

# MDR-NC22

## SERVICE MANUAL

Ver. 1.2 2007.02

US Model  
Canadian Model  
AEP Model  
E Model  
Tourist Model



### SPECIFICATIONS

#### General

Type	dynamic, closed
Driver units	13.5 mm, dome type (CCAW adopted)
Power handling capacity	50 mW
Impedance	20 $\Omega$ at 1 kHz (when the power is on) 8.5 $\Omega$ 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	8 – 22,000 Hz
Frequency range of active noise attenuation	50 – 1,500 Hz more than 12 dB at 200 Hz
Cord	1.5 m (59 1/8 in) OFC litz cord, neck-chain (including battery box)
Plug	Gold-plated L type stereo mini plug
Power source	DC 1.5 V, 1 $\times$ R03 (size AAA) battery
Mass	Approx. 39 g (1.4 oz) including battery box, cord, and battery

#### Supplied accessories

Sony R03 (size AAA) battery (1) (US, Tourist models)  
Earbuds (S  $\times$  2, M  $\times$  2, L  $\times$  2)  
Carrying pouch (1)  
Plug adaptor for in-flight use\* (single/dual) (1)  
Operating Instructions (1)

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

Design and specifications are subject to change without notice.

#### Note on chip component replacement

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

#### 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)

#### LF: 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 viscous (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.

#### NOTES ON REPLACEMENT OF CSP (CHIP SIZE PACKAGE) IC

Replacement of IC2 used in this set requires a special tool.

## NOISE CANCELING HEADPHONES

SECTION 1  
GENERAL

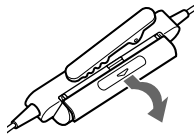
This section is extracted from  
instruction manual.

Features

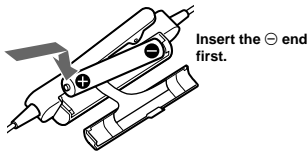
- Noise canceling headphones reduce ambient noise, and provide a quieter environment to enhance audio entertainment. Ambient sound is reduced by synthesizing with a sound in opposite phase produced by the noise canceling circuit.
- Ultra compact headphones fits comfortably in the ears and closed type headphone structure delivers deep bass sound.
- 3 sizes soft silicon rubber earbuds are used for stable and comfortable fit in the ears.
- Operates as passive headphones when noise canceling circuit is not activated.
- Built-in monitor function to hear surrounding sound without taking off the headphones.
- Plug adaptor is supplied to connect directly to stereo or dual jack of in-flight music services.

Installing a battery

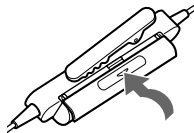
- 1 Open the lid on the rear of the battery box.



- 2 Insert one R03 (size AAA) battery, matching the + and – on the battery to the + and – in the battery compartment.

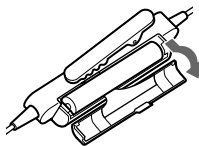


- 3 Close the lid.



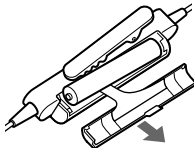
Removing the battery

- 1 Open the lid.



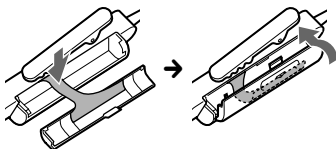
- 2 Pull the lid lightly in the direction of the arrow.

**Note**  
The battery may jump out when the lid is pulled. Pull the lid while placing a finger on the battery.



- 3 Close the lid.

**Note**  
Store the ribbon in the battery compartment to prevent it being pinched by the lid.



Battery life

Battery	Approx. hours*1
Sony alkaline battery LR03/AM-4 (N)	50 hours*2
Sony battery R03/UM-4 (NU)	22 hours*2

\*1 1 kHz, 1 mW + 1 mW input

\*2 Time stated above may vary, depending on the temperature or conditions of use.

When to replace the battery

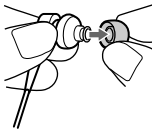
Replace the battery with a new one when the POWER indicator dims.

**Note** (US, Tourist models)

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.

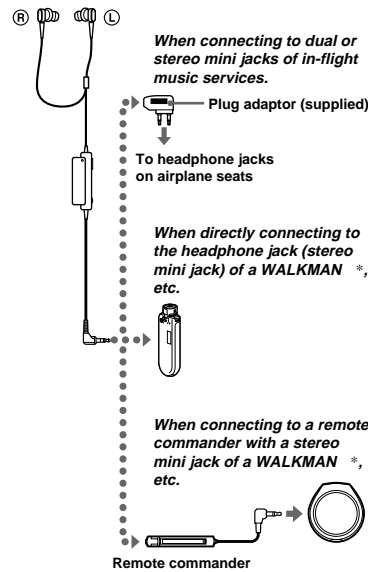
Selecting the earbuds

The M size earbuds are attached to the headphones before shipment. If you feel the M size earbuds do not suit your ears, replace them with the supplied S or L size earbuds.



Listening to music

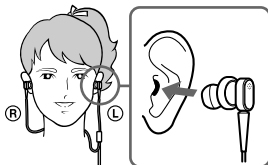
- 1 Connect the headphones to the AV equipment.



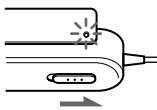
- 2 Wear the headphones marked ® in your right ear and the one marked ① in your left ear. Push the earbud into your ear carefully so that the earbud fits the hole of your ear snugly.

**Note**

Unless the earbuds correctly fit your ears, noise canceling will not function. Adjust the earbuds position to sit on your ear comfortably, and push them into the inside of your ears so that they fit your ears snugly.



- 3 Turn on the power of the headphones. The power indicator lights in red. The power switch is located on the battery box. When power is turned on, ambient noise is reduced, and you can listen to music more clearly at a lower volume.



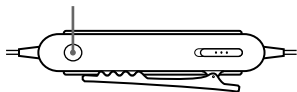
- 4 Turn on the power of the AV equipment.

\* “WALKMAN” and “WALKMAN” logo are registered trademarks of Sony Corporation.

To hear ambient sound for safety

When the power switch is set to on, noise canceling can be deactivated while the MONITOR button is pressed so that you can hear ambient sound.

MONITOR button



Notes on using on the airplane

- The supplied plug adaptor can be connected to the dual or stereo mini jacks of in-flight music services.



dual jacks



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.

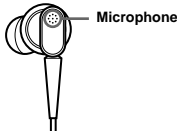
If you have any questions or problems concerning the system that are not covered in this manual, please consult the nearest Sony dealer.

After listening to music

Turn off the power of the headphones.

**Notes**

- The noise canceling function is only effective for noise in the low frequency band. Although noise is reduced, it is not canceled completely.
- Do not cover the microphone of the headphones with your hands. The noise canceling function may not work properly.

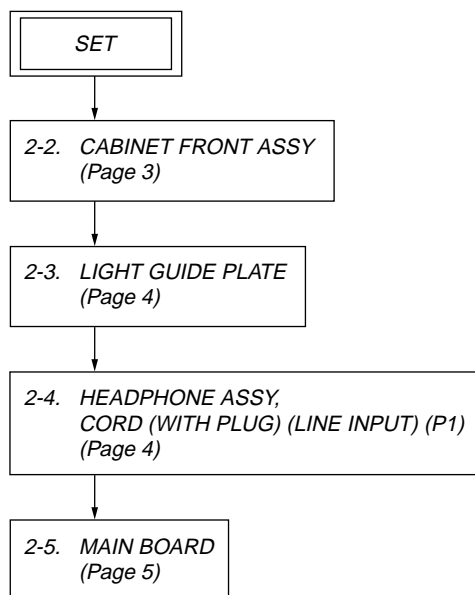


- The noise canceling function may not work properly unless the headphones are put on firmly.
- You can use the headphones even without turning on the power. In this case, the noise canceling function is not active, and the headphones operate as passive headphones.
- After you turn on the power of the headphones, you may hear a slight hiss. This is the operating sound of the noise canceling function, not a malfunction.
- In a quiet place, or depending on certain noises, you may feel that the noise canceling function is not effective, or that noise is accentuated. In this case, turn off the power of the headphones.
- Interference noise can occur from nearby cellular phones. Should this occur, locate the headphones further away from the cellular phone(s).

## SECTION 2 DISASSEMBLY

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

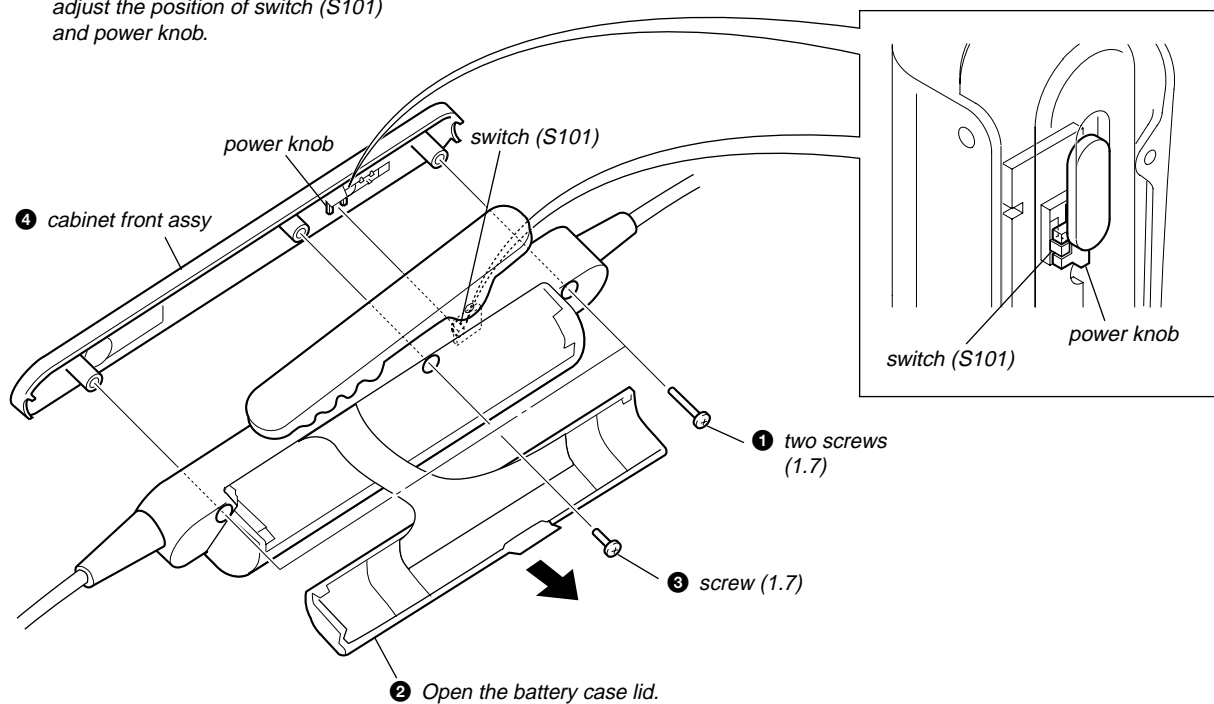
### 2-1. DISASSEMBLY FLOW



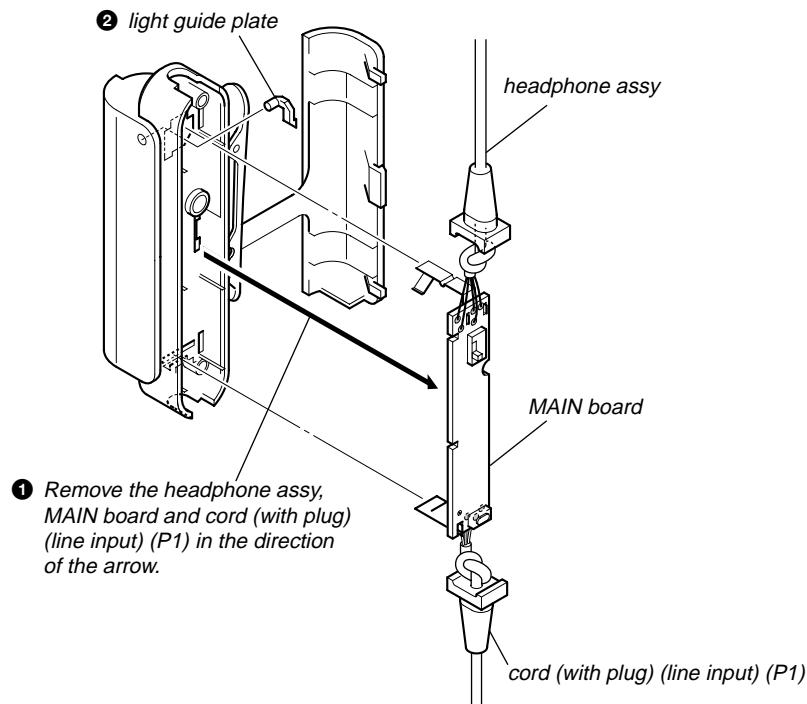
**Note:** Follow the disassembly procedure in the numerical order given.

### 2-2. CABINET FRONT ASSY

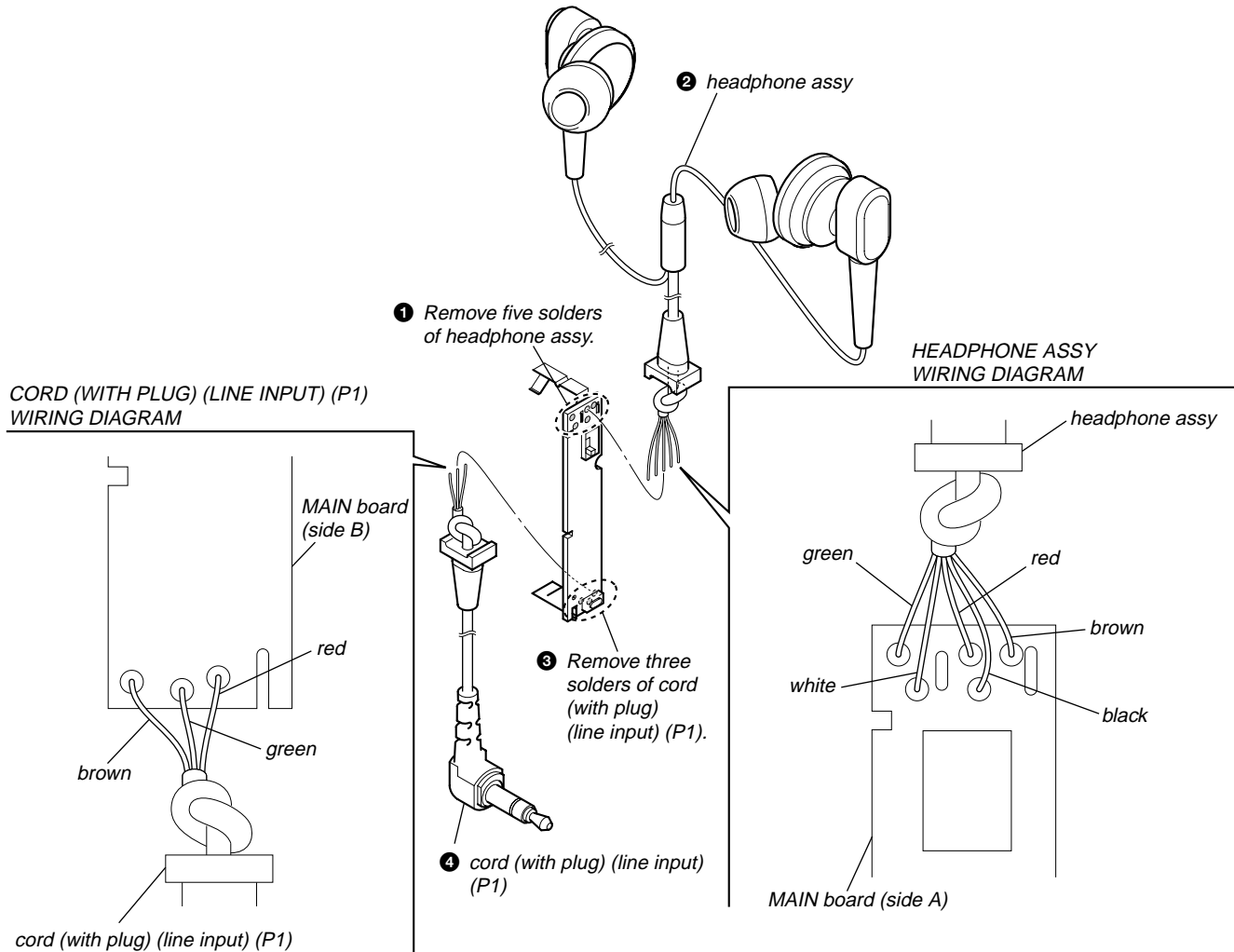
**Note:** On installation of cabinet front assy, adjust the position of switch (S101) and power knob.



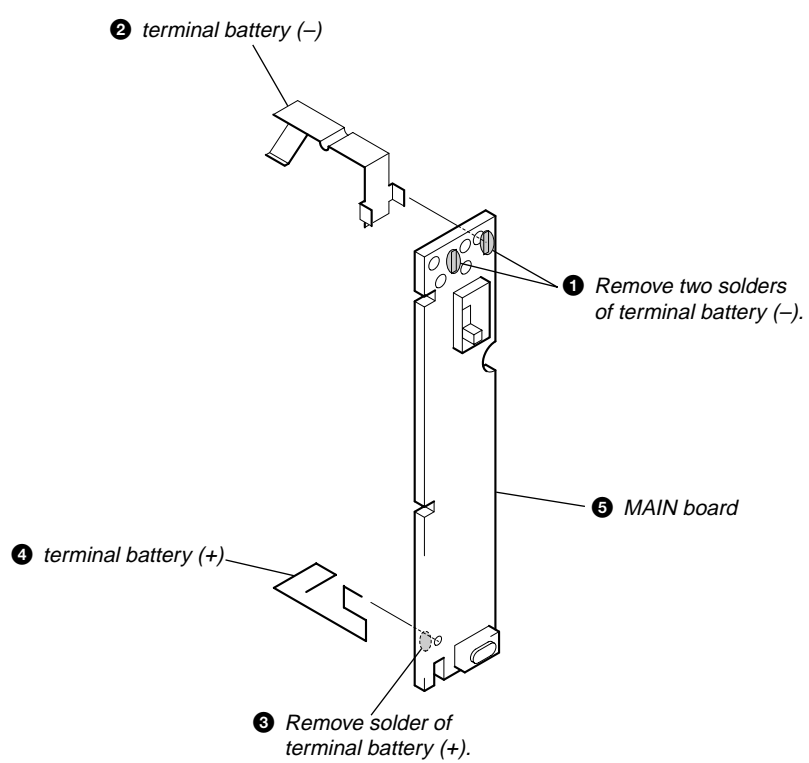
## 2-3. LIGHT GUIDE PLATE



## 2-4. HEADPHONE ASSY, CORD (WITH PLUG) (LINE INPUT) (P1)



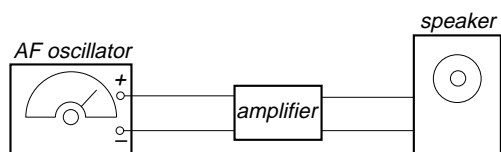
## 2-5. MAIN BOARD



## SECTION 3 ELECTRICAL ADJUSTMENT

### NOISE CANCEL VOLUME ADJUSTMENT

#### Connection:



#### Procedure:

1. Generate a sine wave of specific frequency (200 Hz) from a AF oscillator, and output it from a speaker placed at the forward position.
2. Wear this headphones on the ear, and turn on the **POWER** switch.
3. With this headphones worn, adjust the RV1 (L-ch) and RV51 (R-ch) so that the volume from the speaker becomes lowest aurally.

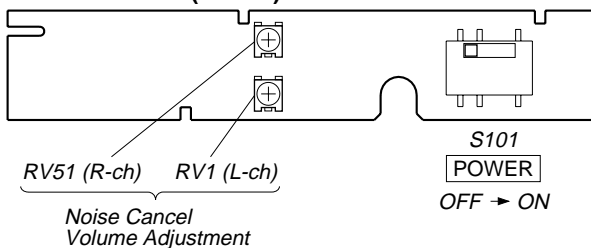
#### Note:

When the headphones are not covered with the ear pieces completely, the adjustment may not be performed correctly.

Make sure that the ear pieces cover the headphone completely.

#### Adjustment Location:

##### – MAIN BOARD (Side A) –



## SECTION 4 DIAGRAMS

### • Note for Printed Wiring Board and Schematic Diagram

#### Note on Printed Wiring Board:

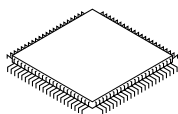
- : parts extracted from the component side.
- : parts extracted from the conductor side.
- : Pattern from the side which enables seeing.  
(The other layers' patterns are not indicated.)

#### Caution:

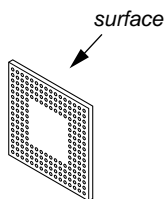
Pattern face side: Parts on the pattern face side seen from the pattern face are indicated.  
(Side B)

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

#### • Lead Layouts



Lead layout of conventional IC



CSP (chip size package)

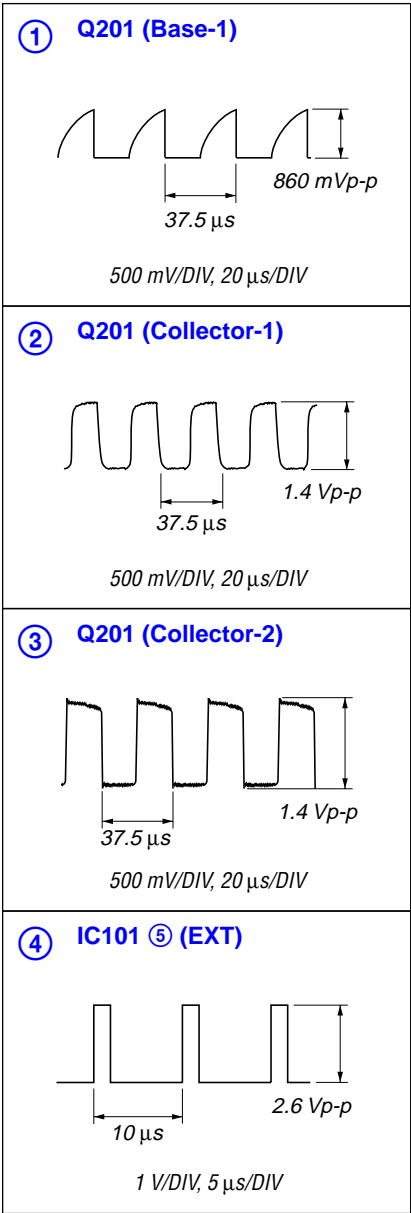
#### Note on Schematic Diagram:

- All capacitors are in  $\mu\text{F}$  unless otherwise noted. (p: pF) 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in  $\Omega$  and  $\frac{1}{4}\text{W}$  or less unless otherwise specified.
- : panel designation.
- : 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 conditions.  
no mark : POWER ON
- Voltages are taken with a VOM (Input impedance 10 M $\Omega$ ). 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.
- Circled numbers refer to waveforms.
- Signal path.  
⇒ : LINE INPUT (POWER ON)  
⇒ : LINE INPUT (POWER OFF)

\* Replacement of IC201 used in this set requires a special tool.

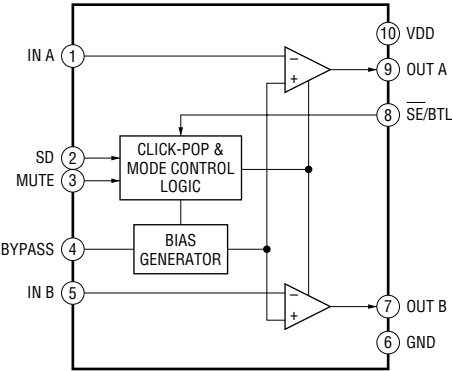
- The voltage and waveform of CSP (chip size package) cannot be measured, because its lead layout is different from that of conventional IC.

• Waveforms

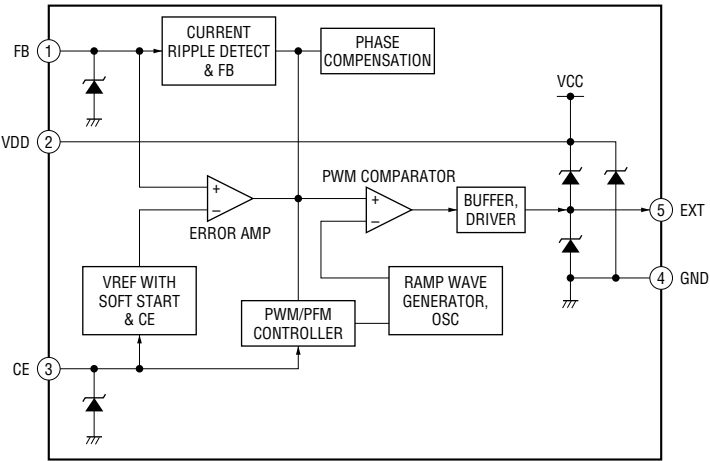


• IC Block Diagrams

IC2 LM4916LDX/NOPB

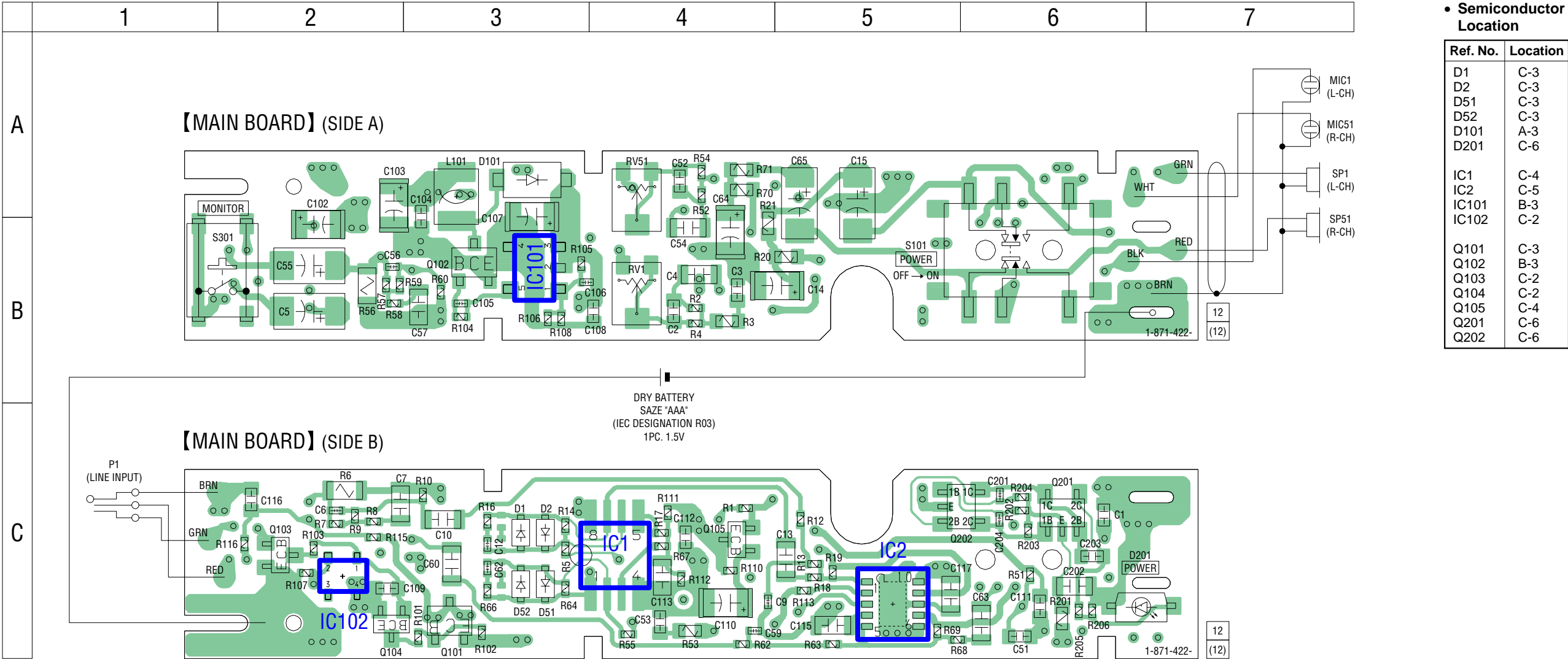


IC101 XC9105D091MR

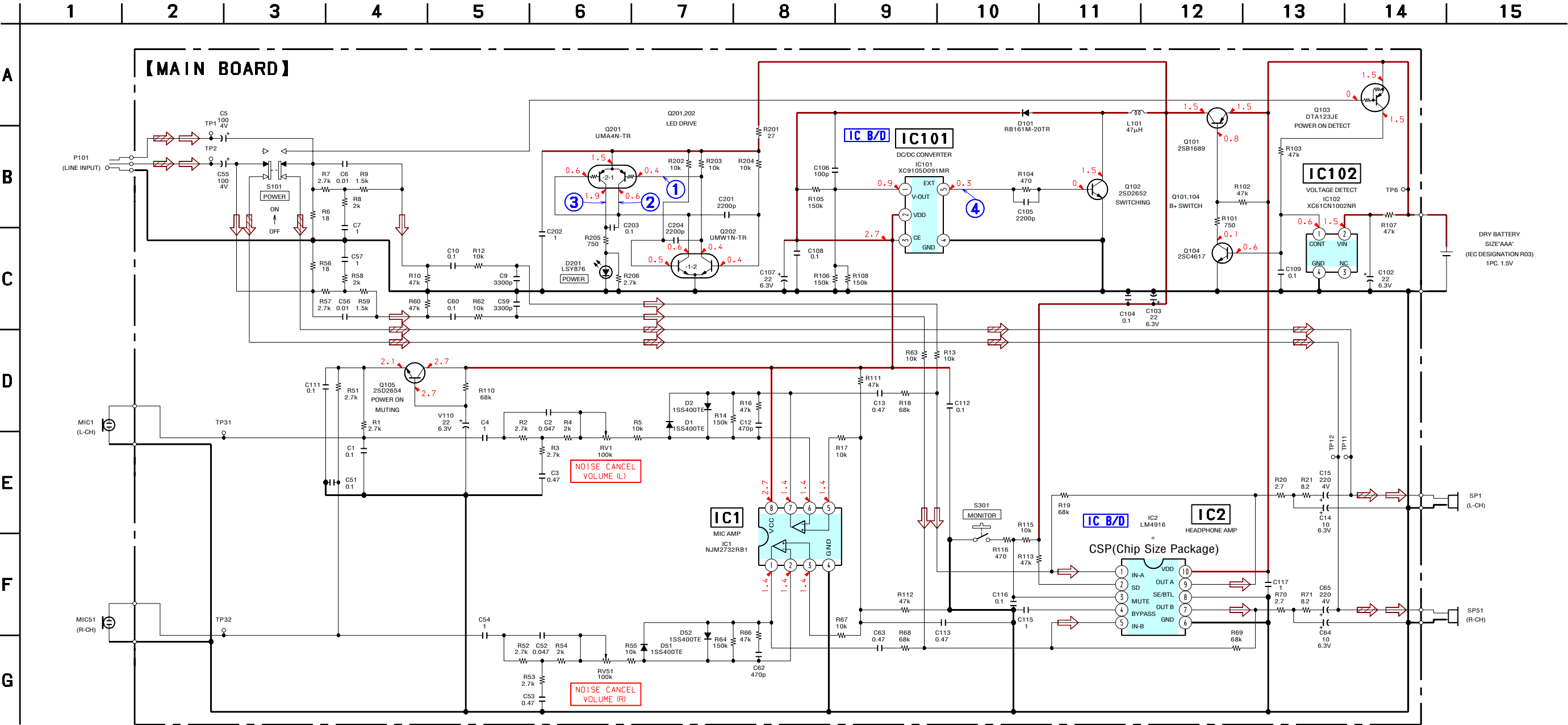




4-1. PRINTED WIRING BOARD



4-2. SCHEMATIC DIAGRAM BOARD • See page 6 for Waveforms. • See page 6 for IC Block Diagrams.



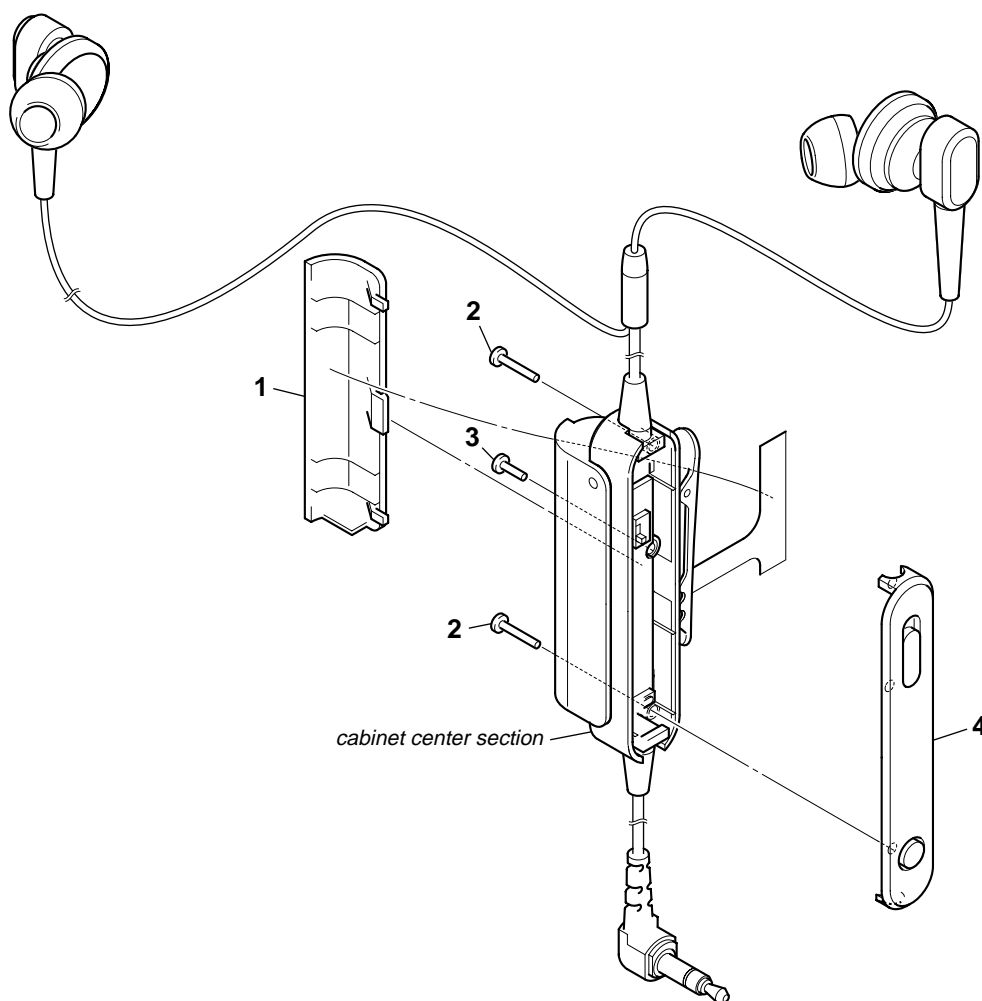
## SECTION 5

### EXPLODED VIEWS

**NOTE:**

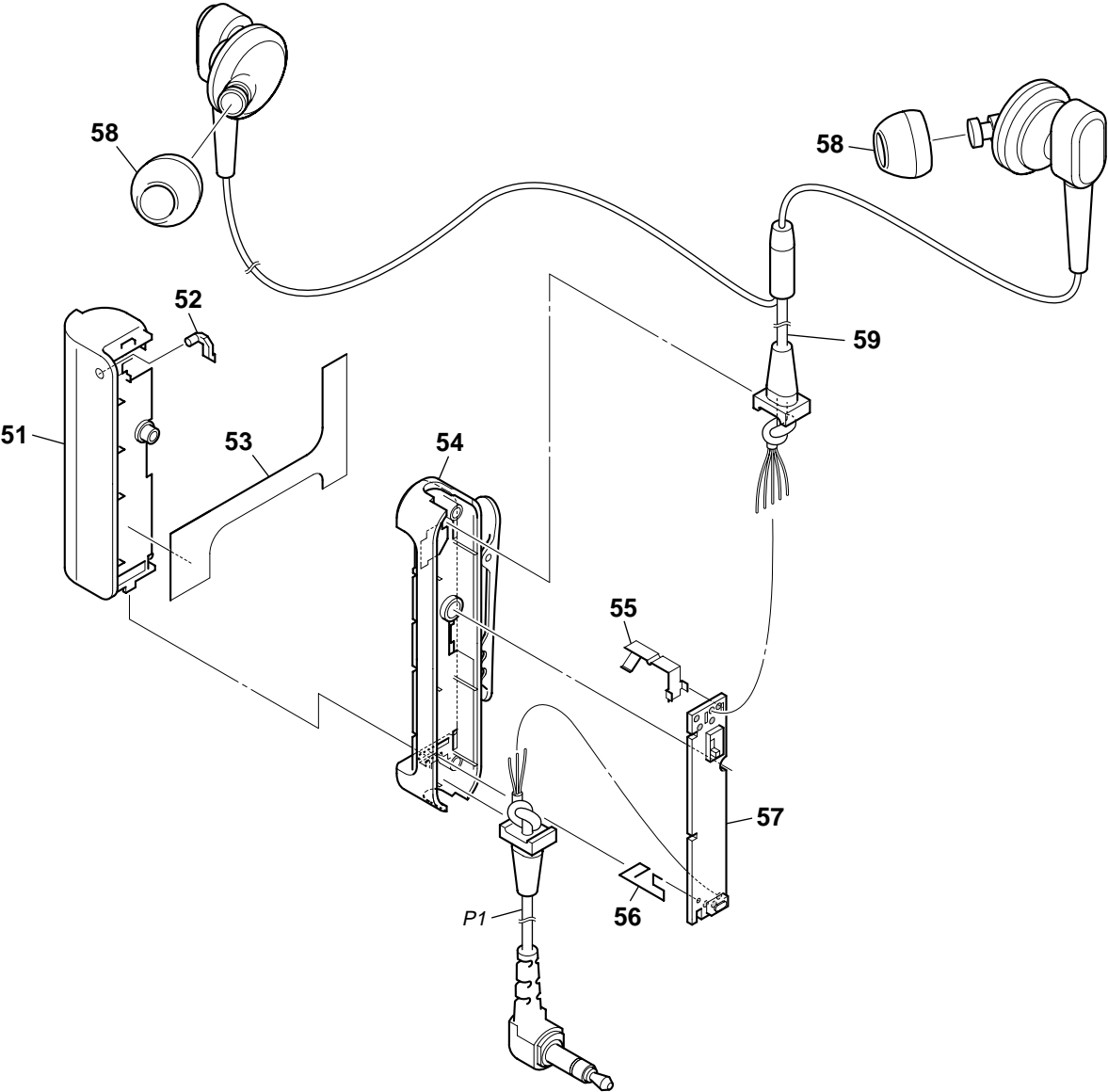
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts  
Example:  
KNOB, BALANCE (WHITE) . . . (RED)  
                                  ↑                                  ↑  
                         Parts Color   Cabinet's 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. CABINET FRONT SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	2-695-980-01	LID, BATTERY CASE (BLACK)		4	X-2176-230-1	CABINET FRONT ASSY (for BLACK)	
1	2-695-980-11	LID, BATTERY CASE (WHITE)		4	X-2176-231-1	CABINET FRONT ASSY (for WHITE)	
1	2-695-980-21	LID, BATTERY CASE (PINK)		4	X-2176-232-1	CABINET FRONT ASSY (for PINK)	
2	3-254-139-01	SCREW (1.7)					
3	3-252-825-11	SCREW (1.7)					

5-2. CABINET CENTER SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	2-695-979-02	CABINET, BATTERY (BLACK)		56	2-695-985-01	TERMINAL BATTERY (+)	
51	2-695-979-12	CABINET, BATTERY (WHITE)		57	A-1215-440-A	MAIN BOARD, COMPLETE	
51	2-695-979-22	CABINET, BATTERY (PINK)		58	4-220-438-21	PIECE (M), EAR (M size) (for BLACK)	
52	2-695-983-01	PLATE, LIGHT GUIDE		58	4-220-438-31	PIECE (M), EAR (M size) (for PINK, WHITE)	
53	2-896-229-01	SHEET, BATTERY (for BLACK)		59	X-2176-211-1	HEADPHONE ASSY (for BLACK)	
53	2-896-229-11	SHEET, BATTERY (for PINK, WHITE)		59	X-2176-212-1	HEADPHONE ASSY (for WHITE)	
54	X-2149-617-1	CABINET CENTER SUB ASSY (for BLACK)		59	X-2176-213-1	HEADPHONE ASSY (for PINK)	
54	X-2149-796-1	CABINET CENTER SUB ASSY (for WHITE)		P1	1-833-189-13	CORD (WITH PLUG) (LINE INPUT) (BLACK)	
54	X-2149-798-1	CABINET CENTER SUB ASSY (for PINK)		P1	1-833-189-23	CORD (WITH PLUG) (LINE INPUT) (WHITE)	
55	2-695-986-01	TERMINAL BATTERY (-)		P1	1-833-189-33	CORD (WITH PLUG) (LINE INPUT) (PINK)	



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MAIN

Ref. No.	Part No.	Description			Remark
R10	1-240-714-91	METAL CHIP	47K	5%	1/20W
R12	1-240-707-91	METAL CHIP	10K	5%	1/20W
R13	1-240-707-91	METAL CHIP	10K	5%	1/20W
R14	1-240-720-91	METAL CHIP	150K	5%	1/20W
R16	1-240-714-91	METAL CHIP	47K	5%	1/20W
R17	1-240-707-91	METAL CHIP	10K	5%	1/20W
R18	1-240-716-91	METAL CHIP	68K	5%	1/20W
R19	1-240-716-91	METAL CHIP	68K	5%	1/20W
R20	1-242-946-81	RES-CHIP	2.7	5%	1/16W
R21	1-245-265-11	METAL CHIP	8.2	5%	1/16W
R51	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R52	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R53	1-218-958-11	RES-CHIP	2.7K	5%	1/16W
R54	1-240-791-91	METAL CHIP	2K	0.5%	1/20W
R55	1-240-707-91	METAL CHIP	10K	5%	1/20W
R56	1-216-800-11	METAL CHIP	18	5%	1/10W
R57	1-240-700-91	METAL CHIP	2.7K	5%	1/20W
R58	1-240-791-91	METAL CHIP	2K	0.5%	1/20W
R59	1-240-697-91	METAL CHIP	1.5K	5%	1/20W
R60	1-240-714-91	METAL CHIP	47K	5%	1/20W
R62	1-240-707-91	METAL CHIP	10K	5%	1/20W
R63	1-240-707-91	METAL CHIP	10K	5%	1/20W
R64	1-240-720-91	METAL CHIP	150K	5%	1/20W
R66	1-240-714-91	METAL CHIP	47K	5%	1/20W
R67	1-240-707-91	METAL CHIP	10K	5%	1/20W
R68	1-240-716-91	METAL CHIP	68K	5%	1/20W
R69	1-240-716-91	METAL CHIP	68K	5%	1/20W
R70	1-242-946-81	RES-CHIP	2.7	5%	1/16W
R71	1-245-265-11	METAL CHIP	8.2	5%	1/16W
R101	1-240-781-91	METAL CHIP	750	0.5%	1/20W
R102	1-240-714-91	METAL CHIP	47K	5%	1/20W
R103	1-240-714-91	METAL CHIP	47K	5%	1/20W
R104	1-240-691-91	METAL CHIP	470	5%	1/20W
R105	1-240-720-91	METAL CHIP	150K	5%	1/20W
R106	1-240-720-91	METAL CHIP	150K	5%	1/20W
R107	1-240-714-91	METAL CHIP	47K	5%	1/20W
R108	1-240-720-91	METAL CHIP	150K	5%	1/20W
R110	1-240-716-91	METAL CHIP	68K	5%	1/20W
R111	1-240-714-91	METAL CHIP	47K	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
R115	1-240-707-91	METAL CHIP	10K	5%	1/20W
R116	1-240-691-91	METAL CHIP	470	5%	1/20W
R201	1-218-934-11	RES-CHIP	27	5%	1/16W
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	1-240-781-91	METAL CHIP	750	0.5%	1/20W
R206	1-240-700-91	METAL CHIP	2.7K	5%	1/20W

Ref. No.	Part No.	Description	Remark
		< VARIABLE RESISTOR >	
RV1	1-227-413-21	RES, ADJ, CERMET	100K
RV51	1-227-413-21	RES, ADJ, CERMET	100K
		< SWITCH >	
S101	1-771-337-21	SWITCH, SLIDE (POWER)	
S301	1-786-700-11	SWITCH, TACTILE (MONITOR)	
*****			
		MISCELLANEOUS	
		*****	
59	X-2176-211-1	HEADPHONE ASSY (for BLACK)	
59	X-2176-212-1	HEADPHONE ASSY (for WHITE)	
59	X-2176-213-1	HEADPHONE ASSY (for PINK)	
P1	1-833-189-13	CORD (WITH PLUG) (LINE INPUT) (BLACK)	
P1	1-833-189-23	CORD (WITH PLUG) (LINE INPUT) (WHITE)	
P1	1-833-189-33	CORD (WITH PLUG) (LINE INPUT) (PINK)	
*****			
		ACCESSORIES	
		*****	
	1-477-125-21	ADAPTOR, PLUG (DUAL) (for in-flight use (single/dual))	
	2-888-749-13	MANUAL, INSTRUCTION (JAPANESE, ENGLISH) (Tourist)	
	2-888-749-21	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH) (Canadian, AEP, E)	
	2-888-749-31	MANUAL, INSTRUCTION (TRADITIONAL CHINESE, SIMPLIFIED CHINESE, KOREAN) (E)	
	2-888-749-42	MANUAL, INSTRUCTION (GERMAN, ITALIAN, PORTUGUESE, RUSSIAN) (AEP)	
	2-888-749-51	MANUAL, INSTRUCTION (POLISH, CZECH, HUNGARIAN, SLOVAKIAN) (AEP)	
	2-888-749-62	MANUAL, INSTRUCTION (ENGLISH, SPANISH) (US)	
	2-890-205-01	POUCH, CARRYING	
	3-046-415-21	PIECE (L), EAR (L size) (for BLACK)	
	3-046-415-31	PIECE (L), EAR (L size) (for PINK, WHITE)	
	4-220-438-21	PIECE (M), EAR (M size) (for BLACK)	
	4-220-438-31	PIECE (M), EAR (M size) (for PINK, WHITE)	
	4-220-439-21	PIECE (S), EAR (S size) (for BLACK)	
	4-220-439-31	PIECE (S), EAR (S size) (for PINK, WHITE)	

MEMO

## REVISION HISTORY

Clicking the version allows you to jump to the revised page.

Also, clicking the version at the upper right on the revised page allows you to jump to the next revised page.

[illegible]