SHR-M1

SERVICE MANUAL

Ver 1.0 1999.10

E Model
Tourist Model

SPECIFICATIONS

Radio segment

Frequency range:	FM 76 – 108 MHz
Channel Step:	0.1 MHz
Power output:	3.5 mW + 3.5 mW

Headphone segment

Headphone type:	Open-air Dynamic
Driver unit:	ø 30 mm Dome type
Input:	ø 3.5 mm stereo mini-jack
Maximum input:	100 mW
Impedance:	24 Ω (at 1 kHz)
Frequency characteristic:	14 to 24,000 Hz

Others

Power requirements	1.5 V DC, one R03 (size AAA) battery
Mass	Approx. 99.5 g (3.5 oz) incl. a battery, not incl. cord
Accessories supplied	Sony R03 (size AAA) battery (1) Connecting cord (1)

Design and specifications are subject to change without notice

PLL SYNTHESIZER
FM STEREO HEADPHONE RADIO

MICROFILM

SONY®

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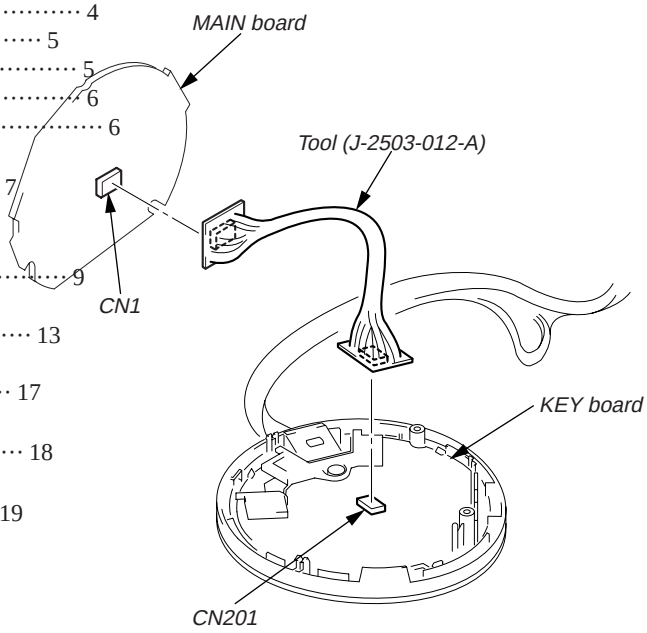
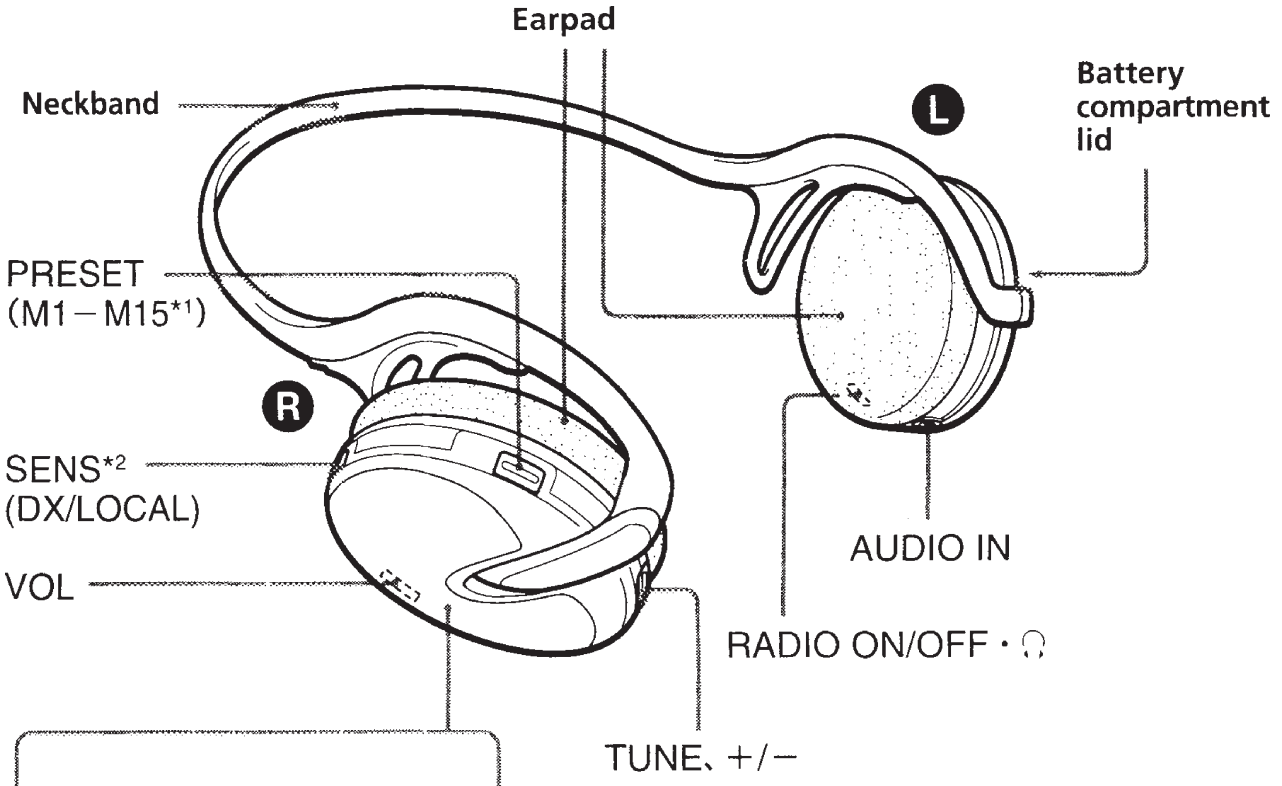
SERVICE NOTE

In order to repair the machine while the main power is on, connecting tool the MAIN board with the KEY board with a dedicated tool (J-2503-012-A), is convenient.



This section is extracted from instruction manual.



Display
When the radio is not operated, the display goes off

*1 M1 to M7 for Sony world model
*2 Except for Sony world model

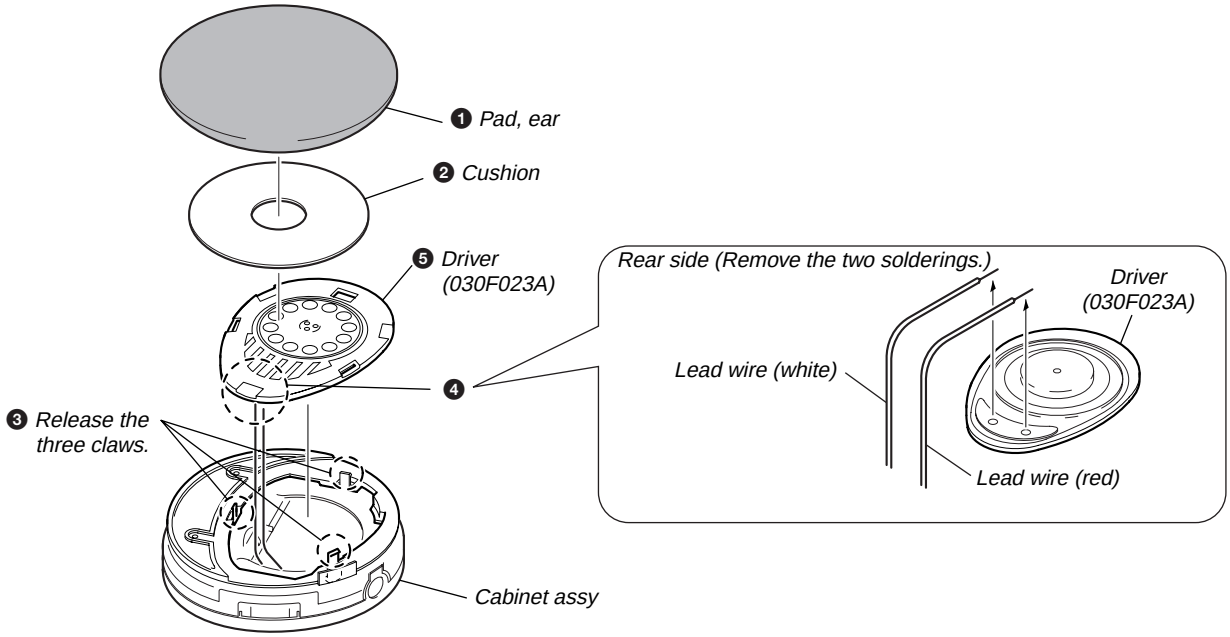
SECTION 2
DISASSEMBLY

Note : Disassemble the unit in the order as shown below.

Set → Driver (030F023A) (L) → JACK Board → Belt
Set → Driver (030F023A) (R) → MAIN Board → KEY Board → Belt

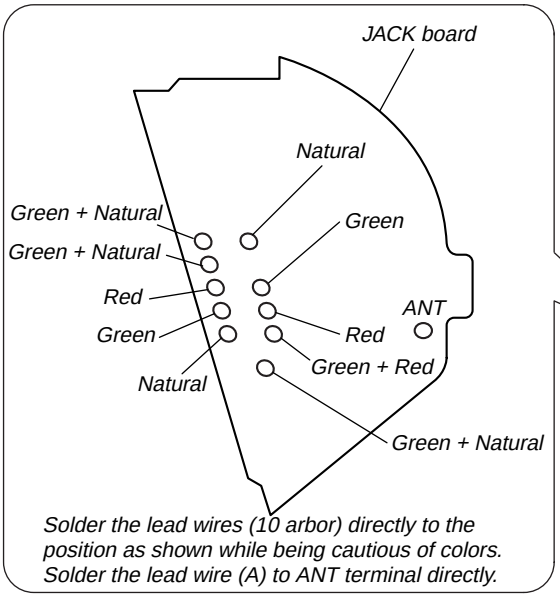
Note : Follow the disassembly procedure in the numerical order given.

2-1. DRIVER (030F023A)(L)

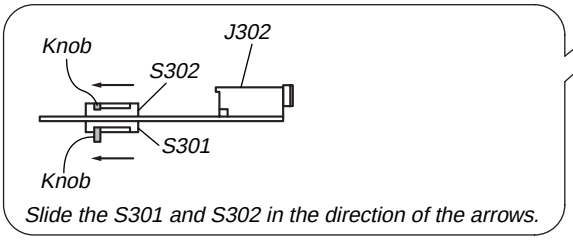


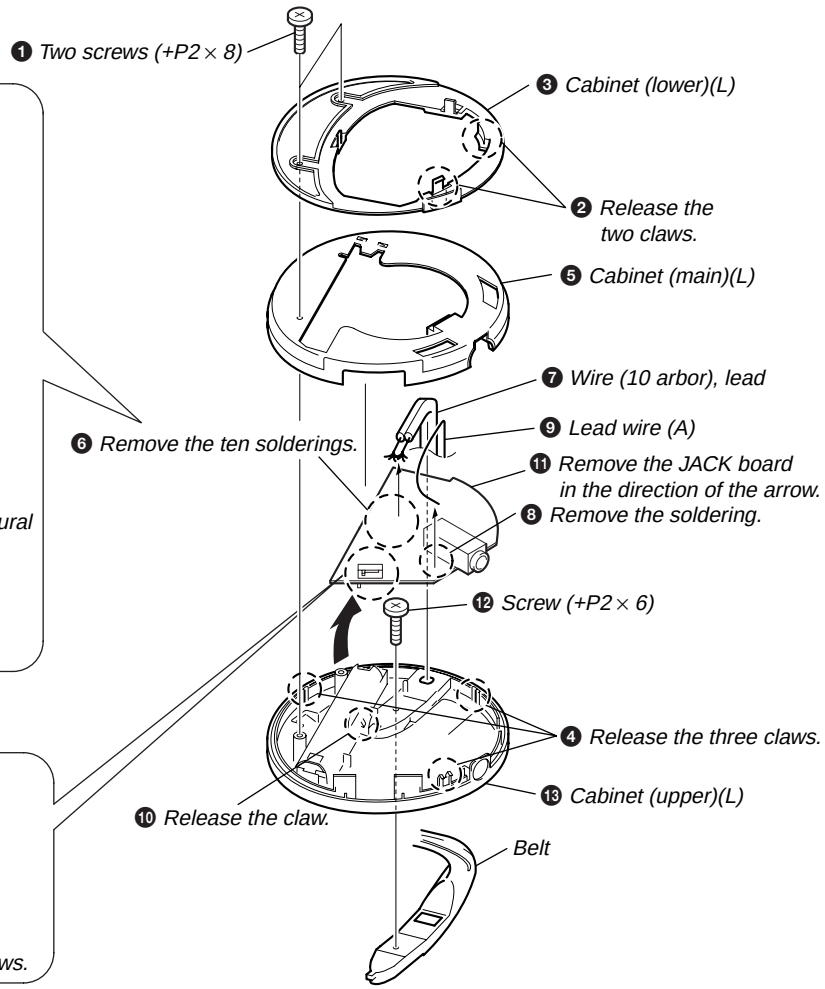
2-2. JACK BOARD

Precaution for installation

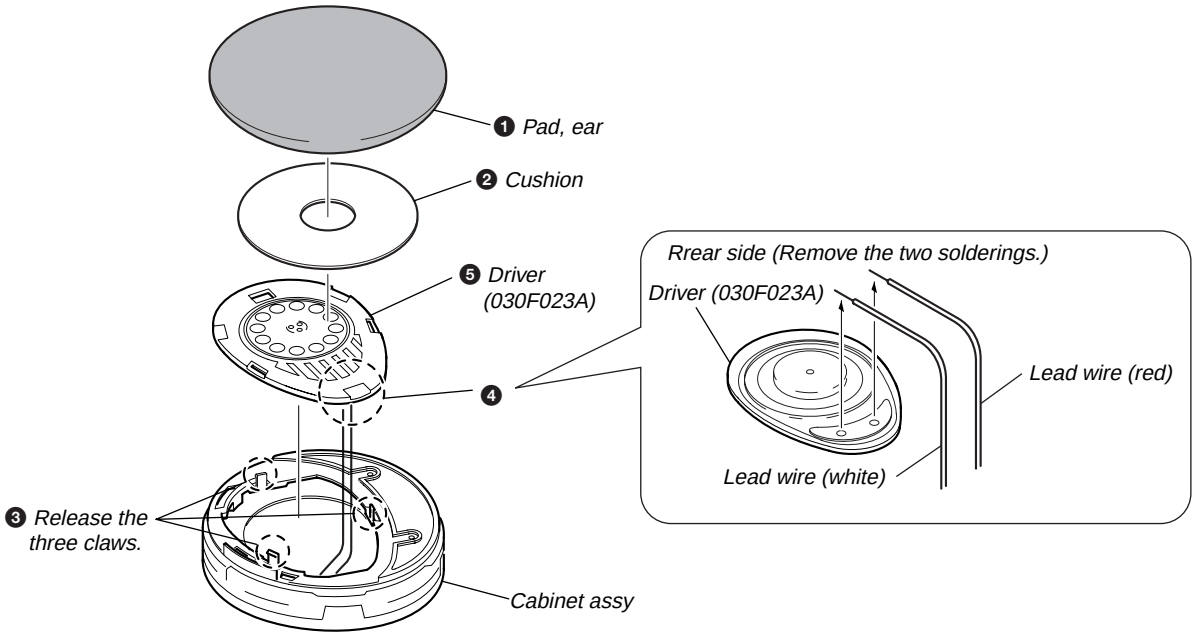


Precaution for installation

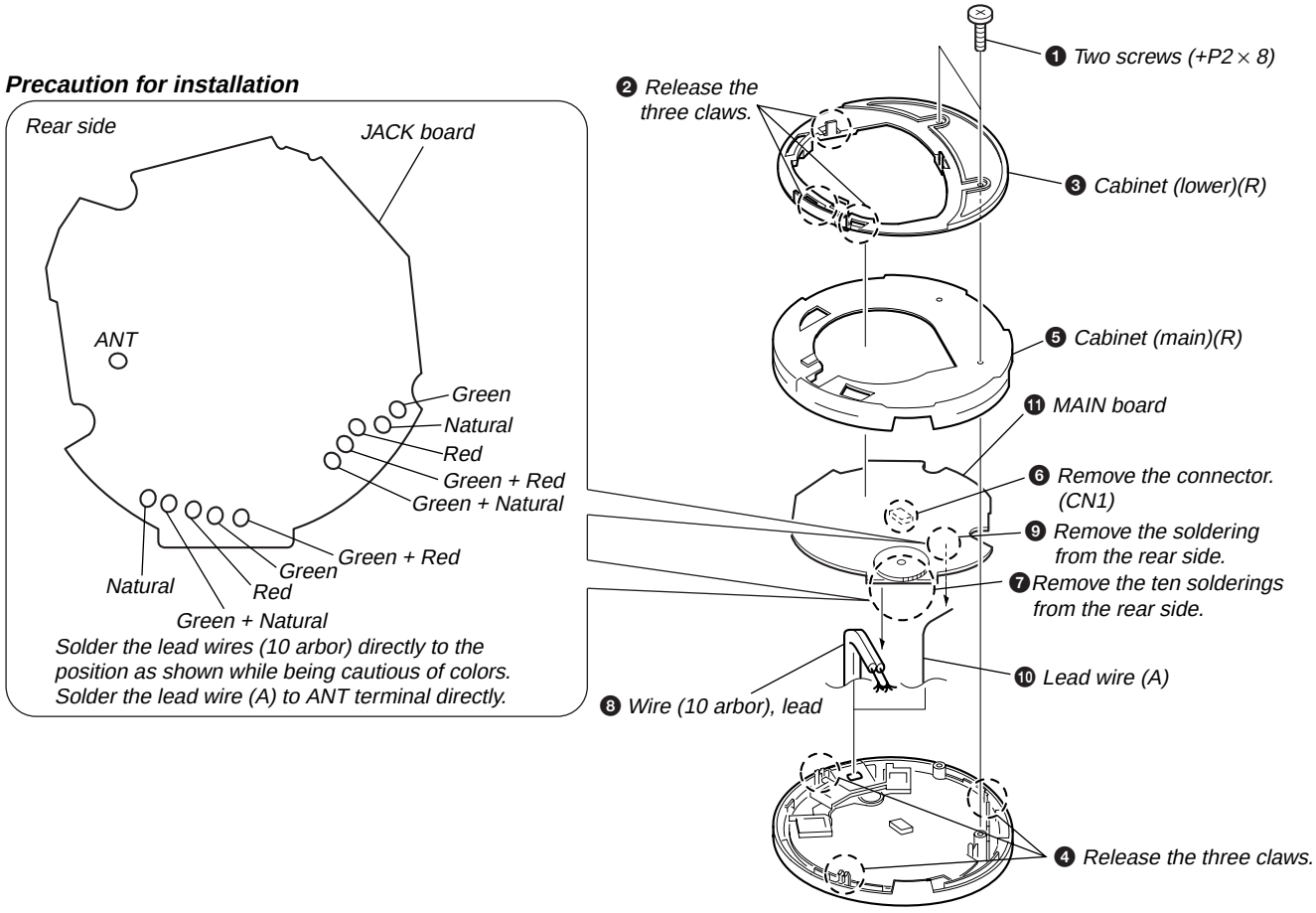




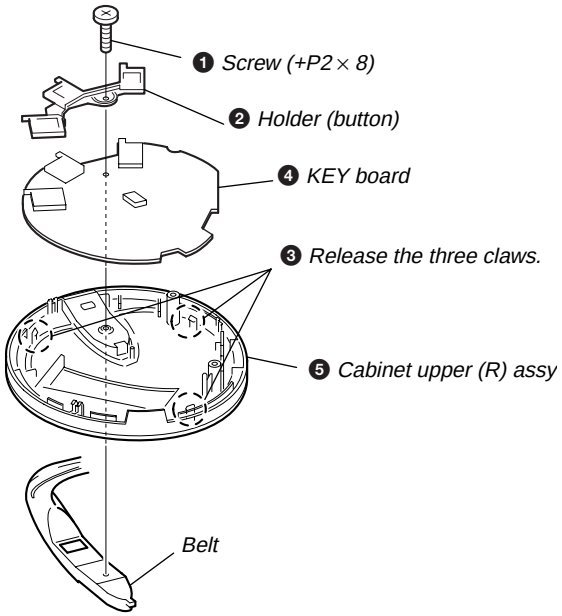
2-3. DRIVER (030F023A)(R)



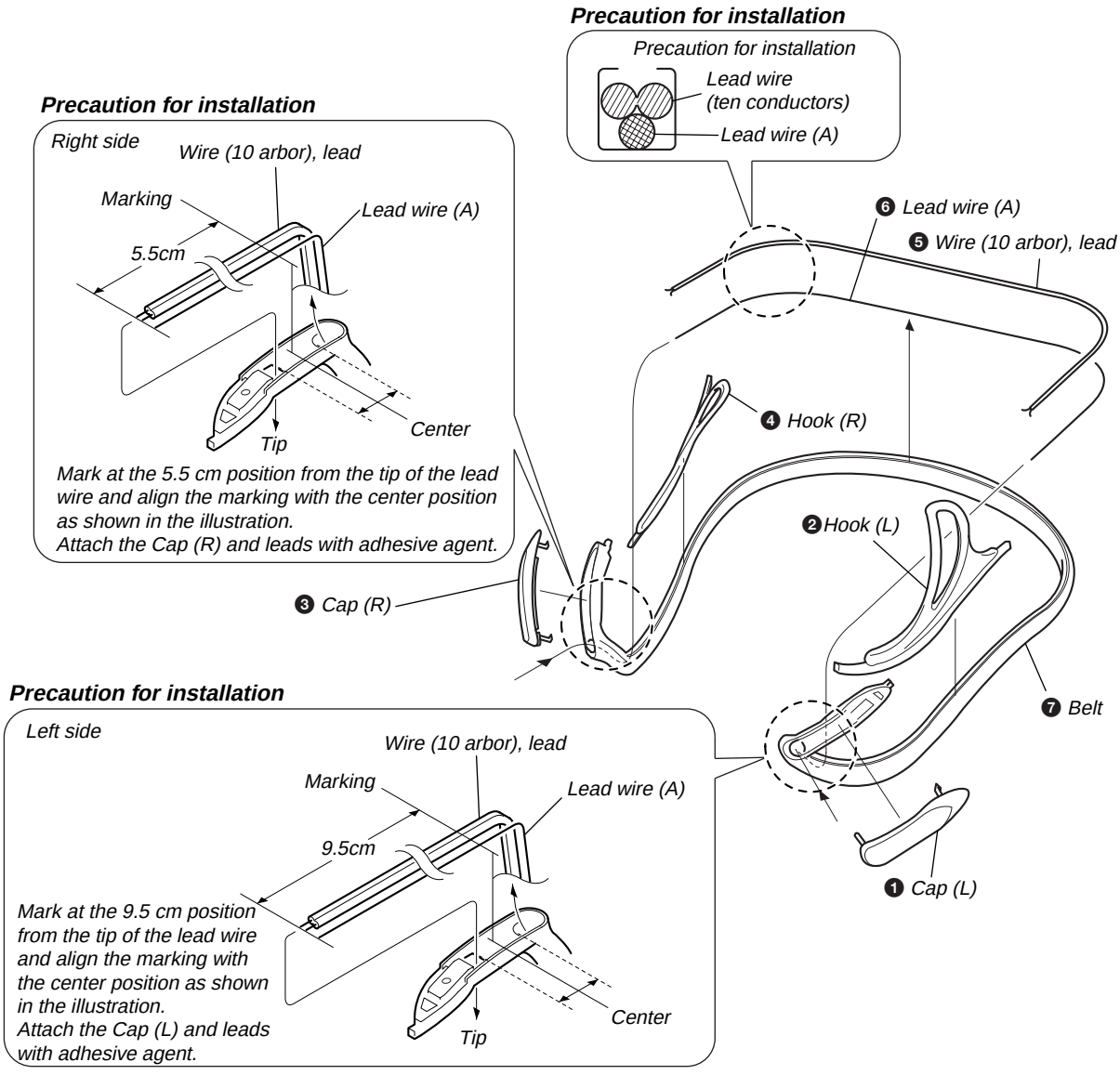
2-4. MAIN BOARD



2-5. KEY BOARD

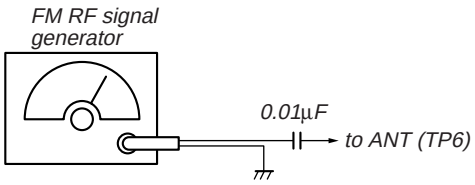


2-6. BELT

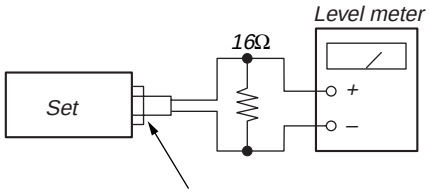


SECTION 3
ELECTRICAL ADJUSTMENT

0dB=1µV



75kHz (100%) amplitude modulation by 1kHz signal.
Output level : as low as possible



Speaker terminal (SP+/SP–)

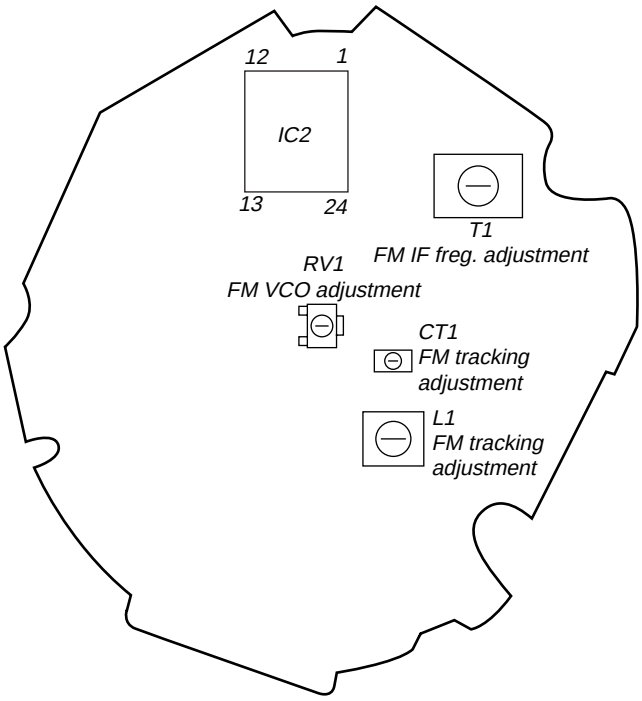
• Repeat the procedures in each adjustment several times.

FM TRACKING ADJUSTMENT	
Adjust for a maximum reading on level meter.	
L1	76.0MHz
CT1	108.0MHz

FM IF ADJUSTMENT	
Adjust for a maximum reading on level meter.	
T1	10.7MHz

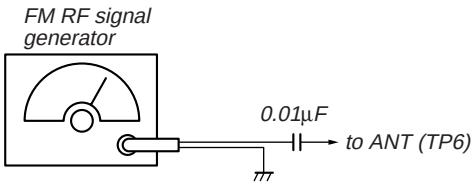
Adjustment Location: MAIN board

— Side A —



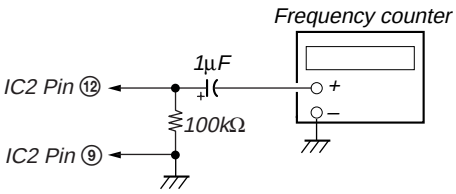
FM VCO Adjustment

Procedure :



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

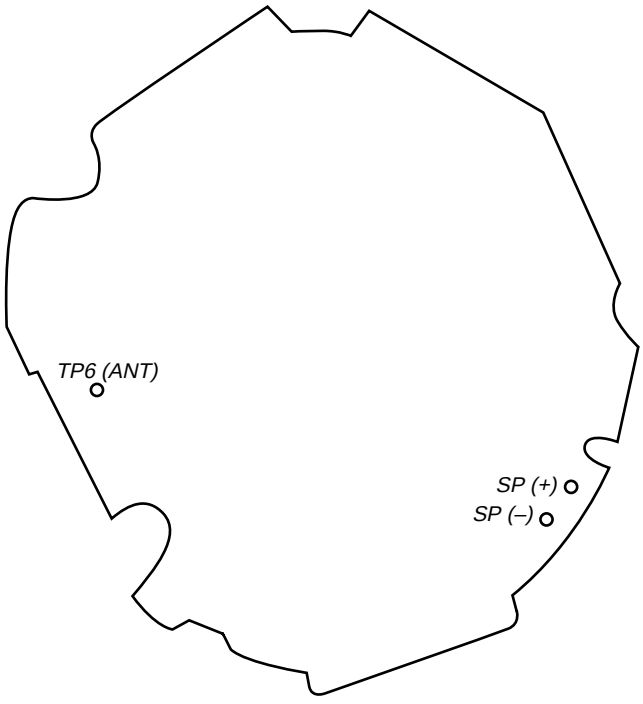
1. Connect frequency counter to the positions shown below.
2. Tune the set to 98 MHz.
3. Adjust RV1 so that the value of the frequency counter reading becomes 19 kHz.



Specification Value :

Frequency counter
18,500 – 19,500 Hz

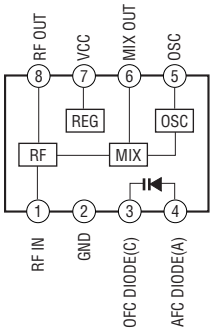
— Side B —



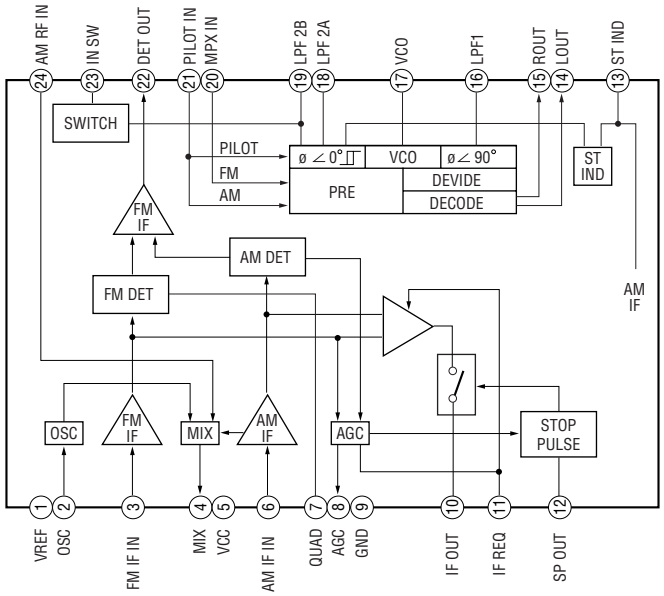
SECTION 4
DIAGRAMS

• IC BLOCK DIAGRAMS

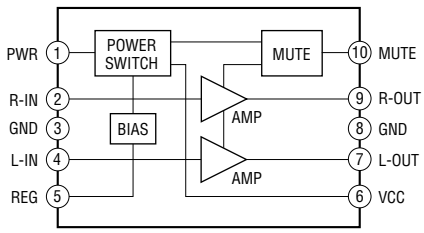
IC1 TA7371AF-EL



IC2 TA2022AFN-EL



IC102 LA4537M



Note on Printed Wiring Board:

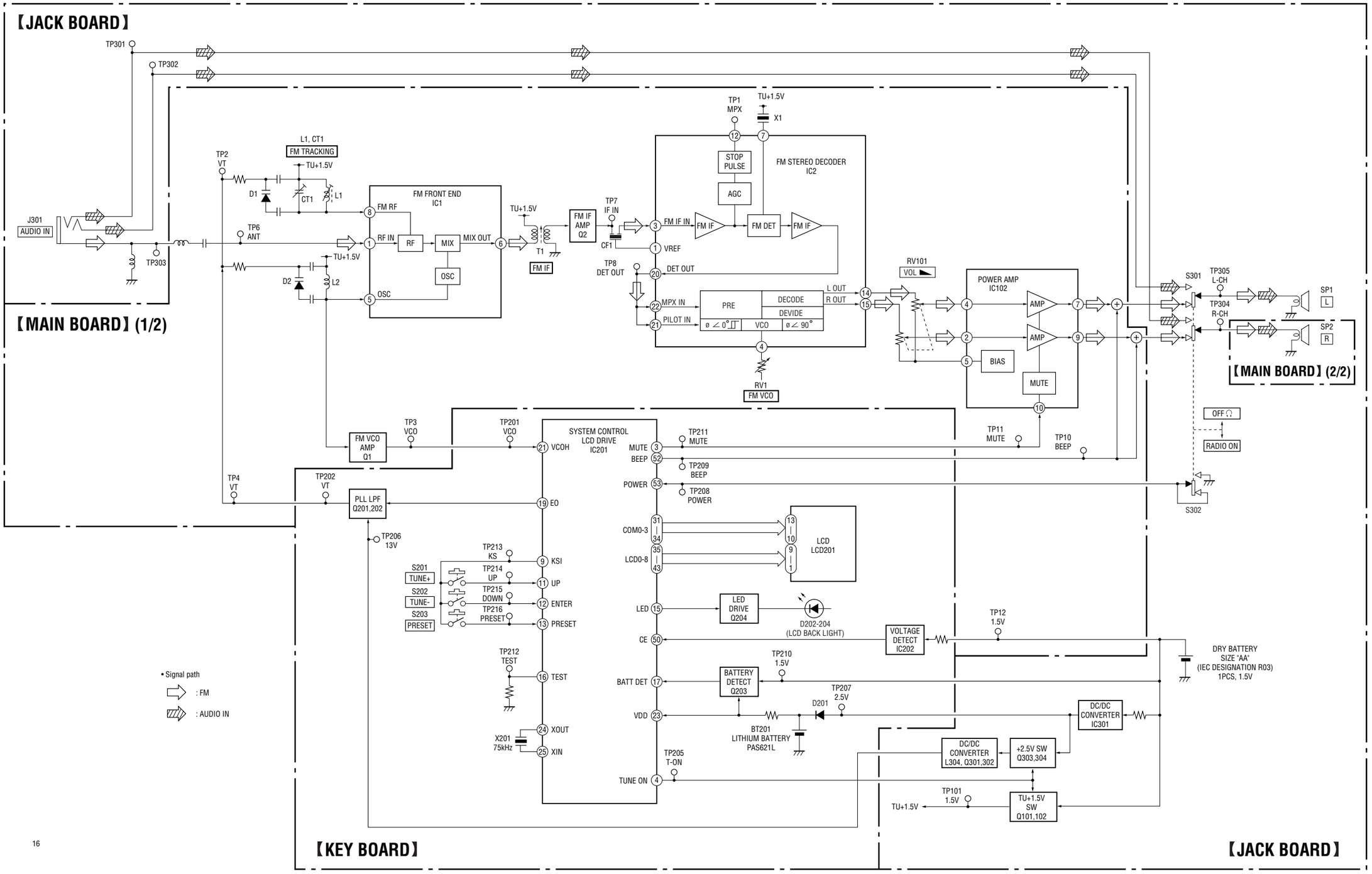
- ⟜——: parts extracted from the conductor side.
- ○ : Through hole.
- ▒▒▒: Pattern from the side which enables seeing.

Caution:	
Pattern face side: (SIDE A)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (SIDE B)	Parts on the parts face side seen from the parts face are indicated.

Note on Schematic Diagram:

- All capacitors are in µF unless otherwise noted. pF: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- ▭ : panel designation.
- B + : B+ Line.
- ▬ : adjustment for repair.
- Power voltage is dc 1.5 V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : FM
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Signal path.
  ⇨ : FM
  ⇨ : AUDIO IN
- Abbreviation
  JE : Tourist model.

4-1. BLOCK DIAGRAM

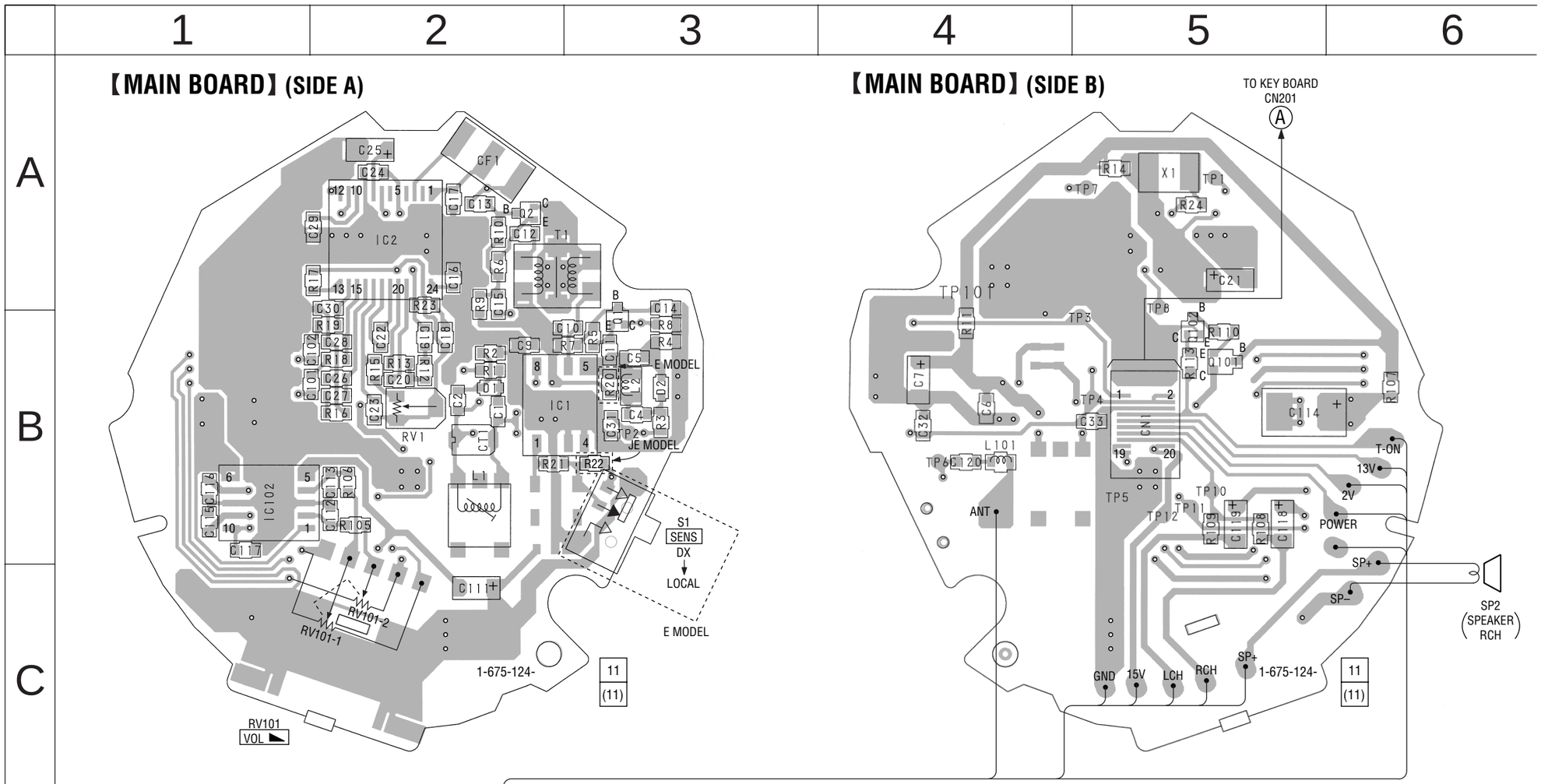


4-2. PRINTED WIRING BOARD — MAIN SECTION —

• Refer to page 8 for Note on Printed Wiring Board.

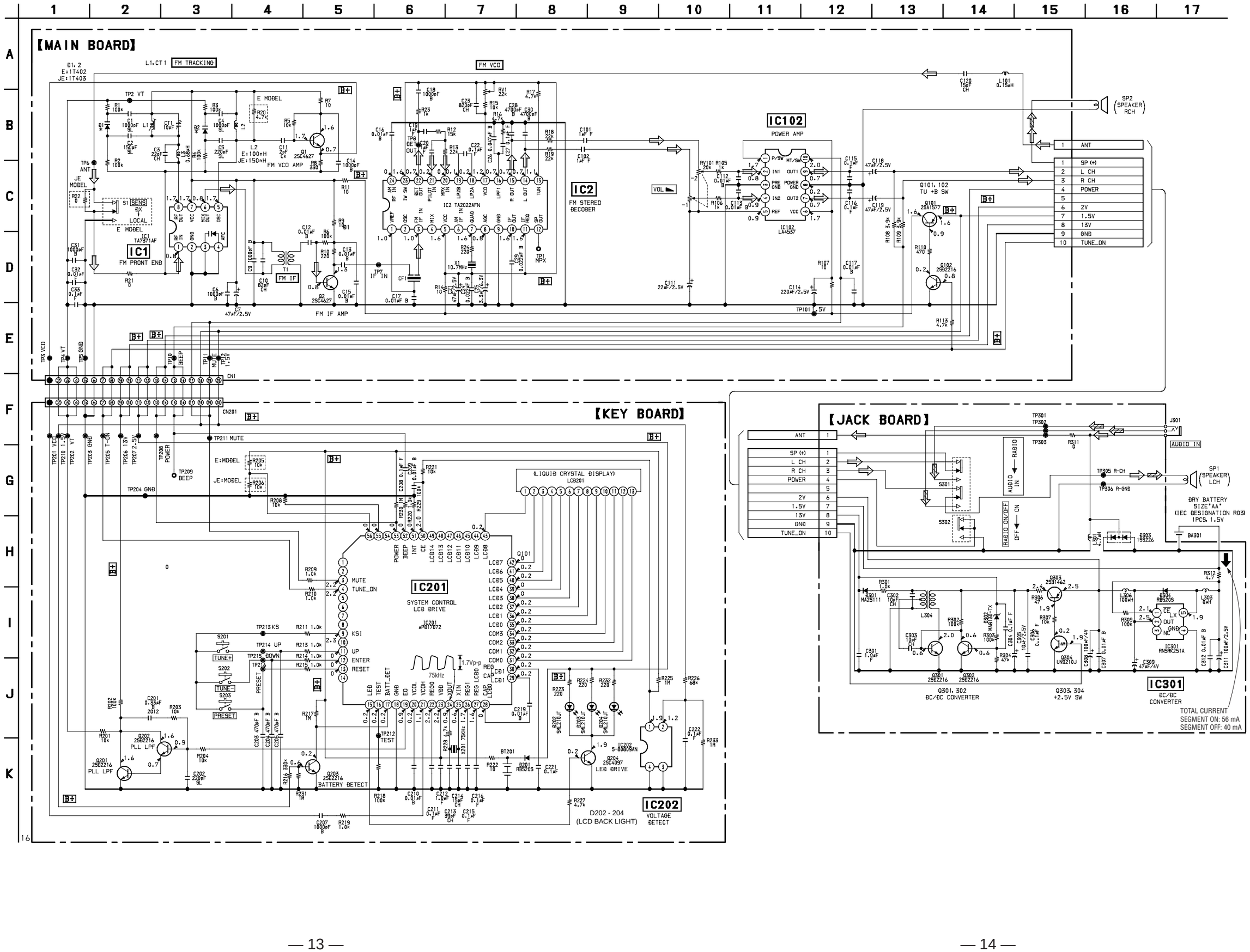
• **Semiconductor Location**

Ref. No.	Location
D1	B-2
D2	B-3
D301	D-2
D302	D-2
D303	E-5
D304	E-4
IC1	B-2
IC2	A-2
IC102	B-1
IC301	D-4
Q1	B-3
Q2	A-2
Q101	B-5
Q102	B-5
Q301	D-3
Q302	D-3
Q303	D-5
Q304	D-5



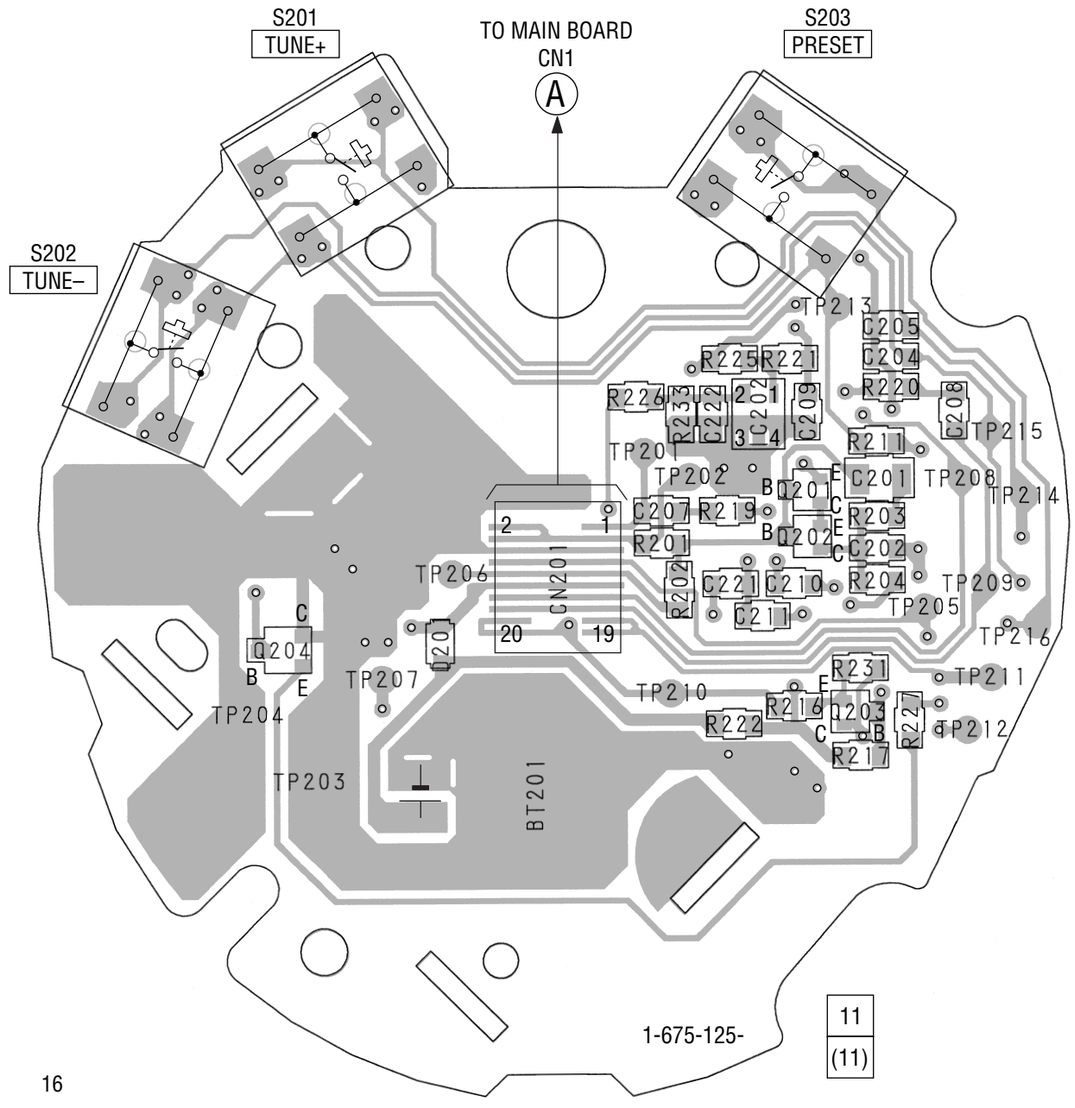
4-3. SCHEMATIC DIAGRAM

• Refer to page 8 for Note on Schematic Diagram and IC block diagrams.

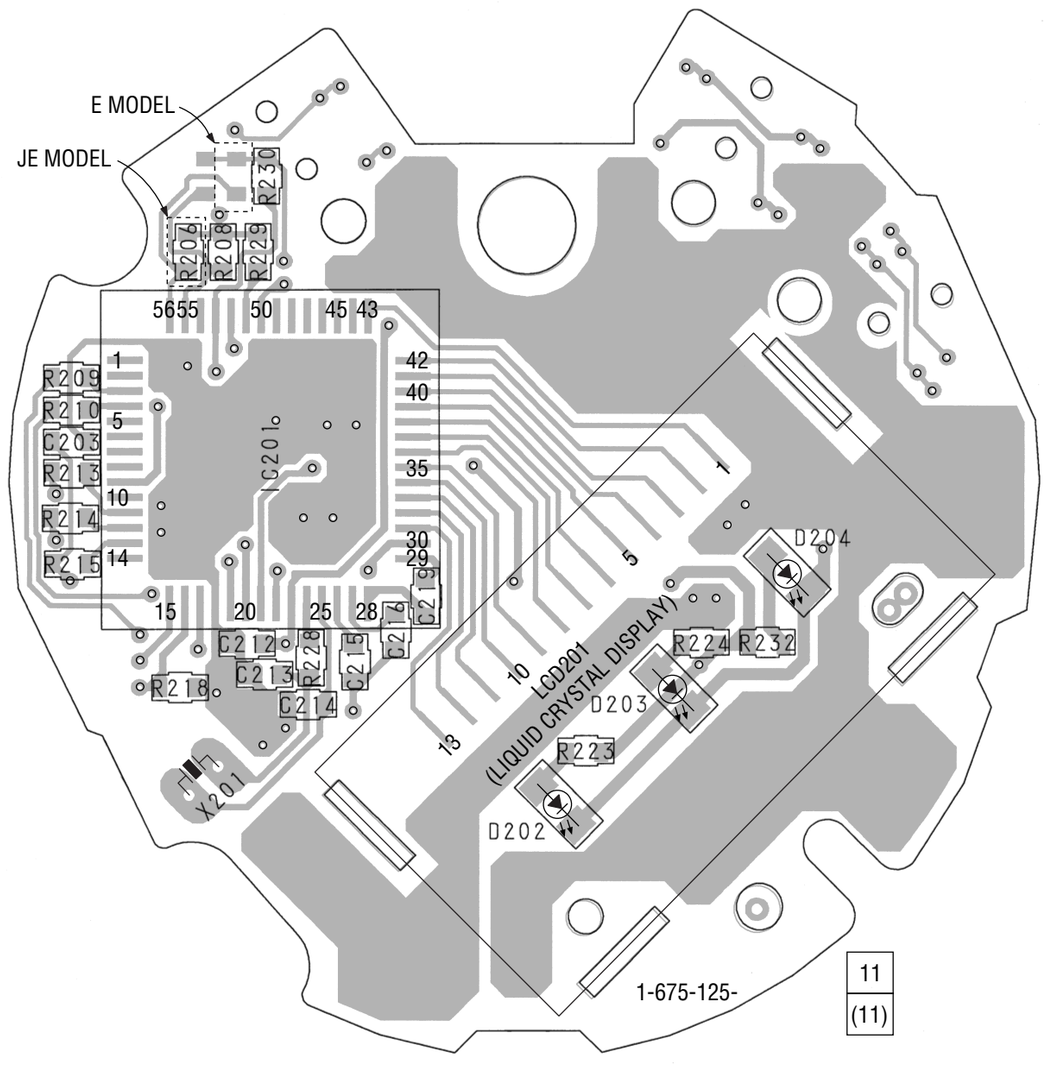


4-4. PRINTED WIRING BOARD — KEY BOARD — • Refer to page 8 for Note on Printed Wiring Board.

【KEY BOARD】(SIDE A)



【KEY BOARD】(SIDE B)



• **Semiconductor Location**

Ref. No.	Location
D201	C-2
D204	C-7
IC201	B-5
IC202	B-3
Q201	B-3
Q202	B-3
Q203	C-3
Q204	C-1

4-5. IC PIN FUNCTION DESCRIPTION

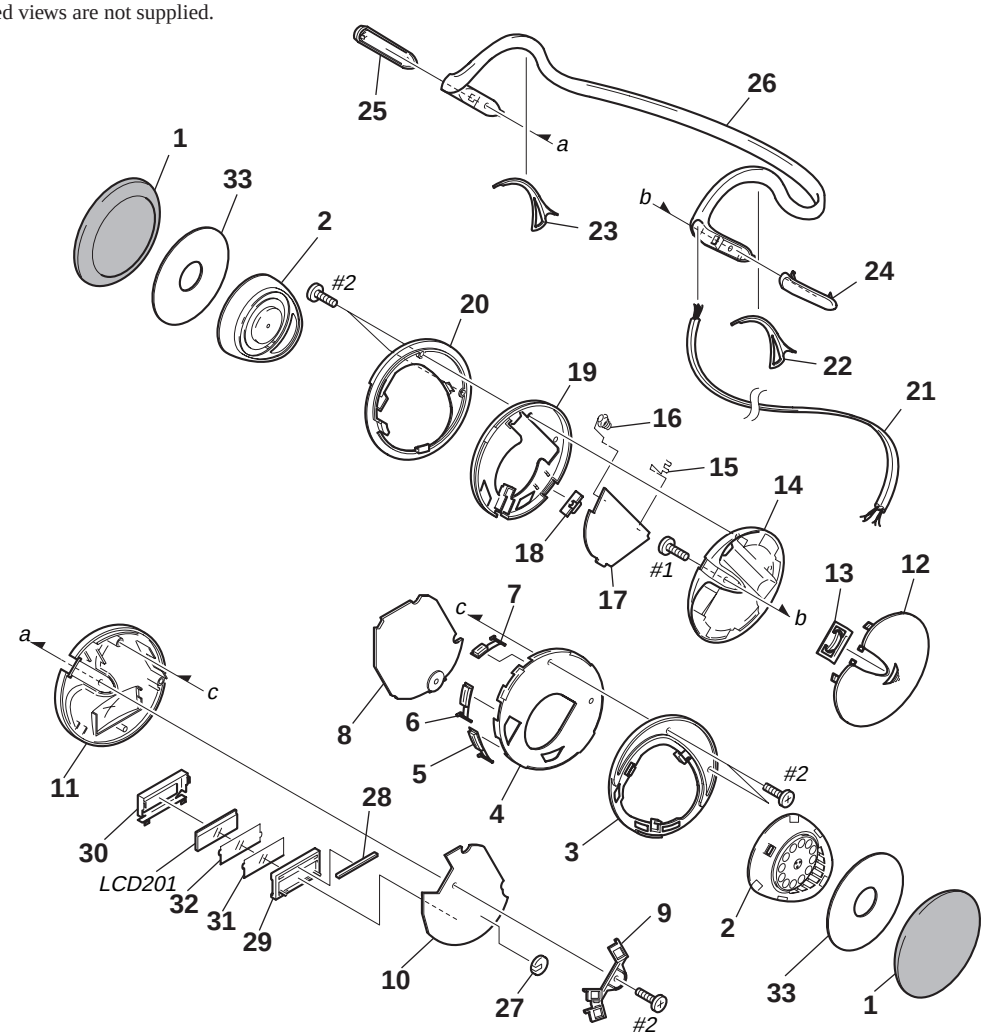
• IC201 (uPD17072GB-563-1A7) SYSTEM CONTROL, LCD DRIVE

Pin No.	Pin Name	I/O	Description
1 to 2	NC	—	Not used (open)
3	MUTE	O	Low when radio muting (no sound)
4	TUNE ON	O	High when radio is turned on
5 to 8	NC	—	Not used (open)s
9	KSI	O	Low when OFF HOLD = HI
10	NC	—	Not used (open)
11	UP	I	Key input
12	ENTER	I	Key input
13	RESET	I	Key input
14	NC	—	Not used (open)
15	LED	O	High when LED is turned on
16	TEST	I	Test mode when initial high
17	BATT DET	I	BATT LOW = High
18	GND	—	GND terminal
19	EO	O	Output to the charge pump of PLL synthesizer
20	VCOL	I	VCO input
21	VCOH	I	VCO input form FM local oscillating circuit
22	REG0	O	2-regulator output
23	VDD	—	Power terminal
24	XOUT	O	System clock output (75 kHz)
25	XIN	I	System clock input (75 kHz)
26	REG1	O	Regulator output
27	REG LCD0	—	LCD drive power terminal
28	CAP LCD0	—	Capacitor ground terminal
29	CAP LCD1	—	2-capacitor ground terminal
30	REG LCD1	—	LCD drive power terminal
31 to 34	COM0-3	O	Common signal output to LCD
35 to 49	LCD0-14	O	Segment signal output to LCD
50	CE	I	Low when back-up
51	INT		Initial setting
52	BEEP	O	Beep sound signal output
53	POWER	I	Power ON/OFF control signal “H” = ON, “L” = OFF
54 to 56	NC	—	Not used (open)

SECTION 5
EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of this parts list.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts of Color Cabinet's Color
- Abbreviation
  JE : Tourist model.



Ref. No.	Part No.	Description	Remarks
1	3-040-773-01	PAD,EAR	
2	1-505-322-11	DRIVER (030F023A)	
3	3-040-281-01	CABINET (LOWER) (R)	
4	3-040-285-01	CABINET (MAIN) (R) (JE)	
4	3-040-285-11	CABINET (MAIN) (R) (E)	
5	3-040-291-01	BUTTON (-)	
6	3-040-289-01	BUTTON (+)	
7	3-040-290-01	BUTTON (PRESET)	
8	A-3663-410-A	MAIN BOARD, COMPLETE (JE)	
8	A-3663-434-A	MAIN BOARD, COMPLETE (E)	
9	3-040-301-01	HOLDER (BUTTON)	
10	A-3663-408-A	KEY BOARD, COMPLETE (JE)	
10	A-3663-436-A	KEY BOARD, COMPLETE (E)	
11	X-3378-016-1	CABINET (UPPER) (R) ASSY (SILVER)	
11	X-3378-059-1	CABINET (UPPER) (R) ASSY (BLUE)	
12	3-040-284-01	LID,BATTERY CASE	
13	3-040-292-01	BUTTON (BATTERY CASE LID)	
14	3-040-280-01	CABINET (UPPER) (L) (JE) (SILVER)	
14	3-040-280-11	CABINET (UPPER) (L) (JE) (BLUE)	
14	3-040-280-31	CABINET (UPPER) (L) (E) (SILVER)	
14	3-040-280-41	CABINET (UPPER) (L) (E) (BLUE)	
15	3-040-303-01	TERMINAL (+), BATTERY	

Ref. No.	Part No.	Description	Remarks
16	3-040-304-01	TERMINAL (-), BATTERY	
17	A-3663-412-A	JACK BOARD, COMPLETE (JE)	
17	A-3663-438-A	JACK BOARD, COMPLETE (E)	
18	3-040-287-01	KNOB(POWER)	
19	3-040-286-01	CABINET (MAIN) (L)	
20	3-040-282-01	CABINET (LOWER) (L)	
21	1-791-740-11	WIRE(10 ARBOR), LEAD	
22	3-040-297-01	HOOK(L)	
23	3-040-296-01	HOOK(R)	
24	3-040-295-01	CAP(L)	
25	3-040-294-01	CAP(R)	
26	3-040-293-01	BELT	
27	1-528-412-11	BATTERY, PAS SECONDARY	
28	1-694-633-11	CONDUCTIVE BOARD, CONNECTION	
29	3-040-300-01	HOLDER (LCD)	
* 30	3-040-302-01	CASE (LCD), SHIELD	
31	3-040-305-01	ILLUMINATOR (A)	
32	3-040-306-01	ILLUMINATOR (B)	
33	3-040-307-01	CUSHION	
LCD201	1-803-780-11	DISPLAY PANEL, LIQUID CRYSTAL	
#1	7-621-255-40	SCREW +P 2X6	
#2	7-621-255-52	SCREW +P 2X8	

SECTION 6
ELECTRICAL PARTS LIST

MAIN

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, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE) . . . (RED)
  ↑ ↑
  Parts of Color Cabinet's Color
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...
- Abbreviation
  JE : Tourist model.

Ref. No.	Part No.	Description			Remarks
	A-3663-434-A	MAIN BOARD, COMPLETE (E)			
		**********			
	A-3663-410-A	MAIN BOARD, COMPLETE (JE)			
		**********			
		< CAPACITOR >			
C1	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C2	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C4	1-164-357-11	CERAMIC CHIP	1000PF	5%	50V
C5	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C6	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C7	1-110-569-11	TANTAL. CHIP	47uF	20%	2.5V
C9	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C10	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C11	1-162-907-11	CERAMIC CHIP	2PF	0.25PF	50V
C12	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C13	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C14	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C15	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C16	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C17	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C18	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C19	1-115-156-11	CERAMIC CHIP	1uF		10V
C20	1-115-156-11	CERAMIC CHIP	1uF		10V
C21	1-110-569-11	TANTAL. CHIP	47uF	20%	2.5V
C22	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C23	1-115-414-11	CERAMIC CHIP	820PF	5%	25V
C24	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C25	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C26	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C27	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C28	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C29	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C30	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C31	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C32	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C33	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C101	1-115-156-11	CERAMIC CHIP	1uF		10V
C102	1-115-156-11	CERAMIC CHIP	1uF		10V
C111	1-135-316-11	TANTAL. CHIP	22uF	20%	2.5V
C112	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C113	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C114	1-109-930-11	TANTAL. CHIP	220uF	20%	2.5V
C115	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C116	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C117	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C118	1-110-569-11	TANTAL. CHIP	47uF	20%	2.5V
C119	1-110-569-11	TANTAL. CHIP	47uF	20%	2.5V
C120	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
		< FILTER >			
CF1	1-767-313-11	FILTER, CERAMIC			
		< CONNECTOR >			
* CN1	1-793-567-21	CONNECTOR, BOARD TO BOARD 20P			
		< TRIMMER >			
CT1	1-141-615-21	CAP, ADJ			
		< DIODE >			
D1	8-713-102-94	DIODE 1T402-M20-T8A (E)			
D1	8-713-102-96	DIODE 1T403-M20-T8A (JE)			
D2	8-713-102-94	DIODE 1T402-M20-T8A (E)			
D2	8-713-102-96	DIODE 1T403-M20-T8A (JE)			
		< IC >			
IC1	8-759-362-23	IC TA7371AF-EL			
IC2	8-759-362-25	IC TA-2022AFN-EL			
IC102	8-759-822-48	IC LA4537M			
		< COIL >			
L1	1-416-903-41	COIL (WITH CORE)			
L2	1-414-691-21	INDUCTOR	100nH (E)		
L2	1-414-693-11	INDUCTOR	150nH (JE)		
L101	1-412-969-31	INDUCTOR	0.15uH		
		< TRANSISTOR >			
Q1	8-729-037-89	TRANSISTOR	2SC4627J-C(TX).SO		
Q2	8-729-037-89	TRANSISTOR	2SC4627J-C(TX).SO		
Q101	8-729-922-10	TRANSISTOR	2SA1577-QR		
Q102	8-729-037-92	TRANSISTOR	2SD2216J-R(TX).SO		
		< RESISTOR >			
R1	1-216-845-11	METAL CHIP	100K	5%	1/16W
R2	1-216-845-11	METAL CHIP	100K	5%	1/16W
R3	1-216-845-11	METAL CHIP	100K	5%	1/16W
R4	1-216-845-11	METAL CHIP	100K	5%	1/16W
R5	1-216-833-91	RES,CHIP	10K	5%	1/16W
R6	1-216-845-11	METAL CHIP	100K	5%	1/16W
R7	1-216-797-11	METAL CHIP	10	5%	1/16W
R8	1-216-815-11	METAL CHIP	330	5%	1/16W
R9	1-216-797-11	METAL CHIP	10	5%	1/16W
R10	1-216-813-11	METAL CHIP	220	5%	1/16W

MAIN **JACK** **KEY**

Ref. No.	Part No.	Description			Remarks
R11	1-216-797-11	METAL CHIP	10	5%	1/16W
R12	1-216-835-11	METAL CHIP	15K	5%	1/16W
R13	1-216-837-11	METAL CHIP	22K	5%	1/16W
R14	1-216-797-11	METAL CHIP	10	5%	1/16W
R15	1-216-833-91	RES,CHIP	10K	5%	1/16W
R16	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R17	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R18	1-216-837-11	METAL CHIP	22K	5%	1/16W
R19	1-216-837-11	METAL CHIP	22K	5%	1/16W
R20	1-216-829-11	METAL CHIP	4.7K	5%	1/16W (E)
R21	1-216-864-11	METAL CHIP	0	5%	1/16W
R22	1-216-864-11	METAL CHIP	0	5%	1/16W (JE)
R23	1-216-821-11	METAL CHIP	1K	5%	1/16W
R24	1-216-813-11	METAL CHIP	220	5%	1/16W
R28	1-216-864-11	METAL CHIP	0	5%	1/16W
R105	1-216-821-11	METAL CHIP	1K	5%	1/16W
R106	1-216-821-11	METAL CHIP	1K	5%	1/16W
R107	1-216-797-11	METAL CHIP	10	5%	1/16W
R108	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R109	1-216-828-11	METAL CHIP	3.9K	5%	1/16W
R110	1-216-817-11	METAL CHIP	470	5%	1/16W
R113	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
		< VARIABLE RESISTOR >			
RV1	1-223-587-11	RES, ADJ, CARBON 22K			
RV101	1-227-153-21	RES, VAR (VOL ◢)			
		< SWITCH >			
S1	1-771-790-21	SWITCH, SLIDE (SENS) (E)			
		< TRANSFORMER >			
T1	1-416-020-41	TRANSFORMER, IF (TV IFT)			
		< VIBRATOR >			
X1	1-767-414-71	FILTER, CERAMIC 10.7MHz			
**********					
	A-3663-438-A	JACK BOARD, COMPLETE (E)			
		**********			
	A-3663-412-A	JACK BOARD, COMPLETE (JE)			
		**********			
		< CAPACITOR >			
C301	1-115-156-11	CERAMIC CHIP	1uF		10V
C302	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C303	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C304	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C305	1-107-983-11	TANTAL. CHIP	10uF	20%	2.5V
C306	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C307	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C308	1-127-569-91	TANTAL. CHIP	100uF	20%	4V
C309	1-110-569-11	TANTAL. CHIP	47uF	20%	4V
C311	1-117-977-11	TANTAL. CHIP	100uF	20%	2.5V
C312	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V

Ref. No.	Part No.	Description			Remarks
		< DIODE >			
D301	8-719-046-91	DIODE MA2S111			
D302	8-719-420-87	DIODE MA8130			
D303	8-719-800-76	DIODE 1SS226			
D304	8-719-069-29	DIODE RB520S-30TE61			
		< IC >			
IC301	8-759-652-77	IC RN5RK251A-TR			
		< JACK >			
J301	1-764-624-11	JACK (AUDIO IN)			
		< COIL >			
L301	1-412-056-11	INDUCTOR CHIP	4.7uH		
L303	1-419-403-21	INDUCTOR	0uH		
L304	1-435-090-21	TRANSFORMER, DC-DC CONVERTER			
L306	1-412-064-11	INDUCTOR CHIP	100uH		
		< TRANSISTOR >			
Q301	8-729-037-92	TRANSISTOR	2SD2216J-R(TX).SO		
Q302	8-729-037-92	TRANSISTOR	2SD2216J-R(TX).SO		
Q303	8-729-037-86	TRANSISTOR	2SB1462J-R(TX).SO		
Q304	8-729-037-71	TRANSISTOR	UN9210J-(TX).SO		
		< RESISTOR >			
R301	1-216-821-11	METAL CHIP	1K	5%	1/16W
R302	1-216-845-11	METAL CHIP	100K	5%	1/16W
R303	1-216-845-11	METAL CHIP	100K	5%	1/16W
R304	1-216-841-11	METAL CHIP	47K	5%	1/16W
R306	1-216-805-11	METAL CHIP	47	5%	1/16W
R307	1-216-833-91	RES,CHIP	10K	5%	1/16W
R309	1-216-845-11	METAL CHIP	100K	5%	1/16W
R311	1-216-864-11	METAL CHIP	0	5%	1/16W
R312	1-216-308-00	METAL CHIP	4.7	5%	1/10W
		< SWITCH >			
S301	1-771-337-21	SWITCH, SLIDE (AUDIO IN/RADIO)			
S302	1-762-741-11	SWITCH, SLIDE (POWER)			
**********					
	A-3663-436-A	KEY BOARD, COMPLETE (E)			
		**********			
	A-3663-408-A	KEY BOARD, COMPLETE (JE)			
		**********			
	1-528-412-11	BATTERY, PAS SECONDARY			
	1-694-633-11	CONDUCTIVE BOARD, CONNECTION			
	3-040-300-01	HOLDER (LCD)			
*	3-040-302-01	CASE (LCD), SHIELD			
	3-040-305-01	ILLUMINATOR (A)			
	3-040-306-01	ILLUMINATOR (B)			
		< CAPACITOR >			
C201	1-110-501-11	CERAMIC CHIP	0.33uF	10%	16V
C202	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C203	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C204	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C205	1-162-962-11	CERAMIC CHIP	470PF	10%	50V

Ref. No.	Part No.	Description			Remarks
C207	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C208	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C209	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C210	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C211	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C212	1-115-156-11	CERAMIC CHIP	1uF		10V
C213	1-162-922-11	CERAMIC CHIP	39PF	5%	50V
C214	1-162-917-11	CERAMIC CHIP	15PF	5%	50V
C215	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C216	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C219	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C221	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C222	1-164-156-11	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
* CN201	1-793-568-21	CONNECTOR, BOARD TO BOARD 20P			
		< DIODE >			
D201	8-719-069-29	DIODE RB520S-30TE61			
D202	8-719-077-82	LED SML-210JTT86PQ (BACK LIGHT)			
D203	8-719-077-82	LED SML-210JTT86PQ (BACK LIGHT)			
D204	8-719-077-82	LED SML-210JTT86PQ (BACK LIGHT)			
		< IC >			
IC201	8-759-640-08	IC uPD17072GB-563-1A7			
IC202	8-759-530-11	IC S-80812ANNP-E72-T2			
		< LIQUID CRYSTAL DISPLAY >			
LCD201	1-803-780-11	DISPLAY PANEL, LIQUID CRYSTAL			
		< TRANSISTOR >			
Q201	8-729-037-92	TRANSISTOR	2SD2216J-R(TX).SO		
Q202	8-729-037-92	TRANSISTOR	2SD2216J-R(TX).SO		
Q203	8-729-037-92	TRANSISTOR	2SD2216J-R(TX).SO		
Q204	8-729-030-20	TRANSISTOR	2SC4097-T106PQR		
		< RESISTOR >			
R201	1-216-833-91	RES,CHIP	10K	5%	1/16W
R202	1-216-845-11	METAL CHIP	100K	5%	1/16W
R203	1-216-833-91	RES,CHIP	10K	5%	1/16W
R204	1-216-833-91	RES,CHIP	10K	5%	1/16W
R205	1-216-833-91	RES,CHIP	10K	5%	1/16W (E)
R206	1-216-833-91	RES,CHIP	10K	5%	1/16W (JE)
R208	1-216-833-91	RES,CHIP	10K	5%	1/16W
R209	1-216-821-11	METAL CHIP	1K	5%	1/16W
R210	1-216-821-11	METAL CHIP	1K	5%	1/16W
R211	1-216-821-11	METAL CHIP	1K	5%	1/16W
R213	1-216-821-11	METAL CHIP	1K	5%	1/16W
R214	1-216-821-11	METAL CHIP	1K	5%	1/16W
R215	1-216-821-11	METAL CHIP	1K	5%	1/16W
R216	1-216-851-11	METAL CHIP	330K	5%	1/16W
R217	1-216-857-11	METAL CHIP	1M	5%	1/16W
R218	1-216-845-11	METAL CHIP	100K	5%	1/16W
R219	1-216-821-11	METAL CHIP	1K	5%	1/16W
R220	1-216-821-11	METAL CHIP	1K	5%	1/16W
R221	1-216-833-91	RES,CHIP	10K	5%	1/16W
R222	1-216-797-11	METAL CHIP	10	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R223	1-216-813-11	METAL CHIP	220	5%	1/16W
R224	1-216-813-11	METAL CHIP	220	5%	1/16W
R225	1-216-857-11	METAL CHIP	1M	5%	1/16W
R226	1-216-843-11	METAL CHIP	68K	5%	1/16W
R227	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R228	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R229	1-216-845-11	METAL CHIP	100K	5%	1/16W
R230	1-216-857-11	METAL CHIP	1M	5%	1/16W
R231	1-216-857-11	METAL CHIP	1M	5%	1/16W
R232	1-216-813-11	METAL CHIP	220	5%	1/16W
R233	1-216-857-11	METAL CHIP	1M	5%	1/16W
		< SWITCH >			
S201	1-692-088-11	SWITCH, TACTILE (UP)			
S202	1-692-088-11	SWITCH, TACTILE (ENTER)			
S203	1-692-088-11	SWITCH, TACTILE (PRESET)			
		< VIBRATOR >			
X201	1-767-718-31	VIBRATOR, CRYSTAL 75KHz			

****

MISCELLANEOUS
****

2	1-505-322-11	DRIVER (030F023A) (JE)
21	1-791-740-11	WIRE (10 ARBOR), LEAD

****

ACCESSORIES & PACKING MATERIALS
****

	1-791-766-11	CORD (WITH PLUG) (SP-SP)
	3-867-924-11	MANUAL, INSTRUCTION (ENGLISH)

9-927-179-11

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