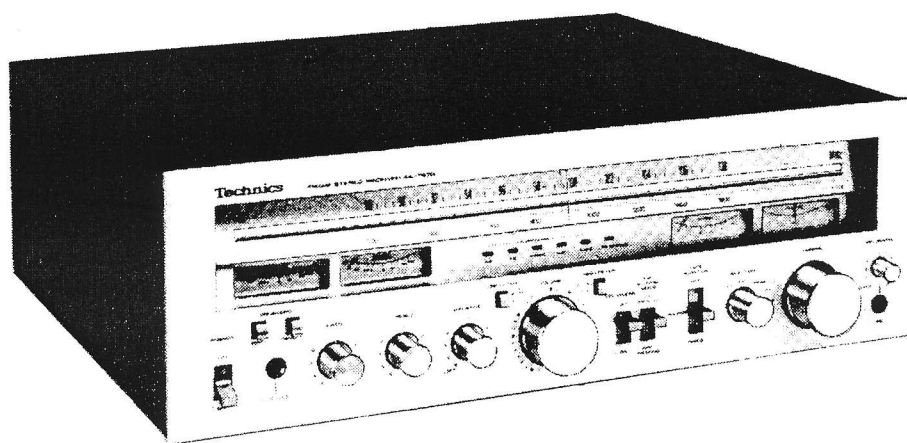


Service Manual

FM/AM STEREO RECEIVER SA-T670KFP



Specifications

(DIN 45 500)

AMPLIFIER SECTION

1 kHz continuous power — both channels driven	2 x 75W (4 ohms) 2 x 65W (8 ohms)
20 Hz — 20 kHz continuous power both channels driven	2 x 65W (4 ohms) 2 x 60W (8 ohms)
Power bandwidth both channels driven at 8 ohms	7 Hz—35 kHz, -3 dB
Total harmonic distortion	
rated power at 1 kHz	0.04% (4, 8 ohms)
rated power at 20 Hz—20 kHz	0.05% (4 ohms)
rated power at 20 Hz—20 kHz	0.03% (8 ohms)
half power at 20 Hz—20 kHz	0.025% (8 ohms)
half power at 1 kHz	0.007% (8 ohms)
Intermodulation distortion	
rated power at 250 Hz: 8 kHz = 4:1, 4 ohms	0.04%
rated power at 60 Hz: 7 kHz = 4:1, SMPTE, 8	0.03%
Damping factor	25 (4 ohms), 50 (8 ohms)

Input sensitivity and impedance

PHONO	2.5 mV/47k ohms
AUX-1, AUX-2	150 mV/33k ohms
TAPE-1, TAPE-2	150 mV/33k ohms
MIC	3 mV/10k ohms
PHONO maximum input voltage (1 kHz, RMS)	170 mV
S/N	
rated power (4 ohms)	PHONO 72 dB (IHF, A:80 dB) TAPE 85 dB (IHF, A:92 dB)
26 dB power (4 ohms)	PHONO 65 dB AUX 75 dB
50 mW power (4 ohms)	PHONO 60 dB AUX 62 dB

Frequency response

PHONO	RIAA standard curve 30 Hz—15 kHz, ±0.2 dB
AUX	20 Hz—20 kHz, +0.5 dB, -1 dB 10 Hz—40 kHz, +0.5 dB, -2.5 dB

Tone Controls

BASS	50 Hz, +12 dB— -12 dB
TREBLE	20 kHz, +12 dB— -12 dB

Acoustic Controls (Tone Controls "0" position)

Low filter	100 Hz, -6 dB/oct
High filter	7 kHz, -6 dB/oct
Loudness control (volume at -30 dB)	50 Hz, +9 dB

Technics

Marketed and Serviced throughout New Zealand
by Fisher and Paykel Limited



SPECIFICATIONS SA-T670KFP

Output voltage and impedance	
TAPE 1 REC OUT	150 mV
TAPE 2 REC OUT	150 mV
TAPE 3 REC/PLAY (Din Socket)	30 mV/80 k ohms
Channel balance, AUX 250 Hz 6300 Hz	± 1.0 dB
Channel separation, AUX 1 kHz	55 dB
Headphones level and output impedance	500 mV/330 ohms
Load impedance	
MAIN or REMOTE	4 — 16 ohms
MAIN + REMOTE	8 — 16 ohms

FM TUNER SECTION

Frequency range	88 — 108 MHz
Antenna terminals	300 ohms (balanced) 75 ohms (unbalanced)
Sensitivity (± 40 kHz deviation)	10.3 dBf, 1.8 µV (IHF, usable) 22 µV (IHF, S/N 46 dB, 75 ohms, STEREO) 1.8 µV (S/N 30 dB, 300 ohms) 1.6 µV (S/N 26 dB, 300 ohms) 1.4 µV (S/N 20 dB, 300 ohms) 1.3 µV (S/N 30 dB, 75 ohms) 1.2 µV (S/N 26 dB, 75 ohms) 0.9 µV (S/N 20 dB, 75 ohms)
Total harmonic distortion (at 1 kHz)	
MONO	0.1%
STEREO	0.2%
S/N (± 40 kHz deviation)	
MONO	60 dB (IHF, 75 dB)
STEREO	56 dB (IHF, 70 dB)
Frequency Response	+0.2 dB 20 Hz — 15 kHz, -0.8 dB
Selectivity (400 kHz)	80 dB
Capture ratio	1.0 dB
Image rejection at 98 MHz	85 dB
IF rejection at 98 MHz	100 dB
Spurious response rejection at 98 MHz	100 dB
AM suppression	60 dB
Stereo separation	
1 kHz	45 dB
10 kHz	35 dB
Leak carrier	
19 kHz	-65 dB, IHF
38 kHz	-70 dB, IHF
Channel balance (250 Hz — 6300 Hz)	± 1.5 dB
Limiting point	1.2 µV
Bandwidth	
IF amplifier	180 kHz
FM demodulator	1000 kHz

AM TUNER SECTION

Frequency Range	525 — 1605 kHz
Sensitivity (S/N 20 dB)	30 µV, 250 µV/m
Selectivity	35 dB
Image rejection at 1000 kHz	50 dB
IF rejection at 1000 kHz	45 dB

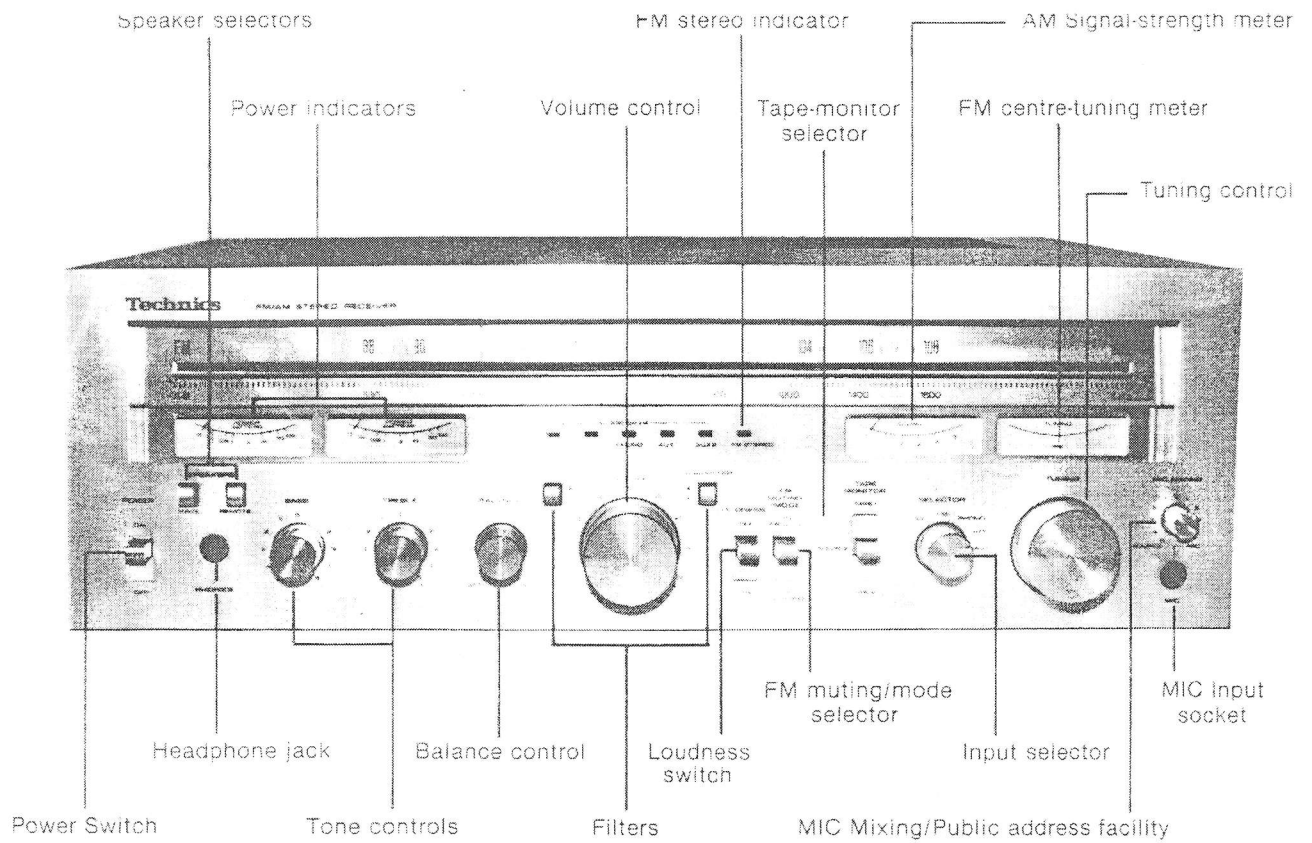
GENERAL

Power Consumption	550W
Power Supply	50 Hz, 230 V
Dimensions (W x H x D)	450 x 157 x 411 mm (17 ³ / ₃₂ " x 6 ³ / ₁₆ " x 16 ³ / ₁₆ ")
Weight	12.5 kg (27.5 lb)

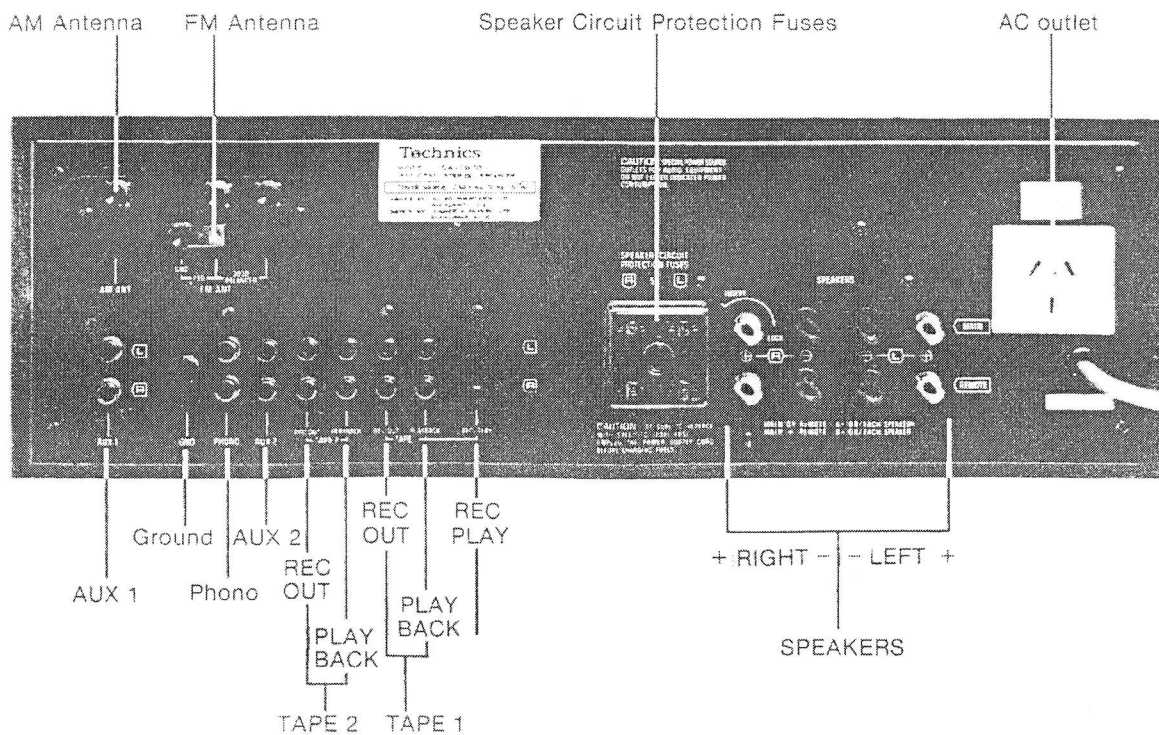
ACCESSORIES

Speaker-circuit protection fuses	2
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SA-T670



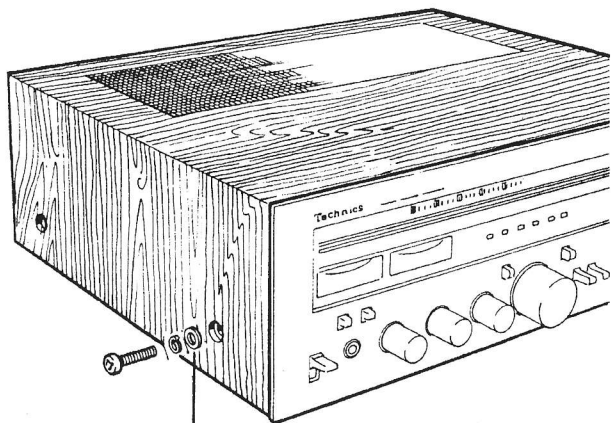
REAR PANEL CONTROLS



SA-T670

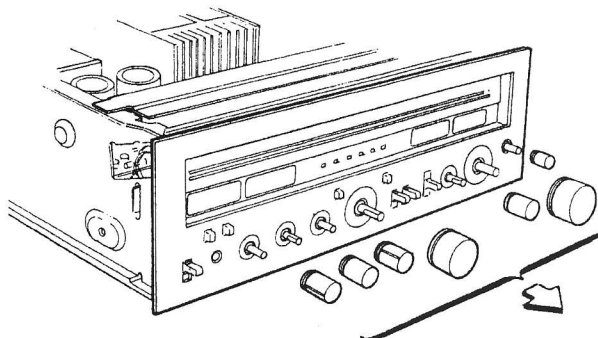
DISASSEMBLY

1. Remove Cabinet



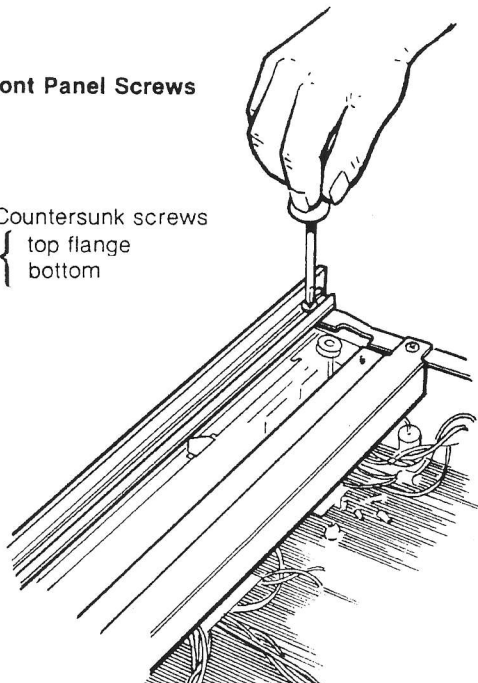
Remove washers under heads

2. Remove Knobs

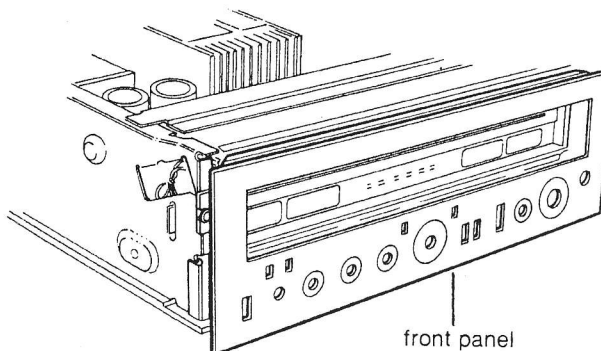


3. Remove Front Panel Screws

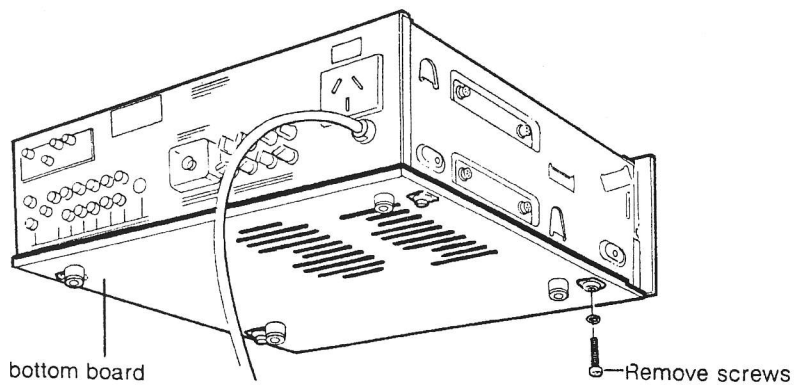
4 Countersunk screws
2 { top flange
bottom



4. Remove Front Panel

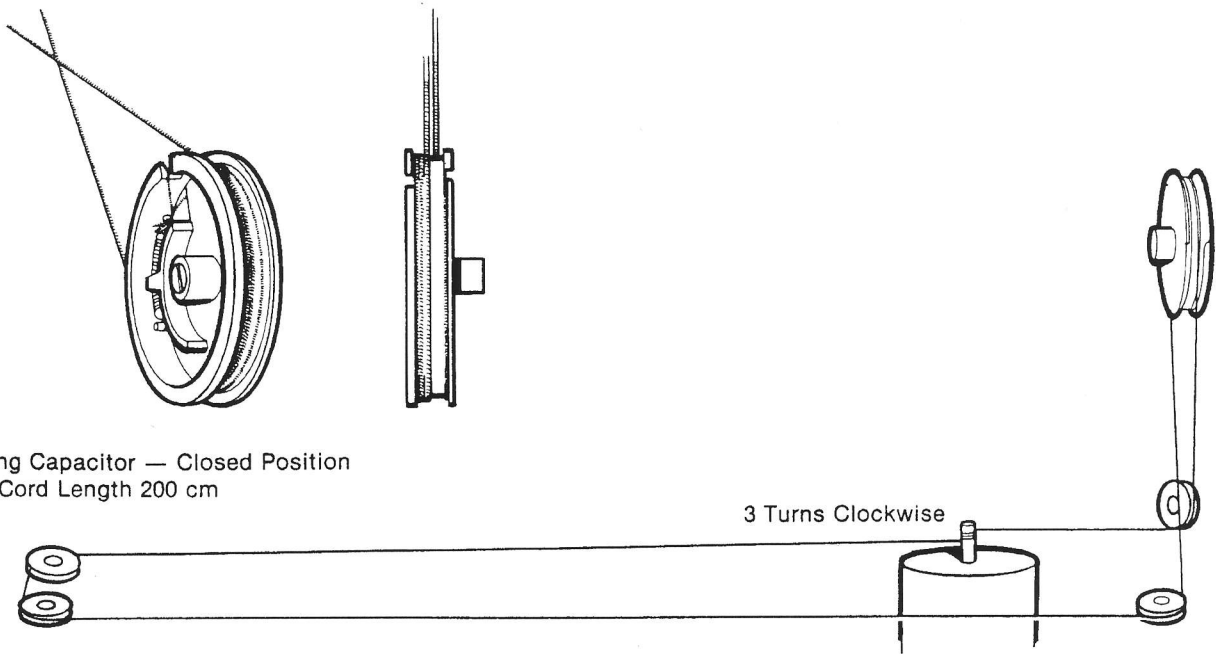


5. Remove Bottom Board

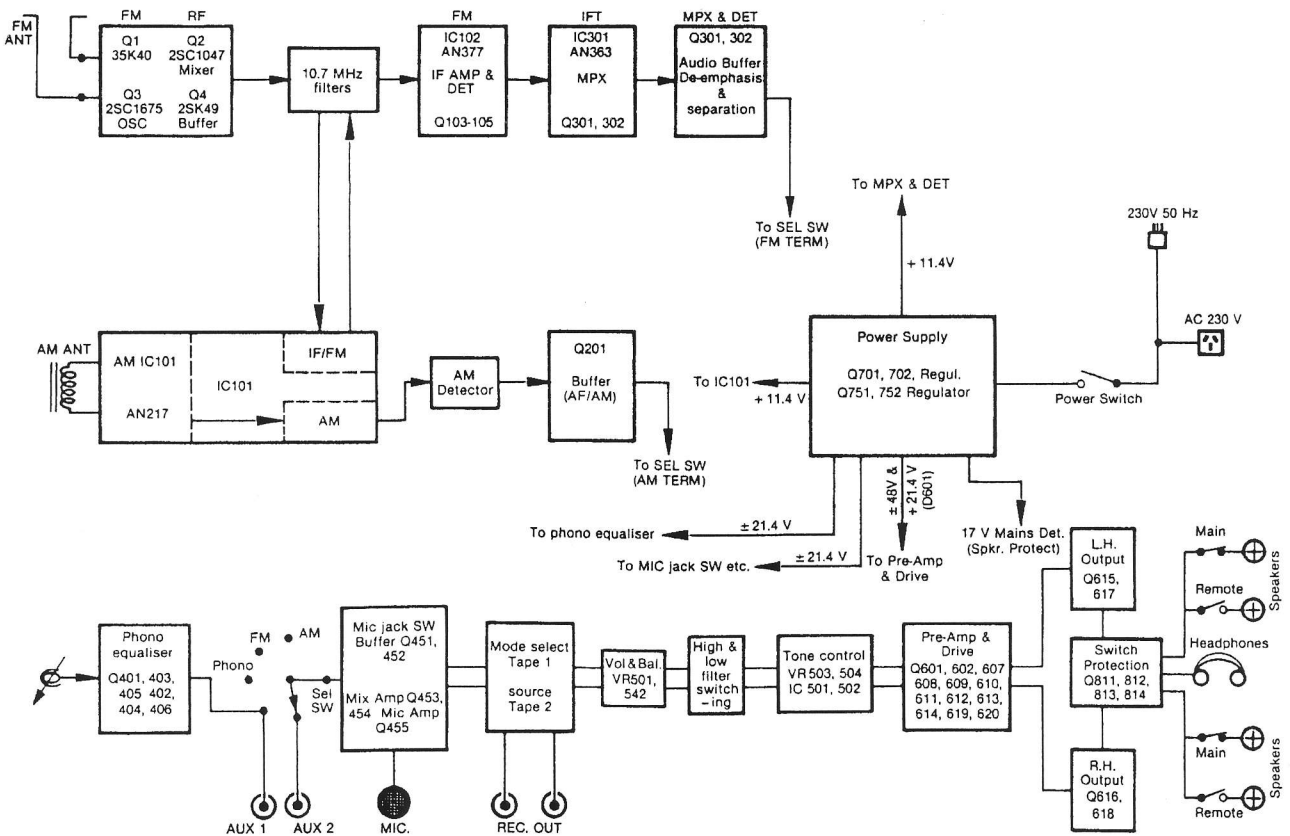


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DIAL CORD STRINGING GUIDE

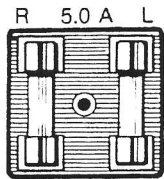


BLOCK DIAGRAM OF SIGNAL PATHS

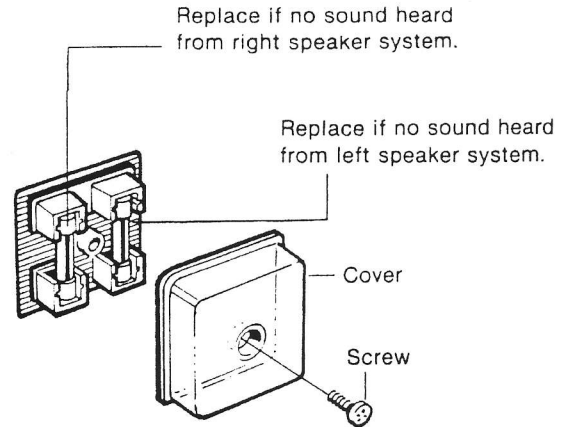
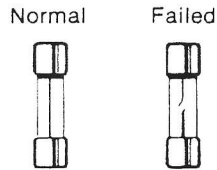


ABOUT THE CIRCUITRY — PROTECTION FUSES

Speaker Circuit Protection Fuses



Circuitry-Protection Fuse



Circuitry damage may result if — with the power on and the volume control set to any position except "0" — the plus (+) and minus (-) speaker terminals are accidentally 'shorted' or if speaker impedance is not correct. These fuses prevent such circuitry damage.

If no sound is heard from one or both speakers although the dial is illuminated and there are no mistakes with connections or operating mode, one fuse or both fuses may have failed.

Note concerning speaker impedance:

1. When two pairs of speaker systems ('MAIN' and 'REMOTE') are used, use speaker systems with an impedance of 8 ohms or more each.

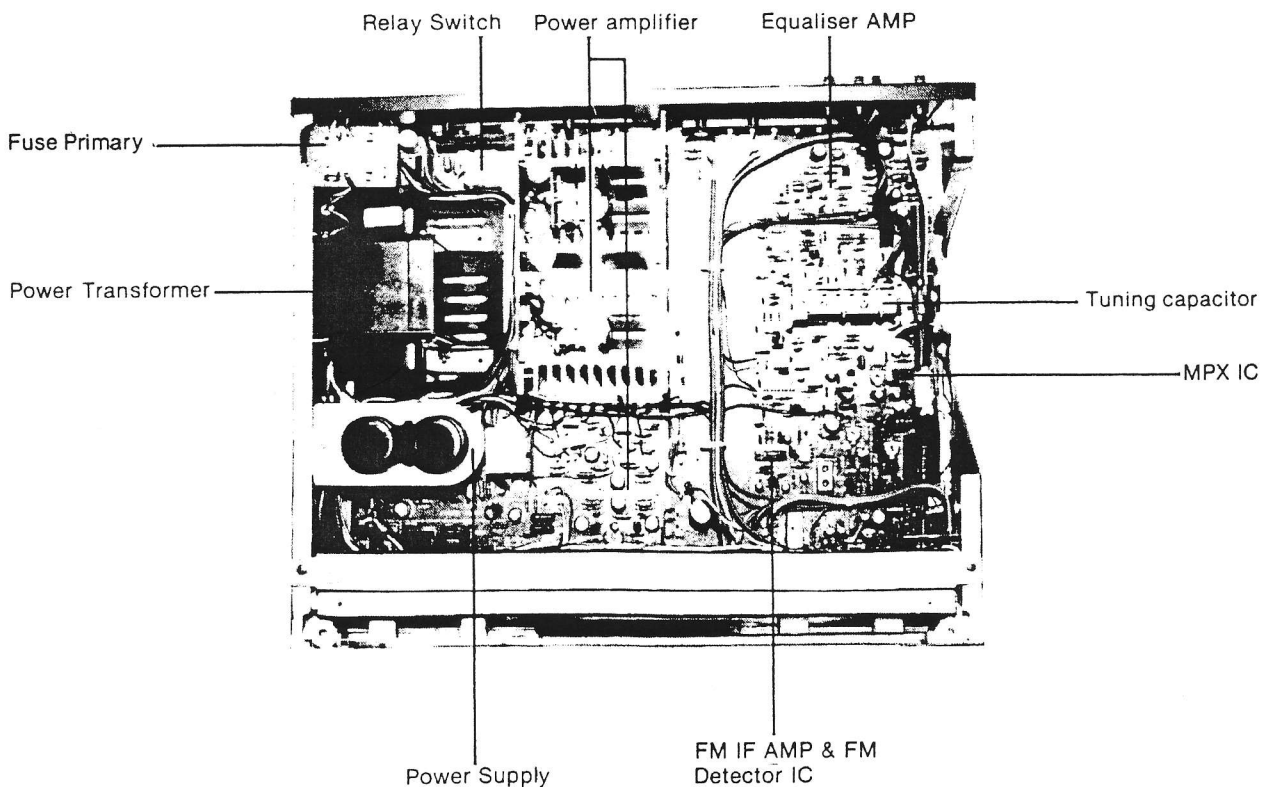
2. When 'MAIN' or 'REMOTE' speaker systems are used separately, use speaker systems with an impedance of 4 ohms or more.

FUSE REPLACEMENT

1. Loosen the screw and remove the cover.
2. After fuse replacement, close the cover.

Note: Replacement fuses are included with the operation instructions.

CHASSIS VIEW



SA-T670

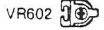
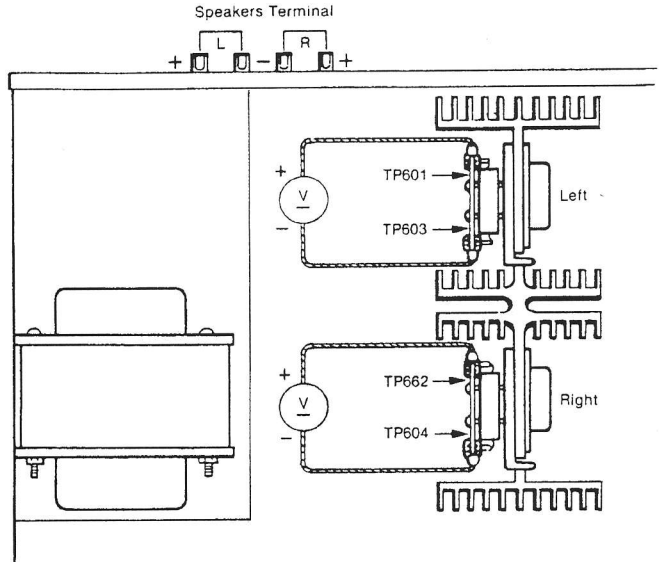
PROTECTION CIRCUIT CHECK

Main Amplifier (ICQ) Alignment

1. The 'ICQ' adjustment should be started in less than 30 secs after setting the power switch to the ON position.
2. Left Channel
 - Connect DC voltmeter between TP601 and TP603.
 - Adjust VR601 to 8 mV on DC voltmeter indication.
3. Right Channel
 - Connect DC voltmeter between TP602 and TP604.
 - Adjust VR602 to 8 mV on DC voltmeter indication.

Note:

The unit is provided with speaker circuit protection fuses for the right and left channels respectively. The fuse protects the power transistor from damage should the speaker terminals be short circuited. Accordingly if the speakers fail to operate after the speaker connections are made, check whether the speaker circuit protection fuses are intact or blown.



ALIGNMENT POINTS

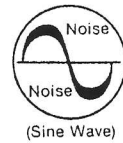
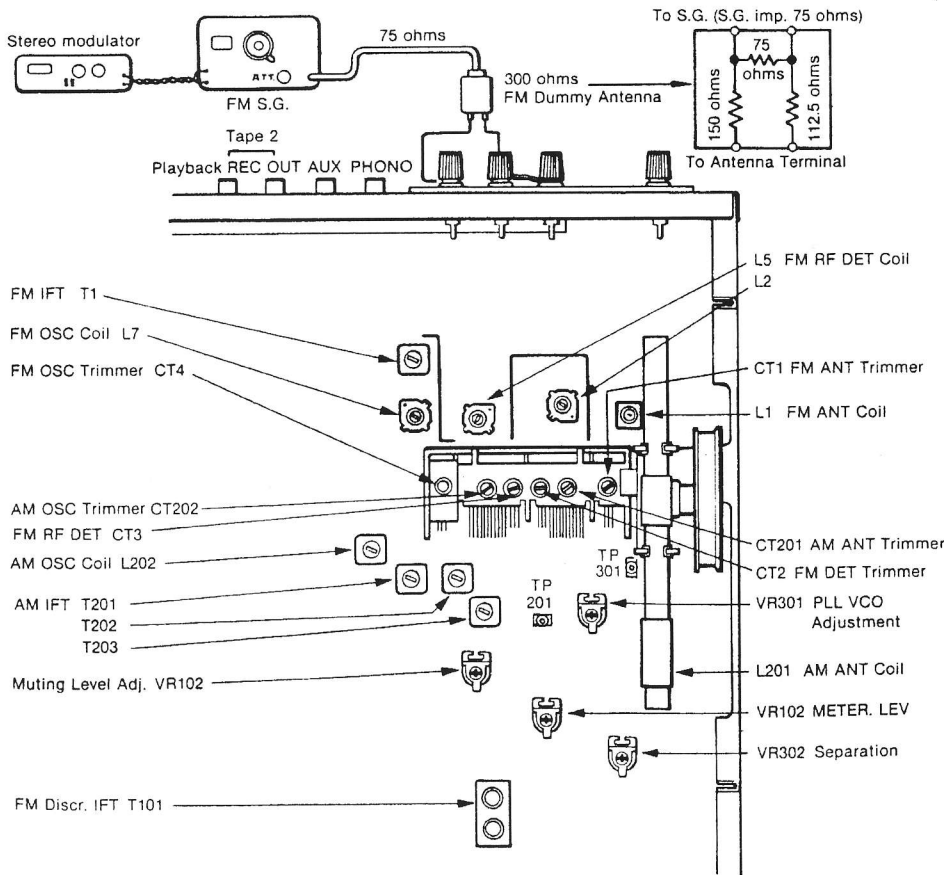
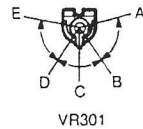


Fig. 4 (Abb. 4)



A—B, D—E: Stereo OFF Position
B—D: Stereo ON Position (Indicator lighting).
C: Adjust Point of Pilot Circuit

Fig. 5 (Abb. 5)

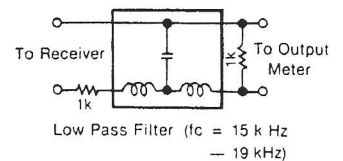


Fig. 6 (Abb. 6)

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ALIGNMENT INSTRUCTIONS (FM/AM TUNER CIRCUITRY)

Notes:

1. Loudness switch — OFF
2. Band selector switch — AM/FM (FM, RF FM-IF)
3. FM muting/mode switch — OFF/MONO
4. Speaker switch — ON
5. Tape monitor switch — SOURCE
6. Filter switch — OFF
7. Maintain line voltage at rated voltage.
8. Output of signal generator should be no higher than necessary to obtain an output reading.

SIGNAL GENERATOR CONNECTION	FREQ.	DIAL SETTING	INDICATOR (AC VTVM or SCOPE (DISTORTION METER))	ADJUSTMENT POINTS	REMARKS
AM ALIGNMENT					
High side through 0.001 uF to AM antenna trimmer terminal. Common to chassis.	455 kHz (30% Mod. with 400Hz)	Point of non-interference	Connect VTVM or scope to TP201 through 0.1 uF	T201 (1st IFT) T202 (2nd IFT) T203 (3rd IFT)	Adjust for maximum output
Fashion loop of several turns of wire and radiate signal into loop of receiver.	600 kHz (30% Mod. with 400 Hz)	600 kHz	Connect VTVM or scope to speaker terminals to receiver	L202 (OSC Coil) L201 (ANT Coil)	Adjust for maximum output. Adjust L201 by moving coil bobbin along ferrite core.
Fashion loop of several turns of wire and radiate signal into loop of receiver	1500 kHz (30% Mod.) with 400Hz)	1500 kHz	Connect VTVM or scope to speaker terminals of receiver	CT202 (OSC Trimmer) CT201 (ANT Trimmer)	Adjust for maximum output. Repeat steps (2) and (3)
FM-IF ALIGNMENT					
	No signal	Point of non-interference	Tuning meter of set	T101 (DISCRI IFT) (A) Orange Core	FM muting/mode switch to ON/FM AUTO. Adjust for centre position of tuning meter.
FM-RF ALIGNMENT					
Connect to FM 300 ohm antenna terminal through FM dummy antenna.	90 MHz (100% Mod. with 400 Hz)	90 Mhz	Connect scope to speaker terminals of receiver	L7 (OSC Coil) L5 (RF-DET Coil) L1 (ANT Coil) L2 (ANT Coil)	FM muting/mode switch to OFF/FM MONO. Adjust for maximum amplitude and symmetrical curve. (Ref. Fig. 4)
Connect to FM 300 ohm antenna terminal through FM dummy antenna.	106 MHz (100% Mod. with 400 Hz)	106 Mhz	Connect scope to speaker terminals of receiver	CT3 (OSC Trimmer) CT3 (RF-DET Trimmer) CT1 (ANT Trimmer) CT2 (ANT Trimmer)	Adjust for maximum amplitude and symmetrical curve. Repeat steps (5) and (6)
FM MONO DISTORTION ALIGNMENT					
Connect to FM 300 ohm antenna terminal through FM dummy antenna. Apply 60 dB to set.	100 MHz (100% Mod. with 400 Hz)	100 MHz	Connect scope to speaker terminals of receiver	T101 (DISCRI IFT) (B) Green Core	Adjust for minimum distortion of left output. Repeat steps (4) and (7).
FM MUTING LEVEL ALIGNMENT					
Connect to FM 300 ohm antenna terminal through FM dummy antenna. Apply 16 dB (6.3 uV) to set.	100 MHz (100% Mod. with 400 Hz)	100 MHz	Connect VTVM or scope to speaker terminals	VR101	FM muting/mode switch to "ON/FM AUTO". Adjust so that output can be obtained.

FM SIGNAL METER ALIGNMENT

1. Apply 100 MHz FM signal of 100 dB (400 Hz 30% modulation) to 300 ohm antenna terminal through FM dummy antenna.
2. Tuning at 100 MHz.
3. Adjust VR102 for about 4.7 point of signal meter indication.

FM MPX PILOT ALIGNMENT

Using a frequency counter

1. 1000 MHz Non-modulated mono signal applied to set. (Apply 60 dB)
2. FM muting/mode switch to "ON/FM AUTO"
3. Connect frequency counter to TP301 through resistor (100 k ohms)
4. Adjust VR301 to 19 kHz \pm 30 Hz.

Using alternate system

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. 5.

- Notes:
1. Stereo modulator
 - Connect stereo modulator output to EXT MOD terminal of signal generator.
 - Pilot signal modulation to "10%"
 - Frequency approximately 100 MHz/Output level to "72 dB (1HF)"
 - Modulation mode to "FM"
 2. FM signal generator
 3. Selector switch to "FM"
 4. FM muting/mode switch to "ON/FM AUTO"

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FM SIGNAL GENERATOR CONNECTION	STEREO MODULATOR MODE & MOD. RATE	INDICATOR (AC VTVM)	ADJUSTMENT POINT	REMARKS
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FM STEREO SEPARATION ALIGNMENT

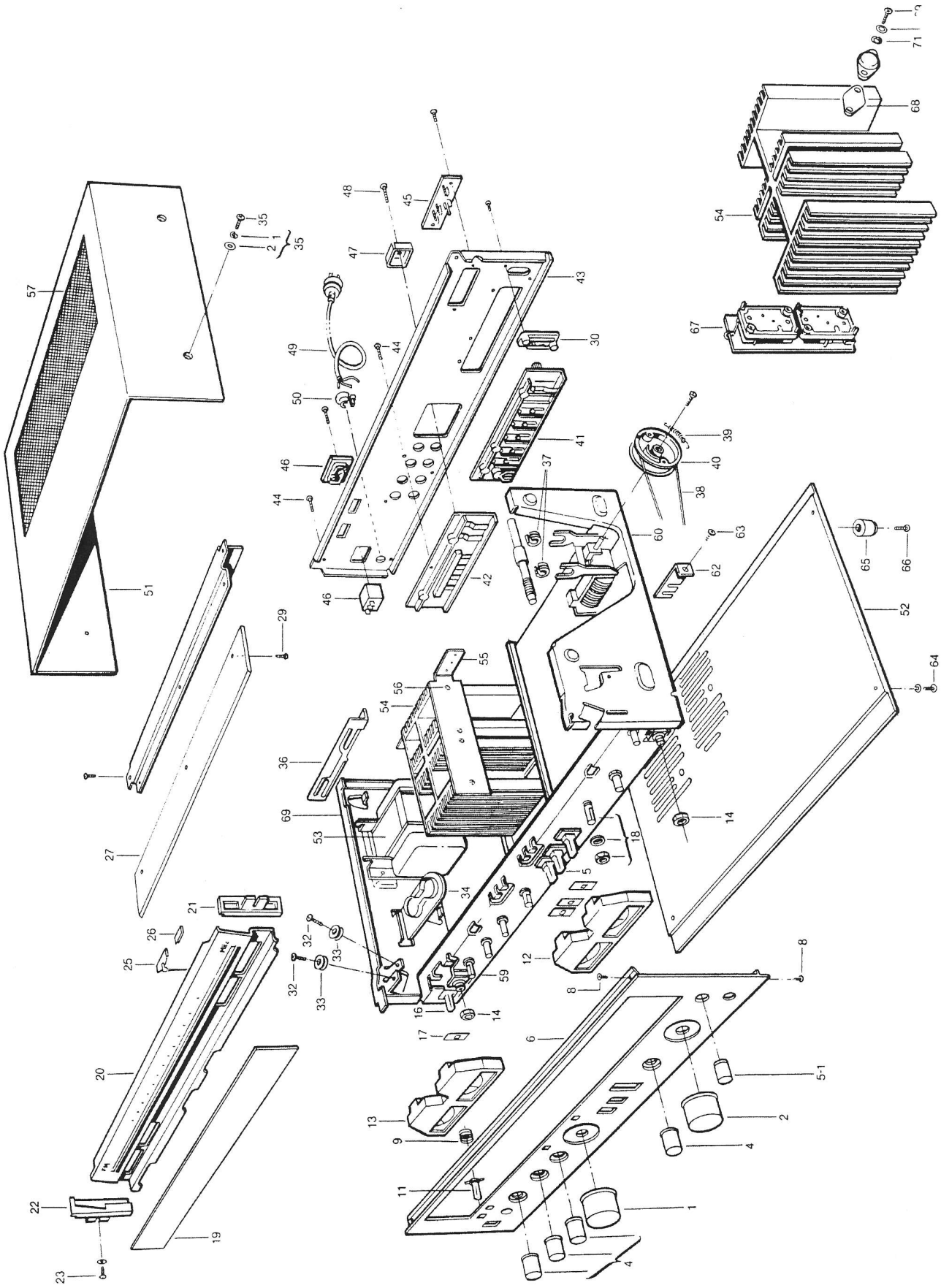
FM 300 ohm antenna terminals through FM dummy antenna.	(1 kHz 30% Modulation) MODE L (and R) Pilot signal to "ON"	Connect VTVM to speaker terminals through low pass VR302 filter. Ref. Fig. 5)		Tuning at 100 MHz. Make adjustment so that, when the antenna input is subjected to L modulation (or R modulation), R channel output (or L channel output) becomes minimum.
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REPLACEMENT PARTS LIST

- NOTES: 1. Part numbers are shown for most mechanical parts.
2. 'S' in the Remarks column indicates that a part is normally a stock item.

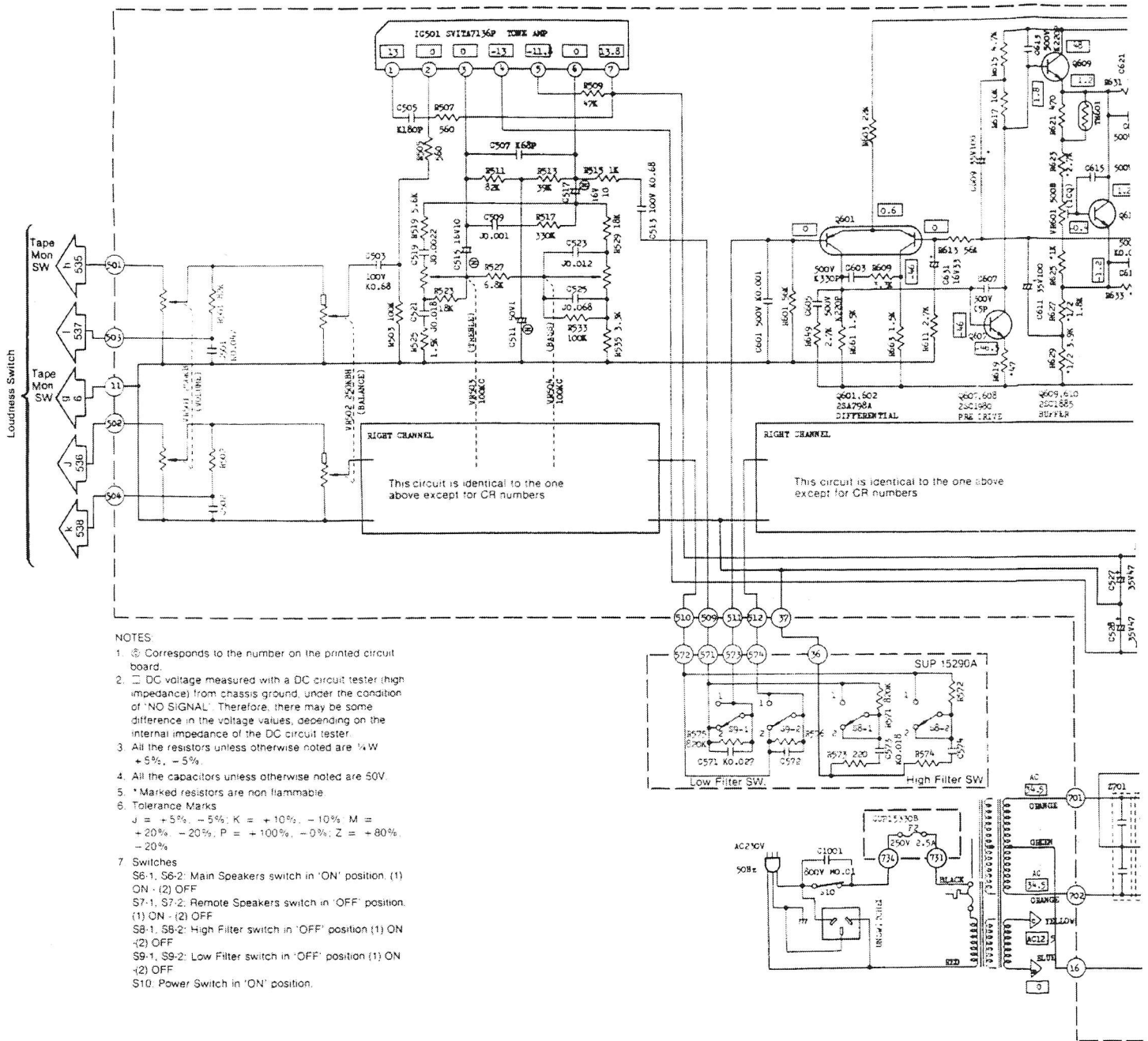
CABINET AND CHASSIS PARTS

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
1	493-281002	Knob, Volume	S	37	RBG109	Rubber, Ant.Mtg. (2)	
2	493-281006	Knob, Tuning	S	38	SDZ6-1	Dial Cord, 200 cm	
4	493-281004	Knob, Bass, Treble, Bal. Sel. (4)	S	39	493-662001	Dial Spring	S
5	493-281002	Knob, Lever Switches (4)	S	40	493-285001	Drum, Tuning Capacitor	S
5-1	493-281005	Knob, Mic Mixing	S	41	SJF3025-1	Term. Plate 12 P & DIN	
6	493-233001	Front Panel Assy	S	42	SJF8013	Term. Plate Speakers	
8	XTS3X8BF2	Front Panel Mtg. Screws (4)		43	SUA9457-6	Rear Panel	
9	SUS123-2	Spring Push Switches (4)		44	XTB3 + 8BFZ	Rear Pan. Mtg. Screw (18)	
10	493-281001	Button, Push Switches (4)	S	45	SJF8013	Term. Plate Ant.	
11	SGX6677	Button, Ornament (4)		46	341-040054	Socket AC Outlet	S
12	422-041005	Meter, Tuning and Signal	S	47	493-343003	Cover, Speaker Fuses	S
13	422-041006	Meter, Power	S	48	XTB3 + 8BFZ	Cover Mt. Screw	
14	XNSS12	Nut, Headphones & Mic Jacks (2)		49	098-026430	Power Cord Assy	
15	SNE59	Wavy Washer, Hd.ph. & Mic Jk (2)		50	SHR131	Bushing	
16	493-349004	Power Switch	S	51	211-201265	Cabinet	S
17	493-281008	Button Sheet (4)	S	52	231-040223	Baseboard	S
18	493-651001	Tuning Shaft Assy	S	53	383-050007	Transformer, Mains	S
19		Glass [Part of Frt. Pan Assy]		54	SMY411	Heat Sink	
20	493-234001	Dial Scale Assy	S	55	SMV415	Sub Heat Sink (2)	
21	696-040054	Brkt, Dial Scale, R.H.	S	56	XTB3 x 10BFZ	Screw, Sub Heat Sink Mtg. (8)	
22	696-040055	Brkt, Dial Scale, L.H.	S	57	SGM39-2	Cover Grille	
23	XTW3X8E	Brkt Mtg. Screw w/washer (2)		58	XT53 x 8A	Wood Screw, Cover Gr. Mtg. (14)	
25, 26	493-284003	Dial Pointer Assy	S	59	SUF225	Front Chassis	
27	493-283002	Reflector Plate	S	60	SUH407	Side Chassis (L)	
28	SDH487	Reflector Plate Angle		61	SUH409	Side Chassis (R)	
29	XTW3X8E	Refl. Plate Mtg. Screw (3)		62	SUW1487	MIC PCB Fixture	
30	SJF3223	Term. Strip AUX L. & R.		63	XTB3 x 8B	Screw, Fixture Mtg.	
31				64		Screw, Baseboard Mtg. (4)	
32	SHD3X1F	Pulley Mtg. Screw (4)		65	SKL151	Foot (4)	
33	653-040026	Pulley, Dial Cord (4)	1/4s	66	MM31 x D20	Wood Screw, Foot Mtg. (4)	
34		Capacitor Bracket		67	493-343001	Socket, Power Transistor (4)	S
35	XSN4 + 12FZ	Cab & Transformer Mtg Screw (8)		68	SMX137	Insulation Film (4)	
35-1	XWA4BFZ	Cab & Trans. Mtg. Sprn. Wshr (8)		69	XSB3 x 14BNS	Screw, Power Transistor (8)	
35-2	XW64BFZ	Cab & Trans. Mtg Washer (8)		70	XWA3BFN	Spring Washer (8)	
36	SMM35 (R) SMM37 (L)	Meter Fixture L. and R.		71	XWE3FN	Washer (8)	



SA-T670

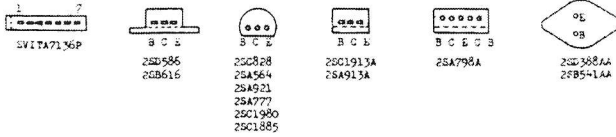
SCHEMATIC DIAGRAM - TONE CONTROL, POWER AMP, POWER SU



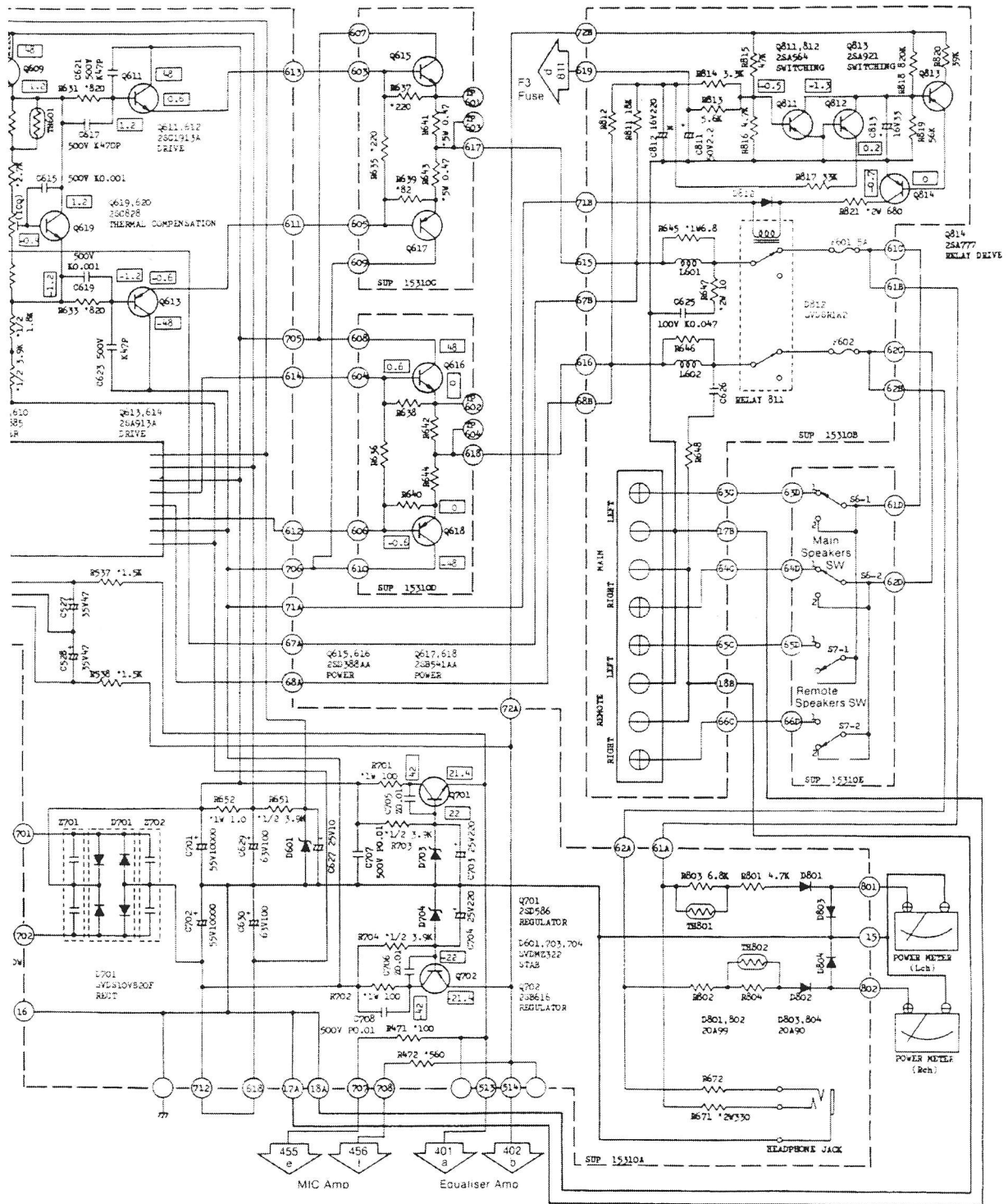
NOTES

- ⊙ Corresponds to the number on the printed circuit board.
- DC voltage measured with a DC circuit tester (high impedance) from chassis ground, under the condition of 'NO SIGNAL'. Therefore, there may be some difference in the voltage values, depending on the internal impedance of the DC circuit tester.
- All the resistors unless otherwise noted are 1/4 W ±5%, -5%.
- All the capacitors unless otherwise noted are 50V.
- * Marked resistors are non flammable.
- Tolerance Marks
 J = +5%, -5%; K = +10%, -10%; M = +20%, -20%; P = +100%, -0%; Z = +80%, -20%.
- Switches
 S6-1, S6-2: Main Speakers switch in 'ON' position (1) ON - (2) OFF
 S7-1, S7-2: Remote Speakers switch in 'OFF' position (1) ON - (2) OFF
 S8-1, S8-2: High Filter switch in 'OFF' position (1) ON - (2) OFF
 S9-1, S9-2: Low Filter switch in 'OFF' position (1) ON - (2) OFF
 S10: Power Switch in 'ON' position.

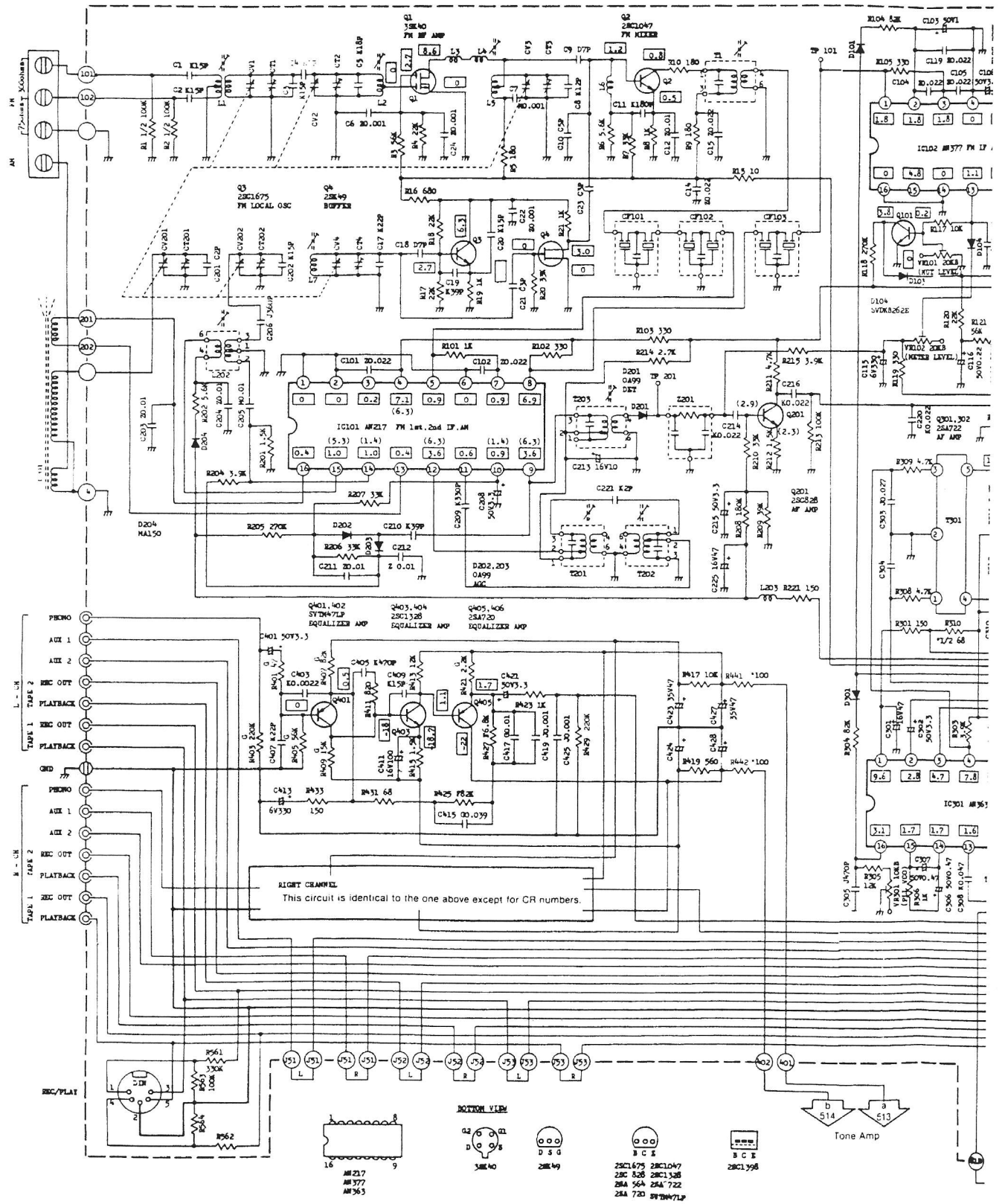
BOTTOM VIEW



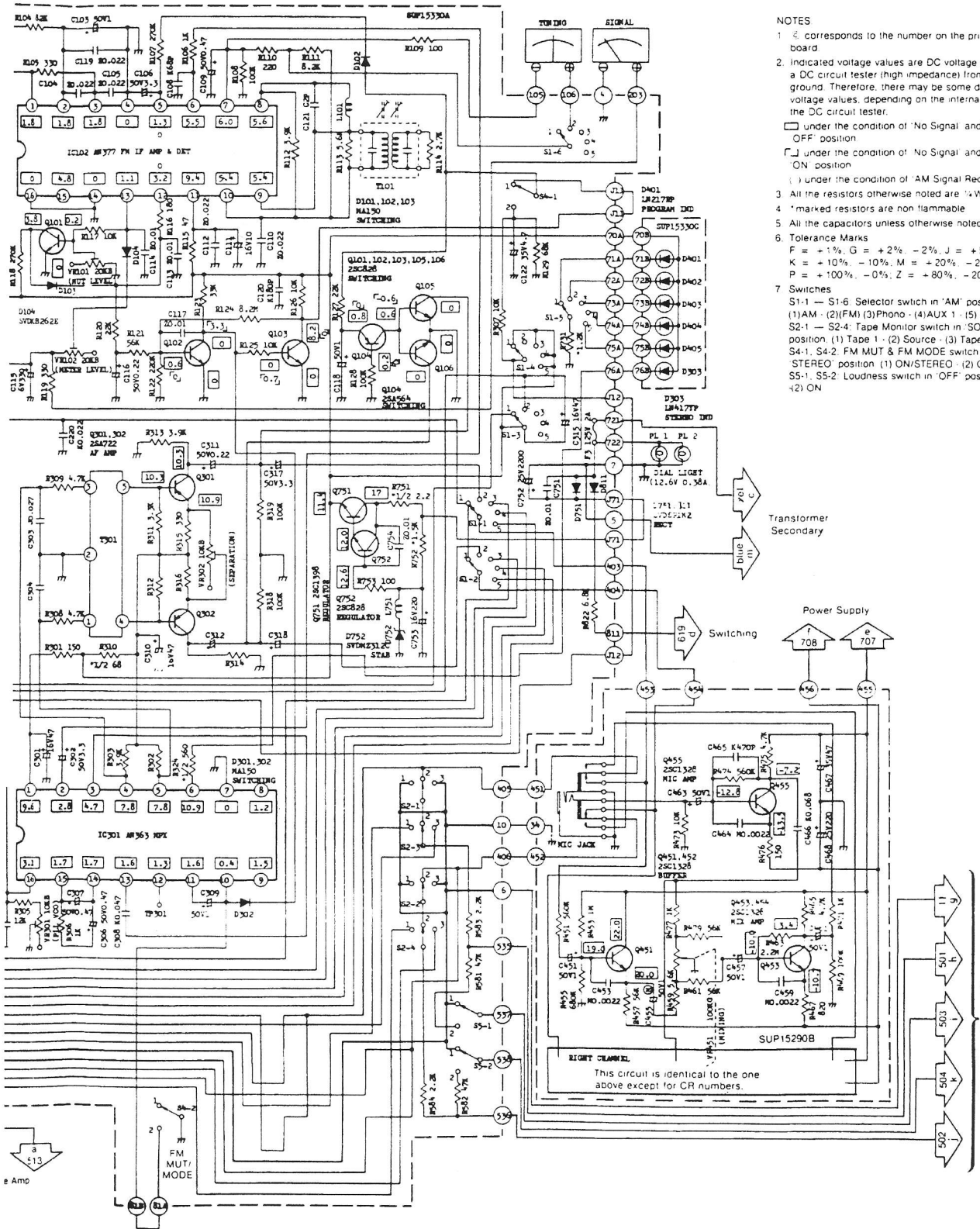
R SUPPLY, MODEL SA-T670



SCHEMATIC DIAGRAM - AM/FM TUNER, MIC AMP, MIC MIXING



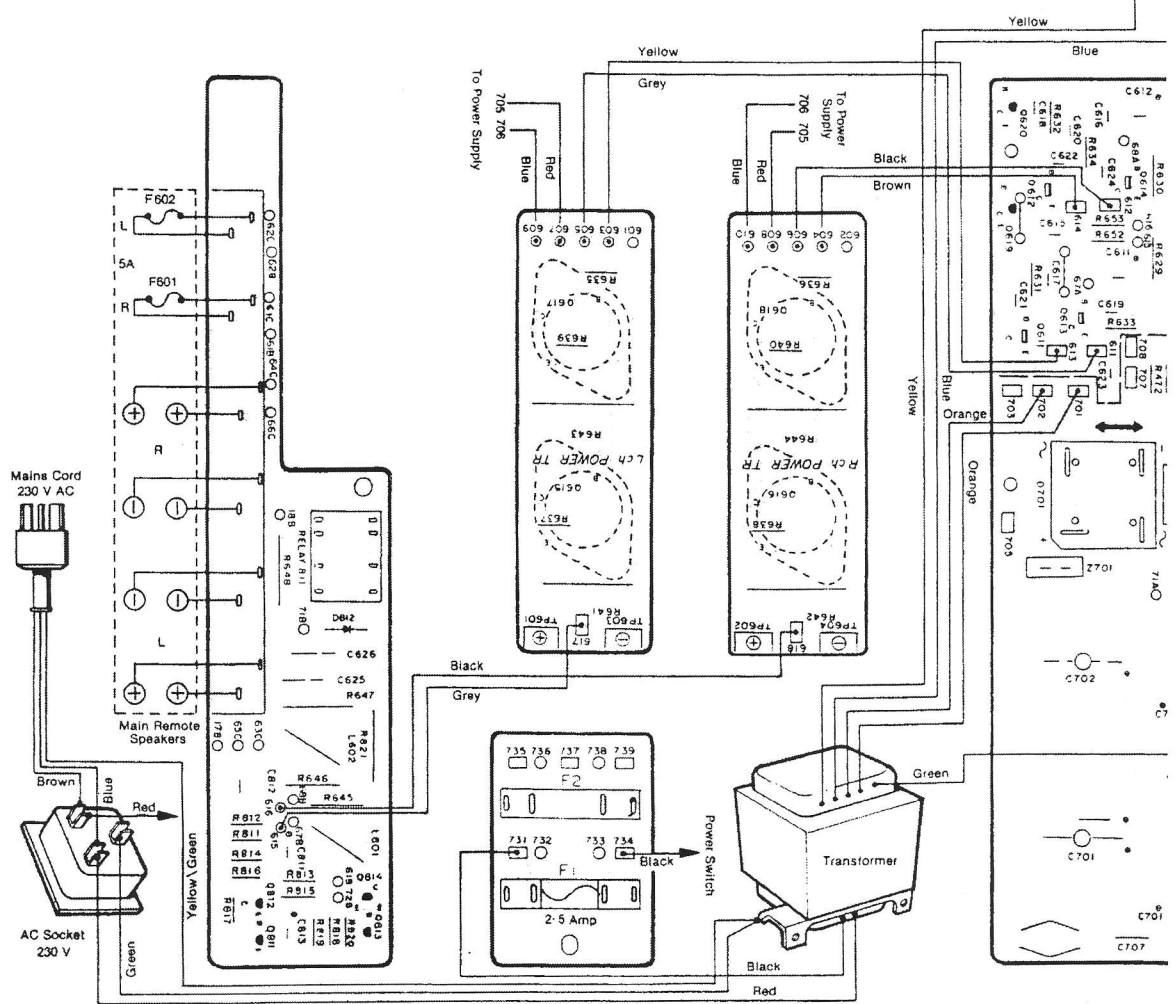
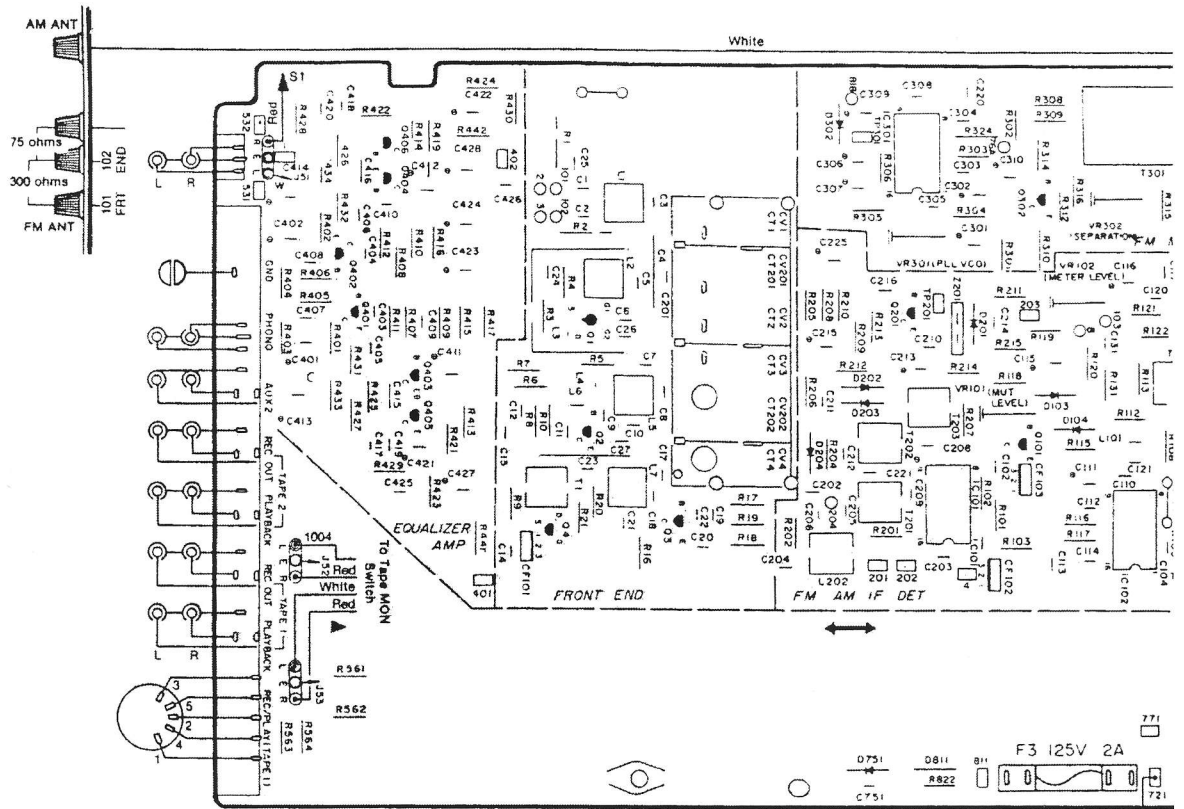
MIXING MODEL; SA-T670



NOTES

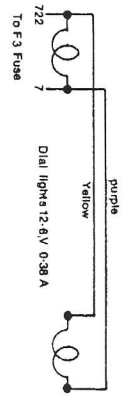
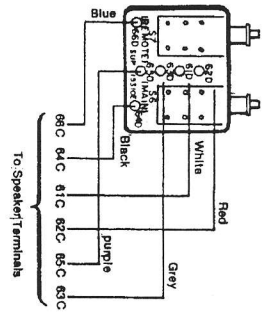
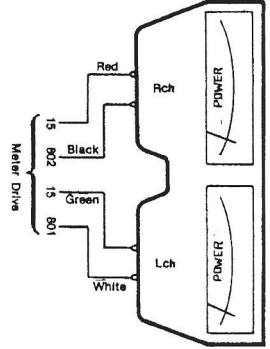
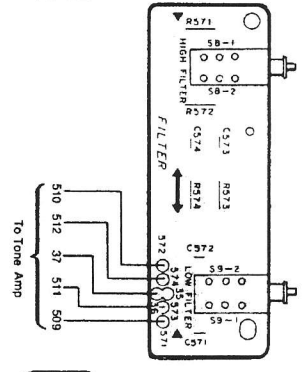
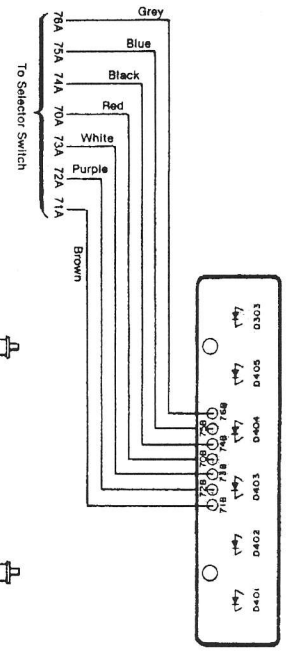
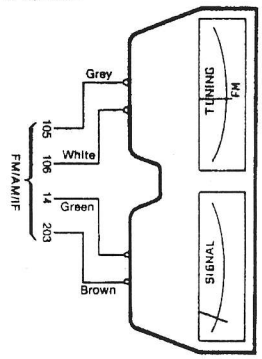
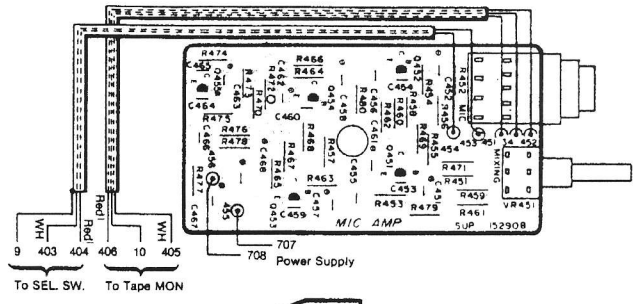
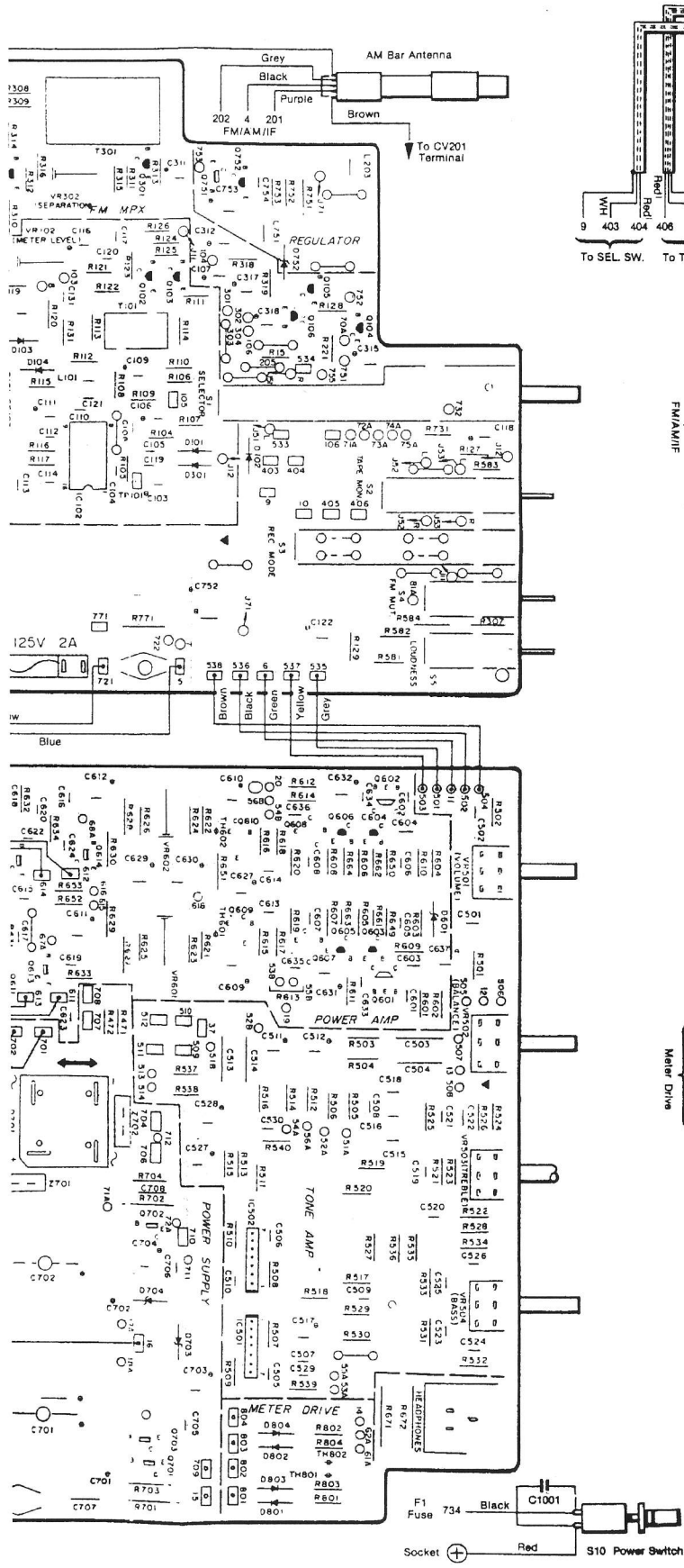
- 1 & 4 corresponds to the number on the printed circuit board
2. Indicated voltage values are DC voltage measured with a DC circuit tester (high impedance) from chassis ground. Therefore, there may be some difference in the voltage values, depending on the internal impedance of the DC circuit tester.
- under the condition of 'No Signal' and Muting switch 'OFF' position
- under the condition of 'No Signal' and Muting switch 'ON' position
- () under the condition of 'AM Signal Reception'
3. All the resistors otherwise noted are 1/4 W - 5%; - 5%
4. * marked resistors are non flammable
5. All the capacitors unless otherwise noted are 50V
6. Tolerance Marks
 F = + 1%, G = + 2% - 2%, J = + 5% - 5%,
 K = + 10% - 10%, M = + 20% - 20%,
 P = + 100% - 0%, Z = + 80% - 20%
7. Switches
 S1-1 - S1-6 Selector switch in 'AM' position
 (1) AM - (2) FM (3) Phono - (4) AUX 1 - (5) AUX 2
 S2-1 - S2-4: Tape Monitor switch in 'SOURCE' position: (1) Tape 1 - (2) Source - (3) Tape 2
 S4-1, S4-2: FM MUT & FM MODE switch in 'ON' & 'STEREO' position (1) ON/STEREO - (2) OFF/MONO
 S5-1, S5-2: Loudness switch in 'OFF' position (1) OFF (2) ON

WIRING DIAGRAM MODEL SA-T670



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REPLACEMENT PARTS LIST

NOTES: 1. Part numbers are shown for most mechanical parts.
2. 'S' in the Remarks column indicates that a part is normally a stock item.

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
RF, IF, PCB TRANSISTORS							
Q1	361-041280	Transistor FM RF Amp	S	C115	ECEAOJS331E	Electrolytic	
Q2	361-041283	Transistor FM Mixer	S	C116	ECEA50ZR2ZE	Electrolytic	
Q3	361-041284	Transistor FM Local OSC	S	C117	ECKW1H103ZF	Ceramic	
Q4	361-041328	Transistor Buffer	S	C118	ECEA1HS010E	Electrolytic	
Q101,102, 103	361-041282	Transistor Switching	S	C119	ECKW1H223ZF	Ceramic	
Q104	361-041327	Transistor Switching	S	C120	ECCW1H181K	Ceramic	
Q105,106	361-041282	Transistor Switching	S	C121	ECCW1H020CC	Ceramic	
Q301,302	361-041281	Transistor AF AMP	S	C122	ECEA1VS4R7E	Electrolytic	
Q201	361-041282	Transistor Switching	S	C201	ECCW1H020CC	Ceramic	
Q401,402	361-041332	Transistor Equaliser AMP	S	C202	ECCW1H150KC	Ceramic	
Q403,404	2SC1328STMS	Transistor Equaliser AMP		C203	ECKW1H103ZF	Ceramic	
Q405,406	361-041329	Transistor Equaliser AMP	S	C204	ECKW1H103ZF	Ceramic	
Q751	361-041228	Transistor Regulator	S	C205	ECKW1H103MD	Ceramic	
Q752	361-041282	Transistor Regulator	S	C206	ECQS1361JZW	Polystyrene	
DIODES & INTEGRATED CIRCUITS							
D101,102				C208	ECEA1HS3R3E	Electrolytic	
103	361-041025	Diode Switching	S	C209	ECKW1H331KB	Ceramic	
D104	361-041093	Diode	S	C210	ECCW1H390KC	Ceramic	
D201	OA99	Diode Detector		C211,212	ECKW1H103ZF	Ceramic	
D202,203	361-041028	Diode AGC	S	C213	ECEA1CS100E	Electrolytic	
D204,301				C214	ECQM1H223KZW	Polyester	
302	361-041025	Diode Switching	S	C215	ECEA1HS3R3E	Electrolytic	
D303	361-041060	Stereo Indicator	S	C216	ECQM1H223KZW	Polyester	
D401,402 403,404				C220	ECQM1H223KZW	Polyester	
405	361-041061	LED, Red Programme Indic	S	C221	ECCW1H020CC	Ceramic	
D751	361-041066	LED, Red Rectifier	S	C225	ECEA1CS470E	Electrolytic	
D752	361-041094	LED, Red Stabiliser	S	C301	ECEA1CS470E	Electrolytic	
D811	361-041066	LED, Red Rectifier	S	C302	ECEA1HS3R3E	Electrolytic	
IC101	363-041015	IC FM 1st, 2nd IF, AM	S	C303,304	ECQM1H273JZW	Polyester	
IC102	363-041017	IC FM IF AMP & DET	S	C305	ECQS1471JZW	Polystyrene	
IC301	363-041018	IC MPX	S	C306,307	ECEA50ZR47E	Electrolytic	
CAPACITORS							
C1,2,3	ECCW1H150KC	Ceramic		C308	ECQM1H473KZW	Polyester	
C4	ECBT1H010K	Ceramic		C309	ECEA50M3R3SE	Electrolytic	
C5	ECCW1H180KC	Ceramic		C310	ECEA1CS470E	Electrolytic	
C6	ECKW1H102ZF	Ceramic		C311,312	ECEA50ZR22E	Electrolytic	
C7	ECKD1H102MDL	Ceramic		C315	ECEA1CS470E	Electrolytic	
C8	ECCW1H120KC	Ceramic		C317,318	ECEA50M3R3SE	Electrolytic	
C9	ECCW1H070DC	Ceramic		C401,402	ECEA50M3R3SE	Electrolytic	
C10	ECCW1H050CC	Ceramic		C403,404	ECQM1H222KZW	Polyester	
C11	ECCW1H181K	Ceramic		C405,406	ECKW1H471KB	Ceramic	
C12	ECKW1H103ZF	Ceramic		C407,408	ECCW1H220KC	Ceramic	
C14,15	ECKW1H223ZF	Ceramic		C409,410	ECCW1H150KC	Ceramic	
C17	ECCW1H220KR	Ceramic		C411,412	ECEA1CS101VE	Electrolytic	
C18	ECW1H070DC	Ceramic		C413,414	ECEAOJS331E	Electrolytic	
C19	ECCW1H390KC	Ceramic		C415,416	ECQF1393GZN	Polyester	
C20	ECCW1H150KC	Ceramic		C417,418	ECQF1103GZN	Polyester	
C21	ECCD1H030CC	Ceramic		C419,420	ECQM1H273JZW	Polyester	
C22	ECKW1H102ZF	Ceramic		C421,422	ECEA50M3R3SE	Electrolytic	
C23	ECCD1H030CC	Ceramic		C423,424	ECEA1VS470VE	Electrolytic	
C24	ECKW1H102ZF	Ceramic		C425,426	ECQM1H102JZW	Polyester	
C101,102	ECKW1H223ZF	Ceramic		C427,428	ECEA1VS470VE	Electrolytic	
C103	ECEA1HS010E	Electrolytic		C751	ECKW1H103ZF	Ceramic	
C104,105	ECKW1H223ZF	Ceramic		C752	ECEA1ES222E	Electrolytic	
C106	ECEA1HS3R3E	Electrolytic		C753	ECEA1CS221E	Electrolytic	
C108	ECCW1H680K	Ceramic		C754	ECKW1H103ZF	Ceramic	
C109	ECEA1HSR47E	Electrolytic		VARIABLE CAPACITOR			
C110	ECKW1H331KB	Ceramic		CV1-CV4,			
C111	ECEA1CS100E	Electrolytic		CV201,			
C112	ECKW1H223ZF	Ceramic		CV202	493-317001	Tuning Gang Cap. w/drum	
C113,114	ECKW1H103ZF	Ceramic		CT1-CT4,			
				CT201,			
				CT202			
RESISTORS							
R1,R2	ERD12SSJ104C	Carbon Film					
R3	ERD25TJ563S	Carbon Film					
R4	ERD25TJ223S	Carbon Film					

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
SWITCHES							
S1-1,S1-6	493-349001	Selector Switch	S	C629,630	ECEA1JS101E	Electrolytic	
S2-1,S2-4	493-349002	Lever Sw. Tape Mon.	S	C631,632	ECEA1CS330E	Electrolytic	
S4-1,S4-2	493-349003	Lever Sw. FM MUT & FM MODE	S	C701,702	311-045008	Electrolytic	S
S5-1,S5-2	493-349003	Lever Sw. Loudness	S	C703,704	ECEA1ES221E	Electrolytic	
CIRCUIT BOARDS							
	347-050060	RF, IF Board	S	C705,506	ECKW1H103ZF	Ceramic	
	347-050062	Filter Board	S	C707,708	ECKW2H103PE	Ceramic	
	347-050061	AF Board	S	C811	ECEA1HS2R2E	Electrolytic	
				C812	ECES16N220VE	Electrolytic	
				C813	ECEA1CS330E	Electrolytic	
AF PCB				COMPONENT COMBINATION			
Q601,602	361-041242	Transistor Differential	S	Z701,702	325-053507	Component Comb. Rectifier	S
Q607,608	361-041334	Transistor Pre-Drive	S	THERMISTORS			
Q609,610	361-041252	Transistor Buffer	S	TH801,			
Q611,612	361-041335	Transistor Drive	S	802	325-052609	Thermistor, Meter Drive	S
Q613,614	361-041336	Transistor Drive	S	TH601,			
Q615,616	361-041339	Transistor Power	S	602	325-052610	Thermistor, Buffer	S
Q617,618	361-041340	Transistor Power	S	COILS			
Q619,620	361-041282	Transistor Therm. Comp.	S	L 601,602	381-050041	Choke Coil	S
Q701	361-041337	Transistor Regulator	S	RESISTORS			
Q702	361-041338	Transistor Regulator	S	R471	ERD25FJ101P	Carbon Film	
Q811,812	361-041327	Transistor Switching	S	R472	ERD25FJ561P	Carbon Film	
Q813	361-041331	Transistor Switching	S	R501,502	ERD25TJ823S	Carbon Film	
Q814	361-041330	Transistor Relay Drive	S	R503,504	ERD25TJ104S	Carbon Film	
DIODES & INTEGRATED CIRCUITS							
D601,703				R505,506,			
704	361-041095	Diode Stab.	S	507,508	ERD25TJ561S	Carbon Film	
D701	361-041091	Diode Rect.	S	R509,510	ERD25TJ473S	Carbon Film	
D801,802	493-361001	Diode Meter Drive	S	R511,512	ERD25TJ823S	Carbon Film	
D803,804	493-361002	Diode Meter Drive	S	R513,514	ERD25TJ393S	Carbon Film	
D812	363-041066	Diode Relay	S	R515,516	ERD25TJ102S	Carbon Film	
IC501,502	363-041030	IC Tone Amp	S	R517,518	ERD25TJ334S	Carbon Film	
CAPACITORS							
C501,502	ECQM1H473KZW	Polyester		R519,520	ERD25TJ562S	Carbon Film	
C503,504	ECQE1684KZ	Polyester		R523,524	ERD25TJ183S	Carbon Film	
C505,506	ECCW1H680K	Ceramic		R525,526	ERD25TJ152S	Carbon Film	
C507,508	ECCW1H181K	Ceramic		R527,528	ERD25TJ682S	Carbon Film	
C509,510	ECQM1H102JZW	Polyester		R529,530	ERD25TJ183S	Carbon Film	
C511,512	ECEA50W1E	Electrolytic		R533,534	ERD25TJ104S	Carbon Film	
C513,514	ECQE1684KZ	Polyester		R535,536	ERD25TJ332S	Carbon Film	
C515,516				R537,538	ERD25FJ152P	Carbon Film	
517,518	ECEA16N10E	Electrolytic		R601,602	ERD25TJ563S	Carbon Film	
C519,520	ECQM1H222JZW	Polyester		R603,604	ERD25TJ223S	Carbon Film	
C521,522	ECQM1H183JZW	Polyester		R609,610	ERD25TJ332S	Carbon Film	
C523,524	ECQM1H123JZW	Polyester		R611,612	ERD25TJ272S	Carbon Film	
C525,526	ECQM1H683JZW	Polyester		R613,614	ERD25TJ563S	Carbon Film	
C527,528	ECEA1CS330E	Electrolytic		R615,616	ERD25TJ472S	Carbon Film	
C601,602	ECKW2H102KB	Ceramic		R617,618	ERD25TJ103S	Carbon Film	
C603,604	ECKW2H331KB	Ceramic		R619,620	ERD25FJ470P	Carbon Film	
C605,606	ECCW2H221K	Ceramic		R621,622	ERD25TJ471S	Carbon Film	
C607,608	ECCW2H050C	Ceramic		R623,624	ERD25FJ272P	Carbon Film	
C609,610				R625,626	ERD25FJ102P	Carbon Film	
611,612	ECEA1VS101E	Electrolytic		R627,628	ERD50FJ182P	Carbon Film	
C613,614	ECCW2H221K	Ceramic		R629,630	ERD50FJ392P	Carbon Film	
C615,616	ECKW2H102KB	Ceramic		R631,632			
C617,618	ECKW2H471KB	Ceramic		633,634	ERD25FJ821P	Carbon Film	
C619,620	ECKW2H102KB	Ceramic		R635,636			
C621,622				637,638	ERD25FJ221P	Carbon Film	
623,624	ECCW2H470K	Ceramic		R639,640	ERD25FJ820P	Carbon Film	
C625,626	ECQM1473KZW	Polyester		R641,642			
C627	ECEA1ES100E	Polyester		643,644	324-041039	Wire Wound	S
				R645,646	ERX1ANJP6R8S	Metal Film	
				R647,648	ERG2ANJP100S	Metal Oxide	
				R649,650	ERD25TJ272S	Carbon Film	

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REPLACEMENT PARTS LIST

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
R651	ERD50FJ392P	Carbon Film		R455,456	ERD25TJ684S	Carbon Film	
R652	ERX1ANJP1R0S	Metal Film		R457,458	ERD25TJ563S	Carbon Film	
R661,662				R459,460	ERD25TJ562S	Carbon Film	
663,664	ERD25TJ152S	Carbon Film		R461,462	ERD25TJ563S	Carbon Film	
R671,672	ERG2ANJP331S	Metal Oxide		R463,464	ERC14GK225	Solid	
R701,702	ERG1ANJP101S	Metal Oxide		R465,466	ERD25TJ472S	Carbon Film	
R703,704	ERD50FJ182P	Carbon Film		R467,468	ERD25TJ821S	Carbon Film	
R801,802	ERD25TJ472S	Carbon Film		R469,470	ERD25TJ104S	Carbon Film	
R803,804	ERD25TJ682S	Carbon Film		R471,472	ERD25TJ102S	Carbon Film	
R811,812	ERD25TJ183S	Carbon Film		R473	ERD25TJ103S	Carbon Film	
R813	ERD25TJ562S	Carbon Film		R474	ERD25TJ564S	Carbon Film	
R814	ERD25TJ332S	Carbon Film		R475	ERD25TJ472S	Carbon Film	
R815	ERD25TJ473S	Carbon Film		R476	ERD25TJ151S	Carbon Film	
R816	ERD25TJ472S	Carbon Film		R477,478	ERD25TJ102S	Carbon Film	
R817	ERD25TJ333S	Carbon Film		R479,480	ERD25TJ563S	Carbon Film	
R818	ERD25TJ824S	Carbon Film		R571,572	ERD25TJ824S	Carbon Film	
R819	ERD25TJ563S	Carbon Film		R573,574	ERD25TJ221S	Carbon Film	
R820	ERD25TJ393S	Carbon Film		R575,576	ERD25TJ824S	Carbon Film	
R821	ERG2ANJP681S	Metal Oxide					

VARIABLE RESISTORS

VR601, 602	327-041053	ICQ Adj. 500 ohm (B)	S
VR501	493-327003	Volume Control 250 k ohm (B)	S
VR502	493-327004	Balance Control 250 k ohm (BH)	S
VR503, 504	493-327005	Base & Treble Control 100kohm (C)	S

SWITCHES

S6	349-041156	Main Spkrs Switch	S
S7	349-041156	Remote Spkrs Switch	S

JACKS

493-341001	Headphones Jack	S
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RELAYS

RLY811	422-041004	Speaker Protection	S
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MIC MIXING & FILTER PCBS — TRANSISTORS

Q451,452	2SC1328STMS	Buffer
Q453,454	2SC1328STMS	Mix Amp
Q455	2SC1328STMS	Mic Amp

CAPACITORS

C451,452	ECEA50M1SE	Electrolytic
C453,454	ECKW1H222MD	Ceramic
C455,456	ECEA50N1E	Electrolytic
C457,458	ECEA50M1SE	Electrolytic
C459,460	ECKW1H222MD	Ceramic
C461,462		
463	ECEA50M1SE	Electrolytic
C464	ECW1H222MD	Ceramic
C465	ECKW1H471KB	Ceramic
C466	ECQM1H483KZW	Polyester
C467	ECEA1VS470VE	Electrolytic
C468	ECEA1ES221E	Electrolytic
C571,572	ECQM1H273KZW	Polyester
C573,574	ECQM1H183KZW	Polyester

RESISTORS

R451,452	ERD25TJ564S	Carbon Film
R453,454	ERD25TJ105S	Carbon Film

VARIABLE RESISTORS

VR451	493-327001	Var. Resistor Mixing	S
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JACKS

341-050023	Mic Jack	S
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SWITCHES

S8, S9	349-041152	Push Switch, Filter	S
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