩ, 1/8W, ± 10%
R323	RRD18XK392	Chip, 3.9kΩ, 1/8W, ± 10%
R324	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%
R325	RRD18XK473	Chip, 47kΩ, 1/8W, ± 10%
R327	ERD25FJ472	Carbon, 4.7kΩ, 1/4W, ± 5%
R328	ERD25FJ102	Carbon, 1kΩ, 1/4W, ± 5%
R329, 330	ERD25FJ561	Carbon, 560Ω, 1/4W, ± 5%
R351	RRD18XK104	Chip, 100kΩ, 1/8W, ± 10%
R390	RRD18XK103	Chip, 10kΩ, 1/8W, ± 10%
R401, 402	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%
R403, 404	ERD25FJ221	Carbon, 220Ω, 1/4W, ± 5%
R405, 406	ERD25TJ823	Carbon, 82kΩ, 1/4W, ± 5%
R407, 408	ERD25FJ822	Carbon, 8.2kΩ, 1/4W, ± 5%
R409, 410	ERD25FJ822	Carbon, 8.2kΩ, 1/4W, ± 5%
R411, 412	ERD25FJ822	Carbon, 8.2kΩ, 1/4W, ± 5%
R413, 414	ERD25FJ391	Carbon, 390Ω, 1/4W, ± 5%
R415, 416	ERD25FJ151	Carbon, 150Ω, 1/4W, ± 5%
R417, 418	ERO25CKF6801	Metal Film, 6.8kΩ, 1/4W, ± 1%
R419, 420	ERO25CKF1003	Metal Film, 100kΩ, 1/4W, ± 1%
R421, 422	ERD25FJ221	Carbon, 220Ω, 1/4W, ± 5%
R423, 424	ERD25FJ471	Carbon, 470Ω, 1/4W, ± 5%
R425, 426	ERD25TJ563	Carbon, 56kΩ, 1/4W, ± 5%
R427, 428	ERD25FJ224	Carbon, 22kΩ, 1/4W, ± 5%
R429, 430	ERD25FJ392	Carbon, 3.9kΩ, 1/4W, ± 5%
R431, 432	ERD25TJ824	Carbon, 82kΩ, 1/4W, ± 5%
R433, 434	ERD25TJ473	Carbon, 47kΩ, 1/4W, ± 5%
R435, 436	ERD25TJ183	Carbon, 18kΩ, 1/4W, ± 5%
R439, 440	ERD25TJ824	Carbon, 82kΩ, 1/4W, ± 5%
R441, 442	ERD25TJ824	Carbon, 82kΩ, 1/4W, ± 5%
R445	ERD25FJ102	Carbon, 1kΩ, 1/4W, ± 5%
R453, 454	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%
R455, 456	RRD18XK472	Chip, 4.7kΩ, 1/8W, ± 10%
R457, 458	RRD18XK472	Chip, 4.7kΩ, 1/8W, ± 10%
R459, 460	ERD25TJ394	Carbon, 390kΩ, 1/4W, ± 5%
R501, 502	ERD25TJ474	Carbon, 470kΩ, 1/4W, ± 5%
R503, 504	ERD25FJ221	Carbon, 220Ω, 1/4W, ± 5%
R505, 506	ERD25TJ474	Carbon, 470kΩ, 1/4W, ± 5%
R507, 508	ERD25TJ474	Carbon, 470kΩ, 1/4W, ± 5%
R551	RRD18XK392	Chip, 3.9kΩ, 1/8W, ± 10%
R552	ERD25FJ392	Carbon, 3.9kΩ, 1/4W, ± 5%
R553	RRD18XK102	Chip, 1kΩ, 1/8W, ± 10%
R554	ERD25FJ102	Carbon, 1kΩ, 1/4W, ± 5%
R555, 556	RRD18XK332	Chip, 3.3kΩ, 1/8W, ± 10%
R557, 558	RRD18XK223	Chip, 22kΩ, 1/8W, ± 10%
R601, 602	ERD25FJ102	Carbon, 1kΩ, 1/4W, ± 5%
R603, 604	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%
R605, 606	ERD25TJ153	Carbon, 15kΩ, 1/4W, ± 5%
R607, 608	ERD25FJ821	Carbon, 820Ω, 1/4W, ± 5%
R609, 610	ERD25FJ561	Carbon, 560Ω, 1/4W, ± 5%
R611, 612	ERD25FJ152	Carbon, 1.5kΩ, 1/4W, ± 5%
R613, 614	ERD25FJ561	Carbon, 560Ω, 1/4W, ± 5%
R615, 616	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%

Ref. No.	Part No.	Part Name & Description
R617, 618	ERD25TJ184	Carbon, 180kΩ, 1/4W, ± 5%
R619, 620	ERD25FJ332	Carbon, 3.3kΩ, 1/4W, ± 5%
R621, 622	ERD25FJ332	Carbon, 3.3kΩ, 1/4W, ± 5%
R623, 624	ERD25TJ563	Carbon, 56kΩ, 1/4W, ± 5%
R625, 626	ERD25FJ101	Carbon, 100Ω, 1/4W, ± 5%
R627, 628	ERD25FJ272	Carbon, 2.7kΩ, 1/4W, ± 5%
R629, 630	ERD25FJ472	Carbon, 4.7kΩ, 1/4W, ± 5%
R631, 632	ERD25FJ822	Carbon, 8.2kΩ, 1/4W, ± 5%
R633, 634	ERD25FJ332	Carbon, 3.3kΩ, 1/4W, ± 5%
R635, 636	ERD25FJ222	Carbon, 2.2kΩ, 1/4W, ± 5%
R637, 638	ERD25FJ561	Carbon, 560Ω, 1/4W, ± 5%
R639, 640	ERD25TJ153	Carbon, 15kΩ, 1/4W, ± 5%
R641, 642	ERD25FJ472	Carbon, 4.7kΩ, 1/4W, ± 5%
R643, 644	ERD25TJ333	Carbon, 33kΩ, 1/4W, ± 5%
R645, 646	ERD25FJ222	Carbon, 2.2kΩ, 1/4W, ± 5%
R647, 648	ERD25FJ821	Carbon, 820Ω, 1/4W, ± 5%
R649, 650	ERD25TJ153	Carbon, 15kΩ, 1/4W, ± 5%
R653, 654	ERD50FJ100	Carbon, 10Ω, 1/2W, ± 5%
R659, 660	ERG1ANJ331	Metal Oxide, 330Ω, 1W, ± 5%
R661	ERD25FJ470	Carbon, 47Ω, 1/4W, ± 5%
R663, 664	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%
R701	ERD25FJ100	Carbon, 10Ω, 1/4W, ± 5%
R702	ERD25FJ472	Carbon, 4.7kΩ, 1/4W, ± 5%
R703	ERD25FJ151	Carbon, 150Ω, 1/4W, ± 5%
R704	ERD25FJ100	Carbon, 10Ω, 1/4W, ± 5%
R705	ERD25FJ472	Carbon, 4.7kΩ, 1/4W, ± 5%
R706	ERD25FJ151	Carbon, 150Ω, 1/4W, ± 5%
R707	ERD25FJ152	Carbon, 1.5kΩ, 1/4W, ± 5%
R708	ERD50FJ222	Carbon, 2.2kΩ, 1/2W, ± 5%
R709	ERD25FJ561	Carbon, 560Ω, 1/4W, ± 5%
R710	ERD50FJ390	Carbon, 39Ω, 1/2W, ± 5%
R711	ERG3ANJ820	Metal Oxide, 82Ω, 3W, ± 5%
R712	ERD25FJ821	Carbon, 820Ω, 1/4W, ± 5%
R713	ERD25FJ222	Carbon, 2.2kΩ, 1/4W, ± 5%
R714	ERD50FJ120	Carbon, 12Ω, 1/2W, ± 5%
R715	ERD25FJ332	Carbon, 3.3kΩ, 1/4W, ± 5%
R716	ERD25FJ392	Carbon, 3.9kΩ, 1/4W, ± 5%
R717	ERD25FJ101	Carbon, 100Ω, 1/4W, ± 5%
R718	ERD25FJ122	Carbon, 1.2kΩ, 1/4W, ± 5%
R719	ERG2ANJ331	Metal Oxide, 330Ω, 1/2W, ± 5%
R751	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%
R752	ERD25FJ100	Carbon, 10Ω, 1/4W, ± 5%
R753	ERD25TJ223	Carbon, 22kΩ, 1/4W, ± 5%
R754	ERD25TJ153	Carbon, 15kΩ, 1/4W, ± 5%
R755	ERD25TJ333	Carbon, 33kΩ, 1/4W, ± 5%
R756	ERD25FJ822	Carbon, 8.2kΩ, 1/4W, ± 5%
R757	ERD25TJ224	Carbon, 22kΩ, 1/4W, ± 5%
R758	ERD25TJ124	Carbon, 12kΩ, 1/4W, ± 5%
R759	ERD25TJ183	Carbon, 18kΩ, 1/4W, ± 5%
R760	ERD25FJ103	Carbon, 10kΩ, 1/4W, ± 5%
R761	ERD25FJ822	Carbon, 8.2kΩ, 1/4W, ± 5%
R762	ERD25TJ473	Carbon, 47kΩ, 1/4W, ± 5%
R763	ERG2ANJ471	Metal Oxide, 470Ω, 2W, ± 5%
R767, 768	ERD25FJ391	Carbon, 390Ω, 1/4W, ± 5%
R769, 770	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%
R771, 772	ERD25FJ272	Carbon, 2.7kΩ, 1/4W, ± 5%
R773, 774	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%
R901	ERD25FJ102	Carbon, 1kΩ, 1/4W, ± 5%
R902	RRD18XK821	Chip, 820Ω, 1/8W, ± 10%
R903	RRD18XK223	Chip, 22kΩ, 1/8W, ± 10%
R904	RRD18XK103	Chip, 10kΩ, 1/8W, ± 10%
R905	RRD18XK104	Chip, 100kΩ, 1/8W, ± 10%
R906, 907	RRD18XK331	Chip, 330Ω, 1/8W, ± 10%
R908	RRD18XK331	Chip, 330Ω, 1/8W, ± 10%
R909	RRD18XK473	Chip, 47kΩ, 1/8W, ± 10%
R910	RRD18XK104	Chip, 100kΩ, 1/8W, ± 10%
R911	RRD18XK333	Chip, 33kΩ, 1/8W, ± 10%
R912	RRD18XK473	Chip, 47kΩ, 1/8W, ± 10%
R914	RRD18XK473	Chip, 47kΩ, 1/8W, ± 10%
R915	RRD18XK103	Chip, 10kΩ, 1/8W, ± 10%
R916, 917	RRD18XK103	Chip, 10kΩ, 1/8W, ± 10%
R918, 919	RRD18XK103	Chip, 10kΩ, 1/8W, ± 10%
R920, 921	RRD18XK332	Chip, 3.3kΩ, 1/8W, ± 10%
R922	RRD18XK104	Chip, 100kΩ, 1/8W, ± 10%
R923	ERD25FJ100	Carbon, 10Ω, 1/4W, ± 5%
R924, 925	RRD18XK223	Chip, 22kΩ, 1/8W, ± 10%
R926	RRD18XK223	Chip, 22kΩ, 1/8W, ± 10%
R927	RRD18XK333	Chip, 33kΩ, 1/8W, ± 10%
R928	RRD18XK332	Chip, 3.3kΩ, 1/8W, ± 10%
R929	ERD25FJ221	Carbon, 220Ω, 1/4W, ± 5%
R930	RRD18XK223	Chip, 22kΩ, 1/8W, ± 10%
R931	RRD18XK103	Chip, 10kΩ, 1/8W, ± 10%

Ref. No.	Part No.	Part Name & Description
R933	ERD25TJ104	Carbon, 100kΩ, 1/4W, ± 5%
R935	RRD18XK104	Chip, 100kΩ, 1/8W, ± 10%
R936	ERD25FJ221	Carbon, 220Ω, 1/4W, ± 5%
CAPACITORS		
C1	ECKD1H1022F	Ceramic, 0.001μF, 50V, ± 80%
C2	ECCD1H030CC	Ceramic, 3pF, 50V, ± 0.25pF
C3	ECKD1H102MD	Ceramic, 0.001μF, 50V, ± 20%
C4	ECCD1H040CC	Ceramic, 4pF, 50V, ± 0.25pF
C5	ECKD1H102ZF	Ceramic, 0.001μF, 50V, ± 80%
C6	ECCD1H050CC	Ceramic, 5pF, 50V, ± 0.25pF
C7	ECKD1H102MD	Ceramic, 0.001μF, 50V, ± 20%
C8, 9	ECCD1H040CC	Ceramic, 4pF, 50V, ± 0.25pF
C10	ECKD1H181K	Ceramic, 180pF, 50V, ± 1C%
C11	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C12	ECKD1H102ZF	Ceramic, 0.001μF, 50V, ± 80%
C14	ECKD1H102MD	Ceramic, 0.001μF, 50V, ± 20%
C15	ECUX1H070DC	Chip, 7pF, 50V, ± 0.5pF
C16	ECUX1H390KC	Chip, 39pF, 50V, ± 10%
C17	ECUX1H100KC	Chip, 10pF, 50V, ± 10%
C18	ECUX1H102ZF	Chip, 0.001μF, 50V, ± 80%
C19	ECUX1H020CC	Chip, 2pF, 50V, ± 0.25pF
C20	ECUX1H010CC	Chip, 1pF, 50V, ± 0.25pF
C21, 22	ECUX1H102ZF	Chip, 0.001μF, 50V, ± 80%
C23, 24	ECKD1H102ZF	Ceramic, 0.001μF, 50V, ± 80%
C50, 51 [XL] only	ECKDHS101MB	Ceramic, 100pF, 400VAC, ± 20%
C52 [XL] only	ECKDHS102MD	Ceramic, 0.001μF, 400VAC, ± 20%
C53 [XL] only	ECEA50Z1	Electrolytic, 1μF, 50V
C101	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C102	ECKD1H223ZF	Ceramic, 0.022μF, 50V, ± 80%
C103	ECUX1H223ZF	Chip, 0.022μF, 50V, ± 80%
C105, 106	ECKD1H223ZF	Ceramic, 0.022μF, 50V, ± 80%
C107	ECKD1H223ZF	Ceramic, 0.022μF, 50V, ± 80%
C108	ECCD1H560K	Ceramic, 56pF, 50V, ± 10%
C109	ECEA50Z1	Electrolytic, 1μF, 50V
C110	ECCD1H050CC	Ceramic, 5pF, 50V, ± 0.25pF
C111	ECEA50M4R7R	Electrolytic, 4.7μF, 50V
C112	ECKD1H223ZF	Ceramic, 0.022μF, 50V, ± 80%
C113	ECEA1HS100	Electrolytic, 10μF, 50V
C114	ECKD1H223ZF	Ceramic, 0.022μF, 50V, ± 80%
C115, 116	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C117	ECUX1H223ZF	Chip, 0.022μF, 50V, ± 80%
C118	ECEA50Z1	Electrolytic, 1μF, 50V
C119	ECEA50S471	Electrolytic, 470μF, 6.3V
C120	ECEA50Z1	Electrolytic, 1μF, 50V
C122	ECEA50ZR68	Electrolytic, 0.68μF, 50V
C124	ECKD1H102ZF	Ceramic, 0.001μF, 50V, ± 80%
C150	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C151	ECUX1H103ZF	Chip, 0.01μF, 50V, ± 80%
C152, 153	ECKD1H223ZF	Ceramic, 0.022μF, 50V, ± 80%
C154	ECUX1H390KC	Chip, 39pF, 50V, ± 10%
C190	ECCD1H121K	Ceramic, 120pF, 50V, ± 10%
C191	ECEA50Z3R3	Electrolytic, 3.3μF, 50V
C201	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C203	ECKD1H223ZF	Ceramic, 0.022μF, 50V, ± 80%
C204	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C206	ECEA1AS470	Electrolytic, 47μF, 10V
C207, 208	ECEA1HS100	Electrolytic, 10μF, 50V
C209	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
C210	ECKD1H223ZF	Ceramic, 0.022μF, 50V, ± 80%
C211	ECCD1H150KC	Ceramic, 15pF, 50V, ± 10%
C212	ECEA1JS4R7	Electrolytic, 4.7μF, 6.3V
C213	ECKD1H223ZF	Ceramic, 0.022μF, 50V, ± 80%
C214	ECQM1H473KZ	Polyester, 0.047μF, 50V, ± 1

Part Name & Description	Ref. No.	Part No.	Part Name & Description
Carbon, 100kΩ, 1/4W, ± 5%	C403, 404	ECCD1H101K	Ceramic, 100pF, 50V, ± 10%
Carbon, 100kΩ, 1/8W, ± 10%	C405, 406	ECCD1H680K	Ceramic, 68pF, 50V, ± 10%
Carbon, 220Ω, 1/4W, ± 5%	C407, 408	ECKD1H103MD	Ceramic, 0.01μF, 50V, ± 20%
	C409	ECEA50Z1	Electrolytic, 1μF, 50V
	C411, 412	ECQM1H102KZ	Polyester, 0.001μF, 50V, ± 10%
	C413, 414	ECQM1H103JZ	Polyester, 0.01μF, 50V, ± 5%
	C415, 416	ECQM1H393JZ	Polyester, 0.039μF, 50V, ± 5%
	C417, 418	ECEA1AS101	Electrolytic, 100μF, 10V
	C419	ECEA50Z1	Electrolytic, 1μF, 50V
	C421, 422	ECEA50N1	Electrolytic, 1μF, 50V
	C423, 424	ECQM1H222KZ	Polyester, 0.0022μF, 50V, ± 10%
	C425, 426	ECCD1H820K	Ceramic, 82pF, 50V, ± 10%
	C427, 428	ECQM1H472KZ	Polyester, 0.0047μF, 50V, ± 10%
	C429, 430	ECQM1H223KZ	Polyester, 0.022μF, 50V, ± 10%
	C431, 432	ECQM1H563KZ	Polyester, 0.056μF, 50V, ± 10%
	C501, 502	ECEA50M3R3R	Electrolytic, 3.3μF, 50V
	C503, 504	ECCD1H101K	Ceramic, 100pF, 50V, ± 10%
	C505, 506	ECCD1H101K	Ceramic, 100pF, 50V, ± 10%
	C507, 508	ECCD1H390K	Ceramic, 39pF, 50V, ± 10%
	C509, 510	ECEA50Z1	Electrolytic, 1μF, 50V
	C511, 512	ECEA1HS100	Electrolytic, 10μF, 50V
	C513, 514	ECEA50Z1	Electrolytic, 1μF, 50V
	C551, 552	ECQM1H332KZ	Polyester, 0.0033μF, 50V, ± 10%
	C553, 554	ECQM1H333KZ	Polyester, 0.033μF, 50V, ± 10%
	C555, 556	ECQM1H104KZ	Polyester, 0.1μF, 50V, ± 10%
	C557, 558	ECQM1H183KZ	Polyester, 0.018μF, 50V, ± 10%
	C601, 602	ECKD1H221KB	Ceramic, 220pF, 50V, ± 10%
	C603, 604	ECCD1H560K	Ceramic, 56pF, 50V, ± 10%
	C605, 606	ECKD1H471KB	Ceramic, 470pF, 50V, ± 10%
	C607, 608	ECCD1H2R5C	Ceramic, 2.5pF, 50V, ± 0.25pF
	C609, 610	ECKD1H681KB	Ceramic, 680pF, 50V, ± 10%
	C615, 616	ECCD1H330K	Ceramic, 33pF, 50V, ± 10%
	C617, 618	ECEA1JS330	Electrolytic, 33μF, 63V
	C621, 622	ECKD1H333ZF	Ceramic, 0.033μF, 50V, ± 80%
	C623, 624	ECCD2H070D	Ceramic, 7pF, 500V, ± 0.5pF
	C625, 626	ECCD2H070D	Ceramic, 7pF, 500V, ± 0.5pF
	C627, 628	ECKD1H821KB	Ceramic, 820pF, 50V, ± 10%
	C629, 630	ECKD1H331KB	Ceramic, 330pF, 50V, ± 10%
	C633, 634	ECKD1H821KB	Ceramic, 820pF, 50V, ± 10%
	C635, 636	ECKD1H681KB	Ceramic, 680pF, 50V, ± 10%
	C639	ECEA1HS331	Electrolytic, 330μF, 50V
	C702, 703	ECETS1HV822U	Electrolytic, 8200μF, 50V
	C704	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
	C705	ECEA1ES101	Electrolytic, 100μF, 25V
	C706	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
	C707	ECEA1ES101	Electrolytic, 100μF, 25V
	C708	ECEA1HS470	Electrolytic, 47μF, 50V
	C709	ECEA1JS330	Electrolytic, 33μF, 63V
	C710	ECKD2H103PE	Ceramic, 0.01μF, 500V, ± 100%
	C711	ECEA1HS331	Electrolytic, 330μF, 50V
	C712	ECEA1HS221	Electrolytic, 220μF, 50V
	C713	ECEA1ES101	Electrolytic, 100μF, 25V
	C714, 715	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
	C716	ECEA1HS100	Electrolytic, 10μF, 50V
	C717	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
	C718	ECKD1H102ZF	Ceramic, 0.001μF, 50V, ± 80%
	C750	ECKDKC103PF	Ceramic, 0.01μF, 400VAC, ± 100%
	C751	ECEA50Z1	Electrolytic, 1μF, 50V
	C752	ECEA1CS330	Electrolytic, 33μF, 16V
	C753	ECEA2AS100	Electrolytic, 10μF, 100V
	C754	ECEA50Z1	Electrolytic, 1μF, 50V
	C755, 756	ECEA50Z3R3	Electrolytic, 3.3μF, 50V
	C901	ECEA1CN470S	Non-Polar Electrolytic, 47μF, 16V
	C902	ECUX1H103ZF	Chip, 0.01μF, 50V, ± 80%
	C903	ECEA50M4R7R	Electrolytic, 4.7μF, 50V
	C904	ECUX1H103ZF	Chip, 0.01μF, 50V, ± 80%
	C905	ECEA1VS101	Electrolytic, 100μF, 35V
	C906, 907	ECUX1H103ZF	Chip, 0.01μF, 50V, ± 80%
	C908	ECUX1H220KC	Chip, 22pF, 50V, ± 10%
	C909	ECUX1H180KC	Chip, 18pF, 50V, ± 10%
	C910	ECUX1H150KC	Chip, 15pF, 50V, ± 10%
	C912	ECUX1H223ZF	Chip, 0.022μF, 50V, ± 80%
	C913	ECEA0JS471	Electrolytic, 470μF, 6.3V
	C915	ECEA0JS471	Electrolytic, 470μF, 6.3V
	C916	ECEA1ES470	Electrolytic, 47μF, 25V
	C917	ECUX1H223ZF	Chip, 0.022μF, 50V, ± 80%
	C918	ECKD1H223ZF	Ceramic, 0.022μF, 50V, ± 80%
	C919	ECKD1H102ZF	Ceramic, 0.001μF, 50V, ± 20%
	C920	ECUX1H391KR	Chip, 390pF, 50V, ± 10%
	C920	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
	C921	ECEA0JS471	Electrolytic, 470μF, 6.3V
	C922	ECUX1H103ZF	Chip, 0.01μF, 50V, ± 80%

Part Name & Description	Ref. No.	Part No.	Part Name & Description
Carbon, 100kΩ, 1/4W, ± 5%	C403, 404	ECCD1H101K	Ceramic, 100pF, 50V, ± 10%
Carbon, 100kΩ, 1/8W, ± 10%	C405, 406	ECCD1H680K	Ceramic, 68pF, 50V, ± 10%
Carbon, 220Ω, 1/4W, ± 5%	C407, 408	ECKD1H103MD	Ceramic, 0.01μF, 50V, ± 20%
	C409	ECEA50Z1	Electrolytic, 1μF, 50V
	C411, 412	ECQM1H102KZ	Polyester, 0.001μF, 50V, ± 10%
	C413, 414	ECQM1H103JZ	Polyester, 0.01μF, 50V, ± 5%
	C415, 416	ECQM1H393JZ	Polyester, 0.039μF, 50V, ± 5%
	C417, 418	ECEA1AS101	Electrolytic, 100μF, 10V
	C419	ECEA50Z1	Electrolytic, 1μF, 50V
	C421, 422	ECEA50N1	Electrolytic, 1μF, 50V
	C423, 424	ECQM1H222KZ	Polyester, 0.0022μF, 50V, ± 10%
	C425, 426	ECCD1H820K	Ceramic, 82pF, 50V, ± 10%
	C427, 428	ECQM1H472KZ	Polyester, 0.0047μF, 50V, ± 10%
	C429, 430	ECQM1H223KZ	Polyester, 0.022μF, 50V, ± 10%
	C431, 432	ECQM1H563KZ	Polyester, 0.056μF, 50V, ± 10%
	C501, 502	ECEA50M3R3R	Electrolytic, 3.3μF, 50V
	C503, 504	ECCD1H101K	Ceramic, 100pF, 50V, ± 10%
	C505, 506	ECCD1H101K	Ceramic, 100pF, 50V, ± 10%
	C507, 508	ECCD1H390K	Ceramic, 39pF, 50V, ± 10%
	C509, 510	ECEA50Z1	Electrolytic, 1μF, 50V
	C511, 512	ECEA1HS100	Electrolytic, 10μF, 50V
	C513, 514	ECEA50Z1	Electrolytic, 1μF, 50V
	C551, 552	ECQM1H332KZ	Polyester, 0.0033μF, 50V, ± 10%
	C553, 554	ECQM1H333KZ	Polyester, 0.033μF, 50V, ± 10%
	C555, 556	ECQM1H104KZ	Polyester, 0.1μF, 50V, ± 10%
	C557, 558	ECQM1H183KZ	Polyester, 0.018μF, 50V, ± 10%
	C601, 602	ECKD1H221KB	Ceramic, 220pF, 50V, ± 10%
	C603, 604	ECCD1H560K	Ceramic, 56pF, 50V, ± 10%
	C605, 606	ECKD1H471KB	Ceramic, 470pF, 50V, ± 10%
	C607, 608	ECCD1H2R5C	Ceramic, 2.5pF, 50V, ± 0.25pF
	C609, 610	ECKD1H681KB	Ceramic, 680pF, 50V, ± 10%
	C615, 616	ECCD1H330K	Ceramic, 33pF, 50V, ± 10%
	C617, 618	ECEA1JS330	Electrolytic, 33μF, 63V
	C621, 622	ECKD1H333ZF	Ceramic, 0.033μF, 50V, ± 80%
	C623, 624	ECCD2H070D	Ceramic, 7pF, 500V, ± 0.5pF
	C625, 626	ECCD2H070D	Ceramic, 7pF, 500V, ± 0.5pF
	C627, 628	ECKD1H821KB	Ceramic, 820pF, 50V, ± 10%
	C629, 630	ECKD1H331KB	Ceramic, 330pF, 50V, ± 10%
	C633, 634	ECKD1H821KB	Ceramic, 820pF, 50V, ± 10%
	C635, 636	ECKD1H681KB	Ceramic, 680pF, 50V, ± 10%
	C639	ECEA1HS331	Electrolytic, 330μF, 50V
	C702, 703	ECETS1HV822U	Electrolytic, 8200μF, 50V
	C704	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
	C705	ECEA1ES101	Electrolytic, 100μF, 25V
	C706	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
	C707	ECEA1ES101	Electrolytic, 100μF, 25V
	C708	ECEA1HS470	Electrolytic, 47μF, 50V
	C709	ECEA1JS330	Electrolytic, 33μF, 63V
	C710	ECKD2H103PE	Ceramic, 0.01μF, 500V, ± 100%
	C711	ECEA1HS331	Electrolytic, 330μF, 50V
	C712	ECEA1HS221	Electrolytic, 220μF, 50V
	C713	ECEA1ES101	Electrolytic, 100μF, 25V
	C714, 715	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
	C716	ECEA1HS100	Electrolytic, 10μF, 50V
	C717	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
	C718	ECKD1H102ZF	Ceramic, 0.001μF, 50V, ± 80%
	C750	ECKDKC103PF	Ceramic, 0.01μF, 400VAC, ± 100%
	C751	ECEA50Z1	Electrolytic, 1μF, 50V
	C752	ECEA1CS330	Electrolytic, 33μF, 16V
	C753	ECEA2AS100	Electrolytic, 10μF, 100V
	C754	ECEA50Z1	Electrolytic, 1μF, 50V
	C755, 756	ECEA50Z3R3	Electrolytic, 3.3μF, 50V
	C901	ECEA1CN470S	Non-Polar Electrolytic, 47μF, 16V
	C902	ECUX1H103ZF	Chip, 0.01μF, 50V, ± 80%
	C903	ECEA50M4R7R	Electrolytic, 4.7μF, 50V
	C904	ECUX1H103ZF	Chip, 0.01μF, 50V, ± 80%
	C905	ECEA1VS101	Electrolytic, 100μF, 35V
	C906, 907	ECUX1H103ZF	Chip, 0.01μF, 50V, ± 80%
	C908	ECUX1H220KC	Chip, 22pF, 50V, ± 10%
	C909	ECUX1H180KC	Chip, 18pF, 50V, ± 10%
	C910	ECUX1H150KC	Chip, 15pF, 50V, ± 10%
	C912	ECUX1H223ZF	Chip, 0.022μF, 50V, ± 80%
	C913	ECEA0JS471	Electrolytic, 470μF, 6.3V
	C915	ECEA0JS471	Electrolytic, 470μF, 6.3V
	C916	ECEA1ES470	Electrolytic, 47μF, 25V
	C917	ECUX1H223ZF	Chip, 0.022μF, 50V, ± 80%
	C918	ECKD1H223ZF	Ceramic, 0.022μF, 50V, ± 80%
	C919	ECKD1H102ZF	Ceramic, 0.001μF, 50V, ± 20%
	C920	ECUX1H391KR	Chip, 390pF, 50V, ± 10%
	C920	ECKD1H103ZF	Ceramic, 0.01μF, 50V, ± 80%
	C921	ECEA0JS471	Electrolytic, 470μF, 6.3V
	C922	ECUX1H103ZF	Chip, 0.01μF, 50V, ± 80%

REPLACEMENT PARTS LIST...Cabinet & Chassis 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. (K) -marked parts are used for black only, while (S) -marked parts are for silver type only.

4. Parts other than (K) and (S) -marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.

Black type model No. : SA-424 (K)

Ref. No.	Part No.	Part Name & Description
CABINET and CHASSIS PARTS		
1	(S) SGX6967	Ornament, Left Side
1	(K) SGX6967-1	Ornament, Left Side (Black)
2	SBC321-7	Button, Power and Input Selector
3	SUS163	Spring, Button
4	(S) SGWA424E	Front Panel Ass'y
4	(K) SGWA424KE	Front Panel Ass'y (Black)
4-1	SGU195	Transparent Cover
4-2	(S) SGX6971-1	Ornament Plate
4-2	(K) SGX6971-5	Ornament Plate (Black)
4-3	SBC329-2	Button, AM FM Selector
4-4	SBC327-1	Button, Tuning
4-5	SBC325-1	Button, Preset
4-6	SDU57	Guide, LED
4-7	LSUW1735-1	Bracket, PCB
5	SBN973	Knob, Tone and Balance Control
6	SBN971	Knob, Volume Control
7	(S) SGX6969	Ornament, Right Side
7	(K) SGX6969-1	Ornament, Right Side (Black)
8	(S) SDU51	Plate, Ornament
8	(K) SDU51-1	Plate, Ornament
9	SDU53-1	Tinted Plate
10	SHR9539	Holder, LED (Quart Lock)
11	SHR9537	Holder, LED (Signal)
12	SBC323-1	Button, Push Switch
13	SJU61	Jack, Headphone
14	SMP301-1	Cover, Lamp
15	(S) SKCA424E	Cabinet Cover
15	(K) SKCA424KE	Cabinet Cover (Black)
16 [EX]	SGP2510-1F	Rear Panel
16 [EG, EH]	SGP2510-1D	Rear Panel
16 [XA]	SGP2510-2B	Rear Panel
16 [XL]	SGP2510-3B	Rear Panel
17	SHR127	Bushing, AC Cord
17 [XL] only	SHR131	Bushing, AC Cord
18	(S) SJA88	AC Cord
18 [XA] only	(S) SJA111	AC Cord
18 [XL] only	(S) QFC1207MA	AC Cord
19	SJF4813-1	Terminal Board, Speaker
20	SJB3005	

