

SYNC I/O

Addendum

For Pro Tools TDM 5.3.1 on Macintosh and Windows

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chapter 1

Introduction and Installation

This addendum describes new SYNC I/O features and capabilities available in Pro Tools version 5.3.1.

Macintosh Pro Tools version 5.3.1 on Macintosh supports the SYNC I/O with Pro Tools|HD systems. (The SYNC I/O can also be used with Pro Tools|24 MIX systems running earlier versions of Pro Tools software.)

Windows Pro Tools version 5.3.1 on Windows supports SYNC I/O with Pro Tools|HD and Pro Tools|24 MIX systems.

About This Guide

Use this addendum if you are upgrading an HD system, installing Pro Tools|HD for the first time, or using the SYNC I/O with a MIX-series system.

New Features

Chapter 1 provides installation instructions for Pro Tools|HD, and Pro Tools|24 MIX or Pro Tools|24 systems.

Chapter 2 provides instructions for all other new and changed SYNC I/O features in Pro Tools 5.3.1. These include:

- Clock Source and Loop Sync features
- PAL/NTSC setting for video
- Improved jitter reduction from LTC
- Support for Digidesign PostConform
- ◆ Support for use of the SYNC I/O with Pro Tools MIX-series systems on Macintosh and Windows

System Requirements

Pro Tools|HD

Macintosh

- A Digidesign-qualified Power Macintosh computer
- A Pro Tools|HD system
- Pro Tools software version 5.3.1

Windows

- A Digidesign-qualified Windows computer
- A Pro Tools|HD system
- Pro Tools software version 5.3.1

Pro Tools|24 MIX and Pro Tools|24

The SYNC I/O can be used with Pro Tools|24 MIX systems and Pro Tools|24 systems. When used with these systems, the SYNC I/O emulates the Digidesign Universal Slave Driver (USD). Only features supported by Pro Tools|24 MIX, Pro Tools|24, and the USD will be available.

Macintosh

- A Digidesign-qualified Power Macintosh computer
- A Pro Tools|24 MIX, or Pro Tools|24 system
- Pro Tools software version 5.1.3 or later

Windows

- A Digidesign-qualified Windows computer
- A Pro Tools|24 MIX, or Pro Tools|24 system
- Pro Tools software version 5.3.1

Serial Port Requirements for Using the SYNC I/O Setup Application

(Macintosh and Windows)

The optional SYNC I/O Setup application requires a serial connection from SYNC I/O to your computer. SYNC I/O Setup software is not available through the DigiSerial port.


Macintosh A serial port (modem or printer, or equivalent serial port adaptor) is required for the SYNC I/O Setup application on Macintosh.

Windows A COM port connection is required for the SYNC I/O Setup application on Windows. SYNC I/O Setup does not work if SYNC I/O is connected to a DigiSerial port.

Compatibility Information

Digidesign can only assure compatibility and provide support for devices it has tested and approved.

For a list of qualified computers, diskette drives, SCSI accelerators, serial port convertors, and hard drives, refer to the latest Digidesign compatibility documents, available from the Digidesign Web site.

 For a list of Digidesign's contact information, see the title page of this guide.

Connecting Loop Sync for Pro Tools|HD

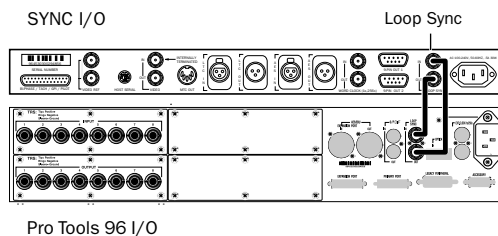
(Pro Tools|HD Only)

SYNC I/O now supports Loop Sync, and can serve as Loop Sync Master. Loop Sync is a dedicated clock loop for synchronizing multiple HD-series interfaces. Loop Sync should only be used to connect multiple HD-series peripherals.

The following steps explain how to make Loop Sync connections between the SYNC I/O and Pro Tools|HD interfaces. See the *SYNC I/O Guide* for complete SYNC I/O installation instructions.

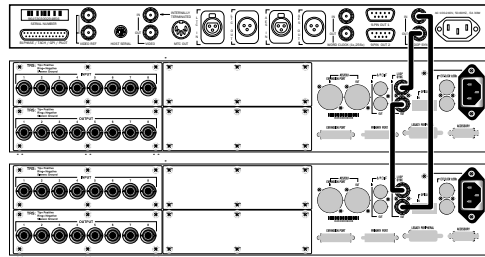
To connect SYNC I/O to Pro Tools|HD interface:

- 1 Connect the Loop Sync Out of the SYNC I/O to the Loop Sync In of your primary HD-series audio interface.
- 2 Connect the SYNC I/O Loop Sync In to the Loop Sync Out of your HD-series interface.



Loop Sync connections between SYNC I/O and a 96 I/O

When using more than one HD-series audio interface, make SYNC I/O the first and last unit in the Loop Sync chain.

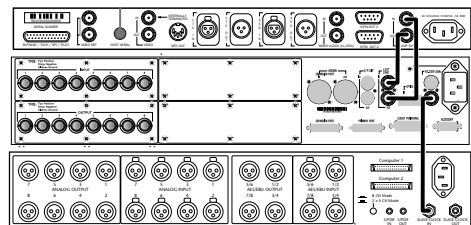


Loop Sync in an expanded Pro Tools|HD system

Using Legacy Audio Interfaces

To connect SYNC I/O to a Pro Tools|HD system that also has an 888|24, 882|20, 1622, or ADAT Bridge audio interface:

- 1 Connect SYNC I/O Loop Sync as described in the previous steps.
- 2 Connect a BNC cable from the Ext Clock Out of your primary HD-series interface to the Slave Clock In of your first legacy audio interface.



Clock for SYNC I/O, a 96 I/O, and an 888|24 I/O

- 3 If using multiple legacy interfaces, daisy-chain their Slave Clock connections from the first interface Slave Clock Out to the next interface Slave Clock In, and so on.

💡 See the *Getting Started with HD Guide* for external clock configuration instructions.

Connections for SYNC I/O with Pro Tools|24 MIX

You can use the SYNC I/O with Pro Tools|24 MIX systems. With these systems, the SYNC I/O supports all features of the USD. MIX-series systems do not support the SYNC I/O 9-pin machine ports, high sample rates, and other Pro Tools|HD features.

The following sections explain how to make serial and clock connections between SYNC I/O and a Pro Tools|24 MIX system.

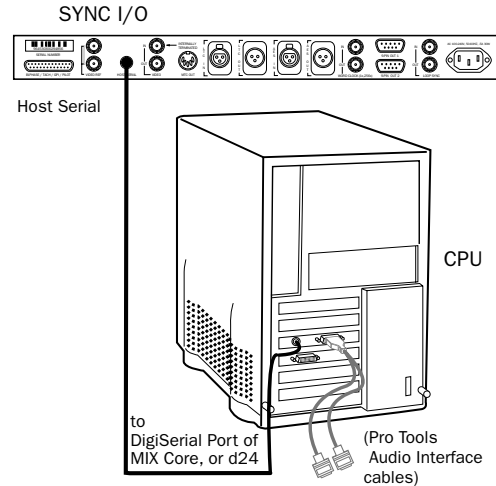
Serial Connections

(Pro Tools|24 MIX and Pro Tools|24)

To connect SYNC I/O to a Pro Tools|24 MIX system:

- 1 Make sure all your equipment is powered off (including your computer, SYNC I/O, and all Pro Tools hardware).
- 2 Connect one end of the DigiSerial cable to the SYNC I/O Host Serial port (whether using a Macintosh or a Windows computer).

- 3 Connect the other end of the cable to the DigiSerial Port on your MIX Core or d24 card. (If using an expanded Pro Tools|24 system that includes a MIX Farm, use the DigiSerial Port on the MIX Farm card. See the *Expanded Systems Guide* that came with your system for details.)



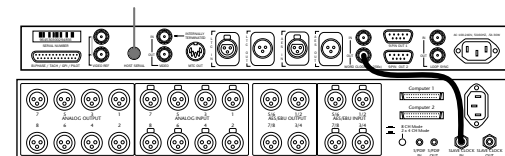
Connecting SYNC I/O to a DigiSerial Port

- 4 Connect the rest of your equipment as described in the following sections. See the *SYNC I/O Guide* for additional connection instructions.

Clock Connections

To connect SYNC I/O to a Pro Tools|24 MIX-series or Pro Tools|24-series audio interface:

- Using a BNC cable, connect the SYNC I/O Word Clock Out to the Slave Clock In of your primary audio interface.



Clock from SYNC I/O to an 888|24

When Pro Tools launches, the SYNC I/O Word Clock Out port will switch to 256x Slave Clock output.

In stand-alone use, you can manually configure the SYNC I/O for 256x Base clock output using the front panel controls, or using SYNC I/O Setup software. See the *SYNC I/O Guide* for instructions.

About the DigiSerial Port

DigiSerial Port with Pro Tools MIX- and Pro Tools|24-Series Systems

Pro Tools MIX and d24 cards feature a DigiSerial Port. Though this port is identical in appearance to the serial ports on your CPU, it is designed to only be used for:

- the SYNC I/O Host Serial connection
- a USD Macintosh Serial connection
- a serial to 9-pin cable in combination with the MachineControl™ option for Pro Tools

⚠ *The DigiSerial Port should not be used for MIDI Interfaces or any other serial device. Attempting to do so will adversely affect Pro Tools performance.*

Selecting a DigiSerial Port for SYNC I/O in Expanded Systems

Always connect the SYNC I/O serial cable to the DigiSerial Port on the card connected to the primary Pro Tools audio interface (your MIX Core card). If using a Pro Tools|24 system that has been expanded with the addition of a MIX Farm, use the DigiSerial Port on the MIX Farm card (see the *Expanded Systems Guide* that came with your system for details).

USB Blue and White G3/G4 Example

- Connect the SYNC I/O Host Serial port to the DigiSerial Port.
- Connect MachineControl™ (optional) to either the SYNC I/O 9-PIN OUT ports, or to a GeeThree, Griffin, or Keyspan serial port adaptor.
- If using MIDI, connect a MIDI interface to a serial port adaptor.

Software Installation and Firmware

Pro Tools|HD Software for the SYNC I/O is included on the Pro Tools Installer CD-ROM with Pro Tools|HD. See the *Getting Started with HD* guide, or the *SYNC I/O Guide*, for software installation instructions.

Pro Tools|24 MIX and Pro Tools|24 Use the Pro Tools software that came with your system. Do not install Pro Tools version 5.3.1 (it is for HD systems only). Do not try to update your SYNC I/O firmware from a Pro Tools|24 MIX or Pro Tools|24 system. Should you ever need to update SYNC I/O firmware, use the included SYNC I/O Setup software.

SYNC I/O Firmware

The new features described in this addendum are provided through new, updated SYNC I/O firmware.

Pro Tools|HD Pro Tools includes new firmware for the SYNC I/O. When Pro Tools 5.3.1 is installed, new firmware for the SYNC I/O will automatically be installed in the SYNC I/O folder within the Digidesign folder. If there is no SYNC I/O folder in the Digidesign folder, the firmware will not be installed. To update your unit, launch Pro Tools and follow the instruction in the next section. You can also update firmware using SYNC I/O Setup. See the *SYNC I/O Guide* for information.

Pro Tools|24 MIX and Pro Tools|24 Use the SYNC I/O Setup application to update SYNC I/O firmware. Updating SYNC I/O firmware through Pro Tools requires Pro Tools software version 5.3.1 or higher.

Updating SYNC I/O Firmware from Pro Tools

When you launch Pro Tools|HD, it checks your SYNC I/O firmware and compares it to the most recent version (see “Auto ID of SYNC I/O through Loop Sync” on page 9 for more information). Pro Tools will compare firmware whenever you launch Pro Tools, or whenever SYNC I/O is enabled in the Peripherals > Synchronization dialog.


If Pro Tools determines that the SYNC I/O does not have the most current firmware, a dialog appears asking if you want to update it now.

- ◆ Click Update to update your unit. This automatically navigates to the firmware in the SYNC I/O folder and updates the SYNC I/O through the DigiSerial Port.

– or –

- ◆ Press Cancel to quit Pro Tools without updating.

If for any reason the firmware file cannot be located, Pro Tools will display a message indicating why (see “Firmware Messages” on page 6). If this happens, reinstall the Pro Tools software and repeat the firmware instructions.

 *Follow the on-screen instructions very closely, being careful to power cycle your unit at the correct time during the process as instructed.*

Firmware Messages

The following messages may appear during firmware updating:

Firmware Not Found If no compatible firmware is found in the SYNC I/O Folder, a dialog appears instructing you to install SYNC I/O firmware. Use the Pro Tools installer CD, or use the latest version of SYNC I/O Setup.

SYNC I/O not on DigiSerial Port In order to update SYNC I/O firmware from Pro Tools, SYNC I/O must be connected to the DigiSerial Port. If the SYNC I/O is connected to the CPU’s serial port, you can update the firmware using SYNC I/O Setup.

SYNC I/O Setup Application and Firmware

If using the SYNC I/O with Pro Tools|24 MIX or Pro Tools|24, or if you are not using Pro Tools, use the most recent version of the SYNC I/O Setup application to install the latest version of firmware. SYNC I/O must be connected to a host computer serial port (SYNC I/O Setup is not supported through the DigiSerial Port.)

chapter 2

What's New for SYNC I/O in Pro Tools 5.3.1

This chapter provides instructions to get you started using the SYNC I/O with your Pro Tools system, and describes the following new and changed SYNC I/O features provided in Pro Tools 5.3.1:

- Loop Sync and Auto Identification
- PAL/NTSC Switching
- Improved jitter reduction from LTC
- Support for PostConform with Pro Tools|HD
- Support for Pro Tools MIX systems

Getting Started with the SYNC I/O

Pro Tools|HD

This section describes how to configure Pro Tools for the SYNC I/O, how to check your configuration and firmware, and how to set session settings relevant to the SYNC I/O.



In Pro Tools 5.3.1, many synchronization controls have been moved to the Pro Tools Session Setup window.

Loop Sync

SYNC I/O now supports Digidesign's Loop Sync feature for connecting HD interfaces. SYNC I/O can be configured as the Clock Source (Loop Master), in order to provide Loop Sync master clock to the rest of your Pro Tools|HD hardware.



For system requirements and Loop Sync connection instructions, see Chapter 1, "Introduction and Installation."

Auto ID of SYNC I/O through Loop Sync

Pro Tools|HD automatically recognizes if a SYNC I/O is connected to the DigiSerial port when Pro Tools is launched. When SYNC I/O is recognized, Pro Tools automatically configures the Device and Port settings for SYNC I/O on the DigiSerial Port in the Peripherals > Synchronization dialog. Pro Tools also checks for recent firmware, and alerts you if you need to update the SYNC I/O. (See "Updating SYNC I/O Firmware from Pro Tools" on page 6 for more information.)

To check SYNC I/O and Pro Tools communication:

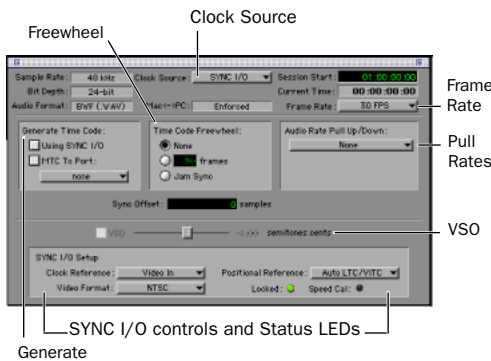
- 1 After installing Pro Tools and connecting the SYNC I/O as described, launch Pro Tools.
- 2 Choose Setup > Peripherals, and click the Synchronization tab. The SYNC I/O should be shown as the Device, with DigiSerial Port as the selected port.

3 If these are not shown, check all your connections, then try manually selecting SYNC I/O and DigiSerial Port from the Device and Port selectors. Once SYNC I/O is selected in this way, the SYNC I/O Setup controls become available in the lower part of the Peripherals window.

4 Click Enable SYNC I/O Setup. Pro Tools scans the DigiSerial port and checks SYNC I/O firmware. See “Updating SYNC I/O Firmware from Pro Tools” on page 6 for more information.

Configuring Sessions for SYNC I/O in Session Setup

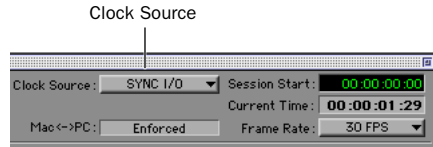
When connected through Loop Sync, and enabled in the Peripherals > Synchronization window, SYNC I/O settings become available in the Session Setup window.



Session Setup window, SYNC I/O controls

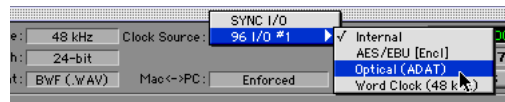
Clock Source

When connected and configured in the Loop Sync chain, SYNC I/O appears along with your HD-series audio interfaces in the Clock Source menu, located in the Session Setup window.



SYNC I/O selected as the current Clock Source in the Session Setup window

Clock Source can be any device in the Loop Sync chain. This lets you utilize any digital input source available on any HD peripheral, including the SYNC I/O, simply by selecting that device and source from the Clock Source menu.



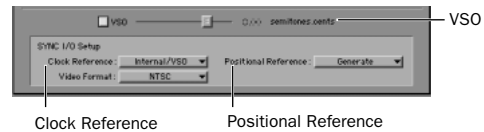
Selecting a 96 I/O option for Clock Source

Clock Reference

The selected Clock Source device determines your choices for clock reference.


When Clock Source is SYNC I/O

When the SYNC I/O is the Clock Source, it is the Loop Master. Clock and Positional Reference selectors become active in the SYNC I/O Setup area of the Session Setup window.



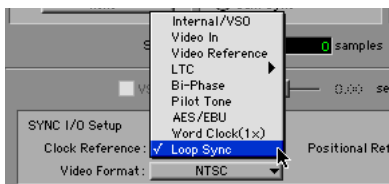
SYNC I/O Setup and VSO controls in the Session Setup window

SYNC I/O Clock Reference choices include Internal/VSO, Video In, Video Reference, LTC, Bi-Phase, Pilot, AES, and Word Clock. When the SYNC I/O is not the selected Clock Source device, the Clock Reference menu in the SYNC I/O Setup area switches to Loop Sync.

 For LTC clock reference, multiple choices are available from the LTC sub-menu. See “Reducing Jitter on LTC Input” on page 14 for more information.

To choose a SYNC I/O Clock Reference:

- Select a SYNC I/O clock choice from the Clock Reference menu

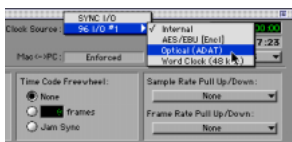


SYNC I/O Clock Reference menu

The Clock Source menu follows your selection of SYNC I/O for Clock reference, and automatically switches to SYNC I/O. (You can also choose the SYNC I/O as Clock Source first, then select a Clock Reference.)

To choose a different Loop Sync device as Clock Source:


- Choose a different Loop Sync device and Clock Source from the hierarchical Clock Source menu.



Clock Source menus in Session Setup

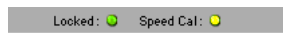
When Clock Source is HD I/O

When a 96 I/O, 192 I/O, or 192 Digital I/O is providing the Clock Source, it will be the Loop Master. Clock Source options are available directly from the Clock Source menu, based on the configuration of that interface in the Hardware Setup dialog. Choices will include AES, S/PDIF, Optical, or Word Clock.

 See the *Getting Started with HD Guide* for more information on audio interface configuration.

Locked and Speed Cal LEDs

The Locked and Speed Cal LEDs are provided in the SYNC I/O area of the Session Setup window. These LEDs display synchronization status of the SYNC I/O, to reflect the state of the same LEDs on the front panel.



Locked and Speed Cal LEDs

Locked The Locked LED stays lit when the SYNC I/O is locked to the selected clock reference. The Locked LED flashes if the selected clock reference source is missing or out of lockable frequency range.

Speed Cal Speed Cal is meant to be used as an indicator of the accuracy of the incoming clock reference. The Speed Cal LED flashes when the output sample rate is not at the expected (or target) rate. Speed Cal stays lit when the output frequency is within 200 ppm (0.02%) of the selected sample rate. If the output frequency is higher than expected, Speed Cal will blink quickly; if it's lower, then Speed Cal will blink slowly. For example, if the session is 30 fps and LTC is the selected clock reference but the LTC is actually 29.97, the SYNC I/O will lock (the Locked LED will stay lit), but the Speed Cal LED will blink slowly.

Positional Reference

To select a positional reference:

- 1 Choose Window > Show Session Setup.
- 2 Choose a positional reference from the Positional Reference menu, located in the SYNC I/O Setup controls.

Sample Rate


The SYNC I/O sample rate is determined by the current Pro Tools session sample rate. In Stand-alone mode, SYNC I/O sample rate can be selected with SYNC I/O Setup software, or using the front panel switches. Current sample rate is indicated by the Sample Rate LEDs.

When used with a Pro Tools|HD system, SYNC I/O supports all available sample rates. Setting the session rate in Playback Engine or Hardware Setup dialogs also sets the SYNC I/O to that sample rate.

When using PostConform with the SYNC I/O, only 44.1 and 48 kHz sessions are supported.

Audio and Video Pull Up and Pull Down

Pro Tools 5.3.1 provides new 4.167% pull up, and 4.0% pull down choices. When working with a Movie track containing video, a separate Video Pull-Down menu becomes available in the Session Setup window, allowing you to apply standard or non-standard pull factors to audio and video separately. This lets Pro Tools synchronize to most supported SMPTE frame rates and formats.

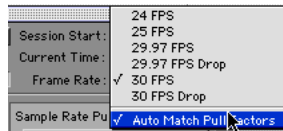
 See the Pro Tools 5.3.1 Addendum for more information.

Frame Rate

While using Pro Tools, SYNC I/O frame rate automatically follows the session frame rate setting. Session Frame Rate is set in the Session Setup window.


To set the session Frame Rate:

- Choose a rate from the Frame Rate selector in the Session Setup window.



Choosing a session Frame Rate (Auto Match Pull Factors shown enabled)

In Stand-alone mode, SYNC I/O frame rate can be set using SYNC I/O Setup and from the front panel.


 Pro Tools provides additional frame rate settings, including audio and video pull up and pull down, as well as Auto Match Pull Factors. See the Pro Tools 5.3.1 Addendum for more information.

PAL/NTSC Video Format Setting

Choose PAL or NTSC format for the session using the Video Format selector in the Session Setup window. See “PAL/NTSC Format Switching” on page 13 for more information.

MachineControl Configuration

If using Digidesign MachineControl, do the following to establish basic communication.

 See the *MachineControl Guide* for installation instructions and additional information.

To configure MachineControl:

- 1 Choose Setup > Peripherals.
- 2 In the Synchronization window, make sure the SYNC I/O is the current Synchronization device, and DigiSerial is the selected port.
- 3 Click the MachineControl tab to open the MachineControl window.
- 4 Enable and configure options for 9-pin Serial or 9-pin Remote. SYNC I/O 9-Pin ports 1 and 2 are available for Serial mode on HD systems only. (Remote mode requires a standard serial or COM connection.)

See the *MachineControl Guide* for more information.

PAL/NTSC Format Switching

The PAL/NTSC selector has been removed from the video track I/O view. Video reference for Pro Tools and the SYNC I/O can now be configured for NTSC or PAL using the Video Format selector in the Session Setup window.

To select NTSC or PAL format:

- In the Session Setup window, choose the desired format from the Video Format selector, in the SYNC I/O control area.

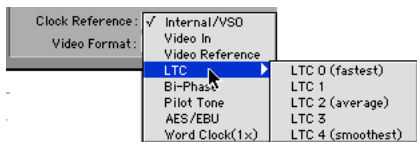
When a Movie has been imported or captured and is still in the video track, the format of the first frame of video (if any) determines the format setting. When there is no video in the session, you can manually set the video format to NTSC or PAL using the Video Format selector in the Session Setup window.

Regardless of whether format is set automatically or manually, Pro Tools|HD and the SYNC I/O both reflect the change. Changing the format in Pro Tools changes the SYNC I/O.

Reducing Jitter on LTC Input

While resolving to LTC clock, the SYNC I/O now provides five options to optimize your system for different types of tasks. This lets you choose between quickest response (for when fast lock-up time is critical), or highest sound quality (during critical laybacks, for example).

The Session Setup window provides a sub-menu for LTC Clock Reference choices. The five choices provide different servo gain settings to reduce the effects of jitter when locking to linear time code. In Stand-alone mode, these settings are also available from the front panel.



Clock Reference > LTC menus in Session Setup

To choose an LTC setting:

- Choose a setting from the hierarchical LTC Clock Reference menu: Choices include:

LTC 0 (fastest) Allows the quickest resolving to incoming LTC, but with greater jitter. This is the default setting, and should be used when fast lock ups are critical.

LTC 1

LTC 2 (average) Offers a compromise of lock up time and jitter quality.

LTC 3

LTC 4(smoothest) Offers the lowest jitter from LTC resolve, but can take six to ten seconds to achieve full resolve. This setting is most appropriate when loading critical audio from an analog master, where reducing or eliminating jitter is more important than lock speed. Be sure to allow adequate pre-roll before punching in.

PostConform Support

The SYNC I/O can be used with Digidesign's PostConform. This lets you utilize either of the two 9-pin machine ports on the SYNC I/O to control a machine with PostConform. See the *PostConform Addendum* for more information.

Pro Tools|24 MIX and Pro Tools|24 Support

The SYNC I/O can be used with Pro Tools|MIX systems, as an alternative to the USD. When used with a MIX-series system, the SYNC I/O emulates the USD.

For instructions on how to connect a SYNC I/O to your MIX system, see "Connections for SYNC I/O with Pro Tools|24 MIX" on page 4.

To configure Pro Tools|24 MIX or Pro Tools|24 for a SYNC I/O:

- 1 Start up your system beginning with hard drives, then the SYNC I/O, then MIDI and other studio equipment, then the CPU. Turn on your speakers and monitoring system last.
- 2 Launch Pro Tools.
- 3 Choose Setups > Peripherals, and open the Synchronization tab.
- 4 Select Universal Slave Driver for the Synchronization Device.
- 5 Select DigiSerial Port for the Port.
- 6 Once the SYNC I/O is declared as a USD, click OK to close the Peripherals window.

Using the SYNC I/O with Pro Tools|24 MIX and Pro Tools|24 for Macintosh

When used with Pro Tools 5.1.3 on Macintosh systems, the SYNC I/O choices are labelled as USD options. This is because the SYNC I/O is able to emulate the USD, providing all of its supported features (the SYNC I/O only supports sample rates and other features as supported by the USD with Pro Tools|24 MIX and Pro Tools|24).

To configure the SYNC I/O for your projects and sessions,

- 1** In the Session Setup window, select Clock and Positional References from their menus.
- 2** To generate time code from the SYNC I/O, enable Generate using USD.
- 3** Configure other settings as needed, selecting USD wherever appropriate.

chapter 3

Corrections to the SYNC I/O Guide

This chapter provides corrections to items in the previous printing of the SYNC I/O guide for Pro Tools 5.3 (Digidesign PN 910609328-00 Rev A 01/02).

LTC Servo Gain

On page 54 of the *SYNC I/O Guide*, the default setting and the number of available options are incorrect.

Corrections:

- ◆ The default LTC Servo Gain setting is 0000 (not -001) when accessing Servo Gain through the front panel controls. In Pro Tools, the default setting is listed as “LTC (0).”
- ◆ There are five Servo Gain settings.

Generating Time Code and Pull Rate Settings

On page 41 of the *SYNC I/O Guide*, the Generating and Regenerating Time Code section omitted information regarding Pull Up and Pull Down settings.

Correction:

- Time code generated by the SYNC I/O does not follow session Pull Up and Pull Down settings.

VSO Range

On page 35 of the *SYNC I/O Guide*, the table listing effective sample rate ranges for VSO (Variable Speed Override) contains incorrect minimum and maximum VSO rates.

Correction:

Effective VSO rates

Sample Rate (kHz)	Rate Type	Min (kHz)	Max (kHz)
44.1	1x	40000	50500
48			
88.2	2x	80000	101000
96			
176.4	4x	160000	202000
192			

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