

16252256

SERVICE MANUAL

US Model

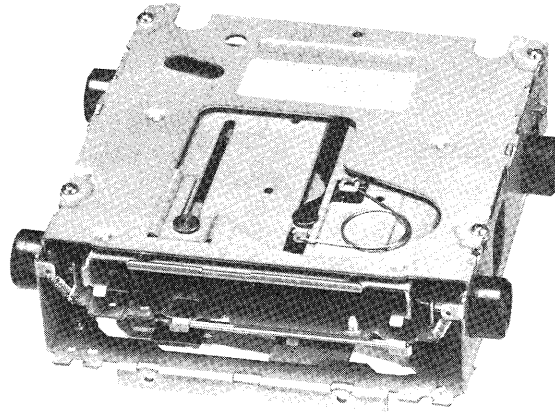


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MINIDISC MECHANISM

SONY®

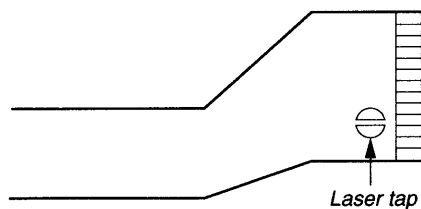
SERVICING NOTES

NOTES ON CHECKING LASER DIODE EMISSION

Never look into the laser diode from the top when checking its emission during adjustment, otherwise you can lose your eyesight.

NOTES ON HANDLING OPTICAL PICK-UP (KMS-193)

Bridge with a solder the laser tap on flexible board when handling the optical pick-up, because the laser diode in optical pick-up is easily destroyed with static electricity. Also, take further action to prevent electrostatic destruction. The flexible board is very damageable, requiring a gentle handling.



Optical pick-up flexible board

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

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.

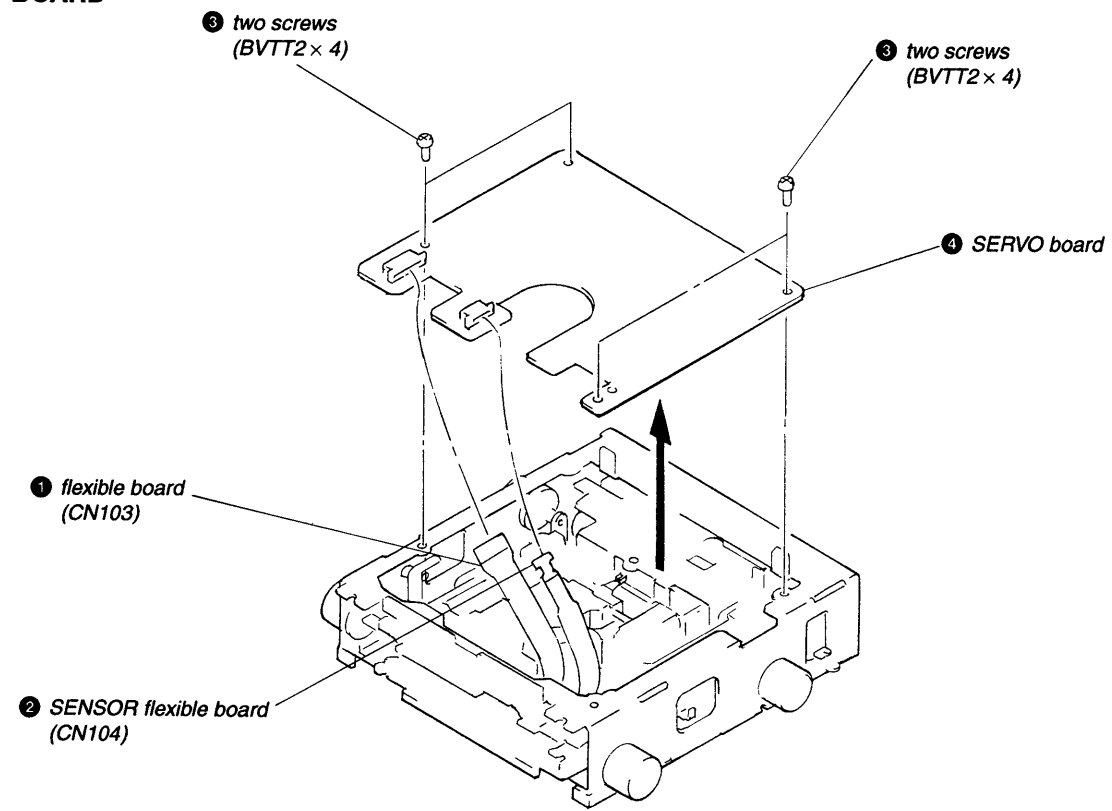
SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK \triangle OR DOTTED LINE WITH MARK \triangle ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

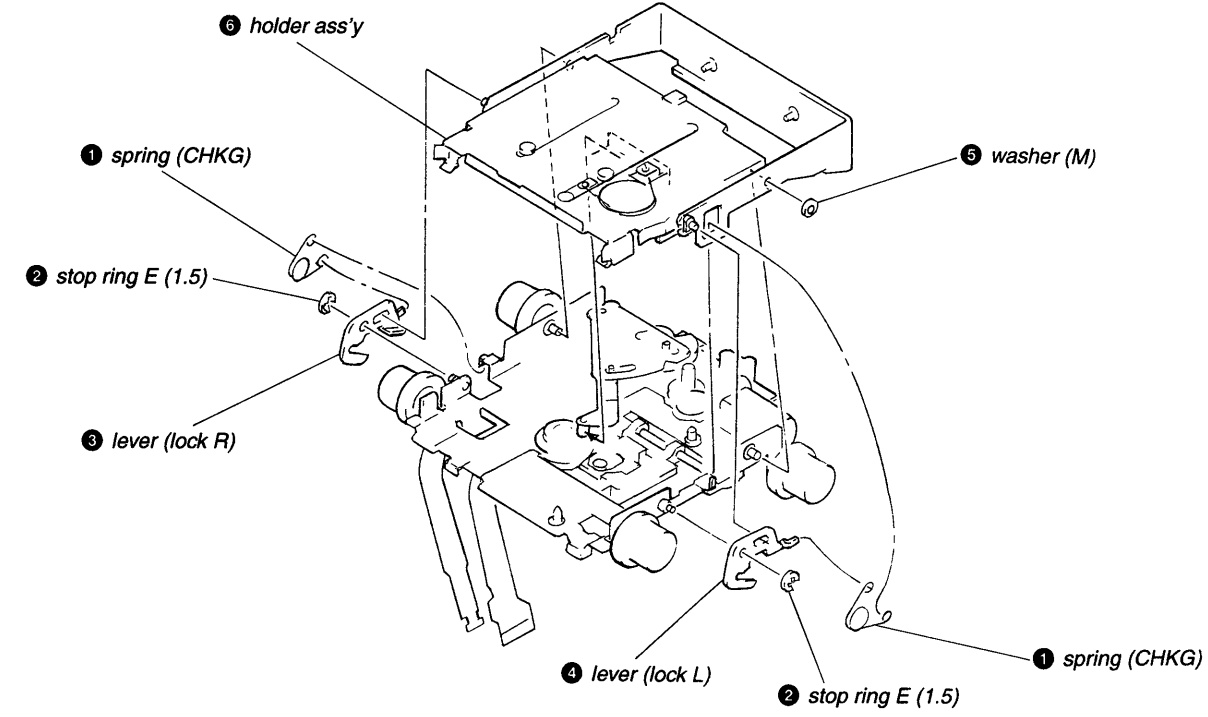
SECTION 1 DISASSEMBLY

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

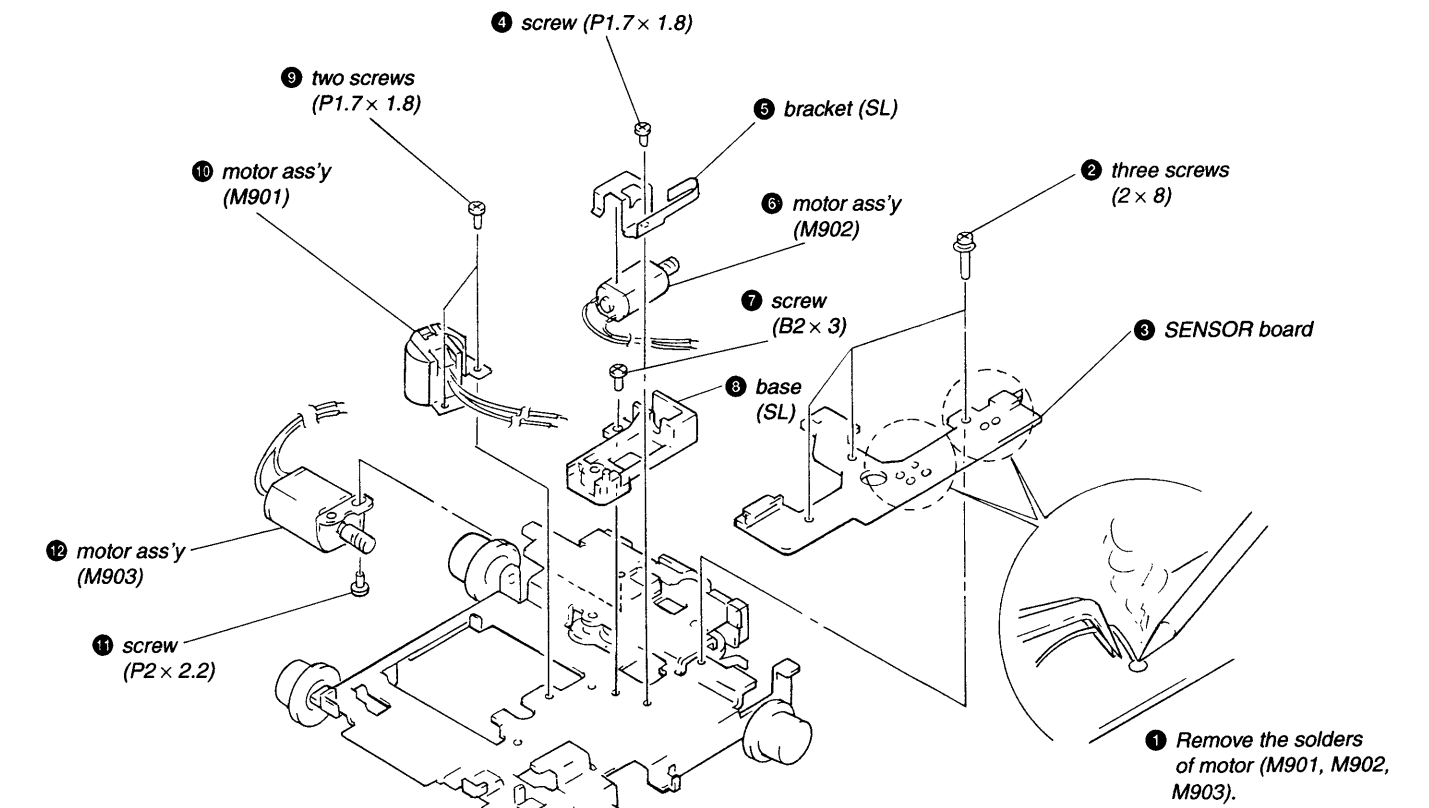
SERVO BOARD



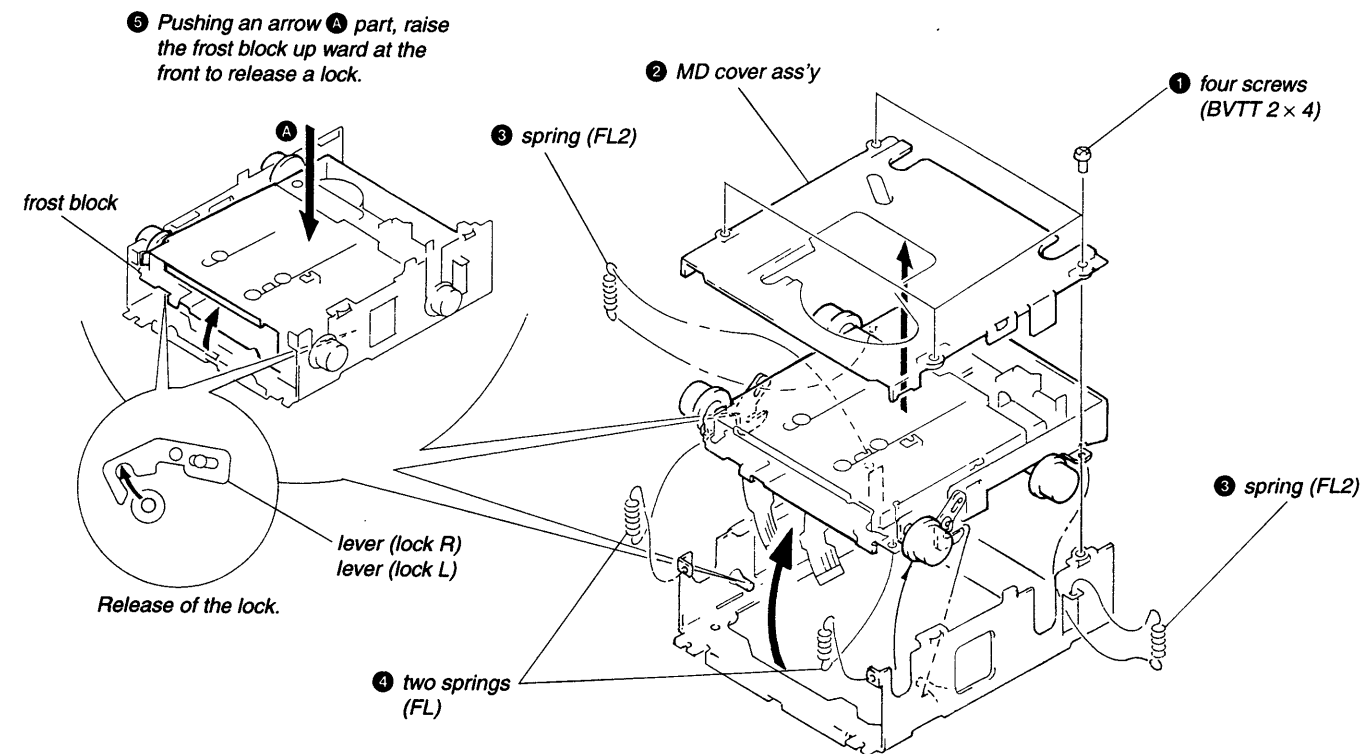
HOLDER ASS'Y



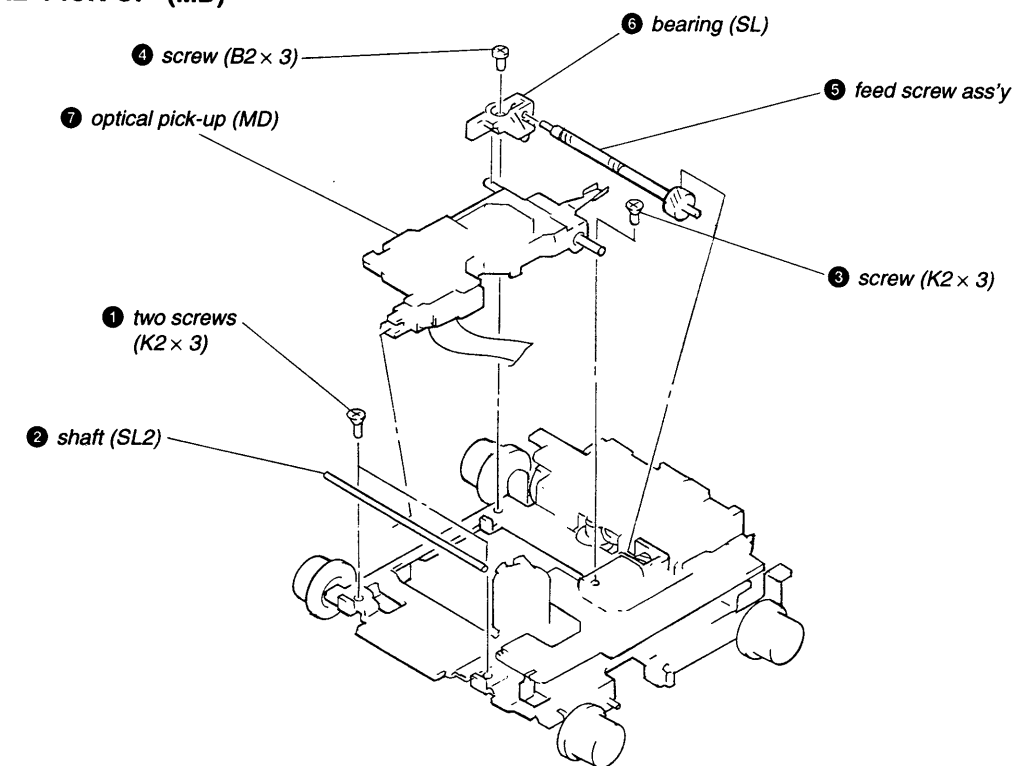
MOTOR ASS'Y (M901, M902, M903), SENSOR BOARD



FROST BLOCK



OPTICAL PICK-UP (MD)

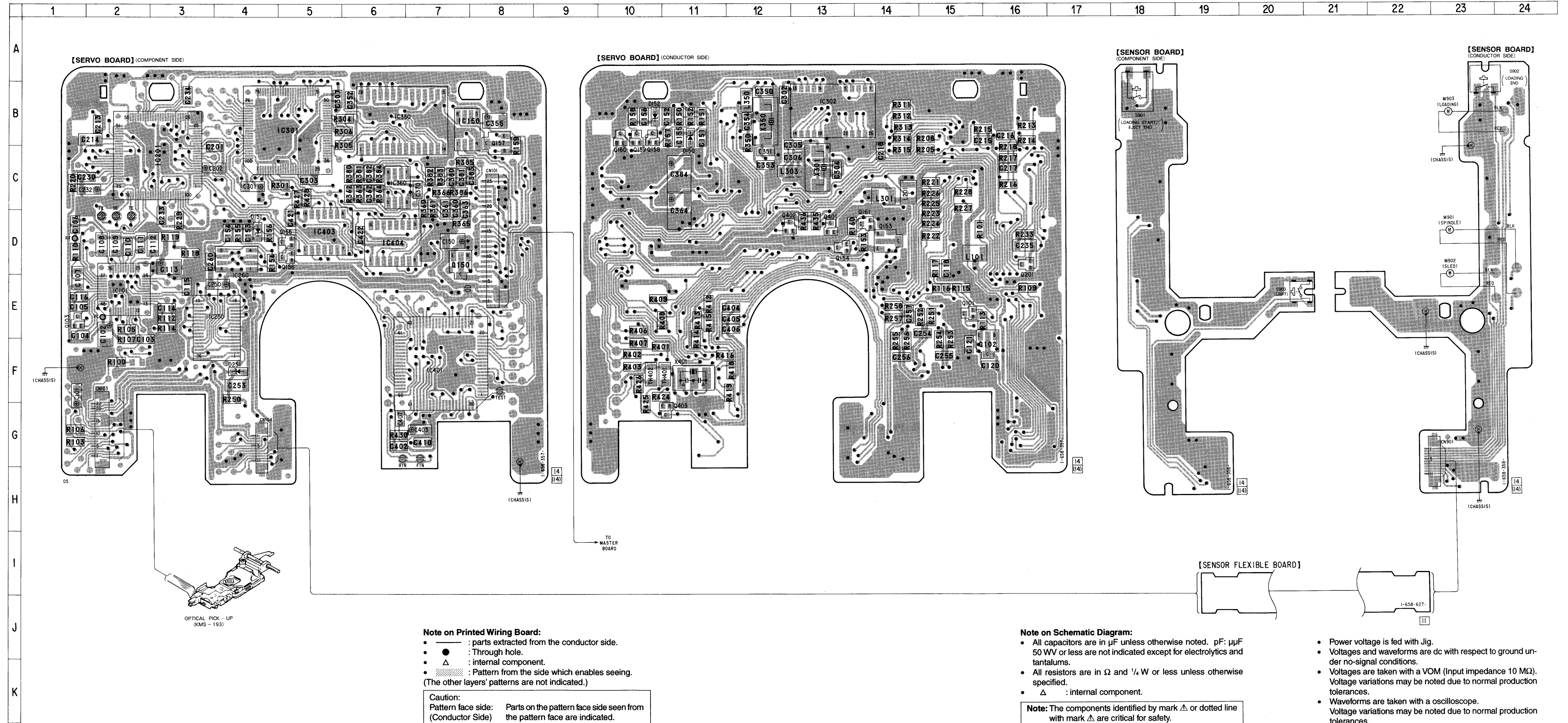


SECTION 2
DIAGRAMS

2-1. PRINTED WIRING BOARDS

• Semiconductor Location

Ref. No.	Location
D150	B-11
D151	D-4
D152	B-10
D251	F-4
IC101	E-2
IC150	B-7
IC201	C-3
IC250	E-4
IC260	D-4
IC301	B-5
IC302	B-13
IC350	B-6
IC360	C-6
IC401	F-7
IC403	D-5
IC404	D-6
Q101	E-15
Q102	F-16
Q103	E-1
Q150	D-7
Q153	D-14
Q154	D-13
Q155	D-5
Q156	D-5
Q157	B-8
Q158	B-10
Q159	B-10
Q160	B-10
Q161	D-14
Q201	D-16
Q401	D-13
Q402	D-12
Q403	G-11



Note on Printed Wiring Board:

- : parts extracted from the conductor side.
- : Through hole.
- △ : internal component.
- : 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.
(Conductor Side)

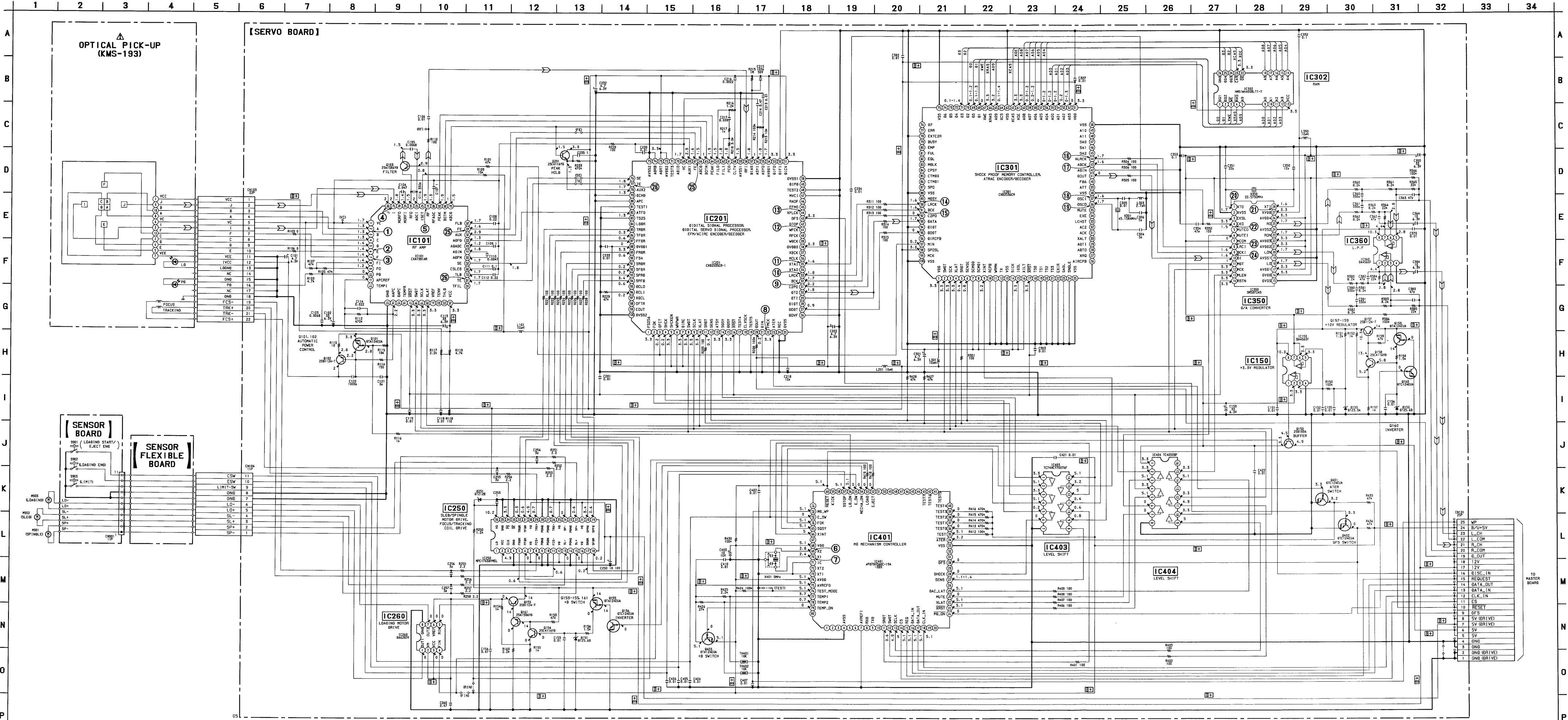
Parts face side: Parts on the parts face side seen from the parts face are indicated.
(Component Side)

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 $\frac{1}{4} W$ or less unless otherwise specified.
- △ : internal component.

Note: The components identified by mark △ or dotted line with mark △ are critical for safety.
Replace only with part number specified.

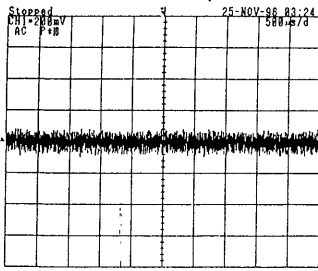
- Power voltage is fed with Jig.
- Voltages and waveforms are dc with respect to ground under no-signal conditions.
- Voltages are taken with a VOM (Input impedance 10 M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
- Σ : MD



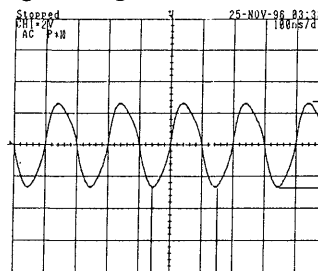
• Waveforms

① IC101 ②

200 mV/DIV 500 μ s/DIV

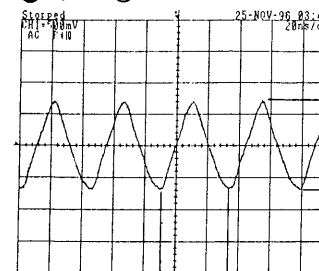


⑥ IC401 ⑥



200ns

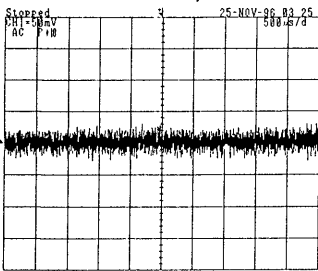
⑪ IC201 ⑬



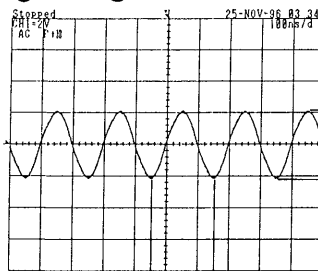
24 ns

② IC101 ⑥

50 mV/DIV 500 μ s/DIV

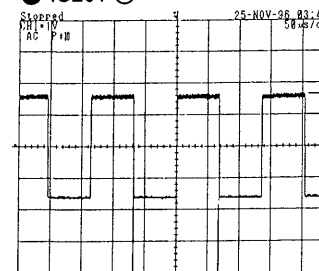


⑦ IC401 ⑦



200ns

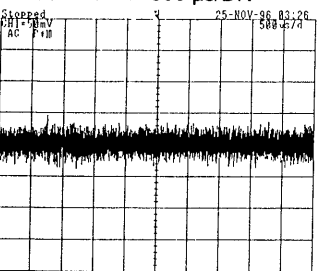
⑫ IC201 ④



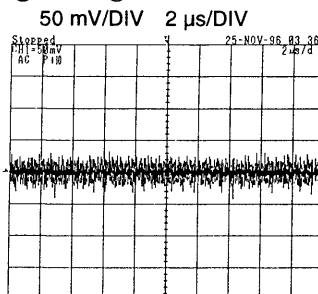
138 μ s

③ IC101 ⑦

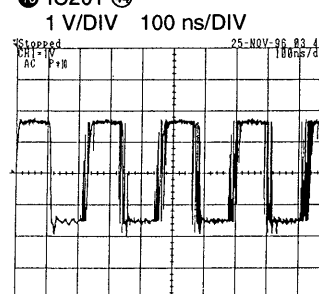
50 mV/DIV 500 μ s/DIV



⑧ IC201 ⑫

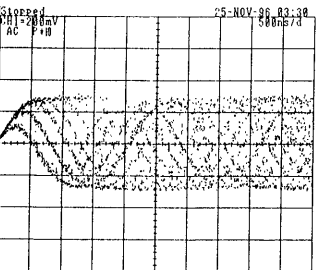


⑭ IC201 ④④

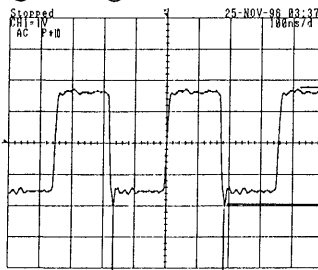


④ IC101 ④⑦, ④⑧

200 mV/DIV 500ns/DIV

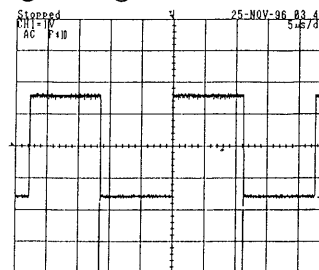


⑨ IC201 ③②



360ns

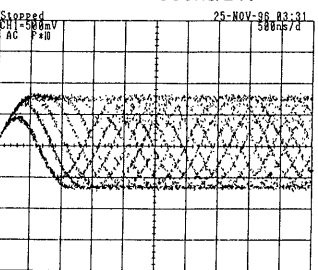
⑮ IC301 ⑨①



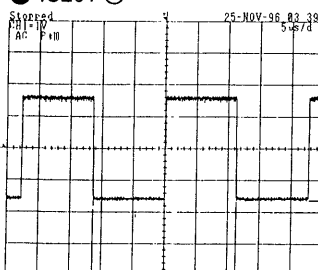
22.6 μ s

⑤ IC101 ④①

500 mV/DIV 500ns/DIV

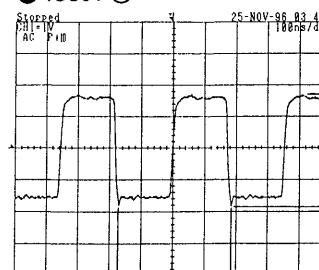


⑩ IC201 ③③



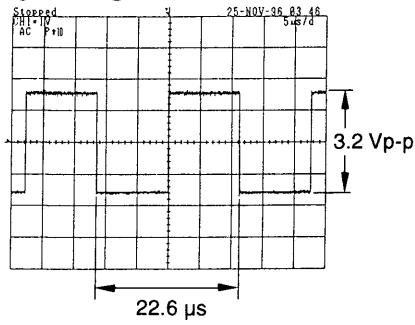
22.8 μ s

⑯ IC301 ⑨②

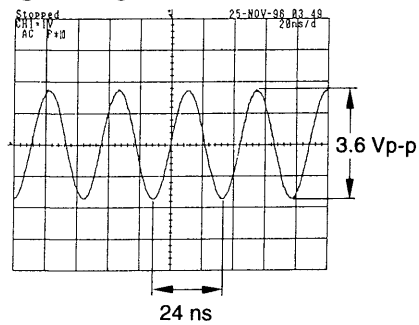


356 ns

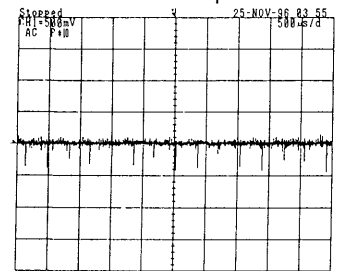
16 IC301 ④④



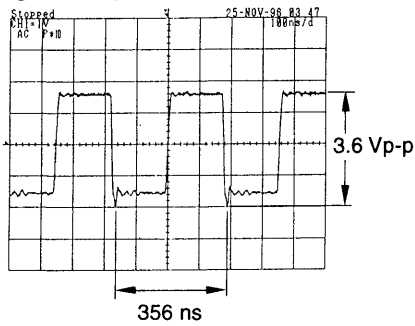
21 IC350 ②③



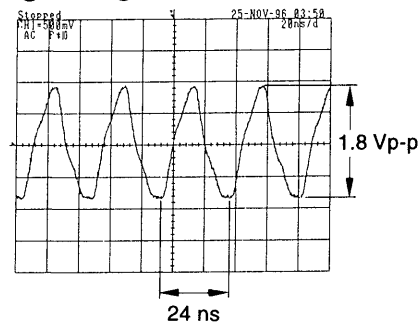
26 IC101 ②⑥, IC201 ⑦⑦
500 mV/DIV 500 μs/DIV



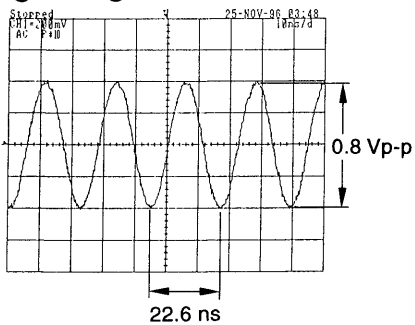
17 IC301 ④③



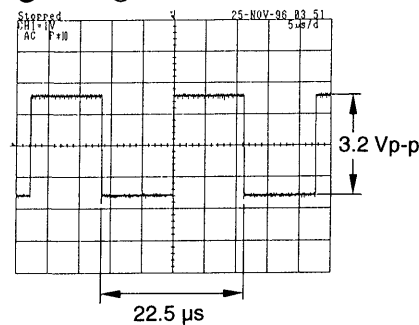
22 IC350 ④④



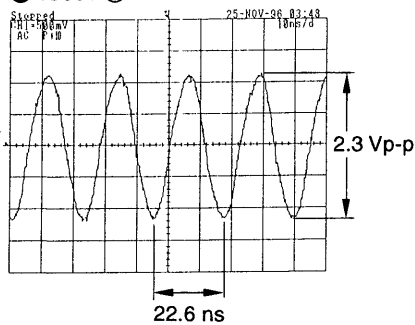
18 IC301 ③⑦



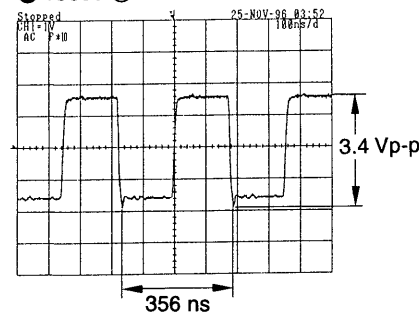
23 IC350 ③③



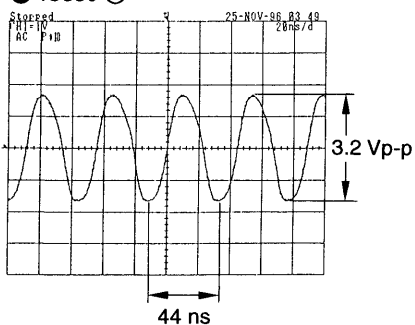
19 IC301 ③⑥



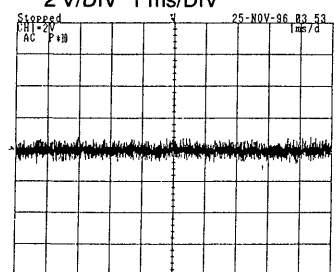
24 IC350 ③⑥



20 IC350 ①①

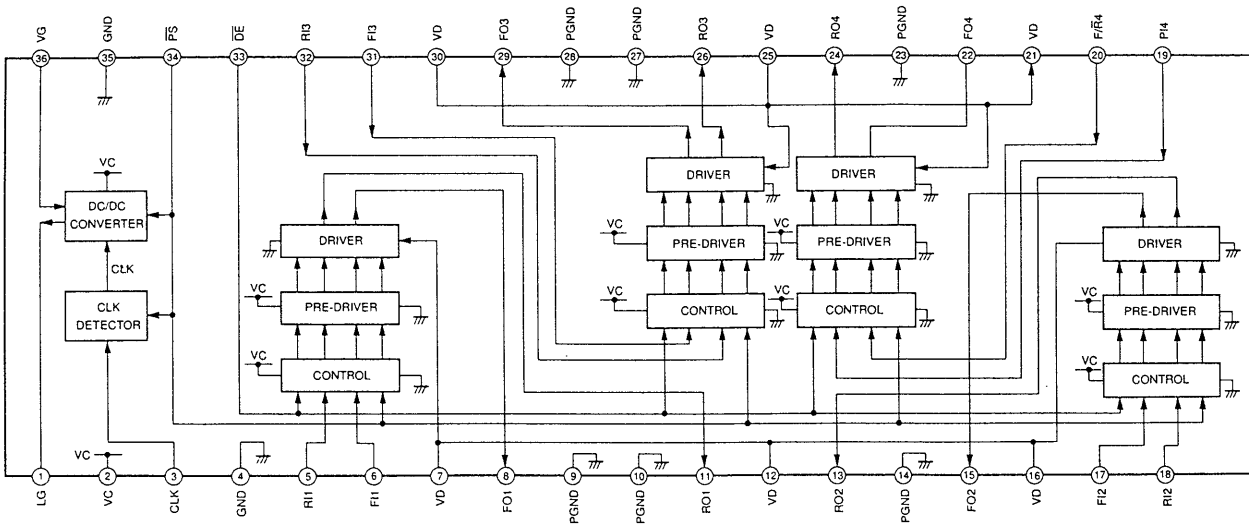


25 IC101 ③⑨, IC201 ⑥⑦
2 V/DIV 1 ms/DIV

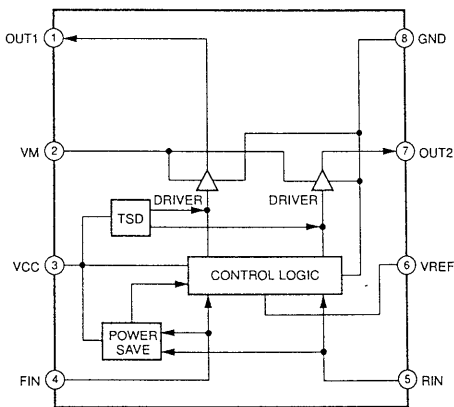


• IC Block Diagrams

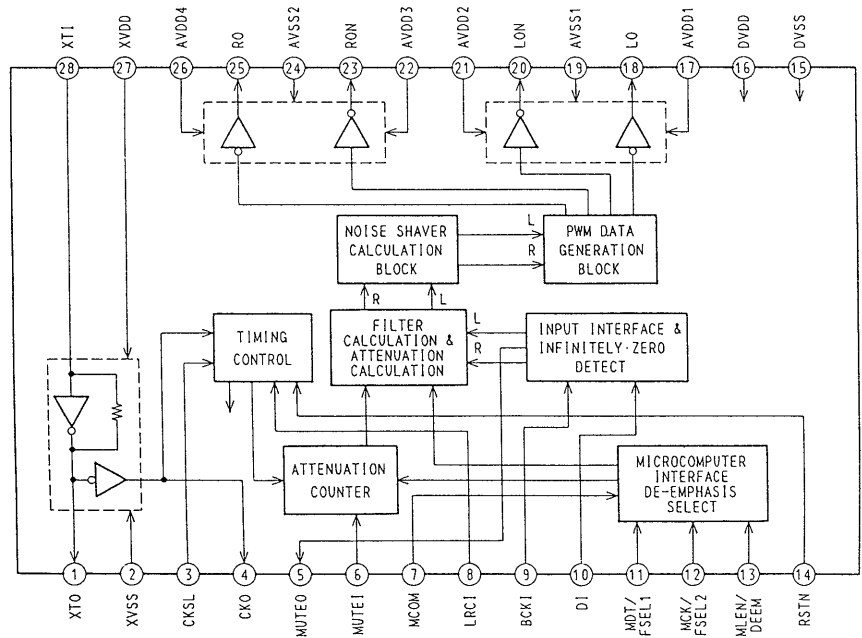
IC250 MPC17A38VMEL (SERVO BOARD)



IC260 BA6287F (SERVO BOARD)



IC350 SM5872AS-ET (SERVO BOARD)



2-3. IC PIN FUNCTION DESCRIPTION
SERVO BOARD IC101 CXA1981AR (RF AMP)

Pin No.	Pin Name	I/O	Function
1	VC	O	Output terminal for the center point voltage (1/2 VCC) generated
2-7	A-F	I	Signal input from detector circuit in the optical pick-up block
8	FI	I	Signal (-) input of the operational amplifier for F signal
9	FO	O	Signal output of the operational amplifier for F signal
10	PD	I	Front monitor. Connected to the photo diode
11	APCREF	I	Input terminal for the setting of laser power
12	TEMPI	I	Terminal for the connection to temperature sensor. Not used this set (OPEN)
13	GND	-	Ground terminal
14	AAPC	O	LD amplifier output terminal of APC circuit
15	DAPC	O	Not used (OPEN)
16	TEMPR	O	Output terminal of the reference voltage for temperature sensor. Not used this set (OPEN)
17	XRST	I	Reset signal input from the mechanism controller (IC401). When reset: "L"
18	SWDT	I	Write data signal input from the mechanism controller (IC401)
19	SCLK	I	Clock signal input from the mechanism controller (IC401)
20	XLAT	I	Latch signal input from the mechanism controller (IC401)
21	VREF	O	Reference voltage output. Not used this set (OPEN)
22	TENV	O	Not used this set (OPEN)
23	THLD	I	Not used this set (OPEN)
24	VCC	-	Power supply terminal (+3.3V)
25	TFIL	I	Not used this set (OPEN)
26	TE	O	Tracking error signal output to CXD2535CR-1 (IC201)
27	TLB	I	Input terminal of the adder signal to tracking error
28	CSLED	I	Terminal for the sled error low pass filter
29	SE	O	Sled error signal output to CXD2535CR-1 (IC201)
30	ADFM	O	FM signal output terminal of the ADIP
31	ADIN	I	Input terminal by AC coupling is FM signal of the ADIP
32	ADAGC	I	External capacitor connect terminal for AGC of the ADIP
33	ADFG	O	ADIP double turned FM signal output to CXD2535CR-1 (IC201) (22.05kHz ± 1kHz)
34	AUX	O	Sub signal output to CXD2535CR-1 (IC201)
35	FE	O	Focus error signal output to CXD2535CR-1 (IC201)
36	FLB	I	Input terminal of the adder signal to focus error
37	ABCD	O	Light amount signal output to CXD2535CR-1 (IC201)
38	BOTM	O	Light amount bottom hold signal output to CXD2535CR-1 (IC201)
39	PEAK	O	Light amount peak hold signal output to CXD2535CR-1 (IC201)
40	PFAGC	I	External capacitor connect terminal of AGC circuit for the RF
41	RF	O	Playback EFM RF signal output to CXD2535CR-1 (IC201)
42	ISET	I	Setting terminal for the internal circuit constant 22kHz, BPF center frequency
43	AGCI	I	Input terminal by AC coupling is RF signal
44	RFO	O	RF signal output terminal
45	MORFI	I	Input terminal by AC coupling is RF signal of the MO
46	MORFO	O	RF signal output terminal of the MO
47, 48	I, J	I	Signal input from detector circuit in the optical pick-up block

SERVO BOARD IC201 CXD2535CR-1
(DIGITAL SIGNAL PROCESSOR, DIGITAL SERVO SIGNAL PROCESSOR, EFM/ACIRC ENCODER/DECODER)

Pin No.	Pin Name	I/O	Function
1	FS256	O	11.2896MHz clock signal output (MCLK system). Not used this set (OPEN)
2	FOK	O	Focus OK signal output to the mechanism controller (IC401). "H" is output when the focus is applied
3	DFCT	O	Defect ON/OFF selection signal output to CXD2536CR (IC301)
4	SHCK	O	Track jump detection signal output to the mechanism controller (IC401)
5	SHCKEN	I	Track jump detection enable input. Not used this set (Fixed at "H")
6	WRPWR	I	Laser power selection signal input. Not used this set (Fixed at "L")
7	DIRC	I	Not used this set (Fixed at "H")
8	SWDT	I	Write data signal input from the mechanism controller (IC401)
9	SCLK	I	Serial clock signal input from the mechanism controller (IC401)
10	XLAT	I	Serial latch signal input from the mechanism controller (IC401)
11	SRDT	O	Read data signal output to the mechanism controller (IC401)
12	SENS	O (3)	Internal status (SENSE) output to the mechanism controller (IC401)
13	ADSY	O	ADIP sync signal output. Not used this set (OPEN)
14	SQSY	O	Sub-code Q sync (SCOR) output to the mechanism controller (IC401) "L" every 13.3msec, Almost "H"
15	DQSY	O	Digital in U-bit CD format sub-code Q sync (SCOR) output to the mechanism controller (IC401). "L" every 13.3msec, Almost "H". Not used this set (OPEN)
16	$\overline{\text{XRST}}$	I	Reset signal input from the mechanism controller (IC401). When reset "L"
17	TEST4	I	Test input terminal (Fixed at "L")
18	CLVCK	O	Not used this set (OPEN)
19	TEST5	I	Test input terminal (Fixed at "L")
20	DOUT	O	Output terminal of the digital audio signal (for optical out)
21	DIN	I	Input terminal of the digital audio signal (for optical out). Not used this set (Fixed at "L")
22	FMCK	O	FM modulation clock signal output of the ADIP. Not used this set (OPEN)
23	ATER	O	ADIP CRC flag output. When error "H"
24	REC	I	Record/playback selection signal input. When recording: "H", when playback: "L" (Fixed at "L")
25	DVSS	-	Ground terminal (Digital system)
26	DOVF	I	Validity flag input terminal for the digital audio out. Not used this set (Fixed at "L")
27	DODT	I	Input terminal of 16-bit data signal for the digital audio out
28	DIDT	O	Output terminal of 16-bit data signal for the digital audio in. Not used this set (OPEN)
29	DTI	I	Record audio data signal input from CXD2536CR (IC301)
30	DTO	O (3)	Playback audio data signal output to CXD2536CR (IC301)
31	C2PO	O	C2PO (indicate the error state of the data) signal output to CXD2536CR (IC301). Playback : C2PO ("H"), Digital recording : D. In-Vflag, Analog recording : "L"
32	BCK	O	Bit clock (2.8224MHz) signal output to CXD2536CR (IC301) (MCLK system)
33	LRCK	O	L/R clock (44.1kHz) signal output to CXD2536CR (IC301) (MCLK system)
34	XTAO	O	System clock (512Fs=22.5792MHz) signal output. Not used this set (OPEN)
35	XTAI	I	System clock (512Fs=22.5792MHz) signal input from D/A converter (IC350)
36	MCLK	O	MCLK clock (22.5792MHz) signal output. Not used this set (OPEN)
37	$\overline{\text{XBCK}}$	O	BCK (pin 32) inverted output. Not used this set (OPEN)
38	DVDD0	-	Power supply terminal (+3.3V) (Digital system)
39	WDCK	O	WDCK clock (88.2kHz) signal output (MCLK system). Not used this set (OPEN)
40	RFCK	O	RFCK clock (7.35kHz) signal output (MCLK system). Not used this set (OPEN)

Pin No.	Pin Name	I/O	Function
41	WFKC	O	WFKC clock (7.35kHz) signal output (When playback : EFM decoder PLL system, When recoding : EFM encoder PLL system). Not used this set (OPEN)
42	GTOP	O	Opens the playback EFM frame sync protection window when "H". Not used this set (OPEN)
43	GFS	O	The playback EFM frame sync and interpolation protection timing match when "H"
44	XPLCK	O	EFM decoder PLL clock (98Fs=4.3218MHz) signal output. Falling edge of the EFM PLL clock and the EFM signal match. Not used this set (OPEN)
45	EFMO	O	FM signal output (When recoding) Not used this set (OPEN)
46	RAOF	O	Overflow detection signal output of the internal RAM (Decoder monitor out). RAOF is signal generated when the 32k RAM exceeds the $\pm 4F$ jitter margin. Not used this set (OPEN)
47	MVCI	I	Oscillation input for PLL of the digital in. Not used this set (Fixed at "L")
48	TEST2	I	Test input terminal (Fixed at "L")
49	DIPD	O (3)	Phase comparator output for PLL of the digital in. When the internal VCO : Frequency ; Low \rightarrow "H". When the external VCO : Frequency ; Low \rightarrow "L" Not used this set (OPEN)
50	DVSS	-	Ground terminal (Digital system)
51	DICV	I (A)	Control voltage input terminal of the internal VCO for digital in PLL
52	DIFI	I (A)	Filter input terminal of the internal VCO for digital in PLL. Not used this set (Fixed at "L")
53	DIFO	O (A)	Filter input terminal of the internal VCO for digital in PLL. Not used this set (OPEN)
54	AVDD	-	Power supply terminal (+3.3V) (Analog system)
55	ASYO	O	Playback EFM full-swing output (L=VSS, H=VDD)
56	ASYI	I (A)	Playback EFM asymmetry compare voltage input terminal
57	BIAS	I (A)	Playback EFM asymmetry circuit constant current input terminal
58	RFI	I (A)	Playback EFM RF signal input from CXA1981AR (IC101)
59	AVSS1	-	Ground terminal (Analog system)
60	CLTV	I (A)	VCO control voltage input terminal of the PLL for decoder PLL master clock
61	PCO	O (3)	Phase comparator output terminal of the PLL for decoder PLL master clock
62	FILI	I (A)	Filter input terminal of the PLL for decoder PLL master clock
63	FILO	O (3)	Filter output terminal of the PLL for decoder PLL master clock
64	PEAK	I (A)	Light amount peak hold signal input from CXA1981AR (IC101)
65	BOTM	I (A)	Light amount bottom hold signal input from CXA1981AR (IC101)
66	ABCD	I (A)	Light amount signal input from CXA1981AR (IC101)
67	FE	I (A)	Focus error signal input from CXA1981AR (IC101)
68	AUXI	I (A)	Sub signal input from CXA1981AR (IC101)
69	VC	I (A)	Center point voltage (1/2 VCC) input from CXA1981AR (IC101)
70	ADIO	O (A)	Monitor output of the A/D converter input signal. Not used this set (OPEN)
71	TEST3	I (A)	Test input terminal (Fixed at "L")
72	AVDD2	-	Power supply terminal (+3.3V) (Analog system)
73	ADRT	I (A)	A/D converter action limits (upper side) voltage input (Fixed at "H")
74	ADRB	I (A)	A/D converter action limits (lower side) voltage input (Fixed at "L")
75	AVSS2	-	Ground terminal (Analog system)
76	SE	I (A)	Sled error signal input from CXA1981AR (IC101)
77	TE	I (A)	Tracking error signal input from CXA1981AR (IC101)
78	AUX2	I (A)	Sub signal input terminal (2) from CXA1981AR (IC101)
79	DCHG	I (A)	Not used this set (Fixed at "L")
80	APC	I (A)	Input terminal for the laser APC. Not used this set (Fixed at "L")

Pin No.	Pin Name	I/O	Function
81	TEST1	I	Test input terminal (Fixed at "L")
82	ADFG	I	ADIP double turned FM signal input from CXA1981AR (IC101) (22.05kHz \pm 1kHz) (TTL schmidt input)
83	TS25	I	Test input terminal (Fixed at "L")
84	LDDR	O	Laser APC signal output to CXA1981AR (IC101). Not used this set (OPEN)
85	TRDR	O	Tracking servo drive signal output (-)
86	TFDR	O	Tracking servo drive signal output (+)
87	FFDR	O	Focus servo drive signal output (+)
88	DVDD1	-	Power supply terminal (+3.3V) (Digital system)
89	FRDR	O	Focus servo drive signal output (-)
90	FS4	O	176.4kHz clock signal output (MCLK system). Not used this set (OPEN)
91	SRDR	O	Sled servo drive signal output (+)
92	SFDR	O	Sled servo drive signal output (+)
93	SPRD	O	Spindle servo drive signal output (-)
94	SPFD	O	Spindle servo drive signal output (+)
95	DCLO	O	Not used (OPEN)
96	DCL1	I	Not used (Fixed at "L")
97	XDCL	O	Not used (OPEN)
98	OFTRK	O	Offtrack signal output. Not used this set (OPEN)
99	COUT	O	Traverse count signal output. Not used this set (OPEN)
100	DVSS2	-	Ground terminal (Digital system)

* On I/O section

(3): 3 state output (A): Analog output

**SERVO BOARD IC301 CXD2536CR
(SHOCK PROOF MEMORY CONTROLLER, ATRAC ENCODER/DECODER)**

Pin No.	Pin Name	I/O	Function
1	VDD	–	Power supply terminal (+3.3V)
2	SWDT	I	Write data signal input from the mechanism controller (IC401)
3	SCK	I	Serial clock signal input from the mechanism controller (IC401)
4	XLAT	I	Serial latch signal input from the mechanism controller (IC401)
5	SRDT	O	Read data signal output to the mechanism controller (IC401)
6	SENSE	O	Internal status (SENSE) output to the mechanism controller (IC401)
7	SCMD0	I	Serial command control mode input. Not used this set (Fixed at “H”)
8	SCMD1	I	Serial command control mode input. Not used this set (Fixed at “H”)
9	XINT	O	Interruption status output to the mechanism controller (IC401)
10	RCPB	I	Record/playback selection signal input. Not used this set (Fixed at “L”)
11	WRMN	I	Write/monitor mode selection signal input. Not used this set (Fixed at “L”)
12	TX	I	Writing data transmission timing input from the system controller. Used together with the magnetic field head ON/OFF output. Not used this set (Fixed at “L”)
13	VSS	–	Ground terminal
14	SICK	I	Chip reserve terminal. Not used this set (Fixed at “H”)
15	IDSL	I	Chip reserve terminal. Not used this set (Fixed at “H”)
16	XILT	I	Chip reserve terminal. Not used this set (Fixed at “H”)
17	XRST	I	Reset signal input from the mechanism controller (IC401). When reset : “L”
18-21	TS0-TS3	I	Test input terminal (Fixed at “L”)
22	EXIR	I	Chip reserve terminal. Not used this set (Fixed at “L”)
23	SASL	I	Single use the block selection. “L” : ATRAC, “H” : RAM controller. Not used this set (Fixed at “L”)
24	SNGLE	I	Normally fixed at “L”, Fixed at “H” when the ATRAC or RAM controller is single used. Not used this set (Fixed at “L”)
25	VSS	–	Ground terminal
26	AIRCPB	O	Record/playback mode signal output terminal of the ATRAC or external audio block. Not used this set (OPEN)
27	XRQ	I/O	XRQ signal input/output terminal of the ATRAC interface. Not used this set (OPEN)
28	ADTO	I/O	Decoder data signal input/output terminal of the ATRAC. Not used this set (OPEN)
29	ADTI	I/O	Encoder data signal input/output terminal of the ATRAC. Not used this set (OPEN)
30	XALT	I/O	Data ready and XALT signal input/output terminal of the ATRAC interface. Not used this set (OPEN)
31	ACK	I/O	ACK signal input/output terminal of the ATRAC interface. Not used this set (OPEN)
32	AC2	I/O	Error data signal input/output terminal of the ATRAC interface. Not used this set (OPEN)
33	LCHST	I/O	Lch Start data signal input/output terminal of the ATRAC interface. Not used this set (OPEN)
34	EXE	I/O	EXE signal input/output terminal of the ATRAC interface. Not used this set (OPEN)
35	MUTE	I/O	MUTE signal input/output terminal of the ATRAC interface. Not used this set (OPEN)
36	OSCO	O	45.1584MHz clock oscillation output
37	OSCI	I	45.1584MHz clock oscillation input
38	VSS	–	Ground terminal
39	ATT	I/O	ATT signal input/output terminal of the ATRAC interface. Not used this set (OPEN)
40	F86	O	11.6msec timing signal output terminal of the ATRAC block
41	DOUT	O	Monitor/audio decode data signal output to the D/A converter (IC350)
42	ADIN	I	Recording data signal input from the D/A converter. Not used this set (Fixed at “L”)
43	ABCK	O	Bit clock signal output to the D/A converter
44	ALRCK	O	L/R clock signal output to the D/A converter (IC350)

Pin No.	Pin Name	I/O	Function
45-47	SA2-SA0	O	Address signal output. Not used this set (OPEN)
48, 49	A11, A10	O	Address signal output. Not used this set (OPEN)
50	VSS	-	Ground terminal
51	VDD	-	Power supply terminal (+3.3V)
52-55	A03-A00	O	Address signal output to the RAM (IC302)
56-60	A04-A08	O	Address signal output to the RAM (IC302)
61	XOE	O	Output enable control signal output to the RAM (IC302)
62	XCAS	O	Column address strobe signal output to the RAM (IC302)
63	VSS	-	Ground terminal
64	XCS	O	Chip select signal output to the RAM. Not used this set (OPEN)
65	A09	O	Address signal output to the RAM (IC302)
66	XRAS	O	Row address strobe signal output to the RAM (IC302)
67	XWE	O	Write enable control signal output to the RAM (IC302)
68, 69	D1,D0	I/O	RAM (IC302) data bus
70,71	D2,D3	I/O	RAM (IC302) data bus
72-74	D4-D6	I/O	Data bus. Not used this set (OPEN)
75	VSS	-	Ground terminal
76	D7	I/O	Data bus. Not used this set (OPEN)
77	ERR	I/O	Input/output terminal of the error (C2PO) data signal to the external RAM. Not used this set (OPEN)
78	EXTC2R	I	External RAM selection signal input for the error data writing (When "H" : External RAM). Not used this set (Fixed at "L")
79	BUSY	O	BUSY signal output of the RAM access. Not used this set (OPEN)
80	EMP	O	Empty or before the full of the ATRAC data (When DSC=ASC+1 : "H"). Not used this set (OPEN)
81	FUL	O	Full or before the empty of the ATRAC data (When ASC=DSC+1 : "H"). Not used this set (OPEN)
82	EQL	O	Empty of the ATRAC data (When DSC=ASC : "H"). Not used this set (OPEN)
83	MDLK	O	Indicate the main/sub of the recording or playback data (When sub and linking : "H", When the main : "L"). Not used this set (OPEN)
84	CPSY	O	Interpolation sync signal output. Not used this set (OPEN)
85	CTMD0	O	DSC (Difference Signal Control) counter mode output. Not used this set (OPEN)
86	CTMD1	O	DSC (Difference Signal Control) counter mode output. Not used this set (OPEN)
87	SPO	O	System clock (512Fs+22.5792MHz) signal output to CXD2535CR-1 (IC201) and D/A converter (IC350). Not used this set (OPEN)
88	VSS	-	Ground terminal
89	MDSY	O	Sync detection signal output of the main data. Not used this set (OPEN)
90	LRCK	I	L/R clock (44.1kHz) signal input from CXD2535CR-1 (IC201)
91	BCK	I	Bit clock (2.8224MHz) signal input from CXD2535CR-1 (IC201)
92	C2PO	I	C2PO (indicate the error mode of the data) signal input from CXD2535CR-1 (IC201). When playback : C2PO ("H"), When digital recording : D. IN-Vflag, When analog recording : "L"
93	DATA	I/O	When recording : Record audio data signal output When playback : Playback audio data signal input
94	DIDT	I	16-bit data input terminal for the digital audio in. Not used this set (Fixed at "L")
95	DODT	O	16-bit data output terminal for the digital audio out
96	DIRCPB	O	Disc drive, Record or playback mode output of the EFM encoder/decoder. Not used this set (OPEN)
97	MIN	I	Defect ON/OFF selection signal input from CXD2535CR-1 (IC201)
98	SPOSL	I	IN/OUT selection input terminal of the pin 87 ("L" : IN, "H" : OUT)
99	MCK	O	Internal master clock signal output terminal of the RAM controller
100	VSS	-	Ground terminal

SERVO BOARD IC401 μ PD78056GC-194-3B9 (MD MECHANISM CONTROLLER)

Pin No.	Pin Name	I/O	Function
1	-	-	Not used (OPEN)
2	-	-	Not used (OPEN)
3	-	-	Not used (OPEN)
4	AVSS	-	Ground terminal (Analog system)
5	-	-	Not used (OPEN)
6	-	-	Not used (OPEN)
7	AVREF1	-	Ground terminal
8	RXD	I	Not used this set (OPEN)
9	TXD	O	Not used this set (OPEN)
10	-	-	Not used (OPEN)
11	SRDT	I	Read data signal input from CXD2535CR-1 (IC201) and CXD2536CR (IC301)
12	SWDT	O	Write data signal output to RF AMP (IC101), CXD2535CR-1 (IC201), CXD2536CR (IC301) and D/A converter (IC350)
13	SCLK	O	Serial clock signal output to RF AMP (IC101), CXD2535CR-1 (IC201), CXD2536CR (IC301) and D/A converter (IC350)
14	CS	I	Chip select signal input
15	REQ	O	Request signal output
16	DATA IN	I	Data signal (serial communications) input
17	DATA OUT	O	Data signal (serial communications) output
18	CLK IN	I	Clock signal (serial communications) input
19	-	-	Not used (OPEN)
20	-	-	Not used (OPEN)
21	$\overline{\text{MD ON}}$	O	Power control signal output (Servo system). Power ON : "L"
22	$\overline{\text{XRST}}$	O	Reset signal output to RF AMP (IC101), CXD2535CR-1 (IC201), CXD2536CR (IC301) and D/A converter (IC350)
23	XLAT	O	Serial latch signal output to RF AMP (IC101), CXD2535CR-1 (IC201) and CXD2536CR (IC301)
24	MUTE	O	Muting control signal output to D/A converter (IC350)
25	DAC LAT	O	Data latch signal output to D/A converter (IC350)
26	-	-	Not used (OPEN)
27	SENS	I	Internal status (SENSE) input from CXD2535CR-1 (IC201) and CXD2536CR (IC301)
28	SHOCK	I	Track jump detection signal input from CXD2535CR-1 (IC201)
29	-	-	Not used (OPEN)
30	$\overline{\text{GFS}}$	I	Frame sync lock state input
31	-	-	Not used (OPEN)
32	-	-	Not used (OPEN)
33	VSS	-	Ground terminal
34	$\overline{\text{ATER}}$	I	ADIP CRC flag input. When error : "H"
35	TEST	I	Test terminal (Fixed at "H")
36	TEST 0	O	Test terminal (Fixed at "H")
37	TEST 1	O	Test terminal (Fixed at "H")
38	TEST 2	O	Test terminal (Fixed at "H")
39	TEST 3	O	Test terminal (Fixed at "H")
40	TEST 4	O	Test terminal (OPEN)

Pin No.	Pin Name	I/O	Function
41	TEST 5	O	Test terminal (OPEN)
42	TEST 6	O	Test terminal (OPEN)
43	TEST 7	O	Test terminal (OPEN)
44-51	–	–	Not used (OPEN)
52	EJECT	O	Loading motor (M903) control output
53	LOAD	O	Loading motor (M903) control output
54	MECHA ON	O	Power ON/OFF control signal output to loading motor drive (IC260)
55	E SW	I	Detection signal input from the loading end sensor switch (S902)
56	LD ON	O	Laser power ON/OFF control output Laser ON : “H”
57	SSTOP	I	Detection signal input from the limit switch (S903)
58	–	–	Not used (OPEN)
59	KICK	–	Not used (OPEN)
60	RESET	I	System reset signal input
61	–	–	Not used (OPEN)
62	MD WP	I	Wake up detection input
63	C SW	I	Detection signal input from the loading start switch (S901)
64	FOK	I	Focus OK signal input from CXD2535CR-1 (IC201)
65	SQSY	I	Sub-code Q sync (SCOR) input from CXD2535CR-1 (IC201) “L” every 13.3 msec, Almost “H”
66	XINT	I	Interruption status input from CXD2536CR (IC301)
67	–	–	Not used (OPEN)
68	VDD	–	Power supply terminal (+5V)
69	X2	O	System clock signal output (5MHz)
70	X1	I	System clock signal input (5MHz)
71	IC	–	Not used this set (Fixed at “L”)
72	XT2	O	Not used this set (OPEN)
73	XT1	I	Not used this set (Fixed at “L”)
74	AVDD	–	Power supply terminal (+5V) (Analog system)
75	AVREF0	I	Reference voltage (+5 V) input for the A/D converter
76	TEST MODE	I	Test mode set up terminal
77	TEMP 1	I	Temperature detection signal input (H)
78	TEMP 2	I	Temperature detection signal input (L)
79	TEMP ON	O	Power control signal output (Temperature detection system)
80	–	–	Not used (OPEN)

SECTION 3 EXPLODED VIEWS

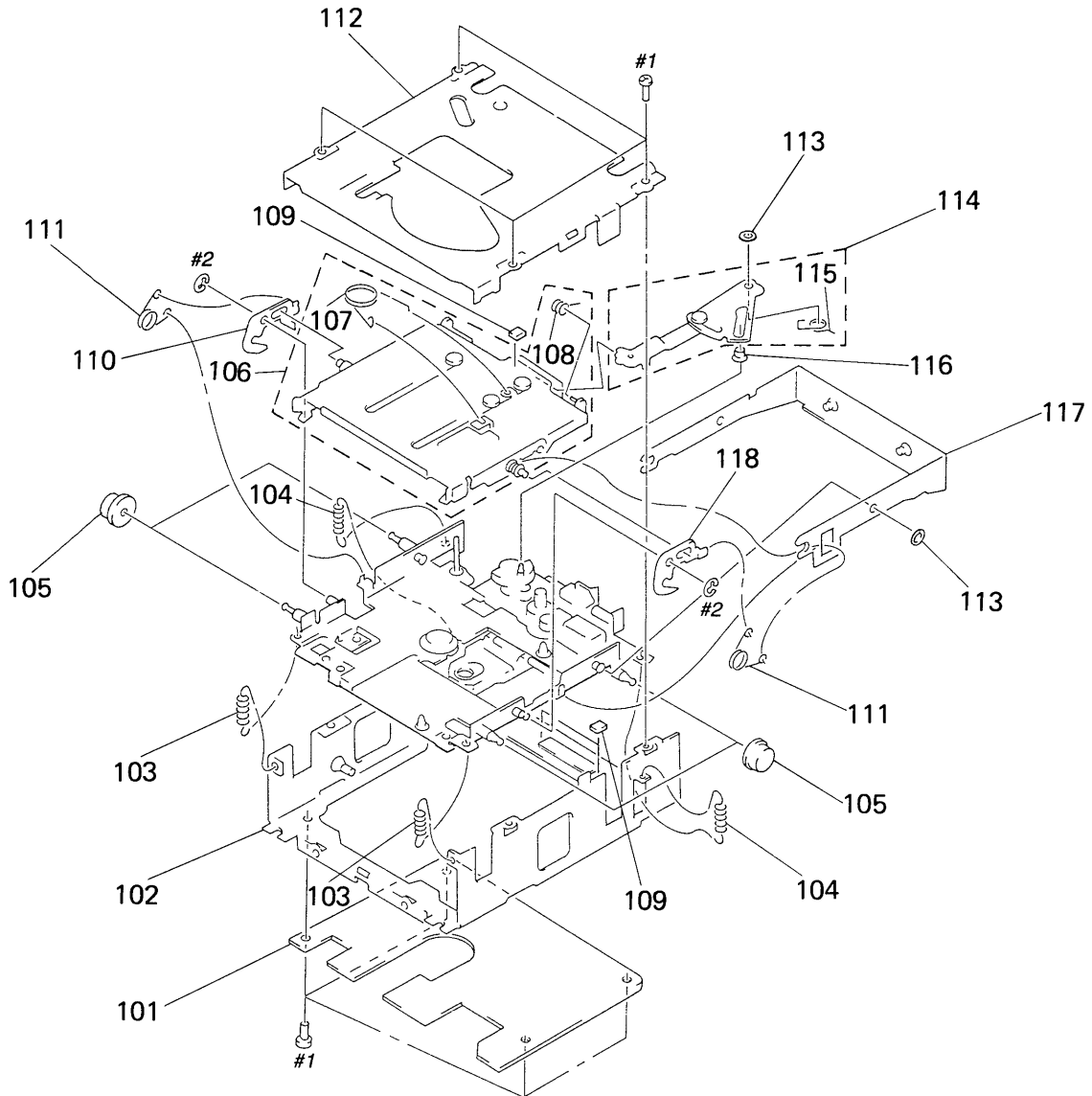
NOTE:

- -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.
- Hardware (# mark) list is given in the last of the electrical parts list.

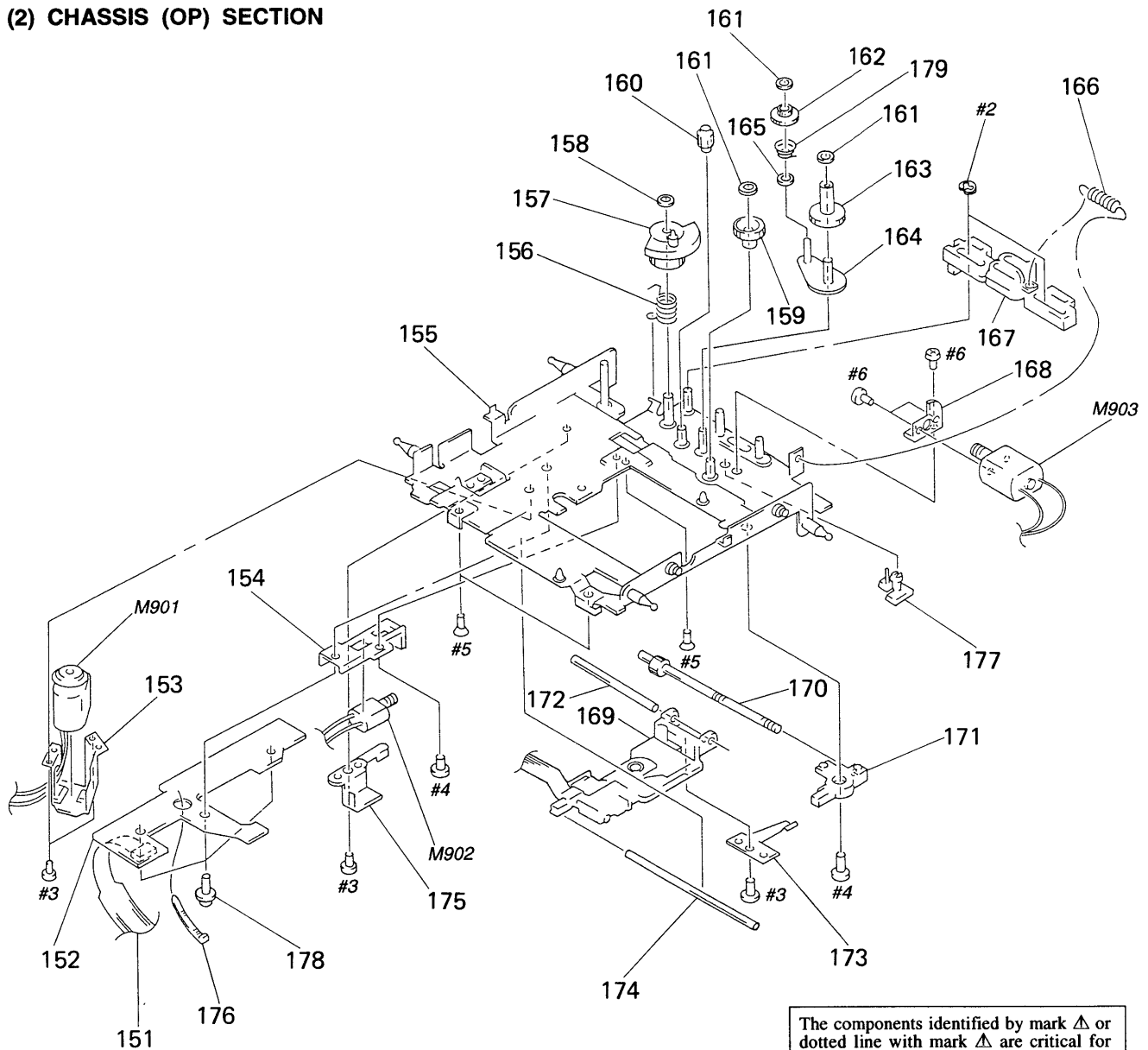
The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

(1) MD CHASSIS SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 101	A-3298-889-A	SERVO BOARD, COMPLETE		* 110	3-919-280-01	LEVER (LOCK R)	
* 102	X-3369-440-1	CHASSIS ASSY, MD		111	3-919-281-01	SPRING (CHKG)	
103	3-919-296-01	SPRING (FL), TENSION		* 112	X-3369-441-1	COVER ASSY, MD	
104	3-921-111-01	SPRING (FL2), TENSION		113	3-342-940-01	WASHER (M)	
105	3-919-273-01	DAMPER, OIL		* 114	X-3369-445-1	LEVER (LE) ASSY	
* 106	X-3369-444-1	HOLDER ASSY		115	3-919-274-01	SPRING (LE)	
107	3-919-319-01	SPRING (HOLDER)		116	3-925-034-01	ROLLER (GLE)	
108	3-919-320-01	SPRING (SUB HOLDER)		* 117	X-3369-443-1	ARM ASSY, CHUCKING	
* 109	3-919-436-01	CUSHION (EJ)		* 118	3-919-279-01	LEVER (LOCK L)	

(2) CHASSIS (OP) SECTION



The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
151	1-658-627-11	SENSOR FLEXIBLE BOARD		167	X-3369-447-1	RACK ASSY	
* 152	1-658-358-11	SENSOR BOARD		* 168	3-919-312-01	BRACKET (MOTOR)	
* 153	3-919-297-01	RETAINER (SP)		Δ 169	8-583-023-13	OPTICAL PICK-UP (MD) KMS-193B/J2RP	
* 154	3-919-284-01	BASE (SL)		170	X-3369-720-1	SCREW ASSY, FEED	
* 155	X-3369-442-1	CHASSIS (OP) ASSY		* 171	3-919-294-01	BEARING (SL)	
156	3-919-339-01	SPRING (GLE)		* 172	3-919-293-01	SHAFT (SL)	
157	3-919-317-01	GEAR (LE)		* 173	3-919-290-01	SPRING (SL), LEAF	
158	4-926-562-01	WASHER, STOPPER		* 174	3-920-537-01	SHAFT (SL2)	
159	3-919-313-01	WHEEL, WORM		* 175	3-919-283-01	BRACKET (SL)	
160	3-919-316-01	GEAR (R)		176	3-905-744-01	BAND	
161	3-342-940-01	WASHER (M)		177	3-926-972-01	CLAMP (R)	
162	3-919-315-01	GEAR (S)		178	2-626-617-01	SCREW (2X8)	
163	3-919-314-01	GEAR (F)		179	3-924-721-01	SPRING (B-T)	
164	X-3369-446-1	LEVER (S) ASSY		M901	A-3291-516-A	MOTOR ASSY, SP (SPINDLE)	
165	3-701-437-01	WASHER		M902	A-3291-190-A	MOTOR ASSY, SL (SLED)	
166	3-919-282-01	SPRING (RACK), TENSION		M903	A-3291-191-A	MOTOR ASSY, LO (LOADING)	

SECTION 4 ELECTRICAL PARTS LIST

SENSOR

SERVO

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
- 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

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

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

Ref. No.	Part No.	Description	Remark
*	1-658-358-11	SENSOR BOARD *****	
		< CONNECTOR >	
CN901	1-774-515-11	CONNECTOR, FPC (ZIF) 11P	
		< SWITCH >	
S901	1-572-288-11	SWITCH, PUSH (LOADING START/EJECT END)	
S902	1-572-288-11	SWITCH, PUSH (LOADING END)	
S903	1-572-467-61	SWITCH, PUSH (1 KEY) (LIMIT)	

*	A-3298-889-A	SERVO BOARD, COMPLETE *****	
		< CAPACITOR >	
C101	1-135-181-21	TANTALUM CHIP 4.7uF	20% 6.3V
C102	1-104-752-11	TANTAL. CHIP 33uF	20% 6.3V
C103	1-163-019-00	CERAMIC CHIP 0.0068uF	10% 50V
C104	1-163-809-11	CERAMIC CHIP 0.047uF	10% 25V
C105	1-163-019-00	CERAMIC CHIP 0.0068uF	10% 50V
C106	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C107	1-107-682-11	CERAMIC CHIP 1uF	10% 16V
C108	1-164-299-11	CERAMIC CHIP 0.22uF	10% 25V
C109	1-107-682-11	CERAMIC CHIP 1uF	10% 16V
C110	1-163-017-00	CERAMIC CHIP 0.0047uF	5% 50V
C111	1-164-004-11	CERAMIC CHIP 0.1uF	10% 25V
C112	1-164-299-11	CERAMIC CHIP 0.22uF	10% 25V
C113	1-104-752-11	TANTAL. CHIP 33uF	20% 6.3V
C114	1-163-037-11	CERAMIC CHIP 0.022uF	10% 25V
C115	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C116	1-163-263-11	CERAMIC CHIP 330PF	5% 50V
C118	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C120	1-163-275-11	CERAMIC CHIP 0.001uF	5% 50V
C121	1-163-220-11	CERAMIC CHIP 3PF	0.25PF 50V
C150	1-104-752-11	TANTAL. CHIP 33uF	20% 6.3V
C151	1-164-232-11	CERAMIC CHIP 0.01uF	50V

Ref. No.	Part No.	Description	Remark
C152	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C153	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C154	1-107-823-11	CERAMIC CHIP 0.47uF	10% 16V
C155	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C156	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C201	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C202	1-135-181-21	TANTALUM CHIP 4.7uF	20% 6.3V
C213	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C214	1-165-320-11	CERAMIC CHIP 0.47uF	10% 16V
C215	1-163-251-11	CERAMIC CHIP 100PF	5% 50V
C216	1-164-161-11	CERAMIC CHIP 0.0022uF	10% 100V
C217	1-162-587-11	CERAMIC CHIP 0.039uF	10% 25V
C218	1-163-229-11	CERAMIC CHIP 12PF	5% 50V
C230	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C232	1-135-181-21	TANTALUM CHIP 4.7uF	20% 6.3V
C233	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C234	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C235	1-107-682-11	CERAMIC CHIP 1uF	10% 16V
C250	1-104-851-11	TANTAL. CHIP 10uF	20% 10V
C253	1-107-682-11	CERAMIC CHIP 1uF	10% 16V
C254	1-163-220-11	CERAMIC CHIP 3PF	0.25PF 50V
C255	1-163-220-11	CERAMIC CHIP 3PF	0.25PF 50V
C256	1-163-220-11	CERAMIC CHIP 3PF	0.25PF 50V
C257	1-163-220-11	CERAMIC CHIP 3PF	0.25PF 50V
C260	1-107-823-11	CERAMIC CHIP 0.47uF	10% 16V
C301	1-135-181-21	TANTALUM CHIP 4.7uF	20% 6.3V
C302	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C303	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C304	1-163-222-11	CERAMIC CHIP 5PF	0.25PF 50V
C305	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C306	1-163-222-11	CERAMIC CHIP 5PF	0.25PF 50V
C307	1-164-232-11	CERAMIC CHIP 0.01uF	50V
C350	1-163-229-11	CERAMIC CHIP 12PF	5% 50V
C351	1-163-235-11	CERAMIC CHIP 22PF	5% 50V
C352	1-164-004-11	CERAMIC CHIP 0.1uF	10% 25V
C353	1-164-004-11	CERAMIC CHIP 0.1uF	10% 25V
C354	1-163-243-11	CERAMIC CHIP 47PF	5% 50V
C355	1-104-752-11	TANTAL. CHIP 33uF	20% 6.3V

SERVO

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
C360	1-163-263-11	CERAMIC CHIP	330PF 5% 50V	L201	1-410-381-11	INDUCTOR CHIP	10uH
C361	1-163-263-11	CERAMIC CHIP	330PF 5% 50V	L301	1-410-381-11	INDUCTOR CHIP	10uH
C362	1-163-243-11	CERAMIC CHIP	47PF 5% 50V	L303	1-410-197-11	INDUCTOR CHIP	2.7uH
C363	1-163-243-11	CERAMIC CHIP	47PF 5% 50V	L350	1-410-204-31	INDUCTOR CHIP	10uH
C364	1-110-446-11	SOLID CHIP	10uF 20% 6.3V			< TRANSISTOR >	
C370	1-164-232-11	CERAMIC CHIP	0.01uF 50V	Q101	8-729-028-83	TRANSISTOR	DTA124EUA-T106
C380	1-163-263-11	CERAMIC CHIP	330PF 5% 50V	Q102	8-729-820-61	TRANSISTOR	2SB1124-T
C381	1-163-263-11	CERAMIC CHIP	330PF 5% 50V	Q103	8-729-230-60	TRANSISTOR	2SA1586-YG
C382	1-163-243-11	CERAMIC CHIP	47PF 5% 50V	Q150	8-729-921-12	TRANSISTOR	2SD1834
C383	1-163-243-11	CERAMIC CHIP	47PF 5% 50V	Q153	8-729-820-61	TRANSISTOR	2SB1124-T
C384	1-110-446-11	SOLID CHIP	10uF 20% 6.3V	Q154	8-729-230-63	TRANSISTOR	2SC4116-YG
C402	1-164-232-11	CERAMIC CHIP	0.01uF 50V	Q155	8-729-028-83	TRANSISTOR	DTA124EUA-T106
C403	1-104-851-11	TANTAL. CHIP	10uF 20% 10V	Q156	8-729-029-06	TRANSISTOR	DTC124EUA-T106
C404	1-164-232-11	CERAMIC CHIP	0.01uF 50V	Q157	8-729-820-61	TRANSISTOR	2SB1124-T
C405	1-164-232-11	CERAMIC CHIP	0.01uF 50V	Q158	8-729-230-63	TRANSISTOR	2SC4116-YG
C406	1-164-232-11	CERAMIC CHIP	0.01uF 50V	Q159	8-729-028-83	TRANSISTOR	DTA124EUA-T106
C407	1-164-232-11	CERAMIC CHIP	0.01uF 50V	Q160	8-729-029-06	TRANSISTOR	DTC124EUA-T106
C410	1-164-232-11	CERAMIC CHIP	0.01uF 50V	Q161	8-729-230-60	TRANSISTOR	2SA1586-YG
C421	1-164-232-11	CERAMIC CHIP	0.01uF 50V	Q201	8-729-230-63	TRANSISTOR	2SC4116-YG
C422	1-164-232-11	CERAMIC CHIP	0.01uF 50V	Q401	8-729-029-06	TRANSISTOR	DTC124EUA-T106
		< CONNECTOR >		Q402	8-729-029-06	TRANSISTOR	DTC124EUA-T106
CN101	1-774-416-11	CONNECTOR, FPC 25P		Q403	8-729-028-83	TRANSISTOR	DTA124EUA-T106
CN103	1-573-362-11	CONNECTOR, FFC/FPC 22P				< RESISTOR >	
CN104	1-774-516-11	CONNECTOR, FPC (ZIF) 11P		R100	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
		< DIODE >		R101	1-216-089-00	METAL GLAZE	47K 5% 1/10W
D150	8-719-976-81	DIODE DTZ3. 3A-TT11		R103	1-216-295-00	CONDUCTOR, CHIP	(2012)
D151	8-719-977-03	DIODE DTZ5. 6B		R105	1-216-089-00	METAL GLAZE	47K 5% 1/10W
D152	8-719-977-03	DIODE DTZ5. 6B		R106	1-216-295-00	CONDUCTOR, CHIP	(2012)
D251	8-719-056-89	DIODE DTZ-TT11-12B		R107	1-216-089-00	METAL GLAZE	47K 5% 1/10W
		< IC >		R109	1-216-077-00	METAL CHIP	15K 5% 1/10W
IC101	8-752-072-68	IC CXA1981AR		R110	1-216-025-00	METAL GLAZE	100 5% 1/10W
IC150	8-759-924-48	IC BA4560F-T2		R112	1-216-113-00	METAL CHIP	470K 5% 1/10W
IC201	8-752-382-23	IC CXD2535CR-1		R113	1-216-001-00	METAL CHIP	10 5% 1/10W
IC250	8-759-179-60	IC MPC17A38VMEL		R114	1-216-029-00	METAL CHIP	150 5% 1/10W
IC260	8-759-040-83	IC BA6287F		R115	1-216-073-00	METAL CHIP	10K 5% 1/10W
IC301	8-752-371-17	IC CXD2536R		R116	1-216-049-00	METAL GLAZE	1K 5% 1/10W
IC302	8-759-341-28	IC HM51W4400TT6-8		R117	1-216-057-00	METAL CHIP	2.2K 5% 1/10W
IC350	8-759-173-51	IC SM5872AS-ET		R118	1-216-026-00	METAL GLAZE	110 5% 1/10W
IC360	8-759-924-48	IC BA4560F-T2		R119	1-216-065-00	METAL CHIP	4.7K 5% 1/10W
IC401	8-759-464-24	IC uPD78056GC-194-3B9		R150	1-216-097-00	METAL GLAZE	100K 5% 1/10W
IC403	8-759-238-47	IC TC74HCT7007AF(EL)		R151	1-216-051-00	METAL CHIP	1.2K 5% 1/10W
IC404	8-759-205-62	IC TC4050BF-TP1		R152	1-216-049-00	METAL GLAZE	1K 5% 1/10W
		< COIL >		R153	1-216-089-00	METAL GLAZE	47K 5% 1/10W
L101	1-410-381-11	INDUCTOR CHIP	10uH	R154	1-216-049-00	METAL GLAZE	1K 5% 1/10W
				R155	1-216-049-00	METAL GLAZE	1K 5% 1/10W
				R156	1-216-053-00	METAL CHIP	1.5K 5% 1/10W
				R157	1-216-049-00	METAL GLAZE	1K 5% 1/10W

SERVO

Ref. No.	Part No.	Description	Remark		
R158	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R159	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R160	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R205	1-216-025-00	METAL GLAZE	100	5%	1/10W
R208	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R213	1-216-073-00	METAL CHIP	10K	5%	1/10W
R214	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R215	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R216	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R217	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R218	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R220	1-216-025-00	METAL GLAZE	100	5%	1/10W
R221	1-216-025-00	METAL GLAZE	100	5%	1/10W
R222	1-216-025-00	METAL GLAZE	100	5%	1/10W
R223	1-216-025-00	METAL GLAZE	100	5%	1/10W
R224	1-216-025-00	METAL GLAZE	100	5%	1/10W
R225	1-216-025-00	METAL GLAZE	100	5%	1/10W
R226	1-216-025-00	METAL GLAZE	100	5%	1/10W
R227	1-216-025-00	METAL GLAZE	100	5%	1/10W
R228	1-216-025-00	METAL GLAZE	100	5%	1/10W
R229	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R233	1-216-113-00	METAL CHIP	470K	5%	1/10W
R250	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R251	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R252	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R253	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R254	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R255	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R256	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R257	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R258	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R301	1-216-025-00	METAL GLAZE	100	5%	1/10W
R304	1-216-025-00	METAL GLAZE	100	5%	1/10W
R305	1-216-025-00	METAL GLAZE	100	5%	1/10W
R306	1-216-025-00	METAL GLAZE	100	5%	1/10W
R311	1-216-025-00	METAL GLAZE	100	5%	1/10W
R312	1-216-025-00	METAL GLAZE	100	5%	1/10W
R313	1-216-025-00	METAL GLAZE	100	5%	1/10W
R314	1-216-025-00	METAL GLAZE	100	5%	1/10W
R315	1-216-025-00	METAL GLAZE	100	5%	1/10W
R350	1-216-025-00	METAL GLAZE	100	5%	1/10W
R360	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W
R361	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W
R362	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W
R363	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W
R364	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R365	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R366	1-216-097-00	METAL GLAZE	100K	5%	1/10W

Ref. No.	Part No.	Description	Remark		
R380	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W
R381	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W
R382	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W
R383	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W
R384	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R385	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R386	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R401	1-216-025-00	METAL GLAZE	100	5%	1/10W
R402	1-216-025-00	METAL GLAZE	100	5%	1/10W
R403	1-216-025-00	METAL GLAZE	100	5%	1/10W
R406	1-216-025-00	METAL GLAZE	100	5%	1/10W
R407	1-216-025-00	METAL GLAZE	100	5%	1/10W
R408	1-216-025-00	METAL GLAZE	100	5%	1/10W
R409	1-216-025-00	METAL GLAZE	100	5%	1/10W
R412	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R413	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R414	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R415	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R416	1-216-113-00	METAL GLAZE	470K	5%	1/10W
R418	1-216-025-00	METAL GLAZE	100	5%	1/10W
R419	1-216-025-00	METAL GLAZE	100	5%	1/10W
R424	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R425	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R426	1-216-083-00	METAL CHIP	27K	5%	1/10W
R427	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R428	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R430	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R435	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R436	1-216-089-00	METAL GLAZE	47K	5%	1/10W
< THERMISTOR >					
TH401	1-810-719-21	THERMISTOR			
TH402	1-810-719-21	THERMISTOR			
< VIBRATOR >					
X301	1-760-168-11	VIBRATOR, CRYSTAL (45.1584MHz)			
X350	1-579-876-21	VIBRATOR, CRYSTAL (22.5792MHz)			
X401	1-579-841-21	VIBRATOR, CERAMIC (CHIP TYPE) (5MHz)			

MISCELLANEOUS					

151	1-658-627-11	SENSOR FLEXIBLE BOARD			
△169	8-583-023-13	OPTICAL PICK-UP (MD) KMS-193B/J2RP			
M901	A-3291-516-A	MOTOR ASSY, SP (SPINDLE)			
M902	A-3291-190-A	MOTOR ASSY, SL (SLED)			
M903	A-3291-191-A	MOTOR ASSY, LO (LOADING)			

The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>
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HARDWARE LIST

#1	7-685-851-04	SCREW +BVTT 2X4 (S)	
#2	7-624-102-04	STOP RING 1.5, TYPE-E	
#3	7-627-852-37	PRECISION SCREW +P1.7X1.8 TYPE3	
#4	7-621-772-00	SCREW +B 2X3	
#5	7-621-555-10	SCREW +K 2X3	
#6	7-627-554-07	SCREW, PRECISION +P 2X2.2	