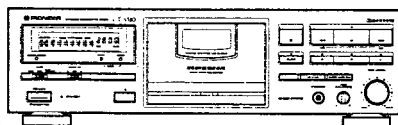


Service Manual

PIONEER®
The Art of Entertainment



ORDER NO.
ARP2751

STEREO CASSETTE DECK

CT-S320

CT-S320 HAS THE FOLLOWING:

Type	Power Requirement	Remarks
HEM	AC220 – 230V, 230 – 240V (switchable) *	
HB	AC220 – 230V, 230 – 240V (switchable) *	
HPW	AC220 – 230V, 230 – 240V (switchable) *	
SD	AC110V, 120 – 127V, 220V, 240V (switchable)	
SL	AC110V, 120 – 127V, 220V, 240V (switchable)	

* Change the connection of the power transformer's primary wiring.

- This manual is applicable to CT-S320/HEM, HB, HPW, SD and SL.
- For HB, HPW, SD and SL types, refer to page 27.

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PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 300 Allstate Parkway Markham, Ontario L3R 0P2 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911
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1. EXPLODED VIEWS, PACKING AND PARTS LIST

1.1 EXTERIOR AND PACKING

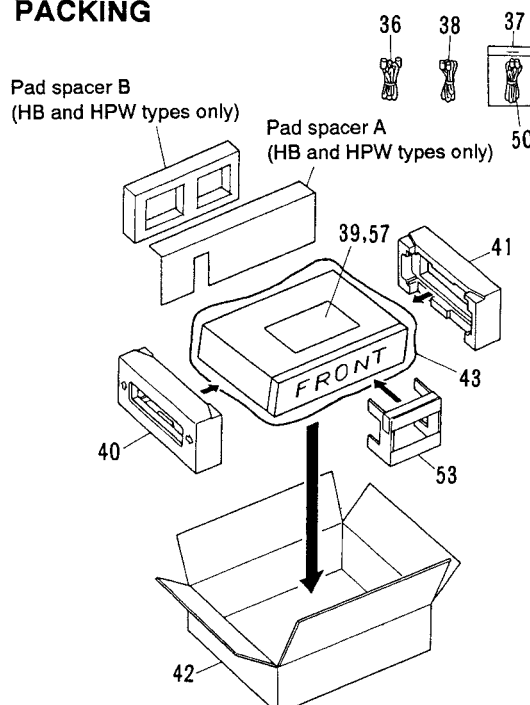
NOTES:

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

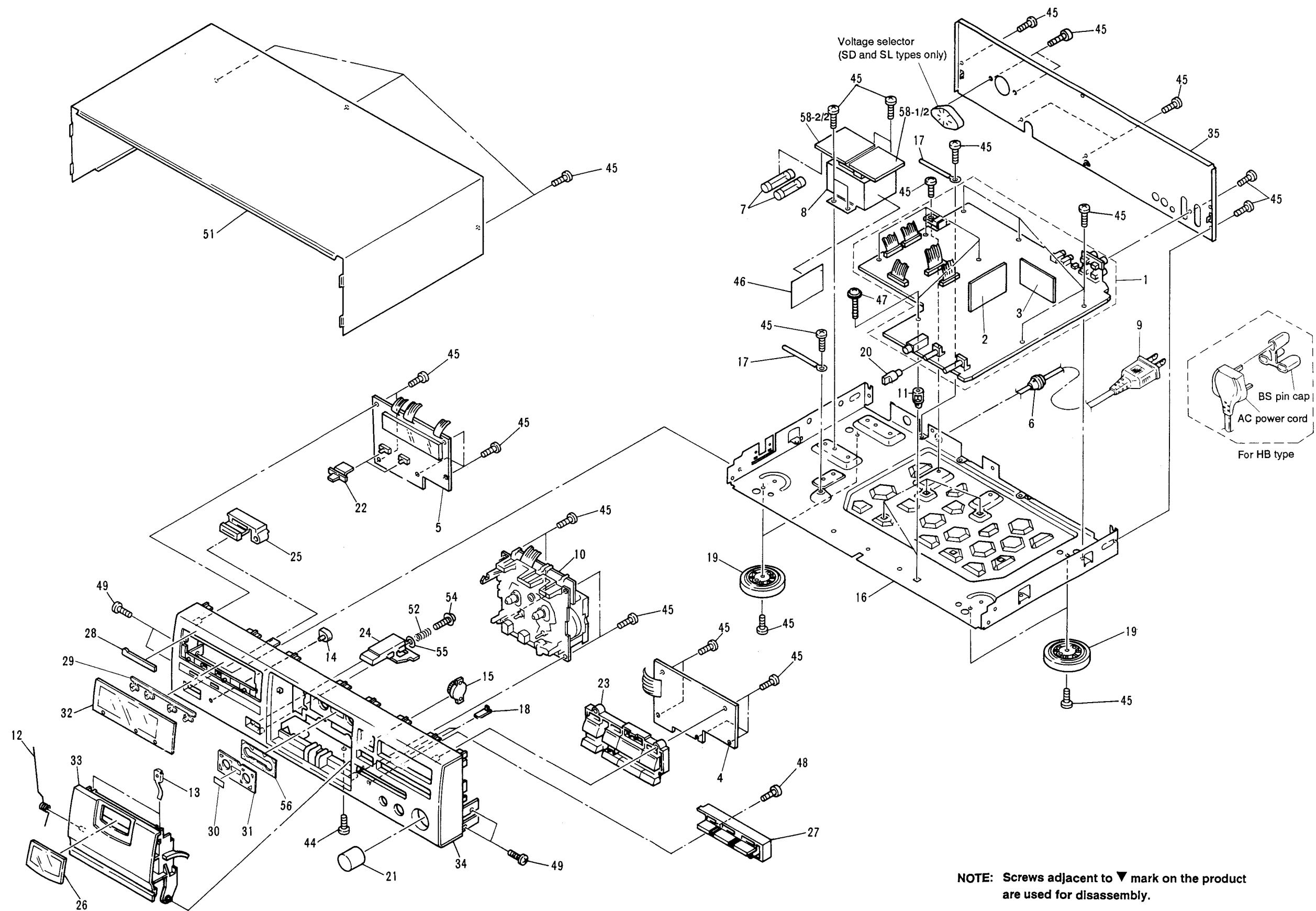
Parts List

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
NSP	1	Main unit	RWZ2872	41	Pad (R)	RHA1112	
	2	HX unit	RWX1034	42	Packing case	RHG1455	
	3	1/f unit	RWX1087	43	Sheet	RHX - 034	
	4	Operate unit	RWZ2873	44	Screw	BBZ30P060FZK	
	5	FL unit	RWZ2874	45	Screw	BBZ30P080FMC	
Δ	6	Strain relief	CM - 22B	46	Sheet	DEC1661	
Δ	7	Fuse FU1001, 1002 (T1.25A)	REK1023	47	Screw	IBZ30P150FCU	
Δ	8	Power transformer	RTT1229	48	Screw	BBZ26P060FMC	
Δ	9	AC power cord	RDG1026	49	Screw	ABZ30P080FMC	
NSP	10	Mechanism unit	RYM1205	50	Connection cord	RDE - 010	
	11	PCB spacer	PNY - 404	51	Bonnet	REA1077	
	12	Door spring L	RBH1341	52	Eject spring	RBH1340	
	13	Half pressure spring	RBK1004	53	Spacer A	RHC1044	
	14	LED lens	PNW2019	54	Screw	IPZ26P080FMC	
	15	Damper assembly	REC1005	55	Washer	WA52D080D025	
NSP	16	Main chassis	RNB1090	56	Stabilizer B	REB1085	
	17	Cord clamber	RNH - 184	57	Operating instructions (German/Italian/Dutch/Spanish/Portuguese/Swedish)	RRD1136	
	18	Indicator lens S	PNW1893	NSP 58	TRN 1 unit	RWZ2875	
	19	Insulator	PNW1912				
	20	Balance knob	RAC1705				
	21	VR knob	RAC1707				
	22	Slide knob	RAC1713				
	23	Operation knob	RAC1795				
	24	Eject knob	RAC1772				
	25	Power knob	RAC1809				
NSP	26	Door lens	RAH2171				
	27	Mode knob A	RAC1802				
	28	PIONEER badge	RAM1007				
	29	Mode knob B	RAC1808				
	30	Remain display paper	REE - 113				
	31	Stabilizer panel	RAH1483				
	32	FL lens	RAH2240				
	33	Door pocket	RAH2232				
	34	Front panel	RAH2236				
	35	Rear panel	RNA1683				
	36	Connection cord with mini plug	PDE - 319				
	37	Connection cord assembly	RDE1002				
	38	Control cord	RDE1030				
	39	Operating instructions (English/French)	RRE1077				
	40	Pad (L)	RHA1111				

PACKING

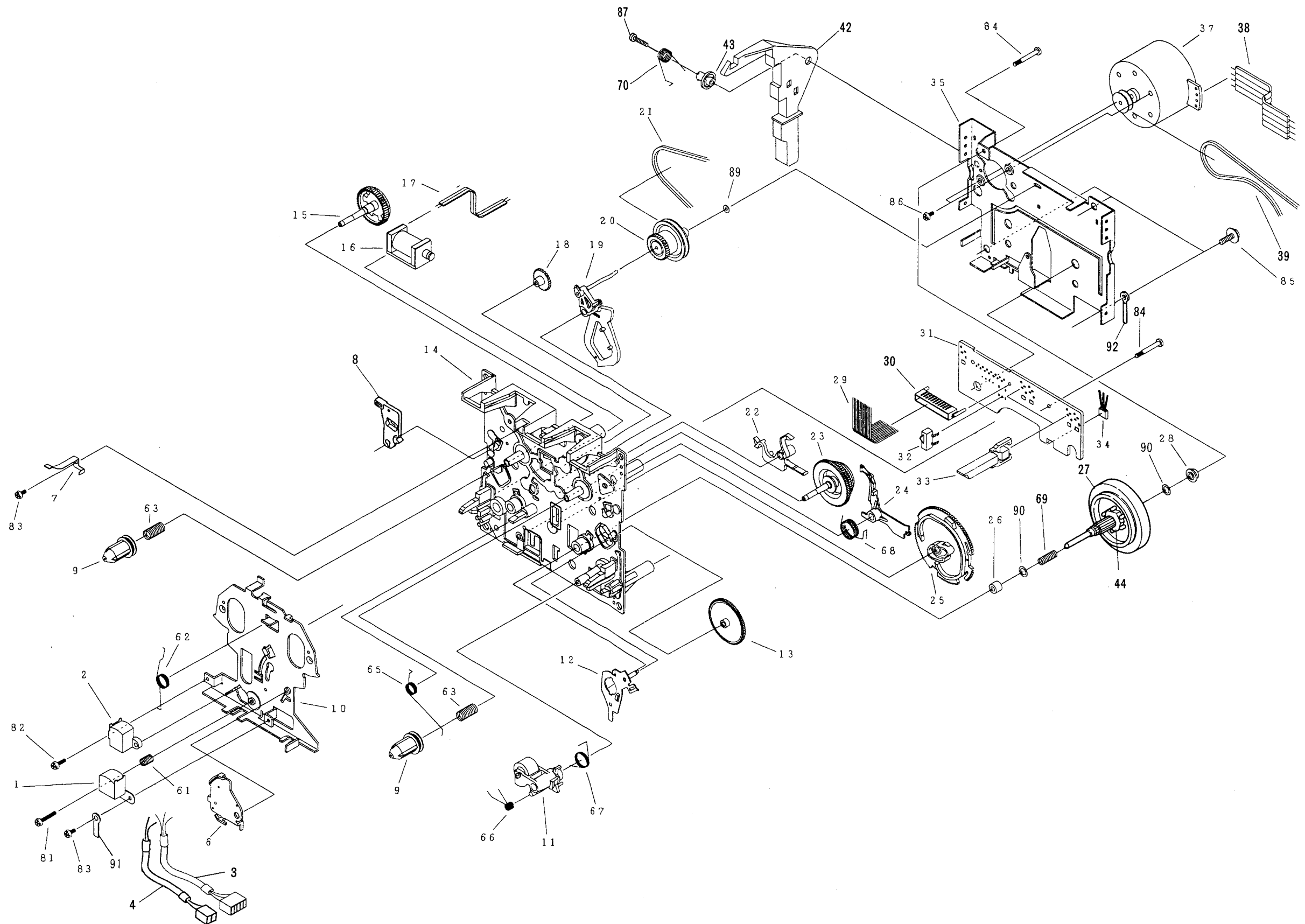


Exterior



CT-S320

1.2 MECHANISM UNIT



Parts List

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	R/P HEAD	RPB1026		81	SCREW (AZIMUTH)	RBA1096
	2	E HEAD	RPB1027		82	SCREW	RBA1029
	3	WIRE HEAD	RKP1404		83	SCREW	PCZ20P040FMC
	4	WIRE HEAD (E)	RKP1405		84	SCREW	RBA1093
					85	SCREW	RBA1094
	6	ASS'Y ARM ASSIST	RXA1401		86	SCREW	RBA1086
	7	SPRING CASSETTE	RBK1039		87	SCREW	RBA1095
	8	EJECT LOCK	RNK1718		89	WASHER	RBF1046
	9	CAP REEL	RNK1719		90	WASHER	WA26D047D013
	10	CHASSIS HEAD	RNE1439				
	11	ASS'Y PINCH ARM R	RXA1404		91	KEEP WIRE	RNE1456
	12	ARM PLAY R	RNK1868		92	KEEP WIRE	RNH1004
	13	GEAR PLAY	RNK1867				
	14	CHASSIS OS.	RXA1417				
	15	REEL GEAR	RNK1726				
△	16	SOLENOID	RXP1020				
	17	WIRE	RDC1006				
	18	GEAR FF	RNK1723				
	19	ASS'Y ARM FR	RXA1412				
	20	ASS'Y PULLEY FR	RXA1413				
	21	BELT FR	REB1158				
	22	ARM BRAKE	RNK1724				
	23	ASS'Y SUB REEL R	RXA1408				
	24	ARM TRIGGER	RNK1722				
	25	GEAR CAM	RNK1725				
	26	SHAFT HOLDER	RNG1049				
	27	ASS'Y FLYWHEEL R	RXA1415				
	28	SHAFT HOLDER	RNG1004				
	29	WIRE	RDD1260				
NSP	30	HOLDER WIRE	RNK1683				
	31	P.C. BOARD	RNP1347				
	32	SWITCH MODE	RSN1020				
	33	SWITCH (LEAF)	RSN1019				
	34	HALL IC.	DN6851A				
	35	BRACKET FW	RNE1438				
	37	ASS'Y MOTOR	RXM1064				
NSP	38	WIRE	RDD1012				
	39	BELT MAIN	REB1223				
	42	EJECT LEVER L	RNK1831				
	43	COLLAR	RNK1704				
	44	GEAR FW R	RNK1733				
	61	SPRING (AZIMUTH)	RBH1296				
	62	SPRING	RBH1284				
	63	SPRING	RBH1286				
	64	.....					
	65	SPRING	RBH1285				
	66	SPRING	RBH1298				
	67	SPRING	RBH1290				
	68	SPRING	RBH1295				
	69	SPRING	RBH1325				
	70	SPRING (L)	RBH1319				

2. PCB PARTS LIST

NOTES:

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

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

560 Ω $\rightarrow$ $56 \times 10^1 \rightarrow 561$ RD1/8PM $\begin{array}{|c|c|c|} \hline 5 & 6 & 1 \\ \hline \end{array}$ J

47k Ω $\rightarrow$ $47 \times 10^3 \rightarrow 473$ RD1/4PS $\begin{array}{|c|c|c|} \hline 4 & 7 & 3 \\ \hline \end{array}$ J

0.5 Ω $\rightarrow$ 0R5 RN2H $\begin{array}{|c|c|c|} \hline 0 & R & 5 \\ \hline \end{array}$ K

1 Ω $\rightarrow$ 010 RS1P $\begin{array}{|c|c|c|} \hline 0 & 1 & 0 \\ \hline \end{array}$ K

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

5.62k Ω $\rightarrow$ $562 \times 10^1 \rightarrow 5621$ RN1/4PC $\begin{array}{|c|c|c|c|} \hline 5 & 6 & 2 & 1 \\ \hline \end{array}$ F

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
------	-----	-------------	----------	------	-----	-------------	----------

LIST OF ASSEMBLIES

NSP	MOTHER UNIT	RWM1600
	└ MAIN UNIT	RWZ2872
NSP	└┐ HX UNIT	RWX1034
	└┐ 1/f UNIT	RWX1087
	└ OPERATE UNIT	RWZ2873
	└ FL UNIT	RWZ2874
NSP	└ TRN 1 UNIT	RWZ2875

MAIN UNIT

SEMICONDUCTORS

	IC223	BA10339
	IC554	BA15218
	IC221, IC701, IC902, IC1601	BA15218N
	IC510	BU2040
	IC351	CXA1198AP
	IC251	CXA1330S
	IC101	M5220L
Δ	IC1003, IC1004	NJM7812FA
Δ	IC1002	NJM78M05FA
	IC501	PD4445A
	IC1701	TC4050BP
	Q1001	2SA1283
	Q421, Q510, Q852, Q1005, Q1010	2SA1309A
	Q431, Q854	2SB1238X
	Q105, Q106, Q163, Q164, Q351, Q352, Q1006, Q1007	2SC3311A
	Q401, Q402	2SD1302
	Q857	2SD1858X
	Q254, Q258, Q353, Q354, Q403, Q701, Q702, Q1603, Q1604	2SD2144S
	Q553	2SK246
	Q161, Q162	2SK373
	Q165	DTA114ES
	Q332, Q762, Q841, Q842	DTA114TS
	Q355-Q358	DTC114ES
	Q422, Q432, Q503-Q506, Q551, Q552,	DTC114TS

Q853, Q901-Q904, Q1151-Q1165
Q167, Q168, Q255-Q257, Q259, Q260, Q507, Q855 DTC124ES

Δ	D1001, D1006, D1013-D1016	1SR35-100AVL
	D431, D434, D812	1SS252
	D161-D166, D251, D421-D425, D432, D433, D435, D502, D507, D510, D521-D527, D742, D807-D811, D814, D841-D844, D901-D903, D913, D921, D1011, D1602-D1604, D1620-D1622, D1701-D1705	1SS254
Δ	D1009, D1010	MTZJ27C
Δ	D1002	

D765 MTZJ3. 9B
D1031 MTZJ5. 1B
D1004 MTZJ7. 5B
D501 MTZJ9. 1A

COILS AND FILTERS

L402	LFA121K
L401 (F=105K)	RTD1039
L351, L352 (L=103J)	RTF1102
F251, F252	RTF1208

CAPACITORS

C161, C162	CCPUSL100J50
C103, C104	CEANL100M16
C107, C108	CEANL330M16
C251-C254, C321, C322, C555, C703, C704, C1601, C1602	CEAS010M50
C255, C269, C281-C284, C408, C707, C708, C915, C916, C1016	CEAS100M50
C132, C711, C1603, C1604	CEAS101M16
C1018	CEAS220M50
C351, C352	CEAS221M10
C1010, C1013, C1015, C1605	CEAS221M16
C1001	CEAS221M50
C1007	CEAS222M16
C285, C286	CEAS330M16
C914, C1004	CEAS330M35

Mark	No.	Description	Part No.
	C913		CEAS331M6R3
	C1011		CEAS332M35
	C111, C120, C131, C361, C402, C403, C409, C513, C705, C1024		CEAS470M16
	C353-C356, C358		CEAS4R7M50
	C265, C266		CEASR22M50
	C267, C268, C273, C274		CEASR33M50
	C917, C918		CEASR47M50
	C287, C288		CFTXA103J50
	C261-C264		CFTXA222J50
	C404		CFTXA223J50
	C405, C406		CFTXA332J50
	C407, C553		CFTXA472J50
	C109, C110		CFTXA682J50
	C554		CGCYX103K25
	C503		CGCYX104K25
	C504		CGCYX123K25
	C505, C552		CGCYX223K25
	C551		CGCYX823K25
	C133, C509, C510, C514, C515, C910, C1606		CKCYF103Z50
	C357, C706, C769, C911, C919, C921, C1008, C1020-C1022, C1030, C1607, C1701, C2020		CKCYF473Z50
	C105, C106, C723, C724		CKPUYB101K50
	C923, C924		CKPUYB122K50
	C359, C360		CKPUYB221K50
	C101, C102, C851		CKPUYB681K50
	C401		CQPA822J100
RESISTORS			
	R502, R531 (22K)		RA4T223J
	R501 (38K)		RA4T683J
	R517, R1185, R1701 (22K)		RA5T223J
	R512 (68K)		RA6T683J
	R1186 (22K)		RA7T223J
	R518 (68K)		RA9T683J
	R321, R322 (560Ω)		RCN1024
	R1702 (11K/22K)		RCX1020
	R413		RD1/2LF010J
	R1001		RD1/2LF152J
	R421		RD1/2LF181J
	R411		RD1/2LF271J
△	R1020 (47Ω)		RFA1/4L470J
	R1031 (820Ω)		RS2LMF821J
	VR101, VR102 (4.7K)		RCP1020
	VR321, VR322, VR551-VR553 (22K)		RCP1046
	VR852 (15K)		RCP1090
	VR2003		RCS1028
	VR2002		RCV1095
	OTHER RESISTORS		RD1/6PM□□□J
OTHERS			
	CN851 CONNECTOR (13P)		KPE13
	JA1602 MINI JACK		PKN1005
	JA701 PIN JACK (4P)		RKB-020

Mark	No.	Description	Part No.
	JA2003	HEADPHONE JACK	RKN1002
	JA902, JA903	REMOTE CONTROL JACK	RKN1004
	X501	CERAMIC RESONATOR (4.19MHz)	VSS1014

HX UNIT

SEMICONDUCTORS

IC601	UPC1297CA
Q601, Q602	2SA1309A
Q603	DTC124ES
D601, D602	1SS254

COILS

L601, L602 (L=4.6mH, Q=25, F=105KHz)	RTD1046
--------------------------------------	---------

CAPACITORS

C609, C610	CCCSL101K500
C615, C617	CEAS100M50
C616	CEAS4R7M50
C614	CEASR10M50
C601, C602	CFTXA103J50
C605, C606	CFTXA223J50
C607, C608	CGCYX473K25
C613	CKPUYB101K50
C603, C604	CKPUYB821K50
C611, C612 (C=430P, V(DC)=500)	RCG1005

RESISTORS

VR601, VR602	VRTB6HS223
OTHER RESISTORS	RD1/6PM□□□J

1/f UNIT

SEMICONDUCTORS

IC1111, IC1131	BA15218N
Q1131-Q1136	DTC124ES
D1111	1SS254

CAPACITORS

C1141-C1143	CEAS010M50
C1131, C1132, C1144, C1147, C1148	CEAS470M16
C1139, C1140	CEAS4R7M50
C1119	CEASR47M50
C1133, C1134	CGCYX152K25
C1135, C1136	CGCYX272K25
C1115, C1116	CGCYX332K25
C1120	CGCYX473K25
C1137, C1138	CGCYX562K25
C1111, C1112	CGCYX822K25
C1113	CKPUYB101K50

RESISTORS

ALL RESISTORS	RD1/6PM□□□J
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OPERATE UNIT

SEMICONDUCTORS

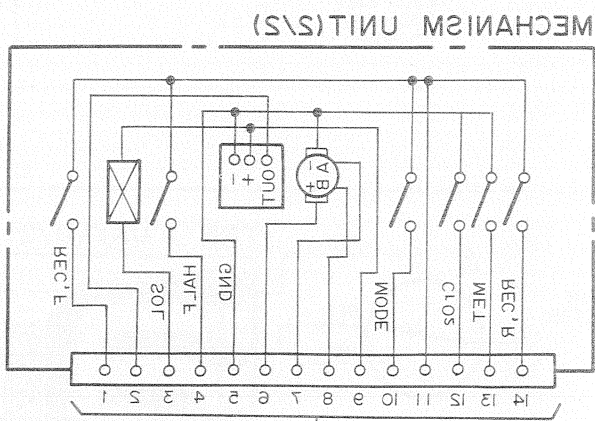
Q1401	DTA114TS
Q1451, Q1452	DTC124ES
D1451	SEL6410G
D1452	SEL6C10R

T-S320

Mark	No.	Description	Part No.
SWITCHES			
	S1401-S1404, S1406-S1411		RSG1030
CAPACITORS			
	C1452		CEAS100M16
RESISTORS			
	ALL RESISTORS		RD1/6PM□□□J
FL UNIT			
SEMICONDUCTORS			
	Q1501		DTC124ES
	D1501, D1503-D1505, D1510-D1515, D1522, D1524, D1525		1SS254
	D1520		SEL6C10R
SWITCHES			
	S1505		RSG1030
	S1501-S1503		RSG1034
	S1521, S1524		RSH1041
CAPACITORS			
	C1501		CEAS100M50
RESISTORS			
	ALL RESISTORS		RD1/6PM□□□J
OTHERS			
	V1501 FL INDICATOR TUBE		RAW1124
TRN 1 UNIT			
TRN1 unit has no service part.			

A

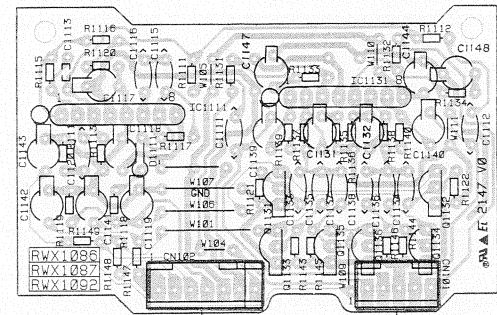
- B



• View from component side

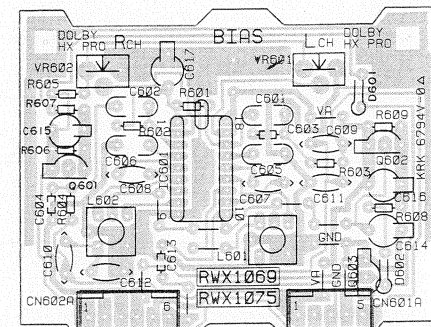
1/f UNIT

RNP1503-A



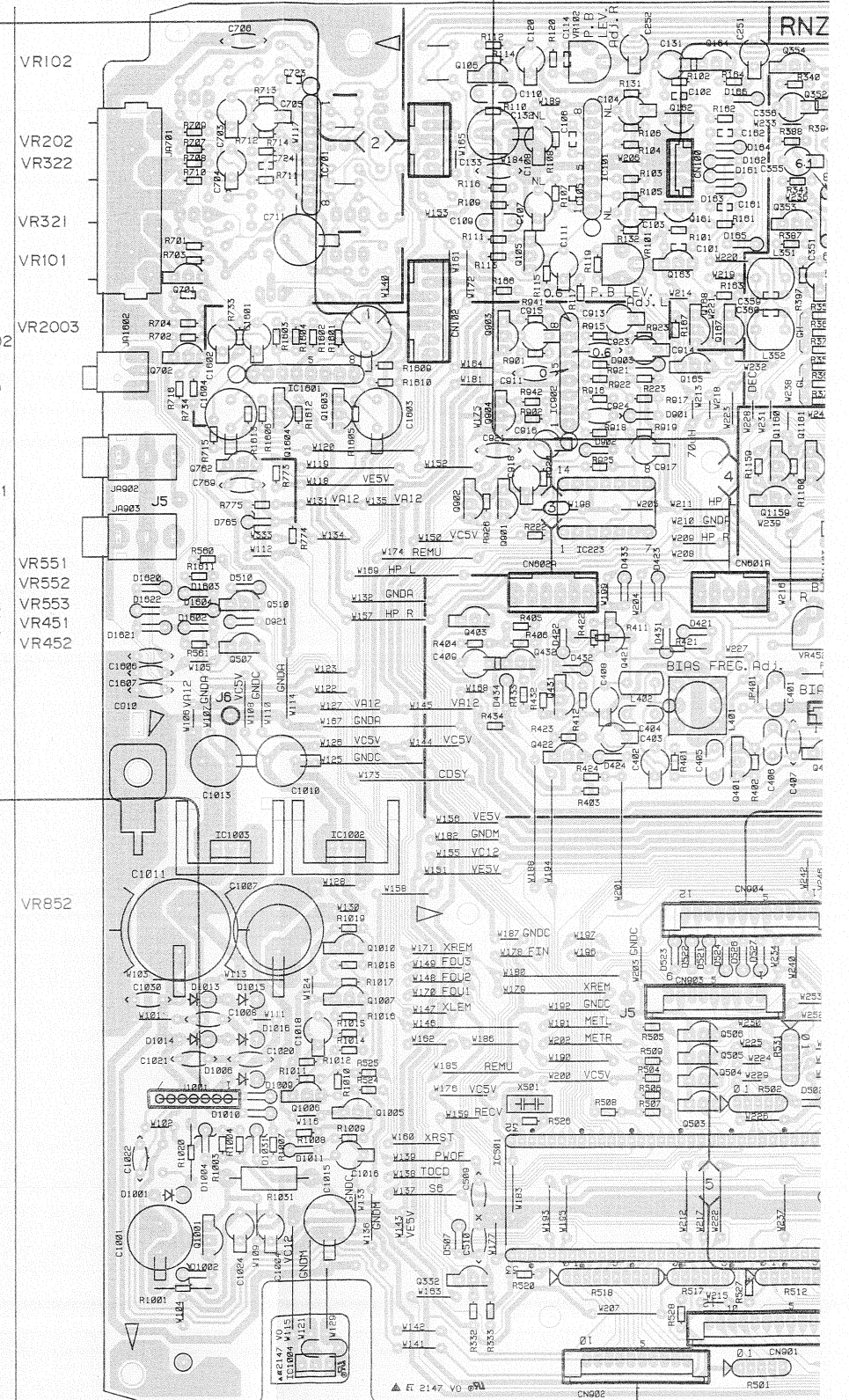
HX UNIT

PNP1281 -A



MAIN UNIT

RNZ



TRN 1 UNIT (1/2)

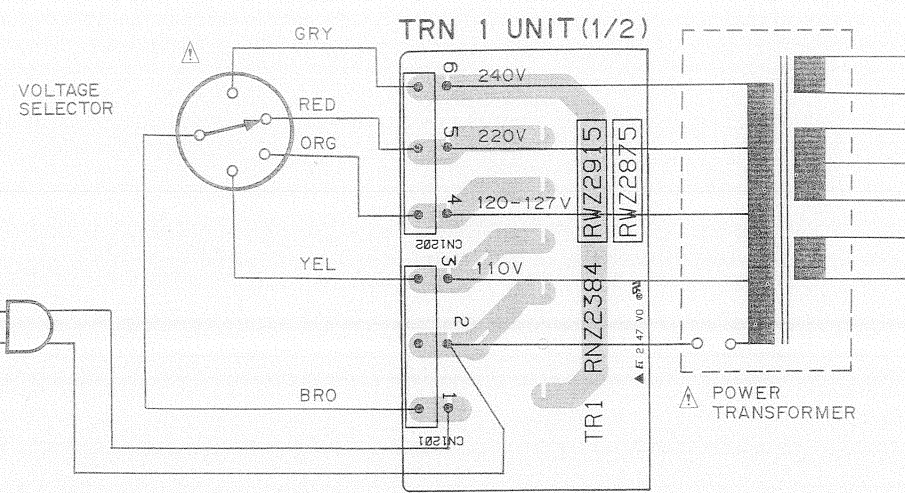
TRN 1 UNIT (2/2)

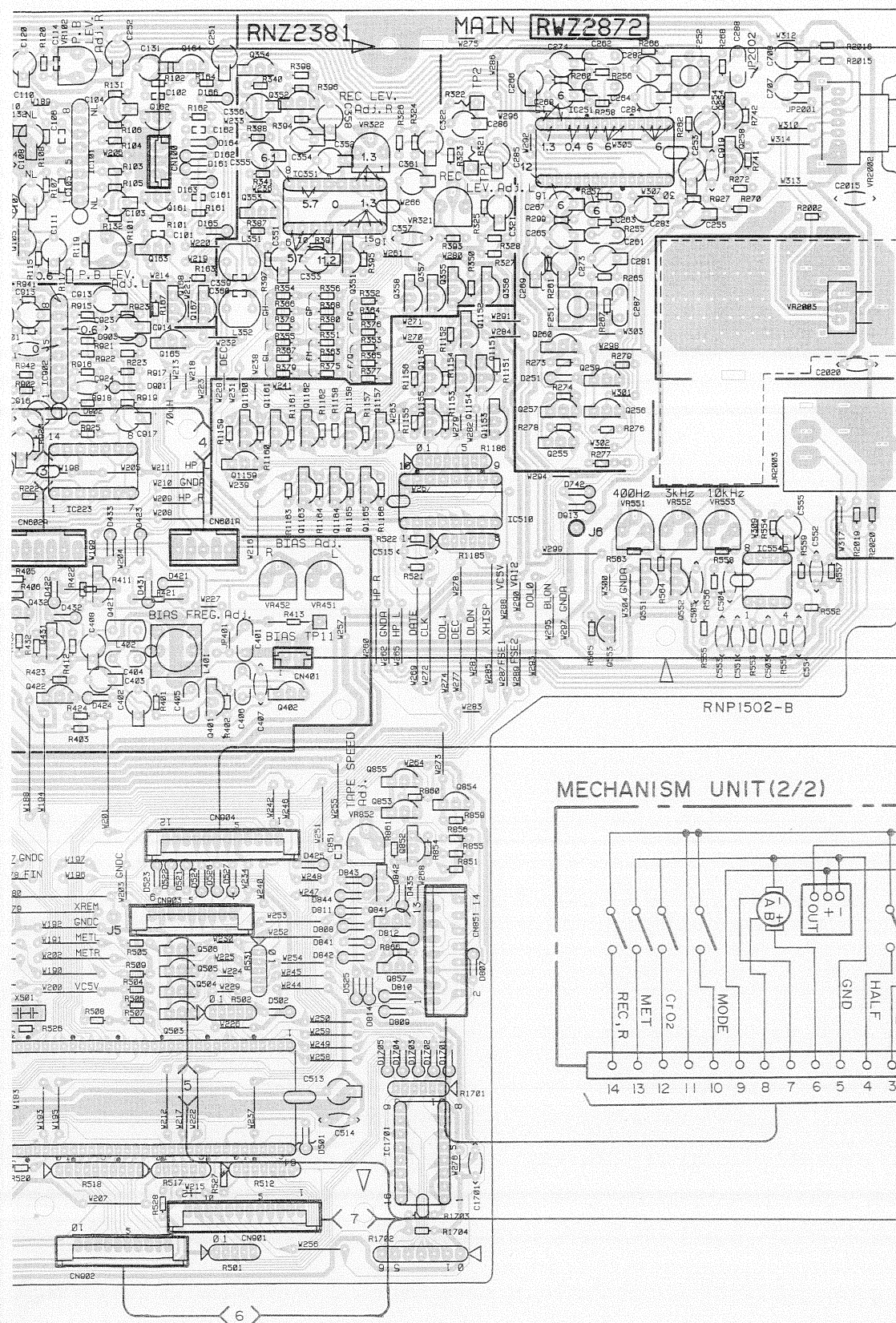
230-240V
220-230VAC
220-230/
230-240
50/60HzPOWER
TRANSFORMER

Line Voltage Selection

- Line voltage can be changed with the follows:
1. Disconnect the AC power cord.
 2. Remove the cover
 3. Change the connection of TRN 1 UNIT primary pins.
 4. Stick the line voltage label on the rear panel.

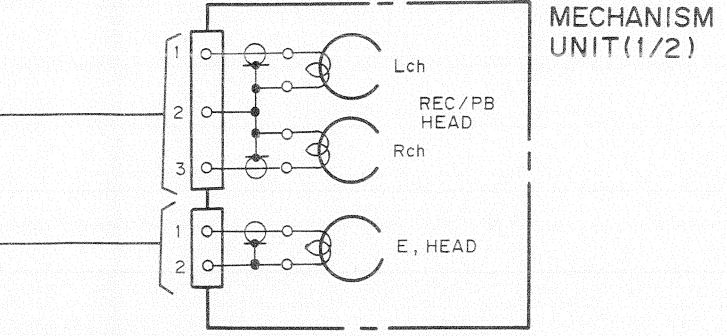
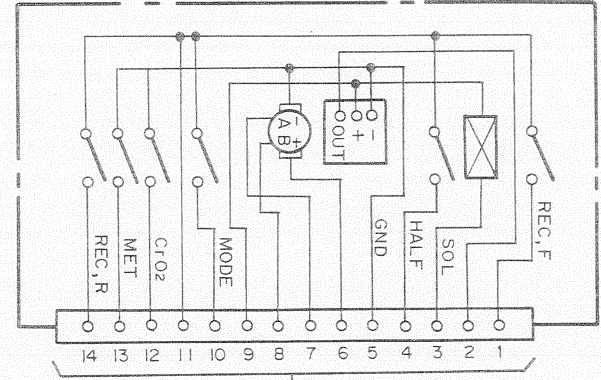
Parts No	Description
AAX-193	220 V label
AAX-192	240 V label

Power Supply Section
for SD and SL types.

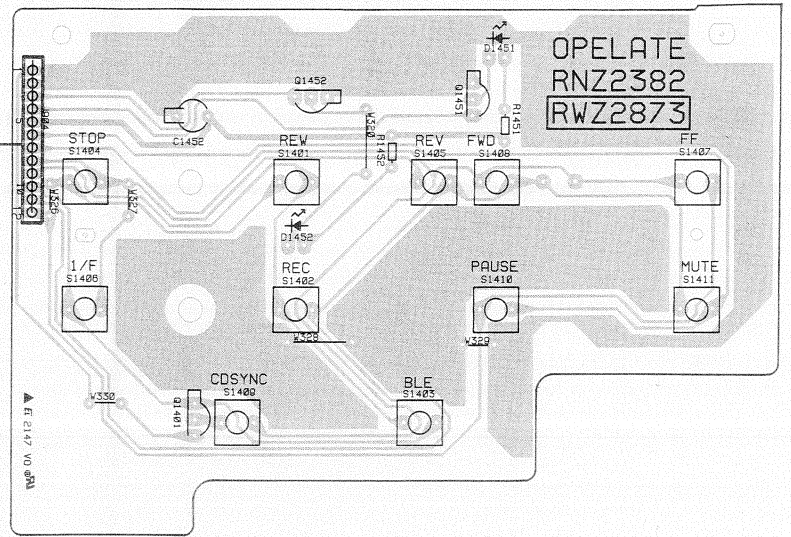


SD and SL
See page 28.

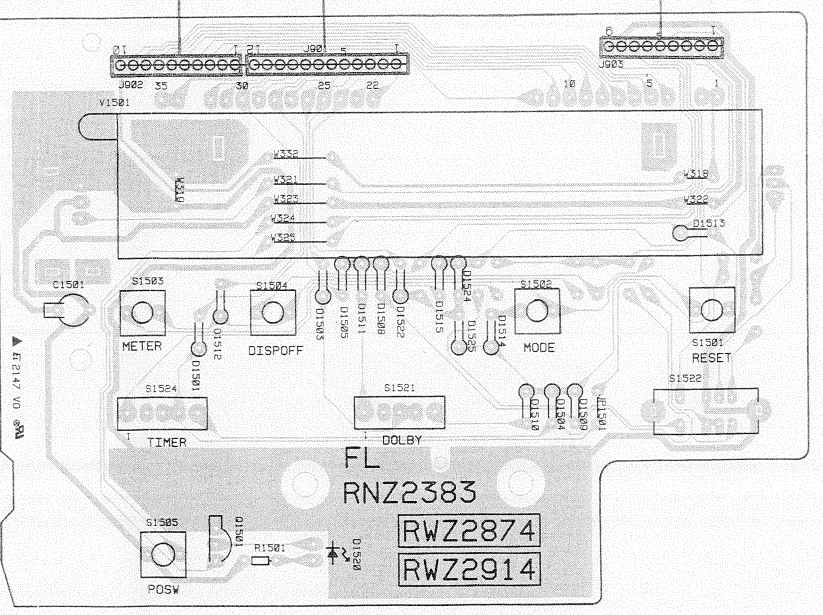
MECHANISM UNIT(2/2)



OPERATE UNIT



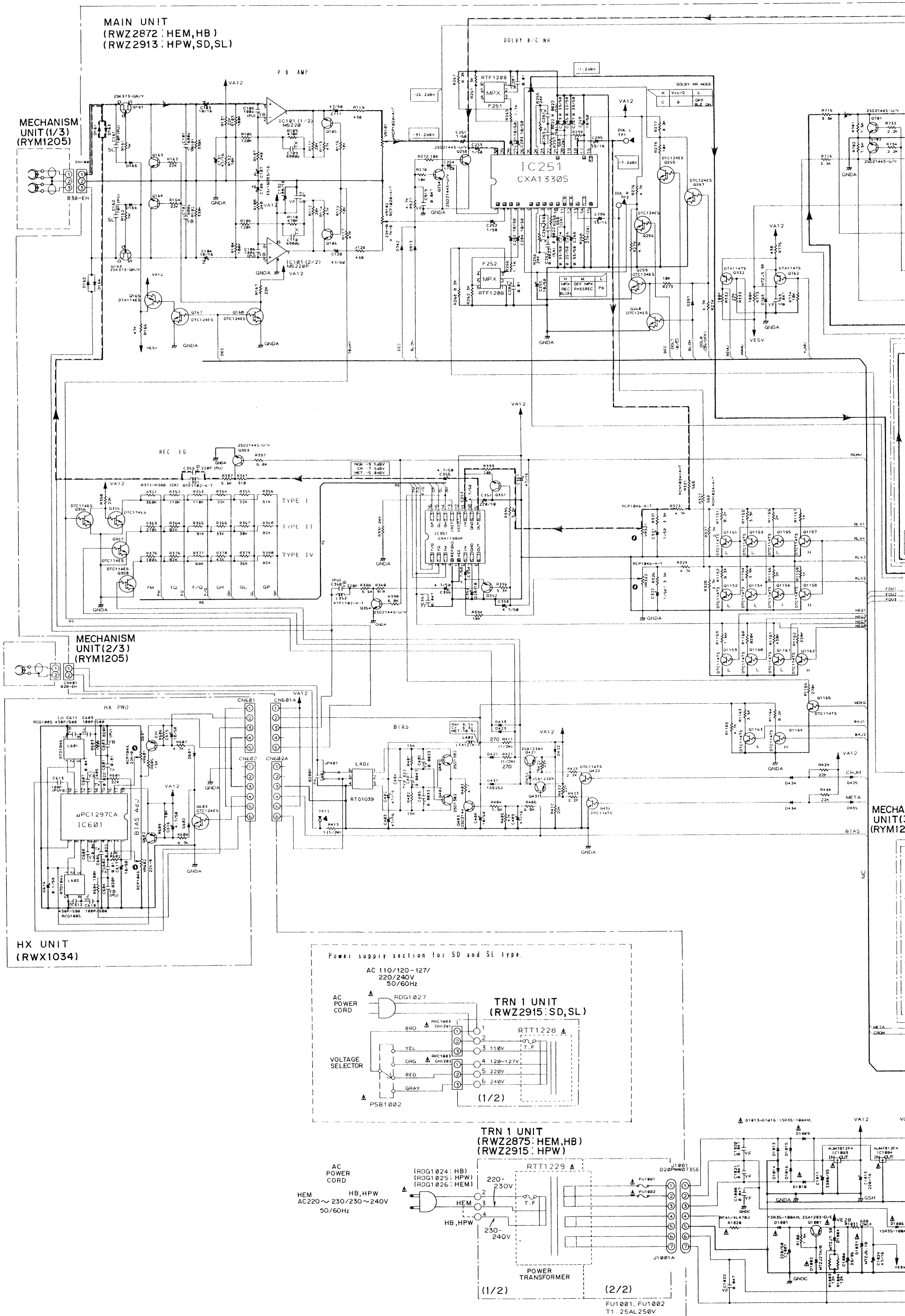
FL UNIT

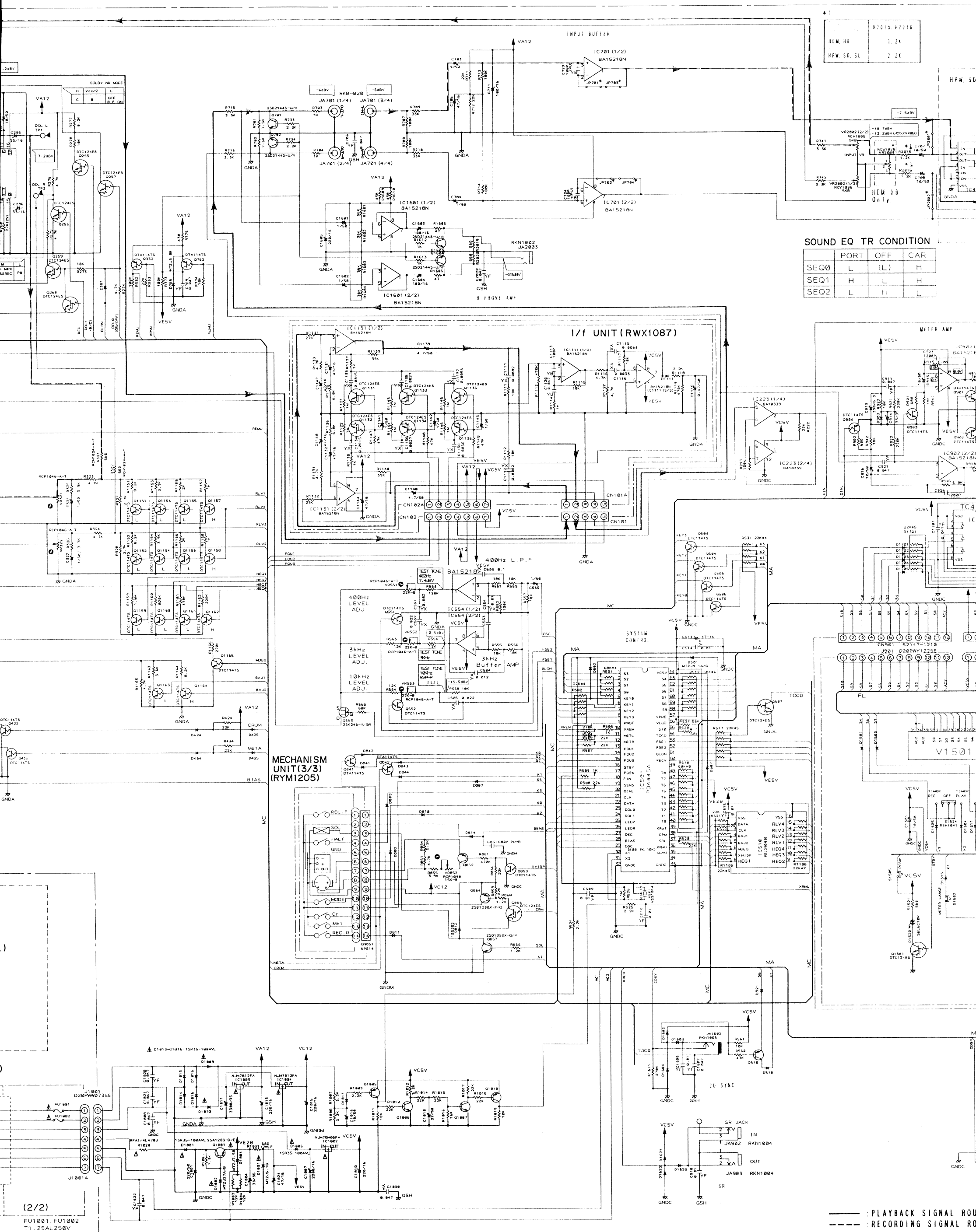


P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor
		FET
		Diode
		Zener diode
		LED
		Varactor
		Tact switch
		Inductor
		Coil
		Transformer
		Filter
		Ceramic capacitor
		Mylar capacitor
		Styro capacitor
		Electrolytic capacitor (Non polarized)
		Electrolytic capacitor (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.

4. SCHEMATIC DIAGRAM







5. ADJUSTMENTS

5.1 MECHANICAL ADJUSTMENT

1. Tape speed Adjustment			
Mode	Test tape	Adjustment position	Specification rating (playback frequency)
PLAY	Play the STD-301 tape (3kHz)	VR852	3020Hz ± 5Hz

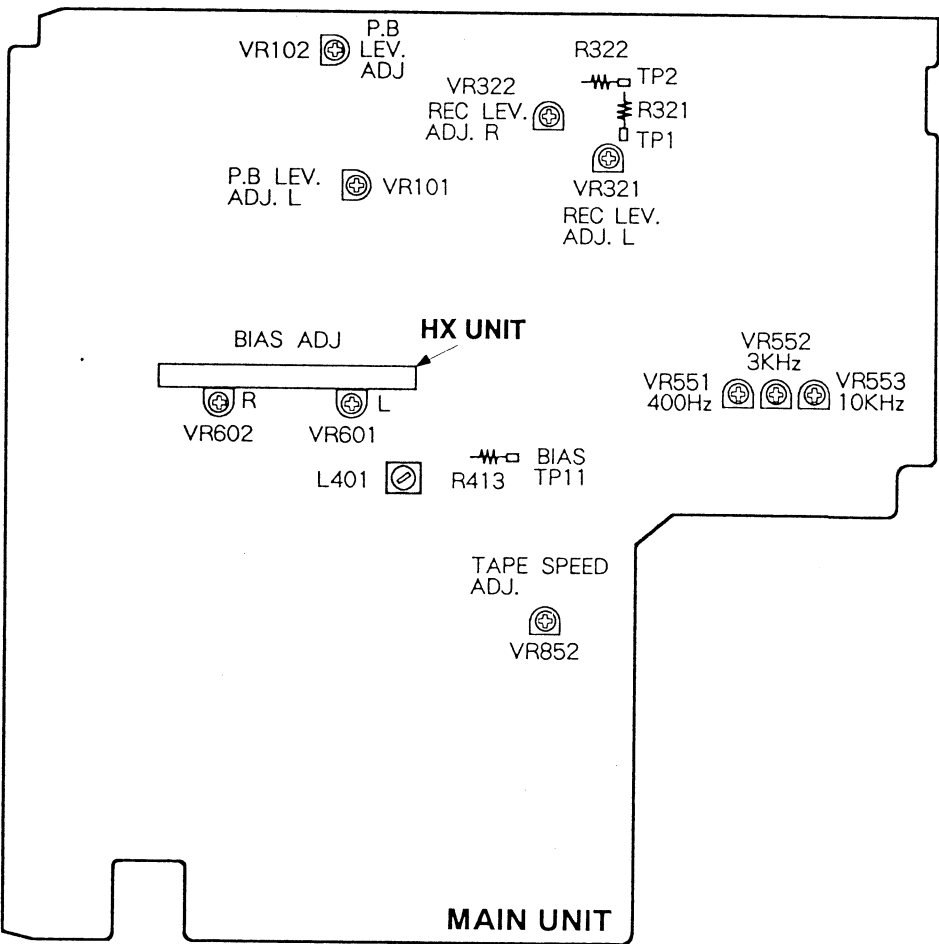


Fig. 5-1 Adjusting points

5.2 ELECTRICAL ADJUSTMENTS

Adjustment Conditions

1. The mechanical adjustments must be completed first.
2. The head must be cleaned and demagnetized.
3. Turn power on allow the deck to warm up for at least a few minutes before commencing any electrical adjustments.
4. The reference signal is 0 dBV=1 Vrms.
5. Connect a 50 kΩ (or between 47k to 52 kΩ) load resistance to the OUTPUT terminals.
6. Unless otherwise specified, the switches listed below are left in the positions indicated.
DOLBY NR : OFF
TAPE SELECTOR : NORM

Test Tapes

- STD-331E : Playback adjustments
(See Fig. 5-2)
- STD-631 : NORMAL blank tape
- STD-621 : CrO2 blank tape
- STD-610 : METAL blank tape

* As the reference recording level is 250 nwb/m for STD-331E, the recording level will be higher by 4 dB for STD-331B (160 nwb/m). When adjusting, pay carefull attention to the type of tape used.

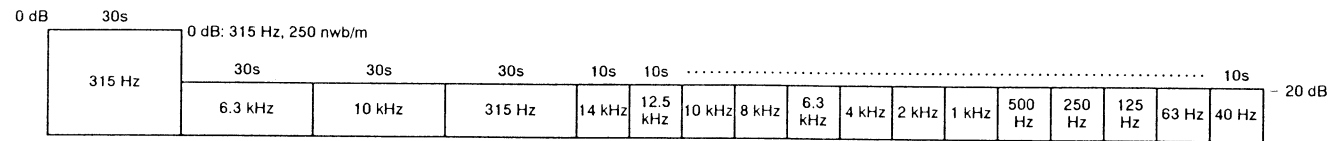


Fig. 5-2 Constants of the test tape STD-331E

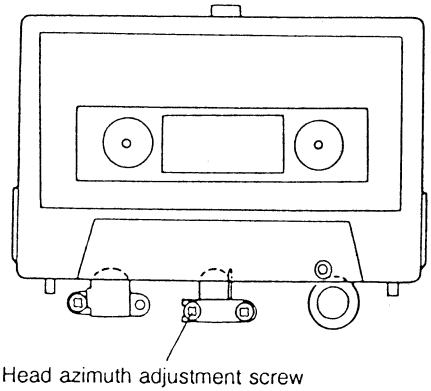


Fig. 5-3 Head azimuth adjustment

List of Adjustments

Playback sections

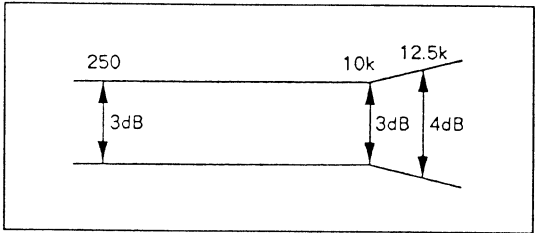
1. Head azimuth adjustment.
2. Playback level adjustment.

Recording sections

1. Bias oscillator adjustment.
2. Recording bias adjustment.
3. Recording level adjustment.
4. Level meter check
5. AUTO BLE adjustment.

NOTE: This unit has an automatic tape selection feature.

PLAY BACK



RECORDING

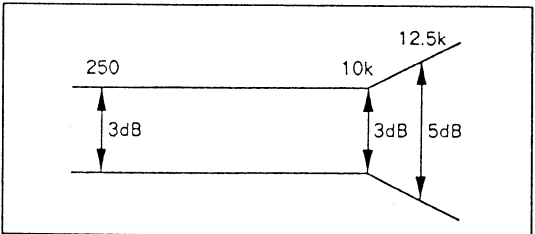


Fig. 5-4 Frequency response zone

PLAYBACK SECTION

1. Head Azimuth Adjustment

- Turn VR101, 102 to mechanical center positions.

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	PLAY	Play the 10 kHz/−20 dB section of STD-331E test tape.	Head azimuth adjustment screw. (See Fig. 5-3)	LINE OUT	Maximum playback signal level.	
2.	STOP	Lock the screw with screw lock after completing adjustment.				

2. Playback Level Adjustment

- This adjustment determines the DOLBY NR level, and must be performed with great care.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	PLAY	Play the 315 Hz/0 dB section of the STD-331E test tape.	Deck	VR101 (Lch) VR102 (Rch)	TP. 1 (Lch) TP. 2 (Rch)	−6.7 dBV	This adjustment must be performed accurately for proper Dolby level setting.

RECORDING SECTION

1. Bias Oscillator Adjustment

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC	Load the STD-610 test tape with no input signal.	Deck	L401	TP. 11	105 kHz $\pm$ 0.3 kHz	

2. Recording Bias Adjustment

- After the adjustment, caution should be exercised so as not to become under bias by checking the distortion rate.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC	Load the STD-631 test tape. Record the 315 Hz and 6.3 kHz signals at −20 dBV input level and playback.	Deck	VR601 (Lch) VR602 (Rch)	LINE OUT	Repeatedly record, playback and adjust so that the playback level of 6.3 kHz signal becomes + 0.5dB $\pm$ 0.5 dB when compared with the 315 Hz signal.	

3. Recording Level Adjustment

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC/ PAUSE	Apply a 315 Hz signal to the line input terminals, load the STD-631 test tape.	Volume of the output level of the oscillator		TP. 1 (Lch) TP. 2 (Rch)	-11.2 dBV	
2.	REC/ PLAY	Record the above signal onto the STD-631 test tape, and playback.	Deck	VR321 (Lch) VR322 (Rch)		Repeatedly record, playback and adjust so that the playback signal level becomes -11.2dBV.	
3.	REC/ PLAY	Record the above signal onto the STD-621 test tape, and playback.	Check			-11.2 dBV ± 1.5 dB	
4.	REC/ PLAY	Record the above signal onto the STD-610 test tape, and playback.	Check			-11.2 dBV ± 1.5 dB	

Note for Schematic Diagram

(Type 6)

1. When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".
2. Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.
3. **RESISTORS:**
Unit: k:k Ω , M:M Ω , or Ω unless otherwise noted.
Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
Tolerance: (F): $\pm 1\%$, (G): $\pm 2\%$, (K): $\pm 10\%$, (M): $\pm 20\%$ or $\pm 5\%$ unless otherwise noted.
4. **CAPACITORS:**
Unit: p:pF or μ F unless otherwise noted.
Ratings: capacitor (μ F)/ voltage (V) unless otherwise noted.
Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
Unit: m:mH or μ H unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
 : DC voltage (V) in STOP mode unless otherwise noted.
 mA or $\leftarrow$ mA: DC current in STOP mode unless otherwise noted.
7. **OTHERS:**
 -  : Signal route.
 -  : Adjusting point.
 -  (Red) : Measurement point.
 - The  mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.

8. SWITCHES (Underline indicates switch position):

OPERATE UNIT

S1401 : REW
S1402 : REC
S1403 : BLE
S1404 : STOP
S1405 : REV
S1406 : 1/F
S1407 : FF
S1409 : CD SYNC
S1410 : PAUSE
S1411 : MUTE

FL UNIT

S1501 : RESET
S1502 : MODE
S1503 : METER LANGE
S1505 : POSW
S1521 : DOLBY B - OFF - C
S1524 : TIMER REC - OFF - PLAY

4. Level Meter Check

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	REC/ PAUSE	Apply a 315 Hz signal to the line input terminals.	Volume of the output level of the oscillator	TP. 1 (Lch) TP. 2 (Rch)	Check that the level meters "0 dB" light up within $-7.2 \text{ dBV} \pm 2 \text{ dB}$ of the signal output level.	

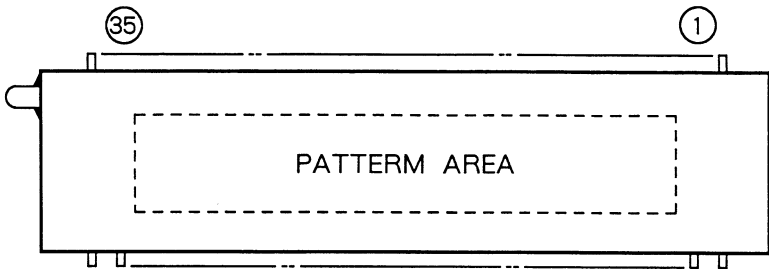
5. AUTO BLE Adjustment

- BLE adjustment should be performed after all other adjustments are completed.
- This adjustment should be performed in the test mode.
- Entering the Test Mode.
Turn on the power, and after more than 4 seconds, press the "COUNTER RESET" button, "COUNTER MODE" button and **||** (PAUSE) button simultaneously.
- Releasing the Test Mode.
Press the "COUNTER RESET" button.

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	-	Set to test mode.	-	-	-	
2.		Press the AUTO BLE key on the front panel.	Level meter Lch	VR551	Adjust the Lch segment which is lit until Rch is not lighting up. Lch  Rch  ( : light up  : not light up)	400 Hz adjustment (Test mode 1 FL indication 1)
3.		Press the AUTO BLE key on the front panel.		VR552		3 kHz adjustment (Test mode 2 FL indication 2)
4.		Press the AUTO BLE key on the front panel.		VR553		10 kHz adjustment (Test mode 3 FL indication 3)

6. FL INFORMATION

● RAW1124 (V1501)

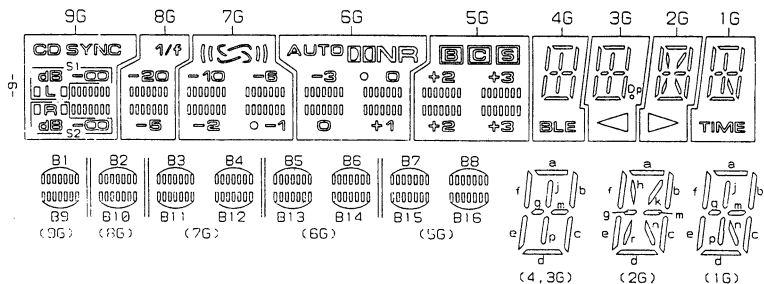


PIN CONNECTION

PIN NO.	3333332222222222111111111111
CONNECTION	FFNNPPPPPPPPPPNNNNNNNNNN987654321NFF

NOTE 1) F1,F2 --- Filament
2) NP ----- No pin
3) DL ----- Datum Line
4) 1G~9G --- Grid

GRID ASSIGNMENT



ANODE CONNECTION

	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	B1	B2	B3	B5	B7	a	a	a	a
P2	-	-	B4	B6	B8	b	b	b	b
P3	B9	B10	B11	B13	B15	f	f	f	f
P4	-	-	B12	B14	B16	g	g	g, m	g
P5	S1	-20	-10 -8 -3 0 0	+2 +3 (Upper)	m	m	k, r	m	
P6	S2	-5	-2 0 -1 0 +1	+2 +3 (Under)	c	c	c	c	
P7	-	-	5	-	-	e	e	e	e
P8	-	-	c, s	-	-	d	d	d	d
P9	CO SYNC	1/4	()	AUTO	Ⓜ	j, p	j, p	h	j, p
P10	-	-	()	DOOR	Ⓜ	-	Dp	n	n
P11	-	-	-	-	Ⓜ	BLE	◁	▷	TIME

7. FOR HB, HPW, SD AND SL TYPES

CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
- The $\triangle$ 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.

HB, HPW, SD, SL and HEM have the same construction except for the following:

Mark	Symbol & Description	Part No.					Remarks
		HEM type	HB type	HPW type	SD type	SL type	
NSP	Mother unit	RWM1600	RWM1600	RWM1609	RWM1609	RWM1609	
NSP	Main unit	RWZ2872	RWZ2872	RWZ2913	RWZ2913	RWZ2913	
$\triangle$	TRN 1 unit	RWZ2875	RWZ2875	RWZ2915	RWZ2915	RWZ2915	
$\triangle$	AC power cord	RDG1026	RDG1024	RDG1025	RDG1027	RDG1026	
$\triangle$	Power transformer (AC220 – 230/230 – 240V)	RTT1229	RTT1229	RTT1229	.....	.....	
$\triangle$	Power transformer (AC110/120 – 127/220/240V)	.....	.....	.....	RTT1228	RTT1228	
$\triangle$	Voltage selector (AC110/120 – 127/220/240V)	.....	.....	.....	PSB1002	PSB1002	
	Balance knob	RAC1705	RAC1705	.....	.....	.....	
	FL lens	RAH2240	RAH2240	RAH2292	RAH2292	RAH2292	
	Front panel	RAH2236	RAH2236	RAH2237	RAH2237	RAH2237	
NSP	BS pin cap	.....	VEC1616	.....	.....	.....	For AC power cord
	Rear panel	RNA1683	RNA1683	RNA1731	RNA1684	RNA1741	
	Packing case	RHG1455	RHG1458	RHG1458	RHG1456	RHG1456	
	Pad spacer A	.....	RHC1039	RHC1039	.....	.....	For packing
	Pad spacer B	.....	RHC1041	RHC1041	.....	.....	For packing
	Operating instructions (German/Italian/ Dutch/Swedish/Spanish/Portuguese)	RRD1136	.....	.....	.....	.....	
	Operating instructions (Spanish)	.....	.....	.....	RRD1139	.....	

MAIN UNIT

RWZ2913 and RWZ2872 have the same construction except for the following:

Mark	Symbol & Description	Part No.		Remarks
		RWZ2872	RWZ2913	
	IC2001	.....	TC4066BP	
	IC2002	.....	BA15218N	
	C2001, C2002	.....	CKPUYB101K50	
	C2003	.....	CEAS010M50	
	C2005, C2010	.....	CEAS470M16	
	C2015	.....	CKCYF473Z50	
	R2001	.....	RD1/6PM222J	
	R2002, R2005, R2006	.....	RD1/6PM223J	
	R2003	.....	RD1/6PM103J	
	R2007, R2013, R2014	.....	RD1/6PM104J	
	R2009	.....	RD1/6PM181J	
	R2011	.....	RD1/6PM393J	
	R2012	.....	RD1/6PM184J	
	R2015, R2016	RD1/6PM122J	RD1/6PM222J	
	R2017	.....	RD1/6PM681J	
	VR2003 (Balance VR)	RCS1028	.....	
	JA2004	.....	RKN1003	

TRN 1 UNIT

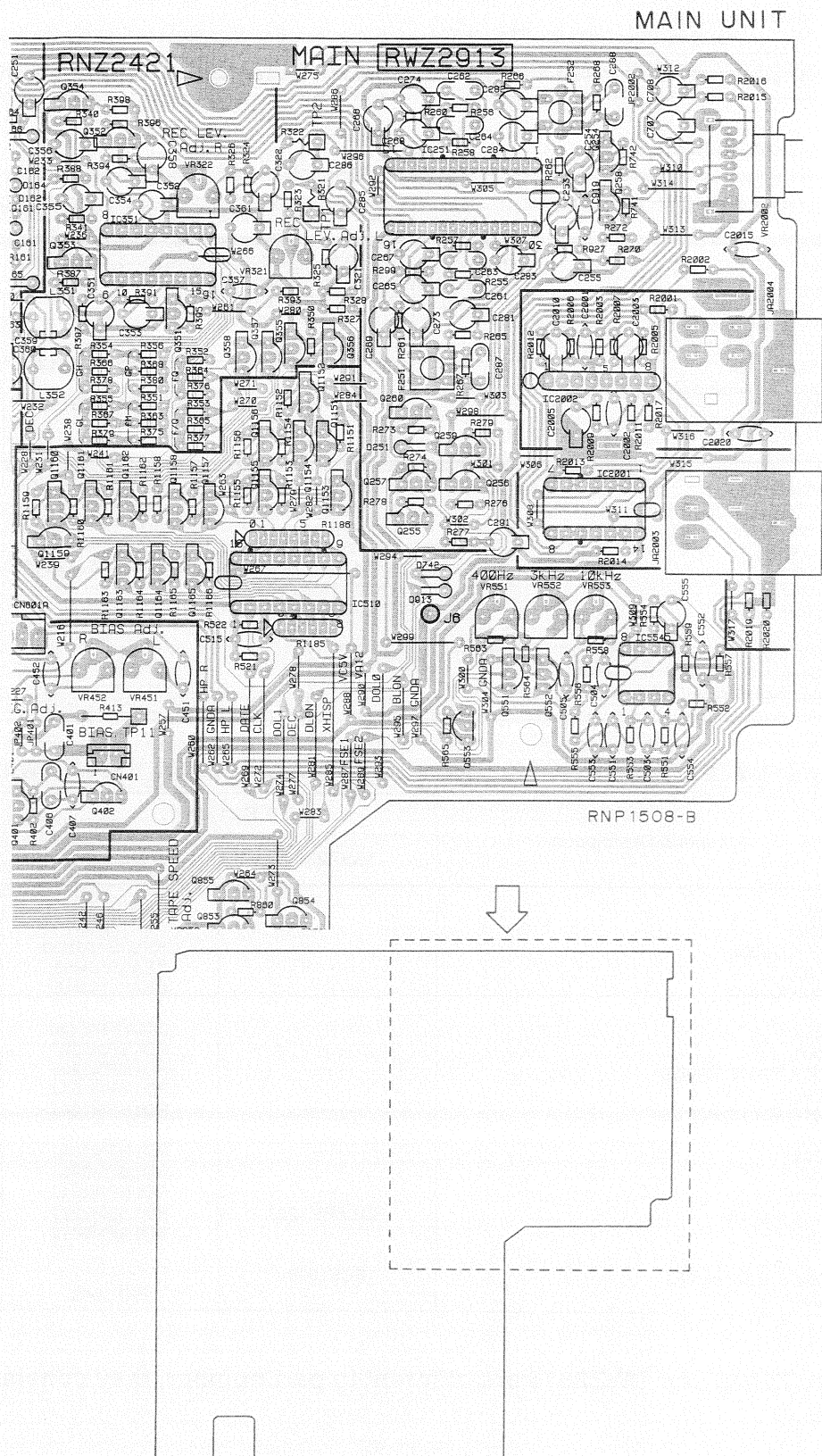
Although RWZ2915 and RWZ2875 are different in part number, they consist of the same components.

● PCB DIAGRAM (SD AND SL TYPES ONLY)

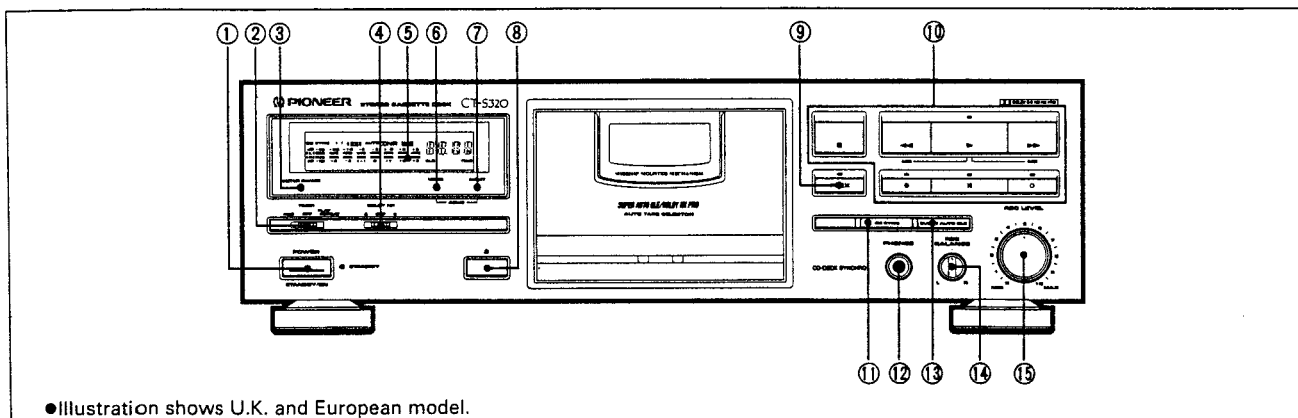
Note: Assembly which is different in CT-S320/SD, SL and CT-S320/HEM, the PCB diagram is shown below.

For schematic diagram, refer to page 21.

● View from component side



8. PANEL FACILITIES



●Illustration shows U.K. and European model.

① POWER STANDBY/ON switch

The POWER switch activates the secondary transformer only. Even when the switch is in the STANDBY position, there will be a power flow to the deck's circuits as long as the power cord is connected to a power outlet.

② Timer mode/repeat play switch (TIMER REC/OFF/PLAY-REPEAT)

③ Level meter range selector button (METER RANGE)

Press to select wide or expanded range on the level meter.

④ Dolby* NR switch (DOLBY NR B/OFF/C)

*

- *Dolby noise reduction and HX Pro headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX Pro originated by Bang & Olufsen.*
- *"DOLBY", the double-D symbol  and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.*

⑤ Function display

⑥ Tape counter mode button (COUNTER MODE)

⑦ Tape counter reset button (COUNTER RESET)

⑧ Eject button ()

- If the tape is moving (recording, playback, tape winding, etc.), press the stop () button before pressing this button.

⑨ FLEX (1/f) button

⑩ Operation buttons

- ◀/MS : Rewind/music search
- : Stop
- ▶ : Playback
- ▶▶/MS : Fast forward/music search
- : Recording
- ⏏ : Pause
- : Recording mute

⑪ CD · DECK SYNCHRO recording button (CD SYNCHRO)

⑫ Headphones jack (PHONES)

⑬ SUPER AUTO BLE button

⑭ Recording balance control (REC BALANCE) (U.K. and European models)

⑮ Microphone jack (MIC) (Multivoltage and Australian models)

When connecting a microphone to the jack, both the left and right channel line inputs will be cut and microphone recording will be performed.

Use the REC LEVEL control for microphone recording level adjustment.

- Microphone sound will distribute on both the left and right channel tracks.
- Disconnect the microphone from the jack when recording from both the left and right channel line inputs.

⑯ Recording level control (REC LEVEL)

FLEX (1/f) SYSTEM

• FLEX System: Frequency Level Expander System

This system automatically compensates high and low frequency level balance above 1 kHz according to the 1/f curve during playback.

Generally, envelope line of sound energy distribution of Hi-Fi sounds corresponds statistically with the 1/f curve.

The 1/f curve indicates that if the frequency doubles, the level decreases by approx. half of the original frequency level.

- During playback, the FLEX system automatically compensates tapes with poor sound quality at high frequency levels of 1 kHz to 20 kHz, based on the appropriate auditory characteristics.

The FLEX system is designed to improve high frequency reproduction in the 10 kHz range by up to 12 dB, particularly in tapes with poor sound clarity and sound presence at high frequency levels. If the playback tape sound matches the 1/f curve, the FLEX system defeats compensation adjustment automatically.

- Press the FLEX (1/f) button to turning the FLEX system on. If the FLEX (1/f) button is pressed during playing back, the  indicator will flash in a programmed graphic sequence, then change to a steadily lit condition. The AUTO indicator stays lit. If the FLEX (1/f) button is pressed during a mode other than playback, only the  indicator will flash.

After approximately 3 to 8 seconds, compensation adjustment is completed and the indicators' programmed graphic sequence changes from flashing to a steadily lit condition. Some music selections may take a little longer than 8 seconds.

- When the FLEX system is engaged, each music selection is automatically adjusted during playback. System operation status is indicated by whether the AUTO indicator is lit.
- Compensation data is memorized after the adjustment is completed. However, memorized data is cleared automatically when:
 - the power cord is disconnected.
 - the FLEX system is turned off.
 - the unit set to recording mode (including AUTO BLE and CD · DECK SYNCHRO recording).
 - the tape is ejected.

NOTE:

- When a tape has been recorded at a high frequency level above the compensation level, FLEX system operation is automatically defeated during playback.

REPEAT PLAYBACK

When the TIMER switch is set to the PLAY-REPEAT position for playback, the forward side of the tape is played back repeatedly until the stop (■) button is pressed, or until the tape has been played completely sixteen sides. When the tape reaches its end, it is rewound and starts automatically from the beginning.

- If any operation button is pressed, repeat playback is reset and repeat playback of all sixteen sides begins.

AUTO BLE TUNING SYSTEM

With commercially available cassette tapes, sensitivity and frequency characteristics might differ slightly from one another, even though the same sound adjustment is set for them. To utilize tape characteristics to the maximum possible and realize an ideal recording which reproduces the source exactly, optimum recording level (sensitivity) and equalizer values must be set accordingly for each tape. In many conventional tape decks, standard values are fixed for standard tapes, thus nullifying the subtle differences between individual tapes. Perfect tuning by ear through use of fine adjustment controllers for bias and sensitivity is difficult and requires a lot of effort. It is especially difficult with a 2-head deck where the recording sound cannot be monitored.

The AUTO BLE on this unit automatically adjusts bias, level and equalizer by using a microprocessor to set the optimum recording characteristics accordingly for each tape.

DOLBY NR & DOLBY HX PRO

■ Dolby NR Systems

Dolby NR systems are designed to reduce the amount of tape hiss, mainly in the treble components. During recording, the high-pitched pianissimo sounds which are most characteristic of audible noise are boosted, and during playback, only these boosted sections are attenuated, so that tape sound is returned to normal. As a result, the noise is attenuated by an amount equal to the boosting in the treble range. The Dolby B-type NR system reduces noise in the treble range, cutting tape hiss and expanding the dynamic range. The Dolby C-type NR system is even more effective in reducing noise, as it cuts the noise from the mid-range on.

NOTE:

When a tape has been recorded using the Dolby B-type or C-type NR system, make sure that the DOLBY NR switch is set to the same position during playback.

■ Dolby HX PRO Headroom Extension System

The Dolby HX PRO system controls the bias current during recording and always keeps it at an optimal level according to the level of the high frequency components of the music signal. If therefore provides excellent recording quality even when recording signals from digital sources which contain a large amount of high-frequency components. To guarantee optimal recording results, the HX PRO system is activated automatically when recording begins. The Dolby HX PRO system operates regardless of the setting of the Dolby NR System switch. Furthermore, since this system affects the recording quality itself, the clarity and high quality of the sound will be maintained even when the tapes are played back on another tape deck which does not contain the HX PRO Headroom Extension System.

9. SPECIFICATIONS

System.....	4 track, 2-channel stereo
Heads.....	"Hard Permalloy" recording/playback head × 1 "Ferrite" erasing head × 1
Motor.....	DC servo motor × 1
Wow and Flutter.....	No more than 0.075% (WRMS, JIS) No more than ±0.18% (DIN)
Fast Winding Time.....	Approx. 90 seconds (C-60 tape)
Frequency Response (at -20 dB recording level)	
TYPE IV (Metal) tape.....	25 to 18,000 Hz
TYPE II (High/CrO ₂) Tape.....	25 to 17,000 Hz
TYPE I (Normal) Tape.....	25 to 17,000 Hz
Signal-to-Noise Ratio (Dolby NR OFF)	
Dolby NR off.....	More than 57 dB
Noise Reduction Effect	
Dolby B-type NR ON.....	More than 10 dB (at 5 kHz)
Dolby C-type NR ON.....	More than 19 dB (at 5 kHz)
Harmonic Distortion.....	No more than 1.0% (at -4 dB: 160 nwb/m)
Input (Sensitivity)	
LINE (INPUT).....	100 mV (Input impedance 67 kΩ)
MIC.....	0.5 mV (Multivoltage and Australian models only)
Output (Reference level)	
LINE (OUTPUT).....	0.5 V (Output impedance 3 kΩ)
Headphone (PHONES).....	0.63 mW (Load Impedance 8 Ω)

Miscellaneous

Power requirements

U.K., model.....	AC 230—240 Volts~, 50/60 Hz
European model.....	AC 220—230 Volts~, 50/60 Hz
Multi-voltage models.....	AC 110V/120V—127V/220V/240V (switchable), 50/60 Hz

Power consumption..... 17 W

Dimensions

U.K. and European models.....	420 (W)×125 (H)×280 (D) mm
Multi-voltage and Australian models	
.....	420 (W)×120 (H)×280 (D) mm

Weight (without package)

European and Multivoltage model.....	3.9 kg
U.K. and Australian models.....	4.2 kg

Subfunctions

- Dolby B-type and C-type NR Systems
- DOLBY HX PRO system
- Auto tape selector (TYPE I, II, IV)
- Headphones jack
- 4-digit electronic tape/time counter
- Music search up to ±15 selections
- Automatic space recording mute
- AUTO BLE tuning system
- FL level meter 7 + 1 segments (with peak hold)
-  System remote control available
- CD · DECK SYNCHRO function
- Timer Recording/Playback (Automatic repeat playback ON)
- MIC jack (Multivoltage and Australian models)

Accessories

Operating instructions.....	1
Connection cord with pin plugs.....	2
 Remote control cord.....	1
CD · DECK SYNCHRO control cord.....	1

NOTE:

Specifications and design subject to possible modifications without notice, due to improvements.