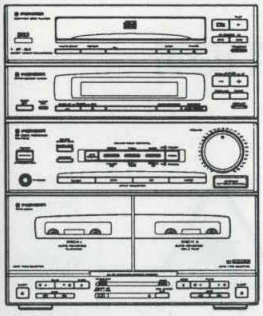
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
ARP2185

STEREO CD CASSETTE DECK RECEIVER

XR-P310

XR-P310 HAS FOLLOWING VERSIONS:

Type	Power Requirement	Remarks
HE	AC220V, 240V (switchable) *	
HEWZI	AC220V, 240V (switchable) *	

*Change the connection with the power transformer primary taps.

- This manual is applicable to the HE type.
- As to the other type, refer to additional service manuals.
- Ce manuel pour le service comprend les explications de réglage en français.
- Este manual de servicio trata del método ajuste escrito en español.

CONTENTS

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SO FEB. 1991 Printed in Japan

1. SAFETY INFORMATION

(FOR EUROPEAN MODEL ONLY)

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

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

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

LASER
Kuva 1
Lasersateilyn varoitusmerkki

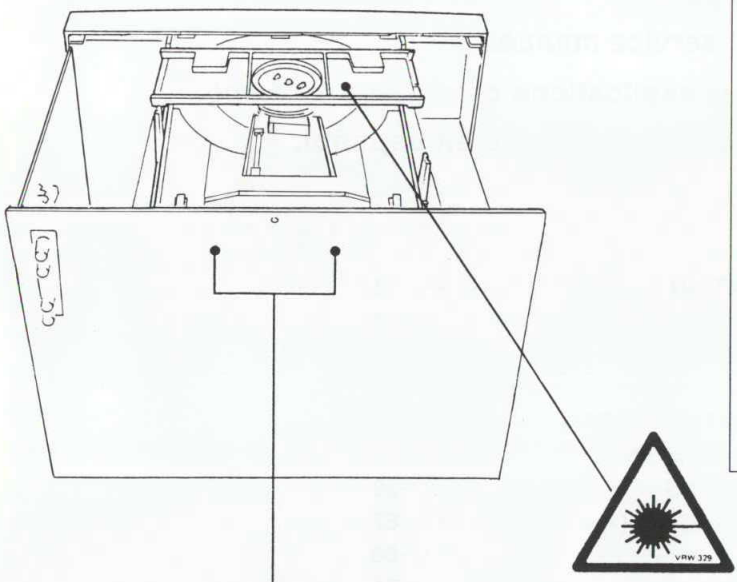
WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

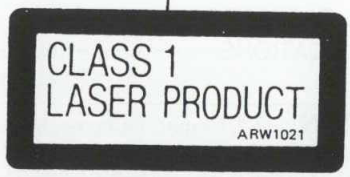
IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF HIGHER CLASS THAN 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

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

LASER
Picture 1
Warning sign for laser radiation

LABEL CHECK





Additional Laser Caution

1. Laser Interlock Mechanism
   The position of the switch (S601) for detecting loading completion is detected by the system microprocessor, and the design prevents laser diode oscillation when the switch (S601) is not $\overline{\text{CLMP}}$ terminal side (when the mechanism is not clamped and $\overline{\text{CLMP}}$ signal is high level).
   Thus, the interlock will no longer function if the switch (S601) is deliberately set to $\overline{\text{CLMP}}$ terminal side (if $\overline{\text{CLMP}}$ signal is low level).
   In the test mode *, the interlock mechanism will not function.
   Laser diode oscillation will continue if pin 2 and 3 of CXA1471S (IC2101) are connected to ground or pin 20 is connected to high level (ON) or the terminals of Q210 are shorted to each other (fault condition).

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

* Refer to page 81.

2. DISASSEMBLY

Note 1: Be sure to disconnect the power cord from a AC power line, before mounting or removing parts.

● When checking the board in XR–P310, remove the parts excepting CD units, cassette mechanism units and their peripheral parts as shown in Fig. 1.

1. CD player unit (Firstly, remove the disc tray.)
2. CD mounting bracket
3. Rear panel

● When checking the cassette mechanism unit and surroundings, remove the followings to take out the front panel assembly from the main unit. (See Fig. 1 to 3.)

1. CD player unit
2. CD mounting bracket
3. Remove the volume assembly by removing the volume control and nut Ⓐ. (See Fig. 2)
4. One fixing screw for head phone jack Ⓒ (See Fig. 3.)
5. One fixing screw for power assembly Ⓓ
6. Six fixing screws for the front panel assembly (See Fig. 2.)
7. Remove the front panel assembly by lifting the front panel assembly hook. (See Fig. 3.)

● CD player unit is the same as in XR–P500. Refer to the XR–P500 service manual (ARP1996).

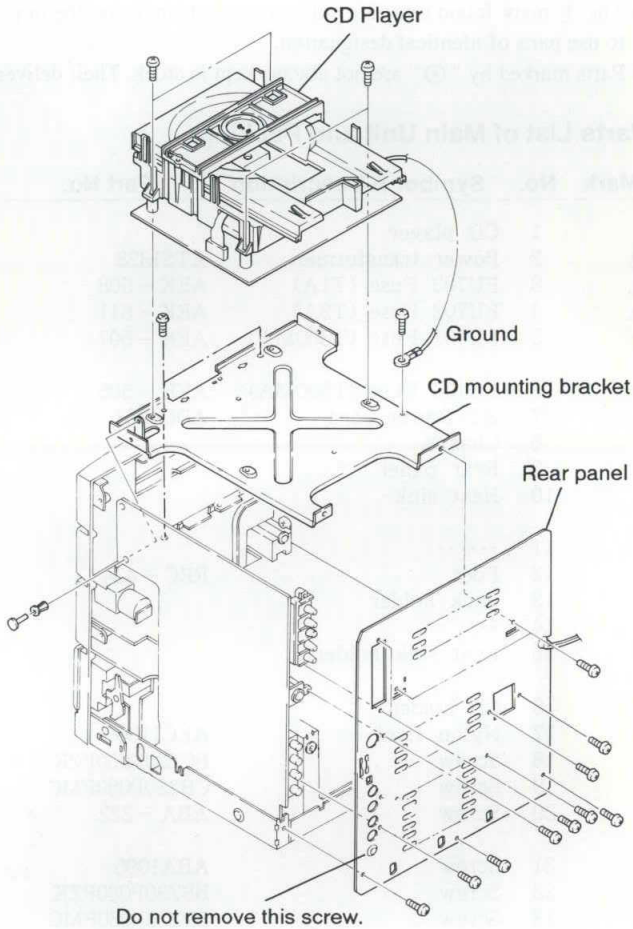


Fig. 1

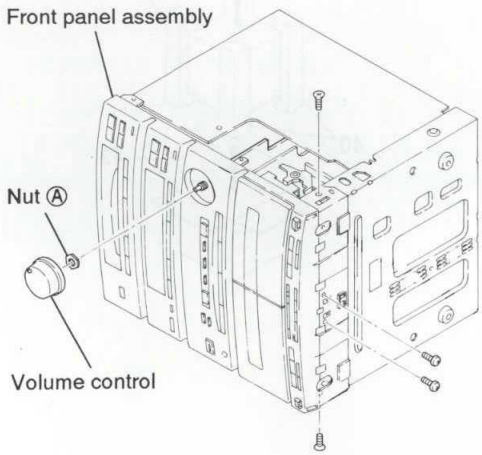


Fig. 2

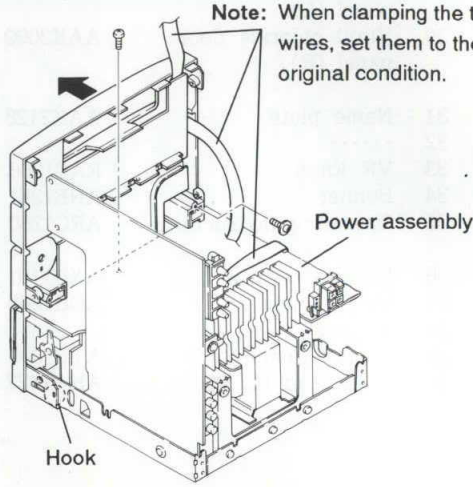


Fig. 3

3. EXPLODED VIEWS, PACKING AND PARTS LIST

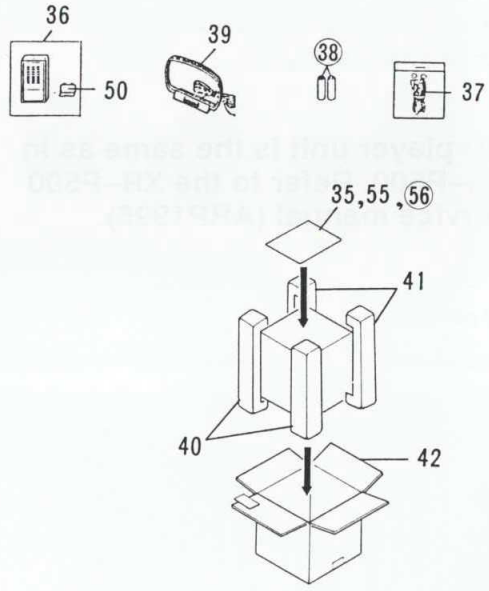
3.1 EXTERIOR

NOTES:

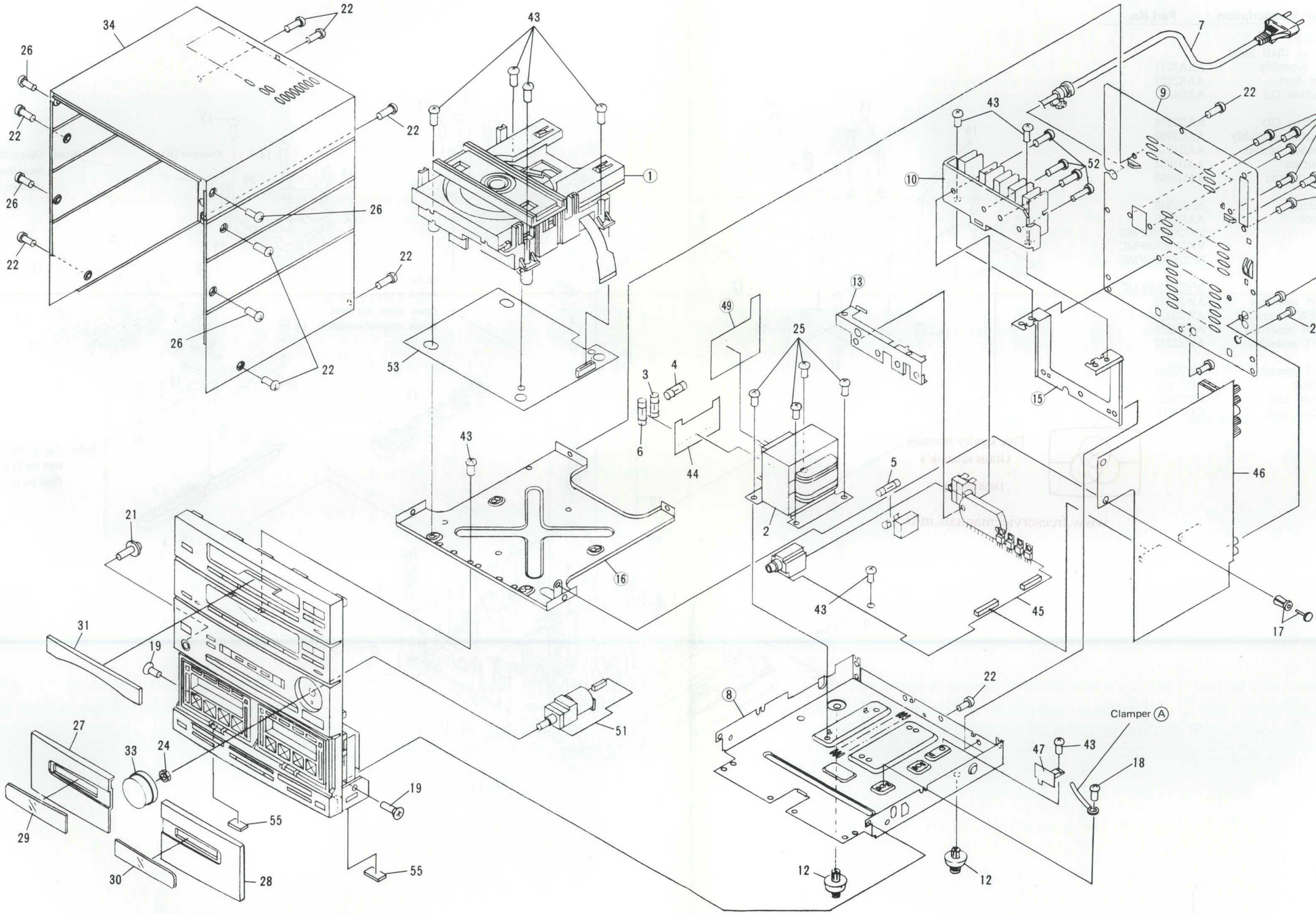
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be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

Parts List of Main Unit and Packing

Mark	No.	Symbol & Description	Part No.
	1	CD player	
⚠	2	Power transformer	ATS1328
⚠	3	FU703 Fuse (T1A)	AEK – 508
⚠	4	FU702 Fuse (T2A)	AEK – 511
⚠	5	FU701 Fuse (T800MA)	AEK – 507
⚠	6	FU704 Fuse (T500MA)	AEK – 505
⚠	7	AC Power cord	ADG1021
	8	Chassis	
	9	Rear panel	
	10	Heat sink	
	11	.....	
	12	Foot	REC – 434
	13	Pack holder	
	14	.....	
	15	Heat sink holder	
	16	CD holder	
	17	Nylon rivet	AEC1160
	18	Screw	BCZ30P060FZK
	19	Screw	CBZ30P080FMC
	20	Screw	ABA – 222
	21	Screw	ABA1095
	22	Screw	BBZ30P080FZK
	23	Screw	BPZ26P080FMC
	24	Nut	NK90FUC
	25	Screw	VBZ30P060FMC
	26	Screw	VPZ30P080FZK
	27	Cassette panel (L)	AAK2121
	28	Cassette panel (R)	AAK2122
	29	Vinyl chloride door panel (L)	AAK2098
	30	Vinyl chloride door panel (R)	AAK2099
	31	Name plate	AAK2128
	32	.....	
	33	VR knob	RAC1566
	34	Bonnet	ANE1281
	35	Operating instructions	ARC1260
	36	Remote control unit	AXD1191
	37	FM antenna	ADH1008
	38	Battery	
	39	Loop antenna	ATB1006
	40	Front pad (L, R)	AHA1427
	41	Rear pad (L, R)	AHA1428
	42	Packing case	AHD2004
	43	Screw	BBZ30P080FMC
⊙	44	TRANS assembly	AWZ3214
⊙	45	POWER assembly	AWZ3230
⊙	46	AF.TUNER assembly	AWZ3223
	47	REGULATOR assembly	
	48	.....	
	49	SPACER assembly	
	50	Case	AZA1302
⊙	51	VOLUME assembly	AZW3224
	52	Screw	VBZ30P160FMC
⊙	53	MOTHER BOARD assembly	PWM1375
	54	Operating instructions	ARE1183
	55	Rubber sheet	AEB1111
	56	Caution card	



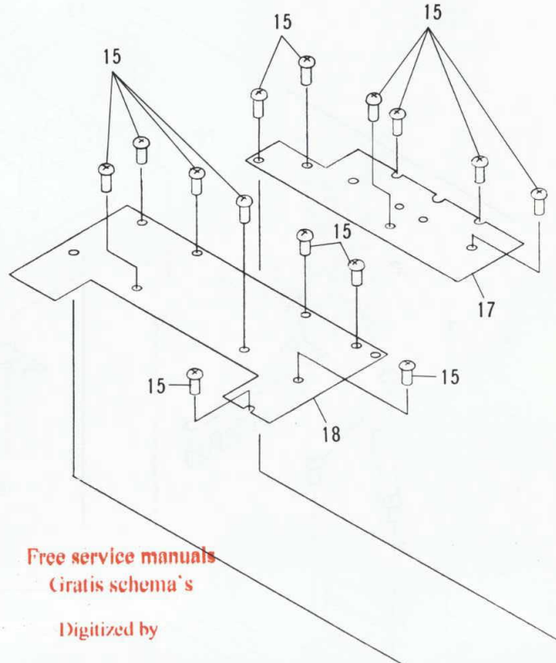
3.1 EXTERIOR

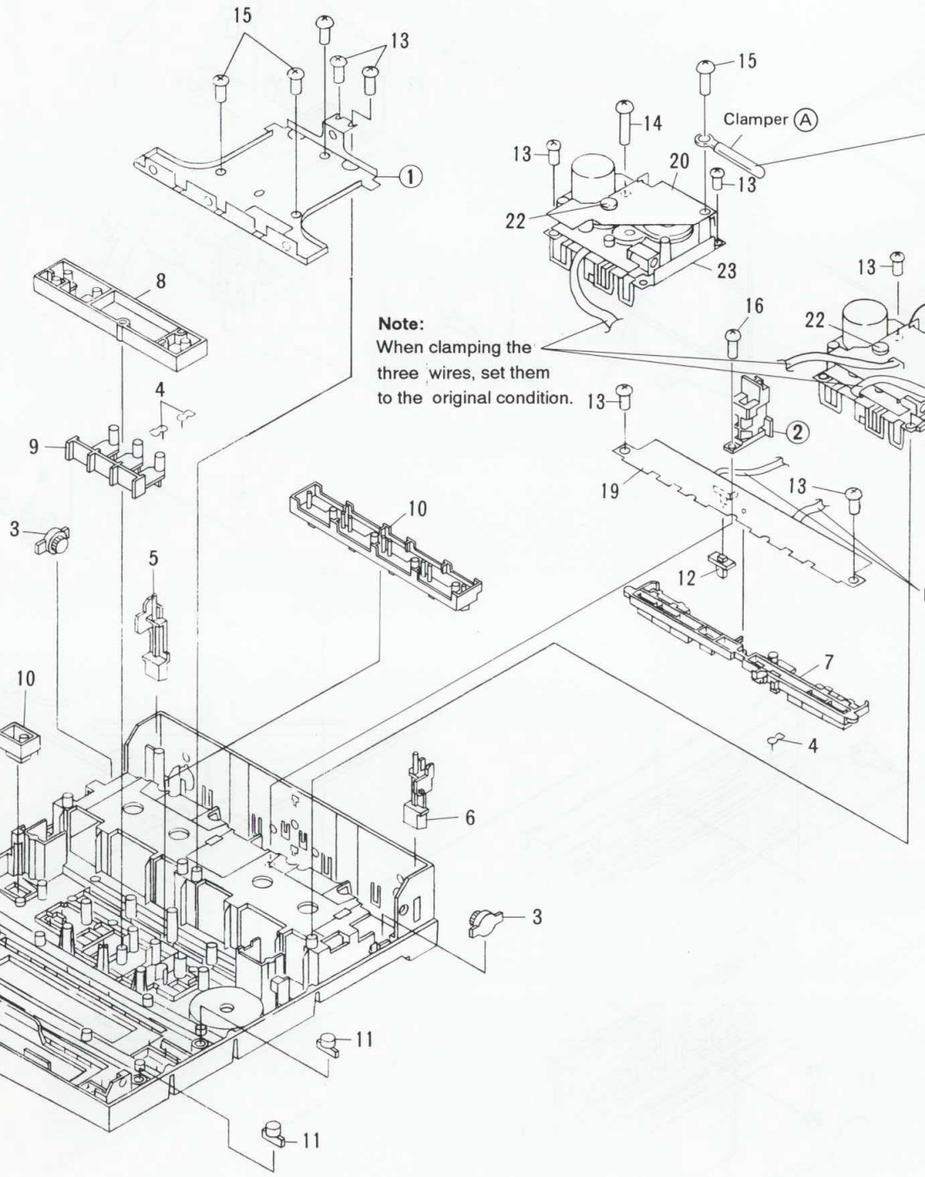


3.2 FRONT PANEL SECTION (REAR VIEW)

Parts List of Front Panel Section (Rear View)

Mark	No.	Symbol & Description	Part No.
	1	P.C.B holder	
	2	Mechanism shaft mold	
	3	Damper assembly	AXA1011
	4	Indicator lens	AAK2101
	5	Eject button (L)	AAD1977
	6	Eject button (R)	AAD1978
	7	Deck button assembly	AAD1992
	8	Direct mode button	AAD1974
	9	S.F.C. button	AAD1962
	10	Function button	AAD1963
	11	Gold button	AAD1943
	12	Slide knob	AAE1136
	13	Screw	VPZ30P080FMC
	14	Screw	VPZ30P200FMC
	15	Screw	BPZ26P080FMC
	16	Screw	BPZ30P100FMC
⊙	17	AMP SW assembly	AWZ3237
⊙	18	TX.CD SW assembly	AWZ3236
⊙	19	DECK SW assembly	AWZ3225
⊙	20	DECK – 1 assembly	AWZ3212
⊙	21	DECK – 2 assembly	AWZ3213
	22	Nylon rivet	AEC1160
	23	Mechanism unit	EXK2020
	24	Mechanism unit	EXK2010

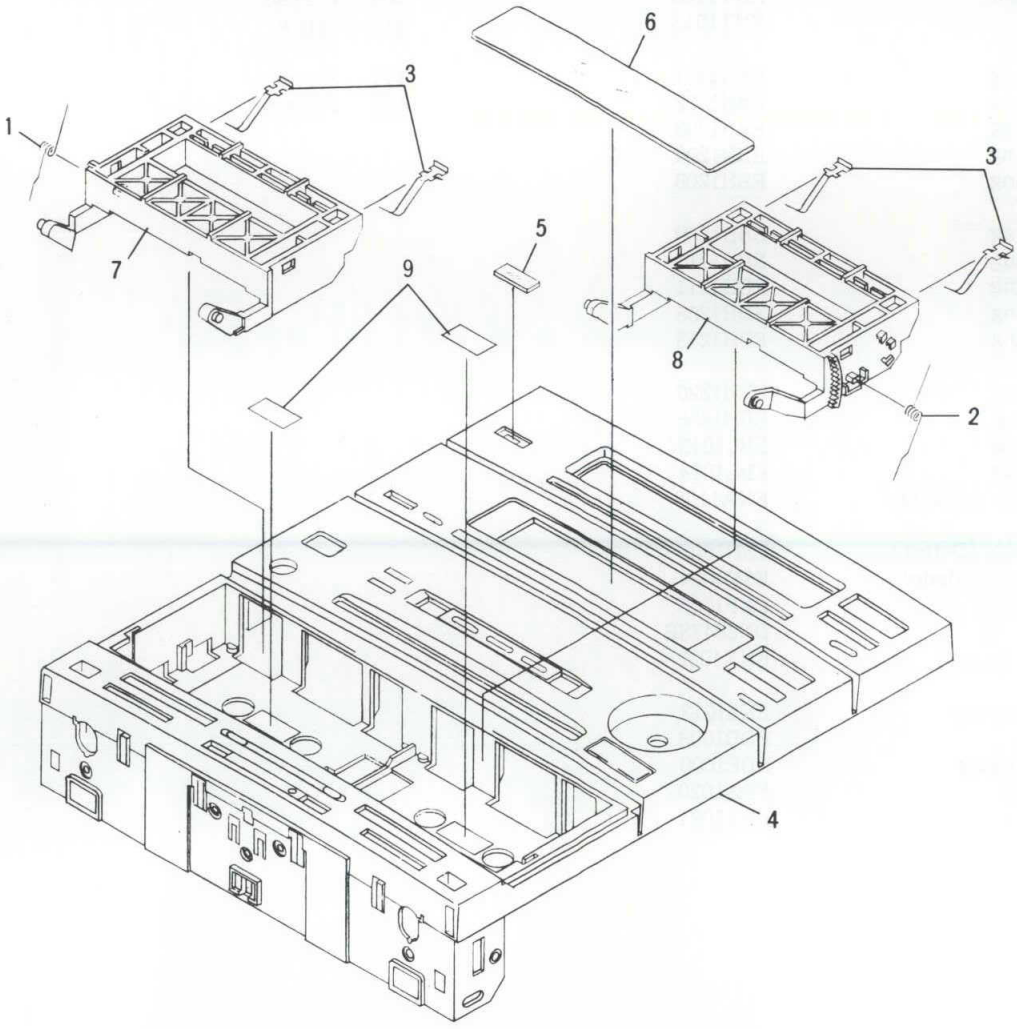




3.3 FRONT PANEL SECTION (FRONT VIEW)

Parts List of Front Panel Section (Front View)

Mark	No.	Symbol & Description	Part No.
	1	Door spring (L)	ABH1070
	2	Door spring (R)	ABH1071
	3	Keep plate	ABK1015
	4	Front panel assembly	AMB1770
	5	Remote control filter	AAK2010
	6	Ornamental plate	AAK2119
	7	Half pocket (L)	AAN1254
	8	Half pocket (R)	AAN1255
	9	Sheet	AAX1301

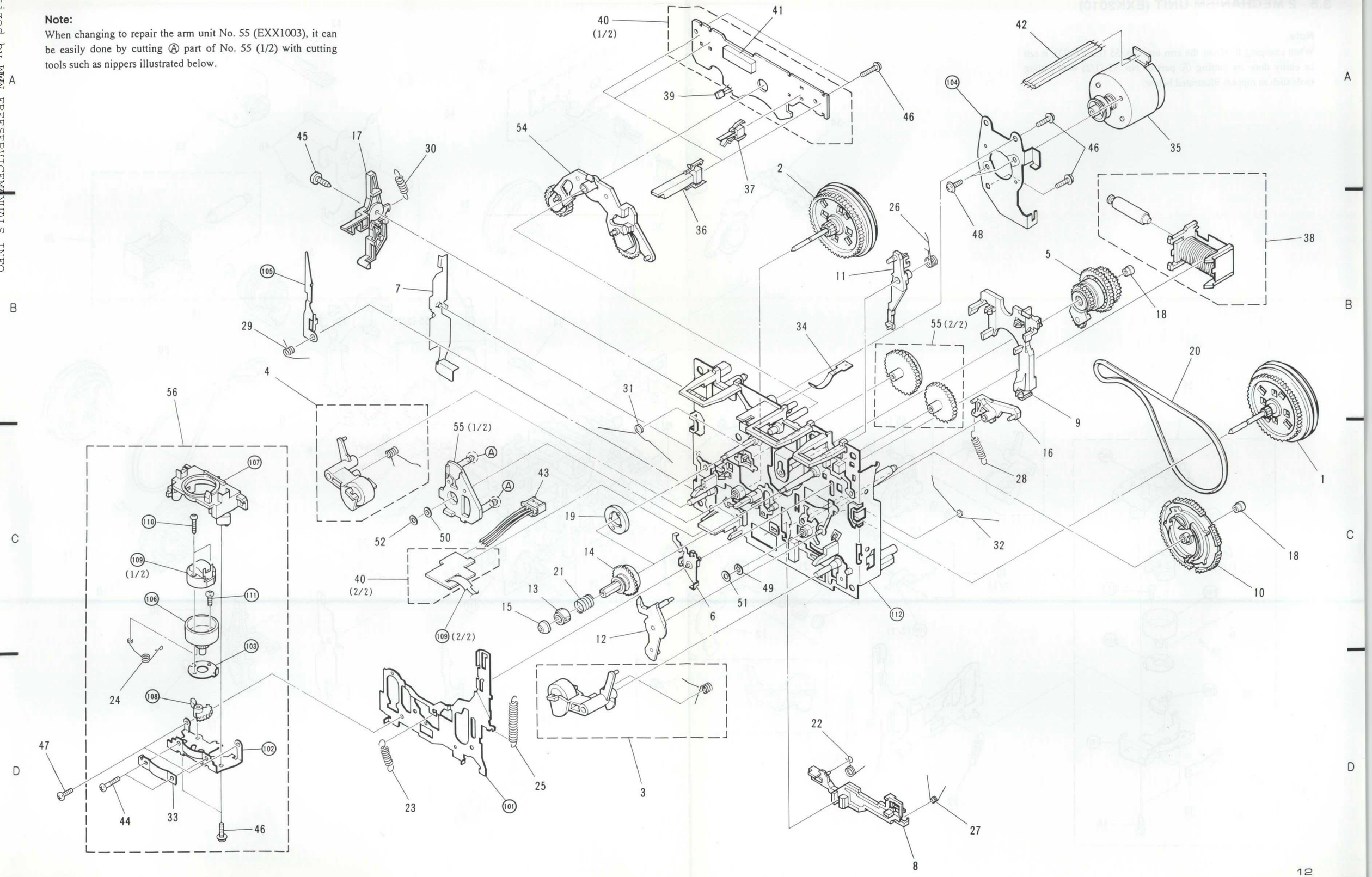


Parts List of 1 Mechanism Unit (EXK2020)

Mark	No.	Symbol & Description	Part No.
	1	F/W assembly (FWD)	EXA1102
	2	F/W assembly (RVS)	EXA1103
	3	Pinch roller assembly (FWD)	EXA1104
	4	Pinch roller assembly (RVS)	EXA1105
	5	Limitter assembly	EXA1106
	6	Lever assembly	EXA1107
	7	Arm	AZN2063
	8	NR lever	ENV1155
	9	Brake	ENV1157
	10	Cam gear	AAK1800
	11	Rock arm	ENV1159
	12	NR arm	ENV1163
	13	Reel	AAK2067
	14	Reel	AAK2068
	15	Reel claw	AAK2069
	16	Arm	ENV1181
	17	Arm	AZN2069
	18	Bush	ENV1184
	19	Magnet	ENV1185
	20	Belt	ENT1015
	21	Spring	EBH1201
	22	Spring	EBH1202
	23	Spring	EBH1203
	24	Spring	EBH1204
	25	Spring	EBH1208
	26	Spring	EBH1209
	27	Spring	EBH1210
	28	Spring	EBH1211
	29	Spring	EBH1255
	30	Spring	EBH1213
	31	Spring	EBH1220
	32	Spring	EBH1256
	33	Spring	EBL1013
	34	Spring	EBL1014
	35	Motor assembly	EXA1108
	36	Switch (Detect)	ESN1003
	37	Switch (Mode)	ESN1004
	38	Solenoid	EXP1005
	39	Hole IC	DN6847SE
	40	P.C. Board	ENX1002
	41	Connector	EKS1013
	42	Wire	EDD1003
	43	Connector	EDE1009
	44	Screw	EBA1020
	45	Screw	EBA1021
	46	Screw (M2 × 8)	ATZ20P080FMC
	47	Screw	BSZ20P050FMC
	48	Screw	PMS26P025FCU
	49	Washer	EBF1008
	50	Washer	EBF1009
	51	Washer	EBF1010
	52	Washer	EBF1011
	53	.....	
	54	Arm assembly	EXX1002
	55	Arm assembly	EXX1003
	56	P head assembly	EXX1005
	101	Head base	
	102	Bracket	
	103	Plate	
	104	Bracket	
	105	Arm	
	106	Holder	
	107	Holder	
	108	Gear	
	109	P head	
	110	Screw	
	111	Screw	
	112	Chassis	

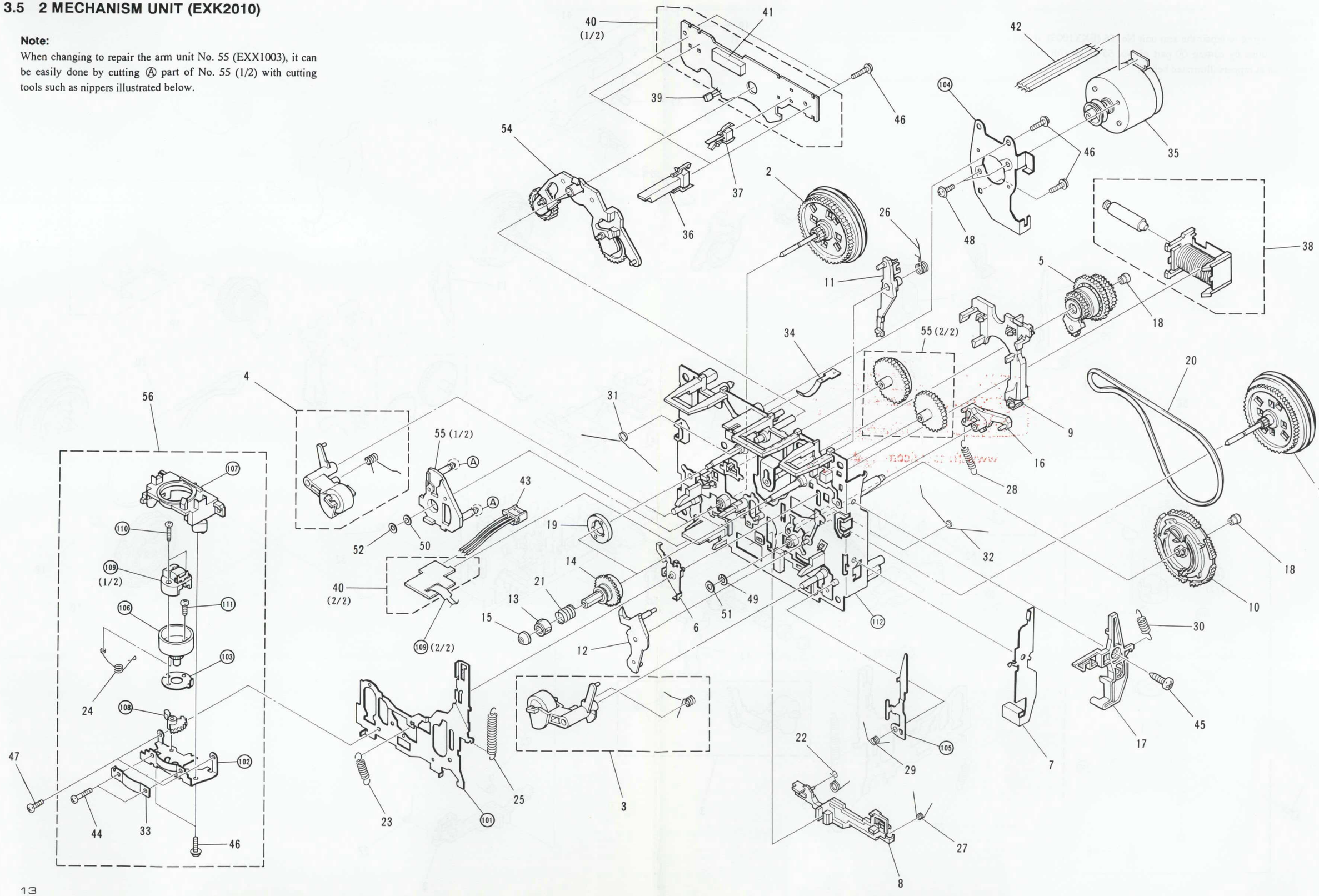
3.4 1 MECHANISM UNIT (EXK2020)

Note:
When changing to repair the arm unit No. 55 (EXX1003), it can be easily done by cutting Ⓐ part of No. 55 (1/2) with cutting tools such as nippers illustrated below.



3.5 2 MECHANISM UNIT (EXK2010)

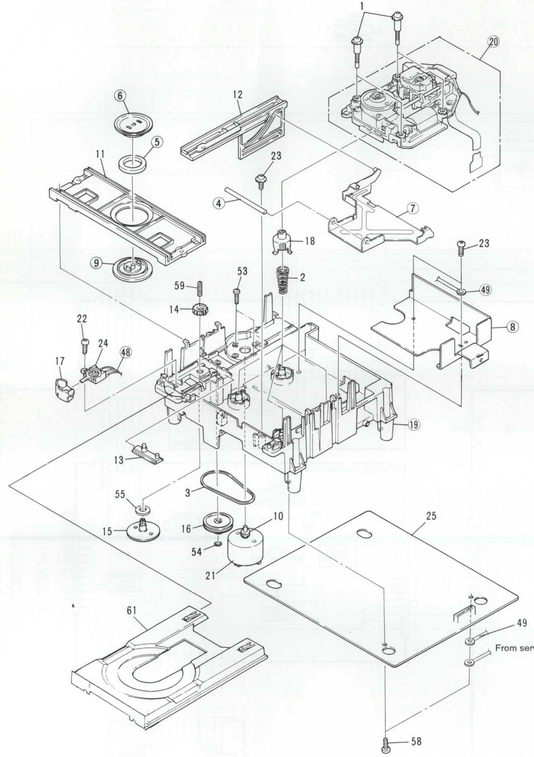
Note:
When changing to repair the arm unit No. 55 (EXX1003), it can be easily done by cutting Ⓐ part of No. 55 (1/2) with cutting tools such as nippers illustrated below.

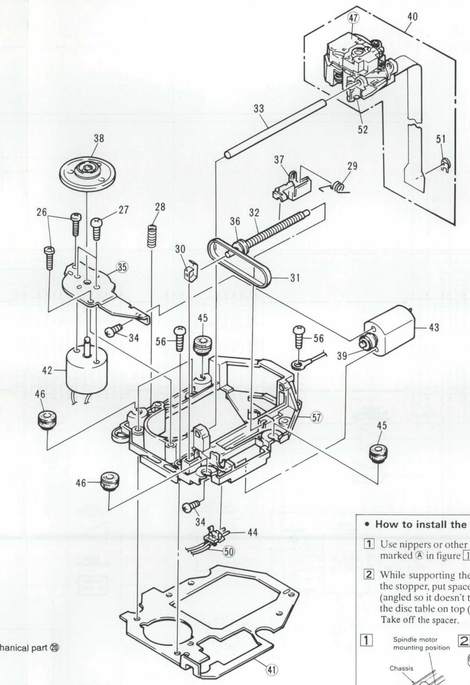


3.6 MECHANISM SECTION

Parts List of 2 Mechanism Unit (EXK2010)

Mark	No.	Symbol & Description	Part No.
	1	F／W assembly (FWD)	EXA1102
	2	F／W assembly (RVS)	EXA1103
	3	Pinch roller assembly (FWD)	EXA1104
	4	Pinch roller assembly (RVS)	EXA1105
	5	Limitter assembly	EXA1106
	6	Lever assembly	EXA1107
	7	Arm	AZN2064
	8	NR lever	ENV1155
	9	Brake	ENV1157
	10	Cam gear	AAK1800
	11	Rock arm	ENV1159
	12	NR arm	ENV1163
	13	Reel	AAK2067
	14	Reel	AAK2068
	15	Reel claw	AAK2069
	16	Arm	ENV1181
	17	Arm	AZN2070
	18	Bush	ENV1184
	19	Magnet	ENV1185
	20	Belt	ENT1015
	21	Spring	EBH1201
	22	Spring	EBH1202
	23	Spring	EBH1203
	24	Spring	EBH1204
	25	Spring	EBH1208
	26	Spring	EBH1209
	27	Spring	EBH1210
	28	Spring	EBH1211
	29	Spring	EBH1254
	30	Spring	EBH1213
	31	Spring	EBH1220
	32	Spring	EBH1256
	33	Spring	EBL1013
	34	Spring	EBL1014
	35	Motor assembly	EXA1108
	36	Switch (Detect)	ESN1003
	37	Switch (Mode)	ESN1004
	38	Solenoid	EXP1005
	39	Hole IC	DN6847SE
	40	P.C. Board	ENX1002
	41	Connector	EKS1012
	42	Wire	EDD1003
	43	Connector	EDE1008
	44	Screw	EBA1020
	45	Screw	EBA1021
	46	Screw (M2 × 8)	ATZ20P080FMC
	47	Screw	BSZ20P050FMC
	48	Screw	PMS26P025FCU
	49	Washer	EBF1008
	50	Washer	EBF1009
	51	Washer	EBF1010
	52	Washer	EBF1011
	53	·····	
	54	Arm assembly	EXX1002
	55	Arm assembly	EXX1003
	56	R／P head assembly	EXX1004
	101	Head base	
	102	Bracket	
	103	Plate	
	104	Bracket	
	105	Arm	
	106	Holder	
	107	Holder	
	108	Gear	
	109	R／P head	
	110	Screw	
	111	Screw	
	112	Chassis	

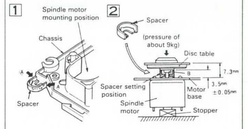




• How to install the disc table

1 Use nippers or other tool to cut the two sections marked Ⓐ in figure 1. Then remove the spacer.

2 While supporting the spindle motor shaft with the stopper, put spacer on top of the motor base (angled so it doesn't touch section Ⓑ), and stick the disc table on top (takes about 9kg pressure). Take off the spacer.



Parts List of Mechanism Section

Mark	No.	Symbol & Description	Part No.
	1	Float screw (FE)	PBA1042
	2	Coil spring	PBH1085
	3	Rubber belt	PEB1127
	4	Shaft (FE)	
	5	Magnet	
	6	Yoke (FE)	
	7	Swing lever (FE)	
	8	Shield plate (FE)	
	9	Clamper S (ABS)	
	10	Motor pulley (POM)	PNW1634
	11	Clamper base (ABS)	PNW1673
	12	Rack (ABS)	PNW1674
	13	Sync plate (POM)	PNW1675
	14	Gear A (POM)	PNW1676
	15	Gear B (POM)	PNW1677
	16	Gear pulley (POM)	PNW1678
	17	Sensor head (ABS)	PNW1679
	18	Slide bush (POM)	PNW1680
	19	Loading base (ABS)	
	20	Servo mechanism assembly	
	21	DC motor／0.75W	PXM1010
	22	Screw	BPZ26P080FMC
	23	Screw	IPZ30P080FMC
	24	Lever switch	DSK1003
	25	Main board assembly	PWZ2043
	26	Screw	BPZ20P080FZK
	27	Screw	JFZ20P025FMC
	28	Ground spring	PBH1009
	29	Drive spring (STEEL)	PBH1084
	30	Plate spring	PBK1057
	31	Belt	PEB1072
	32	Drive screw	PLA1003
	33	Guide bar (STEEL)	PLA1071
	34	Screw	PMZ20P030FMC
	35	Motor base (FE)	
	36	Pulley	PNW1066
	37	Half nut (PLASTIC)	PNW1605
	38	Disk table (PC)	PNW1608
	39	Motor pulley (POM)	PNW1634
	40	Pick－up assembly	PEA1030
	41	Mechanism base	
	42	Spindle DC motor assembly	PEA1028
	43	DC motor／1.7W	PXM1013
	44	Push switch	DSG1014
	45	Floating rubber	PEB1014
	46	Floating rubber	PEB1132
	47	Actuator cover	
	48	Connector assembly (5P)	
	49	Ground lead unit	
	50	Connector assembly	
	51	Semi－fixed VR	PCP1008
	52	Chip capacitor	CKSYF105Z16
	53	Screw	PMZ26P040FMC
	54	Washer	WT26D047D025
	55	Washer	WA62D095D013
	56	Screw	PBZ30P080FMC
	57	Mechanism chassis	
	58	Screw	PPZ30P100FMC
	59	Screw	ZMK20H040FBT
	60	Screw	PPZ30P100FMC
	61	Tray	PNW1682

4. OVERALL SCHEMATIC DIAGRAM

5. SCHEMATIC DIAGRAMS AND P.C. BOARD PATTERNS

5.1 POWER (AWZ2230), TRANS (AWZ3214), LEGULATOR ASSEMBLY

POWER ASSEMBLY (AWZ 3230)

This P.C.B. connection diagram is viewed from the foil side.

5. SCHEMATIC DIAGRAMS AND P.C. BOARD PATTERNS

5.1 POWER (AWZ3230), TRANS (AWZ3214), LEGULATOR ASSEMBLY

POWER ASSEMBLY (AWZ 3230)

NOTE

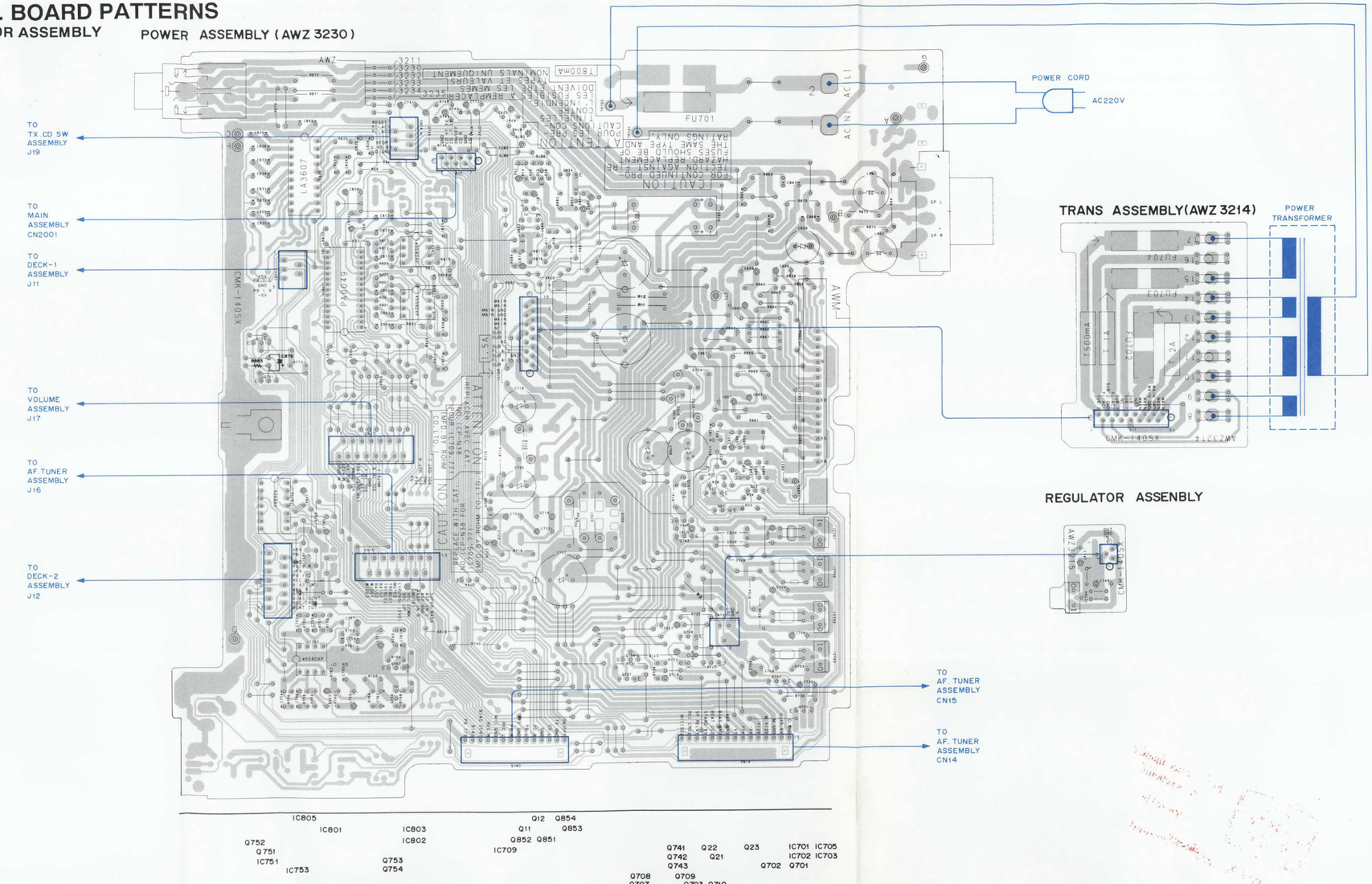
1. This P.C.B connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the following Table.

P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
Q504 E C B	or E C B	Transistor
Q215	or	Radiator type transistor
D203	D203	Diode
R237	R237	Resistor
C513	+	Capacitor (Polarity)
C518		Capacitor (Non-polarity)

Others

P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi fixed resistor

3. The capacitor terminal marked with ⓒ (double circles) shows negative terminal.
4. The diode terminal marked with ⓒ (double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.



POWER ASS'Y
AWZ3230

1. RESISTORS :
Indicated in Ω, 1/8W, ±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 no input signal.
Value in ( ) is DC voltage at rated power.

4. OTHERS
➡ : Signal route.
⊘ ; Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

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

(➡ P54) from DECK 1 J11
+5V
PB 1 L
GND
PB 1 R
-5V

(➡ P54) from DECK 2 J12
+5V
PB 2 L
GND
PB 2 R
-5V
PB 1/2
REC L
BIAS GND
REC R
BIAS
BIAS CONT
REC CrO2
BEAT CUT

(➡ P33) from AF TUNER J16
WIDE 2
WIDE 1
BASS 2
BASS 1
TREBLE 2
TREBLE 1
MUTE 2
L+R/VOL LEVEL
VOL UP
VOL DOWN
MUTE 1
ASP IN R
GND
ASP IN L
NC

(➡ P41) from VOLUME J17
VOL OUT L
GND
VOL OUT R
+5V
-5V
MUTE 1
VOL IN R
GND
VOL IN L
L+R IN
L+R OUT/LEVEL
VOL DOWN
VOL UP
M. +12V
M. GND

(➡ P31) from AF TUNER J14
NC
REC CrO2
SP RELAY
STANDBY
BEAT CUT
N.C
CHASSIS GND
NC
+5V
-5V
+12V
M. +12V
M. GND
u. +5. 6V
D. GND

(➡ P31) from AF TUNER J15
PB 1/2
BIAS
BIAS CONT
REC R
NC
REC L
PB R
GND
PB L
CD R
GND
CD L
TUNER GND
CD ON/OFF

(➡ P60) to CD CN2001
CD L
GND
CD R
ON/OFF
CD -7. 5V
CD +7. 5V
GND

(➡ P52) from CD TUNER SW J19
D. GND
u. +5. 6V
VFDP
FL AC2
FL AC1
RESET

IC751 TAPE PB1/PB2 SWITCHING

Q753,754 REC EQ SWITCHING

IC753(1/2)(2/2) REC EQ AMP
REC AMP

IC801,802,803(1/2),804,805 SOUND FIELD CONTROL CIRCUIT
SFC

B.P.F(70Hz)

B.P.F (7KHz)

IC803 BUFFER

POWER AMP

L IN

R IN

MUTING

IC851 STK4142-20P

L OUT

R OUT

REF GND

Q853 RELAY DRIVE

Q851,852 DC DETECTOR

Q854 POWER OFF MUTE

Q741-743 SUB REGULATOR

Q701,702 +12V ON/OFF

IC704 +12V REGULATOR

REGULATOR ASS'Y

IC703 REGULATOR

Q707,708 +4.9V ON/OFF

IC701 REGULATOR

IC705 +5.6V REGULATOR

Q744 CD POWER ON/OFF CONTROL

Q703 INVERTER

Q706 -29.4V REGULATOR

Q709,710 -5.7V ON/OFF

IC702 REGULATOR

DC POWER SUPPLY

Q11,12 OVER LOAD DET

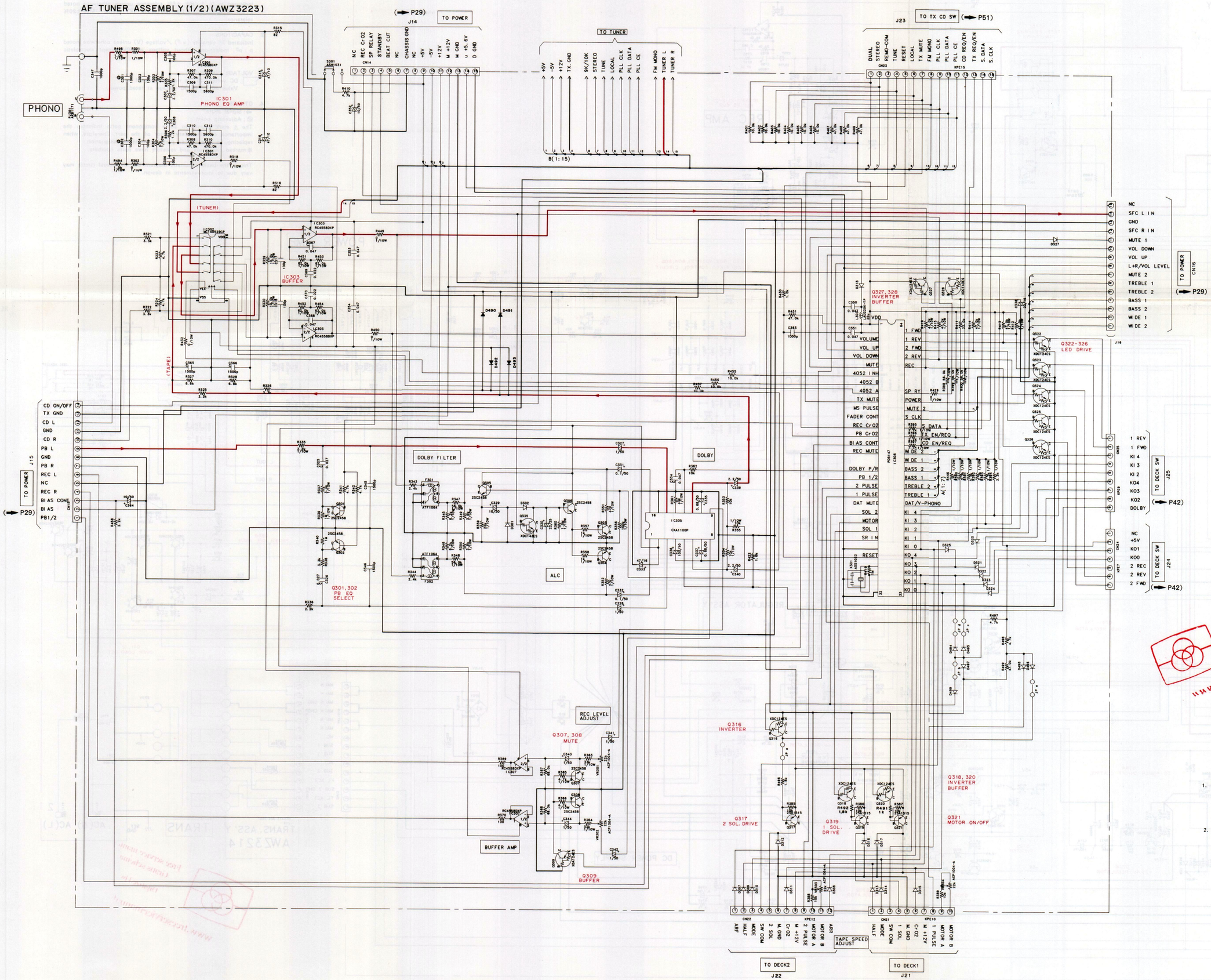
MAIN
MAIN
MAIN GND
MAIN GND
MAIN
MAIN
NC
SUB 1
SUB 1
NC
SUB 2
FL AC2
SUB 2 GND
FL AC1
SUB 2

TRANS. ASS'Y
AWZ3214

TRANS

220V
240V
AC(N) AC(L)

5.2 AF TUNER ASSEMBLY (1/2) (AWZ3223)



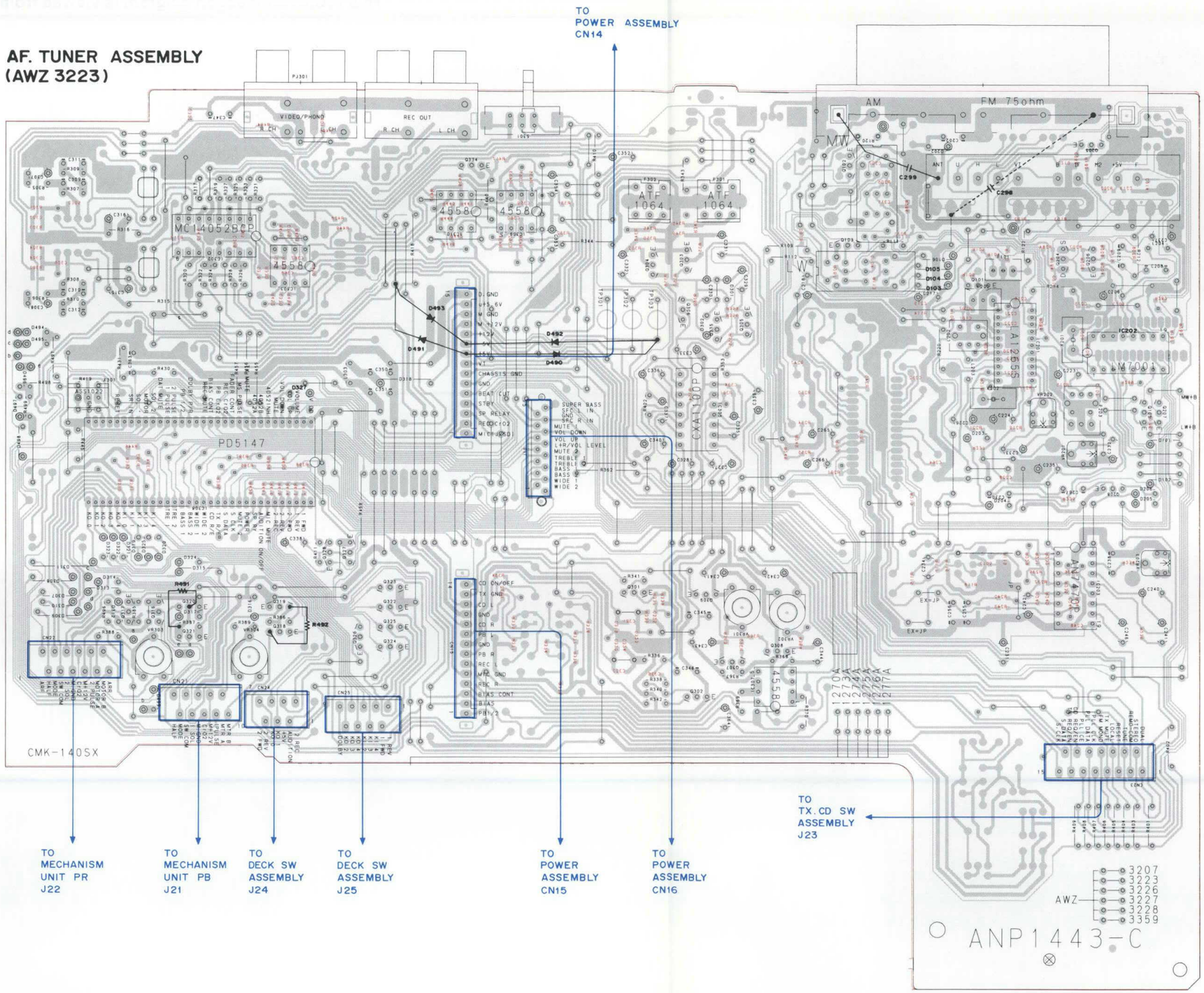
1. RESISTOR

   INDICATED IN .1/8W, 5% TOLERANCE
   UNLESS OTHERWISE NOTED K: K, M: M, 1/10W.

2. CAPACITOR

   INDICATED IN CAPACITY(F)/VOLTAGE(V)
   UNLESS OTHERWISE NOTED p: pF
   INDICATION WITHOUT VOLTAGE IS 50V
   EXCEPT ELECTROLYTIC CAPACITOR.

AF. TUNER ASSEMBLY (AWZ 3223)



VR303 VR304 VR301 VR302 VR202 VR201 VR203

IC302 IC303 Q334 IC310 IC309 Q102 Q103 Q205 Q101 Q204 Q206 IC201 IC202 Q105 Q106 Q208

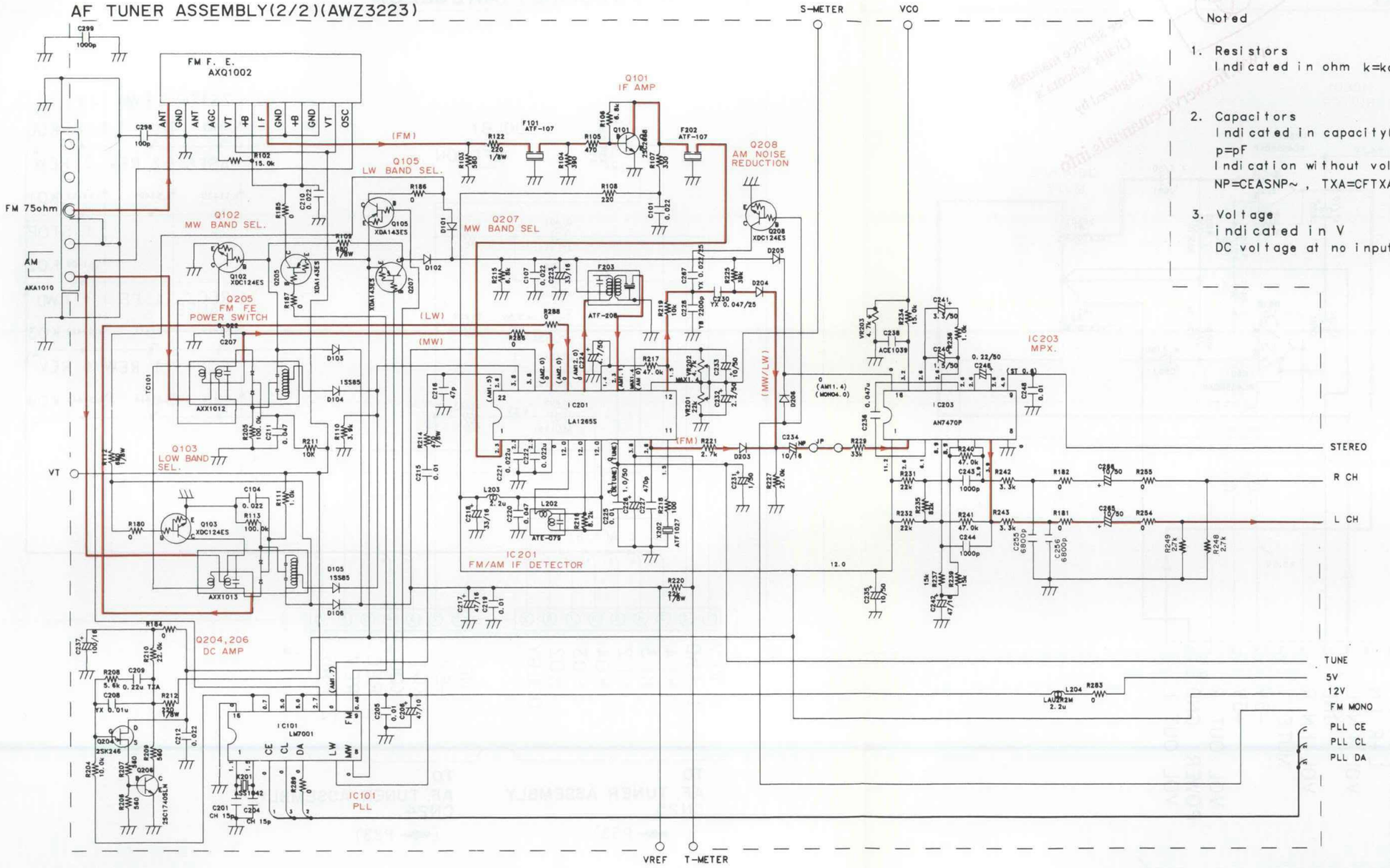
IC308 Q304 Q303 Q306 Q335 Q305 IC305 Q309 Q301 Q302 Q307 Q308 IC307

Q317 Q316 Q320 Q321 Q319 Q318 Q328 Q327 Q323 Q322 Q325 Q324

This P.C.B. connection diagram is viewed from the foil side.

AF. TUNER ASSEMBLY (AWZ 3223)

5.3 AF TUNER ASSEMBLY (2/2) (AWZ3223)



Noted

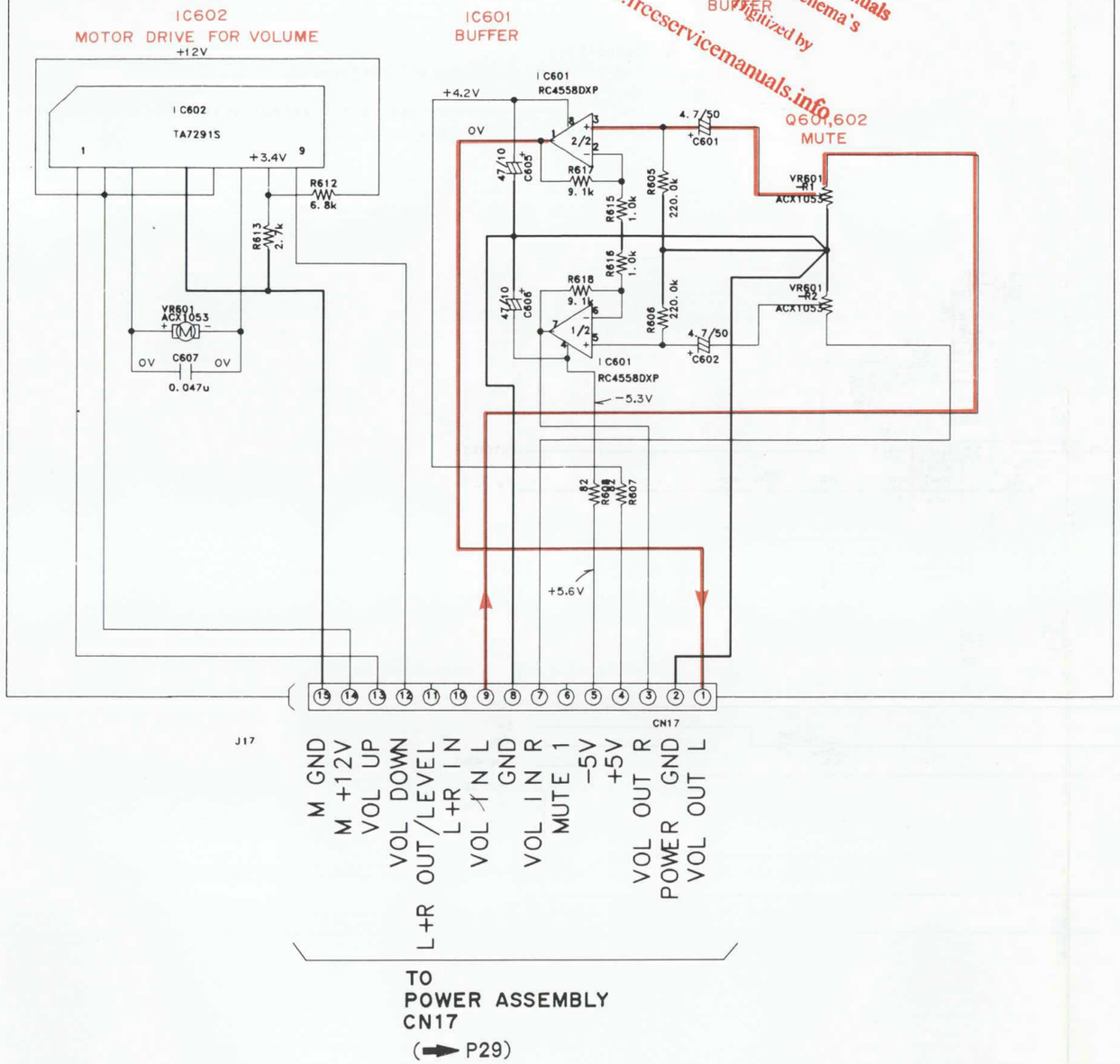
1. Resistors
   Indicated in ohm k=kohm, M=Mohm

2. Capacitors
   Indicated in capacity(uF)/voltage(V)
   p=pF
   Indication without voltage is 50v except electrolytics capacitor.
   NP=CEASNP~ , TXA=CFTXA~

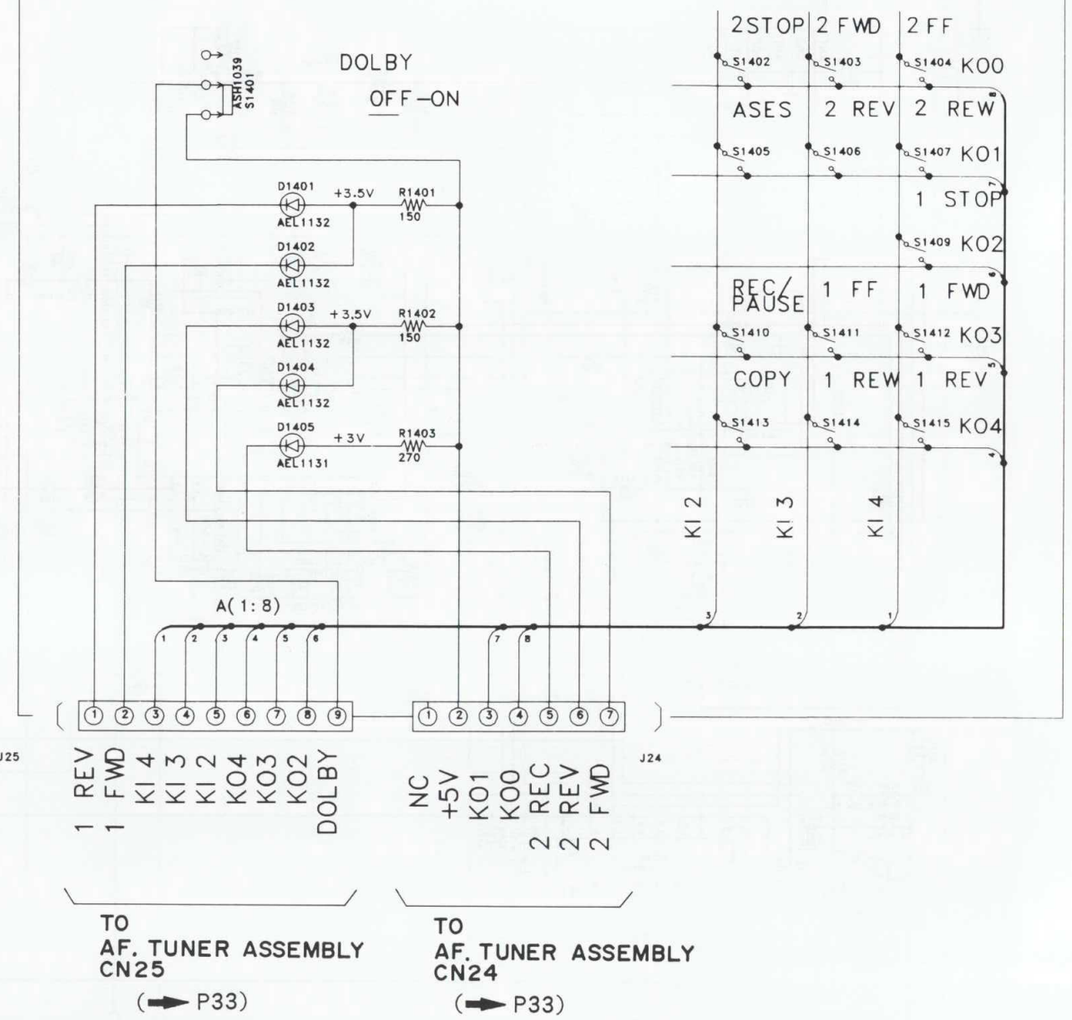
3. Voltage
   indicated in V
   DC voltage at no input signal of FM

5.4 VOLUME (AWZ3224), DECK SW (AWZ3225) ASSEMBLY

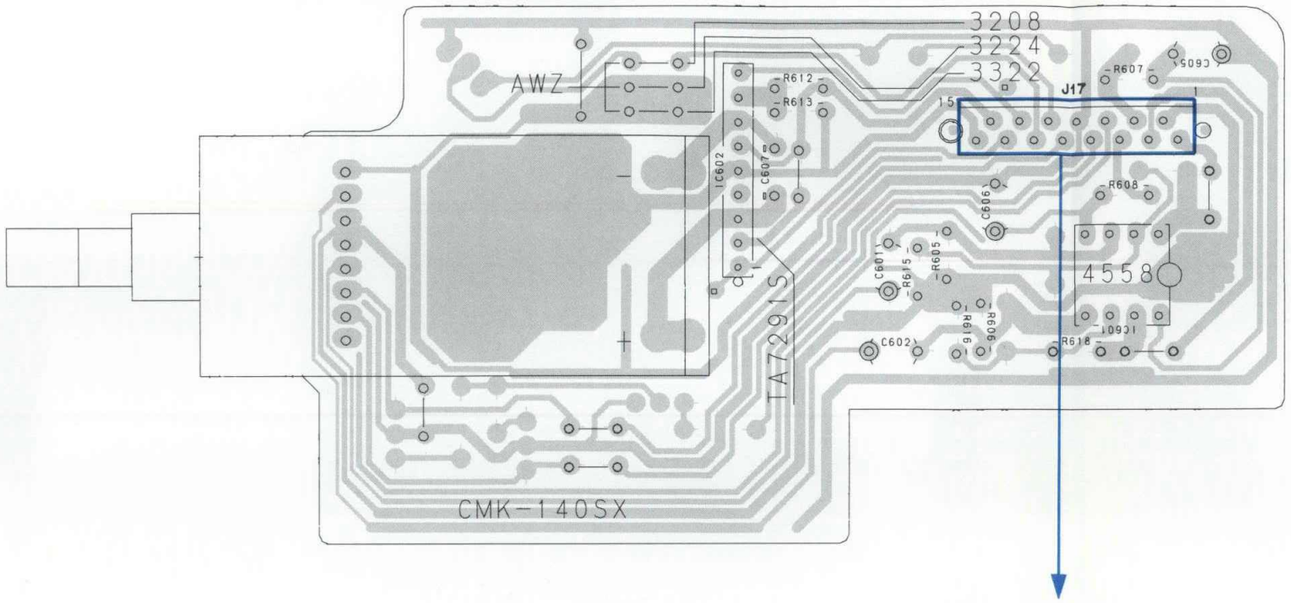
VOLUME ASSEMBLY (AWZ3224)



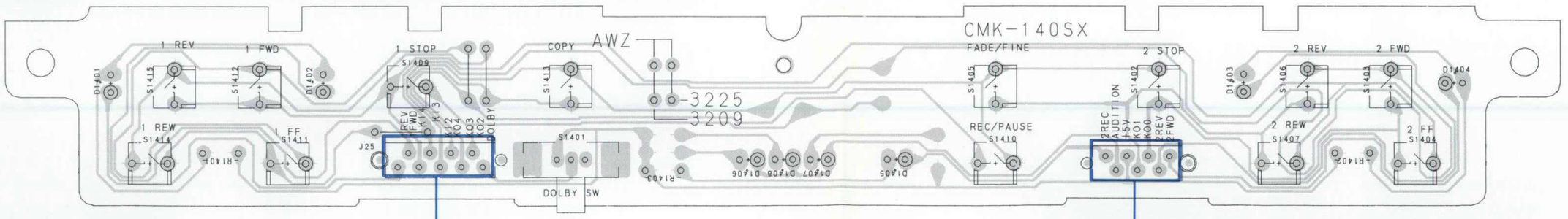
DECK SW ASSEMBLY (AWZ3225)



VOLUME ASSEMBLY (AWZ3224)

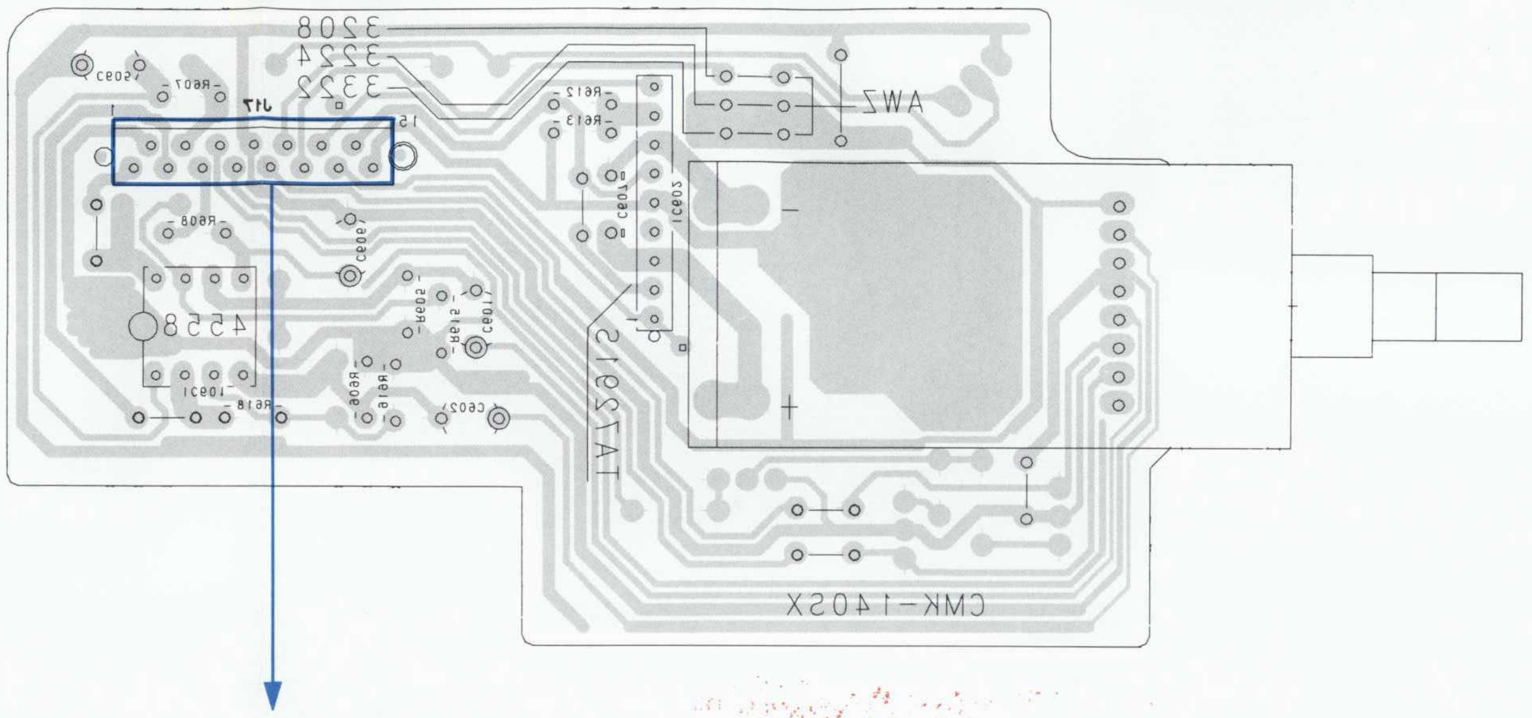


DECK SW ASSEMBLY(AWZ3225)



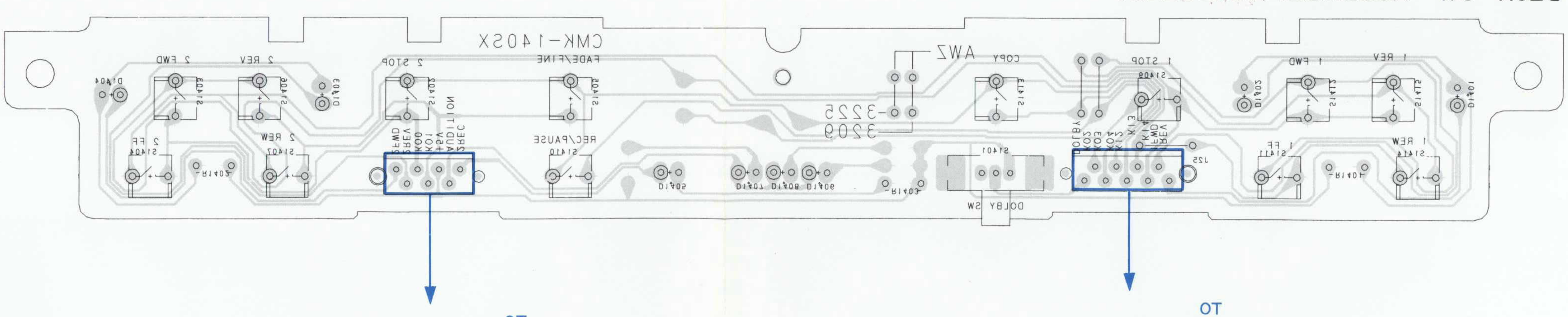
This P.C.B. connection diagram is viewed from the foil side.

VOLUME ASSEMBLY (AWZ3224)



TO
POWER ASSEMBLY
CN17

DECK SW ASSEMBLY (AWZ3225)



TO
AF. TUNER ASSEMBLY
CN27

TO
AF. TUNER ASSEMBLY
CN25

This P.C.B. connection diagram is viewed from the foil side.

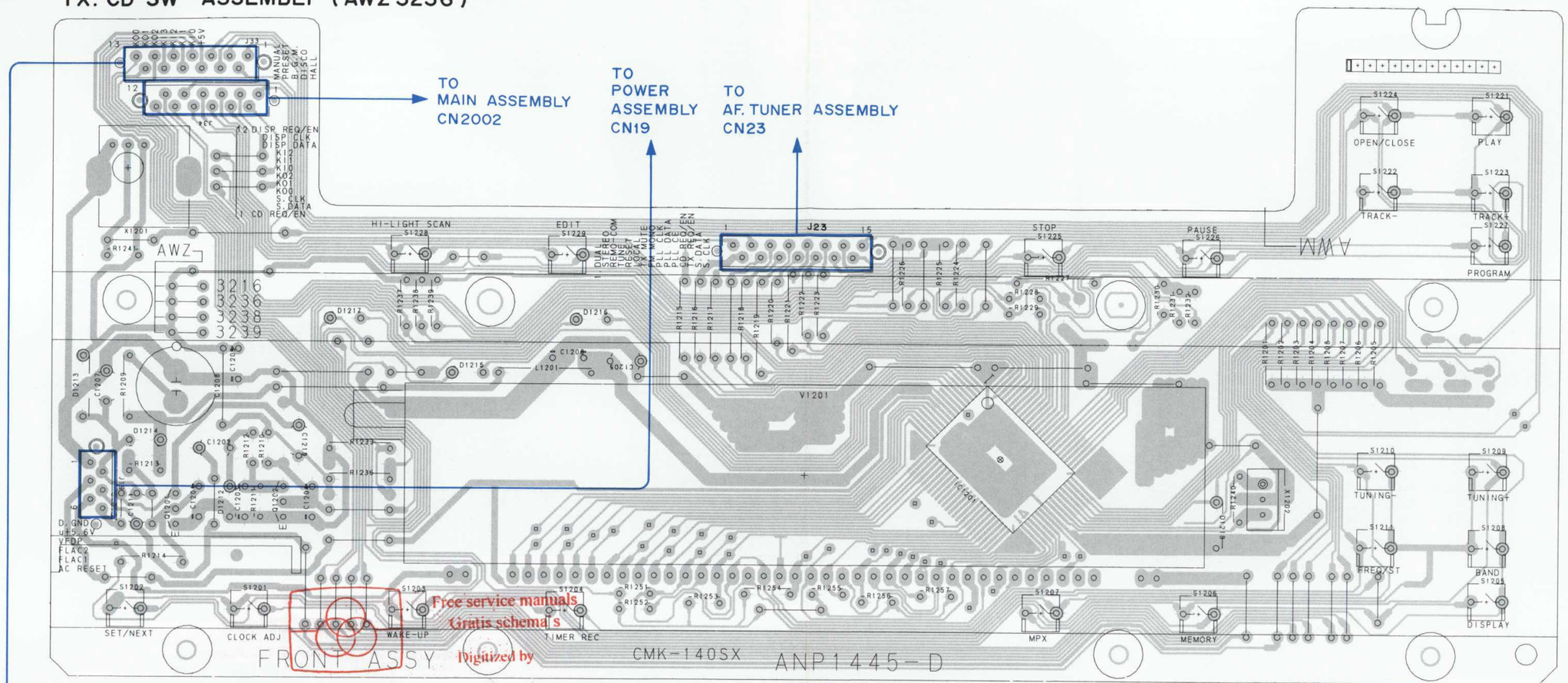
5.5 TX.CD SW (AWZ2236), AMP SW (AWZ2237) ASSEMBLY

TX. CD SW ASSEMBLY (AWZ 2236)

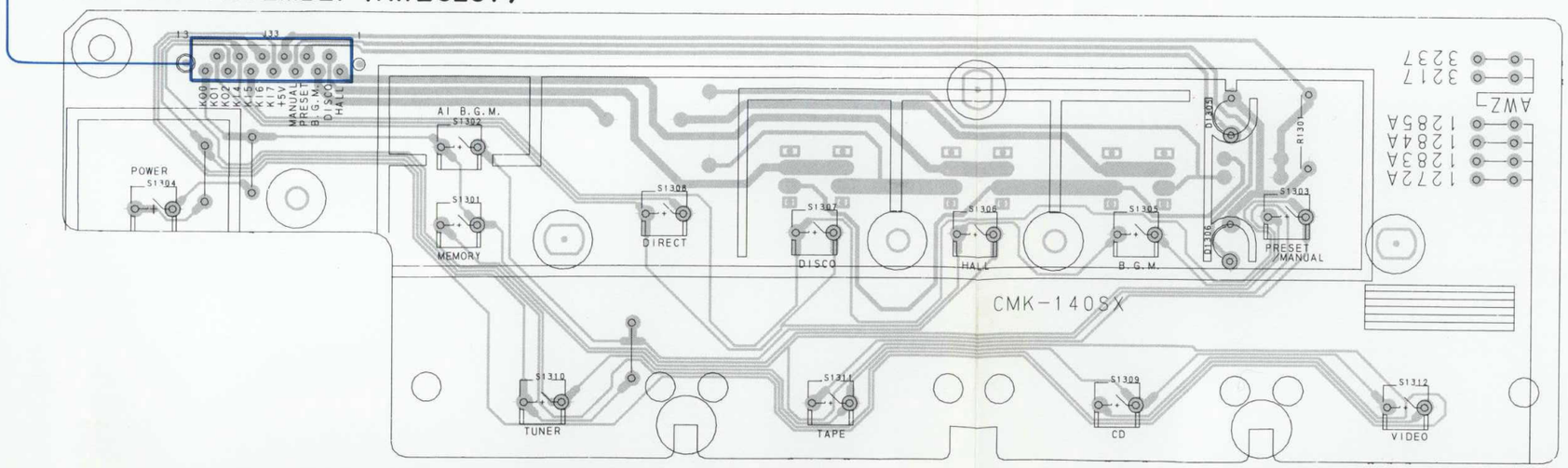
AMP SW ASSEMBLY (AWZ2237)

5.5 TX.CD SW (AWZ3236), AMP SW (AWZ3237) ASSEMBLY

TX. CD SW ASSEMBLY (AWZ 3236)



AMP SW ASSEMBLY (AWZ3237)



(➡ P29)

TO
POWER ASSEMBLY
CN19

RESET
FL AC1
FL AC2
VFDP
u+5.6V
D.GND

TX, CD SW ASSEMBLY (AWZ3236)

1. RESISTORS
Indicated in OHM, 1/8W, ±5% tolerance unless otherwise noted K: kOHM

2. CAPACITORS
Indicated in capacity(uF)/voltage(V) unless otherwise noted: pF. Indication without voltage is 50V expect electrolytic capacitor.

V1201
AAV1127

A(1:26)

Q1202
WAVEFORM SHAPING

Q1201
RESET

I C1201
PDG065B
(U. COM)

F(1:11)

CLOCK ADJ | SET/NEXT | WAKE-UP | TIMER REC
DISPLAY | MEMORY | AM NR/FM MONO
BAND | TUNING+ | TUNING− | FREQ/ST

B(4:5)

CN33
NC NC PRESET MANUAL +5V KI7 KI6 KI5 KI4 KO2 KO1 KO0

TO
AF, TUNER
ASSEMBLY
CN23
(➡ P32)

DUAL
STEREO
REMO-COM
TUNE
RESET
LOCAL
TX MUTE
FM MONO
PLL CLK
PLL DATA
PLL CE
CD REQ/EN
TX REQ/EN
S. DATA
S. CLK

AMP SW ASSEMBLY (AWZ3237)

J33
E(1:7)

KI7 KI6 KI5 KI4
MEMORY | AI BGM | PRESET/MANUAL | POWER
B.G.M/TREBLE | HALL/WIDE | DISCO/P.BASS | SFC CLEAR
CD | TUNER | TAPE | PHONO

PLAY | TRACK− | TRACK+
OPEN/CLOSE | STOP | PAUSE
PROGRAM | HI-LITE SCAN | REPEAT

D(1:6) C(1:3)

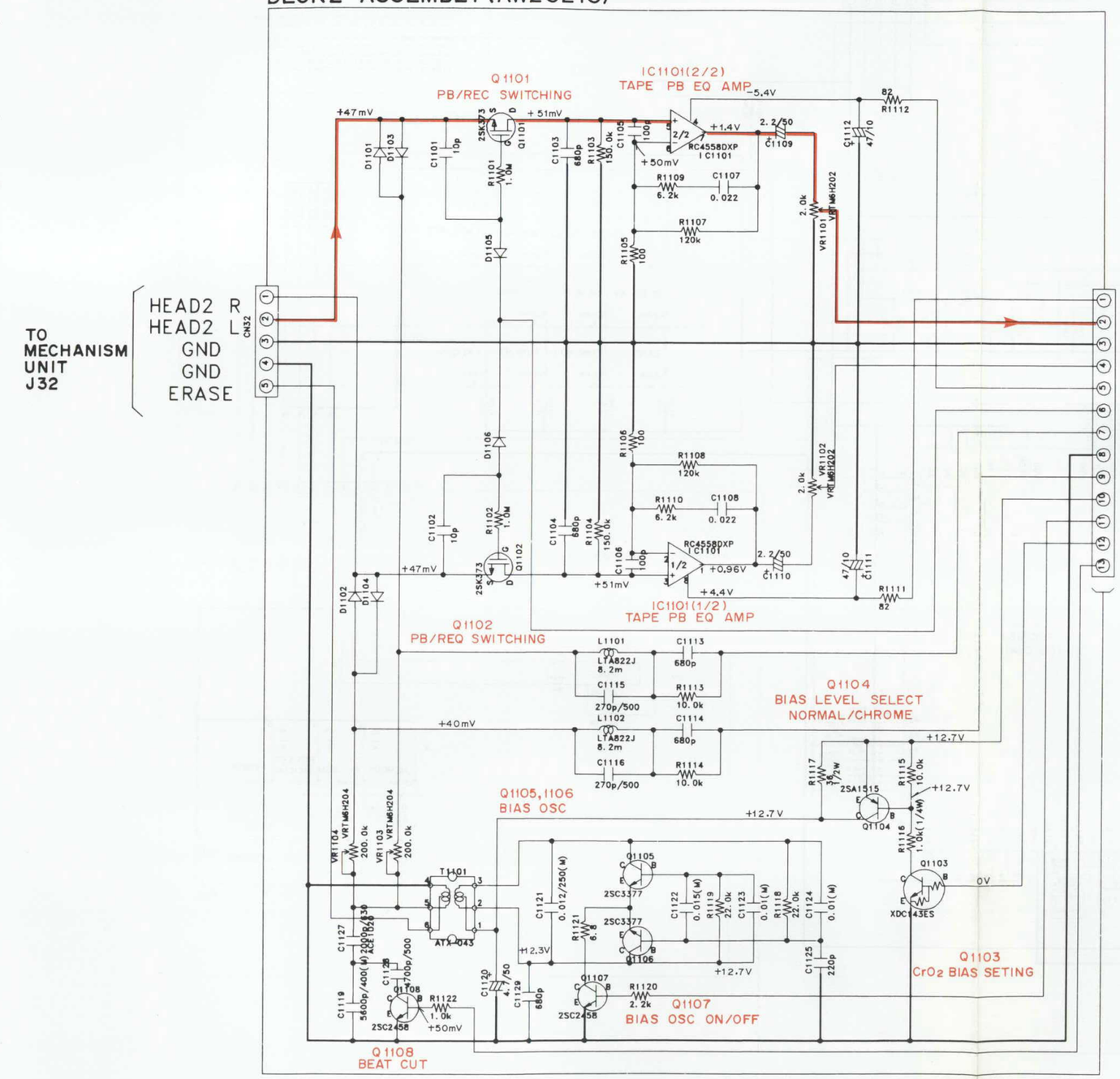
J34

CD REQ/EN
S. DATA
S. CLK
KI 2
KI 1
KI 0
KO2
KO1
KO0
DISP DATA
DISP CLK
DISP REQ

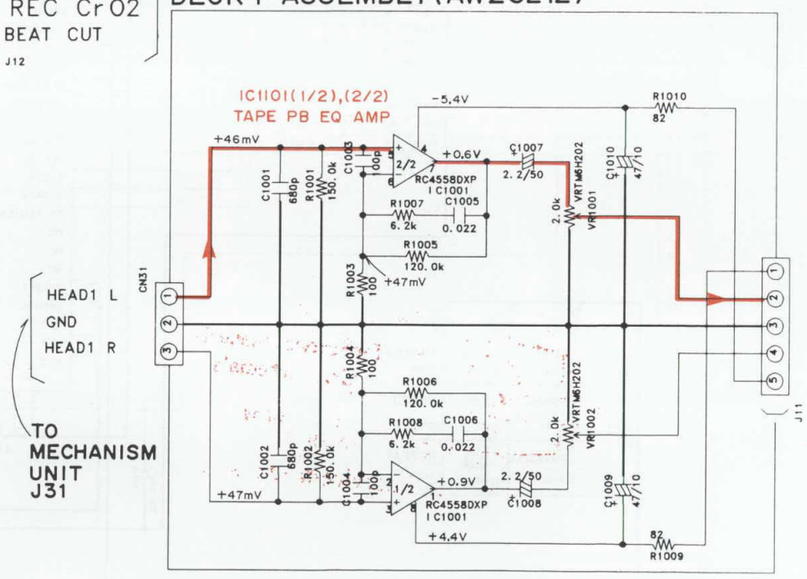
TO
MOTHER BOARD ASSEMBLY
CN2002
(➡ P60)

5.6 DECK–1 (AWZ3212), DECK–2 (AWZ3213) ASSEMBLY

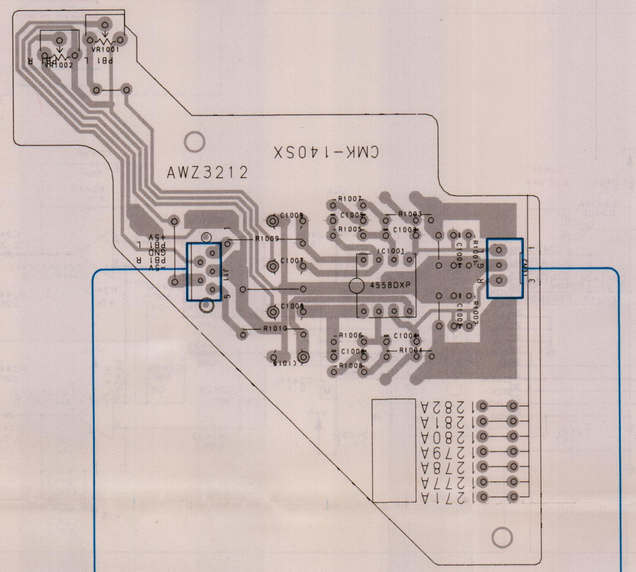
DECK2 ASSEMBLY (AWZ3213)



DECK1 ASSEMBLY (AWZ3212)



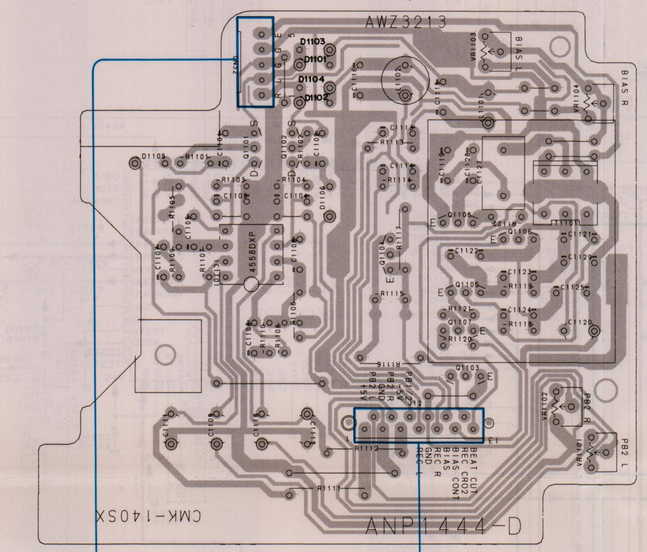
DECK - 1 ASSEMBLY (AWZ3212)



TO
POWER ASSEMBLY
CN11

TO
MECHANISM
UNIT PB
J31

DECK - 2 ASSEMBLY (AWZ3213)

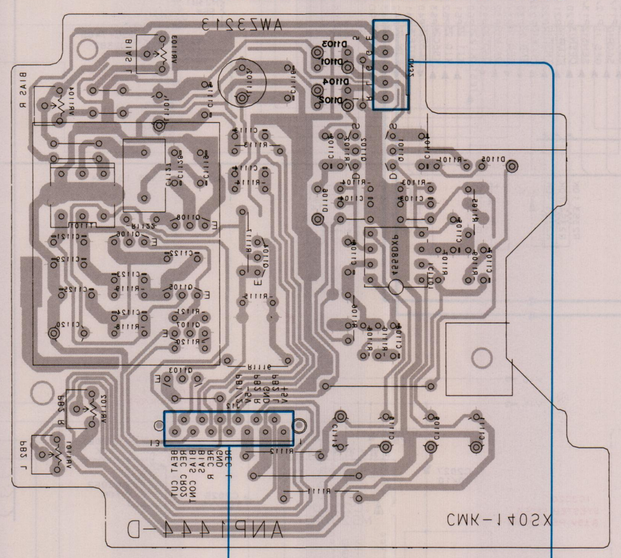


TO
MECHANISM
UNIT PR
J32

TO
POWER ASSEMBLY
CN12

This P.C.B. connection diagram is viewed from the foil side.

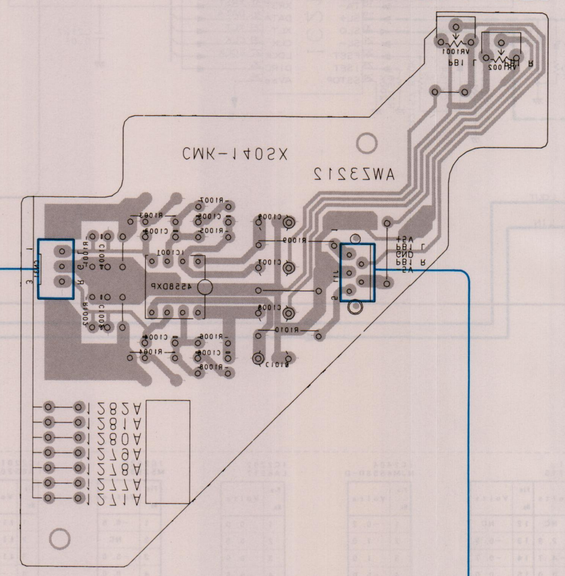
DECK - 2 ASSEMBLY (AWZ3213)



TO
POWER ASSEMBLY
CN12

TO
MECHANISM
UNIT PR
J32

DECK - 1 ASSEMBLY (AWZ3212)



TO
MECHANISM
UNIT PB
J31

TO
POWER ASSEMBLY
CN11

5.7 CD SECTION (PWM1375)

MOTHER BOARD ASSEMBLY (PWM1375)

SERVO MECH ASSEMBLY

PICK UP ASSEMBLY PEA1030

FOCUS COIL

TRACKING COIL

CN2101 52045-1610

IC2101 CXA1471S (RF AMP)

IC2301 CXD2500Q (DECODER)

IC2151 CXA1372S (SERVO CONTROL)

IC2201 (3/3) LA6520 (SPINDLE DRIVE)

IC2201 (1/3) LA6520 (CARRIAGE DRIVE)

IC2201 (2/3) LA6520 (LOADING DRIVE)

IC2202 LA6517 (1/2) (FOCUS DRIVE)

IC2202 LA6517 (2/2) (TRACKING DRIVE)

IC2351 PD4317A (SYSTEM CONTROL)

IC2401 TC9237N (DAC)

IC2404 (1/2), (2/2) NJM4558D-D (LOW PASS FILTER)

IC2020 M5298P (SYESTEM RESET &±5V REGULATOR)

SPDL MTR ASSEMBLY PEA1028

DC MOTOR PXM1013

DC MOTOR PXM1010

INSIDE SW DSG1014

S601 DSK1003 CLAMP SW

CN2202

CN2203

CN2002 KPE12

CN2001 KPE7

TO TX. CD SW ASSEMBLY CN34 (➡ P51)

TO POWER ASSEMBLY J18 (➡ P29)

J2002

Q2101: LD POWER

Q2401: OSC OFF

Q2381: BUFFER

Q2382: BUFFER

Q2062: REGULATOR ON/OFF

MEASUREMENT POINT
FOCUS SERVO LOOP
SIGNAL LINE
TRACKING SERVO LOOP
CARRIAGE MOTOR ROUTE
LOADING MOTOR ROUTE
SPINDLE MOTOR ROUTE

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 no input signal.
Value in ( ) is DC voltage at rated power.

4. OTHERS
➡ : Signal route.
Ø : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
✻ marked capacitors and resistors have parts numbers.

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

IC2301 CXD2500Q

Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts
1	5.0	21	0.0	41	NC	61	NC
2	NC	22	2.5	42	5.0	62	NC
3	5.0	23	5.0	43	NC	63	0.0
4	2.6	24	2.5	44	NC	64	NC
5	NC	25	NC	45	NC	65	0.0
6	5.0	26	0.0	46	4.4	66	1.1~1.1
7	NC	27	2.5	47	0.0	67	5.0
8	NC	28	0.0	48	0.0	68	0.0
9	0.0	29	NC	49	1.1~1.1	69	1.1~1.1
10	0.0	30	0.0	50	NC	70	5.0
11	NC	31	NC	51	NC	71	5.0
12	0.0	32	2.5	52	0.0	72	5.0
13	NC	33	5.0	53	2.5	73	5.0
14	NC	34	2.5	54	NC	74	5.0
15	NC	35	2.5	55	0.0	75	5.0
16	NC	36	NC	56	NC	76	0.0
17	0.0	37	NC	57	NC	77	5.0
18	2.5	38	NC	58	NC	78	5.0
19	2.4	39	NC	59	0.0	79	5.0
20	2.4	40	NC	60	NC	80	0.0

IC2351 PD4317A

Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts
1	NC	17	0.5	33	0.0	49	0.6
2	NC	18	5.0	34	5.0	50	-5.8
3	NC	19	5.0	35	NC	51	5.0
4	NC	20	0.0	36	5.0	52	0.0
5	5.0	21	0.0	37	0.0	53	0.0
6	5.0	22	0.0	38	1.6~1.7	54	NC
7	5.0	23	0.0	39	5.0	55	NC
8	1.1~1.1	24	5.0	40	0.6	56	0.0
9	5.0	25	5.0	41	0.6	57	0.0
10	5.0	26	0.0	42	0.6	58	0.0
11	5.0	27	0.0	43	0.6	59	0.0
12	1.1~1.1	28	0.0	44	0.6	60	0.0
13	5.0	29	5.0	45	0.6	61	NC
14	0.0	30	2.4	46	0.6	62	NC
15	5.0	31	2.5	47	0.6	63	NC
16	5.0	32	0.0	48	0.6	64	5.0

IC2101 CXA1471S

Pin No.	Volts	Pin No.	Volts
1	NC	12	NC
2	2.9	13	-0.9
3	-4.7	14	-0.7
4	0.0	15	0.0
5	0.0	16	0.0
6	-5.0	17	0.0
7	0.0	18	0.8
8	0.0	19	0.0
9	NC	20	5.0
10	0.0	21	5.0
11	NC	22	NC

IC2404 NJM4558D-D

Pin No.	Volts
1	-0.2
2	1.0
3	1.0
4	-5.0
5	1.0
6	1.0
7	-0.2
8	5.0

IC2202 LA6517

Pin No.	Volts
1	0.0
2	6.5
3	0.0
4	-6.5
5	0.0
6	0.0
7	0.0
8	0.0

IC2020 M5298P

Pin No.	Volts
1	-6.5
2	NC
3	-5.0
4	0.0
5	-6.5
6	-5.7
7	3.3
8	1.1
9	5.0
10	1.1
11	0.6
12	5.0
13	6.5
14	5.0
15	1.2
16	6.5

IC2201 LA6520

Pin No.	Volts
1	1.1~1.1
2	1.1~1.1
3	1.1~1.1
4	-0.7
5	1.7
6	1.7
7	0.0
8	0.0
9	0.0
10	NC
11	NC
12	6.5
Fin	-6.5

IC2151 CXA1372S

Pin No.	Volts	Pin No.	Volts
1	0.0	25	-5.0
2	0.0	26	5.0
3	0.0	27	5.0
4	0.0	28	5.0
5	0.0	29	5.0
6	0.0	30	5.0
7	0.0	31	5.0
8	0.0	32	0.0
9	0.0	33	5.0
10	0.0	34	0.0
11	-1.0	35	0.0
12	0.0	36	NC
13	0.2	37	2.5
14	0.0	38	2.5
15	0.0	39	5.0
16	5.0	40	-1.5
17	0.0	41	-1.7
18	0.0	42	5.0
19	0.0	43	-0.7
20	1.1~1.1	44	-1.6
21	0.0	45	0.0
22	-4.0	46	0.8
23	1.3	47	-5.0
24	0.0	48	0.0

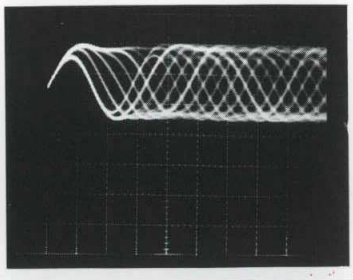
Waveforms

Note: The encircled numbers denote measuring points in the schematic diagram.

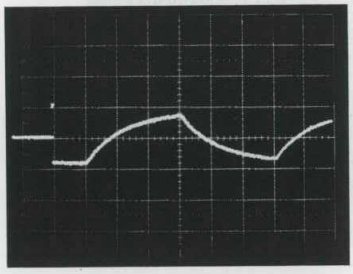
*1 50T-JUMP: After switching to the pause mode, press the manual search key.

*2 FOCUS-IN: Press the key without loading a disc.

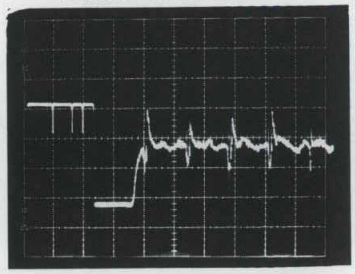
② TP1-Pin 1: PLAY MODE
(RF)
500mV/div 500nsec/div



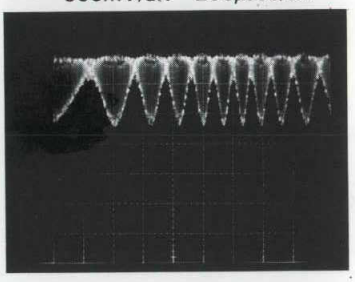
⑤ IC2202-Pin 1: FOCUS-IN (*2) MODE
(FODR)
1V/div 200msec/div



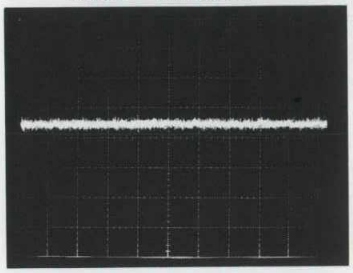
⑦ IC2201-Pin 4: TRACK SEARCH MODE
(SPDR)
2V/div 50msec/div



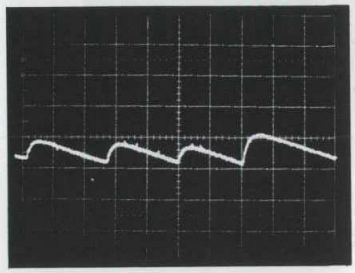
② TP1-Pin 1: TRACK SEARCH MODE
(RF)
500mV/div 200μsec/div



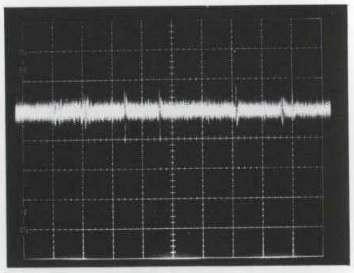
⑤ IC2202-Pin 1: PLAY MODE
(FODR)
1V/div 1msec/div



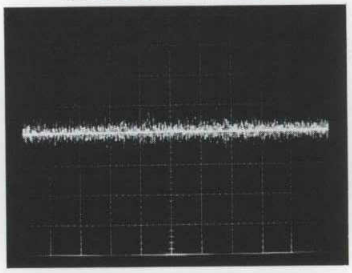
⑧ IC2201-Pin 3: PLAY MODE
(CADR)
1V/div 2S/div



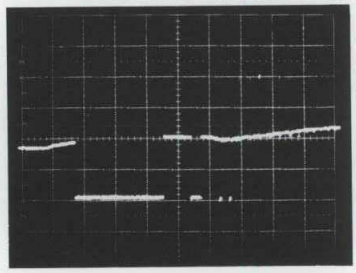
③ TP1-Pin 6: PLAY MODE
(FOER)
100mV/div 10msec/div



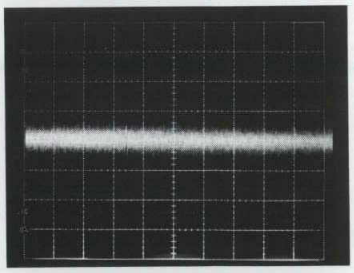
⑥ IC2202-Pin 3: PLAY MODE
(TRDR)
500mV/div 1msec/div



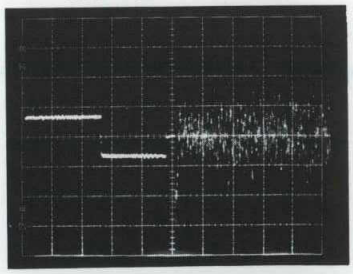
⑧ IC2201-Pin 3: TRACK SEARCH MODE
(CADR)
2V/div 200msec/div



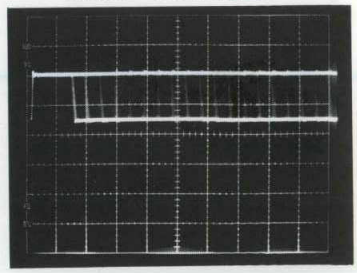
④ TP1-Pin 2: PLAY MODE
(TRER)
1V/div 10msec/div



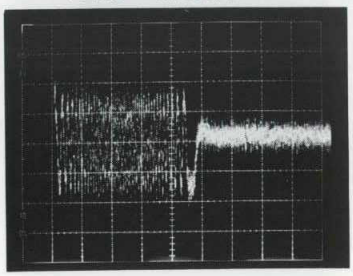
⑥ IC2202-Pin 3: 50T-JUMP (*1) MODE
(TRDR)
500mV/div 1msec/div



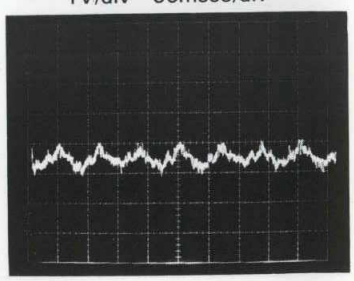
⑨ IC2151-Pin 38: PLAY MODE
(EFM)
2V/div 500nsec/div



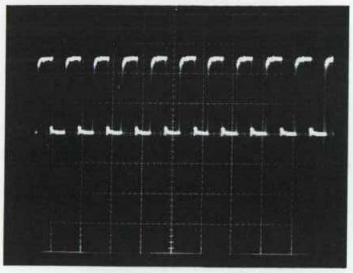
④ TP1-Pin 2: 50T-JUMP (*1) MODE
(TRER)
1V/div 1msec/div



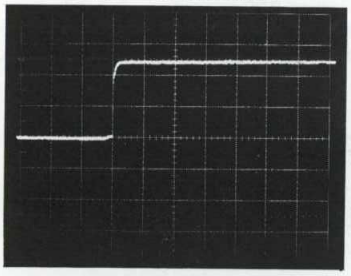
⑦ IC2201-Pin 4: PLAY MODE
(SPDR)
1V/div 50msec/div



(16) IC2301-Pin 35: PLAY MODE (1kHz)
(BCLK)
2V/div 500nsec/div

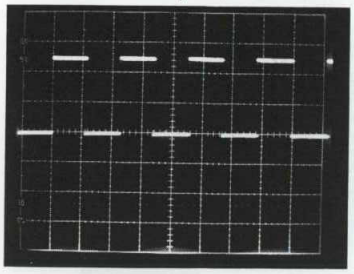


(22) IC2020-Pin 9: POWER SWITCH-ON
(RST)
2V/div 100msec/div

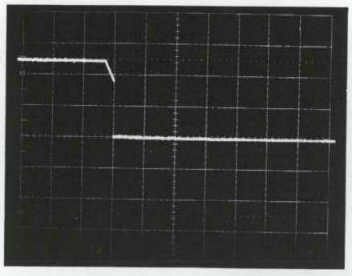


(26)

(18) IC2301-Pin 32: PLAY MODE (1kHz)
(LRCK)
2V/div 10μsec/div

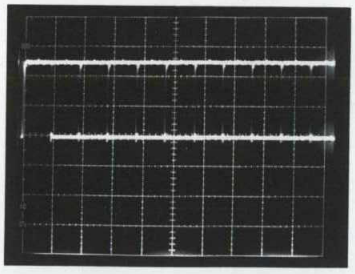


(22) IC2020-Pin 9: POWER SWITCH-OFF
(RST)
2V/div 100msec/div

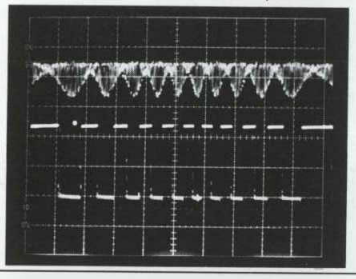


(27)

(19) IC2301-Pin34: PLAY MODE (1kHz)
(DATA)
2V/div 500nsec/div



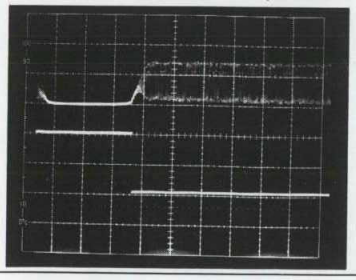
(23) : TRACK SEARCH MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC151-Pin 35 (MIRR)
2V/div 200μsec/div



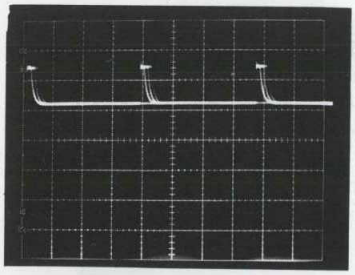
(28)

(20)

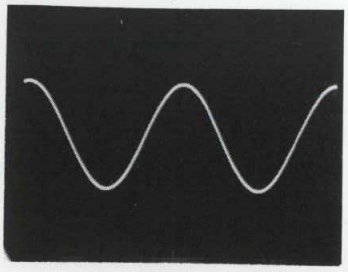
(24) : PLAY MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC151-Pin 36 (DFCT)
5V/div 200μsec/div



(33) IC2301-Pin 4: PLAY MODE
(MDP)
2V/div 2μsec/div

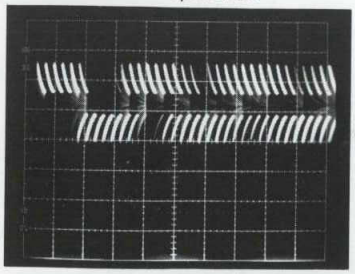


(21) Pin-OUTPUT: PLAY MODE (1kHz)
CN2001-Pin7
1V/div 200μsec/div



(25)

(53) IC2301-Pin 20: PLAY MODE
(PCO)
2V/div 10μsec/div



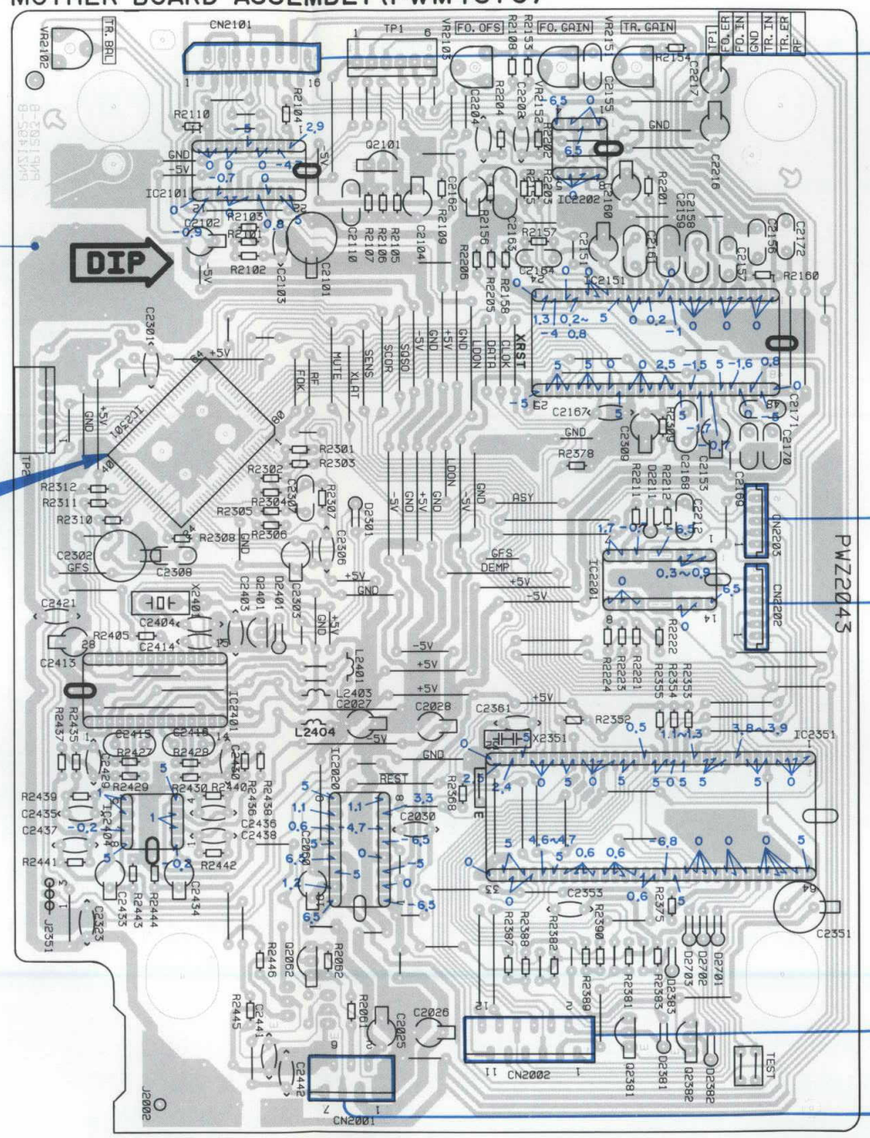
P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor
		FET
		Diode
		Zenner diode
		LED
		Varactor
		Tact switch
		Inductor
		Coil
		Transformer
		Filter
		Ceramic capacitor
		Mylar capacitor
		Styrol capacitor
		Electrolytic capacitor (Non polarized)
		Electrolytic capacitor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

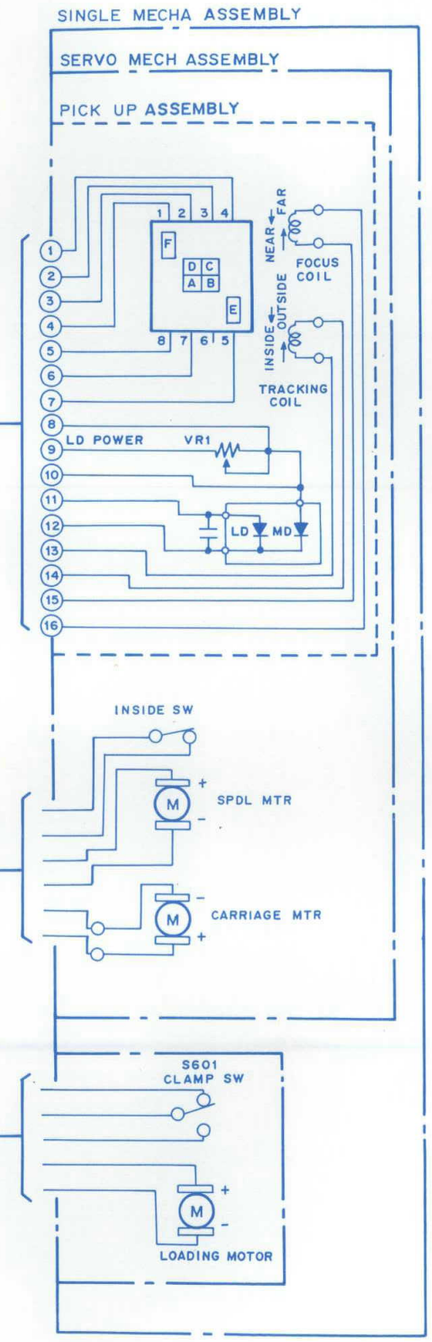
1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked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

IC2301
CXD2500Q

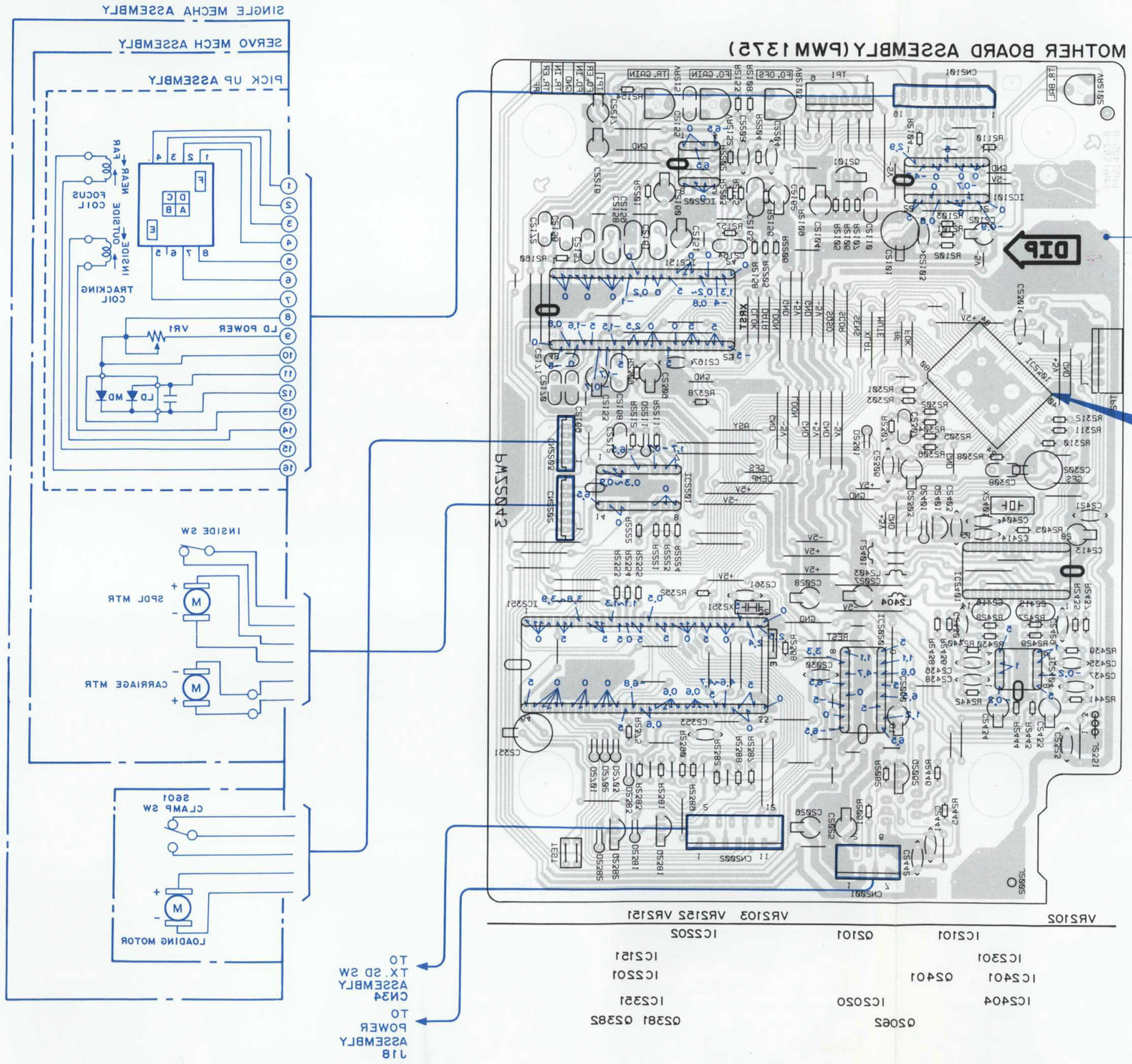
Pin No.	Volts	Pin No.	Volts	Pin No.	Volts
1	5	31	N. C	61	N. C
2	N. C	32	2. 5	62	N. C
3	5	33	5	63	0
4	2. 6	34	2. 5	64	N. C
5	N. C	35	2. 5	65	0
6	5	36	N. C	66	3.3~4.6
7	N. C	37	N. C	67	5
8	N. C	38	N. C	68	0
9	0	39	N. C	69	2.1~3
10	0	40	N. C	70	5
11	N. C	41	N. C	71	5
12	0	42	5	72	5
13	N. C	43	N. C	73	5
14	N. C	44	N. C	74	5
15	N. C	45	N. C	75	5
16	N. C	46	4. 4	76	0
17	0	47	0	77	5
18	2. 5	48	0	78	5
19	2. 4	49	0~0.3	79	5
20	2. 4	50	N. C	80	0
21	0	51	N. C		
22	2. 5	52	0		
23	5	53	2. 5		
24	2. 5	54	N. C		
25	N. C	55	0		
26	0	56	N. C		
27	2. 5	57	N. C		
28	0	58	N. C		
29	N. C	59	0		
30	0	60	N. C		

MOTHER BOARD ASSEMBLY (PWM1375)





This P.C.B. connection diagram is viewed from the foil side.



IC2301
CXD2500Q

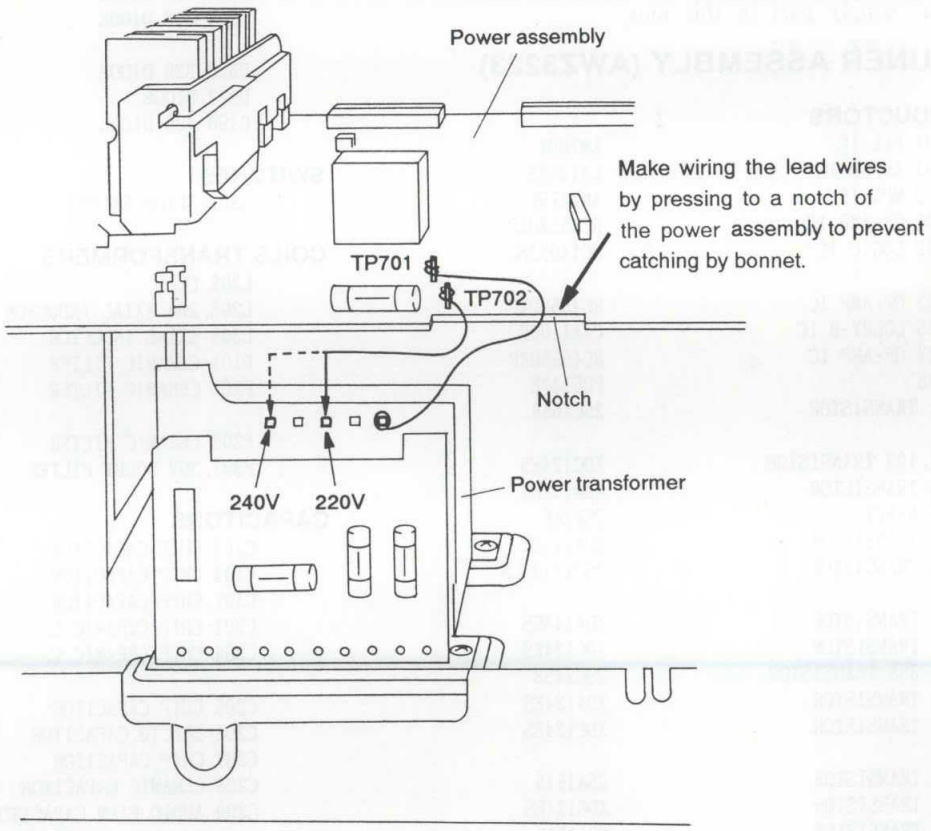
Pin No.	Volts	Pin No.	Volts	Pin No	Volts
1	5	31	N. C	61	N. C
2	N. C	32	2. 5	62	N. C
3	5	33	5	63	0
4	2. 6	34	2. 5	64	N. C
5	N. C	35	2. 5	65	0
6	5	36	N. C	66	3.3~4.6
7	N. C	37	N. C	67	5
8	N. C	38	N. C	68	0
9	0	39	N. C	69	2.1~3
10	0	40	N. C	70	5
11	N. C	41	N. C	71	5
12	0	42	5	72	5
13	N. C	43	N. C	73	5
14	N. C	44	N. C	74	5
15	N. C	45	N. C	75	5
16	N. C	46	4. 4	76	0
17	0	47	0	77	5
18	2. 5	48	0	78	5
19	2. 4	49	0~0.3	79	5
20	2. 4	50	N. C	80	0
21	0	51	N. C		
22	2. 5	52	0		
23	5	53	2. 5		
24	2. 5	54	N. C		
25	N. C	55	0		
26	0	56	N. C		
27	2. 5	57	N. C		
28	0	58	N. C		
29	N. C	59	0		
30	0	60	N. C		

6. LINE VOLTAGE SELECTION

Line voltage can be changed with the following steps.

1. Disconnect the AC power cord.
2. Remove the bonnet.
3. Change the connection with the power transformer primary taps.
4. Stick the line voltage label on the rear panel.

Part No.	Description
AAX–193	220V label
AAX–192	240V label



7. P.C.B's 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 ⚠ 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 Ω → 56 × 10^1 → 561 ..... RD1/4PS 5 6 1 J
47k Ω → 47 × 10^3 → 473 ..... RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ..... RN2H 0 R 5 K
1 Ω → 010 ..... RS1P 0 1 0 K

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

5.62k Ω → 562 × 10^1 → 5621 ..... RN1/4SR 5 6 2 1 F

Mark	No.	Symbol & Description	Part No.

SPACER ASSEMBLY

There is no supply part in this unit.

⊙ AF.TUNER ASSEMBLY (AWZ3223)

SEMICONDUCTORS

	IC101 PLL IC	LM7001
	IC201 AM/FM IC	LA1265S
	IC203 MPX IC	AN7470P
	IC301 OP-AMP IC	RC4558DXP
	IC302 LOGIC IC	MC14052BCP
	IC303 OP-AMP IC	RC4558DXP
	IC305 LOLBY-B IC	CXA1100P
	IC307 OP-AMP IC	RC4558DXP
	IC308	PD5147B
	Q101 TRANSISTOR	2SC2668
	Q102, 103 TRANSISTOR	XDC124ES
	Q105 TRANSISTOR	XDA143ES
	Q204 N-FET	2SK246
	Q205 TRANSISTOR	XDA143ES
	Q206 TRANSISTOR	2SC1740SLN
	Q207 TRANSISTOR	XDA143ES
	Q208 TRANSISTOR	XDC124ES
	Q301-308 TRANSISTOR	2SC2458
	Q309 TRANSISTOR	XDA124ES
	Q316 TRANSISTOR	XDC124ES
	Q317 TRANSISTOR	2SA1515
	Q318 TRANSISTOR	XDC124ES
	Q319 TRANSISTOR	2SA1515
	Q320 TRANSISTOR	XDC124ES
	Q321 TRANSISTOR	2SA1515
	Q322-326 TRANSISTOR	XDC124ES
	Q327 TRANSISTOR	XDA124ES
	Q328 TRANSISTOR	XDC143ES
	Q335 TRANSISTOR	XDC143ES
	D101-103 DIODE	1SS252
	D104, 105 DIODE	1SS85
	D106 DIODE	1SS252
	D203-206 DIODE	1SS252
	D301, 302 DIODE	1SS252
	D307-318 DIODE	1SS252
	D320-325 DIODE	1SS252
	D327 DIODE	1SS252
	D490-499 DIODE	1SS252

SWITCHES

	S301 SLIDE SWITCH	ASH1031

COILS/TRANSFORMERS

	L202 COIL	ATE-079
	L203, 204 AXIAL INDUCTOR	LAU2R2M
	L303 AXIAL INDUCTOR	LAU220K
	F101 CERAMIC FILTER	ATF-107
	F202 CERAMIC FILTER	ATF-107
	F203 CERAMIC FILTER	ATF-208
	F301, 302 DOLBY FILTER	ATF1064

CAPACITORS

	C101 CHIP CAPACITOR	CKSQYF223Z50
	C104 CHIP CAPACITOR	CKSQYF223Z50
	C107 CHIP CAPACITOR	CKSQYF223Z50
	C201 CHIP CERAMIC C.	CCSQCH150J50
	C204 CHIP CERAMIC C.	CCSQCH150J50
	C205 CHIP CAPACITOR	CKSQYF103Z50
	C206 ELECTR. CAPACITOR	CEAS470M10
	C207 CHIP CAPACITOR	CKSQYF223Z50
	C208 CERAMIC CAPACITOR	CKDYX103M25
	C209 AUDIO FILM CAPACITOR	CFTXA224J50
	C210 CHIP CAPACITOR	CKSQYF223Z50
	C211 CERAMIC CAPACITOR	CKSQYF473Z50
	C212 CHIP CAPACITOR	CKSQYF223Z50
	C215 CERAMIC CAPACITOR	CKSQYB103K50
	C216 CERAMIC CAPACITOR	CCSQCH470J50
	C217 ELECTR. CAPACITOR	CEAS470M16
	C218 ELECTR. CAPACITOR	CEAS330M16
	C219 CHIP CAPACITOR	CKSQYF103Z50
	C220 CERAMIC CAPACITOR	CKSQYF473Z50
	C221, 222 CHIP CAPACITOR	CKSQYF223Z50

Mark	No.	Symbol & Description	Part No.
	C223	ELECTR. CAPACITOR	CEAS330M16
	C224	ELECTR. CAPACITOR	CEAS4R7M50
	C225	CHIP CAPACITOR	CKSQYF103Z50
	C226	ELECTR. CAPACITOR	CEAS010M50
	C227	CERAMIC CAPACITOR	CKSQYB471K50
	C228	CHIP CAPACITOR	CKSQYB222K50
	C230	CERAMIC CAPACITOR	CKDYX473M25
	C231	ELECTR. CAPACITOR	CEAS010M50
	C232	ELECTR. CAPACITOR	CEAS2R2M50
	C233	ELECTR. CAPACITOR	CEAS100M50
	C234	ELECTR. CAPACITOR	CEANP100M16
	C235	ELECTR. CAPACITOR	CEAS100M50
	C236	CERAMIC CAPACITOR	CKSQYF473Z50
	C237	ELECTR. CAPACITOR	CEAS101M16
	C238	CAPACITOR	ACE1039
	C240	ELECTR. CAPACITOR	CEAS1R5M50
	C241	ELECTR. CAPACITOR	CEAS3R3M50
	C242	ELECTR. CAPACITOR	CEAS470M16
	C243, 244	CHIP CAPACITOR	CKSQYB102K50
	C246	ELECTR. CAPACITOR	CEASR22M50
	C248	CHIP CAPACITOR	CKSQYF103Z50
	C255, 256	CERAMIC CAPACITOR	CKDYB682K50
	C265, 266	ELECTR. CAPACITOR	CEAS100M50
	C267	CERAMIC CAPACITOR	CKDYX223M25
	C298	CERAMIC CAPACITOR	CCDSL101J50
	C299	CERAMIC CAPACITOR	CKDYF102Z50
	C303-306	CHIP CAPACITOR	CCSQCH101J50
	C307, 308	ELECTR. CAPACITOR	CEAS2R2M50
	C309, 310	CERAMIC CAPACITOR	CKCYB152K50
	C311, 312	CERAMIC CAPACITOR	CKCYB562K50
	C315, 316	ELECTR. CAPACITOR	CEAS470M10
	C317, 318	CHIP CAPACITOR	CCSQCH101J50
	C325, 326		CKSQYB273K50
	C327, 328	ELECTR. CAPACITOR	CEAS010M50
	C329	ELECTR. CAPACITOR	CEAS100M50
	C330	ELECTR. CAPACITOR	CEAS220M25
	C331, 332	ELECTR. CAPACITOR	CEAS0R1M50
	C333	ELECTR. CAPACITOR	CEAS470M16
	C334	CERAMIC CAPACITOR	CKSQYB473K50
	C335	ELECTR. CAPACITOR	CEASR68M50
	C336	ELECTR. CAPACITOR	CEAS101M10
	C337	ELECTR. CAPACITOR	CEASR68M50
	C338	ELECTR. CAPACITOR	CEAS220M16
	C339, 340	ELECTR. CAPACITOR	CEAS2R2M50
	C341-344	ELECTR. CAPACITOR	CEAS010M50
	C345, 346	CERAMIC CAPACITOR	CKCYB152K50
	C347	CERAMIC CAPACITOR	CKCYB102K50
	C350, 351	CERAMIC CAPACITOR	CKCYF473Z50
	C352	ELECTR. CAPACITOR	CEAS100M50
	C353, 354	CERAMIC CAPACITOR	CKDYF473Z50
	C363	CERAMIC CAPACITOR	CKCYB102K50
	C364	ELECTR. CAPACITOR	CEAS100M50
	C365, 366	CERAMIC CAPACITOR	CKSQYB152K50
	C367, 368	CERAMIC CAPACITOR	CKSQYF473Z50
	C369, 370	CHIP CAPACITOR	CKSQYF223Z50

Mark	No.	Symbol & Description	Part No.
RESISTORS			
	R102-108	CHIP RESISTOR	RS1/10S□□□J
	R109	CARBONFILM RESISTOR	RD1/8PM□□□J
	R110	CHIP RESISTOR	RS1/10S□□□J
	R111, 112	CARBONFILM RESISTOR	RD1/8PM□□□J
	R113, 114	CHIP RESISTOR	RS1/10S□□□J
	R122	CARBONFILM RESISTOR	RD1/8PM□□□J
	R180-182	CHIP RESISTOR	RS1/10S□□□J
	R184-187	CHIP RESISTOR	RS1/10S□□□J
	R204-211	CHIP RESISTOR	RS1/10S□□□J
	R212	CARBONFILM RESISTOR	RD1/8PM□□□J
	R214	CARBONFILM RESISTOR	RD1/8PM□□□J
	R215-219	CHIP RESISTOR	RS1/10S□□□J
	R220	CARBONFILM RESISTOR	RD1/8PM□□□J
	R221	CHIP RESISTOR	RS1/10S□□□J
	R225	CHIP RESISTOR	RS1/10S□□□J
	R227	CHIP RESISTOR	RS1/10S□□□J
	R229	CHIP RESISTOR	RS1/10S□□□J
	R231, 232	CHIP RESISTOR	RS1/10S□□□J
	R234-237	CHIP RESISTOR	RS1/10S□□□J
	R239-243	CHIP RESISTOR	RS1/10S□□□J
	R248, 249	CHIP RESISTOR	RS1/10S□□□J
	R254, 255	CHIP RESISTOR	RS1/10S□□□J
	R283	CHIP RESISTOR	RS1/10S□□□J
	R286	CHIP RESISTOR	RS1/10S□□□J
	R288, 289	CHIP RESISTOR	RS1/10S□□□J
	R301-304	CHIP RESISTOR	RS1/10S□□□J
	R305-310	CARBONFILM RESISTOR	RD1/8PM□□□J
	R315, 316	CARBONFILM RESISTOR	RD1/8PM□□□J
	R318	CHIP RESISTOR	RS1/10S□□□J
	R321-328	CARBONFILM RESISTOR	RD1/8PM□□□J
	R329, 330	CHIP RESISTOR	RS1/10S□□□J
	R335	CHIP RESISTOR	RS1/10S□□□J
	R336	CARBONFILM RESISTOR	RD1/8PM□□□J
	R337	CHIP RESISTOR	RS1/10S□□□J
	R338	CARBONFILM RESISTOR	RD1/8PM□□□J
	R339	CHIP RESISTOR	RS1/10S□□□J
	R340-344	CARBONFILM RESISTOR	RD1/8PM□□□J
	R345-352	CHIP RESISTOR	RS1/10S□□□J
	R353	CARBONFILM RESISTOR	RD1/8PM□□□J
	R354-361	CHIP RESISTOR	RS1/10S□□□J
	R362	CARBONFILM RESISTOR	RD1/8PM□□□J
	R363-366	CHIP RESISTOR	RS1/10S□□□J
	R367-370	CARBONFILM RESISTOR	RD1/8PM□□□J
	R385-389	CARBONFILM RESISTOR	RD1/8PM□□□J
	R390-400	CHIP RESISTOR	RS1/10S□□□J
	R401-411	CARBONFILM RESISTOR	RD1/8PM□□□J
	R412-416	CHIP RESISTOR	RS1/10S□□□J
	R419	CARBONFILM RESISTOR	RD1/8PM□□□J
	R422	CARBONFILM RESISTOR	RD1/8PM□□□J
	R429	CHIP RESISTOR	RS1/10S□□□J
	R430, 431	CARBONFILM RESISTOR	RD1/8PM□□□J
	R432	CHIP RESISTOR	RS1/10S□□□J
	R446	CHIP RESISTOR	RS1/10S□□□J
	R449-454	CHIP RESISTOR	RS1/10S□□□J

Mark	No.	Symbol & Description	Part No.
		R455-458 CARBONFILM RESISTOR	RD1/8PM□□□J
		R491, 492	RD1/8PM□□□J
		R494, 495 CHIP RESISTOR	RS1/10S□□□J
		R496-499 CARBONFILM RESISTOR	RD1/8PM□□□J
		VR201 VR	VRTB6VS223
		VR202, 203 VR	VRTB6VS472
		VR301-304 VR	ACP1004
		OTHERS	
		ANTENNA TERMINAL 4-P	AKA1010
			AXQ1002
			AXX1012
			AXX1013
		CN1 PIN JACK(2P)	AKB1171
		CN21 CONNECTOR(10P)	KPE10
		CN22 CONNECTOR(12P)	KPE12
		CN23 CONNECTOR(15P)	KPE15
		CN24 CONNECTOR(7P)	KPE7
		CN25 CONNECTOR(9P)	KPE9
		X201 CRYSTAL RESONATOR	ASS1042
		X202 CERAMIC RESONATOR	ATF1027
		X301 CERAMIC OSCILLATOR	ASS1022

⊙ VOLUME ASSEMBLY (AWZ3224)

		SEMICONDUCTORS	
		IC601 OP-AMP IC	RC4558DXP
		IC602 MECHANISM DRIVER IC	TA7291S
		CAPACITORS	
		C601, 602 ELECTR. CAPACITOR	CEAS4R7M50
		C605, 606 ELECTR. CAPACITOR	CEAS470M10
		C607 CERAMIC CAPACITOR	CKCYF473Z50
		RESISTORS	
		R605-608 CARBONFILM RESISTOR	RD1/8PM□□□J
		R612, 613 CARBONFILM RESISTOR	RD1/8PM□□□J
		R615-618 CARBONFILM RESISTOR	RD1/8PM□□□J
		VR601 VARIABLE RESISTOR	ACX1053

⊙ DECK SW ASSEMBLY (AWZ3225)

		SEMICONDUCTORS	
		D1401-1404 LED(GREEN)	AEL1132
		D1405 LED(RED)	AEL1131
		SWITCHES	
		S1401 SLIDE SWITCH	ASH1039
		S1402-1407 SWITCH	ASG1034
		S1409-1415 SWITCH	ASG1034
		RESISTORS	
		R1401-1403 CARBONFILM RESISTOR	RD1/8PM□□□J

Mark	No.	Symbol & Description	Part No.

⊙ DECK-1 ASSEMBLY (AWZ3212)

		SEMICONDUCTORS	
		IC1001 OP-AMP IC	RC4558DXP
		CAPACITORS	
		C1001, 1002 CERAMIC CAPACITOR	CKCYB681K50
		C1003, 1004 CERAMIC CAPACITOR	CCCSL101J50
		C1005, 1006 AUDIO FILM CAPACITOR	CFTXA223J50
		C1007, 1008 ELECTR. CAPACITOR	CEAS2R2M50
		C1009, 1010 ELECTR. CAPACITOR	CEAS470M10
		RESISTORS	
		R1001-1010 CARBONFILM RESISTOR	RD1/8PM□□□J
		VR1001, 1002 VR	VRTM6H202

⊙ DECK-2 ASSEMBLY (AWZ3213)

		SEMICONDUCTORS	
		IC1101 OP-AMP IC	RC4558DXP
		Q1101, 1102 N-FET	2SK373
		Q1103 TRANSISTOR	XDC143ES
		Q1104 TRANSISTOR	2SA1515
		Q1105, 1106 TRANSISTOR	2SC3377
		Q1107, 1108 TRANSISTOR	2SC2458
		D1101-1106 DIODE	1SS252
		COILS/TRANSFORMERS	
		L1101, 1102 INDUCTOR	LTA822J
		T1101 OSC TRANSFORMER	ATX-043
		CAPACITORS	
		C1101, 1102 CERAMIC CAPACITOR	CCMSL100D50
		C1103, 1104 CERAMIC CAPACITOR	CKCYB681K50
		C1105, 1106 CERAMIC CAPACITOR	CCCSL101J50
		C1107, 1108 AUDIO FILM CAPACITOR	CFTXA223J50
		C1109, 1110 ELECTR. CAPACITOR	CEAS2R2M50
		C1111, 1112 ELECTR. CAPACITOR	CEAS470M10
		C1113, 1114 CERAMIC CAPACITOR	CKDYB681K50
		C1115, 1116 CERAMIC CAPACITOR	CCDSL271K500
		C1117, 1118 CERAMIC CAPACITOR	CCCSL101K500
		C1119 MYLOR FILM CAPACITOR	CQMA562K400
		C1120 ELECTR. CAPACITOR	CEAS4R7M50
		C1121 MYLOR FILM CAPACITOR	CQMA123K250
		C1122 MYLOR FILM CAPACITOR	CQMA153K50
		C1123, 1124 MYLOR FILM CAPACITOR	CQMA103K50
		C1125 CERAMIC CAPACITOR	CCDSL221J50
		C1127 CQPA (2000P/630V)	ACE1020
		C1128 CERAMIC CAPACITOR	CKDYB472K500
		C1129 CERAMIC CAPACITOR	CKDYB681K50
		RESISTORS	
		R1101-1115 CARBONFILM RESISTOR	RD1/8PM□□□J
		R1116 CARBONFILM RESISTOR	RD1/4PM□□□J
		R1117 CARBONFILM RESISTOR	RD1/2PM□□□J
		R1118-1122 CARBONFILM RESISTOR	RD1/8PM□□□J
		VR1101, 1102 VR	VRTM6H202
		VR1103, 1104 VR	VRTM6H204

Mark	No.	Symbol & Description	Part No.

⊙ TRANS ASSEMBLY (AWZ3214)

There is no supply part in this unit

REGULATOR ASSEMBLY

SEMICONDUCTORS

	IC704	REGULATOR IC NJM7812FA

CAPACITORS

	C747, 748	ELECTR. CAPACITOR CEAS100M25

⊙ POWER ASSEMBLY (AWZ3230)

SEMICONDUCTORS

	IC701	REGULATOR IC NJM7805FA
	IC702	REGULATOR IC NJM7905FA
	IC703	REGULATOR IC NJM7812FA
	IC705	REGULATOR IC NJM78M56FAS
	IC709	IC PROTECTOR ICP-N38
	IC751	LOGIC IC TC4066BP
	IC753	OP-AMP IC RC4558DXP
	IC801	SOUND PROCESSOR IC PA0049
	IC802, 803	OP-AMP IC RC4558DXP
	IC805	GEQ IC LA3607
	IC851	AUDIO IC STK4142-2GP
	Q11	TRANSISTOR 2SA1048
	Q12	TRANSISTOR 2SC2458
	Q21, 22	TRANSISTOR 2SC2458
	Q23	TRANSISTOR XDA143ES
	Q701	TRANSISTOR 2SC3377
	Q702	TRANSISTOR XDA124ES
	Q703	TRANSISTOR XDC124ES
	Q706	TRANSISTOR 2SB560
	Q707	TRANSISTOR 2SC2603
	Q708	TRANSISTOR XDA124ES
	Q709	TRANSISTOR XDC124ES
	Q710	TRANSISTOR 2SA933S
	Q741	TRANSISTOR 2SA1515
	Q742	TRANSISTOR XDC143ES
	Q743	TRANSISTOR XDA143ES
	Q744	TRANSISTOR XDC124ES
	Q751	TRANSISTOR XDA143ES
	Q752	TRANSISTOR XDC143ES
	Q753, 754	TRANSISTOR 2SC2458
	Q851-854	TRANSISTOR 2SC2458
	D11	DIODE 1SS252
	D701	DIODE RBV402
	D702-709	DIODE S5566
	D712	DIODE S5566
	D714	DIODE S5566
	D716	ZENER DIODE RD30ESB
	D717	ZENER DIODE RD7.5ESB
	D718, 719	DIODE 1SS252
	D740	DIODE 1SS252
	D741	ZENER DIODE RD6.8ESB
	D742-744	DIODE 1SS252
	D745	ZENER DIODE RD2.7ESB
	D799	DIODE 1SS252
	D851, 852	ZENER DIODE UZ-12BS
	D853	DIODE 1SS252

RELAYS

	RY851	RELAY ASR1005

COILS/TRANSFORMERS

	L751, 752	INDUCTOR LTA392J
	L851, 852	COIL ATH-133

CAPACITORS

	C11	ELECTR. CAPACITOR CEAS100M50
	C701, 702	ELECTR. CAPACITOR ACH1109
	C703, 704	ELECTR. CAPACITOR CEAS222M16
	C705, 706	ELECTR. CAPACITOR CEAS100M25
	C707	ELECTR. CAPACITOR CEAS332M25
	C708, 709	ELECTR. CAPACITOR CEAS100M25
	C716	CAPACITOR (CERAMIC) ACG-009
	C718	ELECTR. CAPACITOR CEAS101M35
	C720	ELECTR. CAPACITOR CEAS220M100
	C723	ELECTR. CAPACITOR CEAS470M50
	C724	ELECTR. CAPACITOR CEAS100M50
	C730	ELECTR. CAPACITOR CEAS101M16
	C731	ELECTR. CAPACITOR CEAS470M10
	C732	ELECTR. CAPACITOR CEAS331M10
	C733	ELECTR. CAPACITOR CEAS470M50
	C741	ELECTR. CAPACITOR CEAS2R2M50
	C742	ELECTR. CAPACITOR CEAS4R7M50
	C753, 754	AUDIO FILM CAPACITOR CFTXA683J50
	C755, 756	MYLOR FILM CAPACITOR CQMA182J50
	C757, 758	ELECTR. CAPACITOR CEAS330M16
	C759, 760	AUDIO FILM CAPACITOR CFTXA273J50
	C761, 762	AUDIO FILM CAPACITOR CFTXA473J50
	C765, 766	ELECTR. CAPACITOR CEAS470M10
	C771	ELECTR. CAPACITOR CEAS3R3M50
	C803, 804	CERAMIC CAPACITOR CKDYB682K50
	C805, 806	MYLOR FILM CAPACITOR CQMA102J50
	C807, 808	MYLOR FILM CAPACITOR CQMA562J50
	C809	ELECTR. CAPACITOR CEASR47M50
	C810	ELECTR. CAPACITOR CEAS6R8M50
	C811	MYLOR FILM CAPACITOR CQMA223J50
	C812	CERAMIC CAPACITOR CKCYX104M25
	C819, 820	ELECTR. CAPACITOR CEAS3R3M50
	C823	CERAMIC CAPACITOR CKDYB561K50
	C824	CERAMIC CAPACITOR CKDYB822K50
	C825	CERAMIC CAPACITOR CKDYB561K50
	C826	CERAMIC CAPACITOR CKDYB272K50
	C829	CERAMIC CAPACITOR CKDYB272K50
	C830	CERAMIC CAPACITOR CKDYX393M25
	C831	CERAMIC CAPACITOR CKDYB472K50
	C832	CERAMIC CAPACITOR CKDYX683M25
	C833	CERAMIC CAPACITOR CKDYB102K50
	C834	CERAMIC CAPACITOR CKDYX153M25
	C835	CERAMIC CAPACITOR CKDYB182K50
	C836	CERAMIC CAPACITOR CKDYX273M25

Mark	No.	Symbol & Description	Part No.
		C837 AUDIO FILM CAPACITOR	CFTXA474J50
		C851, 852 ELECTR. CAPACITOR	CEAS2R2M50
		C855, 856 ELECTR. CAPACITOR	CEAS470M25
		C857, 858 ELECTR. CAPACITOR	CEAS101M25
		C859 ELECTR. CAPACITOR	CEANP220M35
		C860-862 ELECTR. CAPACITOR	CEAS100M50
		C863 ELECTR. CAPACITOR	CEAS470M35
		C865-868 CERAMIC CAPACITOR	CKDYX104M25
		C869 CERAMIC CAPACITOR	CKDYF473Z50
		C870 ELECTR. CAPACITOR	CEAS220M25
		C873 ELECTR. CAPACITOR	CEAS221M10
		C874 CERAMIC CAPACITOR	CKCYF473Z50
		C875 ELECTR. CAPACITOR	CEAS470M35
		C876 ELECTR. CAPACITOR	CEAS220M16
RESISTORS			
		R2	RS2LMF221J
		R11, 12 METAL OXIDE RESISTOR	RS2LMFR□□J
		R13-18 CARBONFILM RESISTOR	RD1/8PM□□□J
		R21-33 CARBONFILM RESISTOR	RD1/8PM□□□J
		R703, 704 CARBONFILM RESISTOR	RD1/8PM□□□J
		R705, 706 CARBONFILM RESISTOR	RD1/4PM□□□J
		R709 CARBONFILM RESISTOR	RD1/8PM□□□J
		R714 CARBONFILM RESISTOR	RD1/2PM□□□J
		R715 METAL OXIDE RESISTOR	RS2LMF□□□J
		R716 CARBONFILM RESISTOR	RD1/4PM□□□J
		R717 CARBONFILM RESISTOR	RD1/8PM□□□J
		R730-734 CARBONFILM RESISTOR	RD1/8PM□□□J
		R741-748 CARBONFILM RESISTOR	RD1/8PM□□□J
		R753-770 CARBONFILM RESISTOR	RD1/8PM□□□J
		R773 CARBONFILM RESISTOR	RD1/8PM□□□J
		R799 CARBONFILM RESISTOR	RD1/8PM□□□J
		R801-813 CARBONFILM RESISTOR	RD1/8PM□□□J
		R829, 830 CARBONFILM RESISTOR	RD1/8PM□□□J
		R851-858 CARBONFILM RESISTOR	RD1/8PM□□□J
		R859-862 CARBONFILM RESISTOR	RD1/4PM□□□J
		R863 CARBONFILM RESISTOR	RD1/4PMFL□□□J
		R864, 865 CARBONFILM RESISTOR	RD1/4PM□□□J
		R866 CARBONFILM RESISTOR	RD1/4PMFL□□□J
		R867 CARBONFILM RESISTOR	RD1/4PM□□□J
		R868 CARBONFILM RESISTOR	RD1/4PMFL□□□J
		R869, 870 CARBONFILM RESISTOR	RD1/4PM□□□J
		R871, 872 METAL OXIDE RESISTOR	RS1LMF□□□J
		R873, 874 CARBONFILM RESISTOR	RD1/4PMFL□□□J
		R875-879 CARBONFILM RESISTOR	RD1/8PM□□□J
		R881 METAL OXIDE RESISTOR	RS2LMF□□□J
		R882-885 CARBONFILM RESISTOR	RD1/8PM□□□J
OTHERS			
		SPEAKER TERMINAL 4-P	AKE1012
		SOCKET 15-P	AKP-048
		SOCKET 14-P	AKP1056
		CN1 JACK	AKN1027
		CN10 CONNECTOR(3P)	KPE3
		CN11 CONNECTOR(5P)	KPE5
		CN12 CONNECTOR(13P)	KPE13
		CN16, 17 CONNECTOR(15P)	KPE15
		CN19 CONNECTOR(6P)	KPE6

⊙ TX.CD SW ASSEMBLY (AWZ3236)

Mark	No.	Symbol & Description	Part No.
SEMICONDUCTORS			
		IC1201	PDG065B
		Q1201 TRANSISTOR	XDC143ES
		Q1202 TRANSISTOR	2SC2458
		D1212-1217 DIODE	1SS252
		D1218 ZENER DIODE	RD6.2ESB
SWITCHES			
		S1201-1211 SWITCH	ASG1034
		S1221-1229 SWITCH	ASG1034
COILS/TRANSFORMERS			
		L1201 AXIAL INDUCTOR	LAU220K
CAPACITORS			
		C1201 CERAMIC CAPACITOR	CKDYX473M25
		C1202 ELECTR. CAPACITOR	CEJA010M50
		C1203 AUDIO FILM CAPACITOR	CFTXA224J50
		C1204 CERAMIC CAPACITOR	CKDYB102K50
		C1205 ELECTR. CAPACITOR	CEJA470M10
		C1206 CERAMIC CAPACITOR	CKDYF473Z50
		C1207 ELECTR. CAPACITOR	CEJA470M10
		C1208 CEA (47000/5.5V)	ACH1037
		C1209 CERAMIC CAPACITOR	CKDYF223Z50
		C1210 ELECTR. CAPACITOR	CEJA4R7M35
		C1211 ELECTR. CAPACITOR	CEJA2R2M50
RESISTORS			
		R1201-1233 CARBONFILM RESISTOR	RD1/8PM□□□J
		R1236-1241 CARBONFILM RESISTOR	RD1/8PM□□□J
		R1251-1257 CARBONFILM RESISTOR	RD1/8PM□□□J
OTHERS			
		REMOTE RECEIVER UNIT	AXX1010
		V1201 FL TUBE	AAV1127
		X1202 CRYSTAL RESONATOR	ASS1015

⊙ AMP SW ASSEMBLY (AWZ3237)

Mark	No.	Symbol & Description	Part No.
SEMICONDUCTORS			
		D1305, 1306 LED(RED)	AEL1108
SWITCHES			
		S1301-1312 SWITCH	ASG1034
RESISTORS			
		R1301 CARBONFILM RESISTOR	RD1/8PM□□□J

⊙ MOTHER BOARD ASSEMBLY (PWM1375)

Mark	No.	Symbol & Description	Part No.
SEMICONDUCTORS			
⚠		IC2020 REGULATOR IC	M5298P
		IC2101 PRE AMP IC	CXA1471S
		IC2151 SERVO IC	CXA1372S
⚠		IC2201 POWER OP-AMP, IC	LA6520
⚠		IC2202 POWER OP-AMP, IC	LA6517

Mark	No.	Symbol & Description	Part No.
	IC2301	EFM DEMODULATION IC	CXD2500Q
	IC2351	MICROCOMPUTER, IC	PD4317A
	IC2401		TC9237N
	IC2404	OP-AMP IC	NJM4558D-D
	Q2062	TRANSISTOR	2SC1740S
	Q2101	TRANSISTOR	2SA854S
	Q2381, 2382	TRANSISTOR	2SC1740S
	Q2401	N-FET	2SK246
	D2211	ZENNER DIODE	MTZJ6.2B
	D2301	DIODE	1SS254
	D2381-2383	DIODE	1SS254
	D2401	DIODE	1SS254
	D2701-2703	DIODE	1SS254

COILS/TRANSFORMERS

	L2401	AXIAL INDUCTOR	LAU100K
	L2403, 2404	AXIAL INDUCTOR	LAU100K

CAPACITORS

	C2025-2028	ELECTR. CAPACITOR	CEAS101M10
	C2060	ELECTR. CAPACITOR	CEAS010M50
	C2101	ELECTR. CAPACITOR	CEAS331M6R3
	C2102	ELECTR. CAPACITOR	CEAS101M10
	C2103	CERAMIC CAPACITOR	CCCCH180J50
	C2104	ELECTR. CAPACITOR	CEAS101M10
	C2110	CERAMIC CAPACITOR	CKCYF103Z50
	C2151	ELECTR. CAPACITOR	CEAS101M10
	C2153	ELECTR. CAPACITOR	CEAS101M10
	C2155	MYLOR FILM CAPACITOR	CQMA182J50
	C2156	MYLOR FILM CAPACITOR	CQMA333K50
	C2157	MYLOR FILM CAPACITOR	CQMA103K50
	C2158, 2159	MYLOR FILM CAPACITOR	CQMA104K50
	C2160	ELECTR. CAPACITOR	CEAS4R7M50
	C2161	MYLOR FILM CAPACITOR	CQMA104K50
	C2162	ELECTR. CAPACITOR	CEAS010M50
	C2163	MYLOR FILM CAPACITOR	CQMA104K50
	C2164	MYLOR FILM CAPACITOR	CQMA103K50
	C2167	CERAMIC CAPACITOR	CKCYF103Z50
	C2168	MYLOR FILM CAPACITOR	CQMA333K50
	C2169	MYLOR FILM CAPACITOR	CQMA103K50
	C2170	MYLOR FILM CAPACITOR	CQMA332J50
	C2171, 2172	MYLOR FILM CAPACITOR	CQMA472J50
	C2202	CERAMIC CAPACITOR	CKCYF103Z50
	C2204	CERAMIC CAPACITOR	CKCYF103Z50
	C2212	MYLOR FILM CAPACITOR	CQMA103K50
	C2216, 2217	ELECTR. CAPACITOR	CEAS330M16
	C2301	MYLOR FILM CAPACITOR	CQMA104K50
	C2302	ELECTR. CAPACITOR	CEAS331M6R3
	C2303	ELECTR. CAPACITOR	CEAS330M16
	C2306	CERAMIC CAPACITOR	CKCYB152K50
	C2307	MYLOR FILM CAPACITOR	CQMA473J50
	C2308	MYLOR FILM CAPACITOR	CQMA103K50
	C2309	ELECTR. CAPACITOR	CEASR47M50
	C2351	ELECTR. CAPACITOR	CEAS471M6R3
	C2353	CERAMIC CAPACITOR	CKCYF103Z50
	C2361	CERAMIC CAPACITOR	CKCYF103Z50
	C2403, 2404	CERAMIC CAPACITOR	CCCCH470J50
	C2413	ELECTR. CAPACITOR	CEAS101M10
	C2414	MYLOR FILM CAPACITOR	CQMA103K50
	C2415, 2416	MYLOR FILM CAPACITOR	CQMA104K50
	C2421	CERAMIC CAPACITOR	CKCYF473Z50
	C2429, 2430	CERAMIC CAPACITOR	CCCCH560J50
	C2433, 2434	ELECTR. CAPACITOR	CEAS2R2M50
	C2435-2438	CERAMIC CAPACITOR	CCCCH390J50
	C2441, 2442	MYLOR FILM CAPACITOR	CQMA152J50

RESISTORS

	R2061, 2062	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2101-2110	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2153-2158	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2160	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2201-2206	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2211, 2212	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2221-2224	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2301-2312	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2352-2355	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2368	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2375	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2378	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2381-2383	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2387-2390	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2405	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2427-2430	CARBONFILM RESISTOR	RD1/6PM□□□J
	R2435-2446	CARBONFILM RESISTOR	RD1/6PM□□□J
	VR2102	VR	RCP1035
	VR2103	VR	RCP1027
	VR2151, 2152	VR	RCP1035

OTHERS

	CN2001	CONNECTOR(7P)	KPE7
	CN2002	CONNECTOR(12P)	KPE12
	CN2101	CONNECTOR	52045-1610
	X2351	CERAMIC RESONATOR	VSS1014
	X2401	XTAL RES (OSC)	PSS1006

8. ADJUSTMENTS

8.1 TUNER SECTION

Preparations

- Set the VOLUME control to minimum.
- Set the input selector to TUNER.
- Refer to Fig. 8–3. for adjustment test points and controls.

FM tuner section adjustment

- Select the FM mode with the BAND selector switch.
- Connect as shown in Fig. 8–1.

Step	Adjustment name	FM SG (1 kHz ± 75 kHz dev.)		XR-P310 Reception frequency indication	Adjustment	
		Frequency (MHz)	Level (dB μ)		Adjusting point	Specification
1	Center meter adjustment	98	60	98 MHz	L202	Adjust so that the voltage of both side of R220 becomes 0V ± 50 mV.
2	FM VCO free-run frequency adjustment	98	60 (No modulation)	98 MHz	VR203	Adjust so that the frequency between TP MPX VCO and GND becomes 76±0.5 kHz.
3	Tuning indicator level adjustment	98	17	98 MHz	VR201	Adjust to the point where the tuning indicator just lights down.

AM tuner section adjustment

- AM SG level (dB μ/m) indicates the electric field strength of the loop antenna.
- Select the AM mode with the BAND selector switch.
- Connect as shown in Fig. 8–2.

Step	Adjustment name	AM SG (400 Hz, 30% modulation)		XR-P310 Reception frequency indication	Adjustment	
		Frequency (kHz)	Level (dB μ /m)		Adjusting point	Specification
1	Tuning indicator level adjustment	999	55	999 kHz	VR202	Adjust to the point where the tuning indicator just lights down.

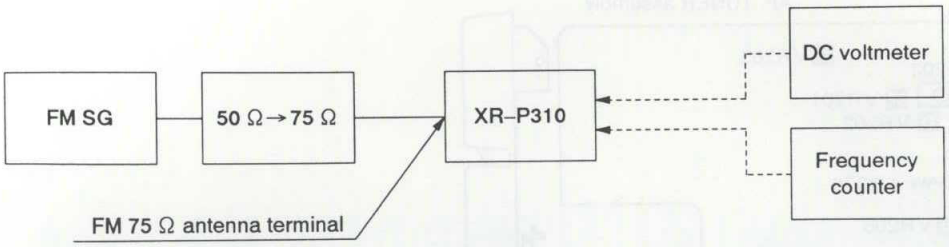


Fig. 8–1. FM Adjustment Connection Diagram

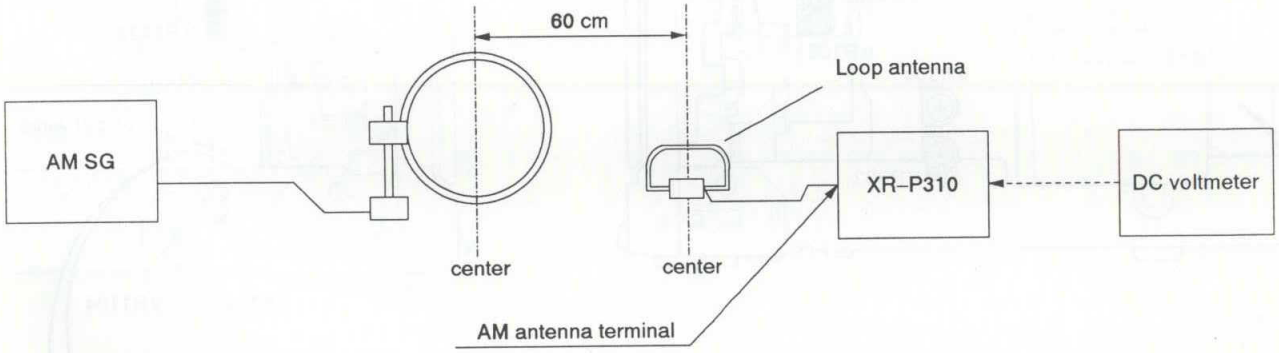


Fig. 8–2. AM Adjustment Connection Diagram

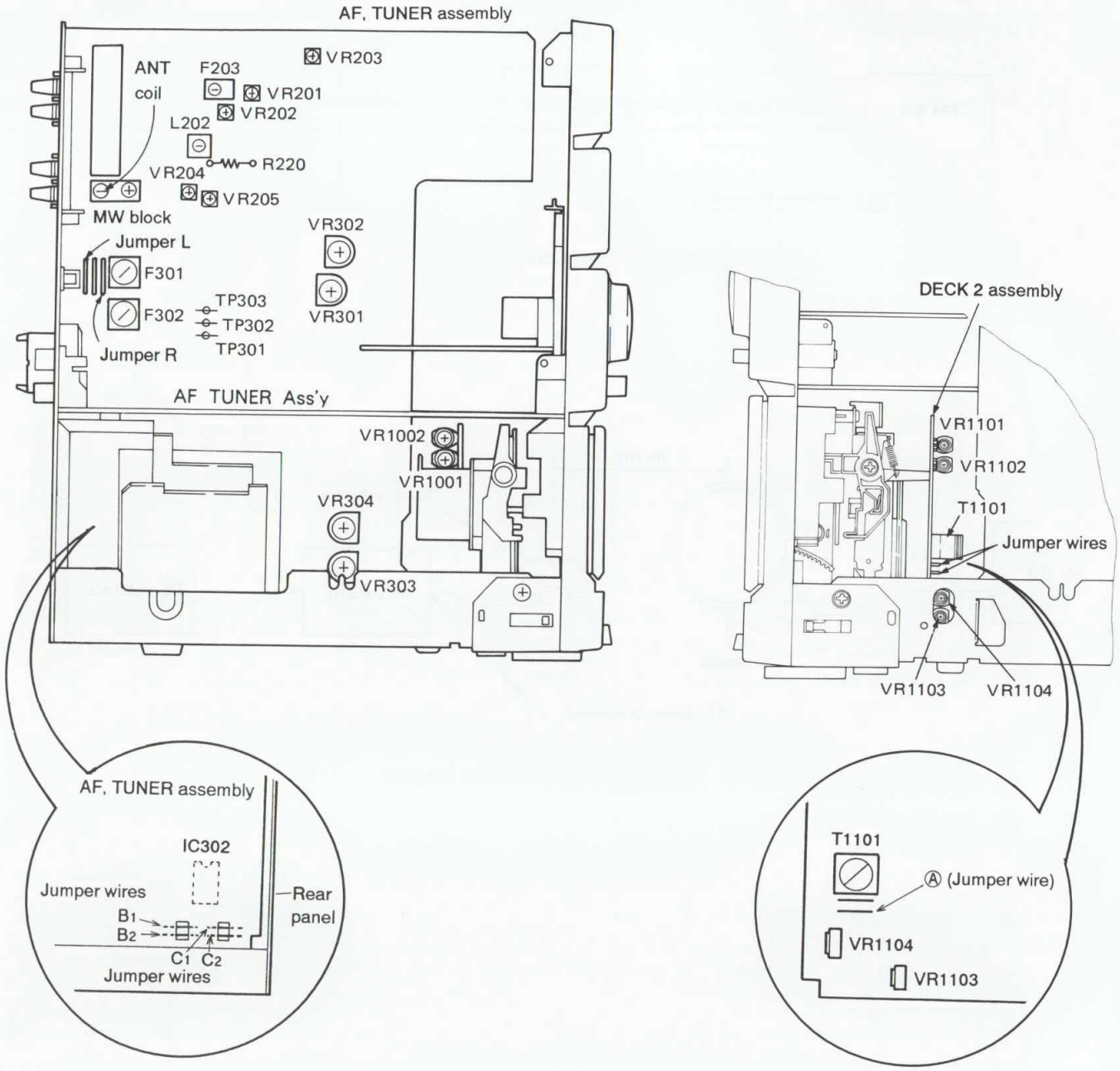


Fig. 8–3. Adjustment Points and Test Points

8.2 TAPE DECK SECTION

• Adjustment points and test points are shown in Fig. 8–3.

● Mechanical Adjustment

• Set the TAPE function.
• Test tape: STD–301 (3 kHz, 30 min.)

1. Tape Speed Adjustment

No.	Mode	Test tape	Adjusting points		Measurement points	Adjustment procedure	Remarks
1	PLAY	STD–301 (playback 3 kHz)	Deck I	AF, TUNER Assembly VR304	TP303 (Rch)	Press the PLAY SW and adjust so that the reading becomes 3010 ± 10 Hz. Confirm that wow & flutter level is below 0.2% (in the reverse direction, confirm that the reading is within 3010 ± 55 Hz).	
2	PLAY		Deck II	AF, TUNER Assembly VR303	TP303 (Rch)	Press the PLAY SW and adjust so that the reading becomes 3010 ± 10 Hz. Confirm that wow & flutter level is below 0.2% (in the reverse direction, confirm that the reading is within 3010 ± 55 Hz).	

● Electrical Adjustment

Check the following before starting.

1. Confirm that tape speed adjustment has been completed.
2. Clean the heads and demagnetize them using a head eraser.
3. Set the measurement level to 0 dBV=1 Vrms.
4. Use the specified tape for adjustment. Use the labeled (A) side of the test tape.
   STD–331B: for playback adjustment
   STD–630: normal blank tape
5. Provide yourself with the following measuring devices:
   AC millivoltmeter, low–frequency oscillator, attenuator, oscilloscope
6. Adjust both right and left channels unless otherwise specified.
7. Turn the DOLBY NR switch off unless otherwise specified.
8. Warm up the unit for several minutes before adjustment. In particular, be sure to warm up the unit in the REC/PLAY mode for 3 to 5 minutes before starting recording/playback frequency characteristics adjustment.
9. Always follow the indicated adjustment order. Otherwise, a complete adjustment may not be achieved.

Playback Adjustment (decks I, II)

1. Head angle adjustment
2. Playback level adjustment

Recording Adjustment (deck II)

1. Bias oscillation frequency check
2. Recording/playback frequency characteristics adjustment
3. Recording level adjustment
4. ALC operation check

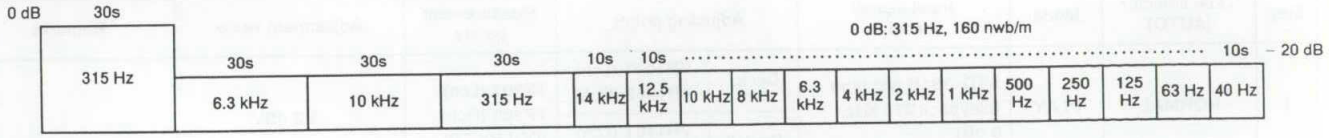


Fig. 8–4. STD–331B Test Tape

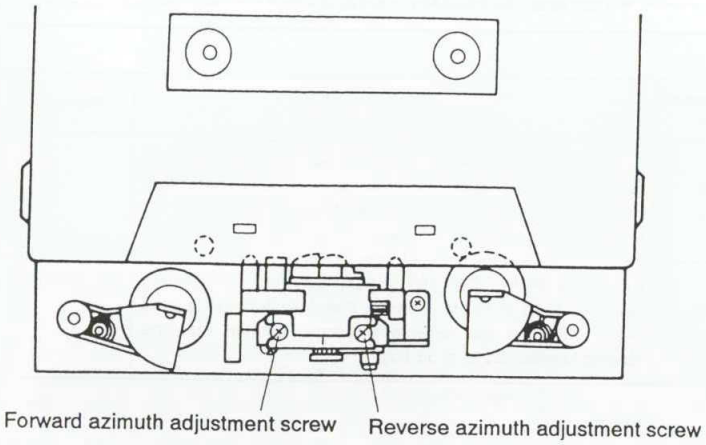


Fig. 8–5. Head Angle Adjustment

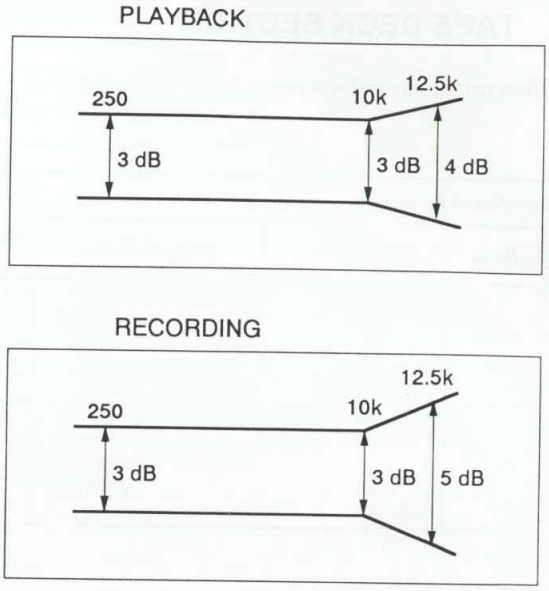


Fig. 8–6. Frequency Characteristics

● Playback Adjustment

1. Head Angle Adjustment

- This unit is equipped with auto tape selector.
- Do not switch between forward and reverse operation with the screwdriver inserted.

Step	Tape selector (AUTO)	Mode	Input signal/ test tape	Adjusting points		Measurement points	Adjustment value	Remarks
1	NORMAL	PLAY	STD–331B test tape (playback 10 kHz, –20 dB)	Deck I	Head angle adjustment screw (Fig. 8–4)	TP301 (Lch) TP303 (Rch) (DOLBY TP)	Max. playback signal level	After adjustment, apply lock paint to the head angle adjustment screw.
				Deck II				

2. Playback Level Adjustment

- Since this adjustment determines playback Dolby NR level, perform it carefully.

Step	Tape selector (AUTO)	Mode	Input signal/ test tape	Adjusting points		Measurement points	Adjustment value	Remarks
1	NORMAL	PLAY	STD–331B test tape (playback 315 kHz, 0 dB)	Deck I	VR1001 (Lch) VR1002 (Rch)	TP301 (Lch) TP303 (Rch) (DOLBY TP)	–5.2 dBV	
				Deck II	VR1101 (Lch) VR1102 (Rch)			

Note: Deck II level also changes when deck I level is adjusted. Therefore, adjust deck I level first.

● Recording Adjustment

Note: To make frequency response of the phone equalizer flat, perform the following adjustment items 2 to 4 with connecting B_1 to B_2 and C_1 to C_2 in Fig. 8–3 respectively.

1. Bias Oscillation Frequency Check

Step	Tape selector (AUTO)	Mode	Input signal/ test tape	Adjusting points		Measurement points	Adjustment value	Remarks
1	NORMAL	REC	Load the STD–630 test tape and set the recording mode.	Deck I		Between the Ⓐ point in Fig. 8–3 and GND	Oscillation frequency to be 106.5 ± 2 kHz with the rear panel beat–cut switch in the "1" position.	Frequency is 2 to 3 kHz lower with the rear panel beat–cut switch in the "2" position.
				Deck II	—			

2. Recording/Playback Frequency Characteristics Adjustment

• Since this adjustment affects recording bias, prevent distortion from increasing due to underbias.

Step	Tape selector (AUTO)	Mode	Input signal/ test tape	Adjusting points		Measurement points	Adjustment value	Remarks
1	NORMAL	REC	Input a 315 Hz signal to the phono terminal and set the input selector to PHONO.	Deck I		TP301 (Lch) TP303 (Rch) (DOLBY TP)	–25.2 dBV	
				Deck II	Input signal level			
2	NORMAL	REC/ PLAY	Load the STD–630 test tape and record/ playback the 315 Hz and 10 kHz signals (see the Note below).	Deck I		TP301 (Lch) TP303(Rch) (DOLBY TP)	Repeat adjustment until playback level of the 10 kHz signal is within 0 ± 0.5 dB from that of the 315 Hz signal.	
				Deck II	VR1103 (Lch) VR1104 (Rch)			

Note: Set to the same level used for the 315 Hz input signal at step 1.

3. Recording Level Adjustment

Step	Tape selector (AUTO)	Mode	Input signal/ test tape	Adjusting points		Measurement points	Adjustment value	Remarks
1	NORMAL	REC	Input a 315 Hz signal to the phono terminal and set the input selector to PHONO.	Deck I	Input signal level	TP301 (Lch) TP303 (Rch) (DOLBY TP)	–5.2 dBV	
				Deck II				
2	NORMAL	REC/ PLAY	STD–630 test tape and record/playback the 315 Hz signal.	Deck I		TP301 (Lch) TP303 (Rch) (DOLBY TP)	Repeat recording, playback and adjustment until playback level of the 315 kHz signal becomes –5.2 dBV.	
				Deck II	VR301 (Lch) VR302 (Rch)			

4. ALC Operation Check

Step	Tape selector (AUTO)	Mode	Input signal/ test tape	Adjusting points	Measurement points	Adjustment value	Remarks
1	NORMAL	REC• PAUSE	Input a 315 Hz signal to the PHONO terminal and set the input selector to PHONO.	Input signal level	TP301 (Lch) TP303 (Rch) (DOLBY TP)	–5.2 dBV	
2				Set to a level +10 dB above the input level at step 1.		–1.2 ± 2.5 dBV	

8.3 CD PLAYER SECTION

Adjustment Methods

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pickup or the circuitry. Adjust correctly following the adjustment procedure.

● Adjustment items/verification items and order

Step	Item	Test point	Adjustment location
1	Focus offset adjustment	TP1, Pin 6 (FCS. ERR)	VR2103 (FCS. OFS)
2	Grating adjustment	TP1, Pin 2 (TRK. ERR)	Grating adjustment slit
3	Tracking error balance adjustment	TP1, Pin 2 (TRK. ERR)	VR2102 (TRK. BAL)
4	Pickup radial/ tangential direction tilt adjustment	TP1, Pin 1 (RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
5	RF level adjustment	TP1, Pin 1 (RF)	VR1 (RF level)
6	Focus servo loop gain adjustment	TP1, Pin 5 (FCS. IN) TP1, Pin 6 (FCS. ERR)	VR2152 (FCS. GAN)
7	Tracking servo loop gain adjustment	TP1, Pin 3 (TRK. IN) TP1, Pin 2 (TRK. ERR)	VR2151 (TRK. GAN)
8	Focus error signal verification	TP1, Pin 6 (FCS. ERR)	———

[Abbreviation table]

FCS. ERR : Focus Error
FCS. OFS : Focus Offset
TRK. ERR : Tracking Error
TRK. BAL : Tracking Balance
FCS. IN : Focus In
TRK. IN : Tracking In

● Measuring instruments and tools

1. Dual trace oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. 12-cm disc (with at least about 70 minutes of recording)
5. Low-pass filter (39 kΩ + 0.001 μF)
6. Resistor (100 kΩ)
7. Hexagonal wrench (M3 mm)
8. Standard tools

● Test point and adjustment variable resistor positions

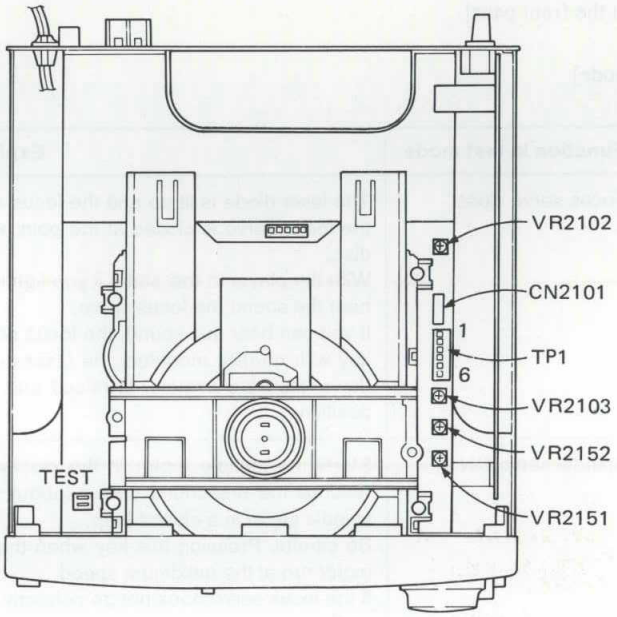


Fig. 8–7 Adjustment Locations

● Notes

1. Use a 10:1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10:1 probe is used.

● Test mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

[Setting these models to test mode]

How to set this model into test mode.

1. Turn off the power switch.
2. Short the test mode jumper wires. (See Fig. 8–7.)
3. Turn on the power switch.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1-3.

[Release from test mode]

Here is the procedure for releasing the test mode:
1. Press the STOP key and stop all operations.
2. Turn off the power switch on the front panel.

[Operations of the keys in test mode]

Code	Key name	Function in test mode	Explanation
	PROGRAM	Focus servo close	The laser diode is lit up and the focus actuator is lowered, then raised slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo. If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled down, then the actuator is raised and lowered twice and returned to its original position.
►	PLAY	Spindle servo ON	Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop. Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed. If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is occurred.
▮▮	PAUSE	Tracking servo close/open	Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal. If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem. This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.
⏮/◄◄	TRACK/ MANUAL SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner periphery of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
►►/⏭	TRACK/ MANUAL SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer periphery of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
■	STOP	Stop	Switches off all the servos and initializes. The pickup remains where it was when this key was pressed.
▲	OPEN/CLOSE	Disc tray open/close	Opens/closes the disc tray. This key is a toggle key and open/close tray alternately. Pressing this key when the disc is turning stops the disc, then opens the tray. This key operation does not affect the position of the pickup.

[How to play back a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.
Here is the key operation sequence for playing back a disc in test mode.

PROGRAM	Lights up the laser diode and closes the focus servo.
⇓	
PLAY ►	Starts the spindle motor and closes the spindle servo.
⇓	
PAUSE ▮▮	Closes the tracking servo.

Wait at least 2-3 seconds between each of these operations.

1. Focus offset adjustment

● Objective ● Symptom when out of adjustment	Sets the DC offset for the focus error amp. The player does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS ERR). [Settings] 5 mV/division 10 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stopped (just the Power switch on) VR2103 (FCS OFS) None needed

[Procedure]

Adjust VR2103 (FCS OFS) so that the DC voltage at TP1, Pin 6 (FCS ERR) is –50 ± 50 mV.

2. Grating adjustment

● Objective ● Symptom when out of adjustment	To align the tracking error generation laser beam spots to the optimum angle on the track Play does not start, track search is impossible, tracks are skipped.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK ERR) via a low pass filter. (See Fig. 8–8) [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open Pickup grating adjustment slit 12 cm disc. (YEDS-7 can not be used.)

[Procedure]

1. Move the pickup to the outer edge of the disc with the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key so that the grating adjustment slit is at the outer edge of the disc where it can be adjusted.
2. Press the PROGRAM key, then the PLAY ▶ key in that order to close the focus servo then the spindle servo.
3. Insert an ordinary screwdriver into the grating adjustment slit and adjust the grating to find the null point. For more details, see the next page.
4. If you slowly turn the screwdriver counterclockwise from the null point, the amplitude of the wave gradually increases, then if you continue turning the screwdriver, the amplitude of the wave becomes smaller again. Turn the screwdriver counterclockwise from the null point and set the grating to the first point where the wave amplitude reaches its maximum.

   Reference: Fig. 8–9 shows the relation between the angle of the tracking beam with the track and the wave form.

   Note: The amplitude of the tracking error signal is about 3 Vp-p (when a 39 kΩ + 0.001 µF low pass filter is used). If this amplitude is extremely small (2 Vp-p or less), the objective lens or the pickup malfunction may be the case. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.
5. Return the pickup to more or less midway across the disc with the TRACK/MANUAL SEARCH REV |◀◀ / ◀◀ key, press the PAUSE ▮▮ key and check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, check the null point and adjust the grating again.

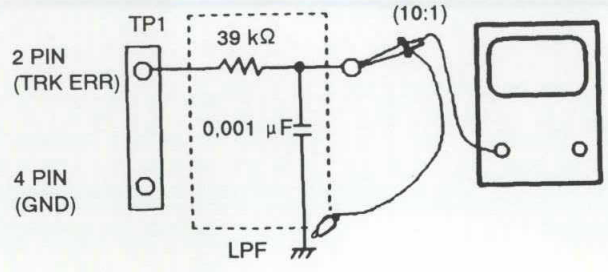
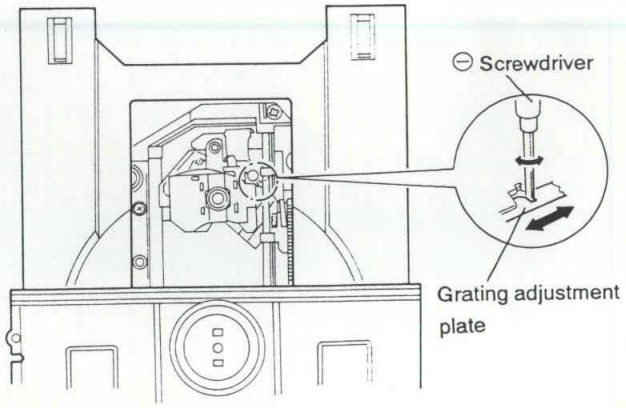


Fig. 8–8



Adjustment Locations

[How to find the null point]

When you insert the regular screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP1 Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which the envelope of the wave form is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Fig. 8–9.)
This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

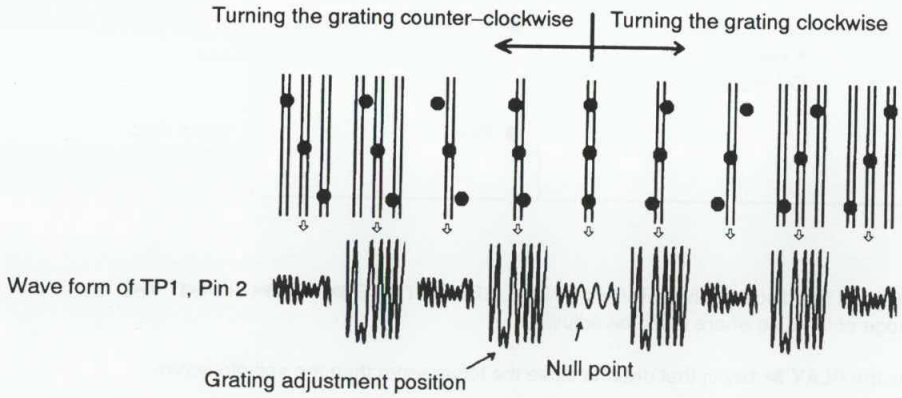
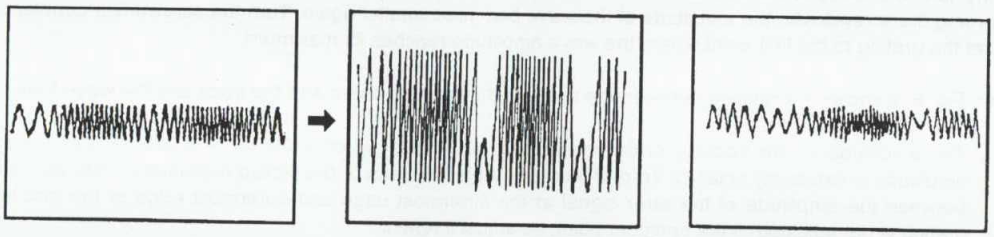


Fig. 8–9

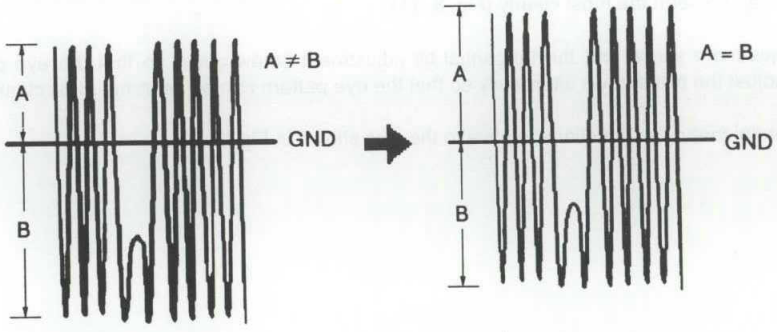


3. Tracking error balance adjustment

● Objective ● Symptom when out of adjustment	To correct for the variation in the sensitivity of the tracking photodiode Play does not start or track search is impossible		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK ERR). This connection may be via a low pass filter. [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open VR2102 (TRK BAL) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key.
2. Press the PROGRAM key, then the PLAY ▶ key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR2102 (TRK BAL) so that positive amplitude and negative amplitude of the tracking error signal at TP1 Pin 2 (TRK ERR) are the same (in other words, so that there is no DC component).



When there is a DC component

When there is no DC component

4. Pickup radial/tangential tilt adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken; some discs can be played but not others.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 20 mV/division 200 ns/division AC mode	● Player state	Test mode, play
		● Adjustment location	Pickup radial tilt adjustment screw and tangential tilt adjustment screw
		● Disc	12 cm disc. (YEDS-7 can not be used.)

[Procedure]

1. Move the pickup to the outer edge of the disc with the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key so that the radial/tangential tilt screws can be adjusted.
   Press the PROGRAM key, the PLAY ▶ key, then the PAUSE ❚❚ key in that order to close the focus servo then the spindle servo and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with an M3 mm hexagonal wrench so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with an M3 mm hexagonal wrench so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Fig. 8–11).
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.

Note: Radial and tangential mean the directions relative to the disc shown in Fig. 8–10.

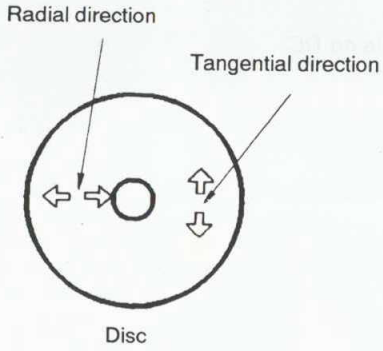
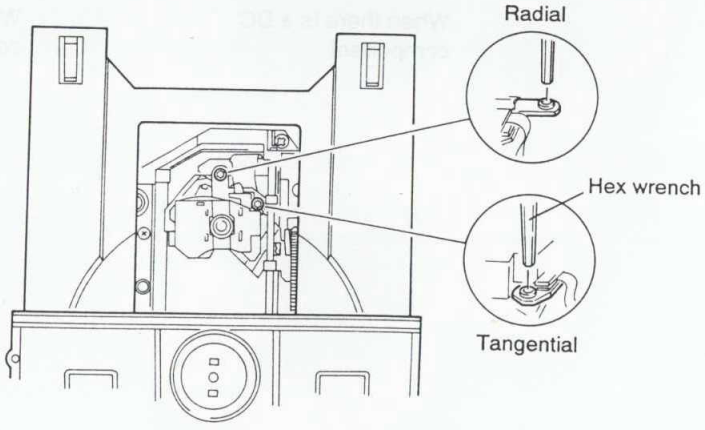


Fig. 8–10



Adjustment Locations

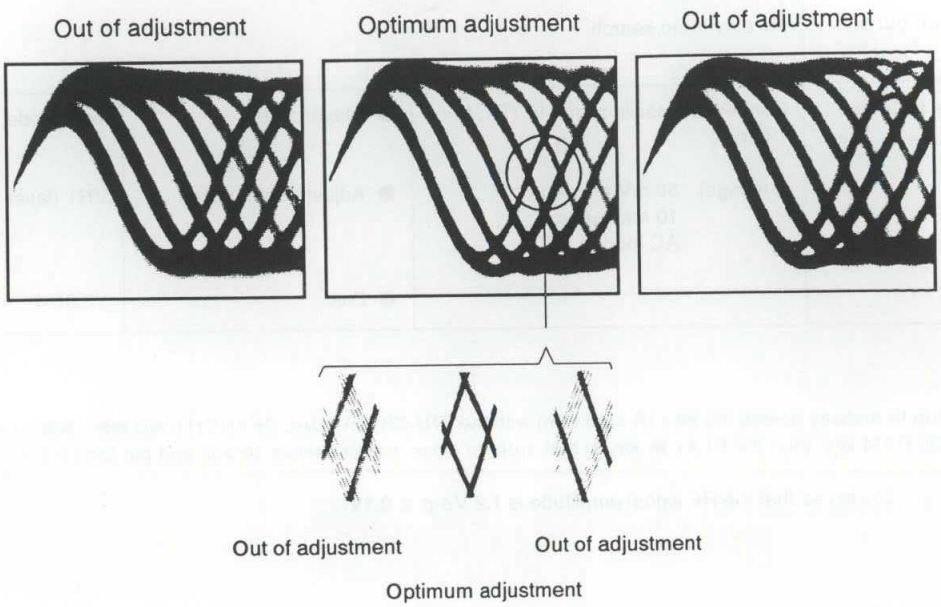


Fig. 8–11 Eye Pattern

5. RF level adjustment

● Objective ● Symptom when out of adjustment	To optimize the playback RF signal amplitude No play or no search		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 50 mV/division 10 ms/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play VR1 (laser power) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key, then press the PROGRAM key, then the PLAY ▶ key in that order to close the respective servos and put the player into play mode.
2. Adjust VR1 (laser power) so that the RF signal amplitude is 1.2 Vp-p ± 0.1V.

6. Focus servo loop gain adjustment

● Objective	To optimize the focus servo loop gain		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy		
● Measurement instrument connections	See Fig. 8–12. [Settings] CH1 20 mV/division CH2 5 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR2152 (FCS GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key to move the pickup to halfway across the disc (R = 35 mm), then press the PROGRAM key, the PLAY ▶ key, then the PAUSE ❚❚ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR2152 (FCS GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

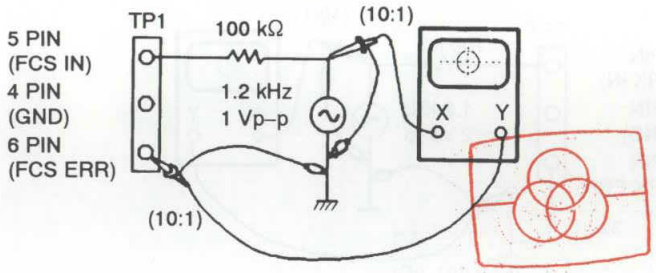
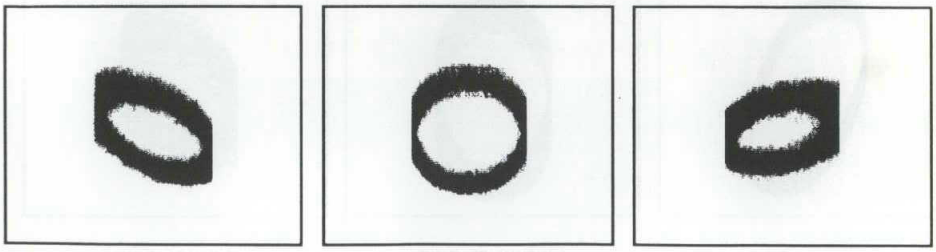


Fig. 8–12

Focus Gain Adjustment



Higher gain | Optimum gain | Lower gain

7. Tracking servo loop gain adjustment

● Objective ● Symptom when out of adjustment	To optimize the tracking servo loop gain Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	See Fig. 8–13. [Settings] CH1 50 mV/division CH2 50 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR2151 (TRK GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 2 Vp-p.
2. Press the TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| or |◀◀ / ◀◀ key to move the pickup to halfway across the disc (R = 35 mm), then press the PROGRAM key, the PLAY ▶ key, then the PAUSE ▮▮ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR2151 (TRK GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

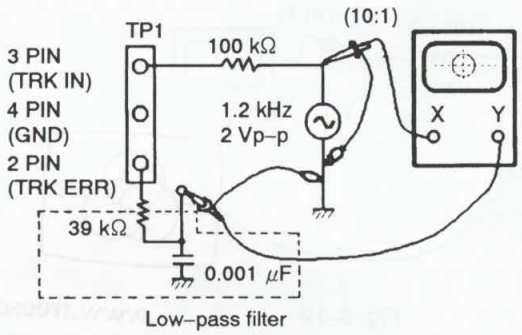
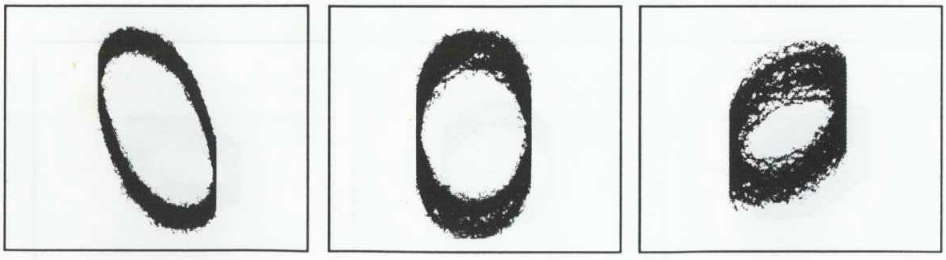


Fig. 8–13

Tracking Gain Adjustment



Higher gain　　Optimum gain　　Lower gain

8. Focus error signal (focus S curve) verification

● Objective ● Symptom when out of adjustment	To judge whether the pickup is ok or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the wave form for the focus error signal.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS ERR). [Settings] 100 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stop None YEDS-7

[Procedure]

1. Connect TP1 Pin 5 to ground.
2. Mount the disc.
3. While watching the oscilloscope screen, press the PROGRAM key and observe the wave form in Fig. 8–14 for a moment. Verify that the amplitude is at least 2.5 Vp-p and that the positive and negative amplitude are about equal. Since the wave form is only output for a moment when the PROGRAM key is pressed, press this key over and over until you have checked the wave form.

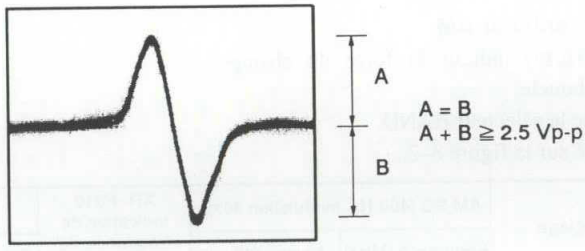


Fig. 8–14

[Judging the pickup]

Do not judge the pickup until all the adjustments have been made correctly. In the following cases, there may be something wrong with the pickup.

1. The tracking error signal amplitude is extremely small (less than 2 Vp-p).
2. The focus error signal amplitude is extremely small (less than 2.5 Vp-p).
3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2:1 ratio or more).
4. The RF signal is too small (less than 0.8 Vp-p) and even if VR1 is adjusted (laser power), the RF signal can not be brought up to the standard level.

8. RÉGLAGES

8.1 PARTIE SYNTONISEUR

Préparatifs

- Régler le VOLUME au minimum.
- Régler le sélecteur d'entrée sur TUNER.
- Pour les réglages des points d'essai et des commandes, se référer à la figure 8–3.

Réglage de la partie syntoniseur FM

- Appeler le mode FM avec le sélecteur BAND.
- Raccorder comme indiqué sur la figure 8–1.

Etape	Dénomination du réglage	FM SG (1 kHz ± 75 kHz dev.)		XR–P310 Indication de fréquence de réception	Réglage	
		Fréquence (MHz)	Niveau (dBμ)		Point de réglage	Spécification
1	Réglage du compteur de centre	98	60	98 MHz	L202	Régler afin que la tension des deux côtés de R220 devienne 0V ± 50 mV.
2	Réglage de fréquence de relaxation de l'OAT FM	98	60 (Absence de modulation)	98 MHz	VR203	Régler afin que la tension entre TP MPX VCO et GND devienne 76 ± 0,5 kHz.
3	Réglage de niveau de l'indicateur d'accord	98	17	98 MHz	VR201	Régler au point où l'indicateur d'accord s'éteint juste.

Réglage de la partie syntoniseur AM

- Le niveau AM SG (dBμ/m) indique la force du champs électrique de l'antenne à boucle.
- Appeler le mode AM avec le sélecteur BAND.
- Raccorder comme indiqué sur la figure 8–2.

Etape	Dénomination du réglage	AM SG (400 Hz, modulation 30%)		XR–P310 Indication de fréquence de réception	Réglage	
		Fréquence (MHz)	Niveau (dB μ)		Point de réglage	Spécification
1	Réglage de niveau d'indicateur d'accord	999	55	999 kHz	VR202	Régler au point où l'indicateur d'accord s'éteint juste.

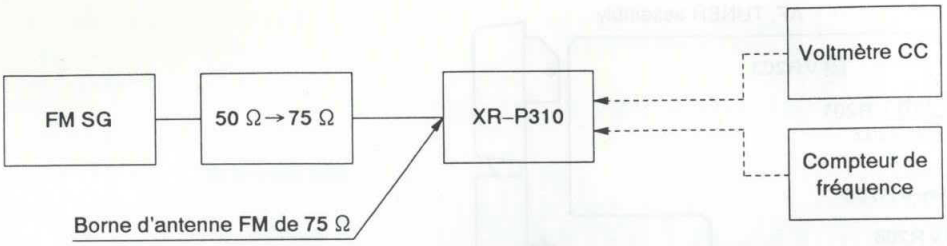


Fig. 8–1. Diagramme de Connexion de Réglage FM

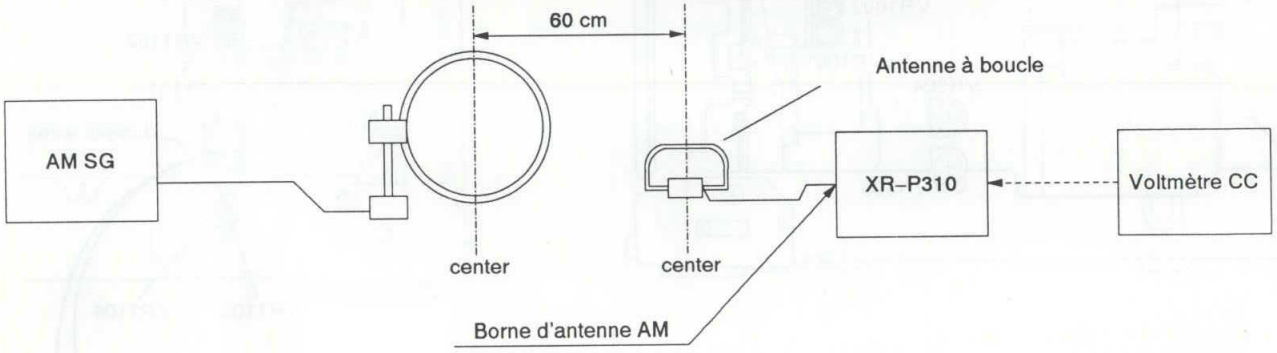


Fig. 8–2. Diagramme de Connexion de Réglage AM

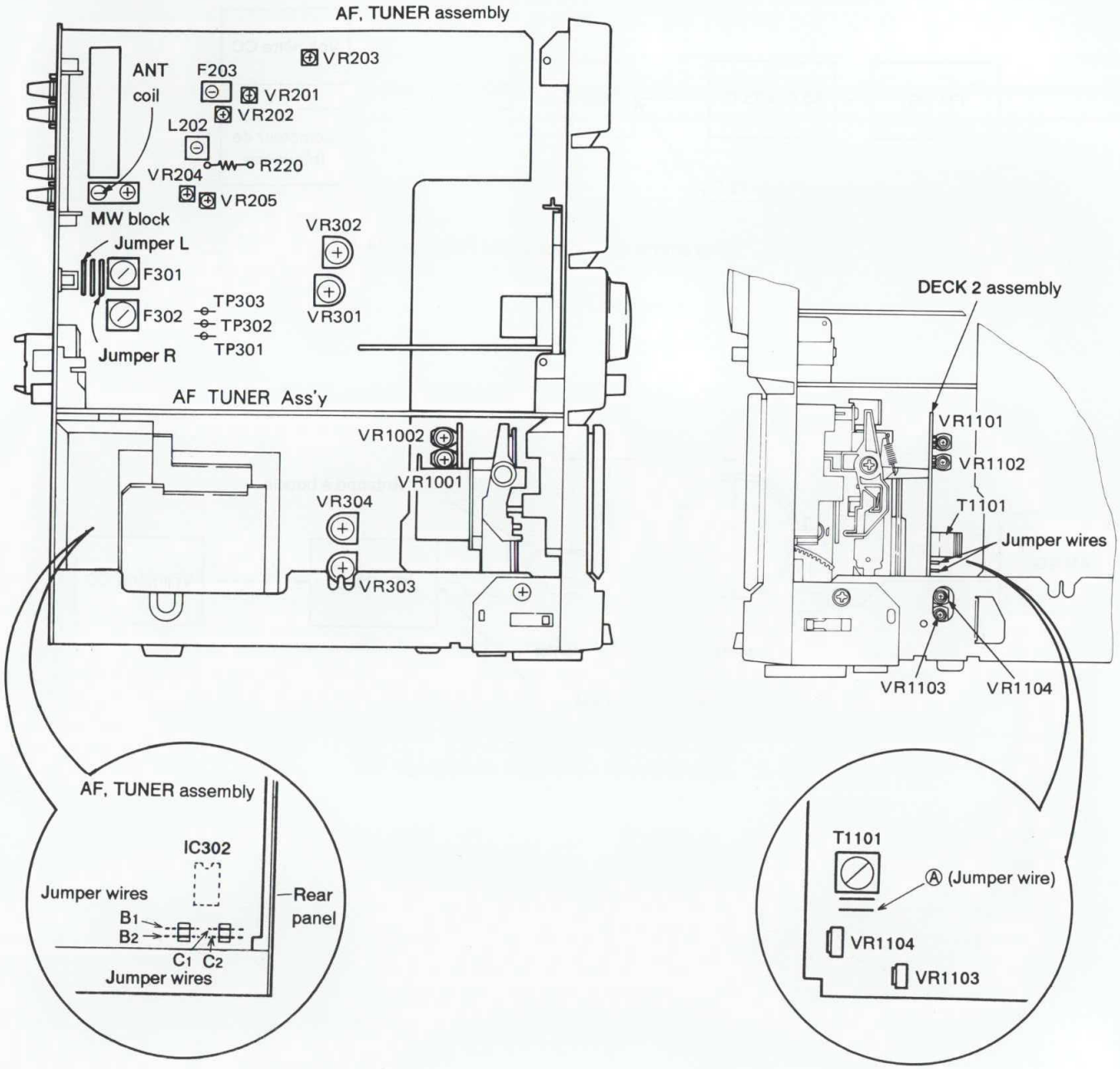


Fig. 8–3. Points de Réglage et Points D'essai

8.2 SECTION MAGNETOCASSETTE

• Les points de réglages et les points d'essais sont représentés à la figure 8–2.

● Réglage Mécanique

• Régler sur la fonction TAPE
• Bande d'essai: STD–301 (3 kHz, 30 mn)

1. Réglage de Vitesse de Bande

No.	Mode	Bande d'essai	Points de réglage		Points de mesure	Procédure de réglage	Remarques
1	PLAY	STD–301 (lecture 3 kHz)	Platine I	Ensemble tuner AF VR304	TP303 (Canal D)	Appuyer sur la touche de lecture PLAY et régler en sorte que la lecture deviennent 3010 ± 10 Hz. Contrôler que le niveau de pleurage est inférieur à 0,2% (dans la direction inverse, contrôler que la lecture est inférieure ou égale à 3010 ± 55 Hz).	
2	PLAY		Platine II	Ensemble tuner AF VR303	TP303 (Canal D)	Appuyer sur la touche de lecture PLAY et régler de sorte que la lecture deviennent 3010 ± 10 Hz. Le niveau de pleurage doit être inférieur à 0,2% (dans la direction inverse, la lecture doit être inférieure ou égale à 3010 ± 55 Hz).	

● Réglage Électrique

Procéder aux contrôles suivants avant le commencement.

1. Contrôler si le réglage de vitesse de bande est bien terminé.
2. Nettoyer les têtes et les démagnétiser avec un démagnétiseur de tête.
3. Régler le niveau de mesure à 0 dBV=1 Vrms
4. Pour le réglage, utiliser la bande recommandée. Utiliser la face étiquetée (A) de la bande d'essai.
   STD–331B: pour le réglage de la lecture
   STD–630: bande vierge normale
5. Se munir des appareils de mesure suivants:
   Millivoltmètre CA, oscillateur basse fréquence, atténuateur, oscilloscope
6. Régler les canaux droit et gauche, à moins qu'il n'en soit précisé autrement.
7. Mettre le commutateur DOLBY NR hors circuit, à moins qu'il n'en soit précisé autrement.
8. Echauffer l'unité quelques minutes avant de procéder au réglage.
   En particulier, échauffer l'unité dans le mode d'enregistrement/lecture REC/PLAY 3 à 5 minutes avant de commencer le réglage des caractéristiques de fréquence d'enregistrement/lecture
9. Procéder toujours selon l'ordre de réglage indiqué. Sinon, le réglage complet peut être impossible à réaliser.

Réglage de Lecture (platines I et II)

1. Réglage d'angle de tête
2. Réglage du niveau de lecture

Réglage D'enregistrement (platine II)

1. Vérification de fréquence d'oscillation de polarisation
2. Réglage des caractéristiques de fréquence d'enregistrement/lecture
3. Réglage du niveau d'enregistrement
4. Contrôle d'opération CAN

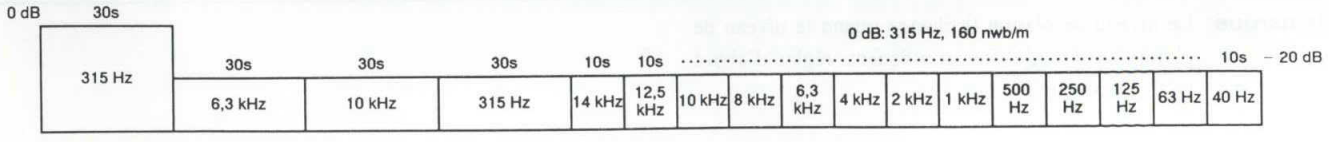


Fig. 8–4. Bande D'essai STD–331B

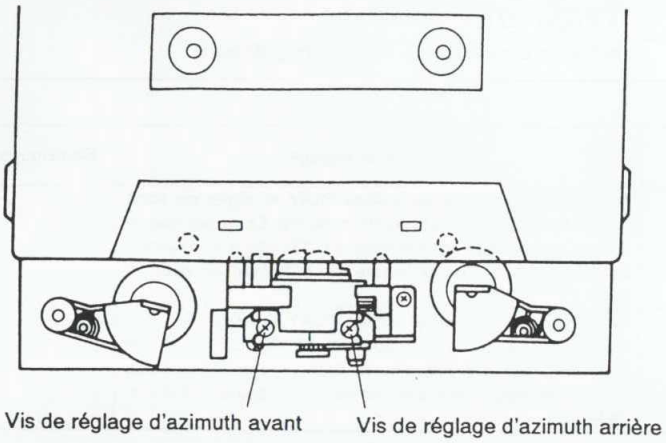


Fig. 8–5. Réglage D'angle de Tête

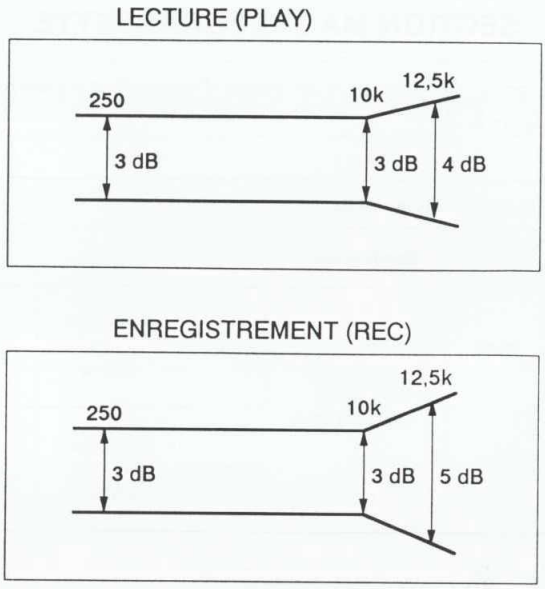


Fig. 8–6. Caractéristiques de Fréquence

● Réglage de Lecture

- Cette unité est équipée d'un sélecteur de bande automatique.
- Ne pas passer du défilement avant au défilement arrière lorsque le tournevis est inséré.

1. Réglage d'angle de tête

Etape	Sélecteur de bande (AUTO)	Mode	Signal d'entrée/bande d'essai	Point de réglage		Points de mesure	Valeur de réglage	Remarques
1	NORMAL	PLAY	Bande d'essai STD–331B (lecture 10 kHz, –20 dB)	Platine I Platine II	Vis de réglage d'angle de tête (Fig. 8–5)	TP301 (Canal G) TP303 (Canal D) (DOLBY TP)	Niveau de signal de lecture maxi.	Après le réglage, appliquer de la peinture de scellement sur la vis de réglage d'angle de tête.

- Comme ce réglage détermine le niveau Dolby NR de lecture, l'effectuer avec soin.

2. Réglage de niveau de lecture

Etape	Sélecteur de bande (AUTO)	Mode	Signal d'entrée/bande d'essai	Point de réglage		Points de mesure	Valeur de réglage	Remarques
1	NORMAL	PLAY	Bande d'essai STD–331B (lecture 315 kHz, 0 dB)	Platine I Platine II	VR1001 (Canal G) VR1002 (Canal D) VR1101 (Canal G) VR1102 (Canal D)	TP301 (Canal G) TP303 (Canal D) (DOLBY TP)	–5,2 dBV	

Remarque: Le niveau de platine II change quand le niveau de platine I est réglé. Par conséquent, régler d'abord le niveau de platine I.

● Réglage D'enregistrement

Remarque: Pour rendre plate la réponse en fréquence de l'égaliseur phono, effectuer les points de réglage 2 à 4 suivants en connectant respectivement B1 à B2 et C1 à C2 (se reporter à la Fig. 8–3).

1. Contrôle de Fréquence D'oscillation de Polarisation

Etape	Sélecteur de bande (AUTO)	Mode	Signal d'entrée/bande d'essai	Point de réglage		Points de mesure	Valeur de réglage	Remarques
1	NORMAL	REC	Charger la bande d'essai STD–630 et appeler le mode d'enregistrement	Platine I		Entre le point (A) représenté sur la figure 8–3 et la mise à la terre	Fréquence d'oscillation devant être 106,5 ± 2 kHz quand le commutateur de coupure de battement sur le panneau arrière est sur la position "1".	La fréquence est 2 ou 3 kHz inférieure quand le commutateur de coupure de battement sur le panneau arrière est sur la position "2".
				Platine II	—			

2. Réglage des Caractéristiques de Fréquence Enregistrement/Lecture

• Comme ce réglage affecte la polarisation d'enregistrement, éviter la distorsion en augmentant à cause de la sous–polarisation.

Etape	Sélecteur de bande (AUTO)	Mode	Signal d'entrée/bande d'essai	Point de réglage		Points de mesure	Valeur de réglage	Remarques
1	NORMAL	REC	Appliquer un signal de 315 Hz à la borne phono et régler le sélecteur d'entrée sur PHONO.	Platine I		TP301 (Canal G) TP303 (Canal D) (DOLBY TP)	–25,2 dBV	
				Platine II	Niveau de signal d'entrée			
2	NORMAL	REC/ PLAY	Charger la bande d'essai STD–630 et enregistrer/lire les signaux 315 Hz et 10 kHz (voir la remarque ci–dessous)	Platine I		TP301 (Canal G) TP303 (Canal D) (DOLBY TP)	Répéter les réglages jusqu'à ce que le niveau de lecture du signal 10 kHz soit inférieur à 0 ± 0,5 dB de celui du signal 315 Hz.	
				Platine II	VR1103 (Canal G) VR1104 (Canal D)			

Remarque: Régler le même niveau utilisé pour le signal d'entrée de 315 Hz à l'étape 1.

3. Réglage du Niveau D'enregistrement

Etape	Sélecteur de bande (AUTO)	Mode	Signal d'entrée/bande d'essai	Point de réglage		Points de mesure	Valeur de réglage	Remarques
1	NORMAL	REC	Appliquer un signal de 315 Hz à la borne phono et régler le sélecteur d'entrée sur PHONO.	Platine I	Niveau de signal d'entrée (REC)	TP301 (Canal G) TP303 (Canal D) (DOLBY TP)	–5,2 dBV	
				Platine II				
2	NORMAL	REC/ PLAY	Bande d'essai STD–630 (enregistrement et lecture 315 Hz)	Platine I		TP301 (Canal G) TP303 (Canal D) (DOLBY TP)	Répéter l'enregistrement, la lecture et le réglage jusqu'à ce que le niveau de lecture du signal de 315 Hz devienne –5,2 dBV.	
				Platine II	VR301 (Canal G) VR302 (Canal D)			

4. Contrôle de L'opération CAN

Etape	Sélecteur de bande (AUTO)	Mode	Signal d'entrée/bande d'essai	Point de réglage	Points de mesure	Valeur de réglage	Remarques
1	NORMAL	REC• PAUSE	Appliquer un signal de 315 Hz à la borne PHONO et régler le sélecteur d'entrée sur PHONO.	Niveau de signal d'entrée	TP301 (Canal G) TP303 (Canal D) (DOLBY TP)	–5,2 dBV	
2				Régler à un niveau de 10 dB au–dessus du niveau d'entrée à l'étape 1.		–1,2 ± 2,5 dBV	

8.3 SECTION LECTEUR CD

Méthodes de réglage

Si le lecteur CD est mal réglé, il risque de ne plus fonctionner normalement, voire ne plus fonctionner du tout, même si le capteur et la circuiterie en présentent aucune anomalie. Par conséquent, ajuster le lecteur correctement en suivant les démarches de réglage.

● Points de réglage/Point et ordre de vérification

Etape	Point	Point d'essai	Emplacement du réglage
1	Réglage du décalage de la mise au point	TP1, Broche 6 (FCS. ERR)	VR2103 (FCS. OFS)
2	Réglage du réseau de diffraction	TP1, Broche 2 (TRK. ERR)	Fente de réglage du réseau de diffraction
3	Réglage d'équilibrage d'erreur d'alignement	TP1, Broche 2 (TRK. ERR)	VR2102 (TRK. BAL)
4	Réglage d'inclinaison radiale/tangentielle du capteur	TP1, Broche 1 (RF)	Vis de réglage d'inclinaison radiale, Vis de réglage d'inclinaison tangentielle
5	Réglage du niveau RF	TP1, Broche 1 (RF)	VR1 (niveau RF)
6	Réglage de gain de boucle asservie de la mise au point	TP1, Broche 5 (FCS. IN) TP1, Broche 6 (FCS. ERR)	VR2152 (FCS. GAN)
7	Réglage de gain de boucle asservie de l'alignement	TP1, Broche 3 (TRK. IN) TP1, Broche 2 (TRK. ERR)	VR2151 (TRK. GAN)
8	Vérification du signal d'erreur de la mise au point	TP1, Broche 6 (FCS. ERR)	———

[Tableau des abbréviations]

FCS. ERR : erreur de mise au point
FCS. OFS : décalage de mise au point
TRK. ERR : erreur d'alignement
TRK. BAL : équilibrage d'erreur d'alignement
FCS. IN : mise au point correcte
TRK. IN : alignement correct

● Intruments de mesure et outils

1. Oscilloscope cathodique à deux faisceaux (sonde 10:1)
2. Oscillateur de basse fréquence
3. Disque d'essai (YEDS-7)
4. Disque de 12 cm (avec au moins 70 minutes d'enregistrement)
5. Filtre passe-bas (39 kΩ + 0,001 μF)
6. Résistance (100 kΩ)
7. Clé hexagonale (M3 mm)
8. Outils conventionnels

● Point d'essai et positions de réglage de la résistance variable

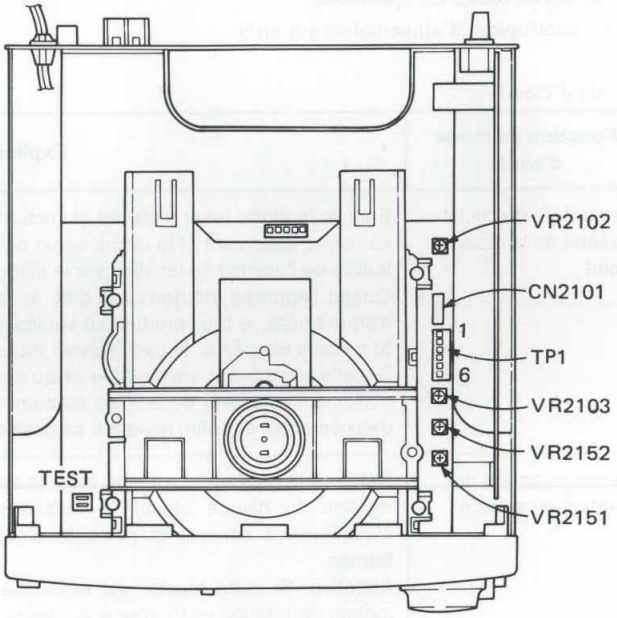


Fig. 8–7. Emplacement des Réglages

● Remarques

1. Utiliser une sonde 10:1 pour l'oscilloscope.
2. Toutes les positions (réglages) des boutons de l'oscilloscope, dans les démarches de réglage, sont conçues pour l'usage d'une sonde 10:1.

● Mode d'essai

Ces modèles sont munis d'un mode d'essai, de façon que les réglages requis à la réparation puissent être effectués aisément. Quand ces modèles sont en mode d'essai, les touches du panneau avant ne fonctionnent pas comme à l'ordinaire. Les réglages et les vérifications peuvent s'effectuer par l'enclenchement de ces touches, à conditions de suivre les démarches requises. Dans le cas de ces modèles, tous les réglages sont réalisés en mode d'essai.

[Mise en mode d'essai]

Voici la manière de mettre le modèle en mode d'essai.

1. Commuter l'interrupteur d'alimentation sur arrêt.
2. Court-circuiter les fils de liaison du mode d'essai. (voir Fig. 8–7.)
3. Commuter l'interrupteur d'alimentation sur marche.

Quand le mode d'essai est correctement réglé, l'affichage est différent de celui qui apparaît généralement à la mise sous tension. Si l'affichage reste le même, le mode d'essai n'a pas été réglé correctement. Dans ce cas, répéter les étapes 1 à 3.

[Pour sortir du mode d'essai]

Voici la procédure pour sortir du mode d'essai.

1. Appuyer sur la touche STOP pour arrêter toutes les opérations.
2. Sur le panneau avant, commuter l'interrupteur d'alimentation sur arrêt.

[Fonctionnement des touches en mode d'essai]

Code	Nom de la touche	Fonction en mode d'essai	Explications
	PROGRAM	Fermeture du circuit asservi de la mise au point	Ensuite la diode laser s'allume et l'actuateur de la mise au point s'abaisse, puis se relève lentement et le circuit servo de la mise au point se ferme au point où la lentille de l'objectif se focalise sur le disque. Quand l'appareil est dans cet état, si l'on fait légèrement tourner à la main le disque arrêté, le bruit produit par le circuit servo de la mise au point sera audible. Si ce bruit est perçu, le circuit servo de la mise au point fonctionne correctement. Si cette touche est enclenchée et qu'aucun disque n'est installé, la diode laser s'allume, l'actuateur de la mise au point s'abaisse, se relève, puis s'abaisse une deuxième fois et enfin, revient à sa position de départ.
►	PLAY	Asservissement de rotation en service	Démarre le moteur de rotation dans le sens des aiguilles d'une montre, quand la rotation du disque atteint la vitesse prescrite (environ 500 tours/min à la circonférence interne) et place le circuit servo de rotation dans une boucle fermée. Attention. Si cette touche est enfoncée et qu'un disque n'est pas installé, le moteur de rotation va tourner á la vitesse maximum. Si le circuit servo de la mise au point ne passe pas comme prévu dans une boucle fermée ou que la diode laser brille dans le miroir à la périphérie externe du disque, le même symptôme se produit.
▮▮	PAUSE	Ouverture/Fermeture du circuit servo de l'alignement	Le fait d'appuyer sur cette touche quand le circuit servo de la mise au point et de la rotation fonctionnent correctement en boucles fermées, place le circuit servo de l'alignement dans une boucle fermée, fait apparaître, sur le panneau avant, le numéro de la piste en cours de lecture et la durée écoulée, puis sort le signal de lecture. Si la durée écoulée n'est pas affichée ou n'est pas correctement calculée, ou si la reproduction sonore est anormale, il se peut que la diode laser s'active dans la section dépourvue de signaux enregistrés, au bord externe du disque, qu'un ajustement quelconque soit déréglé, ou qu'un autre problème se manifeste. Cette touche est de type à bascule et ouvre/ferme alternativement le circuit servo de l'alignement. Cette touche est inopérante si un disque n'est pas installé.
⏮/◄◄	TRACK/ MANUAL SEARCH REV	Inversion du chariot (vers l'intérieur)	Déplace le capteur vers la périphérie interne du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en boucle fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
►►/⏭	TRACK/ MANUAL SEARCH FWD	Inversion du chariot (vers l'extérieur)	Déplace le capteur vers la périphérie externe du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en boucle fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
■	STOP	Arrêt	Met tous les circuits servo hors service et les initialise. Le capteur reste là où il était quand cette touche a été enclenchée.
▲	OPEN/CLOSE	Ouverture/Fermeture	Cette touche est de type à bascule et ouvre/ferme alternativement le plateau. Le fait d'enfoncer cette touche quand le plateau est ouvert le ferme et vice versa. Le fait d'appuyer sur cette touche quand le disque tourne arrête la rotation et ouvre le plateau. La fonction de cette touche n'a aucun effet sur la position du capteur.

[Lecture de disque en mode d'essai]

En mode d'essai, comme les circuits servo fonctionnent de manière indépendante, la lecture d'un disque exige que les touches soient enclenchées dans l'ordre prescrit, afin de fermer les circuits servo.
Voici l'ordre d'enclenchement des touches pour reproduire un disque en mode d'essai.

PROGRAM	Allume la diode laser et ferme le circuit servo de la mise au point.
⇓	
PLAY ▶	Démarre le moteur de rotation et ferme le circuit servo de la rotation.
⇓	
PAUSE ▮▮	Ferme le circuit servo de l'alignement.

Attendre 2 à 3 secondes entre chaque opération.

1. Réglage du décalage de la mise au point

● Objectif ● Symptôme quand déréglé	Règle le décalage CC de l'amplificateur d'erreur de mise au point. Le lecteur ne procède plus à la mise au point et le signal RF n'est pas clair.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 6 (FCS ERR). [Réglages] 5 mV/division 10 ms/division mode CC	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, arrêté (juste l'interrupteur d'alimentation commuté sur marche) VR2103 (FCS OFS) Aucun requis

[Marche à suivre]

Ajuster VR2103 (FCS OFS) de façon que la tension à TP1 broche 6 (FCS ERR) soit −50 ± 50 mV.

2. Réglage du réseau de diffraction

● Objectif	Pour aligner les points du rayon laser producteur d'erreur d'alignement sur l'angle optimum de la piste		
● Symptôme quand déréglé	La lecture ne commence pas, la recherche de piste est impossible, les pistes sont sautées.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK ERR) via un filtre passe-bas. (Voir Fig. 8–8)	● Etat du lecteur	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert
	[Réglages] 50 mV/division 5 ms/division mode CC	● Emplacement du réglage	Fente de réglage du réseau de diffraction du capteur
		● Disque	Disque de 12 cm. (Il est impossible d'employer le disque YEDS-7).

[Marche à suivre]

1. Déplacer le capteur sur le bord externe du disque par la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou la touche |◀◀ / ◀◀, de façon que la fente de réglage du réseau de diffraction se situe sur bord extérieur du disque, où elle peut être réglée.
2. Appuyer sur la touche PROGRAM, puis sur la touche PLAY ▶, dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Insérer un tournevis ordinaire dans le réseau de diffraction pour trouver le point zéro. Pour plus de détails, voir page suivante.
4. Si l'on tourne lentement le tournevis dans le sens contraire des aiguilles d'une montre à partir du point zéro, l'amplitude de l'onde augmente graduellement et si l'on continue à tourner le tournevis, l'amplitude de l'onde diminue de nouveau. Tourner le tournevis dans le sens contraire des aiguilles d'une montre à partir du point zéro et régler le réseau de diffraction au premier point où l'amplitude de l'onde atteint son maximum.

   Référence: La Fig. 8–9. illustre la relation entre l'angle du faisceau de l'alignement et la piste et la forme d'onde.

   Remarque: L'amplitude du signal d'erreur d'alignement se situe aux environs de 3 Vc-c (quand un filtre passe-bas de 39 kΩ + 0,001 µF est utilisé). Si cette amplitude est extrêmement petite (2 Vc-c ou moins), la lentille de l'objectif ou le capteur risque de mal fonctionner. Si la différence entre l'amplitude du signal d'erreur au bord le plus intérieur et au bord le plus extérieur du disque est supérieure à 10%, ceci signifie que le réseau de diffraction n'est pas réglé à son point optimum. Dans ce cas, recommencer le réglage.
5. Replacer le capteur plus ou moins à mi-chemin sur le disque par la touche TRACK/ MANUAL SEARCH REV |◀◀ / ◀◀, appuyer sur la touche PAUSE ▮▮ et vérifier que le numéro de piste et la durée écoulée sont affichés sur le panneau avant. Si ces paramètres n'apparaissent pas ce moment, ou que la durée écoulée change de manière irrégulière, vérifier le point zéro et recommencer le réglage du réseau de diffraction.

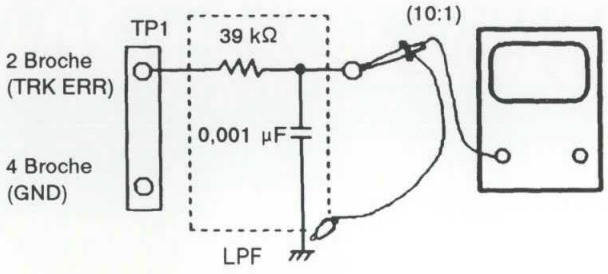
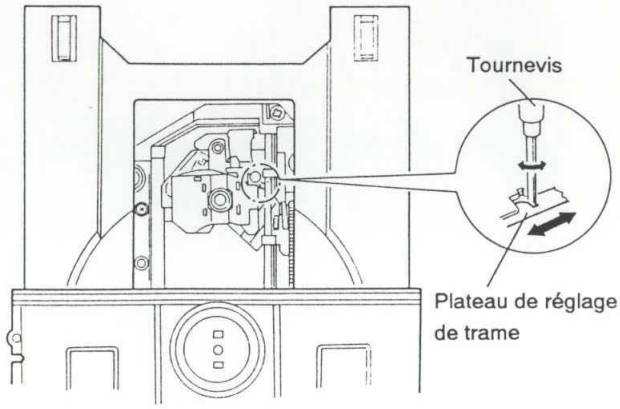


Fig. 8–8.



Emplacement des Réglages

[Repérage du point zéro]

Quand le tournevis est introduit dans la fente de réglage du réseau de diffraction et que l'angle du réseau de diffraction est modifié, l'amplitude du signal d'erreur d'alignement à TP1, broche 2, change. Dans les limites de la plage du réseau de diffraction, il existe six emplacements où l'amplitude de l'onde atteint le minimum. Mais l'enveloppe de la forme d'onde n'est régulière qu'à un seul de ces emplacements. Ce point se situe à l'endroit où les trois rayons laser, divisés par le réseau de diffraction, se situent exactement sur la même piste (voir Fig. 8–9).
Ce point s'appelle le point zéro. Lors du réglage du réseau de diffraction, ce point zéro est repéré et utilisé comme position de référence.

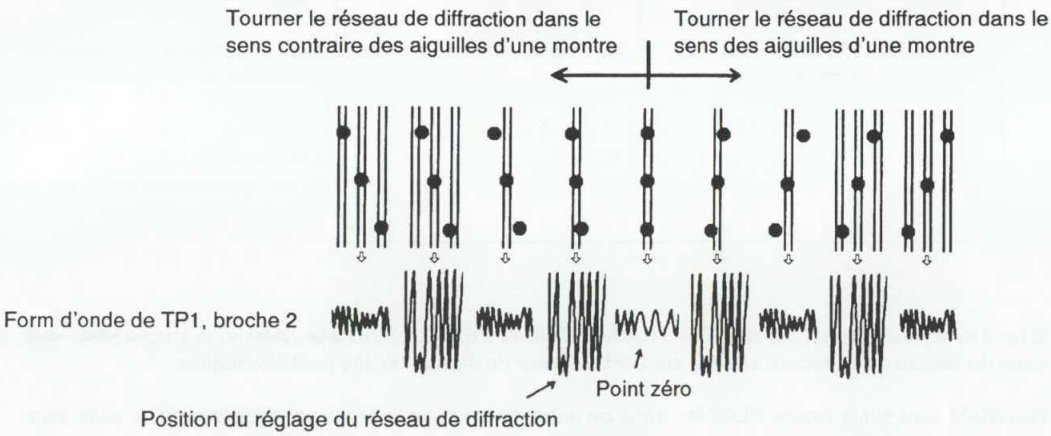
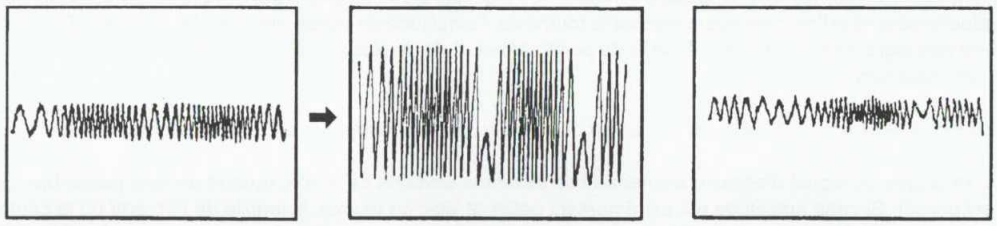


Fig. 8–9.



Forme d'onde du point zéro

Forme d'onde d'amplitude maximum

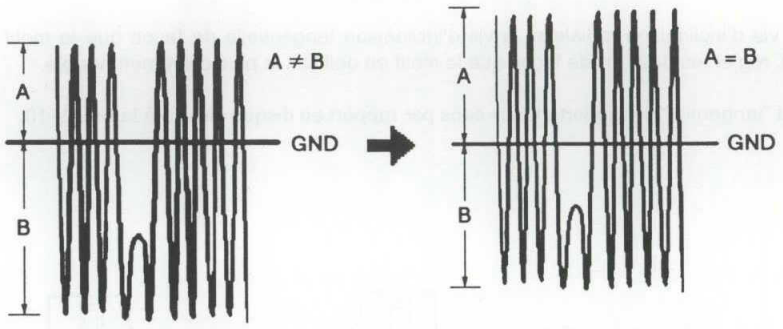
Forme d'onde autre que du point zéro

3. Réglage d'équilibrage d'erreur d'alignement

● Objectif ● Symptôme quand déréglé	Pour corriger la variation de sensibilité de la photodiode d'alignement La lecture ne commence pas, la recherche de piste est impossible.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK ERR). [Réglages] 50 mV/division 5 ms/division mode CC	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert VR2102 (TRK BAL) YEDS-7

[Marche à suivre]

1. Déplacer le capteur à mi-chemin sur le disque (R = 35 mm) par la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou |◀◀ / ◀◀.
2. Appuyer sur la touche PROGRAM, puis sur la touche PLAY ▶, dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Aligner la ligne lumineuse (masse) au centre de l'écran de l'oscilloscope et placer celui-ci en mode CC.
4. Ajuster VR2102 (TRK BAL) de façon que l'amplitude positive et l'amplitude négative du signal d'erreur d'alignement à TP1, broche 2 (TRK ERR) soient identiques (c'est-à-dire, qu'il n'y ait aucun composant CC).



S'il y a un composant CC　　S'il n'y a pas de composant CC

4. Réglage d'inclinaison radiale/tangentielle du capteur

● Objectif	Pour régler l'angle du capteur par rapport au disque, de façon que les rayons laser frappent verticalement le disque et permettre ainsi la lecture optimum des signaux RF.		
● Symptôme quand déréglé	Son interrompu; certains disques peuvent être lus et pas d'autres.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF). [Réglages] 20 mV/division 200 ns/division mode CA	● Etat du lecteur	Mode d'essai, lecture
		● Emplacement du réglage	Vis de réglage d'inclinaison radiale Vis de réglage d'inclinaison tangentielle
		● Disque	Disque de 12 cm. (Il est impossible d'employer le disque YEDS-7).

[Marche à suivre]

1. Déplacer le capteur sur le bord externe du disque par la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou |◀◀ / ◀◀, de façon que les vis de réglage d'inclinaison radiale et tangentielle puissent être réglées.

   Appuyer sur la touche PROGRAM, PLAY ▶ et PAUSE ▮▮ dans cet ordre, afin de fermer le circuit servo de la mise au point, puis celui de la rotation et placer le lecteur en mode de lecture.

2. D'abord, ajuster la vis d'inclinaison radiale à l'aide d'une clé hexagonale M de 3 mm, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible.

3. Ensuite, ajuster la vis d'inclinaison tangentielle à l'aide d'une clé hexagonale M de 3 mm, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible (Fig. 8–11.).

4. Ajuster de nouvear la vis d'inclinaison radiale et la vis d'inclinaison tangentielle de façon que le motif en oeil soit le plus clairement visible. Le cas échéant, régler les deux vis de façon que le motif en oeil soit le plus clairement visible.

   Remarque: "Radial" et "tangentiel" se rapportent aux sens par rapport au disque illustré à la Fig. 8–10.

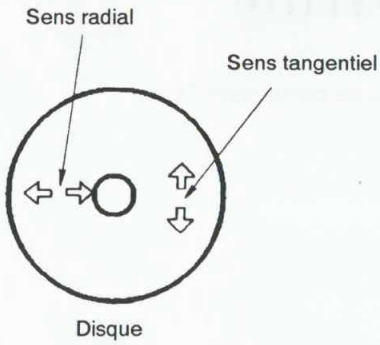
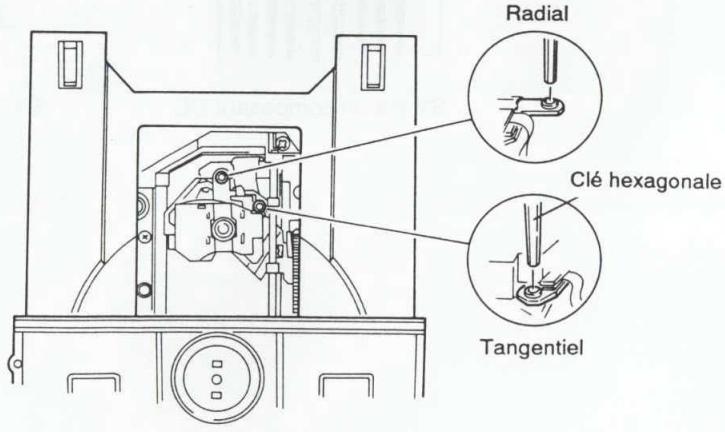


Fig. 8–10.



Emplacements des Réglages

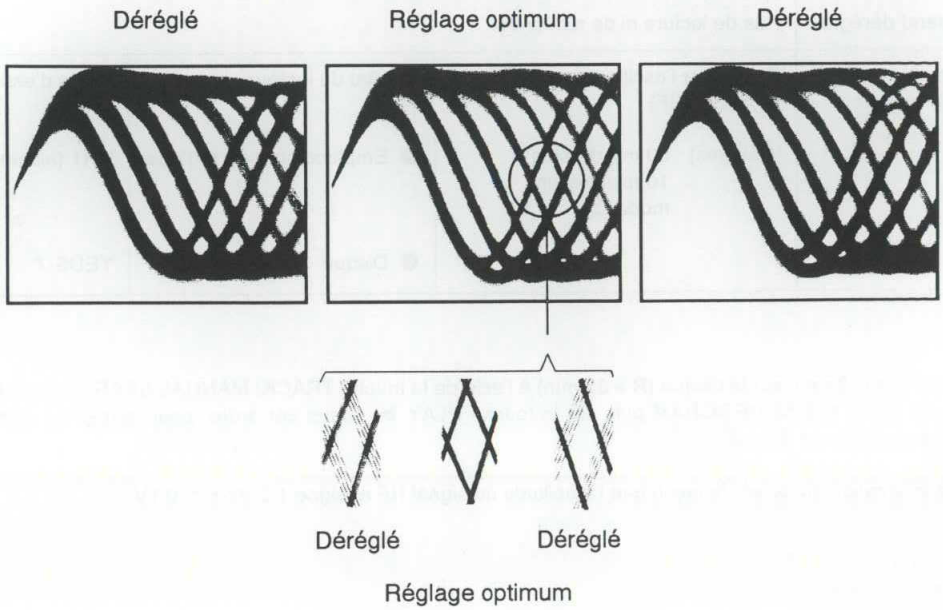


Fig. 8–11. Motif en oeil

5. Réglage du niveau RF (niveau RF)

● Objectif ● Symptôme quand déréglé	Pour optimaliser l'amplitude du signal RF de lecture Pas de lecture ni de recherche		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF) [Rélages] 50 mV/division 10 ms/division mode CA	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture VR1 (alimentation du laser) YEDS-7

[Marche à suivre]

1. Placer le capteur à mi-chemin sur le disque (R = 35 mm) à l'aide de la touche TRACK/ MANUAL SEARCH FWD ▶▶ /▶▶| ou |◀◀ /◀◀. Ensuite, appuyer sur la touche PROGRAM puis sur la touche PLAY ▶, dans cet ordre, pour fermer les circuits servo respectifs et mettre le lecteur en mode de lecteur.
2. Ajuster VR1 (alimentation du laser) de façon que l'amplitude du signal RF atteigne 1,2 Vc-c ± 0,1V.

6. Réglage de gain de boucle asservie de la mise au point

● Objectif	Pour optimaliser le gain de la boucle d'asservissement de la mise au point.		
● Symptôme quand déréglé	La lecture ne commence pas ou l'actuateur de la mise au point est parasité.		
● Raccordement des instruments de mesure	Voir Fig. 8–12 [Réglages] CAN. 1 CAN. 2 20 mV/division 5 mV/division Mode X-Y	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture VR2152 (FCS GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 Vc-c.
2. Appuyer sur la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou la touche |◀◀ / ◀◀ pour placer le capteur à mi-chemin sur le disque (R = 35 mm). Ensuite, appuyer sur la touche PROGRAM, la touche PLAY ▶, puis sur la touche PAUSE ▮▮, dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture.
3. Ajuster VR2152 (FSC GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

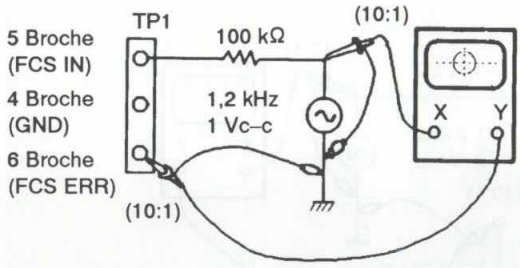
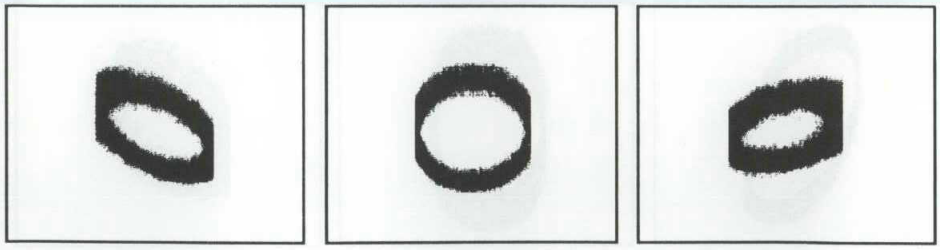


Fig. 8–12.

Adjustment de gain de mise au point



Gain supérieur | Gain optimum | Gain inférieur

7. Réglage de gain de boucle asservie de l'alignement

● Objectif	Pour optimaliser le gain de la boucle d'asservissement de l'alignement.		
● Symptôme quand déréglé	La lecture ne commence pas, l'actuateur est parasité pendant la recherche, ou des pistes sont sautées.		
● Raccordement des instruments de mesure	Voir Fig. 8–13 [Réglages] CAN. 1 CAN. 2 50 mV/division 50 mV/division Mode X-Y	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture VR2151 (TRK GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 Vc-c.
2. Appuyer sur la touche TRACK/ MANUAL SEARCH FWD ▶▶ / ▶▶| ou la touche |◀◀ / ◀◀ pour placer le capteur à mi-chemin sur le disque (R = 35 mm). Ensuite, appuyer sur la touche PROGRAM, la touche PLAY ▶, puis sur la touche PAUSE ▮▮, dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture.
3. Ajuster VR2151 (TRK GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

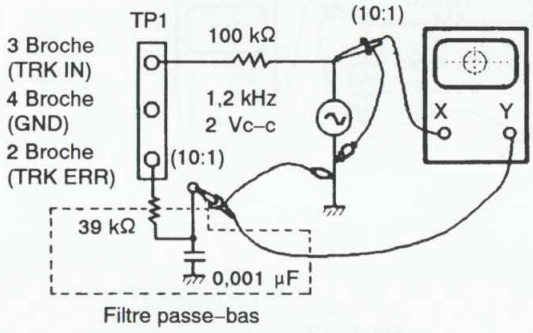
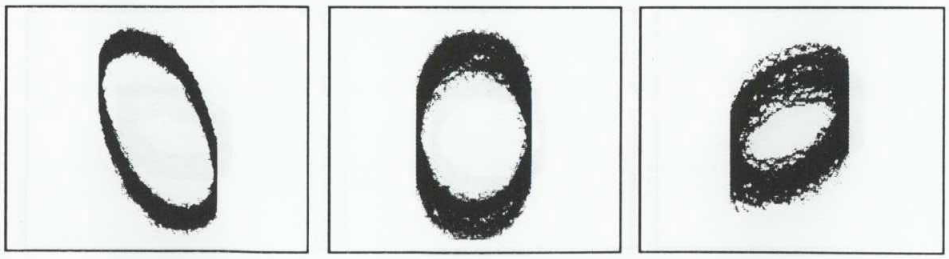


Fig. 8–13.

Adjustment de gain d'alignement



Gain supérieur | Gain optimum | Gain inférieur

8. Vérification du signal d'erreur de la mise au point

● Objectif ● Symptôme quand déréglé	Pour juger si le capteur est bon ou pas, en observant le signal d'erreur de la mise au point. L'état du capteur s'évalue à partir de l'amplitude du signal d'erreur d'alignement (comme décrit dans le paragraphe relatif à l'équilibrage d'erreur d'alignement), ainsi qu'à partir de la forme d'onde du signal d'erreur de mise au point.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 6 (FCS ERR). [Réglages] 100 mV/division 5 ms/division mode CC	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode de test, arrêt Aucun YEDS-7

[Marche à suivre]

1. Raccorder TP1, broche 5 à la masse.
2. Installer le disque.
3. Tout en regardant l'écran de l'oscilloscope, appuyer sur la touche PROGRAM et observer la forme d'onde de la Fig. 8–14, pendant quelques instants.Vérifier que l'amplitude atteint au moins 2,5 Vc-c et que les amplitudes positive et négatives soient égales. Comme la forme ne sort que pour un moment, quand la touche PROGRAM est enclenchée, appuyer sur à plusieurs reprises sur cette touche, jusqu'à ce que la forme d'onde ait été vérifiée.

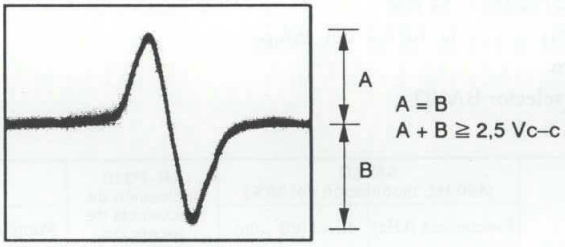


Fig. 8–14.

[Evaluation du capteur]

Ne pas tenter d'évaluer l'état du capteur tant que tous les réglages ne sont pas corrects. Les cas suivants témoignent de l'anomalie du capteur.

1. L'amplitude du signal d'erreur d'alignement est extrêmement petite (inférieure à 2 Vc-c).
2. L'amplitude du signal d'erreur de mise au point est extrêmement petite (inférieure à 2,5 Vc-c).
3. Les amplitudes positive et négative du signal d'erreur de mise au point sont extrêmement asymétriques (taux 2:1 ou plus).
4. Le signal RF est trop petit (inférieur à 0,8 Vc-c) et même si VR1 (alimentation du laser) est ajustée, le signal RF ne peut être élevé au niveau standard.

8. AJUSTES

8.1 SECCIÓN DEL SINTONIZADOR

Preparaciones

- Ponga el control VOLUME en mínimo.
- Ponga el selector de entrada en TUNER.
- Vea los puntos de prueba y los controles de ajuste en la Fig. 8–3.

Ajuste de la sección de sintonizador de FM

- Escoja el modo de FM con el selector BAND.
- Conecte como lo indica la Fig. 8–1.

Paso	Ajuste	FM SG (1 kHz ± 75 kHz dev.)		XR–P310 Indicación de frecuencia de recepción	Ajuste	
		Frecuencia (MHz)	Nivel (dB μ)		Punto de ajuste	Especificación
1	Ajuste central del medidor	98	60	98 MHz	L202	Ajuste de modo que la tensión a ambos lados de R220 sea 0V ± 50 mV.
2	Ajuste de la frecuencia propia del VCO de FM	98	60 (sin modulación)	98 MHz	VR203	Ajuste de modo que la frecuencia entre TP MPX VCO y masa sea 76 ± 0,5 kHz.
3	Ajuste del nivel del indicador de sintonía	98	17	98 MHz	VR201	Ajuste al punto en el que el indicador de sintonía se apaque.

Ajuste de la sección de sintonizador de AM

- El nivel de AM SG (dBμ/m) indica la fuerza del campo eléctrico de la antena de cuadro.
- Escoja el modo de AM con el selector BAND.
- Conecte como lo indica la Fig. 8–2.

Paso	Ajuste	AM SG (400 Hz, modulación del 30%)		XR–P310 Indicación de frecuencia de recepción	Ajuste	
		Frecuencia (kHz)	Nivel (dB μ/m)		Punto de ajuste	Especificación
1	Ajuste del nivel del indicador de sintonía	999	55	999 kHz	VR202	Ajuste al punto en el que el indicador de sintonía se apaque.

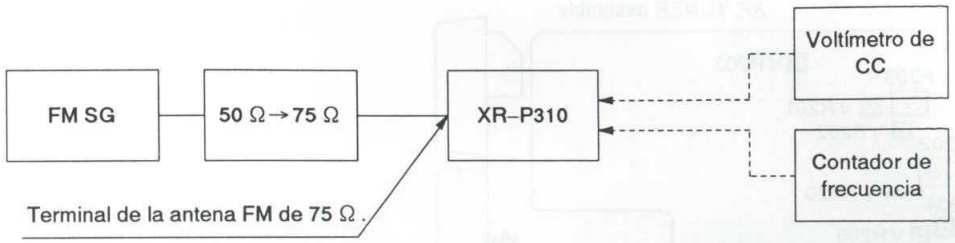


Fig. 8–1. Diagrama de Conexión Para el Ajuste de FM

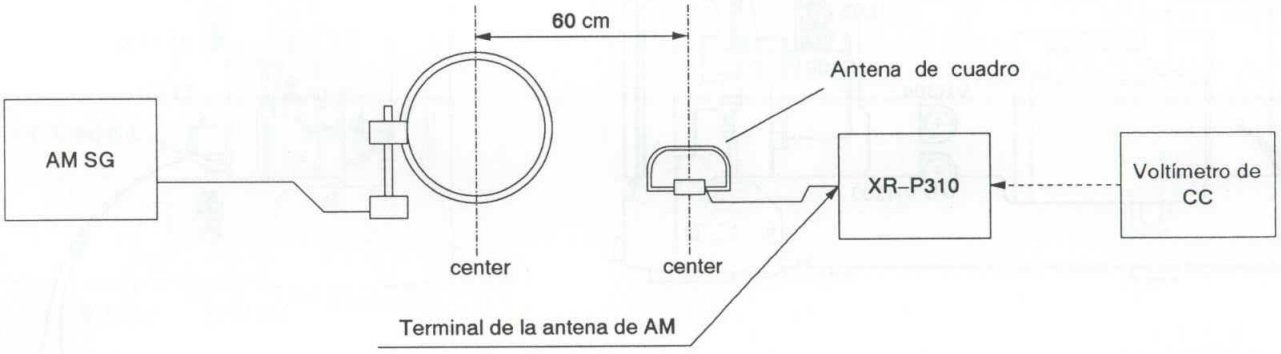


Fig. 8–2. Diagrama de Conexión Para el Ajuste de AM

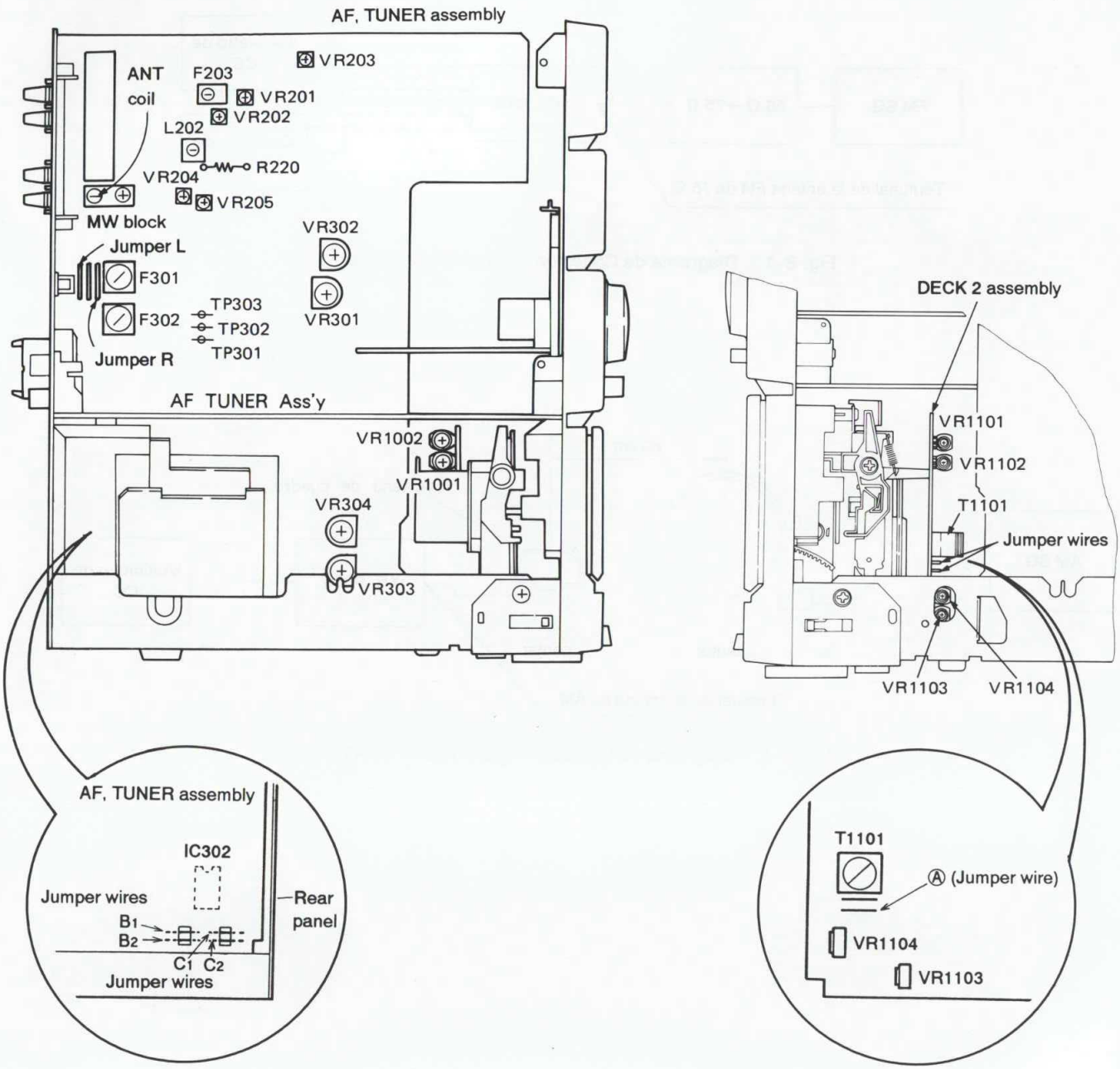


Fig. 8–3. Puntos de Ajuste y Puntos de Prueba

8.2 SECCIÓN DE LA PLATINA MAGNETOFONICA

• Los puntos de ajuste y de prueba están indicados en la Fig. 8–2.

Ajuste Mecánico

• Active la función TAPE.
• Cinta de prueba: STD–301 (3 kHz, 30 min.)

1. Ajuste de la Velocidad de Cinta

No.	Modo	Cinta de prueba	Puntos de ajuste		Puntos de medición	Procedimiento de ajuste	Comentarios
1	PLAY	STD–301 (reproducir 3 kHz)	Platina I	VR304 (Conjunto de sintonizador y AF)	TP303 (der.)	Pulse la tecla PLAY y ajuste de modo que la lectura sea 3010 ± 10 Hz. Confirme que el nivel de lloro y tremolación esté por debajo del 0,2% (en dirección inversa, confirme que la lectura sea 3010 ± 55 Hz).	
2	PLAY		Platina II	VR303 (Conjunto de sintonizador y AF)	TP303 (der.)	Pulse la tecla PLAY y ajuste de modo que la lectura sea 3010 ± 10 Hz. Confirme que el nivel de lloro y tremolación esté por debajo del 0,2% (en dirección inversa, confirme que la lectura sea 3010 ± 55 Hz).	

●Ajuste Eléctrico

Verifique lo siguiente antes de comenzar.

1. Confirme que se haya completado el ajuste de velocidad de la cinta.
2. Limpie los cabezales y desmagnetícelos mediante un desmagnetizador de cabezales.
3. Ajuste el nivel de ajuste a 0 dBV = 1 Vrms.
4. Use la cinta especificada para el ajuste. Utilice el lado rotulado (A) de la cinta de prueba.
   STD–331B: para ajuste de reproducción
   STD–630: cinta virgen normal
5. Hágase de los siguientes dispositivos de medición: Milivoltímetro de CA, oscilador de baja frecuencia, atenuador, osciloscopio.
6. Ajuste tanto el canal derecho como el izquierdo, a menos que se indique lo contrario.
7. Coloque el conmutador DOLBY NR en OFF a menos que se indique lo contrario.
8. Caliente la unidad por varios minutos antes del ajuste. Especialmente, asegúrese de calentarla en el modo de grabación/reproducción por 3 a 5 minutos antes de comenzar el ajuste de las características de frecuencia en grabación/reproducción.
9. Siga siempre el orden de ajuste indicado. De lo contrario, puede no ser posible lograr un ajuste completo.

Ajustes de Reproducción (platinas I y II)

1. Ajuste del ángulo del cabezal
2. Ajuste del nivel de reproducción

Ajustes de Grabación (platina II)

1. Confirmación de la frecuencia de oscilación de polarización
2. Ajuste de las características de frecuencia en grabación/reproducción.
3. Ajuste del nivel de grabación
4. Confirmación de la función ALC.

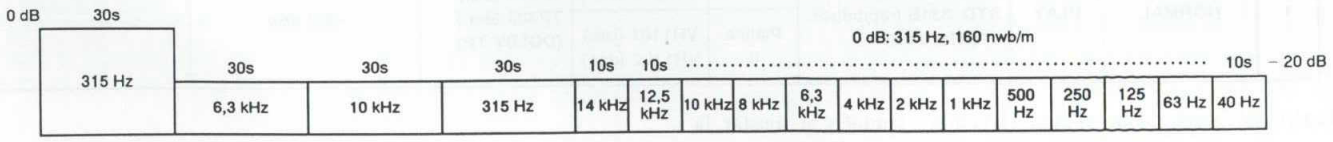


Fig. 8–4. Cinta de Prueba STD–331B

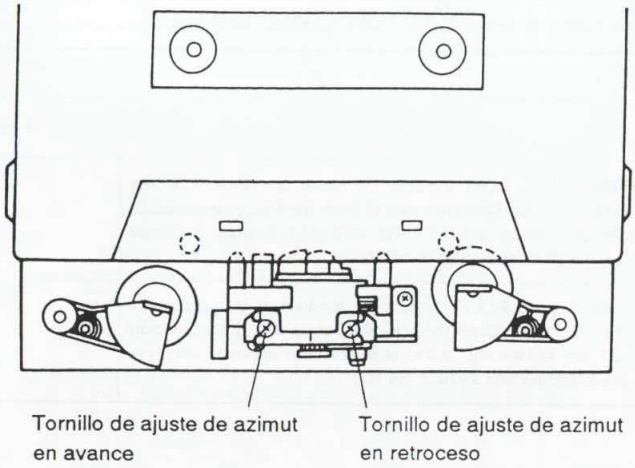


Fig. 8–5. Ajuste del Ángulo del Cabezal

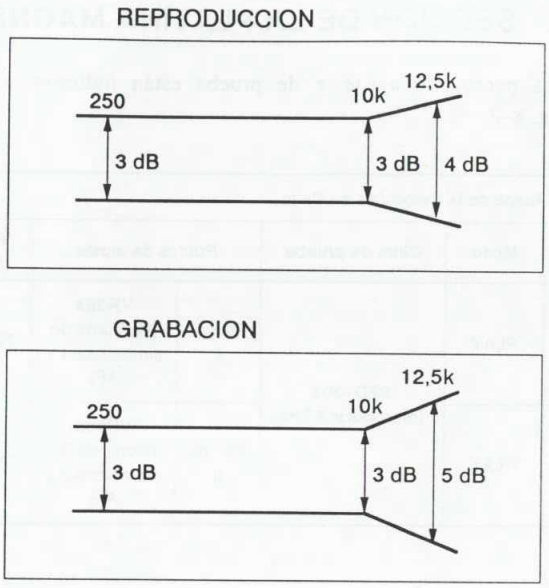


Fig. 8–6. Características de Frecuencia

● Ajustes de Reproducción

- Esta unidad está equipada con selector automático de cinta.
- No cambie entre ambas direcciones de funcionamiento con el destornillador insertado.

1. Ajuste del Ángulo del Cabezal

Paso	Selector de cinta (AUTO)	Modo	Señal de entrada/Cinta de prueba	Punto de ajuste		Puntos de medición	Valor de ajuste	Comentarios
1	NORMAL	PLAY	Cinta de prueba STD–331B (reproducir 10 kHz, –20 dB)	Platina I Platina II	Tornillo de ajuste del ángulo del cabezal (Fig. 8–5)	TP301 (izq.) TP303 (der.) (DOLBY TP)	Máx. nivel de la señal de reproducción	Después del ajuste, aplique pintura de fijación al tornillo de ajuste del ángulo del cabezal.

- Dado que este ajuste determina el nivel de reducción de ruido Dolby en reproducción, hágalo cuidadosamente.

2. Ajuste del Nivel de Reproducción

Paso	Selector de cinta (AUTO)	Modo	Señal de entrada/Cinta de prueba	Punto de ajuste		Puntos de medición	Valor de ajuste	Comentarios
1	NORMAL	PLAY	Cinta de prueba STD–331B (reproducir 315 Hz, 0 dB)	Platina I	VR1001 (izq.) VR1002 (der.)	TP301 (izq.) TP303 (der.) (DOLBY TP)	–5,2 dBV	
				Platina II	VR1101 (izq.) VR1102 (der.)			

Nota: El nivel de la platina II cambia también al ajustar la platina I. Por lo tanto, ajuste primero esta última.

● Ajustes de Grabación

Nota: Para que la respuesta en frecuencia del ecualizador fonográfico sea plana, efectúe los puntos de ajuste 2 a 4 siguientes conectando B1 a B2 y C1 a C2 respectivamente (consúltese la Fig. 8–3).

1. Confirmación de la Frecuencia de Oscilación de Polarización

Paso	Selector de cinta (AUTO)	Modo	Señal de entrada/Cinta de prueba	Punto de ajuste		Puntos de medición	Valor de ajuste	Comentarios
1	NORMAL	REC	Cargue la cinta de prueba STD–630 y ponga la unidad en el modo de reproducción	Platina I		Entre el punto (A) en la Fig. 8–3 y masa	La frecuencia de oscilación debe ser 106,5 ± 2 kHz con el conmutador de eliminación de batido del panel trasero en la posición "1".	La frecuencia es de 2 a 3 kHz menor can el conmutador en la posición "2".
				Platina II	——			

2. Ajuste de las Características de Frecuencia en Grabación/Reproducciónción

• Dado que este ajuste afecta la polarización de grabación, evite el aumento de la distorsión debido a la subpolarización.

Paso	Selector de cinta (AUTO)	Modo	Señal de entrada/Cinta de prueba	Punto de ajuste		Puntos de medición	Valor de ajuste	Comentarios
1	NORMAL	REC	Ingrese una señal de 315 Hz por el terminal fonográfico y ponga el selector de entrada en PHONO.	Platina I		TP301 (izq.) TP303 (der.) (DOLBY TP)	–25,2 dBV	
				Platina II	Nivel de la señal de entrada			
2	NORMAL	REC/ PLAY	Cargue la cinta de prueba STD–630 y grabe/reproduzca las señales de 315 Hz y 10 kHz (vea la Nota al pie).	Platina I		TP301 (izq.) TP303 (der.) (DOLBY TP)	Repita el ajuste hasta que el nivel de reproducción de la señal de 10 kHz difiera no más que 0 ± 0,5 dB del nivel de la señal de 315 Hz.	
				Platina II	VR1103 (izq.) VR1104 (der.)			

Nota: Utilice el mismo nivel aplicado a la señal de entrada de 315 Hz en el paso 1.

3. Ajuste del Nivel de Grabación

Paso	Selector de cinta (AUTO)	Modo	Señal de entrada/Cinta de prueba	Punto de ajuste		Puntos de medición	Valor de ajuste	Comentarios
1	NORMAL	REC	Ingrese una señal de 315 Hz por el terminal fonográfico y ponga el selector de entrada en PHONO.	Platina I	Nivel de la señal de entrada	TP301 (izq.) TP303 (der.) (DOLBY TP)	–5,2 dBV	
				Platina II				
2	NORMAL	REC/ PLAY	Cinta de prueba STD–630 (grabe y reproduzca 315 Hz)	Platina I		TP301 (izq.) TP303 (der.) (DOLBY TP)	Repita la grabación, la reproducción y el ajuste hasta que el nivel de reproducción de la señal de 315 Hz sea –5,2 dBV.	
				Platina II	VR301 (izq.) VR302 (der.)			

4. Confirmación de la Función ALC

Step	Tape selector (AUTO)	Mode	Input signal/ test tape	Adjusting points	Measurement points	Adjustment value	Remarks
1	NORMAL	REC/ PAUSE	Ingrese una señal de 315 Hz por el terminal fonográfico y ponga el selector de entrada en PHONO.	Nivel de la señal de entrada	TP301 (izq.) TP303 (der.) (DOLBY TP)	–5,2 dBV	
2				Utilice un nivel 10 dB por encima del nivel de entrada en el paso 1.		–1,2 ± 2,5 dBV	

8.3 SECCIÓN DEL REPRODUCTOR DE DISCOS COMPACTOS

Métodos de ajuste

Si un reproductor de discos compactos se ajusta incorrecta o inadecuadamente, puede funcionar mal o no trabajar incluso aunque no exista ningún problema en el captor ni en los circuitos. Ajuste correctamente siguiendo el procedimiento de ajuste.

● Ítemes de ajuste/verificación y orden

Paso	Ítem	Punto de prueba	Lugar de ajuste
1	Ajuste del descentramiento de enfoque	TP1, Patilla 6 (FCS. ERR)	VR2103 (FCS. OFS)
2	Ajuste de retícula	TP1, Patilla 2 (TRK. ERR)	Ranura de ajuste de retícula
3	Ajuste del equilibrio de ajuste de seguimiento	TP1, Patilla 2 (TRK. ERR)	VR2102 (TRK. BAL)
4	Ajuste de la inclinación en sentido radial/tangencial del captor	TP1, Patilla 1 (RF)	Tornillo de ajuste de la inclinación radial Tornillo de ajuste de la inclinación tangencial
5	Ajuste del nivel de RF	TP1, Patilla 1 (RF)	VR1 (Nivel de RF)
6	Ajuste de la ganancia del bucle del servo de enfoque	TP1, Patilla 5 (FCS. IN) TP1, Patilla 6 (FCS. ERR)	VR2152 (FCS. GAN)
7	Ajuste de la ganancia del bucle del servo de seguimiento	TP1, Patilla 3 (TRK. IN)) TP1, Patilla 2 (TRK. ERR)	VR2151 (TRK. GAN)
8	Verificación de la señal de error de enfoque	TP1, Patilla 6 (FCS. ERR)	———

[Tabla de abreviaturas]

FCS. ERR : Error de enfoque
FCS. OFS : Descentramiento de enfoque
TRK. ERR : Error de seguimiento
TRK. BAL : Equilibrio de seguimiento
FCS. IN : Entrada de enfoque
TRK. IN : Entrada de seguimiento

● Instrumentos y herramientas de medición

1. Osciloscopio de doble traza (Sonda de 10:1)
2. Oscilador de baja frecuencia
3. Disco de prueba (YEDS-7)
4. Disco de 12 cm (con 70 minutos de grabación por lo menos)
   Para el tipo de reproducción múltiple de disco compacto, emplee solamente el disco de prueba YEDS-7.
5. Filtro de paso bajo (39 kΩ + 0,001 μF)
6. Resistor (100 kΩ)
7. Llave hexagonal (M3 mm)
8. Herramientas estándar

● Ubicación de los puntos de prueba y los resistores variables de ajuste

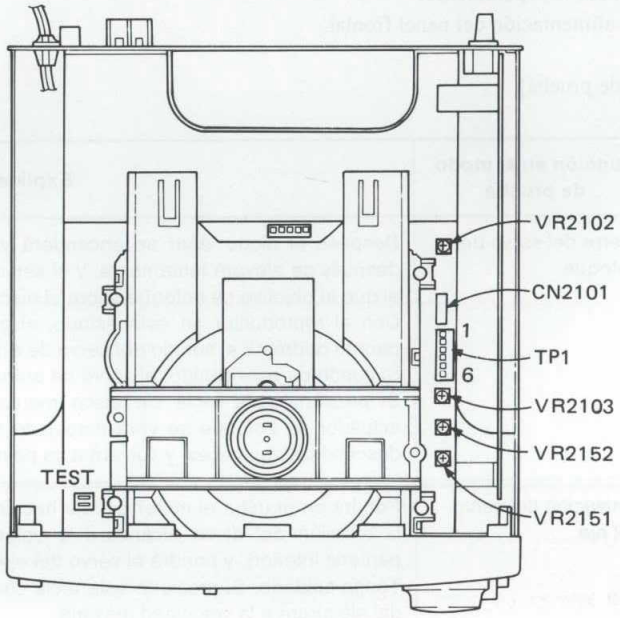


Fig. 8–7. Lugares de Ajuste

● Notas

1. Emplee una sonda de 10:1 para el osciloscopio.
2. Todas las posiciones de los mandos (ajustes) para el osciloscopio de los procedimientos de ajuste son para cuando se emplee la sonda de 10:1.

● Modo de prueba

Estos modelos poseen un modo de prueba que permite realizar fácilmente los ajustes y las comprobaciones requeridos para el servicio. Cuando estos modelos estén en el modo de prueba, las teclas del panel frontal trabajarán de forma diferente a la normal. Los ajustes y las comprobaciones podrán realizarse accionando estas teclas de acuerdo con el procedimiento correcto. Para estos modelos, todos los ajustes se realizarán en el modo de prueba.

[Puesta de estos modelos en el modo de prueba]

A continuación se indica cómo poner estos modelos en el modo de prueba.

1. Ponga en OFF el interruptor de alimentación.
2. Cortocircuite los hilos de puenteado de modo de prueba. (Consulte la Fig. 8–7.)
3. Ponga en ON el interruptor de alimentación.

Cuando haya ajustado correctamente el modo de prueba, la visualización será diferente a la obtenida normalmente al conectar la alimentación. Si la visualización sigue siendo la normal, el modo de prueba no se habrá ajustado normalmente, por lo que tendrá que repetir los pasos 1 a 3.

[Desactivación del modo de prueba]

A continuación se indica el procedimiento para desactivar el modo de prueba.
1. Presione la tecla STOP y cese todas las operaciones.
2. Ponga en OFF el interruptor de alimentación del panel frontal.

[Operaciones de teclas en el modo de prueba]

Código	Nombre de la tecla	Función en el modo de prueba	Explicación
	PROGRAM	Cierre del servo de enfoque	Después el diodo láser se encenderá y el actuador de enfoque descenderá, después se elevará lentamente, y el servo de enfoque se cerrará en el punto en el que el objetivo se enfoque sobre el disco. Con el reproductor en este estado, si gira ligeramente con la mano el disco parado podrá oír el sonido del servo de enfoque. Si puede oír este sonido, el servo de enfoque estará funcionando correctamente. Si presiona esta tecla sin disco montado, el diodo láser se encenderá, el actuador de enfoque se verá empujado hacia abajo, y después se levantará y descenderá dos veces, y volverá a su posición original.
►	PLAY	Activación del servo del eje	Pondrá en marcha el motor del eje haciéndolo girar hacia la derecha y después la rotación del disco alcanzará la velocidad prescrita (unas 500 rpm en la periferia interior), y pondrá el servo del eje en un bucle cerrado. Tenga cuidado. Si presiona esta tecla cuando no haya disco montado, el motor del eje girará a la velocidad máxima. Si el servo de enfoque no pasa correctamente a un bucle cerrado, o si el haz lasérico incide en la sección del espejo en el la periferia del disco, ocurrirá el mismo síntoma.
❚❚	PAUSE	Apertura/cierre del servo de seguimiento	Si presiona esta tecla cuando el servo de enfoque y el servo del eje están funcionando correctamente en bucles cerrados, el servo de sequimiento se pondrá en bucle cerrado, en el panel frontal se visualizarán el número de canción que esté reproduciéndose y el tiempo transcurrido, y se producirá la salida de la señal de reproducción. Si el tiempo transcurrido no se visualiza o no se cuenta correctamente, o si el sonido no se reproduce correctamente, es posible que el rayo lasérico esté incidiendo en la sección sin sonido grabado en el borde exterior del disco, o que exista algún otro problema. Esta tecla es basculante (de acción alternativa) y abre/cierra el servo de seguimiento alternativamente. Esta tecla no funcionará cuando no haya disco montado.
⏮/◄◄	TRACK/ MANUAL SEARCH REV	Retroceso del carro (hacia adentro)	Moverá la posición del captor hacia el diámetro interior del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el punto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
►►/⏭	TRACK/ MANUAL SEARCH FWD	Avance del carro (hacia afuera)	Moverá la posición del captor hacia la periferia del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el punto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
■	STOP	Parada	Desactivará todos los servos e inicializará la unidad. El captor permanecerá donde estaba cuando se presionó esta tecla.
⏏	OPEN/CLOSE	Apertura/cierre de la bandeja del disco	Abrirá/cerrará la bandeja del disco. Esta tecla es basculante (de acción alternativa) y abre/cierra la bandeja alternativamente. Si presiona esta tecla cuando el disco esté girando, lo parará, y abrirá la bandeja. Esta operación de la tecla no afectará la posición del captor.

[Cómo reproducir un disco en el modo de prueba]

En el modo de prueba, como los servos funcionan independientemente, la reproducción de un disco requiere el que usted emplee las teclas en el orden correcto para cerrar los servos.
A continuación se indica la secuencia de operación de teclas para reproducir un disco en el modo de prueba.

PROGRAM	Hará que se encienda el diodo láser y cerrará el servo de enfoque.
⇩	
PLAY ▶	Pondrá en marcha el motor del eje y hará que se cierre el servo del eje.
⇩	
PAUSE ▮▮	Cerrará el servo de seguimiento.

Espere de 2 a 3 segundos por lo menos entre cada una de estas operaciones.

1. Ajuste del descentramiento del enfoque

● Objetivo ● Síntomas en caso de desajuste	Ajuste de la tensión de CC para el amplificador de error de enfoque. El reproductor no enfoca y la señal de RF contiene perturbaciones.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 6, (FCS ERR). [Ajustes] 5 mV/división 10 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, parado (con el interruptor de alimentación en ON) VR2103 (FCS OFS) No es necesario

[Procedimiento]

Ajuste VR2103 (FCS OFS) de forma que la tensión de CC de TP1, patilla 6, (FCS ERR) sea de –50 ± 50 mV.

2. Ajuste de retícula

● Objetivo	Alineación de los puntos del haz lasérico de generación de error de seguimiento al ángulo óptimo en la pista		
● Síntomas en caso de desajuste	La reproducción no se inicia, la búsqueda de canciones es imposible, las pistas se saltan.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 2, (TRK ERR) a través de un filtro de paso bajo. (Consulte la Fig. 8–8) [Ajustes] 50 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto Ranura de ajuste de retícula del captor Disco de 12 cm. (El disco YEDS-7 no podrá emplearse.)

[Procedimiento]

1. Mueva el captor hasta el borde exterior del disco con la tecla TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| o |◀◀ / ◀◀ de forma que la ranura de ajuste de la retícula quede en el borde exterior del disco, donde puede ajustarse.
2. Presione la tecla PROGRAM, y después la tecla PLAY ▶, por este orden, a fin de cerrar el servo de enfoque y después el servo del eje.
3. Inserte un destornillador normal en la ranura de ajuste de la retícula y ajuste la retícula hasta encontrar el punto nulo.
   Para más detalles, consulte la página siguiente.
4. Si gira lentamente el destornillador hacia la izquierda desde el punto nulo, la amplitud de la onda aumentará gradualmente. Después, si continúa girando el destornillador, la amplitud de la onda se volverá otra vez más pequeña. Gire el destornillador hacia la izquierda desde el punto nulo y ajuste la retícula al primer punto en el que la amplitud de la onda alcance su valor máximo.

   Referencia: En la fig. 8–9. se muestra la relación entre el ángulo del haz de seguimiento con la pista y la forma de onda.

   Nota: La amplitud de la señal de error de seguimiento será de aproximadamente 3 Vp-p (cuando se emplee un filtro de paso bajo de 39 kΩ , 0,001 μF). Si esta amplitud es extremadamente pequeña (2 Vp-p o menos), es posible que el objetivo o el captor esté funcionando mal. Si la diferencia entre la amplitud de la señal de error en el borde interior y exterior del disco es superior al 10%, la retícula no estará ajustada al punto óptimo, por lo que tendrá que volver a ajustarla.
5. Devuelva el captor hasta la mitad más o menos del disco con la tecla TRACK/MANUAL SEARCH REV |◀◀ / ◀◀, presione la tecla PAUSE ▮▮, y vuelva a comprobar si en el panel frontal se visualizan el número de canción y el tiempo transcurrido. Si no se visualizan esta vez, o si el tiempo transcurrido cambia irregularmente, vuelva a comprobar el punto nulo y ajuste otra vez la retícula.

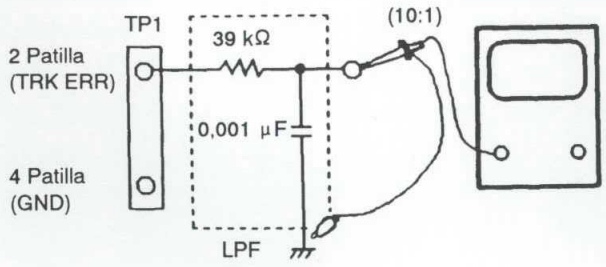
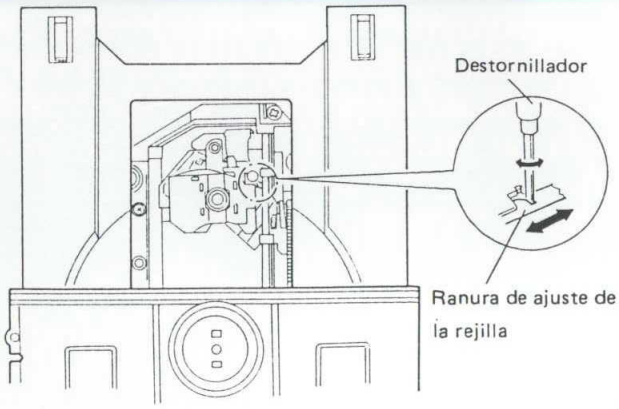


Fig. 8–8.



Lugares de Ajuste

[Cómo encontrar el punto nulo]

Cuando inserte el destornillador normal en la ranura para el ajuste de la retícula y cambie el ángulo de la misma. La amplitud de la señal de error de seguimiento de TP1, patilla 2, cambiará. Dentro del margen para la retícula existen cinco o seis lugares en los que la amplitud alcanza el valor mínimo. De estos cinco o seis lugares, solamente hay uno en el que la envolvente de la forma de onda es uniforme. Este lugar es donde los tres haces lasércicos divididos por la retícula se encuentran exactamente sobre la misma pista. (Consulte la Fig. 8–9.) Este punto se denomina punto nulo. Cuando ajuste la retícula, este punto se encontrará y empleará como posición de referencia.

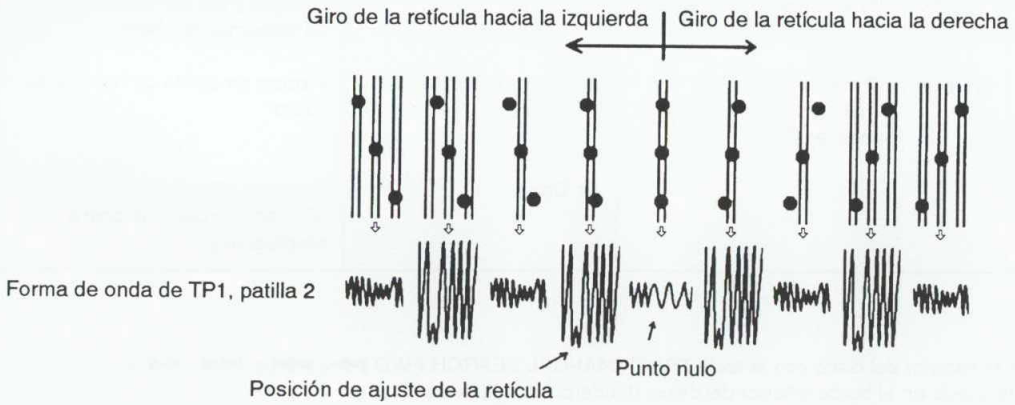
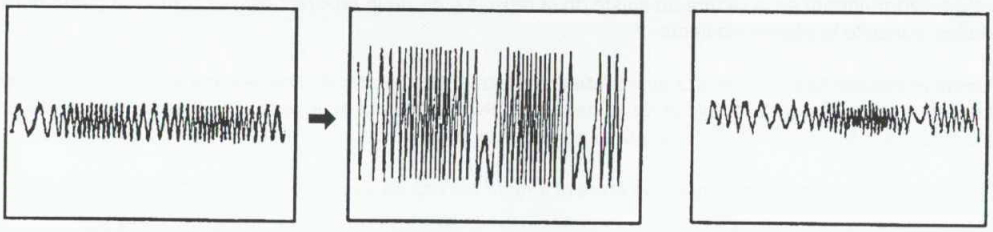


Fig. 8–9.



Forma de onda del punto nulo

Forma de onda de amplitud máxima

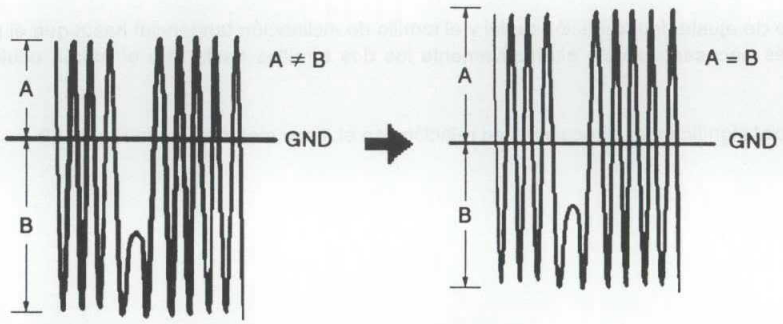
Forma de onda que no es el punto nulo

3. Ajuste del equilibrio de error de seguimiento

● Objetivo	Corrección de la variación de la sensibilidad del fotodiodo de seguimiento		
● Síntomas en caso de desajuste	La reproducción no se inicia o la búsqueda de canciones es imposible.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 2, (TRK ERR). Esta conexión puede realizarse a través de un filtro de paso bajo. [Ajustes] 50 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto VR2102 (TRK BAL) YEDS-7

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R = 35 mm) con la tecla TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| o |◀◀ / ◀◀.
2. Presione la tecla PROGRAM, y después la tecla PLAY ▶, por este orden, a fin de cerrar el servo de enfoque y después el servo del eje.
3. Haga coincidir la línea brillante (masa) del centro de la pantalla del osciloscopio y ponga éste en el modo de CC.
4. Ajuste VR2102 (TRK BAL) de forma que la amplitud positiva y la negativa de la señal de error de seguimiento de TP1, patilla 2, (TRK ERR) sean iguales (en otras palabras, de forma que no haya componente de CC).



Cuando hay componente de CC

Cuando no hay componente de CC

4. Ajuste de la inclinación en sentido radial/tangencial del captor

● Objetivo	Ajustar el ángulo del captor en relación con el disco de forma que los haces laséricos incidan perpendicularmente sobre el mismo a fin de poder leer con la mayor exactitud las señales de RF.		
● Síntomas en caso de desajuste	Sonido quebrado, algunos discos pueden reproducirse pero otros no.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1, (RF). [Ajustes] 20 mV/división 200 ns/división modo de CA	● Estado del reproductor	Modo de prueba, reproducción
		● Lugar de ajuste	Tornillo de ajuste de la inclinación radial y tornillo de ajuste de la inclinación tangencial
		● Disco	Disco de 12 cm. (El disco YEDS-7 no podrá emplearse.)

[Procedimiento]

1. Mueva el captor hasta el borde exterior del disco con la tecla TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| o |◀◀ / ◀◀ de forma que puedan ajustarse los tornillos de inclinación radial/tangencial.
   Presione la tecla PROGRAM, la tecla PLAY ▶, y después la tecla PAUSE ❚❚, por este orden, a fin de cerrar el servo de enfoque, después el servo del eje, y por último para poner el reproductor en el modo de reproducción.
2. En primer lugar, gire el tornillo de ajuste de inclinación radial con una llave hexagonal M 3 mm hasta que el patrón ocular (la forma de diamante del centro de la señal de RF) pueda verse con la mayor claridad.
3. A continuación, ajuste el tornillo de ajuste de inclinación tangencial con una llave hexagonal M 3 mm hasta que el patrón ocular (la forma de diamante del centro de la señal de RF) pueda verse con la mayor claridad (Fig. 8–11.).
4. Vuelva a girar el tornillo de ajuste de inclinación radial y el tornillo de inclinación tangencial hasta que el patrón ocular pueda verse con la mayor claridad. Si es necesario, ajuste alternativamente los dos tornillos hasta que el patrón ocular pueda verse con la mayor claridad.

Nota: Radial y tangencial significan las direcciones en relación con el disco mostrado en la Fig. 8–10.

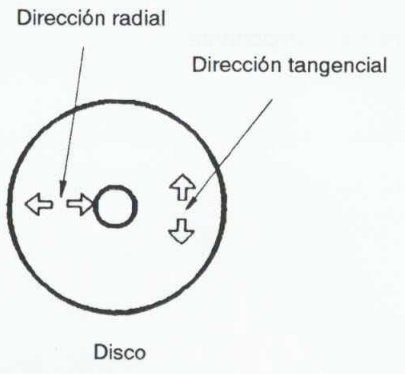
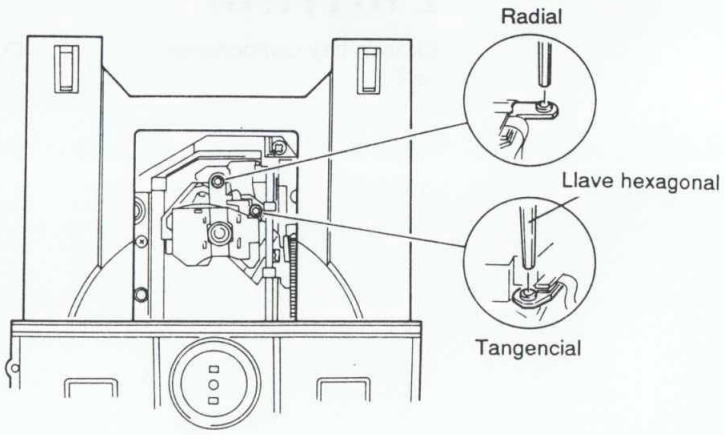


Fig. 8–10.



Lugares de Ajuste

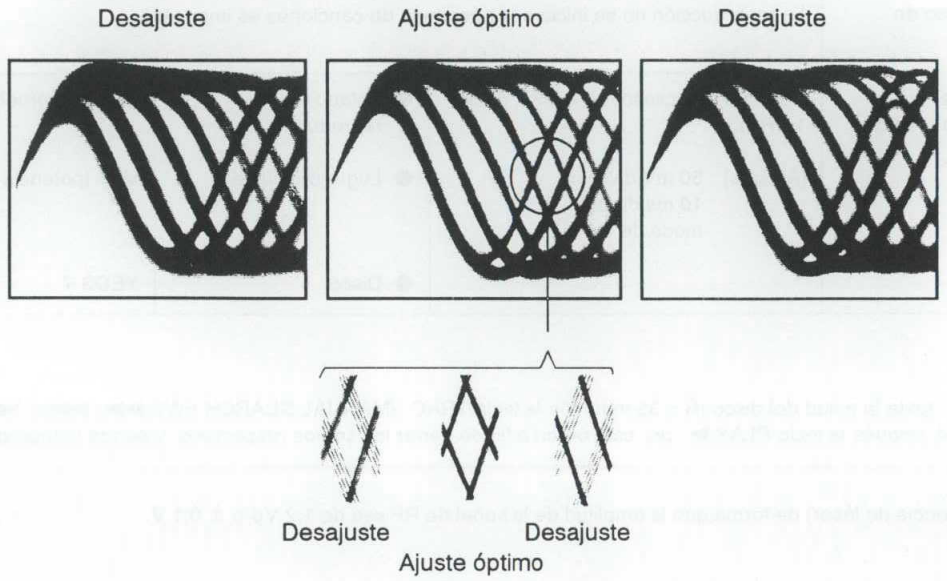


Fig. 8–11. Patron Optico

5. Ajuste del nivel de RF

● Objetivo ● Síntomas en caso de desajuste	Optimización de la amplitud de la señal de RF de reproducción La reproducción no se inicia o la búsqueda de canciones es imposible.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1, (RF). [Ajustes] 50 mV/división 10 ms/división modo de CA	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR1 (potencia de láser) YEDS-7

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R = 35 mm) con la tecla TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| o |◀◀ / ◀◀, presione la tecla PROGRAM, depués la tecla PLAY ▶, por este orden a fin de cerrar los servos respectivos, y ponga el reproductor en el mode de reproducción.

2. Ajuste VR1 (potencia de láser) de forma que la amplitud de la señal de RF sea de 1,2 Vp-p ± 0,1 V.

6. Ajuste de la ganancia del bucle del servo de enfoque

● Objetivo	Optimización de la ganancia del bucle del servo de enfoque		
● Síntomas en caso de desajuste	La reproducción no se inicia o el actuador de enfoque produce ruido.		
● Conexión de los instrumentos de medición	Consulte la Fig. 8–12. [Ajustes] CH1 20 mV/división Modo X-Y CH2 5 mV/división	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR2152 (FCS GAN) YEDS-7

[Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. Presione la tecla TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| o |◀◀ / ◀◀ para mover el captor hasta la mitad del disco (R = 35 mm), y después presione la tecla PROGRAM, la tecla PLAY ▶, y después la tecla PAUSE ▮▮, por este orden, a fin de cerrar los servos correspondientes y poner el reproductor en el modo de reproducción.
3. Ajuste VR2152 (FCS GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

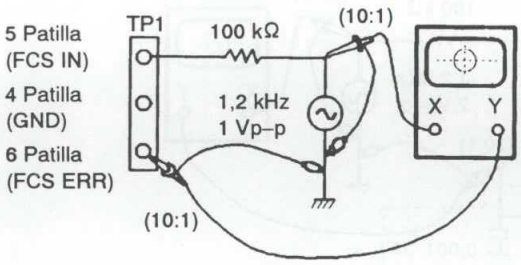
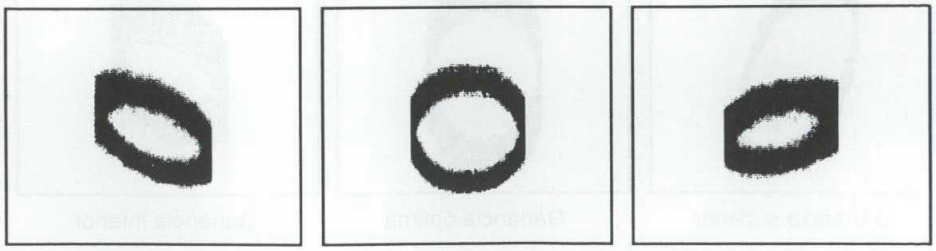


Fig. 8–12.

Ajuste de la ganancia de enfoque



Ganancia superior | Ganancia óptima | Ganancia inferior

7. Ajuste de la ganancia del bucle del servo de seguimiento

● Objetivo ● Síntomas en caso de desajuste	Optimización de la ganancia del bucle del servo de seguimiento La reproducción no se inicia, el actuador de enfoque produce ruido, o se saltan pistas.		
● Conexión de los instrumentos de medición	Consulte la Fig. 8–13. [Ajustes] CH1 CH2 50 mV/división 50 mV/división Modo X-Y	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR2151 (TRK GAN) YEDS-7

[Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. Presione la tecla TRACK/MANUAL SEARCH FWD ▶▶ / ▶▶| o |◀◀ / ◀◀ para mover el captor hasta la mitad del disco (R = 35 mm), y después presione la tecla PROGRAM, la tecla PLAY ▶, y la tecla PAUSE ▮▮, por este orden, a fin de cerrar los servos respectivos y poner el reproductor en el modo de reproducción.
3. Ajuste VR2151 (TRK GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

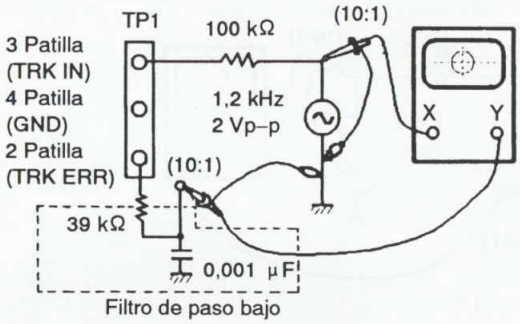
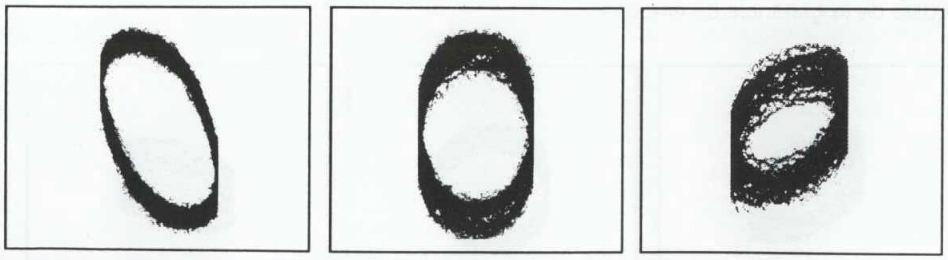


Fig. 8–13.

Ajuste de la ganancia de seguimiento



Ganancia superior | Ganancia óptima | Ganancia inferior

8. Verificación de la señal de error de enfoque (curva S de enfoque)

● Objetivo ● Síntomas en caso de desajuste	Juzgar si el captor est'a bien o no observando la señal de error de enfoque. El captor se juzga por la amplitud de la señal de error de seguimiento (como se ha indicado en la sección sobre el ajuste del equilibrio de error de seguimiento) y la forma de onda de la señal de error de enfoque.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 6, (FCS ERR). [Ajustes] 100 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, parada Ninguno YEDS-7

[Procedimiento]

1. Conecte TP1, patilla 5, a masa.
2. Coloque el disco.
3. Contemplando la pantalla del osciloscopio, presione la tecla PROGRAM y observe durante un momento la forma de onda de la Fig. 8–14. Verifique si la amplitud es de 2,5 Vp-p por lo menos y si la amplitud de las partes positiva y negativa son iguales. Como la forma de onda solamente sale durante un momento cuando se presiona la tecla PROGRAM, presione una y otra vez esta tecla hasta que logre comprobar la forma de onda.

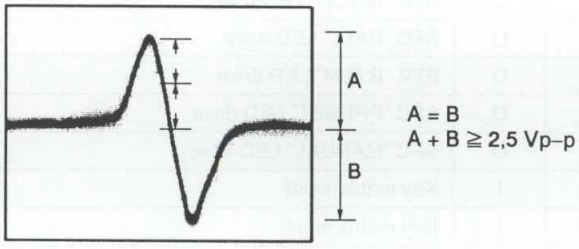


Fig. 8–14.

[Juicio sobre el captor]

No juzgue el captor hasta haber finalizado correctamente todos los ajustes. En los casos siguientes es posible que haya algo erróneo en el captor.

1. La amplitud de la señal de error de seguimiento es extremadamente pequeña (menos de 2 Vp-p).
2. La amplitud de la señal de error de enfoque es extremadamente pequeña (menos de 2,5 Vp-p).
3. Las amplitudes de las partes positiva y negaiva de la señal de error de enfoque son extremadamente asimétricas (relación de 2:1 o superior).
4. La señal de RF es demasiado pequeña (menos de 0,8 Vp-p) y aunque se ajuste VR1 (potencia de láser), la señal de RF no puede aumentarse hasta el nivel estándar.

9. IC INFORMATION

9.1 PDG065B (TIMER/TUNER CONTROL MICROPROCESSOR)

PIN NO.	Name	I/O	Function	Logic
1	DUAL*	I	Tuner TV dual mode	Dual: "L"
2	STEREO	I	Tuner TV/FM receiving condition	STEREO: "L"
3	TUNE	I	Tuner receiving condition	TUNE: "L"
4	RESET	O	Reset output for PD5147A	RESET: "L"
5	LOCAL	O	Tuner TV/FM sensitivity selection	LOCAL: "L"
6	TX MUTE	O	Tuner mute request	MUTE: "H"
7	DISP REQ	I	CD Display data output request	REQ: "L"
8	DISP CLK	I	Clock for CD display data	"L" ACTIVE
9	DISP DATA	I	Data for CD display data	"L" ACTIVE
10	FM MONO/ AM NR	O	Tuner FM forcibly monaural/AM noise reduction	Forcibly monaural: "H" AM NR: "H"
11	PLL CLK	O	Clock for tuner PLL	"L" ACTIVE
12	PLL DATA	O	Data for tuner PLL	"L" ACTIVE
13	PLL CE	O	Tuner PLL chip enable	"L" ACTIVE
14	S.CLK	I	Clock input for system bus	"L" ACTIVE
15	S.DATA	I/O	Data input/output for system bus	"L" ACTIVE
16	TX REQ/EN	I/O	System bus request/enable	"L" ACTIVE
17	DISCO	O	SFC "DISCO" LED drive	LED ON: "H"
18	HALL	O	SFC "HALL" LED drive	LED ON: "H"
19	B.G.M.	O	SFC "B.G.M" LED drive	LED ON: "H"
20	PRESET	O	SFC "PRESET" LED drive	LED ON: "L"
21	MANUAL	O	SFC "MANUAL" LED drive	LED ON: "L"
22	KI0	I	Key matrix input	
23	KI1	I	Key matrix input	
24	KI2	I	Key matrix input	
25	KI3	I	Key matrix input	
26	KI4	I	Key matrix input	
27	KI5	I	Key matrix input	
28	KI6	I	Key matrix input	
29	KI7	I	Key matrix input	
30	$\overline{\text{RESET}}$	I	Reset input	RESET: "L"
31	EXTAL		8 MHz Ceramic oscillator (ASS1015-A) input	
32	XTAL			
33	Vss		GND	
34	P12	O	Segment data output for FL	
35	P13	O	Segment data output for FL	
36	P14	O	Segment data output for FL	
37	P15	O	Segment data output for FL	
38	P9	O	Segment data output for FL	
39	P10	O	Segment data output for FL	
40	P14	O	Segment data output for FL	

PIN NO.	Name	I/O	Function	Logic
41	P8	O	Segment data output for FL	
42	P7	O	Segment data output for FL	
43	P6	O	Segment data output for FL	
44	P2	O	Segment data output for FL	
45	P1	O	Segment data output for FL	
46	P3	O	Segment data output for FL	
47	P5	O	Segment data output for FL	
48	P4	O	Segment data output for FL	
49			Not used	
50			Not used	
51			Not used	
52			Not used	
53			Not used	
54			Not used	
55			Not used	
56			Not used	
57			Not used	
58			Not used	
59			Not used	
60	1G	O	Timing output for FL	
61	2G	O	Timing output for FL	
62	3G	O	Timing output for FL	
63	4G	O	Timing output for FL	
64	5G	O	Timing output for FL	
65	6G	O	Timing output for FL	
66	7G	O	Timing output for FL	
67	8G	O	Timing output for FL	
68	9G	O	Timing output for FL	
69	10G	O	Timing output for FL	
70	11G	O	Timing output for FL	
71	V_{FDP}		Offset voltage for FL (–27V)	
72	V_{DD}		Power (+5V)	
73				
74				
75	KO0	O	Key matrix, key scan output	
76	KO1	O	Key matrix, key scan output	
77	KO2	O	Key matrix, key scan output	
78	50/60 IN	I	AC 50/60 Hz pulse input	
79	TYPE 2*	I	Destination selection	
80	TYPE 1*	I	Destination selection	

*

Pin terminal / Destination	TYPE 1 (80 Pin)	TYPE 2 (79 Pin)
J	L	L
EX LW existed	L	H
EX LW not existed	H	H

1. DUAL becomes 9K/10K selection in EX model. 10K: "L"

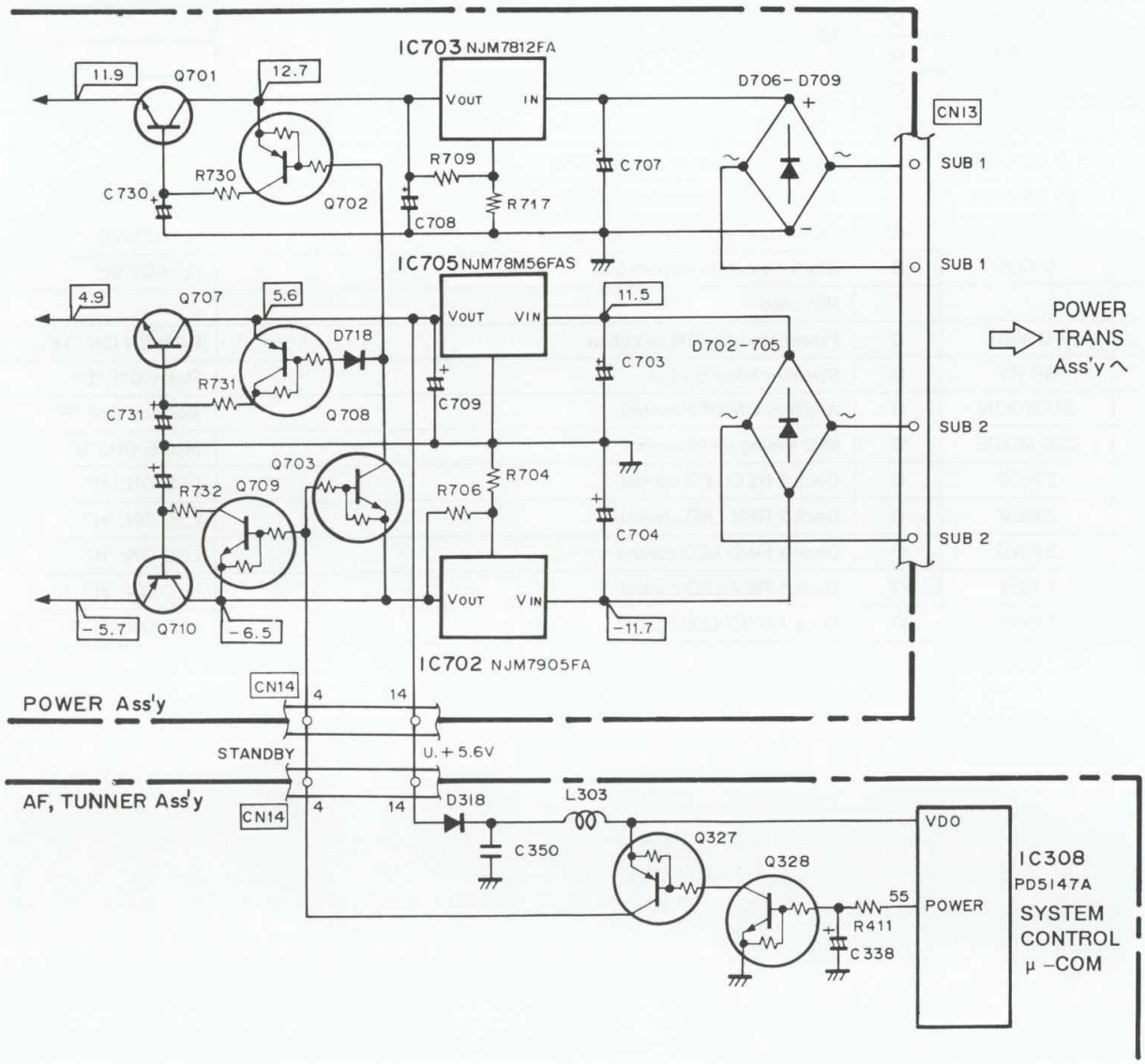
9.2 PD5147B (SYSTEM CONTROL MICROPROCESSOR)

PIN NO.	Name	I/O	Function	Logic
1	Vcc		Power (+5V)	
2	VREF		A/D converter reference input	
3	VOLUME	I	Position detection input	
4	VOL UP	O	Volume up control	
5	VOL DOWN	O	Volume down control	
6	MUTE	O	Line mute control	MUTE ON: "H"
7	4052 INH	O	Function selection IC (MC14052BCP) control	
8	4052 B	O		
9	4052 A	O		
10	TX MUTE	I	Tuner mute request	MUTE: "H"
11			Not used	
12	FADER CONT	O	Fader circuit control	
13	REC CrO_2	O	REC EQ selection	CrO_2: "H"
14	PB CrO_2	O	Playback EQ selection	CrO_2: "H"
15	BIAS	O	Bias oscillation control	During REC: "H"
16	REC MUTE	O	REC Mute control	MUTE ON: "H"
17				
18	DOLBY P/R	O	Dolby IC PB/REC selection	During REC: "H"
19	PB 1/2	O	PB 1/2 selection	Deck 2 PB: "L"
20	PULSE 2	I	Deck 2 real pulse input	
21	PULSE 1	I	Deck 1 real pulse input	
22	DAT MUTE	O	DAT OUT mute control	MUTE ON: "H"
23	SOL 2	O	Deck 2 solenoid control	SOL ON: "H"
24	MOTOR	O	Deck motor control	MOTOR ON: "H"
25	SOL 1	O	Deck 1 solenoid control	SOL ON: "H"
26	SR IN	I	Remote commander signal input	"L" ACTIVE
27	CNVss		GND	
28	RESET	I	Reset input	RESET: "L"
29	XIN		4.19 MHz Ceramic oscillator (ASS1022-A) input	
30	XOUT			
31			Not used	
32	Vss		GND	
33	KO0	O	Key matrix, key scan output	
34	KO1	O	Key matrix, key scan output	
35	KO2	O	Key matrix, key scan output	
36	KO3	O	Key matrix, key scan output	
37	KO4	O	Key matrix, key scan output	
38	KI0	I	Key matrix, key scan input	
39	KI1	I	Key matrix, key scan input	
40	KI2	I	Key matrix, key scan input	

PIN NO.	Name	I/O	Function	Logic
41	KI3	I	Key matrix, key scan input	
42	KI4	I	Key matrix, key scan input	
43		I		
44	TREBLE 1	O	SFC IC (PA0049) control	
45	TREBLE 2	O		
46	BASS 1	O		
47	BASS 2	O		
48	WIDE 1	O		
49	WIDE 2	O		
50	CD REQ/EN	I/O	System bus request/enable (CD)	"L" ACTIVE
51	TX REQ/EN	I/O	System bus request/enable (Tuner)	"L" ACTIVE
52	S.DATA	I/O	Data input/output for system bus	"L" ACTIVE
53	S.CLK	O	Clock output for system bus	"L" ACTIVE
54			Not used	
55	POWER	O	Power standby/ON selection	POWER ON: "H"
56	SP RY	O	Speaker relay control	Relay ON: "L"
57	AUDITION	O	Audition ON/OFF control	Audition ON: "H"
58	MIC MUTE	O	MIC mixing mute control	MUTE ON: "H"
59	2 REC	O	Deck 2 REC LED control	LED ON: "H"
60	2 REV	O	Deck 2 REV LED control	LED ON: "H"
61	2 FWD	O	Deck 2 FWD LED control	LED ON: "H"
62	1 REV	O	Deck 1 REV LED control	LED ON: "H"
63	1 FWD	O	Deck 1 FWD LED control	LED ON: "H"

10. CIRCUIT DESCRIPTIONS

10.1 RIPPLE FILTER CIRCUIT WITH POWER ON/OFF FUNCTION



- Q701, Q707 and Q710 are set to ON/OFF by controlling Q702, Q708 and Q709.
- When 55 Pin (POWER) of the system control microprocessor IC308 (PD5147A) is made "H" or "L", followings are obtained.

55 Pin (POWER) of IC308 output	Q328	Q327	Q703	Q709	Q702	Q708	Q710	Q707	Q701	Emitter voltage (V)		
										Q710	Q707	Q701
H	ON	ON	ON	ON	ON	ON	ON	ON	ON	-5.7	4.9	11.9
L	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	0	0	0

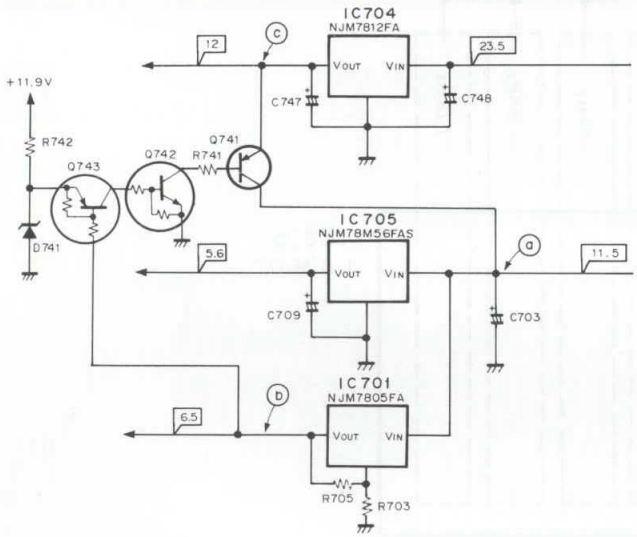
10.2 SUB–POWER SOURCE CIRCUIT

When the power voltage at the primary side of the power transformer is decreased or the load current of IC701 and IC705 are suddenly increased, the voltage at ⓐ is dropped and IC701 does not work as voltage regulator (The voltage at ⓑ is dropped). The sub–power circuit prevents this.

If the voltage at ⓐ is made high, this circuit is not required. However, considering temperature increase at each part, power consumption increase and increased cost, the voltage at ⓐ is set to be low.

The voltage at ⓑ is monitored by the base terminal of Q743.The voltage at the emitter of Q743 is kept constant by the zener diode D741. Therefore, if decreased voltage at ⓐ may decrease the voltage at ⓑ, Q743, Q742 and Q741 become ON and voltage is fed from ⓒ to ⓐ.

This keeps the voltage at ⓑ constant.



The voltage waveform at ⓐ and ⓑ with sub-power source circuit connected and not connected are shown in Fig. 10–1 and 10–2.

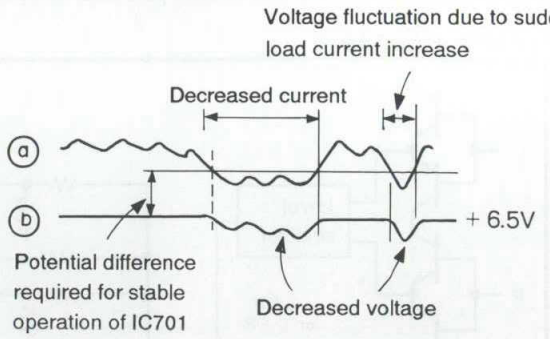


Fig. 10–1 Without Sub-power Source Circuit

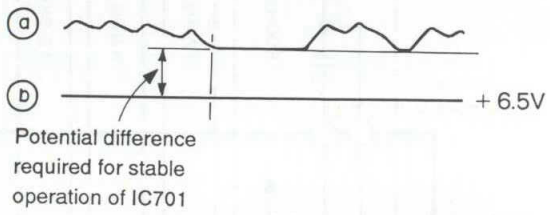
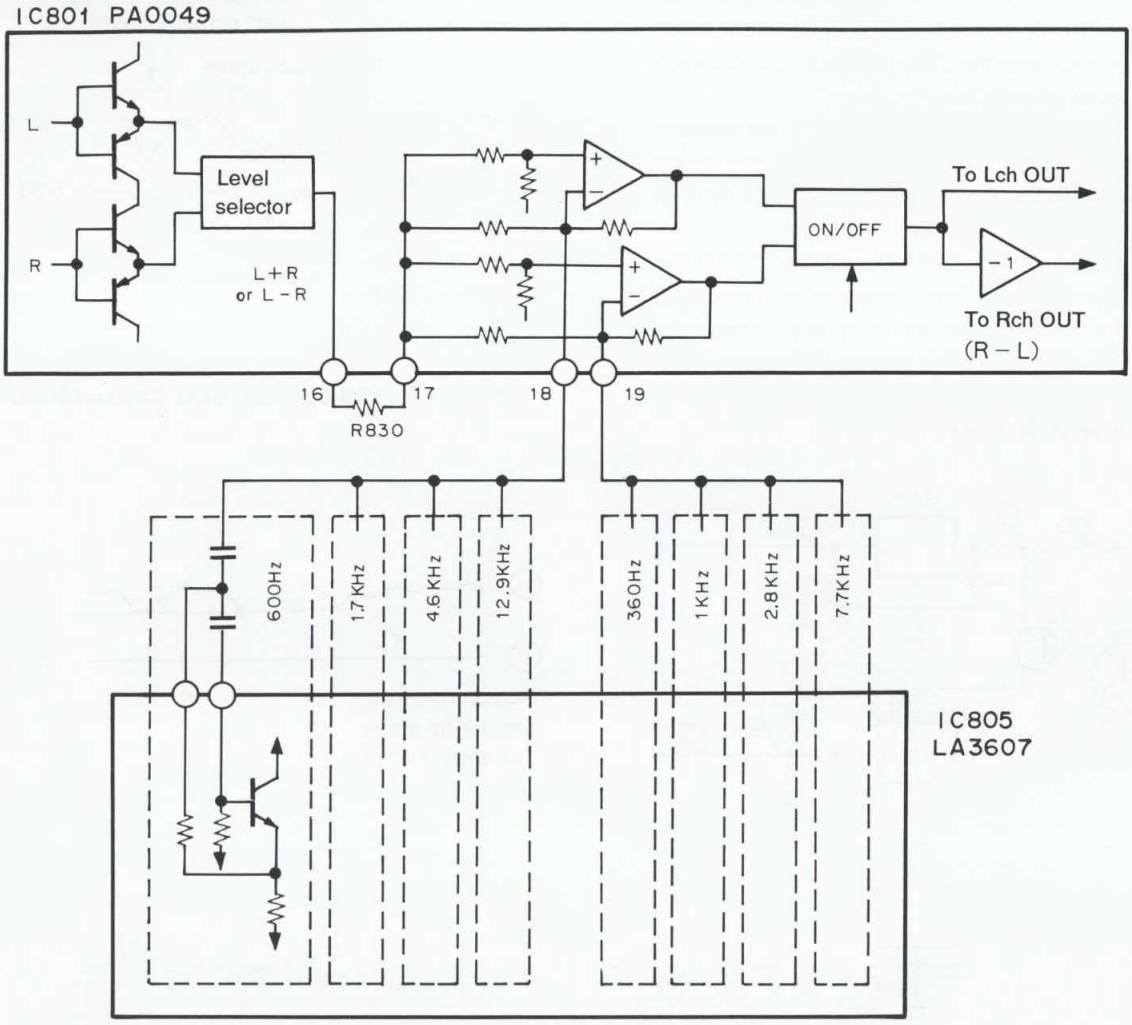


Fig. 10–2 With Sub-power Source Circuit

10.3 PHASE SHIFTER CIRCUIT

- The phase shifter circuit consists of band pass filter composed of a part of IC801 (PA0049) and IC805 (LA3607).



The phase characteristics of the circuit is shown in Fig. 10–4.
Normal position when actually hearing is shown in Fig. 10–3.
Realism can be felt by uncertain imaginary power source of A signal in Fig. 10–4.

B signal becomes imaginary sound source outside of SP.
C signal becomes imaginary sound source inside of SP.

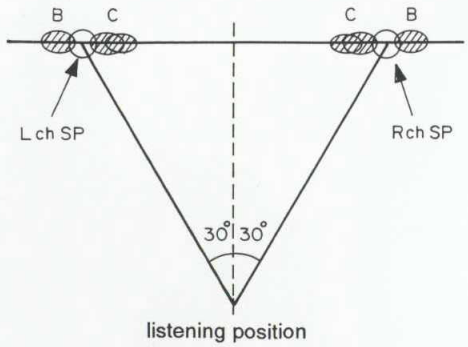


Fig. 10–3 Phase Shifter Frequency and Phase Characteristics

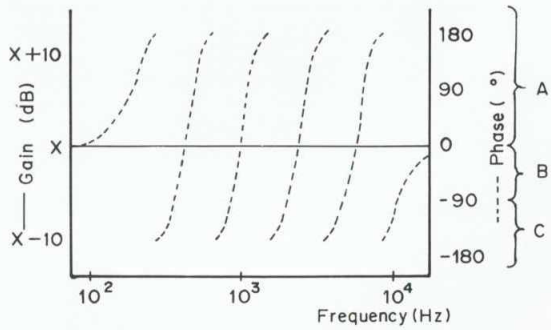
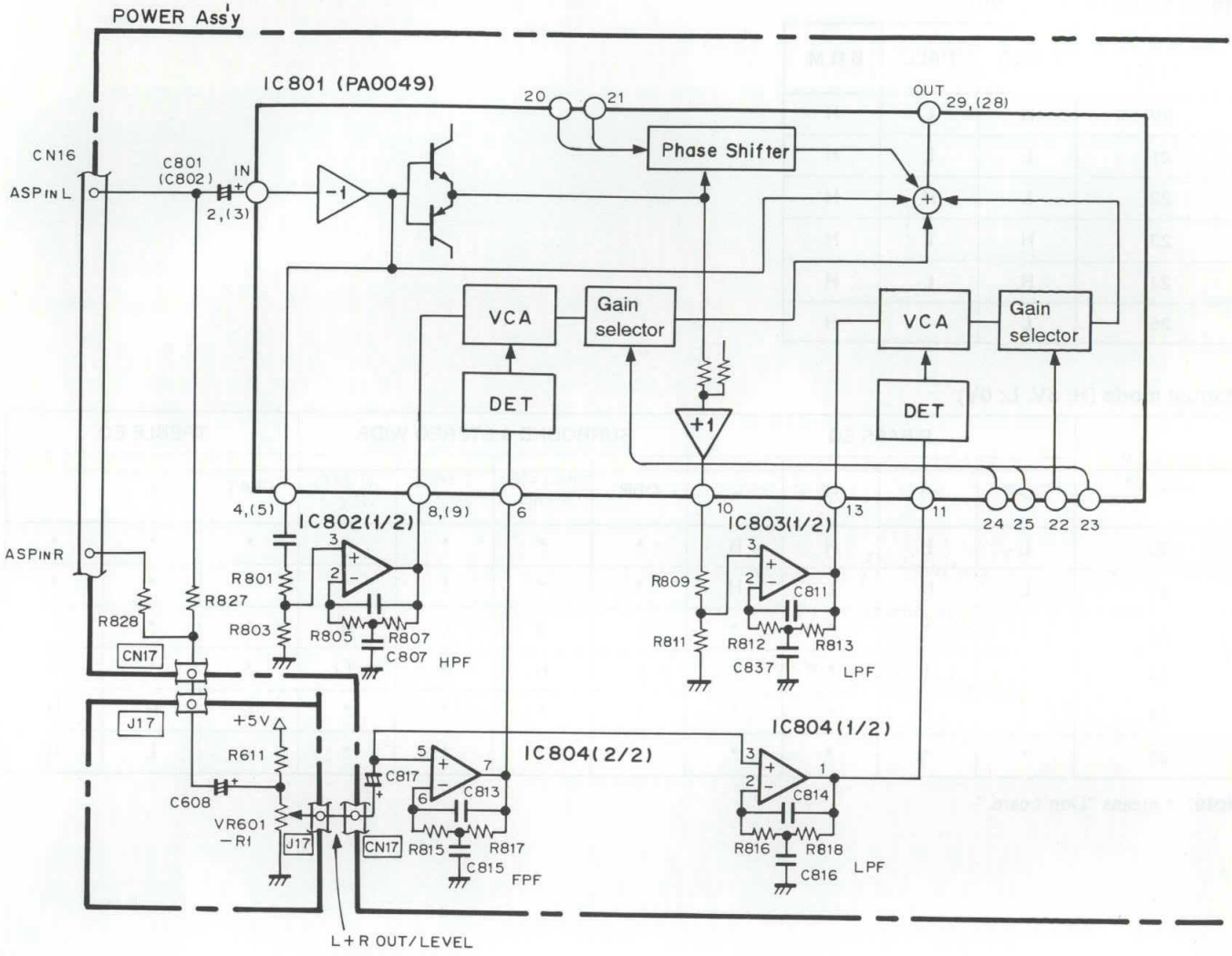


Fig. 10–4

10.4 DYNAMIC TORN CONTROL CIRCUIT



Note: ( ) is for Rch.

- In XR–P310, the circuit consists of IC801 (PA0049).

The basic operation principle of this circuit is the same as the high–frequency and low-frequency area dynamic loudness of XR–P500. (See the XR–P500 service manual issued in ARP1996.)

- The table of truth value for the control system of IC801 (PA0049) is shown below.

Preset mode (H: 5V, L: 0V)

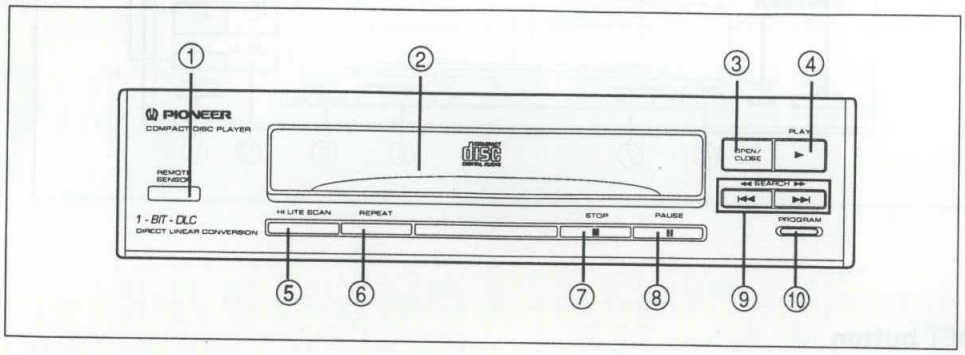
Terminal No. of IC801	DISCO	HALL	B.G.M.
20	H	L	H
21	L	L	H
22	L	H	H
23	H	L	H
24	H	L	H
25	L	–	H

Manual mode (H: 5V, L: 0V)

Terminal No. of IC801	P.BASS EQ				SURROUND & STEREO WIDE				TREBLE EQ		
	FLAT	+1	+2	–	OFF	SIMULATED STEREO	STEREO WIDE 1	STEREO WIDE 2	FLAT	+	–
20	L	L	H	H	*	*	*	*	*	*	*
21	L	H	L	H	*	*	*	*	*	*	*
22	*	*	*	*	L	H	L	H	*	*	*
23	*	*	*	*	L	H	H	L	*	*	*
24	*	*	*	*	*	*	*	*	L	H	H
25	*	*	*	*	*	*	*	*	–	L	H

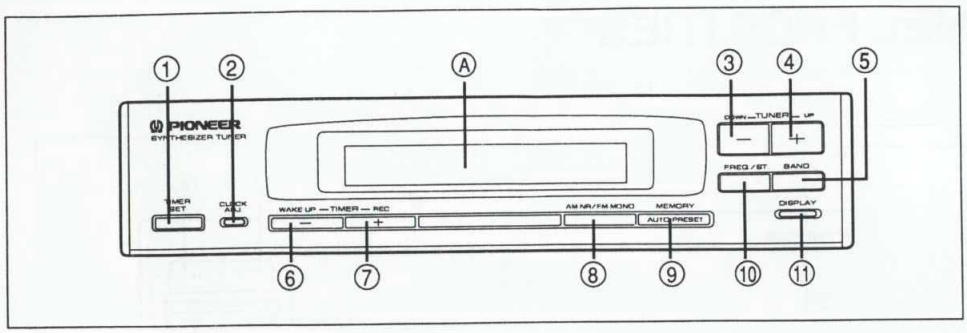
Note: * means "Don't care."

11. PANEL FACILITIES



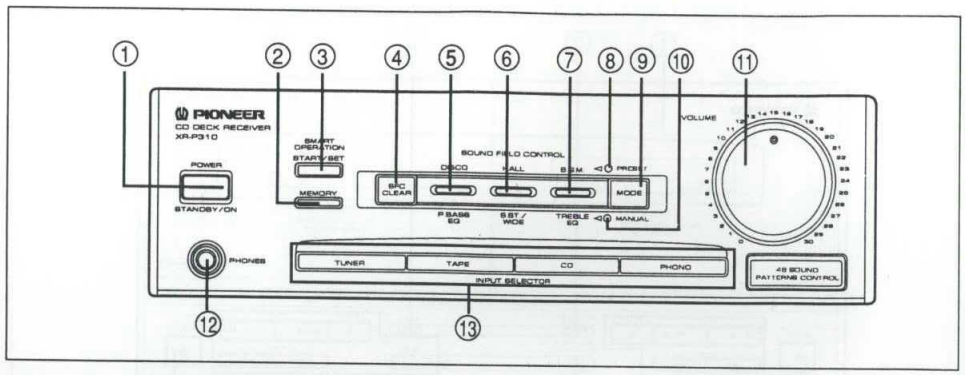
CD PLAYER

① **REMOTE SENSOR window**
② **Disc tray**
③ **OPEN/CLOSE button**
④ **PLAY button (▶)**
⑤ **HI-LITE SCAN button**
⑥ **REPEAT button**
⑦ **STOP button (■)**
⑧ **PAUSE button (❚❚)**
⑨ **SEARCH buttons (◀◀/▶▶, ⏮/⏭)**
⑩ **PROGRAM button**



TUNER

① **TIMER SET button**
② **CLOCK ADJ. button**
Ⓐ **Display**
③ **TUNER DOWN/– button**
④ **TUNER UP/+ button**
⑤ **BAND button**
⑥ **TIMER WAKE-UP/– button**
⑦ **TIMER REC/+ button**
⑧ **AM-NR/FM-MONO button**
⑨ **MEMORY/AUTO PRESET button**
⑩ **FREQ./ST. button**
⑪ **DISPLAY button**



AMPLIFIER

① POWER STANDBY/ON switch

This is the switch for electric power.

ON: When set to the ON position, power is supplied and the unit becomes operational.

STANDBY: When set to the STANDBY position, the main power flow is cut and the unit is no longer fully operational. A minute flow of power feeds the unit to maintain operation readiness. (The display shows only the time.)

② SMART OPERATION MEMORY button

③ SMART OPERATION START/SET button

④ SFC CLEAR button

⑤ DISCO/P.BASS EQ button

⑥ HALL/S.ST./WIDE button

⑦ B.G.M./TREBLE EQ button

⑧ PRESET mode indicator

⑨ MODE button

⑩ MANUAL mode indicator

⑪ VOLUME control

⑫ Headphones jack (PHONES)

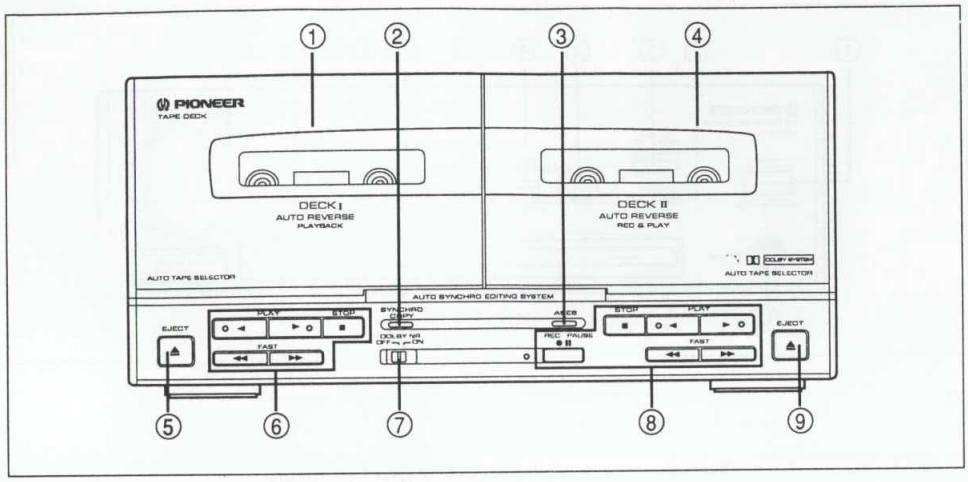
⑬ INPUT SELECTOR buttons (TUNER/TAPE/CD/PHONO)

Auto Function

This model is equipped with "Auto Function" operation, so when the switch for CD PLAY, RANDOM, PLAY (tape), TUNER UP/DOWN (+/–) or BAND is pressed, the function switches automatically. Use the PHONO function button to select the component connected to the PHONO jacks, since Auto Function is not effective for this.

NOTE:

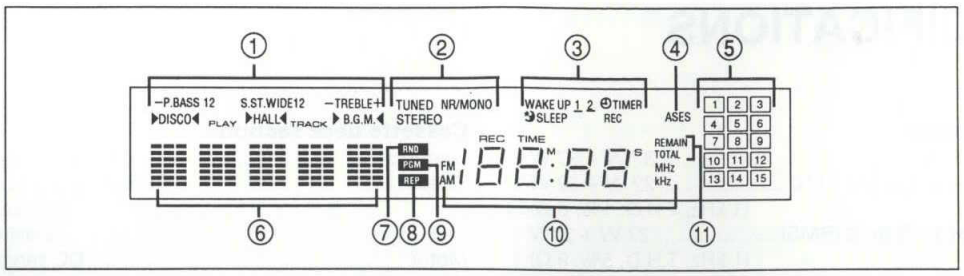
The function cannot be switched during recording except for tape copying. (Auto Function does not operate either.)



TAPE DECK

① **DECK I cassette door**
② **SYNCHRO COPY button**
③ **ASES (Auto Synchro Editing System) button**
④ **DECK II cassette door**
⑤ **DECK I EJECT button (⏏)**
⑥ **DECK I operation buttons (PLAY ◄ ►, STOP ■ , FAST ◄◄ ►►)**
⑦ **DOLBY* NR switch**
⑧ **DECK II operation buttons (PLAY ◄ ►, STOP ■, FAST ◄◄ ►►, REC PAUSE ● II)**
⑨ **DECK II EJECT button (⏏)**

* Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"DOLBY" and the double-D symbol ⧈ are trademarks of Dolby Laboratories Licensing Corporation.



Ⓐ DISPLAY

① Sound field control indicators
Display SOUND FIELD CONTROL settings.

② Tuner indicators
Indicate the tuning mode.

③ Timer indicators
Display timer settings.

④ A.S.E.S. (Auto Synchro Editing System) indicator.
Lights when A.S.E.S. is performed.

⑤ Music calendar

⑥ Function display
Displays the selected function. In the TUNER mode, this displays the station No., and when playing a CD it displays the track No. (During program play it displays the step No.)

⑦ Random indicator

⑧ Repeat indicator

⑨ Program indicator

⑩ Frequency/Time display
In TUNER mode, frequency is displayed. In any other mode it displays the time.

⑪ REMAIN/TOTAL indicator
In CD mode, "REMAIN" shows the remaining play time and "TOTAL" shows the total play time.

12. SPECIFICATIONS

Amplifier section

Music Power (DIN) ..... 37 W + 37 W
Continuous Power Output (DIN) ..... 22 W + 22 W
(1 kHz, T.H.D. 1%, 8 Ω)
Continuous Power Output (RMS) ..... 27 W + 27W
(1 kHz, T.H.D. 5%, 8 Ω)
Hum & Noise
(DIN, Continuous Power/50 mW) ..... 68 dB/60 dB
Total Harmonic Distortion
(40 Hz to 20,000 Hz, 11 W, 8 ohms)*PHONO
..... No more than 0.2%

FM/AM tuner section

FM Tuner Section

Frequency Range ..... 87.5 MHz to 108 MHz
Usable Sensitivity ..... Mono: 12.8 dBf, IHF
(1.2 µV/75 ohms)
Sensitivity (DIN) ..... Mono S/N 26 dB: 1 µV/75 Ω
Stereo S/N 46 dB: 50 µV/75 Ω
Signal-to-Noise Ratio (IHF, 85 dBf Input) ..... Mono: 77 dB
Stereo: 73 dB
Signal-to-Noise Ratio (DIN) ..... Mono: 66 dB
Stereo: 60 dB
Distortion ..... Stereo: 0.5 % (1kHz)
Antenna Input ..... 75 ohms unbalanced

MW (AM) Tuner Section

Frequency Range ..... 531 kHz to 1,602 kHz
Sensitivity (IHF, Loop antenna) ..... 350 µV/m
Antenna ..... Loop Antenna

LW Tuner Section

Frequency Range ..... 153 kHz to 281 kHz
Sensitivity (IHF, Loop antenna) ..... 1500 µV/m
Antenna ..... Loop Antenna

CD Section

Type ..... Compact disc digital audio system
Signal to Noise Ratio ..... 98 dB or more (EIAJ)
Dynamic Range ..... 92 dB or more (EIAJ)
Wow and Flutter ..... Limit of measurement
(±0.001% W.PEAK) or less (EIAJ)

Cassette deck section

Systems ..... 4 track, 2-channel stereo
Heads ..... Recording/playback head x 1
Playback head x 1
Erasing head x 1
Motor ..... DC servo motor x 2
Wow and Flutter ..... No more than 0.09 % (WRMS)
Frequency Response (-20 dB recording):
CrO_2 tape ..... 35 Hz to 15,000 Hz ±6 dB
Normal tape ..... 35 Hz to 14,000 Hz ±6 dB
Signal-to-Noise Ratio
Dolby NR OFF ..... 56 dB
Noise Reduction Effect
Dolby B type NR ON ..... More than 10 dB (at 5 kHz)

Miscellaneous

Power Requirements ..... AC. 220 Volts ~, 50/60 Hz
Power Consumption ..... 150 W
Dimensions ..... 260 (W) x 310 (H) x 295 (D) mm
Weight (without package) ..... 8.0 kg

Accessories

Operating Instructions 1
Remote Control Unit 1
Dry Cell Batteries (AAA/R03) 2
FM Antenna 1
AM Loop Antenna 1

NOTE:
Specifications and design subject to possible modification without notice due to improvements.

* Measured by audio spectrum analyzer.

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