SERVICE MANUAL

PERFORMANCE SIGNAL PROCESSOR

A1

CONTENTS

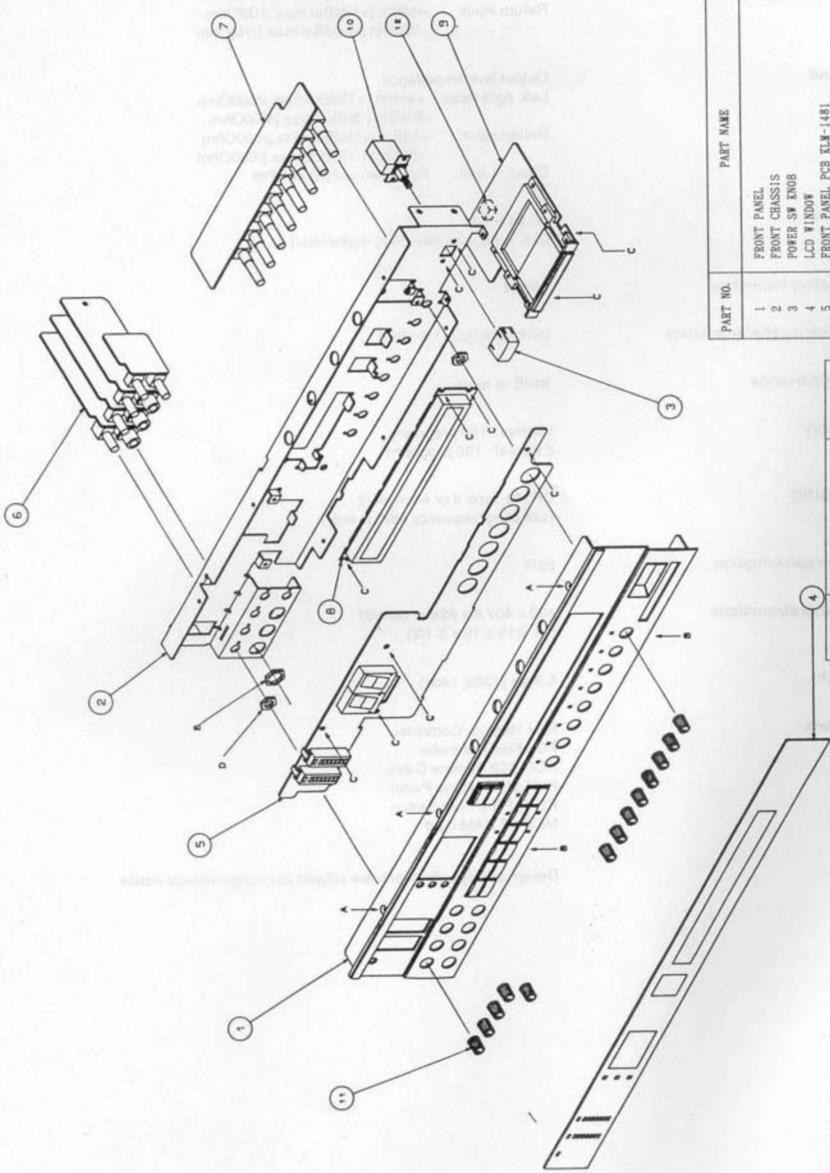
KORG

1. SPECIFICATIONS

Input	Input level/impedance Left, right input: +4dBm (+19dBm max.)/1MOhm -20dBm (+19dBm max.)/1MOhm Return input: +4dBm (+19dBm max.)/1MOhm -20dBm (+19dBm max.)/1MOhm
Output	Output level/impedance Left, right input: +4dBm (+19dBm max.)/600Ohm -20dBm (-5dBm max.)/600Ohm Return input: +4dBm (+19dBm max.)/600Ohm -20dBm (-19dBm max.)/600Ohm Direct output: Input gain unity/2.2KOhm
AD/DA	16-bit linear (DA: 4-ply over-sampling digital filter)
Sampling frequency	48KHz
Frequency characteristics	20Hz-20KHz (+1.5/-3dB)
Dynamic range	85dB or more
Memory	Internal - 100 programs External - 100 programs
Digital I/O	CP340 Type II or equivalent (sampling frequency 48KHz only)
Power consumption	25W
External dimensions	430 x 407.8 x 89mm (w/h/d) (16 9/10 x 16 x 3 1/2)
Weight	6.3 Kg (13lbs 14oz)
Options	RE1 Remote Controller FC6 Foot Controller RCC-050 Remote Cable KVP-001 Volume Pedal PS-1, PS-2 Foot Switch MCP-03 RAM card

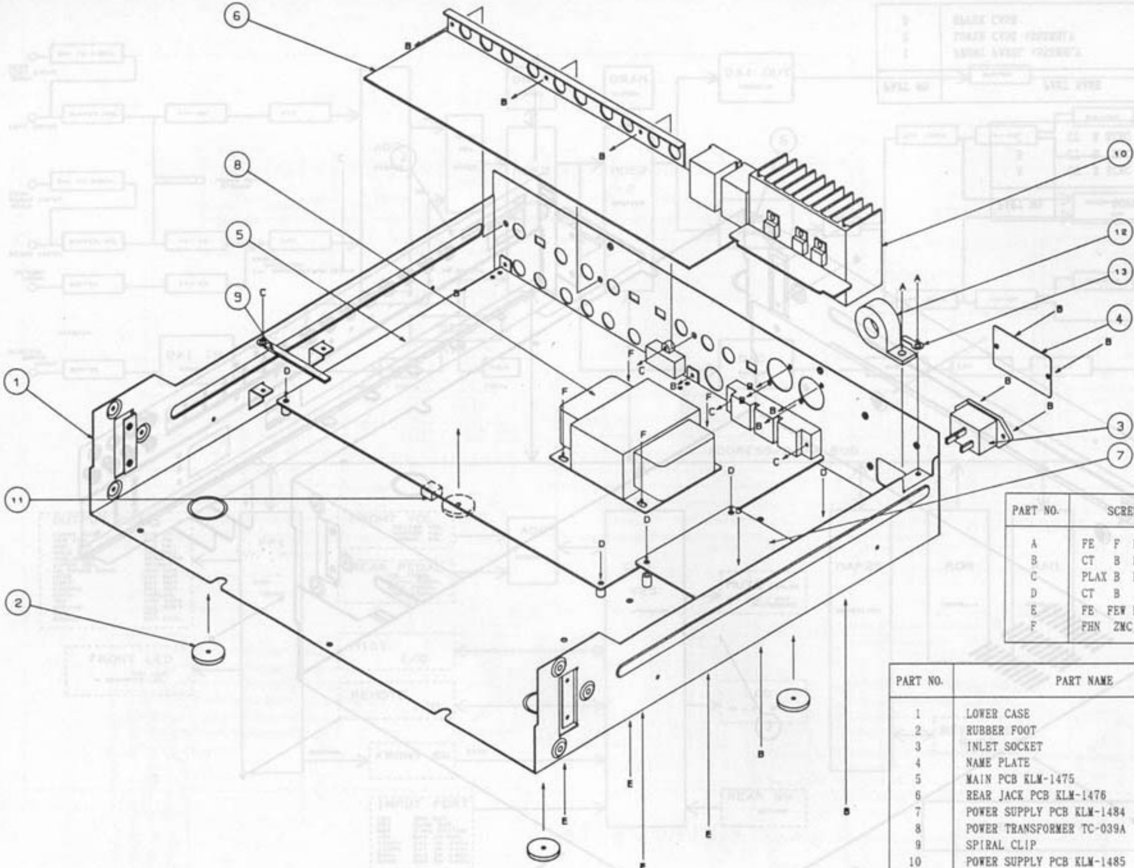
Design and specifications are subject to change without notice.

2. STRUCTURAL DIAGRAM



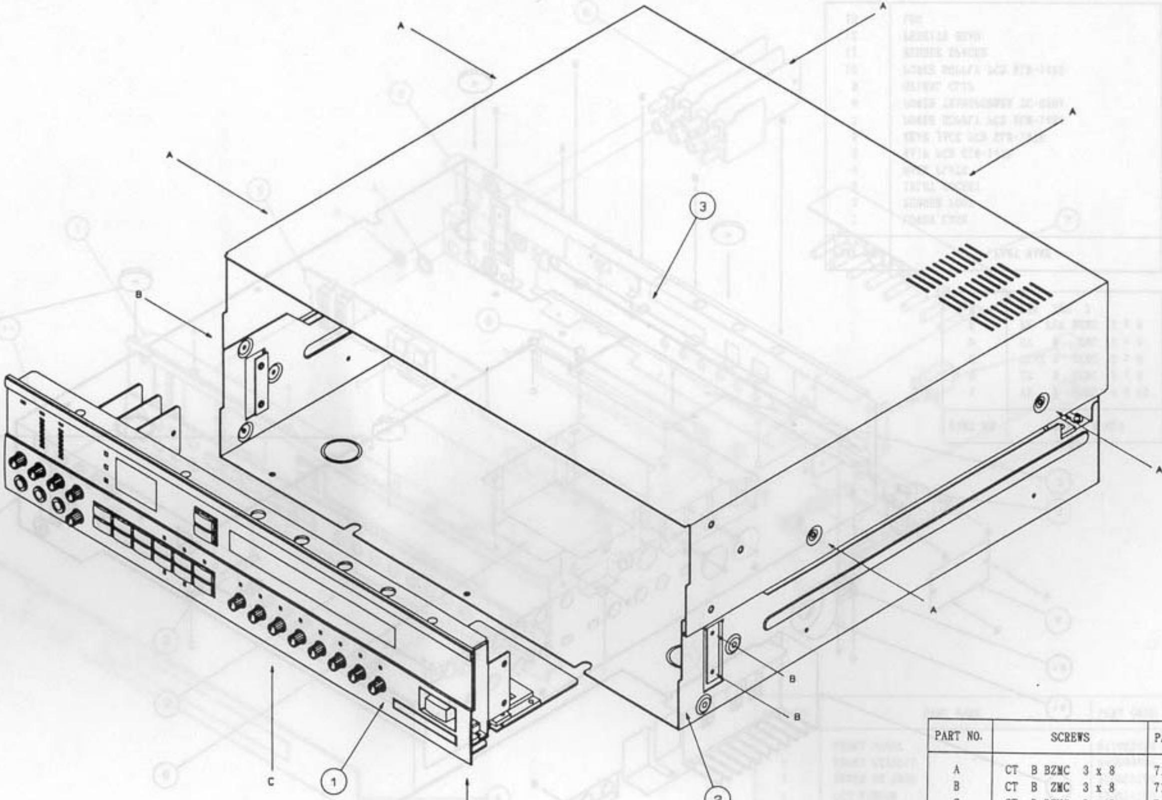
PART NO.	PART NAME	PART CODE
1	FRONT PANEL	641022600
2	FRONT CHASSIS	640099600
3	POWER SW KNOB	620023100
4	LCD WINDOW	630014100
5	FRONT PANEL PCB KLM-1481	001148100
6	FRONT JACK PCB KLM-1477-80	001147700
7	D.FUNCTION EDITOR PCB KLM-1482	001148100
8	LCD DMC2079NYU-LY	313002300
9	CARD SLOT ASSEMBLY	---------
10	POWER SW ESB-8213V	375007800
11	VR KNOB	620023600
12	RUBBER SPACER	500012900

PART NO.	SCREWS & NUTS	PART CODE
A	TS F ZMC 3 x 6	791030306
B	CT B BZMC 3 x 6	715260306
C	CT B ZMC 3 x 8	715230308
D	VN BZMC 7	773060701
E	VN BZMC 12	773061200



PART NO.	SCREWS & NUT	PART CODE
A	FE F BZMC 4 x 10	701060410
B	CT B BZMC 3 x 8	715260308
C	PLAX B BZMC 3 x 8	745060308
D	CT B ZMC 3 x 8	715230308
E	FE FEW BZMC 3 x 8	707060308
F	FHN ZMC 3	770030300

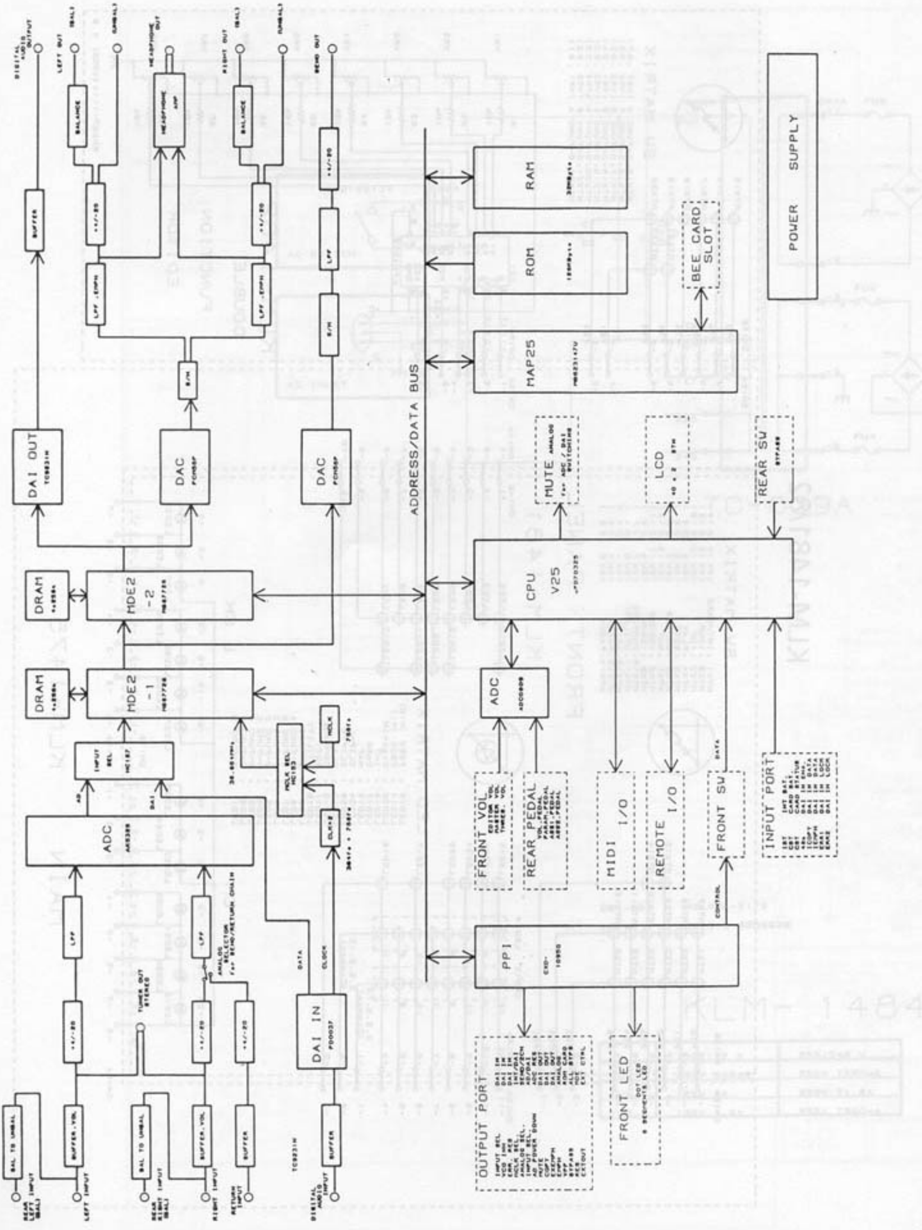
PART NO.	PART NAME	PART CODE
1	LOWER CASE	640099700
2	RUBBER FOOT	500013000
3	INLET SOCKET	---------
4	NAME PLATE	---------
5	MAIN PCB KLM-1475	001147500
6	REAR JACK PCB KLM-1476	001147600
7	POWER SUPPLY PCB KLM-1484	001148400
8	POWER TRANSFORMER TC-039A	400012800
9	SPIRAL CLIP	540008600
10	POWER SUPPLY PCB KLM-1485	001148400
11	RUBBER SPACER	500012900
12	FERRITE BEAD	---------
13	LUG	---------



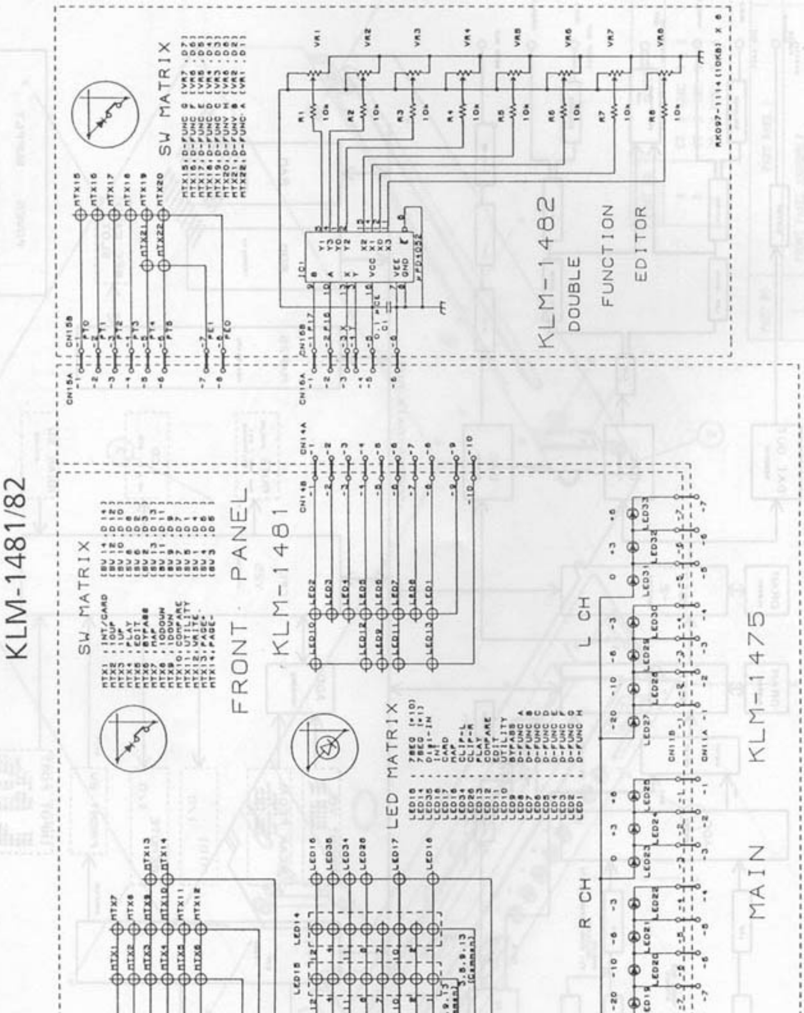
PART NO.	SCREWS	PART CODE
A	CT B BZMC 3 x 8	715260308
B	CT B ZMC 3 x 8	715230308
C	CT B BZMC 3 x 6	715260306

PART NO.	PART NAME	PART CODE
1	FRONT PANEL ASSEMBLY	---------
2	LOWER CASE ASSEMBLY	---------
3	UPPER CASE	640099800

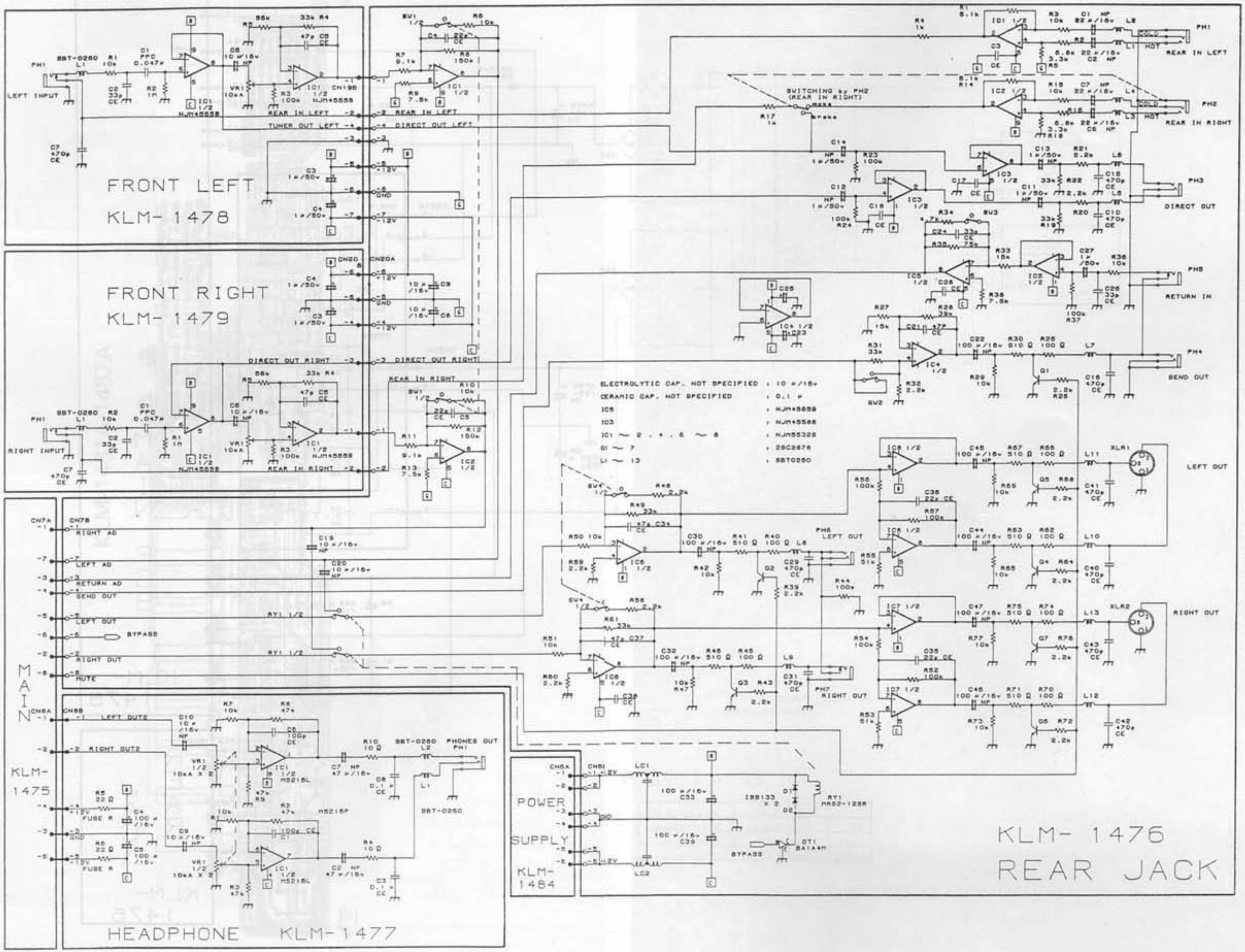
3. BLOCK DIAGRAM



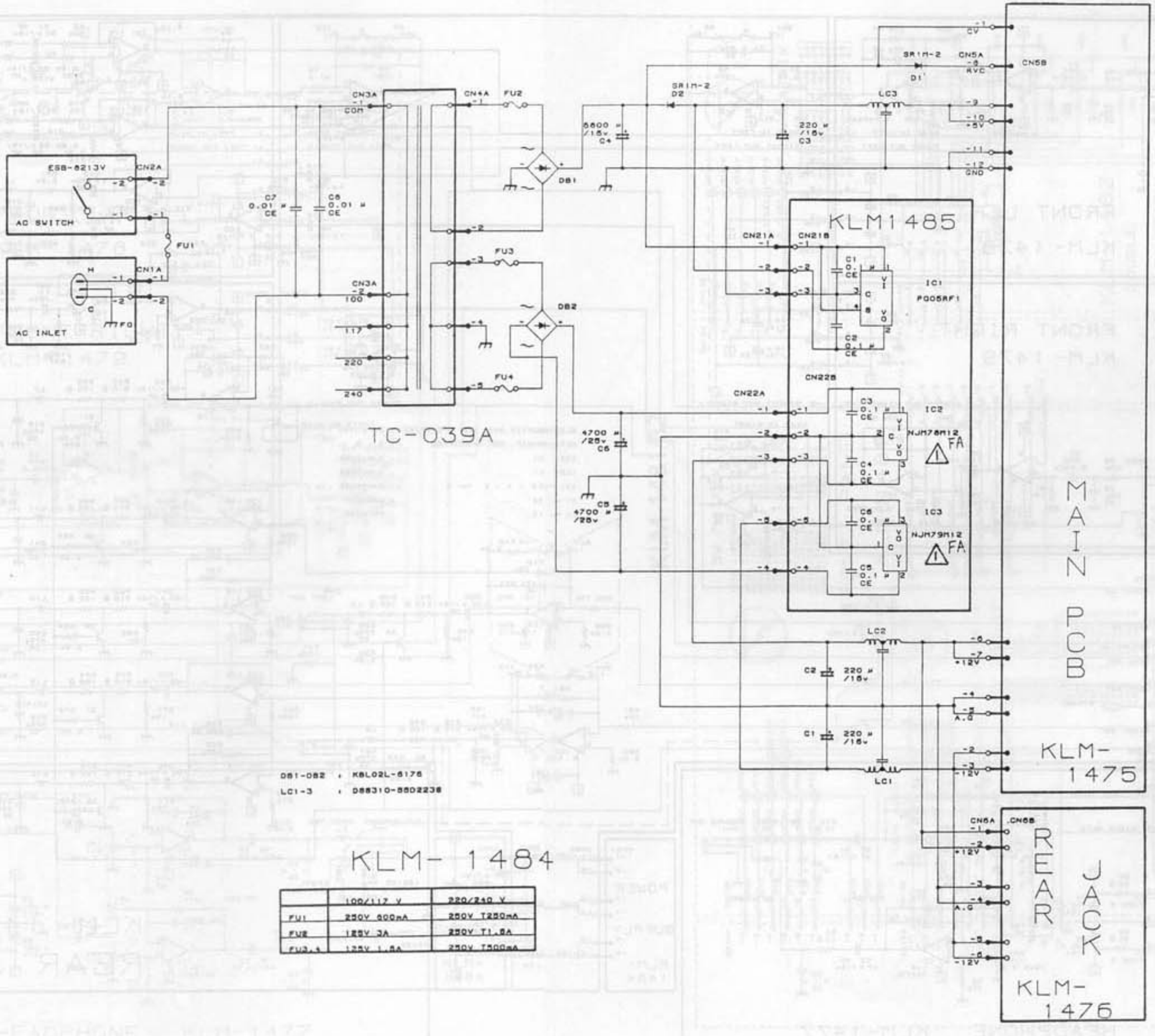
4. CIRCUIT DIAGRAM



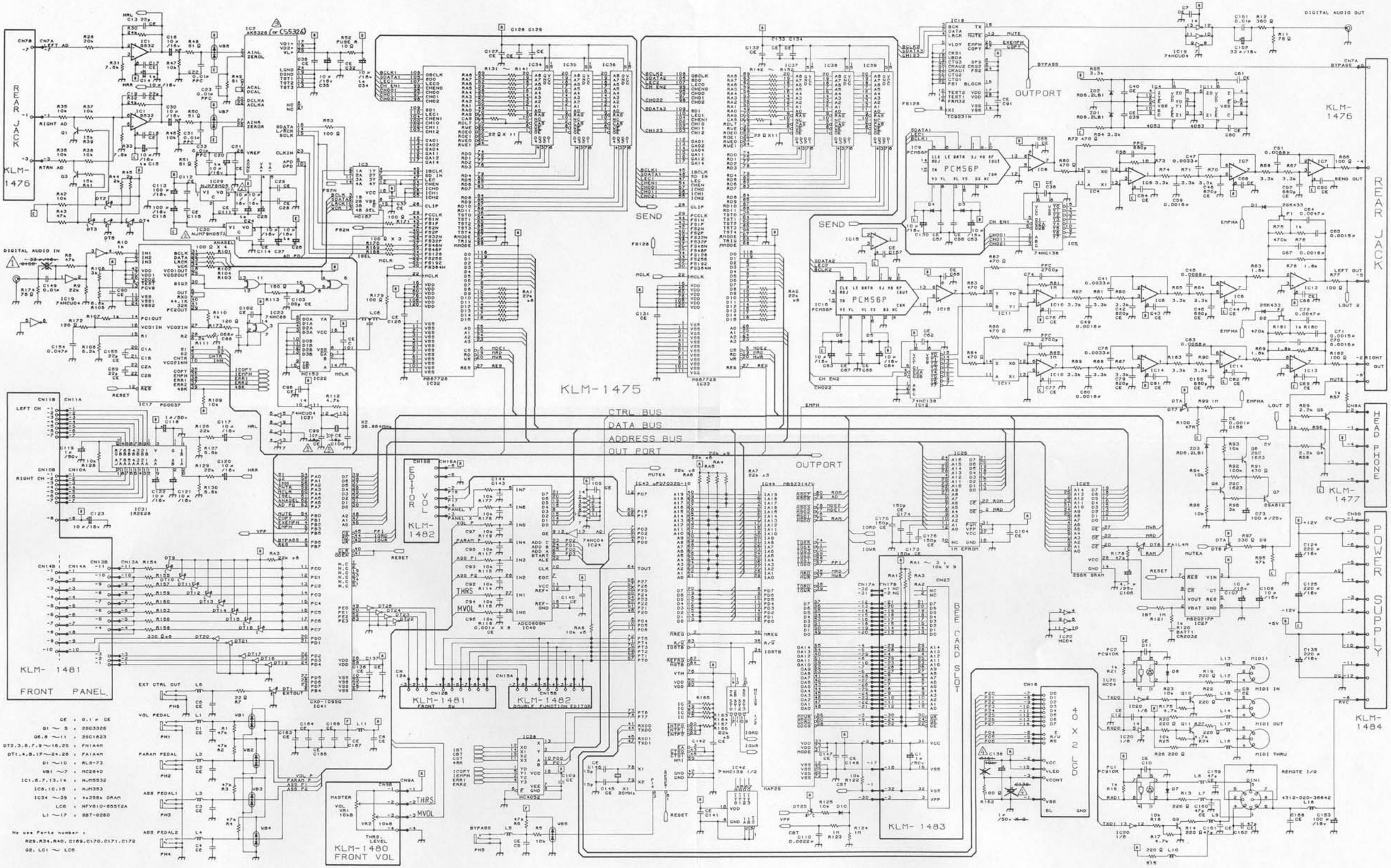
KLM-1476/77/78/79



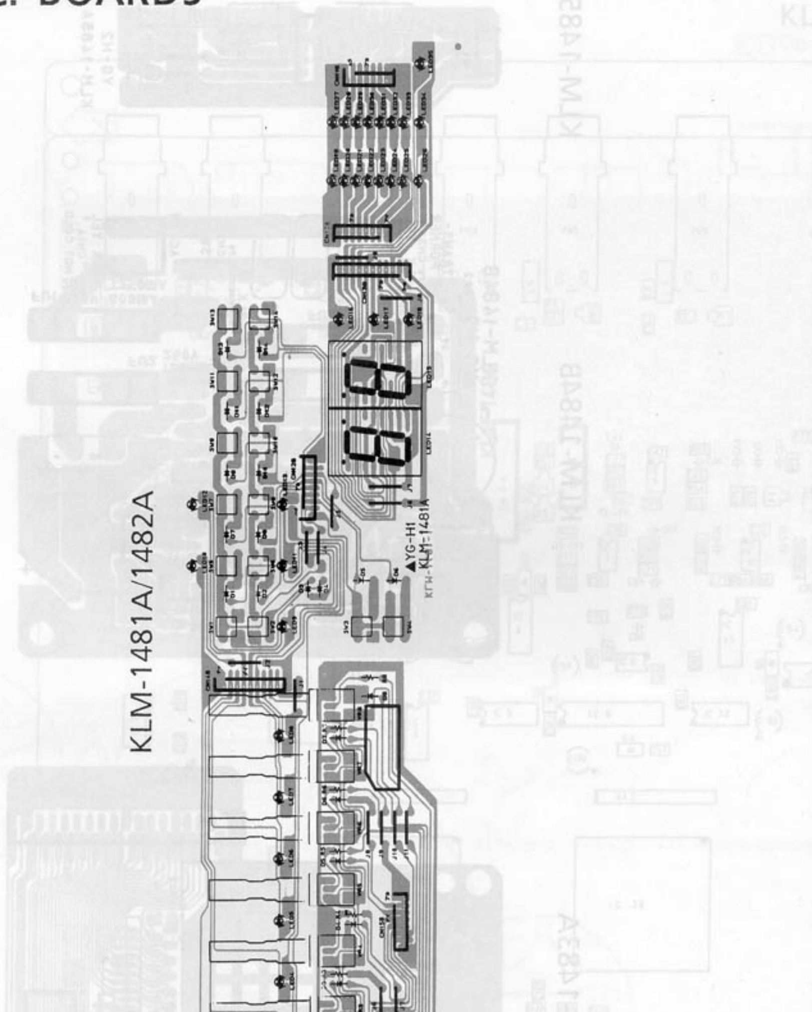
KLM-1484/85



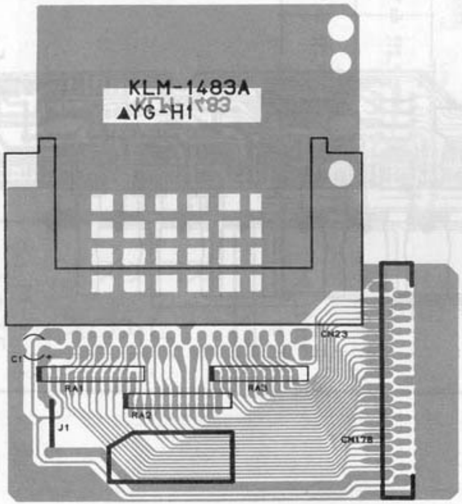
	100/117 V	220/240 V
FU1	250V 500mA	250V T250mA
FU2	125V 3A	250V T1.6A
FU3,4	125V 1.6A	250V T500mA


REAR JACK
KLM-1476
DIGITAL AUDIO IN
DIGITAL AUDIO OUT
OUTPORT
SEND
KLM-1475
CTRL BUS
DATA BUS
ADDRESS BUS
OUT PORT
EDITOR VOL
KLM-1482
KLM-1481 FRONT PANEL
KLM-1481 FRONT SW
KLM-1482 DOUBLE FUNCTION EDITOR
KLM-1480 FRONT VOL
BEE CARD SLOT
KLM-1483
40 X 2 LCD
HEAD PHONE
KLM-1477
POWER SUPPLY
KLM-1484
MIDI IN
MIDI OUT
MIDI THRU
REMOTE I/O
EXT CTRL OUT
VOL PEDAL
PARAM PEDAL
ASS PEDAL1
ASS PEDAL2
MASTER VOL
THRS LEVEL
THRS
MVOL
BYPASS
PCM56P
CXD-1095Q
ADC0809N
MB87728
MB8231472
HC4052
TC9231N
PD0037
LEFT CH
RIGHT CH
LEFT OUT
RIGHT OUT
SEND OUT
EMPHA

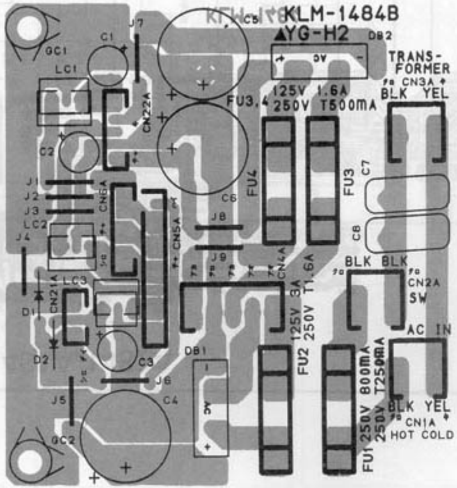
5. P.C. BOARDS



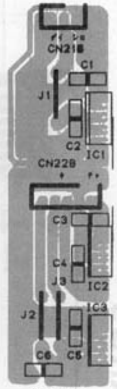
KLM-1483A



KLM-1484B

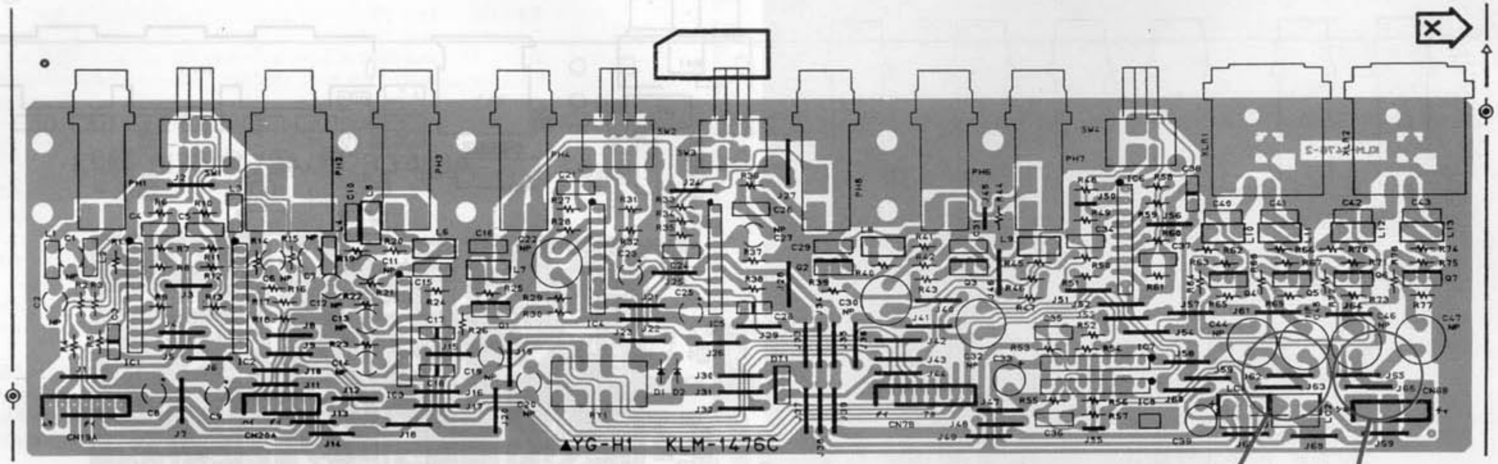


KLM-1485A



YG-H2
KLM-1485A

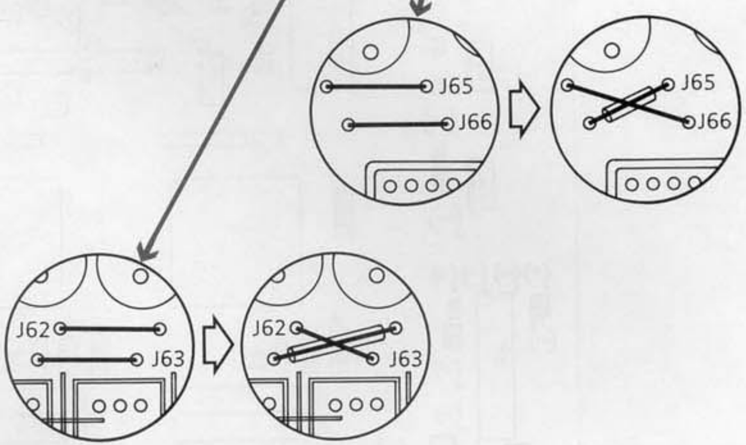
KLM-1476C



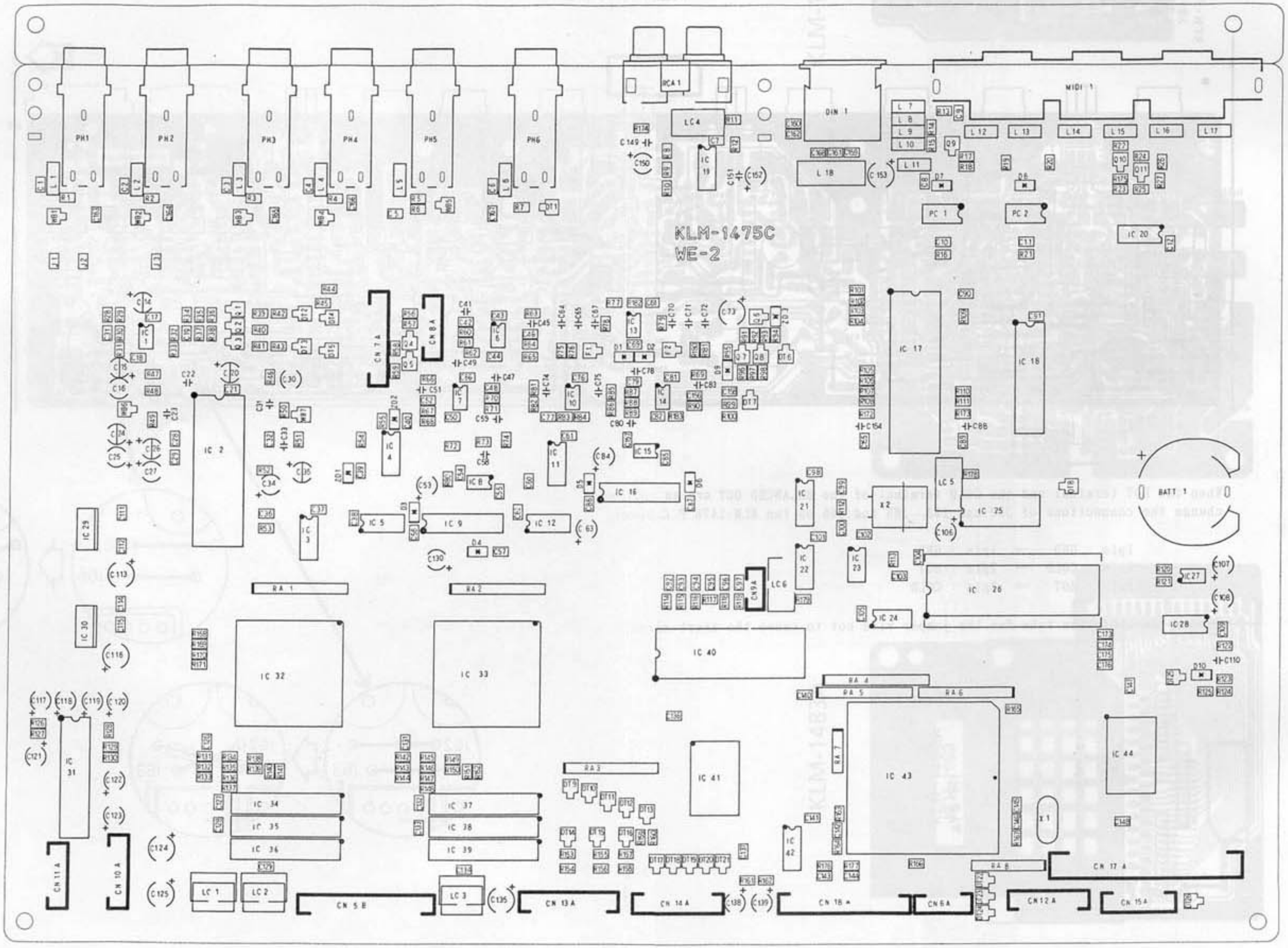
When the HOT terminal and the COLD terminal of the BALANCED OUT are as follows, change the connections of J62 and J63, J65 and J66 on the KLM-1476 P.C. board.

1pin : GND → 1pin : GND
2pin : COLD → 2pin : HOT
3pin : HOT → 3pin : COLD

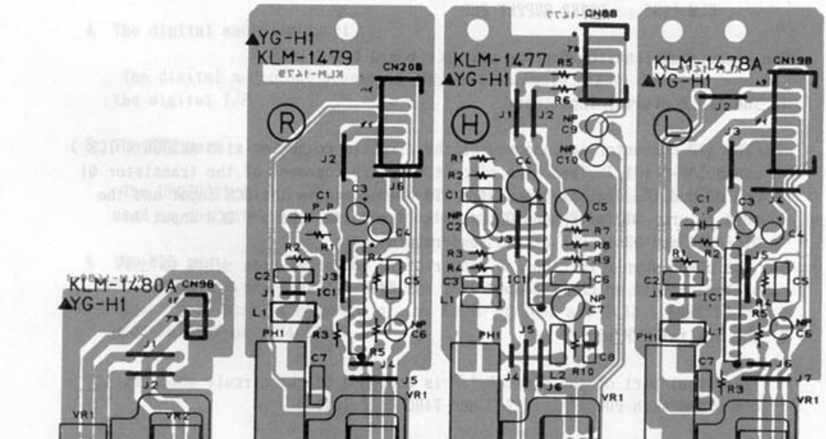
※ Use the isolation tube for the jumper wire not to cause the short-circuit.



KLM-1475



KLM-1477/1478A/1479/1480A



6. CIRCUIT EXPLANATION

The AI's hardware is composed of the following p. c. boards.

KLM-1475	MAIN PCB
KLM-1476	REAR JACK PCB
KLM-1477	HEADPHONE PCB
KLM-1478	FRONT JACK PCB (LEFT)
KLM-1479	FRONT JACK PCB (RIGHT)
KLM-1480	FRONT VR PCB
KLM-1481	FRONT PANEL PCB
KLM-1482	DOUBLE FUNCTION EDITOR PCB
KLM-1483	CARD SLOT PCB
KLM-1484	POWER SUPPLY PCB
KLM-1485	POWER SUPPLY PCB

The circuit explanation for the main p. c. board (KLM-1475)

1. The A/D convertor input part

The A/D convertor is composed of the circuits connected with AK5326 (IC2) and M5532 (IC1). Then, the circuit which is composed of the transistor Q1 and Q3 and the digital transistor DT2~DT5 converts the 2CH input and the send-return. Q1 is OFF and Q3 is ON at the normal chain (2CH input). Q1 is ON and Q3 is OFF at the send-return chain.
The power supply for the A/D convertor is converted from ±12V to ±5V by the circuit which is composed of NJM78M05 (IC29) and NJM79M05 (IC30).

2. The digital I/F part

The input part of the digital I/F is composed of the circuit which is connected with PD0037 (IC17) and 74HCU04 (IC19).

IC23 (74HC86)

This IC converts the clock 18.432MHz (25 pin and 30 pin of IC17), which is transmitted from the digital I/F (PD0037), to 36.864MHz.

IC22 (74HC153)

This IC converts the clock of the internal oscillator (X2) and that of IC23 (74HC86). The master clock is usually the clock of the internal oscillator (X2) but when the digital I/O of the utility parameter is changed to ENABLE and the sampling signal of 48KHz is received into the digital IN, the master clock is converted.

IC3 (74HC157)

This IC converts the signal from the A/D convertor and the signal from the digital I/F IN for transmitting.

3. The D/A convertor output part

IC9 (PCM56)

IC9 (PCM56) is the D/A convertor only for the send-out. This send-signal is transmitted only when the send-return chain is selected.

IC16 (PCM56)

IC16 (PCM56) transmits the signals for 2 channels of L/R with time division.

4. The digital audio out part

The digital audio out transmits the digital audio signal through the digital I/F.

5. The CPU part

The UPD70325-10 (IC43) is used for the CPU. The MB623147U (IC44) is used as the gate array for the decoder and the card buffer.

6. The MDE part

The effect part is composed of the MDEⅡ of IC32 and IC33 (MB87728) and the DRAM of IC34～IC39.

7. DIAGNOSTIC TEST

1. Before you start the diagnostic test

When this test program starts, the data in the AI is initialized. Thus, the necessary data like users' should be saved into the RAM card.

2. Regarding the operation switches on the diagnostic test

" PAGE +" SW : The item proceeds to the next.
" PAGE -" SW : The item returns to the previous one.
" INT/CARD " SW : The check proceeds to the next.
" MAP " SW : The check returns to the previous one.

3. Starting the diagnostic test

(1) Connect the MIDI cable to the MIDI IN and OUT of the rear panel when the power is off. Then, connect the short plug (the DIN plug which short-circuits 1pin and 4pin, 3pin and 5pin).

(2) When the power is turned on after the test card is inserted into the card slot, the test program automatically starts. (The card protect must be OFF.)

4. Internal check

When the test program starts, the following checks are automatically carried out.

(1) MIDI I/O circuit check

The MIDI IN-OUT circuit is checked.

The following is indicated in the LCD.

```
〈 MIDI 〉
              Checking ...
```

When this check passes, the item proceeds to the next automatically.

When this check fails, all the LEDs go on and off and the letter " Err " is indicated in the LED display. Also, the following is indicated in the LCD, so that check the MIDI cable and the circuit connected with the MIDI.

```
〈 MIDI 〉
              OUT—— × ——→IN
```

(2) Remote I/O circuit check

The remote terminal circuit is checked.

The following is indicated in the LCD.

〈 REMOTE 〉 Checking ...

When this check passes, the item proceeds to the next automatically.

When this check fails, all the LEDs go on and off and the letter " Err " is indicated in the LED display. Also, the following is indicated in the LCD, so that check the DIN plug and the REMOTE I/O circuit.

〈 REMOTE 〉 OUT－－×－→IN

(3) RAM card check

The RAM card is checked.

The following is indicated in the LCD.

〈 RAM CARD 〉 Checking ...

When this check passes, the item proceeds to the next automatically.

When this check fails, all the LEDs go on and off and the letter " Err " is indicated in the LED display. Also, the following is indicated in the LCD, so that check the RAM card (the potect switch) and the circuit connected with the card slot.

〈 RAM CARD 〉 Adr:[xxxxH] sourc:[xxH] read:[xxH]

(4) Internal RAM check

The internal RAM is cheked.

The following is indicated in the LCD.

```
〈 INT RAM 〉
                    Checking ...
```

When this check passes, the item proceeds to the next automatically.

When this check fails, all the LEDs go and off and the letter " Err " is indicated in the LED display. Also, the following is indicated in the LCD, so that check the circuit connected with the RAM.

```
〈 INT RAM 〉
   Adr:[xxxxH] sourc:[xxH] read:[xxH]
```

(5) Internal battery check

The battery voltage of the A1 is checked.

When this check passes, the item proceeds to the next automatically.

When this check fails, all the LEDs go and off and the letter " Err " is indicated in the LED display. Also, the following is indicated in the LCD, so that check the battery and the circuit connected with it.

```
〈 INT BATT 〉
                    BATTERY ERROR !
```

5. LED check

When the internal check is finished, the item proceeds to the LED check automatically and each LED lights. Also, the following is indicated in the LCD.

```
〈 LED 〉
                    Checking ...
```

The turn of the LED's lighting is as follows.

DIGITAL IN → CLIP(L) → CLIP(R) → INT → CARD → MAP → LED DISPLAY
→ PLAY→ EDIT → BYPASS → COMPARE → UTILITY → WRITE → A → B → C
→ D → E → F → G → H

When this check is finished, the item proceeds to the next check automatically.

6. LCD check

(1) LCD dot lighting check

The following is indicated in the LCD.

Confirm all the dots in the LCD light.

When this check is finished, press the "INT/CARD" switch to proceed to the next check.

(2) LCD dot going-out check

Nothing is indicated in the LCD as follows.

Confirm all the dots in the LCD go out.

When this check is finished, press the "INT/CARD" switch to proceed to the next check.

7. Volume, switch and pedal checks.

(1) Volume check

The master VR and the threshold VR are checked.

The following is indicated in the LCD.

```
 ( VOLUME )
 MASTEROUT : [xxH] THRESHOLD : [xxH]
```

Confirm the value in the parenthesis changes between 00 and 7FH by turning each VR.

When this check is finished, press the INT/CARD switch to proceed to the next check.

(2) Switch check

Each switch on the front panel is checked.

The following is indicated in the LCD.

```
〈SWITCH 〉
                push : [PAGE+]
```

The turn to check is as follows.

PAGE+ → PAGE- → INT/CARD → +10 → +1 → PLAY → EDIT → BYPASS → MAP → -10 → -1 → COMPARE → UTILITY → WRITE

When the check of the WRITE switch is finished, the item proceeds to the next check automatically.

(3) Double function editor check

The double function editors A ～ H are checked.

The following is indicated in the LCD.

```
〈 DOUBLE FUNCTION 〉
[xxH][xxH][xxH][xxH][xxH][xxH][xxH][xxH]
```

Confirm the LED lights when each D.F.E. is pressed and the value in the parenthesis changes between 00 and 7FH when each VR is turned.

When this check is finished, press the INT/CARD switch to proceed to the next check.

(4) Pedal check

The pedal foot switch on the rear panel is checked.

Connect the pedal foot switch PS-2 to the SWITCH 1&2 jacks on the rear panel with signal cords and connect the volume pedal KVP-001 to the VOL jack and the PARAM jack with signal cords.

The following is indicated in the LCD.

```
〈 PEDAL 〉 VOL : [xxH]  PARAM : [xxH]
           SW-1 : [7FH]   SW-2 : [7FH]
```

Confirm the values in the parentheses change from 7F to 00H when the pedal switch is pressed and the values in the parentheses change between 00 and 7FH when the volume pedal is operated.

After this check is finished, connect the EXT CTRL OUT jack on the rear panel to the DAMPER jack of the M1 (or any synthesizer which has the DAMPER jack) with a signal cord.

Confirm there is no damper effect for the generated sound at this time. When this check is finished, press the INT/CARD switch to proceed to the next check.

8. EXT. CONTROL OUT CHECK

It is checked whether the A1 controls the external device or not.

(1) EXT. CONTROL OUT ON

The following is checked in the LCD.

```
( EXT CTRL )
                  EXT CTRL OUT ON
```

Confirm there is a damper effect by pressing the M1's key at this time.

When this check is finished, press the INT/CARD switch to proceed to the next check.

(2) EXT. CONTROL OUT OFF

The following is indicated in the LCD.

```
( EXT CTRL )
  EXT CTRL OUT OFF ( push BYPASS pedal )
```

Confirm there is no damper effect by pressing the M1's key at this time.

When this check is finished, press the INT/CARD switch to proceed to the next check.

9. MDE check

The test waveform of the MDE is checked with an oscilloscope.

(1) MDE TEST (IC33)

The following is indicated in the LCD.

〈 MDE 〉 MDE TEST IC-33 UNBAL L

Connect the oscilloscope to the OUTPUT L / MONO jack on the rear panel and confirm the following waveform is generated.

If it is not normal, check the circuit connected with IC33.

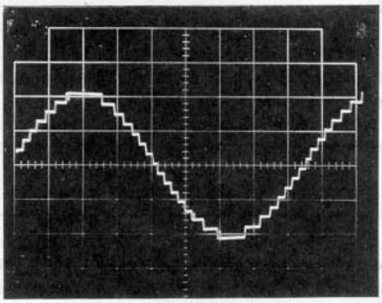
When this check is finished, press the INT/CARD switch to proceed to the next check.

(2) MDE TEST (IC32)

The following is indicated in the LCD.

〈 MDE 〉 MDE TEST IC-32 UNBAL R

Connect the oscilloscope to the OUTPUT R jack on the rear panel and confirm the following waveform is generated.



MDE (IC32, 33) TEST WAVEFORM

If it is not normal, check the circuit connected with IC32.

After this check is finished, turn the power off and pull out the test card to finish the test mode.

※ Regarding the check item of the diagnostic test.

We don't mention anything about the checks after the MDE check because they are for the inspection at the factory and because an audio analyzer and a special controller are needed.

Regarding the A1's copy mode

The A1 has the copy mode of the card and can copy the test program in the test card into the other RAM card. This function enables to copy not only the A1's test program but also the test programs of the M1, the M1R and the WS1 into the RAM card (within 256K).

※ When this copy mode is started, the internal data is initialized as well as the test program. Therefore, the necessary data should be saved into a RAM card previously.

How to copy the test program

1. Insert the diagnostic test card (RAM card) into the card slot and then turn the power on while pressing the C, D, E switches of the D.F.E — the test data is automatically loaded into the RAM in the A1.
(No message is indicated in the LCD.)

2. Pull out the RAM card and insert a new RAM card.
(The protect switch of the card must be OFF.)

3. When the WRITE switch is pressed, the test data in the A1 is loaded into the RAM card.

In case the test program is for the A1, the test program starts automatically after loading is completed.
If the test is not necessary, turn the power off and pull out the RAM card.

In case the test program is not for the A1, the mode returns to the normal one. However, the data is initialized.

《 Caution when the A1's ROM is changed 》

After you change the A1's system ROM, clear the memory of the internal RAM. In this case save the important data into a RAM card previously because the data of the internal RAM is initialized.

How to clear the memory is to turn the power on while pressing the [-1/▼] switch and the [WRITE] switch.

The turn to change the ROM is as follows.

1. Save the internal data into a RAM card or a data filer.
2. Change the ROM.
3. Clear the memory.
4. Load the saved data from the RAM card or the data filer.

Then, how to know the ROM version is as follows.

When you turn the power on while pressing the [WRITE] switch, the version number appears at the upper-right side of the LCD.

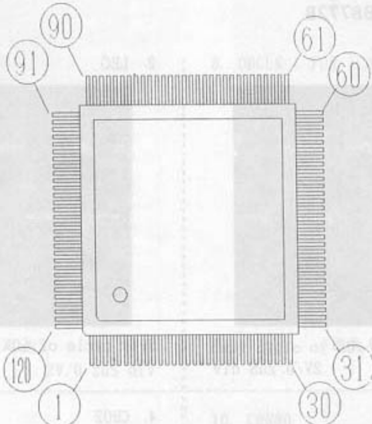
KORG	# xx
PERFORMANCE SIGNAL PROCESSOR A 1	

↑
Version NO.

8. REFERENCE DATA

MB87728 (MDE II)

PIN ASSIGNMENT



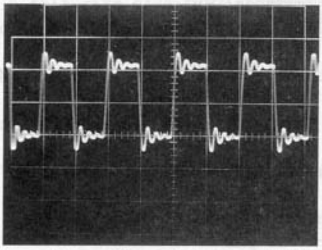
MB87728 (MDE II)

PIN FUNCTION

NO.	I/O	PIN NAME	NO.	I/O	PIN NAME	NO.	I/O	PIN NAME	NO.	I/O	PIN NAME
1	---	VSS	31	---	VSS	61	---	VSS	91	---	VSS
2	I/O	D2	32	0	FS192	62	I/O	RA6	92	0	RWE
3	I/O	D3	33	0	FS256	63	I/O	RA7	93	0	RWE0
4	I/O	D4	34	0	FS128	64	I	TST1	94	0	RWE1
5	I/O	D5	35	0	FS48P	65	I	TST2	95	0	CH00
6	I	CS	36	I	TST0	66	I	TRIG	96	I	TST4
7	I/O	D6	37	0	FS48N	67	I	RMODE	97	0	CH01
8	I/O	D7	38	0	FS32P	68	I	MMODE	98	0	CH02
9	I/O	D8	39	0	FS32N	69	0	RA8	99	0	CHEN0
10	I/O	D9	40	0	FS2P	70	0	RAS	100	0	CH10
11	---	VSS	41	---	VSS	71	---	VSS	101	---	VSS
12	I/O	D10	42	0	FS2N	72	0	CAS	102	0	CH11
13	I/O	D11	43	0	FS1P	73	I	RDLT	103	0	CH12
14	I/O	D12	44	0	FS1N	74	I/O	RD0	104	0	CHEN1
15	I/O	D13	45	I	IBCK	75	I/O	RD1	105	0	SD0
16	---	VDD	46	---	VDD	76	---	VDD	106	---	VDD
17	I/O	D14	47	I	LEC	77	I/O	RD2	107	0	LEC0
18	I/O	D15	48	I	SDIN	78	I/O	RD3	108	0	OBCLK
19	I	RD	49	I/O	RA0	79	I/O	RD4	109	0	SDI
20	I	WR	50	I/O	RA1	80	I/O	RD5	110	0	LEC1
21	---	VSS	51	---	VSS	81	---	VSS	111	---	VSS
22	I	MCLK	52	I/O	RA2	82	I/O	RD6	112	0	GA01
23	I	A3	53	I/O	RA3	83	I/O	RD7	113	0	GA02
24	I	A2	54	I	CHEN	84	I/O	RD8	114	0	GA04
25	I	A1	55	I	ICH2	85	I/O	RD9	115	0	GA11
26	I	A0	56	I	ICH1	86	I	TST3	116	0	GA12
27	I	RES	57	I	ICH0	87	I/O	RD10	117	0	GA14
28	0	CLIP	58	I/O	RA4	88	I/O	RD11	118	I/O	D0
29	0	PCCLK	59	I/O	RA5	89	0	ROE0	119	I/O	D1
30	0	FS384H	60	---	VDD	90	0	ROE1	120	---	VDD

CHECK POINT FOR MB87728

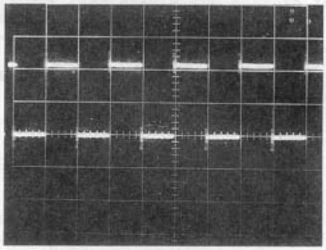
1. IBCLK



duty cycle of 50% T=0.4uS

2V/0.2uS div

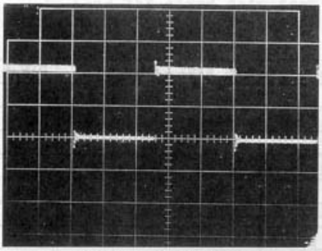
2. LEC



duty cycle of 50% T=10uS

2V/5uS div

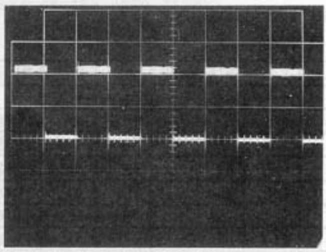
3. CH01



duty cycle of 50% T=10uS

2V/2uS div

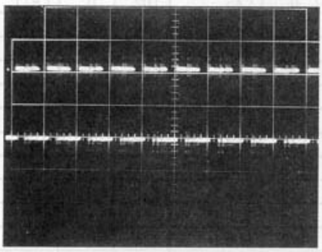
4. CH02



duty cycle of 50% T=20uS

2/10uS div

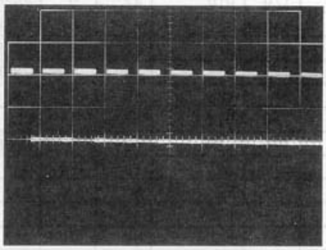
5. SDIN



When a sound is received,
the width of the pulse changes.

2V/10uS div

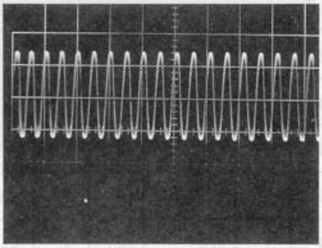
6. SDO



When a sound is received,
the width of the pulse changes.
the threshold VR = 0

2V/10uS div

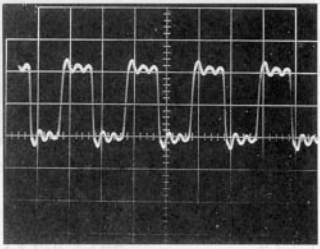
7. OBCLK (FOR IC32)



duty cycle of 50%   T=0.1uS

2V/0.2uS div

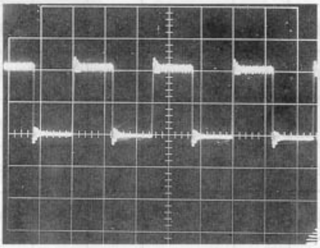
8. OBCLK (FOR IC33)



duty cycle of 50%   T=0.4uS

2V/0.2uS div

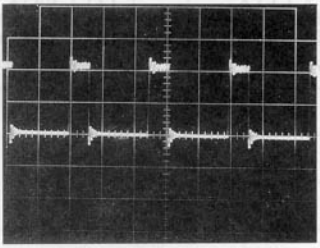
9. LECO



duty cycle of 50%   T=2.6uS

2V/1uS div

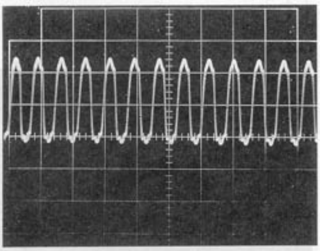
10. CHENO



T=2.6uS

2V/1uS div

11. FS128

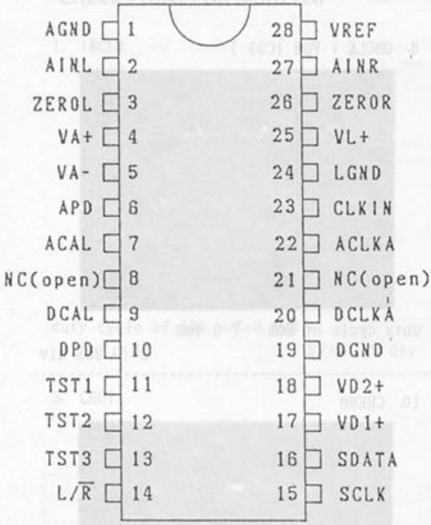


duty cycle of 50%   T=0.16uS

2V/0.2uS div

AK5326

PIN ASSIGNMENT



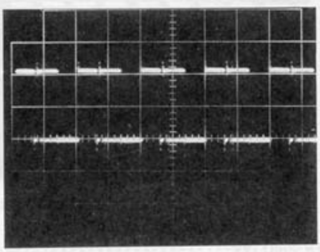
AK5326

PIN FUNCTION

NO.	I/O	PIN NAME	NO.	I/O	PIN NAME
1	--	AGND	15	I	SCLK
2	I	AINL	16	0	SDATA
3	I	ZEROL	17	---	VD1+
4	---	VA+	18	---	VD2+
5	---	VA-	19	---	DGND
6	I	APD	20	I	DCLKA
7	I	ACAL	21	---	NC
8	---	NC	22	0	ACLKA
9	0	DCAL	23	I	CLKIN
10	I	DPD	24	---	LGND
11	I	TST1	25	---	VL+
12	I	TST2	26	I	ZEROR
13	I	TST3	27	I	AINR
14	I	L/R	28	0	VREF

CHECK POINT FOR AK5326

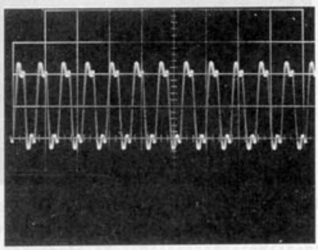
1. SDATA



When a sound is received,
the width of the pulse changes.

2V/5uS div

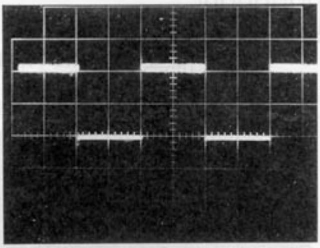
2. CLKIN



duty cycle of 50% T=0.16uS

2V/0.2uS div

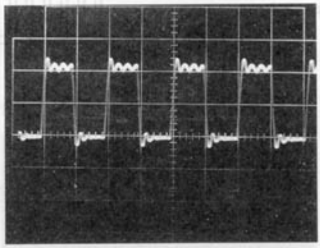
3. L/RCK



duty cycle of 50%   T=20uS

2V/5uS div

4. SCLK

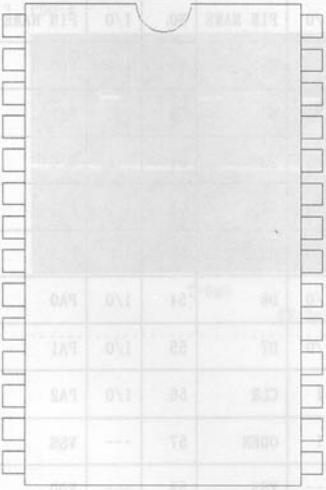


duty cycle of 50%   T=0.2uS

2V/0.2uS div

TC9231N

PIN ASSIGNMENT

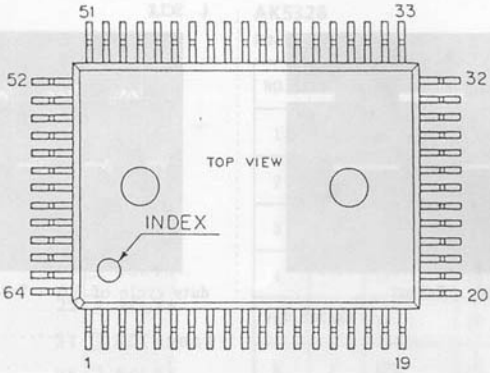


TC9231N

PIN FUNCTION

NO.	I/O	PIN NAME	NO.	I/O	PIN NAME
1	---	VSS	15	0	DIGO
2	I	DATA	16	0	BLOCK
3	I	BCK	17	---	VDD
4	I	LRCK	18	I	UBDA
5	I	VLDY	19	I	CTG3
6	I	SPSEL	20	I	CKAU2
7	I	CKSE1	21	I	CKAU1
8	I	CKSE2	22	I	CTG2
9	I	XI	23	I	CTG1
10	I	TEST2	24	I	FS2
11	I	TEST1	25	I	FS1
12	0	FRM32	26	I	EMPH
13	I	MUTE	27	I	CPY
14	---	VSS	28	---	VDD

CXD1095Q
PIN ASSIGNMENT

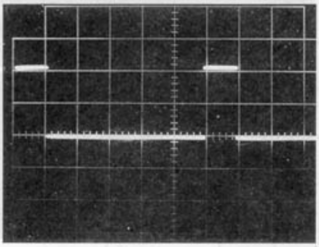


CXD1095Q
PIN FUNCTION

NO.	I/O	PIN NAME	NO.	I/O	PIN NAME	NO.	I/O	PIN NAME	NO.	I/O	PIN NAME
1	---	N.C	17	I/O	PC6	33	---	N.C	49	I/O	PE0
2	---	N.C	18	I/O	PC7	34	---	N.C	50	I/O	PE1
3	I/O	PB1	19	---	N.C	35	I/O	D3	51	---	N.C
4	I/O	PB2	20	I/O	PD0	36	I/O	D4	52	I/O	PE2
5	I/O	PB3	21	I/O	PD1	37	I/O	D5	53	I/O	PE3
6	I/O	PB4	22	I/O	PD2	38	I/O	D6	54	I/O	PA0
7	I/O	PB5	23	I/O	PD3	39	I/O	D7	55	I/O	PA1
8	I/O	PB6	24	I/O	PD4	40	I	CLR	56	I/O	PA2
9	I/O	PB7	25	---	VSS	41	I	ODEN	57	---	VSS
10	---	VSS	26	---	VDD	42	---	VSS	58	---	VDD
11	I/O	PC0	27	I/O	PD5	43	I	WR	59	I/O	PA3
12	I/O	PC1	28	I/O	PD6	44	I	RD	60	I/O	PA4
13	I/O	PC2	29	I/O	PD7	45	I	CS	61	I/O	PA5
14	I/O	PC3	30	I/O	D0	46	I	A0	62	I/O	PA6
15	I/O	PC4	31	I/O	D1	47	I	A1	63	I/O	PA7
16	I/O	PC5	32	I/O	D2	48	I	A2	64	I/O	PB0

CHECK POINT FOR CXD1095Q

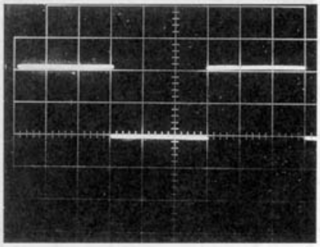
1. PE0-2



T=30mS

2V/5mS div

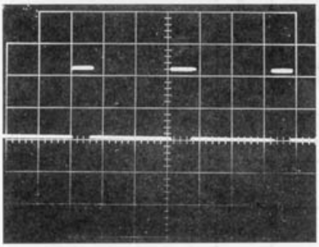
2. PE3



duty cycle of 50% T=30mS

2V/5mS div

3. PD0-4

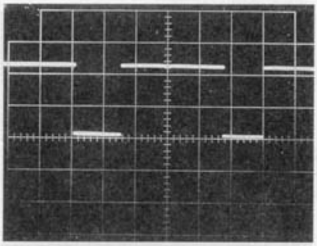


T=6mS

2V/2mS div

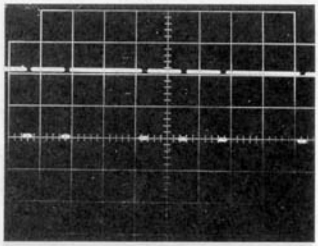
CHECK POINT FOR ADC0809N

1. ADDC



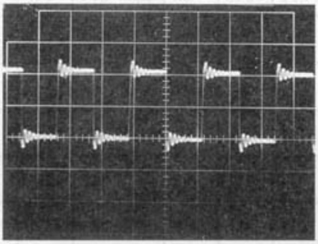
T=25mS
2V/5mS div

2. ALE



T=5mS
2V/1mS div

3. CLK



duty cycle of 50% T=1.2uS
2V/0.5uS div

PD0037

PIN ASSIGNMENT

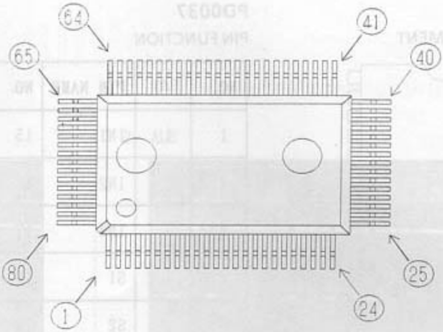
PD0037

PIN FUNCTION

NO.	I/O	PIN NAME	NO.	I/O	PIN NAME	NO.	I/O	PIN NAME
1	I	IN1	15	---	R1	29	O	PC2OUT
2	I	IN2	16	I	VCO1IN	30	I	SIG2
3	I	IN3	17	---	VDD	31	O	BCK
4	I	S1	18	O	VCO1OUT	32	O	DATA
5	I	S2	19	---	VSS1	33	O	LRCK
6	O	OUT	20	---	C1A	34	O	WCK
7	I	RXD	21	---	C1B	35	O	COPY
8	I	TEST	22	---	C2B	36	O	EMPH
9	I	CNTR	23	---	C2A	37	O	ERR2
10	I	VCO2INH	24	---	VSS2	38	O	ERR1
11	---	VSS	25	O	VCO2OUT	39	O	48K
12	I	RESET	26	---	VDD2	40	O	44.1K
13	I	PCVS	27	I	VCO2IN	41	O	32K
14	O	PC1OUT	28	---	R2	42	---	VDD

MB623147U (MAP25)

PIN ASSIGNMENT



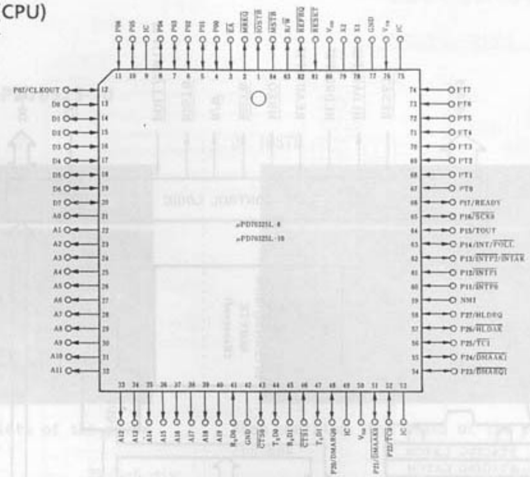
MB623147U (MAP25)

PIN FUNCTION

NO.	I/O	PIN NAME	NO.	I/O	PIN NAME	NO.	I/O	PIN NAME	NO.	I/O	PIN NAME
1	I	IA19	21	I	IA8	41	O	OA7	61	O	OA11
2	I	IA18	22	I	IA7	42	O	OA6	62	O	OA9
3	I	IA17	23	I	IA6	43	O	OA5	63	O	OA8
4	I	IA16	24	I	IA5	44	O	OA4	64	O	OA13
5	I	IA15	25	I	IA4	45	O	OA3	65	O	OA14
6	I	IA14	26	I	IA3	46	O	OA2	66	O	CDWR
7	I	IA13	27	I	IA2	47	O	OA1	67	O	IOS0
8	I/O	PD7	28	I	IA1	48	O	OA0	68	O	IOS1
9	I/O	PD6	29	I	IA0	49	I/O	D0	69	O	IOS2
10	I/O	PD5	30	I	MREQ	50	I/O	D1	70	O	IOS3
11	I/O	PD4	31	I	MODE	51	I/O	D2	71	O	IOS4
12	---	VSS	32	---	VSS	52	---	VSS	72	---	VSS
13	I/O	PD3	33	---	VDD	53	I/O	D3	73	---	VDD
14	I/O	PD2	34	I	IOST	54	I/O	D4	74	O	IOS5
15	I/O	PD1	35	I	R/W	55	I/O	D5	75	O	MS00
16	I/O	PD0	36	O	MRD	56	I/O	D6	76	O	MS01
17	I	IA12	37	O	MWR	57	I/O	D7	77	O	MS02
18	I	IA11	38	O	IORD	58	O	CDCS	78	O	MS03
19	I	IA10	39	O	IOWR	59	O	OA10	79	O	MS06
20	I	IA9	40	O	OA12	60	O	CDRD	80	O	MS07

μPD70325-10 (CPU)

PIN ASSIGNMENT



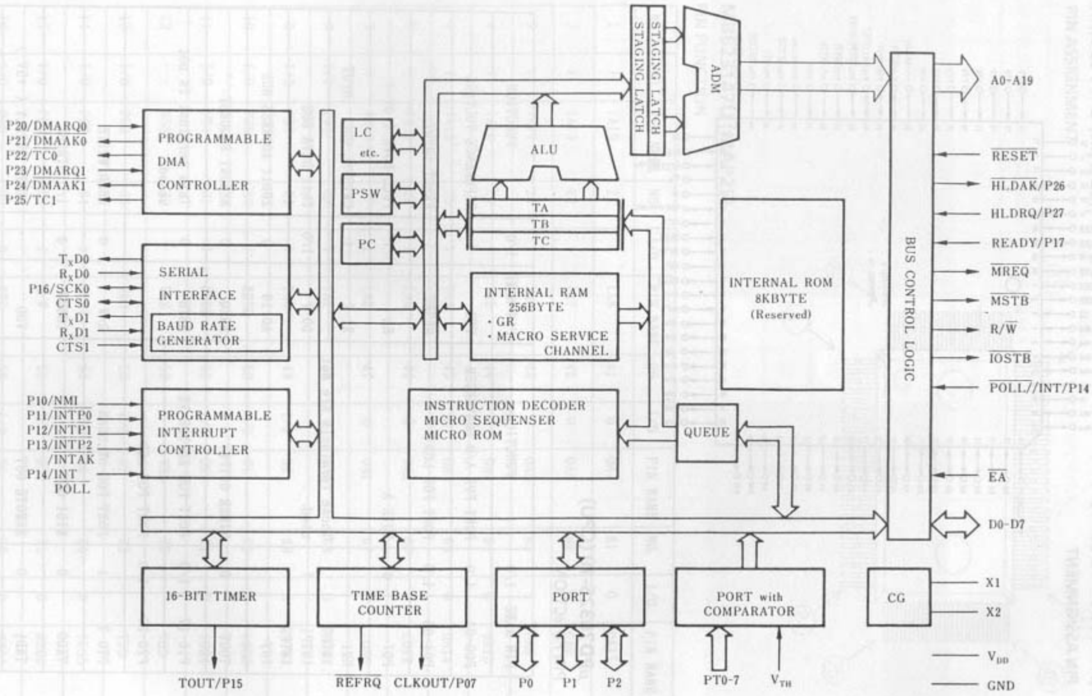
μPD70325-10 (CPU)

PIN FUNCTION

PIN NAME	I/O	FUNCTION	PIN NAME	I/O	FUNCTION
P00-03	I/O	PORT FOR A/D CONVERTER	VTH	I	REFERENCE VOLTAGE
P04-06	I/O	PORT FOR LCD	RESET	I	RESET INPUT
P07	O	MUTE A	EA	I	PULL DOWN (0V)
NMI INTP0 INTP1 INTP2 INT	I	These terminals are not used.	X1-2	I	CRYSTAL OSC. INPUT
			D0-7	I/O	8bit DATA BUS
			A0-19	O	20bit ADDRESS BUS
TOUT	O	TIMER OUTPUT	MREQ	O	MEMORY REQUEST
P16-17	I/O	PORT FOR EDITOR VR	MSTB	O	This terminal is not uesed.
P20-27	I/O	PORT FOR LCD			
PT0-7	I	PORT FOR SW SCAN	R/W	O	READ/WRITE
TXD0	O	MIDI OUT	IOSTB	O	I/O STROBE
TXD1	O	REMOTE OUT	VDD	---	POWER SUPPLY (+5V)
RXD0	I	MIDI IN	GND	---	GND (0V)
RXD1	I	REMOTE OUT	IC	---	INTERNAL CONNECT
CTS0 CTS1 REFRQ	I/O I O	These terminals are not used.			

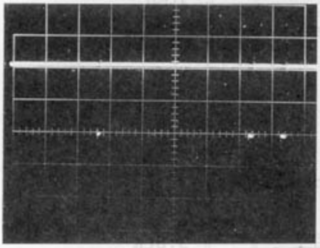
μPD70325-10

INTERNAL BLOCK DIAGRAM



CHECK POINT FOR μPD70325-10

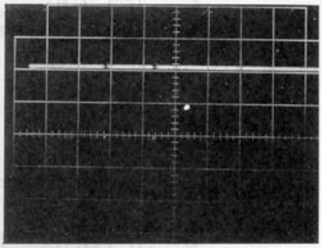
1. R/W



When operated, the width of the pulse changes.

2V/5uS div

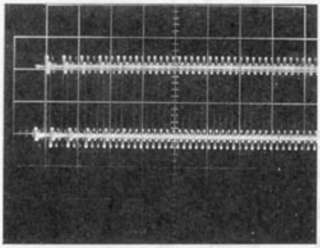
2. IOSTB



When operated, the width of the pulse changes.

2V/2uS div

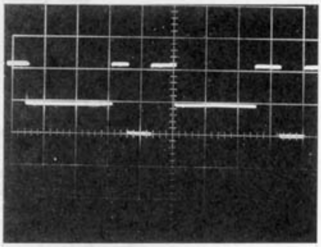
3. MREQ



When operated, the width of the pulse changes.

2V/0.5uS div

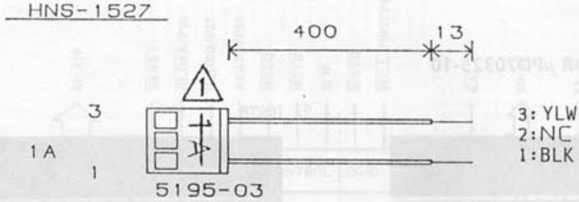
4. P16-17

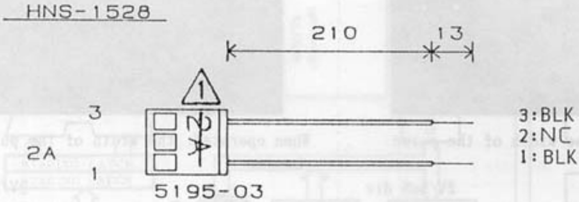


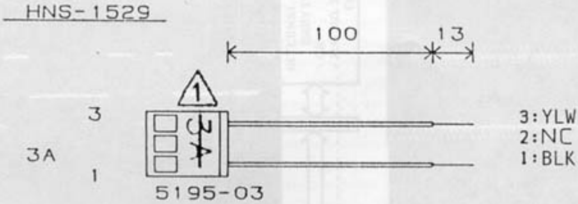
The width of the pulse changes sharply according to the place of the volume of the D.F.E..

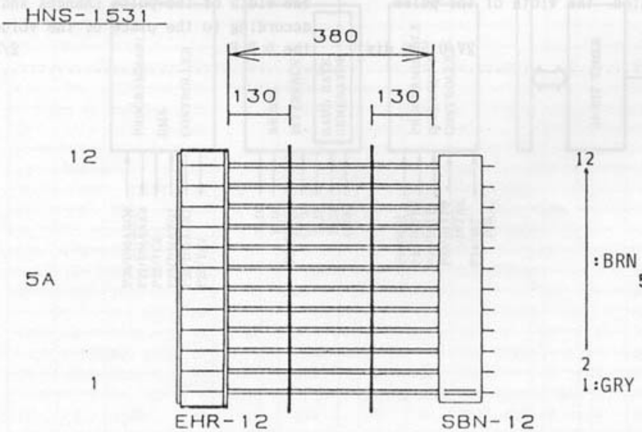
2/5mS div

FOR HARNESSES

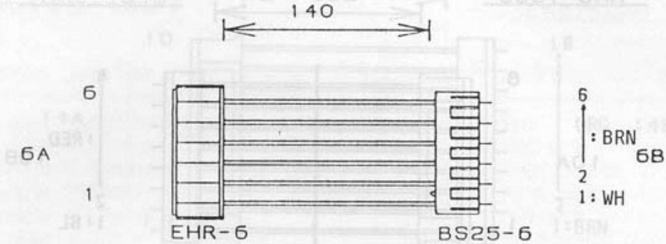




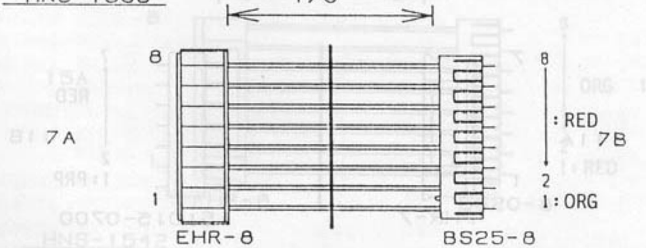




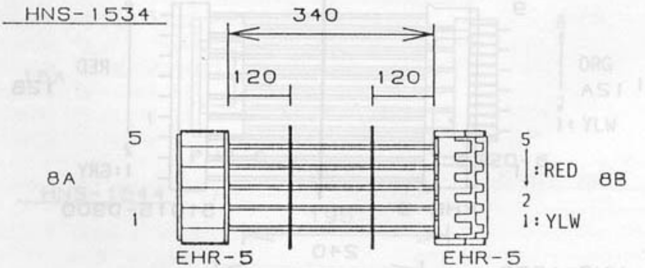
HNS-1532



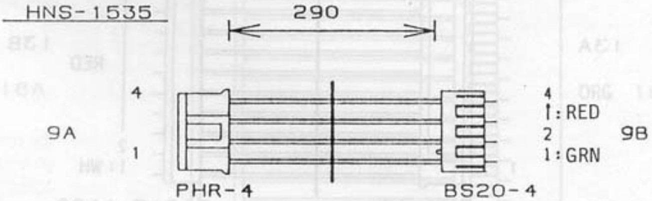
HNS-1533



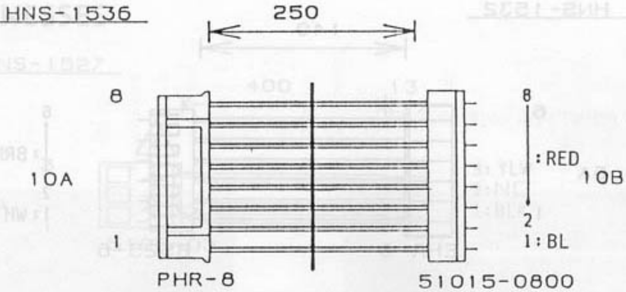
HNS-1534



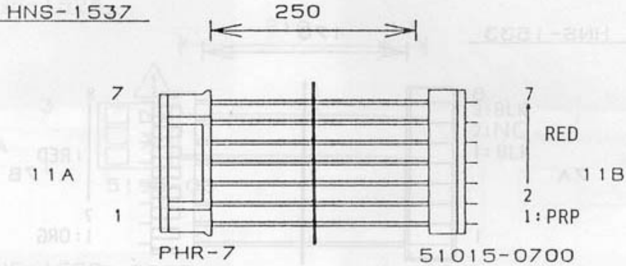
HNS-1535



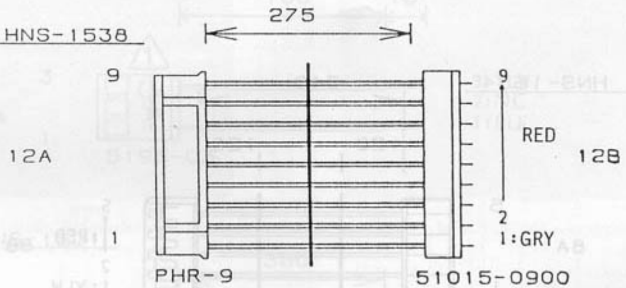
HNS-1536



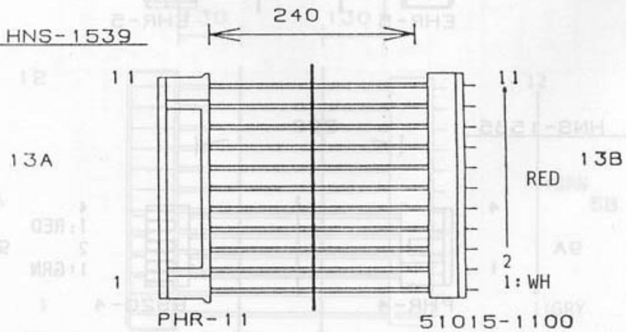
HNS-1537

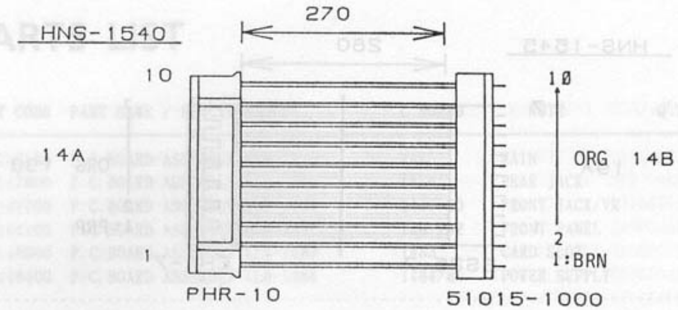


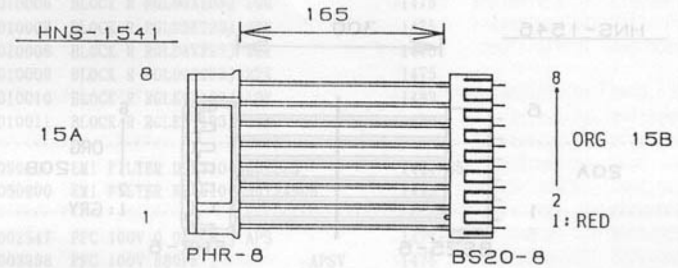
HNS-1538

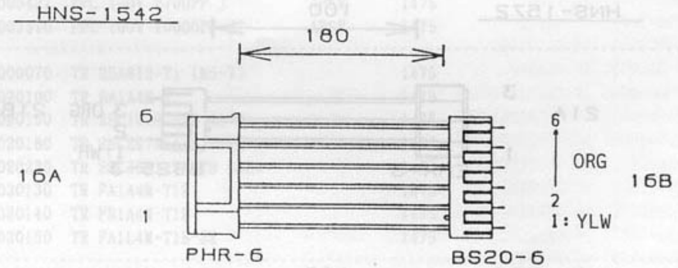


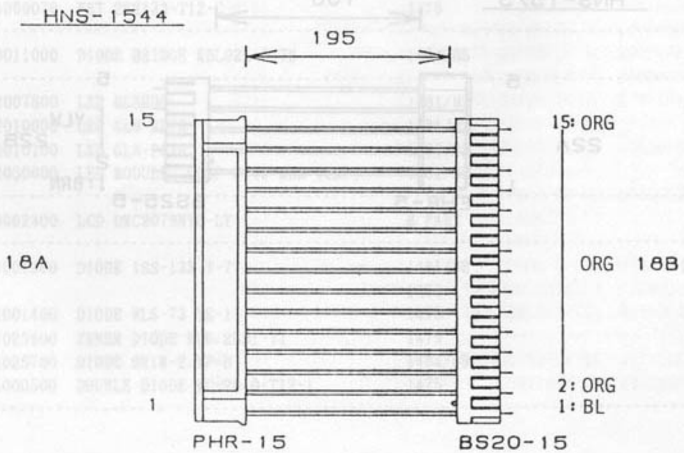
HNS-1539



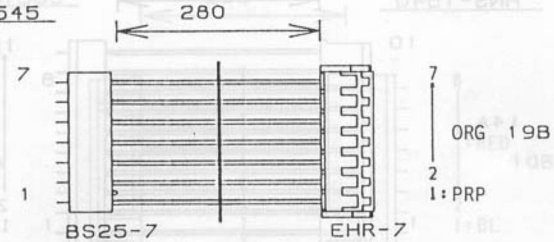

HNS-1540
270
10
14A
1
PHR-10
10
ORG
14B
2
1:BRN
51015-1000


HNS-1541
165
8
15A
1
PHR-8
8
ORG
15B
2
1:RED
BS20-8

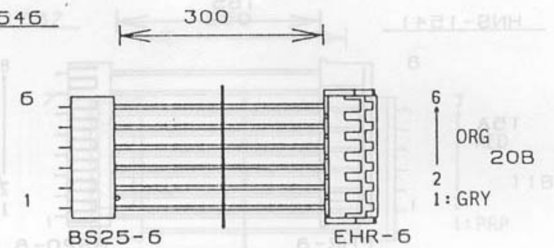

HNS-1542
180
6
16A
1
PHR-6
6
ORG
16B
2
1:YLW
BS20-6


HNS-1544
195
15
18A
1
PHR-15
15:ORG
ORG
18B
2:ORG
1:BL
BS20-15

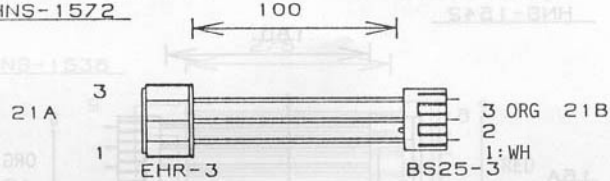
HNS-1545



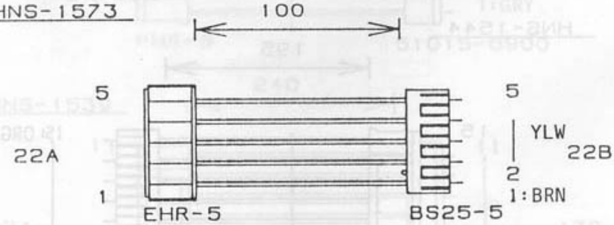
HNS-1546



HNS-1572



HNS-1573



9. PARTS LIST

PART CODE	PART NAME / SPECIFICATION		P.C.BOARD	NOTE	Q'TY
001147500	P.C.BOARD ASSEMBLY KLM-1475		1475	MAIN	1
001147600	P.C.BOARD ASSEMBLY KLM-1476		1476	REAR JACK	1
001147700	P.C.BOARD ASSEMBLY KLM-1477		1477-80	FRONT JACK/VR	1
001148100	P.C.BOARD ASSEMBLY KLM-1481		1481/82	FRONT PANEL	1
001148300	P.C.BOARD ASSEMBLY KLM-1483		1483	CARD SLOT	1
001148400	P.C.BOARD ASSEMBLY KLM-1484		1484/85	POWER SUPPLY	1
139010006	BLOCK R RGLD6X103J 10K		1475		1
139010007	BLOCK R RGLD3X223J 22K		1475		1
139010008	BLOCK R RGLD8X223J 22K		1475		5
139010009	BLOCK R RGLD9X223J 22K		1475		1
139010010	BLOCK R RGLE9X103J 10K		1483		1
139010011	BLOCK R RGLE9T103J 10K		1483		2
219050100	EMI FILTER DSS310-55D223S		1484/85		3
219050900	EMI FILTER NFV610-655T2A506		1475		2
260002547	PPC 100V 0.047UF J APS		1477-80		2
264003368	PPC 100V 680PF J	APSV	1475		1
264003427	PPC 100V 2700PF J	APSV	1475		2
264003510	PPC 100V 10000PF J	APSV	1475		4
304000070	TR 2SA812-T1 (M5-7)		1475		1
304020100	TR BA1A4M-T		1476		1
304020150	TR 2SC1623-T1B (L7)		1475		5
304020180	TR 2SC2878 A/B TPE2		1476		7
304020230	TR 2SC3661-TA/TB (3K)		1475		12
304030130	TR FA1A4M-T1B		1475		12
304030140	TR FN1A4M-T1B		1475		13
304030150	TR FA1L4M-T1B-3K		1475		1
304060070	FET 2SK433-T12-C		1475		2
310011000	DIODE BRIDGE KBL02L-6176		1484/85		2
312007800	LED GL3HD8		1481/82		17
312010000	LED GL8-HD26		1481/82		8
312010100	LED GL8-PG26		1481/82		8
312050600	LED MODULE QDSP-N146 RED (YHP)		1481/82		2
313002300	LCD DMC2079NYU-LY		M.PART		1
314001300	DIODE 1SS-133 T-77		1481/82		22
			1476		2
314001400	DIODE RLS-73 TE-11		1475		10
314025600	ZENER DIODE RD6.2LB1-T1		1475		3
314025700	DIODE SR1M-2 TP-B		1484/85		2
315000500	DOUBLE DIODE MC-2840-T12-1		1475		7

PART CODE	PART NAME / SPECIFICATION	P.C.BOARD	NOTE	Q'TY
320001191	IC UPD4052BC	1481/82		1
320001270	IC UPD70325L-10 (PLCC)	1475	CPU	1
320003187	IC TC9231N	1475	DIGITAL I/F (OUT)	1
320009005	IC NJM-4558 S	1476		1
320009062	IC NJM-78M05FA	1475		1
320009072	IC NJM-5532S	1476		6
320009078	IC NJM78M12FA	1484/85		1
320009079	IC NJM79M12FA	1484/85		1
320009080	IC NJM79M05FA	1475		1
320009090	IC NJM-4565S	1477-80		2
		1476		1
320010002	IC CXD1095Q (QFP)	1475	I/O EXPANDER	1
320011026	IC M5216L	1477-80		1
320012072	IC MB623147PF (QFP80)	1475	DECODER (MAP25)	1
320012093	IC MB87728PF (QFP120)	1475	MDE II	2
320012097	IC MBM27C1000-15Z-G	1475	EP ROM	1
320012098	IC MB81C4256-70PSZ-G	1475	DRAM	6
320013033	IC IR2E28	1475	LED DRIVER	1
320013035	IC PQ05RF1	1484/85	REGULATOR	1
320016002	IC PD0037	1475	DIGITAL I/F (IN)	1
320018001	IC AK5326	1475	A/D CONVERTER	1
320021141	IC ADC0809N	1475	A/D CONVERTER	1
320036004	IC PCM56P	1475	D/A CONVERTER	2
324001006	IC UPD74HCU04GS-E2 (SOP)	1475		2
324001007	IC UPD74HC139GS-E2 (SOP)	1475		1
324001009	IC UPD74HC138GS-E2 (SOP)	1475		2
324001011	IC UPD74HC04GS-E2 (SOP)	1475		2
324001024	IC UPD74HC86GS-E2	1475		1
324001025	IC UPD74HC4052GS-E2(SOP)	1475		1
324001027	IC UPD74HC153GS-E2 (SOP)	1475		1
324001028	IC UPD74HC157GS-E2 (SOP)	1475		1
324001033	IC UPD43256AGU-15L-E2	1475	SRAM	1
324004001	IC HD14053BFPER (SOP)	1475		2
324009002	IC NJM5532M-T1	1475		5
324009009	IC NJM353M-TE3 (SOP)	1475		3
324011013	IC M62021FP-600C	1475	RESET	1
330001400	PHOTO COUPLER PC-910K	1475		2
334000500	SB COIL SBT-0260 TF	1475		17
		1476		13
		1477-80		2
335006000	CRYSTAL OSC. AT-49 20.00MHZ	1475		1
335007100	CRYSTAL OSC. HC-49/U 36.864MHZ	1475		1
360021700	VR RK0971110D86A 10KB	1477-80		2
360023400	VR RK0971110 10KA	1477-80		2

PART CODE	PART NAME / SPECIFICATION	P.C.BOARD	NOTE	Q'TY
360023500	VR RK0971220 10KAX2	1477-80		1
362005400	VR RK097111400BA 10KB	1481/82		8
373005300	SLIDE SW SLS-25-2022-2	1476		4
375007800	POWER SW ESB-8213V	M.PART		1
375010900	TOUCH SW EVQPAC07K	1481/82		14
400012800	POWER TRANSFORMER TC-039A	M.PART		1
402002800	COIL 2943-666671	1475		1
403001500	RELAY MR62-12SR	1476		1
404000100	FERRITE BEAD BL03RN2-R62T4-F	1477-80		2
454006700	DIN JACK YKF-51-5014A	1475		1
454007900	PHONE JACK YKB21-5176	1477-80		2
		1476		2
454008000	PHONE JACK YKB21-5138	1475		6
		1476		4
		1477-80		1
454008400	PIN JACK YKC21-0487	1475		1
454008500	PHONE JACK YKB21-5222	1476		1
464002201	FUSE 125V 1.6A UL	M.PART	117CN	2
		M.PART	117US	2
		M.PART	117EX	2
		M.PART	100JP	2
464002501	FUSE 125V 3A UL	M.PART	117EX	1
		M.PART	117CN	1
		M.PART	117US	1
		M.PART	100JP	1
464011901	FUSE 250V 0.8A UL	M.PART	117CN	1
		M.PART	117US	1
		M.PART	117EX	1
		M.PART	100JP	1
464061401	FUSE 250V T250MA	M.PART	240UK	1
		M.PART	240AU	1
		M.PART	240AF	1
		M.PART	240GE	1
		M.PART	220SE	1
		M.PART	220WG	1
		M.PART	220FR	1
		M.PART	220GE	1
		M.PART	220SC	1
464061701	FUSE 250V T500MA	M.PART	240AF	2
		M.PART	220SC	2

PART CODE	PART NAME / SPECIFICATION	P.C.BOARD	NOTE	Q'TY
464061701	FUSE 250V T500MA	M.PART	240GE	2
		M.PART	220FR	2
		M.PART	240UK	2
		M.PART	220SE	2
		M.PART	220GE	2
		M.PART	220WG	2
		M.PART	240AU	2
464062201	FUSE 250V T1.6A	M.PART	240UK	1
		M.PART	240AF	1
		M.PART	240AU	1
		M.PART	220GE	1
		M.PART	220SE	1
		M.PART	220GE	1
		M.PART	220FR	1
		M.PART	220SC	1
		M.PART	220WG	1
471050500	CONNECTOR TOP B5P-VH	1484/85		1
471060300	CONNECTOR TOP B3B-EH	1484/85		1
471060500	CONNECTOR TOP B5B-EH	1475		1
		1484/85		1
471060600	CONNECTOR TOP B6B-EH	1484/85		1
471060800	CONNECTOR TOP B8B-EH	1475		1
471061200	CONNECTOR TOP B12B-EH	1475		1
471070400	CONNECTOR TOP B4B-PH	1475		1
471070600	CONNECTOR TOP B6B-PH	1475		1
471070700	CONNECTOR TOP B7B-PH	1475		1
471070800	CONNECTOR TOP B8B-PH	1475		2
471070900	CONNECTOR TOP B9B-PH	1475		1
471071000	CONNECTOR TOP B10B-PH	1475		1
471071100	CONNECTOR TOP B11B-PH	1475		1
471071500	CONNECTOR TOP B15B-PH	1475		1
471090200	CONNECTOR TOP 5096-02C	1484/85		3
472060500	CONNECTOR SIDE S5B-EH	1477-80		1
472060600	CONNECTOR SIDE S6B-EH	1477-80		1
472060700	CONNECTOR SIDE S7B-EH	1477-80		1
474004715	CARD FIT CONNECTOR ZC-032	1475		1
		1483		1
474009900	BC CONNECTOR L-32	1483		1
475001527	HARNESS HNS-1527	M.PART		1
475001528	HARNESS HNS-1528	M.PART		1
475001529	HARNESS HNS-1529	M.PART		1
475001531	HARNESS HNS-1531 BOARD IN	1484/85		1
475001532	HARNESS HNS-1532 BOARD IN	1476		1
475001533	HARNESS HNS-1533 BOARD IN	1476		1
475001534	HARNESS HNS-1534	M.PART		1
475001535	HARNESS HNS-1535 BOARD IN	1477-80		1

PART CODE	PART NAME / SPECIFICATION	P.C.BOARD	NOTE	Q'TY
475001536	HARNESS HNS-1536 BOARD IN	1481/82		1
475001537	HARNESS HNS-1537 BOARD IN	1481/82		1
475001538	HARNESS HNS-1538 BOARD IN	1481/82		1
475001539	HARNESS HNS-1539 BOARD IN	1481/82		1
475001540	HARNESS HNS-1540 BOARD IN	1481/82		1
475001541	HARNESS HNS-1541 BOARD IN	1481/82		1
475001542	HARNESS HNS-1542 BOARD IN	1481/82		1
475001544	HARNESS HNS-1544	M.PART		1
475001545	HARNESS HNS-1545 BOARD IN	1476		1
475001546	HARNESS HNS-1546 BOARD IN	1476		1
475001572	HARNESS HNS-1572 BOARD IN	1484/85		1
475001573	HARNESS HNS-1573 BOARD IN	1484/85		1
480001324	IC SOCKET 32P DICF-32CS-E	1475		1
480010200	3P DIN JACK SOCKET YKF51-5046	1475		1
480010280	IC SOCKET PLPS-N84B-T	1475		1
515002300	FUSE HOLDER S-N5057 #01	1484/85		8
520001700	LITHIC BATTERY CR2032	1475		1
525000100	DATA LINE FILTER ESD-R-25D-B	M.PART	220WG	1
525000400	EMI FERRITE	M.PART	220WG	1
525000600	DATA LINE FILTER ESD-R-19B	M.PART		1
540012300	INLET SOCKET PA-125-BS	M.PART	240UK	1
540012400	INLET SOCKET PA-125-CU	M.PART	117US	1
		M.PART	117CN	1
		M.PART	100JP	1
		M.PART	220FR	1
		M.PART	220SC	1
		M.PART	117EX	1
		M.PART	240AU	1
		M.PART	220SE	1
		M.PART	220WG	1
		M.PART	240AF	1
		M.PART	240GE	1
		M.PART	220GE	1
545020460	SMSC 32X205BDX10(2.7)P1.25-S6	M.PART		1
560007000	X-952 HEAT SINK	1484/85		1
575014700	LED SPACER LS-15-3 L=3mm	1481/82		17
600003200	AC CORD UC-948-S01	M.PART	117EX	1
600003300	AC CORD UC-953-S01	M.PART	117US	1
		M.PART	117CN	1

PART CODE	PART NAME / SPECIFICATION	P.C.BOARD	NOTE	Q'TY
600003500	AC CORD SC-304-S01	M.PART	240AU	1
600003700	AC CORD BH-309-S01	M.PART	240UK	1
600003800	AC CORD DC-480-S01	M.PART	100JP	1
600004700	AC CORD EC-651-E05	M.PART	220WG	1
		M.PART	240AF	1
		M.PART	240GE	1
		M.PART	220GE	1
		M.PART	220FR	1
		M.PART	220SC	1
600004800	AC CORD EC-472-S01	M.PART	220SE	1
620023100	X-952 POWER SW KNOB	M.PART		1
620023600	X-943 VR KNOB	M.PART		13
630014100	X-952 LCD WINDOW	M.PART		1
630014600	X-952 LED HOLDER	1481/82		2
640084600	GROUNDING CONTACT	1484/85		2
640088500	CARD GUIDE	1483		1
640099600	X-952 FRONT CHASSIS	M.PART		1
640099700	X-952 LOWER CASE	M.PART		1
640099800	X-952 UPPER CASE	M.PART		1
641018400	X-952 JACK PLATE	1476		1
641019800	X-952 L TYPE ANGLE	1475		2
641019900	VR SHIELD	1477-80		4
641022500	RACK MOUNT ADAPTOR	M.PART		2
641022600	FRONT PANEL ASSEMBLY	M.PART		1
646038300	RECEPTACLE XLB-3-32PCV-M01	1476		2
649007400	BATTERY HOLDER	1475		1

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

ADVARSEL!

Lithiumbatteri – Eksplosionsfare ved fejlagtig handtering.
Udskiftning má kun ske med batteri af samme
fabrikat og type.
Levér det brugte batteri tilbage til leverand ø ren.

ADVERSEL

Lithiumbatteri – Eksplosjonsfare.
Ved utskifting benyttes kun batteri som
anbefalt av apparatfabrikanten.
Brukt batteri returneres apparatleverand ø ren.

VARNING

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens instruktion.

CAUTION

Danger of explosion if battery is incorrectly replaced . Replace only with the same or equivalent type recommended by the equipment manufacturer .
Discard used batteries according to manufacturer 's instructions.

KORG

KORG INC. 15-12, Shimotakaido 1-chome, Suginami-ku, Tokyo 168

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