SoundLink DRS
Digital Recording Systems

Fully Integrated Digital Recording Systems
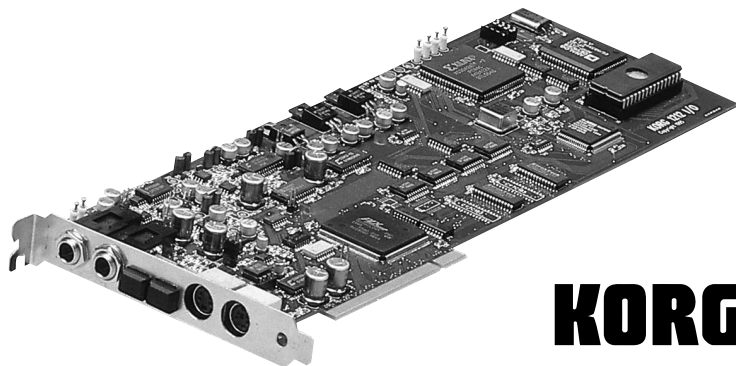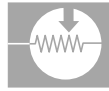
1212 I/O
PCI MULTI-CHANNEL AUDIO INTERFACE

Owner's Manual

KORG

The FCC Regulation Warning

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules and CISPR pursuant to subchapter EN 55022 of the EMC Directive. 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 instructions, 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 means:

• Reorient or relocate the receiving antenna.

• Increase the separation between the equipment and the receiver.

• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

If necessary, consult an experienced radio/television technician for additional suggestions. The following booklet prepared by the Federal Communications Commission may also be helpful: "How to Identify and Resolve Radio-TV Interference Problems." The booklet is available from the U.S. Government Printing Office, Washington, DC 20402 Stock No. 004-000-00345-4.

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Manual Version: August 1997

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Contents

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Introduction

Congratulations and thank you for purchasing the SoundLink DRS 1212 I/O PCI Multi-Channel Audio Interface card.

The 1212 I/O features ADAT optical input and output, S/PDIF input and output, and stereo analog input and output, all of which can be used simultaneously (with compatible software). An ADAT sync input allows software applications to synchronize directly to ADAT timecode, without need for external devices. Word clock input and output allow integration of the 1212 I/O into complex digital audio environments. The internal DSP processor allows format conversion between S/PDIF and ADAT channels.

The 1212 I/O is supported by a variety of digital audio software on both MacOS and Windows 95; it is also compatible with Sound Manager on the MacOS, and can appear as multiple wave devices under Windows 95.

The SoundLink DRS Product Line

The 1212 I/O is a component of the SoundLink DRS product line. SoundLink DRS, developed by Korg Professional Audio, is a collection of recording components designed to work together as a complete system or independently with other recording equipment.

The centerpiece of the DRS line is the 168RC Recording Console. The 168RC is a fully digital recording console with a total of 24 input and 22 output interfaces in a combination of analog, ADAT optical and S/PDIF formats.

SoundLink DRS also offers the 880 A/D and 880 D/A Audio Interfaces, which can be used to expand the analog inputs and outputs of the 168RC and 1212 I/O via ADAT optical cables. Each audio interface is an eight channel device, and offers additional flexibility thanks to routing selection and ADAT Thru provisions.

One of the most important pieces of equipment in the signal path is the monitor amplifier. SoundLink DRS offers the RMA240 Monitor Amplifier to maintain the integrity of your system. Its simple design philosophy offers a clean and quiet signal, yet includes all the necessary features to make the RMA240 flexible enough to fit within any system.

All SoundLink DRS products are designed and built with the goal of helping you make better recordings. Through the use of advanced digital technology, custom designed DSP processors and flexible interfacing capabilities, Sound Link DRS products bring the reality of completely digital, fully automated, component based recording systems to everyone working on that next great recording.

Please contact your local Korg dealer or distributor for more information about Sound Link Digital Recording Systems.

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Installation

Installing the 1212 I/O is simple and straightforward. However, to make sure that you don't damage the card or the computer, please read the instructions on pages 2-11 *completely* before performing the installation. They're short, they're sweet, and they're even sprinkled with a few zippy graphics–the perfect accompaniment to a brief coffee break.

Unpacking

The 1212 I/O package contains the following items:

*   1212 I/O PCI audio card (don't remove this from its envelope yet!)
*   1212 I/O software floppy disks for MacOS and Windows 95
*   S/PDIF breakout cable
*   ADAT sync and Word Clock breakout cable
*   ADAT Timecode Conditioner
*   This manual
*   Warranty card

The package may also contain a bundled software application.

Handle carefully!

Avoid static electricity

The 1212 I/O card is packaged within a protective anti-static envelope, which prevents static electricity from damaging its delicate electronic components. It's a good idea to keep this envelope around; whenever you need to ship your card, or to store it outside of your computer, put it back in its envelope.

Before handling the card, **always discharge any static electricity from your clothes and body by touching a grounded metal surface, such as the case around your computer's power supply**. After doing this, use one hand to hold the card by the metal jack panel (where the connectors are), and touch the power supply again with your other hand. While working with the card, avoid moving around on carpeted surfaces–shuffling your feet on a rug is almost guaranteed to build up a static charge. If you need to walk around in the middle of working with the card, just repeat the static discharge procedure before touching the card again.

These simple steps will ensure that a tiny little jolt of static electricity–like the kind that holds your socks together when they come out of the dryer–doesn't zap your card into oblivion.

Hold the 1212 I/O by its edges

Did we already mention that the 1212 I/O uses a whole bunch of delicate electronic components? Well, OK, so we've said it again. To avoid damaging those lovely little silicon jewels, **always hold the 1212 I/O by the edges of the card,** or by the metal jack panel (where the connectors are). Don't touch the electronic parts, the PCI connector pins, or any of the traces on the board (those little silvery paths that run between the components).

There, we're done nagging now.

Analog levels: +4 or -10

The 1212 I/O's analog inputs and outputs can be configured for use with either +4 dBu or -10 dBV signal levels, to allow clean interfacing with a wide variety of equipment. You can even set the input and output levels independently, if desired, so that you can record at -10 and play back at +4, or vice versa.

The 1212 I/O ships from the factory configured for -10 input and output. If you will be working with -10 levels, then you can jump ahead to the next section, "Installing the 1212 I/O card in your computer," on page 5. If you need to switch either inputs or outputs to operate at +4, read on.

Setting the analog levels

The nominal analog signal levels are set by several *jumpers* on the card's circuit board. A jumper is a small black connector which fits over a pair of metal pins mounted on the board. The jumper makes an electrical connection between the pins, just as if you were to solder a wire between them. Unlike a wire, however, jumpers can be easily installed and removed. The diagram below shows what they look like:

Jumpers, installed and removed

Jumper Removed (+4 dBu)   *Jumper Installed (-10 dBV)*
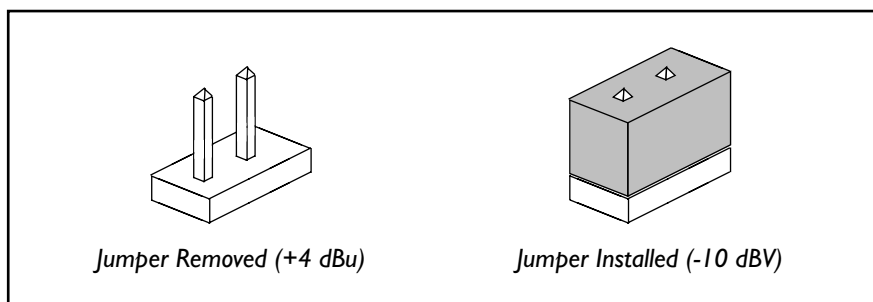
There are six jumpers on the 1212 I/O circuit board; each one is labeled with a small "JP" (for "jumper") followed by a number. The upper group of four jumpers, labeled JP1 through JP4, set the input level; the lower group of two, labeled JP5 and JP6, set the output level. The locations of the jumpers are shown in the diagram below.

IMPORTANT: Within each group (input or output), all of the jumpers must be set the same way: either all installed, or all removed.

When the jumpers are installed, the level is set to -10 dBV; when they are removed, the level is set to +4 dBu. The 1212 I/O ships from the factory with all six jumpers installed, so that both input and output are set to -10.

The 1212 I/O card and analog level jumpers
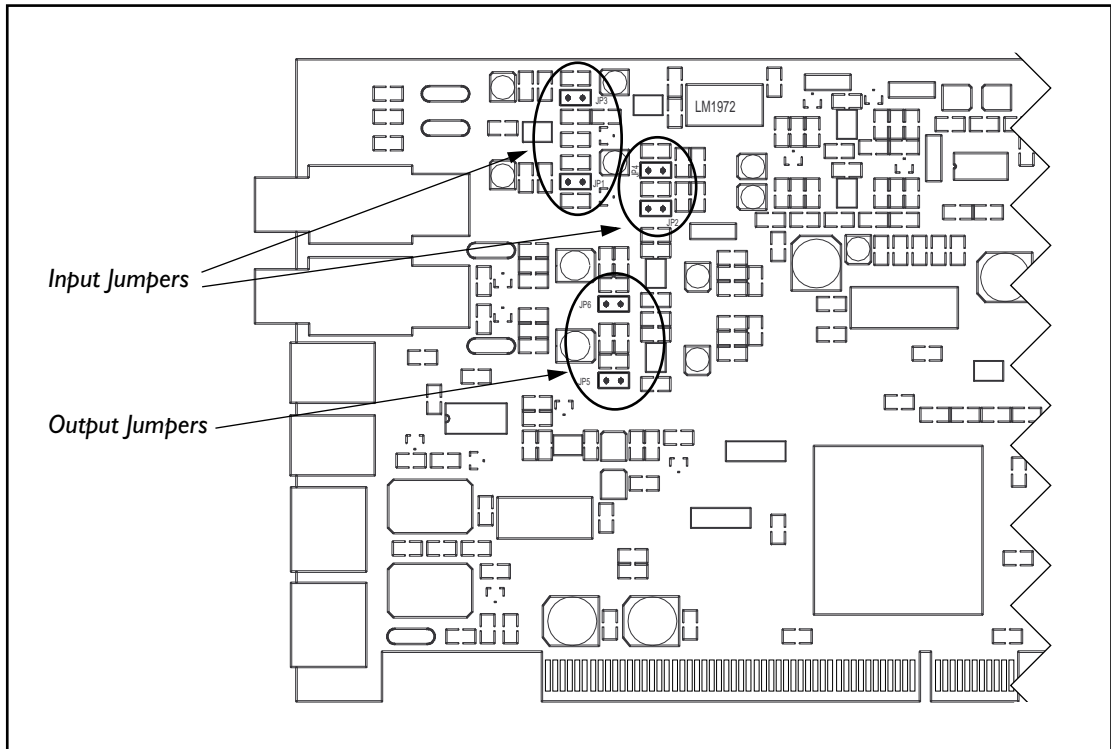
To change the nominal input or output levels:

1. **Before handling the 1212 I/O card, touch a grounded metal surface (such as your computer's power supply). Follow the complete instructions under "Handle carefully!," on page 2.**

2. **Place the card on a clean surface.**

3. **To remove a jumper, simply grasp it gently but firmly, and then lift it away from the board.**
   or:
   To install a jumper, slide it gently onto the pins.

4. **Repeat for all jumpers within the group: four for input, and two for output.**

All jumpers within a group must be set the same way: either all installed, or all removed.

5.   If you have removed any jumpers, store them in a safe place.

They'll be necessary if you ever want to switch the card back to -10dBv operation.

Installing the 1212 I/O card in your computer

Please consult your compatible computer's manuals for detailed instructions on installing a card in your specific system. The instructions below are a brief overview of the installation procedure.

1.   If you have not done so already, read "Analog levels: +4 or -10" on page 3, and set the 1212 I/O's levels as desired.

2.   Shut down the computer.

3.   Detach the power cable from the computer.

4.   Remove the computer's main cover.

5.   Choose any available PCI slot.

For each slot, there is a small port on the back of the computer, which allows access to one end of the card (in the case of the 1212 I/O, this is the jack panel, into which you plug all your digital and analog connectors). There will be a small cover over the port.

6.   Remove the cover from the port on the back of the computer.

7.   Before handling the 1212 I/O card, touch a grounded metal surface (such as your computer's power supply). Follow the complete instructions under "Handle carefully!," on page 2.

8.   Before plugging the card in, align it with the selected PCI slot.

The jack panel should line up with the port on the back of the computer. There also should be a corresponding guide towards the front of the computer, to hold the other end of the card in place.

9.   Press the card gently but firmly into the slot, until the connector is fully inserted.

Don't force the card into the slot. If you encounter a lot of resistance, pull the card out and try inserting it again.

10.   To make sure that the connector is properly inserted, pull on the card gently.

If the card resists your gentle pull and stays in place, then it's inserted properly.

If it moves easily, then go back to step 9 and try again.

11.   After installing the card in the slot, replace the computer's main cover and power cable.

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With the card installed in the computer, you're now ready to install the 1212 I/O software.

Installing the 1212 I/O software (MacOS)

The 1212 I/O includes three important pieces of software for MacOS-compatible computers. The 1212 I/O extension allows software to talk directly to the card, and also provides compatibility with the Apple Sound Manager. The 1212 I/O Utility program offers quick and easy access to the routing and mixing features of the card, and allows you to set up the card for use with the Sound Manager. The Sound control panel is used to select the 1212 I/O as a Sound Manager device. All of these are included on the *MacOS Software* floppy disk shipped with the 1212 I/O.

To install the 1212 I/O software:

1.   Disable any installed virus detection extensions.

Virus detection software may interfere with the startup procedure the first time that the 1212 I/O extension loads.

2.   Disable virtual memory, in the Memory control panel.

Virtual memory must be disabled when working with the 1212 I/O.

3.   Restart the computer.

4.   Insert the Korg 1212 I/O MacOS Software disk into your computer's floppy disk drive.

The disk's icon and window will appear on the desktop.

5.   Open the folder named, "Install in System Folder."

6.   Select the "1212 I/O" and "Sound" files, and drag them onto the icon of the System Folder on your startup hard drive.

Dragging onto the System Folder's icon in the Finder ensures that the files will be placed in the correct location within the System Folder. The "1212 I/O" extension will be placed in the Extensions folder; the Sound control panel will be placed in the Control Panels folder.

7.   Copy the folder "Korg 1212 I/O Software" onto your hard drive.

This folder includes the 1212 I/O Utility and a Read Me text file.

8.   Open the "Korg 1212 I/O Software" folder, and double click on the "1212 I/O Read Me" file.

This is a text file which contains any late-breaking information about the card and the software.

9.   Read the file.

We're not taking any chances, here.

10.   Restart the computer before using the 1212 I/O.

Restarting allows the 1212 I/O extensions to be loaded into the system; the extensions must be loaded before the card can be used.

11. **After successfully re-starting with the 1212 I/O extension loaded, re-enable any installed virus detection extensions.**

Virus detection software will only interfere the first time that the 1212 I/O extension loads.

Installing the 1212 I/O software (Windows 95)

The 1212 I/O includes several important pieces of software for Windows 95-compatible computers. Some of this software is driver software, which you can just install and forget about, but two programs–the 1212 I/O Utility, and the 1212 I/O Wave Device Control–allow you to control various aspects of the 1212 I/O.

The 1212 I/O Utility program offers quick and easy access to the routing and mixing features of the card. The 1212 I/O Wave Mixer offers various controls for using the card as multiple Wave devices, including synchronization of each device for playback and record, and settings for each device's volume and balance.

The 1212 I/O package includes two floppy disks for Windows 95. The *Windows 95 Drivers* disk includes all device driver-related files, including the 1212 I/O Wave Mixer. The *Windows 95 Software* disk contains an installer program, which installs the 1212 I/O Utility program and adds the 1212 I/O software to the Start menu.

To install the 1212 I/O software:

1. **If you have not done so already, install the 1212 I/O card (see "Installing the 1212 I/O card in your computer" on page 5, above).**

2. **Turn the computer on.**

Windows 95 will automatically detect that a new card has been installed, and the Update Device Driver Wizard will appear.

3. **Insert the Korg 1212 I/O Windows 95 Drivers floppy disk into your computer's floppy disk drive A.**

4. **Follow the on-screen instructions to finish the installation of the 1212 I/O driver software.**

When the driver installation is complete, Windows 95 will return you to the desktop. Next, you need to run the Korg 1212 I/O setup, which will install the 1212 I/O Utility program and add the 1212 I/O software to the Start menu.

5. **Eject the Korg 1212 I/O Windows 95 Drivers floppy disk.**

6. **Insert the Korg 1212 I/O Windows 95 Software floppy disk.**

7. **Press the Start button, and then press Run.**

8.   In the Run dialog box, type the following command:

```
A:\setup.exe
```

9.   Press OK.

The Korg 1212 I/O Software Welcome dialog will appear.

10.   Follow the on-screen instructions.

The on-screen instructions will walk you through the rest of the installation.

Audio connectors

Korg engineers worked valiantly to squeeze an incredible number of inputs and outputs onto the 1212 I/O's relatively small jack panel. To produce such a densely packed piece of digital audio real estate, they used a number of breakout cables–that is, cables with a single connector on one end, fanning out to two or three connectors on the other.

The analog inputs and outputs use 1/4" TRS (tip-ring-sleeve) connectors to carry stereo, unbalanced signals, similar to a stereo headphone jack. You can use standard "insert" cables to bring these signals out to a pair of 1/4" mono connectors. We've provided special, custom cables for use with the S/PDIF and Word Clock & ADAT Sync connectors.

The 1212 I/O jack panel

❶ *Stereo Analog Input*

❷ *Stereo Analog Output*

❸ *ADAT Optical Input*

❹ *ADAT Optical Output*

❺ *S/PDIF Breakout Connector*

❻ *Word Clock & ADAT Sync Breakout Connector*
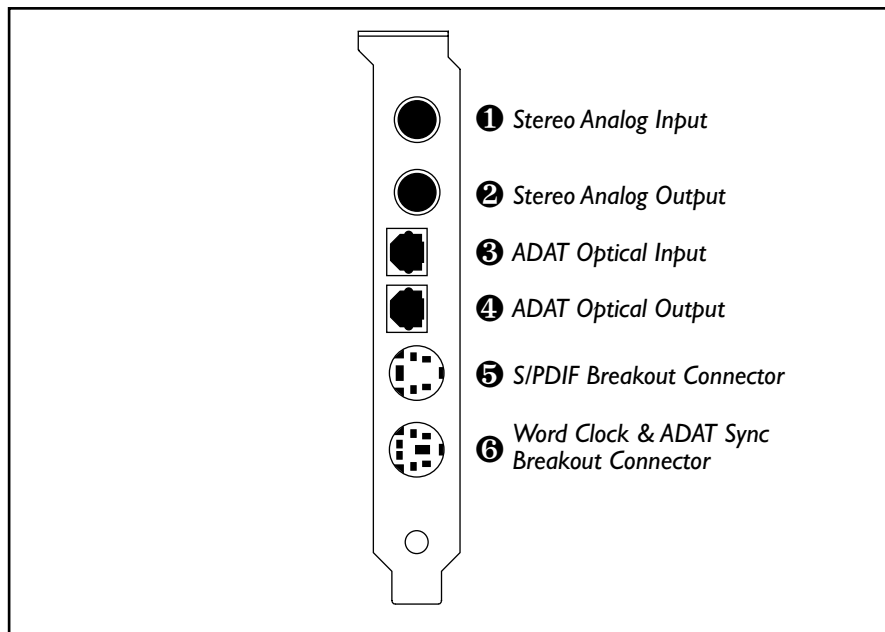
❶ Stereo analog input

This input is used to bring analog signals into the 1212 I/O. You can connect this to the output of a mixer, microphone pre-amp, synthesizer, and so on. To allow use with a wide range of equipment, the analog input may be configured for either +4 dBu or -10 dBV signal levels. For more information, please see "Analog levels: +4 or -10" on page 3.

Microphones and electric guitar outputs should be sent through a mixer or pre-amp first, to bring them up to +4 or -10 levels; otherwise, their signals will be too weak.

The analog input uses a 1/4" TRS (tip-ring-sleeve) connector to carry a stereo, unbalanced signal. The tip carries the right side, the ring carries the left side, and the sleeve carries the ground. You can use standard "insert" cables to bring the signals out to a pair of 1/4" mono connectors.

❷ Stereo analog output

This connector is used to bring analog signals out of the 1212 I/O, into your mixer, amplifier, etc. To allow use with a wide range of equipment, the analog output may be configured for either +4 dBu or -10 dBV signal levels. For more information, please see "Analog levels: +4 or -10" on page 3.

As with the analog inputs, described above, the output uses a 1/4" TRS (tip-ring-sleeve) connector to carry a stereo, unbalanced signal. The tip carries the right side, the ring carries the left side, and the sleeve carries the ground. You can use standard "insert" cables to bring the signals out to a pair of 1/4" mono connectors.

❸ ADAT optical input

The ADAT optical input carries eight channels of digital audio. You can connect this to the digital output of any multitrack recorder, digital mixer, effects processor, or other digital audio device which supports the ADAT optical format.

You can also connect this to the SoundLink DRS 880 A/D Audio Interface, which will provide the 1212 I/O with eight additional analog inputs.

❹ ADAT optical output

The ADAT optical output carries eight channels of digital audio. You can connect this to the digital input of any multitrack recorder, digital mixer, effects processor, or other digital audio device which supports the ADAT optical format.

You can also connect this to the SoundLink DRS 880 D/A Audio Interface, which will provide the 1212 I/O with eight additional analog outputs.

❺ S/PDIF breakout connector

This connector should only be used with the special S/PDIF breakout cable included with the 1212 I/O. This cable has a 4-pin mini-DIN connector at

English

one end, which connects to the 1212 I/O, and fans out to a pair of female RCA connectors. One of these connectors is white, and labeled "In," while the other is yellow, and labeled "Out."

S/PDIF stands for "Sony/Philips Digital Interface." The S/PDIF format carries two channels of digital audio, and is commonly used for transferring stereo signals between DAT recorders, digital signal processors, digital musical instruments, and so on.

S/PDIF input. The white RCA connector, labeled "In," is the S/PDIF input. You can connect this to the S/PDIF output of a DAT, signal processor, sampler, and so on. Please use high-quality, shielded, 75-ohm cables manufactured specifically for video or digital audio.

The 1212 I/O can accept either 16 or 20 bit audio data via the S/PDIF input.

S/PDIF output. The yellow RCA connector, labeled "Out," is the S/PDIF output. You can connect this to the S/PDIF input of a DAT, signal processor, sampler, and so on. Please use high-quality, shielded, 75-ohm cables manufactured specifically for video or digital audio.

The 1212 I/O can transmit either 16 or 20 bit audio data via the S/PDIF output.

❻ Word Clock and ADAT Sync breakout connector

This connector should only be used with the special Word Clock and ADAT breakout cable included with the 1212 I/O. This cable has a 6-pin mini-DIN connector at one end, which connects to the 1212 I/O, and fans out to a pair of female BNC connectors, one yellow and one white, and the ADAT 9-pin D-sub sync connector.

ADAT sync input. This 9-pin connector receives timecode from the ADAT system. 1212 I/O-compatible digital audio software can use this to synchronize recording and playback with a connected ADAT system. Connect this to the ADAT Timecode Conditioner (described below) and then to the ADAT's sync out port. If you have multiple ADATs in your system, connect this to the sync output of the last machine in the chain.

Word Clock input. The white BNC connector, labeled "In," is the Word Clock input. This allows the sample rate of the 1212 I/O to be controlled by an external device. Connect this to the word clock output of the master clock source.

The Word Clock input requires a shielded, video-quality cable (75-ohm or greater impedance) with BNC connectors. This type of cable is different from those commonly used in analog audio applications, but is readily available at professional audio and video dealers.

Word Clock output. The yellow BNC connector, labeled "Out," is the Word Clock output. This allows the 1212 I/O to control the sample rate of an external device; it will always echo the currently selected Clock Source (see

"Clock Source," on page 25). Connect this to the word clock input of the slave device.

Most commonly, this will be connected to the Word Clock input of an Alesis BRC; this is necessary when transferring audio from S/PDIF input to ADAT output in a BRC-equipped system.

As with the Word Clock input, above, the Word Clock output requires a shielded, video-quality cable, with 75-ohm or greater impedance.

ADAT Timecode Conditioner

The 1212 I/O's ADAT Timecode Conditioner is a small device which fits between the ADAT 9-pin sync cable and the 1212 I/O's ADAT timecode connector. This device pre-conditions the ADAT timecode, enhancing the 1212 I/O's timecode sync capabilities.

If you will be using ADAT timecode with the 1212 I/O, please make sure that the ADAT Timecode Conditioner is connected between the ADAT sync cable and the ADAT sync connector on the 1212 I/O's ADAT sync input.

Adat Timecode Conditioner

ADAT Sync Cable   ADAT Timecode Conditioner   1212 I/O Breakout Cable
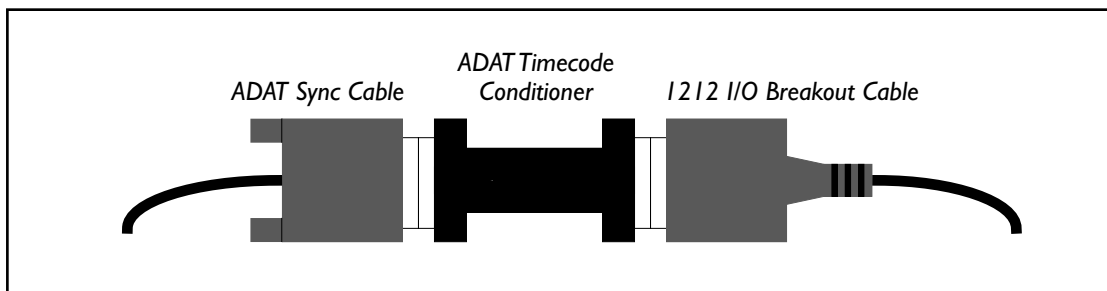
System Configurations

This chapter is intended to provide a quick guide for integrating the 1212 I/O into a variety of different setups. By its nature, the instructions here are brief; for additional detail, please consult the manuals of the other digital audio hardware and software being used.

Word clock settings

The great majority of technical support questions regarding the 1212 I/O are the result of incorrect word clock settings. Incorrect word clock settings may cause subtle degradation of audio, louder pops and clicks, altered playback speeds, and/or timecode problems.

Keeping track of the word clock source may seem confusing at first, but it's really pretty simple. Just remember that, as with SMPTE synchronization setups, there must be one and only one word clock master, with all other devices set to slave to the master device. This means that you need to keep track of the word clock settings on all of your digital audio devices–not just on the 1212 I/O.

Using only the 1212 I/O's analog input and output

The 1212 I/O can be used as a stand-alone analog I/O card, without any digital connections. In this case, set the 1212 I/O's word clock source to Internal.

S/PDIF devices (DAT, effects, etc.)

There are two broad classifications of S/PDIF devices: those which can use an external clock to control their digital output, and those which cannot. These two types require different settings on the 1212 I/O.

Devices which do not accept external word clock

Many S/PDIF devices don't have a separate setting for the word clock source. For instance, many DAT machines automatically use incoming digital audio data as the word clock source when recording, and automatically use the internal clock source when playing back. Some stand-alone A/D converters also may not accept an external word clock.

When recording from such devices, all the other devices must slave to the S/PDIF device's clock.

1. **Connect the digital audio cables between the S/PDIF input and output of the 1212 I/O and the S/PDIF device.**

2. **When recording from the S/PDIF device into a digital audio program, set the 1212 I/O's word clock source to S/PDIF•Word Clock.**

In Deck, set the Sync Mode to Digital. For more information on word clock settings in audio software, please see "Setting the word clock source in digital audio software," on page 16.

3. **When playing back into the S/PDIF device from a digital audio program, set the 1212 I/O's word clock source to Internal (or ADAT, if you generally use an ADAT system as the master clock source).**

Devices which accept external word clock

Some S/PDIF devices, on the other hand, may allow you to freely select between internal and external word clock. Some may use a dedicated word clock input; others may use the clock signal received at their S/PDIF input.

When using the 1212 I/O with these devices, you don't need to change word clock settings between recording and playback. Instead:

1. **Connect the digital audio cables between the S/PDIF input and output of the 1212 I/O and the S/PDIF device.**

2. **If the S/PDIF device has a dedicated word clock input, connect the word clock output of the 1212 I/O to the word clock input of the S/PDIF device.**

3. **Set the S/PDIF device to use the external clock source.**

4. **In the digital audio program, set the 1212 I/O's word clock source to Internal or ADAT, as desired.**

You can also use a dedicated word clock source as the master for the 1212 I/O. In this case, connect the word clock output of the master device to the word clock input of the 1212 I/O, and set the 1212 I/O's word clock source to S/PDIF•Word Clock.

Korg 880D/A

The 880D/A provides the 1212 I/O with an additional 8 high-quality analog outputs. The 880D/A connects directly to the 1212 I/O's ADAT optical output, so setup is very simple.

1. **Connect the optical output of the 1212 I/O to the optical input of the 880A/D.**

You don't need to make any word clock settings on the 880D/A; it will automatically slave to its ADAT optical input.

2. **In the digital audio program, set the 1212 I/O's word clock source as desired.**

If you are using the 1212 I/O and 880D/A as a stand-alone system, set the word clock source to Internal. If you are using the 1212 I/O in combination with other digital audio devices, see this manual's instructions for those devices.

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Korg 880A/D

The 880A/D provides the 1212 I/O with an additional 8 high-quality analog inputs. The 880A/D connects directly to the 1212 I/O's ADAT optical input, so setup is very simple.

First, connect the cables:

1. **Connect the Word Clock output of the 1212 I/O to the Word Clock input of the 880A/D.**

2. **Connect the optical output of the 880A/D to the optical input of the 1212 I/O.**

Next, make all the word clock settings:

3. **On the 880A/D, set the CLK. SOURCE to EXT.WCLK.**

This makes the 880 A/D sync to the word clock output of the 1212 I/O.

4. **In the digital audio program, set the 1212 I/O's word clock source as desired.**

If you are using the 1212 I/O and 880A/D as a stand-alone system, set the word clock source to Internal. If you are using the 1212 I/O in combination with other digital audio devices, see this manual's instructions for those devices.

Korg 880A/D and 880D/A

This setup combines the 1212 I/O with the Korg SoundLink DRS 880A/D and 880D/A to create a system with 10 analog inputs and 10 analog outputs. The1212 I/O provides the master word clock, and both the 880A/D and 880D/A slave to the 1212 I/O.

To use the 1212 I/O with both the 880A/D and 880D/A, simply follow the directions under "880D/A" and "880A/D," above.

880A/D and 880D/A, recording from a S/PDIF device

If you like, you may also record simultaneously from a S/PDIF device (such as a DAT, or an external A/D). This will allow you to record up to 12 tracks simultaneously from an S/PDIF source, the 880A/D, and the 1212 I/O's analog inputs.

You may or may not need to change the 1212 I/O's word clock source to S/PDIF•Word Clock; the 880A/D and 880D/A can remain as described above. For more information, see "S/PDIF devices (DAT, effects, etc.)" on page 12.

Korg 168RC

This setup combines the 1212 I/O with the Korg SoundLink DRS 168RC digital mixer. The 1212 I/O provides the word clock source; the 168RC slaves to the 1212 I/O.

1. **Connect the 1212 I/O's optical cables to the 168RC's Dig A ports.**

2. **On the 168RC, press the MISC button, and scroll down until you reach the CLK Source parameter. Set this to DIG-IN-A (the 1212 I/O).**

This selects the 1212 I/O as the word clock source for the 168RC.

3. **In the digital audio program, set the 1212 I/O's word clock source to Internal.**

Korg 168RC and ADAT

This setup combines the 1212 I/O and an ADAT with the Korg SoundLink DRS 168RC digital mixer. The ADAT provides the word clock source; the 168RC slaves to the ADAT, and the 1212 I/O slaves to the 168RC.

1. **Connect the ADAT's optical cables to the 168RC's Dig A ports, and the 1212 I/O's optical cables to the 168RC's Dig B ports.**

2. **On the 168RC, press the MISC button, and scroll down until you reach the CLK Source parameter. Set this to DIG-IN-A (the ADAT).**

This selects the ADAT as the word clock source for the 168RC.

3. **Connect the ADAT Timecode Conditioner to the 1212 I/O's ADAT sync input.**

4. **Connect the sync output from the ADAT to the 1212 I/O's ADAT Timecode Conditioner.**

5. **In the digital audio program, set the 1212 I/O's word clock source to ADAT.**

6. **Set the ADAT's word clock source to Internal.**

For more information, see "Setting the word clock source on an ADAT system," on page 19.

7. **If using an Alesis BRC, connect the BRC's sync output to the ADAT's sync input, and then connect the Word Clock output of the 1212 I/O to the 48kHz Input of the BRC.**

This connection is necessary when recording from the 1212 I/O's S/PDIF input.

Yamaha 02R

The 1212 I/O and the Yamaha 02R digital mixer can be connected in many different ways, depending on the rest of your studio setup. Either the 1212 I/O or the 02R can be the word clock master, each using either the ADAT optical cables or a dedicated word clock cable.

Whatever configuration you decide upon, you'll need to set all the word clocks accordingly. One possible setup is to sync the 02R to the 1212 I/O, using the 1212 I/O's ADAT output. In this case:

1. **Connect the 1212 I/O's optical input and output to an ADAT I/O card on the 02R.**

2. **On the 02R, Press the Digital I/O button.**

3. **Go to the Word Clock Select page.**

This page shows a list of all the installed I/O cards, and allows you to select a pair of channels from any card as the master clock source. You can also select the dedicated word clock input, or the internal clock.

4. **Set the 02R to use the ADAT 1/2 channels from the card connected to the 1212 I/O.**

5. **In the digital audio program, set the 1212 I/O's word clock source to Internal.**

Using multiple 1212 I/O cards

Multiple 1212 I/O cards may be used simultaneously. 1212 I/O-compatible digital audio software may or may not support the use of multiple 1212 I/O cards; consult your software's manual for details.

When using multiple 1212 I/O cards, the only additional concern is that one of the cards needs to be the word clock master for the rest of the cards. To do this:

1. **Connect the word clock output of the master 1212 I/O card to the word clock input of the slave 1212 I/O card.**

You can daisy-chain the word clock cables from card to card, as necessary.

2. **When using the 1212 I/O as a Windows wave device, use the 1212 I/O Utility to set the word clock source of all slave cards to S/PDIF•Word Clock.**

The master card's word clock source can be set as desired.

Setting the word clock source in digital audio software

When using the 1212 I/O with digital audio software which directly supports the 1212 I/O, the clock source, sample rate, and other parameters are controlled directly by the digital audio software (and not by the 1212 I/O Utility).

In Deck II, the word clock source is set by the Sync Mode parameter, in the Options menu's Hardware Configuration dialog. Deck's "Digital" setting is equivalent to the 1212 I/O's "S/PDIF•Word Clock."

In Cubase VST, the word clock source is set by the Audio Clock Source parameter, in the Audio menu's Audio Setup dialog.

For other digital audio software, please refer to the program's manual for more information.

Make sure that the program's sample rate matches the external clock source

When you record or play back audio data using external clock sources (such as the S/PDIF, ADAT, or Word Clock inputs), the sample rate is controlled entirely by the external source, and not by the digital audio program's sample rate parameter. Because of this, you must make sure that the external clock source is actually set to the same sample rate as the digital audio program. If the two are different, it can result in audio playing back faster or slower than expected.

For more information, see "Audio playback is slightly slow, or slightly fast," on page 50.

Connecting the 1212 I/O to an ADAT system

The 1212 I/O will work equally well in a system with only one ADAT, or in a more complex system with multiple ADATs and a remote controller, such as the Alesis BRC. When the 1212 I/O is used in a system with multiple ADATs, it should always be connected to the last ADAT in the chain.

In this manual, by the way, we'll use the term ADAT to refer to any ADAT-compatible multitrack recorder, such as the Alesis ADAT and ADAT XT, the Fostex RD-8 and CX-8, and the Panasonic MDA-1.

To connect the 1212 I/O to an ADAT system:

1. **Connect the ADATs together as usual, with the sync and optical outputs from ADAT #1 going into ADAT #2, from ADAT #2 to ADAT #3, and so on.**
2. **Connect the ADAT Timecode Conditioner to the 1212 I/O's ADAT sync input.**
3. **Connect the sync output from the last ADAT to the 1212 I/O's ADAT Timecode Conditioner.**
4. **Connect the optical outputs from the last ADAT to the optical inputs of the 1212 I/O.**
5. **Connect the optical output of the 1212 I/O to the optical input of ADAT #1.**
6. **If using an Alesis BRC, connect the BRC's sync output to ADAT #1's sync input, and then connect the Word Clock output of the 1212 I/O to the 48kHz Input of the BRC.**

This connection is necessary when recording from the 1212 I/O's S/PDIF input.

7. **For general use, set the 1212 I/O's word clock source to ADAT, and the ADAT system's word clock source to Internal.**

For more information, see "Setting the word clock source on an ADAT system," on page 19.

English

Below is a nifty little diagram, showing the 1212 I/O hooked up in a simple system with two ADATs and a BRC. If you have more ADATs than shown here (lucky you!), just pretend that this diagram's ADAT #2 is the last one in your chain.

ADAT Timecode Conditioner

The 1212 I/O's ADAT Timecode Conditioner is a small device which fits between the ADAT 9-pin sync cable and the 1212 I/O's ADAT timecode connector. This device pre-conditions the ADAT timecode, enhancing the 1212 I/O's timecode sync capabilities.

If you will be using ADAT timecode with the 1212 I/O, please make sure that the ADAT Timecode Conditioner is connected between the ADAT sync cable and the ADAT sync connector on the 1212 I/O's ADAT sync input.

The 1212 I/O with 2 ADATs and a BRC
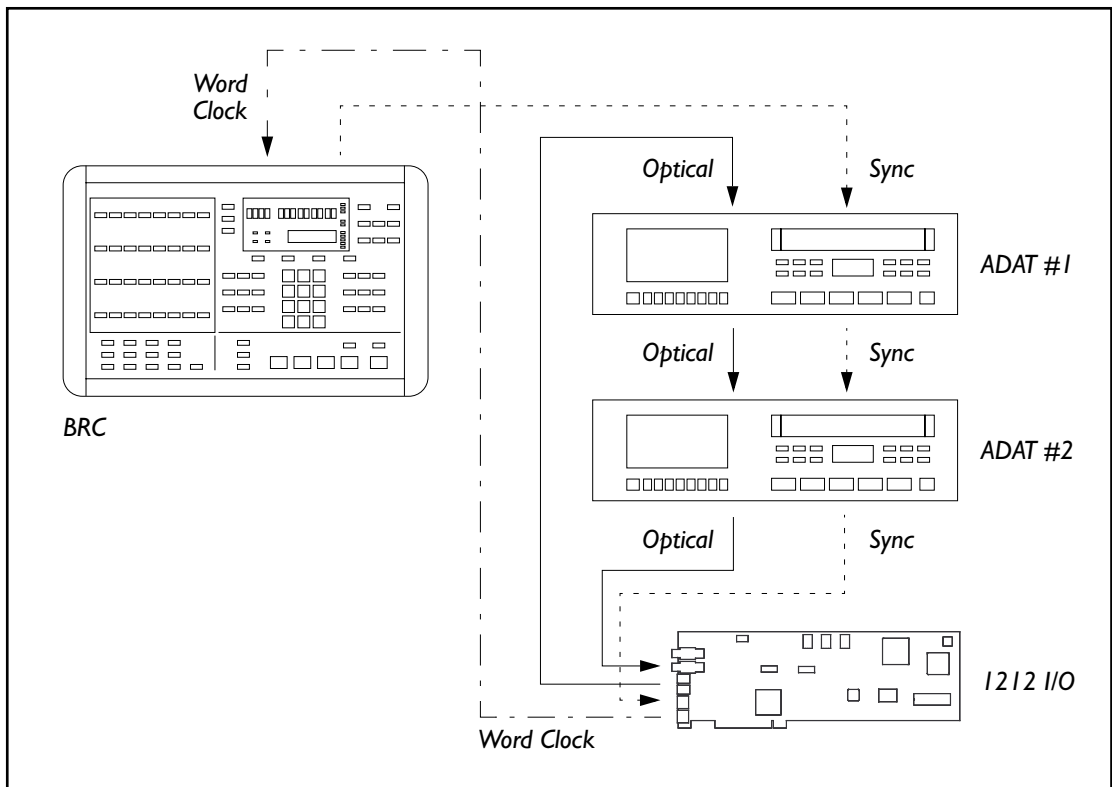
Setting the word clock source on an ADAT system

ADATs have three settings for word clock source: "Digital," "Internal," and "External."

Digital means that they sync to an external clock through their optical or 9-pin inputs, if they are connected to another ADAT optical device (such as the 1212 I/O); if there are no other devices connected, then they use their internal clock.

Internal means that they use their internal clock, regardless of any signal at the optical input.

External will only appear if the ADAT is connected to a BRC, or another ADAT sync master (such as the Mark Of The Unicorn MIDI Timepiece AV).

In a multi-device system without the Alesis BRC, the first device (the unit that displays "Id 1" at startup) will have been designated the word clock master at startup, and this is the only one you need to change. The rest of the devices will automatically be set to slave to the master through their digital inputs.

When using the Alesis BRC, you do not need to make any settings on the ADATs themselves (they'll automatically be set to External); instead, the BRC controls the word clock of the connected ADATs. See below for instructions on working with the BRC.

ADAT XT, Fostex CX-8, Panasonic MDA-1 (without BRC)

On the ADAT XT, Fostex CX-8, and Panasonic MDA-1, both the word clock source and the sample rate are set using the Clock Source button on the front panel. The current Clock Source setting is shown in the lower right-hand side of the fluorescent display. Pressing the button repeatedly toggles through the four choices: INT 48kHz, INT 44.1kHz, DIG 48kHz, and DIG 44.1kHz. "INT" is Internal, and "DIG" is Digital.

If the ADAT is providing the master clock source, the sample rate (48kHz or 44.1kHz) will control the entire system, including the 1212 I/O. If the tape is not formatted for the current sample rate, the sample rate may flash in the display, and the front-panel clock may not be correct, but otherwise everything will be fine; please see your ADAT manual for details.

If DIG is selected, the on-screen "DIG" indicator will flash if there is a problem with the signal at the ADAT's optical input (such as no cable connected, or invalid word clock).

Original ADAT (without BRC)

On the original ADAT, hold the "SET LOCATE" button, and then press "DIGITAL IN." This toggles the ADAT between "int" (Internal) and "dig" (Digital). This is a little tricky, since you cannot see the setting without changing it. Press the buttons until you see the desired setting.

English

NOTE: The original ADAT defaults to "dig" at power-on.

BRC (with either original ADAT or ADAT XT)

When using the BRC with either original ADATs or ADAT XTs, the BRC supplies the word clock to the ADAT system. The BRC can use its internal word clock, or word clock from its 48kHz input. This is controlled by the Clock Source parameter, under the EXT SYNC button. Once the Clock Source has been set, you can enable or disable external sync by pressing the EXT SYNC button, and the button's light will toggle on and off accordingly.

To set the BRC to use its internal clock, simply make sure that the EXT SYNC button's light is off. (EXT SYNC also controls SMPTE synchronization; if you need to use this feature, make sure that the Clock Source is set to Internal.)

To set the BRC to use a word clock from the 1212 I/O, set the Clock Source to 48kHz Input, and then turn on EXT SYNC. Connect the word clock output of the 1212 I/O to the 48kHz Input on the back of the BRC.

Special note: ADAT timecode synchronization and clock source

When using ADAT timecode sync with the original ADAT (without BRC), the ADAT must be the master clock source (1212 I/O set to ADAT, and ADAT set to Internal). The 1212 I/O clock source cannot be set to either S/PDIF•Word Clock or Internal.

With using ADAT timecode sync with the ADAT XT, the 1212 I/O's clock source may be set to either ADAT or S/PDIF•Word Clock. If the 1212 I/O's clock source is set to ADAT, set the ADAT to Internal; if the 1212 I/O is set to S/PDIF•Word Clock, set the ADAT to Digital.

When using ADAT timecode sync with a BRC-controlled ADAT system (with either original ADATs or ADAT XTs), it is the same as with the ADAT XT: the 1212 I/O's clock source may be set to either ADAT or S/PDIF•Word Clock. See the notes under "BRC (with either original ADAT or ADAT XT)," above.

These restrictions apply only to digital audio recording using ADAT timecode.

Recording and playback without ADAT timecode work well with all 1212 I/O clock settings.

A few words on word clock

Whenever two or more audio devices are connected together digitally, they are sending and receiving thousands of individual bits of data every second.The bits are sent out continuously, one after another, at a very steady pace. This is similar to two jugglers passing balls between each other, while at the same time keeping up their own steady juggling patterns.

When one device sends out a bit of data (like the ball being thrown to the other juggler), the other needs to be ready to receive it. If the data is being sent even just slightly faster than it can be received, bits will be lost, causing errors in the audio (like the ball being dropped).

Similarly, if the data is being sent even slightly slower than the receiver expects it to be, then the receiver will occasionally be left without real data at its input (like a juggler grabbing at the air). In digital audio, these errors show up as loud pops and clicks, as well as lower-level noise.

The rate at which those bits are sent and received is controlled by the word clock, which "ticks" for every bit of data. Each device has its own word clock, so that it can work on its own–such as a single ADAT, or a single 1212 I/O.

When you send digital audio data between two devices, however, their word clocks need to be synchronized together, so that devices send and receive each bit at the exact same moment. One of the devices–usually the sender–will provide the master clock; the other will ignore its internal clock, and instead slave to the master clock.

This clock signal is normally carried along with the digital audio data, so that when connecting two devices together in a simple configuration–such as dubbing between two DAT machines–you don't need to make any other connections. Sometimes, however, it is necessary to send the word clock separately from the digital audio data–as in the case of the BRC, for example.

As part of the BRC's master control functions, it provides the word clock for the connected ADAT system; since the BRC does not actually send or receive audio data, it sends the word clock through the ADAT sync cables. To control the BRC's word clock–necessary when transferring audio from S/PDIF to ADAT, for example–you must use a separate word clock connection to synchronize the BRC to the S/PDIF source.

Editing ADAT audio off-line

As explained above, a digital audio device's word clock controls the speed of the digital audio bit-stream, and unless the clocks of two devices are explicitly synchronized, they will tend to run at slightly different speeds.

This means that the same DAT tape, played in two different, un-synchronized DAT machines, will play slightly slower in one of the machines–and thus will play for a slightly longer time. The difference will be so slight that you almost certainly couldn't hear it in isolation, but if you made an exact copy of the tape and played the two tapes back at the same time on un-synchronized machines, you'd notice that they would drift apart over time.

The same thing can happen when transferring audio data from an ADAT system to the 1212 I/O. As long as ADAT is select as Clock Source for the

1212 I/O, the audio will play back from the 1212 I/O at the exact same speed as the ADAT, and the duration of the audio will stay exactly the same. If you switch the Clock Source to Internal or S/PDIF, however, the duration of the audio will probably change very slightly. Over the course of a several minute song, this timing offset can become noticeable.

In particular, if you are using a digital audio sequencer to play back audio tracks along with MIDI data, you may find that the two become out of sync. Similarly, if you are editing audio for video, you may notice the audio slipping against the video. This is a completely temporary effect; as soon as you switch the Clock Source back to ADAT, the audio will become synchronized again.

To avoid this effect, keep the Clock Source set to ADAT when editing ADAT audio data along with MIDI tracks in a digital audio sequencer, or when editing audio synced to video. Even when the ADAT tape is not moving, the ADAT system will continue to send out its word clock, which will make sure that the durations of files played back on the 1212 I/O will exactly match their ADAT counterparts.

1212 I/O Utility

In the MacOS, you can use the 1212 I/O Utility to set up the card for use with the Apple Sound Manager; in Windows 95, you can use it to set up the card for use as a wave device.

You can also use the Utility as a stand-alone application for such tasks as transferring audio data between S/PDIF and ADAT formats, re-routing tracks in an ADAT system, and generating "digital black."

IMPORTANT: In the MacOS, settings made in the 1212 I/O Utility affect all software which uses the 1212 I/O through the Apple Sound Manager; in Windows 95, they affect all software which uses the card as a wave device. However, software which specifically supports the 1212 I/O will initialize these parameters for their own use. Making settings in the 1212 I/O Utility will not affect these other 1212 I/O-compatible applications.

Korg 1212 I/O Utility (MacOS)

Korg 1212 I/O Utility (Windows 95)

Current Card

1212 I/O In PCI Slot (MacOS)

You can install multiple 1212 I/O cards in a single computer. The 1212 I/O Utility displays parameters for one card at a time; this selects which of the Cards you are currently viewing, identified by the PCI slot in which the card is installed.

1212 I/O Card (Windows 95)

You can install multiple 1212 I/O cards in a single computer. The 1212 I/O Utility displays parameters for one card at a time; this selects which of the Cards you are currently viewing, identified by the PCI bus number and PCI bus device number of the currently selected card.

Word Clock & Sample Rate

Clock Source

When connecting multiple digital audio devices–such as the 1212 I/O, an ADAT system, and a S/PDIF device–it is important that the word clocks of the devices be locked together. If the clocks are not locked, the audio may be marred by pops and clicks. The 1212 I/O can lock to incoming clocks from any of its digital inputs, or it can generate its own clock. For more information, see "A few words on word clock," on page 20.

You will need to select different clock sources from time to time, depending on what you are currently doing with the 1212 I/O; see the section "Applications," on page 32, for details.

ADAT. The ADAT optical input will provide the master word clock.

S/PDIF•ClockIn. This is a dual-purpose setting, which depends on whether or not a device is connected to the Word Clock input.

If an external clock source is connected to the Word Clock input, and is generating a word clock signal, then it will be used as the master word clock source.

Otherwise, the S/PDIF input will provide the master clock.

Internal. The 1212 I/O's internal clock will be the master. With this setting, the Sample Rate parameter, below, controls the clock.

Sample Rate

This parameter has two functions. First, it sets the clock rate when the Clock Source parameter, described above, is set to Internal. Second, it sets the sample rate information embedded in the S/PDIF output data, which in turn sets the sample rate of any connected S/PDIF devices.

When transferring audio from the ADAT inputs to S/PDIF output, it is important to set this parameter so that it matches the sample rate of the ADAT. Since original ADATs used their pitch controls to choose between 48kHz and 44.1kHz, the 1212 I/O cannot be sure of the sample rate of ADAT input. Setting the Sample Rate parameter lets the S/PDIF device know what rate to expect. If this parameter is set incorrectly, the connected S/PDIF device may not function properly.

44.1 kHz. The internal sample rate and S/PDIF output will be set to 44.1 kHz.

48 kHz. The internal sample rate and S/PDIF output will be set to 48 kHz.

Analog Input Trim

Left

0dB to -78dB, OFF. This allows you to attenuate the analog input sensitivity of the left channel, prior to the A/D conversion. At the

maximum value of 0dB, the volume of the input signal will be unchanged. At lower values, the volume will be reduced. At the minimum value of OFF, the input signal will be completely muted.

In general, it's best to leave the input pad set to 0dB, and attenuate only when necessary to avoid digital clipping. If you're using an external mixer, you may find it more convenient to reduce the output level of the mixer.

Also, if you find yourself routinely attenuating by around -12dB, this may mean that the 1212 I/O is configured for -10 levels, while the rest of your system is operating at +4. For more details on setting the 1212 I/O's analog levels, please see "Analog levels: +4 or -10" on page 3.

Right

0dB to -78dB, OFF. This allows you to attenuate the analog input sensitivity of the right channel, prior to the A/D conversion. It works just the same as the control for the left channel, as described above.

Sound Manager Routing (MacOS)

The Apple Sound Manager offers two audio inputs and two audio outputs, each of which can be routed to (or from) any of the 1212 I/O's twelve input channels and outputs, respectively. For more information on setting up and using the Sound Manager, please see the section titled "Sound Manager (MacOS)," starting on page 39.

If the 1212 I/O is not selected for use with Sound Manager (as described under "Sound Manager (MacOS)," starting on page 39), the Sound Manager Routing parameters will be inactive and grayed out. If the 1212 I/O is selected for input only, then the output parameters will be grayed out; if it is selected for output only, then the input parameters will be grayed out.

If you have multiple 1212 I/O cards installed in your computer, select the same card for Sound Manager input and output. If the current card (as set in the 1212 I/O In PCI Slot parameter) is not assigned for use with the Sound Manager, the input and output parameters will be grayed out, as described above.

Input L

Analog L, Analog R, S/PDIF L, S/PDIF R, ADAT 1-8. This selects the 1212 I/O input channel which will be routed to the Sound Manager's left input channel.

Input R

Analog L, Analog R, S/PDIF L, S/PDIF R, ADAT 1-8. This selects the 1212 I/O input channel which will be routed to the Sound Manager's right input channel.

Output L

Analog L, Analog R, S/PDIF L, S/PDIF R, ADAT 1-8. This selects the 1212 I/O output channel which will be routed to the Sound Manager's left output channel.

Output R

Analog L, Analog R, S/PDIF L, S/PDIF R, ADAT 1-8. This selects the 1212 I/O output channel which will be routed to the Sound Manager's right output channel.

Channel Routing

You can adjust the volume, phase, and output routing for each of the twelve audio inputs. These control the 1212 I/O's built-in monitor mixer, which routes directly from the card's inputs to the card's outputs.

When using the 1212 I/O as a Windows 95 wave device, you can use these for monitoring audio during recording. The routing, volume, and phase only affect monitoring, and do not in any way affect audio recorded into or played back from the digital audio software.

When using the 1212 I/O through the Apple Sound Manager, the Sound Manager itself handles record monitoring, and the Utility's controls are disabled.

Volume

0dB to -96dB. This allows you to attenuate the volume of the input channel. At the maximum value of 0dB, the volume of the input signal will be unchanged. At lower values, the volume will be reduced. At the minimum value of -96dB, the input signal will be completely muted.

Phase Invert

When this box is checked, the phase of the input signal will be inverted.

Output

Analog L, Analog R, S/PDIF L, S/PDIF R, ADAT 1-8. This selects the output channel to which the input will be routed. Any of the twelve inputs–Analog left and right, S/PDIF left and right, and ADAT 1 through 8–may be routed to any of the twelve outputs.

Multiple inputs may be sent to the same output. The 1212 I/O is not designed as a full-fledged mixer, however, and so there is an important limitation: no additional headroom is provided when mixing multiple inputs to a single output. To avoid clipping, you'll need to reduce the volumes of the input channels.

English

Mute All

Pressing this button mutes all the inputs, so that all inputs receive only the purest, cleanest, most eminently silent digital black. Pressing the button again restores the previous settings of the window.

Through All

Pressing this button sends all inputs to their corresponding outputs, so that ADAT 1 in goes to ADAT 1 out, ADAT 2 in to ADAT 2 out, and so on. All volumes are set to full, and all phases are set to normal. Pressing the button again restores the previous settings of the window.

File Menu

You can save the settings in the 1212 I/O Utility's window as a document on disk. Use this to store frequently used configurations of channel routing and mixer settings.

New

This command creates a new, untitled 1212 I/O configuration, with all parameters set to their default settings.

Open

This command brings up the standard Open dialog, allowing you to load a previously saved 1212 I/O setup from disk.

If a document is currently open, selecting the Open command will automatically close the document. If the document has been edited, you will be prompted to save your edits before the document is closed.

Opening a document sets all the parameters in the 1212 I/O to match the settings in the document, so that what you see on the screen always matches what's going on in the card itself.

If you have multiple 1212 I/O cards installed in your computer, the parameters for all of the cards are stored in a single file. If the file that you are opening has parameters for a different number of cards than are currently installed, a warning message will appear, and the file will load as best as it can.

This works slightly differently under the MacOS and Windows 95.

On the MacOS, if the file contains parameters for three cards, but only two are currently installed, then the parameters for the file's third card will be ignored. If the file contains parameters for two cards, but three are currently installed, the parameters for the third card will be set to default values.

Under Windows 95, the parameters in a multi-card file are always restored to the same PCI bus/device location. If no 1212 I/O card is in the stored location, then the settings for that card are ignored. If a card is in a location

for which the file has no data, then its parameters will be set to default values. If a file contains parameters for only a single card, the data will always be loaded, even if the card is now in a different location.

Close

This command closes the current document. If the document has been edited, you will be prompted to save your edits before the document is closed.

Save

If you started with a new, untitled document, this command will bring up the standard Save dialog box, allowing you to enter a name for the file and to select where it will be stored.

If the document has already been saved and named, this command will simply save any edits you have made to the existing document.

All settings in the window are saved, including the state of the Mute and Through buttons.

If you have multiple 1212 I/O cards installed in your computer, the parameters for all of the cards are saved into a single file.

Save As...

This command brings up the standard Save dialog box, allowing you to enter a name for the file and to select where it will be stored.

Revert To Saved…

This command returns you to the last saved version of the current file, undoing any edits which you have made. A dialog box will appear, giving you an opportunity to cancel the operation.

Save As Defaults...

This command saves the current settings to the 1212 I/O Preferences file (in the MacOS) or to the System Registry (in Windows 95). All settings are saved, except for the Mute All and Through All buttons.

On startup, these settings will be loaded into 1212 I/O, and used for the Auto-Routing Mode.

The default Preferences file routes each input to the same output, with internal clock source, 48kHz sample rate, and analog input trims all the way up.

Most Recently Used files (Windows 95)

This list shows the most recently used files, allowing you to open them easily.

English

Quit (MacOS) or Exit (Windows 95)

This command quits the Korg 1212 I/O Utility. If the current document has been edited, you will be prompted to save your edits.

Edit Menu

The editing commands only affect numerical parameters, such as the channel volumes and analog input trim. They do not affect any menu selections.

Undo

In the MacOS, this command is disabled.

In Windows 95, this will undo the last numerical edit.

Cut

This cuts the currently selected numerical value, and places it on the clipboard.

Copy

This copies the currently selected numerical value, and places it on the clipboard.

Paste

This pastes the contents of the clipboard into the currently selected numerical parameter. In the MacOS, press return or enter after pasting, to confirm the edit.

Clear (MacOS)

This clears the currently selected numerical value.

Select All (MacOS)

This selects all of the digits of the currently selected numerical value.

View Menu (Windows 95)

Toolbar

Checking this item shows the Toolbar at the top of the window.

Status Bar

Checking this item shows the Status Bar at the bottom of the window.

Help Menu (Windows 95)

About 1212 I/O Utility

This brings up a dialog which shows the version number of the Utility application.

Toolbar (Windows 95)

The Toolbar appears at the top of the window, and includes buttons for creating a new file, opening a file, saving a file, cutting, copying, and pasting, and showing the "About 1212 I/O Utility" box. For more information on each of these features, see their descriptions above.

The Toolbar can be shown or hidden by checking or un-checking the "Toolbar" option in the View menu.

Status Bar (Windows 95)

The Status Bar appears at the bottom of the window. As you move the mouse over buttons in the Toolbar, or over menu items, the Status Bar displays brief descriptions of each item.

The Status Bar can be shown or hidden by checking or un-checking the "Status Bar" option in the View menu.

English

Applications

This section provides brief, step-by-step instructions for the major functions of the 1212 I/O. Many of these can be performed using the simple 1212 I/O Utility program. Digital audio software written for use with the 1212 I/O should allow you to access to all of the parameters provided in the Utility program, so these tricks should work in those programs as well.

All of the following instructions assume that you've followed this single, very important step:

1. **Enable Digital In on the ADAT system, and enable digital I/O for any connected S/PDIF devices. If you are using an Alesis BRC, set the digital I/O source and destination to ADAT.**

This is necessary for almost any operation using the 1212 I/O.

Auto-Routing Mode

The 1212 I/O Utility can be used for routing audio directly from the card's inputs to the card's outputs. For instance, you can route ADAT channels through the card for doing dubs between ADATs, you can route ADAT inputs to S/PDIF outputs (or vice versa), and so on.

Even when the 1212 I/O Utility isn't active, however, the 1212 I/O will route audio from input to output whenever it is not otherwise in use; this is called the Auto-Routing Mode. On startup, the 1212 I/O will load a setup from the 1212 I/O Preferences file. By default, this routes each input to the same output, with internal clock source, 48kHz sample rate, and analog input trims all the way up.

You can change these preferences by using the 1212 I/O Utility's "Save As Defaults..." command, as described on page 29.

When the 1212 I/O is being used by a 1212 I/O-compatible digital audio application (such as Deck II or Cubase VST), the Auto-Routing Mode will be disabled. 1212 I/O-compatible applications can use the routing for their own purposes, including record monitoring.

When you quit the application, the Auto-Routing Mode will be restored.

On MacOS computers, with some Sound Manager applications, the enabling and disabling of the Auto-Routing Mode works slightly differently. These Sound Manager applications use the card only when actually playing a sound; when the sound stops, the Sound Manager will "quit" the 1212 I/O. At this point, the 1212 I/O will go into Auto-Routing Mode.

For this reason, when using the 1212 I/O with some Sound Manager programs, you may want to mute the Auto-Routing Mode by pressing the Mute All button in the 1212 I/O Utility.

Whenever you edit the current settings in the 1212 I/O Utility, the 1212 I/O remembers these settings, and continues to use them for the Auto-Routing Mode as long as the computer is on. On the next startup, it will again be restored to the settings in the Preferences file (in the MacOS) or the System Registry (in Windows 95).

Routing from S/PDIF In to ADAT Out

You can use the 1212 I/O Utility to transfer digital audio from a S/PDIF device, such as a DAT machine, synth, sampler, or external A/D converter, to an ADAT-compatible multitrack recorder.

1.   **Set inputs S/PDIF L and S/PDIF R to the desired ADAT output channels.**

2.   **Set the Clock Source to "S/PDIF•ClockIn."**

3.   **Set the ADAT system to sync to the external word clock.**

For more information, please see "Setting the word clock source in digital audio software" on page 16.

If you are using the Alesis BRC, read the instructions under "Using the Alesis BRC: 1212 I/O output to ADAT input," on page 36.

This procedure makes the ADAT system sync to the word clock of the S/PDIF source, as translated into ADAT optical output through the 1212 I/O. If the ADAT system is not set to sync to an external word clock, it will not interpret the incoming audio data correctly, and you'll hear clicking or other nasty audio artifacts.

4.   **If you are using the Alesis BRC, connect the Word Clock output of the 1212 I/O to the 48kHz In of the BRC, and then follow the instructions under "Using the Alesis BRC: 1212 I/O output to ADAT input," on page 36.**

When the BRC is connected, it supplies the word clock to the ADAT system. Without the BRC, the clock is derived from the ADAT optical I/O, and so an explicit word clock connection is unnecessary.

Routing from ADAT In to S/PDIF Out

Routing from ADAT in to S/PDIF out is slightly different from the other way around.

1.   **Set the desired ADAT inputs to the S/PDIF L and S/PDIF R outputs.**

2.   **Set the 1212 I/O's Sample Rate to match that of the ADAT system.**

Since original ADATs used the pitch control to choose between 48kHz and 44.1kHz, the 1212 I/O cannot be sure of the sample rate of ADAT input.

English

Setting the Sample Rate parameter lets the S/PDIF device know what rate to expect.

3. **Set the Clock Source to ADAT.**

4. **Set the ADAT system's word clock to Internal.**

For more information, please see "Setting the word clock source in digital audio software" on page 16.

If you are using the Alesis BRC, read the instructions under "Using the Alesis BRC: 1212 I/O output to ADAT input," on page 36.

Unlike the S/PDIF-to-ADAT routing described above, the S/PDIF device derives word clock sync automatically from the input signal.

5. **If you are using the Alesis BRC, press the BRC's Digital I/O button until you see the "Select source with track buttons" page, and then select the same tracks as you did in step 1.**

Processing ADAT audio through a S/PDIF device

The 1212 I/O allows you to send audio data from the ADAT inputs through a S/PDIF signal processor–such as an effects processor, digital EQ, etc.–and then back to the ADAT outputs.

To route ADAT audio through a S/PDIF device;

1. **Set the desired ADAT inputs to the S/PDIF L and S/PDIF R outputs.**

2. **Set inputs S/PDIF L and S/PDIF R to the desired ADAT output channels.**

3. **Set the Sample Rate to the same rate as the ADAT system.**

As described under ADAT-S/PDIF routing, above, setting the Sample Rate parameter lets the S/PDIF device know what rate to expect.

4. **Set the Clock Source to ADAT.**

5. **Set the ADAT system's word clock to Internal.**

For more information, please see "Setting the word clock source in digital audio software" on page 16.

If you are using the Alesis BRC, read the instructions under "Using the Alesis BRC: 1212 I/O output to ADAT input," on page 36.

Again, the S/PDIF device derives word clock sync automatically.

6. **If you are using the Alesis BRC, press the BRC's DIGITAL I/O button until you see the "Select source with track buttons" page, and then select the same tracks as you did in step 1.**

Using a S/PDIF processor with multiple ADATs and the Alesis BRC

To record the output of the S/PDIF processor onto another ADAT machine, the recording machine should be in the digital loop *after* the 1212 I/O, and

before the machine containing the source tracks. This is because the source machine will block the output of the 1212 I/O, in favor of its own output.

For instance, let's say that you have a three-ADAT system, with the 1212 I/O at the end of the ADAT chain. If the source tracks are on ADAT #2, you can record the S/PDIF output onto ADAT #1, but not onto ADAT #3. If the source tracks are on ADAT #3, you can record the S/PDIF output onto either ADAT #1 or ADAT #2.

Bouncing ADAT tracks

You can use the 1212 I/O Utility to bounce audio from one ADAT track to another–for instance, from tracks 1 and 2 to tracks 3 and 4.

1. **In the 1212 I/O Utility, set the desired ADAT inputs to the desired ADAT outputs.**

2. **Set the 1212 I/O's Clock Source to ADAT.**

3. **Set the ADAT system's word clock to Internal.**

For more information, please see "Setting the word clock source on an ADAT system" on page 19.

If you are using the Alesis BRC, read the instructions under "Using the Alesis BRC: 1212 I/O output to ADAT input," on page 36.

Synchronizing to ADAT timecode

The 1212 I/O provides rock-steady, drift-free ADAT audio and timecode synchronization. When used with compatible digital audio software, this creates a non-linear editing system directly integrated into your ADAT system–which can also operate as an additional, ADAT-compatible multitrack.

To set up your digital audio software for ADAT timecode synchronization:

1. **Select the 1212 I/O as the audio input and output hardware, as well as the timecode source.**

See your digital audio software's manual for more information.

2. **In the digital audio program, set the 1212 I/O's word clock source to ADAT.**

For more information, please see "Setting the word clock source in digital audio software" on page 16 for more information.

3. **Set the ADAT system's word clock to Internal.**

For more information, please see "Setting the word clock source on an ADAT system" on page 19.

When using a BRC and/or ADAT XTs, you may also set the ADAT word clock to Digital, and the 1212 I/O to S/PDIF•Word Clock. See "Special

note: ADAT timecode synchronization and clock source," on page 20, for more information.

When synchronizing to ADAT timecode, the 1212 I/O's word clock source cannot be set to Internal.

SMPTE and MTC offsets have no effect on ADAT timecode

Some ADAT devices, such as the Alesis BRC and Fostex RD-8, allow you to enter SMPTE and/or MIDI Time Code (MTC) offsets from the normal ADAT timecode. It is important to remember that these offsets do not affect the basic ADAT timecode itself, as it is sent along the ADAT sync cables; the offsets only affect synchronization through the device's SMPTE or MIDI inputs and outputs.

The 1212 I/O listens only to the simple, unadulterated timecode carried on the ADAT sync cable. This means that entering a SMPTE offset on the BRC, for instance, has no effect on the sync received by the 1212 I/O.

Using Premiere Plug-Ins with 1212 I/O-compatible software (MacOS)

Premiere Plug-Ins automatically use the Apple Sound Manager for preview audio output. When the 1212 I/O is selected as the Sound Manager output device, the previews will play back through the 1212 I/O.

Since Premiere Plug-Ins use the Sound Manager, they are totally unaffected by the output assignments in software which directly supports the 1212 I/O (such as Deck II); instead, they use the output channels assigned to the Sound Manager in the 1212 I/O Utility.

For more information on using the 1212 I/O with the Sound Manager, please see the chapter "Sound Manager (MacOS)," beginning on page 39.

Using the Alesis BRC: 1212 I/O output to ADAT input

The BRC's track routing features (under the BRC's Digital I/O button) control the digital I/O routing for the ADAT system. When copying tracks between ADATs, the BRC is used to select one or more source tracks on a single ADAT machine; this machine becomes the digital audio "transmitter," and the selected tracks are sent out on the optical bus. All the other ADATs in the system become audio "receivers," listening to the output of the transmitter and passing it on to their own outputs.

When using the 1212 I/O as the digital I/O source, all of the ADATs need to be receivers. If one of the ADATs is acting as a transmitter, then it will block the output of the 1212 I/O to all subsequent ADATs in the optical loop.

The diagram below shows the 1212 I/O connected to a three-ADAT system, with the optical inputs and outputs of all the devices chained together. Using the digital I/O routing feature of the BRC (not shown),

several tracks have been selected on ADAT #2, making it into a transmitter. Notice how this blocks the output of the 1212 I/O.

To avoid this situation, you need to clear the BRC's digital I/O settings. To do this:

1. **Press the BRC's EDIT button.**
2. **Press the BRC's DIGITAL I/O button until you see the "Select source with track buttons" page.**
3. **Make sure that no tracks are selected. If necessary, de-select any currently selected tracks.**

Even if no tracks are selected, it is possible that one of the machines is still designated as a digital I/O transmitter–so continue on to the next step.

4. **Press EDIT again to exit edit mode.**
5. **Press the DIGITAL I/O button twice, to toggle it off and then on again.**

This ensures that the digital I/O settings have been reset, so that all of the ADATs are acting as digital audio receivers.

Digital I/O transmitters block incoming optical data
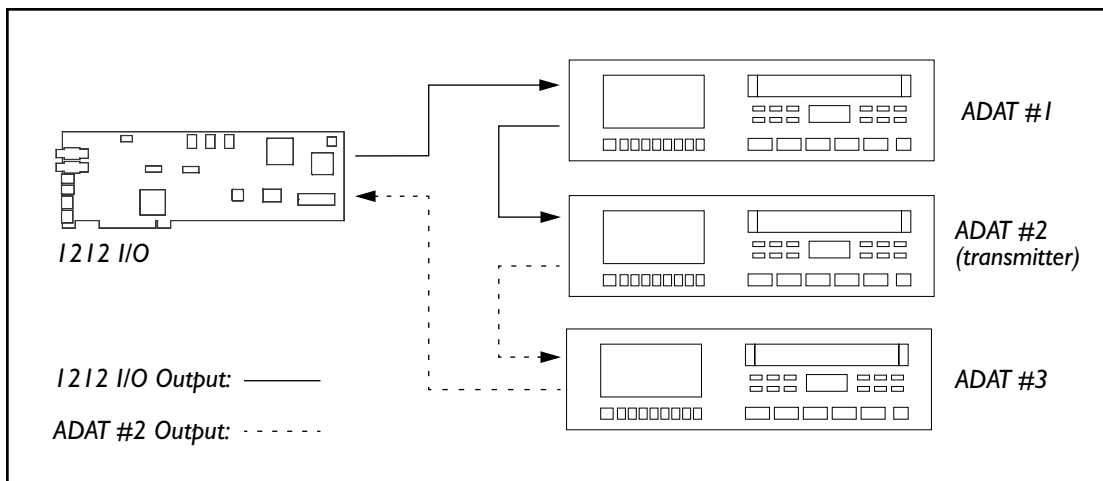
Using the 1212 I/O with multiple ADATs, without the BRC

When using two or more ADATs without the BRC, the 1212 I/O can only share digital audio data with ADATs to which it is directly connected. This is because, without the BRC, the ADATs do not pass data from their optical input to their optical output. Instead, each ADAT's optical output carries only the audio tracks from its own tape. In this way, each ADAT receives only the output of the previous machine in the loop.

For instance, let's return once again to the configuration of three ADATs and a 1212 I/O, in which the 1212 I/O is connected at the end of the chain, so that it sits in the optical loop between ADAT #3 and ADAT #1. The 1212 I/O can record the optical output of ADAT #3, and ADAT #1 can record the optical output of the 1212 I/O. ADAT #2 does not directly communicate with the 1212 I/O at all; it can only record the output of ADAT #1, and play into ADAT #3.

To use the 1212 I/O effectively in this setup, you will need to either re-patch the optical cables to let the 1212 I/O communicate with the desired ADAT, or swap tapes between machines so that the desired tracks are on a machine which is connected to the 1212 I/O.

Sound Manager (MacOS)

Introduction

Digital audio software designed for the 1212 I/O can take advantage of all the card's advanced features, such as multitrack input and output and ADAT timecode synchronization. Even if a program has not been specifically written for use with the 1212 I/O, however, you may still use the card for digital or analog sound input and output through Apple's Sound Manager. Some Sound Manager programs may not be compatible with the 1212 I/O; for a list of supported programs, please see the 1212 I/O Read Me file.

Sound Manager controls the basic sound input and output for the computer as a whole, including system alert beeps, speech input and output, game sounds, and so on. Through the Sound Manager, add-on hardware, such as the 1212 I/O, can be used in place of the computer's built-in sound input and output.

When you are using the 1212 I/O through the Sound Manager, only two channels are available for input and output (you can choose any two that you want, separately for input and output). The 1212 I/O Utility is used to select these input and output channels, and also to select the sample rate and clock source for use with Sound Manager programs. ADAT timecode synchronization is not available through the Sound Manager.

Sound Manager setup

Apple's Sound control panel is included on the 1212 I/O floppy disk, in the folder named "Install in System Folder." This control panel is not automatically installed with the MacOS system software, but for audio cards, it works much better than the other sound-oriented control panels (including Monitors & Sound and Sound & Displays).

For this reason, only the Sound control panel is recommended for configuring the 1212 I/O and Sound Manager.

You can continue to use the Monitors & Sound and Sound & Displays control panels for any purpose other than configuring the 1212 I/O for use with Sound Manager.

To set up the Sound Manager to use the 1212 I/O:

1. **Open the Sound control panel.**

2. **Select "Sound In" from the Sound control panel's menu.**

The Sound In page appears, with the on-screen instruction, "Choose a source for recording."

3. **Select the 1212 I/O icon.**

It will become hilighted. The 1212 I/O will now be used for input to Sound Manager-compatible programs.

If you have multiple 1212 I/O cards installed in your computer, each card will appear separately in the control panel. We recommend that you select the same card for input and output.

4.   Select "Sound Out" from the menu.

The Sound Out page appears, with the on-screen instruction, "Choose a device for playback."

5.   Select the 1212 I/O icon.

It will become hilighted. The 1212 I/O will now be used for output from Sound Manager-compatible programs.

The Sound control panel also includes an output volume setting.

6.   Select "Volumes" from the menu.

7.   Set the 1212 I/O's output volume to the maximum value.

With the 1212 I/O selected in the Sound control panel, the computer will now use the 1212 I/O for all sound input and output, including alert sounds (the alert sound is the "beep," or other sound, which plays when software displays a warning message). To keep extraneous MacOS beeps and chirps out of your digital audio system, you may wish to turn the alert volume off entirely.

8.   Optional: select "Alert Sounds" from the menu, and turn the Alert Sound volume all the way down.

9.   Close the control panel.

The Sound Manager supports only two inputs and two outputs. Using the 1212 I/O Utility, you can set the inputs and outputs to use any two of the 1212 I/O's channels.

10.   Open the 1212 I/O Utility.

11.   If you have multiple cards installed, set the 1212 I/O In PCI Slot parameter to the card selected for input and/or output.

If the current card is not selected for use with Sound Manager, the Sound Manager Routing parameters will be inactive and grayed out. If the current card is selected for input only, then the output parameters will be grayed out; if it is selected for output only, then the input parameters will be grayed out.

12.   Select the desired 1212 I/O channels in the input and output menus under "Sound Manager Routing."

13.   Set the Sample Rate, Clock Source, and Analog Input Trim parameters as desired.

For more information on these parameters, please see the chapter titled "1212 I/O Utility," beginning on page 23.

14. Optional: Press the "Mute All" button to mute the direct input-output channel routing.

When using the 1212 I/O with the Sound Manager, the input-to-output routing of the Auto-Routing Mode can sometimes be distracting. To avoid this, you may wish to mute the routing. This can be done on a temporary basis, by simply pressing the 1212 I/O Utility's Mute All button, or you can set this as the default state using the "Save As Defaults…" command.

When using the "Save As Defaults…" command, you will need to manually turn all of the volumes down (just the 12 volumes on the right, not the analog input trims). The state of the Mute All and Through All buttons is not saved by the "Save As Defaults…" command.

English

Wave Devices (Windows 95)

Using the Korg 1212 I/O as multiple wave devices

Through the 1212 I/O's standard wave device driver, the card can be used by almost any Windows digital audio program. The 1212 I/O appears as six full-duplex stereo cards, one for each output pair. Programs which support the use of multiple cards have simultaneous access to all 12 audio inputs and outputs, up to the limits of the program itself. You can even install multiple 1212 I/O cards, and use them simultaneously!

The 1212 I/O's wave device functionality is controlled by two programs: the 1212 I/O Utility, and the 1212 I/O Wave Device Control.

The 1212 I/O Utility allows you to set the card's sample rate, word clock source, and monitor routing, as well as the analog input trim. The 1212 I/O Wave Device Control allows you to synchronize playback and recording between the six input and output pairs, and, optionally, to adjust output volume and balance.

To set up the 1212 I/O for use as a wave device:

1. **In the 1212 I/O Utility, select the desired sample rate and word clock source.**

2. **Also in the 1212 I/O Utility, set up input-to-output monitoring as desired, using the channel routing and volume controls.**

For more information, see the chapter "1212 I/O Utility," beginning on page 23.

3. **Optional: to use the 1212 I/O as the default input and/or output wave device, use the Multimedia Properties control panel.**

For more information, see "Setting the default playback or recording device," on page 43.

4. **Open the 1212 I/O Wave Device Control Panel.**

5. **Enable the Auto Sync check-box (under Sync Settings).**

This will ensure that all of the input and output pairs are synchronized. For more information, see "Sync Settings" on page 45.

In some special cases, you may wish to disable Auto Sync; for more information, see "Custom Synchronization" on page 47.

Wave device numbering

When selecting 1212 I/O inputs and outputs in digital audio software, each stereo pair is identified by name, PCI bus, and PCI device number - such as ADAT 3-4, Bus 0, Device 11.

However, the Windows 95 multimedia system keeps track of each audio device simply by a number, generated by the order in which they were initialized. It is this number that is stored in a digital audio program's input and output assignments.

You can check the device order by looking at the audio "preferred device" menus in the Multimedia Properties control panel. In these menus, the devices are shown in order (although no actual numbers are displayed).

If you install or remove other soundcards, this may change the device numbers assigned to the 1212 I/O. This, in turn, can change the track output assignments of previously recorded files. If so, you'll need to re-select the desired outputs, and save the updated file.

As mentioned previously, the 1212 I/O appears to the Windows 95 multimedia system as six stereo audio devices–one for each stereo pair. The devices appear in the following order: ADAT 1/2, ADAT 3/4, ADAT 5/6, ADAT 7/8, Analog L/R, and S/PDIF L/R.

Setting the default playback or recording device

Some programs will automatically use only the default recording and playback devices, as set in the Multimedia Properties control panel. To select the 1212 I/O as the default device:

1. **Open the Multimedia Properties control panel.**
2. **Select the desired 1212 I/O channels as the preferred device under both Playback and Recording.**
3. **Set the Preferred Quality to CD Quality.**

This will set the audio device to stereo, 16 bit, 44.1kHz sample rate. You can use the Customize button to select other sample rates and bit depths, if desired; the 44.1, 22.05, and 11.025kHz sample rates are valid for the 1212 I/O.

Note also that the volume controls in the Multimedia Properties control panel are disabled when the 1212 I/O is selected. The 1212 I/O's output volumes may be adjusted using the 1212 I/O Wave Device Control, if desired.

English

Korg 1212 I/O Wave Device Control

Korg 1212 I/O Wave Device Control window
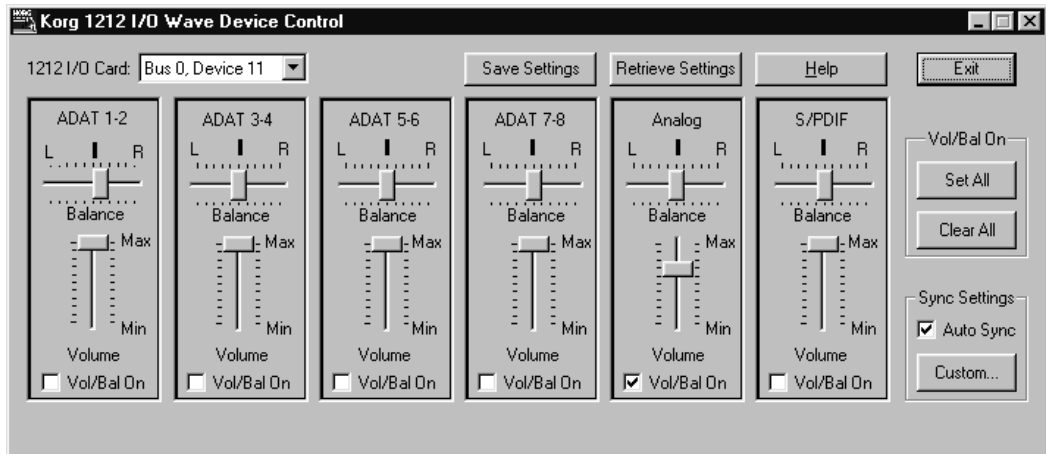
1212 I/O Card

The 1212 I/O Wave Device Control displays parameters for one 1212 I/O card at a time. This menu displays the PCI bus number and PCI bus device number of the currently selected card.

You can install multiple 1212 I/O cards in a single computer. Separate wave device settings are maintained for each installed card.

To view or edit the settings of a different card, simply select it from the menu; the sliders and check-boxes will be updated to reflect its current settings.

Volume slider

Each stereo output pair has a volume slider, which controls the overall output level for the wave device. To adjust the left and right channels independently, use the balance slider in conjunction with the volume slider.

Moving the slider to the top of its range provides the maximum output level; moving it to the bottom of its range will mute the output.

The volume control is only active when the device's Vol/Bal On box is checked. If your digital audio application provides its own volume controls, then the volume control provided here may be unnecessary, and you can save some CPU processing power by disabling it. For more information, please see "Vol/Bal On" on page 45.

Please note that wave device volume and balance adjustment apply only to output (playback). The 1212 I/O Utility program allows adjustment of the

input sensitivity for the analog inputs; for adjusting audio input level from ADAT or S/PDIF sources, we recommend that you use an external mixer.

Balance Slider

Each stereo output pair has a balance slider, which controls the relative output levels of the left and right channels.

The balance control is active only when the device's Vol/Bal On box is checked. For more information, please see "Vol/Bal On," below.

Vol/Bal On

The Vol/Bal On check-boxes allow you to enable or disable volume/balance control for each wave device, as desired. To enable volume/balance control for a particular device, check the Vol/Bal On box below the device's volume slider; to disable volume/balance control, un-check the box.

You can check or un-check all of the boxes at once by using the Set All and Clear All buttons at the right side of the page.

Volume and balance controls consume CPU resources, and so we recommend that volume/balance control remain disabled except when needed. For more information, see below.

When to use volume/balance control

Volume/balance control is provided so that the 1212 I/O may be used for playing back system sounds, or used in conjunction with simple wave applications without a volume control (such as the Windows 95 Media Player). In these cases, the volume/balance controls will be helpful.

However, they do consume some of the real-time resources of the CPU. When volume/balance control is enabled for a wave device, every sample passed to the device gets scaled by the current volume and balance settings.

If you are using the 1212 I/O with an application that already provides volume control, or if you have an external means of adjusting the playback volume, then you can get better performance from your PC by disabling the wave device volume/balance controls.

Sync Settings

Through the standard Windows 95 driver, each of the 1212 I/O's six input and output pairs appears to the system as an independent wave device. The digital audio program must start recording or playback on each of them, one at a time, which (when the Sync Settings are not used) can cause small offsets between the stereo pairs.

The Sync Settings solve this by creating a group of synchronized input and output pairs. The 1212 I/O will not start either recording or playback until

English

all of the devices in the group have received the start command from the digital audio program.

Note that this synchronization applies only to input and output pairs on the same 1212 I/O card.

Auto Sync

When Auto Sync is checked, synchronization happens automatically. Whenever you select or de-select a 1212 I/O input or output pair in your digital audio program, Auto Sync will add or delete the pair from the synchronization group.

This should work well for most applications; however, you can also disable Auto Sync, and makes settings manually using the Custom Synchronization window (under the Custom button).

Custom…

Pressing this button brings up the Custom Synchronization window, which allows you to manually control the 1212 I/O's wave device synchronization. For more information, see "Custom Synchronization," on page 47.

When Auto Sync is checked, the Custom button is disabled, and any previous settings in the Custom Synchronization window will be ignored.

Save Settings

Pressing the "Save Settings" button saves the current card's settings into the Windows 95 System Registry. Once saved to the registry, these settings become the default settings, and will be loaded into the card whenever the system boots.

Retrieve Settings

Pressing the "Retrieve Settings" button restores the current card's default settings from the Windows 95 system registry. The default settings are stored by the "Save Settings" button, described above.

Help

Pressing the "Help" button brings up the Microsoft Windows Help file for the 1212 I/O, with lots of helpful, hypertext-linked information.

Exit

Pressing the "Exit" button quits the Korg 1212 I/O Wave Device Control.

Vol/Bal On: Set All and Clear All

Set All

Pressing this button sets all of the "Vol/Bal On" check-boxes at once.

Clear All

Pressing this button clears all of the "Vol/Bal On" check-boxes at once.

Custom Synchronization

Custom Synchronization window

As noted under "Sync Settings," on page 45, the standard Windows 95 driver makes each of the 1212 I/O's six input and output pairs appear as an independent wave device. The Sync Settings make sure that all of the channels start to play back and/or record at the same time; without using the Sync Settings, you may sometimes notice delays between the different output pairs.

In general, enabling the Auto Sync check box should give the best results. In some cases, however, you may wish to have manual control over the wave device synchronization. The Custom Synchronization windows offers just that; you can individually set record and playback synchronization for each input and output pair, as described below.

NOTE: When the Wave Device Control window's Auto Sync parameter is checked, any settings in the Custom Synchronization window will be ignored.

Sync Rec

Each of the six input pairs has its own Sync Rec check-box. If one or more of these is checked, the 1212 I/O will not start recording or playback until all of the checked devices have received the "start record" command from the digital audio program.

When recording from multiple input pairs simultaneously, make sure that each active input's Sync Rec box is checked, and that all of the inactive inputs' Sync Rec boxes are not checked.

When you are not recording, make sure that none of the Sync Rec boxes are checked. If one or more of the boxes are checked, then playback will not be able to start.

Sync Play

Similarly, each of the six output pairs has its own Sync Play check-box. If one or more of these is checked, the 1212 I/O will not start playing or recording until all of the checked devices have received the "start play" command from the digital audio program.

When playing from multiple output pairs simultaneously, make sure that each active output's Sync Play box is checked, and that all of the inactive outputs' Sync Play boxes are not checked.

When you are not playing back any audio–for instance, if you are recording into a new file–make sure that none of the Sync Play boxes are checked. If one or more of the boxes are checked, but no audio is actually being played back, then recording will not be able to start.

What happens to un-checked input or output pairs?

When one or more boxes are checked, the stereo pairs that are not checked cannot start to play or record until all of the checked pairs have been started.

For instance, let's assume that there are two wave programs running at the same time. Program A is using ADAT 1-2 and S/PDIF, and Program B is using ADAT 5-6. The Sync Rec boxes are checked for ADAT 1-2 and S/PDIF, and are un-checked for all other pairs, including ADAT 5-6.

If you press "record" in Program B, but Program A is idle, the card will not start. As long as Program A's inputs have their Sync Rec boxes checked, you must start recording in Program A before you can record in Program B.

On the other hand, if you un-check the Sync Rec boxes for ADAT 1-2 and S/PDIF, then both programs can record freely, without waiting for one another.

Sync Rec: Set All and Clear All

Pressing the Set All button sets all of the "Sync Rec" check-boxes at once.

Pressing the Clear All button clears all of the "Sync Rec" check-boxes at once.

Sync Play: Set All and Clear All

Pressing the Set All button sets all of the "Sync Play" check-boxes at once.

Pressing the Clear All button clears all of the "Sync Play" check-boxes at once.

Exit

Pressing the Exit button returns you to the main Korg 1212 I/O Wave Device Control window.

Troubleshooting

General

Cannot select 1212 I/O within digital audio program (MacOS)

Is the 1212 I/O extension installed in the System Extensions folder? This file must be installed in order to use the 1212 I/O.

Is the 1212 I/O card seated properly in the PCI slot? Cards can sometimes become unseated if the computer is moved, or if the card is jostled during installation of another card (or RAM, disk drives, etc.). If you think this might be the case, turn off the computer and re-seat the card, following the safety instructions under "Installing the 1212 I/O card in your computer," on page 5.

Is the digital audio program's 1212 I/O module installed in the correct folder in the Finder? For Macromedia Deck II, the DECK II 1212 I/O Driver must be installed in the Plug-Ins folder. For Steinberg Cubase VST, the ASIO Korg 1212 file must be in the ASIO Drivers folder.

1212 I/O extension is crossed out on startup (MacOS)

Make sure that virtual memory is disabled in the Memory control panel. Virtual memory must be disabled when working with the 1212 I/O.

Cubase VST displays "No Clock" error message

If the cables connections or word clock settings are not correct, the "No Clock" message will appear in the Sample Rate menu (in the Audio Setup dialog box). Normally, fixing any cabling problems and adjusting the word clock settings of the connected digital audio devices should restore Cubase to normal.

Sometimes, however, once the "No Clock" message has appeared, Cubase will not automatically reset itself. In this case, reset it manually by doing the following:

1. **Set the Audio Clock Source to Internal.**
2. **A "sample rate has changed" message may appear; if so, Click "OK."**
3. **Return the Audio Clock Source to ADAT.**

Playback or recording will not start (Windows 95)

When using the 1212 I/O as multiple wave devices, make sure that the 1212 I/O Wave Device Control's Sync Rec and Sync Play boxes are set properly. For more information, see "Sync Settings," on page 45.

Audio

Audio has pops and clicks
OR
The same audio sounds different between ADAT, S/PDIF, and Analog inputs or outputs
OR
ADAT or S/PDIF inputs or outputs sound distorted

Make sure that the word clock settings are correct for all hardware and software, including ADAT-compatible multitracks, digital mixers, S/PDIF devices, and digital audio software.

Audio playback is very slow and low-pitched

If the digital audio program's word clock source is set to S/PDIF•Word Clock (in Deck, this is called "Digital"), is there a device connected to the 1212 I/O's S/PDIF or Word Clock input?

If the digital audio program's word clock source is set to ADAT, is there a device connected to the 1212 I/O's ADAT optical input?

If the connections are correct, is the S/PDIF, Word Clock, or ADAT device turned on? Note: Some early DAT players may not output S/PDIF word clock when stopped.

If Deck is running at the same time as another 1212 I/O-compatible application, Deck does not automatically reset the 1212 I/O's sample rate, clock source, or analog input level when switched to foreground. To reset the card to match Deck's settings, go to the Hardware Configuration dialog box, and press OK.

Audio playback is slightly slow, or slightly fast

When you record or play back audio data using external clock sources (such as the S/PDIF, ADAT, or Word Clock inputs), the sample rate is controlled entirely by the external source, and not by the digital audio program's sample rate parameter. Because of this, you must make sure that the external clock source is actually set to the same sample rate as the digital audio program. If the two are different, it can result in audio playing back faster or slower than expected.

For instance, let's say that you have recorded audio from an ADAT, with both the ADAT and the digital audio program set to 44.1kHz. Later, you play back the same audio - but the ADAT's sample rate has been changed to 48kHz. In this case, the 44.1kHz audio data will be played back at 48kHz, resulting in faster, higher-pitched playback. If you change the ADAT's sample rate back to 44.1kHz, that audio will play back normally again.

When recording, it is even more important to make sure that the digital audio program's sample rate parameter matches the actual sample rate of

the external clock source. This is because when audio is recorded into a digital audio program, the audio files are stored with the program's current sample rate setting - even if the real sample rate is different, as in the example above. This can result, for example, in a file containing 48kHz data, but marked as 44.1kHz. Avoid this by always making sure that both the digital audio software and the external source are set to the same sample rate.

Note that sample rate conversion will not help to repair these files; this will change the data to play back at the other sample rate, but will preserve the incorrect speed and pitch. The way to repair these files is to do the opposite: change the file's sample rate parameter, while leaving the data unchanged. Some programs, such as BIAS's Peak and Digidesign's Sound Designer II, allow you to do this easily, by simply typing in a new sample rate.

No sound from Analog inputs (MacOS)

In Deck, make sure that the Options menu's Analog Input Level is set to 7.

No audio is recorded (MacOS)

In Deck, are the desired tracks record-enabled? Deck gives no indication when the transport is in record, but no tracks selected.

Audio dropouts (Windows 95)

As the 1212 I/O transfers data into buffers on the PC, it periodically interrupts the PC to let it know that a new block of recorded samples is ready and that it has read a block of playback samples. If these interrupts are held off for too long, the playback buffers will not be refilled with playback samples, and the recorded samples will be overwritten before they are read.

To track this down, determine the IRQ assignments of the 1212 I/O and other PCI and SCSI devices, using the Device Manager (Control Panel->System-> Device Manager). Try giving the 1212 I/O a higher priority IRQ than the other devices. IRQ priorities, from highest to lowest, are 0, 1, 2, 8 - 15, and finally 3 - 7.

Sometimes, changing IRQs can be accomplished by swapping PCI slots with other devices. As an alternative, you can manually change assignments using the Resources tab of the device to be changed under the Device Manager. In general, swapping slots is preferred over manual IRQ assignment.

1212 I/O word clock syncs to Word Clock input instead of S/PDIF input

The 1212 I/O's Word Clock input has precedence over the S/PDIF input. When the 1212 I/O's clock source is set to S/PDIF•Word Clock, and a valid word clock is received at the Word Clock input, it will be used instead of the S/PDIF input.

English

Card stops, audio squeals, or channels shift (Windows 95)

The 1212 I/O card relies on being able to transfer small amounts of data across the PCI bus at regular intervals (roughly 12,000 times per second). If other devices tie up the PCI bus for extended periods of time, this can prevent the 1212 I/O from completing a transfer before the next scheduled transfer.

If this happens, the audio stream will be corrupted. The audible effects of this corruption will be manifested in one of the following ways:

a. The card may detect the condition and stop playback.

b. The audio channels may shift. For example, audio destined for the left analog output may instead appear on ADAT channel 7.

c. A high pitch squeal may be heard in one or more of the outputs.

In our experience, most of these situations are the result of interactions with video cards that tie up the PCI bus for extended periods of time. Some possible solutions are listed below.

Try adjusting the acceleration settings of other devices on the PCI bus.

Try swapping the 1212 I/O with other PCI cards. In some instances (depending upon the PCI BIOS of your PC), placing the cards in new locations will change their assigned priorities on the PCI bus.

If you have a Matrox Millennium or Mystique video card, do the following:

1. **Add the following two lines to your system.ini file.**
   ```
   [mga.drv]
   PCIChipset=1
   ```

2. **Disable the Use PowerGDI acceleration feature in the Advanced Matrox setup (Control Panel->Display Properties->MGA Settings->Advanced->Performance).**

If you are using another PCI video card, try installing the standard Windows 95 VGA driver. If the problem goes away, then there is an interaction with that card's video driver. If this is the case, contact the video card's manufacturer. They may have an updated driver or a switch similar to the Matrox above that addresses the problem.

Timecode Synchronization

Digital audio program repeatedly tries to locate, but does not remain locked

In Deck, try increasing the SMPTE Pre-Roll time; insufficient Pre-Roll settings may cause locates to fail. In general, this should be a minimum of 4 seconds. When playing back a large number of tracks, you may need to increase the Pre-Roll time.

Make sure that all word clock settings are correct for all connected hardware and software, including ADAT-compatible multitracks, digital mixers, S/PDIF devices, and digital audio software.

In Deck, is Trigger Sync turned on (in the Options menu)? Deck requires that Trigger Sync be enabled when working with ADAT timecode.

In the MacOS, Is AppleTalk turned off? AppleTalk should be turned off whenever using timing-critical music applications.

Digital audio program does not sync at all

Make sure that the 1212 I/O is selected as the timecode source. In Deck, this is set by the Time Code Source sub-menu in the Options menu.

Is the ADAT sync/Word Clock breakout cable securely connected to the 1212 I/O? Try re-seating the cable in the jack.

Is the ADAT's sync output securely connected to the 1212 I/O's ADAT Timecode Conditioner (ATC), and is the ATC securely connected to the breakout cable?

If the digital audio program's word clock source is set to ADAT, is the ADAT's optical output connected to the 1212 I/O's optical input? The optical cable must be connected in order for the 1212 I/O to use its word clock.

If you are using an original ADAT without a BRC, is the digital audio program's word clock set to ADAT? Original ADATs must be the word clock master when using ADAT timecode. In Deck, word clock source is set by the Sync Mode parameter, in the Options menu Hardware Configuration dialog.

Is the ADAT's pitch-shifting feature being used? When the sample rate is set to 48kHz (the only setting for the original ADAT), keep the ADAT's pitch setting between -300 cents and +13 cents. When the sample rate is set to 44.1kHz, keep the pitch setting between -170 cents and +160 cents.

If you are using the Word Clock input as the word clock source, is the frequency of the master device between 40kHz and 48.4kHz? The 1212 I/O requires that the sample rate be within this range.

English

Specifications

Sample Rates: 44.1 kHz, 48 kHz, external clock

Analog Inputs: 20-bit Enhanced dual bit Delta Sigma*

Analog Outputs: 18-bit linear

Analog Levels: +4 dBu or -10 dBV, switchable

Frequency Response: 20 Hz - 20 kHz, +0 dB, -0.6 dB

S/(THD+N) Ratio (A weighted), Input to Output: 90 dB

Dynamic Range, Input to Output: 94 dB

THD+N @ 1kHz (A weighted), Input to Output: 0.009%

Input Impedance: 1M ohm

Output impedance: 50 ohm

Headroom: 12 dB

Measured in accordance with FCC class A Part 15

Card Specifications: PCI revision 2.1 compliant, full length, installable in any MacOS-compatible or Windows 95-compatible computer equipped with full-length PCI slots.

PCI Power Consumption: +5V = 1.75 watts, +12V = 1.2 watts, -12V = 0.6 watts

*Current software uses 16 bits for analog I/O

Specifications, operations, and appearance are subject to change without notice.