Smart Research Ltd

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2TOOLS™ MANUAL

For use with version 1.4U software.   20 April 2005

Revision History
Revision 17 additions for OSX and PT v6.7
Revision 16 Revision for v1.4U - Factory fitted ROM.
Revision 15.1 SSL page revised.
Revision 15 Imported new graphical illustrations.
Revision 14 Updated SSL pages.
Revision 12 Incorporating *PROTOOLS™* version 5.1 screen shots.
Revision 10 First production release of manual.

CONTENTS

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1. BASIC SYSTEM DIAGRAM

- 2TOOLS™ takes parallel transport switch closures from mixing consoles and turns them into Transport control messages (via MIDI MACHINE CONTROL or RS422.)

- 2TOOLS™ translates transport information from systems such as *PROTOOLS™* into tach, direction & lamp signals, for mixing consoles and their associated automation systems.

Mixing Console, e.g SSL E/G Series

Parallel cable (for Switch closures and Lamps) and/or Serial data for NEVE FF etc.

MIDI MACHINE CONTROL, (and/or 9 pin (P2) etc.) for direct transport control.

One Transport e.g.
PROTOOLS™

2. 2TOOLS

2.1 2Tools Front Panel Controls - V1.4U
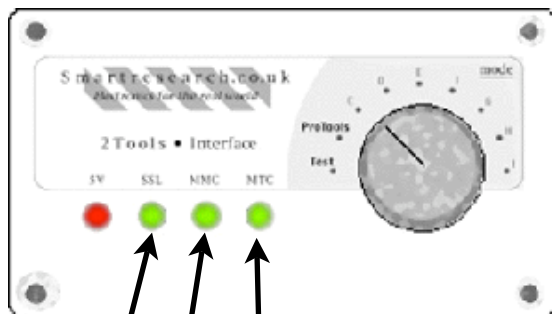
Rotary Switch Settings:
Test--------   Lamp & Switch Tests
ProTools---   *PROTOOLS™*
C ------------   trial setting MMC
D ------------   trial setting 9 pin (P2)
E ------------   trial setting 9 pin (using Pause)
F ------------   *PROTOOLS™*
G -----------   not defined in this version
H -----------   not defined in this version
I ------------   not defined in this version

MTC LED
Indicates that MIDI TIME CODE (MTC) is being received. Flashing indicates syncing or intermittent MTC, solid indicates good MTC.

MMC LED
Indicates a valid MIDI MACHINE CONTROL or *PROTOOLS™* message (reply) was received.

CONSOLE (SSL) LED
Indicates when a transport switch has been detected. The LED stays on while the switch is closed and goes out when switch is released. When interfaced to a serial Mixing Console (e.g. NEVE FF) the CON LED will flash when receiving any messages.
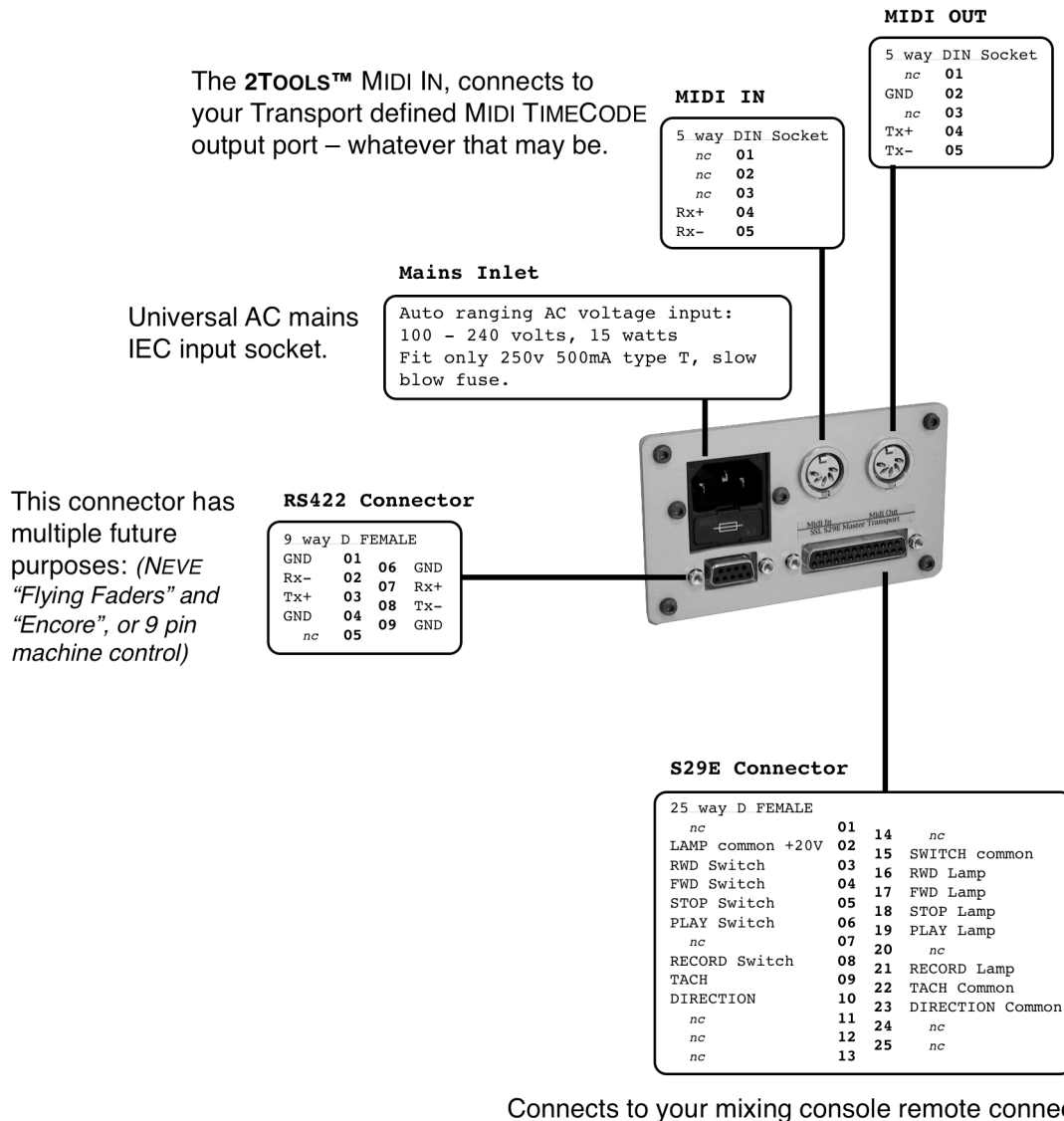
WHAT DO THE VARIOUS SETTINGS DO?

Except for testing, this control would normally be left set in the chosen mode for your setup:

Test	This shuts down all communication and flashes the LEDS on 2TOOLS™ and SSL transport lamps, the sequence of these indicates the software version. *see Appendix B.* The switches can be manually tested and the lamps are held in the state of the switch press. This mode can also be used to 'reset' any downloaded software running in RAM.
ProTools	In this mode MIDI MACHINE CONTROL messages are used to produce the PLAY, STOP and wind functions, and MIDI CONTROLLER messages for RECORD. In play, 2TOOLS™ locks the TACH output signal to the incoming MTC.
C	(*preliminary trial setting only*) In this mode MIDI MACHINE CONTROL messages are used to control an MMC transport. (DA88 etc.)
D	(*preliminary trial setting only*) Here standard 9 pin control protocol messages are used to control a 9 pin compatible transport via the **RS422** connector. (MFX-3, RADAR 1&2, Betacam, 3348 etc.)
E	(*preliminary trial setting only*) As **D** but using Pause in place of Stop.
F	Optional. As *PROTOOLS™* above but sends slower MIDI messages. This helps avoid filling up *PROTOOLS™* MIDI buffer if the system is busy. Also, avoids sending some stop commands, improving 'timeline follows insertion' issues.

2.2 2Tools - Rear Panel And Connectors

The **2TOOLS™** MIDI OUT, connects to your Transport defined MIDI MACHINE CONTROL input port. It supplies the MMC and additional MIDI messages to your Transport.

The **2TOOLS™** MIDI IN, connects to your Transport defined MIDI TIMECODE output port – whatever that may be.

MIDI OUT

```
5 way DIN Socket
  nc    01
GND     02
  nc    03
Tx+     04
Tx-     05
```

MIDI IN

```
5 way DIN Socket
  nc    01
  nc    02
  nc    03
Rx+     04
Rx-     05
```

Mains Inlet

Universal AC mains IEC input socket.

```
Auto ranging AC voltage input:
100 - 240 volts, 15 watts
Fit only 250v 500mA type T, slow
blow fuse.
```

This connector has multiple future purposes: *(NEVE "Flying Faders" and "Encore", or 9 pin machine control)*

RS422 Connector

```
9 way D FEMALE
GND     01
Rx-     02    06  GND
Tx+     03    07  Rx+
GND     04    08  Tx-
  nc    05    09  GND
```

S29E Connector

```
25 way D FEMALE
  nc                01    14    nc
LAMP common +20V    02    15  SWITCH common
RWD Switch          03    16  RWD Lamp
FWD Switch          04    17  FWD Lamp
STOP Switch         05    18  STOP Lamp
PLAY Switch         06    19  PLAY Lamp
  nc                07    20    nc
RECORD Switch       08    21  RECORD Lamp
TACH                09    22  TACH Common
DIRECTION           10    23  DIRECTION Common
  nc                11    24    nc
  nc                12    25    nc
  nc                13
```

Connects to your mixing console remote connector.

NOTE: There are two versions of the rear panel. The later version (not shown) has an ON/OFF switch and the MIDI connectors are in slightly different positions. Both versions are fully compatible.

3. SSL E/G SERIES

3.1 SSL E/G Installation

1. Attach the supplied 25 way D cable from 2TOOLS™ to the SSL CONSOLE REMOTE (MASTER REMOTE S29E - usually found under the SSL patchbay).
2. Patch the LTC (SMPTE) output from your transport to the SSL READER INPUT on the patchbay.

SSL 4000, 6000.
with E or G Series
Automation System

TIMECODE PATCHING
The SSL Automation System needs to see LTC (timecode) from your transport when in play.This is achieved by taking LTC out from your transport to the SSL patchbay - READER INPUT.Timecode should only be active to the SSL when your transport is in play.

25 way cable. (supplied)
see Appendix C

LTC output (Timecode / SMPTE) to
SSL patchbay. (SMPTE Reader)

Transport e.g.
PROTOOLS™

TACH & DIRECTION
At play speed 2TOOLS™ generates frame rate tach pulses for the SSL, based on the incoming MTC from the connected transport.

Wind speed tach and direction (FFWD and FRWD) are derived from the virtual tape machine (within 2TOOLS™) which in turn controls the wind speed of the Transport, and is located by the SSL Automation System. In some of the rotary switch settings the Transport will control its own wind speed.

S29E
The SSL Automation System gets tach & direction signals from 2TOOLS™ via the S29E cable (a male 25 connector usually under the console patchbay).

The 5 transport switches and lamps can be tested to check the correct connections have been made by using 2TOOLS™ TEST MODE. see Section 2.

3.2 SSL E/G Computer Setup

To connect 2TOOLS™ to the SSL **E** or **G** series computers as a normal tape machine, you need to set up a new SSL Master Tape Machine page. Here are the best settings we have found:

E SERIES MASTER MACHINE PAGE

```
Autolocate type               | 3
Autolocate decision interval  | 0.02
Forward direction sense (L/H)  | LOW
Multi play speeds (Y/N/S)?    | NO
Pulses/second at 15 ips
or at std. Play speeds        | 25/30/24
Target window                 | 1.00
Drop-out command type         | 1
Drop-in command type          | 1
Drop-in rehearse hold-off     | 8
Time for machine to startup   | 3.00
Time before sure tape stopped | 0.10
Pessimism factor (fwd)        | 150
Pessimism factor (bkwd)       | 150
Short locate time (secs)      | 1
Max stopping distance         | 0
```

G SERIES MASTER MACHINE PAGE

The SSL G series is very similar to E series, with the exception of the frame rate setting.

```
Autolocate type               | 3
Autolocate decision interval  | 0.02
Forward direction sense (L/H)  | LOW
Multi play speeds (Y/N/S)?    | NO
Pulses/second at std. Speed   | FRAME
Target window                 | 1.00
Drop-out command type         | 1
Drop-in command type          | 1
Time for machine to startup   | 3.00
Time before sure tape stopped | 0.10
Pessimism factor (fwd)        | 150
Pessimism factor (bkwd)       | 150
Short locate time (secs)      | 1
Max stopping distance         | 0
Frames to stop from play      | 0.10
Frame jog card fitted         | NO
```
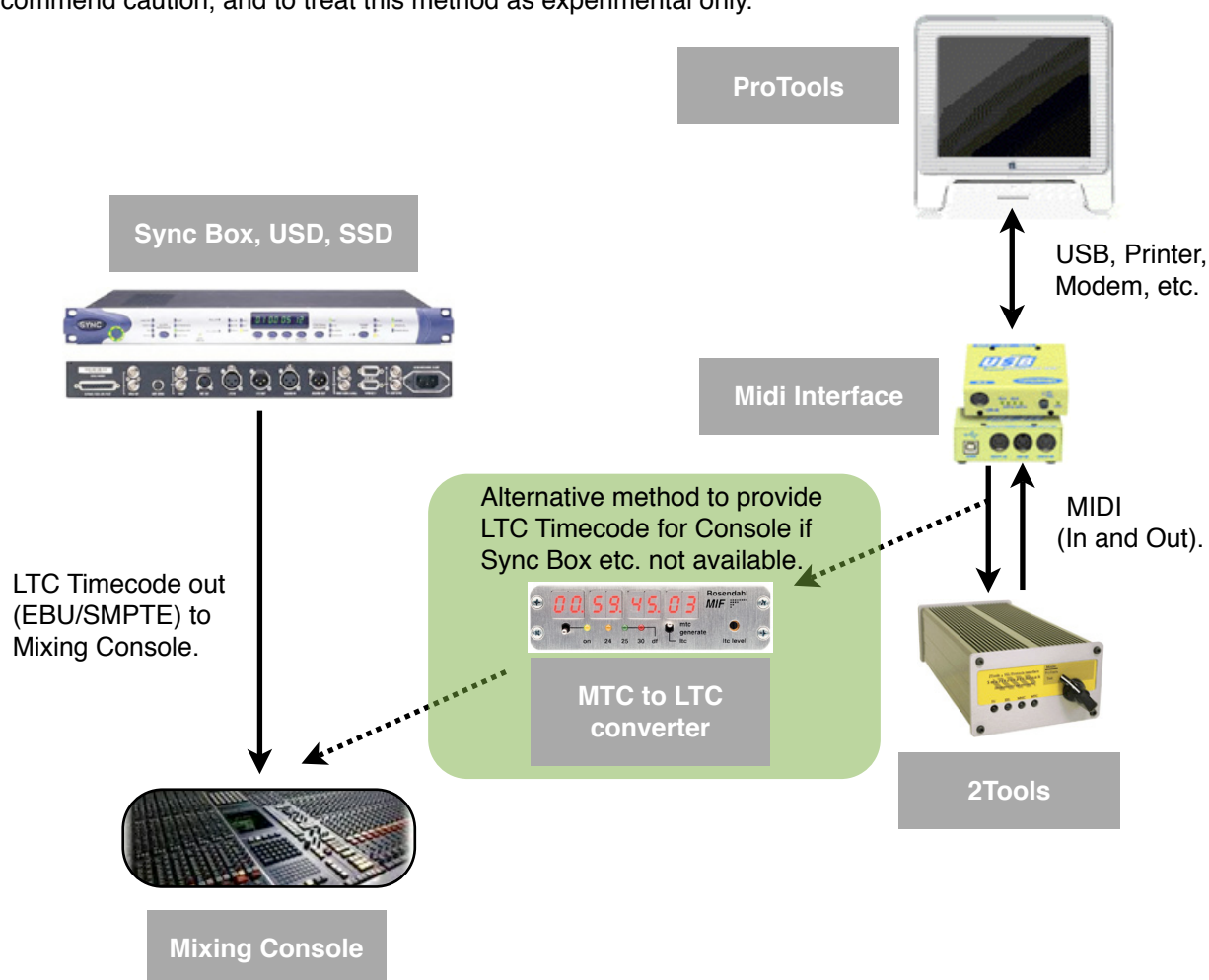

NOTE: Make sure that the SSL **TAPE ENABLE** button is selected (this is located close to the **RECORD ENABLE** button).

4. PROTOOLS

4.1 ProTools Overview And Connections

Your *PROTOOLS™* system will need both MIDI IN and OUT connections set up via a suitable MIDI interface. Timecode will also need to be derived from *PROTOOLS™* to feed to the console's LTC reader input. Normally, the LTC generated by an HD SYNC UNIT; SSD; or USD is used.

If a Sync Box or USD etc. is not available, it may also be possible to use an external device to generate LTC timecode from the MIDI TIME CODE from *PROTOOLS™*. However, we   would recommend caution, and to treat this method as experimental only.

ProTools

USB, Printer, Modem, etc.

Sync Box, USD, SSD

Midi Interface

MIDI
(In and Out).

Alternative method to provide LTC Timecode for Console if Sync Box etc. not available.

LTC Timecode out (EBU/SMPTE) to Mixing Console.

MTC to LTC converter

2Tools

Mixing Console

The computer running *PROTOOLS™* will need midi configuring to and from 2TOOLS™. If you are using Apple **OSX**, see **section 4.3** for 'AUDIO MIDI SETUP' , or for Apple **OS9**, you may need the 'OMS' **section 4.2**.
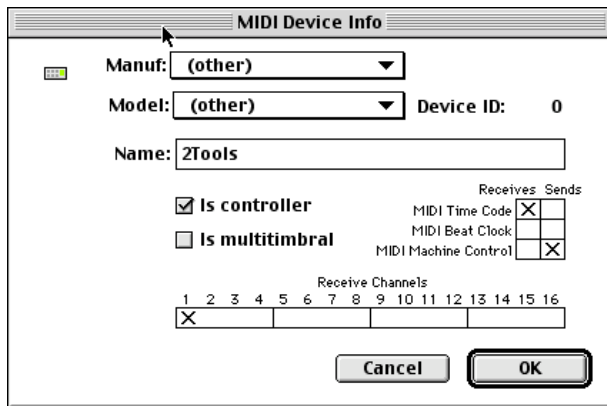
Sections 4.4 onward detail setting up different versions of *PROTOOLS™*. Refer to the one section that suits your software.

Chose one of the two *PROTOOLS™* settings on the rotary switch on 2TOOLS™, and leave it set for normal operation.
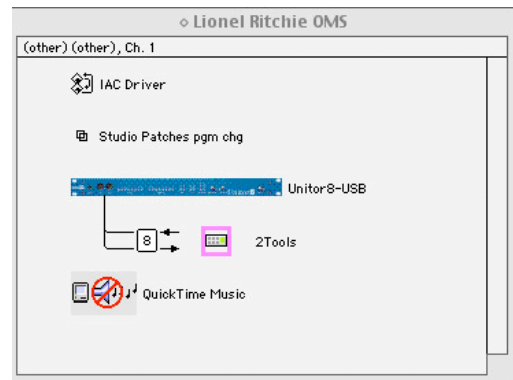
4.2 Apple OS9 - OMS Studio Setup

If you are using OS9 and OMS for Midi; create a new MIDI device to add 2TOOLS™ to your 'Studio setup':

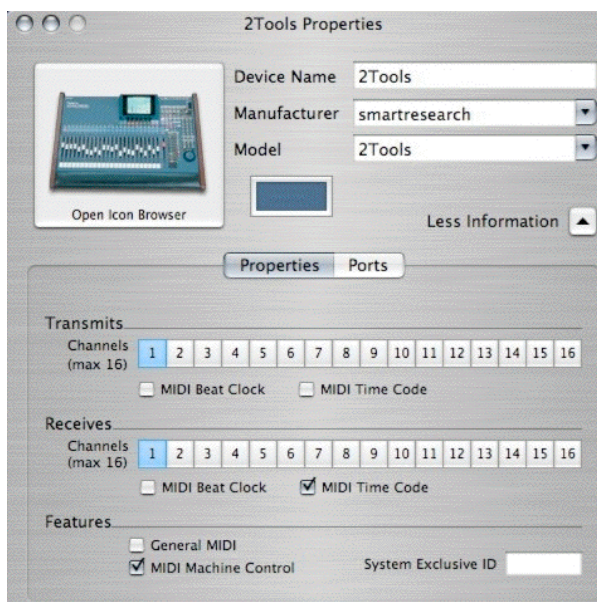Example Setup - OMS Studio Setup - new device...   OMS Midi Setup - enable your port...
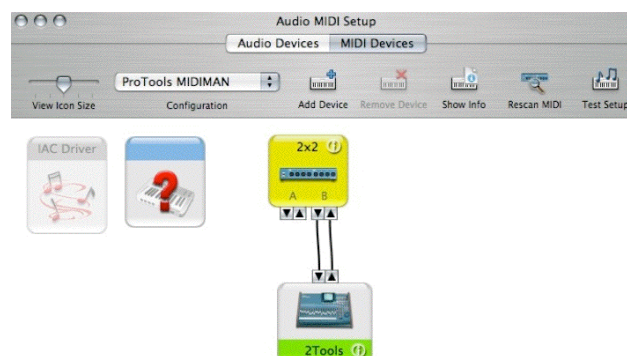

4.3 Apple OSX - AUDIO MIDI SETUP

For OSX users, open 'AUDIO MIDI SETUP'.Then, create a new device for 2TOOLS™:

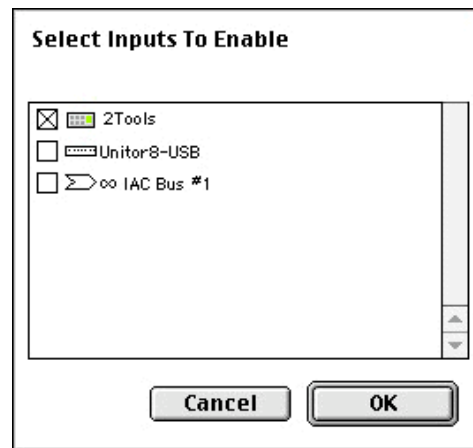Setup midi properties like this:

And connect 2Tools to your midi interface to enable. This example uses a Midiman 2x2 interface:
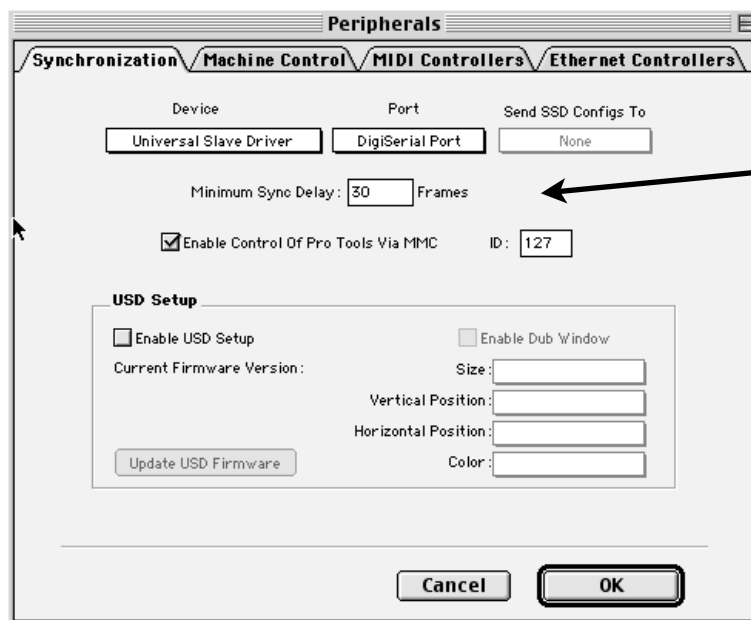
4.4 ProTools TDM (v5.2)

First, ENABLE THE MIDI INPUT !

Make sure *PROTOOLS™* Midi is enabled thus:

Select Inputs To Enable

- ☒ 🔲 2Tools
- ☐ 🔲 Unitor8-USB
- ☐ ∑∞ IAC Bus #1

Cancel   OK

PERIPHERALS PAGES:

Peripherals

/Synchronization\/Machine Control\/MIDI Controllers\/Ethernet Controllers\

| Device | Port | Send SSD Configs To |

Universal Slave Driver   DigiSerial Port   None

Minimum Sync Delay: 30 Frames

☑ Enable Control Of Pro Tools Via MMC   ID: 127

USD Setup

☐ Enable USD Setup   ☐ Enable Dub Window

Current Firmware Version: Size:

Vertical Position:

Horizontal Position:

Update USD Firmware   Color:

Cancel   OK

Ensure that *PROTOOLS™* MMC is enabled, and that USD etc. is setup correctly.

Peripherals

/Synchronization\/Machine Control\/MIDI Controllers\/Ethernet Controllers\

MIDI Machine Control
Send To   ID
☐ Enable   Mini MacMan   127
Preroll: 90 frames

9-Pin Serial
Port   Machine Type   Node
☐ Enable   None   Sony 9-Pin
Preroll: 150 frames
☐ Use Serial Time Code For Positional Reference
(Requires USD Using Video Clock Reference)

9-Pin Remote
Port   Machine ID
☐ Enable   None   0 0000   ☐ Ignore Track Arming

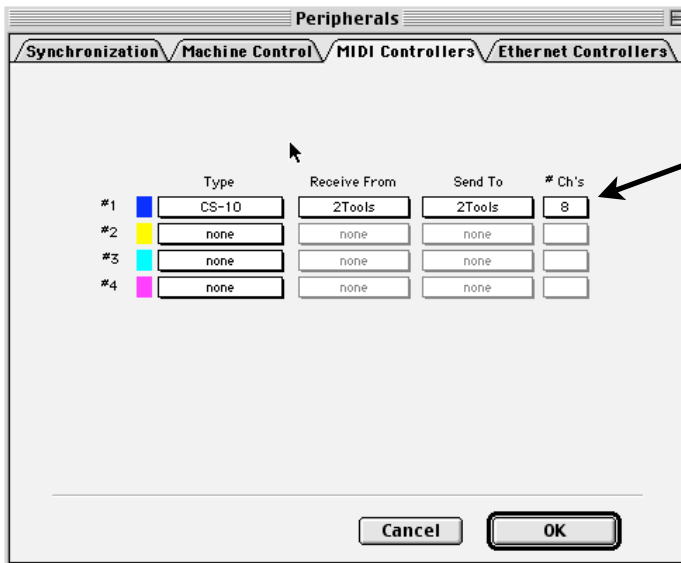Cancel   OK

Turn off (Disable) MMC for controlling external machines…
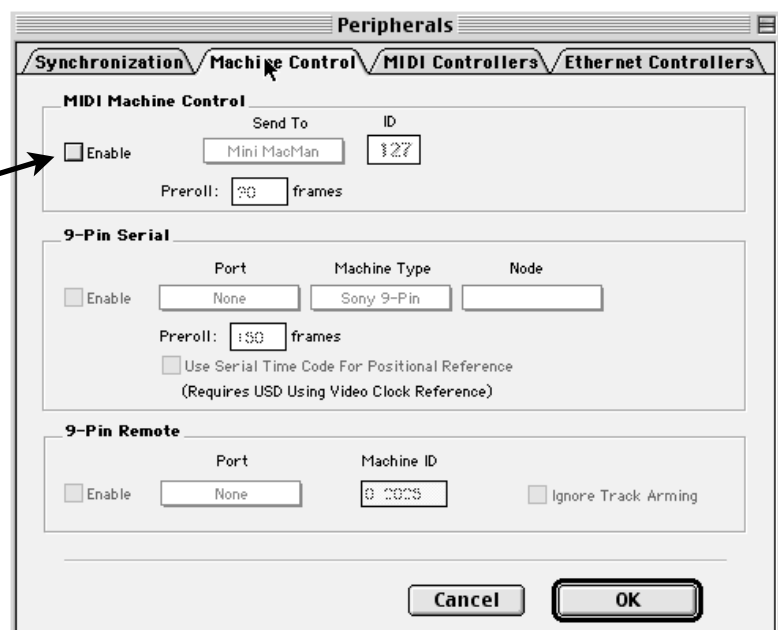
Enable CS-10 for Record.

Because *PROTOOLS™* does not currently support record functions using MMC, 2TOOLS™ emulates this hardware controller for record functions.

SESSION SETUP WINDOW:
In the session setup menu, timecode needs to be <u>set to generate</u>, using the SSD or USD.
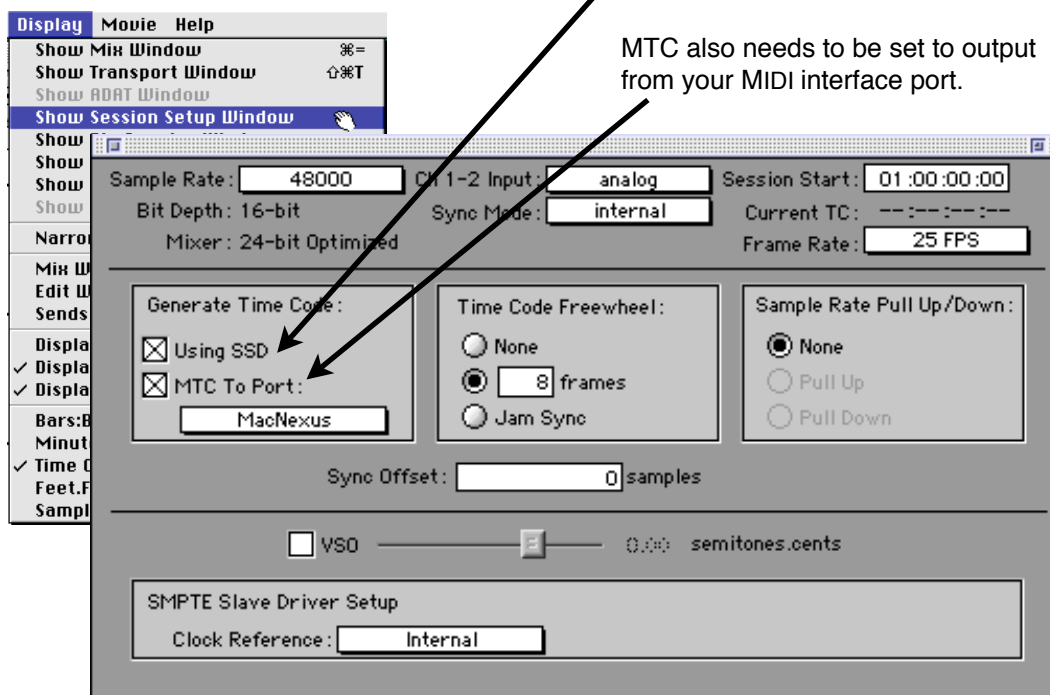
MTC also needs to be set to output from your MIDI interface port.

RECORD MODE
The QuickPunch mode needs to be set to allow record (from the 2TOOLS™ parallel remote transport keys) to work properly.

WARNING:
If "Loop Playback" is used the Automation computer will have problems locating *PROTOOLS™*

4.5 ProTools HD (v5.3.1)

First, ENABLE THE MIDI INPUT !

Make sure *PROTOOLS™* Midi is enabled thus:

Select Inputs To Enable

☒ 2Tools
☐ Unitor8-USB
☐ ∞ IAC Bus #1

Cancel   OK

PERIPHERALS PAGES:

Peripherals

/ Synchronization \/ Machine Control \/ MIDI Controllers \/ Ethernet Controllers \/ Mic Preamps \

Device   Port
SYNC I/O   DigiSerial Port

Minimum Sync Delay: 30   Frames

☑ Enable Control Of Pro Tools Via MMC   ID: 127

SYNC I/O Setup

☑ Enable SYNC I/O Setup   ☑ Enable Dub Window
Current Firmware Version: 1.0.2   Size: Large
                        Vertical Position: 20% From Bottom
                        Horizontal Position: Center
[Update SYNC I/O Firmware]   Color: White on Black Bkgnd

Cancel   OK

Ensure that *PROTOOLS™* MMC is enabled, and sync i/o set up correctly.

Peripherals

/ Synchronization \/ Machine Control \/ MIDI Controllers \/ Ethernet Controllers \/ Mic Preamps \

MIDI Machine Control
                  Send to   ID
☐ Enable   Unavailable   127
        Preroll: 30   frames

9-Pin Serial
            Port   Machine Type   Node
☐ Enable   None   Sony 9-Pin
        Preroll: 150   frames
☐ Use Serial Time Code For Positional Reference
        (Requires SYNC I/O Using Video Clock Reference)

9-Pin Remote
            Port   Machine ID
☐ Enable   None   BVW-75 (NTSC)   ☐ Ignore Track Arming

Cancel   OK

Disable MMC for controlling external machines…

Peripherals

Synchronization \ Machine Control \ **MIDI Controllers** \ Ethernet Controllers \ Mic Preamps

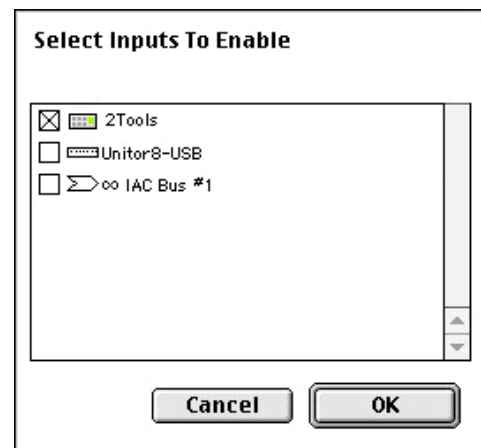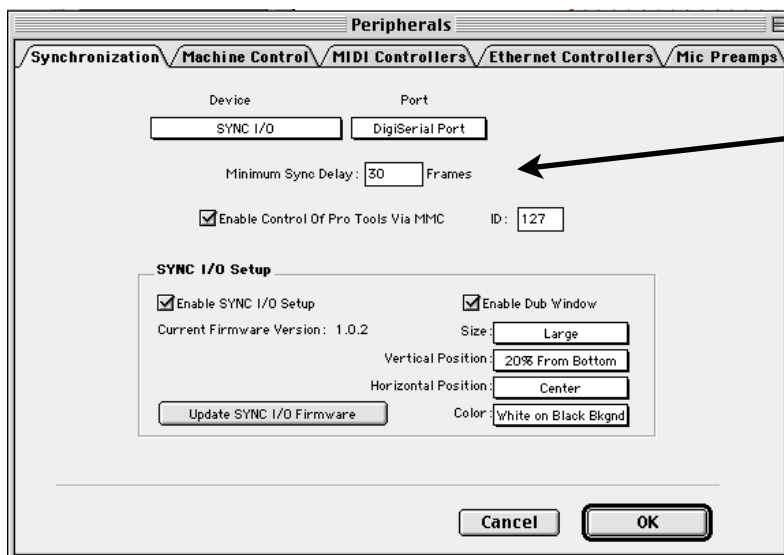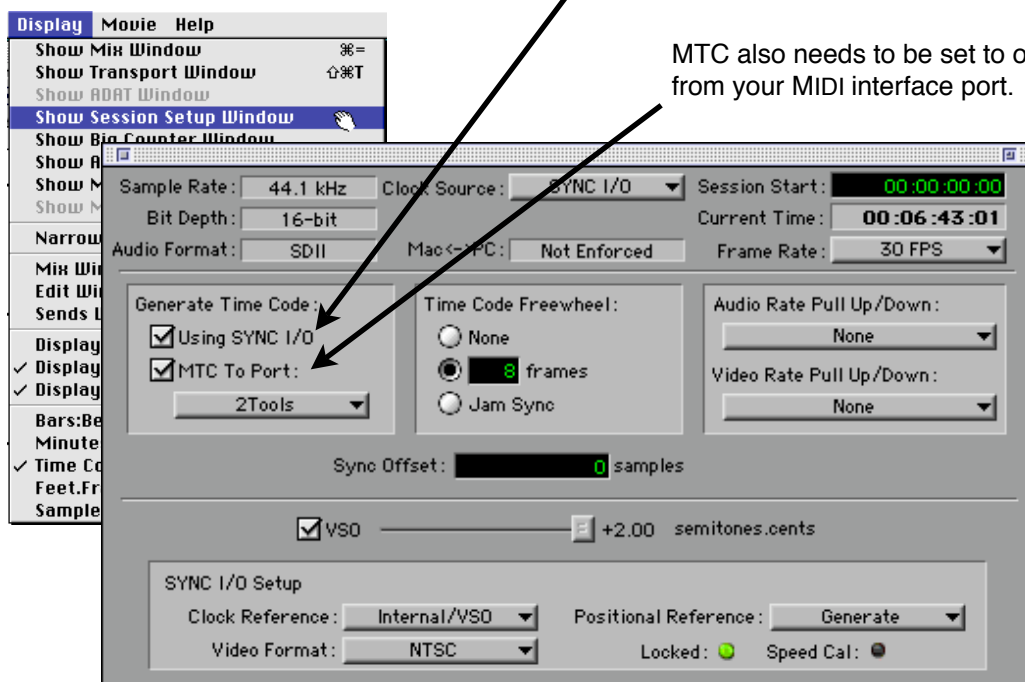|	Type	Receive From	Send To	# Ch's
#1	CS-10	007	007	8
#2	none	none	none	
#3	none	none	none	
#4	none	none	none	

Cancel   OK

Enable CS-10 for Record.

Because *PROTOOLS™* does not currently support record functions using MMC, 2TOOLS™ emulates this hardware controller for record func-

SESSION SETUP WINDOW:
In the session setup menu, timecode needs to be <u>set to generate</u>, using the SSD or USD.

Display Movie Help

Show Mix Window	⌘=
Show Transport Window	⇧⌘T
Show ADAT Window	
Show Session Setup Window	👆
Show Big Counter Window	
Show A	
Show M	
Show M	
Narrow	
Mix Wi	
Edit Wi	
Sends	
Display	
✓ Display	
✓ Display	
Bars:Be	
Minute	
✓ Time Co	
Feet.Fr	
Sample	

MTC also needs to be set to output from your MIDI interface port.

Sample Rate: 44.1 kHz   Clock Source: SYNC I/O ▼   Session Start: 00:00:00:00
Bit Depth: 16-bit   Current Time: 00:06:43:01
Audio Format: SDII   Mac<->PC: Not Enforced   Frame Rate: 30 FPS ▼

Generate Time Code:
☑ Using SYNC I/O
☑ MTC To Port:
   2Tools ▼

Time Code Freewheel:
○ None
◉ 8 frames
○ Jam Sync

Audio Rate Pull Up/Down:
   None ▼

Video Rate Pull Up/Down:
   None ▼

Sync Offset: 0 samples

☑ VSO ————————— +2.00 semitones.cents

SYNC I/O Setup
Clock Reference: Internal/VSO ▼   Positional Reference: Generate ▼
Video Format: NTSC ▼   Locked: 🟢   Speed Cal: ⚫

Options Setups Display Mov

Destructive Record	
Loop Record	
✓ QuickPunch	⇧⌘P
Auto Input Monitor	
✓ Input Only Monitor	
Online	⌘J
Pre/Post-Roll Playback	⌘K
Loop Playback	⇧⌘L
✓ Mute Frees Voice	
Auto-Spot Regions	⌘P
✓ MIDI Thru	
Active In Background	
Pre-Fader Metering	

RECORD MODE
The QuickPunch mode needs to be set to allow record (from the 2TOOLS™ parallel remote transport keys) to work properly.

WARNING:
If "Loop Playback" is used the Automation computer will have problems locating *PROTOOLS™*
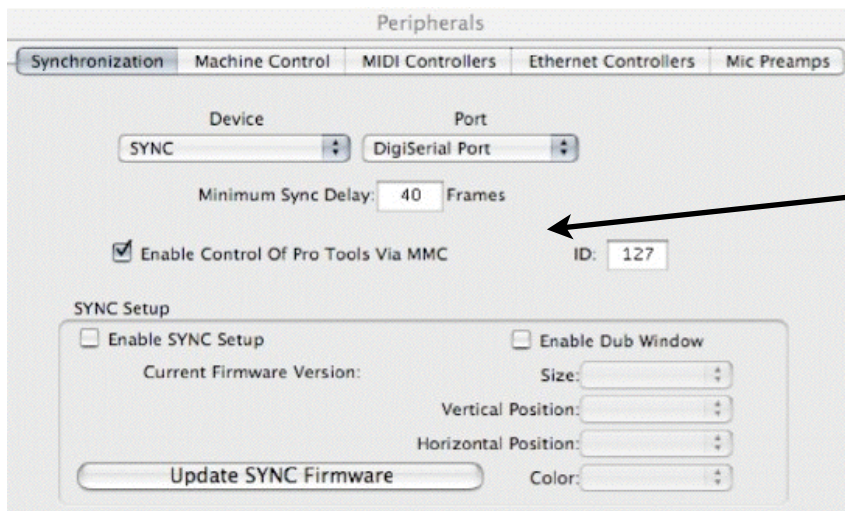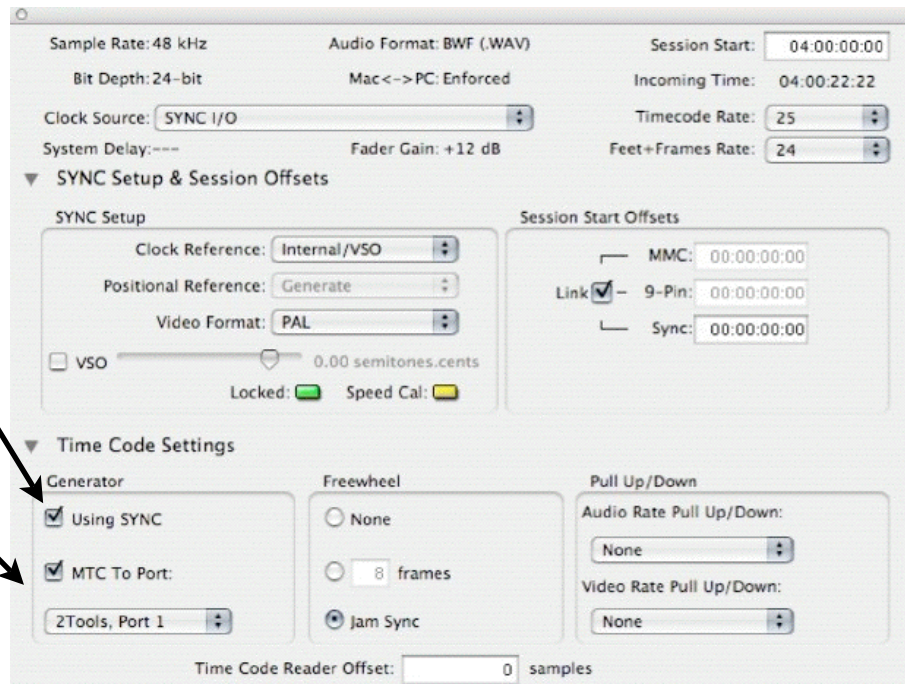
4.6 ProTools HD (v6.7)

SESSION SETUP WINDOW:

The Session Window sets
Time Code options. 'Time-
code Rate' should agree with
your Console's settings.

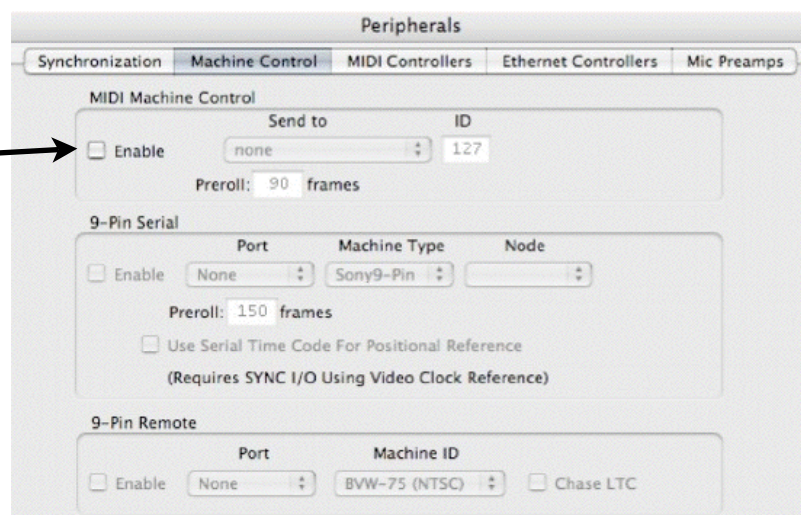Enable LTC Timecode from
the SYNC unit for your Con-
sole.

Enable MTC from your MIDI
output port to the 2Tools in-
put. (When PROTOOLS™ is
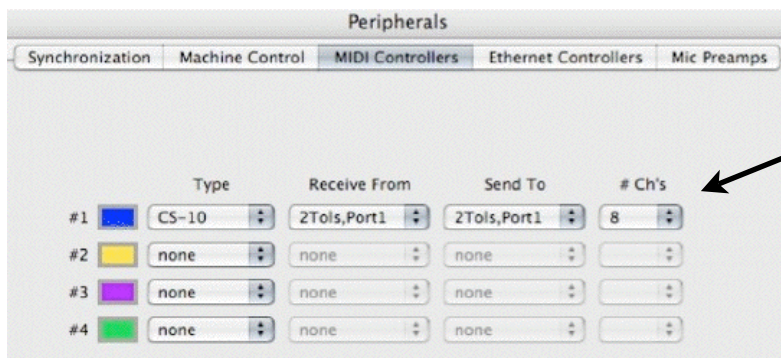in play, the 2Tools MTC LED
should light).

PERIPHERALS-PAGES:

| Sample Rate: 48 kHz | Audio Format: BWF (.WAV) | Session Start: 04:00:00:00 |
| Bit Depth: 24-bit | Mac<->PC: Enforced | Incoming Time: 04:00:22:22 |

Clock Source: SYNC I/O   Timecode Rate: 25
System Delay:---   Fader Gain: +12 dB   Feet+Frames Rate: 24

▼ SYNC Setup & Session Offsets

SYNC Setup

Clock Reference: Internal/VSO
Positional Reference: Generate
Video Format: PAL

☐ VSO   0.00 semitones.cents
Locked: ▢   Speed Cal: ▢

Session Start Offsets

MMC: 00:00:00:00
Link ☑ 9-Pin: 00:00:00:00
Sync: 00:00:00:00

▼ Time Code Settings

Generator
☑ Using SYNC
☑ MTC To Port:
2Tools, Port 1

Freewheel
○ None
○ 8 frames
◉ Jam Sync

Pull Up/Down
Audio Rate Pull Up/Down:
None
Video Rate Pull Up/Down:
None

Time Code Reader Offset: 0 samples

Peripherals

Synchronization | Machine Control | MIDI Controllers | Ethernet Controllers | Mic Preamps

Device   Port
SYNC   DigiSerial Port

Minimum Sync Delay: 40 Frames

☑ Enable Control Of Pro Tools Via MMC   ID: 127

SYNC Setup
☐ Enable SYNC Setup   ☐ Enable Dub Window
Current Firmware Version: Size:
                                 Vertical Position:
                                 Horizontal Position:
Update SYNC Firmware   Color:

Ensure that control of
PROTOOLS™ via MMC is
enabled, and that the
Sync i/o is setup cor-
rectly.

Peripherals

Synchronization | Machine Control | MIDI Controllers | Ethernet Controllers | Mic Preamps

MIDI Machine Control
              Send to   ID
☐ Enable   none   127
    Preroll: 90 frames

9-Pin Serial
          Port   Machine Type   Node
☐ Enable None   Sony9-Pin
    Preroll: 150 frames
    ☐ Use Serial Time Code For Positional Reference
    (Requires SYNC I/O Using Video Clock Reference)

9-Pin Remote
          Port   Machine ID
☐ Enable None   BVW-75 (NTSC)   ☐ Chase LTC

Disable MMC for
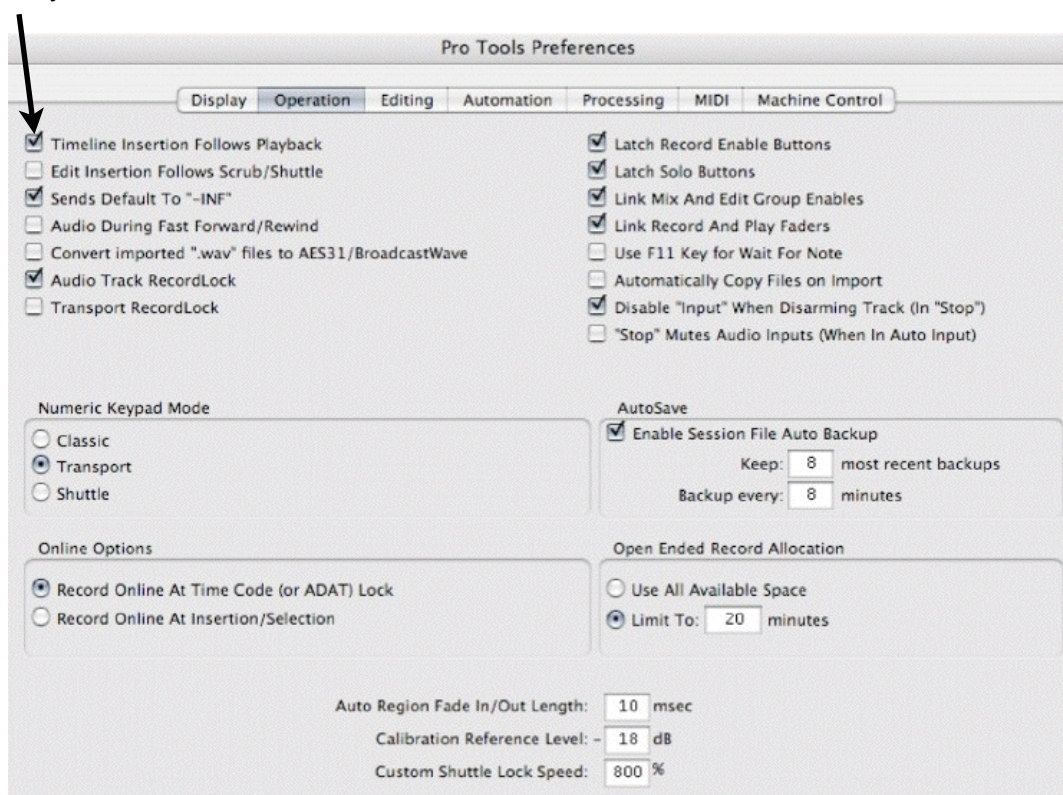controlling external
machines…

Enable CS-10 for Record.

Because *PROTOOLS™* does not currently support record functions using MMC, 2TOOLS™ emulates this hardware controller for record functions.

PREFERENCES-PAGES:

On the 'Operation' tab from 'Preferences' select Timeline Insertion Follows Playback. This is the key to TAPE MACHINE style control from the desk.

None of the other preferance pages should contain settings relevant to 2Tools, except that 'Machine Control' options should not be selected.
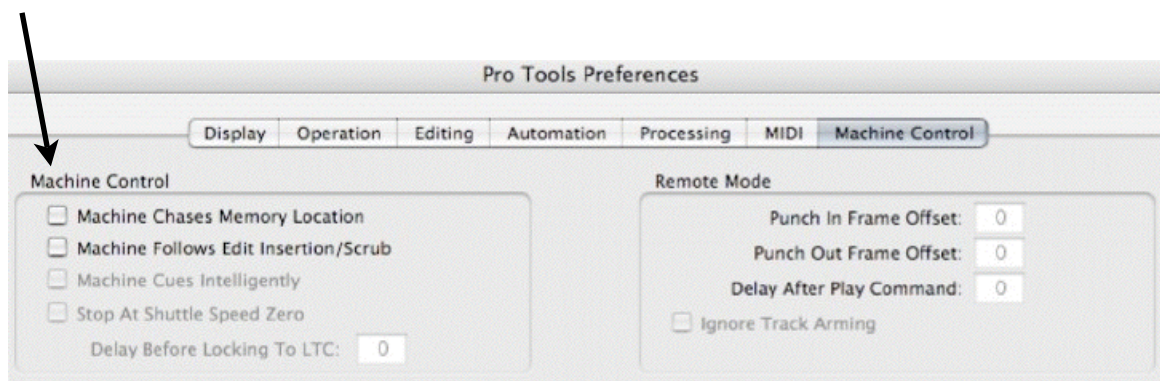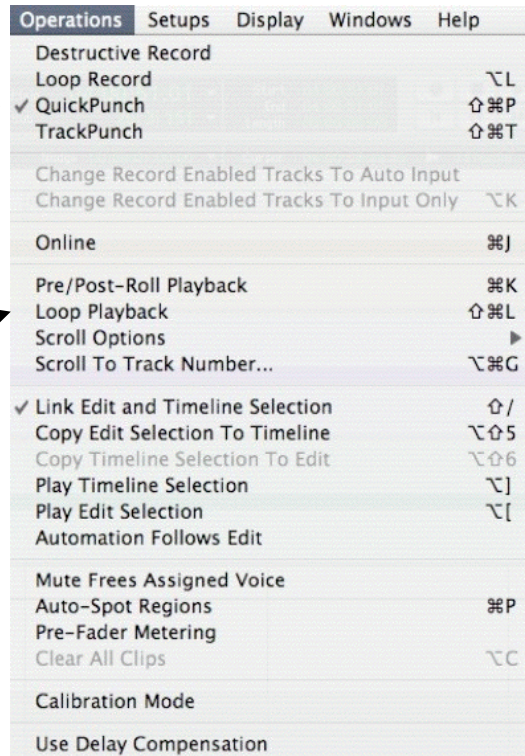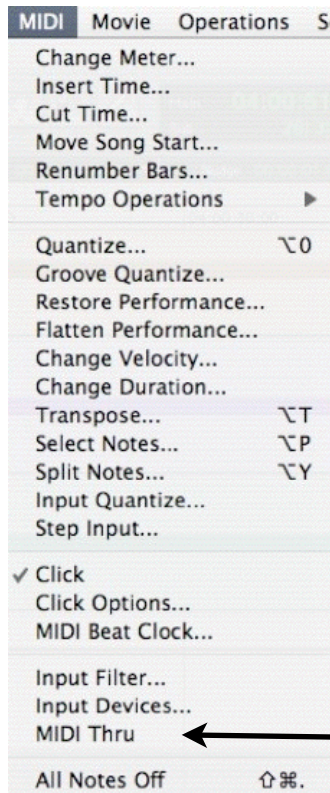
OPERATIONS MENU:

RECORD MODE
The QuickPunch mode needs to be set to allow record (from the 2TOOLS™ parallel remote transport keys) to work properly.

WARNING:
If "Loop Playback" is used the Automation computer will have problems locating *PROTOOLS™*

Operations	Setups	Display	Windows	Help
Destructive Record				
Loop Record				⌥L
✓ QuickPunch				⇧⌘P
TrackPunch				⇧⌘T
Change Record Enabled Tracks To Auto Input				
Change Record Enabled Tracks To Input Only				⌥K
Online				⌘J
Pre/Post-Roll Playback				⌘K
Loop Playback				⇧⌘L
Scroll Options				▶
Scroll To Track Number...				⌥⌘G
✓ Link Edit and Timeline Selection				⇧/
Copy Edit Selection To Timeline				⌥⇧5
Copy Timeline Selection To Edit				⌥⇧6
Play Timeline Selection				⌥]
Play Edit Selection				⌥[
Automation Follows Edit				
Mute Frees Assigned Voice				
Auto-Spot Regions				⌘P
Pre-Fader Metering				
Clear All Clips				⌥C
Calibration Mode				
Use Delay Compensation				

MIDI MENU:

MIDI	Movie	Operations	S
Change Meter...			
Insert Time...			
Cut Time...			
Move Song Start...			
Renumber Bars...			
Tempo Operations			▶
Quantize...			⌥0
Groove Quantize...			
Restore Performance...			
Flatten Performance...			
Change Velocity...			
Change Duration...			
Transpose...			⌥T
Select Notes...			⌥P
Split Notes...			⌥Y
Input Quantize...			
Step Input...			
✓ Click			
Click Options...			
MIDI Beat Clock...			
Input Filter...			
Input Devices...			
MIDI Thru			
All Notes Off			⇧⌘.

TRANSPORT:

The sync button needs to be enabled for the SYNC box to produce Timecode:

'Midi Thru' would be best turned off.

That should be everything needed for success with v6.7.....

APPENDIX A

Updating Software

2TOOLS™ is shipped with permanent software installed in ROM. Also, all units from version 1.4 onward have the capacity to download updated software, which will then supercede the ROM on power up, and run permanently in battery backed RAM until replaced or removed. This section describes:

- how to remove software running in RAM, and revert to your original ROM software.
- how to update 2TOOLS™ with new software in RAM .

REQUIREMENTS TO DOWNLOAD NEW SOFTWARE

HARDWARE....
You will need at least version v1.4T running in ROM. If you have an earlier version, (some serial numbers before 2T0038) we can supply a ROM for you to install, together with simple instructions as to how to do this.

You will also need a MIDI interface to 2TOOLS™ capable of sending System Exclusive data. Most users will already have one for their audio systems.

Connect Mac (or PC) MIDI OUT >>>> 2TOOLS™ MIDI IN

SOFTWARE....
You will need a Mac (or PC) utility program capable of sending System Exclusive data files via your MIDI interface. If you do not have one, we recommend the Mac program by Steve Grace, SysEx470, which comes with a comprehensive pdf manual (276K). If you already have a program capable of MIDI System Exclusive Dumps please use it.

FIRST: REMOVE OLD SOFTWARE IN RAM

METHOD ONE....
If the S29E cable is plugged in, set 2TOOLS™ to the 'TEST' position. Then, turn it off and on again while holding down the RW; FF, and STOP switches on your console. It will re-boot and display a sign-on message corresponding to the version of software now running.
see 'CHECK WHAT SOFTWARE IS RUNNING'.

METHOD TWO....
Load the MIDI file named 'purge.syx' into 2TOOLS™, which will empty the RAM . It is always supplied bundled with any new software, and is a very small file which loads almost instantly. 2TOOLS™ will then re-boot and display a sign-on message corresponding to the version of software now running.

LOADING NEW SOFTWARE INTO RAM

First, make sure that no other MIDI signals such as MTC are reaching 2TOOLS™. Then set 2TOOLS™ to the *PROTOOLS™* Tools setting.

USING THE SYSEX PROGRAM....
Open the downloaded file (from smartresearch.co.uk) i.e. 2T21A.syx. Click on the Transmit button to send the file. Alternatively you can "open any" from within the SysEx470 program.
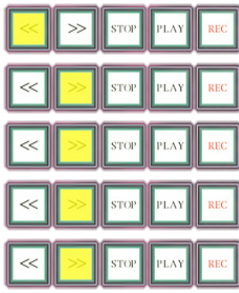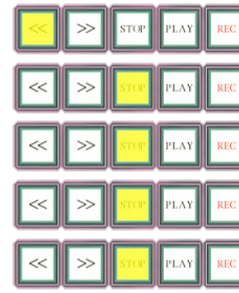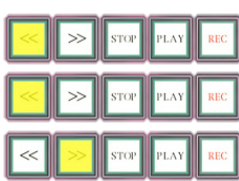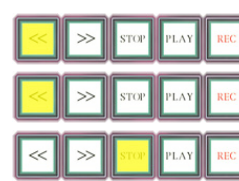
DID IT GET THERE? ....
The download is very quick, taking around 8 seconds. 2TOOLS™ checks the incoming software for errors and does not run it unless it is fully verified. If the download was sucessful, your 2TOOLS™ will then reboot and display a sign-on message corresponding to the version of software now running. see 'CHECK WHAT SOFTWARE IS RUNNING'.

APPENDIX B

Check What Software Is Running

On power up (and in the Test position from v1.4u onwards), 2TOOLS™ will flash its front panel LEDs and the console transport lamps to indicate what software is running, and whether running in ROM (original) or battery backed RAM (which can be changed), as shown in the following table.

Note: all versions after **v1.4T** conform to the message format shown for **v1.4U** and **v2.1**; i.e: first SSL/RW flash for the first digit of the software number, then MMC/FF flash for the second digit if in ROM, or, MTC/STOP if in RAM .

SOFTWARE VERSION	RUNNING IN ROM		RUNNING IN RAM	
	LED'S	LAMP'S	LED'S	LAMP'S
v1.0				
v1.4T	CON MMC MTC	<< >> STOP PLAY REC		
v1.4U	CON MMC MTC	<< >> STOP PLAY REC	CON MMC MTC	<< >> STOP PLAY REC
FUTURE VERS… E.G v2.1	CON MMC MTC	<< >> STOP PLAY REC	CON MMC MTC	<< >> STOP PLAY REC

From **v1.4U** onwards the version sequence is also shown and repeated in TEST mode, and alternates with the test LED and LAMP sequence.

APPENDIX C

Connector Pinouts and Cables

MIDI OUT 5 way DIN Socket
01 *nc*
02 GND
03 *nc*
04 Tx+
05 Tx-

MIDI IN 5 way DIN Socket
01 *nc*
02 *nc*
03 *nc*
04 Rx+
05 Rx-

RS422 Connector 9 way D FEMALE
01 GND
02 Rx-
03 Tx+
04 GND
05 *nc*
06 GND
07 Rx+
08 Tx-
09 GND

S29E Connector 25 way D FEMALE
01 *nc*
02 LAMP common +20V
03 RWD Switch
04 FWD Switch
05 STOP Switch
06 PLAY Switch
07 *nc*
08 RECORD Switch
09 TACH
10 DIRECTION
11 *nc*
12 *nc*
13 *nc*
14 *nc*
15 SWITCH common
16 RWD Lamp
17 FWD Lamp
18 STOP Lamp
19 PLAY Lamp
20 *nc*
21 RECORD Lamp
22 TACH Common
23 DIRECTION Common
24 *nc*
25 *nc*

CABLES PROVIDED:

SSL S29E Console Remote Cable: Male-Female 25way D connectors, all pins connected one to one.
IEC Mains cable.

APPENDIX D

Specifications, Notices, and Such

Specifications:

INS & OUTS:
2 x 5 way MIDI DIN Sockets
9 way D Female.
25 way S29E D Female.
IEC mains inlet (incorporating drawer for fuse and spare).
.
MECHANICAL:
A quite little biddy, bitty box, 230 x 105 x 62 mm. Approx 1KG.

POWER:
Auto ranging AC voltage input: 100v - 240v, 15 watts.
Fit only 250v 500mA type T, slow blow fuse.

> ~CAUTION~
> High voltages are present on the circuit boards inside the case. Remove power to the unit before opening.

(1) Unauthorised transfer or duplication of all or any part of this Manual is very easy using modern technology but we would rather you don't, please.

(2) SMART RESEARCH LTD. accepts no liability whatsoever for any loss or injury incurred by the owner or by any third party while using the device or any other device anywhere and at any time, ever.

(3) Every effort has been made to ensure that this product is flawless. If any defect is found that is due to a fault on the part of the manufacturer or global warming, the product will be replaced free of charge, at the discretion of SMART RESEARCH LTD. No responsibility is accepted for defects not caused by the manufacturer.

(4) The contents of the software and Manual are subject to change without anyone knowing.

(5) Every effort has been made to ensure that no engineers where harmed during the making and testing of this product but moral accidents will happen despite all our best efforts.

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