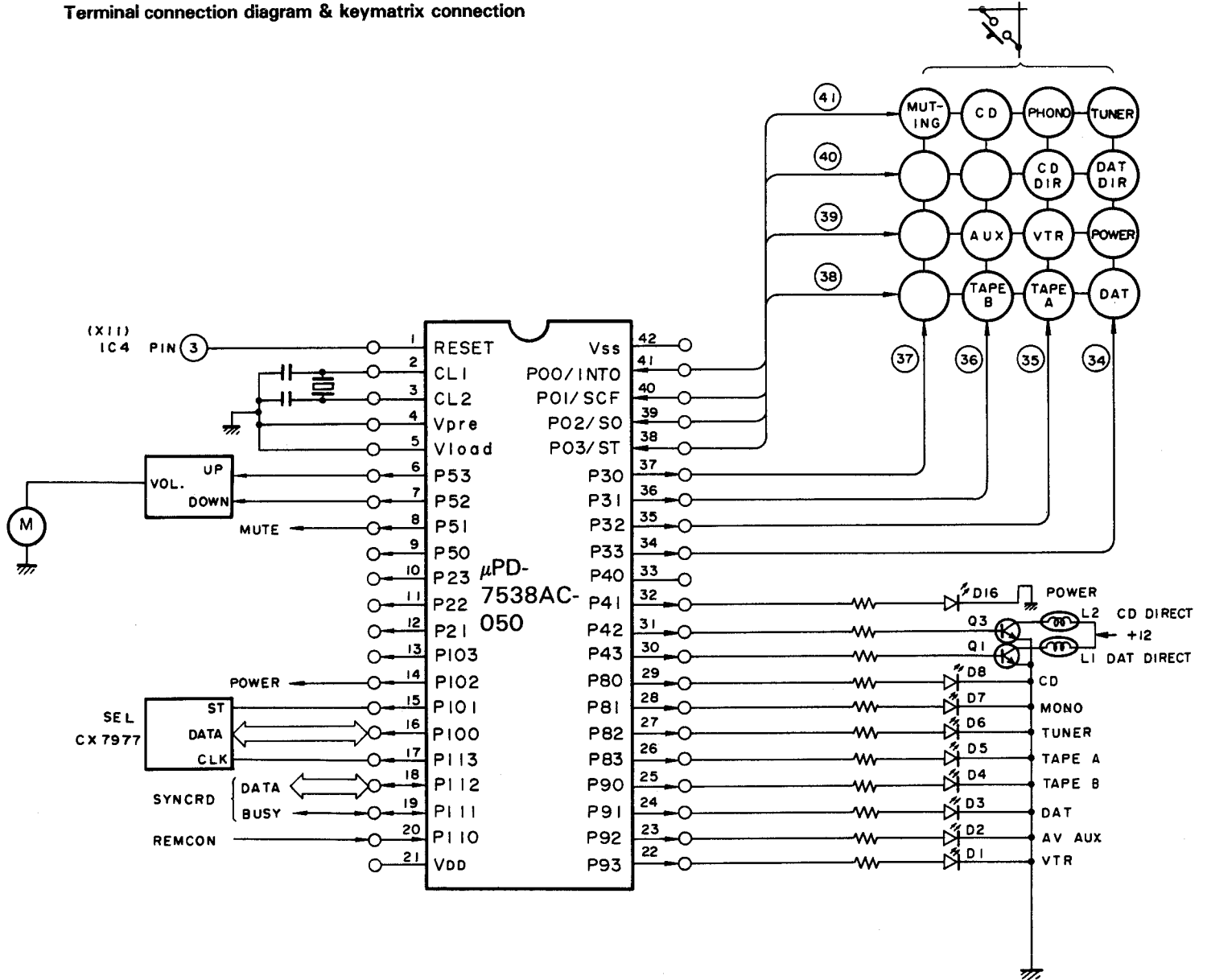


## CIRCUIT DESCRIPTION

IC1:  $\mu$ PD7538AC-050 (X11-2452-71)  
Microprocessor

Terminal connection diagram & keymatrix connection



## CIRCUIT DESCRIPTION

### Initial status

Status	Explanation	Display
After connection to Acc power outlet	<ul style="list-style-type: none"> <li>• INPUT SELECTOR → TUNER</li> <li>• VIDEO OUT → VTR</li> <li>• CD/DAT DIRECT → OFF</li> <li>• MUTING → OFF</li> <li>• POWER OFF</li> </ul>	All OFF
After pressing POWER key ON	The INPUT SELECTOR, VIDEO OUT, MUTING, CD/DAT DIRECT hold the last statuses.	

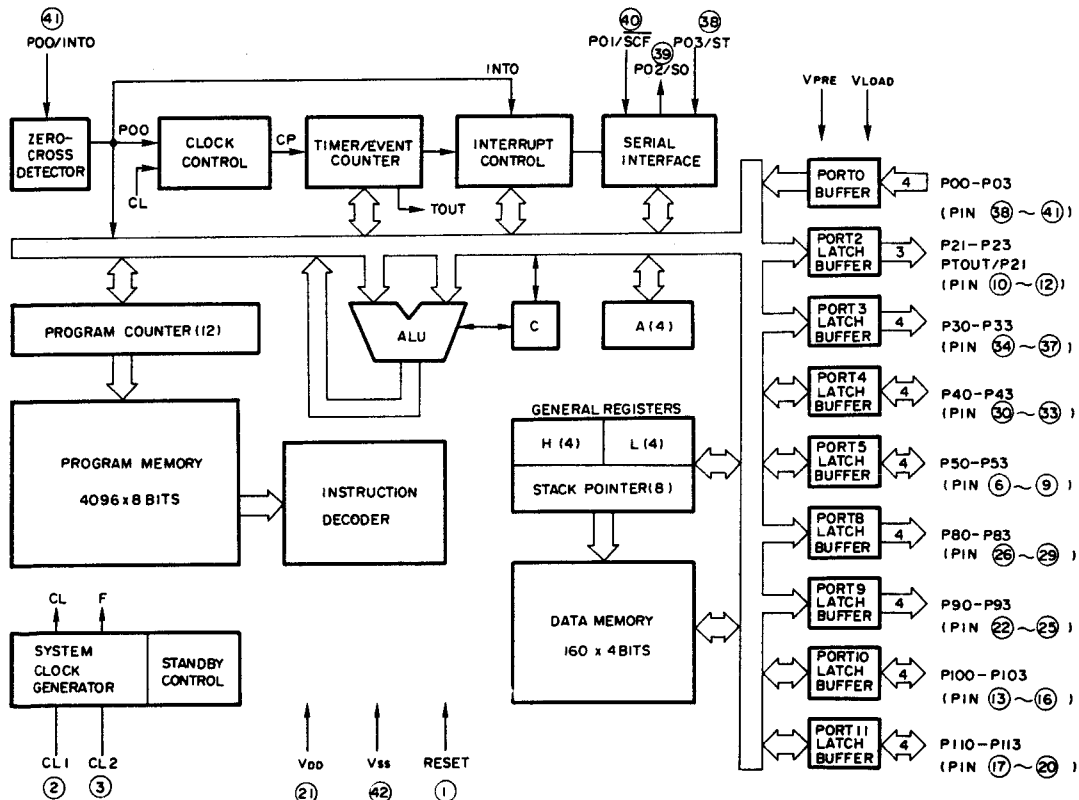
### Explanation of pins

Pin No.	Pin Name	I/O	Active Mode	Name	Explanation															
1	PRESET	—	H	—	Reset terminal. Active High.															
2	CL1	—	—	—	Clock terminal.															
3	CL2	—	—	—																
4	Vpre	—	—	—	N.C.															
5	Vload	—	—	—																
6	P53	O	L or H	Vol up	Volume UP/DOWN terminals. Motor drive IC control.															
7	P52	O	L or H	Vol down																
					<table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td>P53</td> <td>P52</td> <td></td> </tr> <tr> <td>L</td> <td>L</td> <td>STOP</td> </tr> <tr> <td>L</td> <td>H</td> <td>Vol down</td> </tr> <tr> <td>H</td> <td>L</td> <td>Vol up</td> </tr> <tr> <td>H</td> <td>H</td> <td>STOP</td> </tr> </table>	P53	P52		L	L	STOP	L	H	Vol down	H	L	Vol up	H	H	STOP
P53	P52																			
L	L	STOP																		
L	H	Vol down																		
H	L	Vol up																		
H	H	STOP																		
8	P51	O	L	MUTE	Muting terminal. Active Low.															
14	P102	O	H	POWER	Power ON/OFF terminal. Active High.															
15	P101	O	H	ST	Selector IC strobe port.															
16	P100	O	H	DATA	Selector IC data.															
17	P113	O	H	CLK	Selector IC clock.															
18	P112	O	H	DATA	Serial communication data port.															
19	P111	O	H	BUSY	Serial communication busy signal.															
20	P110	I	H	REMOCON	Remote control input port.															
21	VDD	—	—	VDD	+ B (+ 5 V).															
22	P93	O	H	VTR	LED display.															
23	P92	O	H	AUX																
24	P91	O	H	DAT																
25	P90	O	H	TAPE A																

## CIRCUIT DESCRIPTION

Pin No.	Pin Name	I/O	Active Mode	Name	Explanation
26	P83	O	H	TAPE B	LED display.
27	P82	O	H	TUNER	
28	P81	O	H	PHONO	
29	P80	O	H	CD	
30	P43	O	H	CD DIRECT	
31	P42	O	H	DAT DIRECT	
32	P41	O	H	MUTE	Used for Power-ON muting, MUTE key and VOL UP/DOWN muting.
33	P40	—	H	—	N.C.
34	P33	O	H	—	Key scanning output.
35	P32	O			
36	P31	O			
37	P30	O			
38	P03	I	H	—	Key scanning input
39	P02	I			
40	P01	I			
41	P00	I			
42	Vss	—			

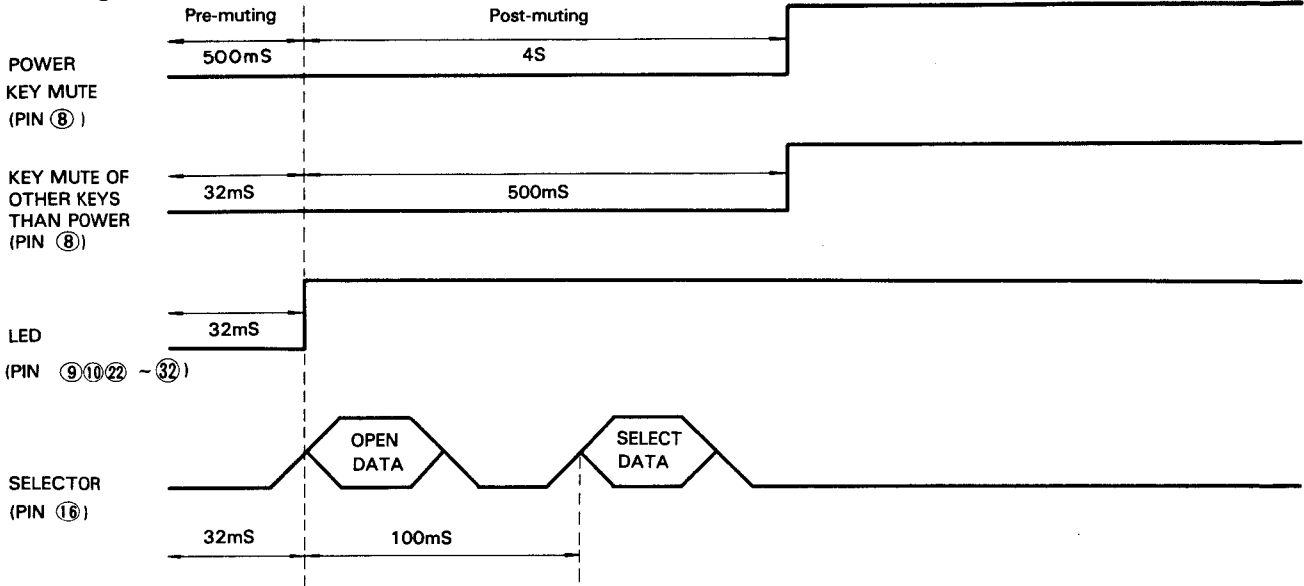
### Inner block diagram



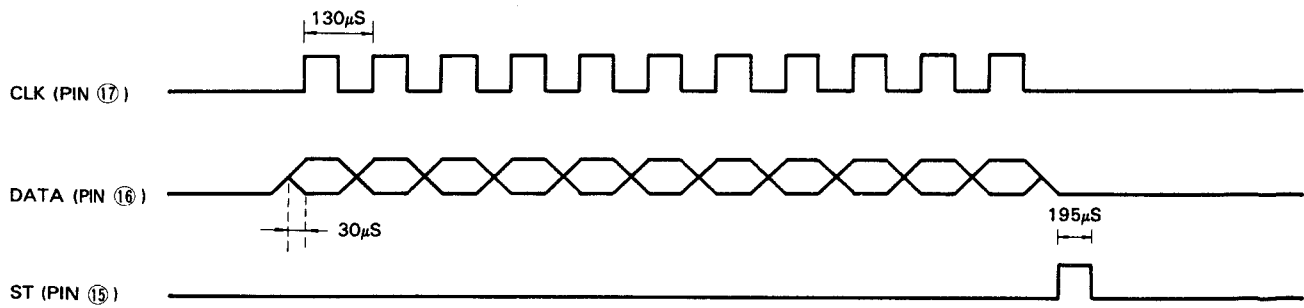
# CIRCUIT DESCRIPTION

## Timing chart

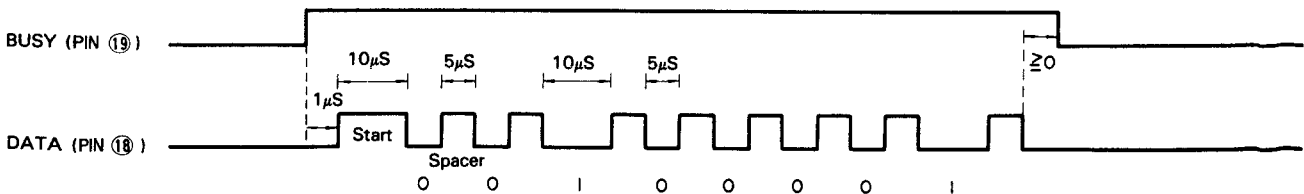
### • Muting



### • Selector IC



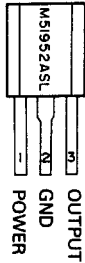
### • Serial communication



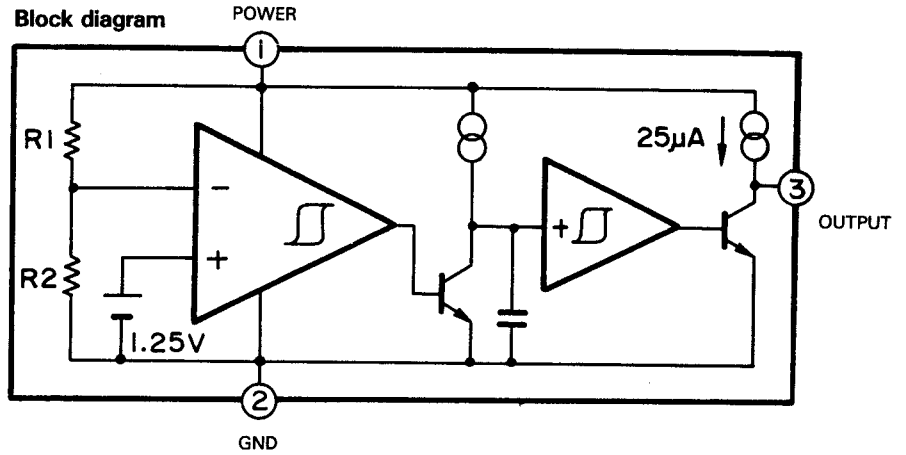
## CIRCUIT DESCRIPTION

IC4: M51952ASL (X11-2452-71)  
 Supply voltage detector & delay circuit

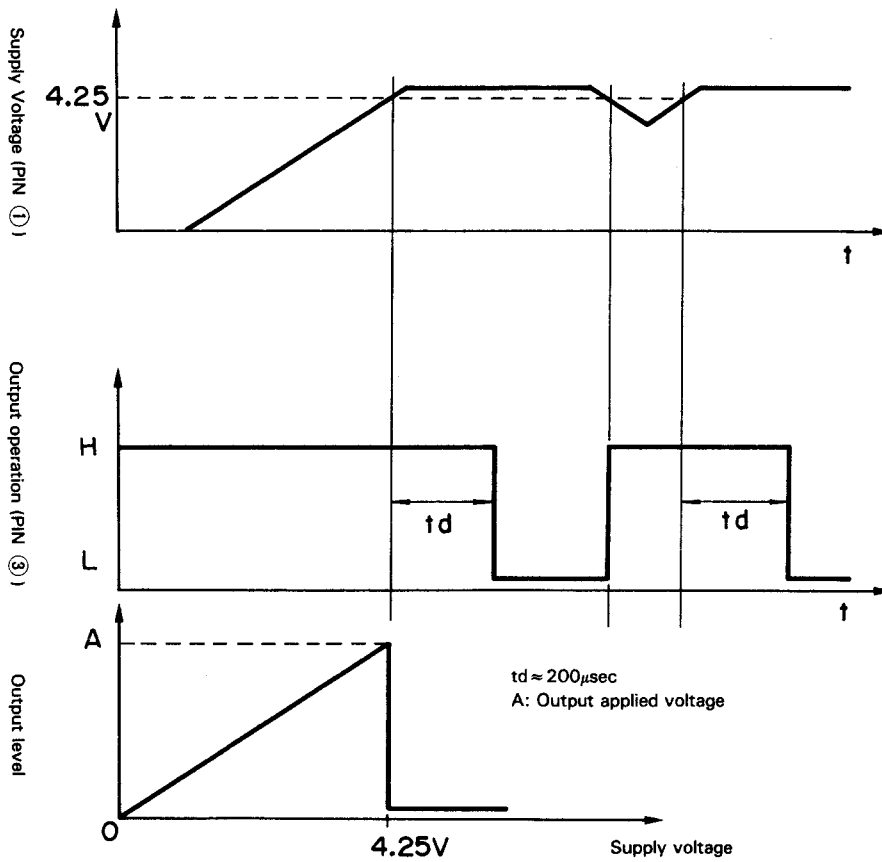
Package



Block diagram



Operation waveform



## CIRCUIT DESCRIPTION

### Explanation of pins

Pin Name	Symbol	I/O	Function
1	GND		Audio signal reference voltage (0 V).
2~7	I1 (L)~I6 (L)	I	L ch audio signal input terminals (6 inputs).
8~10	F3 (L)~F1 (L)	O	L ch audio signal output terminals (3 outputs).
11	CS	I	Chip Select terminal. The chip is selected when serial data bit (9) coincides with the level at the CS terminal, that is, when CS = bit (9). CS = Vss when the level is "0", CS = open or VDL when it is "1".
12	M/S	I	Serial data input mode switching terminal. The input is 8-bit when the M/S terminal is fixed at Vss, and 11-bit when it is set to open or VDL.
13	VDL		Logic circuitry power supply (Vss + 5 V).
14	Vss		IC board potential (-14 V).
15	Clock	I	Serial data input clock. The data is 11-bit or 8-bit, and input at the rise of the clock.
16	Data	I	11-bit or 8-bit serial data.
17	Strobe	I	The serial data input in the analog switch status set pulse (1-bit) IC is latched at the rise of the Strobe pulse, turning ON the switch indicated by the data.
18	L Vref	I	Sets the control signal (Clock, Data, Strobe) input level.
19	VDD		Switch driver power (+14 V).
20~22	F1 (R)~F3 (R)	O	R ch audio signal output terminals (3 outputs).
23~28	I6 (R)~I1 (R)	I	R ch audio signal input terminals (6 inputs).

### Control data configuration

	8	7	6	5	4	3	2	1
<b>With 8-bit data (M/S = Vss)</b>	R	L	F2 F3	F1				I1~I6 Data
<b>With 11-bit data (M/S = Open or VDL)</b>	11	10	9	8	7	6	5	4
	1	1	CS	R	L	F2 F3	F1	

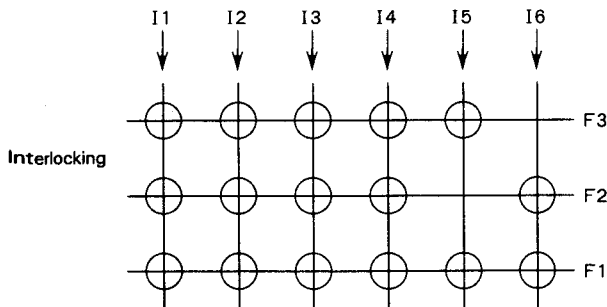
  

Position	Bit	
	8	7
No change	0	0
No change	0	1
No change	1	0
L+R	1	1

Position	Bit	
	8	7
No change	0	0
L	0	1
R	1	0
L+R	1	1

\*: The F2 output control and F3 output control are interlocked to each other. The signal of 15 input is not output from F2, and that of 16 input is not output from F3. The following diagram indicates this relation.



: Indicates a switch.

Position	Bit		
	3	2	1
I1	0	0	0
I2	0	0	1
I3	0	1	0
I4	0	1	1
I5	1	0	0
I6	1	0	1

Position	Bit	
	6	5
No change	0	0
Output F1	0	1
Output F1, F2	1	0
Output F1, F2, F3	1	1

## VOLTAGE TABLES

### X09-253\*\*\*

IC1-4

7	12V
14	11.9V

IC6

3	11.9V
4	2.7V
7	2.7V
8	2.7V
10	2.7V
12	-12V

IC7

3	11.9V
4	2.7V
7	2.7V
9	2.7V
10	2.7V
12	-12V

IC8

4	-12V
6	11.9V

IC9

4	-12V
8	11.9V

IC10

7	12V
8	11.9V

IC11

1	21.8V
3	12.0V

Q1.2

E	0V
B	0V
C	-

Q3,4

E	-
B	0.6V
C	38.0V

Q5

E	-
B	-0.6V
C	-38V

Q6

E	-
B	-0.6V
C	-38V

Q7,8

E	-
B	-0.5V
C	1.2V

Q9

E	3.6V
B	0V
C	0V

Q10

E	-
B	-0.6V
C	-12.6V

Q11

E	-12.1V
B	-12.6V
C	-21.0V

D1-24

Cathode	-12V
Anode	11.9V

### X11-2452-71

IC1

1	0V
20	5V
21	5V

IC2

7	-12V
14	12V

IC3

1	12V
2	0V
3	5V

IC4

1	5V
3	0V

Q4,5

E	-1.2V
B	-0.6V
C	11.8V

Q6

E	0V
B	0.6V
C	0V

D18-23

Cathode	-11.9V
Anode	11.8V

### X13-5520-00

IC1

14	-12V
19	11.9V

### X85-1032-72

IC1

4	-12V
8	11.9

### X89-1010-02

Q1,3

E	0.7V
B	-0.1V
C	-35.5V

Q5

E	-36V
B	-35.5V
C	20V

Q8

E	-
B	-
C	1.2V

Q7

E	-36V
B	-35.5V
C	-1.1V

Q9

E	37V
B	36.4V
C	1.2V

Q10

E	-
B	-
C	1.2V

Q11

E	0.6V
B	-
C	38V

Q12

E	-
B	-
C	38.0V

Q13

E	-0.6V
B	-
C	-38V

Q14

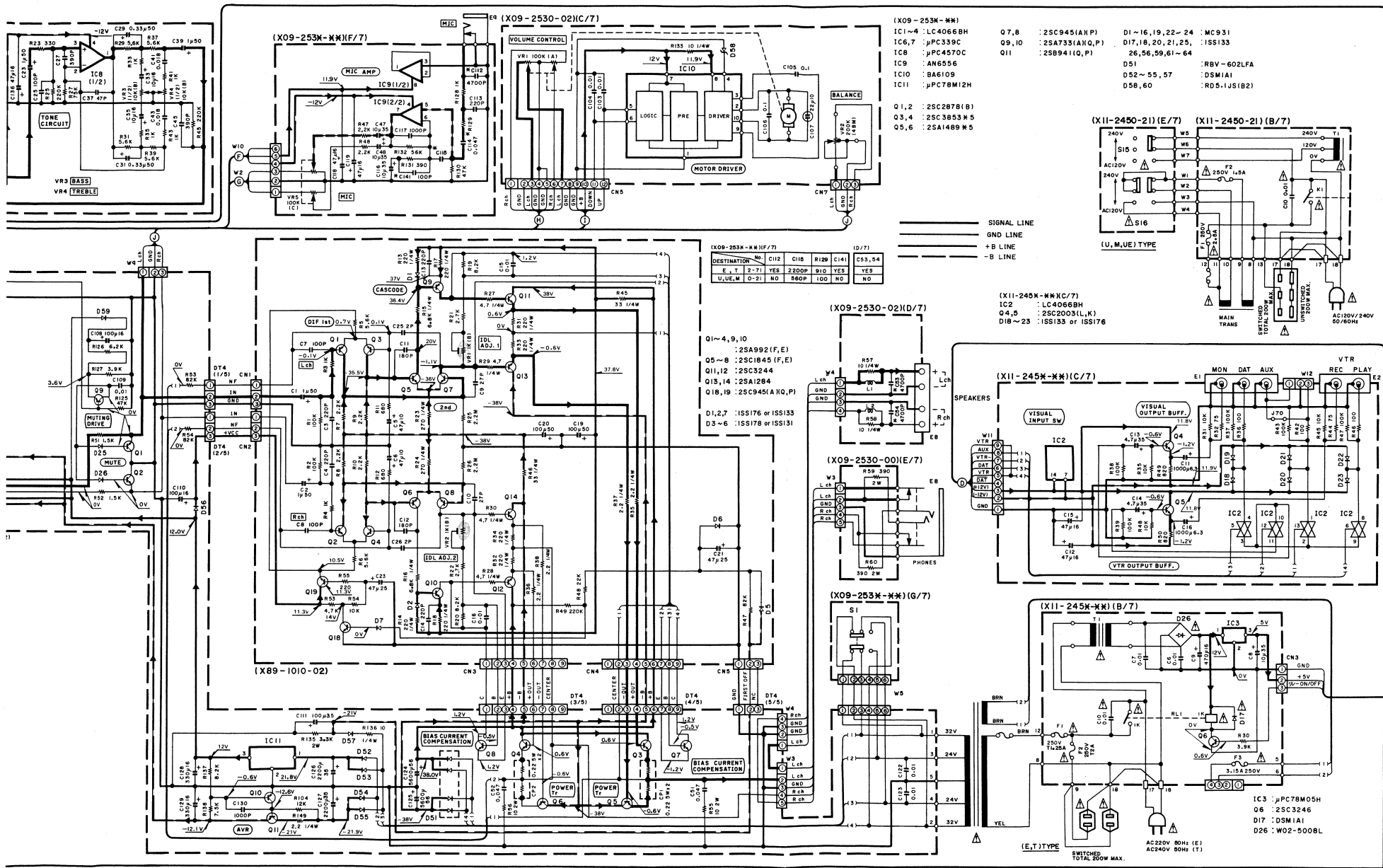
E	-
B	-
C	-38V

Q18

E	14V
B	0V
C	-

Q19

E	10.5V
B	11.3V
C	11.3V



- (X09-253K-MK)
- IC1~4 : LC4066BH
  - IC6,7 :  $\mu$ PC359C
  - IC8 :  $\mu$ PC4570C
  - IC9 : AN6556
  - IC10 : BA6109
  - IC11 :  $\mu$ PC78M12H
  - Q7,8 : 2SC945(A,N,P)
  - Q9,10 : 2SA733(A,N,Q,P)
  - Q11 : 2SB941(Q,P)
  - D1~16,19,22~24 : MC931
  - D17,18,20,21,25 : ISS133
  - 26,56,59,61~64 : 26,56,59,61~64
  - D51 : RBV-602LFA
  - D52~55,57 : DSM1A1
  - D58,60 : RD5.1JS(B2)

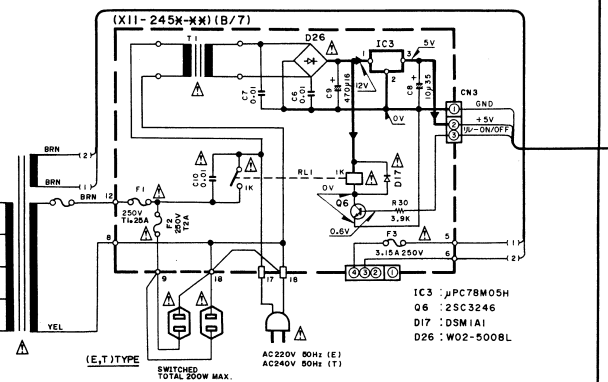
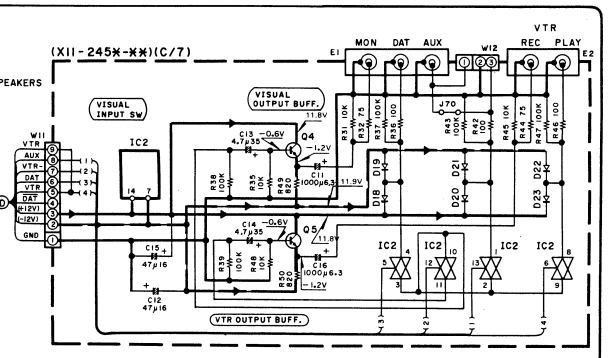
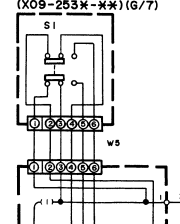
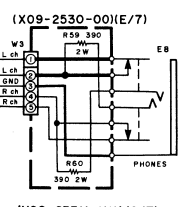
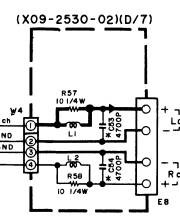
- Q1,2 : 2SC2878(B)
- Q3,4 : 2SC3853 X 5
- Q5,6 : 2SA1489 X 5

SIGNAL LINE  
 GND LINE  
 +B LINE  
 -B LINE

- (X11-245K-MK)(C/7)
- IC2 : LC4066BH
  - Q4,5 : 2SC2003(L,K)
  - D18~23 : ISS133 or ISS176

DESTINATION		NO.	C112	C118	R130	R141	C23,24
E, T	2-71	YES	2200P	910	YES	YES	YES
U, UE, M	0-21	NO	660P	100	NO	NO	NO

- Q1~4,9,10 : 2SA992(F,E)
- Q5~8 : 2SC1845(F,E)
- Q11,12 : 2SC3244
- Q13,14 : 2SA1284
- Q18,19 : 2SC945(A,N,Q,P)
- D1,2,7 : ISS176 or ISS133
- D3~6 : ISS178 or ISS131



(E, T) TYPE

SWITCHED TOTAL 200W MAX.

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 volt-mètre 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.

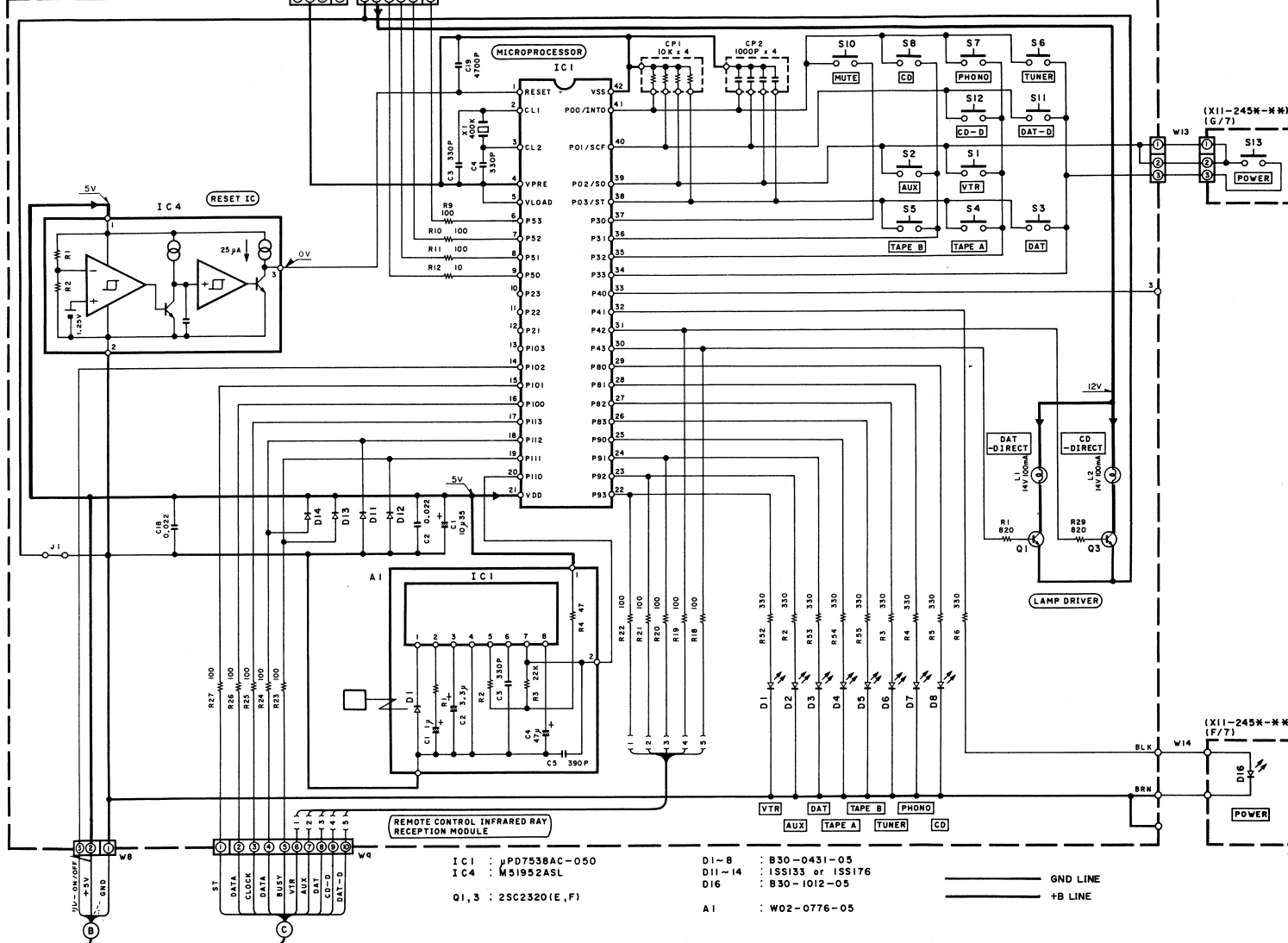
Die angegebenen Gleichspannungswerte wurden mit einem hochohmigen Spannungsmesser ohne Eingangssignal gemessen. Dabei schwanden die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u.U. geringfügig.

**CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list).  $\Delta$  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.



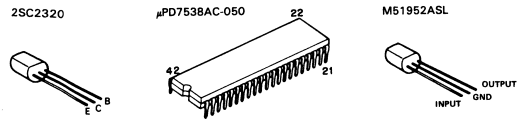


(X11-245X-XX) (A/7)



- IC 1 : µPD7538AC-050
- IC 4 : M51952ASL
- Q1, 3 : 2SC2320 (E, F)
- D1 ~ 8 : B30-0431-05
- D11 ~ 14 : ISS133 or ISS176
- D16 : B30-1012-05
- A1 : W02-0776-05

— GND LINE  
 — +B LINE

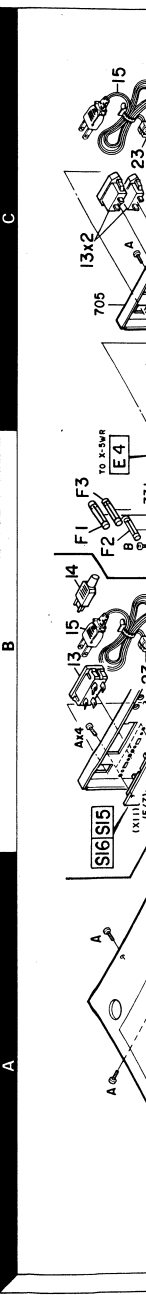


DC voltages are as measured with a high impedance voltmeter with no signal input. Values may vary slightly due to variations between individual instruments or/and units.

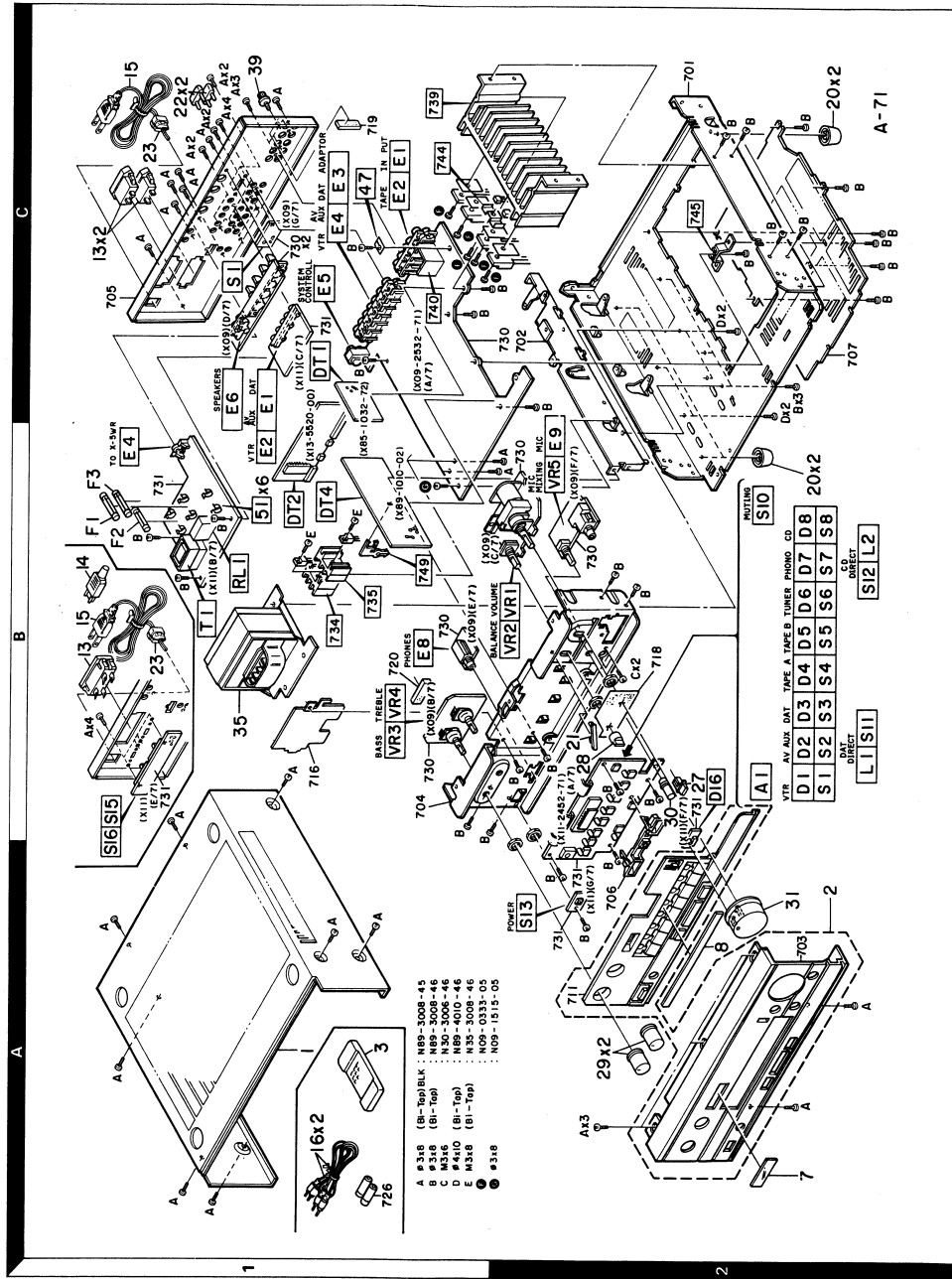
Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance sans signal d'entrée. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels.

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.

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## EXPLODED VIEW



## PARTS LIST

※ New Parts

Parts without Parts No. are not supplied.

Les articles non mentionnés dans le Parts No. ne sont pas fournis.

Telle ohne Parts No. werden nicht geliefert.

Ref. No.	Address	New Parts	Parts No.	Description	Destination	Remarks
参照番号	位置	新	部品番号	部品名 / 規格	仕向	備考
<b>A-71</b>						
1	1A		A01-1584-01	METALLIC CABINET		
2	2A	*	A20-5361-02	PANEL ASSY		
3	1A	*	A70-0184-05	REMOTE CONTROLLER ASSY		
7	2A		B03-2323-04	DRESSING PLATE (REMOTE CONTROL)		
8	2A		B03-2334-04	DRESSING PLATE (LED)		
			B46-0094-03	WARRANTY CARD	UUE	
			B46-0095-03	WARRANTY CARD	UUE	
			B46-0122-13	WARRANTY CARD	E	
			B46-0143-03	WARRANTY CARD	T	
			B50-6982-00	INSTRUCTION MANUAL (ENGLISH)		
			B50-6983-00	INSTRUCTION MANUAL (FRENCH)	ME	
			B50-6984-00	INSTRUCTION MANUAL (SPANISH)	M	
			B50-6985-00	INSTRUCTION MANUAL (ARABIC)	M	
			B50-6986-00	INSTRUCTION MANUAL (G.D.I)	E	
			B52-0254-00	CONNECTING DIAGRAM		
			B58-0223-04	CAUTION CARD (PRE-SET 120V)	U	
			B58-0513-04	CAUTION CARD (PRESET220-240)	E	
			B58-0803-03	CAUTION CARD	E	
			B59-0092-00	SERVICE DIRECTORY	UUE	
Δ	13	1C	E03-0055-05	AC OUTLET	E	
Δ	13	1C	E03-0068-05	AC OUTLET	UMUE	
Δ	13	1C	E03-0085-05	AC OUTLET	T	
Δ	14	1B	E03-0049-05	AC PLUG	T	
Δ	15	1B	E30-0459-05	AC POWER CORD	E	
Δ	15	1B	E30-0812-05	AC POWER CORD	UMUE	
Δ	15	1C	E30-1416-05	AC POWER CORD	T	
Δ	16	1B	E30-1392-05	CORD WITH PLUG		
Δ	F1	1B	F05-1222-05	FUSE (SEMKN) (250V T1.25A)	TE	
Δ	F1	1B	F05-3022-05	FUSE (250V 3A)	UMUE	
Δ	F2	1B	F05-1521-05	FUSE (250V 1.5A)	UMUE	
Δ	F2	1B	F06-2021-05	FUSE (SEMKN) (250V T2A)	TE	
Δ	F3	1B	F05-3022-05	FUSE (250V 3A)	UMUE	
Δ	F3	1B	F05-3121-05	FUSE (250V 3.15A)	TE	
			H01-7644-04	ITEM CARTON CASE		
			H10-3502-02	POLYSTYRENE FOAMED FIXTURE		
			H10-3503-02	POLYSTYRENE FOAMED FIXTURE		
			H25-0181-04	PROTECTION BAG (150X260XD.05)		
			H25-0232-04	PROTECTION BAG (235X350XD.03)		
			H25-0304-04	PROTECTION BAG		
20	2B,2C		J02-0366-05	FOOT		
21	2B		J11-0106-05	CLAMPER		
22	1C		J12-0094-05	PIN		
Δ	23	1B,1C	J42-0083-05	POWER CORD BUSHING		
			J61-0307-05	WIRE BAND		
28	2B		K29-2201-04	KN0B (BALANCE)		
29	2A		K29-2506-14	KN0B (BASS, TREBLE)		
30	2B		K29-2737-04	KN0B (MIC MIXING)		
31	2A	*	K29-2767-04	KN0B ASSY (VOLUME)		
Δ	35	1B	L01-4652-05	POWER TRANSFORMER	T	
Δ	35	1B	L01-4655-05	POWER TRANSFORMER	UMUE	

E: Scandinavia & Europe K: USA P: Canada

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

UE: AAFES(Europe) X: Australia

Δ indicates safety critical components.

## PARTS LIST

× New Parts

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Telle ohne Parts No. werden nicht geliefert.

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
Q1 ,2 Q3 ,4 Q5 ,6 Q7 ,8 Q9 ,10 Q11			2SC2878(B) 2SC3853*5 2SA1489*5 2SC945(A)(P) 2SA733(A)(Q,P) 2SB941(Q,P)	TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR TRANSISTOR		
<b>CONTROL UNIT (X11-2452-71)</b>						
D1 -8 D16 L1 ,2	2B 2B 2B		B30-0431-05 B30-1012-05 B30-1196-05	LED(LN21CPH) VTR,CD,ETC LED(SLP-981C-50)VOLUME LAMP (DAT DIRECT,CD DIRECT)		
C1 C2 C3 ,4 C6 ,7 C8			CE04KW1V100M CK45FF1H223Z CC45FSL1H331J CK45FF1H103Z CE04KW1V100M	ELECTRO 10UF 35WV CERAMIC 0.022UF Z CERAMIC 330PF J CERAMIC 0.010UF Z ELECTRO 10UF 35WV		
C9 C10 C11 C12 C13 ,14			CE04KW1C471M C91-0647-05 CE04KW0J102M CE04KW1C470M CE04KW1V4R7M	ELECTRO 470UF 16WV CERAMIC 0.01UF P ELECTRO 1000UF 6.3WV ELECTRO 47UF 16WV ELECTRO 4.7UF 35WV		
C15 C16 C18 C19 C100			CE04KW1C470M CE04KW0J102M C91-0085-05 CK45FF1H472Z CK45FF1H103Z	ELECTRO 47UF 16WV ELECTRO 1000UF 6.3WV CERAMIC 0.022UF N CERAMIC 4700PF Z CERAMIC 0.010UF Z		
E1 E2 E4	1C 1B 1B		E13-0309-05 E13-0297-05 E08-0411-05	PHONE JACK(MONITOR,DAT,AV AUX) PHONE JACK(VTR) RECTANGULAR RECEPTACLE		
51 51	1B 1B		J13-0041-05 J13-0054-05	FUSE CLIP FUSE CLIP		UMUE TE
T1 T1 X1	1B 1B 1B		L01-4782-05 L01-4784-05 L78-0202-05	POWER TRANSFORMER POWER TRANSFORMER RESONATOR (400KHZ)		TE UMUE
CP1 CP2 R49 ,50			R90-0233-05 R90-0478-05 RS14KB3A821J	MULTI-COMP 10KX4 J 1/6W MULTI-COMP 1000PX4 J 1/6W FL-PROOF RS 820 J 1W		
RL1 S1 -8 S10 -13 S15 ,16	1B 2B 2A,2B		S51-1036-05 S40-1064-05 S40-1064-05 S31-2083-05	MAGNETIC RELAY PUSH SWITCH PUSH SWITCH SLIDE SWITCH (POWER TYPE)		UMUE
D11 -14 D11 -14 D17 D18 -23 D18 -23			1SS133 1SS176 DSM1A1 1SS133 1SS176	DIODE DIODE DIODE DIODE DIODE		
D26 IC1 IC2 IC3 IC4		*	W02-5008L UPD7538AC-050 LC4066BH UPC78M05H M51952ASL	DIODE IC(MICROPROCESSOR) IC(BILATERAL SWITCH X4) IC(VOLTAGE REGULATOR/ +5V) IC(SYSTEM RESET)		
Q1 Q3			2SC2320(E,F) 2SC2320(E,F)	TRANSISTOR TRANSISTOR		

E: Scandinavia & Europe K: USA P: Canada  
U: PX(Far East, Hawaii) T: England M: Other Areas  
UE: AAFES(Europe) X: Australia

印は安全部品

△ indicates safety critical components.

## PARTS LIST

\* New Parts


Parts without Parts No. are not supplied.

Les articles non mentionnés dans le Parts No. ne sont pas fournis.

Teile ohne Parts No. werden nicht geliefert.

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
Q4 .5 Q6			2SC2003(L,K) 2SC3246	TRANSISTOR TRANSISTOR		
A1	2B		W02-0776-05	ELECTRIC CIRCUIT MODULE(REMOTE)		
<b>SUB-CIRCUIT UNIT (X13-5520-00)</b>						
C1 -6			CF92FV1H473J	MF 0.047UF J		
IC1		*	CX7977	IC(FUNCTION SW FOR AUDIO)		
<b>PRE AMPLIFIER UNIT (X85-1032-72)</b>						
C1 .2			CE04FW1C100M	ELECTRO 10UF 16WV		
C3 .4			CE04FW1A470M	ELECTRO 47UF 10WV		
C5			CF92FV1H123J	MF 0.012UF J		
C6			CF92FV1H123J	MF 0.012UF J		
C7			CF92FV1H332J	MF 3300PF J		
C8			CF92FV1H332J	MF 3300PF J		
C9 .10			CE04KW1V100M	ELECTRO 10UF 35WV		
C11 .12			CK45FF1H103Z	CERAMIC 0.010UF Z		
C15 .16			CK45FB1H222K	CERAMIC 2200PF K	TE	
C15 .16			CK45FB1H561K	CERAMIC 560PF K	UMUE	
C17 .18			CC45FSL1H101J	CERAMIC 100PF J	UMUE	
C17 .18			CC45FSL1H221J	CERAMIC 220PF J	TE	
IC1			AN6556	IC(OP AMP X2)		
IC1			M5218P	IC(OP AMP X2)		
<b>MAIN AMPLIFIER UNIT (X89-1010-02)</b>						
C1 .2			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C3 .4			CC45FSL1H221J	CERAMIC 220PF J		
C5 .6			CE04KW1A470M	ELECTRO 47UF 10WV		
C7 .8			CC45FSL1H101J	CERAMIC 100PF J		
C9 .10			CC45FSL1H270J	CERAMIC 27PF J		
C11 .12			CC45FSL1H181J	CERAMIC 180PF J		
C13 .14			CC45FSL1H221J	CERAMIC 220PF J		
C15 .16			CK45FF1H103Z	CERAMIC 0.010UF Z		
C19			CE04KW1H101M	ELECTRO 100UF 50WV		
C20			CE04KW1H101M	ELECTRO 100UF 50WV		
C21			CE04KW1E470M	ELECTRO 47UF 25WV		
C23			CE04KW1E470M	ELECTRO 47UF 25WV		
C25 .26			CC45FSL1H020C	CERAMIC 2.0PF C		
R13 .14			RD14AB2E221J	FL-PROOF RD 220 J 1/4W		
R17 .18			RD14AB2E221J	FL-PROOF RD 220 J 1/4W		
R23 .24			RD14AB2E271J	FL-PROOF RD 270 J 1/4W		
R27 -30			RD14AB2E4R7J	FL-PROOF RD 4.7 J 1/4W		
R31 -34			RD14AB2E221J	FL-PROOF RD 220 J 1/4W		
R35 -38			RD14AB2E2R2J	FL-PROOF RD 2.2 J 1/4W		
R45 .46			RD14AB2E330J	FL-PROOF RD 33 J 1/4W		
VR1 .2			R12-1070-05	TRIMMING PNT. (1K) IDLE ADJ.		
D1 .2			1SS133	DIODE		
D1 .2			1SS176	DIODE		
D5 .6			1SS131	DIODE		
D5 .6			1SS178	DIODE		
D7			1SS133	DIODE		
D7			1SS176	DIODE		
Q1 -4			2SA992(F,E)	TRANSISTOR		
Q5 -8			2SC1845(F,E)	TRANSISTOR		

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