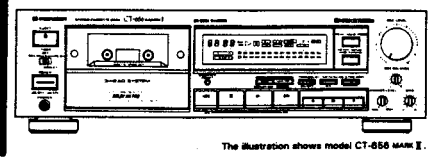
PIONEER®
The future of sound and vision.

Service Manual



The illustration shows model CT-656 MARK II.

ORDER NO.
ARP 1974

STEREO CASSETTE DECK

CT-S707
CT-656MARKII
CT-656MARKII-S

MODEL CT-S707, CT-656MARKII and CT-656MARKII-S HAVE FOLLOWING VERSIONS:

Type	Applicable model			Power requirement	Export destination
	CT-S707	CT-656MARKII	CT-656MARKII-S		
KU/CA	○			AC 120V only	U.S.A. and Canada
HEM		○		AC 220V, 240V (Switchable) *	European continent
HEWM			○	AC 220V, 240V (switchable) *	European continent
HB		○		AC 220V, 240V (switchable) *	United Kingdom
SD		○		AC110V, 120-127V, 220V, 240V (Switchable)	Kingdom of Saudi Arabia and General market

* Change the primary wiring of the power transformer.

- This manual is applicable to the CT-S707/KU/CA, CT-656 MARK II/HEM, HB, SD and CT-656 MARK II-S/HEWM types.
- As to the CT-656 MARKII/HEM, HB, SD and CT-656 MARK II-S/HEWM types, refer to pages 43.
- Ce manual 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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PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
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SEI APR. 1990 Printed in Japan

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

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

1. SAFETY INFORMATION

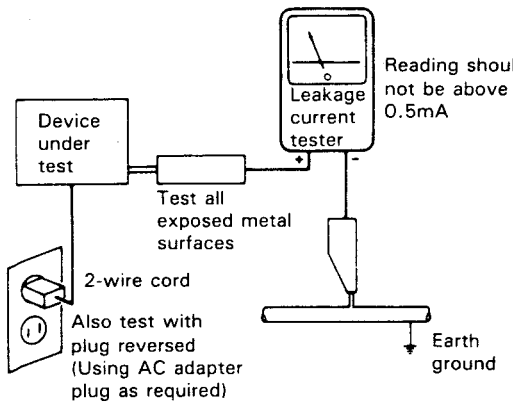
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

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

LEAKAGE CURRENT CHECK

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



AC Leakage Test

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

2. PRODUCT SAFETY NOTICE

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

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

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

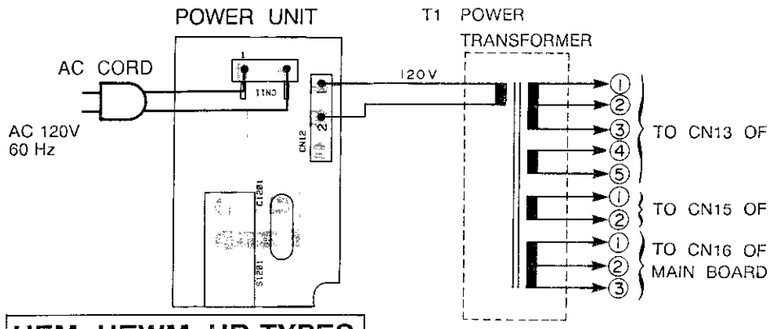
3. P.C. BOARDS CONNECTION DIAGRAM

- View from component side

TO POWER TRANS ①~⑤
TO POWER TRANS ①, ②
TO POWER TRANS ①~③

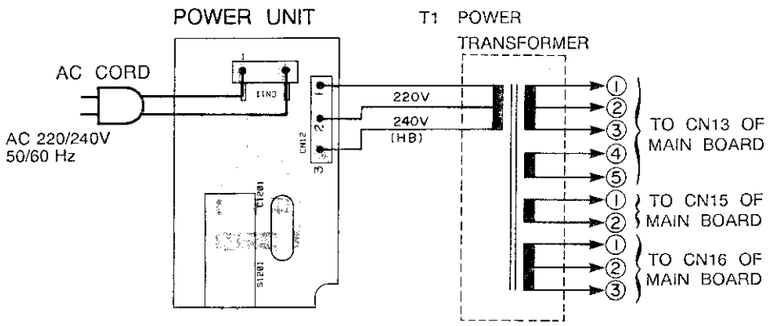
A

KU/CA TYPE



B

HEM, HEWM, HB TYPES



C

HEM, HEWM, HB type Line Voltage Selection

Line voltage can be changed with following steps.

1. Disconnect the AC power cord.
2. Remove the Bonnet case.
3. Change the transformer wire of terminal CN12-2 and CN12-3 as follows.

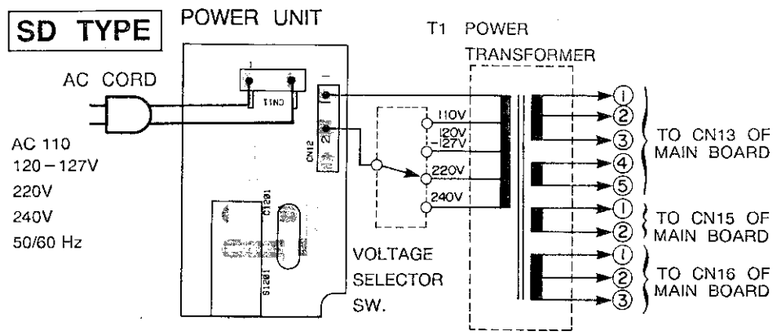
Voltage	Terminal No. CN12-2	Terminal No. CN12-3
220V	RED	GRAY
240V	GRAY	RED

4. Stick the line voltage label on the rear panel.

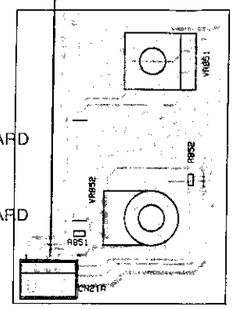
Parts No.	Description
AAX-193	220V label
AAX-192	240V label

D

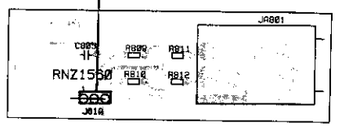
SD TYPE



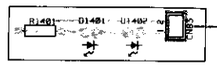
INPUT VR UNIT



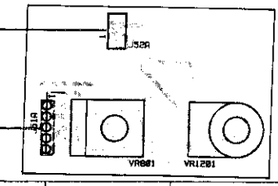
HP JACK UNIT



DOOR IND. UNIT

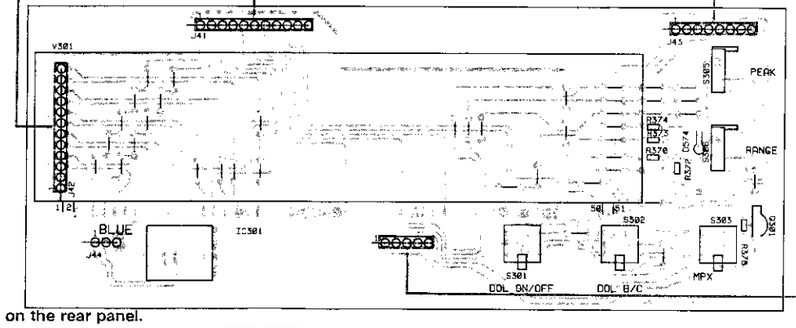


HP BIAS UNIT

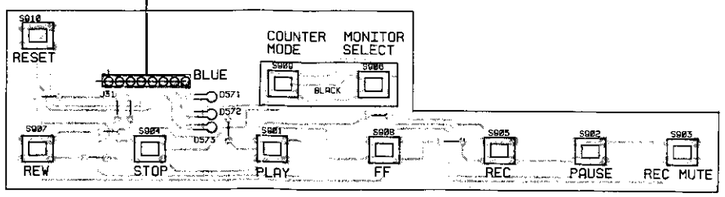


	KU/CA Type	HEM, HB, HEWM, SD Types
FU401 FU402	800mA/125V	T800mA/250V
FU403	1.25A/125V	T1.25A/250V

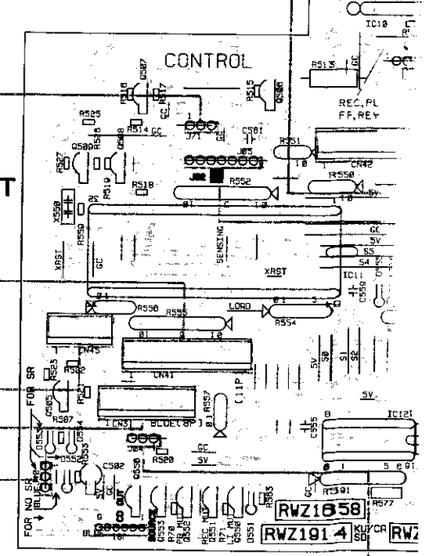
DISPLAY UNIT



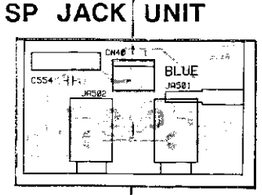
SW. UNIT



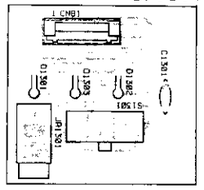
TIMER UNIT



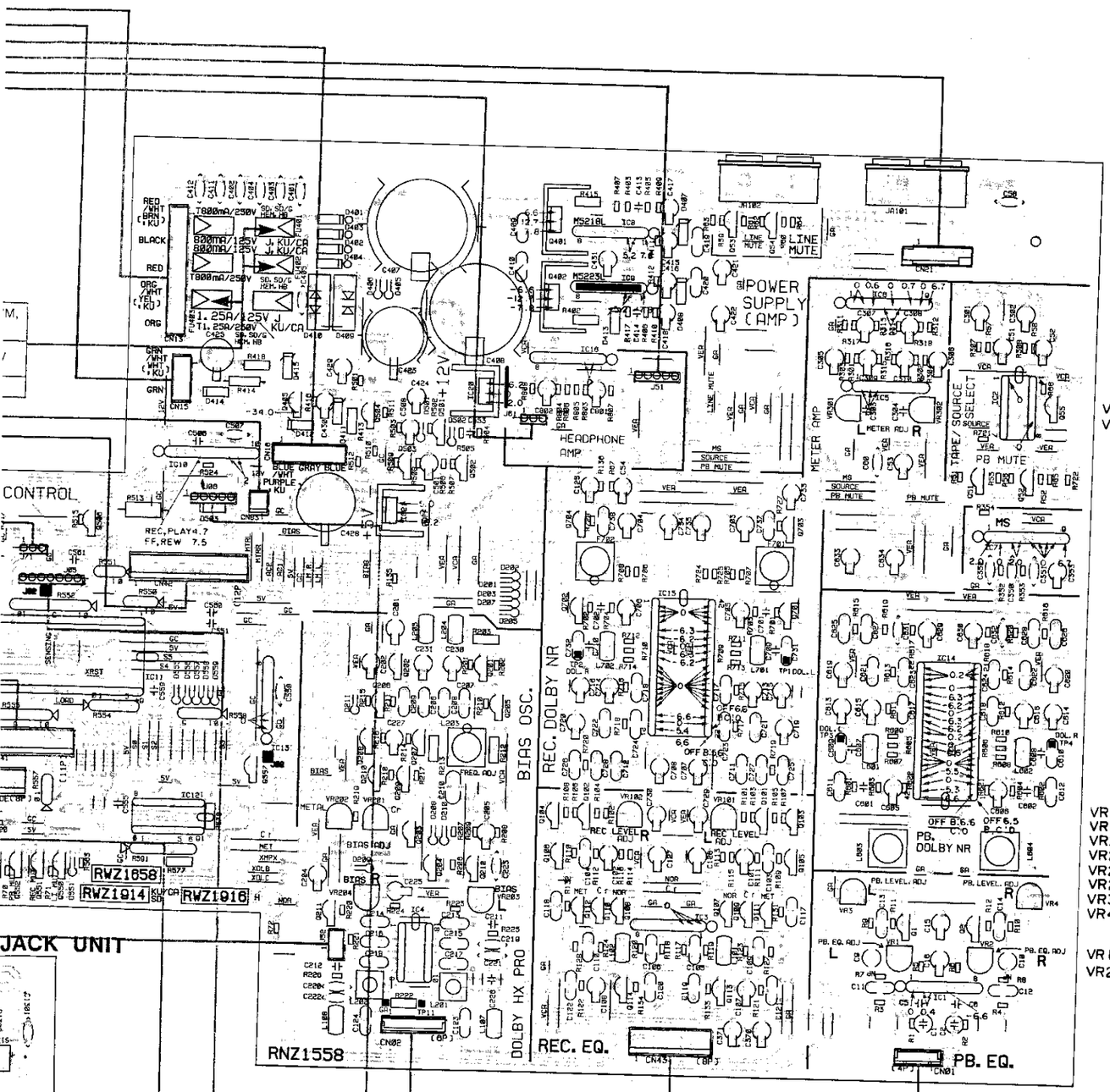
SP JACK UNIT



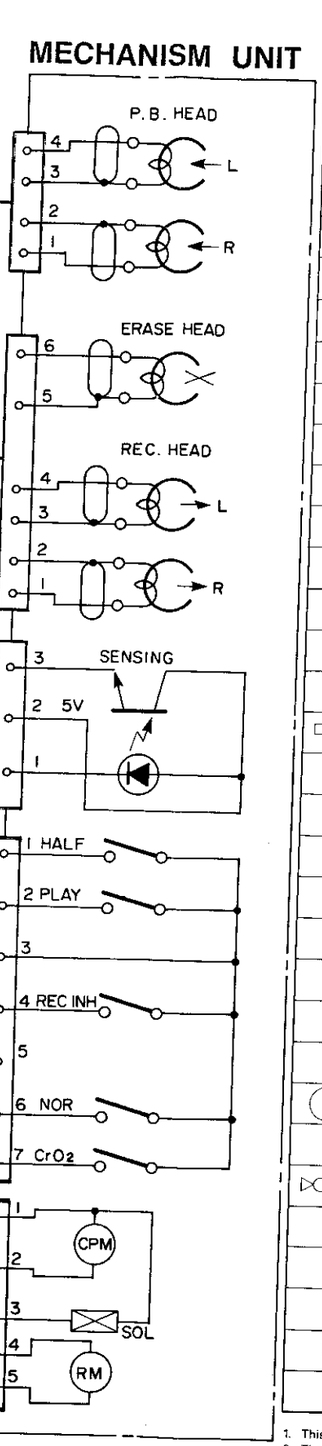
JACK UNIT



KU/CA Type only



MECHANISM UNIT



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.

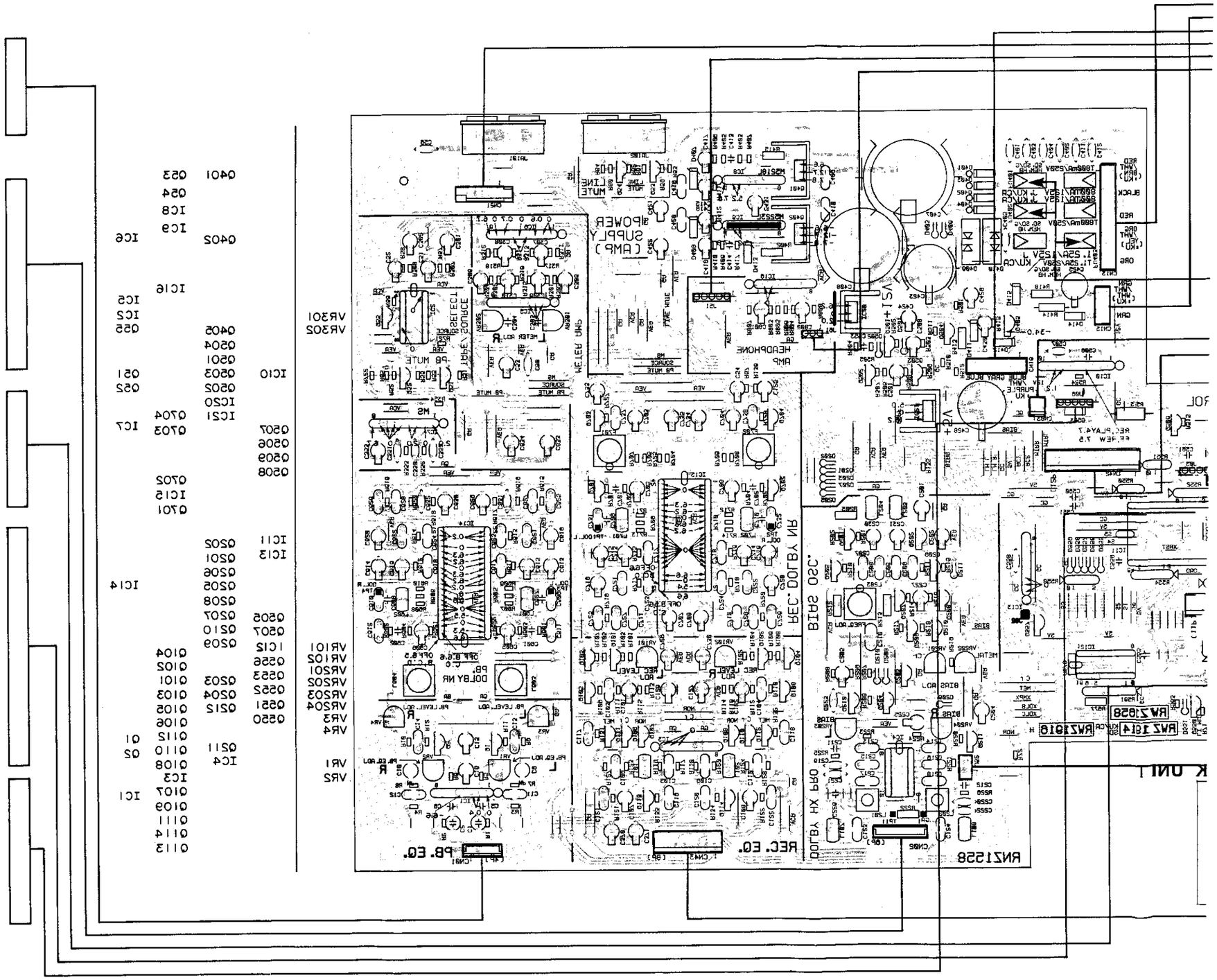
- View from soldering side

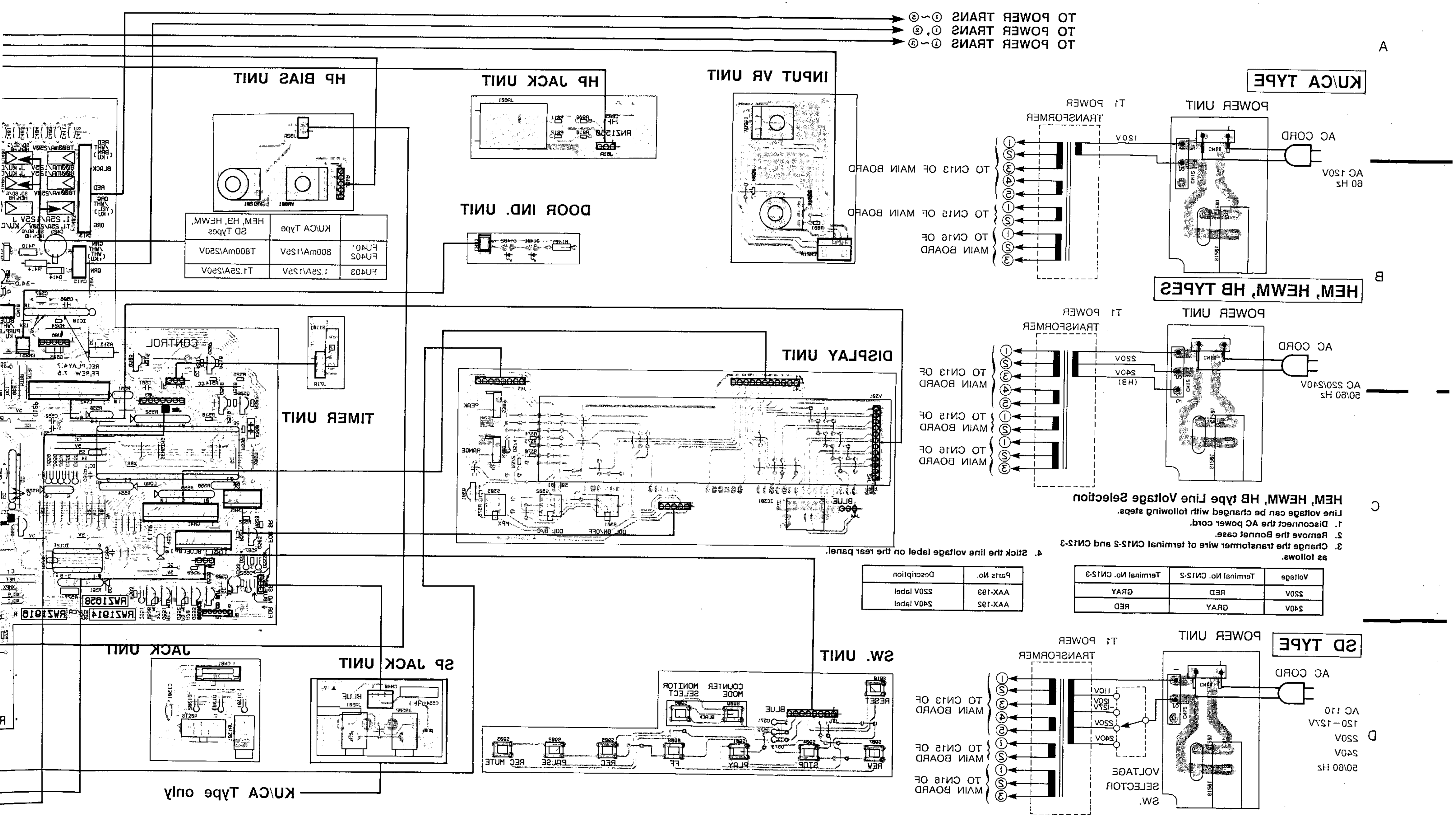
A

B

C

D





	KU/CA Type	HEM, HB, HEWM, SD Types
FU401 FU402	800mA/125V	T800mA/250V
FU403	1.25A/125V	T1.25A/250V

HEM, HEWM, HB type Line Voltage Selection

Line voltage can be changed with following steps.

1. Disconnect the AC power cord.
2. Remove the Bonnet case.
3. Change the transformer wire of terminal CN12-2 and CN12-3 as follows.

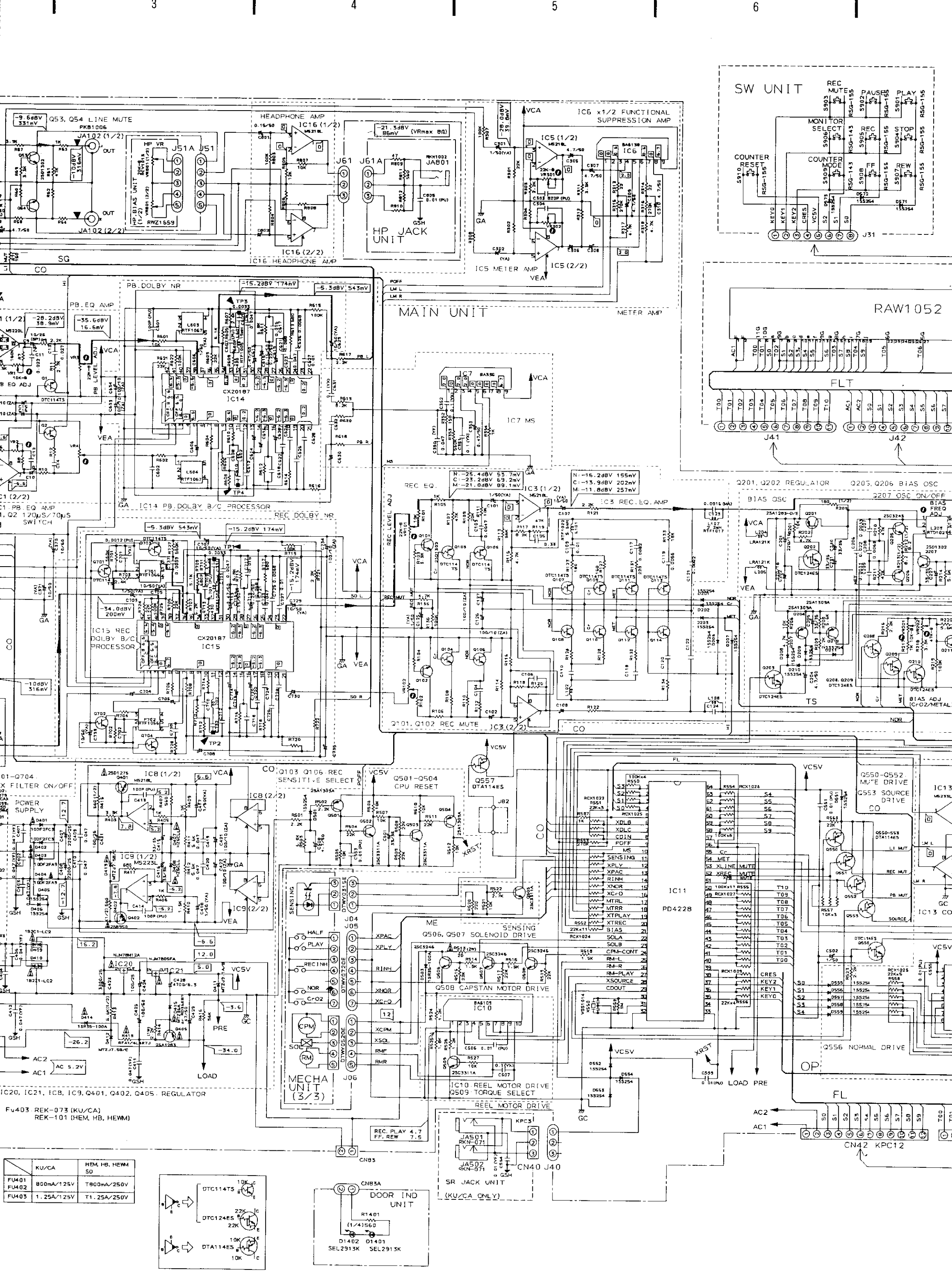
Voltage	Terminal No. CN12-2	Terminal No. CN12-3
220V	RED	GRAY
240V	GRAY	RED

4. Stick the line voltage label on the rear panel.

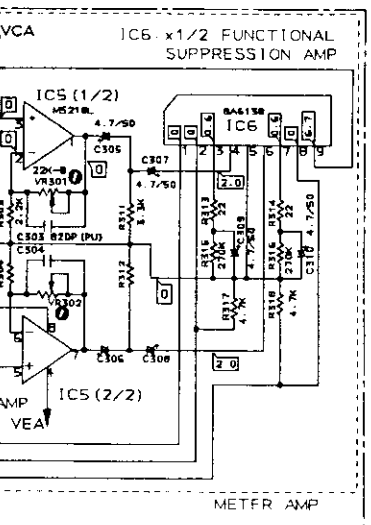
Parts No.	Description
AAX-183	220V label
AAX-182	240V label

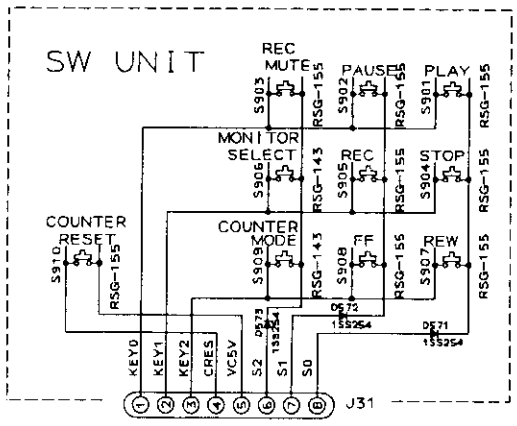
4. SCHEMATIC DIAGRAM

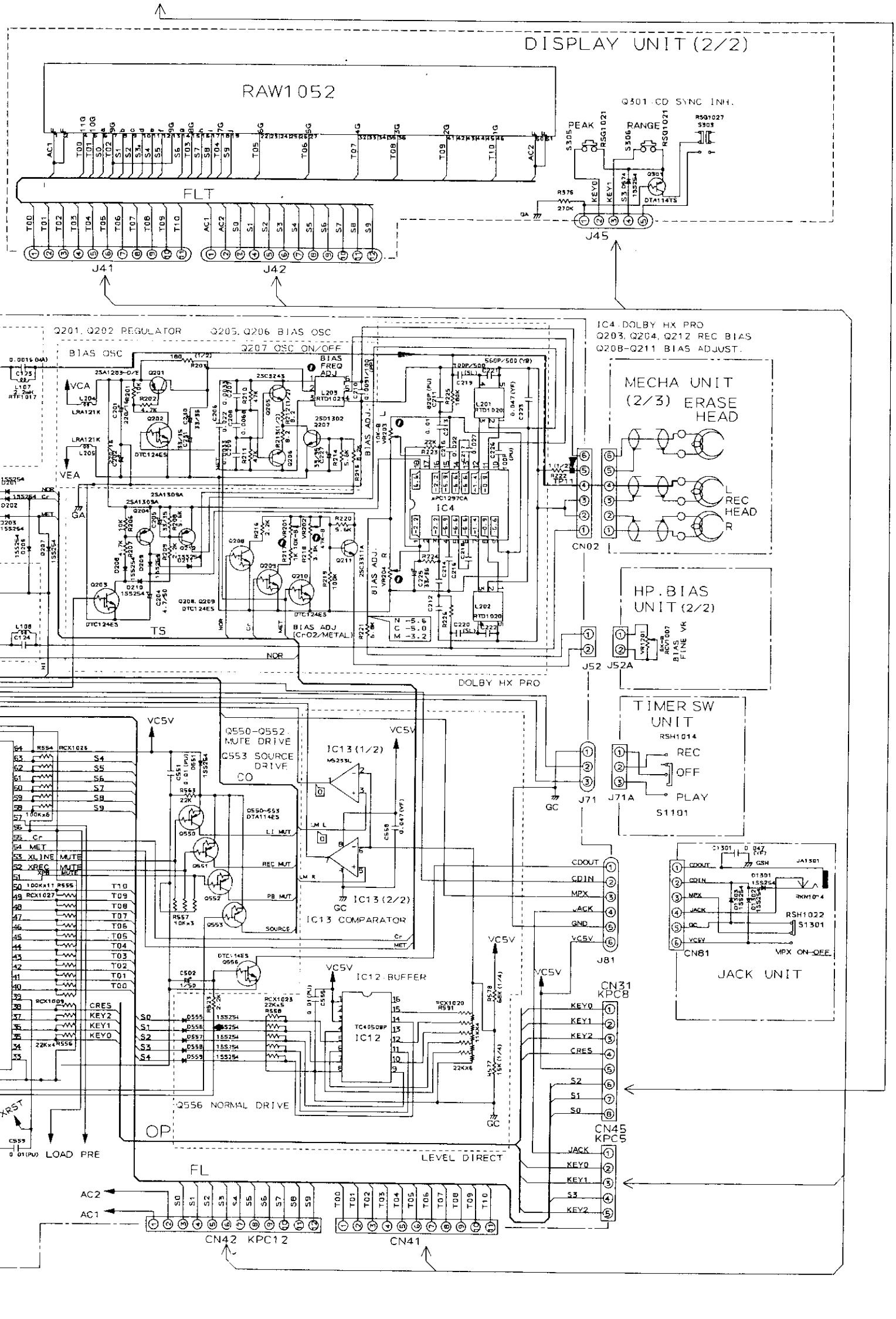
	KU/CA	HEM, HB, HEWM SD
FU401 FU402	800mA/125V	T800mA/250V
FU403	1.25A/125V	T1.25A/250V



	KU/CA	HEM, HB, HEWM SD
FU401 FU402	800mA/125V	T800mA/250V
FU403	1.25A/125V	T1.25A/250V


VCA
IC6 x1/2 FUNCTIONAL SUPPRESSION AMP
IC5 (1/2)
IC6
IC5 (2/2)
AMP
VEA
METER AMP


SW UNIT
REC MUTE
PAUSE
PLAY
MONITOR SELECT
REC
STOP
COUNTER RESET
COUNTER MODE
FF
REW
KEY0
KEY1
KEY2
CRES
VC5V
S2
S1
S0
J31


DISPLAY UNIT (2/2)
RAW1052
FLT
J41
J42
J45
PEAK
RANGE
Q301 CD SYNC INH.
IC3 (1/2)
IC3 REC. EQ. AMP
Q201, Q202 REGULATOR
Q203, Q206 BIAS OSC
Q207 OSC ON/OFF
BIAS OSC
BIAS FREQ ADJ
IC4 DOLBY HX PRO
Q203, Q204, Q212 REC BIAS
Q208-Q211 BIAS ADJUST.
MECHA UNIT (2/3)
ERASE HEAD
L REC HEAD R
CN02
IC4
HP. BIAS UNIT (2/2)
J52 J52A
BIAS FINE VR
DOLBY HX PRO
TIMER SW UNIT
RSH1014
REC
OFF
PLAY
S1101
J71 J71A
J81
CN81
JACK UNIT
RSH1022
S1301
MPX ON-OFF
CN31 KPC8
CN45 KPC5
IC11
PD4228
Q550-Q552 MUTE DRIVE
Q553 SOURCE DRIVE
IC13 (1/2)
IC13 (2/2)
IC13 COMPARATOR
IC12 BUFFER
IC12
Q556 NORMAL DRIVE
LEVEL DIRECT
LOAD PRE
CN42 KPC12
CN41
CN40 J40

1. **RESISTORS:**
Indicated in Ω, 1/4W, 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.

4. **OTHERS**
——— PLAYBACK SIGNAL ROUTE
— - — - RECORDING SIGNAL ROUTE
⊘; Adjusting point.
The ⚠ mark found on some component parts indicates the importane of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitor and resistor have parts number.
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.
◀; Test point

5. **SWITCHES (underline indicates switch position)**
JACK UNIT:
S1301 : MPX ON-OFF
TIMER SW. UNIT
S1101 : REC-OFF-PLAY
CONTROL SW. UNIT
S901 : PLAY
S902 : PAUSE
S903 : REC MUTE
S904 : STOP
S905 : REC
S906 : MONITOR SELECT
S907 : REW
S908 : FF
S909 : COUNTER MODE
S910 : COUNTER RESET
POWER SW. UNIT
S1201 : POWER OFF-ON
DISPLAY UNIT
S301 : DOLBY NR ON-OFF
S302 : DOLBY NR B-C
S303 : CD SYNCHRO
S305 : PEAK
S306 : RANGE

5. ELECTRICAL PARTS LIST

NOTES:
- *Parts without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ 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%).

560Ω	*56 × 10¹*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47 × 10³*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

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

5.62kΩ	*562 × 10¹*	*5621*	*RN1/4SR 5 6 2 1 F*

Miscellaneous Parts

P. C. BOARD UNIT

Mark	No.	Description	Parts No.
JACK UNIT			
SEMICONDUCTORS			
	D1301-D1303	DIODE	1SS254
SWITCH			
	S1301	SLIDE SWITCH	RSH1022
CAPACITOR			
	C1301	AXIAL CERAMIC CAPACITOR	CKCYF473Z50
OTHERS			
	JA1301	MINI JACK	RKN1014
DOOR DISPLAY UNIT			
SEMICONDUCTORS			
	D1401, D1402	DIODE (LED)	SEL2913K
RESISTOR			
	R1401	CARBON RESISTOR	RD1/4PM□□□J
SR JACK UNIT			
CAPACITOR			
	C554	CERAMIC CAPACITOR	CKCYF103Z50
OTHERS			
	CN40	CONNECTOR (3P)	KPC3
	JA50 1, JA502	MINI JACK (3.5φ)	RKN-071
INPUT VR UNIT			
RESISTORS			
	VR851	VARIABLE RESISTOR (50KA)	RCV1034
	VR852	VARIABLE RESISTOR (100KB)	RCV1010
	OTHER RESISTORS		RD1/6PM□□□J
OTHER			
	CN21	CONNECTOR SOCKET	W-D2505

Mark	No.	Description	Parts No.
CONTROL SW. UNIT			
SEMICONDUCTORS			
	D571-D573	DIODE	1SS254
SWITCHES			
	S901-S905	TACT SWITCH	RSG-155
	S906	TACT SWITCH	RSG-143
	S907, S908	TACT SWITCH	RSG-155
	S909	TACT SWITCH	RSG-143
	S910	TACT SWITCH	RSG-155
POWER SW. UNIT			
CAPACITOR			
⚠	C1201	CERAMIC CAPACITOR	RCG-009
OTHERS			
⚠	S1201	POWER SWITCH	RSA-063
DISPLAY UNIT			
SEMICONDUCTORS			
	Q301	TRANSISTOR	DTA114TS
	D574	DIODE	1SS254
SWITCHES			
	S301, S302	PUSH SWITCH	RSG-150
	S303	PUSH SWITCH	RSG1027
	S305, S306	TACT SWITCH	RSG1021
RESISTORS			
	ALL RESISTORS		RD1/6PM□□□J
OTHERS			
	V301	FL TUBE	RAW1052
HP. BIAS UNIT			
RESISTORS			
	VR801	VARIABLE RESISTOR (20KB)	RCV1013
	VR1201	VARIABLE RESISTOR (5KB)	RCV1007

Mark	No.	Description	Parts No.
HP. JACK UNIT			
RESISTORS			
		OTHER RESISTOR	RD1/6PM□□□J
CAPACITOR			
	C805	AXIAL CERAMIC	CKPUYY103M16
OTHER			
	JA801	HEADPHONE JACK	RKN1002
TIMER SW. UNIT			
SWITCH			
	S1101	SLIDE SWITCH	RSH1014
MAIN UNIT			
SEMICONDUCTORS			
	IC1	OP-AMP 1C	M5220L
	IC2	LOGIC IC	TC4066BP
	IC3	OP-AMP IC	M5218L
	IC4	DOLBY-HX-PRO IC	UPC1297CA
	IC5	OP-AMP IC	M5218L
	IC6	AMP IC	BA6138
	IC7	IC	BA335
	IC8	OP-AMP IC	M5218L
	IC9	OP-AMP IC	M5233L
	IC10	IC	BA6109
	IC11	CPU	PD4228
	IC12	CMOS IC	TC4050BP
	IC13	DUAL-COMPARATER	M5233L
	IC14, IC15	DOLBY-B,C IC	CX20187
	IC16	OP-AMP IC	M5218L
⚠	IC20	REGULATER IC	NJM78M12A
⚠	IC21	REGULATER IC	NJM7805FA
	Q1, Q2	TRANSISTOR	DTC114TS
	Q51-Q54	TRANSISTOR	2SD1302
	Q55	TRANSISTOR	DTC124ES
	Q101, Q102	TRANSISTOR	2SD1302
	Q103-Q114	TRANSISTOR	DTC114TS
⚠	Q201	TRANSISTOR	2SA1283
	Q202, Q203	TRANSISTOR	DTC124ES
	Q204	TRANSISTOR	2SA1309
	Q205, Q206	TRANSISTOR	2SC3243
	Q207	TRANSISTOR	2SD1302
	Q208-Q210	TRANSISTOR	DTC124ES
	Q211	TRANSISTOR	2SC3311
	Q212	TRANSISTOR	2SA1309
⚠	Q401	TRANSISTOR	2SD1276
⚠	Q402	TRANSISTOR	2SB950
⚠	Q405	TRANSISTOR	2SA1283
	Q501	TRANSISTOR	2SA1309
	Q502, Q503	TRANSISTOR	2SC3311
	Q504	TRANSISTOR	2SA1309
	Q505	TRANSISTOR	2SC3311
	Q506-Q508	TRANSISTOR	2SC2346
	Q509	TRANSISTOR	2SC3311
	Q550-Q553	TRANSISTOR	DTA114ES

Mark	No.	Description	Parts No.
	Q556	TRANSISTOR	DTC114ES
	Q557	TRANSISTOR	DTA114ES
	Q701-Q704	TRANSISTOR	DTC114TS
	D201-D203	DIODE	1SS254
	D205	DIODE	1SS254
	D207-D211	DIODE	1SS254
⚠	D401, D402	DIODE	10DF2FC3
⚠	D403, D404	DIODE	10DF2FA9
	D405, 406	DIODE	1SS254
⚠	D407, D408	ZENER DIODE	HZ5CLL
⚠	D409	DIODE	1B2C1-LC2
⚠	D410	DIODE	1B2Z1-LC2
	D411	ZENER DIODE	MTZJ9.1A
⚠	D412, D413	ZENER DIODE	MTZJ7.5B
⚠	D414	DIODE	1SR35-100A
⚠	D415	ZENER DIODE	MTZ36A
	D501	DIODE	1SS254
	D503	DIODE	1SR35-100A
	D551-D559	DIODE	1SS254

COILS AND FILTERS

L101, L102	COIL (5.6 MH)	RTF1022
L107, L108	COIL (2.2 MH)	RTF1017
L201, L202	COIL	RTD1020
L203	COIL	RTD1021
L204, 205	COIL	LRA121K
L601, L602	COIL	RTF1005
L603, L604	COIL	RTF1067
L701, L702	COIL	RTF1005
F701, F702	MPX FILTER	RTF1066

CAPACITOR

C1, C2	CAPACITOR	CQSF181J50
C5, C6	AXIAL CERAMIC	CKPUYB101K50
C9, C10	ELECTR. CAPACITOR	CEYANP100M25
C11,C12	AUDIO FILM CAPACITOR	CFTXA223J50
C13, C14	AUDIO FILM CAPACITOR	CFTXA273J50
C15, C16	ELECTR. CAPACITOR	CEZA101M10
C51, C52	ELECTR. CAPACITOR	CEYA100M50
C53, C54	ELECTR. CAPACITOR	CEAS4R7M50
C56	CERAMIC CAPACITOR	CKCYF473Z50
C60	CERAMIC CAPACITOR	CKCYF473Z50
C101, C102	ELECTR. CAPACITOR	CEYA010M50
C103, C104	AUDIO FILM CAPACITOR	CFTXA472J50
C105, C106	AUDIO FILM CAPACITOR	CFTXA334J50
C107, C108	ELECTR. CAPACITOR	CEYA100M50
C109, C110	AUDIO FILM CAPACITOR	CFTXA103J50
C117, C118	AUDIO FILM CAPACITOR	CFTXA822J50
C119, C120	AUDIO FILM CAPACITOR	CFTXA562J50
C121, C122	AUDIO FILM CAPACITOR	CFTXA222J50
C123, C124	CAPACITOR	CQMA162J50
C125	ELECTR. CAPACITOR	CEYA010M50
C126, C127	ELECTR. CAPACITOR	CEZA101M10
C201, C202	ELECTR. CAPACITOR	CEAS221M16
C204	ELECTR. CAPACITOR	CEAS4R7M50
C205	ELECTR. CAPACITOR	CEAS330M35
C206	AUDIO FILM CAPACITOR	CFTXA223J50
C207	AUDIO FILM CAPACITOR	CFTXA332J50
C208	AUDIO FILM CAPACITOR	CFTXA682J50
C209	AUDIO FILM CAPACITOR	CFTXA332J50
C210	CAPACITOR	CQPA912J100
C211, C212	AXIAL CERAMIC	CKPUYB821K50
C213, C214	AUDIO FILM CAPACITOR	CFTXA103J50
C215, C216	AUDIO FILM CAPACITOR	CFTXA223J50
C217, C218	AUDIO FILM CAPACITOR	CFTXA273J50
C219, C220	CERAMIC CAPACITOR	CCCSL101K500
C221, C222	CERAMIC CAPACITOR	CKCYB561J500
C223	CERAMIC CAPACITOR	CKCYF473Z50
C225	ELECTR. CAPACITOR	CEAS330M35
C226	AXIAL CERAMIC	CKPUYB101K50
C227	ELECTR. CAPACITOR	CEAS330M35
C230, C231	ELECTR. CAPACITOR	CEAS330M35
C301, C302	ELECTR. CAPACITOR	CEYA010M50
C303, C304	AXIAL CERAMIC	CKPUYB821K50
C305-C310	ELECTR. CAPACITOR	CEAS4R7M50
C350	CERAMIC CAPACITOR	CKCYF473Z50
C351, C352	CERAMIC CAPACITOR	CGCYX104K25
C353	ELECTR. CAPACITOR	CEASR47M50
C370, C371	ELECTR. CAPACITOR	CEYA100M50
C401-C405	CERAMIC CAPACITOR	CKCYF473Z50
C407, C408	ELECTR. CAPACITOR (2200µF)	RCH1029
C409, C410	AUDIO FILM CAPACITOR	CFTXA473J50
C411, C412	CERAMIC CAPACITOR	CKCYF473Z50
C413, C414	AXIAL CERAMIC	CKPUYB101K50
C415, C416	ELECTR. CAPACITOR	CEAS330M35
C417, C418	ELECTR. CAPACITOR	CEYA010M50
C419, C420	AUDIO FILM CAPACITOR	CFTXA473J50
C421, C422	ELECTR. CAPACITOR	CEZA101M10
C423	ELECTR. CAPACITOR	CEAS332M25
C424	ELECTR. CAPACITOR	CEAS101M25
C425	ELECTR. CAPACITOR	CEAS101M50
C428	ELECTR. CAPACITOR	CEAS472M6R3
C429	ELECTR. CAPACITOR	CEAS470M50
C431	ELECTR. CAPACITOR	CEAS101M25
C501	ELECTR. CAPACITOR	CEAS330M35
C502	ELECTR. CAPACITOR	CEYA010M50
C506	AXIAL CERAMIC	CKPUYY103M16
C507	CERAMIC CAPACITOR	CGCYX104K25
C508	ELECTR. CAPACITOR	CEAS4R7M50
C551	AXIAL CERAMIC	CKPUYY103M16
C553	AXIAL CERAMIC	CKPUYY103M16
C555	AXIAL CERAMIC	CKPUYY103M16
C558	CERAMIC CAPACITOR	CKCYF473Z50
C559	AXIAL CERAMIC	CKPUYY103M16
C601, C602	AXIAL CERAMIC	CKPUYB101K50
C605, C606	ELECTR. CAPACITOR	CEYA010M50
C607, C608	AXIAL CERAMIC	CKPUYB681K50
C609, C610	AUDIO FILM CAPACITOR	CFTXA332J50
C611, C612	AUDIO FILM CAPACITOR	CFTXA472J50
C613, C614	ELECTR. CAPACITOR	CEASR47M50
C615, C616	ELECTR. CAPACITOR	CEASR15M50
C617, C618	AUDIO FILM CAPACITOR	CFTXA153J50
C619, C620	ELECTR. CAPACITOR	CEASR22M50
C621, C622	AUDIO FILM CAPACITOR	CFTXA683J50
C623, C624	AUDIO FILM CAPACITOR	CFTXA473J50
C625, C626	AUDIO FILM CAPACITOR	CFTXA682J50
C627, C628	AUDIO FILM CAPACITOR	CFTXA103J50
C629, C630	ELECTR. CAPACITOR	CEYA100M50
C631, C632	CERAMIC CAPACITOR	CGCYX104K25
C633, C634	ELECTR. CAPACITOR	CEZA101M10
C701, C702	AXIAL CERAMIC	CKPUYX122M16
C703, C704	ELECTR. CAPACITOR	CEYA010M50
C705-C708	ELECTR. CAPACITOR	CEYA100M50
C709, C710	AXIAL CERAMIC	CKPUYB681K50
C711, C712	AUDIO FILM CAPACITOR	CFTXA472J50
C713, C714	ELECTR. CAPACITOR	CEASR47M50
C715, 716	ELECTR. CAPACITOR	CEASR15M50
C717, C718	AUDIO FILM CAPACITOR	CFTXA153J50
C719, C720	ELECTR. CAPACITOR	CEASR22M50
C721, C722	AUDIO FILM CAPACITOR	CFTXA683J50
C723, C724	AUDIO FILM CAPACITOR	CFTXA473J50
C725, C726	AUDIO FILM CAPACITOR	CFTXA682J50
C727, C728	AUDIO FILM CAPACITOR	CFTXA103J50
C729, C730	ELECTR. CAPACITOR	CEYA100M50
C731, C732	AUDIO FILM CAPACITOR	CFTXA332J50
C733	ELECTR. CAPACITOR	CEYA100M50
C734, C735	ELECTR. CAPACITOR	CEZA101M10
C737, C738	AUDIO FILM CAPACITOR	CFTXA392J50
C801, C802	ELECTR. CAPACITOR	CEASR15M50

RESISTORS

VR1, VR2	SEMI-FIXED RESISTOR	VRTB6VS103
VR3, VR4	SEMI-FIXED RESISTOR	VRTB6VS223
VR101, VR102	SEMI-FIXED RESISTOR	VRTB6VS223
VR201	SEMI-FIXED RESISTOR	VRTB6VS103
VR202	SEMI-FIXED RESISTOR	VRTB6VS473
VR203, VR204	SEMI-FIXED RESISTOR	VRTB6VS103
VR301, VR302	SEMI-FIXED RESISTOR	VRTB6VS223
R203	CARBON FILM RESISTOR	RD1/2PMF□□□J
R212, R213	CARBON FILM RESISTOR	RD1/2LF□□□J
R222	CARBON FILM RESISTOR	RD1/2LF□□□J
R402	CARBON FILM RESISTOR	RD1/2PMF□□□J
R413	CARBON FILM RESISTOR	RD1/2PMF□□□J
R414	METAL OXIDE	RS1LMF222J
R415	CARBON FILM RESISTOR	RD1/2PMF□□□J
⚠ R418	FUSE IBLF RESISTOR	RFA1/4L4R7J
⚠ R513	METAL OXIDE	RS2LMF200J
R550	RESISTOR ARRAV (100k)	RCX1025
R551	RESISTOR ARRAV (22k)	RCX1022
R552	RESISTOR ARRAV (22k)	RCX1024
R554	RESISTOR ARRAV (100k)	RCX1026
R555	RESISTOR ARRAV (100k)	RCX1027
R556	RESISTOR ARRAV (22k)	RCX1009
R557	RESISTOR ARRAV (10k)	RCX1021
R558	RESISTOR ARRAV (22k)	RCX1023
R577	METAL FILM RESISTER	RN1/4PQ1502F
R578	METAL FILM RESISTER	RN1/4PQ6802F
R591	RESISTOR (22K) (11K)	RCX1020
OTHER RESISTORS		RD1/6PM□□□J

OTHERS

CN1	CONNECTOR B4B-XH	RKS-002
CN2	CONNECTOR B6B-XH	RKP-985
CN21	CONNECTOR	W-P9805
CN83	KR CONNECTOR (Vertical)	B2B-PH
JA101, JA102	2 PIN JACK	PKB1006
X550	CERAMIC RESONATOR	VSS1014

5. ELECTRICAL PARTS LIST

NOTES:

- *Parts without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ 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%).

560Ω	*56 × 10¹*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47 × 10³*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

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

5.62kΩ	*562 × 10¹*	*5621*	*RN1/4SR 5 6 2 1 F*

Miscellaneous Parts

P. C. BOARD UNIT

Mark	No.	Description	Parts No.
JACK UNIT			
SEMICONDUCTORS			
	D1301-D1303	DIODE	1SS254
SWITCH			
	S1301	SLIDE SWITCH	RSH1022
CAPACITOR			
	C1301	AXIAL CERAMIC CAPACITOR	CKCYF473Z50
OTHERS			
	JA1301	MINI JACK	RKN1014
DOOR DISPLAY UNIT			
SEMICONDUCTORS			
	D1401, D1402	DIODE (LED)	SEL2913K
RESISTOR			
	R1401	CARBON RESISTOR	RD1/4PM□□□J
SR JACK UNIT			
CAPACITOR			
	C554	CERAMIC CAPACITOR	CKCYF103Z50
OTHERS			
	CN40	CONNECTOR (3P)	KPC3
	JA50 1, JA502	MINI JACK (3.5φ)	RKN-071
INPUT VR UNIT			
RESISTORS			
	VR851	VARIABLE RESISTOR (50KA)	RCV1034
	VR852	VARIABLE RESISTOR (100KB)	RCV1010
	OTHER RESISTORS		RD1/6PM□□□J
OTHER			
	CN21	CONNECTOR SOCKET	W-D2505

Mark	No.	Description	Parts No.
CONTROL SW. UNIT			
SEMICONDUCTORS			
	D571-D573	DIODE	1SS254
SWITCHES			
	S901-S905	TACT SWITCH	RSG-155
	S906	TACT SWITCH	RSG-143
	S907, S908	TACT SWITCH	RSG-155
	S909	TACT SWITCH	RSG-143
	S910	TACT SWITCH	RSG-155
POWER SW. UNIT			
CAPACITOR			
⚠	C1201	CERAMIC CAPACITOR	RCG-009
OTHERS			
⚠	S1201	POWER SWITCH	RSA-063
DISPLAY UNIT			
SEMICONDUCTORS			
	Q301	TRANSISTOR	DTA114TS
	D574	DIODE	1SS254
SWITCHES			
	S301, S302	PUSH SWITCH	RSG-150
	S303	PUSH SWITCH	RSG1027
	S305, S306	TACT SWITCH	RSG1021
RESISTORS			
	ALL RESISTORS		RD1/6PM□□□J
OTHERS			
	V301	FL TUBE	RAW1052
HP. BIAS UNIT			
RESISTORS			
	VR801	VARIABLE RESISTOR (20KB)	RCV1013
	VR1201	VARIABLE RESISTOR (5KB)	RCV1007

CT-S707

1. **RESISTORS:**
Indicated in Ω, 1/4W, 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.

4. **OTHERS**
——— PLAYBACK SIGNAL ROUTE
— - — RECORDING SIGNAL ROUTE
⊘; Adjusting point.
The ⚠ mark found on some component parts indicates the importane of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitor and resistor have parts number.
This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.
◀; Test point

5. **SWITCHES (underline indicates switch position)**
JACK UNIT:
S1301 : MPX ON-OFF
TIMER SW. UNIT
S1101 : REC-OFF-PLAY
CONTROL SW. UNIT
S901 : PLAY
S902 : PAUSE
S903 : REC MUTE
S904 : STOP
S905 : REC
S906 : MONITOR SELECT
S907 : REW
S908 : FF
S909 : COUNTER MODE
S910 : COUNTER RESET
POWER SW. UNIT
S1201 : POWER OFF-ON
DISPLAY UNIT
S301 : DOLBY NR ON-OFF
S302 : DOLBY NR B-C
S303 : CD SYNCHRO
S305 : PEAK
S306 : RANGE

Mark	No.	Description	Parts No.
HP. JACK UNIT			
RESISTORS			
		OTHER RESISTOR	RD1/6PM□□□J
CAPACITOR			
	C805	AXIAL CERAMIC	CKPUYY103M16
OTHER			
	JA801	HEADPHONE JACK	RKN1002
TIMER SW. UNIT			
SWITCH			
	S1101	SLIDE SWITCH	RSH1014
MAIN UNIT			
SEMICONDUCTORS			
	IC1	OP-AMP 1C	M5220L
	IC2	LOGIC IC	TC4066BP
	IC3	OP-AMP IC	M5218L
	IC4	DOLBY-HX-PRO IC	UPC1297CA
	IC5	OP-AMP IC	M5218L
	IC6	AMP IC	BA6138
	IC7	IC	BA335
	IC8	OP-AMP IC	M5218L
	IC9	OP-AMP IC	M5233L
	IC10	IC	BA6109
	IC11	CPU	PD4228
	IC12	CMOS IC	TC4050BP
	IC13	DUAL-COMPARATER	M5233L
	IC14, IC15	DOLBY-B,C IC	CX20187
	IC16	OP-AMP IC	M5218L
⚠	IC20	REGULATER IC	NJM78M12A
⚠	IC21	REGULATER IC	NJM7805FA
	Q1, Q2	TRANSISTOR	DTC114TS
	Q51-Q54	TRANSISTOR	2SD1302
	Q55	TRANSISTOR	DTC124ES
	Q101, Q102	TRANSISTOR	2SD1302
	Q103-Q114	TRANSISTOR	DTC114TS
⚠	Q201	TRANSISTOR	2SA1283
	Q202, Q203	TRANSISTOR	DTC124ES
	Q204	TRANSISTOR	2SA1309
	Q205, Q206	TRANSISTOR	2SC3243
	Q207	TRANSISTOR	2SD1302
	Q208-Q210	TRANSISTOR	DTC124ES
	Q211	TRANSISTOR	2SC3311
	Q212	TRANSISTOR	2SA1309
⚠	Q401	TRANSISTOR	2SD1276
⚠	Q402	TRANSISTOR	2SB950
⚠	Q405	TRANSISTOR	2SA1283
	Q501	TRANSISTOR	2SA1309
	Q502, Q503	TRANSISTOR	2SC3311
	Q504	TRANSISTOR	2SA1309
	Q505	TRANSISTOR	2SC3311
	Q506-Q508	TRANSISTOR	2SC2346
	Q509	TRANSISTOR	2SC3311
	Q550-Q553	TRANSISTOR	DTA114ES
	Q556	TRANSISTOR	DTC114ES
	Q557	TRANSISTOR	DTA114ES
	Q701-Q704	TRANSISTOR	DTC114TS
	D201-D203	DIODE	1SS254
	D205	DIODE	1SS254
	D207-D211	DIODE	1SS254
⚠	D401, D402	DIODE	10DF2FC3
⚠	D403, D404	DIODE	10DF2FA9
	D405, 406	DIODE	1SS254
⚠	D407, D408	ZENER DIODE	HZ5CLL
⚠	D409	DIODE	1B2C1-LC2
⚠	D410	DIODE	1B2Z1-LC2
	D411	ZENER DIODE	MTZJ9.1A
⚠	D412, D413	ZENER DIODE	MTZJ7.5B
⚠	D414	DIODE	1SR35-100A
⚠	D415	ZENER DIODE	MTZ36A
	D501	DIODE	1SS254
	D503	DIODE	1SR35-100A
	D551-D559	DIODE	1SS254
COILS AND FILTERS			
	L101, L102	COIL (5.6 MH)	RTF1022
	L107, L108	COIL (2.2 MH)	RTF1017
	L201, L202	COIL	RTD1020
	L203	COIL	RTD1021
	L204, 205	COIL	LRA121K
	L601, L602	COIL	RTF1005
	L603, L604	COIL	RTF1067
	L701, L702	COIL	RTF1005
	F701, F702	MPX FILTER	RTF1066
CAPACITOR			
	C1, C2	CAPACITOR	CQSF181J50
	C5, C6	AXIAL CERAMIC	CKPUYB101K50
	C9, C10	ELECTR. CAPACITOR	CEYANP100M25
	C11,C12	AUDIO FILM CAPACITOR	CFTXA223J50
	C13, C14	AUDIO FILM CAPACITOR	CFTXA273J50
	C15, C16	ELECTR. CAPACITOR	CEZA101M10
	C51, C52	ELECTR. CAPACITOR	CEYA100M50
	C53, C54	ELECTR. CAPACITOR	CEAS4R7M50
	C56	CERAMIC CAPACITOR	CKCYF473Z50
	C60	CERAMIC CAPACITOR	CKCYF473Z50
	C101, C102	ELECTR. CAPACITOR	CEYA010M50
	C103, C104	AUDIO FILM CAPACITOR	CFTXA472J50
	C105, C106	AUDIO FILM CAPACITOR	CFTXA334J50
	C107, C108	ELECTR. CAPACITOR	CEYA100M50
	C109, C110	AUDIO FILM CAPACITOR	CFTXA103J50
	C117, C118	AUDIO FILM CAPACITOR	CFTXA822J50
	C119, C120	AUDIO FILM CAPACITOR	CFTXA562J50
	C121, C122	AUDIO FILM CAPACITOR	CFTXA222J50
	C123, C124	CAPACITOR	CQMA162J50
	C125	ELECTR. CAPACITOR	CEYA010M50
	C126, C127	ELECTR. CAPACITOR	CEZA101M10
	C201, C202	ELECTR. CAPACITOR	CEAS221M16
	C204	ELECTR. CAPACITOR	CEAS4R7M50
	C205	ELECTR. CAPACITOR	CEAS330M35
	C206	AUDIO FILM CAPACITOR	CFTXA223J50

Mark	No.	Description	Parts No.
	C207	AUDIO FILM CAPACITOR	CFTXA332J50
	C208	AUDIO FILM CAPACITOR	CFTXA682J50
	C209	AUDIO FILM CAPACITOR	CFTXA332J50
	C210	CAPACITOR	CQPA912J100
	C211, C212	AXIAL CERAMIC	CKPUYB821K50
	C213, C214	AUDIO FILM CAPACITOR	CFTXA103J50
	C215, C216	AUDIO FILM CAPACITOR	CFTXA223J50
	C217, C218	AUDIO FILM CAPACITOR	CFTXA273J50
	C219, C220	CERAMIC CAPACITOR	CCCSL101K500
	C221, C222	CERAMIC CAPACITOR	CKCYB561J500
	C223	CERAMIC CAPACITOR	CKCYF473Z50
	C225	ELECTR. CAPACITOR	CEAS330M35
	C226	AXIAL CERAMIC	CKPUYB101K50
	C227	ELECTR. CAPACITOR	CEAS330M35
	C230, C231	ELECTR. CAPACITOR	CEAS330M35
	C301, C302	ELECTR. CAPACITOR	CEYA010M50
	C303, C304	AXIAL CERAMIC	CKPUYB821K50
	C305-C310	ELECTR. CAPACITOR	CEAS4R7M50
	C350	CERAMIC CAPACITOR	CKCYF473Z50
	C351, C352	CERAMIC CAPACITOR	CGCYX104K25
	C353	ELECTR. CAPACITOR	CEASR47M50
	C370, C371	ELECTR. CAPACITOR	CEYA100M50
	C401-C405	CERAMIC CAPACITOR	CKCYF473Z50
	C407, C408	ELECTR. CAPACITOR (2200μF)	RCH1029
	C409, C410	AUDIO FILM CAPACITOR	CFTXA473J50
	C411, C412	CERAMIC CAPACITOR	CKCYF473Z50
	C413, C414	AXIAL CERAMIC	CKPUYB101K50
	C415, C416	ELECTR. CAPACITOR	CEAS330M35
	C417, C418	ELECTR. CAPACITOR	CEYA010M50
	C419, C420	AUDIO FILM CAPACITOR	CFTXA473J50
	C421, C422	ELECTR. CAPACITOR	CEZA101M10
	C423	ELECTR. CAPACITOR	CEAS332M25
	C424	ELECTR. CAPACITOR	CEAS101M25
	C425	ELECTR. CAPACITOR	CEAS101M50
	C428	ELECTR. CAPACITOR	CEAS472M6R3
	C429	ELECTR. CAPACITOR	CEAS470M50
	C431	ELECTR. CAPACITOR	CEAS101M25
	C501	ELECTR. CAPACITOR	CEAS330M35
	C502	ELECTR. CAPACITOR	CEYA010M50
	C506	AXIAL CERAMIC	CKPUYY103M16
	C507	CERAMIC CAPACITOR	CGCYX104K25
	C508	ELECTR. CAPACITOR	CEAS4R7M50
	C551	AXIAL CERAMIC	CKPUYY103M16
	C553	AXIAL CERAMIC	CKPUYY103M16
	C555	AXIAL CERAMIC	CKPUYY103M16
	C558	CERAMIC CAPACITOR	CKCYF473Z50
	C559	AXIAL CERAMIC	CKPUYY103M16
	C601, C602	AXIAL CERAMIC	CKPUYB101K50
	C605, C606	ELECTR. CAPACITOR	CEYA010M50
	C607, C608	AXIAL CERAMIC	CKPUYB681K50
	C609, C610	AUDIO FILM CAPACITOR	CFTXA332J50
	C611, C612	AUDIO FILM CAPACITOR	CFTXA472J50
	C613, C614	ELECTR. CAPACITOR	CEASR47M50
	C615, C616	ELECTR. CAPACITOR	CEASR15M50
	C617, C618	AUDIO FILM CAPACITOR	CFTXA153J50
	C619, C620	ELECTR. CAPACITOR	CEASR22M50
	C621, C622	AUDIO FILM CAPACITOR	CFTXA683J50
	C623, C624	AUDIO FILM CAPACITOR	CFTXA473J50
	C625, C626	AUDIO FILM CAPACITOR	CFTXA682J50
	C627, C628	AUDIO FILM CAPACITOR	CFTXA103J50
	C629, C630	ELECTR. CAPACITOR	CEYA100M50
	C631, C632	CERAMIC CAPACITOR	CGCYX104K25
	C633, C634	ELECTR. CAPACITOR	CEZA101M10
	C701, C702	AXIAL CERAMIC	CKPUYX122M16
	C703, C704	ELECTR. CAPACITOR	CEYA010M50
	C705-C708	ELECTR. CAPACITOR	CEYA100M50
	C709, C710	AXIAL CERAMIC	CKPUYB681K50
	C711, C712	AUDIO FILM CAPACITOR	CFTXA472J50
	C713, C714	ELECTR. CAPACITOR	CEASR47M50
	C715, 716	ELECTR. CAPACITOR	CEASR15M50
	C717, C718	AUDIO FILM CAPACITOR	CFTXA153J50
	C719, C720	ELECTR. CAPACITOR	CEASR22M50
	C721, C722	AUDIO FILM CAPACITOR	CFTXA683J50
	C723, C724	AUDIO FILM CAPACITOR	CFTXA473J50
	C725, C726	AUDIO FILM CAPACITOR	CFTXA682J50
	C727, C728	AUDIO FILM CAPACITOR	CFTXA103J50
	C729, C730	ELECTR. CAPACITOR	CEYA100M50
	C731, C732	AUDIO FILM CAPACITOR	CFTXA332J50
	C733	ELECTR. CAPACITOR	CEYA100M50
	C734, C735	ELECTR. CAPACITOR	CEZA101M10
	C737, C738	AUDIO FILM CAPACITOR	CFTXA392J50
	C801, C802	ELECTR. CAPACITOR	CEASR15M50

RESISTORS

	VR1, VR2	SEMI-FIXED RESISTOR	VRTB6VS103
	VR3, VR4	SEMI-FIXED RESISTOR	VRTB6VS223
	VR101, VR102	SEMI-FIXED RESISTOR	VRTB6VS223
	VR201	SEMI-FIXED RESISTOR	VRTB6VS103
	VR202	SEMI-FIXED RESISTOR	VRTB6VS473
	VR203, VR204	SEMI-FIXED RESISTOR	VRTB6VS103
	VR301, VR302	SEMI-FIXED RESISTOR	VRTB6VS223
	R203	CARBON FILM RESISTOR	RD1/2PMF□□□J
	R212, R213	CARBON FILM RESISTOR	RD1/2LF□□□J
	R222	CARBON FILM RESISTOR	RD1/2LF□□□J
	R402	CARBON FILM RESISTOR	RD1/2PMF□□□J
	R413	CARBON FILM RESISTOR	RD1/2PMF□□□J
	R414	METAL OXIDE	RS1LMF222J
	R415	CARBON FILM RESISTOR	RD1/2PMF□□□J
⚠	R418	FUSE IBLF RESISTOR	RFA1/4L4R7J
⚠	R513	METAL OXIDE	RS2LMF200J
	R550	RESISTOR ARRAV (100k)	RCX1025
	R551	RESISTOR ARRAV (22k)	RCX1022
	R552	RESISTOR ARRAV (22k)	RCX1024
	R554	RESISTOR ARRAV (100k)	RCX1026
	R555	RESISTOR ARRAV (100k)	RCX1027
	R556	RESISTOR ARRAV (22k)	RCX1009
	R557	RESISTOR ARRAV (10k)	RCX1021
	R558	RESISTOR ARRAV (22k)	RCX1023
	R577	METAL FILM RESISTER	RN1/4PQ1502F
	R578	METAL FILM RESISTER	RN1/4PQ6802F
	R591	RESISTOR (22K) (11K)	RCX1020
	OTHER RESISTORS		RD1/6PM□□□J

OTHERS

CN1	CONNECTOR B4B-XH	RKS-002
CN2	CONNECTOR B6B-XH	RKP-985
CN21	CONNECTOR	W-P9805
CN83	KR CONNECTOR (Vertical)	B2B-PH
JA101, JA102	2 PIN JACK	PKB1006
X550	CERAMIC RESONATOR	VSS1014

6. ADJUSTMENTS

6.1 MECHANICAL ADJUSTMENT

1. Tape speed adjustment

Mode	Test tape	Adjustment position	Specification rating (playback frequency)
PLAY	Play the STD-301 tape (3kHz)	Variable resistor control	3000Hz ±5Hz

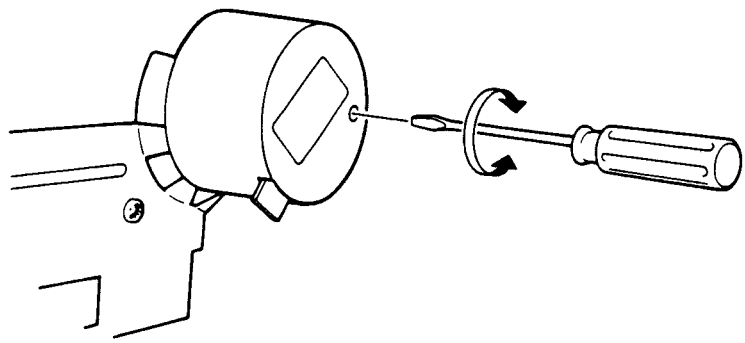


Fig. 6-1 Tape Speed Adjustment

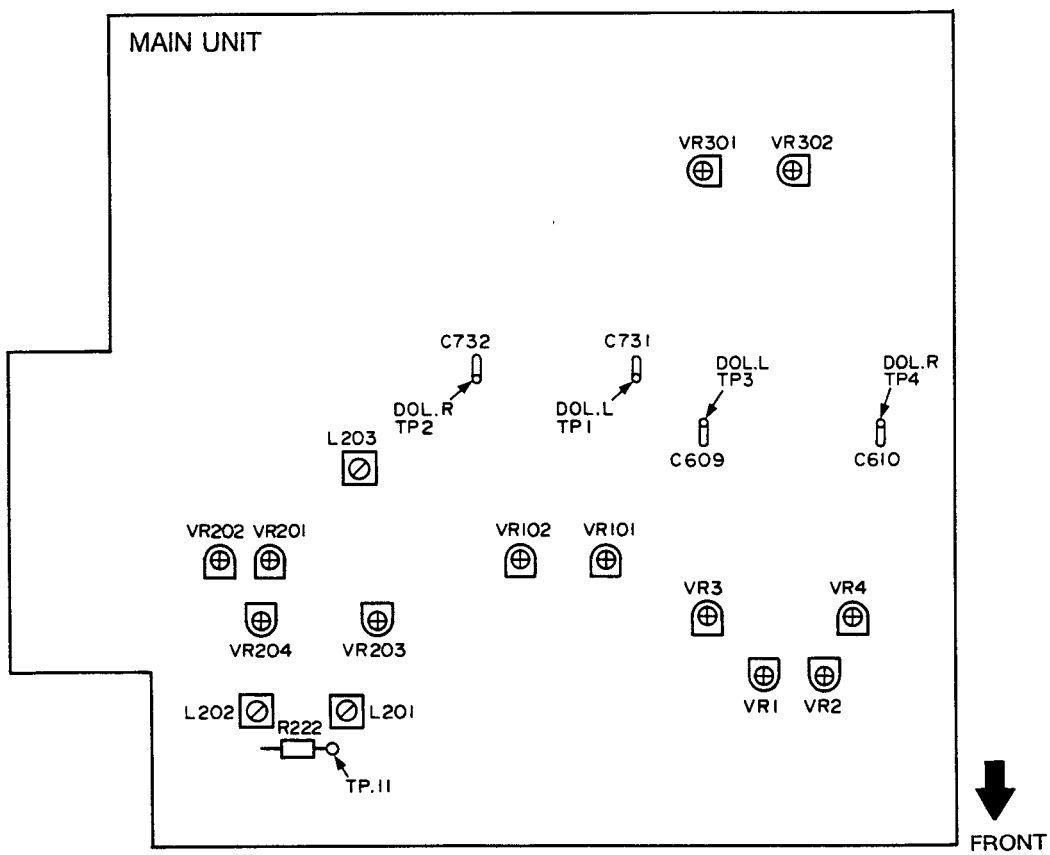


Fig. 6-2 Adjustment Locations

6.2 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 0dBv = 1Vrms.
5. Connect a 50 kilo-ohm (or between 47 to 52 kilo-ohm) 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-331B : Playback adjustments (See Fig. 6-3)
STD-630 : NORMAL blank tape
STD-620 : CrO_2 blank tape
STD-610 : METAL blank tape

List of Adjustments

Playback sections

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

Recording sections

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

NOTE: This unit has an automatic tape selection feature.

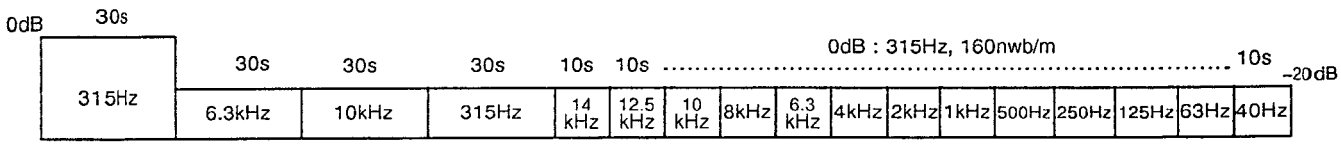


Fig. 6-3 Constants of the test tape STD-331B

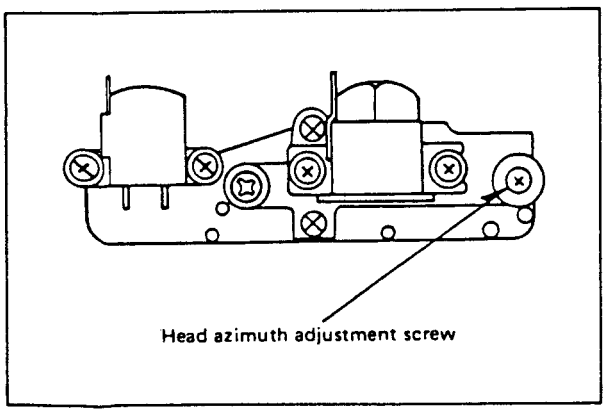


Fig. 6-4 Head azimuth adjustment

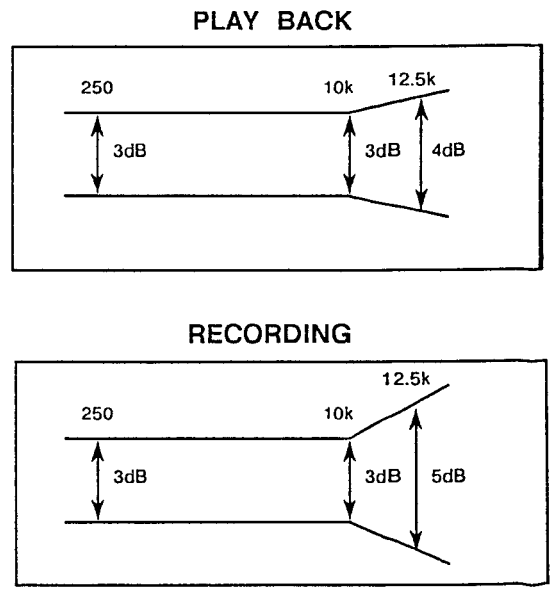


Fig. 6-5 Allowable playback frequency response zone

PLAYBACK SECTION

1. Head Azimuth Adjustment

- Turn VR3, VR4 to mechanical center positions.

No.	Mode	Input signal & test tape	Adjustment locations	Measuring locations	Adjustment value	Remarks
1.	PLAY	Play the 10 kHz/–20 dB section of STD-331B test tape.	Head azimuth adjustment screw. (See Fig. 6-4)	LINE OUT	Maximum playback signal level.	
2.	STOP	Lock the screw with screw lock after completing adjustment.				

2. Playback Equalizer Adjustment

No.	Mode	Input signal & test tape	Adjustment locations		Measuring locations	Adjustment value	Remarks
1.	PLAY	Play the 315 Hz and 10 kHz/–20 dB portion of the STD-331B test tape.	Deck I	VR1 (Lch) VR2 (Rch)	LINE OUT	Adjust the 10 kHz level to 0.5 dB ±0.5 dB in respect to the 315 Hz playback level.	
2.	PLAY	Play various frequencies at –20dB on the STD-331B test tape.	Check			The results must lie in the zone shown in Fig. 6-5.	

3. Playback Level Adjustment

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

No.	Mode	Input signal & test tape	Adjustment locations		Measuring locations	Adjustment value	Remarks
1.	PLAY	Play the 315 Hz/0 dB section of STD-331B test tape.	Deck I	VR3 (Lch) VR4 (Rch)	TP. 3 (Lch) TP. 4 (Rch)	–14.7 dBv	

RECORDING SECTION

1. Bias Oscillator Frequency Adjustment

No.	Mode	Input signal & test tape	Adjustment locations		Measuring locations	Adjustment value	Remarks
1.	PLAY	Load the STD-610 test tape with no input signal.	Deck I	L 203	TP. 11	85 kHz ±300 Hz	

2. Recording Bias Adjustment

2-1. Overbias Adjustment

No.	Mode	Input signal & test tape	Adjustment locations		Measuring locations	Adjustment value		Remarks
1.	REC/ PAUSE	Apply a 6.3 kHz/10dBv (−10VU meter reading) signal to the Line input terminals and insert STD-630.	———		LINE OUT	———		
2.	REC →PLAY	Record and play back the 6.3 kHz signal at −10 dBv input level.	NOR	VR203 (L)		NOR	3.0 dB Overbias	Turn control clockwise past the peak to assure proper overbias value.
				VR204 (R)				
3.		Record the 6.3 kHz/ −10 dBv signal on STD-620 and play back.	CrO2	VR201 (L/R)		CrO2	2.5 dB Overbias	
4.		Record the 6.3kHz/ −10 dBv signal on STD-610 and play back.	METAL	VR202 (L/R)		METAL	10 dB overbias	

2-2. Frequency Response Adjustment

No.	Mode	Input signal & test tape	Adjustment locations		Measuring locations	Adjustment value	Remarks
1.	REC/ PAUSE	Apply a 315 Hz/−20dBv signal to the Line input terminals and insert STD-630.	———		LINE OUT	———	
2.	REC →PLAY	Record and play back the 315 Hz signal and a 10 kHz signal at −20 dBv input level.	NOR	VR203 (L)		Record and play back repeatedly, comparing the 315 Hz and 10 kHz playback levels, and adjust to +0.5 dB ±0.5 dB.	
				VR204 (R)			
3.		Record the 10 kHz/ 315 Hz, −20 dBv signal on STD-620 and play back.	CrO2	VR201 (L/R)		+0.5 dB ±1.0 dB	
4.		Record the 10 kHz/ 315 Hz, −20 dBv signal on STD-610 and play back.	METAL	VR202 (L/R)		+0.5 dB ±1.0 dB	
5.	Check distortion value after adjustment is completed and confirm that there is no underbias.						

3. Recording Level Adjustment

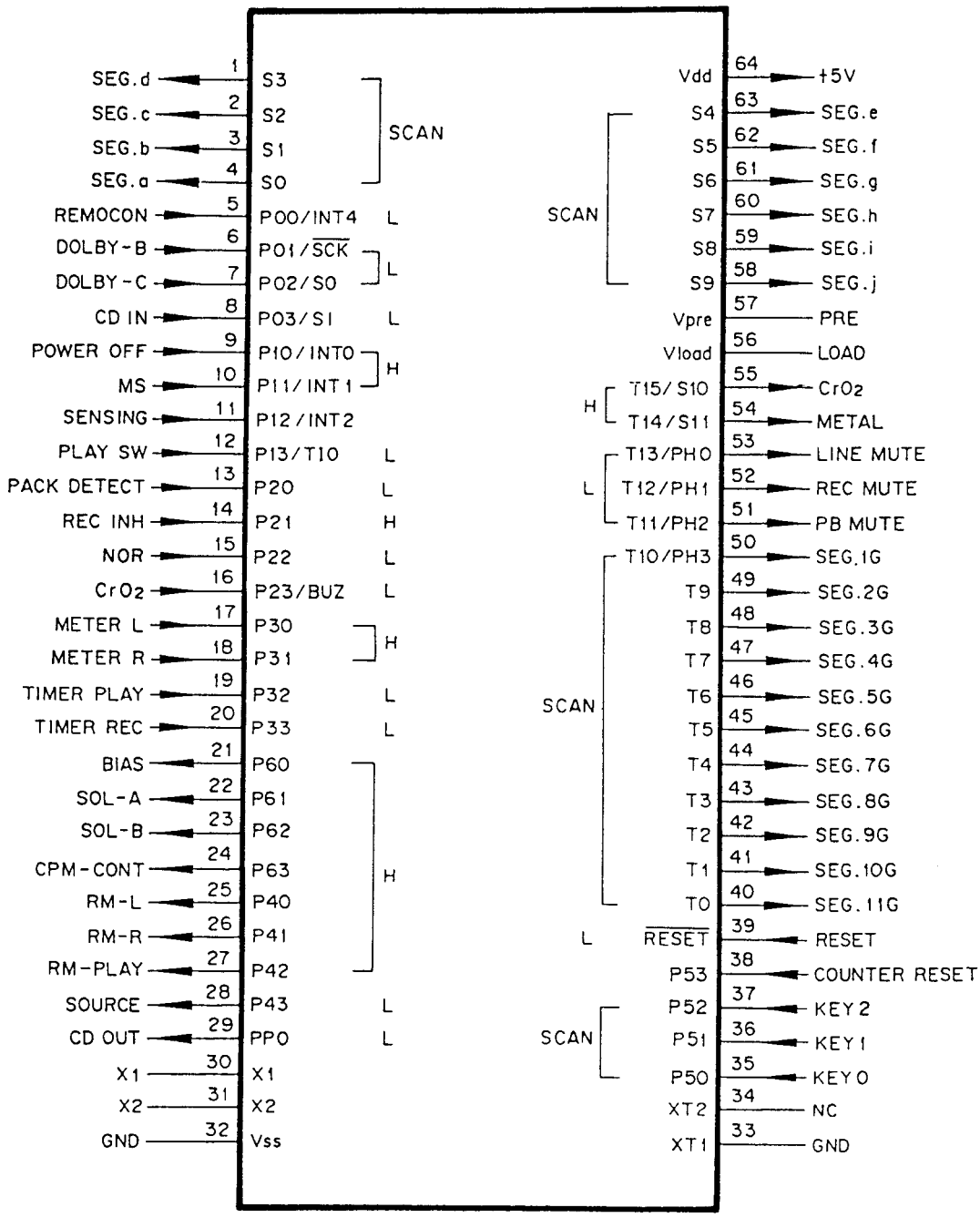
No.	Mode	Input signal & test tape	Adjustment locations	Measuring locations	Adjustment value	Remarks
1.	STOP	Set the TAPE SELECTOR switch to the NORM position.				
2.	REC/ PAUSE	Apply a 315Hz/0dBv signal to the line input terminals, load the STD-630 test tape.	Rec Level control Volume	TP. 1 (Lch) TP. 2 (Rch)	−15.2 dBv	
3.	STOP	Set the DOLBY NR switch to the ON position. (DOLBY B)				
4.	REC/ PLAY	Record the above signal onto the STD-630 test tape, and playback.	Deck I VR101 (Lch) VR102 (Rch)	TP. 3 (Lch) TP. 4 (Rch)	Repeatedly record, playback and adjust so that the playback signal level becomes −15.2 dB.	
5.	STOP	Set the TAPE SELECTOR switch to the CrO_2 position.				
6.	REC/ PLAY	Record the above signal onto the STD-620 test tape, and playback.	Check	TP. 3 (Lch) TP. 4 (Rch)	−15.2 dBv ± 1.5dB	
7.	STOP	Set the TAPE SELECTOR switch to the METAL position.				
8.	REC/ PLAY	Record the above signal onto the STD-610 test tape, and playback.	Check	TP. 3 (Lch) TP. 4 (Rch)	−15.2 dBv ± 1.5dB	

4. Level Meter Adjustment

No.	Mode	Input signal & test tape	Adjustment locations	Measuring locations	Adjustment value	Remarks
1.	REC/ PAUSE Meter : Expand Mode	Apply a 315 Hz/−10 dBv (316 mV) signal to the Line Input terminals.	VR301 (Lch) VR302 (Rch)	TP. 1 (Lch) TP. 2 (Rch)	Adjust that the level meters "0 dB" light up within −15.2 dBv ±0.5dB of the signal output level.	

7. IC INFORMATION (PD4228)

• Terminal Connecting Diagram

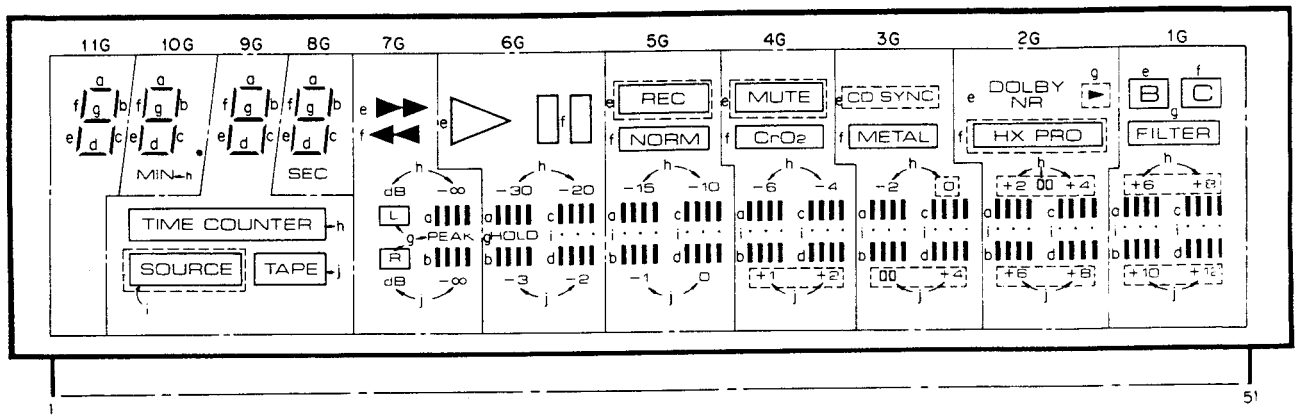


• Terminal Function

Terminal No.	Terminal Name	I/O	Function	ACTIVE
1	S3	O	High voltage output terminal for segment output.	-
2	S2			-
3	S1			-
4	S0			-
5	P00/INT4	I	High detection vector interrupt input terminal (Detected at either edge of start-up or start-down)	L
6	P01/$\overline{SCK}$	I	Input terminal of serial lock	L
7	P02/SO	I	Output of serial data, or input/output terminal of serial data terminal	L
8	P03/SI	I	Input terminal of serial data, or normal input terminal	L
9	P10/INT0	I	Edge detection vector interrupt input terminal with noise cleaner (detection edge select able)	H
10	P11/INT1	I		H
11	P12/INT2	I	Edge detection testable input terminal (Start-up edge detection)	-
12	P13/T10	I	External event pulse input terminal to timer/event counter	L
13	P20	I	4 bit I/O port (PORT 2)	L
14	P21	I		H
15	P22	I		L
16	P23/BUS	I		L
17	P30	I	Programmable 4 bit I/O port (PORT 3), with bit unit I/O setting	H
18	P31	I		H
19	P32	I		L
20	P33	I		L
21	P60	O	Programmable 4 bit I/O port (PORT 6), with bit unit input/output setting, pull-down resistor built-in (mask option)	H
22	P61	O		H
23	P62	O		H
24	P63	O		H
25	P40	O	4 bit input/output port	H
26	P41	O		H
27	P42	O		H
28	P43	O		L
29	PPO	O	Pulse output terminal of timer/pulse generator	L
30	X1	I	Crystal/ceramic connection terminal for main system lock oscillation	
31	X2			

Terminal No.	Terminal Name	I/O	Function	ACTIVE
32	Vss		GND	
33	XT1		GND	
34	NC		Unused	
35	P50	I	4 bit input/output port	-
36	P51	I		-
37	P52	I		-
38	P53	I		
39	$\overline{\text{RESET}}$	I	System reset Input terminal	L
40	T0	O	High voltage/large current output terminal for digit output able)	-
41	T1	O		-
42	T2	O		-
43	T3	O		-
44	T4	O		-
45	T5	O		-
46	T6	O		-
47	T7	O		-
48	T8	O		-
49	T9	O		-
50	T10/PH3	O	High voltage/large current output terminal for digit output (useable as PORT H)	-
51	T11/PH2	O		L
52	T12/PH1	O		L
53	T13/PH0	O		L
54	T14/S11	O	High voltage/large current terminal for digit/segment output (static output)	H
55	T15/S10	O		H
56	VLOAD	I	Pull-down resistor connecting terminal for FIP control/driver	
57	VPRE	I	Output buffer power supply terminal for FIP control/driver	
58	S9	O	High voltage output terminal for segment output (static output able)	-
59	S8	O	High voltage output terminal for segment output	-
60	S7	O		-
61	S6	O		-
62	S5	O		-
63	S4	O		-
64	VDD		Positive power supply terminal	

PIN FUNCTION AND SEGMENTS OF FL TUBE



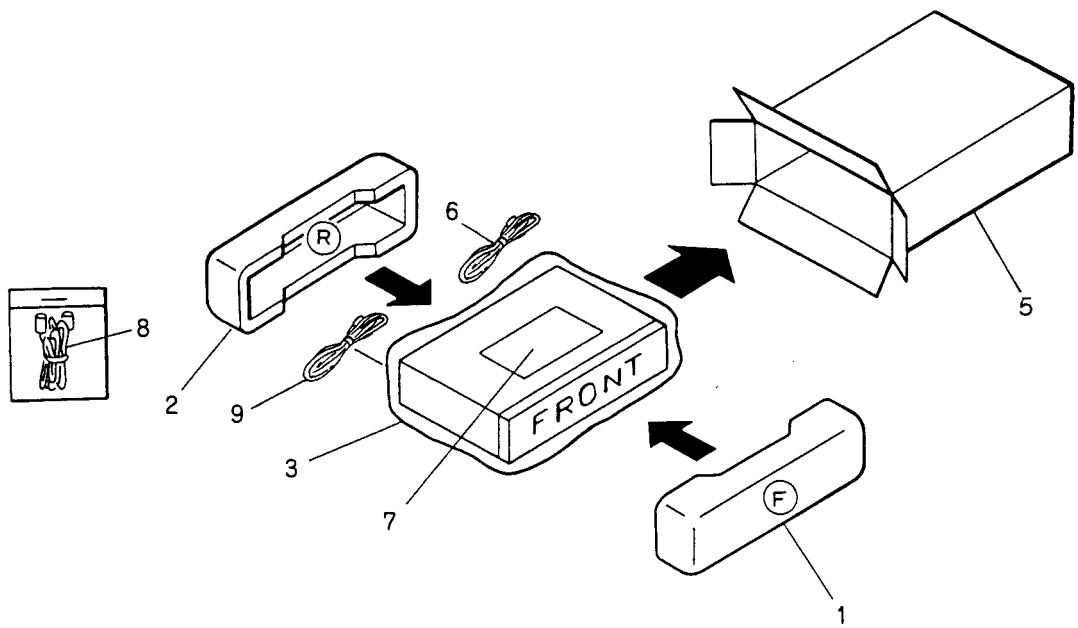
Terminal No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Electrode	F(L)	F(L)	NP	11G	10G	P(a)	9G	P(b)	P(c)	P(d)	P(e)	P(f)	9G	P(g)	8G
Terminal No.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Electrode	P(h)	P(i)	7G	P(j)	NP	NP	6G	NC	NC	NC	NC	5G	NP	NP	NP
Terminal No.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Electrode	NP	4G	NC	NC	NC	3G	NP	NP	NP	NP	2G	NC	NC	NC	NC
Terminal No.	46	47	48	49	50	51									
Electrode	1G	NP	NP	NP	F(R)	F(R)									

Notes) F: Filament NP: No Pin
G: Grid NC: No Connection
P: Anode

8. PACKING

Parts List of Packing

Mark	No.	Description	Parts No.
	1	Pad A	RHA1023
	2	Pad B	RHA1024
	3	Sheet	RHX-034
	4	- - - - - - - -	- - - - - - -
	5	Packing case	RHG1175
	6	Junction code with Mini-plug	RDE-319
	7	Operating instractions (English)	RRB1061
	8	Connection Code	RDE-010
	9	Control code	RED1018



9. FOR CT-656 MARK II/HEM, HB, SD AND CT-656 MARK II-S/HEWM TYPES

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.*

• Contrast of Miscellaneous Parts

The CT-656 MARK II/HEM, HB, SD and CT-656 MARK II-S/HEWM types are the same as the CT-S707/KU/CA type with the exception of the following sections.

Mark	Symbol & Description	Parts No.				
		CT-S707/ KU/CA	CT-656MARK II/ HEM	CT-656MARK II/ HB	CT-656MARK II/ SD	CT-656MARK II-S/ HEWM
	Main unit	Non supply	Non supply	Non supply	Non supply	Non supply
	SR Jack unit	Non supply	- - - - - - - -	- - - - - - - -	No supply	- - - - - - - -
	Mechanism unit	Non supply	Non supply	Non supply	Non supply	Non supply
⚠	Strain relief	CM-22C	CM-22B	CM-22B	CM-22B	CM-22B
	Connection cord with mini plug	PDE-319	- - - - - - - -	- - - - - - - -	PDE-319	- - - - - - - -
⚠	AC power cord	PDG1002	PDG1003	PDG1004	PDG1013	PDG1003
	Knob A (Slide switch)	RAC-668	RAC-668	RAC-668	RAC-668	RAC1219
	Knob (Tape select)	RAC1230	RAC1230	RAC1230	RAC1230	RAC1308
	Knob (Tact)	RAC1332	RAC1332	RAC1332	RAC1332	RAC1346
	Knob (Eject)	RAC1361	RAC1361	RAC1361	RAC1361	RAC1494
	Knob (Operation)	RAC1362	RAC1362	RAC1362	RAC1362	RAC1495
	Knob (VR)	RAC1363	RAC1363	RAC1363	RAC1363	RAC1496
	Button (AC power)	RAC1364	RAC1364	RAC1364	RAC1364	RAC1497
	Knob (Headphone)	RAC1366	RAC1366	RAC1366	RAC1366	RAC1498
	Knob (Phone jack)	RAC1416	RAC1416	RAC1416	RAC1416	RAC1499
	FL Filter	RAH1285	RAH1245	RAH1245	RAH1285	RAH1245
	Pannel botton	RAH1377	RAH1377	RAH1377	RAH1377	RAH1462
	Front panel	RAH1634	RAH1633	RAH1633	RAH1644	RAH1641
	Door panel	RAH1642	RAH1642	RAH1642	RAH1642	RAH1643
⚠	Fuse (1.25A)	REK-073	REK-101	REK-101	REK-101	REK-101
⚠	Fuse (800 MA)	REK-079	REK-099	REK-099	REK-099	REK-099
	Packing case	RHG1175	RHG1176	RHG1176	RHG1176	RHG1183
	Mold (Eject)	RNK1313	RNK1313	RNK1313	RNK1313	RNK1314
	VR Escutcheon	RNK1444	RNK1444	RNK1444	RNK1444	RNK1445
	Operating instructions (French/German/Italian/ Dutch/Swedish/Spanish/ Portuguese)	- - - - - - - -	RRD1072	- - - - - - - -	- - - - - - - -	RRD1072
	Power transformer	RTT1090	RTT1070	RTT1070	RTT1089	RTT1070
	Bonnet	RXX1172	RXX1172	RXX1172	RXX1172	RXX1179
	Front panel ass'y	RXX1265	RXX1289	RXX1289	RXX1291	RXX1290
⚠	Line voltage selector	- - - - - - - -	- - - - - - - -	- - - - - - - -	PSB1002	- - - - - - - -

• MECHANISM UNIT

The MECHANISM UNIT (For CT-656 MARK II/HEM, HB, SD and CT-656 MARK II-S/HEWM types) is the same as the MECHANISM UNIT (For CT-S707/KU/CA type) with the exception of the following sections:

Mark	Symbol & Description	Parts No.				
		CT-S707/ KU/CA	CT-656 MARK II/ HEM	CT-656 MARK II/ HB	CT-656 MARK II/ SD	CT-656 MARK II-S/ HEWM
	FLYWHEEL ASS'Y	RXA1250	RXA1260	RXA1260	RXA1250	RXA1260

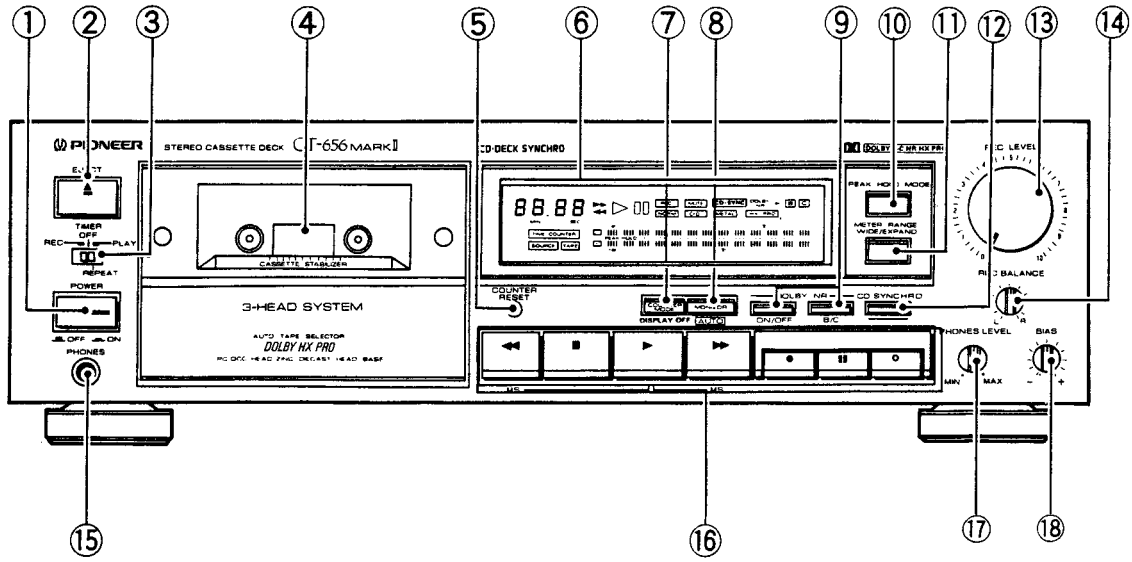
• MAIN UNIT

The MAIN units (for CT-656 MARK II/HEM, HB and CT-656 MARK II-S/HEWM types) are the same as the main unit (for CT-S707/KU/CA type) for the service supply parts.

• SR JACK UNIT

The parts of the SR JACK unit (for CT-656 MARK II/SD type) and the SR JACK unit (for CT-S707/KU/CA) are the same.

10. PANEL FACILITIES



The illustration shows model CT-656 MARK II

① POWER switch

Turns the power on and off.
After the power is turned on, the dotted lines in the level meters flash for approximately 4 seconds until the circuits of the unit have stabilized. The unit will not operate during this time.

② EJECT (⏏) button

Used to open the cassette holder.
To close the cassette holder, press the cassette holder with your finger.

③ TIMER mode selector

REC:
Set to this position for timer recording.
OFF:
When the timer is not be used or the repeat playback is not carried out, set the selector to this position.
PLAY/REPEAT:
Set to this position for timer playback or for repeat playback.

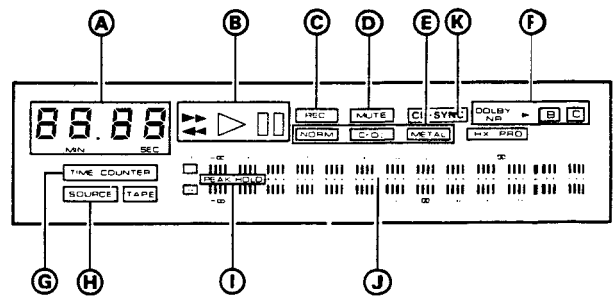
④ Cassette holder

Insert a cassette to be played back or recorded with the exposed tape downwards and the side to be played facing the front.

⑤ Tape/time COUNTER RESET button

Press this button to zero the tape/time counter.
Resets the tape/time counter reading "0000"

⑥ Display window



Ⓐ Tape/time counter
Ⓑ Tape transport indicators
Ⓒ REC (recording) indicator
Ⓓ MUTE indicator
Ⓔ Tape type indicators
Ⓕ DOLBY NR indicators
Ⓖ TIME COUNTER indicator
Ⓗ SOURCE/TAPE indicators
Ⓘ PEAK HOLD indicator
Ⓙ Level meters
Ⓚ CD SYNCHRO indicator
Lights when synchro recording from a CD player is being carried out.

⑦ COUNTER MODE button

When pressed, the following three modes are displayed in sequence.

- Normal tape counter.
- Time counter (displays elapsed time of recording/ playback).
- Display OFF (turns off the indicator).

⑧ MONITOR [AUTO] selector

Used to moniter the source sound or just recorded sound during recording.

- When the unit is set to record or playback mode, [TAPE] indicator lights up and the monitor mode is automatically selected.

⑨ DOLBY* NR selectors

Use the right button to select the Dolby B-type or C type NR system.
Use the left button to use the Dolby NR selected with the right button.

*

- *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.*

⑩ PEAK HOLD MODE button

Used to select the display mode of the peak, level meters.

⑪ METER RANGE WIDE/EXPAND button

Used to change the display range of the peak level meters.

⑫ CD SYNCHRO button

This button is used to carry out CD·Deck synchro recording from a CD player.

⑬ REC LEVEL control

Used to adjust the right and left recording levels.

⑭ REC BALANCE control

Used to adjust the right and left recording level balance.

⑮ PHONES jack

Connect the plug of the stereo headphones.

⑯ Tape transport mode buttons

Rewind(◄◄):
Press this button to fast rewind the tape. Also, use this button during playback for music search operation.

Stop(■):
Press this button to stop tape transport.
Play(►):
Press this button to start playback.
Fast forward(►►):
Press this button to fast forward the tape. Also, use this button during playback for music search operation.

Recording(●):
When this button is pressed, the unit is set to one-touch recording pause (recording standby mode).
Pause(❚❚):
Press this button to temporarily stop tape transport during recording and playback. Press this button again to resume tape transport.
Recording mute(O):
Press this button to provide 4-second blank during recording.

⑰ PHONES LEVEL control

Use this control to adjust the headphones level.

⑱ Rec BIAS control

Use this control to adjust the bias according to the tape used and the source to be recorded.

11. SPECIFICATIONS

System ..... 4 track, 2-channel stereo
Heads ... "Hard Permalloy" PC-OCC recording/playback head × 1
"Ferrite" erasing head × 1
Motor ..... DC servo capstan motor × 1
DC reel motor × 1
Wow and Flutter ..... No more than 0.05% (WRMS)
No more than ±0.14% (DIN)
Fast winding Time ..... Approximately 90 seconds
(C-60 tape)
Frequency Response (±6 dB)
−20 dB recording:
Normal tape ..... 15 to 20,000 Hz
Chrome tape ..... 15 to 20,000 Hz
Metal tape ..... 15 to 21,000 Hz
Signal-to-Noise Ratio
Dolby NR OFF ..... More than 58 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 0.7% (0 dB)
Input (Sensitivity)
LINE (INPUT) ..... 56 mV (Input impedance 56 kΩ)
Output (Reference level)
LINE (OUTPUT) ..... 316 mV (Output impedance 5 kΩ)
PHONES ..... 0.8 mW
(load impedance 8Ω, Headphone level control max.)

Subfunctions

- Dolby B-type and C-type NR Systems
- DOLBY HX PRO system
- MPX FILTER switch
- Auto tape selector (NORM/CrO_2/METAL)
- CD·DECK Synchro recording capability
- Auto monitor function
- 3-mode counter
- Meter range selection
- Display off
- Headphones jack with level control
- 4-digit electronic tape counter
(Time counter)
- Music search up to ± 15 selections
- Automatic space recording mute
- REC BIAS control
- 12 segments/channel Peak level meter with Peak-hold function
- Timer Recording/Playback
- System remote control available.
(For CT-S707 and CT-656 MARK II Multi-voltage models only)
- REC BALANCE control
- REPEAT playback

Miscellaneous

Power Requirements
U.S. Canadian models ..... AC 120 V, 60 Hz
European model ..... a.c. 220 Volts~, 50/60 Hz
U.K. model ..... a.c. 240 Volts~, 50/60 Hz
Other destination models (Multi-voltage models)
..... AC 110 V/120 V-127 V/220 V/240 V
(switchable), 50/60 Hz
Power Consumption ..... 18 W
Dimensions ..... 420 (W) × 130 (H) × 323 (D)mm
16-9/16 (W) × 5-1/8 (H) × 12-11/16 (D) in
Weight (without package) ..... 5.7 kg (12 lb 9 oz)

Accessories

Operating instructions 1
Connection cord with pin plugs 2
CD·Deck synchro control cord 1
SR System remote control cord 1
(For CT-S707 and CT-656 MARK II Multi-voltage model only)

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