

# AlphaStation Sound Card

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## Hardware Information

Part Number: EK-PBXJA-HI. A01

**Revision/Update Information:** This is a new manual.

**Digital Equipment Corporation  
Maynard, Massachusetts**

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## **FCC Information - Class B**

The sound card has been tested, and it complies with the limits for a Class B computing device in accordance with the specifications in Part 15 of the Federal Communications Commission (FCC) rules. These limits are designed to provide reasonable protection against harmful RF interference in a residential installation. There is, however, no guarantee that RF interference will not occur in a particular installation.

To determine if your hardware device is causing interference, disconnect the device from your computer. If the interference stops, it probably was caused by the device. If the interference continues, disconnect the hardware device, then turn the computer off and then on again. If the interference stopped when the computer was off, check to see if one of the input/output (I/O) devices of one of the computer's internal accessory boards is causing the problem. Disconnect the I/O devices one at a time and see if the interference stops.

If your computer does cause interference, try the following measures to correct it:

Relocate the radio or TV antenna until the interference stops.

Move the computer farther away from the radio or TV, or move it to one side or the other of the radio or TV.

Plug the computer into a different power outlet so that the computer and radio or TV are on different circuits controlled by different circuit breakers or fuses.

If necessary, ask your computer dealer or an experienced radio-TV technician for more suggestions. You may find helpful information in the booklet *How to Identify and Resolve Radio-TV Interference Problems* (stock number 004-000-00345-4), published by the FCC, which is available from the U.S. Government Printing Office, Washington, D.C. 20402.



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# Welcome

The AlphaStation sound card<sup>1</sup> adds a whole new dimension to your AlphaStation system. With the addition of sound, you will enjoy far greater productivity and effectiveness.

## Audience

This booklet is for people who are preparing to install and set up the AlphaStation sound card into an AlphaStation system.

## What Is the AlphaStation Sound Card?

The AlphaStation sound card is an enjoyable business productivity tool. The sound card accepts input from a microphone or a stereo device such as a CD player. The card can output stereo audio to headphones or speakers as well as a cassette recorder or amplifier.

The sound card is supported on AlphaStation systems running the DEC OSF/1, OpenVMS, or Microsoft Windows NT operating systems.

## Sound Card Package

Your AlphaStation sound card package contains the following:

- Sound card
- Microphone with a base
- Headphones
- *AlphaStation Sound Card Hardware Information* booklet

You can obtain an additional microphone and headphone by ordering part number AVH01-AA.

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<sup>1</sup>The AlphaStation sound card is compatible with the Microsoft Windows Sound System.

## For More Information

For more information, refer to the following sources:

- *Microsoft Windows NT Workstation System Guide* (located on the Windows NT CD-ROM)
- *Multimedia Services for DEC OSF/1 AXP Installation Guide* and the related release notes
- *OpenVMS AXP Version 6.1-1H1 Release Notes and Installation Procedures* or later version

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# Installing the AlphaStation Sound Card

## Overview

Before you can use the AlphaStation sound card, you must perform certain steps, including: planning, configuring the card, configuring the operating system, and plugging the card into an expansion slot. The following sections (I-VI) detail these steps.

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### NOTE

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Your current operating system affects how you perform the steps here. The DEC OSF/1 AXP, OpenVMS AXP, or Microsoft Windows NT Workstation operating systems each learn about the sound card in a different manner. Operating system-specific differences in the steps are identified.

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## I. Planning IRQ, DMA, and Address Assignments

The IRQ level and the DMA channel of the sound card are set under software control. The I/O address is set with jumpers.

Ensure that your sound card is not assigned to IRQ levels, DMA channels, or I/O addresses that are already in use by other devices. Plan to prevent this from happening. Keeping records of your system's IRQ level, DMA channel, and I/O address assignments helps ensure that you choose unused values. The equipment log section of your system's user manual is designed for keeping this type of record.

You can gather the necessary information in other ways, depending on which operating system your system is running.

## Microsoft Windows NT Workstation

If your system is running Microsoft Windows NT Workstation, use the Windows NT Diagnostics to identify the IRQ, DMA, and I/O address assignments. To access the diagnostics, follow these steps:

1. From the Program Manager, open the Administrative Tools group.
2. Double-click on the Windows NT Diagnostics icon. The Windows NT Diagnostics menu displays.
3. Click on the IRQ/Port Status button.
4. Make a note of the available IRQs.

## DEC OSF/1 AXP and OpenVMS AXP

If your Digital AlphaStation system is running either the DEC OSF/1 AXP or OpenVMS AXP operating system, use the SRM console's ISACFG command to display the contents of the configuration database.

To display the full console database, first shut down the operating system. Then, from the SRM console prompt, type:

```
>>>isacfg -all.
```

Use control S (^S) and control Q (^Q) to stop or continue the scrolling of the display. A list of device information similar to the following is displayed on the monitor (relevant information is highlighted in **bold** type below):

```
=====
handle:MOUSE
etyp: 2
slot: 0 dev: 0
enadev: 1
totdev: 6
iobase0: 60 membase0:8000000000000000
iobase1: 8000000000000000 memlen0: 8000000000000000
iobase2: 8000000000000000 membase1: 8000000000000000
iobase3: 8000000000000000 memlen1: 8000000000000000
iobase4: 8000000000000000 membase2: 8000000000000000
iobase5: 8000000000000000 memlen2: 8000000000000000
rombase: 8000000000000000
romlen: 8000000000000000
```

```

dmamode0/chan0: 80000000 irq0: 12
dmamode1/chan1: 80000000 irq1: 80000000
dmamode2/chan2: 80000000 irq2: 80000000
dmamode3/chan3: 80000000 irq3: 80000000
=====
=====
handle:KBD
etyp: 2
slot: 0 dev: 1
enadev: 1
totdev: 6
iobase0: 60 membase0:8000000000000000
iobase1: 8000000000000000 memlen0: 8000000000000000
iobase2: 8000000000000000 membase1: 8000000000000000
iobase3: 8000000000000000 memlen1: 8000000000000000
iobase4: 8000000000000000 membase2: 8000000000000000
iobase5: 8000000000000000 memlen2: 8000000000000000
rombase: 8000000000000000
romlen: 8000000000000000
dmamode0/chan0: 80000000 irq0: 1
dmamode1/chan1: 80000000 irq1: 80000000
dmamode2/chan2: 80000000 irq2: 80000000
dmamode3/chan3: 80000000 irq3: 80000000
=====
.
.
.

```

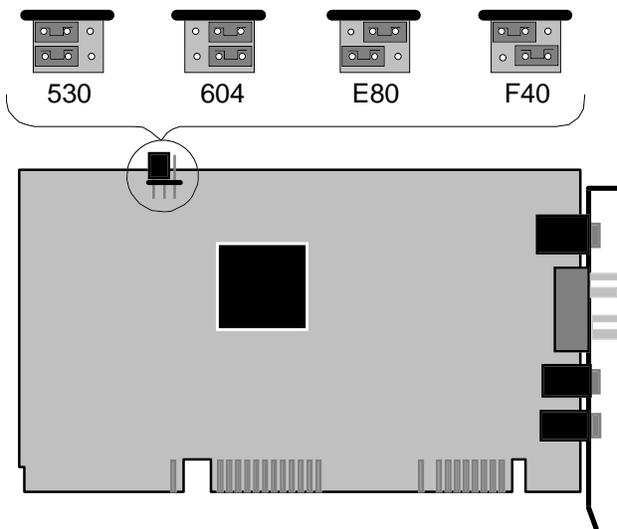
and so forth. Note which IRQ levels (irq0-3), DMA channels (chan0-3), and I/O addresses (iobase0-5), are in use.

## II. Setting the Address Jumper

The sound card contains a jumper pin block for specifying I/O addresses. Armed with your list from the planning step of option addresses in use, you can set the sound card's address jumper appropriately.

The default address is 530. Figure 1 shows the four possible I/O address jumper settings.

**Figure 1. I/O Address Jumpers**



### III. Updating the Console Database

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#### CAUTION

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This section applies to DEC OSF/1 and OpenVMS Systems only. If you have a Windows NT system, go directly to Section IV.

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When you are preparing to add an ISA option such as the AlphaStation sound card to an AlphaStation 400 Series system running the DEC OSF/1 AXP or OpenVMS AXP operating system, *you must update the SRM console's configuration database before installing the option.*

The database needs information about the sound card's I/O address, IRQ level, DMA channel, and driver "handle." (The handle is a name bound to the driver.)

Use the ISA configuration utility (ISACFG) to perform the update. ISACFG is run from the SRM console prompt (>>>).

The following examples show two methods that you can use to update the database.

1. From the SRM console prompt, type:

```
>>>add_sound
```

The above example uses a script command. The actual contents of the "add\_sound" script are:

```
>>>isacfg -slot 2 -etyp 1 -mk -iobase0 530 -iobase1 388  
-irq0 9 -dmachan0 0 -dmachan1 1 -handle PCXBJ -enadev 1
```

2. If your system's current configuration requires an IRQ level or I/O address other than the add\_sound script command, enter the command manually as follows (enter the command all on one line; it is wrapped here to fit on the page):

```
>>>isacfg -slot 2 -etyp 1 -mk -iobase0 604 -iobase1 388  
-irq0 7 -dmachan0 0 -dmachan1 1 -handle PCXBJ -enadev 1
```

The above example uses an alternate address of 604 and IRQ0 of 7.

To modify the IRQ0 entry of the sound card after you have entered it in the database, type:

```
>>>isacfg -mod -slot 2 -irq0 7
```

After the sound card is added to the console database, type `isacfg -all`. An entry such as the one below is displayed at the end of the database:

```
=====
handle:PCXBJ
etyp: 1
slot: 2 dev: 0
enadev: 1
totdev: 6
iobase0: 530 membase0:8000000000000000
iobase1: 388 memlen0: 8000000000000000
iobase2: 8000000000000000 membase1: 8000000000000000
iobase3: 8000000000000000 memlen1: 8000000000000000
iobase4: 8000000000000000 membase2: 8000000000000000
iobase5: 8000000000000000 memlen2: 8000000000000000
rombase: 8000000000000000
romlen: 8000000000000000
dmamode0/chan0: 0 irq0: 9
dmamode1/chan1: 1 irq0: 80000000
dmamode2/chan2: 80000000 irq0: 80000000
dmamode3/chan3: 80000000 irq0: 80000000
=====
```

 For more details on using the ISACFG utility, refer to the ISACFG Utility section of this document.

## IV. Installing the Sound Card

This procedure tells you how to install the sound card into an expansion slot in your system.

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### WARNING

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**Turn off your system before removing the cover. Observe the safety warnings in your system's user documentation.**

---

To install the sound card, follow these steps:

1. Use the appropriate command to shut down your operating system.
2. Turn off the system and all peripheral devices.

---

### CAUTION

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To avoid system damage from static electricity discharge, touch bare (unpainted) metal on the system box before you touch anything inside the system.

---

3. Remove the system box cover.  
 Refer to your system's user documentation for information on removing the cover.
4. Locate an unused ISA expansion slot inside your system.
5. Unscrew and remove the solid bracket at the rear of an unused ISA expansion slot.
6. Gently insert the sound card into the expansion slot. Use sufficient pressure to thoroughly seat the card into the slot. If necessary, carefully rock the card back and forth.
7. Secure the sound card with the screw you removed from the slot bracket.
8. Replace the system box cover.
9. Proceed to Section V, Connecting Audio Equipment.

## V. Connecting Audio Equipment

The connectors on the AlphaStation sound card let you connect a range of audio equipment, from headphones and microphones to stereo system components.

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### WARNINGS

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**Turn off your system and audio equipment whenever you need to connect or disconnect it.**

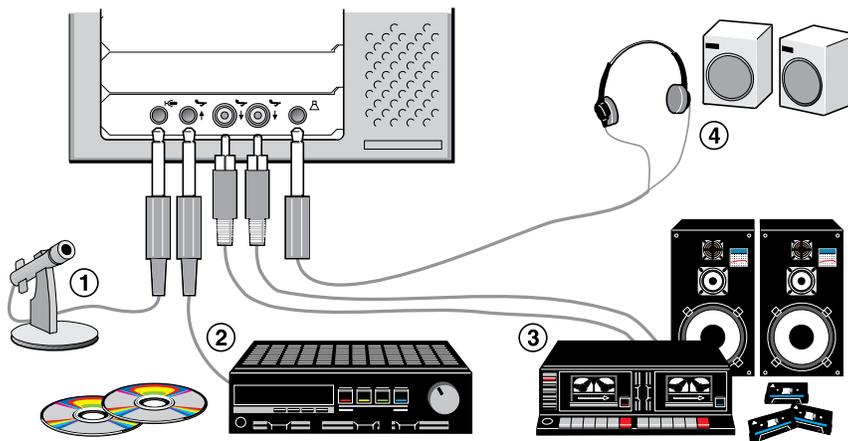
**The sound card can output high volume. To avoid hearing loss or damage, test the sound volume by holding the headphones away from your ears.**

---

Figure 2 shows the audio equipment connections for the following items:

1. Microphone
2. Audio input (Line in)
3. Audio amplifier or recorder (Line out)
4. Headphones or self-amplified speakers

**Figure 2. Sound Card Connections**



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## VI. Installing Software Drivers

After you install your sound card and connect your audio equipment, you must set up the operating system. Each operating system handles the setup differently.

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### WARNING

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**The sound card can output high volume. To avoid hearing loss or damage, test the sound volume by holding the headphones away from your ears.**

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### Microsoft Windows NT Workstation

For the sound card to function, you must install the Windows Sound System driver in the Microsoft Windows NT Workstation operating system. Perform the following steps:

1. Access the Control Panel.
2. Double-click on the Drivers icon.
3. Click on the Add button.
4. Select Windows Sound System driver.
5. Click on OK. If there is no driver on the system, you are asked to mount the Windows NT distribution media. Once the driver is loaded, the Windows Sound System Driver setup menu displays.
6. Use the Windows Sound System Driver setup menu to set the DMA channel, IRQ level, and I/O address. (Set the I/O address to match the setting specified by the sound card jumper.)



Refer to the *Microsoft Windows NT Workstation System Guide* (available online or in hardcopy) for information on installing a driver.

### DEC OSF/1 AXP

The DEC OSF/1 AXP operating system supports the sound card through Multimedia Services for DEC OSF/1 AXP, which is normally preloaded at the manufacturing site. Use the following command when you are logged in as "root" to verify that the multimedia services are installed:

```
# setld -i |grep MME
```

Look for the following response and verify that the word installed is present:

```
MMExxxxxx installed xxx xxx Audio Card Driver
```



Refer to the *Multimedia Services for DEC OSF/1 AXP Installation Guide* for more information.

Digital's multimedia application programming interface (API), which is included with the Multimedia Services for DEC OSF/1 AXP, is based on Microsoft's Video for Windows interface. This provides developers with a common API and support for the same audio and video file formats as Video for Windows does.

## OpenVMS AXP

OpenVMS AXP Versions 6.1-1H1 and later contain a sound driver that supports the AlphaStation sound card. If the SRM console configuration database and the ISA\_CONFIG.DAT file are properly set up, you see the following display when you type a show device command:

```
$ show device
Device          Device          Error
  Name          Status          Count
AUA0:          online          0
```



Refer to the *OpenVMS AXP Version 6.1-1H1 Release Notes and Installation Procedures* for more information.

# Troubleshooting

## Overview

This section helps you to identify and solve problems that might occur with your sound card. Table 1 lists problems, possible causes, and actions for you to take.

**Table 1. Sound Card Troubleshooting**

Problem	Possible Cause	Action
<p>After you have installed the sound card, the operating system does not come up, comes up with errors such as machine checks, or does not allow you to install the driver.</p>	<p>I/O address conflict            IRQ level conflict            DMA channel conflict            Defective ISA bus slot</p> <p>(A conflict in any of these areas can manifest itself in numerous ways, depending on which operating system is being used.)</p>	<p><i>Windows NT:</i> Check the Windows Sound System driver to see that the hardware configuration matches the settings you planned for in section I. If the settings are different, modify the driver. If the settings are the same, run the Windows NT Diagnostics and look at the IRQ/Port Status section. Check to see if a device is installed on your system but is not displayed by the diagnostic. If so, change your plan from section I accordingly and reenter the sound card settings.</p> <p><i>DEC OSF/1:</i> Use the console &gt;&gt;&gt;ISACFG -all command to check the configuration database for conflicts or missing information.</p> <p><i>OpenVMS:</i> Use the console &gt;&gt;&gt;ISACFG -all command to check the configuration database for conflicts or missing information. Also check the VMS file, ISA_CONFIG.DAT to see that the sound card data is properly entered and is not commented out.</p> <p><i>All operating systems:</i> Try the sound card in a different ISA bus slot.</p>

**Table 1. Sound Card Troubleshooting (continued)**

No sound.	Cables not plugged in.  Driver not installed.  Volume control set low.	Plug in the cables.  <i>Windows NT:</i> Install the driver. <i>DEC OSF/1:</i> Install Multimedia Services for DEC OSF/1 AXP  Use the on-screen volume control to increase the volume.
Cannot record.	Cables not plugged in.  Record level set low.	Plug in the cables.  Use the appropriate control to increase the record level.
Distorted sound.	Volume level set high.	Reduce the volume level. (Use amplified speakers.)
Repeating beginning of sound or entire sounds.	An IRQ or DMA channel conflict.	Refer to the section on Resolving Hardware Conflicts.

## Resolving Hardware Conflicts

Resolving conflicts between the AlphaStation sound card and other devices on the system can require a bit of detective work. The three areas likeliest to have conflicts are the:

- IRQ level
- DMA channel
- I/O address

Generally, you should not assign two devices to the same IRQ level, DMA channel, or I/O address. If this occurs, change one of the device's settings. Go back to section I, Planning IRQ, DMA, and Address Assignments. Use the procedures there to determine which devices might be in conflict. When you assign a device to different IRQ level, DMA channel, or I/O address, verify that you have not created a new conflict.

# ISACFG Utility

## Overview

ISA (industry-standard architecture) devices are not capable of being probed for configuration information by the DEC OSF/1 or OpenVMS operating systems. Therefore, you must enter ISA option information manually using the ISA configuration utility (ISACFG). Run this utility *before* installing a new ISA option module on a Digital AlphaStation system running either the DEC OSF/1 or OpenVMS operating system.

Prior to adding an ISA device, you must use an ISACFG to assign an IRQ to the device. Make sure to leave enough IRQs unassigned to meet the needs of your PCI devices.

 Refer to your AlphaStation system user information for details.

## Command Format

The syntax of the ISACFG command is shown below:

```
isacfg [-slot <slot#>] [-dev <device#>]  
[-all|-rm|-mk|-mod] [-<field> <value>] . . .
```

The ISACFG command options are described in Table A-2.

**Table 2. ISACFG Command Options**

Command Option	Description
-all	Shows the entire configuration table. Overrides all other commands.
-dev <dev#>	Optional; defaults to 0 if not entered. On a multifunction or multiport adapter, this specifies the device on the adapter.
-dmachan{0-3} <#>	Allows you to specify up to four DMA (direct memory access) channels for the device.
-dmamode{0-3} <#>	Allows you to specify the DMA type for -dmachan{0-3}. DMA modes are: 1 - Block 2 - Demand 4 - Single 8 - Cascade

**Table 2. ISACFG Command Options (continued)**

Command Option	Description
-enadev <#>	Allows you to specify whether an entry is enabled or disabled. Disabled devices are not used in resource allocation calculations. Possible values are: 0 - No (disabled) 1 - Yes (enabled)
-etyp <#>	Defines an entry type for this entry. The # sign can be: 0 - Causes the entry to be deleted 1 - Single option 2 - Embedded multiport device 3 - Multiport option device
-handle <string>	Binds a name to the driver (up to 15 characters).
-init	Initializes the configuration table to the default settings.
-iobase{0-5} <#>	Specifies up to six I/O base registers (in hexadecimal) for a particular device entry.
-irq{0-3} <#>	Allows you to assign up to four IRQ (interrupt request) channels to the device (use decimal IRQ levels).
-membase{0-2} <#>	Specifies up to three R/W ISA memory regions.
-memlen{0-2} <#>	Specifies the length corresponding to membase{0-2}.
-mk	Adds an entry into the table.
-mod	Modifies an entry in the table.
-rm	Deletes an entry from the table.
-rombase <#>	Specifies an address for ISA BIOS ext. ROM.
-romlen <#>	Specifies the length of ROM.
-slot <slot#>	Allows you to enter a unique slot number for each ISA adapter. You can assign the numbers in any order. The slot number does not relate to a physical ISA adapter position in the motherboard. Slot 0 is reserved for the local multiport adapter.
-totdev <#>	Placeholder for you to keep track of the total number of devices, specified by the # sign, at this slot. Modify this for your own use.