

TCS-60DV

SERVICE MANUAL

Ver 1.2 2004.07

*US Model
Canadian Model
AEP Model
E Model*



Model Name Using Similar Mechanism	TCM-50DV
Tape Transport Mechanism Type	MT-50-30

SPECIFICATIONS

Recording system	4-track 2 channel stereo
Tape speed	4.8 cm/s or 2.4 cm/s
Frequency range	250 – 8,000 Hz using nomal (TYPE1) cassette (with REC TIME switch at “NORMAL”)
Speaker	Approx. 3.6 cm (1 ⁷ / ₁₆ in.) dia. ×2
Power output	Speakers : 160 mW + 160 mW (at 10 % harmonic distortion) Headphones : 6 mW + 6 mW (at 10 % harmonic distortion)
Input	Microphone input jack (minijack) sensitivity 0.2 mV for 3 Ω or lower impedance microphone
Output	⌚ (headphones) jack (minijack) for 8 – 300 Ω earphone

Variable range of the tape speed	From approx. +25 % to – 15 % (with REC TIME switch at “NOMAL”)
Power requirements	3 V DC batteries AA (R6) ×2/ External DC 3 V power sources
Dimensions (w/h/d)(incl. projecting parts and controls)	Approx. 88.7 × 113.4 × 41.3 mm (3 ¹ / ₂ × 4 ¹ / ₂ × 1 ¹¹ / ₁₆ inches), incl.
Mass	Approx. 280 g (9.9 oz)

Design and specifications are subject to change without notice

CASSETTE CORDER

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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.

Flexible Circuit Board Repairing

- Keep the temperature of 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.

SECTION 1 SERVICE NOTE

The TCS-60DV detects rotation of both the supply and take-up side reels using the PH701 (photo reflector). Because the PH701 is mounted on the Main board, auto stop is activated and reel rotation cannot be detected when the Main board is removed. To check the operation of mechanism deck and voltage without the Main board, follow the procedure as described below.

How to remove the Main board (opening the Main board)

- 1) Refer to page 5 "3. Disassembly".

How to enter the fast forward/rewind modes

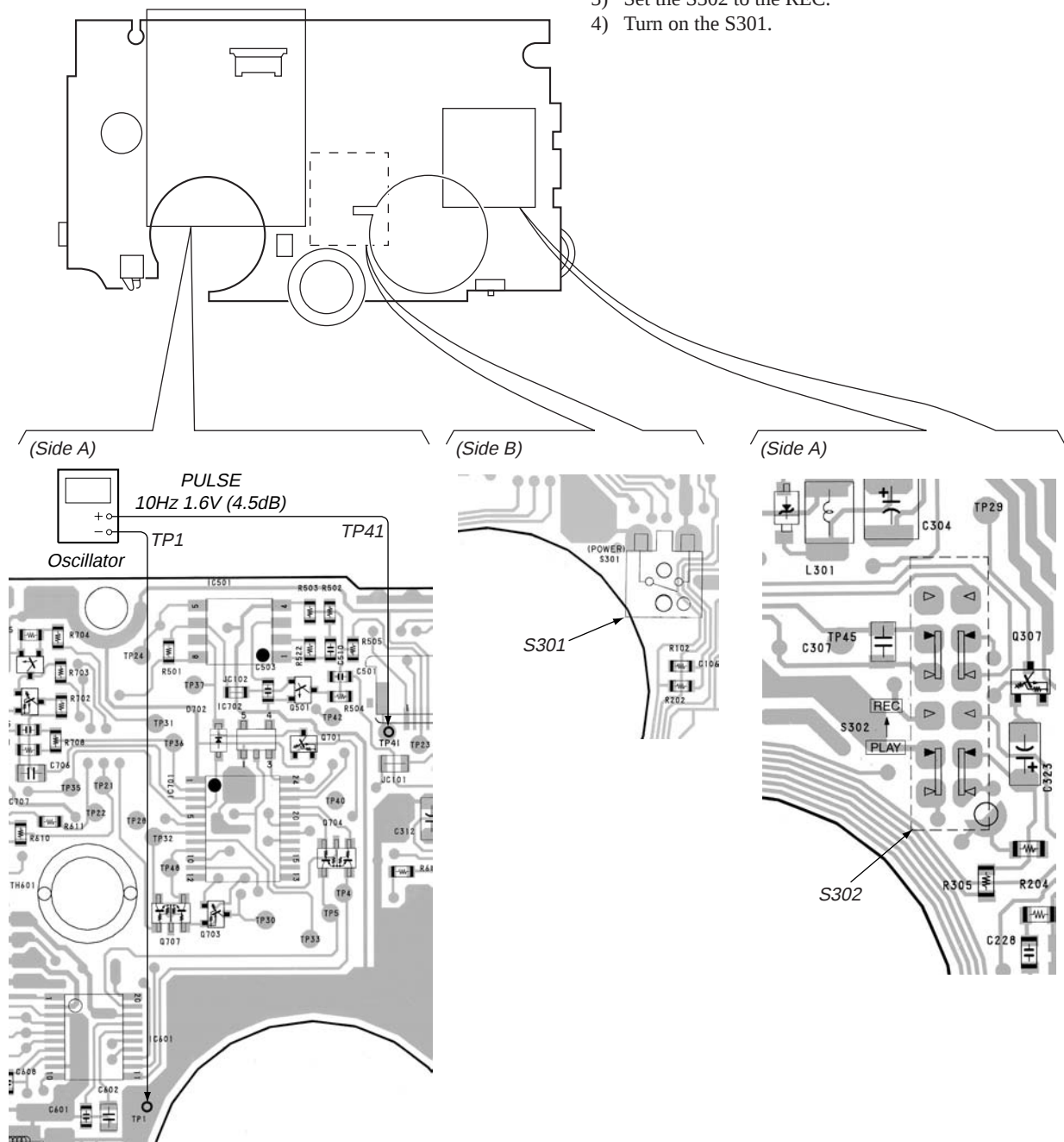
- 1) Input the square wave to the TP41. (Refer to the illustration below.)
- 2) Press the fast forward/rewind keys.
- 3) Turn on the S301.

How to enter the playback mode

- 1) Input the square wave to the TP41. (Refer to the illustration below.)
- 2) Press the playback key.
- 3) Set the S302 to the PLAY.
- 4) Turn on the S301.

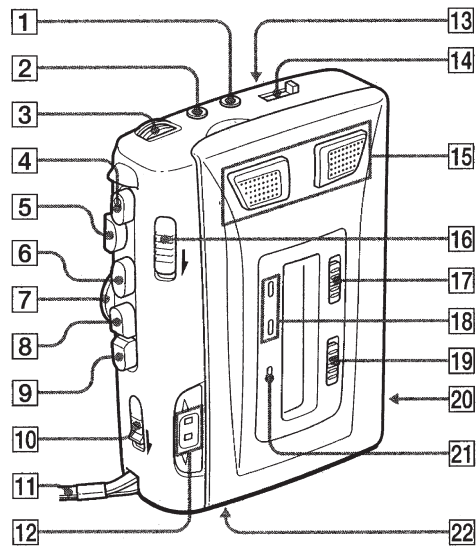
How to enter the record mode

- 1) Input the square wave to the TP41. (Refer to the illustration below.)
- 2) Press the record key.
- 3) Set the S302 to the REC.
- 4) Turn on the S301.



SECTION 2 GENERAL

This section is extracted
from instruction manual.



- | | |
|-----------------------------------|-------------------------------------|
| 1 ☐ Headphone jack | 12 Tape direction indicators |
| 2 MIC (PULG IN POWER) jack | 13 SPEAKER (REAR SIDE) |
| 3 VOL knob | 14 TAPE COUNTER switch |
| 4 ● REC button | 15 Flat mic |
| 5 ■ STOP button | 16 PAUSE ➡ switch |
| 6 PLAY button | 17 REC TIME switch |
| 7 SPEED CONTROL knob | 18 BATT/REC indicator |
| 8 REW/REVIEW button | 19 VOR switch |
| 9 FF/CUE button | 20 Battery compartment |
| 10 DIR ➡ switch | 21 ⚡ indicator |
| 11 Hand strap | 22 DC IN 3V jack |

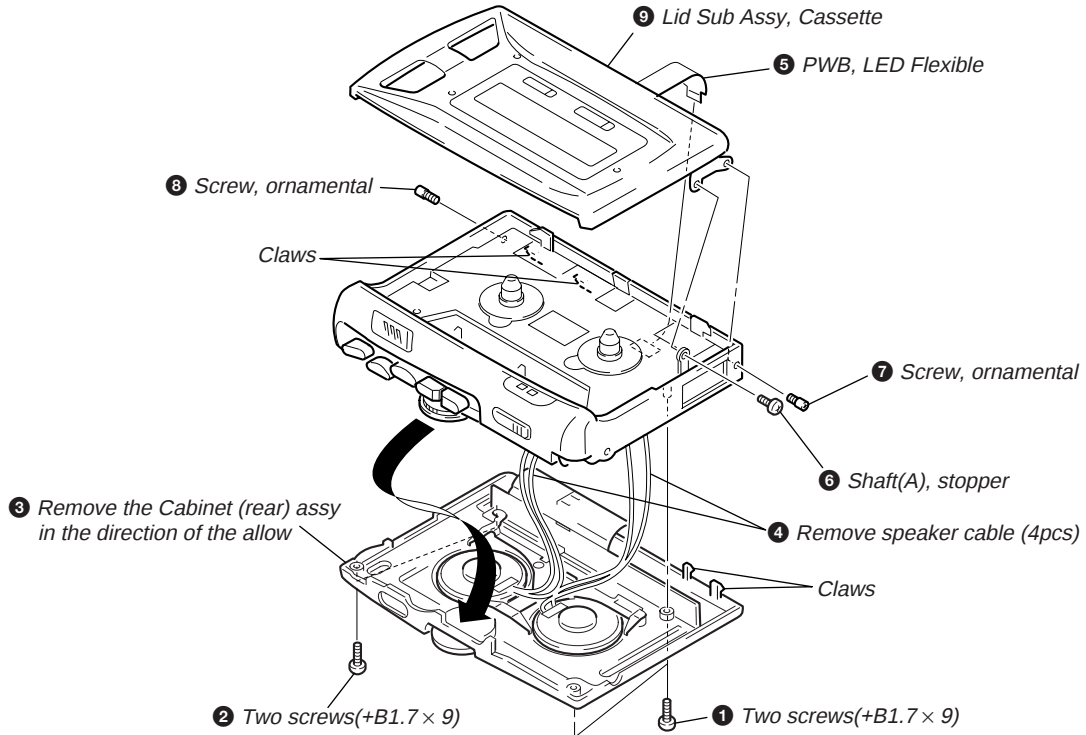
SECTION 3 DISASSEMBLY

Disassemble the unit in the order as shown below.

Set ➡ "Cabinet (rear) assy", "lid sub assy, cassette" ➡ Main board, Mechanism deck ➡ Belt ➡ Head
 ➡ Motor, dc

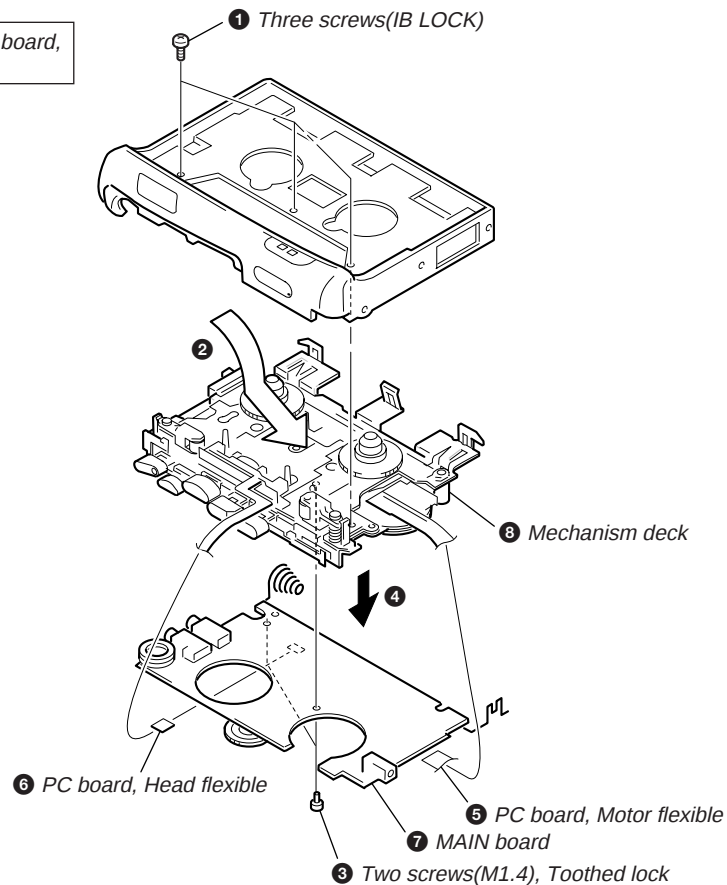
Note : Follow the disassembly procedure in the numerical order given.

3-1. "CABINET (REAR) ASSY", "LID SUB ASSY, CASSETTE"

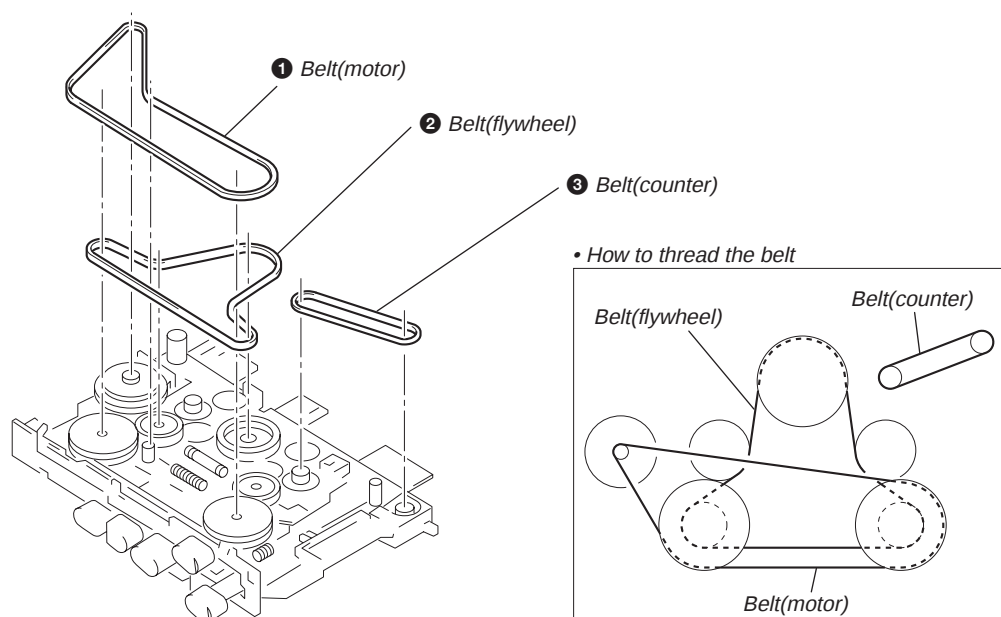


3-2. MAIN BOARD, MECHANISM DECK

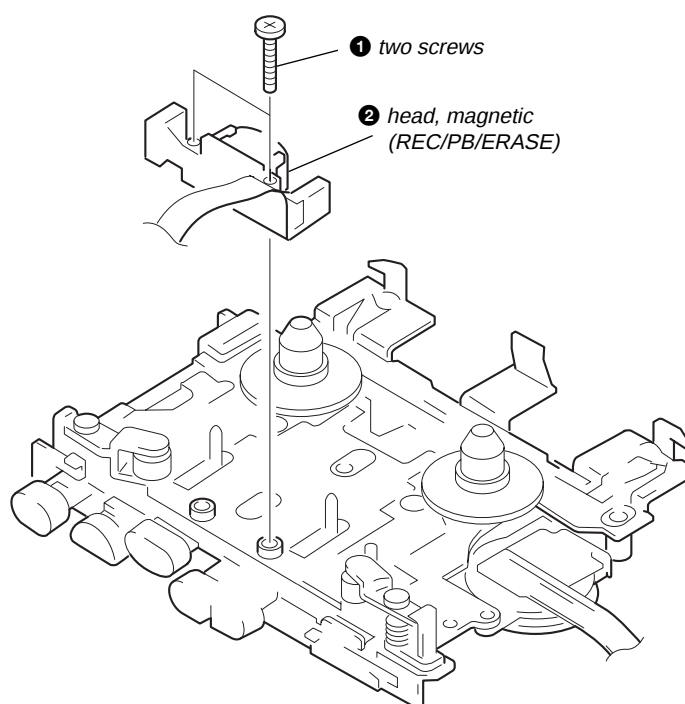
NOTE: For attaching the Main board, refer to the next page.



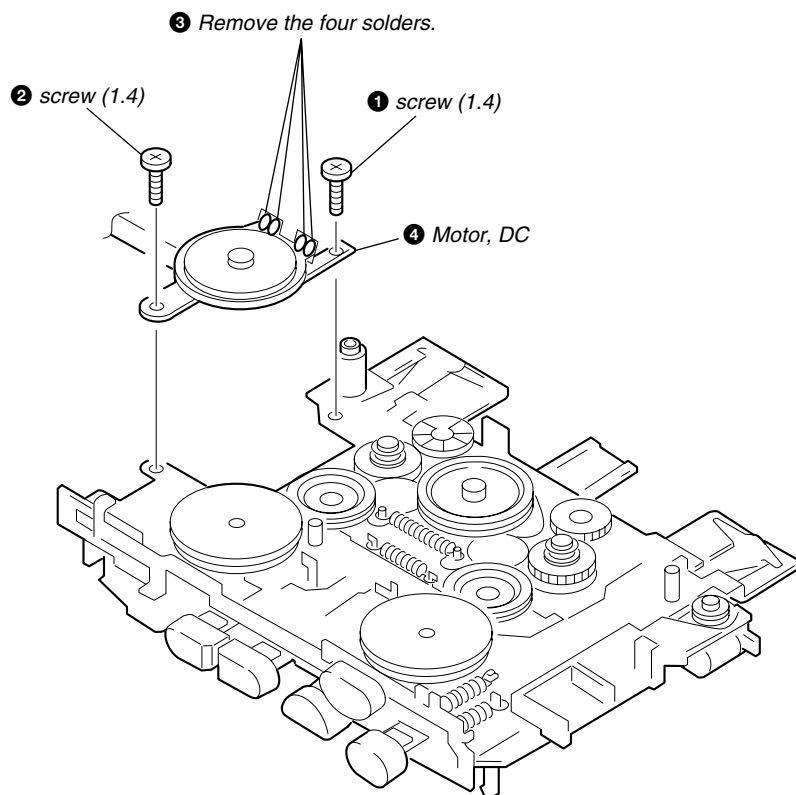
3-3. BELT



3-4. HEAD

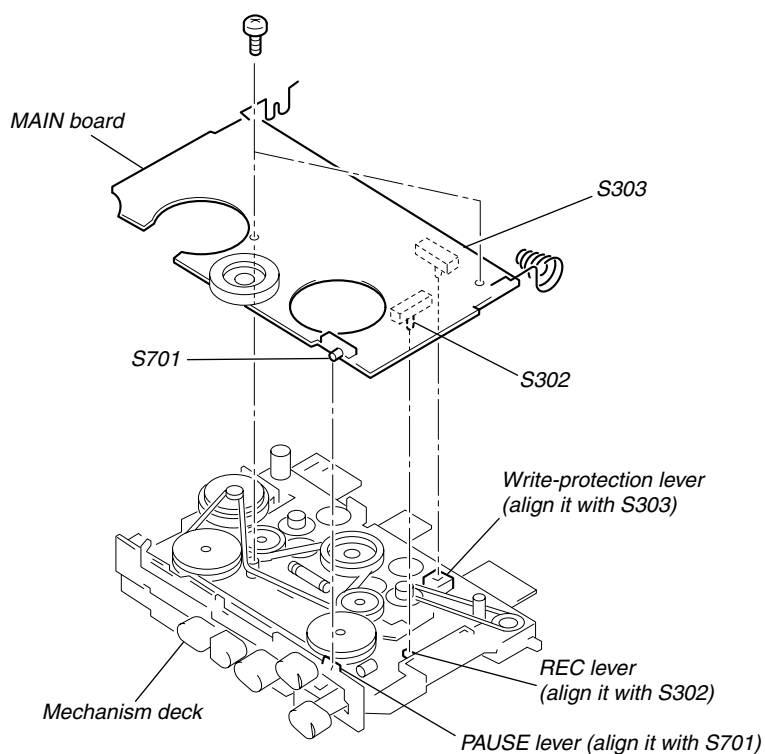


3-5. MOTOR, DC



3-6. PRECAUTION FOR ATTACHING THE MAIN BOARD

- Attach the knobs of the switches S302, S303, and S701 on the Main board while aligning them with the claws of the REC lever, write-protection 2 lever, and the PAUSE lever respectively.



SECTION 4 ADJUSTMENTS

4-1. MECHANICAL ADJUSTMENT

PRECAUTION

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

record/playback/erase head	pinch roller
head	rubber belts
capstans	idlers
- Demagnetize the record/playback/erase head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
- Do not use a magnetized screwdriver for the adjustments.
- After the adjustments, apply suitable locking compound to the parts adjusted.
- Unless specified otherwise, use a specified voltage (3.0V) to perform the adjustments.

Torque Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-102C	20 – 35g•cm 0.28 – 0.48 oz•inch
FWD back tension		0.5 – 5.0g•cm 0.007 – 0.07 oz•inch
FWD	CQ-102RC	20 – 35g•cm 0.28 – 0.48 oz•inch
FWD back tension		0.5 – 5.0g•cm 0.007 – 0.07 oz•inch
FF	CQ-201B	more than 40g•cm
REW		more than 0.5 oz•inch

4-2. ELECTRICAL ADJUSTMENT

0dB = 0.775V

- Perform adjustments on the following conditions unless otherwise specified.

- Switches and controls positions

VOL knob		Maximum
SPEED CONTROL knob		Mechanical center
V•O•R switch		OFF
REC TIME switch		Normal

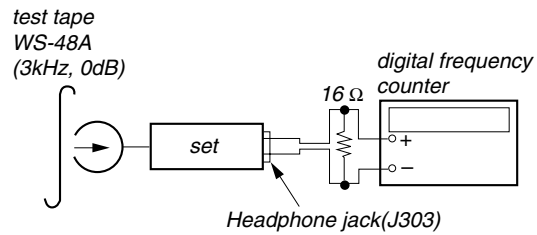
Test tape

Test Tape	Signal	Used for
WS-48A	3kHz, 0dB	Tape speed adjustment

Tape Speed Adjustment

Procedure :

Mode : Playback (FWD)



Adjust RV602 (standard)/RV603 (double speed) until the frequency counter reading becomes 3,000 Hz at the standard mode and 1,500 Hz at the double speed mode.

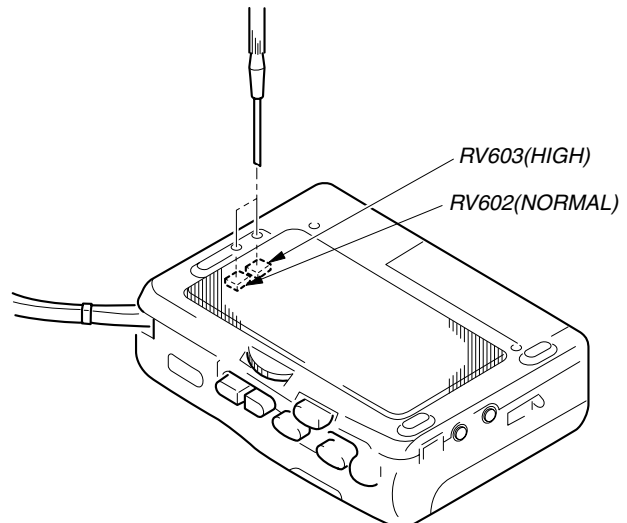
Specification Value :

Tape speed	Digital frequency counter
RV602(Normal)	2,970 – 3,030Hz
RV603(High)	1,485 – 1,515Hz

Frequency difference between the beginning and the end of the tape should be within 1% (30Hz).

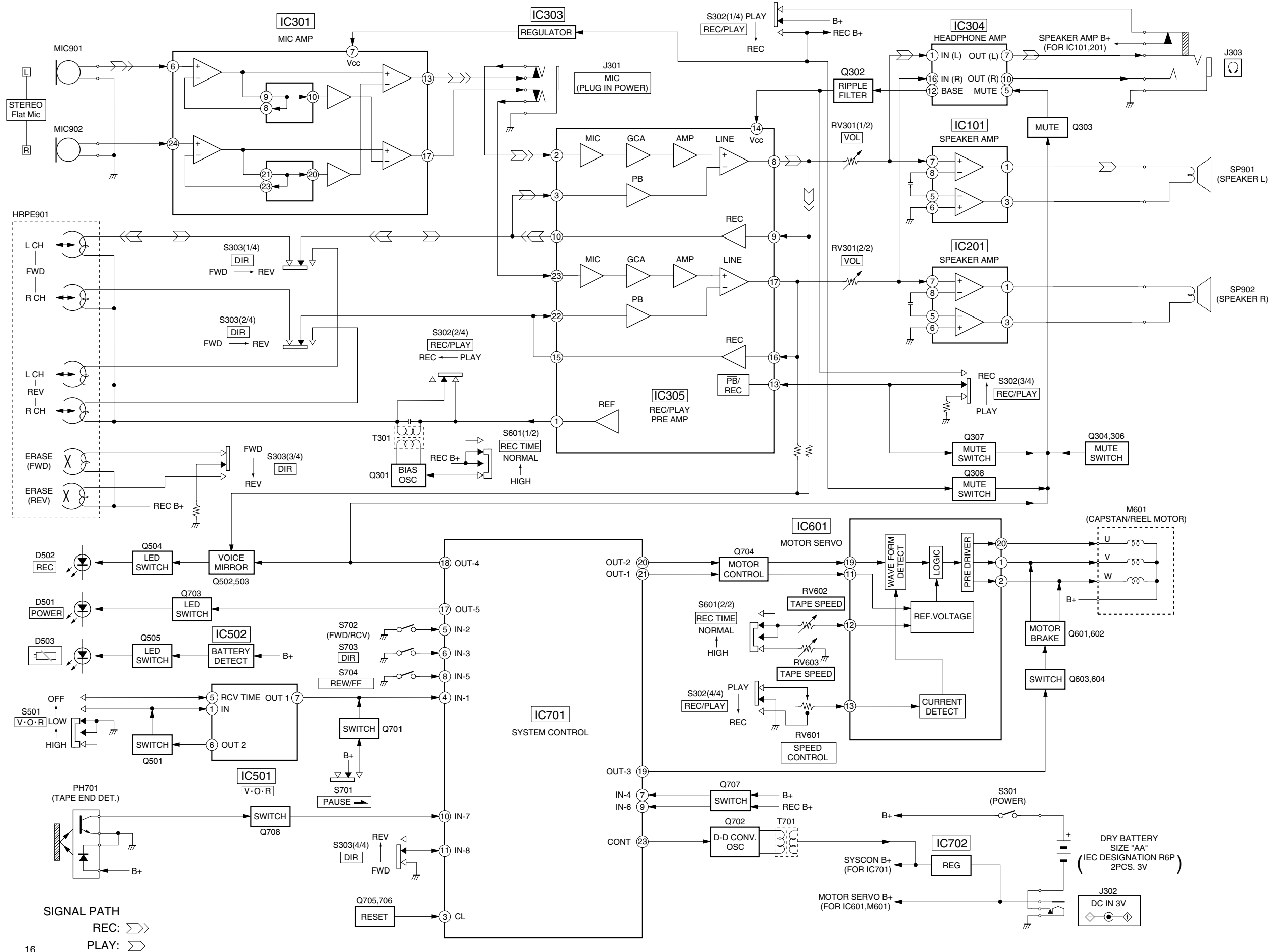
Upon completion of adjustments, select the REV playback mode and check that the measurement value is within the specifications.

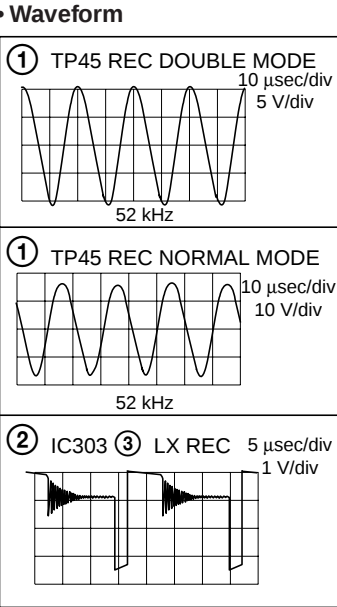
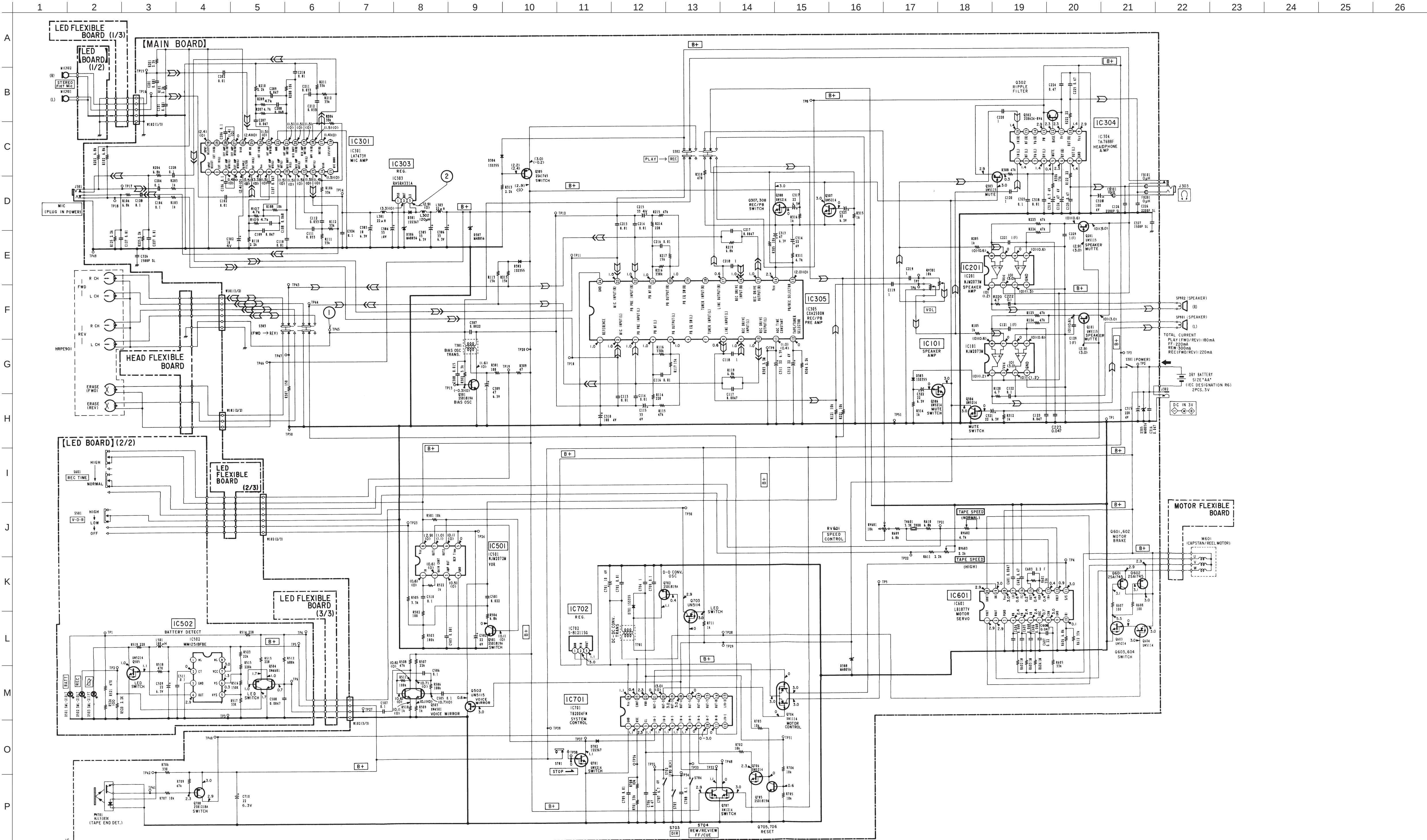
Adjustment Location :



SECTION 5 DIAGRAMS

5-1. BLOCK DIAGRAM

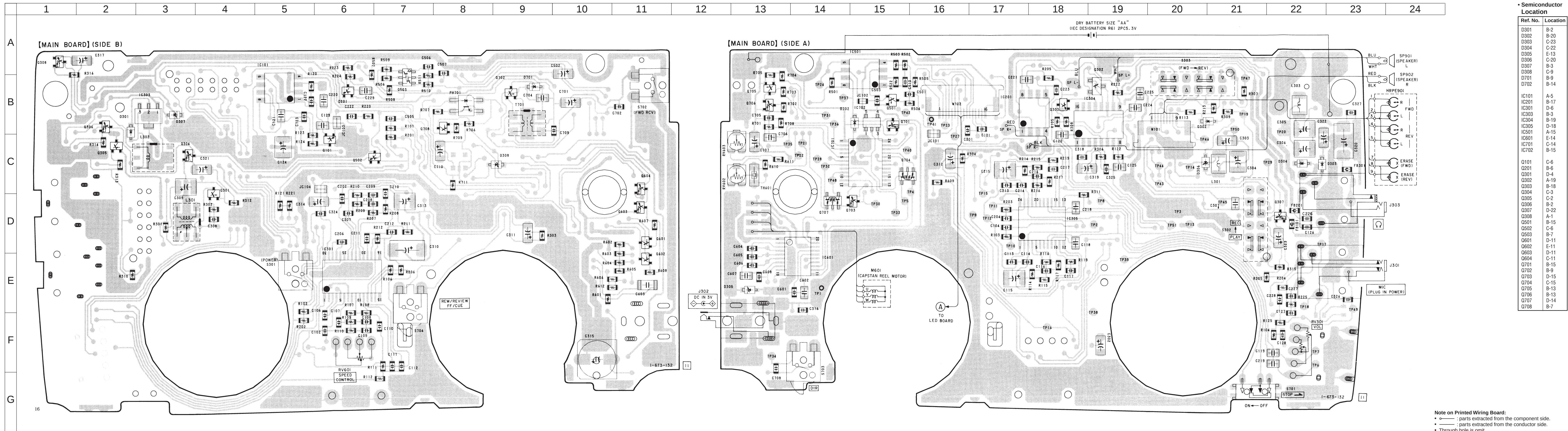


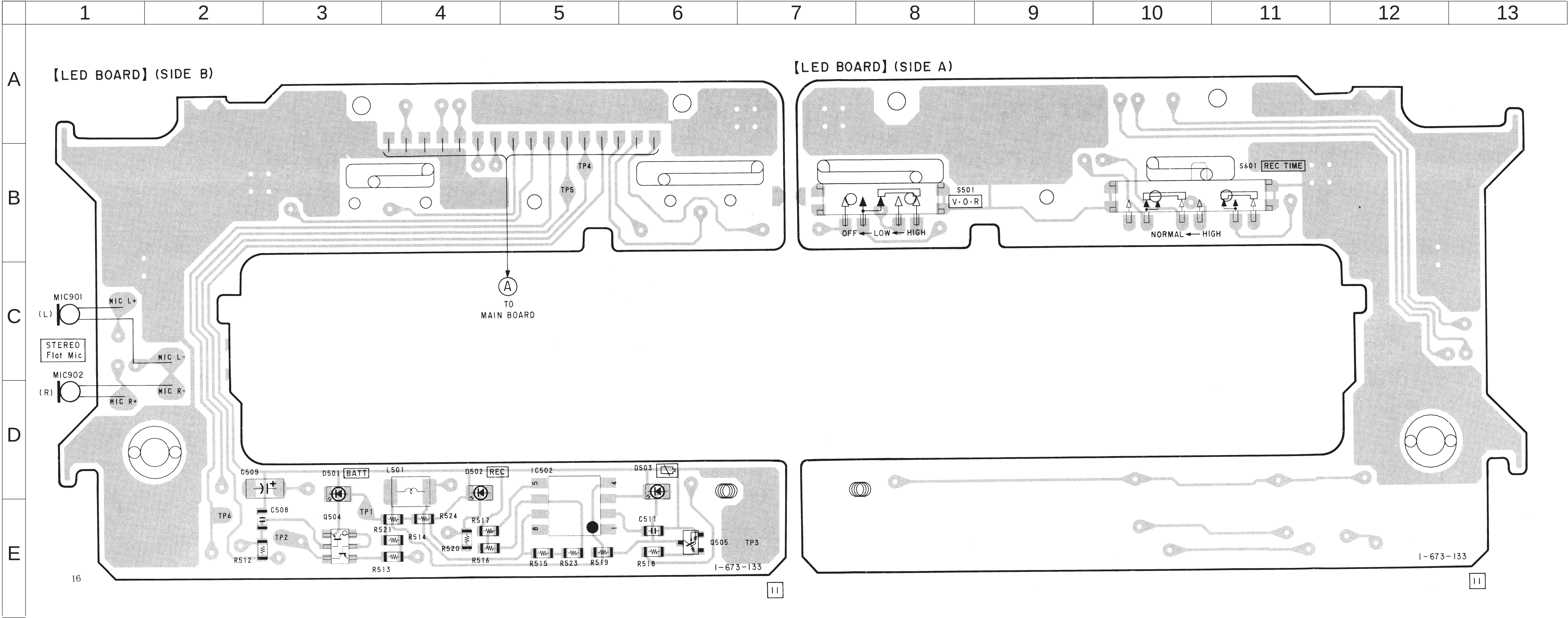


Note on Schematic Diagram:

- All capacitors are in μF unless otherwise noted. pF: pμF
- 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.
- % : indicates tolerance.
- : panel designation.
- B+ : B+ Line.
- : adjustment for repair.
- Power voltage is dc3 V and fed with regulated dc power supply from battery terminal.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark : REC/PB
- () : REC
- < : PB
- Voltages are taken with a VOM (Input impedance 10 MΩ). 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.
- Circled numbers refer to waveforms.
- Signal path.
- : REC
- : PB

5-3. PRINTED WIRING BOARD – MAIN SECTION –





Semiconductor Location	
Ref. No.	Location
D501	E-3
D502	E-4
D503	E-6
IC502	E-5
Q504	E-3
Q505	E-7

Note on Printed Wiring Board:

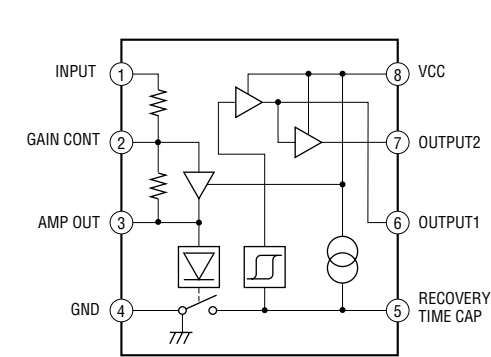
- : parts extracted from the component side.
- : parts extracted from the conductor side.
- Through hole is omit.
- Pattern from the side which enables seeing.

Caution:

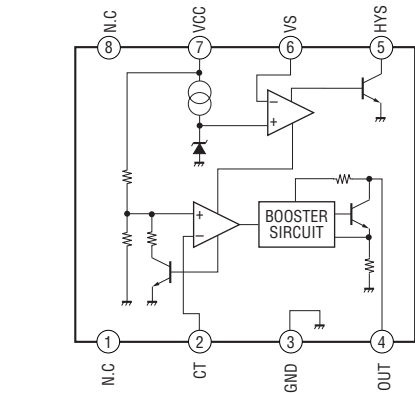
Pattern face side: (SIDE A)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (SIDE B)	Parts on the parts face side seen from the parts face are indicated.

5-5. IC BLOCK DIAGRAMS

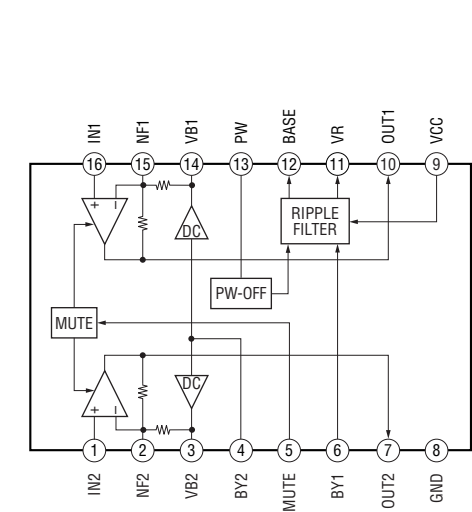
IC501 NJM2072M



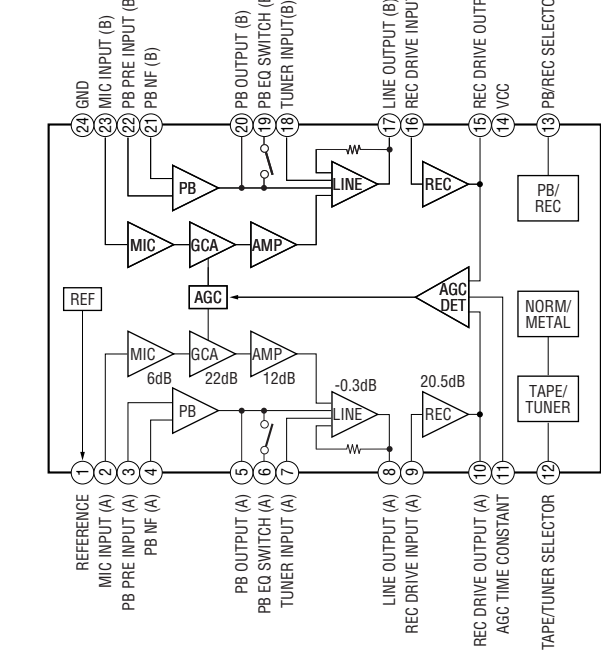
IC502 MM1251BFBE



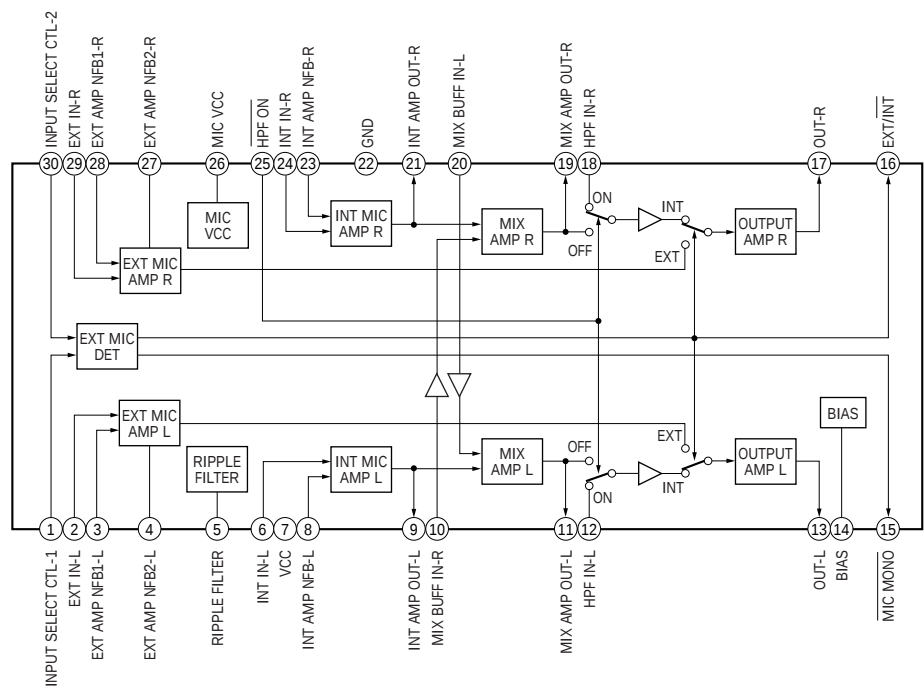
IC304 TA7688F-S0



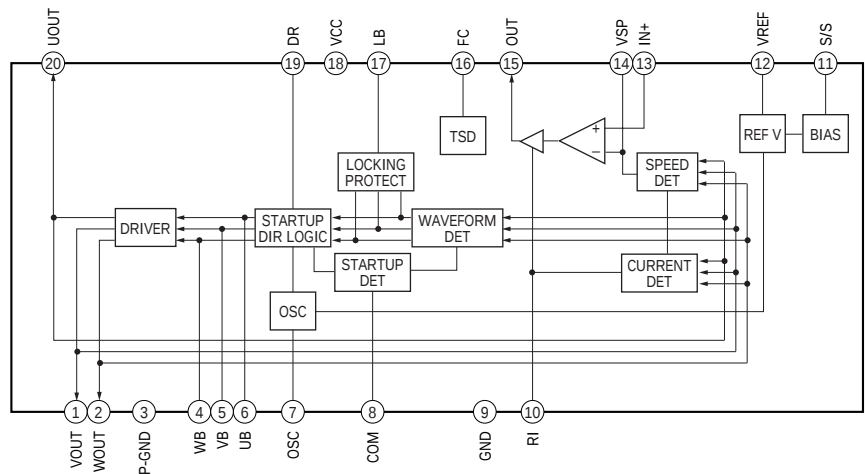
IC305 CXA2500N-T4



IC301 LA7473V-TLM



IC601 LB1877V-TLM



5-6. IC PIN FUNCTION DESCRIPTION

IC701 TB2004FN-020-ER(SYSTEM CONTROL)/MAIN BOARD

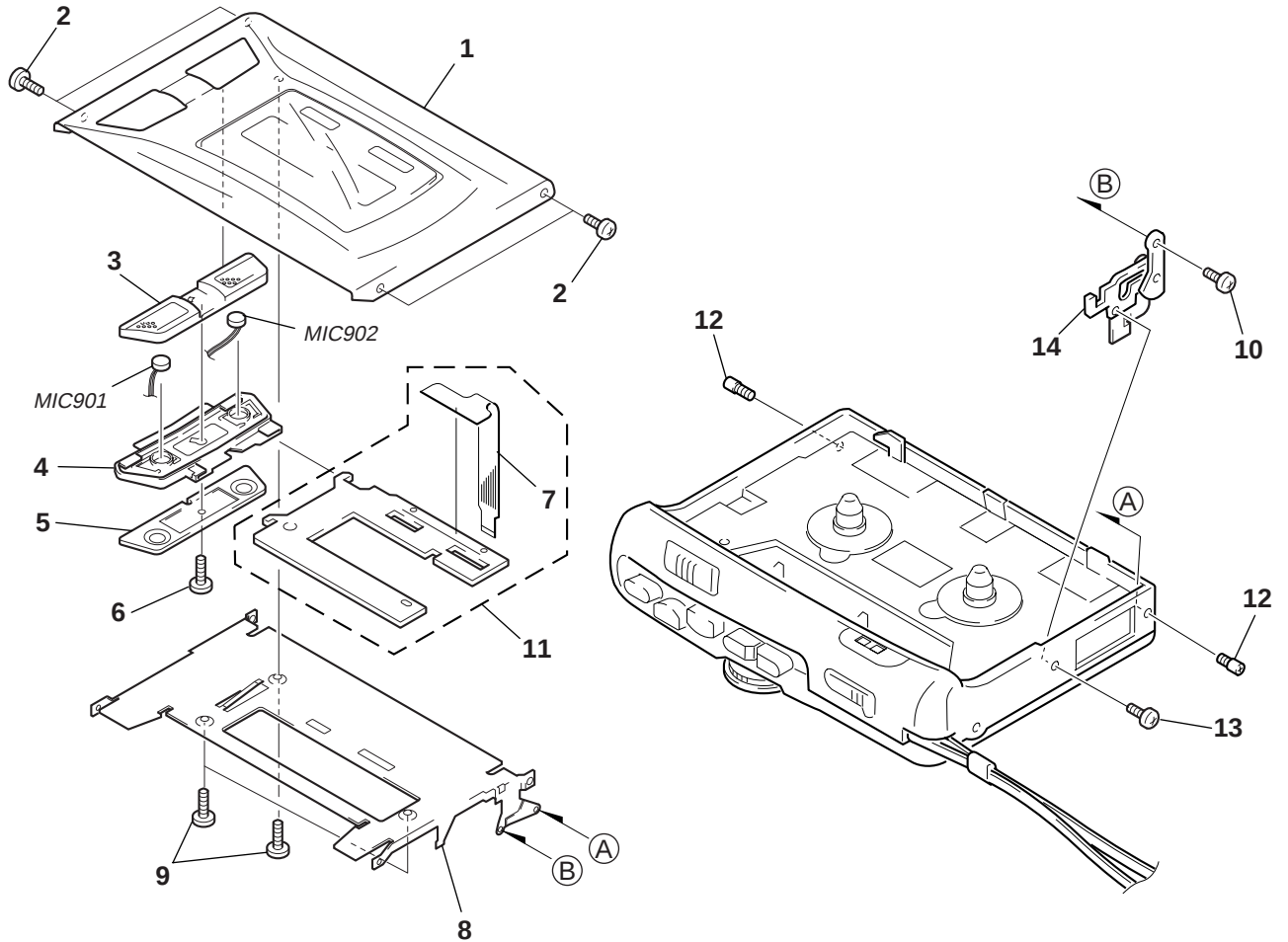
Pin No.	Pin Name	I/O	Description
1	GND	—	Ground
2	OSC	—	For generation of system clock (fosc = 3.2 kHz)
3	CL	I	Reset signal input
4	IN-1	I	PAUSE ON/OFF by the PAUSE switch and V•O•R switch “L”: ON, “OPEN”: OFF
5	IN-2	I	Recovery to FWD when opening/closing the cassette lid “L”: ON, “OPEN”: OFF
6	IN-3	I	Direction “L”: ON, “OPEN”: OFF
7	IN-4	I	REC/PB selection “L”: ON, “OPEN”: OFF
8	IN-5	I	FF/REW “L”: ON, “OPEN”: OFF
9	IN-6	I	POWER : ON/OFF “L”: ON, “OPEN”: OFF
10	IN-7	I	Photo reflector pulse input for tape end detection
11	IN-8	I	FWD/REV selection “L”: ON, “OPEN”: OFF
12	I/O-1	—	Not used
13	I/O-2	—	Not used
14 – 16	OUT-8 – 6	—	Not used
17	OUT-5	O	LED ON/OFF “L”: ON, “OPEN”: OFF
18	OUT-4	O	Audio mute “L”: ON, “OPEN”: OFF
19	OUT-3	O	Motor brake “L”: ON, “OPEN”: OFF
20	OUT-2	O	Motor direction “L”: FWD, “OPEN”: OFF
21	OUT-1	O	Motor ON/OFF “L”: ON, “OPEN”: OFF
22	VDD	—	Power supply for CMOS block
23	CONT	O	Voltage doubler circuit control output
24	VCC	—	Power supply for bipolar block

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.
- Accessories and packing materials are given in the last of this parts list.

6-1. MAIN SECTION-1



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
1	A-3050-908-A	LID SUB ASSY, CASSETTE		9	3-318-382-01	SCREW(1.7 × 3), TAPPING	
2	3-704-197-31	SCREW(M1.4 × 3.0), LOCKING		10	3-311-772-11	SHAFT (A), STOPPER	
3	3-033-592-01	HOLDER, MICROPHONE		11	A-3021-186-A	LED BOARD, COMPLETE	
4	3-033-593-01	CUSHION, MICROPHONE		12	3-315-989-11	SCREW, ORNAMENTAL	
5	3-033-594-01	COVER, MICROPHONE		13	3-704-245-42	SCREW (1.4)	
6	3-318-382-31	SCREW(1.7 × 3), TAPPING		* 14	X-3370-480-1	TOGGLE ASSY	
7	1-673-130-11	PWB,LED FLEXIBLE		MIC901	1-542-298-11	MICROPHONE, ELECTRET CONDENSER (L)	
* 8	3-033-584-01	HOLDER, CASSETTE		MIC902	1-542-298-11	MICROPHONE, ELECTRET CONDENSER (R)	

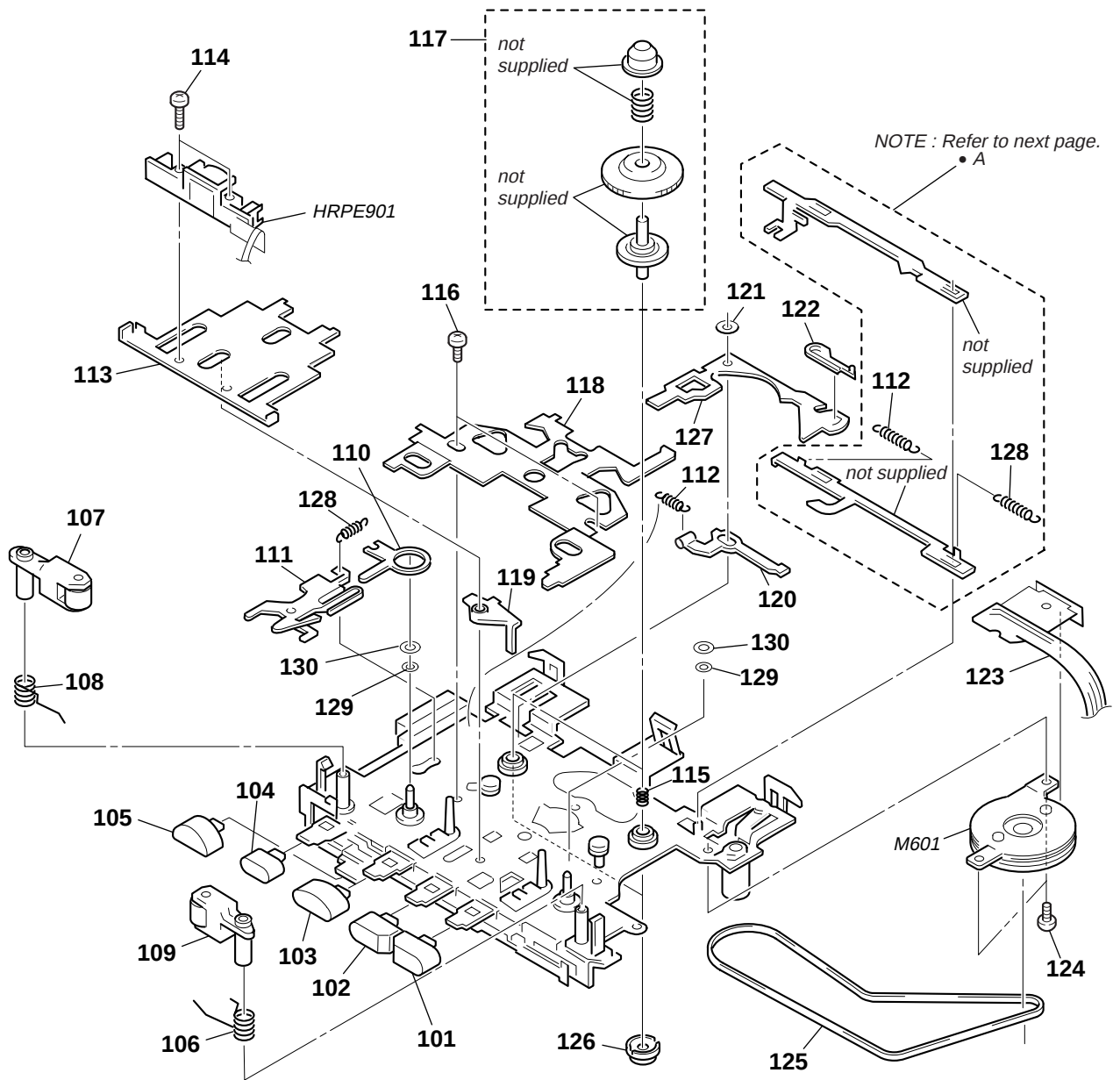
Exploded view diagram of the MT-50-30 antenna assembly. The diagram illustrates the assembly of the antenna system, showing the main antenna unit (52) being mounted onto the base plate (63). Key components and their assembly sequence are indicated by callouts:

- 51:** Screws for mounting the antenna unit.
- 52:** The main antenna unit.
- 53:** A small rectangular component, likely a label or marker.
- 54:** A small rectangular component, likely a label or marker.
- 55:** A small rectangular component, likely a label or marker.
- 56:** A small rectangular component, likely a label or marker.
- 57:** A small rectangular component, likely a label or marker.
- 58:** A small rectangular component, likely a label or marker.
- 59:** A small rectangular component, likely a label or marker.
- 60:** A small rectangular component, likely a label or marker.
- 61:** A small rectangular component, likely a label or marker.
- 62:** A small rectangular component, likely a label or marker.
- 63:** The base plate or mounting bracket.
- 64:** Screws for mounting the base plate.
- 65:** A cable or antenna lead.
- 66:** A small rectangular component, likely a label or marker.
- 67:** A small rectangular component, likely a label or marker.
- 68:** A small rectangular component, likely a label or marker.
- 69:** A small rectangular component, likely a label or marker.
- 70:** Screws for mounting the base plate.
- 71:** A small rectangular component, likely a label or marker.
- 72:** A small rectangular component, likely a label or marker.

The diagram also includes a note: "not supplied" near component 64, indicating that the screws shown are not included in the kit.

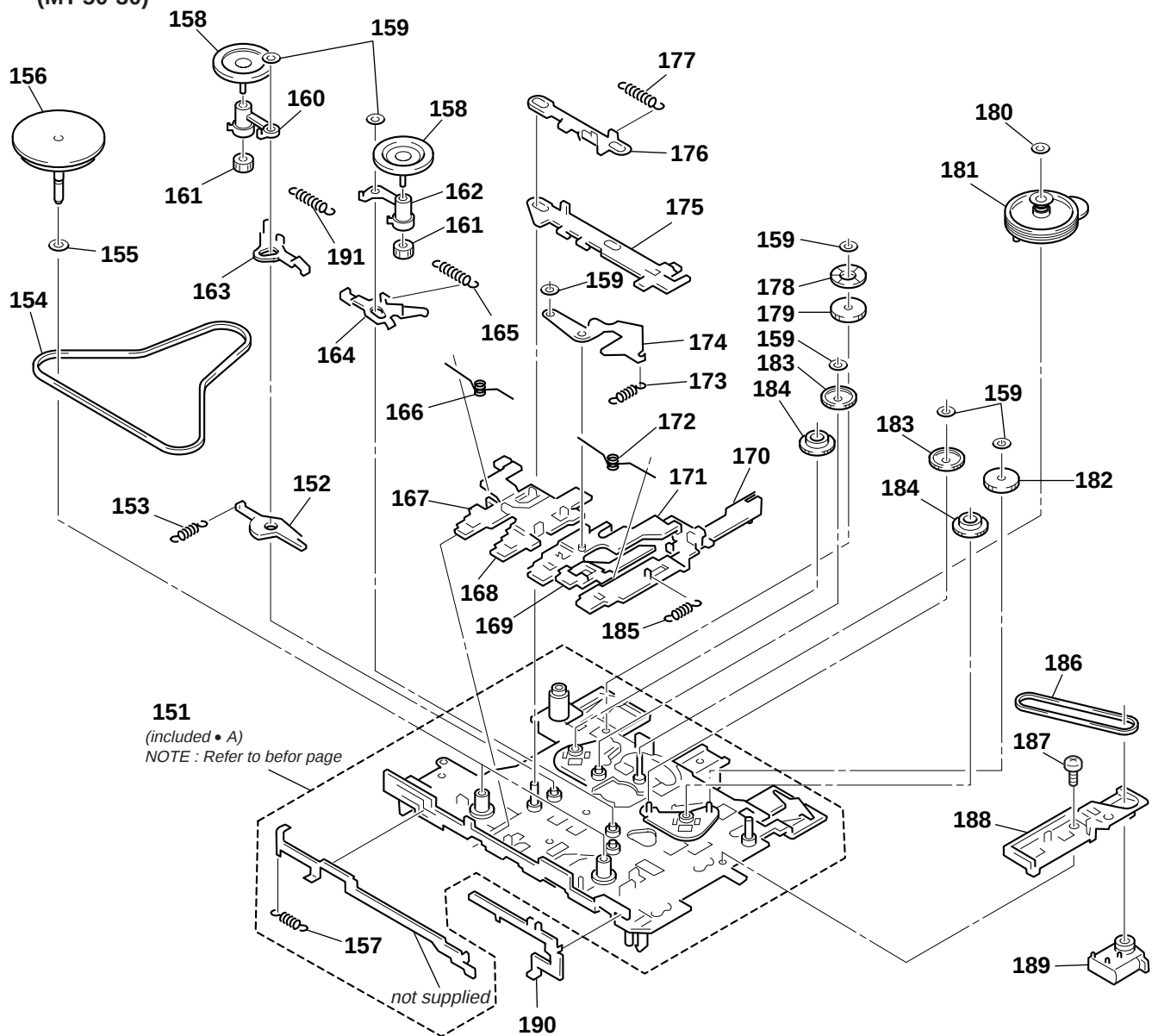
— 28 —

6-3. MECHANISM DECK SECTION-1 (MT-50-30)



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
101	3-925-247-11	BUTTON, FF		117	X-3370-375-1	TABLE ASSY, REEL	
102	3-925-246-11	BUTTON, REW		* 118	3-924-535-01	LEVER (FR)	
103	3-925-245-11	BUTTON, PLAY		* 119	3-924-534-01	LEVER (C/R)	
104	3-032-787-01	BUTTON, REC		* 120	3-924-538-01	LEVER (S-OFF)	
105	3-925-248-11	BUTTON, STOP		121	3-321-483-11	RING, RETAINING	
106	3-924-595-01	SPRING (PINCH-N), TORSION		122	3-924-569-01	PAD(S-OFF)	
107	X-3370-380-1	ARM(PINCH-R) ASSY		123	1-657-172-11	PC BOARD, MOTOR FLEXIBLE	
108	3-924-596-01	SPRING (PINCH-R), TORSION		124	3-704-245-42	SCREW (1.4)	
109	X-3370-379-1	ARM(PINCH-N) ASSY		125	3-035-367-11	BELT (MOTOR)	
* 110	3-924-572-01	LEVER (DIR)		126	3-924-577-01	PULLEY (COUNTER)	
* 111	3-924-575-01	LEVER (DIR-M)		* 127	3-924-536-01	LEVER (OFF)	
112	3-924-601-01	SPRING, TENSION		128	3-924-602-01	SPRING, TENSION	
113	X-3370-378-1	LEVER (HEAD) ASSY		129	3-305-925-00	WASHER	
114	3-938-133-01	SCREW		130	3-321-483-01	RING, RETAINING	
115	3-018-121-01	SPRING (B.T), COMPRESSION		M601	1-698-804-21	MOTOR, DC	
116	3-365-630-02	SCREW (M1.4)				(including PULLEY)(CAPSTAN/REEL)	
				HRPE9011	1-500-590-11	HEAD, MAGNETIC (REC/PB/ERAES)	

6-4. MECHANISM DECK SECTION-2 (MT-50-30)



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
151	X-3370-373-1	CHASSIS ASSY		172	3-924-598-01	SPRING (P/S), TORSION	
* 152	3-924-537-01	LEVER (F/R)		173	3-924-604-01	SPRING (PLAY), TENSION	
153	3-924-605-01	SPRING (FF), TENSION		* 174	3-924-547-01	ARM (PLAY-SUB)	
154	3-924-593-01	BELT (FLYWHEEL)		* 175	3-924-545-01	LEVER (LOCK)	
155	3-701-437-51	WASHER		* 176	3-924-546-01	LEVER (SW)	
156	X-3377-138-1	FLYWHEEL ASSY		177	3-924-606-01	SPRING (LOCK), TENSION	
157	3-924-602-01	SPRING, TENSION		178	3-924-725-01	REFLECTOR	
158	3-924-558-01	PULLEY (T)		179	3-924-579-01	GEAR (REF)	
159	3-321-483-11	RING, RETAINING		180	3-348-993-01	WASHER	
160	3-924-548-01	ARM(T-N)		181	X-3370-376-1	LEVER (CENTER) ASSY	
161	3-924-557-01	GEAR (T)		182	3-924-556-01	GEAR (REW)	
162	3-924-549-01	ARM(T-R)		183	3-924-562-01	GEAR (FF)	
* 163	3-924-539-01	LEVER (REW-F)		184	3-924-560-01	GEAR (REEL)	
* 164	3-924-540-01	LEVER (REW-R)		185	3-924-600-01	SPRING (REC), TENSION	
165	3-924-603-01	SPRING (F/R), TENSION		186	3-032-620-01	BELT (COUNTER)	
166	3-924-597-01	SPRING (F/R), TORSION		187	3-704-245-42	SCREW (1.4)	
* 167	3-924-568-01	LEVER (FF)		188	3-032-438-01	BRACKET (COUNTER)	
* 168	3-924-567-01	LEVER (REW)		189	1-548-582-11	COUNTER, TAPE (SMALL TYPE)	
* 169	3-924-566-01	LEVER (STOP)		* 190	3-924-574-01	LEVER (PAUSE)	
* 170	X-3370-377-1	LEVER (REC) ASSY		191	3-924-607-01	SPRING (ARM-T), TENSION	
* 171	3-924-565-01	LEVER (PLAY)					

SECTION 7 ELECTRICAL PARTS LIST

MAIN

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- CAPACITORS:
uF: 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...

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

Ref. No.	Part No.	Description	Remarks			Ref. No.	Part No.	Description	Remarks		
	A-3021-185-A	MAIN BOARD, COMPLETE *****				C216	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
		< CAPACITOR >				C217	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C101	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	C218	1-164-346-11	CERAMIC CHIP	1uF		16V
C102	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C219	1-164-346-11	CERAMIC CHIP	1uF		16V
C104	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	C220	1-164-346-11	CERAMIC CHIP	1uF		16V
C106	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V						
C107	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	C221	1-164-346-11	CERAMIC CHIP	1uF		16V
						C222	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C108	1-164-490-11	CERAMIC CHIP	0.068uF		16V	C223	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C109	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	C224	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C110	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C225	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C111	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V						
C112	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V	C226	1-164-676-11	CERAMIC CHIP	2200PF	5%	16V
						C227	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C113	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C228	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C114	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C229	1-164-346-11	CERAMIC CHIP	1uF		16V
C115	1-135-318-11	TANTAL. CHIP	33uF	20%	4V	C302	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C116	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V						
C117	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	C303	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
						C304	1-113-682-11	TANTAL. CHIP	33uF	20%	10V
C118	1-164-346-11	CERAMIC CHIP	1uF		16V	C305	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V
C119	1-164-346-11	CERAMIC CHIP	1uF		16V	C306	1-104-752-11	TANTAL. CHIP	33uF	20%	6.3V
C120	1-164-346-11	CERAMIC CHIP	1uF		16V	C307	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C121	1-164-346-11	CERAMIC CHIP	1uF		16V						
C122	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	C308	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V
						C309	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
C123	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	C310	1-104-848-11	TANTAL. CHIP	100uF	20%	4V
C124	1-104-908-11	TANTAL. CHIP	47uF	20%	4V	C311	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C125	1-164-005-11	CERAMIC CHIP	0.47uF		25V	C312	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C126	1-164-676-11	CERAMIC CHIP	2200PF	5%	16V						
C127	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C313	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
						C314	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
C128	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	C315	1-126-246-11	ELECT CHIP	220uF	20%	4V
C129	1-164-346-11	CERAMIC CHIP	1uF		16V	C316	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C201	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	C317	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C202	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V						
C204	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	C318	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
						C319	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C206	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	C320	1-104-848-11	TANTAL. CHIP	100uF	20%	4V
C207	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	C321	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C208	1-164-490-11	CERAMIC CHIP	0.068uF		16V	C322	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C209	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V						
C210	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C323	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
						C324	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C211	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V	C325	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C212	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V	C326	1-164-672-11	CERAMIC CHIP	1500PF	5%	16V
C213	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	C327	1-164-672-11	CERAMIC CHIP	1500PF	5%	16V
C214	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V						
C215	1-135-318-11	TANTAL. CHIP	33uF	20%	4V	C501	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
						C502	1-104-847-11	TANTAL. CHIP	22uF	20%	4V
						C503	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
						C505	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
						C506	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V

MAIN

Ref. No.	Part No.	Description				Remarks	Ref. No.	Part No.	Description				Remarks
C507	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V				< COIL >				
C510	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V								
C601	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V		L301	1-412-030-11	INDUCTOR CHIP	22uH			
C602	1-164-005-11	CERAMIC CHIP	0.47uF		25V		L302	1-414-222-11	INDUCTOR	120uH			
C603	1-164-337-11	CERAMIC CHIP	2.2uF		16V		L303	1-412-030-11	INDUCTOR CHIP	22uH			
C604	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V				< PHOTO INTERRUPTER >				
C605	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V								
C606	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V		PH701	8-749-925-05	REFLECTOR NJL5183KA-F20-TE1				
C607	1-115-340-11	CERAMIC CHIP	0.22uF	10%	25V				< TRANSISTOR >				
C608	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V								
C701	1-135-201-11	TANTALUM CHIP	10uF	20%	4V		Q101	8-729-420-53	TRANSISTOR	UN5115			
C702	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V		Q201	8-729-420-53	TRANSISTOR	UN5115			
C704	1-164-346-11	CERAMIC CHIP	1uF		16V		Q301	8-729-230-63	TRANSISTOR	2SC4116-YG			
C705	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V		Q302	8-729-141-48	TRANSISTOR	2SB624-BV345			
C706	1-164-005-11	CERAMIC CHIP	0.47uF		25V		Q303	8-729-420-53	TRANSISTOR	UN5115			
C707	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V		Q304	8-729-402-93	TRANSISTOR	UN5214-TX			
C708	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V		Q305	8-729-823-86	TRANSISTOR	2SA1745			
C709	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V		Q306	8-729-402-93	TRANSISTOR	UN5214-TX			
C710	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V		Q307	8-729-402-93	TRANSISTOR	UN5214-TX			
		< DIODE >					Q308	8-729-402-93	TRANSISTOR	UN5214-TX			
D301	8-719-049-09	DIODE	1SS367-T3SONY				Q501	8-729-230-63	TRANSISTOR	2SC4116-YG			
D302	8-719-988-61	DIODE	1SS355TE-17				Q502	8-729-420-53	TRANSISTOR	UN5115			
D303	8-719-988-61	DIODE	1SS355TE-17				Q503	8-729-402-81	TRANSISTOR	XN4501			
D304	8-719-988-61	DIODE	1SS355TE-17				Q601	8-729-823-86	TRANSISTOR	2SA1745			
D305	8-719-977-03	DIODE	DTZ5.6B				Q602	8-729-823-86	TRANSISTOR	2SA1745			
D306	8-719-977-03	DIODE	DTZ5.6B				Q603	8-729-402-93	TRANSISTOR	UN5214-TX			
D307	8-719-977-03	DIODE	DTZ5.6B				Q604	8-729-402-96	TRANSISTOR	UN5114			
D308	8-719-977-03	DIODE	DTZ5.6B				Q701	8-729-402-93	TRANSISTOR	UN5214-TX			
D701	8-719-988-61	DIODE	1SS355TE-17				Q702	8-729-230-63	TRANSISTOR	2SC4116-YG			
D702	8-719-049-09	DIODE	1SS367-T3SONY				Q703	8-729-402-96	TRANSISTOR	UN5114			
		< FERRITE BEAD >					Q704	8-729-422-41	TRANSISTOR	XN1114			
FB101	1-500-444-11	FERRITE	0uH				Q705	8-729-230-63	TRANSISTOR	2SC4116-YG			
FB201	1-500-444-11	FERRITE	0uH				Q706	8-729-402-93	TRANSISTOR	UN5214-TX			
FB301	1-500-444-11	FERRITE	0uH				Q707	8-729-420-16	TRANSISTOR	XN1214			
		< IC >					Q708	8-729-420-24	TRANSISTOR	2SB1218A-QRS			
IC101	8-759-701-02	IC	NJM2073M						< RESISTOR >				
IC201	8-759-701-02	IC	NJM2073M				R101	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
IC301	8-759-380-80	IC	LA7473V-TLM				R102	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
IC303	8-759-434-03	IC	RH5RH331A-T1				R103	1-216-821-11	METAL CHIP	1K	5%	1/16W	
IC304	8-759-205-43	IC	TA7688F-SO				R104	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
IC305	8-752-089-40	IC	CXA2500N-T4				R105	1-216-821-11	METAL CHIP	1K	5%	1/16W	
IC501	8-759-701-51	IC	NJM2072M				R106	1-216-839-11	METAL CHIP	33K	5%	1/16W	
IC601	8-759-566-10	IC	LB1877V-TLM				R107	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
IC701	8-759-494-76	IC	TB2004FN-020-ER				R108	1-216-833-91	RES,CHIP	10K	5%	1/16W	
IC702	8-759-280-84	IC	S-81211SG-QA-T1				R109	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
		< JACK >					R110	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
J301	1-774-321-31	JACK (SMALL TYPE)(MIC)					R111	1-216-839-11	METAL CHIP	33K	5%	1/16W	
J302	1-750-061-11	JACK,DC(POLARITY UNIFIED TYPE)(DC IN 3V)					R112	1-216-839-11	METAL CHIP	33K	5%	1/16W	
J303	1-695-514-21	JACK (SMALL TYPE) 1P(HEAD PHONE)					R113	1-216-835-11	METAL CHIP	15K	5%	1/16W	
		< JUMPER CHIP >					R114	1-216-813-11	METAL CHIP	220	5%	1/16W	
JC101	1-216-295-91	SHORT	0				R115	1-216-841-11	METAL CHIP	47K	5%	1/16W	
JC102	1-216-864-11	METAL CHIP	0	5%	1/16W		R116	1-216-851-11	METAL CHIP	330K	5%	1/16W	
JC103	1-216-295-91	SHORT	0				R117	1-216-835-11	METAL CHIP	15K	5%	1/16W	
JC104	1-216-295-91	SHORT	0				R119	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
							R120	1-216-793-11	RES,CHIP	4.7	5%	1/16W	
							R121	1-216-833-91	RES,CHIP	10K	5%	1/16W	

Ref. No.	Part No.	Description				Remarks	Ref. No.	Part No.	Description				Remarks
R122	1-216-801-11	METAL CHIP	22	5%	1/16W		R605	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R123	1-216-841-11	METAL CHIP	47K	5%	1/16W		R606	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R124	1-216-841-11	METAL CHIP	47K	5%	1/16W		R607	1-216-809-11	METAL CHIP	100	5%	1/16W	
R125	1-216-825-11	METAL CHIP	2.2K	5%	1/16W		R608	1-216-809-11	METAL CHIP	100	5%	1/16W	
R201	1-216-825-11	METAL CHIP	2.2K	5%	1/16W		R609	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R202	1-216-831-11	METAL CHIP	6.8K	5%	1/16W		R610	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R203	1-216-821-11	METAL CHIP	1K	5%	1/16W		R611	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R204	1-216-831-11	METAL CHIP	6.8K	5%	1/16W		R612	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R205	1-216-821-11	METAL CHIP	1K	5%	1/16W		R701	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R206	1-216-839-11	METAL CHIP	33K	5%	1/16W		R702	1-216-833-91	RES,CHIP	10K	5%	1/16W	
R207	1-216-829-11	METAL CHIP	4.7K	5%	1/16W		R703	1-216-833-91	RES,CHIP	10K	5%	1/16W	
R208	1-216-833-91	RES,CHIP	10K	5%	1/16W		R704	1-216-833-91	RES,CHIP	10K	5%	1/16W	
R209	1-216-829-11	METAL CHIP	4.7K	5%	1/16W		R705	1-216-833-91	RES,CHIP	10K	5%	1/16W	
R210	1-216-825-11	METAL CHIP	2.2K	5%	1/16W		R706	1-216-815-11	METAL CHIP	330	5%	1/16W	
R211	1-216-839-11	METAL CHIP	33K	5%	1/16W		R707	1-216-833-91	RES,CHIP	10K	5%	1/16W	
R212	1-216-839-11	METAL CHIP	33K	5%	1/16W		R708	1-216-833-91	RES,CHIP	10K	5%	1/16W	
R213	1-216-835-11	METAL CHIP	15K	5%	1/16W		R709	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R214	1-216-813-11	METAL CHIP	220	5%	1/16W		R711	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R215	1-216-841-11	METAL CHIP	47K	5%	1/16W		< VARIABLE RESISTOR >						
R216	1-216-851-11	METAL CHIP	330K	5%	1/16W								
R217	1-216-835-11	METAL CHIP	15K	5%	1/16W		RV301	1-225-743-11	RES, VAR, CARBON 10K/10K(VOL)				
R219	1-216-831-11	METAL CHIP	6.8K	5%	1/16W		RV601	1-225-293-11	RES, VAR, CARBON 10K(SPEED CONTROL)				
R220	1-216-793-11	RES,CHIP	4.7	5%	1/16W		RV602	1-238-663-11	RES, ADJ, CARBON 4.7K				
R221	1-216-833-91	RES,CHIP	10K	5%	1/16W		RV603	1-223-584-11	RES, ADJ, CARBON 2.2K				
R222	1-216-801-11	METAL CHIP	22	5%	1/16W		< SWITCH >						
R223	1-216-841-11	METAL CHIP	47K	5%	1/16W								
R224	1-216-841-11	METAL CHIP	47K	5%	1/16W		S301	1-762-594-41	SWITCH, PUSH (1 KEY)(POWER)				
R225	1-216-825-11	METAL CHIP	2.2K	5%	1/16W		S302	1-692-896-11	SWITCH, SLIDE(PLAY/REC)				
R301	1-216-809-11	METAL CHIP	100	5%	1/16W		S303	1-692-896-11	SWITCH, SLIDE(FWD/REV)				
R302	1-216-827-11	METAL CHIP	3.3K	5%	1/16W		S701	1-572-922-11	SWITCH, SLIDE(STOP)				
R303	1-216-863-11	RES,CHIP	3.3M	5%	1/16W		S702	1-572-688-11	SWITCH, PUSH (1 KEY)(FWD RCV)				
R304	1-216-825-11	METAL CHIP	2.2K	5%	1/16W		S703	1-572-288-21	SWITCH, PUSH(DIR)				
R305	1-216-833-91	RES,CHIP	10K	5%	1/16W		S704	1-762-594-41	SWITCH, PUSH (1 KEY)(REW/FF)				
R306	1-216-835-11	METAL CHIP	15K	5%	1/16W		< TRANSFORMER >						
R307	1-216-811-11	METAL CHIP	150	5%	1/16W								
R308	1-216-841-11	METAL CHIP	47K	5%	1/16W		T301	1-433-286-11	TRANSFORMER, BIAS OSCILLATION				
R309	1-216-805-11	METAL CHIP	47	5%	1/16W		T701	1-450-667-11	TRANSFORMER, DC-DC CONVERTER				
R310	1-216-817-11	METAL CHIP	470	5%	1/16W		< THERMISTOR >						
R311	1-216-829-11	METAL CHIP	4.7K	5%	1/16W								
R312	1-216-821-11	METAL CHIP	1K	5%	1/16W								
R313	1-216-825-11	METAL CHIP	2.2K	5%	1/16W		TH601	1-810-794-11	THERMISTOR, POSITIVE				
R314	1-216-821-11	METAL CHIP	1K	5%	1/16W		< FLAT CABLE >						
R315	1-216-821-11	METAL CHIP	1K	5%	1/16W								
R316	1-216-821-11	METAL CHIP	1K	5%	1/16W		W101	1-750-336-21	CONNECTOR, FFC/FPC (ZIF) 9P				
R501	1-216-833-91	RES,CHIP	10K	5%	1/16W		W102	1-573-925-11	CONNECTOR, FFC/FPC (ZIF) 16P				

R502	1-216-809-11	METAL CHIP	100	5%	1/16W								
R503	1-216-845-11	METAL CHIP	100K	5%	1/16W		A-3021-186-A	LED BOARD, COMPLETE					
R504	1-216-831-11	METAL CHIP	6.8K	5%	1/16W		*****						
R505	1-216-827-11	METAL CHIP	3.3K	5%	1/16W								
R506	1-216-845-11	METAL CHIP	100K	5%	1/16W		1-673-130-11	PWB,LED FLEXIBLE					
R507	1-216-837-11	METAL CHIP	22K	5%	1/16W		< CAPACITOR >						
R508	1-216-841-11	METAL CHIP	47K	5%	1/16W								
R509	1-216-821-11	METAL CHIP	1K	5%	1/16W		C508	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
R510	1-216-821-11	METAL CHIP	1K	5%	1/16W		C509	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V	
R511	1-216-845-11	METAL CHIP	100K	5%	1/16W		C511	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	
R522	1-216-821-11	METAL CHIP	1K	5%	1/16W								
R601	1-216-839-11	METAL CHIP	33K	5%	1/16W								
R602	1-216-857-11	METAL CHIP	1M	5%	1/16W								
R603	1-216-857-11	METAL CHIP	1M	5%	1/16W								
R604	1-216-857-11	METAL CHIP	1M	5%	1/16W								

LED

Ref. No.	Part No.	Description	Remarks
< DIODE >			
D501	8-719-059-96	DIODE SML-210LT-T86(POWER)	
D502	8-719-059-96	DIODE SML-210LT-T86(REC)	
D503	8-719-057-99	DIODE SML-211YT-T86 (BATT CHECK)	
< IC >			
IC502	8-759-399-49	IC MM1251BFBE	
< COIL >			
L501	1-412-032-11	INDUCTOR CHIP 100uH	
< TRANSISTOR >			
Q504	8-729-402-84	TRANSISTOR XN4601	
Q505	8-729-402-93	TRANSISTOR UN5214-TX	
< RESISTOR >			
R512	1-216-855-11	METAL CHIP 680K 5% 1/16W	
R513	1-216-813-11	METAL CHIP 220 5% 1/16W	
R514	1-216-813-11	METAL CHIP 220 5% 1/16W	
R515	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R516	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R517	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R518	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R519	1-216-813-11	METAL CHIP 220 5% 1/16W	
R520	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R521	1-216-817-11	METAL CHIP 470 5% 1/16W	
R523	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R524	1-216-809-11	METAL CHIP 100 5% 1/16W	
< SWITCH >			
S501	1-692-605-31	SWITCH, SLIDE(VOR)	
S601	1-571-277-51	SWITCH, SLIDE(REC TIME)	

Ref. No.	Part No.	Description	Remarks
MISCELLANEOUS			

123	1-657-172-11	PC BOARD, MOTOR FLEXIBLE	
189	1-548-582-11	COUNTER, TAPE (SMALL TYPE)	
M601	1-698-804-21	MOTOR, DC	
		(including PULLEY)(CAPSTAN/REEL)	
SP901	1-504-314-12	SPEAKER (3.6CM) (L)	
SP902	1-504-314-12	SPEAKER (3.6CM) (R)	
MIC901	1-542-298-11	MICROPHONE, ELECTRET CONDENSER (L)	
MIC902	1-542-298-11	MICROPHONE, ELECTRET CONDENSER (R)	
HRPE901	1-500-590-11	HEAD, MAGNETIC (REC/PB/ERAES)	

ACCESSORIES & PACKING MATERIALS			

X-2542-167-1		STAND ASSY	
3-032-436-01		FOOT(B), RUBBER	
3-865-283-11		MANUAL, INSTRUCTION	
		(ENGLISH/FRENCH)(US/Canadian)	
3-865-283-21		MANUAL, INSTRUCTION	
		(ENGLISH/SPANISH/PORTUGUESE)(AEP/E)	
3-865-283-31		MANUAL, INSTRUCTION	
		(FRENCH/GERMAN/DUTCH)(AEP)	
3-865-283-41		MANUAL, INSTRUCTION	
		(SWEDISH/ITALIAN/FINNISH)(AEP)	
8-814-296-90		MICROPHONE, CONDENSER ECM-TC60	
8-953-130-90		HEADPHONE MDR-E801/K SET(AEP)	

TCS-60DV

SONY®

SERVICE MANUAL

Ver 1.1 2000.11

*US Model
Canadian Model
AEP Model
E Model*

SUPPLEMENT-1

File this supplement with the Service Manual.

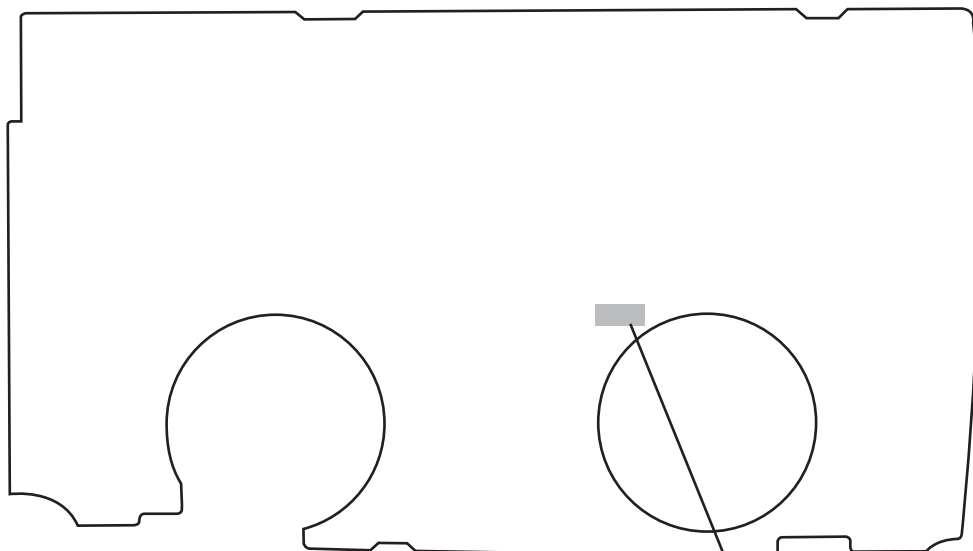
Subject : 1. Change of MAIN board
2. Change of Capstan/Reel Motor

(SPM-00037)

This service manual supplement-1 only describes the differences between the new and former boards. For other information, refer to the provided service manual (9-926-969-□□).

To discriminate between the new and former boards, check the part code of the printed wiring board marked on the board.

– MAIN board (side A) –

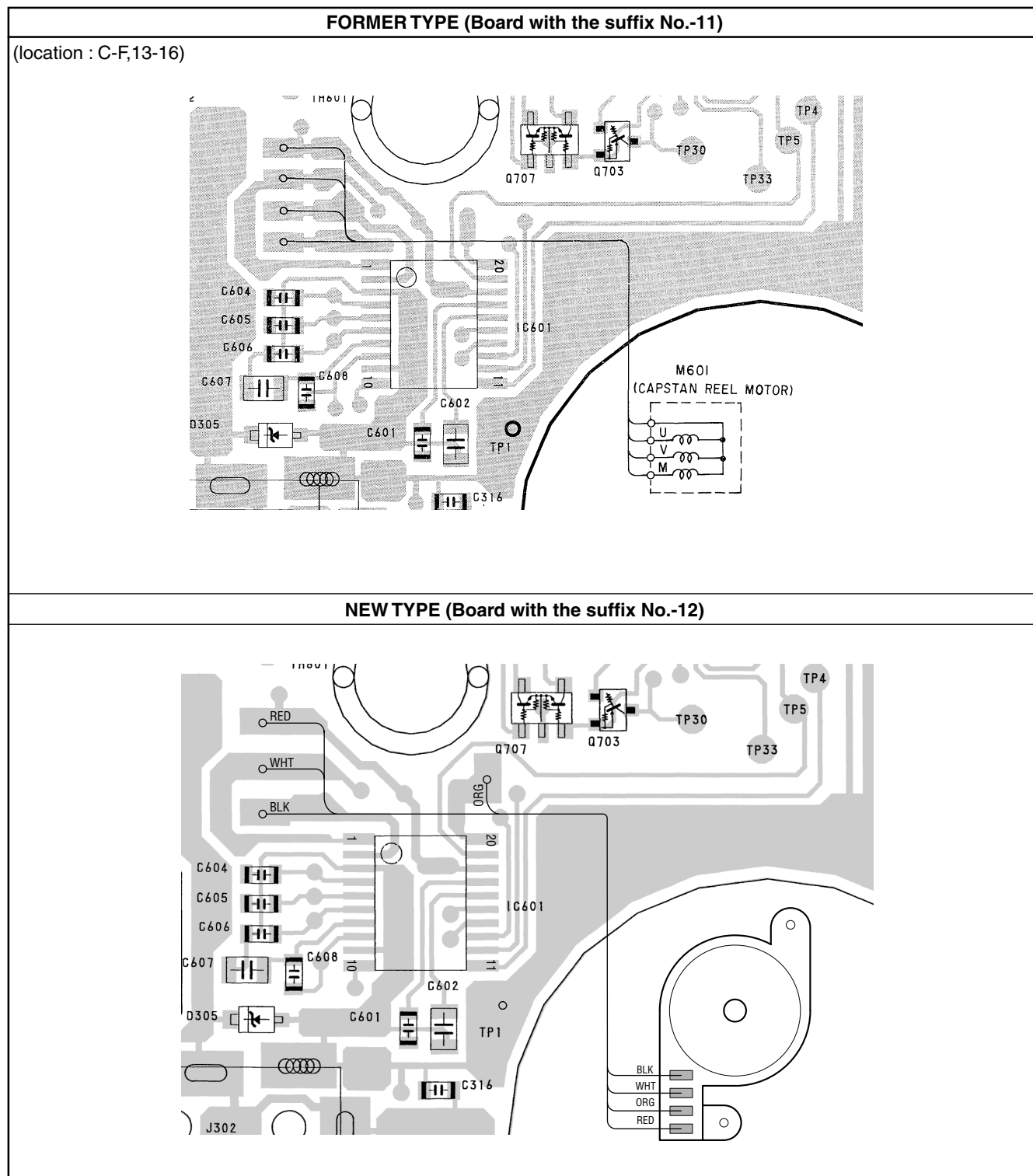


MAIN board parts No.
Former type : 1-673-132-11
New type : 1-673-132-12

1. Changes to the Board

As the motor is changed, the main board is to be changed from the board with the suffix No.-11 to the board with No.-12.
When only replacing the motor or main board by a new part, replace the appropriate components on the main board.
(For details, refer to “2. Replacing the Board/Motor” on page 9.)

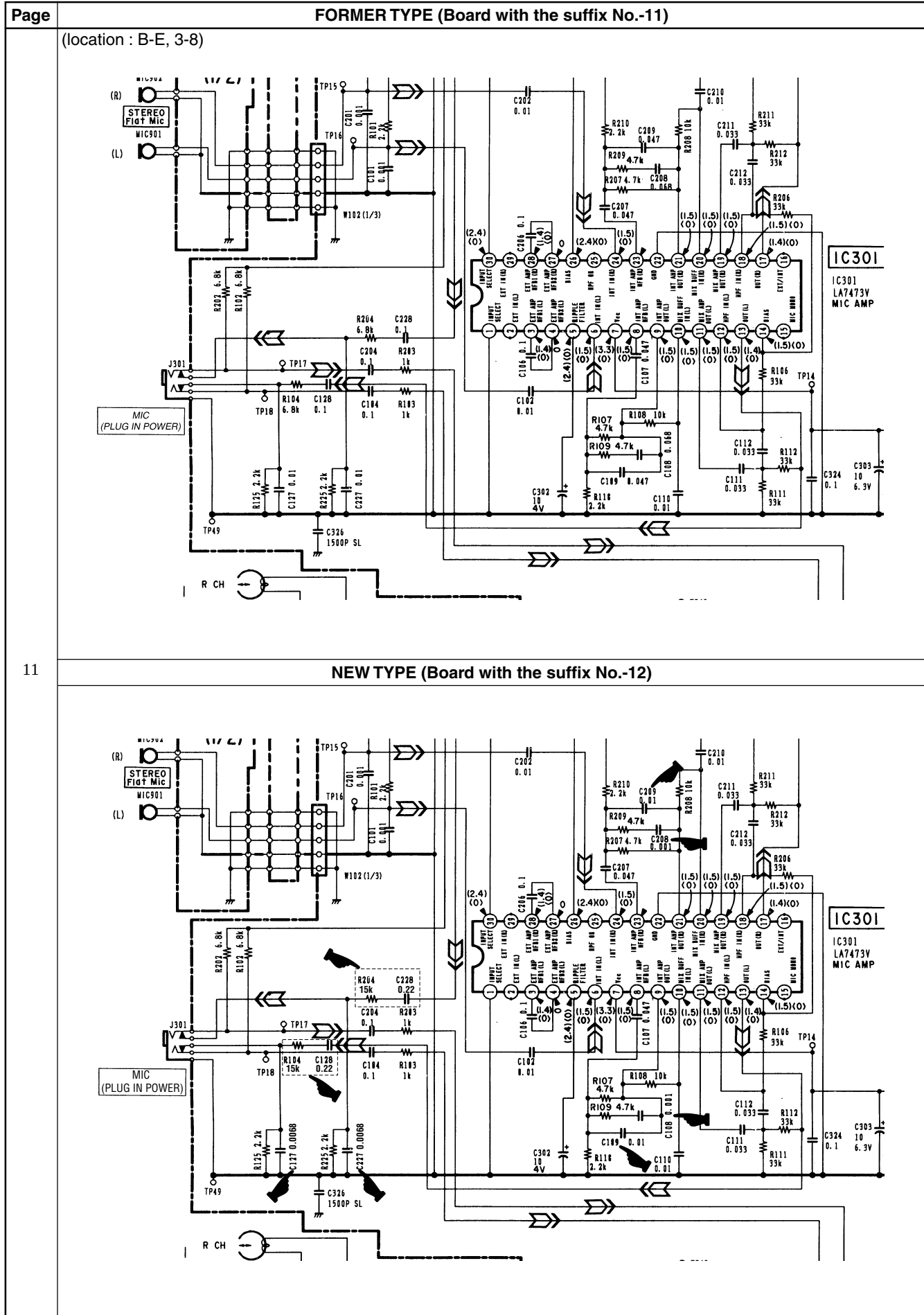
1-1. Printed Wiring Board (page 17)



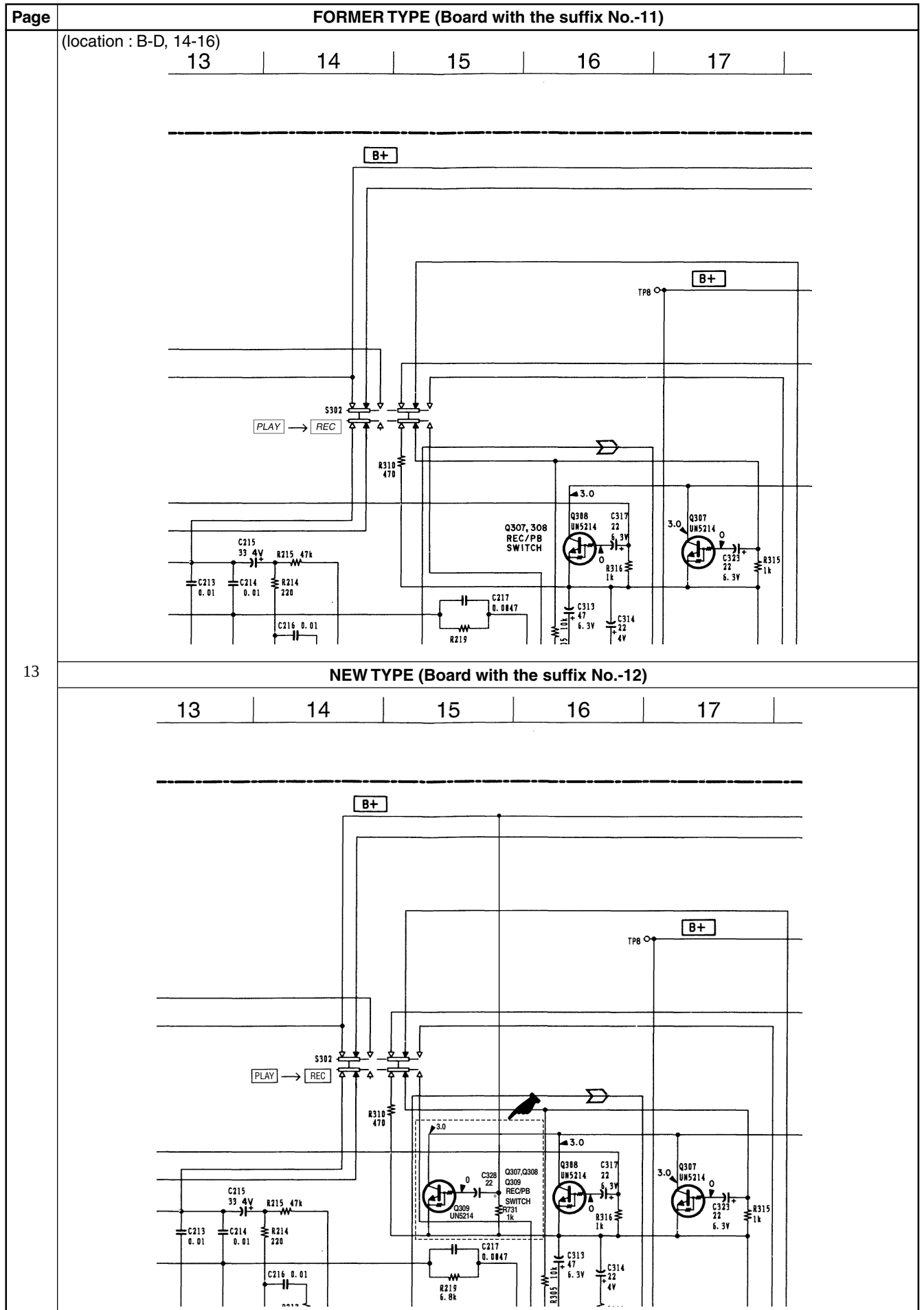
✂ : indicates corrected portion.

Page	FORMER TYPE (Board with the suffix No.-11)	NEW TYPE (Board with the suffix No.-12)
15	(location : E-G,1-3) 	
16	(location : E-F,10-12) 	
18	(location : D-G,21-23) 	

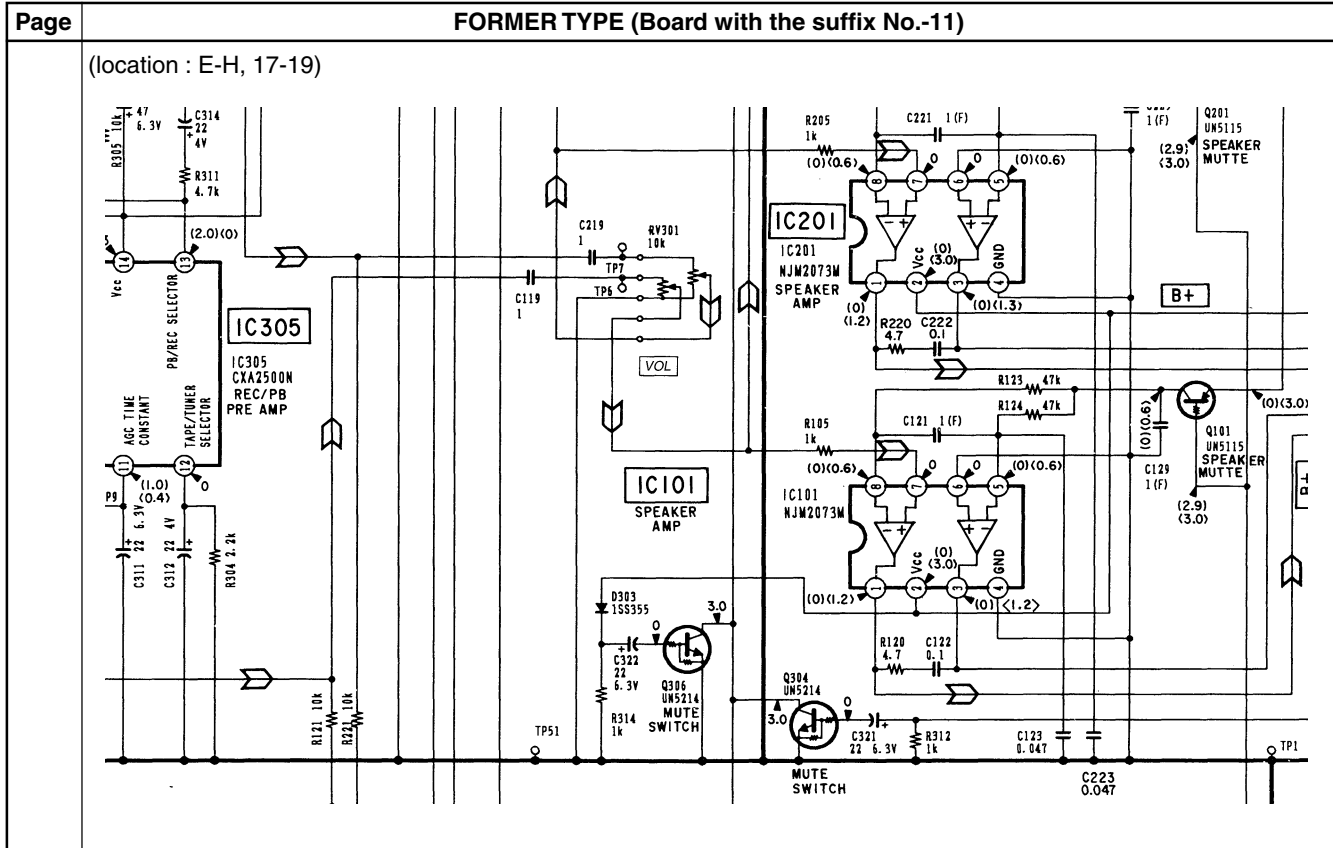
1-2. Schematic Diagram : indicates corrected portion.



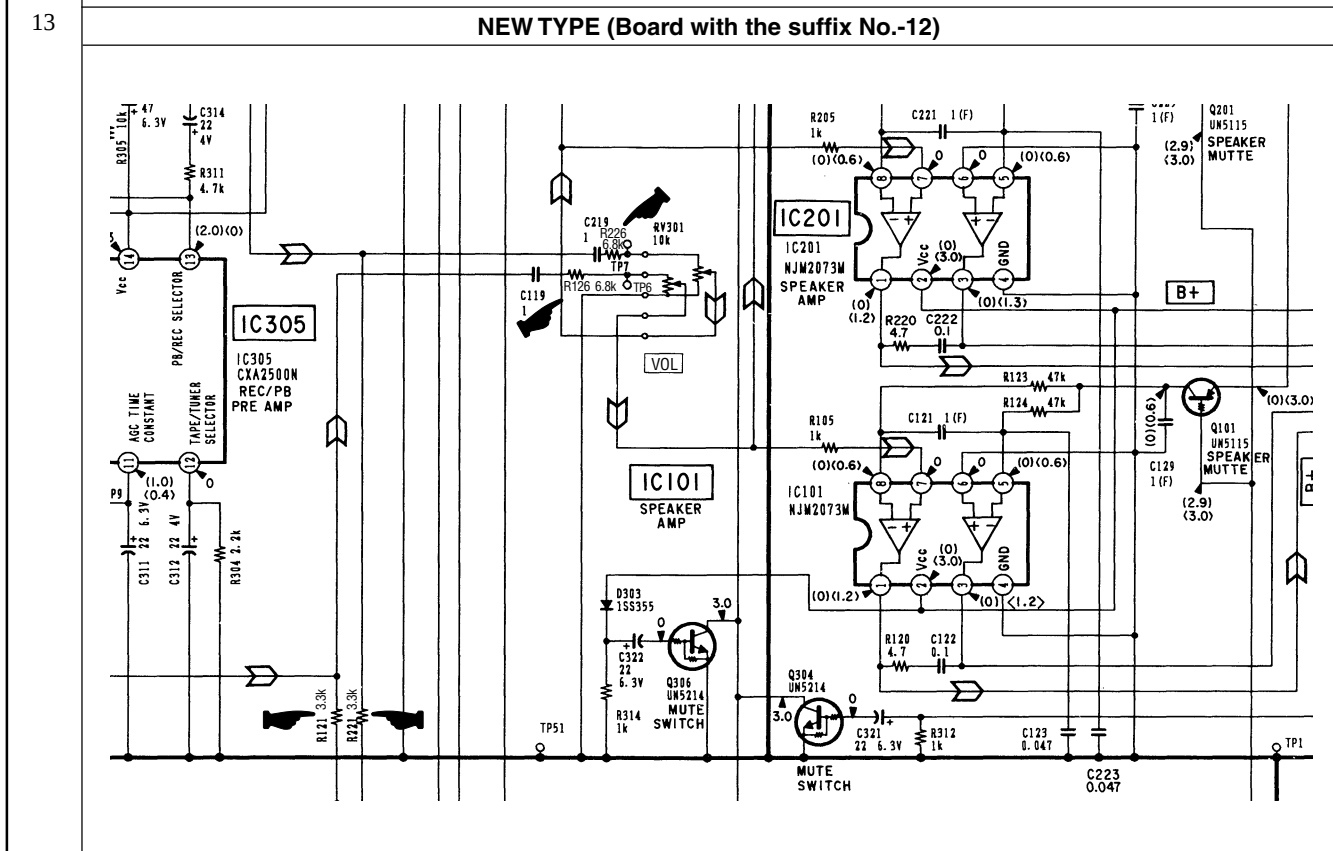
✎ : indicates corrected portion.



✎ : indicates corrected portion.



13

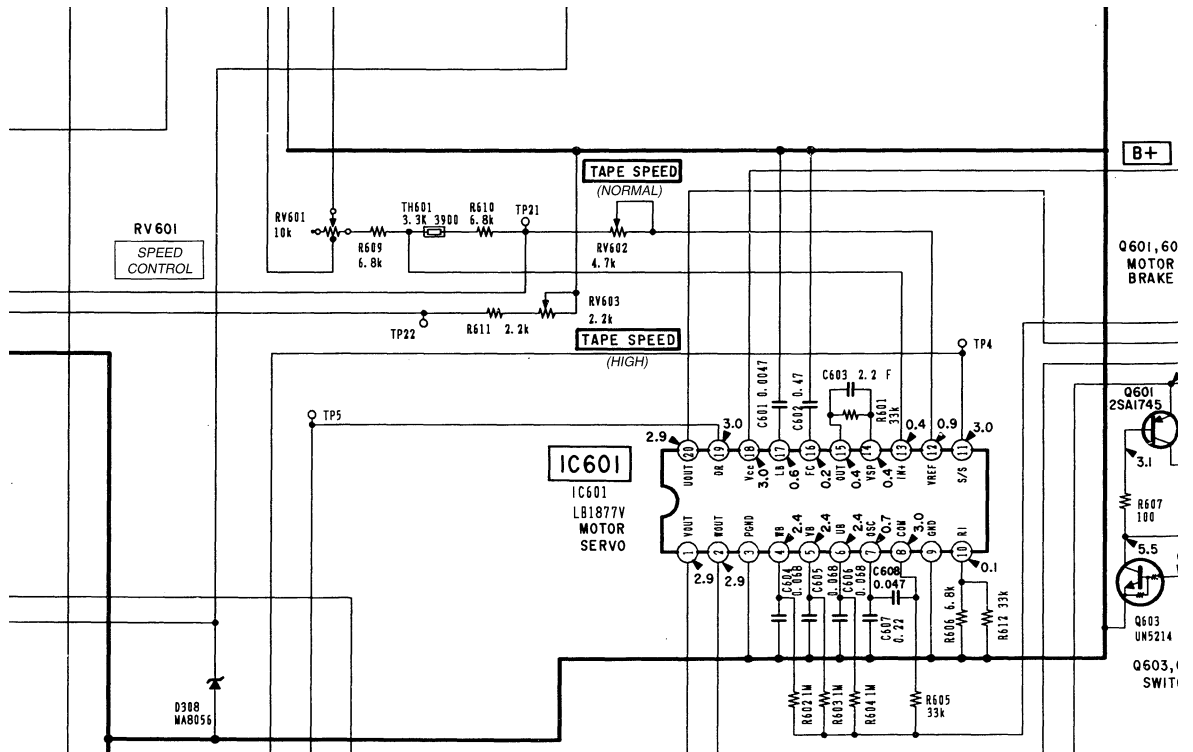


✎ : indicates corrected portion.

Page

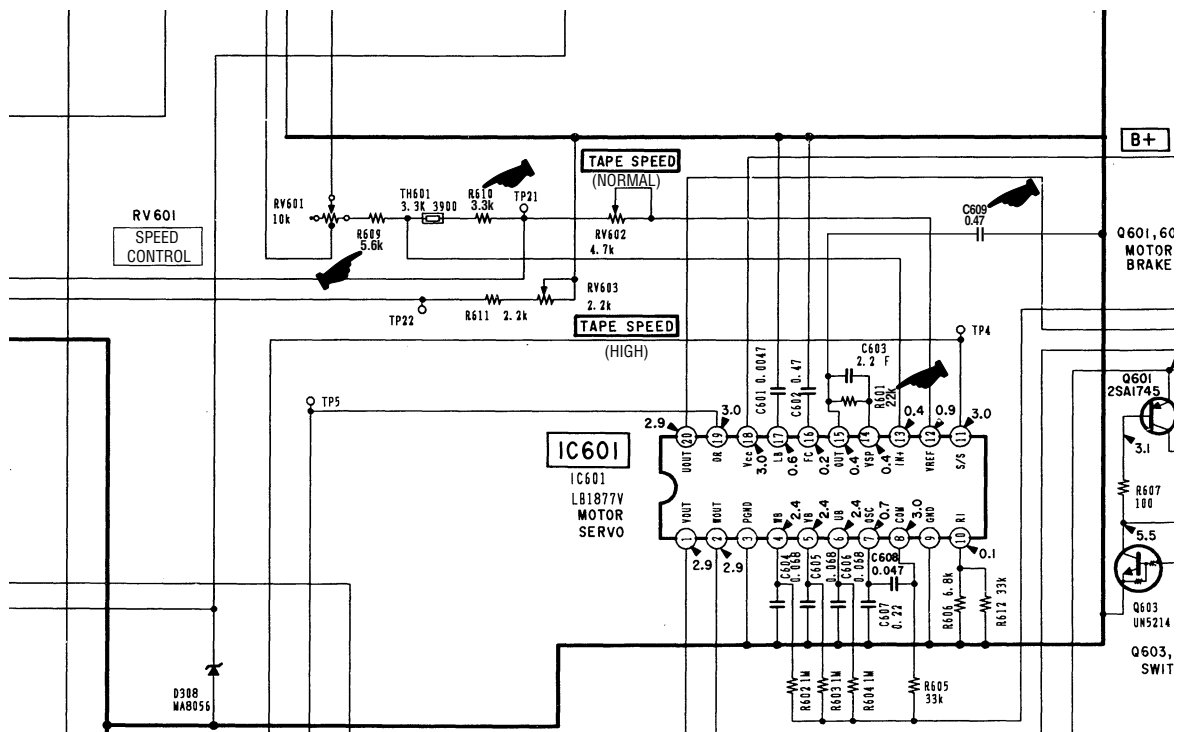
FORMER TYPE (Board with the suffix No.-11)

(location : J-L, 18-22)

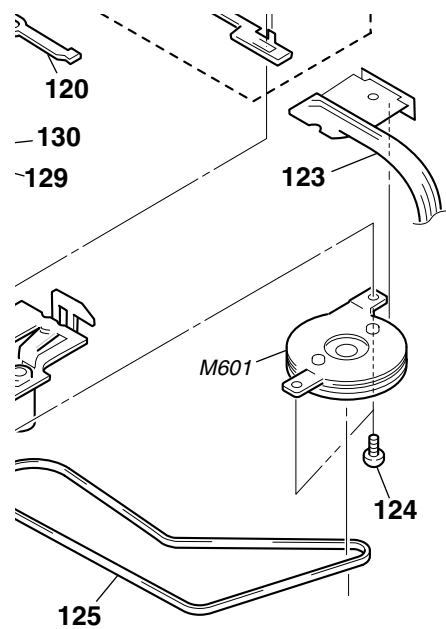
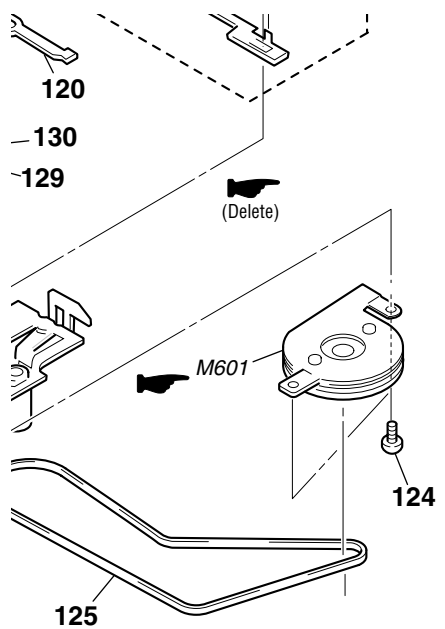


13

NEW TYPE (Board with the suffix No.-12)



1-3. Part List : indicates corrected portion.

Page	FORMER TYPE (Board with the suffix No.-11)						NEW TYPE (Board with the suffix No.-12)					
29												
	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>			<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>			
	123	1-657-172-11	PC BOARD, MOTOR FLEXIBLE				1-763-273-11	MOTOR, DC (INCLUDING PULLEY)			(CAPSTAN / REEL)	
	M601	1-698-804-21	MOTOR, DC (INCLUDING PULLEY)								(CAPSTAN / REEL)	
31	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>			<u>Part No.</u>	<u>Description</u>	<u>Remarks</u>			
	C108	1-165-176-11	CERAMIC CHIP	0.068uF	10%	16V	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
	C109	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
	C127	1-165-970-11	CERAMIC CHIP	0.01uF	10%	25V	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
	C128	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V	
	C208	1-164-490-11	CERAMIC CHIP	0.068uF	10%	16V	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
	C209	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
	C227	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
	C228	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V	
	C328	_____	_____				1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V	
32	C609	_____	_____				1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V	
	Q309	_____	_____				8-729-402-93	TRANSISTOR	UN5214-TX			
	R104	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	1-216-835-11	METAL CHIP	15K	5%	1/16W	
	R121	1-216-833-11	METAL CHIP	10K	5%	1/16W	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
33	R126	_____	_____				1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
	R204	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	1-216-835-11	METAL CHIP	15K	5%	1/16W	
	R221	1-216-833-11	METAL CHIP	10K	5%	1/16W	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
	R226	_____	_____				1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
	R601	1-216-839-11	METAL CHIP	33K	5%	1/16W	1-216-837-11	METAL CHIP	22K	5%	1/16W	
	R609	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
	R610	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
	R731	_____	_____				1-216-821-11	METAL CHIP	1K	5%	1/16W	

2. Replacing the Board/Motor

When riplacing the board or motor only, the following parts are required:

2-1. Replacing the board (when replacing the board with the suffix No.-11 by that with -12 without changing the motor:)

Page	BEFORE CHANGE						AFTER CHANGE					
32	Ref. No.	Part No.	Description	Remarks			Part No.	Description	Remarks			
	C609	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V	_____	_____				
33	R601	1-216-837-11	METAL CHIP	22K	5%	1/16W	1-216-839-11	METAL CHIP	33K	5%	1/16W	
	R610	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	

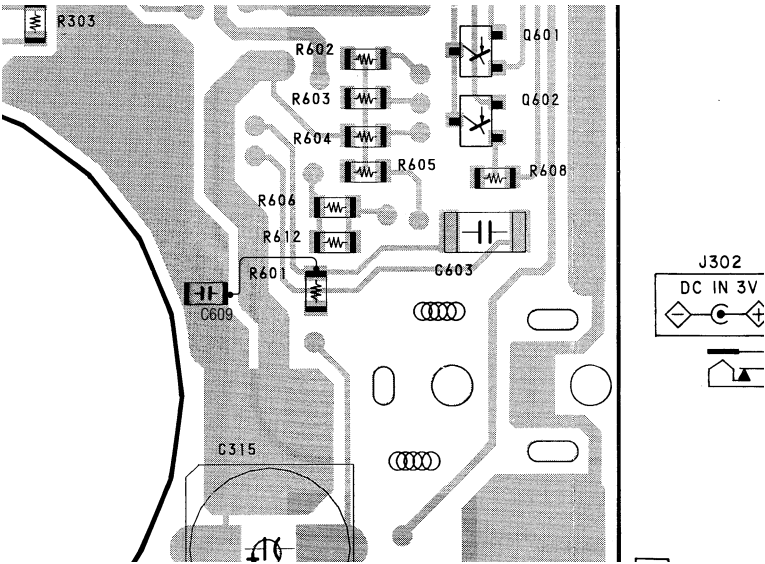
Note: The new board differs from the former board in the location of the land where the motor flexible board is soldered. Therefore, the board cannot be used as it is. Remove the motor flexible board and connect the terminals with lead wire.

2-2. Replacing the motor (when replacing by the new motor without changing the boatd with suffix No.-11.)

Page	BEFORE CHANGE						AFTER CHANGE					
32	Ref. No.	Part No.	Description	Remarks			Part No.	Description	Remarks			
	C609	_____	_____				1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V	
33	R601	1-216-839-11	METAL CHIP	33K	5%	1/16W	1-216-837-11	METAL CHIP	22K	5%	1/16W	
	R610	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	

Mounting location of C609

Note: When connecting between C609 and R601, take care to prevent contact between lead and pattern.



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]