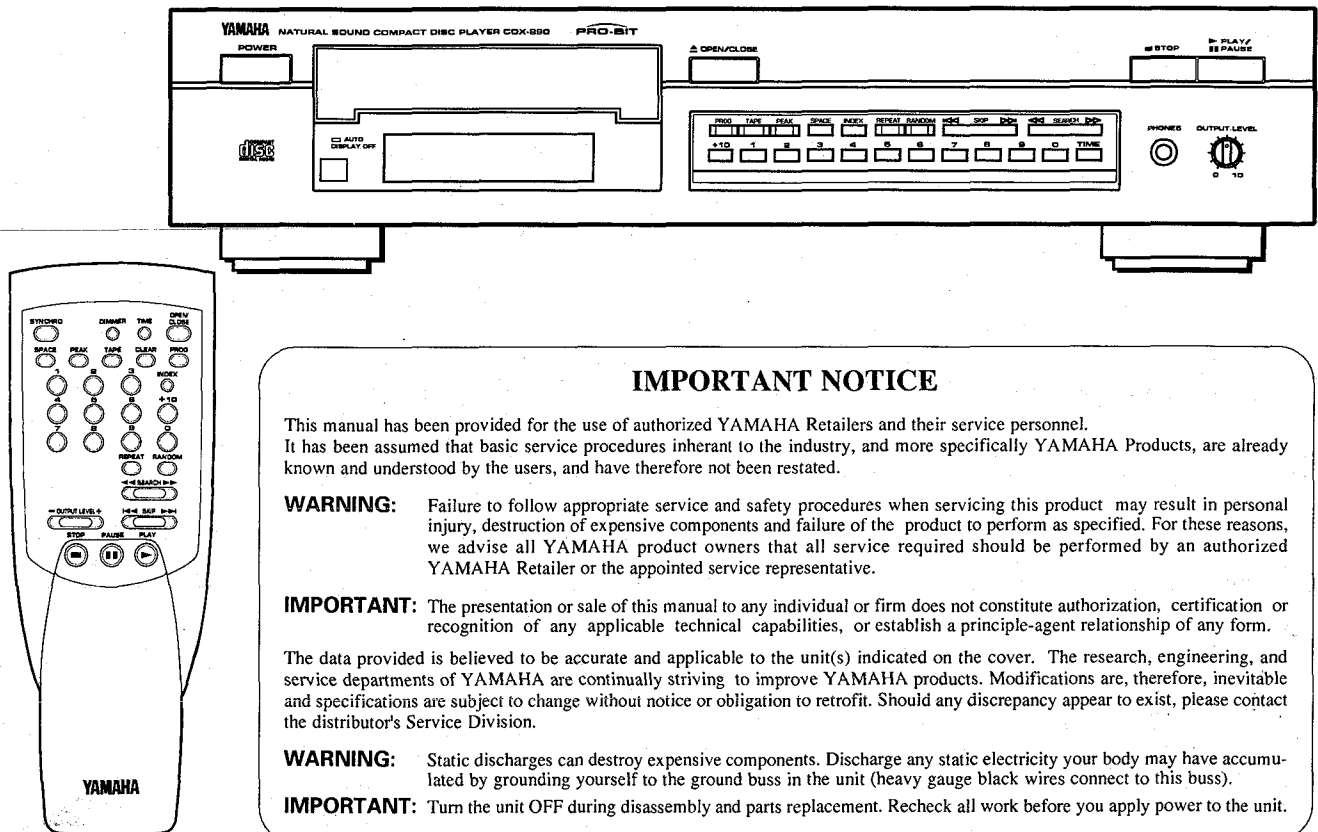


COMPACT DISC PLAYER CDX-890

SERVICE MANUAL



IMPORTANT NOTICE

This manual has been provided for the use of authorized YAMAHA Retailers and their service personnel. It has been assumed that basic service procedures inherent to the industry, and more specifically YAMAHA Products, are already known and understood by the users, and have therefore not been restated.

WARNING: Failure to follow appropriate service and safety procedures when servicing this product may result in personal injury, destruction of expensive components and failure of the product to perform as specified. For these reasons, we advise all YAMAHA product owners that all service required should be performed by an authorized YAMAHA Retailer or the appointed service representative.

IMPORTANT: The presentation or sale of this manual to any individual or firm does not constitute authorization, certification or recognition of any applicable technical capabilities, or establish a principle-agent relationship of any form.

The data provided is believed to be accurate and applicable to the unit(s) indicated on the cover. The research, engineering, and service departments of YAMAHA are continually striving to improve YAMAHA products. Modifications are, therefore, inevitable and specifications are subject to change without notice or obligation to retrofit. Should any discrepancy appear to exist, please contact the distributor's Service Division.

WARNING: Static discharges can destroy expensive components. Discharge any static electricity your body may have accumulated by grounding yourself to the ground buss in the unit (heavy gauge black wires connect to this buss).

IMPORTANT: Turn the unit OFF during disassembly and parts replacement. Recheck all work before you apply power to the unit.

CONTENTS

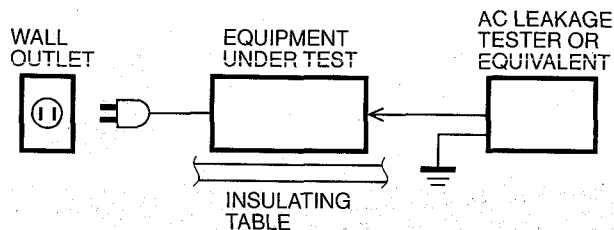
TO SERVICE PERSONNEL	1~2
INTERNAL VIEW	2
REAR PANEL	3
SPECIFICATIONS	3
DISASSEMBLY PROCEDURES	4
STANDARD OPERATION CHART	5~6
TEST MODE	7~8
MEMORY BACKUP	8
ERROR MESSAGE	9~11

DISPLAY DATA	12
IC DATA	13~16
PIN CONNECTION DIAGRAM	17
PRINTED CIRCUIT BOARD	18~21
BLOCK DIAGRAM	22~23
IC BLOCKS	24~25
SCHEMATIC DIAGRAM	26
REMOTE CONTROL TRANSMITTER.....	27
PARTS LIST	28~38

■ TO SERVICE PERSONNEL

Critical Components Information.

Components having special characteristics are marked and must be replaced with parts having specifications equal to those originally installed.



CAUTION: USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

THE COMPACT DISC PLAYER SHOULD NOT BE ADJUSTED OR REPAIRED BY ANYONE EXCEPT PROPERLY QUALIFIED SERVICE PERSONNEL.

PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

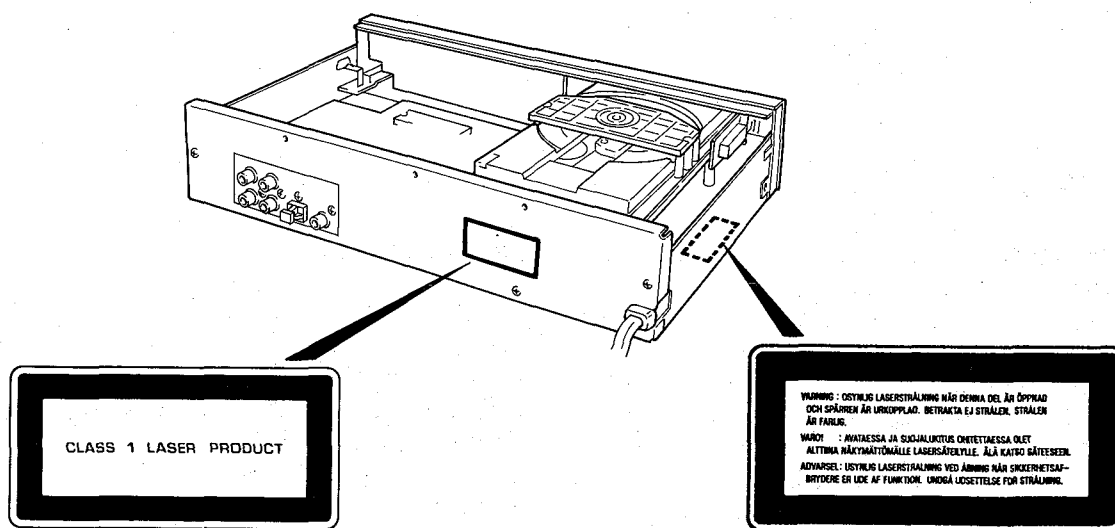
This set employs a laser. Therefore, be sure to carefully follow the instructions below when servicing.

1. Laser Diode Properties

- Material : GaAlAs
- Wavelength : 780 nm
- Emission Duration : Continuous
- Laser Output : max. 44.6 μ W*

* This output is the value measured at a distance of about 200 mm from the objective lens surface on the Optical Pick-up Block.

2. When checking the laser diode emission, keep your eyes more than 30 cm away from the objective lens.



English

- ① THIS LABEL (SEE POSITION SHOWN IN THE ILLUSTRATION) INFORMS THE USER THAT THE APPARATUS CONTAINS A LASER COMPONENT.
- ② THIS LABEL (SEE POSITION SHOWN IN THE ILLUSTRATION) WARNS THAT ANY FURTHER PROCEDURE WILL BRING THE USER INTO EXPOSURE WITH THE LASER BEAM.

CAUTION : USE OF CONTROLS, ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN, MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

Swedish

- ① DENNA MÄRKNING (SE FIGUR) UPPLYSER OM ATT DET I APPARATEN INGÅR EN LASERKOMPONENT AV TYP KLASS 1.
- ② VARNINGSMÄRKNING (SE FIGUR) FÖR STRÅLNING. INGREPP I APPARATEN BÖR ENDAST FÖRETAGAS AV FACKMAN MED KÄNNEDOM OM LASER. APPARATEN INNEHÅLLER EN LASERKOMPONENT SOM AVGER STRÅLNING ÖVERSTIGANDE GRÄNSEN FÖR LASERKLASS 1.

VARNING : OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD : BETRAKTA EJ STRÅLEN.

Danish

- ① DETTE MÆRKAT ER ANBRAGT SOM VIST I ILLUSTRATIONEN FOR AT ADVARE BRUGEREN OM AT APPARATET INDEHOLDER EN LASERKOMPONENT.
- ② DETTE MÆRKAT OM LASEREN ER ANBRAGT PÅ APPARATET SOM EN OPLYSNING OM AT APPARATET INDEHOLDER ET LASERKOMPONENT.

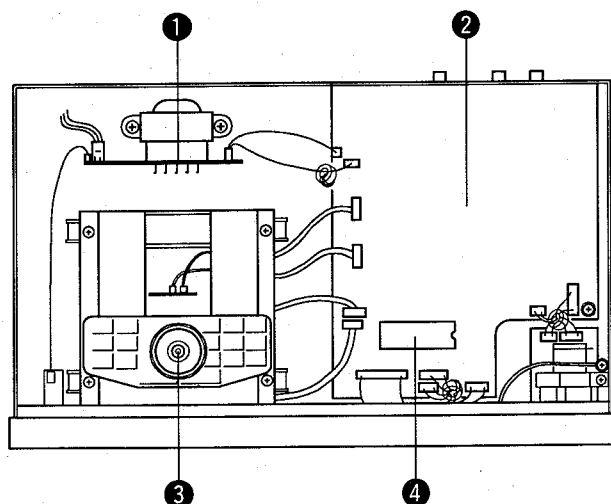
ADVARSEL : INDGREG BOR KUN FORETAGES AF EN FAGMAND DA DER ER RISIKO FOR RADIOAKTIV STRÅLING.

ADVARSEL : USYNLIG LASERSTRÅLING VED ÅBNING.
UNDGÅ UDSAETTELSE FOR STRÅLING.

Finnish

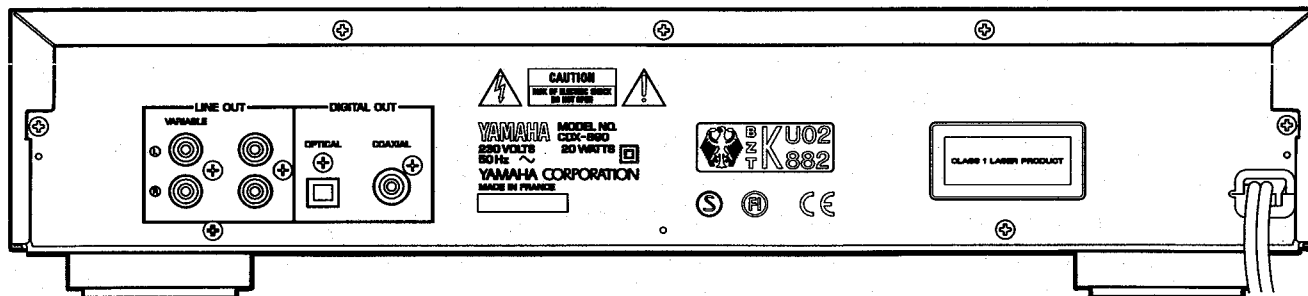
VARO! :
AVATTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

INTERNAL VIEW



- ① P.C.B. MAIN (5)
- ② P.C.B. MAIN (1)
- ③ CD MECHANISM UNIT
- ④ 4BIT μ -COM (IC12)

REAR PANEL



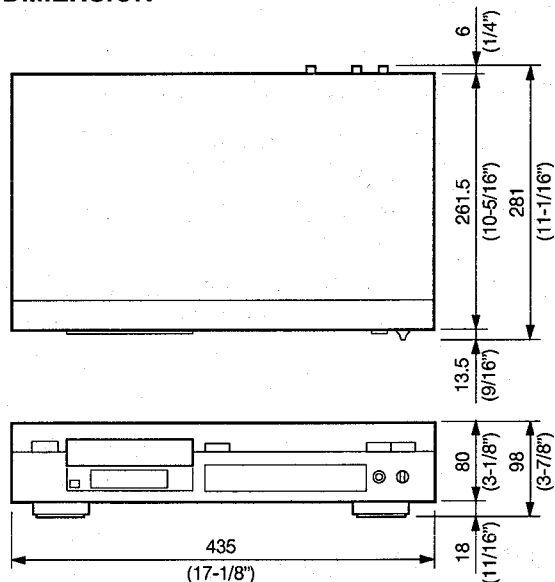
SPECIFICATIONS

Output Level 1kHz, 0dB	2.0±0.5Vrms
Signal to Noise Ratio (EIAJ)	118dB
Dynamic Range	98dB
Harmonic Distortion+Noise (1kHz)	0.002%
Frequency Response 2Hz — 20kHz	±0.3dB
Headphone Output 150Ω, 1kHz, -20dB Input	300mV±60mV
Power Requirements	230V AC 50Hz
Power Consumption	20W
Dimensions (W x H x D)	435 x 98 x 281mm (17-1/8" x 3-7/8" x 11-1/16")
Weight	5.9kg (13 lbs)
Accessories	Pin plug code Remote control transmitter (Dry-cell : x 2: Size "AA", R06)

*Specifications are subject to change without notice.

B British model
G European model

DIMENSION



Unit : mm (inch)

■ DISASSEMBLY PROCEDURES (Remove parts in disassembly order as numbered.)

1. Removal of Top Cover

- Remove 4 screws (①) and 3 screws (②) in Fig. 1.
- Lift the Top Cover to the back side and move it rearward slantingly.

2. Removal of Front Panel

- Remove 7 connectors in Fig. 2.
CB413, CB6, CB8~12
- Remove 3 screws (③), 2 screws (④) and 2 screw (⑤) in Fig. 1.
- Remove 2 hooks and then pull the Front Panel forward.

3. Removal of CD Mechanism Unit

- Remove 4 connectors in Fig. 2.
CB2~5
- Remove 4 screws (⑥) in Fig. 1.

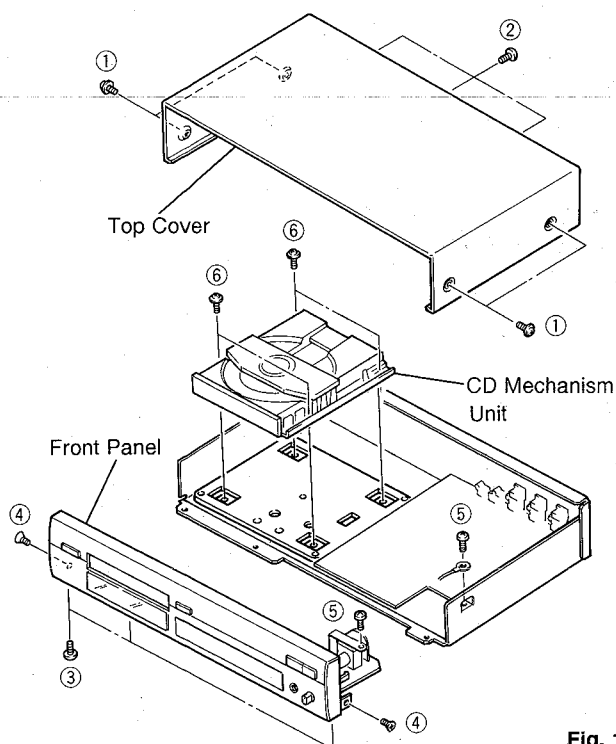


Fig. 1

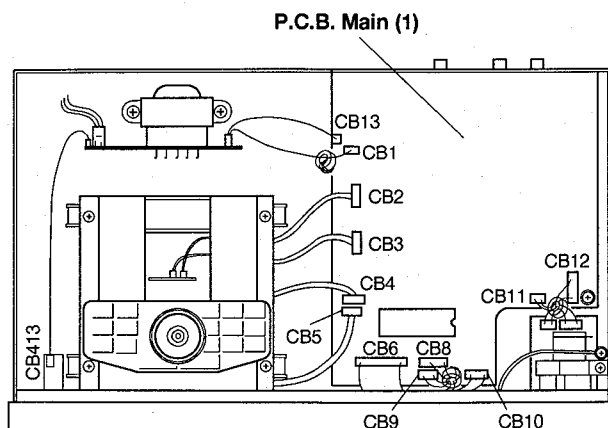


Fig. 2

4. Removal of Tray Unit

- Remove 2 screws (⑦) and then remove the Chucking Unit in Fig. 3.
- Remove 1 hook and then remove the Stopper Pin in Fig. 3.
- Rotate the Drive Gear and then open the Tray Unit in Fig. 3.
- Detach the Stoppers on both sides and then pull out the Tray in Fig. 3.

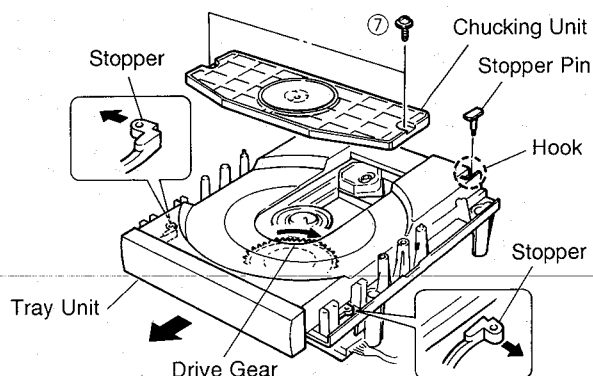


Fig. 3

5. Removal of Pick-up Head

- Remove 2 screws (⑧) in Fig. 4.
- Remove 4 screws (⑨) and then remove the Drive Unit in Fig. 4.

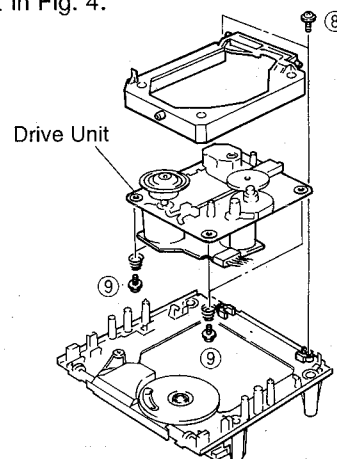


Fig. 4

- Remove the gear A in Fig. 5.
- Pull out the Sled Shaft in Fig. 5.
- Remove the Pick-up Head.

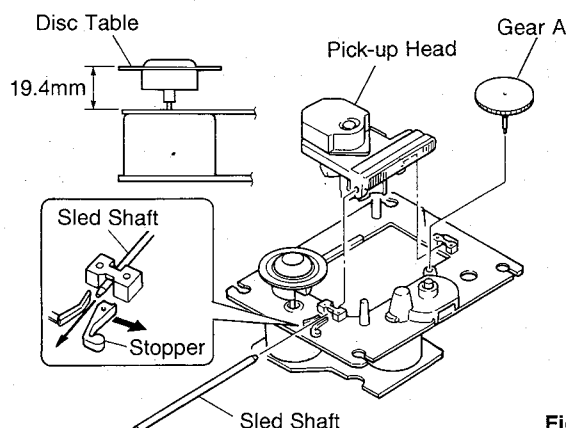
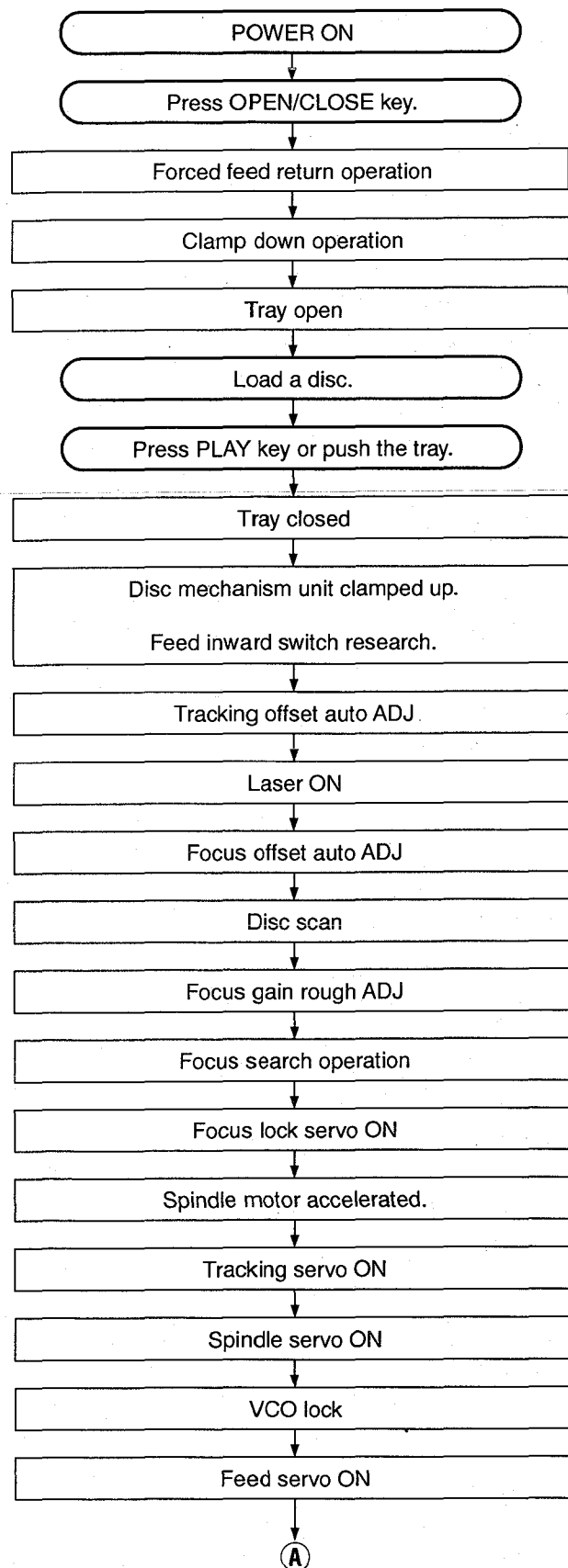


Fig. 5

■ STANDARD OPERATION CHART



If a disc is not loaded, "0:00" appears in the time indicator.

" : " appears in the TIME indicator.

"TRV" signal is output until detection of LIMIT switch.

Stop after detection of LOADING switch.

Proceeds to next step after detection of LOADING switch.

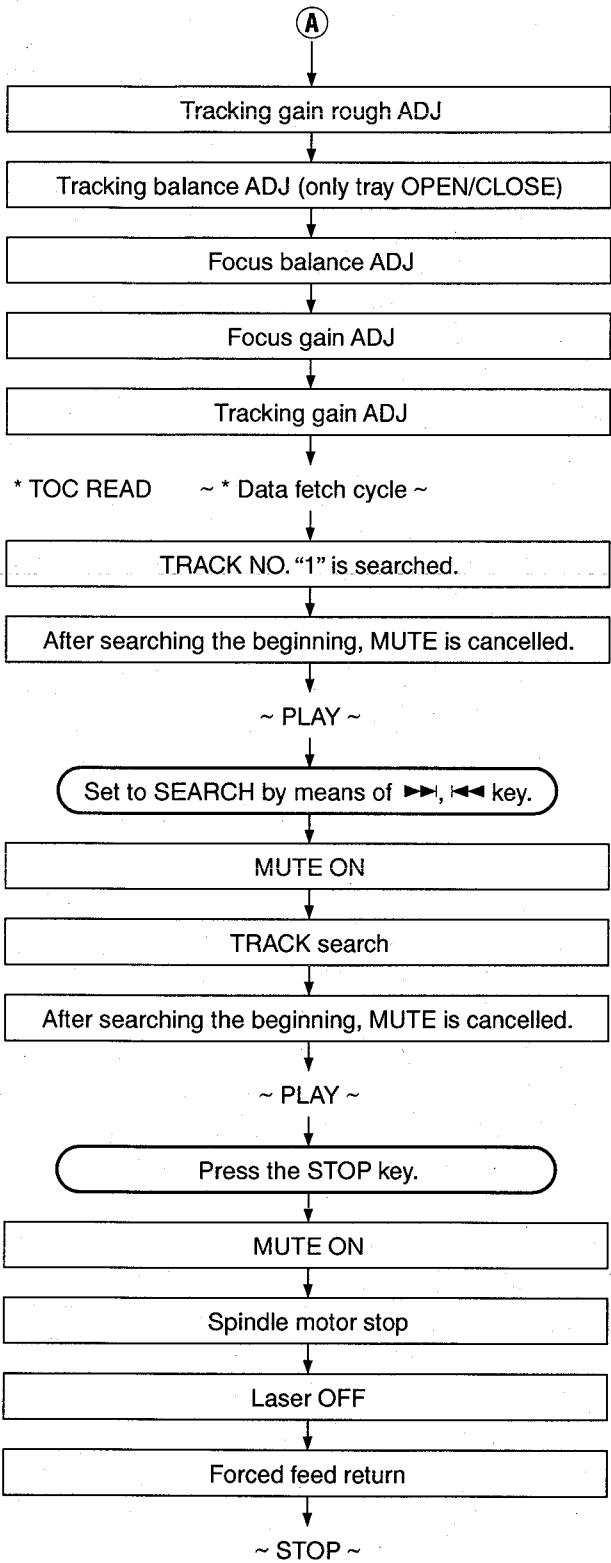
if FLSW = L, (IC12, 28 pin)
Proceeds To Next Step.

LSON = "H" (IC1, 3 pin)

$\overline{\text{FLOCK}}$ = "H" → "L" (IC12, 11 pin)

$\overline{\text{TLOCK}}$ = "H" → "L" (IC12, 12 pin)

CRC = "H" (IC11, 67 pin)



: MUTE OFF = "H" → "L" (Q7 Collector)
"0:00" appears in the time indicator.

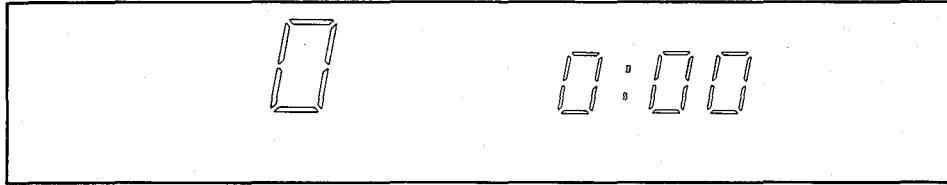
: MUTE OFF = "L" → "H"

: MUTE OFF = "H" → "L"
"0:00" appears in the time indicator.

: LSON = "H" → "L" (IC1, 3 pin)

■ TEST MODE

- (1) Turning ON the POWER while pressing the keys "4" and "7" will set to the TEST mode. (When the TEST mode is set, all indicators light for 1 second.)



- (2) Shown below are the panel keys and remote control transmitter in the TEST mode.

● Function List of Panel keys

Note) "traverse servo" means the same as "feed servo".

PANEL KEY	FUNCTION
OPEN/CLOSE	Tray open/close.
PLAY/PAUSE	FOON, TRON, SPON, TVON(FEON).
STOP	All stop. (Focus, spindle, feed, laser, tray, etc.) Initializes FL display
◀◀	Inner circumference traverse servo.
▶▶	Outer circumference traverse servo.
◀◀	Inner 10 tracks kick continuously.
▶▶	Outer 10 tracks kick continuously.
REPEAT	TROF, FOON, FEOF
RANDOM	TRON, FOON, FEON, MUTEON
PROG	Decelerates spindle.
PEAK	Accelerates spindle.
TAPE	TROF, FOON
SPACE	Rotates or accelerates spindle. → Focus search, TROF → Spindle free.
INDEX	Rotates or accelerates spindle. → Focus search, TROF → Spindle play, TRON.
TIME	Checks FL display. (Test pattern 88 8888 → All lamps → goes out)
+10	Rotating the mode of coefficients. (Coefficient mode → Coefficient setting → product mode) Pressing twice will set to the product mode.
1	Returns to product mode.
2	Auto adjustment mode 1 (TR-off set, FO-off set, FO-rough gain adjustment)
3	Auto adjustment mode 2 (TR-balance, TR-rough gain adjustment)
4	Auto adjustment mode 3 (FO-fine gain, TR-fine gain, FO-balance adjustment)
5	1 TRACK KICK – continuously (Coefficient set up mode : address down)
6	1 TRACK KICK + continuously (Coefficient set up mode : address up)
7	30 TRACK KICK – continuously (Coefficient set up mode : upper digit down)
8	30 TRACK KICK + continuously (Coefficient set up mode : upper digit up)
9	150 TRACK KICK – continuously (Coefficient set up mode : lower digit down)
0	150 TRACK KICK + continuously (Coefficient set up mode : lower digit up)

● Function List of Remote Control Transmitter

CUSTOM CODE = (79)x

CODE	KEY	FUNCTION
01	OPEN/CLOSE	Tray open/close.
02	PLAY	PLAY (FOON, TRON, TVON(FEON), SPON)
04	◀◀ SKIP	Inner circumference traverse servo.
05	◀◀ SEARCH	Inner 10 tracks kick continuously.
06	▶▶ SEARCH	Outer 10 tracks kick continuously.
07	▶▶ SKIP	Outer circumference traverse servo.
08	REPEAT	FOON, TROF (Enter focus search if focus servo is off.)
0A	TIME	Checks FL display. (All lamps → 88 8888 → goes out.)
0B	INDEX	FOON, TROF, TVOF(EFOF) (Enter focus search if focus servo is off.)
0C	PROG	Rotates or accelerates spindle.
0D	CLEAR	Decelerates spindle. (checking EFM pattern and reflected STAT)
0F	SPACE	FOOF, TROF, TVOF(EFOF)
10	0	150 TRACK KICK + continuously (Coefficient set up mode : lower digit up)
11	1	Returns to product mode. (tray inoperative.)
12	2	Auto adjustment mode 1 (TR-off set, FO-off set, FO-rough gain adjustment)
13	3	Auto adjustment mode 2 (TR-balance, TR-rough gain adjustment)
14	4	Auto adjustment mode 3 (FO-fine gain, TR-fine gain, FO-balance adjustment)
15	5	1 TRACK KICK – continuously (Coefficient set up mode : address down)
16	6	1 TRACK KICK + continuously (Coefficient set up mode : address up)
17	7	30 TRACK KICK – continuously (Coefficient set up mode : upper digit down)
18	8	30 TRACK KICK + continuously (Coefficient set up mode : upper digit up)
19	9	150 TRACK KICK – continuously (Coefficient set up mode : lower digit down)
1A	+10	Rotating the mode of coefficients.
1B	RANDOM	SPON (Spindle servo on.)
1C	OUTPUT LEVEL–	Move output level down.
1D	OUTPUT LEVEL+	Move output level up.
1E	DIMMER	Checks FL display. (All lamps → 88 8888 → goes out.)
55	PAUSE	FOON, TROF, TVOF(EFOF) (Enter focus search if focus servo is off.)
56	STOP	All stop. (Focus, spindle, traverse, laser, tray, etc.)
57	TAPE	Spindle free (off)
58	SYNCHRO	TV(Feed) REV
5D	PEAK	—

■ MEMORY BACKUP

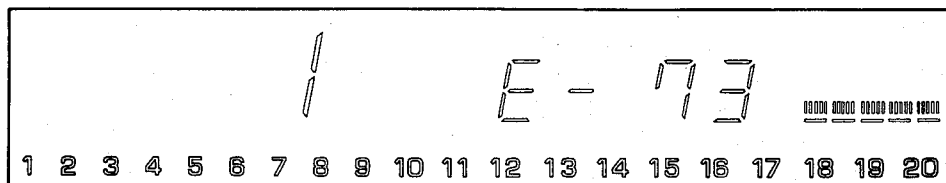
After the Power is turned OFF, some functions are kept in memory.

Functions kept in memory are :

- DIMMER
- FULL REPEAT
- RANDOM MODE
- TIME MODE
- AUTO SPACE

■ ERROR MESSAGE

- (1) When operation is terminated in an abnormal condition (stop or open), pressing STOP on the remote control while pressing STOP on the panel will set to the error message display enable mode.
- (2) Shown below is an example of display. ("E-73" as an example)



- (3) This function stays effective till the power is turned OFF. (It is cleared at OFF.)
- (4) Listed in the table below are error messages.

● Error Messages List

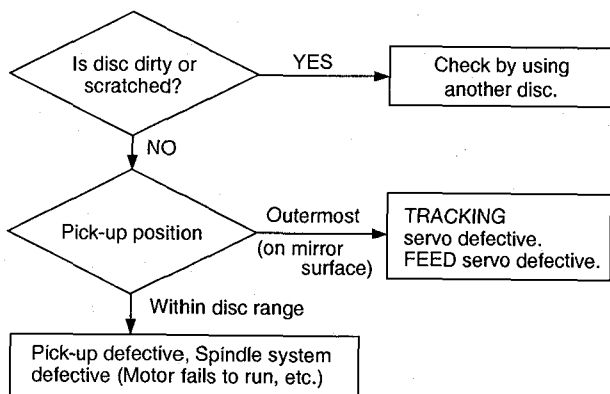
ERROR MESSAGES	DESCRIPTION
E - X 0	Data cannot be read after finishing search.
E - X 1	Data cannot be read during PLAY(X=0), PAUSE(X=3), or SCAN(X=2).
E - 7 1	At the start, tracking servo is not effective.
E - 7 2	At the start, spindle servo PLL is not effective.
E - 7 3	At the start, data can not read.
E - 9 4	Close switch does not work with tray closed.
E - - 5	Open switch does not work with tray open.
E - X 7	Traverse(Feed) inner switch does not work.
E - X 8	Recovery action fails after focus drop.
E r r	MN662720 does not give response of SENSE, with resetting by the unit's microcomputer.

*No. for each state (meaning of "X")

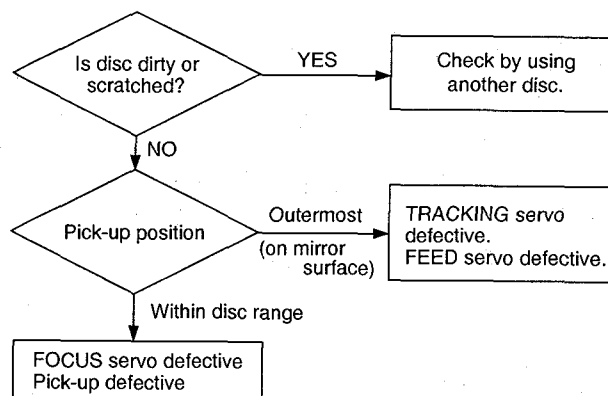
PLAY	X="0"
SCAN	X="2"
PAUSE	X="3"
PEAK SEARCH	X="4"
SEARCH	X="5"
START	X="7"
STOP	X="8"
LOADING	X="9"
OPEN	X="-"
NO DISC	X="C"

1) Error Code Troubleshooting

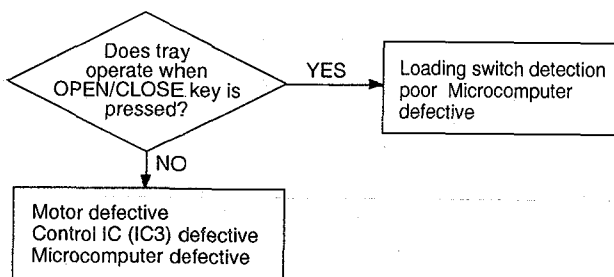
Error code **X0** , **X1** , **73** Data cannot be read.



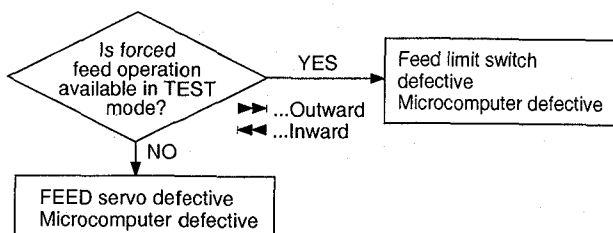
Error code **X8** Focus drops.



Error codes **94** , **-5** Poor tray loading operation.

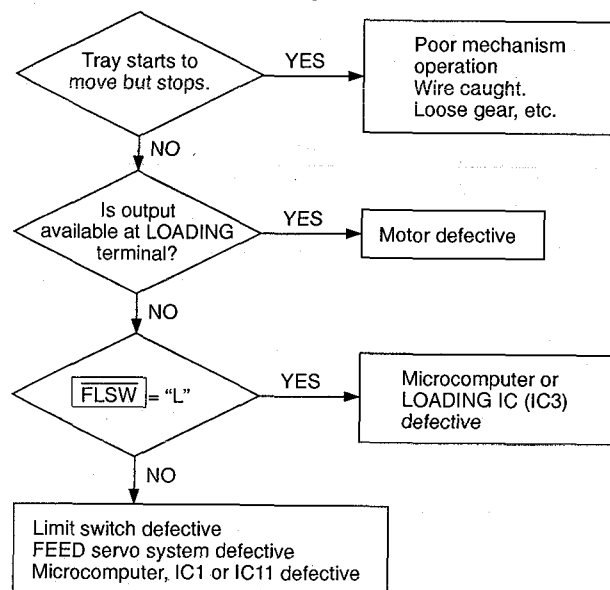


Error code **X7** FEED operation defective. (Limit switch fails)



2) Troubleshooting from System Malfunctions

a) Tray fails to come out/go in.

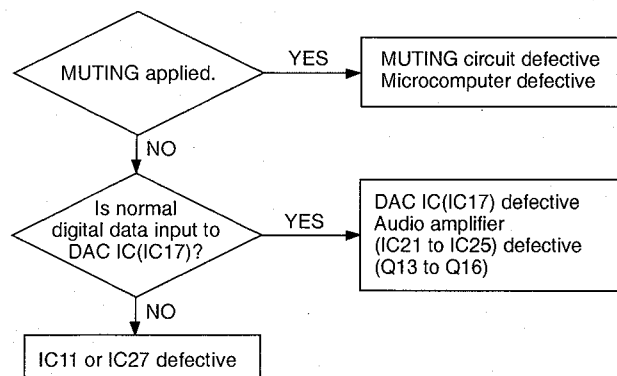


When tray fails to close completely (when it stops midway)

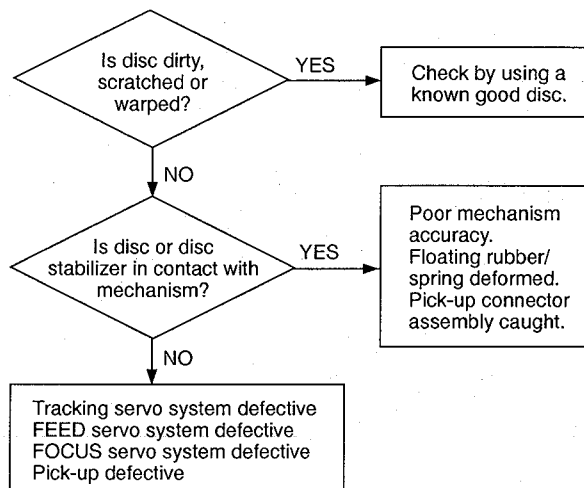
[Corrective measure]

- 1) Turn ON the power and open the tray.
* If it failed to open (head and tray contacting each other), open it after removing the chucking unit.
- 2) Turn OFF the power and force the tray to go in fully and close.
- 3) With the power turned ON, open and close the tray to check if the tray close completely.

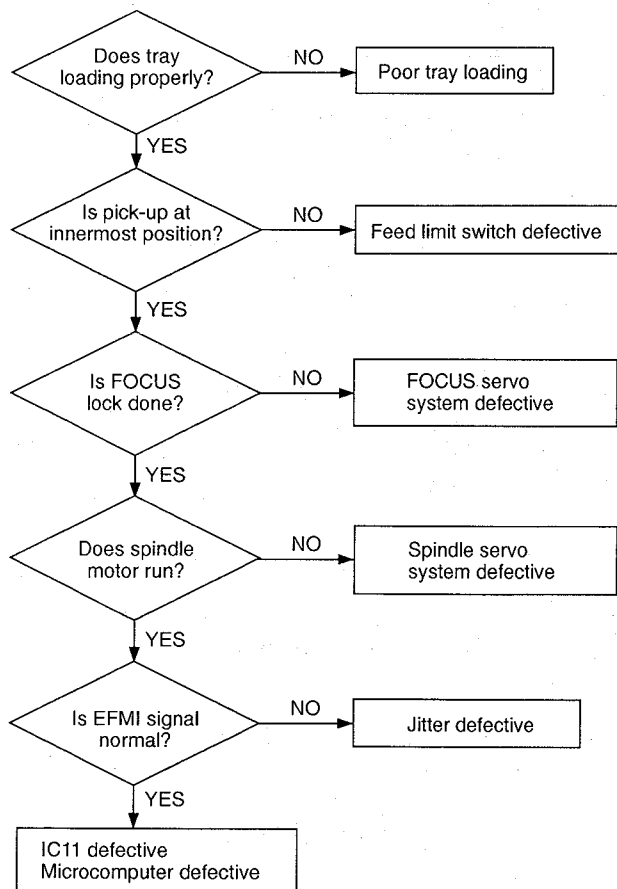
**b) No sound generated, Sound cut during play.
(but time display advances properly)**



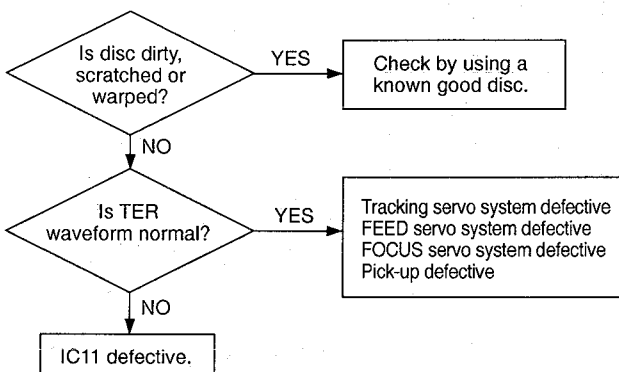
**d) Sound skips.
(Time display fails to advance properly)**



c) Operates as if no disc loaded. (although loaded)

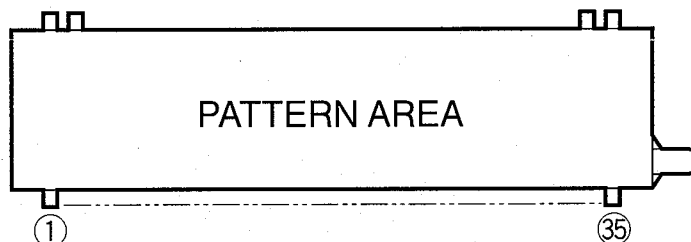


e) No search provided. (Sound skipped after search)



■ DISPLAY DATA (VR061600)

V401 : 9-MT-133GK



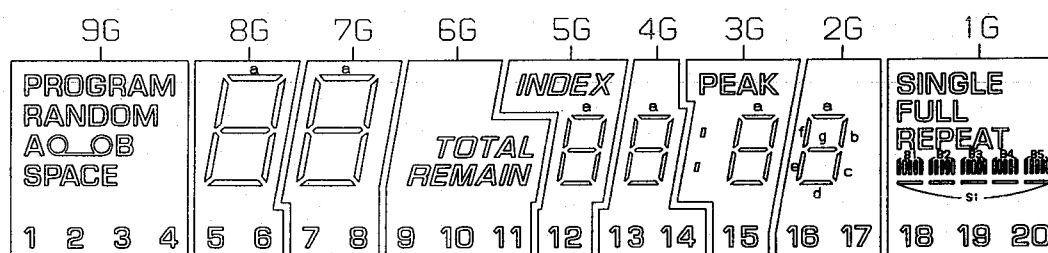
PIN CONNECTION

PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
CONNECTION	F1	F1	NP	9G	8G	7G	6G	5G	4G	3G	2G	1G	NC	NC	NC	NC	NC	NC

PIN NO.	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
CONNECTION	NC	NC	P12	P11	P10	P9	P8	P7	P6	P5	P4	P3	P2	P1	NP	F2	F2

- NOTE 1) F1, F2 Filament
 2) NP No pin
 3) NC No connection
 4) P1~P10 ... Datum Line
 5) 1G~9G Grid

GRID ASSIGNMENT

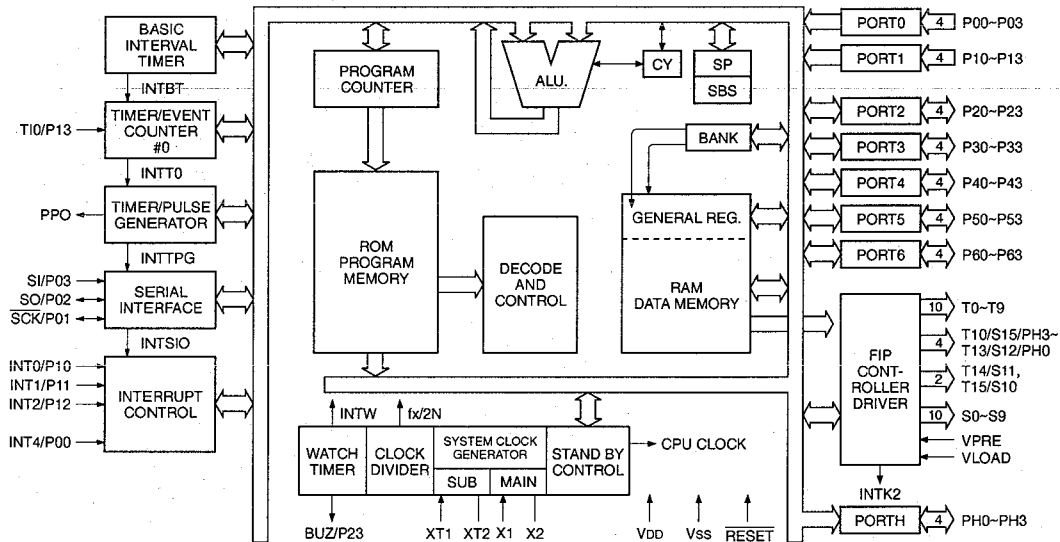
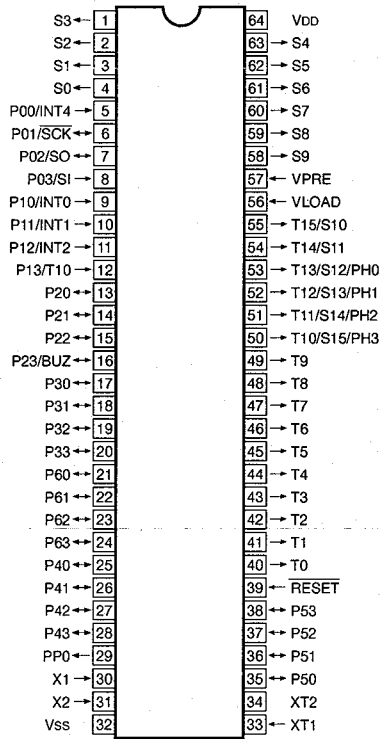


ANODE CONNECTION

	9G	7G	7G	6G	5G	4G	3G	2G	1G
P1	PROGRAM	a	a	TOTAL	a	a	a	a	SINGLE
P2	RANDOM	b	b	REMAIN	b	b	b	b	FULL
P3	A	c	c	—	c	c	c	c	REPEAT
P4	□○□	d	d	—	d	d	d	d	B1
P5	B	e	e	—	e	e	e	e	B2
P6	SPACE	f	f	—	f	f	f	f	B3
P7	—	g	g	—	g	g	g	g	B4
P8	—	—	—	—	—	—	:	—	B5
P9	1	5	7	9	12	13	15	16	S1
P10	2	6	8	10	INDEX	14	PEAK	17	18
P11	3	—	—	11	—	—	—	—	19
P12	4	—	—	—	—	—	—	—	20

IC DATA

IC12 : μ PD75217CW
System Controller (4bit μ -COM)

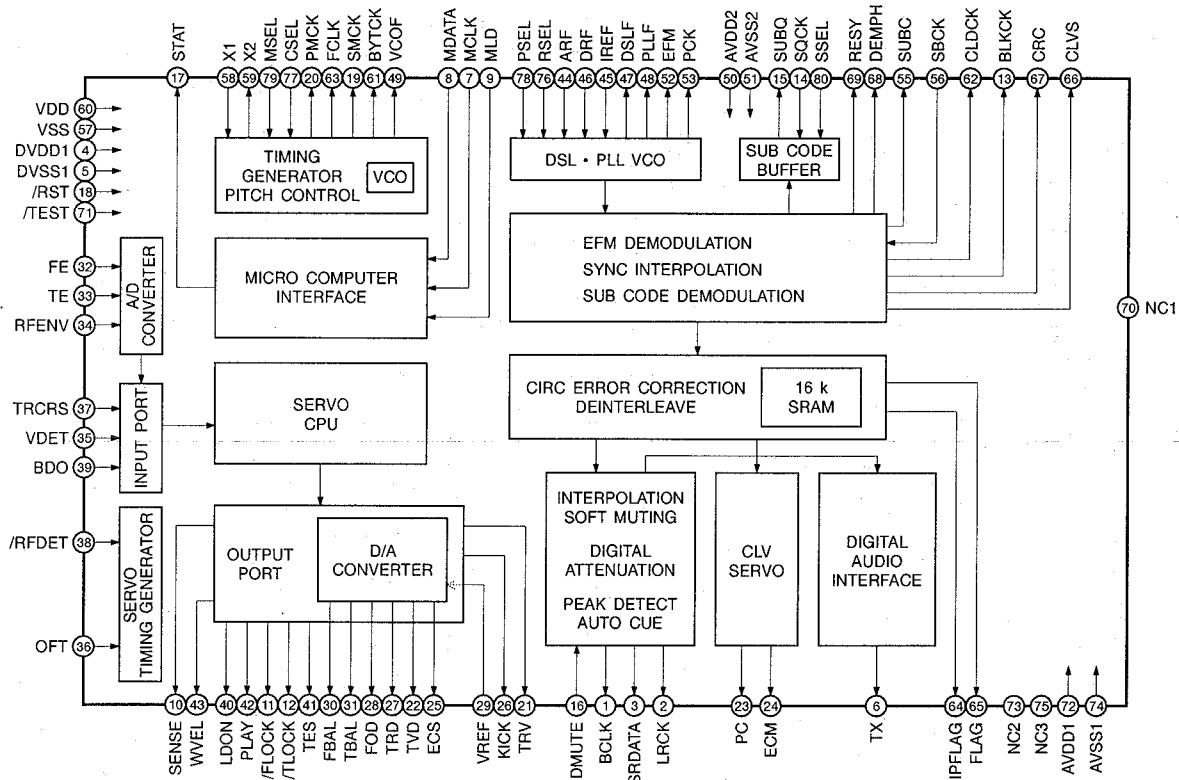


Pin No.	Pin Name	Description	Function
1	S3	S3	Fluorescent character display tube anode drive signal
2	S2	S2	
3	S1	S1	
4	S0	S0	
5	PO0	D/A	N.C
6	PO1	SCK	Serial clock output to MN662720
7	PO2	SO	Serial data output to MN662720
8	PO3	SI	Serial data input from MN662720
9	P10	REM	Input from remote control beam receiving unit
10	P11	BLKICK	Synchronous clock input for Q-code RCV from MN662720 (Fine pulse at RCV, normally LO)
11	P12	FLOCK	FOCUS lock signal input from MN662720 (LO at LOCK)

Pin No.	Pin Name	Description	Function
12	P13	$\overline{\text{TLOCK}}$	Tracking lock signal input from MN662720 (HI at LOCK)
13	P20	$\overline{\text{MLD}}$	Read signal output for transmitting command from MN662720 (After command transmission, LO pulse at LOAD TIMING)
14	P21	COMMAND	Serial I/F switching signal output (switching at 74HC125) Q CODE received at HI
15	P22	QCODE	Serial I/F switching signal output (switching at 74HC125) CMD transmit/receive selection
16	P23	DMUTE	Digital mute signal output (HI at MUTE)
17	P30	STAT	STAT signal input
18	P31	$\overline{\text{MNRESET}}$	RESET signal output (LO at RESET)
19	P32	SCL	Serial clock signal with X24C00
20	P33	SDA	Serial data signal with X24C00
21	P60	$\overline{\text{MUTE}}$	Analog mute signal output (LO at MUTE)
22	P61	—	Open
23	P62	—	Open
24	P63		MODEL selection CDX-490/590 = "L", CDX-890 = "H"
25	P40		MODEL selection CDX-590 = "L", CDX-490/890 = "H"
26	P41	OPSW	Open state of tray sensing switch input Open state at "L"
27	P42	CLSW	Closed state of tray sensing switch input Closed state at "L"
28	P43	FELTSW	Feed origin switch input Feed origin at "L"
29	PP0	LED	LED ON/OFF signal (AUTO DISPLAY OFF)
30	X1	X1	] Crystal oscillator Oscillation terminal (4.19MHz)
31	X2	X0	
32	VSS	VSS	GND
33	XT1	—	Open
34	XT2	—	Open
35	P50	K3	] Key matrix input
36	P51	K2	
37	P52	K1	
38	P53	K0	
39	$\overline{\text{RESET}}$	$\overline{\text{RESET}}$	Reset input
40	T0	T0/9G	] Fluorescent character display tube grid drive signal
41	T1	T1/8G	
42	T2	T2/7G	
43	T3	T3/6G	
44	T4	T4/5G	
45	T5	T5/4G	
46	T6	T6/3G	
47	T7	T7/2G	
48	T8	T8/1G	
49	T9	—	Open
50	T10	OPEN	Opening of tray at OP "H" and CL "L"
51	T11	CLOSE	Closing of tray at CL "H" and OP "L"
52	T12	VLUP	Volume motor drive signal (UP)
53	T13	VLDN	Volume motor drive signal (DOWN)
54	T14	S11	] Fluorescent character display tube anode drive signal
55	T15	S10	
56	V LOAD	-VP	-20V
57	V PRE	GND	GND
58	S9	S9	] Fluorescent character display tube anode drive signal
59	S8	S8	
60	S7	S7	
61	S6	S6	
62	S5	S5	
63	S4	S4	
64	VDD	+5	+5V

IC11 : MN662720RB

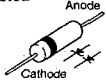
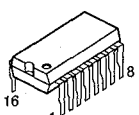
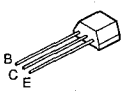
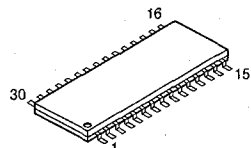
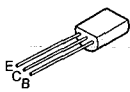
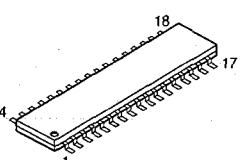
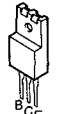
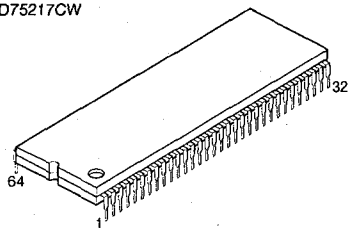
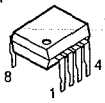
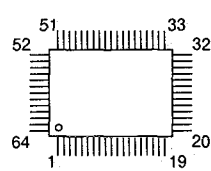
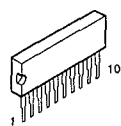
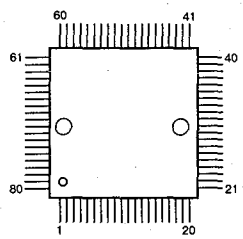
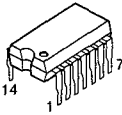
Signal Processor & Controller (SPC)



Pin No.	Pin Name	I/O	FUNCTION
1	BCLK	O	Bit clock output for SR DATA
2	LRCK	O	L/R identification signal output
3	SRDATA	O	Serial data output
4	DVDD1	I	Power supply for digital circuit
5	DVSS1	I	GND for digital circuit
6	TX	O	Digital, audio, interface output signal
7	MCLK	I	Microprocessor command clock signal input (data latched at leading edge)
8	MDATA	I	Microprocessor command data input
9	MLD	I	Microprocessor command load signal input L : LOAD
10	SENSE	O	Sense signal output
11	FLOCK	O	Focus servo drawing signal (L : when drawn)
12	TLOCK	O	Tracking servo drawing signal (L : when drawn)
13	BLKCK	O	Sub code block clock signal
14	SQCK	I	Clock input for sub-code Q register
15	SUBQ	O	Sub-code Q code output
16	DMUTE	I	Muting input H : MUTE
17	STAT	O	Status signal
18	RST	I	Reset input L : RESET
19	SMCK	O	8.4672MHz clock signal output when MSEL = H 4.2336MHz clock signal output when MSEL = L
20	PMCK	O	88.2KHz clock signal output
21	TRV	O	Traverse (Feed) forced feed output
22	TVD	O	Traverse (Feed) drive output
23	PC	O	Spindle motor ON signal L : ON
24	ECM	O	Spindle motor drive signal (forced mode output) 3-State
25	ECS	O	Spindle motor drive signal (servo error signal output)

Pin No.	Pin Name	I/O	FUNCTION
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive output
28	FOD	O	Focus drive output
29	VREF	I	Reference voltage for DA output block
30	FBAL	O	Focus balance adjustment output
31	TBAL	O	Tracking balance adjustment output
32	FE	I	Focus error signal input (analog input)
33	TE	I	Tracking error signal input (analog input)
34	RFENV	I	RF envelope signal input (analog input)
35	VDET	I	Oscillation detect signal input (H : DETECT)
36	OFT	I	Off track signal input (H : OFF TRACK)
37	TRCRS	I	Track cross signal input
38	RFDET	I	RF detect signal input (L : DETECT)
39	BDO	I	Drop out signal input (H : DROP OUT)
40	LDON	O	Laser ON signal output (H : ON)
41	TES	O	Tracking error shunt signal output (H : SHUNT)
42	PLAY	O	Play signal output (H : PLAY)
43	WVEL	O	Double speed status signal output
44	ARF	I	RF signal input
45	IREF	I	Reference current input terminal
46	DRF	I	Bias terminal for DSL
47	DSLIF	I/O	Loop filter terminal for DSL
48	PLLF	I/O	Loop filter terminal for PLL
49	VCOF	I/O	Loop filter terminal for VCO
50	AVDD2	I	Power supply for analog circuit (for DSL, PLL, OA output blocks)
51	AVSS2	I	GND for analog circuit (for DSL, PLL, DA output blocks)
52	EFM	O	EFM signal output
53	PCK	O	PLL extract clock output (f PCK = 4.321MHz)
54	PDO	O	EFM signal to PCK signal phase comparison signal output
55	SUBC	O	Sub-code serial output data output
56	SBCK	I	Clock input for sub-code serial output
57	VSS	I	GND for oscillation circuit
58	X1	I	Crystal oscillation circuit input terminal (f = 16.9344MHz)
59	X2	O	Crystal oscillation circuit output terminal (f = 16.9344MHz)
60	VDD	I	Power supply for oscillation circuit
61	BYTCK	O	Byte clock output
62	CLDCK	O	Sub-code frame clock signal output (f CLDCK = 7.35kHz)
63	FCLK	O	Crystal frame clock output (f FCLK = 7.35kHz)
64	IPFLAG	O	Interpolation flag output H : INTERPOLATION
65	FLAG	O	Flag output
66	CLVS	O	Spindle servo phase synchronous status signal outut H : CLV L : ROUGH SERVO
67	CRC	O	Sub-code CRC check result output H : OK , L : NG
68	DEMPH	O	Deemphasis detect signal output H : ON
69	RESY	O	Re-synchronous signal output of frame synchronization H : SYNCHRONOUS L : ASYNCHRONOUS
70	NC1	–	N. C.
71	TEST	I	Test terminal (Normal : H)
72	AVDD1	I	Power supply for digital circuit
73	NC2	–	N. C.
74	AVSS1	I	GND for digital circuit
75	NC3	–	N. C.
76	RSEL	I	RF signal polarity specifying terminal RSEL = H when Bright level is at "H" RSEL = L when Bright level is at "L"
77	CSEL	I	Crystal oscillation frequency specifying terminal (Normal : L)
78	PSEL	I	Test terminal (Normal : L)
79	MSEL	I	SMCK terminal Output frequency switch terminal H : SMCK = 8.4672MHz , L : SMCK = 4.2336MHz
80	SSEL	I	SUBQ terminal Output mode switch terminal H : Q code buffer use mode

PIN CONNECTION DIAGRAM／半導体外形図

1SS133 1T2 MTZJ4.7C MTZJ5.1B MTZJ5.6B 	M5290P 
2SA933S(Q,R) 	LA6536M 
2SB544(E,F,G) 2SC2878(A,B) 2SD400(E,F) 	AN8903SB 
2SB1565(E,F) 2SD2394(E,F) 	μPD75217CW 
BA15218 NJM2068D NJM5532D X24C00P 	YAC514 
LB1641 	MN662720RB 
HD74HC125P TC74HCU04AP 	

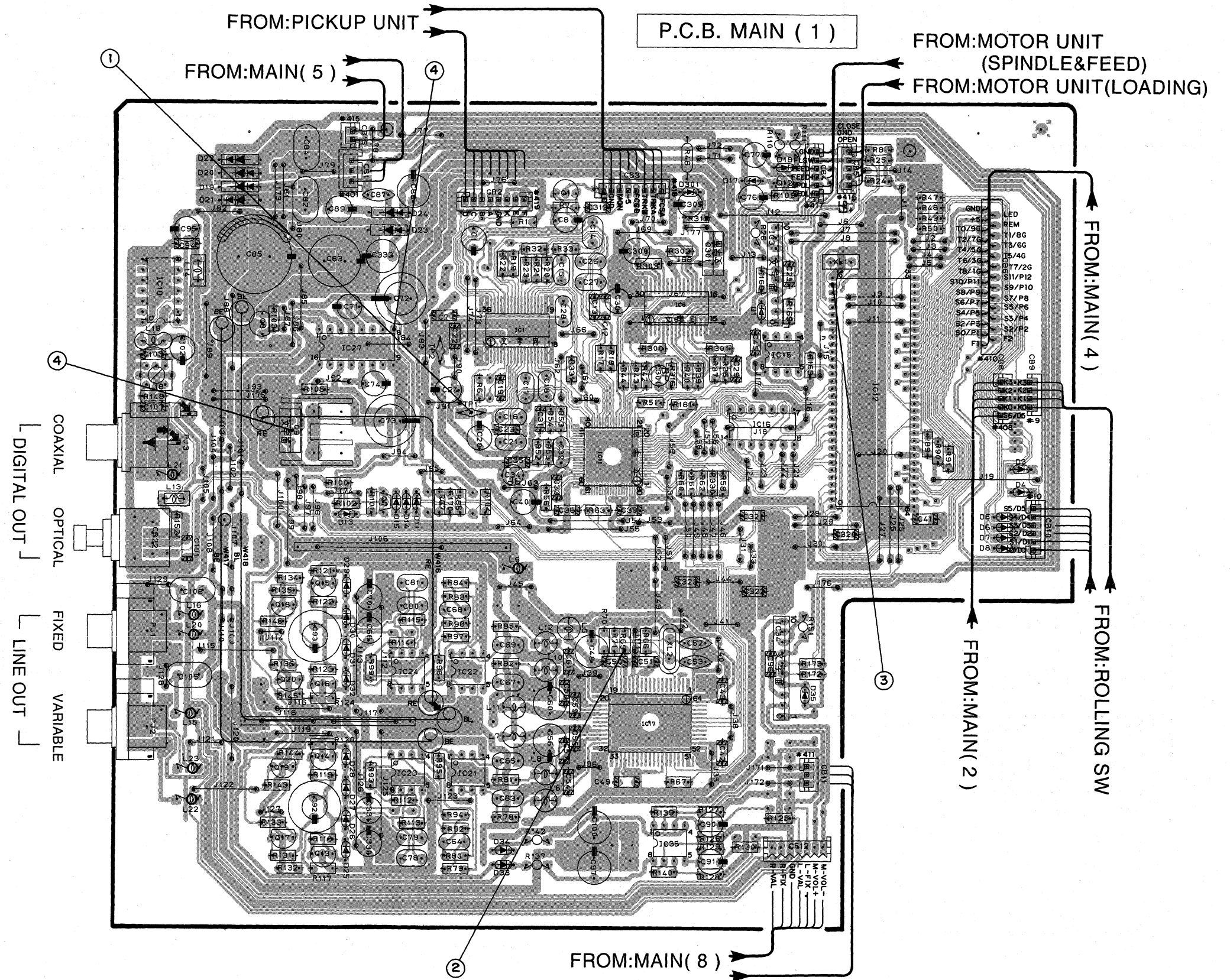
■ PRINTED CIRCUIT BOARD (Foil side) / シート図 (パターン側)

①～④ : TEST POINT WAVEFORMS (See page 26)／波形ポイント(24ページ参照)

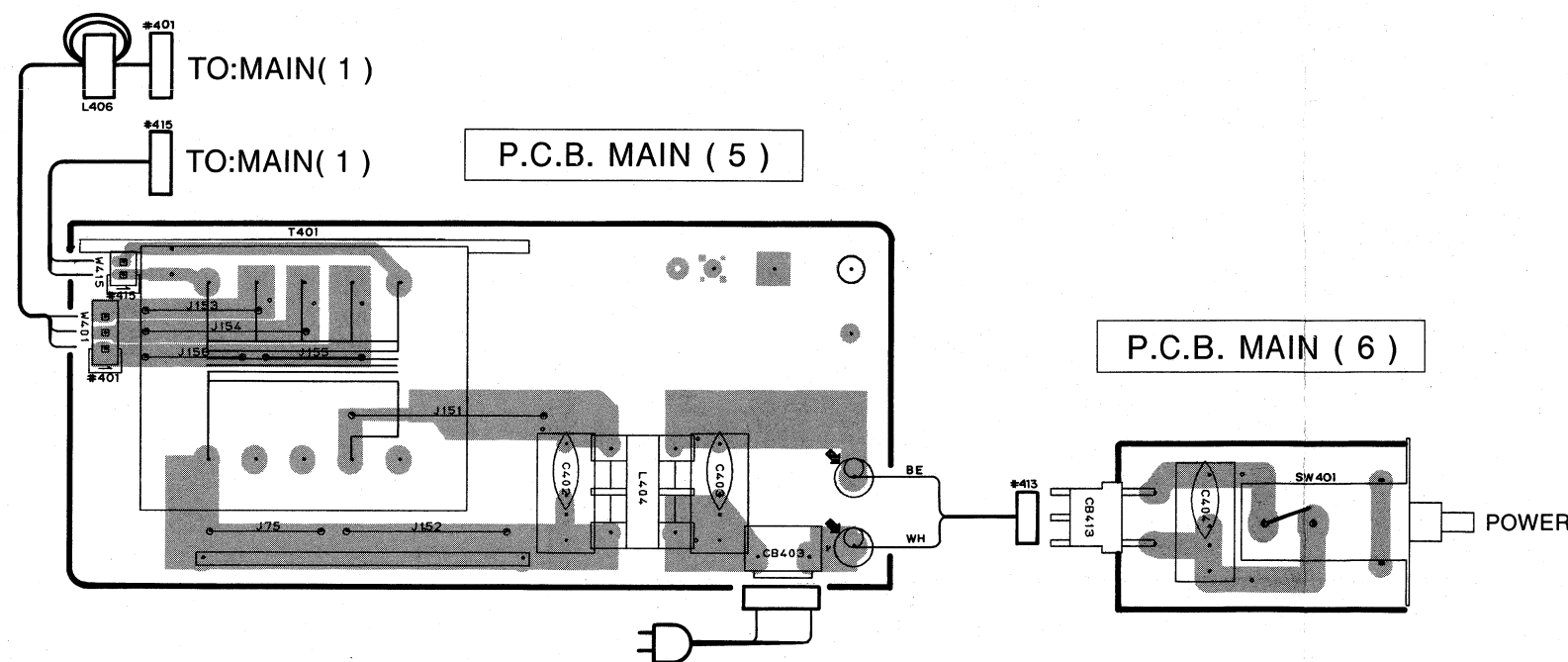
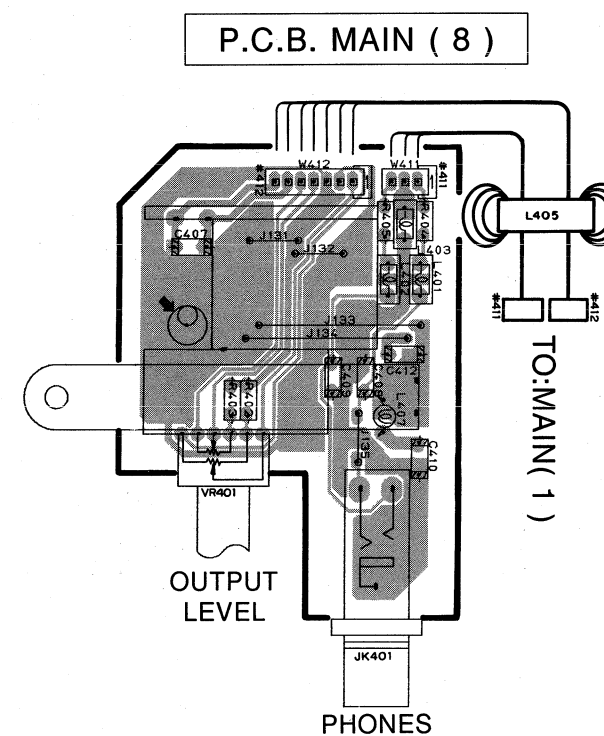
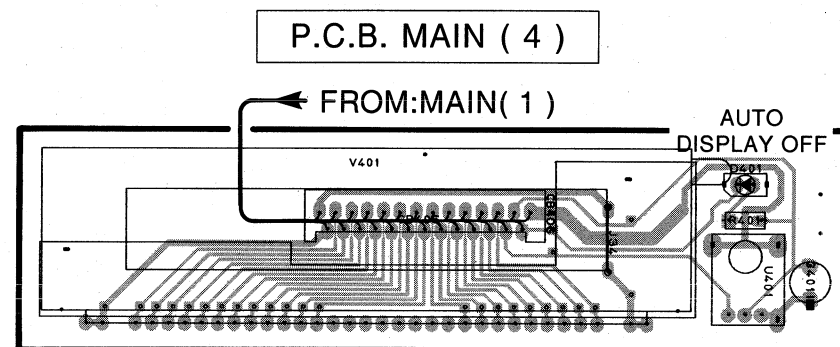
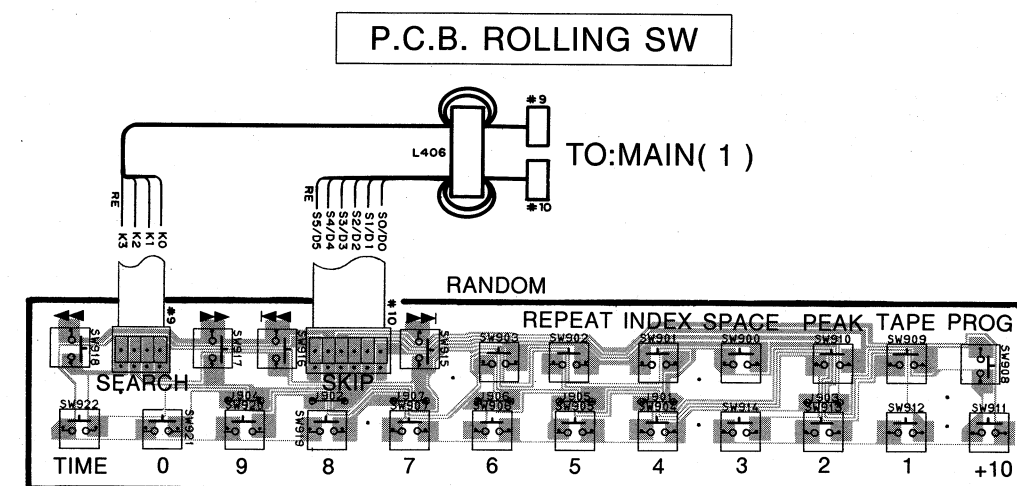
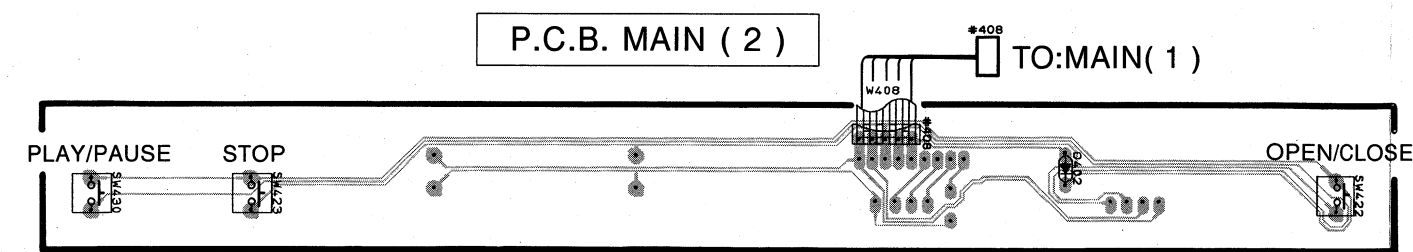
● Semiconductor Location

Ref. No.	Location
IC 1	E3
IC 3	F2
IC 6	E3
IC 11	E3
IC 12	F3
IC 15	F3
IC 16	F3
IC 17	E5
IC 18	C3
IC 21	E5
IC 22	E4
IC 23	D5
IC 24	D4
IC 27	D3
IC 34	F4
IC 35	E5

Ref. No.	Location
Q 1	E2
Q 7	D4
Q 8	D3
Q 9	D3
Q 12	F2
Q 13	D5
Q 14	D5
Q 15	D4
Q 16	D4
Q 17	D5
Q 18	D4
Q 19	D5
Q 20	D4
Q301	F2



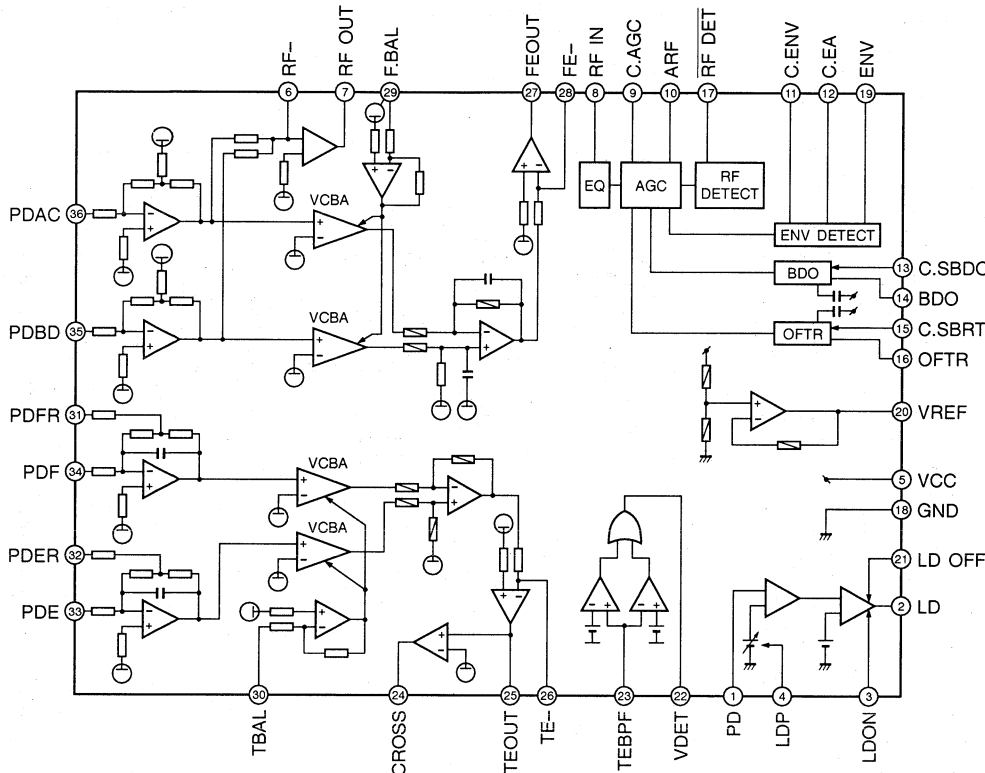
■ PRINTED CIRCUIT BOARD (Foil sdie)／シート図 (パターン側)



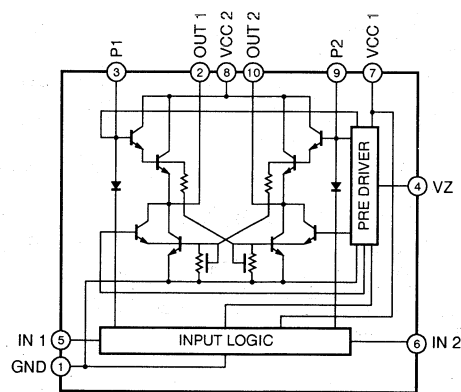


IC BLOCKSIC／ブロック

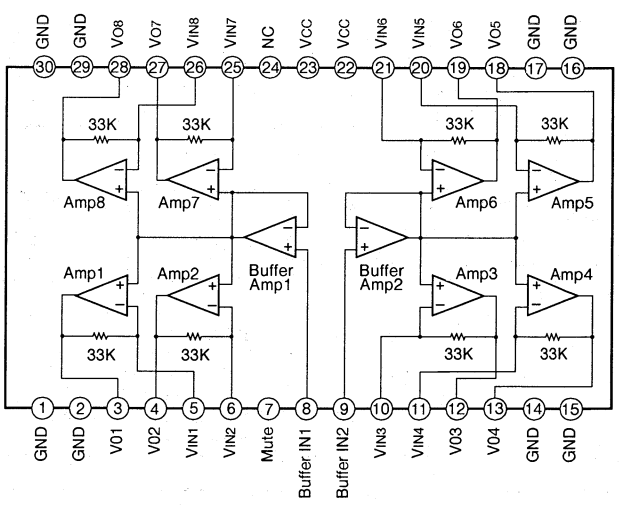
IC1 : AN8803SB
Digital Servo Head Amp



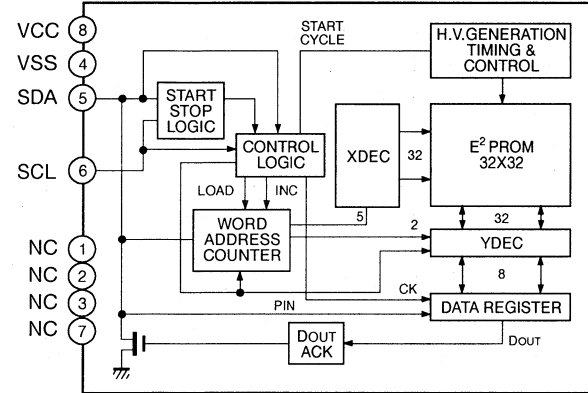
IC3 : LB1641
Motor Driver



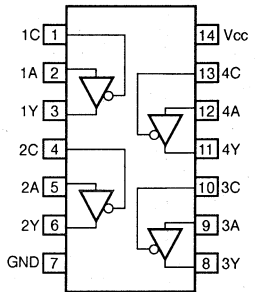
IC6 : LA6536M
4-Channel BTL Driver



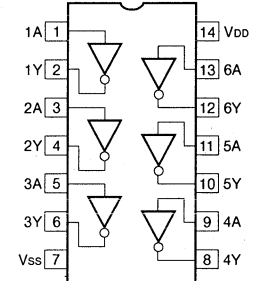
IC15 : X24C00P
Electrically Erasable PROM



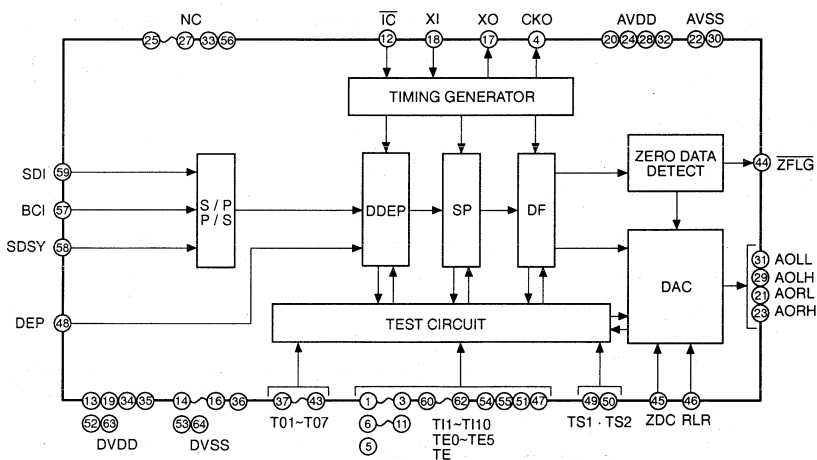
IC16 : HD74HC125AP
Quad 3 State Bus Buffers



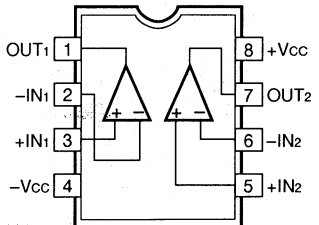
IC18 : TC74HCU04AP
Hex Inverter



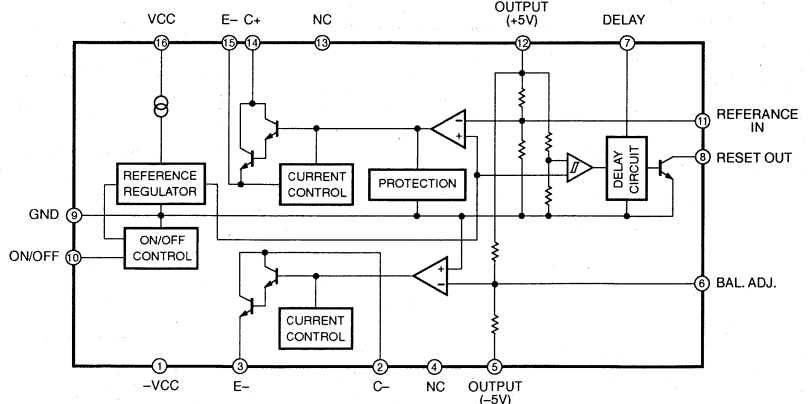
IC17 : YAC514
D/A Converter



IC21, 22 : NJM2068D-D
IC23, 24 : NJM5532D-D
IC35 : BA15218
Dual OP-Amp

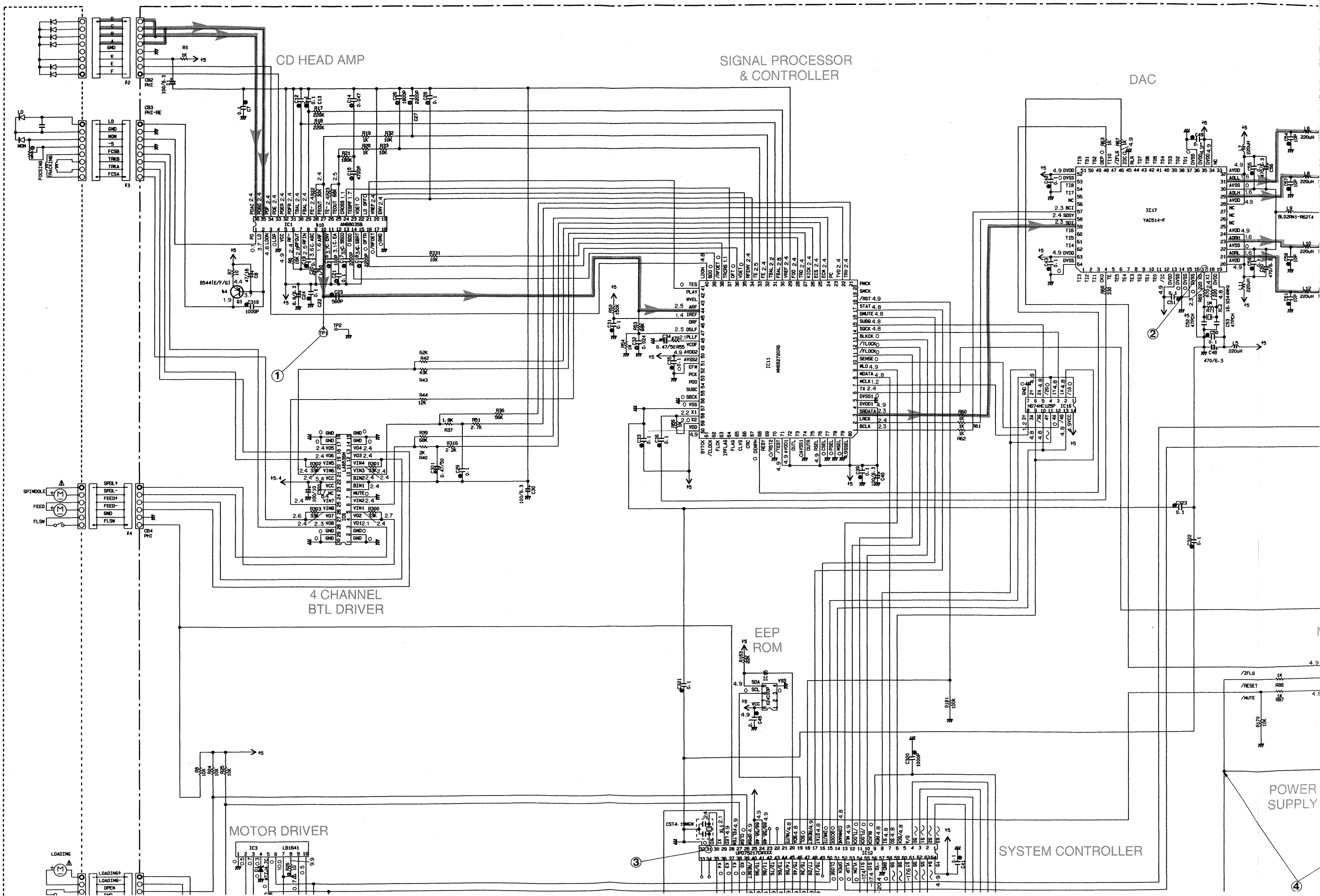


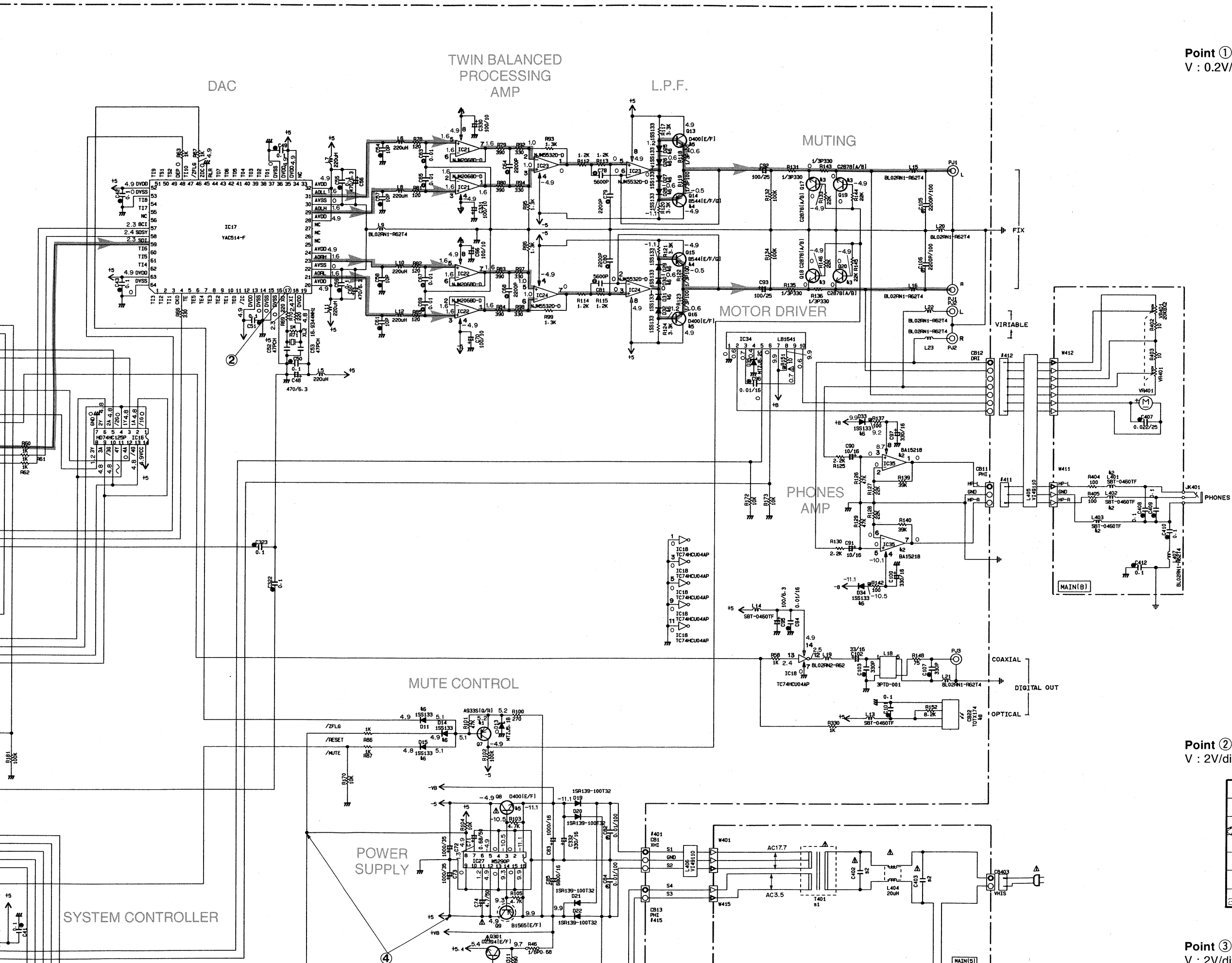
IC27 : M5290P
Constant-Voltage Tracking Supply with Reset



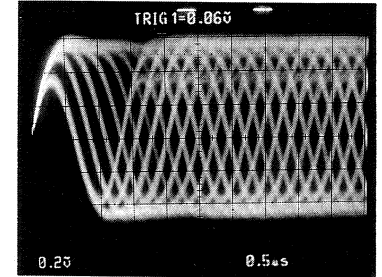
SCHEMATIC DIAGRAM/総回路図

※The voltage are measured by TEST mode at PLAY/各電圧は、ノーマルプレイ時の電圧です。

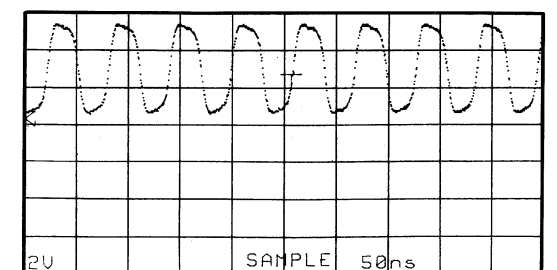




Point ① TP1 (EFM)
V : 0.2V/div H : 0.5μsec/div AC range 1 : 1 probe



Point ② (Pin 17 of IC17)
V : 2V/div H : 50nsec/div DC range 1 : 1 probe



Point ③ (Pin 31 of IC12)
V : 2V/div H : 0.1μsec/div DC range 1 : 1 probe

5

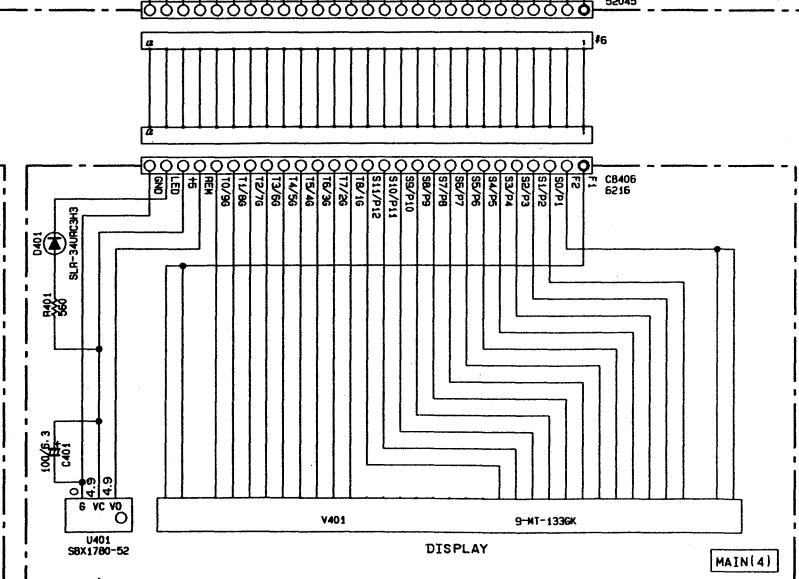
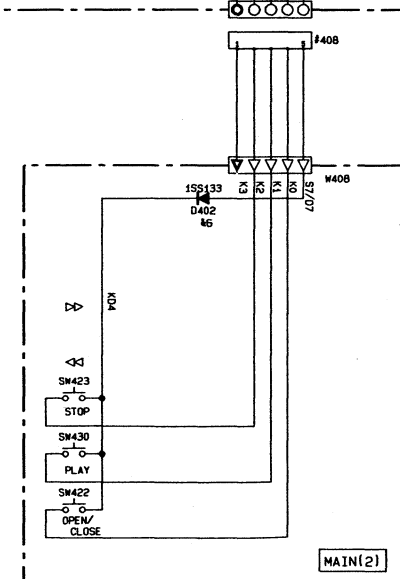
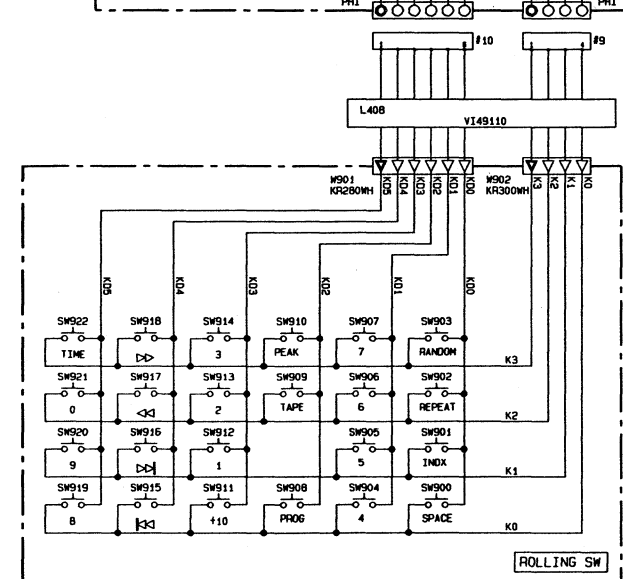
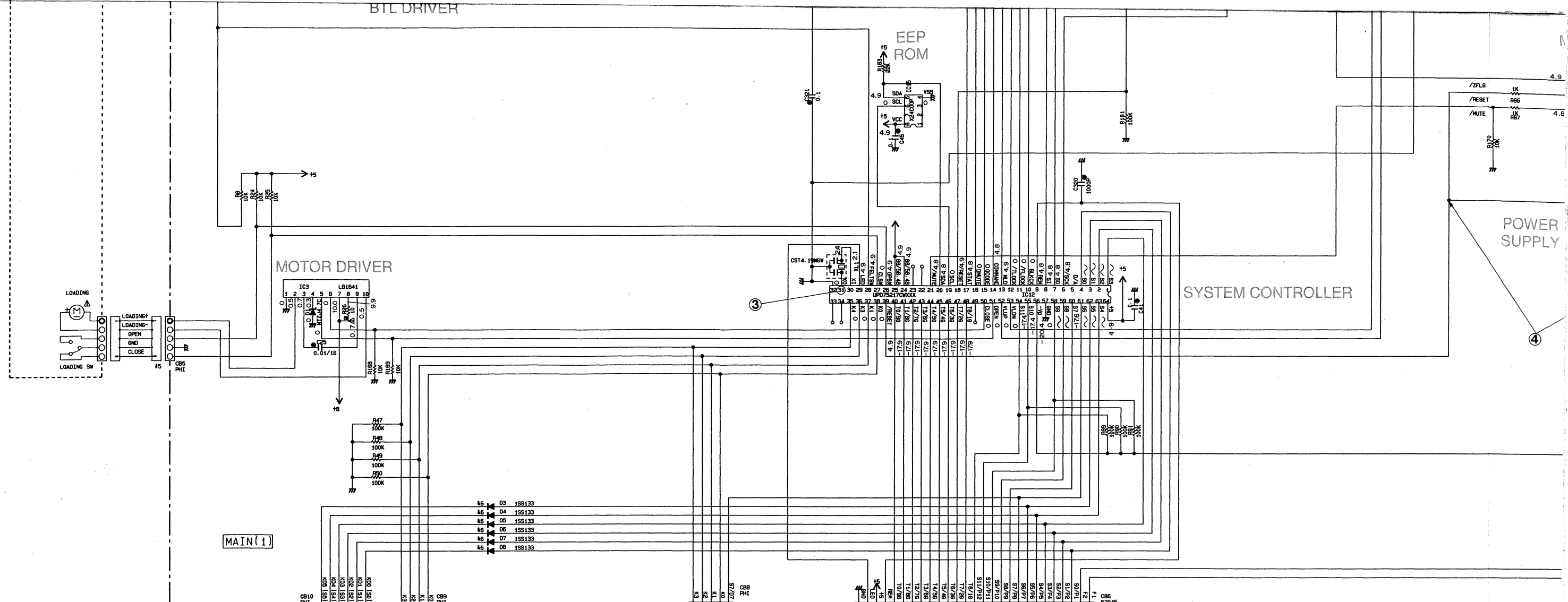
6

7

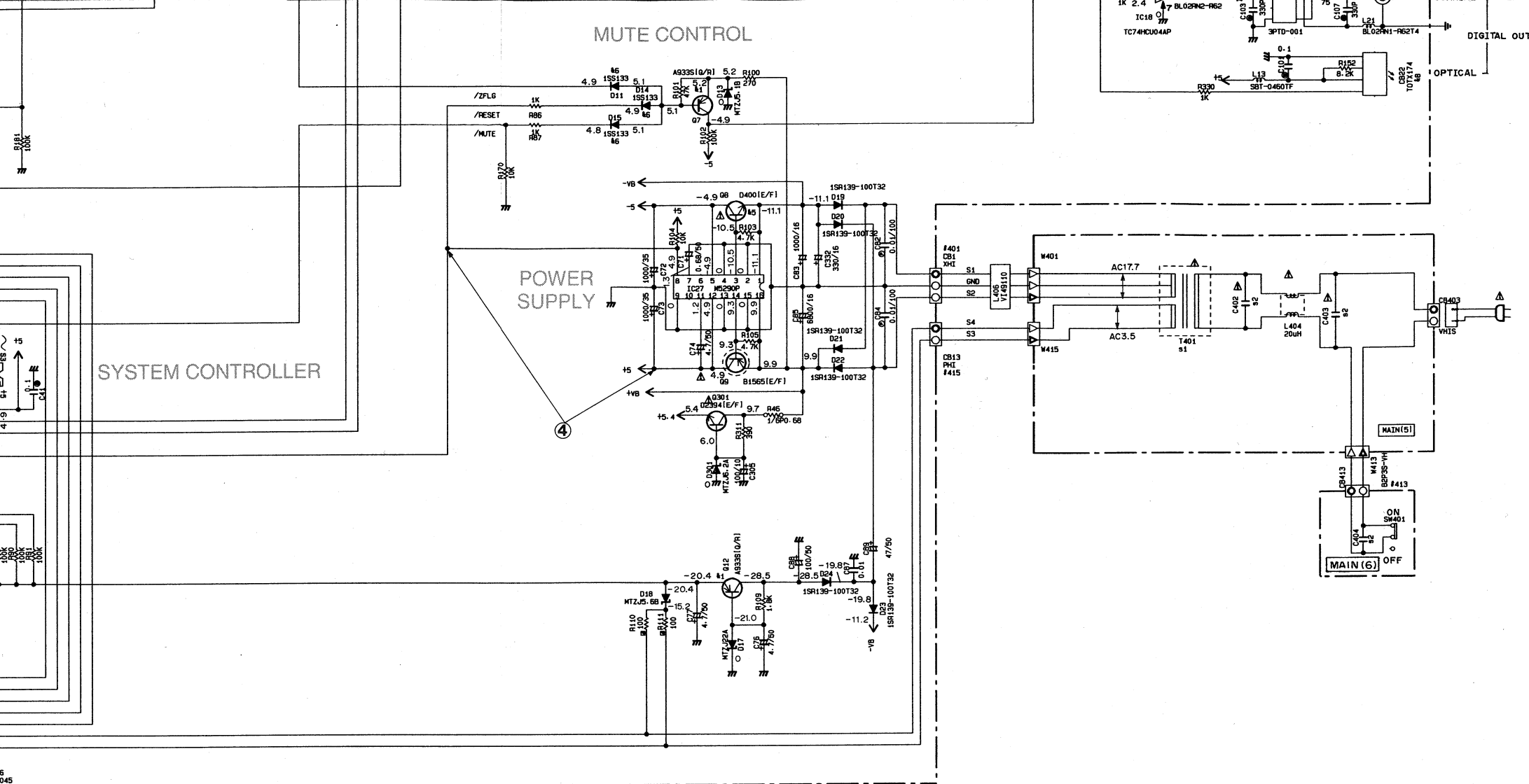
8

9

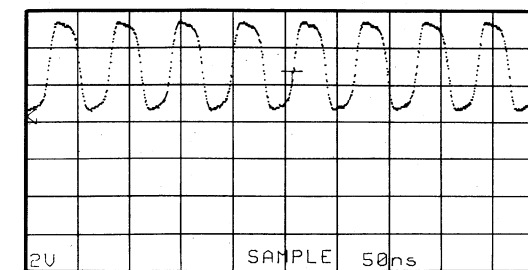
10



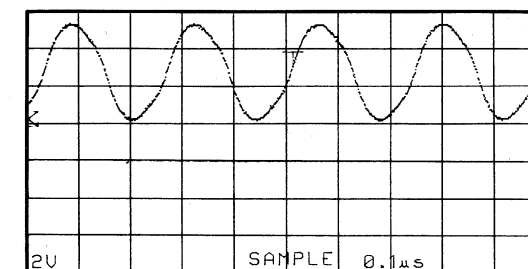
Interchangeable Parts at Manufacture-Stage		
Mark	Reference Parts Number	Parts Name
41	07-12	2SA933S(Q/R) 2SA1115(E/F) 2SA1309A(Q/R/S)
42	IC35	8A15218 M0218AP
43	017-20	2SC2678(A/B) 2SD1919F(S/T)
44	01-14-15	2SB944(E/F/G) 2SA934(P/Q/R)
45	08-13-16	2SD4001(E/F) 2SC2060(P/Q/R)
46	03-B-11-14-15 25-34-402	1SS133 HSS104TD
47		
48	CB22	10TX174 10TX176
49		
410	IC1	AN8803GB AN8805GB



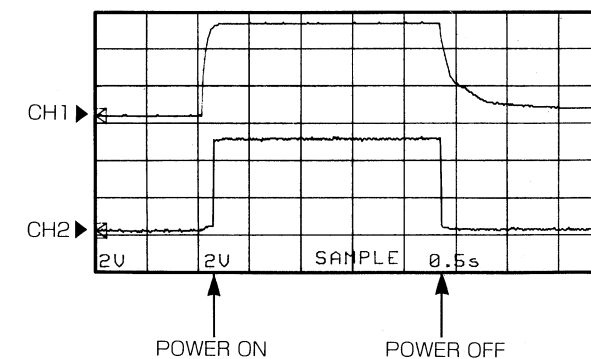
Point ② (Pin 17 of IC17)
V : 2V/div H : 50nsec/div DC range 1 : 1 probe



Point ③ (Pin 31 of IC12)
V : 2V/div H : 0.1μsec/div DC range 1 : 1 probe



Point ④
(CH1 : Collector of Q9) V : 5V/div CH1
(CH2 : Pin8 of IC27) V : 2V/div CH2
H : 0.5sec/div DC range 1 : 1 probe



Interchangeable Parts at Manufacture-Stage

Mark	Reference Parts Number	Parts Name
k1	07-12	2SA933S(Q/R) 2SA1115(E/F) 2SA1309A(Q/R/S)
k2	IC35	BA15218 MS218AP
k3	017-20	2SC2878(A/B) 2SD1915F(S/T)
k4	01-14-15	2SB544(E/F/G) 2SA934(P/Q/R)
k5	08-13-16	2SD4001(E/F) 2SC2060(P/Q/R)
k6	03-B-11-14-15 25-34-402	1SS133 HSS104TD
k7		
k8	C822	TOT1174 TOT1176
k9		
k10	IC1	AN890358 AN890658

NOTICE (model)

(J)..... JAPANESE
(U)..... U. S. A
(C)..... CANADIAN
(R)..... GENERAL
(A)..... AUSTRALIAN
(B)..... BRITISH
(G)..... EUROPEAN
(L)..... SINGAPORE

NO	J	B-G
1	T401	XR299 XR300
2	C402-404	F132410 VS74170
3		
4		

REMARKS	PARTS NAME
NO MARK	ELECTROLYTIC CAPACITOR
⊗	TANTALUM CAPACITOR
NO MARK	CERAMIC CAPACITOR
⊙	CERAMIC TUBULAR CAPACITOR
⊖	POLYESTER FILM CAPACITOR
○	POLYSTYRENE FILM CAPACITOR
①	MICA CAPACITOR
⊕	POLYPROPYLENE FILM CAPACITOR
●	SEMICONDUCTIVE CERAMIC CAPACITOR

REMARKS	PARTS NAME
NO MARK	CARBON FILM RESISTOR (P=5)
⊠	CARBON FILM RESISTOR (P=10)
△	METAL OXIDE FILM RESISTOR
▲	METAL FILM RESISTOR
⊞	METAL PLATE RESISTOR
⬢	FIRE PROOF CARBON FILM RESISTOR
□	CEMENT MOLDED RESISTOR
⊗	SEMI VARIABLE RESISTOR
■	CHIP RESISTOR

- * All voltage are measured with a 10MΩ/V DC electric volt meter.
- * Components having special characteristics are marked △ and must be replaced with parts having specifications equal to those originally installed.
- * Schematic diagram is subject to change without notice.

- 電圧は、内部抵抗10MΩの電圧計で測定したものです。
- △印のある部品は、安全性確保部品を示しています。部品の交換が必要な場合、パーツリストに記載されている部品を使用してください。
- 本回路図は標準回路図です。改良のため予告なく変更することがございます。

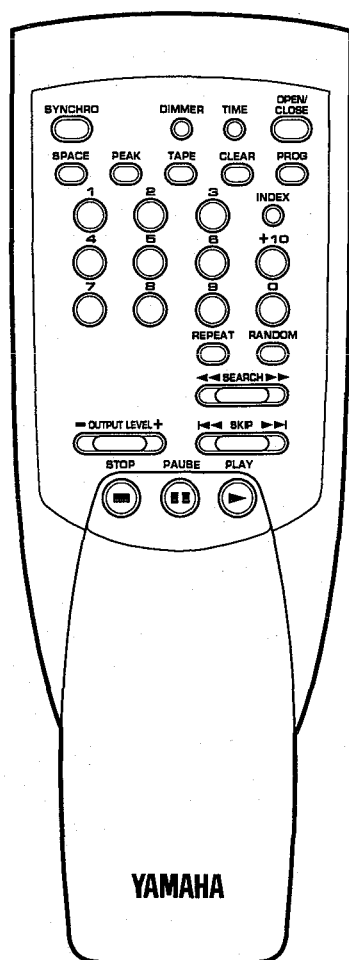
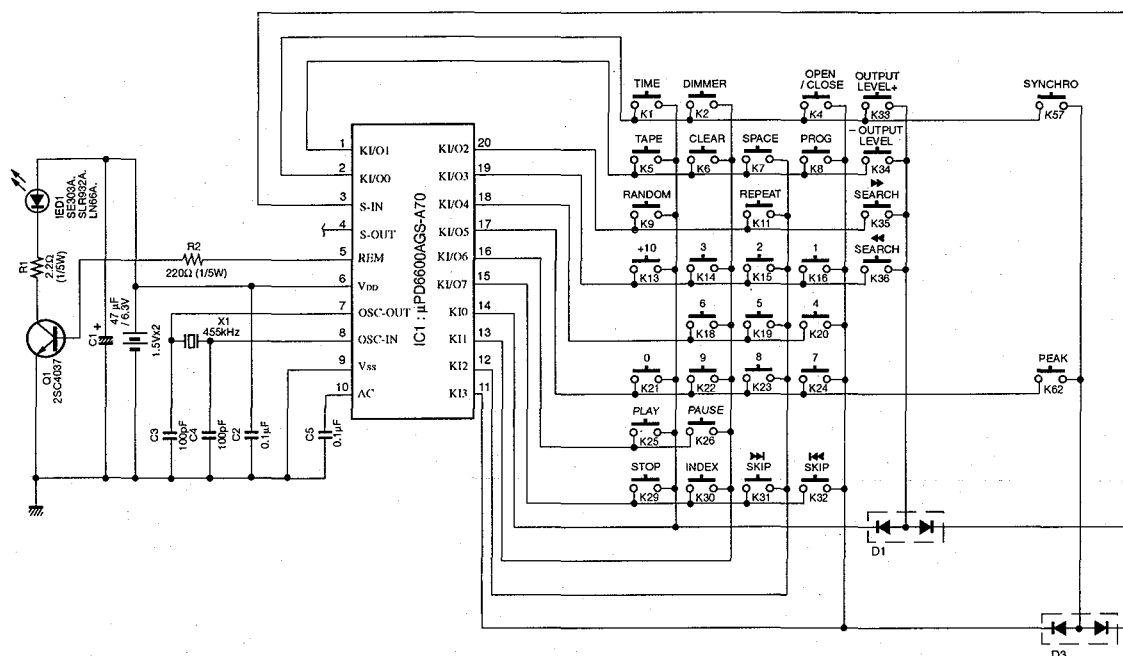
1

REMOTE CONTROL TRANSMITTER

■ SCHEMATIC DIAGRAM

2

3



KEY No.	FUNCTION	CUSTOM CODE (HEX)	REVERSE CUSTOM CODE (HEX)	DATA CODE (HEX)	REMARKS D0 D7
K1	TIME	79	86	0A	01010000
K2	DIMMER	79	86	1E	01111000
K4	OPEN/CLOSE	79	86	01	10000000
K5	TAPE	79	86	57	11101010
K6	CLEAR	79	86	0D	10110000
K7	SPACE	79	86	0F	11110000
K8	PROG	79	86	0C	00110000
K9	RANDOM	79	86	1B	11011000
K11	REPEAT	79	86	08	00010000
K13	+10	79	86	1A	01011000
K14	3	79	86	13	11001000
K15	2	79	86	12	01001000
K16	1	79	86	11	10001000
K18	6	79	86	16	01101000
K19	5	79	86	15	10101000
K20	4	79	86	14	00101000
K21	0	79	86	10	00001000
K22	9	79	86	19	10011000
K23	8	79	86	18	00011000
K24	7	79	86	17	11101000
K25	PLAY	79	86	02	01000000
K26	PAUSE	79	86	55	10101010
K29	STOP	79	86	56	01101010
K30	INDEX	79	86	0B	11010000
K31	SKIP	79	86	07	11100000
K32	SKIP	79	86	04	00100000
K33	OUTPUT LEVEL +	79	86	1D	10111000
K34	- OUTPUT LEVEL	79	86	1C	00111000
K35	SEARCH	79	86	06	01100000
K36	SEARCH	79	86	05	10100000
K57	SYNCHRO	79	86	58	00011010
K62	PEAK	79	86	5D	10111010

PARTS LIST

■ ELECTRICAL PARTS

■ WARNING

Components having special characteristics are marked Δ and must be replaced with parts having specifications equal to those originally installed.

- Carbon resistors (1/6W or 1/4W) are not included in the ELECTRICAL PARTS List. For the parts No. of the carbon resistors, refer to last page.

ABBREVIATIONS IN THIS LIST ARE AS FOLLOWS :

C.A.EL.CHP	: CHIP ALUMI. ELECTROLYTIC CAP	L.EMIT	: LIGHT EMITTING MODULE
C.CE	: CERAMIC CAP	LED.DSPLY	: LED DISPLAY
C.CE.ARRAY	: CERAMIC CAP ARRAY	LED.INFRD	: LED, INFRARED
C.CE.CHP	: CHIP CERAMIC CAP	MODUL.RF	: MODULATOR, RF
C.CE.ML	: MULTILAYER CERAMIC CAP	PHOT.CPL	: PHOTO COUPLER
C.CE.M.CHP	: CHIP MULTILAYER CERAMIC CAP	PHOT.INTR	: PHOTO INTERRUPTER
C.CE.SAFTY	: RECOGNIZED CERAMIC CAP	PHOT.RFLCT	: PHOTO REFLECTOR
C.CE.TUBLR	: CERAMIC TUBULAR CAP	PIN.TEST	: PIN, TEST POINT
C.CE.SMI	: SEMI CONDUCTIVE CERAMIC CAP	PLST.RIVET	: PLASTIC RIVET
C.EL	: ELECTROLYTIC CAP	R.ARRAY	: RESISTOR ARRAY
C.MICA	: MICA CAP	R.CAR	: CARBON RESISTOR
C.ML.FLM	: MULTILAYER FILM CAP	R.CAR.CHP	: CHIP RESISTOR
C.MP	: METALLIZED PAPER CAP	R.CAR.FP	: FLAME PROOF CARBON RESISTOR
C.MYLAR	: MYLAR FILM CAP	R.FUS	: FUSABLE RESISTOR
C.MYLAR.ML	: MULTILAYER MYLAR FILM CAP	R.MTL.CHP	: CHIP METAL FILM RESISTOR
C.PAPER	: PAPER CAPACITOR	R.MTL.FLM	: METAL FILM RESISTOR
C.PLS	: POLYSTYRENE FILM CAP	R.MTL.OXD	: METAL OXIDE FILM RESISTOR
C.POL	: POLYESTER FILM CAP	R.MTL.PLAT	: METAL PLATE RESISTOR
C.POLY	: POLYETHYLENE FILM CAP	RSNR.CE	: CERAMIC RESONATOR
C.PP	: POLYPROPYLENE FILM CAP	RSNR.CRYS	: CRYSTAL RESONATOR
C.TNTL	: TANTALUM CAP	R.TW.CEM	: TWIN CEMENT FIXED RESISTOR
C.TNTL.CHP	: CHIP TANTALUM CAP	R.WW	: WIRE WOUND RESISTOR
C.TRIM	: TRIMMER CAP	SCR.BND.HD	: BIND HEAD B-TITE SCREW
CN	: CONNECTOR	SCR.BW.HD	: BW HEAD TAPPING SCREW
CN.BS.PIN	: CONNECTOR, BASE PIN	SCR.CUP	: CUP TITE SCREW
CN.CANNON	: CONNECTOR, CANNON	SCR.TERM	: SCREW TERMINAL
CN.DIN	: CONNECTOR, DIN	SCR.TR	: SCREW, TRANSISTOR
CN.FLAT	: CONNECTOR, FLAT CABLE	SUPRT.PCB	: SUPORT, P.C.B.
CN.POST	: CONNECTOR, BASE POST	SURG.PRTCT	: SURGE PROTECTOR
COIL.MX.AM	: COIL, AM MIX	SW.TACT	: TACT SWITCH
COIL.AT.FM	: COIL, FM ANTENNA	SW.LEAF	: LEAF SWITCH
COIL.DT.FM	: COIL, FM DETECT	SW.LEVER	: LEVER SWITCH
COIL.MX.FM	: COIL, FM MIX	SW.MICRO	: MICRO SWITCH
COIL.OUTPT	: OUTPUT COIL	SW.PUSH	: PUSH SWITCH
DIOD.ARRAY	: DIODE ARRAY	SW.RT.ENC	: ROTARY ENCODER
DIODE.BRG	: DIODE BRIDGE	SW.RT.MTR	: ROTARY SWITCH WITH MOTOR
DIODE.CHP	: CHIP DIODE	SW.RT	: ROTARY SWITCH
DIODE.VAR	: VARACTOR DIODE	SW.SLIDE	: SLIDE SWITCH
DIOD.Z.CHP	: CHIP ZENER DIODE	TERM.SP	: SPEAKER TERMINAL
DIODE.ZENR	: ZENER DIODE	TERM.WRAP	: WRAPPING TERMINAL
DSCR.CE	: CERAMIC DISCRIMINATOR	THRMST.CHP	: CHIP THERMISTOR
FER.BEAD	: FERRITE BEADS	TR.CHP	: CHIP TRANSISTOR
FER.CORE	: FERRITE CORE	TR.DGT	: DIGITAL TRANSISTOR
FET.CHP	: CHIP FET	TR.DGT.CHP	: CHIP DIGITAL TRANSISTOR
FL.DSPLY	: FLUORESCENT DISPLAY	TRANS	: TRANSFORMER
FLTR.CE	: CERAMIC FILTER	TRANS.PULS	: PULSE TRANSFORMER
FLTR.COMB	: COMB FILTER MODULE	TRANS.PWR	: POWER TRANSFORMER ASS'y
FLTR.LC.RF	: LC FILTER, EMI	TUNER.AM	: TUNER PACK, AM
GND.MTL	: GROUND PLATE	TUNER.FM	: TUNER PACK, FM
GND.TERM	: GROUND TERMINAL	TUNER.PK	: FRONT-END TUNER PACK
HOLDER.FUS	: FUSE HOLDER	VR	: ROTARY POTENTIOMETER
IC.PRTCT	: IC PROTECTOR	VR.MTR	: POTENTIOMETER WITH MOTOR
JUMPER.CN	: JUMPER CONNECTOR	VR.SW	: POTENTIOMETER WITH ROTARY SW
JUMPER.TST	: JUMPER, TEST POINT	VR.SLIDE	: SLIDE POTENTIOMETER
L.DTCT	: LIGHT DETECTING MODULE	VR.TRIM	: TRIMMER POTENTIOMETER

Note) Those parts marked with “#” are not included in the P.C.B. ass'y.

Schm Ref.	PART NO.	Description
*	VT976600	P.C.B.
		MAIN(BG)
CB1	VL844700	CN. BS. PIN 3P
CB2	VD005100	CN. BS. PIN 8P
CB3	VK506300	CN. BS. PIN 8P
CB4	VD004900	CN. BS. PIN 6P
CB5	VD004800	CN. BS. PIN 5P
CB6	VQ047800	CN. BS. PIN 27P
CB8	VD004800	CN. BS. PIN 5P
CB9	VD004700	CN. BS. PIN 4P
CB10	VD004900	CN. BS. PIN 6P
CB11	VD004600	CN. BS. PIN 3P
CB12	VK184500	CN. BS. PIN 7P
CB13	Vi374600	CN. BS. PIN 2P
CB22	VG067200	L. EMIT TOTX174
CB403	VG879900	CN. BS. PIN 2P
CB406	VR062400	CN. BS. PIN 27P
CB413	VP245600	CN 2P
C1	VF760000	C. EL 100uF 10V
C7	VH053100	C. CE. TUBLR 0.1uF 50V
C8	VJ837200	C. EL 47uF 16V
C12	VH053100	C. CE. TUBLR 0.1uF 50V
C13	VH053100	C. CE. TUBLR 0.1uF 50V
C14	UA654470	C. MYLAR 0.047uF 50V
C15	UA653470	C. MYLAR 4700pF 50V
C16	UA652100	C. MYLAR 100pF 50V
C17	UA653220	C. MYLAR 2200pF 50V
C18	UA653220	C. MYLAR 2200pF 50V
C19	VH053100	C. CE. TUBLR 0.1uF 50V
C20	VJ839100	C. EL 1uF 50V
C21	UA655100	C. MYLAR 0.1uF 50V
C22	VH053100	C. CE. TUBLR 0.1uF 50V
C23	VG278800	C. CE. TUBLR 560pF 50V
C24	VR498100	C. EL 6.8uF 6.3V
C25	VF467300	C. CE. TUBLR 0.01uF 16V
C26	UA653180	C. MYLAR 1800pF 50V
C27	UA653220	C. MYLAR 2200pF 50V
C28	UA655100	C. MYLAR 0.1uF 50V
C29	VH053100	C. CE. TUBLR 0.1uF 50V
C30	VF760000	C. EL 100uF 10V
C31	VH053100	C. CE. TUBLR 0.1uF 50V
C32	UA654240	C. MYLAR 0.024uF 50V
C33	VH053100	C. CE. TUBLR 0.1uF 50V
C34	UK665470	C. EL 0.47uF 50V
C35	VH053100	C. CE. TUBLR 0.1uF 50V
C36	VH053100	C. CE. TUBLR 0.1uF 50V
C39	VH053100	C. CE. TUBLR 0.1uF 50V
C40	VF760000	C. EL 100uF 10V
C41	VH053100	C. CE. TUBLR 0.1uF 50V
C42	VH053100	C. CE. TUBLR 0.1uF 50V
C43	VH053100	C. CE. TUBLR 0.1uF 50V
C45	VH053100	C. CE. TUBLR 0.1uF 50V
C48	VG287100	C. EL 470uF 10V
C49	VH053100	C. CE. TUBLR 0.1uF 50V

* New Parts

Schm Ref.	PART NO.	Description
C50	VH053100	C. CE. TUBLR 0.1uF 50V
C51	VH053100	C. CE. TUBLR 0.1uF 50V
C52	VA761400	C. CE 47pF 50V
C53	VA761400	C. CE 47pF 50V
C54	VF466600	C. CE. TUBLR 10pF 50V
C55	VH053100	C. CE. TUBLR 0.1uF 50V
C56	VG287100	C. EL 470uF 10V
C57	VF466600	C. CE. TUBLR 10pF 50V
C58	VF466600	C. CE. TUBLR 10pF 50V
C59	VH053100	C. CE. TUBLR 0.1uF 50V
C60	VG287100	C. EL 470uF 10V
C61	VF466600	C. CE. TUBLR 10pF 50V
C63	UA654100	C. MYLAR 0.01uF 50V
C64	VU347900	C. MYLAR 2200pF 50V
C65	UA654100	C. MYLAR 0.01uF 50V
C66	VP809500	C. EL 100uF 10V
C67	UA654100	C. MYLAR 0.01uF 50V
C68	VU347900	C. MYLAR 2200pF 50V
C69	UA654100	C. MYLAR 0.01uF 50V
C70	VP809500	C. EL 100uF 10V
C71	UJ865680	C. EL 0.68uF 50V
C72	Vi709700	C. EL 1000uF 50V
C73	Vi709700	C. EL 1000uF 50V
C74	UM416470	C. EL 4.7uF 50V
C76	UM416470	C. EL 4.7uF 50V
C77	UM416470	C. EL 4.7uF 50V
C78	Vi716400	C. MYLAR 5600pF 50V
C79	Vi715900	C. MYLAR 2200pF 50V
C80	Vi715900	C. MYLAR 2200pF 50V
C81	Vi716400	C. MYLAR 5600pF 50V
C82	VK534100	C. PP 0.01uF 100V
C83	VN137400	C. EL 1000uF 16V
C84	VK534100	C. PP 0.01uF 100V
C85	VR420400	C. EL 6800uF 16V
C87	UG444100	C. CE 0.01uF 50V
C88	UJ668100	C. EL 100uF 50V
C89	UJ667470	C. EL 47uF 50V
C90	VJ836900	C. EL 10uF 16V
C91	VJ836900	C. EL 10uF 16V
C92	VQ569900	C. EL 100uF 25V
C93	VQ569900	C. EL 100uF 25V
C94	VF467300	C. CE. TUBLR 0.01uF 16V
C95	VF760000	C. EL 100uF 10V
C96	VF467300	C. CE. TUBLR 0.01uF 16V
C97	UJ638330	C. EL 330uF 16V
C100	UJ638330	C. EL 330uF 16V
C101	VH053100	C. CE. TUBLR 0.1uF 50V
C102	UM397330	C. EL 33uF 16V
C103	VG278600	C. CE. TUBLR 330pF 50V
C105	VL883800	C. PP 2200pF 100V
C106	VL883800	C. PP 2200pF 100V
C107	VG278600	C. CE. TUBLR 330pF 50V
C300	VF760000	C. EL 100uF 10V

* New Parts

Schm Ref.	PART NO.	Description
C301	UK665470	C. EL 0.47uF 50V
C305	VF760000	C. EL 100uF 10V
C319	VF467000	C. CE. TUBLR 1000pF 50V
C320	VF467000	C. CE. TUBLR 1000pF 50V
C321	VH053100	C. CE. TUBLR 0.1uF 50V
C322	VH053100	C. CE. TUBLR 0.1uF 50V
C323	VH053100	C. CE. TUBLR 0.1uF 50V
C330	VP809500	C. EL 100uF 10V
C331	VP809500	C. EL 100uF 10V
C332	VG287800	C. EL 330uF 16V
C401	VF760000	C. EL 100uF 10V
C402	VS741700	C. CE. SAFTY 0.01uF 275V
C403	VS741700	C. CE. SAFTY 0.01uF 275V
C404	VS741700	C. CE. SAFTY 0.01uF 275V
C407	VG280100	C. CE. TUBLR 0.022uF 25V
C408	VH053100	C. CE. TUBLR 0.1uF 50V
C409	VH053100	C. CE. TUBLR 0.1uF 50V
C410	VH053100	C. CE. TUBLR 0.1uF 50V
C412	VH053100	C. CE. TUBLR 0.1uF 50V
D1	VG437200	DIODE. ZENR MIZJ4.7C 4.7V
D3	iF004600	DIODE 1SS133
D4	iF004600	DIODE 1SS133
D5	iF004600	DIODE 1SS133
D6	iF004600	DIODE 1SS133
D7	iF004600	DIODE 1SS133
D8	iF004600	DIODE 1SS133
D11	iF004600	DIODE 1SS133
D13	VG437400	DIODE. ZENR MIZJ5.1B 5.1V
D14	iF004600	DIODE 1SS133
D15	iF004600	DIODE 1SS133
D17	VG442000	DIODE. ZENR MIZJ22A 22V
D18	VG437700	DIODE. ZENR MIZJ5.6B 5.6V
D19	VH770800	DIODE 1SR139-100
D20	VH770800	DIODE 1SR139-100
D21	VH770800	DIODE 1SR139-100
D22	VH770800	DIODE 1SR139-100
D23	VH770800	DIODE 1SR139-100
D24	VH770800	DIODE 1SR139-100
D25	iF004600	DIODE 1SS133
D26	iF004600	DIODE 1SS133
D27	iF004600	DIODE 1SS133
D28	iF004600	DIODE 1SS133
D29	iF004600	DIODE 1SS133
D30	iF004600	DIODE 1SS133
D31	iF004600	DIODE 1SS133
D32	iF004600	DIODE 1SS133
D33	iF004600	DIODE 1SS133
D34	iF004600	DIODE 1SS133
D35	VG438100	DIODE. ZENR MIZJ6.2C 6.2V
D301	VG437900	DIODE. ZENR MIZJ6.2A 6.2V
D401	iF008730	LED (re) SLR-34URC3H3
D402	iF004600	DIODE 1SS133
IC1	XM571A00	IC AN8803SB

* New Parts

Schm Ref.	PART NO.	Description
IC3	XF494A00	IC LB1641
IC6	XN105A00	IC LA6536M
IC11	XN481A00	IC MN66270RB
IC12	XN443A00	IC uPD75217CW-230
IC15	XM683A00	IC X24C00P
IC16	iR012510	IC HD74HC125P
IC17	XM911A00	IC YAC514-F
IC18	iG142200	IC TC74HCU04AP
IC21	XA987001	IC NJM2068D
IC22	XA987001	IC NJM2068D
IC23	XA673A00	IC NJM5532D-D
IC24	XA673A00	IC NJM5532D-D
IC27	XD201A00	IC M5290P
IC34	XF494A00	IC LB1641
IC35	Xi249A00	IC BA15218
JK401	VR422300	JACK. PHONE YKB22-5138
L5	VB056900	COIL 220uH
L6	VB056900	COIL 220uH
L7	VB056900	COIL 220uH
L8	VB056900	COIL 220uH
L9	VP133800	FER. BEAD BL02RN1-R62T4
L10	VB056900	COIL 220uH
L11	VB056900	COIL 220uH
L12	VB056900	COIL 220uH
L13	VD473700	COIL 60uH
L14	VD473700	COIL 60uH
L15	VP133800	FER. BEAD BL02RN1-R62T4
L16	VP133800	FER. BEAD BL02RN1-R62T4
L18	Vi530800	TRANS. PULS 3PTD-001
L19	VB871100	FER. BEAD BL02RN2-R62
L20	VP133800	FER. BEAD BL02RN1-R62T4
L21	VP133800	FER. BEAD BL02RN1-R62T4
L22	VP133800	FER. BEAD BL02RN1-R62T4
L23	VP133800	FER. BEAD BL02RN1-R62T4
L401	VD473700	COIL 60uH
L402	VD473700	COIL 60uH
L403	VD473700	COIL 60uH
L404	VH227500	FLTR 20uH SU10VD-10020
L405	Vi491100	FER. CORE BP53RB19012080M
L406	Vi491100	FER. CORE BP53RB19012080M
L407	VP133800	FER. BEAD BL02RN1-R62T4
PJ1	VF645900	JACK. PIN 2P
PJ2	VF645900	JACK. PIN 2P
PJ3	VK525600	JACK. PIN 1P
Q1	iB054430	TR 2SB544 D, E, F, G
Q7	iA093320	TR 2SA933S Q, R
Q8	iD040040	TR 2SD400
Q9	VS883300	TR 2SB1565 E, F
Q12	iA093320	TR 2SA933S Q, R
Q13	iD040040	TR 2SD400
Q14	iB054430	TR 2SB544 D, E, F, G
Q15	iB054430	TR 2SB544 D, E, F, G
Q16	iD040040	TR 2SD400

* New Parts

Schm Ref.	PART NO.	Description
Q17	iC287820	TR 2SC2878 A, B
Q18	iC287820	TR 2SC2878 A, B
Q19	iC287820	TR 2SC2878 A, B
Q20	iC287820	TR 2SC2878 A, B
△ Q301	VS883400	TR 2SD2394 E, F
△ R26	HV454100	R. CAR. FP 10 Ω 1/4W
R46	Vi868300	R. FUS 0.68 Ω 1/6W
R110	HV455100	R. CAR. FP 100 Ω 1/4W
R111	HV455100	R. CAR. FP 100 Ω 1/4W
R137	HV455100	R. CAR. FP 100 Ω 1/4W
R142	HV455100	R. CAR. FP 100 Ω 1/4W
△ R151	HV454100	R. CAR. FP 10 Ω 1/4W
△ SW401	Vi319200	SW. PUSH SDDL1
SW422	VG392900	SW. TACT SKHVAA
SW423	VG392900	SW. TACT SKHVAA
SW430	VG392900	SW. TACT SKHVAA
△ * T401	XR300A00	TRANS. PWR (BG)
TP1	VL448600	JUMPER. TST
TP2	VL448600	JUMPER. TST
U401	VQ395300	L. DETCT SBX1780-52
V401	VR061600	FL. DSPLY 9-MT-133GK
VR401	VK084000	VR. MTR B20K Ω x2
XL1	VJ677200	RSNR. CE 4.19MHz
XL2	VJ719800	RSNR. CRY 16.9344MHz
W411	VK341400	CN ASS'Y 3P 180mm
	VB966900	CN IMSA-6024
	VQ713100	GND. MIL
	VQ713000	SUPRT FL
	VQ948800	SHEET FL
	Vi835500	HEAT. SINK PH-0124S-B
	VR506800	HEAT. SINK PUH16-25
	ED330066	SCR. BND. HD 3x6 FCRM3-BL

* New Parts

Schm Ref.	PART NO.	Description
	VR195100	P.C.B. ROLLING SW
SW900	VG392900	SW. TACT SKHVAA
SW901	VG392900	SW. TACT SKHVAA
SW902	VG392900	SW. TACT SKHVAA
SW903	VG392900	SW. TACT SKHVAA
SW904	VG392900	SW. TACT SKHVAA
SW905	VG392900	SW. TACT SKHVAA
SW906	VG392900	SW. TACT SKHVAA
SW907	VG392900	SW. TACT SKHVAA
SW908	VG392900	SW. TACT SKHVAA
SW909	VG392900	SW. TACT SKHVAA
SW910	VG392900	SW. TACT SKHVAA
SW911	VG392900	SW. TACT SKHVAA
SW912	VG392900	SW. TACT SKHVAA
SW913	VG392900	SW. TACT SKHVAA
SW914	VG392900	SW. TACT SKHVAA
SW915	VG392900	SW. TACT SKHVAA
SW916	VG392900	SW. TACT SKHVAA
SW917	VG392900	SW. TACT SKHVAA
SW918	VG392900	SW. TACT SKHVAA
SW919	VG392900	SW. TACT SKHVAA
SW920	VG392900	SW. TACT SKHVAA
SW921	VG392900	SW. TACT SKHVAA
SW922	VG392900	SW. TACT SKHVAA

* New Parts

■ MECHANICAL PARTS

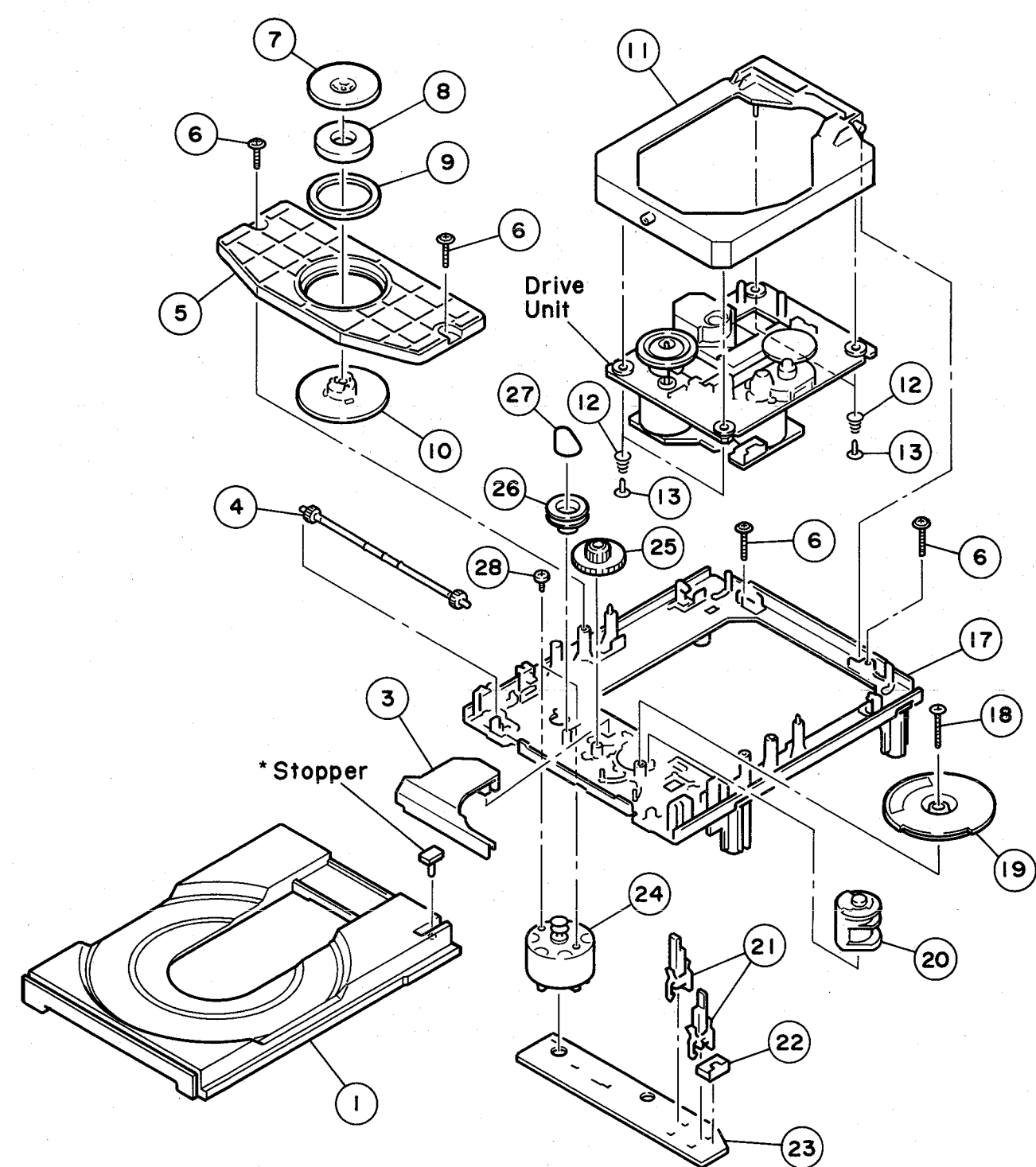
Ref. No.	PART NO.	Description	Remarks	Markets
1-2-A	VR195100	P.C.B. ASS'Y	ROLLING SW	
1-2-B	VN034200	CONNECTOR ASS'Y	1P 200mm	
1-2-C	VK341000	BINDING TIE	8904A3106	
1-2-D	VQ856700	ROLLING PANEL T		BL
1-2-D	VQ856800	ROLLING PANEL T		TI
1-2-E	VQ856900	ROLLING PANEL L		BL
1-2-E	VQ857000	ROLLING PANEL L		TI
1-2-F	VL706400	GROUND PLATE		
1-2-G	VL708600	BUTTON, ROLLING		BL
* 1-2-G	VU116800	BUTTON, ROLLING		TI
1-2-H	Vi491100	FERRITE CORE	BP53RB19012080M	
1-2-i	Ei326066	BIND HEAD TAPPING SCREW	2.6x6 ZMC2-BL	
1-2-J	VD294600	BIND HEAD P-TITE SCREW	2x6 FCRM3-BL	
1-3	VR119100	CONNECTOR, FLAT CABLE	27P 250mm	
* 1-4	VT876600	FRONT PANEL		BL
* 1-4	VT876800	FRONT PANEL		TI
1-5	VQ708800	SUB PANEL		BL
1-5	VT941200	SUB PANEL		TI
* 1-6	VT879100	WINDOW		
1-7	VQ780000	BUTTON	10x25	BL
1-7	VT990000	BUTTON	10x25	TI
1-8	VQ712800	KNOB, VR		BL
* 1-8	VT941300	KNOB, VR		TI
1-9	VT876700	SPACER, PWS		
1-10	EP630290	BIND HEAD P-TITE SCREW	3x6 FCRM3-BL	
1-11	Ei030046	BIND HEAD TAPPING SCREW	3x4 ZMC2-Y	
1-12	VQ712400	SUPPORT	HP	
1-13	VQ712500	SUPPORT	RP	
1-14	VL810800	SPRING	P	
* 2	VT976600	P.C.B. ASS'Y	MAIN	
5	VQ905800	PICK UP MECHA. UNIT	KSL-2101ABM	
△ 8	VL238900	POWER CORD ASS'Y		(G)
△ 8	VS680700	POWER CORD ASS'Y		(B)
9	VN158600	CORD STOPPER	No. 2104	
11	VR207400	CONNECTOR ASS'Y	8P 150mm	
12	VM987900	CONNECTOR ASS'Y	8P 160mm	
13	VR111800	CONNECTOR ASS'Y	6P 90mm	
14	VR111900	CONNECTOR ASS'Y	5P 100mm	
20	VU330800	CHASSIS		
* 21	VT878300	REAR PANEL		
23	VQ709200	TOP COVER		BL
23	VQ709300	TOP COVER		TI
* 26	VT878800	LID		BL
* 26	VT878900	LID		TI
* 27	VT879000	HOLDER, LID		BL
* 27	VT913200	HOLDER, LID		TI
* 28	VT878600	BOTTOM COVER		
* 29	VT878500	FRAME, MECH		
30	VQ775900	GROUND PLATE		
32	VQ780300	LEG	D60xH16	
33	VQ861300	CUSHION	TOP	
35	VA772900	SUPPORT, P.C.B.	No. 2127	
36	VQ861500	CUSHION	SHEET	

* New Parts

Ref. No.	PART NO.	Description	Remarks	Markets
37	VR605200	TRAY MAT	0.5+0.12mm	*1
* 37	VU985100	TRAY MAT	0.3+0.12mm	*2
38	VU592100	SPACER, PLATE		*1
60	EK365090	PW HEAD S-TITE SCREW	4x8-10 FCRM3-BL	BL
60	EX601150	BW HEAD S-TITE SCREW	4x8-10 FNM3-BL	TI
61	EK930010	PW HEAD B-TITE SCREW	3x8-8 FCRM3-BL	
63	EN301010	BIND HEAD BONDING TAP. SCREW	3x8 FCRM3-BL	
64	EX602710	BIND HEAD BONDING P-T. SCREW	3x8 FCRM3-BL	
66	EO030066	FLAT HEAD SCREW	3x6 ZMC2-Y	
67	EK396010	BIND HEAD S-TITE SCREW	4x8 FCRM3-BL	
69	Ei330086	BIND HEAD B-TITE SCREW	3x8 FCRM3-BL	
71	EX602860	BIND HEAD B-TITE SCREW	3x8 FCM3-CU	
72	VK002600	HEXAGONAL CAP NUT	4mm	
75	VU590000	BINDING TIE	CBTD001B	
76	EX602660	BIND HEAD S-TITE SCREW	3x10 FCRM3-BL	
77	VS558400	HEXAGONAL CAP NUT	3mm MFZN2-BL	
78	EX000820	HEXAGONAL NUT	4mm #1 MFZN2-BL	
81	VK527900	PW HEAD S-TITE SCREW	3x8-8 ZMC2-Y	
82	EV410036	TOOTH LOCKED WASHER	3 MFZN2Y	
200	VT989900	ACCESSORIES		
200-1	CX679050	REMOTE CONTROL TRANSMITTER		
	VS381600	LID	74x34BLALPS	
		PIN PLUG CORD	1.0m	
		BATTERY, MANGANESE	SUM-3, AA, R06	

* New Parts

EXPLODED VIEW (CD Macha. Unit)



* The stopper is not supplied with the tray as a spare part.
 When replacing the tray, keep the removed stopper and reuse it.
 Should it be lost and a new one be necessary, order service part ⑰ Main Chassis (S) and remove the stopper only from it and use it as a spare part.

MECHANICAL PARTS (CD Macha. Unit)

Ref. No.	PART NO.	Description	Remarks	Markets
	VQ905800	CD MECHANISM UNIT	KSL-2101ABM	
1	CX675290	TRAY (S)		262555003
3	CX675250	GEAR COVER (S)		262554402
4	CX675210	TRAY GEAR (S)		262553501
5	AX619150	CHUCKING PLATE (S)		262554601
6	EX602890	BW HEAD P-TITE SCREW	2.6x7	262629401
7	BX602660	CHUCKING YOKE (S)		262553701
8	NX610570	MAGNET ASS'Y		145249321
9	CX675240	DAMPER (S)		262554102
10	CX675280	CHUCKING PULLEY (S)		262554802
11	NX613060	SUB CHASSIS ASS'Y (S)		X26252272
12	AX619140	SPRING (S)		262553901
13	AX619180	SCREW WITH WASHER		262573001
17	AX619160	MAIN CHASSIS (S), OUTSERT		262555206
18	VH554700	BW HEAD P-TITE SCREW	2.6x16	331950151
19	CX675270	DRIVE GEAR (S)		262554703
20	CX675260	CONTROL CAM (S)		262554504
21	KX604180	LEAF SWITCH		157208611
22	LX608390	CONNECTOR PIN	5P	156472111
23	NX613050	PWB, LOADIND (S)		164052312
24	JX601470	LOADING MOTOR		X26251171
25	CX675200	CENTER GEAR (S)		262553402
26	CX675220	LOADING PULLEY (S)		262553602
27	CX672840	BELT, LOADING MOTOR		365338701
28	EX602880	SCREW	2.6x2.5	262527901

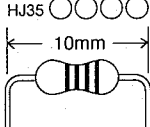
* New Parts

Parts List for Carbon Resistors

Value	1/4W Type Part No.	1/6W Type Part No.	Value	1/4W Type Part No.	1/6W Type Part No.
1.0 Ω	HJ35 3100	HF85 3100	10 k Ω	HF45 7100	HF45 7100
1.8 Ω	HJ35 3180	*	11 k Ω	HF45 7110	HF45 7110
2.2 Ω	HJ35 3220	HF85 3220	12 k Ω	HJ35 7120	HF85 7120
3.3 Ω	HJ35 3330	HF85 3330	13 k Ω	HF45 7130	HF45 7130
4.7 Ω	HJ35 3470	HF85 3470	15 k Ω	HF45 7150	HF45 7150
5.6 Ω	HJ35 3560	HF85 3560	18 k Ω	HF45 7180	HF45 7180
10 Ω	HF45 4100	HF45 4100	22 k Ω	HF45 7220	HF45 7220
15 Ω	HJ35 4150	HF85 4150	24 k Ω	HF45 7240	HF45 7240
22 Ω	HF45 4220	HF45 4220	27 k Ω	HJ35 7270	HF85 7270
27 Ω	HJ35 4270	HF85 4270	30 k Ω	HF45 7300	HF45 7300
33 Ω	HF45 4330	HF45 4330	33 k Ω	HF45 7330	HF45 7330
39 Ω	HJ35 4470	HF85 4390	36 k Ω	HF45 7360	HF45 7360
47 Ω	HF45 4470	HF45 4470	39 k Ω	HF45 7390	HF45 7390
56 Ω	HF45 4560	HF45 4560	47 k Ω	HF45 7470	HF45 7470
68 Ω	HF45 4680	HF45 4680	51 k Ω	HF45 7510	HF45 7510
75 Ω	HF45 4750	HF45 4750	56 k Ω	HF45 7560	HF45 7560
82 Ω	HF45 4820	HF45 4820	62 k Ω	HF45 7620	HF45 7620
91 Ω	HF45 4910	HF45 4910	68 k Ω	HF45 7680	HF45 7680
100 Ω	HF45 5100	HF45 5100	82 k Ω	HF45 7820	HF45 7820
110 Ω	HJ35 5110	HF85 5110	91 k Ω	HF45 7910	HF45 7910
120 Ω	HF45 5120	HF45 5120	100 k Ω	HF45 8100	HF45 8100
150 Ω	HF45 5150	HF45 5150	110 k Ω	HF45 8110	HF45 8110
160 Ω	HJ35 5160	*	120 k Ω	HF45 8120	HF45 8120
180 Ω	HF45 5180	HF45 5180	150 k Ω	HF45 8150	HF45 8150
200 Ω	HF45 5200	HF45 5200	180 k Ω	HF45 8180	HF45 8180
220 Ω	HF45 5220	HF45 5220	220 k Ω	HJ35 8220	HF85 8220
270 Ω	HF45 5270	HF45 5270	270 k Ω	HF45 8270	HF45 8270
330 Ω	HF45 5330	HF45 5330	300 k Ω	HF45 8300	HF45 8300
390 Ω	HF45 5390	HF45 5390	330 k Ω	HF45 8330	HF45 8330
430 Ω	HF45 5430	HF45 5430	390 k Ω	HJ35 8390	HF85 8390
470 Ω	HF45 5470	HF45 5470	470 k Ω	HF45 8470	HF45 8470
510 Ω	HF45 5510	HF45 5510	560 k Ω	HJ35 8560	HF85 8560
560 Ω	HF45 5560	HF45 5560	680 k Ω	HJ35 8680	HF85 8680
680 Ω	HF45 5680	HF45 5680	820 k Ω	HJ35 8820	HF85 8820
820 Ω	HF45 5820	HF45 5820	1.0 M Ω	HF45 9100	HF45 9100
910 Ω	HF45 5910	HF45 5910	1.2 M Ω	HJ35 9120	*
1.0 k Ω	HF45 6100	HF45 6100	1.5 M Ω	HJ35 9150	HF85 9150
1.2 k Ω	HF45 6120	HF45 6120	1.8 M Ω	HJ35 9180	HF85 9180
1.5 k Ω	HF45 6150	HF45 6150	2.2 M Ω	HJ35 9220	HF85 9220
1.8 k Ω	HF45 6180	HF45 6180	3.3 M Ω	HJ35 9330	HF85 9330
2.0 k Ω	HJ35 6200	HF85 6200	3.9 M Ω	HJ35 9390	*
2.2 k Ω	HF45 6220	HF45 6220	4.7 M Ω	HJ35 9470	HF85 9470
2.4 k Ω	HJ35 6240	HF85 6240			
2.7 k Ω	HF45 6270	HF45 6270			
3.0 k Ω	HF45 6300	HF45 6300			
3.3 k Ω	HF45 6330	HF45 6330			
3.6 k Ω	HJ35 6360	HF85 6360			
3.9 k Ω	HF45 6390	HF45 6390			
4.7 k Ω	HF45 6470	HF45 6470			
5.1 k Ω	HF45 6510	HF45 6510			
5.6 k Ω	HF45 6560	HF45 6560			
6.8 k Ω	HF45 6680	HF45 6680			
8.2 k Ω	HF45 6820	HF45 6820			
9.1 k Ω	HF45 6910	HF45 6910			

1/4W Type

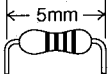
HJ35 ○○○○



10mm

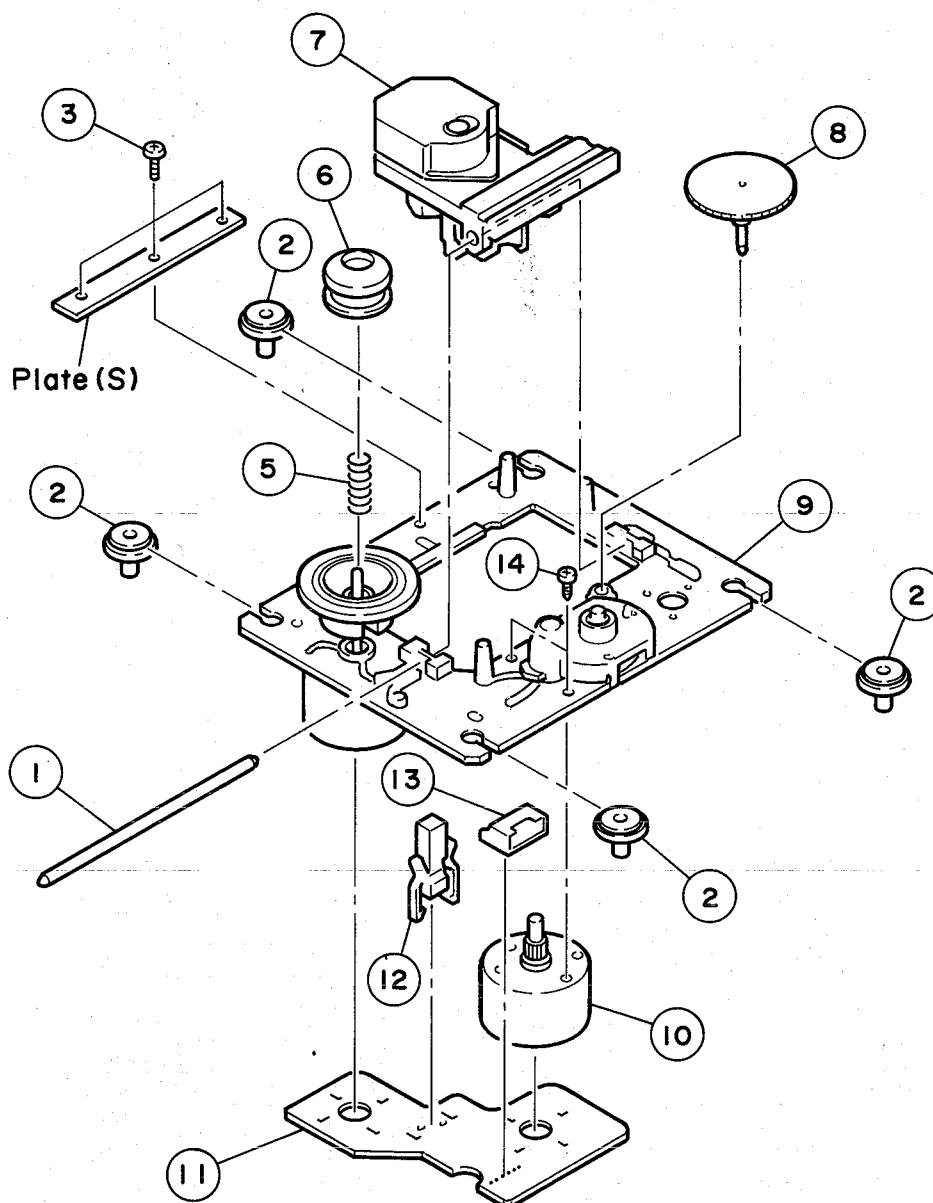
1/6W Type

HF45 ○○○○



5mm

EXPLODED VIEW (Drive Unit)



Ref. No.	PART NO.	Description	Remarks	Markets
1	AX619110	SLED SHAFT (S)	262546401	
2	CX675230	INSULATOR (S)	262553801	
3	AX607540	SPECIAL SCREW	2641386	
5	AX619120	COIL SPRING (S)	262546501	
6	AX619130	CENTER RING, LO (S)	262547701	
7	PX600431	LASER PICK UP	8848127	
8	CX675190	GEAR, A (S)	262546201	
9	NX610600	CHASSIS ASS'Y, T.T.	X26251332	
10	NX610610	MOTOR GEAR ASS'Y	X26251321	
11	NX613040	PWB, MOTOR	163967813	
12	KX603720	LEAF SWITCH	157208512	
13	LX608400	CONNECTOR	1564722	
14	EA020036	PAN HEAD SCREW	762125515	

* New Parts