

Service Manual

Supplement

Radio Cassette
RX-DT630

Colour

(K) ... Black Type

•Please file and use this Supplement Manual together with the Service Manual for Model No. RX-DT630 (P/PC/PX-K) Order No. MD9205032C5
RX-DT630 (GC-K) MD9207066C3

•The CD Drive used in Model RX-DT610 has been modified during mid-operation for improved operation.

• This supplement includes the following information regarding the Modified CD drive

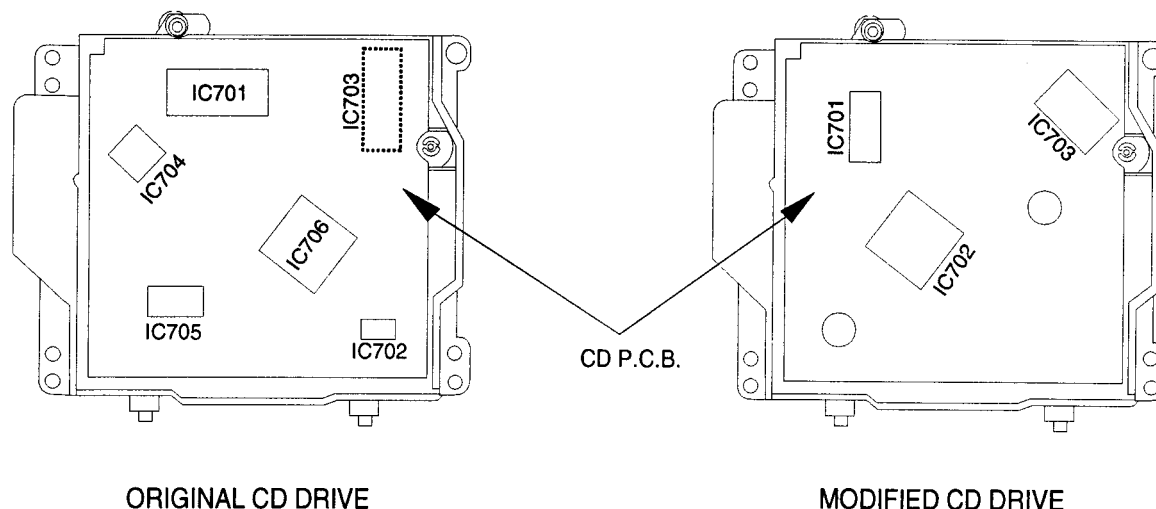
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|-------------------------------|------------------------------|
| 1. PRINTED CIRCUIT BOARD | 5. FUNCTION OF IC TERMINALS |
| 2. SCHEMATIC DIAGRAM | 6. NEW DIGITAL SERVO CIRCUIT |
| 3. TROUBLESHOOTING GUIDE | 8. CD UNIT PARTS LOCATION |
| 4. BLOCK DIAGRAM | 9. CD REPLACEMENT PARTS LIST |
| 5. MEASUREMENT AND ADJUSTMENT | |

Area

Suffix for Model No.	Area	Colour
(P)	U.S.A	(K)
(PC)	Canada	
(PX)	Far East PX and Europe PX	
(GC)	Asia, Latin America, Middle Near East and Africa	

How to identify the units with Modified CD Drive

The units with modified CD drive can be identified by the reduction of number of Integrated Circuit Chips used from the CD P.C.B. as illustrated (ie. IC701~IC706 → IC701~IC703)

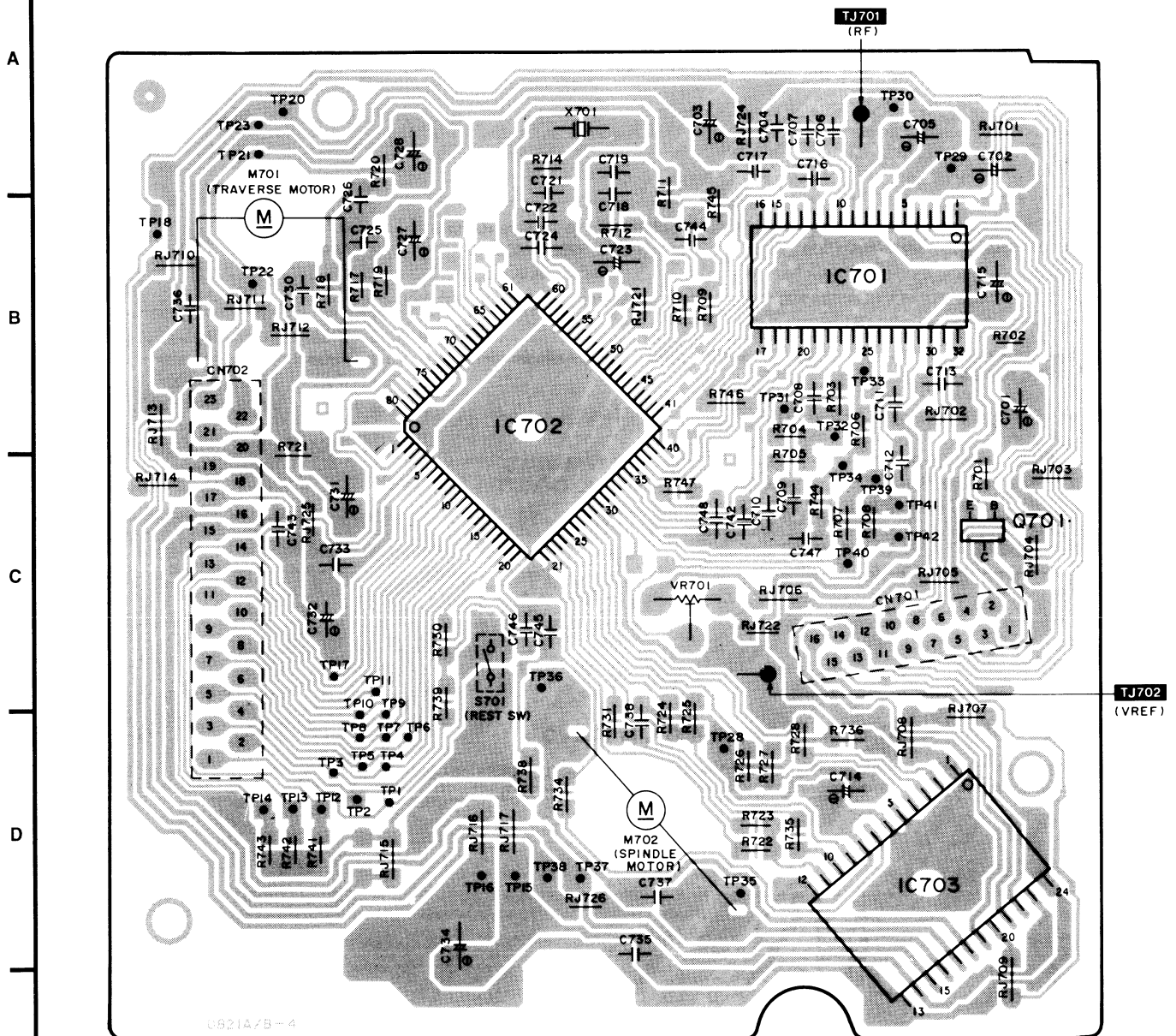


•This Service Manual Supplement is strictly used for Units with a Modified CD Drive.

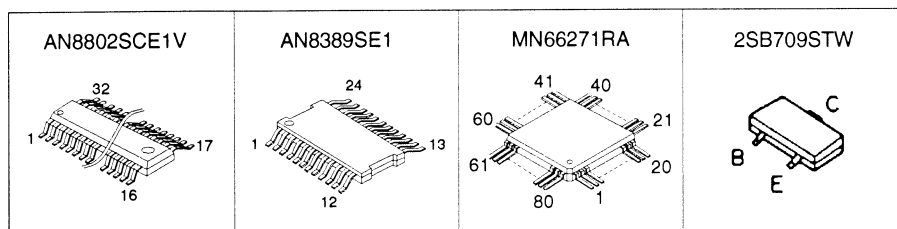
Panasonic®

PRINTED CIRCUIT BOARD DIAGRAM

A SERVO P.C.B. (REP1391A-N)



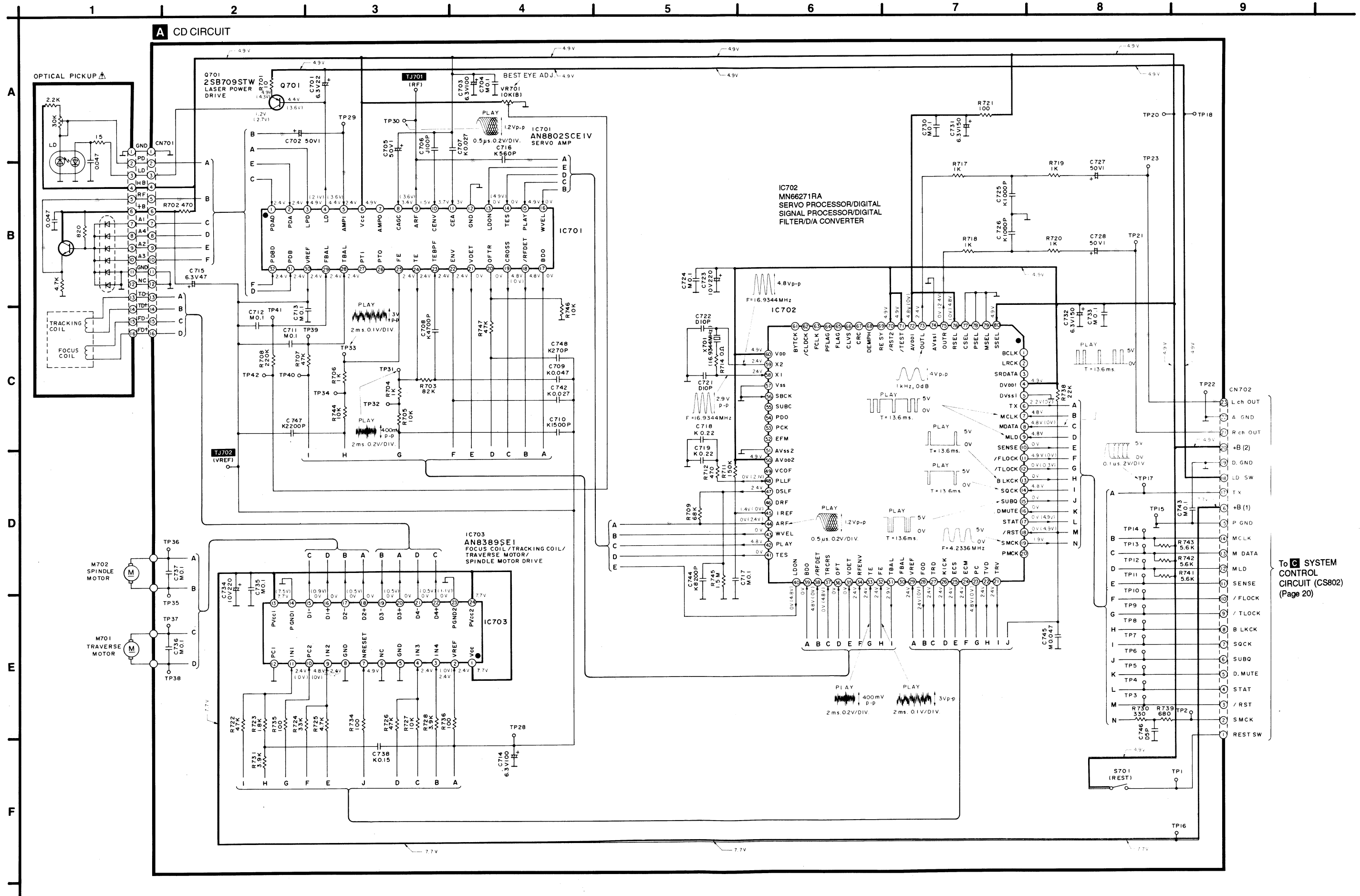
Note: This Servo PCB diagram is shown as viewed from the copper pattern side



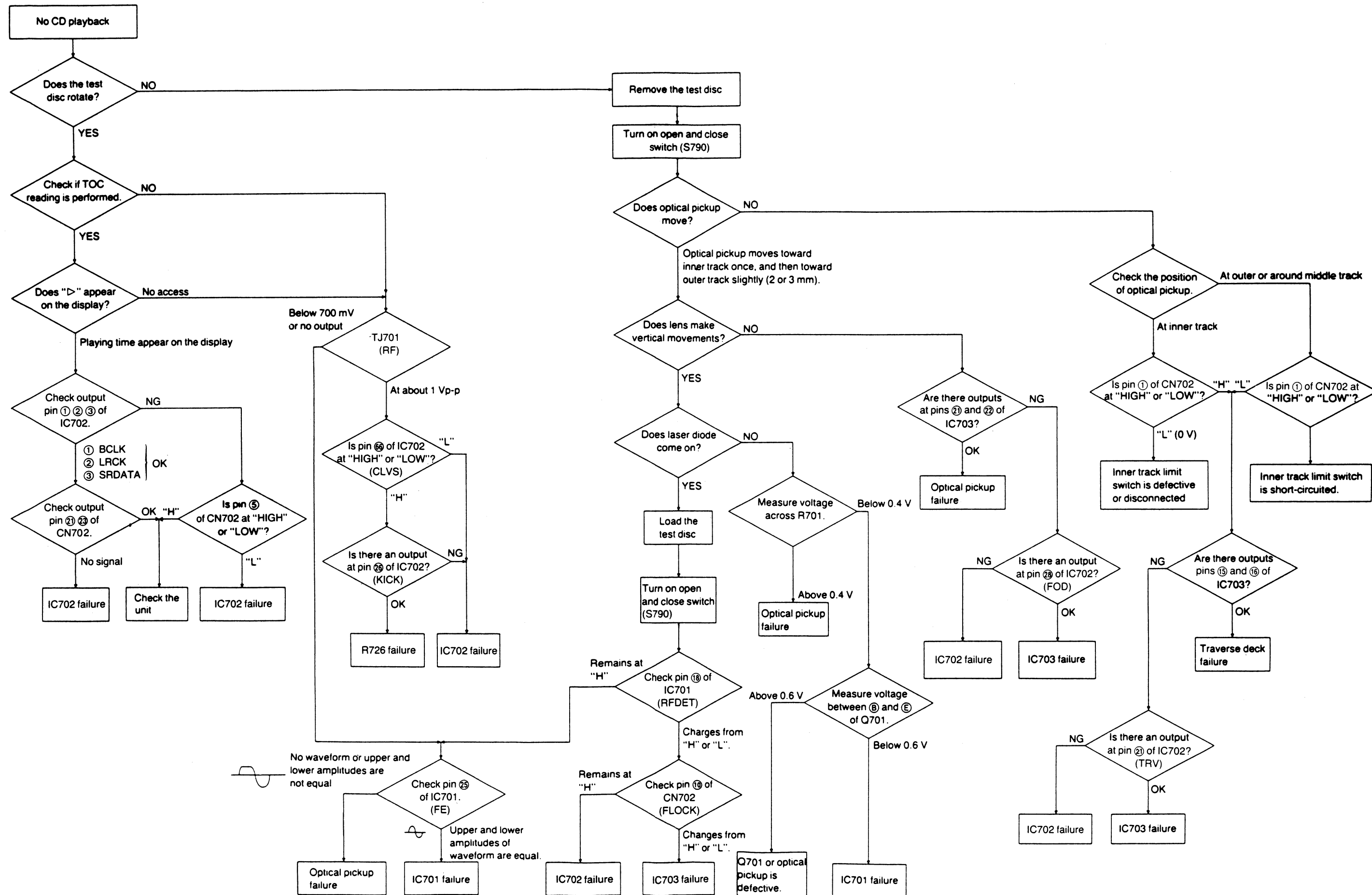
Included in this supplement are the CD drive Printed Circuit Board diagram and Schematic diagram for the new modified CD drive.

Other Printed Circuit Board diagrams and Schematic Circuit Diagrams remains unchanged and not affected by this modification.

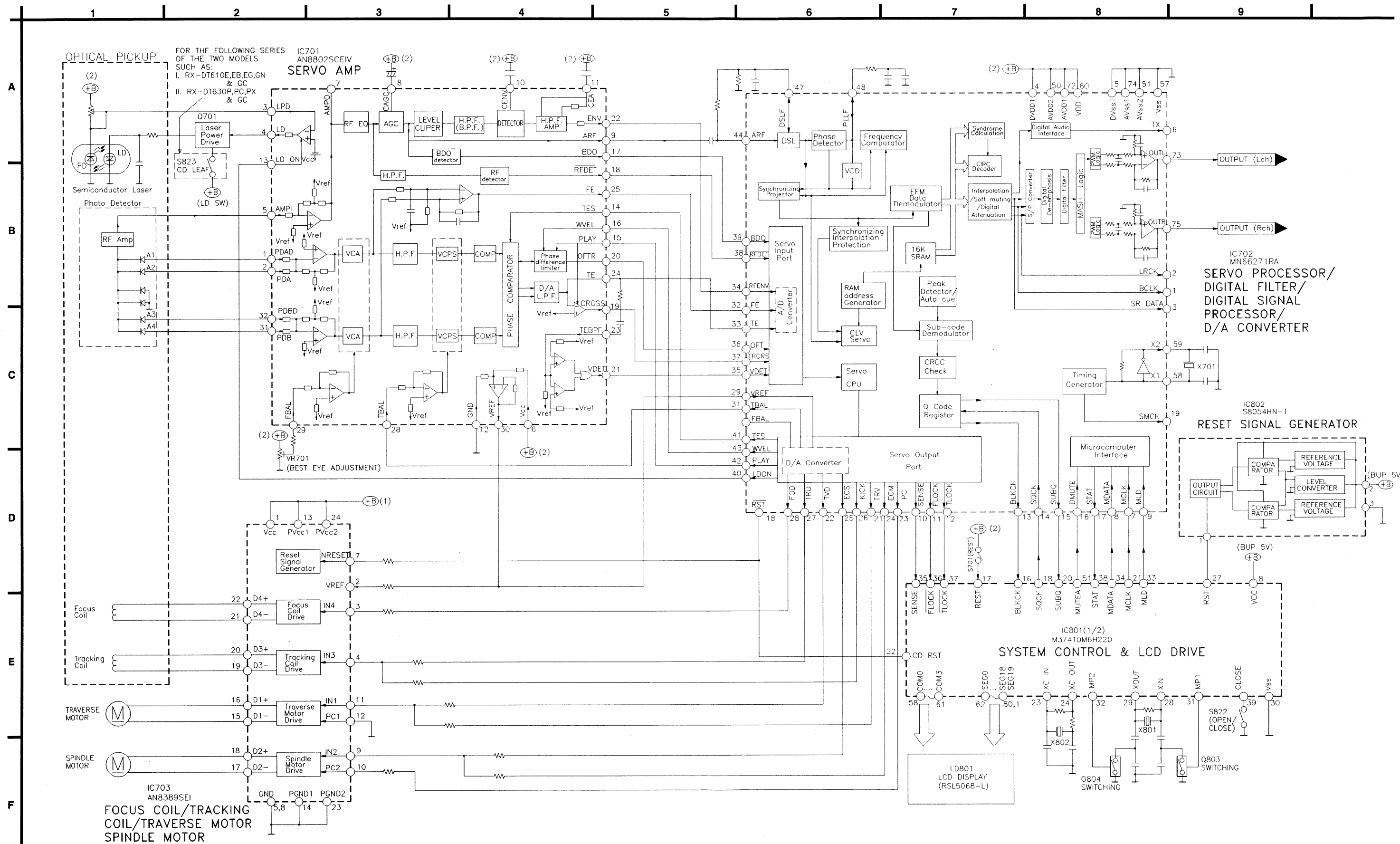
■ SCHEMATIC DIAGRAM • OPTICAL PICKUP AND SERVO CIRCUIT



TROUBLESHOOTING GUIDE



BLOCK DIAGRAM



MEASUREMENT AND ADJUSTMENT

- Warning :** This product uses a laser diode. Refer to caution statements on page 2 .
- Caution :** It is very dangerous to look or touch the laser beam. (laser radiation is invisible)
With the unit turned "on", laser radiation is emitted from the pickup lens.
Avoid exposure to the laser beam, especially when performing adjustments.

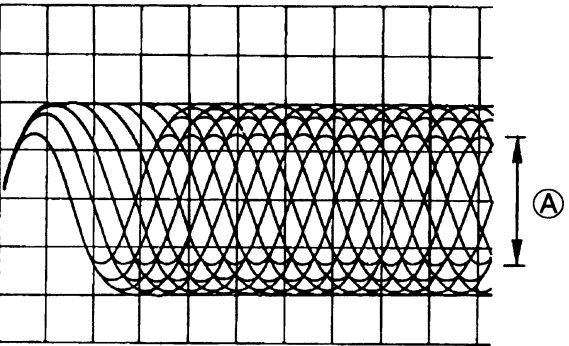
Measuring Instruments and Special Tools

- * Test discs
 - 1. Playability test disc (SZZP1054C)
 - 2. Uneven test disc (SZZP1056C)
- * Allen wrench (M2.0) (SZZP1101C).
- * Dual-beam Oscilloscope with bandwidth of 30MHz or better (with EXT. trigger and 1:1 probe)

(1) MECHANICAL ADJUSTMENT

When the traverse deck is replaced, making adjustments is not necessary. (The traverse deck ass'y is already adjusted.)
Make adjustments to improve playability if the traverse deck has not been replaced.

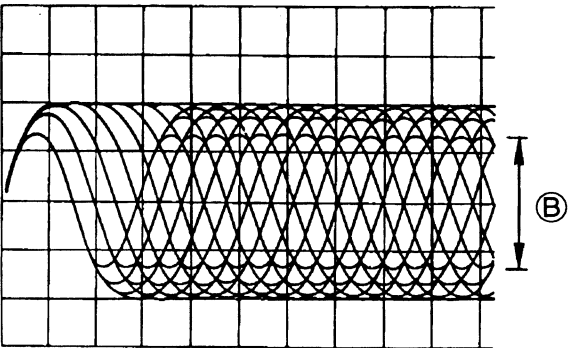
- Connect the oscilloscope's CH. 1 probe across **TJ701** (RF) (+) and **TJ702** (VREF) (-) on the Servo P.C.B.
Oscilloscope setting : VOLT200mV.
SWEEP0.5μs.
Input couplingAC.
- Switch the player power ON, and play track 19 on the test disc (SZZ1056C).
- Leave the player in Play mode , and place it as shown in the figure on the right.
- Alternately adjust the two mechanical adjusting screws with the 2.0mm allen wrench (SZZP1101C) until the RF signal amplitude on the oscilloscope is maximized. (Refer to Fig. 2 on page 10)
- After completing the adjustment, lock the **Mechanical Adjustment Screw** with lock paint (RZZ0L01).



* Maximize the amplitude

(2) BEST EYE (PD BALANCE) AJUSTMENT

- Connect the oscilloscope's CH. 1 probe across **TJ701** (RF) (+) and **TJ702** (VREF) (-) on the Servo P.C.B.
Oscilloscope setting: VOLT.....200mV
SWEEP.....0.5μs.
Input coupling..... AC
- Switch the player power ON, and play the 1 KHz (track 1) on the test disc (SZZP1054C).
- Adjust VR701 until the RF signal eye pattern amplitude is maximized. (Refer to Fig. 1 on page 10)



* Maximize the amplitude

(3) CHECK OF PLAY OPERATION AFTER ADJUSTMENT

• Checking skip Search

- Play an ordinary musical program disc.
- Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

• Checking Manual Search

- Play an ordinary musical program disc.
- Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

• Checking Playability

- Play the 0.7mm black dot and the 0.7mm wedge on the test disc (SZZP1054C) and verify that no sound skip or noise occurs.
- Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

Caution: It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.)
With the unit turned "ON", laser radiation is emitted from the pickup lens.
Avoid exposure to the laser beam, especially when performing adjustments.

The conventional CD drive (Servo Board) requires manual adjustment for items (1) through (7) listed below:

- (1) Best eye pattern (PD balance)
- (2) Focus offset
- (3) Tracking offset
- (4) Ficus gain
- (5) Tracking gain
- (6) Tracking balance
- (7) Angle of elevation

On the modified CD drive (Servo Board), a servo processor IC (IC702: MN66271RA) automatically adjusts items (2) through (6) out of seven items listed above. Auto adjustment is performed when:

- A CD is loaded or replaced, or
 - the unit is turned ON with a CD loaded in the drive.
- *The auto adjustment is reset each time the CD drive is turned OFF.

• Preparation

After setting up the unit for adjustment, temporarily switch it off, switch it on again.
(This is necessary for the automatic adjustment procedure with the CD drive placed on its side.)

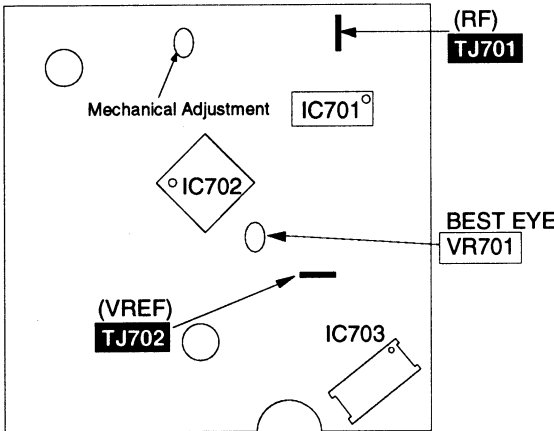


Fig.1

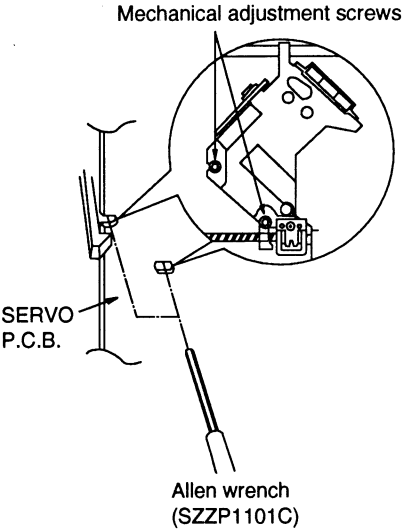


Fig.2

FUNCTION OF IC TERMINALS

• IC703 (AN8389SE1)

Pin No.	Terminal Name	I/O	Function
1	Vcc	I	Power Supply
2	VREF	I	VREF input
3	IN4	I	Motor driver (4) input
4	IN3	I	Motor driver (3) input
5	GND	—	Ground connection
6	NC	—	No connection
7	NRESET	I	Reset input
8	GND	—	Ground connection
9	IN2	I	Motor driver (2) input
10	PC2	I	PC2 (power cut) input
11	IN1	I	Motor driver (1) input
12	PC1	I	PC1 (power cut) input (not used, open)

Pin No.	Terminal Name	I/O	Function
13	PVcc1	I	Power supply (1) for driver
14	PGND1	—	Ground connection (1) for driver
15	D1-	O	Motor driver (1) reverse-action output
16	D1+	O	Motor driver (1) forward-action output
17	D2-	O	Motor driver (2) reverse-action output
18	D2+	O	Motor driver (2) forward-action output
19	D3-	O	Motor driver (3) reverse-action output
20	D3+	O	Motor driver (3) forward-action output
21	D4-	O	Motor driver (4) reverse-action output
22	D4+	O	Motor driver (4) forward-action output
23	PGND2	—	Ground connection (2) for driver
24	PVcc2	I	Power supply (2) for driver

• IC701 (AN8802SCE1V)

Pin No.	Terminal Name	I/O	Function
1	PDAD	I	PD A channel signal input with delay
2	PDA	I	PD A channel signal input without delay
3	LPD	I	Laser PD connection
4	LD	O	Power supply for LD driving
5	AMPI	I	RF amplifier input
6	Vcc	I	Power supply connection
7	AMPO	O	RF amplifier output (not used, open)
8	CAGC	I	AGC loop filter connection
9	ARF	O	RF AGC output
10	CENV	I	Capacitor connection for RF detection
11	CEA	I	Capacitor connection for HPF amplifier
12	GND	—	Ground connection
13	LDON	I	ON/OFF input of LD APC ("H": ON, "L": OFF)
14	TES	I	Tracking error shunt signal input ("H": shunt)
15	PLAY	I	Play signal input ("H": PLAY)
16	WVEL	I	WVEL control
17	BDO	O	BDO output
18	/RFDET	O	NRFDET output
19	CROSS	O	CROSS output
20	OFTR	O	OFTR output
21	VDET	O	VDET output
22	ENV	O	ENV output
23	TEBPF	I	Vibration detection input
24	TE	O	Tracking error output
25	FE	O	Focus error output
26	PTO	O	Potential amplifier output (not used, open)
27	PTI	I	Potential amplifier inversion input (no use, open)
28	TBAL	I	Tracking balance input
29	FBAL	I	Focus balance input
30	VREF	O	VREF output
31	PDB	I	PD B channel signal input without delay
32	PDBD	I	PD B channel signal input with delay

• IC702 (MN66271RA)

Pin No.	Terminal Name	I/O	Function
1	BCLK	O	Bit clock output for serial data (not used, open)
2	LRCK	O	L/R identification signal output (Not used, open)
3	SRDATA	O	Serial data output (Not used, open)
4	DVDD1	I	Power Supply Input (for digital circuit)
5	DVSS1	—	GND (for digital circuit)
6	TX	O	Digital audio interface signal output
7	MCLK	I	Microprocessor command clock signal input (Latches data at first transition)
8	MDATA	I	Microprocessor command data signal input
9	MLD	I	Microprocessor command load signal input
10	SENSE	O	Sense signal output (OFT, FESL, MAGEND, NAJEND, POSAD, SFG)
11	/FLOCK	O	Focus servo feeding signal output ("L": Feed)
12	/TLOCK	O	Tracking servo feeding signal output ("L": Feed)
13	BLKCK	O	Sub-code block clock signal output (fBLKCK=75 Hz during normal playback)
14	SQCK	I	External clock signal 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 output (CRC, CUE, CLVS, TTSTVP, FCLV, SQCK)
18	/RST	I	Reset input
19	SMCK	O	1/2-divided CLK signal of X'tal oscillating at MSEL="H" (fSMCK=8.4672MHz) 1/4-divided CLK signal of X'tal oscillating at MSEL="L" (fSMCK=4.2336MHz)
20	PMCK	O	1/192-divided CLK signal of X'tal oscillating (fPMCK=88.2 KHz) (Not used, open)
21	TRV	O	Traverse forced feed output
22	TVD	O	Traverse drive output
23	PC	O	Spindle motor ON signal output ("L": ON)
24	ECM	O	Spindle motor drive signal output (forced mode output)
25	ECS	O	Spindle motor drive signal output (Servo error signal output)
26	KICK	O	Kick pulse output
27	TRD	O	Tracking drive output
28	FOD	O	Focus drive output

Pin No.	Terminal Name	I/O	Function
29	VREF	I	D/A (Drive) output (TV, ECS, TRD, FOD, FBAL, TBAL) Reference voltage input
30	FBAL	O	Focus balance adjustment output (Not used, open)
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
35	VDET	I	Vibration detection signal input ("H": Detection)
36	OFT	I	Off-track signal input ("H": Off track)
37	TRCRS	I	Track cross signal input
38	/RFDET	I	RF detection signal input ("L": Detection)
39	BDO	I	Dropout signal input ("H": Dropout)
40	LDON	O	Laser on signal output ("H": ON)
41	TES	O	Tracking error shunt signal output ("H": shunt)
42	PLAY	O	Play signal out ("H": PLAY)
43	WVEL	O	Double speed status signal output ("H": Double speed)
44	ARF	I	RF signal input
45	IREF	I	Reference current input
46	DRF	I	DSL bias (Not used, open)
47	DSLIF	I/O	DSL loop filter
48	PLLIF	I/O	PLL loop filter
49	VCOF	I/O	VCO loop filter (Not used, open)
50	AVDD2	I	Power supply input (for analog circuit)
51	AVSS2	—	GND (for analog circuit)
52	EFM	O	EFM signal output (Not used, open)
53	PCK	O	PLL extraction CLK output (fPCK=4.321 MHz during normal playback (Not used, open))
54	PDO	O	Phase comparison signal of EFM and PCK signal (Not used, open)
55	SUBC	O	Sub-code serial data output (Not used, open)
56	SBCK	I	CLK input for sub-code serial data (Not used, open)
57	VSS	—	GND
58	X1	I	X'tal oscillating cct input (f=16.9344MHz)
59	X2	O	X'tal oscillating cct output (f=16.9344MHz)
60	VDD	I	Power supply input (for oscillating cct)
61	BYTCK	O	Byte CLK output (Not used, open)

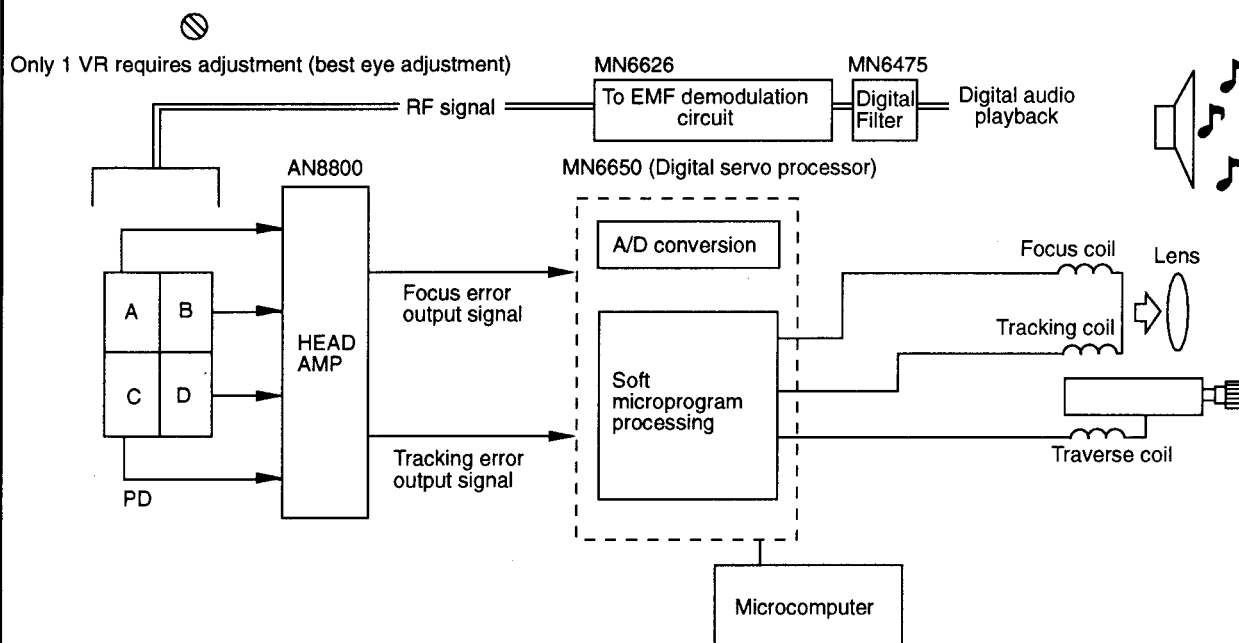
Pin No.	Terminal Name	I/O	Function
62	/CLDCK	O	Sub-code frame CLK signal output (fCLDCK=7.35kHz during normal playback)
63	FCLK	O	X'tal frame CLK signal output (fFCLK=7.35kHz, double=14.7kHz)
64	PFLAG	O	Interpolation flag output ("H": Interpolation) (Not used, open)
65	FLAG	O	Flag output (Not used, open)
66	CLVS	O	Spindle servo phase synchronizing signal output ("H": CLV, "L": rough servo) (Not used, open)
67	CRC	O	Sub-code CRC checked output ("H": OK, "L": NG) (Not used, open)
68	DEMPH	O	De-emphasis ON signal output ("H": ON) (Not used)
69	RESY	O	Frame resynchronizing signal output (Not used, open)
70	/RST2	I	Reset input through MASH cct ("L": reset)
71	/TEST	I	Test input
72	AVDD1	I	Power supply input (for analog cct)
73	OUTL	O	Left channel audio signal output
74	AVSS1	—	GND
75	OUTR	O	Right channel audio signal output
76	RSEL	I	RF signal polarity assignment input (at "H" level, RSEL="H"; at "L" level, RSEL="L";)
77	CSEL	I	Crystal oscillating frequency designation input ("L": 16.9344MHz, "H": 33.8688MHz)
78	PSEL	I	Test input (normally, "L") (Not used, open)
79	MSEL	I	Output frequency switching for SMCK terminal "H": SMCK=8.4672MHz "L": SMCK=4.2336MHz (Not used, open)
80	SSEL	I	Output mode switching of SUBQ terminal ("H": Q code buffer mode)

NEW DIGITAL SERVO CIRCUIT

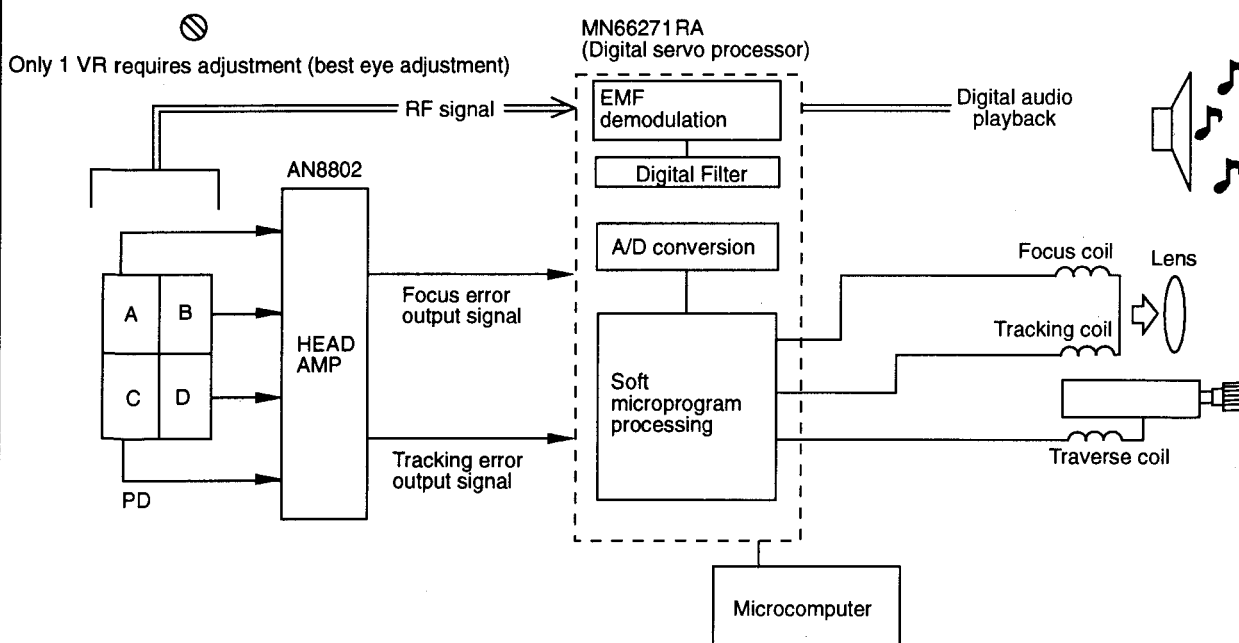
This model employs a new digital servo circuit. Compared to the old digital servo circuit, the following points have been improved.

- 1. Reduced operated noise**
Loading mechanism 2-level speed reducer
- 2. Reduced access time**
[(old) 2.9 seconds → (new) 1.9 seconds]
Change of traverse gear
- 3. Improved vibration resistance**
Rubber and spring 2-level floating mechanism
[$f_0=50$ Hz (old) → 20 Hz (new)]
- 4. Reduced number of parts**
Use of a single super IC chip
3 chips (MN6626, MN6650, MN6475) are reduced to a single chip (MN66271RA)
- The servo processor IC (MN66271RA) of the newly-developed digital servo circuit automatically performs the following adjustments which were previously manually adjusted in the analog servo circuit: (1) Focus offset, (2) Tracking offset, (3) Focus gain, (4) Tracking gain and (5) Tracking balance. Therefore, the above mentioned 6 electrical adjustments are discarded in the new digital servo circuit. The unit optimizes the servo for each loaded disc. (The Best eye (PD balance) adjustment is to be performed manually.)

DIGITAL SERVO SYSTEM (OLD)



DIGITAL SERVO SYSTEM (NEW)



CD REPLACEMENT PARTS LIST

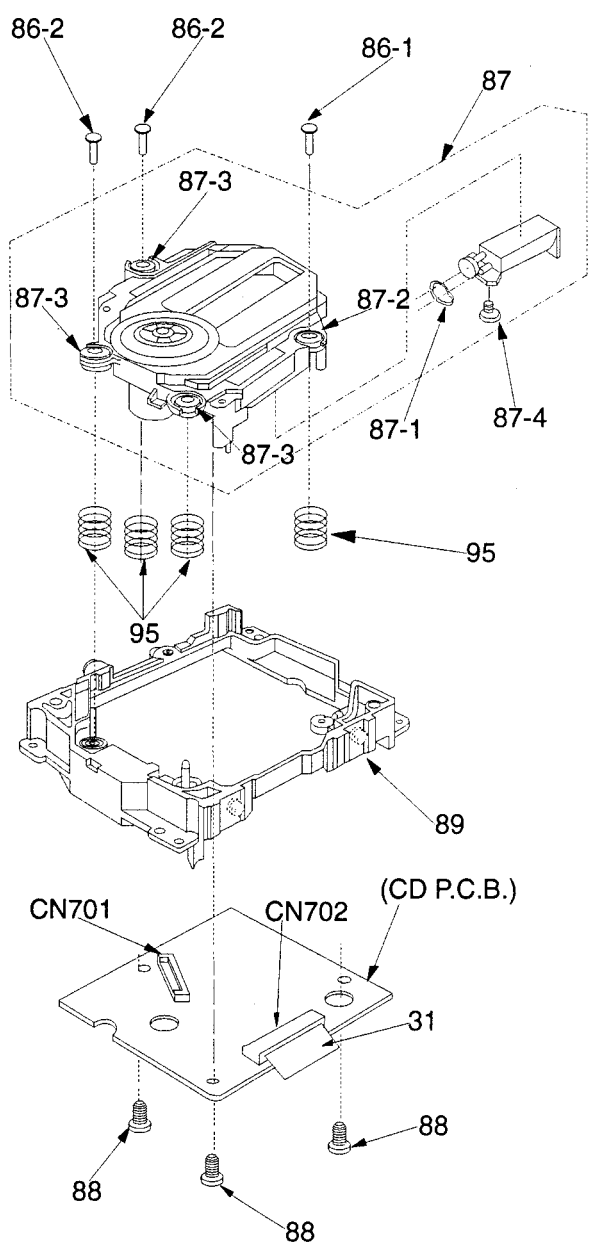
Ref. No	Part No.	Part Name & Description	Remarks	Ref. No	Part No.	Part Name & Description	Remarks
INTEGRATED CIRCUITS				VARIABLE RESISTORS			
IC701	AN8802SCE1V	I.C, SERVO AMP		VR701	EVNDXAA00B14	V.R, BEST EYE ADJ	
IC702	MN66271RA	I.C, SERVO PROCESSOR		CONNECTORS			
IC703	AN8389SE1	I.C, MOTOR DRIVE		CN701	RJU035T016-1	SOCKET (16P)	
TRANSISTORS				CN702	RJS1A6723-1Q	SOCKET (23P)	
Q701	2SB709S	TRANSISTOR		CHIP JUMPERS			
SWITCHES				RJ701-717	ERJ8GEY0R00A	1/10W 0	
S701	RSM0006-P	SW, REST		RJ721-726	ERJ8GEY0R00A	1/10W 0	
OSCILLATORS				TEST JUMPERS			
X701	RSXZ16M9M02T	OSCILLATOR (16.9344MHz)		TJ701,702	RRJ8GET001H	TEST JUMPER	

RESISTORS AND CAPACITORS

Notes: * Capacitance values are in microfarads(μF) unless specified otherwise, P=Pico-farads(pF) F=Farads(F)
 * Resistance values are in ohms, unless specified otherwise, 1K=1,000(OHM), 1M=1,000K(OHM)

Ref.No.	Part No.	Values & Remarks	Ref.No.	Part No.	Values & Remarks	Ref.No.	Part No.	Values & Remarks
RESISTORS			R731	ERJ6GEYJ392V	1/10W 3.9K	C715	ECEA0JKA470I	6.3V 47
R701	ERJ6GEYJ100	1/10W 10	R734~736	ERJ6GEYJ101V	1/10W 100	C716	ECUE1H561KBN	50V 560P
R702	ERJ6GEYJ471V	1/10W 470	R738	ERJ6GEYJ223V	1/10W 22K	C717	ECUZ1E104MBN	25V 0.1
R703	ERJ6GEYJ823	1/10W 82K	R739	ERJ6GEYJ681V	1/10W 680	C718,719	ECUV1C224KBM	16V 0.22
R704	ERJ6GEYJ102A	1/10W 1K	R741~743	ERJ6GEYJ562V	1/10W 5.6K	C721,722	ECUE1H100DCN	50V 10P
R705	ERJ6GEYJ103V	1/10W 10K	R744	ERJ6GEYJ103V	1/10W 10K	C723	ECEA1AKA221I	10V 220
R706	ERJ6GEYJ102A	1/10W 1K	R745	ERJ6GEYJ155V	1/10W 1.5M	C724	ECUV1C104MBM	16V 0.1
R707	ERJ6GEYJ473V	1/10W 47K	R746	ERJ8GEYJ103V	1/8W 10K	C725,726	ECUE1H102KBN	50V 1000P
R708	ERJ6GEYJ224V	1/10W 220K	R747	ERJ6GEYJ473V	1/10W 47K	C727,728	ECEA1HKA010I	50V 1
R709	ERJ6GEYJ683V	1/10W 68K	CAPACITORS			C730	ECUZ1E104MBN	25V 0.1
R711	ERJ6GEYJ154V	1/10W 150K	C701	ECEA0JKA220	6.3V 22	C731,732	ECA05SD151I	6.3V 150
R712	ERJ6GEYJ471V	1/10W 470	C702	ECEA1HKA010I	50V 1	C733	ECUZ1E104MBN	25V 0.1
R714	ERJ6GEY0R00A	1/10W 0.00	C703	ECEA0JKA101I	6.3V 100	C734	ECEA1AKA221I	10V 220
R717~720	ERJ6GEYJ102A	1/10W 1K	C704	ECUZ1E104MBN	25V 0.1	C735~737	ECUZNE104MBN	25V 0.1
R721	ERJ8GEYJ101V	1/10W 100	C705	ECEA1HKA010I	50V 1	C738	ECUV1C154KBN	16V 0.15
R722	ERJ6GEYJ473V	1/10W 47K	C706	ECUE1H101JCN	50V 100P	C742	ECUV1E273KBN	25V 0.027
R723	ERJ6GEYJ182V	1/10W 1.8K	C708	ECUE1H472KBN	50V 4700P	C743	ECUZNE104MBN	25V 0.1
R724	ERJ6GEYJ333V	1/10W 33K	C709	ECUE1C473KBN	16V 0.047	C744	ECUE1E822KBN	25V 8200P
R725	ERJ6GEYJ472V	1/10W 4.7K	C710	ECUE1H152KBN	50V 1500P	C745	ECUE1C473MBN	16V 0.047
R726	ERJ6GEYJ473V	1/10W 47K	C711,712	ECUZ1E104MBN	25V 0.1	C746	ECUE1H050DCN	50V 5P
R727	ERJ6GEYJ103V	1/10W 10K	C713	ECUV1C104MBM	16V 0.1	C747	ECUE1H222KBN	50V 2200P
R728	ERJ6GEYJ392V	1/10W 3.9K	C714	ECEA0JKA101I	6.3V 100	C748	ECUV1H271KBM	50V 270P
R730	ERJ6GEYJ331V	1/10W 330K						

CD UNIT PARTS LOCATION



CD REPLACEMENT PARTS LIST

Ref. No	Part No.	Part Name & Description	Remarks
		CABINET & CHASSIS	
31	REE0397	FPC WIRE	[M]
86-1	RMS0123-1	PIN(A)	
86-2	RMS0350	PIN(B)	
87	RAE0111Z	TRAVERSE DECK UNIT	
87-1	RDV0023	BELT	

Ref. No	Part No.	Part Name & Description	Remarks
87-2	SHGD112	RUBBER(A)	
87-3	SHGD113-1	RUBBER(B)	
87-4	SNSD38	SCREW	
88	XTV2+6G	SCREW	
89	RMR0533-K	CHASSIS	
95	RME0109	SPRING	