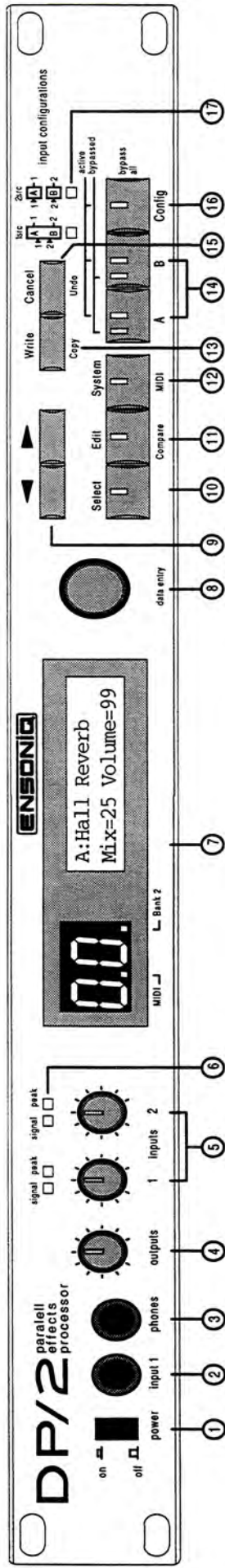


DP/2

Service Manual





Front Panel Controls

1. Power

The power switch turns the DP/2 on and off. This switch must be in the off (button out) position when connecting the PS-1 Power Supply to the rear panel.

2. Input 1

This 1/4" mono input jack is for connecting a guitar or any high or low impedance instrument. This jack is routed to the same input circuitry as the **Input 1** jack located on the rear panel, and is electrically equivalent. When an instrument is plugged into the front panel jack, **Input 1** on the rear panel is disabled.

3. Phones

Plug headphones into this 1/4" stereo jack to listen to the DP/2 in stereo. The signal going to this jack is from the sum of the rear outputs, even if they are not connected. The rear outputs are mapped to the stereo headphone as follows: 1 is mostly to the left; 2 is mostly to the right. Headphone volume is controlled by the **Output Knob**. Plugging headphones into this jack does not turn off the audio in the outputs.

Warning: The headphone output circuit is designed to minimize the volume differences between low and high impedance headphones. Because some headphones are more efficient than others, set the **Output Knob** accordingly — high output volume levels could damage your hearing.

4. Outputs Knob

The **Outputs** knob controls the stereo output level of each channel. If separate signals are being processed in the ENSONIQ DP/2, this knob will control their "overall" volume. The maximum output level is +17.3 dBu.

5. Input Knobs

These two input knobs control the gain applied to the input signals at Input 1 and 2 respectively. The input circuitry is designed to work with signals ranging from -18.5 dBV to +19.5 dBu. Use these knobs to set each input to the optimal level for the signal you are feeding into it.

6. Signal/Peak LEDs

The LEDs above the Input knobs indicate the level of the input signal being fed into the Analog-to-Digital Converters (ADCs) at Input 1 and 2 respectively.

- The Signal LED (green) will light when a low level signal (-30dB) is present at the input. Extremely low level input signals may not trigger this LED.
- The Peak LED (red) will light when the incoming signal reaches -6dB below the ADC clipping point.

For optimal level, adjust each **Input Knob** so that the Peak LED flashes only occasionally. Note that the Peak LEDs indicate the levels of the input signals only and will not reflect clipping in the digital processing stages.

7. LED Numeric and LCD Display

In Select mode, the red, two-digit LED display shows the preset number. In Edit and System/MIDI modes, this display shows the currently active parameter number. This will also show a "—" when the preset number is invalid (i.e. when current settings are not saved).

The 32-character alphanumeric LCD display shows you information about parameters, presets, and may also ask you for additional input.

The MIDI Message Indicator (the left red decimal point in the LED Display) will light momentarily to indicate MIDI reception in all system modes.

The Bank 2 Indicator (the right red decimal point in the LED Display) will light when the preset number displayed is from Bank 2.

8. Data Entry Knob

In Select mode, turning the **Data Entry Knob** will select presets. In all other modes, the knob will change the value of the currently active parameter. In most cases, turning clockwise will increase and counterclockwise will decrease the values.

9. Left and Right Arrow Buttons

The (←) and (→) buttons are used to change parameters except in Select mode, where they scroll to the next preset. Also when naming presets, they are used to change the cursor position within the name.

10. Select Button

This is used to select presets which can load effects into the units and set up signal routing parameters, depending on the type of preset selected.

11. Edit Button

This is used to edit preset parameters, edit preset names and save presets. Once you've edited parameters in an algorithm, the Edit LED will flash, and pressing this button will toggle between the original (saved) preset (solidly lit) and your newly edited version (flashing).

12. System/MIDI Button

This is used to view and modify system (or global) and MIDI parameters.

13. Write/Copy Button

The (WRITE/COPY) button is used to save or copy presets to the DP/2's internal RAM memory.

14. Unit Buttons

The two Unit buttons (A and B) correspond to the two separate signal processors in the DP/2. Use these buttons to activate a Unit for selecting presets or editing parameters. The yellow LED in each button will light when that Unit is active. When a Unit button is pressed a second time, it will be bypassed (the red LED will be lit). Pressing again will reactivate that Unit.

15. Cancel/Undo Button

The **Cancel/Undo** button is used to cancel command functions, return to the selected preset, or to undo your last unit or system parameter edit.

16. Config Button

This button allows you to select config presets and edit config parameters. When the Config is selected, the yellow LED above the button will light. By pressing this button a second time, you can bypass both Units (both red Unit LEDs lit). Pressing this button a third time will reactivate both Units (no red Unit LEDs lit).

17. Input Configuration LEDs

One of the LEDs beneath the diagram will be lit, to show the currently selected input configuration.

TABLE OF CONTENTS

TABLE OF FIGURES.....	2
IMPORTANT THINGS TO KNOW ABOUT THE DP/2.....	3
SAFETY FIRST!	3
OPERATING SYSTEM (O.S.) VERSIONS	3
CHECKING THE OPERATING SYSTEM VERSION	3
SAVING ALL DATA TO A SYS-EX STORAGE DEVICE (BACKING UP THE DP/2 RAM).....	4
LOADING DATA BACK IN FROM A SYSEX STORAGE DEVICE:	5
REINITIALIZING	5
TO REINITIALIZE FROM THE FRONT PANEL.....	6
TO REINITIALIZE USING THE SYSTEM RESET SEQUENCE	6
HARD RESET	6
SOFTWARE MESSAGES.....	7
MECHANICAL ISSUES	8
HARDWARE NOTES.....	9
DISPLAYS WITH POOR TOP VIEWING ANGLE	9
HOW THE DP/2 WORKS.....	10
MAINBOARD	10
KEYPAD/DISPLAY BOARD.....	10
FRONT PANEL JACK BOARD	10
TROUBLESHOOTING	11
THE POWER SUPPLY.....	12
POWER SUPPLY VOLTAGE CHECK POINTS	12
DP/2 TEST PROCEDURE.....	13
AUTOMATED TESTS.....	13
TESTING THE DISPLAY AND BUTTONS.....	16
TEST THE INPUT CONFIGURATION LEDS	16
CV PEDAL TEST.....	17
BATTERY BACKUP TEST.....	17
LOW BATTERY MESSAGE.....	18
BATTERY CAUTIONS	19
REPLACING DP/2 MODULES	21
SECTION A REPLACING THE DIGITAL BOARD	21
SECTION B REPLACING THE FRONT PANEL JACK BOARD	22
SECTION C REPLACING THE KEYPAD/DISPLAY BOARD.....	23
DP/2 MODULE PART NUMBERS	23

TABLE OF FIGURES

FIGURE 1 - LOCATING PIN 1	4
FIGURE 2 - SYS-EX DUMP SCREEN.....	4
FIGURE 3 - REINITIALIZATION SCREEN.....	6
FIGURE 4 - CORRECT TOOL FOR REMOVING CABLES	9
FIGURE 5 - CORRECTING DISPLAY WITH POOR TOP VIEWING ANGLE.....	9
FIGURE 6 - DP/2 MODULES	10
FIGURE 7 - DP/2 POWER SUPPLY PLUG PIN-OUT	12
FIGURE 8 - VOLTAGE TEST POINTS ON PCB MOUNTED POWER JACK	12
FIGURE 9 - INITIAL FRONT PANEL KNOB POSITIONS FOR TESTING	13
FIGURE 10 - REINITIALIZATION SCREEN	13
FIGURE 11 - ENTERING TEST MODE	14
FIGURE 12 - FIRST TEST STATUS SCREEN.....	14
FIGURE 13 - SECOND TEST STATUS SCREEN.....	15
FIGURE 14 - DOWNLOAD STATUS SCREEN.....	15
FIGURE 15 - EDITING THE PRESET NAME.....	17
FIGURE 16 - THE NEW PRESET NAME	18
FIGURE 17 - THE NEW PRESET NAME SHOULD STILL APPEAR	18
FIGURE 18 - A DP/2 DISPLAYING THIS MESSAGE NEEDS SERVICE.	18
FIGURE 19 - EXPLODED VIEW	20

IMPORTANT THINGS TO KNOW ABOUT THE DP/2

As with every ENSONIQ product, all DP/2 service will be handled through the ENSONIQ Module Exchange Program. Rather than diagnose and exchange individual components, you will replace complete modules. We feel that this is the most time and cost effective method of repair, both for you and your customers. If you have any questions about this, contact ENSONIQ Customer Service, refer to the back cover of this manual for contact numbers.

SAFETY FIRST!

Safety instructions are prioritized in the following manner:

-  **Warnings (To safeguard people).** Whenever there is the possibility that a person may harm themselves following instructions or procedures, you will see a warning.
-  **Cautions (To safeguard your equipment and the equipment you are working on).** Whenever there is a possibility of damage to your test equipment, you will see a caution.

 **Warning - Be careful! Do not receive an electrical shock!** Make sure the DP/2 power supply is unplugged before disassembling or reassembling the DP/2 or opening the case for any reason!

 **Warning -** The DP/2 is made out of aluminum extrusions and steel. **There are very sharp edges inside and outside the DP/2. Be careful not to cut yourself when working on a DP/2.**

 **Caution -** Make sure the DP/2 power switch is off before plugging in the power supply.

OPERATING SYSTEM (O.S.) VERSIONS

The DP/2 O.S. is contained entirely on EPROM chips installed in sockets on the DP/2 mainboard. Any O.S. changes require changing the O.S. EPROMs. If an O.S. change is necessary, an update kit will be made available for you to order from ENSONIQ Customer Service. Always check the DP/2 to make sure it has the current O.S.

CHECKING THE OPERATING SYSTEM VERSION

The DP/2 displays the software version on its initial power-up screen. Call the ENSONIQ Fax Retrieval System at 1-800-257-1439 and order document number 0010 for information on current operating system versions. Outside of the US call 1-610-408-0741. You can also call ENSONIQ Customer Service for information concerning O.S. versions. Refer to the back cover of this manual for contact numbers.

 **Caution** - The DP/2 O.S. EPROMs should always be justified to pin 1 on the chip and the socket (see Figure 1).

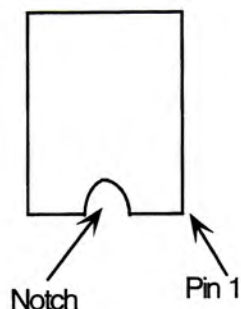


Figure 1 - Locating pin 1

SAVING ALL DATA TO A SYS-EX STORAGE DEVICE (BACKING UP THE DP/2 RAM)

The DP/2 is able to send System Exclusive (Sys-Ex) dumps containing all of the system parameters. These dumps can be directly transmitted to another DP/2, or can be recorded by an external device which has MIDI Sys-Ex recorder capabilities (such as the ENSONIQ TS-10, TS-12 or ASR-10) to be stored and later retransmitted to the DP/2.

 **Caution** - The System Exclusive ID number (system parameter 38) is embedded in every message, so it must be set correctly on the transmitting and receiving units.

1. Connect the MIDI OUT from the DP/2 to the MIDI IN of the storage device.
2. Press **(SYSTEM•MIDI)**.
3. Press the **(WRITE)** button at any time while in System-MIDI mode to engage the System Exclusive dump utility. The display looks similar to this:

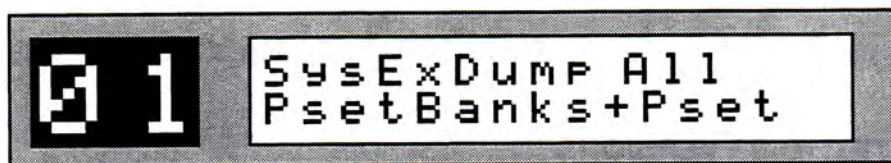


Figure 2 - Sys-Ex Dump Screen

4. If the display doesn't say "All Pset Banks + System", turn the data entry knob until it does.
5. Press **(WRITE)** once more to start transmission of MIDI data.
6. When the dump is complete, the display will say "Write OK" briefly to indicate the data was saved without errors.

LOADING DATA BACK IN FROM A SYSEX STORAGE DEVICE:

1. Connect a MIDI cable from the MIDI OUT of the storage device to the MIDI IN of the DP/2.
2. System Exclusive message reception is "automatic". It does not have to be enabled by any actions other than making sure that DP/2 System Exclusive reception is enabled and that the ID number setting matches the ID embedded in the dump to be received (System-MIDI parameters 38 and 39). The MIDI message indicator will light while the dump is being received. A confirmation message is displayed when the dump reception is complete.
3. Send the dump from the storage device.

 **Caution** - An error message will be displayed instead of the confirmation message if there was a problem with the incoming data. If no message appears after the MIDI LED goes off, then the dump was ignored. Make sure the Receive enable is set to "On" and the ID number is set correctly.

It is possible that some computer interfaces can transmit Sys-Ex dumps faster than the DP/2 can receive it. On many Macintosh applications, however, the Sys-Ex transfer rate can be reduced. You could also try reducing the speed of the interface (e.g., from 2x to 1x).

REINITIALIZING

The DP/2 is essentially a computer with its own operating system, RAM, and so on. Like a computer, it can lock up (stop operating) or glitch (behave erratically) if the RAM is corrupted by bad data. Some examples of how this can happen are if the unit receives a Sys-Ex transfer with bad data, if the unit receives a significant static shock, or if there is a power spike at the AC input.

Since scrambled data in RAM can cause problems that at first glance appear to be hardware related, reinitialization is recommended as a first step in troubleshooting.

Reinitialization causes all internal RAM to be erased, so periodic backing up of data is required to enable the user to restore the system.

 **Caution** - A given unit is likely to have data in RAM that is near and dear to its owner. It is highly recommended that you or the owner back up the unit's RAM before reinitializing it. See page 4.

 **Caution** - Unplug all audio cables before reinitializing. The audio outputs may make a loud pop when reinitializing.

There are three methods for reinitializing the DP/2. The method you should try first is reinitializing from the front panel. If the system is so scrambled that the front panel isn't responding, try the system reset sequence. If the unit still doesn't respond, try the hard reset procedure.

TO REINITIALIZE FROM THE FRONT PANEL

1. While holding down the **(SYSTEM•MIDI)** button,
2. Press the **(B)** button.
3. Press the **(▶)** button. The display shows:

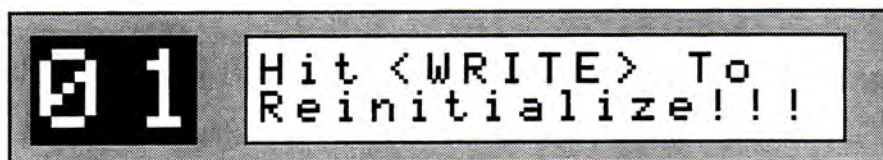


Figure 3 - Reinitialization screen

*To quit without reinitializing the system, press the **(CANCEL)** button.*

4. Press the **(WRITE)** button to reinitialize the DP/2. Remember that by doing this you will replace *all* of the RAM Preset data in the DP/2, and *all* System/MIDI parameters will be reset to their default settings.

TO REINITIALIZE USING THE SYSTEM RESET SEQUENCE

1. Turn the unit off and then on 8 times. When you turn it on, it should be just long enough to see the display start to show characters. When you turn it off it should be just long enough for the display to go dim. On most units, a one second interval between on and off works well. For example, you could count "off one thousand, on one thousand, off one thousand, on one thousand...".
Sometimes you may need to experiment with the interval between on and off.
2. The eighth time you turn the unit on, the unit should automatically reinitialize itself and show the wake-up screen.

If the front panel buttons still do not respond, try the hard reset procedure.

HARD RESET



Warning - Make sure the power is off and the power cord is disconnected from the unit.

1. Short the positive (+) side of the battery to the case of the unit for a few seconds.
2. When you turn the unit back on, it should be reinitialized.

If the reinitialization procedures do not return the DP/2 to normal operation, there is probably a defective module present. You should proceed to the troubleshooting section of the service manual.

SOFTWARE MESSAGES

Occasional unexpected event messages are not unusual, and unless they become chronic, they are not a cause for concern. It is important to realize that these messages are diagnostic in nature and do not necessarily indicate a problem. These messages were designed to help our software engineers in the development of the software, not as hardware diagnostics.

It is possible that chronic unexpected event messages could be caused by scrambled memory. Be sure to reinitialize the system before troubleshooting any further.

System error codes:

00	system reset error	used for reset (no error occurred)
01	pool head error	pool head value illegal
02	buffer pool error	bad buffer pointer
03	no buffers error	buffer pool depleted past limit
04	bad IRQ error	spurious IRQ interrupt
05	bad button error	unidentified byte from display
06	bad ptype error	illegal parameter type
07	bad value error	routine argument out of range
08	bad unit error	unit argument out of range
09	bad dc offset error	DC offset out of range
10	bad string error	string byte count exceeded limit
11	bad display char error	attempt to display illegal byte
12	display queue error	byte count disagrees with pointers
13	bad ucode rom ver	incompatible version of UCODE EPROM
127	illegal system error	invalid system error code encountered

ESP error codes:

ESP A	ESP B	Error
30	31	bad ucode tag
35	36	esp not halted error
40	41	esp never ready
45	46	esp sync error
50	51	gpr verify error
60	61	inst verify error
70	71	both verify error
75	76	DRAM clear bit error
80	81	table verify error
85	86	DRAM write error
90	91	download verify error

The following messages may appear at start-up and may or may not indicate a problem with the DP/2 . Usually if there is a problem, the message will only be one symptom. Take into account other symptoms reported by the user and troubleshoot the unit accordingly.

Warning Battery is Low - This may indicate that the RAM back-up battery is low, but it could also indicate a problem with the digital board (see page 18).

Warning Bad DC Offset(s) - Out of range DC offsets were detected when calibrating the two A/D inputs. This can indicate a hardware problem which requires repair, especially if the message is persistent. This message can also appear after selecting 2 Unit or Config presets, and will remain visible until a button is pressed to display a new page. Test the unit according to the test procedures in this manual if the message is persistent.

Units Reloaded ! Bad Unit Data=0# - This message indicates that illegal values were detected in the unit control block (UCB) of one or both of the units at start-up. This causes the last loaded config preset (or preset 50) to be reloaded. The displayed error message contains a code in which # = a hex digit (01..0F) showing which unit(s) had corrupted UCB data. In the hex digit, the unit bits are assigned in reverse order (i.e. 000000ba). Test the unit according to the test procedures in this manual if the message is persistent.

Unexpected Event Code ### - If the system becomes "stuck" in a repeating Unexpected Event loop, there are two options that can be used to handle the situation. While the Unexpected Event message is on the display you may either:

- Press **(WRITE)** to transmit a Sys-Ex All Data Dump. This allows the current contents of the RAM (presets and global parameters) to be saved to an external device; or
- Press **(SYSTEM)** to display the Hard Reset (reinitialization) prompt. Pressing write while this prompt is displayed will reinitialize the system and possibly cure the problem causing the error loop. Pressing any other key will return to the reset cycle.

MECHANICAL ISSUES

- **DP/2 case (avoid stripping screws):** Be careful when assembling or disassembling any part of the DP/2. **Do not over-tighten screws when repairing a unit! Use no more than 8 inch/lb. of torque when tightening any screw.** When replacing any screws, it is possible to over-tighten the screws and strip out a hole.
- **High Retention Force Connectors (Repair Technicians Label):** Inside the DP/2 is a warning/information label just for you. We wanted to let you know that we use high retention force connectors in the DP/2. This means it is very difficult to remove a connector by just pulling. We recommend using a scribe, screwdriver, or similar object when disconnecting cables. **Please don't pull on the wires!**



Caution - We have found that some units develop further problems once a module has been replaced. This may be the result of improper handling of cables. We recommend removing cable connectors using the angled end of a scribe (see figure 4).



Figure 4 - Correct Tool for Removing Cables

Scribes can be found in the following catalogs:

- Techni-Tool catalog, part number 400PR144.
- Newark catalog, part number 76-1510.

HARDWARE NOTES

DISPLAYS WITH POOR TOP VIEWING ANGLE

Two types of LCD displays have been used for the DP/2. Very early production units have a display with a green background and yellow characters, this is known as a negative display. Later units have a display with black characters, this is known as a positive display. Negative display units should not have a problem with the top view contrast.

There is a possibility that some positive display units have a poor top view contrast, that is, you must be looking directly at the display to read it.

If you have a customer that has a unit with a poor top view contrast, use the following procedure to correct it:

1. Remove the top cover from the DP/2.
2. From behind the keypad/display board, connect pins one and three together with a small piece of bus wire and solder (see figure 5). This shorts out R2 on the keypad/display board.
3. Power up the DP/2 and verify the top view contrast is improved.
4. Power down the unit and reinstall the top cover.

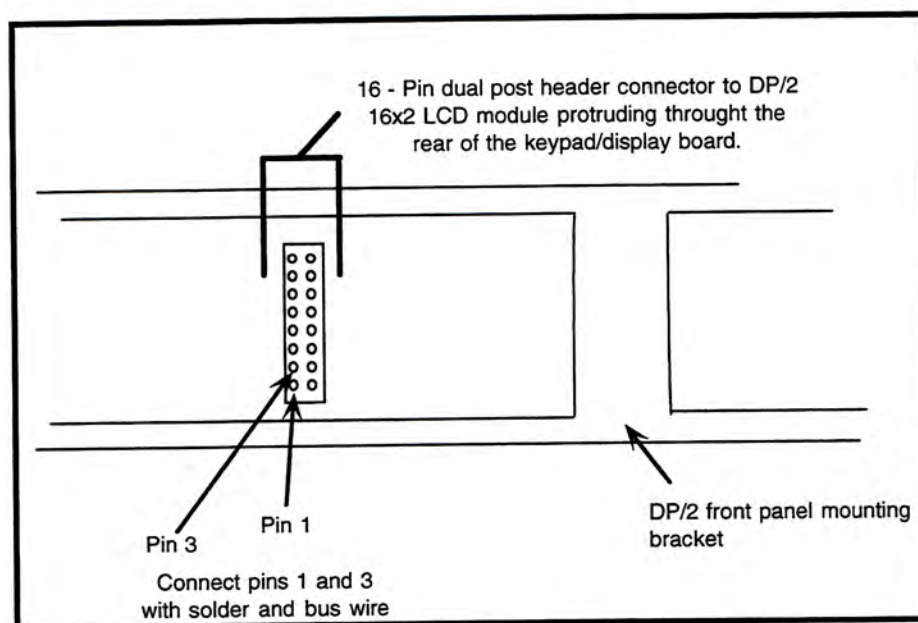


Figure 5 - Correcting display with poor top viewing angle

HOW THE DP/2 WORKS

The DP/2 is a very powerful computer based on the processing power of ENSONIQ's **ESP** chip. There are 3 PCB's inside the DP/2. There is a mainboard, a keypad/display board, and a jack board for the front panel inst/mic jack.

Figure 6 is a block diagram that shows the DP/2 modules.

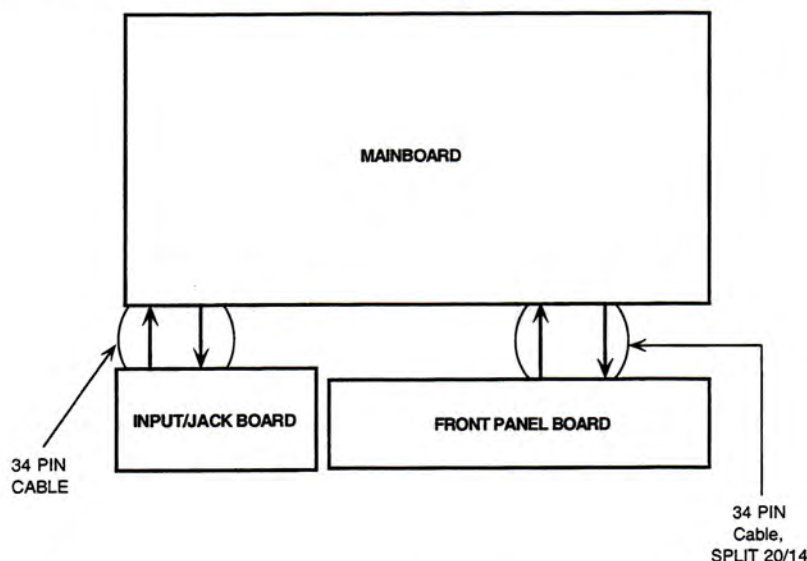


Figure 6 - DP/2 Modules

MAINBOARD

The mainboard does all of the signal processing. The analog to digital conversion, the digital to analog conversion and the effects processing.

KEYPAD/DISPLAY BOARD

The keypad/display board transmits user input to the digital board, and displays information transmitted from the digital board.

FRONT PANEL JACK BOARD

The front panel jack board has the power switch on it, the input and output volume controls, the headphone jack, and the front panel input jack on it. It is important to note that the analog preamplifier circuitry is on this board. This means that a unit demonstrating distorted audio problems could have a problem with this board or the mainboard.

TROUBLESHOOTING

Often the faulty module in a DP/2 can be determined through normal use. Sometimes it is difficult to isolate the problem. When troubleshooting a DP/2, be sure no devices are connected to the MIDI ports. It is also important to be sure the DP/2 is plugged into a properly grounded outlet.

You should always follow this sequence when troubleshooting a DP/2:

1. Reinitialize the unit.
2. Check the power supply voltages.
3. Run system tests.

Following this sequence will often save you and your customer's time.

Remember to always follow safety precautions to safeguard yourself, your test equipment, and the unit you are repairing.

The following chapters include troubleshooting and repair information.

THE POWER SUPPLY

POWER SUPPLY VOLTAGE CHECK POINTS

The DP/2 uses an external brick type power supply. If this power supply fails, there are replacement power supplies available from ENSONIQ customer service.

****The power from the wall outlet must be within $\pm 10\%$ of the rated voltage of the power supply unit.***

If the power supply is suspected to be faulty:

First check the power supply voltages with the power supply unloaded at the plug at the end of the power supply cord:

Use any ground pin for your meter's ground, then check that each of the 12-volt supplies and the 5-volt supply are within $\pm 10\%$.

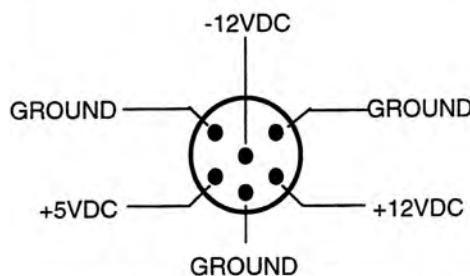


Figure 7 - DP/2 Power Supply Plug Pin-Out

If the voltages are bad there, order a replacement power supply module. If the voltages are good there, open the DP/2 and check the voltages inside the unit at the test points in figure 8 with the power supply plugged in and connected:

Use either ground pin for your meter's ground, then check that each of the 12-volt supplies and the 5-volt supply are within $\pm 10\%$.

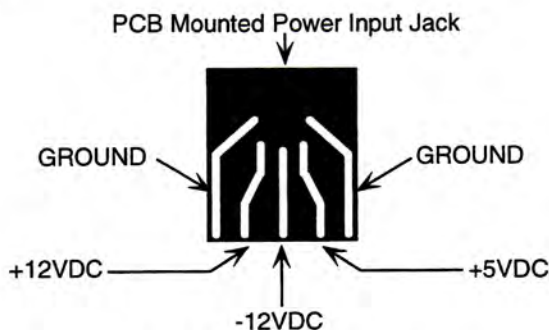


Figure 8 - Voltage Test Points on PCB Mounted Power Jack

- If the voltages are bad there, replace the DP/2 mainboard.
- If the voltages are good there and the unit will not power up, the mainboard or the front panel jack board may be faulty.
- Substitute a replacement jack board for the one in the unit.
- If the DP/2 still doesn't work with the replacement board, replace the mainboard.

DP/2 TEST PROCEDURE

The following tests should help you decide which module inside a DP/2 to replace in case of a failure. Remember that there are only three modules inside the DP/2 and most of the circuitry is located on the main board.

Equipment needed:

- 2 short mono-to-mono 1/4" audio cables
- Short MIDI cable
- CV pedal
- Dual footswitch (SW-10 or SW-5)
- ENSONIQ MIDI Bug™ or some other MIDI THRU indicator

AUTOMATED TESTS

1. Set the front panel pots as shown:



Figure 9 - Initial Front Panel Knob Positions For Testing

2. Connect the 2 audio cables:
Input 1 to output 1
Input 2 to output 2
3. Plug the MIDI cable in to the MIDI IN and MIDI OUT jacks. Connect the MIDI Bug to the MIDI THRU jack.
4. While holding down **(SYSTEM)**, quickly press **(B)** then press **(▷)** once. The display should read:



Figure 10 - Reinitialization Screen

5. Press **(WRITE)**. Let the DP/2 reinitialize.
6. While holding down **(SYSTEM)**, quickly press **(▶)**. The display should read:



Figure 11 - Entering Test Mode

7. Press **(WRITE)**. The built-in test code will loop through the following tests in the order shown:

- ROM Checksums.
- MIDI Loopback.
- ESP Dram.
- OS RAM.
- Audio Loop Test
- ESP MAC Test

While the tests are running, watch the MIDI through indicator for activity.

8. If the display is flashing “E r” then an error has occurred. Press **(◀)** to display the first test status screen.

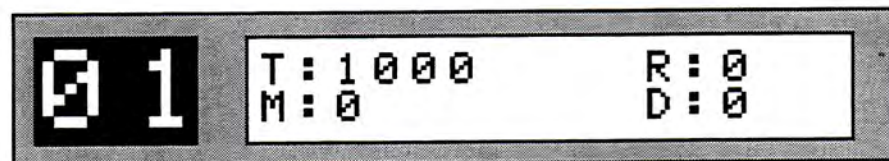


Figure 12 - First Test Status Screen

9. The first test status screen displays the following information:

- T:** **Total.** The total number of times the test has run.
- R:** **RAM.** OS RAM test failures.
- M:** **MIDI.** MIDI loopback test failures.
- D:** **DRAM.** ESP DRAM failures.

10. If the MIDI test has failed, make sure that the MIDI cable is in good working order and run the tests again. Failure of any of these tests means that the mainboard has to be replaced. If there is no MIDI THRU indicated (see step 7), replace the mainboard.

1. Press **(▶)** to display the second test status screen.

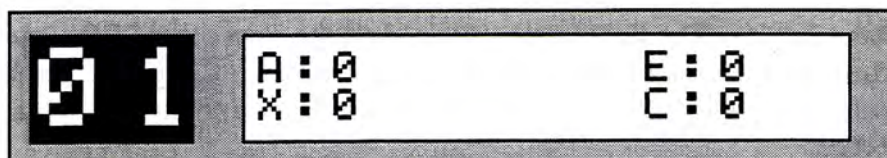


Figure 13 - Second Test Status Screen

12. The second test status screen displays the following information:
 - A: Audio.** Audio loopback test failures.
 - E: ESP.** ESP down load errors. Flashing red unit LEDs indicate which unit(s) are responsible for the failures.
 - X: MAC.** ESP MAC (multiply/accumulate) test errors. Flashing red unit LEDs indicate which unit(s) are responsible for the failures.
 - C: Checksum.** EPROM checksum test failures.
13. If the audio test fails, make sure your audio cables are in proper working order and run the test again. If the test still fails, replace the front panel jack board with a known good one. If the front panel jack board doesn't fix the problem, replace the mainboard. Failure of any of the other tests indicates a faulty mainboard.
14. Press **(SELECT)** to display the unit download status screen. This screen displays the number of times a unit failed to download data.

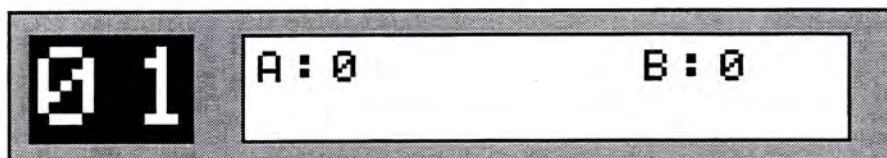


Figure 14 - Download Status Screen

15. If download errors are shown for either ESP chip, that may or may not indicate a faulty ESP chip. When an ESP chip fails to download, the processor invisibly and automatically tries again, and if it is successful a subsequent time, there may not be a problem with the ESP chip. If the number of download failures coincides closely with the number of test cycles (see figure 12), replace the mainboard. If the DP/2 is displaying chronic or persistent software messages (see page 7), and there are numerous download errors, replace the mainboard.

TESTING THE DISPLAY AND BUTTONS

1. Plug the dual footswitch into The Footswitch 1 jack. Test the front panel LEDs (excluding the signal and peak LEDs) by holding down **(SYSTEM)** and pressing **(CANCEL)**. The dual seven-segment display should now show "8 . 8 .". If each segment is not lighted, replace the keypad/display board.
2. The display should go blank after about five seconds. The display is now in self-test mode.
3. Test every button by pressing the button and checking that the correct message is displayed.

<u>Button Pressed</u>	<u>Display Should Read</u>
(WRITE•COPY)	BUTTON #10
(CANCEL•UNDO)	BUTTON #2
(◀)	BUTTON #12
(▶)	BUTTON #11
(SELECT)	BUTTON #13
(EDIT•COMPARE)	BUTTON #9
(SYSTEM•MIDI)	BUTTON #5
(A)	BUTTON #4
(B)	BUTTON #3
(CONFIG)	BUTTON #1

4. Test Footswitch 1 by pressing the left pedal and the right pedal while checking the display.

<u>Pedal Pressed</u>	<u>Display Should Read</u>
Left	BUTTON #14
Right	BUTTON #6

5. Remove the dual footswitch from the Footswitch 1 jack and plug it into the Footswitch 2 jack. Test Footswitch 2 by pressing the left pedal and the right pedal while checking the display.

<u>Pedal Pressed</u>	<u>Display Should Read</u>
Left	BUTTON #15
Right	BUTTON #7

6. Turn power off to the DP/2, then turn it on.
7. If any of the buttons do not respond properly, replace the keypad/display board.

TEST THE INPUT CONFIGURATION LEDS

1. Make sure the input configuration one source LED is on.
2. Press **(CONFIG)**, the config LED should light.

3. Turn the data entry knob until the dual seven-segment display reads "5 0".
4. Press **(SELECT)**.
5. The one source LED should turn off and the 2 source LED should turn on.
6. If this does not work, replace the keypad/display board.

CV PEDAL TEST

1. While holding down **(SYSTEM)**, quickly press **(CONFIG)**.
2. The display should read $A / D = \times \times \times$
3. Move the CV pedal fully down and make sure that $\times \times \times$ is a value from 152 to 255.
4. Move the CV pedal fully up and make sure that $\times \times \times$ is 000.
5. Disconnect the CV pedal and make sure that $\times \times \times$ is a value from 234 to 255.
6. Press **(CANCEL)** to exit this test.
7. If this test fails, check the CV pedal with an ohm meter. The pedal should read anywhere from 0 to 1000 ohms when up and from 9000 to 11000 ohms when fully depressed. If the pedal checks good, replace the mainboard.

BATTERY BACKUP TEST

1. Turn power OFF to the DP/2, then turn power back ON.
2. Press **(WRITE•COPY)** 2 times. The display should read:

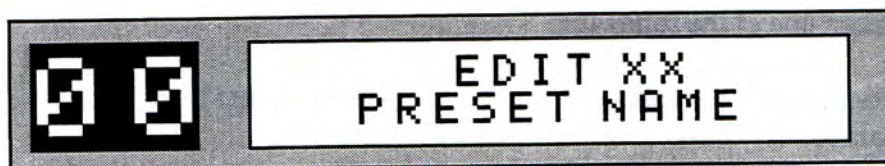


Figure 15 - Editing the preset name

3. Use the data entry knob to change a letter in the name. **NOTE! Remember the new name.**

4. Press **(WRITE•COPY)**. The display should read:



Figure 16 - The new preset name

5. Power the unit off & on 4 times. Then power off one more time and wait 10 seconds.
6. Power on the unit. The display should read:

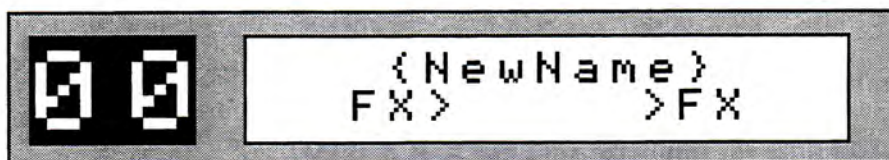


Figure 17 - The new preset name should still appear

7. If this test fails, see LOW BATTERY MESSAGE below.

LOW BATTERY MESSAGE

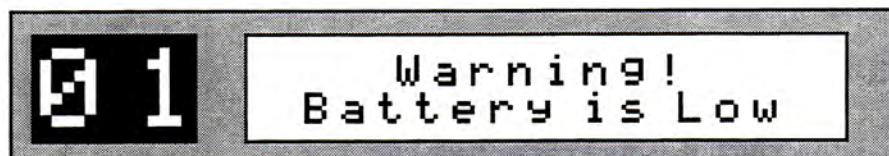


Figure 18 - A DP/2 displaying this message needs service

This message can mean one of the following:

1. The static RAM backup battery voltage is low and the battery should be replaced within a week to avoid possible data loss.
2. There is a problem with the digital board.

Measure the battery voltage. If it is below 2.7VDC, order a replacement battery from ENSONIQ Customer Service and replace it. If the battery voltage is 2.7VDC or above, order a replacement digital board.

BATTERY CAUTIONS

In order to comply with safety agency requirements, translations of the warning on the battery label inside the KT are listed here.

English CAUTION!

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

Denmark ADVARSEL!

Litiumbatteri - Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Lever det brugte batteri tilbage til leverandør.

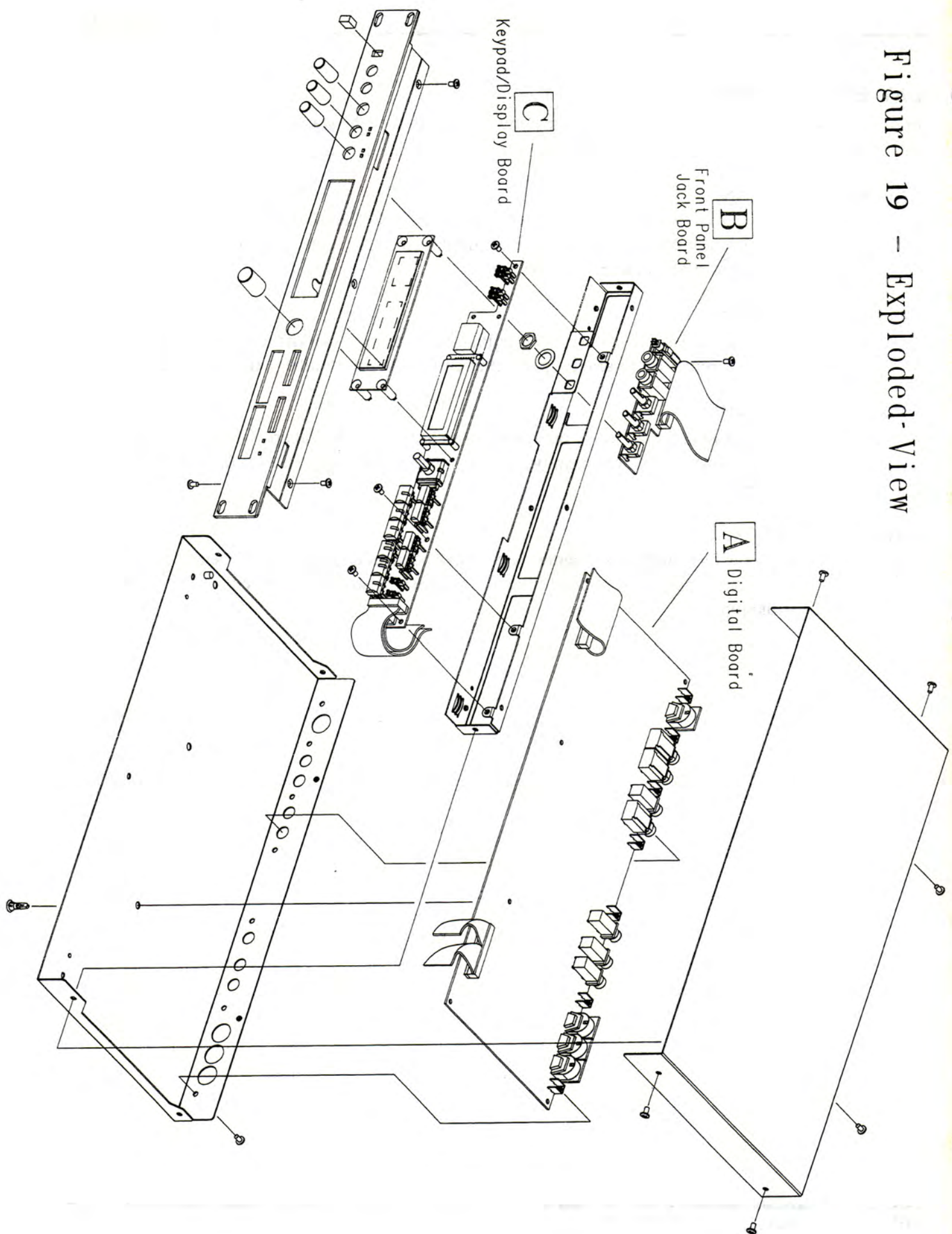
Finland VAROITUS!

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

Sweden VARNING!

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

Figure 19 - Exploded-View



REPLACING DP/2 MODULES

When reading sections A, B and C on the following pages refer to the exploded view in Figure 19.

SECTION
A

Replacing the Digital Board

Removing:

1. Remove any cables connected to the DP/2, including the power supply cable.
2. Remove all of the screws from the top cover of the DP/2.
3. Carefully remove the top cover from the DP/2.
4. Remove the 34-pin cable from J12 and the split 34-pin cable from J13.
5. Remove the seven screws from the back panel.
6. Using needlenose pliers to compress the four plastic stand-offs, release the mainboard from the four plastic stand-offs.
7. Lift the mainboard out of the unit.

Installing:

1. Place the new mainboard in the unit over the four plastic stand-offs, and push the mainboard onto the stand-offs until they snap into place.
2. Replace the screws removed in step 5 above.
3. Replace the cables removed in step 4 above.
4. Power up and reinitialize the DP/2 see page 5.
5. Test the DP/2 to see that it is repaired.
6. Power down the DP/2 and replace the DP/2 cover.
7. Clean the DP/2 by wiping it down with a slightly damp cloth before returning it to the customer.

SECTION

B

Replacing the Front Panel Jack Board

Removing:

1. Remove any cables connected to the DP/2 including the power supply cable.
2. Remove all of the screws from the top cover of the DP/2.
3. Carefully remove the top cover from the DP/2.
4. Remove the 34-pin cable from J3 on the front panel jack board and the 34-pin cable from J13 on the mainboard.
5. Remove the three screws along the top of the front panel assembly and the two outside screws along the bottom of the front panel assembly. Leave the center screw in place.
6. Slide the black aluminum extrusion off the unit.
7. Remove the input and output knobs from the input and output pots.
8. Remove the power switch knob from the power switch.
9. Unscrew the nuts from the input and output knob shafts and remove the washers.
10. The front panel jack board should now be able to be lifted from the metal frame.

Installing:

1. Put the new board in place in the metal frame.
2. Reinstall the nuts and washers removed in step 9 above.
3. Replace the knobs removed in steps 7 and 8 above.
4. Slide the black aluminum extrusion back on the unit.
5. Replace the screws removed in step 5 above.
6. Replace the cables removed in step 4 above.
7. Power up and reinitialize the DP/2 see page 5.
8. Test the DP/2 to see that it is repaired.
9. Power down the DP/2 and replace the DP/2 cover.
10. Clean the DP/2 by wiping it down with a slightly damp cloth before returning it to the customer.

SECTION**C****Replacing the Keypad/Display Board****Removing:**

1. Remove any cables connected to the DP/2 including the power supply cable.
2. Remove all of the screws from the top cover of the DP/2.
3. Carefully remove the top cover from the DP/2.
4. Remove the 34-pin cable from J3 on the front panel jack board and the 34-pin cable from J13 on the mainboard.
5. Remove the three screws along the top of the front panel assembly and the two outside screws along the bottom of the front panel assembly. Leave the center screw in place.
6. Slide the black aluminum extrusion off the unit.
7. Remove the three screws holding the keypad/display board to the metal frame.
8. You should now be able to lift the keypad/display board out of the metal frame.

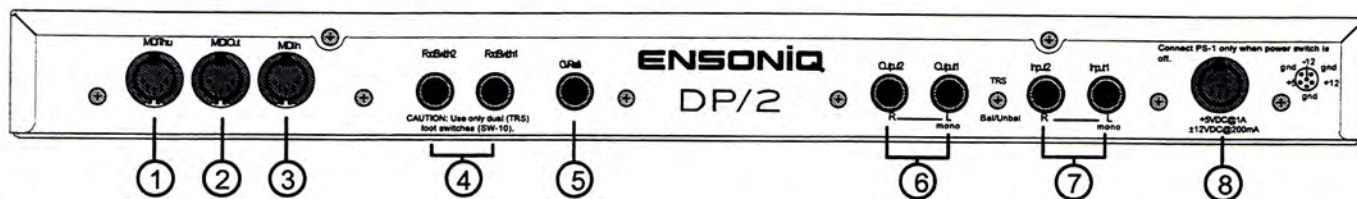
Installing:

1. Put the new board in place in the metal frame aligning it with the punched out slots.
2. Replace the screws removed in step 7 above.
3. Slide the black aluminum extrusion back on the unit.
4. Replace the screws removed in step 5 above.
5. Replace the cables removed in step 4 above.
7. Power up and reinitialize the DP/2 see page 5.
8. Test the DP/2 to see that it is repaired.
9. Power down the DP/2 and replace the DP/2 cover.
10. Clean the DP/2 by wiping it down with a slightly damp cloth before returning it to the customer.

DP/2 MODULE PART NUMBERS

Mainboard	4090028001
Front Panel Jack Board	4090028101
Keypad/Display Board	4090027401
Power Supply 120 Volt*	6010000201
Power Supply 100 Volt*	6010000301
Power Supply 230 Volt* European Union	6010000101
Power Supply 220 Volt* Non European Union	6010000401
Power Supply 240 Volt*	6010000501

**The power from the wall outlet must be within $\pm 10\%$ of the rated voltage of the power supply unit.*



Rear Panel Connections

1. MIDI Thru

"Passes on" all MIDI (Musical Instrument Digital Interface) information received by the DP/2 to other devices. Information generated by the DP/2 itself does not go to this jack — the Thru jack merely echoes what comes in at the MIDI In jack.

2. MIDI Out

Sends out MIDI information to other instruments and computers when the System/MIDI parameter "48 Send MIDI PrgChg + Controllers" is set to "ON."

3. MIDI In

This jack receives MIDI information from other MIDI instruments or computers.

4. Foot Switch 1 and 2 Jacks

These two independent foot switch jacks are designed for dual (stereo) foot switches, and can be assigned to a number of different functions, allowing a total of four independent foot switch controllers (when two optional SW-10 Dual Foot Switches are connected).

Warning!

The use of single (mono) foot switches is not recommended, and can affect the operation and performance of the DP/2.

5. CVPedal

This jack is for connecting an ENSONIQ Model CVP-1 Control Voltage Foot Pedal, which is assignable as a modulator to control parameters within the DP/2.

Pedal/CV Specs: 3-conductor (tip = control voltage input, ring = 424. Ohm resistor to +4.25 volts, sleeve = ground). 110. KOhm input impedance, DC coupled. Input voltage range = 0 to 4. volts DC. For use with an external control voltage, use a 2-conductor cable with the voltage on the tip and the sleeve grounded.

6. Output Jacks

The two ground compensated output jacks can be configured in either a single mono output or a mixed stereo signal.

7. Input Jacks

These two balanced input jacks are independent inputs and can be used in a 1 source or 2 source configuration.

8. Line

The ENSONIQ PS-1 Power Supply is connected here. The DP/2 power switch must be off when this is connected. Use only the PS-1 Power Supply from ENSONIQ.

ENSONIQ Customer Service

Hours: Monday through Friday 9:30 AM to 6:30 PM Eastern Time
Closed for lunch 12:15 PM to 1:15 PM
Parts ordering: U.S. ☎ 1-800-441-1003 (Confidential)
Canada ☎ 1-514-633-8877
ENSONIQ Fax: 1-610-647-8908
*Customer Tech Support: 1-610-647-3930
***This is the phone number to give customers that want to contact ENSONIQ directly (U.S.A).**

**Use the ENSONIQ Automatic Fax Retrieval System: 1-800-257-1439
or 1-610-408-0741 outside of the US**

**Learn how to retrieve schematics and other technical information by fax! Call ENSONIQ
Customer Service for instructions.**

When contacting ENSONIQ Customer Service, please have the following information ready:

- ☞ Model Number,
- ☞ Serial Number,
- ☞ Operation System Version,
- ☞ Warranty Status, and
- ☞ Your Purchase Order Number when ordering parts.



LEADING THE WORLD IN SOUND INNOVATION

Worldwide Headquarters:
155 Great Valley Parkway • Malvern, Pennsylvania 19355 U.S.A.

In Canada: Kaysound Imports, Inc.
2165 46th Avenue • Lachine • Quebec, Canada H8T2P1