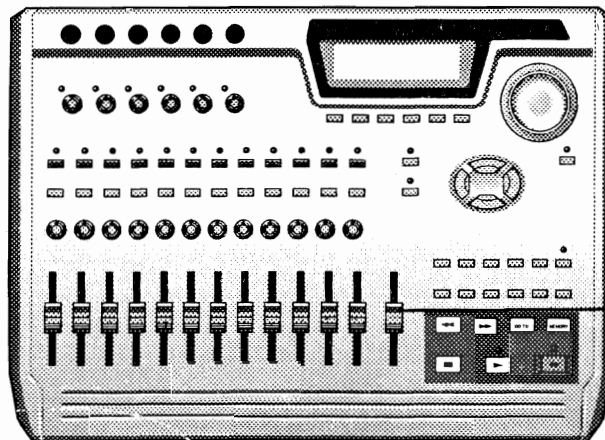


AKAI SERVICE MANUAL



DIGITAL PERSONAL STUDIO
MODEL DPS12
OPTIONAL BOARD
MODEL EB2M

★ SPECIFICATIONS

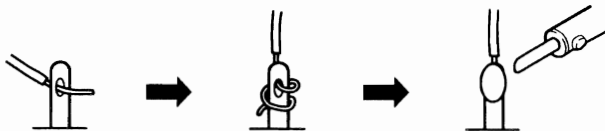
Recording media	Internal JAZ drive (1G byte), or an external JAZ or hard disk	Analog audio output	ø 6.3mm stereo phone jack (balanced/unbalanced connection)
Sampling rate	48 kHz, 44.1 kHz, 32 kHz	Output level	
Recording time (Using a 1 G byte JAZ disk, total recording time)		MASTER OUT	-10 dBu (max. = 5 dBu/47 kΩ)
FS=48 kHz	Approx. 3 hours (12 tracks x 15 minutes)	AUX SEND	-10 dBu (max. = 5 dBu/47 kΩ)
FS=44.1 kHz	Approx. 3 hours 16 minutes (12 tracks x 16.3 minutes)	Impedance	1 kΩ (MASTER OUT) 100 Ω (AUX SEND)
FS=32 kHz	Approx. 4 hours 30 minutes (12 tracks x 22.5 minutes)	Stereo phone output	ø 6.3mm stereo phone jack x 1
Number of simultaneous recording tracks	8	Maximum output	24 mW/32 Ω
Frequency response		Digital audio input	Optical (SPDIF)
FS=48 kHz	10 Hz - 22 kHz ± 2.0 dB	Digital audio output	Optical (SPDIF)
FS=44.1 kHz	10 Hz - 20 kHz ± 2.0 dB	Foot switch	ø 6.3mm phone jack x 1
FS=32 kHz	10 Hz - 15 kHz ± 2.0 dB	SCSI	Half pitch 50-pin (for external hard disk) x 1
Quantization bit	16 bit linear	Display	248 x 60 dots, backlit, graphical LCD
ADC	18 bits, 64-times oversampling, Fifth order delta/sigma modulation	Power supply	AC100 V, 50/60 Hz for Japan A C 117 V, 60 Hz for U.S.A. and Canada AC220-240 V 60 Hz for Europe
DAC	20 bits, 8-times oversampling, 1 bit delta/sigma method	Power consumption	21 W (with internal JAZ drive)
Dynamic range	85 dB or higher (terminal resistance 100 Ω)	Operating temperature	10°C - 35°C
Distortion	0.05 % or less (standard level: 1 kHz, FS = 48 kHz)	Operating humidity	10 % - 60 % (no condensation allowed)
Channel crosstalk	75 dB or higher (10 kHz standard, terminal resistance 100 Ω)	Dimensions (mm)	445 (W) x 98 (H) x 334 (D) (M a x . 443.5 measured on the projection)
Wow and flutter	Lower than measurable limit.	Weight	4.3 kg
Analog audio input	ø 6.3mm stereo phone jack (balanced/unbalanced connection)	ACCESSORIES	
Input level	-46 dBu ± 4 dBu (max. +19 dBu, at 1 kHz)	Operator's manual	1
Impedance	15 kΩ	3 pin power cable	1 (with a two polar conversion plug)
		OPTION	EB2M (Effect board)

* For improvement purposes, specifications and design are subject to change without notice.

0 dBμ = 0.775 V

PRECAUTIONS DURING SERVICING

1. Parts identified by the Δ symbol are critical for safety. Replace them only with the parts number specified.
2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation. These must also be replaced only with the specified replacements.
Examples : RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
3. Use specified internal wiring. Note especially :
 - 1) Wires covered with PVC tubing
 - 2) Double insulated wires
 - 3) High voltage leads
4. Use specified insulating materials for hazardous live parts. Note especially :
 - 1) Insulation Tape
 - 2) PVC tubing
 - 3) Spacers (insulating barriers)
 - 4) Insulation sheets for transistors
 - 5) Plastic screws for fixing micro switches
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap the ends of the wires securely around the terminals before soldering.



6. Make sure that wires do not contact heat producing parts (heat sinks, oxide metal film resistors, fusible resistors, etc.).
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. Also check areas surrounding repaired locations.
9. Make sure that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

SYMBOLS FOR PRIMARY DESTINATION

Unit destinations are indicated with letters as shown below.

Symbols	Principal Destinations
A	U.S.A
B	U.K
C	Canada
E	Europe (except U.K)
J	Japan
S	Australia
V	Germany
U	Universal Area
Y*	Custom version

SAFETY CHECK AFTER SERVICING

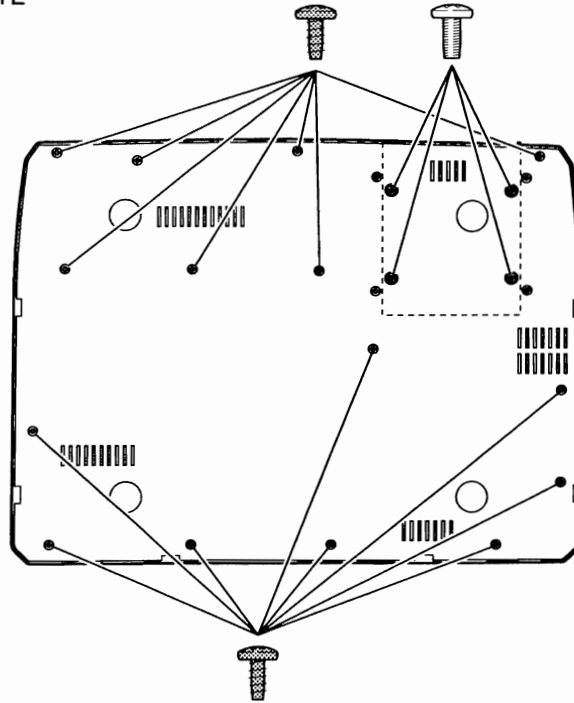
After servicing, make measurements of leakage-current or resistance in order to determine that exposed parts are acceptably insulated from the supply circuit. The leakage-current measurement should be done between accessible metal parts (such as chassis, ground terminal, microphone jacks, signal input/output connectors, etc.) and the earth ground through a resistor of 1500 ohms paralleled with a 0.15 μ F capacitor, under the unit's normal working conditions.

The leakage-current should be less than 0.5 mA rms AC. The resistance measurement should be done between accessible exposed metal parts and power cord plug prongs with the power switch (if included) "ON". The resistance should be more than 2.2 M ohms.

I. DISASSEMBLY

In case of trouble, etc., necessitating dismantling, please dismantle in the order shown in the illustrations. Reassemble in the reverse order.

1. Removal of the BOTTOM PLATE



II. PRINCIPAL PARTS LOCATION

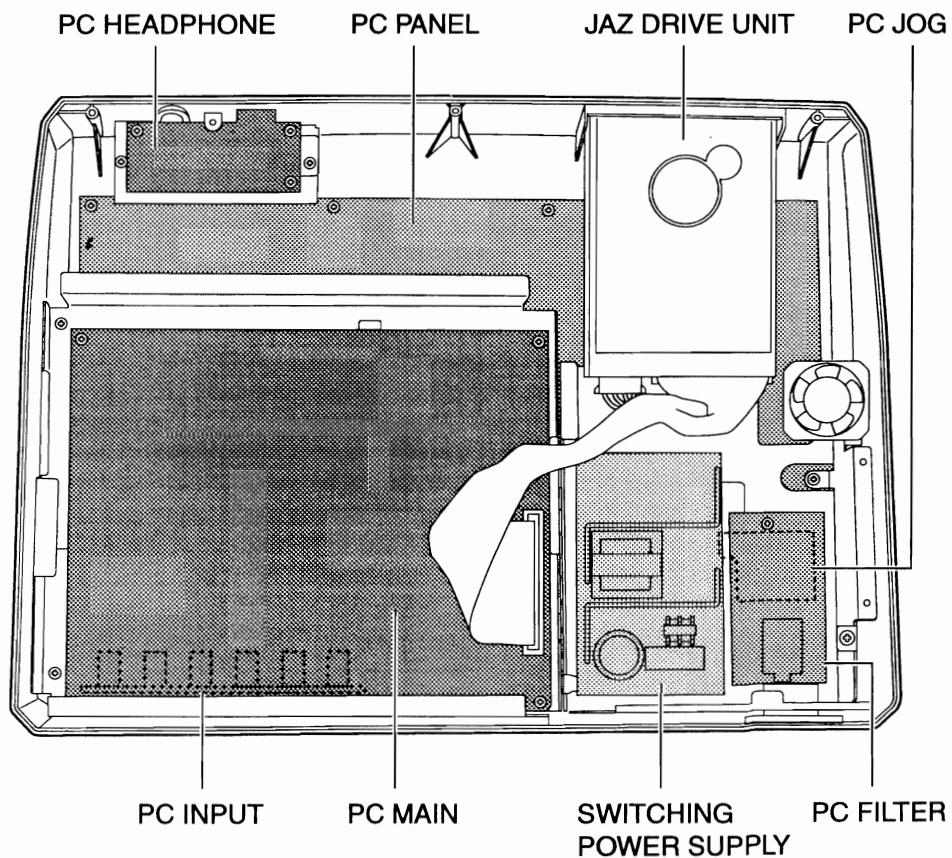


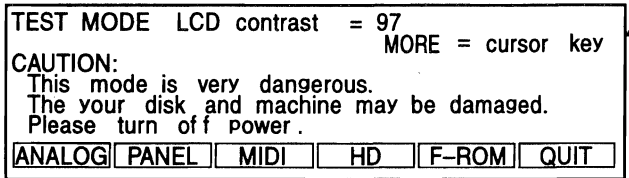
Fig. 2-1 Top view

III. TEST MODE

3-1. Engaging the "TEST MODE"

Turn the unit's power on while pressing and holding the "REC" key.

Keep holding the "REC" key until the following screen appears on the FL display.



3-2. Main screen

The following functions can be selected

- F1: ANALOG Go to the analog test mode.
- F2: PANEL Go to the panel test mode.
- F3: MIDI Go to the MIDI test mode.
- F4: HD Go to the SCSI test mode.
- F5: F-ROM Go to the flash ROM utility OS mode. Use this mode for writing the IPL from EP-ROM to flash ROM, etc.
- F6: QUIT Disengage the test mode.

3-3. Analog test mode.

This test mode is used for analog circuit test.

Normally, use the "0 dB TONE" mode and "ALL INPUT MIX" mode.

If any problem is found in this test mode, use a different test mode in order to find the defective part.

The input level meter and output level meter will be displayed on the left side of the screen.

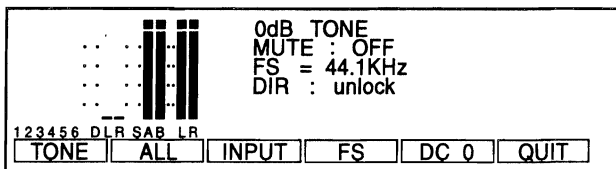
3-3-1. Button Functions

- F1: Enter the "0 dB TONE" mode.
- F2: Enter the "ALL INPUT MIX" mode.
- F3: Enter the "INPUT" mode.
- F4: Switch the sampling frequency (This function is not available).
- F5: Enter the DC output mode.
- F6: Return to the Main screen.

3-3-2. 0 dB TONE mode

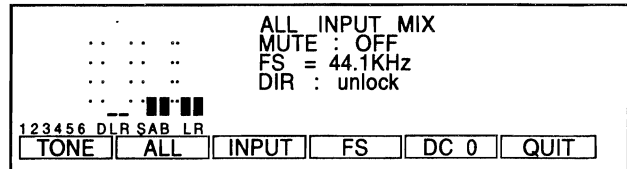
A 0 dB, 1 kHz sine-wave signal will be output from the MASTER OUT L/R and SEND A/B.

Use this mode for the output test.



3-3-3. ALL INPUT MIX mode

All inputs (L/R of analog input 1 - 6 and digital input) are mixed together with the same percentage and are output from the MASTER OUT L/R.

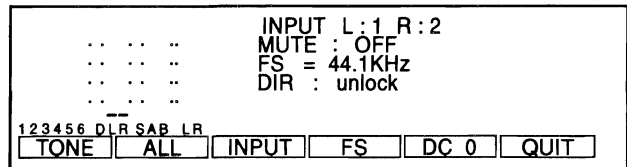


3-3-4. INPUT mode

The specified input channel that you have selected will be output.

The channel can be selected by pressing the "F3" key repeatedly. The 1 to 6 display corresponds to the analog input 1 to 6. The 7 display corresponds to digital input L and 8 is digital input R.

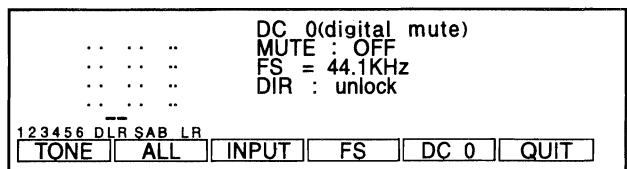
This mode can be used to find a defective channel.



NOTE : If you select "L: 8, R: 9", unexpected sound will be heard from the R-channel.

3-3-5. DC output mode

Digital 0 data will be sent to the D/A in this mode for measurement of the noise level.



3-3-6. Output in various modes

	MASTER OUT		AUX	
	L	R	A	B
0 dB TONE MODE	TONE	TONE	TONE	TONE
ALL INPUT MIX MODE	MIX	MIX	MIX	MIX
INPUT MODE	selected input	selected input	input-1	input-2
DC OUTPUT MODE	MUTE	MUTE	MUTE	MUTE

The data sound of the MASTER OUT L/R is exactly the same as AUX A/B except INPUT mode.

3-4. PANEL test mode

This test mode confirms various controls on the upper panel such as the keys, LEDs, JOG, SHUTTLE, PAN rotary volumes and sliders. Pressing both the F5 and F6 keys returns to the MAIN screen.

3-4-1. LED test

Input level over LEDs turn off from the left by pressing the F1 to F6 keys accordingly.

Releasing the keys will turn on the LEDs.

Other LEDs will turn off respectively if the keys under the corresponding LEDs is pressed.

3-4-2. Key test

If none of keys is pressed, "NO KEY" will appear on the upper right of the display.

If a certain key is pressed, the key code and the abbreviated key name (KEY=.....) will appear on the upper right of the display.

```
sub cpu version =0002 NO KEY
JOG = 0
SHUTTLE = cent.
Foot Switch = OFF (normal CLOSE)
80 7d 80 7e 7c 7c 81 80 80 7e 7f 81
00 00 00 00 00 00 00 00 00 00 00 00
QUIT
```

If "NO KEY" or "DOUBLE KEYS" appears, even when a certain key is pressed, it indicates that an error has been found.

If more than two keys are pressed at the same time, the key code is displayed within the recognizable range.

But in this case, the incorrect key code (that is not corresponding to the keys pressed) may appear on the display.

3-4-3. Volume test

The lower two lines on the FL display indicate the present volume level in hexadecimal values. The order of the respective two figures correspond to the position of the control volumes.

```
sub cpu version =0002 NO KEY
JOG = 0
SHUTTLE = cent.
Foot Switch = OFF (normal CLOSE)
80 7d 80 7e 7c 7c 81 80 80 7e 7f 81
00 00 00 00 00 00 00 00 00 00 00 ff ff
QUIT
```

(Example: The MASTER & No.12 volumes are at maximum position.)

3-4-4. JOG test

The value that is indicated at the "JOG=" display changes by turning the JOG wheel. The value increases if the JOG wheel is turned in the clockwise direction. Turning the JOG wheel in the counter-clockwise direction decreases the value.

3-4-5. SHUTTLE test

The SHUTTLE knob position is indicated at the "SHUTTLE=" display.

The "cent." is displayed if the SHUTTLE knob is positioned at the center.

Turning the knob to the left indicates "L0", "L1" "L7" in that order.

Turning the knob to the right indicates "R0", "R1" "R7" in that order.

3-4-6. FOOT switch

The FOOT switch condition is displayed at the "Foot Sw=" display.

"ON" is displayed if the FOOT switch engaged.

"OFF" is displayed if the FOOT switch is disengaged.

The type of the switch (normal open or normal close) is also displayed at the "Foot SW=ON (or OFF)" display. If the FOOT switch is not connected, the test mode recognizes that the switch is the normal close type.

NOTE : This test mode detects the switch type at the moment when the unit is turned on.

If the FOOT switch is pressed down while turning the power on, the test mode detects that the switch is opposite the type.

3-5. SCSI test mode

```
HD utility
F1: TEST SCSI
F2: HD speed
F3: read check
F4: format
F5: defect list
TEST SPEED READ FORMAT QUIT
```

3-5-1. TEST SCSI

Pressing the F1 key will enter the "TEST SCSI" mode and SCSI communication test is performed.

Insert a JAZ disk into the JAZ drive before entering this test mode. If "READY" is displayed following the "TEST UNIT" display, this means the SCSI drive and disk are working properly.

It takes a maximum of 10 seconds for the display to appear "READY" after the disk is inserted.

```
SCSI test ID:4
TEST UNIT: READY
CAPACITY =2091049blocks
jaz 1GB
iomega
H.71
ID UP DOWN QUIT
```

3-5-2. Speed check

Pressing the F2 key will enter the "HD speed" mode and performs the hard disk speed check.

```
HD Access Time      read      fullseek
12ch min =0.0ms
12ch max =0.0ms
 1ch min =0.0ms
 1ch max =0.0ms
average =0.0ms
[RD/WR] [SEEK]      [EXEC]      [QUIT]
```

The following screen will appear when the F4 (EXEC) key is pressed.

```
Found ID :4. OK=F1 key. NG=F2 keys.
jaz 1GB
iomega
H.71
[OK] [NG]
```

Press the F1 (OK) key.

```
HD Access Time      read      fullseek
12ch min =28.0ms
12ch max =34.6ms
 1ch min =25.1ms
 1ch max =44.3ms
average =31.4ms
Stop ...Push F6 Key
```

Example of the write speed check result.

```
HD Access Time      write     sequentialseek
12ch min =43.8ms
12ch max =45.0ms
 1ch min =42.5ms
 1ch max =55.9ms
average =44.0ms
Stop ...Push F6 Key
```

3-5-3. Read check

Pressing the F3 key will enter the "read check" mode and performs the hard disk read check.

```
Found ID:4. OK=F1 key. NG=F2 keys.
jaz 1GB
iomega
H.71
[OK] [NG]
```

Press the F1 (OK) key.

```
blk = 1556480
remain = 534569
capacity = 2091049
[QUIT]
```

The block value starts incrementing (this test will take approx. 5 minutes).

3-5-4. Format

Pressing the F4 key will format the JAZ disk or hard disk. (It is necessary to initialize the disk before use.)

3-5-5. Quit

Pressing the F6 key terminates the SCSI test mode and returns to the main screen.

3-6. Flash ROM utility mode

```
FLASH ROM
F1: program load from serial
F2: write only program from DRAM
F3: write boot and program from EP-ROM
F4: write boot and program from SCSI
[LOAD] [PRG] [BOOT] [SCSI] [QUIT]
```

3-6-1. Boot

This mode writes IPL as well as OS from EP-ROM to Flash ROM. Press the F3 key and follow the instruction on the screen when proceeding.

If an EP-ROM IC is not inserted on the PC MAIN, the following screen will appear.

```
Not EP-ROM.
press any key
```

3-6-2. Quit

Pressing the F6 key terminates the Flash ROM utility mode and returns to the main screen.

IV. ERROR CODE

4-1. DISPLAY

Error messages are displayed as follows. There is an error code, description and the SCSI error. The SCSI error does not appear when a SCSI communication error is not found.

00: Error code
 *no error-97/12/12-1 Simple description of the error

SCSI ERROR=2(ID:4) - 01 0203 SCSI error

4-2. Error codes and their description

The No.0 does not appear. Numbers 1 to 49 and beyond 900 will be displayed as "WARNING". Numbers 50 to 799 will be displayed as "OOPS".

If an error is found on the SCSI write or read command, the SCSI device has to be re-formatted (not erased) or you should stop using it. But if an SCSI error is not displayed at the same time, this means that the unit is not defective and the error is caused by some other reason.

Error code	Display	Description
0	*no error-97/12/12-1	This will not be displayed. This manages the version of the error description.
1	Write Audio File Table failed.	The audio file table could not write. The audio data may be lost. The SCSI write command has ended abnormally. If spare file table is normal, the audio is all right but it is better to re-format the SCSI device.
2	Write spare Audio File Table failed.	The spare audio file table could not written. The SCSI write command was ended a bnormally. If the master file table is normal, the audio is all right but it is better to re-format the SCSI device.
3	Write Setup Table failed.	The setup data table, EQ setup and virtual track setup could not be written. The setup data might be lost. The SCSI write command has ended abnormally.
4	Write Audio Data failed.	An error has occurred while writing the recording audio data. The recording audio data might be lost. The SCSI write command has ended abnormally.
5	Write Memory Table failed.	The memory table and memory name could not be written. The memory table and memory name may be lost. The SCSI write command has ended abnormally.
6	Read Setup Table failed.	The setup data table, EQ setup and virtual track setup could not be read. The setup data might be lost. The SCSI read command has ended abnormally.
7	Read Memory Table failed.	The memory table and memory name could not be read. The memory data may be lost. The SCSI read command has ended abnormally.
8	Disk access too busy. (Try ALIGN) or disk may be too slow. (Recording may be faulty.)	The SCSI device could not operate in time during recording or playback. The audio data could not be recorded or be played back properly.
9	Hard disk error	SCSI device error (include various SCSI error).
10	Read Tempo Map Table failed.	The tempo map could not read. The SCSI read command has ended abnormally.
11	Write Tempo Map Table failed.	The tempo map could not be written. The SCSI write command has ended abnormally.
12	Read Audio File Table failed.	The audio file table could not be read. As the second one is all right, the audio data is not lost. The SCSI read command has ended abnormally.
13	Read spare Audio File Table failed.	Both of the audio file tables could not be read. The audio data is lost. The SCSI read command has ended abnormally.
20	Read Capacity & Block Size failed. Try FORMAT in Format Operation.	The capacity and block size of the SCSI device could not be read. The SCSI read capacity command has ended abnormally.
21	Unsupported Block Size.	The SCSI device block size that is not supported for backup. It must be 512, 1024 or 2048 bytes/block for backup.
22	Read System Block failed.	The system could not recognize that the SCSI device is formatted for backup. This media is not backed up with the DPS12. This means that the SCSI read command has ended abnormally or the ID code written in the system block did not match.
23	Write System Block 1 failed.	An error has occurred when writing the system block 1 onto the backup SCSI device. The SCSI write command has ended abnormally.

Error code	Display	Description
24	Write System Block 2 failed.	An error has occurred when writing the system block 2 onto the backup SCSI device. The SCSI write command has ended abnormally.
25	Read Cluster failed.	An error has occurred when reading out the data from the backup SCSI device. The SCSI read command has ended abnormally.
26	Write Cluster failed.	An error has occurred when writing the data to the backup SCSI device. The SCSI write command has ended abnormally.
28	Unknown media.	This media is not backed up with the DPS12. The file ID (file data's header code) does not match to the DPS12.
30	Read User Data failed.	The user data could not be read. The user data may be lost. The SCSI read command has ended abnormally.
31	Write User Data failed.	The user data could not be written. The SCSI write command has ended abnormally.
36	Write Effect Data failed.	The effect data could not be written. The effect data may be lost. The SCSI write command has ended abnormally.
37	Read Effect Data failed.	The effect data could not be read. The effect data may be lost. The SCSI read command has ended abnormally.
38	Write Scene Data failed.	The scene memory data could not be written. The scene memory data may be lost. The SCSI write command has ended abnormally.
39	Read Scene Data failed.	The scene memory data could not be read. The effect data may be lost. The SCSI read command has ended abnormally.
40	Format failed.	The disk could not be formatted. The disk can not be used. The SCSI format command has ended abnormally.
41	Set 512 byte/sector failed.	The disk could not be formatted as 512 bytes/block. The disk can not be used. Could not change the read capacity command's return block size in the mode sense command.
42	Too many defective sectors.	Too many defective blocks were found during read check after the format. The bad block exceeds 16384.
43	Reassign Blocks failed.	An alternative operation has failed. The SCSI's reassign blocks command has ended abnormally.
44	Not in DPS12 format.	The disk is not formatted for DPS12. The ID in the system sector or project sector does not match to the DPS12 or partition data is not found.
46	Can't COPY to same ID! Change disk ID.	The same ID is assigned when making a disk copy.
47	COPY TO disk is too small.	The capacity of the disk in which the data is to be copied is too small.
49	Parameter write error. Data maybe lost.	An error has occurred when writing the parameter into the flash ROM. The parameter data may be lost.
50	Repeat region set too short. Set region longer.	Tried repeated playback within a too short region. The regional time is less than 1024 FS.
51	Sectional Play region set too short. Set region longer.	Tried sectional playback within a too short region. The regional time is less than 1024 FS.
52	Recording time too short. No recording made. Try recording longer.	Tried to record in a too short region, recording could not be made. The recording region is less than 1024 FS.
53	Edit region set too short. Set region longer.	Tried to edit in a too short region. The regional time is less than 1024 FS.
54	PLL unlocked. Check connection/setup and try it again.	PLL is unlocked during recording or playback.
55	Not enough space to Edit . Disk/File Table full. Erase some unnecessary data.	Not enough space to edit. Not enough capacity to edit. The file table may not be sufficient.
56	Edit result would exceed 24 hour limit.	As a result of the edit, the last of the cut or copied data exceeded absolute 24 hour limit.
57	Audio File Table full. Try Disk Alignment.	Internal audio file table is not enough for edit. Internal audio file table is enough but could not divided into segments.
58	No Audio Data found to backup.	Tried to backup although there is no audio data.

Error code	Display	Description
59	Not enough space to load. Erase some unnecessary data.	Not enough space to load. Erase some unnecessary data.
60	Audio File Table full. Not all data loaded.	Audio File Table full. Not all the data loaded.
61	Time overlaps found in loading data. Not all data loaded.	Some data could not be loaded due to time overlaps.
63	PLL unlocked while loading. Audio Data may be corrupted. Try it again.	PLL is unlocked while data loading. The audio data may be corrupted.
65	Requested function would exceed 24 hour limit. Set new time.	It could not record or play back because the data exceeds the 24 hour limit.
66	Auto-punch not ready. Disk full, IN/OUT region set too short or too close to IN time.	It is not possible to use auto-punch when the region is less than 1024 FS, when the spare capacity is not enough or when the IN time is less than 1024FS from the absolute 24 hour.
68	Files in wrong order. Use correct file.	The order of the divided files are wrong when re-loading from the SCSI device.
69	Solo mode still active. Disable Solo mode.	Could not operate (recording, punch-in or auto-punch) because it is in the solo mode.
73	Disk full.	It is not possible to make a partition because there is not enough space on the disk.
74	Project PROTECTED! Function was canceled.	The function was canceled because the PROJECT was protected.
75	No Project in disk.	There is no project in the disk.
76	Still in DEMO mode.	As the demo mode was still ON, the function was not active.
77	This ID is already used. Use other ID.	Self ID that was supposed to be used was already used on the other device.
78	Partition is full.	Tried to make another partition when the partition is already full.
79	Scene memory is full.	Tried to make another scene memory when the scene memory is already full.
80	This ID is for DPS12. Select other ID.	Self ID of the DPS12 is selected in the SCSI ID column during MO backup or reloading.
81	No drive found. Select other ID	The ID selected has no device during MO backup or reloading.
82	*no edit channel	The channel was not selected during the edit execution.
83	Running at 48 kHz. Rec/play may not work right. Press STOP to abort.	PLL is not locked even though the external clock is selected during recording or playback.
84	Bad sector found on disk! Please Format disk.	There is a bad sector on the disk. (It is not possible to back up.)
85	Bad sector found on disk! Backup data and Format disk.	There is a bad sector on the disk. (It is possible to back up.)
86	ALIGN canceled by disk error. Backup data and Format disk.	An error has occurred during aligning.
87	Too many Projects!	It is not possible to make another project because too many projects already exist.
88	This ID is current. Select other ID.	NOW SELECT disk is selected during MO backup or reloading.

HARDWARE Error

These errors indicate hardware problems. No comment is displayed for hardware errors.

Error code	Description
900	The DSP program is not operating properly. It is not possible to send a command to the DSP. The HC of the CVR is still 1.
901	DSP program transferring has stopped. Load error of the DSP. The HF2 did not turn to 1 during booting the program.
903	The DSP program is not operating properly. The data was not returned when requesting the data transmission to the DSP.
904	The DSP program is not operating properly. The DSP's program boot has finished properly but could not receive the program execution start signal.
906	Overrun has occurred when transferring the header data to/from the MPU during the data backup.

4-3. About the SCSI error

SCSI ERROR = 2 (ID : 4) - 01 0203
 ↑ ↑ ↑ ↑ ↑
 a b c d e

- a : SCSI error code
- b : The SCSI ID where the error is occurred
- c : Sense key (might not be displayed)
- d : Additional sense code (might not be displayed)
- e : Additional sense code qualifier (might not be displayed)

a. SCSI error codes

Error code	Description
-1	System error (SCSI controller's operation phase did not match the software).
-2	Phase error (the SCSI device requested abnormal phase movement).
-3	Timeout (the SCSI device did not respond on the SCSI selection phase).
-4	SCSI reset (SCSI reset signal was asserted).
-5	SCSI driver busy (Sequence start request has occurred during SCSI driver sequence - caused by a software bug).
-15	Illegal interrupt (the SCSI controller made an unexpected interruption).
2	Check condition status (check condition status was sent from the target device. The sense key, additional sense code and additional sense code qualifier are generated at that time).

b. SCSI ID that an error has occurred

If an error has occurred during sequence, the target SCSI ID at that time will be displayed.

If an error has not occurred during sequence, the SCSI ID that was accessed previously will be displayed.

c. Sense key, additional sense code and additional sense code qualifier

These are the codes in the data, that were sent from the target device by the request sense command of the SCSI command. These codes are indicated in hexadecimal two digit numbers.

In most cases when one of these codes is displayed, the target device has a problem.

In most cases when none of these codes is displayed, the DPS12 itself, SCSI cable or the terminator has problem.

These are displayed by the request sense command when a SCSI error code 2 has occurred.

If one of these codes is displayed (except SCSI error code 2), there was a SCSI error code 2 that has previously occurred, was saved and not displayed, before the present error.

1) Sense key

Sense key	Description
00	NO SENSE: Indicates that there is no specific sense key information to be reported for the designated logical unit. This would be the case for a successful command or a command that received CHECK CONDITION or COMMAND TERMINATED status because one of the filemark, EOM, or ILI bits is set to one.
01	RECOVERED ERROR: Indicates that the last command completed successfully with some recovery action performed by the target. Details may be determinable by examining the additional sense bytes and the information field. When multiple recovered errors occur during one command, the choice of which error to report (first, last, most severe, etc.) is device specific.
02	NOT READY: Indicates that the logical unit addressed cannot be accessed. Operator Intervention may be required to correct this condition.
03	MEDIUM ERROR: Indicates that the command terminated with a non-recovered error condition that was probably caused by a flaw in the medium or an error in the recorded data. This sense key may also be returned if the target is unable to distinguish between a flaw in the medium and a specific hardware failure (sense key 04).
04	HARDWARE ERROR: Indicates that the target detected a non-recoverable hardware failure (for example, controller failure, device failure, parity error, etc.) while performing the command or during a self test.
05	ILLEGAL REQUEST: Indicates that there was an illegal parameter in the command descriptor block or in the additional parameters supplied as data for some commands (FORMAT UNIT, SEARCH DATA, etc.). If the target detects an invalid parameter in the command descriptor block then it shall terminate the command without altering the medium. If the target detects an invalid parameter in the additional parameters supplied as data, then the target may have already altered the medium. This sense key may also indicate that an invalid IDENTIFY message was received.
06	UNIT ATTENTION: Indicates that the removable medium may have been changed or the target has been reset.
07	DATA PROTECT: Indicates that a command that reads or writes the medium was attempted on a block that is protected from this operation. The read or write operation is not performed.
08	BLANK CHECK: Indicates that a write-once device or a sequential access device encountered blank medium or format-defined end-of-data indication while reading or a write-once device encountered a non-blank medium while writing.
09	Vendor Specific: This sense key is available for reporting vendor specific conditions.
0A	COPY ABORTED: Indicates a COPY COMPARE, or COPY AND VERIFY command was aborted due to an error condition on the source device, the destination device, or both.
0B	ABORTED COMMAND: Indicates that the target aborted the command. The Initiator may be able to recover by trying the command again.
0C	EQUAL: Indicates a SEARCH DATA command has satisfied an equal comparison.
0D	VOLUME OVERFLOW: Indicates that a buffered peripheral device has reached the end-of-partition and data may remain in the buffer that has not been written to the medium. A RECOVER BUFFERED DATA command(s) may be issued to read the unwritten data from the buffer.
0E	MISCOMPARE: Indicates that the source data did not match the data read from the medium.
0F	RESERVED.

2) Additional sense code (ASC) and additional sense code qualifier (ASCQ)

ASC	ASCQ	Description
13	00	ADDRESS MARK NOT FOUND FOR DATA FIELD
12	00	ADDRESS MARK NOT FOUND FOR ID FIELD
30	02	CANNOT READ MEDIUM - INCOMPATIBLE FORMAT
30	01	CANNOT READ MEDIUM - UNKNOWN FORMAT
3F	02	CHANGED OPERATING DEFINITION
30	03	CLEANING CARTRIDGE INSTALLED
4A	00	COMMAND PHASE ERROR
2C	00	COMMAND SEQUENCE ERROR
2F	00	COMMANDS CLEARED BY ANOTHER INITIATOR
2B	00	COPY CANNOT EXECUTE SINCE HOST CANNOT DISCONNECT
41	00	DATA PATH FAILURE (SHOULD USE 40 NN)
4B	00	DATA PHASE ERROR
16	00	DATA SYNCHRONIZATION MARK ERROR
19	00	DEFECT LIST ERROR
19	03	DEFECT LIST ERROR IN GROWN LIST

ASC	ASCQ	Description
19	02	DEFECT LIST ERROR IN PRIMARY LIST
19	01	DEFECT LIST NOT AVAILABLE
1C	00	DEFECT LIST NOT FOUND
32	01	DEFECT LIST UPDATE FAILURE
40	NN	DIAGNOSTIC FAILURE ON COMPONENT NN (80H-FFH)
0A	00	ERROR LOG OVERFLOW
11	02	ERROR TOO LONG TO CORRECT
31	01	FORMAT COMMAND FAILED
1C	02	GROWN DEFECT LIST NOT FOUND
00	06	I/O PROCESS TERMINATED
10	00	ID CRC OR ECC ERROR
22	00	ILLEGAL FUNCTION (SHOULD USE 20 00, 24 00, OR 26 00)
30	00	INCOMPATIBLE MEDIUM INSTALLED
48	00	INITIATOR DETECTED ERROR MESSAGE RECEIVED
3F	03	INQUIRY DATA HAS CHANGED
44	00	INTERNAL TARGET FAILURE
3D	00	INVALID BITS IN IDENTIFY MESSAGE
20	00	INVALID COMMAND OPERATION CODE
24	00	INVALID FIELD IN CDB
26	00	INVALID FIELD IN PARAMETER LIST
49	00	INVALID MESSAGE ERROR
5B	02	LOG COUNTER AT MAXIMUM
5B	00	LOG EXCEPTION
5B	03	LOG LIST CODES EXHAUSTED
2A	02	LOG PARAMETERS CHANGED
21	00	LOGICAL BLOCK ADDRESS OUT OF RANGE
08	00	LOGICAL UNIT COMMUNICATION FAILURE
08	02	LOGICAL UNIT COMMUNICATION PARITY ERROR
08	01	LOGICAL UNIT COMMUNICATION TIME-OUT
05	00	LOGICAL UNIT DOES NOT RESPOND TO SELECTION
4C	00	LOGICAL UNIT FAILED SELF-CONFIGURATION
3E	00	LOGICAL UNIT HAS NOT SELF-CONFIGURED YET
04	01	LOGICAL UNIT IS IN PROCESS OF BECOMING READY
04	00	LOGICAL UNIT NOT READY, CAUSE NOT REPORTABLE
04	04	LOGICAL UNIT NOT READY, FORMAT IN PROGRESS
04	02	LOGICAL UNIT NOT READY, INITIALIZING COMMAND REQUIRED
04	03	LOGICAL UNIT NOT READY, MANUAL INTERVENTION REQUIRED
25	00	LOGICAL UNIT NOT SUPPORTED
15	01	MECHANICAL POSITIONING ERROR
53	00	MEDIA LOAD OR EJECT FAILED
31	00	MEDIUM FORMAT CORRUPTED
3A	00	MEDIUM NOT PRESENT
53	02	MEDIUM REMOVAL PREVENTED
43	00	MESSAGE ERROR
3F	01	MICROCODE HAS BEEN CHANGED
1D	00	MISCOMPARE DURING VERIFY OPERATION
11	0A	MISCORRECTED ERROR
2A	01	MODE PARAMETERS CHANGED
07	00	MULTIPLE PERIPHERAL DEVICES SELECTED
11	03	MULTIPLE READ ERRORS
00	00	NO ADDITIONAL SENSE INFORMATION
32	00	NO DEFECT SPARE LOCATION AVAILABLE
01	00	NO INDEX/SECTOR SIGNAL
06	00	NO REFERENCE POSITION FOUND
02	00	NO SEEK COMPLETE
28	00	NOT READY TO READY TRANSITION (MEDIUM MAY HAVE CHANGED)

ASC	ASCQ	Description
5A	01	OPERATOR MEDIUM REMOVAL REQUEST
5A	00	OPERATOR REQUEST OR STATE CHANGE INPUT (UNSPECIFIED)
5A	03	OPERATOR SELECTED WRITE PERMIT
5A	02	OPERATOR SELECTED WRITE PROTECT
4E	00	OVERLAPPED COMMANDS ATTEMPTED
1A	00	PARAMETER LIST LENGTH ERROR
26	01	PARAMETER NOT SUPPORTED
26	02	PARAMETER VALUE INVALID
2A	00	PARAMETERS CHANGED
03	00	PERIPHERAL DEVICE WRITE FAULT
15	02	POSITIONING ERROR DETECTED BY READ OF MEDIUM
29	00	POWER ON, RESET, OR BUS DEVICE RESET OCCURRED
42	00	POWER-ON OR SELF-TEST FAILURE (SHOULD USE 40 NN)
1C	01	PRIMARY DEFECT LIST NOT FOUND
40	00	RAM FAILURE (SHOULD USE 40 NN)
15	00	RANDOM POSITIONING ERROR
11	01	READ RETRIES EXHAUSTED
14	01	RECORD NOT FOUND
14	00	RECORDED ENTITY NOT FOUND
18	02	RECOVERED DATA - DATA AUTO-REALLOCATED
18	05	RECOVERED DATA - RECOMMEND REASSIGNMENT
17	05	RECOVERED DATA USING PREVIOUS SECTOR ID
18	01	RECOVERED DATA WITH ERROR CORRECTION AND RETRIES APPLIED
18	00	RECOVERED DATA WITH ERROR CORRECTION APPLIED
17	03	RECOVERED DATA WITH NEGATIVE HEAD OFFSET
17	00	RECOVERED DATA WITH NO ERROR CORRECTION APPLIED
17	02	RECOVERED DATA WITH POSITIVE HEAD OFFSET
17	01	RECOVERED DATA WITH RETRIES
17	06	RECOVERED DATA WITHOUT ECC - DATA AUTO-REALLOCATED
17	07	RECOVERED DATA WITHOUT ECC - RECOMMEND REASSIGNMENT
1E	00	RECOVERED ID WITH ECC CORRECTION
37	00	ROUNDED PARAMETER
5C	00	RPL STATUS CHANGE
39	00	SAVING PARAMETERS NOT SUPPORTED
47	00	SCSI PARITY ERROR
45	00	SELECT OR RESELECT FAILURE
5C	02	SPINDLES NOT SYNCHRONIZED
5C	01	SPINDLES SYNCHRONIZED
1B	00	SYNCHRONOUS DATA TRANSFER ERROR
3F	00	TARGET OPERATING CONDITIONS HAVE CHANGED
5B	01	THRESHOLD CONDITION MET
26	03	THRESHOLD PARAMETERS NOT SUPPORTED
09	00	TRACK FOLLOWING ERROR
11	00	UNRECOVERED READ ERROR
11	04	UNRECOVERED READ ERROR - AUTO REALLOCATE FAILED
11	0B	UNRECOVERED READ ERROR - RECOMMEND REASSIGNMENT
11	0C	UNRECOVERED READ ERROR - RECOMMEND REWRITE THE DATA
46	00	UNSUCCESSFUL SOFT RESET
0C	02	WRITE ERROR - AUTO REALLOCATION FAILED
0C	01	WRITE ERROR RECOVERED WITH AUTO REALLOCATION
27	00	WRITE PROTECTED

V. OS UPDATE

DPS12 OS Update Procedure

There are two ways to update the OS in Flash-ROM in the DPS12. One way is to use ROM and the other is to use SCSI media.

EPROM Update

Here's how to update the Flash-ROM OS with programmed OS EPROM.

1. Open up the bottom cover. Remove all screws visible on the bottom cover.
2. Insert the PROGRAMMED ROM IC to IC socket (located between IC12 and IC22) and change the position of short pin on P3 to "ROM (EP)" side.
3. Turn the unit on while holding down the [REC] key. Keep holding it until the screen shows test mode.

4. Press [F5 (F-ROM)] key.
5. Press [F3 (BOOT)] key to select "write boot and program from EP-ROM" option.
6. Change the position of P3 short pin to "FLASH ROM (FL)" side and then press [REC] key. This will write the OS program into Flash-ROM.

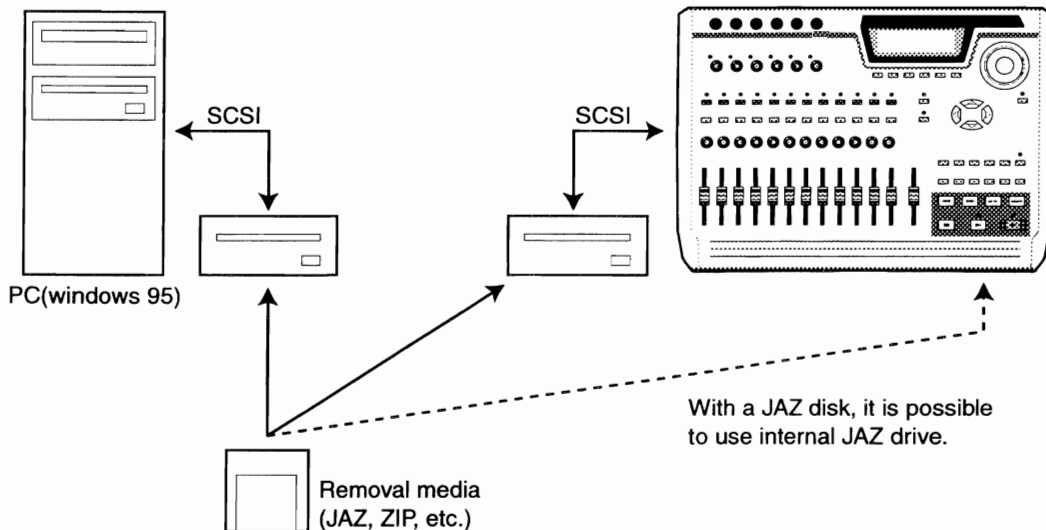
Warning : Please use extreme caution as this is done while the unit is still on.

7. Press [REC] key to restart the system. This will show the default screen of normal operation.
8. Turn the unit off, remove the Programmed ROM IC and then replace the bottom cover.

SCSI Media Update

Here's how to update the contents of the Flash-ROM with OS programmed SCSI media*, e.g. Jaz disk, Zip disk, MO disk, etc.

*Refer to How to use "OSMaker2".



NOTE : The OS version of DPS12 must be V0.61 or higher. If it's lower than V0.60, it must first be updated by the method described above (EPROM).

1. Connect the SCSI drive to the SCSI port of DPS12 and turn the SCSI drive on.

NOTE: Do not turn the DPS12 on yet at this time.

2. Insert the OS programmed disk into the SCSI drive.
3. Turn the DPS12 on while holding the [REC] and [PLAY] keys down.
4. Press [F6 (NG)] repeatedly until the ID number of SCSI drive used is displayed.

5. Press [F1 (OK)] to start loading the OS program from the disk into DPS12's internal memory.
6. Press [REC] key when the prompting message "SUCCESS Continue to press [REC]" is displayed. The OS program is loaded into Flash-ROM.
7. Press [REC] key when the prompting message "Press [REC] key to Restart" appears. This will switch the DPS12 into normal operation mode.
8. Turn the system off and disconnect the SCSI drive.

NOTE: If the OS program is on a Jaz disk and the DPS12 has a Jaz drive installed internally, skip steps 1 and 8.

How to use "OSMaker2" (VI .O1)

This software, when installed on a PC (or IBM clone) machine, will allow the PC to format and write the OS program software for DPS12 onto a removable SCSI media.

Here's how to use "OSMaker2" on the PC to make the OS programmed disk for the DPS12.

NOTE 1: This "OSMaker2" is different from "OSMaker" that is designed for the sampler OS.

NOTE 2: The OS Program media is limited to removable media, e.g. Jaz disk, Zip disk, etc.

1. Download or copy "OSM2101.ZIP" file into the PC and make a temporary folder.
2. Unzip "OSM2101.ZIP" file into that temporary folder and boot up the "setup.exe" by double clicking on its icon.

NOTE: When reinstalling "OSMaker2" or updating its version, delete the previous OSMaker2 application first (click on Add/Delete Application icon in Control Panel), before booting up the "setup.exe".

3. Continue the setup procedure following the prompts.
4. The directory "C:\PROGRAM FILES\OSMAKER2" will be made.
5. Download or copy the "dpsxxx.cod" file into the above directory (folder) where "xxx" is its version number.
6. Boot up "OSMaker2.exe" file.
7. Select the "dpsxxx.cod" file you want to install into the DPS12 and EXECUTE. The file will be copied onto the removable media and it'll be ready to update the DPS12.

NOTE: The "dpsxxx.cod" file must be in the same folder as "OSMaker2.exe" file to be recognized properly.

For the subsequent version-ups, copy the new "dpsxxx.cod" file into the "OSMAKER2" folder first. Then boot up "OSMaker2.exe" file and select an appropriate "dpsxxx.cod" file as in the steps 5 to 7 above.

Warning: When the OS program is written, the entire disk space is used regardless of its media size and the media becomes proprietary as the DPS12 OS disk. This disk cannot be recognized as properly formatted media by the PC nor DPS12. To make it recognizable again, perform Quick Format on PC for PC use or use Erase on DPS12 for DPS12 use.

MEMO

VI. PARTS LIST

ATTENTION

1. When placing an order for parts, be sure to list the Part No., Model No. and the description of each part. Otherwise, the non-delivery of the part or the delivery of a wrong part may result.
2. Please make sure that Part No. is correct when ordering.
If not, a part different from the one you ordered may be delivered.
3. Since the parts shown in Parts List or Preliminary Service Manual may have been the subject of changes, please use this Parts List for all future reference.

HOW TO USE THIS PARTS LIST

1. This Parts List lists those parts which are considered necessary for repairs. Other common parts, such as resistors and capacitors, are listed in the "Common List for Service Parts" from which these parts should be selected and stocked.
2. The Recommended Spare Parts List shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not in principle be supplied.
4. How to read the Parts List.

a) Mechanism Block

2. HEAD BASE BLOCK

Ref. No.	Part. No.	Description
1	BH-T2023A320A	HEAD BASE BLOCK
2	HP-H2206A010A	HEAD R/P PR4-8FU C
3	ZS-477876	PAN20↔03STL CMT
4	ZS-536488	BID20↔08STL CMT
5	ZG-402895	SP CS ANGLE ADJUST

SP (Service Parts) Classification

This number corresponds with the individual parts index number in the figure.

b) PC Board

2. MAIN PC BOARD

Ref. No.	Part. No.	Description
IC1	EI-324536	IC HD14049BP
IC2	EI-336801	IC MB8841-564M
C1A	EC-338399	C MMY V 223M 250AC [U,E,B,S]
C1B	EC-350949	C MMY V 223M 250DC [J]
C1C	EC-338397	C MMY V 223M 125AC [C,A]
X1	EI-318384	OSC X'TAL NC-18C

Symbols for primary destination

[A]: AAL (U.S.A) [S]: SAA (Australia)
 [B]: BEAB (England) [U]: U/T (Universal Area)
 [C]: CSA (Canada)
 [E]: CEE (Europe) [V]: VDE (Germany)
 [J]: JPN (Japan) [Y]: Custom

SP (Service Parts) Classification

These reference symbols correspond with component symbols in the Schematic Diagrams.

The available PC Board Blocks are listed separately.

5. When Part No. is known, Parts Index at end of Parts List can be used to locate where that part is shown in Parts List by its Reference No. listed at right of Part No.

WARNING

INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

AVERTISSEMENT

IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT.

1. RECOMMENDED SPARE PARTS

We suggest you to stock the following Recommended Spare Part items listed below since they can cover most of the routine service.

Ref. No.	Part No.	Description
1	ED-405339J	D SILICON C.DA115 T106T08E
2	ED-810570J	D LED SLR-342MG3F GREEN
3	ED-431071J	D LED SLR-342VR3F RED
4	ED-344280	D SILICON H GMA-01-FY2 F05
5	ED-403280C	D SILICON 1N4002N02 T05 100/1A
6	EI-810825J	IC AK4320-VME1 FPE1T16E
7	EI-810412J	IC AK5340-VS
8	EI-810887J	IC AV9173-01-CS8 FP T12E
9	EI-810679J	IC CS8402A-CS
10	EI-810820J	IC DSP56002FC66 QFTY
11	EI-811370J	IC DSP56004FJ-66 QFTY
12	EI-810823J	IC EPF10K10QC208-4 QFTY
13	EI-810819J	IC HD6417032F16 QFTY
14	EI-810683J	IC HD74HC00FP
15	EI-386289J	IC HD74HC138P
16	EI-810849J	IC HD74HC4052P
17	EI-811255J	IC HM5117800TT-6 FPTY
18	EI-811348J	IC HM5118160TT-6 FPTY
19	EI-810848J	IC MB89623R-499PF L3039 V1.0
20	EI-810828J	IC MCCS142236DWR2 18B FPR2T24E
21	EI-431113J	IC M51953BFP-73A FP73AT12E
22	EI-427685J	IC NJM2068L
23	EI-430928J	IC NJM2100M
24	EI-811350J	IC NJM4560DD
25	EI-811311J	IC NJM7809A
26	EI-424469J	IC NJM7909FA
27	EI-810822J	IC SYM53CF96-2 QFTY
28	EI-377044J1	IC TC74HC14AF
29	EI-377101	IC UPC7805HF
30	EI-379997J	IC YM3623B
31	EI-810826J	IC.NJM4558M FTP1T32P
32	EI-810824J	IC.PA28F400BV-B80 FPST
33	EI-414889N	OSC CE CST10.0MTW-TF01 T05
34	EI-810832J	OSC X'TAL C.SMD-49 14.112MHZ
35	EI-810833J	OSC X'TAL C.SMD-49 18.432MHZ
36	EJ-811269J	PHONE J 3P HTJ-06410D
37	EJ-811270J	PHONE J 3P HTJ-06410D S/N
38	EJ-811268J	PHONE J 3P HTJ-06410I
39	EJ-394459J	SOCKET OPTICAL GP1F32R
40	EJ-394490J	SOCKET OPTICAL GP1F32T
41	ES-415016J	SW ROTARY ENCODER SRGPHJ
42	ES-411687N	SW TACT EVQ PAE 05R
43	ET-386104J	TR C.DTA114TU T106T08E
44	ET-430926J	DETECTOR PC400
45	ET-366753C	TR DTA114ES T05
46	ET-392746C	TR 2SA933AS R,S T05
47	ET-810831J	TR.CHIP 2SC3326 A,B TE85LT08E
48	EV-810835J	VR ROTARY RK09K113 L20 DC B103
49	EV-810836J	VR ROTARY RK09K113 L20C/L B503
50	EV-810852J	VR ROTARY RK10J12E R=16 C103
51	EV-810834J	VR SLIDE RS6011Y L5 DC10V B103

2. P.C. BOARD BLOCK

Ref. No.	Part No.	Description
1	BA-L3039A020A	PC MAIN BLK DPS12
2	BA-L3039A030A	PC (#) OPERATION BLK DPS12

PC (#) OPERATION BLK CONSISTS OF FOLLOWING P.C. BOARDS.

- PC PANEL
- PC INPUT
- PC JOG
- PC FILTER
- PC HEAD PHONE

3. PC MAIN

Ref. No.	Part No.	Description
D1	ED-405339J	D SILICON C.DA115 T106T08E
D2	ED-403280C	D SILICON 1N4002N02 T05 100/1A
FL1	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL2	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL3	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL4	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL5	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL6	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL7	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL8	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL9	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL10	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL11	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL12	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL13	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL14	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL15	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL16	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL17	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL18	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL19	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL20	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL21	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL22	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL23	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL24	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL25	EH-397281J	FILTER EMI DSS306-54B 101M CUT
FL26	EH-397281J	FILTER EMI DSS306-54B 101M CUT
IC1	EI-810826J	IC.NJM4558M FTP1T32P
IC2	EI-810826J	IC.NJM4558M FTP1T32P
IC3	EI-810683J	IC HD74HC00FP
IC4	EI-810679J	IC CS8402A-CS
IC5	EI-810828J	IC MCCS142236DWR2 18B FPR2T24E
IC6	EI-431113J	IC M51953BFP-73A FP73AT12E
IC7	EI-379997J	IC YM3623B
IC8	EI-810822J	IC SYM53CF96-2 QFTY
IC9	EI-377044J1	IC TC74HC14AF
IC10	EI-810825J	IC AK4320-VME1 FPE1T16E
IC11	EI-810825J	IC AK4320-VME1 FPE1T16E
IC12	EI-810824J	IC.PA28F400BV-B80 FPST
IC13	EI-377101	IC UPC7805HF
IC14	EI-424469J	IC NJM7909FA
IC15	EI-811311J	IC NJM7809A
IC16	EI-377101	IC UPC7805HF
IC17	EI-810412J	IC AK5340-VS
IC18	EI-430928J	IC NJM2100M
IC19	EI-811348J	IC HM5118160TT-6 FPTY
IC20	EI-810887J	IC AV9173-01-CS8 FP T12E
IC21	EI-430928J	IC NJM2100M
IC22	EI-811348J	IC HM5118160TT-6 FPTY
IC23	EI-810412J	IC AK5340-VS
IC24	EI-430928J	IC NJM2100M
IC25	EI-430928J	IC NJM2100M
IC26	EI-810412J	IC AK5340-VS
IC27	EI-430928J	IC NJM2100M
IC28	EI-810819J	IC HD6417032F16 QFTY
IC29	EI-810820J	IC DSP56002FC66 QFTY
IC30	EI-810823J	IC EPF10K10QC208-4 QFTY
IC31	EI-430928J	IC NJM2100M
IC32	EI-430928J	IC NJM2100M
J1	EJ-810830J	SOCKET NHS050-032-BS2 50P
J2	EJ-430956J	DIN J YKF51-5058 2X5P
J3	EJ-394459J	SOCKET OPTICAL GP1F32R
J4	EJ-394490J	SOCKET OPTICAL GP1F32T
J5	EJ-811267J	PIN J HSP-252V2-04
J6	EJ-811268J	PHONE J 3P HTJ-06410I
J7	EJ-811268J	PHONE J 3P HTJ-06410I
J8	EJ-811268J	PHONE J 3P HTJ-06410I
J9	EJ-810886J	SOCKET 128A-032S2A-S14A 32P
P2	EJ-810270J	PLUG SCP50GS3 50P
P5	EJ-361565	PLUG B14B-EH-A WHT 14P
P9	EJ-353870	PLUG B10B-EH-A WHT 10P
PH1	ET-430926J	DETECTOR PC400
TR1	ET-810831J	TR.CHIP 2SC3326 A,B TE85LT08E
TR2	ET-810831J	TR.CHIP 2SC3326 A,B TE85LT08E
TR3	ET-386104J	TR C.DTA114TU T106T08E
X1	EI-810833J	OSC X'TAL C.SMD-49 18.432MHZ
X2	EI-810832J	OSC X'TAL C.SMD-49 14.112MHZ

4. PC PANEL

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
D1	ED-431071J	D LED SLR-342VR3F RED	SW29	ES-411687N	SW TACT EVQ PAE 05R
D2	ED-431071J	D LED SLR-342VR3F RED	SW30	ES-411687N	SW TACT EVQ PAE 05R
D3	ED-431071J	D LED SLR-342VR3F RED	SW31	ES-411687N	SW TACT EVQ PAE 05R
D4	ED-431071J	D LED SLR-342VR3F RED	SW32	ES-411687N	SW TACT EVQ PAE 05R
D5	ED-431071J	D LED SLR-342VR3F RED	SW33	ES-411687N	SW TACT EVQ PAE 05R
D6	ED-431071J	D LED SLR-342VR3F RED	SW34	ES-411687N	SW TACT EVQ PAE 05R
D7	ED-431071J	D LED SLR-342VR3F RED	SW35	ES-411687N	SW TACT EVQ PAE 05R
D8	ED-431071J	D LED SLR-342VR3F RED	SW36	ES-411687N	SW TACT EVQ PAE 05R
D9	ED-431071J	D LED SLR-342VR3F RED	SW37	ES-411687N	SW TACT EVQ PAE 05R
D10	ED-431071J	D LED SLR-342VR3F RED	SW38	ES-411687N	SW TACT EVQ PAE 05R
D11	ED-431071J	D LED SLR-342VR3F RED	SW39	ES-411687N	SW TACT EVQ PAE 05R
D12	ED-431071J	D LED SLR-342VR3F RED	SW40	ES-411687N	SW TACT EVQ PAE 05R
D13	ED-431071J	D LED SLR-342VR3F RED	SW41	ES-411687N	SW TACT EVQ PAE 05R
D14	ED-431071J	D LED SLR-342VR3F RED	SW42	ES-411687N	SW TACT EVQ PAE 05R
D15	ED-431071J	D LED SLR-342VR3F RED	SW43	ES-411687N	SW TACT EVQ PAE 05R
D16	ED-431071J	D LED SLR-342VR3F RED	SW44	ES-411687N	SW TACT EVQ PAE 05R
D17	ED-431071J	D LED SLR-342VR3F RED	SW45	ES-411687N	SW TACT EVQ PAE 05R
D18	ED-431071J	D LED SLR-342VR3F RED	SW46	ES-411687N	SW TACT EVQ PAE 05R
D19	ED-810570J	D LED SLR-342MG3F GREEN	SW47	ES-411687N	SW TACT EVQ PAE 05R
D20	ED-810570J	D LED SLR-342MG3F GREEN	SW48	ES-411687N	SW TACT EVQ PAE 05R
D21	ED-810570J	D LED SLR-342MG3F GREEN	SW49	ES-411687N	SW TACT EVQ PAE 05R
D22	ED-431071J	D LED SLR-342VR3F RED	SW50	ES-411687N	SW TACT EVQ PAE 05R
D23	ED-810570J	D LED SLR-342MG3F GREEN	SW51	ES-411687N	SW TACT EVQ PAE 05R
D24	ED-431071J	D LED SLR-342VR3F RED	SW52	ES-411687N	SW TACT EVQ PAE 05R
D25	ED-344280	D SILICON H GMA-01-FY2 F05	SW53	ES-411687N	SW TACT EVQ PAE 05R
D26	ED-344280	D SILICON H GMA-01-FY2 F05	SW54	ES-411687N	SW TACT EVQ PAE 05R
D27	ED-344280	D SILICON H GMA-01-FY2 F05	SW55	ES-411687N	SW TACT EVQ PAE 05R
D28	ED-344280	D SILICON H GMA-01-FY2 F05	SW56	ES-411687N	SW TACT EVQ PAE 05R
D29	ED-344280	D SILICON H GMA-01-FY2 F05	TR1	ET-392746C	TR 2SA933AS R,S T05
D30	ED-344280	D SILICON H GMA-01-FY2 F05	TR2	ET-392746C	TR 2SA933AS R,S T05
D31	ED-344280	D SILICON H GMA-01-FY2 F05	TR3	ET-392746C	TR 2SA933AS R,S T05
D32	ED-344280	D SILICON H GMA-01-FY2 F05	TR4	ET-392746C	TR 2SA933AS R,S T05
IB1	EH-370491	COMP R RGLD6X 104J	TR5	ET-392746C	TR 2SA933AS R,S T05
IB2	EH-370493	COMP R RGLD7X 104J	TR6	ET-392746C	TR 2SA933AS R,S T05
IC1	EI-810848J	IC MB89623R-499PF L3039 V1.0	TR7	ET-392746C	TR 2SA933AS R,S T05
IC2	EI-386289J	IC HD74HC138P	TR8	ET-392746C	TR 2SA933AS R,S T05
IC3	EI-810849J	IC HD74HC4052P	TR9	ET-366753C	TR DTA114ES T05
IC4	EI-810849J	IC HD74HC4052P	TR10	ET-366753C	TR DTA114ES T05
IC5	EI-810849J	IC HD74HC4052P	TR11	ET-366753C	TR DTA114ES T05
IC6	EI-427685J	IC NJM2068L	VR1	EV-810835J	VR ROTARY RK09K113 L20 DC B103
IC7	EI-427685J	IC NJM2068L	VR2	EV-810835J	VR ROTARY RK09K113 L20 DC B103
IC8	EI-427685J	IC NJM2068L	VR3	EV-810835J	VR ROTARY RK09K113 L20 DC B103
IC9	EI-427685J	IC NJM2068L	VR4	EV-810835J	VR ROTARY RK09K113 L20 DC B103
IC10	EI-427685J	IC NJM2068L	VR5	EV-810835J	VR ROTARY RK09K113 L20 DC B103
IC11	EI-427685J	IC NJM2068L	VR6	EV-810835J	VR ROTARY RK09K113 L20 DC B103
J2	EW-810837J	WIRE ASSY L3039(1) 10P	VR7	EV-810835J	VR ROTARY RK09K113 L20 DC B103
J4	EW-810838J	WIRE ASSY L3039(2) 14P	VR8	EV-810835J	VR ROTARY RK09K113 L20 DC B103
P1	EJ-810851J	SOCKET SLP19R-2 19P	VR9	EV-810835J	VR ROTARY RK09K113 L20 DC B103
SW1	ES-411687N	SW TACT EVQ PAE 05R	VR10	EV-810835J	VR ROTARY RK09K113 L20 DC B103
SW2	ES-411687N	SW TACT EVQ PAE 05R	VR11	EV-810835J	VR ROTARY RK09K113 L20 DC B103
SW3	ES-411687N	SW TACT EVQ PAE 05R	VR12	EV-810835J	VR ROTARY RK09K113 L20 DC B103
SW4	ES-411687N	SW TACT EVQ PAE 05R	VR13	EV-810834J	VR SLIDE RS6011Y L5 DC10V B103
SW5	ES-411687N	SW TACT EVQ PAE 05R	VR14	EV-810834J	VR SLIDE RS6011Y L5 DC10V B103
SW6	ES-411687N	SW TACT EVQ PAE 05R	VR15	EV-810834J	VR SLIDE RS6011Y L5 DC10V B103
SW7	ES-411687N	SW TACT EVQ PAE 05R	VR16	EV-810834J	VR SLIDE RS6011Y L5 DC10V B103
SW8	ES-411687N	SW TACT EVQ PAE 05R	VR17	EV-810834J	VR SLIDE RS6011Y L5 DC10V B103
SW9	ES-411687N	SW TACT EVQ PAE 05R	VR18	EV-810834J	VR SLIDE RS6011Y L5 DC10V B103
SW10	ES-411687N	SW TACT EVQ PAE 05R	VR19	EV-810834J	VR SLIDE RS6011Y L5 DC10V B103
SW11	ES-411687N	SW TACT EVQ PAE 05R	VR20	EV-810834J	VR SLIDE RS6011Y L5 DC10V B103
SW12	ES-411687N	SW TACT EVQ PAE 05R	VR21	EV-810834J	VR SLIDE RS6011Y L5 DC10V B103
SW13	ES-411687N	SW TACT EVQ PAE 05R	VR22	EV-810834J	VR SLIDE RS6011Y L5 DC10V B103
SW14	ES-411687N	SW TACT EVQ PAE 05R	VR23	EV-810834J	VR SLIDE RS6011Y L5 DC10V B103
SW15	ES-411687N	SW TACT EVQ PAE 05R	VR24	EV-810834J	VR SLIDE RS6011Y L5 DC10V B103
SW16	ES-411687N	SW TACT EVQ PAE 05R	VR25	EV-810834J	VR SLIDE RS6011Y L5 DC10V B103
SW17	ES-411687N	SW TACT EVQ PAE 05R	VR26	EV-810836J	VR ROTARY RK09K113 L20COL B503
SW18	ES-411687N	SW TACT EVQ PAE 05R	VR27	EV-810836J	VR ROTARY RK09K113 L20COL B503
SW19	ES-411687N	SW TACT EVQ PAE 05R	VR28	EV-810836J	VR ROTARY RK09K113 L20COL B503
SW20	ES-411687N	SW TACT EVQ PAE 05R	VR29	EV-810836J	VR ROTARY RK09K113 L20COL B503
SW21	ES-411687N	SW TACT EVQ PAE 05R	VR30	EV-810836J	VR ROTARY RK09K113 L20COL B503
SW22	ES-411687N	SW TACT EVQ PAE 05R	VR31	EV-810836J	VR ROTARY RK09K113 L20COL B503
SW23	ES-411687N	SW TACT EVQ PAE 05R	X1	EI-414889N	OSC CE CST10.0MTW-TF01 T05
SW24	ES-411687N	SW TACT EVQ PAE 05R	400	ZW-810519J	SPACER LED L=8.1
SW25	ES-411687N	SW TACT EVQ PAE 05R			
SW26	ES-411687N	SW TACT EVQ PAE 05R			
SW27	ES-411687N	SW TACT EVQ PAE 05R			
SW28	ES-411687N	SW TACT EVQ PAE 05R			

5. PC INPUT

Ref. No.	Part No.	Description
J101	EJ-811270J	PHONE J 3P HTJ-06410D S/N
J102	EJ-811270J	PHONE J 3P HTJ-06410D S/N
J103	EJ-811270J	PHONE J 3P HTJ-06410D S/N
J104	EJ-811270J	PHONE J 3P HTJ-06410D S/N
J105	EJ-811270J	PHONE J 3P HTJ-06410D S/N
J106	EJ-811270J	PHONE J 3P HTJ-06410D S/N

6. PC JOG

Ref. No.	Part No.	Description
SW201	ES-415016J	SW ROTARY ENCODER SRGPHJ

7. PC FILTER

Ref. No.	Part No.	Description
C301	△ EC-427562J	C MMY V CUT MKP3362 103M 275AC
C302	△ EC-427562J	C MMY V CUT MKP3362 103M 275AC
C303	△ EC-425606J	C MMY V CUT MMRC 683M 275AC
L301	△ EO-389172J	COIL LF LF-4N 502
SW301	△ ES-430685J1	SW PUSH SDDF3A 02-1

8. PC HEAD PHONE

Ref. No.	Part No.	Description
IC401	EI-811350J	IC NJM4560DD
J401	EJ-811269J	PHONE J 3P HTJ-06410D
VR401	EV-810852J	VR ROTARY RK10J12E R=16 C103

9. FINAL ASSEMBLY BLOCK DPS12

Ref. No.	Part No.	Description
1	BD-810874J	PANEL TOP DPS12 PART
2	SB-810796J	BUTTON PUSH
3	SB-810797J	BUTTON PUSH (2) (REC)
4	SB-810812J	BUTTON PUSH A(2) (STOP)
5	SB-810882J	BUTTON PUSH A(3) (PLAY)
6	SB-810748J	BUTTON PUSH B(4) (WHITE)
7	SB-810862J	BUTTON PUSH B(5) (BLUE)
8	SB-810799J	BUTTON CURSOR
9	SE-810795J	MASK DRIVE

Cover plate.

Ref. No.	Part No.	Description
10	EM-810599J	IND LCD GMV24160AFTW L=175
11	ZS-810640J	BT PAN17X05STL CMT PS3
12	ZS-331182	BT BID30X08STL BNI
13	BA-810408J	INVERTER 13585A-CFL-INV
14	ZS-379405C	BID30X06STL CMT (CH)
15	SB-810525J	BUTTON POWER
16	EJ-358632J2	SOCKET INLET SOT-16 3P
17	ZS-376875	BT CTS30X08STL BNI
18	ZW-273892	TWA40STL CMT
19	ZS-313796	ST BID40X06STL CMT
20	△ BP-810446J	SW REGULATOR SNP-9541
21	△ EF-306950	FUSE TSC A 250V 2.00A (J)
22	BM-811223J	MOTOR FAN F412R-12LB-35 12V
23	ZS-811222J	ST BR30X18STL CMT
24	ZS-590128	BID26X06STL BNI
25	MB-811360J	RUBBER BUSH
26	SA-811368J	FOOT
27	SE-810800J	WINDOW LCD
28	SK-810801J	KNOB VOL(A) (ORANGE)
29	SK-810802J	KNOB VOL(B) (BLUE)
30	SK-810814J	KNOB SHUTTLE(3)
31	SK-810815J	KNOB JOG(3)
32	SK-810816J	KNOB SLIDE(3) (ORANGE)
33	SK-810863J	KNOB SLIDE(4) (GREEN)
34-A	△ EW-368420J1	AC CORD200SKP30KS16 B AC (A)
34-B	△ EW-410608J	AC CORD 250S KP4819D KS31A B E (E,V)
34-C	△ EW-419170J	AC CORD200S KP610 KS31A B (B)
34-D	△ EW-380905J	AC CORD 250S KP300 KS16A H B J (J)
35	△ EJ-405424J	PLUG ADAPTOR KPR-25 (J)
36	EW-810841J	WIRE ASSY L3039(5) 4P
37	EW-810842J	WIRE ASSY L3039(6) 50P
38	ZS-413785	BID30X12STL CMT
39	ZW-811369J	SPACER 3X9

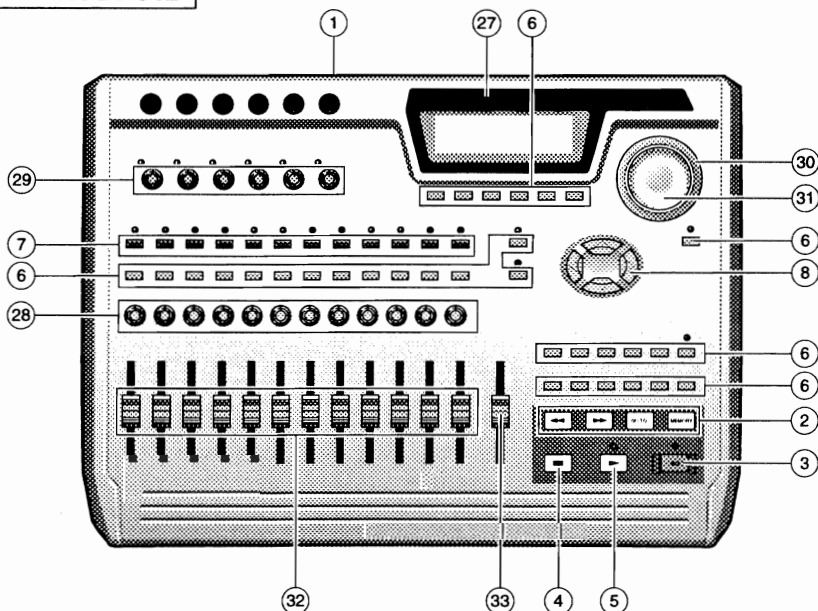
NOTE :

Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

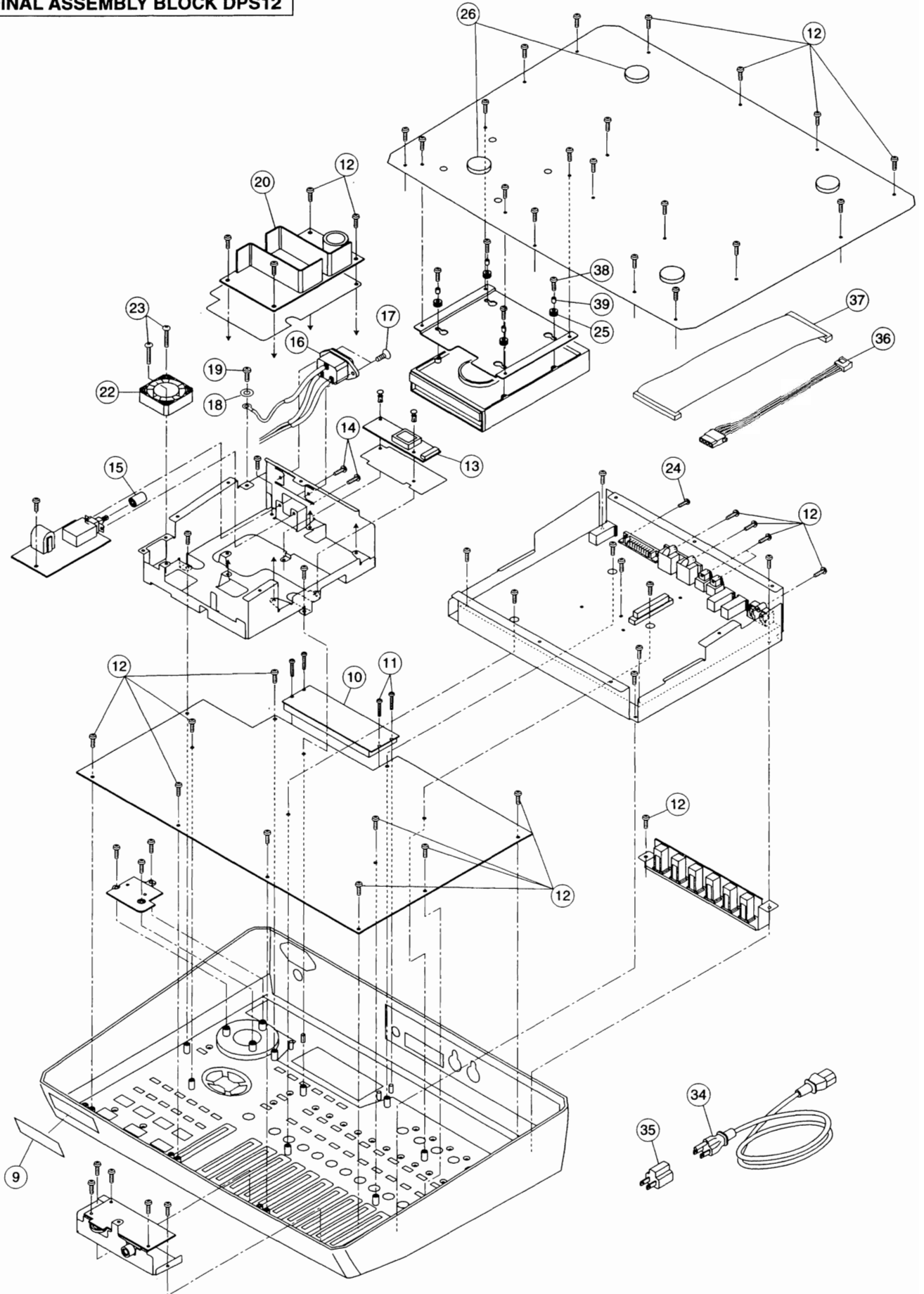
10. P.C. EFFECT(EB2M OPTIONAL P.C. BOARD)

Ref. No.	Part No.	Description
IC1	EI-811370J	IC DSP56004FJ-66 QFTY
IC2	EI-811255J	IC HM5117800TT-6 FPTY
P1	EJ-810880J	PLUG 128A-032P2C-S14A 32P
401	MH-810867J	PC SUPPORT 2627

FINAL ASSEMBLY BLOCK DPS12



FINAL ASSEMBLY BLOCK DPS12



PARTS LIST

INDEX

Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.
BA-L3039A020A	2-1	EH-397281J	3-FL25	EJ811270J	5-J103	ET-392746C	4-TR3
BA-L3039A030A	2-2	EH-397281J	3-FL26	EJ-811270J	5-J104	ET-392746C	4-TR4
BA-810408J	9-13	EI-377044J1	3-IC9	EJ-811270J	5-J105	ET-392746C	4-TR5
BD-810874J	9-1	EI-377101	3-IC13	EJ-811270J	5-J106	ET-392746C	4-TR6
BM-811223J	9-22	EI-377101	3-IC16	EM-810599J	9-10	ET-392746C	4-TR7
BP-810446J	9-20	EI-379997J	3-IC7	EO-389172J	7-L301	ET-392746C	4-TR8
EC-425606J	7-C303	EI-386289J	4-IC2	ES-411687N	4-SW1	ET-430926J	3-PH1
EC-427562J	7-C301	EI-414889N	4-X1	ES-411687N	4-SW2	ET-810831J	3-TR1
EC-427562J	7-C302	EI-424469J	3-IC14	ES-411687N	4-SW3	ET-810831J	3-TR2
ED-344280	4-D25	EI-427685J	4-IC6	ES-411687N	4-SW4	EV-810834J	4-VR13
ED-344280	4-D26	EI-427685J	4-IC7	ES-411687N	4-SW5	EV-810834J	4-VR14
ED-344280	4-D27	EI-427685J	4-IC8	ES-411687N	4-SW6	EV-810834J	4-VR15
ED-344280	4-D28	EI-427685J	4-IC9	ES-411687N	4-SW7	EV-810834J	4-VR16
ED-344280	4-D29	EI-427685J	4-IC10	ES-411687N	4-SW8	EV-810834J	4-VR17
ED-344280	4-D30	EI-427685J	4-IC11	ES-411687N	4-SW9	EV-810834J	4-VR18
ED-344280	4-D31	EI-430928J	3-IC18	ES-411687N	4-SW10	EV-810834J	4-VR19
ED-344280	4-D32	EI-430928J	3-IC21	ES-411687N	4-SW11	EV-810834J	4-VR20
ED-403280C	3-D2	EI-430928J	3-IC24	ES-411687N	4-SW12	EV-810834J	4-VR21
ED-405339J	3-D1	EI-430928J	3-IC25	ES-411687N	4-SW13	EV-810834J	4-VR22
ED-431071J	4-D1	EI-430928J	3-IC27	ES-411687N	4-SW14	EV-810834J	4-VR23
ED-431071J	4-D2	EI-430928J	3-IC31	ES-411687N	4-SW15	EV-810834J	4-VR24
ED-431071J	4-D3	EI-430928J	3-IC32	ES-411687N	4-SW16	EV-810834J	4-VR25
ED-431071J	4-D4	EI-431113J	3-IC6	ES-411687N	4-SW17	EV-810835J	4-VR1
ED-431071J	4-D5	EI-810412J	3-IC17	ES-411687N	4-SW18	EV-810835J	4-VR2
ED-431071J	4-D6	EI-810412J	3-IC23	ES-411687N	4-SW19	EV-810835J	4-VR3
ED-431071J	4-D7	EI-810412J	3-IC26	ES-411687N	4-SW20	EV-810835J	4-VR4
ED-431071J	4-D8	EI-810679J	3-IC4	ES-411687N	4-SW21	EV-810835J	4-VR5
ED-431071J	4-D9	EI-810683J	3-IC3	ES-411687N	4-SW22	EV-810835J	4-VR6
ED-431071J	4-D10	EI-810819J	3-IC28	ES-411687N	4-SW23	EV-810835J	4-VR7
ED-431071J	4-D11	EI-810820J	3-IC29	ES-411687N	4-SW24	EV-810835J	4-VR8
ED-431071J	4-D12	EI-810822J	3-IC8	ES-411687N	4-SW25	EV-810835J	4-VR9
ED-431071J	4-D13	EI-810823J	3-IC30	ES-411687N	4-SW26	EV-810835J	4-VR10
ED-431071J	4-D14	EI-810824J	3-IC12	ES-411687N	4-SW27	EV-810835J	4-VR11
ED-431071J	4-D15	EI-810825J	3-IC10	ES-411687N	4-SW28	EV-810835J	4-VR12
ED-431071J	4-D16	EI-810825J	3-IC11	ES-411687N	4-SW29	EV-810836J	4-VR26
ED-431071J	4-D17	EI-810826J	3-IC1	ES-411687N	4-SW30	EV-810836J	4-VR27
ED-431071J	4-D18	EI-810826J	3-IC2	ES-411687N	4-SW31	EV-810836J	4-VR28
ED-431071J	4-D22	EI-810828J	3-IC5	ES-411687N	4-SW32	EV-810836J	4-VR29
ED-431071J	4-D24	EI-810832J	3-AX2	ES-411687N	4-SW33	EV-810836J	4-VR30
ED-810570J	4-D19	EI-810833J	3-AX1	ES-411687N	4-SW34	EV-810836J	4-VR31
ED-810570J	4-D20	EI-810848J	4-IC1	ES-411687N	4-SW35	EV-810852J	8-VR401
ED-810570J	4-D21	EI-810849J	4-IC3	ES-411687N	4-SW36	EW-368420J1	9-34-A
ED-810570J	4-D23	EI-810849J	4-IC4	ES-411687N	4-SW37	EW-380905J	9-34-D
EF-306950	9-21	EI-810849J	4-IC5	ES-411687N	4-SW38	EW-410608J	9-34-B
EH-370491	4-IB1	EI-810887J	3-IC20	ES-411687N	4-SW39	EW-419170J	9-34-C
EH-370493	4-IB2	EI-811255J	10-IC2	ES-411687N	4-SW40	EW-810837J	4-J2
EH-397281J	3-FL1	EI-811311J	3-IC15	ES-411687N	4-SW41	EW-810838J	4-J4
EH-397281J	3-FL2	EI-811348J	3-IC19	ES-411687N	4-SW42	EW-810841J	9-36
EH-397281J	3-FL3	EI-811348J	3-IC22	ES-411687N	4-SW43	EW-810842J	9-37
EH-397281J	3-FL4	EI-811350J	8-IC401	ES-411687N	4-SW44	MB-811360J	9-25
EH-397281J	3-FL5	EI-811370J	10-IC1	ES-411687N	4-SW45	MH-810867J	10-1
EH-397281J	3-FL6	EJ-353870	3-P9	ES411687N	4-SW46	SA-811368J	9-26
EH-397281J	3-FL7	EJ-358632J2	9-16	ES-411687N	4-SW47	SB-810525J	9-15
EH-397281J	3-FL8	EJ-361565	3-P5	ES-411687N	4-SW48	SB-810748J	9-6
EH-397281J	3-FL9	EJ-394459J	3-J3	ES-411687N	4-SW49	SB-810796J	9-2
EH-397281J	3-FL10	EJ-394490J	3-J4	ES-411687N	4-SW50	SB-810797J	9-3
EH-397281J	3-FL11	EJ-405424J	9-35	ES-411687N	4-SW51	SB-810799J	9-8
EH-397281J	3-FL12	EJ-430956J	3-J2	ES-411687N	4-SW52	SB-810812J	9-4
EH-397281J	3-FL13	EJ-810270J	3-P2	ES-411687N	4-SW53	SB-810862J	9-7
EH-397281J	3-FL14	EJ-810830J	3-J1	ES-411687N	4-SW54	SB-810882J	9-5
EH397281J	3-FL15	EJ-810851J	4-P1	ES-411687N	4-SW55	SE-810795J	9-9
EH397281J	3-FL16	EJ810880J	10-P1	ES-411687N	4-SW56	SE-810800J	9-27
EH397281J	3-FL17	EJ810886J	3-J9	ES-415016J	6-SW201	SK-810801J	9-28
EH397281J	3-FL18	EJ811267J	3-J5	ES-430685J1	7-SW301	SK-810802J	9-29
EH397281J	3-FL19	EJ811268J	3-J6	ET-366753C	4-TR9	SK-810814J	9-30
EH397281J	3-FL20	EJ811268J	3-J7	ET-366753C	4-TR10	SK-810815J	9-31
EH397281J	3-FL21	EJ811268J	3-J8	ET-366753C	4-TR11	SK-810816J	9-32
EH397281J	3-FL22	EJ811269J	8-J401	ET-386104J	3-TR3	SK-810863J	9-33
EH397281J	3-FL23	EJ811270J	5-J101	ET-392746C	4-TR1	ZS-313796	9-19
EH397281J	3-FL24	EJ811270J	5-J102	ET-392746C	4-TR2	ZS-331182	9-12

Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.
ZS-376875	9-17						
ZS-379405C	9-14						
ZS-413785	9-38						
ZS-590128	9-24						
ZS-810640J	9-11						
ZS-811222J	9-23						
ZW-273892	9-18						
ZW-810519J	4-400						
ZW-811369J	9-39						

ABBREVIATIONS FOR THE SERVICE MANUAL

ABBREVIATION	EXPLANATION	ABBREVIATION	EXPLANATION
AMP (Amp)	AMPlifier	MINI	MINimum
BBD	Backet Brigade Diode	MIX	MIXer
BCD	Binary Code Decimal	MOD	MODulation / MODulator
B.DOWN	Brake DOWN	M.WHEEL	Modulation WHEEL
B.UP	Back UP	OSC	OSCillator
CE	Chip Enable	PLD	Programmable Logic Device
CH	CHannel	RAM	Random Access Memory
COMP	COMParator	RD	ReaD
CONT	CONTRol	REG	REGulator
CV	Control Voltage	RESO	RESONance
D/A	Digital to Analogue	RL	ReLay
DIR	DIRectory	ROM	Read Only Memory
DMA	Direct Memory Access	SCSI	Small Computer System Interface
DSP	Digital Signal Processor	S/H	Sample and Hold
EG	Envelope Generator	SIMM	Single Inline Memory Module
EXT	EXTernal	SMPTE	Society of Motion Picture & Television Engineers
FREQ	FREQuency	SW	SWitch
HPF	High Pass Filter	THRU	THRoUgh
INH	INHibit	TRANS	TRANSpose
INT	INTerrupt	U	Upper
INV	INVerter	VA	Voltage Analog
L	Lower	VCA	Voltage Controlled Amplifier
LAN	Local Area Network	VCF	Voltage Controlled Filter
LFO	Low Frequency Oscillator	VR	Variable Resistor
MAX	MAXimum	VREF	REFerence Voltage
MEMO	MEMOry	WR	WRite
MIDI	Musical Instrument Digital Interface		

AKAI ELECTRIC CO., LTD.

ELECTRONIC MUSICAL INSTRUMENT DIV.

11-5, Shin-Yokohama 2-Chome, Kouhoku-Ku, Yokohama, Japan

SERVICE SECT. PHONE :+81-45-476-6950 FAX :+81-45-476-6936

Printed No. 980114-A1-400

AKAI

MODEL **DPS12**

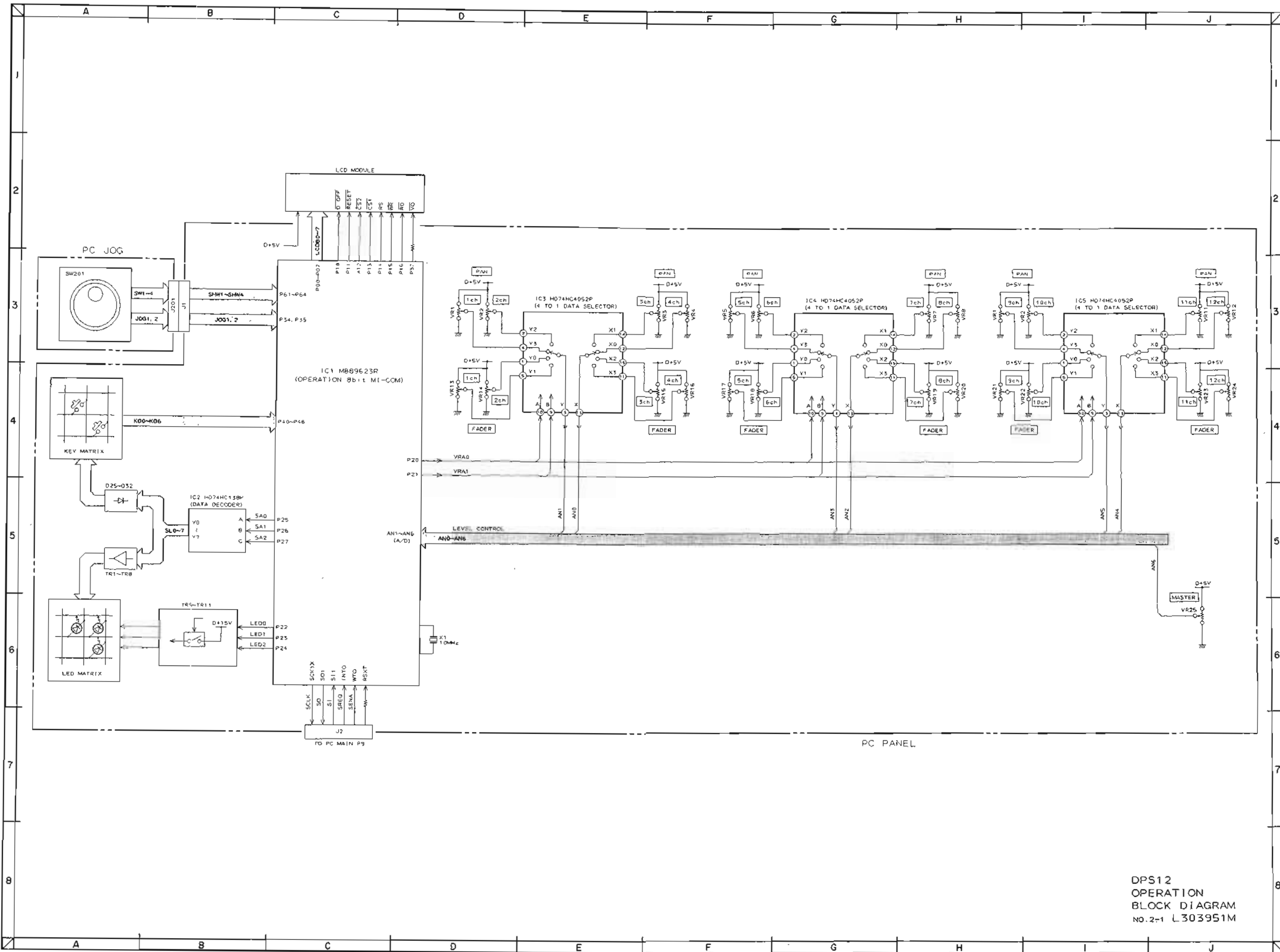
MODEL **EB2M**

SCHEMATIC DIAGRAMS AND PC BOARDS

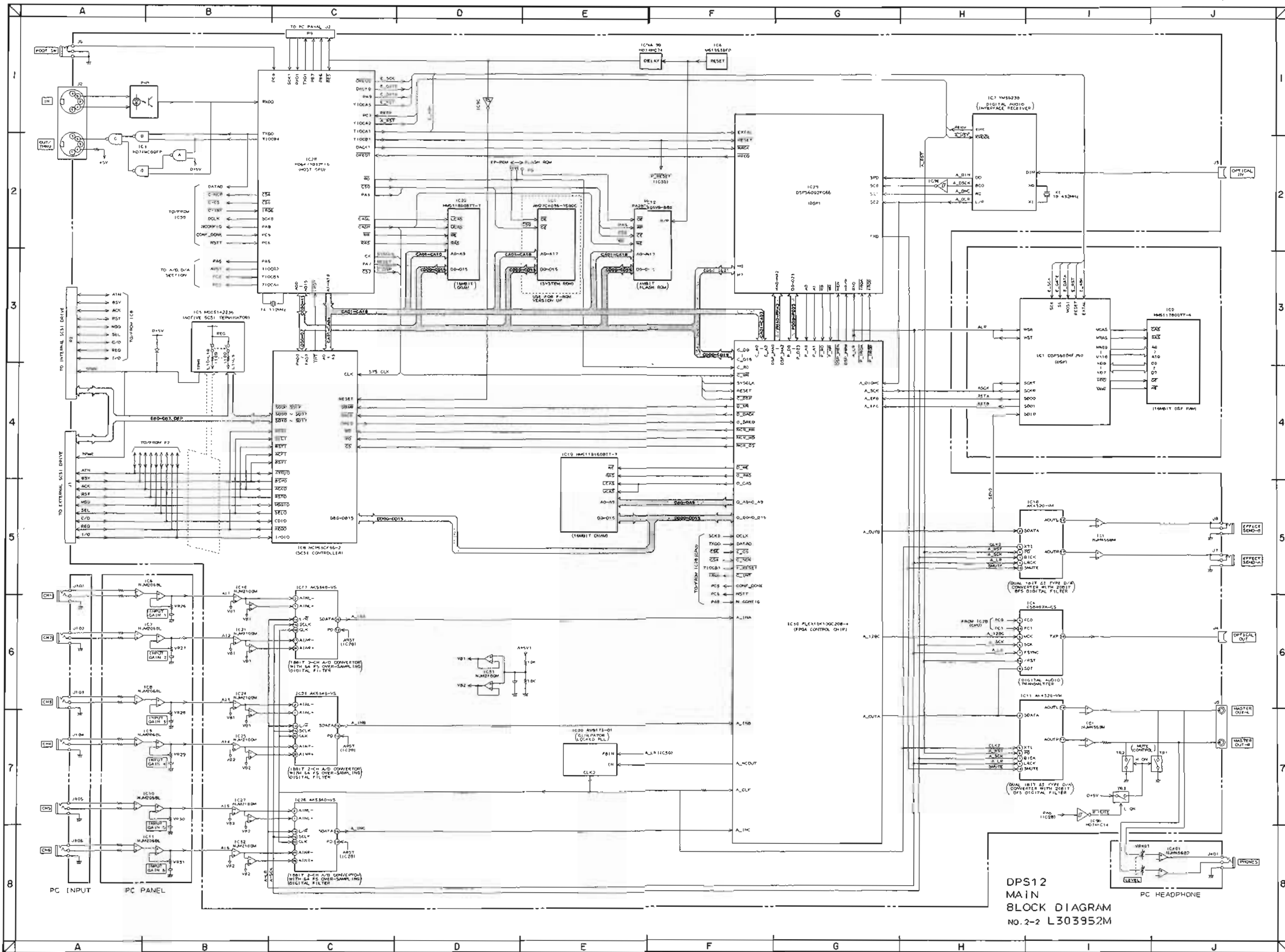
TABLE OF CONTENTS

I. BLOCK DIAGRAMS	
1. OPERATION	3
2. MAIN	4
II. SCHEMATIC DIAGRAMS AND PC BOARDS	
1. CONNECTION DIAGRAM	5
2. MAIN1/2	7
3. MAIN2/2	8
4. OPERATION	10
5. EB2M EFFECT	12
III. INFORMATION OF ICS	13

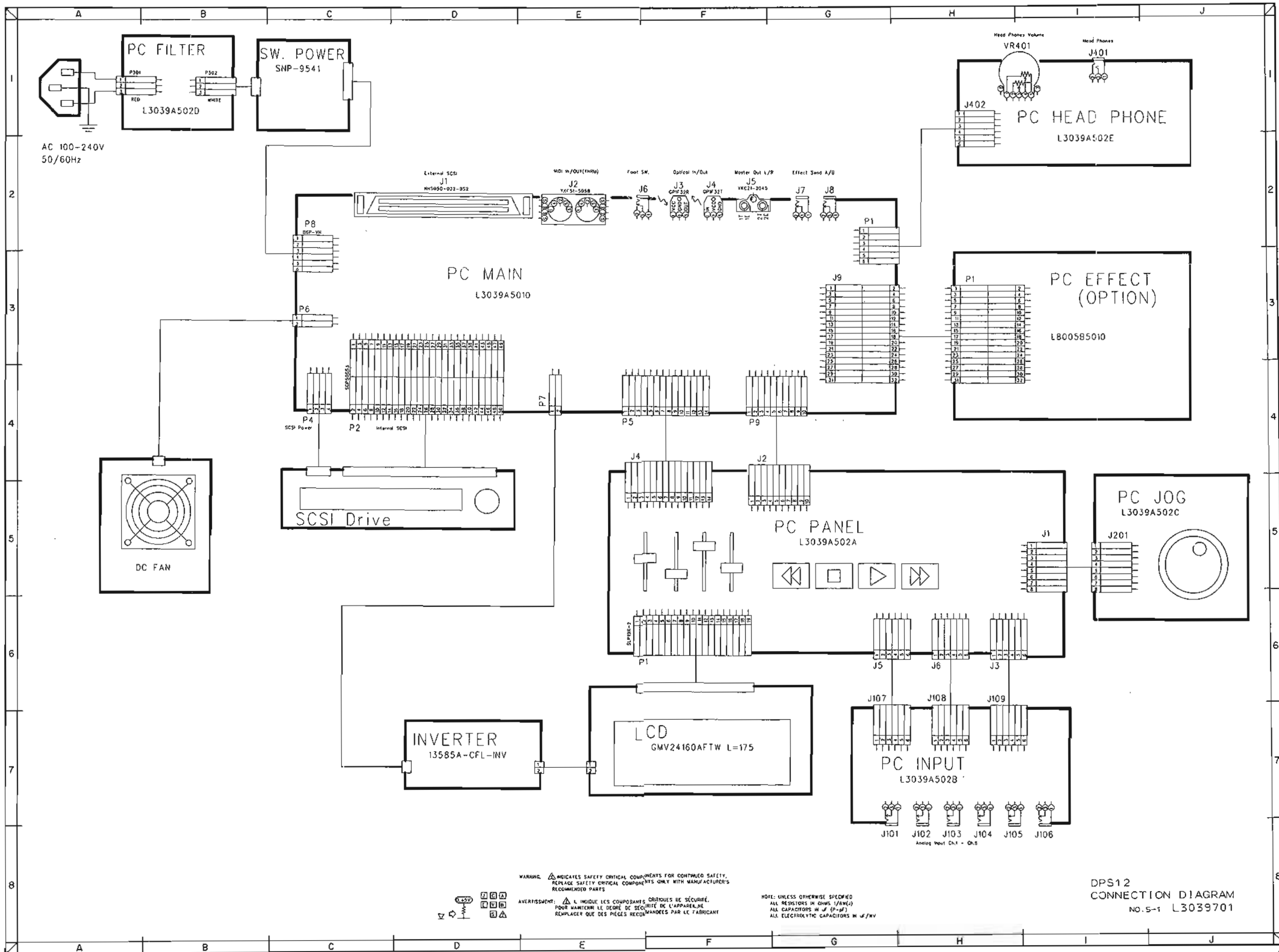
Use these schematic diagrams and PC boards together with the provided service manual.



DPS12
OPERATION
BLOCK DIAGRAM
No. 2-1 L303951M



DPS12
 MAIN
 BLOCK DIAGRAM
 NO. 2-2 L303952M



AC 100-240V
50/60Hz

PC FILTER
L3039A502D

SW. POWER
SNP-9541

Head Phones Volume
VR401
Head Phones
J401
J402
PC HEAD PHONE
L3039A502E

External SCSI
J1
MH5050-022-952
MIDI in/OUT(THRU)
J2
YK51-5058
Foot SW.
J6
Optical in/Out
J3
GPV 32R
J4
GPV 32T
Master Out L/R
J5
YK21-3045
Effect Send A/B
J7
J8

P8
BSP-VH
1
2
3
4
5
6
PC MAIN
L3039A5010

P1
1 2
3 4
5 6
7 8
9 10
11 12
13 14
15 16
17 18
19 20
21 22
23 24
25 26
27 28
29 30
31 32
PC EFFECT
(OPTION)
L800585010

DC FAN

SCSI Drive

J4
J2
PC PANEL
L3039A502A

PC JOG
L3039A502C
J201

INVERTER
13585A-CFL-INV

LCD
GMV24160AFTW L=175

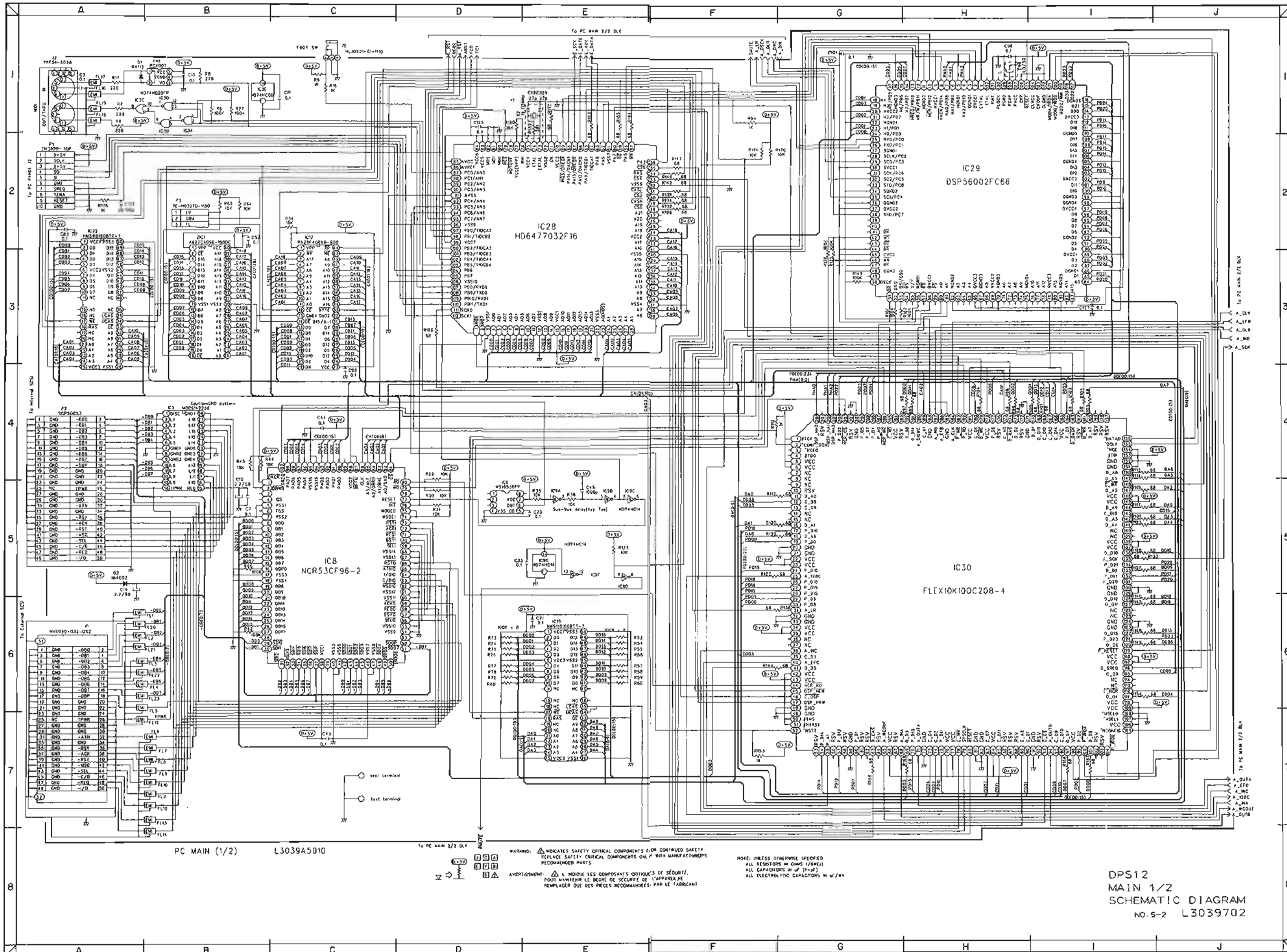
J107 J108 J109
J101 J102 J103 J104 J105 J106
PC INPUT
L3039A502B
Analog Input Ch.1 - Ch.6

WARNING: INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

AVERTISSEMENT: L'INDIQUE LES COMPOSANTS CRITIQUES DE SECURITE. POUR MAINTIENIR LE DEGRE DE SECURITE DE L'APPAREIL, NE REMPLACER QUE DES PIECES RECOMMANDEES PAR LE FABRICANT.

NOTE: UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS (R/W/J)
ALL CAPACITORS IN uF (P-pF)
ALL ELECTROLYTIC CAPACITORS IN uF/NV

DPS12
CONNECTION DIAGRAM
NO. 5-1 L3039701



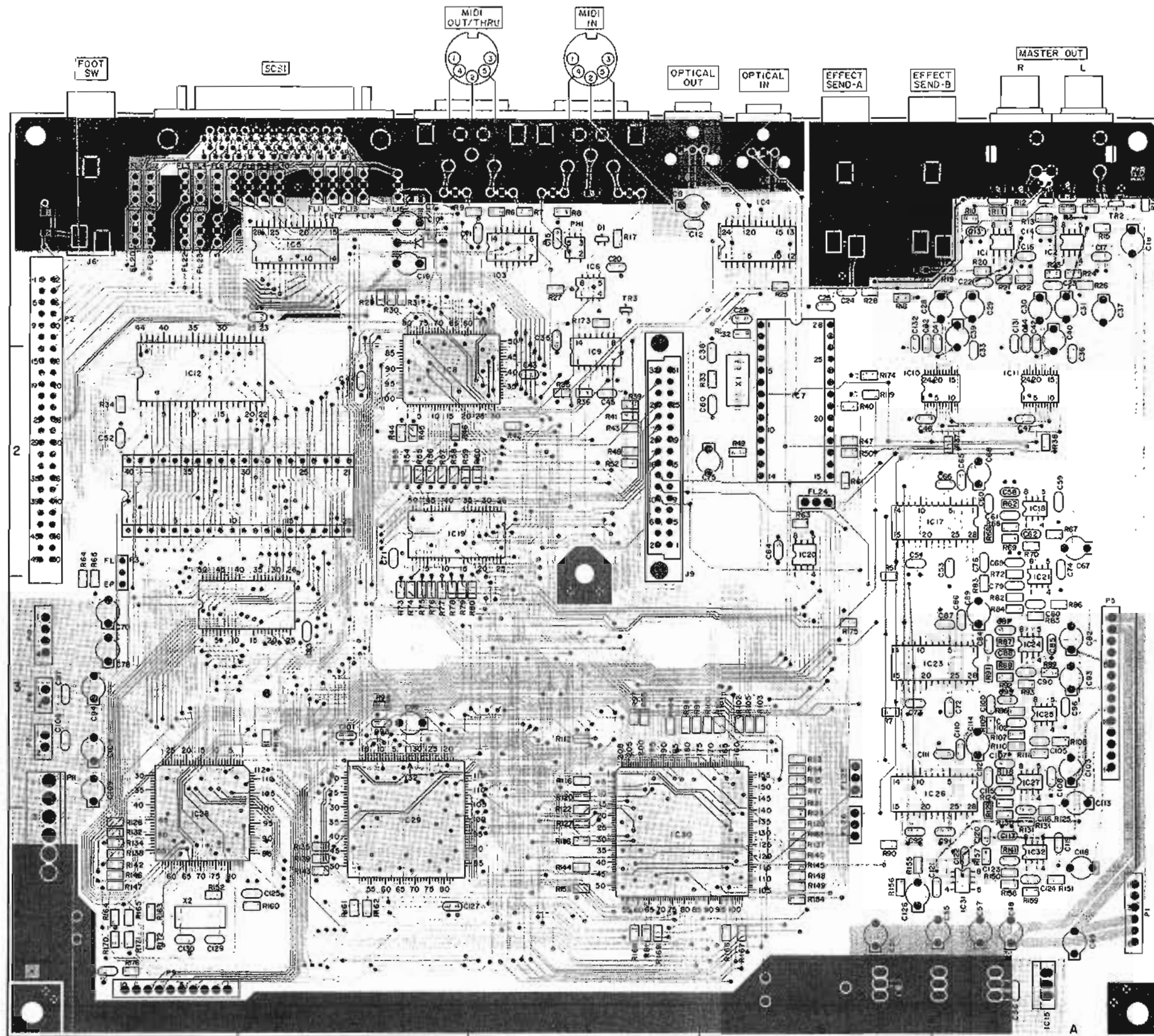
PC MAIN (1/2) L3039A5010

WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY
 REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S
 RECOMMENDED PARTS

AVERTISSEMENT: ⚠ A INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ.
 POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, SE
 REMPLACER SEULEMENT PAR DES PIÈCES RECOMMANDÉES PAR LE FABRICANT.

NOTE: UNLESS OTHERWISE SPECIFIED
 ALL RESISTORS IN OHMS (R#K#)
 ALL CAPACITORS IN P.F. (P#F#)
 ALL ELECTROLYTIC CAPACITORS IN W/F#V

DPS12
 MAIN 1/2
 SCHEMATIC DIAGRAM
 NO. 5-2 L3039702



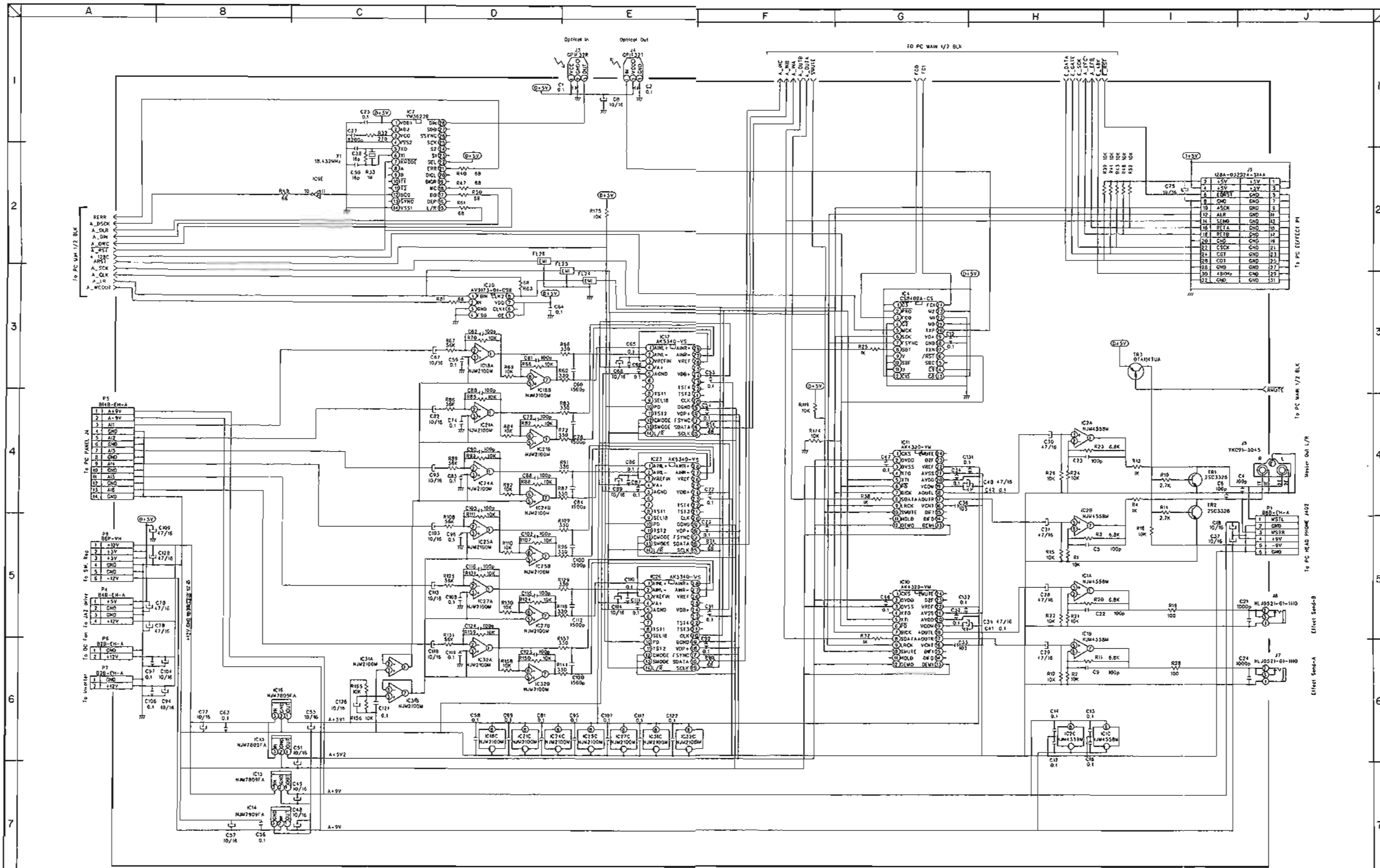
PC MAIN L3039A5010 (TOP VIEW)

PRINCIPAL PARTS LOCATION

ICs	
IC1	A1
IC2	A2
IC3	C1
IC4	B1
IC5	D1
IC6	C1
IC7	B2
IC8	C,D2
IC9	C1,2
IC10	A2
IC11	A2
IC12	E2
IC13	B4
IC14	A4
IC15	A4
IC16	A4
IC17	A,B2
IC18	A2
IC19	C,D2
IC20	B2
IC21	A2
IC22	D,E3
IC23	A,B3
IC24	A3
IC25	A3
IC26	A,B3
IC27	A3
IC28	E3,4
IC29	D3,4
IC30	C4
IC31	A4
IC32	A4
PH1	C1

CONNECTORS

J1	D,E1
J2	C1
J3	B1
J4	C1
J5	A1
J6	E1
J7	B1
J8	A,B1
J9	C2
P1	A4
P2	E2
P4	E3
P5	A3
P6	E3
P7	E3
P8	E3,4
P9	E4



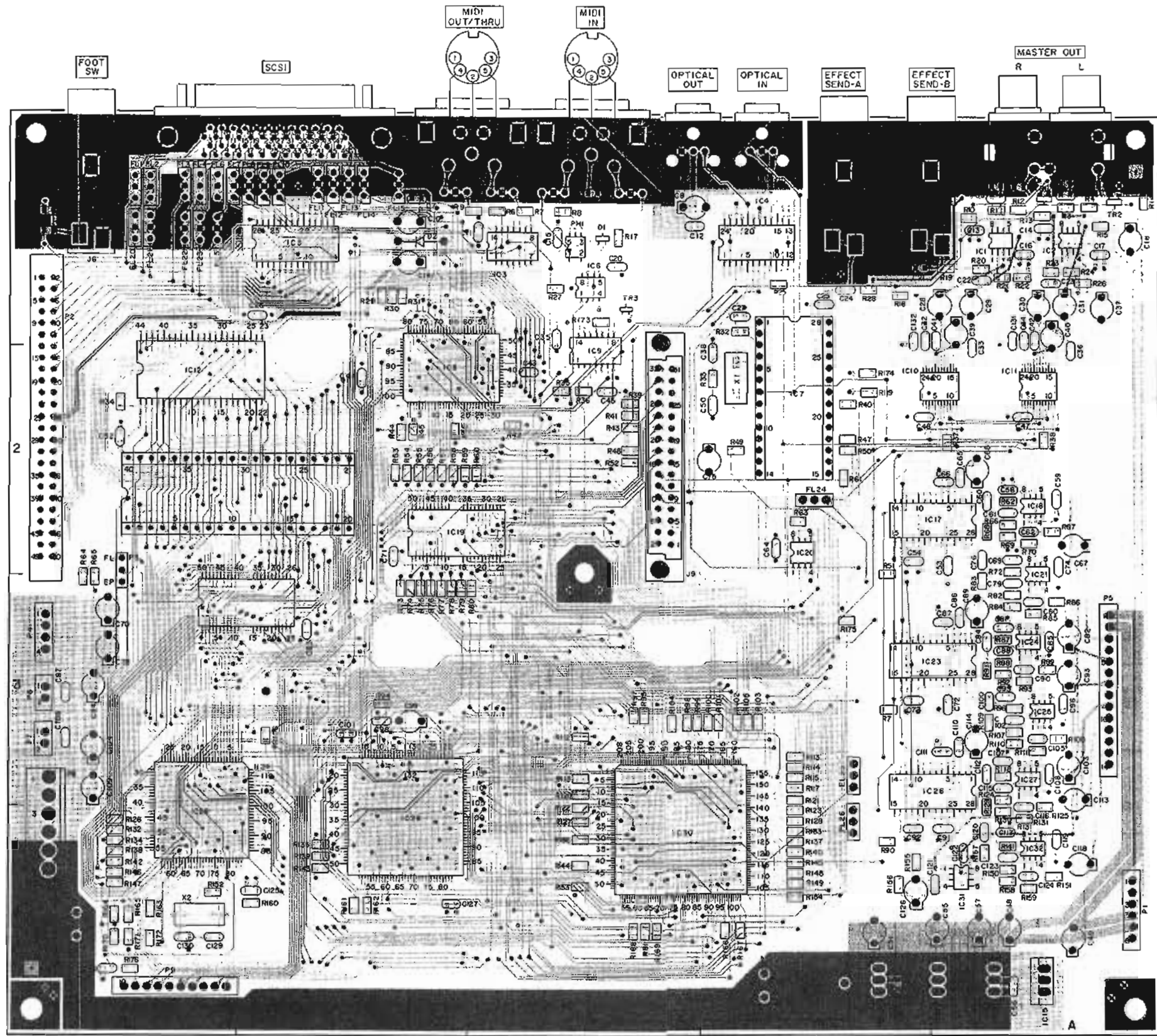
PC MAIN (2/2) L3039A5010

WARNING: Δ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

AVERTISSEMENT: Δ R INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. REMPLACER DES PIÈCES RECOMMANDÉES PAR LE FABRICANT.

NOTE UNLESS OTHERWISE SPECIFIED
 ALL RESISTORS IN OHMS (R/S) (R)
 ALL CAPACITORS IN μ F (P-P)
 ALL ELECTROLYTIC CAPACITORS IN μ F/V

DPS12
 MAIN 2/2
 SCHEMATIC DIAGRAM
 NO. 5-3 L3039703



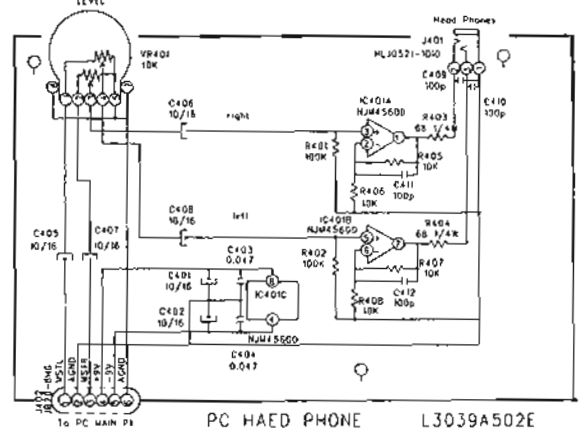
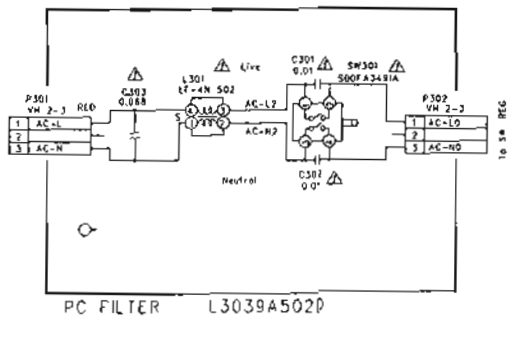
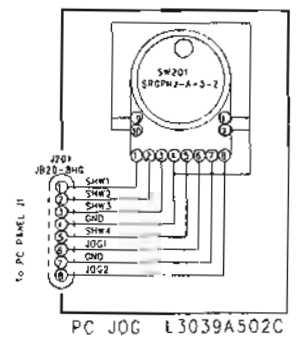
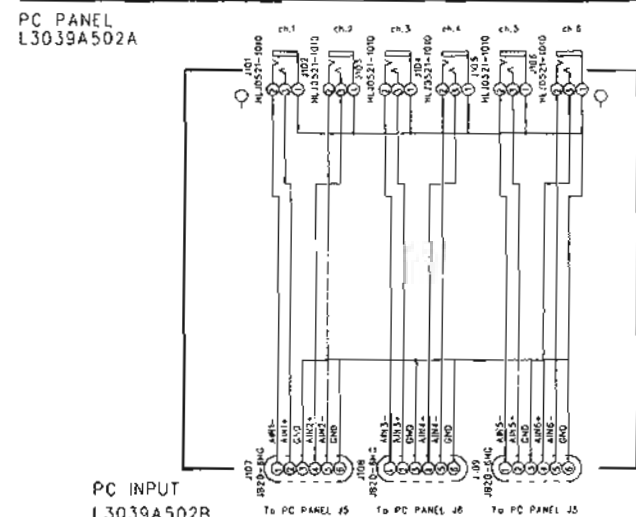
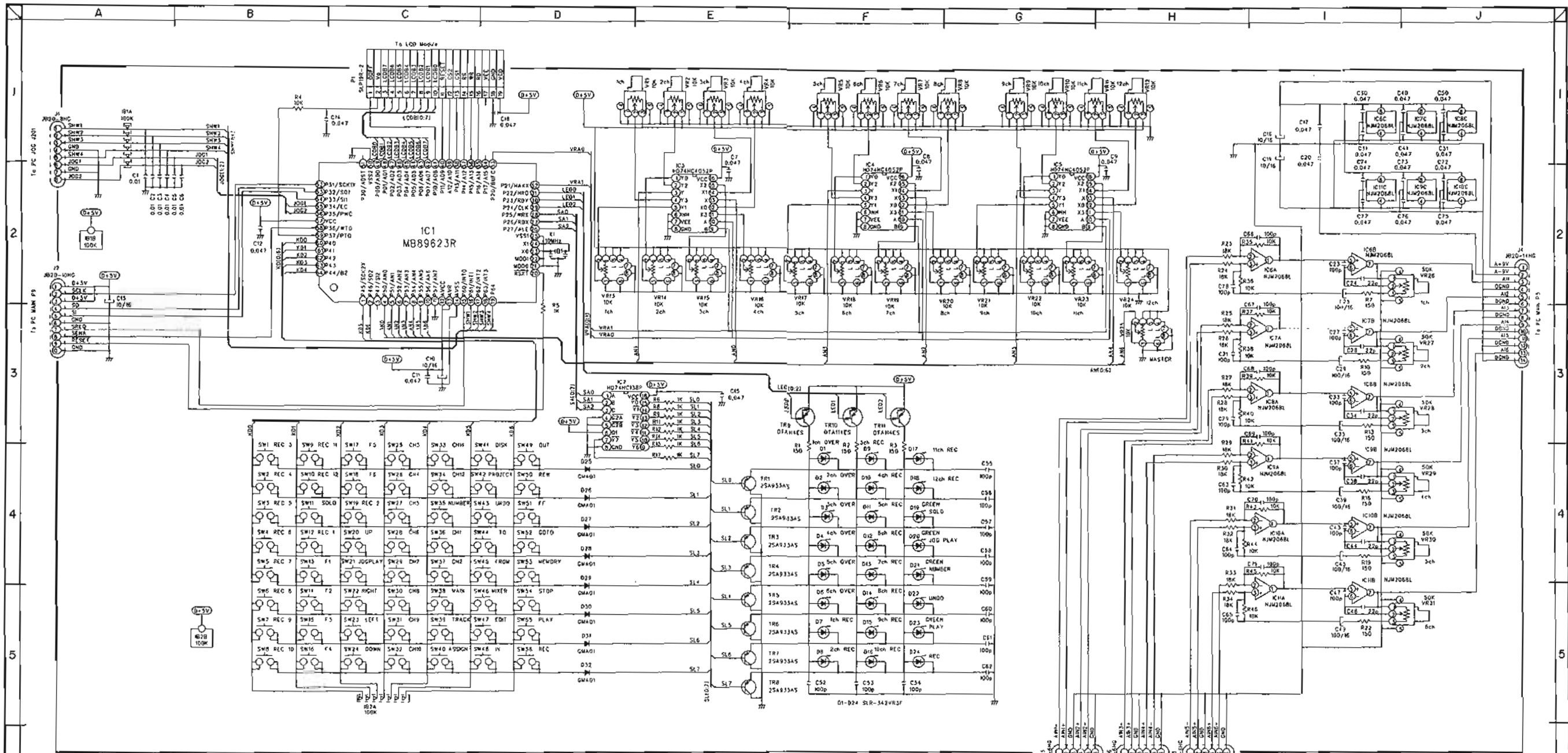
PC MAIN L3039A5010 (TOP VIEW)

PRINCIPAL PARTS LOCATION

- ICs
- IC1 A1
- IC2 A2
- IC3 C1
- IC4 B1
- IC5 D1
- IC6 C1
- IC7 B2
- IC8 C,D2
- IC9 C1,2
- IC10 A2
- IC11 A2
- IC12 E2
- IC13 B4
- IC14 A4
- IC15 A4
- IC16 A4
- IC17 A,B2
- IC18 A2
- IC19 C,D2
- IC20 B2
- IC21 A2
- IC22 D,E3
- IC23 A,B3
- IC24 A3
- IC25 A3
- IC26 A,B3
- IC27 A3
- IC28 E3,4
- IC29 D3,4
- IC30 C4
- IC31 A4
- IC32 A4
- PH1 C1

CONNECTORS

- J1 D,E1
- J2 C1
- J3 B1
- J4 C1
- J5 A1
- J6 E1
- J7 B1
- J8 A,B1
- J9 C2
- P1 A4
- P2 E2
- P4 E3
- P5 A3
- P6 E3
- P7 E3
- P8 E3,4
- P9 E4

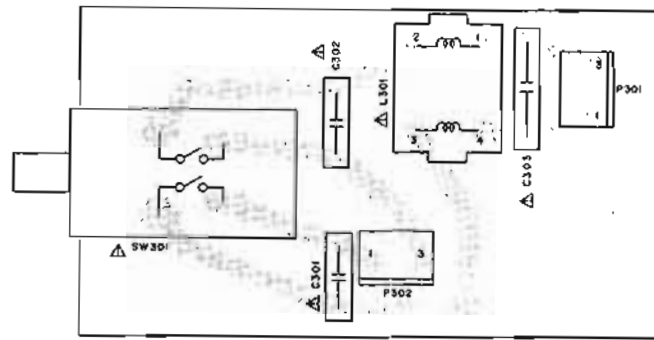


WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

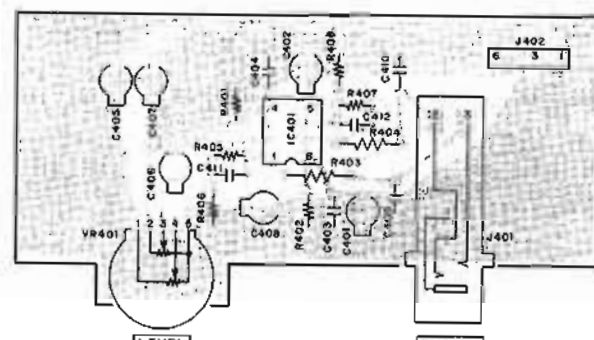
AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE RÉGIME DE SÉCURITÉ D'ÉQUIPEMENT, REMPLACER SEULEMENT LES PIÈCES RECOMMANDÉES PAR LE FABRICANT.

NOTE: UNLESS OTHERWISE SPECIFIED ALL RESISTORS IN OHMS (Ω/Ω/Ω) ALL CAPACITORS IN μF (μF/μF) ALL ELECTROLYTIC CAPACITORS IN μF/RY

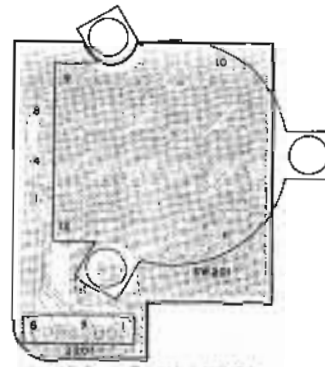
DPS12
OPERATION
SCHEMATIC DIAGRAM
NO 5-4 L3039704



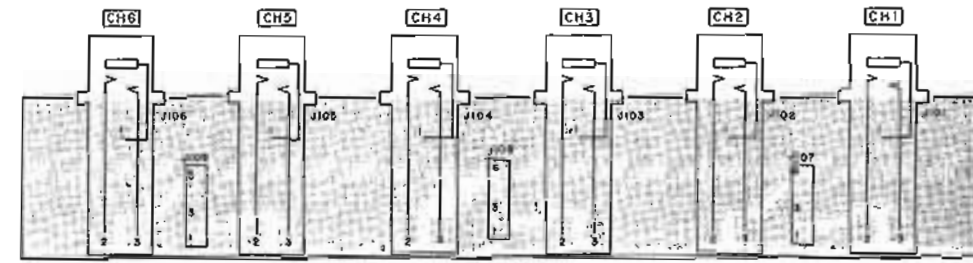
PC FILTER L3039A502D



PC HEAD PHONE L3039A502E

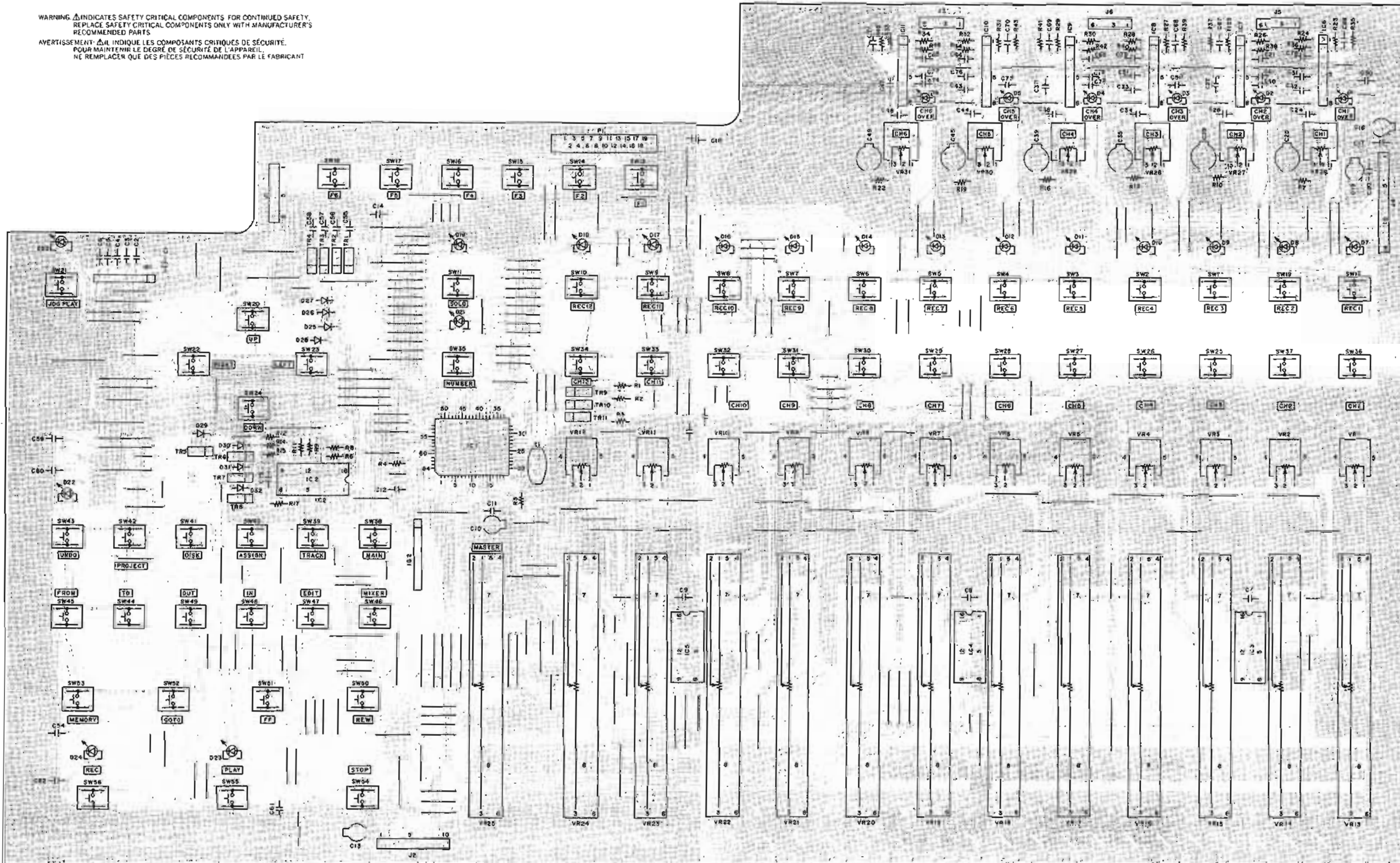


PC JOG L3039A502C

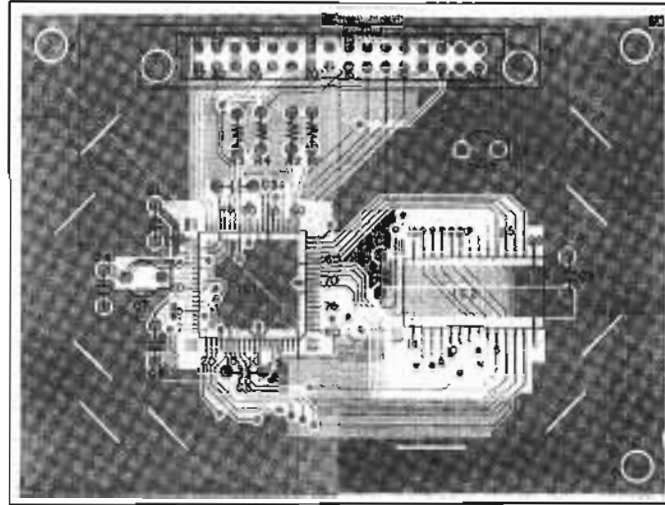


PC INPUT L3039A502B

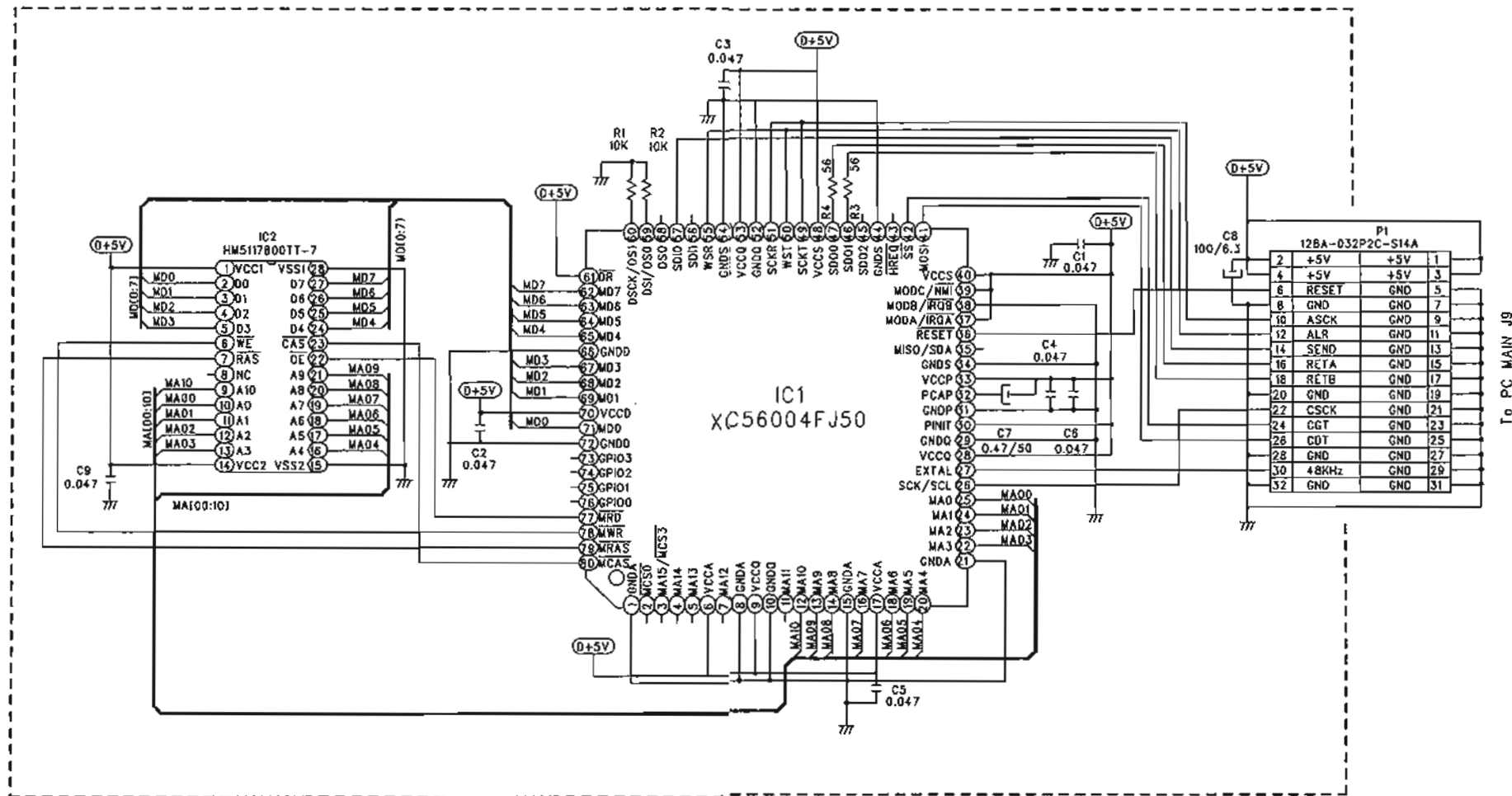
WARNING: Δ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.
 AVERTISSEMENT: Δ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT.



PC PANEL L3039A502A



PC EFFECT L8005B5010 (BOTTOM VIEW)

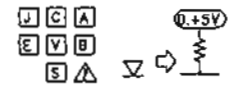


PC EFFECT L8005B5010

WARNING: INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT

NOTE: UNLESS OTHERWISE SPECIFIED
 ALL RESISTORS IN OHMS 1/6W(J)
 ALL CAPACITORS IN uF (P-pF)
 ALL ELECTROLYTIC CAPACITORS IN uF/WV

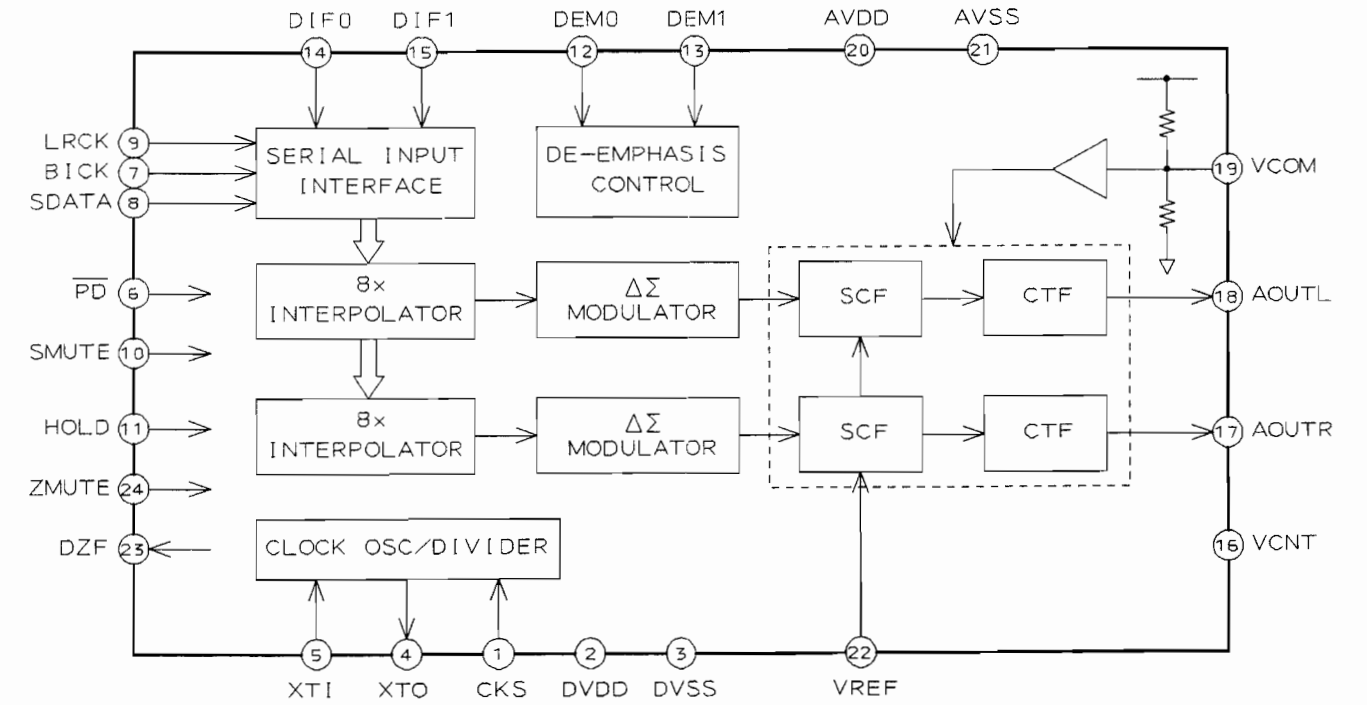


EB2M
 EFFECT
 SCHEMATIC DIAGRAM
 NO. 5-5 L8005701

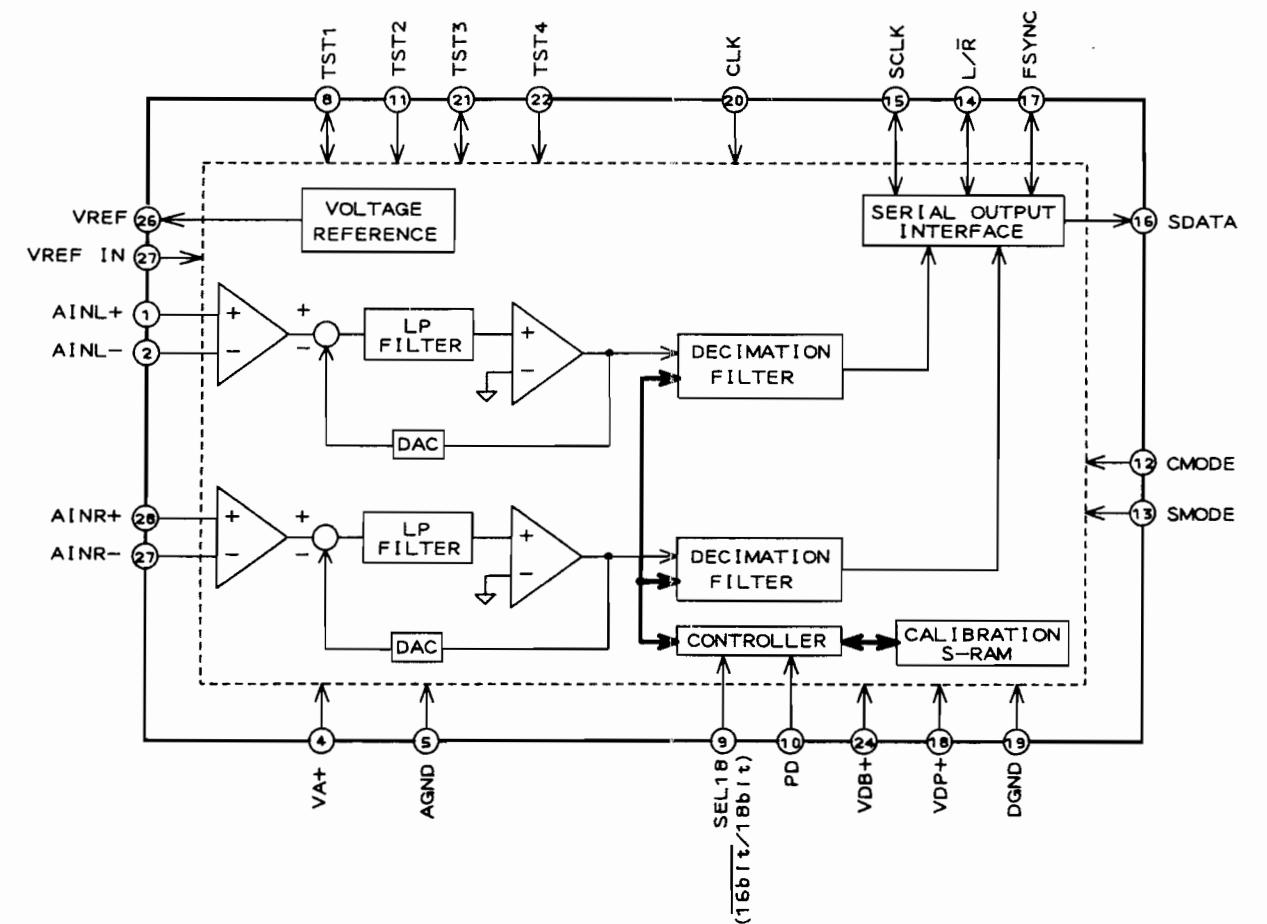
INFORMATION OF ICS

NAME OF IC	FUNCTION
AK4320-VM	Dual 1 bit $\Delta\Sigma$ type D/A converter with 20 bit 8 fs digital filter.
AK5340-VS	Dual 18 bit A/D converter with 64 fs oversampling digital filter.
AM27C4096-150DC	4 M bit E-P ROM.
AV9173-01-CS8	Video generator locked PLL.
CS8402A-CS	Digital audio transmitter.
DSP56002FC66	24 bit digital signal processor.
DSP56004	24 bit digital signal processor.
FLEX10K10QC208-4	FPGA (Field Programmable Gate Array) type control chip.
HD74HC00FP	Quad 2 input NAND gate.
HD74HC14	Hex schmitt trigger inverters.
HD74HC138P	3 to 8 line decoder.
HD74HC4052P	Analog multiplexers/demultiplexers.
HD6477032F16	16 bit host micro processing unit.
HM5117800TT-7	16 M bit Dynamic RAM.
HM5118160BTT-7	16 M bit Dynamic RAM.
M51953BFP	System reset pulse generator.
MB89623R	Operation control MI-COM.
MCCS142236	18 bit switchable active SCSI-2 bus terminator (110 Ω) with voltage regulator.
NCR53CF96-2	SCSI controller.
NJM2100M	Dual OP amp.
NJM2068L	Dual OP amp.
NJM4558M	Dual OP amp.
NJM4560D	Dual OP amp.
NJM7805FA	+ 5 V regulator.
NJM7809FA	+ 9 V regulator.
NJM7909FA	- 9 V regulator.
PA28F400VB-B80	4 M bit flash ROM
YM3623B	Receiver for digital audio interface formatted signal.

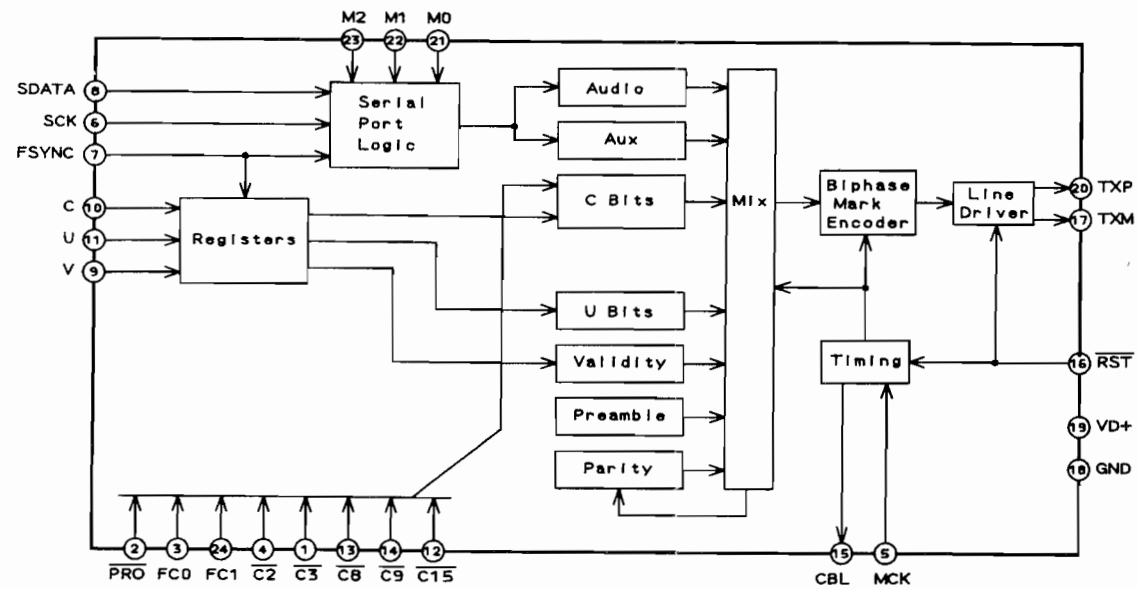
AK4320-VM (Dual 1 bit $\Delta\Sigma$ type D/A converter with 20 bit 8 fs digital filter.)



AK5340-VS (Dual 18 bit A/D converter with 64 fs oversampling digital filter.)

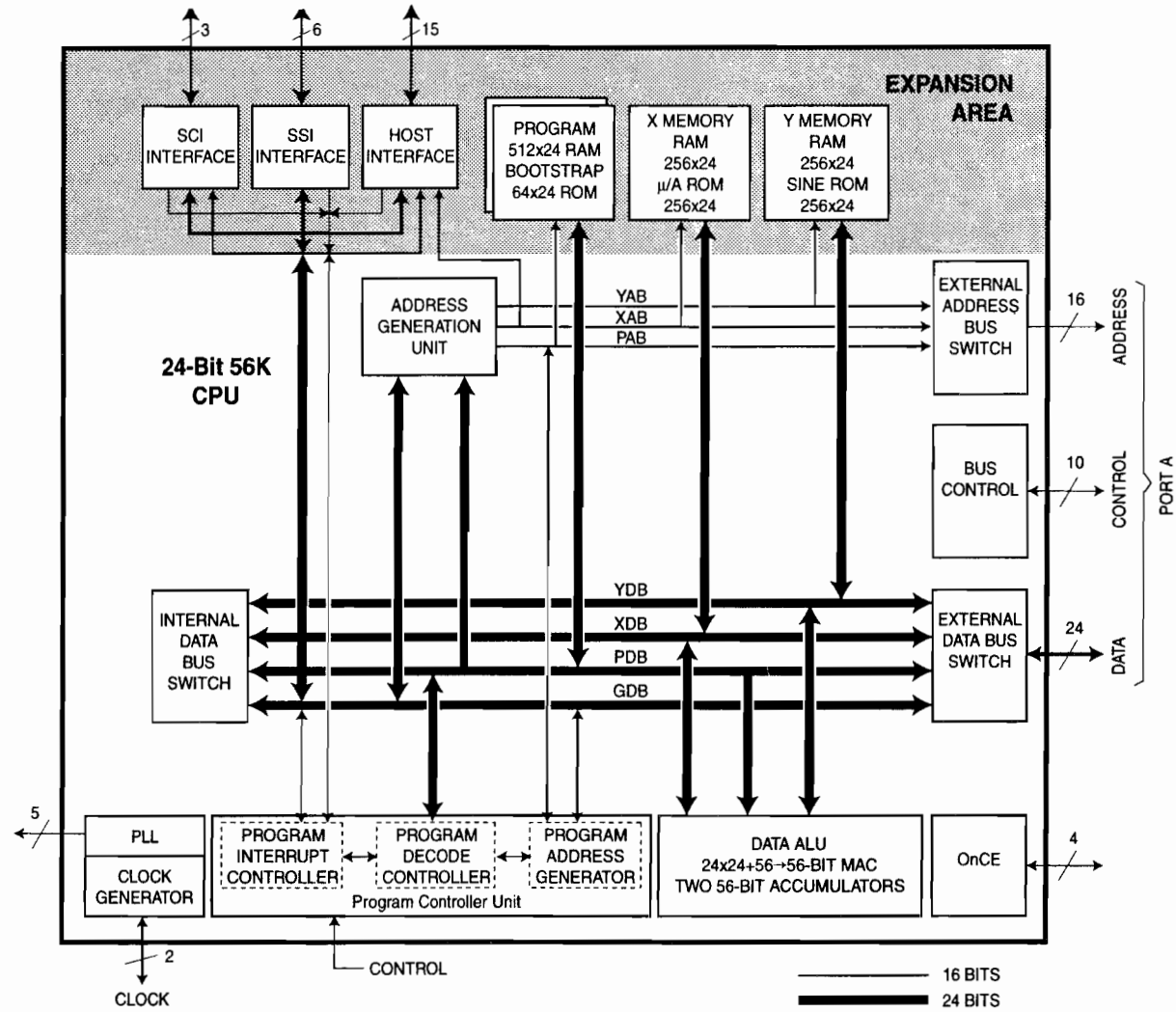


CS8402A-CS (Digital audio transmitter.)

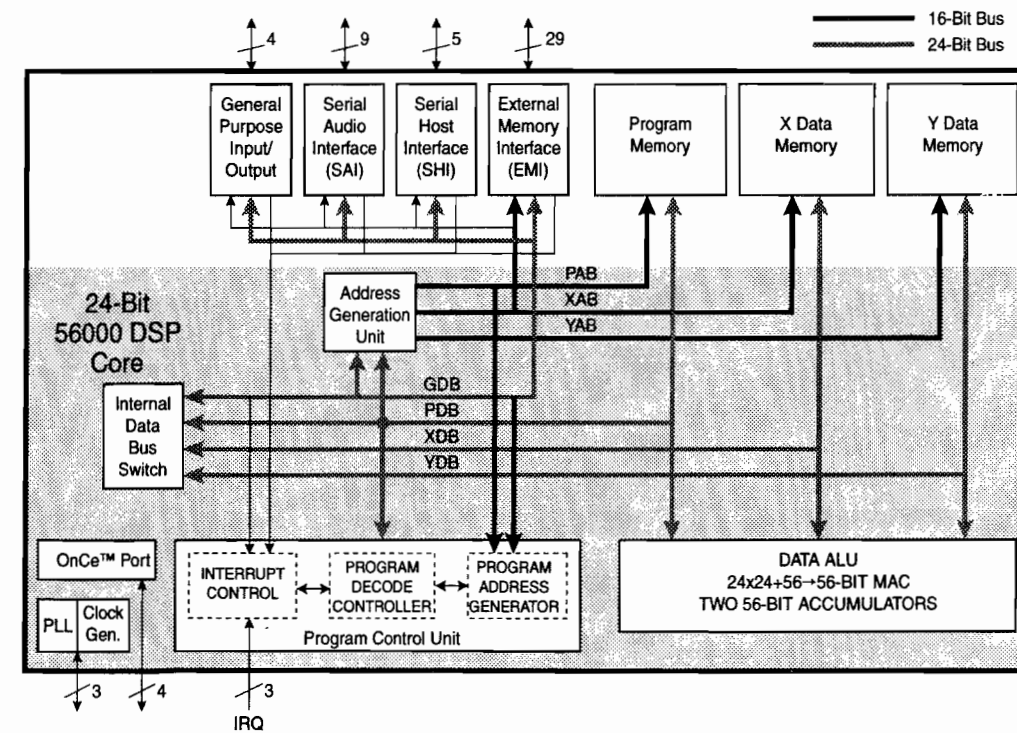


PIN No.	PORT NAME	I/O	FUNCTION
1	C7/C3	I	C7 is the inverse of channel status bit 7 (in professional mode). C3 is the inverse of channel status bit 3 (in consumer mode).
2	PRO	I	Select the professional mode (low) and consumer mode (high). C1 is the inverse of channel status bit 1 (in professional mode).
3	C1/FC0	I	FC0 and FC1 are encoded versions of channel status bits 24 and 25 (bits 0 and 1 of byte 3). When FC0 and FC1 are both high, CD mode is selected.
4	C6/C2	I	C6 is the inverse of channel status bit 6 (in professional mode). C2 is the inverse of channel status bit 2 (in consumer mode).
5	MCK	I	Master clock input pin.
6	SCK	I	Serial clock input pin.
7	FSYNC	I	Frame sync input pin.
8	SDATA	I	Audio data serial input pin.
9	V	I	Validity bit serial input port.
10	C/SBF	I	C is the channel status serial input port (in professional & consumer modes). This pin inputs the CD subcode frame clock (CD mode).
11	U	I	User bit serial input port.
12	C9/C15	I	C9 is the inverse of channel status bit 9 (in professional mode). C15 is the inverse of channel status bit 15 (in consumer mode).
13	EM1/C8	I	Emphasis 0,1 (In professional mode, EM0 and EM1 encode channel status bits 2,3 and 4).
14	EM0/C9		C8 and C9 are inverse of channel status bits 8 and 9. In professional and consumer modes, the channel status block output is high
15	CBL/SBC	O	for the first four bytes of channel status. In CD mode, this pin outputs the subcode bit clock.
16	RST	I	Master reset pin.
17	TXN	O	RS422 compatible differential line driver.
18	GND	-	Ground pin.
19	VD+	-	Positive side of the power supply pin.
20	TXP	O	RS422 compatible differential line driver.
21 - 23	M0 to M2	I	Serial port mode select pins. (Select the format of F SYNC and the sample edge of SCK with respect to SDATA.)
24	CRE/FC1	I	If CRE is high, the channel status local sample address and reliability flag are internally generated (in professional mode). FC0 and FC1 are encoded versions of channel status bits 24 and 25 (bits 0 and 1 of byte 3). When FC0 and FC1 are both high, CD mode is selected.

DSP56002FC66 (24 bit digital signal processor.)



DSP56004 (24 bit digital signal processor.)



DPS56002FC66 (24 bit digital signal processor)

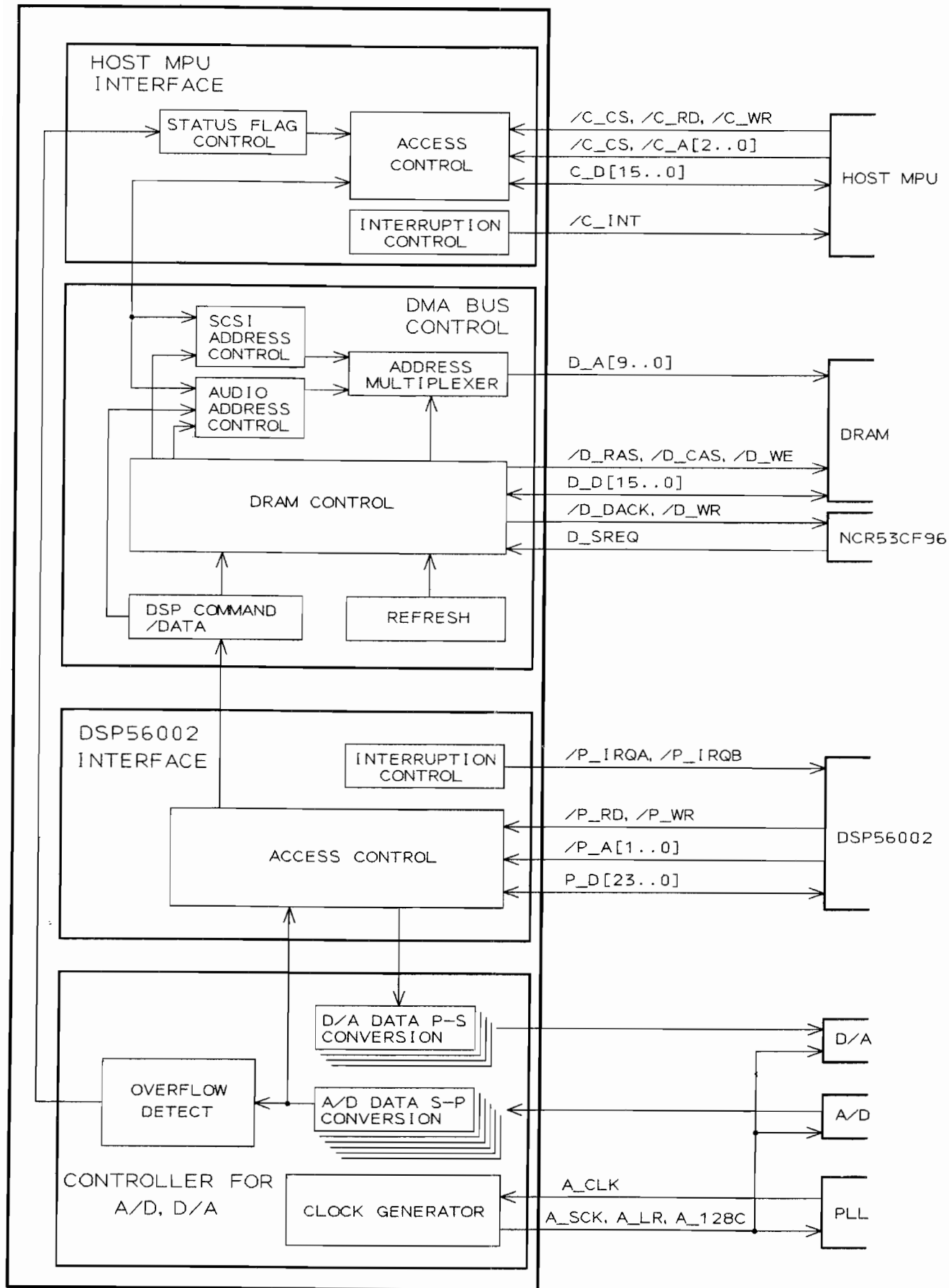
PIN No.	PORT NAME	I/O	FUNCTION
1	EXTAL	I	External clock or crystal input pin.
2,37,66,97	QVCC1-4	-	+ 5 V power supply input.
3,36,67,98	QGND1-4	-	Ground pins
4,6,7	HA0-2	I	Host address inputs for address selection of each host interface register.
5,11,16,22	HGND1-4	-	Ground pins.
8	HACK	I	Host acknowledge input pin.
9,20	HVCC1-2	-	+ 5 V power supply input.
10	HEN	I	Host enable input pin.
12	HR \bar{W}	I	Host read/write select pin. This input selects the direction of data transfer for each host processor access.
13	HREQ	O	Host request output pin.
14,15,17-19, 21,23,24	H0-7	I/O	Host data bus. The bidirectional bus transfers data between the host processor and the DPS56002.
25	RXD	I	Receive data pin. This input receives byte-oriented data and transfers the data to the SCI (serial communication interface) receive shift register.
26	TXD	O	Transmit data pin. This output transmits serial data from the SCI transmit shift register.
27,34,	SGND1-2	-	Ground pins.
28	SCLK	I/O	SCI serial clock in/out pin.
29	SC0	I/O	Serial clock zero pin. This pin's function is determined by whether the SCLK is in synchronous or asynchronous mode.
30	SVCC1	-	+ 5 V power supply input.
31	SCK	I/O	SSI serial clock in/out pin. This pin provides the serial bit rate clock for the SSI when only one clock is being used.
32	SC2	I/O	Serial control 2 pin. The SSI uses this pin to control frames synchronization only.
33	STD	O	SSI transmit data pin. This pin transmits serial data from the SSI transmit shift register.
35	SC1	I/O	Serial control 1 pin. This pin controls flag or frame synchronization. This pin's function is determined by whether the SCLK is in synchronous or asynchronous mode.
38	SRD	I	SSI receive data pin. This pin receives serial data into the SSI receive shift register.
39,40,49	-		Not used.
41	$\bar{B}N$	O	Bus needed pin. This pin is asserted whenever the chip requires the external memory expansion port (PORT A).
42	$\bar{W}T$	I	Bus wait pin. For as long as it is asserted by an external device, this input allows that device to force the DSP56002 to generate wait status.
43	$\bar{B}G$	O	Bus grant pin. When this output is asserted, it signals to the external device that it has granted the external bus (i.e. Port A has been three stated).
44	$\bar{B}R$	I	Bus request pin. When this input is asserted, the DSP56002 will always relinquish the bus to an external device such as a processor or DMA controller.
45	CVCC	-	+ 5 V power supply pin.
46	$\bar{W}R$	O	Write enable pin. This three state output is asserted to write external memory on the data bus (D0-D23).
47	$\bar{R}D$	O	Read enable pin. This three state output is asserted to read external memory on the data bus (D0-D23).
48	CGND	-	Ground pin.
50	DSCK/OS1	I/O	Debug serial clock/ Chip status 1 pin. This pin supplies the serial clock to the OnCE (On Chip Emulation) when it is an input.
51	$\bar{D}R$	I	Debug request input pin.
52	DSO	O	Debug serial output pin. The DSP reads serial data from the OnCE through the DSO output pin.
53	DSI/OS0	I/O	Debug serial input/ Chip status 0 pin. Serial data or commands are provided to the OnCE controller through the DSO/OS0 pin when it is input.
54	$\bar{B}S$	O	Bus strobe pin. The BS output is asserted when the DSP accesses Port A.
55	X \bar{Y}	O	* X/Y select pin. This three-state output selects which external data memory space (X or Y) is referenced by DS.
56,62, 70,75,81	NGND1-5	-	Ground pins.

PIN No.	PORT NAME	I/O	FUNCTION
57	$\bar{D}S$	O	* Data memory select pin. This three-state output is asserted only when external data memory is referenced.
58	BVCC1	-	Power supply pin.
59	$\bar{P}S$	O	* Program memory select pin. This three-state output is asserted only when external program memory is referenced.
60,61,63-65,68, 71-74,76-78, 80,82,83	A0-15	O	These three-state output pins specify the address for external program and data memory accesses.
69,79	NVCC2-3	-	+ 5 V power supply pins.
84,85,87,88, 90,91,93-96, 100,101,103, 104,106-109, 111,112,114, 115,117,118	D0-23	I/O	Bidirectional data bus for external program and data memory accesses.
86,92,99, 105,110,116	DGND1-6	-	Ground pins.
89,102,113	DVCC1-3	-	+ 5 V power supply pins.
119	MODC/ $\bar{N}MI$	I	Mode select C/ Non-maskable interrupt request pin. This input pin works with the MODA and MODB pins to select the chip's operating mode, and it receives an interrupt request from an external source.
120	MODB/ $\bar{I}RQB$	I	Mode select B/ External interrupt request B pin. This input pin works with the MODA and MODC pins to select the chip's operating mode, and it receives an interrupt request from an external source.
121	MODA/ $\bar{I}RQA$	I	Mode select A/ External interrupt request A/ Stop recovery pin. This input pin has three functions. It works with the MODB and MODC pins to select the chip's operating mode, it receives an interrupt request from an external source and it turns on the internal clock generator, causing the chip to recover from the stop processing state.
122	CLGND	-	Ground pin for the CKOUT output.
123	CKOUT	O	Clock output pin that is synchronized to the internal processor clock when the PLL is enable and locked.
124	CLVCC	-	CKOUT power supply pin.
125	$\bar{R}ESET$	I	This schmitt trigger input pin is used to reset the DSP56002.
126	CKP	I	This pin defines the polarity of the CKOUT clock output.
127	PVCC	-	Analog PLL circuit power supply.
128	PCAP	-	Capacitor connecting pin for the PLL filter.
129	PGND	-	Analog PLL circuit ground.
130	PLOCK	O	Phase and frequency locked pin. The PLOCK output originates from the phase detector.
131	PINT	I	PLL initialization input pin.
132	XTAL	O	Internal crystal oscillator output to an external crystal.

* Program and Data Memory Select Encoding

PS	DS	X \bar{Y}	External Memory Reference
1	1	1	No Activity
1	0	1	X Data Memory on Data Bus
1	0	0	Y Data Memory on Data Bus
0	1	1	Program Memory on Data Bus (Not Exception)
0	1	0	External Exception Fetch: Vector + 1 (Development Mode Only)
0	0	X	Reserved
1	1	0	Reserved

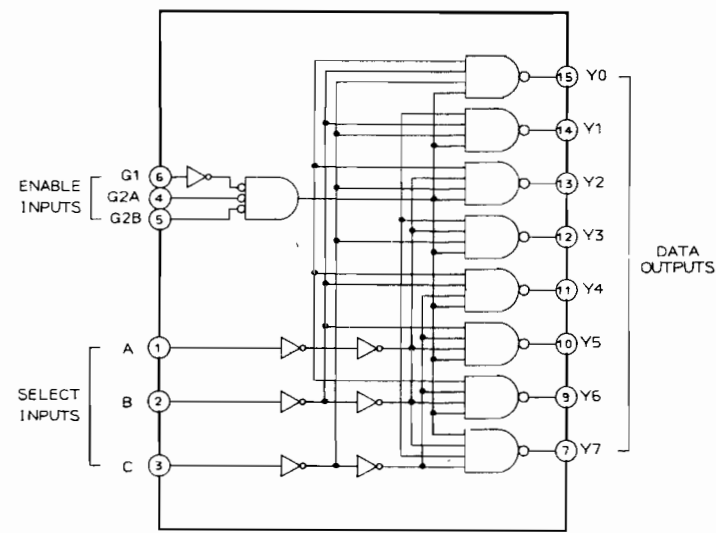
FLEX10K10QC208-4 (FPGA (Field Programmable Gate Array) type control chip.)



HD6477032F16 (16 bit host MPU)

PIN No.	PORT NAME	I/O	FUNCTION
1	IRQ6	I	Interruption input from FPGA.
2	IRQ7	I	Interruption input from NCR53C94.
3,12,22,31,40,52,61,72,96,106	VSS1-10	-	Ground pins.
4-11,13,14,16-21	AD0-15	I/O	Data bus lines.
15,43,70,75,83,84,99	VCC1-7	-	+ 5 V power supply pins.
23	A0	O	Address 0 (Upper strobe) pin.
24-30,32-39,41,42,44	A1-A21	O	Address bus lines.
48	CS0	O	Chip select 0 for Flash ROM (8 bit, 2 long wait).
49	CASH	O	Column address strobe (high) for DRAM.
50	CS2	O	Chip select 2 (8/16 bit) for DSP56002 (8 bit, 2 long wait).
51	CASL	O	Column address strobe (low) for DRAM.
53	CS4	O	Chip select 4 for NPC53C96 (8 bit, 2 state).
54	RAS	O	Raw address output for DRAM.
55	CS6	O	Chip select 6 for FPGA (16 bit, 1 long wait).
56	PA3/CS7/WAIT	O	Flash ROM write protect.
57	WR	O	Memory write strobe output.
58	PA5	O	Analog mute signal output.
59	RD	O	Memory read strobe signal output.
60	PA7	O	FPGA logic reset output.
62	PA8	O	FPGA configuration control signal output.
63	PA9	O	Data output to the optional Effect board.
64	TIOCA1	O	48 kHz clock output to the DSP56002.
65	PA11/TIOCB1	O	Reset output for the DSP56002.
66	PA12/DACK0	O	Data gate signal output to the optional effect board for data transmission.
67	PA13/DREQ0	O	Shift clock output to the optional effect board for data transmission.
68	PA14/DACK1	O	DSP56002 DMA acknowledge output to HACK.
69	IRQ3/DREQ1	I	DSP56002 interruption and DMA request from HREQ.
71	CK	O	System clock output.
73	EXTAL	-	Crystal connecting pin.
74	XTAL	-	Crystal connecting pin.
76	NMI	I	Non maskable interruption.
78	WDTOVF	O	Watch dog timer over flow output.
79	RES	I	Power on reset (if NMI=H) or manual reset (if NMI=L).
80-82	MD0-2	I	8 bit external ROM mode (if 3 pins are 000) or 16 bit external ROM mode (if 3 pins are 001).
85	AVCC	-	Power supply pin for the analog circuit.
86	AVREF	-	Voltage reference pin for the analog circuit..
87	PC0/AN0	I	Foot switch input.
88-90,92	PC1-4/AN1-4	I	Not used.
93	PC5/AN5	I	FPGA configuration signal input pins (CONF DONE from FPGA).
94	PC6/AN6	I	FPGA configuration signal input pin (nSTATUS from FPGA).
95	PC7/AN7	I	Digital receiver (YM3623B) error input pin.
97	PB0/TIOCA2	O	Analog reset output (I/O, AK4320PD & CS8402).
98	PB1/TIOCB2	O	Analog reset output (I/O, AK5340PD).
100	PB2/TIOCA3	O	Reset output for the optional effect board.
101	PB3/TIOCB3	O	Digital audio output FS selection control.
102	PB4/TIOCA4	O	Digital audio output FS selection control.
103	PB5/TIOCB4	O	MIDI output hardware control (THRU=H, OUT=L).
104	PB6	O	Transfer enable output to the operation MI-COM.
105	PB7	O	Transfer request output to the operation MI-COM.
107	PB8/RXD0	I	Serial receive data input 0 from MIDI.
108	PB9/TXD0	O	Serial transmit data 0 to MIDI (& to FPGA data 0).
109	PB10/RXD1	I	Serial data input 1 from the operation MI-COM.
110	PB11/TXD1	O	Serial data output 1 to the operation MI-COM.
111	SCK0	O	Shift clock output for the FPGA (to DCLK of FPGA).
112	SCK1	I	Serial clock input from the operation MI-COM.

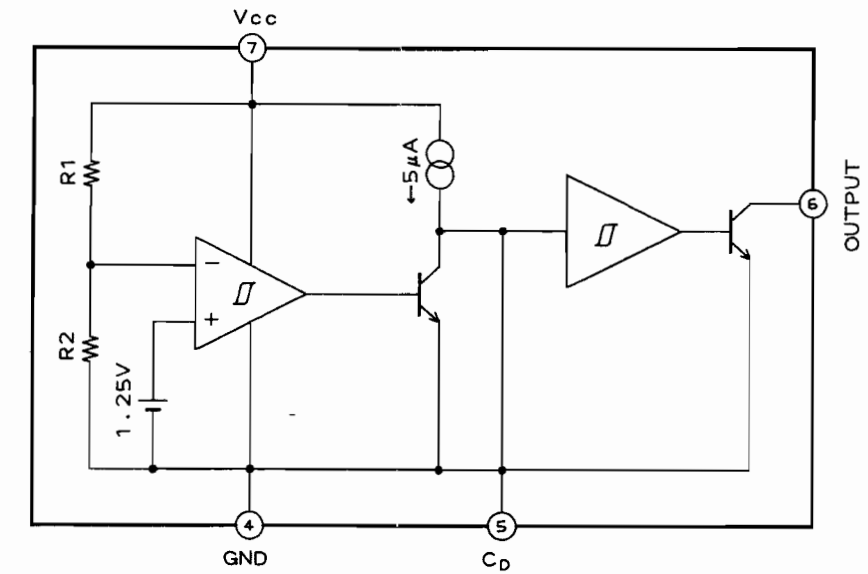
HD74HC138P (3 to 8 line decoder)



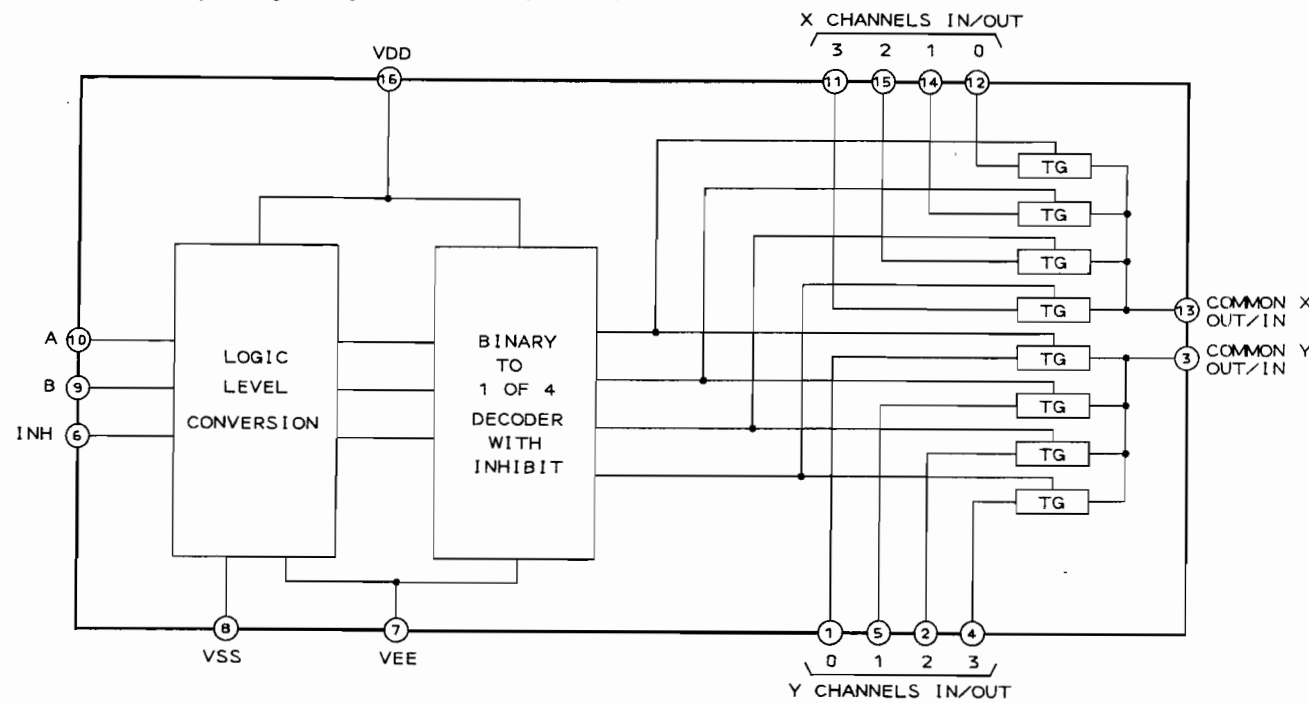
TRUTH TABLE

INPUTS			OUTPUTS								
ENABLE	SELECT			Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
G1	G2	C	B	A							
X	H	X	X	X	H	H	H	H	H	H	H
L	H	X	X	X	H	H	H	H	H	H	H
H	L	L	L	L	L	H	H	H	H	H	H
H	L	L	L	H	H	L	H	H	H	H	H
X	H	X	X	X	H	H	L	H	H	H	H
H	L	L	H	L	H	H	H	L	H	H	H
H	L	L	H	H	H	H	H	L	H	H	H
H	L	H	H	L	H	H	H	H	L	H	H
H	L	H	H	H	H	H	H	H	L	H	H
H	L	H	H	H	H	H	H	H	H	L	H
H	L	H	H	H	H	H	H	H	H	H	L

M51953BFP (System reset pulse generator.)



HD74HC4052P (Analog multiplexers/demultiplexers.)



MB89623R (Operation MI-COM)

PIN No.	PORT NAME	I/O	FUNCTION
1,2,60-64	P46-40	I	Key data input pins.
3	P47	-	Not used.
4-10	P50-56/AN0-6	I	A/D converter input pins. Each volume control's output voltage will enter these pins.
11	P57	-	Not used.
12	AVCC	-	+ 5 V power supply for the analog circuit.
13	AVR	-	+ 5 V reference voltage pin for the analog circuit.
14	AVSS	-	Ground pin for the analog circuit.
15	P60/INT0	I	Shift request pin. Data transmission request signal from the host MPU.
16-19	P61-64/INT0-3	I	Shuttle code input pins.
20	RSXT	I	System reset input pin.
21	MOD0	-	Operation mode control pins.
22	MOD1	-	
23	X0	-	Crystal connecting pin.
24	X1	-	
25,50	VSS1,2	-	Ground pins for the digital circuit.
26-28	P27-25	O	Select address pins. These signal select one of eight LED group and key group.
29-31	P24-22	O	Data output signal for the LEDs.
32,33	P21,20	O	Variable resistor address pins.
34	P17	-	Not used.
35	P16	O	Read strobe signal for the LCD register.
36	P15	O	Write strobe signal for the LCD register.
37	P14	O	Register select pin for the LCD.
38	P13	O	This pin selects chip1 of the LCD.
39	P12	O	This pin selects chip2 of the LCD.
40	P11	O	LCD reset signal output.
41	P10	O	LCD display on/off control.
42-49	P0-7	I/O	LCD data bus lines.
51	P30	-	Not used.
52	P31	O	Shift clock output to the host MPU.
53	P32	O	Serial data output to the host MPU.
54	P33	I	Serial data input from the host MPU.
55,56	P34,35	I	Jog data input pins.
57	VCC	-	+ 5 V power supply for the digital circuit.
58	P36	I	Shift enable pin. Data transmission enable input from the host MPU.
59	P37	O	PWM signal output for the LCD brightness control.

NCR53CF96-2 (SCSI controller)

PIN No.	PORT NAME	I/O	FUNCTION
1	DACK	I	DMA acknowledge signal from the DMA controller (L: active)
2	DBWR	I	DMA write signal (L: active)
3,28,39, 53,78,89		-	Not used.
4	IGS	O	Initiator group select signal (H: active)
5,7,17,18, 40,41,46,47, 54,55,60,61, 67,68,94,95	Vss	-	Ground pins.
6	TGS	O	Target group select signal (H: active)
8-15,19-26	DB0-15	I/O	16 bit data bus lines (H: active)
16	DBP0	I/O	Odd parity of DB7-DB0.
27	DBP1	I/O	Odd parity of DB15-DB8.
29-37	SDI7-0,SDIP	I/O	Low active schmitt trigger SCSI data/Parity input bus lines (SCSI data bus input in single end mode.)
42-45,48-52	SDO0-7,SDOP	O	SCSI data/parity output bus lines. (Low active SCSI data signal in single end mode.)
56	SELO	O	Open drain SCSI output signal.
57	BSYO		
58	REQO		
59	ACKO		
62	MSGIO	I/O	SCSI phase signal. (48 mA output in the target mode, schmitt trigger input in the initiator mode.)
63	C/DIO		
64	I/OIO		
65	ATNIO		
66	RSTO	O	48 mA open drain SCSI output.
69	SELI	I	Schmitt trigger SCSI input signal (L: active).
70	BSYI		
71	REQI		
72	ACKI		
73	RSTI		
76	INT	O	Open drain interruption signal to the micro processor (L: active).
77	RESET	I	Chip reset signal input.
79	WR	I	Register write signal (L: active).
80	RD	I	Register read signal (L: active).
81	CS	I	Chip select input.
82-85	A0-A3	I	Address input pins (non multiplex mode).
86	CLK	I	Clock signal input.
87	DIFFM	-	Differential mode enable pin (H: FSC is single end mode, L: differential mode.)
90-93,96-99	PAD0-7	I/O	Processor address data bus lines (H: active)
100	DREQ	O	DMA request signal to DMA controller (H: active)

YM3623B (Receiver for digital audio interface formatted signal)

PIN No.	PORT NAME	I/O	FUNCTION
1	Vdd1	-	+5 V power supply pin for system.
2	ADJ	I	VCO oscillating frequency adjusting pin.
3	VCO	I/O	Capacitor connecting pin for the VCO circuit.
4	Vss2	-	Ground pin for the VCO circuit.
5	XO	O	Crystal connecting pin.
6	XI	I	
7	KMODE	I	H : PLL circuit will operate when DIN pin receives input signal. System uses crystal oscillator when DIN pin has no input signal. L : System uses crystal oscillator whichever DIN pin receives signal or not.
8	ΦA	O	16.9344 MHz output (when the crystal oscillator is used). Output frequency varies according to the DIN input when the PLL circuit is operating.
9	ΦB	O	1/3 frequency of the ΦA (when the crystal oscillator is used). Output frequency varies according to the DIN input when the PLL circuit is operating.
10,11	T1,T2	I	Internal circuit check pins.
12	BCO	O	Timing clock for the output signal from DO pin.
13	SYNC	O	Synchronization signal.
14	Vss1	O	Ground pin for system.
15	L/R	O	Identification signal between L-ch and R-ch. (H : L-ch, L : R-ch)
16	DEF	O	H indicates that the input data is emphasised. L indicates that the input data is not emphasised.
17	DO	O	16 bit data output.
18	WC	O	This pin indicates that the output data is being output from the DO pin.
19	DIGR	O	signal out for R-ch deglitching.
20	DIGL	O	signal out for L-ch deglitching.
21	ERR	O	H indicates parity error or crystal oscillator is operating. L indicates there is no error.
22	SEL	I	Refer to the "NOTE"
23	S1	O	
24	S2	O	
25	SCK	O	Clock out for subcode output.
26	SSYNC	O	Signal for subcode.
27	SDO	O	Subcode data output pin.
28	DIN	I	Data input pin.

*NOTE : Relations between the SEL, S1 and S2

INPUT	OUTPUT		OUTPUT	
	S1	Function	S2	Function
L	L	Copy prohibited	L	CD (except DAT)
	H	Copy possible	H	DAT
H	L		L	The sampling frequency of the DIN signal is 44.1 kHz
	L		H	48 kHz
	H		H	32 kHz
	H		L	-