SeaSound

Solo

Includes instructions for Solo Expander

User's Guide

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Version 1.9

Important Safety Instructions

1. Read all instructions prior to operating this product.

2. Retain all instructions and packing materials.

3. Do not attempt to service this product beyond those means described in this manual or the SeaSound web site. Contact SeaSound should service be necessary.

4. To reduce the risk of electrical shock do not expose this appliance to rain or moisture.

5. If you are installing a SOLO EXPANDER, connect the SOLO only to the SOLO PCI card and the EXPANDER only to the Expansion PCI Bracket. See Quick Start for directions. Reversing connections to the SOLO and EXPANDER could seriously damage your SOLO system as well as your computer.

6. Turn off your computer and disconnect its power cord before connecting or disconnecting interface cables to the computer, the SOLO, or the SOLO EXPANDER. Connecting cables with power on could seriously damage your SOLO system as well as your computer.

Introduction

Congratulations on your purchase of a SOLO system!!

You're about to experience the most hands-on, efficient way to do solo recording with computer-based audio audio software.

This manual includes instructions for the SeaSound SOLO and SeaSound SOLO EXPANDER (optional 6 channel expansion unit.)

We know you're anxious to get started, but please take your time when installing the PCI card and the drivers. This is the foundation upon which your SOLO system depends; improper card installation could damage your computer or the card, while improper driver installation could cause your computer to become unstable. Just follow the step-by-step instructions, and all will be well.

If you have never installed a PCI card before, please look at the included video. It contains useful information on how to get your SOLO system up and running.

Thank you for becoming part of the SeaSound phenomenon! We hope you enjoy your SOLO system, and welcome your comments.

Note: Please write your SOLO (and SOLO EXPANDER) serial numbers in the space below.

Enjoy your SOLO system!

Table of Contents

Quick Start Guide

If you're experienced with installing computer software and hardware, this Quick Start Guide should get you up and running. However, please read the rest of the manual at some point to learn about the many unique features that the SOLO offers.

*This manual also covers installing and operating the SOLO EXPANDER. Text which relates to the EXPANDER is printed in this font. If you are just adding an EXPANDER to an existing SOLO system, see *

System Requirements

The SOLO system places very little demand on computer resources and will function with just about any Macintosh® or Windows® PC sold today. Recording software typically places great demands on computer resources. Therefore, SeaSound recommends that you follow the computer system requirements of the audio software you plan to use. In general, the performance of audio software improves with faster CPUs, more RAM, and bigger, faster disks.

For digital audio software, SeaSound recommends the following **minimum** computer system requirements.

- PC: Windows 95/98/98 SE, Intel Pentium 200 MMX (Pentium II or III recommended) or equivalent AMD processor, VGA color monitor, CD-ROM drive (for installation), 128 MB RAM, 5-10 MB hard disk space for audio application installation. Note: Cyrix chips are not recommended for digital audio applications. SOLO is not compatible with PC laptops which have no PCI slots. (Some PC laptops can be connected to a SOLO system via a third-party PCI bus, but this has not been tested.)

- Macintosh: 604e or better processor (G3/G4 recommended), 128 MB RAM, CD-ROM drive (for installation), 2nd level cache, MacOS 8.6 or higher. SOLO is not compatible with the iMac, which has no PCI slot. Accelerator cards, which accelerate older processors to G3 or G4 speed are not recommended.

- SOLO Only: One unused PCI card slot.

- SOLO + EXPANDER: one unused PCI slot and one adjacent empty PCI bracket.

A Little Orientation

Before we proceed, here are the components you will be installing:

- SeaSound SOLO 19" rack-mountable chassis
- SeaSound SOLO PCI card
- Interface cable which connects the SOLO to the PCI card
- *If you are installing the SeaSound EXPANDER, it's 19" rack-mountable chassis adds six additional analog audio channels for a total of10 (8 analog, two digital).*
- *Expansion PCI Bracket and ribbon cable to connect the EXPANDER to the PCI card.*
- *Interface cable marked with a yellow band which connects the Expansion PCI Bracket to the EXPANDER.*
- SOLO CD which includes drivers, SeaSound utility programs and bundled recording software.

If you are installing a new system, check out "Quick Start" on page 2 to get going right away. *If you are adding an EXPANDER to an existing system, check out* "Adding an EXPANDER to Your Existing SOLO System" *on page 6.*

Figure 1.   SOLO + EXPANDER System

Quick Start

Assuming you are familiar with installing PCI cards and drivers and are familiar with your audio software, let's plug in the SOLO + *EXPANDER* right away.

Caution: This section is only for those who are experienced at installing PC hardware. If you are unfamiliar with these procedures, *do not use this Quick Start*

guide, instead follow the more detailed instructions in "Installing a New SOLO + EXPANDER System" on page 3.

1. Shut down your computer. Unplug the power cord to your computer. Turn off your audio monitoring system (amplifier or powered speakers).

2. Remove the computer's cover, and install the PCI card in an available slot, as follows.

   Discharge any static electrical charge by touching your fingers to bare metal on the computer chassis before removing the PCI card from its plastic bag. Remove the blank PCI card slot bracket from the PCI slot you will use. Plug in the PCI card and replace the screw anchoring it to the chassis.

   If you are installing an EXPANDER too, there must be two empty PCI slots available. Optimally these are adjacent and the Expansion PCI Bracket occupies the right-most of the two. Attach the ribbon cable to the header on the PCI card. See Figure 2 on page 8 for the location of the header. There's only one place it can go, and it's keyed so you can't get it in backwards. Then install both the PCI card and the Expansion PCI Bracket. See "Installing a New SOLO + EXPANDER System" on page 3 if you are unsure of what to do.

3. Connect the SOLO to your computer via the supplied interface cable (see "Connecting the EXPANDER to Your Computer" on page 7).

4. *Connect the EXPANDER to your computer via the supplied interface cable with yellow bands.*

   Before applying power, be sure that the SOLO cable connects to the PCI card and that the Expansion PCI Bracket connects to the EXPANDER. Reversing these two connections could seriously damage both interfaces as well as your computer.

5. Replace the computer's cover and turn to "Installing Drivers & Software" on page 8.

If you wish to perform a quick audio test of your system at this point, see "Quick Audio Tests" on page 13.

Installing a New SOLO + EXPANDER System

Caution: The PCI card can be damaged by static electricity until is installed. Keep the card in its protective bag until it is ready for use. Ground yourself by touching the computer chassis metal before opening the PCI card package. Handle the card only by the edges (but not the edge with the gold fingers that insert into the computer's card slot). After opening the bag, leave the card on its conductive plastic bag until you're ready to install it. If you are not comfortable installing PCI cards, refer installation to a qualified computer or music store.

1. Turn off the power to the computer, audio monitoring system and all associated peripherals. Unplug the computer. (Some computers keep the PCI Bus powered even in shut-down mode, and the only way to turn it off is to unplug the computer.)

2. Remove the computer's cover to expose the PCI card slots.
   - Windows: Only slots that have associated rear panel brackets are usable with SOLO. There may be other slots for internal cards; do not use these with the SOLO PCI card. Identify the PCI slots, which are usually white or ivory and shorter than the ISA slots.
   - Macintoshes have only PCI card slots.
3. Touch the metal computer chassis to discharge any static electricity, then remove the PCI card *and Expansion Bracket* from the conductive plastic bag by the edges.
4. Install the SOLO PCI card.
   a. **SOLO Only PCI Card Installation:**

      The SOLO requires one available PCI slot.
      (1) Locate an available PCI slot. Remove its blank bracket (if any) and keep the retaining screw (if present) for re-installation in a later step.
      (2) Make sure the bracket of the SOLO PCI card faces the rear of the computer. Line up the card edge connector with the vacant PCI slot, and gently nudge the card inward. There may be some resistance as the card slips into the slot, but do not force the card. You will feel it held securely by the slot when it is in proper position. The bracket should now line up with the rear panel, and the connector should be seated all the way in its slot.
      (3) Secure the PCI card in place with the retaining screw (if present). Some computers have other ways to lock down cards in the card cage, be sure yours is secured.

   b. *SOLO + EXPANDER PCI Card Installation:*

      Altogether, the SOLO + EXPANDER system requires two empty PCI slots, one for the PCI card, the other for the Expansion PCI Bracket. Optimally these slots are adjacent and the Expansion PCI Bracket occupies the right-most of the two. But any available PCI slot can be used for the Expansion PCI Bracket, so long as the ribbon cable can reach between the PCI card and the Expansion PCI Bracket.
      (1) Locate two available PCI slots. Remove their blank brackets (if any) and keep the retaining screws (if present) for re-installation in a later step.
      (2) Attach the ribbon cable on the Expansion PCI Bracket to the header on the PCI card. See Figure 2 on page 8 for the location of the header. There's only one place it can go, and it's keyed so you can't get it in backwards.
      (3) Install the SOLO PCI card. Make sure the PCI card bracket faces the rear of the computer. Line up the card edge connector with the vacant PCI slot, and gently nudge the card inward. There may be some resistance as the card slips into the slot, but do not force the card. You will feel it held securely by the slot when it is in proper position. The bracket should now line up with the rear panel, and the connector should be seated all the way in its slot.

(4) Mount the Expansion PCI Bracket on its PCI slot. You may need to adjust the way the ribbon cable folds to make it fit securely in its slot. If so, don't crease it too hard.

(5) Secure the PCI card and Expansion Bracket in place with the retaining screws (if present). Some computers have other ways to lock down cards in the card cage, be sure yours is secured.

5. Before you close up the computer, look again at the PCI card you've installed to make sure that the card edge is seated properly to the connector on the motherboard and that the bracket at the rear of the card is securely fastened to the rear of the card cage.

6. Replace the computer cover.

   Do not re-plug the power cord into the computer yet.

7. Now turn to

Connecting the SOLO + EXPANDER to Your Computer

Caution: *Turn off your computer and disconnect its power cord before connecting or disconnecting interface cables to the computer, the SOLO, or the EXPANDER.*
Be sure that the SOLO is connected to the SOLO PCI card and the EXPANDER is connected to the Expansion PCI Bracket.

Warning: Connecting cables with power on or reversing connections to the SOLO and EXPANDER could seriously damage your SOLO system as well as your computer.

1. With the computer powered off and the power cable removed, connect the interface cable between the PCI card's 25-pin connector and the corresponding connector on the SOLO's rear panel. *If you are also installing an Expander, you have two of these cables; you want to use the one without yellow stripes for the SOLO.* Tighten the lock-down screws at both ends; these connections must be rock-solid.

2. *If you are also installing an EXPANDER, patch the interface cable with yellow stripes between the Expansion PCI Bracket's 25-pin connector and the corresponding connector on the EXPANDER's rear panel.*

   If you need a replacement cable, use an IEEE-1284-compatible printer cable. SeaSound does not recommend using SCSI cables, or cables longer than 12 feet (approximately 4 meters). Make sure that any replacement cables can be distinguished from each other so that connections will never be reversed. If replacement cables are similar, mark both ends of one cable so you can tell them apart easily.

3. If you are using MIDI, connect the appropriate MIDI cables to the SOLO's rear panel. For more information on connecting MIDI devices, see

4. Connect 1/4" cables from the SOLO's rear panel Control Room Outputs to your monitor system (powered speakers or power amplifier).

5. *The EXPANDER's Monitor Outputs can be connected directly to the SOLO's Auxiliary Inputs, eliminating the need for a separate mixer. Or you can connect 1/4" cables from the EXPANDER's rear panel Monitor Outputs to your monitor system.*

6. Proceed to "Installing Drivers & Software" on page 8.

If you wish to perform a quick audio test of your system at this point, see "Quick Audio Tests" on page 13.

Adding an EXPANDER to Your Existing SOLO System

If you already have a SOLO and you are just adding an EXPANDER to it, follow the steps in this section.

Here are the necessary steps:

- *Add the Expansion PCI Bracket to your computer.*
- *Connect a ribbon cable from the SOLO PCI card to the Expansion PCI Bracket.*
- *Connect the EXPANDER to the Expansion PCI Bracket with the supplied 25-pin yellow-striped cable.*

Adding an EXPANDER to your system requires one unused PCI slot for the Expansion PCI Bracket. Optimally, the unused slot is adjacent to your existing SOLO PCI card, and the Expansion PCI Bracket can go into the right-most of the two. However, any available PCI slot can be used for the Expansion PCI Bracket. Because the ribbon cable is 9 inches long, all you need to do is fold the ribbon cable so it reaches from the SOLO PCI card to the slot which the Expansion PCI Bracket occupies, as described below.

Adding the Expansion PCI Bracket

1. *Turn off the power to the computer, audio monitoring system and all associated peripherals. Unplug the computer. (Some computers keep the PCI Bus powered even in shut-down mode, and the only way to turn it off is to unplug the computer.)*

2. *Open up the computer to expose the PCI card slots.*

3. *Identify the SOLO PCI card (it's the one which connects to your existing SOLO). Touch the metal computer chassis to discharge any static electricity, then remove the SOLO PCI card from its slot.*

4. *Attach the Expander PCI Bracket's ribbon cable to the header on the SOLO PCI card. See Figure 2 on page 8 for an illustration of where the header is on the PCI card. There's only one place it can go, and it's keyed so you can't get it in backwards.*

5. *Reinstall the SOLO PCI card in its slot. Line up the card edge connector with the PCI slot, and gently nudge the card inward. There may be a slight bit of*

resistance, but do not force the card. You will feel the card slip securely into position. The PCI card's bracket should now line up with the rear panel, and the connector should be seated all the way on its connector.

6. *Select the vacant PCI slot you will use for the Expansion PCI Bracket. Remove the blank bracket (if any) and keep the bracket retaining screw (if present) for re-installation in a later step.*

7. *Put the Expansion Bracket into the empty slot. This may involve folding the ribbon cable so it lies flat. If so, don't crease it too hard.*

8. *Secure the PCI card and Expansion Bracket in place with the retaining screws (if present). Some computers have other ways to lock down cards in the card cage, be sure yours is secured.*

9. *Replace the computer cover.*

Do not re-plug the power cord into the computer yet.

10. *Now continue with* "Connecting the EXPANDER to Your Computer" *on page 7.*

Connecting the EXPANDER to Your Computer

Caution: *Turn off your computer and disconnect its power cord before connecting or disconnecting interface cables to the computer, the SOLO, or the EXPANDER.*
*Be sure that the SOLO is connected to the SOLO PCI card and the EXPANDER is connected to the Expansion PCI Bracket.*

Warning: Connecting cables with power on or reversing connections to the SOLO and EXPANDER could seriously damage your SOLO system as well as your computer.

1. *With the computer powered off and the power cable removed, patch the interface cable with the yellow bands between the Expansion PCI Bracket's 25-pin connector and the corresponding connector on the EXPANDER's rear panel. Tighten the lock-down screws at both ends; these connections must be rock-solid.*

2. *The EXPANDER's Monitor Outputs can be connected directly to the SOLO's Auxiliary Inputs, eliminating the need for a separate mixer. Or you can connect 1/4" cables from the EXPANDER's rear panel Monitor Outputs to your monitor system.*

3. *Proceed to* "Installing Drivers & Software" *on page 8.*

If you wish to perform a quick audio test of your system at this point, see "Quick Audio Tests" on page 13.

Figure 2.   SOLO PCI card and connector showing location of EXPANDER header.

Header for EXPANDER
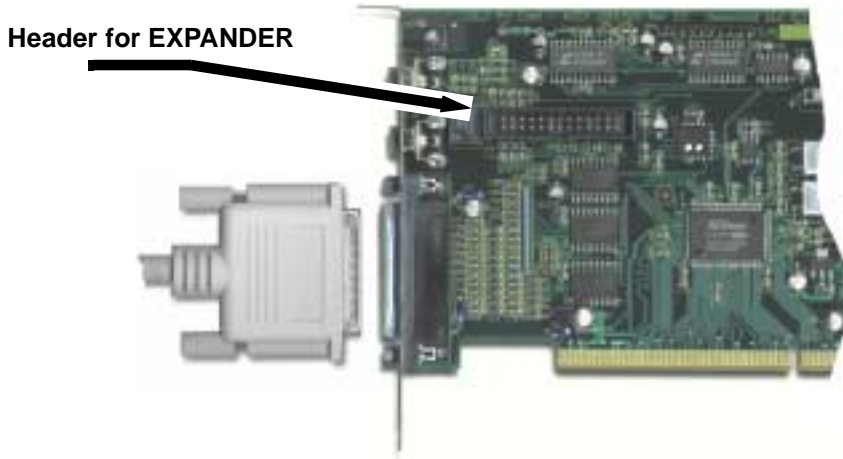
Installing Drivers & Software

If you are adding a SOLO EXPANDER to an existing SOLO system, SeaSound recommends that you update your drivers to the ones that came with your SOLO EXPANDER. The EXPANDER requires drivers version 3.0 or later, which may be more recent than the existing SOLO drivers you have installed in your system.

Installing Windows Drivers

1. Attach the computer's power cable.

2. Turn on the computer. When power is applied, the SOLO runs through a systems test, flashing its lights. *The EXPANDER simply turns on its Power LED.*

3. As part of its startup process, Windows should automatically take you through the steps of installing the SOLO's drivers. Insert the SOLO CD into your CD-ROM drive when Windows asks for it. Windows may ask you to restart your computer in order to complete installation. It will display a dialog asking if you want to restart now or later. Restart it now.

    If driver installation does not run automatically during Windows startup, you can force installation as follows.

    a. Navigate to your CD-ROM device from My Computer, or by using Windows Explorer.

    b. Double-click on the CD icon so you can see its contents.

    c. Double-click on the Setup.exe icon. The setup program will install both the drivers and software.

4. After rebooting, verify that the drivers were installed as follows:

a. Right-click on the My Computer icon on the Desktop and select Properties.

b. Click on the Device Manager tab.

c. Click on the + sign next to "Sound, Video, and Game Controllers."

d. SOLO should appear under this tree.

   If it does appear, but there is an exclamation point ("!") or "X" covering it, or it appears in the "Unknown Device" category, there was a problem with driver installation. Often, the problem can be fixed either by reinstalling the drivers (by repeating step 3 above) or updating the drivers (see "Updating Drivers" on page 10). If not, see "Troubleshooting" on page 38.

5. Select the Preferred Audio Device

   Selecting your SOLO system as the Preferred Audio Device informs Windows that you wish programs such as the Windows Media Player and other audio software applications to record and play back audio through your SOLO system.

   Set the Preferred Audio Device and check your SOLO system computer audio ports as follows.

   a. Open the Multimedia Control Panel: go to Start > Settings > Control Panel.

   b. Double-click on the Multimedia control panel.

   c. Select the Audio tab.

   d. In the Playback controls, select the Preferred device to be SS 1/2 Out.

   e. In the Recording controls, select the Preferred device to be SS 1/2 In.

   f. Check the "Use only preferred devices" box.

   g. Click "OK."

   If SS 1/2 Out or SS 1/2 In are not listed as Playback or Recording choices, go to "Troubleshooting" on page 38.

   Now turn to "MIDI Setup" on page 11.

Installing Macintosh Drivers

Note: Additional information on the driver installation procedure shown below can be found in the "Read Me" file on your SOLO or EXPANDER CD. Please read that file in addition to the directions below.

1. Attach the computer's power cable. Turn on the computer after the card has been installed.

2. Insert the SOLO CD after startup.

3. Drag the "SeaSound Solo Driver" to the Extensions folder located inside your System folder.

4. If you are using an application that supports ASIO, drag the "ASIO SeaSound" icon into the application's ASIO folder.

Note: the "ASIO SeaSound (Legacy)" driver is included for Cubase 3.5 and other programs which use the ASIO 1.0 specification. If your recording software was released before the year 2000, this may be the driver you need.

5. Most Mac audio software includes OMS. Drag the "Solo OMS Driver" into the OMS folder located in your System Folder. If you do not have an OMS folder in your System Folder, you need to install OMS. Get the latest version at http://www.opcode.com or find and OMS install included with any Mac recording software you may own. Make sure the version is 2.3.6 or later.

6. To install Cubasis, double click on the "Install Cubasis" icon in the Cubasis folder on the SeaSound CD.

Updating Drivers

If you are adding a SOLO EXPANDER to an existing SOLO system you may need to update the drivers. Follow the procedures below.

Updating Windows Drivers

1. Verify your current driver version by right clicking on the "My Computer" icon on the Desktop. Select Properties. The System Properties dialog appears. Select the Device Manager tab. Scroll down to "Sound, video and game controllers" and expand it by clicking the plus sign in front of it. Double click on the "Solo" icon. The Solo Properties dialog appears. Select the Driver tab and click on "Driver File Details." The Driver File Details dialog appears. If the File Version is lower than 3.0 you must update drivers before using the SOLO EXPANDER. Click OK to dismiss this dialog and return to the Solo Properties dialog.

2. Update the driver as follows. On the Solo Properties dialog, press "Update Driver." Insert the CD which came with your EXPANDER and follow the directions from the Update Device Driver Wizard.

Updating Mac Drivers

1. Verify your current driver version by highlighting (clicking once on) the current "SeaSound Solo driver" (which is found in System folder/Extension folder). Press and hold the Apple key while pressing the "I" key. A dialog appears which provides version information.

2. If your version is not 3.0 or above you should replace your current SOLO OMS driver and current SOLO ASIO driver in any applications which use ASIO. To do this, follow the directions in "Installing Macintosh Drivers" on page 9 but substitute the EXPANDER CD instead of your original SOLO CD to replace your old drivers.

MIDI Setup

Windows MIDI Setup

Selecting your SOLO system as the Preferred MIDI Device informs Windows that you wish programs such as the Windows Media Player and other audio software applications to record and play back MIDI through your SOLO system.

1. Go to Start>Settings>Control Panel
2. Double-click Multimedia
3. Select the MIDI tab.
4. In the MIDI Output group, select Single Instrument and click on SOLO MIDI Out.

Each audio application will provide its own way of allowing you to specify which MIDI output to use. The SOLO will be one of these choices.

Note: do not activate the "Solo Command Port" as a MIDI In or MIDI Out device in your software, unless you have a SeaSound DTC-1 or other device which utilizes the External Controller port on the Soloist back panel.

MAC MIDI Setup

1. Verify that the "Solo OMS driver" has been installed on your hard drive by making sure that the System Folder contains an OMS Folder. Go to "Installing Macintosh Drivers" on page 9 if it is not present.
2. Run OMS Set Up by double clicking on the "OMS Setup" icon on your hard drive located in Opcode>OMS Applications. A dialog will appear on your screen. Appletalk may be left on or disabled depending on your preference. Do not check the Modem or Print boxes unless you have a MIDI device connected to them.
3. Press the Search button on the dialog. OMS will look for the SOLO as a MIDI device. OMS Setup should find "Solo 1." If it does, press OK. If "Solo 1" is not detected press the "Troubleshooting" button on the dialog. Or see "Troubleshooting" on page 38. "Solo 1" will appear with the "Unknown" MIDI device icon (which is a keyboard with a question mark.) This is normal.
4. Save this setup as "MyStudio Set Up".
5. Change device icon to sound card by going to file menu Studio>Device icon.
6. You can perform a quick In/Out continuity test on your MIDI setup as follows.
   a. With the OMS Set Up program still running, go to the File menu, then select Studio>Test studio.
   b. Click on the "Solo 1" icon in the My Studio Setup window to trigger MIDI devices attached to Solo EX.
   c. Then play any MIDI Controllers attached to your SOLO. You will hear a "MIDI received" message if successful.

Additional interfaces will remain available in OMS in case you need to expand your MIDI setup in the future.

Recording Software Settings

SeaSound highly recommends using the SeaSound ASIO drivers if your software supports ASIO. Consult your software manual or manufacturer. On Windows, the SOLO ASIO drivers are named "SS SOLO." On the MAC they are named "ASIO SeaSound."

(Please refer to our Technical Support web page at http://www.seasound.com for software-specific settings for DMA, offsets and other useful information.)

CUBASIS VST

Mac

1. Launch Cubasis VST.
2. Pull down the Options menu.
3. Select Audio Setup>System.
4. Select "ASIO SeaSound" as the ASIO device. (The Soloist can be used with "Apple Sound Manager" selected as your ASIO device, so long as SeaSound is selected as your Input and Output device in the Sound Control Panel. In general, the native ASIO Seasound drivers offer superior performance.)
5. Click OK.

Windows

1. Launch Cubasis VST.
2. Pull down the Audio menu.
3. Select System.
4. Select "SS ASIO" as the ASIO device. (The SOLO system can be used with "ASIO Multimedia" as well, so long as SS 1/2 is selected as your Multimedia Preferred Device. In general the native SS ASIO drivers offer superior performance.).
5. Click OK. Cubasis will then run a DMA block test. Press start. When the test is finished, the SOLO should be selected and ready to use.

Acid Rock (Windows only)

Acid Style plays and records via whatever audio device you have selected as your Preferred Audio Device. If you have not already selected the SOLO, turn to "Select the Preferred Audio Device" on page 9.

Quick Audio Tests

The tests in this section are designed to quickly verify that your SOLO system is functioning properly without the use of software.

Quick SOLO Audio Test

Here is a way to verify that the SOLO is receiving input correctly using a microphone and headphones.

1. With your computer turned on, check that the SOLO's Power light is illuminated. If not, there was an installation problem. Go back and check the installation, or see "Installing a New SOLO + EXPANDER System" on page 3.

2. Plug a pair of headphones into the SOLO's Phones 1 jack and turn the associated Phones volume control down all the way.
   Or, plug a stereo phone jack from the Phone 1 plug to your monitoring system.
   Or, turn down the Control Room volume all the way and patch 1/4" phone cables from the SOLO's rear panel Control Room Outputs to your monitoring system, and use the Control Room volume in the tests to follow.

   To prevent feedback, do not bring the microphone into close range to monitor loudspeakers. Instead, use headphones to prevent possible feedback.

3. Perform the following test with a microphone:
   a. Plug your microphone into the Preamp 1 Mic XLR plug. If the microphone requires phantom power, set the Phantom Power switch On. If you don't have a mic with an XLR connector, plug in a mic to theInst input; or plug in a guitar, or whatever you've got.
   b. Set the Mon Pan control for that channel to 12 o'clock.
   c. Push the Input/Output button (located near the Level Meters) so that the In LED lights (yellow).
   d. Set the Mic Trim knob fully counter-clockwise, and the Mic Level knob at 3 o'clock.
   e. Flip the Record switch up so the Rec LED lights.
   f. Speak or sing loudly into your mic while slowly turning up the Trim knob. Adjust the Trim until the Clip/Signal LED turns red (indicating possible distortion), then back off just a tiny bit on the Trim to keep the Signal LED on, but not red.
   g. Use the Level knob as you would a fader on a mixing desk.
      Using low-level instruments (guitar, bass, electric piano, etc.) works similarly, except that these never use Phantom power, and will almost always plug into the 1/4" input jack, not the XLR.

      Seeing activity on the Level Meters tells you that the SOLO is receiving signals and producing a signal for its converters.

4. To verify that the mic signal is arriving at the headphones, do the following:
   a. Turn the Phones 1 control all the way down.
   b. Turn the Input volume control in the Monitor Mix section to 3 o'clock.
   c. Slowly turn up the Phones 1 control while singing into the mic. At some point you will hear it if the last test was successful. If it sounds distorted, go back to the previous step and turn down the Trim.

These tests verify that the SOLO is functioning normally. If you did this step as part of installation, return to the installation process where you left off. Otherwise, if the system is still not behaving as expected, check out "Troubleshooting" on page 38.

Quick EXPANDER Audio Test

Here is a simple way to verify that the EXPANDER is receiving input correctly using a line input and monitoring system.

1. *With your computer turned on, check that the EXPANDER's Power light is illuminated. If not, there was an installation problem. Go back and check the installation, or see "Installing a New SOLO + EXPANDER System" on page 3.*
2. *Turn the Input Monitor volume control down (fully counter-clockwise).*
3. *Plug a CD player or other line-level audio source into Inputs 3 & 4 on the back panel of the EXPANDER.*
4. *On the EXPANDER's front panel, set the switches for Level Meters 3–4 to Input and –10.*
5. *You should see activity on the Level Meters for those channels on the EXPANDER. If not, check the CD player, cables and connectors to the EXPANDER. If the Level Meters go into the red (indicating clipping) set the input sensitivity switch to +4, and/or reduce the output signal from the CD player.*
6. *Turn down the input volume to your monitoring system. Connect your monitoring system to the stereo Monitor Outputs on the back panel of the EXPANDER with 1/4" jacks. Turn up the input to your monitoring system.*
7. *Turn up the Input Monitor volume on the EXPANDER. You should hear the CD through your monitoring system.*

These tests verify that the EXPANDER is functioning normally. If you did this step as part of installation, return to the installation process where you left off. Otherwise, if the system is still not behaving as expected, check out "Troubleshooting" on page 38.

Windows Note: When using professional recording applications on a PC, SeaSound recommends you disable Windows system sounds. (Go to Start > Settings> Control Panel> Sounds> Schemes and select "No Sounds.") If you must use Windows sounds, check the box "Use Preferred Devices Only" at Start > Settings> Control Panel > Multimedia > Sounds.

SOLO University

Here's a little orientation for how the SOLO system fits together.

Audio Ports

The audio software on your computer routes audio to and from the SOLO and EXPANDER through *audio ports*, which are software-selectable sources and destinations for audio signals in your audio software. Exactly how many audio ports you have and what they are called varies somewhat depending on your system and software, but their function is straightforward, as described in this section. First, a little orientation.

How Audio Ports Work

- *In ports* receive audio data from the SOLO and/or EXPANDER and allow your audio software to record it.
- *Out ports* send audio data to your SOLO and/or EXPANDER and allow your monitoring system to play it back.
- The S/PDIF In Port receives digital sample data from the SeaSound PCI card's S/PDIF input.
- The S/PDIF Out Port sends digital sample data to the SeaSound PCI card's S/PDIF output.

The SOLO has two stereo In Ports and two stereo Out Ports. *The EXPANDER adds three additional stereo In Ports and three additional stereo Out Ports.* The SeaSound PCI card provides one stereo S/PDIF In Port and one stereo S/PDIF Out Port on its back panel.

Generic Audio Port Names

Because different computer systems and audio drivers may name them differently, the audio ports are given generic names in this section that will be used throughout the rest of this manual to identify the various ports. Table 1 supplies the equivalent names for the audio ports for various computer and driver combinations.

SOLO Out Port — This is the port your audio software uses for analog stereo playback through the SOLO. In Windows, this should be chosen as the "Preferred Audio Device" for playback so that the audio software uses this port by default when it plays audio. See "Select the Preferred Audio Device" on page 9.

SOLO In Port — When your audio software records audio from this port, the input comes from the SOLO's Preamp Inputs and Line Inputs.

EXPANDER Out Port — *Audio Out ports 3/4, 5/6, 7/8 are used by your audio software for audio playback through the EXPANDER. When your audio software plays audio to these ports it goes to the Monitor Outputs of the EXPANDER as well as to the individual master outputs on the EXPANDER's back panel.*

EXPANDER In Port — *Audio In ports 3/4, 5/6, 7/8 are used by your audio software for audio recording from the EXPANDER's A/D Converters.*

S/PDIF Out Port — routes audio from your audio software to the S/PDIF Out port on the back of the SeaSound PCI Card. See Digital Audio Connections.

The exact routing of these ports is modified by the SOLO's Signal Routing. For instance, when the signal routing mode is set to Normal, audio sent to SOLO Out Port is also copied to S/PDIF Out Port.

S/PDIF In Port — routes audio from your audio software to the S/PDIF In port on the back of the SeaSound PCI Card. See Digital Audio Connections.

The exact routing of these ports is modified by the SOLO's Signal Routing.

Audio Port Names for Specific Computers and Drivers

If you have a SOLO-only system, the Audio Port names are given below in Table 1 on page 16. If you have a SOLO + EXPANDER system, the names are given in Table 2 on page 31, along with a full discussion of the "EXPANDER Controls and Connections" on page 30.

Table 1.   SOLO-Only Audio Port Names

	SOLO Out Port	**S/PDIF Out Port**	**SOLO In Port**	**S/PDIF In Port**
WIN Multimedia	SS 1/2 Out	SS 3/4(S/PDIF) Out	SS 1/2 In	SS 3/4 (S/PDIF) In
WIN ASIO-Multimedia	SS 1/2 Out	SS 3/4(S/PDIF) Out	SS 1/2 In 1 SS 1/2 In 2	SS 3/4 (S/PDIF) In 1 SS 3/4 (S/PDIF) In 2
Win SS ASIO	SS1	SS3-S/PDIF	SS1 SS2	SS3-S/PDIF SS4-S/PDIF
Mac Sound Manger	SeaSound	(not supported)	SeaSound	(not supported)
Mac ASIO	Solo Analog Out	Solo SPDIF Out	Solo AnalogIn-1 Solo AnalogIn-2	Solo SPDIFIn-L Solo SPDIFIn-R

Main SOLO Components

It's easiest to think of the SOLO as composed of the following main components.

- Analog Inputs on the SOLO receive audio signals from microphones, guitars, CD players, and the like. (Do not confuse these with the SOLO In Port which connects your audio software to the SOLO. Here, we're talking about actual physical connectors.)

- A/D Converters in the SOLO convert the Analog Inputs to digital signals and sends them to your computer.

- D/A Converters convert digital signals sent to the SOLO from your computer into analog audio which you can hear through headphones and speakers.
- The Stereo Monitor Mixer combines the Analog Inputs and D/A Converter output so you can monitor both inputs and outputs simultaneously.
- The Level Meters allow you to see the strength of the signals you are recording and/or playing back.

If we look at each of these components in more detail, here's what we find:

Analog Inputs — The Preamp Inputs allow microphones or low-level instruments such as guitars to be recorded. The Line Inputs allow line-level signals from CD players, mixers and other such devices to be recorded. These analog inputs are mixed and sent to the A/D Converters and to the Stereo Monitor Mixer. Two Auxiliary Inputs are also available which go directly to the Stereo Monitor Mixer, but they do not go to the A/D Converters.

A/D Converters — Stereo Analog-to-Digital Converters receive stereo signals from the Preamp Inputs and Line Inputs, and convert these analog signals to digital samples which are then sent to the computer and to the S/PDIF Out. The A/D Converters receive input from whichever inputs have their Record Mode Switch turned on and send their converted digital signals to the audio software's SOLO In Port.

D/A Converters — Two Digital-to-Analog Converters receive digital audio from the audio software via the SOLO Out Port and convert them to analog signals which are then sent to the Master Outputs and to the Stereo Monitor Mixer.

**Stereo Monitor Mixer —** mixes stereo signals received from the D/A Converters, the Preamp Inputs, Line Inputs and Auxiliary Inputs. The output of the Stereo Monitor Mixer is sent to the Control Room Outputs, and Headphone Jacks.

Level Meters — can be used to visually track the signal levels being recorded or playing back. They can be switched to monitor the signals being sent to the A/D Converters or to monitor the signals coming from the D/A Converters.

S/PDIF In and S/PDIF Out — are used to receive and transmit digital audio signals.

Figure 3 on page 18 shows a high-level block diagram of how these components fit together with your audio software.

**Figure 3. High-level SOLO System Block Diagram**
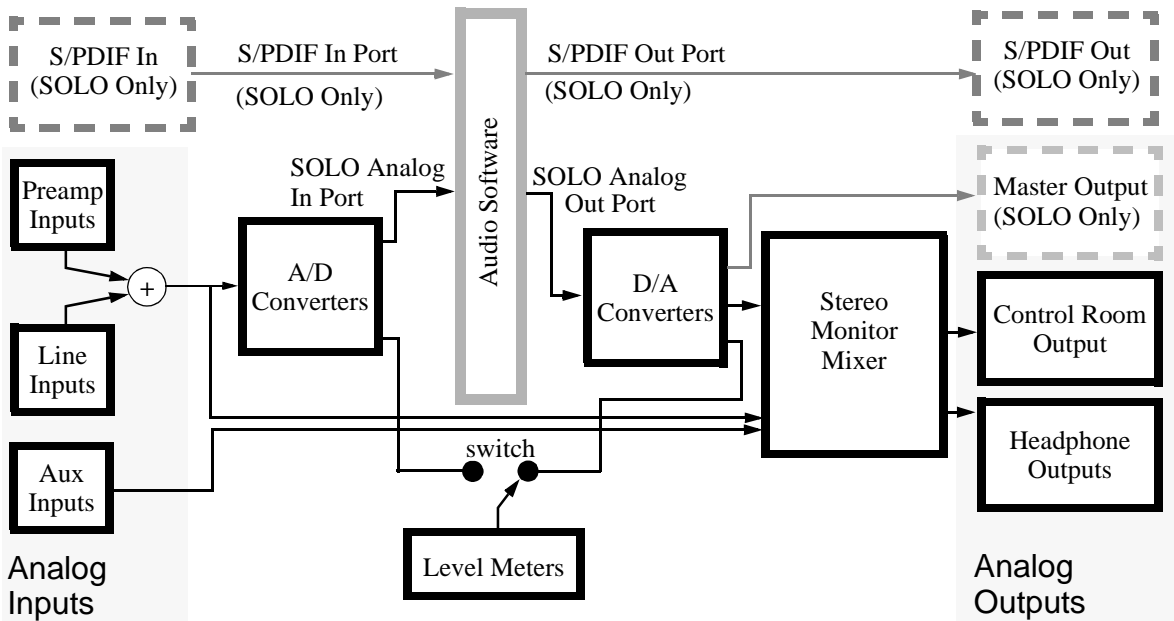
Main EXPANDER Components

The EXPANDER contains all of the basic components of the SOLO but it has no preamplifier inputs (Line Inputs and Auxiliary Inputs only), and has fewer controls. Figure 4 on page 19 shows a high-level block diagram for a SOLO + EXPANDER system. The EXPANDER's Line Inputs are converted through A/D Converters to the Analog Input Ports which are available to your audio software for recording. The Analog Output Ports are converted by the D/A Converters and are available to your mastering and monitoring systems. EXPANDER Level Meters are available to show signal strength, and are switchblade from input to output.

Connecting the EXPANDER Monitor Outputs to the SOLO Auxiliary Inputs offers a convenient way to monitor the EXPANDER without the need for a mixer.

Figure 4.   High-level SOLO + EXPANDER System Block Diagram
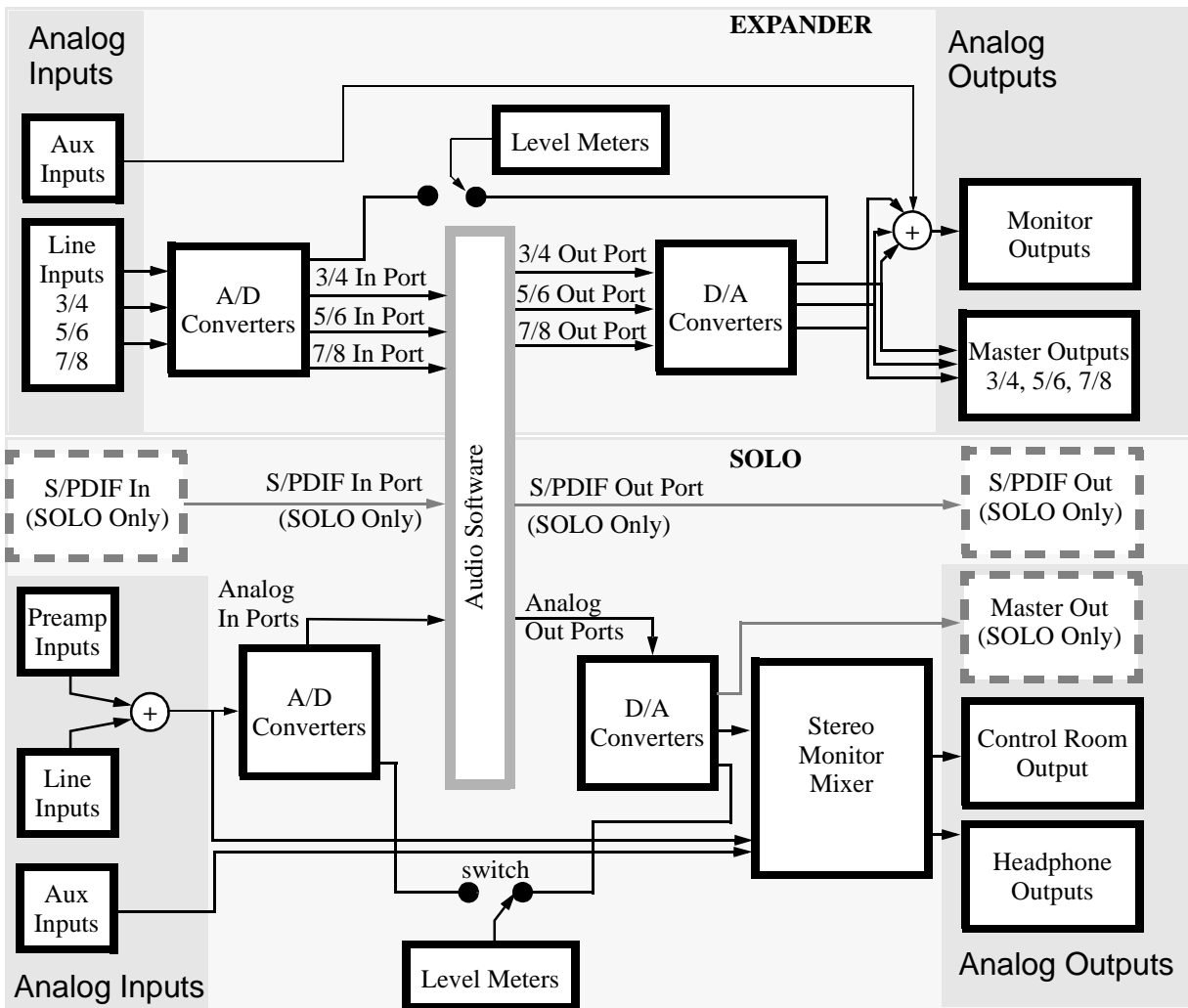
Gain Structure of the SOLO System

Now that you have had a look at the layout of the SOLO's components, let's think about how to get the best performance from it while recording and playing back. The most important thing to understand is how the various volume controls combine to give you the widest possible recording range from soft to loud—called *dynamic range*. The SOLO is capable of recording with an extremely wide dynamic range, but it is up to you to

understand how to make use of it to get the best possible recording. Fortunately, it's not hard to understand.

Recording Gain Structure

Figure 5 shows a block diagram of the connections for one of the two channels from the input signal through the SOLO and on into your audio recording software.

Figure 5.   Recording Gain Structure for One Channel
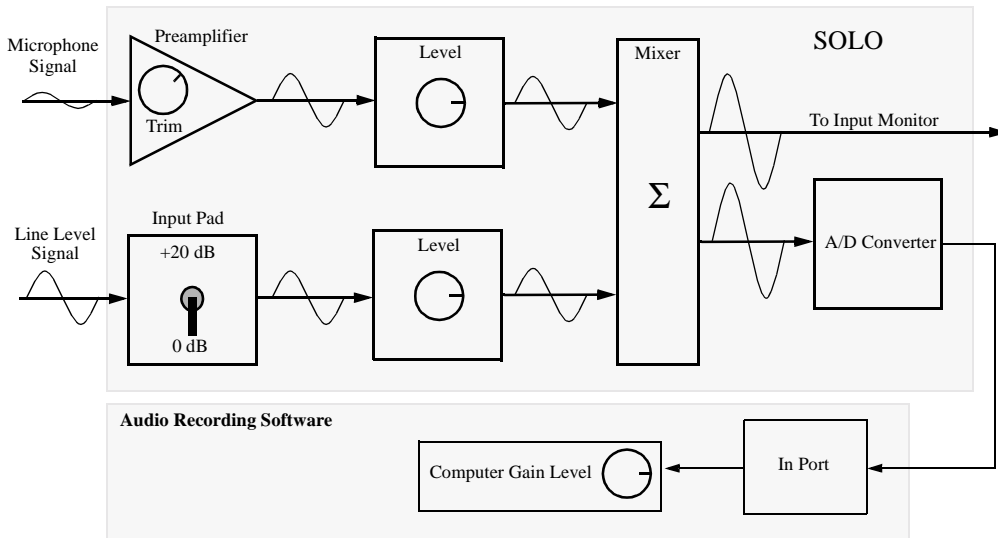
Waveforms on the arrows connecting the boxes show the strengths of signals for a hypothetical recording session. Preamp inputs are best at amplifying low-level signals from microphones or guitars. Line Level inputs are best at amplifying signals from CD players, mixers, etc.

When you are recording from the Preamp Input, there are three gains to think about:

- Input Trim — This control sees the input signal first, and is used to amplify it to line level. If it is set too low, the input signal is not amplified enough and the resultant recording will sound weak and possibly noisy. If it is set too high, it will sound distorted. You want it to be as high as possible without distorting the incoming signal.

- Level — Think of this control like the fader on a mixing desk: use it to make the level of this signal match the others you are recording. When it is set at about 3 o'clock, it passes the signal through at *unity gain*. Above that it *amplifies*, below that it *attenuates*.

- Computer record gain level — There may be a volume control inside your recording software or operating system which determines the final level of the incoming signal.

When you are recording from the Line Input, there are likewise three gains to think about:

- Input Pad switch — Think of this as a two-stage input trim control that either passes the signal through at unity gain (0 dB setting) or amplifies it by 20 dB.
- Level — same as above.
- Computer record gain level — likewise, same as above.

Each of these volume controls is like a link in a chain: the quality of recording you get depends upon having all these links working together. As a consequence, it is usually best if each of these controls is in the middle of its operating range. If one is mostly down and the other is mostly up, one control will be throwing away the amplification being provided by the other, and since all amplification introduces some noise, the quality of your signal will be worse than if they are all evenly matched.

Notice that the Preamp Input and Line Input are eventually summed in the Mixer prior to the A/D Converter. Here is another potential problem: if both input signals are close to maximum before they are mixed, they might start clipping (distorting) after they are mixed. Then the A/D Converter gets a distorted signal which the audio software records. The Level Meters tell you when this is happening by lighting their red LEDs.

Playback Gain Structure

Figure 6 shows a block diagram of the connections for one of the two channels from the audio recording software through the SOLO and out to your monitoring system.

Figure 6.   Playback Gain Structure for One Channel
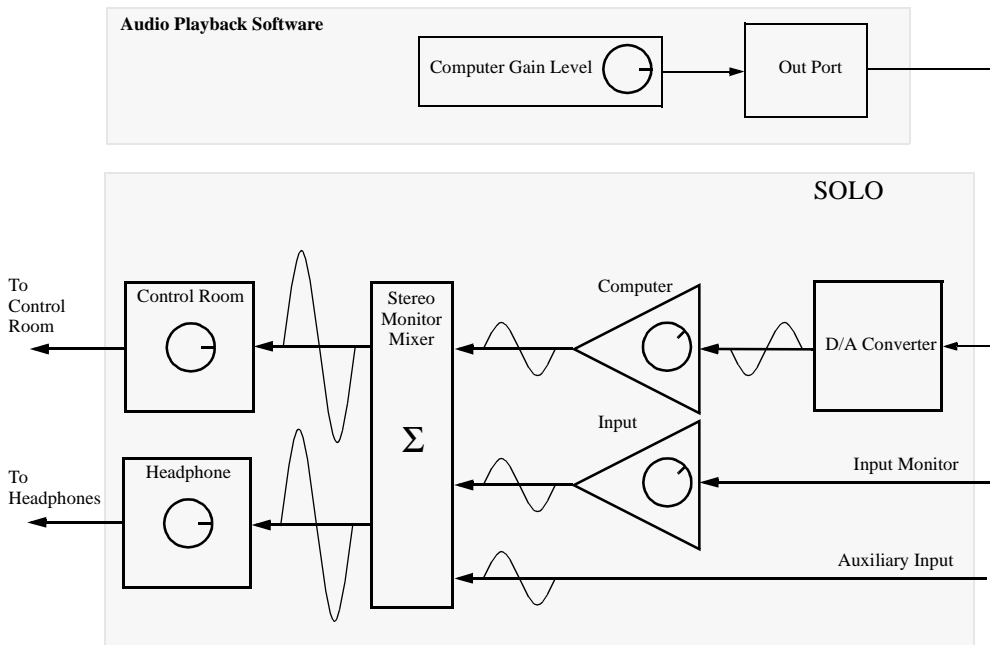
As with recording, you must balance the work done by the various volume controls, keeping in mind how signals are mixed together.

When playing back from the computer, there are three volume controls to think about:

- Computer playback gain level — this determines how strong a signal is given to the D/A converters.
- Computer Monitor Mix Level — this scales the output of the D/A Converters. Use this control to balance the strength of the computer output signal to match the signals you want to hear via the Input Monitor.
- Control Room Level and/or Headphone Level — the final stage in output, use these controls to adjust the strength of the sound you listen to.

When monitoring an input signal, you must think about all the volume controls along that path as well:

- The levels in the recording chain shown in Figure 5 on page 20 determine the signal sent to the Input Monitor.
- The Input Monitor Level matches the input signal to that coming from the D/A Converters.
- The monitor signal is then mixed with the computer signal, and sent together to the output gain controls.
- The Auxiliary Inputs are also mixed with the computer signal, and sent together to the output gain controls.

The quality of playback you get depends upon having all these controls working together. As a consequence, it is usually best if each of these controls is in the middle of its operating range. If one is mostly down and the other is mostly up, one control will be throwing away the amplification being provided by the other, and since all amplification introduces some noise, the quality of your signal will be worse than if they are all evenly matched.

Notice that the D/A Converter, the Input Monitor signal and the Auxiliary Inputs are all summed in the Stereo Monitor Mixer (of which only one channel is shown in Figure 6 on page 21) prior to the final output gain controls. Here is another potential problem: if all these signals are close to maximum before they are mixed, they might start clipping (distorting) after they are mixed. Then the outputs get a distorted signal. The Level Meters can tell you when this is happening by lighting their red LEDs.

SOLO Analog Input Controls

The SOLO has stereo preamplified inputs for low-level signals such as microphones and guitars, and stereo line-level inputs. By adjusting the trim, it can also be used for line-level signals. Signals received by record-enabled inputs are combined and sent to the A/D Converters and also to the Stereo Monitor Mixer. (The Auxiliary Inputs do not go to the A/D Converters, only to the Stereo Monitor Mixer.)

Preamplifier Input Controls

Preamplifier controls are shown in Figure 7.

Figure 7.   Preamp Input Controls and Connectors

Signal Present/Clip LED

Trim

Instrument Input

Mic. Input

Record Enable

Monitor Pan

Record Mode

Mic Level

Phantom Power

Preamp Inputs — There are two XLR microphone inputs with switchable phantom power. When plugging or unplugging a mic, always turn the Preamp Level control to minimum (fully counter-clockwise).

Phantom Power — Most modern condenser microphones require phantom power; dynamic mics do not. Check your microphone's documentation to determine if it needs phantom power. If so, flip this switch up to supply both microphones with 48V. The one switch turns on phantom power to both XLR connectors.

Inst Input — These inputs ideal for low-level sources such as guitar, bass, or acoustic instruments with pickups.

Trim — adjusts the input sensitivity of the microphone and instrument inputs. Set this control for the highest signal level possible, short of distortion.

Signal Present/Clip LED — helps determine if a signal is present and helps set levels. When it lights green, it indicates that a signal is present. Red warns you that clipping is about to take place, or is taking place. The SOLO has approximately 6dB of headroom when the LED illuminates red. For best results, adjust Trim so the LED rarely turns red, but is green as much as possible. When in doubt, the Solo-o-meter gives more precise indications about clipping. Also, your audio software may provide additional ways of monitoring clipping.

Preamp Level — This sets the signal level output of the Preamplifiers. From here the signal goes to the A/D Converters if the Record Mode Switch is up, and also goes to the Stereo Monitor Mixer via the Monitor Input Volume controls.

Record Mode Switch — When in the up position, this switch turns on the Rec LED, sets the channel to record-ready mode, and starts the A/D Converters, sending digital audio to your audio software.

Rec LED — when on (red), indicates the Microphone Preamplifier is sending its signal to the A/D Converters. It is turned on by the Record Mode Switch.

**The Level Meters receive input from Microphone Preamplifiers and Line Inputs only if the respective Record Mode Switch is up.**

Mon Pan — determines the position of the channel signal in the stereo field going to the Stereo Monitor Mixer. It does not pan the signal sent to the A/D Converters. Turning the knob counter-clockwise pans the signal toward the left; clockwise pans it toward the right.

Line Input Controls

The SOLO has two Line Amplifiers which can be used for line-level signals.

Line Amplifier controls are shown in Figure 8.

Figure 8.   Line Amplifier Controls
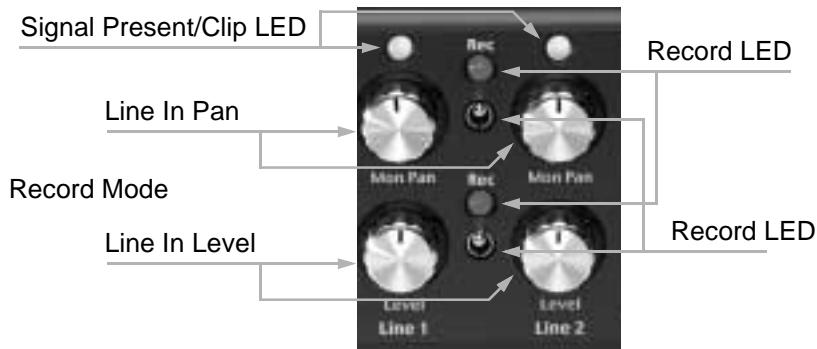
Signal Present/Clip LED — helps determine if a signal is present and helps set levels. When it lights green, it indicates that a signal is present. Red warns you that clipping is about to take place, or is taking place. The SOLO has approximately 6dB of headroom when the LED illuminates red. For best results, adjust Line Level so the red LED illuminates rarely, but the green LED is on as much as possible. When in doubt, the Solo-o-meter gives more precise indications about clipping. Also, your audio application may provide additional ways of monitoring clipping.

Line Level — TheLine 1 and Line 2 Line Level controls set the signal level output of the left and right channel Line Amplifiers, respectively. From here the signal goes to the left and right inputs to the A/D Converters if the Rec LED is lit and also goes to the Stereo Monitor Mixer via the Monitor Input Volume controls.

Record Mode Switch — When in the up position, this switch turns on the Rec LED, sets the channel to record-ready mode, and starts the A/D Converters, sending digital audio to your computer via the SOLO In Port.

Rec LED — When on (red), indicates the Line Amplifiers are sending signals to the A/D Converters. It is turned on by the Record Mode Switch.

The Level Meters receive input from Microphone Preamplifiers and Line Inputs only if the respective Record Mode Switch is up.

Mon Pan — determines the position of the channel signal in the stereo field going to the Stereo Monitor Mixer. It does not pan the signal sent to the A/D Converters. Turning the knob counter-clockwise pans the signal toward the left; clockwise pans it toward the right.

Level Meters and MIDI Activity Meters

Level Meters provide visual cues about the presence and strength of signals in the SOLO. They can be switched to track the levels going to the A/D Converters, or they can be switched to track the output of the D/A Converters.

The MIDI Activity LEDs give a visual indication of MIDI commands at the MIDI Jacks.

Figure 9. Level Meters and MIDI Activity Meters
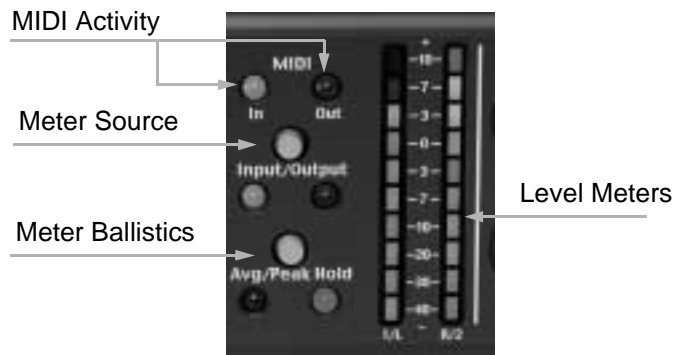
Meter Ballistics — determines how the Level Meters display signal strength. Peak mode (indicated by the yellow LED) tracks the instantaneous peak amplitude of the signal. Peak Hold (indicated by the green LED) retains the highest peak level achieved over approximately one second intervals. This makes it easy to watch levels, even if you take your eyes off the meter momentarily.

Meter Source — Pressing this button so that the LED turns yellow sets the Level Meters to monitor the input to the A/D Converters. Pressing the button again so that the LED turns green sets the Level Meters to monitor the output of the D/A Converters.

Level Meters — track the level of the signal you're listening to, as determined by the Meter Source switch. If your signal at peak volume only lights up the green LEDs, the

signal may be too weak and your recording may sound faint and noisy. The yellow LEDs should mostly light up for normal recording applications. If the meter's red LED lights, clipping may be occurring. However, note that there is approximately 6 dB of headroom left after the red LED first lights, so clipping may not actually be happening. When in doubt, the Solo-o-meter gives more precise indications about clipping. Also, your audio application may provide additional ways of monitoring clipping.

MIDI Activity LEDs – Displays the presence of MIDI information going in and out of the SOLO MIDI Jacks.

SOLO Stereo Monitor Mixer Controls

The Stereo Monitor Mixer combines signals from the Preamp Inputs, Line Inputs, D/A Converters, and Auxiliary Inputs and routes them to the Control Room Outputs and Headphone Jacks.

Its controls are shown in Figure 10.

Figure 10.   Stereo Monitor Mixer Selection

Monitor Input Volume — determines the signal level sent to the Stereo Monitor Mixer from the Preamp Inputs and Line Inputs.

Computer Volume — determines the level of the output of the D/A Converters. These are the volume controls for the audio output from your computer software. Use these controls to listen to what is recorded in your computer. Because the SOLO has separate Monitor Input Volume and Computer Volume controls, you can adjust the balance between already-recorded audio and the instrument you're playing when overdubbing.

Control Room Volume — This sets the level coming from the Stereo Monitor Mixer out to your audio monitoring system via the rear panel's Control Room Outputs.

Headphone Jacks — Plug in up to two sets of headphones here. SeaSound recommends using closed-ear headphones (where the earphone cup surrounds the ear) to minimize leakage and feedback during recording.

Headphone Volume Controls — level control for headphones. Because the headphones have dedicated level controls, changing headphone levels does not change the control room or master output levels.

Caution: Because of the earphone driver's proximity to your ear, excessive levels or loud transients can cause hearing damage. Turn down the headphone volume when switching inputs or plugging and unplugging instruments from the SOLO, as this can create pops that can hurt your ears.

Master Volume — sets the level coming from the D/A Converters, and feeds the Master Outputs on the back panel. These typically go to a mastering recorder such as a DAT, stand-alone CD-R, cassette, Minidisc, etc. It can also be used for a second monitoring system.

Power LED — When lit, indicates that the SOLO is plugged in and receiving power.

SOLO Midi Jacks/Computer Interface

Figure 11.   MIDI and Computer Interfaces
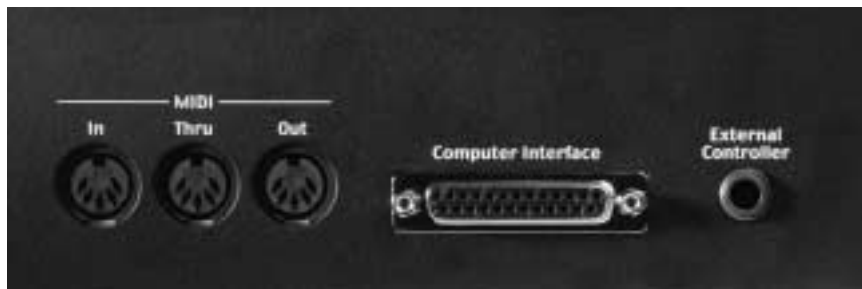
Computer Interface — connects your computer to your SOLO. With computer power off and the power cord disconnected, connect one end of the interface cable to this jack, and the other end to the corresponding PCI card jack.

Caution: *Turn off your computer and disconnect its power cord before connecting or disconnecting interface cables to the computer, the SOLO, or the EXPANDER.*
Be sure that the SOLO is connected to the SOLO PCI card and the EXPANDER is connected to the Expansion PCI Bracket.

Warning: Connecting cables with power on or reversing connections to the SOLO and EXPANDER could seriously damage your SOLO system as well as your computer.

If you need a replacement cable, use an IEEE-1284-compatible printer cable. SeaSound does not recommend using SCSI cables, or cables longer than 12 feet (approximately 4 meters). Make sure that any replacement cables can be distinguished from each other so that connections will never be reversed. If replacement cables are similar, mark both ends of one cable so you can tell them apart easily.

External Controller — for seaSound DTC-1 (desk top controller) and future control interfaces. This can be used in conjunction with your audio software to start/stop recording from a desktop controller. For more information on expansion products, visit your SeaSound dealer or go to the SeaSound web site at http://www.seasound.com.

MIDI Jacks — allow MIDI instruments, controllers, and sync generators to communicate with MIDI-compatible software. The device generating MIDI—such as an external MIDI keyboard—plugs into the SOLO's MIDI In. MIDI Thru provides a buffered copy of the MIDI In signal, which, if you patch to other MIDI devices, results in a copy of the MIDI In signal being forwarded to the other devices. MIDI Out provides MIDI data playback from your software.

Here are some typical applications:

- With sequencers, patch a MIDI master keyboard's MIDI Out into the SOLO MIDI In, and patch the SOLO MIDI Out to a MIDI-controlled sound module. Your software will allow you to patch the MIDI In to the MIDI Out while recording (called "MIDI Thru" or "MIDI Echo"), thus allowing you to hear what you're playing. On playback, MIDI data exits the MIDI Out and plays back through the sound module.

- With the same scenario but using a keyboard with self-contained sound generation, patch the keyboard MIDI Out into the SOLO MIDI In, and patch the SOLO MIDI Out to the keyboard's MIDI In. Turn off Local Control at the keyboard (refer to the unit's manual for information on how to do this), and enable the software's MIDI thru function described above.

- Some programs allow MIDI controller changes to control mixer faders, signal processing parameters, etc. In this case, you could patch the MIDI Out from a MIDI Machine Controller device to the SOLO MIDI In to control the software's parameters.

- If you need to synchronize your software to another source (such as another computer, an all-in-one "groove box," time code from a video project, or anything else that generates MIDI Time Code), patch the MIDI Time Code source's MIDI Out into the SOLO's MIDI In.

For more information on typical MIDI setups and studio interconnections, SeaSound recommends the book *Home Recording for Musicians*, published by AMSCO.

SOLO Analog Audio Connections

Figure 12.   Analog Audio Connections

Analog Outputs

Master Outputs — The output of the D/A Converters goes through the Master Volume control directly to the Master Outputs. When your audio software directs audio to the SOLO, it will end up here. Connect these jacks to an external DAT machine, stand-alone CD recorder, cassette deck, or other stereo mixdown device. If your recording device accepts S/PDIF digital I/O, you can avoid going through the SOLO's D/A Converters by using the S/PDIF In and S/PDIF Out jacks located on the PCI card. See Digital Audio Connections.

Control Room Outputs — The output of the Stereo Monitor Mixer is fed through the Control Room Volume control, then to these outputs. Connect these to your control room monitoring system and/or outboard recorders.

To avoid transients and spikes that could damage your speakers, make sure the monitoring system is off when connecting it to the SOLO.

Analog Inputs

Line Inputs — are routed first through the Line Level controls on the front panel, then are routed to the A/D Converters and the Stereo Monitor Mixer. They are best for line-level signals such as keyboards, drum machines, or preamplified guitars.

Auxiliary Inputs — are routed directly into the Stereo Monitor Mixer without volume control. They are best used for adding in another signal that you want to monitor; they are not mixed into the signal that feeds your computer. They accept line level signals from sources such as drum machines, cassettes, CDs, DATs, or the EXPANDER Monitor Outputs. Another use of the Auxiliary Inputs is to monitor yourself with effects that you don't want to record. For example, a vocalist might feel more comfortable recording with reverb, but you don't necessarily want to record the reverb, as you would prefer to add it during mixdown. To accommodate the vocalist, send a signal from the Direct Outputs to

the reverb, then patch the reverb outputs to the Auxiliary Inputs. Note that there are no level controls for these inputs. Adjust levels at the device feeding the Auxiliary Inputs.

Direct Outputs — sends a pre-level, post-insert signal from the Preamplifiers. You can think of them as a way to tap a copy of the SOLO's Microphone Preamplifiers. This is useful for adding non-insert effects such as reverberation, which you can then route back into the SOLO via the Auxiliary Inputs. Or you can send a "dry" signal elsewhere. For example, if you want to record both a direct and amped guitar sound, feed the guitar into a Micropone Preamplifier. Send its Direct Out to a guitar amp, then mic the amp, and return the mic output to the other Preamp Input. See "Using Direct Outputs" on page 47 for more information.

Preamp Inserts — can be used to add effects such as compression, EQ and distortion, for example. When nothing is plugged in, the Preamp Inserts simply copy the preamplified signal straight through to the Preamplifier's Preamp Level controls. If an effects device is plugged in, this straight-through connection is broken, and the signal must be routed through the effects device. The device must be wired so as to receive the SOLO's preamplified signal from the tip of a 1/4" TRS (tip-ring-sleeve) plug, and to return the signal with overlaid effects on the ring of the same jack. See "Using Inserts" on page 46 for more information.

EXPANDER Controls and Connections

The EXPANDER has fewer connections and controls than the SOLO, so they are presented together here.

EXPANDER Audio Ports

See Table 2 for specific names given to these ports by various computer systems and device drivers.

EXPANDER Audio Output Ports — *connect the output of your audio software to the EXPANDER's D/A Converters.*

EXPANDER Audio Input Ports — *connect the output of the EXPANDER's A/D Converters to the input of your audio software.*

Table 2. SOLO + EXPANDER Audio Port Names

	SOLO Out Port	S/PDIF Out Port	SOLO In Port	S/PDIF In Port
WIN Multimedia	SS 1/2 Out SS 3/4 Out SS 5/6 Out SS 7/8 Out	SS 9/10(S/PDIF) Out	SS 1/2 In SS 3/4 In SS 5/6 In SS 7/8 In	SS 9/10 (S/PDIF) In
WIN ASIO-Multimedia	SS 1/2 Out SS 3/4 Out SS 5/6 Out SS 7/8 Out	SS 9/10 (S/PDIF) Out	SS 1/2 In 1 SS 1/2 In 2 SS 3/4 In 1 SS 3/4 In 2 SS 5/6 In 1 SS 5/6 In 2 SS 7/8 In 1 SS 7/8 In 2	SS 9/10 (S/PDIF) In 1 and SS 9/10 (S/PDIF) In 2
Win SS ASIO	SS1 SS3 SS5 SS7	SS9-S/PDIF	SS1 SS2 SS3 SS4 SS5 SS6 SS7 SS8	SS9-S/PDIF and SS10-S/PDIF
Mac Sound Manger	SeaSound	(not supported)	SeaSound	(not supported)
Mac ASIO	Solo Analog Out Expander Analog Out 3 Expander Analog Out 5 Expander Analog Out 7	Solo SPDIF Out	Solo AnalogIn-1 and Solo AnalogIn-2 Expander Analog In-3 Expander Analog In-4 Expander Analog In-5 Expander Analog In-6 Expander Analog In-7 Expander Analog In-8	Solo SPDIFIn-L and Solo SPDIFIn-R

EXPANDER Front Panel Controls

Expander front panel connections are shown in Figure 13.

Figure 13.   EXPANDER Front Panel

Power LED — *when illuminated, shows that the EXPANDER is receiving power.*

Input Monitor Volume — *All EXPANDER Line Inputs are summed and routed to this control. Its output is mixed with the Computer Monitor Volume output and the combined signal goes to the Monitor Outputs.*

Computer Monitor Volume — *All EXPANDER Audio Output Ports are summed and routed to this control. Its output is mixed with the signal coming from the Input Monitor Volume and the combined signal goes to the Monitor Outputs.*

Level Meter Groups — *There are three Level Meter Groups which contain two switches and a level meter.*

- *Input/Output switch — the Level Meter will register either EXPANDER Line Inputs or EXPANDER Audio Output Ports.*
- *+4/−10 — adjusts input sensitivity. Set this to −10 when input comes from standard consumer-electronics devices such as CD players. Set it to +4 for professional audio sources.*
- *Level Meters — EXPANDER metering uses only Peak meter ballistics, but in all other regards, they operate like SOLO Level Meters. In particular, there's still 6 dB of headroom when the red LED lights. Aim to get only the yellow LEDs to light for typical recording applications.*

EXPANDER Back Panel

Expander back panel connections are shown in Figure 14.

Figure 14.   EXPANDER Back Panel
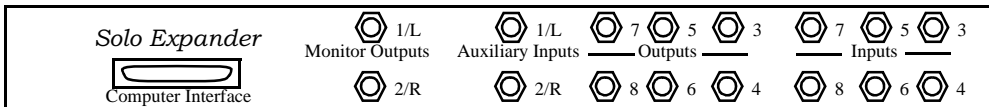
Inputs — *Use these line inputs for any line-level signal. Adjust the input sensitivity if necessary with the +4/−10 switch. See Level Meter Groups.*

Auxiliary Inputs — *connect directly to the EXPANDER's Stereo Monitor Mix.*

Outputs — *The individual outputs of the EXPANDER's D/A Converters are available at these plugs.*

Monitor Outputs — *The combined outputs of the Input Monitor Volume control, Auxiliary Inputs and the Computer Monitor Volume control are routed to these plugs. For convenient monitoring, connect these outputs to the Auxiliary Inputs on your SOLO.*

Digital Audio Connections

In addition to providing analog I/O, the SOLO can receive and generate digital audio via the S/PDIF connectors on the back of the SeaSound PCI card, shown in Figure 15.

The SeaSound S/PDIF connectors only send and receive S/PDIF digital audio at 48 kHz sampling rate.

The purpose of digital I/O is to permit transmission of sound data to and from the computer and other equipment (such as DATs, DVDs, etc.) without having to convert to and from analog audio. Any time audio is converted to or from analog signals, a certain amount of degradation occurs, much like record generations in analog tape recordings (but not necessarily as severe). Once an audio signal is converted to digital for purposes of recording, editing, mixing or processing, every effort should be made to keep the audio in the digital domain throughout editing, post-processing, and mastering.

Figure 15.   S/PDIF Connectors

S/PDIF In — The red RCA Connector receives S/PDIF digital audio. See About S/PDIF.

S/PDIF Out — The white RCA Connector transmits S/PDIF digital audio. See About S/PDIF.

About S/PDIF

S/PDIF is an abbreviation for Sony and Philips Digital Interconnect Format. It is a serial digital transmission scheme that is based on the AES3 standard for sending two channels of digital audio in a time-division-multiplexed fashion. It can carry a stereo pair of channels with a sampling rate of up to a maximum of 96 thousand samples per second with a sample precision of up to 24-bits. S/PDIF uses a coaxial unbalanced line with RCA connectors and the signal levels are around 0.5 volts.

The SeaSound PCI card is equipped with S/PDIF input and output using industry-standard RCA jacks on the PCI card bracket. Connect the S/PDIF Output to your outboard recorder's inputs, and its S/PDIF output to the SeaSound PCI card's S/PDIF Input.

Using the Solo-o-meter, the SeaSound PCI card can configure your SOLO for your digital I/O application. For example, you may want to record a mix to a DAT machine while monitoring the results. Set the Solo-o-meter to Normal Mode (see Signal Routing), which sends the digital signal from your audio software both to the S/PDIF Out connector on the PCI card and also to the SOLO D/A Converters so you can listen on headphones or powered speakers while the digital-audio is simultaneously streamed to the S/PDIF Out.

S/PDIF Clock

The SOLO has the provision to operate as S/PDIF Clock Master or S/PDIF Clock Slave.

Master Mode — In Clock Master Mode, the SOLO generates the master digital audio clock rate from its internal sample-rate clock, and this clock is used to control the sample rate of S/PDIF Out. It is also used internally to provide clock timing for the SOLO's A/D Converters and D/A Converters. In Master Mode, the SOLO also determines the sample precision (16- or 24-bit audio) for the A/D Converters and D/A Converters, S/PDIF Out and S/PDIF In. By default, the SOLO operates in Master Mode, 16-bit samples, at 44.1 kHz sampling rate. See Solo-o-meter for how to change these settings.

Slave Mode — In Clock Slave Mode, the SOLO derives its sample clock from the S/PDIF In signal. In this mode, the SOLO automatically adapts to the sample rate and precision of the external digital audio source. The SOLO also uses this timing information to control the sample rate and precision of the SOLO's A/D Converters and D/A Converters, and also to control the sample rate and precision of the SOLO's S/PDIF Out.

If the SOLO is in Master Mode but is also trying to receive S/PDIF input, it is quite likely that the input signal will have clicks and drop-outs.

This is because it is highly unlikely that the external S/PDIF source will have exactly the same rate as the SOLO, and so the S/PDIF source will be feeding samples at a slightly different rate than the SOLO is expecting them, and sooner or later (probably sooner) samples will be missed. There are two solutions:

- Run the SOLO in Slave Mode so that it synchronizes precisely to the external device's clock.
- Run the SOLO in Master Mode and the external device in slave mode. The external device synchronizes to the SOLO's S/PDIF Out, and its own output is therefore also synchronized to the SOLO's S/PDIF In.

Wherever possible, it is best to run the SOLO in Master Mode. This is because the SOLO's internal clock is generally more stable than a clock derived from an external source, resulting in slightly less phase distortion in your recording.

Solo-o-meter

The Solo-o-Meter is a utility program that allows control and monitoring of several of SOLO's parameters.

Windows users: The Solo-o-Meter's metering function uses a lot of computing power. Turn it off if you don't need it.

Installation

Windows: Click "Install the Solo utility programs" on the SOLO CD, and follow the install wizard.

Mac: Drag the Solo-O-Meter icon to your System folder>Apple menu items, or wherever you prefer.

Controls

Signal Routing → ← Clip Indicators

Sample Rate →

Master/Slave Mode → ← Metering

Meter Ballistics →

Clip Detection →

Sample Precision → ← Details
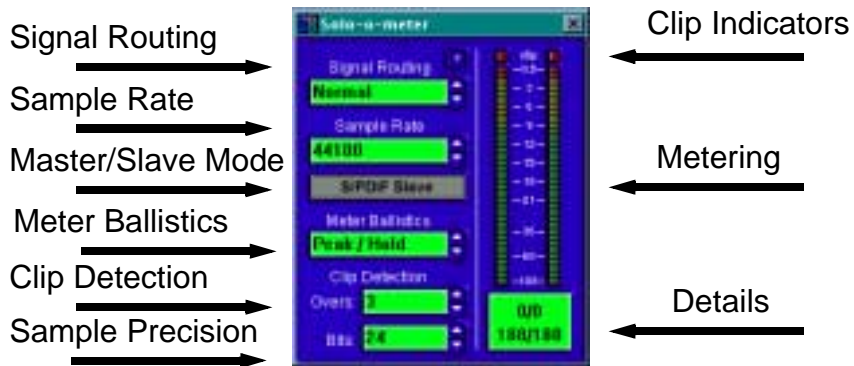
Signal Routing — Five routing modes are availableSOLOSOLO:

- **Normal** — (Default) Digital audio routed from your audio software to the SOLO Out Port is sent to the SOLO D/A Converters and a copy is simultaneously sent to S/PDIF Out Port. Audio routed directly to the S/PDIF Out Port is not played. Digital audio routed from the SOLO A/D Converters is sent to the SOLO In Port. S/PDIF input is not connected to anything.
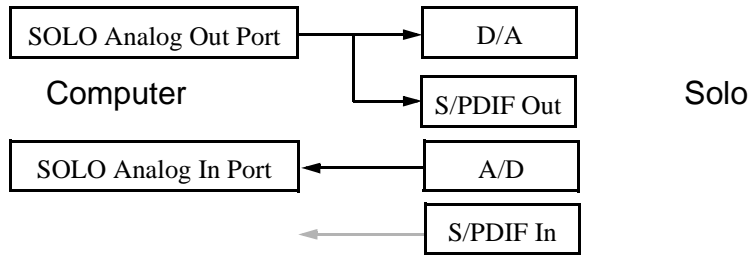
- **4 x 4** — Audio routed to SOLO Out Port is sent to the SOLO D/A Converters; audio sent to S/PDIF Out Port is played through S/PDIF Out. So the SOLO has four channels in and four channels out: 4 x 4.

Computer

SOLO Analog Out Port	→	D/A
S/PDIF Out	→	S/PDIF In
SOLO Analog In Port	←	A/D
S/PDIF In	←	S/PDIF In
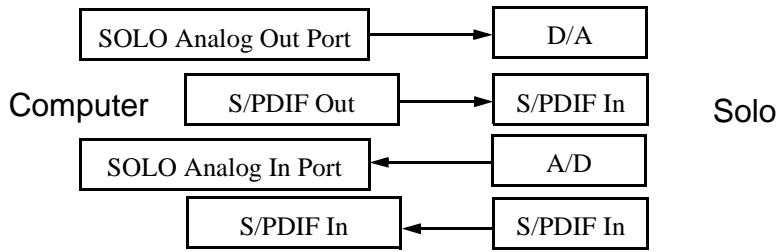
Solo

- **Converter** — The Solo-o-meter receives input from the SOLO (if it is in record mode). You can use this to test whether your computer is actually receiving audio samples from the SOLO. See "Troubleshooting" on page 38. The SOLO functions as a converter box between S/PDIF and analog audio. Audio is not sent to or from the computer. Instead, audio recorded by the SOLO Analog Inputs is converted and sent directly to S/PDIF Out, while the S/PDIF In is routed to the D/A Converters. .

Computer

S/PDIF In	→	D/A
A/D	→	S/PDIF Out
Solo-o-meter	←	
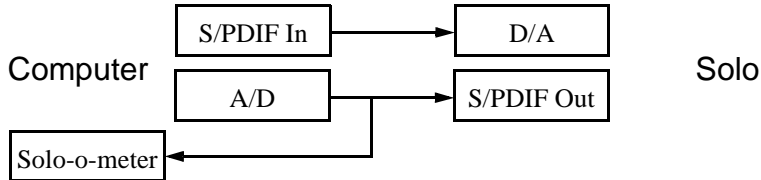
Solo

Don't forget to set the Solo-o-meter back to Normal mode before trying to use your audio software again. The SOLO system does not send or receive any signals to or from your audio software in Converter mode.

- **Normal + S/PDIF** — Like Normal mode above, but the S/PDIF In signal is also digitally mixed in with the signal sent to your audio software via SOLO In Port. This allows you to monitor the signal being received from both the A/D Converters and S/PDIF In on one input.

Computer

SOLO Analog Out Port	→	D/A
	→	S/PDIF Out
SOLO Analog In Port	← + ←	A/D
	←	S/PDIF In
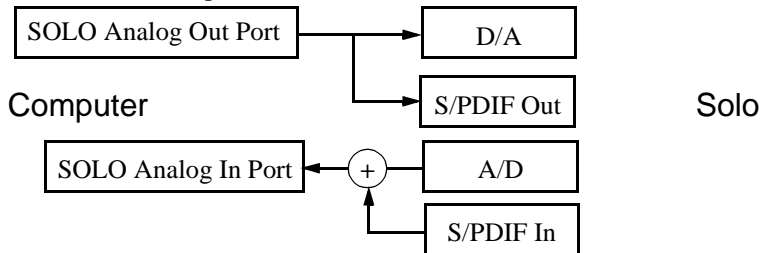
Solo

- **4 x 4 + S/PDIF** — Like 4 x 4 mode above, but the signal being recieved at S/PDIF In is routed to the Stereo Monitor Mixer.

Computer

| SOLO Analog Out Port | → | D/A |

| S/PDIF Out Port | → | S/PDIF Out |

| SOLO Analog In Port | ← (+) ← | A/D |

| S/PDIF In Port | ← | S/PDIF In |
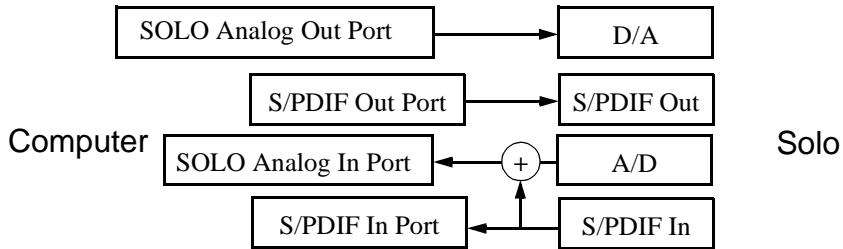
Solo

Sample Rate Control — (Default: 44100 Hz.) Displays the current sample rate for all channels. If the SOLO is in Master Mode, use this control to set the SOLO's sample rate. In Slave Mode, the Sample Rate Control indicates the sample rate detected on S/PDIF In. If there is no S/PDIF In, the Sample Rate Control reads: "(no input clock)."

Master/Slave Mode — (Default: Master Mode) When lit, this control puts the SOLO in Slave Mode, which causes the SOLO to use the sample rate and sample precision of the S/PDIF In signal to control the sample rate and precision of the S/PDIF Out and the A/D Converters and D/A Converters. When recording from the S/PDIF In, be sure that Slave Mode is enabled (the control is lit in Slave Mode).

Meter Ballistics — (Default: Peak Program) The Level Meters can model the ballistics of several types of standard audio VU meters. The current version supports two modes: Peak Program and Peak Hold. See Meter Ballistics.

Clip Detection — The clip detector displays when the digital input signal is clipping. You can set the threshold yourself: **Overs** — sets the number of consecutive clipped samples required to light the Clip Indicators.

Bits — (Default: 16) sets the number of bits per sample. In Master Mode set this to match your recording application's bits-per-sample resolution (typically 16 or 24 bits). In Slave Mode, the sample precision is set by the signal arriving on the S/PDIF In.

Clip Indicators — The top segments of the Level Meters light to indicate that clipping has been detected based on the number of Overs. They stay lit until cleared by clicking them with the mouse. This way you can do a recording and check afterwards to see if there was any clipping.

Level Meters — The Level Meters indicate signal strength. Green segments indicate low-amplitude signals; yellow indicate nominal level; red indicate danger of clipping. If the Clip Indicators are lit, clipping has definitely happened.

Details — There are two fields in this indicator: The first line displays the maximum number of consecutive Overs (clipped samples) encountered since the last time you cleared the Clip Indicators. This is useful to see how many times clipping occurred while you weren't watching the meters. The second line indicates the current meter level in dB.

Troubleshooting

Computers are complex devices, and while most of the time the SOLO will work just fine right out of the box, complications sometimes arise. Despite its high-quality performance, the SOLO places little burden on the computer processing resources. More than likely, the problem will be in one of the following areas:

- Improper settings of SOLO knobs and switches
- Improper analog or S/PDIF cable connections
- Improper installation of the PCI card
- Improper installation of SOLO drivers
- Improper configuration of audio software
- Improper selection of default playback/recording device.

We have yet to encounter a situation where we couldn't get a SOLO working, so don't panic.

If the following steps don't solve the problem, call our Technical Support line at (415) 485-3788 during normal business hours, Monday through Friday 9:00am to 5:00pm, PST.

We pride ourselves on fast, courteous, knowledgeable response.

General Troubleshooting

Most problems can be solved by following these instructions for either Mac or Windows installations.

1. Verify that the SOLO is receiving an input signal.
    a. Plug a known-good signal into an input on the front of the SOLO.
    b. Make sure there is an audio signal on the cable coming into the SOLO, perhaps by first playing the audio through your control room monitors directly.
    c. Turn the Trim, Preamp Level and Mon Pan controls all to 12 o'clock.
    d. The Signal Present/Clip LED should be illuminated. If not, re-verify step 1b.
2. Switch on the Record Mode Switch so the Rec LED lights. This sends the selected Analog Inputs to the Level Meters. Set the Meter Source to Input. Verify that the Level Meters respond to the signal. Adjust the level of the Analog Inputs to a nominal level.
3. You can run the SOLO in stand-alone mode and test both its analog and digital signal routing without any software using Solo Test Control Mode.
4. On your computer, launch the Solo-o-meter application. Set the Signal Routing to Converters. If the Solo-o-meter's Level Meters show activity which matches the Level

Meters on the front of the SOLO, then digital audio is getting into your computer from the SOLO.

5. Check the Solo-o-meter's settings.

    a. Set Signal Routing back to Normal mode.

    b. Select the correct sample rate for your audio software.

    c. Darken the Master/Slave Mode control so the SOLO is in Master Mode.

    d. With the Bits control, select the correct sample precision for your audio software, usually either 16 or 24 bits.

6. Exit the Solo-o-meter, run your audio software again. Be sure it is selecting the correct Audio Ports, usually SOLO Out Port for playback and SOLO In Port for recording.

If the above steps fail to correct the problem, or if you get signal to the SOLO's Level Meters but no signal to the Solo-o-meter when Signal Routing is set to Computer, there may be a software driver or hardware installation problem. Proceed to platform-specific troubleshooting, below.

Windows Troubleshooting

The most likely Windows-based problems are as follows:

- The PCI card is not fully seated into its slot on the motherboard. Turn off power, and unplug the computer; check for a proper fit, and reinsert or realign as necessary.

- The cable between the PCI card and the SOLO is not secure. Turn off power, and tighten the connector screws all the way.

- Miss-set controls. Check your audio software's settings to be sure it is set to receive input from the SOLO.

- Audio software is not set up properly to communicate with the SOLO. Check your audio software's settings to be sure it is set to receive input from the SOLO. Check the software manual carefully to see how to send and receive signals from sound cards.

- Drivers are not installed or should be updated. To verify that the SOLO has been properly installed, do the following:

    a. Right-click on My Computer, select Properties, then select Device Manager.

    b. Click the "+" sign by "Sound, video and game controllers." One of the devices listed there should be the SOLO.

    c. If the SOLO icon has an "X" or an "!" over it, there is a driver problem. Otherwise...

    d. Select the SOLO so it is highlighted and then press the Properties button.

    e. Under the "General" tab, the "Device status" should read "This device is working properly." If it says anything else, the hardware or software is not installed correctly.

    f. The "Device usage" checkbox should *not* be checked, or the device is disabled.

g. Click the "Resources" tab and check that the "Conflicting Devices" list reads "No conflicts," otherwise, the hardware has a conflict with another device.

h. Click "Cancel" to return to the Device Manager.

If you suspect software driver problems, you can remove and reinstall the drivers as follows.

a. Exit all applications running on your computer except Device Manager.

b. Select the SOLO so it is highlighted.

c. Press the Remove button.

d. Windows will remove the device, then ask you to reboot the computer.

e. When it has rebooted, it will once again go through the driver installation process described in "Installing a New SOLO + EXPANDER System" on page 3.

Check http://www.seasound.com for updated drivers for Mac or PC. Drivers are often updated to reflect changes in other programs, increase functionality, or fix bugs.

Other computer problems can impact the SOLO's functions. Before getting into specific troubleshooting techniques, let's look at some of the broader problems associated with computer operating systems.

PCI bus problems — Some video cards, especially those designed for optimum game performance, hog the PCI bus, starving other devices such as the SOLO. As this bus is also how audio cards communicate with the computer, video cards can actually affect the efficiency of audio software. The best solution is to use a graphics card that goes in the motherboard's AGP slot (as found on most recent computers). This will also give improved graphics performance. If you're stuck with a PCI type video card, low-cost cards are often better for audio than "high-performance" types. Video acceleration can also be turned down, or off if necessary in the System Control Panel. Go to Start>Settings>Control Panels>System, then Perfomance>Graphics. Adjust the slider to reduce graphics acceleration.

Interrupt Request (IRQ) conflicts — There are only so many interrupt request lines available in a PC. When the system boots, Windows assigns PCI cards to share IRQ lines if there are not enough to go around. With well-behaved systems, devices can share IRQs without problems, but it is still preferable for audio devices to have their own IRQs. Sometimes one device which shares an IRQ with the SOLO may prevent the SOLO from getting the computer's attention when it needs to send a buffer of audio samples. The SOLO will appear to be hung. Often you can correct the problem by rearranging the order of the PCI cards in your computer, or by disabling a conflicting device using the Device Manager. If you suspect you are having IRQ conflicts, get help from a qualified professional or contact SeaSound Technical Support, since the steps required go beyond what can be described here.

Other common problems include the following:

Problem	Solution
After installing the SOLO PCI card, one or more peripheral devices no longer functions.	Possible interrupt (IRQ) conflict. Remove or disable any devices you don't need such as modems, other sound cards, etc. You can disable devices as follows: Open the Device Manager, double-click on the device, and its properties dialog will appear. Under the General tab, check "Disable In This Hardware Profile."
The System crashes or hangs after installation of drivers, or upon playback and record.	Try removing the PCI card, then reinstall the drivers before reinstalling the card. There may also be a possible interrupt conflict (see above).
After installing the SOLO and restarting the computer, Windows reports New Hardware and wants you to load drivers for hardware you've previously installed.	If you've moved a card to a different slot during installation, Windows may no longer recognize that card. Reinstall the driver.
After installing the SOLO, the computer does not recognize it in the Device Manager.	Drivers are not loaded correctly, reinstall them. Try putting the PCI card in a different slot.
No sound on playback or record.	Check that drivers were installed correctly. Go to Device Manger and make sure there is not a yellow triangle or question mark by the SOLO audio device. Check that the SOLO is chosen as the Preferred Audio Device in the Multimedia control panel. Also check the Solo-o-Meter settings.
Project is playing back at half speed.	Go to Start > Settings > Control Panel > Multimedia > Audio. Check the "Use preferred devices only" box to ensure proper playback.
No signal at input or output.	Restart audio software. Triple-check all your cable connections; speakers, computer interface cable, and audio in/out cables. Make sure the Trim and/or Volumes on the SOLO channels are turned up. Also check the Solo-o-Meter settings.
Pops, clicks, and/or memory problems.	Turn video acceleration down or off, and set Virtual Memory to no more than twice the amount of RAM in your system. Use the same setting for Minimum and Maximum.

Mac Troubleshooting

- Extension conflicts – In this case, drivers for two devices try to access the same computer resources. The Macintosh Extensions Manager is the best way to resolve these conflicts. If the computer behaves unpredictably or refuses to boot, first determine if an extension conflict is the problem. Do this as follows:

  a. Shutdown the Mac and Restart while holding down the Shift key. The Mac will indicate that extensions are off while booting.

  b. If the computer boots properly with extensions off, then there must be an extension conflict.

  c. Go to the Apple Menu > Control Panels > Extensions Manager. Disable all extensions other than those indicated as being part of the Apple OS and the SeaSound extension. Save this under a different name, such as "Extensions Test."

  d. Reboot normally (don't hold down the Shift key). Verify that the SOLO works. If not, it's time to call Tech Support so we can walk you through a solution. Otherwise...

  e. Return to the Extensions Manager and turn on half of the extensions you normally use, then reboot.

  f. If there is no problem, continue turning extensions on until the problem arises again.

  g. If there is a problem, start turning extensions off until the problem goes away again.

This should help narrow down which extension is causing the conflict: If a problem occurs, you know the conflict is between SOLO and one of the extensions you turned on. Turn off half of that group of extensions and test again. Continue in this manner until you isolate the offending extension or extensions. You can then create a custom setup in Extensions Manager for SOLO that turns on the SeaSound extension and all other extensions except the offending extension. Also check the Internet to see if there is a revised version of the conflicting extension, as that may solve the problem.

- Preferences file trashing – If the SOLO or the program running with the SOLO starts behaving mysteriously for no obvious reason, the Preferences file may be corrupted. Drag any associated preferences files into the trash. The program will generate a new Preferences file the next time you run the application.

Other common Mac problems include:

Problem	Solution
No audio on playback	Check to see that the SOLO extension is enabled in the extensions manager. If not, enable it and restart the computer.
No output sound	Check all cabling and make sure volumes are up on the SOLO.
No sound control panel	Usually found in the apple extra folder. If not, Look in your Mac OS install CD.

Recording Setups

The SOLO's inputs and outputs provide a multitude of high-quality recording solutions whether your application is a home or project studio or a large-scale professional system.

Basic Mic Record/Playback System

The easiest setup is just to use the microphone and headphone jacks on the front of the SOLO.
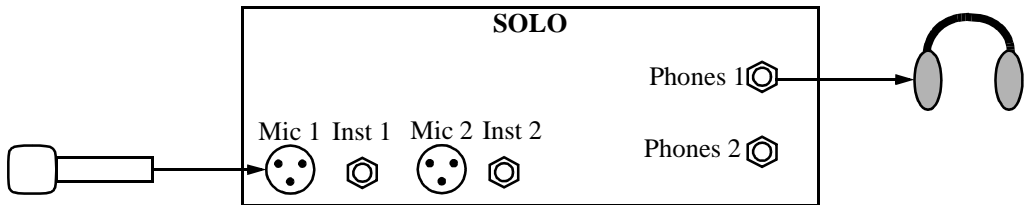
Basic Line-level Record/Playback System

You can hook up your SOLO to receive line-level inputs such as a synthesizer, CD player, mixer output, etc. and hear the result over monitor speakers.

| Analog Audio Source |

| Master Outputs L | Control Room Outputs L | Auxiliary Inputs 1 | Line Inputs 1 | Direct Outputs 1 | Preamp Inserts 1 |
| R | R | 2 | 2 | 2 | 2 |

| Monitor System |
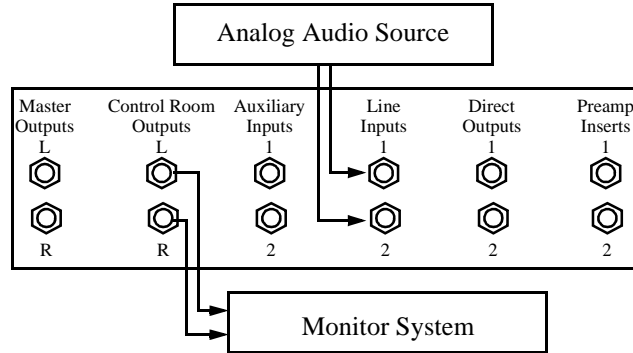
SOLO Plus Sound Card

The SOLO can coexist with other sound cards in your computer. For instance, you can hook up a sound card which has an on-board MIDI synthesizer you like to the SOLO's Line Inputs. Then, using sequencer software that can control both MIDI tracks and audio tracks, the SOLO can monitor the output of both. All that's needed is the setup shown in

When you are satisfied with the mix of MIDI and audio and want to master it, simply record-enable the Line Inputs on the SOLO, and record-enable audio tracks in your sequencer software; the SOLO's digital output will supply the sequencer with a high-quality mix of the MIDI and audio tracks which it can simultaneously record. You can monitor all this simultaneously to verify that you are getting what you want.

Recording SOLO to a Master Recorder

Typically, a mastering recorder such as a DAT or stand-alone CD-R will be attached to the SOLO's Master Outputs.
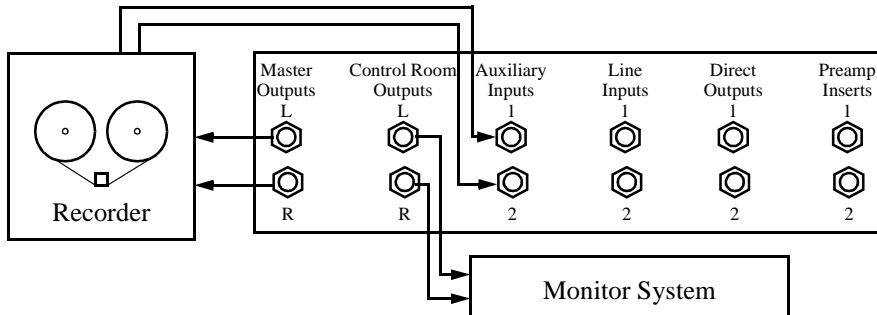
When creating a final mix to cassette, connect the SOLO's Master Outputs to the Cassette recorder's input. For monitoring you can return the cassette's outputs to the SOLO's Auxiliary Inputs or the Line Inputs (for recording).

SOLO Plus MIDI Keyboard

Your SOLO comes with MIDI Jacks for attaching outboard synthesizers and keyboards. A typical setup is shown below.
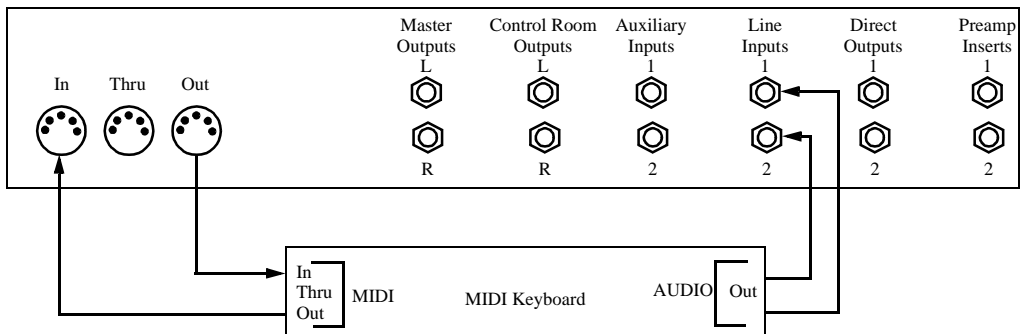
Routing SOLO + EXPANDER

If you also purchased an EXPANDER, you can use its inputs and outputs to do sophisticated multi-track recording and editing. Here are but two of an infinite number of scenarios:

- *Minimal — route additional line level inputs and outputs directly to the EXPANDER. That's it! Just select the appropriate EXPANDER audio port in your audio application, and you are on your way to multitrack recording.*
- *Microphone recording — You can use an EXPANDER for multi-track recording from additional microphones by connecting it's Inputs to a high-quality mixing console output. Tip: connect the console's direct outputs to the EXPANDER's Inputs. This uses the console only as a microphone preamplifier, avoiding the noise all mixers introduce in later stages, and preserves your inputs as separate signals.*
- *Monitoring — You can use the Auxiliary Inputs of the SOLO to mix the Monitor Outputs from the EXPANDER with the output of the SOLO, as shown below. This way, EXPANDER output will be added automatically to SOLO output.*
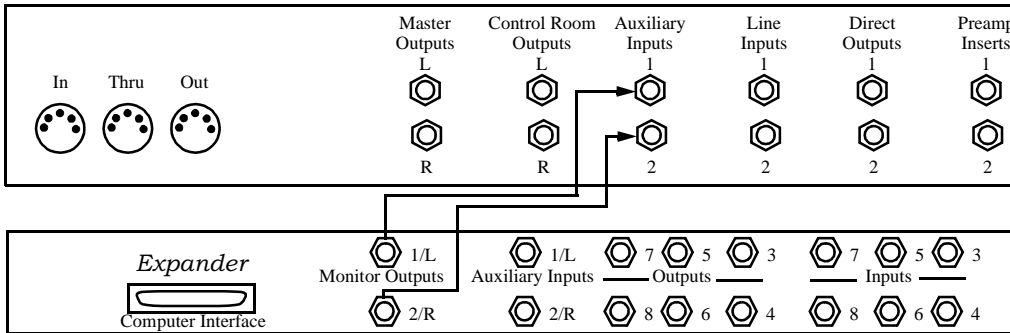
Advanced Applications

This section contains advanced applications for the SOLO. It combines information from many other sections of the manual into one place.

Using Inserts

To use a compressor, EQ, or any processing you wish to record, SOLO provides Preamp Inserts. These inserts follow the Trim controls, but come before the Preamp Level controls.

Using the inserts requires a special insert cable (obtainable at music stores), shown in Figure 16. One end of the cable has a 1/4" TRS (tip-ring-sleeve) plug which connects into the SOLO Insert jack. Two cables emerge from this plug, one carrying the SOLO's *send* signal, the other carrying the effects *return* signal.

Plug the TRS side of the cable into the Insert jack of the SOLO's Preamp channel you wish to process. Then plug the TS cables into the processor. Standard insert cables are labeled "tip send, ring return." Most often, the black end is *send* and the red end is *return*, which is also how the SOLO is wired. Attach the *send* to the effects input and the *return* to the effects output.

Figure 16.   Insert Cable

TRS Connector   TS Send Connector

TS Return Connector

Because the Inserts are after the preamplifier, you can use line-level effects with low-level signals such as microphones or guitar, because the preamplifier will raise the guitar to line level.

See Preamp Inserts for more information.

Figure 17.   Using Inserts
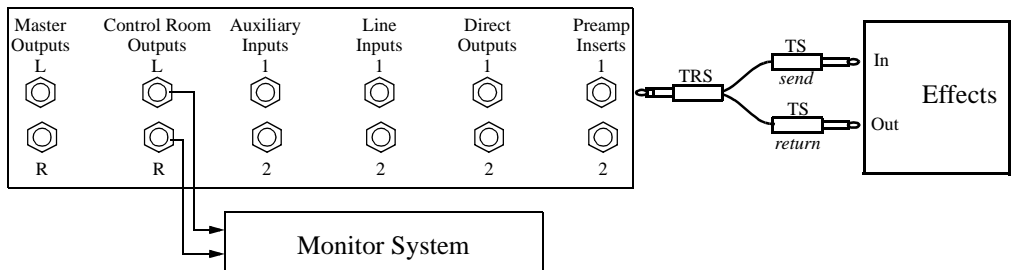
Using Direct Outputs

To monitor effects such as reverb or delay without recording them, the SOLO provides Direct Outputs and Auxiliary Inputs. Take the signal from the Direct Output of the SOLO's Preamp you wish to process, and plug it into your outboard effects processor. Then return the signal to the SOLO's Auxiliary Inputs. The mix of wet to dry signal and the volume can be adjusted on the outboard processor. The SOLO's Auxiliary Inputs feed the Stereo Monitor Mixer of the SOLO, and are routed from there to the Control Room Outputs and Headphone Jacks.

Figure 18.   Using Direct Outs
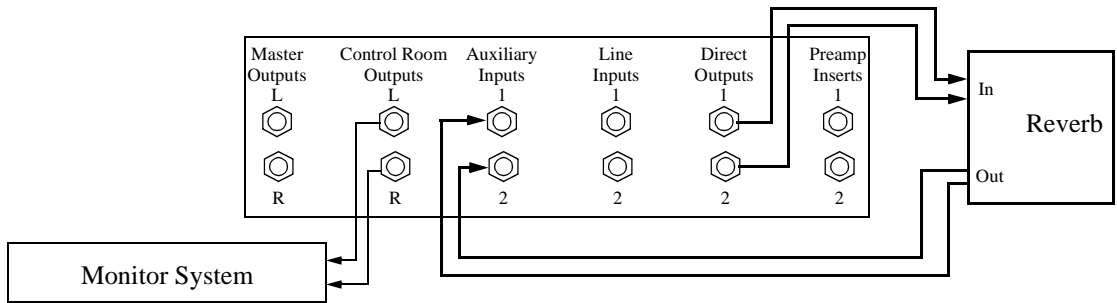
If you wish to have more control over the processed signal, you may want to return the signal to the SOLO's Line Inputs. To record and blend the dry signal with the wet signal, engage the Record Mode Switch on the Line Inputs.

Sub-mixer

For production rooms with multiple audio sources such as samplers and sound modules, a sub-mixer can be used in conjunction with the SOLO. There are a number of ways to return the signal from the sub-mixer to the SOLO. Here is one example.

Take the monitor outputs of the sub-mixer and plug them into the Auxiliary Inputs of the SOLO. This only works for monitoring the sub-mixer because the Auxiliary Inputs do not go to the A/D Converters.

Figure 19.   Using a Sub-mixer
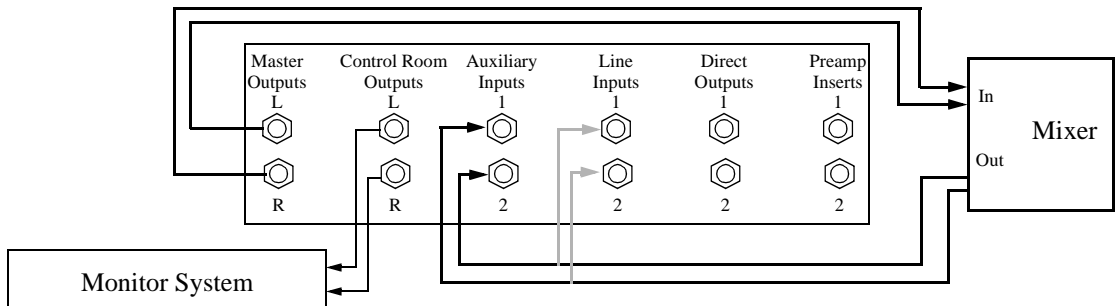
Or, for recording the sub-mixer's signal, connect the master outputs of the sub-mixer to the Line Inputs of the SOLO.

When you need to record the signal from the sub-mixer, record-enable a track in your audio software and switch on the Record Mode Switch on the selected Line Inputs of the SOLO.

Mixing & Digital/Analog Connections

Here are some connection suggestions when creating a final mix to DAT or cassette. Connect the SeaSound PCI card's S/PDIF connections to the DAT machine, and use this path for mastering whenever possible. This keeps your project in the digital domain at all times, which is a Good Thing. The SeaSound PCI Card contains coaxial RCA jacks for your digital I/O (S/PDIF). The red jack is Input, white is Output.

To engage S/PDIF monitoring, go to the Solo-o-meter and choose Normal + S/PDIF or 4 x 4 + S/PDIF in the Signal Routing box. For analog monitoring, return the DAT's analog signal into the SOLO's Auxiliary Inputs or Line Inputs (if you want to record back to the computer).

Figure 20.   Digital Final Mix
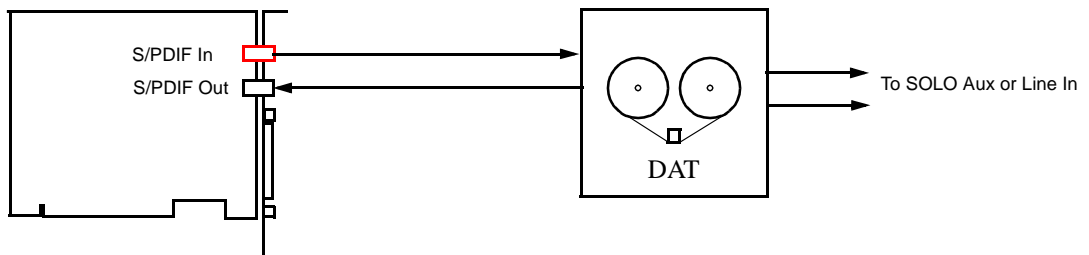
SOLO Maintenance Tests

Bypass Startup Test

To bypass the startup test, press the Peak/Peak Hold button during boot-up.

Solo Test Control Mode

SOLO test control mode permits verification of the entire digital-audio path from analog inputs to analog outputs without requiring any application software. Use it to verify that your SOLO is functioning properly on its own.

Entering Test Control Mode — SOLO test control mode is entered by pressing and holding the Meter Source button (labeled "Input/Output" on the front panel) and Meter Ballistics button (labeled "Peak/Peak-Hold") simultaneously for 3 seconds. The SOLO performs a display test (as occurs when it is first turned-on) and then enters test control mode. Test control mode is indicated by the flashing of the Power LED.

Loopback mode — The Meter Source ("Input/Output") button switches the SOLO between normal digital-audio mode and digital-audio loop-back. When the Output LED

indicator is flashing, the SOLO digital-audio stream operates normally: enabled SOLO inputs are converted to digital format and sent to the computer; digital-audio data from the computer is converted to analog and sent to the Control Room Outputs and Master Outputs. When the Input LED indicator is flashing, the output of the A/D Converters is looped back locally to the D/A Converters.

Testing with Loopback Mode — While in loop back mode, turn the Computer Volume level all the way off and apply a signal to any of the Analog Inputs. Turn up the Monitor Input Volume and verify that the signal can be heard through the Stereo Monitor Mixer at the Control Room Outputs and/or Headphone Jacks. (Check the Control Room Volume and Headphone Volume Controls.) Then turn the Monitor Input Volume all the way off and bring up the Computer Volume control. The same signals should be heard through the Control Room Outputs and/or Headphone Jacks because the A/D Converters are locally looped back to the D/A Converters. The signals should be present in the Master Outputs as well. The Analog Inputs are converted to digital and immediately converted back again to analog via the loop-back feature. These tests, along with regular audio checks, will verify that the SOLO is operating normally.

Status information — While in test control mode, the SOLO indicators display various information.

- The hardware version number is displayed in hexadecimal fashion via the four signal-activity LEDs.
- The firmware version number is displayed in decimal fashion via the two program meter displays (0-9).

Exiting Test Control Mode — To return to normal operation, press the Meter Ballistics button (labeled "Peak/Peak-Hold"). The Power LED will stop flashing and the displays will resume their normal operation.

SOLO Block Diagram
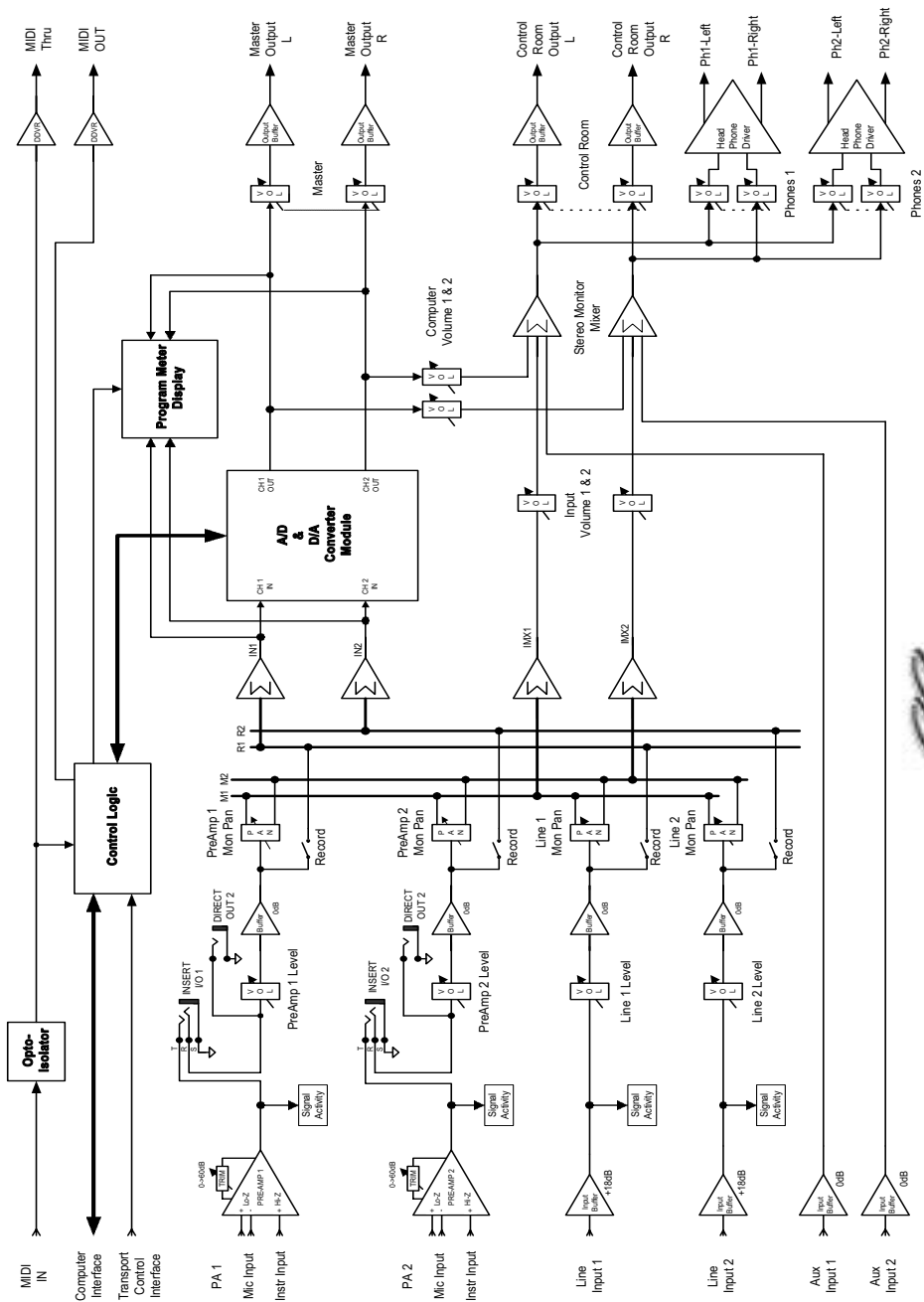
EXPANDER Block Diagram

SeaSound EXPANDER
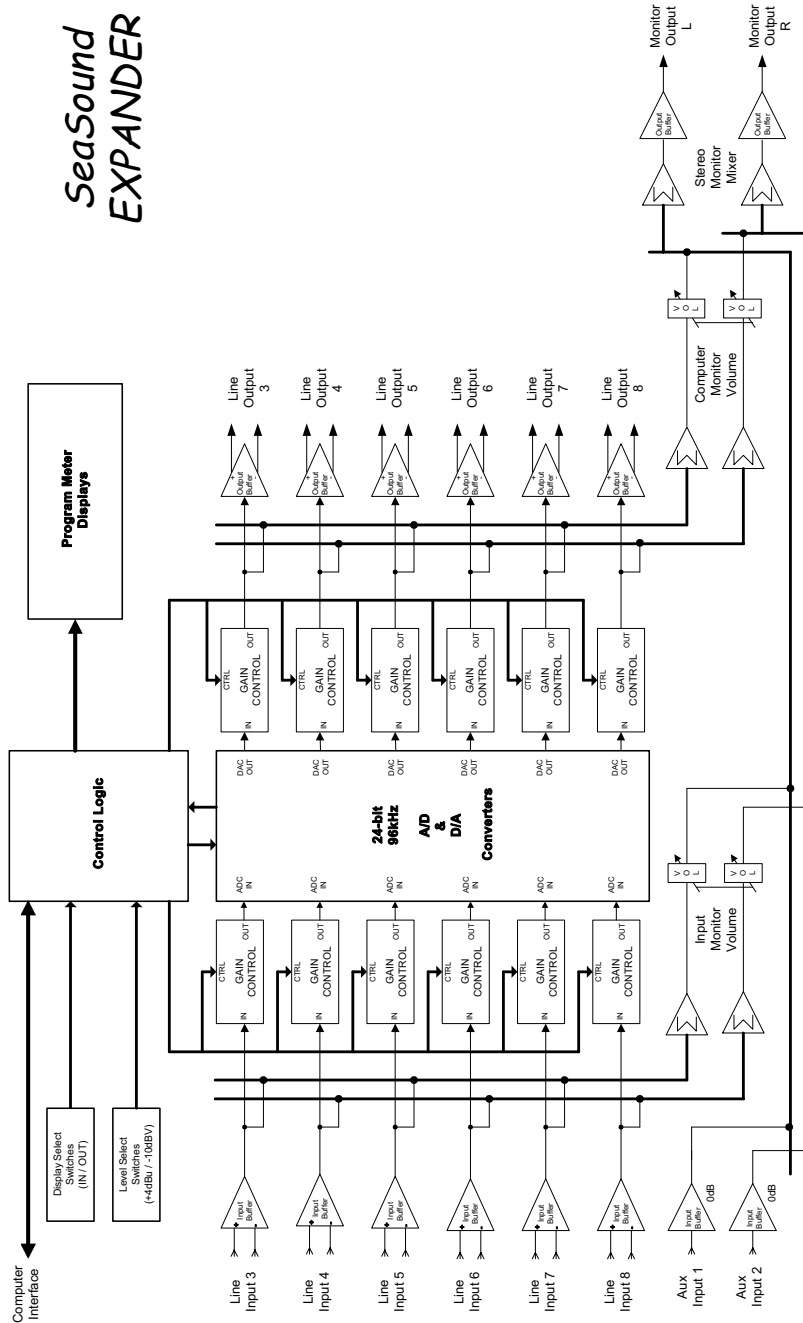
SOLOIST Block Diagram

Soloist EX

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