

MachineControl Guide

for Pro Tools 5.1

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chapter 1

Introduction

MachineControl™ is special purpose software for Pro Tools that enables serial communication with remote audio and video machines. MachineControl lets you integrate TDM-equipped Pro Tools systems with external 9-pin or V-LAN machines.

MachineControl Components

Your MachineControl package includes:

- ◆ MachineControl Installer Diskette.
- ◆ One Remote mode cable (female 9-pin)
- ◆ One serial-to-9-pin Serial Control Cable (male 9-pin) for Macintosh systems

Features

MachineControl can be installed for either Remote, or standard Serial, machine communication.

Remote Mode

Configures Pro Tools to operate in machine emulation mode. Pro Tools can then be controlled by machines and edit controllers using standard 9-pin Sony Remote Protocol for playback, cueing, and record-arming of tracks. Remote mode requires a Digidesign Universal Slave Driver (USD), and use of the special Remote mode cable.

Serial Control Mode

Serial Control mode allows Pro Tools to control track arming, synchronization, and transport features of tape machines, hard disk recorders, any other systems through standard 9-pin Sony Remote Protocol.

With a USD

Track Arming Lets you arm tracks of external machines from within Pro Tools, for layback and transfer configuration. Features include individual record-enables for up to 48 external tracks, with selectable record protocol and mode. Machine profiles preconfigure track arming for most machine types.

Serial Time Code Enables Pro Tools to locate, chase, and synchronize to incoming serial time code.

All Systems

On all MachineControl-equipped systems, with or without a USD, MachineControl enables the following Pro Tools features:

Pro Tools Transport Master The Pro Tools Transport lets you select Pro Tools or a machine as the *transport master*. The transport master is the device that will be driven by Pro Tools Transport

commands. When online, this lets you select whether Pro Tools is the transport master with the machine chasing, or the machine is the transport master, with Pro Tools chasing.

Cueing, Scrubbing, and Pre-Roll Numerous settings let you optimize MachineControl operation. Adjustable machine pre-roll, selectable edit and Memory Location chasing, and other preference settings are provided.

System Requirements

Macintosh

- Pro Tools 24 MIX or MIXplus, or Pro Tools 24 system.
- A serial port must be available for the MachineControl cable (included). On USB-only CPUs such as the G4 and the Blue & White G3, a supported USB-to-serial adaptor, or modem adaptor, may be required.

Power Macintosh G3 and G4 If you are using a G4 or a Blue & White G3 and you are *not* using a Universal Slave Driver (USD), MachineControl can be connected to the DigiSerial Port. See “When to use the DigiSerial Port” on page 6 for more information.).

Windows NT

- Pro Tools 24 MIX or MIXplus, or Pro Tools 24 system.
- A serial port (COM port) must be available for the included MachineControl cable. If you are not using a USD with Pro Tools, MachineControl can be connected to the DigiSerial Port.

For the latest compatibility information, and a list of qualified computers and hard drives, contact your Digidesign dealer or visit the Digidesign Web site (www.digidesign.com/compato).

Software Requirements

Pro Tools version 5.1 or later is required to utilize 9-pin Remote mode. See “MachineControl and Pro Tools” on page 2 for more information.

MachineControl and Pro Tools

This guide documents features available in Pro Tools version 5.1. Though MachineControl can be used with some earlier software releases of Pro Tools, not all features are available in each version. (1.0.1 is the current version of the MachineControl key diskette, as of this writing.)


History of MachineControl Features in Pro Tools

Pro Tools	Features Introduced
4.1.1 or later	Original release
4.3 or later	Track Arming of Remote Decks
5.0 or later	Support for Serial Time Code as positional reference
5.1 or later (Macintosh only)	9-pin Remote mode

Hardware Requirements

Cables

- Remote mode 9-Pin cable (included), required for machine emulation. This cable has a female 9-pin connector, and is designed specifically for Remote mode.
- Standard Serial-to-9-pin cable (included), for serial time code and all other MachineControl functions (some features require a USD). This cable can be identified by its male 9-pin connector.

 See also Appendix D, “9-Pin Cable Pinouts.”

Machine Requirements

- Video or audio machines that are Sony 9-pin or Videomedia® V-LAN™ compatible devices. Certain V-LAN machines may not require a time code reader card. Refer to your machine's documentation for more information. For 9-pin Remote mode, a controller compatible with the Sony "P2" 9-Pin specification is required.

Synchronization Requirements

- A Digidesign Universal Slave Driver™ (USD) is required to support serial time code and 9-pin Remote mode features of Pro Tools. USD is also the recommended synchronization peripheral for all applications.
 - or –
- A Digidesign Video Slave Driver™ (VSD), plus a standard MIDI interface capable of converting Linear Time Code (LTC) to MIDI Time Code (MTC). This configuration does not support Remote mode.
 - or –
- A compatible third-party synchronization device, capable of generating SuperClock (256x clock), and LTC-to-MTC conversion (along with an available serial port for it - do not use the DigiSerial Port for any device other than a USD). This configuration does not support Remote mode or Serial Time Code.

About This Guide

This guide assumes:

- You have installed Pro Tools and verified that it works properly.
- You have a thorough understanding of your video deck, external 9-pin decks, or mixer.
- You have an understanding of your synchronization equipment.

This guide uses the following conventions to indicate menu choices and key commands:

Convention	Action
File > Save Session	Choose Save Session from the File menu
Control+N	Hold down the Control key and press the <i>N</i> key
Option/Alt-click	Hold down the Option (Macintosh) or Alt (Windows) key and click the mouse button
Right-click (Windows)	Click with the right mouse button

The following symbols are used to highlight important information:



User Tips are helpful hints for getting the most from your system.



Important Notices include information that could affect your Pro Tools session data or the performance of your Pro Tools system.



Cross References point to related sections in the Pro Tools Guides.

chapter 2

Installation

Installing MachineControl on your system involves the following steps:

- Connect the machine (serial-to-9-pin connection)
- Confirm synchronization
- Install the MachineControl software
- Enable and configure MachineControl in Pro Tools

Before you Begin

Before you install MachineControl, you must install Pro Tools and confirm that it is operating correctly.

Make sure that Pro Tools and your USD or other synchronization equipment is already installed and working properly. For any other information about the USD, see the *Universal Slave Driver Guide*.

9-pin Cables

MachineControl requires its own connection between Pro Tools (or its host computer) and the machine. There are two options for the MachineControl cable connection, each utilizing a specific cable determined by whether you plan to use Pro Tools in *Remote mode* or *Serial Control mode*.

Remote Mode Cable Serial-to-9pin (female)

This cable enables a form of *machine emulation* in Pro Tools. When installed, Pro Tools responds to record-arming, transport, and other standard 9-pin commands. See “Machine Connection for Remote Mode” on page 7 for instructions.

Serial Control Cable Serial-to-9pin (male)

This cable enables bi-directional, serial 9-pin communication between Pro Tools and the machine. Features include the ability to sync to serialized time code, remote track arming, transport master control, and many machine settings and options. See “Machine Connection for Serial Mode” on page 7 for instructions.

⚠ *Do not attempt to substitute 9-pin or serial adaptors for either MachineControl cable. Each cable is especially wired and supports only Remote mode, or Serial Control mode.*

Ports and MachineControl

Serial port requirements vary depending on whether or not you are using a USD, a DigiSerial Port, or other synchronization devices. Before you install MachineControl, you must determine the ports you will use for your system's connections.

9-Pin-to-Serial

MachineControl communication requires a serial connection between your machine (9-pin or V-LAN) and Pro Tools, or your computer. Serial port requirements vary depending on your type of computer and Pro Tools systems. See "Selecting a Port" on page 6 for serial port instructions.

This can include either the Remote mode cable, or the Serial Control cable, or both. Remote mode and Serial Control mode cannot be used simultaneously, but with enough available serial ports you can have both options connected simultaneously. (See "9-pin Cables" on page 5 for more information.)

Synchronization

Synchronization communication requires additional serial and other connections between devices. See "Sync Connections" on page 8.

Selecting a Port

When to use the DigiSerial Port


Pro Tools MIX Core and d24 cards feature the DigiSerial Port, a special-purpose serial connector. Though this port is identical in appearance to the serial ports on your computer, it is designed to be used according to the following rules:

When using a USD:

◆ If you are using a USD, the USD should always be connected to the DigiSerial Port.

Without a USD:

◆ If you are using MachineControl, but *not* a USD, then the DigiSerial Port can be used for MachineControl.


 *The DigiSerial Port should not be used for MIDI interfaces or any other serial device.*

G3 and G4 Computers

Power Macintosh G3 and G4 computers do not have a conventional serial port, so use of a supported serial port adaptor is required.

Currently supported devices include:

- Keyspan USA-28X dual-port high-speed USB-to-Serial adapter
- GeeThree.com Stealth serial port for G4/AGP
- Griffin Technology G4Port serial port for G4/AGP

 *For an up-to-date list of Digidesign-qualified peripherals, including serial port devices, visit the Digidesign Web site (www.digidesign.com/compato).*

Macintosh 9500 and 9600 Computers

Macintosh 9500, 9600, and similar computers provide serial ports (Macintosh Modem and Printer ports) that can be used for MachineControl. When no USD is present, the DigiSerial Port can be utilized for MachineControl connection.

Example Setup

The following is one possible MachineControl installation on a Macintosh G4 computer:

- MachineControl Serial Control cable connected to a Keyspan 28X, Port 1.
- MachineControl Remote mode cable connected to a Keyspan 28X, Port 2.
- The Serial Control cable and Remote mode cable are connected to their respective ports on the machine.
- MIDI interface connected to a Stealth serial connector.

Connecting the Machine

MachineControl serial connection can be made using one or both of the two serial-to-9pin cables. Determine which cable you want to use before proceeding (see “9-pin Cables” on page 5 for descriptions of the two cables and modes).

In addition, be sure to determine the best serial port for MachineControl. For additional information about serial ports and connections, see “Ports and MachineControl” on page 6.

⚠ *Do not attempt to use adapters (such as 9-pin male/female adapters) as a substitute for the specific MachineControl cable you plan to use. Each cable is especially wired and supports only Remote mode, or Serial Control mode.*

Machine Connection for Remote Mode

To connect a machine for Pro Tools Remote mode:

- Connect the Remote mode 9-Pin Cable (female 9-pin) to the 9-pin output of the machine.

Machine Connection for Serial Mode

To connect a machine for standard Serial Control mode

- For all other Macintosh installations (standard Serial Control mode), connect the Serial Control Cable (male 9-pin) to the 9-pin input on the machine.

Serial Connection for All Modes

To connect to a Macintosh G3 or G4:

- Connect the serial end of your MachineControl cable to the computer, or Pro Tools:
 - If the DigiSerial Port is being used for the USD, connect the MachineControl cable to an available port on a supported serial port adaptor. (See “G3 and G4 Computers” on page 6 for more information.)
 - If you are not using a USD, connect the other end to the DigiSerial Port on your Pro Tools MIX or d24 card.

To connect to a Macintosh 9500 or 9600:

- Connect the serial end of your MachineControl cable to the computer, or to Pro Tools:
 - If you are using a USD, use the computer Modem or Printer port, whichever is available. (See “Selecting a Port” on page 6 for more information.)
 - If you are not using a USD, connect the other end to the DigiSerial Port.

To connect to a Windows computer:

- Connect the serial end of your MachineControl cable to the computer, or to Pro Tools:
- If you are not using a USD, connect the other end to the DigiSerial Port on your Pro Tools MIX Core or d24 card.
- If you are using a USD, use an available COM port for MachineControl connection. (See the *Universal Slave Driver User's Guide* if you need more information.)

Sync Connections

In addition to 9-pin connection, Pro Tools requires *positional* reference and *clock* reference connections to achieve synchronization with external machines: Both positional and clock reference are sent to and from Pro Tools by the USD, or other synchronization peripherals.

Make sure that you have already connected and verified positional and clock communication and operation of all your sync peripherals. See your *Pro Tools Reference Guide* for information.

If you are using a USD, use the instructions included in the *Universal Slave Driver's Guide*.

If you are using a third-party synchronization peripheral, refer to its documentation for the proper connections and software settings. Confirm operation and sync in Pro Tools.

Starting Up Your System

You should start up (power) your system in a specific order.

Start your equipment in this order:

- 1 External hard drives. Wait approximately ten seconds for them to come up to speed
- 2 External machine (VTR, ATR, or synchronizer, and monitors)
- 3 Pro Tools audio interfaces
- 4 MIDI interfaces and devices
- 5 Computer
- 6 Speakers or monitor system

Software Installation

Check the MachineControl Installer Disk and make sure it is unlocked. If it is locked, you will not be able to authorize or deauthorize your copy of MachineControl.

Macintosh

- 1 Insert the "MachineControl Installer" diskette into your computer.
- 2 Double-click the Install MachineControl icon on the diskette.
- 3 Follow the on-screen instructions to install the software on a selected hard drive. This must be the same hard drive on which Pro Tools is installed.
- 4 When installation is complete, click Finish to restart your computer.
- 5 Launch Pro Tools, and follow the onscreen instructions for authorizing MachineControl.

Windows NT

- 1 Insert the “MachineControl Install 1” diskette into your computer.
- 2 Locate and double-click the “Install MachineControl.exe” application on the Installer diskette.
- 3 Follow the on-screen instructions to install the software on a selected hard drive. In most cases, this will be your Windows System drive.)
- 4 When installation is complete, click Finish to restart your computer.
- 5 Once your computer has restarted, if a warning dialog appears, click Cancel to close the dialog.
- 6 Launch Pro Tools, and follow the onscreen instructions for authorizing MachineControl. Because Pro Tools is typically installed on your Windows System drive, this hard drive will be selected. If you want to install the authorization on another hard drive, navigate to its location and select it.
- 7 Click OK.

Authorizing MachineControl


Each copy of MachineControl permits one hard disk authorizations. Once you have installed this authorization, you cannot perform additional authorizations until you reclaim an authorization.

Macintosh Authorization

The Macintosh version of MachineControl comes on a single floppy disk, which contains all software necessary to install, authorize or deauthorize/remove MachineControl on your CPU. You can temporarily authorize MachineControl for Macintosh by placing the key diskette in the computer’s floppy drive.

Windows Authorization

MachineControl for Windows NT is on two separate floppy disks. A DeAuthorizer application, named “MachineControl DeAuthorizer.exe” is installed automatically in the Pro Tools folder. This application lets you reclaim authorizations and return them to the “MachineControl Install 1” disk. You *cannot* temporarily authorize MachineControl for Windows by placing the key diskette in the computer’s floppy drive.

 *It is not necessary to remove MachineControl software or reclaim an authorization before you defragment or optimize your drive. However, if you re-initialize (or reformat) your hard drive, you must reclaim MachineControl authorization (and all other authorizations) or they will be erased.*

Removing MachineControl Software

If you want to remove MachineControl, deauthorize your hard drive before you remove the MachineControl software.

Macintosh

To remove authorization from a hard drive:

- 1 Insert the “MachineControl Installer” diskette into your computer.
- 2 Double-click the MachineControl DeAuthorizer icon on the diskette.
- 3 Click Setup.
- 4 From the Authorization pop-up menu, choose Remove, then select the hard drive from the list of connected drives.
- 5 Click Remove.
- 6 Click Done to finish the process.

To remove the MachineControl software:

- 1 Locate the MachineControl extension (in the DAE Extensions folder inside the DAE folder) and drag it to the Trash.
- 2 Empty the Trash.

Windows NT

To remove authorization from a hard drive:

- 1 Double-click the file “MachineControl DeAuthorizer.exe” on your hard drive (in Program Files/Digidesign/DeAuthorizers).
- 2 Insert the “MachineControl Install 1” or the backup authorization diskette into your computer.
- 3 Select the drive containing the authorization you want to remove (indicated by a small key icon).
- 4 Click Remove.

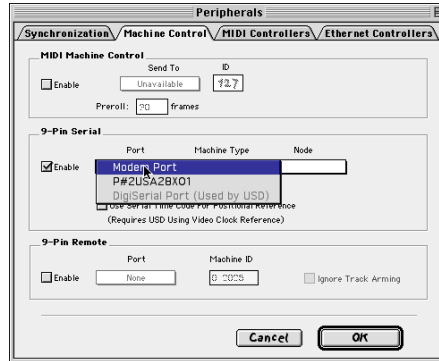
To remove the MachineControl software:

- 1 From the Start menu, choose Settings > Control Panels and double-click Add/Remove Programs.
- 2 Select “Pro Tools MachineControl” from the list of installed applications and click Add/Remove.
- 3 A dialog appears asking you to confirm the removal of the “Tpkd.sys” file. Click Yes.
- 4 When the removal process is complete, click OK and close the “Add/Remove Programs Properties” window.

Configuring MachineControl

To set up a MachineControl device:

- 1 Make sure your equipment is powered on, and launch Pro Tools.
- 2 Choose Setups > Peripherals, and click Machine Control.
- 3 In the 9-pin serial section, click Enable.
- 4 Use the Port pop-up to select the 9-pin or V-LAN MachineControl port/connection. The available choices will depend on your platform and configuration.

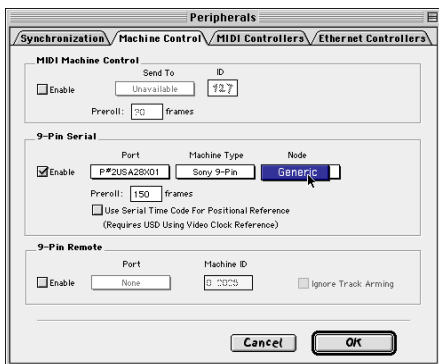


Selecting a port for 9-pin Serial

The first time MachineControl is enabled, or when Pro Tools detects a connect or disconnect on the serial connection, Pro Tools automatically polls the port to see what kind of machine is connected. This process is referred to as *auto detection*. Pro Tools also allows you to choose the profile from the machine pop-up menu. If your machine is not auto-detected, or if you want to use one of the generic profiles, you can choose it from this pop-up menu. Pro Tools does not automatically update this setting.

Machine Auto-detection

If the machine is recognized, Pro Tools loads the corresponding Machine Type and Node, as well as the corresponding track layout and automatically enters the name of that machine into the Pro Tools Machine Track Arming window.



MachineControl enabled (G4 shown).

If the machine isn't recognized, the generic1 personality is loaded.

⚠ *Do not use the designated machine port for any other function (such as time code or MIDI metronome). Make sure that 9-pin or V-LAN is the only communication on the selected port.*

5 If necessary, select the appropriate machine type (Sony 9-pin or V-LAN) from the Machine Type pop-up menu.

Machine Pre-Roll

You can set a variable amount of Machine pre-roll to account for any time it may take the machine to achieve servo lock. Set this value low for non-linear machines (including the DoReMi V1, for example). Longer pre-roll values may work better for some older tape transports.

The Machine pre-roll value is added to any pre-roll specified in the Pro Tools Transport window

To set MachineControl pre-roll:

- 1 In Pro Tools, choose Setups > Peripherals, and select Machine Control.
- 2 In the 9-pin serial section, enter the desired number of frames of pre-roll.
- 3 Click OK to close this dialog.

Pro Tools retains this Peripherals configuration unless you change or disconnect it.

Machine Remote or External Mode

Be sure to set your machine-controllable device to "remote" or "ext" mode to receive the 9-pin or V-LAN information. These options should be available from the main control panel of your machine, or the main menus of its interface. If all other Pro Tools machine communication is established and the machine is not in Remote mode, Pro Tools will indicate machine "local" mode and display the message "Cannot Establish Sync" in the status display.

chapter 3

Remote Mode

This chapter explains how to use Pro Tools when MachineControl is connected for Remote mode operation.

9-Pin Remote Mode makes Pro Tools operate as a virtual tape deck, capable of slaving to most standard Sony P2 9-pin commands. For a list of supported commands, see “9-Pin Commands” on page 14.

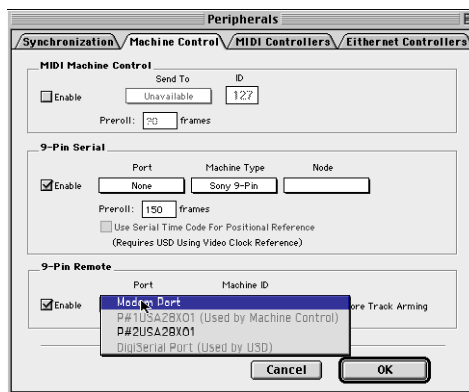
By default, Pro Tools emulates a Sony BVW-75 model video deck. You can also configure Pro Tools to emulate other machines. For more information, see “Alternate Machine Types” on page 14.

For instructions on connecting and configuring Pro Tools for Remote mode, see Chapter 2, “Installation.”

Configuring Remote Mode

To configure Pro Tools for 9-Pin Remote mode:

- 1 Choose Setups > Peripherals, and select the MachineControl tab.
- 2 Make sure the USD is enabled, set to Generate mode, and set to Video Ref.
- 3 Select Enable under 9-Pin Remote.
- 4 Choose the port that your 9-pin-to-serial cable is connected to from the pop-up menu.



Selecting a port for 9-pin Remote mode

- 5 Leave the Machine ID as “0x2025,” or enter another ID from the list (see “Alternate Machine Types” on page 14 for more information).

6 If you do not want Pro Tools to respond to remote track arming commands, select Ignore Track Arming.

7 Click OK when you are done.

8 In the Pro Tools Transport window, select Remote as the Transport master.

9 Put Pro Tools online.

Online Status Display

When online in Remote mode, the Online button flashes until Pro Tools and the machine establish communication. When MachineControl and Remote mode are enabled and communication is established, the Online button will remain highlighted.

Alternate Machine Types

By default, MachineControl lets Pro Tools emulate a Sony BVW-75 when the ID is 0x2025. If you use a machine that follows a different 9-pin command set, you can configure Pro Tools for its machine description in the Peripherals dialog.

To change the emulation type:

1 Choose Operations > Preferences, and select the MachineControl window.

2 Enter an appropriate hex value for your device in the Machine Type field. For a listing of supported machines and their IDs, see Appendix C, “Machine IDs.”

9-Pin Commands

In Remote Mode, Pro Tools with MachineControl can respond to the following 9-pin commands:

- Play
- Stop
- Pause
- Rewind
- Forward
- Cue To
- Poll Time Code
- Record Arm Track
- Set In/Out Point (for Auto Edit)
- Set Pre/Post Roll (for Auto Edit)
- Perform Auto Edit Record
- Perform Punch-In/Punch-Out Record (requires QuickPunch mode and voices)
- Return Status -Online, State, Tracks Armed
- Servo Lock
- Clear “In” Point


Playback in 9-Pin Remote Mode

Pro Tools will only play back audio when the received command requires audio play back at 1X speed in the forward direction. Reverse playback and varispeed playback are not supported in Pro Tools.

Recording in 9-Pin Remote Mode

MachineControl lets Pro Tools support Auto Edit (selection-based) and Punch-in/Punch-Out (QuickPunch) commands.

Pro Tools must have QuickPunch enabled when recording in Remote mode with an edit controller.

 *Preview Edit and Record Rehearse modes are not supported by Pro Tools.*

Auto Edit Recording

When a machine sends Auto Edit commands to Pro Tools in 9-Pin Remote Mode, the edit in and out points are converted to a Pro Tools Timeline selection. This selection, with offsets options, will then be used to record on all armed tracks when Pro Tools receives the Perform Auto Edit Record command.

Punch In/Out Recording

Punch-In/Punch-Out Recording supports punch-on-the-fly, with Pro Tools in QuickPunch mode. In this mode, tracks are armed before the record pass, and recording begins and ends when Punch-In and Punch-Out commands are received from the master machine.

QuickPunch must be enabled and the required voices must be available in Pro Tools for Punch-In/Punch-Out recording commands to work. This mode must be set manually in Pro Tools.

Track Arming and 9-Pin Remote Mode

In 9-Pin Remote mode, Pro Tools responds to track arming (record-enable) commands for the first eight Pro Tools audio tracks that are not hidden in a session (video and MIDI tracks are not recognized, and will be ignored if any exist within the first eight tracks). Additional tracks can be record enabled manually in Pro Tools.

Ignore Track Arming Commands

You can set Pro Tools to ignore incoming track arming (record-enable) commands. Use this to record safe Pro Tools if, for example, you are using a master 9-pin transport controller to arm tracks on several other machines, but not tracks in Pro Tools. You can still manually arm Pro Tools audio tracks, as needed, using the track Record Enable buttons.

To have Pro Tools ignore remote track arming commands:

- 1 Choose Setups > Peripherals, and select the MachineControl window.
- 2 Select Ignore Track Arming.


chapter 4

Serial Control Mode and Transport Control

This chapter explains how to use MachineControl in Serial Control mode. Serial Control mode is enabled whenever MachineControl is connected using the Serial Control cable. In this mode, MachineControl enables bi-directional transport, track arming, and machine command communication between Pro Tools and your machine.

For more information about connecting and configuring Pro Tools for Serial Control mode, see Chapter 2, “Installation.” You must have MachineControl installed correctly before continuing with this chapter.

When connected for Serial Control mode, MachineControl enables all Pro Tools track arming, synchronization, and transport features, as available on your system. Some features require a USD, as noted throughout this chapter.

 *Track arming is explained in Chapter 5, “Remote Track Arming.”*

Pro Tools Session Settings

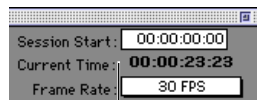
Whenever you are working with synchronization, make it a habit to always confirm the following Pro Tools session settings.

To configure Session Setup for MachineControl:

- Choose Windows > Show Session Setup Window, and do the following:
- Set the Sample Rate, time code frame rate and format appropriate to your session.
- Set the Ch 1-2 Input and session Sync Mode as necessary. (Sync mode must be set to analog for the USD to be clock master.)
- Set a Session start time.

Time code signal test

To check your settings, manually start playback on the external machine. If Pro Tools is receiving time code, the current location will be shown in the Current Time display.



Current Time display

Current Time display in the Session Setup window

Online and Offline Operation

To trigger Pro Tools playback or recording from an external source, you must put it online.

There are four ways to put Pro Tools online:

- Click the Online button in the Transport window
- Select Operations > Online
- Press Command+J or Control+J
- Press Option+Spacebar (Macintosh) or Alt+Spacebar (Windows)

MachineControl Preferences

Preferences are available to specify the following aspects of MachineControl behavior.

Punch In and Out Frame Offset

The Operation Preference setting for “Punch In and Out Frame Offset” is available in Remote mode only. This settings lets you configure Pro Tools to compensate for any advanced or delayed record commands issued by an edit controller.

Record and Chase Settings

The following Operation Preferences select record and chase options available while working with external time code, including:

- Preferences for “Record Online at Time Code (or ADAT) Lock” and “Record Online at Insertion/Selection”
- Preferences for “Machine Chases Memory Locations” and “Machine Follows Edit Insertion/Scrub”

To change Record or Chase Preferences:

- 1 Choose Setups > Preferences, and click Operations.
- 2 Select one of the following modes:

Record Online at Time Code (or ADAT) Lock Online recording begins as soon as Pro Tools receives and locks to time code.

Record Online at Edit Insertion/Selection Online recording begins at the current Edit selection start or playback location.

Machine Follows Edit Insertion/Scrub Pro Tools sends locate commands to the external deck whenever the timeline selection changes.

Machine Chases Memory Locations The machine chases Pro Tools memory location selections. The machine will not locate with pre-roll, but will instead park on the desired frame for Auto Spotting.

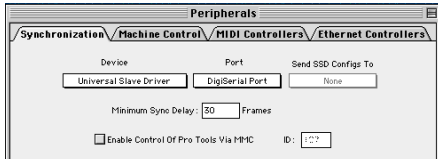
Serial Time Code

If you are using a Digidesign USD connected to your DigiSerial Port, you can take advantage of *serial time code* to achieve faster lockup times.

Most professional machines (including DA88, D2, DigiBeta, and most 3/4” decks) can be controlled remotely using standard Sony 9-pin Remote Protocol. Serial time code is part of the 9-pin data stream and supplies precise control information to and from Pro Tools through the DigiSerial Port.

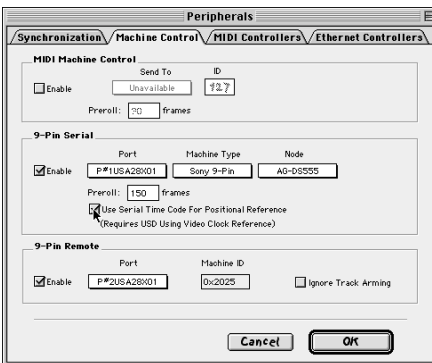
To enable Serial Time code:

- 1 In Pro Tools, choose Setups > Peripherals and click Synchronization.
- 2 Make sure USD and DigiSerial Port are the selected device and port.



Synchronization settings for Serial Time Code.

- 3 Make sure the USD clock reference is set to Video Ref.
- 4 Click Machine Control in the Peripherals window.
- 5 Select “Use Serial Time Code for Positional Reference.” This option can only be selected if the currently defined sync peripheral is the USD.

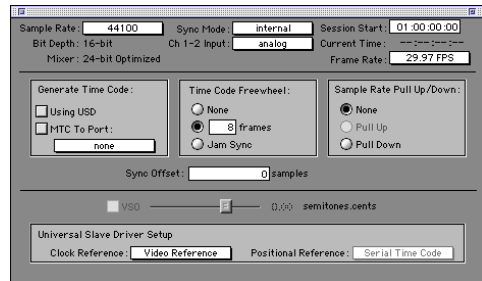


Serial Time Code enabled in the Peripherals dialog

Serial Time Code and USD Settings

When Serial Time Code is enabled, the Clock Reference setting in the USD Setup section of the Session Setup window switches to Video Reference/Video In/Word Clock 1x.

Additionally, the Positional Reference pop-up is dimmed and displays Serial Time code.



Session Setup when Serial Time Code is enabled

Generate and Serial Time Code

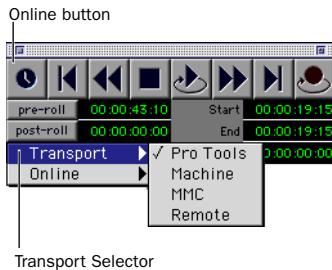
Pro Tools automatically puts the USD in Generate mode and prohibits any changes to the USD Positional Reference setting. While Serial Time Code is being used, this Generate mode is engaged to calculate frame-edge accuracy in Pro Tools.

Transport Controls

With MachineControl, the Pro Tools Transport window becomes a multi-function controller.


To toggle the Pro Tools Transport between Pro Tools, Machine, and 9-Pin Remote mode:

1 Click the area labeled Transport (directly below the Online button in the Transport window) to display the Transport pop-up.



Selecting the MachineControl Transport

2 Select Transport = Machine, Transport = Pro Tools, or Transport = Remote.

 You can also press **Control+backslash** to toggle between Pro Tools, the Machine, and Remote transport (or, on a Digidesign control surface, press **EXT TRANS**).

Transport = Pro Tools

In this mode, the controls in the Transport window are focussed on Pro Tools playback, recording, and so on. When Pro Tools is online and you begin playback, the machine slaves to Pro Tools, cueing to a pre-roll time before the current insertion time before rolling. The session locks to the machine's time code.

Additionally, when online, the Machine will follow current Preferences for Machine Chase and Online Record (see "Record and Chase Settings" on page 18).

Transport = Machine

In this mode, the controls in the Transport window are focussed on the machine. If online, Pro Tools will slave to the machine. When offline, the Transport will only control the machine.

When Pro Tools is slaved to the machine, the Pro Tools Transport can be used as a machine remote control or a system master control. When online, the Transport still controls the machine, but Pro Tools will chase and lock to the machine.

In addition:

- ◆ When Auto Spot is turned on, regions are spotted to the current machine time.
- ◆ When Auto Spot is turned on, the Trimmer tool trims to the current machine time.

 Refer to the *Pro Tools Reference Guide* for details on Auto Spotting.

Counter Display

The Pro Tools Edit window counter displays the current machine (9-pin) or session time code location, depending on which device is the transport master.

Transport = Remote

When Pro Tools is online in 9-Pin Remote mode, many Pro Tools commands, including transport controls, are inactive. In this mode, Pro Tools responds to commands sent by the 9-pin master machine, including play, track arming, transport, and record commands. See Chapter 3, "Remote Mode."

When Pro Tools is offline, Pro Tools operates in local mode. In local mode, Pro Tools responds only to Transport window commands, and does not respond to commands from the 9-pin master. Pro Tools will respond to requests from the 9-pin master for machine type and status, and respond that it is in local mode.

Counter Display

The Pro Tools Edit window counter displays the current machine (9-pin) or session time code location, depending on which device is the transport master.

Toggling the Transport while Online

When online, toggling the transport control between Pro Tools and your Machine will also toggle their master and slave relationship.

Using the Transport

To play or cue your machine independently of Pro Tools:

- 1 Select Transport > Machine in the Pro Tools Transport window.
- 2 Make sure Pro Tools is not online (the Online button in the Transport window is not highlighted).
- 3 Click any of the buttons in the Pro Tools Transport window to control your machine.

Pro Tools always displays incoming LTC or 9-pin time in the Current Time field during fast-wind, and switches during playback to display the current positional reference.

To synchronize Pro Tools and machine playback from the Pro Tools Transport:

- 1 Select Transport > Pro Tools in the Pro Tools Transport window.

- 2 Put Pro Tools online.

- 3 Click Play in the Transport window.

If the tape in the machine is striped with time code that matches your Session time, the machine will locate to the position of the Pro Tools on-screen selection/insertion point or Memory Location (plus pre-roll), and begin playing back in sync.

Machine Remote Setting

If the Transport toggle will not stay in Machine mode, or if the toggle suddenly switches to Pro Tools mode from Machine mode, check your machine's Local/Remote setting. Pro Tools polls the connected machine periodically to check the status of the machine's Local/Remote setting and posts a message if a problem is detected.

Online Display Information

Several display elements of the Edit and Transport windows provide machine status information.

- ◆ When Pro Tools is online, the Transport online button flashes. "Waiting for Sync" will be displayed in the status box in the lower left corner of the Edit window.
- ◆ The online button continues to flash until you click Play and time code lockup occurs (all devices locked and responding in sync). The Time Code display in the Edit window shows the Machine Time when the machine is Master.
- ◆ Upon lockup, the display switches to show the session time. If your system doesn't lock up quickly enough, you may want to adjust your machine pre-roll. See "Machine Pre-Roll" on page 11 for more information.

Machine Cueing

MachineControl provides two cue modes for remote machine operation: search and hi-speed.

- ◆ In *search* mode, the tape remains laced during Fast Forward or Rewind.
- ◆ In *hi-speed* mode, the tape is unlaced before fast-forward/rewind. The Pro Tools Transport window indicates the status of the tape as described below.

Search Mode

In search mode, the tape is laced against the heads when the machine is paused or searching, and the Stop button stays lit (it does not flash) and the Play button flashes. When cueing in this mode, the Fast Forward or Rewind button also lights when searching in either direction.

A *Some devices, including several popular VHS decks, do not support a shuttle mode in which the tape stays laced. These decks unlace the tape before shuttling. Refer to your tape machine's user manual for more information.*

Hi-Speed Mode

In hi-speed mode, the tape is unlaced, and all Transport buttons turn off (none light or flash). While cueing in this mode, only the selected Fast Forward or Rewind button lights.

To fast-forward and rewind in search mode:

- 1 Select Transport > Machine in the Pro Tools Transport window.
- 2 Click Play in the Transport window or press the Spacebar to begin machine playback, then press the Spacebar again to pause the machine (this is to ensure that the tape is laced).
- 3 Click Fast Forward or Rewind in the Transport window to search the tape.

To fast-forward and rewind in hi-speed mode:

- 1 Select Transport > Machine in the Pro Tools Transport window.
- 2 Press Command+period or click Stop in the Transport window to unlace the tape.
- 3 Click Fast Forward or Rewind in the Transport window. The Pro Tools cursor indicates the current machine location.
- 4 Press the Spacebar to pause the machine.

A *Some devices may not support a shuttle mode, and will not accept the above shuttle commands. In these cases, the Fast Forward and Rewind buttons in the Pro Tools Transport window blink, and clicking them places the device in true Fast Forward /Rewind mode.*

Spotting to the Machine

To spot regions to the machine's current location, use Pro Tools Spot mode and/or Auto Spot (if using VITC). Refer to the *Pro Tools Reference Guide* for information on using Spot and Auto Spot mode to spot regions to SMPTE locations.

A *Auto Spot mode uses incoming VITC for location information. Therefore, Auto Spot mode will force the Region to be spotted to the current incoming machine time code location, not the current insertion cursor location. To spot your elements directly to the current cursor location, Control-drag (Macintosh) or Right-click and drag (Windows) the elements.*

chapter 5

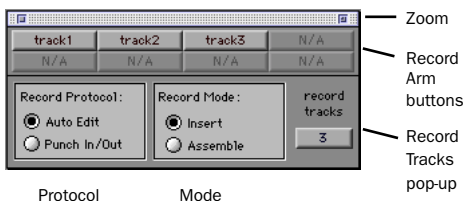
Remote Track Arming

Pro Tools with MachineControl provides the ability to arm audio or video tracks on external decks.

On MachineControl-equipped systems, the Show Machine Track Arming Window command is available in the Pro Tools Windows menu.

To display the Machine Track Arming Window:

- Choose Windows > Show Machine Track Arming Window.



Machine Track Arming window

Zoom Box

A zoom box is located in the upper right-hand corner of the Machine Track Arming window. In small view, only the Record Arms buttons appear. In large view, all other controls of the window are visible. Once you configure these other controls for your setup, you may find it convenient to leave the Track Arming window in small view, giving you access to just the Record Arm buttons.

Configuring Track Arming

Pro Tools provides automatic, direct support for track configuration of most common video decks. If your deck is supported, MachineControl will be able to identify and display your machine's particular track layout.

Even if your machine is not directly supported, the Track Arming window lets you designate the number of record tracks, arm the tracks, set the Record Protocol and configure the Record mode for the machine.



Not all machines support independent arming of their audio tracks locally or remotely. In addition, some machines require a separate utility menu selection. Pro Tools remote track arming cannot operate in these situations.

Identifying your Machine

If Pro Tools does not recognize your machine, you can use the generic1 personality. However, you should try a few test laybacks, using backup tapes or other non-vital material, to determine the best settings for your system.

▲ *If you are using the generic1 device personality, be sure to double-check record behavior using non-essential tapes before attempting to use MachineControl's remote track arming modes.*

Requesting additional machine profiles for Track Arming

If you would like Digidesign to facilitate auto-detection of a specific machine in an upcoming release, you can e-mail a request, including the manufacturer and machine model to *post-prod@digidesign.com*.

Configuring the Number of Tracks

Use the Record Tracks pop-up to specify the number of record tracks for the target deck. The maximum number of supported record tracks is eight. If you specify more record tracks than the machine possesses, they will be ignored.

If you are using a “generic” device personality, set the number of tracks to eight. Be sure to double-check track arming, as machines differ in how they will map arming commands.

After the number of record tracks is specified in the Record Tracks pop-up, the record-arming track buttons are active. The Record Arm buttons will be named with the appropriate machine-specific track name. The button text displays in red when armed.

Choosing a Record Protocol

The following two choices are available for configuring the recording protocol to be utilized by the target deck:

Auto Edit

This mode is a highly accurate way to ensure that the target deck will record only within the boundaries of an on-screen selection. (If your deck does not support Auto Edit, use Punch In/Punch Out, explained below.)

In this mode, the record start/end times are downloaded to the target deck (along with any pre- or post-roll), and the deck is responsible for performing the insert punch in/out at the specified times (see “Rules for On-Screen Selections” on page 25 for details).

Because this protocol removes the vagaries of CPU timing from the remote recording process, Auto Edit is frame-accurate. It is also the best way to ensure that your machine will punch out correctly and avoid accidental erasure of audio, even in the event of a CPU error.

Punch In/Out

This mode uses Pro Tools to control the process of punch in/out. Instead of downloading the punch points (as in Auto Edit), Pro Tools actually performs them during the record pass. Because serial communication has inherent delays, timing with Punch In/Punch Out mode cannot guarantee frame-accuracy (though it will almost always be within 2 to 3 frames).

Choosing a Record Mode

The Remote Track Arming window provides two choices for Record Mode:

Insert

This mode is used to perform insert editing (punching in individual tracks) where one or more audio tracks is replaced by new material and the video material is retained.



As a safety precaution, Pro Tools does not support arming of video for insert editing.

Assemble

Assemble mode should be used when you want to:

- ◆ Begin recording program onto a completely blank tape (unformatted)
- or –
- ◆ Append program to the remainder of a tape that already has program you wish to keep

Assemble mode is not appropriate for audio laybacks to video masters, for example.

Assemble mode should be used carefully because it arms *all* tracks on the target deck for recording—including the video track, time code track and control track. When performing an Assemble edit, all material on all tracks after the edit in point will be replaced. Because a break in the control track will result at the edit out point, any remaining program material after an Assemble edit may be unusable.

To avoid accidentally recording over program material, experiment with Assemble and Insert modes on a dispensable tape to familiarize yourself with the edit capabilities of your deck.

▲ *Assemble mode replaces all the elements on the target tape deck—audio, video and time code. Use this mode with caution.*

Rules for On-Screen Selections

The Record Protocol buttons allow you to choose between the two different record protocol choices described above (Auto Edit and Punch In/Punch Out). Regardless of which choice is used, however, Pro Tools follows these rules for record selection:

- ◆ If there is an on-screen selection, recording will take place over the period of the selection and punch out at the end of the selection.
- ◆ If pre/post roll is enabled, recording takes place only in the selection area, not during pre/post roll.
- ◆ If there is no selection (only a start location), recording will continue until it is manually stopped.
- ◆ If you make a selection in Pro Tools that crosses the “midnight” boundary (00:00:00:00), make sure your deck can handle this situation. Experiment with a dispensable tape to familiarize yourself with the crossover capabilities of your deck.

Using Remote Track Arming

The first step in using Remote Track Arming is to configure the parameters of the Track Arming window.

To configure Track Arming:

- 1 Make sure your machine is properly connected and configured to slave to Pro Tools as described in your MachineControl and Pro Tools Guides.
- 2 Make sure Transport = Machine.
- 3 Open the Track Arming window. If the entire window is not visible, click the zoom box.
- 4 Designate the number of record tracks using the Record Tracks popup. If you are using the generic device personality, set the number of record tracks to 8.
- 5 Select a Record Protocol (Auto Edit or Punch In/Out).
- 6 Select a Record Mode (Insert or Assemble).



Once the Track Arming parameters are configured, you can change the Track Arming window to “small view” and still see the track arm buttons.

To perform a layback:

- 1 In Pro Tools, select the audio to layback, or place the playback cursor at a start point.
- 2 In the Remote Track Arming window, arm the appropriate tracks.
- 3 Select Transport > Machine in the Pro Tools Transport window.
- 4 Click Record in the Transport window to arm recording.
- 5 Click Play in the Transport Window.

Your machine will cue to the selection start minus all relevant pre-roll, then begin to play back. Pro Tools will then sync to the deck, and the target deck will record as determined by your settings for Record Protocol and Record Mode. If you did not create an on-screen selection, deck recording will continue until you manually stop playback.

appendix a

Key Commands

Command	Macintosh	Windows
Rewind	Shift+<	
Fast Forward	Shift+>	
Shuttle Backward	Option+comma	Alt+comma
Shuttle Forward	Option+period	Alt+period
Toggle Transport Master	Command+\	Control+\
All Transport Buttons Off/Unthread Tape	Command+period	Control+period
Search Mode Toggle (Play-Pause/Stop)	Spacebar/Command+period	

When Transport = Machine:

Locate to Selection Start	Command+Left Arrow	Control+Left Arrow
Locate to Selection End	Command+Right Arrow	Control+Right Arrow
Locate to Selection Start Minus Preroll	Option+Left Arrow	Alt+Left Arrow
Locate to Selection End Minus Preroll	Option+Right Arrow	Alt+Right Arrow

Nudging:

Frame Bump Backward	Command+Option+comma	Control+Alt+comma
Frame Bump Forward	Command+Option+period	Control+Alt+period

Troubleshooting

Machine Not Recognized

Problem

The session was saved with MachineControl, but now opens without it being selected in the Transport window. When opening a session saved with MachineControl, a dialog warns there were “problems initializing MachineControl.” When spotting a region, the “Capture Machine Time” button is dimmed.

Possible Solutions

- ◆ Open the Peripherals dialog (Setups menu) and confirm that the correct port is chosen for MachineControl. Verify that the correct serial port is chosen in the Serial Port dialog (Setups menu). Make certain that the 9-pin serial cable is connected at both ends.
- ◆ If you are using the “Through” port on a MIDI interface, make sure that it is switched to “Through” and is powered on. To rule out a problem with the connection, remove the MIDI interface and connect the machine directly to the computer (unless the MIDI interface is being used for LTC-to-MTC conversion).
- ◆ Verify that the machine and any V-LAN interfaces are powered on. Try opening the Serial Ports dialog, reset the machine port and closing the dialog (doing this causes Pro Tools to scan the serial port for V-LAN or 9-pin).

- ◆ Make certain that a Digidesign-approved cable is being used for Sony 9-Pin applications. Do not use a standard modem cable.

Pro Tools Transport Not Controlling Machine

Problem

Though the MachineControl dialog indicates that Pro Tools recognizes the machine, nothing happens when you use the Transport in Pro Tools (the machine doesn’t respond to commands). When spotting a region using the “Capture Machine Time” button, an incorrect time is entered.

Possible Solutions

- ◆ Most machine controllable transports need to be placed in a “Remote” or “Ext” mode to allow them to be slaved to other devices. Verify that the device is in this mode. Refer to the documentation that came with your device for more information on Remote and Local modes.
- ◆ In the Transport window, check the status of the “Transport = Pro Tools” or “Transport = Machine” setting.
- ◆ If the machine protocol is V-LAN and there are multiple machines on the V-LAN network, choose Setups > Machine Setup and verify that the correct machine is selected in the pop-up menu.

Time Code Inaccuracy

Problem

The time code locations shown in the Selection and Position Indicator boxes do not match machine time code.

Possible Solutions

This problem can be caused by a number of things. Sometimes the Time Code times reported by machines are not in sync with the time code that gets played out of their time code ports. (One example of this is when the machine's time code reader is looking at VITC while Pro Tools is chasing LTC.)

- ◆ If the values get progressively farther and farther apart, check the frame rate. Make sure you have set Pro Tools to the same frame rate as the movie/machine frame rate. Also check the frame format (drop or non-drop).
- ◆ If the values differ by a significant margin (such as an hour or more), perhaps the Start Frame number isn't set correctly. Choose **Setup > Machine Setup** and check the Pro Tools Start Frame number.

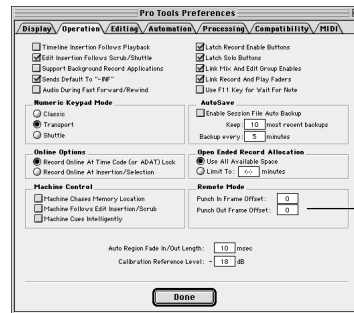
Remote Mode

Problem

While recording in Remote mode, Pro Tools is consistently a frame (or more) early, or late, for punch in or out.

Solution

Adjust the Punch In/Out frame offset. To do this, choose **Setup > Preferences > Operations** and configure the Remote Mode Offset settings.



Operation Preferences for MachineControl

Problem

Remote is mode unavailable, or doesn't seem to be recording.

Possible Causes and Solutions

- ◆ You must have a USD set to the proper frame and sample rate. You must also be in Generate mode and in Video Clock Reference.
- ◆ Make sure you have set Transport = Remote.
- ◆ Make sure the Pro Tools Online button is blue. If the Online button is blinking, Pro Tools is not properly communicating with the controller.

- ◆ Make sure Pro Tools is in QuickPunch mode.
- ◆ Make sure your track is armed. The track arming light must be red.
- ◆ Make sure the controller knows what machine is connected. Pro Tools in Remote mode defaults to 0x2025, which is a BVW-75. Make sure the controller is properly configured for a BVW-75 machine.

Problem

Pro Tools appears to be recording, but nothing is actually recorded to disk.

Solution

Make sure that your controller has record enabled Pro Tools. Some controllers require you to manually record enable the machine. If you don't do this, they will let you play back and appear as if recording is occurring, when in fact they don't actually send an Insert Edit command.

appendix c

Machine IDs

The following table lists the machine profiles supported in MachineControl, by their Pro Tools hex ID.

Not included are special IDs to support 48-track arming support.

Machines and Hex ID Numbers

The first 0x signifies hex value. The next four numbers is the machine ID. The name of the associated machine follows.

Machines, by ID number

ID number	Machine
0x0000	Generic
0x1000	BVU-800
0x101C	BVU-950
0x1019	BVU-920
0x1080	BVU-900
0x104C	VO-9850
0x1048	VO-9800
0x102C	SV0-9600
0x2000	BVW-10
0x2001	BVW-40
0x2002	BVW-11
0x2003	BVW-15
0x2010	BVW-35
0x2020	BVW-60

Machines, by ID number

ID number	Machine
0x2021	BVW-65
0x2022	BVW-95
0x2023	BVW-96
0x2024	BVW-70
0x2025	BVW-75
0x2125	BVW-75P
0x4000	DVR-10
0x4003	DVR-18
0x4002	DVRC-10
0x4020	DVR-20
0x4022	DVR-28
0xF019	AJ-D350 (D3)
0x3011	DVR-2100
0x3000	DVR-1000
0x0010	BVH-2000
0x0011	BVH-2000
0x0110	BVH-2000 PS
0x0111	BVH-2000 PS
0x0018	BVH-2180
0x0020	BVH-2500
0x0120	BVH-2500 PS
0x0030	BVH-2700
0x0040	BVH-2800

Machines, by ID number

ID number	Machine
0x0048	BVH-2830
0x0050	BVH-3000 (NTSC)
0x0060	BVH-3100 (NTSC)
0x0150	BVH-3000 PS
0x0160	BVH-3100 PS
0x2041	PVW-2800
0x1211	ASC Virtual Recorder
0x1011	Fostex D-10
0xF027	Otari R-DAT
0x7001	TASCAM DA-88
0xF01D	TASCAM DA-88
0x7003	PCM-800
0x7000	PCM-7000
0xA088	AG-DS555
0x2051	UVW-1800
0xB000	DVW-500
0xB010	DVW-500
0xA050	V1
0x2124	BCB-70
0x2101	BVW-40P
0x2141	PVW-2800P

appendix d

9-Pin Cable Pinouts

Remote Mode 9-Pin Cable

Digidesign PN 918008813-00

Mini-8 wired to D-sub pins 9 and 1.

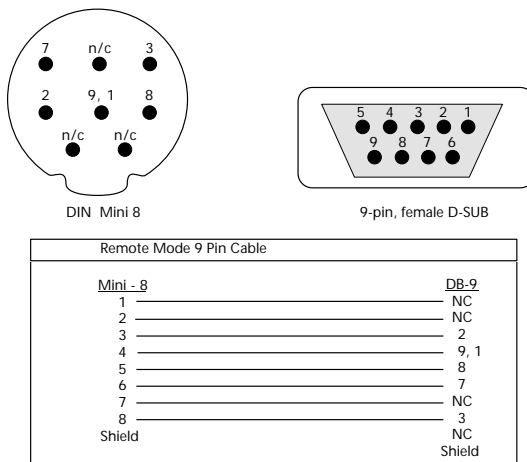
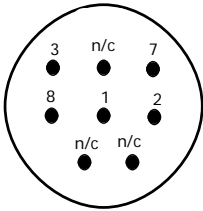


Figure 1. MachineControl Remote Mode 9-Pin Cable pinout

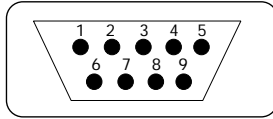
Shielding

The outside shielding of the D-Sub 9 (female) should be wired to the outside shielding of the Mini DIN 8 (male). *Note: the original graphic in this document reversed the D-SUB Pinouts. Corrected Nov. 8, 2001*

Serial Control 9-Pin Cable



DIN Mini 8



9-pin, male D-SUB

Serial Control Cable	
<u>Mini - 8</u>	<u>DB-9</u>
1	NC
2	NC
3	8
4	1
5	2
6	3
7	NC
8	7
Shield	NC
	Shield

V-Lan Pin Configuration	
<u>Mini - 8</u>	<u>DB-9</u>
1	NC
2	NC
3	2
4	1
5	8
6	7
7	NC
8	3
Shield	NC
	Shield

Figure 2. MachineControl Serial Control 9-Pin Cable pinouts

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