MONTANa

User's Guide

Contents

Introduction

Montana™ is an expansion card that can be combined with the Frontier Design Group Dakota card to double the number of ADAT optical ports and provide additional synchronization capabilities.

Montana can be installed in either a PCI or ISA slot, and adds these features to Dakota:

- Two more ADAT optical inputs (16 additional independent channels)
- Two more ADAT optical outputs (16 additional independent channels)
- RCA connector for either video sync input or word clock input, and a parallel internal connector for use with digital video boards
- 9-pin connector for ADAT sync output

When Montana is installed, the Dakota control panel automatically accommodates Montana's expansion features. No additional drivers are needed to use Montana's audio ports and sync functions.

Montana's ADAT optical ports can be connected to any device that also has ADAT optical ports, including ADAT-compatible tape machines, digital mixers, digital format converters, and pro-quality A/D and D/A converters such as Tango™ and Zulu™ from Frontier Design Group. Montana's optical ports can also be routed to/from Dakota's 2-channel SPDIF receiver/transmitter.

With Frontier Design Group's SoDA™ technology (SMPTE on Digital Audio), any audio input can record SMPTE timecode, and any audio output can play back SMPTE timecode, without using dedicated SMPTE I/O ports. See the Dakota User's Guide for details.

In addition to this User's Guide, your Montana package should contain:

- Montana PCI/ISA circuit board with PCI bracket attached
- 40-wire ribbon cable (attached to connector P7 on the Montana circuit board)
- ISA bracket for installation in ISA slot
- BNC-to-RCA adapter for video/word clock connector

About the Company

Frontier Design Group develops, manufactures and sells digital audio hardware and software. Our goal is to provide high-quality, high-value tools to help our customers be more creative and productive.

We're always interested in receiving your feedback on our products, as well as your suggestions for improvements and new products. You can send e-mail to feedback@FrontierDesign.com or send a fax to 603-448-6398.

Technical Support

If you have any problems or questions that aren't addressed in this Guide, there are three ways to get more help:

- Refer to our web site (http://www.FrontierDesign.com) for information on current revisions, answers to frequently asked questions, troubleshooting procedures, and additional documentation. The web site is available every day, 24 hours a day.
- Send specific questions via e-mail to support@FrontierDesign.com. We'll respond promptly (usually within one business day).
- For time-critical questions, you can call Frontier Design Group at 1-800-928-3236 (outside the USA, call 603-448-6283). Phone support is normally provided weekdays from 9:30 am to 5:30 pm EST.

≡ Installation ≡

WARNING! The components in your computer and on the Montana board are sensitive to electrostatic discharge. Follow these precautions to avoid damage caused by static electricity —

- Leave the Montana board in its anti-static wrapping until you're properly grounded.
- To become grounded, make sure the computer is off but leave its power cord plugged in. Remove the cover, and touch the computer's metal chassis.
- Only handle the Montana board by its edges and metal bracket.

Installing Montana

This installation procedure assumes that you've already installed the Dakota board next to an empty PCI or ISA slot, and you've verified that Dakota functions properly. Montana comes with two metal brackets — one for PCI installation (attached at the factory) and one for ISA installation.

1. If you're planning to install Montana in an ISA slot, remove the two screws next to its 9-pin connector and set aside the PCI bracket. Attach the ISA bracket to the Montana board, securing the bracket with the two screws next to the 9-pin connector.
2. If you want an unterminated video/word clock input, remove the shunt from jumper P6. For more details about termination, see the video sync section in "Connecting Montana to Other Devices" later in this Guide.
3. If you intend to use Montana's internal video connection, attach a jumper cable from the appropriate connector on the video board to component P3 on the Montana board. For more information about how the internal video connector can be used, see the video sync section in "Connecting Montana to Other Devices" later in this Guide.

continued➔

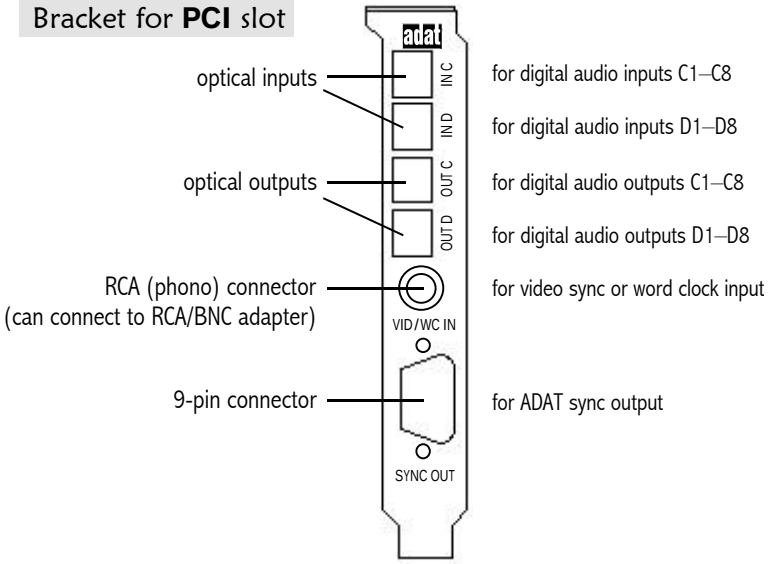
4. Verify that the 40-wire ribbon cable is firmly attached to component P7 on the Montana board.
5. Remove the protective plugs from Montana's four optical ports.
6. Make sure the computer is off (but leave its power cord plugged in), and then remove its cover.
7. Using a screwdriver, remove the blank metal bracket from the empty PCI or ISA slot (next to the Dakota board), and verify that the motherboard has no protruding components that would obstruct the 9-pin connector near the bottom of the Montana bracket.
8. Insert the Montana board into the empty PCI or ISA slot, and secure the Montana bracket with a mounting screw.
9. Attach the loose end of Montana's 40-wire ribbon cable to component P1 on the Dakota board. Press the cable firmly into the connector.
10. Replace the cover, and restart your computer. Dakota will automatically detect the presence of Montana, and the Dakota control panel will display settings for the additional audio and sync resources.

Uninstalling Montana

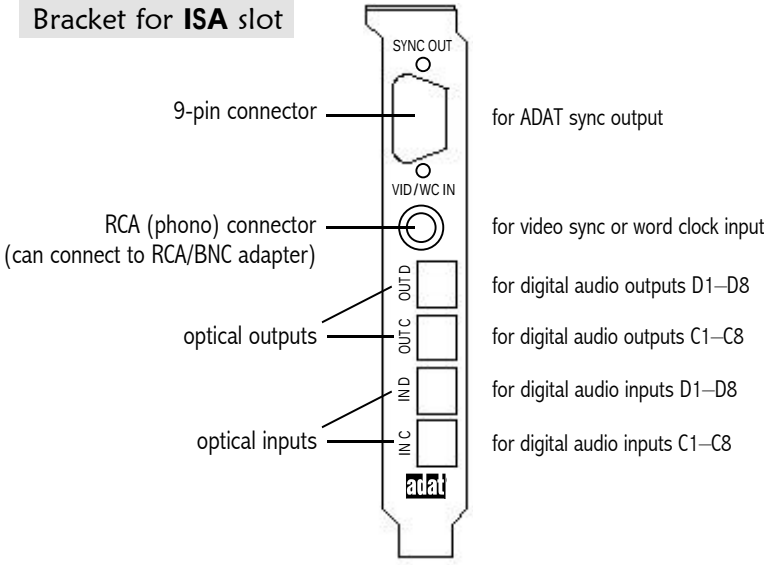
1. Make sure the computer is off (but leave its power cord plugged in), and then remove its cover.
2. Disconnect the 40-wire ribbon cable from P1 on the Dakota board.
3. If you had an internal video cable connected to Montana, disconnect the that cable from your video board.
4. Remove the mounting screw that holds the Montana bracket in the computer.
5. Lift the Montana board straight out of its slot.
6. Insert the plastic protective plugs into the four optical ports, and put the Montana board into an antistatic bag.
7. Replace the blank metal bracket and the computer's cover, and restart your computer.

Montana Connectors

Bracket for **PCI** slot



Bracket for **ISA** slot



Connecting Montana to Other Devices

Montana has several types of connectors on it. Here are some suggestions for using them.

— Optical ports and cables —

Montana ships with plastic plugs covering its optical input and output connectors. Before installing Montana in your computer, you can remove the plugs by pulling them out of the connectors.

The optical ports accept standard TOSLINK™ optical cables. You can purchase optical cables in lengths up to 10 meters (33 feet) from Frontier Design Group. Many optical cables have small flexible plastic covers on their tips to prevent scratches. Make sure you remove the plastic covers before connecting the cable to an optical port.

The optical connectors are flat on one edge and rounded on the other, so if the cable doesn't easily snap into the port, rotate the end of the cable 180° and try again.

You can connect either end of an optical cable to any optical port, as long as you're connecting an output to an input. The direction of an optical signal is easy to verify because optical outputs emit red light. The light itself is not dangerous, since TOSLINK and ADAT optical ports use light-emitting diodes (LEDs) rather than laser light.

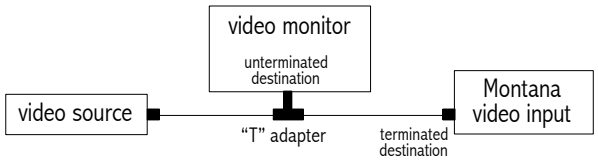
Montana's optical ports can be used in either 8-channel or 2-channel mode. See the "Software Reference" chapter in the Dakota User's Guide for more details.

- The 8-channel ADAT mode lets you connect Montana to multitrack tape machines, digital mixers, multichannel external A/D and D/A converter boxes such as Tango and Zulu (also from Frontier Design Group), and other devices that use 8-channel ADAT optical I/O.
- The 2-channel SPDIF mode lets you connect Montana to DAT machines, CD players, MiniDisc recorders and other devices that use 2-channel SPDIF optical I/O.

— Video sync / word clock input —

Although any audio RCA cable can physically connect to Montana's video/word clock input, using a standard audio cable for such high frequency signals can result in serious signal distortion. Instead, you should use a 75-ohm coax video cable. The Montana package includes a BNC/RCA adapter, so you can use either a BNC or RCA connector with Montana's video input.

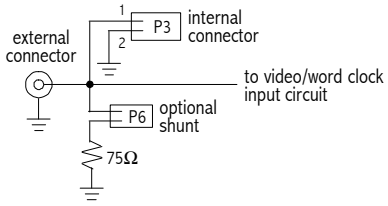
If the video or word clock signal is being sent to multiple inputs, the signal should be passed from one device to the next (in a chain, rather than "star" distributed), and only the last device in the chain should be terminated.



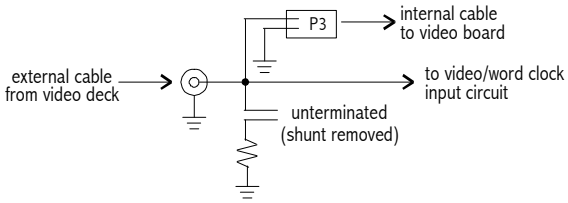
Montana includes a jumper (P6) with a shunt installed at the factory, making the video/word clock input terminated. If you need an unterminated input (if Montana is not the last device in the chain), you can remove the shunt from P6.

Montana also has an internal video connector on a standard 2-pin header (P3) that lets you route a video signal to or from another computer card such as a video capture board.

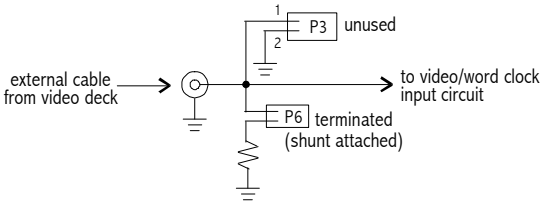
As shown in this input schematic, pin 1 of the internal connector is active, and pin 2 is ground.



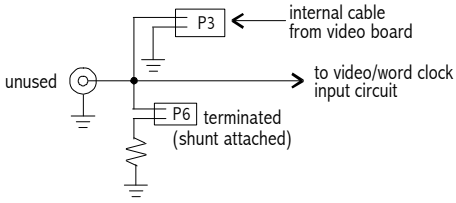
Montana's internal video connector provides great flexibility in your connections. For example, you can send a video signal from an external deck to both Montana and a video board using only one external cable. In this case, the video board should be terminated, and Montana should be unterminated.



If you're sending video sync from an external deck to Montana but not to another video board, the internal video connector remains unused and Montana should be terminated.



If your video board is generating a master video signal, Montana can receive it through the internal video connector. In this case, Montana should be terminated.

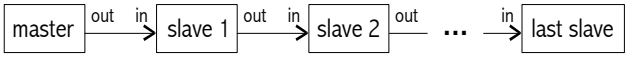


When working with a video deck, you can use its SMPTE signal for both timecode and audio clock inputs in the Dakota control panel. However, you may have more stable audio if you use video sync directly from the deck as the audio clock reference.

— ADAT 9-pin sync output —

The ADAT sync output can be connected to any device with an ADAT sync input. To insure proper data transmission, use only cables that are made for ADAT sync connections.

ADAT sync connections transmit sample rate, timecode, and machine commands down a sync "chain" and responses to the commands run up the chain. The chain runs from the sync output of the first device (the master) to the sync input of the next device (slave 1), and from the sync output of slave 1 to the sync input of slave 2, and so on. With both Dakota and Montana installed, the computer can be in any slave position in the chain.



With both Dakota and Montana installed, the computer can be in any slave position in the chain. In the initial Dakota software, Montana's sync output lets your computer be in the sync chain transparently to the other ADAT sync devices. The computer will follow ADAT timecode without affecting the operation of other ADAT sync devices.

Montana Specifications

These specifications are subject to revision without notice.

Digital audio inputs	16 channels, ADAT optical format on 2 TOSLINK connectors; either can be switched to 2-channel SPDIF optical format in the Dakota Control Panel
Digital audio outputs	16 channels, ADAT optical format on 2 TOSLINK connectors; either or both can be switched to 2-channel SPDIF optical format in the Dakota Control Panel
External video sync or word clock	RCA connector (phono) with RCA/BNC adapter included, jumpered 75-ohm termination
Internal video sync or word clock	2-pin connector with 0.1" spacing between pins, pin 1 active, pin 2 ground
ADAT sync output	DB-9 connector
SMPTE timecode	any audio input (or output) can be used for receiving (or sending) SMPTE timecode, as specified in the Dakota Control Panel
Sample rates	44.1 and 48 kHz internal, Varispeed and input tracking from 39–51 kHz, Driver resampling for 8, 11.025, 16, 22.05, 32 kHz rates
Audio data	8, 16, 20, 24 bit resolution
System requirements	Dakota, additional PCI or ISA slot, Windows 95/98
Dimensions	6.5" x 3.7" (16.5cm x 9.4cm)

Compliance Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the User's Guide, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

Declaration of Conformity

Frontier Design Group, LLC declares that the multichannel digital I/O card called Montana conforms to the following Directives and Standards:

Council Directives: 89/336/EEC, 73/23/EEC
Conformance Standards: EN55022 Class B, EN50082-1

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