

CFS-229L

SERVICE MANUAL

AEP Model
UK Model



Model Name Using Similar Mechanism	CFS-209L
Tape Transport Mechanism Type	MF-209-102

SPECIFICATIONS

Frequency range	FM : 87.6—107MHz MW : 531—1,602kHz LW : 153—279kHz SW : 5.95—18MHz
Aerials	FM/SW : Telescopic aerial MW/LW : Built-in ferrite bar aerial
Recording system	4-track, 2-channel stereo
Frequency response	80—10,000Hz
Speakers	Two way 10cm dia. full range×2 2cm dia. tweeter×2
Input	CD/LINE IN jacks (stereo pinjacks) (2) input impedance 47 kilohms, sensitivity 0.44V
Output	Headphones jack (stereo minijack) for 16—68 ohm impedance headphones

Maximum power output	2.6W+2.6W
Power requirements	220—230V AC, 50Hz (AEP, G model) 230V AC, 50Hz (UK model) 9V DC, six R20 (size D) batteries
Power consumption	14W in AC operation
Battery life	

Batteries	FM recording	Tape playing
Sony SUM-1 (NS)	Approx. 12 hours	Approx. 7 hours
Sony AM1 alkaline	Approx. 24 hours	Approx. 14 hours

Dimensions	Approx. 428×153×147.5mm (w/h/d) incl. projecting parts and controls, not incl. handle
Mass	Approx. 2.9kg incl. batteries
Accessory supplied	Mains lead (1)

Design and specifications subject to change without notice.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

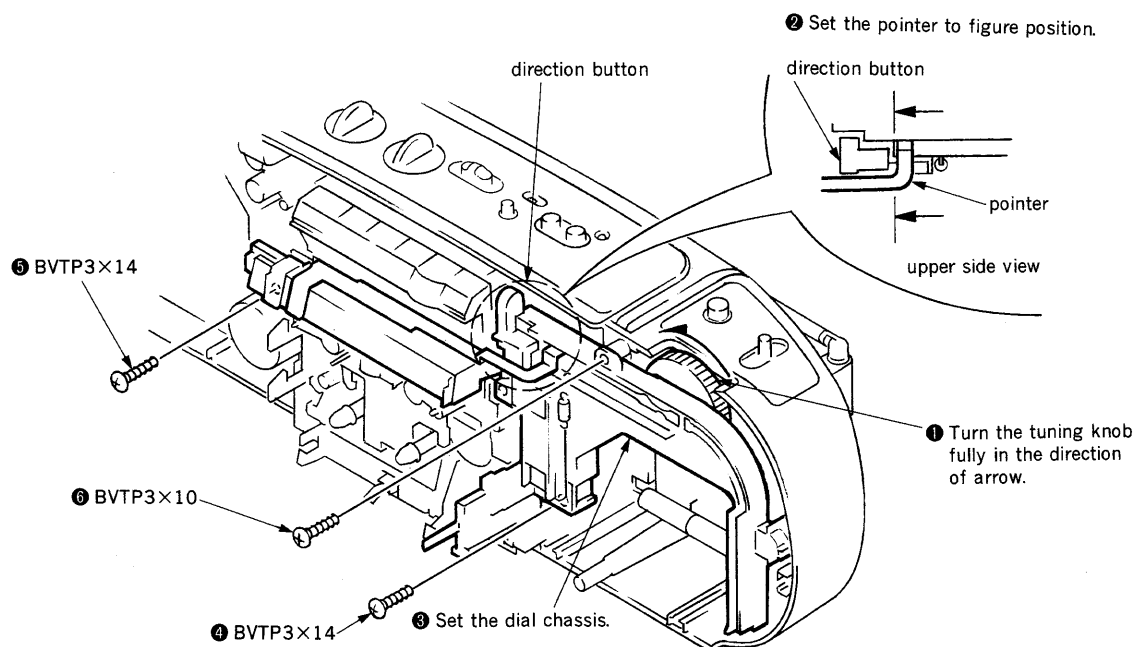
RADIO CASSETTE-CORDER
SONY®

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SECTION 1 DIAL POINTER SETTING

1-1. DIAL POINTER SETTING



SECTION 2 MECHANICAL ADJUSTMENTS

PRECAUTION

- Clean the following parts with a denatured-alcohol-moistened swab :

record/playback head	pinch roller
erase head	rubber belts
capstan	idlers
- Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
- Do not use a magnetized screwdriver for the adjustments.
- After the adjustments, apply suitable locking compound to the parts adjusted.
- The adjustments should be performed with the rated power supply voltage unless otherwise noted.
- Power supply voltage: 9V dc.

Torque Measurement

Torque	Torque Meter	Meter Reading
FWD	CQ-102C	22—55g•cm (0.31—0.76oz•inch)
FWD Back Tension	CQ-102C	2—5g•cm (0.03—0.06oz•inch)
REV	CQ-102RC	22—55g•cm (0.31—0.76oz•inch)
REV Back Tension	CQ-102RC	2—5g•cm (0.03—0.06oz•inch)
FF	CQ-201B	more than 60g•cm (more than 0.84oz•inch)
REW	CQ-201B	more than 55g•cm (more than 0.77oz•inch)

Tape Tension Measurement

Mode	Tension meter	Meter Reading
FWD	CQ-403A	more than 100g (more than 3.53 oz)
REV	CQ-403R	

SECTION 3 ELECTRICAL ADJUSTMENTS

3-1. TAPE RECORDER SECTION 0dB=0.775V

Standard Output Level

Output terminal	SP OUT	HP OUT
load impedance	3.2Ω	32Ω
output signal level	0.775V (0dB)	0.25V (−10dB)

Test Tape

Type	Signal	Used for
WS-48A	3kHz, 0dB	tape speed adjustment

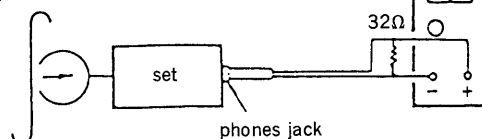
Tape Speed Adjustment

Procedure :

Mode : playback

speed checker
LFM-30
or
digital frequency
counter

test tape
WS-48A
(3kHz, 0dB)



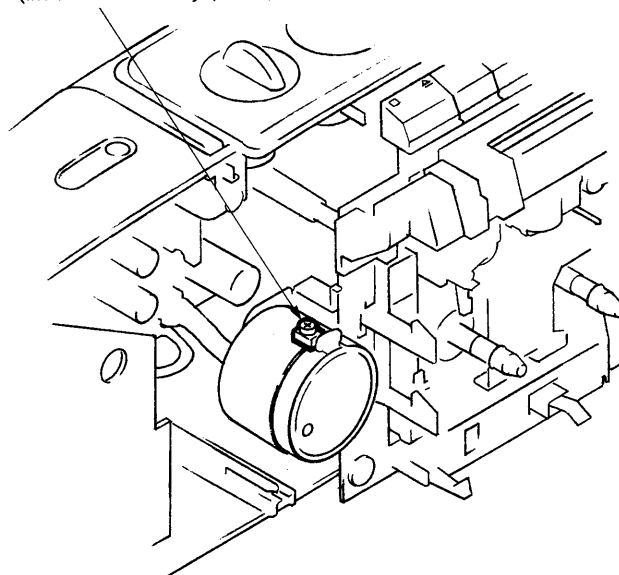
Adjustment Value :

Speed checker	Digital frequency counter
−3% to +3%	2,910 to 3,090Hz

Frequency difference between the beginning and the end of the tape should be within $\pm 1.5\%$ (45Hz).

Adjustment Location :

adjustment resistor RV401
(included motor assy (M901))

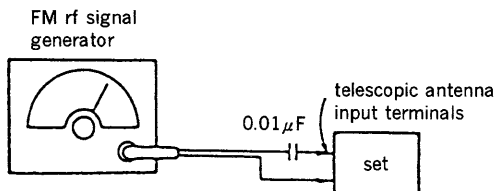


3-2. TUNER SECTION $0\text{dB}=1\mu\text{V}$

• FM Section

Setting :

FUNCTION switch : FM

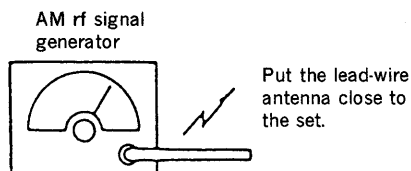


22.5kHz frequency
deviation by 400Hz signal
output level: as low as possible

• MW/LW Section

Setting :

FUNCTION switch : MW or LW



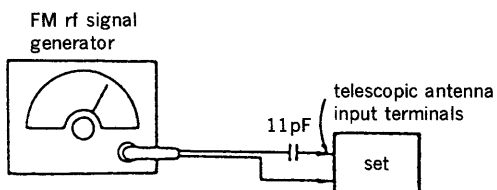
30% amplitude
modulation by
400Hz signal
output level: as low as possible

• SW Section

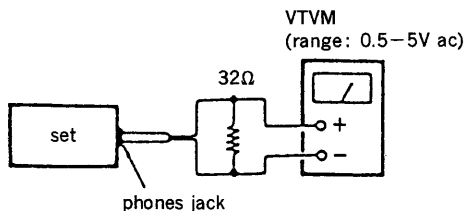
Setting :

FUNCTION switch : SW

FINE TUNE control : mechanical mid



22.5kHz frequency
deviation by 400Hz signal
output level: as low as possible



- Repeat the procedures in each adjustment several times, and the frequency coverage and tracking adjustments should be finally done by the trimmer capacitors.
- Remove telescopic antenna in FM/SW section adjustments.

FM FREQUENCY COVERAGE ADJUSTMENT

Adjust for a maximum reading on VTVM.

L2	CT2
87.35MHz	107.8MHz

FM TRACKING ADJUSTMENT

Adjust for a maximum reading on VTVM.

L1	CT1
87.35MHz	107.8MHz

AM IF ADJUSTMENT

Adjust for a maximum reading on VTVM.

T1
455kHz

MW FREQUENCY COVERAGE ADJUSTMENT

Adjust for a maximum reading on VTVM.

L8	CT4
515kHz	1,680kHz

MW TRACKING ADJUSTMENT

Adjust for a maximum reading on VTVM.

L3-1	CT3
600kHz	1,400kHz

LW FREQUENCY COVERAGE ADJUSTMENT

Adjust for a maximum reading on VTVM.

L4	CT8
145kHz	300kHz

LW TRACKING ADJUSTMENT

Adjust for a maximum reading on VTVM.

L3-2	CT7
160kHz	260kHz

SW FREQUENCY COVERAGE ADJUSTMENT

Adjust for a maximum reading on VTVM.

L6	CT6
5.8MHz	18.4MHz

SW TRACKING ADJUSTMENT

Adjust for a maximum reading on VTVM.

L5	CT5
5.8MHz	18.4MHz

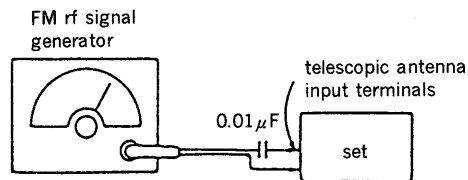
Note :

This set employs three ceramic filters (CF1, 3 and 4) which should have the same color marking to identify their center frequency.

mark1	mark2	mark1	mark2	Carrier Frequency
red	—	red	—	10.70MHz
blue	—	blue	—	10.67MHz
orange	—	orange	—	10.73MHz
black	—	black	—	10.64MHz
white	—	white	—	10.76MHz
white	white	white	white	10.75MHz
yellow	—	yellow	—	10.79MHz

FM VCO Adjustment

Setting :

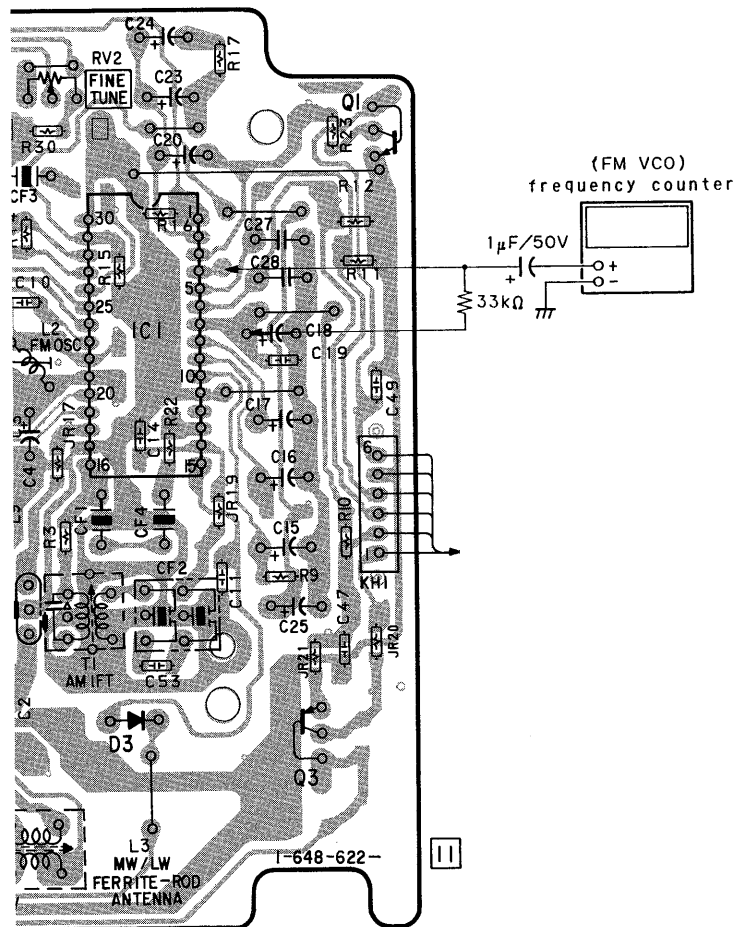


Carrier frequency: 98MHz
Modulation: no modulation
Output level: 0.1V (100dB)

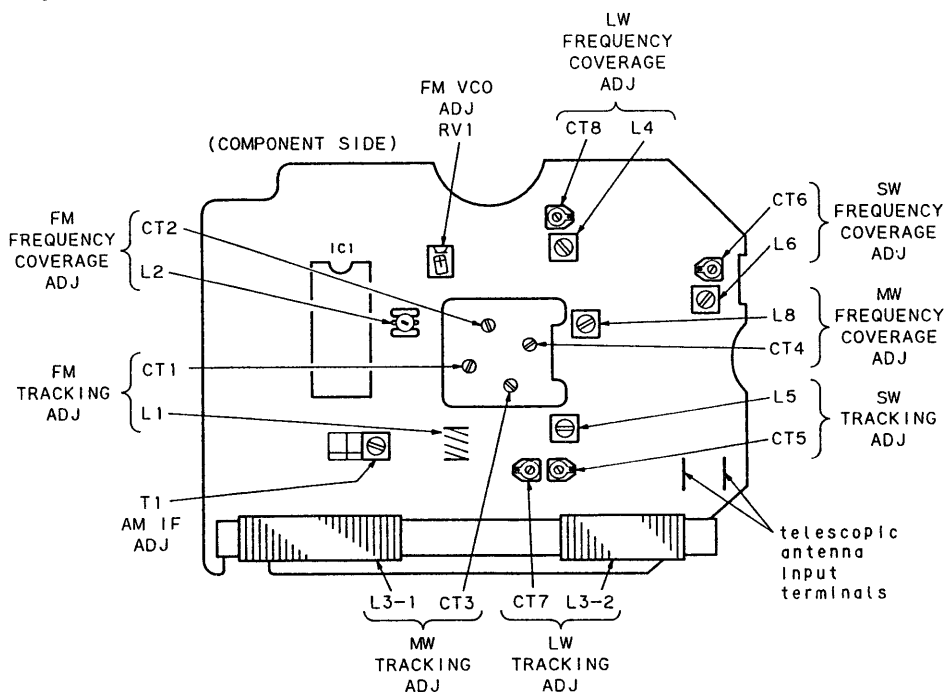
Procedure :

1. Connect frequency counter as shown below.
2. Tune the set to 98MHz.
3. Adjust RV1 for 76kHz $\pm$ 500Hz reading on the frequency counter.

Adjustment Location : tuner board (conductor side)

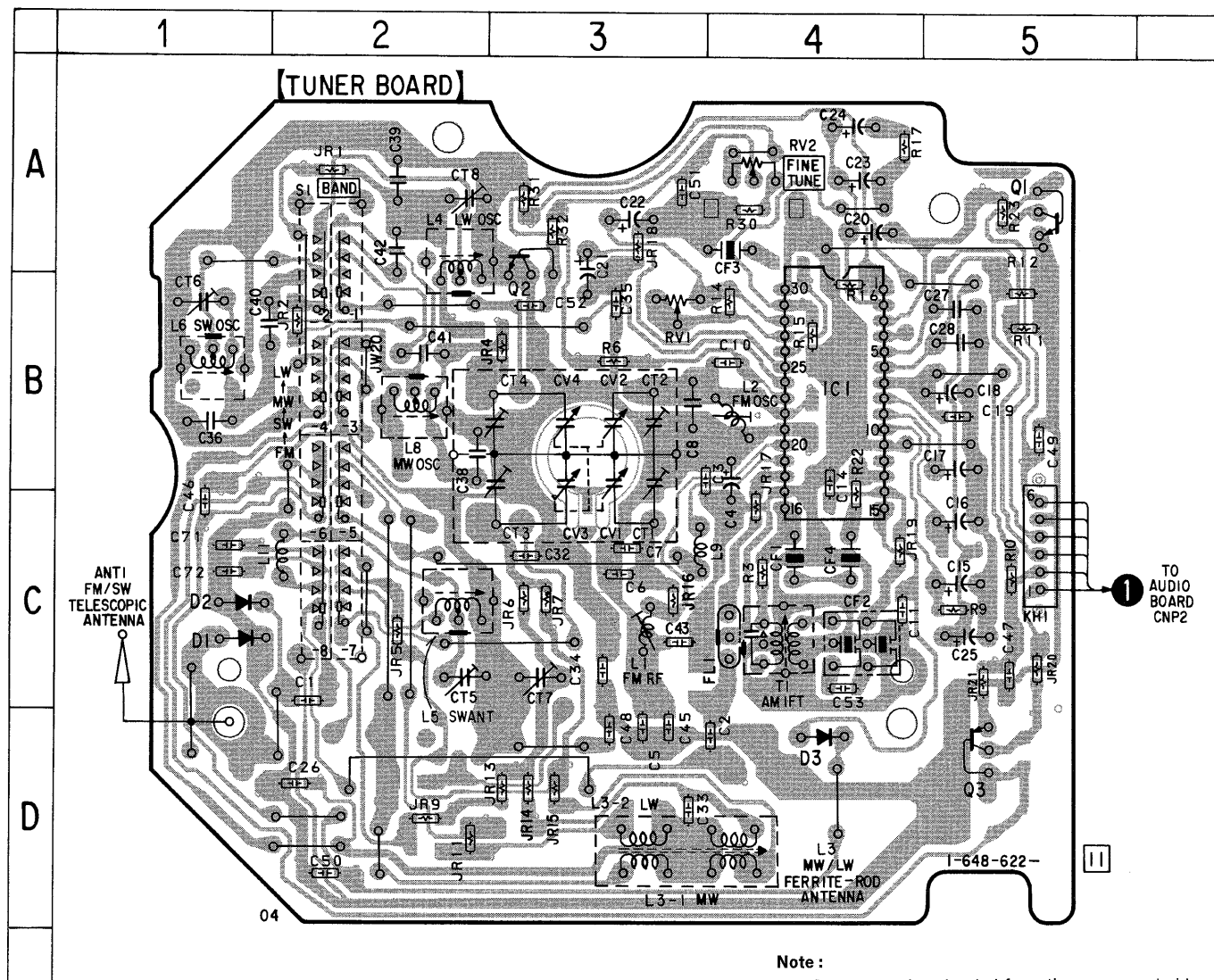


Adjustment Location : tuner board (component side)



SECTION 4 DIAGRAMS

4-1. PRINTED WIRING BOARD—TUNER SECTION—

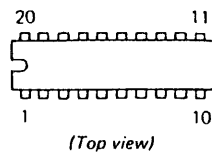


Note:

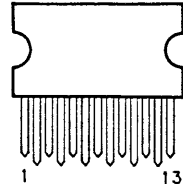
- : parts extracted from the component side.
- : indicates side identified with part number.
- : Pattern on the side which is seen.

4-2. SEMICONDUCTOR LEAD LAYOUTS

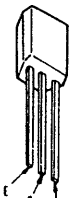
BA3870



LA4598



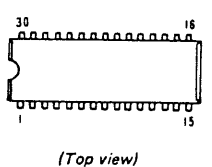
DTA114ES DTA144ES DTC114YS RN1202 RN1207



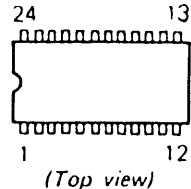
2SC1815-GR 2SC2001-LK



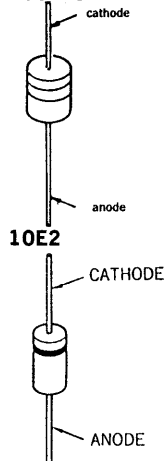
CXA1238S



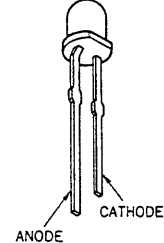
TA2036N



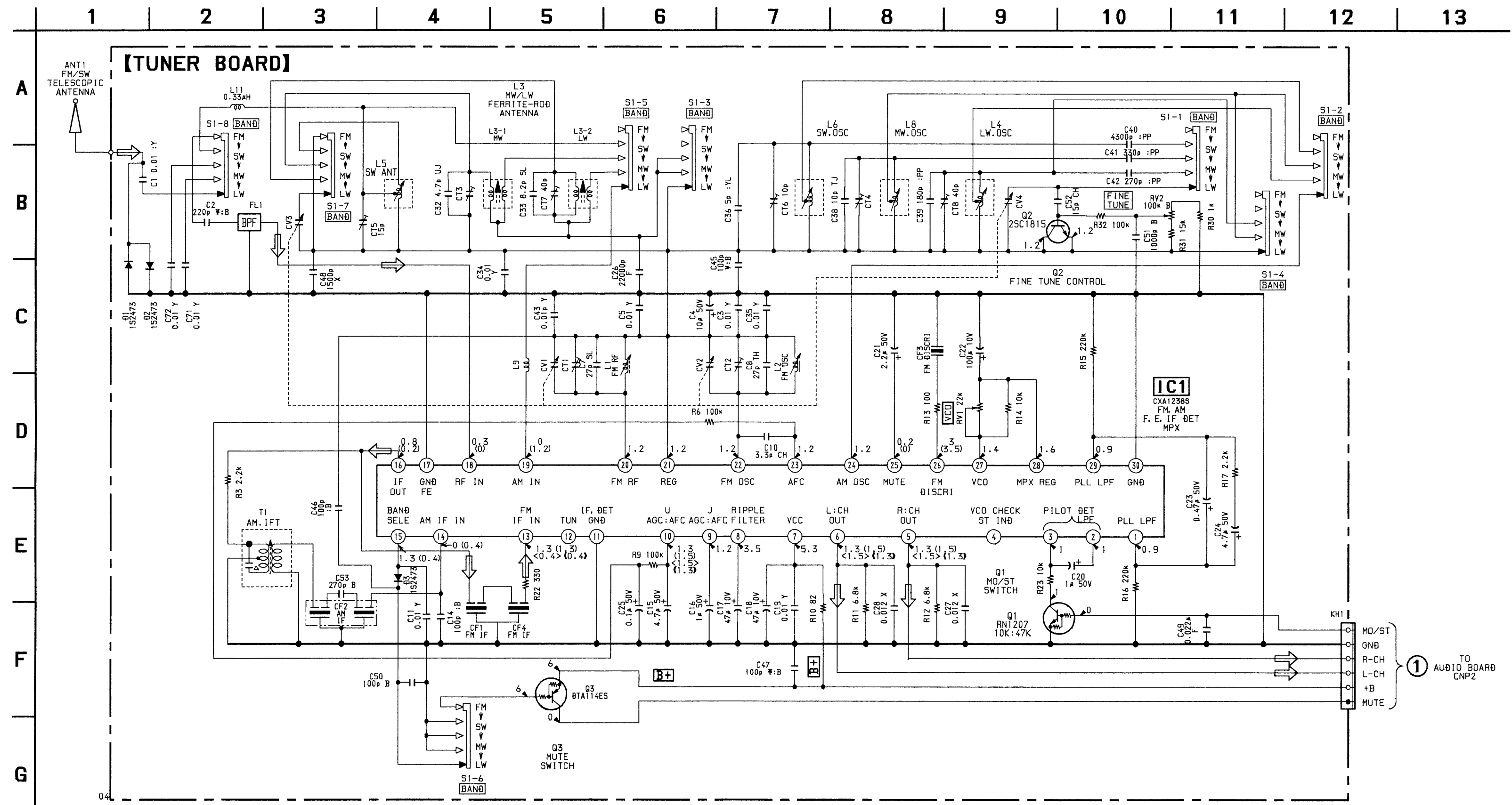
RD6.8ES-B2 1SS119



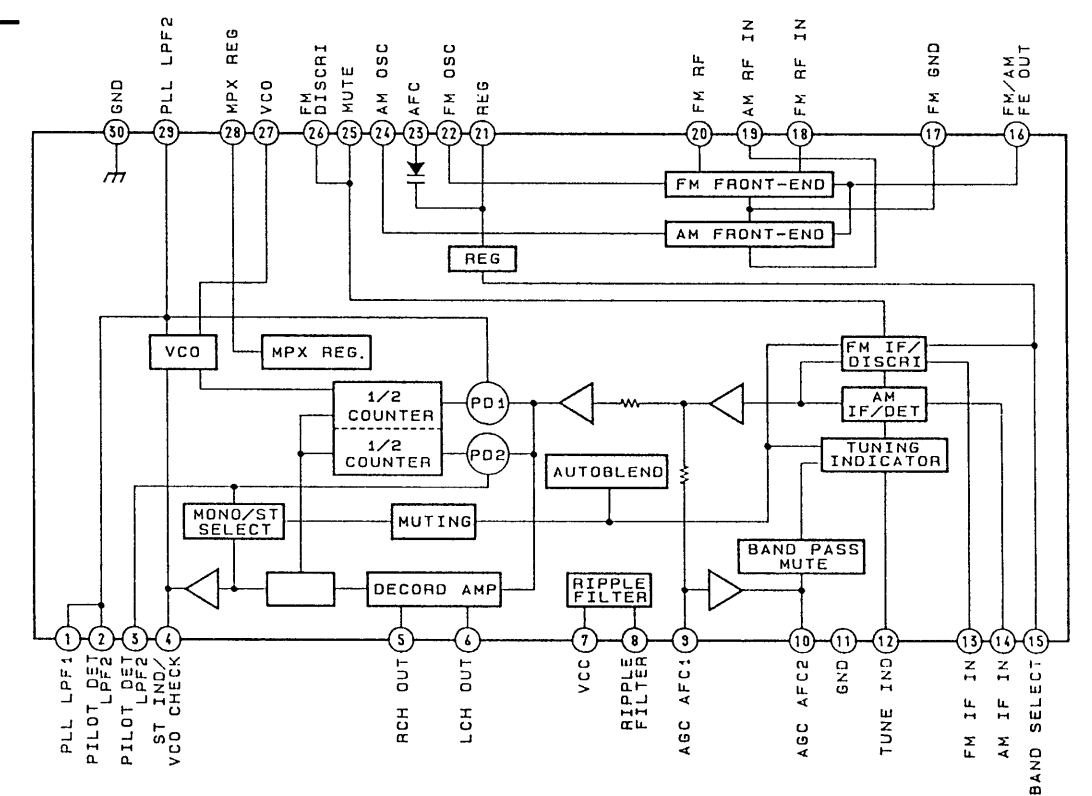
MVR3338S



4-3. SCHEMATIC DIAGRAM—TUNER SECTION—



• IC Block Diagram
IC1 CXA1238S

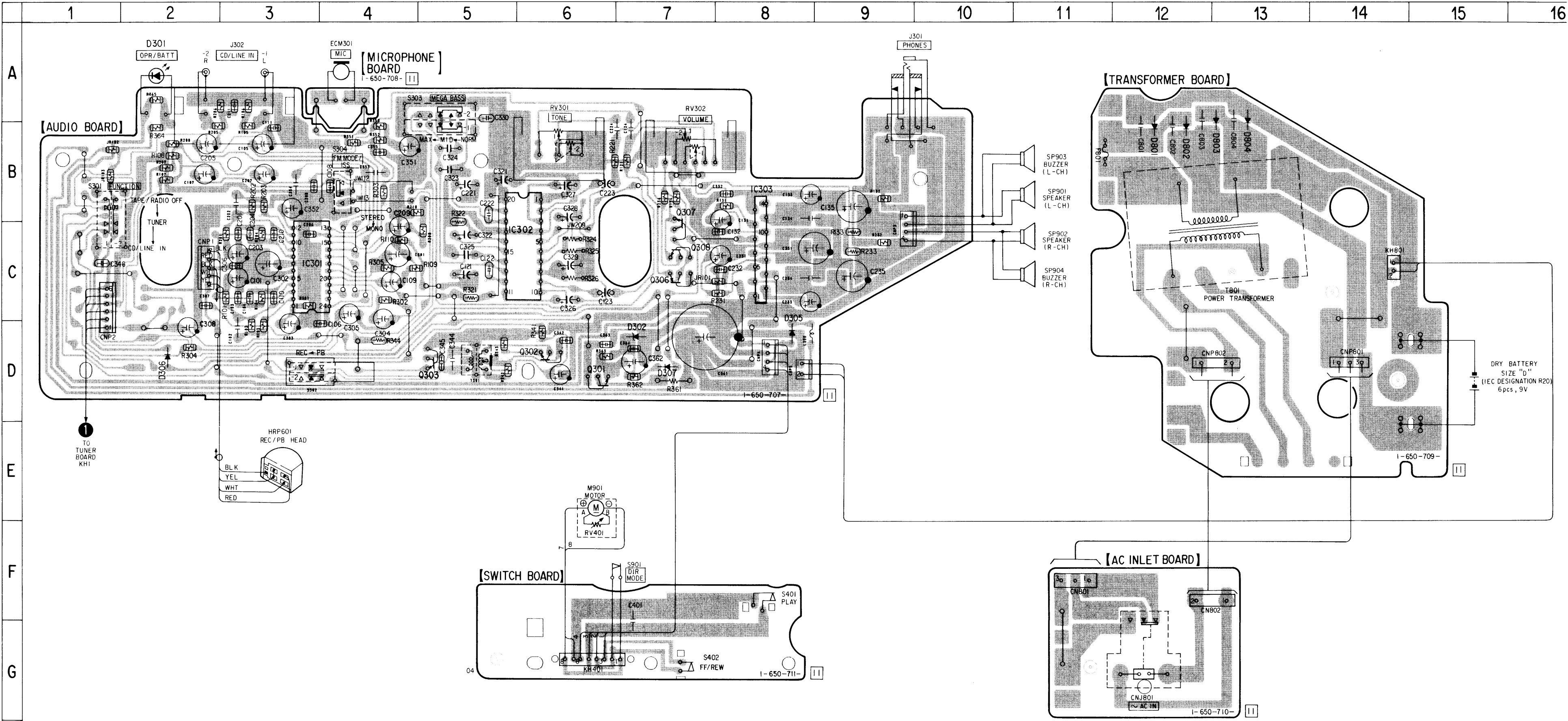


- Note :**
- All capacitors are in μF unless otherwise noted. pF : μF 50WV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and 1/4 W or less unless otherwise specified.
 - Δ : internal component.
 - B+ : B+ Line
 - $\square$: adjustment for repair.
 - Voltage is dc with respect to ground under no-signal (detuned) conditions.
 - no mark: FM
 - (): SW
 - < > : MW
 - << >> : LW
 - Voltages are taken with a VOM (Input Impedance 10M Ω). Voltage variations may be noted due to normal production tolerances.
 - Signal path.
 - $\Rightarrow$: FM

• Semiconductor Location

Ref. No.	Location
D301	A-2
D302	D-7
D305	D-8
D306	D-2
D307	D-7
D801	B-12
D802	B-12
D803	B-12
D804	B-13
IC301	C-3
IC302	C-6
IC303	B-8
Q301	D-6
Q302	D-6
Q306	C-7
Q307	C-7
Q308	C-7

4-4. PRINTED WIRING BOARDS—AUDIO SECTION— • Refer to page 6 for Semiconductor Lead Layouts.



SECTION 5 EXPLODED VIEWS

NOTE:

The mechanical parts with no reference number in the exploded views are not supplied.
Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

-XX and -X mean standardized parts, so they may have some difference from the original one.

Color Indication of Appearance Parts
Example :

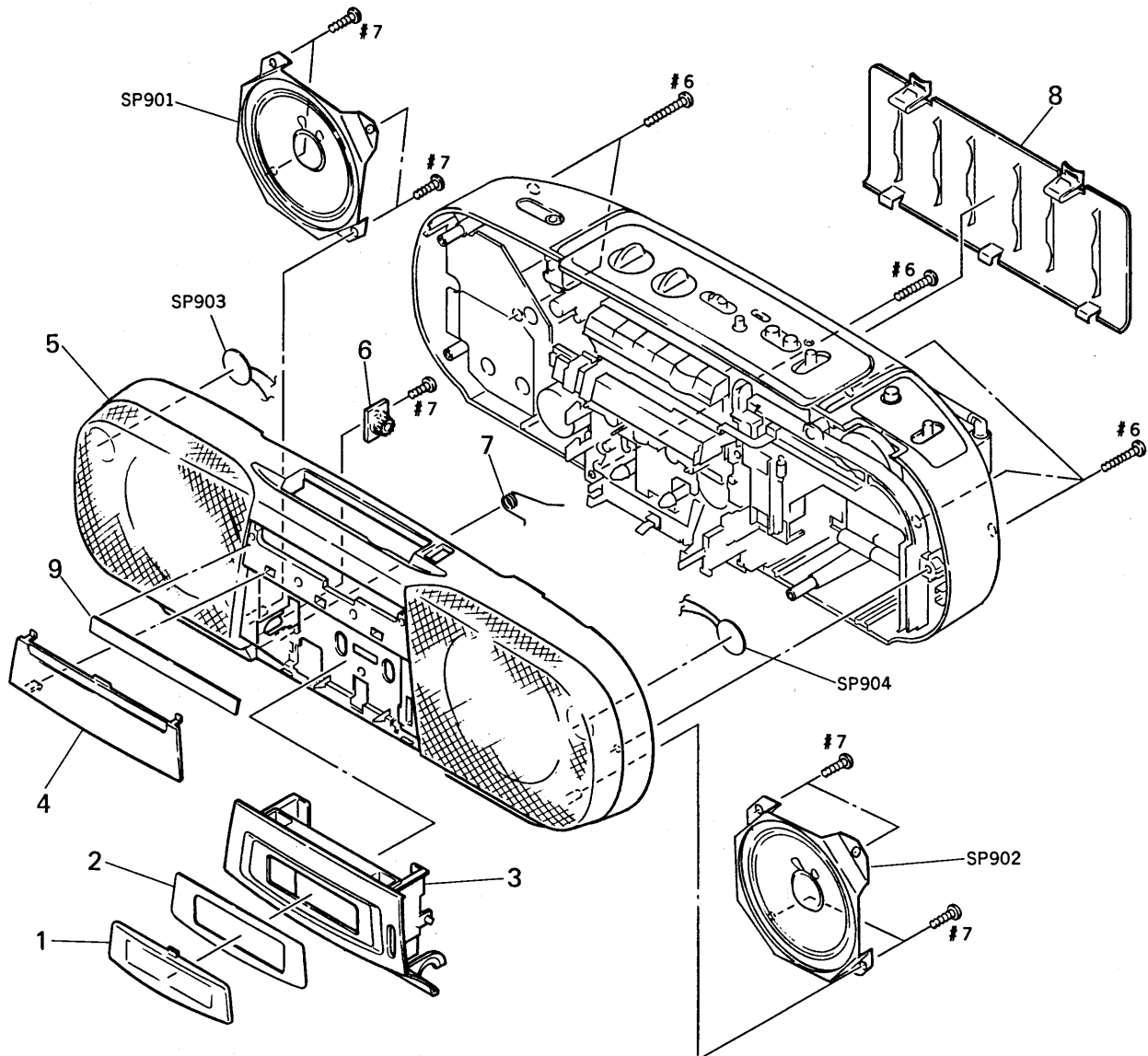
KNOB, BALANCE (WHITE)... (RED)

↑ ↑
Parts Color Cabinet's Color

Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

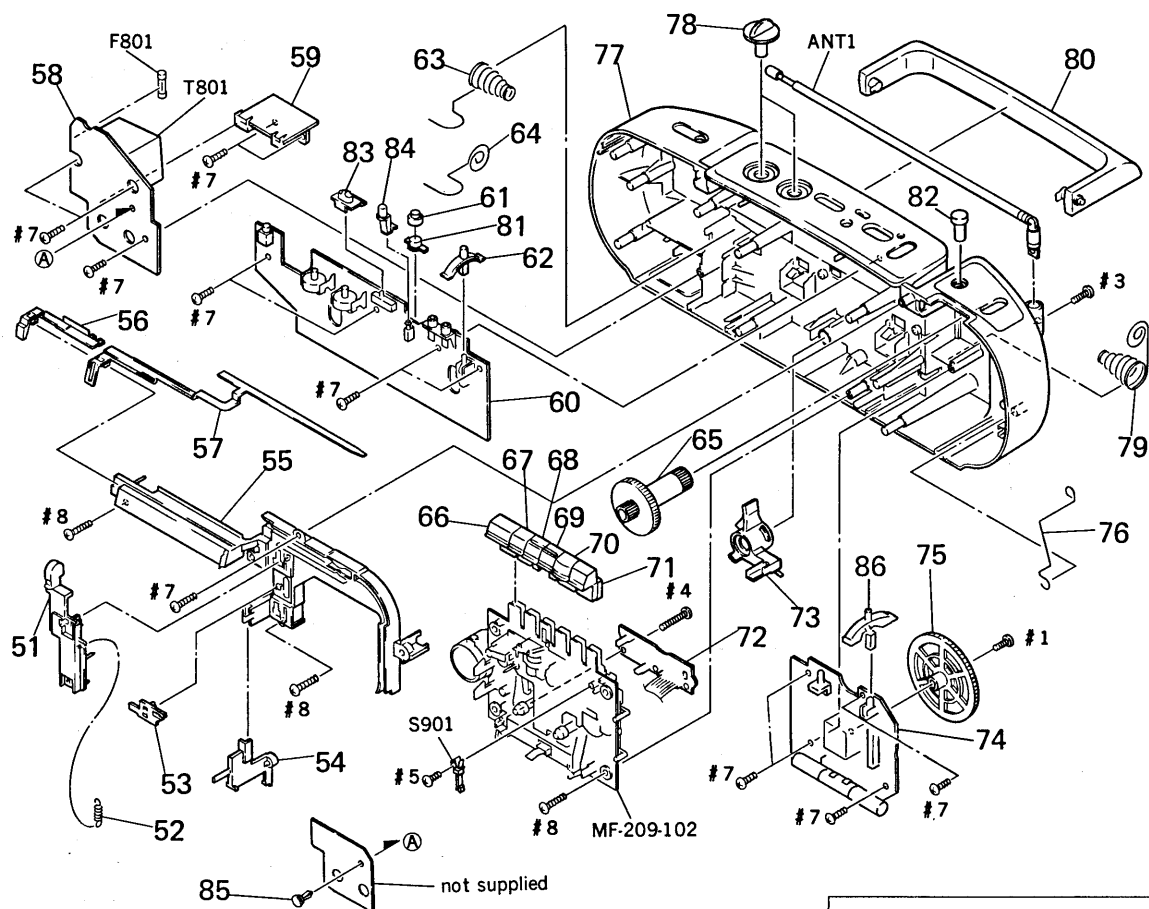
5-1. FRONT CABINET SECTION



Ref. No.	Part No.	Description	Remark
1	3-908-068-01	WINDOW, CASSETTE	
* 2	3-909-459-01	SHEET, ADHESIVE	
3	3-908-073-11	HOLDER, CASSETTE	
4	3-908-069-51	PLATE, DIAL	
5	X-3367-744-1	CABINET (F) SUB ASSY	
6	3-351-377-11	DAMPER	
7	3-909-454-01	SPRING, CASSETTE	

Ref. No.	Part No.	Description	Remark
8	3-368-522-01	LID, BATTERY CASE	
* 9	3-909-458-01	SHEET (DIAL PLATE), ADHESIVE	
SP901	1-504-474-11	SPEAKER (10CM)	
SP902	1-504-474-11	SPEAKER (10CM)	
SP903	1-529-059-12	BUZZER	
SP904	1-529-059-12	BUZZER	

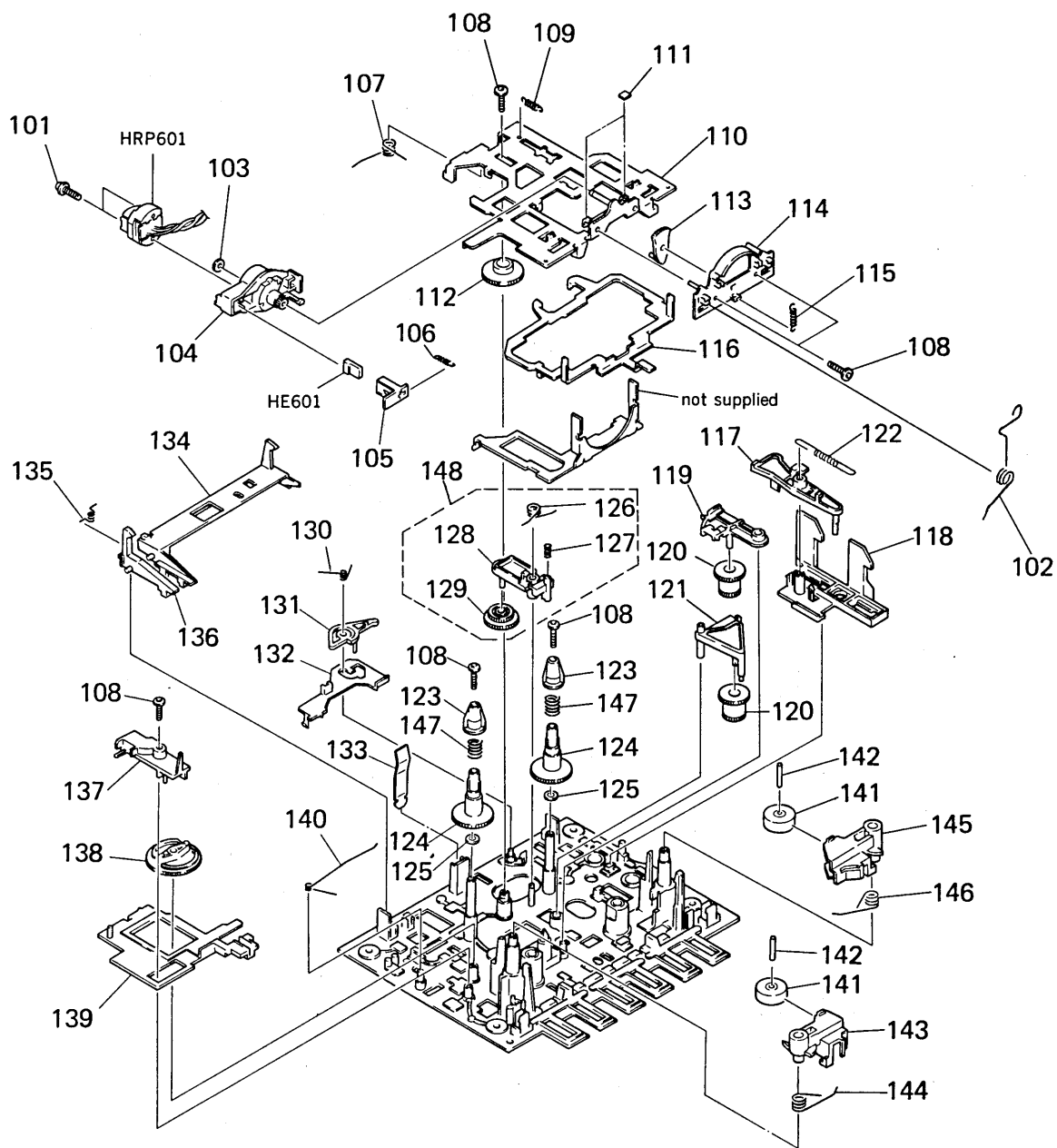
5-2. REAR CABINET SECTION



Ref. No.	Part No.	Description	Remark
51	3-909-480-01	BUTTON, DIRECTION	
52	3-379-754-01	SPRING (DIR.), TENSION	
53	3-909-456-01	LEVER, DIRECTION	
54	3-909-457-01	KNOB, DIRECTION	
55	3-909-481-01	CHASSIS, DIAL	
56	3-909-460-01	INDICATOR	
57	3-908-072-01	POINTER	
* 58	1-650-709-11	TRANSFORMER BOARD	
* 59	1-650-710-11	AC INLET BOARD	
* 60	A-3269-046-A	AUDIO BOARD, COMPLETE	
61	3-379-413-01	CUSHION (MICROPHONE)	
62	3-386-953-01	KNOB (LEVER)	
63	3-909-453-01	SPRING (-), BATTERY COIL	
64	3-909-452-01	TERMINAL (+), BATTERY	
65	3-908-066-01	KNOB, TUNING	
66	3-908-062-01	BUTTON (S/E), M. D.	
67	3-908-065-01	BUTTON (PAUSE), M. D.	
68	3-908-063-01	BUTTON (FF), M. D.	
69	3-908-064-01	BUTTON (REW), M. D.	
70	3-908-060-01	BUTTON (PLAY), M. D.	

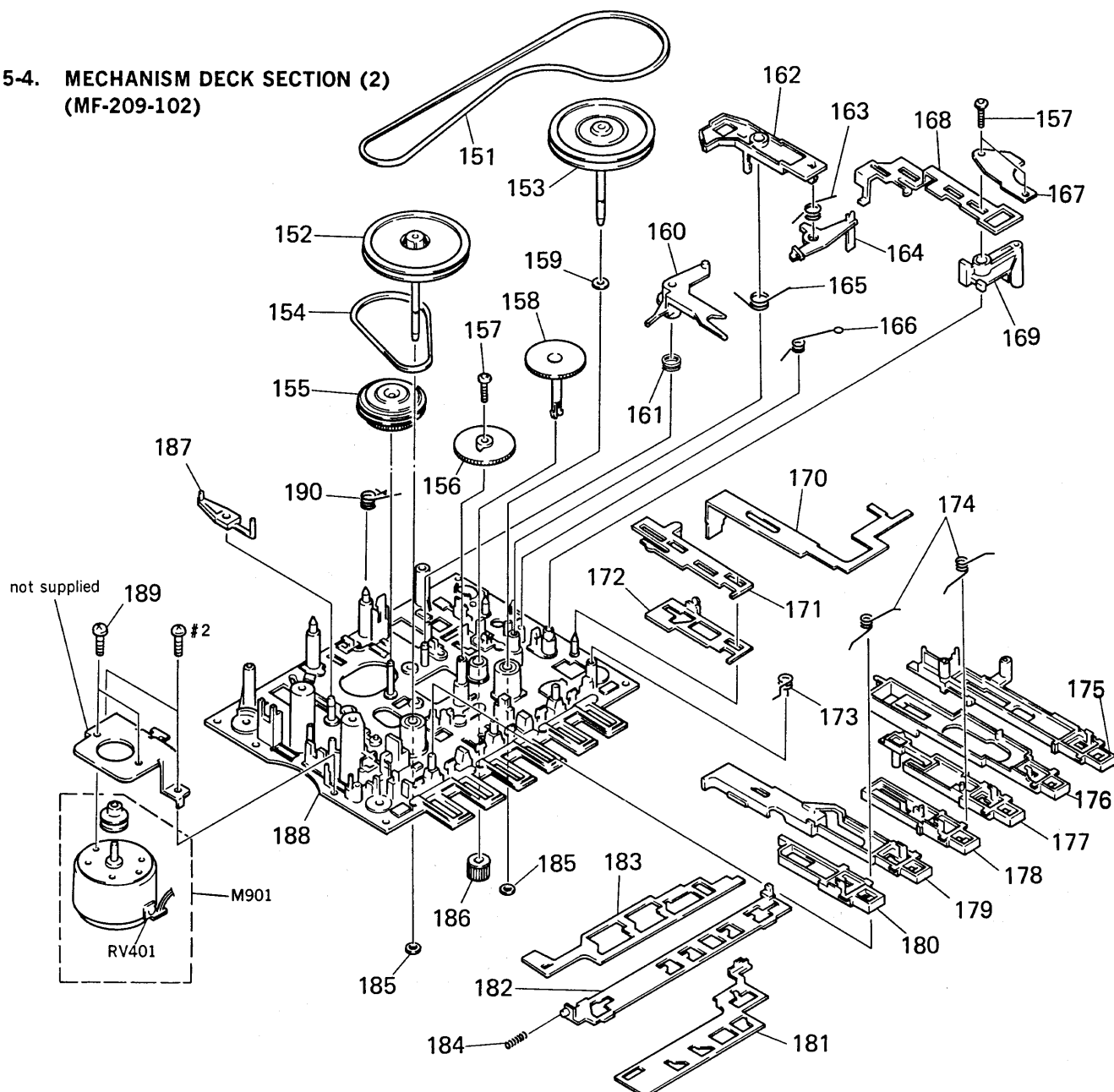
Ref. No.	Part No.	Description	Remark
71	3-908-061-01	BUTTON (REC), M. D.	
* 72	1-650-711-11	SWITCH BOARD	
73	3-909-461-01	LEVER, REC	
* 74	A-3269-047-A	TUNER BOARD, COMPLETE	
75	3-907-415-01	DRUM (PVC)	
* 76	3-909-455-01	TERMINAL, ANTENNA	
77	3-908-224-31	CABINET, REAR	
78	3-379-771-31	KNOB (ROTARY)	
79	3-379-412-01	TERMINAL (+ -), BATTERY	
80	X-3367-740-1	HANDLE ASSY	
* 81	1-650-708-11	MICROPHONE BOARD	
82	3-908-225-01	KNOB (F. T)	
83	3-907-412-01	KNOB (MEGA BASS)	
84	3-909-450-01	PUSH BUTTON	
85	4-812-134-00	RIVET, NYLON 3.5	
86	3-908-067-01	KNOB, LEVER	
ANT1	1-501-378-11	ANTENNA, TELESCOPIC	
ΔF801	1-532-285-00	FUSE, TIME-LAG (T1.25A)	
S901	1-570-559-11	SWITCH, LEAF (DIR MODE)	
ΔT801	1-450-492-11	TRANSFORMER, POWER	

5-3. MECHANISM DECK SECTION (1)
(MF-209-102)



Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
101	3-309-597-81	SCREW (1.4), TAPPING		124	3-374-326-01	TABLE, REEL	
102	3-384-551-01	SPRING (R), HEAD WIRE		125	3-377-195-01	WASHER (S)	
103	3-336-319-01	RING, RETAINING		126	3-374-327-01	SPRING (N R), TORSION	
104	3-374-371-01	HOLDER, HEAD		127	3-343-264-81	COLLAR, SPRING	
105	3-374-344-01	GUIDE, ERASE HEAD		128	3-374-363-01	LEVER (FWD)	
106	3-374-345-01	SPRING, TENSION		129	3-374-328-01	GEAR, FWD	
107	3-374-342-01	SPRING (HEAD), TORSION		130	3-374-334-01	SPRING (BRAKE), TORSION	
108	3-344-737-11	SCREW (B1.4X6), TAPPING		131	3-374-333-01	LEVER (PAUSE)	
109	3-380-814-01	SPRING, TENSION		132	3-374-332-01	SLIDER (BRAKE)	
* 110	X-3363-914-1	CHASSIS ASSY, HEAD		133	3-376-135-01	SPRING, CASSETTE	
* 111	3-377-197-01	SHEET (AZ) (T=0.09)		134	3-374-366-01	LEVER (ERASE R)	
* 111	3-377-197-11	SHEET (AZ) (T=0.115)		135	4-930-451-01	SPRING	
* 111	3-377-197-21	SHEET (AZ) (T=0.14)		136	3-374-335-01	LEVER (ERASE N)	
* 111	3-377-197-31	SHEET (AZ) (T=0.165)		137	3-374-330-01	LEVER (DIR A)	
* 111	3-377-197-41	SHEET (AZ) (T=0.23)		138	3-374-365-01	GEAR (NR), CAM	
112	3-374-329-01	GEAR, MIDWAY		139	3-374-364-01	SLIDER (NR)	
113	3-374-343-01	LEVER (FAN TYPE)		140	3-374-331-01	SPRING (DIR), TORSION	
114	3-374-369-01	GEAR (BASE), HEAD		141	3-366-051-11	PINCH ROLLER	
115	3-386-829-01	SPRING, TENSION		142	3-366-052-11	SHAFT, PINCH ROLLER	
* 116	3-374-370-01	SLIDER (HD)		* 143	3-374-373-01	LEVER (PINCH R)	
117	3-374-336-01	LEVER (SW)		144	3-374-347-01	SPRING (R), TORSION	
* 118	3-374-367-01	LEVER (EJECT)		* 145	3-374-372-01	LEVER (PINCH N)	
119	3-374-338-01	LEVER (REW)		146	3-374-346-01	SPRING (N), TORSION	
120	3-374-339-01	GEAR, FR		147	4-931-747-11	SPRING, COMPRESSION	
121	3-374-368-01	LEVER (FF)		148	X-3364-952-1	LEVER (FWD) ASSY	
122	3-377-194-01	SPRING, TENSION		HE601	1-543-719-11	HEAD, MAGNETIC (ERASE)	
123	4-930-408-11	CLAW, REEL		HRP601	1-543-872-11	HEAD, MAGNETIC (REC/PB)	

5-4. MECHANISM DECK SECTION (2)
(MF-209-102)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	3-374-322-01	BELT		* 172	3-374-305-01	SLIDER (MODE A)	
152	X-3365-411-1	FLY ASSY (N2)		173	3-374-309-01	SPRING (REC), TORSION	
153	X-3363-913-1	FLY ASSY (R)		174	3-374-308-01	SPRING (CONTROL), TORSION	
154	3-374-321-01	BELT		175	3-374-356-01	SLIDER (REC)	
155	X-3363-917-1	LIMITER ASSY, FWD		176	3-374-355-01	SLIDER (FWD)	
156	3-374-359-11	GEAR (S OFF), CAM		177	3-374-354-01	SLIDER (REW)	
157	3-344-737-11	SCREW (B1.4X6), TAPPING		178	3-374-353-01	SLIDER (FF)	
158	3-374-318-11	GEAR (A), DECELERATION		179	3-374-352-01	SLIDER (PAUSE)	
159	3-683-454-01	WASHER, POLYETHYLENE		180	3-374-351-01	SLIDER (STOP)	
* 160	3-374-316-01	LEVER (S OFF A)		* 181	3-374-348-01	SLIDER (FR)	
161	3-375-011-01	SPRING, COMPRESSION		182	3-374-350-01	SLIDER (LOCK)	
162	3-374-357-01	LEVER (S OFF C)		* 183	3-374-349-01	SLIDER (SW)	
163	3-374-311-01	SPRING (S OFF C), TORSION		184	4-932-648-01	SPRING, COMPRESSION	
164	3-374-312-01	LEVER (S OFF B)		185	3-374-324-01	RING, RETAINING	
165	3-374-313-01	SPRING (S OFF), TORSION		186	3-374-325-01	GEAR (B), DECELERATION	
166	3-374-307-01	SPRING (MUTUAL), TORSION		187	3-374-304-01	LEVER (PAUSE ROCK)	
* 167	3-374-317-01	REINFORCEMENT		* 188	X-3363-918-1	CHASSIS ASSY, MECHANICAL	
168	3-374-358-01	SLIDER (ERASING)		189	3-343-251-01	SCREW (M2.6X2.5)	
169	3-374-314-01	LEVER (DIR B)		190	3-374-310-01	SPRING (FWD), TORSION	
* 170	3-374-315-01	SLIDER (CR)		M901	A-3253-181-A	MOTOR ASSY	
171	3-374-306-01	SLIDER (MODE B)		RV401	1-230-495-11	RES, ADJ, CARBON 2K	

SECTION 6 ELECTRICAL PARTS LIST

AC INLET

AUDIO

NOTE:

Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.

- -XX and -X mean standardized parts, so they may have some difference from the original one.

● RESISTORS

All resistors are in ohms.

METAL: Metal-film resistor.

METAL OXIDE: Metal oxide-film resistor.

F: nonflammable

- Abbreviation

G : German model

Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

● SEMICONDUCTORS

In each case, u: μ , for example:

uA ..: μ A. uPA..: μ PA.

uPB..: μ PB. uPC..: μ PC. uPD..: μ PD.

● CAPACITORS

uF: μ F

● COILS

uH: μ H

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	1-650-710-11	AC INLET BOARD *****		C206	1-163-181-00	CERAMIC MELF 100PF	10% 50V
		< CONNECTOR >		C207	1-124-902-00	ELECT 0.47uF	20% 50V
* CN801	1-764-648-11	HOUSING, CONNECTOR 3P		C208	1-163-181-00	CERAMIC MELF 100PF	10% 50V
* CN802	1-764-647-11	HOUSING, CONNECTOR 3P		C209	1-124-925-11	ELECT 2.2uF	20% 100V
		< AC INLET >		C210	1-163-181-00	CERAMIC MELF 100PF	10% 50V
Δ CNJ801	1-526-838-11	INLET, AC 2P (~AC IN)		C211	1-163-181-00	CERAMIC MELF 100PF	10% 50V
*****				C221	1-124-903-11	ELECT 1uF	20% 50V
*	A-3269-046-A	AUDIO BOARD, COMPLETE *****		C222	1-163-213-00	CERAMIC CHIP 0.0022uF	5% 50V
		< CAPACITOR >		C223	1-124-925-11	ELECT 2.2uF	20% 100V
C101	1-124-126-00	ELECT 47uF	20% 10V	C224	1-161-057-00	CERAMIC 0.033uF	10% 50V
C102	1-161-020-11	CERAMIC 0.039uF	10% 16V	C231	1-124-126-00	ELECT 47uF	20% 10V
C103	1-163-213-00	CERAMIC CHIP 0.0022uF	5% 50V	C232	1-163-209-00	CERAMIC MELF 0.0015uF	20% 16V
C104	1-163-209-00	CERAMIC MELF 0.0015uF	20% 16V	C233	1-124-443-00	ELECT 100uF	20% 10V
C105	1-124-902-00	ELECT 0.47uF	20% 50V	C234	1-130-495-00	MYLAR 0.1uF	5% 50V
C106	1-163-181-00	CERAMIC MELF 100PF	10% 50V	C235	1-124-471-00	ELECT 1000uF	20% 6.3V
C107	1-124-902-00	ELECT 0.47uF	20% 50V	C301	1-124-443-00	ELECT 100uF	20% 10V
C108	1-163-181-00	CERAMIC MELF 100PF	10% 50V	C302	1-126-176-11	ELECT 220uF	20% 10V
C109	1-124-925-11	ELECT 2.2uF	20% 100V	C303	1-124-126-00	ELECT 47uF	20% 10V
C110	1-163-181-00	CERAMIC MELF 100PF	10% 50V	C304	1-124-907-11	ELECT 10uF	20% 50V
C111	1-163-181-00	CERAMIC MELF 100PF	10% 50V	C305	1-124-927-11	ELECT 4.7uF	20% 100V
C121	1-124-903-11	ELECT 1uF	20% 50V	C306	1-163-181-00	CERAMIC MELF 100PF	10% 50V
C122	1-163-213-00	CERAMIC CHIP 0.0022uF	5% 50V	C307	1-163-181-00	CERAMIC MELF 100PF	10% 50V
C123	1-124-925-11	ELECT 2.2uF	20% 100V	C308	1-124-902-00	ELECT 0.47uF	20% 50V
C124	1-161-057-00	CERAMIC 0.033uF	10% 50V	C321	1-124-443-00	ELECT 100uF	20% 10V
C131	1-124-126-00	ELECT 47uF	20% 10V	C322	1-124-902-00	ELECT 0.47uF	20% 50V
C132	1-163-209-00	CERAMIC MELF 0.0015uF	20% 16V	C323	1-161-057-00	CERAMIC 0.033uF	10% 50V
C133	1-124-443-00	ELECT 100uF	20% 10V	C324	1-162-847-11	CERAMIC 0.047uF	10% 16V
C134	1-130-495-00	MYLAR 0.1uF	5% 50V	C325	1-161-057-00	CERAMIC 0.033uF	10% 50V
C135	1-124-471-00	ELECT 1000uF	20% 6.3V	C326	1-124-464-11	ELECT 0.22uF	20% 50V
C201	1-124-126-00	ELECT 47uF	20% 10V	C327	1-124-792-51	ELECT 33uF	20% 50V
C202	1-161-020-11	CERAMIC 0.039uF	10% 16V	C328	1-124-907-11	ELECT 10uF	20% 50V
C203	1-163-213-00	CERAMIC CHIP 0.0022uF	5% 50V	C329	1-126-233-11	ELECT 22uF	20% 50V
C204	1-163-209-00	CERAMIC MELF 0.0015uF	20% 16V	C330	1-163-181-00	CERAMIC MELF 100PF	10% 50V
C205	1-124-902-00	ELECT 0.47uF	20% 50V	C331	1-124-120-11	ELECT 220uF	20% 25V
				C332	1-163-181-00	CERAMIC MELF 100PF	10% 50V
				C341	1-124-126-00	ELECT 47uF	20% 10V
				C342	1-163-213-00	CERAMIC CHIP 0.0022uF	5% 50V
				C344	1-130-481-00	MYLAR 0.0068uF	5% 50V
				C345	1-162-397-11	CERAMIC MELF 0.001uF	10% 50V
				C346	1-163-063-00	CERAMIC MELF 0.022uF	25V

AUDIO

Ref. No.	Part No.	Description	Remark
C351	1-126-233-11	ELECT 22uF	20% 50V
C352	1-124-903-11	ELECT 1uF	20% 50V
C353	1-162-847-11	CERAMIC 0.047uF	10% 16V
C354	1-161-057-00	CERAMIC 0.033uF	10% 50V
C355	1-163-181-00	CERAMIC MELF 100PF	10% 50V
C361	1-124-887-00	ELECT 3300uF	20% 16V
C362	1-126-176-11	ELECT 220uF	20% 10V
C363	1-163-063-00	CERAMIC MELF 0.022uF	25V
C364	1-163-063-00	CERAMIC MELF 0.022uF	25V

< CONNECTOR >

CNP1	1-506-987-11	PIN, CONNECTOR (PC BOARD) 5P
* CNP2	1-568-272-11	SOCKET, CONNECTOR 6P
CNP3	1-506-986-11	PIN, CONNECTOR (PC BOARD) 4P
CNP4	1-506-986-11	PIN, CONNECTOR (PC BOARD) 4P
* CNP5	1-691-573-11	PIN, CONNECTOR (PC BOARD) 2P

< DIODE >

D301	8-719-980-67	LED MVR3338S (OPR/BATT)
D302	8-719-109-97	DIODE RD6.8ES-B2
D305	8-719-911-19	DIODE 1SS119
D306	8-719-911-19	DIODE 1SS119
D307	8-719-911-19	DIODE 1SS119

< IC >

IC301	8-759-164-45	IC TA2036N
IC302	8-759-048-60	IC BA3870
IC303	8-759-060-21	IC LA4598

< JACK >

J301	1-566-891-11	JACK (PHONES)
J302	1-563-716-11	JACK, PIN (CD/LINE IN)

< JUMPER RESISTOR >

JR101-103	1-259-041-11	CARBON MELF 0 5% 1/8W
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< COIL >

L300	1-414-183-41	INDUCTOR 10uH
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< TRANSISTOR >

Q301	8-729-142-46	TRANSISTOR 2SC2001-LK
Q302	8-729-281-53	TRANSISTOR 2SC1815-GR
Q303	8-729-206-20	TRANSISTOR RN1202
Q306	8-729-900-65	TRANSISTOR DTA144ES
Q307	8-729-904-36	TRANSISTOR DTC114YS
Q308	8-729-904-36	TRANSISTOR DTC114YS

Ref. No.	Part No.	Description	Remark		
< RESISTOR >					
R101	1-249-404-00	CARBON	82	5%	1/4W
R102	1-249-440-11	CARBON	82K	5%	1/4W
R103	1-249-423-11	CARBON	3.3K	5%	1/4W
R104	1-249-431-11	CARBON	15K	5%	1/4W
R105	1-249-437-11	CARBON	47K	5%	1/4W
R106	1-249-424-11	CARBON	3.9K	5%	1/4W
R107	1-249-417-11	CARBON	1K	5%	1/4W
R108	1-249-437-11	CARBON	47K	5%	1/4W
R109	1-249-423-11	CARBON	3.3K	5%	1/4W
R110	1-249-430-11	CARBON	12K	5%	1/4W
R121	1-249-423-11	CARBON	3.3K	5%	1/4W
R131	1-249-406-11	CARBON	120	5%	1/4W
R132	1-247-807-11	CARBON	100	5%	1/8W
R133	1-215-493-00	METAL	1M	1%	1/6W
R134	1-249-408-11	CARBON	180	5%	1/4W
R201	1-249-404-00	CARBON	82	5%	1/4W
R202	1-249-440-11	CARBON	82K	5%	1/4W
R203	1-249-423-11	CARBON	3.3K	5%	1/4W
R204	1-249-431-11	CARBON	15K	5%	1/4W
R205	1-249-437-11	CARBON	47K	5%	1/4W
R206	1-249-424-11	CARBON	3.9K	5%	1/4W
R207	1-249-417-11	CARBON	1K	5%	1/4W
R208	1-249-437-11	CARBON	47K	5%	1/4W
R209	1-249-423-11	CARBON	3.3K	5%	1/4W
R210	1-249-430-11	CARBON	12K	5%	1/4W
R221	1-249-423-11	CARBON	3.3K	5%	1/4W
R231	1-249-406-11	CARBON	120	5%	1/4W
R232	1-247-807-11	CARBON	100	5%	1/8W
R233	1-215-493-00	METAL	1M	1%	1/6W
R234	1-249-408-11	CARBON	180	5%	1/4W
R301	1-215-493-00	METAL	1M	1%	1/6W
R302-304	1-249-429-11	CARBON	10K	5%	1/4W
R305	1-247-807-11	CARBON	100	5%	1/8W
R321	1-249-402-11	CARBON	56	5%	1/4W
R322	1-249-427-11	CARBON	6.8K	5%	1/4W
R323	1-249-418-11	CARBON	1.2K	5%	1/4W
R324	1-249-424-11	CARBON	3.9K	5%	1/4W
R325	1-259-090-11	CARBON MELF	100K	5%	1/8W
R326	1-215-493-00	METAL	1M	1%	1/6W
R341	1-249-406-11	CARBON	120	5%	1/4W
R342	1-249-435-11	CARBON	33K	5%	1/4W
R343	1-249-389-11	CARBON	4.7	5%	1/4W
R344	1-249-417-11	CARBON	1K	5%	1/4W
R351	1-247-807-11	CARBON	100	5%	1/8W
R352	1-249-421-11	CARBON	2.2K	5%	1/4W
R353	1-249-426-11	CARBON	5.6K	5%	1/4W

AUDIO

MICROPHONE

SWITCH

TRANSFORMER

TUNER

Ref. No.	Part No.	Description	Remark
△R361	1-219-113-11	FUSIBLE	6.8 5% 1/4W F
R362	1-249-411-11	CARBON	330 5% 1/4W
R363	1-247-807-11	CARBON	100 5% 1/8W
R364	1-249-416-11	CARBON	820 5% 1/4W
R365	1-249-411-11	CARBON	330 5% 1/4W
< VARIABLE RESISTOR >			
RV301	1-241-745-11	RES, VAR, CARBON 20K/20K (TONE)	
RV302	1-241-746-11	RES, VAR, CARBON 20K/20K (VOLUME)	
< SWITCH >			
S301	1-572-299-11	SWITCH, LEVER SLIDE (FUNCTION)	
S302	1-570-068-11	SWITCH, PUSH (1 KEY) (PB/REC)	
S303	1-571-307-11	SWITCH, SLIDE (MEGA BASS)	
S304	1-572-006-11	SWITCH, PUSH (1 KEY) (FM MODE/ISS)	
< TRANSFORMER >			
T301	1-433-268-00	TRANSFORMER, BIAS OSCILLATOR	

*	1-650-708-11	MICROPHONE BOARD	

< MICROPHONE >			
ECM301	1-542-178-11	MICROPHONE, ELECTRET CONDENSER (MIC)	

*	1-650-711-11	SWITCH BOARD	

< CAPACITOR >			
C401	1-101-004-00	CERAMIC	0.01uF 50V
< CABLE HOLDER >			
* KH401	1-573-288-11	HOLDER, CABLE 8P	
< SWITCH >			
S401	1-696-515-11	SWITCH, LEAF (PLAY)	
S402	1-696-515-11	SWITCH, LEAF (FF/REW)	

Ref. No.	Part No.	Description	Remark
*	1-650-709-11	TRANSFORMER BOARD	

	1-533-217-31	HOLDER, FUSE	
< CAPACITOR >			
C801-804	1-101-005-00	CERAMIC	22000PF 50V
< CONNECTOR >			
* CNP801	1-560-666-00	PIN, CONNECTOR 3P	
* CNP802	1-764-646-11	PIN, CONNECTOR (PC BOARD) 2P	
< DIODE >			
D801	8-719-200-02	DIODE	10E2
D802	8-719-200-02	DIODE	10E2
D803	8-719-200-02	DIODE	10E2
D804	8-719-200-02	DIODE	10E2
< FUSE >			
△F801	1-532-285-00	FUSE, TIME-LAG (T1.25A)	
< CABLE HOLDER >			
* KH801	1-573-287-11	HOLDER, CABLE 2P	
< TRANSFORMER >			
△T801	1-450-492-11	TRANSFORMER, POWER	

*	A-3269-047-A	TUNER BOARD, COMPLETE	

	3-907-415-01	DRUM (PVC)	
	7-621-770-87	SCREW +P 2.6X5	
< CAPACITOR >			
C1	1-163-059-00	CERAMIC CHIP	0.01uF 10% 50V
C2	1-163-189-00	CERAMIC MELF	220PF 10% 50V
C3	1-163-059-00	CERAMIC CHIP	0.01uF 10% 50V
C4	1-124-907-11	ELECT	10uF 20% 50V
C5	1-163-059-00	CERAMIC CHIP	0.01uF 10% 50V
C7	1-163-167-00	CERAMIC MELF	27PF 5% 50V
C8	1-102-961-00	CERAMIC	27PF 5% 50V
C10	1-163-150-00	CERAMIC MELF	3.3PF 10% 50V
C11	1-163-059-00	CERAMIC CHIP	0.01uF 10% 50V
C14	1-163-181-00	CERAMIC MELF	100PF 10% 50V
C15	1-124-927-11	ELECT	4.7uF 20% 100V
C16	1-124-903-11	ELECT	1uF 20% 50V
C17	1-124-126-00	ELECT	47uF 20% 10V

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

TUNER

Ref. No.	Part No.	Description	Remark		
C18	1-124-126-00	ELECT	47uF	20%	10V
C19	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C20	1-124-903-11	ELECT	1uF	20%	50V
C21	1-124-925-11	ELECT	2.2uF	20%	100V
C22	1-124-443-00	ELECT	100uF	20%	10V
C23	1-124-902-00	ELECT	0.47uF	20%	50V
C24	1-124-927-11	ELECT	4.7uF	20%	100V
C25	1-124-463-00	ELECT	0.1uF	20%	50V
C26	1-163-063-00	CERAMIC MELF	0.022uF		25V
C27	1-162-840-11	CERAMIC	0.012uF	10%	16V
C28	1-162-840-11	CERAMIC	0.012uF	10%	16V
C32	1-163-152-00	CERAMIC MELF	4.7PF	10%	50V
C33	1-163-155-00	CERAMIC MELF	8.2PF	10%	50V
C34	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C35	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C36	1-102-942-00	CERAMIC	5PF	0.5PF	50V
C38	1-102-947-00	CERAMIC	10PF	5%	50V
C39	1-136-980-91	FILM	180PF	5%	63V
C40	1-136-232-11	FILM	0.0043uF	5%	63V
C41	1-136-355-11	FILM	330PF	5%	63V
C42	1-130-011-00	FILM	270PF	5%	63V
C43	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C45-47	1-163-181-00	CERAMIC MELF	100PF	10%	50V
C48	1-163-209-00	CERAMIC MELF	0.0015uF	20%	16V
C49	1-163-063-00	CERAMIC MELF	0.022uF		25V
C50	1-163-181-00	CERAMIC MELF	100PF	10%	50V
C51	1-162-397-11	CERAMIC MELF	0.001uF	10%	50V
C52	1-163-161-00	CERAMIC MELF	15PF	5%	50V
C53	1-163-191-00	CERAMIC MELF	270PF	10%	50V
C71	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C72	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
< FILTER >					
CF1	1-577-327-81	FILTER, CERAMIC			
CF2	1-567-670-11	FILTER, CERAMIC			
CF3	1-577-327-81	FILTER, CERAMIC			
CF4	1-577-327-81	FILTER, CERAMIC			
< VARIABLE CAPACITOR >					
CT1-4	1-151-693-11	CAP, VAR (TUNING)			
CV1-4					
< TRIMMER >					
CT5	1-141-361-41	CAP, VAR FILM TRIMMER			
CT6	1-141-486-11	CAP, ADJ			
CT7	1-141-439-21	CAP, ADJ			
CT8	1-141-439-21	CAP, ADJ			

Ref.No.	Part No.	Description	Remark
< DIODE >			
D1	8-719-911-19	DIODE 1SS119	
D2	8-719-911-19	DIODE 1SS119	
D3	8-719-911-19	DIODE 1SS119	
< FILTER >			
FL1	1-236-711-21	FILTER, BAND PASS	
< IC >			
IC1	8-752-050-20	IC CXA1238S	
< JUMPER RESISTOR >			
JR1	1-259-041-11	CARBON MELF 0 5% 1/8W	
JR2	1-259-041-11	CARBON MELF 0 5% 1/8W	
JR4	1-259-041-11	CARBON MELF 0 5% 1/8W	
JR5	1-259-041-11	CARBON MELF 0 5% 1/8W	
JR7	1-259-041-11	CARBON MELF 0 5% 1/8W	
JR9	1-259-041-11	CARBON MELF 0 5% 1/8W	
JR11	1-259-041-11	CARBON MELF 0 5% 1/8W	
JR13-22	1-259-041-11	CARBON MELF 0 5% 1/8W	
< COIL >			
L1	1-406-999-11	COIL, AIR-CORE	
L2	1-406-956-11	COIL (WITH CORE)	
L3	1-402-590-11	ANTENNA, FERRITE-ROD (LW/MW)	
L4	1-406-252-11	COIL (OSC)	
L5	1-402-596-31	COIL (ANT)	
L6	1-406-280-11	COIL (OSC)	
L8	1-406-253-11	COIL (OSC)	
L9	1-414-174-11	INDUCTOR 0.33uH	
L11	1-414-174-11	MICRO INDUCTOR 0.33uH	
< TRANSISTOR >			
Q1	8-729-206-25	TRANSISTOR RN1207	
Q2	8-729-281-53	TRANSISTOR 2SC1815-GR	
Q3	8-729-900-61	TRANSISTOR DTA114ES	
< RESISTOR >			
R3	1-249-421-11	CARBON 2.2K 5% 1/4W	
R6	1-259-090-11	CARBON MELF 100K 5% 1/8W	
R9	1-259-090-11	CARBON MELF 100K 5% 1/8W	
R10	1-249-404-00	CARBON 82 5% 1/4W	
R11	1-249-427-11	CARBON 6.8K 5% 1/4W	
R12	1-249-427-11	CARBON 6.8K 5% 1/4W	
R13	1-247-807-31	CARBON MELF 100 5% 1/8W	
R14	1-249-429-11	CARBON 10K 5% 1/4W	
R15	1-215-477-00	METAL 220K 1% 1/6W	

Ref. No.	Part No.	Description	Remark
R16	1-215-477-00	METAL 220K 1% 1/6W	
R17	1-249-421-11	CARBON 2.2K 5% 1/4W	
R22	1-249-411-11	CARBON 330 5% 1/4W	
R23	1-249-429-11	CARBON 10K 5% 1/4W	
R30	1-249-417-11	CARBON 1K 5% 1/4W	
R31	1-249-431-11	CARBON 15K 5% 1/4W	
R32	1-259-090-11	CARBON MELF 100K 5% 1/8W	

< VARIABLE RESISTOR >

RV1	1-238-601-11	RES, ADJ, CARBON 22K	
RV2	1-223-384-11	RES, VAR, CARBON 100K (FINE TUNE)	

< SWITCH >

S1	1-571-147-11	SWITCH, LEVER SLIDE (BAND)	
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< TRANSFORMER >

T1	1-406-952-11	TRANSFORMER, IF	
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MISCELLANEOUS

ANT1	1-501-378-11	ANTENNA, TELESCOPIC	
△F801	1-532-285-00	FUSE, TIME-LAG (T1.25A)	
HE601	1-543-719-11	HEAD, MAGNETIC (ERASE)	
HRP601	1-543-872-11	HEAD, MAGNETIC (REC/PB)	
M901	A-3253-181-A	MOTOR ASSY	

RV401	1-230-495-11	RES, ADJ, CARBON 2K	
S901	1-570-559-11	SWITCH, LEAF (DIR MODE)	
SP901	1-504-474-11	SPEAKER (10CM)	
SP902	1-504-474-11	SPEAKER (10CM)	
SP903	1-529-059-12	BUZZER	

SP904	1-529-059-12	BUZZER	
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HARDWARE LIST

#1	7-621-770-87	SCREW +P 2.6X5	
#2	7-621-775-20	SCREW +PTT 2.6X5 (S)	
#3	7-682-548-09	SCREW +B 3X8	
#4	7-682-553-04	SCREW +BVTT 3X20 (S)	
#5	7-685-133-19	SCREW +P 2.6X6 TYPE2	
#6	7-685-153-19	SCREW +P 3X30 TYPE2 NON-SLIT	
#7	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
#8	7-685-649-79	SCREW +BVTP 3X14 TYPE2 N-S	

Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS	

△	1-575-131-11	CORD, POWER (AEP, G)	
△	1-751-214-11	CORD, POWER (UK)	
	3-758-128-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, GERMAN, SPANISH)	
	3-758-128-41	MANUAL, INSTRUCTION (DUTCH, SWEDISH, ITALIAN, PORTUGUESE) (AEP)	
*	3-909-587-01	INDIVIDUAL CARTON	
*	3-912-042-01	CUSHION (LEFT)	
*	3-912-043-01	CUSHION (RIGHT)	

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

