

TCM-36/459V

SERVICE MANUAL

Ver 1.2 2004.03



Photo: TCM-459V

US Model
Canadian Model
AEP Model
E Model
Chinese Model
TCM-459V
Tourist Model
TCM-36/459V

Model Name Using Similar Mechanism	NEW
Tape Transport Mechanism Type	MT-459V-118

SPECIFICATIONS

Recording system

2-track 1 channel monaural

Frequency range

250 - 6,300 Hz

Speaker

Approx. 3.6 cm (1⁷/₁₆ in.) dia.

Power output

300 mW (at 10 % harmonic distortion)

Input

Microphone input jack (minijack) sensitivity 0.2 mV for 3 kilohms or lower impedance microphone

Output

Earphone jack (minijack) for 8 - 300 ohms earphone

Variable range of the tape speed

from +30% to -15%

Power requirements

- Two size R6 (AA) batteries (supplied to TCM-36 only): 3V DC
- DC IN 3 V jack accepts:
 - AC-E30M (TCM-36 only) or AC-E30HG AC power adaptor (not supplied) suitable in the country where the unit is to be used.
 - Sony DCC-E230 car battery cord (not supplied) for use on 12 V car battery.

Dimensions (w/h/d) (incl. projecting parts and controls)

Approx. 116 × 91 × 38mm (4⁵/₁₆ × 3⁵/₁₆ × 1¹/₂ in.)

Mass (not incl. batteries)

Approx. 195 g (6.9 oz.)

Supplied accessories

R6 (size AA) batteries (2) (TCM-36 only)

Design and specifications are subject to change without notice.

Battery life (Approximate hours)

(EIAJ*)

	Playback	Recording
Sony alkaline LR6 (SG)	11	11
Sony R6P (SR)	3	3

* Measured value by the standard of EIAJ (Electric Industries Association of Japan). (Using a Sony HF series cassette tape)

Note

The battery life may shorten depending on the operation of the unit.

Connect the AC power adaptor to DC IN 3V and to the wall outlet. Use the AC-E30HG AC power adaptor (not supplied). (For TCM-36: For Japan use the AC-E30M, not supplied) Do not use any other AC power adaptor.

Polarity of the plug



Note

Specifications for AC-E30HG varies for each area. Check your local voltage and the shape of plug before purchasing.

CASSETTE-CORDER

SONY®

9-923-317-12

2004C05-1

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Sony Corporation

Personal Audio Company

Published by Sony Engineering Corporation

TABLE OF CONTENTS

1. GENERAL	2
2. DISASSEMBLY	3
3. MECHANICAL ADJUSTMENTS	5
4. ELECTRICAL ADJUSTMENTS	6
5. DIAGRAMS	
5-1. Block Diagram	7
5-2. Printed Wiring Boards	9
5-3. Schematic Diagram	13
6. EXPLODED VIEWS	16
7. ELECTRICAL PARTS LIST	19

Flexible Circuit Board Repairing

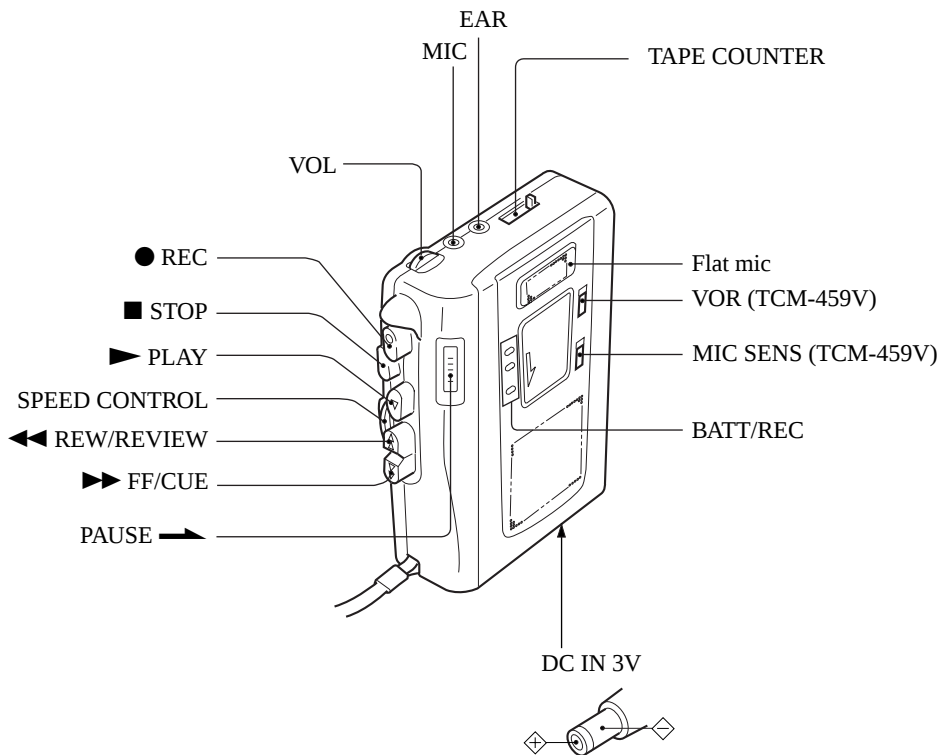
- Keep the temperature of the soldering iron around 270 °C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

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

• Parts Identification



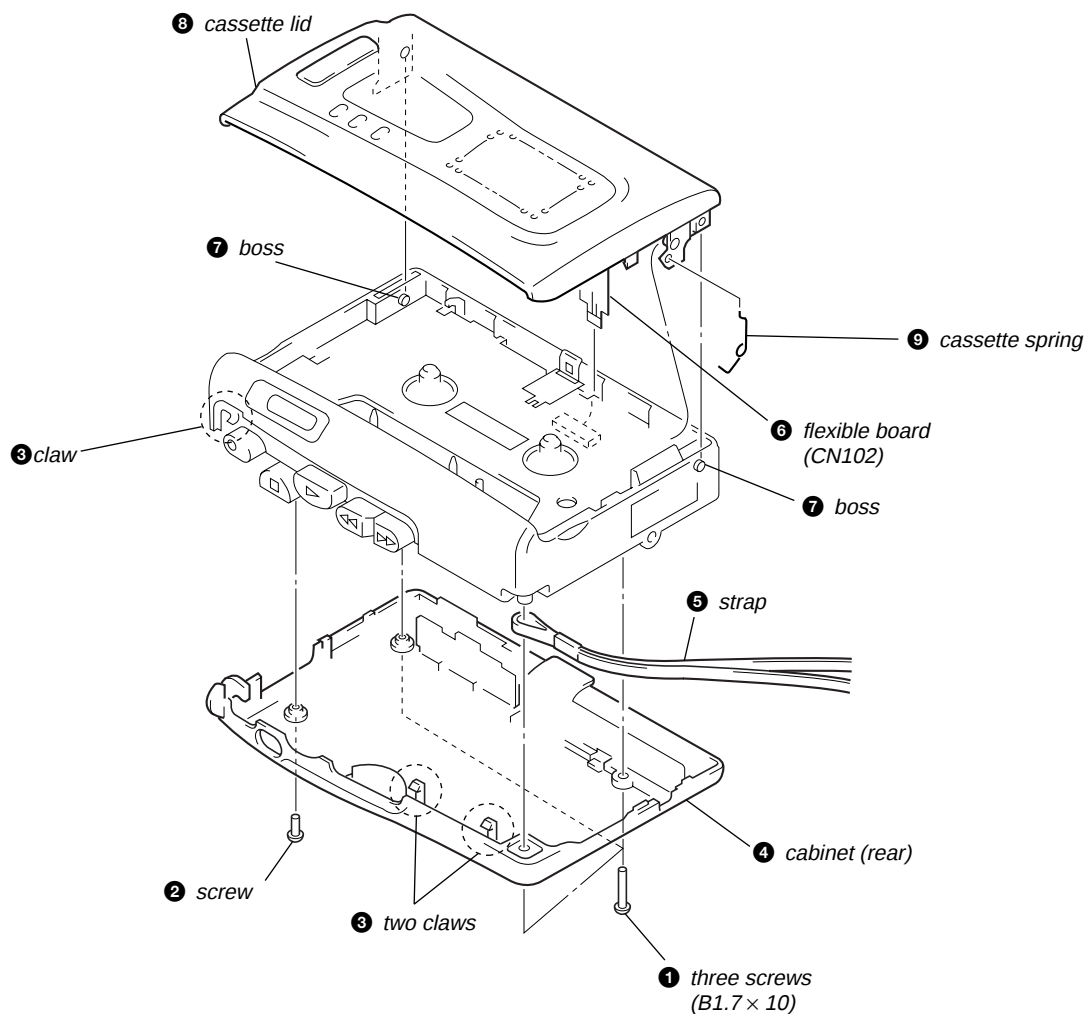
SECTION 2 DISASSEMBLY

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

SET ➡ CABINET (REAR) ➡ CASSETTE LID ➡ MAIN BOARD ➡ MECHANISM DECK (MT-459V-118) ➡ BELT

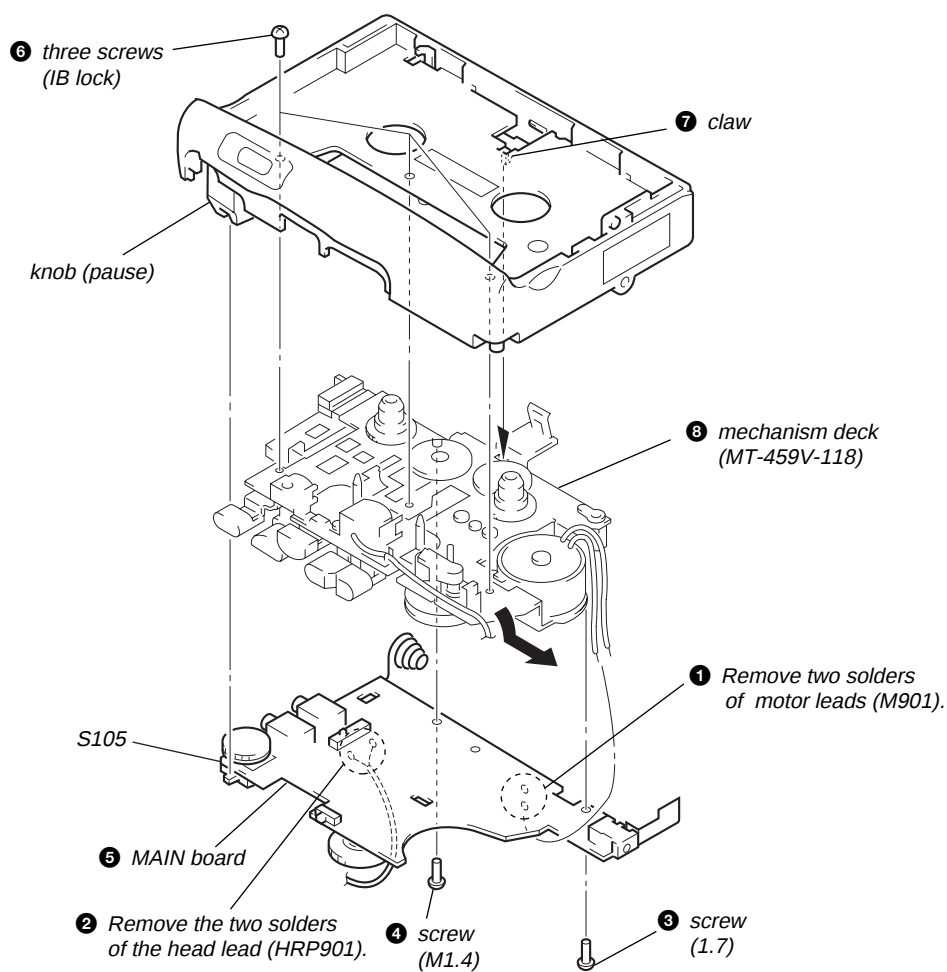
Note: Follow the disassembly procedure in the numerical order given.

CABINET (REAR), CASSETTE LID



MAIN BOARD, MECHANISM DECK (MT-459V-118)

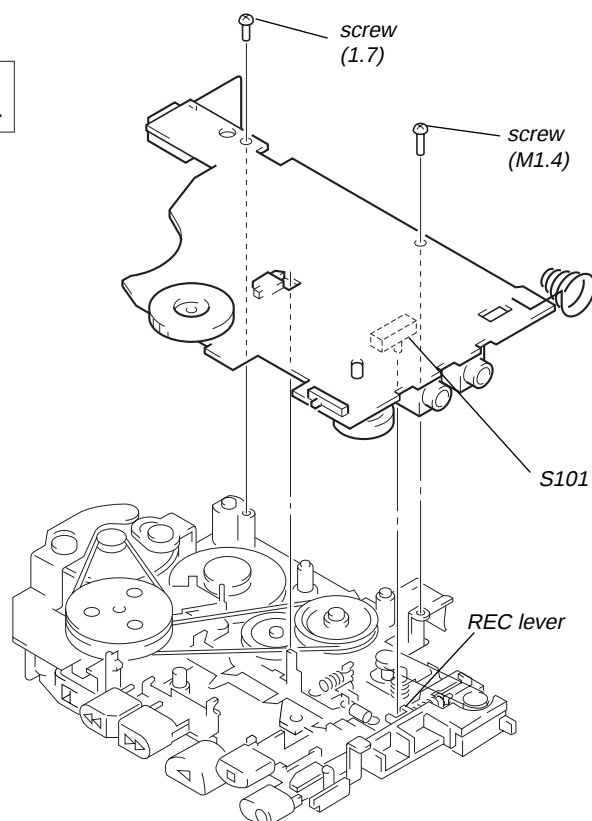
Note: On installation MAIN board adjust the S105 and knob (pause).



NOTE FOR INSTALLATION

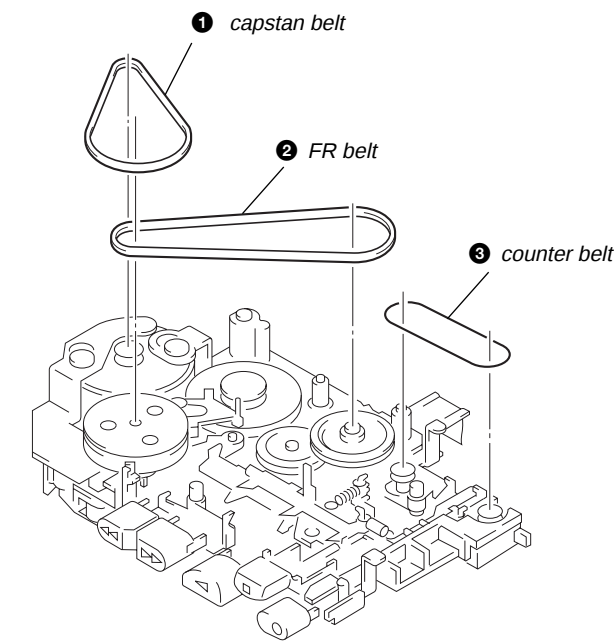
• MAIN BOARD

On installation MAIN board adjust the S101 and REC lever.



SECTION 3 MECHANICAL ADJUSTMENTS

BELT



1. Clean the following parts with a denatured-alcohol-moistened swab:
 record/playback head pinch roller
 erase head rubber belt
 capstan idler
2. Demagnetize the record/playback head with a head demagnetizer. (Do not bring the head demagnetizer close to the erase head.)
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 (2.5 V) unless otherwise noted.

Torque Measurement

Mode	Torque Meter	Meter Reading
FWD	CQ-102C	22 – 48 g•cm (0.31 – 0.67 oz•inch)
Forward Back Tension		1.0 – 4.5 g•cm (0.014 – 0.063 oz•inch)
FF, REW	CQ-201B	more than 50 g•cm (more than 0.69 oz•inch)

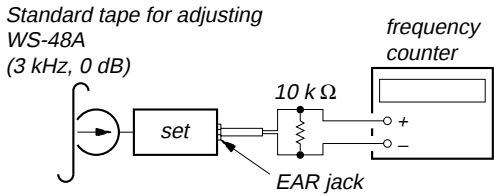
Tape Tension Measurement

Mode	Tension Meter	Meter Reading
FWD	CQ-403C	more than 50 g (more than 1.76 oz)

SECTION 4 ELECTRICAL ADJUSTMENTS

Tape Speed Adjustment

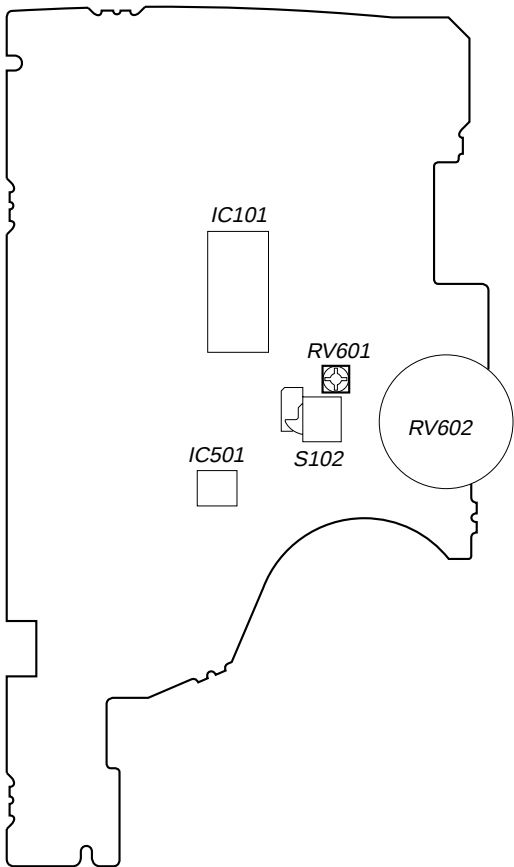
Procedure:
Mode: playback



1. Play back WS-48A (tape end part) and adjust RV601 so that the frequency counter reading becomes $3,000 \pm 15$ Hz.
2. Play back WS-48A tape the beginning and the end part, check that the frequency counter reading is within same standard of step1.

Adjustment Location:

[MAIN BOARD] (Side B)



Precaution

- Supplied voltage: 2.5 V
- Switch and control position
 VOR switch (S401): OFF (459V)
 PAUSE switch (S105): OFF
 VOL (RV101): mechanical mid
 SPEED CONTROL (RV602): mechanical center
 MIC SENS switch (S201): H (459V)

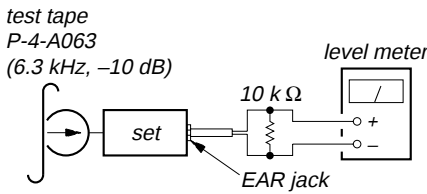
Test Tape

Type	Signal	Used for
P-4-A063	6.3 kHz, -10 dB	head azimuth adjustment
WS-48A	3 kHz, 0 dB	tape speed adjustment

0 dB=0.775 V

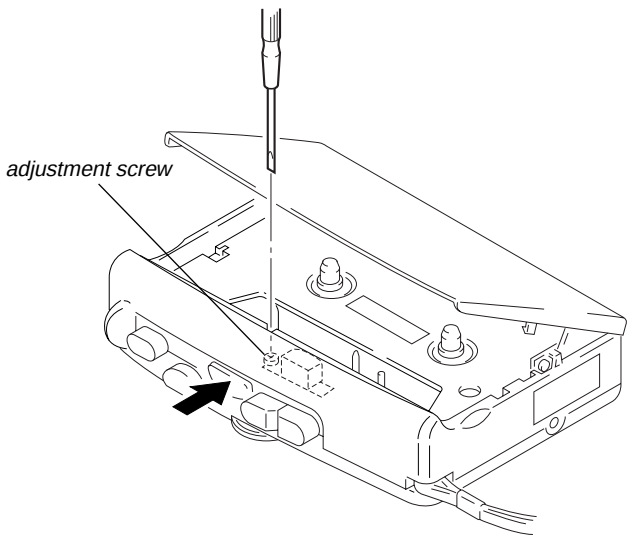
Record/Playback Head Azimuth Adjustment

Procedure:
Mode: playback



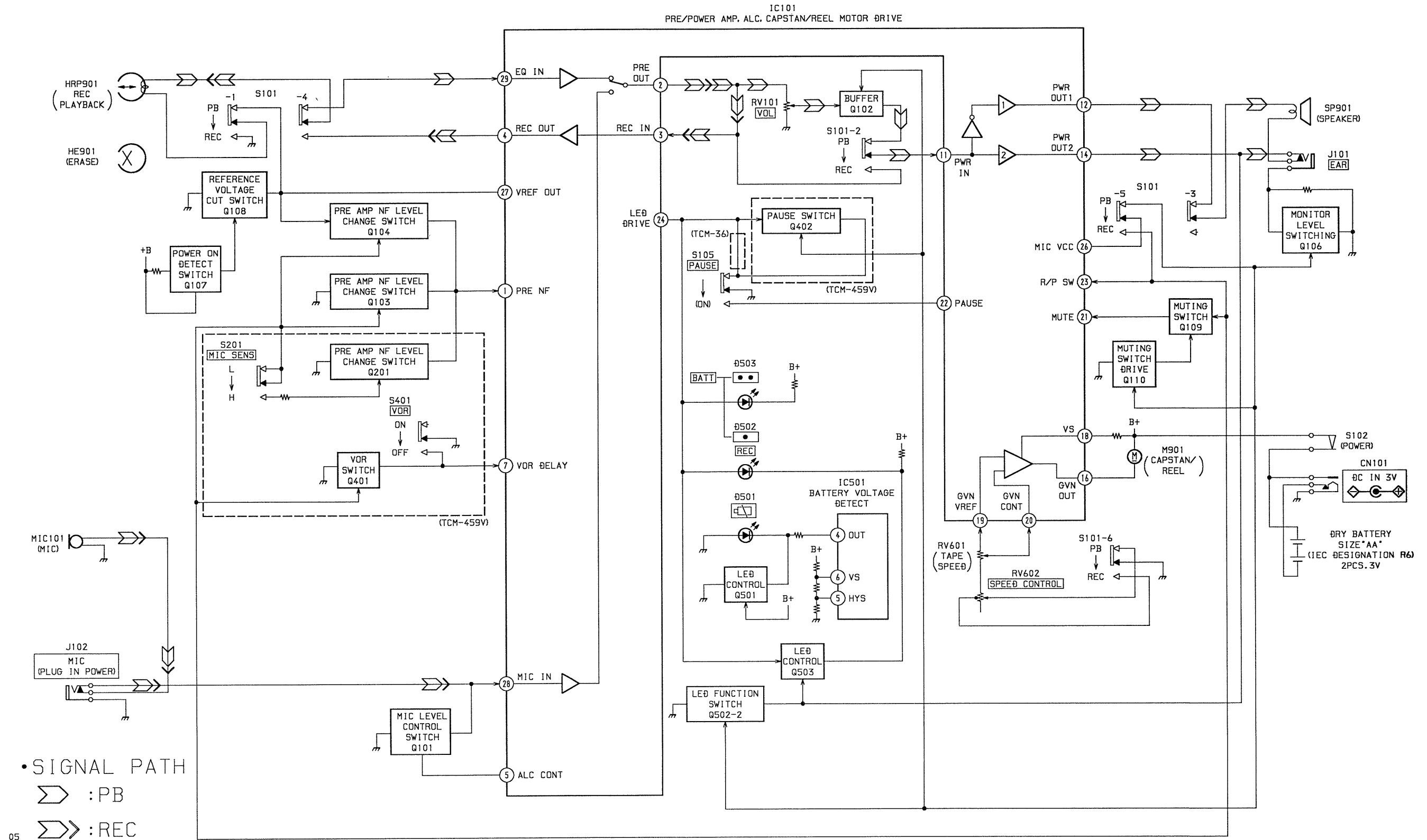
1. Turn the adjustment screw to obtain the maximum reading on level meter.
Note: Several peaks may appear, but take the maximum.
2. After the adjustment, lock the adjustment screw with suitable locking compound.

Adjustment Location:

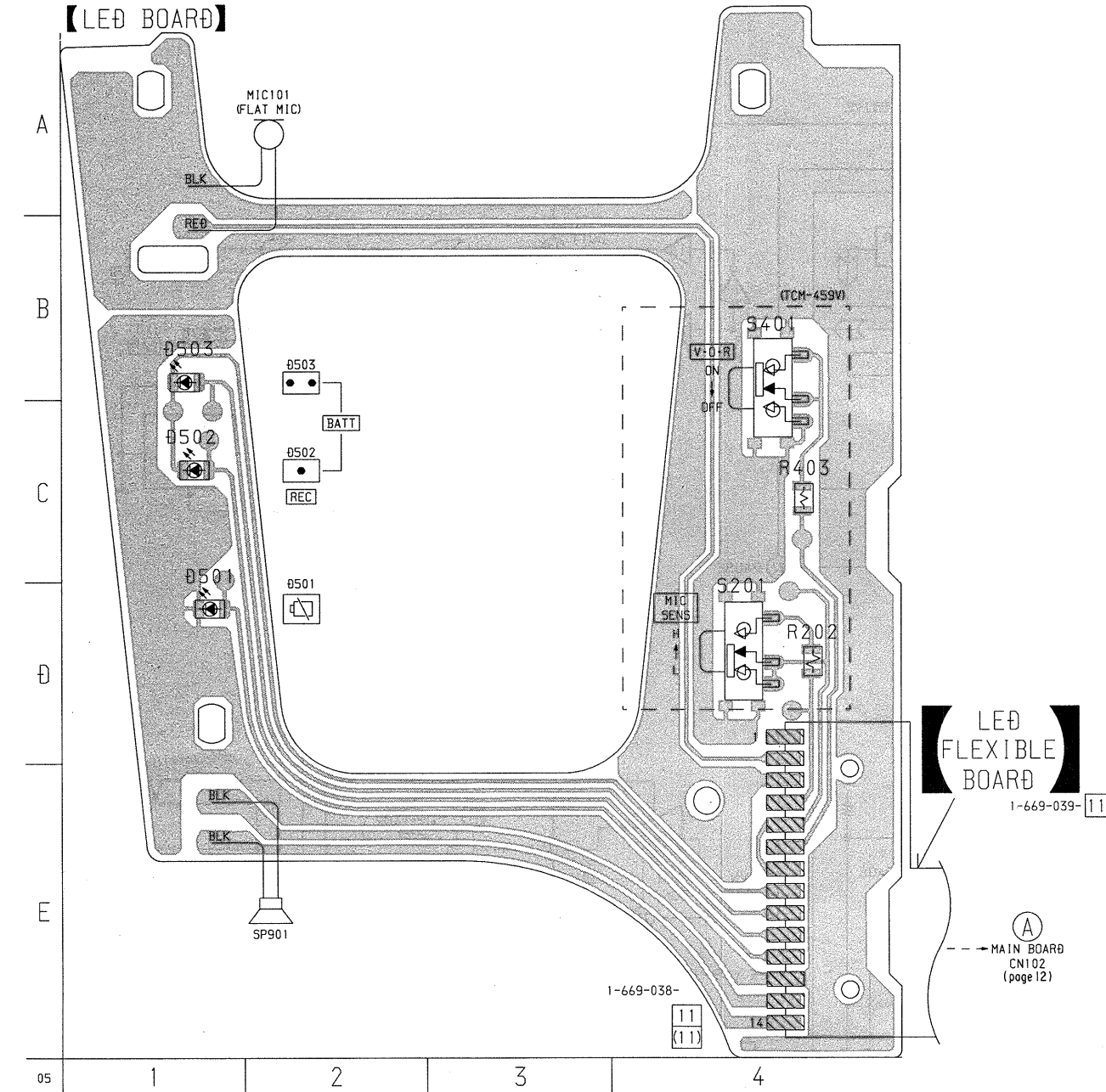


SECTION 5 DIAGRAMS

5-1. BLOCK DIAGRAM

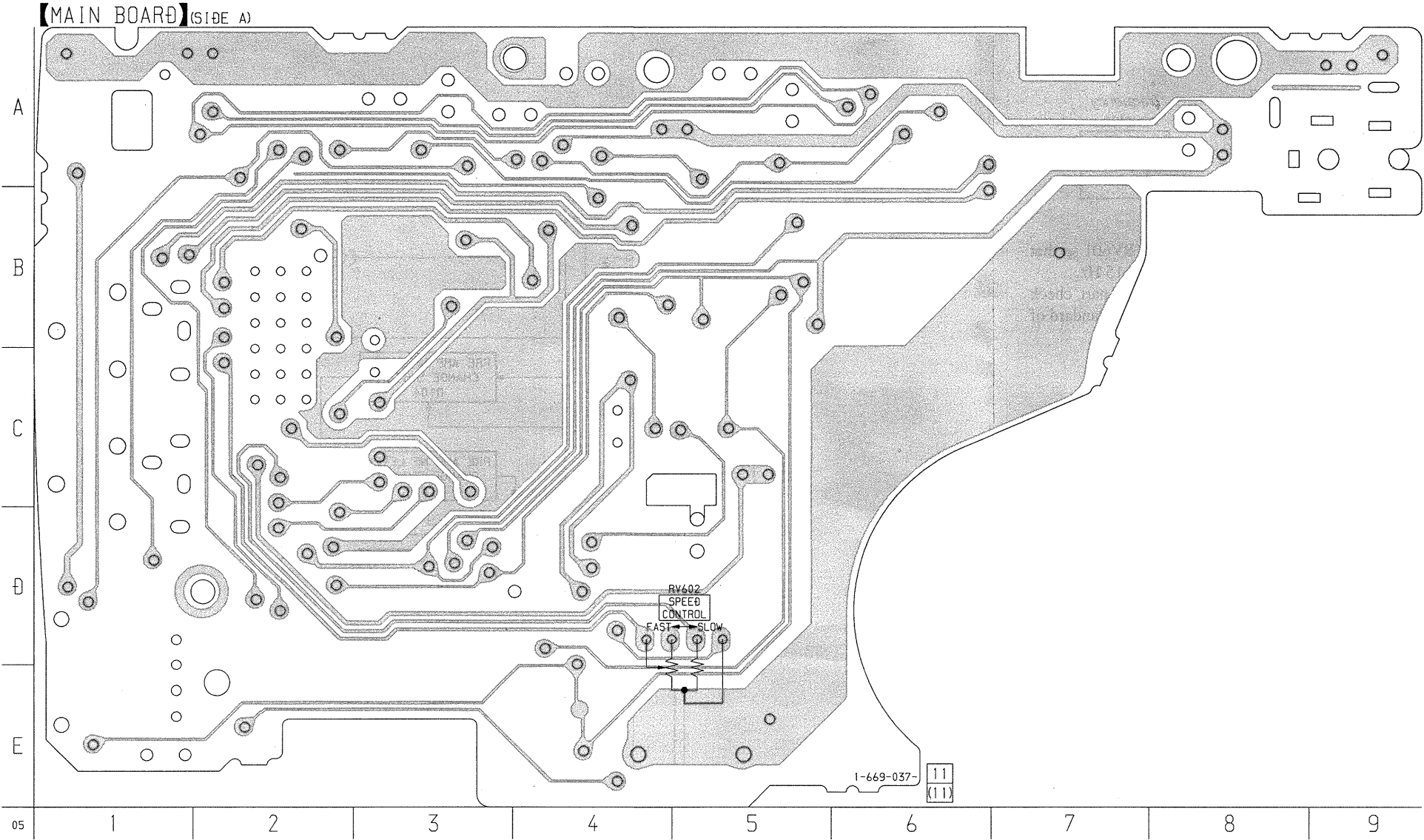


5-2. PRINTED WIRING BOARDS



• Semiconductor
Location
(LED Board)

Ref. No.	Location
D501	D-1
D502	C-1
D503	B-1



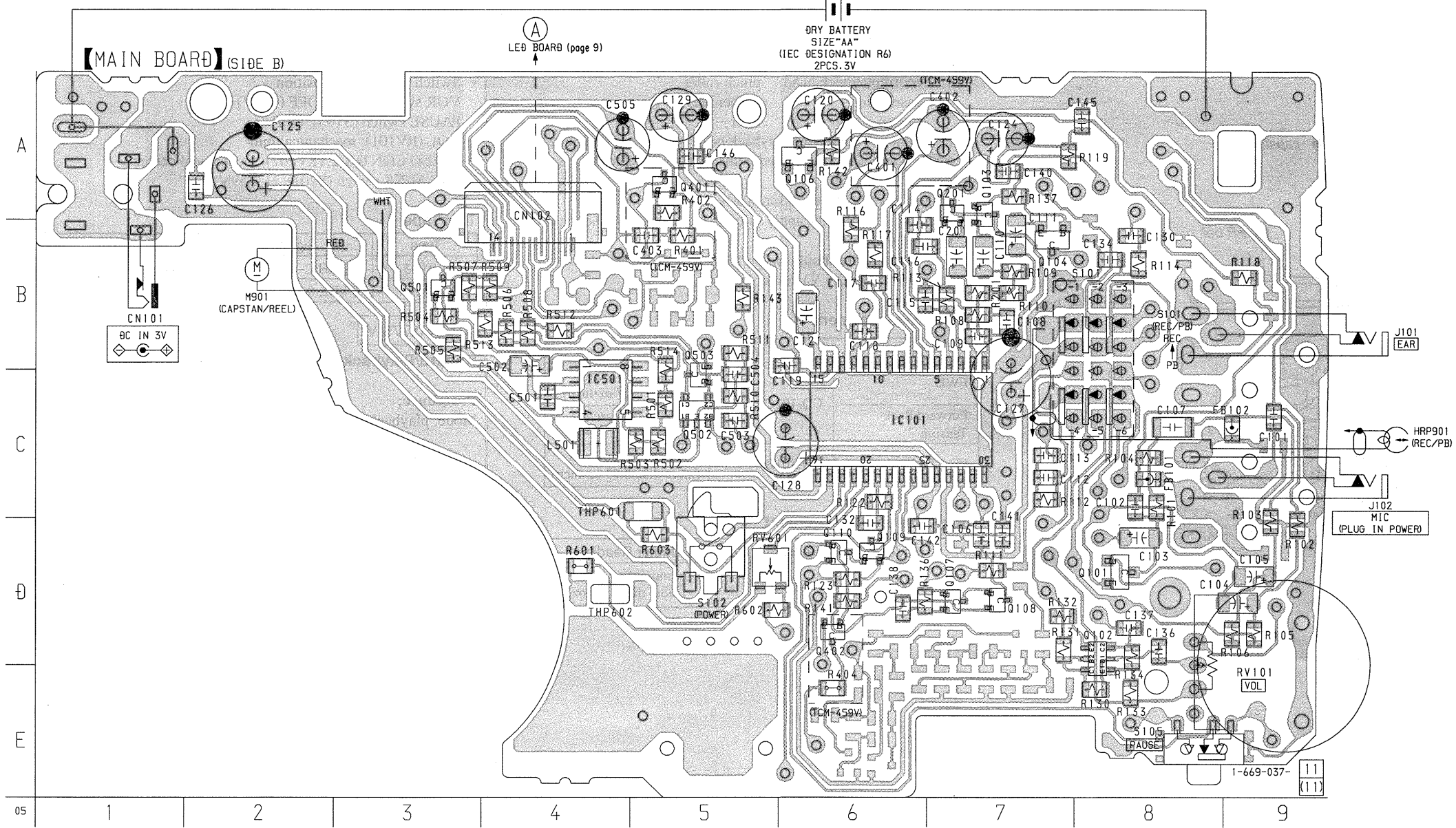
Note on Printed Wiring Boards:

- : parts extracted from the component side.
- : parts extracted from the conductor side.
- ▨ : Pattern from the side which enables seeing.
(The other 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)



• Semiconductor
Location
(MAIN Board Side B)

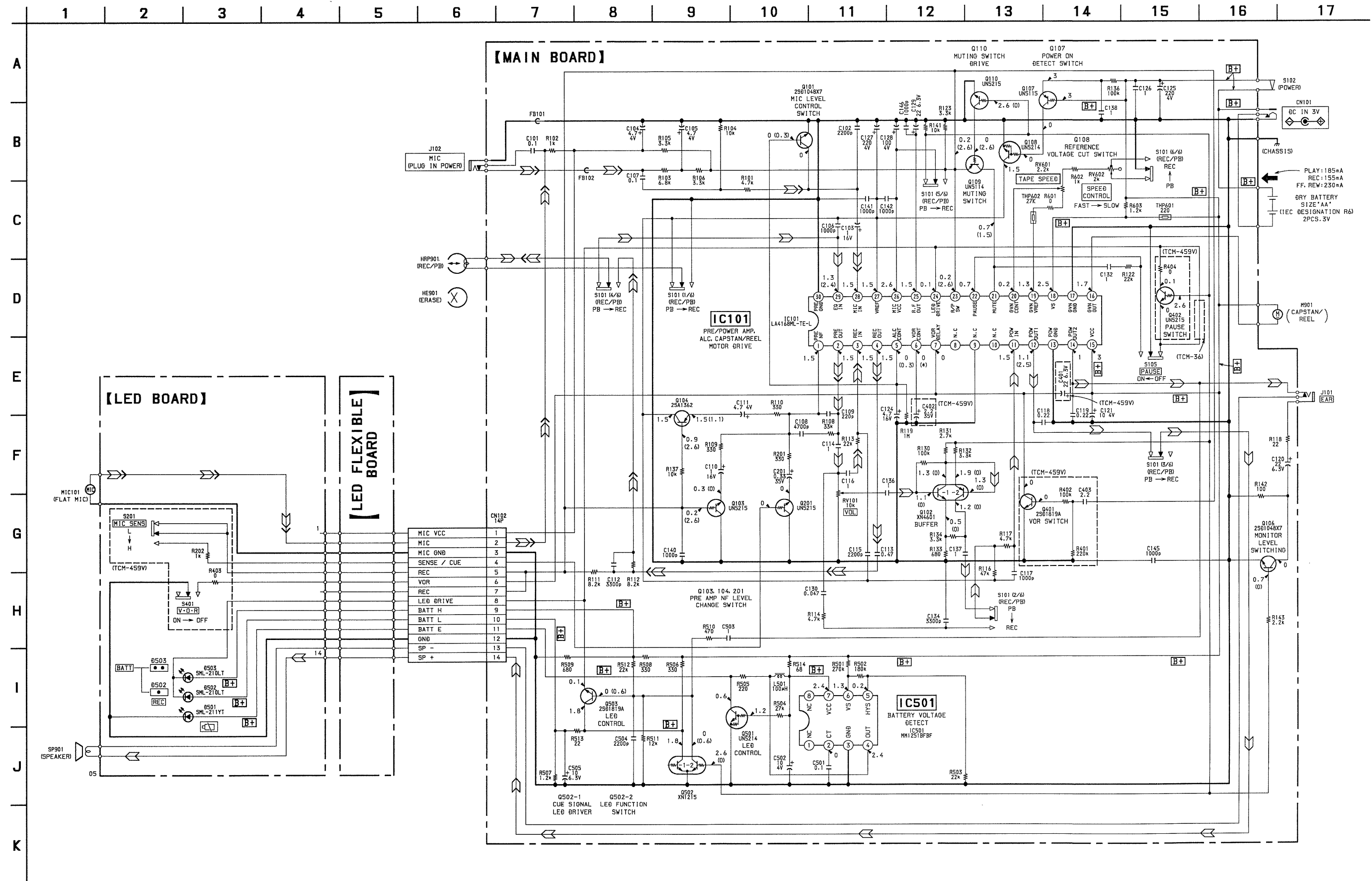
Ref. No.	Location
IC101	C-6
IC501	C-4
Q101	D-8
Q102	D-8
Q103	A-7
Q104	B-7
Q106	A-6
Q107	D-7
Q108	D-7
Q109	D-6
Q110	D-6
Q201	A-7
Q0401	A-5
Q0402	D-6
Q501	B-3
Q502	C-5
Q503	C-5

Note:
○: TCM-459V only

Note on Schematic Diagram:

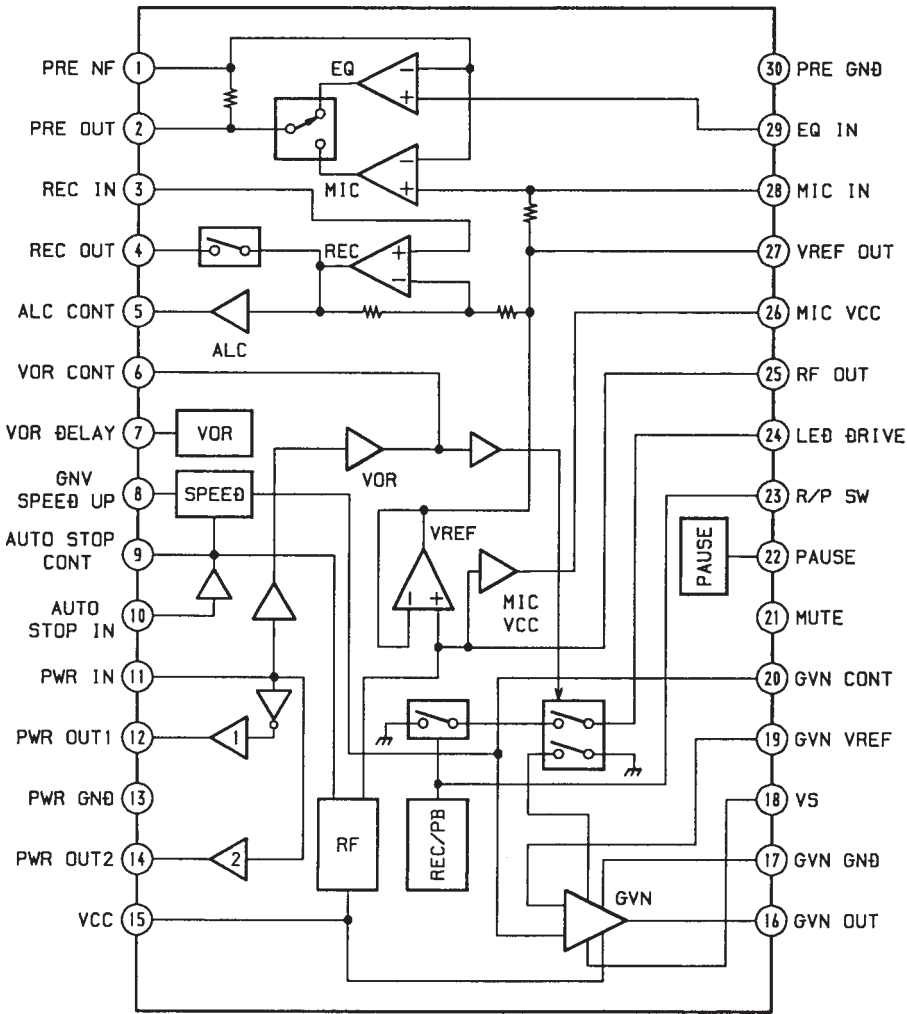
- All capacitors are in μF unless otherwise noted. pF : μpF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $1/4\text{W}$ or less unless otherwise specified.
- Panel designation: $\square$
- B+: B+ Line.
- Adjustment for repair: $\square$
- Total current is measured with no cassette installed.
- Power voltage is dc 3 V and fed with regulated dc power supply from external power voltage jack.
- Voltages are dc with respect to ground under no-signal conditions.
no mark : PLAY
() : REC
* : Impossible to measure
- Voltages are taken with a VOM (Input impedance 10 M Ω).
Voltage variations may be noted due to normal production tolerances.
- Signal path:
PB : PB
REC : REC

5-3. SCHEMATIC DIAGRAM • See page 15 for IC Block Diagrams. • See page 12 for Note on Schematic Diagram.

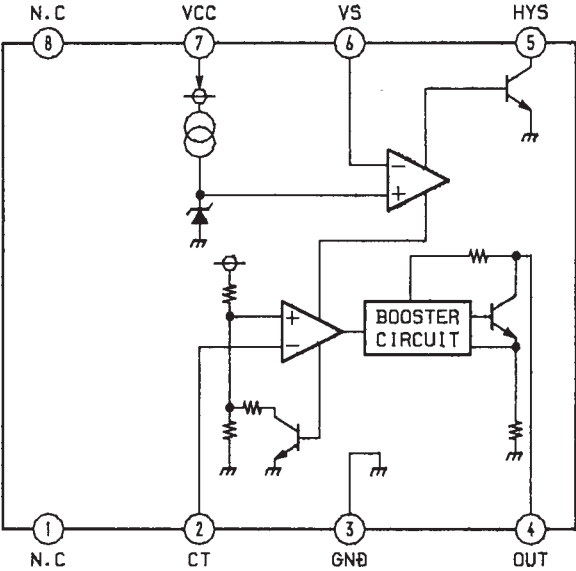


• IC Block Diagrams

IC101 LA4168ML-TE-L



IC501 MM1251BFBE



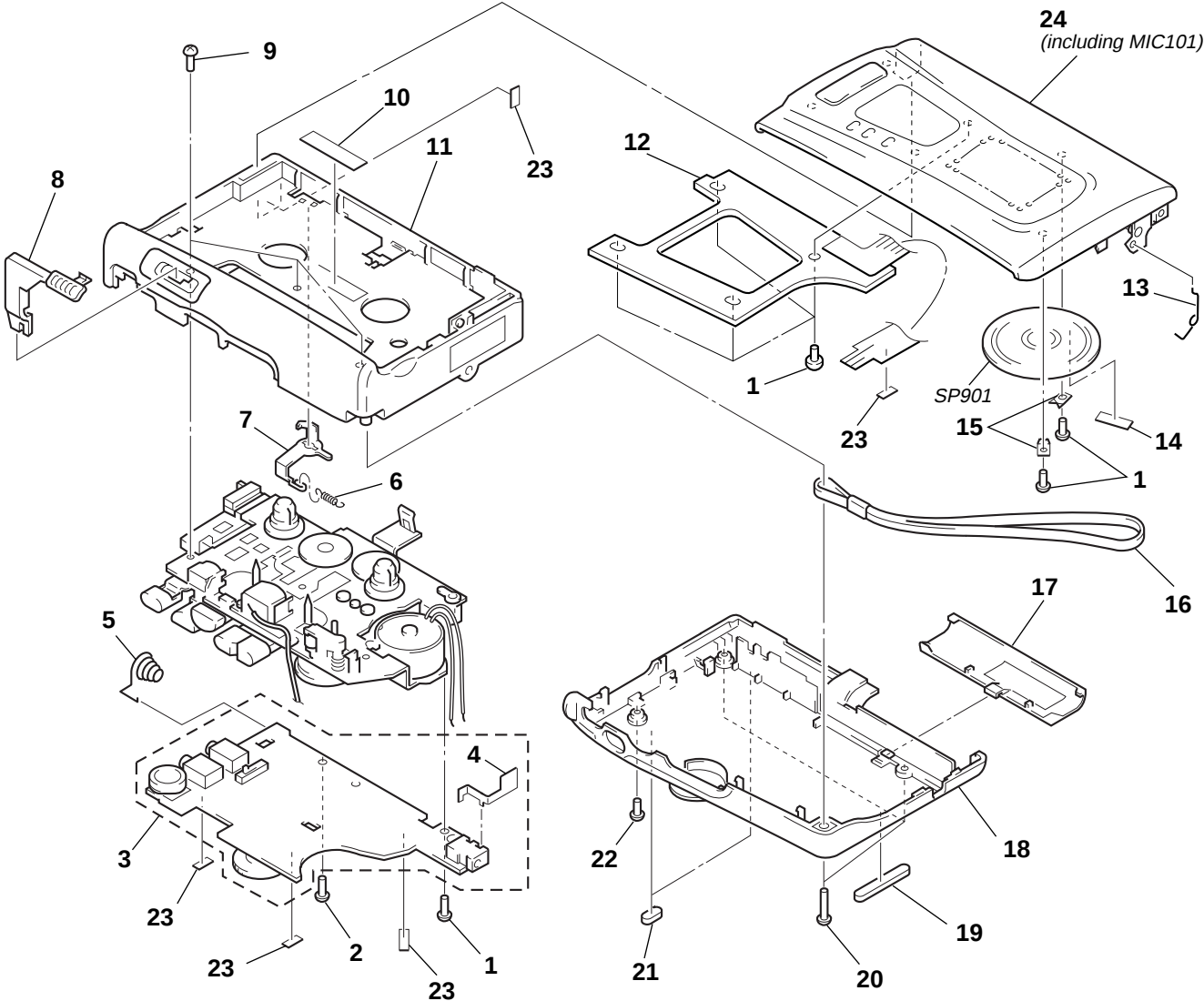
SECTION 6
EXPLODED VIEWS

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

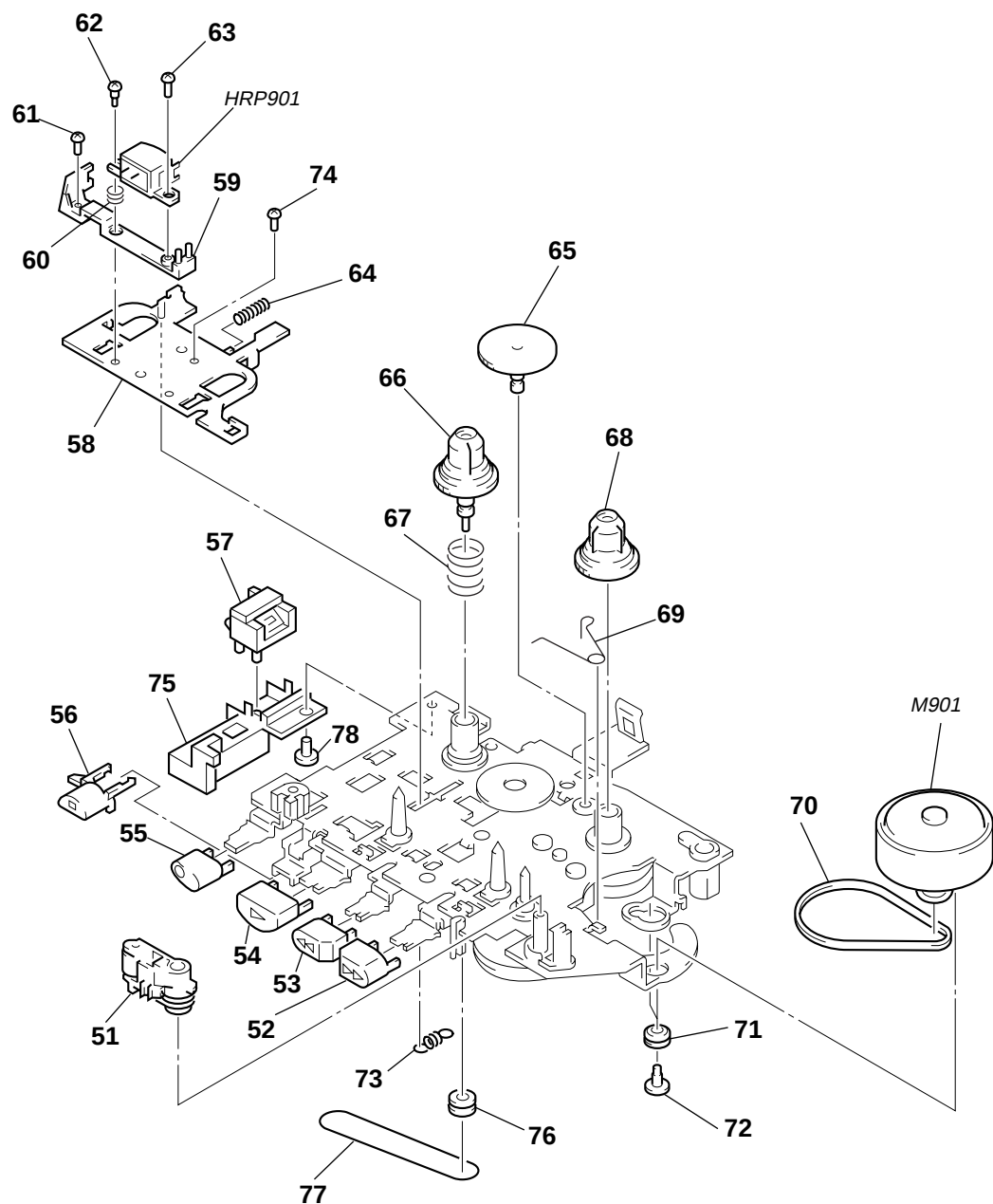
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of the electrical parts list.

(1) CABINET SECTION



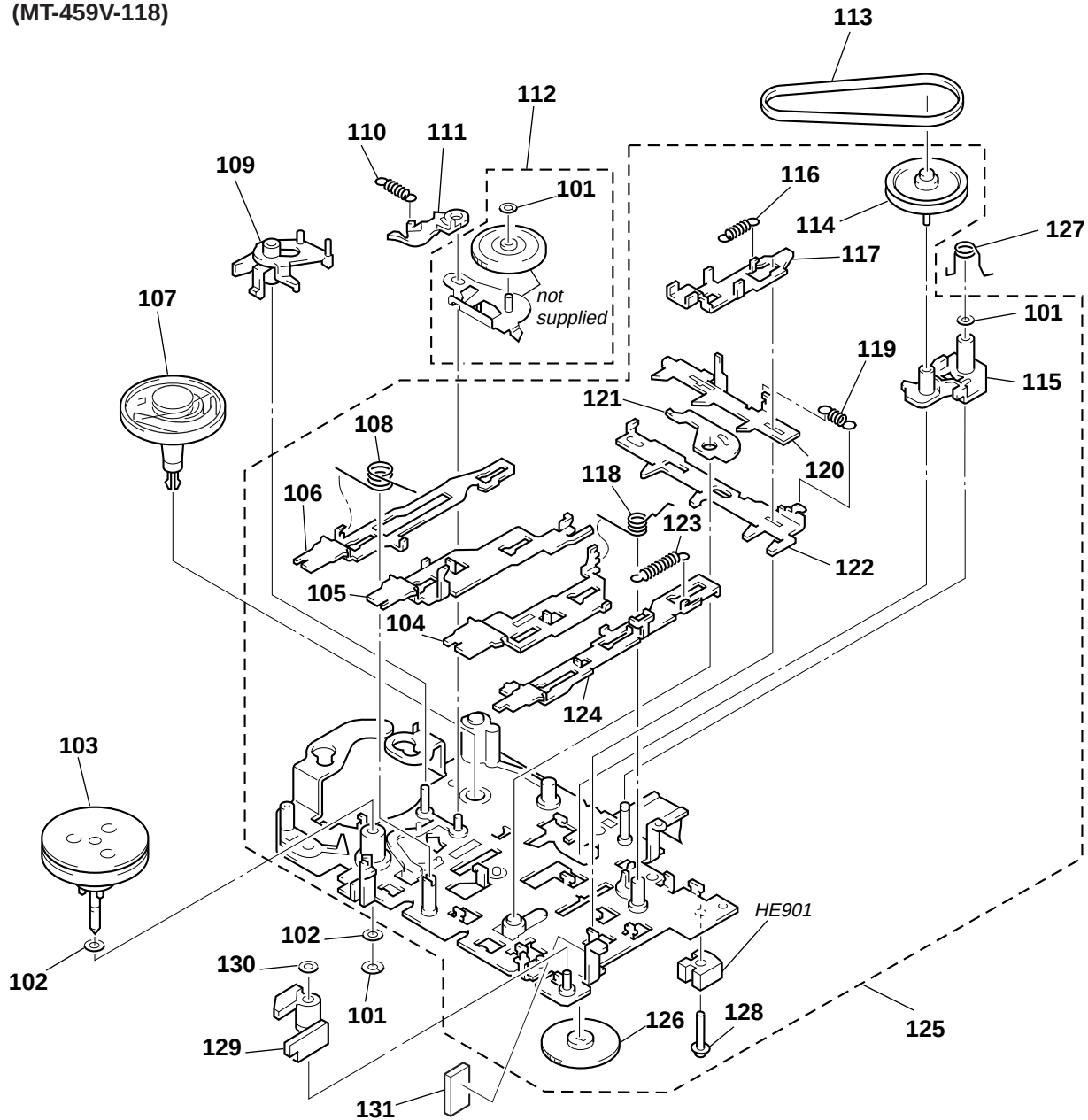
Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	3-318-382-31	SCREW (1.7), TAPPING		14	4-017-441-01	CUSHION (B)	
2	3-345-648-51	SCREW (M1.4), TOOTHED LOCK		* 15	3-924-757-01	BRACKET (SPEAKER)	
* 3	A-3021-022-A	MAIN BOARD, COMPLETE (TCM-459V)		16	3-924-761-01	STRAP	
* 3	A-3021-024-A	MAIN BOARD, COMPLETE (TCM-36)		17	3-018-309-01	LID, BATTERY CASE	
4	3-008-612-01	TERMINAL, PLUS		18	3-018-308-11	CABINET (REAR) (TCM-459V)	
5	3-924-750-01	TERMINAL, MINUS		18	3-018-308-31	CABINET (REAR) (TCM-36)	
6	3-924-744-01	SPRING (CLAW DETECTION), TENSION		19	3-018-312-01	FOOT (A)	
7	3-018-311-01	CLAW, ERASING PREVENTION		20	3-334-565-11	SCREW (B1.7X10), TAPPING	
8	3-018-310-01	KNOB (PAUSE)		21	3-023-856-01	FOOT (B)	
9	4-969-980-21	SCREW (1B LOCK)		22	3-907-531-01	SCREW	
10	3-578-101-41	PLATE, ORNAMENTAL		23	3-831-441-XX	SPACER, KNOB	
11	3-018-307-01	CABINET (FRONT) (TCM-459V)		24	X-3375-895-1	LID SUB ASSY, CASSETTE (TCM-459V)	
11	3-018-307-31	CABINET (FRONT) (TCM-36)				(including MIC101)	
* 12	1-669-038-11	LED BOARD		24	X-3375-897-1	LID SUB ASSY, CASSETTE (TCM-36)	
13	3-936-424-01	SPRING, CASSETTE				(including MIC701)	
				SP901	1-505-838-11	SPEAKER (3.6CM)	

(2) MECHANISM DECK SECTION-1
(MT-459V-118)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	X-3370-386-1	PINCH ROLLER ASSY		66	3-924-673-01	GEAR (S REEL)	
52	3-925-146-01	BUTTON (FF) (▶▶)		67	3-924-674-01	SPRING (B. T), COMPRESSION	
53	3-925-147-01	BUTTON (REW) (◀◀)		68	3-924-641-01	GEAR (T REEL)	
54	3-925-148-01	BUTTON (PLAY) (▶)		69	3-924-726-01	SPRING (M GROUND), TORSION	
55	3-925-145-11	BUTTON (REC) (●)		70	3-924-681-01	BELT (CAPSTAN)	
56	3-936-409-01	BUTTON (STOP) (■)		71	3-925-109-01	CUSHION (MOTOR)	
57	1-548-582-11	COUNTER, TAPE (SMALL TYPE)		72	3-925-108-01	SCREW (MOTOR)	
58	3-924-625-01	LEVER (HEAD)		73	3-924-644-01	SPRING (POWER TENSION), TENSION	
59	3-924-645-01	BRACKET (HEAD)		74	3-348-160-11	SCREW (M1.4X1.6), PRECISION PAN	
60	3-924-685-01	SPRING (AZIMUTH), COMPRESSION		75	3-018-522-01	COUNTER, BRACKET	
61	3-704-197-91	SCREW (IB LOCK)		76	3-924-675-01	PULLEY (COUNTER)	
62	3-375-135-01	SCREW (1.4), SPECIAL		77	3-924-683-01	BELT (COUNTER)	
63	3-376-177-01	SCREW (M1.4X3.8)		78	3-376-407-01	SCREW (M1.4)	
64	3-925-107-01	SPRING (IDLER), COMPRESSION		HRP901	1-500-073-11	HEAD, MAGNETIC (RECORD/PLAYBACK)	
65	3-924-637-01	GEAR (FF)		M901	1-698-588-11	MOTOR, DC (CAPSTAN/REEL)	

(3) MECHANISM DECK SECTION-2
(MT-459V-118)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	3-321-483-11	RING, RETAINING (0.25)		117	3-924-622-01	LEVER (STOP)	
102	3-701-437-51	WASHER		118	3-924-643-01	SPRING (PR), TORSION	
103	X-3370-384-1	FLYWHEEL ASSY		119	3-924-684-01	SPRING (LOCK PLATE), TENSION	
104	3-924-623-01	LEVER (PLAY)		120	3-924-619-01	LEVER (SW)	
105	3-924-621-01	LEVER (REW)		121	3-924-639-01	LEVER (CR)	
106	3-924-620-01	LEVER (FF)		122	3-924-618-01	LEVER (LOCK)	
107	X-3370-388-1	TABLE ASSY, FELT		123	3-925-208-01	SPRING (REC), TENSION	
108	3-924-642-01	SPRING (FR), TORSION		124	3-924-624-01	LEVER (REC)	
109	3-924-629-01	LEVER (DETECTION)		125	X-3375-018-1	CHASSIS SUB ASSY	
110	3-925-207-01	SPRING (SHUT. OFF), TENSION		126	3-924-613-01	GEAR (FR)	
111	3-924-630-01	LEVER (S. OFF)		127	3-024-378-01	SPRING (FR LEVER), TORSION	
112	X-3370-387-1	LEVER ASSY, IDLER		128	3-703-925-21	SCREW (M1.4)	
113	3-924-682-01	BELT (FR)		129	3-936-405-01	LEVER (RELEASE)	
114	X-3370-385-1	PULLEY (FR) ASSY		130	3-578-242-11	WASHER	
115	3-924-628-01	LEVER (FR)		131	3-014-082-02	SPACER	
116	3-924-633-01	SPRING (STOP), TENSION		HE901	1-500-515-11	HEAD, MAGNETIC (ERASE)	

SECTION 7 ELECTRICAL PARTS LIST

LED

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 and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
All resistors are in ohms.
METAL: Metal-film resistor.
METAL OXIDE: Metal oxide-film resistor.
F: nonflammable
- Abbreviation
CH : Chinese
CND : Canadian
EE : East European

- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
In each case, u: μ , for example:
uA. . : μ A. . uPA. . : μ PA. .
uPB. . : μ PB. . uPC. . : μ PC. .
uPD. . : μ PD. .
- CAPACITORS
uF: μ F
- COILS
uH: μ H

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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	1-669-038-11	LED BOARD *****		C116	1-164-346-11	CERAMIC CHIP 1uF	16V
	1-669-039-11	LED FLEXIBLE BOARD		C117	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
		< LED >		C118	1-164-489-11	CERAMIC CHIP 0.22uF 10%	16V
D501	8-719-057-99	LED SML-211YT-T86 (ㄠ)		C119	1-164-489-11	CERAMIC CHIP 0.22uF 10%	16V
D502	8-719-059-96	LED SML-210LT-T86 (BATT • /REC)		C120	1-126-153-11	ELECT 22uF 20%	6.3V
D503	8-719-059-96	LED SML-210LT-T86 (BATT ••)		C121	1-135-201-11	TANTALUM CHIP 10uF 20%	4V
		< RESISTOR >		C124	1-124-259-11	ELECT 4.7uF 20%	16V
R202	1-216-049-11	RES, CHIP 1K 5% 1/10W	(TCM-459V)	C125	1-124-434-00	ELECT 220uF 20%	4V
R403	1-216-295-00	SHORT 0 (TCM-459V)		C126	1-164-346-11	CERAMIC CHIP 1uF	16V
		< SWITCH >		C127	1-124-434-00	ELECT 220uF 20%	4V
S201	1-572-922-11	SWITCH, SLIDE (MIC SENS) (TCM-459V)		C128	1-124-433-00	ELECT 100uF 20%	4V
S401	1-572-922-11	SWITCH, SLIDE (VOR) (TCM-459V)		C129	1-126-153-11	ELECT 22uF 20%	6.3V
*****				C130	1-163-035-00	CERAMIC CHIP 0.047uF	50V
*	A-3021-022-A	MAIN BOARD, COMPLETE (TCM-459V)		C132	1-164-346-11	CERAMIC CHIP 1uF	16V
*	A-3021-024-A	MAIN BOARD, COMPLETE (TCM-36) *****		C134	1-164-182-11	CERAMIC CHIP 0.0033uF 10%	50V
	3-008-612-01	TERMINAL, PLUS		C136	1-164-346-11	CERAMIC CHIP 1uF	16V
		< CAPACITOR >		C137	1-164-346-11	CERAMIC CHIP 1uF	16V
C101	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V	C138	1-164-346-11	CERAMIC CHIP 1uF	16V
C102	1-164-161-11	CERAMIC CHIP 0.0022uF 10%	100V	C140	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C103	1-135-091-00	TANTALUM CHIP 1uF 20%	16V	C141	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C104	1-135-151-21	TANTALUM CHIP 4.7uF 20%	4V	C142	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C105	1-135-151-21	TANTALUM CHIP 4.7uF 20%	4V	C145	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C106	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V	C146	1-163-009-11	CERAMIC CHIP 0.001uF 10%	50V
C107	1-163-077-00	CERAMIC CHIP 0.1uF 10%	25V	C201	1-135-073-00	TANTALUM CHIP 0.33uF 10%	35V
C108	1-163-017-00	CERAMIC CHIP 0.0047uF 5%	50V	C401	1-126-153-11	ELECT 22uF 20%	6.3V (TCM-459V)
C109	1-163-001-11	CERAMIC CHIP 220PF 10%	50V	C402	1-124-257-00	ELECT 2.2uF 20%	35V (TCM-459V)
C110	1-135-091-00	TANTALUM CHIP 1uF 20%	16V	C403	1-164-505-11	CERAMIC CHIP 2.2uF	16V (TCM-459V)
C111	1-135-151-21	TANTALUM CHIP 4.7uF 20%	4V	C501	1-164-004-11	CERAMIC CHIP 0.1uF 10%	25V
C112	1-164-182-11	CERAMIC CHIP 0.0033uF 10%	50V	C502	1-135-201-11	TANTALUM CHIP 10uF 20%	4V
C113	1-164-005-11	CERAMIC CHIP 0.47uF	16V	C503	1-164-346-11	CERAMIC CHIP 1uF	16V
C114	1-164-346-11	CERAMIC CHIP 1uF	16V	C504	1-164-161-11	CERAMIC CHIP 0.0022uF 10%	100V
C115	1-164-161-11	CERAMIC CHIP 0.0022uF 10%	100V	C505	1-126-157-11	ELECT 10uF 20%	6.3V
						< CONNECTOR/JACK >	
				CN101	1-750-061-11	JACK, DC (POLARITY UNIFIED TYPE)	(DC IN 3V)
				* CN102	1-691-378-21	CONNECTOR, FFC/FPC (ZIF) 14P	

MAIN

Ref. No.	Part No.	Description	Remark
< FERRITE BEAD >			
FB101	1-414-235-21	INDUCTOR CHIP 0uH	
FB102	1-414-235-21	INDUCTOR CHIP 0uH	
< IC >			
IC101	8-759-492-49	IC LA4168ML-TE-L	
IC501	8-759-399-49	IC MM1251BFBE	
< JACK >			
J101	1-766-847-11	JACK (EAR)	
J102	1-766-847-11	JACK (MIC (PLUG IN POWER))	
< COIL >			
L501	1-412-032-11	INDUCTOR CHIP 100uH	
< TRANSISTOR >			
Q101	8-729-800-37	TRANSISTOR 2SD1048-X7	
Q102	8-729-402-84	TRANSISTOR XN4601	
Q103	8-729-420-50	TRANSISTOR UN5215	
Q104	8-729-230-72	TRANSISTOR 2SA1362YG	
Q106	8-729-800-37	TRANSISTOR 2SD1048-X7	
Q107	8-729-420-53	TRANSISTOR UN5115	
Q108	8-729-402-93	TRANSISTOR UN5214-TX	
Q109	8-729-402-96	TRANSISTOR UN5114	
Q110	8-729-420-50	TRANSISTOR UN5215	
Q201	8-729-420-50	TRANSISTOR UN5215	
Q401	8-729-420-24	TRANSISTOR 2SD1819A-QRS-TX	(TCM-459V)
Q402	8-729-420-50	TRANSISTOR UN5215 (TCM-459V)	
Q501	8-729-402-93	TRANSISTOR UN5214-TX	
Q502	8-729-403-17	TRANSISTOR XN1215	
Q503	8-729-420-24	TRANSISTOR 2SD1819A-QRS-TX	
< RESISTOR >			
R101	1-216-065-00	RES, CHIP 4.7K 5%	1/10W
R102	1-216-049-11	RES, CHIP 1K 5%	1/10W
R103	1-216-069-00	METAL CHIP 6.8K 5%	1/10W
R104	1-216-073-00	METAL CHIP 10K 5%	1/10W
R105	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R106	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R108	1-216-085-00	METAL CHIP 33K 5%	1/10W
R109	1-216-037-00	METAL CHIP 330 5%	1/10W
R110	1-216-037-00	METAL CHIP 330 5%	1/10W
R111	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R112	1-216-071-00	METAL CHIP 8.2K 5%	1/10W
R113	1-216-081-00	METAL CHIP 22K 5%	1/10W
R114	1-216-065-00	RES, CHIP 4.7K 5%	1/10W
R116	1-216-089-00	RES, CHIP 47K 5%	1/10W
R117	1-216-065-00	RES, CHIP 4.7K 5%	1/10W
R118	1-216-009-00	METAL CHIP 22 5%	1/10W
R119	1-216-121-00	RES, CHIP 1M 5%	1/10W
R122	1-216-081-00	METAL CHIP 22K 5%	1/10W
R123	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R130	1-216-097-00	RES, CHIP 100K 5%	1/10W
R131	1-216-059-00	METAL CHIP 2.7K 5%	1/10W
R132	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R133	1-216-045-11	METAL CHIP 680 5%	1/10W

Ref. No.	Part No.	Description	Remark
R134	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
R136	1-216-097-00	RES, CHIP 100K 5%	1/10W
R137	1-216-073-00	METAL CHIP 10K 5%	1/10W
R141	1-216-073-00	METAL CHIP 10K 5%	1/10W
R142	1-216-025-00	RES, CHIP 100 5%	1/10W
R143	1-216-057-00	METAL CHIP 2.2K 5%	1/10W
R201	1-216-037-00	METAL CHIP 330 5%	1/10W
R401	1-216-105-00	RES, CHIP 220K 5%	1/10W (TCM-459V)
R402	1-216-097-00	RES, CHIP 100K 5%	1/10W (TCM-459V)
R404	1-216-295-00	SHORT 0 (TCM-459V)	
R501	1-216-107-00	METAL CHIP 270K 5%	1/10W
R502	1-216-103-00	METAL CHIP 180K 5%	1/10W
R503	1-216-081-00	METAL CHIP 22K 5%	1/10W
R504	1-216-083-00	METAL CHIP 27K 5%	1/10W
R505	1-216-033-00	METAL CHIP 220 5%	1/10W
R506	1-216-037-00	METAL CHIP 330 5%	1/10W
R507	1-216-051-00	METAL CHIP 1.2K 5%	1/10W
R508	1-216-037-00	METAL CHIP 330 5%	1/10W
R509	1-216-045-00	RES, CHIP 680 5%	1/10W
R510	1-216-041-00	METAL CHIP 470 5%	1/10W
R511	1-216-075-00	METAL CHIP 12K 5%	1/10W
R512	1-216-081-00	METAL CHIP 22K 5%	1/10W
R513	1-216-009-00	METAL CHIP 22 5%	1/10W
R514	1-216-021-00	METAL CHIP 68 5%	1/10W
R601	1-216-295-00	SHORT 0	
R602	1-216-049-11	RES, CHIP 1K 5%	1/10W
R603	1-216-051-00	METAL CHIP 1.2K 5%	1/10W
< VARIABLE RESISTOR >			
RV101	1-225-597-11	RES, VAR, CARBON 10K (VOL)	
RV601	1-223-584-11	RES, ADJ, CARBON 2.2K	
RV602	1-225-598-11	RES, VAR, CARBON 2K (SPEED CONTROL)	
< SWITCH >			
S101	1-771-321-11	SWITCH, SLIDE (REC/PB)	
S102	1-771-092-21	SWITCH, PUSH (1 KEY) (POWER)	
S105	1-572-922-11	SWITCH, SLIDE (PAUSE)	
< THERMISTOR (POSITIVE) >			
THP601	1-810-007-11	THERMISTOR, POSITIVE	
THP602	1-803-117-11	THERMISTOR, POSITIVE	

MISCELLANEOUS			

HE901	1-500-515-11	HEAD, MAGNETIC (ERASE)	
HRP901	1-500-073-11	HEAD, MAGNETIC (RECORD/PLAYBACK)	
M901	1-698-588-11	MOTOR, DC (CAPSTAN/REEL)	
SP901	1-505-838-11	SPEAKER (3.6cm)	

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
ACCESSORIES & PACKING MATERIALS			

3-862-203-02		MANUAL, INSTRUCTION (JAPANESE, ENGLISH) (TCM-36: Tourist)	
3-862-203-11		MANUAL, INSTRUCTION (ENGLISH) (TCM-459V: US, AEP, EE, CH)	
3-862-203-21		MANUAL, INSTRUCTION (ENGLISH, FRENCH) (TCM-36/459V: CND, E)	
3-862-203-31		MANUAL, INSTRUCTION (FRENCH, SPANISH, PORTUGUESE, ITALIAN) (TCM-459V: AEP)	
3-862-203-41		MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, DANISH) (TCM-459V: AEP, EE)	
3-862-203-51		MANUAL, INSTRUCTION (SPANISH, PORTUGUESE, CHINESE, KOREAN) (TCM-36/459V: E)	
3-862-203-61		MANUAL, INSTRUCTION (CHINESE) (TCM-459V: CH)	
3-862-203-71		MANUAL, INSTRUCTION (POLISH, RUSSIAN, HUNGARIAN, CZECH) (TCM-459V: EE)	

MEMO

Printing Method for Large Sized Documents Such As Circuit Diagrams

Printing the page that exceeds A4-size two pages (or letter size) is possible by specifying the print range. (Acrobat Reader Version 4.0 or later)

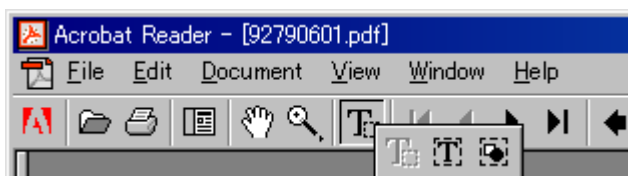
1. The enlarged print is made, if a smaller range than A4 size is specified and the A4 size is selected as a print paper.
2. Almost real sized print is made, if the range is specified, meeting the print paper size.
3. The reduced print is made, if a larger range than the print paper size is specified.

Printing by Specifying a Range

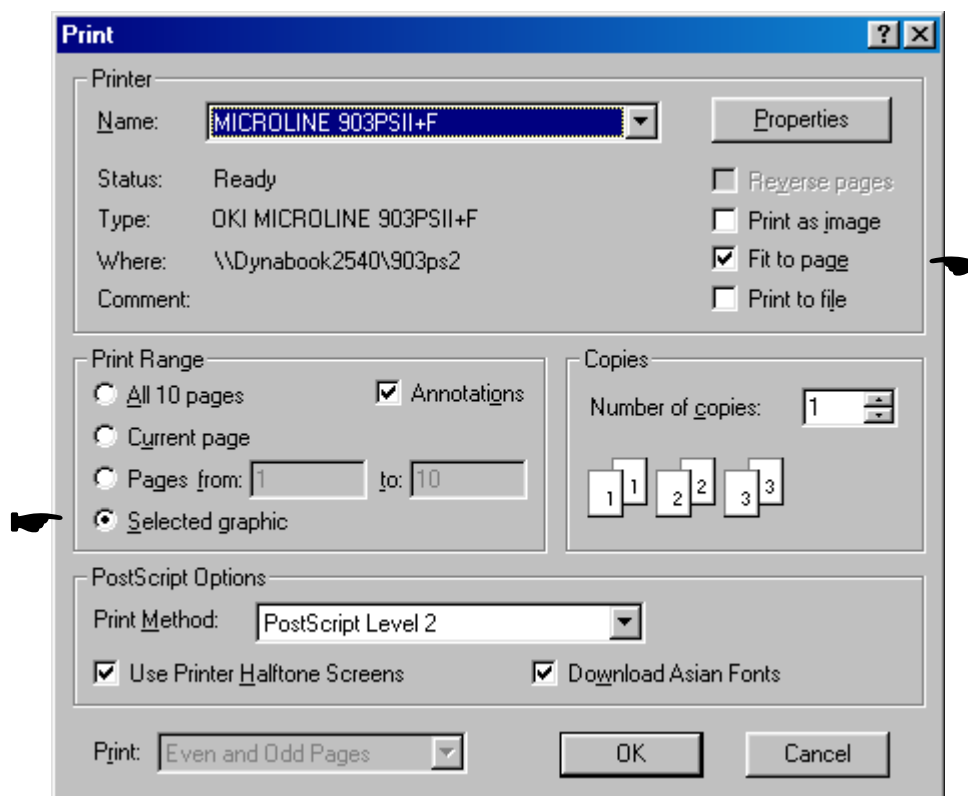
In printing out the drawings such as a schematic diagram and a printed wiring board larger than the printed paper size, they can be printed by specifying the range. (Acrobat Reader Version 4.0 or later)

1. Display the page to be printed.
2. From the File menu, select [Page Setup] and set the paper size.
3. From the Command bar, select [Graphic Select Tool].

(Keep pressing  , select )



4. Dragging the cursor, enclose the range on the page to be printed.
5. From the File menu, select [Print] and make sure that the [Selected Graphic] is already checked. Also, if [Fit to page] is checked, the selected range is enlarged or reduced (and rotated as necessary) meeting the paper size.



6. To cancel the printed range, click an arbitrary position on the screen.

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.

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