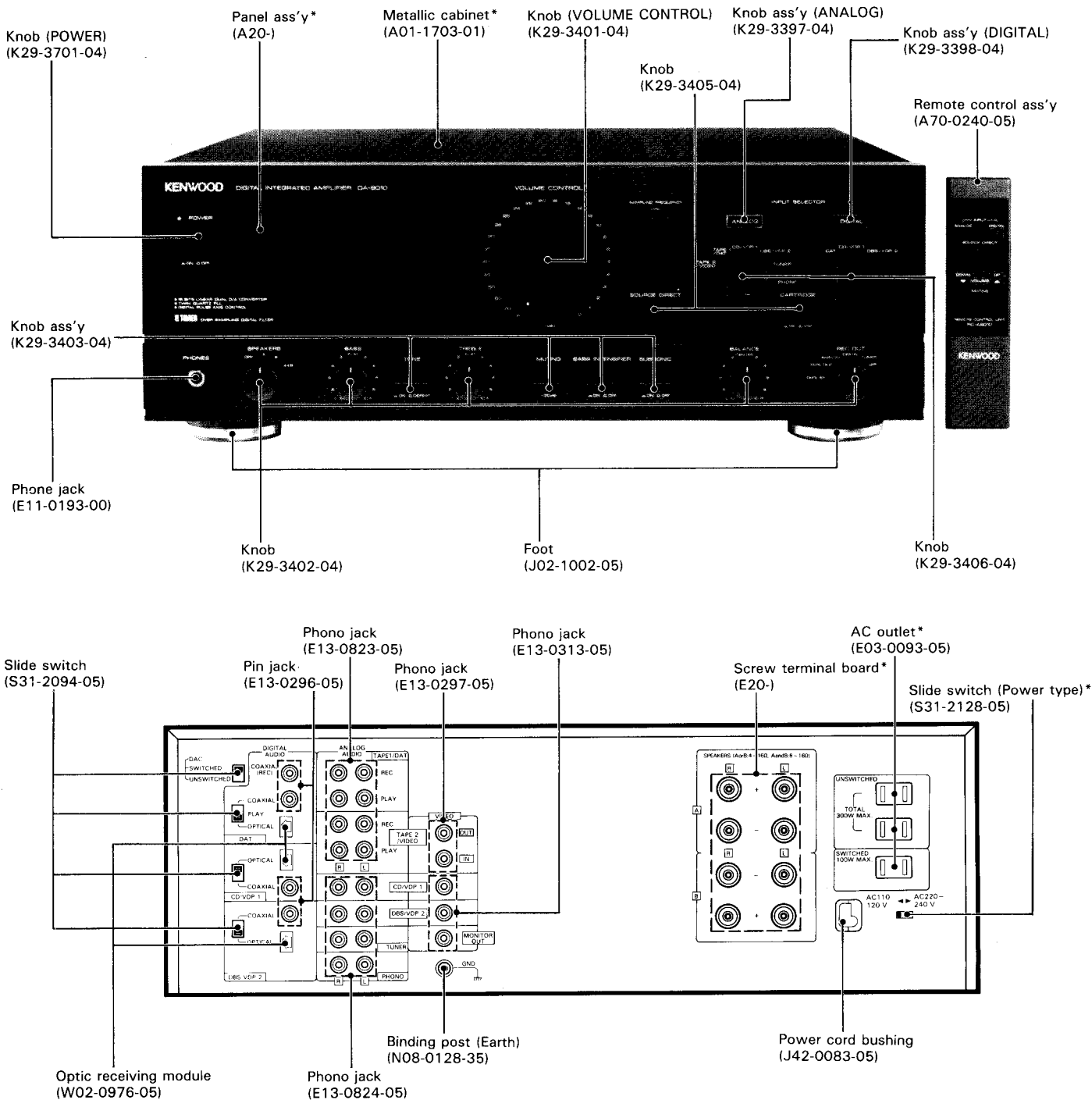


# DA-9010

## SERVICE MANUAL

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B51-3686-00(T)1842

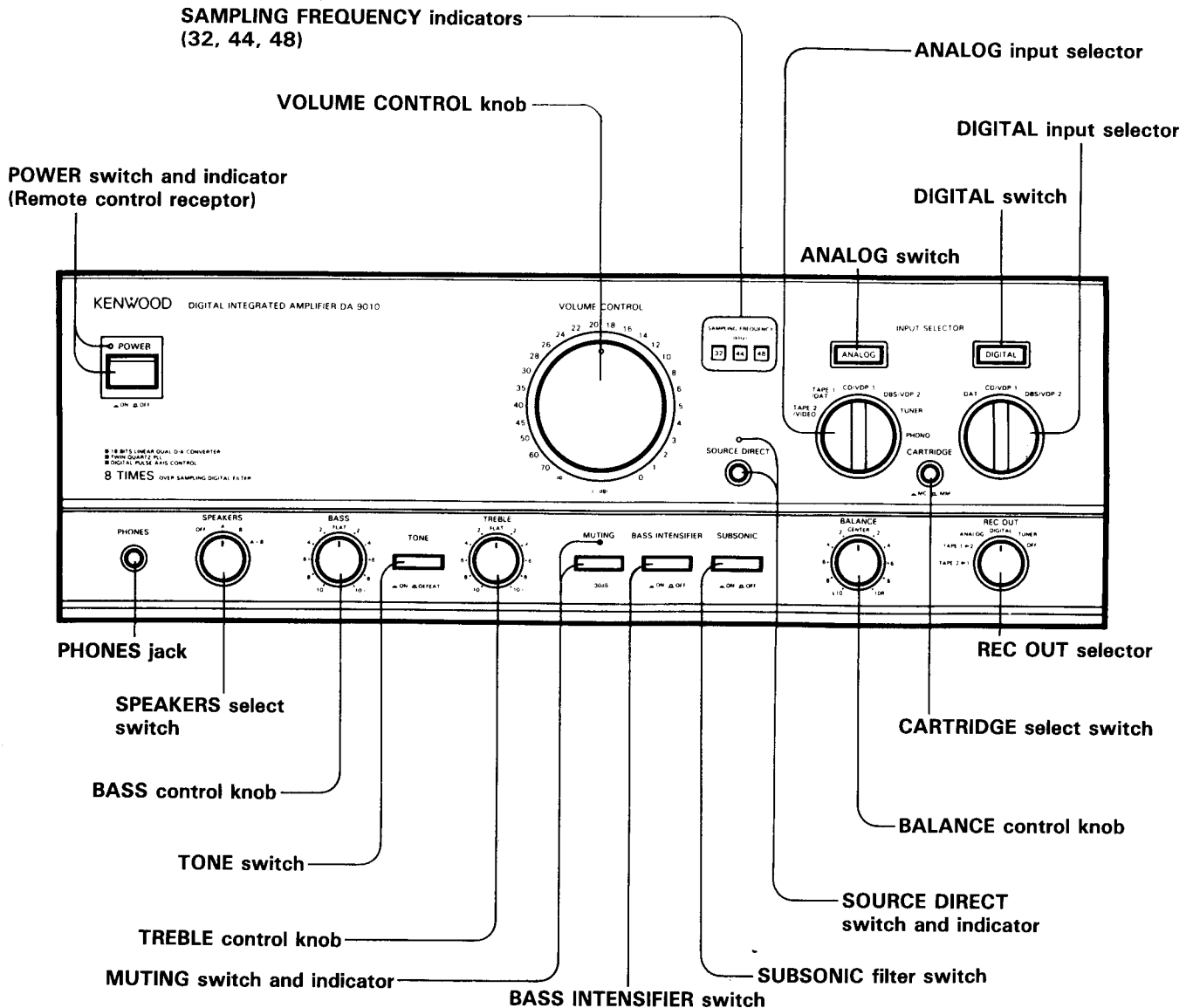


# DA-9010

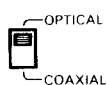
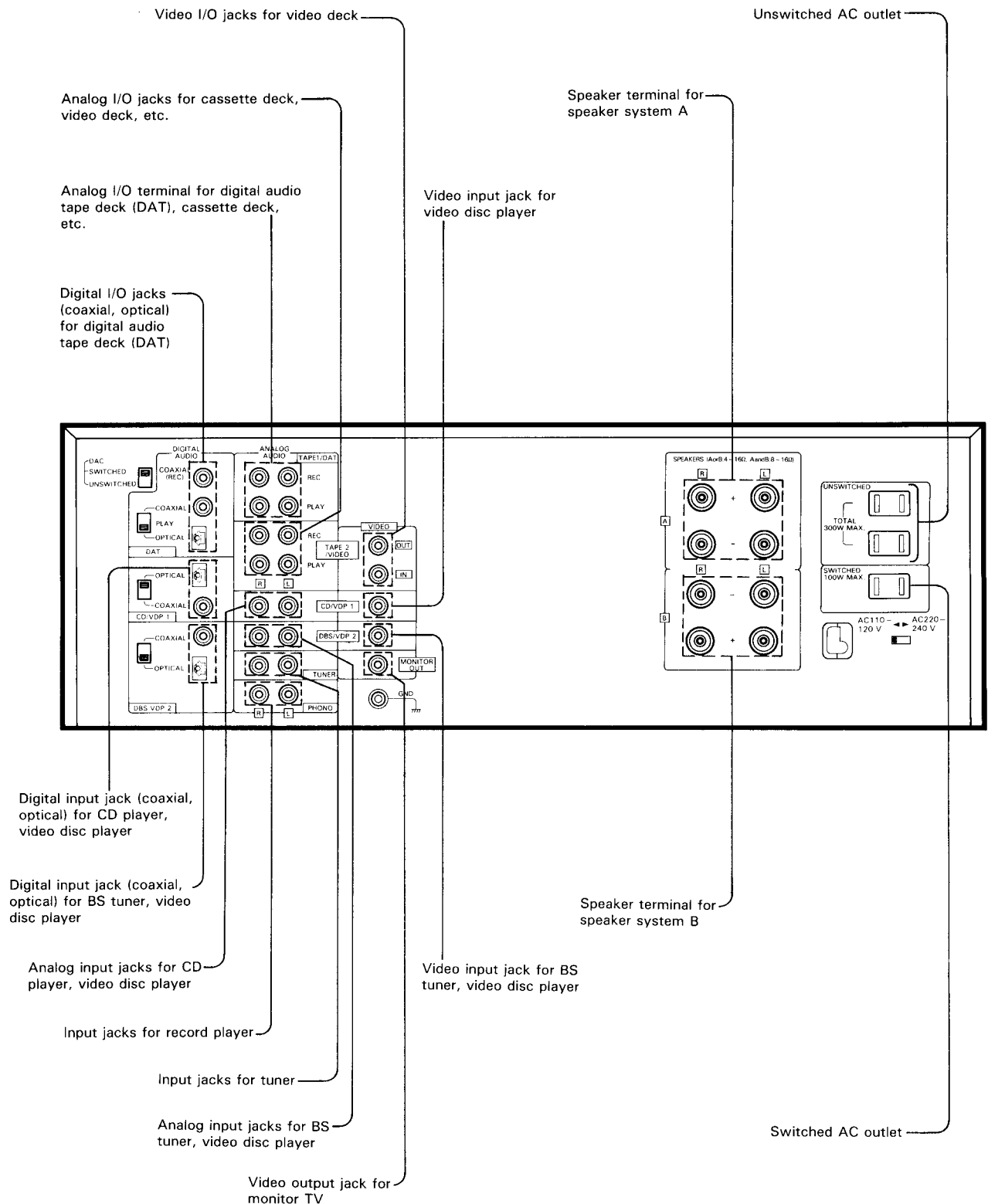
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## CONTROLS AND INDICATORS



## CONTROLS AND INDICATORS



COAXIAL/OPTICAL switch

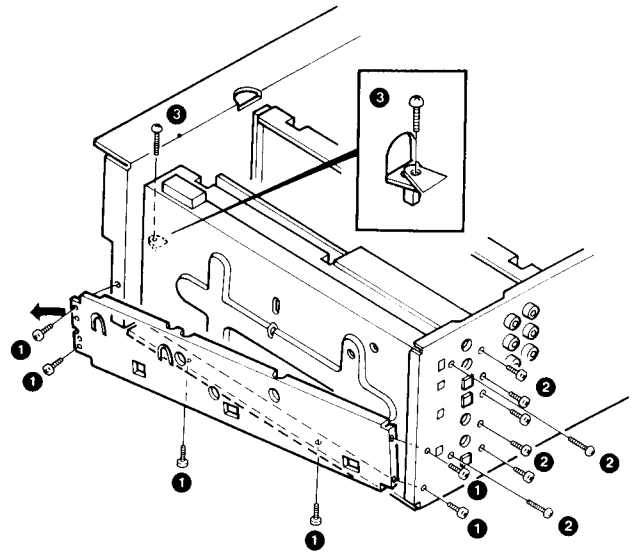
- \* Set the COAXIAL/OPTICAL switch according to the connection.
- \* Other than components shown in the above diagram, any digital components having digital audio output (coaxial or optical) can be connected to the DA-9010. For details, refer to the Instruction Manual of the components used.

# DA-9010

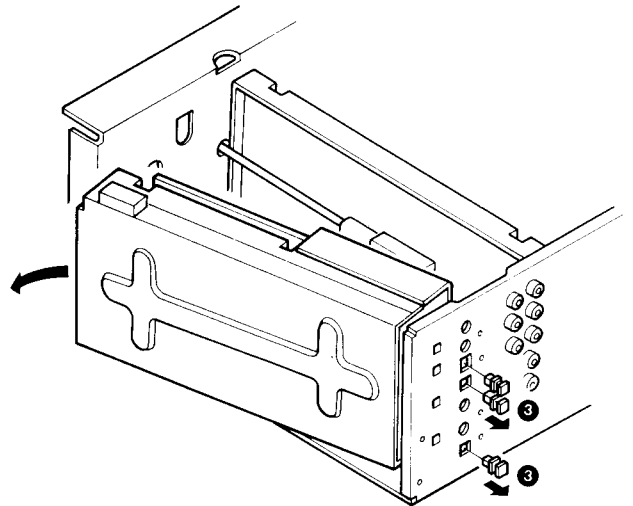
## DISASSEMBLY FOR REPAIR

Detach the top cover and the front panel beforehand.

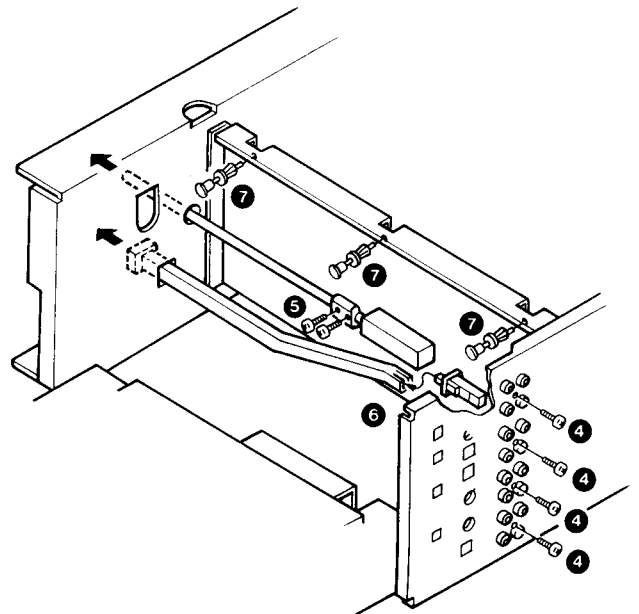
1. Remove the six screws (1).
2. Remove the seven screws (2), and detach the right side panel in the direction of an arrow.



3. Remove the three optical caps (3) in the direction of arrows.



4. Remove the four screws (4).
5. Remove the two screws (5) and take out the input selector's shaft.
6. Take out the carriage's shaft (6).
7. Remove the three push rivets (7).



## DISASSEMBLY FOR REPAIR

8. Take out the printed board in the direction of an arrow.

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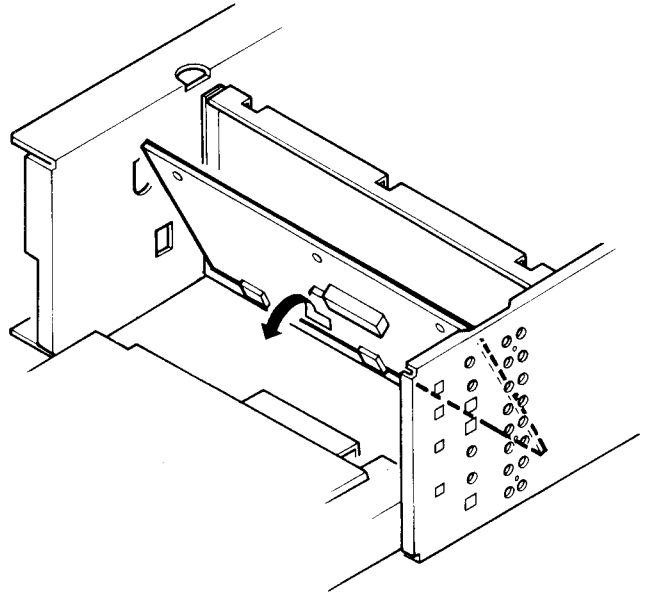
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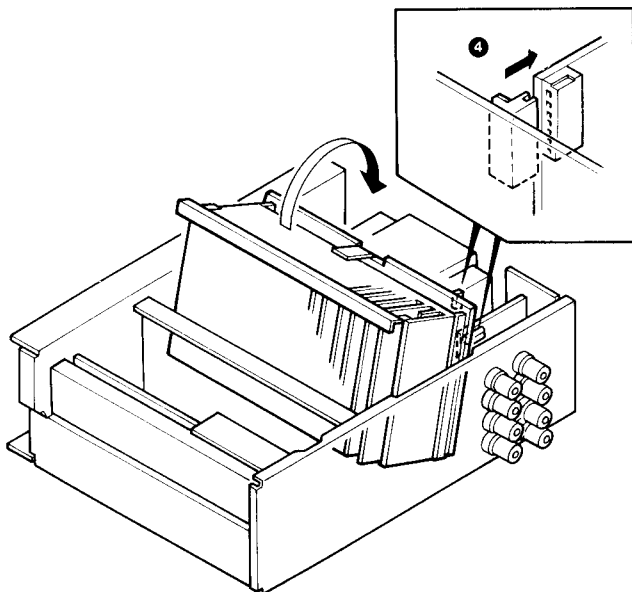
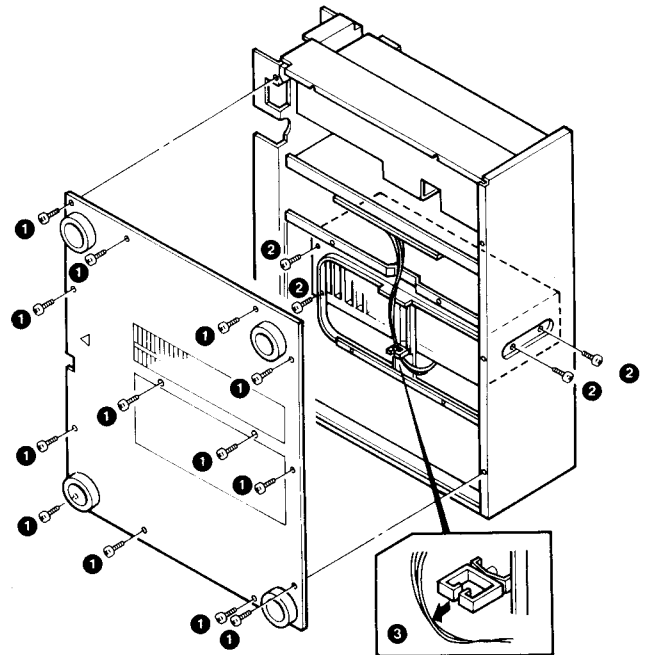
Mob : 098-788-319

[rtv-servis-horvat@os.tel.hr](mailto:rtv-servis-horvat@os.tel.hr)



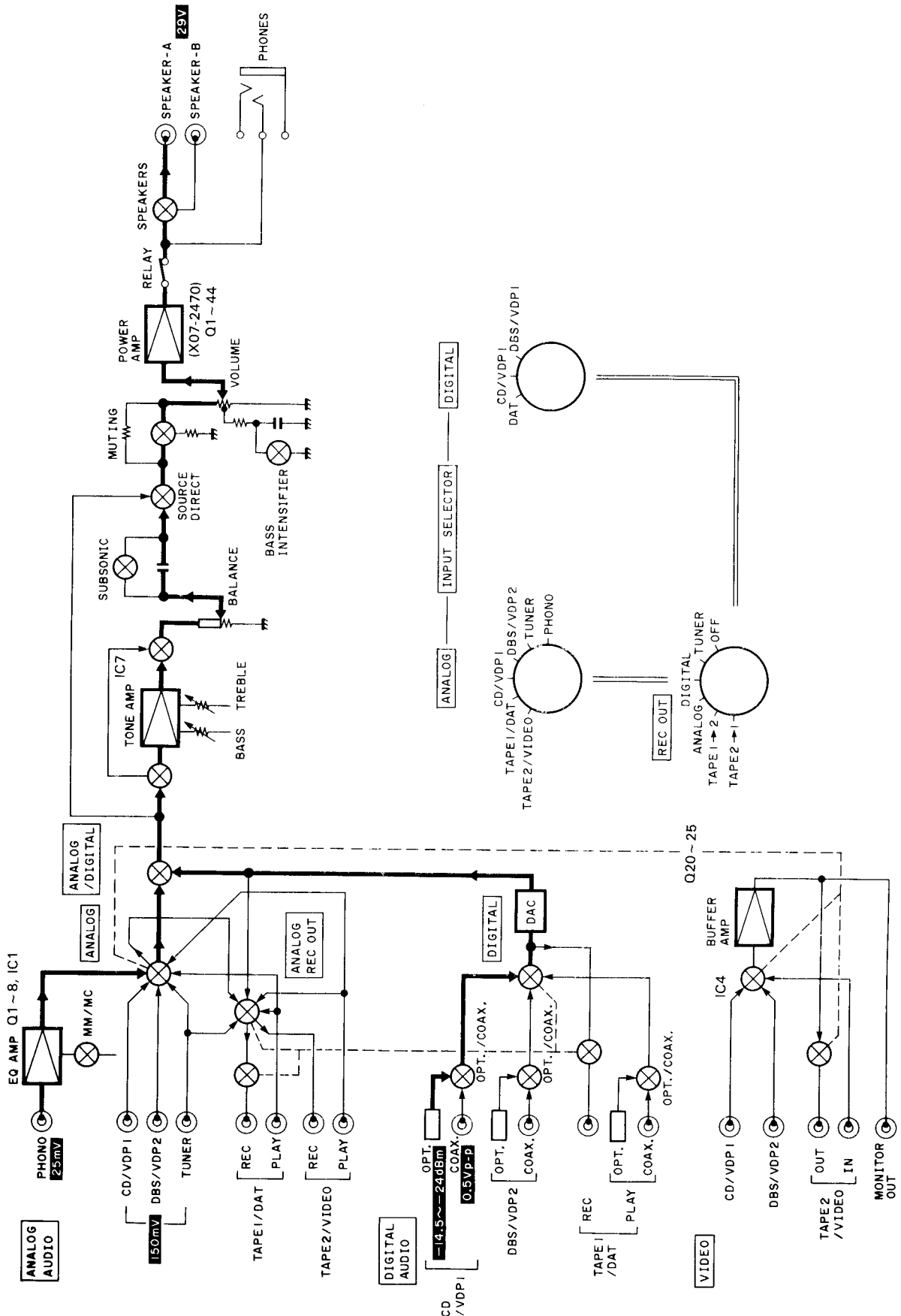
#### Removing the heat sink:

1. Remove the thirteen screws (1).
2. Remove the four screws (2).
3. Disconnect the cord (3).



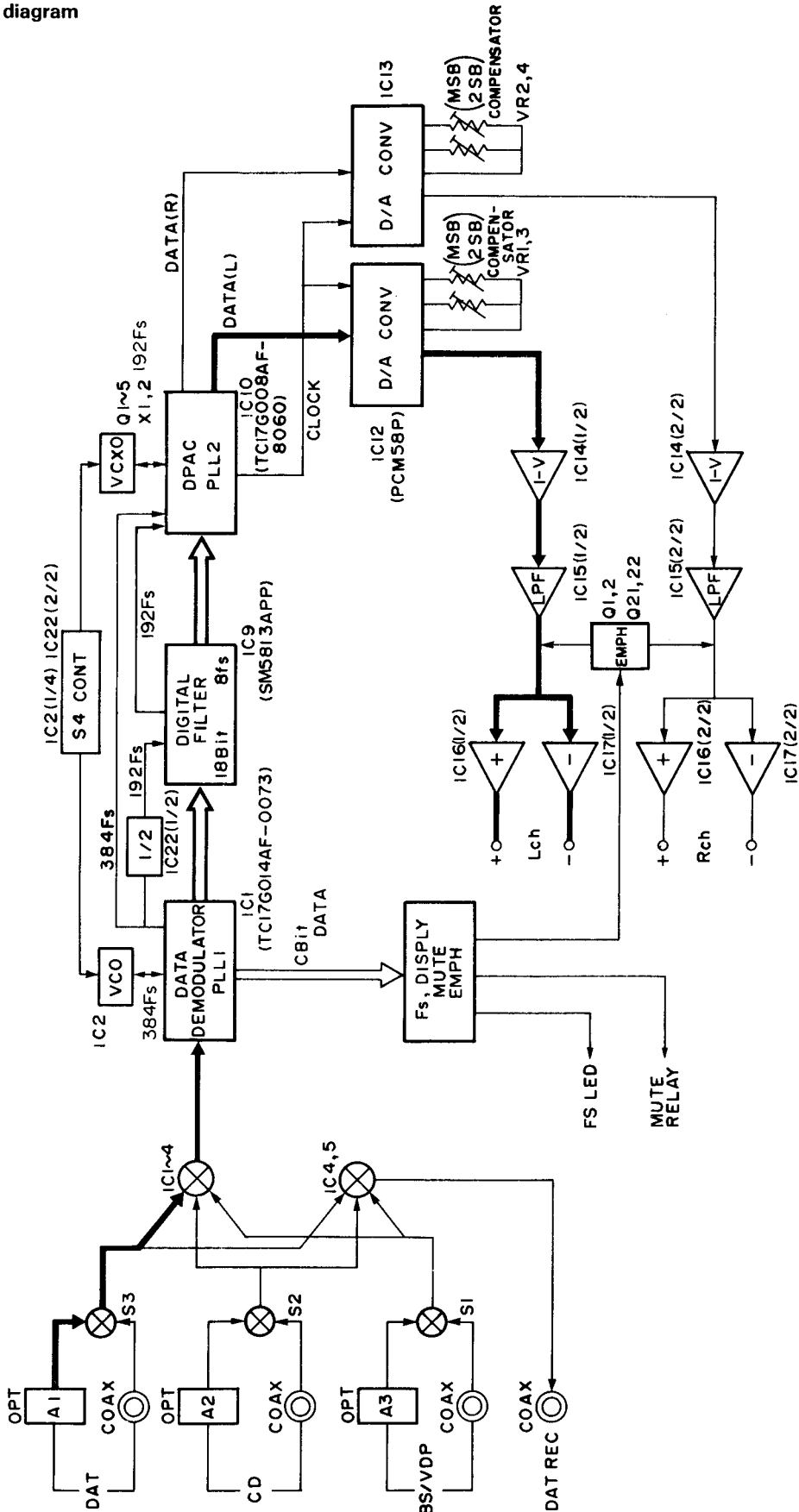
4. Disconnect the connector (4).
5. Detach the heat sink in the direction of an arrow.

## BLOCK & LEVEL DIAGRAM



## BLOCK DIAGRAM

D/A converter block diagram



X32-1290-00

## CIRCUIT DESCRIPTION

## Main amplifier unit (X07-247X-XX)

Ref. No.	Components	Use/Function	Operation/Condition/Compatibility
IC1	μPC1237HA	Protection IC	
Q1~4	2SC1845	Class A first-stage differential amplifier circuit	
Q5~8	2SC1845	Class A first-stage cascode circuit	
Q9,10	2SC1740S	Constant current circuit	Constant current circuit for class A first-stage differential circuit, 2SC945(A)
Q11~14	2SA733(A)	Class A second-stage differential amplifier circuit	2SA933S
Q15~18	2SA1123	Class A second-stage cascode circuit	
Q19,20	2SC1740S	Class A second-stage current mirror circuit	2SC945(A)
Q21,22	2SC2631	Class A second-stage cascode circuit	
Q23,24	2SC2631	Predriver transistors	
Q25,26	2SA1123		
Q27,28	2SC3944	Driver transistors	
Q29,30	2SA1535		
Q31,32	2SD1717	Final transistors	
Q33,34	2SB1162		
Q35,36	2SD1717		
Q37,38	2SB1162		
Q39,40	2SC2631	Current limiter	With an overload current, current limitation is applied to the final transistors.
Q41,42	2SA1123		
Q43,44	2SC4137	Idling adjustment transistors	For temperature compensation
Q51	2SA992	Constant-voltage circuit	The ON signal of the current limiter consisting of Q39 and Q40 is transmitted to the protection IC (IC1).
Q53,54	2SC2003		Constant-voltage regulated power supply circuit for class A stages
Q55,56	2SA954		

## Tone unit (X11-258X-XX)

Ref. No.	Components	Use/Function	Operation/Condition/Compatibility
IC1	NJM5532D-D	EQ amplifier	
IC2	NJM4560D-N	Constant-voltage regulated power supply error amplifier	
IC3	NJM4565D-D	Balanced-unbalanced conversion	The output of the DAC signal which is input balanced is converted into an unbalanced signal.
IC4	NJM2245D	3-input video amplifier	From three video signal inputs (pins ①, ③ and ⑤), one is selected by control pins ② and ④, then amplified 6 dB and output from pin ⑦.
IC5	μPC7812HF	Constant-voltage regulated power supply	
IC6	BX-1408	Infrared light receiver	
IC7	NJM2041D-D	Tone amplifier	
IC8	LB1641	Motor drive	
IC9	μPD7564CS-099	Microprocessor	
IC10	M51951ASL	Microprocessor reset pulse generation	
Q1~4	2SK369	EQ amplifier first-stage differential amplification	2SK371
Q5~8	2SC1845	EQ amplifier first-stage cascode circuit	
Q9,10		EQ amplifier first-stage constant current circuit	
Q11	2SD882	Constant-voltage regulated power supply control transistors	
Q12	2SB772		



## CIRCUIT DESCRIPTION

## Tone unit (X11-258X-XX)

Ref. No.	Components	Use/Function	Operation/Condition/Compatibility
Q13	2SA733(A)	Negative power supply first OFF circuit	
Q14	2SC2003		
Q15,16	2SC2878(B)	Muting transistors	
Q17	DTA124EN	Muting drive	
Q18	DTC124EN		
Q19	DTC124EN	Relay drive	
Q20,21	DTC124EN	Muting drive	At ON, muting is canceled.
Q22,23	2SC2878(B)	Muting transistors	
Q24,25	2SC945(A)	Video signal buffer	
Q28 ~ 30	DTC124EN	LED driver	
Q31 ~ 36	DTA143EFF	Microprocessor output interface	

## Processing unit (X32-1290-00)

Ref. No.	Components	Use/Function	Operation/Condition/Compatibility
IC1,2	TC74HC00P	2-input NAND circuit	Digital input, OPTICAL/COAXIAL selection circuit IC2 3/4, 4/4: Used as inverter circuit
IC3	TC74HC10P	3-input NAND circuit	DAT, CD/VDP1, DBS/VDP2 selection circuit
IC4	TC74HC20P	4-input NAND circuit	IC4 1/2: For digital output recording IC4 2/2: Output for digital output DAT recording
IC5	TC74HCU04P	Inverter circuit	Digital input 0.5 Vp-p is changed to 5 Vp-p.
IC6	AN7805F	3-terminal regulator	Power supply for microprocessor in memory unit and for FS display. $\mu$ PC7805HF
IC7	TC74HC08P	2-input NAND circuit	FS display LED lighting control circuit
IC8	M5218P	Constant-voltage regulated power supply	
IC9	SM5813APT	Digital filter	
IC10	TC17G008AF-8060	Gate array	Phase comparator for TBC (DPAC) circuit, twin quartz PLL circuit and VCXO
IC11	M51951ASL	Reset IC	
IC12,13	PCM58P	DAC IC	For D/A conversion
IC14	NJM4565-D-D	I/V conversion	
IC15	NJM4565-D-D	L.P.F.	
IC16,17	NJM4565D-D	Unbalanced input-balanced output conversion	
IC18	M5223P	VCXO loop filter	
IC19 ~ 21	M5218P	Regulated power supply	
IC22	TC74HC74F	D flip-flop IC	1/2 division circuit, inverter
IC23	TC74HCU04P	Inverter	
IC24	TC74HC157P	Clock pulse phase selector	Clock pulse delay for FS32
Q1,2	2SC2878(B)	Deemphasis control transistors	
Q11	2SK105	Constant current circuit	Constant current circuit to provide a stable bias to the VCXO oscillation circuit
Q12	2SK161	VCXO oscillation circuit	18.4396 MHz

## CIRCUIT DESCRIPTION

## Processing unit (X32-1290-00)

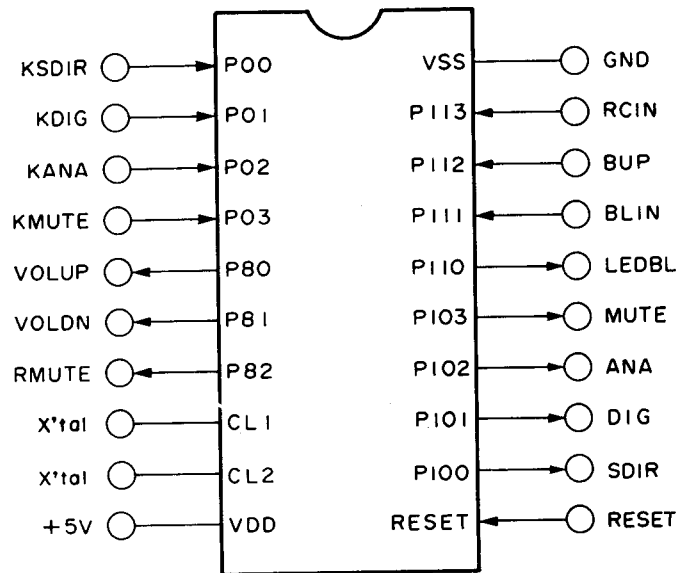
Ref. No.	Components	Use/Function	Operation/Condition/Compatibility
Q13	2SC1740S	Constant current circuit	Constant current circuit to provide a bias to Q12. 2SC945(A)
Q14	2SK161	VCXO oscillation circuit	16.9409 MHz
Q15	2SC1740S	Constant current circuit	Constant current circuit to provide a bias to Q14. 2SC945(A)
Q16	2SC3666	AVR control transistors	
Q17	2SA1426		
Q18	2SC3666		
Q19	2SD1266		
Q21	2SA733(A)	Deemphasis control transistors	2SA933S
Q22	2SC1740S		2SC945(A)
Q23	2SD1266	AVR control transistors	
Q24	2SB941		
Q25	2SA933S		D/A converter initial setting

## Digital I/O unit (X88-1010-00)

Ref. No.	Components	Use/Function	Operation/Condition/Compatibility
IC1	TC17G014AF-0073	Digital audio data demodulation	
IC2	SN74LS624N	V . C . O .	
IC3	M5223P	PLL loop filter	
IC4	TC74HCU04F	Inverter	
IC5	TC74HC123F	Monostable multivibrator	

## CIRCUIT DESCRIPTION

IC9 (X11-2580-00):  $\mu$ PD7564 CONTROL IC



Terminal No.	Terminal name	I/O	Name	Function
1	P00	I	KSDIR	SOURCE DIRECT ON/OFF SW
2	P01	I	KDIG	DIGITAL ON SW
3	P02	I	KANA	ANALOG ON SW
4	P03	I	KMUTE	MUTE ON/OFF SW
5	P80	O	VOLUP	Volume up output port
6	P81	O	VOLDN	Volume down output port
7	P82	O	RMUTE	Relay mute output port
8	CL1			Clock pulse pins
9	CL2			
10	VDD			+5 V
11	RESET		RESET	Reset pin
12	P100	O	SDIR	SOURCE DIRECT LED
13	P101	O	DIG	DIGITAL LED
14	P102	O	ANA	ANALOG LED
15	P103	O	MUTE	MUTE LED
16	P110	O	LEDBL	Pilot LED
17	P111	I	BLIN	Pilot LED flicker detection pin
18	P112	I	BUP	Backup detection pin
19	P113	I	RCIN	Remote control input pin
20	VSS			GND

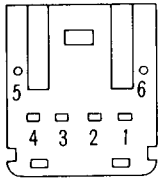
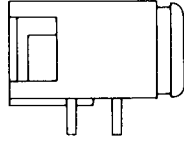
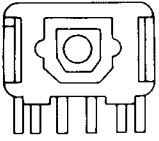
## CIRCUIT DESCRIPTION

### DIGITAL I/O UNIT (X88-1010-00)

### A2/3 (X32-1200-00): W02-0774-05

Light receiving module:

Contour diagram



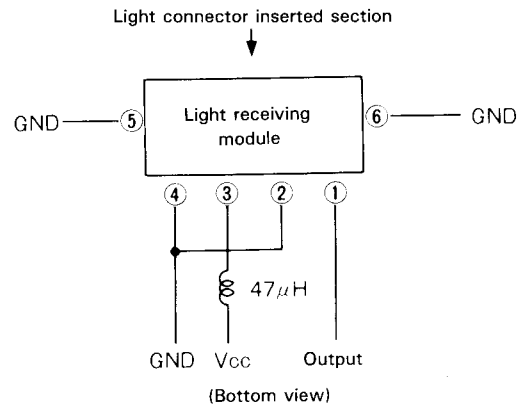
### Pin connections

Pin No.	Connection
1	Output
2	GND
3	Vcc
4	GND
5	Case
6	Case

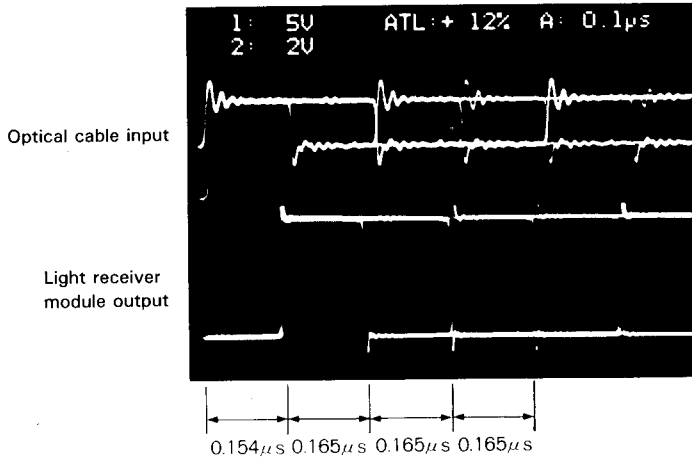
### Input sensitivity

Light input level		
MIN	MAX	Unit
-24	-14.5	dBm
3.9	35	$\mu$ W
(0 dBm = 1 mW)		

### Connection method



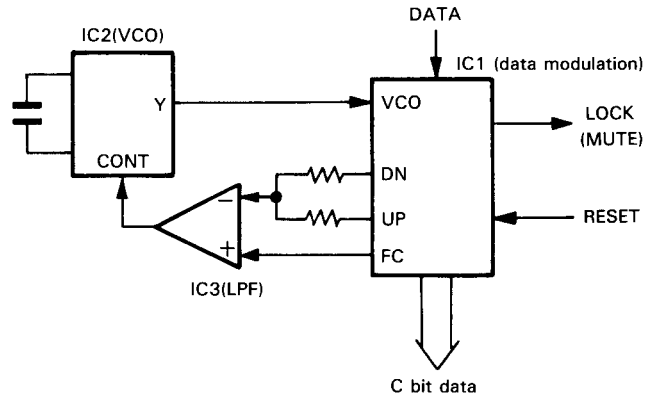
### Output waveform of light receiving module



## CIRCUIT DESCRIPTION

### X88-1010-00 Operation

In order to extract the bit sync signal from the data signal entered to the pin 43 of IC1, a phase locked loop is formed of IC1→IC3→IC2. More, the information demodulated in IC1 is output as a fla. Refer to the following table.



CN1	Function	CN2	Function
1	GND	1	MUTE/LOCK indicator OFF at "L"
2	DATA IN	2	WCK
3	FS32	3	DATA OUT
4	FS44	4	Emphasis
5	FS48	5	LRCK
6	CT0: GENRAL	6	BCK
7	CT1: CD	7	384 × FS: To clock for digital filter
8	CT2: PCM	8	Reset at "L"
9	CT3: DAT	9	V <sub>DD</sub>
10	CT4: BS	10	GND
11	PLL ON/OFF specification. ON at "L"	11	

Display selection between sampling frequencies according to the mode of C bit. (Active "H")

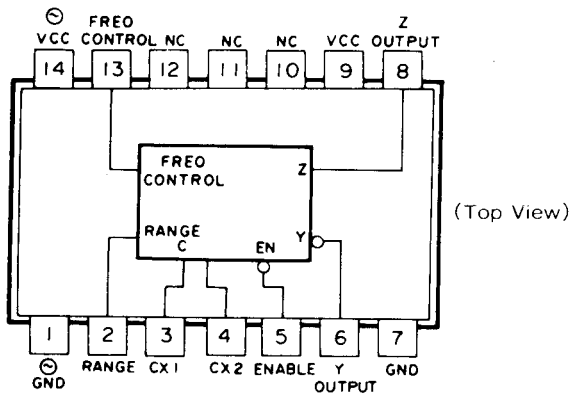
Selected according to the mode of C bit. One of CT0~CT4 becomes "H" correspondingly.

# DA-9010

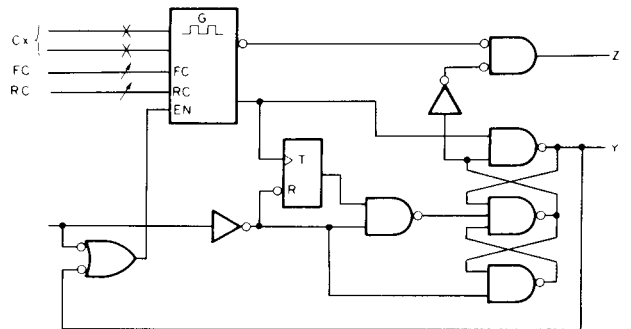
## CIRCUIT DESCRIPTION

VCO SN74LS624N (X88-1010-00: IC2):

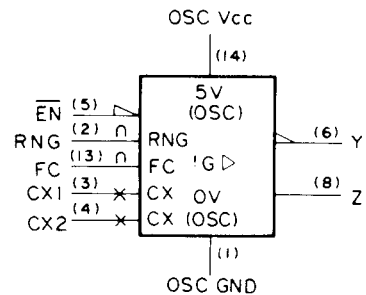
Pin connection diagram



Logic circuit diagram

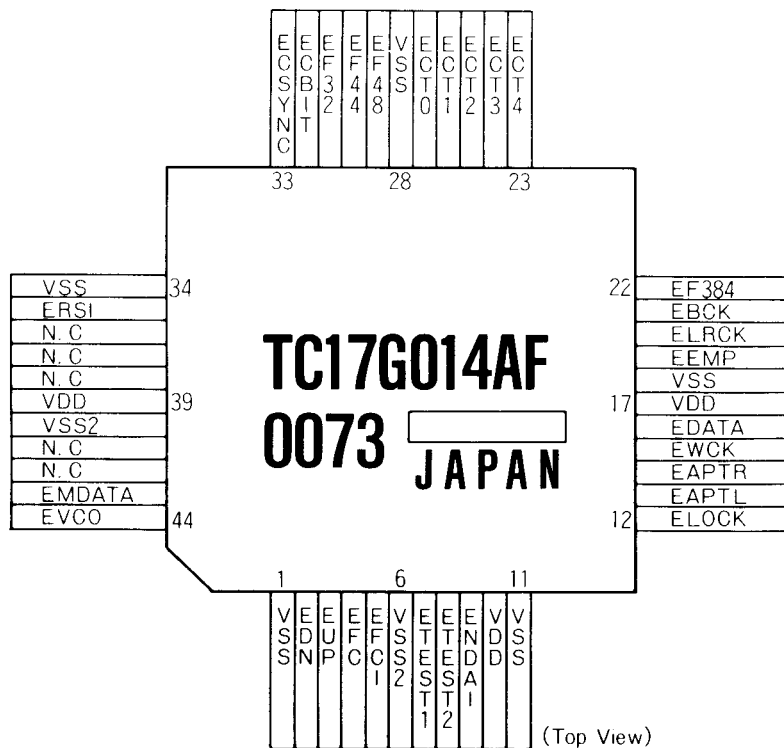


Logic symbol diagram



DIGITAL AUDIO DATA DEMODULATION TC17G014AF-0073 (X88-1010-00: IC1):

Pin connection diagram



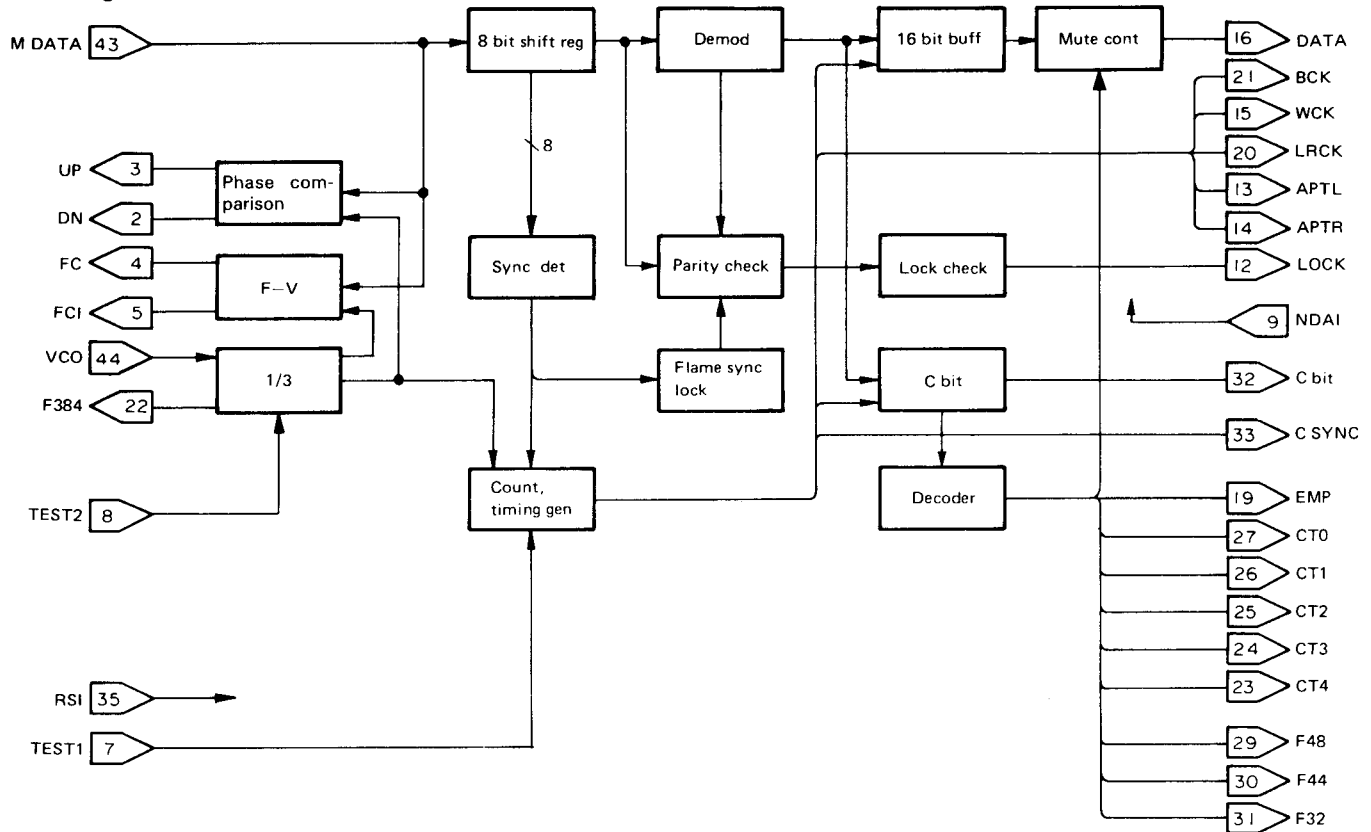
## CIRCUIT DESCRIPTION

## Pin functions

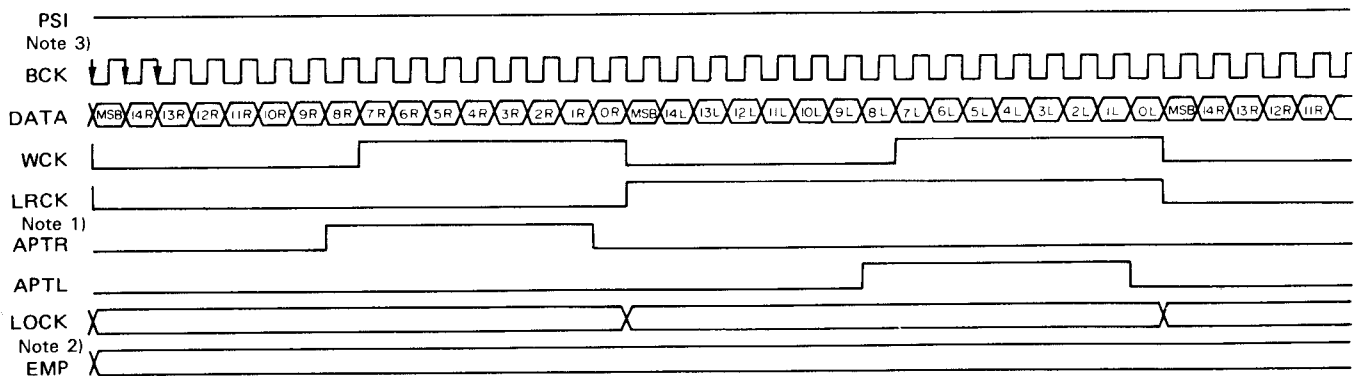
Terminal No.	Symbol	I/O	Terminal name	Function
1	V <sub>SS</sub>		V <sub>SS</sub>	GND
2	EDN	O	DN	Phase comparison output
3	EUP	O	UP	Phase comparison output
4	EFC	O	FC	Frequency comparison output. "0" output when resetting.
5	EFCI	O	FC1	Inversion output of FC
6	V <sub>SS2</sub>		V <sub>SS2</sub>	GND
7	ETEST1	I	TEST1	Test pin 1. "0" input in normal operation
8	ETEST2	I	TEST2	Test pin 2. "0" input in normal operation
9	ENDAI	I	NDAI	D/A data clock pulse line control pin. Normal output at NDAI = "0". High-impedance at NDAI = "1".
10	V <sub>DD</sub>		V <sub>DD</sub>	+5 V
11	V <sub>SS</sub>		V <sub>SS</sub>	GND
12	ELOCK	O	ELOCK	PLL lock output. Mute control. "0" output when resetting. LOCK = "1" output when preamble is detected.
13	EAPTL	O	APTL	D/A converter Lch deglitcher output. High-impedance at NDAI = "1".
14	EAPTR	O	APTR	D/A converter Rch deglitcher output. High-impedance at NDAI = "1".
15	EWCK	O	WCK	D/A data word clock pulse. 2fs deglitcher output. High-impedance at FDAI = "1".
16	EDATA	O	DATA	D/A serial data. 16-bit. Sent from MSB. High-impedance at NDAI = "1". At power ON, undefined data output until LOCK = "1".
17	V <sub>DD</sub>		V <sub>DD</sub>	+5 V
18	V <sub>SS</sub>		V <sub>SS</sub>	GND
19	EEMP	O	EMP	"1" when input C bits are of a type of 00x100 in order from LSB. (EMP = "1" at emphasis ON)
20	ELRCK	O	LRCK	D/A data Lch/Rch clock pulse. Fs. High-impedance at NDAI = "1". Lch data output at LRCK = "1".
21	EBCK	O	BCK	D/A data shift clock pulse. 32fs. High-impedance at NDAI = "1". D/A data sent at leading edge of BCK.
22	EF384	O	F384	VCO signal re-send signal. 384fs when locked.
23	ECT4	O	CT4	C bit category code decode output. "1" when category code is "4" or more.
24	ECT3	O	CT3	C bit category code decode output. "1" when category code is "3" (DAT).
25	ECT2	O	CT2	C bit category code decode output. "1" when category code is "2" (PCM Encoder/Decoder).
26	ECT1	O	CT1	C bit category code decode output. "1" when category code is "1" (CD).
27	ECT0	O	CT0	C bit category code decode output. "1" when category code is "0" (General Format).
28	V <sub>SS</sub>		V <sub>SS</sub>	GND
29	EF48	O	F48	C bit decode output. F48 = "1" when bits 25 and 24 are of "10".
30	EF44	O	F44	C bit decode output. F44 = "1" when bits 25 and 24 are of "00".
31	EF32	O	F32	C bit decode output. F32 = "1" when bits 25 and 24 are of "11".
32	ECBIT	O	CBIT	Input C bits is output as it is.
33	ECSYNC	O	CSYNC	"1" when input C bit is "0".
34	V <sub>SS</sub>		V <sub>SS</sub>	GND
35	ERSI	I	RSI	Reset input. Reset at RSI = "0".
36~38	NC		NC	Unconnected
39	V <sub>DD</sub>		V <sub>DD</sub>	+5 V
40	V <sub>SS2</sub>		V <sub>SS2</sub>	GND
41~42	NC		NC	Unconnected
43	EMDATA	I	MDATA	Modulation data input pin
44	EVCO	I	VCO	VCO (384fs) input pin

## CIRCUIT DESCRIPTION

### Block diagram



### D/A data timing chart



Note 1: When LRCK = "1", Lch data is output.

Note 2: In one of the following cases, LOCK becomes "0" (when DR is taken).

- 1) When preamble is not detected in input data
- 2) When parity error occurs in input data
- 3) When input data is digital (when C bits 0~5 = 01x000)

When LOCK = "1", input data is output to DATA (from MSB) at WCK with delay of 1 clock pulse.

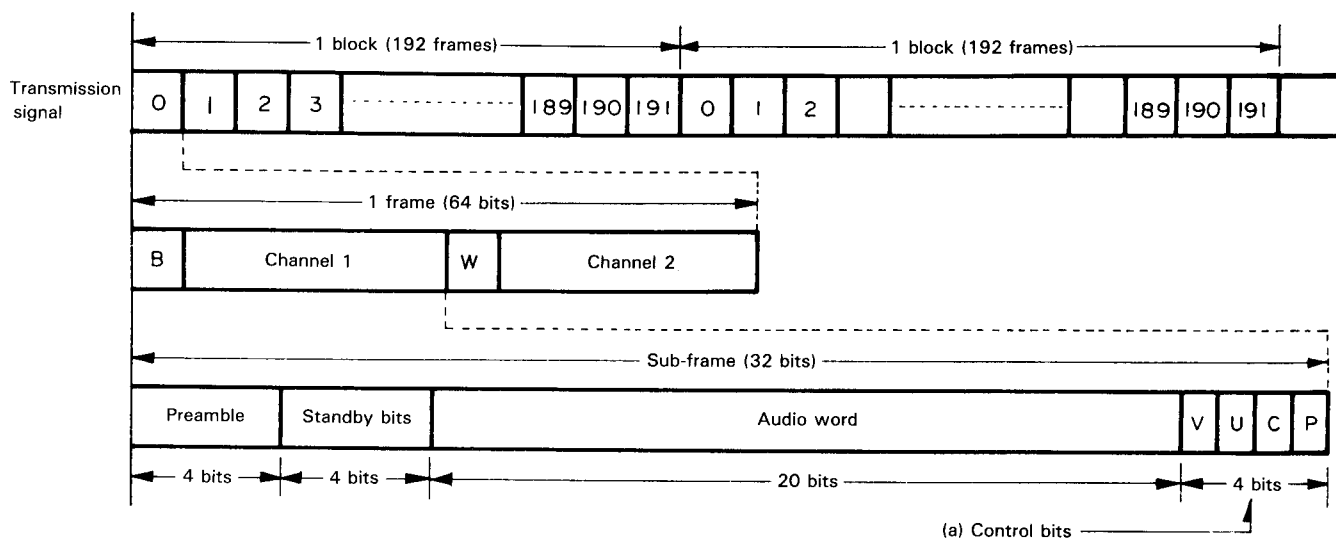
When LOCK = "0", -6 dB of predata (data 1-bit shifted for code extension) is output to DATA.

Note 3: When power is turned ON with RSI = "1" kept as it is, undefined data (noise) is output to DATA until LOCK = "1". When RSI becomes "1" from "0" (more than 50 nsec), undefined data is output to DATA until LOCK = "1".



## CIRCUIT DESCRIPTION

### Digital audio interface format



#### Details of control bits:

<b>V</b>	0: Audio data valid, 1: Audio data invalid
<b>U</b>	Unused
<b>C</b>	1 block consists of total 192 bits, starting with preamble "B mode".
<b>P</b>	"0" or "1" is selected in such a way that the total of all bits excluding the preamble from the sub-frame is even-numbered.

#### Contents represented by C bits (30 bits are used in practice out of 192 bits):

<b>0 and 15</b>	Musical software specified, for broadcasting use or for personal use
<b>1 ~ 5</b>	Emphasis and digital copy, possible or impossible
<b>8 ~ 14</b>	Category code/general, CD, PCM, DAT, BS, etc.
<b>16 ~ 19</b>	SOURCE No. 1 to 15
<b>20 ~ 23</b>	Channel No. A to O
<b>24 ~ 27</b>	Sampling frequency (32 MHz, 44.1 MHz, 48 kHz)
<b>28, 29</b>	Sampling frequency accuracy (level I to III)

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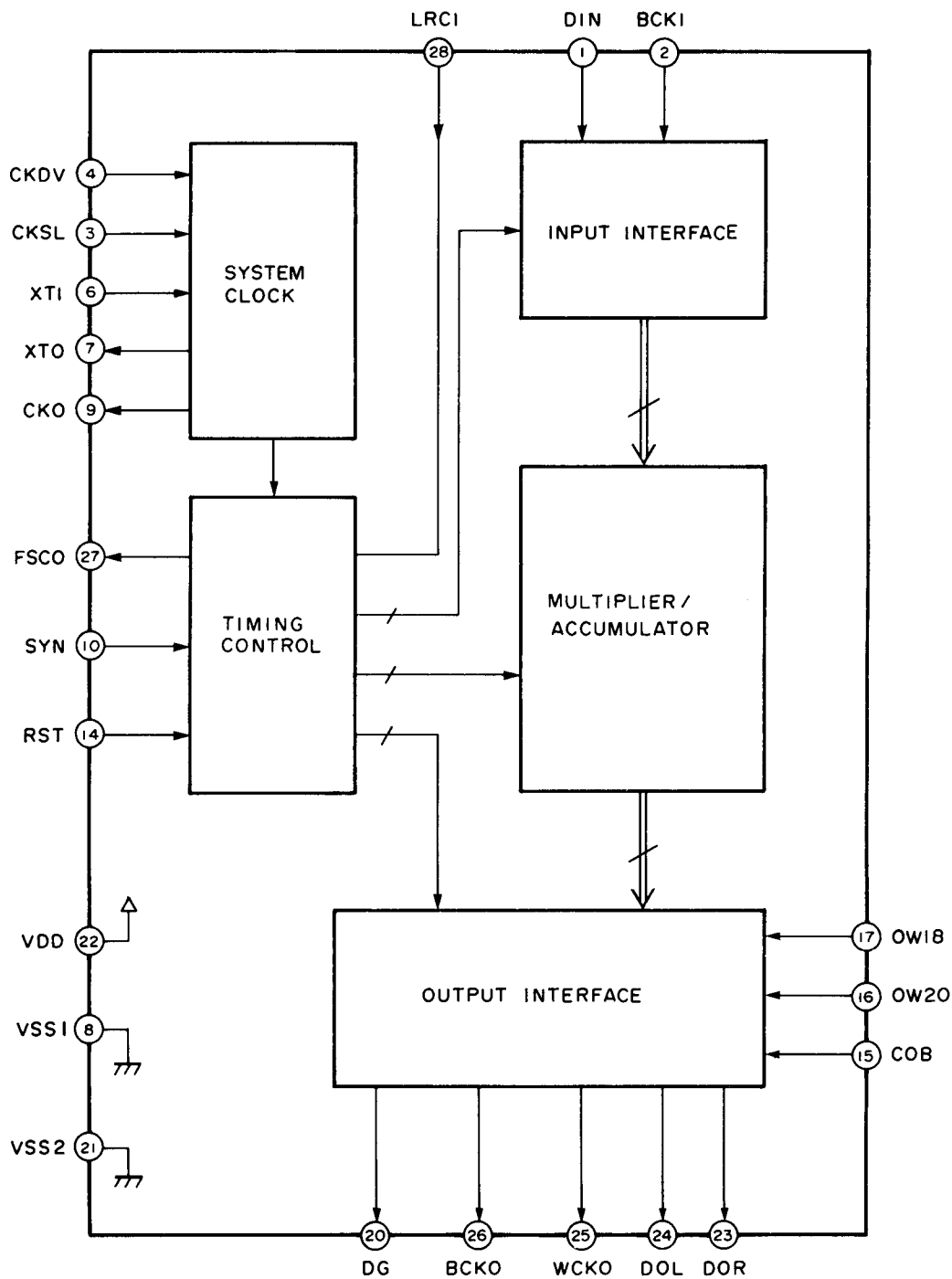
[rtv-servis-horvat@os.tel.hr](mailto:rtv-servis-horvat@os.tel.hr)

# DA-9010

## CIRCUIT DESCRIPTION

IC9 (X32-1290-00): SM5813APT DIGITAL FILTER

Block diagram



## CIRCUIT DESCRIPTION

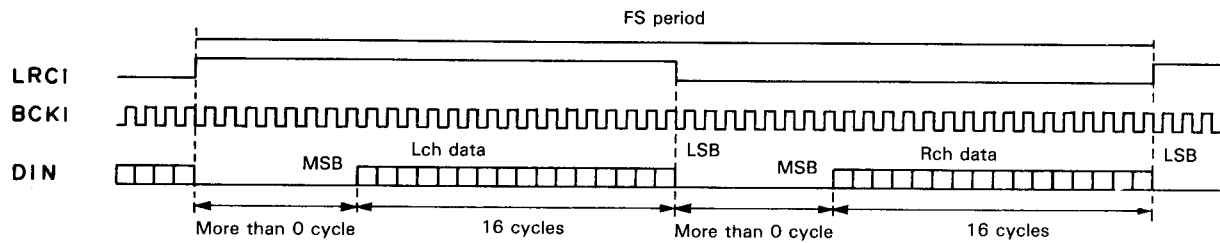
## Pin functions

In the description below, "fs" means the input data sampling frequency.

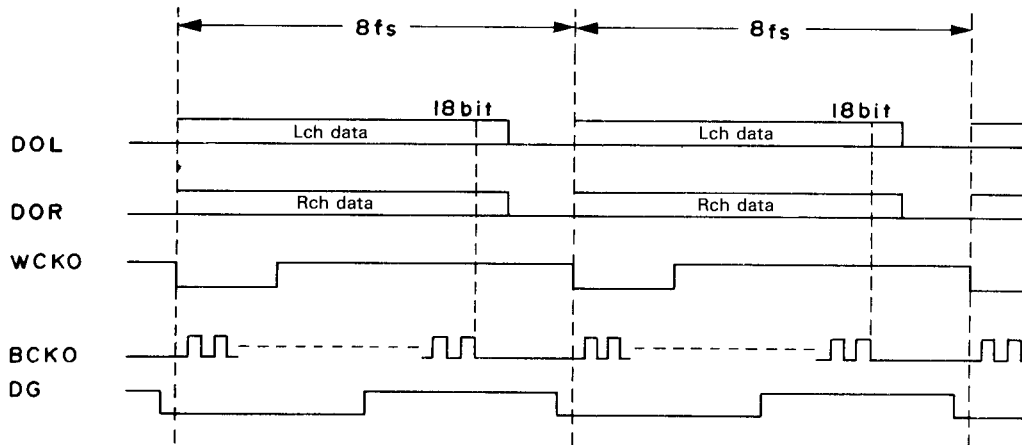
Terminal No.	Terminal name	I/O	Function												
1	DIN	I	Input data												
2	BCKI	I	Input data bit clock pulse												
3	CKLS	I	Pin XTI input frequency selection (6: Refer to the description of pin XTI.)												
4	CKDV	I	Pin XTI input frequency selection (6: Refer to the description of pin XTI.)												
5	(NC)														
6	XTI	I	Oscillation section input pin (192fs: CKSL="H", CKDV="H") (DA-9010 uses 192fs.) (384fs: CKSL="H", CKDV="L") (With fs32, XTI is phase shifted.) (256fs: CKSL="L", CKDV="H") (512fs: CKSL="L", CKDV="L")												
7	XTO	O	Oscillation section output pin												
8	VSS1		Grounding pin 1												
9	CKO	O	Oscillation section output clock pulse (Frequency is the same as XTI.)												
10	SYN	I	Jitter-free mode/compulsory sync mode selection "H" = Jitter-free mode, "L" = Compulsory sync mode												
11	(NC)														
12	(NC)														
13	(NC)														
14	RST	I	System reset. "H" = Normal operation, "L" = System reset												
15	COB	I	2's complement/COB selection. "H" = 2's complement, ("H" for DA-9010) "L" = COB												
16	OW20	I	Number-of-output-bits selection <table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr> <th>No. of output bits</th> <th>16</th> <th>18</th> <th>20</th> </tr> </thead> <tbody> <tr> <td>OW18</td> <td>H</td> <td>L</td> <td>H</td> </tr> <tr> <td>OW20</td> <td>H</td> <td>H</td> <td>L</td> </tr> </tbody> </table> (18-bit for DA-9010)	No. of output bits	16	18	20	OW18	H	L	H	OW20	H	H	L
No. of output bits	16	18		20											
OW18	H	L		H											
OW20	H	H	L												
17	OW18	I													
18	(NC)														
19	(NC)														
20	DG	O	Deglintch control clock pulse												
21	VSS2		Grounding pin 2												
22	VDD		Power supply pin (5 V)												
23	DOR	O	Rch 8x oversampling output data												
24	DOL	O	Lch 8x oversampling output data												
25	WCKO	O	Output data word clock pulse												
26	BCKO	O	Output data bit clock pulse												
27	FSCO	O	fs-period internal operation timing clock pulse												
28	LRCI	I	Input data sampling rate (fs) clock pulse "H" = Lch, "L" = Rch												

## CIRCUIT DESCRIPTION

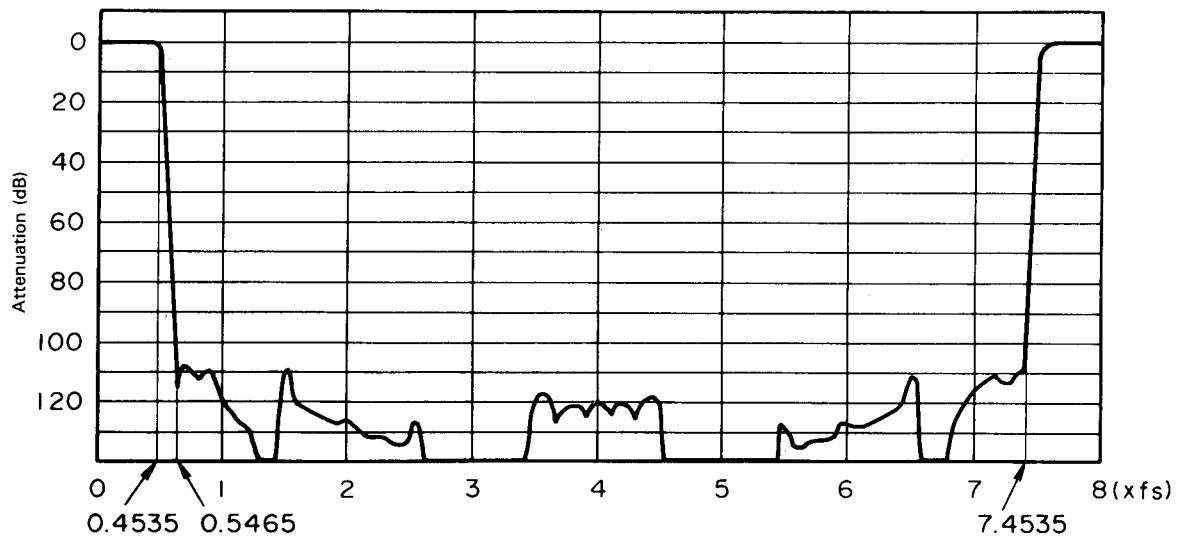
### Serial input timing (DIN, BCKI, LRCI)



### Serial output timing (DOL, DOR, BCKO, WCKO, DG)

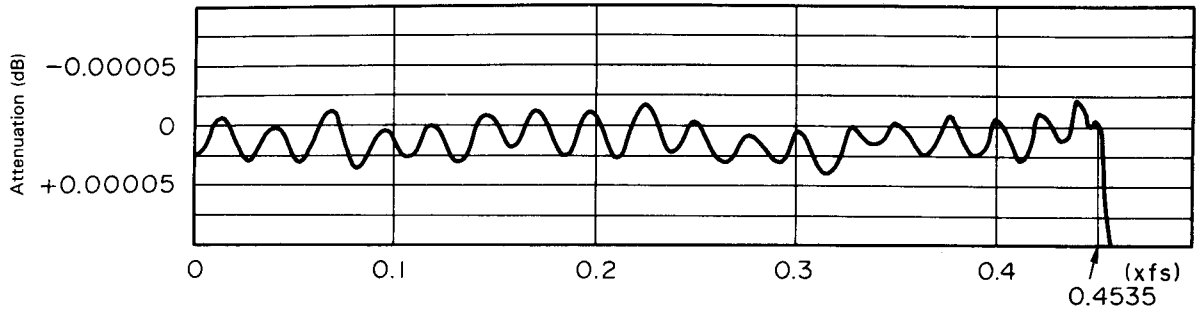


### Frequency characteristic

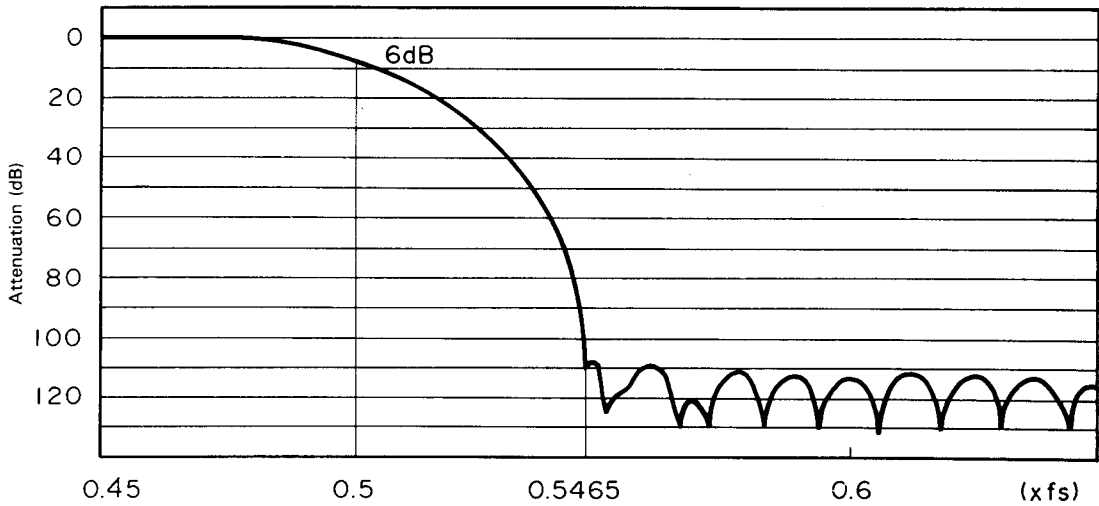


## CIRCUIT DESCRIPTION

Pass band characteristic



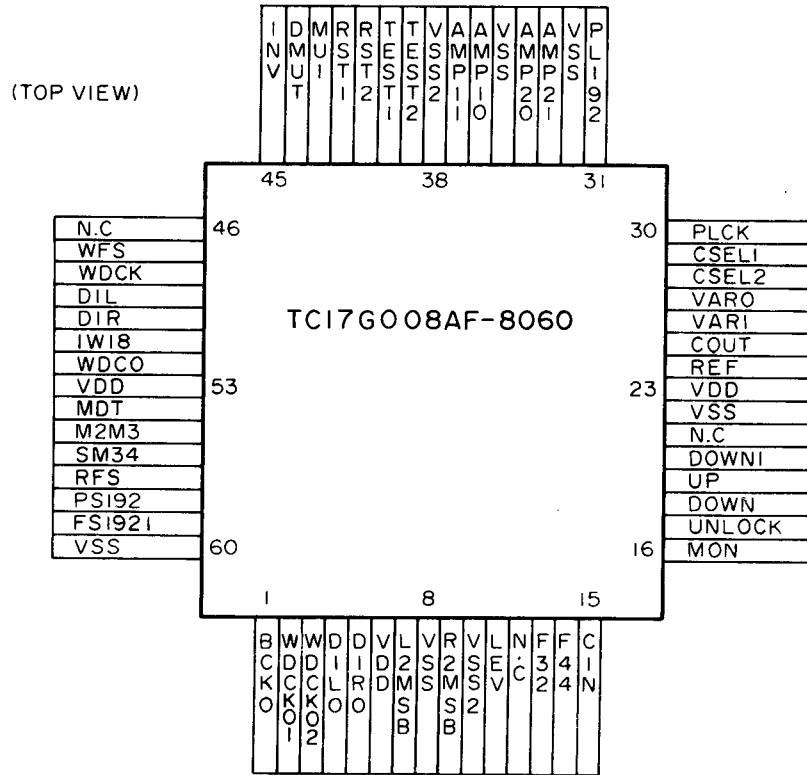
Transit band characteristic



# DA-9010

## CIRCUIT DESCRIPTION

### IC10 (X32-1290-00): TC17G008AF-8060 GATE ARRAY



### Features of gate array IC

#### <A> DPAC

- 1) The data write system and the data read system are independent in clock pulse from each other. (Jitter-free mode)
- 2) For the jitter margin, 4 bits are used as a register file to absorb the jitter within  $\pm 2$  bits.
- 3) At power ON, auto setting is performed of the offset address for the write and read counters.
- 4) To prevent the deviation in timing between data and word clock pulse due to the noise, the timing is re-set by each appearance of a word clock pulse. Thereby, the timing, if disturbed, is restored to normal by the next word clock pulse.
- 5) By virtue of the synchronous digital mute operation, 16-bit or 18-bit is free from sound cut on the way. (WDCK synchronous system)
- 6) The 2MSB detection output is given. Distortion can be reduced by adding that voltage level to the D/A conversion. However, in DA-9010, DAC (PCM58P) is adopted, and this pin is not used.

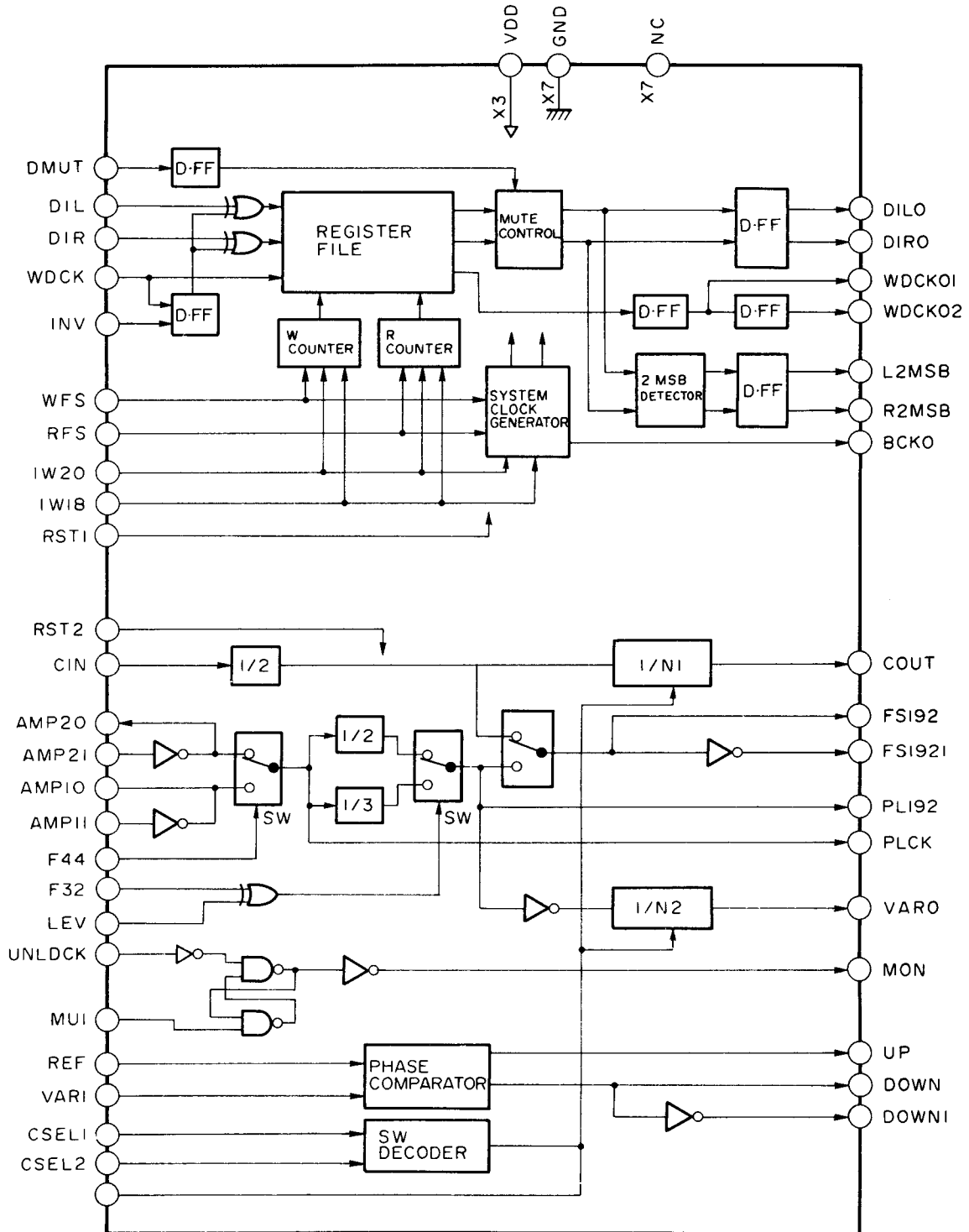
- 7) Connectable with the data length 16-bit/18-bit digital filter. DA-9010 uses the 18-bit length.

#### <B> PLL

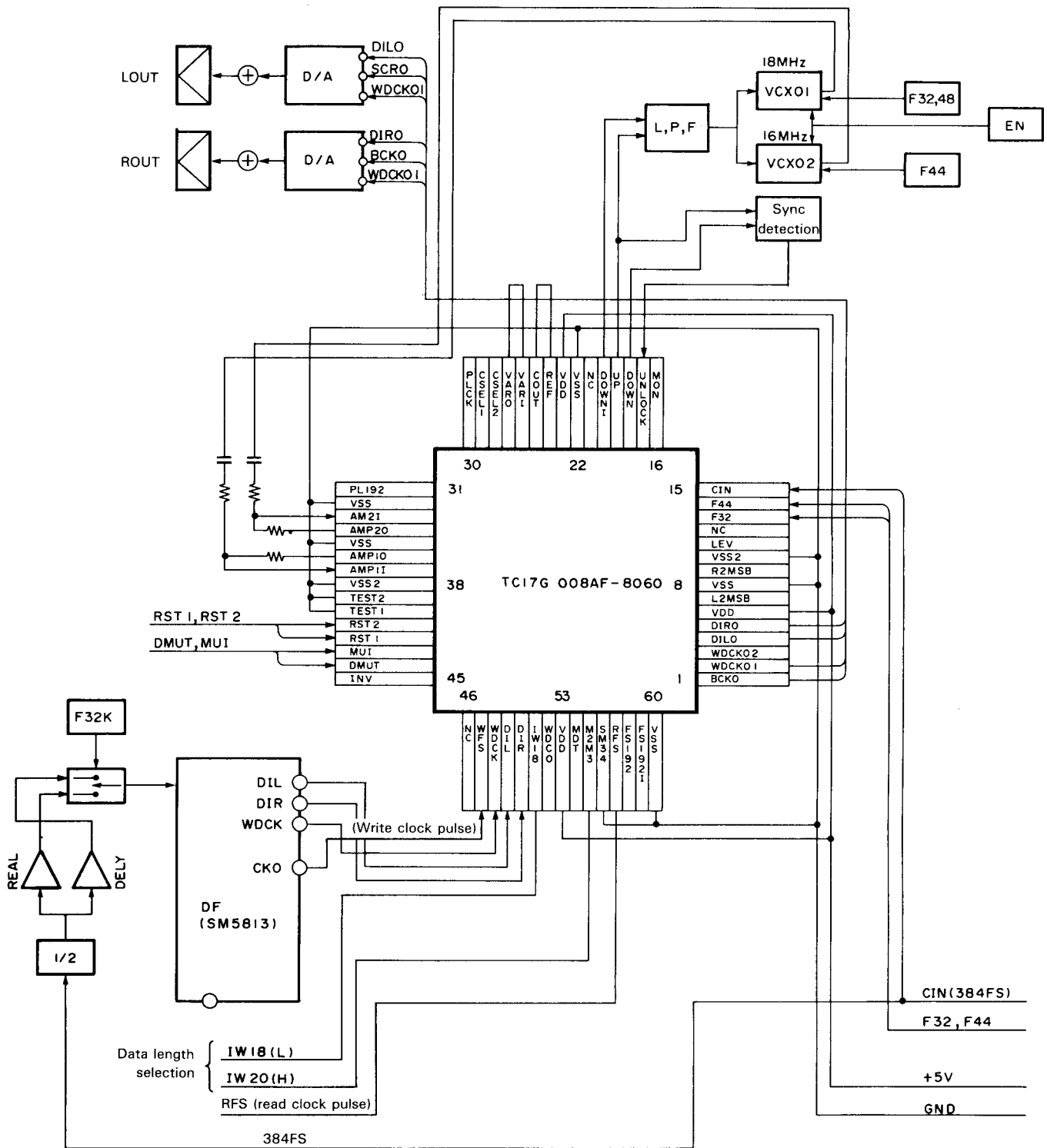
- 1) PLL circuits are incorporated for two systems. (18.4896 MHz, 16.9409 MHz)
- 2) Compatible with different frequencies in digital I/O reception (Fs 32 kHz, Fs 44.1 kHz, Fs 48 kHz)

## CIRCUIT DESCRIPTION

Block diagram



## CIRCUIT DESCRIPTION



Data length selection

	16 bit	18 bit	20 bit
IW18	L	H	H (L)
IW20	L	L	H (L)



## CIRCUIT DESCRIPTION

## Pin functions

Terminal No.	Terminal name	I/O	Function	Operation																									
1	BCKO	O	Bit clock pulse																										
2	WDCKO1	O	Output word clock pulse (synchronous with the rise of data)																										
3	WDCKO2	O	Output word clock pulse (delayed half clock pulse width from the rise of data)	(NC)																									
4	DILO	O	Lch output data																										
5	DIRO	O	Rch output data																										
6	VDD	I	+5 V																										
7	L2MSB	O	Lch 2MSB level output	(NC)																									
8	VSS	I	0 V																										
9	R2MSB	O	Rch 2MSB level output	(NC)																									
10	VSS2	I	0 V																										
11	LEV	I	VCXO clock pulse division selection	(L)																									
12	(NC)																												
13	F32	I	FS32 flag																										
14	F44	I	FS44 flag																										
15	CIN	I	384FS clock pulse																										
16	MON	O	Monitoring to see which state is engaged, unlock or lock.	(NC)																									
17	UNLOCK	I																											
18	DOWN	O	Phase comparator down output																										
19	UP	O	Phase comparator up output																										
20	DOWNI	O	Inversion output of DOWN																										
21	(NC)																												
22	VSS	I	0 V																										
23	VDD	I	5 V																										
24	REF	I	Phase comparator R input																										
25	COUT	O	Clock pulse obtained from 1/N1 division of 384FS clock pulse																										
26	VARI	I	Phase comparator V input																										
27	VARO	O	Clock pulse obtained from 1/N2 division of VCXO																										
28	CSEL2	I	Division setting <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>CEL1</th> <th>CEL2</th> <th>N1</th> <th>N2</th> <th>Application</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>0</td> <td>1</td> <td>1</td> <td>—</td> </tr> <tr> <td>1</td> <td>0</td> <td>8</td> <td>96</td> <td>BS</td> </tr> <tr> <td>0</td> <td>1</td> <td>192</td> <td>192</td> <td>AMP</td> </tr> <tr> <td>1</td> <td>1</td> <td>256</td> <td>256</td> <td>AMP</td> </tr> </tbody> </table>	CEL1	CEL2	N1	N2	Application	0	0	1	1	—	1	0	8	96	BS	0	1	192	192	AMP	1	1	256	256	AMP	(H)
CEL1	CEL2			N1	N2	Application																							
0	0			1	1	—																							
1	0			8	96	BS																							
0	1	192	192	AMP																									
1	1	256	256	AMP																									
29	CSEL1	(H)																											
30	PLCK	O	Check to see whether VCXO is 18 MHz or 16 MHz.																										
31	PL192	O	FS192 monitor																										
32	VSS	I	0 V																										
33	AMP2I	I	VCO (16 MHz) clock pulse amplification	(Operates for F44.)																									
34	AMP2O	O																											
35	VSS	I	0 V																										
36	AMP1O	I	VCO (18 MHz) clock pulse amplification	(Operates for F32 or F48.)																									
37	AMP1I	O																											
38	VSS2	I	0 V																										
39	TEST2	I	Test pin, fixed to 0 V.																										
40	TEST1																												

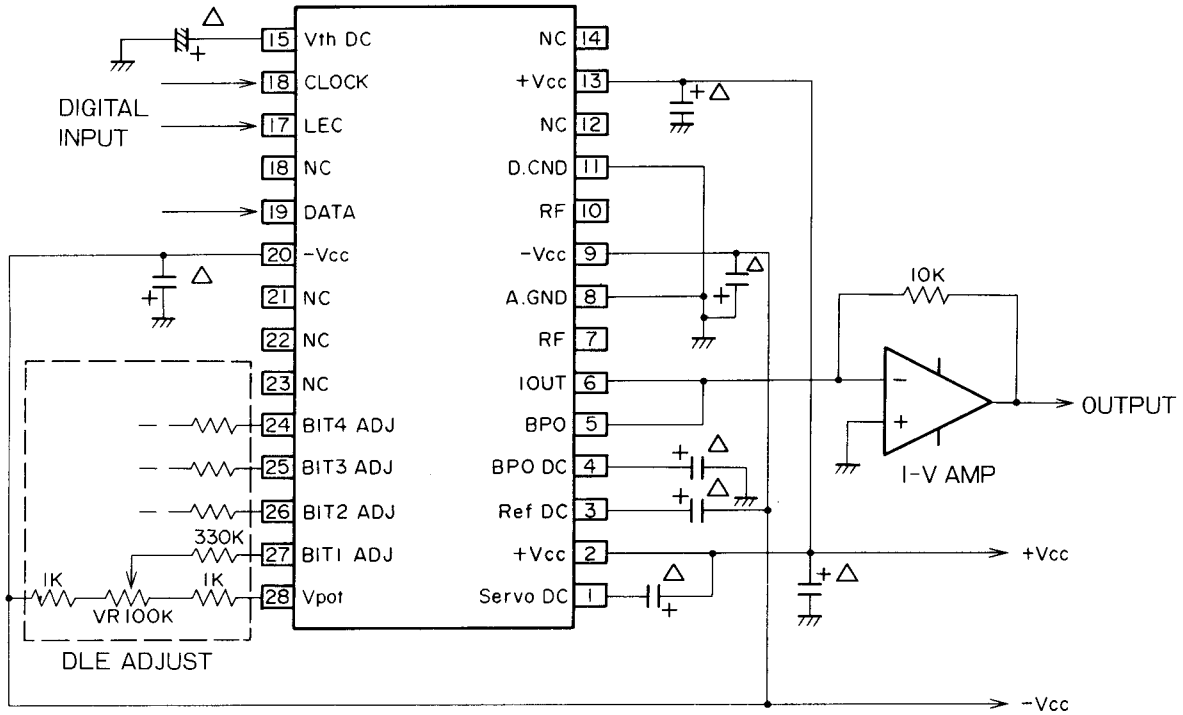
## CIRCUIT DESCRIPTION

## Pin functions

Terminal No.	Terminal name	I/O	Function	Operation
41	RST2	I	PLL system reset input pin (Reset at "L")	
42	RST1	I	TBC system reset input pin (Reset at "L")	
43	MUI	I	PLL system mute input pin	
44	DMUT	I	TBC system mute input pin (Mute at "H")	
45	INV	I	Input data inversion (both Lch and Rch) (Inversion at "H")	(L)
46	(NC)			
47	WSF	I	Write clock pulse synchronous with input data	
48	WDCK	I	Input word clock pulse	
49	DIL	I	Lch input data	
50	DIR	I	Rch input data	
51	IW18	I	Data bit length selection, 16-bit/18-bit = "L"/"H"	(H)
52	WDCO	O	Digital filter MEN signal (SM5813)	(NC)
53	VDD	I	5 V	
54	MDT	O	Digital filter MDT signal (SM5813)	(NC)
55	M2M3	O	Digital filter A1/A2 input signal (SM5813)	(NC)
56	SM34	I	Digital filter selection, SM5813/SM5804 = "L"/"H"	(L)
57	RFS	I	Read clock pulse synchronous with output data	
58	FS192	O	FS192 clock pulse	(NC)
59	FS192I	O	FS192 clock pulse inversion	
60	VSS	I	0 V	

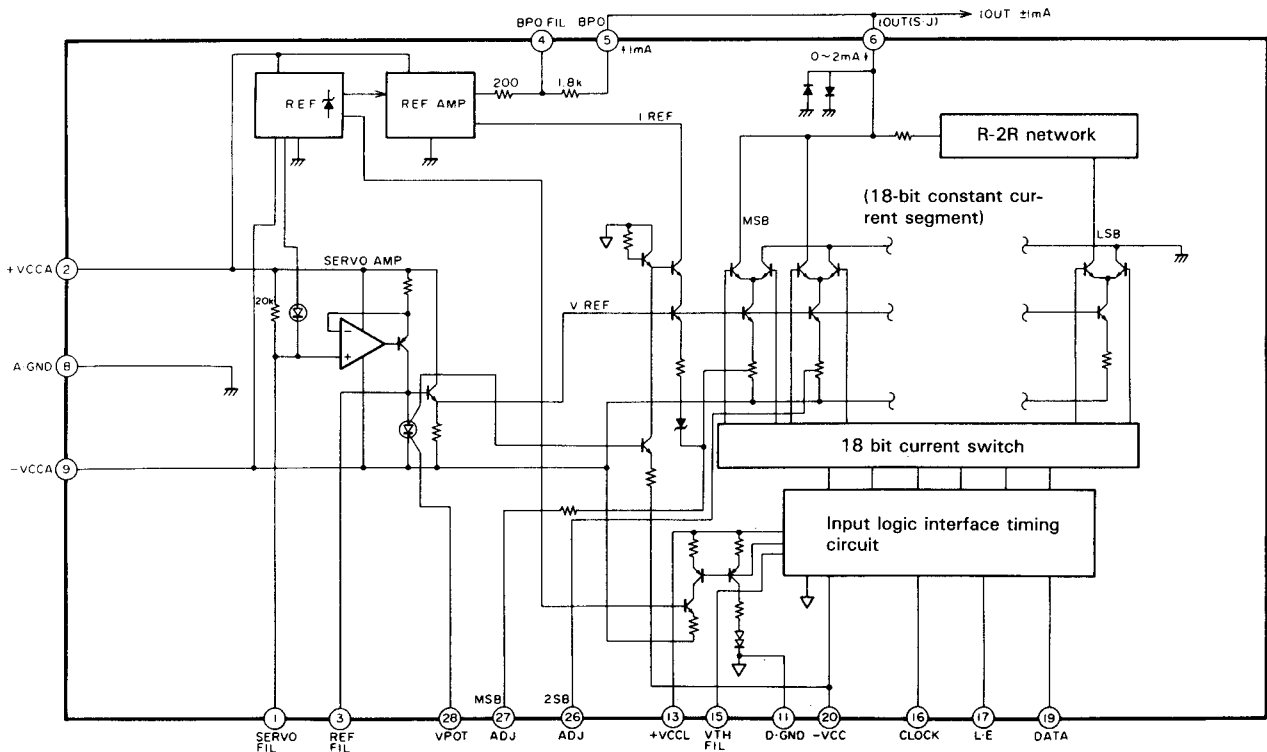
## CIRCUIT DESCRIPTION

### IC12/IC13 (X32-1290-00): PCM58P D/A CONVERTER



△ Bypass capacitor

### Block diagram

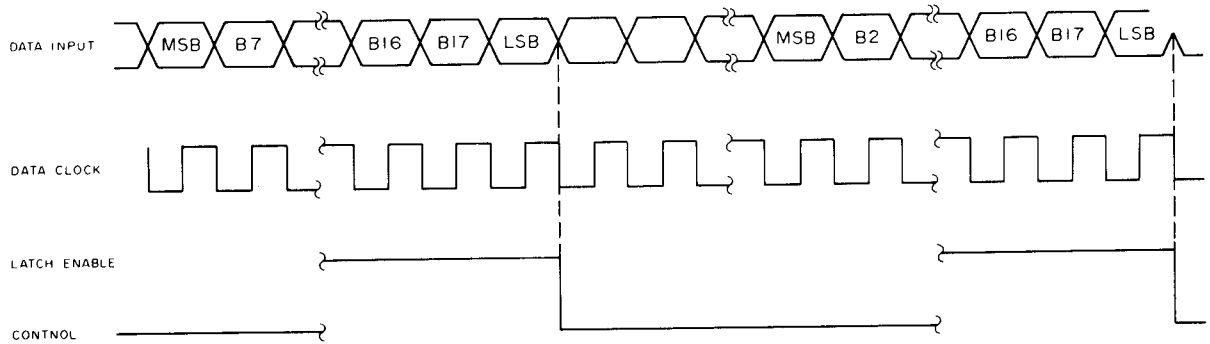


## CIRCUIT DESCRIPTION

### Pin connections

1.	Servo filter	15.	VTH filter
2.	+VCC	16.	Clock pulse input
3.	Reference filter	17.	LEC input
4.	BPO filter	18.	NC
5.	Bipolar offset	19.	Data input
6.	Current output	20.	-VCC
7.	RF	21.	NC
8.	Analog COM	22.	NC
9.	-VCC	23.	NC
10.	RF	24.	BIT 1 ADJ
11.	Digital COM	25.	BIT 2 ADJ
12.	NC	26.	BIT 3 ADJ
13.	+VCC	27.	BIT 4 ADJ
14.	NC	28.	V POT

### Timing chart



- The data format is of 2's complement, right-justified data or communication data with MSB first.
- Data is taken in to the shift register at the leading edge of the data clock pulse.

## ADJUSTMENT/REGLAGES

## Adjustment

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMPLIFIER SETTING	ALIGNMENT POINTS	ALIGN FOR	FIG.
1	IDLE CURRENT	—	Connect a DC voltmeter across TP6 and 8(Lch) or across TP3 and 5(Rch) on X07-A/7.	VOLUME:0	VR1(Lch) VR2(Rch) (X07- A/7)	9mV	(a)
2	VCOX (1)	Apply 4V DC to TP7(VT). (X32-1290-00)	Connect a frequency counter to TP3. (X32-1290-00)	—	L20 (X32-1290-00)	Oscillation frequency: 18.432MHz	(b)
3	VCOX (2)	Apply 4V DC to TP7(VT). (X32-1290-00)	Connect a frequency counter to TP3. (X32-1290-00)	—	L21 (X32-1290-00)	Oscillation frequency: 16.9344MHz	(c)
4	DISTORTION ADJUSTMENT (1)	Connect a digital SG or CD player to DIGITAL IN, and play 1kHz at 0dB. (CD test disc: Sony Type 4, T-No. 2) (X32-1290-00)	Connect a distortion meter to REC OUT. (X32-1290-00)	—	VR3(Lch) VR4(Rch) (X32-1290-00)	Adjust VR3 and VR4 alternately and repeated until the distortion is minimized.	(d)
5	DISTORTION ADJUSTMENT (2)	Connect a digital SG or CD player to DIGITAL IN, and play 1kHz at 20dB. (CD test disc: Sony Type 4, T-No. 15) (X32-1290-00)	Connect a distortion meter to REC OUT. (X32-1290-00)	—	VR1(Lch) VR2(Rch) (X32-1290-00)	Adjust VR1 and VR2 alternately and repeated until the distortion is minimized.	(d)

## Reglages

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DE L'AMPLIFICATEUR	POINTS DE L'ALIGNMENT	ALIGNER POUR	FIG.
1	COURANT DEWATTE	—	Raccorder un voltmètre CC entre TP6 et 8 (canal gauche) ou entre TP3 et 5 (canal droit) sur X07- A/7.	VOLUME:0	VR1(Lch) VR2(Rch) (X07- A/7)	9mV	(a)
2	VCOX (1)	Appliquer 4V CC à TP7(VT). (X32-1290-00)	Raccorder un compteur de fréquence à TP3. (X32-1290-00)	—	L20 (X32-1290-00)	Fréquence d'oscillation: 18.432MHz	(b)
3	VCOX (2)	Appliquer 4V CC à TP7(VT). (X32-1290-00)	Raccorder un compteur de fréquence à TP3. (X32-1290-00)	—	L21 (X32-1290-00)	Fréquence d'oscillation: 16.9344MHz	(c)
4	ADJUSTEMENT DE DISTORSION (1)	Raccorder un SG numérique ou lecteur CD à DIGITAL et lire 1kHz à 0dB. (Disc CD test: Type Sony 4, T-N°2) (X32-1290-00)	Raccorder un compteur de distorsion à REC OUT. (X32-1290-00)	—	VR3(Lch) VR4(Rch) (X32-1290-00)	Ajuster VR3 et VR4 alternativement et répéter jusqu' à ce que la distorsion soit minimisée.	(d)
5	ADJUSTEMENT DE DISTORSION (2)	Raccorder un SG numérique ou lecteur CD à DIGITAL et lire 1kHz à -20dB. (Disc CD test: Type Sony 4, T-N°15) (X32-1290-00)	Raccorder un compteur de distorsion à REC OUT. (X32-1290-00)	—	VR1(Lch) VR2(Rch) (X32-1290-00)	Ajuster VR1 et VR2 alternativement et répéter jusqu' à ce que la distorsion soit minimisée.	(d)

## ABGLEICH

## Abgleich

NR.	GENGENSTAND	EINGANGS-EINSTELLUNG	AUSANG-EINSTELLUNG	VORSTÄRKER-EINSTELLUNG	ABGLEICHE-PUNKTE	ABGLEICHEN FÜR	ABB.
1	BLINDSTROM	-	Ein Gleichstrom-Voltmeter zwischen TP6 und 8(linker Kanal) oder zwischen TP3 und 5(rechter Kanal) auf X07- A/7 anschließen.	VOLUME:0	VR1(Lch) VR2(Rch) (X07- A/7)	9mV	(a)
2	VCXO (1)	4V Gleichstrom an TP7(VT) anlegen. (X32-1290-00)	Einen Frequenzzähler an TP3 anschließen. (X32-1290-00)	-	L20 (X32-1290-00)	Oszillationfrequenz: 18.432MHz	(b)
3	VCXO (2)	4V Gleichstrom an TP7(VT) anlegen. (X32-1290-00)	Einen Frequenzzähler an TP3 anschließen. (X32-1290-00)	-	L21 (X32-1290-00)	Oszillationfrequenz: 16.9344MHz	(c)
4	VERZERRUNGS-EINSTELLUNG (1)	Einen digitalen Signalgenerator oder CD-Spieler an DIGITAL IN anschließen und 1kHz bei 0dB wiedergeben. (CD-Testdisc: Sony Typ 4, T-Nr.2) (X32-1290-00)	Ein Verzerrungs-meter an REC OUT anschließen. (X32-1290-00)	-	VR3(Lch) VR4(Rch) (X32-1290-00)	VR3 und VR4 abwechselnd und wiederholt einstellen, bis die Verzerrung minimal wird.	(d)
5	VERZERRUNGS-EINSTELLUNG (2)	Einen digitalen Signalgenerator oder CD-Spieler an DIGITAL IN anschließen und 1kHz bei 0dB wiedergeben. (CD-Testdisc: Sony Typ 4, T-Nr.15) (X32-1290-00)	Ein Verzerrungs-meter an REC OUT anschließen. (X32-1290-00)	-	VR1(Lch) VR2(Rch) (X32-1290-00)	VR1 und VR2 abwechselnd und wiederholt einstellen, bis die Verzerrung minimal wird.	(d)

# PC BOARD (Component side view)

## PROCESSOR UNIT (X32-1290-00)

IC1  
IC3  
IC4  
IC5  
IC6

1-13	-
14	5.5V

IC2

1	5.5V
2-13	-
14	5.5V

IC8

IN	10.5V
OUT	5.5V
GND	0.6V

IC7

1-13	-
------	---

IC8

1	-0.6V
2,3	0V
4	-14.2V
5,6	5V
7	6.3V
8	14V

IC9

1,2	-
3,4	5V
5-9	-
10	5V
11-14	-
15,16	5V
17-21	-
22	5V
23-28	-

IC10

1-5	-
6	5V
7-22	-
23	5V
24-27	-
28,29	5V
30-50	-
51	5V
52	-
53	5V
54-60	-

IC11

SENS	5V
OUT	-
GND	-

IC12  
IC13

1	-
2	4.6V
3-8	-
9	-12V
10-12	-
13	4.6V
14-19	-
20	-12V
21-28	-

IC14

1	0V
2-3	-
4	-14V
5-6	-
7	0V
8	14V

IC15

1,2	0V
3	-
4	-14V
5	-
6,7	0V
8	14V

IC16  
IC17

1	0V
2,3	-
4	-14V
5,6	-
7	0V
8	14V

IC18

1	0V
2	5V
3	2.8V
4	-
5	3.4V
6	2.8V
7	10.4V
8	11.8V

IC19

1-4	-
5,6	5V
7	7.2V
8	11.7V

IC20

1-4	-
5,6	2.5V
7	3.6V
8	5.5V

IC21

1	-10.8V
2,3	0V
4	-12.1V
5,6	2.1V
7	3V
8	4.7V

IC22

1	5V
2,3	-
4	5V
5-13	-
14	5V

IC23

1-12	-
13,14	5V

IC24

1-16	-
------	---

Q1  
Q2  
Q21  
Q22

E	-
C	-
B	-

Q11

G	7.7V
D	11.6V
S	7.7V

Q12

G	3.8V
D	11.6V
S	5.9V

Q13

E	0V
C	5.9V
B	0V

Q14

G	3.8V
D	11.6V
S	4.1V

Q15

E	0.8V
C	5V
B	1.2V

Q16

E	4.7V
C	14.2V
B	5.4V

Q17

E	-12.1V
C	-14.1V
B	-12.7V

Q18

E	11.7V
C	17V
B	12.4V

Q19

E	5.5V
C	10.5V
B	6.2V

Q23

E	14V
C	19.6V
B	14.6V

Q24

E	-14.2V
C	19.8V
B	14.8V

Q25

E	5.5V
C	-
B	-

## DIGITAL I/O UNIT (X88-1010-00)

IC1

1-9	-
10	5V
11-16	-
17	5V
18-33	-

IC2

1-5	-
6	4.4V
7	-
8	5V

IC3

1	0V
2	-
3	1.5V
4-7	-
8	5V

IC4

1-5	-
6	5V
7-12	-
13,14	5V

IC5

1-3	-
-----	---

## MAIN AMPLIFIER UNIT (X07-247X-XX)

IC1

1-3	0V
4	2.1V
5	0V
6	0.7V
7	2.1V
8	3.4V

Q1, Q6, Q7,  
Q9, Q11, Q13,  
Q15, Q17, Q19,  
Q21, Q40, Q42

E	-
C	-
B	-

Q2

E	-0.6V
C	3.7V
B	0V

Q4

E	-0.6V
C	3.7V
B	-

Q6

E	3.7V
C	-
B	4.2V

Q8

E	3.7V
C	49.8V
B	4.2V

Q10

E	-46.6V
C	-27.9V
B	-46V

Q12  
Q14

E	50.4V
C	48.6V
B	49.8V

Q16

E	48.6V
C	1.8V
B	48V

Q18

E	48.6V
C	-22.7V
B	48V

Q20

E	-50.4V
C	-48.6V
B	-49.8V

Q22

E	-48.6V
C	-1.2V
B	-48V

Q23

E	1.2V
C	57.8V
B	1.8V

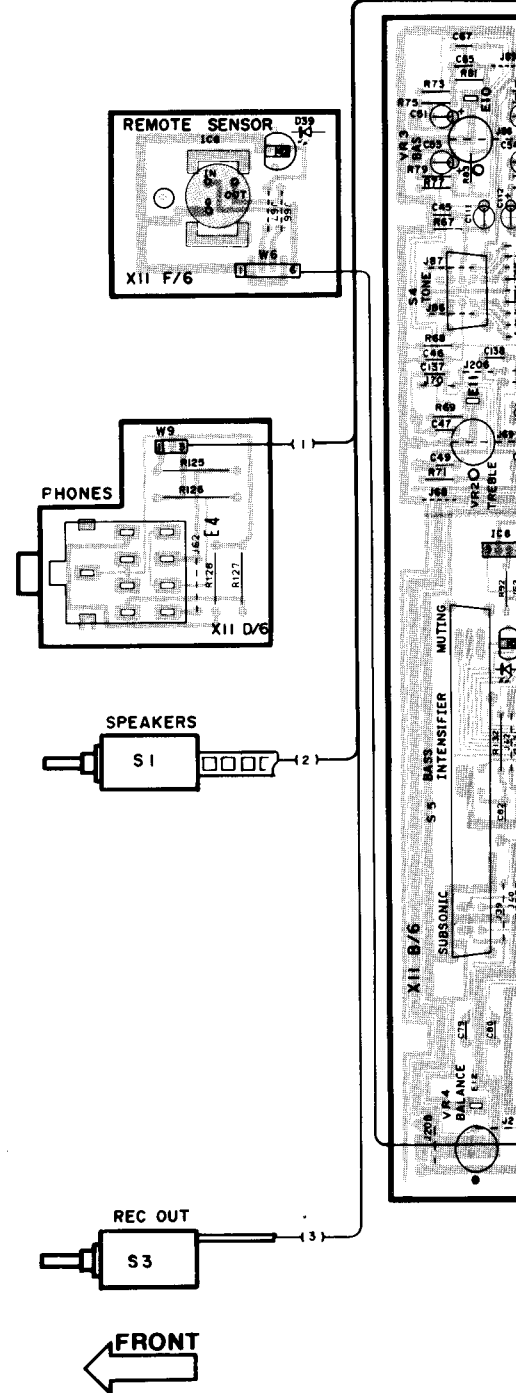
Q24, Q26, Q28,  
Q31, Q32, Q35,  
Q36

E	-
C	57.8V
B	-

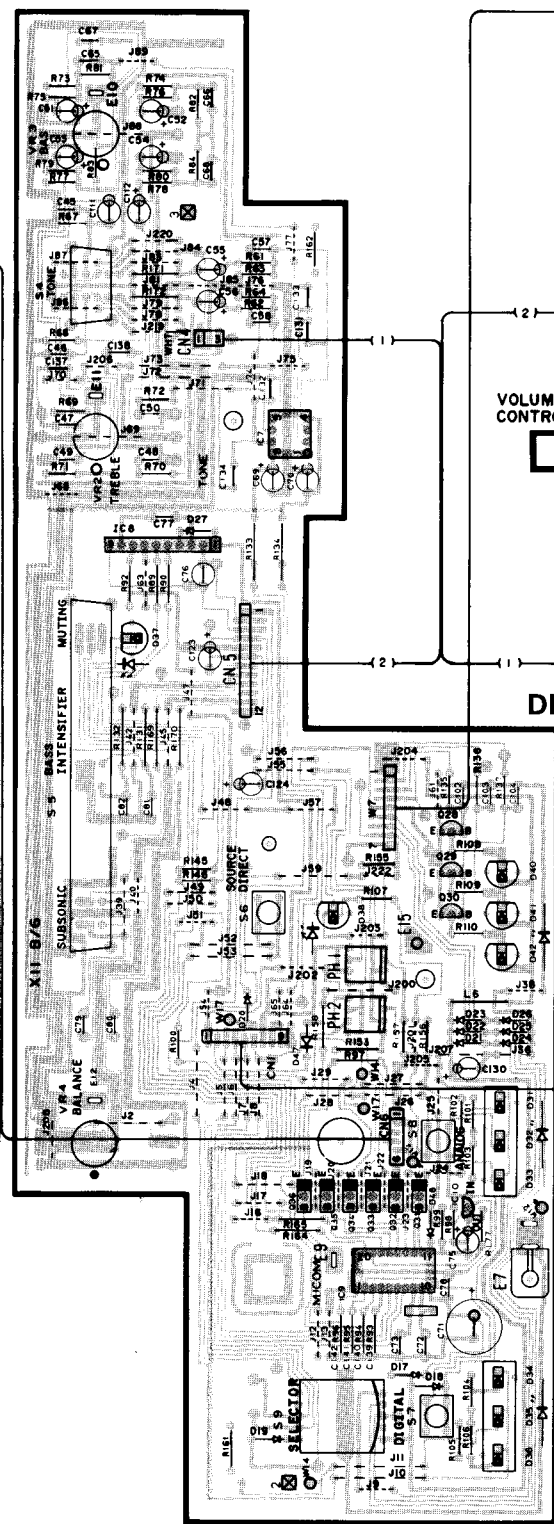
Q25

E	-
C	-57.8V
B	-1.8V

## TONE UNIT

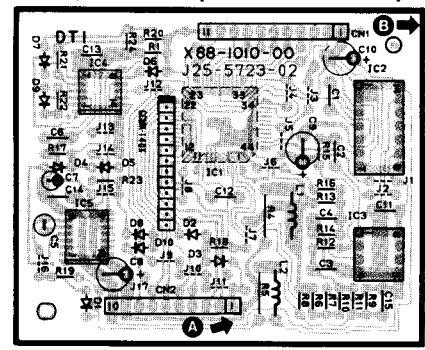


TONE UNIT (X11-258X-XX)

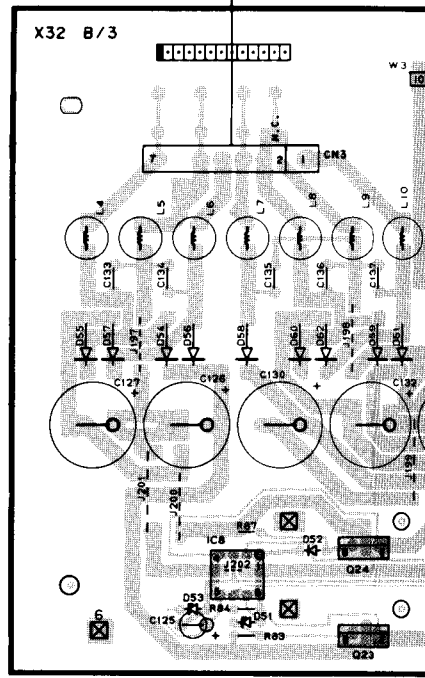
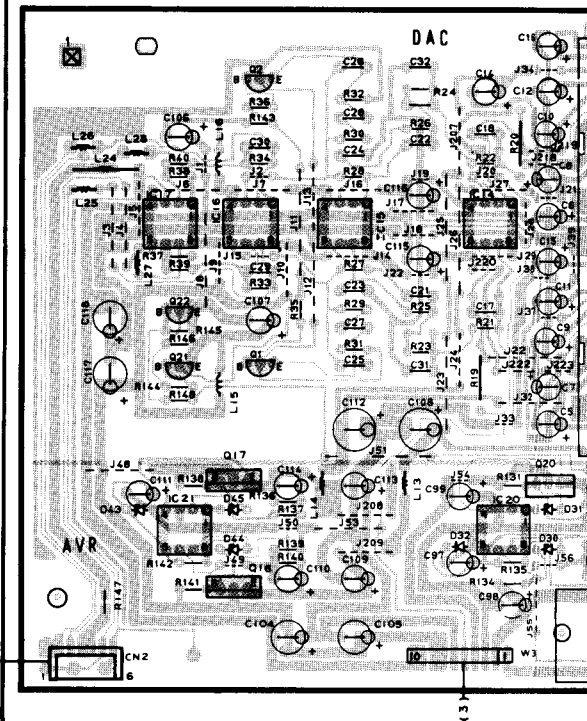


VOLUME CONTROL

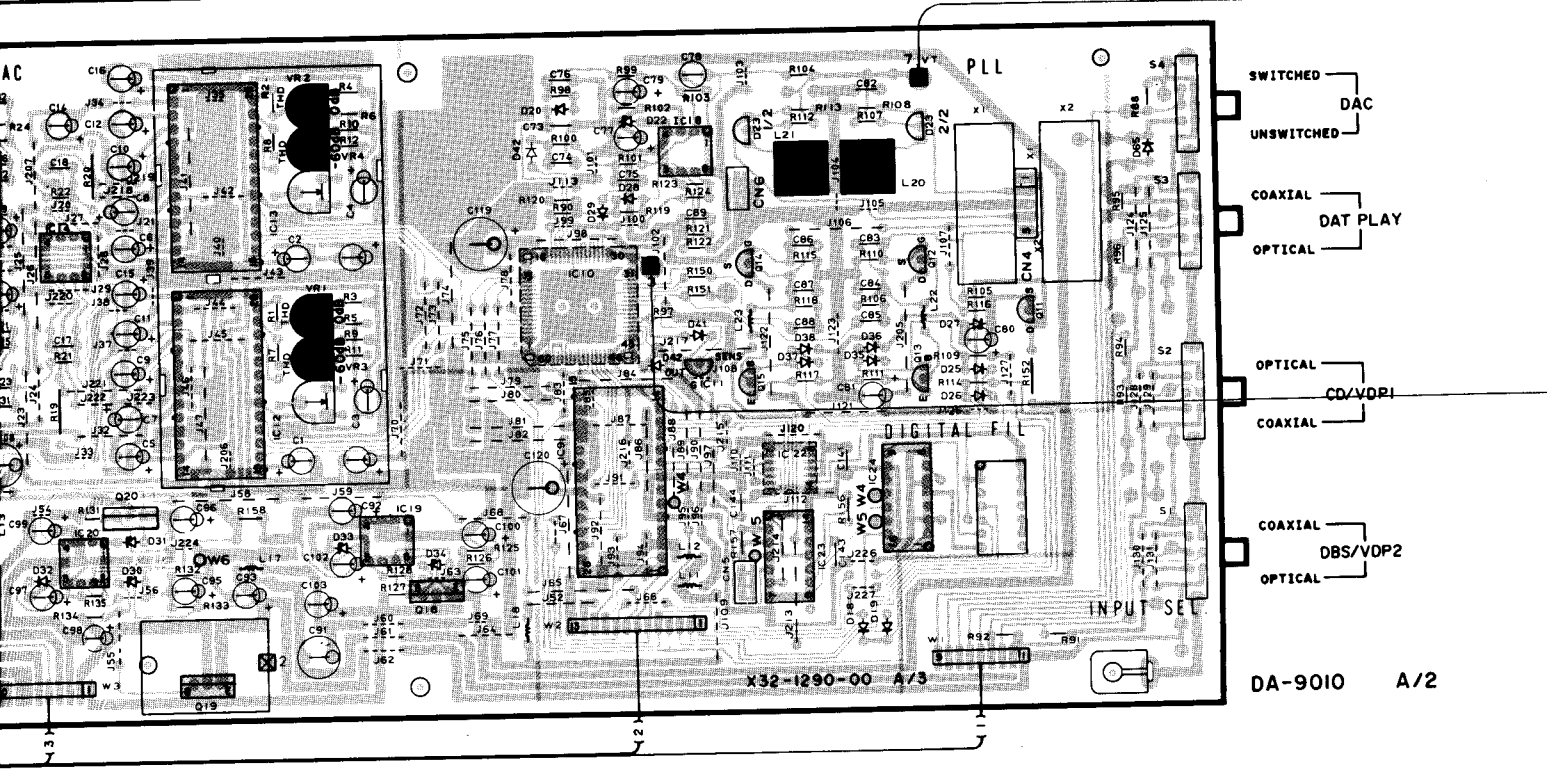
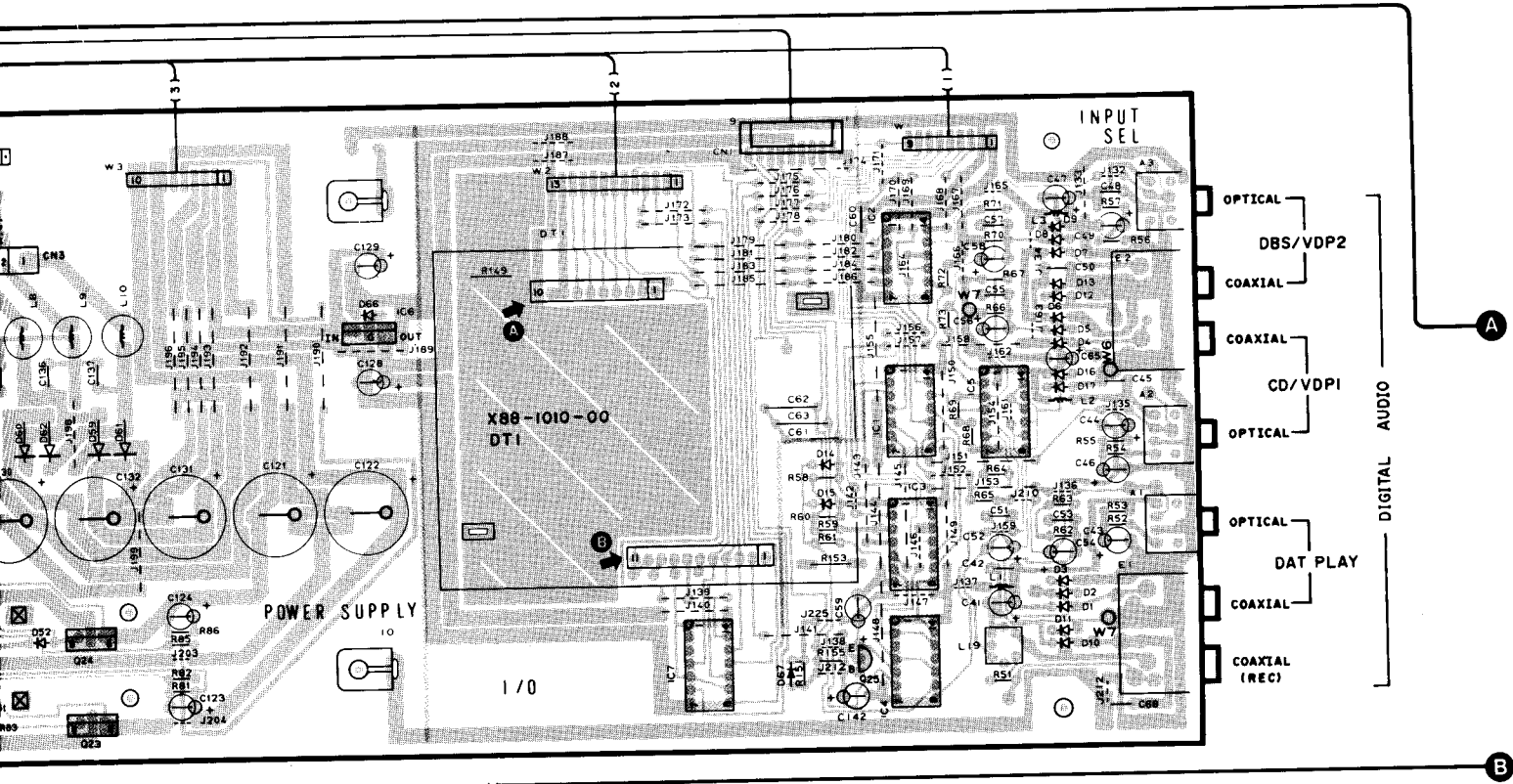
DIGITAL I/O UNIT (X88-1010-00)



PROCESSOR UNIT (X32-1290-00)







Q21	E
C	
B	
Q22	E
C	
B	
Q23	E
C	
B	
Q24	E
C	
B	
Q25	E
C	
B	
Q26	E
C	
B	
Q27	E
C	
B	
Q28	E
C	
B	
Q29	E
C	
B	

(b) VCOX
(c) VCOX

Q27

E	0.6V
C	57.8V
B	-

Q29

E	-0.6V
C	-57.8V
B	-1.2V

Q30, Q33, Q34, Q38

E	-
C	-57.8V
B	-

Q37

E	-
C	-57.8V
B	-0.6V

Q39

E	0V
C	57.7V
B	0V

Q41

E	0V
C	-1.2V
B	0V

Q43

E	-
C	-0.5V
B	-

Q44

E	-1.2V
C	-
B	-

Q51

E	57.7V
C	0V
B	57.7V

Q53, Q54

E	-
C	57.7V
B	52V

Q55, Q56

E	-
C	-57.7V
B	-52V

**TONE UNIT (X11-258X-XX)**

IC1

1	0V
2,3	10.3V
4	-20V
5-7	-
8	20V

IC2

1	-12.5V
2	-0.2V
3	0V
4	-20.1V
5	5V
6	4.9V
7	12.5V
8	20.1V

IC3

1-3	0V
4	-16V
5-7	0V
8	16V

IC4

1-5	-
6	12V
7-8	-

IC5

IN	27V
OUT	12V
GND	-

IC6

1-3	-
-----	---

IC7

1-3	0V
4	-16V
5-7	0V
8	16V

IC8

1	-
2	4.5V
3	-
4	4.7V
5,6	-
7,8	12V
9	-
10	4.5V

IC9

1-4	-
5,6	4.5V
7-9	-
10	5V
11-20	-

IC10

IN	-
RS	-
GND	-

Q1

G	0V
D	4.7V
S	0.3V

Q2

G	0V
D	0.3V
S	4.7V

Q3, Q4

G	-
D	-
S	-

Q5, Q6

E	4.7V
C	10.3V
B	5.3V

Q7, Q8, Q16, Q18, Q19, Q28, Q29, Q30, Q31, Q32, Q33, Q34, Q35, Q36

E	-
C	-
B	-

Q9, Q10

E	-
C	-6.1V
B	-15V

Q11

E	20.1V
C	27V
B	20.7V

Q12

E	-20V
C	-27V
B	-20.7V

Q13

E	5V
C	-27V
B	15V

Q14

E	-27V
C	0V
B	-

Q17

E	12V
C	-
B	-

Q20, Q21

E	-
C	0V
B	10.7V

Q22, Q23

E	6.3V
C	-
B	0V

Q24

E	12V
C	5.7V
B	6.3V

Q25

E	5.7V
C	12V
B	6.3V

**DIGITAL I/O UNIT (X88-1010-00)**

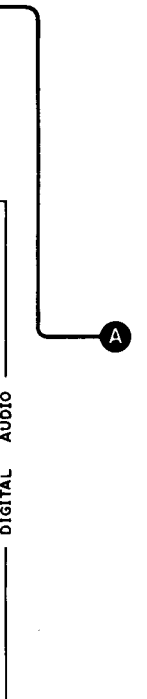
Ref. No.	IC	Q	Address
	1		4G
	2		4H
	3		5H
	4		4G
	5		5G

**PROCESSOR UNIT (X32-1290-00)**

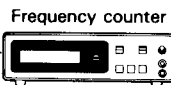
Ref. No.	IC	Q	Address
	1		5J
	2		4I
	11		5M
	12		5L
	13		5L
	14		5L
	15		5L
	16		6I
	17		6I
	18		6K
	19		6K
	21		5I
	22		5I
	23		4J
	24		4J
	25		4L
	1		3M
	2		2M
	3		3M
	4		4M
	5		3M
	6		2K
	7		4L
	8		4I
	9		6K
	10		5K
	11		5L
	12		5J
	13		5J
	14		5J
	15		5I
	16		5I
	17		5I
	18		5L
	19		6K
	20		6J
	21		6I
	22		6L
	23		6L
	24		6L

**TONE UNIT (X11-258X-XX)**

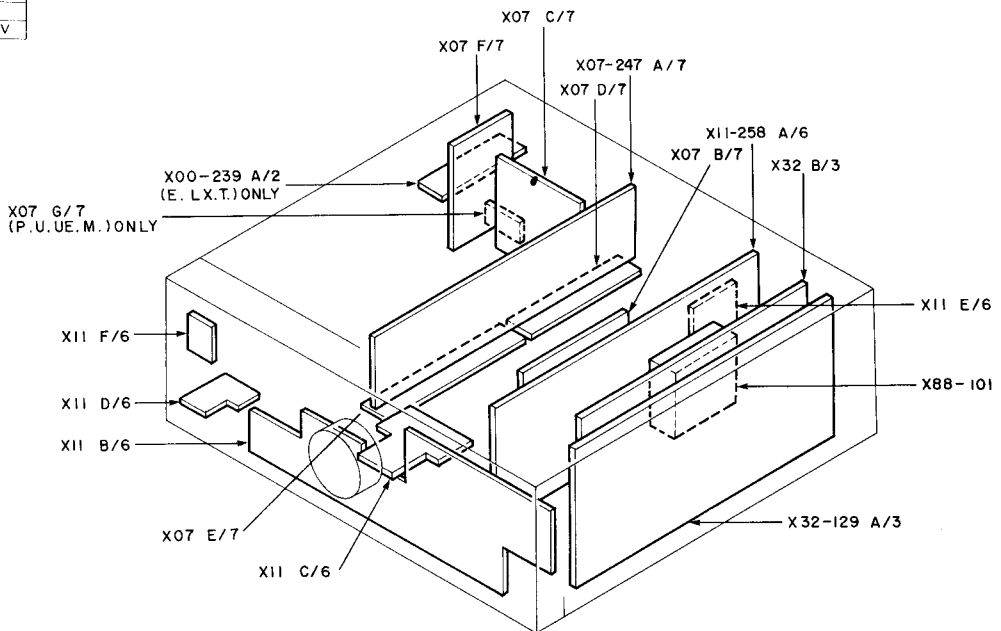
Ref. No.	IC	Q	Address
		28	4F
		29	4F
		30	5F
		31	6F
		32	6F
		33	6F
		34	6F
		35	6K
		36	6F
	6		2D
	7		3F
	8		3E
	9		6F
	10		5F



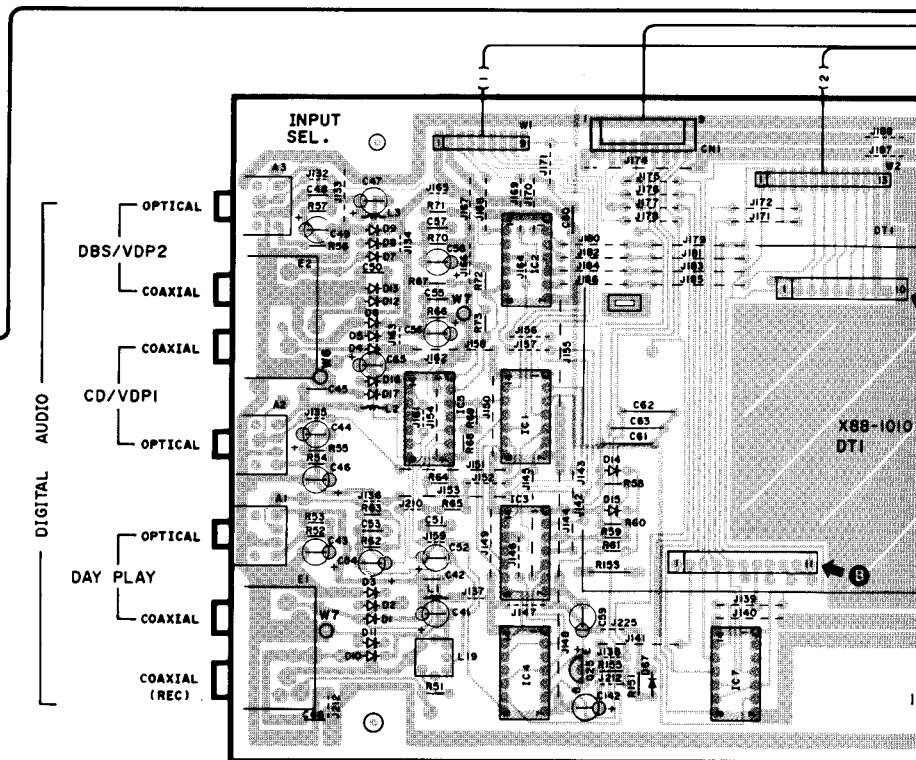
(b) VCOX (1)  
(c) VCOX (2)  
**DC4V**



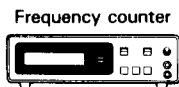
(b) VCOX (1) **18.432 MHz**  
(c) VCOX (2) **16.9344 MHz**



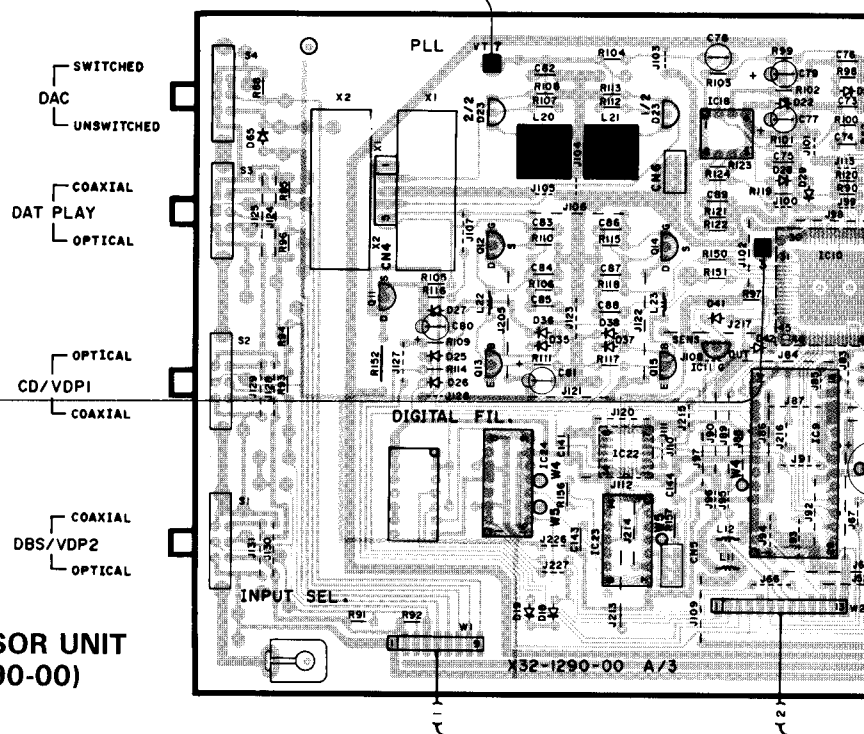
Refer to the schematic diagram for the values of resistors and capacitors.



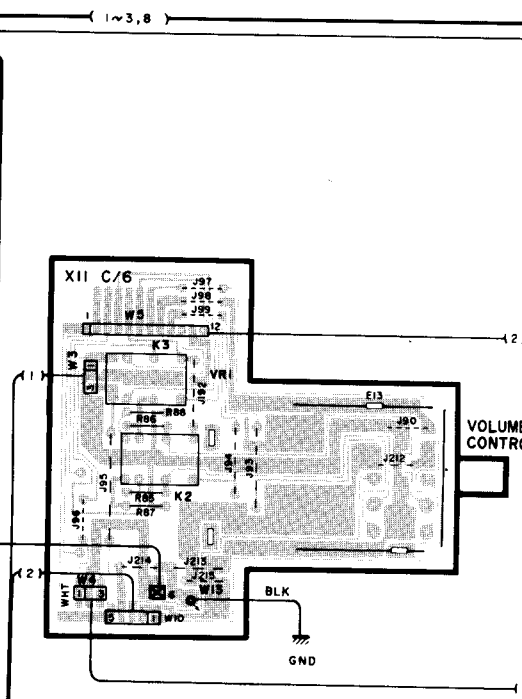
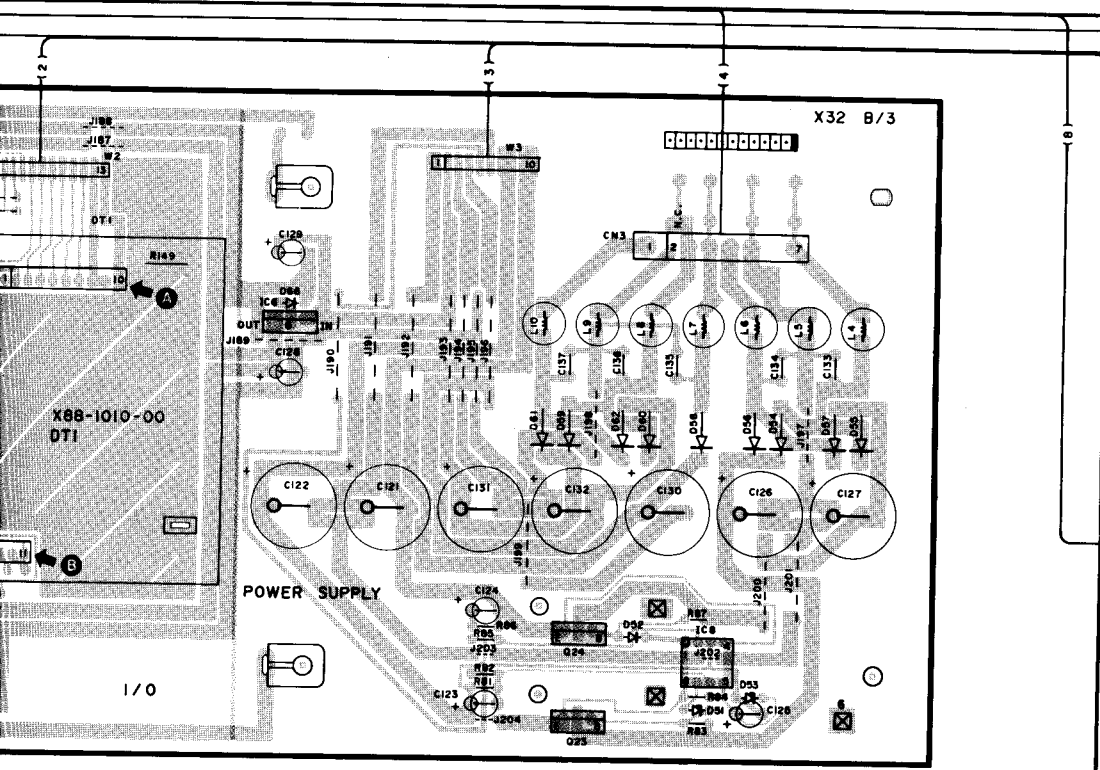
(b) VCOX (1)  
 (c) VCOX (2)  
 DC4V



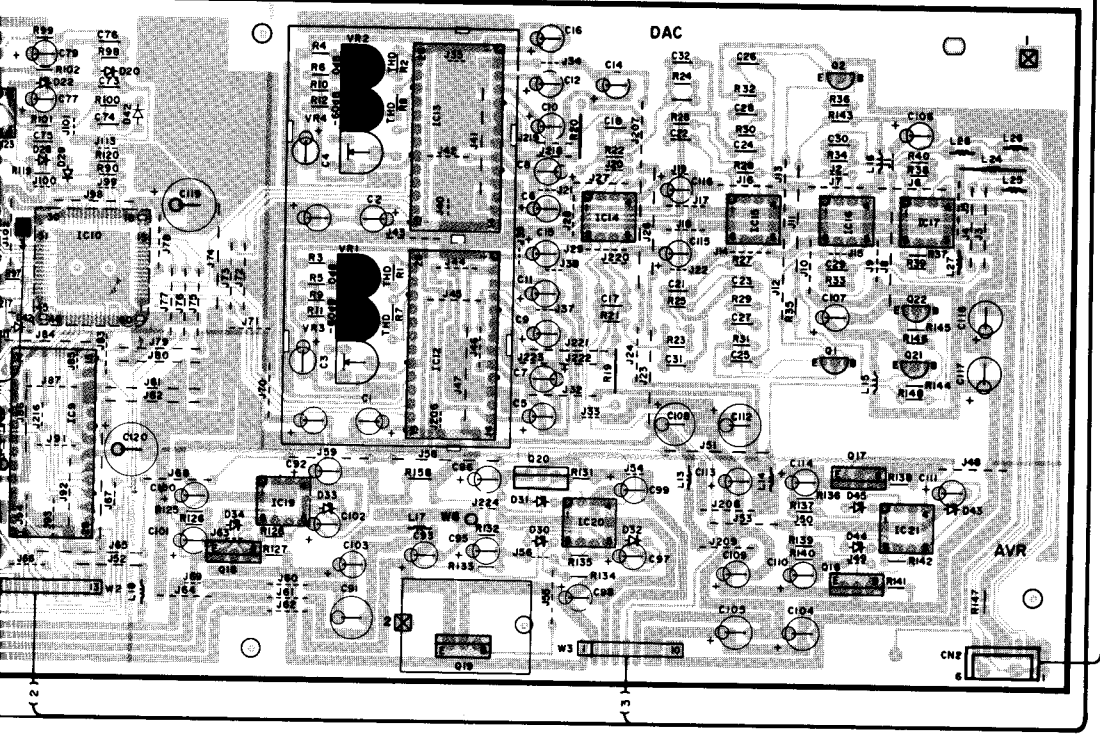
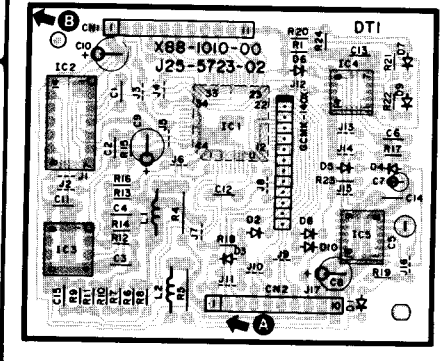
(b) VCOX (1) **18.432 MHz**  
 (c) VCOX (2) **16.9344 MHz**



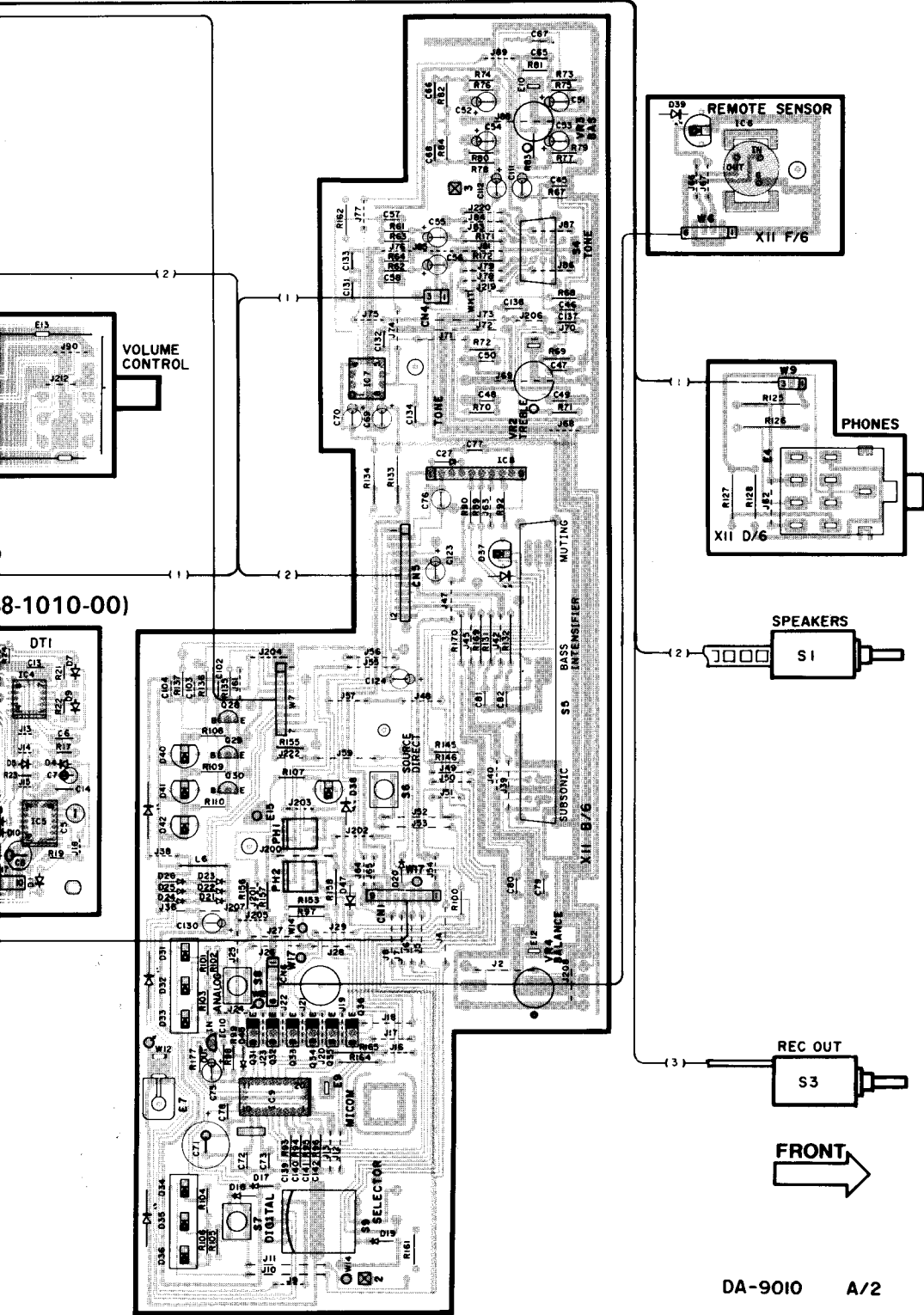
**PROCESSOR UNIT  
 (X32-1290-00)**



DIGITAL I/O UNIT (X88-1010-00)

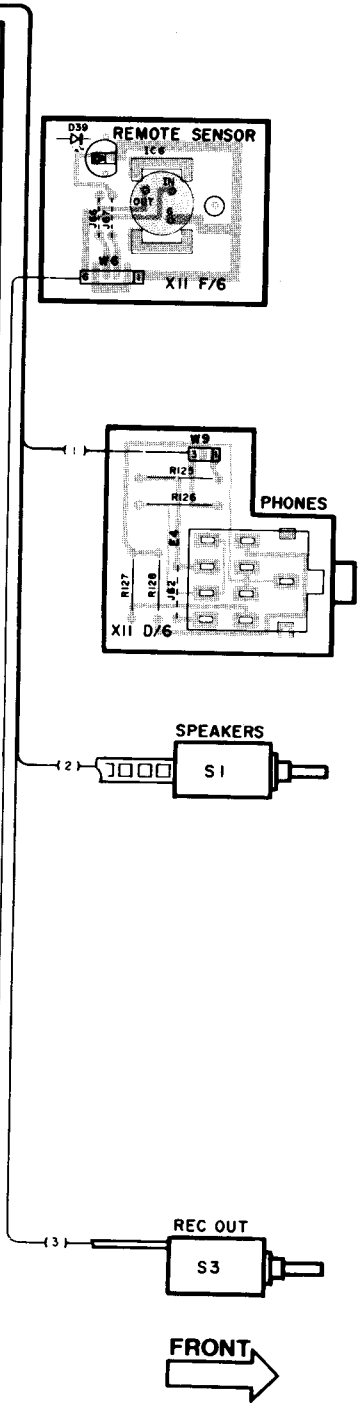


TONE UNIT (X11-258X-XX)



DA-9010 A/2

XX)



**DIGITAL I/O UNIT  
(X88-1010-00)**

Ref. No.		Address
IC	Q	
1		4AE
2		4AE
3		5AE
4		4AE
5		5AF

**PROCESSOR UNIT  
(X32-1290-00)**

Ref. No.		Address
IC	Q	
1		6AC
2		5AC
11		5Z
12		5Z
13		6Z
14		5AA
15		6AA
16		6AD
17		6AD
18		6AA
19		7AB
21		6AD
22		5AD
23		4AC
24		4AC
25		4Z
1		3Z
2		2Z
3		3Z
4		4Z
5		3Z
6		3AB
7		4AA
8		4AC
9		6AA
10		5AA
11		5AA
12		6AB
13		5AB
14		5AC
15		5AC
16		5AC
17		5AD
18		5AA
19		6AB
20		6AC
21		6AD
22		6Z
23		6Z
24		6Z

**TONE UNIT  
(X11-258X-XX)**

Ref. No.		Address
IC	Q	
	28	4AF
	29	5AF
	30	5AF
	31	6AF
	32	6AF
	33	6AF
	34	6AG
	35	6AG
	36	6AG
6		2AH
7		3AG
8		3AG
9		6AF
10		6AF

DA-9010 A/2

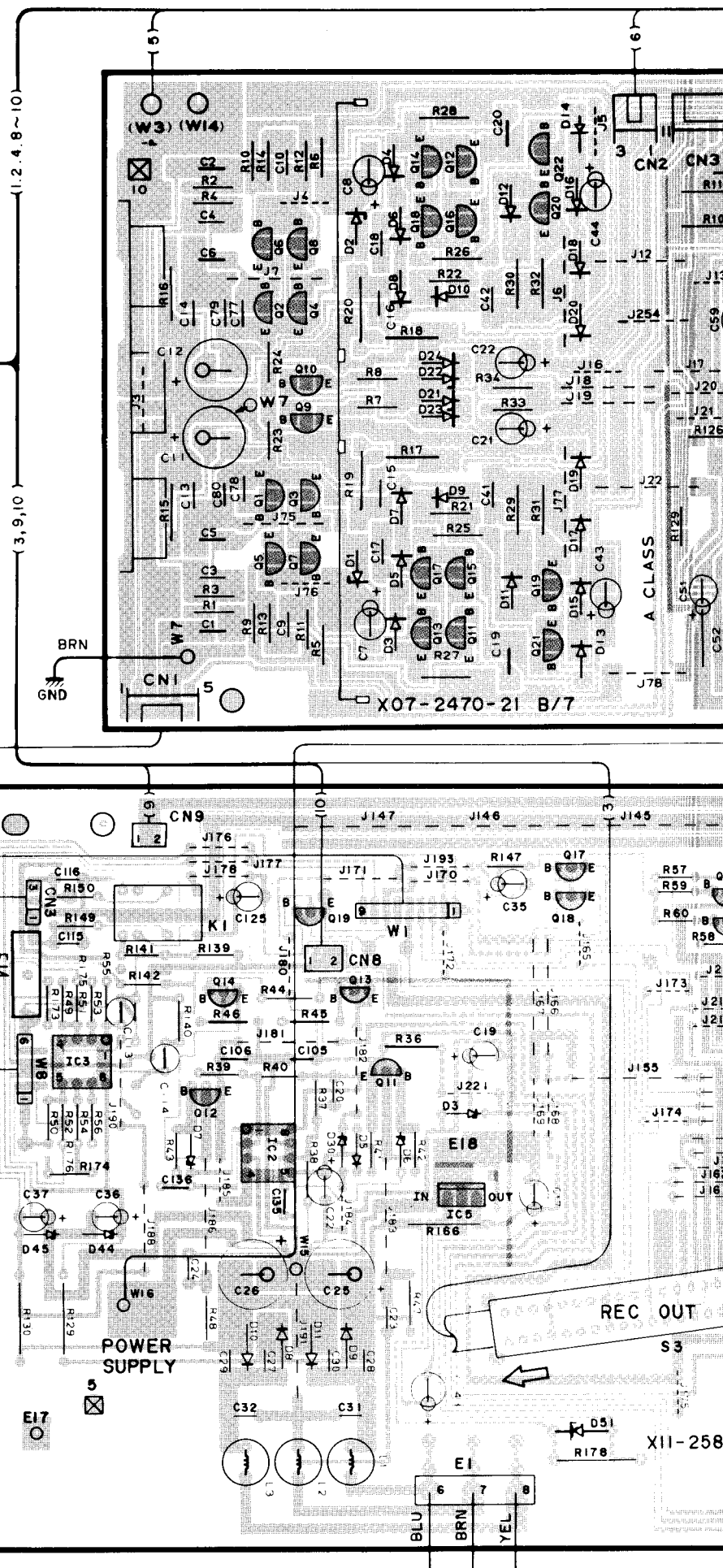
# PC BOARD (Component side view)

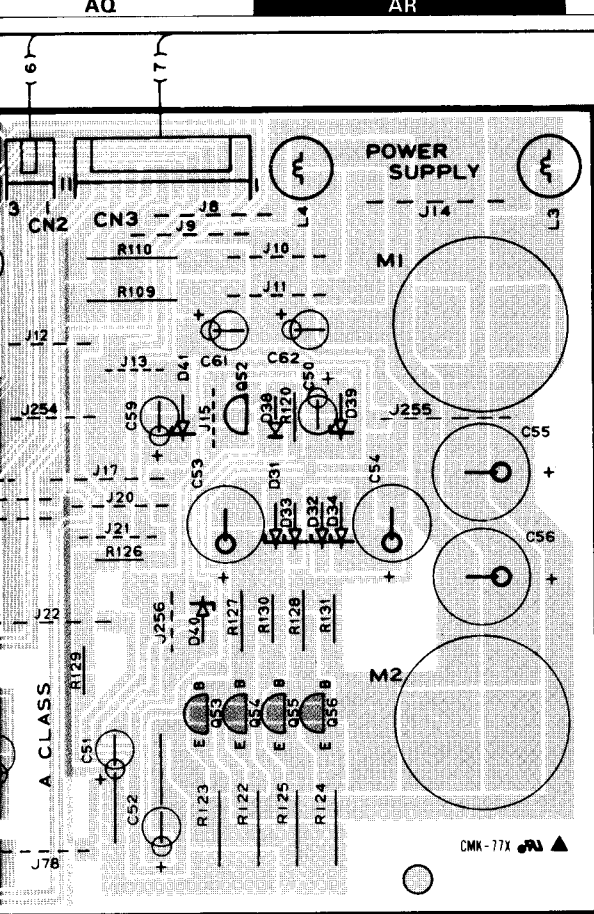
## TONE UNIT (X11-2580-00)

Ref. No. IC	Q	Address
1	1	6AS
2	2	6AS
3	3	7AS
4	4	7AS
5	5	6AS
6	6	6AS
7	7	7AS
8	8	7AS
9	9	6AT
10	10	7AT
11	11	5AP
12	12	5AO
13	13	5AP
14	14	5AO
15	15	4AQ
16	16	4AQ
17	17	4AP
18	18	4AP
19	19	4AO
20	20	2AT
21	21	3AT
22	22	2AT
23	23	3AT
24	24	2AT
25	25	3AT
1	1	6AR
2	2	5AO
3	3	5AN
4	4	2AU
5	5	5AP

## MAIN AMPLIFIER UNIT (X07-2470-21)

Ref. No. IC	Q	Address
1	1	3AO
2	2	2AO
3	3	3AO
4	4	2AO
5	5	3AO
6	6	2AO
7	7	3AO
8	8	2AO
9	9	2AO
10	10	2AO
11	11	3AP
12	12	1AP
13	13	3AP
14	14	1AP
15	15	3AP
16	16	1AP
17	17	3AP
18	18	1AP
19	19	3AP
20	20	3AP
21	21	3AP
22	22	1AP
23	23	6AY
24	24	6BB
25	25	6AY
26	26	6BA
27	27	6AY
28	28	6BB
29	29	6AX
30	30	6BB
31	31	5AZ
32	32	5BD
33	33	5AW
34	34	5BA
35	35	6AY
36	36	5BC
37	37	5AX
38	38	5BB
39	39	6AX
40	40	5BC
41	41	5AX
42	42	5BC
43	43	5AX
44	44	5BB
53	53	3AQ
54	54	3AQ
55	55	3AR
56	56	3AR
7BD	7BD	7BD





# RTV servis Horvat

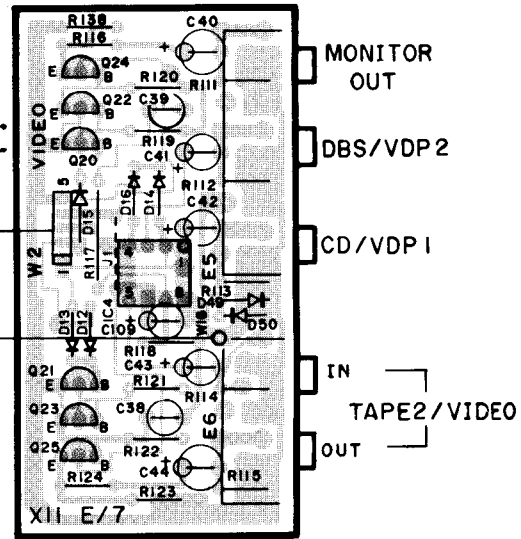
Kešinci, 31402 Semeljci

Tel : 031-856-637

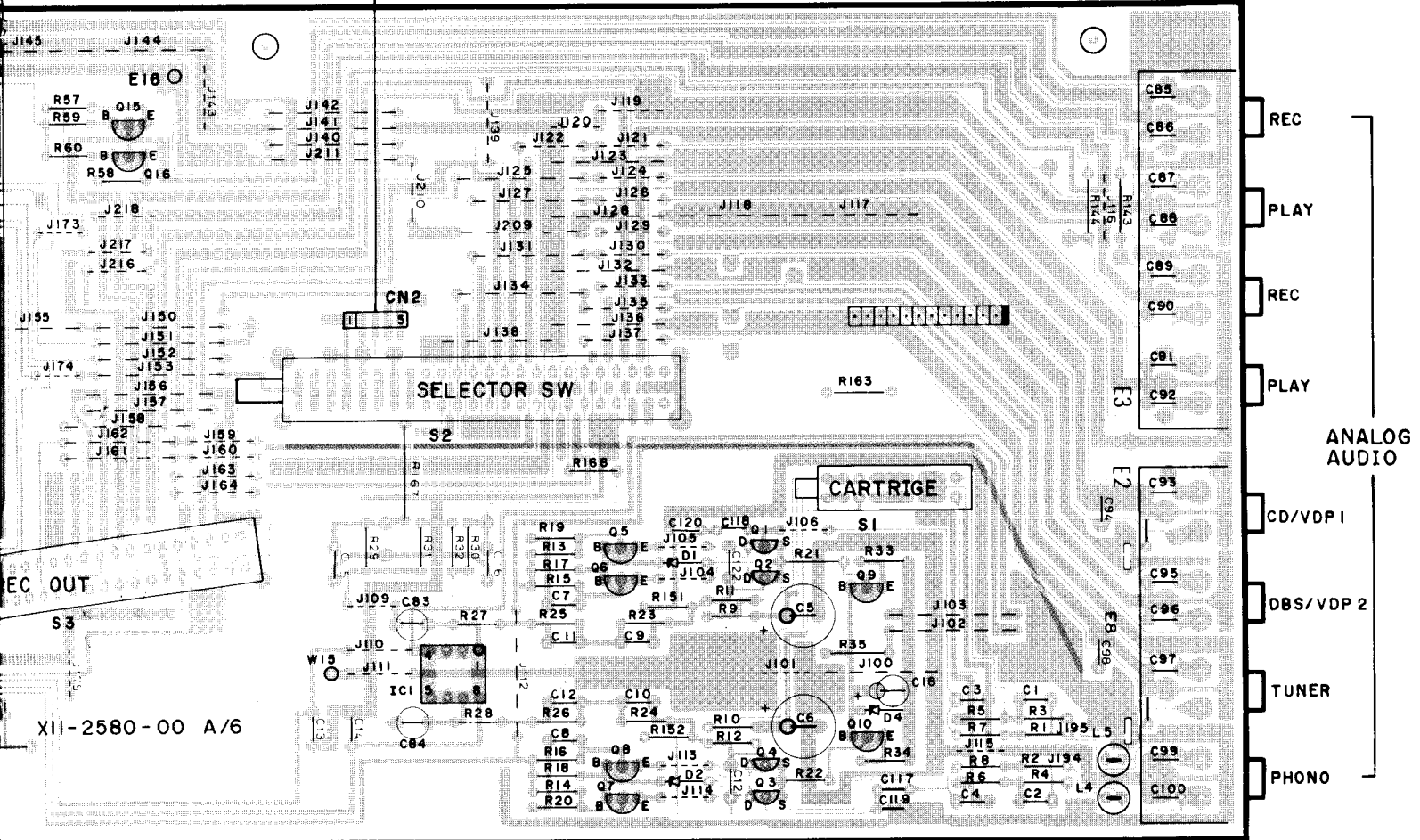
Tel / fax : 031-856-139

Mob : 098-788-319

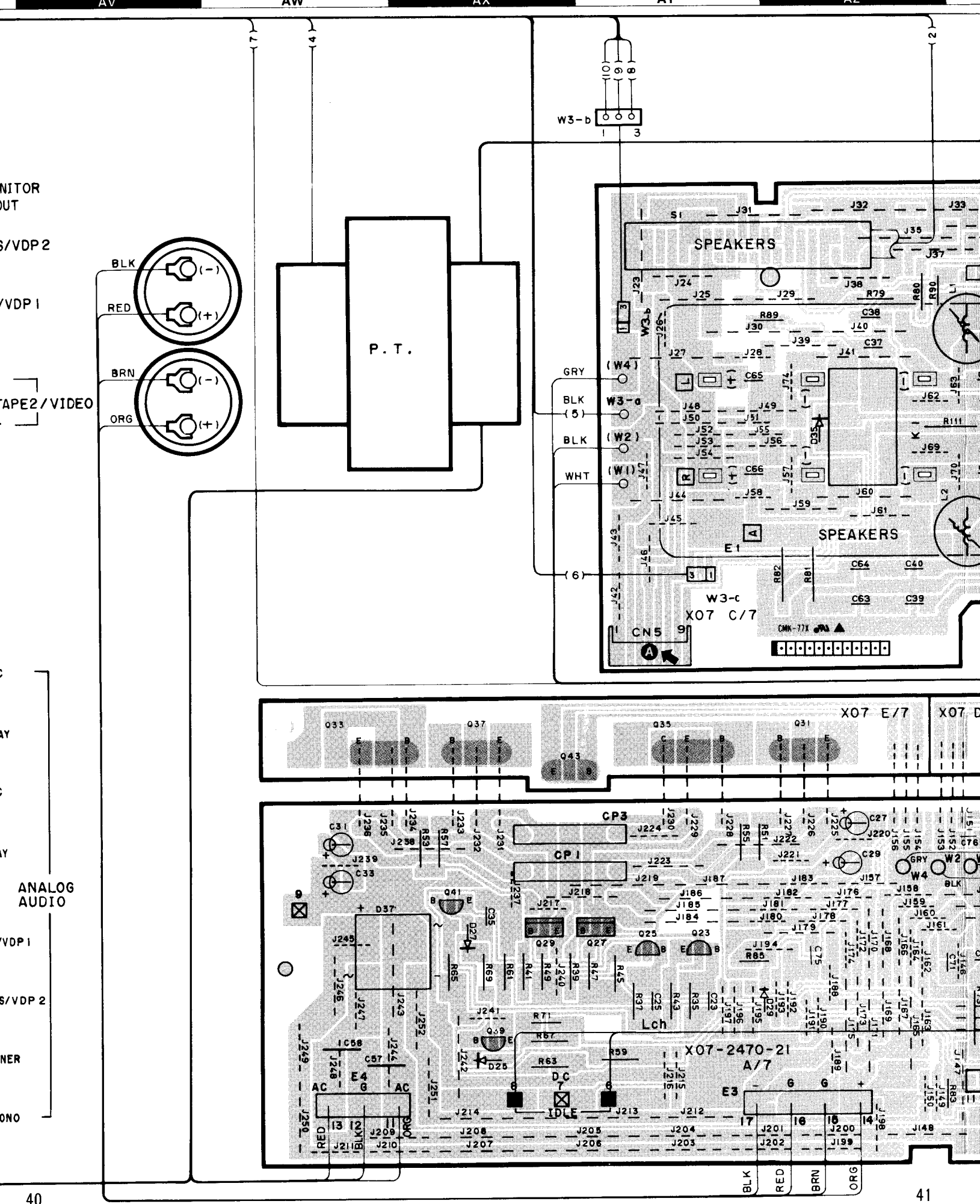
[rtv-servis-horvat@os.tel.hr](mailto:rtv-servis-horvat@os.tel.hr)



## TONE UNIT (X11-2580-00)







MONITOR  
OUT

S/VDP 2

S/VDP 1

TAPE2/VIDEO

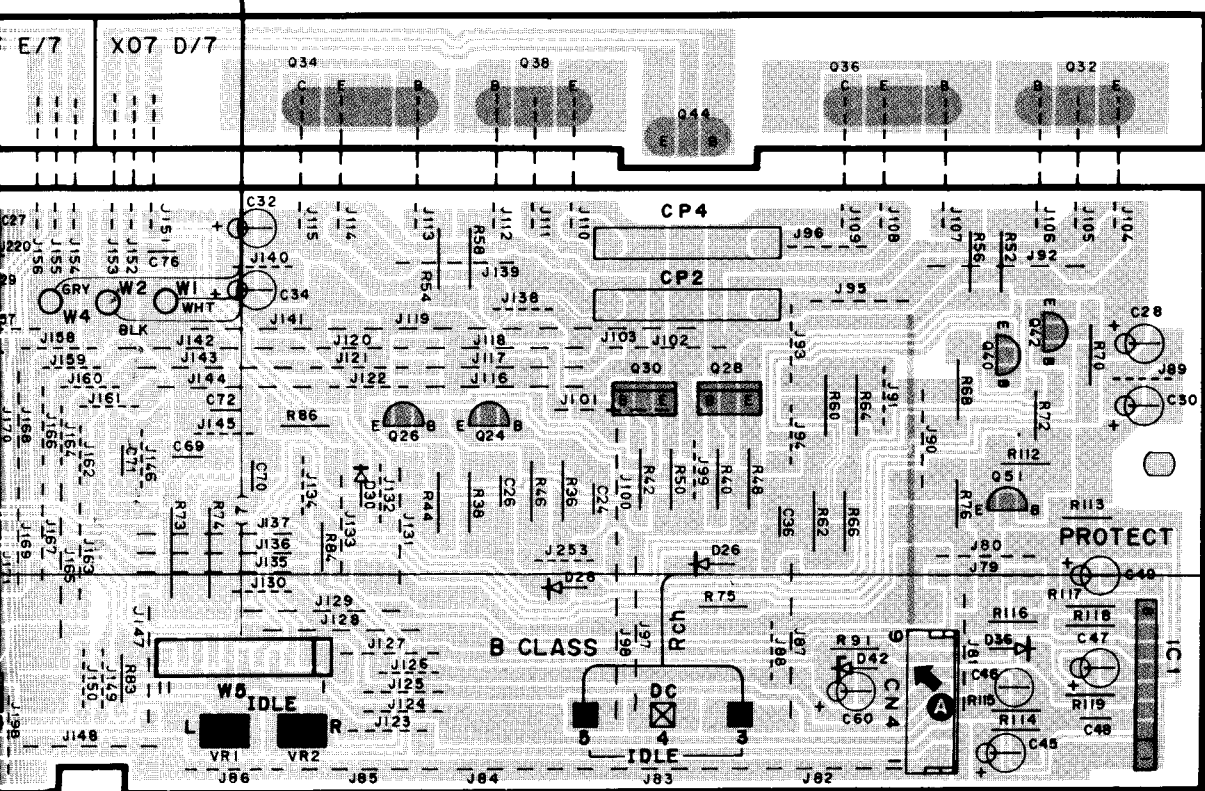
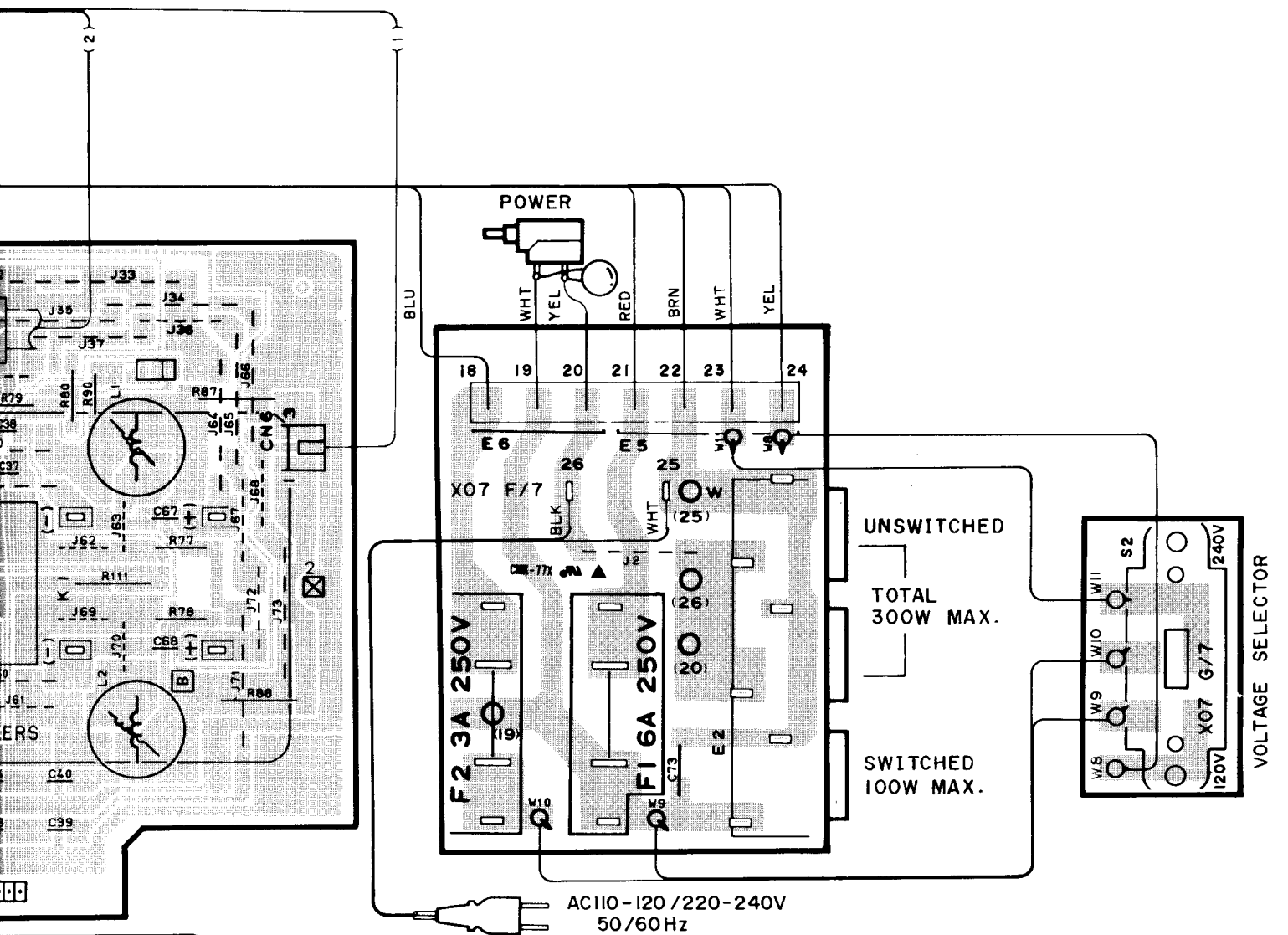
ANALOG  
AUDIO

S/VDP 1

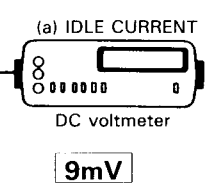
S/VDP 2

MONITOR

MONITOR



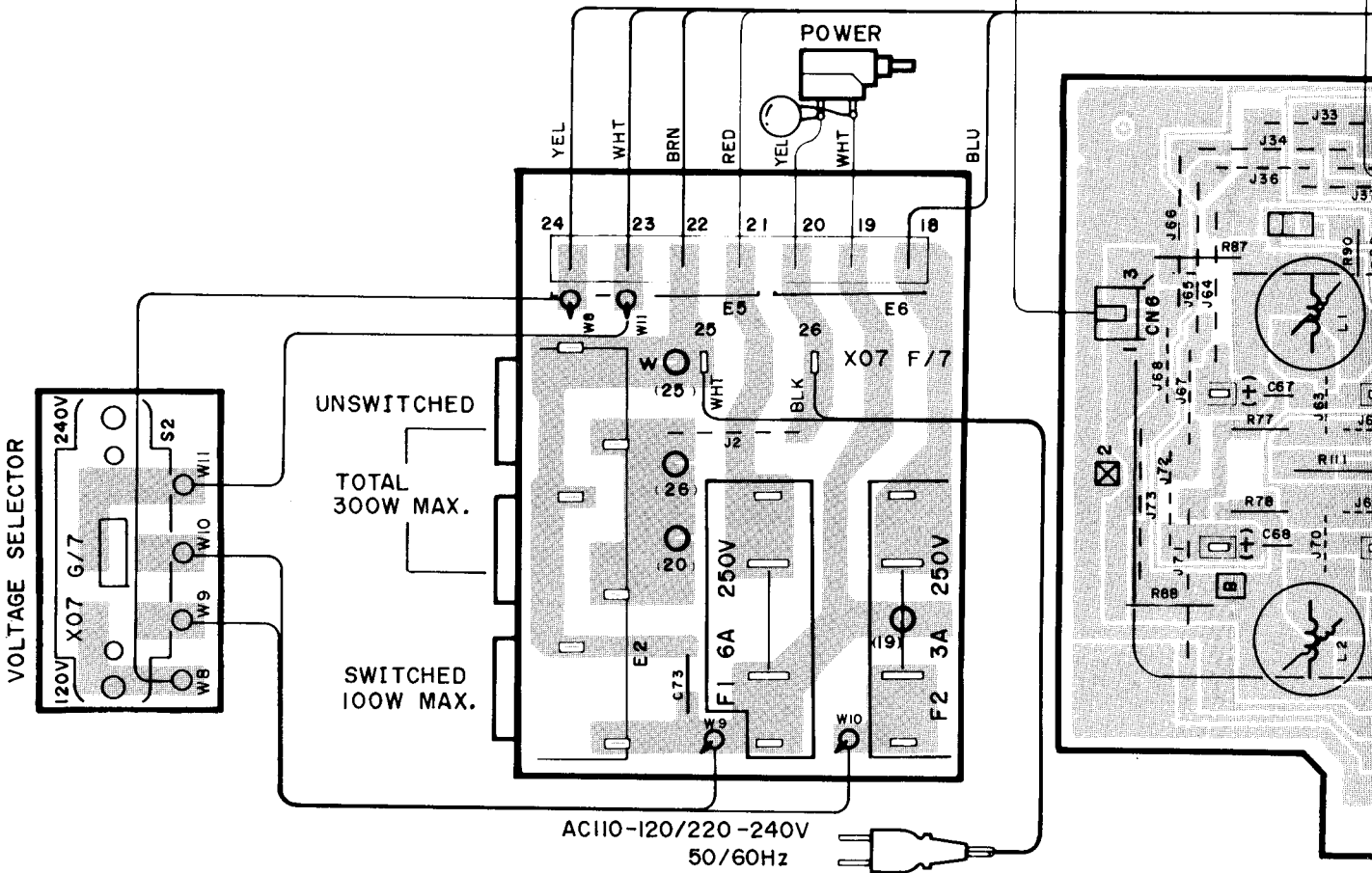
MAIN AMPLIFIER UNIT (XO7-2470-21)



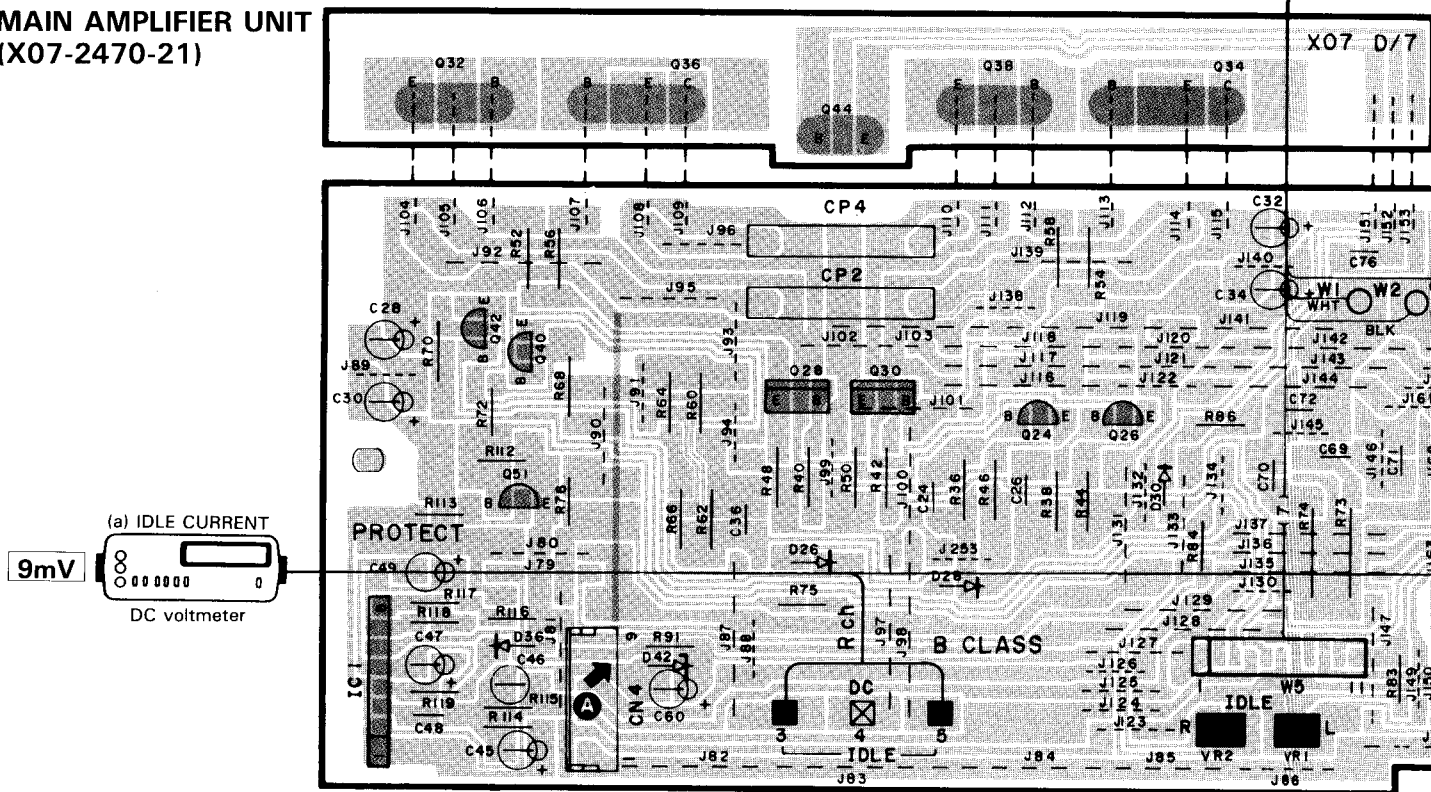
DA-9010 (U,UE,M) (B/2)

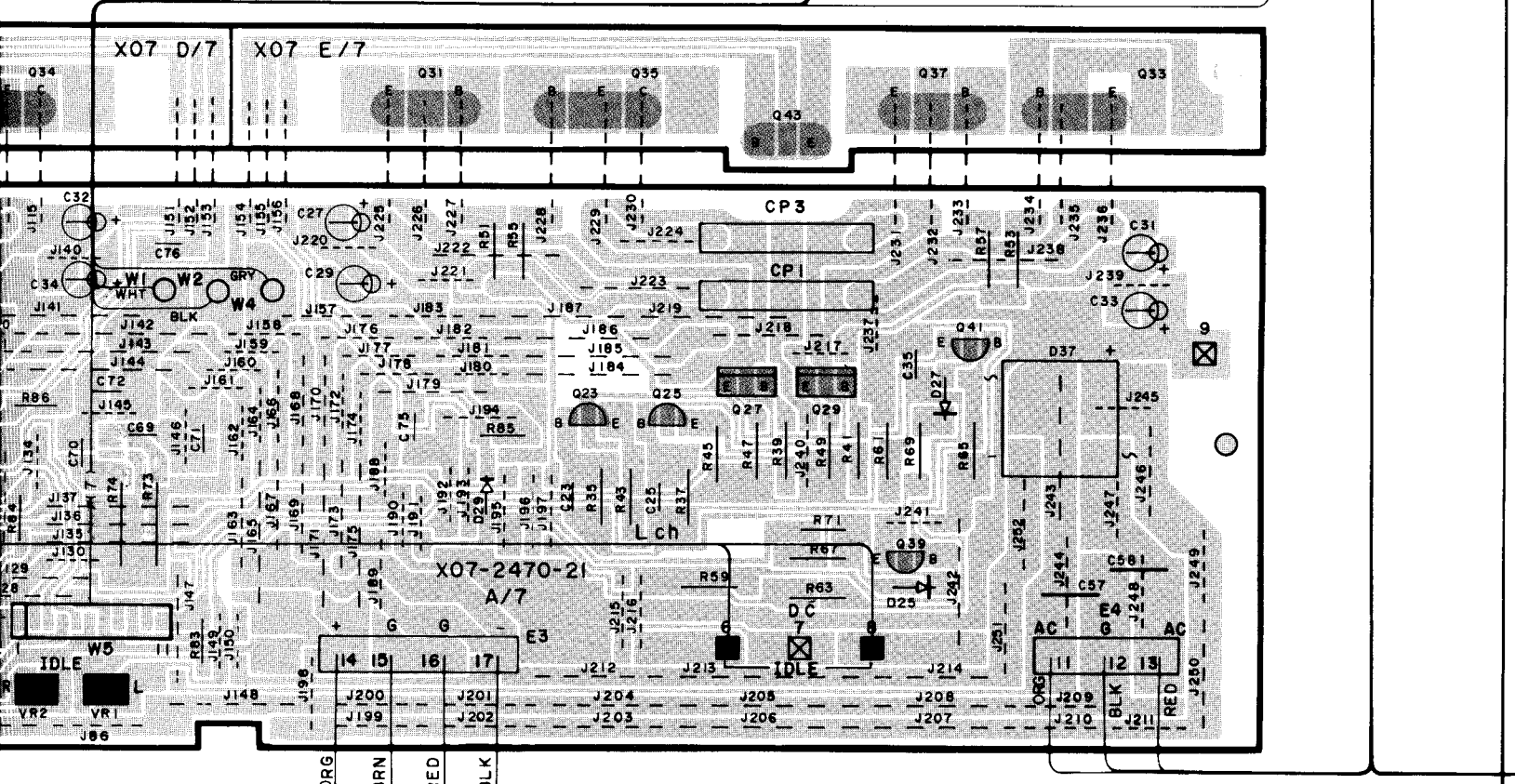
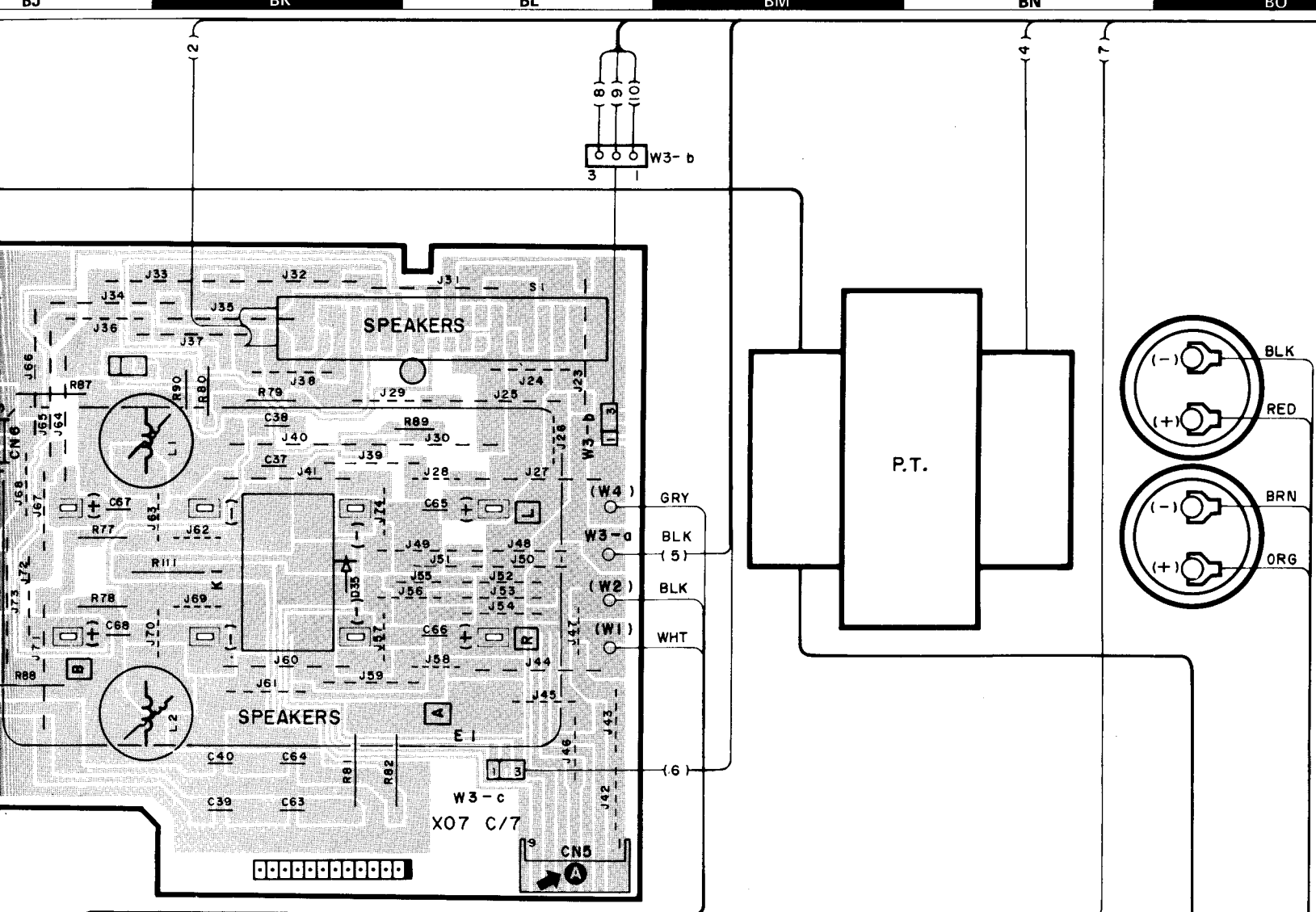
Refer to the schematic diagram for the values of resistors and capacitors.

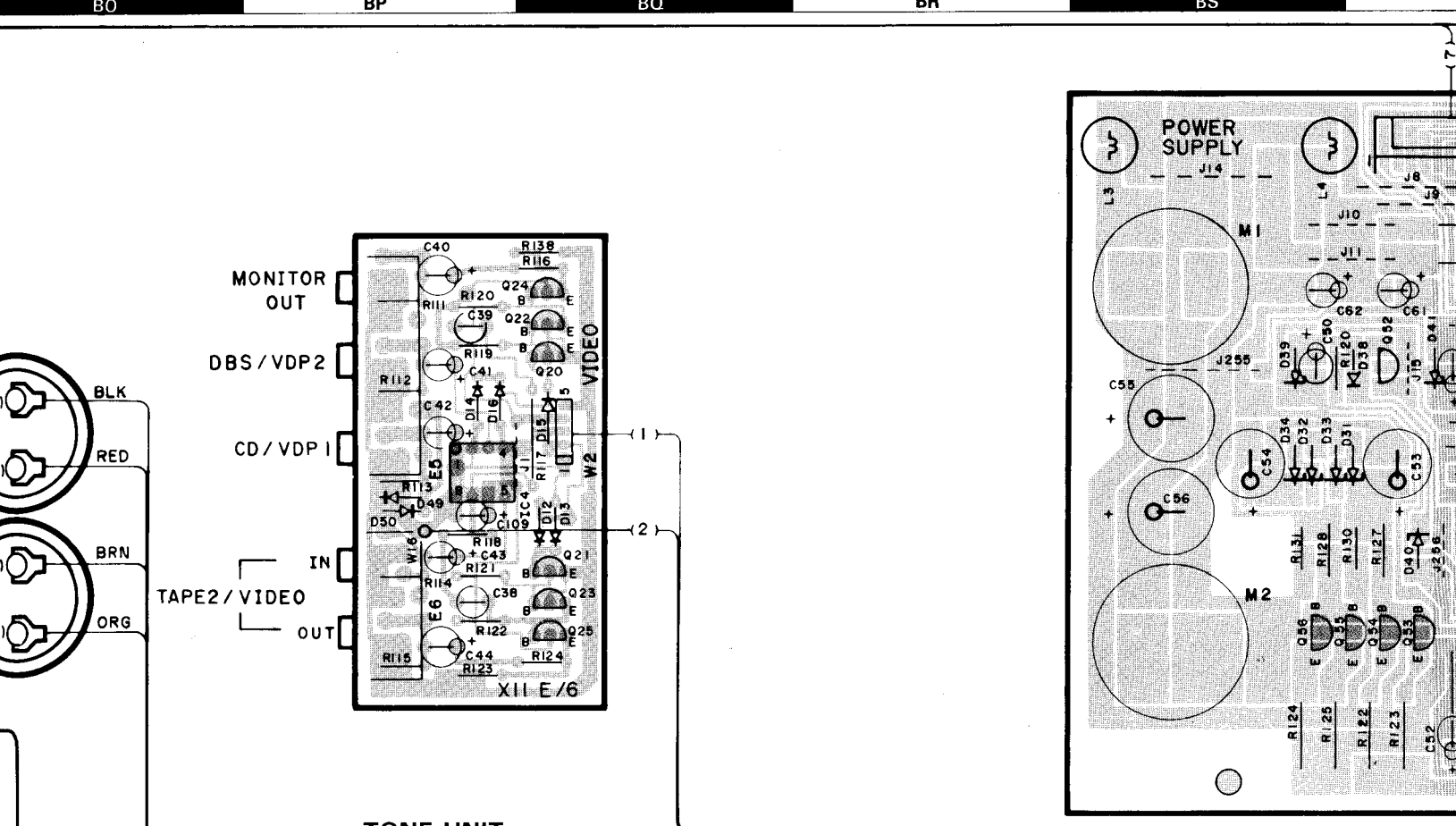
# PC BOARD (Foil side view)



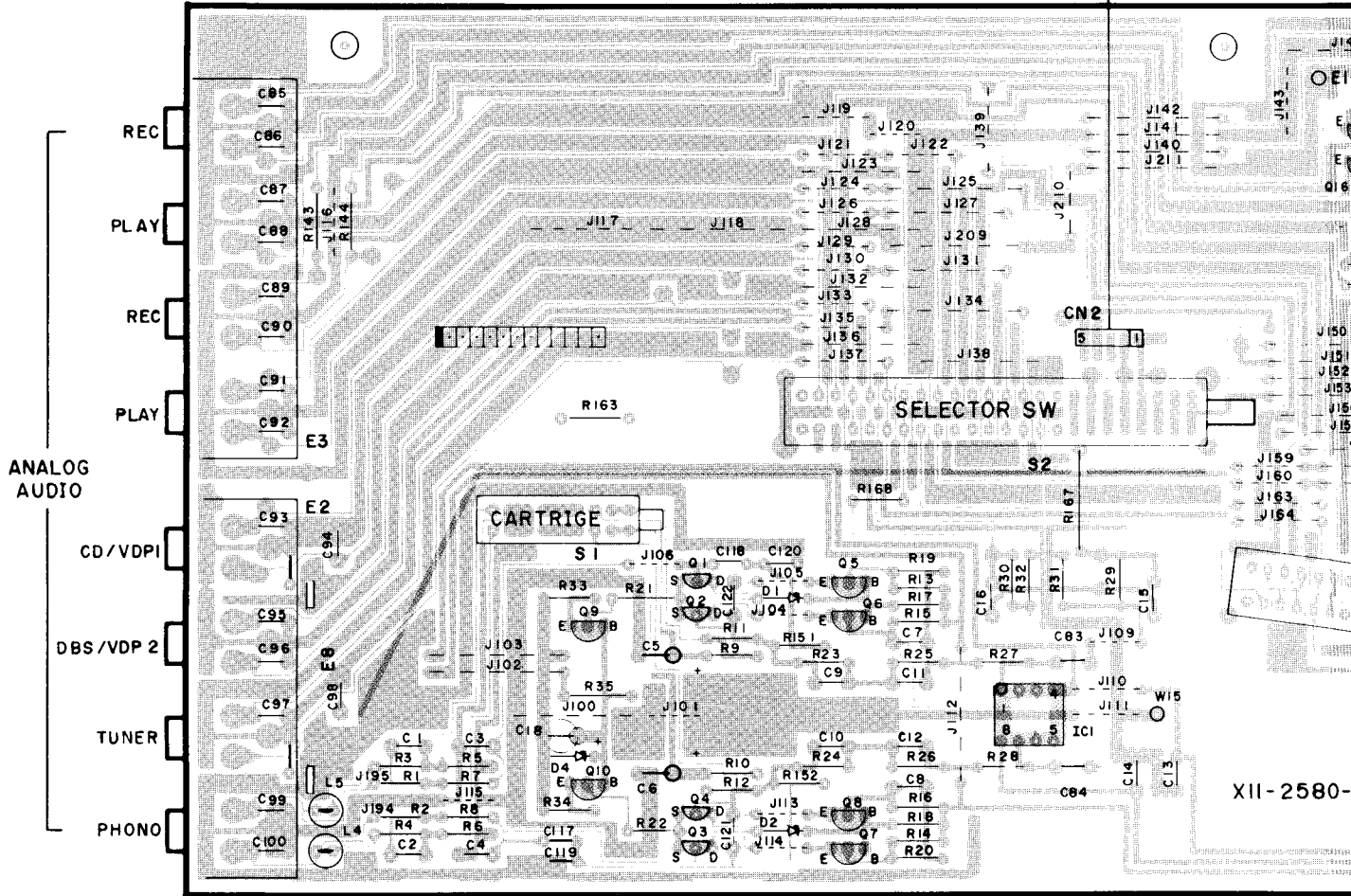
## MAIN AMPLIFIER UNIT (X07-2470-21)

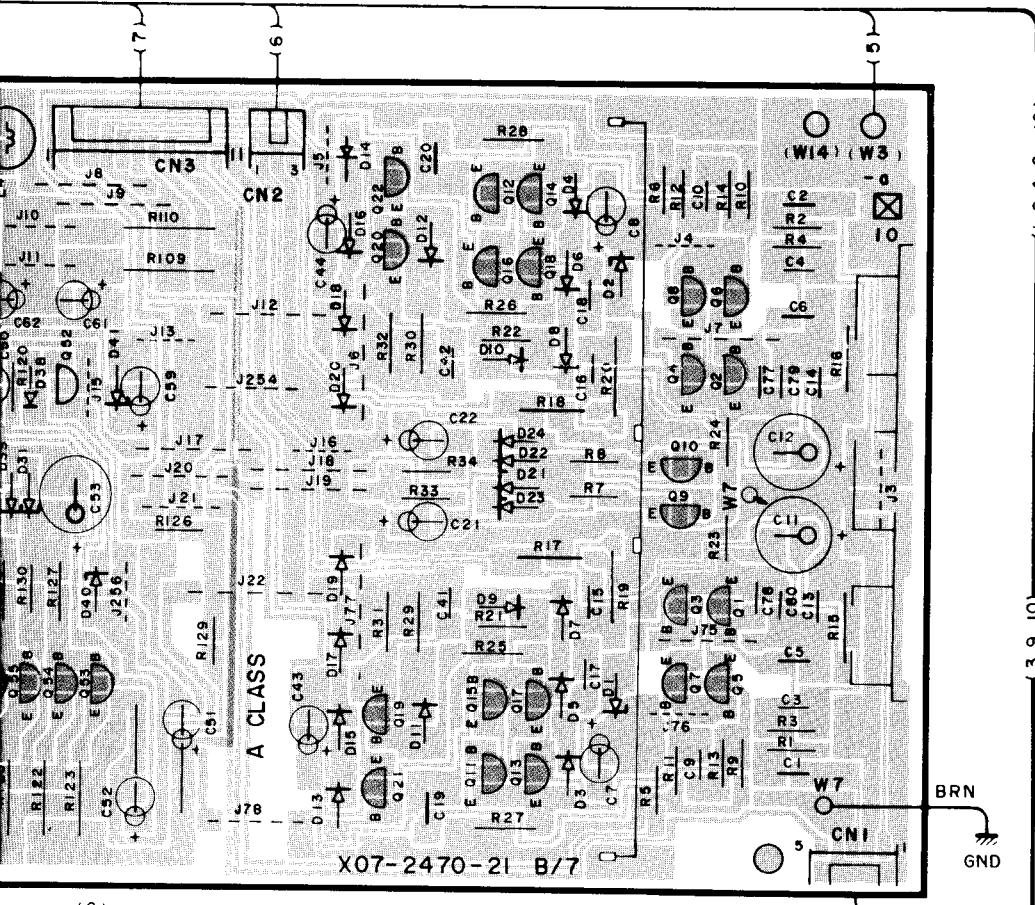




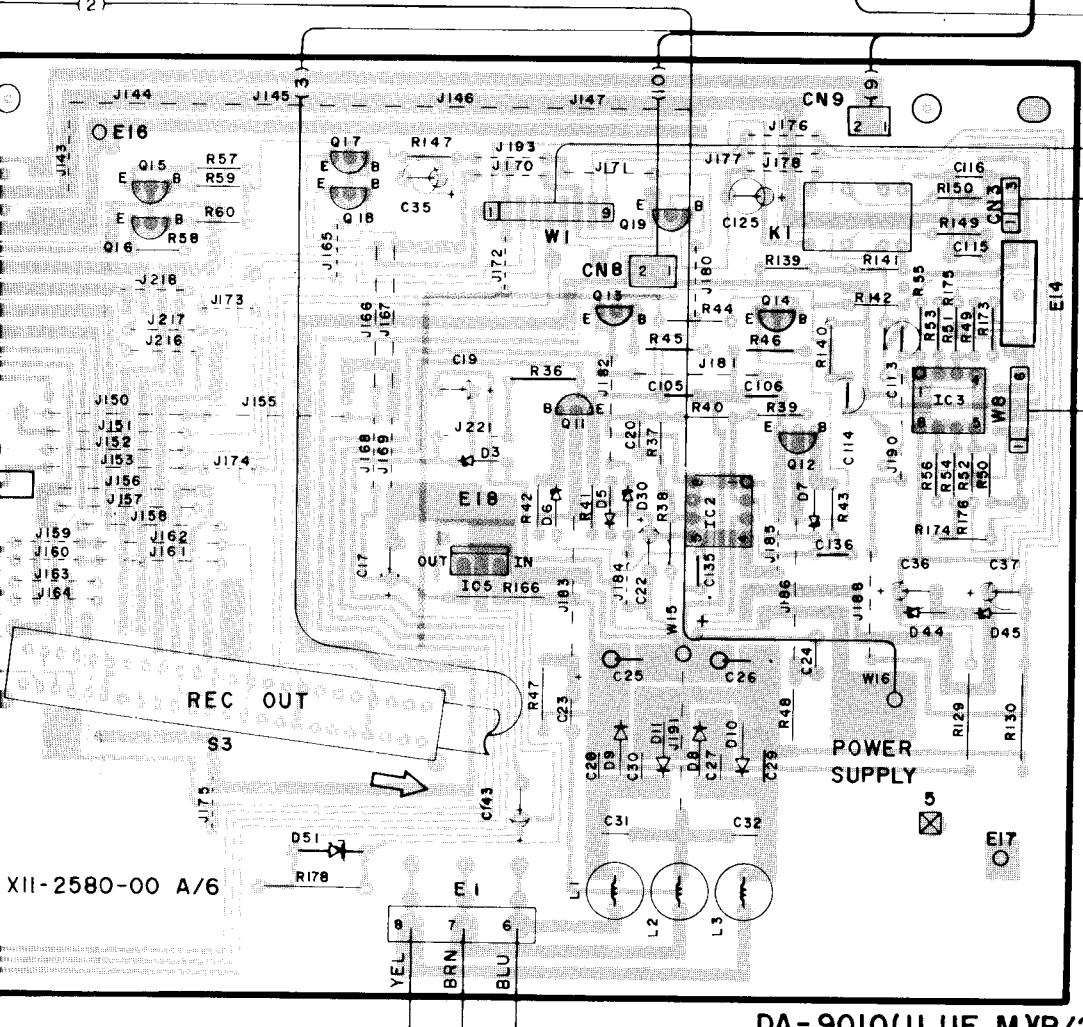


**TONE UNIT  
(X11-2580-00)**





X07-2470-21 B/7



XII-2580-00 A/6

DA-9010(U,UE,MXB/2)

Refer to the schematic diagram for the values of resistors and capacitors.

TONE UNIT (X11-258X-XX)

Ref. No.	IC	Q	Address
1			6BR
2			6BR
3			7BR
4			7BR
5			6BR
6			6BR
7			7BR
8			7BR
9			6BQ
10			7BQ
11			5BU
12			5BV
13			5BV
14			5BV
15			4BT
16			4BT
17			4BU
18			4BU
19			4BU
20			2BQ
21			3BQ
22			2BQ
23			3BQ
24			2BQ
25			3BQ
1			6BS
2			5BV
3			5BV
4			2BP
5			6BU

MAIN AMPLIFIER UNIT (X07-247X-71)

Ref. No.	IC	Q	Address
1			3BV
2			2BV
3			3BV
4			2BV
5			3BV
6			2BV
7			3BV
8			2BV
9			2BV
10			2BV
11			3BU
12			1BU
13			3BU
14			1BU
15			3BU
16			1BU
17			3BU
18			1BU
19			3BU
20			1BU
21			3BU
22			1BU
23			6BL
24			6BI
25			6BL
26			6BJ
27			6BM
28			6BI
29			6BM
30			6BI
31			5BK
32			5BK
33			5BN
34			5BJ
35			6BL
36			5BH
37			5BM
38			5BI
39			6BM
40			5BH
41			6BM
42			5BH
43			5BM
44			5BI
51			6BH
53			3BT
54			3BT
55			3BT
56			3BS
1			7BG

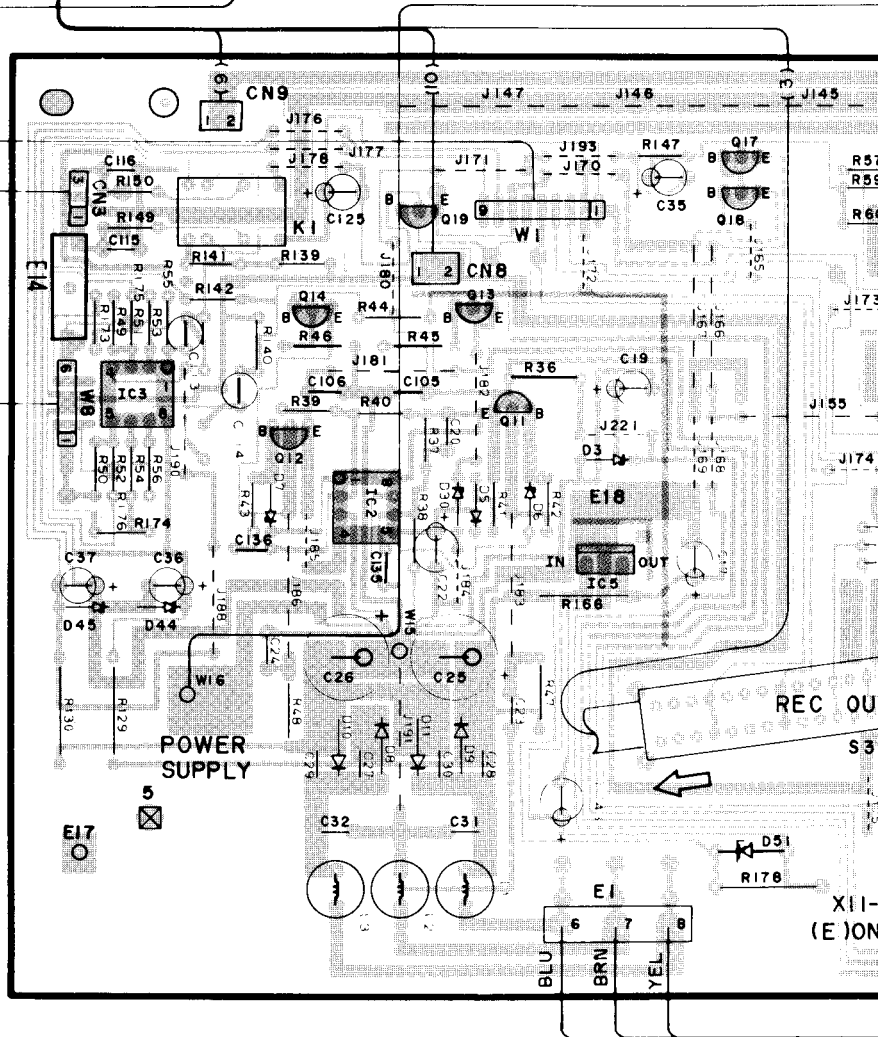
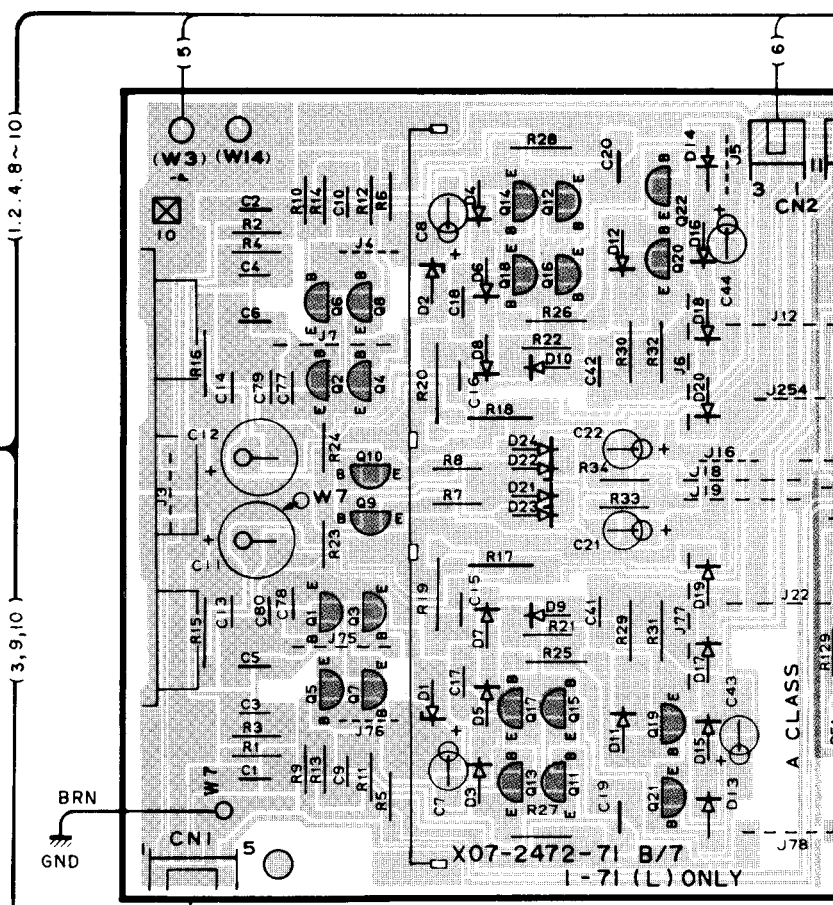
# PC BOARD (Component side view)

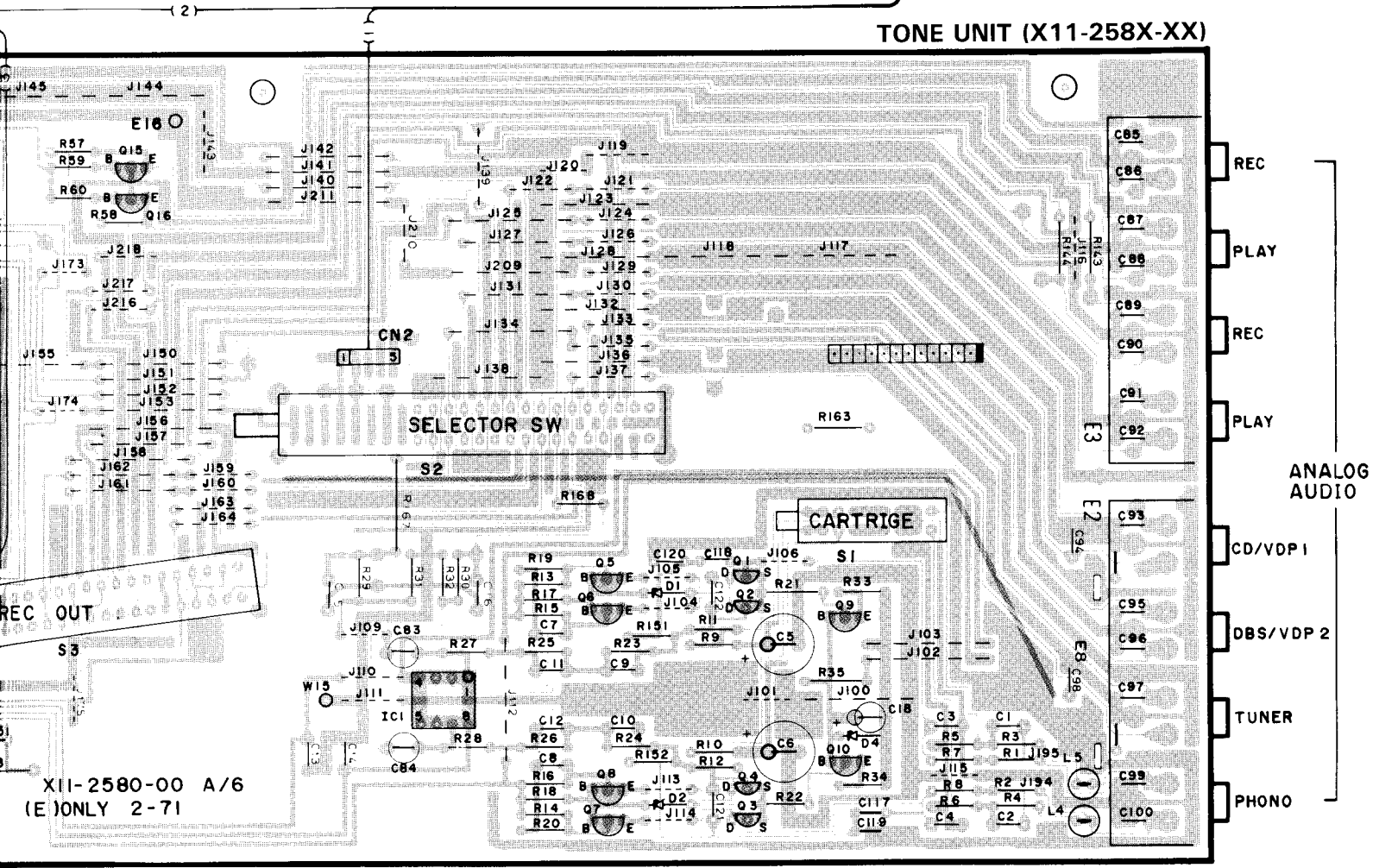
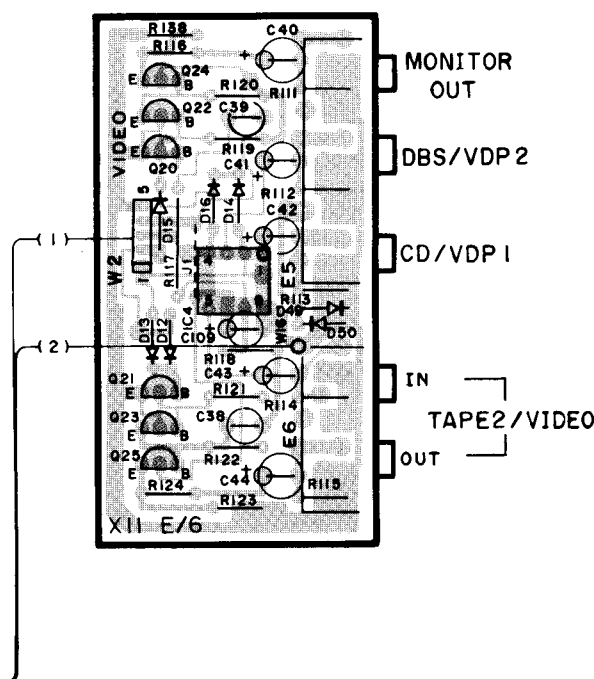
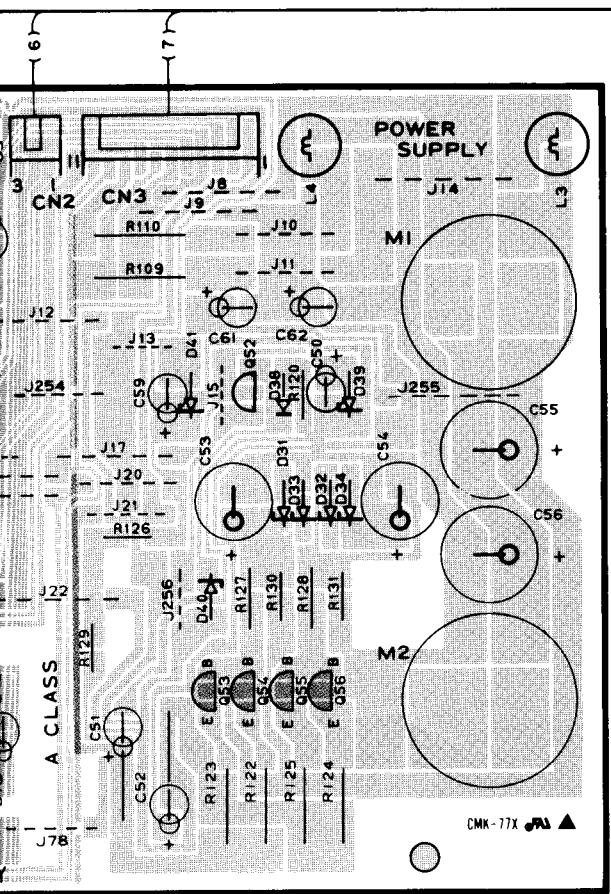
### 1 TONE UNIT (X11-258X-XX)

Ref. No. IC	Q	Address
	1	6CF
	2	6CF
	3	7CF
	4	7CF
	5	6CE
	6	6CE
	7	7CE
	8	7CE
	9	6CF
	10	7CF
	11	5CB
	12	5CA
	13	5CB
	14	5CA
	15	4CC
	16	4CC
	17	4CC
	18	4CC
	19	4CC
	20	2CG
	21	3CG
	22	2CG
	23	3CG
	24	2CG
	25	3CG
1		6CD
2		5CA
3		5CA
4		2CG
5		6CB

### 2 MAIN AMPLIFIER UNIT (X07-247X-71)

Ref. No. IC	Q	Address
	1	3CA
	2	2CA
	3	3CB
	4	2CB
	5	3CA
	6	2CA
	7	3CB
	8	2CB
	9	2CB
	10	2CB
	11	3CB
	12	1CB
	13	3CB
	14	1CB
	15	3CB
	16	1CB
	17	3CB
	18	1CB
	19	3CC
	20	1CC
	21	3CC
	22	1CC
	23	6CK
	24	6CN
	25	6CK
	26	6CN
	27	6CK
	28	6CO
	29	6CJ
	30	6CN
	31	5CL
	32	5CP
	33	5CJ
	34	5CM
	35	5CK
	36	5CO
	37	5CJ
	38	5CN
	39	6CJ
	40	6CO
	41	6CJ
	42	5CP
	43	5CK
	44	5CN
	51	6CP
	53	3CC
	54	3CD
	55	3CD
	56	3CD
1		7CP







MONITOR  
OUT

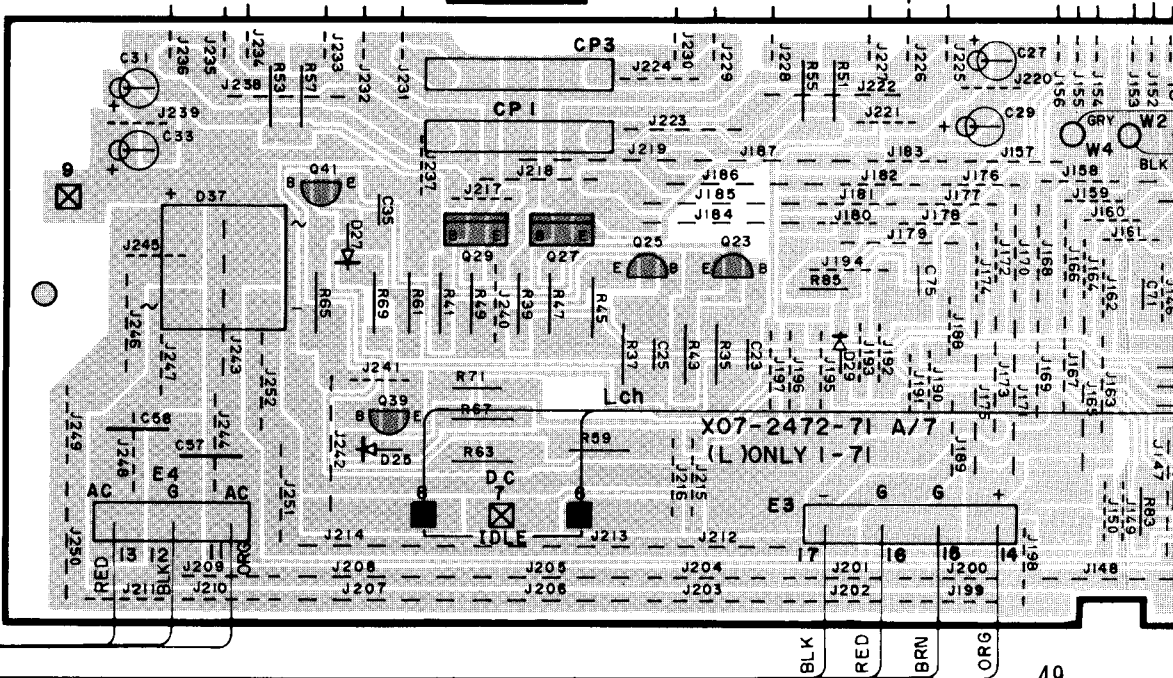
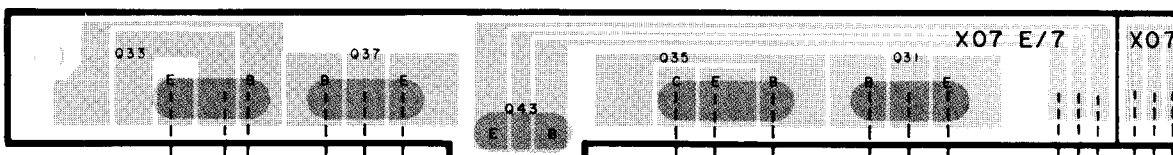
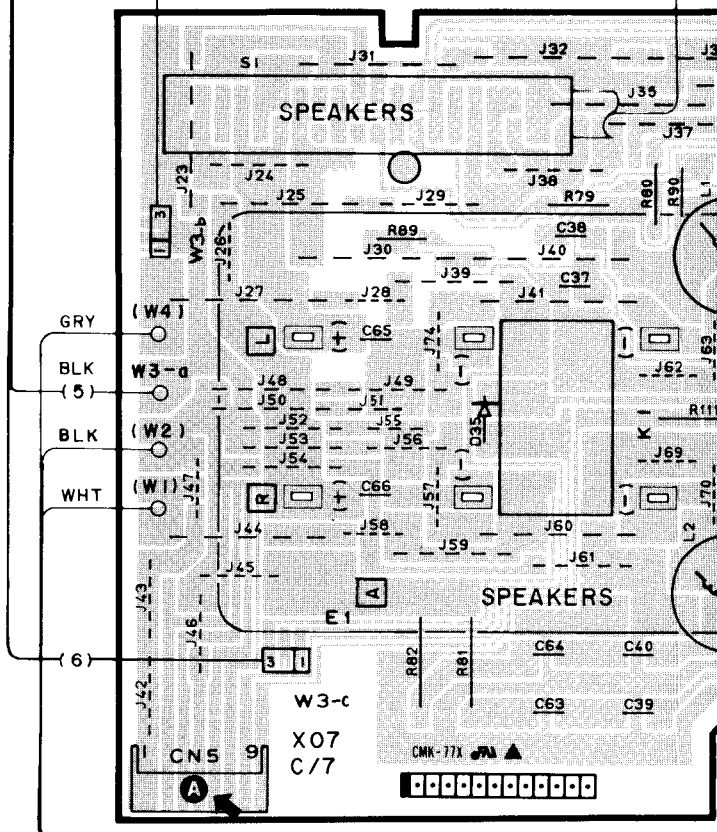
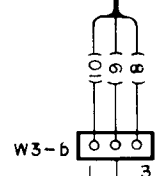
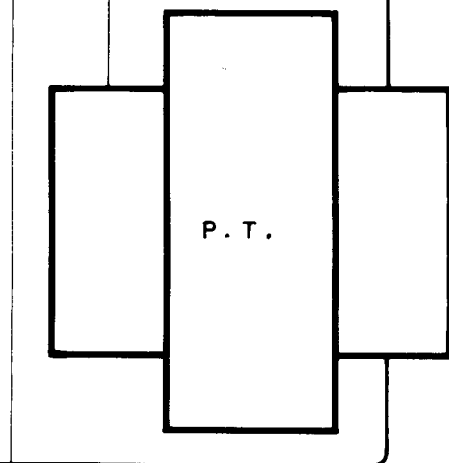
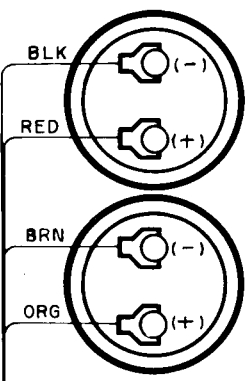
BS/VDP 2

D/VDP 1

IN

TAPE2/VIDEO

UT



REC

LAY

EC

LAY

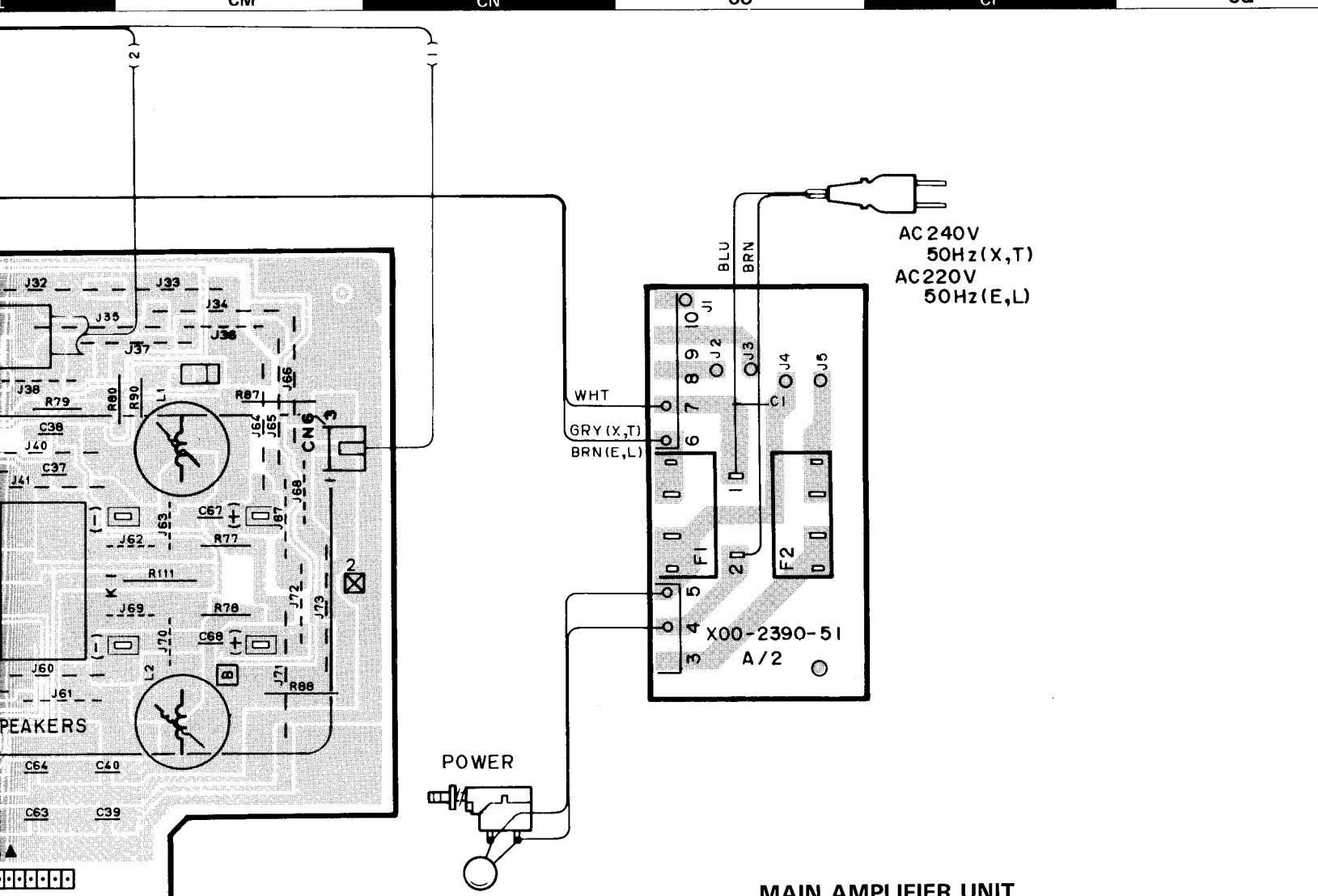
ANALOG AUDIO

D/VDP 1

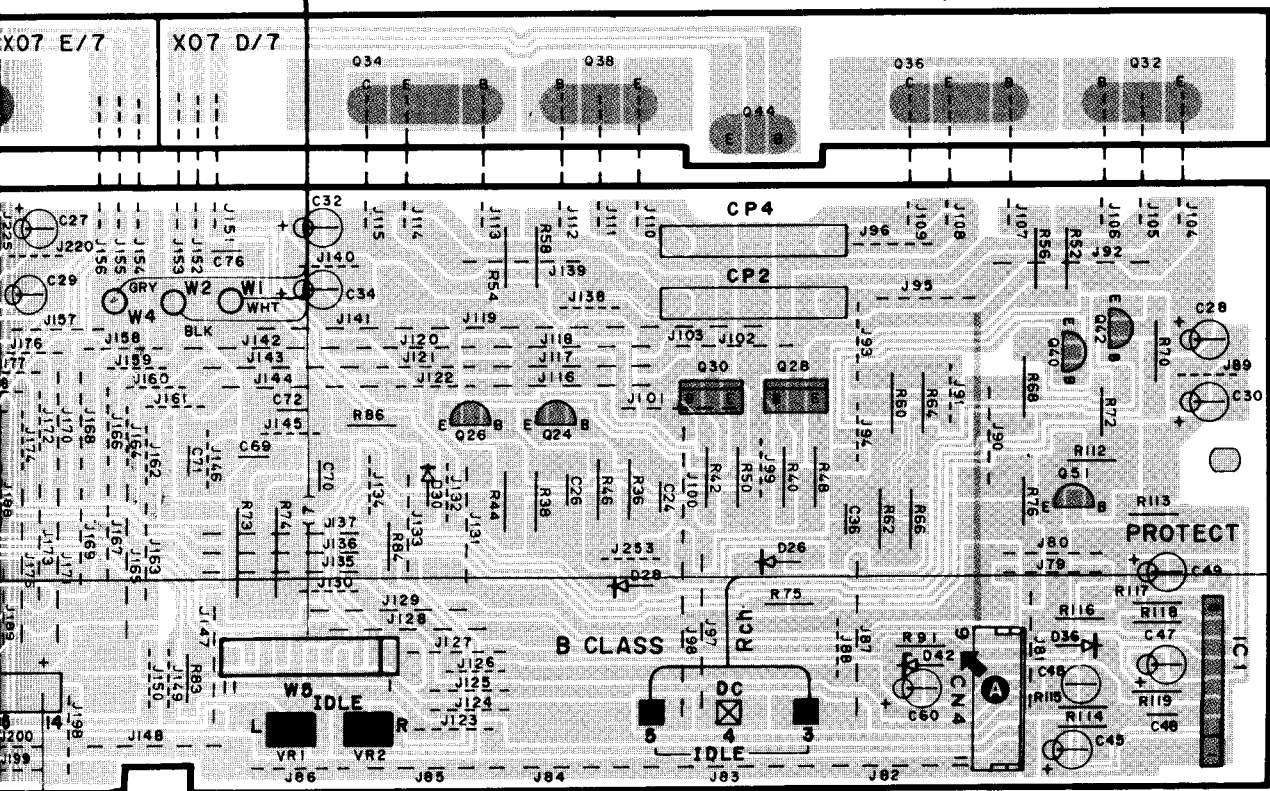
BS/VDP 2

UNER

HONO



**MAIN AMPLIFIER UNIT  
(X07-247X-71)**



Refer to the schematic diagram for the values of resistors and capacitors.

**DA - 9010 (E,L),(X,T) (B/2)**

# PC BOARD (Foil side view)

**RTV servis Horvat**

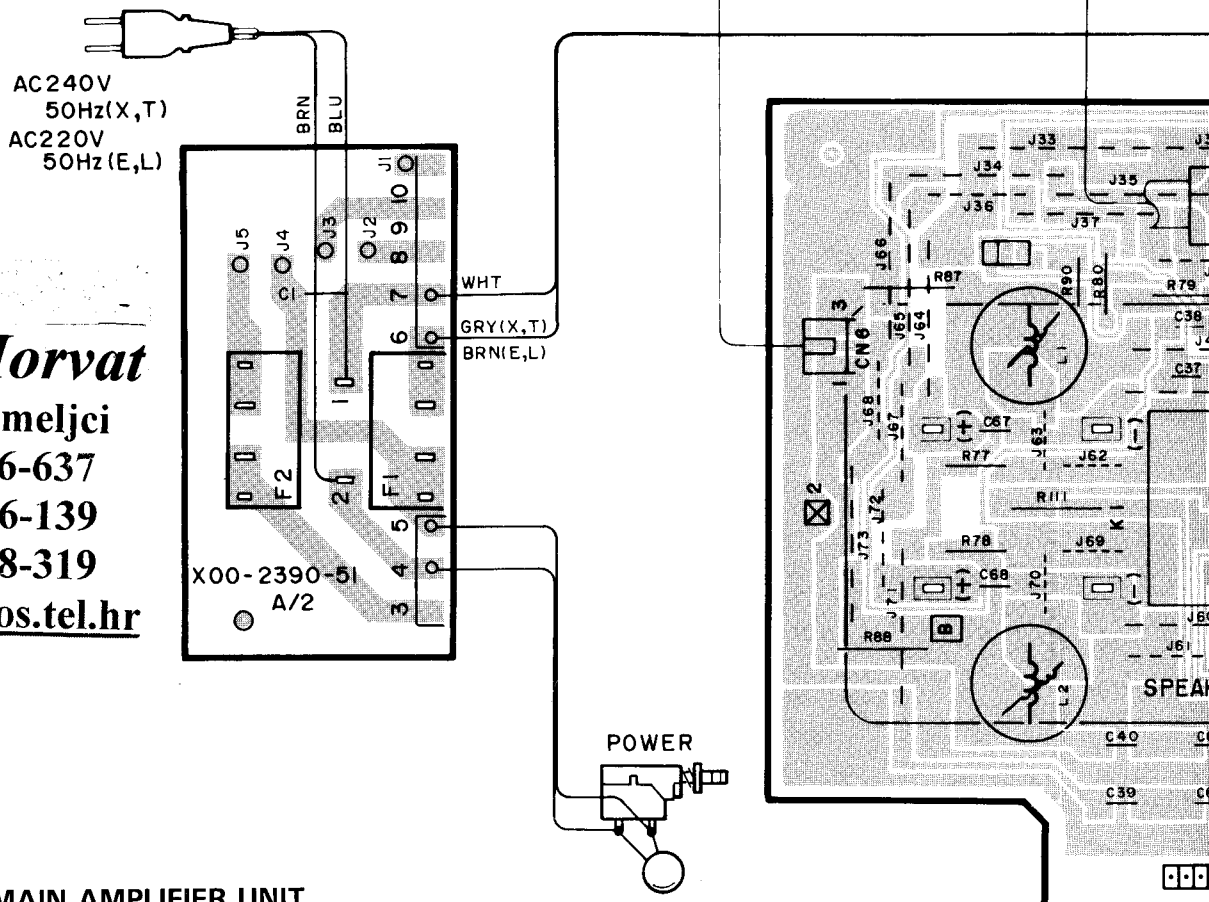
Kešinci, 31402 Semeljci

Tel: 031-856-637

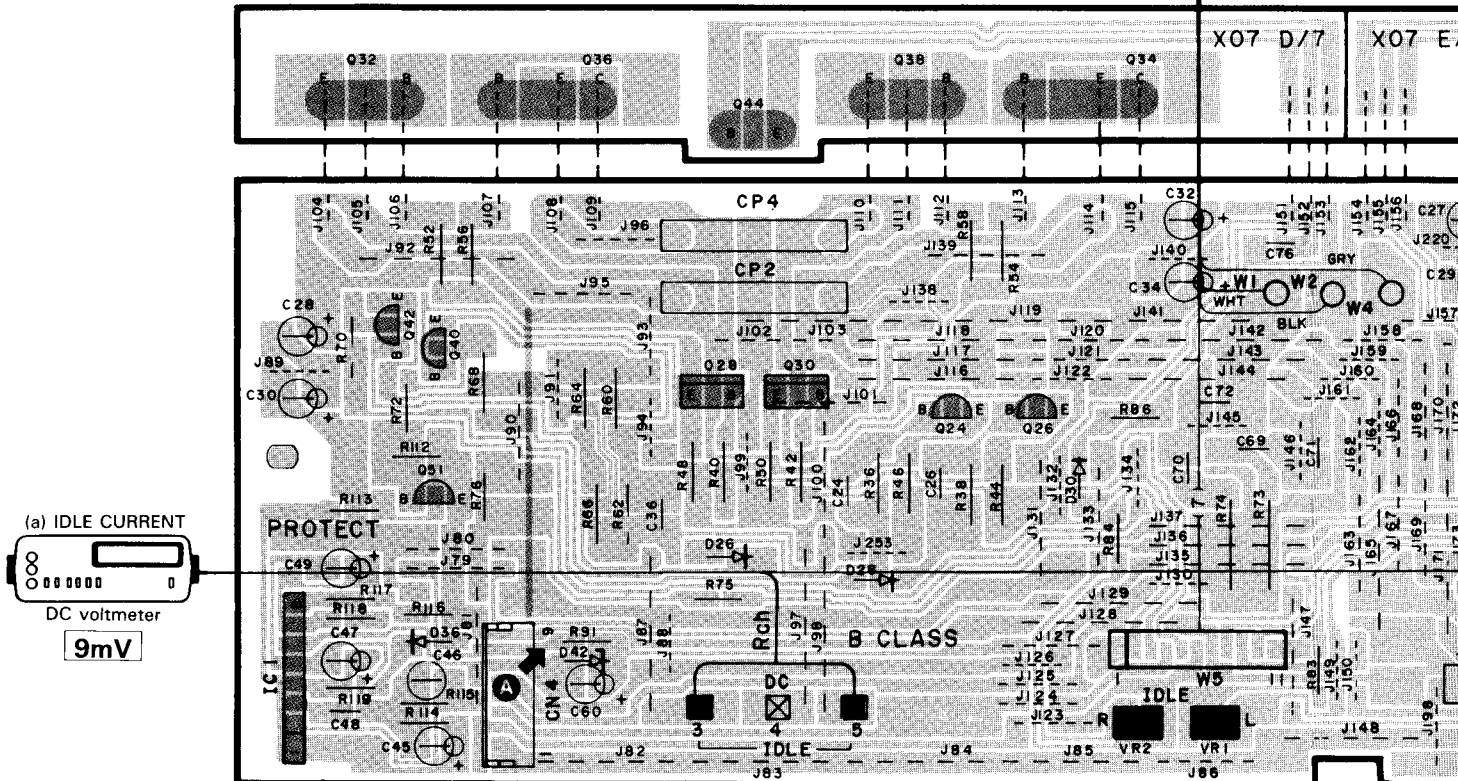
Tel / fax: 031-856-139

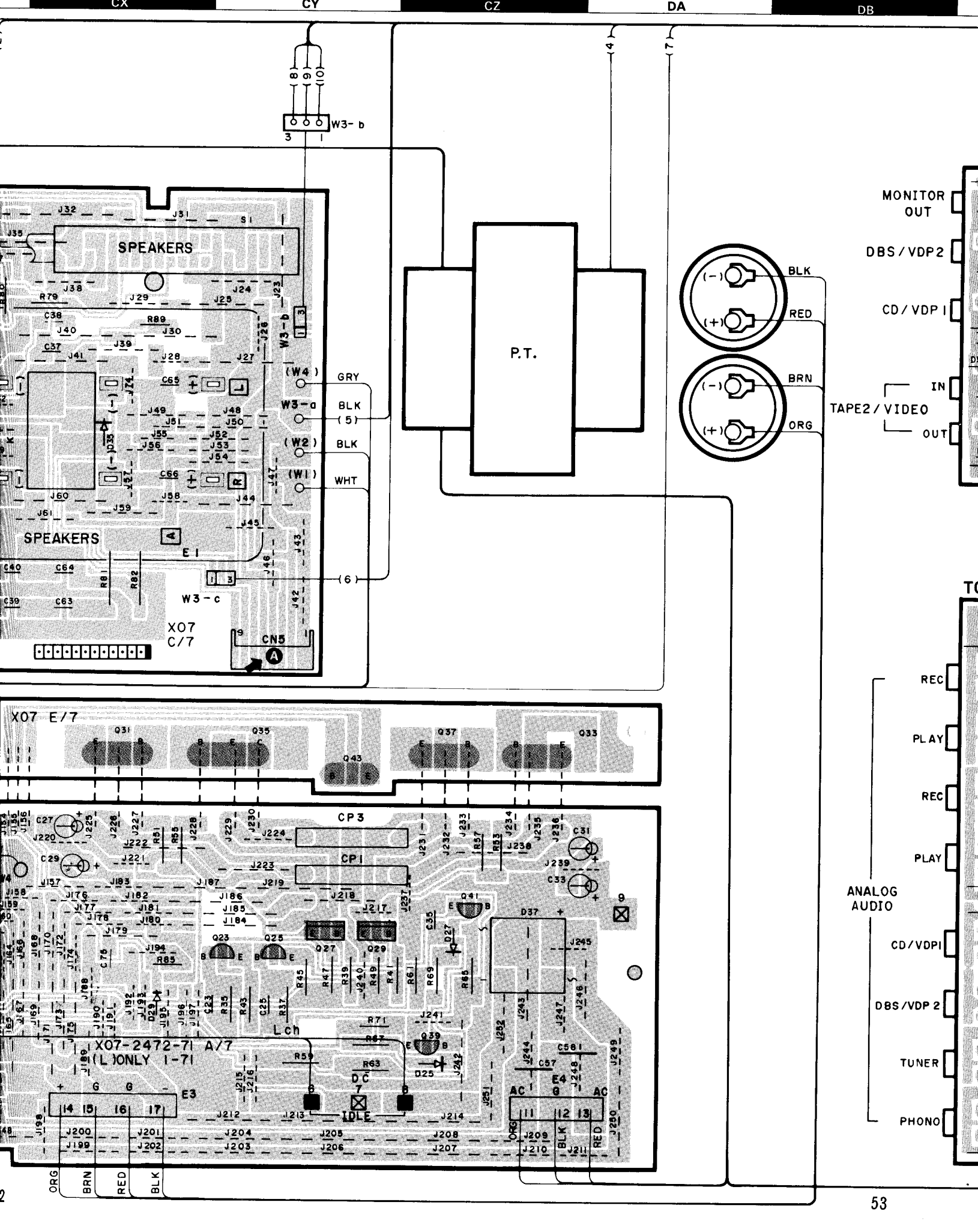
Mob: 098-788-319

[rtv-servis-horvat@os.tel.hr](mailto:rtv-servis-horvat@os.tel.hr)



## MAIN AMPLIFIER UNIT (X07-247X-71)





CX

CY

CZ

DA

DB

W3-b

SPEAKERS

P.T.

MONITOR OUT

DBS/VDP2

CD/VDP1

TAPE2/VIDEO IN

OUT

BLK

RED

BRN

ORG

SPEAKERS

X07 C/7

X07 E/7

CP3

CP1

X07-2472-71 A/7 (L) ONLY 1-71

ANALOG AUDIO

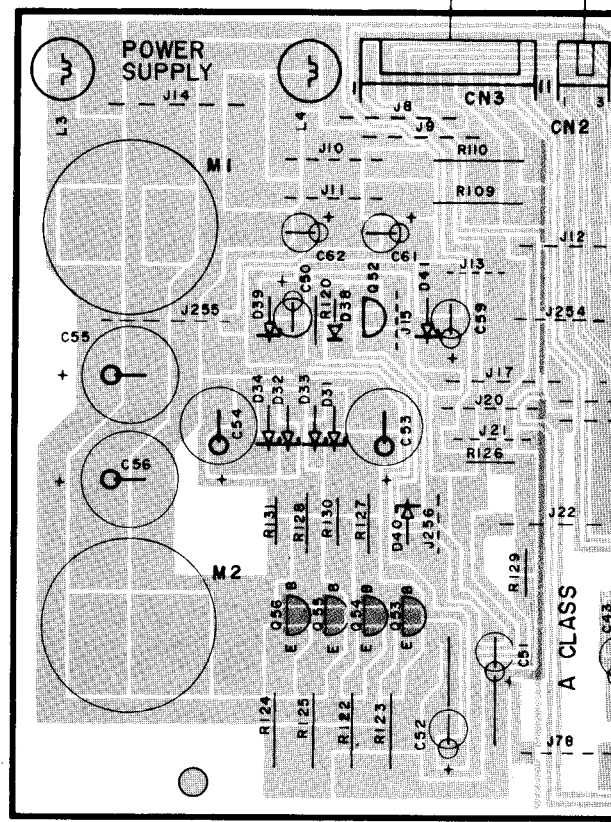
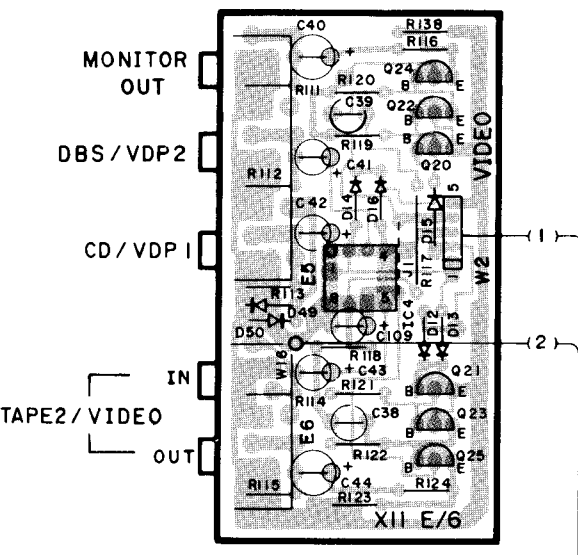
CD/VDPI

DBS/VDP2

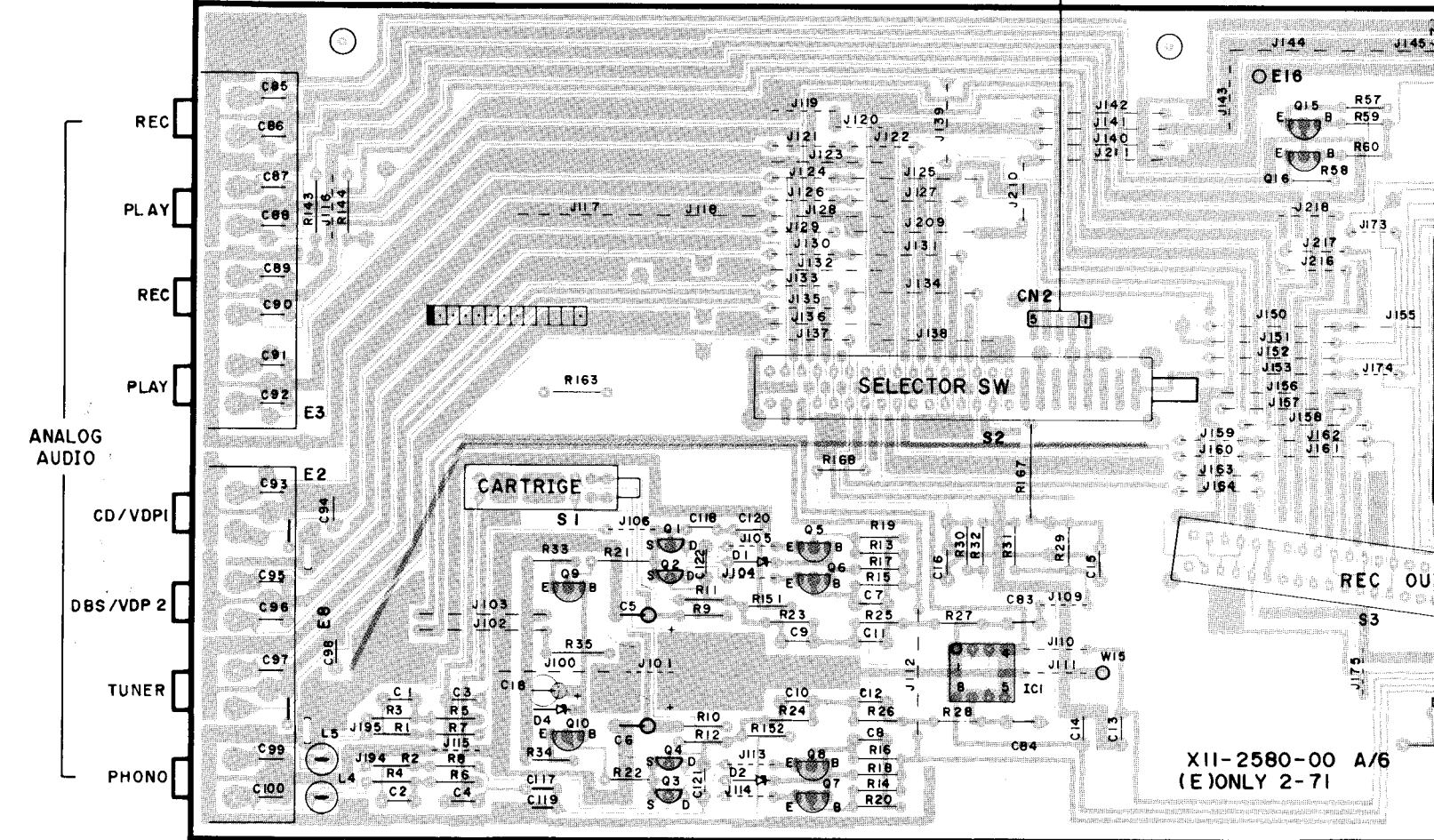
TUNER

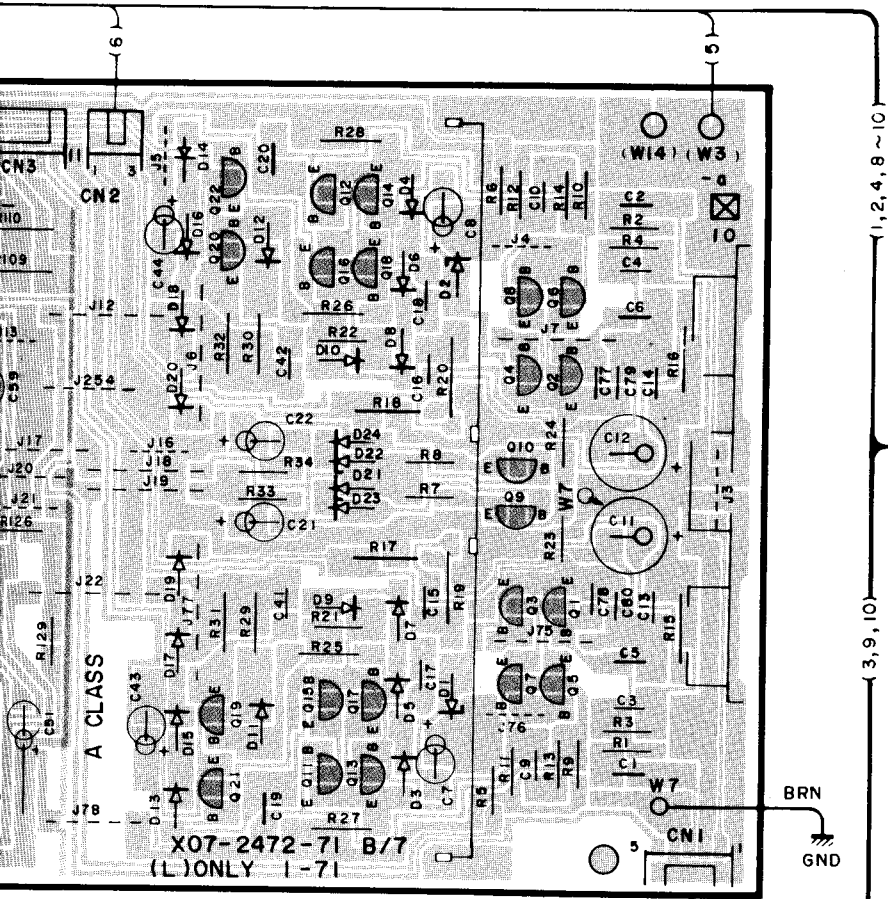
PHONO

ORG  
BRN  
RED  
BLK



TONE UNIT (X11-258X-XX)



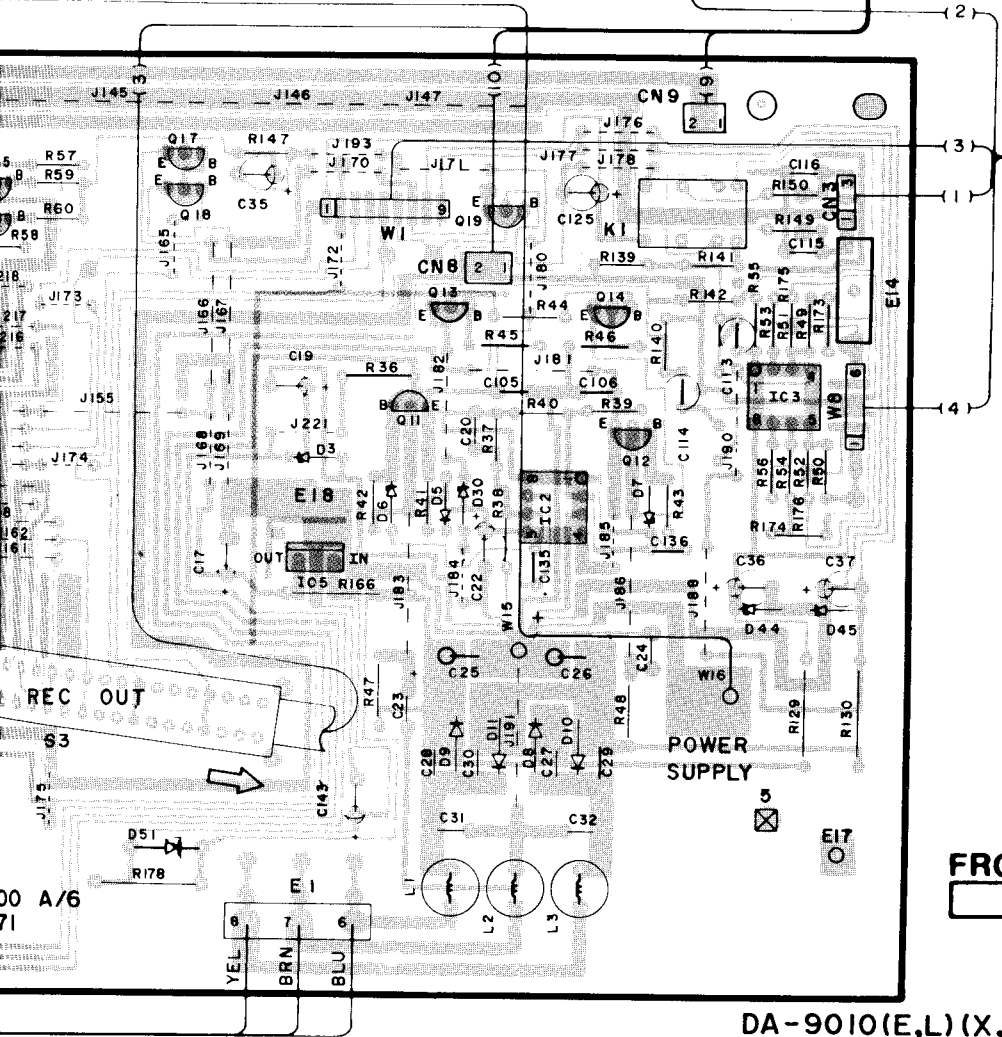


**TONE UNIT  
(X11-258X-XX)**

Ref. No. IC	Q	Address
1		6DD
2		6DD
3		7DD
4		7DD
5		6DE
6		6DE
7		7DE
8		7DE
9		6DD
10		7DD
11		5DH
12		5DI
13		5DH
14		5DI
15		4DG
16		4DG
17		4DG
18		4DG
19		4DH
20		2DC
21		3DC
22		2DC
23		3DC
24		2DC
25		3DC
1		6DE
2		5DH
3		5DI
4		2DC
5		5DH

**MAIN AMPLIFIER UNIT  
(X07-247X-71)**

Ref. No. IC	Q	Address
1		3DH
2		2DH
3		3AH
4		2DH
5		3DH
6		3DH
7		3DH
8		2DH
9		2DH
10		2DH
11		3DH
12		1DH
13		3DH
14		1DH
15		3DH
16		1DH
17		3DH
18		1DH
19		3DG
20		1DG
21		3DG
22		1DG
23		6CY
24		6CV
25		6CY
26		6CV
27		6CY
28		6CU
29		6CY
30		6CU
31		5CX
32		5CT
33		5CZ
34		5CW
35		5CY
36		5CU
37		5CZ
38		5CV
39		6CZ
40		6CT
41		6CZ
42		5CT
43		5CY
44		5CU
51		6CT
53		3DF
54		3DF
55		3DF
56		3DF
1		7CT



**DA-9010(E,L) (X,T) (B/2)**

Refer to the schematic diagram for the values of resistors and capacitors.

TAPE I/DAT (X32-1290-00) (B/3)

2

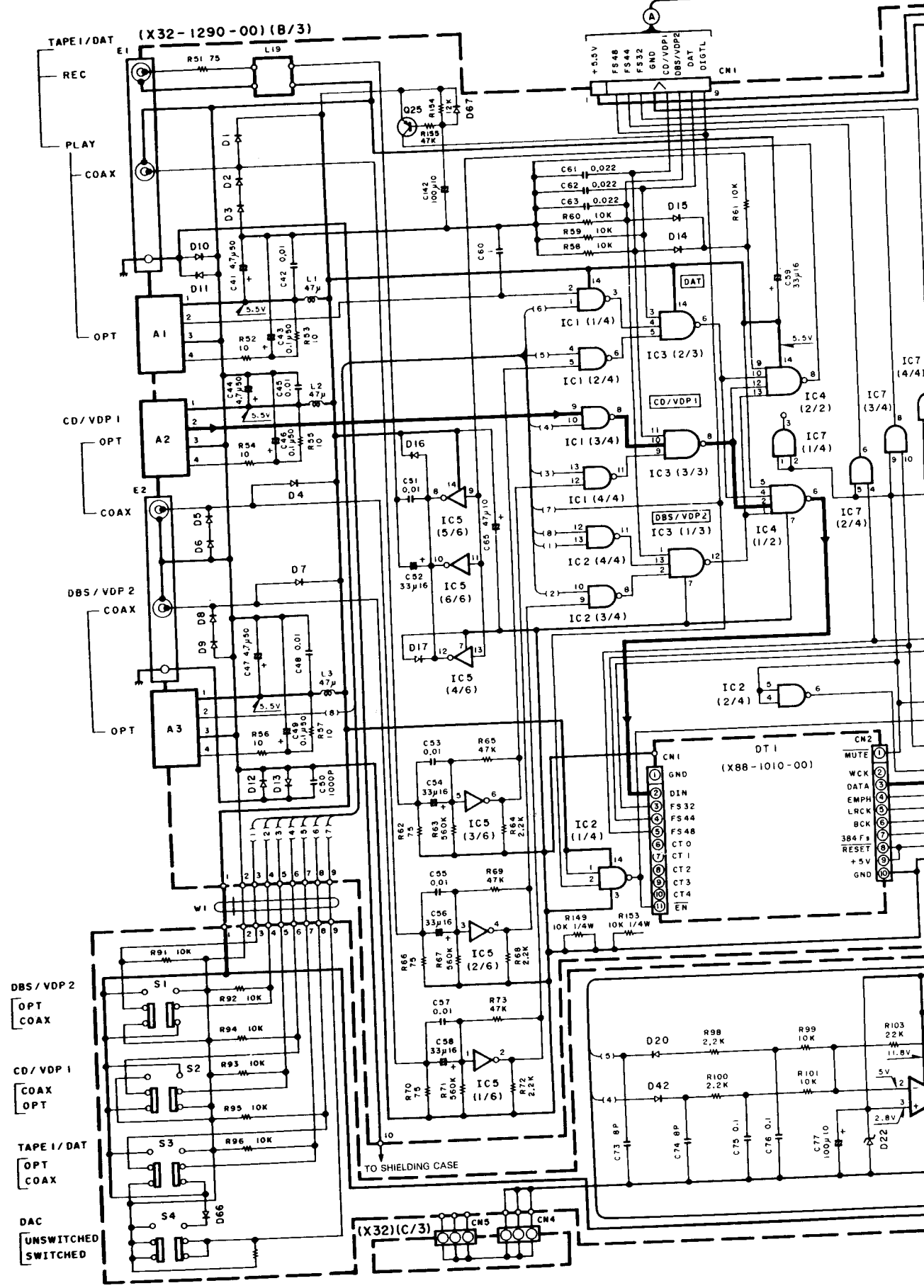
3

4

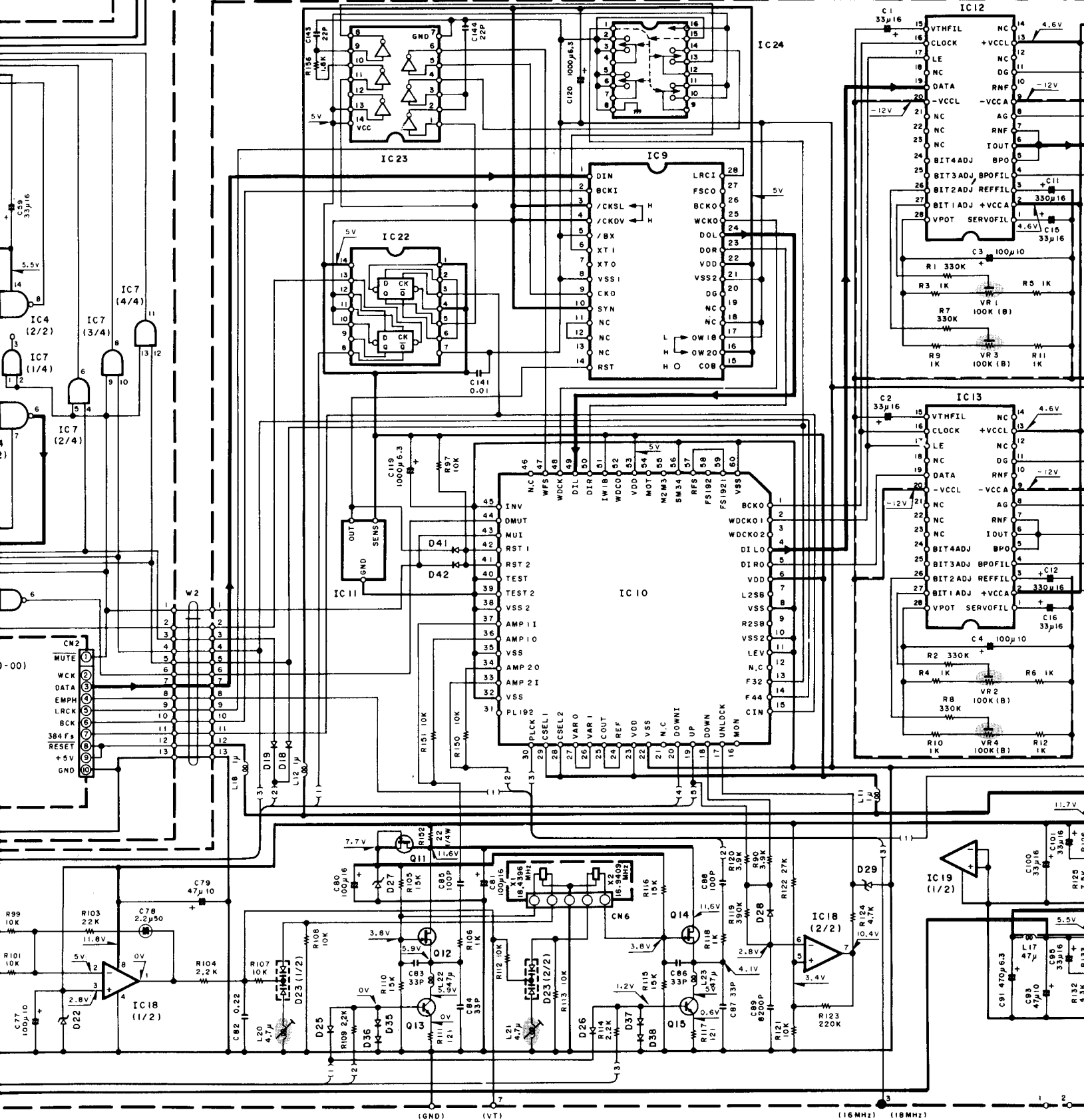
5

6

7

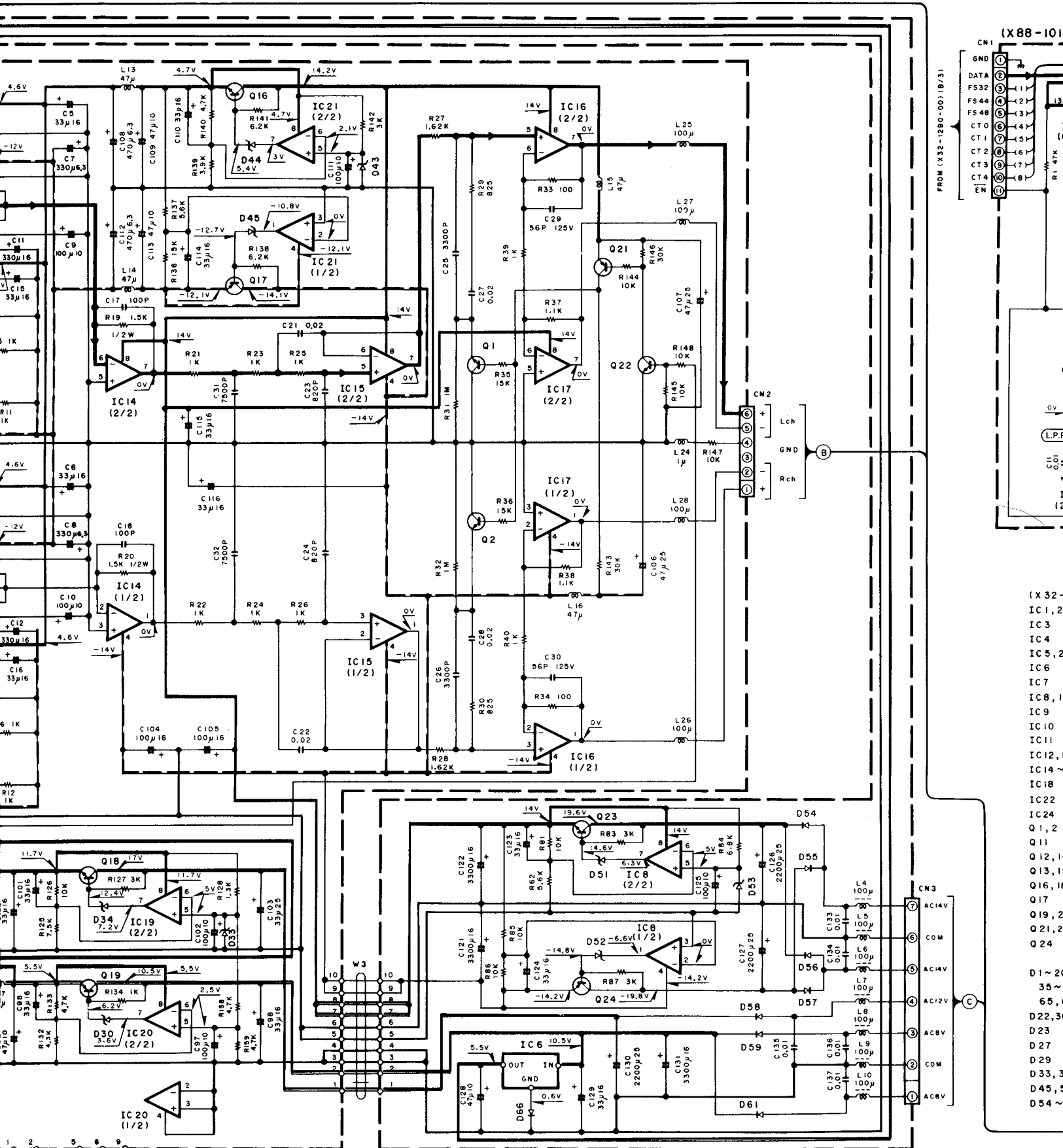


(X32-1290-00) (A/3)



(GND) (VT) (16MHz) (18MHz)



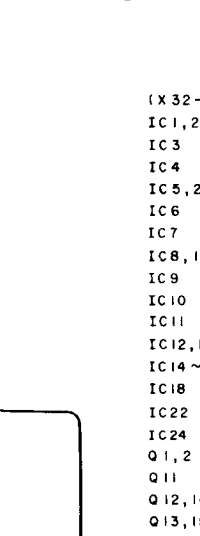
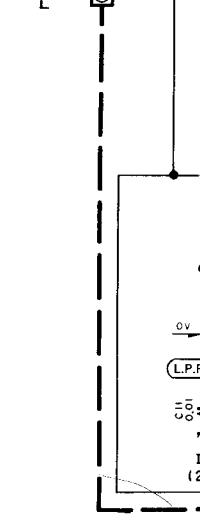
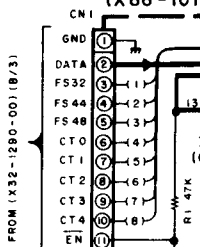


DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance sans signal d'entrée. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

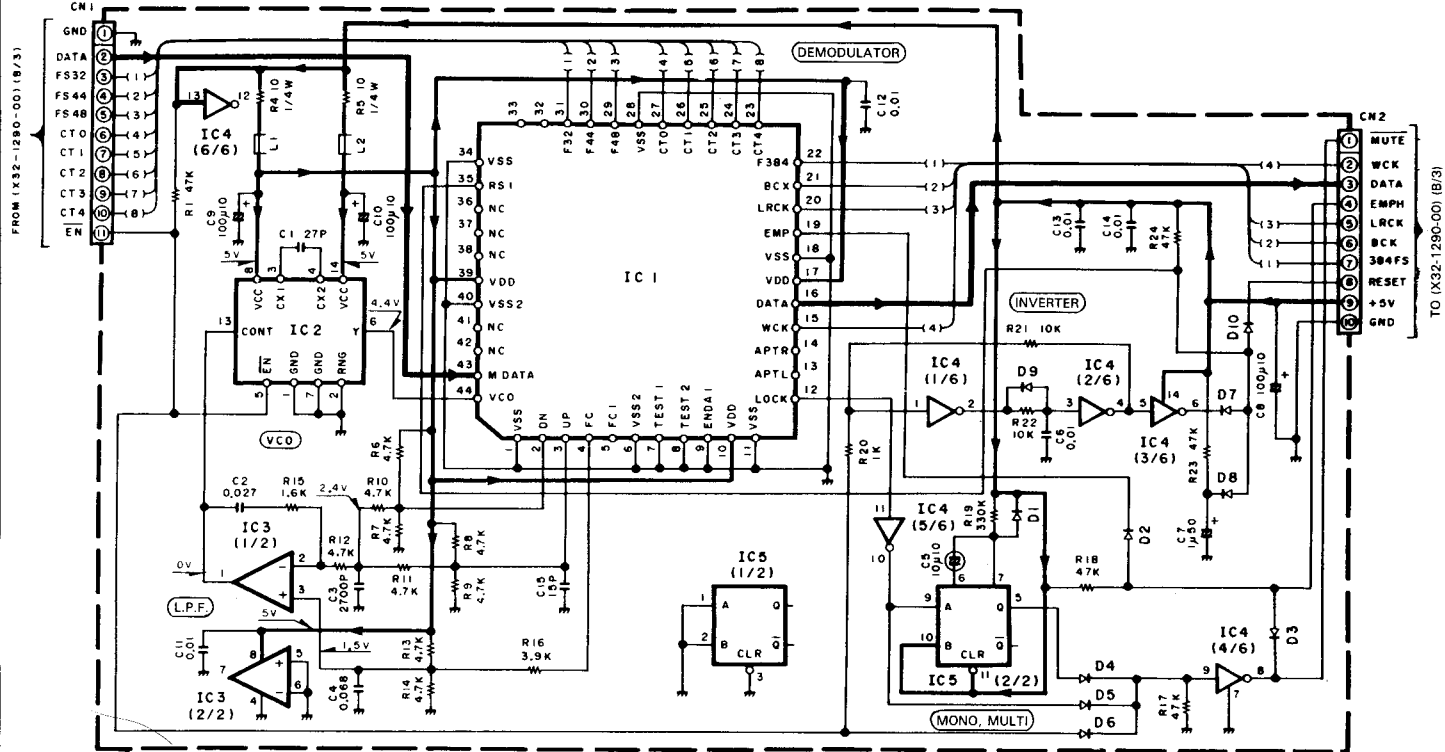
Die angezeigten DC-Spannungen sind mit einem hochohmigen Voltmeter ohne Signal gemessen worden. Die Werte können durch die inhärenten Abweichungen der einzelnen Instrumente voneinander abweichen.

(X88-101)



- (X32-
- IC1,2
- IC3
- IC4
- IC5,2
- IC6
- IC7
- IC8,15
- IC9
- IC10
- IC11
- IC12,1
- IC14~
- IC18
- IC22
- IC24
- Q1,2
- Q11
- Q12,14
- Q13,15
- Q16,18
- Q17
- Q19,21
- Q21,25
- Q24
- D1~20
- 35~
- 65,6
- D22,30
- D23
- D27
- D29
- D33,3
- D45,5
- D54~

(X88-1010-00)




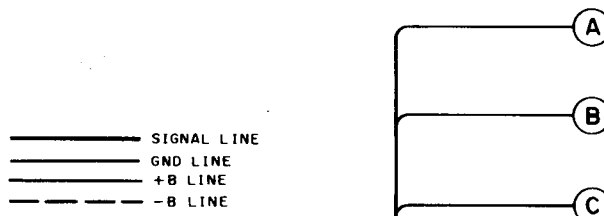
(X32-1290-00)

- IC1, 2 : TC74HC00P
- IC3 : TC74HC10P
- IC4 : TC74HC20P
- IC5, 23 : TC74HCU04P
- IC6 : AN7805F or  $\mu$ PC7805HF
- IC7 : TC74HC08P
- IC8, 19~21 : M5218P
- IC9 : SM5813APP
- IC10 : TC17G008AF-8060
- IC11 : M51951ASL
- IC12, 13 : PCM58P
- IC14~17 : NJM4565D-D
- IC18 : M5223P
- IC22 : TC74HC74F
- IC24 : HD74HC157P
- Q1, 2 : 2SC287B(B)
- Q11 : 2SK105(F,H)
- Q12, 14 : 2SK161(GR)
- Q13, 15, 22 : 2SC945(A)(Q,P) or 2SC1740S(Q,R)
- Q16, 18 : 2SC3666
- Q17 : 2SA1426
- Q19, 23 : 2SD1266(Q,P)
- Q21, 25 : 2SA733(A)(Q,P) or 2SA933(Q,R)
- Q24 : 2SB941(Q,P)
- D1~20, 25, 26, 28 : HSS104 or ISS133
- 35~38, 41, 42 : RD2.7ES(B2) or HZS2.7N(B2)
- D22, 30, 43, 44 : KV1330A-2
- D23 : RD7.5JS(B) or HZS7.5S(B)
- D27 : RD4.7ES(B) or HZS4.7N(B)
- D29 : RD5.1JS(B2) or HZS5.1S(B2)
- D33, 34, 53 : RD8.2JS(B2) or HZS8.2S(B2)
- D45, 51, 52 : S5566B
- D54~59, 61

(X88-1010-00)

- TC1 : TC17G014AF-0073
- IC2 : SN74LS624N
- IC3 : M5223P
- IC4 : TC74HCU04F
- IC5 : TC74HC123F
- D1 : ISS237(1)
- D2~10 : ISS133 or ISS176

**CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list).  Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.



DA-9010 (P) (1/3)

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entrée. Les  
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struments de

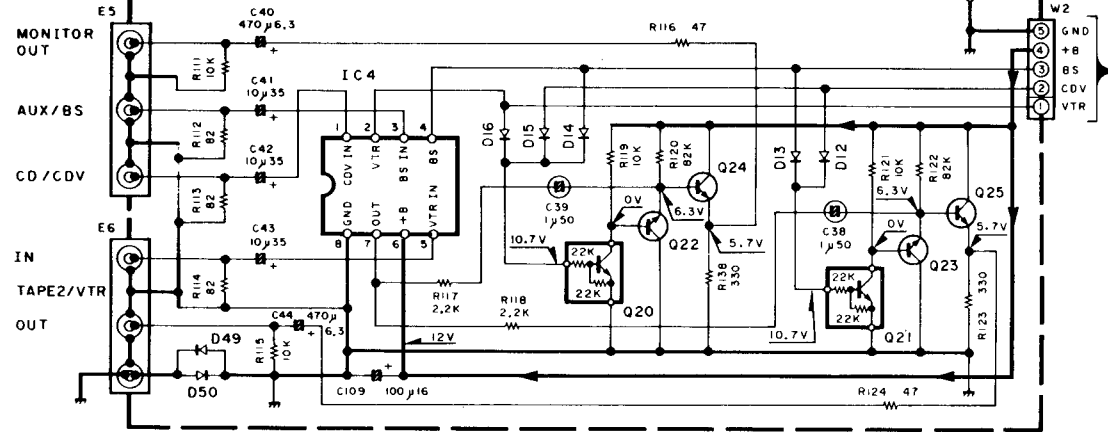
Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser ohne Eingangssignal gemessen. Dabei schwanden die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

Y08-3570-71

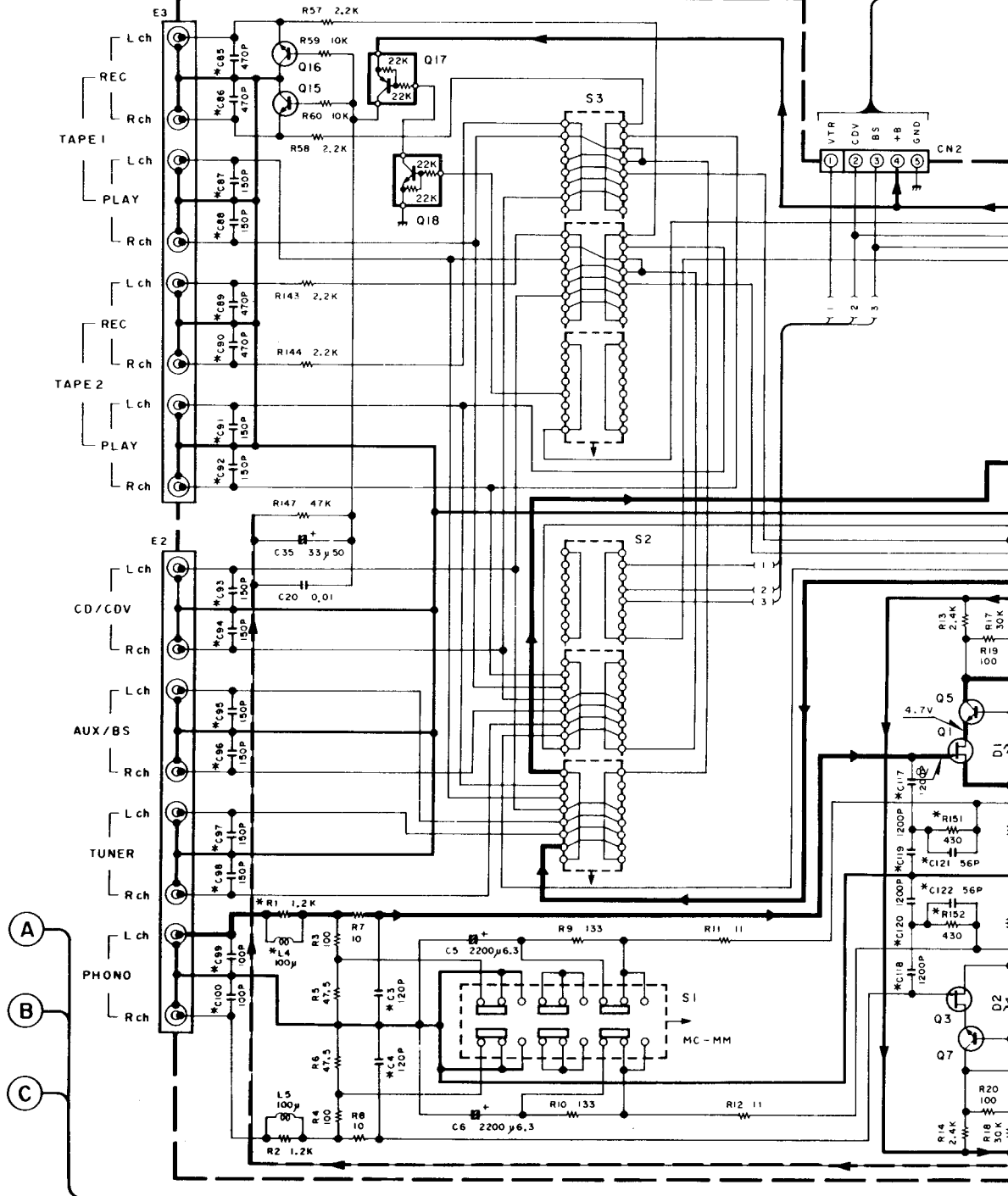
DA-9010

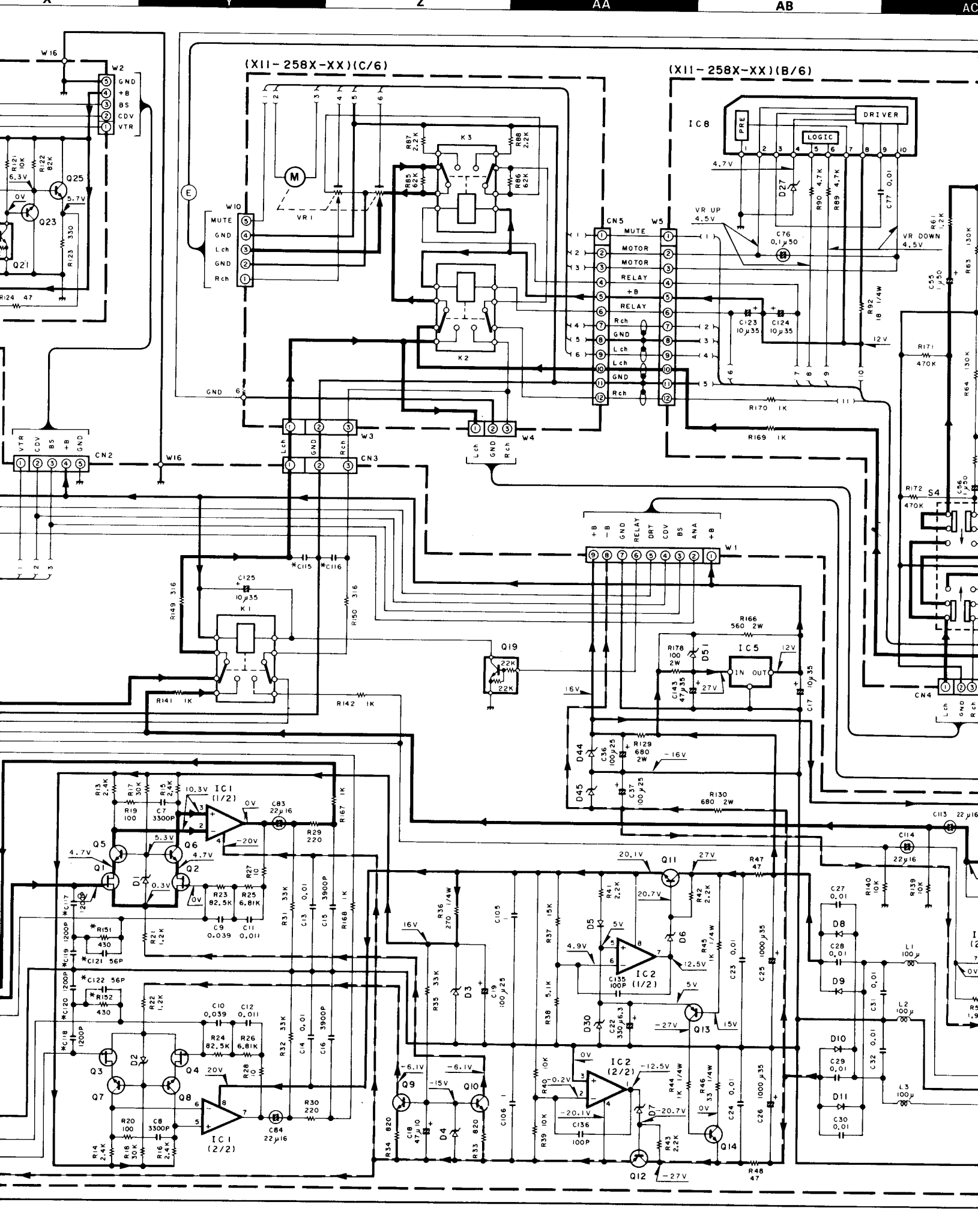
KENWOOD

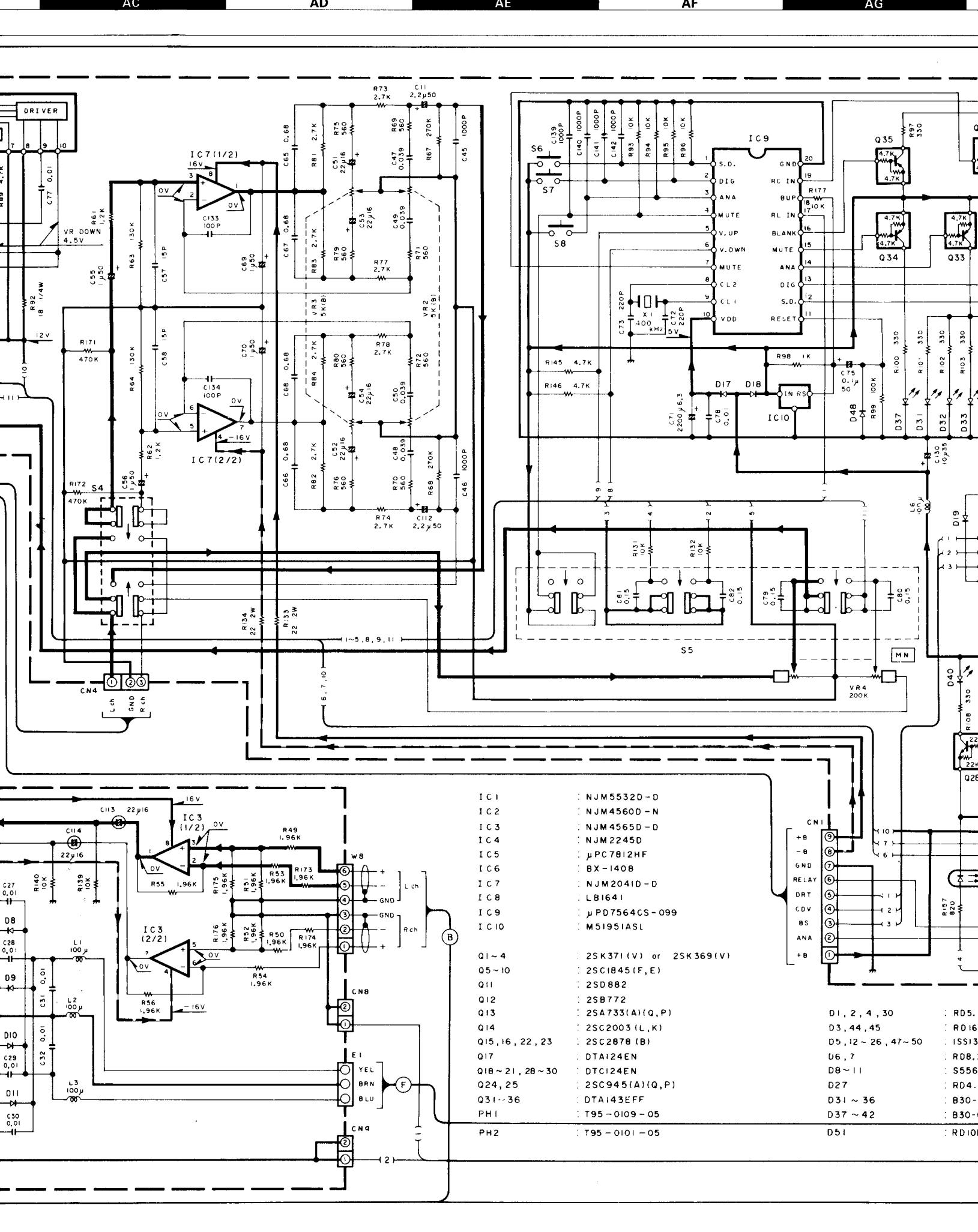
(XII-258X-XX) (E/6)



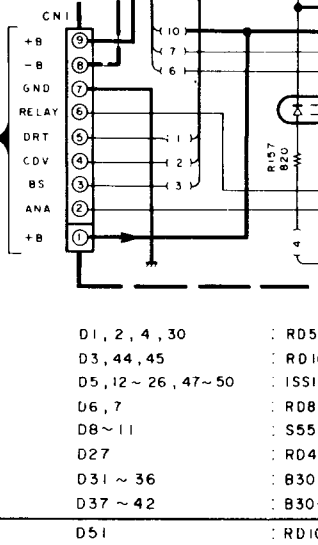
(XII-258X-XX) (A/6)

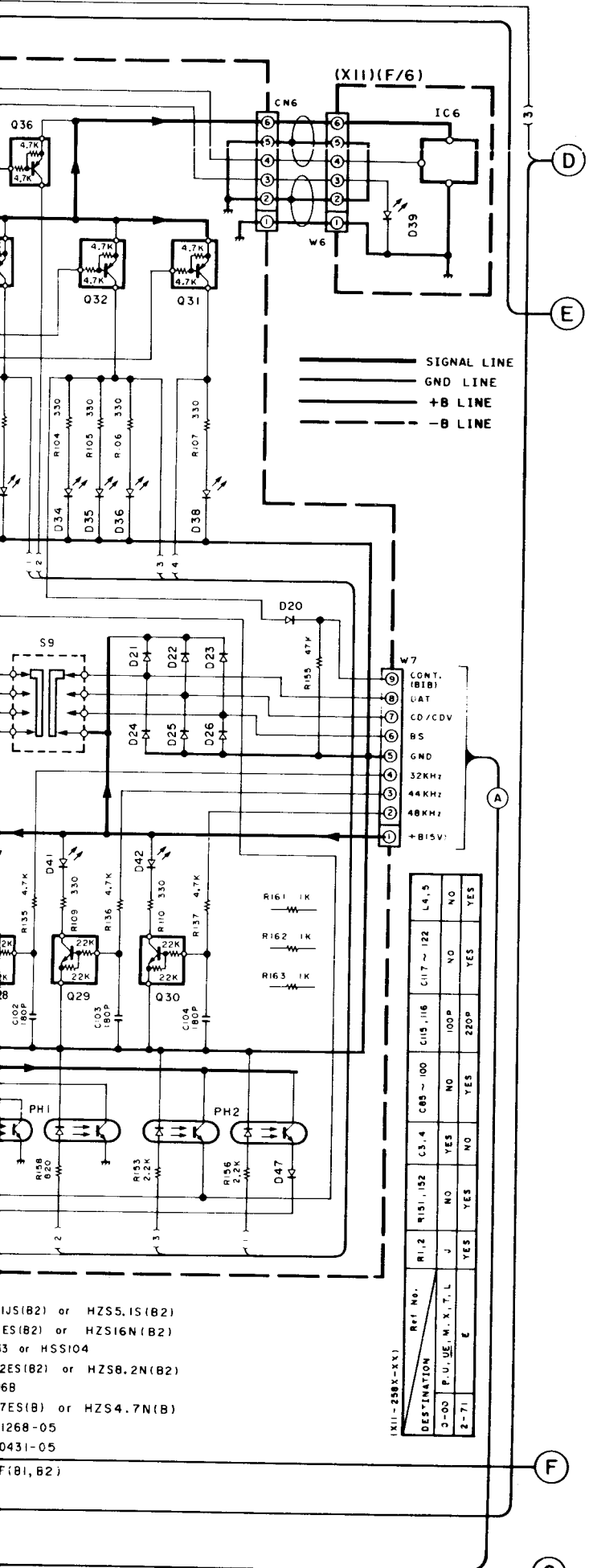






- |       |                 |
|-------|-----------------|
| IC 1  | : NJM5532D-D    |
| IC 2  | : NJM4560D-N    |
| IC 3  | : NJM4565D-D    |
| IC 4  | : NJM2245D      |
| IC 5  | : μPC7812HF     |
| IC 6  | : BX-1A08       |
| IC 7  | : NJM2041D-D    |
| IC 8  | : LBI641        |
| IC 9  | : μPD7564CS-099 |
| IC 10 | : M5195IASL     |
- 
- |                   |                            |
|-------------------|----------------------------|
| Q1 ~ 4            | : 2SK371 (V) or 2SK369 (V) |
| Q5 ~ 10           | : 2SC1845 (F, E)           |
| Q11               | : 2SD882                   |
| Q12               | : 2SB772                   |
| Q13               | : 2SA733 (A) (Q, P)        |
| Q14               | : 2SC2003 (L, K)           |
| Q15, 16, 22, 23   | : 2SC2878 (B)              |
| Q17               | : DTA124EN                 |
| Q18 ~ 21, 28 ~ 30 | : DTC124EN                 |
| Q24, 25           | : 2SC945 (A) (Q, P)        |
| Q31 ~ 36          | : DTA143EFF                |
| PH1               | : T95-0109-05              |
| PH2               | : T95-0101-05              |






(XII) - 258X - XX

DESTINATION	Ref No.	R1,2	R151, 152	C3, 4	C05 ~ 100	C15, 116	C117 ~ 122	L4, 5
J	P, U, UE, M, X, T, L	NO	YES	NO	NO	100P	NO	NO
E		YES	YES	NO	YES	220P	YES	YES

DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

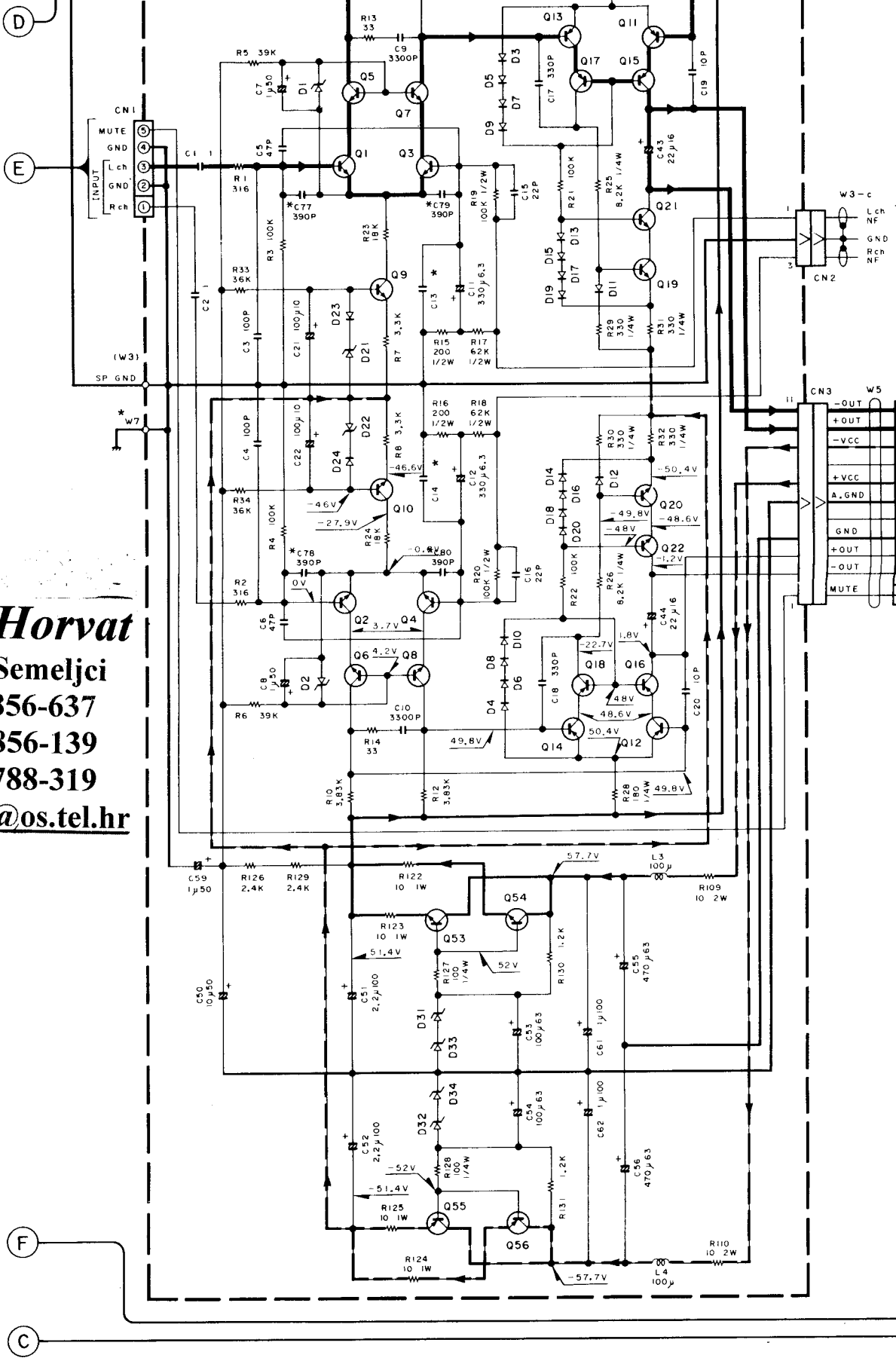
Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance sans signal d'entrée. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser ohne Eingangssignal gemessen. Dabei schwanden die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

**CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list).  Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

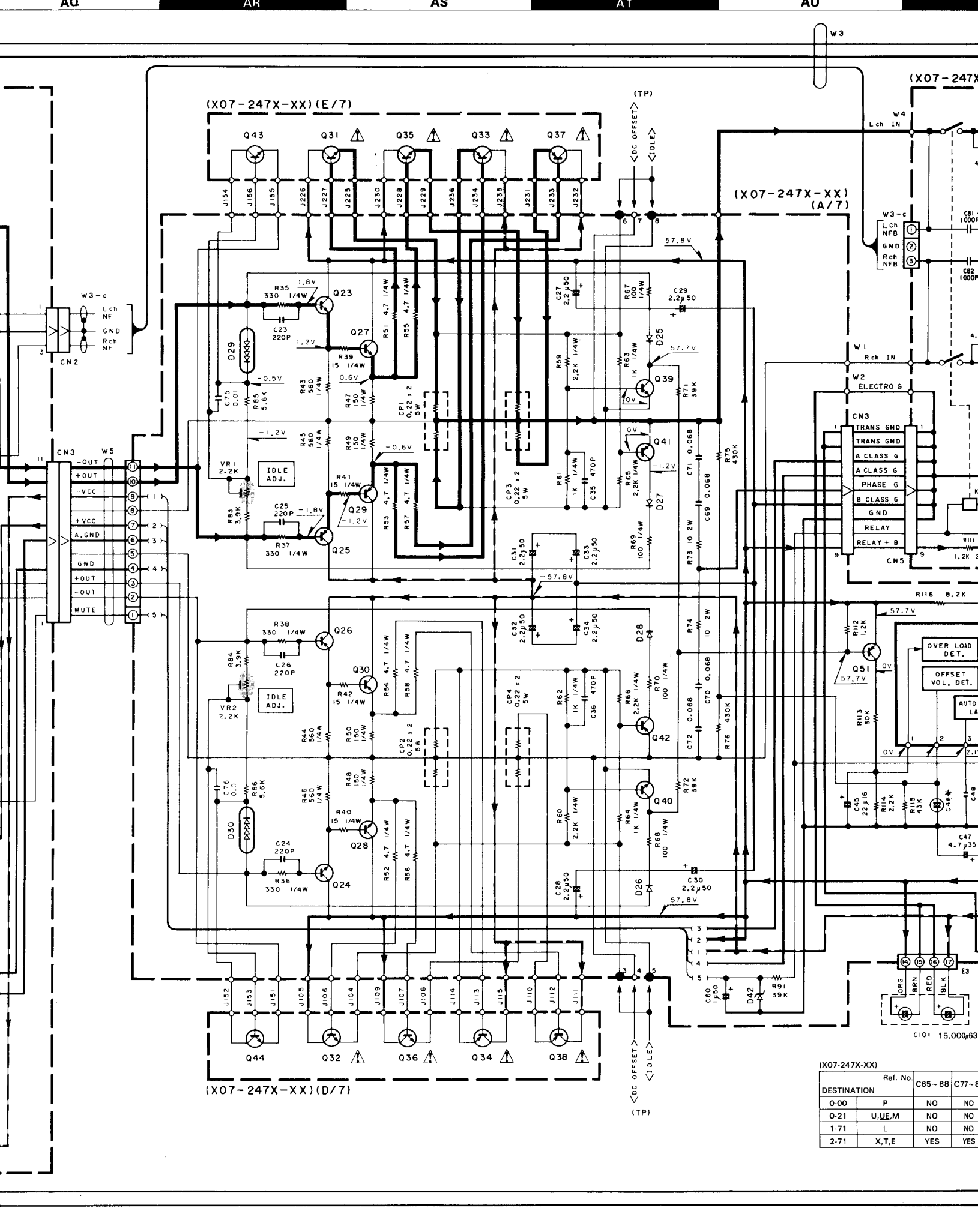


(X07-247X-XX)(B/7)



**RTV servis Horvat**  
 Kešinci, 31402 Semeljci  
 Tel : 031-856-637  
 Tel / fax : 031-856-139  
 Mob : 098-788-319  
[rty-servis-horvat@os.tel.hr](mailto:rty-servis-horvat@os.tel.hr)

1  
2  
3  
5  
6  
7



(X07-247X-XX) (E/7)

(X07-247X-XX) (A/7)

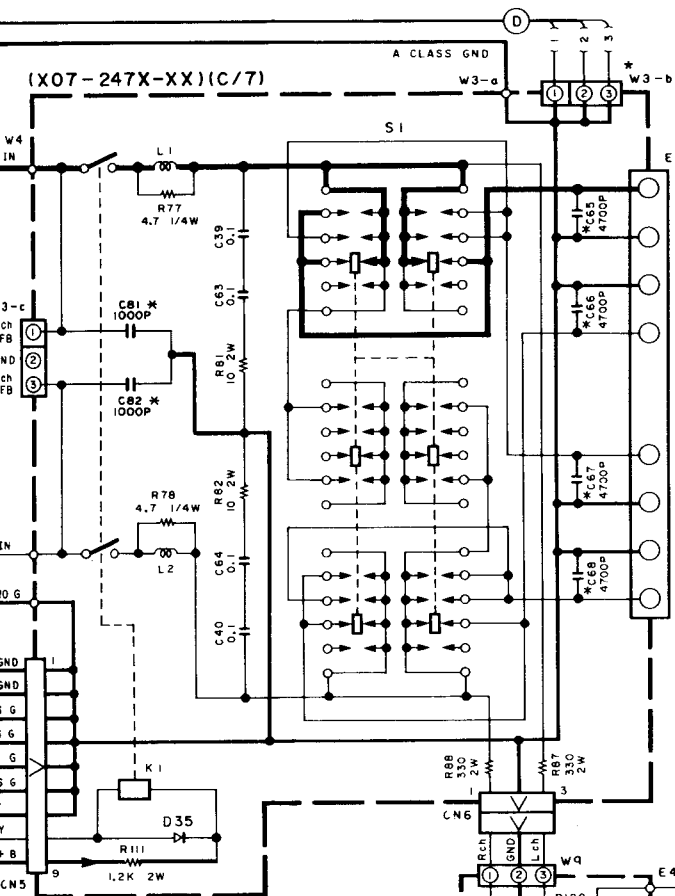
(X07-247X-XX) (D/7)

(TP)

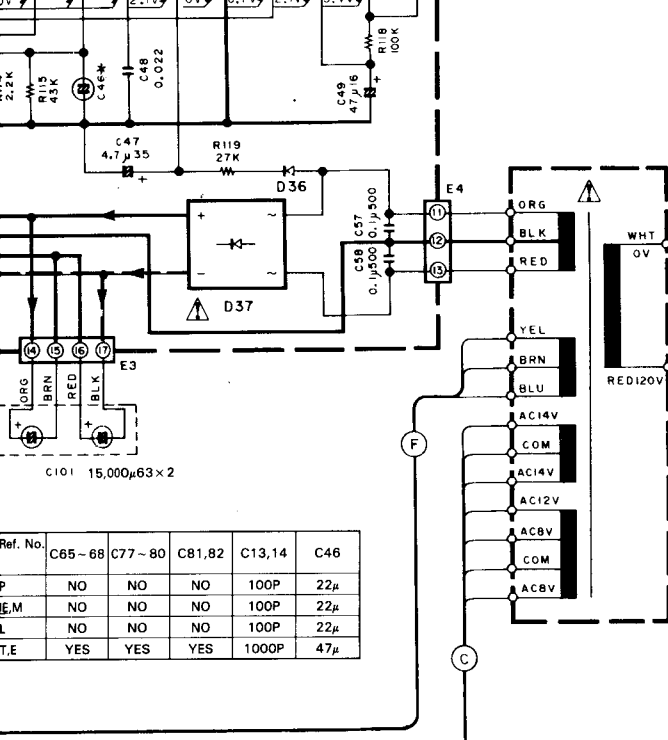
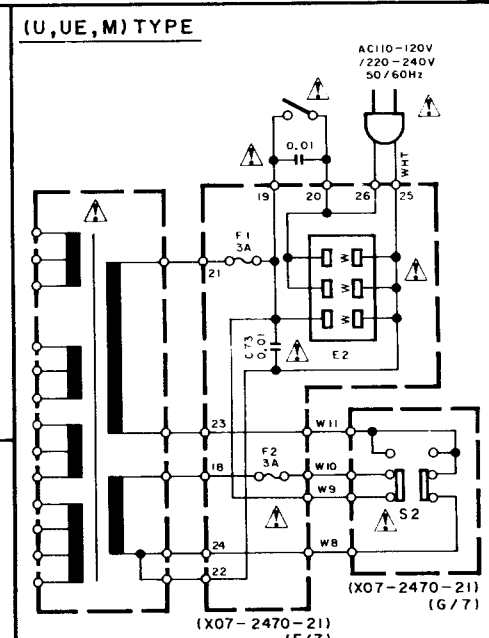
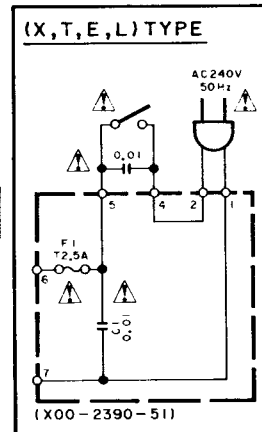
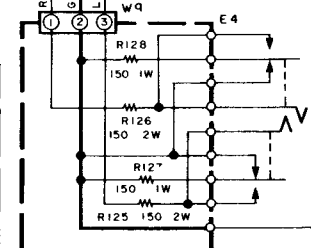
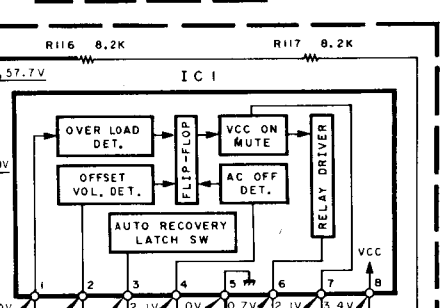
(X07-247X-XX)

DESTINATION	Ref. No	C65-68	C77-8
0-00	P	NO	NO
0-21	U,UE,M	NO	NO
1-71	L	NO	NO
2-71	X,T,E	YES	YES





- IC1 :  $\mu$ PCI237HA
- Q1 ~ 8 : 2SC1845 (F, E)  
 Q9, 10, 19, 20 : 2SC945A (Q, P) or 2SC1740S (Q, R)  
 Q11 ~ 14 : 2SA733A (Q, P) or 2SA933S (Q, R)  
 Q15 ~ 18, 25, 26, 41, 42 : 2SA1123 (R, S)  
 Q21 ~ 24, 39, 40 : 2SC2631 (R, S)  
 Q27, 28 : 2SC3944 (Q, R)  
 Q29, 30 : 2SA1535 (Q, R)  
 Q31, 32, 35, 36 : 2SD1717 \*5  
 Q33, 34, 37, 38 : 2SB1162 \*5  
 Q43, 44 : 2SC4137 (V, W)  
 Q51 : 2SA992 (F, E)  
 Q53, 54 : 2SC2003 (L, K)  
 Q55, 56 : 2SA954 (L, K)
- D1, 2, 21, 22, 42 : RD5.1JS (B2) or HZS5.1S (B2)  
 D3 ~ 20, 23, 24 : ISS133 or HSS104  
 D25 ~ 28, 35, 36 : ISS131 or HSS104R  
 D29, 30 : MA27Q (A)  
 D31, 32 : RD30ES (B) or HZS30N (B)  
 D33, 34 : RD24ES (B) or HZS24N (B)  
 D37 : D5FB20 \*1



Ref. No.	C65-68	C77-80	C81,82	C13,14	C46
P	NO	NO	NO	100P	22 $\mu$
E,M	NO	NO	NO	100P	22 $\mu$
L	NO	NO	NO	100P	22 $\mu$
T,E	YES	YES	YES	1000P	47 $\mu$

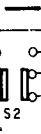
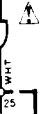
- SIGNAL LINE
- GND LINE
- +B LINE
- - - B LINE

DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

2, R)  
1, R)

2)

-120V  
-240V  
50Hz



2470-21)  
(G/7)

high impedance  
es may vary  
individual instru-

Les tensions c.c. doivent être mesurées avec un volt-  
mètre à haute impédance sans signal d'entrée. Les  
valeurs peuvent différer légèrement du fait des varia-  
tions inhérentes aux appareils et aux instruments de  
mesure individuels.

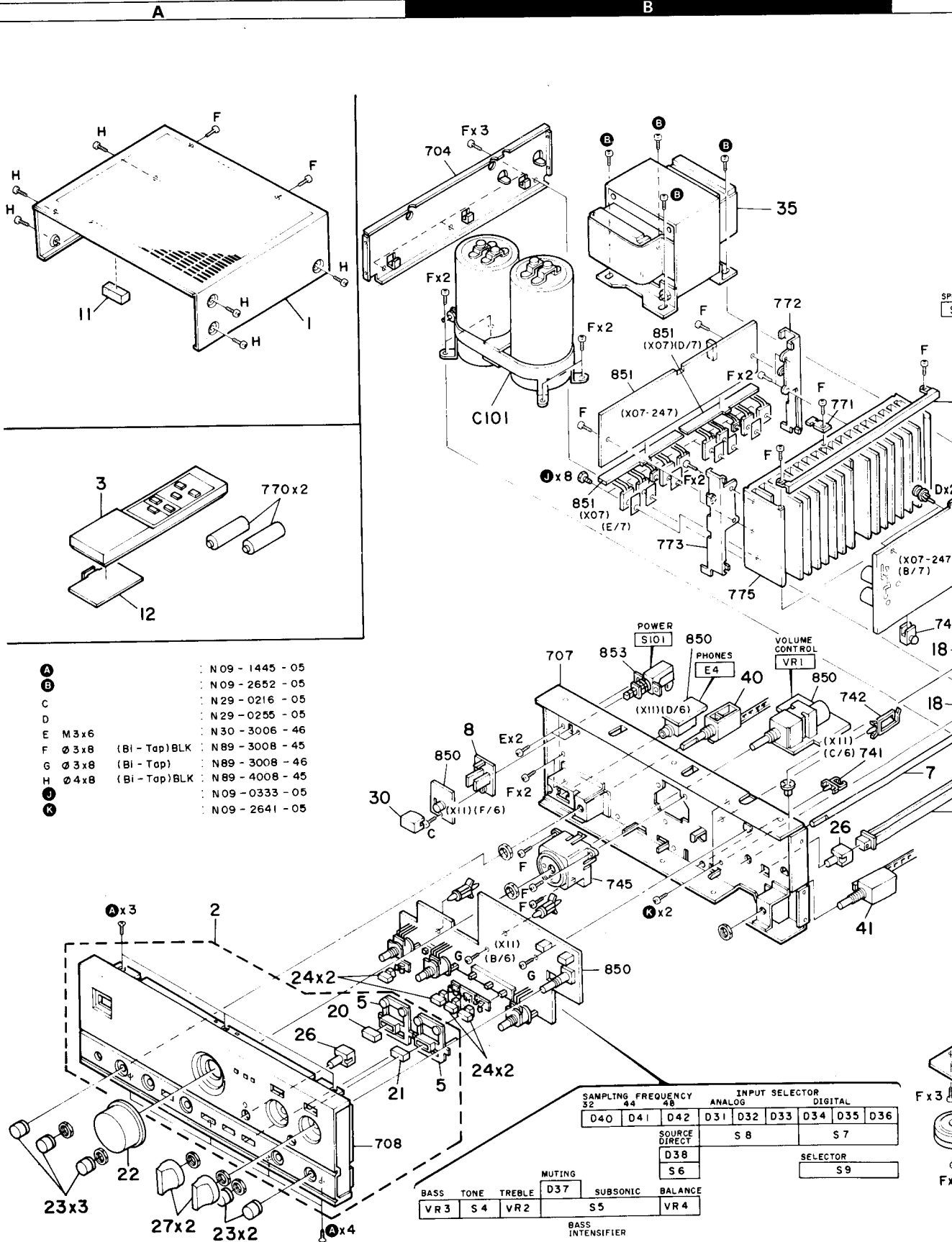
Die angegebenen Gleichspannungswerte wurden mit  
einem hochohmigen Spannungsmesser ohne Eingangs-  
signal gemessen. Dabei schwanden die Meßwerte  
aufgrund von Unterschieden zwischen einzelnen  
Instrumenten oder Geräten u.U. geringfügig.

DTA124EN		TC74HCU04P TC74HC00P TC74HC08P TC74HC10P TC74HC20P		SM5813APT	
DTC124EN 2SA1123 2SA733 (A) 2SA954 2SA992 2SC1845 2SC2003 2SC2631 2SC2878 2SC945 (A)		$\mu$ PD7564CS-099		TC17G008AF-8060 TC17G014AF-0073	
2SB772 2SD882		PCM58P		LB1641	
2SD1266		M5218P M5223P NJM4565D-D			
DTA143EFF 2SA1426 2SC3666		$\mu$ PC1237HA			
2SA933S 2SC1740S		TC74HC123F			
2SC4137		AN7805F $\mu$ PC7805HF $\mu$ PC7812HF			
2SA1535 2SB941 2SC3944		M51951ASL			
NJM2041D-D NJM2245D NJM4560D-N NJM5532D-D		2SK105 2SK369			
SN74LS624N		2SK161			
		2SK371			
		TC74HCU04F TC74HC74F			

**CAUTION:** For continued safety, replace safety critical com-  
ponents only with manufacturer's recommended parts (refer  
to parts list). Indicates safety critical components. To  
reduce the risk of electric shock, leakage-current or resistance  
measurements shall be carried out (exposed parts are accepta-  
bly insulated from the supply circuit) before the appliance is  
returned to the customer.

# DA-9010 D

## EXPLODED V



- A : N09 - 1445 - 05
- B : N09 - 2652 - 05
- C : N29 - 0216 - 05
- D : N29 - 0255 - 05
- E M 3x6 : N30 - 3006 - 46
- F Ø 3x8 (Bi - Tap) BLK : N89 - 3008 - 46
- G Ø 3x8 (Bi - Tap) : N89 - 3008 - 46
- H Ø 4x8 (Bi - Tap) BLK : N89 - 4008 - 45
- I : N09 - 0333 - 05
- K : N09 - 2641 - 05

SAMPLING FREQUENCY			INPUT SELECTOR			
32	44	48	ANALOG		DIGITAL	
D40	D41	D42	D31	D32	D33	D34 D35 D36

SOURCE DIRECT S 8 S 7

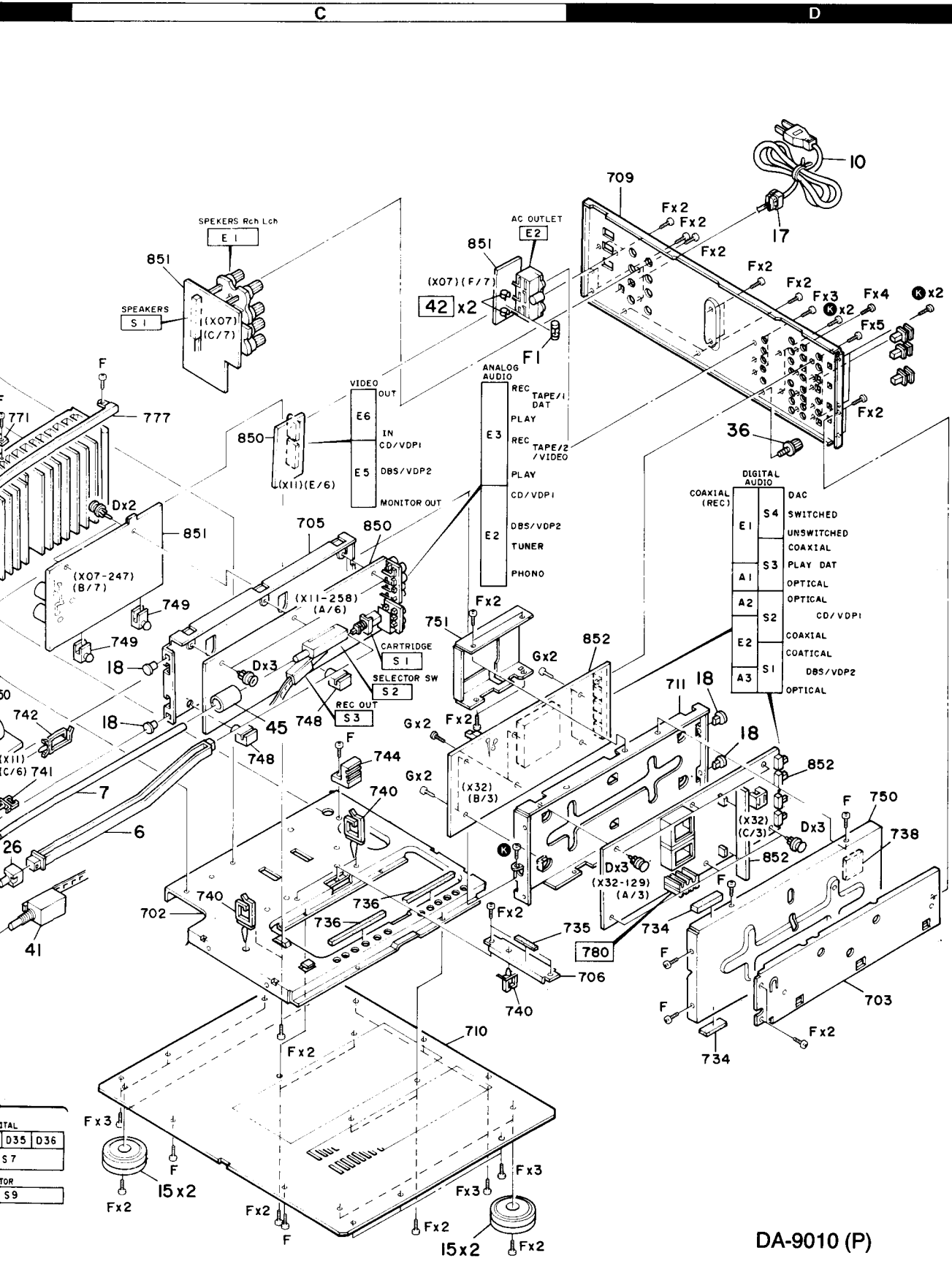
D38 S 6 SELECTOR S 9

MUTING			SUBSONIC		BALANCE	
BASS	TONE	TREBLE	D37	S5	VR 4	
VR 3	S 4	VR 2				

BASS INTENSIFIER

# DA-9010

## EXPLODED VIEW



DA-9010 (P)

## PARTS LIST

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Ref. No. 参照番号	Address 位置	New Parts 新	Parts No. 部品番号	Description 部品名 / 規格	Desti- nation 仕 向	Re- marks 備考
<b>DA-9010</b>						
1	1A	*	A01-1703-01	METALLIC CABINET		
2	3A	*	A20-5639-12	PANEL ASSY	PUUEMX	
2	3A	*	A20-5710-12	PANEL ASSY	TE1	
3	2A		A70-0240-05	REMOTE CONTROLLER ASSY		
12	2A		A09-0077-08	BATTERY COVER (REMOTE CONT)		
--			B46-0094-03	WARRANTY CARD	UUE	
--			B46-0095-03	WARRANTY CARD	UUE	
--			B46-0096-13	WARRANTY CARD	X	
--			B46-0121-03	WARRANTY CARD	P	
--			B46-0122-13	WARRANTY CARD	E1	
--			B46-0143-03	WARRANTY CARD	T	
--		*	B50-9170-00	INSTRUCTION MANUAL		
--		*	B50-9171-00	INSTRUCTION MANUAL	PME1	
--		*	B50-9172-00	INSTRUCTION MANUAL	M	
--		*	B50-9173-00	INSTRUCTION MANUAL	E1	
--			B58-0223-04	CAUTION CARD (PRE-SET 120V)	U	
--			B58-0513-04	CAUTION CARD (PRESET220-240)	UE	
--			B58-0803-13	CAUTION CARD	E1	
C101	1B	*	C90-1726-15	ELECTROLYTIC CAPACITOR ASSY	PUUEMX	
C101	1B	*	C90-1773-05	ELECTROLYTIC CAPACITOR ASSY	TE1	
C102	2B		C91-0023-05	CERAMIC 0.01UF AC250V	UUEM	
C102	2B		C91-0647-05	CERAMIC 0.01UF P	PXTE1	
5	3A	*	D10-2271-04	ARM		
6	2B, 2C	*	D21-1490-13	EXTENSION SHAFT		
7	2B, 2C	*	D21-1491-04	EXTENSION SHAFT		
8	2B	*	D21-1492-14	EXTENSION SHAFT		
△	10		E30-0459-05	AC POWER CORD	E1	
△	10		E30-0812-05	AC POWER CORD	UUEM	
△	10		E30-0974-05	AC POWER CORD	P	
△	10		E30-1341-05	AC POWER CORD	X	
△	10		E30-1416-05	AC POWER CORD	T	
△	F1		F05-2525-05	FUSE (SEMCO) (250V T2.5A)	XTE1	
△	F1		F05-3022-05	FUSE (250V 3A)	UUEM	
△	F1		F05-6027-05	FUSE (UL) (250V 6A)	P	
11	1A		G11-0163-04	SOFT TAPE (40X20X20)		
--		*	H01-8310-04	ITEM CARTON CASE		
--		*	H10-3718-02	POLYSTYRENE FOAMED FIXTURE		
--		*	H10-3719-02	POLYSTYRENE FOAMED FIXTURE		
--			H25-0225-04	PROTECTION BAG (850X450X0.03)		
--			H25-0232-04	PROTECTION BAG (235X350X0.03)		
△	15		J02-1002-05	FOOT		
17	1D		J42-0083-05	POWER CORD BUSHING		
18	2C, 2D	*	J42-0168-05	BUSHING		
--			J61-0033-05	WIRE BAND		
--			J61-0035-05	WIRE BAND		
--			J61-0307-05	WIRE BAND		
19	3A	*	K27-1938-04	KNOB ADAPTER		
20	3A	*	K29-3397-04	KNOB ASSY		
21	3A	*	K29-3398-04	KNOB ASSY		
22	3A	*	K29-3401-04	KNOB		
23	3A	*	K29-3402-04	KNOB		

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24	3A	*	K29-3403-04	KNØB ASSY		
25	3A	*	K29-3404-04	KNØB		
26	3A, 3B	*	K29-3405-04	KNØB		
27	3A	*	K29-3406-04	KNØB		
28	3A	*	K29-3514-04	KNØB		
29	3A	*	K29-3515-04	KNØB		
30	2A	*	K29-3701-04	KNØB		
△	35	*	L01-5611-05	POWER TRANSFORMER	P	
△	35	*	L01-5612-05	POWER TRANSFORMER	E1	
△	35	*	L01-5615-05	POWER TRANSFORMER	UJEM	
△	35	*	L01-5617-05	POWER TRANSFORMER	XT	
L101	1B	*	L92-0019-05	FERRITE CORE		
36	2D		N08-0128-35	BINDING POST (EARTH)		
A	3A		N09-1445-05	SET SCREW (M3X8)		
B	1B		N09-2652-05	SET SCREW		
C	2B		N29-0216-05	RIVET		
D	2D, 2C		N29-0255-05	PUSH RIVET		
K	1D, 3C	*	N09-2641-05	SET SCREW		
40	2B		S90-0108-05	REMOTE SWITCH SHAFT		
41	2B	*	S90-0109-05	REMOTE SWITCH SHAFT		
△	S101		S40-1073-05	PUSH SWITCH		
		*	X00-2390-53	POWER SUPPLY UNIT	XTE1	
		*	X07-2470-21	POWER AMPLIFIER UNIT	UJEM	
		*	X07-2471-01	POWER AMPLIFIER UNIT	P	
		*	X07-2471-71	POWER AMPLIFIER UNIT		
		*	X07-2472-71	POWER AMPLIFIER UNIT	XTE1	
		*	X11-2580-00	TONE UNIT	PUJEMX	
		*	X11-2580-00	TONE UNIT	T	
		*	X11-2582-71	TONE UNIT	E1	
		*	X90-2790-00	COMPOUND ASSY UNIT		
<b>POWER SUPPLY UNIT (X00-2390-53)</b>						
△	C1		C91-0647-05	CERAMIC 0.01UF P	XTE1	
	42	1C	J13-0054-05	FUSE CLIP	XTE1	
<b>MAIN AMPLIFIER UNIT (X07-247X-XX, 0-21: U,UE,M, 0-00: P, 1-71: L, 2-71: X,T,E)</b>						
C1	.2		CF92FV1H105J	MF 1.0UF J		
C3	.4		CO09FS1H101J	POLYSTY 100PF J		
C5	.6		CC45FSL1H470J	CERAMIC 47PF J		
C7	.8		CE04KW1H010M	ELECTRO 1.0UF 50WV		
C9	.10		CF92FV1H332J	MF 3300PF J		
C11	.12		C90-1757-05	ALMINIUM ELECTROLYTIC C.		
C13	.14		CF92FV1H101K	MF 100PF K		
C15	.16		C91-0170-05	POLYSTY 22PF K		
C17	.18		CC45FSL1H331J	CERAMIC 330PF J		
C19	.20		CC45FSL1H100D	CERAMIC 10PF D		
C21	.22		CE04KW1A101M	ELECTRO 100UF 10WV		
C23	.26		CC45FSL1H221J	CERAMIC 220PF J		
C27	.34		CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C35	.36		CK45FB1H471K	CERAMIC 470PF K		
C39	.40		CF92FV1H104J	MF 0.10UF J		
C43	.45		CE04KW1C220M	ELECTRO 22UF 16WV		
C46			C90-1333-05	NP-ELEC 22UF 10WV		
C47			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		

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C48			CF92FV1H223J	MF 0.022UF J		
C49			CE04KW1C470M	ELECTR0 47UF 16WV		
C50			CE04KW1H100M	ELECTR0 10UF 50WV		
C51 ,52			CE04KW2A2R2M	ELECTR0 2.2UF 100WV		
C53 ,54			CE04KW1J101M	ELECTR0 100UF 63WV		
C55 ,56			CE04KW1J471M	ELECTR0 470UF 63WV		
C57 ,58			CK45FE2H103P	CERAMIC 0.010UF P		
C59 ,60			CE04KW1H010M	ELECTR0 1.0UF 50WV		
C61 ,62			CE04KW2A010M	ELECTR0 1.0UF 100WV		
C63 ,64			CF92FV1H104J	MF 0.10UF J		
C65 -68			CF92FV1H472J	MF 4700PF J	XTE1	
C69 -72			CF92FV1H683J	MF 0.068UF J		
C73			C91-0023-05	CERAMIC 0.01UF AC250V	UUEM	
C73			C91-0647-05	CERAMIC 0.01UF P	P	
C75 ,76			CF92FV1H103J	MF 0.010UF J		
C81 ,82			CF92FV1H102J	MF 1000PF J	XTE	
M1 ,2			D91-0082-05	UNIT STABILIZER		
E1			E20-0824-05	SCREW TERMINAL BOARD(8P)	UUEM	
E1			E20-0834-05	SCREW TERMINAL BOARD	PXTE1	
E2			E03-0093-05	AC OUTLET	PUUEM	
42	1C		J13-0041-05	FUSE CLIP	PUUEM	
L1 ,2		*	L39-0187-05	PHASE-COMPENSATION COIL		
L3 ,4			L33-0328-05	CHOKe COIL		
J	2B		N09-0333-05	TAPPING SCREW (3X12)		
CP1 -4			R90-0187-05	MULTI-COMP 0.22X2 K 5W		
R1 ,2			RN14BK2C3160F5	RN 316.0 F 1/6W		
R9 -12			RN14BK2C3831F5	RN 3.83K F 1/6W		
R15 ,16			R92-0390-05	CARBON FILM RESISTOR		
R17 ,18			R92-0395-05	CARBON FILM RESISTOR		
R19 ,20			R92-0396-05	CARBON FILM RESISTOR		
R25 ,26			RD14AB2E822JTS	FL-PROOF RD 8.2K J 1/4W		
R27 ,28			RD14AB2E181JTS	FL-PROOF RD 180 J 1/4W		
R29 -32			RD14AB2E331JTS	FL-PROOF RD 330 J 1/4W		
R35 -38			RD14AB2E331JTS	FL-PROOF RD 330 J 1/4W		
R39 -42			RD14AB2E150JTS	FL-PROOF RD 15 J 1/4W		
R43 -46			RD14AB2E561JTS	FL-PROOF RD 560 J 1/4W		
R47 -50			RD14AB2E151JTS	FL-PROOF RD 150 J 1/4W		
R51 -58			RD14AB2E4R7JTS	FL-PROOF RD 4.7 J 1/4W		
R59 ,60			RD14AB2E222JTS	FL-PROOF RD 2.2K J 1/4W		
R61 -64			RD14AB2E102JTS	FL-PROOF RD 1.0K J 1/4W		
R65 ,66			RD14AB2E222JTS	FL-PROOF RD 2.2K J 1/4W		
R67 -70			RD14AB2E101JTS	FL-PROOF RD 100 J 1/4W		
R73 ,74			RS14DB3D100JTE	FL-PROOF RS 10 J 2W		
R77 ,78			RD14AB2E4R7JTS	FL-PROOF RD 4.7 J 1/4W		
R81 ,82			RS14DB3D100JTE	FL-PROOF RS 10 J 2W		
R87 ,88			RS14DB3D331JTE	FL-PROOF RS 330 J 2W		
R109,110			RS14DB3D100JTE	FL-PROOF RS 10 J 2W		
R111			RS14DB3D122JTE	FL-PROOF RS 1.2K J 2W		
R122-125			RS14DB3A100JTE	FL-PROOF RS 10 J 1W		
R127,128			RD14AB2E101JTS	FL-PROOF RD 100 J 1/4W		
VR1 ,2			R12-1086-05	TRIMMING P0T.		
K1			S51-2045-05	MAGNETIC RELAY		

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S1 S2			S90-0062-05	SLIDE SWITCH	UUEM	
			S31-2128-05	SLIDE SWITCH (POWER TYPE)		
D1 ,2			HZS5. 1S(B2)	ZENER DIODE		
D1 ,2			RD5. 1JS(B2)	ZENER DIODE		
D3 -20			HSS104	DIODE		
D3 -20			1SS133	DIODE		
D21 ,22			HZS5. 1S(B2)	ZENER DIODE		
D21 ,22			RD5. 1JS(B2)	ZENER DIODE		
D23 ,24			HSS104	DIODE		
D23 ,24			1SS133	DIODE		
D25 -28			HSS104A	DIODE		
D25 -28			1SS131	DIODE		
D29 ,30			MA27Q(A)	VARISTOR		
D31 ,32			HZS30N(B)	ZENER DIODE		
D31 ,32			RD30ES(B)	ZENER DIODE		
D33 ,34			HZS24N(B)	ZENER DIODE		
D33 ,34			RD24ES(B)	ZENER DIODE		
D35 ,36			HSS104A	DIODE		
D35 ,36			1SS131	DIODE		
D37			D5FB20*1	DIODE		
D42			HZS5. 1S(B2)	ZENER DIODE		
D42			RD5. 1JS(B2)	ZENER DIODE		
IC1			UPC1237HA	IC(POWER AMP)		
Q1 -8			2SC1845(F,E)	TRANSISTOR		
Q9 ,10			2SC1740S(Q,R)	TRANSISTOR		
Q9 ,10			2SC945(A)(Q,P)	TRANSISTOR		
Q11 -14			2SA733(A)(Q,P)	TRANSISTOR		
Q11 -14			2SA933S(Q,R)	TRANSISTOR		
Q15 -18			2SA1123(R,S)	TRANSISTOR		
Q19 ,20			2SC1740S(Q,R)	TRANSISTOR		
Q19 ,20			2SC945(A)(Q,P)	TRANSISTOR		
Q21 -24			2SC2631(R,S)	TRANSISTOR		
Q25 ,26			2SA1123(R,S)	TRANSISTOR		
Q27 ,28			2SC3944(Q,R)	TRANSISTOR		
Q29 ,30			2SA1535(Q,R)	TRANSISTOR		
Q31 ,32			2SD1717*5	TRANSISTOR		
Q33 ,34			2SB1162*5	TRANSISTOR		
Q35 ,36			2SD1717*5	TRANSISTOR		
Q37 ,38			2SB1162*5	TRANSISTOR		
Q39 ,40			2SC2631(R,S)	TRANSISTOR		
Q41 ,42			2SA1123(R,S)	TRANSISTOR		
Q43 ,44			2SC4137(V,W)	TRANSISTOR		
Q51			2SA992(F,E)	TRANSISTOR		
Q53 ,54			2SC2003(L,K)	TRANSISTOR		
Q55 ,56			2SA954(L,K)	TRANSISTOR		
<b>TONE UNIT (X11-258X-XX, 0-00: P,U,UE,M,X,T,L, 2-71: E)</b>						
D31 -36			B30-1268-05	LED		
D37 -42			B30-0431-05	LED(LN21CPH)		
C3 ,4			CQ09FS1H121J	POLYSTY 120PF J	PUUEMX T	
C3 ,4			CQ09FS1H121J	POLYSTY 120PF J		
C5 ,6			CE04KWOJ222M	ELECTRO 2200UF 6.3WV		
C7 ,8			CF92FV1H332J	MF 3300PF J		
C9 ,10			C91-0790-05	FILM 0.039UF J		

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C11 ,12			CQ93HP2A113G	MYLAR 0.011UF G		
C13 ,14			CF92FV1H103J	MF 0.010UF J		
C15 ,16			CQ93HP2A392J	MYLAR 3900PF J		
C17			CE04KW1V100M	ELECTRØ 10UF 35WV		
C18			CE04KW1A470M	ELECTRØ 47UF 10WV		
C19			CE04KW1E101M	ELECTRØ 100UF 25WV		
C20			CF92FV1H103J	MF 0.010UF J		
C22			CE04KWOJ331M	ELECTRØ 330UF 6.3WV		
C23 ,24			CK45FF1H103Z	CERAMIC 0.010UF Z		
C25 ,26			CE04KW1V102M	ELECTRØ 1000UF 35WV		
C27 -32			CK45FF1H103Z	CERAMIC 0.010UF Z		
C35			CE04KW1H3R3M	ELECTRØ 3.3UF 50WV		
C36 ,37			CE04KW1E101M	ELECTRØ 100UF 25WV		
C38 ,39			C90-1349-05	NP-ELEC 1UF 50WV		
C40			CE04KWOJ471M	ELECTRØ 470UF 6.3WV		
C41 -43			CE04KW1V100M	ELECTRØ 10UF 35WV		
C44			CE04KWOJ471M	ELECTRØ 470UF 6.3WV		
C45 ,46			CF92FV1H102J	MF 1000PF J		
C47 -50			CF92FV1H393J	MF 0.039UF J		
C51 -54			CE04KW1C220M	ELECTRØ 22UF 16WV		
C55 ,56			CE04KW1H010M	ELECTRØ 1.0UF 50WV		
C57 ,58			CC45FSL1H150J	CERAMIC 15PF J		
C65 -68			CF92FV1H684J	MF 0.68UF J		
C69 ,70			CE04KW1H010M	ELECTRØ 1.0UF 50WV		
C71			CE04KWOJ222M	ELECTRØ 2200UF 6.3WV		
C72 ,73			CC45FSL1H221J	CERAMIC 220PF J		
C75			CE04KW1HOR1M	ELECTRØ 0.1UF 50WV		
C76			C90-1455-05	NP-ELEC 0.1UF 50WV		
C77 ,78			CK45FF1H103Z	CERAMIC 0.010UF Z		
C79 -82			CF92FV1H154J	MF 0.15UF J		
C83 ,84			C90-1748-05	ALMINIUM ELECTROLYTIC C.		
C85 ,86			CF92FV1H471J	MF 470PF J	E1	
C87 ,88			CF92FV1H151K	MF 150PF K	E1	
C89 ,90			CF92FV1H471J	MF 470PF J	E1	
C91 -98			CF92FV1H151K	MF 150PF K	E1	
C99 ,100			CF92FV1H101K	MF 100PF K	E1	
C102-104			CC45FSL1H181J	CERAMIC 180PF J		
C105,106			CF92FV1H105J	MF 1.0UF J		
C109			CE04KW1C101M	ELECTRØ 100UF 16WV		
C111,112			CE04KW1H2R2M	ELECTRØ 2.2UF 50WV		
C113,114			C90-1748-05	ALMINIUM ELECTROLYTIC C.		
C115,116			CQ09FS1H101JZS	POLYSTY 100PF J	PUUEMX	
C115,116			CQ09FS1H101JZS	POLYSTY 100PF J	T	
C115,116			CQ09FS1H221JZS	POLYSTY 220PF J	E1	
C117-120			CF92FV1H122J	MF 1200PF J	E1	
C121,122			C91-0175-05	POLYSTY 56PF K	E1	
C123-125			CE04KW1V100M	ELECTRØ 10UF 35WV		
C130			CE04KW1V100M	ELECTRØ 10UF 35WV		
C131-136			CC45FSL1H101J	CERAMIC 100PF J	E1	
C133-136			CC45FSL1H101J	CERAMIC 100PF J	PUUEMX	
C133-136			CC45FSL1H101J	CERAMIC 100PF J	T	
C137			CF92FV1H222J	MF 2200PF J		
C138			CF92FV1H222J	MF 2200PF J		
C139-142			C91-0757-05	CERAMIC 1000PF K		
C143			CE04KW1V470M	ELECTRØ 47UF 35WV		

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45	2C		D22-0063-04	SHAFT COUPLING		
E2			E13-0824-05	PHONE JACK		
E3			E13-0823-05	PHONE JACK		
E4			E11-0193-05	PHONE JACK		
E5			E13-0313-05	PHONE JACK		
E6			E13-0297-05	PHONE JACK		
E8			F10-0675-04	SHIELDING PLATE		
E9			F10-0704-04	SHIELDING PLATE		
E10 -12			F10-0575-04	SHIELDING PLATE		
E13			F11-0424-04	SHIELDING COVER		
E18			F01-0655-04	HEAT SINK		
E14			J11-0111-05	CLAMPER		
E15 -17			J11-0098-05	WIRE CLAMPER		
L1 -3			L33-0328-05	CHOKER COIL		
L4 ,5			L40-1011-47	SMALL FIXED INDUCTOR(100UH,K)	E1	
L6			L40-1011-11	SMALL FIXED INDUCTOR(100UH,K)		
X1			L78-0202-05	RESONATOR (400KHZ)		
R3 ,4			RN14BK2C100DF	RN 100.0 F 1/6W		
R5 ,6		*	RN14BK2C4752F	RN 47.5K F 1/6W		
R7 ,8		*	RN14BK2C10ROF	RN 10.0 F 1/6W		
R9 ,10		*	RN14BK2C1330F	RN 133.0 F 1/6W		
R11 ,12		*	RN14BK2C11ROF	RN 11.0 F 1/6W		
R23 ,24		*	RN14BK2C8252F	RN 82.5K F 1/6W		
R25 ,26			RN14BK2C6811F	RN 6.81K F 1/6W		
R36			RD14AB2E271JTS	FL-PROOF RD 270 J 1/4W		
R44 ,45			RD14AB2E102JTS	FL-PROOF RD 1.0K J 1/4W		
R46			RD14AB2E330JTS	FL-PROOF RD 33 J 1/4W		
R47 ,48			RD14AB2E470JTS	FL-PROOF RD 47 J 1/4W		
R49 -52		*	RN14BK2C1961FTS	RN 1.96K F 1/6W		
R53 ,54		*	RN14BK2C1961FTS	RN 1.96K F 1/6W		
R55 ,56		*	RN14BK2C1961FTS	RN 1.96K F 1/6W		
R92		*	RD14AB2E180JTS	FL-PROOF RD 18 J 1/4W		
R125,126			RS14DB3D151JTE	FL-PROOF RS 150 J 2W		
R127,128			RS14DB3A151JTE	FL-PROOF RS 150 J 1W		
R129,130			RS14DB3D681JTE	FL-PROOF RS 680 J 2W		
R133,134			RS14DB3D220JTE	FL-PROOF RS 22 J 2W		
R149,150			RN14BK2C3160F	RN 316.0 F 1/6W		
R166			RS14DB3D561JTE	FL-PROOF RS 560 J 2W		
R173-176		*	RN14BK2C1961FTS	RN 1.96K F 1/6W		
R178		*	RS14DB3D101JTE	FL-PROOF RS 100 J 2W		
VR1			R29-5020-05	POTENTIOMETER		
VR2 ,3			R06-2017-05	POTENTIOMETER(5KBX2)		
VR4			R06-5171-05	POTENTIOMETER		
K1 -3			S51-2074-05	MAGNETIC RELAY		
S1			S40-6035-05	PUSH SWITCH		
S2			S29-6011-05	ROTARY SWITCH		
S3			S90-0078-05	SLIDE SWITCH		
S4			S40-4074-05	PUSH SWITCH		
S5			S42-3114-05	MULTIPLE PUSH SWITCH		
S6 -8			S40-1064-05	PUSH SWITCH		
S9			S29-2034-05	ROTARY SWITCH		
PH1			T95-0109-05	OPTO ISOLATOR		

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PH2			T95-0101-05	OPTO ISOLATOR		
D1 ,2			HZ55. 1S(B2)	ZENER DIODE		
D1 ,2			RD5. 1JS(B2)	ZENER DIODE		
D3			HZS16N(B2)	ZENER DIODE		
D3			RD16ES(B2)	ZENER DIODE		
D4			HZ55. 1S(B2)	ZENER DIODE		
D4			RD5. 1JS(B2)	ZENER DIODE		
D5			HSS104	DIODE		
D5			1SS133	DIODE		
D6 ,7			HZ58. 2N(B2)	ZENER DIODE		
D6 ,7			RDB. 2ES(B2)	ZENER DIODE		
D8 -11			S5566B	DIODE		
D12 -26			HSS104	DIODE		
D12 -26			1SS133	DIODE		
D27			HZ54. 7N(B)	ZENER DIODE		
D27			RD4. 7ES(B)	ZENER DIODE		
D30			HZ55. 1S(B2)	ZENER DIODE		
D30			RD5. 1JS(B2)	ZENER DIODE		
D44 ,45			HZS16N(B2)	ZENER DIODE		
D44 ,45			RD16ES(B2)	ZENER DIODE		
D47 -50			HSS104	DIODE		
D47 -50			1SS133	DIODE		
D51		*	RD10F(B1,B2)	ZENER DIODE		
IC1			NJM5532D-D	IC(OP AMP X2)		
IC2			NJM4560D-N	IC(OP AMP X2)		
IC3			NJM4565D-D	IC(OP AMP X2)		
IC4			NJM2245D	IC(VIDEO SWITCH)		
IC5			UPC7812HF	IC(VOLTAGE REGULATOR/ +12V)		
IC6			BX-140B	IC(REMOTE SENSOR)		
IC7			NJM2041D-D	IC(OP AMP X2)		
IC8			LB1641	IC(MOTOR DRIVER)		
IC9			UPD7564CS-099	IC(MICROPROCESSOR)		
IC10			M51951ASL	IC(SYSTEM RESET)		
Q1 -4			2SK369(V)	FET		
Q1 -4			2SK371(V)	FET		
Q5 -10			2SC1845(F,E)	TRANSISTOR		
Q11			2SD882	TRANSISTOR		
Q12			2SB772	TRANSISTOR		
Q13			2SA733(A)(Q,P)	TRANSISTOR		
Q14			2SC2003(L,K)	TRANSISTOR		
Q15 ,16			2SC2878(B)	TRANSISTOR		
Q17			DTA124EN	DIGITAL TRANSISTOR		
Q18 -21			DTC124EN	DIGITAL TRANSISTOR		
Q22 ,23			2SC2878(B)	TRANSISTOR		
Q24 ,25			2SC945(A)(Q,P)	TRANSISTOR		
Q28 -30			DTC124EN	DIGITAL TRANSISTOR		
Q31 -36			DTA143EFF	DIGITAL TRANSISTOR		
<b>PROCESSOR UNIT (X32-1290-00)</b>						
C1 ,2			CE04KW1C330M	ELECTRO	33UF	16WV
C3 ,4			CE04KW1A101M	ELECTRO	100UF	10WV
C5 ,6			CE04KW1C330M	ELECTRO	33UF	16WV
C7 ,8			CE04KW1C331M	ELECTRO	330UF	16WV
C9 ,10			CE04KW0J101M	ELECTRO	100UF	6.3WV

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C11 ,12			CE04KW1C331M	ELECTR0 330UF 16WV		
C15 ,16			CE04KW1C330M	ELECTR0 33UF 16WV		
C17 ,18			CQ09FS1H101JZS	P0LYSTY 100PF J		
C21 ,22			CF92FV1H203J	MF 0.020UF J		
C23 ,24			CQ09FS1H021JZS	P0LYSTY 820PF J		
C25 ,26			CF92FV1H332J	MF 3300PF J		
C27 ,28			CF92FV1H203J	MF 0.020UF J		
C29 ,30			C91-0175-05	P0LYSTY 56PF K		
C31 ,32			CF92FV1H752J	MF 7500PF J		
C41			CE04KW1H4R7M	ELECTR0 4.7UF 50WV		
C42			CK45FF1H103Z	CERAMIC 0.010UF Z		
C43			CE04KW1HOR1M	ELECTR0 0.1UF 50WV		
C44			CE04KW1H4R7M	ELECTR0 4.7UF 50WV		
C45			CK45FF1H103Z	CERAMIC 0.010UF Z		
C46			CE04KW1HOR1M	ELECTR0 0.1UF 50WV		
C47			CE04KW1H4R7M	ELECTR0 4.7UF 50WV		
C48			CK45FF1H103Z	CERAMIC 0.010UF Z		
C49			CE04KW1HOR1M	ELECTR0 0.1UF 50WV		
C50			CF92FV1H102J	MF 1000PF J		
C51			CF92FV1H103J	MF 0.010UF J		
C52			CE04KW1C330M	ELECTR0 33UF 16WV		
C53			CF92FV1H103J	MF 0.010UF J		
C54			CE04KW1C330M	ELECTR0 33UF 16WV		
C55			CF92FV1H103J	MF 0.010UF J		
C56			CE04KW1C330M	ELECTR0 33UF 16WV		
C57			CF92FV1H103J	MF 0.010UF J		
C58 ,59			CE04KW1C330M	ELECTR0 33UF 16WV		
C60			CF92FV1H105J	MF 1.0UF J		
C61 -63			C91-0085-05	CERAMIC 0.022UF N		
C65			CE04KW1A470M	ELECTR0 47UF 10WV		
C73 ,74			CC45FSL1H080D	CERAMIC 8.0PF D		
C75 ,76			CF92FV1H104J	MF 0.10UF J		
C77			CE04KW1A101M	ELECTR0 100UF 10WV		
C78			C90-1350-05	NP-ELEC 2.2UF 50WV		
C79			CE04KW1A470M	ELECTR0 47UF 10WV		
C80 ,81			CE04KW1C101M	ELECTR0 100UF 16WV		
C82			CF92FV1H224J	MF 0.22UF J		
C83 ,84			CC45FSL1H330J	CERAMIC 33PF J		
C85			CQ09FS1H101JZS	P0LYSTY 100PF J		
C86 ,87			CC45FSL1H330J	CERAMIC 33PF J		
C88			CQ09FS1H101JZS	P0LYSTY 100PF J		
C89			CF92FV1H822J	MF 8200PF J		
C91			CE04KWOJ471M	ELECTR0 470UF 6.3WV		
C93			CE04KW1A470M	ELECTR0 47UF 10WV		
C95			CE04KW1C330M	ELECTR0 33UF 16WV		
C97			CE04KW1A101M	ELECTR0 100UF 10WV		
C98			CE04KW1C330M	ELECTR0 33UF 16WV		
C100,101			CE04KW1C330M	ELECTR0 33UF 16WV		
C102			CE04KW1A101M	ELECTR0 100UF 10WV		
C103			CE04KW1E330M	ELECTR0 33UF 25WV		
C104,105			CE04KW1C101M	ELECTR0 100UF 16WV		
C106,107			CE04KW1E470M	ELECTR0 47UF 25WV		
C108			CE04KWOJ471M	ELECTR0 470UF 6.3WV		
C109			CE04KW1A470M	ELECTR0 47UF 10WV		
C110			CE04KW1C330M	ELECTR0 33UF 16WV		

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C111			CE04KW1A101M	ELECTRØ 100UF 10WV		
C112			CE04KW1C471M	ELECTRØ 470UF 16WV		
C113			CE04KW1C470M	ELECTRØ 47UF 16WV		
C114-116			CE04KW1C330M	ELECTRØ 33UF 16WV		
C119,120			CE04KW0J102M	ELECTRØ 1000UF 6.3WV		
C121,122			CE04KW1C332M	ELECTRØ 3300UF 16WV		
C123,124			CE04KW1C330M	ELECTRØ 33UF 16WV		
C125			CE04KW1A101M	ELECTRØ 100UF 10WV		
C126,127			CE04KW1E222M	ELECTRØ 2200UF 25WV		
C128			CE04KW1A470M	ELECTRØ 47UF 10WV		
C129			CE04KW1C330M	ELECTRØ 33UF 16WV		
C130			CE04KW1E222M	ELECTRØ 2200UF 25WV		
C131			CE04KW1C332M	ELECTRØ 3300UF 16WV		
C133-137			CK45FF1H103Z	CERAMIC 0.010UF Z		
C141			CK45FF1H103Z	CERAMIC 0.010UF Z		
C142			CE04KW1A101M	ELECTRØ 100UF 10WV		
E1 ,2			E13-0296-05	PIN JACK		
L1 -3			L40-4701-16	SMALL FIXED INDUCTØR(47UH,K)		
L4 -10			L33-0328-05	CHØKE COIL		
L11 ,12			L40-1092-16	SMALL FIXED INDUCTØR(1UH,M)		
L13 -17			L40-4701-16	SMALL FIXED INDUCTØR(47UH,K)		
L18			L40-1092-16	SMALL FIXED INDUCTØR(1UH,M)		
L19			L39-0155-05	MATCHING COIL		
L20 ,21			L39-0181-05	VARIABLE INDUCTØR		
L22 ,23			L40-4701-16	SMALL FIXED INDUCTØR(47UH,K)		
L24			L40-1021-11	SMALL FIXED INDUCTØR(1.0MH,K)		
L25 -28			L40-1011-16	SMALL FIXED INDUCTØR(100UH,K)		
X1			L77-1153-05	CRYSTAL RESØNATOR		
X2			L77-1152-05	CRYSTAL RESØNATOR		
R3 -6			RN14BK2C1001FTS	RN 1.00K F 1/6W		
R9 -12			RN14BK2C1001FTS	RN 1.00K F 1/6W		
R19 ,20			R92-0392-05	CARBØN FILM RESISTØR		
R21 -26			RN14BK2C1001FTS	RN 1.00K F 1/6W		
R27 ,28			RN14BK2C1621FTS	RN 1.62K F 1/6W		
R29 ,30			RN14BK2C8250FTS	RN 825.0 F 1/6W		
R33 ,34			RN14BK2C1000FTS	RN 100.0 F 1/6W		
R37 ,38		*	RN14BK2C1101FTS	RN 1.10K F 1/6W		
R39 ,40			RN14BK2C1001FTS	RN 1.00K F 1/6W		
R106			RN14BK2C1001FTS	RN 1.00K F 1/6W		
R111			RN14BK2C1210FTS	RN 121.0 F 1/6W		
R117			RN14BK2C1210FTS	RN 121.0 F 1/6W		
R118			RN14BK2C1001FTS	RN 1.00K F 1/6W		
R152			RD14GB2E220JTS	FL-PROOF RD 22 J 1/4W		
VR1 -4			R12-5072-05	TRIMMING PØT.		
S1 -4			S31-2094-05	SLIDE SWITCH		
D1 -20			HSS104	DIØDE		
D1 -20			1SS133	DIØDE		
D22			HZS2.7N(B2)	ZENER DIØDE		
D22			RD2.7ES(B2)	ZENER DIØDE		
D23			KV1330A-2	VARIABLE CAPACITANCE DIØDE		
D25 ,26			HSS104	DIØDE		
D25 ,26			1SS133	DIØDE		

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D27			HZS7.5S(B)	ZENER DIODE		
D27			RD7.5JS(B)	ZENER DIODE		
D28			HSS104	DIODE		
D28			1SS133	DIODE		
D29			HZS4.7N(B)	ZENER DIODE		
D29			RD4.7ES(B)	ZENER DIODE		
D30			HZS2.7N(B2)	ZENER DIODE		
D30			RD2.7ES(B2)	ZENER DIODE		
D33 ,34			HZS5.1S(B2)	ZENER DIODE		
D33 ,34			RD5.1JS(B2)	ZENER DIODE		
D35 --38			HSS104	DIODE		
D35 --38			1SS133	DIODE		
D41 ,42			HSS104	DIODE		
D41 ,42			1SS133	DIODE		
D43 ,44			HZS2.7N(B2)	ZENER DIODE		
D43 ,44			RD2.7ES(B2)	ZENER DIODE		
D45			HZS8.2S(B2)	ZENER DIODE		
D45			RDB.2JS(B2)	ZENER DIODE		
D51 ,52			HZS8.2S(B2)	ZENER DIODE		
D51 ,52			RDB.2JS(B2)	ZENER DIODE		
D53			HZS5.1S(B2)	ZENER DIODE		
D53			RD5.1JS(B2)	ZENER DIODE		
D54 --59			S5566B	DIODE		
D61			S5566B	DIODE		
D65 --67			HSS104	DIODE		
D65 --67			1SS133	DIODE		
IC1 ,2			TC74HC00P	IC(QUAD 2-INPUT NAND GATE)		
IC3			TC74HC10P	IC(NAND X3)		
IC4			TC74HC20P	IC(CMOS)		
IC5			TC74HC04P	IC(HEX INVERTER)		
IC6			AN7805F	IC(VOLTAGE REGULATOR/ +5V)		
IC6			UPC7805HF	IC(VOLTAGE REGULATOR/ +5V)		
IC7			TC74HC08P	IC(AND X2)		
IC8			M5218P	IC(OP AMP X2)		
IC9			SMS813APT	IC		
IC10			TC176008AF--8060	IC(DPAC)		
IC11			M51951ASL	IC(SYSTEM RESET)		
IC12,13			PCMS8P	IC(DA CONVERTER)		
IC14-17			NJM4565D--D	IC(OP AMP X2)		
IC18			M5223P	IC(OP AMP X2)		
IC19-21			M5218P	IC(OP AMP X2)		
IC22			TC74HC74F	IC(D-FLIP FLOP)		
IC23			TC74HC04P	IC(HEX INVERTER)		
IC24			TC74HC157P	IC		
Q1 ,2			2SC2878(B)	TRANSISTOR		
Q11			2SK105(F,H)	FET		
Q12			2SK161(GR)	FET		
Q13			2SC1740S(Q,R)	TRANSISTOR		
Q13			2SC945(A)(Q,P)	TRANSISTOR		
Q14			2SK161(GR)	FET		
Q15			2SC1740S(Q,R)	TRANSISTOR		
Q15			2SC945(A)(Q,P)	TRANSISTOR		
Q16			2SC3666	TRANSISTOR		
Q17			2SA1426	TRANSISTOR		
Q18			2SC3666	TRANSISTOR		

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Q19			2SD1266(Q,P)	TRANSISTOR		
Q21			2SA733(A)(Q,P)	TRANSISTOR		
Q21			2SA933S(Q,R)	TRANSISTOR		
Q22			2SC1740S(Q,R)	TRANSISTOR		
Q22			2SC945(A)(Q,P)	TRANSISTOR		
Q23			2SD1266(Q,P)	TRANSISTOR		
Q24			2SB941(Q,P)	TRANSISTOR		
Q25			2SA733(A)(Q,P)	TRANSISTOR		
Q25			2SA933S(Q,R)	TRANSISTOR		
A1	-3		W02-0976-05	OPTIC RECEIVING MODULE		
<b>DIGITAL I/O UNIT (X88-1010-00)</b>						
C1			CC45FSL1H270J	CERAMIC 27PF J		
C2			CF92FV1H273J	MF 0.027UF J		
C3			CF92FV1H272J	MF 2700PF J		
C4			CF92FV1H683J	MF 0.068UF J		
C5			C90-1602-05	NP-ELEC 10UF 10WV		
C6			CF92FV1H103J	MF 0.010UF J		
C7			CE04JW1H010M	ELECTRO 1.0UF 50WV		
C8	-10		CE04JW1A101M	ELECTRO 100UF 10WV		
C11	-14		CK45FF1H103Z	CERAMIC 0.010UF Z		
C15			CC45FSL1H150J	CERAMIC 15PF J		
L1	.2		L92-0018-05	FERRITE CORE		
R4	.5		RD14AB2E100JTS	FL-PROOF RD 10 J 1/4W		
D1			1SS237(1)	DIODE		
D2	-10		1SS133	DIODE		
D2	-10		1SS176	DIODE		
IC1			TC17G014AF-0073	IC(DIGITAL IN)		
IC2			SN74LS624N	IC(VCR)		
IC3			M5223P	IC(OP AMP X2)		
IC4			TC74HC004F	IC(HEX INVERTER)		
IC5			TC74HC123F	IC(DUAL MONO MULTI)		
<b>COMPOUND ASS'Y UNIT (X90-2790-00)</b>						
60	2D, 3D		J42-0168-05	BUSHING		
D	2D		N29-0255-05	PUSH RIVET		

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U: PX(Far East, Hawaii) T: England M: Other Areas

UE: AAFES(Europe) X: Australia

 indicates safety critical components.

## SPECIFICATIONS

## POWER OUTPUT

## Rated Power

100 watts per channel minimum RMS, both channels driven, at 8 ohms from 20 Hz to 20,000 Hz with no more than 0.015% total harmonic distortion

## Maximum Continuous Power Output (DIN)

1 kHz at 4 ohms ..... 175 W

## Maximum Continuous Power Output (DIN)

1 kHz at 8 ohms ..... 115 W

## Maximum Continuous Power Output (IEC/NF)

from 63 Hz to 12,500 Hz, 0.7% Total Harmonic

Distortion at 8 ohms ..... 110 W + 110 W

Dynamic Power ..... 340 W per channel at 2 ohms

230 W per channel at 4 ohms

140 W per channel at 8 ohms

## TOTAL HARMONIC DISTORTION

(LINE input to SPEAKER output)

## Rated Output Power at 8 ohms,

20 Hz ~ 20,000 Hz ..... 0.015%

## 1/2 Rated Output Power at 8 ohms,

20 Hz ~ 20,000 Hz ..... 0.01%

Rated Output Power at 8 ohms, 1 kHz ..... 0.008%

## INTERMODULATION DISTORTION (60 Hz:7 kHz = 4:1)

at Rated Output Power ..... 0.0035%

## FREQUENCY RESPONSE

LINE to SPEAKER ..... 5 Hz to 90 kHz +0 dB, -3 dB

## PHONO "RIAA" Response

PHONO (MM) Input ..... 20 Hz to 20 kHz  $\pm 0.3$  dB

PHONO (MC) Input ..... 20 Hz to 20 kHz  $\pm 0.3$  dB

## SIGNAL TO NOISE RATIO

PHONO (MM) (IHF-A) (IHF'66) ..... 87 dB for 2.5 mV input

PHONO (MC) (IHF-A) (IHF'66) ..... 70 dB for 0.25 mV input

## TUNER/AUX/TAPE

(IHF-A) (IHF'66) ..... 106 dB for 150 mV input

PHONO (MM) (IHF-A) ..... 78 dB

PHONO (MC) (IHF-A) ..... 73 dB

TUNER/AUX/TAPE (IHF-A) ..... 80 dB

## PHONO (MM) at Unweighted,

50 mW Output (DIN) ..... 56 dB

## TUNER/AUX/TAPE at Unweighted,

50 mW Output (DIN) ..... 58 dB

POWER BANDWIDTH ..... 10 Hz to 50 kHz,

0.1% T.H.D., 8 ohms

FILTER ..... SUBSONIC 18 Hz 6 dB/oct

## TONE CONTROL

BASS .....  $\pm 10$  dB at 100 Hz

TREBLE .....  $\pm 10$  dB at 10 kHz

BASS INTENSIFIER ..... 20 Hz +9 dB, 100 Hz +3 dB

DAMPING FACTOR ..... 150/50 Hz at 8 ohms

## CHANNEL SEPARATION at 1 kHz (DIN)

PHONO (MM) ..... 69 dB (Terminated with 2.2 kohms)

TUNER/AUX/TAPE ..... 58 dB

(Terminated with 47 kohms + 250 pF)

## INPUT SENSITIVITY/IMPEDANCE

PHONO (MM) ..... 2.5 mV 47 kohms

PHONO (MC) ..... 0.2 mV 100 ohms

TUNER/AUX/TAPE ..... 150 mV 47 kohms

## PHONO MAXIMUM INPUT LEVEL (PHONO to TAPE REC)

MM at 1 kHz 0.008% T.H.D. ..... 200 mV

MC at 1 kHz 0.008% T.H.D. ..... 15 mV

PHONO INPUT CAPACITY (DIN) ..... 120 pF

## OUTPUT LEVEL/IMPEDANCE

TAPE REC (Pin) ..... 150 mV 2.2 kohms

## D/A CONVERTER

Input Sampling Frequencies ..... 32 kHz/44.1 kHz/48 kHz

Signal to Noise Ratio ..... 110 dB

Total Harmonic Distortion ..... 0.0015%

Channel Separation ..... 110 dB

## Digital Inputs

Optical ..... -14.5 ~ -24 dBm

Coaxial ..... 0.5 Vp-p/75 ohms

DAT MONITOR ..... 0.5 Vp-p/75 ohms

## Digital Output

Coaxial ..... 0.5 Vp-p/75 ohms

## VIDEO SECTION

Input Sensitivity/Impedance ..... 1 Vp-p/75 ohms

Output Level/Impedance ..... 1 Vp-p/75 ohms

## GENERAL

## Power Consumption

6 A ..... Canada Model

350 W ..... UK & European Models

350 W ..... Other Countries

AC Outlet ..... Switched  $\times 1$  (100 W)

Unswitched  $\times 2$  (300 W)

Except UK, European & Australia Models

Dimensions ..... W : 440 mm (17-5/16")

H : 162 mm (6-3/8")

D : 422 mm (16-5/8")

Weight ..... Net 18.0 kg (39.6 lb)

Kenwood follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.

Kenwood poursuit une politique de progrès constants en ce qui concerne le développement. Pour cette raison, les spécifications sont sujettes à modifications sans préavis.

Kenwood strebt ständige, Verbesserungen in der Entwicklung an. Daher bleiben Änderungen der technischen Daten jederzeit vorbehalten.

## Note:

Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on, the Canada (P) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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