

WM-EX190/EX192

SERVICE MANUAL

Ver 1.0 2000.01



Photo : WM-EX192

US Model
Canadian Model
WM-EX190

AEP Model
E Model
Chinese Model
WM-EX190/192

Model Name Using Similar Mechanism	NEW
Tape Transport Mechanism Type	MT-WMEX192-114

SPECIFICATIONS

- **Power requirements**
3V DC batteries R6 (AA) × 2
- **Dimensions**
82 × 111.5 × 34.5 mm
(w / h / d) incl. projecting parts and controls
- **Mass**
Approx. 115 g / Approx. 190 g incl.
batteries and a cassette
- **Supplied accessories**
Stereo headphones or Stereo earphones (1) / Belt clip (1)

Design and specifications are subject to change without notice.

CASSETTE PLAYER

SONY®



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Flexible Circuit Board Repairing

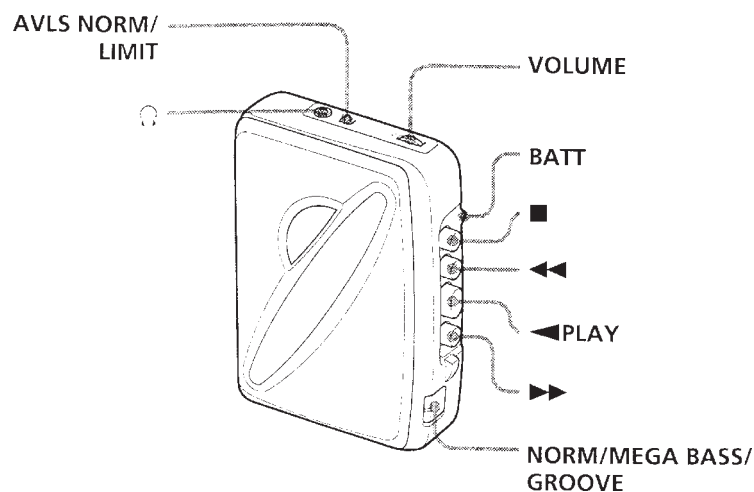
- Keep the temperature of the soldering iron around 270° C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

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.

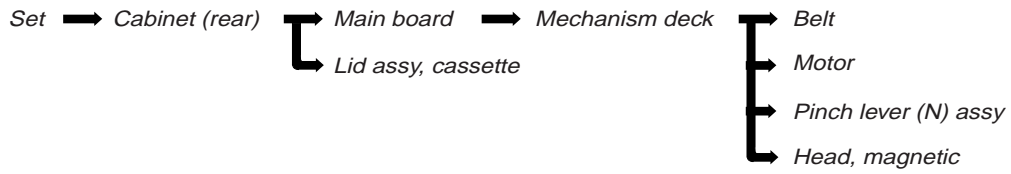
SECTION 1 GENERAL

This section is extracted from instruction manual.



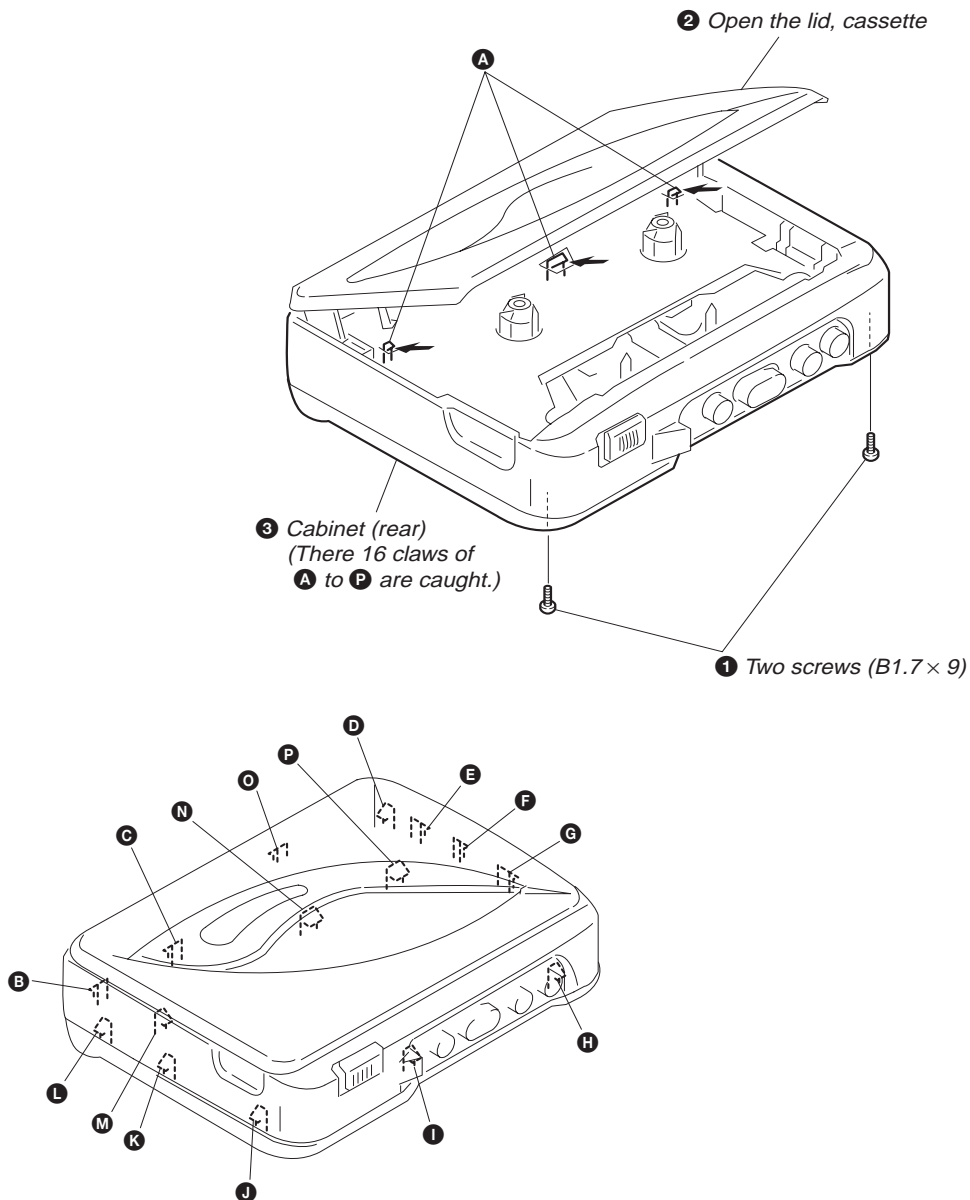
SECTION 2 DISASSEMBLY

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

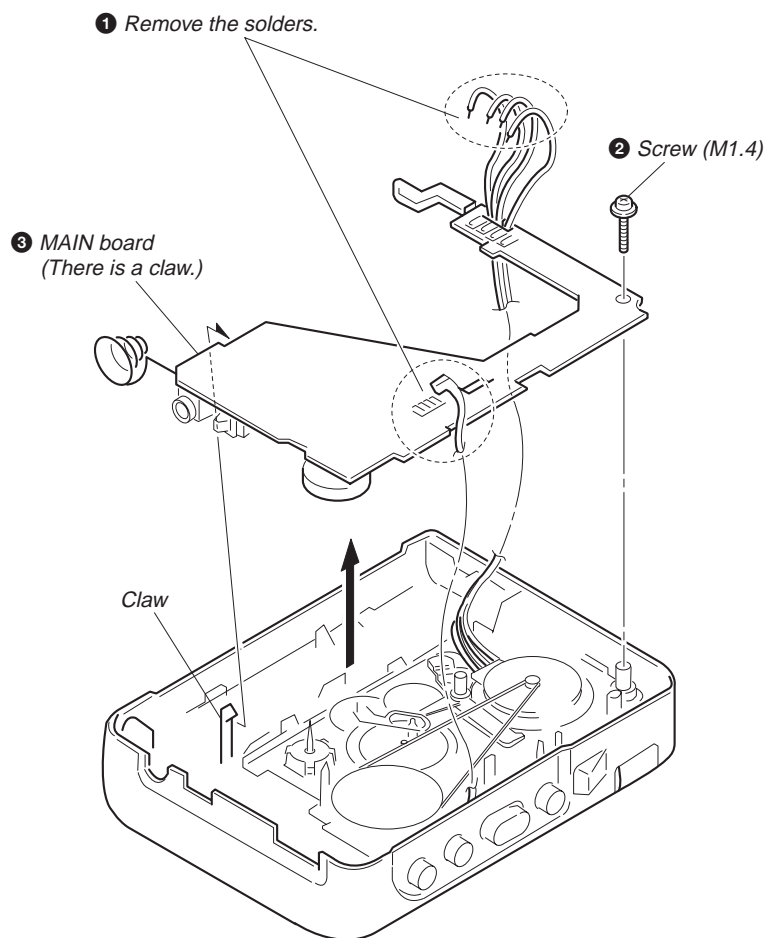


Note : Follow the disassembly procedure in the numerical order given.

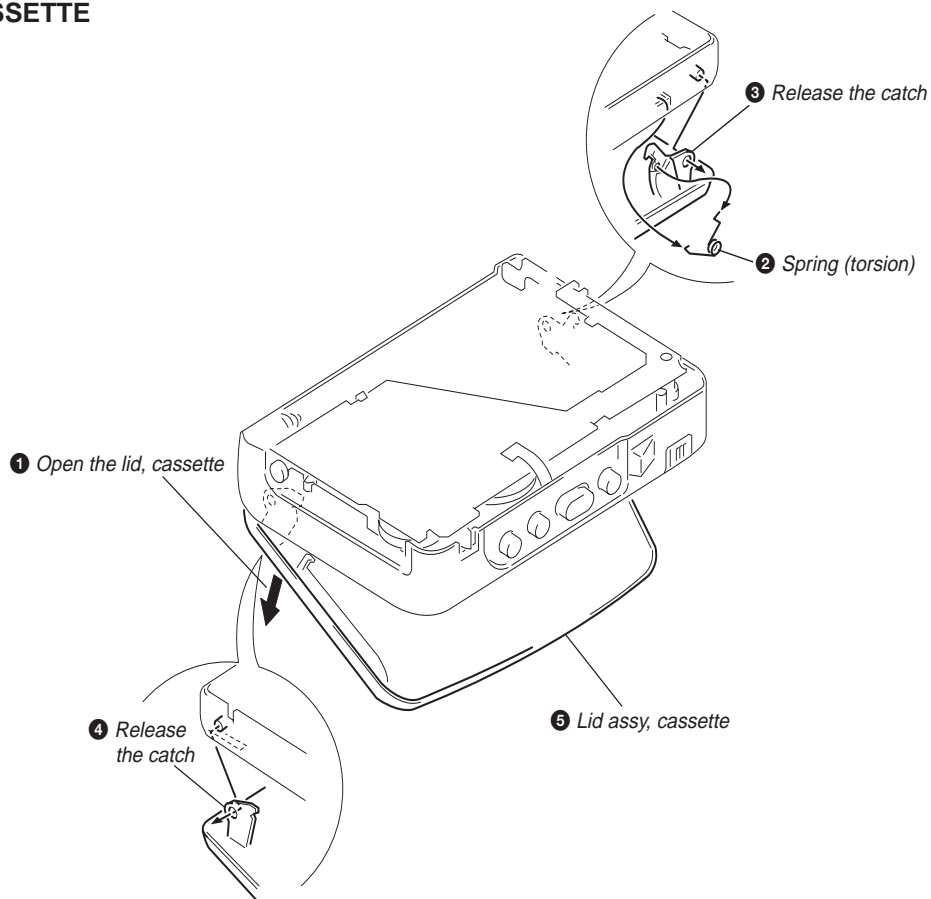
2-1. CABINET (REAR)



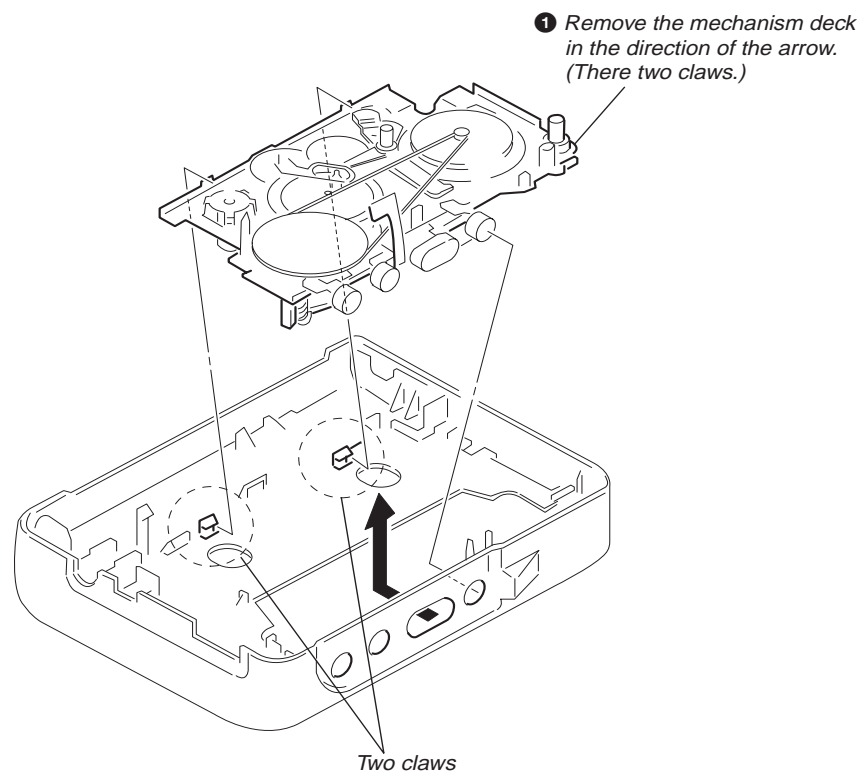
2-2. MAIN BOARD



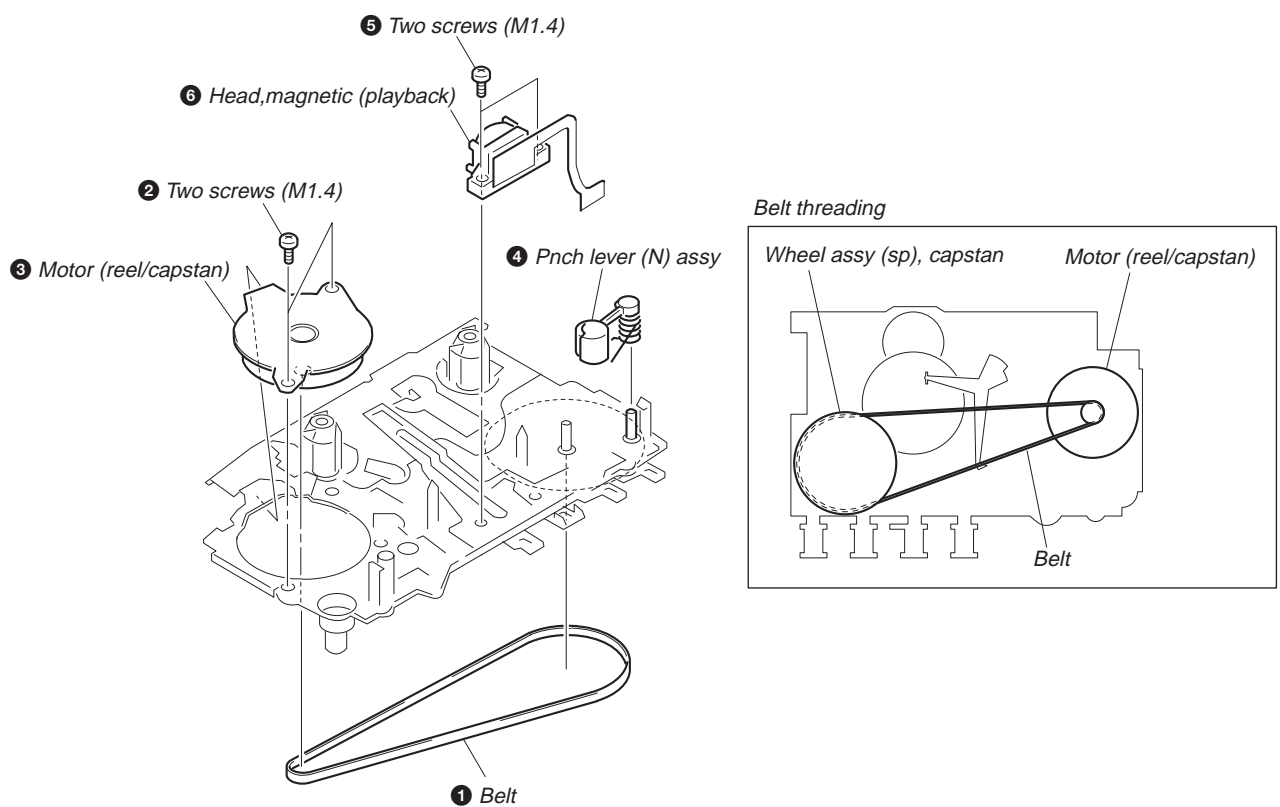
2-3. LID ASSY, CASSETTE



2-4. MECHANISM DECK



2-5. BELT, MOTOR, PINCH LEVER (N) ASSY, "HEAD, MAGNETIC"



SECTION 3 MECHANICAL ADJUSTMENTS

PRECAUTION

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

playback head	pinch roller
capstan	rubber belt
- Demagnetize the playback head with a head demagnetizer.
- The adjustments should be performed with the rated power supply voltage (3.0 V) unless otherwise noted.

Torque Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-102C	20 – 30 g • cm (0.28 – 0.42 oz • inch)
FWD back tension		less than 2 g • cm (less than 0.03 oz • inch)
FF, REW	CQ-201B	more than 40 g • cm (more than 0.56 oz • inch)

SECTION 4 ELECTRICAL ADJUSTMENT

PRECAUTION

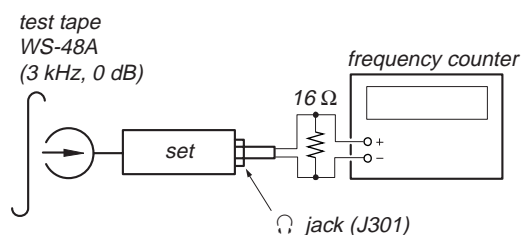
- Supplied voltage : 3.0 V
- Switch position
 - AVLS switch : NORM
 - MEGA BASS switch : OFF/NORM

Test tape

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

Tape Speed Adjustment

Procedure :



- Playback WS-48A (tape center part) in the REV state and adjust RV601 so that the frequency counter reading becomes 3,000 Hz.

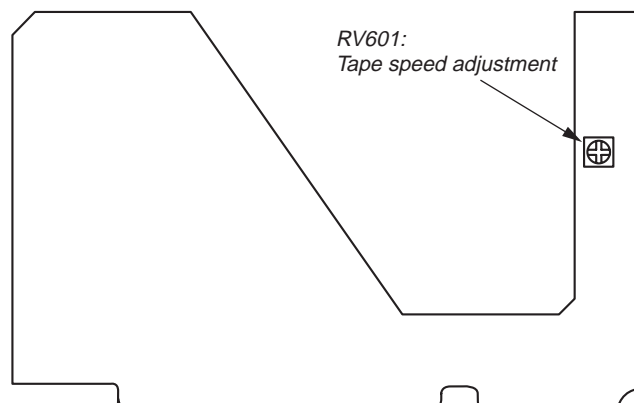
Specification Value :

Digital frequency counter
2,985 to 3,015 Hz

- Playback WS-48A (tape counter part) in the FWD state. Check that frequency counter reading is within 1.5% of reading of step 1.

Adjustment Location :

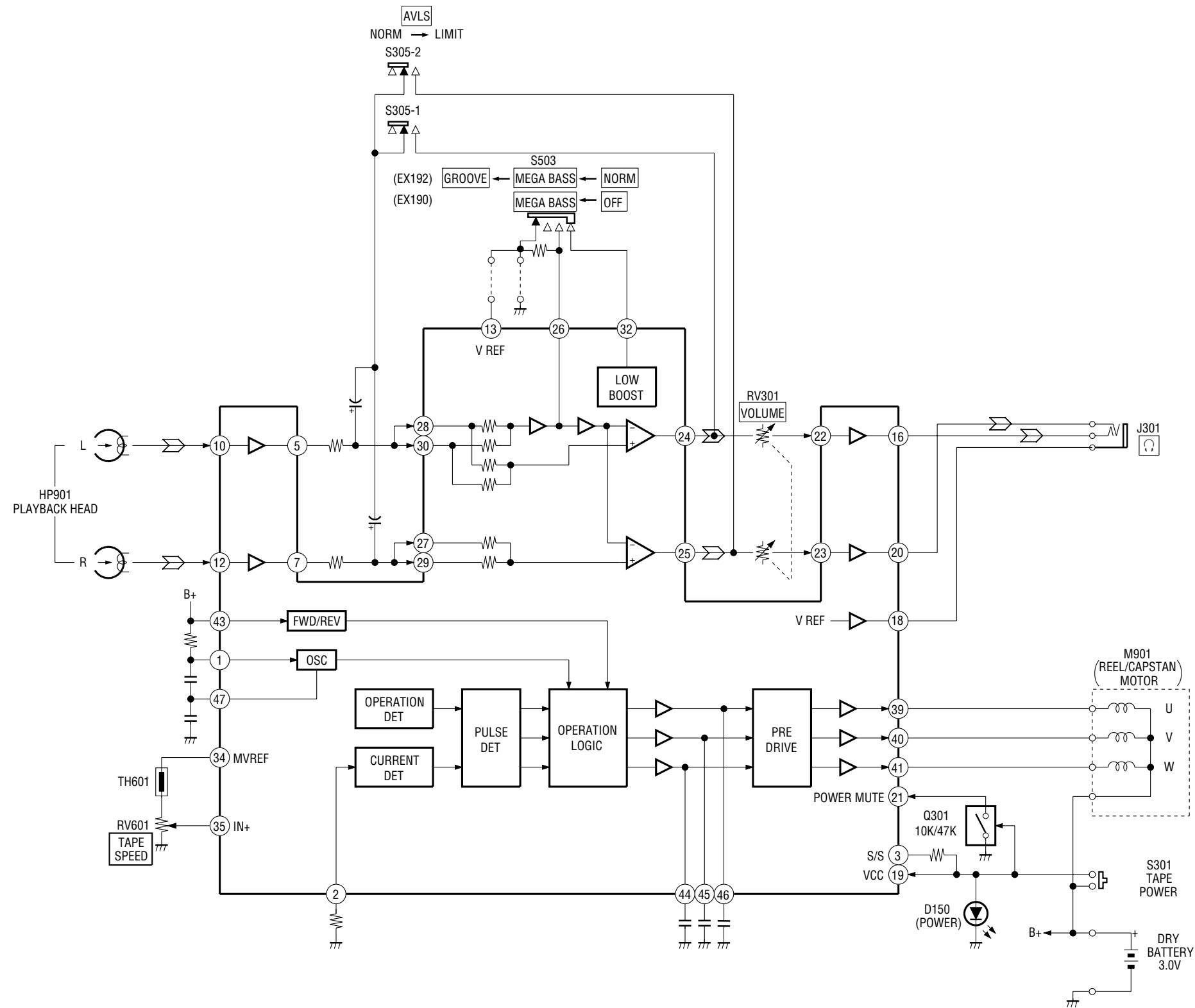
[MAIN BOARD]



SECTION 5

DIAGRAMS

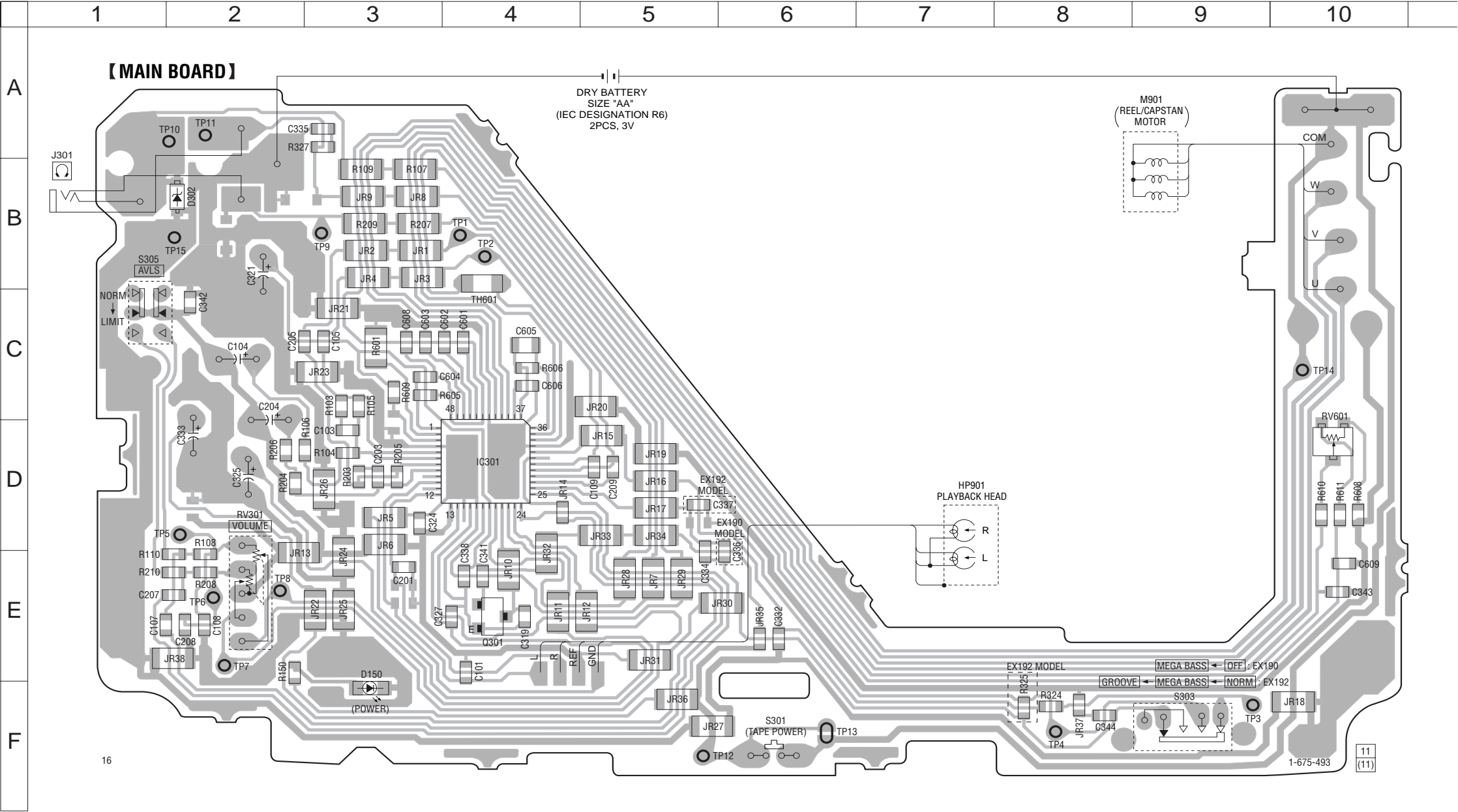
5-1. BLOCK DIAGRAM



- Signal path.
 : PB

• Semiconductor Location

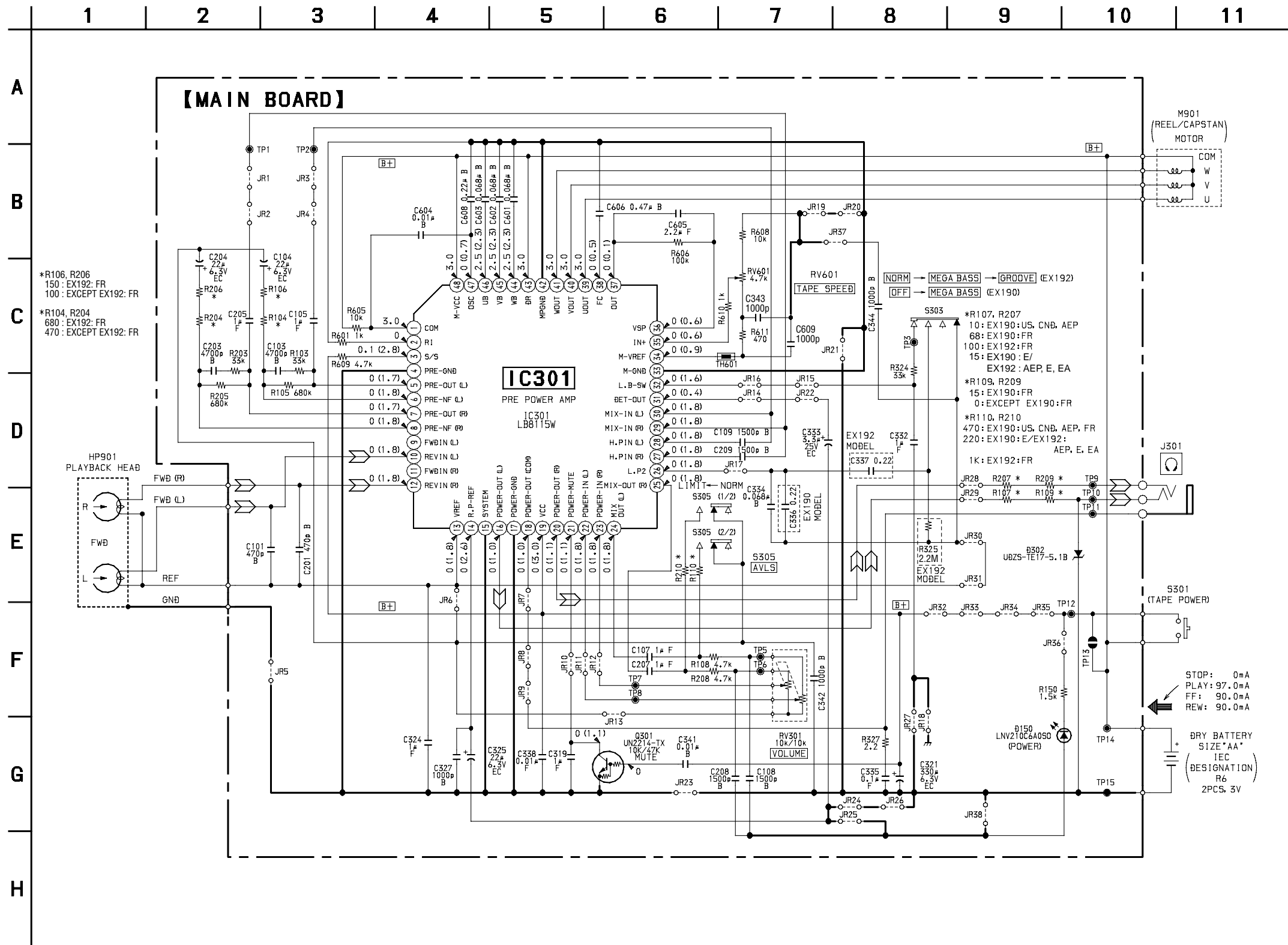
Ref. No.	Location
D150	F-3
D302	B-2
IC301	D-4
Q301	E-4



Note on Printed Wiring Board:

- : parts extracted from the component side.
- : Pattern from the side which enables seeing.

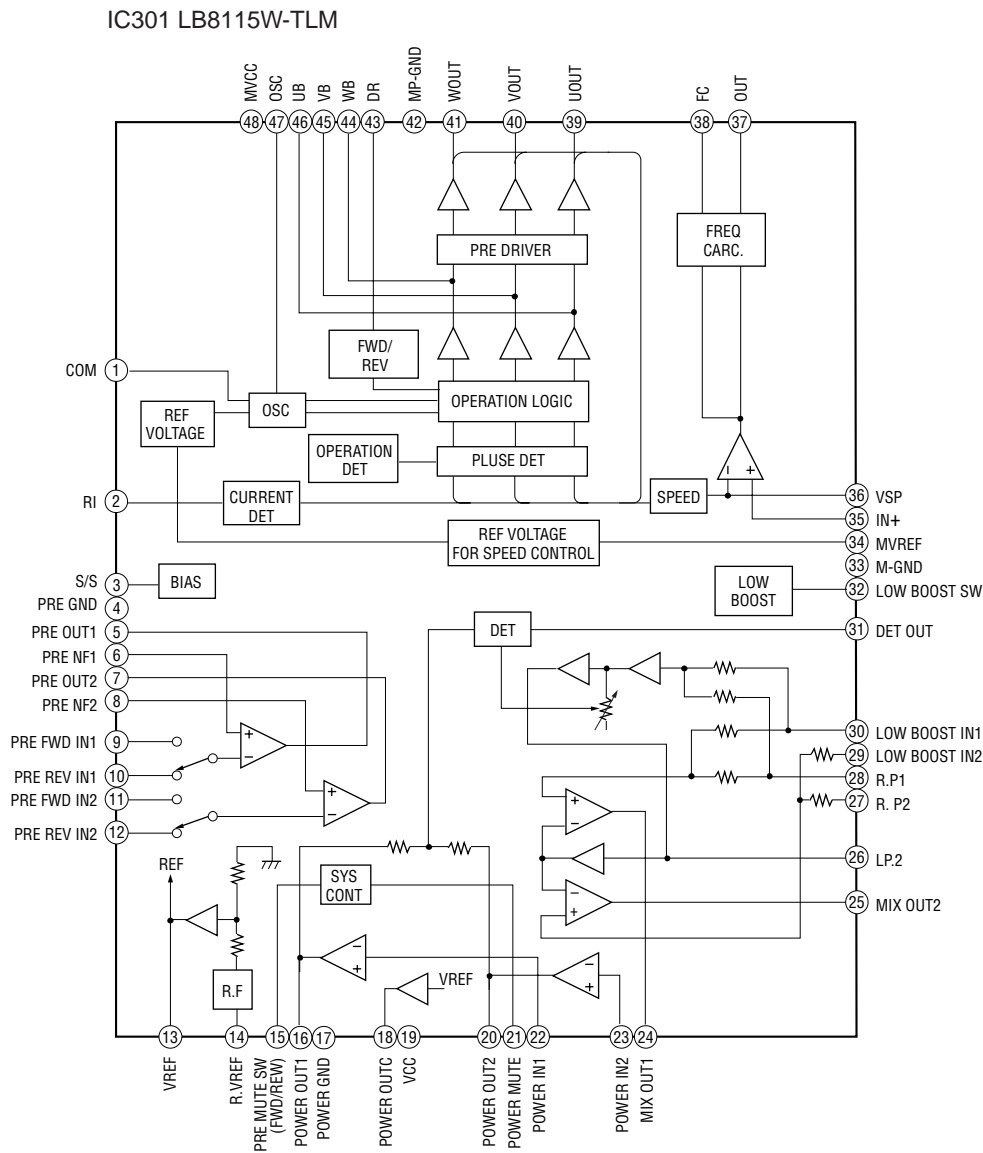
5-3. SCHEMATIC DIAGRAM • Refer to page 13 for IC Block Diagram.



Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF : μpF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $1/4\text{ W}$ or less unless otherwise specified.
- % : indicates tolerance.
- [] : panel designation.
- B+ : B+ Line.
- [] : adjustment for repair.
- Total current is measured with no cassette installed.
- Power voltage is dc V and fed with regulated dc power supply from external power voltage jack.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark : STOP
- () :PLAY
- Voltages are taken with a VOM (Input impedance $10\text{ M}\Omega$). Voltage variations may be noted due to normal production tolerances.
- Signal path.
- Abbreviation
- CND : Canadian model
- FR : French model
- EA : Saudi Arabia model

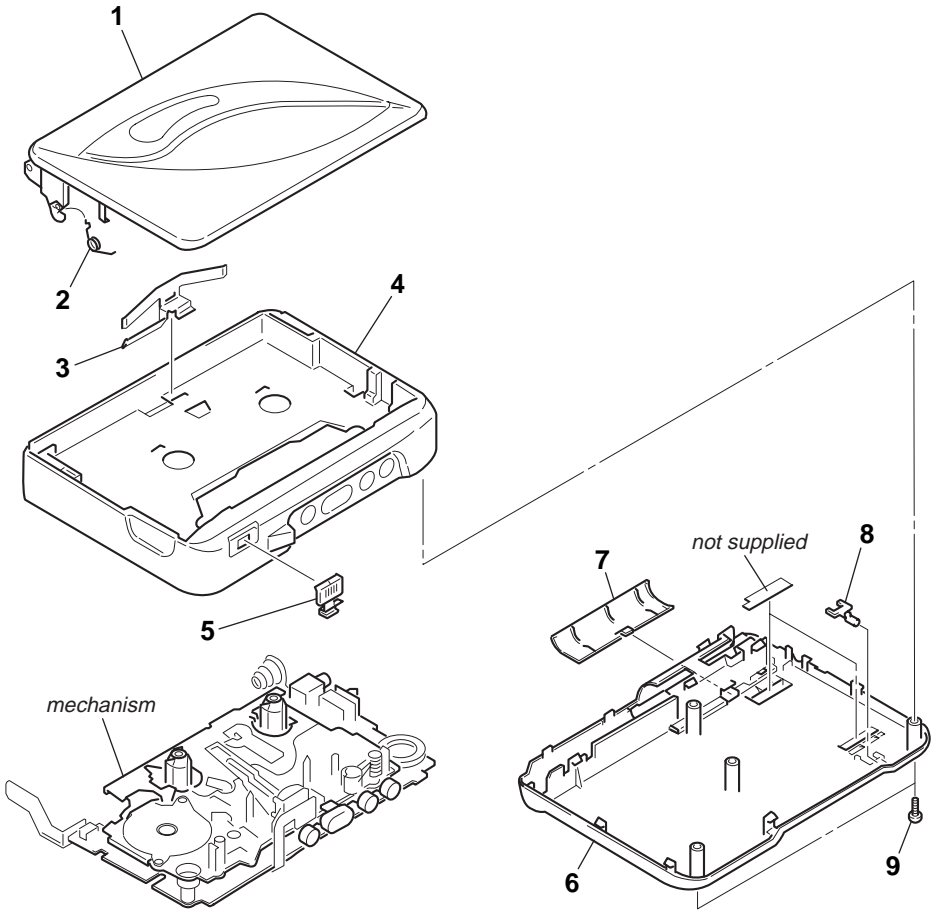
5-4. IC BLOCK DIAGRAM



SECTION 6
EXPLODED VIEWS

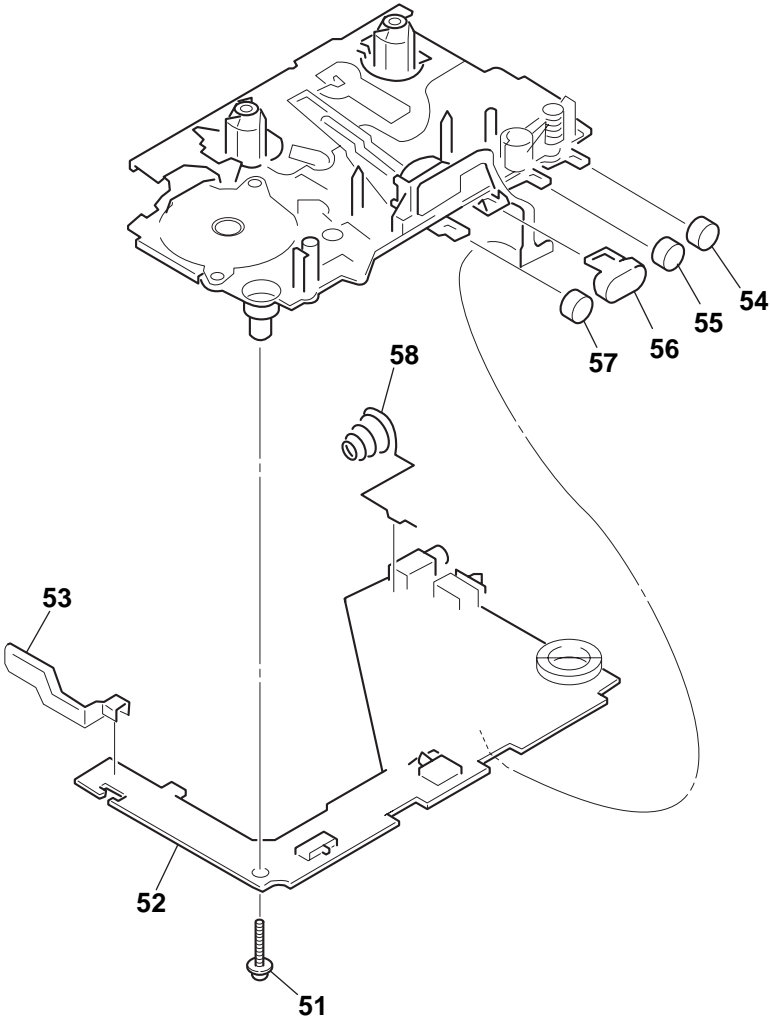
- NOTE:
- -XX, -X mean standardized parts, so they may have some differences from the original one.
 - Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
 - The mechanical parts with no reference number in the exploded views are not supplied.
 - Abbreviation
CND : Canadian model
FR : French model
EA : Saudi Arabia model
 - Color Indication of Appearance Parts
Example:
KNOB, BALANCE (WHITE) . . . (RED)
Parts of Color Cabinet's Color

6-1. CABINET SECTION



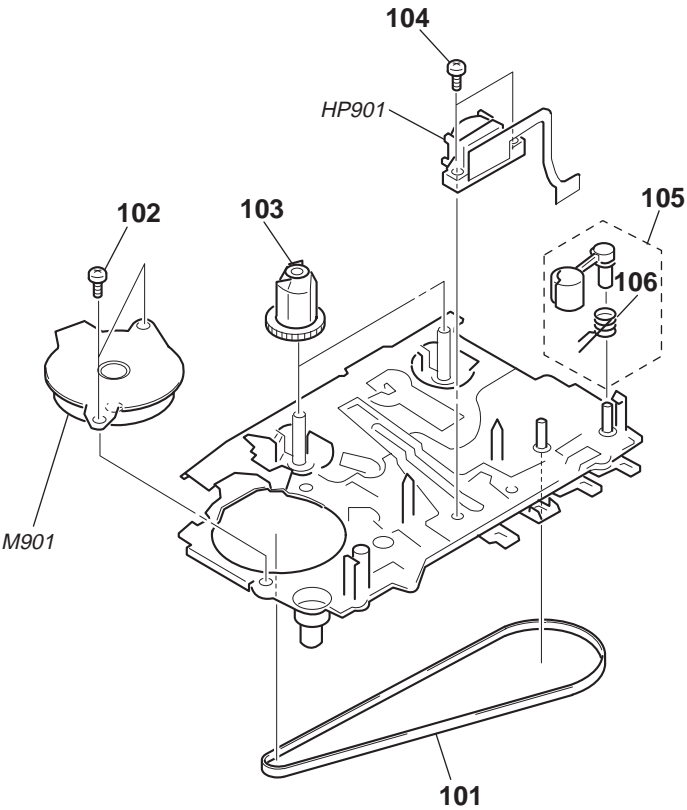
Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
1	X-3378-625-1	LID ASSY, CASSETTE (GRAY)(EX190)		4	3-040-908-01	CABINET (FRONT)(EX190)	
1	X-3378-626-1	LID ASSY, CASSETTE (BLUE)(EX190)		4	3-040-908-11	CABINET (FRONT)(EX192)	
1	X-3378-627-1	LID ASSY, CASSETTE (GREEN)(EX190)		5	3-040-911-01	KNOB(MEGA BASS) (EX190)	
1	3-040-914-01	LID,CASSETTE (GOLD)(EX192)		5	3-040-915-01	KNOB(GROOVE) (EX192)	
1	3-040-914-11	LID,CASSETTE (BLACK)(EX192)		6	3-040-909-01	CABINET (REAR)	
				7	3-040-910-01	LID,BATTERY CASE	
1	3-040-914-21	LID,CASSETTE (BLUE)(EX192)					
2	3-019-949-01	SPRING (TORSION)		8	3-022-346-01	LENS	
3	3-041-234-01	SPRING (CASSETTE)		9	3-318-203-92	SCREW(B1.7X9), TAPPING	

6-2. MAIN BOARD SECTION



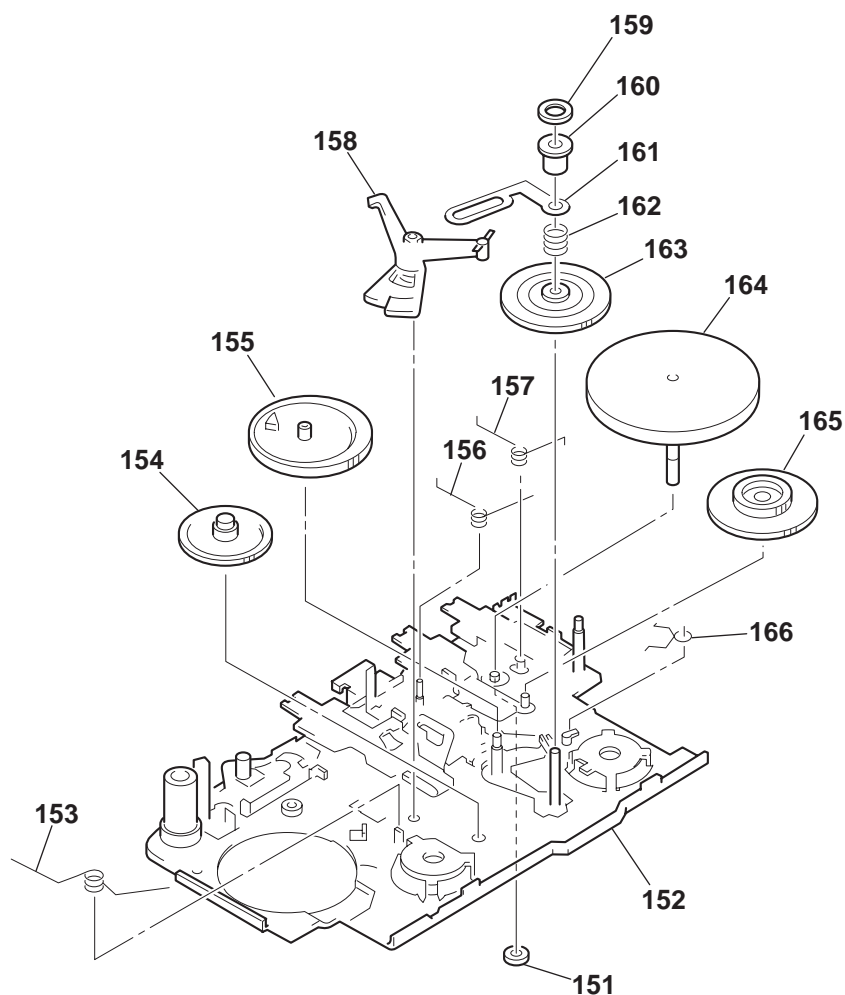
Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
51	3-703-816-73	SCREW (M1.4), SPECIAL HEAD		53	3-040-912-01	TERMINAL (+), BATTERY	
52	A-3021-303-A	MAIN BOARD, COMPLETE (EX190:FR)		54	3-019-944-01	BUTTON (STOP)	
52	A-3021-304-A	MAIN BOARD, COMPLETE (EX190:US,CND,AEP)		55	3-019-943-01	BUTTON (REW)	
52	A-3021-305-A	MAIN BOARD, COMPLETE (EX190:E)		56	3-019-941-01	BUTTON (PLAY)	
52	A-3021-306-A	MAIN BOARD, COMPLETE (EX192:AEP,E,EA)		57	3-019-942-01	BUTTON (FF)	
52	A-3021-307-A	MAIN BOARD, COMPLETE (EX192:FR)		58	3-040-913-01	TERMINAL (-), BATTERY	

6-3. MECHANISM SECTION-1



<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>
101	3-013-560-11	BELT		105	X-3369-749-1	PINCH LEVER (N) ASSY	
102	3-703-816-07	SCREW (M1.4), SPECIAL HEAD		106	3-920-996-01	SPRING (PINCH N)	
103	3-019-776-01	GEER (REEL-S)		M901	1-763-073-11	MOTOR (REEL/CAPSTAN)(WITH PULLY)	
104	3-703-816-73	SCREW (M1.4), SPECIAL HEAD		HP901	1-500-640-11	HEAD, MAGNETIC (PLAYBACK)	

6-4. MECHANISM SECTION-2



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
151	3-921-797-01	WASHER		159	3-728-091-01	WASHER, STOPPER	
152	X-3378-363-1	CHASSIS ASSY (GL/O-99)		160	3-019-778-01	SLEEVE (MS)	
153	3-938-628-11	SPRING (PLAY-CP)		161	3-921-335-03	WASHER, LEVER	
154	3-019-773-01	GEAR (AS)		162	3-920-990-02	SPRING (UD), COMPRESSION	
155	X-3374-598-1	CLUTCH ASSY (S)		163	3-019-774-01	GEAR (BS)	
156	3-022-093-01	SPRING (FR-S)		164	X-3372-558-1	WHEEL ASSY (SP), CAPSTAN	
157	3-022-094-01	SPRING (STOP-S)		165	3-019-775-01	GEAR (DS)	
158	3-019-777-03	LEVER (OWS), DETECTION		166	3-036-664-01	SPRING (FR LEVER OWN)	

SECTION 7 ELECTRICAL PARTS LIST

NOTE:

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

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.

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

CAPACITORS:

uF: μ F

RESISTORS

All resistors are in ohms.

METAL: metal-film resistor

METAL OXIDE: Metal Oxide-film resistor

F: nonflammable

COILS

uH: μ H

SEMICONDUCTORS

In each case, u: μ , for example:uA...: μ A..., uPA..., μ PA...,uPB..., μ PB..., uPC..., μ PC...,uPD..., μ PD...

Abbreviation

CND : Canadian model

FR : French model

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
	A-3021-304-A	MAIN BOARD, COMPLETE (EX190:US,CND,AEP) *****		C606	1-125-891-11	CERAMIC CHIP 0.47uF 10.00% 10V	
	A-3021-305-A	MAIN BOARD, COMPLETE (EX190:E) *****		C608	1-115-467-11	CERAMIC CHIP 0.22uF 10.00% 10V	
	A-3021-303-A	MAIN BOARD, COMPLETE (EX190:FR) *****		C609	1-162-964-11	CERAMIC CHIP 0.001uF 10.% 50V	
	A-3021-306-A	MAIN BOARD, COMPLETE (EX192:AEP,E,EA) *****				< DIODE >	
	A-3021-307-A	MAIN BOARD, COMPLETE (EX192:FR) *****		D150	8-719-074-20	LED LNV210C6A0SO (POWER)	
				D302	8-719-069-54	DIODE UDZS-TE17-5.1B	
						< IC >	
3-040-912-01	TERMINAL (+), BATTERY			IC301	8-759-574-69	IC LB8115W-TLM	
3-040-913-01	TERMINAL (-), BATTERY					< JACK >	
		< CAPACITOR >				< JUMPER RESISTOR >	
C101	1-162-962-11	CERAMIC CHIP 470PF 10% 50V		J301	1-565-287-11	JACK (HEADPHONES)	
C103	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V					
C104	1-126-153-11	ELECT 22uF 20% 6.3V					
C105	1-115-156-11	CERAMIC CHIP 1uF 10V		JR1	1-216-296-91	SHORT 0	
C107	1-115-156-11	CERAMIC CHIP 1uF 10V		JR2	1-216-296-91	SHORT 0	
				JR3	1-216-296-91	SHORT 0	
C108	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V		JR4	1-216-296-91	SHORT 0	
C109	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V		JR5	1-216-296-91	SHORT 0	
C201	1-162-962-11	CERAMIC CHIP 470PF 10% 50V					
C203	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V		JR6	1-216-296-91	SHORT 0	
C204	1-126-153-11	ELECT 22uF 20% 6.3V		JR7	1-216-296-91	SHORT 0	
				JR8	1-216-296-91	SHORT 0	
C205	1-115-156-11	CERAMIC CHIP 1uF 10V		JR9	1-216-296-91	SHORT 0	
C207	1-115-156-11	CERAMIC CHIP 1uF 10V		JR10	1-216-296-91	SHORT 0	
C208	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V					
C209	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V		JR11	1-216-296-91	SHORT 0	
C319	1-115-156-11	CERAMIC CHIP 1uF 10V		JR12	1-216-296-91	SHORT 0	
				JR13	1-216-296-91	SHORT 0	
C321	1-128-057-11	ELECT 330uF 20.00% 6.3V		JR14	1-216-864-11	METAL CHIP 0 5% 1/16W	
C324	1-115-156-11	CERAMIC CHIP 1uF 10V		JR15	1-216-296-91	SHORT 0	
C325	1-126-153-11	ELECT 22uF 20% 6.3V					
C327	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V		JR16	1-216-296-91	SHORT 0	
C332	1-115-156-11	CERAMIC CHIP 1uF 10V		JR17	1-216-296-91	SHORT 0	
				JR18	1-216-296-91	SHORT 0	
C333	1-126-162-11	ELECT 3.3uF 20% 50V		JR19	1-216-296-91	SHORT 0	
C334	1-110-563-11	CERAMIC CHIP 0.068uF 10.00% 16V		JR20	1-216-296-91	SHORT 0	
C335	1-164-156-11	CERAMIC CHIP 0.1uF 25V					
C336	1-115-467-11	CERAMIC CHIP 0.22uF 10.00% 10V		JR21	1-216-296-91	SHORT 0	
		(EX190)		JR22	1-216-296-91	SHORT 0	
C337	1-115-467-11	CERAMIC CHIP 0.22uF 10.00% 10V		JR23	1-216-296-91	SHORT 0	
		(EX192)		JR24	1-216-296-91	SHORT 0	
				JR25	1-216-296-91	SHORT 0	
C338	1-162-974-11	CERAMIC CHIP 0.01uF 50V					
C341	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V		JR26	1-216-296-91	SHORT 0	
C342	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V		JR27	1-216-296-91	SHORT 0	
C343	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V		JR28	1-216-296-91	SHORT 0	
C344	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V		JR29	1-216-296-91	SHORT 0	
				JR30	1-216-296-91	SHORT 0	
C601	1-110-563-11	CERAMIC CHIP 0.068uF 10.00% 16V					
C602	1-110-563-11	CERAMIC CHIP 0.068uF 10.00% 16V		JR31	1-216-296-91	SHORT 0	
C603	1-110-563-11	CERAMIC CHIP 0.068uF 10.00% 16V					
C604	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V					
C605	1-164-505-11	CERAMIC CHIP 2.2uF 16V					

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
JR32	1-216-296-91	SHORT	0	R210	1-216-813-11	RES-CHIP	220 5% 1/16W (EX190:E/EX192:AEP,E,EA)
JR33	1-216-296-91	SHORT	0	R210	1-216-821-11	RES-CHIP	1K 5% 1/16W (EX192:FR)
JR34	1-216-296-91	SHORT	0	R210	1-216-817-11	RES-CHIP	470 5% 1/16W (EX190:US,CND,AEP,FR)
JR35	1-216-296-91	SHORT	0	R324	1-216-839-91	RES-CHIP	33K 5% 1/16W
JR36	1-216-296-91	SHORT	0	R325	1-216-861-91	RES-CHIP	2.2M 5% 1/16W (EX192)
JR37	1-216-864-11	METAL CHIP	0 5% 1/16W				
JR38	1-216-296-91	SHORT	0				
< TRANSISTOR >							
Q301	8-729-900-52	TRANSISTOR	DTC114YK	R327	1-216-789-11	RES-CHIP	2.2 5% 1/16W
< RESISTOR >				R601	1-216-198-91	RES-CHIP	1K 5% 1/8W
R103	1-216-839-11	RES-CHIP	33K 5% 1/16W	R605	1-216-833-91	RES-CHIP	10K 5% 1/16W
R104	1-216-817-11	RES-CHIP	470 5% 1/16W (EXCEPT EX192:FR)	R606	1-216-845-11	RES-CHIP	100K 5% 1/16W
R104	1-216-819-11	RES-CHIP	680 5% 1/16W (EX192:FR)	R608	1-216-833-91	RES-CHIP	10K 5% 1/16W
R105	1-216-855-11	RES-CHIP	680K 5% 1/16W	R609	1-216-829-11	RES-CHIP	4.7K 5% 1/16W
R106	1-216-809-11	RES-CHIP	100 5% 1/16W (EXCEPT EX192:FR)	R610	1-216-821-11	RES-CHIP	1K 5% 1/16W
				R611	1-216-817-11	RES-CHIP	470 5% 1/16W
R106	1-216-811-11	RES-CHIP	150 5% 1/16W (EX192:FR)	< VARIABLE RESISTOR >			
R107	1-216-170-00	RES-CHIP	68 5% 1/8W (EX190:FR)	RV301	1-225-544-21	RES, VAR, CARBON 10K/10K (VOLUME)	
R107	1-216-150-91	RES-CHIP	10 5% 1/8W (EX190:US,CND,AEP)	RV601	1-238-663-11	RES, ADJ, CARBON 4.7K	
R107	1-216-154-91	RES-CHIP	15 5% 1/8W (EX190:E/EX192:AEP,E,EA)	< SWITCH >			
R107	1-216-174-00	RES-CHIP	100 5% 1/8W (EX192:FR)	S301	1-762-302-11	SWITCH, DETECTION (SMALL TYPE)(TAPE POWER)	
R108	1-216-829-11	METAL CHIP	4.7K 5% 1/16W	S303	1-771-824-11	SWITCH, SLIDE (MEGA BASS)	
R109	1-216-154-91	RES-CHIP	15 5% 1/8W (EX190:FR)	S305	1-692-298-11	SWITCH, SLIDE (AVLS)	
R109	1-216-296-91	SHORT	(EXCEPT EX190:FR)	< THERMISTOR >			
R110	1-216-813-11	RES-CHIP	220 5% 1/16W (EX190:E/EX192:AEP,E,EA)	TH601	1-810-794-11	THERMISTOR, POSITIVE	
R110	1-216-821-11	RES-CHIP	1K 5% 1/16W (EX192:FR)	*****			
R110	1-216-817-11	RES-CHIP	470 5% 1/16W (EX190:US,CND,AEP,FR)	MISCELLANEOUS			
R150	1-216-823-11	RES-CHIP	1.5K 5% 1/16W	*****			
R203	1-216-839-11	RES-CHIP	33K 5% 1/16W	M901	1-763-073-11	MOTOR (REEL/CAPSTAN)(WITH PULLY)	
R204	1-216-817-11	RES-CHIP	470 5% 1/16W (EXCEPT EX192:FR)	HP901	1-500-640-11	HEAD, MAGNETIC (PLAYBACK)	
R204	1-216-819-11	RES-CHIP	680 5% 1/16W (EX192:FR)	*****			
R205	1-216-855-11	METAL CHIP	680K 5% 1/16W	ACCESSORIES & PACKING MATERIALS			
R206	1-216-809-11	RES-CHIP	100 5% 1/16W (EXCEPT EX192:FR)	*****			
R206	1-216-811-11	RES-CHIP	150 5% 1/16W (EX192:FR)	1-505-521-11	HEADPHONE (MDR-023)	(EX190:US,CND,AEP,FR)	
R207	1-216-170-00	RES-CHIP	68 5% 1/8W (EX190:FR)	3-022-755-01	CLIP, BELT		
R207	1-216-150-91	RES-CHIP	10 5% 1/8W (EX190:US,CND,AEP)	3-868-007-11	MANUAL, INSTRUCTION (ENGLISH,FRENCH,SPANISH,PORTUGUESE,GERMAN, ITALIAN,DUTCH,SWEDISH,FINNISH,RUSSIAN, HUNGARIAN,CZECH,POLISH,GREEK,SLOVAK)	(EX190:AEP/EX192:AEP)	
R207	1-216-154-91	RES-CHIP	15 5% 1/8W (EX190:E/EX192:AEP,E,EA)	3-868-007-21	MANUAL, INSTRUCTION (ENGLISH,FRENCH,CHINESE,ARABIC)	(EX190:US,CND,E,FR/EX192:EA,FR)	
R207	1-216-174-00	RES-CHIP	100 5% 1/8W (EX192:FR)	3-868-007-31	MANUAL, INSTRUCTION (ENGLISH,FRENCH,CHINESE,ARABIC)	(EX190:EEX192:E)	
R208	1-216-829-11	RES-CHIP	4.7K 5% 1/16W	8-953-130-90	HEADPHONE MDR-E805LP	(EX190:E/EX192)	
R209	1-216-154-91	RES-CHIP	15 5% 1/8W (EX190:FR)				
R209	1-216-296-91	SHORT	(EXCEPT EX190:FR)				

