MDR-NC60

SERVICE MANUAL

Ver. 1.1 2007.11

US Model
Canadian Model
AEP Model
E Model
Tourist Model

SPECIFICATIONS

General

Type	Dynamic, closed
Driver units	40 mm, dome type (CCAW adopted)
Power handling capacity	100 mW
Impedance	40 Ω at 1 kHz (when the power is on) 100 Ω at 1 kHz (when the power is off)
Sensitivity	102 dB/mW (when the power is on) 100 dB/mW (when the power is off)
Frequency response	14 – 24,000 Hz
Frequency range of active noise attenuation	40 – 1,500 Hz, more than 16.5 dB at 200 Hz
Power source	DC 1.5 V, 1 × R03 (size AAA) battery
Mass	Approx. 230 g (8 oz) including battery

Supplied accessories

Connecting cord (0.5 m, gold plated stereo mini plug)(1) (Tourist)
Connecting cord (1.5 m, gold plated L type stereo mini plug)(1)
Sony R03 (size AAA) battery (1) (US, Tourist)
Carrying case (1)
Plug adapter for in-flight use* (single/dual)(1)
Gold-plated unimatch plug adapter (stereo phone plug ⟷ stereo mini jack)(1)
Operating Instructions (1)
Card warranty (1) (Except E)

* May not be compatible with some in-flight music services.

Battery life

Battery	Approx. hours*1
Sony alkaline LR03/AM-4 (N) (size AAA) battery	30 hours*2
Sony manganese R03/ UM-4 (NU) (size AAA) battery	15 hours*2

*1 1 kHz, 0.1 mW + 0.1 mW output
*2 Time stated above may vary, depending on the temperature or conditions of use.

Note

Because the supplied battery was included in the package from the time of manufacture (as a convenience to the user), it is possible that the battery life may be somewhat depleted by the time of purchase. The actual life of the supplied battery may be shorter than the standard time described in this manual when using a fresh battery.

When to replace the battery

Replace the battery with a new one when the POWER indicator dims. The noise canceling feature may not work correctly if battery power is low.

Design and specifications are subject to change without notice.

NOISE CANCELING HEADPHONES

9-887-554-02
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Sony Corporation
Audio Business Group
Published by Sony Techno Create Corporation

SONY®

UNLEADED SOLDER

Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead.
(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size)

: LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40 ˚C higher than ordinary solder.
  Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
  Soldering irons using a temperature regulator should be set to about 350 ˚C.
  Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
  Unleaded solder is more viscou-s (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
  It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

Note on chip component replacement

- Never reuse a disconnected chip componet
- Notice that the minus side of a teamtalum capacitor may be damaged by heat

TABLE OF CONTENTS

SECTION 1 GENERAL

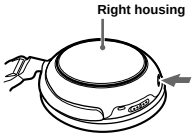
This section is extracted from instruction manual.

Features

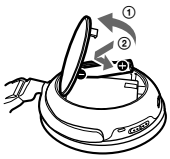
- Noise canceling headphones reduce unwanted ambient noise, providing a quieter environment to enhance your listening experience. A microphone inside each earpiece works with electronic circuitry to create an opposite sound wave to cancel out the noise. Up to 85 % ambient noise cancellation (Over 16.5 dB is reduced at 200 Hz)
- Slim, folding design for easy portability
- Neodymium magnets for powerful sound
- Dual-use capability allows option to listen to music with or without noise cancellation
- Built-in monitor function lets you silence the audio to listen outside
- Supplied plug adaptor for easy connectivity to stereo or dual jack for in-flight music services

Installing a battery

1 Push the "BATT ⏏" button located at the bottom of the right housing.
The lid of the battery box opens slightly.



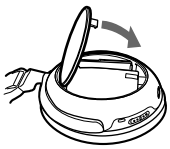
2 Open the lid of the battery box of the headphone to insert one size AAA battery.



Note

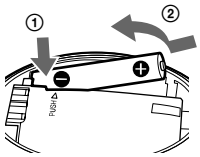
The lid of the battery box opens only so far, as shown in the illustration. Do not further force open the lid as it may damage it.

3 Close the lid.



To remove the battery

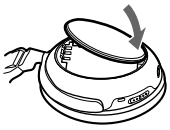
Open the lid of the battery box, then push the position marked with "PUSH ▷". The ⊕ side of the battery comes up. Remove the battery by pulling it.



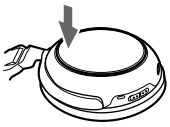
If the lid of the battery box is detached

Follow the procedure below to reattach the lid.

1 Attach the lower side of the lid.

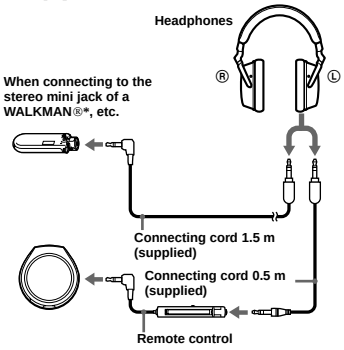


2 Push the upper side of the lid straight forward until it clicks into position.



Listening to music

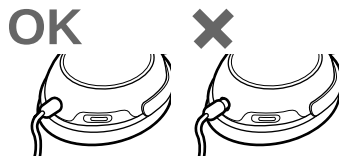
1 Connect the headphones to the AV equipment.



* "WALKMAN" and "WALKMAN" logo are registered trademarks of Sony Corporation.

Notes

- When connecting the cord, insert the plug into the jack until the green portion of the plug disappears.



- To disconnect the cord, pull it out by the plug, not the cord, as the inner conductors may break.

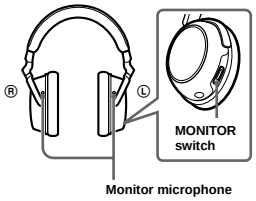
2 Turn on the power on the right side of the headphones.
The POWER indicator lights in red. When the power is turned on, ambient noise is reduced, and you can listen to music more clearly at a lower volume.

3 Put on the headphones so that the ear pads cover your ears.

4 Turn on the power of the AV equipment.

Hearing environmental sound for safety

If the MONITOR switch is pressed and held while the POWER switch is set to ON, playback silences so you can hear the surrounding environment.

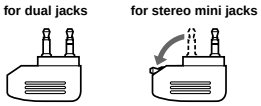


Note

The environmental sound might not be heard if the microphone is covered with your fingers.

Notes on using on the airplane

- The supplied plug adaptor can be connected to dual and stereo mini jacks.



- Do not use the headphones when use of electronic equipment is prohibited or when use of personal headphones for in-flight music services is prohibited.

If you have any questions or problems concerning the system that are not covered in this manual, please consult the nearest Sony dealer.

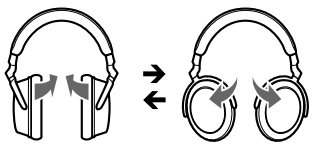
After listening to music

Turn off the power of the headphones.

Folding the headphones

Folding

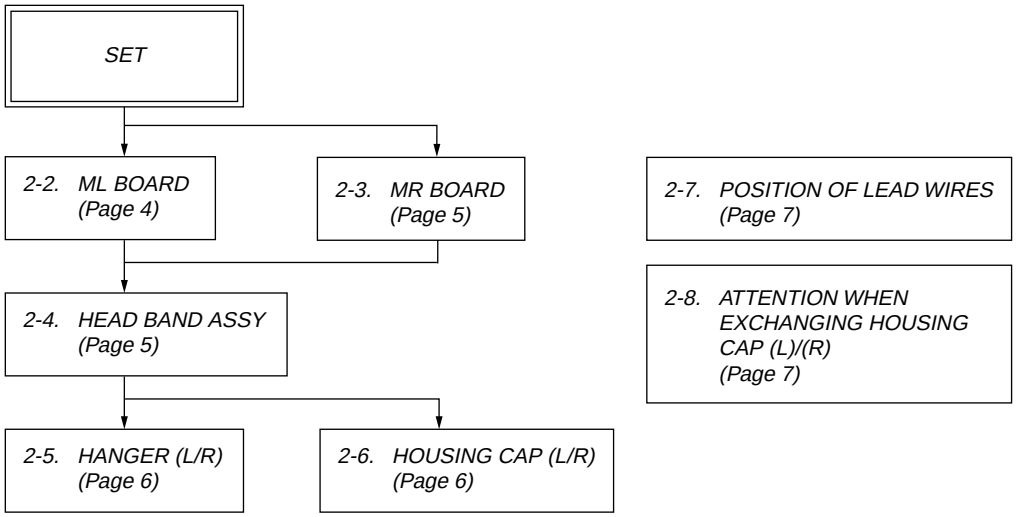
The housings rotate to make them flat for easy storage in the carrying case (supplied), or in a seat pocket.
Restore to their usual position before using.



SECTION 2
DISASSEMBLY

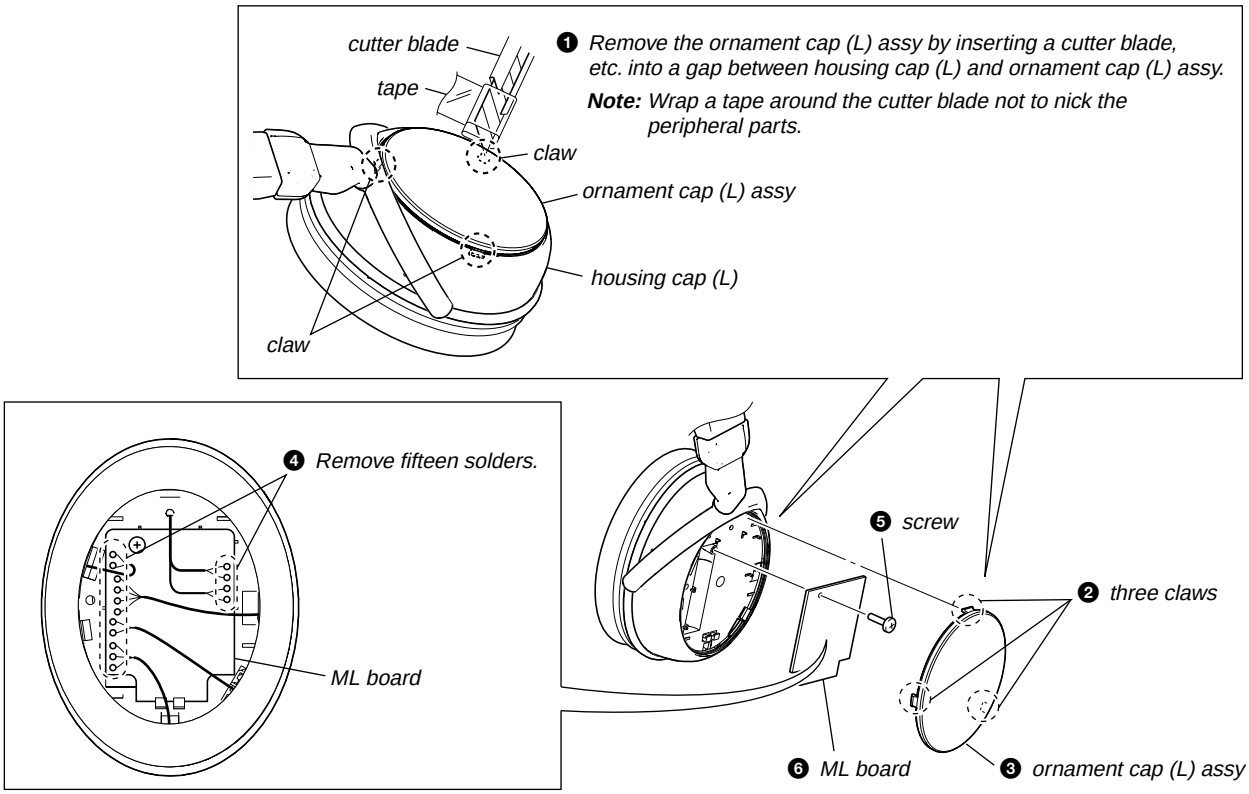
- This set can be disassembled in the order shown below.

2-1. DISASSEMBLY FLOW

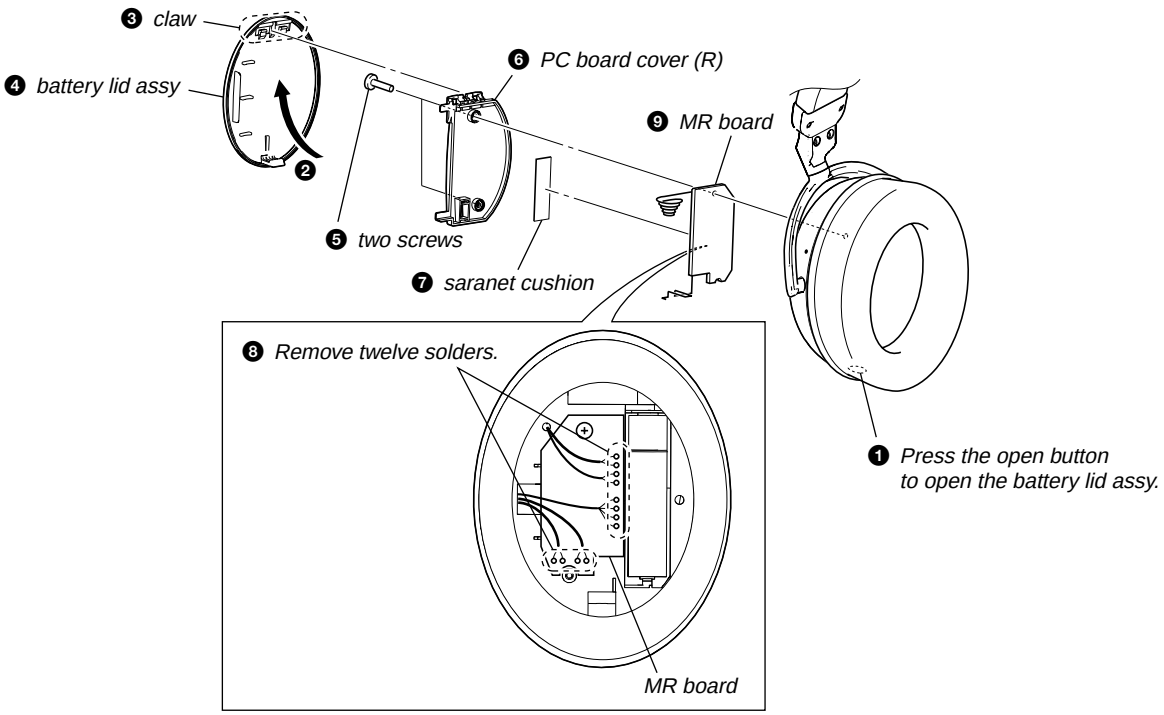


Note: Follow the disassembly procedure in the numerical order given.

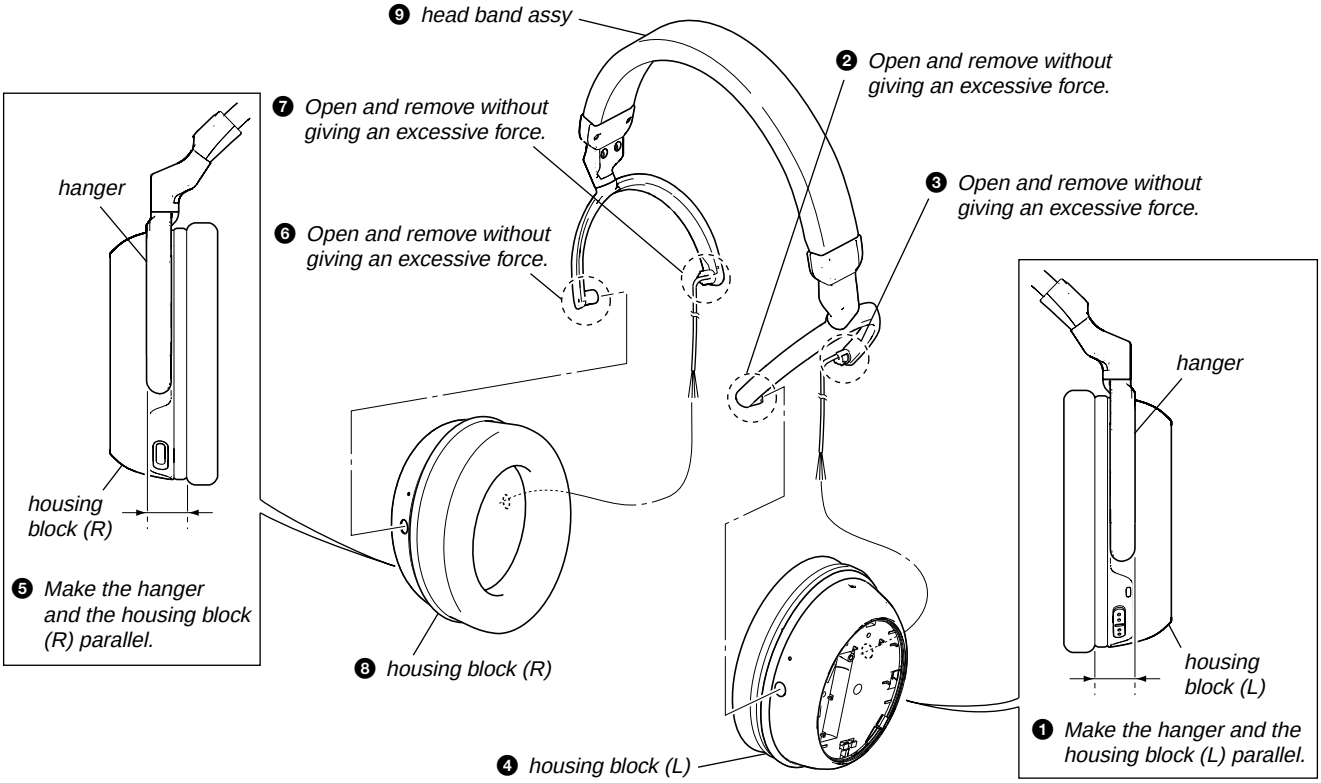
2-2. ML BOARD



2-3. MR BOARD

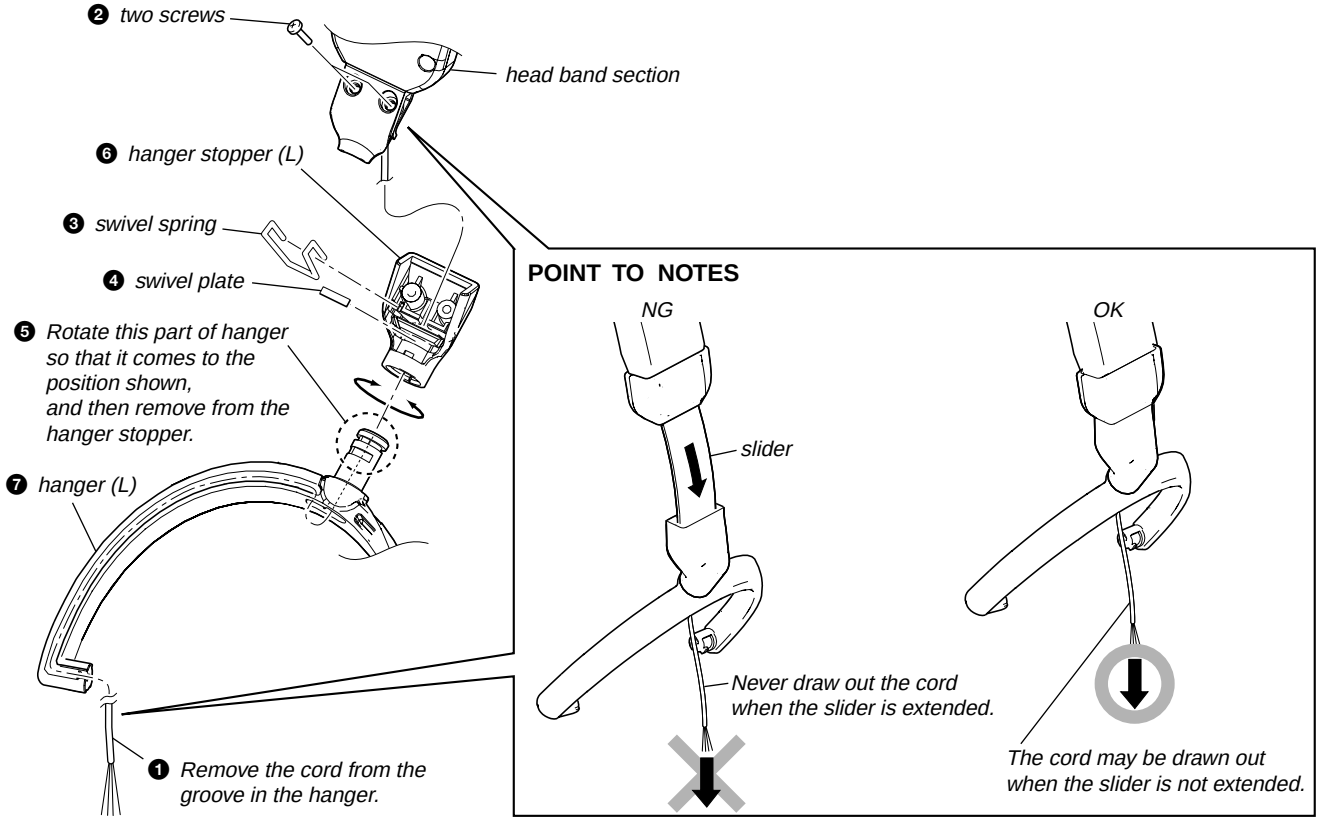


2-4. HEAD BAND ASSY



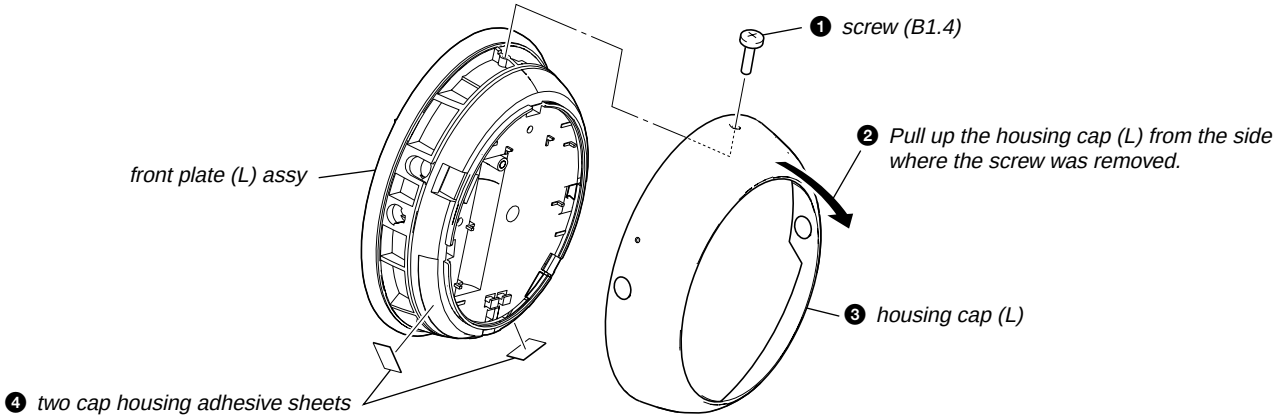
2-5. HANGER (L/R)

Note: *Use the same method as that on the L side when removing the hanger (R).*



2-6. HOUSING CAP (L/R)

Note: *Use the same method as that on the L side when removing the housing cap (R).*

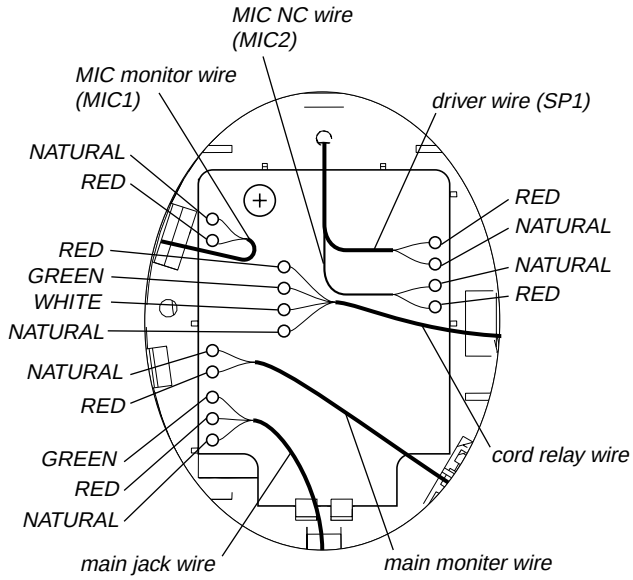


Note: *Cap housing adhesive sheets cannot re-used. Please replace to brand-new part ones cap housing adhesive sheets is removed.*

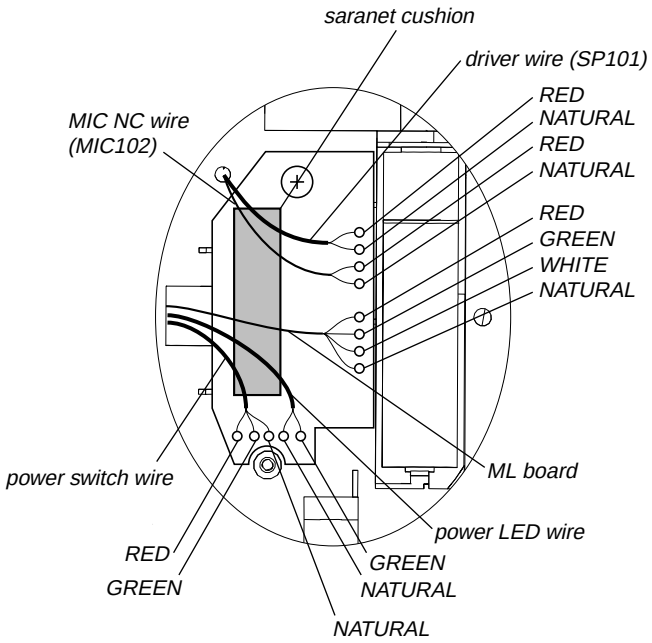
Note: When exchanging housing cap (L) or (R), please be sure to refer to “ATTENTION WHEN EXCHANGING HOUSING CAP (L)/(R)” (page 7).

2-7. POSITION OF LEAD WIRES

– ML board –



– MR board –



2-8. ATTENTION WHEN EXCHANGING HOUSING CAP (L)/(R)

The specification of the painting is change from the way of the production in housing cap (L)/(R).
When exchanging housing cap (L) or (R), please refer to following how to distinguish and combination table and exchange it for housing cap (L)/(R) of the same type as before an exchange.

Type A/Type B Discrimination

HOUSING CAP

Combination table

Type	Marking	HOUSING CAP		Destination
		Left	Right	
A	No mark	2-898-389-01	2-898-390-01	US
	No mark	2-898-389-11	2-898-390-11	Except US model
B	A21	2-898-389-21	2-898-390-21	US
	A31	2-898-389-31	2-898-390-31	Except US model

SECTION 3
ELECTRICAL ADJUSTMENT

NOISE CANCELING VOLUME ADJUSTMENT

Note: The value of AMP gain adjustment is different according to new/former of the ML and MR boards.
Execute the adjustment after confirming which type the ML and MR boards beforehand.
Refer to supplement-1 for discrimination of the ML and MR boards.

① AMP Gain Adjustment

Preparation:

– L-CH –

1. Remove wires of the TP903, TP904, TP905. (for HP board (audio in jack))
2. Remove wires of the TP915, TP916. (for SP1)
3. Remove wire of the TP913, (for MIC2)

– R-CH –

4. Remove wires of the TP932, TP933. (for SP101)
5. Remove wire of the TP930. (for MIC102)

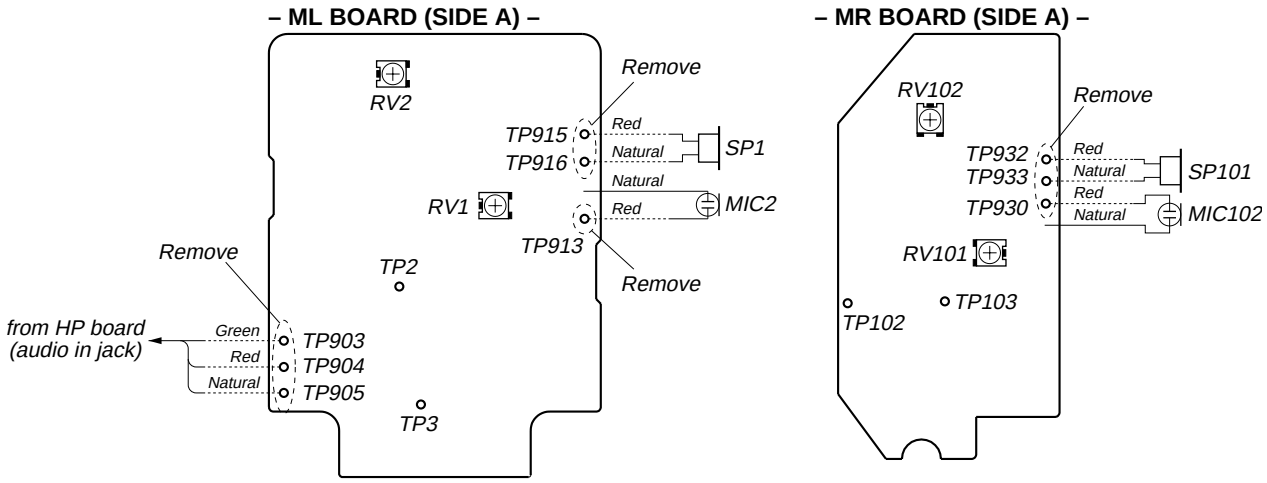


Figure 1

Setting:

– L-CH –

1. Connect resistors to the TP903, TP904, TP905.
2. Connect a resistor to the TP915, TP916.
3. Connect a lead wire to the TP2.

– R-CH –

4. Connect a resistor to the TP932, TP933.
5. Connect a lead wire to the TP102.

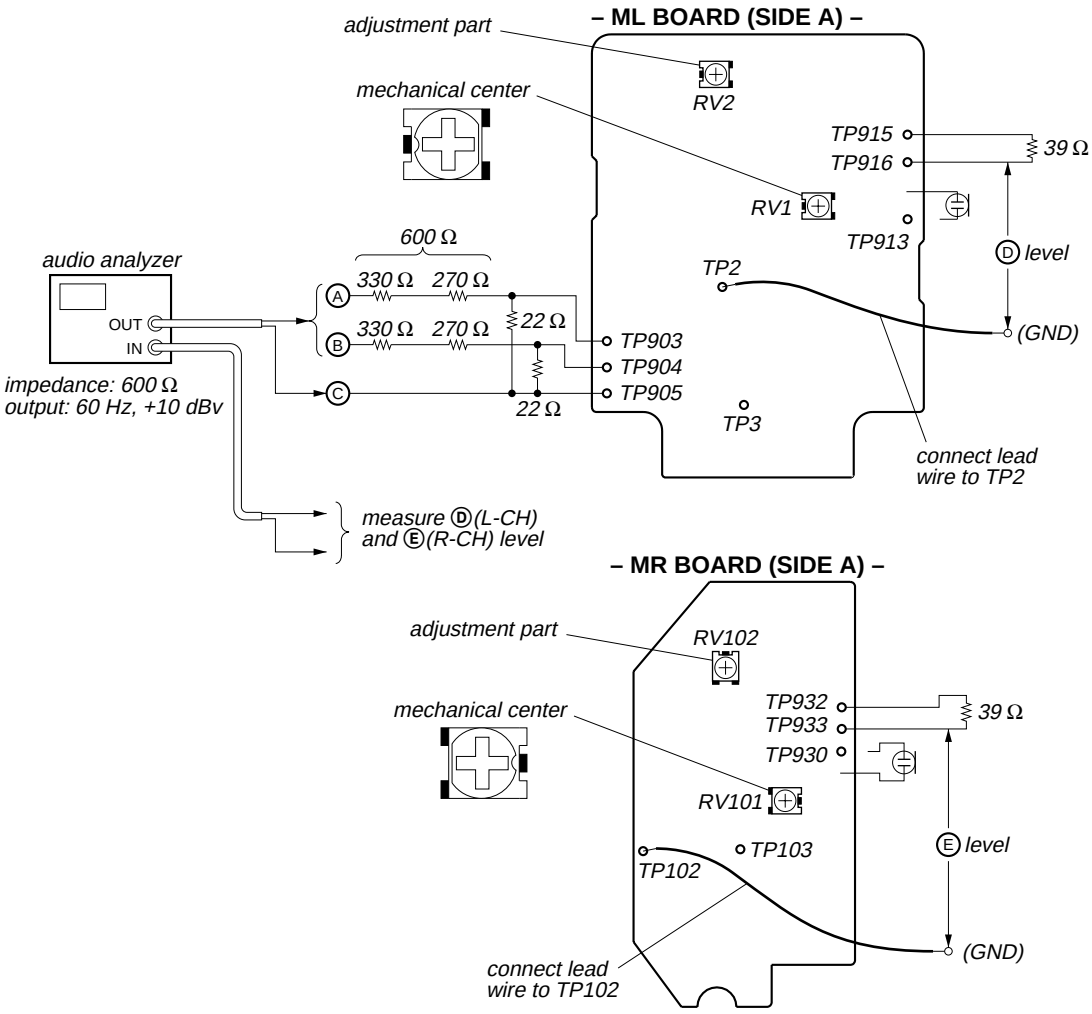


Figure 2

Procedure:

1. Check that the volume position of RV1 (L-CH) and RV101 (R-CH) are mechanical center.

– L-CH –

2. Connect an audio analyzer (impedance: 600 Ω) to Ⓐ and Ⓒ in figure 2.
3. Connect the audio analyzer to the lead wire of TP2 and the resistor of TP916.
4. Input the signal (60 Hz, +10dBv) from the audio analyzer.
5. Adjust RV2 so that Ⓓ level in figure 2 (between TP2 and TP916) is –21 dBv ± 0.2 dB (former type) or –16 dBv ± 0.2 dB (new type).

– R-CH –

6. Connect an audio analyzer (impedance: 600 Ω) to Ⓑ and Ⓒ in figure 2.
7. Connect the audio analyzer to the lead wire of TP102 and the resistor of TP933.
8. Input the signal (60 Hz, +10dBv) from the audio analyzer.
9. Adjust RV102 so that the Ⓔ level in figure 2 (between TP102 and TP933) is –21 dBv ± 0.2 dB (former type) or –16 dBv ± 0.2 dB (new type).

Figure 3. Adjusted position (reference)

② Canceling Gain Adjustment

Preparation and setting:

– L-CH –

1. Remove the resistors from TP903, TP904, TP905.
2. Connect the wires of HP board (audio in jack)) to the TP903 (green), TP904 (red), TP905 (natural).
3. Remove the resistor from TP915, TP916.
4. Connect the wires of SP1 to the TP915 (red), TP916 (natural).
5. Connect the wire of MIC2 to the TP913 (red).
6. Connect a lead wire to the TP3.
7. Connect a resistor and capacitor to the TP913.

– R-CH –

8. Remove the resistor from TP932, TP933.
9. Connect the wires of SP101 to the TP932 (red), TP933 (natural).
10. Connect the wire of MIC102 to the TP930 (red).
11. Connect a lead wire to the TP103.
12. Connect a resistor and capacitor to the TP930.

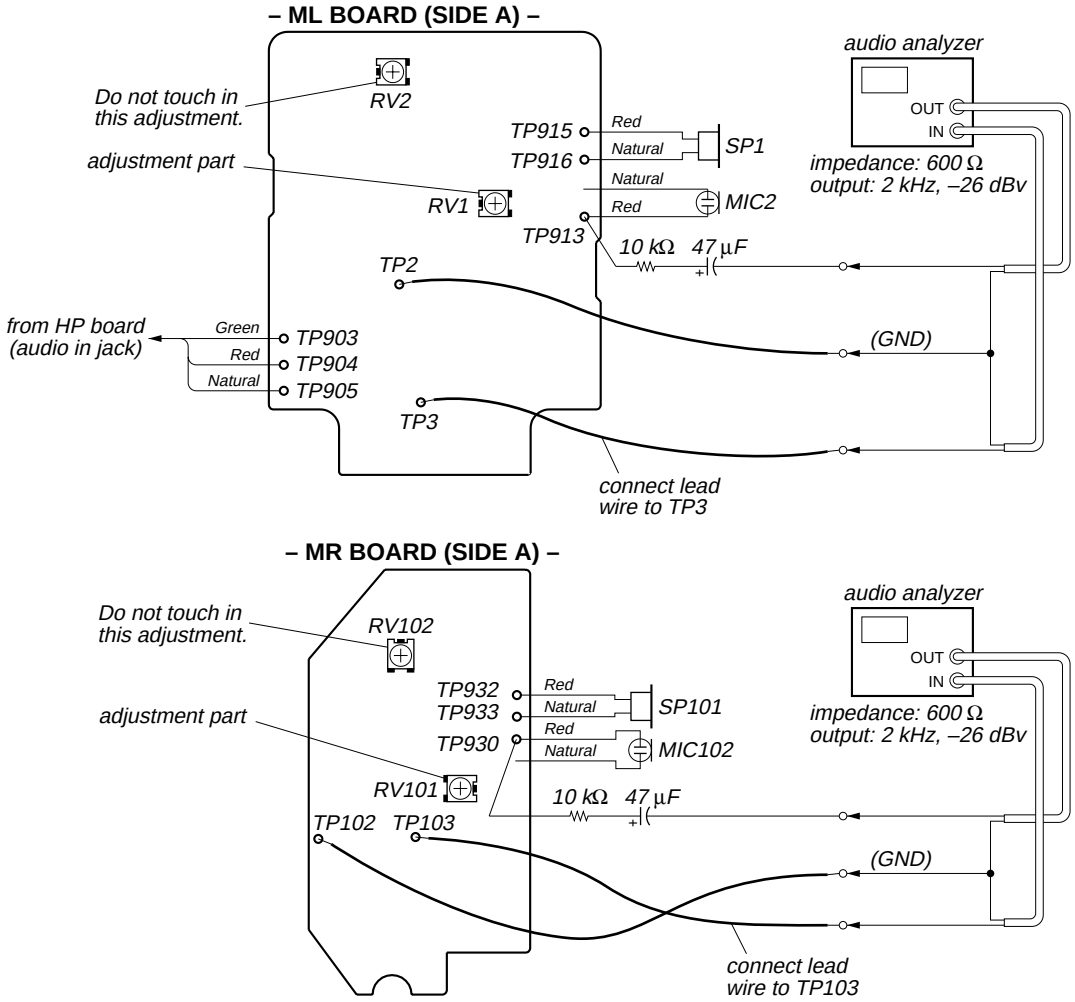


Figure 4

Procedure:

– L-CH –

1. Connect an audio analyzer (impedance: 600 Ω) to the capacitor of TP913 and lead wire of TP2.
2. Connect the audio analyzer to the lead wire of TP2 and the lead wire of TP3.
3. Put the housing (L-CH side) on flat table.
4. Sway and press softly the housing so that the contact surface of ear pad is sealed. (Do not press very strong)
5. Put a weight (150 g) on the housing. (figure 5)
6. Input the signal (2 kHz, –26 dBv) from the audio analyzer.
7. Adjust RV1 so that the level of between TP2 and TP3 is –26.5 dBv.

– R-CH –

8. Connect an audio analyzer (impedance: 600 Ω) to the capacitor of TP930 and lead wire of TP102.
9. Connect the audio analyzer to the wire of TP102 and the wire of TP103.
10. Put the housing (R-CH side) on flat table.
11. Sway and press softly the housing so that the contact surface of ear pad is sealed. (Do not press very strong)
12. Put a weight (150 g) on the housing. (figure 5)
13. Input the signal (2 kHz, –26 dBv) from the audio analyzer.
14. Adjust RV101 so that the level of between TP102 and TP103 is –26.5 dBv.

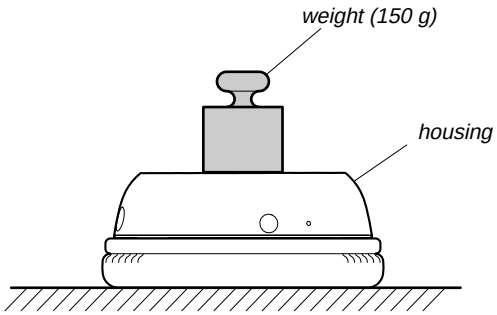
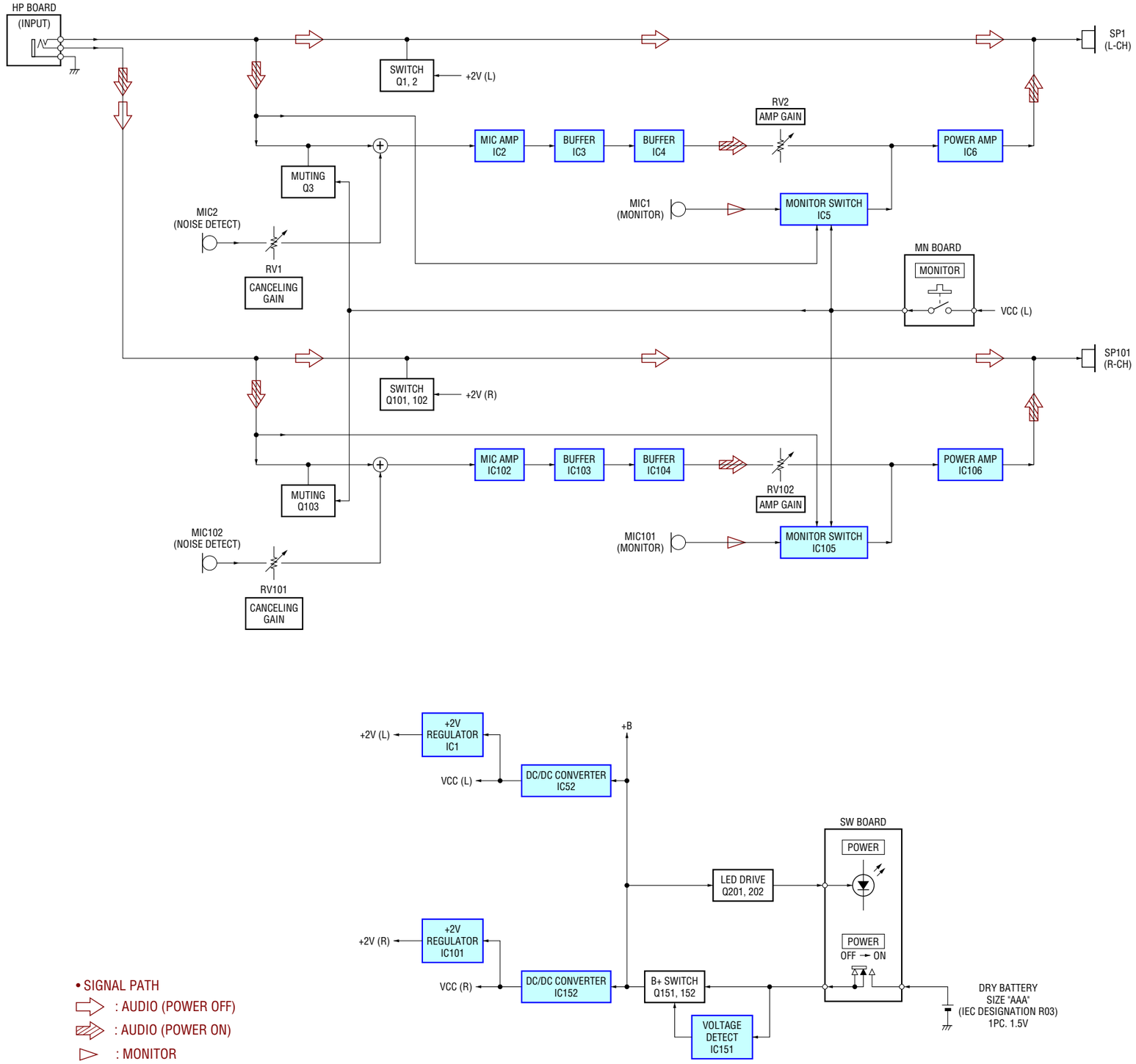


Figure 5

MEMO

SECTION 4
DIAGRAMS

4-1. BLOCK DIAGRAM



• Note for Printed Wiring Boards and Schematic Diagrams

Note on Printed Wiring Boards:

- ○——— : parts extracted from the component side.
- ——— : parts extracted from the conductor side.
- ▭ : Pattern from the side which enables seeing.

(The other layer's pattens are not indicated.)

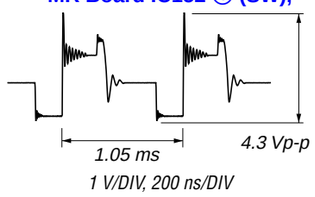
Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

Note on Schematic Diagram:

- All capacitors are in µF unless otherwise noted. (p: pF) 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.
- ▬ : B+ Line.
- ▭ : adjustment for repair.
- Power voltage is dc 1.5 V and fed with regulated dc power supply from battery terminal.
- Voltages and waveform is dc with respect to ground under no-signal conditions.
  no mark : POWER ON
- Voltages are taken with a VOM (Input impedance 10 MΩ).
  Voltage variations may be noted due to normal production tolerances.
- Waveform is taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveform.
- Signal path.
  ⇨ : AUDIO (POWER OFF)
  ⇨ : AUDIO (POWER ON)
  ▷ : MONITOR

• Waveform

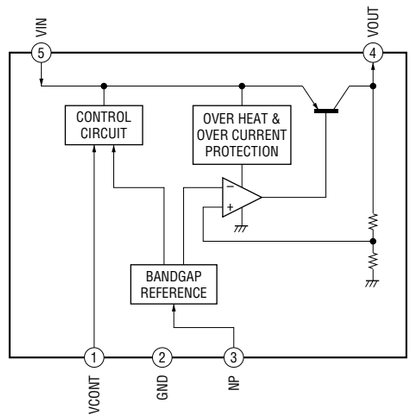
① ML Board IC52 ① (SW), MR Board IC152 ① (SW),



• IC Block Diagrams

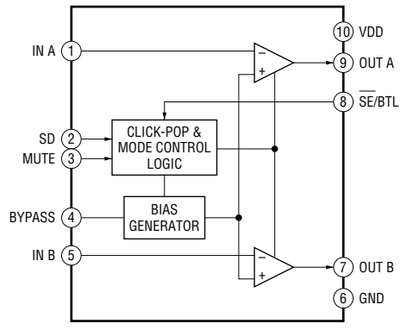
MR Board IC101

TK70520SCL-G



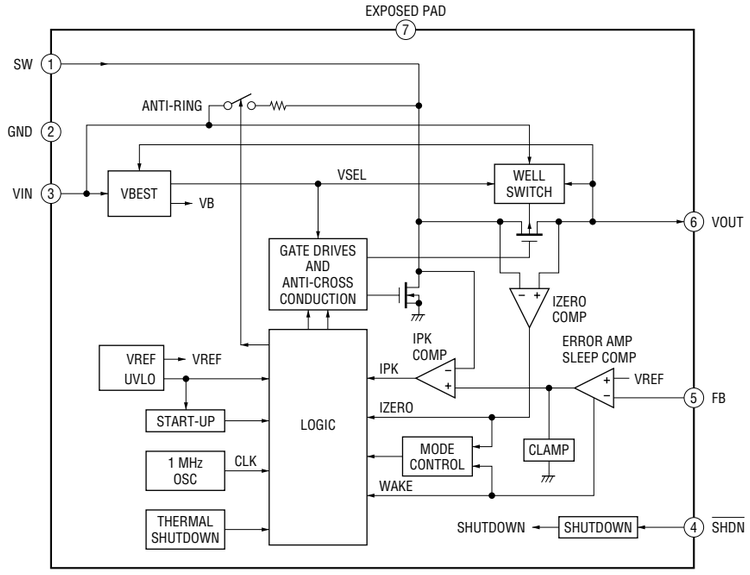
ML Board IC6
MR Board IC106

LM4916LDX/NOPB



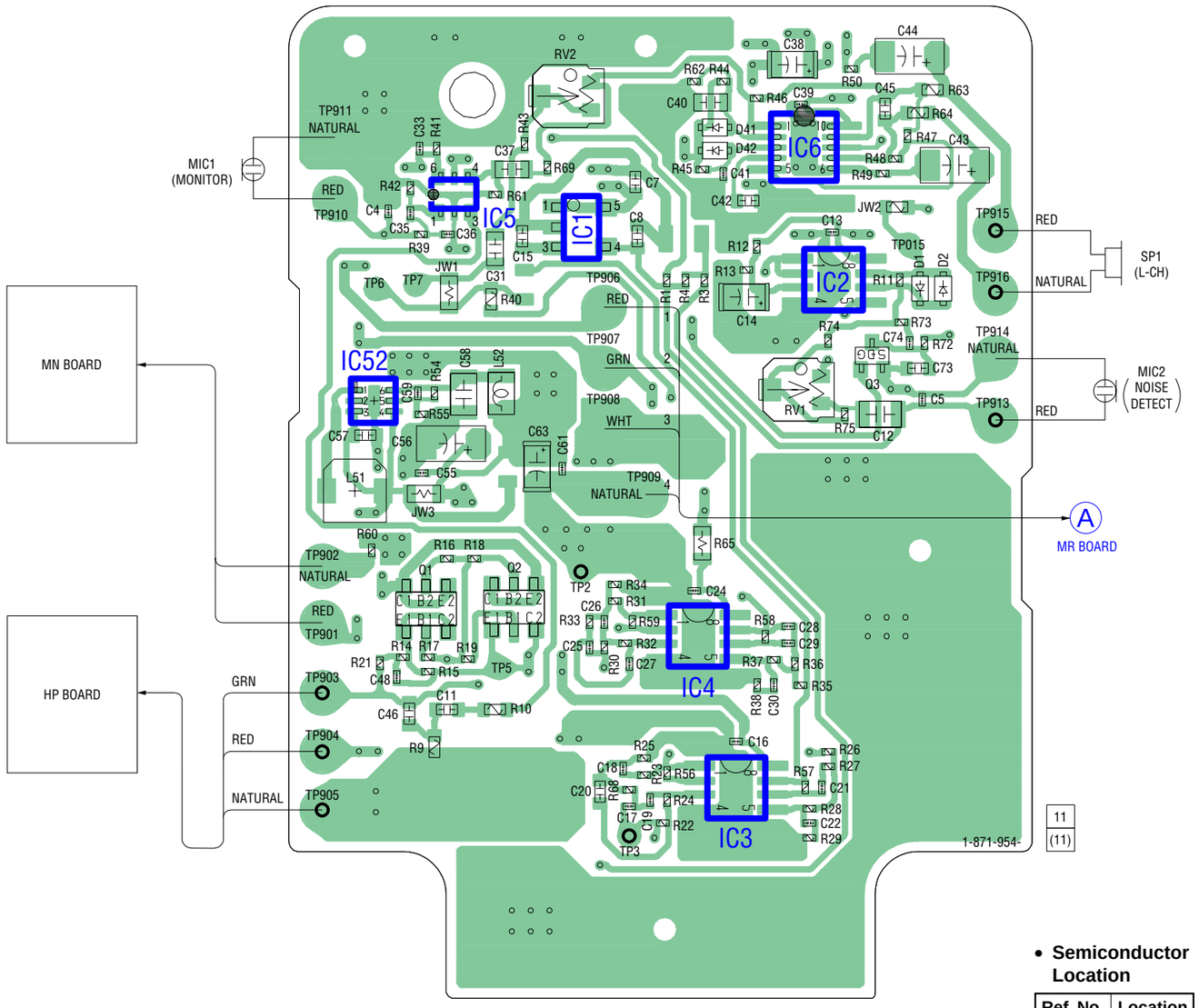
ML Board IC52
MR Board IC152

LTC3526BEDC#TR

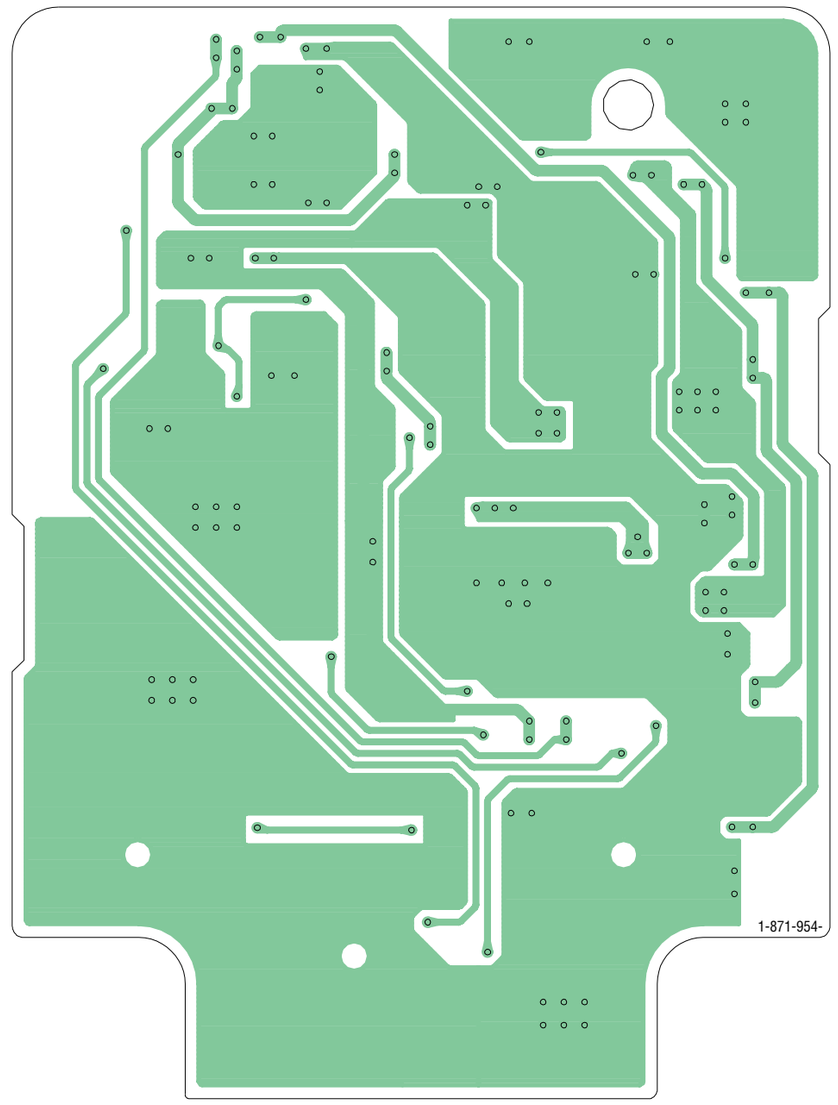


4-2. PRINTED WIRING BOARDS – L-CH Section – : Uses unleaded solder.

【ML BOARD】(SIDE A)



【ML BOARD】(SIDE B)

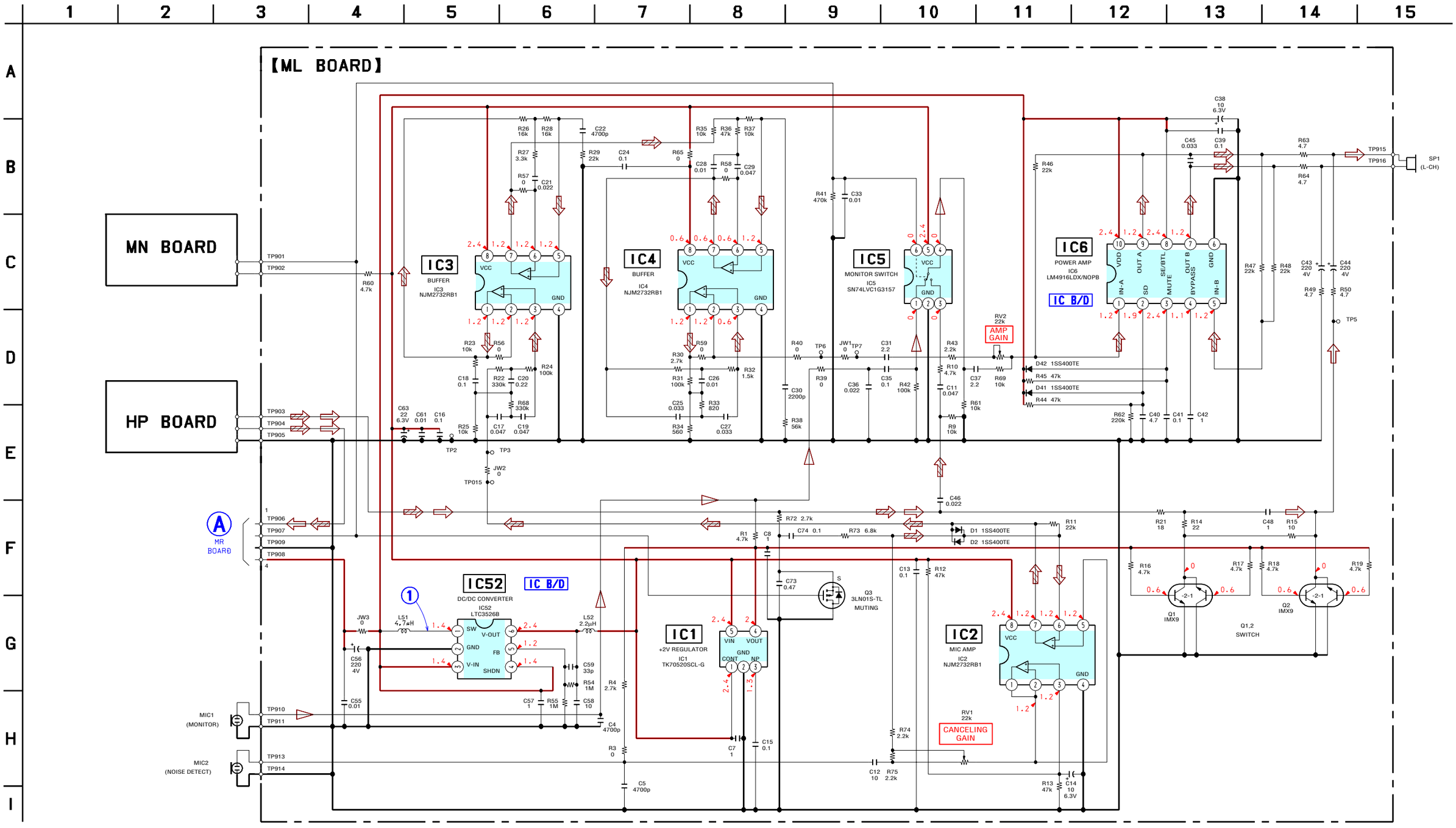


- **Semiconductor Location**

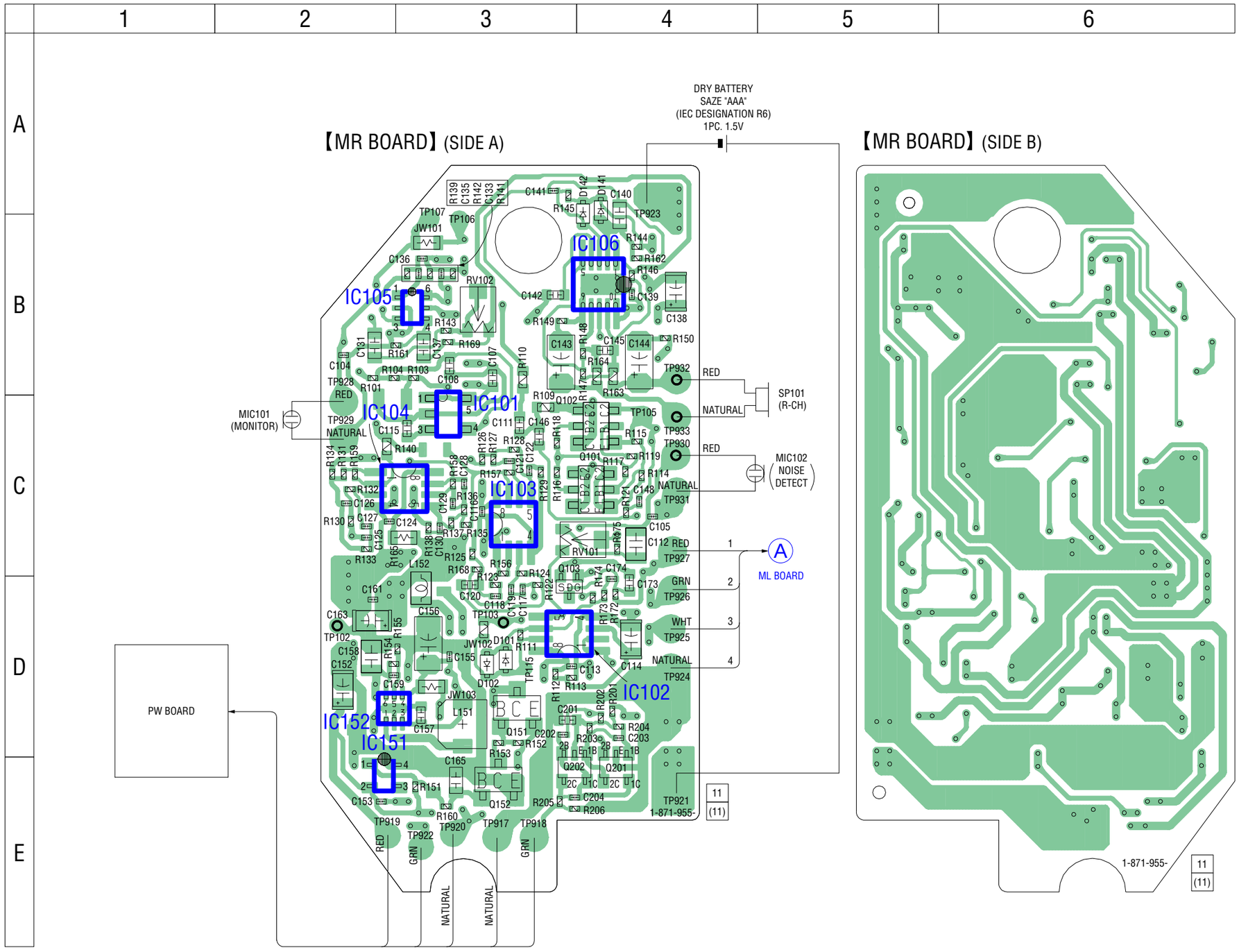
Ref. No.	Location
D1	B-5
D2	B-5
D41	B-4
D42	B-4
IC1	B-3
IC2	B-5
IC3	D-4
IC4	D-4
IC5	B-3
IC6	B-4
IC52	C-3
Q1	D-3
Q2	D-3
Q3	B-5

4-3. SCHEMATIC DIAGRAM – L-CH Section –

• See page 14 for Waveform. • See page 14 for IC Block Diagrams.



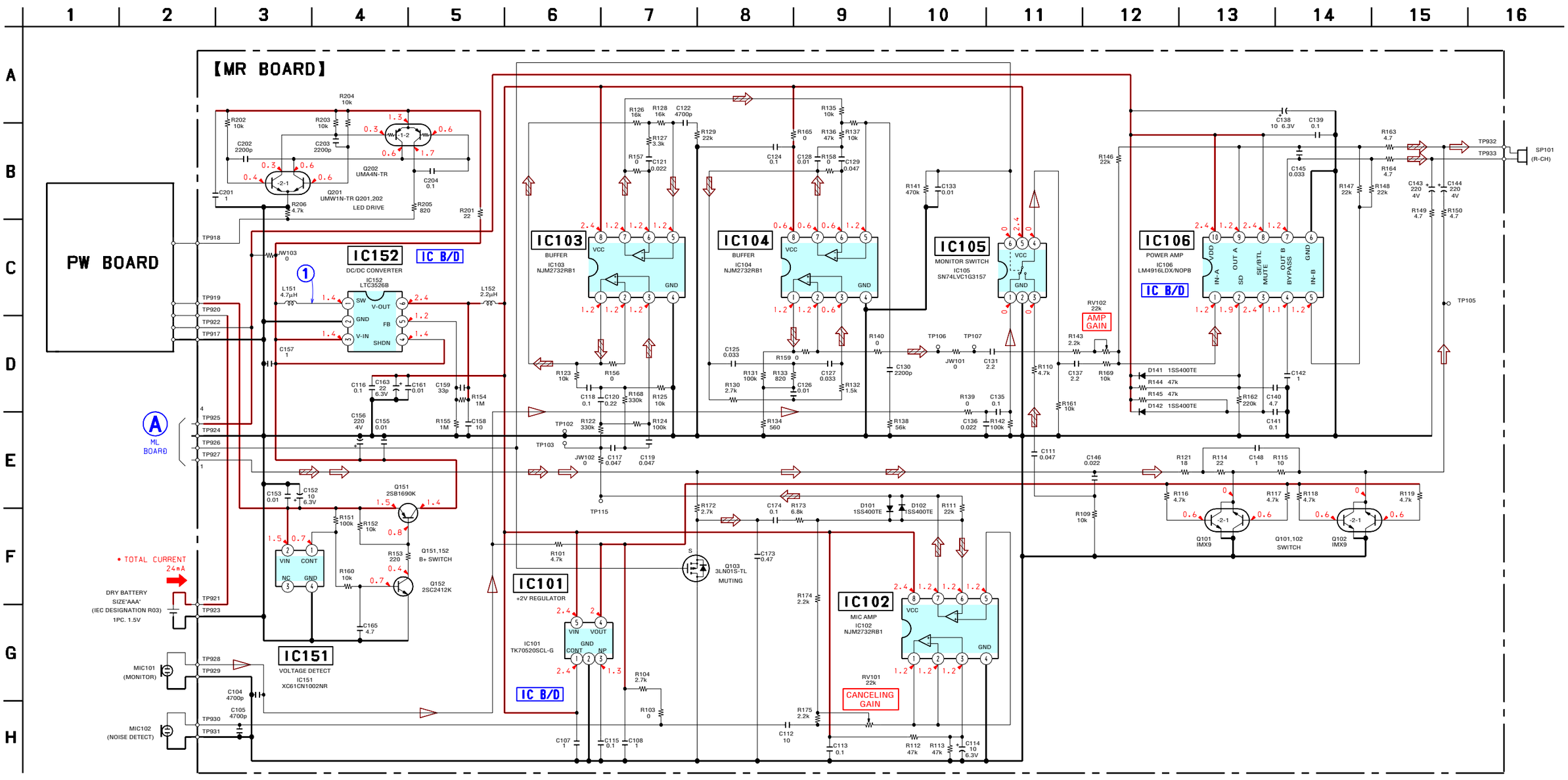
4-4. PRINTED WIRING BOARDS – R-CH Section – : Uses unleaded solder.



- **Semiconductor Location**

Ref. No.	Location
D101	D-3
D102	D-3
D141	A-4
D142	A-4
IC101	C-3
IC102	D-3
IC103	C-3
IC104	C-3
IC105	B-3
IC106	B-4
IC151	E-2
IC152	D-2
Q101	C-4
Q102	C-4
Q103	D-3
Q151	D-3
Q152	E-3
Q201	E-4
Q202	E-3

4-5. SCHEMATIC DIAGRAM – R-CH Section – • See page 14 for Waveform. • See page 14 for IC Block Diagrams.

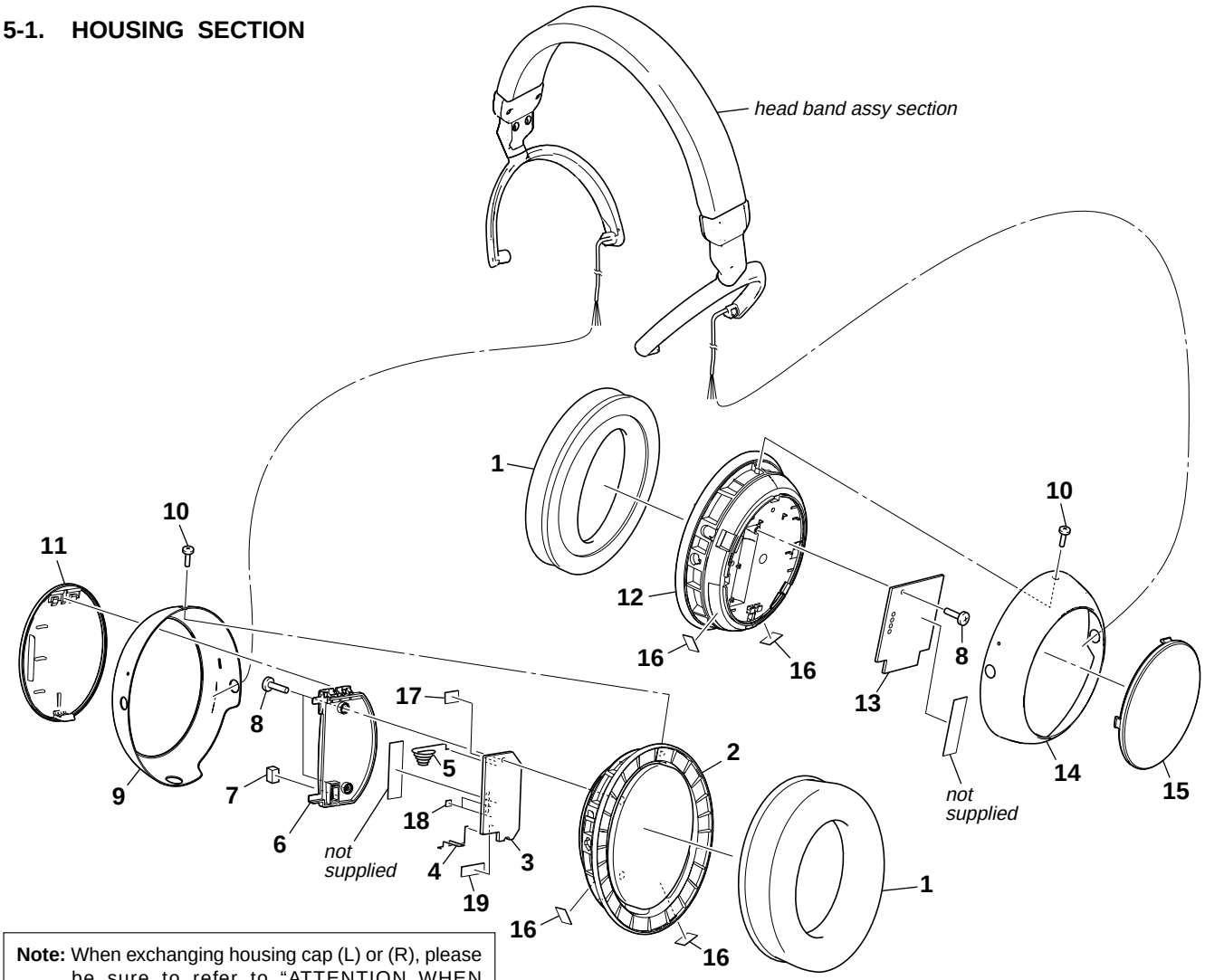


SECTION 5
EXPLODED VIEWS

NOTE:

- -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
- 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 are given in the last of the electrical parts list.

5-1. HOUSING SECTION

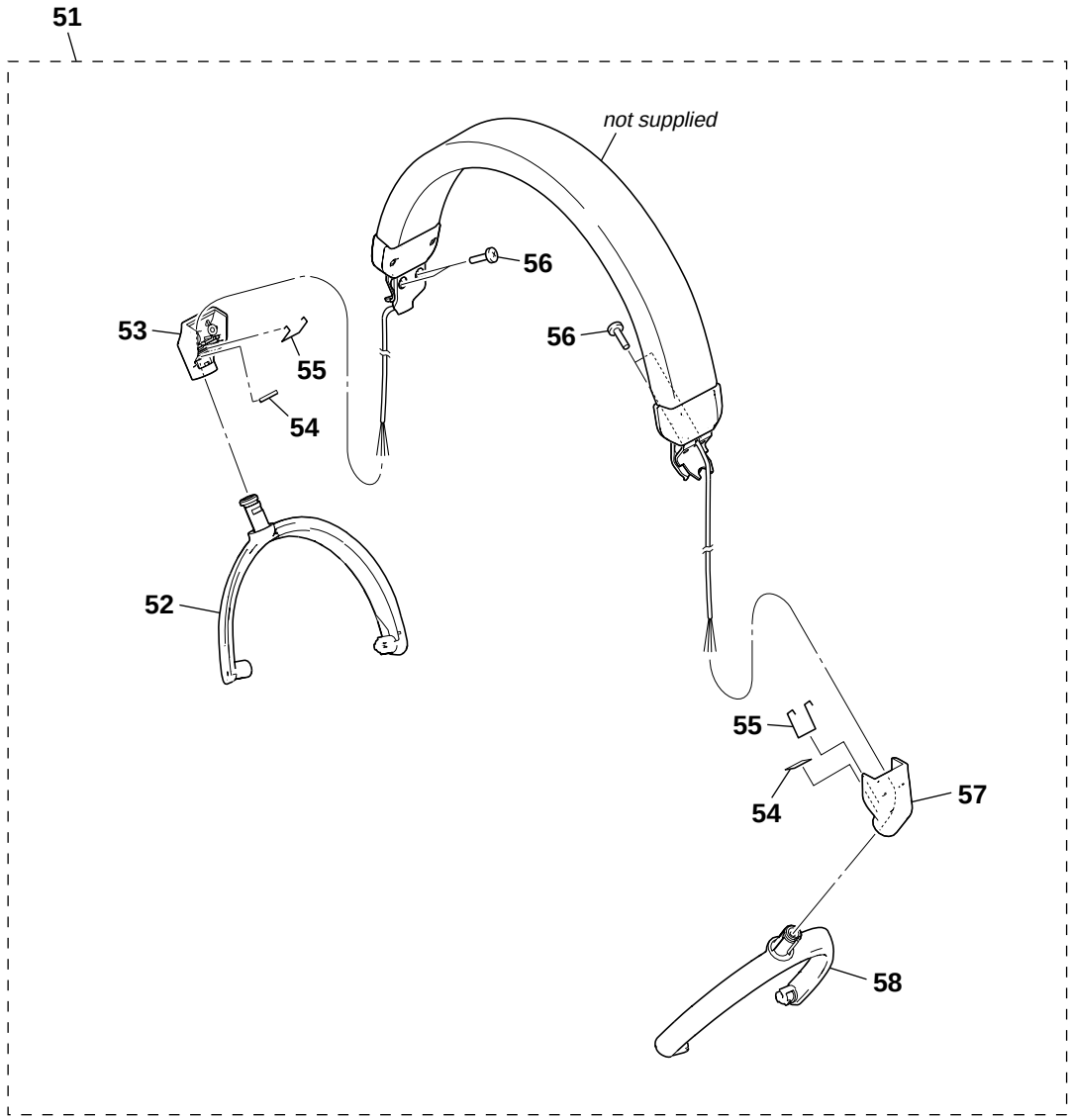


Note: When exchanging housing cap (L) or (R), please be sure to refer to "ATTENTION WHEN EXCHANGING HOUSING CAP (L)/(R)" (page 7).

Ref. No.	Part No.	Description	Remark
1	2-319-787-02	PAD, EAR	
2	X-2178-117-1	FRONT PLATE (R) ASSY (including MIC101, MIC102, SP101)	
3	A-1246-884-A	MR BOARD, COMPLETE	
4	2-898-399-01	TERMINAL (+), BATTERY	
5	2-898-400-01	TERMINAL (–), BATTERY	
6	2-898-423-02	COVER (R), PC BOARD	
7	2-898-430-11	CUSHION, OPEN	
8	3-254-070-11	SCREW	
9	2-898-390-01	CAP (R), HOUSING (US) (Type A)	
9	2-898-390-11	CAP (R), HOUSING (EXCEPT US) (Type A)	
9	2-898-390-21	CAP (R), HOUSING (US) (Type B)	
9	2-898-390-31	CAP (R), HOUSING (EXCEPT US) (Type B)	
10	3-254-135-01	SCREW (B1.4)	

Ref. No.	Part No.	Description	Remark
11	X-2178-118-1	BATTERY LID ASSY	
12	X-2178-116-1	FRONT PLATE (L) ASSY (including MIC1, MIC2, SP1)	
13	A-1246-882-A	ML BOARD, COMPLETE	
14	2-898-389-01	CAP (L), HOUSING (US) (Type A)	
14	2-898-389-11	CAP (L), HOUSING (EXCEPT US) (Type A)	
14	2-898-389-21	CAP (L), HOUSING (US) (Type B)	
14	2-898-389-31	CAP (L), HOUSING (EXCEPT US) (Type B)	
15	X-2178-129-1	ORNAMENT CAP (L) ASSY	
16	3-099-752-01	SHEET, CAP HOUSING ADHESIVE	
17	3-242-558-11	SPACER (LINE IN)	
18	2-680-917-01	SHEET (REC SW)	
19	2-662-254-01	SPACER (HP JACK)	

5-2. HEAD BAND ASSY SECTION



Ref. No.	Part No.	Description	Remark
51	A-1246-889-A	HEAD BAND ASSY (EXCEPT AEP)	
51	A-1246-890-A	HEAD BAND ASSY (AEP)	
52	2-898-414-01	HANGER (R)	
53	2-898-412-11	STOPPER, HANGER (R)	
54	2-319-788-01	PLATE, SWIVEL	
55	2-898-392-01	SPRING, SWIVEL	
56	3-254-070-11	SCREW	
57	2-898-412-01	STOPPER, HANGER (L)	
58	2-898-413-01	HANGER (L)	

SECTION 6
ELECTRICAL PARTS LIST

ML

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.
- 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
- COILS
  uH: µH
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA... : µA... uPA... : µPA...
  uPB... : µPB... uPC... : µPC...
  uPD... : µPD...

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

Ref. No.	Part No.	Description			Remark
	A-1246-882-A	ML BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C4	1-128-630-91	CERAMIC CHIP	0.0047uF	10%	6.3V
C5	1-128-630-91	CERAMIC CHIP	0.0047uF	10%	6.3V
C7	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C8	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C11	1-119-923-11	CERAMIC CHIP	0.047uF	10%	10V
C12	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
C13	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C14	1-117-919-11	TANTALUM CHIP	10uF	20%	6.3V
C15	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C16	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C17	1-100-965-91	CERAMIC CHIP	0.047uF	10%	6.3V
C18	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C19	1-100-965-91	CERAMIC CHIP	0.047uF	10%	6.3V
C20	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C21	1-112-560-91	CERAMIC CHIP	0.022uF	10%	6.3V
C22	1-128-630-91	CERAMIC CHIP	0.0047uF	10%	6.3V
C24	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C25	1-114-342-91	CERAMIC CHIP	0.033uF	10%	6.3V
C26	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C27	1-114-342-91	CERAMIC CHIP	0.033uF	10%	6.3V
C28	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C29	1-100-965-91	CERAMIC CHIP	0.047uF	10%	6.3V
C30	1-128-628-91	CERAMIC CHIP	0.0022uF	10%	6.3V
C31	1-100-742-91	CERAMIC CHIP	2.2uF	20%	10V
C33	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C35	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C36	1-112-560-91	CERAMIC CHIP	0.022uF	10%	6.3V
C37	1-100-742-91	CERAMIC CHIP	2.2uF	20%	10V
C38	1-117-919-11	TANTALUM CHIP	10uF	20%	6.3V
C39	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C40	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C41	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C42	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C43	1-114-169-21	TANTALUM CHIP	220uF	20%	4V
C44	1-114-169-21	TANTALUM CHIP	220uF	20%	4V
C45	1-127-772-81	CERAMIC CHIP	0.033uF	10%	10V
C46	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C48	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C55	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C56	1-114-169-21	TANTALUM CHIP	220uF	20%	4V
C57	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C58	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
C59	1-128-611-11	CERAMIC CHIP	33PF	5%	25V
C61	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C63	1-100-786-91	TANTALUM CHIP	22uF	20%	6.3V
C73	1-100-415-91	CERAMIC CHIP	0.47uF	10%	6.3V
C74	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
		< DIODE >			
D1	8-719-069-28	DIODE 1SS400TE-61			
D2	8-719-069-28	DIODE 1SS400TE-61			
D41	8-719-069-28	DIODE 1SS400TE-61			
D42	8-719-069-28	DIODE 1SS400TE-61			
		< IC >			
IC1	6-711-054-01	IC TK70520SCL-G			
IC2	6-706-906-01	IC NJM2732RB1 (TE2)			
IC3	6-706-906-01	IC NJM2732RB1 (TE2)			
IC4	6-706-906-01	IC NJM2732RB1 (TE2)			
IC5	6-707-207-01	IC SN74LVC1G3157DCKR			
IC6	6-707-110-01	IC LM4916LDX/NOPB			
IC52	6-711-055-01	IC LTC3526BEDC#TR			
		< JUMPER RESISTOR >			
JW1	1-216-864-11	SHORT CHIP	0		
JW2	1-218-990-81	SHORT CHIP	0		
JW3	1-216-864-11	SHORT CHIP	0		
		< COIL >			
L51	1-457-250-11	COIL, CHOKE	4.7uH		
L52	1-481-255-21	INDUCTOR	2.2uH		
		< TRANSISTOR >			
Q1	8-729-043-90	TRANSISTOR	IMX9T110		
Q2	8-729-043-90	TRANSISTOR	IMX9T110		
Q3	6-550-746-01	FET	3LN01S-K-TL-E		
		< RESISTOR >			
R1	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R3	1-694-535-91	SHORT CHIP	0		
R4	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R9	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R10	1-218-961-11	RES-CHIP	4.7K	5%	1/16W

ML **MR**

Ref. No.	Part No.	Description			Remark
R11	1-240-711-91	METAL CHIP	22K	5%	1/20W
R12	1-240-714-91	METAL CHIP	47K	5%	1/20W
R13	1-240-714-91	METAL CHIP	47K	5%	1/20W
R14	1-240-676-91	METAL CHIP	22	5%	1/20W
R15	1-240-672-11	METAL CHIP	10	5%	1/20W
R16	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R17	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R18	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R19	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R21	1-240-675-91	METAL CHIP	18	5%	1/20W
R22	1-240-724-91	METAL CHIP	330K	5%	1/20W
R23	1-240-707-91	METAL CHIP	10K	5%	1/20W
R24	1-240-718-91	METAL CHIP	100K	5%	1/20W
R25	1-240-707-91	METAL CHIP	10K	5%	1/20W
R26	1-240-813-91	METAL CHIP	16K	0.5%	1/20W
R27	1-240-701-91	METAL CHIP	3.3K	5%	1/20W
R28	1-240-813-91	METAL CHIP	16K	0.5%	1/20W
R29	1-240-711-91	METAL CHIP	22K	5%	1/20W
R30	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R31	1-240-718-91	METAL CHIP	100K	5%	1/20W
R32	1-240-697-91	METAL CHIP	1.5K	5%	1/20W
R33	1-240-694-91	METAL CHIP	820	5%	1/20W
R34	1-240-778-91	METAL CHIP	560	0.5%	1/20W
R35	1-240-707-91	METAL CHIP	10K	5%	1/20W
R36	1-240-714-91	METAL CHIP	47K	5%	1/20W
R37	1-240-707-91	METAL CHIP	10K	5%	1/20W
R38	1-240-715-91	METAL CHIP	56K	5%	1/20W
R39	1-694-535-91	SHORT CHIP	0		
R40	1-218-990-81	SHORT CHIP	0		
R41	1-240-726-91	METAL CHIP	470K	5%	1/20W
R42	1-240-718-91	METAL CHIP	100K	5%	1/20W
R43	1-240-699-91	METAL CHIP	2.2K	5%	1/20W
R44	1-240-714-91	METAL CHIP	47K	5%	1/20W
R45	1-240-714-91	METAL CHIP	47K	5%	1/20W
R46	1-240-711-91	METAL CHIP	22K	5%	1/20W
R47	1-240-711-91	METAL CHIP	22K	5%	1/20W
R48	1-240-711-91	METAL CHIP	22K	5%	1/20W
R49	1-245-645-91	METAL CHIP	4.7	5%	1/20W
R50	1-245-645-91	METAL CHIP	4.7	5%	1/20W
R54	1-240-729-91	METAL CHIP	1M	5%	1/20W
R55	1-240-729-91	METAL CHIP	1M	5%	1/20W
R56	1-694-535-91	SHORT CHIP	0		
R57	1-694-535-91	SHORT CHIP	0		
R58	1-694-535-91	SHORT CHIP	0		
R59	1-694-535-91	SHORT CHIP	0		
R60	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R61	1-240-707-91	METAL CHIP	10K	5%	1/20W
R62	1-240-722-91	METAL CHIP	220K	5%	1/20W
R63	1-220-803-81	RES-CHIP	4.7	5%	1/16W
R64	1-220-803-81	RES-CHIP	4.7	5%	1/16W
R65	1-216-864-11	SHORT CHIP	0		
R68	1-240-724-91	METAL CHIP	330K	5%	1/20W
R69	1-240-707-91	METAL CHIP	10K	5%	1/20W
R72	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R73	1-240-705-91	METAL CHIP	6.8K	5%	1/20W
R74	1-240-699-91	METAL CHIP	2.2K	5%	1/20W
R75	1-240-699-91	METAL CHIP	2.2K	5%	1/20W

Ref. No.	Part No.	Description			Remark
		< VARIABLE RESISTOR >			
RV1	1-227-411-21	RES, ADJ, CERMET 22K			
RV2	1-227-411-21	RES, ADJ, CERMET 22K			
**********					
	A-1246-884-A	MR BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C104	1-128-630-91	CERAMIC CHIP	0.0047uF	10%	6.3V
C105	1-128-630-91	CERAMIC CHIP	0.0047uF	10%	6.3V
C107	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C108	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C111	1-119-923-11	CERAMIC CHIP	0.047uF	10%	10V
C112	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
C113	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C114	1-117-919-11	TANTALUM CHIP	10uF	20%	6.3V
C115	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C116	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C117	1-100-965-91	CERAMIC CHIP	0.047uF	10%	6.3V
C118	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C119	1-100-965-91	CERAMIC CHIP	0.047uF	10%	6.3V
C120	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C121	1-112-560-91	CERAMIC CHIP	0.022uF	10%	6.3V
C122	1-128-630-91	CERAMIC CHIP	0.0047uF	10%	6.3V
C124	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C125	1-114-342-91	CERAMIC CHIP	0.033uF	10%	6.3V
C126	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C127	1-114-342-91	CERAMIC CHIP	0.033uF	10%	6.3V
C128	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C129	1-100-965-91	CERAMIC CHIP	0.047uF	10%	6.3V
C130	1-128-628-91	CERAMIC CHIP	0.0022uF	10%	6.3V
C131	1-100-742-91	CERAMIC CHIP	2.2uF	20%	10V
C133	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C135	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C136	1-112-560-91	CERAMIC CHIP	0.022uF	10%	6.3V
C137	1-100-742-91	CERAMIC CHIP	2.2uF	20%	10V
C138	1-117-919-11	TANTALUM CHIP	10uF	20%	6.3V
C139	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C140	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C141	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C142	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C143	1-114-169-21	TANTALUM CHIP	220uF	20%	4V
C144	1-114-169-21	TANTALUM CHIP	220uF	20%	4V
C145	1-127-772-81	CERAMIC CHIP	0.033uF	10%	10V
C146	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C148	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C152	1-117-919-11	TANTALUM CHIP	10uF	20%	6.3V
C153	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C155	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C156	1-114-169-21	TANTALUM CHIP	220uF	20%	4V
C157	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C158	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
C159	1-128-611-11	CERAMIC CHIP	33PF	5%	25V
C161	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C163	1-100-786-91	TANTALUM CHIP	22uF	20%	6.3V
C165	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V

Ref. No.	Part No.	Description			Remark
C173	1-100-415-91	CERAMIC CHIP	0.47uF	10%	6.3V
C174	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C201	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C202	1-128-628-91	CERAMIC CHIP	0.0022uF	10%	6.3V
C203	1-128-628-91	CERAMIC CHIP	0.0022uF	10%	6.3V
C204	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
		< DIODE >			
D101	8-719-069-28	DIODE 1SS400TE-61			
D102	8-719-069-28	DIODE 1SS400TE-61			
D141	8-719-069-28	DIODE 1SS400TE-61			
D142	8-719-069-28	DIODE 1SS400TE-61			
		< IC >			
IC101	6-711-054-01	IC TK70520SCL-G			
IC102	6-706-906-01	IC NJM2732RB1 (TE2)			
IC103	6-706-906-01	IC NJM2732RB1 (TE2)			
IC104	6-706-906-01	IC NJM2732RB1 (TE2)			
IC105	6-707-207-01	IC SN74LVC1G3157DCKR			
IC106	6-707-110-01	IC LM4916LDX/NOPB			
IC151	8-759-690-96	IC XC61CN1002NR			
IC152	6-711-055-01	IC LTC3526BEDC#TR			
		< JUMPER RESISTOR >			
JW101	1-216-864-11	SHORT CHIP	0		
JW102	1-218-990-81	SHORT CHIP	0		
JW103	1-216-864-11	SHORT CHIP	0		
		< COIL >			
L151	1-457-250-11	COIL, CHOKE	4.7uH		
L152	1-481-255-21	INDUCTOR	2.2uH		
		< TRANSISTOR >			
Q101	8-729-043-90	TRANSISTOR	IMX9T110		
Q102	8-729-043-90	TRANSISTOR	IMX9T110		
Q103	6-550-746-01	FET	3LN01S-K-TL-E		
Q151	6-550-363-01	TRANSISTOR	2SB1690KT146		
Q152	8-729-901-81	TRANSISTOR	2SC2412K-T-146-R		
Q201	8-729-050-11	TRANSISTOR	UMW1NTR		
Q202	8-729-055-39	TRANSISTOR	UMA4N-TR		
		< RESISTOR >			
R101	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R103	1-694-535-91	SHORT CHIP	0		
R104	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R109	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R110	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R111	1-240-711-91	METAL CHIP	22K	5%	1/20W
R112	1-240-714-91	METAL CHIP	47K	5%	1/20W
R113	1-240-714-91	METAL CHIP	47K	5%	1/20W
R114	1-240-676-91	METAL CHIP	22	5%	1/20W
R115	1-240-672-11	METAL CHIP	10	5%	1/20W
R116	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R117	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R118	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R119	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R121	1-240-675-91	METAL CHIP	18	5%	1/20W

Ref. No.	Part No.	Description			Remark
R122	1-240-724-91	METAL CHIP	330K	5%	1/20W
R123	1-240-707-91	METAL CHIP	10K	5%	1/20W
R124	1-240-718-91	METAL CHIP	100K	5%	1/20W
R125	1-240-707-91	METAL CHIP	10K	5%	1/20W
R126	1-240-813-91	METAL CHIP	16K	0.5%	1/20W
R127	1-240-701-91	METAL CHIP	3.3K	5%	1/20W
R128	1-240-813-91	METAL CHIP	16K	0.5%	1/20W
R129	1-240-711-91	METAL CHIP	22K	5%	1/20W
R130	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R131	1-240-718-91	METAL CHIP	100K	5%	1/20W
R132	1-240-697-91	METAL CHIP	1.5K	5%	1/20W
R133	1-240-694-91	METAL CHIP	820	5%	1/20W
R134	1-240-778-91	METAL CHIP	560	0.5%	1/20W
R135	1-240-707-91	METAL CHIP	10K	5%	1/20W
R136	1-240-714-91	METAL CHIP	47K	5%	1/20W
R137	1-240-707-91	METAL CHIP	10K	5%	1/20W
R138	1-240-715-91	METAL CHIP	56K	5%	1/20W
R139	1-694-535-91	SHORT CHIP	0		
R140	1-218-990-81	SHORT CHIP	0		
R141	1-240-726-91	METAL CHIP	470K	5%	1/20W
R142	1-240-718-91	METAL CHIP	100K	5%	1/20W
R143	1-240-699-91	METAL CHIP	2.2K	5%	1/20W
R144	1-240-714-91	METAL CHIP	47K	5%	1/20W
R145	1-240-714-91	METAL CHIP	47K	5%	1/20W
R146	1-240-711-91	METAL CHIP	22K	5%	1/20W
R147	1-240-711-91	METAL CHIP	22K	5%	1/20W
R148	1-240-711-91	METAL CHIP	22K	5%	1/20W
R149	1-245-645-91	METAL CHIP	4.7	5%	1/20W
R150	1-245-645-91	METAL CHIP	4.7	5%	1/20W
R151	1-240-718-91	METAL CHIP	100K	5%	1/20W
R152	1-240-707-91	METAL CHIP	10K	5%	1/20W
R153	1-240-687-91	METAL CHIP	220	5%	1/20W
R154	1-240-729-91	METAL CHIP	1M	5%	1/20W
R155	1-240-729-91	METAL CHIP	1M	5%	1/20W
R156	1-694-535-91	SHORT CHIP	0		
R157	1-694-535-91	SHORT CHIP	0		
R158	1-694-535-91	SHORT CHIP	0		
R159	1-694-535-91	SHORT CHIP	0		
R160	1-240-707-91	METAL CHIP	10K	5%	1/20W
R161	1-240-707-91	METAL CHIP	10K	5%	1/20W
R162	1-240-722-91	METAL CHIP	220K	5%	1/20W
R163	1-220-803-81	RES-CHIP	4.7	5%	1/16W
R164	1-220-803-81	RES-CHIP	4.7	5%	1/16W
R165	1-216-864-11	SHORT CHIP	0		
R168	1-240-724-91	METAL CHIP	330K	5%	1/20W
R169	1-240-707-91	METAL CHIP	10K	5%	1/20W
R172	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R173	1-240-705-91	METAL CHIP	6.8K	5%	1/20W
R174	1-240-699-91	METAL CHIP	2.2K	5%	1/20W
R175	1-240-699-91	METAL CHIP	2.2K	5%	1/20W
R201	1-240-676-91	METAL CHIP	22	5%	1/20W
R202	1-240-707-91	METAL CHIP	10K	5%	1/20W
R203	1-240-707-91	METAL CHIP	10K	5%	1/20W
R204	1-240-707-91	METAL CHIP	10K	5%	1/20W
R205	1-240-694-91	METAL CHIP	820	5%	1/20W
R206	1-240-703-91	METAL CHIP	4.7K	5%	1/20W

MR

Ref. No.	Part No.	Description	Remark
		< VARIABLE RESISTOR >	
RV101	1-227-411-21	RES, ADJ, CERMET 22K	
RV102	1-227-411-21	RES, ADJ, CERMET 22K	
**********			
		MISCELLANEOUS	
		**********	
2	X-2178-117-1	FRONT PLATE (R) ASSY (including MIC101, MIC102, SP101)	
12	X-2178-116-1	FRONT PLATE (L) ASSY (including MIC1, MIC2, SP1)	
51	A-1246-889-A	HEAD BAND ASSY (EXCEPT AEP)	
51	A-1246-890-A	HEAD BAND ASSY (AEP)	
**********			
		ACCESSORIES	
		**********	
	1-477-125-22	ADAPTOR, PLUG (DUAL) (for in-flight use (single/dual))	
	1-566-410-21	ADAPTOR, PLUG (Gold-plated unimatch plug adaptor (stereo phone plug ⟷ stereo mini jack))	
	1-833-783-12	CORD (WITH PLUG) (0.5m, gold plated stereo mini plug) (Tourist)	
	1-833-784-12	CORD (WITH PLUG) (1.5m, gold plated L type stereo mini plug)	
	3-093-749-01	CASE, CARRYING	
	3-100-028-12	MANUAL, INSTRUCTION (ENGLISH, SPANISH) (US)	
	3-100-028-21	MANUAL, INSTRUCTION (JAPANESE, ENGLISH) (Tourist)	
	3-100-028-31	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH) (Canadian, AEP, E)	
	3-100-028-41	MANUAL, INSTRUCTION (TRADITIONAL CHINESE, SIMPLIFIED CHINESE, KOREAN) (E)	
	3-100-028-51	MANUAL, INSTRUCTION (GERMAN, ITALIAN, PORTUGUESE, RUSSIAN) (AEP)	

MDR-NC60

SONY

SERVICE MANUAL

Ver. 1.1 2007.11

US Model
Canadian Model
AEP Model
E Model
Tourist Model

SUPPLEMENT-1

File this supplement with the service manual.

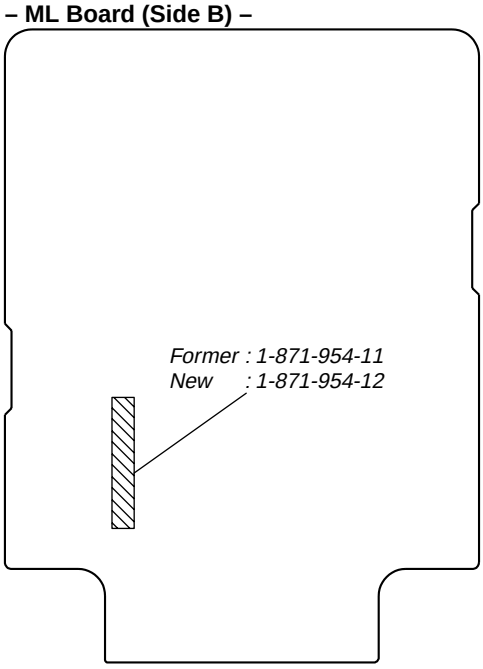
Subject: Change of ML and MR boards (Suffix-12)

In this set, ML and MR boards have been changed in the midway of production.
Printed wiring board, schematic diagrams and electrical parts list of new type are described in this supplement-1.
Refer to original service manual for other information.

Note: The value of AMP gain adjustment is different according to new/former of the ML and MR boards.
Execute the adjustment after confirming which type the ML and MR boards beforehand.
Refer to orginal service manual “SECTION 3 ELECTRICAL ADJUSTMENT” (page 8) for adjustment method.

1. NEW/FORMER DISCRIMINATION

– ML Board (Side B) –



– MR Board (Side B) –

2. DIAGRAMS

- **Note for Printed Wiring Boards and Schematic Diagrams**

Note on Printed Wiring Boards:

- ○——— : parts extracted from the component side.
- ——— : parts extracted from the conductor side.
- ▭ : Pattern from the side which enables seeing.

(The other layer's pattens are not indicated.)

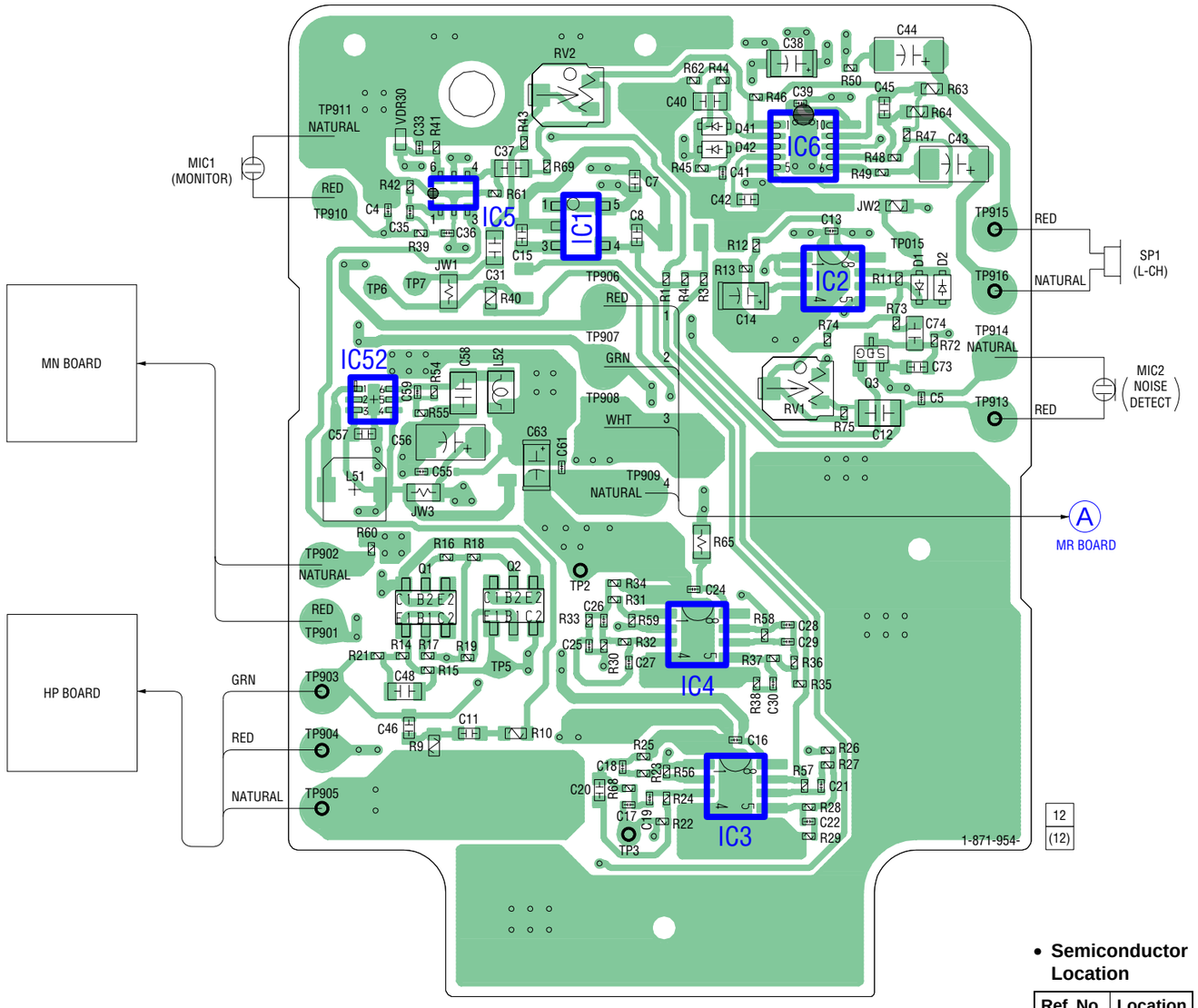
Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

Note on Schematic Diagram:

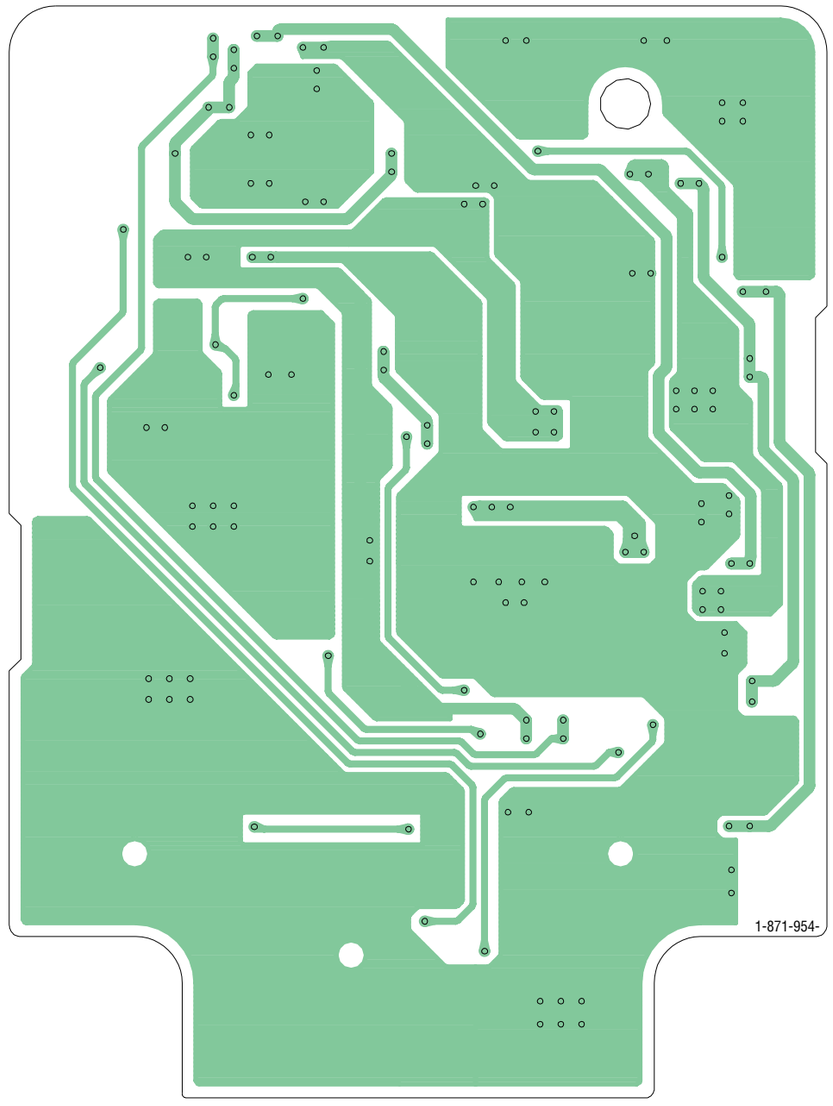
- All capacitors are in µF unless otherwise noted. (p: pF) 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- ▬ : B+ Line.
- ▭ : adjustment for repair.
- Power voltage is dc 1.5 V and fed with regulated dc power supply from battery terminal.
- Voltages is dc with respect to ground under no-signal conditions. no mark : POWER ON
- Voltages are taken with a VOM (Input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveform.
- Signal path.
  - ⇨ : AUDIO (POWER OFF)
  - ⇨ : AUDIO (POWER ON)
  - ▷ : MONITOR

2-1. PRINTED WIRING BOARDS – L-CH Section – : Uses unleaded solder.

【ML BOARD】(SIDE A)



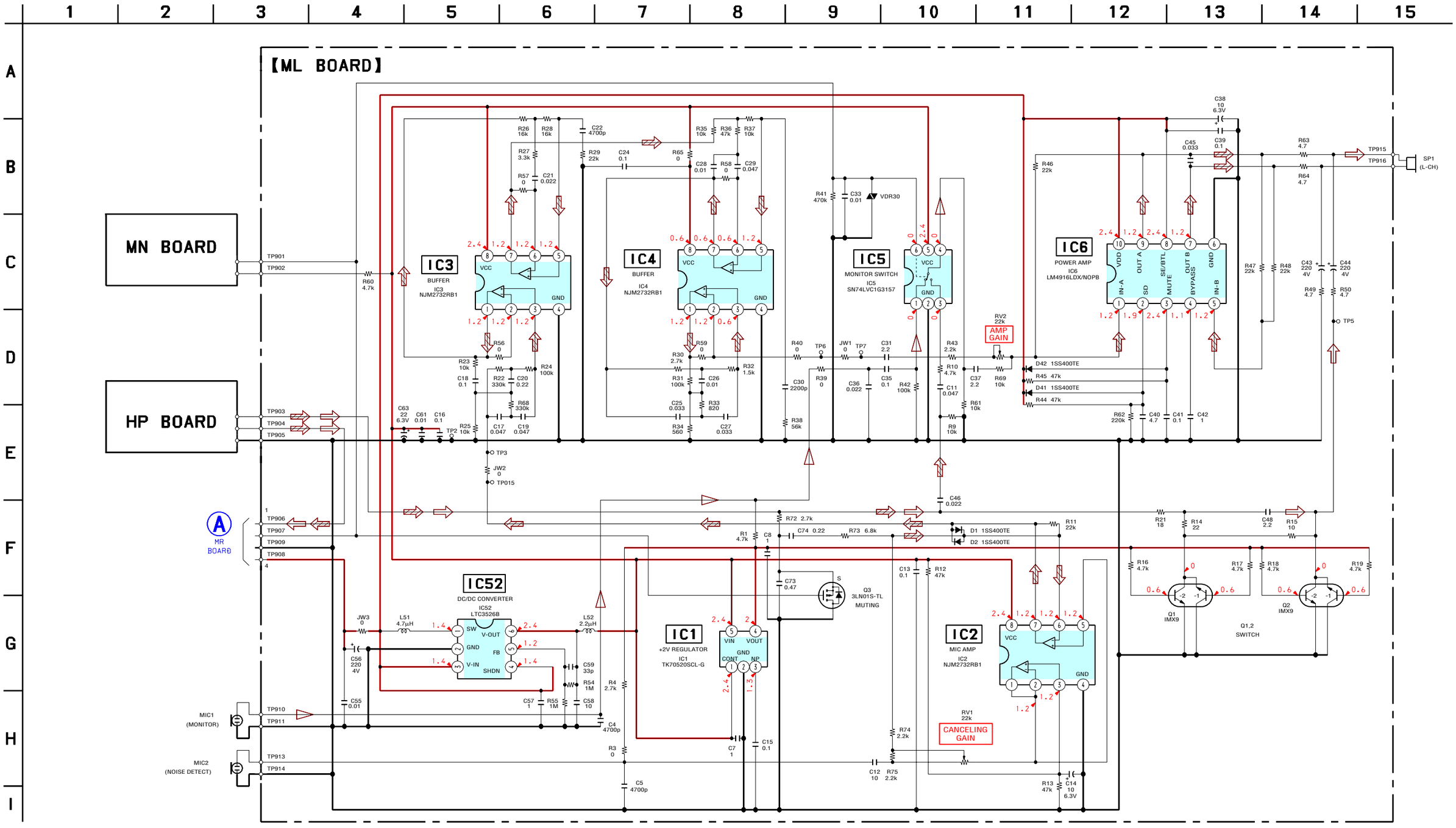
【ML BOARD】(SIDE B)



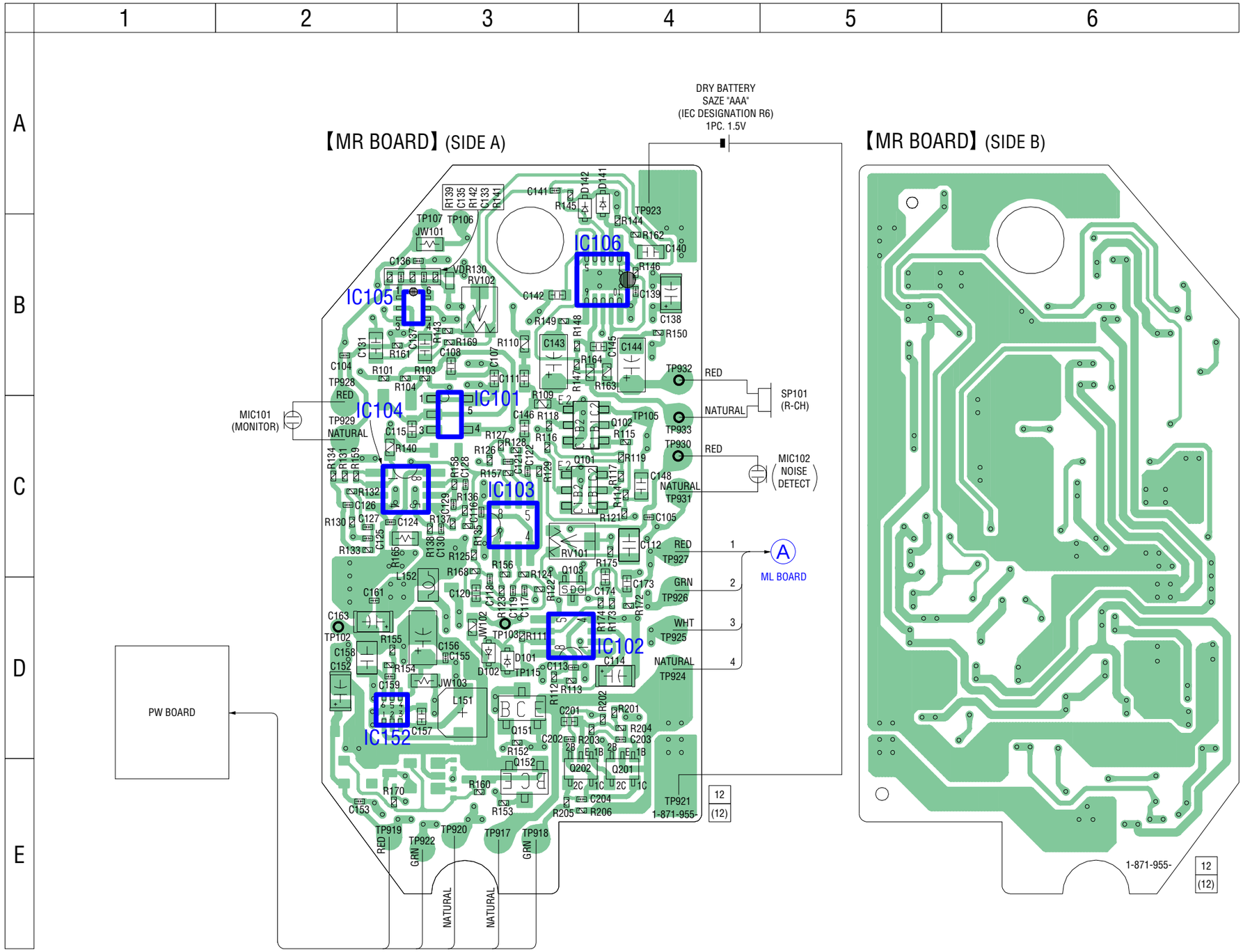
- **Semiconductor Location**

Ref. No.	Location
D1	B-5
D2	B-5
D41	B-4
D42	B-4
IC1	B-3
IC2	B-5
IC3	D-4
IC4	D-4
IC5	B-3
IC6	B-4
IC52	C-3
Q1	D-3
Q2	D-3
Q3	B-5

2-2. SCHEMATIC DIAGRAM – L-CH Section –



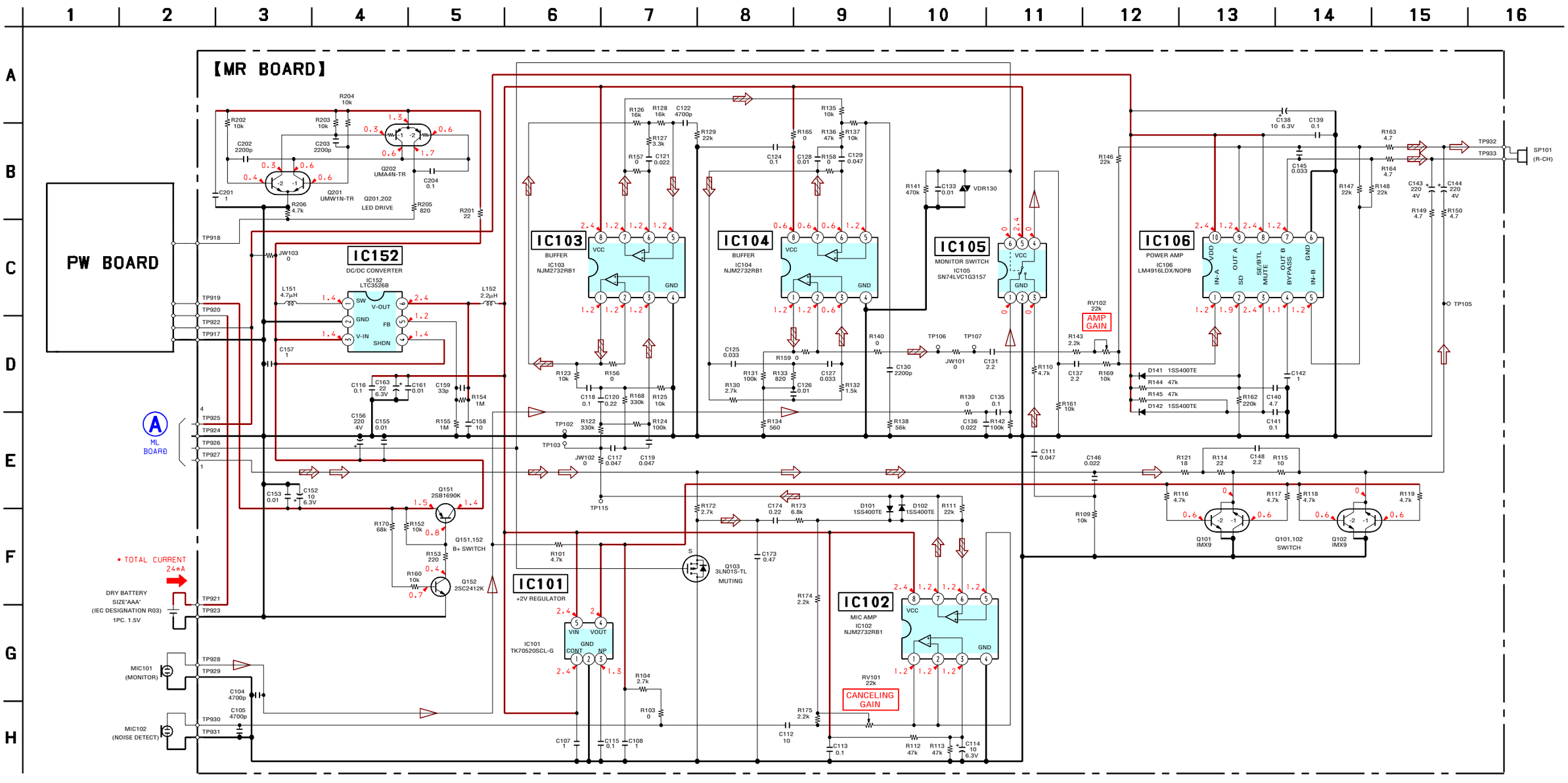
2-3. PRINTED WIRING BOARDS – R-CH Section – : Uses unleaded solder.



- **Semiconductor Location**

Ref. No.	Location
D101	D-3
D102	D-3
D141	A-4
D142	A-4
IC101	C-3
IC102	D-3
IC103	C-3
IC104	C-3
IC105	B-3
IC106	B-4
IC152	D-2
Q101	C-4
Q102	C-4
Q103	D-3
Q151	D-3
Q152	E-3
Q201	E-4
Q202	E-4

2-4. SCHEMATIC DIAGRAM – R-CH Section –



ML

3. ELECTRICAL PARTS LIST

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.
- 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
- COILS
  uH: µH
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA... : µA... uPA... : µPA...
  uPB... : µPB... uPC... : µPC...
  uPD... : µPD...

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

Ref. No.	Part No.	Description			Remark
	A-1246-882-A	ML BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C4	1-128-630-91	CERAMIC CHIP	0.0047uF	10%	6.3V
C5	1-128-630-91	CERAMIC CHIP	0.0047uF	10%	6.3V
C7	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C8	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C11	1-119-923-11	CERAMIC CHIP	0.047uF	10%	10V
C12	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
C13	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C14	1-117-919-11	TANTALUM CHIP	10uF	20%	6.3V
C15	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C16	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C17	1-100-965-91	CERAMIC CHIP	0.047uF	10%	6.3V
C18	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C19	1-100-965-91	CERAMIC CHIP	0.047uF	10%	6.3V
C20	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C21	1-112-560-91	CERAMIC CHIP	0.022uF	10%	6.3V
C22	1-128-630-91	CERAMIC CHIP	0.0047uF	10%	6.3V
C24	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C25	1-114-342-91	CERAMIC CHIP	0.033uF	10%	6.3V
C26	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C27	1-114-342-91	CERAMIC CHIP	0.033uF	10%	6.3V
C28	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C29	1-100-965-91	CERAMIC CHIP	0.047uF	10%	6.3V
C30	1-128-628-91	CERAMIC CHIP	0.0022uF	10%	6.3V
C31	1-100-742-91	CERAMIC CHIP	2.2uF	20%	10V
C33	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C35	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C36	1-112-560-91	CERAMIC CHIP	0.022uF	10%	6.3V
C37	1-100-742-91	CERAMIC CHIP	2.2uF	20%	10V
C38	1-117-919-11	TANTALUM CHIP	10uF	20%	6.3V
C39	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C40	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C41	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C42	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C43	1-114-169-21	TANTALUM CHIP	220uF	20%	4V
C44	1-114-169-21	TANTALUM CHIP	220uF	20%	4V
C45	1-127-772-81	CERAMIC CHIP	0.033uF	10%	10V
C46	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C48	1-165-884-11	CERAMIC CHIP	2.2uF	10%	6.3V
C55	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C56	1-114-169-21	TANTALUM CHIP	220uF	20%	4V
C57	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C58	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
C59	1-128-611-11	CERAMIC CHIP	33PF	5%	25V
C61	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C63	1-100-786-91	TANTALUM CHIP	22uF	20%	6.3V
C73	1-100-415-91	CERAMIC CHIP	0.47uF	10%	6.3V
C74	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
		< DIODE >			
D1	8-719-069-28	DIODE 1SS400TE-61			
D2	8-719-069-28	DIODE 1SS400TE-61			
D41	8-719-069-28	DIODE 1SS400TE-61			
D42	8-719-069-28	DIODE 1SS400TE-61			
		< IC >			
IC1	6-711-054-01	IC TK70520SCL-G			
IC2	6-706-906-01	IC NJM2732RB1 (TE2)			
IC3	6-706-906-01	IC NJM2732RB1 (TE2)			
IC4	6-706-906-01	IC NJM2732RB1 (TE2)			
IC5	6-707-207-01	IC SN74LVC1G3157DCKR			
IC6	6-707-110-01	IC LM4916LDX/NOPB			
IC52	6-711-055-01	IC LTC3526BEDC#TR			
		< JUMPER RESISTOR >			
JW1	1-216-864-11	SHORT CHIP	0		
JW2	1-218-990-81	SHORT CHIP	0		
JW3	1-216-864-11	SHORT CHIP	0		
		< COIL >			
L51	1-457-250-11	COIL, CHOKE	4.7uH		
L52	1-481-255-21	INDUCTOR	2.2uH		
		< TRANSISTOR >			
Q1	8-729-043-90	TRANSISTOR	IMX9T110		
Q2	8-729-043-90	TRANSISTOR	IMX9T110		
Q3	6-550-746-01	FET	3LN01S-K-TL-E		
		< RESISTOR >			
R1	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R3	1-694-535-91	SHORT CHIP	0		
R4	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R9	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R10	1-218-961-11	RES-CHIP	4.7K	5%	1/16W

ML **MR**

Ref. No.	Part No.	Description			Remark
R11	1-240-711-91	METAL CHIP	22K	5%	1/20W
R12	1-240-714-91	METAL CHIP	47K	5%	1/20W
R13	1-240-714-91	METAL CHIP	47K	5%	1/20W
R14	1-240-676-91	METAL CHIP	22	5%	1/20W
R15	1-240-672-11	METAL CHIP	10	5%	1/20W
R16	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R17	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R18	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R19	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R21	1-240-675-91	METAL CHIP	18	5%	1/20W
R22	1-240-724-91	METAL CHIP	330K	5%	1/20W
R23	1-240-707-91	METAL CHIP	10K	5%	1/20W
R24	1-240-718-91	METAL CHIP	100K	5%	1/20W
R25	1-240-707-91	METAL CHIP	10K	5%	1/20W
R26	1-240-813-91	METAL CHIP	16K	0.5%	1/20W
R27	1-240-701-91	METAL CHIP	3.3K	5%	1/20W
R28	1-240-813-91	METAL CHIP	16K	0.5%	1/20W
R29	1-240-711-91	METAL CHIP	22K	5%	1/20W
R30	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R31	1-240-718-91	METAL CHIP	100K	5%	1/20W
R32	1-240-697-91	METAL CHIP	1.5K	5%	1/20W
R33	1-240-694-91	METAL CHIP	820	5%	1/20W
R34	1-240-778-91	METAL CHIP	560	0.5%	1/20W
R35	1-240-707-91	METAL CHIP	10K	5%	1/20W
R36	1-240-714-91	METAL CHIP	47K	5%	1/20W
R37	1-240-707-91	METAL CHIP	10K	5%	1/20W
R38	1-240-715-91	METAL CHIP	56K	5%	1/20W
R39	1-694-535-91	SHORT CHIP	0		
R40	1-218-990-81	SHORT CHIP	0		
R41	1-240-726-91	METAL CHIP	470K	5%	1/20W
R42	1-240-718-91	METAL CHIP	100K	5%	1/20W
R43	1-240-699-91	METAL CHIP	2.2K	5%	1/20W
R44	1-240-714-91	METAL CHIP	47K	5%	1/20W
R45	1-240-714-91	METAL CHIP	47K	5%	1/20W
R46	1-240-711-91	METAL CHIP	22K	5%	1/20W
R47	1-240-711-91	METAL CHIP	22K	5%	1/20W
R48	1-240-711-91	METAL CHIP	22K	5%	1/20W
R49	1-245-645-91	METAL CHIP	4.7	5%	1/20W
R50	1-245-645-91	METAL CHIP	4.7	5%	1/20W
R54	1-240-729-91	METAL CHIP	1M	5%	1/20W
R55	1-240-729-91	METAL CHIP	1M	5%	1/20W
R56	1-694-535-91	SHORT CHIP	0		
R57	1-694-535-91	SHORT CHIP	0		
R58	1-694-535-91	SHORT CHIP	0		
R59	1-694-535-91	SHORT CHIP	0		
R60	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R61	1-240-707-91	METAL CHIP	10K	5%	1/20W
R62	1-240-722-91	METAL CHIP	220K	5%	1/20W
R63	1-220-803-81	RES-CHIP	4.7	5%	1/16W
R64	1-220-803-81	RES-CHIP	4.7	5%	1/16W
R65	1-216-864-11	SHORT CHIP	0		
R68	1-240-724-91	METAL CHIP	330K	5%	1/20W
R69	1-240-707-91	METAL CHIP	10K	5%	1/20W
R72	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R73	1-240-705-91	METAL CHIP	6.8K	5%	1/20W
R74	1-240-699-91	METAL CHIP	2.2K	5%	1/20W
R75	1-240-699-91	METAL CHIP	2.2K	5%	1/20W

Ref. No.	Part No.	Description			Remark
		< VARIABLE RESISTOR >			
RV1	1-227-411-21	RES, ADJ, CERMET 22K			
RV2	1-227-411-21	RES, ADJ, CERMET 22K			
		< VARISTOR >			
VDR30	1-802-081-11	VARISTOR (SMD)			
**********					
	A-1246-884-A	MR BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C104	1-128-630-91	CERAMIC CHIP	0.0047uF	10%	6.3V
C105	1-128-630-91	CERAMIC CHIP	0.0047uF	10%	6.3V
C107	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C108	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C111	1-119-923-11	CERAMIC CHIP	0.047uF	10%	10V
C112	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
C113	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C114	1-117-919-11	TANTALUM CHIP	10uF	20%	6.3V
C115	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C116	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C117	1-100-965-91	CERAMIC CHIP	0.047uF	10%	6.3V
C118	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C119	1-100-965-91	CERAMIC CHIP	0.047uF	10%	6.3V
C120	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C121	1-112-560-91	CERAMIC CHIP	0.022uF	10%	6.3V
C122	1-128-630-91	CERAMIC CHIP	0.0047uF	10%	6.3V
C124	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C125	1-114-342-91	CERAMIC CHIP	0.033uF	10%	6.3V
C126	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C127	1-114-342-91	CERAMIC CHIP	0.033uF	10%	6.3V
C128	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C129	1-100-965-91	CERAMIC CHIP	0.047uF	10%	6.3V
C130	1-128-628-91	CERAMIC CHIP	0.0022uF	10%	6.3V
C131	1-100-742-91	CERAMIC CHIP	2.2uF	20%	10V
C133	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C135	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C136	1-112-560-91	CERAMIC CHIP	0.022uF	10%	6.3V
C137	1-100-742-91	CERAMIC CHIP	2.2uF	20%	10V
C138	1-117-919-11	TANTALUM CHIP	10uF	20%	6.3V
C139	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C140	1-100-507-91	CERAMIC CHIP	4.7uF	20%	6.3V
C141	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
C142	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C143	1-114-169-21	TANTALUM CHIP	220uF	20%	4V
C144	1-114-169-21	TANTALUM CHIP	220uF	20%	4V
C145	1-127-772-81	CERAMIC CHIP	0.033uF	10%	10V
C146	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C148	1-165-884-11	CERAMIC CHIP	2.2uF	10%	6.3V
C152	1-117-919-11	TANTALUM CHIP	10uF	20%	6.3V
C153	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C155	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C156	1-114-169-21	TANTALUM CHIP	220uF	20%	4V
C157	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C158	1-165-989-11	CERAMIC CHIP	10uF	10%	6.3V
C159	1-128-611-11	CERAMIC CHIP	33PF	5%	25V

Ref. No.	Part No.	Description			Remark
C161	1-128-632-91	CERAMIC CHIP	0.01uF	10%	6.3V
C163	1-100-786-91	TANTALUM CHIP	22uF	20%	6.3V
C173	1-100-415-91	CERAMIC CHIP	0.47uF	10%	6.3V
C174	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C201	1-100-506-91	CERAMIC CHIP	1uF	20%	6.3V
C202	1-128-628-91	CERAMIC CHIP	0.0022uF	10%	6.3V
C203	1-128-628-91	CERAMIC CHIP	0.0022uF	10%	6.3V
C204	1-100-504-91	CERAMIC CHIP	0.1uF	20%	6.3V
		< DIODE >			
D101	8-719-069-28	DIODE 1SS400TE-61			
D102	8-719-069-28	DIODE 1SS400TE-61			
D141	8-719-069-28	DIODE 1SS400TE-61			
D142	8-719-069-28	DIODE 1SS400TE-61			
		< IC >			
IC101	6-711-054-01	IC TK70520SCL-G			
IC102	6-706-906-01	IC NJM2732RB1 (TE2)			
IC103	6-706-906-01	IC NJM2732RB1 (TE2)			
IC104	6-706-906-01	IC NJM2732RB1 (TE2)			
IC105	6-707-207-01	IC SN74LVC1G3157DCKR			
IC106	6-707-110-01	IC LM4916LDX/NOPB			
IC152	6-711-055-01	IC LTC3526BEDC#TR			
		< JUMPER RESISTOR >			
JW101	1-216-864-11	SHORT CHIP	0		
JW102	1-218-990-81	SHORT CHIP	0		
JW103	1-216-864-11	SHORT CHIP	0		
		< COIL >			
L151	1-457-250-11	COIL, CHOKE	4.7uH		
L152	1-481-255-21	INDUCTOR	2.2uH		
		< TRANSISTOR >			
Q101	8-729-043-90	TRANSISTOR	IMX9T110		
Q102	8-729-043-90	TRANSISTOR	IMX9T110		
Q103	6-550-746-01	FET	3LN01S-K-TL-E		
Q151	6-550-363-01	TRANSISTOR	2SB1690KT146		
Q152	8-729-901-81	TRANSISTOR	2SC2412K-T-146-R		
Q201	8-729-050-11	TRANSISTOR	UMW1NTR		
Q202	8-729-055-39	TRANSISTOR	UMA4N-TR		
		< RESISTOR >			
R101	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R103	1-694-535-91	SHORT CHIP	0		
R104	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R109	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R110	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R111	1-240-711-91	METAL CHIP	22K	5%	1/20W
R112	1-240-714-91	METAL CHIP	47K	5%	1/20W
R113	1-240-714-91	METAL CHIP	47K	5%	1/20W
R114	1-240-676-91	METAL CHIP	22	5%	1/20W
R115	1-240-672-11	METAL CHIP	10	5%	1/20W
R116	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R117	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R118	1-240-703-91	METAL CHIP	4.7K	5%	1/20W
R119	1-240-703-91	METAL CHIP	4.7K	5%	1/20W

Ref. No.	Part No.	Description			Remark
R121	1-240-675-91	METAL CHIP	18	5%	1/20W
R122	1-240-724-91	METAL CHIP	330K	5%	1/20W
R123	1-240-707-91	METAL CHIP	10K	5%	1/20W
R124	1-240-718-91	METAL CHIP	100K	5%	1/20W
R125	1-240-707-91	METAL CHIP	10K	5%	1/20W
R126	1-240-813-91	METAL CHIP	16K	0.5%	1/20W
R127	1-240-701-91	METAL CHIP	3.3K	5%	1/20W
R128	1-240-813-91	METAL CHIP	16K	0.5%	1/20W
R129	1-240-711-91	METAL CHIP	22K	5%	1/20W
R130	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R131	1-240-718-91	METAL CHIP	100K	5%	1/20W
R132	1-240-697-91	METAL CHIP	1.5K	5%	1/20W
R133	1-240-694-91	METAL CHIP	820	5%	1/20W
R134	1-240-778-91	METAL CHIP	560	0.5%	1/20W
R135	1-240-707-91	METAL CHIP	10K	5%	1/20W
R136	1-240-714-91	METAL CHIP	47K	5%	1/20W
R137	1-240-707-91	METAL CHIP	10K	5%	1/20W
R138	1-240-715-91	METAL CHIP	56K	5%	1/20W
R139	1-694-535-91	SHORT CHIP	0		
R140	1-218-990-81	SHORT CHIP	0		
R141	1-240-726-91	METAL CHIP	470K	5%	1/20W
R142	1-240-718-91	METAL CHIP	100K	5%	1/20W
R143	1-240-699-91	METAL CHIP	2.2K	5%	1/20W
R144	1-240-714-91	METAL CHIP	47K	5%	1/20W
R145	1-240-714-91	METAL CHIP	47K	5%	1/20W
R146	1-240-711-91	METAL CHIP	22K	5%	1/20W
R147	1-240-711-91	METAL CHIP	22K	5%	1/20W
R148	1-240-711-91	METAL CHIP	22K	5%	1/20W
R149	1-245-645-91	METAL CHIP	4.7	5%	1/20W
R150	1-245-645-91	METAL CHIP	4.7	5%	1/20W
R152	1-240-707-91	METAL CHIP	10K	5%	1/20W
R153	1-240-687-91	METAL CHIP	220	5%	1/20W
R154	1-240-729-91	METAL CHIP	1M	5%	1/20W
R155	1-240-729-91	METAL CHIP	1M	5%	1/20W
R156	1-694-535-91	SHORT CHIP	0		
R157	1-694-535-91	SHORT CHIP	0		
R158	1-694-535-91	SHORT CHIP	0		
R159	1-694-535-91	SHORT CHIP	0		
R160	1-240-707-91	METAL CHIP	10K	5%	1/20W
R161	1-240-707-91	METAL CHIP	10K	5%	1/20W
R162	1-240-722-91	METAL CHIP	220K	5%	1/20W
R163	1-220-803-81	RES-CHIP	4.7	5%	1/16W
R164	1-220-803-81	RES-CHIP	4.7	5%	1/16W
R165	1-216-864-11	SHORT CHIP	0		
R168	1-240-724-91	METAL CHIP	330K	5%	1/20W
R169	1-240-707-91	METAL CHIP	10K	5%	1/20W
R170	1-240-718-91	METAL CHIP	100K	5%	1/20W
R172	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R173	1-240-705-91	METAL CHIP	6.8K	5%	1/20W
R174	1-240-699-91	METAL CHIP	2.2K	5%	1/20W
R175	1-240-699-91	METAL CHIP	2.2K	5%	1/20W
R201	1-240-676-91	METAL CHIP	22	5%	1/20W
R202	1-240-707-91	METAL CHIP	10K	5%	1/20W
R203	1-240-707-91	METAL CHIP	10K	5%	1/20W
R204	1-240-707-91	METAL CHIP	10K	5%	1/20W
R205	1-240-694-91	METAL CHIP	820	5%	1/20W
R206	1-240-703-91	METAL CHIP	4.7K	5%	1/20W

MR

Ref. No.	Part No.	Description	Remark
		< VARIABLE RESISTOR >	
RV101	1-227-411-21	RES, ADJ, CERMET 22K	
RV102	1-227-411-21	RES, ADJ, CERMET 22K	
		< VARISTOR >	
VDR130	1-802-081-11	VARISTOR (SMD)	

MEMO

REVISION HISTORY

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Also, clicking the version at the top of the revised page allows you to jump to the next revised page.

Ver.	Date	Description of Revision
1.0	2007.03	New
1.1	2007.11	Change of adjustment value for RV2 and RV102 according to ML and MR boards changes Addition of “ATTENTION WHEN EXCHANGING HOUSING CAP (L)/(R)” on DISASSEMBLY Addition of Ref. No. 19 on EXPLODED VIEWS Change of ML and MR boards (Suffix-12) (SUPPLEMENT-1) (ECN-ECC20609/ECC21163/ENG-07010/SPM-07103)