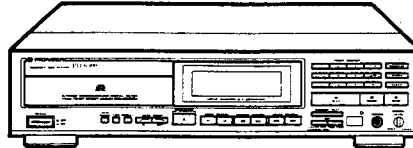


100-2100

# Service Manual



ORDER NO.  
ARP1833

COMPACT DISC PLAYER

# PD-6300 PD-6300-S

PD-6300 AND PD-6300-S HAVE FOLLOWING VERSIONS :

Type	Applicable model		Power requirement	Export destination
	PD-6300	PD-6300-S		
KU	○	—	AC120V only	U. S. A.
KC	○	—	AC120V only	Canada
HEM	○	○	AC220V, 240V (switchable) *	European continent
HB	○	—	AC220V, 240V (switchable) *	United Kingdom
SD	○	—	AC110V, 120V-127V, 220V, 240V (switchable)	Kingdom of Saudi Arabia and general market
HP	○	—	AC220V, 240V (switchable) *	Australia

\*Change the primary wiring of the power transformer.

- This manual is applicable to the HEM, HB, SD, KU, KC, and HP types.
- For the HB, SD, KU, KC, HP and PD-6300-S/HEM types, refer to pages 71-72.
- The PD-6300-S is the same as the PD-6300 except for the color.
- Ce manuel pour le service comprend les explications en français de réglage.
- Este manual de servicio trata del método ajuste escrito en español.

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# 1. SAFETY INFORMATION

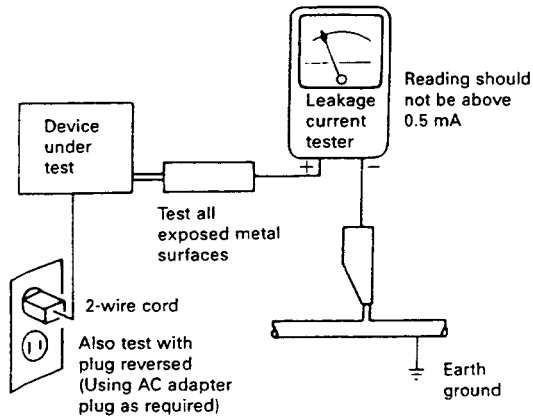
(FOR USA MODEL ONLY)

## 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 120 V AC 60 Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5 mA.



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  $\Delta$  on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does 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)

### VAROITUS!

LAITE SISÄLTÄÄ LASERDIODIN, JOKA LAHETTAA NÄKYMÄTÖNTÄ, SILMILLE VAARALLISTA INFRAPUNASÄTEILYÄ LAITTEEN SISÄLLÄ ON LASERDIODIN LÄHEISYYDESSÄ KUVAN 1. MUKAINEN VAROITUSMERKKI.



LASER  
Kuva 1  
Lasersäteilyn  
varoituserkki

### 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.



LASER  
Picture 1  
Warning sign for  
laser radiation

### ADVERSEL:

USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSÆTTELSE FOR STRÅLING.

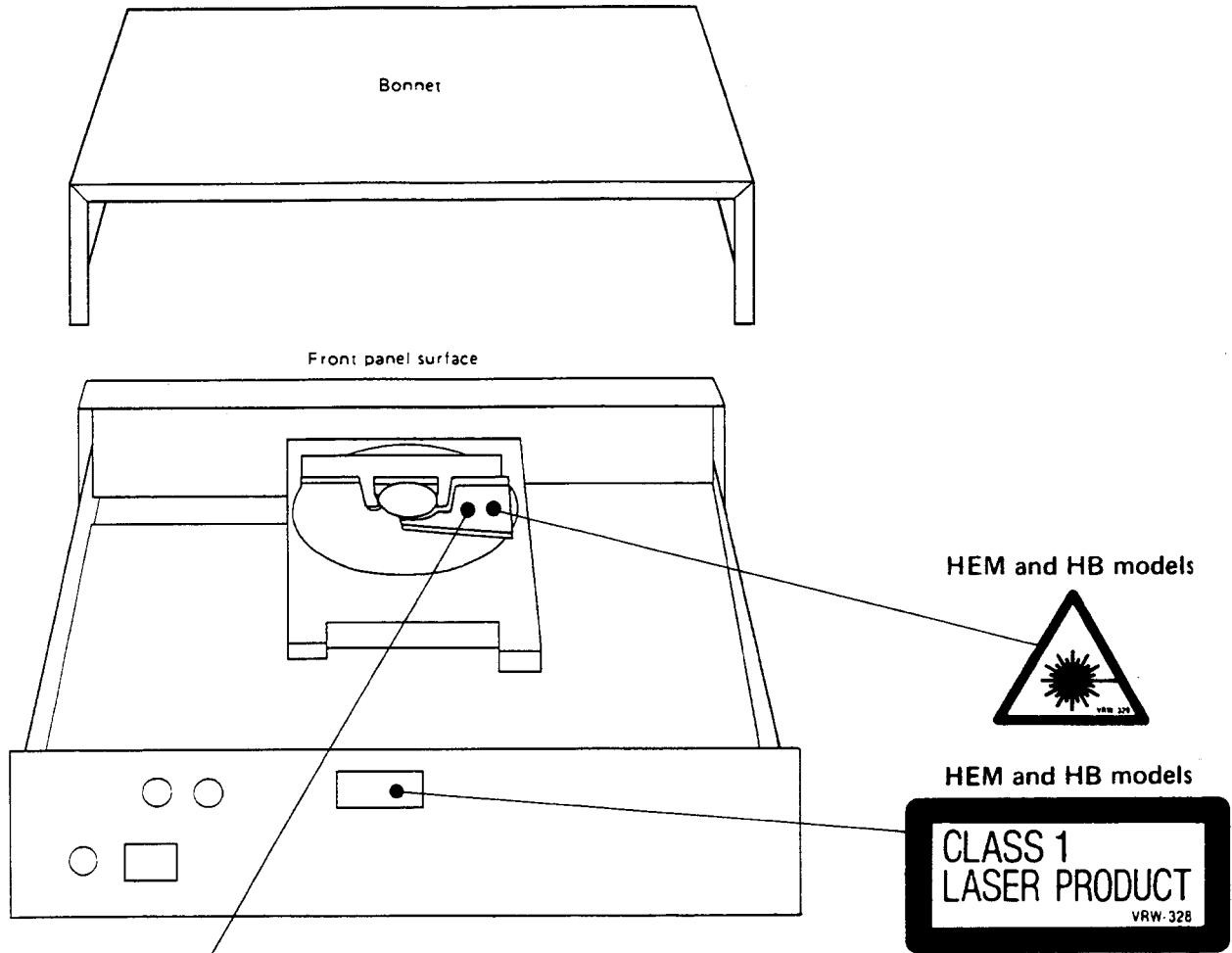
### VIKTIGT

APPARATEN INNEHÅLLER LASER AV HÖGRE KLASS ÄN 1. INGREPP I APPARATEN BÖR GÖRAS AV SPECIELLT UTBILDAD PERSONAL.

### IMPORTANT

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

LABEL CHECK



HB model

**CAUTION**  
**INVISIBLE LASER RADIATION WHEN OPEN, AVOID EXPOSURE TO BEAM**  
 PRW1018

HEM model

**CAUTION**  
 LASER RADIATION WHEN OPEN, AVOID EXPOSURE TO BEAM  
 ADVARSEL  
 FARE FOR USYNLIG LASERSTRÅLING VED ÅBNING AF DÆKSEL  
 UNDGÅ AT UDSÆTTE ØJENE FOR STRÅLING.  
 VORSICHT!  
 UNSICHTBARE LASER STRAHLUNG TRITT AUS, WENN DECKEL  
 (ODER KLAPPE) GEOFFNET IST! NICHT DEM STRAHL AUSSETZEN!  
 PRW-175

**ADDITIONAL LASER CAUTION**

1. Laser Interlock Mechanism

The ON/OFF status of the clamp switch (S102) for detecting loading completion is detected by the system microprocessor, and the design prevents laser diode oscillation when the clamp switch is OFF.

Thus, the interlock will no longer function if the clamp switch (S102) is deliberately started. In the test mode the interlock mechanism will not function (Refer to page 32).

Laser diode oscillation will continue if pin 4, 5, or 29 of CXA1081S (IC1) is connected to ground or the terminals of Q1 are shorted to each other (fault condition).

2. If the fault condition described in 1 is induced with the cover removed and the objective lens extending past the outer circumference of the disc clamped diameter, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 or higher laser beam.

## 2. SPECIFICATIONS

### 1. General

Type .....	Compact disc digital audio system
Usable discs .....	Compact Disc
Power requirements	
European models .....	AC 220V, 50/60Hz
Canadian model .....	AC 120V, 60Hz
Power consumption .....	16W
Operating temperature .....	+5°C— +35°C (+41°F— +95°F)
Weight .....	4.1kg (9lb, 1oz)
External dimensions .....	420(W) × 324(D) × 98(H)mm 16-9/16(W) × 12-3/4(D) × 3-7/8(H) in.

### 2. Audio section

Frequency response .....	4Hz—20kHz (±0.5dB)
S/N .....	104dB or more (EIAJ)
Dynamic range .....	96dB or more (EIAJ)
Channel separation .....	100dB or more (EIAJ)
Total harmonic distortion .....	0.0035% or less (EIAJ)
Output voltage .....	2.0V
Wow and flutter .....	Limit of measurement (±0.001% W.PEAK) or less (EIAJ)
Number of channels .....	2 channels (stereo)
Digital output .....	Coaxial output: 0.5 Vp-p ±20% (75Ω)

### 3. Output terminal

Coaxial digital output terminal  
 Control input/output terminals (Canadian model only)  
 Audio line output terminals  
 Headphone jack (with volume control)

### 4. Functions

- Play
- Pause
- Stop
- Manual search
- Track search
- Index search
- Direct selection
- Single track repeat
- All track repeat
- Programmed repeat
- Random play repeat
- Programmed random play repeat
- Programmed playback (up to 24 tracks)
- Pause program
- Program check
- Program correction
- Program clear
- Add-on program
- Auto program editing
- Time fade editing
- Computer allocated program editing
- One touch fade
- Digital level control (remote control)
- Random play
- Programmed random play
- Auto space
- Timer start

### 5. Accessories

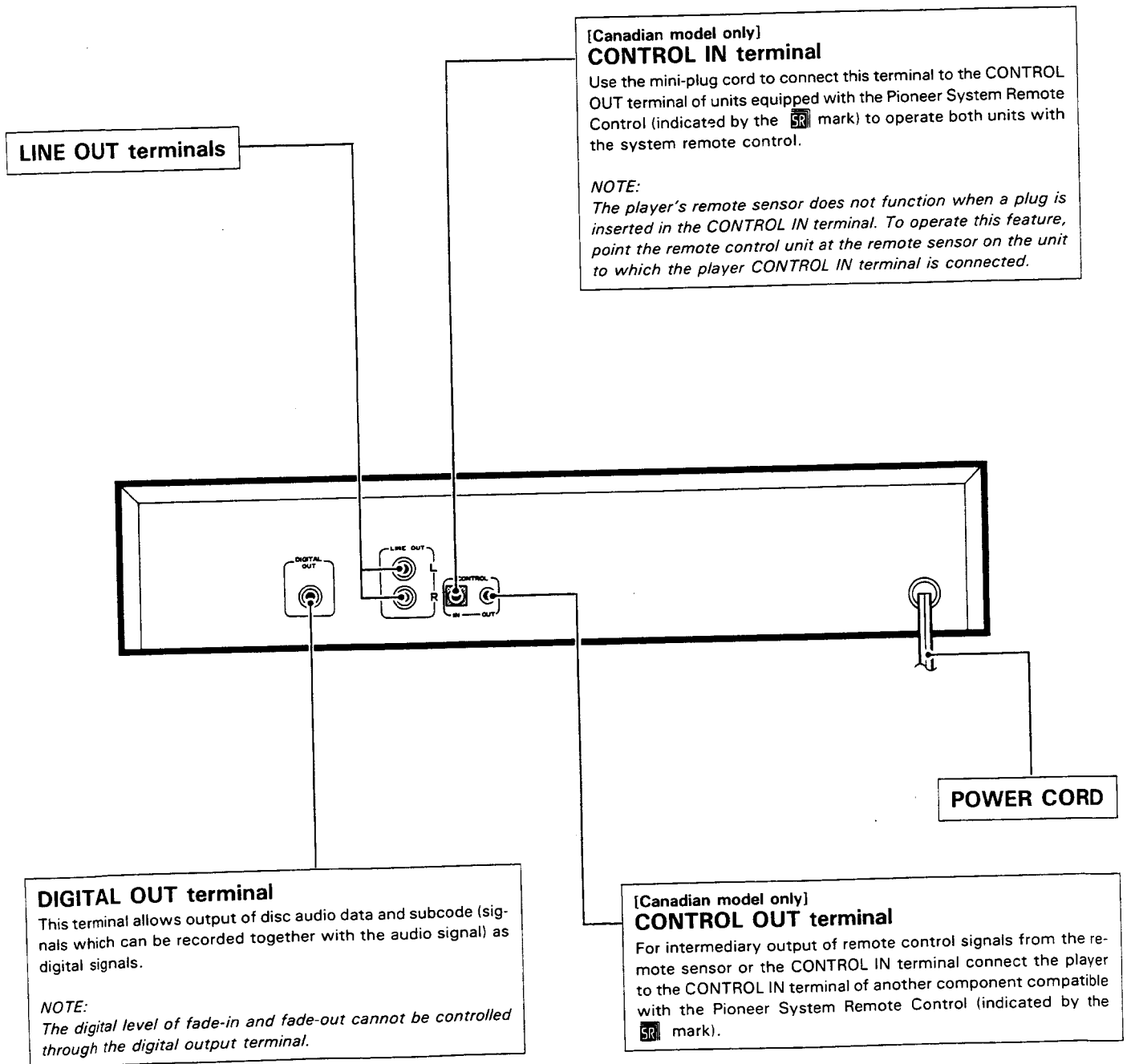
● Remote control unit .....	1
● Size AAA/R03 dry cell batteries .....	2
● Output cable .....	1
● Control cord (Canadian model only) .....	1
● Operating instructions .....	1

**NOTE:**

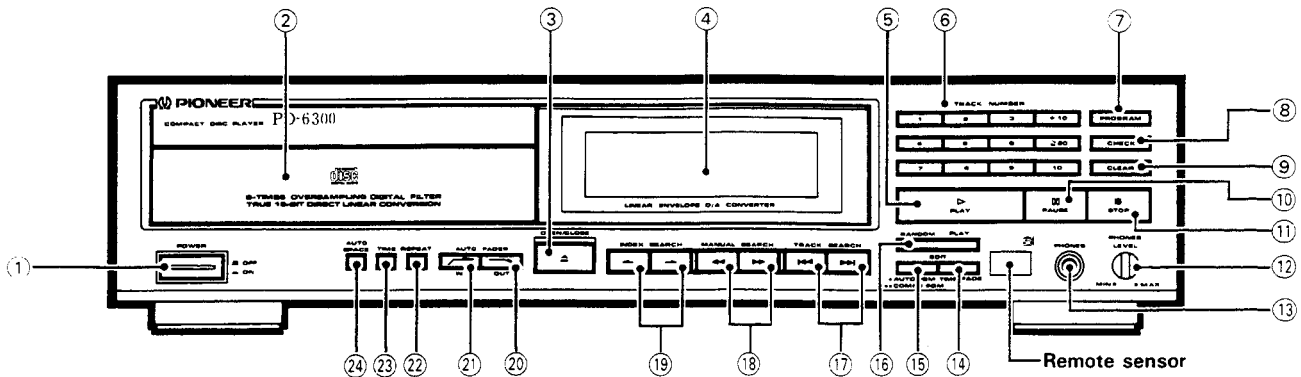
*The specifications and design of this product are subject to change without notice, due to improvements.*

### 3. PANEL FACILITIES

#### REAR PANEL



## FRONT PANEL



### ① POWER switch

Press to turn power to the unit ON and OFF.

### ② Disc Tray

This is where the disc is set. When power is switched ON and the OPEN/CLOSE key is pressed, the tray is ejected forward. To insert the tray, press the OPEN/CLOSE key, or lightly push the tray in with your finger.

### ③ OPEN/CLOSE key (▲)

Press when you wish to eject or load a disc. Each time the key is pressed, the tray is alternately pushed out or pulled in.

### ④ Indicators

See page 8.

### ⑤ PLAY key/Indicator (▷)

Press to begin playback, and to cancel the pause mode.

### ⑥ TRACK NUMBER keys (1 to 10, + 10 and ≥20)

- These keys are used to specify the track numbers (tracks 1 to 99) for direct track selection or program entry.
- During auto program editing or time fade editing, the keys are used to specify the time period (in minutes).

### ⑦ PROGRAM key

This is used to program tracks to play in a desired sequence.

- Press this key to set the unit to program mode. Then specify the desired tracks with the TRACK NUMBER keys. The tracks will be programmed as they are entered in this way.

### ⑧ CHECK key

Press this key to check the contents of a program that has been entered. Starting with step 1 of the program the next program step will be shown each time the key is pressed.

### ⑨ CLEAR key

Press this key during program entry or playback to clear the last program step. This will also cancel the time fade editing mode.

### ⑩ PAUSE key/Indicator (⏸)

Press to temporarily interrupt playback. when pressed again, the pause mode is cancelled and playback resumes.

### ⑪ STOP key (■)

Press to stop playback. When pressed, the player goes into stop mode and all operations stop.

Press to clear a program. When pressed during stop mode, the program stored in memory is cleared.

### ⑫ PHONES LEVEL control knob

Use to adjust the level of sound when using headphones. Turning the knob to the right increases the sound level.

### ⑬ PHONES (headphones) jack

When you wish to use headphones, insert the plug for the headphones into the headphone jack.

### ⑭ TIME FADE EDIT key

Press this key when ending play at a desired time with fade out.

### ⑮ AUTO/COMPU PGM EDIT key

If this key is pressed, the selections are automatically programmed (Auto Program Editing) in sequence so they are played within the desired time. If it is pressed again, the selection order is switched to fill the playback time as completely as possible (Computer Allocated Program Editing).

### ⑯ RANDOM PLAY key

Press to begin random playback.

17 TRACK SEARCH keys

During playback (or programmed play) or pause, these keys are used to search for the desired track. The search keys are pressed to advance or reverse the player to the next or previous track respectively.  
When pressed during stop mode, the playing time of the displayed track will be displayed.

18 MANUAL SEARCH keys

When the player is in play or pause modes, these keys are pressed to perform fast forward or fast reverse operations, to allow manual searching. These operations are only carried out during the time either key is pressed.

19 INDEX SEARCH keys

Searches, during playback or pause, for the music section of a track or the track index. When pressed, the unit will return to the previous index or advance to the next index.  
[→] : Advances to the next index number.  
[←] : Returns to the index number of the currently-playing music section or track.

20 AUTO FADER OUT key

Press this key for fade-out sound. (After fade-out is completed, the unit will enter pause mode.)

21 AUTO FADER IN key

Press this key to start playback with fade-in sound. (Effective only during playback pause mode and fade-out.)

22 REPEAT key

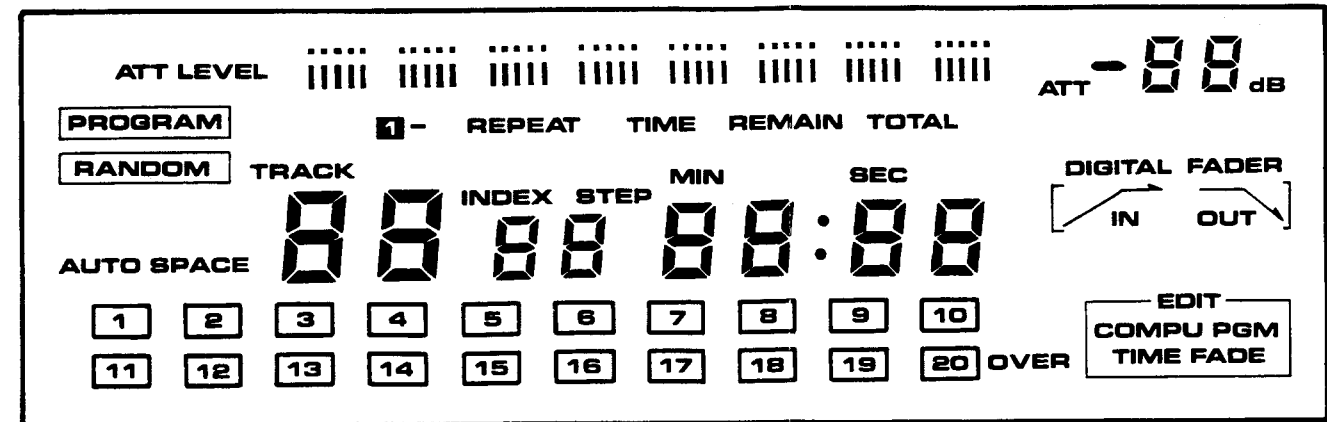
Press this key for repeat playback. Pressing the key once, twice, or three times will change the repeat mode from single track repeat, all tracks repeat, and repeat playback cancellation.

23 TIME key

This switches the indicator display mode. Each time the key is pressed, the display will show TIME, REMAIN, and TOTAL respectively. (For a description of each display mode, refer to the item concerning the indicator.)

24 AUTO SPACE key

During playback, there will be a pause of about three seconds before the next track is played.



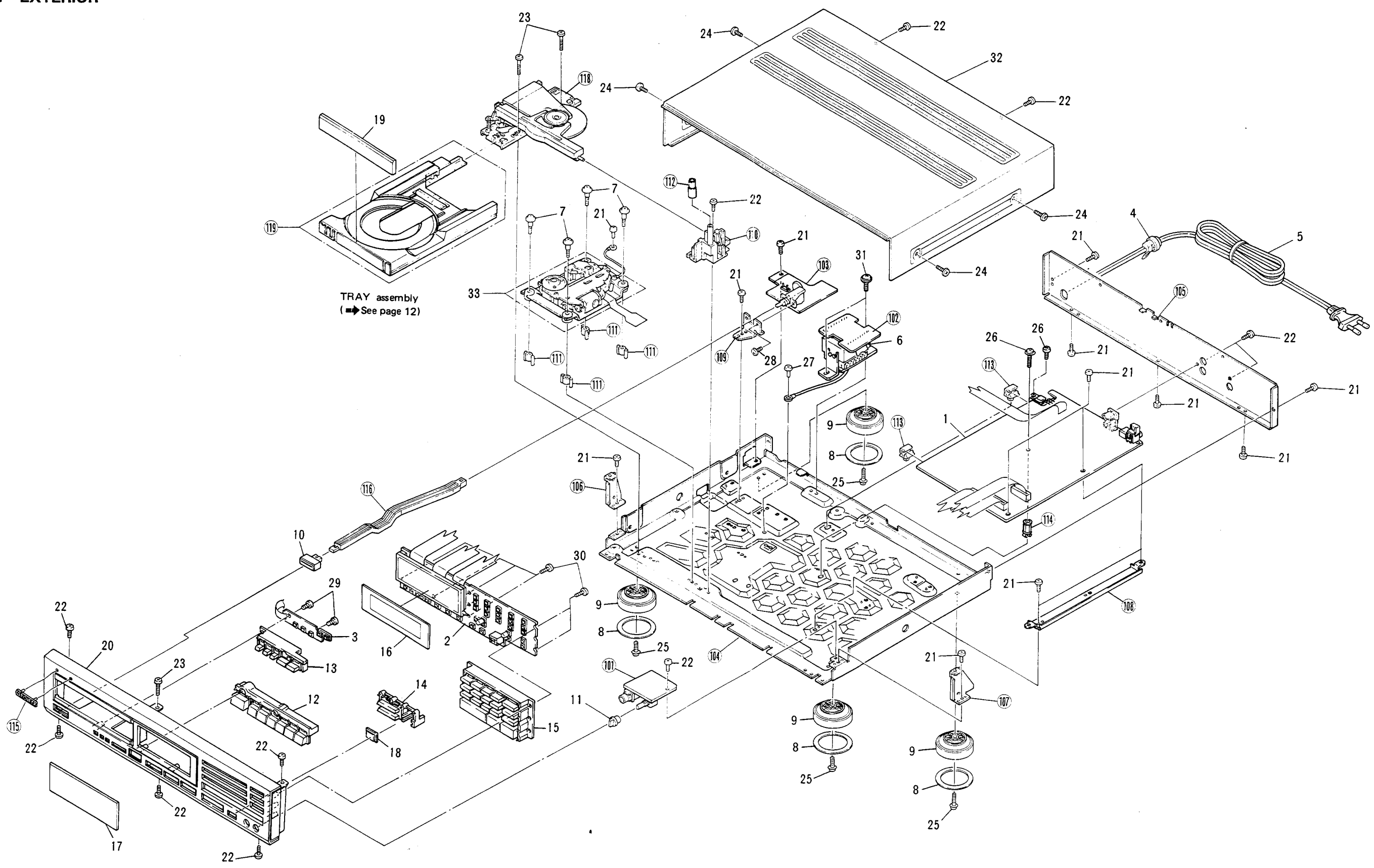
INDICATORS

- ATT LEVEL : The volume level of fade-in, fade-out, and digital level control is displayed.
- PROGRAM : Lights during the program mode.
- RANDOM : Lights during random playback.
- AUTO SPACE : Lights during auto space playback.
- 1 - REPEAT : Lights during repeat playback of one track.
- REPEAT : Lights during repeat playback of all tracks (or programs).
- TRACK : Display the current track number (during normal playback and programmed playback) or the track being programmed during programming operation. The lower figures light up in accordance with the number of tracks recorded on the disc, and the numbers of the tracks which have been played are deleted in order. (During entering a program, and programmed playback only the programmed tracks light.) For 21 or over, OVER will light.
- INDEX : Displays the index \* number of the music section of a track or the track division.
- STEP : Displays the program steps.
- TIME/REMAIN/TOTAL : Changes each time the TIME key is pressed.
- TIME : Displays the track number of the track being played (TRACK) and the elapsed time (minutes and seconds).

- REMAIN : Displays the remaining time on the track being played. When the TIME key is pressed again, the remaining time on the disc will be displayed.
  - TOTAL : Displays the total number of tracks on the disc (TRACK) and the overall playback time (minutes and seconds). During playback, the display goes on for about 5 seconds before changing to the TIME display. During programmed playback operation, displays the playing time, the remaining time of the track being played and the total program steps (TOTAL). During time fade editing mode playback, TIME-FADE-REMAIN will be displayed instead of remaining time on the disc.
  - MIN (minute) : Displays the minutes of the elapsed time, total playback time, and remaining time.
  - SEC (second) : Displays the seconds of the elapsed time, total playback time, and remaining time.
  - ATT : Displays the volume decrease (-dB) of fade-in, fade-out and digital level control.
  - IN : Lights during fade-in operation.
  - OUT : Lights during fade-out operation.
  - COMPU PGM : Displays when Computer Allocated Program Editing is set or used.
  - TIME FADE : Displays when time fade editing is set or used.
- \* The INDEX is a signal which is recorded within a track to indicate division of the track into separate tunes and items of music.

# 4. EXPLODED VIEWS AND PARTS LIST

## 4.1 EXTERIOR





Parts List of Exterior

NOTES :

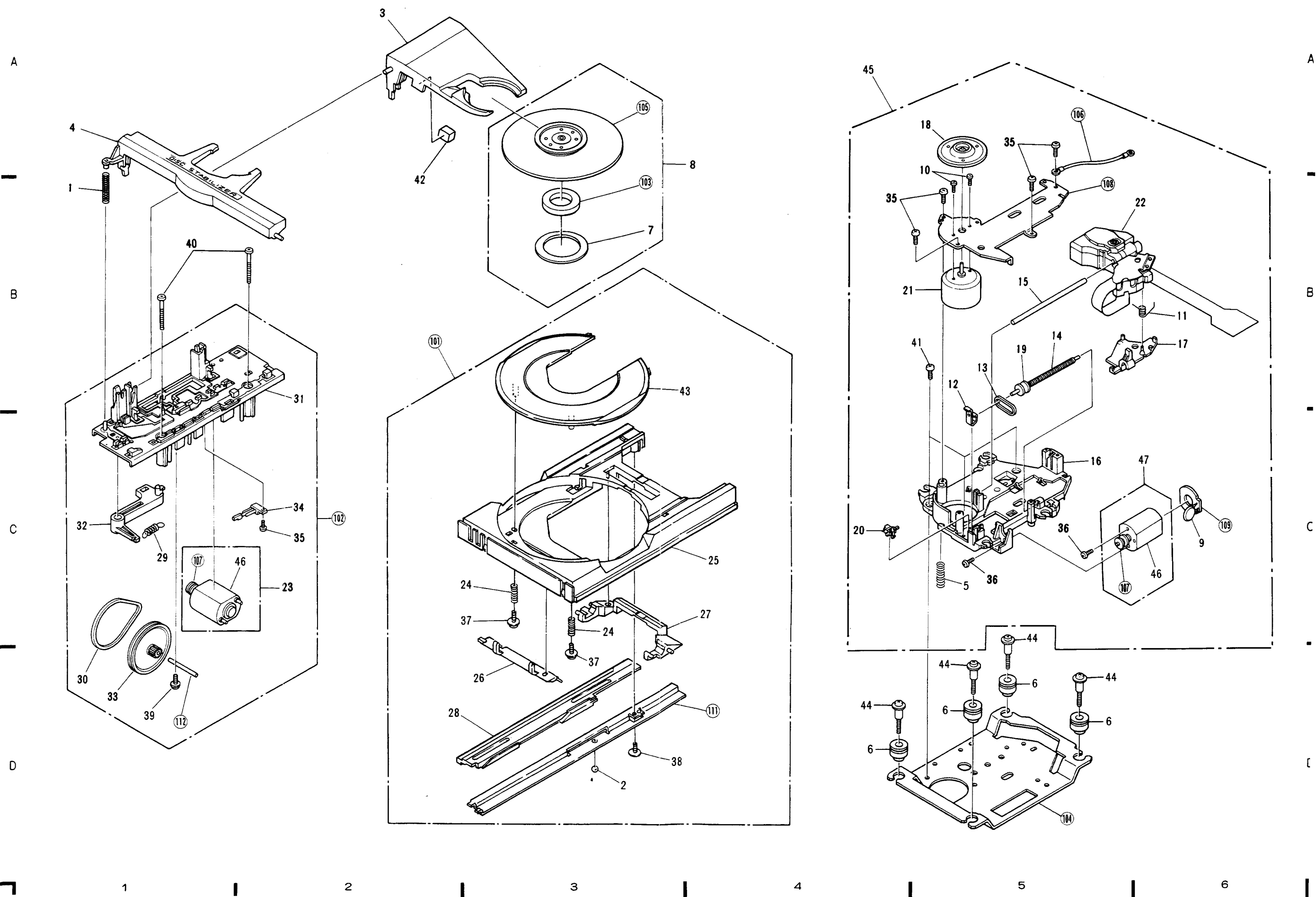
- Parts without part number cannot be supplied.
- The  $\Delta$  mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "O" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
⊙	1	PWZ1593	Main board assembly		101		Headphone board assembly
⊙	2	PWZ1639	Control board assembly		102		Transformer board assembly
⊙	3	PWZ1640	Sub control board assembly		103		Switch board unit
$\Delta$	4	CM-22B	Strain relief		104		Under base
$\Delta$	5	PDG1003	AC power cord		105		Rear base
$\Delta$	6	PTT1063	Power transformer		106		Angle
	7	PBA1001	Screw		107		Panel angle
	8	PNM1070	Stopper		108		P.C. Board angle
	9	PNW1263	Insulator		109		Switch angle
	10	PAC1252	Power button (POWER)		110		Slide guide
	11	PAC1370	Knob (PHONES LEVEL)		111		Mechanism support
	12	PAC1378	Track button (TRACK NUMBER, PROGRAM,CHECK, CLEAR, PLAY, PAUSE, STOP)		112		Guide spacer
					113		P.C. Board holder
					114		P.C. Board spacer
					115		Friction name plate
	13	PAC1380	Repeat button (AUTO SPACE, TIME, REPEAT, AUTO FADER)		116		SW joint
					117		Binder
					118		Loading base assembly
	14	PAC1382	ED button (RANDOM PLAY, EDIT)		119		Tray assembly
	15	PAD1049	Play button assembly (OPEN/CLOSE, INDEX SEARCH, MANUAL SEARCH, TRACK SEARCH)				
	16	PAM1292	Display window				
	17	PAM1305	Window screen				
	18	PNW1075	Plate				
	19	PNW1527	Tray plate				
	20	PNW1529	Panel				
	21	BBZ30P060FMC	Screw				
	22	BBZ30P080FZK	Screw				
	23	BBZ30P230FMC	Screw				
	24	FBT40P080FZK	Screw				
	25	IBZ30P120FCC	Screw				
	26	IBZ30P150FCU	Screw				
	27	PDZ30P050FMC	Screw				
	28	PMZ30P060FCU	Screw				
	29	PPZ30P080FMC	Screw				
	30	PPZ30P150FMC	Screw				
	31	PSA40P080FZB	Screw				
	32	PYY1093	Bonnet				
	33	PYY1113	Servo mechanism assembly				

Parts List of Mechanism Section

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1	PBH1013	Spring		31	PNW1069	Loading base
	2	PBP-001	Steel ball $\phi 4$		32	PNW1083	Clamp lever
	3	PNW1084	Clamp holder		33	PNW1171	Gear pulley
	4	PNW1085	Clamp retainer		34	VSK-015	Leaf switch (S102.OPEN/CLAMP)
	5	PBH1009	Earth spring				
	6	PEB1031	Floating rubber		35	BPZ20P080FZK	Screw
	7	PNM1010	Disc cushion		36	PMZ20P030FMC	Screw
	8	PYY1084	Clamper assembly		37	PBA1025	Screw
	9	CGDYX104M25	Semiconductive ceramic capacitor		38	PPZ30P080FMC	Screw
					39	IPZ30P060FMC	Screw
	10	PBA1037	Screw M2 x 2.5		40	BBZ30P230FMC	Screw
	11	PBH1008	Drive spring		41	BBZ30P080FCC	Screw
	12	PBK1057	Plate spring		42	PEB1032	Stopper rubber
	13	PEB1072	Belt (CARRIAGE)		43	PNW1521	Disc plate
	14	PLA1003	Drive worm		44	PBA1001	Screw
	15	PLA1004	Guide bar		45	PYY1113	Servo mechanism assembly
	16	PNW1520	Mechanism chassis		46	PXM1002	Motor (LOADING, CARRIAGE)
	17	PNW1578	Carriage plate				
	18	PNW1064	Disc table		47	PYY1025	Motor assembly (CARRIAGE)
	19	PNW1066	Pulley				
	20	PSH1003	Slide switch (S101. INSIDE)		101		Tray assembly
	21	PYY1109	Spindle motor assembly		102		Loading base assembly
	22	PWY1010	Pick up assembly		103		Magnet
	23	PYY1090	Motor assembly (LOADING)		104		Ballast base
	24	PBH1045	Plate Spring		105		Clamper
	25	PNW1390	Tray		106		Earth lead wire unit
	26	PNW1330	Plate lever (F)		107		Motor pulley
	27	PNW1331	Plate lever (R)		108		Base plate
	28	PNW1332	Rack		109		Carriage M board
	29	PBH1012	Clamp spring		110		.....
	30	PEB1013	Belt (LOADING)		111		Slide base
					112		Gear shaft

4.2 MECHANISM SECTION



# 5. SCHEMATIC DIAGRAM

- 1. RESISTORS:**  
Indicated in Ω, 1/6W, ±5% tolerance unless otherwise noted  
k: kΩ, M: MΩ, (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% tolerance.
- 2. CAPACITORS:**  
Indicated in capacity (μF) / voltage (V) unless otherwise noted  
p: pF.  
Indication without voltage is 50V except electrolytic capacitor.
- 3. VOLTAGE CURRENT:**  
□: DC voltage (V) at play state.  
◻: mA: DC current at play state.  
Value in ( ) is DC current at stop state.

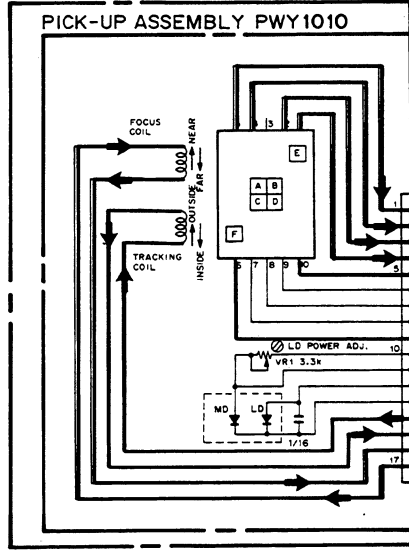
- 4. OTHERS:**  
→: Signal route.  
⊙: Adjusting point.  
The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.  
\*marked capacitor and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

### 5. SWITCHES (Underline indicates switch position)

- Main board assembly**
- S1: TEST
- Control board assembly**
- S201: OPEN/CLOSE
- S202: PLAY
- S203: PROGRAM
- S204: RANDOM PLAY
- S205: TRACK SEARCH
- S206: PAUSE
- S207: MANUAL SEARCH
- S208: TIME FADE
- S209: TRACK SEARCH
- S210: STOP
- S211: MANUAL SEARCH
- S212: REPEAT
- S213: TIME
- S214: 4
- S215: 7
- S216: 0
- S217: 2
- S218: 5
- S219: 8
- S220: AUTO PROGRAM
- S221: 3
- S222: 6
- S223: 9
- S224: CLEAR
- S225: 10
- S226: 11
- S227: 12
- S228: 13
- S229: 14
- S230: 15
- S231: 16
- S232: 17
- S233: 18
- S234: 19
- S235: 20
- Sub control board assembly**
- S24: SPACE
- S25: 1
- S26: 2
- S27: 3
- S28: 4
- S29: 5
- S30: 6
- S31: POWER ON-OFF
- S32: CLAMP CLAMP-OPEN
- Switch board assembly**
- S101: INSIDE ON-OFF
- S102: CLAMP CLAMP-OPEN

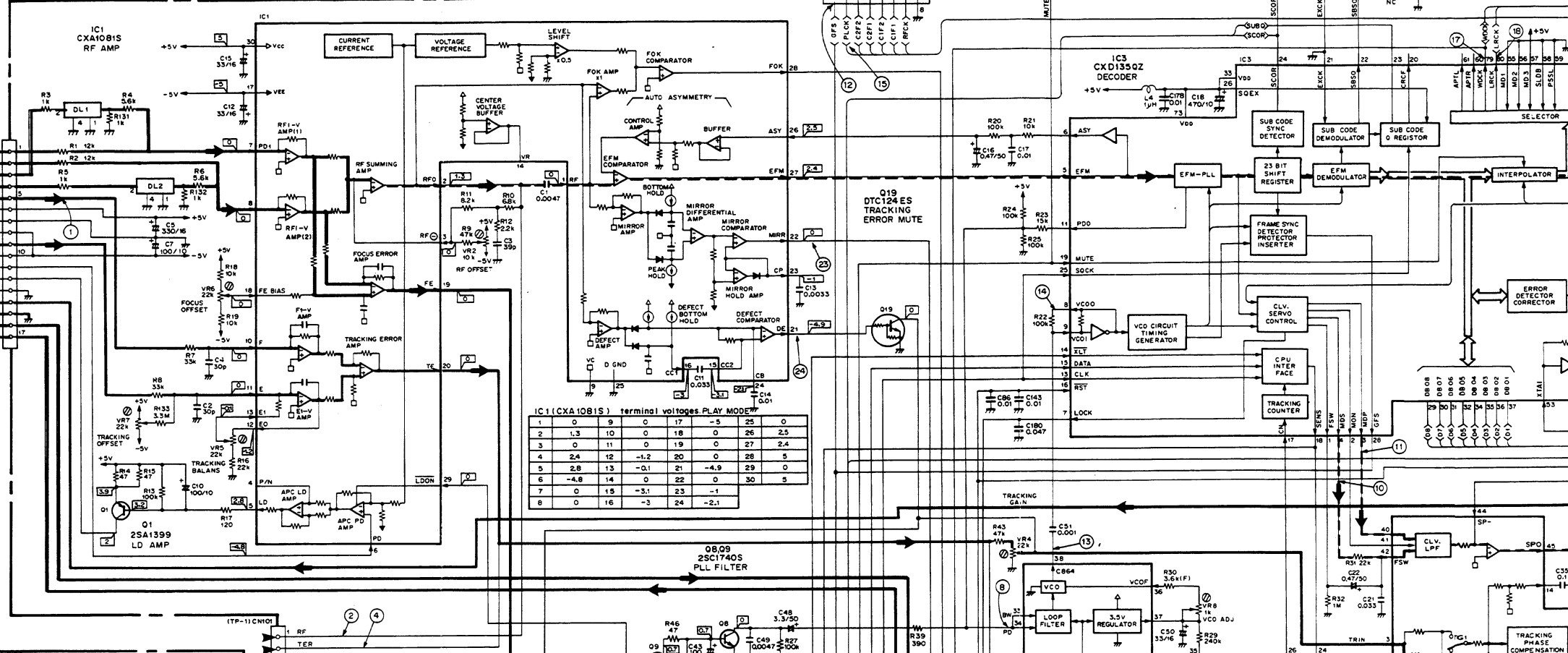
### SERVO MECHANISM ASSEMBLY PYY 1113 (1/2)



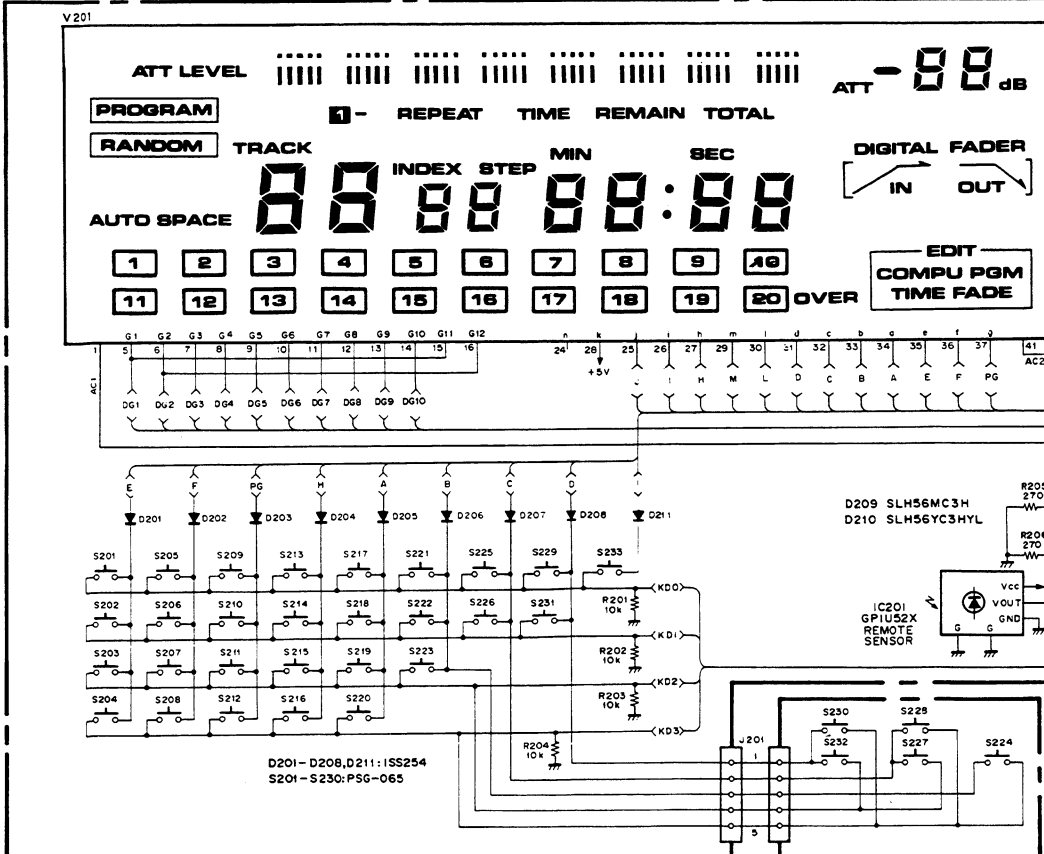
IC6 (PD4200) terminal voltages, PLAY MODE

1	-2.5	21	5	41	-2.3	-2.35	61	-0.4	-0.3	
2	-19.9	-22.3	22	3	42	-2.3	-2.35	62	-0.4	-0.3
3	-0.1	-8.7	23	0	43	-2.35	63	-2.3	-5.3	
4	-7.7	-10.7	24	0	44	-2.35	64		5	
5	3	25	0	45	-2.35					
6	3	26	0	46	-2.35					
7	5	27	0	47	-2.35					
8	2.5	28	0	48	-2.35					
9	4.5	29	0	49	-2.35					
10	0.1	30	2.4	50	-0.1	-0.6				
11	5	31	2.6	51	4.3					
12	5	32	0	52	0.5					
13	0	33	0	53	-5					
14	0	34	2.3	54	0.9	-1.3				
15	0	35	0	55	-4.3	-4.8				
16	0	36	5	56	-26.1					
17	5	37	5	57	-5					
18	0	38	5	58	-4.5	-4.9				
19	5	39	0	59	-3.3	-5.5				
20	5	40	-2.3	-2.35	60	-5.2	-11.2			

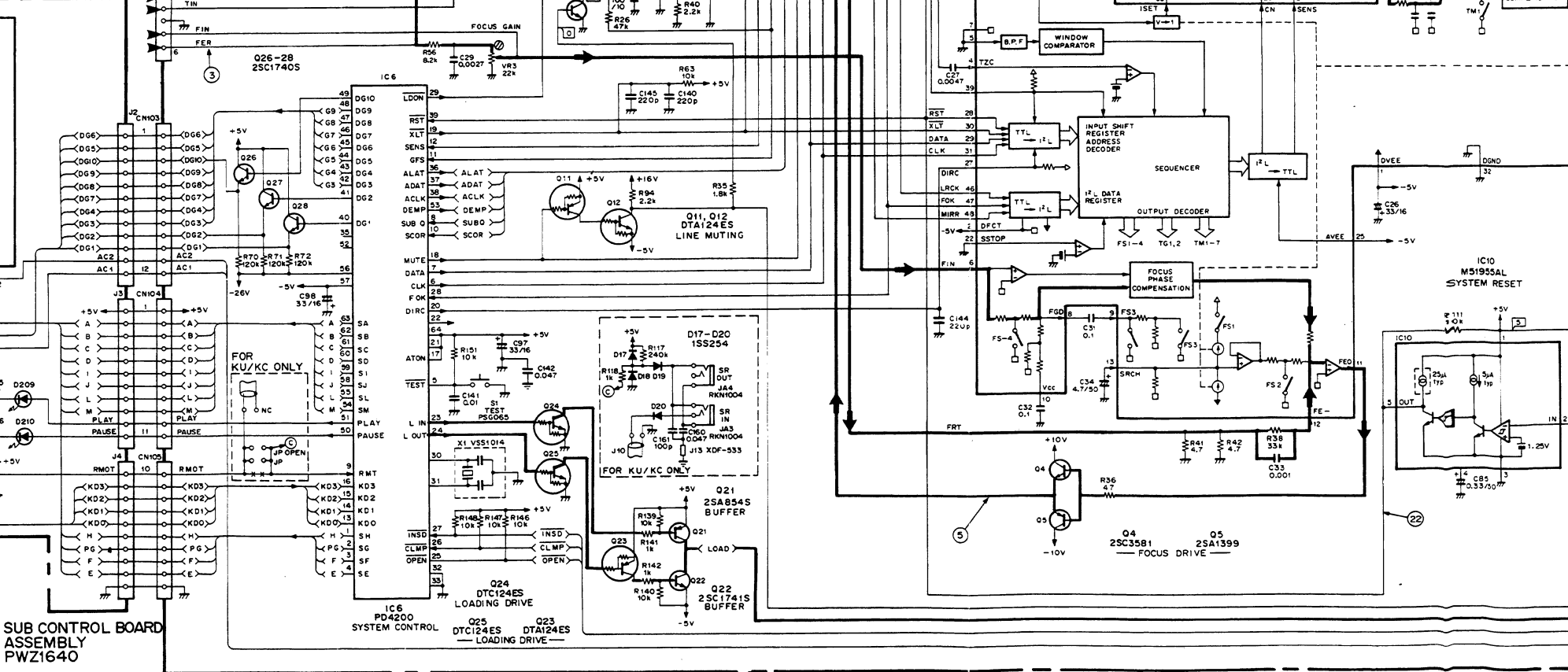
### MAIN BOARD ASSEMBLY PWZ 1593

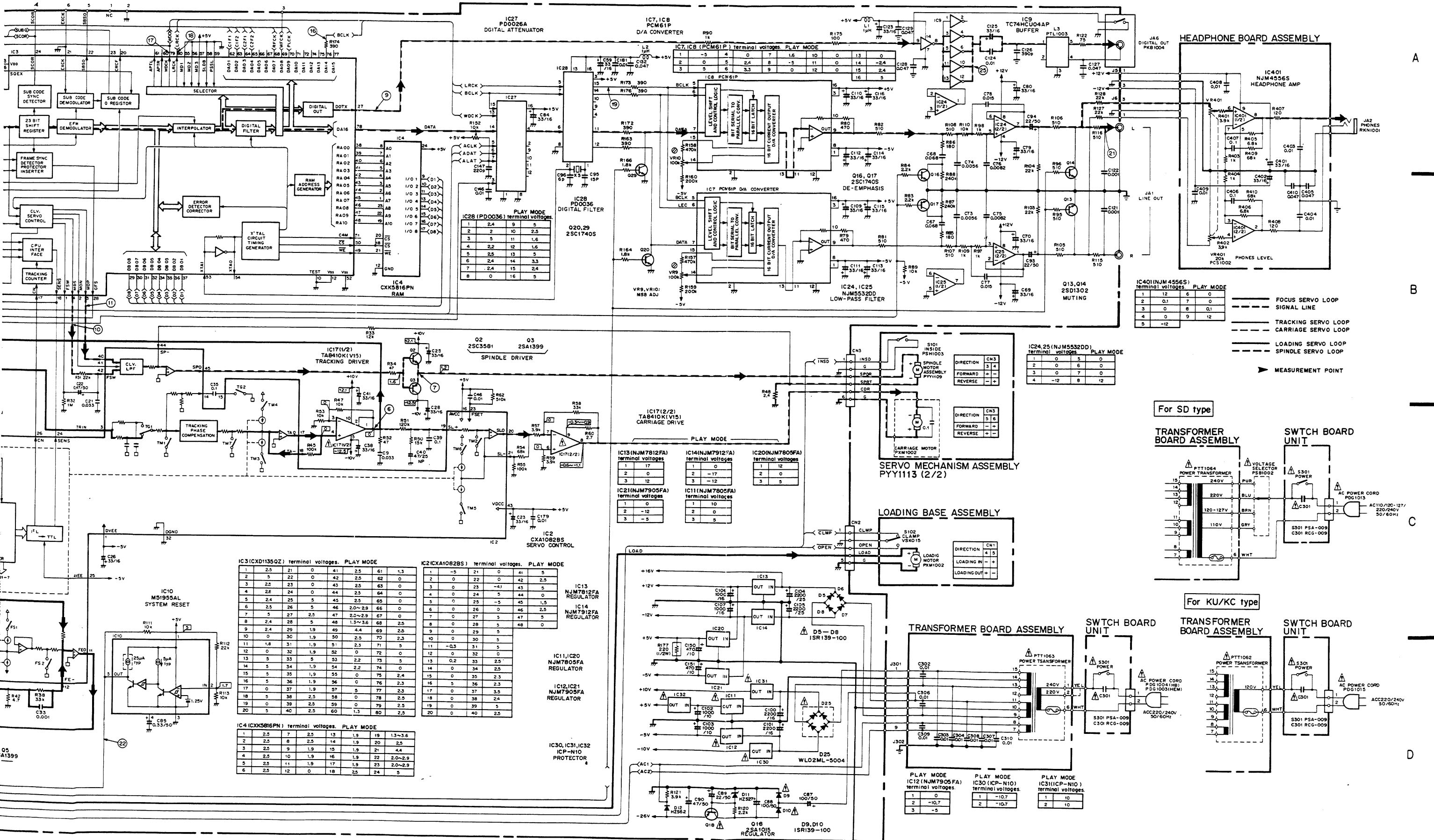


### CONTROL BOARD ASSEMBLY PWZ1639



### SUB CONTROL BOARD ASSEMBLY PWZ1640





IC3 (CXD135QZ) terminal voltages. PLAY MODE

1	2.5	21	0	41	2.5	61	1.3
2	5	22	0	42	2.5	62	0
3	2.2	23	0	43	2.5	63	0
4	2.8	24	0	44	2.5	64	0
5	2.4	25	5	45	2.5	65	0
6	2.5	26	5	46	2.0-2.9	66	0
7	5	27	2.5	47	2.0-2.9	67	0
8	2.4	28	5	48	1.5-3.6	68	2.5
9	2.4	29	1.9	49	4.4	69	2.5
10	0	30	1.9	50	2.5	70	2.5
11	1.8	31	1.9	51	2.3	71	5
12	0	32	1.9	52	0	72	0
13	5	33	5	53	2.2	73	5
14	5	34	1.9	54	2.2	74	0
15	5	35	1.9	55	0	75	2.4
16	5	36	1.9	56	0	76	2.3
17	0	37	1.9	57	5	77	2.3
18	5	38	2.5	58	0	78	2.5
19	0	39	2.5	59	0	79	2.5
20	5	40	2.5	60	1.3	80	2.5

IC2 (CX1082BS) terminal voltages. PLAY MODE

1	-5	21	0	41	5
2	0	22	0	42	2.5
3	0	23	-4.1	43	5
4	0	24	5	44	0
5	0	25	-5	45	1.5
6	0	26	0	46	2.5
7	0	27	5	47	5
8	0	28	5	48	0
9	0	29	5	49	0
10	0	30	5	50	5
11	-0.3	31	5	51	5
12	0	32	0	52	0
13	0.2	33	2.5	53	2.5
14	0	34	2.5	54	2.5
15	0	35	2.5	55	2.5
16	5	36	2.5	56	2.5
17	0	37	1.9	57	5
18	0	38	2.5	58	0
19	0	39	2.5	59	0
20	5	40	2.5	60	1.3

IC4 (CXK5816PN) terminal voltages. PLAY MODE

1	2.5	7	2.5	13	1.9	19	1.3-3.6
2	2.5	8	2.5	14	1.9	20	2.5
3	2.5	9	1.9	15	1.9	21	4.4
4	2.5	10	1.9	16	1.9	22	2.0-2.9
5	2.5	11	1.9	17	1.9	23	2.0-2.9
6	2.5	12	0	18	2.5	24	5

IC28 (PD0036) terminal voltages. PLAY MODE

1	2.4	9	5
2	2	10	2.5
3	5	11	1.6
4	2.2	12	1.6
5	2.5	13	5
6	2.4	14	3.3
7	2.4	15	2.4
8	0	16	5

IC13 (NJM7812FA) terminal voltages. PLAY MODE

1	17
2	0
3	12

IC21 (NJM7905FA) terminal voltages. PLAY MODE

1	0
2	-12
3	-5

IC11 (NJM7805FA) terminal voltages. PLAY MODE

1	0
2	-12
3	5

IC14 (NJM7912FA) terminal voltages. PLAY MODE

1	0
2	-17
3	-12

IC20 (NJM7805FA) terminal voltages. PLAY MODE

1	12
2	0
3	5

IC12 (NJM7905FA) terminal voltages. PLAY MODE

1	0
2	-10.7
3	-5

IC30 (ICP-N10) terminal voltages. PLAY MODE

1	10
2	10

IC31 (ICP-N10) terminal voltages. PLAY MODE

1	10
2	10

IC32 (ICP-N10) terminal voltages. PLAY MODE

1	10
2	10

IC40 (NJM4556S) terminal voltages. PLAY MODE

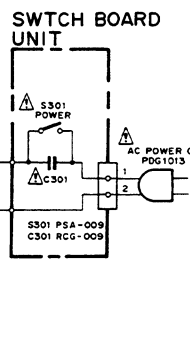
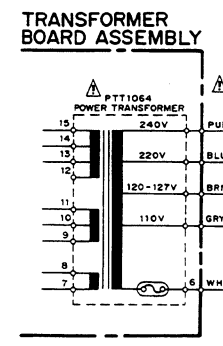
1	12	6	0
2	0.1	7	0
3	0	8	0.1
4	0	9	12
5	-12		

IC24, IC25 (NJM5532DD) terminal voltages. PLAY MODE

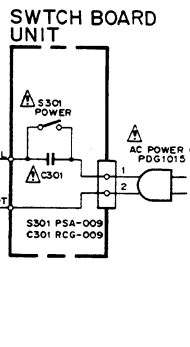
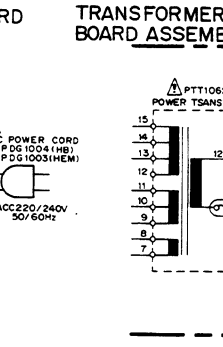
1	0	5	0
2	0	6	0
3	0	7	0
4	-12	8	12

- FOCUS SERVO LOOP SIGNAL LINE
- TRACKING SERVO LOOP CARRIAGE SERVO LOOP
- LOADING SERVO LOOP SPINDLE SERVO LOOP
- MEASUREMENT POINT

For SD type



For KU/KC type



A

B

C

D

# 6. P.C. BOARDS CONNECTION DIAGRAM

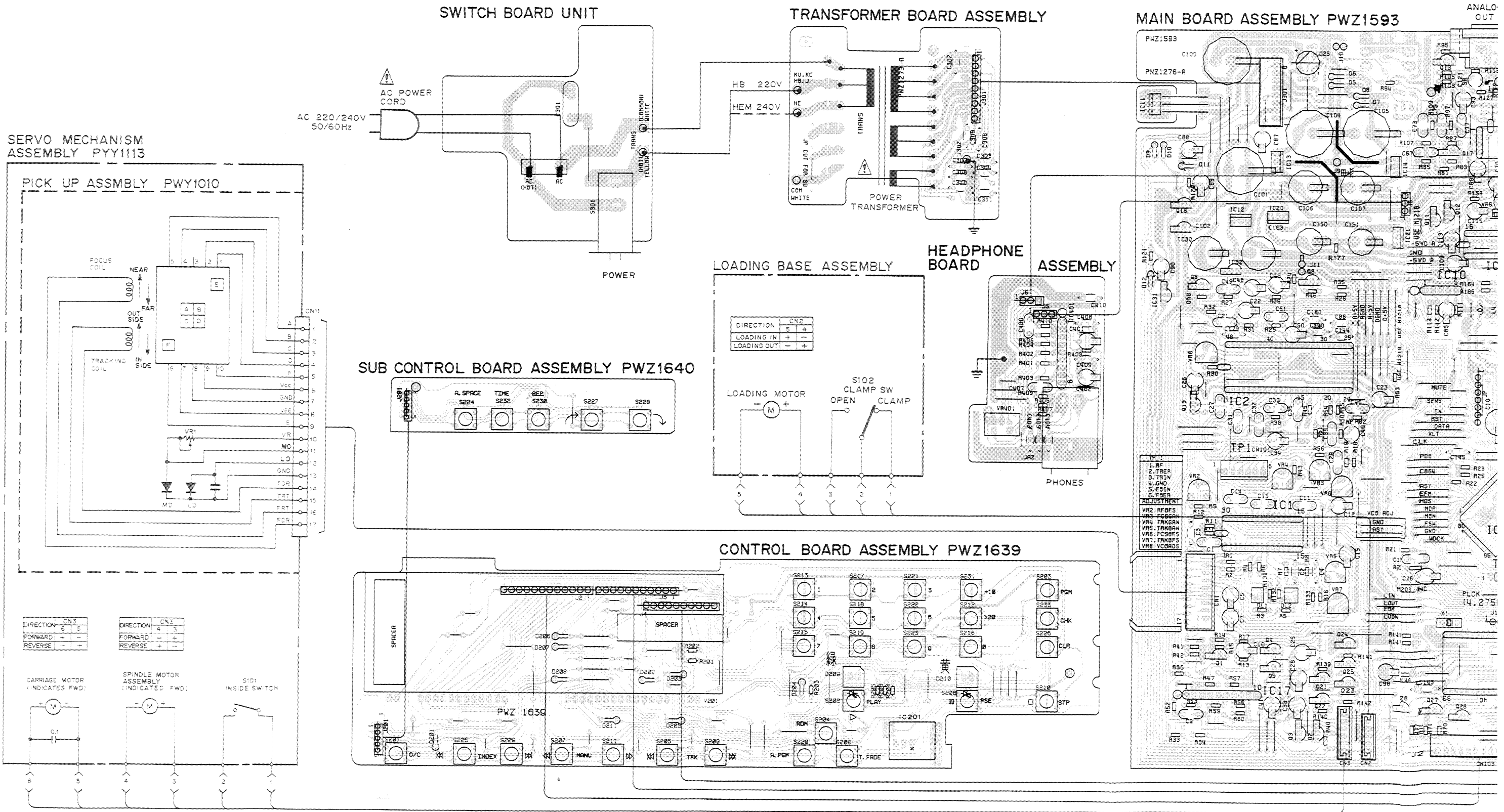
• View from component side

A

B

C

D



1

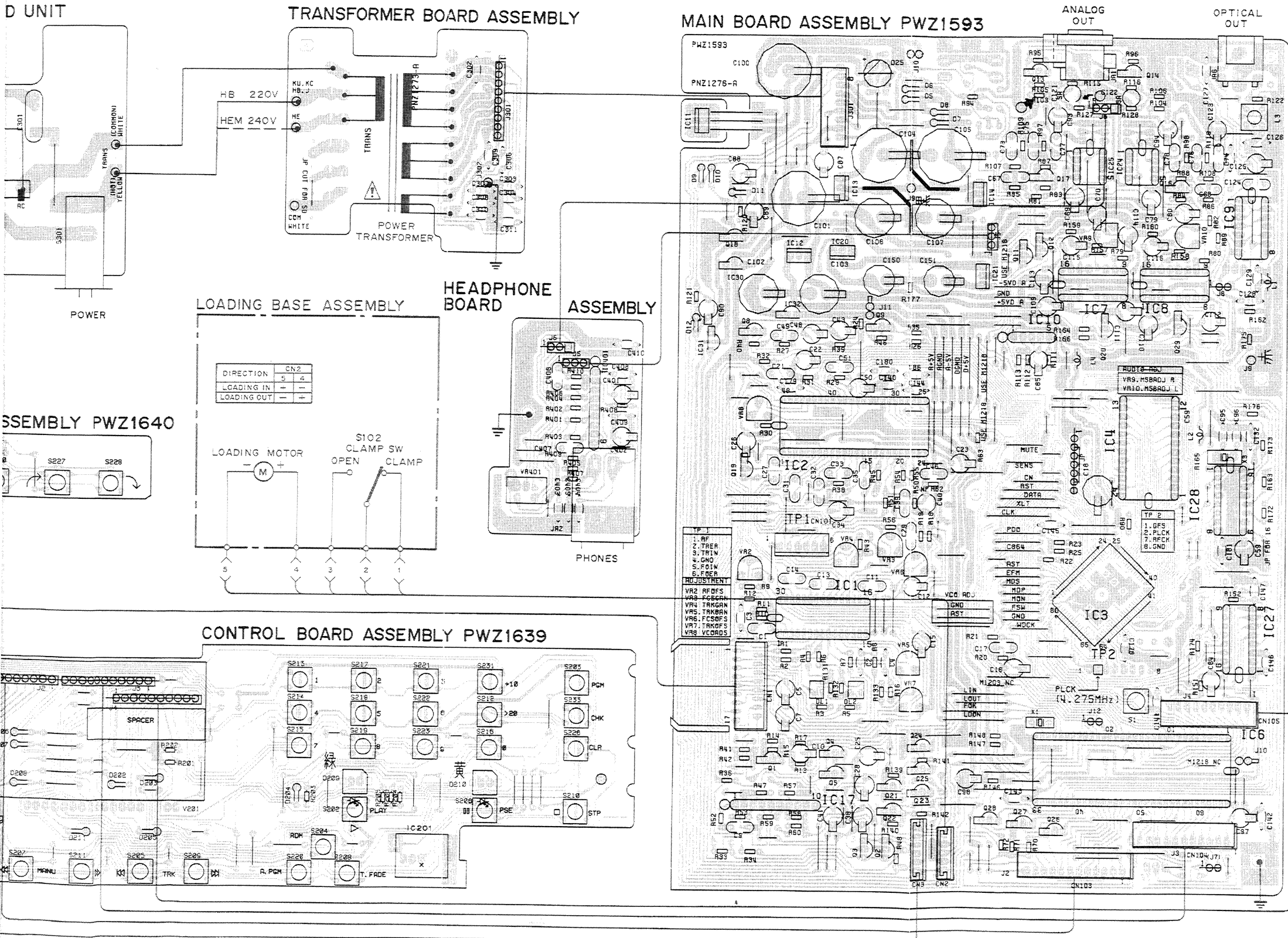
2

3

4

5

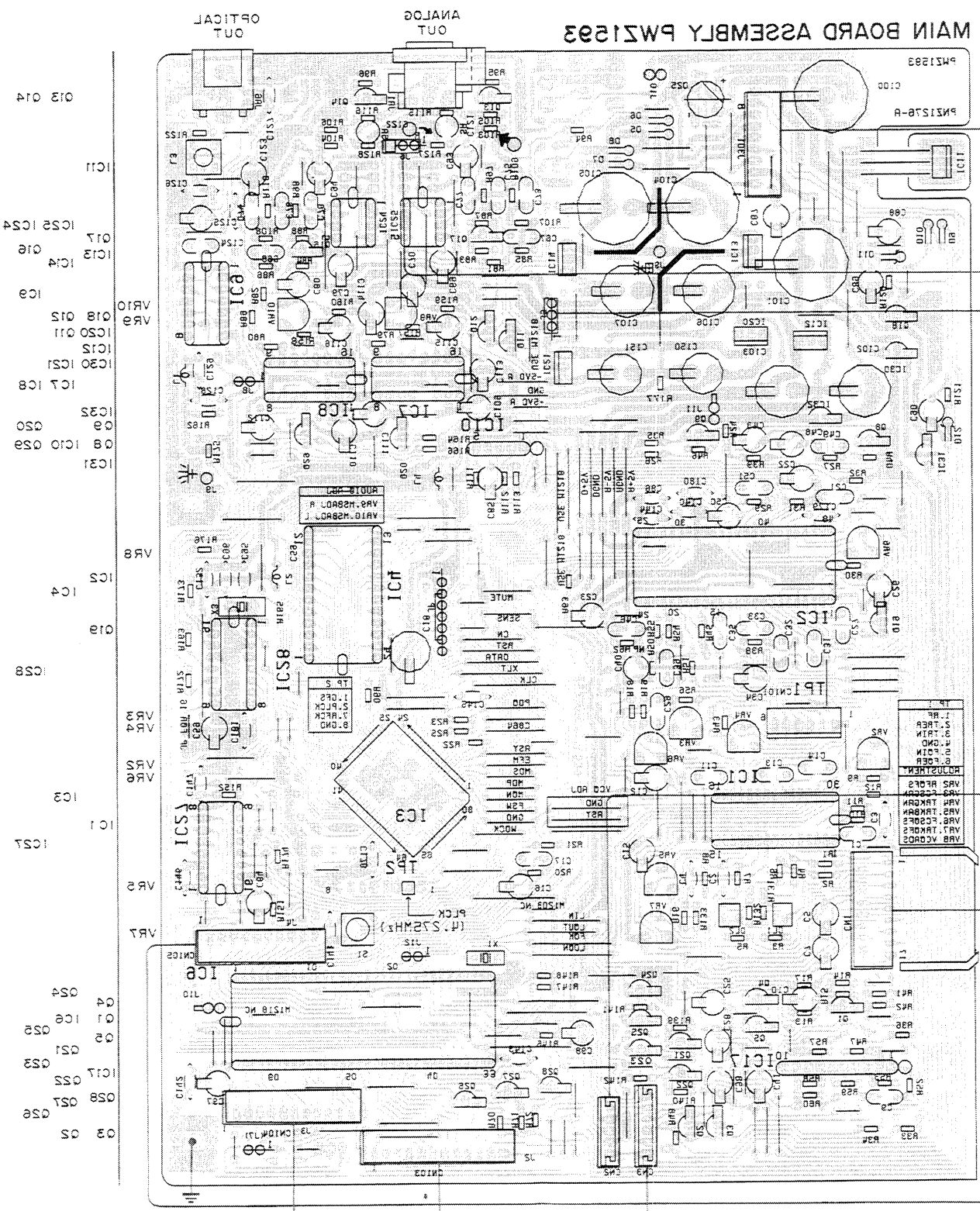
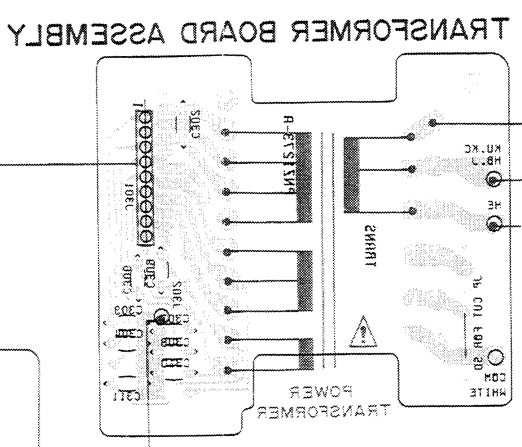
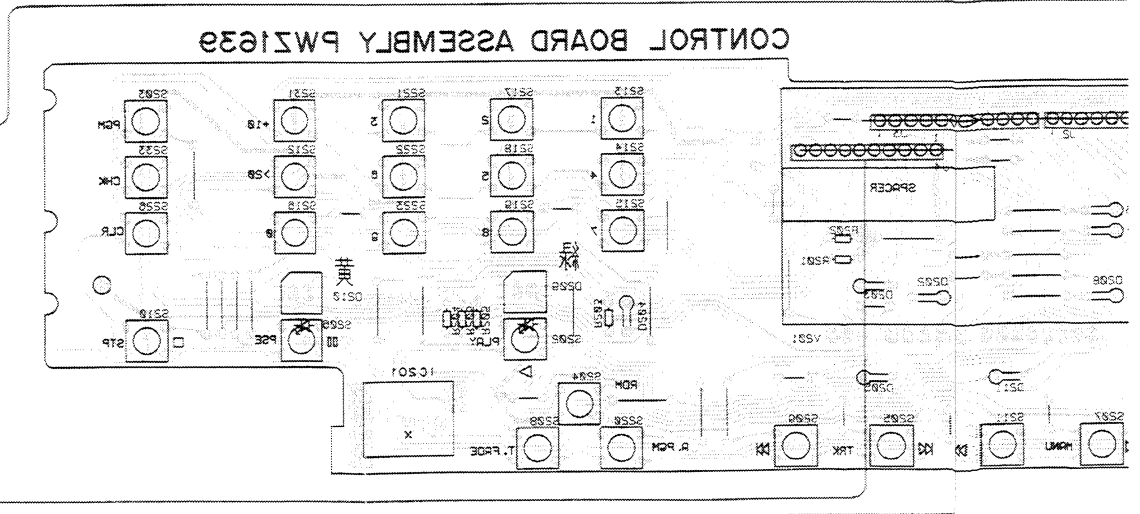
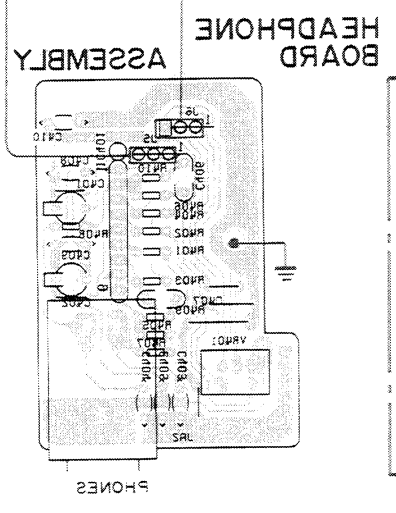
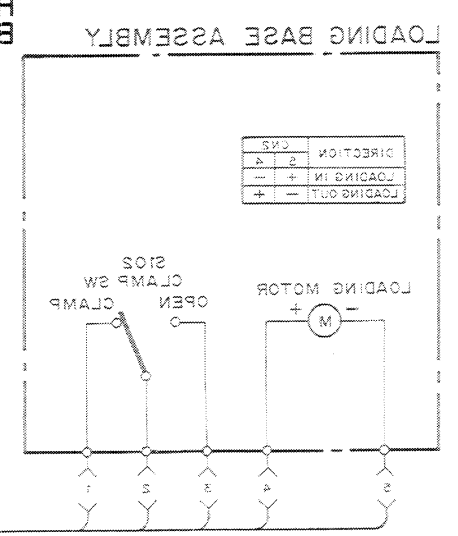
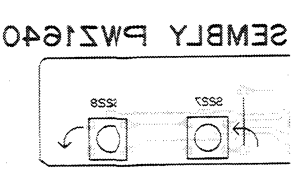
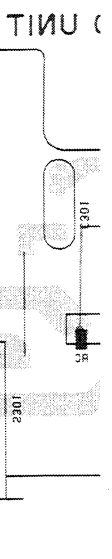
6



- Q13 Q14
- IC11
- Q17 IC25 IC24
- IC13 Q16
- IC14
- IC9
- VR10 Q18 Q12
- VR9 IC20 Q11
- IC12
- IC30 IC21
- IC7 IC8
- IC32 Q9 Q20
- Q8 IC10 Q29
- IC31
- VR8
- IC2 IC4
- Q19
- IC28
- VR3
- VR4
- VR2
- VR1
- VR5
- VR7
- Q4 Q24
- Q1 IC6 Q25
- Q5 Q21 Q23
- IC17 Q22
- Q28 Q27 Q26
- Q3 Q2

P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor
		FET
		Diode
		Zener diode
		LED
		Varactor
		Tact switch
		Inductor
		Coil
		Transformer
		Filter
		Ceramic capacitor
		Mylar capacitor
		Siyrol capacitor
		Electrolytic capacitor (Non polarized)
		Electrolytic capacitor (Noiseless)
		Electrolytic capacitor (Polarized)
		Electrolytic capacitor (Polarized)
		Power capacitor
		Semi-fixed resistor
		Resistor array
		Resistor
		Resonator
		Thermistor

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with shows negative terminal.
4. The diode marked with shows cathode side.
5. The transistor terminal marked with shows emitter.



A

B

C

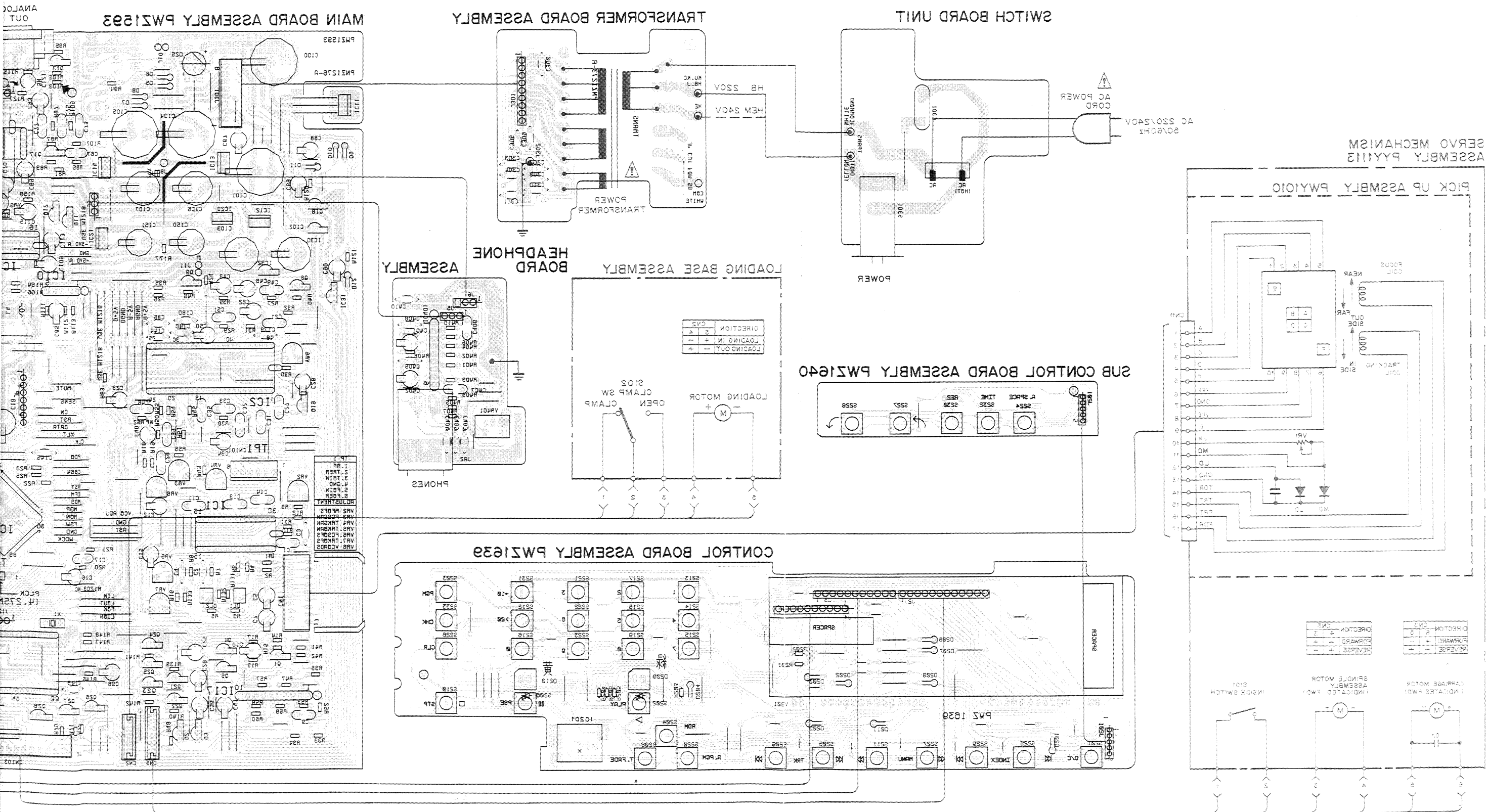
D

3  
4  
5  
6  
7  
8

3  
4  
5  
6  
7  
8

# 6. P.C. BOARDS CONNECTION DIAGRAM

• View from soldering side



A  
B  
C  
D

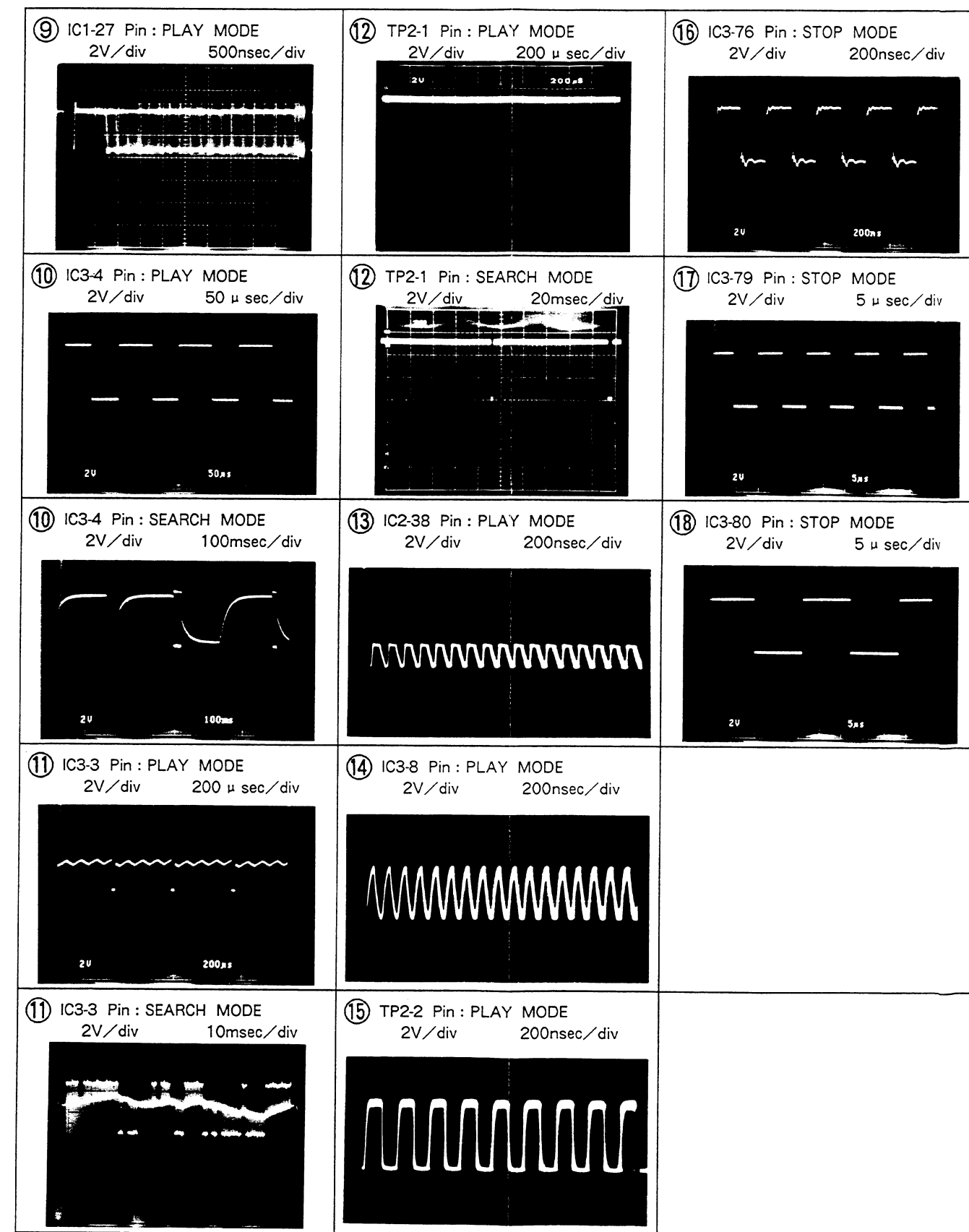
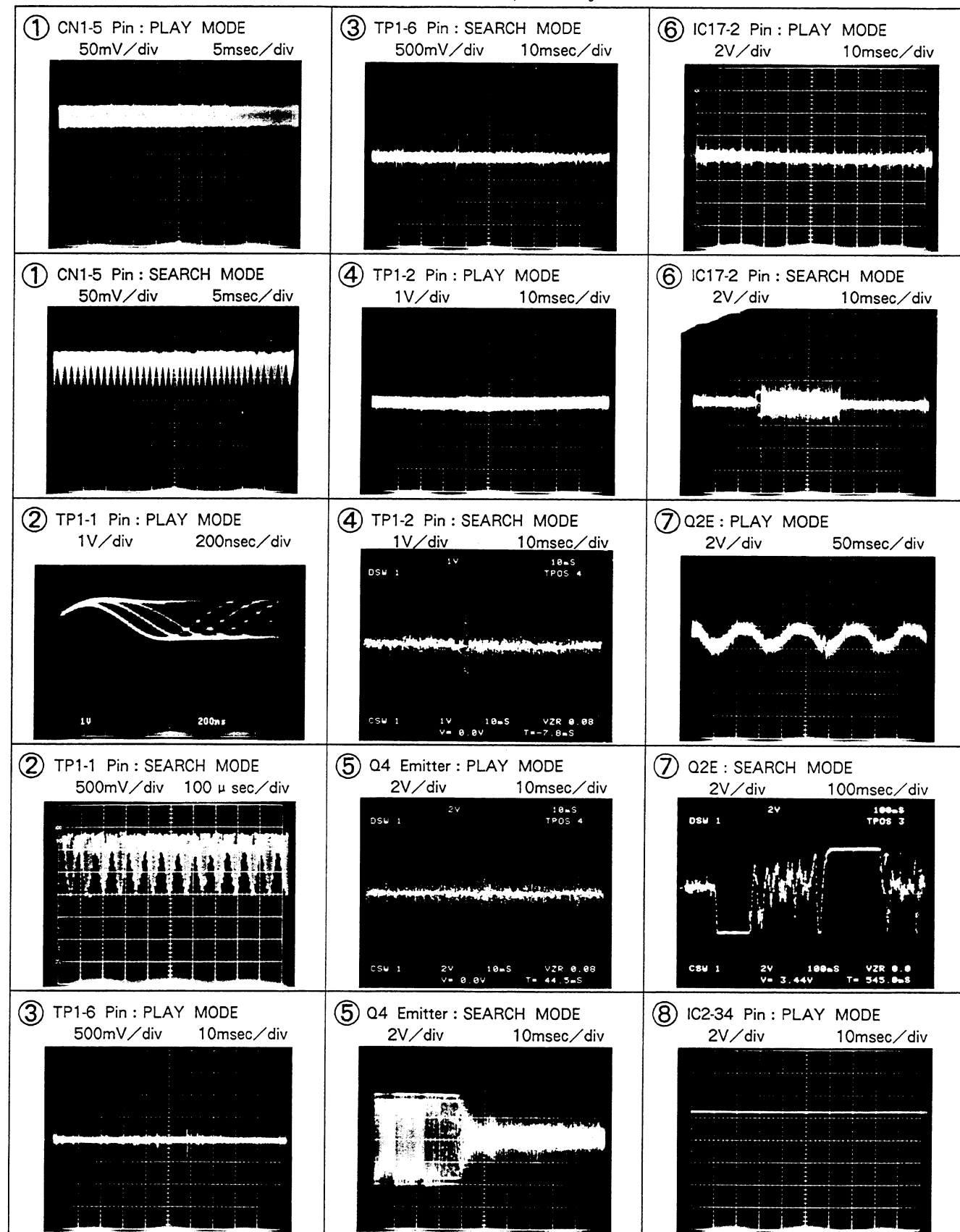
1  
2  
3  
4  
5  
6

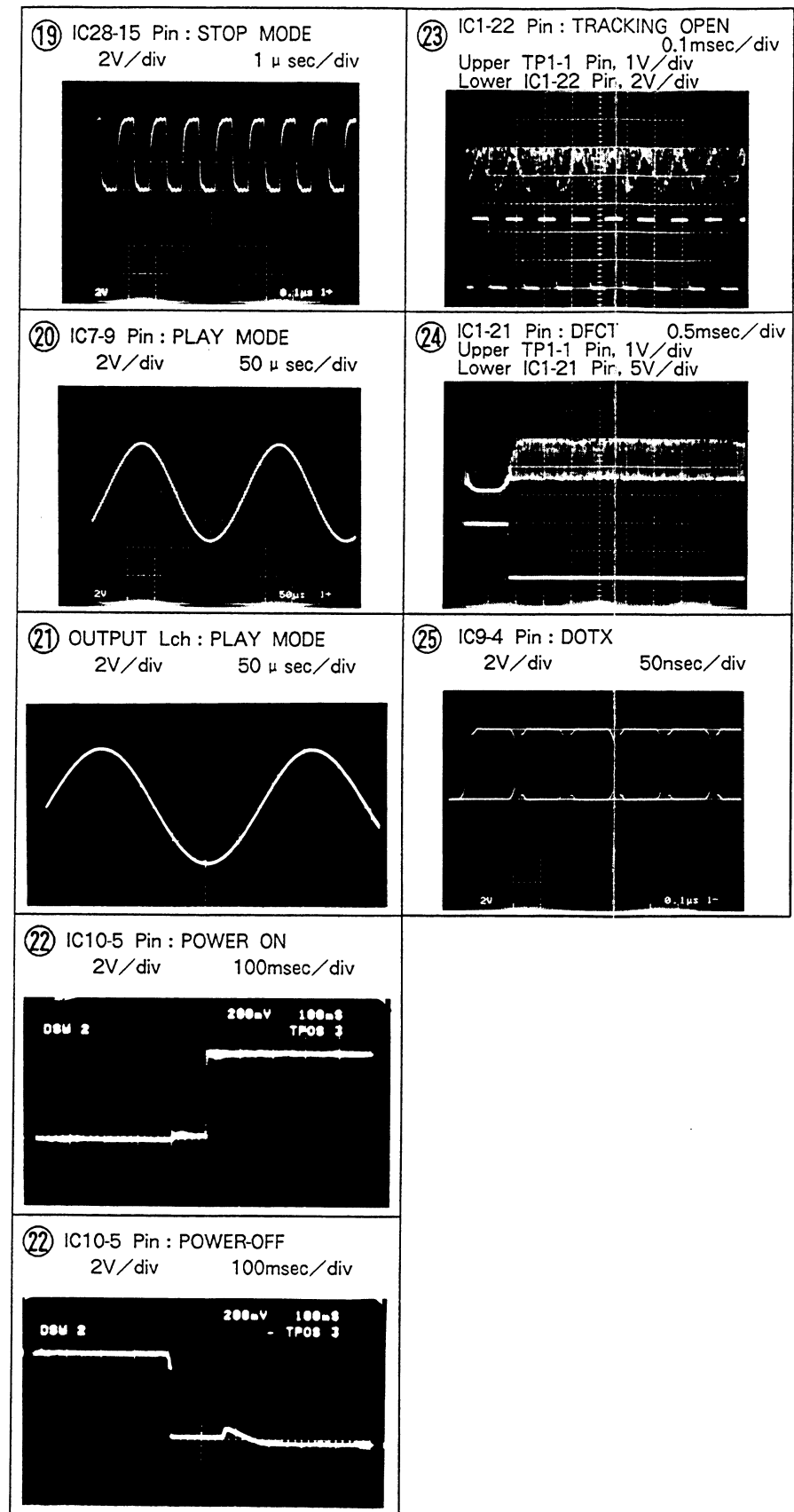
1  
2  
3  
4  
5  
6



WAVE FORMS

NOTE: The encircled numbers denote measuring points in the circuit and pattern diagrams.

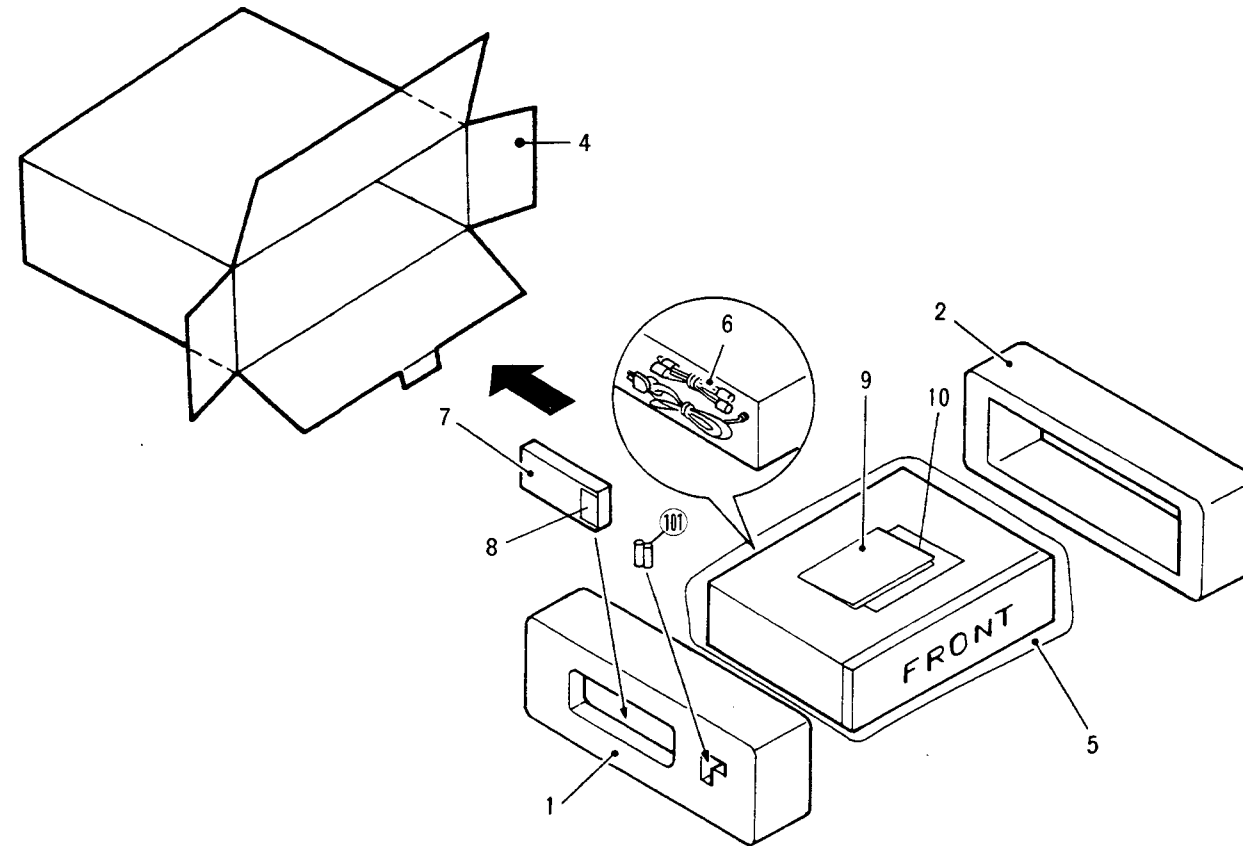




**7. PACKING**

**Parts List**

Mark	No.	Part No.	Description
	1	PHA1059	Protector (L)
	2	PHA1060	Protector (R)
	3	PHC1030	Spacer (in the tray)
	4	PHG1340	Packing case
	5	Z23-007	Sheet
	6	PDE1002	Connection cord (For HEM, HB and SD)
		PDE-319	Connection cord (For KU, KC)
	7	PWW1039	Remote control unit
	8	PZN1001	Battery cover
	9	PRE1085	Operating instructions (English/French)
	10	PRF1022	Operating instructions (German/Italian/Dutch/ Spanish/Swedish/ Portuguese)
	101		Battery



## 8. ELECTRICAL PARTS LIST

### NOTES :

- Parts without part number cannot be supplied.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The  $\Delta$  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.
- 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  $\Omega$  56 $\times 10^1$  561 .....RD1/4PS  $\overline{561}$ J

47k  $\Omega$  47 $\times 10^3$  473 .....RD1/4PS  $\overline{473}$ J

0.5  $\Omega$  0R5 .....RN2H  $\overline{0R5}$ K

1  $\Omega$  010 .....RS1P  $\overline{010}$ K

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

5.62k  $\Omega$  562 $\times 10^1$  5621 .....RN1/4SR  $\overline{5621}$ F

### Miscellaneous Parts

#### P.C. BOARD ASSEMBLY

Mark	Symbol & Description	Part No.
⊙	Main board assembly	PWZ1593
⊙	Control board assembly	PWZ1639
⊙	Sub control board assembly	PWZ1640
	Headphone board assembly	
	Transformer board assembly	
	Switch board unit	

#### OTHERS

Mark	Symbol & Description	Part No.
$\Delta$	Strain relief	CM-22B
$\Delta$	AC power cord	PDG1003
$\Delta$	Power transformer	PTT1063
	S101 Slide switch (INSIDE)	PSH1003
	S102 Leaf switch (OPEN/CLOSE)	VSK-015
	Spindle motor assembly	PYY1109
	Motor assembly (CARRIAGE)	PYY1025
	Motor assembly (LOADING)	PYY1090
	Pick up assembly	PWY1010
	Semiconductive ceramic capacitor	CGDYX104M25

#### ⊙ Main Board Assembly (PWZ1593)

#### SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC1	CXA1081S
	IC2	CXA1082BS
	IC3	CXD1135QZ
	IC4	CXK5816PN-15L
$\Delta$	IC30-IC32	ICP-N10
	IC10	M51957AL
	IC24, IC25	NJM5532DD
$\Delta$	IC11, IC20	NJM7805FA
	IC13	NJM7812FA
$\Delta$	IC12, IC21	NJM7905FA

Mark	Symbol & Description	Part No.
	IC14	NJM7912FA
	IC7, IC8	PCM61P
	IC27	PD0026A
	IC28	PD0036
	IC6	PD4200
$\Delta$	IC17	TA8410K
	Q11, Q23	DTA124ES
	IC9	TC74HCU04AP
	Q12, Q19, Q24, Q25	DTC124ES
$\Delta$	Q18	2SA1015
	Q1, Q3, Q5	2SA1399
	Q21	2SA854S
	Q8, Q9, Q16, Q17, Q20, Q26-Q29	2SC1740S
	Q22	2SC1741S
	Q2, Q4	2SC3581
	Q13, Q14	2SD1302
	D11	HZS27NB2
	D12	HZS6.2NB2
$\Delta$	D25	WL02ML-5004
$\Delta$	D5-D10	1SR139-100

#### SWITCH

Mark	Symbol & Description	Part No.
	S1 Tact switch (TEST)	PSG-065

#### COILS

Mark	Symbol & Description	Part No.
	L1, L2, L4 Inductor	LAU010K

#### CAPACITORS

Mark	Symbol & Description	Part No.
	C96	CCCCH060D50
	C95	CCCCH150J50
	C2, C4, C120	CCCCH300J50
	C140, C144, C145, C147	CCCCL221J50
	C126	CCCCL391J50

Mark	Symbol & Description	Part No.
	C3	CCDCH390J50
	C40	CEANP4R7M25
	C85	CEASR33M50
	C16, C22	CEASR47M50
	C7, C10, C43	CEAS101M10
	C87, C88	CEAS101M50
	C102, C103	CEAS102M10
	C106, C107	CEAS102M16
	C89, C93, C94	CEAS220M50
	C100, C101	CEAS222M16
	C104, C105	CEAS222M25
	C48	CEAS3R3M50
	C12, C15, C23, C25, C26, C28, C38, C41, C50, C59, C69, C70, C79, C80, C84, C97, C98, C109-C116, C123, C125	CEAS331M16
	C5	CEAS4R7M50
	C34	CEAS470M50
	C90	CEAS471M10
	C18, C150, C151	CEAS471M10
	C86, C141, C143, C146, C178, C179, C181	CKCYF103Z50
	C127-C129, C132, C142, C180	CKCYF473Z50
	C33, C51	CQMA102J50
	C14, C17, C46, C124	CQMA103K50
	C31, C32, C35, C39	CQMA104K50
	C77, C78	CQMA153J50
	C29	CQMA272J50
	C13	CQMA332J50
	C9, C11, C21	CQMA333K50
	C1, C27, C49	CQMA472J50
	C73, C74	CQMA562J50
	C67, C68	CQMA683J50
	C75, C76	CQMA821J50
	C121, C122	CQSA102J50

#### RESISTORS

Mark	Symbol & Description	Part No.
	R177	RDR $\frac{1}{2}$ PM221J
	R30	RN $\frac{1}{4}$ PQ3601F
	VR2	VRTB6VS103
	VR9, VR10	VRTB6VS104
	VR3-VR7	VRTB6VS223
	VR8	VRTS6VS102
	Other resistors	RD $\frac{1}{4}$ PM $\square\square\square$ J

#### OTHERS

Mark	Symbol & Description	Part No.
	JA6 Pin jack 1P (DIGITAL OUT)	PKB1004
	JA1 Pin jack 1P (LINE OUT)	PKB1009
	X3 Crystal resonator	PSS1001
	DL1, DL2 Delay line	PTF1012
	L3 Pulse transformer	PTL1003
	X1 Ceramic resonator	VSS1014

### ⊙ Control Board Assembly (PWZ1639)

#### SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	D209	SLH-56MC3H
	D210	SLH-56YC3HYL
	D201-D208, D211	1SS254

#### SWITCHES

Mark	Symbol & Description	Part No.
	S201-S223, S225, S226, S229, S231, S233 (OPEN/CLOSE, PLAY, PGM, RANDOM PLAY, $\lll$ PAUSE, $\lll$ AUTO FADER, $\ggg$ STOP, $\ggg$ , 1, 4, 7, 0, 2, 5, 8, AUTO PGM, 3, 6, 9, INDEEX SEARCH, CLEAR, +10, CHECK)	PSG-065

#### RESISTORS

Mark	Symbol & Description	Part No.
	All resistors	RD $\frac{1}{4}$ PM $\square\square\square$ J

#### OTHERS

Mark	Symbol & Description	Part No.
	V201 Fluorescent indicator Remote sencer	PEL1031 GP1U52X

### ⊙ Sub Control Board Assembly (PWZ1640)

#### SWITCHES

Mark	Symbol & Description	Part No.
	S224, S227, S228, S230, S232 Tact switch (AUTO SPACE, AUTO FEDER, TIME REPEAT)	PSG-065

#### Headphone Board Assembly

#### SEMICONDUCTOR

Mark	Symbol & Description	Part No.
	IC401	NJM4556S

#### CAPACITORS

Mark	Symbol & Description	Part No.
	C401, C402	CEAS330M16
	C403, C404, C408, C409	CKCYF103Z50
	C405, C410	CKCYF473Z50
	C406, C407	CQMA104K50

#### RESISTORS

Mark	Symbol & Description	Part No.
	VR401 Variable resistor (20k) (PHONES LEVEL)	PCS1002
	Other resistors	RD $\frac{1}{4}$ PM $\square\square\square$ J

**OTHER**

<u>Mark</u>	<u>Symbol &amp; Description</u>	<u>Part No.</u>
	JA2 Headphone jack (PHONES)	RKN1001

**Transformer Board Assembly**

**CAPACITORS**

<u>Mark</u>	<u>Symbol &amp; Description</u>	<u>Part No.</u>
	C302-C304, C306-C311	CKCYF103Z50

**Switch Board Unit**

**SWITCH**

<u>Mark</u>	<u>Symbol &amp; Description</u>	<u>Part No.</u>
△	S301 Power switch (POWER)	PSA-009

**CAPACITOR**

<u>Mark</u>	<u>Symbol &amp; Description</u>	<u>Part No.</u>
△	C301 (0.01 $\mu$ F/AC400V)	RCG-009

## 9. ADJUSTMENTS

The adjustments for this unit are given below. Adjustments must be made in the order listed.

### ● Adjustments and check items

1. Tracking error offset (VR7), focus error offset (VR6) and RF offset (VR2) adjustment
2. RF level (VR1) adjustment
3. LD (Laser Diode) power check
4. Focus servo lock and spindle servo lock check
5. Grating adjustment
6. Tracking error balance adjustment (VR5)
7. Tangential adjustment
8. Focus gain adjustment (VR3)
9. Tracking gain adjustment (VR4)
10. VCO free-run frequency adjustment (VR8)
11. Method for confirming S character (focus error)
12. MSB adjustment (VR9, VR10)

### ● Measuring equipment

1. Dual trace oscilloscope
2. Optical power meter
3. Test disc (YEDS-7), 8 cm disc
4. Loop gain adjustment filter
5. Signal generator
6. Frequency counter
7. Other regular measuring equipment

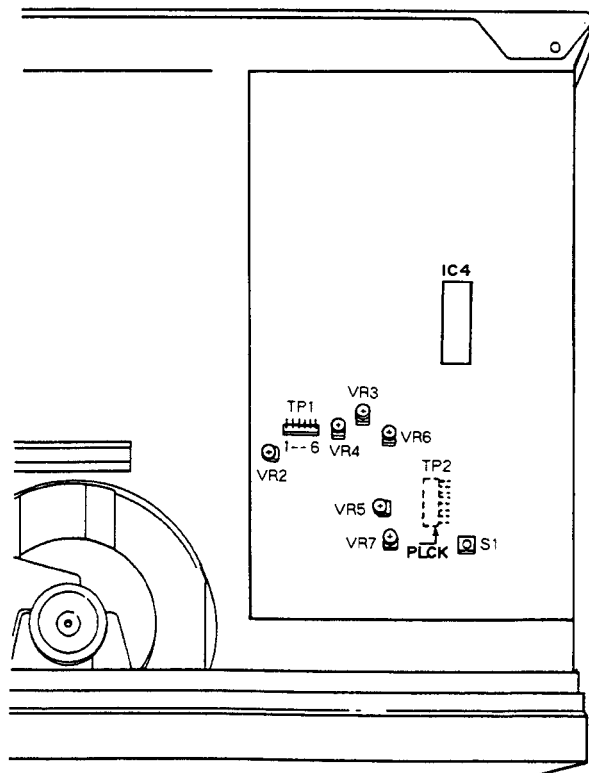
### ● About the test mode

#### How to activate and release the test mode

- ① To activate the test mode, turn ON the power switch (S301) with the test mode switch (S1) in the ON position.
- ② The test mode is released by turning the power switch OFF.

The functions of the keys in the test mode are outlined in Table 9-1.

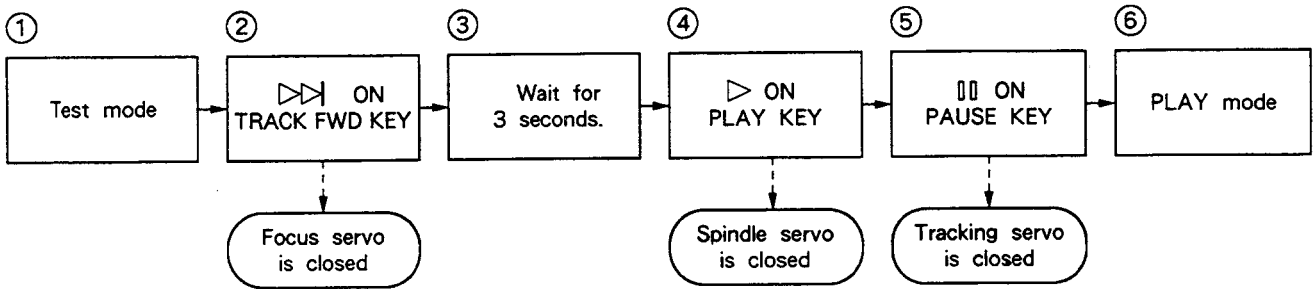
Adjustment Point



In the test mode, focus, tracking and spindle servos must be closed and opened individually. Consequently, the servos must each be closed in the proper sequence (serial sequence) in order to put the machine into the normal play mode. Note also that the machine will not enter the play mode when the PAUSE (⏸) key is pressed.

For example, in order to change from the stop to the play mode, the function keys must be pressed in the following order.

\* In the test mode, the servos must be operated in serial sequence.



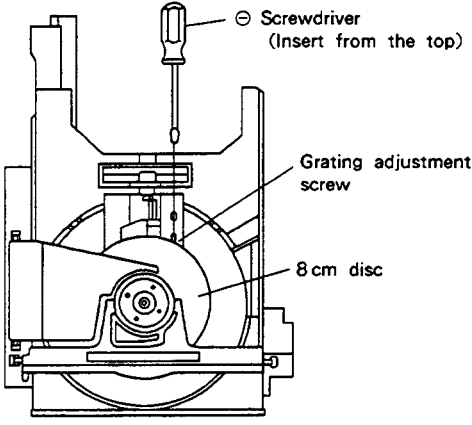
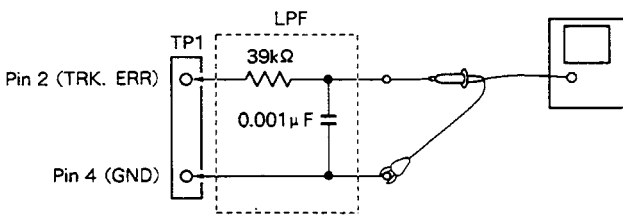
● Key Functions in Test Mode

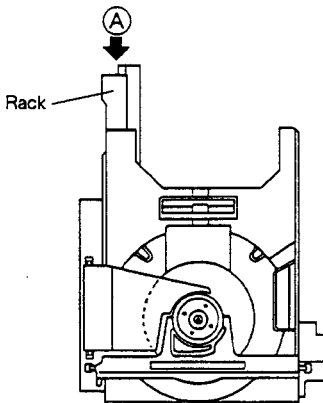
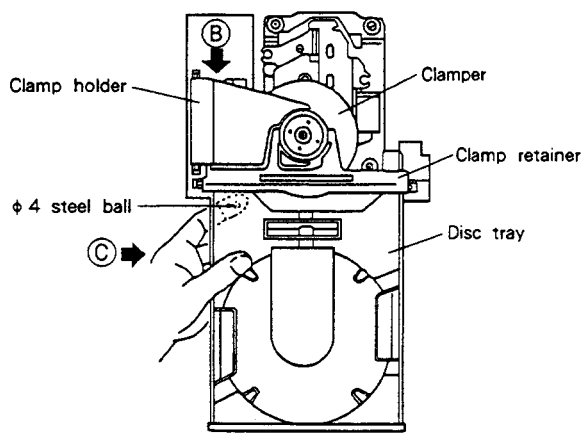
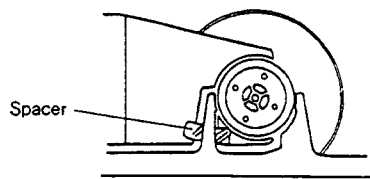
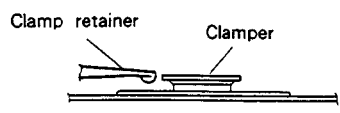
Symbol	Key name	Function in test mode	Description
⏩	TRACK FWD	Focus servo close	Turns ON the laser diode, and raises and lowers the focusing actuator to close the focus servo.
▶	PLAY	Spindle servo close	Closes the servo in the CLV-A mode after kicking the spindle motor.
⏸	PAUSE	Tracking servo close/open	Acts as a toggle : closes the tracking servo and activates play mode when pressed (provided the focus and spindle servos are closed), at which time the PAUSE indicator illuminates ; opens the tracking servo when pressed again.
◀◀	MANUAL SEARCH REV	Carriage reverse (moves inward)	Moves carriage quickly (3cm/s) toward innermost track. Be careful not to move too far as there is no safety device to stop the carriage.
▶▶	MANUAL SEARCH FWD	Carriage forward (moves outward)	Moves carriage quickly (3cm/s) toward outermost track. Be careful not to move too far as there is no safety device to stop the carriage.
□	STOP	Stop	Stops all servos and returns system to its initial state.
⏴	OPEN/CLOSE	Disc tray open/close	Opens and closes the disc tray. However, pickup does not return to rest on OPEN, and it remains stationary on CLOSE.

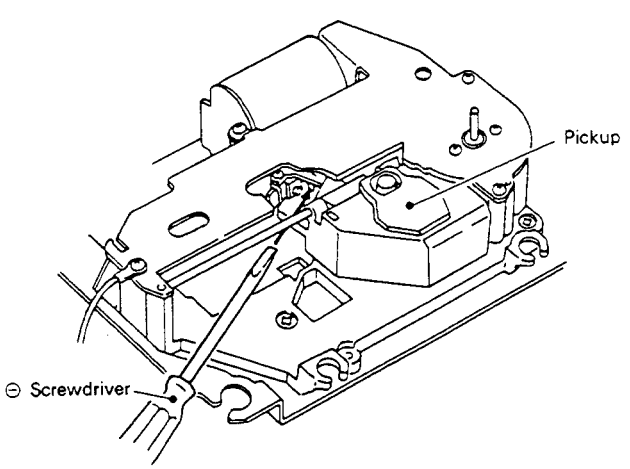
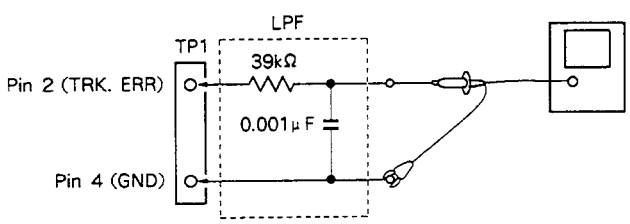
Table 9-1

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
<b>1 Tracking error offset, focus error offset and RF offset adjustment</b>						
			TP1 Pin 2 (TRK. ERR) TP1 Pin 6 (FCS. ERR) TP1 Pin 1 (RF OUTPUT)	VR5 (TRK. BAL) VR7 (TRK. OFS)  VR6 (FCS. OFS)  VR2 (RF. OFS)	Tracking error offset 45°  0V ± 50mV  FOCUS error offset 0V ± 50mV RF offset 100mV ± 50mV	<ul style="list-style-type: none"> <li>● Put unit in the TEST mode (see page 32).</li> <li>● Set VR5 TRK. BAL (tracking balance) to the position about 45° to the left of center.</li> <li>● Adjust VR7 TRK. OFS (tracking offset) so that the TRK. ERR (tracking error) voltage at TP1 pin 2 becomes 0V ± 50mV.</li> <li>● Adjust VR6 FCS. OFS (focus offset) so that the FCS. ERR (focus error) voltage at TP1 pin 6 becomes 0V ± 50mV.</li> <li>● Adjust VR2 RF. OFS (RF offset) so that the RF output voltage at TP1 pin 1 becomes 100mV ± 50mV.</li> </ul> <p>Note : When adjusting the tracking offset, always perform "6. Tracking error Balance Adjustment."</p>
<b>2 RF level adjustment</b>						
			TP1 Pin 1 (RF OUTPUT)	VR1 (Laser power)	1.5Vp-p $\begin{smallmatrix} +0.2 \\ -0 \end{smallmatrix}$ V	<ul style="list-style-type: none"> <li>● Put unit in the test mode (see page 32).</li> <li>● Load the test disc and connect the oscilloscope to TP1 pin 1 (RF output), play the test disc, and measure the P-P voltage of the RF waveform.</li> <li>● Adjust VR1 (Laser power) so that the voltage is 1.5Vp-p <math>\begin{smallmatrix} +0.2 \\ -0 \end{smallmatrix}</math> V.</li> </ul>
<b>3 LD (laser diode) power check</b>						
				Check	Less than 0.13mW	<ul style="list-style-type: none"> <li>● Put unit in the test mode (see page 32).</li> <li>● Press the TRACK FWD (▷▷ ) key to turn ON the laser diode (LD).</li> <li>● Place the sensor of the optical power meter directly above the objective lens and confirm that the LD power is less than 0.13mW.</li> </ul>
<b>4 Focus servo lock and spindle servo lock check</b>						
	0.5V/div	100msec/div	TP1 Pin 1 (RF output)		RF signal is output.  Forward (clockwise) rotation	<ul style="list-style-type: none"> <li>● Set the test disc.</li> <li>● Put unit in the test mode (see page 32).</li> <li>● Connect the MANUAL SEARCH FWD JP to move the pickup to the center of the disc.</li> <li>● Observe the output of TP1 pin 1 (RF output) on the oscilloscope. Confirm that the RF signal is output after the TRACK FWD (▷▷ ) key is pressed.</li> <li>● Press the PLAY (▷) key and confirm that the disc rotates at constant speed (approx. 300 rpm) near center of disc in the forward (clockwise) direction ; disc rotate at an abnormal speed or rotate counterclockwise.</li> </ul>



Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
<b>5 Grating Adjustment (1) (When an 8 cm disc is used.)</b>						
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">  <p style="text-align: center;">Fig. 9-1</p> </div> <div style="width: 50%;"> <p>Note : This adjustment can be made by using an 8 cm disc, having pits within the diameter range of 75 mm.</p> <ul style="list-style-type: none"> <li>● Put unit in the test mode (see page 32).</li> <li>● Load the 8 cm disc, move the pickup to the outer periphery so that the pickup grating adjustment hole is visible from the pit surface of the disc or from the hole in the servo mechanism (see Fig. 9-1).</li> <li>● Press the TRACK FWD key (▶▶) and PLAY key (▶) in sequence to close the focus servo and spindle servo (do not close the tracking servo).</li> <li>● Observe the TRK.ERR (tracking error) waveform at TP1 pin 2 on an oscilloscope, inserting a 4 kHz low-pass filter (see Fig. 9-2).</li> <li>● Insert a ⊖ screwdriver into the grating hole, turn and find the null point (see Photo 9-1).</li> <li>● Next, slowly turn the ⊖ screwdriver COUNTERCLOCKWISE from the null point and adjust until the waveform (tracking error signal) reaches maximum amplitude (see Photo 9-2).</li> </ul> </div> </div>						
0.5V/div	5msec/div	TP1 Pin 2 (TRK. ERR)	Grating adjustment screw Grating adjustment screw	Null point Maximum amplitude	<p>Note : Use caution since inserting the ⊖ screwdriver forcefully will cause the pickup unit to tilt upward.</p> <ul style="list-style-type: none"> <li>● Lastly, make sure that there is no major fluctuation in the p-p voltage of the tracking error signal (do not insert the cutoff 4 kHz low-pass filter) when the pickup is moved to the inner and outer periphery. If there is a difference of more than ±10% again turn the grating adjustment screw and adjust the tracking error signal to maximum.</li> </ul>	
 <p style="text-align: center;">Fig. 9-2</p>						

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
5'	<b>Grating adjustment (2) (When 8 cm disc is not used.)</b>					
 <p>Fig. 9-3</p>			<p>The following procedure tells how to adjust the grating without using 8 cm disc. Remove the disc tray to perform this adjustment.</p> <p>● Removal of the disc tray</p> <ol style="list-style-type: none"> <li>1. Press the rear edge of the rack, (*1) marked ① in Fig. 9-3, while pulling the disc tray out to the position where it catches, illustrated in Fig. 9-4.</li> <li>(*1) When the rear edge of rack ① is pressed, first the disc clamp is released. If you continue pressing after it has been released completely, the disc tray is ejected.</li> <li>2. While pulling the clamp holder ② (see Fig. 9-4) upward with the right hand, hold the tray as indicated by ③ in the left hand and pull it outward. Take care not to allow the <math>\phi 4</math> steel ball to fall (we recommend holding the ball in place with the left index finger while extracting the tray.)</li> </ol>			
 <p>Fig. 9-4</p>						
 <p>Fig. 9-5</p>						
 <p>Fig. 9-6</p>						

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
						 <p>Fig. 9-7</p>  <p>Fig. 9-8</p> <ul style="list-style-type: none"> <li>● Put unit in the test mode (see page 32).</li> <li>● Press the MANUAL SEARCH FWD (▶▶) key to move the pickup to the vicinity of what would be the center of the disc. Position the pick up so its grating adjusting screw is visible through the elongated hole on the spindle motor side of the servo mechanism base plate.</li> <li>● As shown in Fig. 9-7, insert a (slotted) ⊖ screwdriver from the top of the mechanism and check that the grating adjusting screw can be rotated.</li> <li>● Mount the test disc ; be sure to insert a 3-5 mm spacer (if no spacer is available, use a hex wrench) between the clamp holder and clamp retainer, as shown in Fig. 9-5.</li> <li>● Confirm that the clammer and the clamp retainer are not contacting one another (Fig. 9-6).</li> <li>● Press the TRACK FWD (▶▶ ) and the PLAY (▶) keys sequentially to close the focus and spindle servos (do not close the tracking servo).</li> <li>● Insert a 4kHz-cutoff low pass filter between the oscilloscope and TP1 pins 2 (TRK.ERR) and 4 (GND) as shown in Fig. 9-8 and observe the waveform of TP1 pin 2 (tracking error) on the oscilloscope.</li> </ul>
	0.5V/div	5msec /div	TP1 Pin 2 (TRK. ERR)	Grating adjusting screw  Grating adjusting screw	Null point  Maximum amplitude	<ul style="list-style-type: none"> <li>● Turn the grating adjusting screw with the ⊖ screwdriver to find the null point (see Photo 9-1).</li> <li>● Next , slowly turn the ⊖ screwdriver COUNTERCLOCKWISE and adjust to the point where the waveform (tracking error signal) first achieves its maximum amplitude (see Photo 9-2).</li> </ul> <p>Note : Avoid applying pressure to the ⊖ screwdriver while adjusting the screw. Doing so causes the pickup to move inward, making adjustment more difficult.</p> <ul style="list-style-type: none"> <li>● Lastly, remove the low pass filter and confirm that the tracking error signal (do not insert the cutoff 4kHz low-pass filter) p-p voltage does not greatly vary when the pickup is moved to the innermost and outermost tracks of the disc. If the levels diverge by ±10% or more, re-adjust the maximum error amplitude point by turning the grating adjustment screw.</li> </ul>

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
						<p>Re-mount the disc tray according to the following procedure when the grating adjustment is complete.</p> <ol style="list-style-type: none"> <li>1. Remove the disc and the spacer.</li> <li>2. While lifting the clamp holder [marked ⑧ in Fig. 9-4] with the right hand, hold the tray in the left hand as indicated by ⑨ and slide the slide base into the hard resin fittings on the loading base as shown in Fig. 9-9 to re-insert the disc tray. At this time, be sure to hold the steel ball in place with the index finger of the left hand. Also, be careful that the front panel is not damaged by the slide base and steel ball's bearing (in the slide base) coming into contact with the panel.</li> <li>3. Insert the slide base so that it fits into the two hard resin fittings at the rear of the loading base (see Fig. 9-10).</li> <li>4. Insert the tray tightly.</li> </ol>

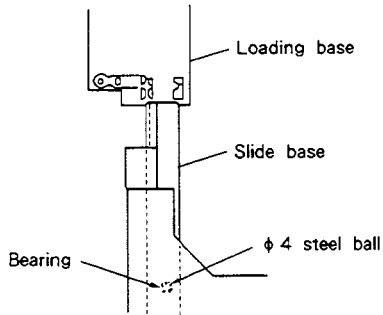


Fig. 9-9

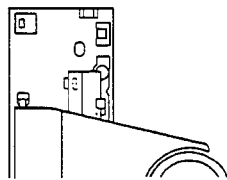


Fig. 9-10

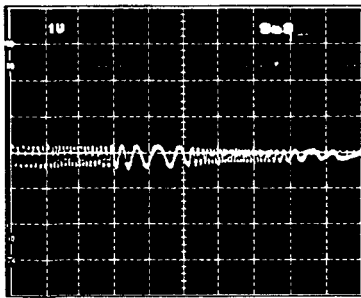


Photo 9-1  
Null point

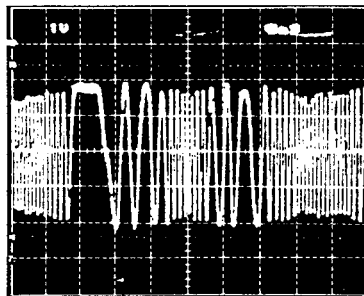


Photo 9-2  
Maximum amplitude

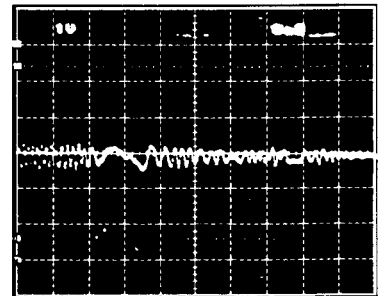
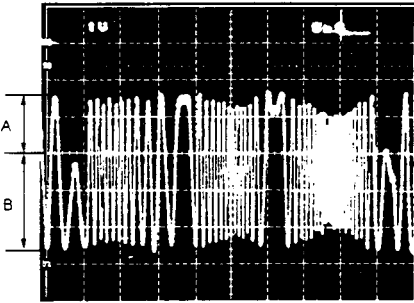
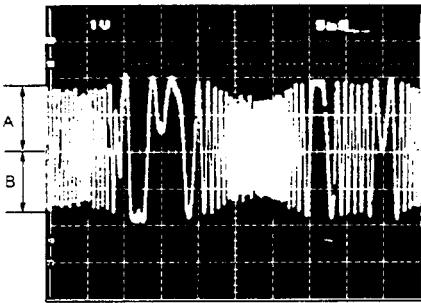
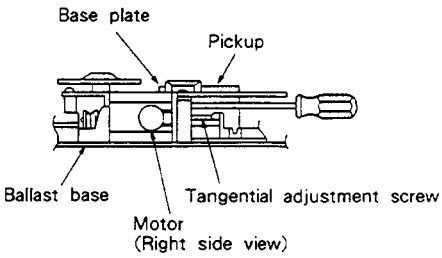
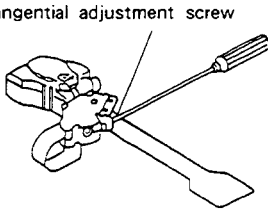


Photo 9-3  
This is not the null-point waveform.

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
<b>6 Tracking error balance adjustment</b>						
	0.5V/div	5msec /div	TP1 Pin 2 (TRK. ERR)	VR5 (TRK. BAL)		<ul style="list-style-type: none"> <li>● Load the test disc.</li> <li>● Put unit in the test mode (see page 32).</li> <li>● Press the MANUAL SEARCH FWD (▷▷) key to position the pickup near the center of the disc.</li> <li>● Press the TRACK FWD (▷▷ ) and PLAY (▷) keys sequentially to cause the disc to rotate.</li> <li>● Observe TP1 pin 2 TRK. ERR (tracking error) on the oscilloscope and adjust VR5 TRK. BAL (tracking balance) to eliminate the DC elements from the tracking error signal.</li> </ul>
			 <p style="text-align: center;">A ≠ B</p> <p style="text-align: center;">Photo 9-4 DC elements mixed in signal</p>		 <p style="text-align: center;">A = B</p> <p style="text-align: center;">Photo 9-5 DC elements eliminated</p>	
<b>7 Tangential adjustment</b>						
						<ul style="list-style-type: none"> <li>● Put unit in the test mode (see page 32).</li> <li>● Open the tray and load the test disc.</li> <li>● Press the MANUAL SEARCH FWD (▷▷) key to position the pickup near the center of the disc.</li> <li>● Insert a hex wrench into the tangential adjustment screw section from the rear of the mechanism.</li> <li>● Close the tray.</li> </ul> <p>Note : Do not use an L-shaped hex wrench. Use one such as shown to the left. Using an L-shaped hex wrench can cause the tray to come loose (see page 36 5'. Grating Adjustment (2)).</p>
	 <p style="text-align: center;">Tangential adjustment screw</p> <p style="text-align: center;">Fig. 9-11</p>					<ul style="list-style-type: none"> <li>● Press the TRACK FWD (▷▷ ), PLAY (▷), and PAUSE (⏏) keys sequentially to close the all servos (PAUSE indicator will illuminate).</li> </ul>

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
		200nsec / div	TP1 Pin 1 RF output	Tangential adjustment screw	Sharpest possible eye pattern	<ul style="list-style-type: none"> <li>● Observe TP1 pin 1 (RF output) on the oscilloscope and adjust the tangential adjustment screw to achieve the sharpest possible eye pattern.</li> <li>● When the whole waveform becomes clear, concentrate on sharpening the fine lines forming the diamond at the center of the eye pattern (see Photo 9-8). Adjust until the fine lines on all four sides of the diamond are both sharply defined and dense, as shown in Photo 9-6.</li> </ul> <p>Note: Use a hex wrench to raise the pickup some what while making this adjustment.</p>

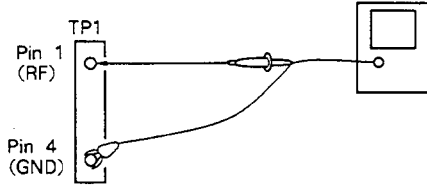
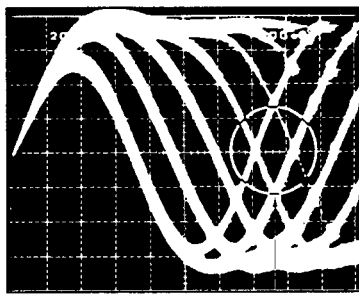


Fig. 9-12



Part to be observed

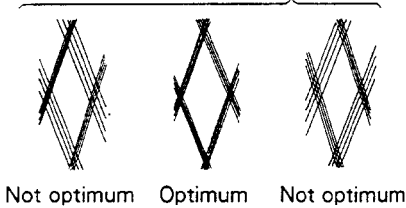


Photo 9-6

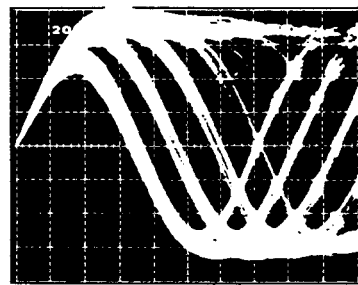


Photo 9-7

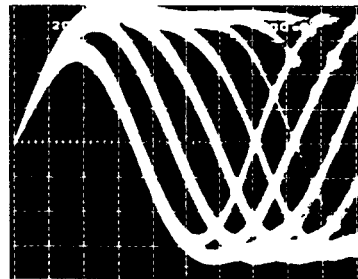


Photo 9-8

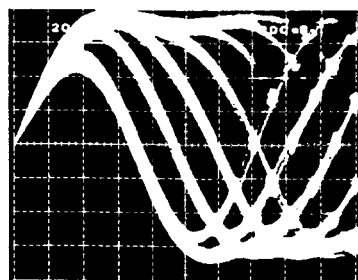


Photo 9-9

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
8	<b>Focus gain adjustment</b>					
	20mV/div CH1 (X) 5mV/div CH2 (Y) (prove 10 : 1)	X-axis : TP1 Pin 5 (FCS. IN) Y-axis : TP1 Pin 6 (FCS. ERR)	VR3 (FCS. GAN)	Phase difference of 90°	<ul style="list-style-type: none"> <li>● In the POWER OFF state, connect the oscilloscope and oscillator as shown in Fig. 9-13.</li> <li>● Set the unit to the normal PLAY mode.</li> <li>● Turn ON the power to the oscillator and set it to output a 1.2kHz 1Vp-p signal.</li> </ul> <p>Note : Some oscillators discharge a DC voltage when turned on . It is therefore recommended that the oscillator be connected after it has been turned on.</p> <ul style="list-style-type: none"> <li>● Adjust VR3 FCS. GAN (focus gain) so that the Lissajous's figure becomes a horizontal circle (phase difference of 90° )</li> </ul>	

Fig. 9-13

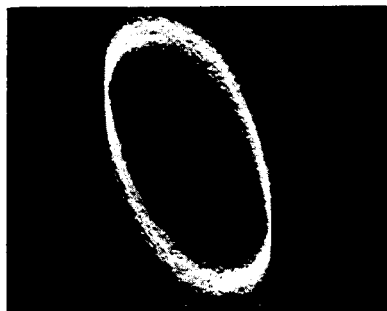


Photo 9-10  
High gain

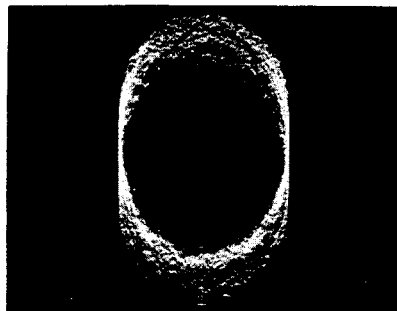


Photo 9-11  
Optimum gain

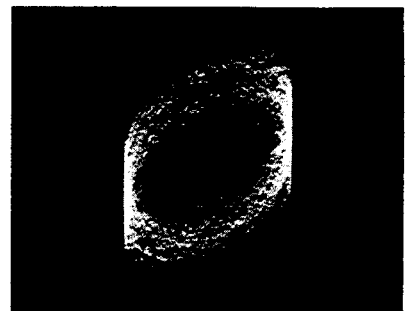


Photo 9-12  
Low gain

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
9	<b>Tracking gain adjustment</b>					
	50mV/div CH1 (X) 5mV/div CH2 (Y) (probe 10 : 1)	X-axis : TP1 Pin 3 (TRK. IN) Y-axis : TP1 Pin 2 (TRK. ERR)	VR4 (TRK. GAN)	Phase difference of 90°	<ul style="list-style-type: none"> <li>● In the POWER OFF state, connect the oscilloscope and oscillator as shown in Fig. 9-14.</li> <li>● Set the unit to the normal PLAY mode.</li> <li>● Turn ON the power to the oscillator and set it to output a 1.2kHz 2Vp-p signal.</li> </ul> <p>Note : some oscillators discharge a DC voltage when turned on . It is therefore recommended that the oscillator be connected after it has been turned on.</p> <ul style="list-style-type: none"> <li>● Adjust VR4 TRK. GAN (tracking gain) so that the Lissajous's figure becomes a horizontal circle (phase difference of 90°).</li> </ul>	

Fig. 9-14



Photo 9-13  
High gain

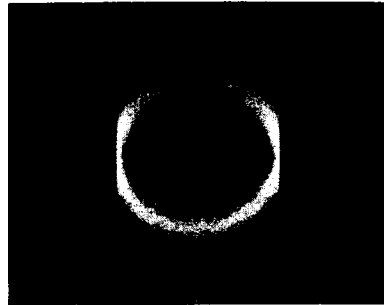


Photo 9-14  
Optimum gain

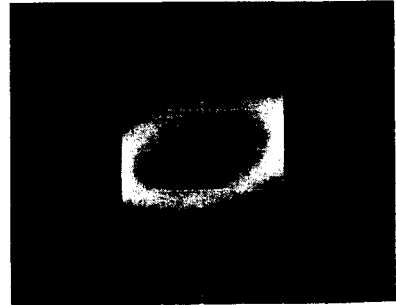


Photo 9-15  
Low gain



Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
10	<b>VCO free-run frequency adjustment</b>					
			TP2 Pin 2 (PLCK)	VR8 (VCO. ADJ)	4.275 ± 0.025MHz	<ul style="list-style-type: none"> <li>Put unit in the test mode (see page 32).</li> <li>Short the ASY and GND jumper with a ⊖ screwdriver or similar tool (see Fig. 9-15).</li> <li>Connect a frequency counter capable of measuring frequencies of 10MHz and above to TP2 pin 2 (PLCK).</li> <li>Adjust VR8 (VCO adjustment) so that the frequency counter reading becomes 4.275 ± 0.025MHz.</li> </ul>
11	<b>Method for confirming S character (focus error)</b>					
			TP1 Pin 6 (FCS. ERR)			<ul style="list-style-type: none"> <li>Put unit in the test mode (see page 32).</li> <li>Ground TP1 pin 5 FCS.IN (focus in) to GND.</li> <li>Observe the waveform output by TP1 pin 6 FCS.ERR (focus error) when the TRACK FWD (▷▷) key is pressed.</li> </ul>

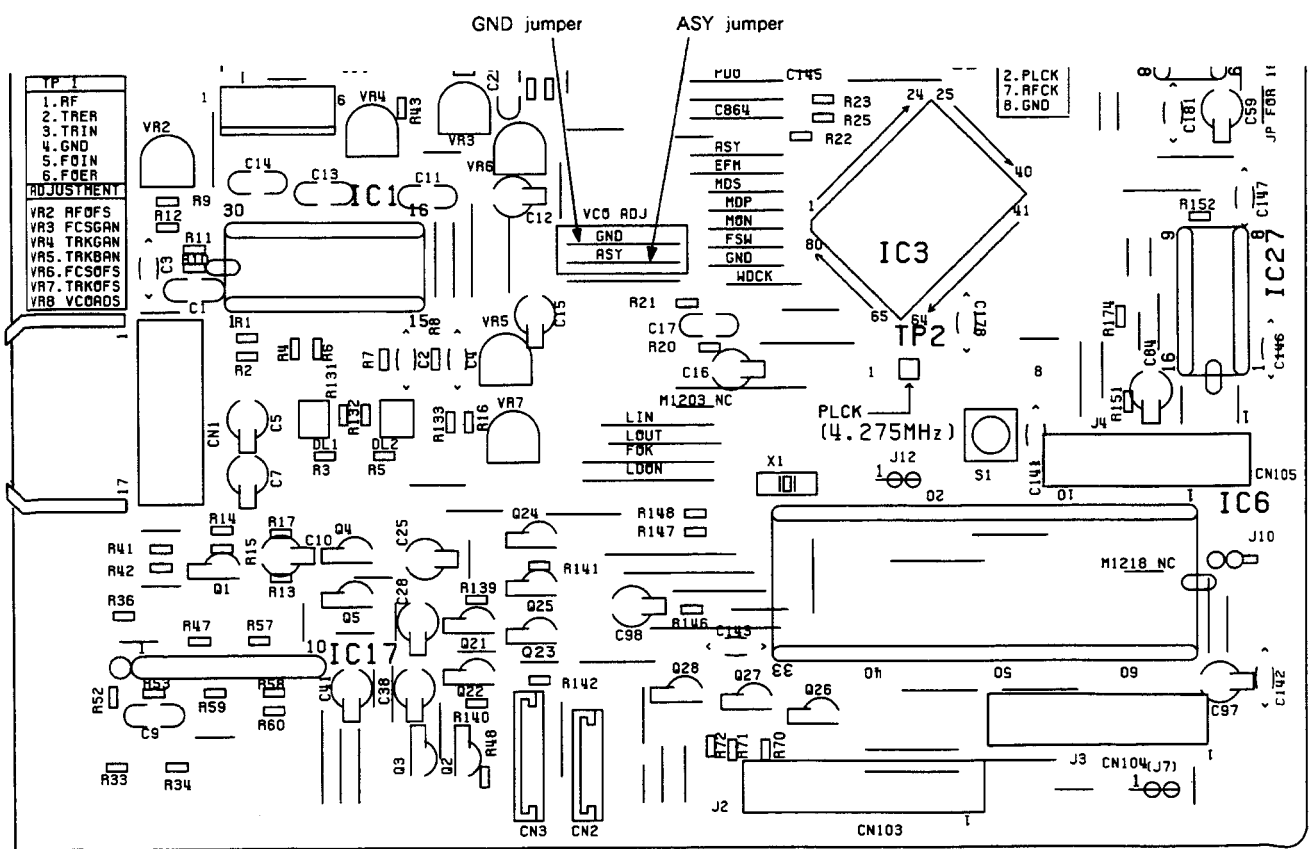
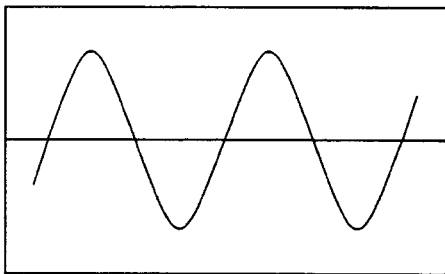


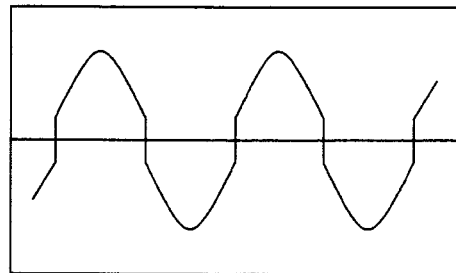
Fig. 9-15 ASY and GND Jumper position

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items/ Adjustment specifications	Adjustment procedure
	V	H				
<b>12</b>	<b>MSB adjustment</b>					
	5mV/div	0.2msec /div	JA1 LINE OUTPUT terminal (L CH)	VR9	Sine wave	<ul style="list-style-type: none"> <li>● Set the unit to the normal PLAY mode.</li> <li>● Playback the track 20 (-60 dB, 1kHz, Lch, Rch) of the test disc (YEDS-7). Connect the oscilloscope to the Lch of the LINE OUTPUT terminal (JA1), and observe the audio output waveform.</li> <li>● Adjust VR9 MSB (Lch) so that the sine wave is obtained on the oscilloscope.</li> <li>● Adjust VR10 (Rch) in the same way.</li> </ul>
			JA1 LINE OUTPUT terminal (R CH)	VR10	Sine wave	

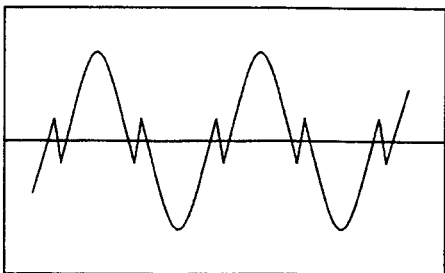
● ZERO cross distortion waveform



OK



NG



NG

## 9. RÉGLAGES

On trouvera ci-après les réglages requis pour cet appareil. Ils doivent être exécutés dans l'ordre donné.

### ● Réglages et items de vérification

1. Réglage de décalage d'erreur d'alignement (VR7), de mise au point (VR6) et de décalage RF (VR2).
2. Réglage du niveau RF (VR1)
3. Vérification d'alimentation de diode laser (LD).
4. Vérification de verrouillage le servo de mise au point et de verrouillage le servo d'axe
5. Réglage du grincement
6. Réglage d'équilibre d'erreur d'alignement (VR5)
7. Réglage tangentiel
8. Réglage de gain de mise au point (VR3)
9. Réglage de gain d'alignement (VR4)
10. Réglage de fréquence libre VCO (VR8)
11. Méthode de confirmation du caractère S (erreur de mise au point)
12. Réglage de MSB (VR9, VR10)

### ● Matériel de mesure

1. Oscilloscope cathodique à deux faisceaux.
2. Wattmètre optique
3. Disque d'essai (YEDS-7), disque de 8 cm
4. Filtre d'ajustement de gain de boucle
5. Générateur de signal
6. Fréquencemètre
7. Tournevis, pinces, fer à souder, etc.

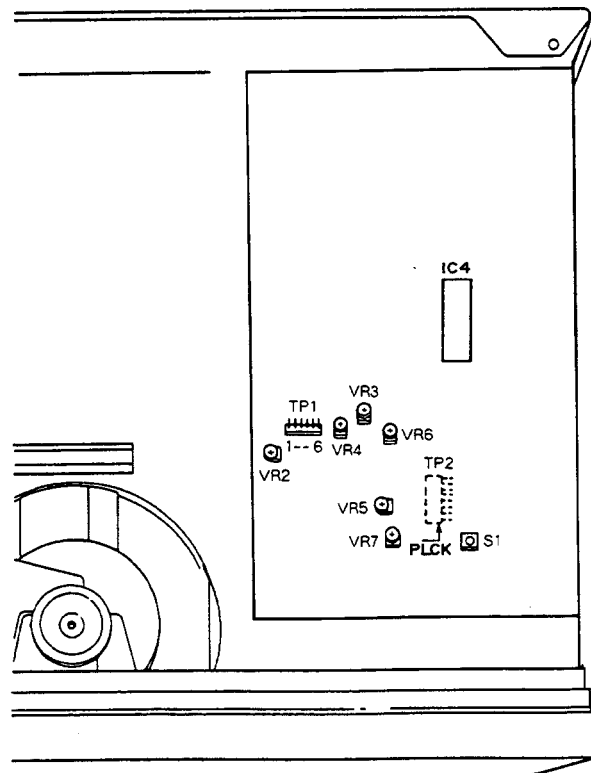
### ● A propos du mode d'essai

#### Mise en/hors service du mode d'essai

- ① Pour actualiser le mode d'essai, allumer (ON) l'interrupteur d'alimentation (S301) après avoir placé l'interrupteur du mode d'essai (S1) à la position ON.
- ② Le mode d'essai est annulé en ramenant l'interrupteur d'alimentation sur OFF.

Les fonctions des touches en mode d'essai sont décrites au Tableau 9-1.

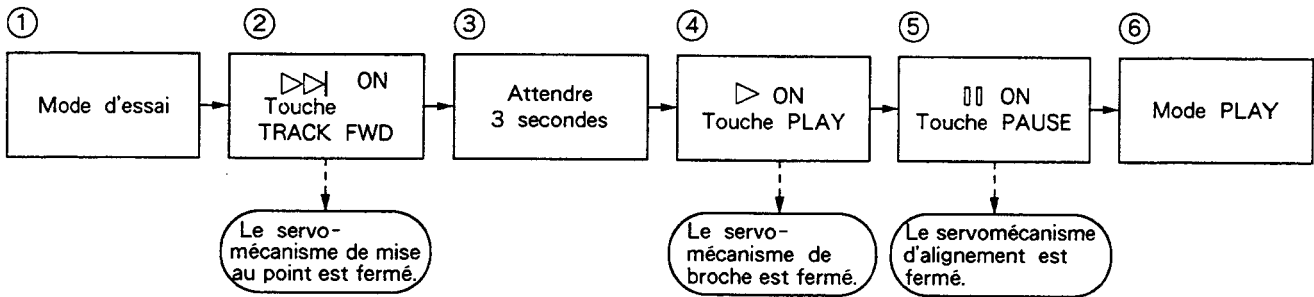
#### Points de réglage



En mode d'essai, mise au point, alignement et d'axe servos doivent être fermés et ouverts individuellement. En conséquence, les servos doivent chacun être fermés dans la séquence correcte (séquence sérielle) afin de placer l'appareil en mode de lecture normale. Remarque également que l'appareil ne se placera pas en mode de lecture, par une poussée sur la touche PAUSE (||).

Par exemple, pour passer du mode d'arrêt au mode de lecture, les touches de fonction doivent être actionnées dans l'ordre suivant.

\* En mode d'essai, les servos doivent être opérés en séquence sérielle.

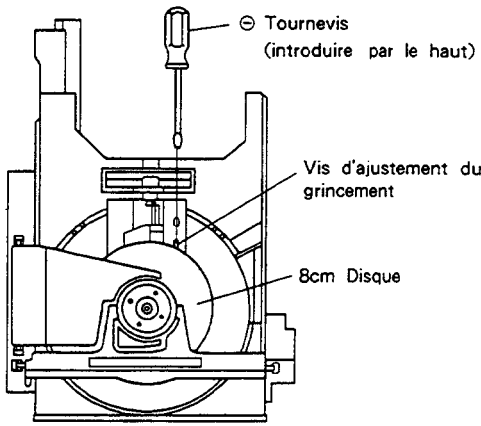
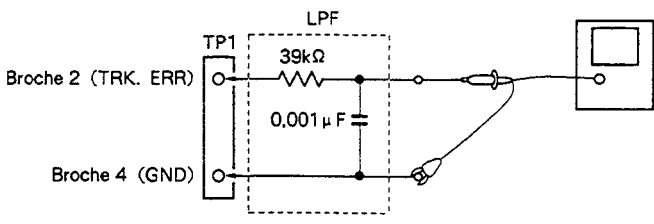


• Fonctions des touches en mode d'essai

Symbole	Nom de touche	Fonction en mode d'essai	Description
▷▷	TRACK FWD	Servo de mise au point fermé	Allume la diode laser et élève ou abaisse l'actuateur de mise au point pour fermer le servo de mise au point.
▷	PLAY	Servo d'axe fermé	Ferme le servo en mode CLV-A après cognement du moteur d'axe.
	PAUSE	Fermeture/ouverture de servo d'alignement	Agit comme interrupteur articulé: ferme le servo d'alignement et active le mode de lecture quand poussé (pourvu que les servos de mise au point et d'alignement soient fermés), auquel moment le témoin PAUSE s'allume; ouvre le servo d'alignement à la poussée suivante.
◁◁	MANUAL SEARCH REV	Inversion du chariot (déplacement vers l'intérieur)	Déplace rapidement (3 cm/sec) le chariot vers la plage la plus au centre. Prendre garde à ne pas déplacer trop loin car il n'existe pas de dispositif de sécurité pour arrêter le chariot.
▷▷	MANUAL SEARCH FWD	Avance du chariot (déplacement vers l'extérieur)	Déplace rapidement (3 cm/sec) le chariot vers la plage la plus à l'extérieur. Prendre garde à ne pas déplacer trop loin car il n'existe pas de dispositif de sécurité pour arrêter le chariot.
□	STOP	STOP	Arrête tous les servos et ramène le système à l'état initial.
△	OPEN/CLOSE	Ouverture/fermeture du plateau de disque	Ouvre et ferme le plateau du disque. Cependant, le capteur ne revient pas à la position de repos à OPEN et il reste stationnaire à CLOSE.

Tableau 9 - 1

N° de étape	Réglage d'oscilloscope		Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
	V	H				
<b>1 Réglage de décalage d'erreur d'alignement, de mise au point et de décalage RF.</b>						
			TP1 Broche 2 (TRK. ERR)	VR5 (TRK. BAL) VR7 (TRK. OFS)	Décalage d'erreur d'alignement 45°  0V ± 50mV	<ul style="list-style-type: none"> <li>● Placer l'appareil en mode d'essai (voir page 45).</li> <li>● Régler VR5 TRK. BAL (équilibre d'alignement) à la position environ à 45° à la gauche du centre.</li> <li>● Régler VR7 TRK. OFS (décalage d'alignement) de sorte que la tension TRK. ERR (erreur d'alignement) à TP1 broche 2 devienne 0V ± 50mV.</li> </ul>
			TP1 Broche 6 (FCS. ERR)	VR6 (FCS. OFS)	Décalage d'erreur de mise au point 0V ± 50mV	<ul style="list-style-type: none"> <li>● Régler VR6 FCS. OFS (décalage de mise au point) de sorte que la tension FCS. ERR (erreur de mise au point) à TP1 broche 6 devienne 0V ± 50mV.</li> </ul>
			TP1 Broche 1 (RF OUTPUT)	VR2 (RF. OFS)	Décalage RF 100mV ± 50mV	<ul style="list-style-type: none"> <li>● Régler VR2 RF. OFS (décalage RF) de sorte que la tension de sortie RF à TP1 broche 1 devienne 100mV ± 50mV.</li> </ul> <p>Remarque : Lors de l'ajustement de la compensation, effectuer toujours "6. Réglage d'équilibre d'erreur d'alignement".</p>
<b>2 Réglage du niveau RF</b>						
			TP1 Broche 1 (RF OUTPUT)	VR1 (Puissance laser)	1,5Vc-c $\pm$ $\frac{0,2}{0}$ V	<ul style="list-style-type: none"> <li>● Placer l'appareil en mode d'essai (voir page 45).</li> <li>● Installer le disque d'essai et raccorder l'oscilloscope à TP1 broche 1 (sortie RF), reproduire le disque d'essai et mesurer la tension P-P de la forme d'onde RF.</li> <li>● Régler VR1 (puissance laser) de façon que la tension soit de 1,5Vc-c <math>\pm</math> <math>\frac{0,2}{0}</math> V.</li> </ul>
<b>3 Vérification d'alimentation de diode laser (LD)</b>						
				Vérification	Moins de 0,13mW	<ul style="list-style-type: none"> <li>● Placer l'appareil en mode d'essai (voir page 45).</li> <li>● Appuyer sur les touches TRACK FWD (▷▷) pour allumer la diode laser (LD).</li> <li>● Placer le puissance-mètre optique directement sur la lentille et vérifier que la puissance de la diode laser (LD) est inférieure à 0,13mW.</li> </ul>
<b>4 Vérification de verrouillage le servo de mise au point et de verrouillage le servo d'axe</b>						
	0,5V/div	100msec/div	TP1 Broche 1 (sortie RF)		Le signal RF est fourni.  Rotation avant (Sens des aiguilles)	<ul style="list-style-type: none"> <li>● Installer le disque d'essai.</li> <li>● Placer l'appareil en mode d'essai (voir page 45).</li> <li>● Reconnecter le câble MANUAL SEARCH FWD JP pour amener le capteur au centre du disque.</li> <li>● Observer la sortie de TP1 broche 1 (sortie RF) sur l'oscilloscope. Confirmer que le signal haute fréquence est fourni après que la touche TRACK FWD (▷▷) est actionnée.</li> <li>● Appuyer sur la touche PLAY (▷) et confirmer que le disque tourne à vitesse constante (env. 300 tr/mn près du centre du disque) dans le sens avant (sens des aiguilles). Il peut arriver que le disque ne tourne pas ou tourne dans le sens contraire des aiguilles.</li> </ul>

N° de étape	Réglage d'oscilloscope		Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
	V	H				
<b>5</b>	<b>Réglage du grincement (1) (Lorsqu'un disque de 8 cm est utilisé)</b>					
	 <p>Fig. 9-1</p>					<p>Remarque : Ce réglage peut être effectué en utilisant un disque de 8 cm, dont les cavités se trouvent dans un diamètre de 75 mm.</p> <ul style="list-style-type: none"> <li>● Régler l'appareil en mode d'essai (voir page 45).</li> <li>● Installer le 8 cm disque d'essai, amener le capteur à la périphérie extérieure de sorte que l'orifice d'ajustement du grincement soit visible de la surface du disque ou par l'orifice du servomécanisme (voir Fig. 9-1).</li> <li>● Appuyer sur la touche TRACK FWD (▷▷) et PLAY (▷) en séquence pour allumer le servo de mise au point et le servo d'axe (ne pas fermer le servo d'alignement).</li> <li>● Observer la forme d'onde TRK.ERR (erreur d'alignement) à TP1 broche 2 sur un oscilloscope, en insérant un filtre passebas de 4 kHz (voir Fig. 9-2).</li> <li>● Insérer un ⊖ tournevis dans l'orifice du grincement, le tourner et rechercher le point nul (voir Photo 9-1).</li> <li>● Tourner ensuite lentement le ⊖ tournevis <b>DANS LE SENS CONTRAIRE DES AIGUILLES</b> à partir du point nul jusqu'à ce que la forme d'onde (signal d'erreur d'alignement) atteigne l'amplitude maximale (voir Photo 9-2).</li> </ul> <p>Remarque : Agir avec précaution car une insertion forcée du ⊖ tournevis provoquera un flottement du capteur vers l'intérieur.</p> <ul style="list-style-type: none"> <li>● Finalement, confirmer qu'il n'y a pas de fluctuation importante dans la tension c-c du signal d'erreur d'alignement (ne pas insérer le filtre passe-bas 4 kHz) quand le capteur est déplacé vers la périphérie intérieure et vers la périphérie extérieure. Si l'on constate une différence supérieure à 10% tourner à nouveau le grincement et régler le signal d'erreur d'alignement au maximum.</li> </ul>
	0,5V / div	5msec / div	TP1 Broche 2 (TRK. ERR)	Vis d'ajustement de grincement  Vis d'ajustement de grincement	Point nul  Amplitude maximale	
	 <p>Fig. 9-2</p>					

N° de étape	Réglage d'oscilloscope		Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
	V	H				

**5' Réglage du grincement (2) (Lorsqu'un disque de 8 cm n'est utilisé)**

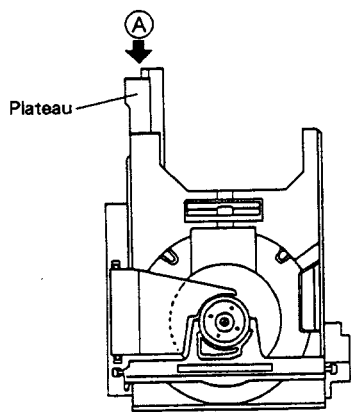


Fig. 9-3

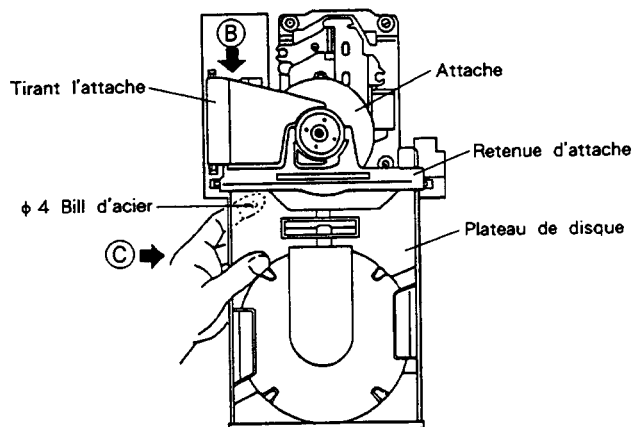


Fig. 9-4

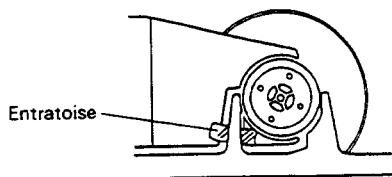


Fig. 9-5

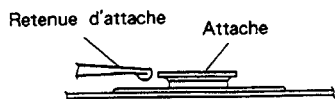


Fig. 9-6

Ce réglage est effectué si aucun disque de 8 cm n'est disponible et que le réglage du grincement (1) ne peut être effectué. Retirer le plateau du disque pour procéder à ce réglage.

- Retrait du plateau du disque
- 1. Pousser sur le bord arrière à l'endroit marqué **A** sur la Fig. 9-3, (\* 1) tout en retirant le plateau du disque vers la position où il tient, comme illustré sur la Fig. 9-4.
- (\*1) Lorsqu'on appuie à l'arrière de la crémaillère **A**, le dispositif de maintien du disque est déverrouillé. Une pression prolongée au-delà de l'ouverture complète éjecte le tiroir du disque.
- 2. Tout en tirant l'attache **B** (voir Fig. 9-4) vers le haut de la main droite, tenir le plateau comme indiqué par **C** de la main gauche et tirer vers l'extérieur. Prendre garde à ne pas laisser tomber les bills d'acier. Il est conseillé de maintenir la bille en place par l'index gauche tout en extrayant le plateau.

N° de étape	Réglage d'oscilloscope		Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
	V	H				
						<ul style="list-style-type: none"> <li>● Placer l'appareil en mode d'essai (voir page 45).</li> <li>● Appuyer sur la touche MANUAL SEARCH FWD (▷▷) pour amener le capteur près de l'endroit qui devrait être le centre du disque. Positionner le capteur de sorte de sa vile de réglage de grille soit visible par l'orifice allongé sur le côté du moteur d'axe de la plaque de base sur servomécanisme.</li> <li>● Comme illustré sur la Fig. 9-7, introduire un ⊖ tournevis (moins) par le haut du mécanisme de sorte que la vis de réglage de grincement puisse être tournée.</li> <li>● Installer le disque d'essai; veiller à insérer une entretoise de 3-5mm (si aucune entretoise n'est disponible, se servir d'une clé hexagonale) entre l'attache et la retenue d'attache illustré sur la Fig. 9-5.</li> <li>● Confirmer que l'attache et la retenue ne fasse pas contact l'une sur l'autre (Fig. 9-6).</li> <li>● Appuyer sur les touches TRACK FWD (▷▷ ) et PLAY (▷) en séquence pour fermer les servos de mise au point et d'axe (ne pas fermer le servo d'alignement).</li> <li>● Installer un filtre passe-bas de coupure à 4 kHz entre l'oscilloscope et TP1 broche 2 (TRK. ERR) et 4 (GND) comme illustré sur la Fig. 9-8 et observer la forme d'onde de TP1 broche 3 (erreur d'alignement) sur l'oscilloscope.</li> </ul>
	0,5V/div	5msec /div	TP1 Broche 2 (TRK. ERR)	Vis d'ajustement de grincement  Vis d'ajustement de grincement	Point nul  Amplitude maximale	<ul style="list-style-type: none"> <li>● Tourner la vis d'ajustement de grincement à l'aide du ⊖ tournevis pour trouver le point nul (voir Photo 9-1).</li> <li>● Tourner ensuite lentement la ⊖ tournevis <b>DANS LE SENS CONTRAIRE DES AIGUILLES</b> du point nul et régler au point où la forme d'onde (signal d'erreur d'alignement) arrive à son amplitude maximale (voir Photo 9-2).</li> </ul> <p>Remarque : Eviter d'appuyer sur le ⊖ tournevis pendant le réglage de la vis, car ceci déplacerait le capteur vers l'intérieur, rendant l'ajustement plus difficile.</p> <ul style="list-style-type: none"> <li>● En dernier lieu, retirer le filtre passe-bas et confirmer que la tension p-p du signal d'erreur d'alignement (ne pas insérer le filtre passe-bas 4 kHz) ne varie pas fortement quand le capteur est déplacé à la première et à la dernière plage du disque. Si les niveaux divergent de 10% ou davantage, ré-ajuster le point d'amplitude d'erreur maximale en tournant sur la vis d'ajustement.</li> </ul>

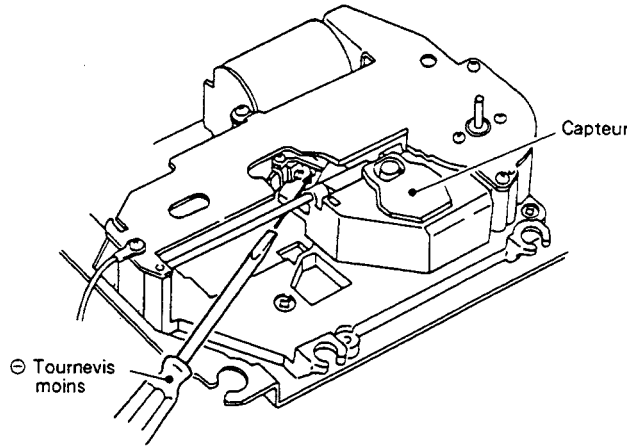


Fig. 9-7

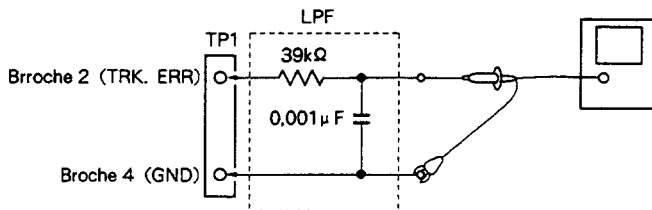


Fig. 9-8



N° de étape	Réglage d'oscilloscope		Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
	V	H				
						<p>Remonter le plateau du disque selon la procédure ci-après après avoir terminé l'ajustement de grincement.</p> <ol style="list-style-type: none"> <li>1. Retirer le disque et l'entretoise.</li> <li>2. Tout en levant l'attache (marquée par ⓑ sur la Fig. 9-4) de la main droite, tenir le plateau de la main droite comme illustré par Ⓒ et déplacer la base coulissante dans les armatures en résine dure sur la base de chargement, comme indiqué sur la Fig. 9-9 pour ré-insérer le plateau du disque.</li> </ol> <p>A ce moment, prendre soin de tenir la bille d'acier en place par l'index de la main droite. Veiller également que le panneau avant ne soit pas endommagé par le roulement (dans la base coulissante), entrant en contact avec le panneau.</p> <ol style="list-style-type: none"> <li>3. Insérer la base coulissante de sorte qu'elle s'engage dans les armatures en résine dure à l'arrière de la base de chargement (voir Fig. 9-10).</li> <li>4. Insérer à ferme le plateau.</li> </ol>

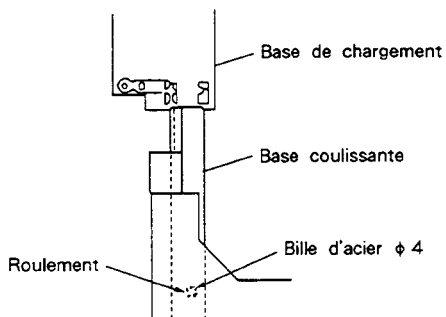


Fig. 9-9

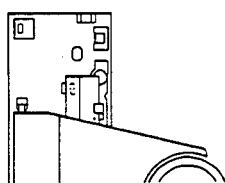


Fig. 9-10

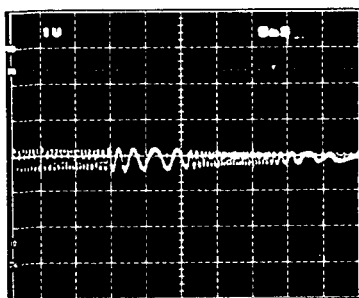


Photo 9-1  
Point nul

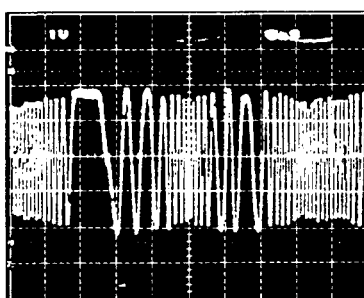


Photo 9-2  
Amplitude maximale

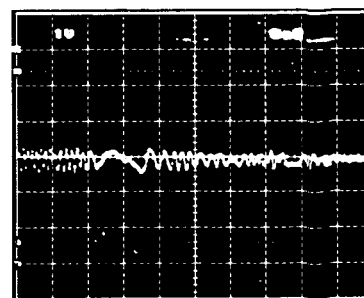
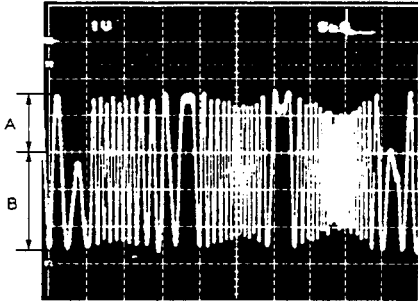
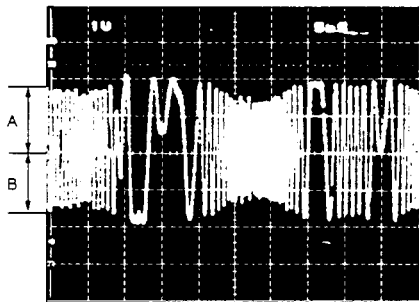
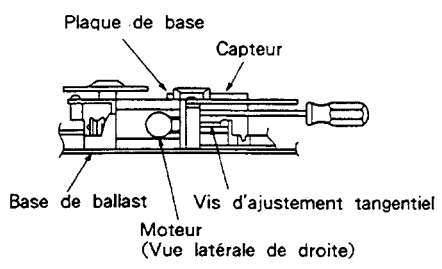
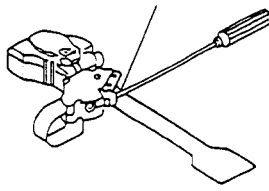


Photo 9-3  
Ceci n'est pas la forme  
d'onde du point nul

N° de étape	Réglage d'oscilloscope		Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
	V	H				
<b>6 Réglage d'équilibre d'erreur d'alignement</b>						
	0,5V/div	5msec/div	TP1 Broche 2 (TRK. ERR)	VR5 (TRK. BAL)		<ul style="list-style-type: none"> <li>● Installer le disque d'essai.</li> <li>● Régler l'appareil en mode d'essai (voir page 45).</li> <li>● Appuyer sur la touche MANUAL SEARCH FWD (▷▷) pour amener le capteur près du centre du disque.</li> <li>● Appuyer sur les touches TRACK FWD (▷▷ ) et PLAY (▷) en séquence pour faire tourner le disque.</li> <li>● Observer TP1 broche 2 TRK.ERR (erreur d'alignement) sur l'oscilloscope et régler VR5 TRK.BAL (équilibrage d'alignement) pour éliminer les éléments DC du signal d'erreur d'alignement.</li> </ul>
					 <p style="text-align: center;">A ≠ B</p> <p style="text-align: center;">Photo 9-4 Eléments DC mêlés au signal</p>	 <p style="text-align: center;">A = B</p> <p style="text-align: center;">Photo 9-5 Eléments DC éliminés</p>
<b>7 Réglage tangentiel</b>						
						<ul style="list-style-type: none"> <li>● Régler l'appareil en mode d'essai (voir page 45).</li> <li>● Ouvrir le plateau et installer le disque d'essai.</li> <li>● Appuyer sur la touche MANUAL SEARCH FWD (▷▷) pour amener le capteur vers le centre du disque.</li> <li>● Insérer une clé hexagonale par l'orifice de la vis d'ajustement tangentiel par l'arrière du mécanisme.</li> <li>● Refermer le plateau.</li> </ul> <p>Remarque : Ne pas se servir d'une clé hexagonale en L, mais une comme illustré sur la gauche. L'emploi d'une clé hexagonale en L pourrait relâcher le plateau [ voir page 49 5'. Réglage du grincement (2).]</p> <ul style="list-style-type: none"> <li>● Appuyer sur les touches TRACK FWD (▷▷ ) et PLAY (▷) en séquence pour fermer les servos (le témoin PAUSE s'allume).</li> </ul>
				 <p style="text-align: center;">Vis d'ajustement tangentiel</p>  <p style="text-align: center;">Fig. 9-11</p>		

N° de étape	Réglage d'oscilloscope		Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
	V	H				
		200nsec /div	TP1 Broche 1 Sortie RF	Vis d'ajustement tangentiel	Mire la plus nette possible	<ul style="list-style-type: none"> <li>● Observer TP1 broche 1 (sortie RF) sur l'oscilloscope et agir sur la vis d'ajustement tangentiel pour obtenir la mire la plus nette possible.</li> <li>● Quand toute la forme d'onde devient claire, se concentrer sur la netteté des lignes fines, formant un losange au centre de la mire (voir Photo 9-8). Régler jusqu'à ce que les lignes fines sur les quatre côtés du losange soient bien définies et denses, comme illustré sur la Photo 9-6.</li> </ul> <p>Remarque : Se servir d'une clé hexagonale pour lever légèrement le capteur pendant cet ajustement.</p>

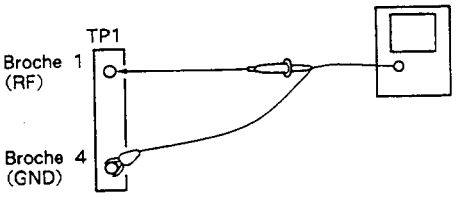
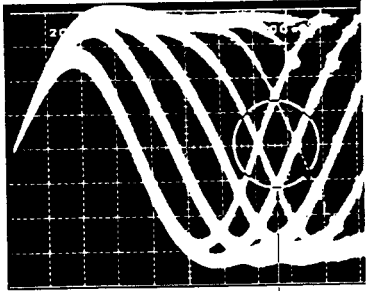


Fig. 9-12



Concentre sur la netteté du losange

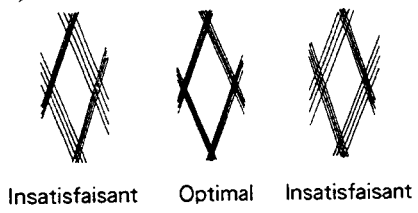


Photo 9-6

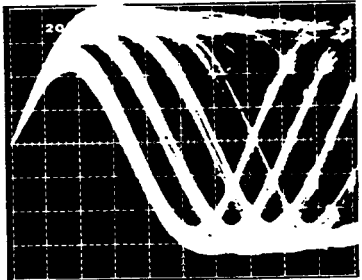


Photo 9-7

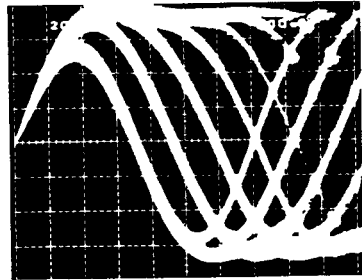


Photo 9-8

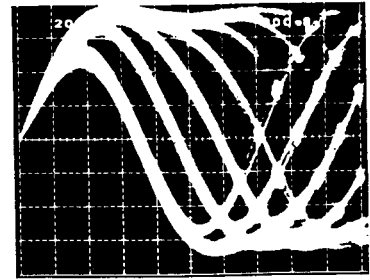
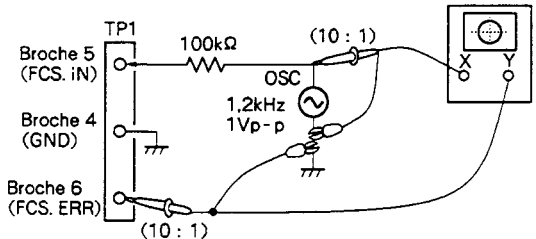
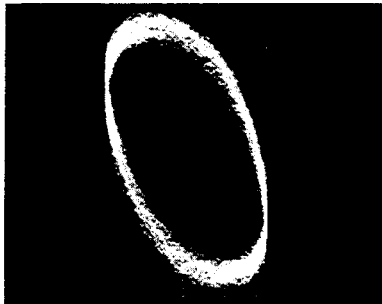
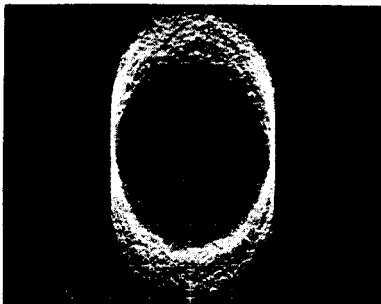
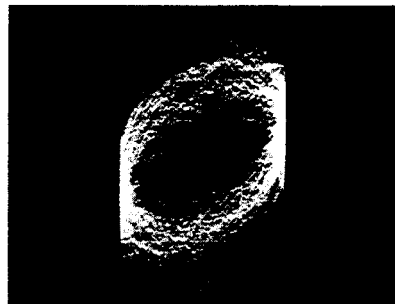


Photo 9-9

N° de étape	Réglage d'oscilloscope		Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
	V	H				
<b>8 Réglage de gain de mise au point</b>						
	20mV/div CH1 (X) 5mV/div CH2 (Y) (sonde 10 : 1)		Axe des X : TP1 Broche 5 (FCS. IN) Axe des Y : TP1 Broche 6 (FCS. ERR)	VR3 (FCS. GAN)	Différence de phase de 90°	<ul style="list-style-type: none"> <li>● L'alimentation étant coupée (POWER OFF), raccorder l'oscillateur comme illustré sur la Fig. 9-13.</li> <li>● Régler l'appareil en mode de lecture normale.</li> <li>● Mettre l'oscillateur sous tension (ON) et le régler pour fournir un signal de 1,2kHz 1Vp-p.</li> </ul> <p>Remarque : Certains oscillateurs déchargent une tension DC lors de leur mise sous tension. Par conséquent, il est conseillé de connecter l'oscillateur après l'avoir mis sous tension.</p> <ul style="list-style-type: none"> <li>● Ajust VR3 FCS. GAN (gain de mise au point) de sorte que la figure de Lissajou devienne un cercle horizontal (différence de phase de 90° ).</li> </ul>
					 <p>Fig. 9-13</p>	
						
						
						
	Photo 9-10 Gain sur-compensé				Photo 9-11 Gain optimal	Photo 9-12 Gain sous-compensé

N° de étape	Réglage d'oscilloscope		Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
	V	H				
<b>9 Réglage de gain d'alignement</b>						
	50mV/div CH1 (X) 5mV/div CH2 (Y) (sonde 10 : 1)		Axe des X : TP1 Broche 3 (TRK. IN) Axe des Y : TP1 Broche 2 (TRK. ERR)	VR3 (TRK. GAN)	Difference de phase de 90°	<ul style="list-style-type: none"> <li>● L'alimentation étant coupée (POWER OFF), raccorder l'oscillateur comme illustré sur la Fig. 9-14.</li> <li>● Régler l'appareil en mode de lecture normale.</li> <li>● Mettre l'oscillateur sous tension (ON) et le régler pour fournir un signal de 1,2kHz 2Vp-p.</li> </ul> <p>Remarque : Certains oscillateurs déchargent une tension DC lors de leur mise sous tension. Par conséquent, il est conseillé de connecter l'oscillateur après l'avoir mis sus tension.</p> <ul style="list-style-type: none"> <li>● Ajuster VR4 TRK. GAN (gain d'alignement) de sorte que la figure de Lissajou devienne un cercle horizontal (différence de phase de 90° )</li> </ul>

Fig. 9-14



Photo 9-13  
Gain sur-compensé



Photo 9-14  
Gain optimal

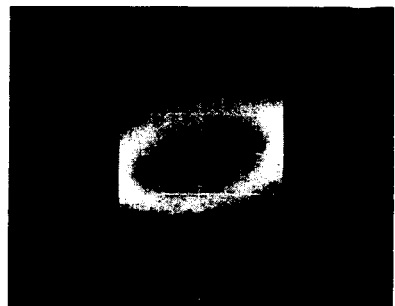


Photo 9-15  
Gain sous-compensé

N° de étape	Réglage d'oscilloscope		Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
	V	H				
<b>10 Réglage de fréquence libre VCO</b>						
			TP2 Broche 2 (PLCK)	VR8 (VCO. ADJ)	4,275 ± 0,025MHz	<ul style="list-style-type: none"> <li>● Régler l'appareil en mode d'essai (voir page 45).</li> <li>● Court-circuiter l'ensemble et le cavalier de masse (GND) à l'aide d'un ⊖ tournevis ou d'un outil analogue (voir Fig. 9-15).</li> <li>● Raccorder un fréquencemètre, capable de mesurer des fréquences de 10MHz et audelà, sur TP2 broche 2 (PLCK).</li> <li>● Ajuster VR8 (ajustement VCO) de sorte que la lecture du fréquencemètre devienne 4,275 ± 0,025MHz.</li> </ul>
<b>11 Méthode de confirmation du caractère S (erreur de mise au point)</b>						
			TP1 Broche 6 (FCS. ERR)			<ul style="list-style-type: none"> <li>● Régler l'appareil en mode d'essai (voir page 45).</li> <li>● Mettre TP1 broche 5 FCS. IN (gain de mise au point) à la masse (GND).</li> <li>● Observer la sortie de forme d'onde à TP1 broche 6 FCS. ERR (erreur de mise au point) quand la TRACK FWD (▷▷ ) est actionnée.</li> </ul>

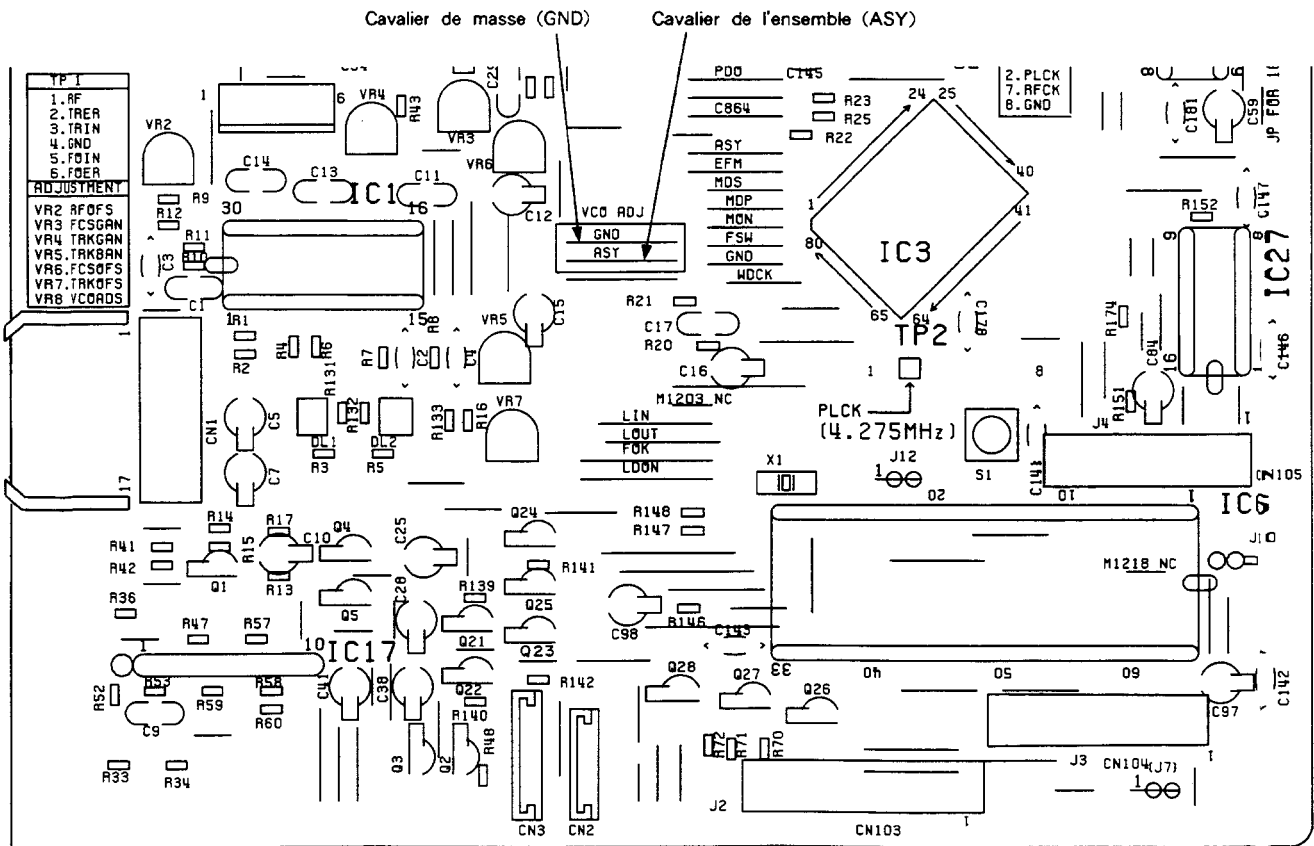
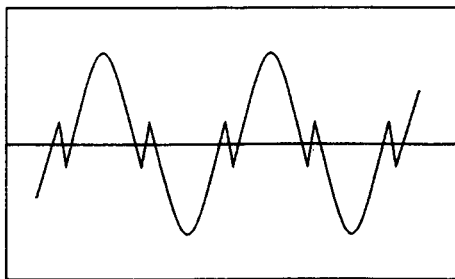
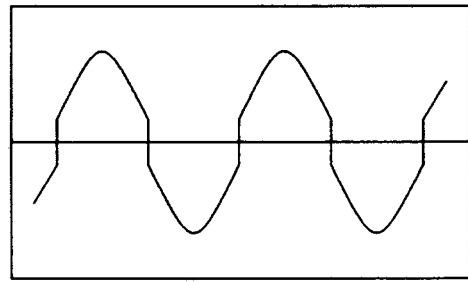
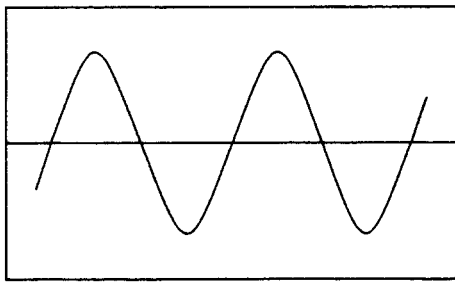


Fig. 9-15 Position des cavaliers des ASY et GND

N° de étape	Réglage d'oscilloscope		Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
	V	H				
<b>12</b>	<b>Réglage de MSB</b>					
	5mV/div	0.2msec /div	JA1 Borne LINE OUTPUT (canal gauche)  JA1 Borne LINE OUTPUT (canal droit)	VR9  VR10	Onde sinusoidale  Onde sinusoidale	<ul style="list-style-type: none"> <li>● Régler l'appareil en mode de lecture normale.</li> <li>● Reproduire la piste 20 (-60dB, 1kHz, canal gauche, canal droit du disque d'essai YEDS-7). Raccorder l'oscilloscope au canal gauche de la borne LINE OUTPUT (JA1) et observer la forme d'onde de la sortie audio.</li> <li>● Ajuster VR9 MSB (canal gauche) de sorte que l'onde sinusoidale apparaisse sur l'oscilloscope.</li> <li>● Ajuster VR10 (canal droit) de la même manière.</li> </ul>

● Forme d'onde de la distorsion de croisement zéro



## 9. AJUSTE

A continuación se of recen los ajustes para esta unidad. Estos ajustes deberán realizarse en el orden indicado.

### ● Ajustes e ítemes de comprobación

1. Ajuste de la desviación de error de seguimiento (VR7), enfoque (VR6) y desviación de RF (VR2).
2. Ajuste del nivel de RF (VR1)
3. Comprobación de la energía del diodo láser (LD)
4. Comprobación de la sincronización el servo del enfoque y del eje
5. Ajuste de retícula
6. Ajuste del equilibrio de error de seguimiento (VR5)
7. Ajuste tangencial
8. Ajuste de la ganancia de enfoque (VR3)
9. Ajuste de la ganancia de seguimiento (VR4)
10. Ajuste de la frecuencia de oscilación libre del oscilador controlado por tensión (VCO) (VR8)
11. Método para confirmar el carácter S (error de enfoque)
12. Ajuste de MSB (VR9, VR10)

### ● Equipos de medición

1. Osciloscopio de doble traza
2. Medidor de energía óptica
3. Disco de prueba (YEDS - 7), disco de 8 cm
4. Filtro de ajuste de ganancia de bucle
5. Generador de señales
6. Frecuencímetro
7. Otros equipos de medición regulares

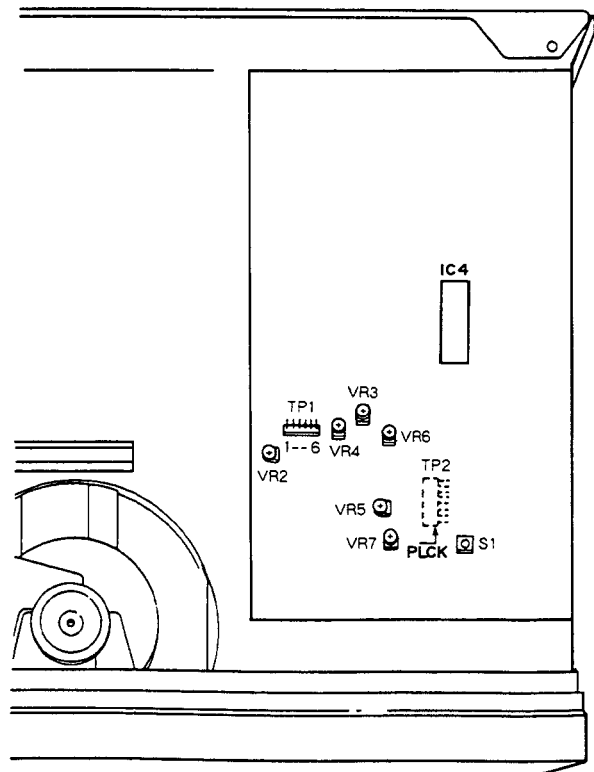
### ● Modo de prueba

#### Activación y desactivación del modo de prueba

- ① Para activar el modo de prueba, ponga en ON el interruptor de alimentación (S301) con el interruptor de modo de prueba (S1) en ON.
- ② El modo de prueba se desactivará poniendo el interruptor de alimentación en OFF.

Las funciones de las teclas en el modo de prueba se describen en la tabla 9-1.

Punto de ajuste

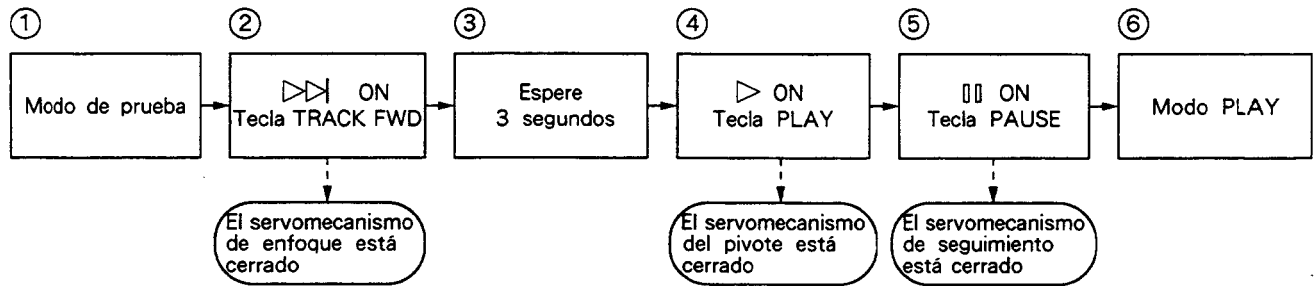




En el modo de prueba, enfoque, seguimiento y eje servos deberán abrir y cerrarse individualmente. Por consiguiente, los servos deberán cerrarse en la secuencia apropiada (secuencia en serie) a fin de poner la máquina en el modo de reproducción normal. Tenga en cuenta además que la máquina no entrará en el modo de reproducción cuando haya presionado la tecla PAUSE (||).

Por ejemplo, para cambiar del modo de parada al de reproducción, tendrá que presionar las teclas de función en el orden siguiente :

\* En el modo de prueba, los servos deberán operarse en secuencia en serie.

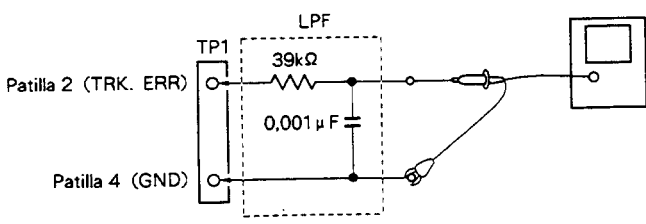


● Funciones de las teclas en el modo de prueba

Símbolo	Nombre de la tecla	Función en el modo de prueba	Descripción
▷▷	TRACK FWD	Cierre del servo de enfoque	Activa el diodo láser, y eleva y hace descender el actuador de enfoque para cerrar el servo de enfoque.
▷	PLAY	Cierre del servo del eje	Cierra el servo en el modo CLV-A después de impulsar el motor del eje.
	PAUSE	Cierre/apertura del servo de seguimiento	Actúa como conmutador: cierra el servo de seguimiento y activa el modo de reproducción cuando se presiona (suponiendo que los servos de enfoque y del eje estén cerrados), momento en el que se encenderá el indicador PAUSE; y abre el servo de seguimiento cuando vuelve a presionarse.
◁◁	MANUAL SEARCH REV	Retroceso del carro (se mueve hacia adentro)	Mueve el carro rápidamente (3 cm/s) hacia la pista más interior. Tenga cuidado para no moverlo demasiado ya que no hay dispositivo de seguridad para detener el carro.
▷▷	MANUAL SEARCH FWD	Avance del carro (mueve el carro hacia afuera)	Mueve el carro rápidamente (3 cm/s) hacia la pista más exterior. Tenga cuidado para no moverlo demasiado ya que no hay dispositivo de seguridad para detener el carro.
□	STOP	Parada	Para todos los servos y devuelve el sistema a su estado inicial.
△	OPEN/CLOSE	Apertura/cierre de la bandeja del disco	Abre cierra la bandeja del disco. Sin embargo, el captor no regresa a su soporte en OPEN (apertura), y permanece estacionario en CLOSE (cierre).

Tabla 9-1

N° de paso	Ajuste del osciloscopio		Puntos de prueba	Puntos de ajuste	Ítemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
<b>1 Ajuste de la desviación de error de seguimiento, enfoque y desviación de RF</b>						
			TP1 Patilla 2 (TRK. ERR)	VR5 (TRK. BAL) VR7 (TRK. OFS)	Desviación de error de seguimiento 45 é  0V ± 50mV	<ul style="list-style-type: none"> <li>● Ponga la unidad en el modo de prueba (consulte la página 58).</li> <li>● Ponga VR5 TRK. BAL (equilibrio de seguimiento) en una posición aproximadamente 45 é a la izquierda del centro*.</li> <li>● Ajuste VR7 TRK. OFS (desviación de seguimiento) de forma que la TRKG. ERR (tensión de error) de seguimiento de la patilla 2 de TP1 sea de 0V ± 50mV.</li> <li>● Ajuste VR6 FCS. OFS (desviación de enfoque) de forma que la tensión de FOCS. ERR (error de enfoque) en pa patilla 6 de TP1 sea de 100mV ± 50mV.</li> <li>● Ajuste VR2 RF. OFS (desviación de RF) de forma que la tensión de salida de RF de la patilla de TP1 sea de 100mV ± 50mV.</li> </ul> <p>Nota : Cuando ajuste la desviación de seguimiento, realice siempre "6. Ajuste del equilibrio de error de seguimiento".</p>
			TP1 Patilla 6 (FCS. ERR)	VR6 (FCS. OFS)	Desviación de error de enfoque 0V ± 50mV	
			TP1 Patilla 1 (RF OUTPUT)	VR2 (RF. OFS)	Desviación de RF 100mV ± 50mV	
<b>2 Ajuste del nivel de RF</b>						
			TP1 Patilla 1 (RF OUTPUT)	VR1 (Alimentación de láser)	1.5Vp-p $\pm$ 0.2 V	<ul style="list-style-type: none"> <li>● Ponga la unidad en el modo de prueba (consulte la página 58).</li> <li>● Instale el disco de prueba y conecte el osciloscopio a la patilla 1 de TP1 (salida de RF), ponga en reproducción el disco de prueba, y mida la tensión de pico a pico de la forma de onda de RF.</li> <li>● Ajuste VR1 (alimentación de láser) de forma que la tensión sea 1.5Vp-p <math>\pm</math> 0.2 V.</li> </ul>
<b>3 Comprobación de la energía del diodo láser (LD)</b>						
				Comprobación	Menos de : 0.13mW	<ul style="list-style-type: none"> <li>● Ponga la unidad en el modo de prueba (consulte la página 58).</li> <li>● Presione la tecla TRACK FWD (▷▷ ) para activar el diodo láser (LD).</li> <li>● Coloque el medidor de potencia óptico directamente encima del objetivo y confirme que la potencia LD sea menos de 0,13mW.</li> </ul>
<b>4 Comprobación de la sincronización el servo del enfoque y del eje</b>						
	0,5V/div	100msec /div	TP1 Patilla 1 (Salida de RF)		La señal de RF sale  Giro en sentido de avance (hacia la derecha)	<ul style="list-style-type: none"> <li>● Instale el disco de prueba.</li> <li>● Ponga la unidad en el modo de prueba (consulte la página 58).</li> <li>● Conecte el JP MANUAL SEARCH FWD para mover el captor hasta el centro del disco.</li> <li>● Observe la salida de la patilla 1 de TP1 (salida de RF) en el osciloscopio. Compruebe si la señal de RF sale después de presionar la tecla TRACK FWD (▷▷ ).</li> <li>● Presione la tecla PLAY (▷) y compruebe si el disco gira a velocidad constante (aprox. 300 rpm cerca del centro del disco) en sentido de avance (hacia la derecha) ; el disco puede no girar o hacerlo hacia la izquierda.</li> </ul>

N° de paso	Ajuste del osciloscopio		Puntos de prueba	Puntos de ajuste	Ítemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
<b>5</b>	<b>Ajuste de retícula (1) (Cuando emplee un disco de 8 cm)</b>					
						<p>Nota : Este ajuste podrá realizarse empleando un disco de 8 cm que posea los hoyos dentro de un diámetro de 75 mm.</p> <ul style="list-style-type: none"> <li>● Ponga la unidad en el modo de prueba (consulte la página 58).</li> <li>● Instale el 8 cm disco de prueba, desplace el captor hasta la pista exterior de forma que el orificio de ajuste de retícula del captor quede visible desde la superficie de hoyos del disco o a través del orificio del mecanismo de servos (consulte la Fig. 9-1).</li> <li>● Presione secuencialmente las teclas TRACK FWD (&gt;&gt; ) y PLAY (&gt;) para cerrar los servos de enfoque y del eje (no cierre el servo de seguimiento).</li> <li>● Observe la forma de onda de TRK.ERR (error de seguimiento) de la patilla 2 de TP1 en el osciloscopio, insertando un filtro de paso bajo de 4 kHz (consulte la Fig. 9-2).</li> <li>● Inserte un ⊖ destornillador en el orificio del tornillo de ajuste de retícula, gire y halle el punto nulo (consulte la foto 9-1).</li> <li>● A continuación, gire lentamente ⊖ destornillador HACIA LA IZQUIERDA desde el punto nulo hasta que la forma de onda (señal de error de seguimiento) alcance la máxima amplitud (consulte la foto 9-2).</li> </ul> <p>Nota : Tenga cuidado, porque si inserta el destornillador a la fuerza, la unidad captora se elevará.</p> <ul style="list-style-type: none"> <li>● Por último, confirme que no haya gran fluctuación la tensión de pico a pico de la señal de error de seguimiento (no inserte el filtro de paso bajo de 4 kHz de corte) cuando el captor se desplace de la pista más interior a la más exterior del disco. Si la diferencia es mayor del 10% o más, vuelva a girar el tornillo de ajuste de retícula y ajuste la señal de error al máximo.</li> </ul>
	0,5V/div	5msec /div	TP1 Patilla 2 (TRK. ERR)	Tornillo de ajuste de retícula  Tornillo de ajuste de retícula	Punto nulo  Amplitud máxima	
						
						Fig. 9-2

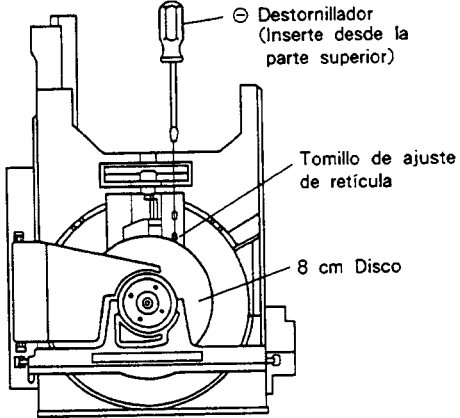
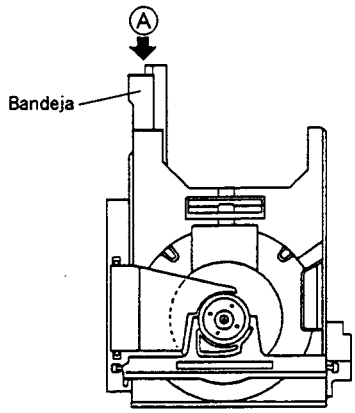
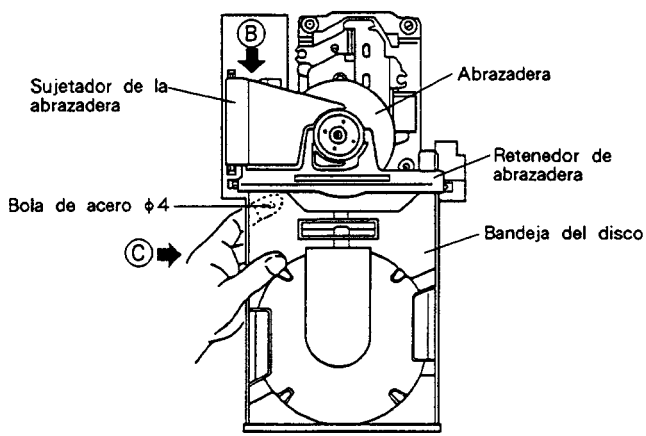
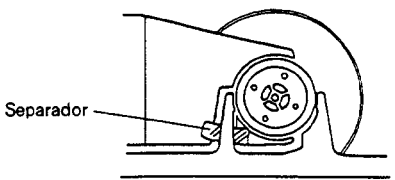
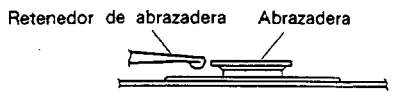
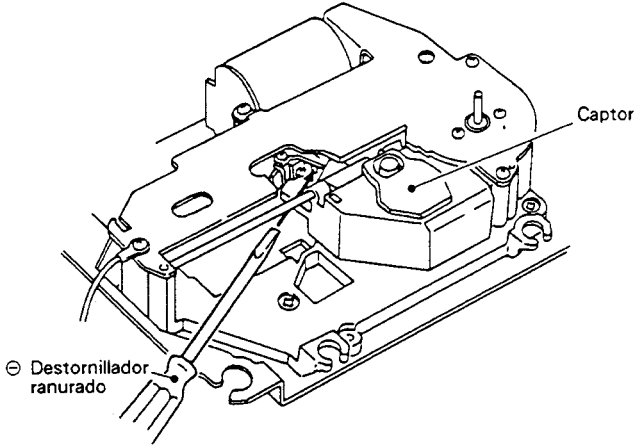
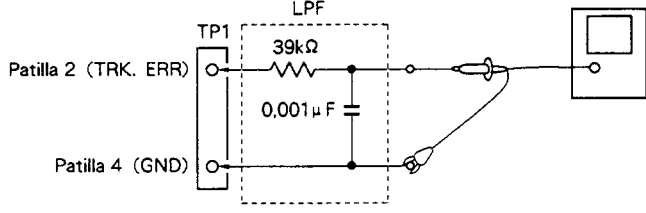


Fig. 9-1

N° de paso	Ajuste del osciloscopio		Puntos de prueba	Puntos de ajuste	Items de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
<b>5' Ajuste de retícula (2) (Cuando no disponga de disco de 8 cm)</b>						
 <p>Fig. 9-3</p>			<p>Este ajuste se realiza cuando no haya disco de 8 cm disponible, y el ajuste de retícula (1) no pueda realizarse. Para realizar este ajuste, extraiga la bandeja del disco.</p> <p>● Extracción de la bandeja del disco.</p> <ol style="list-style-type: none"> <li>Presione el borde posterior del bastidor, marcado con <b>A</b> en la Fig. 9-3, (*1) tirando de la bandeja del disco hasta la posición en la que agarre, mostrada en la Fig. 9-4.</li> </ol> <p>(*1) Si presiona el borde posterior del bastidor <b>A</b>, se libera la abrazadera de discos. Si continua presionando después de que se haya liberado completamente la abrazadera, sale eyectada la bandeja del disco.</p> <ol style="list-style-type: none"> <li>Tirando del soporte de abrazadera <b>B</b> (consulte la Fig. 9-4) hacia arriba con la mano derecha, sujete la bandeja como se indica en <b>C</b> con la mano izquierda y tire de ella hacia afuera. Tenga cuidado para que no caiga la bola de acero <math>\phi 4</math> (recomendamos sujetar la bola en su lugar con el dedo índice de la mano izquierda al sacar la bandeja).</li> </ol>			
 <p>Fig. 9-4</p>						
 <p>Fig. 9-5</p>						
 <p>Fig. 9-6</p>						

N° de paso	Ajuste del osciloscopio		Puntos de prueba	Puntos de ajuste	Items de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
						 <p>Fig. 9-7</p>  <p>Fig. 9-8</p> <ul style="list-style-type: none"> <li>● Ponga la unidad en el modo de prueba (consulte la página 58).</li> <li>● Presione la tecla MANUAL SEARCH FWD (▷▷) para mover el captor hasta cerca de lo que sería el centro del disco. Coloque el captor de forma que su tornillo de ajuste de retícula se vea a través del orificio alargado situado al lado del motor del eje de la placa base del mecanismo deservos.</li> <li>● Como se muestra en la Fig. 9-7, inserte un ⊖ destornillador (ranurado) desde la parte superior del mecanismo y compruebe si puede girar el tornillo de ajuste de retícula.</li> <li>● Instale el disco de prueba, asegúrese de insertar un separador de 3-5 mm (si no dispone de separador emplee una llave hexagonal) entre el sujetador de abrazadera y el retenedor de abrazadera, como se muestra en la Fig. 9-5.</li> <li>● Confirme que la abrazadera y el retenedor de la misma no estén en contacto entre sí (Fig. 9-6).</li> <li>● Presione secuencialmente las teclas TRACK FWD (▷▷ ) y PLAY (▷) para cerrar los servos de enfoque y del eje (no cierre el servo de seguimiento).</li> <li>● Inserte un filtro de paso bajo de 4 kHz de corte entre el osciloscopio y la patilla 3 (TRK. ERR) y 5 (GND) de TP1, como se muestra en la Fig. 9-8, y observe la forma de onda de la patilla 3 de TP1 (error de seguimiento) en el osciloscopio.</li> </ul>
	0,5V/div	5msec /div	TP1 Patilla 2 (TRK. ERR)	Tornillo de ajuste de retícula  Tornillo de ajuste de retícula	Punto nulo  Amplitud máxima	<ul style="list-style-type: none"> <li>● Gire el tornillo de ajuste de retícula con el destornillador hasta encontrar el punto nulo (consulte la foto 9-1).</li> <li>● A continuación, gire lentamente el ⊖ destornillador HACIA LA IZQUIERDA de punto nulo y ajústelo hasta el punto en el que la forma de onda (señal de error de seguimiento) llegue por primera vez a su máxima amplitud (consulte la foto 9-2).</li> </ul> <p>Nota: Evite aplicar excesiva presión al ⊖ destornillador cuando ajuste el tornillo. De lo contrario, el captor se moverá hacia adentro haciendo más difícil el ajuste.</p> <ul style="list-style-type: none"> <li>● Por último, desconecte el filtro de paso bajo y confirme que la tensión de pico a pico de la señal de error de seguimiento (no inserte el filtro de paso bajo de 4 kHz de corte) no varíe mucho cuando el captor se mueva de la pista más interior a la más exterior del disco. Si los niveles difieren en un 10% o más, reajuste el punto de error de amplitud máxima girando el tornillo de ajuste de retícula.</li> </ul>

N° de étape	Réglage d'oscilloscope		Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
	V	H				
						<p>Una vez finalizado el ajuste de retícula, vuelva a montar la bandeja del disco de acuerdo con el procedimiento siguiente.</p> <ol style="list-style-type: none"> <li>1. Extraiga el disco y el separador.</li> <li>2. Levantando el sujetador de abrazadera (marcado con ⓑ en la Fig. 9-4) con la mano izquierda, sujete la bandeja con la mano izquierda como se indica en Ⓒ y deslice la base deslizable en los acopladores de resina rígida de la base de carga como se muestra en la Fig. 9-9 para reinsertar la bandeja del disco.</li> </ol> <p>En este momento, asegúrese de sujetar la bola de acero en su lugar con el dedo índice de la mano izquierda. Además, tenga cuidado para no dañar el panel frontal con la base deslizable y el cojinete de boals de acero (de la base deslizable).</p> <ol style="list-style-type: none"> <li>3. Inserte la base deslizable de forma que encaje en los dos acopladores de resina rígida de la parte posterior de la base de carga (consulte la Fig. 9-10).</li> <li>4. Inserte completamente la bandeja del disco.</li> </ol>

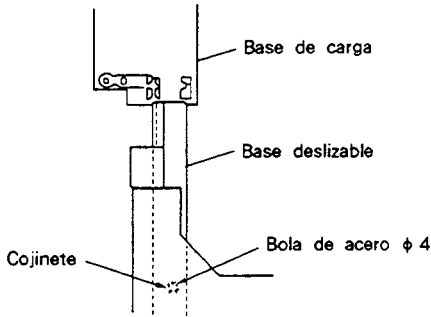


Fig. 9-9

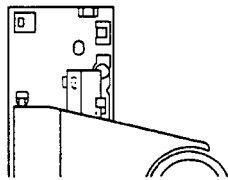


Fig. 9-10

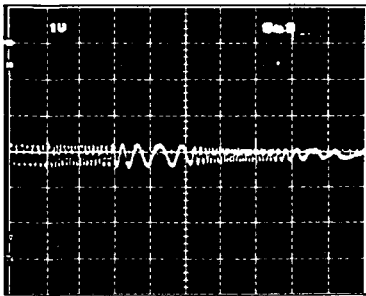


Foto 9-1  
Punto cero

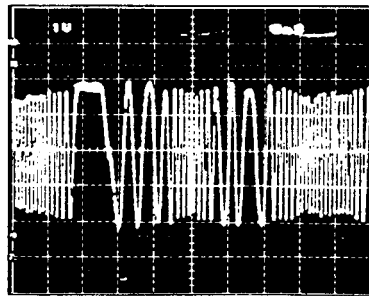


Foto 9-2  
Amplitud máxima

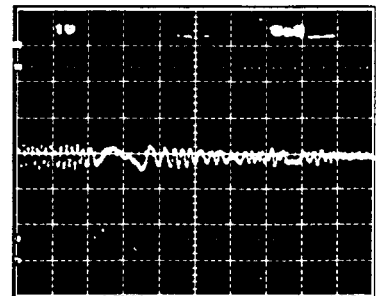


Foto 9-3  
Forma de onda de un punto no cero

N° de paso	Ajuste del osciloscopio		Puntos de prueba	Puntos de ajuste	Ítems de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				

**6 Ajuste del equilibrio de error de seguimiento**

0.5V/div

5msec /div

TP1  
Patilla 2  
(TRK. ERR)

VR5  
(TRK. BAL)

- Instale el disco de prueba.
- Ponga la unidad en el modo de prueba (consulte la página 58).
- Presione la tecla MANUAL SEARCH FWD (▷▷) para colocar el captor cerca del centro del disco.
- Presione secuencialmente las teclas TRACK FWD (▷▷|) y PLAY (▷) para hacer que el disco gire.
- Observe la forma de onda (error de seguimiento) de la patilla 2 (TRK. ERR) de TP1 en el osciloscopio, y ajuste VR5 TRK. BAL (equilibrio de seguimiento) para eliminar los elementos de CC de la señal de error de seguimiento.

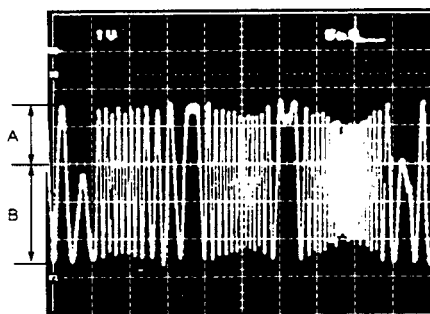


Foto 9-4 Elementos de CC mezclados con la

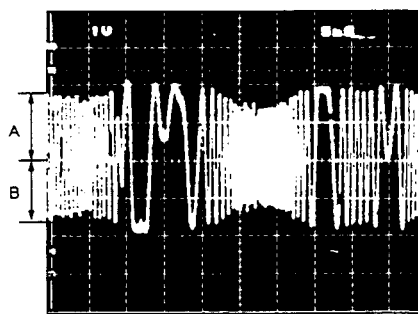
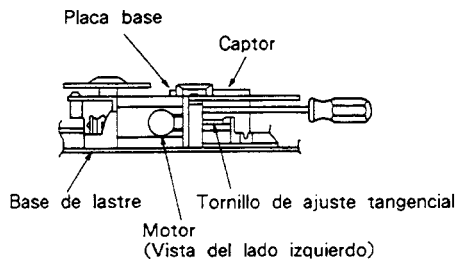


Foto 9-5 Elementos de CC eliminados

**7 Ajuste tangencial**



Tornillo de ajuste tangencial

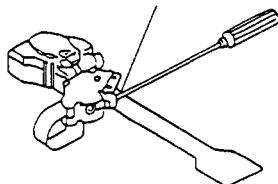


Fig. 9-11

- Ponga la unidad en el modo de prueba (consulte la página 58).
- Abra la bandeja y instale el disco prueba.
- Presione la tecla MANUAL SEARCH FWD (▷▷) para colocar el captor cerca del centro del disco.
- Inserte una llave hexagonal en la sección del tornillo de ajuste tangencial desde la parte posterior del mecanismo.
- Cierre la bandeja.

Note : No emplee una llave hexagonal en forma de L. Emplee una como la mostrada a la izquierda. Si emplea una llave hexagonal en forma de L Puede hacer que se afloje la bandeja [consulte la página 62 5'. "Ajuste de retícula (2)"].

- Presione secuencialmente las teclas TRACK FWD (▷▷|) y PLAY (▷) para cerrar los servos (el indicador de PAUSE se encenderá).

N° de étape	Réglage d'oscilloscope		Points d'essai	Points de réglage	Postes de contrôle / Spécifications / dérèglage	Procédure de réglage
	V	H				
		200nsec / div	TP1 Patilla 1 Salida de RF	Tornillo de ajuste tangencial	Patrón ocular más nitido posible	<ul style="list-style-type: none"> <li>● Observe la forma de onda de la patilla 1 de TP1 (salida de RF) en el osciloscopio, y ajuste el tornillo de ajuste tangencial hasta lograr el patrón ocular más nitido posible.</li> <li>● Cuando toda la forma de onda sea clara, concentre o aguce las líneas finas que forman el diamante en el centro del patrón ocular (consulte la foto 9-8). Ajuste hasta que las líneas finas de los cuatro lados del diamante queden nitidamente definidas y densas, como se muestra en la foto 9-6.</li> </ul> <p>Nota : Emplee una llave hexagonal para levantar algo en captor cuando realice este ajuste.</p>

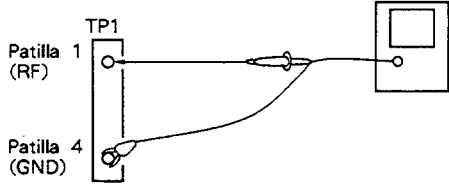
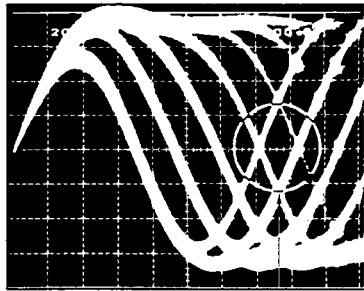


Fig. 9-12



Concentre o aguce este diamante.

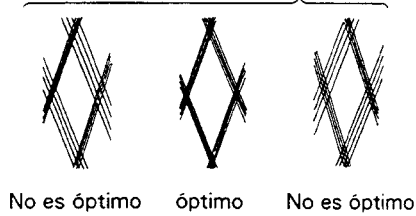


Foto 9-6

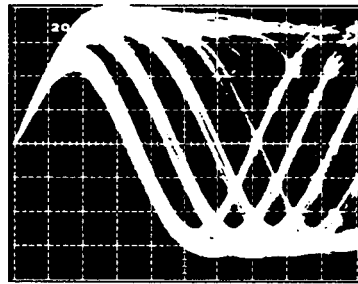


Foto 9-7

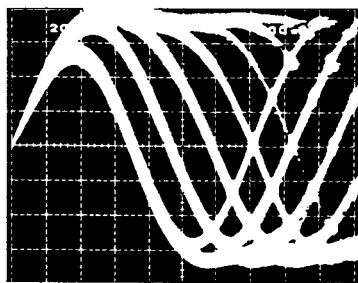


Foto 9-8

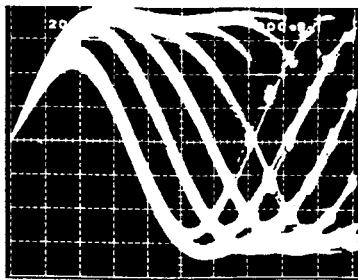


Foto 9-9



N° de paso	Ajuste del osciloscopio		Puntos de prueba	Puntos de ajuste	Items de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
<b>8 Ajuste de la ganancia de enfoque</b>						
	20mV/div CH1 (X) 5mV/div CH2 (Y) (sonda 10 : 1)	Eje X : TP1 Patilla 5 (FCS. IN) Eje Y : TP1 Patilla 6 (FCS. ERR)	VR3 (FCS. GAN)	Diferencia de fase de 90°	<ul style="list-style-type: none"> <li>● En el estado de POWER OFF (apagado), conecte el osciloscopio y el oscilador como se muestra en la Fig. 9-13.</li> <li>● Ponga la unidad en el modo de reproducción (PLAY) normal.</li> <li>● Conecte la alimentación del oscilador y ajuste su salida a una señal de 1.2kHz, 1Vp-p.</li> </ul> <p>Nota : Algunos osciladores descargan una tensión CC cuando se conecta su alimentación. Pro lo tanto, se recomienda conectar el oscilador después de haber conectado su alimentación.</p> <ul style="list-style-type: none"> <li>● Ajuste VR3 FCS. GAN (ganancia de enfoque) de forma que la figura de Lissajous se convierta en un círculo horizontal (diferencia de fase de 90°).</li> </ul>	

Fig. 9-13



Foto 9-10  
Ganancia sobrecompensada

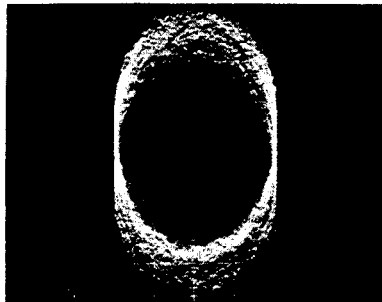


Foto 9-11  
Ganancia óptima

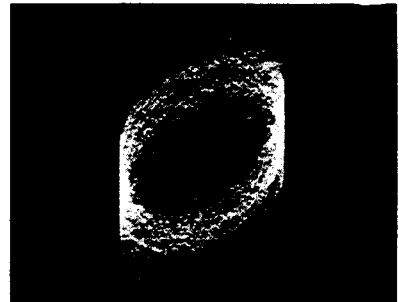


Foto 9-12  
Ganancia subcompensada

N° de paso	Ajuste del osciloscopio		Puntos de prueba	Puntos de ajuste	Ítemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
<b>9 Ajuste de la ganancia de seguimiento</b>						
	50mV/div CH1 (X) 5mV/div CH2 (Y) (sonda 10 : 1)		Eje X : TP1 Patilla 3 (TRK. IN) Eje Y : TP1 Patilla 2 (TRK. ERR)	VR4 (TRK. GAN)	Diferencia de fase de 90°	<ul style="list-style-type: none"> <li>● En el estado de POWER OFF (apagado), conecte el osciloscopio y el oscilador como se muestra en la Fig. 9-14.</li> <li>● Ponga la unidad en el modo de reproducción (PLAY) normal.</li> <li>● Conecte la alimentación del oscilador y ajuste su salida a una señal de 1,2kHz, 2Vp-p.</li> </ul> <p>Nota : Algunos osciladores descargan una tensión CC cuando se conecta su alimentación. Por lo tanto, se recomienda conectar el oscilador después de haber conectado su alimentación.</p> <ul style="list-style-type: none"> <li>● Ajuste VR4 TRK .GAN ( ganancia de seguimiento) de forma que la figura de Lissajous se convierta en un círculo horizontal (diferencia de fase de 90°).</li> </ul>

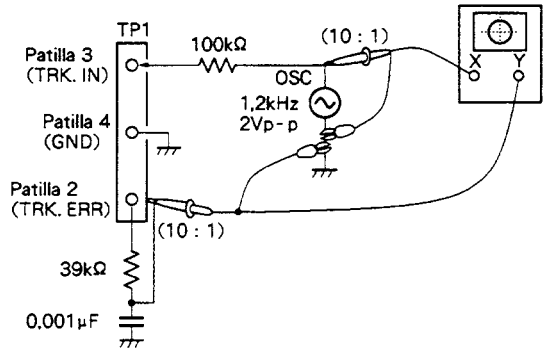


Fig. 9-14



Foto 9-13  
Ganancia sobrecompensade

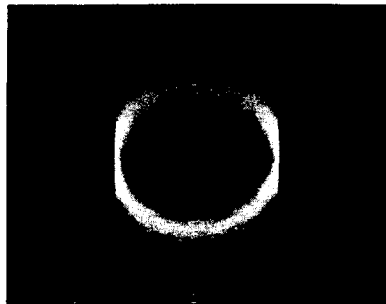


Foto 9-14  
Ganancia óptima

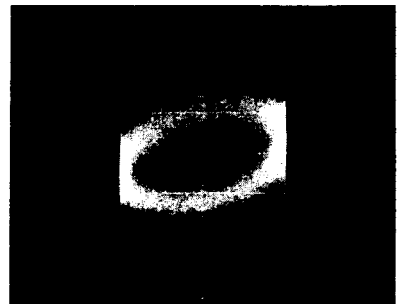


Foto 9-15  
Ganancia subcompensade

N° de paso	Ajuste del osciloscopio		Puntos de prueba	Puntos de ajuste	Items de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
10	<b>Ajuste de la frecuencia de oscilación libre del oscilador controlado por tensión (VCO)</b>					
			TP2 Patilla 2 (PLCK)	VR8 (VCO. ADJ)	4,275 ± 0,025MHz	<ul style="list-style-type: none"> <li>● Ponga la unidad en el modo de prueba (consulte la página 58).</li> <li>● Cortocircuite ASY y GND con un ⊖ destornillador a algún objeto similar (consulte la Fig. 9-15).</li> <li>● Conecte un frecuencímetro capaz de medir frecuencias de más 10MHz a la patilla 2 de TP2.</li> <li>● Ajuste VR8 (ajuste del VCO) hasta que el frecuencímetro indique 4,275 ± 0,025MHz.</li> </ul>
11	<b>Método para confirmar el carácter S (error de enfoque)</b>					
			TP1 Patilla 6 (FCS. ERR)			<ul style="list-style-type: none"> <li>● Ponga la unidad en el modo de prueba (consulte la página 58).</li> <li>● Conecte a masa la patilla 5 de TP1 (ganancia de enfoque).</li> <li>● Observe la forma de onda de salida de la patilla 6 FCS.ERR de TP1 (error de enfoque) al presionar la tecla TRACK FWD (&gt;&gt; ).</li> </ul>

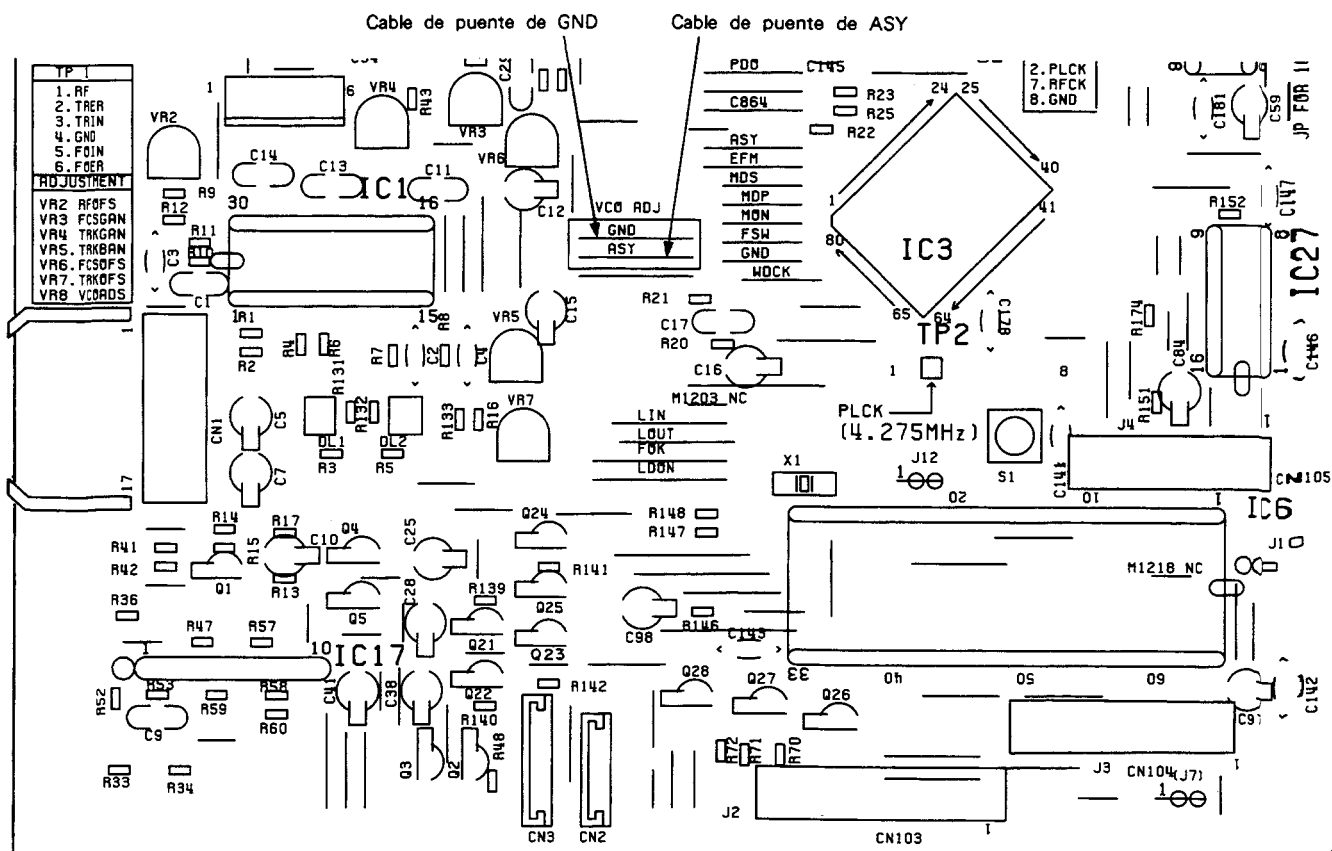
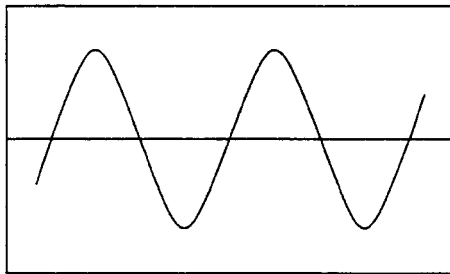


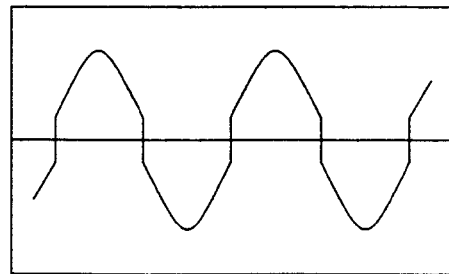
Fig. 9-15 Posición del cable de puente de ASY y GND

N° de paso	Ajuste del osciloscopio		Puntos de prueba	Puntos de ajuste	Ítemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
	V	H				
<b>12</b>	<b>Ajuste de MSB</b>					
	5mV/div	0.2msec / div	JA1 terminal LINE OUTPUT (canal derecho)	VR9	Onda senoidal	<ul style="list-style-type: none"> <li>● Ponga la unidad en el modo de reproducción normal.</li> <li>● Reproduzca la canción 20 (-60 dB, 1kHz, canales izquierdo y derecho) del disco de prueba (YEDS-7). Conecte el osciloscopio a el canal derecho del terminal LINE OUTPUT (JA1), y observe la forma de onda de salida de audio.</li> <li>● Ajuste VR9 MSB (canal derecho) hasta obtener una forma de onda senoidal en el osciloscopio.</li> <li>● Ajuste VR10 (canal izquierdo) de la misma forma.</li> </ul>
			JA1 terminal LINE OUTPUT (canal izquierdo)	VR10	Onda senoidal	

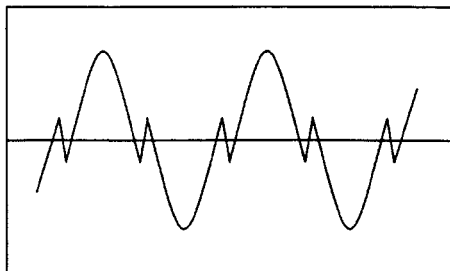
● Forma de onda de la distorsion del punto de intersección del eje con cero



OK



NG



NG

## 10. FOR HB, SD, KU, KC, HP AND PD-6300-S/HEM TYPES

### CONTRAST OF MISCELLANEOUS PARTS

**NOTES :**

- Parts without part number cannot be supplied.
- The  $\Delta$  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 only the coaxial output is connected, the remote sensor of the amplifier does not function. To operate it, connect the output cable to the stereo amplifier as well as connecting the digital output.

The PD-6300/HB, SD, KU, KC, HP and PD-6300-S/HEM types are the same as the PD-6300/HEM type with the exception of the following sections.

Mark	Symbol & Description	Part No.						
		PD-6300/ HEM type	PD-6300/ HB type	PD-6300/ SD type	PD-6300/ KU type	PD-6300/ KC type	PD-6300/ HP type	PD-6300-S/ HEM type
⊙	Main board assembly	PWZ1593	PWZ1593	PWZ1593	PWZ1686	PWZ1686	PWZ1593	PWZ1593
$\Delta$	AC power cord	PDG1003	PDG1004	PDG1013	PDG1015	PDG1015	PDG1006	PDG1003
$\Delta$	T1 Power transformer (AC220/240V)	PTT1063	PTT1063	.....	.....	.....	PTT1063	PTT1063
$\Delta$	T1 Power transformer (AC110/120-127/220/240V)	.....	.....	PTT1064	.....	.....	.....	.....
$\Delta$	T1 power transformer (AC120V)	.....	.....	.....	PTT1062	PTT1062	.....	.....
$\Delta$	Voltage selector	.....	.....	PSB1002	.....	.....	.....	.....
	Window screen	PAM1035	PAM1035	PAM1323	PAM1323	PAM1323	PAM1323	PAM1035
	Insulator	PNW1263	PNW1263	PNW1376	PNW1376	PNW1376	PNW1376	PNW1263
	Operating instructions (English/French)	PRE1085	.....	.....	.....	PRE1085	.....	PRE1085
	Operating instructions (German/Italian/Dutch/Spanish/Swedish/Portuguese)	PRF1022	.....	.....	.....	.....	.....	PRF1022
	Operating instructions (English)	.....	PRB1101	PRB1101	PRB1101	PRB1101	PRB1101	.....
	Operating instructions (Spanish)	.....	.....	PRC1012	.....	.....	.....	.....
	Power button (B)	PAC1252	PAC1252	PAC1252	PAC1252	PAC1252	PAC1252	PAC1289
	Knob	PAC1370	PAC1370	PAC1370	PAC1370	PAC1370	PAC1370	PAC1402
	Track button	PAC1378	PAC1378	PAC1378	PAC1378	PAC1378	PAC1378	PAC1379
	Repeat button	PAC1380	PAC1380	PAC1380	PAC1380	PAC1380	PAC1380	PAC1381
	ED button	PAC1382	PAC1382	PAC1382	PAC1382	PAC1382	PAC1382	PAC1383
	Play button assembly	PAD1049	PAD1049	PAD1049	PAD1049	PAD1049	PAD1049	PAD1050
	Tray plate	PNW1527	PNW1527	PNW1527	PNW1527	PNW1527	PNW1527	PNW1528
	Panel	PNW1529	PNW1529	PNW1529	PNW1529	PNW1529	PNW1529	PNW1530
	Bonnet	PNA1292	PNA1292	PNA1292	PNA1292	PNA1292	PNA1292	PNA1304
	CD packing case	PHG1340	PHG1340	PHG1340	PHG1342	PHG1340	PHG1340	PHG1341
	Connection cord with mini plug	.....	.....	.....	PDE-319	PDE-319	.....	.....

**MAIN BOARD ASSEMBLY**

The main board assembly (PWZ1593) is the same as the main board assembly (PWZ1686) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		PWZ1593/HEM type	PWZ1686/KU and KC types	
	C160	.....	CKCYF473Z50	
	C161	.....	CCCSL101J50	
	D17-D20	.....	1SS254	
	R117, R118	.....	RD 1/2 PM □□□J	
	JA3, JA4 Remote control jack	.....	RKN1004	



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