

Analog Devices AD1816 Soundport Controller Driver for OS/2

Installation Instructions

Distribution Diskette File List

AD1816DD.SYS	- AD1816 Soundport controller driver
AD1816DD.SYM	- Driver symbol file
CARDINFO.DLL	- AD1816 Soundport controller card information file
AD1816.HLP	- AD1816 Soundport controller help file
AD1816.SCR	- AD1816 Soundport controller driver file list
CONTROL.SCR	- Main install script
README.TXT	- This file
UPDTCLK.BAT	- Batch file for updating timer basedevs
RSTRCLK.BAT	- Batch file for restoring timer basedevs
MPU401.SYS	- MPU-401 driver
MPURES.DLL	- MPU-401 resource DLL
AUDPLAY.ICO	- Audio ICON
MIDIPLAY.ICO	- MIDI ICON
JOYSTK.ICO	- Joystick ICON
OPLRES.DLL	- OPL3 resource file
OPL3.DLL	- OPL3 driver
OPL3.HLP	- OPL3 Help File
CLOCK01.SYS	- Timer driver
CLOCK02.SYS	- Timer driver
TIMER0.SYS	- Timer driver
GAMEDD.SYS	- Joystick driver
GAMEVDD.SYS	- Joystick driver
JOYSTK.CH	- Joystick install script

Before You Begin

Proper operation of the Analog Devices AD1816 Soundport Controller requires that:

- You are using OS/2 Warp version 3.
- The OS/2 Multimedia Extensions are installed.
- The Analog Devices AD1816 driver is installed.

NOTE: You must have the OS/2 Multimedia Extensions installed BEFORE you install this driver. You will use the OS/2 Multimedia Extensions to install and configure the Analog Devices AD1816 Soundport Controller driver.

If your installation fails, you may need to update some of your OS/2 system files. See the "Troubleshooting" section for more information.

Checking for the OS/2 Multimedia Extensions

Check your system for the following conditions:

- If the extensions are already installed you will see the “Multimedia” icon on your OS/2 desktop. If the extensions are already installed, skip ahead to the procedure “Installing the AD1816 Soundport Controller Driver.”
- If the “Multimedia” icon is not visible, OS/2 Multimedia Extensions may not yet be installed. Install the extensions using the following procedure.

Installing the Multimedia Extensions

To install the Multimedia Extensions:

1. Open the “OS/2 System” folder on the OS/2 desktop. Double-click the “System Setup” icon.
2. From the “System Setup” window, double-click the “Selective Install” icon to display the “System Configuration” window. The box labeled “Multimedia Device Support” in the lower left corner of the “System Configuration” window should read “None”.
3. Click the “OK” button. The “OS/2 Setup and Installation” window appears.
4. Click the box next to “Multimedia Software Support”. You should now see a check mark in that box.
5. Click the “Install” button. OS/2 will begin installing the extensions. Follow all on-screen instructions, including the last one that instructs you to restart your system. Once your system has restarted, use the following procedure to install the driver for the Analog Devices AD1816 Soundport Controller.

Installing the AD1816 Soundport Controller Driver

To install the AD1816 Soundport Controller Driver:

1. Double-click the “Multimedia” folder icon on the OS/2 desktop. Run the “Multimedia Application Install” program.
2. Insert the AD1816 Soundport Controller OS/2 Driver Diskette into your diskette drive.
3. Use the drop-down “Drive” list box to select the drive letter, A: or B:, that contains the diskette.
4. Click the “Analog Devices AD1816” line to place a check mark next to the selection. By default, the AD1816 driver installation does not install the MPU-401 support for MIDI devices. If you want MPU-401 support, click the “IBM MPU-401” line to place a check mark next to it.
5. Click the “Install” button. If you receive a warning that the program will change your CONFIG.SYS file, click the “Yes” button to allow the program to make the required changes.
6. The “Analog Devices AD1816” window appears. This window displays the configuration information for the AD1816 Soundport Controller. Note that the Analog Devices AD1816 Soundport Controller has no jumpers or switches; all of the hardware configuration is from this window.
7. Click the “OK” button. You will receive several additional notifications: installation windows for several driver components, that your CONFIG.SYS file was backed up, and that the installation is complete. Click “OK” on each of these alerts.

8. Exit OS/2 and reboot your system. When you reboot your system you should hear the OS/2 start-up sounds, indicating that your audio card is properly installed and working.

Configuring the 3D Sound Features

The Analog Devices AD1816 Soundport Controller can produce sound in simulated 3D. This feature is controlled using the card's configuration window. To access these settings:

1. Open the "OS/2 System" folder on the OS/2 desktop. Double-click the "System Setup" icon.
2. From its window, run "Selective Install" to display the "System Configuration" window.
3. In the "System Configuration" window, the "Multimedia Device Support" drop-down list should show the "Analog Devices AD1816 Soundport" as the active device. Click the square button next to the device name.
4. Click the "Device Settings" button to display the card's hardware settings. The "Analog Devices AD1816" window appears. This window contains controls to turn 3D effects on or off, and change the acoustic properties of the 3D simulation algorithm.
5. After you have changed the settings, click the "OK" button. The changed settings take effect immediately, and are written to your CONFIG.SYS file to be used when you start OS/2.

Troubleshooting

A majority of problems observed with the AD1816 Soundport device drivers for OS/2 Warp 3 are caused by inconsistent versions of the following system files: CLOCK01.SYS, CLOCK02.SYS, TIMER0.SYS, and OPL3.SYS. Before continuing, make sure that your versions of these system files match the AD1816 Soundport device driver install diskette files:

```
\OS2\BOOT\CLOCK01.SYS
\OS2\BOOT\CLOCK02.SYS
\MOS2\TIMER0.SYS
\MOS2\OPL3.SYS
```

If your files do not match the versions on the diskette, then either copy the diskette files over the files on your system, or use the UPDTCLK.CMD or UPDTCLK.BAT command files to update your system files.

Note that this command file saves a copy of CLOCK01.SYS and CLOCK02.SYS to CLOCK01.WRP and CLOCK02.WRP respectively. Do not overwrite or delete these files as these files can be used to restore your original configuration, if required. Use the RSTRCLK.BAT command file to restore your original CLOCK01.SYS and CLOCK02.SYS drivers in the \OS2\BOOT directory.

Problems Observed and Possible Solutions

Exception in device driver: CLOCK\$ TRAP 00d

This problem is due to mismatched CLOCK01.SYS, CLOCK02.SYS, and TIMER0.SYS drivers installed on your system. Make sure that the CLOCK01.SYS, CLOCK02.SYS and TIMER0.SYS drivers from the AD1816DD.SYS driver install diskette are copied into the proper subdirectories of the system.

Make sure that the \OS2\BOOT directory has its read-only attributes reset. Use ATTRIB CLOCK0?.SYS to view the attributes, and ATTRIB -r to reset the read-only attributes, if required. To install the files:

1. Copy CLOCK01.SYS to \OS2\BOOT
2. Copy CLOCK02.SYS to \OS2\BOOT
3. Copy TIMER0.SYS to \MMOS2

Or, use the UPDTCLK.BAT command file to update these drivers.

MINSTALL Display “MMPM/2 Copy Failed File in Use” while doing install

This problem is due to some CLOCK01.SYS and CLOCK02.SYS files having the read-only attribute set. Use OS/2's ATTRIB.EXE utility to reset the read-only attribute for these files. Note that on some versions of Warp, an option is presented to retry the operation, and when a retry is attempted, the copy appears to have succeeded, and in fact fails. This problem may manifest itself as a trap when trying to play a MIDI file (see TRAP in CLOCK\$ driver when opening MIDI player).

When performing a shutdown while the MIDI player is still open, the system hangs.

This problem is due to mismatched CLOCK01.SYS, CLOCK02.SYS, and TIMER0.SYS drivers. Use the procedure described above to correct this problem.

When playing a MIDI file, I switch to Audio Player, then back to MIDI player. No audio is heard, and an error occurs when I press start, pause, or stop.

This problem is due to an inconsistent version of OPL3 with the version of WARP 3 and the TIMER0.SYS set of drivers. Use the procedure described above to correct this problem.

List of Known Problems

This driver is a Beta-level release. There are four known problems that we are working to correct. Where required, we are working with IBM to resolve these problems as quickly and efficiently as possible. Three of the problems relate to a conflict between multimedia applications and the use of system sounds. These problems can be solved by turning off

system sounds.

Problem 1

The Digital Audio applet gives an error message after you:

1. Click Record.
2. Click Stop.
3. Click New.
4. Click Discard.

The error message may say that either the device is busy or that there was a device error. This is a problem with the way Digital Audio interacts with the device driver while Warp tries to play system sounds. To avoid this problem, turn off system sounds. Alternatively, close Digital Audio and restart it to continue, or save the recorded audio to a file.

Problem 2

The MIDI Player Applet displays an error after you take the following steps:

1. Start playing a MIDI file using the MIDI Player applet.
2. Bring up another multimedia application, such as Master Volume or Digital Audio.
3. Click on the MIDI Player applet.
4. Close the other application.
5. Click the MIDI Player applet Start button.

This is a problem with the way MIDI Player interacts with the device driver while Warp tries to play system sounds. To avoid this problem, turn off system sounds.

Problem 3

When playing a MIDI file, switching to master volume control, then back to MIDI play causes the MIDI audio to appear to be muted.

This is a problem with the way Warp plays systems sounds. Turn off system sounds to avoid this problem.

Problem 4

The AD1815/AD1816 audio cards are plug-and-play cards. Since OS/2 Warp 3 does not support plug-and-play, the Warp 3 driver for these cards needs to set the resources according to what resources the user knows is not being used. In a few cases, the system BIOS does not support plug-and-play BIOS enumeration in cooperation with a non plug-and-play enabled operating system, such as Warp 3. This is complicated by the fact that since the AD1815/AD1816 devices are not critical to system operation (such as a hard disk controller, or graphics controller) the card is not enabled by the BIOS. In some cases, the system plug-and-play BIOS does not properly setup system resources to coexist with the AD1815/AD1816 device. If the system appears to behave strangely, that is, audio files play continuously, or the system appears to freeze, or a sound file snippet plays continuously, or other devices behave unexpectedly, some ROM setup modifications may be necessary. Most plug-and-play enabled systems have a ROM-based setup menu which allows different plug-and-play options. It may be necessary to try different plug-and-play settings within these ROM-based BIOS settings to allow proper operation of the AD1815/AD1816 device in certain systems.

For example, a Gateway-2000 P5-133 system required setting the "Plug-and-Play

Configuration" mode to "Use ICU or PnP OS" with an Operating System setting of "Other OS" in order for the AD1815 card to work properly. The AD1816 does not require this option. Other systems may require other settings in order for these cards to work properly.

Driver Reference -- For Advanced Users Only

WARNING: The following information allows advanced users to adjust driver parameters. Improper use of the parameters can damage your system. DO NOT attempt to adjust parameters if you are not knowledgeable in OS/2 driver and system configuration issues.

AD1816DD - AD1816 Soundport controller device driver

This device driver initializes the AD1816 for WAV, MIDI, and Joystick operation, as specified by the device driver command line parameters. Plug-and-play resources specified by the operating system will be used if available, otherwise the driver will initialize the AD1816 through the plug-and-play hardware interface. See the "Plug and Play ISA Specification", version 1.0a for more details. This driver also supports the WAV file format for playback and record.

This driver takes the following parameters for resources in the event that OS/2 PnP is not installed or available. PnP for OS/2 will be made available with the release of OS/2 Warp Version 4.

```
DEVICE=c:\nmos2\ad1816dd.sys <parameter list>

/S:xxxx    - Soundblaster IO port in hex (240)
/C:xxxx    - CODEC Base Address in hex (FFE0)
/F:xxx     - FM Synth base address in hex (388)
/I:y       - Interrupt level in decimal (5)
/N:$string$ - Device driver name assigned by MINSTALL
/P:y       - Playback DMA channel in decimal (1)
/R:y       - Record DMA Channel in decimal (3)
/M:xxx     - MPU-401 Base address (330)
/J:xxx     - Joystick base address (200)
/T:y       - MPU-401 interrupt level (15)
/3:y       - 3D Phase expansion (0-31)
```

OPL3, or FM Synthesis device driver

This driver provides the support required for FM synthesis through OPL3 emulation. The AD1816DD driver initializes the OPL3, and allows the OPL3 driver to control FM synthesis.

```
DEVICE=c:\nmos2\opl3.sys /P:xxx /N:OPL31$

/P:xxx     - Base address of OPL3
/N:$string$ - Device driver name assigned by MINSTALL
```

GAMEDD, or Joystick support

This driver provides OS/2 Joystick support.

```
DEVICE=c:\rmos2\gamevdd.sys  
DEVICE=c:\rmos2\gamedd.sys
```

These device drivers take no parameters.

MPU-401 Device Interface

This driver provides the MPU-401 device support required for external MIDI devices.

```
DEVICE=c:\rmos2\mpu401.sys <parameter list>
```

- ```
/Pn:yyy
```

 - Base I/O: Sets the base I/O address for port n, usually 300 or 330 (# is in hex)
- ```
/In:yyy
```

 - IRQ level: Sets the IRQ level for port n. yyy is a decimal number from 1 to 15. If the base I/O address for a given port is specified (e.g. /P1:300), but the IRQ is not specified, the driver will attempt to autodetect the IRQ. Note that an IRQ is not used for MPM/2 playback anyway.
- ```
/L
```

 - Long name support. If specified, /L directs the driver to include the base I/O address and the IRQ in the instance name for RIMIDI Type A registration. For example, without /L the instance name might be "MPU-401 #1". With /L, it would look like "MPU-401 #1 (I/O=0330, IRQ=05)"
- ```
/N:sss
```

 - Driver name, an 8-character length string, ending in a \$. Do not specify a port number. Default is "MPU401\$".
- ```
/Q
```

 - Tells the driver to ignore errors when initializing the hardware for playback. May be necessary for some cards.
- ```
/R:yyy
```

 - Resolution of MPM/2 timing. If the highres timer (TIMER0.SYS) is installed, this parameter tells the MPU-401 driver what resolution to use (where yyy is the number of milliseconds) when playing MPM/2 MIDI streams. Default is one millisecond. Default is 2.
- ```
/V
```

 - Verbose output during boot. If used, this should be the first parameter.

# Analog Devices AD1816 Soundport Controller Driver for OS/2

## Installation Instructions

### Distribution Diskette File List

|              |                                                     |
|--------------|-----------------------------------------------------|
| AD1816DD.SYS | - AD1816 Soundport controller driver                |
| AD1816DD.SYM | - Driver symbol file                                |
| CARDINFO.DLL | - AD1816 Soundport controller card information file |
| AD1816.HLP   | - AD1816 Soundport controller help file             |
| AD1816.SCR   | - AD1816 Soundport controller driver file list      |
| CONTROL.SCR  | - Main install script                               |
| README.TXT   | - This file                                         |
|              |                                                     |
| UPDTCLK.BAT  | - Batch file for updating timer basedevs            |
| RSTRCLK.BAT  | - Batch file for restoring timer basedevs           |
|              |                                                     |
| MPU401.SYS   | - MPU-401 driver                                    |
| MPURES.DLL   | - MPU-401 resource DLL                              |
|              |                                                     |
| AUDPLAY.ICO  | - Audio ICON                                        |
| MIDIPLAY.ICO | - MIDI ICON                                         |
| JOYSTK.ICO   | - Joystick ICON                                     |
|              |                                                     |
| OPLRES.DLL   | - OPL3 resource file                                |
| OPL3.DLL     | - OPL3 driver                                       |
| OPL3.HLP     | - OPL3 Help File                                    |
|              |                                                     |
| CLOCK01.SYS  | - Timer driver                                      |
| CLOCK02.SYS  | - Timer driver                                      |
| TIMER0.SYS   | - Timer driver                                      |
|              |                                                     |
| GAMEDD.SYS   | - Joystick driver                                   |
| GAMEVDD.SYS  | - Joystick driver                                   |
| JOYSTK.CH    | - Joystick install script                           |

### Before You Begin

Proper operation of the Analog Devices AD1816 Soundport Controller requires that:

- You are using OS/2 Warp version 3.
- The OS/2 Multimedia Extensions are installed.
- The Analog Devices AD1816 driver is installed.

NOTE: You must have the OS/2 Multimedia Extensions installed BEFORE you install this driver. You will use the OS/2 Multimedia Extensions to install and configure the Analog Devices AD1816 Soundport Controller driver.

If your installation fails, you may need to update some of your OS/2 system files. See the "Troubleshooting" section for more information.

## Checking for the OS/2 Multimedia Extensions

Check your system for the following conditions:

- If the extensions are already installed you will see the “Multimedia” icon on your OS/2 desktop. If the extensions are already installed, skip ahead to the procedure “Installing the AD1816 Soundport Controller Driver.”
- If the “Multimedia” icon is not visible, OS/2 Multimedia Extensions may not yet be installed. Install the extensions using the following procedure.

## Installing the Multimedia Extensions

To install the Multimedia Extensions:

1. Open the “OS/2 System” folder on the OS/2 desktop. Double-click the “System Setup” icon.
2. From the “System Setup” window, double-click the “Selective Install” icon to display the “System Configuration” window. The box labeled “Multimedia Device Support” in the lower left corner of the “System Configuration” window should read “None”.
3. Click the “OK” button. The “OS/2 Setup and Installation” window appears.
4. Click the box next to “Multimedia Software Support”. You should now see a check mark in that box.
5. Click the “Install” button. OS/2 will begin installing the extensions. Follow all on-screen instructions, including the last one that instructs you to restart your system. Once your system has restarted, use the following procedure to install the driver for the Analog Devices AD1816 Soundport Controller.

## Installing the AD1816 Soundport Controller Driver

To install the AD1816 Soundport Controller Driver:

1. Double-click the “Multimedia” folder icon on the OS/2 desktop. Run the “Multimedia Application Install” program.
2. Insert the AD1816 Soundport Controller OS/2 Driver Diskette into your diskette drive.
3. Use the drop-down “Drive” list box to select the drive letter, A: or B:, that contains the diskette.
4. Click the “Analog Devices AD1816” line to place a check mark next to the selection. By default, the AD1816 driver installation does not install the MPU-401 support for MIDI devices. If you want MPU-401 support, click the “IBM MPU-401” line to place a check mark next to it.
5. Click the “Install” button. If you receive a warning that the program will change your CONFIG.SYS file, click the “Yes” button to allow the program to make the required changes.
6. The “Analog Devices AD1816” window appears. This window displays the configuration information for the AD1816 Soundport Controller. Note that the Analog Devices AD1816 Soundport Controller has no jumpers or switches; all of the hardware configuration is from this window.
7. Click the “OK” button. You will receive several additional notifications: installation windows for several driver components, that your CONFIG.SYS file was backed up, and that the installation is complete. Click “OK” on each of these alerts.

8. Exit OS/2 and reboot your system. When you reboot your system you should hear the OS/2 start-up sounds, indicating that your audio card is properly installed and working.

## Configuring the 3D Sound Features

The Analog Devices AD1816 Soundport Controller can produce sound in simulated 3D. This feature is controlled using the card's configuration window. To access these settings:

1. Open the "OS/2 System" folder on the OS/2 desktop. Double-click the "System Setup" icon.
2. From its window, run "Selective Install" to display the "System Configuration" window.
3. In the "System Configuration" window, the "Multimedia Device Support" drop-down list should show the "Analog Devices AD1816 Soundport" as the active device. Click the square button next to the device name.
4. Click the "Device Settings" button to display the card's hardware settings. The "Analog Devices AD1816" window appears. This window contains controls to turn 3D effects on or off, and change the acoustic properties of the 3D simulation algorithm.
5. After you have changed the settings, click the "OK" button. The changed settings take effect immediately, and are written to your CONFIG.SYS file to be used when you start OS/2.

## Troubleshooting

A majority of problems observed with the AD1816 Soundport device drivers for OS/2 Warp 3 are caused by inconsistent versions of the following system files: CLOCK01.SYS, CLOCK02.SYS, TIMER0.SYS, and OPL3.SYS. Before continuing, make sure that your versions of these system files match the AD1816 Soundport device driver install diskette files:

```
\OS2\BOOT\CLOCK01.SYS
\OS2\BOOT\CLOCK02.SYS
\MOS2\TIMER0.SYS
\MOS2\OPL3.SYS
```

If your files do not match the versions on the diskette, then either copy the diskette files over the files on your system, or use the UPDTCLK.CMD or UPDTCLK.BAT command files to update your system files.

Note that this command file saves a copy of CLOCK01.SYS and CLOCK02.SYS to CLOCK01.WRP and CLOCK02.WRP respectively. Do not overwrite or delete these files as these files can be used to restore your original configuration, if required. Use the RSTRCLK.BAT command file to restore your original CLOCK01.SYS and CLOCK02.SYS drivers in the \OS2\BOOT directory.

## **Problems Observed and Possible Solutions**

### **Exception in device driver: CLOCK\$ TRAP 00d**

This problem is due to mismatched CLOCK01.SYS, CLOCK02.SYS, and TIMER0.SYS drivers installed on your system. Make sure that the CLOCK01.SYS, CLOCK02.SYS and TIMER0.SYS drivers from the AD1816DD.SYS driver install diskette are copied into the proper subdirectories of the system.

Make sure that the \OS2\BOOT directory has its read-only attributes reset. Use ATTRIB CLOCK0?.SYS to view the attributes, and ATTRIB -r to reset the read-only attributes, if required. To install the files:

1. Copy CLOCK01.SYS to \OS2\BOOT
2. Copy CLOCK02.SYS to \OS2\BOOT
3. Copy TIMER0.SYS to \MMOS2

Or, use the UPDTCLK.BAT command file to update these drivers.

### **MINSTALL Display “MMPM/2 Copy Failed File in Use” while doing install**

This problem is due to some CLOCK01.SYS and CLOCK02.SYS files having the read-only attribute set. Use OS/2's ATTRIB.EXE utility to reset the read-only attribute for these files. Note that on some versions of Warp, an option is presented to retry the operation, and when a retry is attempted, the copy appears to have succeeded, and in fact fails. This problem may manifest itself as a trap when trying to play a MIDI file (see TRAP in CLOCK\$ driver when opening MIDI player).

### **When performing a shutdown while the MIDI player is still open, the system hangs.**

This problem is due to mismatched CLOCK01.SYS, CLOCK02.SYS, and TIMER0.SYS drivers. Use the procedure described above to correct this problem.

### **When playing a MIDI file, I switch to Audio Player, then back to MIDI player. No audio is heard, and an error occurs when I press start, pause, or stop.**

This problem is due to an inconsistent version of OPL3 with the version of WARP 3 and the TIMER0.SYS set of drivers. Use the procedure described above to correct this problem.

## **List of Known Problems**

This driver is a Beta-level release. There are four known problems that we are working to correct. Where required, we are working with IBM to resolve these problems as quickly and efficiently as possible. Three of the problems relate to a conflict between multimedia applications and the use of system sounds. These problems can be solved by turning off

system sounds.

### **Problem 1**

The Digital Audio applet gives an error message after you:

1. Click Record.
2. Click Stop.
3. Click New.
4. Click Discard.

The error message may say that either the device is busy or that there was a device error. This is a problem with the way Digital Audio interacts with the device driver while Warp tries to play system sounds. To avoid this problem, turn off system sounds. Alternatively, close Digital Audio and restart it to continue, or save the recorded audio to a file.

### **Problem 2**

The MIDI Player Applet displays an error after you take the following steps:

1. Start playing a MIDI file using the MIDI Player applet.
2. Bring up another multimedia application, such as Master Volume or Digital Audio.
3. Click on the MIDI Player applet.
4. Close the other application.
5. Click the MIDI Player applet Start button.

This is a problem with the way MIDI Player interacts with the device driver while Warp tries to play system sounds. To avoid this problem, turn off system sounds.

### **Problem 3**

When playing a MIDI file, switching to master volume control, then back to MIDI play causes the MIDI audio to appear to be muted.

This is a problem with the way Warp plays system sounds. Turn off system sounds to avoid this problem.

### **Problem 4**

The AD1815/AD1816 audio cards are plug-and-play cards. Since OS/2 Warp 3 does not support plug-and-play, the Warp 3 driver for these cards needs to set the resources according to what resources the user knows is not being used. In a few cases, the system BIOS does not support plug-and-play BIOS enumeration in cooperation with a non plug-and-play enabled operating system, such as Warp 3. This is complicated by the fact that since the AD1815/AD1816 devices are not critical to system operation (such as a hard disk controller, or graphics controller) the card is not enabled by the BIOS. In some cases, the system plug-and-play BIOS does not properly setup system resources to coexist with the AD1815/AD1816 device. If the system appears to behave strangely, that is, audio files play continuously, or the system appears to freeze, or a sound file snippet plays continuously, or other devices behave unexpectedly, some ROM setup modifications may be necessary. Most plug-and-play enabled systems have a ROM-based setup menu which allows different plug-and-play options. It may be necessary to try different plug-and-play settings within these ROM-based BIOS settings to allow proper operation of the AD1815/AD1816 device in certain systems.

For example, a Gateway-2000 P5-133 system required setting the "Plug-and-Play

Configuration" mode to "Use ICU or PnP OS" with an Operating System setting of "Other OS" in order for the AD1815 card to work properly. The AD1816 does not require this option. Other systems may require other settings in order for these cards to work properly.

## Driver Reference -- For Advanced Users Only

**WARNING:** The following information allows advanced users to adjust driver parameters. Improper use of the parameters can damage your system. **DO NOT** attempt to adjust parameters if you are not knowledgeable in OS/2 driver and system configuration issues.

### AD1816DD - AD1816 Soundport controller device driver

This device driver initializes the AD1816 for WAV, MIDI, and Joystick operation, as specified by the device driver command line parameters. Plug-and-play resources specified by the operating system will be used if available, otherwise the driver will initialize the AD1816 through the plug-and-play hardware interface. See the "Plug and Play ISA Specification", version 1.0a for more details. This driver also supports the WAV file format for playback and record.

This driver takes the following parameters for resources in the event that OS/2 PnP is not installed or available. PnP for OS/2 will be made available with the release of OS/2 Warp Version 4.

```
DEVICE=c:\nmos2\ad1816dd.sys <parameter list>

/S:xxxx - Soundblaster IO port in hex (240)
/C:xxxx - CODEC Base Address in hex (FFE0)
/F:xxx - FM Synth base address in hex (388)
/I:y - Interrupt level in decimal (5)
/N:$string$ - Device driver name assigned by MINSTALL
/P:y - Playback DMA channel in decimal (1)
/R:y - Record DMA Channel in decimal (3)
/M:xxxx - MPU-401 Base address (330)
/J:xxx - Joystick base address (200)
/T:y - MPU-401 interrupt level (15)
/3:y - 3D Phase expansion (0-31)
```

### OPL3, or FM Synthesis device driver

This driver provides the support required for FM synthesis through OPL3 emulation. The AD1816DD driver initializes the OPL3, and allows the OPL3 driver to control FM synthesis.

```
DEVICE=c:\nmos2\opl3.sys /P:xxx /N:OPL31$

/P:xxx - Base address of OPL3
/N:$string$ - Device driver name assigned by MINSTALL
```

## **GAMEDD, or Joystick support**

This driver provides OS/2 Joystick support.

```
DEVICE=c:\rmos2\gamevdd.sys
DEVICE=c:\rmos2\gamedd.sys
```

These device drivers take no parameters.

## **MPU-401 Device Interface**

This driver provides the MPU-401 device support required for external MIDI devices.

```
DEVICE=c:\rmos2\mpu401.sys <parameter list>
```

- ```
/Pn:yyy
```

 - Base I/O: Sets the base I/O address for port n, usually 300 or 330 (# is in hex)
- ```
/In:yyy
```

 - IRQ level: Sets the IRQ level for port n. yyy is a decimal number from 1 to 15. If the base I/O address for a given port is specified (e.g. /P1:300), but the IRQ is not specified, the driver will attempt to autodetect the IRQ. Note that an IRQ is not used for MPM/2 playback anyway.
- ```
/L
```

 - Long name support. If specified, /L directs the driver to include the base I/O address and the IRQ in the instance name for RIMIDI Type A registration. For example, without /L the instance name might be "MPU-401 #1". With /L, it would look like "MPU-401 #1 (I/O=0330, IRQ=05)"
- ```
/N:sss
```

 - Driver name, an 8-character length string, ending in a \$. Do not specify a port number. Default is "MPU401\$".
- ```
/Q
```

 - Tells the driver to ignore errors when initializing the hardware for playback. May be necessary for some cards.
- ```
/R:yyy
```

 - Resolution of MPM/2 timing. If the highres timer (TIMER0.SYS) is installed, this parameter tells the MPU-401 driver what resolution to use (where yyy is the number of milliseconds) when playing MPM/2 MIDI streams. Default is one millisecond. Default is 2.
- ```
/V
```

 - Verbose output during boot. If used, this should be the first parameter.