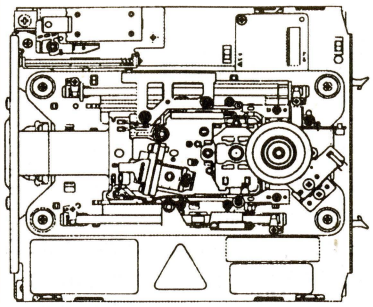
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
RRV1199

CD-ROM WRITER
DR-R504X

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	Remarks
	DR-R504X		
ZUCEB/WL	○	DC power supplied from other system component	

- **This product is a component of a system.**
  For the system composition, instruction manuals etc., refer to the service manual RRV1173 for DRM-5004X.
- **This product does not function properly when independent; to avoid malfunctions, be sure to connect it to the prescribed system component(s), otherwise damage may result.**

CONTENTS

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1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

NOTICE
(FOR CANADIAN MODEL ONLY)
Fuse symbols (fast operating fuse) and/or (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE
(POUR MODÈLE CANADIEN SEULEMENT)
Les symboles de fusible (fusible de type rapide) et/ou (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

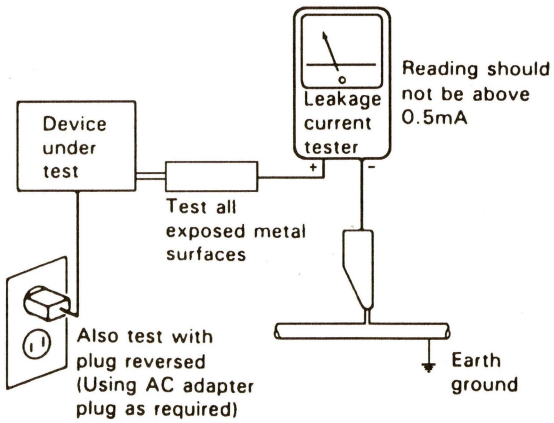
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

(FOR EUROPEAN MODEL ONLY)

VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

ADVERSEL:
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

VARNING!
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

LASER
Kuva 1
Lasersateilyn
varoitusmerkki

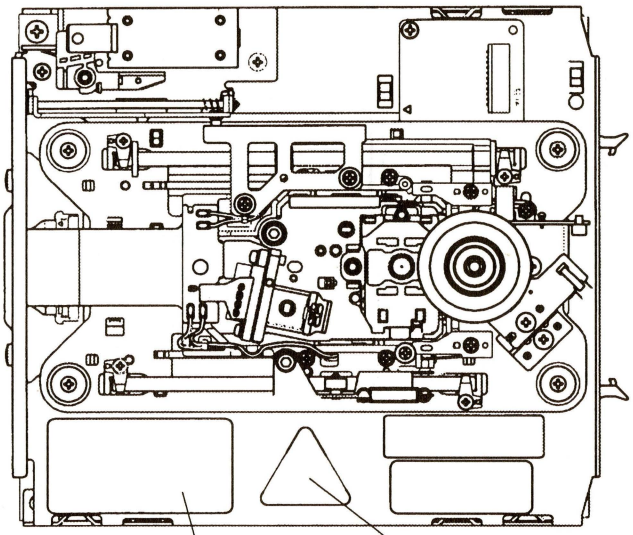
WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

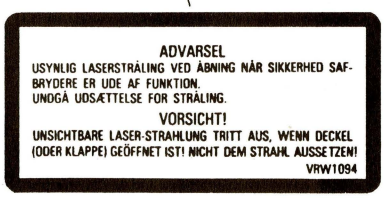
IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1.
SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

LASER
Picture 1
Warning sign for
laser radiation

LABEL CHECK





ZUCEB/WL model

ZUCEB/WL model

Additional Laser Caution

1. Laser Interlock Mechanism
   The position of the switch ＊1 (S614, S615, S616) for detecting loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when the switch ＊1 (S614, S615, S616) is not on $\overline{\text{CLMP}}$ terminal side ($\overline{\text{CLMP}}$ signal is OFF or high level.).
   Thus, the interlock will no longer function if the switch ＊1 (S614, S615, S616) is deliberately set to $\overline{\text{CLMP}}$ terminal side. (low level)
   The interlock also does not function in the test mode ＊2.
   Laser diode oscillation will continue, if between collector and emitter of Q102 and Q110 mounted on the HEAD UNIT is connected to GND, shorted to each other (fault condition).

2. When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

Note
＊1 : S614, S615 and S616 are situated in the CMSB UNIT of DRM - 5004X.
＊2 : Refer to page 29.

2. EXPLODED VIEWS, PACKING AND PARTS LIST

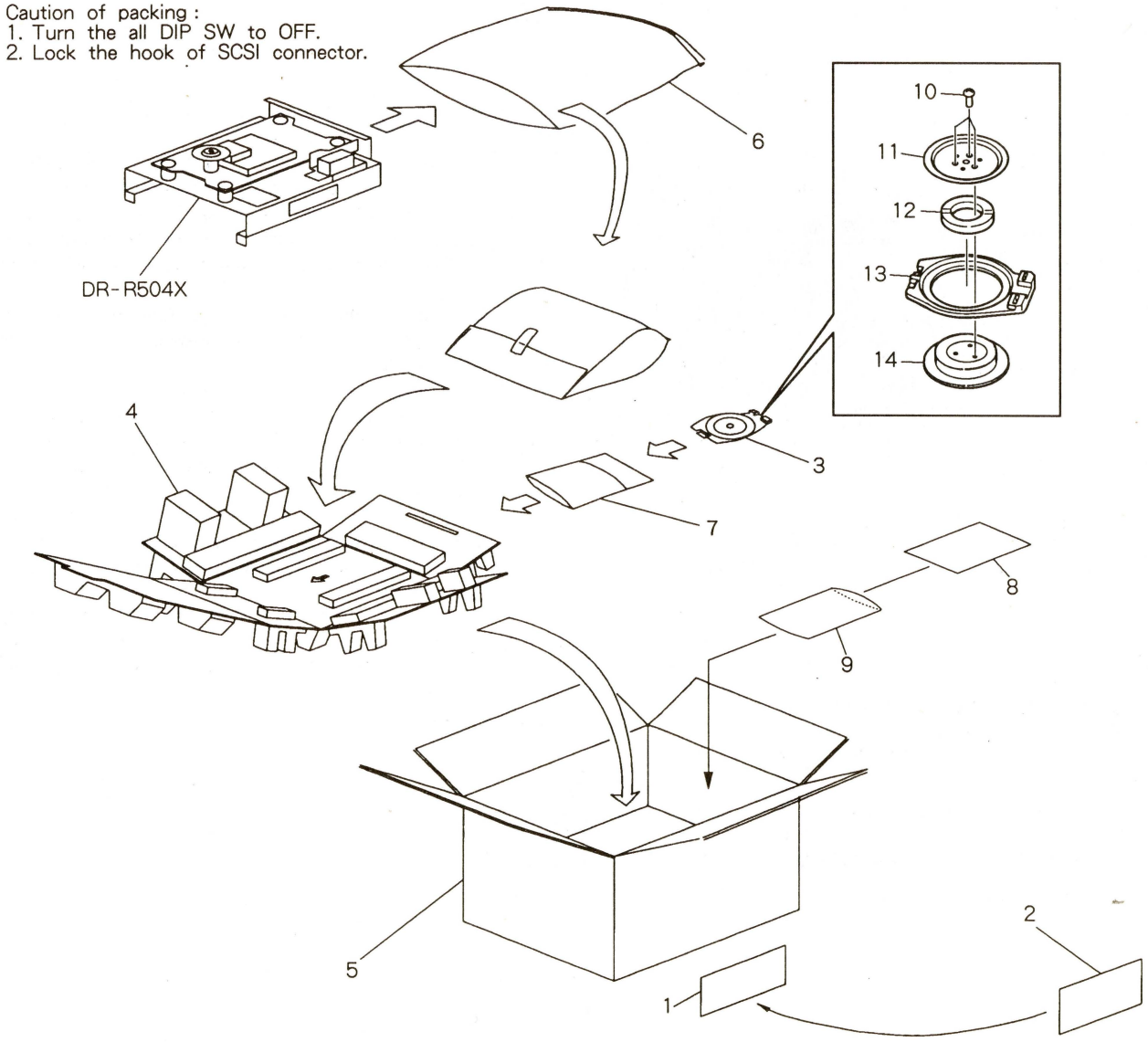
NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

2.1 PACKING

Parts List

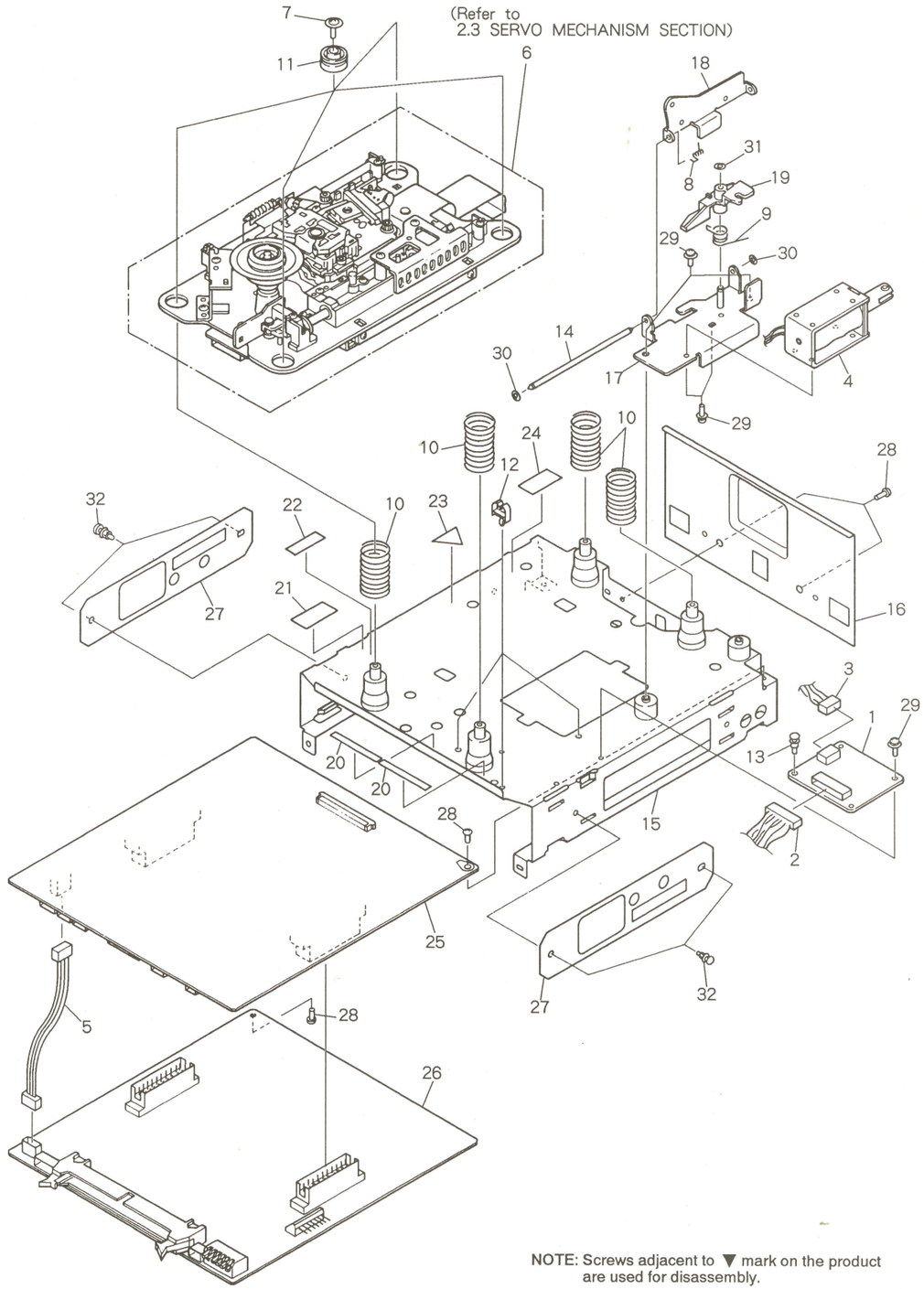
Mark	No.	Description	Part No.
NSP	1	Follow card bag	DHL1011
NSP	2	Follow up card	DRY1032
	3	Clamper assy - S	DXX2270
	4	Protector	DHA1326
	5	Paking case	DHG1626
	6	Polyethylene bag	DHL1093
NSP	7	Air cap bag	DHL1057
	8	Caution note (English)	DRM1172
	9	Polyethlene bag	Z21 - 016
	10	Screw	IPZ20P050FMC
	11	Yoke	RNE1627
NSP	12	C magnet	PMF1017
	13	Clamper retainer	RNK1945
NSP	14	Clamp cushion assy	DXB1557



2.2 MAIN SECTION

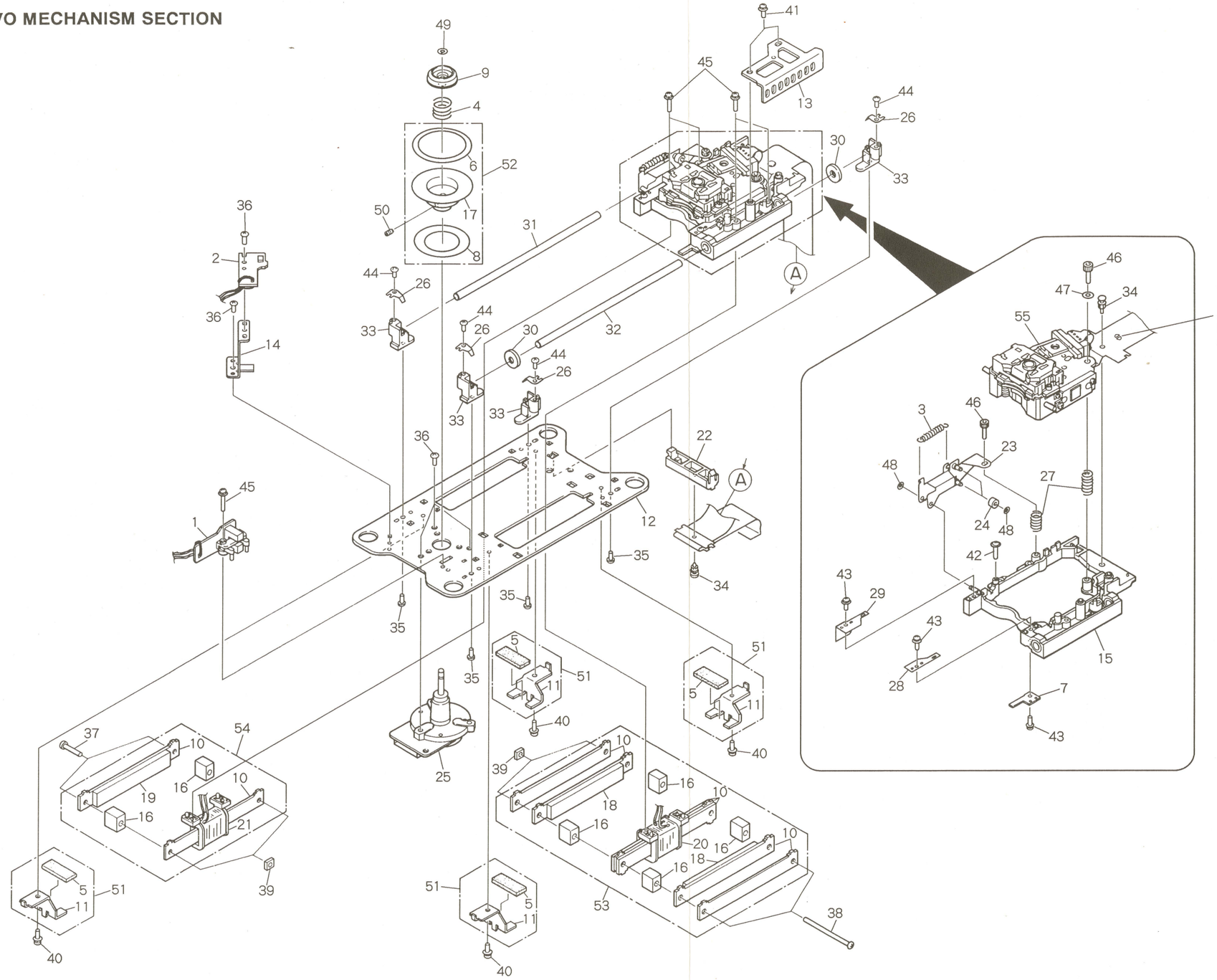
Parts List

Mark	No.	Description	Part No.
⚠	1	DRIVE unit	DWX1552
	2	Connector assy (11P)	DKP2993
	3	Connector assy (5P)	DKP2994
	4	Plunger	DXP1036
	5	Connector	PF04PP6B05
	6	Servo mechanism assy	DXB1530
	7	Float screw	DBA1072
	8	LP spring	DBH1280
	9	LA spring	DBH1281
	10	Float spring	DBH1282
	11	Float rubber	DEB1306
NSP	12	Cord clamp S	DEC1574
	13	Nylon rivet	DEC1830
	14	LP shaft	DLA1651
	15	RW box	DNE1280
	16	Shield plate	DNH1984
	17	P base	DNH1985
	18	Lock plate B	DNH1986
	19	Lock arm	DNK3051
NSP	20	Mechanism sheet	VEX1024
NSP	21	Label	DAL1094
NSP	22	Serial label	DRW1618
	23	Caution label (G)	VRW-329
	24	Caution label	VRW1094
	25	HEAD unit	DWX1519
	26	MAIN unit	DWX1520
	27	Sheet	DEC1870
	28	Screw	BBZ30P060FMC
	29	Screw	PMH26P060FMC
	30	Washer	WT16D032D025
	31	Washer	WT21D050D025
NSP	32	Plastic rivet	DEC1704



NOTE: Screws adjacent to ▼ mark on the product are used for disassembly.

2.3 SERVO MECHANISM SECTION



Parts List

Mark	No.	Description	Part No.
	1	TOC board assy	DWX1538
	2	FG board assy	DWX1539
	3	Roller holder spring (SUS)	ABH7023
	4	Centering spring	DBH1242
NSP	5	Cushion	DEB1302
NSP	6	Table sheet	DEC1484
	7	Shading plate	DEC1825
NSP	8	Reflection sheet	DEC1826
	9	Centering hab	DLA1644
NSP	10	Yoke	DNH1974
NSP	11	Yoke angle	DNH1975
NSP	12	Mechanism base	DNH1976
NSP	13	Lock plate	DNH1980
NSP	14	FG angle	DNH2012
	15	Carriage unit	DNS1174
NSP	16	Yoke holder	DNS1175
NSP	17	Disc table	DNS1171
NSP	18	Motor magnet	DNS1177
NSP	19	Sensor magnet	DNS1178
NSP	20	Motor bobbin	DNV1025
NSP	21	Sensor bobbin	DNV1026
	22	Flexible holder	DNV1027
NSP	23	TAN arm unit	DXB1527
	24	Bearing	DXB1531
	25	Spindle motor	DXM1071
	26	Shaft holder spring	PBH1136
	27	Skew spring	PBH1155
	28	Plate spring S	PBK1122
	29	Plate spring L	PBK1123
	30	Stopper rubber	PEB1035
	31	Guide bar	PLA1026
	32	Guide shaft	PLA1120
NSP	33	Shaft holder	PNR1038
	34	Nylon rivet	DEC1830
	35	Screw	BMZ20P040FZK
	36	Screw	BMZ26P040FMC
	37	Screw	BMZ30P160FMC
	38	Screw	BMZ30P350FMC
	39	Nut	NZ30FMC
	40	Screw	PMA26P040FMC
	41	Screw	PMB20P050FMC
	42	Screw	PMF20P050FMC
	43	Screw	PMH20P040FMC
	44	Screw	PMH20P050FZK
	45	Screw	PMH20P100FMC
	46	Screw	SMZ30H080FNI
	47	Washer	WC30FMC
	48	Washer	WT17D034D050
	49	Washer	WT26D047D025
	50	Screw	ZMD26H040FBT

Mark	No.	Description	Part No.
	51	Yoke angle assy	DXX2237
	52	Disc table assy	DXX2238
	53	Linear motor assy	DXX2239
	54	Sensor assy	DXX2240
	55	Pickup assy	DXX2241

3. SCHEMATIC AND PCB CONNECTION DIAGRAMS

NOTE FOR SCHEMATIC DIAGRAMS

(Type 4A)

1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**

2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**

3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance:(F):±1%, (G):±2%, (K):±10%, (M):±20% or ±5% unless otherwise noted.

4. **CAPACITORS:**
   Unit : p:pF or μF unless otherwise noted.
   Ratings : capacitor (μF) / voltage (V) unless otherwise noted.
   Rated voltage : 50V except for electrolytic capacitors.

5. **COILS:**
   Unit : m:mH or μH unless otherwise noted.

6. **VOLTAGE AND CURRENT:**
   ▭ or ←V :
   DC voltage (V) in PLAY mode unless otherwise noted.
   ⇦mA or ←mA :
   DC current in PLAY mode unless otherwise noted.
   Value in ( ) is DC current in STOP mode.

7. **OTHERS:**
   - ⊘ or ⊘ : Adjusting point.
   - ◀ : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.

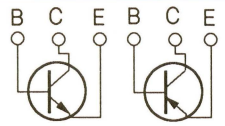
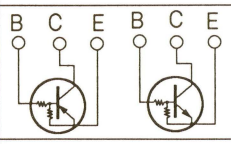
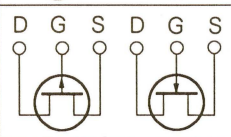
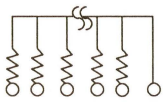
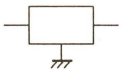
8. **SCH - □ ON THE SCHEMATIC DIAGRAM:**
   - SCH-□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)

9. **SWITCHES** (Underline indicates switch position):

MAIN UNIT
S1001 :DIP SW
S1001-1:BLKSZ
S1001-2:PARTY
S1001-3:TEARM
S1001-4:$\overline{\text{MTCS}}$
S1001-5:$\overline{\text{TEST-1}}$
S1001-6:$\overline{\text{TEST-2}}$

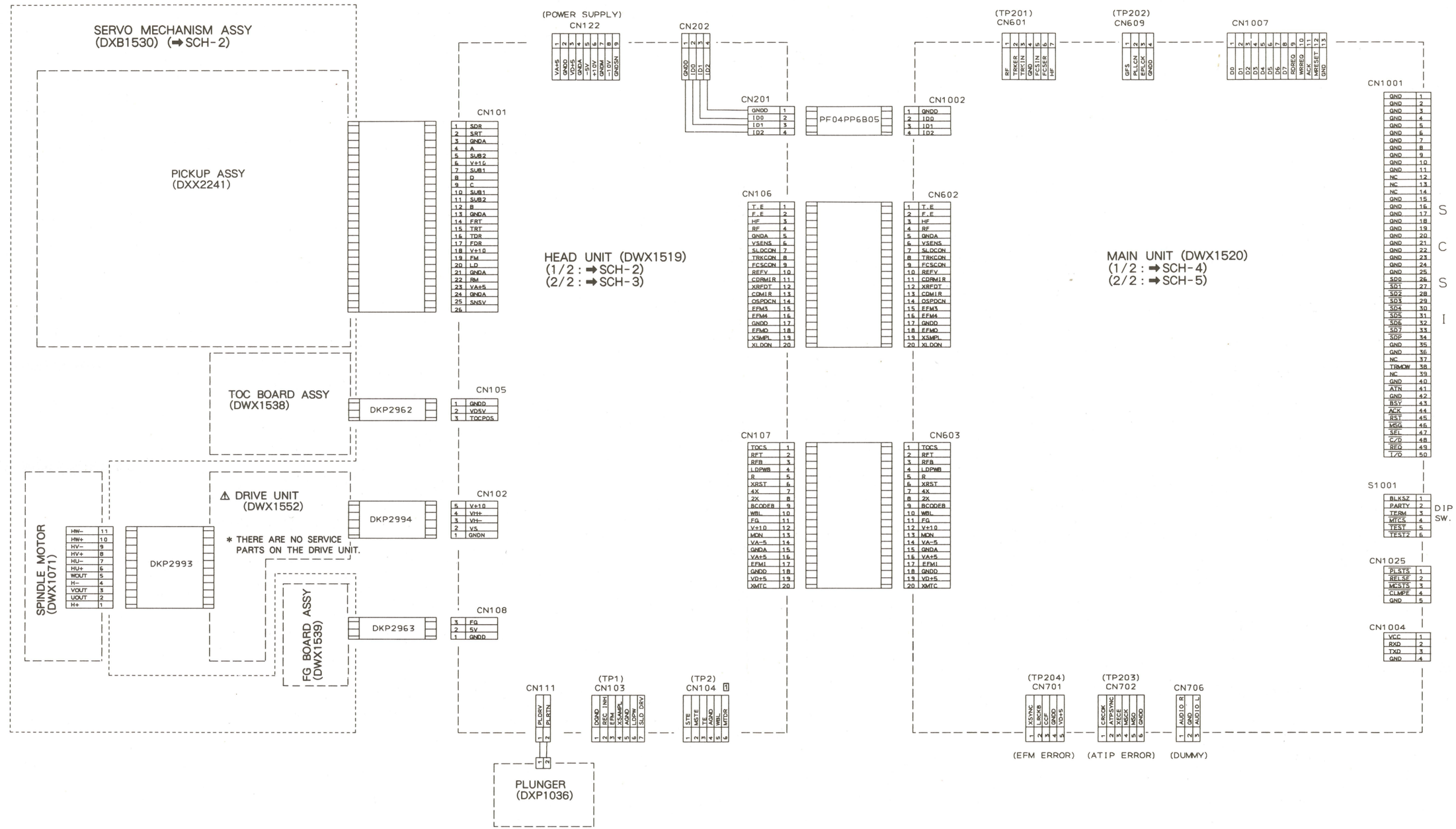
NOTE FOR PCB DIAGRAMS:

1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between main parts of PCB and schematic diagrams is shown below.

Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
		Transistor
		Transistor with resistor
		Field effect transistor
		Resistor array
		3-terminal regulator

3.1 OVERALL WIRING DIAGRAM

SCH-1



3.2 HEAD UNIT (1/2), TOC BOARD, FG BOARD AND PICKUP ASSEMBLIES

HEAD UNIT (DWX1519) (1/2)

SIGNAL ROUTE
➡ : RF SIGNAL LINE

MAIN UNIT (2/2) CN1002 (➡ SCH-5)

IC118 : MAIN BEAM I-V CONVERSION AMP

IC11 : RF AMP

IC14 : HF AMP

IC12,IC121 : WBL AMP

IC15,IC111 : WBL AMP

IC119 (2/2) : FRONT MONITOR I-V CONVERSION AMP

IC26 : WBL AUTO BALANCE

IC119 (1/2) : SUB BEAM I-V CONVERSION AMP

LASER DIODE DRIVE

PICKUP ASSY (DXX2241)

IC17 : MAIN BEAM TRKG ERROR AMP

IC16 : FOCUS ERROR AMP

IC18 (2/2) : SUB BEAM TRKG ERROR AMP (SUB1-SUB2)

IC18 (1/2) : TRKG ERROR AMP

IC113 : REC POWER BUFFER AMP

IC19 : PB POWER AMP

IC116 (1/2) : TRKG COIL DRIVE

IC116 (2/2) : FOCUS COIL DRIVE

IC109 (1/2) : SLIDER COIL DRIVE

IC117 (2/2) : SPEED SENSOR COIL AMP

SERVO MECHANISM ASSY (DXB1530)

TOC BOARD ASSY (DWX1538)

IC711,IC1104 : EFM COMPARATOR

Q200 - Q202 : PLUNGER DRIVE

PLUNGER

SPINDLE MOTOR (DWX1071)

DRIVE UNIT (DWX1552)

FG BOARD ASSY (DWX1539)

PHOTO REFLECTOR NJL5901K-F1

IC108 (1/2) : SPINDLE HOLE ELEMENT DRIVE INVERTER AMP

IC108 (2/2) N.JM5560M

* THERE ARE NO SERVICE PARTS ON THE DRIVE UNIT.

MAIN UNIT (1/2) CN602 (➡ SCH-4)

MAIN UNIT (1/2) CN603 (➡ SCH-4)

POWER SUPPLY ASSY (DRM-5004X)

CAUTION : FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE WITH SAME TYPE NO. ICP-N15, MFD BY ROHM CO., LTD, FOR IC124.

Waveforms of HEAD UNIT (1/2)

① RF
0.5 μS/div 20mV/div
• At the X1 PLAY
130mVp-p

② EFMI
0.5 μS/div 0.2V/div
• At the X1 PLAY
0.5Vp-p

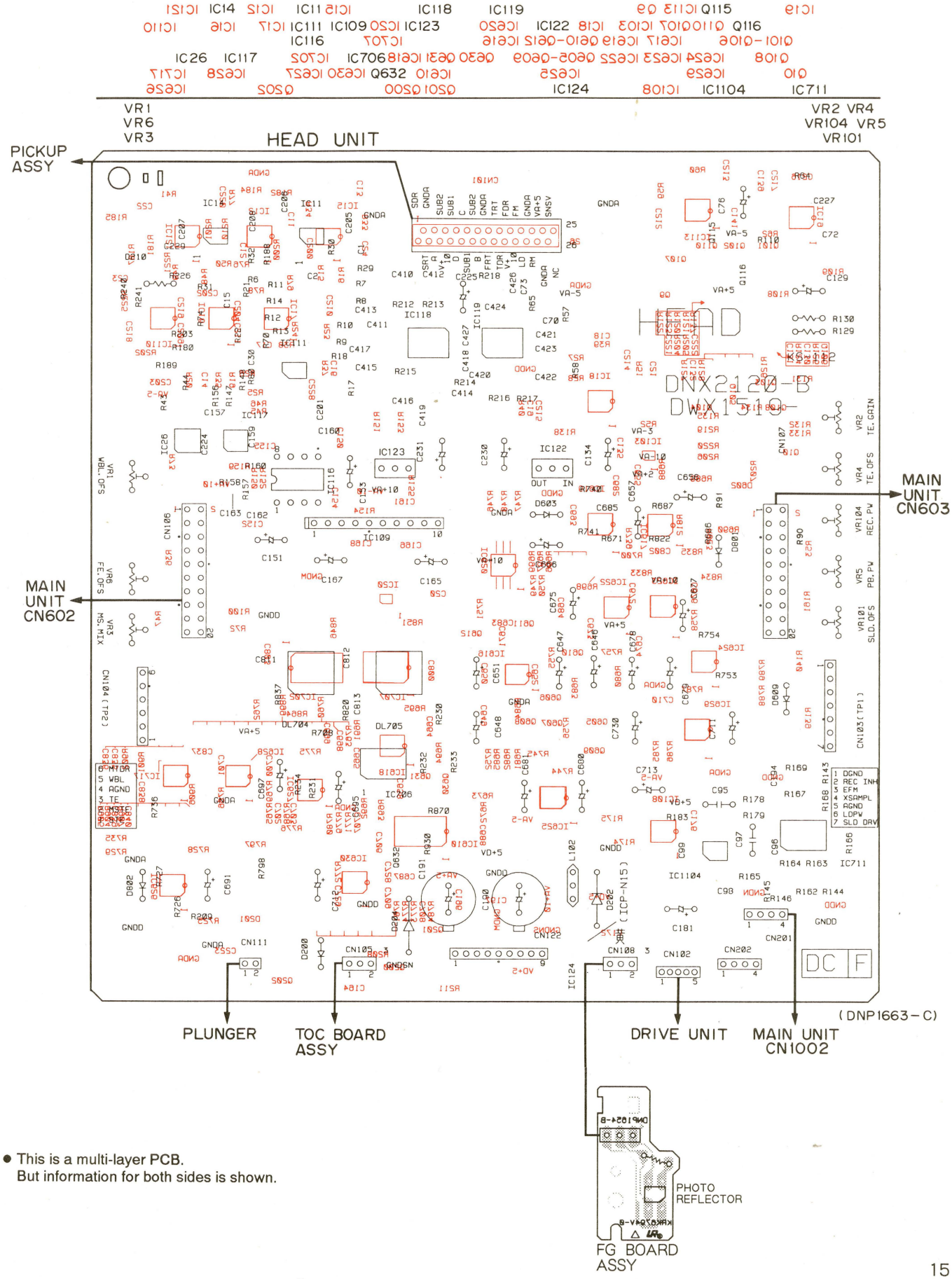
③ EFM
0.5 μS/div 0.2V/div
• At the REC POWER ON
Approx. 0.6Vp-p

④ WBLB
0.1mS/div 50mV/div
• At the X1 PLAY
(CD-R disc recorded)
50mVp-p

HEAD UNIT (1/2), TOC BOARD ASSY, FG BOARD ASSY, PICKUP ASSY

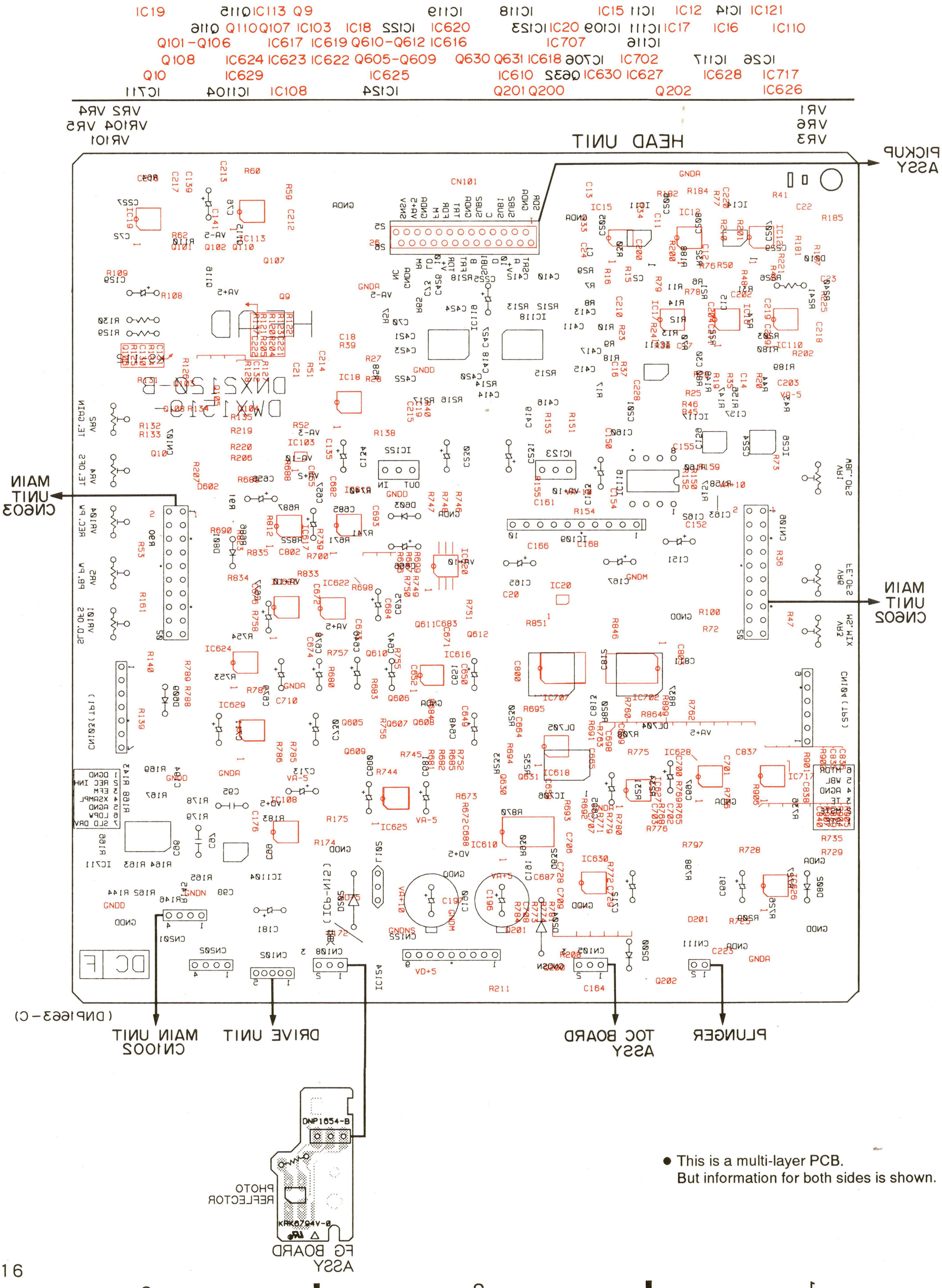
SCH-2

PCB – 1



- This is a multi-layer PCB.
  But information for both sides is shown.

PCB-1

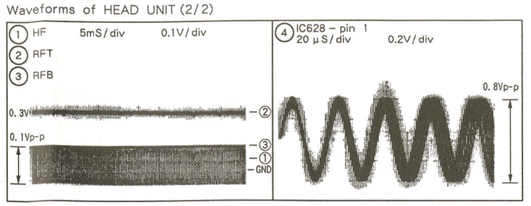


- This is a multi-layer PCB.
  But information for both sides is shown.

3.3 HEAD UNIT (2/2)

HEAD UNIT (DWX1519) (2/2)

Waveforms of HEAD UNIT (2/2)



SCH-3

DL704 : EFM 3T PULSE DELAY

DL705 : EFM 4T PULSE DELAY

IC616 (1/2) : RF TOP HOLD

IC616 (2/2) : RF BOTTOM HOLD

IC617 (2/2) : RF DET.

IC619 (1/2) : CD-R MIRROR SIGNAL GENERATION

IC617 (1/2) : BAR CODE DET.

IC702 : STRATEGY SWITCH EVERY SPEED

IC707 (1/4), IC706 (1/3 - 3/3) : STRATEGY MIX EVERY SPEED

IC620 (2/2) : CD MIRROR SIGNAL GENERATION

IC610 : WBL FILTER SW AND SPINDLE STOP SW

IC625 (2/2) : REFERENCE VOLTAGE GENERATION

IC626 (1/2) : SPINDLE DRIVE LEVEL SHIFT

IC622:RF TOP HOLD(for OPC)

IC623: RF BOTTOM HOLD (for OPC)

IC627 (2/2) NJM4560M

IC628 (1/2) NJM4560M

IC628 (2/2) NJM4560M

IC628 : NORMAL SPEED WBL BANDPASS FILTER

IC630 (2/2) NJM4560M

IC630 (1/2) NJM4560M

IC630 : FOURTH SPEED WBL BANDPASS FILTER

IC717 (2/2) NJM4560M

IC717 (1/2) NJM4560M

IC717 : DOUBLE SPEED WBL BANDPASS FILTER

IC629 (2/2) : WBL COMPARATOR

3.4 MAIN UNIT (1/2)

MAIN UNIT (DWX1520) (1/2)

SCH-4

SIGNAL ROUTE
➡ : EFM SIGNAL LINE

HEAD UNIT (1/2) CN106 (➡SCH-2)

HEAD UNIT (1/2) CN107 (➡SCH-2)

IC601 : SERVO CONTROL IC

IC601 CXA1372Q (SERVO CONTROL) (BD-AC)

IC602 : EFM ENCODER, DECODER, SPINDLE SERVO AND ATIP DECODER

IC602 PDS004A

IC603 : MECHA. CONTROL MICROCOMPUTER

IC603 GGC1077 (UPD78355GC-7EA)

IC604 : ATIP DECODER

IC604 PDJ006A

IC605 : PROGRAM ROM

IC605 DYW1389 (HN27C1024HCP-15)

IC606 : SRAM

IC606 LC35178ML-15

IC607,IC710 : DATA BUS AND ADDRESS BUS DIVIDER

IC607 TC74AC573F

IC710 TC74AC573F

IC608 : TRACKING AUTO GAIN CONTROL

IC609 : MIRROR SIGNAL SWITCH

IC611 : PB & REC PLL

IC612 : SENS SIGNAL SW

IC613 (2/2) : TRACKING LOW-PASS BOOST

IC615 : EFM SPNDLE CONTROL AMP

IC621 : TRACKING ERROR LEVEL DET.

IC632,IC633,IC635 : WBL SPINDLE CONTROL AMP

IC636 : WBL SPINDLE AMP SPEED SWITCH

IC637 (1/2),IC614 : PLL PHASE DIFFERENCE INPUT LPF

IC712 : WOBBLE SPINDLE SERVO GAIN SW.

Waveforms of MAIN UNIT (1/2)

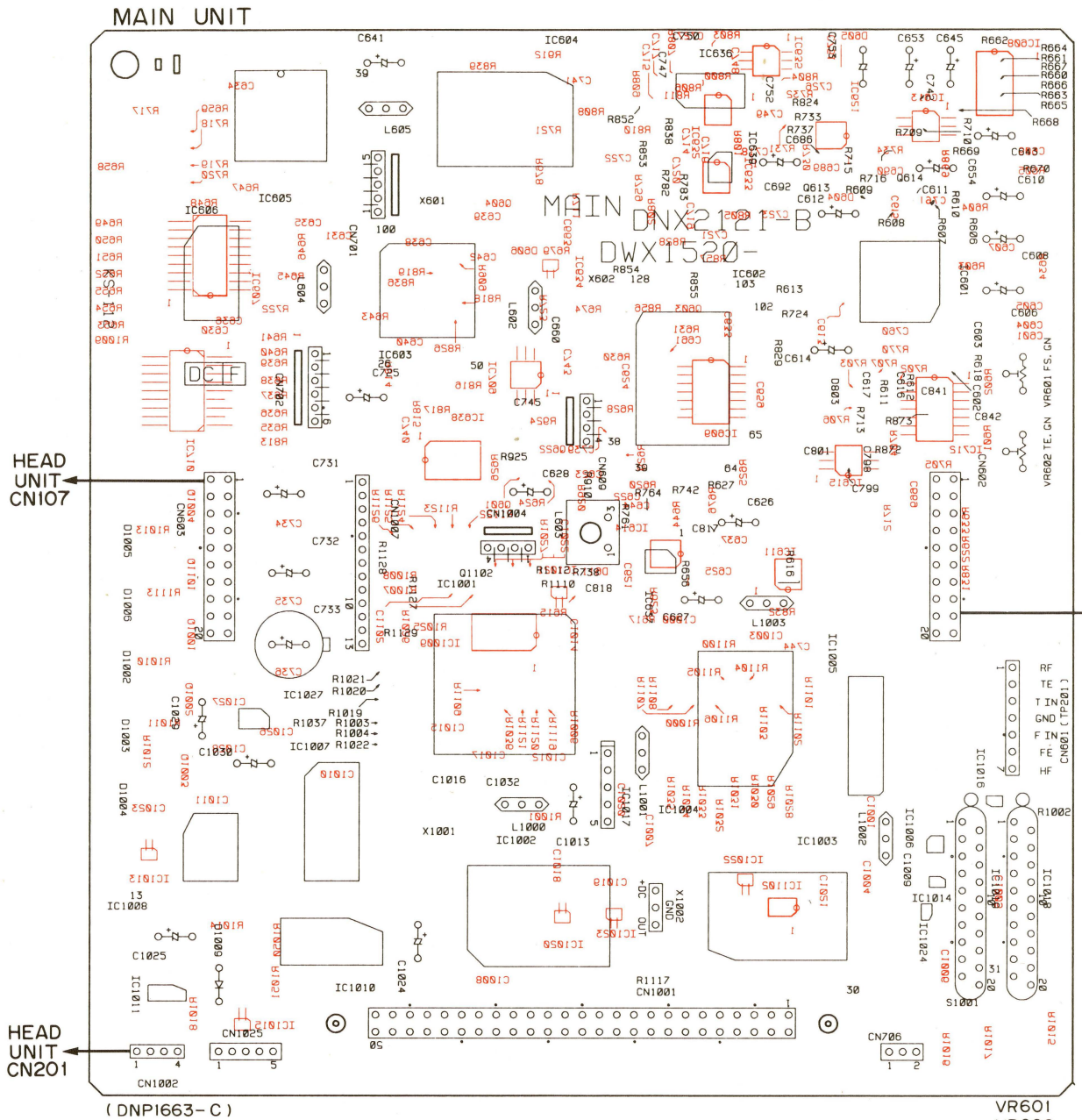
① PLLCN
0.1mS/div 50mV/div
• At the X1 PLAY
50mVp-p

② TRKER
1mS/div 50mV/div
• At the X1 PLAY (Tracking OFF)
Approx. 200Vp-p

MAIN UNIT (1/2)

SCH-4

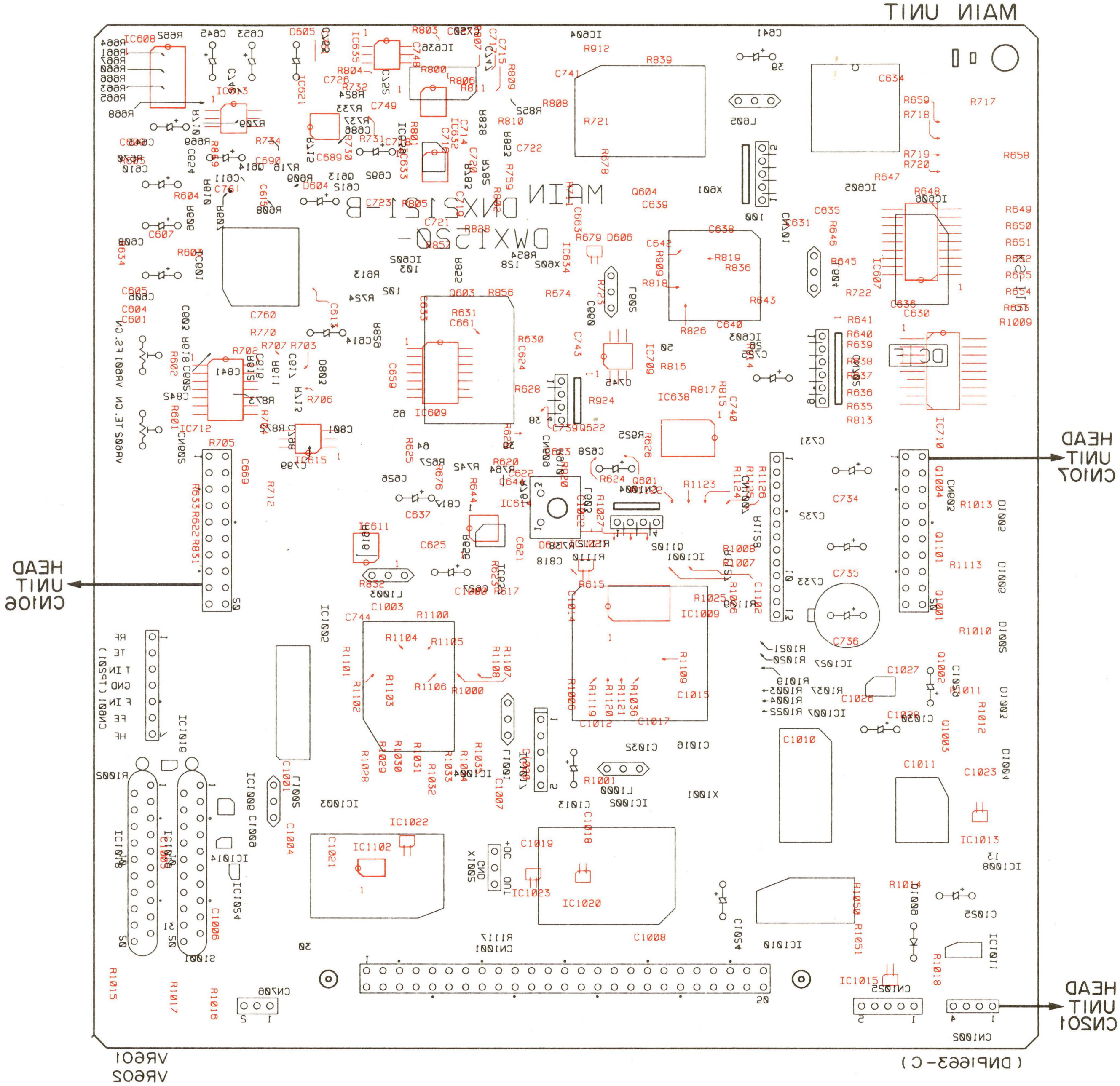
PCB – 2



IC606 IC605
IC604 IC603 Q1102 IC1001 IC1002
IC636 IC639 Q613 IC601 Q614 IC602 IC637 IC1004 IC1005 IC1003
IC1006 IC1016 IC1014 IC1019 IC1024 IC1018
IC1027 IC1007 IC1010
IC1011 IC1008

- This is a multi-layer PCB.
  But information for both sides is shown.

PCB-2



IC608 IC613 IC621 IC635 IC632 IC636 IC604 Q604 IC605 IC606
Q614 IC601 Q613 IC633 IC639 IC634 IC709 IC603 IC607 IC710
IC712 IC615 Q603 Q622 Q601 IC638 Q1001 – Q1004
IC1016 IC1006 IC611 IC609 IC602 IC1021 Q1102 IC1007 IC1027 Q1101 IC1013
IC1019 IC1014 IC1005 IC1004 IC614 IC637 IC1017 IC1009 IC1001 IC1010 IC1011 IC1008
IC1018 IC1024 IC1003 IC1102 IC1022 IC1023 IC1020 IC1002 IC1015

- This is a multi-layer PCB.
  But information for both sides is shown.

3.5 MAIN UNIT (2/2)

MAIN UNIT (DWX1520) (2/2)

SCH - 5

SIGNAL ROUTE
➡ : DIGITAL AUDIO SIGNAL LINE

IC1005 : HIGH-SPEED SRAM FOR ROM ENCODE AND DECODE (256KB)

IC1006,IC1014,IC1016,IC1024 : SUBCODE DATA TIMING SIGNAL CONVERSION

IC1018,IC1019 : 1MB BUFFER RAM (4Mb DRAM × 2)

IC1003 : BUFFER MEMORY CONTROLLER
BMC
IC1003
CXD1198AQ

IC1004 : ROM ENCODER AND DECODER
CD-ROM EN/DECODE
IC1004
PDS005A

IC1002 : SCSI CONTROL
SPC
IC1002
MB86601(A)

IC1001 : SYSTEM CONTROL MICROCOMPUTER
CPU
IC1001
GGC1062
(UPD70325GJ-10-5BG)

IC1007 : SRAM (256KB)

IC1008 : PROGRAM ROM FOR SYSTEM CONTROL (FLASH MEMORY)

IC1017 : RESET IC

IC1009 : RD AND WR PULSE GENERATION FOR MEMORY

IC1023 : RD PULSE GENERATION

IC1020 : WR PULSE GENERATION

IC1102 : CS DECODER

IC1027 : POWER SUPPLY GENERATION FOR FLASH MEMORY WR

IC1010 : ACTIVE TERMINATOR

IC1011 : POWER SUPPLY FOR TERMINATOR

Q1001 – Q1004,Q1101 : LED DRIVER

Q1102 : REMOTE CONTROL INTERFACE

HEAD UNIT (1/2) CN201 (➡ SCH-2)

SCSI BUS

(➡ SCH-4)

4. PCB PARTS LIST

NOTES:

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 When there are 2 effective digits(any digit apart from 0), such as 560 ohm and 47k ohm(tolerance is shown by J=5%, and K=10%).

560 Ω → 56 × 10¹ → 561 ····· RD1/8PM 5 6 1 J
47k Ω → 47 × 10³ → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits(such as in high precision metal film resistors).

5.62k Ω → 562 × 10¹ → 5621 ····· RN1/4PC 5 6 2 1 F

Mark	No.	Description	Part No.
LIST OF ASSEMBLIES			
NSP		COMP UNIT	DWM1454
		├HEAD UNIT	DWX1519
		└MAIN UNIT	DWX1520
⚠		DRIVE UNIT	DWX1552
		SERVO MECHANISM ASSY	DXB1530
		├TOC BOARD ASSY	DWX1538
		├FG BOARD ASSY	DWX1539
		└PICKUP ASSY	DXX2241
		*:THERE ARE NO SERVICE PARTS ON THE DRIVE UNIT.	
HEAD UNIT			
SEMICONDUCTORS			
		IC26	CXD7500M
⚠		IC124	ICP-N15
		IC116	LA6517
		IC11, IC14	LM6364M
		IC616	M5238AFP
		IC617, IC619, IC629	NJM2903M
		IC624, IC626	NJM2904M
		IC622, IC623	NJM311M
		IC108, IC110, IC1104, IC113, IC12	NJM4560M
		IC121, IC16-IC19, IC618, IC620	NJM4560M
		IC625, IC627, IC628, IC630, IC717	NJM4560M
		IC122	NJM78L02A
		IC123	NJM79L03A
		IC118, IC119	PA6004A
		IC109	TA8410AK
		IC610	TC4053BF
		IC707	TC74HC08AF
		IC702	TC74HC253AF
		IC706	TC74HC4075AF
		IC711	TC74HCU04AF

Mark	No.	Description	Part No.
		IC103	TC7S08F
		IC20	TC7S32F
		IC111, IC15	UPC811G2
		IC117	UPC812G2
		Q115, Q116, Q200, Q605, Q606	2SA1037K
		Q609, Q610	2SA1037K
		Q102-Q106, Q110	2SA1461
		Q10, Q107, Q108, Q9	2SA1462
		Q202	2SB1114
		Q101, Q607, Q608, Q611, Q612	2SC2412K
		Q201, Q630-Q632	DTC124EU
		D603, D609, D801, D802	1SS133X
		D202, D204	21DQ04
		D201, D210, D602	DA114
		D200	RB100A
COILS			
		DL704	DTF1083
		DL705	DTF1084
		L102	RTF1163
CAPACITORS			
		C2, C410, C412, C414, C416	CCSQCH020C50
		C420, C422, C424	CCSQCH020C50
		C16-C19	CCSQCH030C50
		C710	CCSQCH101J50
		C683, C684, C706-C709	CCSQCH151J50
		C1, C14, C15, C202	CCSQCH220J50
		C835, C836, C839, C840	CCSQCH221J50
		C24	CCSQCH330J50
		C698, C699, C702, C703	CCSQCH331J50
		C411, C413, C415, C417, C73	CCSQCH391J50
		C30	CCSQCH470J50
		C21	CCSQCH680J50
		C22, C23	CCSQCH820J50
		C666, C678, C679	CEAL010M50
		C134, C230, C231, C76	CEAL100M16
		C691	CEAL220M16
		C730	CEAL2R2M50
		C151, C153, C165, C167, C181	CEAL470M16
		C225	CEAL470M16
		C647, C651, C656, C657, C675	CEAL470M6R3

Mark	No.	Description	Part No.
		C677, C680, C681, C695, C697	CEAL470M6R3
		C711, C713	CEAL470M6R3
		C646, C648	CEAL4R7M35
		C129	CEAS101M6R3
		C190, C191	CEAS102M6R3
		C160, C95, C97	CFTYA474J50
		C655	CKSQYB102K50
		C130, C131, C141, C221, C222	CKSQYB103K50
		C194, C203, C658, C672, C70	CKSQYB104K25
		C72, C98, C99	CKSQYB104K25
		C227	CKSQYB182K50
		C421, C423	CKSQYB332K50
		C162, C163, C685	CKSQYB333K25
		C649, C671, C96	CKSQYB472K50
		C150, C155, C161	CKSQYB473K50
		C802	CKSQYB822K50
		C11-C13, C135, C139, C152	CKSQYF103Z50
		C154, C164, C166, C168, C172	CKSQYF103Z50
		C176, C20, C200, C201	CKSQYF103Z50
		C204-C220, C224, C228, C229	CKSQYF103Z50
		C418, C419, C426, C427, C650	CKSQYF103Z50
		C652, C673, C674, C676	CKSQYF103Z50
		C687, C688, C800, C803	CKSQYF103Z50
		C811-C813	CKSQYF103Z50
		C132, C157, C159, C196, C197	CKSQYF104Z25
		C682, C693	CKSQYF104Z25
		C223, C664, C665	CKSQYF473Z50
		C700, C701, C728, C729	CKSQYF473Z50
		C837, C838	CKSQYF473Z50
RESISTORS			
		R226(2.2kΩ)	DCN1028
		R129, R130(100Ω)	DCN1055
		R209	RD1/2PM2R7J
		VR1, VR101, VR104, VR4-VR6	VRTB6HS103
		VR2, VR3	VRTB6HS223
		Other resistors	RS1/10S□□□J
OTHERS			
		CN106, CN107 DIN CONNECTOR	52299-0200
		CN201 KR CONNECTOR	B4B-PH-K
		CN101 FLEXIBLE CONNECTOR(26P)	DKP2991
		EARTH PLATE	DNF1446
		CN111 KR CONNECTOR	S2B-PH-K
		CN105 KR CONNECTOR	S3B-PH-K
		CN202 KR CONNECTOR	S4B-PH-K
		CN122 KR CONNECTOR	S9B-PH-K

Mark	No.	Description	Part No.
MAIN UNIT			
SEMICONDUCTORS			
		IC601	CXA1372Q
		IC1003	CXD1198AQ
		IC1008	DYW1388
		IC605	DYW1389
		IC1018, IC1019	HM514400BZ-8
		IC606	LC3517BML-15
		IC1005	LH52258AK-25
		IC1017	M51953BL
		IC1027	MAX662CSA
		IC1002	MB86601
		IC1011	MC34268D
		IC1010	MCCS142235DW
		IC1007(MS62256CLL-10FC)	GGC1029
		IC611, IC613-IC615, IC621	NJM4560M
		IC632, IC633, IC635, IC637, IC639	NJM4560M
		IC709	NJM4560M
		IC604	PDJ006A
		IC602	PDS004A
		IC1004	PDS005A
		IC638	TC74AC04F
		IC1009	TC74AC139F
		IC607, IC710	TC74AC573F
		IC608	TC74HC4051AF
		IC609, IC636, IC712	TC74HC4053AF
		IC1021	TC7S00F
		IC1015, IC1016	TC7S04F
		IC1014, IC1022	TC7S08F
		IC1013, IC1024, IC634	TC7S32F
		IC1020, IC1023	TC7SH32F
		IC1102	TC7W74F
		IC1006	TC7W74FU
		IC1001(UPD70325GJ-10-5BG)	GGC1062
		IC603(UPD78355GC-7EA)	GGC1077
		Q601, Q613	2SC2412K
		Q603, Q614, Q622	DTA124EU
		Q1001-Q1004, Q1101, Q1102, Q604	DTC124EU
		D604-D606, D803	DA114
		D611	KV1420
		D1009	RB100A
		D1003(SLR-342MCT31-TS)	GGC1084
		D1004, D1006(SLR-342VCT31-TS)	GGC1085
		D1002, D1005(SLR-342YCT31-TS)	GGC1086
COILS			
		L603(1UH)	DTL1012
		L1000 -L1003, L602, L604, L605	RTF1163
SWITCH			
		S1001	DSX1040
CAPACITORS			
		C638, C639	CCSQCH100D50
		C744	CCSQCH102J50
		C1015, C1016	CCSQCH120J50
		C748, C761	CCSQCH271J50
		C739	CCSQCH470J50

Mark	No.	Description	Part No.
	C637, C644		CCSQCH820J50
	C610		CEAL010M50
	C1029, C1030, C606		CEAL100M16
	C612		CEAL101M6R3
	C692		CEAL2R2M50
	C1025		CEAL470M16
	C1024, C608, C614, C627, C641		CEAL470M6R3
	C643, C645, C653, C654, C725		CEAL470M6R3
	C753		CEALNP2R2M35
	C628		CEALNP3R3M25
	C626		CEALNP4R7M16
	C1013		CEALR47M50
	C733		CEAS102M6R3
	C731, C732		CEAS471M6R3
	C1009, C715		CKSQYB102K50
	C603, C611, C617, C622, C623		CKSQYB103K50
	C663		CKSQYB103K50
	C604, C605, C607, C609, C625		CKSQYB104K25
	C690, C742, C760		CKSQYB104K25
	C720		CKSQYB122K50
	C749		CKSQYB123K50
	C669		CKSQYB153K50
	C727		CKSQYB183K50
	C721		CKSQYB223K50
	C686		CKSQYB272K50
	C714, C716		CKSQYB273K50
	C601		CKSQYB332K50
	C602, C613, C719		CKSQYB333K25
	C615, C616		CKSQYB472K50
	C801		CKSQYB823K25
	C1000, C1001, C1003-C1007		CKSQYF103Z50
	C1010-C1012, C1014, C1017-C1019		CKSQYF103Z50
	C1021-C1023, C1032, C1102, C624		CKSQYF103Z50
	C630, C634-C636, C642		CKSQYF103Z50
	C659-C661, C717, C718		CKSQYF103Z50
	C722, C723, C740, C743, C745		CKSQYF103Z50
	C747, C750-C752, C798, C799		CKSQYF103Z50
	C817, C818, C841, C842		CKSQYF103Z50
	C1008, C1020, C1028, C631, C633		CKSQYF104Z25
	C640, C689, C726, C734-C736		CKSQYF104Z25
	C741		CKSQYF104Z25
	C1026, C1027		CKSQYF224Z25
	C621		CKSQYF473Z50

RESISTORS

	VR601, VR602	VRTB6HS103
	Other resistors	RS1/10S□□□J

OTHERS

	CN1004, CN609 CONNECTOR(2MM)	52084-0410
	CN701 CONNECTOR(2MM)	52084-0510
	CN702 CONNECTOR(2MM)	52084-0610
	CN602, CN603 DIN CONNECTOR	53229-0200
	CN1007 KR CONNECTOR	B13B-PH-K
	CN1002 KR CONNECTOR	B4B-PH-K
	EARTH PLATE	DNF1446
	X1002 CRYSTAL OSCILATOR(24.00MHz)	DSS1055
	X602 CRYSTAL OSCILATOR (45.1584MHz)	DSS1060

Mark	No.	Description	Part No.
	CN1001	(FAP-5001-1202-OBS) CONNECTOR	GGC1078
		IC SOCKET(PLCC32P) (IC160-0324-230)	GGC1080
		IC SOCKET(PLCC44P) (IC160-0444-230)	GGC1079
	X1001	CERAMIC RESONATOR(20MHz)	OSS1020
	X601	CERAMIC RESONATOR(32MHz)	OSS1021
	CN706	KR CONNECTOR	S3B-PH-K
	CN1025	KR CONNECTOR	S5B-PH-K

TOC BOARD ASSY

RESISTORS

	All resistors	RD1/6PM□□□J

OTHERS

	PHOTO INTERRUPTER	GP1A51HR
	BINDER(SKB-90BK)	Z09-056

FG BOARD ASSY

RESISTORS

	All resistors	RD1/6PM□□□J

OTHERS

	PHOTO REFLECTOR	NJL5801K-F1
	BINDER(SKB-90BK)	Z09-056

5. ADJUSTMENTS

• Adjustment and Check Items

Perform the adjustment of this model in the order as shown below.

(Adjustment 1)

1. Playback power adjustment
2. Coarse focus offset adjustment
3. Coarse skew adjustment
4. Grating adjustment
5. DPP (tracking offset) adjustment
6. Fine skew adjustment
7. Grating re-adjustment

(Adjustment 2)

1. VCO free-run frequency adjustment
2. Slider speed control offset adjustment
3. Playback power re-adjustment
4. Recording power adjustment
5. Focus offset adjustment
6. Main and Sub mix ratio adjustment
7. Tracking amp. gain adjustment
8. Tracking offset adjustment
9. Fine focus offset adjustment
10. Focus servo loop gain adjustment
11. Tracking servo loop gain adjustment
12. VCO free-run frequency verification
13. WBL offset adjustment

• Measuring Equipment

1. Dual trace oscilloscope (10:1 probe)
2. Laser power meter
3. Test disc (YEDS - 7)
4. CDR disc with recorded
   (Type No. CD - R63, manufactured by TDK.)
5. Low-pass filter (39k Ω +1000pF)
6. Hight-pass filter (3.9k Ω +180pF)
7. Signal generator
8. Frequency counter (measurable over 10MHz)
9. Hexagonal screwdriver (1.5mm diagonal)
10. Other general tools

• Adjustment Points and Their Names

VR1 : WBL offset (WBL. OFS)
VR2 : Tracking amp gain (TE. GAIN)
VR3 : Main and Sub mix ratio (MS. MIX)
VR4 : Tracking offset (TE. OFS)
VR5 : Playback power (PB. PW)
VR6 : Focus offset (FE. OFS)
VR101 : Slider speed control offset (SLD. OFS)
VR104 : Recording power (REC. PW)
VR601 : Focus servo loop gain (FCS. GAIN)
VR602 : Tracking servo loop gain (TRK. GAIN)
L603 : VCO adjustment (VCO ADJ)
Radial/tangential adjustment screws of pickup
: Skew
Grating adjustment slit of pickup
: Grating

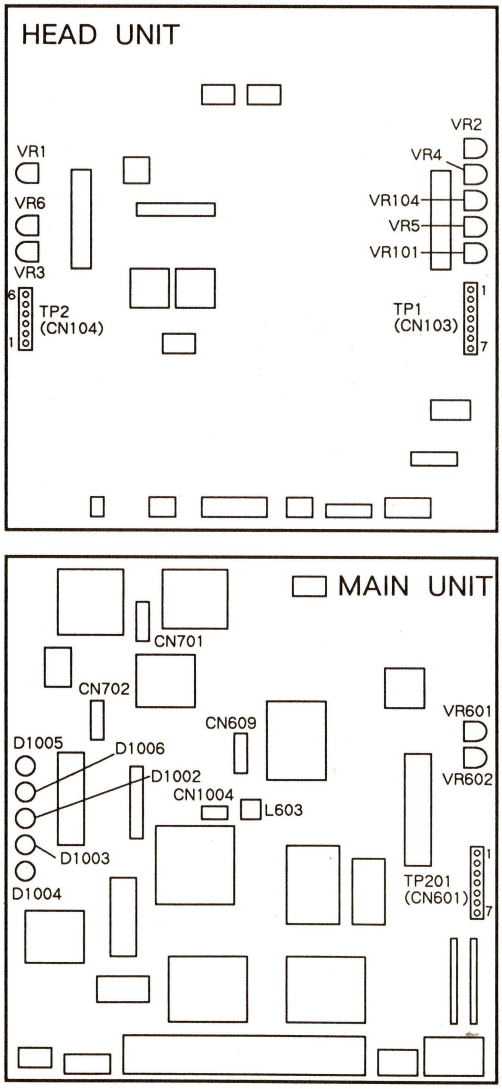


Fig. 1 Adjustment point

5.1 Function Table of the Remote Controller (RU–V101) for Service

• Test mode

Shows the function table of the remote controller (RU-V101) for service as follows. When operating the CD-ROM writer directly, it is possible to operate as shown below by connecting the wired-remote control to the CD-ROM writer with the interface.

• Schematic Diagram of the Conversion Jig for Remote Control Operation

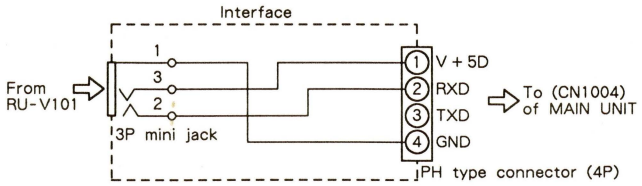


Fig. 2

5.2 How to Control the Remote Control Unit

Importance : When perfoming the adjustment, be sure to turn the power on after set to DIP SW5 to ON, SW6 to OFF and SCSI ID to 7 (Pins 1 to 4 of CN202 are all shorted.)At this time, operation can not performed from the Host.

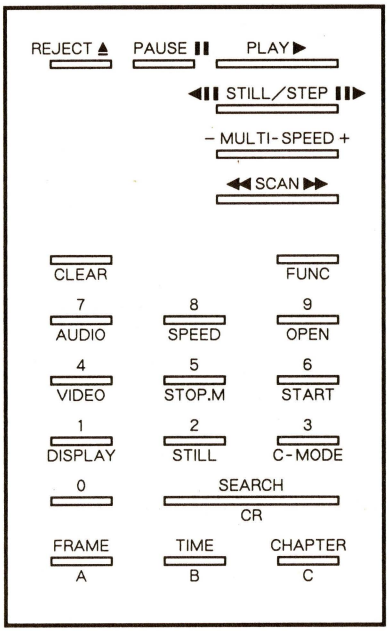


Fig. 3 RU-V101

• Test command

key operation	Description
[REJECT]	STOP
[0]+[TIME]	All servo OFF
[1]+[TIME]	Laser diode (LD) ON
[2]+[TIME]	Focus ON
[3]+[TIME]	Spindle ON/tracking OFF
[4]+[TIME]	Tracking ON
[5]+[TIME]	MAX power ON entry
[6]+[TIME]	MAX power ON
[7]+[TIME]	Spindle rotation frequency : Normal speed
[8]+[TIME]	Spindle rotation frequency : Twofold speed
[9]+[TIME]	Spindle rotation frequency : Fourfold speed
[3]+[4]+[CHAPTER]	TOC read
[4]+[2]+[CHAPTER]	Power calibration
[3]+[7]+[CHAPTER]	REC pause
[2]+[1]+[CHAPTER]	REC start
[4]+[1]+[CHAPTER]	PMA record
[5]+[3]+[CHAPTER]	Calibration power ON
[0]+[9]+[CHAPTER]	1 Track jump : FWD
[1]+[0]+[CHAPTER]	1 Track jump : RWD
[1]+[1]+[CHAPTER]	10Track jump : FWD
[1]+[2]+[CHAPTER]	10Track jump : RWD
[1]+[3]+[CHAPTER]	96Track jump : FWD
[1]+[4]+[CHAPTER]	96Track jump : RWD
[MIN]+[SEC]+[FRM]+[SEARCH]	TIME search
[TRACK NUMBER]+[FUNC]+[0]	Track number search

Caution :

- •When replacing the disc, perform the TOC read. (However, does not perform the TOC read in the adjustment.)
- •Perform the power calibration before first recording after the disc is replaced.
- •Perform the PMA record after the recording.
- •Perform the STOP when changing the spindle rotation frequency.
- •Perform the power calibration before first recording after the spindle rotation frequency is changed.

5.3 Adjustments

5.3.1 Adjustment 1

1. Playback Power Adjustment

(Adjustment 1)

● Objective ● Symptom when out of adjustment	To optimize the playback power of the laser diode. Play does not start, track search is impossible, track are skipped.		
● Measurement instrument connections	Shine the light dischrged from the objective lens on the light power meter sensor. [Settings] Wavelength 790nm Average mode	● Player state ● Adjustment location ● Disc	Laser diode (LD) ON VR5 (PB. PW) None needed

[Procedure]

1. Move the pickup to the outer edge of the disc.
2. Lights up the playback laser diode by laser diode (LD) ON.
3. Shine the light discharged from the objective lens in the pickup on the light power meter sensor. Adjust VR5 (PB.PW) so that the playback laser diode output is an average 0.6 mW ± 0.02 mW.

2. Coarse focus offset adjustment

(Adjustment 1)

● Objective ● Symptom when out of adjustment	To optimize the DC offset voltage of the focus error amp. The player does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP201 (CN601), Pin 6 (FCSER). [Settings] 5 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Stop VR6 (FE. OFS) None needed

[Procedure]

1. Adjust VR6 (FE. OFS) so that the DC voltage at TP201, Pin 6 (FCSER) is 0 ± 10mV.

3. Coarse Skew Adjustment

(Adjustment 1)

● Objective ● Symptom when out of adjustment	To coarse adjust the angle to the disc of pickup for perform the grating and DPP (tracking offset) adjustments correctly. Some discs can be played but not others.		
● Measurement instrument connections	Connect the oscilloscope to TP201 (CN601), Pin 1 (RF). [Settings] 20 mV/division 200 ns/division AC mode	● Player state ● Adjustment location ● Disc	Spindle rotation frequency : Normal speed, focus ON, spindle ON/ tracking OFF Radial adjustment screw and tangential adjustment screw YEDS-7

[Procedure]

1. Move the pickup to the position where the radial/tangential adjustment screws will be seen so that the radial/tangential adjustment screws can be adjusted.
   Set to normal speed, focus ON and spindle ON.
2. Adjust the RAD (radial direction) and TAN (tangential direction) adjustment acrews alternately with hexagonal screwdriver (1.5 mm) to maximize the RF output at TP201 (CN601), pin 1.

Note : Radial and tangential mean the direction relative to the disc shown in Fig. 4.

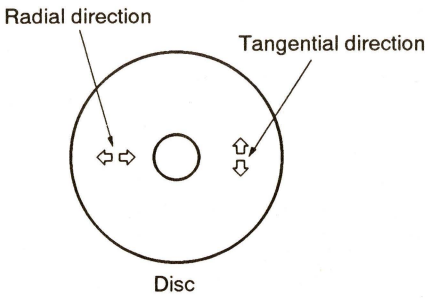
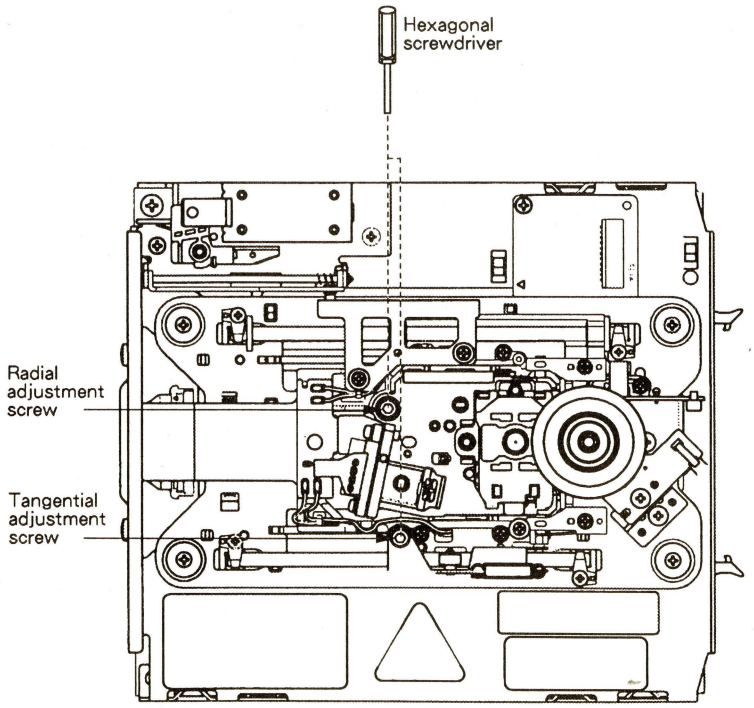


Fig. 4



4. Grating Adjustment

(Adjustment 1)

● Objective	To align the tracking error generation laser beam spots to the optimum angle on the track.		
● Symptom when out of adjustment	Play does not start, track search is impossible, tracks are skipped.		
● Measurement instrument connections	Connect the oscilloscope to TP201, Pin 2 (TE) via a low-pass filter. (see Fig. 5) [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Spindle rotation frequency : Normal speed, focus ON, spindle ON/ tracking OFF Grating slit on pickup YEDS-7

[Procedure]

1. Move the pickup to the position where the grating adjustment slit will be seen so that the grating adjustment can be adjusted.
2. Set to normal speed, focus ON and spindle ON.
3. Insert a screwdriver into the grating adjustment slit and adjust the grating to find the null point.
   For more details, see next page.
4. Turn the screw driver counterclockwise from the null point and set the grating to the first point where the wave amplitude reaches its maximum.
   Reference : Fig.6 shows the relation between the angle of the tracking beam with the track and the waveform.

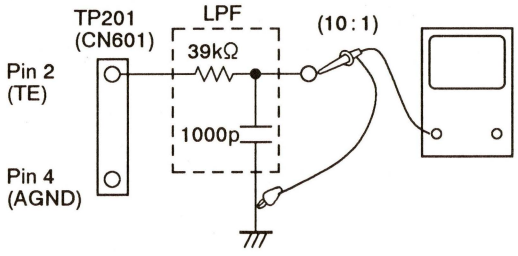
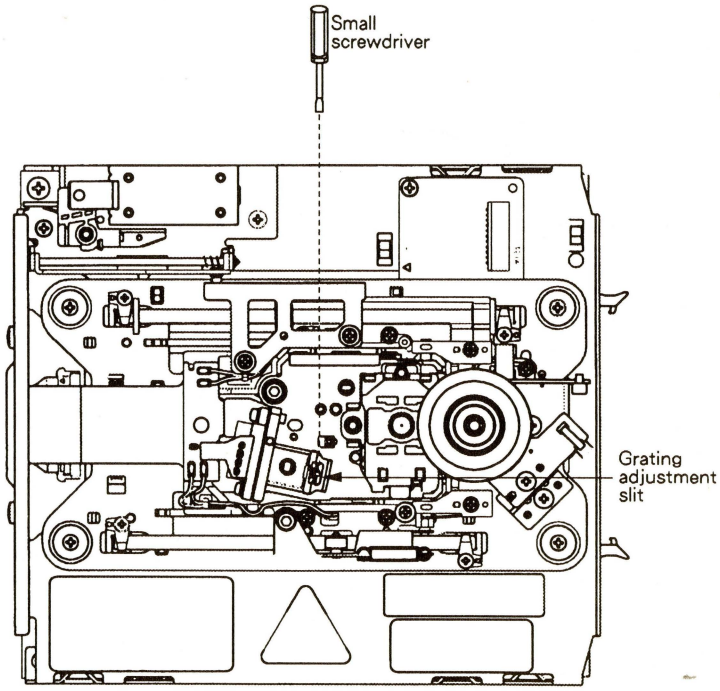


Fig. 5



[How to find the null point]

When you insert the small screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP201 (CN601), Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which the envelope of the waveform is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Fig. 6.)

This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

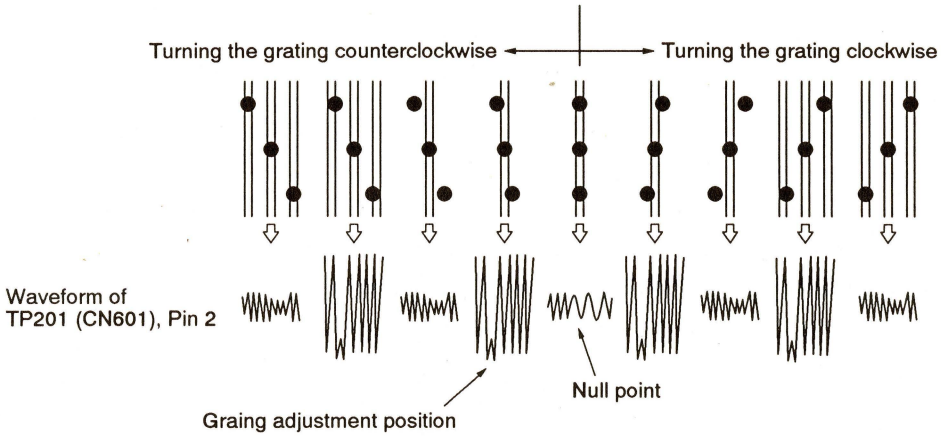
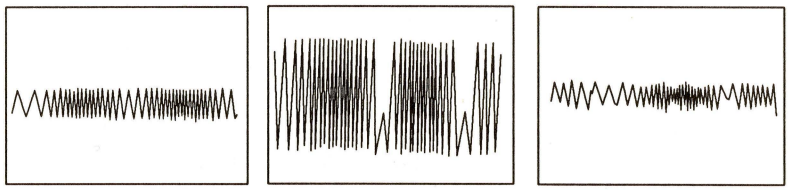


Fig. 6



Null point waveform

Maximum amplitude waveform

Waveform other than the null point

Note : If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, adjust the grating again.

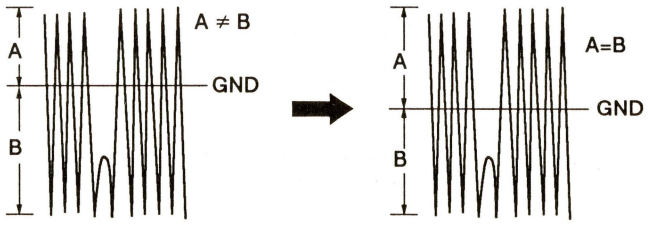
5. DPP (Tracking Offset) Adjustment

(Adjustment 1)

● Objective	To correct for the variation in the sensitivity of the tracking photodiode.		
● Symptom when out of adjustment	Play does not start or track search is impossible.		
● Measurement instrument connections	Connect the oscilloscope to TP201 (CN601), Pin 2 (TE) [This connection may be via a low-pass filter (39kΩ +1000pF).] [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Spindle rotation frequency : Normal speed, focus ON, spindle ON/ tracking OFF VR4 (TE. OFS) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R=35mm).
2. Set to normal speed, focus ON and spindle ON.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR4 (TE. OFS) so that the positive amplitude and negative amplitude of the tracking error signal at TP201 (CN601), Pin 2 (TE) are the same (in other words, so that there is no DC component).



When there is a DC component

When there is no DC component

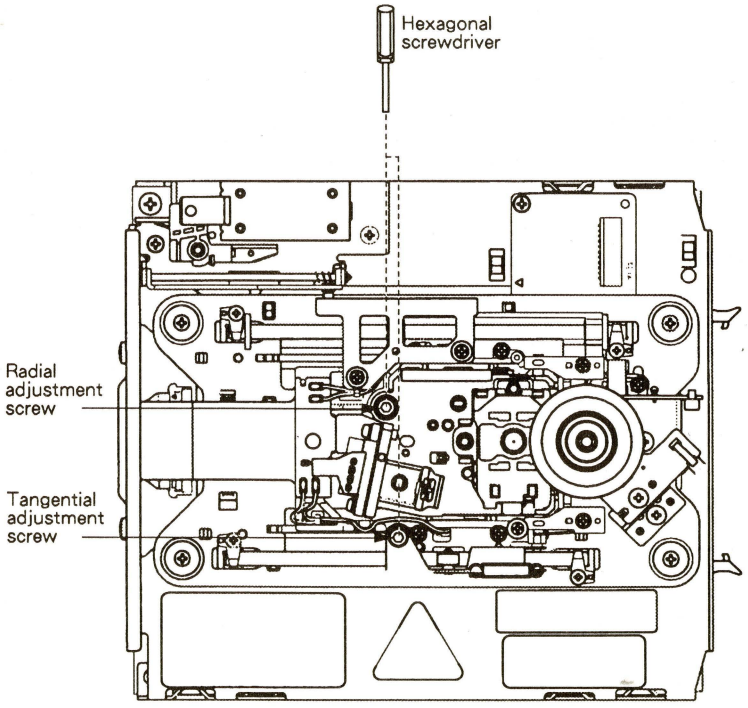
6. Fine Skew Adjustment

(Adjustment 1)

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Some discs can be played but not others.		
● Measurement instrument connections	Connect the oscilloscope to TP201 (CN601), Pin 1 (RF). [Settings] 20mV/division 200ns/division AC mode	● Player state ● Adjustment location ● Disc	Spindle rotation frequency : Normal speed, focus ON, spindle ON/ tracking ON Pickup radial adjustment screw and tangential adjustment screw YEDS-7

[Procedure]

1. Move the pickup to the position where the radial/tangential adjustment screws will be seen so that the radial/tangential adjustment screws can be adjusted.
   Set to normal speed, focus ON, spindle ON and tracking OFF.
2. First, adjust the radial adjustment screw with the hexagonal screwdriver so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly(Fig. 7).
3. Next, adjust the tangential adjustment screw with the hexagonal screwdriver so that the eye pattern can be seen the most clearly (Fig. 7).
4. Adjust the radial adjustment screw and the tangential adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.



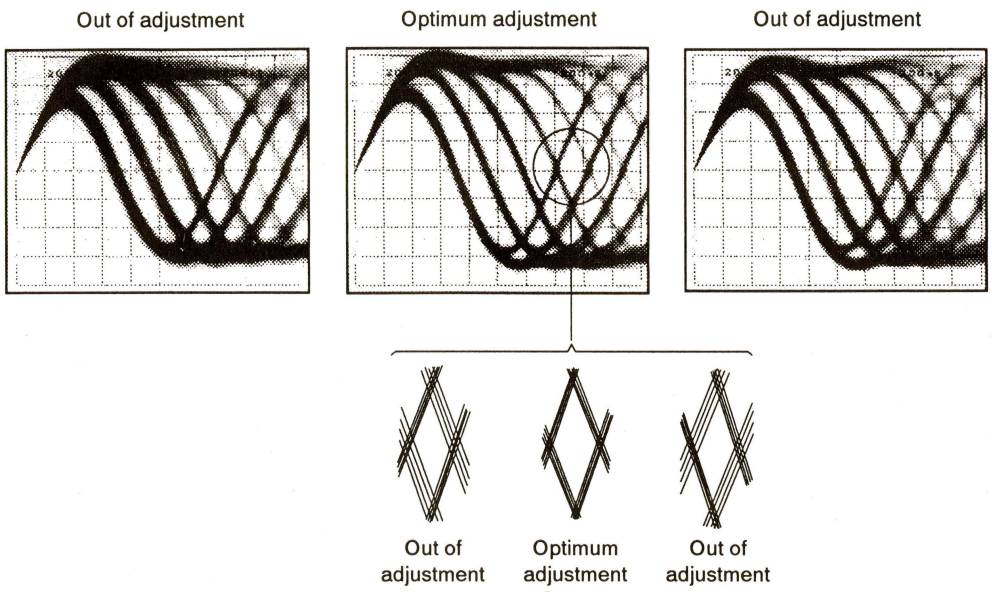


Fig. 7 Eye pattern

7. Grating Re-Adjustment

(Adjustment 1)

Adjust in the same manner as "4. Grating Adjustment" in (Adjustment 1).

5.3.2 Adjustment 2

1. VCO Free-run Frequency Adjustment

(Adjustment 2)

● Objective	To optimize the VCO free-run frequency.		
● Symptom when out of adjustment	No play.		
● Measurement instrument connections	Connect the frequency counter and TP202 (CN609), pin 3 (EPLCK) [Settings]	● Player state ● Adjustment location ● Disc	Stop (just the power switch ON) L603 (VCO. ADJ) None needed

[Procedure]

1. Adjust L603 so that the VCO oscillation frequency at TP202 (CN609), pin 3 (EPLCK) is 4.322MHz ± 0.00.1MHz.

2. Slider Speed Control Offset Adjustment

(Adjustment 2)

● Objective	To optimize the DC offset voltage of the slider speed control amp.		
● Symptom when out of adjustment	Player does not playback (slider moves at stop).		
● Measurement instrument connections	Connect the oscilloscope to TP1(CN103), Pin 7 (SLDDRV). GND : TP1 (CN103), Pin 5 (AGND) [This connection may be via a low-pass filter (39k Ω +1000pF)] [Settings] 5 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Stop VR101 (SLD. OFS) None needed

[Procedure]

1. Move the pickup to midway across the disc.
2. If the pickup continues moving even when you try to stop it, coarse adjust VR101 (SLD.OFS) to stop it.
3. Adjust VR101 (SLD.OFS) so that the DC voltage at TP1 (CN103), pin 7 (SLDDRV) is 0 ± 10 mV.
4. Check that pickup movement is stopped.

3. Playback Power Re-Adjustment

(Adjustment 2)

Adjust in the same manner as "1. Playback Power Adjustment" in (Adjustment 1).

4. Recording Power Adjustment

(Adjustment 2)

● Objective	To optimize the recording power of the laser diode.		
● Symptom when out of adjustment	The player does not record nor playback self-recorded discs. It also skips tracks and the RF waveform is dirty. (No problems during CD playback)		
● Measurement instrument connections	Shine the light discharged from the objective lens on the light power meter sensor. [Settings] Wavelength 790 nm Average mode	● Player state ● Adjustment location ● Disc	Spindle rotation frequency : Fourfold speed, max power ON entry, max power ON VR104 (REC. PW) None needed

[Procedure]

1. Fully turn VR104 (REC.PW) counterclockwise to reduce the power to the minimum.
2. Move the pickup to the outer edge of the disc.
3. Spindle rotation frequency : Fourfold speed, max power ON entry and max power ON to lights up the laser diode.
4. Shine the light discharged from the objective lens in the pickup on the light power meter sensor and adjust VR104 (REC.PW) so that the playback laser diode output is an average of 10 mW ± 0.05 mW.

Notes

- Power more than ten times greater than playback power is released during these adjustments. Never look directly at the objective lens.
- The laser diode may be damaged if the recording power is greater than the specified value. Always perform step 1 before making adjustments.

5. Focus Offset Adjustment

(Adjustment 2)

● Objective	To coarse adjust the DC offset voltage of the focus servo circuit for perform the tracking adjustments correctly.		
● Symptom when out of adjustment	The model does not focus in, sound broken and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP201 (CN601), Pin 1 (RF) [Settings] 20mV/division 10 ms/division DC mode	● Player state ● Adjustment location ● Disc	Spindle rotation frequency : Normal speed, focus ON, spindle ON/ tracking OFF VR6 (FE. OFS) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R=35mm).
2. In the normal speed, focus ON and spindle ON state, adjust VR6 (FE. OFS) so that the amplitude of TP201 (CN601), Pin 1 (RF) becomes maximam.

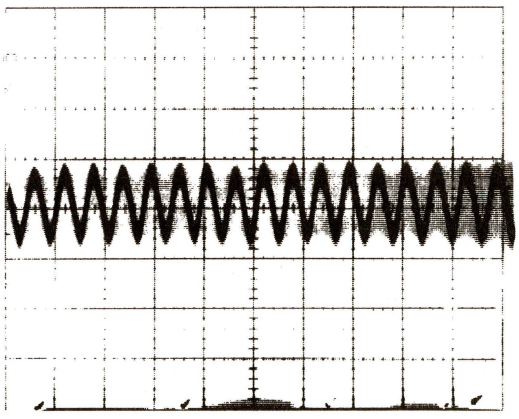
6. Main and Sub Mix Ratio Adjustment

(Adjustment 2)

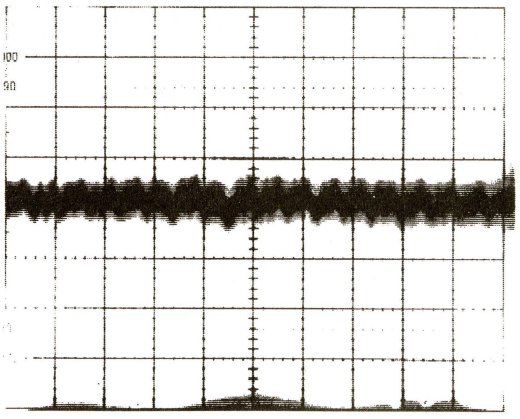
● Objective	To mix the gain of the main signal output and sub signal output of the pickup.		
● Symptom when out of adjustment	Player does not playback.		
● Measurement instrument connections	Connect the oscilloscope to CH1 : TP2 (CN104), Pin 1 (STE) CH2 : TP2 (CN104), Pin 2 (MSTE). [This connection may be via a L.P.F. (39kΩ +1000pF).] [Settings] CH 1 : 5 mV/div. AC mode 1 ms/div. ADD mode CH 2 : 10 mV/div. AC mode (Match the GND level of CH1 and CH2.)	● Player state ● Adjustment location ● Disc	Spindle rotation frequency : Normal speed, focus ON, spindle ON/ tracking OFF VR3 (MS. MIX) YEDS-7

[Procedure]

1. Spindle rotation frequency : Normal speed, focus ON and spindle ON to move the pickup to midway across the disc.
2. Set the oscilloscope to ADD mode (waveform adding mode of CH1 and CH2) and observe the adding waveform of CH1 and CH2.
3. Adjust VR3 (MS. MIX) so that the amplitude of waveform becomes minimum.



Out of adjustment



Optimum adjustment

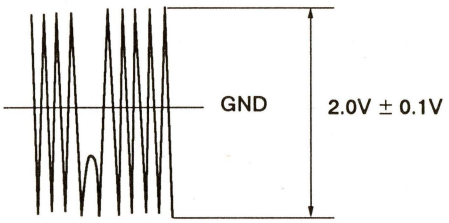
7. Tracking Amp. Gain Adjustment

(Adjustment 2)

● Objective	To correct the discrepancy in the tracking error level with the pickup.		
● Symptom when out of adjustment	Player does not playback, track search is impossible, tracks are skipped.		
● Measurement instrument connections	Connect the oscilloscope to TP201 (CN601), Pin 2 (TE). [This connection may be via a low-pass filter (39kΩ +1000pF).] [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Spindle rotation frequency : Normal speed, focus ON, spindle ON/ tracking OFF VR2 (TE. GAIN) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R=35mm).
2. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
3. Set to spindle rotation frequency : Normal speed, focus ON and spindle ON.
4. Adjust VR2 (TE. GAIN) so that the positive amplitude and negative amplitude of the tracking error signal at TP201 (CN601), Pin 2 (TE) is 2.0V ± 0.1V.



8. Tracking Offset Adjustment

(Adjustment 2)

Adjust in the same manner as "5. DPP (Tracking Offset) Adjustment" in (Adjustment 1).
Note : Perform the run-on adjustment in the section 7 and 8.

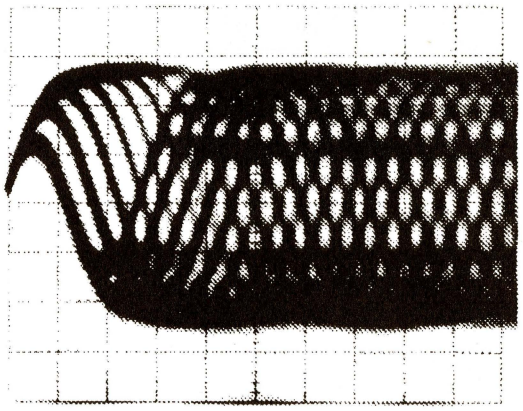
9. Fine Focus Offset Adjustment

(Adjustment 2)

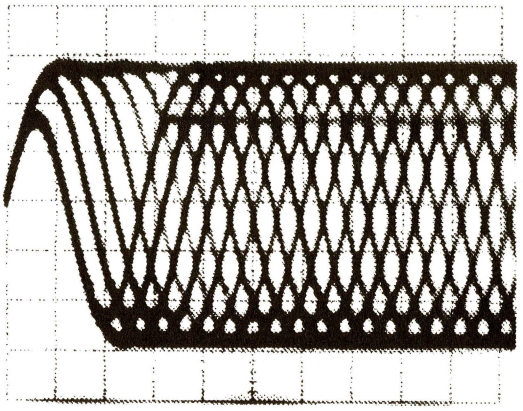
● Objective	To optimize the DC offset voltage of the focus servo circuit.		
● Symptom when out of adjustment	The player does not focus in, sound broken and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP201 (CN601), Pin 1 (RF). [Settings] 20 mV/division 500 ns/division AC mode	● Player state ● Adjustment location ● Disc	Spindle rotation frequency : Normal speed, focus ON, spindle ON, tracking ON VR6 (FE. OFS) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R=35mm). Spindle rotation frequency : Normal speed, focus ON, spindle ON and tracking ON put the player into play mode.
2. Adjust VR6 (FE. OFS) so that the eye pattern of TP201 (CN601), Pin 1 (RF) (the diamond shape at the center of the RF signal) can be seen the most clearly.



Out of adjustment



Optimum adjustment

10. Focus Servo Loop Gain Adjustment

(Adjustment 2)

● Objective	To optimize the focus servo loop gain.		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy.		
● Measurement instrument connections	See Fig. 8 [Settings] CH 1 : 0.1 V/division X-Y mode CH 2 :10 mV/division	● Player state ● Adjustment location ● Disc	Spindle rotation frequency : Normal speed, focus ON, spindle ON, tracking ON VR601 (FCS. GAIN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.44kHz and 1Vp-p.
2. Move the pickup to midway across the disc (R=35mm). Spindle rotation frequency : Normal speed, focus ON, spindle ON and tracking ON put the player into play mode.
3. Adjust VR601 (FCS. GAIN) so that the lissajous waveform is symmetrical about the X axis and the Y axis.

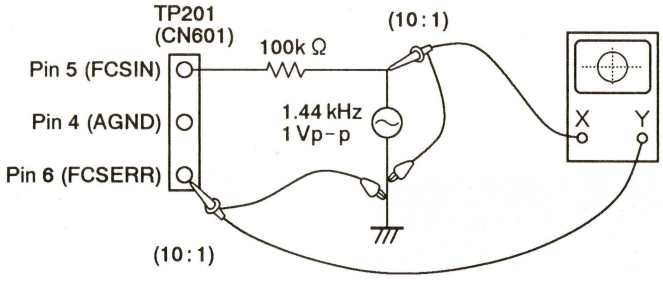
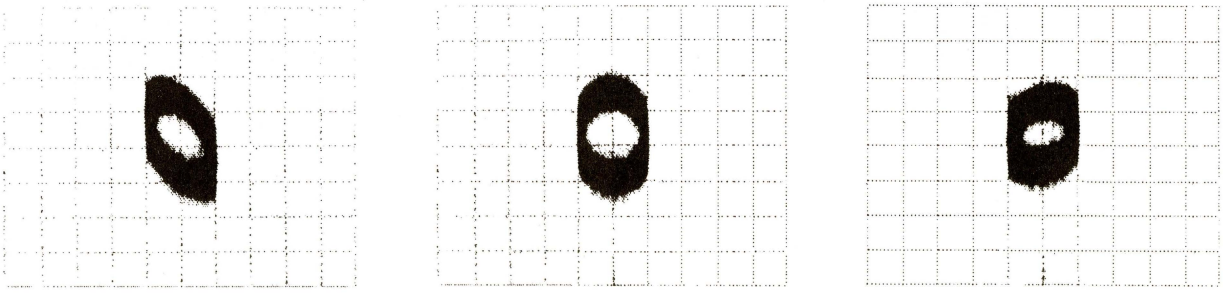


Fig. 8



Higher gain | Optimum gain | Lower gain

11. Tracking Servo Loop Gain Adjustment

(Adjustment 2)

● Objective	To optimize the tracking servo loop gain.		
● Symptom when out of adjustment	Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	See Fig. 9. [Settings] CH 1 : 0.1 V/division X-Y mode CH 2 :10 mV/division	● Player state ● Adjustment location ● Disc	Spindle rotation frequency : Normal speed, focus ON, spindle ON, tracking ON VR602 (TRK. GAIN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.33kHz and 2Vp-p.
2. Move the pickup to midway across the disc (R=35mm). Spindle rotation frequency : Normal speed, focus ON, spindle ON and tracking ON put the player into play mode.
3. Adjust VR602 (TRK. GAIN) so that the lissajous waveform is symmetrical about the X axis and the Y axis.

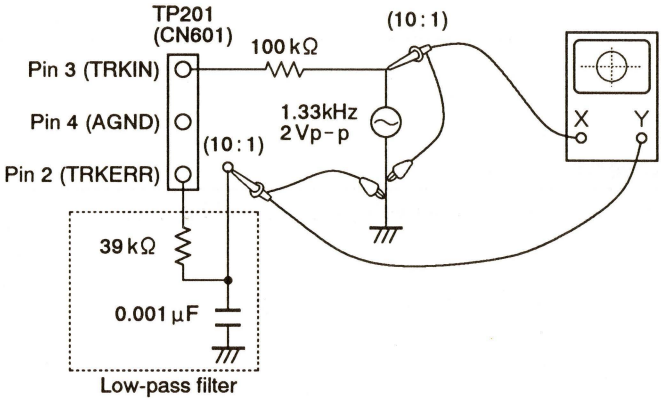
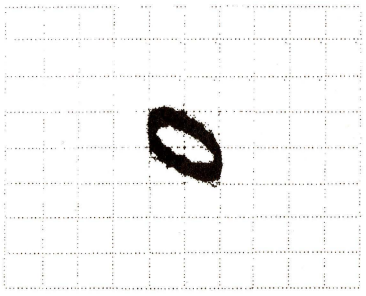
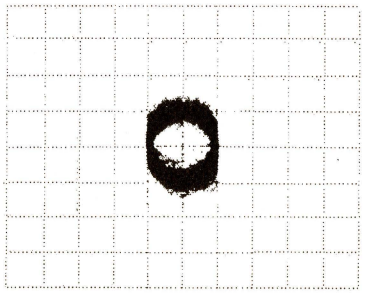


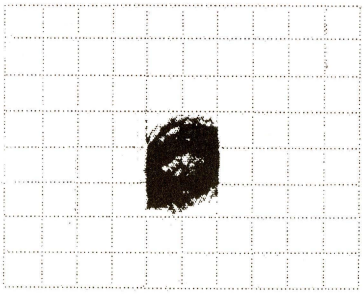
Fig. 9



Higher gain



Optimum gain



Lower gain

12. VCO free-run frequency verification

(Adjustment 2)

● Objective	To verify the VCO free-run frequency is optimized.		
● Symptom when out of adjustment	No play and track search is inpossible.		
● Measurement instrument connections	Connect the foscilloscope to TP202 (CN609) , pin 2 (PLLCN) [Settings] 0.1 V/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Spindle rotation frequency : Normal speed•Fourfold speed, focus ON, spindle ON/tracking ON L603 (VCO ADJ) YEDS-7

[Procedure]

1. In the normal speed, focus ON, spindle ON and tracking ON state, verify the center value (center value which is the thick portion of line) of waveform's DC elements at TP202 (CN609), pin 2 (PLLCN) is 0V ± 0.1V.
2. In the fourfold speed, focus ON, spindle ON and tracking ON state, verify the center value of waveform's DC elements at TP202 (CN609), pin 2 (PLLCN) is 0V ± 0.1V.
3. If the specified values cannot be obtained, perform the verification after adjusting the section "1. VCO free-run frequency adjustment" in (Adjustment 2) again.

13. WBL Offset Adjustment

(Adjustment 2)

● Objective	To optimize the DC offset voltage of the wobble amp.		
● Symptom when out of adjustment	CD-R disc does not record and playback.		
● Measurement instrument connections	Connect the oscilloscope to TP2 (CN104), Pin 5 (WBL). [This connection may be via a high-pass filter (180pF+39.0kΩ).] [Settings] 100 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Spindle rotation frequency : Normal speed, focus ON, spindle ON, tracking ON VR1 (WBL. OFS) CDR disc with recorded (Type No. CD-R63, manufactured by TDK.)

[Procedure]

1. Move the pickup to the midway across the disc.
2. Set to the normal speed, focus ON, spindle ON and tracking ON state.
3. Adjust VR1 (WBL. OFS) so that the amplitude of the waveform becomes minimum.

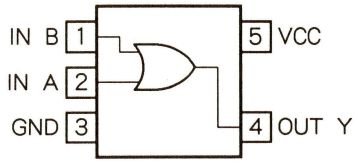
6. IC INFORMATION

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

■ TC7S32F (IC20 : HEAD UNIT)

•CMOS DIGITAL INTEGRATED CIRCUIT

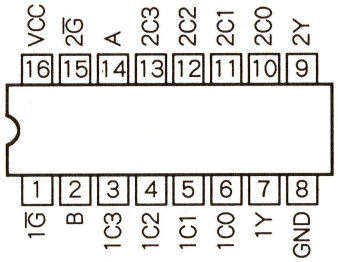
- **Block Diagram (Top View)**



■ TC74HC253AF (IC702 : HEAD UNIT)

•DUAL 4 - CHANNEL MULTIPLEXER WITH 3 - STATE OUTPUT

- **Pin Arrangement (Top View)**



- **Truth Table**

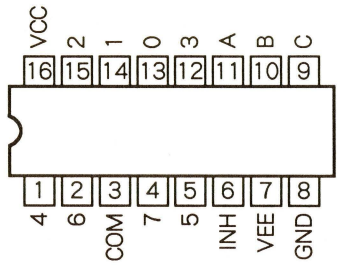
SELECT INPUTS		DATA INPUTS				STROBE	OUTPUT Y
B	A	C0	C1	C2	C3	G̅	
X	X	X	X	X	X	H	Z
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

X : Don't care
Z : High-Impedance

■ TC74HC4051AF (IC608 : MAIN UNIT)

•8 - CHANNEL ANALOG MULTIPLEXER/ DEMULTIPLEXER

- **Pin Arrangement (Top View)**



- **Truth Table**

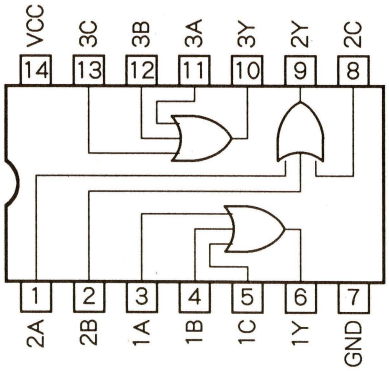
CONTROL INPUTS				"ON" CHANNEL
INHIBIT	C	B	A	
L	L	L	L	0
L	L	L	H	1
L	L	H	L	2
L	L	H	H	3
L	H	L	L	4
L	H	L	H	5
L	H	H	L	6
L	H	H	H	7
H	X	X	X	NONE

X : Don't care

■ TC74HC4075AF (IC706 : HEAD UNIT)

•TRIPLE 3 - INPUT OR GATE

- **Block Diagram (Top View)**



- **Truth Table**

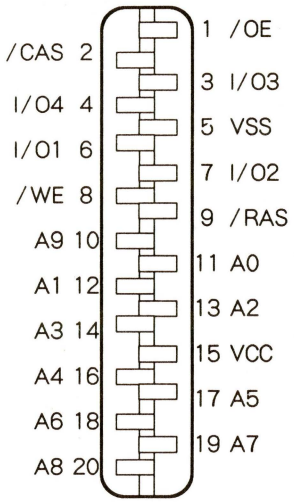
A	B	C	Y
H	X	X	H
X	H	X	H
X	X	H	H
L	L	L	L

X : Don't care

■ HM514400BZ - 8
(IC1018, IC1019 : MAIN UNIT)

•1MB BUFFER RAM

• Pin Arrangement (Bottom View)



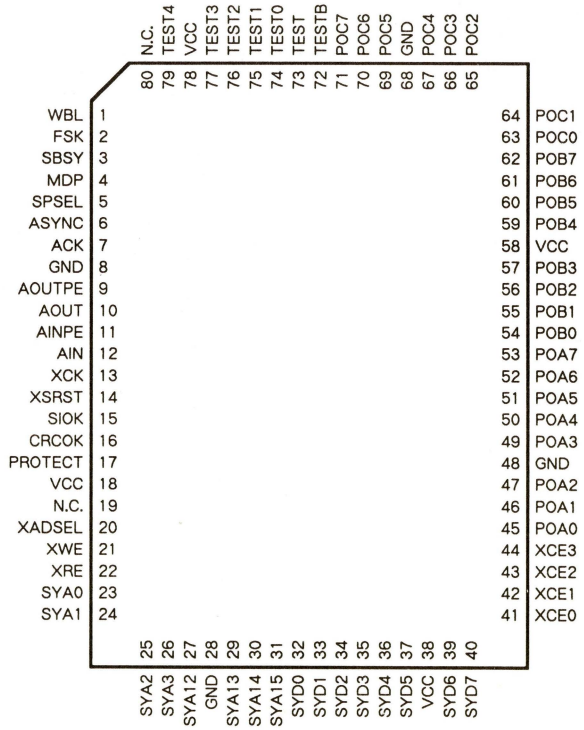
• Pin Arrangement Table

Pin No.	Pin Name	I/O
1	/OE	–
2	/CAS	–
3	I/O3	I/O
4	I/O4	I/O
5	VSS	
6	I/O1	I/O
7	I/O2	I/O
8	/WE	–
9	/RAS	–
10	A9	I
11	A0	I
12	A1	I
13	A2	I
14	A3	I
15	VCC	–
16	A4	I
17	A5	I
18	A6	I
19	A7	I
20	A8	I

■ PDJ006A (IC604 : MAIN UNIT)

•ATIP DECODER

• Pin Arrangement (Top View)



• Pin Function

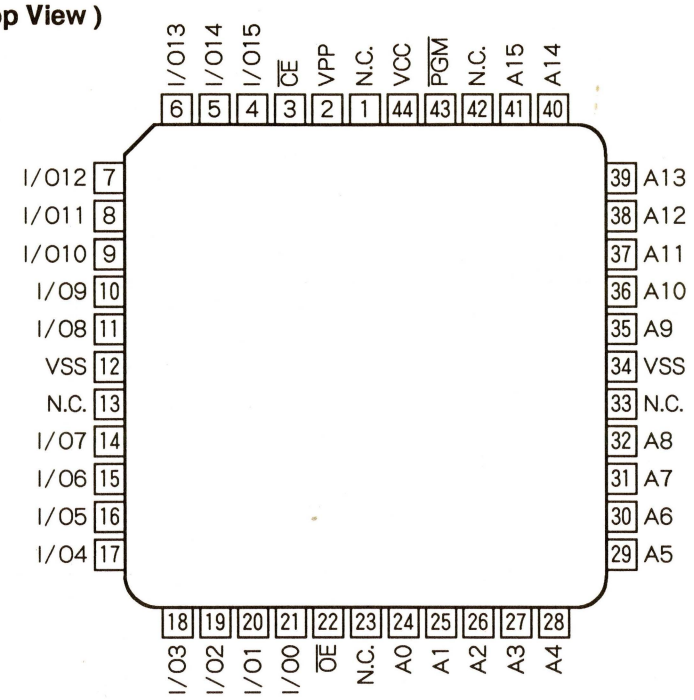
No.	Pin Name	I/O	Function
1	WBL	I	WOBBLE signal input.
2	FSK	O	FSK demodulation signal output.
3	SBSY	I	Subcode sync. signal input. Normal speed:75Hz
4	MDP	O	MDP output for CLV servo.
5	SPSEL	I	Selection input of microcomputer interface mode. H:Serial mode, L:Parallel mode
6	ASYNC	O	ATIP sync. output. Normal speed:75Hz
7	ACK	I	Clock input for serial interface.
8	GND	–	Ground.
9	AOUTPE	I	Read enable input of serial data.
10	AOUT	O	Serial data output. 32 bits
11	AINPE	I	Write enable input of serial data.
12	AIN	I	Serial data input. 16 bits
13	XCK	I	Master clock input. Normal speed:4.3218MHz
14	XSRST	I	System reset input. Low active
15	SIOK	O	Special information standby flag output. STS BIT2 H:Special information is able to read.
16	CRCOK	O	CRC arithmetic result output. STS BIT7 H:CRCOK, L:CRCNG
17	PROTECT	O	ATIP sync. protection state output. H:Protection state, L:Non protection state
18	VCC	–	Power supply voltage pin.
19	N.C.	–	Not used.
20	XADSEL	I	Start address setting strobe input of address decoder.
21	XWE	I	Write enable input of microcomputer.
22	XRE	I	Read enable input of microcomputer.
23	SYA0	I	Address bus of microcomputer.
24	SYA1	I	
25	SYA2	I	
26	SYA3	I	
27	SYA12	I	
28	GND	–	Ground.
29	SYA13	I	Address bus of microcomputer.
30	SYA14	I	
31	SYA15	I	
32	SYD0	I/O	Data bus of microcomputer.
33	SYD1	I/O	
34	SYD2	I/O	
35	SYD3	I/O	
36	SYD4	I/O	
37	SYD5	I/O	
38	VCC	–	Power supply voltage pin.
39	SYD6	I/O	Data bus of microcomputer.
40	SYD7	I/O	

No.	Pin Name	I/O	Function
41	XCE0	O	Chip enable output.
42	XCE1	O	
43	XCE2	O	
44	XCE3	O	
45	POA0	I/O	Parallel output of general - purpose register A. GRA BIT0
46	POA1	I/O	Parallel output of general - purpose register A. GRA BIT1
47	POA2	I/O	Parallel output of general - purpose register A. GRA BIT2
48	GND	–	Ground.
49	POA3	I/O	Parallel output of general - purpose register A. GRA BIT3
50	POA4	I/O	Parallel output of general - purpose register A. GRA BIT4
51	POA5	I/O	Parallel output of general - purpose register A. GRA BIT5
52	POA6	I/O	Parallel output of general - purpose register A. GRA BIT6
53	POA7	I/O	Parallel output of general - purpose register A. GRA BIT7
54	POB0	O	Parallel output of general - purpose register B. GRB BIT0
55	POB1	O	Parallel output of general - purpose register B. GRB BIT1
56	POB2	O	Parallel output of general - purpose register B. GRB BIT2
57	POB3	O	Parallel output of general - purpose register B. GRB BIT3
58	VCC	–	Power supply voltage pin.
59	POB4	O	Parallel output of general - purpose register B. GRB BIT4
60	POB5	O	Parallel output of general - purpose register B. GRB BIT5
61	POB6	O	Parallel output of general - purpose register B. GRB BIT6
62	POB7	O	Parallel output of general - purpose register B. GRB BIT7
63	POC0	O	Parallel output of general - purpose register C. GRC BIT0
64	POC1	O	Parallel output of general - purpose register C. GRC BIT1
65	POC2	O	Parallel output of general - purpose register C. GRC BIT2
66	POC3	O	Parallel output of general - purpose register C. GRC BIT3
67	POC4	O	Parallel output of general - purpose register C. GRC BIT4
68	GND	–	Ground.
69	POC5	O	Parallel output of general - purpose register C. GRC BIT5
70	POC6	O	Parallel output of general - purpose register C. GRC BIT6
71	POC7	O	Parallel output of general - purpose register C. GRC BIT7
72	TESTB	I	Test pins.
73	TEST	I	
74	TEST0	I	
75	TEST1	I	
76	TEST2	I	
77	TEST3	I	
78	VCC	–	Power supply voltage pin.
79	TEST4	–	Test pins.
80	N.C.	–	Not used.

■ DYW1389 (IC605 : MAIN UNIT)

•ROM

• Pin Arrangement (Top View)



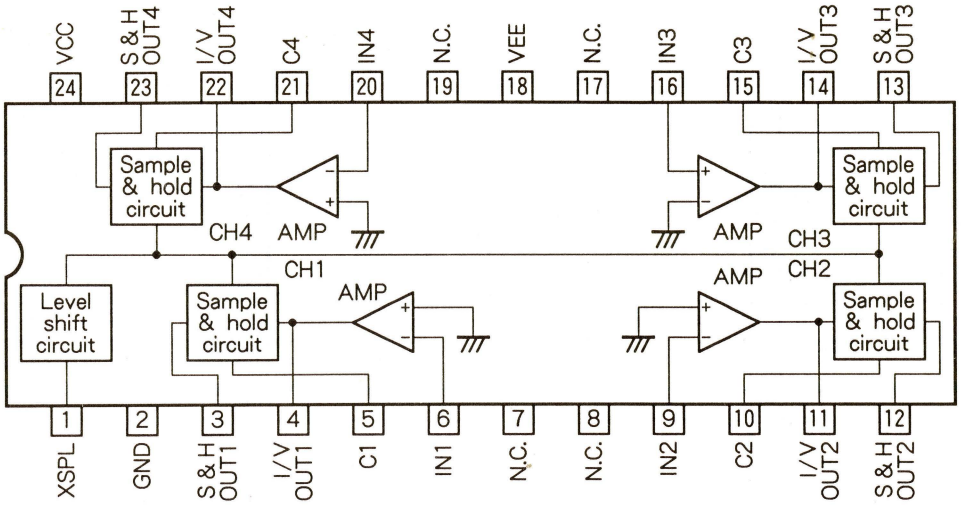
• Pin Function

No.	Pin Name	Function	No.	Pin Name	Function
1	N.C.	Non connection.	23	N.C.	Non connection.
2	VPP	Program power supply.	24	A0	Address input.
3	$\overline{CE}$	Chip enable.	25	A1	
4	I/O15	Data input/output.	26	A2	
5	I/O14		27	A3	
6	I/O13		28	A4	
7	I/O12		29	A5	
8	I/O11		30	A6	
9	I/O10		31	A7	
10	I/O9		32	A8	
11	I/O8		33	N.C.	Non connection.
12	VSS	Ground.	34	VSS	Ground.
13	N.C.	Non connection.	35	A9	Address input.
14	I/O7	Data input/output.	36	A10	
15	I/O6		37	A11	
16	I/O5		38	A12	
17	I/O4		39	A13	
18	I/O3		40	A14	
19	I/O2		41	A15	
20	I/O1		42	N.C.	Non connection.
21	I/O0		43	$\overline{PGM}$	Program enable.
22	$\overline{OE}$	Output enable.	44	VCC	Power supply voltage.

■ PA6004A (IC118, IC119 : HEAD UNIT)

•MAIN BEAM I - V CONVERSION AMP.

• Block Diagram (Top View)



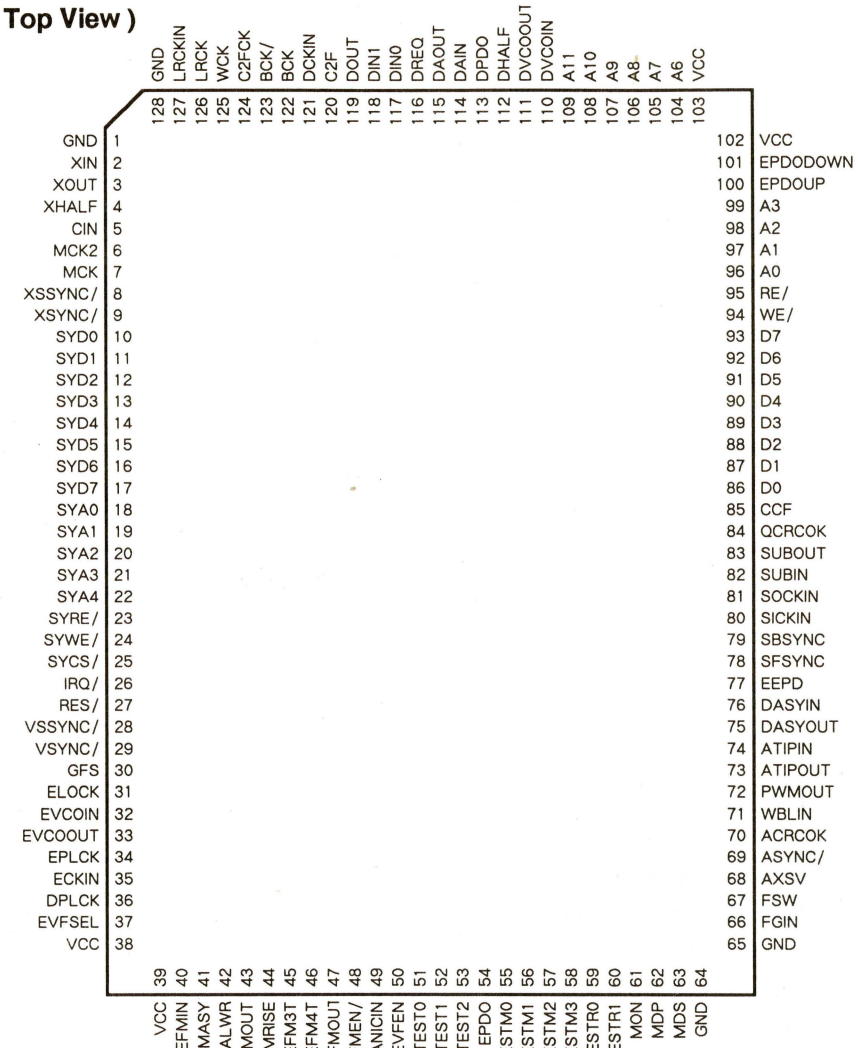
• Pin Function

No.	Pin Name	Function
1	XSPL	Sample & hold control signal input.
2	GND	Ground.
3	S&H OUT1	Sample & hold output pin 1.
4	I/V OUT1	I/V conversion output pin 1.
5	C1	Hold capacitor connecting pin 1.
6	IN1	Input pin 1.
7	N.C.	Non connection.
8	N.C.	Non connection.
9	IN2	Input pin 2.
10	C2	Hold capacitor connecting pin 2.
11	I/V OUT2	I/V conversion output pin 2.
12	S&H OUT2	Sample & hold output pin 2.
13	S&H OUT3	Sample & hold output pin 3.
14	I/V OUT3	I/V conversion output pin 3.
15	C3	Hold capacitor connecting pin 3.
16	IN3	Input pin 3.
17	N.C.	Non connection.
18	VEE	Power supply voltage pin.
19	N.C.	Non connection.
20	IN4	Input pin 4.
21	C4	Hold capacitor connecting pin 4.
22	I/V OUT4	I/V conversion output pin 4.
23	S&H OUT4	Sample & hold output pin 4.
24	VCC	Power supply voltage pin.

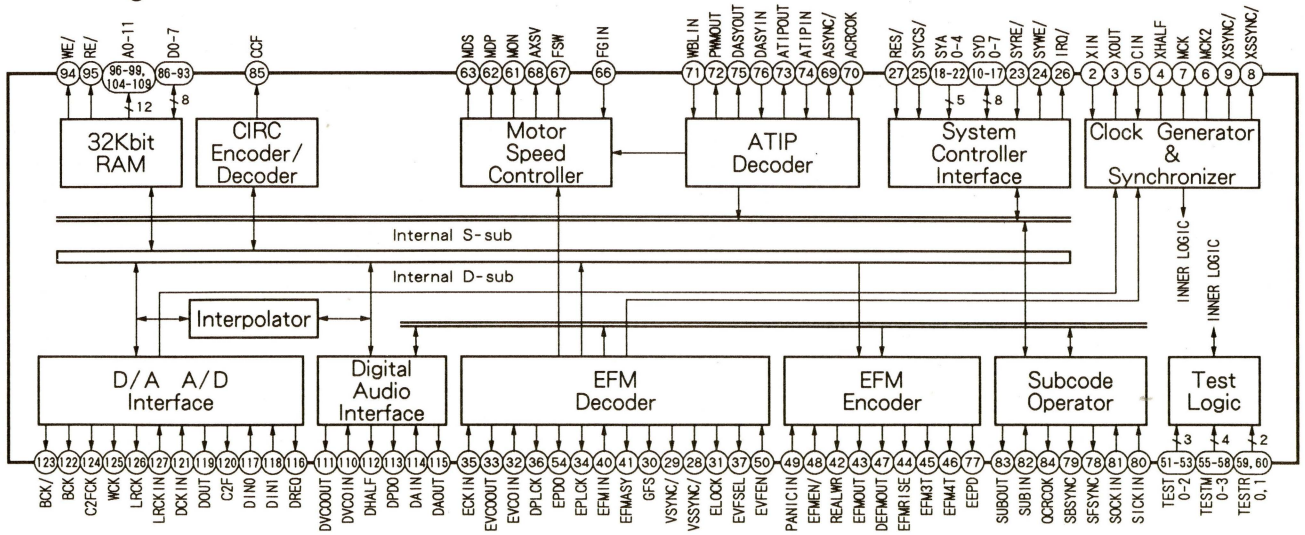
■ PDS004A (IC602 : MAIN UNIT)

·EFM, CIRC ENCODE/DECODE AND ATIP DEMODULATION

• Pin Arrangement (Top View)



• Block Diagram



• Pin Function

No.	Pin Name	I/O	Function
1	GND	–	Ground.
2	XIN	I	X'tal clock (45.1584/22.5792/11.2896MHz) input.
3	XOUT	O	X'tal clock (45.1584/22.5792/11.2896MHz) feedback output.
4	XHALF	O	X'tal clock divided for two output.
5	CIN	I	External clock (33.8688/16.9344MHz) input.
6	MCK2	O	Master double clock (256xfs) output (11.2896MHz). *
7	MCK	O	Master clock (128xfs) output (5.6448MHz). *
8	XSSYNC/	O	Subcode frame sync. signal output of X'tal system (75Hz). *
9	XSYNC/	O	EFM frame sync. signal output of X'tal system (7.35kHz). *
10	SYD0	I/O	MCU data bus.
11	SYD1	I/O	
12	SYD2	I/O	
13	SYD3	I/O	
14	SYD4	I/O	
15	SYD5	I/O	
16	SYD6	I/O	
17	SYD7	I/O	
18	SYA0	I	MCU address bus.
19	SYA1	I	
20	SYA2	I	
21	SYA3	I	
22	SYA4	I	
23	SYRE/	I	MCU read input.
24	SYWE/	I	MCU write input.
25	SYCS/	I	MCU chip select input.
26	IRQ/	O	MCU interrupt requirement output.
27	RES/	I	Reset input.
28	VSSYNC/	O	Subcode frame sync.signal output of EVCO system (75Hz). *
29	VSYNC/	O	EFM frame sync. signal output of EVCO system (7.35kHz). *
30	GFS	O	EFM frame sync. discordance output.
31	ELOCK	O	Decode EFM - PLL lock output.
32	EVCOIN	I	EVCO clock (34.5744/17.2872/8.6436MHz) input.
33	EVCOOUT	O	EVCO clock (34.5744/17.2872/8.6436MHz) feedback output.
34	EPLCK	O	EFM channel clock (4.3218MHz) of EVCO clock. *
35	ECKIN	I	EFM clock input for decode.
36	DPLCK	O	EFM channel clock (4.3218MHz) of ECKIN clock. *
37	EVFSEL	O	EVCO filter switching output (Read/Write mode command output).
38	VCC	–	Power supply voltage.
39	VCC	–	
40	EFMIN	I	EFM data input.
41	EFMASY	O	EFM data feedback output.
42	REALWR	O	Output period command output of EFM writing pulse.
43	EFMOUT	O	EFM writing pulse output.

* : Frequency values are in the normal speed.

No.	Pin Name	I/O	Function
44	EFMRISE	O	Rising command output of EFM writing pulse.
45	EFM3T	O	3T command output of EFM writing pulse.
46	EFM4T	O	4T command output of EFM writing pulse.
47	DEFMOUT	O	Failing 2T delayed output of EFM writing pulse.
48	EFMEN/	I	Permission input of EFM writing pulse output.
49	PANICIN	I	Forced stop requirement signal input of EFM writing pulse output.
50	EVFEN	I	EVFSEL switch timing adjustment input.
51	TEST0	I	Test mode setting input.
52	TEST1	I	
53	TEST2	I	
54	EPDO	O	Phase error output for EFM clock generating PLL.
55	TESTM0	I	Test mode setting input.
56	TESTM1	I	
57	TESTM2	I	
58	TESTM3	I	
59	TESTR0	I	
60	TESTR1	I	
61	MON	O	Spindle motor ON output.
62	MDP	O	Motor drive output of phase difference factor.
63	MDS	O	Motor drive output of speed difference factor.
64	GND	–	Ground.
65	GND	–	
66	FGIN	I	Spindle motor FG pulse input.
67	FSW	O	ATIP servo command output.
68	AXSV	O	AX servo command output.
69	ASYNC/	O	ATIP frame sync. signal output (75Hz). *
70	ACROCK	O	ATIP CRC result output.
71	WBLIN	I	ATIP - WOBBLE input (22.05kHz). *
72	PWMOUT	O	PWM output.
73	ATIPOUT	O	FSK demodulation output.
74	ATIPIN	I	FSK demodulation input.
75	DASYOUT	O	DETASYNC output for correcting the filter delay.
76	DASYIN	I	DETASYNC input for correcting the filter delay.
77	EEPD	O	Phase error output for EFM clock generating PLL for encode.
78	SFSYNC	O	EFM frame sync. clock for subcode data output.
79	SBSYNC	O	Subcode sync. clock for subcode data output.
80	SICKIN	I	Subcode data input clock.
81	SOCKIN	I	Subcode data output clock.
82	SUBIN	I	Subcode data input.
83	SUBOUT	O	Subcode data output.
84	QCRCOK	O	Q channel subcode CRC result output.
85	CCF	O	CIRC error correction flag output.

* : Frequency values are in the normal speed.

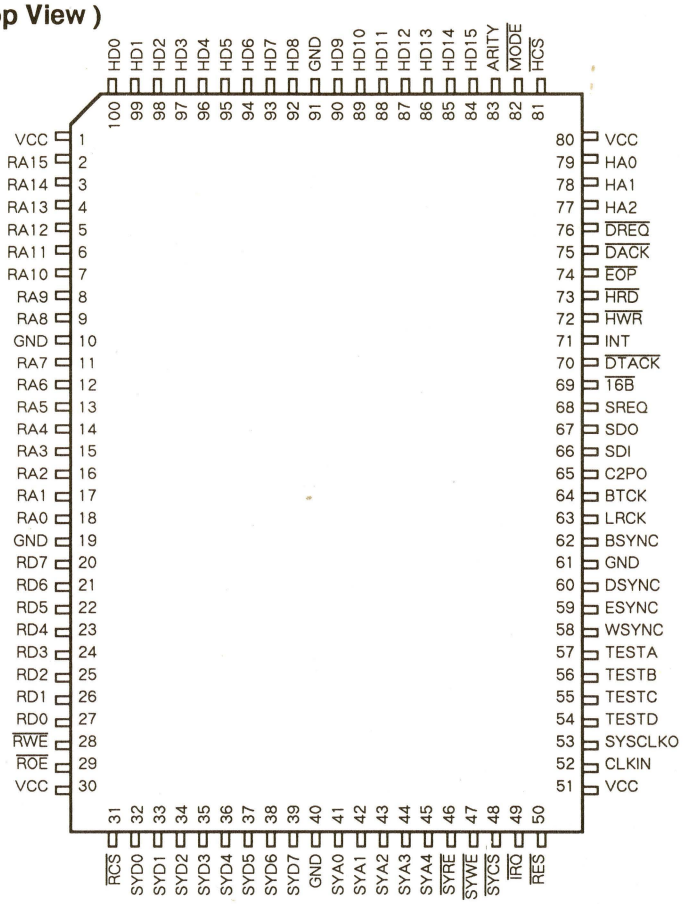
No.	Pin Name	I/O	Function
86	D0	I/O	SRAM data bus for CIRC (for TEST).
87	D1	I/O	
88	D2	I/O	
89	D3	I/O	
90	D4	I/O	
91	D5	I/O	
92	D6	I/O	
93	D7	I/O	
94	WE/	O	SRAM write signal output for CIRC (for TEST).
95	RE/	O	SRAM read signal output for CIRC (for TEST).
96	A0	O	SRAM address bus for CIRC (for TEST).
97	A1	O	
98	A2	O	
99	A3	O	
100	EPDOUP	O	EPDOUP output.
101	EPDODOWN	O	EPDODOWN output.
102	VCC	–	Power supply voltage.
103	VCC	–	
104	A6	O	SRAM address for CIRC (for TEST).
105	A7	O	
106	A8	O	
107	A9	O	
108	A10	O	
109	A11	O	
110	DVCOIN	I	DVCO clock (45.1584/22.5792/11.2896MHz) input.
111	DVCOOUT	O	DVCO clock (45.1584/22.5792/11.2896MHz) feedback output.
112	DHALF	O	DVCO clock divided for two output.
113	DPDO	O	Digital audio interface sync. agreement output.
114	DAIN	I	Digital audio interface input.
115	DAOUT	O	Digital audio interface output.
116	DREQ	O	Serial data input requirement output.
117	DIN0	I	Serial data input (0).
118	DIN1	I	Serial data input (1).
119	DOUT	O	Serial data output.
120	C2F	O	Validity flag output.
121	DCKIN	I	Serial data input clock.
122	BCK	O	Bit clock output (2.8224MHz). *
123	BCK/	O	Bit clock inverting output (2.8224MHz). *
124	C2FCK	O	Validity flag clock output (176.4kHz). *
125	WCK	O	Word clock output (88.2kHz). *
126	LRCK	O	LEFT/RIGHT clock output (44.1kHz). *
127	LRCKIN	I	LEFT/RIGHT clock input (44.1kHz). *
128	GND	–	Ground.

*: Frequency values are in the normal speed.

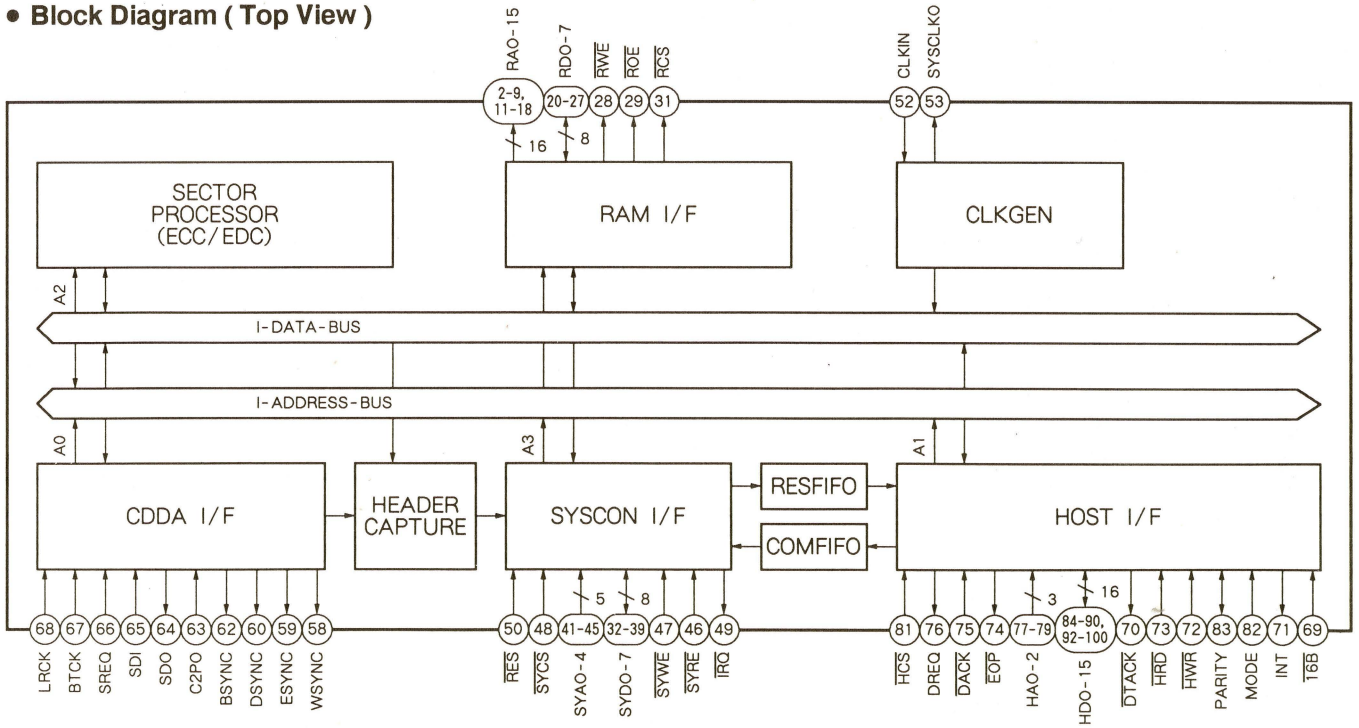
■ PDS005A (IC1004 : MAIN UNIT)

·CD - ROM SIGNAL MANAGEMENT, INTERFACE

- **Pin Arrangement (Top View)**



- **Block Diagram (Top View)**



• Pin Function

No.	Pin Name	I/O	Function
1	VCC	–	
2	RA15	O	RAM address output.
3	RA14	O	
4	RA13	O	
5	RA12	O	
6	RA11	O	
7	RA10	O	
8	RA9	O	
9	RA8	O	
10	GND	–	Ground.
11	RA7	O	RAM address output.
12	RA6	O	
13	RA5	O	
14	RA4	O	
15	RA3	O	
16	RA2	O	
17	RA1	O	
18	RA0	O	
19	GND	–	Ground.
20	RD7	I/O	RAM data input/output.
21	RD6	I/O	
22	RD5	I/O	
23	RD4	I/O	
24	RD3	I/O	
25	RD2	I/O	
26	RD1	I/O	
27	RD0	I/O	
28	$\overline{RWE}$	O	RAM write enanble.
29	$\overline{ROE}$	O	RAM output enanble.
30	VCC	–	Power supply voltage.
31	$\overline{RCS}$	O	RAM chip select output.
32	SYD0	I/O	System control data bus.
33	SYD1	I/O	
34	SYD2	I/O	
35	SYD3	I/O	
36	SYD4	I/O	
37	SYD5	I/O	
38	SYD6	I/O	
39	SYD7	I/O	
40	GND	–	Ground.
41	SYA0	I	System control address bus.
42	SYA1	I	
43	SYA2	I	
44	SYA3	I	
45	SYA4	I	

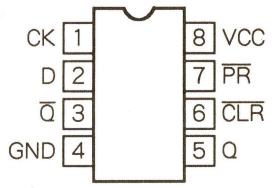
No.	Pin Name	I/O	Function
46	$\overline{\text{SYRE}}$	I	Read strobe input to system control.
47	$\overline{\text{SYWE}}$	I	Write strobe input to system control.
48	$\overline{\text{SYCS}}$	I	Chip select input to system control.
49	$\overline{\text{IRQ}}$	O	Interrupt requirement to system control.
50	$\overline{\text{RES}}$	I	System control reset input.
51	VCC	–	Power supply voltage.
52	CLKIN	I	22.5792MHz.
53	SYSCLKO	O	System clock output. Clock is changed by speed, then output the system clock (22.5792MHz, 11.2896MHz, 5.6448MHz).
54	TESTD	I	Test pin. Connect to GND at actual use.
55	TESTC	O	Test pin. Open at actual use.
56	TESTB	O	
57	TESTA	O	
58	WSYNC	O	Word sync. signal output.
59	ESYNC	O	ENC sync signal output.
60	DSYNC	O	Detecting sync. signal output.
61	GND	–	Ground.
62	BSYNC	O	Block sync. signal output.
63	C2PO	I	CIRC C2 pointer signal.
64	SDO	O	Serial data output.
65	SDI	I	Serial data input.
66	SREQ	I	Serial data requirement signal.
67	BTCK	I	Bit clock input.
68	LRCK	I	LEFT/RIGHT clock input.
69	$\overline{\text{16B}}$	I	16 bit display signal output.
70	$\overline{\text{DTACK}}$	O	Data acknowledge.
71	INT	O	Interrupt requirement signal.
72	$\overline{\text{HWR}}$	I	Write enanble.
73	$\overline{\text{HRD}}$	I	Read enanble.
74	$\overline{\text{EOP}}$	O	End of process.
75	$\overline{\text{DACK}}$	I	DMA acknowledge.
76	DREQ	O	DMA request.
77	HA2	I	Host MPU address input.
78	HA1	I	
79	HA0	I	
80	VCC	–	Power supply voltage.
81	$\overline{\text{HCS}}$	I	Perform the host MPU chip select input.
82	$\overline{\text{MODE}}$	I	Switch the 80 - system and 68 - system.
83	PARITY	I/O	Generate or check when transferring the ODD parity data.
84	HD15	I/O	Host MPU data bus.
85	HD14	I/O	
86	HD13	I/O	
87	HD12	I/O	
88	HD11	I/O	
89	HD10	I/O	
90	HD9	I/O	

No.	Pin Name	I/O	Function
91	GND	–	Ground.
92	HD8	I/O	Host MPU data bus.
93	HD7	I/O	
94	HD6	I/O	
95	HD5	I/O	
96	HD4	I/O	
97	HD3	I/O	
98	HD2	I/O	
99	HD1	I/O	
100	HD0	I/O	

■ TC7W74FU (IC1006 : MAIN UNIT), TC7W74F (IC1102 : MAIN UNIT)

•D - TYPE FLIP FLOP WITH PRESET AND CLEAR

• Block Diagram (Top View)



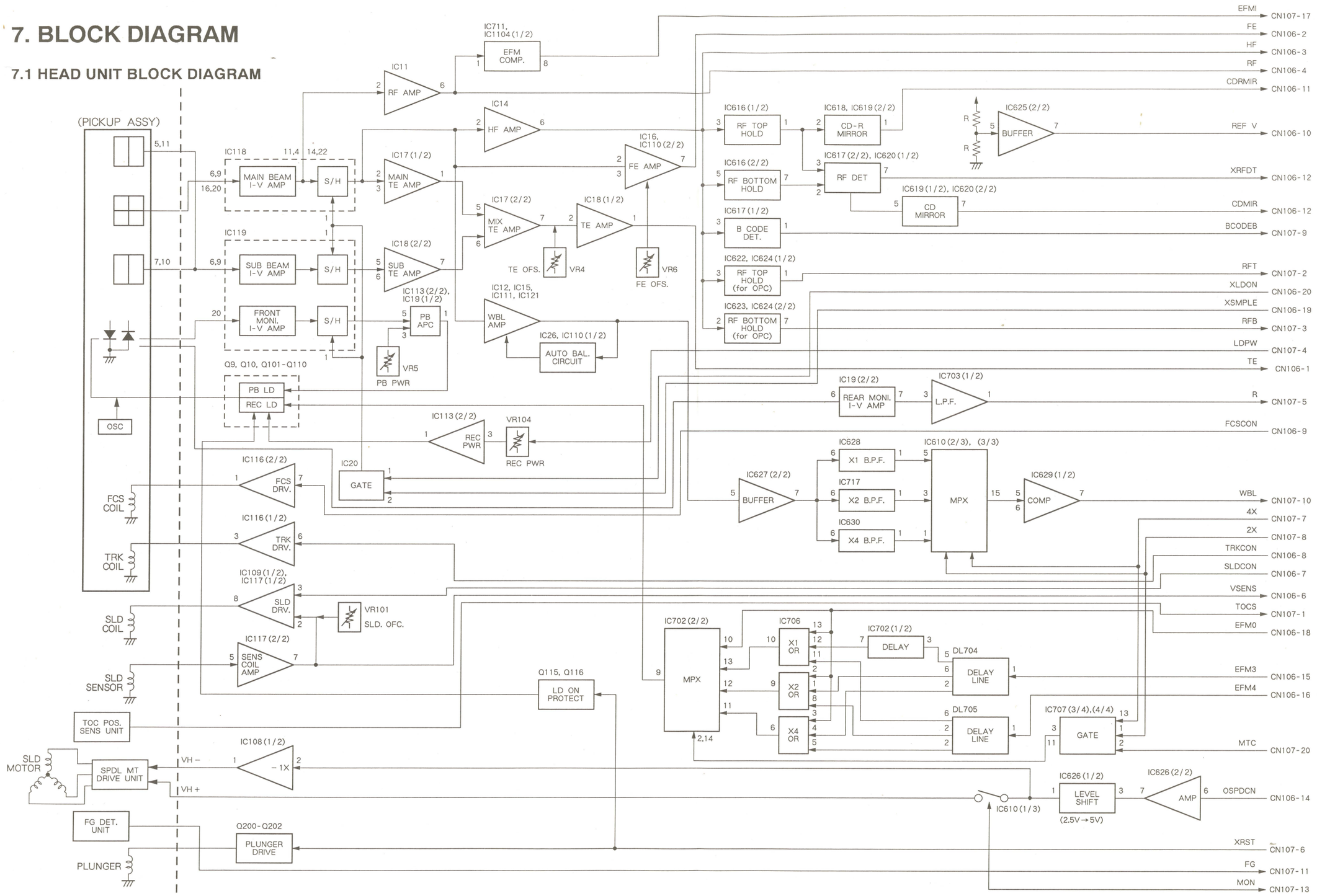
• Table of Truth Value

INPUTS				OUTPUTS		FUNCTION
$\overline{CLR}$	$\overline{PR}$	D	CK	Q	$\overline{Q}$	
L	H	X	X	L	H	CLEAR
H	L	X	X	H	L	PRESET
L	L	X	X	H	H	–
H	H	L	↑	L	H	–
H	H	H	↑	H	L	–
H	H	X	↓	Qn	$\overline{Q}$n	NO CHANGE

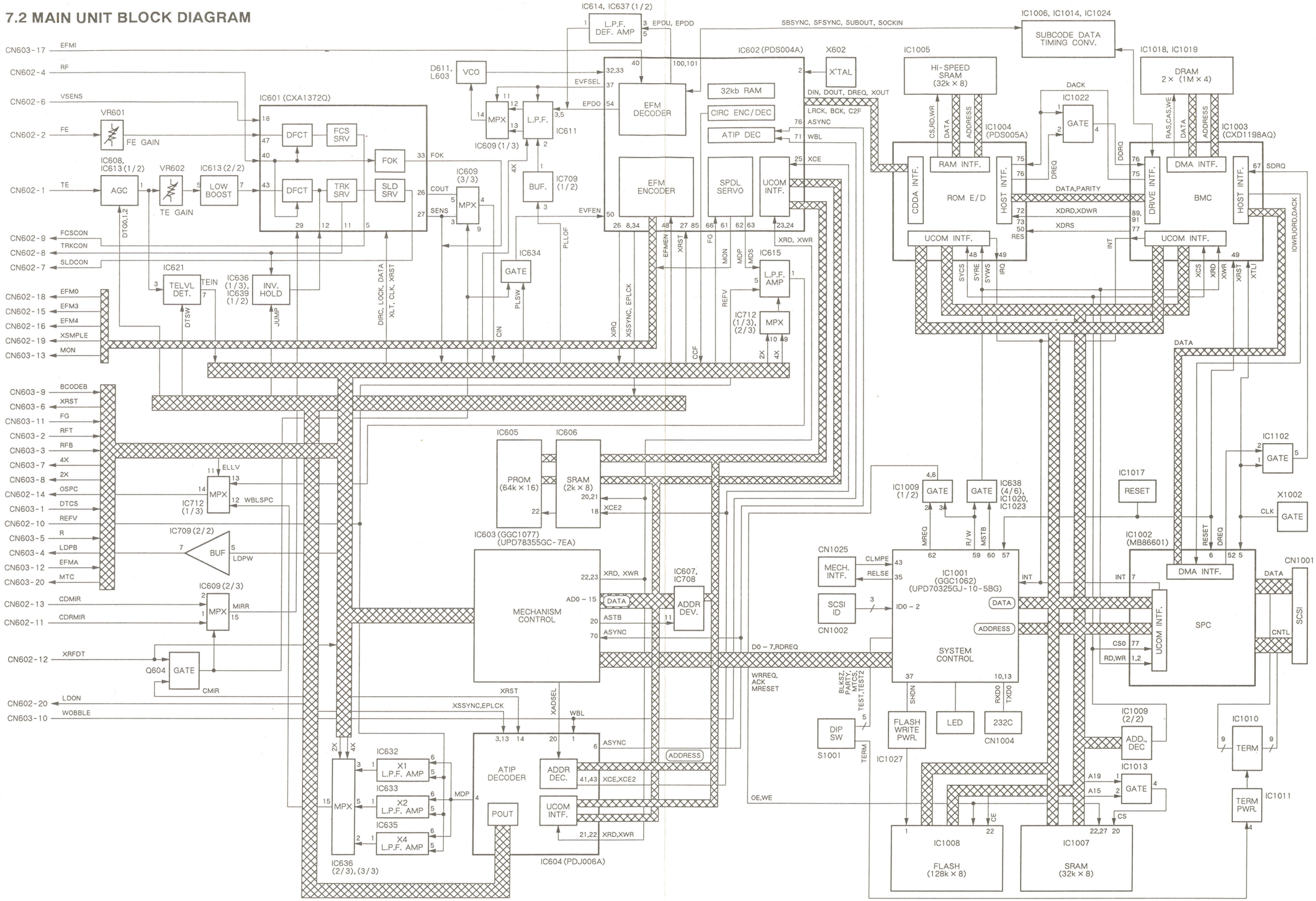
X : Don't care

7. BLOCK DIAGRAM

7.1 HEAD UNIT BLOCK DIAGRAM



7.2 MAIN UNIT BLOCK DIAGRAM



PIONEER
The Art of Entertainment

SERVICE INFORMATION

Date : Nov.14, 1995 No : SI-V50085-G

MODEL No	*	SER. No	S/M No	PG
DR-R504X/ZUCEB/WL	A	PJ0403531-	RRV1199	30-

MODEL No	*	SER. No	S/M No	PG

DETAIL

SYMPTOM

Sometimes an error occurs during recording, play back and seek operation under high-temperature environment.

CAUSE

A characteristic of defocus becomes a critical.

SERVICE REMEDY

#		
1	Change of focus offset adjustment.	

FACTORY COUNTER -MEASURE

#		
1	Change of focus offset adjustment.	

COUNTERMEASURE

1.Perform "P30, 5.3 Adjustments" of service manual.
Adds an adjustment to "P41, 9.Fine focus offset adjustment ".
Adjust 3T of RF waveform for Max, with normal speed (uses CD-R disc recorded at factory).
2.Make sure recording, playback and seek operation.

Focus offset adjustment value becomes it almost just and obtains more margin under high temperature.

We will inform you about part number for CD-R Test disc.

Ref. *	Ref. #	CURRENT PARTS SYMBOL/DESCRIPTION	CURRENT PARTS PART NUMBER	CODE	NEW PARTS PART NUMBER	NEW PARTS SYMBOL/DESCRIPTION
A	1				adjustment	

PIONEER ELECTRONIC CORPORATION
Y. IMAMIZU, MANAGER
Industrial Engineering Section
Service Division

NOTE: PARTS CODE
1: Changeable from old to new.
2: Not Interchangeable at all.
3: Interchangeable in both ways.
5: Do not use old parts.

Classify

FIXTURE NEWS

PIONEER
The Art of Entertainment

No. : SI-J50010
Date: March 27, 1996

Recorded CD-R disk for adjustment GGF1278

[FIXTURE No.] GGF1278

[DESCRIPTION] Recorded CD-R disk for adjustment

[PRICE CODE] C

[APPLICABLE MODELS] DR-R504X
DW-S114X

[USAGE]

1. If you adjust focus off set, please adjust with this disk after adjusted with YEDS-7.
2. If you adjust WBL off set, please use this disk.

* Please refer to SI-V50079-G.

PIONEER ELECTRONIC CORPORATION

(KS/MH101)

Akio Tokumo

A. TOKUMO, General Manager
Engineering Coordination Section
Service Division , Customer Satisfaction Group