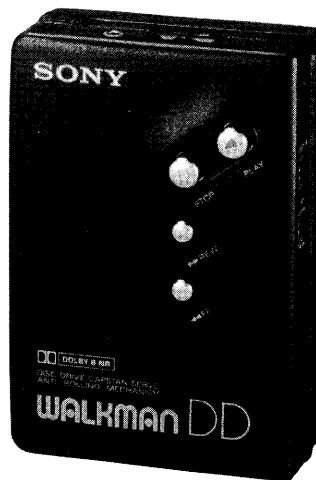


WM-DD11

SERVICE MANUAL

Germany Model



Model Name Using Similar Mechanism	WM-DD1
Tape Transport Mechanism Type	MT-WMDD11-16

SPECIFICATIONS

Frequency response
40 – 15,000 Hz

Wow and flutter
± 0.25% (DIN)/0.15% WRMS (NAB)

Power output
Headphones: 10 mW + 10 mW (at 10% harmonic distortion)
load impedance 16 ohms at DC operation

Outputs HEADPHONES jack (stereo minijack)
load impedance 8 – 300 ohms

Power requirements
3 V DC, two R6 (size AA) batteries
DC IN 3V jack accepts:
— EBP-500B battery case (not supplied) for use on two R20 (size D) batteries
— AC-D2M AC power adaptor (not supplied) for use on 220 V AC, 50 Hz
— DCC-70 car battery cord (not supplied) for use on 12 V car battery

Dimensions
Approx. 82.1 × 119.6 × 37.1 mm (w/h/d) incl. projecting parts and controls

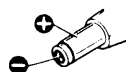
Weight Approx. 250 g incl. batteries, not incl. other accessories

Accessories supplied
Stereo headphones (1),
Carrying case (1)

Design and specifications subject to change without notice.

Notes

- This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.
- If a car battery cord or an AC power adaptor not manufactured by Sony is used, a fuse must be installed in the battery cord or the AC power adaptor and the polarity of the plug must be as illustrated.



Notes on Batteries


- When the batteries are run down, the BATTERY indicator glows faintly.
- Battery life

Batteries	Continuous playback hours
Sony batteries SUM-3 (NS)	Approx. 3.5 hrs.
Sony alkaline batteries AM3 (N)	Approx. 7 hrs.

For maximum performance we recommend the use of alkaline batteries.

- To avoid damage from battery leakage and corrosion, remove the batteries when you will not use the unit for a long time.
- The unit does not operate on the internal batteries when the DC IN 3V jack is used.

Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.

"DOLBY" and the double-D symbol  are trade-marks of Dolby Laboratories Licensing Corporation.

CASSETTE PLAYER
SONY®

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SERVICING NOTES**Flexible Circuit Board Repairing**

- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on Chip Component Replacement

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

Notes on replacing the speed detection coil (FG901)

FG901 is pressed in chassis.

Replace as chassis ass'y when FG901 is defective.

Decide if FG901 is defective or not by removing lead wires of FG901 from audio board and measuring DC resistance value.

DC resistance value of FG901 : Approx. 690Ω

SECTION 1 ADJUSTMENTS

PRECAUTION

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

playback head	pinch roller
capstan	rubber belt
2. Demagnetize the playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless otherwise noted.

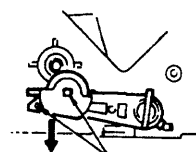
Pinch Roller Pressure Adjustment

— Playback Mode —

1. Pull the spring scale in the direction shown by the arrow.
2. Slowly return the pinch roller and read the spring scale just when the pinch roller starts rotating.

Specification :

$170 \pm 20\text{g}$ (5.3 - 6.7 oz)



Hook the spring scale to one of these holes and pull it in the direction of arrow.

1-1. MECHANICAL ADJUSTMENT

Torque Measurement

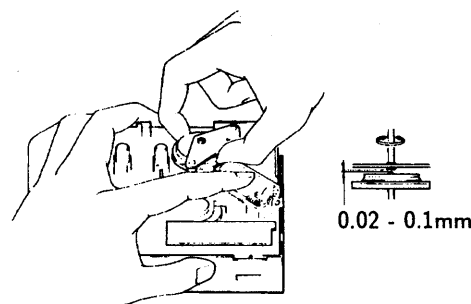
Mode	Torque meter	Meter reading
FWD	CQ-102C	22 - 38 g-cm (0.31 - 0.52 oz-inch)
FWD Back Tension		1 - 2 g-cm (0.01 - 0.02 oz-inch)
FF, REW	CQ-201B	More than 65 g-cm (more than 0.9 oz-inch)

Tape Tension Measurement

Mode	Torque meter	Meter reading
FWD	CQ-403A	More than 60 g (more than 2.12 oz)

Wow & flutter and motor position

1. Adjust with the adjustment screw so that rotor thrust play is within 0.1mm. (When confirming



play, press motor down so that the motor pulley and rotor rubber section do not touch.)

2. Wow & flutter adjustment

Setting :

Power supply voltage : 2.5V

Tape : Adjust by using end portion of tape.

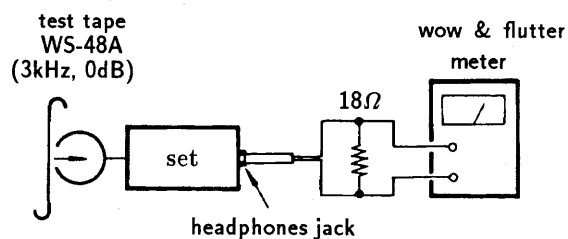
VOLUME control : mechanical mid

TAPE SELECT switch : NORM

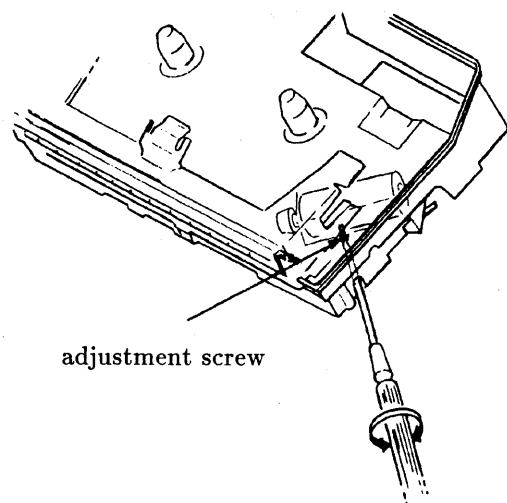
DOLBY NR switch : OFF

Procedure :

1 Mode : playback



Turn the adjustment screw so that the wow and flutter meter reads minimum (less than 0.12% W-RMS).

**1-2. ELECTRICAL ADJUSTMENTS****Test Tape**

Type	Signal	Used for
WS-48A	3 kHz, 0dB	Tape Speed Adjustment
P-4-A100	10kHz, -10dB	Playback Head Azimuth Adjustment
P-4-A063	6.3kHz, -10dB	
P-4-L300	315Hz, 0dB	Playback Level Adjustment

Tape Speed Adjustment**Setting :**

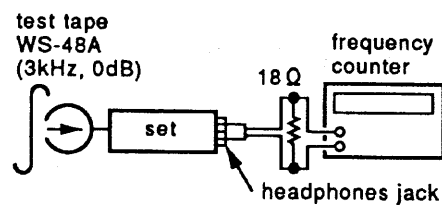
VOLUME control : mechanical mid

TAPE SELECT switch : NORM

DOLBY NR switch : OFF

Procedure :

Mode : playback



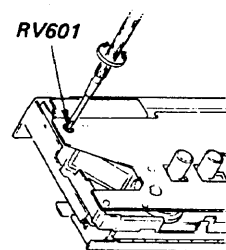
1. Turn RV601 so that frequency reading becomes in 3,000Hz. (at the ending part of the test tape)
2. Play back the test tape top and end and confirm that the frequency reading becomes in the adjustment limit below.

Adjustment Limit :

Frequency counter
3000Hz \pm 90Hz

Adjustment Location :

- main board -



Playback Head Azimuth Adjustment

Setting :

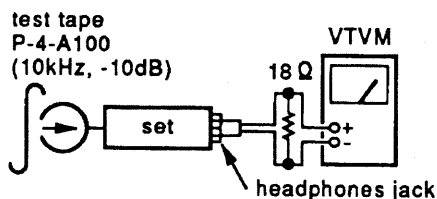
VOLUME control : mechanical mid

TAPE SELECT switch : NORM

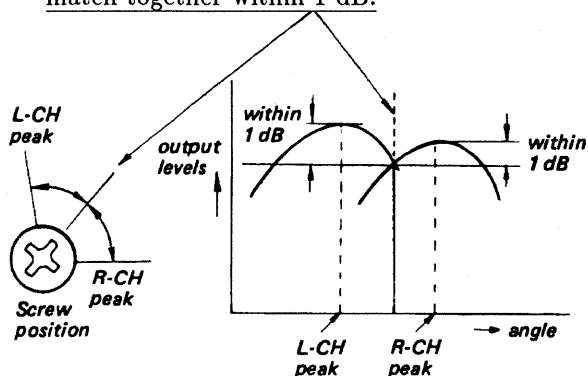
DOLBY NR switch : OFF

Procedure :

1. Mode : playback



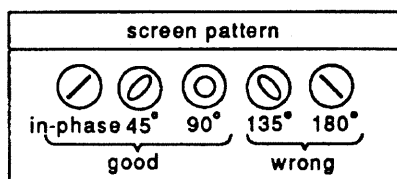
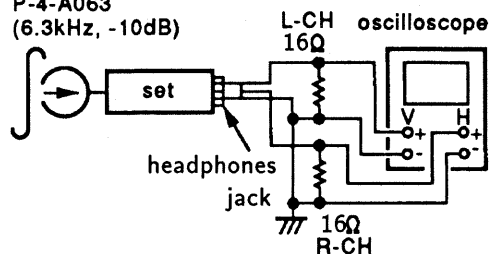
2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 1 dB.



3. Phase Check

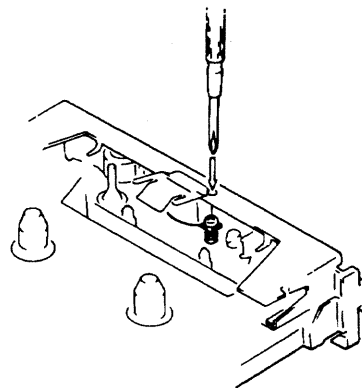
Mode : playback

test tape
P-4-A063
(6.3kHz, -10dB)



Adjustment Location :

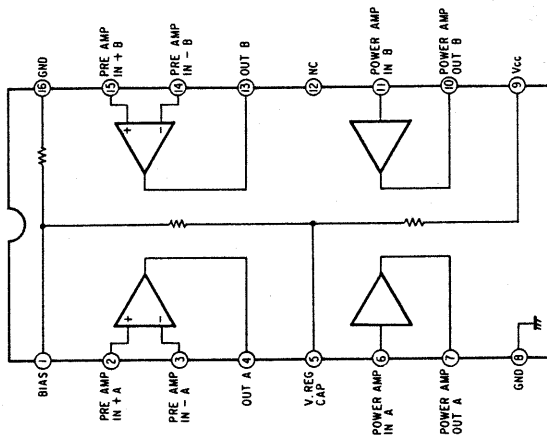
- cassette chamber -



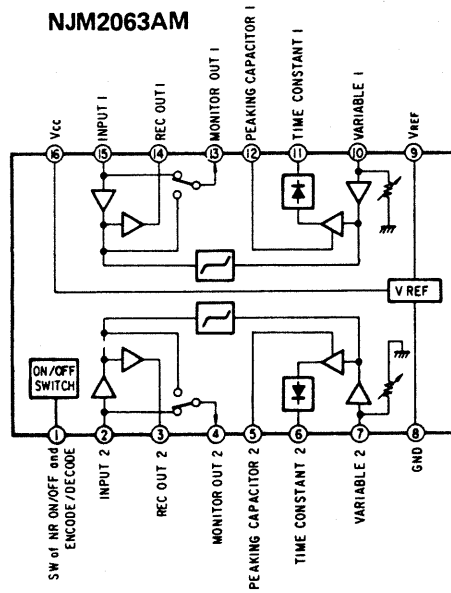
SECTION 2 DIAGRAMS

• IC BLOCK DIAGRAMS

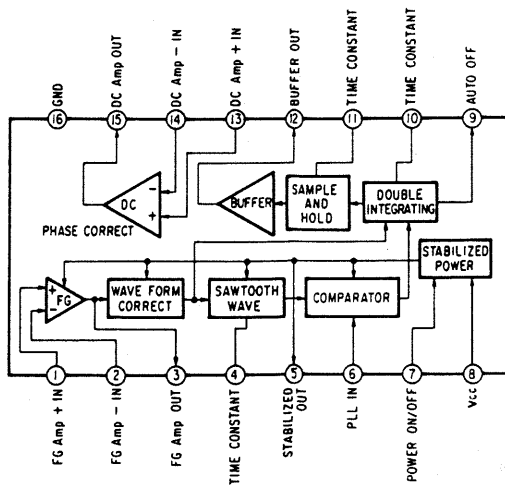
**IC301
LA4570M**



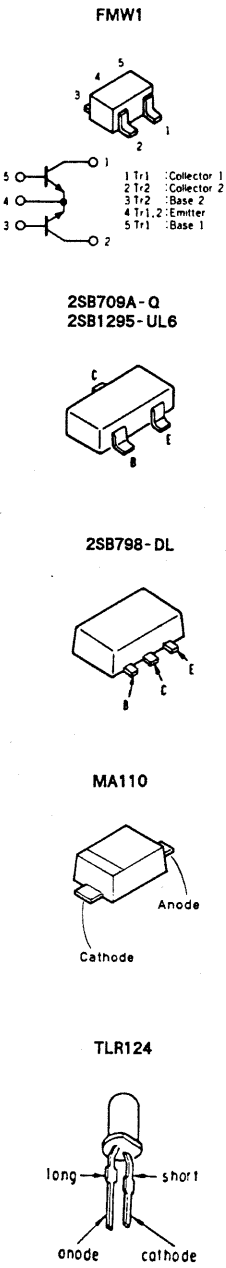
**• IC302
NJM2063AM**



**IC601
CX20084**



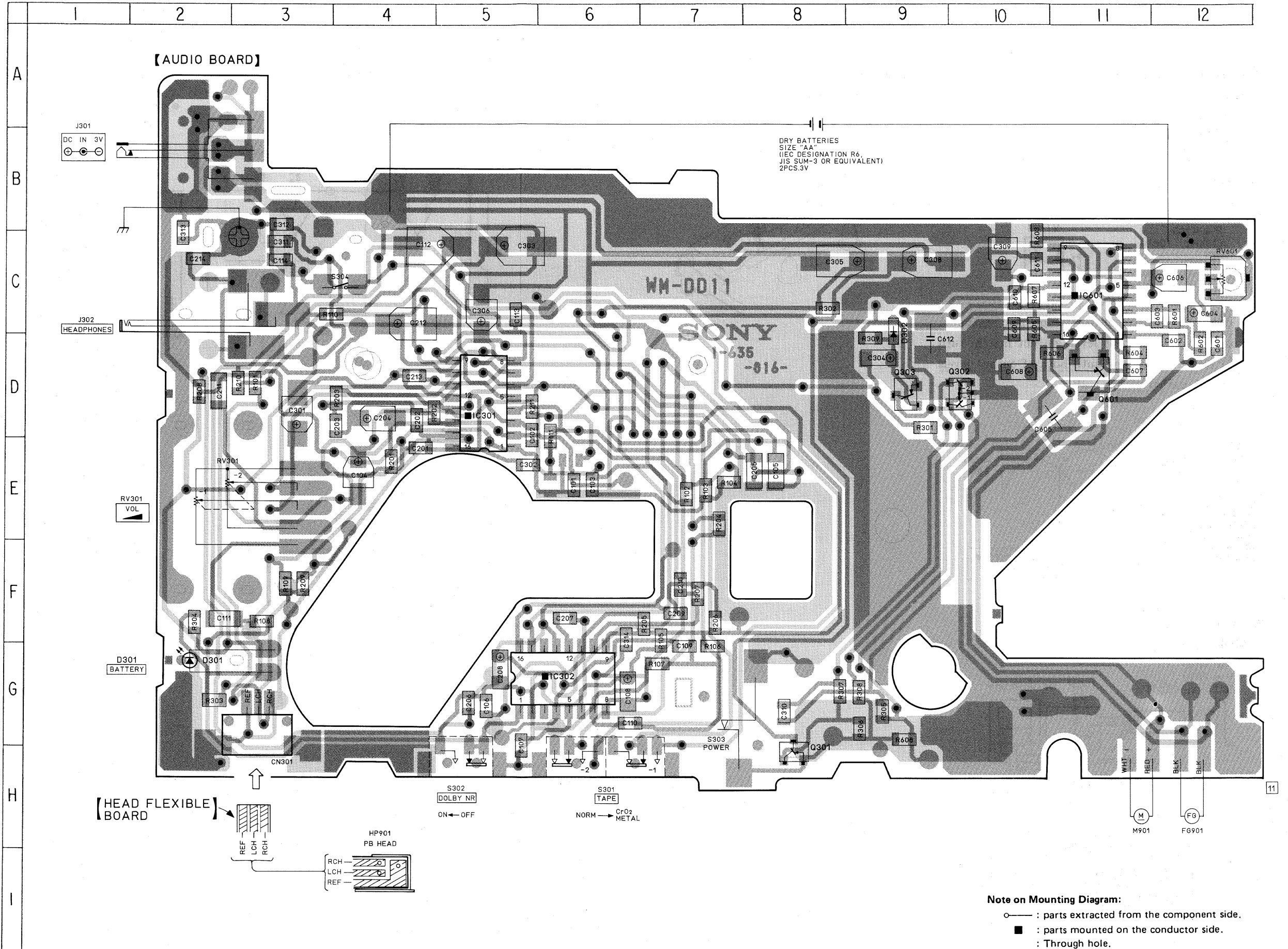
2-1. SEMICONDUCTOR
LEAD LAYOUTS



• Semiconductor Location

Ref. No.	Location
D301	G-3
D302	D-9
IC301	D-5
IC302	G-6
IC601	C-12
Q301	H-8
Q302	D-10
Q303	D-10
Q601	D-12

2-2. PRINTED WIRING BOARD

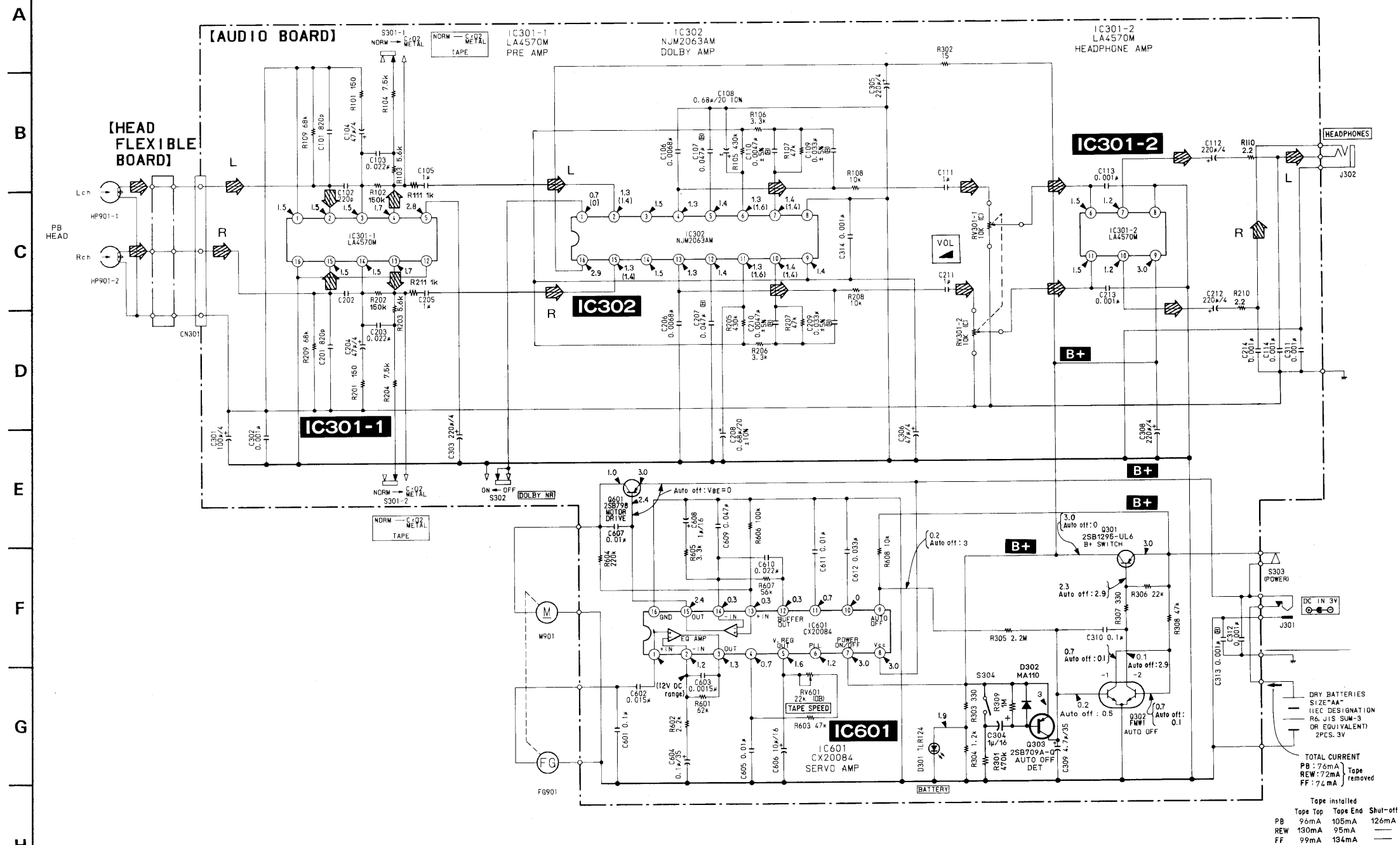


Note on Mounting Diagram:

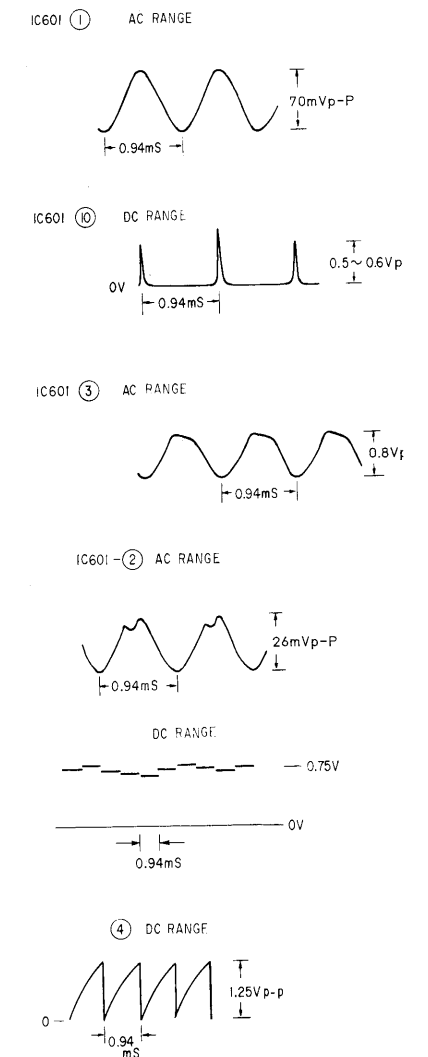
- : parts extracted from the component side.
- : parts mounted on the conductor side.
- : Through hole.
- : Pattern on the side which is seen.
- : Pattern of the rear side.
- : Chip components extracted from the rear side.

2-3. SCHEMATIC DIAGRAM

• See page 6 for IC block diagram.



TEST POINTS, WAVE FORMS AND OPERATING VOLTAGES



Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: μF 50WV or less are not indicated except for electrolytics and tantalums.
 - All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
 - % : indicates tolerance.
 - B+ : B+ Line
 - adjustment for repair.
- Total current is measured with no cassette installed.

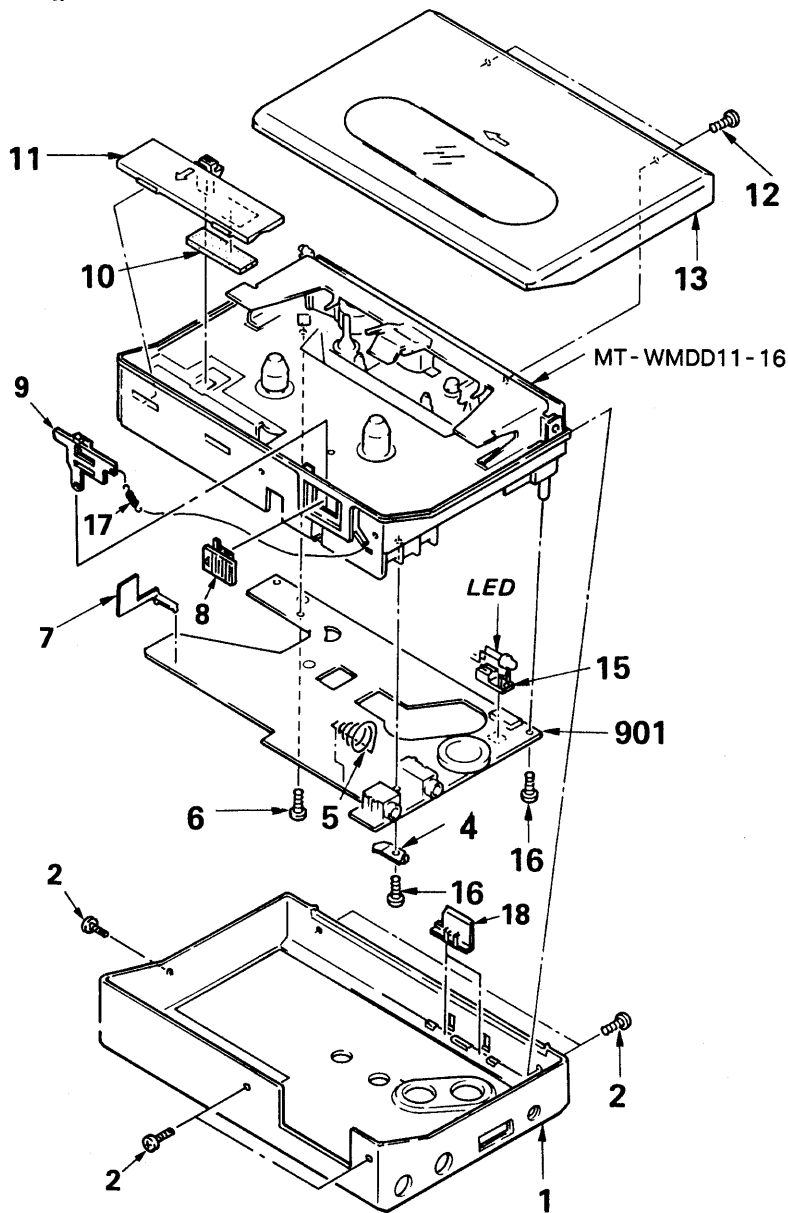
- Power voltage is dc 3 V and fed with regulated dc power supply from external power voltage jack.
- no mark : PLAY
- () : DOLBY NR switch : ON
- Voltages are taken with a VOM (Input impedance 10M Ω)
- Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope.
- Voltage variations may be noted due to normal production tolerances.
- Signal path.
- ⚡ : PB

EXPLODED VIEWS

NOTE:

- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts
Example:
(RED) ... KNOB, BALANCE (WHITE)
 ↑ ↑
Cabinet's Color Parts Color

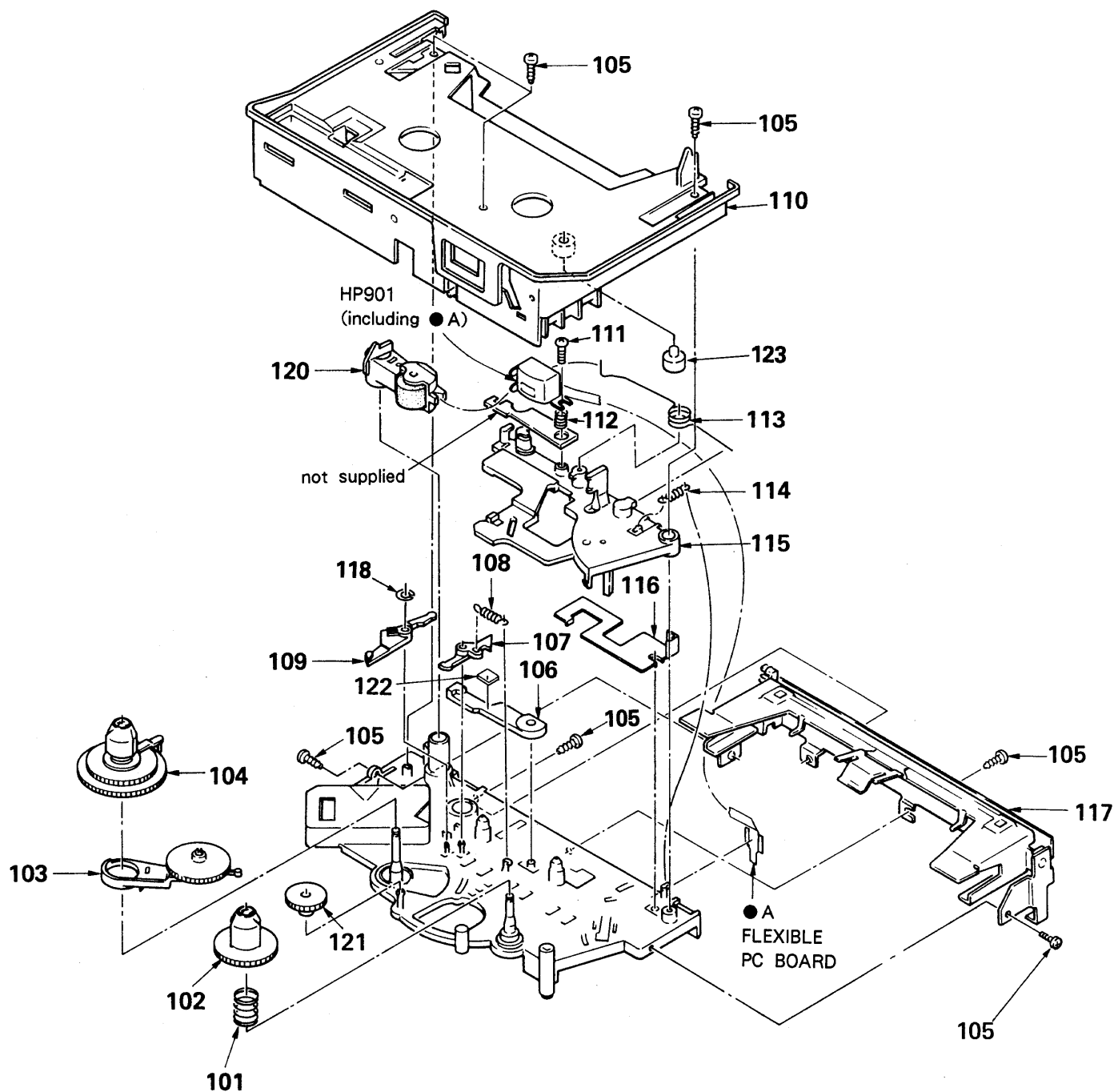
3-1. CABINET



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
1	X-3362-059-1	CASE ASSY (TITANIUM BLACK)		11	3-324-459-01	LID, BATTERY CASE	
	X-3362-060-1	CASE ASSY (TITANIUM)		12	3-893-942-11	SCREW (1.7X3), TAPPING (B)	
	X-3362-061-1	CASE ASSY (MIDNIGHT BLUE BLACK)		13	X-3362-058-1	LID ASSY, CASSETTE (TI BLACK)	
2	3-893-942-01	SCREW (1.7X4), TAPPING (B)			X-3362-062-1	LID ASSY, CASSETTE (TITANIUM)	
4	3-324-444-01	PLATE, GROUND			X-3362-063-1	LID ASSY, CASSETTE (BLUE BLACK)	
5	3-324-448-01	SPRING					
6	7-627-552-07	SCREW, PRECISION +P 1.7X2.5		15	*3-343-524-01	HOLDER, LED	
7	3-324-450-01	TERMINAL BOARD, BATTERY		16	3-893-942-31	SCREW (1.7X4), TAPPING (B)	
8	3-362-282-01	KNOB (OPEN)		17	3-561-627-00	SPRING, TENSION	
9	3-362-286-01	LEVER, LOCK		18	3-362-283-01	KNOB (DOLBY)	
10	*9-911-81 5-01	CUSHION, MICROPHONE		901	A-301 5-91 8-A	PC BOARD ASSY, AU	

3-2. TAPE TRANSPORT MECHANISM (1)

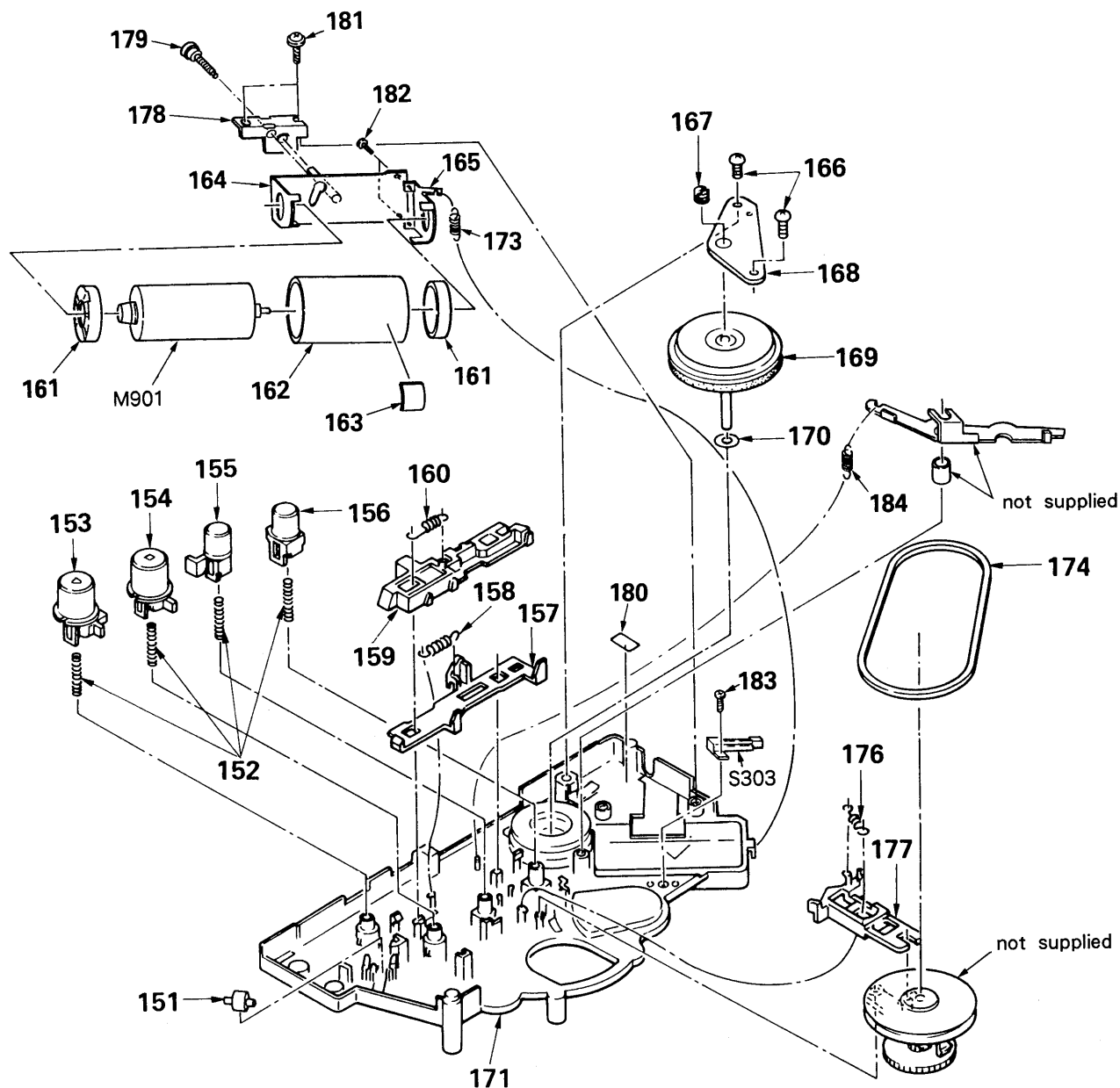
(MT-WMDD11-16)



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
101	3-343-505-01	SPRING, COMPRESSION		112	3-343-506-01	SPRING, COMPRESSION	
102	3-324-478-01	GEAR (S REEL)		113	3-343-519-01	SPRING	
103	X-3310-958-1	ARM ASSY, PLAY		114	3-343-503-01	SPRING, TENSION	
104	X-3310-956-1	REEL ASSY, T		115	3-343-513-01	CHASSIS, HEAD	
105	3-893-942-01	SCREW (1.7X4), TAPPING (B)		116	3-324-465-01	LEVER (RELEASE)	
106	3-324-493-01	LEVER (S.OFF)		117	X-3310-974-9	HINGE ASSY	
107	3-343-508-01	LEVER (DETECTION SAFETY)		118	3-570-615-00	POLY-WASHER (DIA.1.2)	
108	3-343-509-01	SPRING, TENSION		120	X-3310-962-1	PINCH LEVER ASSY	
109	X-3310-977-1	ARM ASSY, DETECTION		121	3-324-495-01	GEAR (FF)	
110	X-3362-040-1	CHASSIS ASSY, SUB		123	3-362-280-01	LEVER (PUSH)	
111	3-336-706-01	SCREW (IT3-C), TAPPING		HP901	1-543-481-11	HEAD, MAGNETIC (PLAY BACK)	

3-3. TAPE TRANSPORT MECHANISM (2)

(MT-WMDD11-16)



No.	Part No.	Description	Remarks	No.	Part No.	Description	Remarks
151	3-324-498-01	SHAFT (ROLLER)		170	3-315-495-11	WASHER (thickness=0.13mm)	
152	3-324-497-01	SPRING, COMPRESSION			3-315-495-21	WASHER (thickness=0.18mm)	
153	X-3310-971-1	LEVER ASSY, PLAY BUTTON			3-315-495-31	WASHER (thickness=0.30mm)	
154	X-3310-972-1	LEVER ASSY, STOP BUTTON		171	A-3163-183-A	CHASSIS BLOCK ASSY	
155	X-3310-973-1	LEVER ASSY, REW BUTTON		173	3-571-832-00	SPRING, TENSION	
				174	3-499-042-99	BELT	
156	X-3310-970-1	LEVER ASSY, FF BUTTON		176	3-343-501-01	SPRING, TENSION	
157	3-343-512-01	LEVER (SW)		177	3-324-485-01	LEVER (FR)	
158	3-343-509-01	SPRING, TENSION					
159	3-343-511-01	PLATE, LOCK		178	*X-3362-038-1	BLACKET ASSY	
160	3-343-502-01	SPRING, TENSION		179	3-362-275-01	SHAFT (MOTOR HOLDER)	
161	*3-362-276-01	CUSHION (MOTOR)		180	3-831-441-11	CUSHION (B)	
162	3-343-507-01	SHIELD, MOTOR		181	3-669-480-21	+ PTPWH 2	
163	3-831-441-XX	SPACER		182	3-704-197-01	SCREW (M1.4X1.6), LOCKING	
164	*X-3362-039-1	BLACKET (MOTOR) ASSY					
165	*3-362-277-01	BLACKET (MOTOR B)		183	3-318-201-51	SCREW (B) (1.4X4), TAPPING	
166	3-318-203-71	SCREW (B1.7X5), TAPPING		184	3-363-785-01	SPRING, (LEVER RETURN), TENSION	
167	3-357-127-01	SCREW (THRUST)		M901	8-835-277-01	MOTOR, DC MNR-1603A	
168	*3-324-496-01	RETAINER, THRUST		S303	1-553-226-00	SWITCH, LEAF (POWER)	
169	X-3310-957-1	WHEEL ASSY, CAPSTAN					

SECTION 4

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.

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

- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:

MF: μ F, PF: μ F.

RESISTORS

- All resistors are in ohms.
- F: nonflammable

COILS

- MMH: mH, UH: μ H

SEMICONDUCTORS

In each case, U: μ , for example:

UA....: μ A...., UPA....: μ PA....,

UPC....: μ PC, UPD....: μ PD...

Ref.No.	Part No.	Description			Ref.No.	Part No.	Description			
901	A-3015-918-A	PC BOARD ASSY, AU			C602	1-163-023-00	CERAMIC CHIP 0.015MF	10%	50V	
C101	1-163-139-00	CERAMIC CHIP 820PF	10%	50V	C603	1-163-011-11	CERAMIC CHIP 0.0015MF	10%	50V	
C102	1-163-001-11	CERAMIC CHIP 220PF	10%	50V	C604	1-135-070-00	TANTAL. CHIP 0.1MF	20%	35V	
C103	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V	C605	1-130-483-00	MYLAR 0.01MF	5%	50V	
C104	1-126-607-11	ELECT CHIP 47MF	20%	4V	C606	1-124-779-00	ELECT CHIP 10MF	20%	16V	
C105	1-162-638-11	CERAMIC CHIP 1MF		16V	C607	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V	
C106	1-163-019-00	CERAMIC CHIP 0.0068MF	10%	50V	C608	1-135-091-00	TANTAL. CHIP 1MF	10%	16V	
C107	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V	C609	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V	
C108	1-135-087-21	TANTAL. CHIP 0.68MF	10%	20V	C610	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V	
C109	1-163-989-11	CERAMIC CHIP 0.033MF	5%	25V	C611	1-164-232-11	CERAMIC CHIP 0.01MF	10%	50V	
C110	1-163-017-00	CERAMIC CHIP 0.0047MF	5%	50V	C612	1-130-489-00	MYLAR 0.033MF	5%	50V	
C111	1-162-638-11	CERAMIC CHIP 1MF		16V	CN301	*1-566-935-11	HOUSING, CONNECTOR 3P			
C112	1-126-246-11	ELECT CHIP 220MF	20%	4V	D301	8-719-812-41	DIODE TL124			
C113	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	D302	8-719-404-46	DIODE MA110			
C114	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	HP901	1-543-481-11	HEAD, MAGNETIC (PLAY BACK)			
C201	1-163-139-00	CERAMIC CHIP 820PF	10%	50V	IC301	8-759-820-19	IC LA4570M			
C202	1-163-001-11	CERAMIC CHIP 220PF	10%	50V	IC302	8-759-701-07	IC NJM2063AM			
C203	1-163-037-11	CERAMIC CHIP 0.022MF	10%	25V	IC601	8-759-909-45	IC CX20084			
C204	1-126-607-11	ELECT CHIP 47MF	20%	4V	J301	8-954-799-00	JACK, OUTER POWER (DC IN 3V)			
C205	1-162-638-11	CERAMIC CHIP 1MF		16V	J302	8-759-800-11	JACK (HEADPHONES)			
C206	1-163-019-00	CERAMIC CHIP 0.0068MF	10%	50V	M901	8-835-277-01	MOTOR, DC MNR-1603A			
C207	1-163-809-11	CERAMIC CHIP 0.047MF	10%	25V	Q301	8-729-807-87	TRANSISTOR 2SB1295-UL6			
C208	1-135-087-21	TANTAL. CHIP 0.68MF	10%	20V	Q302	8-729-903-10	TRANSISTOR FMM			
C209	1-163-989-11	CERAMIC CHIP 0.033MF	5%	25V	Q303	8-729-422-36	TRANSISTOR 2SB709A-Q			
C210	1-163-017-00	CERAMIC CHIP 0.0047MF	5%	50V	Q601	8-729-101-07	TRANSISTOR 2SB798-DL			
C211	1-162-638-11	CERAMIC CHIP 1MF		16V	R101	1-216-029-00	METAL GLAZE 150 5%	1/10W		
C212	1-126-246-11	ELECT CHIP 220MF	20%	4V	R102	1-216-101-00	METAL GLAZE 150K 5%	1/10W		
C213	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	R103	1-216-067-00	METAL GLAZE 5.6K 5%	1/10W		
C214	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	R104	1-216-070-00	METAL GLAZE 7.5K 5%	1/10W		
C301	1-126-209-11	ELECT CHIP 100MF	20%	4V	R105	1-216-112-00	METAL GLAZE 430K 5%	1/10W		
C302	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	R106	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W		
C303	1-126-246-11	ELECT CHIP 220MF	20%	4V	R107	1-216-089-00	METAL GLAZE 47K 5%	1/10W		
C304	1-135-091-00	TANTAL. CHIP 1MF	10%	16V	R108	1-216-073-00	METAL GLAZE 10K 5%	1/10W		
C305	1-126-246-11	ELECT CHIP 220MF	20%	4V	R109	1-216-093-00	METAL GLAZE 68K 5%	1/10W		
C306	1-126-607-11	ELECT CHIP 47MF	20%	4V	R110	1-216-298-00	METAL GLAZE 2.2 5%	1/10W		
C308	1-126-246-11	ELECT CHIP 220MF	20%	4V	R111	1-216-049-00	METAL GLAZE 1K 5%	1/10W		
C309	1-126-603-11	ELECT CHIP 4.7MF	20%	35V	R201	1-216-029-00	METAL GLAZE 150 5%	1/10W		
C310	1-163-038-00	CERAMIC CHIP 0.1MF		25V	R202	1-216-101-00	METAL GLAZE 150K 5%	1/10W		
C311	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	R203	1-216-067-00	METAL GLAZE 5.6K 5%	1/10W		
C312	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	R204	1-216-070-00	METAL GLAZE 7.5K 5%	1/10W		
C313	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	R205	1-216-112-00	METAL GLAZE 430K 5%	1/10W		
C314	1-163-009-11	CERAMIC CHIP 0.001MF	10%	50V	R206	1-216-061-00	METAL GLAZE 3.3K 5%	1/10W		
C601	1-163-038-00	CERAMIC CHIP 0.1MF		25V	R207	1-216-089-00	METAL GLAZE 47K 5%	1/10W		

Ref.No.	Part No.	Description			
R208	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R209	1-216-093-00	METAL GLAZE	68K	5%	1/10W
R210	1-216-298-00	METAL GLAZE	2.2	5%	1/10W
R211	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R301	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R302	1-216-005-00	METAL GLAZE	15	5%	1/10W
R303	1-216-037-00	METAL GLAZE	330	5%	1/10W
R304	1-216-051-00	METAL GLAZE	1.2K	5%	1/10W
R305	1-216-129-00	METAL GLAZE	2.2M	5%	1/10W
R306	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R307	1-216-037-00	METAL GLAZE	330	5%	1/10W
R308	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R309	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R601	1-216-092-00	METAL GLAZE	62K	5%	1/10W
R602	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R603	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R604	1-216-105-00	METAL GLAZE	220K	5%	1/10W
R605	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R606	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R607	1-216-091-00	METAL GLAZE	56K	5%	1/10W
R608	1-216-073-00	METAL GLAZE	10K	5%	1/10W
RV301	1-237-872-21	RES, VAR, CARBON 10K/10K (VOL)			
RV601	1-237-005-11	RES, ADJ, METAL GLAZE 22K (SPEED)			
S301	1-571-277-11	SWITCH, SLIDE (TAPE)			
S302	1-571-275-11	SWITCH, SLIDE (DOLBY NR)			
S303	1-553-226-00	SWITCH, LEAF (POWER)			
S304	1-572-287-21	SWITCH, PUSH			

ACCESSORY & PACKING MATERIAL

*3-362-045-01	CUSHION (UPPER)
*3-362-046-01	CUSHION (LOWER)
*3-362-044-01	INDIVIDUAL CARTON
3-363-048-01	CASE, CARRYING
3-570-631-61	BAG, POLYETHYLENE
3-752-292-11	MANUAL, INSTRUCTION
8-952-260-92	HEADPHONE MDR-W10L/K SET

