

The Patch Chain edit window creates a list of patches used by the Patch Chain Controls module (discussed in Chapter 8). The Patch Chain Controls module (found in the Program Change Sources window) lets you step through a predetermined patch sequence using an external MIDI controller.

This chapter discusses creating and editing a Patch Chain.

OPENING A PATCH CHAIN EDIT WINDOW

- Click the **Patch Chain** button in the patch document window, or choose **Edit Patch Chain** from the **Patch** menu to open the Patch Chain edit window.

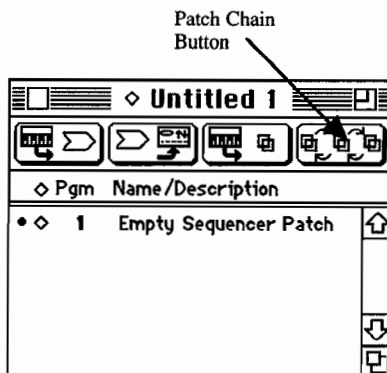


Figure 9-1: Patch Chain Button

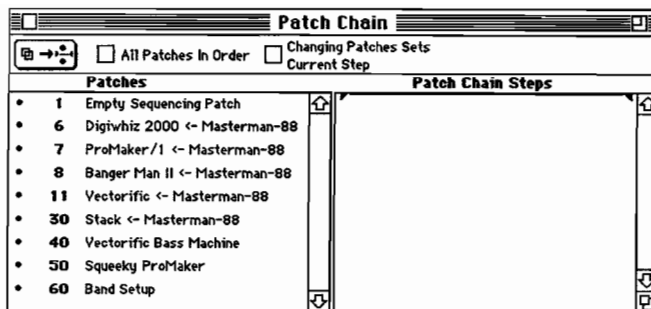


Figure 9-2: Empty Patch Chain Edit Window

PATCH CHAIN EDIT WINDOW TERMINOLOGY

Figure 9-3 shows the terminology for the Patch Chain edit window.

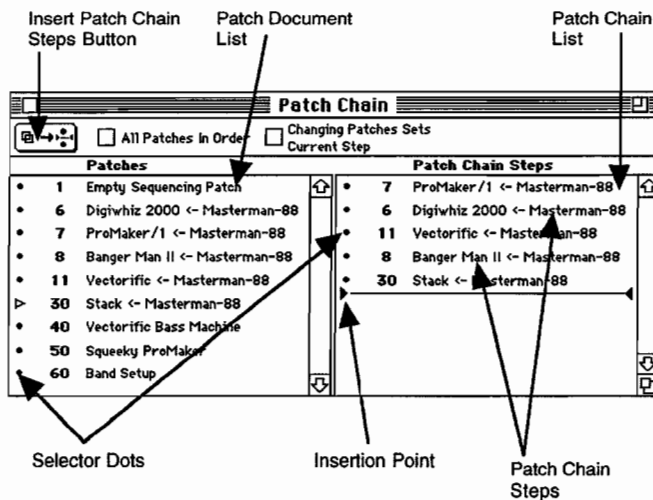


Figure 9-3: Anatomy of a Patch Chain Edit Window

The Patch Chain edit window is divided into two scrolling lists. The list on the left is a copy of the current patch document. It lists all the current patches and shows the first line of each patch description. The list on the right is the patch chain.

CREATING A PATCH CHAIN

You create a Patch Chain by defining an insertion point in the Patch Chain List and selecting patches from the Patch Document List.

The Patch Chain List is blank when you first open an empty Patch Chain edit window.

- Click the selector dot of a patch in the Patch Document List.

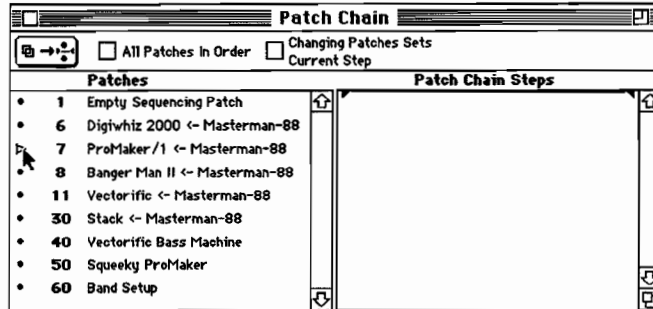


Figure 9-4: Select Patch from Patch Document List

- Click the **Insert Patch Chain Steps** Button to insert the patch in the Patch Chain List.

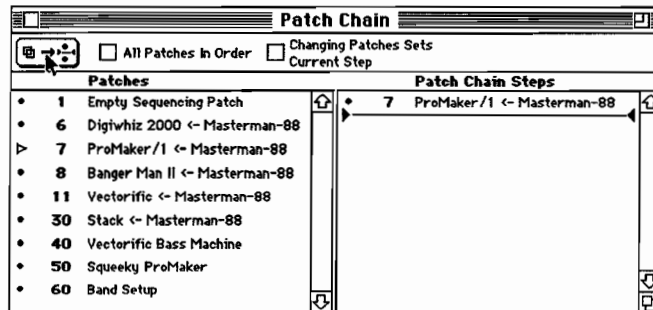


Figure 9-5: Click Patch Chain Steps Button

Notice that the insertion point moves to follow the step you just inserted.

SHORTCUT: Double-click a selector dot in the Patch Document List to insert that patch into the Patch Chain List automatically. When you double-click a patch selector dot, you do not have to click the **Insert Patch Chain Steps** button to insert the patch.

Selecting Multiple Patches

You can insert multiple patches into the Patch Chain List by selecting more than one patch at a time from the Patch Document List.

- Shift-click two or more patches in the Patch Document List.

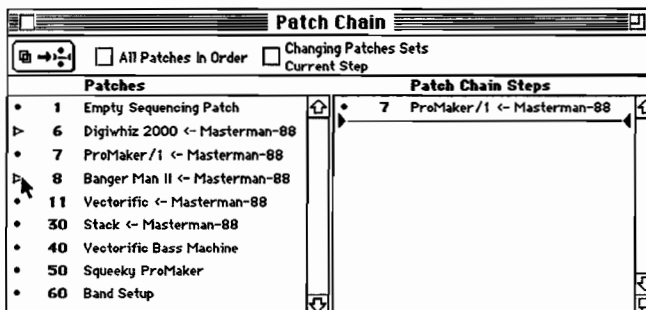


Figure 9-6: Shift-Clicking Multiple Patches

- Click the **Insert Patch Chain Steps** button to insert the selected patches at the insertion point in the Patch Chain List.

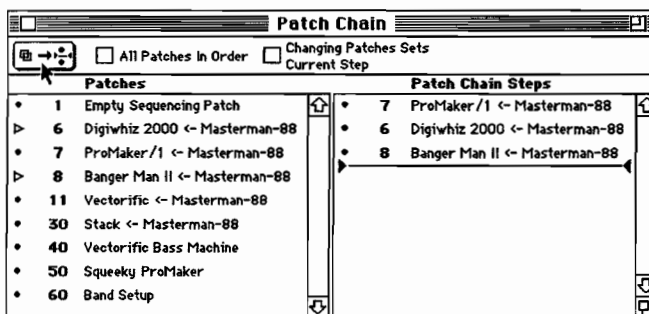


Figure 9-7: Inserting Multiple Patches

Using the “All Patches In Order” Check Box

The **All Patches In Order** check box, when checked, *replaces* the current patch chain with a chain containing all patches in the patch document. Patches appear in numerical order (not necessarily in the order they appear in the Patch Document List). If you add, remove, or renumber patches in a patch document when the **All Patches In Order** box is checked, the Patch Chain will change to always reflect your patch document.

You may not make changes directly to the Patch Chain List when the **All Patches In Order** box is checked. If you want to make changes to a Patch Chain List, first uncheck the **All Patches In Order** check box.

Assume, for example, that you had the Patch Chain shown in Figure 9-8.

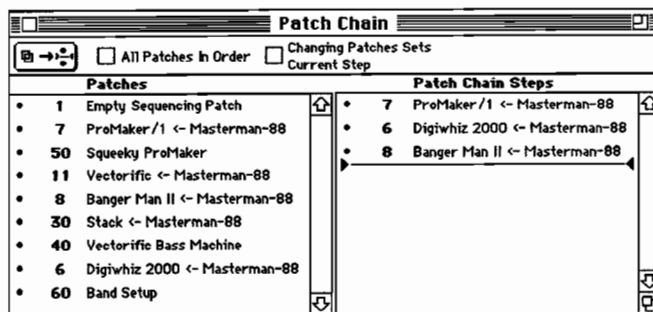


Figure 9-8: Patch Chain Before Checking All Patches In Order

- Click the **All Patches In Order** check box to check it. Your Patch Chain now lists, in numerical order, all the patches in your current patch document (see Figure 9-9).

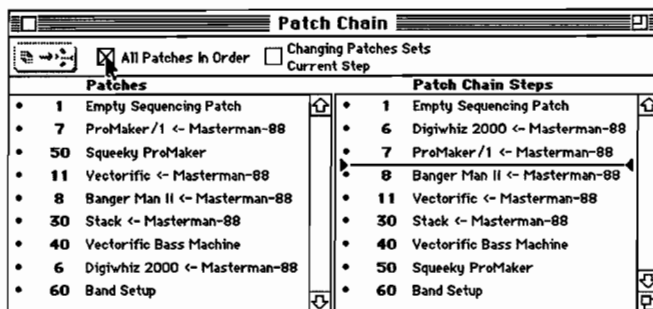


Figure 9-9: Patch Chain After Checking All Patches In Order

EDITING A PATCH CHAIN

You may copy, cut, paste and clear Patch Chain Steps. Cut and copied Patch Chain Steps appear in the Clipboard window. The following example shows how to copy and paste a Patch Chain Step.

- Click the selector dot next to the Patch Chain Step you wish to copy.
- Choose **Copy (⌘C)** from the **Edit** menu.

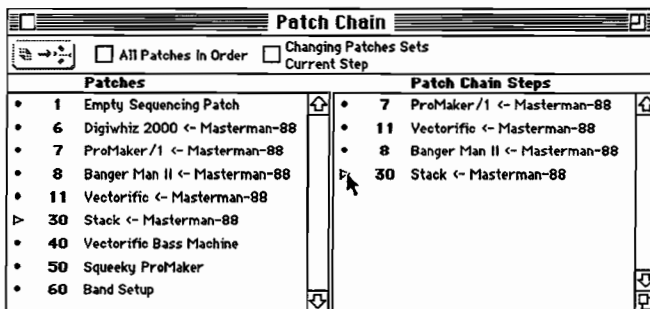


Figure 9-10: Select and Copy a Patch Chain Step

- Click between Patch Chain Steps to select a new insertion point.

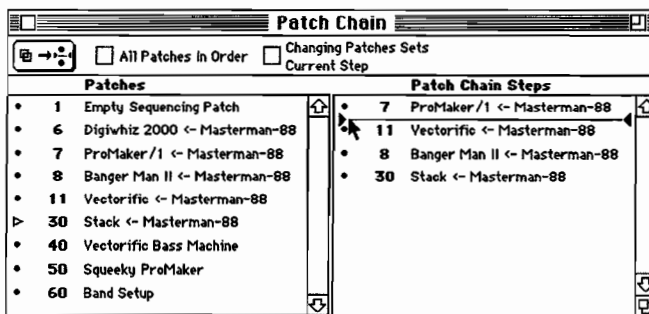


Figure 9-11: Defining an Insertion Point

- Choose **Paste (⌘V)** from the **Edit** menu to paste the copied Patch Chain Step at the insertion point.

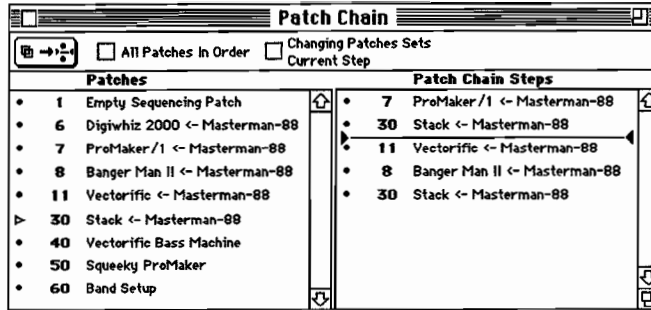


Figure 9-12: Pasting a Patch Chain Step

If you paste a cut or copied Patch Chain Step without selecting an insertion point, it will be inserted at the end of the Patch Chain List. As an example...

- Copy a Patch Chain Step to the Clipboard as shown in Figure 9-13.

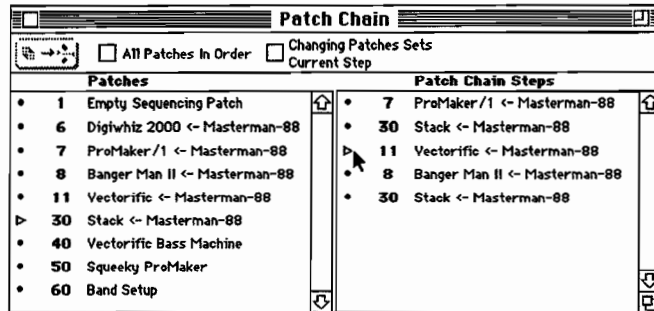


Figure 9-13: Copying a Patch Chain Step

- Paste the Patch Chain Step without choosing an insertion point. Look at Figure 9-14 to see that the Patch Chain Step was pasted to the end of the Patch Chain List.

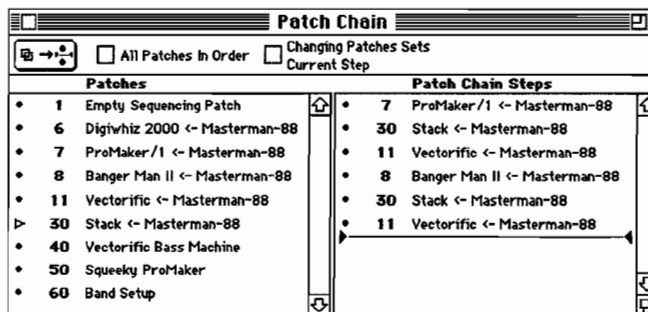


Figure 9-14: Pasting to the End of the Patch Chain List

*NOTE: If the **Insert Patch Chain Steps** button is greyed-out, it means you have not defined an insertion point. If you paste a Patch Chain Step without selecting an insertion point, it will appear at the end of the Patch Chain List.*

CHANGING THE PATCH DOCUMENT

If the Patch Chain references a patch that you later remove from the patch document window, the Patch Chain continues to reference the patch by its number.

Follow this example to see how deleting a patch affects the Patch Chain:

- Look at the Patch Chain window shown in Figure 9-15. Notice the position of Patch #8 in both the Patch Document List and the Patch Chain List.

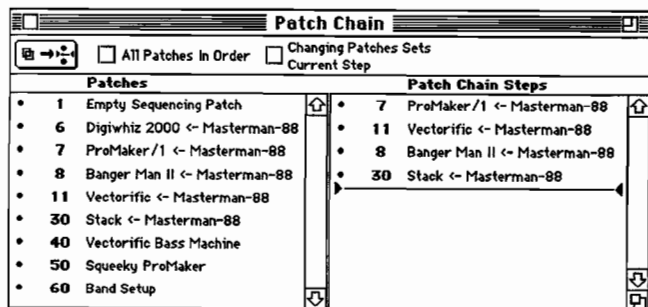


Figure 9-15: Typical Patch Chain Window

- Open the current Patch Document window and select Patch #8.

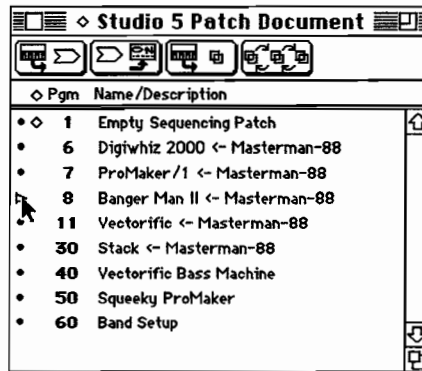


Figure 9-16: Selecting a Patch in the Patch Document Window

- Choose **Clear (⌘B)** from the **Edit** menu to remove Patch #8.

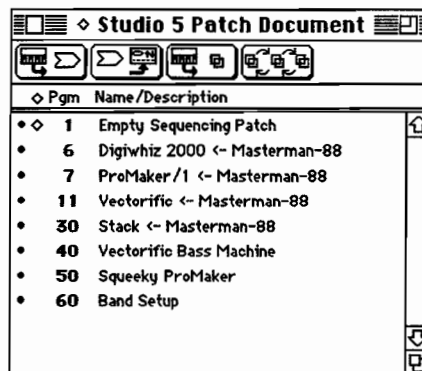


Figure 9-17: Clearing a Patch in the Patch Document Window

- Look at the Patch Chain window. Notice that Patch #8 has disappeared from the Patch Document List. Notice that the Patch Chain List still references the missing patch, but indicates that the patch has been removed.

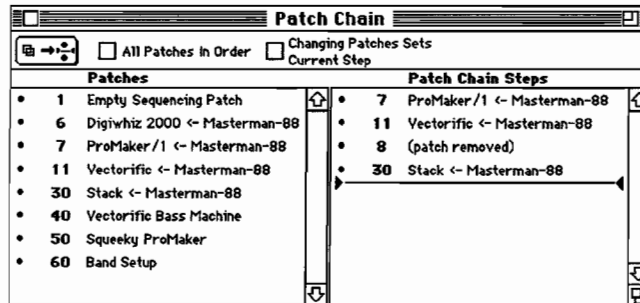


Figure 9-18: Patch Chain After Deleting a Patch

USING A PATCH CHAIN

To use the Patch Chain, you must define a connection using a Patch Chain Controls module in the Program Change Sources window. See Chapter 8 for details.

NETWORKING NOTE: *If you're using multiple Studio 5's, Opcode recommends you connect all MIDI devices defined as Patch Chain control sources to the same interface. The reason is that each OMS microprocessor (whether it's in the Macintosh or a Studio 5) has its own concept of the current location in the patch chain. If you use different devices connected to different interfaces to advance a patch chain, you may not get the results you expect.*

Using the "Changing Patches Sets Current Step" Check Box

There may be times that you want to interrupt a pre-determined Patch Chain to use a different OMS patch. The "Changing Patches Sets Current Step" check box determines how changing an OMS Patch affects your position in the Patch Chain.

If the "Changing Patches Sets Current Step" check box is unchecked, then the current Patch Chain step will be unaffected by changing OMS patches. Any manual OMS patch changes will not affect the current Patch Chain step. This could be useful if, in a live performance, you want to deviate from your pre-determined sequence and then return to the Patch Chain exactly at the point you left.

If the "Changing Patches Sets Current Step" check box is checked, then the current Patch Chain step will jump to the next step that matches the new OMS patch. If the newly selected OMS patch isn't contained in the Patch Chain, then the Patch Chain step does not change. This could be useful if, in a live performance, you want to jump around within your patch chain to change the order of your performance.

Follow through the chart shown in Figure 9-19 to see how various changes affect the current Patch Chain step with and without the "Changing Patches Sets Current Step" option checked.

Assume your Patch Document contains the following OMS patches: 1 2 3 4 5 6 7 8 and that your Patch Chain is as follows: 2 5 6 4 8 6. THEN...			
If your current Patch Chain Step is:	And you change the OMS Patch to:	Then, when you advance the Patch Chain with "Changing Patches Sets Current Step" <i>checked</i> , your chain advances to step:	When you advance the Patch Chain with "Changing Patches Sets Current Step" <i>unchecked</i> , your chain advances to step:
② 5 6 4 8 6	8	2 5 6 4 8 ⑥	2 ⑤ 6 4 8 6
2 ⑤ 6 4 8 6	6	2 5 6 ④ 8 6	2 5 ⑥ 4 8 6
2 5 6 ④ 8 6	6	② 5 6 4 8 6	2 5 6 4 ⑧ 6
2 5 6 4 ⑧ 6	3	2 5 6 4 8 ⑥	2 5 6 4 8 ⑥

Figure 9-19: Changing Patches Sets Current Step Chart

10 Patch Sequences

Each OMS patch can contain a pair of sequences—the Start Sequence and the End Sequence. A patch’s Start Sequence is a short list of MIDI events sent to various devices when the patch is recalled. The patch’s End Sequence is a short list of events sent when a different patch is called up.

Start Sequences are very useful for sending program changes, system exclusive patch data, initial controller values, or note off commands to a device when a patch is selected. End Sequences are often used, when leaving a patch, to undo the effects of the start sequence.

***NOTE:** Sequence events are sent one immediately after another. They do not contain timing information.*

CREATING/EDITING PATCH SEQUENCES

- Select a patch by clicking its selector dot.
- Choose **Edit Patch Start Sequence** or **Edit Patch End Sequence** from the **Patch** menu. The sequence edit window opens.

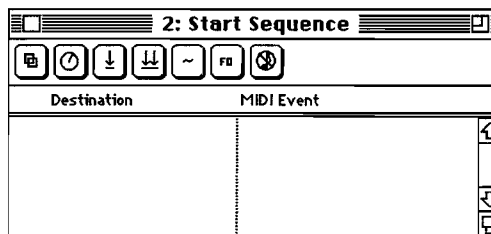


Figure 10-1: Start Sequence Edit Window

The seven buttons across the top of the sequence edit window represent different MIDI events. These are, from left to right: Program Change, Control, Mono Aftertouch, Pitch Bend, System Exclusive, and All Notes Off.

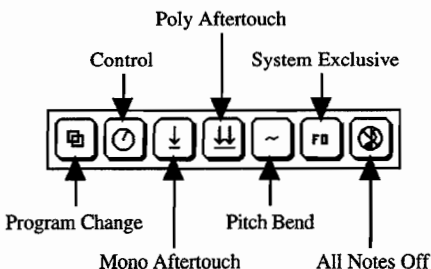


Figure 10-2: Sequence Event Buttons

- Click each button and an undefined corresponding event appears in the space below the Module Palette.

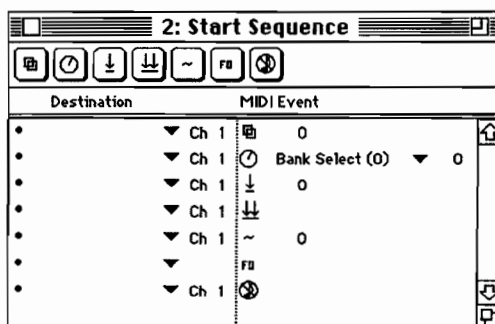


Figure 10-3: Undefined Start Sequence Events

Clicking a sequence event's selector dot selects that event. Shift-clicking sequence events will select more than one event for cutting, copying, or clearing. Sequence events can be rearranged by option-clicking their selector dots and dragging them to new locations.

Editing Events

You define and edit most MIDI events by choosing MIDI destinations and MIDI control numbers from pop-up menus. Select MIDI channels and event values by their corresponding numerals.

MIDI program change events are numbered 0-127.

The System Exclusive Event

To edit a system exclusive event:

- Click the area to the right of the “F0” icon to open an Edit Event window.

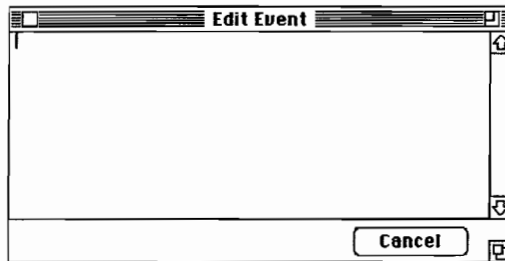


Figure 10-4: Empty Edit Event Window

- Type in the desired hexadecimal data.

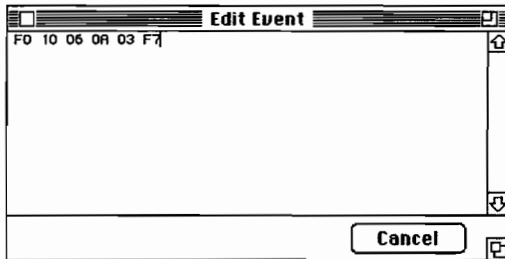


Figure 10-5: Entering Data Into Edit Event Dialog

- Click the close box to return to the Sequence Edit window. The data is displayed in the MIDI Event column.

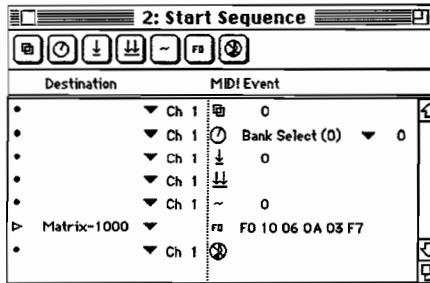


Figure 10-6: Sequence Edit Window w/SysEx Event Defined

You may enter any MIDI event into the system exclusive edit dialog. System exclusive data must be four bytes or more and end with F7. Non-system exclusive data must start with a value between 80 and FF (except F5 which is reserved) and it must be three bytes or less.

You can paste system exclusive data from the Macintosh's Clipboard. If you have a large string of system exclusive data (like a patch dump), it can be copied to the Clipboard from within Vision (or Studio Vision) and then pasted into the Edit Event window.

NOTE: *System Exclusive messages in a Start or End Sequence should always be sent directly to the intended device. Sending SysEx to a Virtual Instrument containing a splitter module and different devices thickens the MIDI data stream unnecessarily. Sending SysEx to a Virtual Instrument consisting of a splitter module routed to different channels of the same device will corrupt the data.*

Viewing Sequence Event Types

You can move the cursor over a sequence event in a Sequence editing window and see the event type's name displayed. This makes it easier to edit long Start or End Sequences.

1. Move the cursor over an event, and...
- ...2. the type of event is displayed, here.

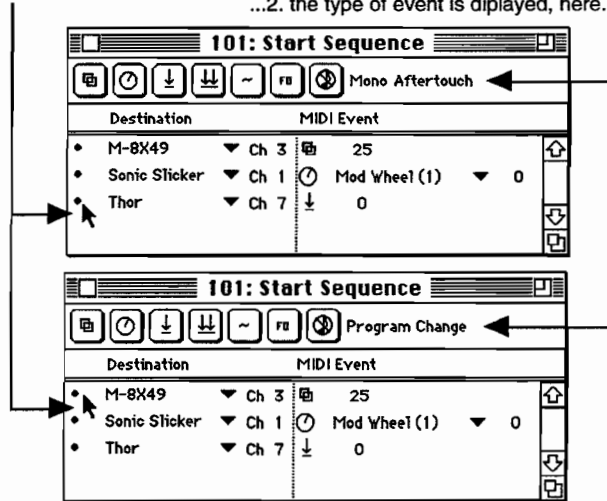


Figure 10-7: Viewing a Sequence's Event Type

You will also see the event name displayed when you move the cursor over any of the sequence event buttons.

SENDING ALL NOTES OFF EVENTS

OMS does not automatically send note off commands when you change patches. If you hold notes and change OMS patches, any devices not used in the new patch will not receive note off commands. This is useful in live performance for changing patches while sustaining chords or synth pads. If you wish any held notes to turn off when you change patches, you should send an All Notes Off event in a Patch End Sequence.

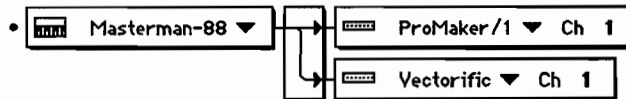
There are two ways to send an All Notes Off event to your devices: use the MIDI All Notes Off command or use the All Notes Off button. If your device responds to the MIDI All Notes Off command, insert a Control Patch Sequence event, and select Control 123. If your device does *not* respond to the MIDI All Notes Off command, you should use the All Notes Off button—this sends actual note off commands to all 128 MIDI notes on the specified channel (and, consequently, takes a couple more seconds).

PATCH SEQUENCE EXAMPLE

Let's assume, for example, that you're performing in a live situation and need to define OMS Patch #2 as a MIDI "stack" that combines a modulated vibe sound from the ProMaker/1 with a soft organ sound from the Vectorific.

Defining the Start Sequence

- Define the patch using the techniques discussed in previous chapters.



You must now define a Start Sequence that sets the ProMaker/1 and Vectorific to the proper sounds, volumes and modulations.

- Choose **Edit Patch Start Sequence** from the **Patch** menu to open a Start Sequence edit window.

Assume that the ProMaker/1 has Patch #12 defined as a Vibe sound.

- Click the **Program Change** sequence event button to place an undefined Program Change sequence event in the edit area.
- Choose the ProMaker/1 from the Destination pop-up menu.

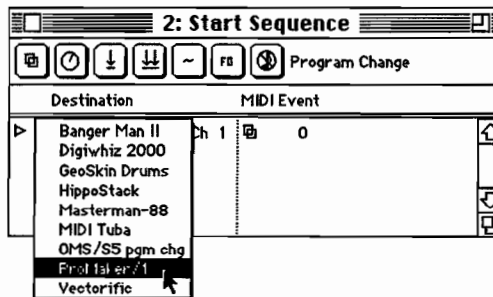


Figure 10-8: Selecting a Destination Device

- Select Patch #12 as the Program Change number in the MIDI Event numerical.

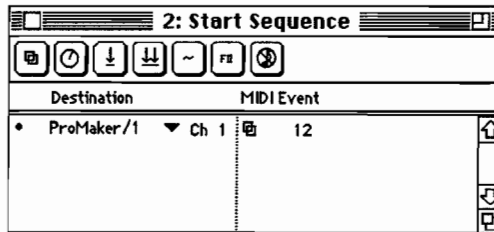


Figure 10-9: Selecting a Program Change Number

- Click the **Control** sequence event button, choose the ProMaker/1 as the destination, the Mod Wheel as the MIDI Event and 127 as its value. This sets the vibe sound's modulation to full value.

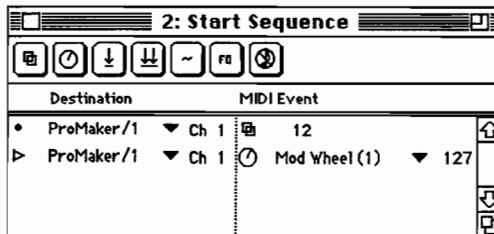


Figure 10-10: Setting a Control Event

- Choose the desired organ patch for the Vectorific and set each synthesizer's volume level using MIDI Volume Control.

The final start sequence would look as shown in Figure 10-11.

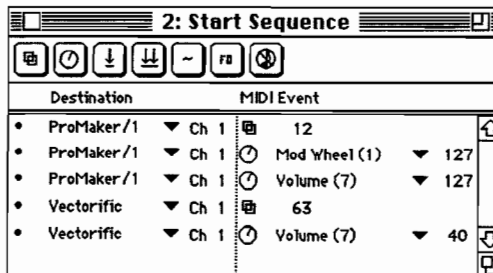


Figure 10-11: Fully Defined Start Sequence

Now, whenever you recall OMS Patch #2, your Masterman-88 keyboard will control a stack that combines the ProMaker/1 (Channel 1, Patch #12 with full modulation and volume) with the Vectorific (Channel 1, Patch #63 and a MIDI volume level of 40).

Defining the End Sequence

You'll need to create an End Sequence to undo the effects of the Start Sequence. The End Sequence will play whenever you recall a patch other than OMS Patch #2.

To create an End Sequence:

- Choose **Edit Patch End Sequence** from the **Patch** menu to open an End Sequence edit window.
- Define Program Change and Control events to undo the effects of the patch's Start Sequence.

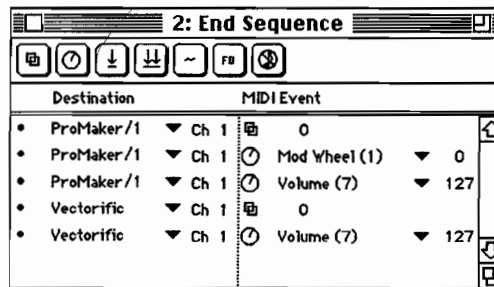


Figure 10-12: Fully Defined End Sequence

The End Sequence shown in Figure 10-12 will reset the ProMaker/1 and Vectorific to Patch #0, their volumes to 127, and the ProMaker/1's Mod Wheel value to zero whenever you select a different OMS patch.

11 Patch Ideas

MIDI MERGING

An individual patch can contain more than one MIDI routing. As an example, let's say that you (operating your Masterman-88 keyboard controller) and your drummer (playing his new GeoSkin MIDI percussion pads) both want to control the same Vectorific sound module patch from your individual controllers. This is a classic example of MIDI merging.

- Choose **New Patch** from the **Patch** menu and create an OMS patch with the Masterman-88 as the MIDI source and the Vectorific module as the MIDI destination.



Figure 11-1: Define the First Connection

- Click the MIDI Source module icon and create a second connection below the first.

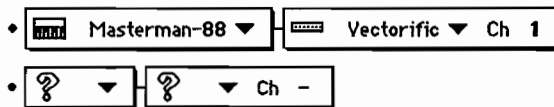


Figure 11-2: Create a Second Connection

- Choose the GeoSkin drums as the MIDI source and the Vectorific as the MIDI destination.



Figure 11-3: A Complete MIDI Merging Patch

With this patch, both the Masterman-88 keyboard and the GeoSkin drums will play MIDI Channel 1 of the Vectorific module.

BAND ROUTINGS

You can route your entire band through the Studio 5. For instance, you could have the MIDI Tuba playing the Digiwhiz 2000, the GeoSkin drum pads playing the Banger Man II drum module, and the Masterman-88 keyboard playing a ProMaker/1 stacked with a Vectorific. This configuration would have a patch window similar to the one shown in Figure 11-4.

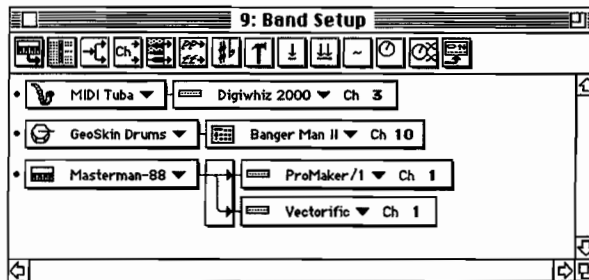


Figure 11-4: A Band Routing Patch

STUDIO 5 FOOTSWITCH IDEAS

The Studio 5's two footswitches (FS1, FS2) and one foot controller (FC1) can be used as controllers in an OMS patch. To use the footswitches or foot controller in a patch, simply choose the Studio 5 as your MIDI source.

Volume Pedal

A simple volume pedal is created in the following example. The Masterman-88 controls MIDI Channel 1 of the Vectorific synth module. The foot controller (FC1) controls the volume of the Vectorific.

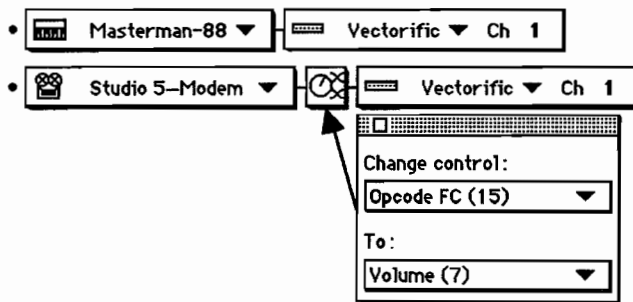


Figure 11-5: Volume Pedal

NOTE: You must make certain that *Foot Controller In* in the *Studio 5* menu is checked in order for Foot Controller information to be recognized. Foot Controller status is saved within the Studio 5's internal memory.

Improved Volume Pedal

You can improve upon the above example by adding an Event Type Filter module. Use the filter to pass only Opcode foot controller data from the Studio 5 to the Vectorific as shown below. This prevents MIDI Time Code, if it's in use, from being sent to the Vectorific—thus thinning the MIDI data stream.

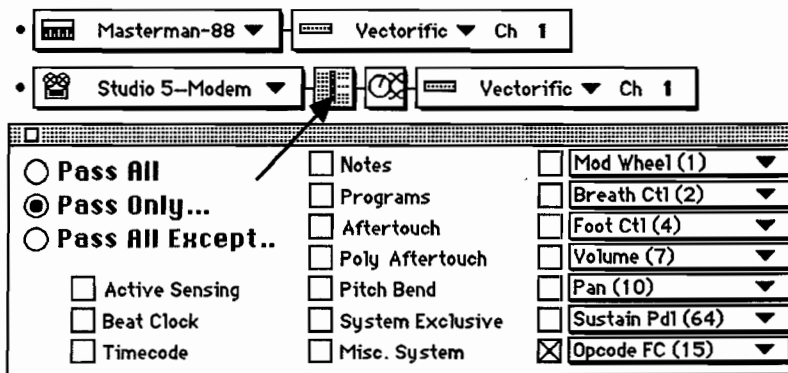


Figure 11-6: Improved Volume Pedal

Virtual Pedals

As another example, assume that you want to use the Studio 5 foot controller (FC1) as a volume pedal, and a Studio 5 footswitch (FS1) as a sustain pedal. Using Virtual Controllers is the easiest and most efficient way to handle this task.

- Choose **Edit Virtual Controllers** from the **Patch** menu or click the **Virtual Controllers** button in the current patch document window to open the Virtual Controllers editing window.
- Design a Virtual Controller similar to the one shown in Figure 11-7. See Chapter 7 to learn about Virtual Controllers and Virtual Instruments.

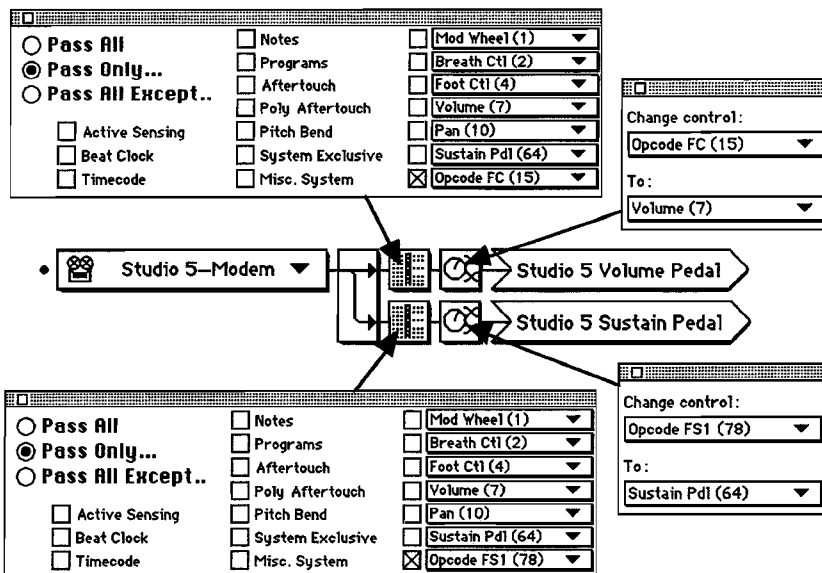


Figure 11-7: Defining Virtual Pedals

You can now use these Virtual Controllers in any patch, without worrying if they are sending MIDI Time Code to your MIDI output devices. The following example illustrates the use of these Virtual Controllers in a patch where the Masterman-88 plays Channel 1 of the Vectorific while the Studio 55's foot controller controls Vectorific volume and the Studio 5's FS1 acts as a sustain pedal.

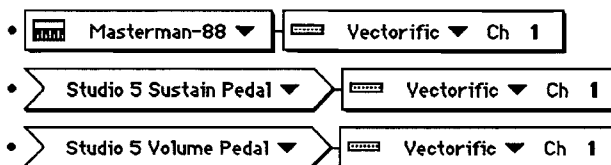


Figure 11-8: Using Virtual Pedals

EXPRESSIVE INSTRUMENTS

You can use velocity switching to trigger different sounds—the triggered sound depends on the note-on velocity. Velocity switching can add greater dynamic realism to instruments, or provide startling special effects. You can design OMS patches to perform velocity switching if your synthesizers don't offer it. Even if your synthesizers do offer velocity splitting, OMS patches provide the additional advantage of velocity switching *between* devices.

Assume, for example, that your Vectorific sound module has a nice pianissimo piano sound, and that the Digiwhiz 2000 sampler has good mezzo-forte piano and forte piano sounds. Build a patch similar to the one shown in Figure 11-9.

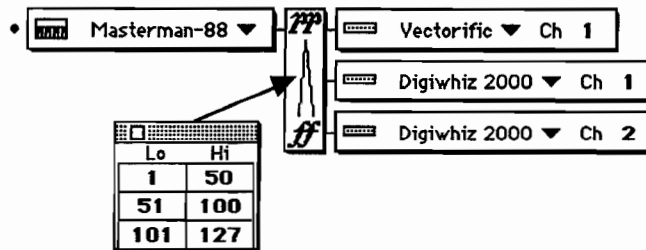


Figure 11-9: Velocity Switching

Notice that a soft touch plays the Vectorific piano sound, medium playing triggers a mezzo-forte piano sound on the Digiwhiz 2000 (Ch. 1), and banging on the keys plays a forte piano sound on the Digiwhiz 2000 (Ch. 2).

ONE FINGER CHORDS

To ease the pressure during a live performance or to compensate for a short reach, you can use splitters and transposers to build one-finger chords.

The patch example shown in Figure 11-10 produces a minor ninth chord from just one note.

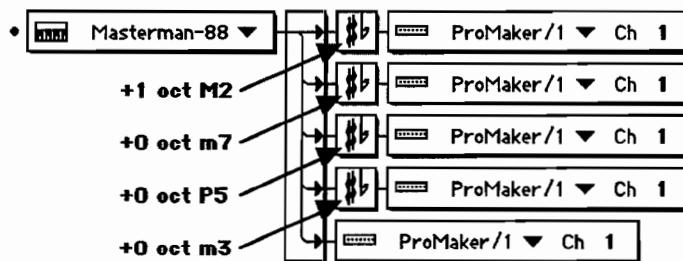


Figure 11-10: One Finger Chord

If you hit a C, then your sound module would produce the chord shown in Figure 11-11.



Figure 11-11: Cm9 Chord

BANK SELECTION

You can use the Start and End Sequences to send bank select messages to your synthesizers. For each bank in your synthesizer, simply design an OMS patch that recalls and plays that bank.

The patch document shown in Figure 11-12 contains 10 different patches for playing the Matrix-1000 synthesizer. Each patch contains a Start Sequence with a system exclusive event that selects and locks a Matrix-1000 bank. The End Sequence unlocks the bank when you leave the patch.

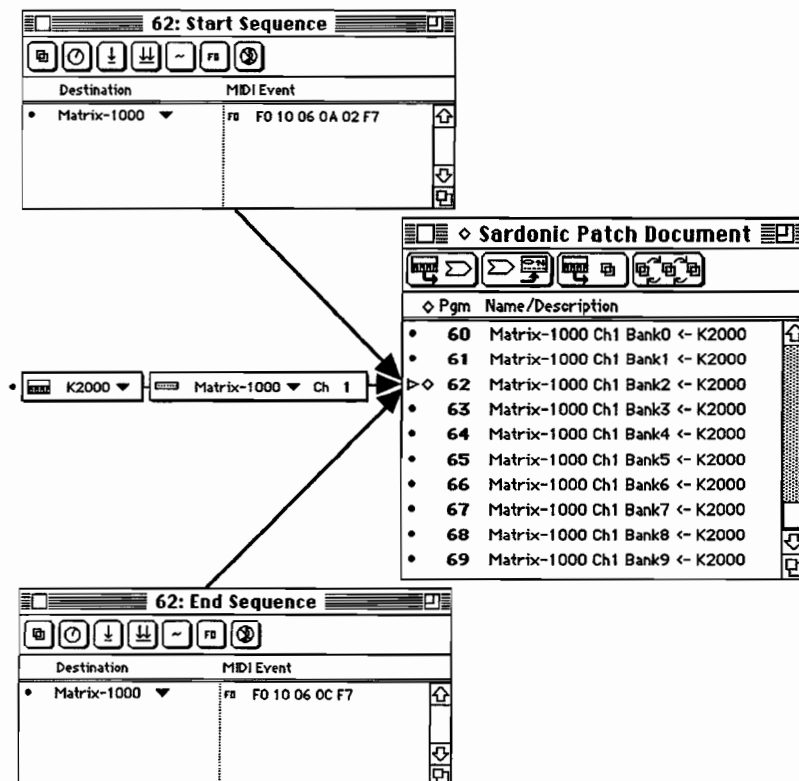


Figure 11-12: OMS Patch Selects Matrix-1000 Bank

PART THREE:

Other Functions

Using the Studio 5 with Non-OMS MIDI Software—Chapter 12

SMPTE Functions—Chapter 13

Networking—Chapter 14

Menus—Chapter 15

Using the Studio 5 with Non-OMS MIDI Software

This chapter discusses using the Studio 5 with non-OMS MIDI Software. If you will *always* be using the Studio 5 with OMS applications (such as Vision, Studio Vision, Galaxy, Max, and Track Chart), you will not need the Compatibility Setup window and may skip ahead to Chapter 13. If you plan to use the Studio 5 *mainly* with OMS applications, you may still wish to skip ahead to Chapter 13, returning to this section when you're ready to use a non-OMS MIDI application. If you will be using mostly non-OMS MIDI applications, read this section now.

The Studio 5 always requires OMS for its configuration, but it can be used with non-OMS MIDI software in one of two ways:

- via MIDI Manager.
- in Compatibility Mode

If you'll be using the Studio 5 with MIDI Manager, you should consult your OMS manual. There, you'll learn how to configure the OMS MIDI Manager Driver and how to connect MIDI Manager ports to Studio 5 devices, Virtual Controllers and Virtual Instruments.

If you're not using OMS or MIDI Manager, you must use Compatibility Mode. This mode configures the Studio 5 to emulate either a standard MIDI interface or a MIDI Time Piece (MTP).

When the Studio 5 is turned on, it acts like a standard interface as defined by the current compatibility setup.

When OMS is active, the Studio 5 is automatically in "OMS Mode". When OMS becomes inactive, the Studio 5 returns to standard interface mode. OMS is active if an OMS application is currently being used, or if the OMS mode is set to either "OMS Applications Only" or "Use MIDI Manager" (see your OMS manual for details). When OMS is active, the Studio 5 operates transparently; applications send to and receive from individual devices.

When Performer or some other MTP-aware program becomes active, the Studio 5 switches from standard interface emulation into MTP emulation. Similarly, when an MTP-aware program becomes inactive, the Studio 5 switches back into standard interface emulation.

THE COMPATIBILITY SETUP WINDOW

To configure the Studio 5 for use in Compatibility Mode, choose **Compatibility Setup** from the **Studio 5** menu. A Compatibility Setup window opens similar to Figure 12-1.

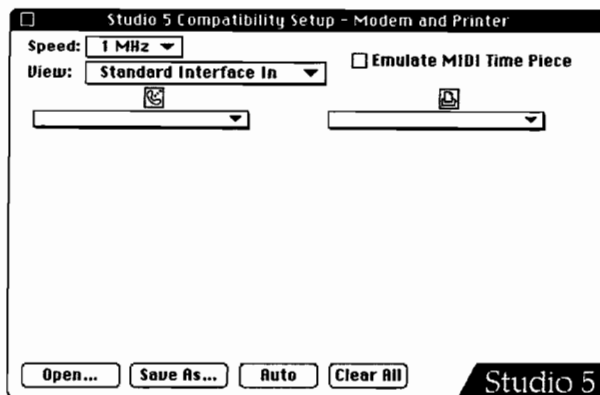


Figure 12-1: Compatibility Setup Window (Both Ports Connected)

The large area in the center of the window contains pop-up menus for choosing devices. The left half of the window represents the Macintosh Modem port; the right half represents the Printer port.

If you connect only one Macintosh serial port to the Studio 5, the Compatibility Setup window displays only that port (as shown in Figure 12-2).

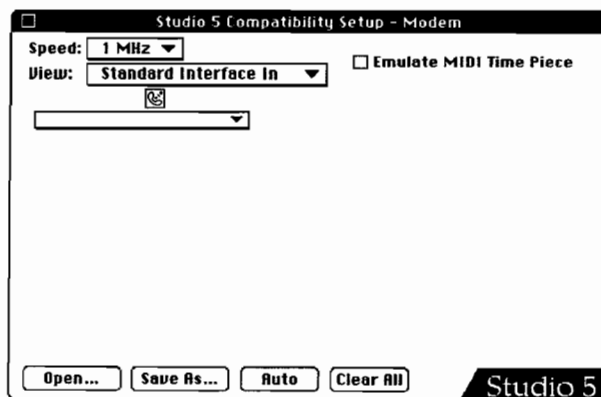


Figure 12-2: Compatibility Setup Window (Modem Port->A Port)

IMPORTANT: If you are using only one Macintosh serial port for MIDI (either Modem or Printer), be certain to connect that port to the Studio 5's "A" port.

Speed pop-up menu

This must match the interface speed selected within your non-OMS MIDI applications. Choose **1 MHz** if your MIDI applications don't support Fast mode. A 1 MHz communication speed is used by most standard MIDI interfaces (such as Opcode's Studio 3). If your application supports a Fast mode and you wish to use it, choose **Fast**. To set the Fast mode speed, choose **Fast Mode Communication Speed** from the **Studio 5** menu and select transfer speeds from the pop-up menus (see Chapter 4 for more information on fast speed settings).

IMPORTANT: If you plan to send system exclusive messages from the Macintosh to some MIDI device, you must use a Compatibility Setup Speed of 1MHz to insure successful data transfer. OMS applications are unaffected by this setting and can transfer system exclusive messages in Fast mode.

View pop-up menu

The pop-up **View** menu offers a choice of four different views—**Standard Interface In**, **Standard Interface Out**, **MIDI Time Piece In**, and **MIDI Time Piece Out**. Select a view to change the display in the lower portion of the Compatibility Setup window. Use the **View** menu to see and change various aspects of the interface.

Emulate MIDI Time Piece Check Box

If **Emulate MIDI Time Piece** is checked, the Studio 5 emulates Mark of the Unicorn's MIDI Time Piece and all views, except **Standard Interface In** will be enabled. If **Emulate MIDI Time Piece** is not checked, the Studio 5 emulates a standard MIDI interface and only **Standard Interface In** and **Standard Interface Out** views can be selected.

NOTE: Performer always sends messages that put the Studio 5 into MIDI Time Piece emulation mode—even if you tell Performer you only have a standard MIDI interface. Performer users should always check the **Emulate MIDI Time Piece** check box.

Open...

This button opens a standard Macintosh dialog box from which you may open any stored Compatibility Setup document.

Save As...

This button opens a standard Macintosh "Save As" dialog box for saving Compatibility Setups. Since the current Compatibility window settings are kept within the Studio 5 driver, you should save all current settings before updating the Studio 5 driver.

Auto

This button uses the current Studio Setup document to make sensible default assignments for all of the pop-up menus in the current view. The **Auto** button will yield different results depending on which view is active.

***NOTE:** The following information is better understood after you've learned to use each of the compatibility views. It's presented here for easy reference.*

For **Standard Interface In**, the **Auto** button enables the controllers and sync sources. If you have both the Modem and Printer ports connected, controllers are routed to the Studio 5's "A" port (usually connected to the Macintosh Modem port), and the sync sources (including the Studio 5's timecode output) are routed to the Studio 5's "B" port. A controller which sends sync will be routed to the Studio 5's "B" port.

For **Standard Interface Out**, the **Auto** button routes each MIDI channel only to devices that receive that channel. Beat clock and timecode are routed only to devices that receive sync. Other system events are routed to all devices. If you have both the Modem and Printer ports connected, data entering the Studio 5's "A" port (usually attached to the Macintosh Modem port) is routed to Studio 5 MIDI ports 1-8 and data entering the "B" port is routed to Studio 5 MIDI ports 9-15.

For **MIDI Time Piece In**, the **Auto** button enables the controllers and sync sources. Controllers will appear to be sent on the MIDI Time Piece cable numbers that match the Studio 5 port numbers to which they're connected. If you have both the Modem and Printer ports connected, Studio 5 timecode, footswitch, and audio data goes to the "B" port. Everything else goes to the "A" port.

For **MIDI Time Piece Out**, the **Auto** button routes cable 1 to the device on Studio 5 port 1, cable 2 to the device on Studio 5 port 2, and so on. Sync is routed to all devices that receive sync. "All" is not routed to anything by default, but can be set manually to any device or Virtual Instrument.

Clear All

This button clears all port (or cable) selections for the current view.

THE FOUR COMPATIBILITY VIEWS

This section discusses how to set up and edit each of the four possible compatibility views.

Standard Interface In View

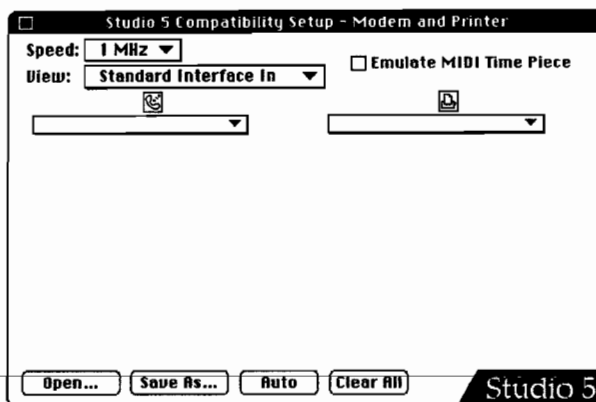


Figure 12-3: Standard Interface In View

Use this view to enable Studio 5 inputs when emulating a standard MIDI interface. There is one pop-up menu per port. From this menu, you can choose to enable any number of devices and Virtual Controllers. All enabled devices can send data to the Macintosh. Enabled devices have check marks next to their names in the pop-up menu. To enable a device, choose it from the pop-up menu (a check will appear). To disable a device, choose it again (the check will disappear).

NOTE: This view is available only if *Emulate MIDI Time Piece* is not checked, however all devices enabled in the *MIDI Time Piece In* view are enabled when the Studio 5 emulates a standard MIDI interface.

As an example, assume that your current Studio Setup document looks as shown in Figure 12-4:

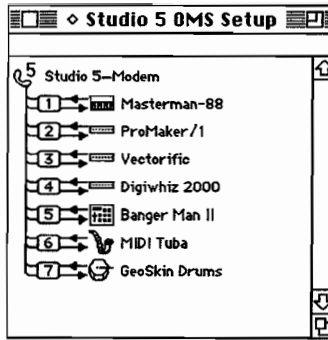


Figure 12-4: Sample Studio Setup Document

You can enable any and all devices for Macintosh input by checking them in the pop-up menu. You could also use the **Auto** button to assign devices automatically according to the rules specified earlier in this chapter.

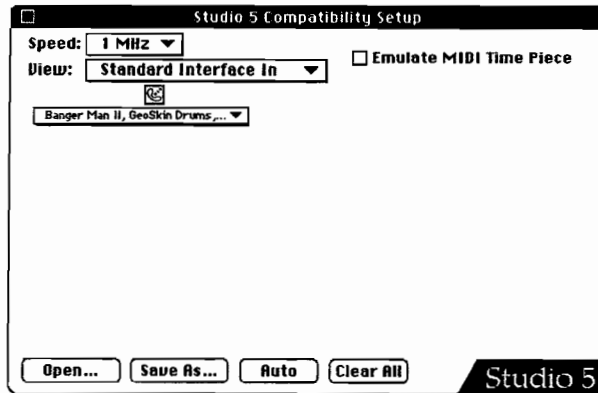


Figure 12-5: Enabling Standard Interface Inputs

Standard Interface Out View

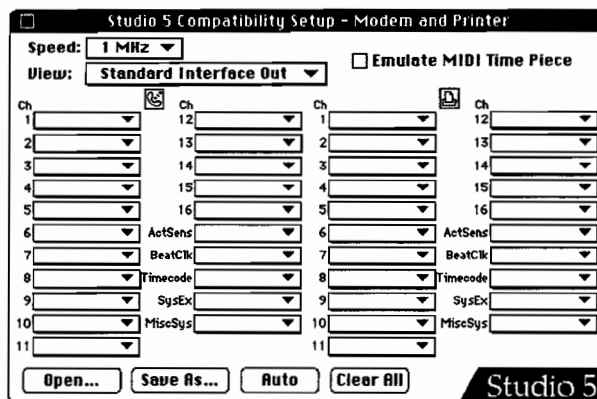


Figure 12-6: Standard Interface Out View

There are 22 pop-up menus per port—one for each of the 16 MIDI channels, plus six others for various non-channel-specific MIDI system events. Choose, from each pop-up menu, any number of devices or Virtual Instruments that need to receive data of the specified type or MIDI channel. You may also route a channel to the OMS/S5 Pgm Chg device. Program changes received on this channel will select OMS patches contained in the Studio 5.

If, for example, your current Studio Setup is the same as that described previously, then you could enable a device (or devices) for each of the 16 MIDI channels as well as for various MIDI system events.

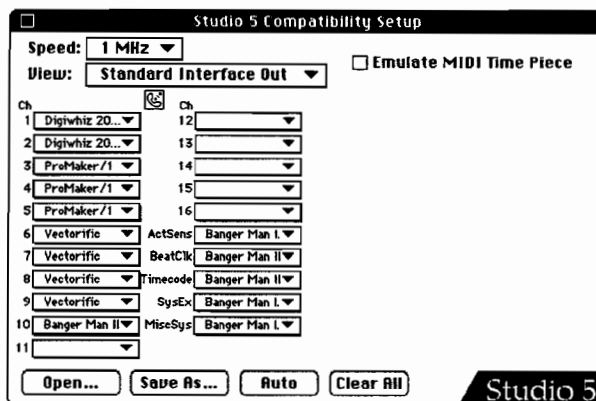


Figure 12-7: Enabling Standard Interface Outputs

In Figure 12-7, the Digiwhiz 2000 responds to data on channels 1 and 2, the ProMaker/1 receives on MIDI Channels 3 through 5, the Vectorific receives on Channels 6 through 9, and the Banger Man II drum module responds on MIDI Channel 10. All devices will receive active sensing, system exclusive, and miscellaneous MIDI system messages. Beat Clock and Timecode are sent only to the Banger Man II since it's the only device defined in the current Studio Setup document that will receive this type of data.

MIDI Time Piece In View

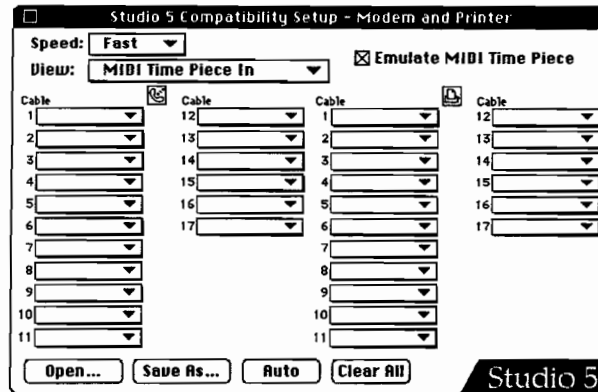


Figure 12-8: MIDI Time Piece In View

There are 17 pop-up menus per port—one for each of the 17 possible MIDI Time Piece cables. Choose, from each pop-up menu, those devices or Virtual Controllers that will send data to the Macintosh. The chosen devices or Virtual Controllers will appear to the Macintosh application as having been sent from the MIDI Time Piece cable number next to the menu.

NOTE: All enabled controllers in the MIDI Time Piece In view are also enabled when the Studio 5 is in standard interface mode.

MIDI Time Piece Out View

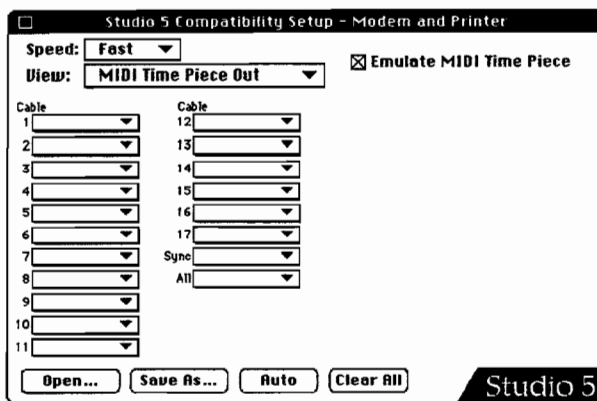


Figure 12-9: MIDI Time Piece Out View

There are 19 pop-up menus—including one for each of the 16 possible MIDI Time Piece cables. Choose the device or instrument from a cable's pop-up menu. In addition, there is a pop-up menu that represents the MIDI Time Piece's Network port (cable 17). "Sync" can be sent to any device or devices enabled for sync in the current Studio Setup document. "All" determines which device or Virtual Instrument is controlled by the "All" setting in Performer. You may also route a cable to the OMS/S5 Pgm Chg device. Program changes received on this cable will select OMS patches contained in the Studio 5.

NOTE: Cable numbers do not necessarily have to correspond to Studio 5 port numbers (although this is the default mode if the **Auto** button is used). Each cable can be assigned to any device or Virtual Instrument of your choice.

Using Output Cables

A single Studio 5 emulates two networked MIDI Time Pieces. If you have both serial ports connected to the Studio 5, you will still see only one set of output cables in the Compatibility Setup window—the Studio 5 does not distinguish between a cable on the modem port and a cable on the printer port.

Cable numbers have a specific and permanent meaning in the MIDI Time Piece: MIDI Time Piece #1 sends data to cables 1-8, MIDI Time Piece #2 sends data to cables 9-16, cable 17 is an optional standard interface connected to any MTP serial port (typically the network port of a single MTP, or the computer port of a second MTP), and "All" sends data to all 17 MIDI Time Piece cables.

With the Studio 5, you can assign *any* device or Virtual Instrument to *any* cable. This is much more flexible than the rigid MIDI Time Piece cable assignment described in the previous paragraph. Notice that there are three more cables (16, 17, and "All") than Studio 5 MIDI ports. You could, as an example, assign the device attached to MIDI port 1 to cable 1, the device attached to MIDI port 2 to cable 2, and so on up to cable 15 (although any device or Virtual Instrument can be routed to any cable). This still leaves three cables free for complex routing schemes involving Virtual Instruments. Using Virtual Instruments with cable outputs is discussed in the "All Menu" section which follows shortly.

Sync Menu

This menu allows you to send sync to any single device or Virtual Instrument. If you need to send sync to more than one device, create a Virtual Instrument consisting of a simple splitter routed to all devices that need to receive sync. Then choose that Virtual Instrument in the “Sync” pop-up menu. See Chapter 7 for more information about Virtual Instruments.

All Menu

Implementation of the Studio 5’s “All” function is slightly different (but much more flexible) than the “All” interaction between the MIDI Time Piece and Performer. In Performer, choosing the “All Cables” row causes data to be sent out *all cables* on that serial port.

If, for example, you were using a *real* MIDI Time Piece, the Performer cable assignment grid shown in Figure 12-10 would send data on Channel 1 to all 17 cables attached to the Macintosh Modem port.

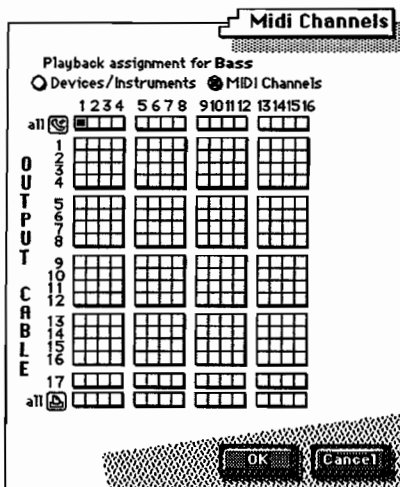


Figure 12-10: Performer Cable Assignment Grid

Performer’s Track window would illustrate this assignment as Ma-1 (with the lower case “a” indicating “all” cables), as shown below.



Figure 12-11: Performer Track Window

When a Studio 5 emulates a MIDI Time Piece, *you* define the meaning of the word “All”. The “All” cable can send data to one or more devices by creating a Virtual Instrument (see Chapter 7). This Virtual Instrument would consist of a simple splitter routed to all devices that need to receive MIDI data. You would then select that Virtual Instrument in the “All” pop-up menu.

As an example, assume your Studio Setup document that looks like Figure 12-12.

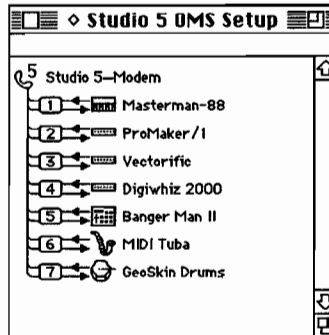


Figure 12-12: Sample Studio Setup Document

If you set your Performer cable assignment grid as before (ie. Ma-1), and want the same results as if you used a real MIDI Time Piece (ie. MIDI Channel 1 sent out every cable), then you would define a Virtual Instrument that consists of a simple splitter module and all the devices in your Studio Setup document.

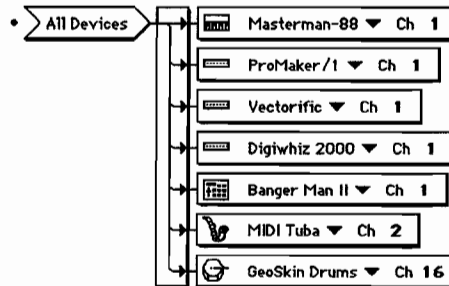


Figure 12-13: Virtual Instrument Emulates Performer “ALL” Function

From the “All” pop-up menu in the MIDI Time Piece Out view, you would select the Virtual Instrument named “All Devices”. Whenever Performer played that track, MIDI data (on Channel 1) would be sent to every device in your Studio Setup document—just as if you used a MIDI Time Piece.

The previous example showed how to *exactly* imitate the MTP “All” function. But what if you don’t want the MIDI data sent to *every* device in your studio? What if you only want data sent to the ProMaker/1 and the Vectorific? Simply design another Virtual Instrument as shown in Figure 12-14, then choose “Pro/Vector Stack” from the “All” pop-up menu.

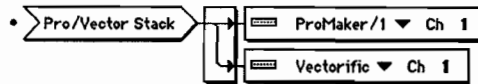


Figure 12-14: Redefining “ALL” with a Virtual Instrument

The same Performer track that, when used with a real MIDI Time Piece, played Channel 1 on every cable, will now play Channel 1 *only* on the ProMaker/1 and the Vectorific. This, as you can see, results in a more flexible cable handling arrangement.

NOTE: Virtual Instruments can be used with any cable—their use is not limited exclusively to the “All” cable. Since a Performer track assignment grid contains 18 cable selections (cables 1-17 and “All”), and a Studio 5 has 15 ports, there are always at least three extra cable outputs available for Virtual Instruments.

COMPATIBILITY SETUP EXAMPLES

The following examples will illustrate various methods of using the Studio 5 with different types of non-OMS software. Specifically, let’s look at two setups:

- 1) emulating a standard MIDI interface and using it with EZ Vision (without MIDI Manager)
- 2) emulating a MIDI Time Piece (fast mode) for use with Performer

Your own compatibility needs may differ, but these examples will help guide you through many of the basic configuration techniques.

Example 1: Emulating a Standard MIDI Interface

In this example you’ll use the Studio 5 to emulate a Standard MIDI Interface. You’ll work with Opcode’s EZ Vision sequencer and will *not* use MIDI Manager.

Assume that you have the simple studio shown in Figure 12-15. Your Gizmatronics master keyboard controller is plugged into MIDI port pair 2, a Proteus/1 sound module is plugged into MIDI port pair 7, and the Macintosh Modem port is connected to the Studio 5 “A” port.

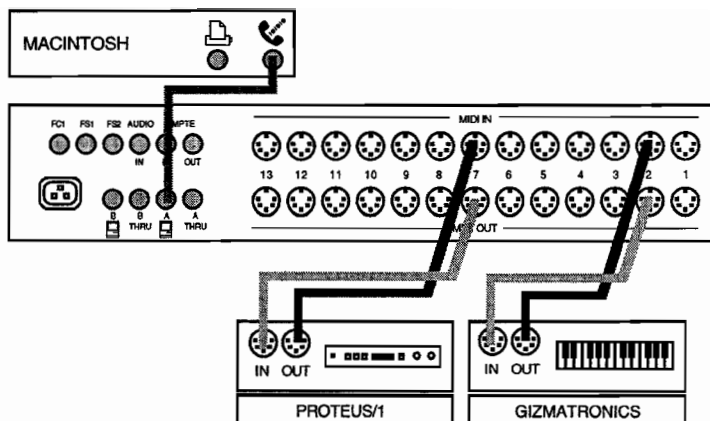


Figure 12-15: Sample MIDI Connections

- Open the OMS Setup+Patches application and choose **Compatibility Setup** from the **Studio 5** menu.
- Verify that **Emulate MIDI Time Piece** is NOT checked since you want the Studio 5 to emulate a standard MIDI interface.
- Choose **Standard Interface In** from the **View** pop-up menu.
- Choose MIDI source devices from the “A” port side of the Compatibility Setup window.

In your simple studio you have only two devices; a Gizmatronics keyboard and a Proteus/1, as shown below.

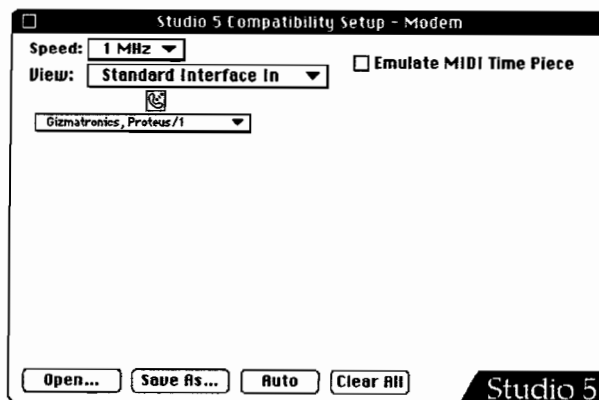


Figure 12-16: Standard Interface In Setup

- Choose **Standard Interface Out** from the **View** pop-up menu.
- Select those devices that will be MIDI destinations from the “A” port side of the compatibility window (or use the **Auto** button).

Since your simple studio has only one sound module, you'll send all 16 MIDI channels on the Modem port to the Proteus/1. You'll also enable other types of MIDI messages to be sent to the Proteus/1.

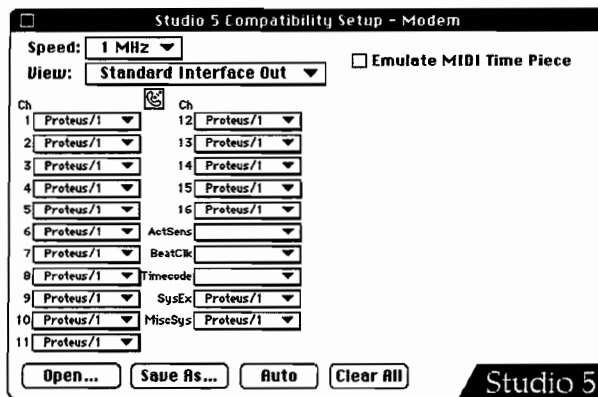


Figure 12-17: Standard Interface Out Setup

- Select patch number 1 on the Studio 5. This should be defined as your “do nothing” patch—the patch used for sequencing applications.
- Launch EZ Vision.
- Choose **MIDI Setup** from the **Setups** menu and make sure the Modem port is enabled, MIDI Manager is off, and the interface speed is set for 1 MHz.

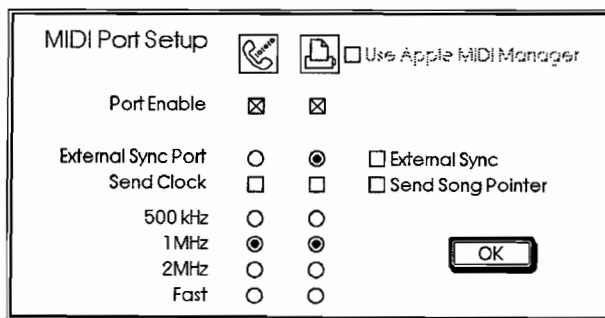


Figure 12-18: EZ Vision MIDI Setup Window

- EZ Vision can now be used as though attached to any standard MIDI Interface (such as an Opcode Studio 3 or MIDI Translator).

Example 2: Emulating a MIDI Time Piece (Fast mode)

Performer comes with a demonstration sequence named *Night Move "Lite"*, *Proteus 1*. Use that file for this example. You'll configure the Studio 5 to emulate a MIDI Time Piece operating in Fast mode. All studios are different, but for this example, assume you have a very simple studio consisting of a Gizmatronics MIDI controller (plugged into MIDI port pair 2) and an E-mu Proteus/1 sound module (plugged into MIDI port pair 7). Also assume that the Studio 5 is connected only to the Macintosh's Modem port. Your studio looks like Figure 12-19.

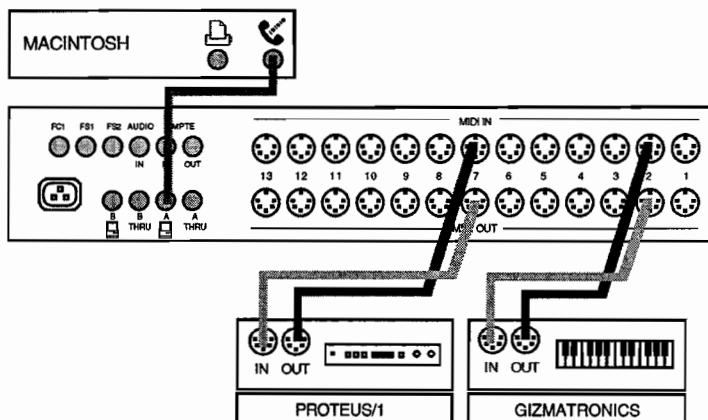


Figure 12-19: Sample MIDI Connections

- Make sure that MIDI Manager is not in your System folder and launch Performer (Performer cannot enter Fast mode if MIDI Manager is in the System folder).
- Open the *Night Move "Lite"*, *Proteus 1* file included with your Performer application.
- Choose **MIDI Interface** from Performer's **Basics** menu and configure it as shown in Figure 12-20. This indicates that a MIDI Time Piece (which is what the Studio 5 is emulating) is connected to the Macintosh's Modem port and that it is operating in Fast mode.

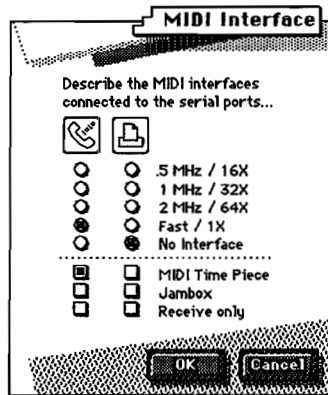


Figure 12-20: Performer's MIDI Interface Dialog

- Click **OK**.
- Choose **Patch Thru** from Performer's **Basics** menu, select **Auto Channelize** and click **OK**.

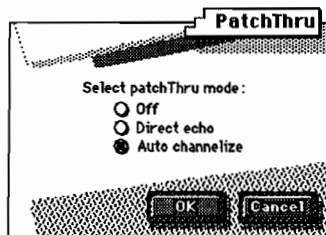


Figure 12-21: Performer's Patch Thru Dialog

- Look at Performer's Tracks window.

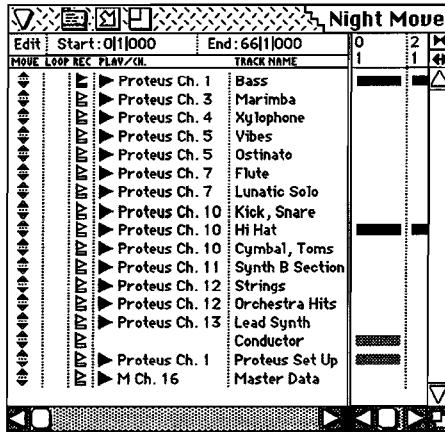


Figure 12-22: Performer's Tracks Window

- Notice that each track is assigned to a Proteus device (except the last track).
- Choose **MIDI Configuration** from Performer's **Windows** menu to open the MIDI Configuration window.

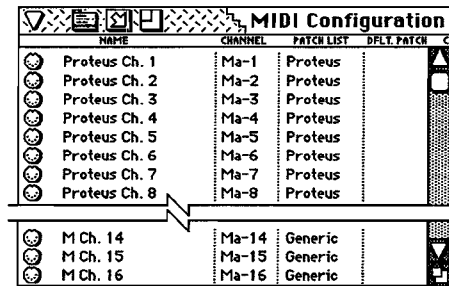


Figure 12-23: Performer's MIDI Configuration Window

- Notice that each Proteus device and the M Ch. 16 device are assigned to "All" MIDI Time Piece cables on the modem port.
- Open the OMS Setup+Patches application.
- Choose **OMS MIDI Setup** from the **Edit** menu.
- Select **Allow Non-OMS Applications** from the pop-up dialog box. This will allow non-OMS applications such as Performer to use the Macintosh serial ports.

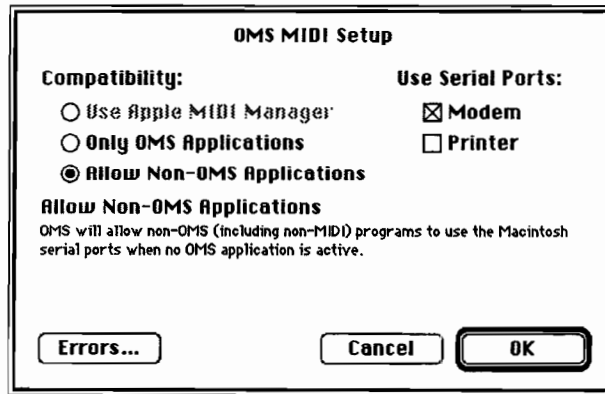


Figure 12-24: OMS MIDI Setup Dialog

- Choose **Compatibility Setup** from the **Studio 5** menu.
- Check the **Emulate MIDI Time Piece** box and choose **Fast** from the **Speed** pop-up menu.
- Choose **MIDI Time Piece In** from the **View** pop-up menu. Your studio has a Gizmatronics attached to port 2 and a Proteus/1 attached to port 7. Assign these ports to cables 2 and 7, respectively.

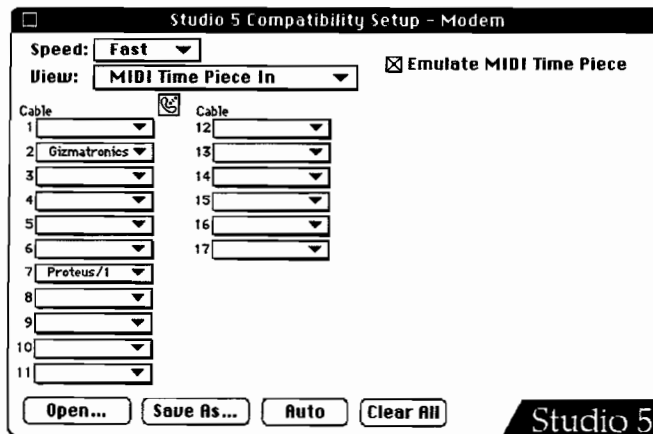


Figure 12-25: MIDI Time Piece In Settings

- Choose **MIDI Time Piece Out** from the **View** pop-up menu.

- Choose the Proteus/1 as the destination of the “All” cable routing (since the *Night Move "Lite", Proteus 1* Performer file was factory-configured to send data out “All” cables).

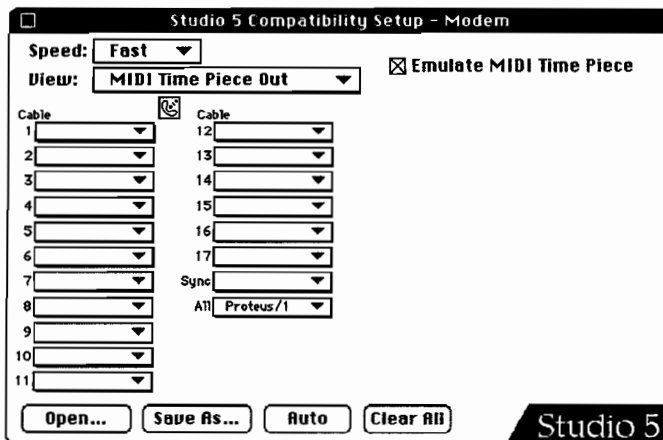


Figure 12-26: MIDI Time Piece Out Settings

- Select patch number 1 on the Studio 5. This should be defined as your “do nothing” patch—the patch used for sequencing applications.
- Click Performer’s **Play** button. Setup data will be sent to the Proteus and the demo sequence will begin playing.
- Click any track’s record-enable icon and play your Gizmatronics controller to hear the Proteus/1 on that MIDI channel.

The Gizmatronics will play the bass sound assigned to the Proteus/1 (Channel 1) if the “Bass” track is enabled as shown in Figure 12-27.



Figure 12-27: Playing Channel 1

Similarly, The Gizmatronics will play the Marimba sound assigned to the Proteus/1 (Channel 3) if enabled as shown in Figure 12-28.

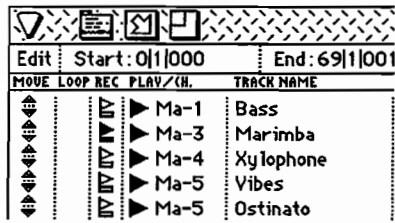


Figure 12-28: Playing Channel 3

13 SMPTE Functions

You control SMPTE functions with two windows that are accessed from the Studio 5 menu:

- the SMPTE Reader window
- the Stripe SMPTE window

The following sections discuss these two windows and provide a syncing tutorial.

SMPTE READER WINDOW

- Choose **SMPTE Reader** from the **Studio 5** menu to open the SMPTE Reader window.

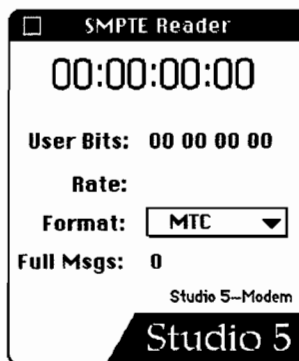


Figure 13-1: SMPTE Reader Window

From top to bottom, the SMPTE Reader window contains a timecode display, User Bits display, Rate display, Format pop-up menu and Full Message display. These are discussed in the following sections.

Timecode Display

This window displays the SMPTE timecode signal received at the SMPTE IN jack on the Studio 5 unless the Studio 5 is striping tape; then it displays the SMPTE time being striped. It uses the MIDI format (MTC/DTL/DTLe) set in the **Format** pop-up menu.

***NOTE:** The SMPTE Reader cannot distinguish between 29.97 non-drop and 30 non-drop. When the Studio 5 is reading a frame rate of 29.97 non-drop, the SMPTE Reader window will display the rate as 30 non-drop.*

User Bits Display

If you choose MTC from the **Format** pop-up menu, then any user bits that are encoded with the SMPTE timecode are displayed in the user bits display. User bits cannot be read if you use DTL or DTLe as the MIDI synchronization format.

For more information about user bits, see "User Bits" later in this chapter.

Rate Display

This area displays the SMPTE frame rate of the incoming SMPTE signal.

Format Menu

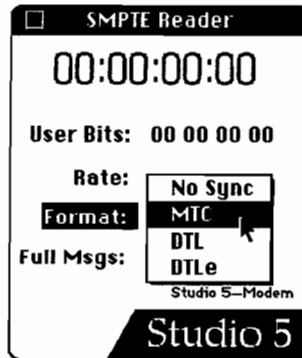


Figure 13-2: Setting MIDI Format

From the **Format** pop-up menu, choose the MIDI sync format your software uses. This pop-up menu duplicates the **MIDI Format** pop-up menu found in the SMPTE Reader window (discussed later in this chapter). The Studio 5 converts SMPTE timecode into the MIDI format set in this pop-up menu. The choices are:

- **No Sync:** The Studio 5 ignores the SMPTE input signal. Also, it doesn't show timecode when striping.
- **MTC:** The Macintosh uses MIDI Time Code to read the value of the SMPTE signal.

- **DTL:** The Macintosh uses Direct Time Lock to read the value of the SMPTE signal.
- **DTLe:** The Macintosh uses Enhanced Direct Time Lock to read the value of the SMPTE signal.

DTL NOTE: *There is one important point you need to consider when using either Direct Time Lock or Enhanced Direct Time Lock: DTL and MIDI Beat Clock use identical messages. Consequently, any MIDI Beat Clock messages received by the Studio 5 merge with DTL messages generated by the Studio 5, making both messages unreadable. Therefore, when you sync your sequencer to DTL, you must not allow any devices to send MIDI Beat Clock to the Macintosh. Either stop the device from sending MIDI Beat Clock, use an OMS Patch to mute the MIDI Beat Clock messages or use MIDI Time Code instead of DTL.*

Full Message Display

If you choose MTC as the MIDI format, then every time the Studio 5 achieves sync, it generates a “Full Message”. During a normal syncing situation, you will get only one full message (when the Studio 5 initially locks to tape). If the tape is of poor quality or the SMPTE signal isn't strong enough, additional full messages are sent. Each full message increments the counter and provides a good way to check the quality of your tape or incoming SMPTE signal. The SMPTE Reader window doesn't display Full Messages when you use DTL or DTLe as the MIDI synchronization format.

Using the SMPTE Reader Window with Multiple Studio 5's

The SMPTE Reader displays the timecode received at the SMPTE IN jack of the selected Studio 5. You must select a Studio 5 from the bottom of the **Studio 5** menu *before* opening the SMPTE Reader window. The SMPTE Reader window isn't affected by new Studio 5 selections after it's open—the window continues to work with the Studio 5 that was selected before it was opened. The SMPTE Reader window shows the name of the Studio 5 with which it works.

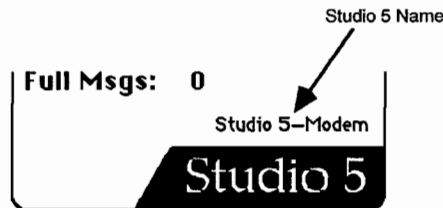


Figure 13-3: Studio 5 Identification in SMPTE Reader Window

NOTE: *If you have multiple Studio 5's connected in a network (see Chapter 14), you should use the Studio 5 connected directly to the Macintosh for SMPTE functions.*

STRIPE SMPTE WINDOW

- Choose **Stripe SMPTE** from the **Studio 5** menu to open the Stripe SMPTE window.

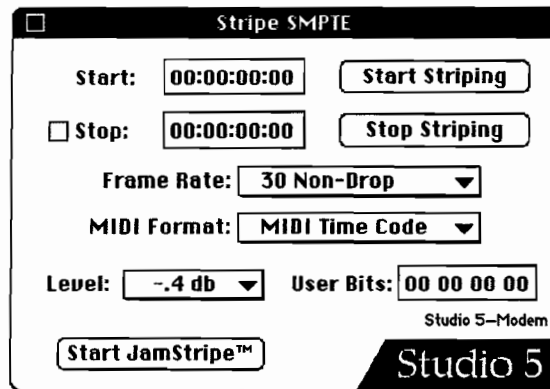


Figure 13-4: Stripe SMPTE Window

The following sections discuss the mechanics of this window. See the SMPTE tutorial later in this chapter for a step-by-step syncing tutorial.

Setting and Using Start and Stop Times

The **Start** field contains the SMPTE start time. Reading from left to right, the numbers represent hours, minutes, seconds and frames.

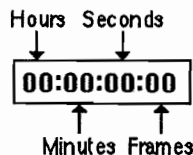


Figure 13-5: SMPTE Start Field

The Studio 5 can stop generating time code automatically. This is especially useful for unattended striping sessions. You can enter a stop time value in the **Stop** field. The check box to the left of the **Stop** field turns on the automatic stop feature. If the box is checked *and* a value is entered into the **Stop** field, the Studio 5 will automatically stop sending SMPTE timecode when that value is reached. If the box is not checked, the Studio 5 will ignore the Stop value, and continue striping until the **Stop Striping** button is clicked.

☒ Stop: 00:01:00:00

Figure 13-6: SMPTE Stop Field

The Studio 5 will begin to generate SMPTE timecode from its SMPTE Out jack as soon as the **Start Striping** button is clicked. The SMPTE value will begin at the time specified in the Start field. The Studio 5 will cease to generate SMPTE timecode when the **Stop Striping** button is clicked (or when the Stop field value is reached and the Stop check box is checked).

NOTE: The Stop check box must be checked *BEFORE* clicking the **Start Striping** button. If you check the Stop check box *AFTER* clicking **Start Striping**, then striping will not stop automatically.

As an example, let's say you wanted to stripe a tape with exactly 33 minutes of time code, and you wanted this stripe to begin at 1 hour SMPTE time. You would type 01:00:00:00 into your **Start** field, check the Stop check box, enter 01:33:00:00 into your **Stop** field, roll tape, and press the **Start Striping** button.

Setting and Using SMPTE Frame Rates

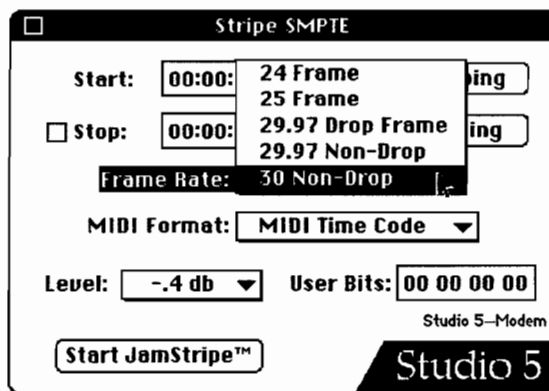


Figure 13-7: Setting SMPTE Frame Rate

You can choose one of five SMPTE frame rates from the Frame Rate pop-up menu. When you click the **Start Striping** button, the chosen rate is generated within the Studio 5 and sent to the SMPTE OUT jack. The following is a brief description of the various SMPTE frame rates.

- 24 Frame: Film frame rate.
- 25 Frame: EBU (European) television frame rate.
- 29.97 Drop Frame: NTSC color television frame rate.

- **29.97 Non-Drop:** Used to sync to NTSC color television without dropping frames. SMPTE time does not match real-time, but playback pitch is unaffected.
- **30 Non-Drop:** Original NTSC black and white television standard. Often used in audio-only situations since there are no dropped frames and the SMPTE time is equal to real time.

Setting and Using the MIDI Format

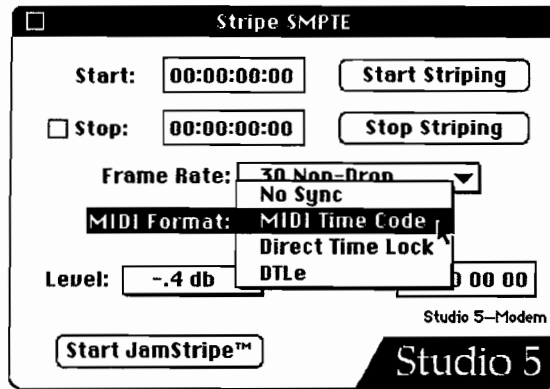


Figure 13-8: Setting MIDI Format

From the **MIDI Format** pop-up menu, choose the MIDI sync format your software uses. This pop-up menu duplicates the **Format** pop-up menu found in the SMPTE Reader window. The Studio 5 converts SMPTE timecode into the MIDI format set in this pop-up menu. The choices are:

- **No Sync:** The Studio 5 ignores the SMPTE input signal. Also, it doesn't show timecode when striping.
- **MIDI Time Code:** The Macintosh uses MIDI Time Code to read the value of the SMPTE signal.
- **Direct Time Lock:** The Macintosh uses Direct Time Lock to read the value of the SMPTE signal.
- **DTLe:** The Macintosh uses Enhanced Direct Time Lock to read the value of the SMPTE signal.

Guide to Setting SMPTE Levels

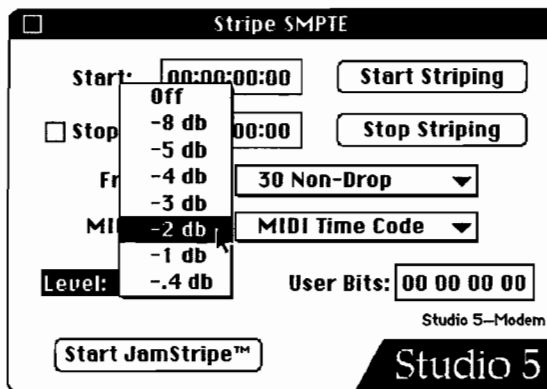


Figure 13-9: Setting SMPTE Output Level

The pop-up **Level** menu lists eight settings for the SMPTE output level. Choose one that provides the best input signal for your particular tape recorder. The following guide covers the optimum input levels for various types of machines. Choose a **Level** that gives a SMPTE input value closest to the following:

- If your tape machine operates at -10 dB, adjust the SMPTE output level for a tape input of about -3 dB.
- If your tape machine operates at +4 dB, adjust the SMPTE output level for a tape input of about -7dB.
- If you are using a -10 dB machine with LED metering, adjust the SMPTE output level for a tape input between -1 and -2 dB.
- If your audio recorded uses dbx noise reduction and you can't defeat it, adjust the SMPTE output level for a tape input between -1 and 0 dB.
- If you have a mixer in the SMPTE signal path (and you shouldn't), make sure that the equalization is either switched out or flat. Any filtering of the SMPTE signal will render it invalid.

Jam Sync

The Studio 5 has a Jam Sync mode. In this mode, it generates a fresh SMPTE signal from the SMPTE OUT jack in sync with the signal received at the SMPTE IN jack. You should always use Jam Sync mode to regenerate a SMPTE track when you copy tapes; a copied SMPTE track may degrade enough to make it unusable.

The Studio 5 is always in Jam Sync mode unless you choose **Off** from the pop-up **Level** menu in the Stripe SMPTE window.

If you want to copy a multitrack tape and its SMPTE track, connect the Studio 5 between the two tape recorders and enable Jam Sync mode by choosing a value other than **Off** from the pop-up **Level** menu. The Studio 5 will generate a fresh copy of SMPTE from the original tape's signal regardless of any dropouts in the original copy.

If you do not need to regenerate SMPTE (such as when you're using the Studio 5 to sync a sequencing application to tape), you should disable Jam Sync by choosing **Off** from the pop-up **Level** menu.

Start JamStripe™ Button

JamStripe™ takes Jam Sync one step further. If a tape has a very large drop-out in the SMPTE signal, or if the SMPTE signal stops at some point in the tape, JamStripe will cause the Studio 5 to continue generating timecode without having any SMPTE present at the SMPTE IN jack. To stop generating, click the **Stop Striping** button. If you have a tape in need of this kind of service, click the **Start JamStripe™** button when you make a copy of the tape. The Studio 5 will Jam Sync until it reaches the end of the SMPTE signal, at which point it will switch seamlessly into a generating mode.

NOTE: When Jam Syncing or Jam Striping, the SMPTE frame rate at the SMPTE OUT jack is the same as that being received at the SMPTE IN jack. The SMPTE Frame Rate pop-up menu has nothing to do with the SMPTE signal in either Jam Sync or JamStripe modes. You can view the actual SMPTE frame rate by using the SMPTE Reader window.

User Bits

This field allows you to enter user bits as defined by the SMPTE standard. User bits are often used to mark off and identify various sections of a tape. User bits are hexadecimal, so legal values are the numbers 0-9, and the letters A-F.

DTL NOTE: You can stripe timecode that includes user bits regardless of the MIDI synchronization format you specify. However, if you're reading timecode using either DTL or DTLe, user bits will not be displayed in the SMPTE Reader window—you must use MTC.

Using the Stripe SMPTE Window with Multiple Studio 5's

The Stripe SMPTE window works with the selected Studio 5. You must select a Studio 5 from the bottom of the **Studio 5** menu *before* opening the Stripe SMPTE window. The Stripe SMPTE window isn't affected by new Studio 5 selections after it's open—the window continues to work with the Studio 5 that was selected before it was opened. The Stripe SMPTE window shows the name of the Studio 5 with which it works.

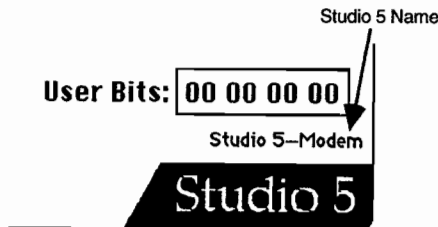


Figure 13-10: Studio 5 Identification in Stripe SMPTE Window

SMPTE TUTORIAL

Follow through these tutorial sections to learn how to stripe a tape with SMPTE timecode and to sync to SMPTE using either Vision or Performer.

Striping a Tape

Unless you already have tapes with SMPTE on them, you will need to put SMPTE timecode onto a blank tape. This process is usually called “striping” a tape with SMPTE.

To stripe a new tape with SMPTE timecode, familiarize yourself with the Stripe SMPTE window as well as the operation of your tape recorder. A typical striping operation might go something like this:

- Use a new roll of recording tape and turn off any noise reduction on your tape recorder. Do not use any equalization or alter the SMPTE signal in any way.
- Make sure that your Studio 5 is connected as discussed in “Chapter 3: Hardware Installation”.
- Choose **Stripe SMPTE** from the **Studio 5** menu to open the Stripe SMPTE window.

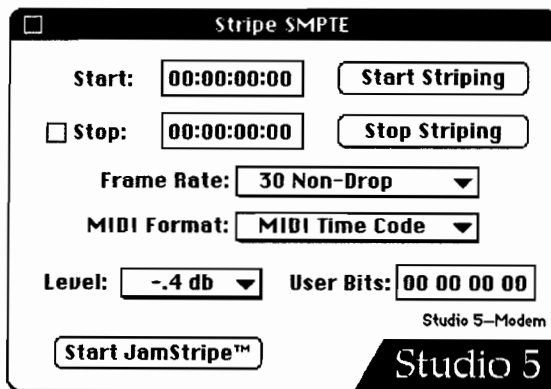


Figure 13-11: Stripe SMPTE Window

- Enter the SMPTE frame rate using the **Frame Rate** pop-up menu. Enter a Start time. If you wish the striping to stop automatically, enter a Stop time and check the **Stop** check box. If desired, enter the User Bits. Set a SMPTE output level.
- Choose a MIDI Format.
- Put your tape recorder into Record mode, but paused.
- Click the **Start Striping** button in the Stripe SMPTE window and the Studio 5 SMPTE/Power LED will begin to flash. You should see the SMPTE signal level on your recorder's input meters. Verify that the proper amount of SMPTE signal is going onto tape.

- Adjust, if necessary, either the SMPTE output level on the Mac, or the input level on your tape machine.
- When you are satisfied with the levels, click the **Stop Striping** button in the Stripe SMPTE window.
- Choose **SMPTE Reader** from the **Studio 5** menu so that you can monitor the SMPTE time.
- Turn off the Pause on your audio recorder to begin recording. When tape is rolling, click the **Start Striping** button in the Stripe SMPTE window.
- SMPTE timecode will stop generating when it reaches the time specified in the **Stop** field if the **Stop** check box is checked.
- If the **Stop** check box is unchecked, you can click **Stop Striping** when you reach the end of the tape.
- When you are finished striping, the Studio 5 SMPTE/Power LED will cease to flash. Click the close box to close the Stripe SMPTE window.

Syncing to Tape

Once you have a tape with SMPTE striped on it, you can use the Studio 5 to synchronize the Macintosh to the tape.

- Connect the SMPTE track output of your multitrack tape recorder to the Studio 5 SMPTE IN jack (as discussed in the “Audio Connections” section of Chapter 3).
- Connect the computer as discussed in the “Computer Connections” section of Chapter 3.
- Turn Jam Sync off by choosing **Off** from the Stripe SMPTE window’s pop-up **Level** menu.
- Open the SMPTE Reader window and choose the MIDI Format that will be sent to the Macintosh (MTC, DTL, or DTLe).
- Put your tape machine into play mode.
- Verify that the SMPTE/Power LED is flashing. When the Studio 5 detects valid SMPTE code at its input, the SMPTE/Power LED flashes and MIDI Time Code (or, if selected, DTL or DTLe) is sent to the computer.
- View the SMPTE timecode in the SMPTE Reader window.

The Studio 5 performs an operation known as “flywheeling”. If your multitrack tape has timecode dropouts, the Studio 5 will continue to send timecode to the Macintosh as if the signal were still present at the input. If the Studio 5 loses sync there could be one of a number of problems. See “Studio 5 loses sync” in Appendix B for more information.

SMPTE, Vision and the Studio 5

This section discusses using the Studio 5 with Vision. The information is also applicable to working with Studio Vision.

Vision uses MIDI Time Code for synchronization, so...

- Choose **Stripe SMPTE** from the **Studio 5** menu and choose **MIDI Time Code** from the **MIDI Format** pop-up menu.

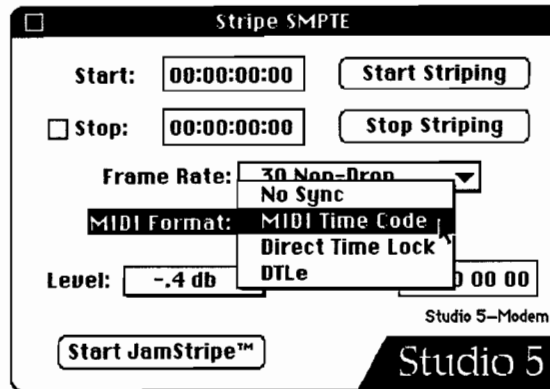


Figure 13-12: Choose a MIDI Format

- Turn off Jam Sync by selecting **Off** from the Stripe SMPTE window's **Level** pop-up menu.

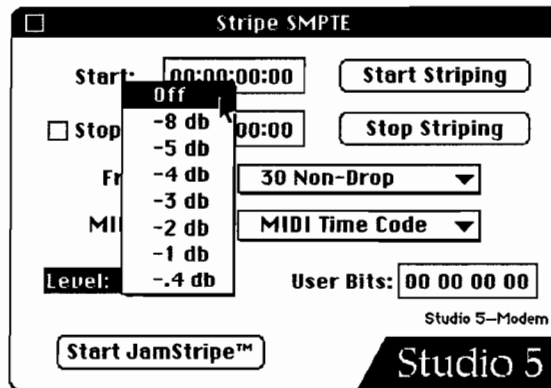


Figure 13-13: Turn Jam Sync Off

- Choose **Receive Sync Mode** from Vision's **Options** menu and choose **MIDI Time Code** from the submenu.

- Choose **Receive Sync Device** from Vision's **Options** pop-up menu and choose the Studio 5 from the submenu.
- Select the desired playback sequence, its **Sync** and its **Offset**.
- Click **Play** in Vision's Control window. The play button will flash while Vision waits for sync.
- Hit **Play** on your tape recorder and Vision will start playing back in sync with the tape.

Use a similar procedure for recording tracks into Vision while synced to tape. For more information concerning Vision's various sync modes, see your Vision manual.

SMPTE, Performer and the Studio 5

This tutorial is based on the one in "Example #2: Emulating a MIDI Time Piece" in the "Compatibility Setup Examples" section of Chapter 12. See that example for studio and setup assumptions. Additionally, this tutorial assumes your tape is striped with 30 FPS SMPTE and that you'll use MTC to lock Performer to the audio tape.

- Launch Performer, open the *Night Move "Lite"*, *Proteus 1* file and set Performer's MIDI Interface dialog as discussed in Chapter 12.
- Open the OMS Setup+Patches application, make sure OMS is in "Allow non-OMS applications" mode, and set the Compatibility Setup windows as discussed previously.

You want the *Night Move "Lite"*, *Proteus 1* file to sync to an external SMPTE source, so you'll need to perform the following additional steps:

- Choose the Studio 5 as an input device in the OMS Setup+Patches Compatibility Setup window.

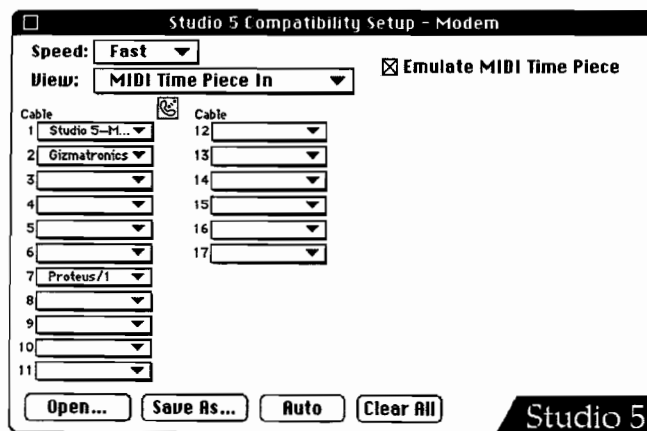


Figure 13-14: Setting the Compatibility Window

It doesn't matter which cable you use for the Studio 5 input—only that one of the cables lists the Studio 5 as an input. Footswitch, timecode and audio in events will appear to Performer as having come from that cable.

You'll be using MIDI Time Code, so...

- Choose **MIDI Time Code** from the Stripe SMPTE window's pop-up **MIDI Format** menu.
- Turn off Jam Sync by selecting **Off** from the Stripe SMPTE window's pop-up **Level** menu.
- Choose **Receive Sync** from Performer's **Basics** menu and set the window as shown in Figure 13-12.

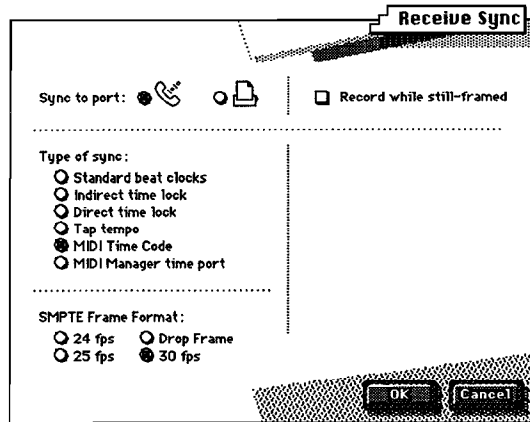


Figure 13-15: Performer's Receive Sync Window

- Choose **Slave to External Sync** from Performer's **Basics** menu to put a check to the left of the option. This causes Performer's playback to be locked to MTC.
- Hit the **Play** button in Performer. It will be greyed out, indicating that Performer is waiting to receive external sync.
- Hit **Play** on your tape recorder. The *Night Move "Lite"*, *Proteus 1* sequence will begin to play back in sync with the tape recorder.

NOTE: Unless your tape is at SMPTE time 0:00:00:00, it will be necessary to set a SMPTE offset in Performer's Counter window. See your Performer manual for details.

NOTE: Performer may have difficulty handling timecode, beat clock, active sensing and note data all on one serial port. For trouble-shooting tips, please see "Sync Problems" in Appendix B in this manual.



14 Networking

You may connect more than one Studio 5 to a Macintosh. This is called networking. You can connect up to six Studio 5's to a single Macintosh for a maximum of 1,440 MIDI channels.

NETWORKING BASICS

A network is defined as the connection of one or more Studio 5's to a Macintosh serial port. The Macintosh has two serial ports, so it can support two networks. You can connect up to six Studio 5's to a single Macintosh (two networks of three Studio 5's).

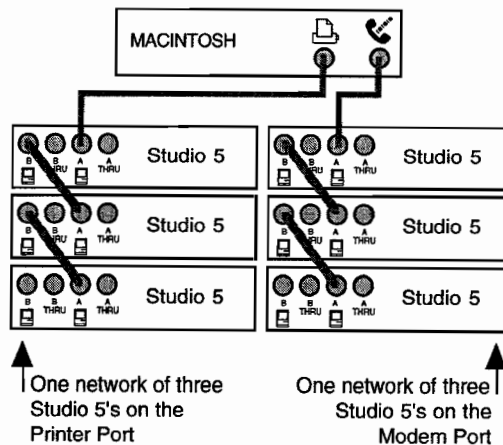


Figure 14-1: Two Networks of Three Studio 5's Each

When networking Studio 5's, always connect the "B" port of the Studio 5 closest to the Macintosh to the "A" port of the next Studio 5 (as shown in Figure 14-1).

Studio 5 Numbering

When you turn on a Studio 5, it displays a number in the middle of its display for about one second before it displays the current patch number. This is the Studio 5 unit number. Any Studio 5 connected directly to the Macintosh is number 1. The Studio 5 networked to it is number 2, and the Studio 5 furthest from the Macintosh is number 3. Figure 14-2 illustrates Studio 5 numbering.

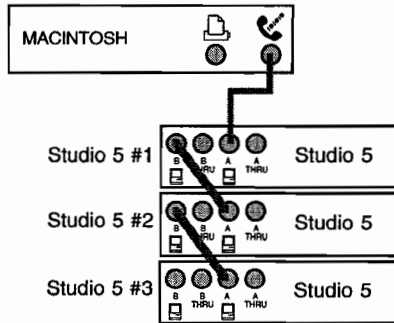


Figure 14-2: Numbering Studio 5's

Changing Studio 5 Patches

When you change patches on one Studio 5, the patches change on all Studio 5's in the network. Each Studio 5 contains the patches defined by your current patch document.

Studio Setup Documents

Each Studio 5 has its own icon in the Studio Setup document. If you have two Studio 5's, you'll see two Studio 5 icons; four Studio 5's will produce four icons, and so on. The names of the icons depend on how you're connected the Studio 5's to the Macintosh. Studio 5 icon names are discussed in the following section.

NETWORKING OPTIONS

There are numerous ways to connect multiple Studio 5's. The following sections discuss your networking options.

One Network/One Cable

The first option is to connect all Studio 5's in a single network as shown in Figure 14-3. You can connect no more than three Studio 5's in this fashion. The one network/one cable connection gives you the advantage of leaving a Macintosh serial port free while still accessing up to 720 MIDI channels.

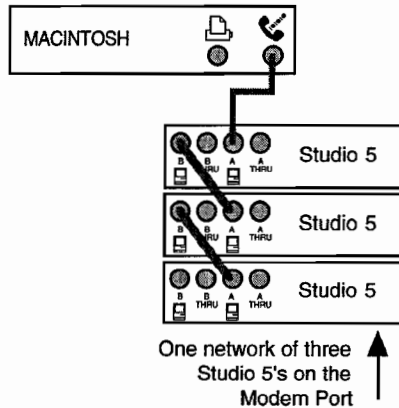


Figure 14-3: One Network of Three Studio 5's

Each Studio 5 has its own icon in the Studio Setup document. The icon contains the name of the serial port and the number of the Studio 5. The network shown in Figure 14-3 produces three Studio 5 Studio Setup icons as shown in Figure 14-4. You may change the name of any Studio 5 as discussed in "Renaming Studio 5's" in Chapter 4.

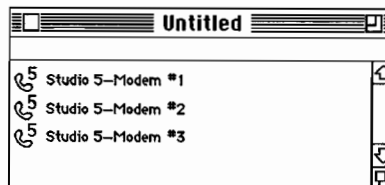


Figure 14-4: Studio Setup Document for Figure 14-3

One Network/Two Cables

The second option is to connect all Studio 5's in a single network and connect a second cable between the last Studio 5's "B" port and the unused Macintosh serial port as shown in Figure 14-5. You can connect no more than four Studio 5's in this fashion. This helps balance the MIDI data stream between the two Macintosh serial ports.

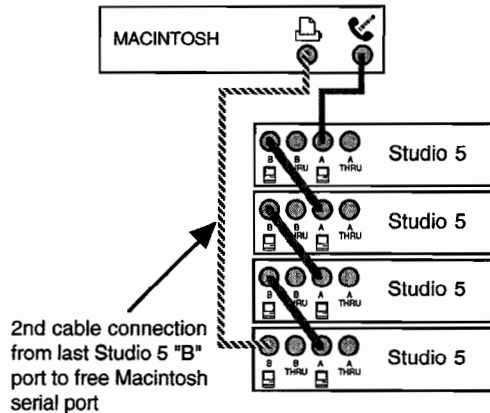


Figure 14-5: One 2-cable Network of Four Studio 5's

If you have four Studio 5's in a 2-cable network, MIDI data distribution occurs as follows:

- The Studio 5 that's connected directly to the Modem port will communicate exclusively over the Modem port.
- The Studio 5 that's connected directly to the Printer port will communicate exclusively over the Printer port.
- Studio 5 #2 communicates through Studio 5 #1. Studio 5 #3 communicates through Studio 5 #4.

For the example shown in Figure 14-5, Studio 5 #1 communicates with the Modem port, Studio 5 #4 communicates with the Printer port, Studio 5 #2 communicates with the Modem port through Studio 5 #1, and Studio 5 #3 communicates with the Printer port through Studio 5 #4.

Each Studio 5 has its own icon in the Studio Setup document. The icon shows the number of the Studio 5 and the fact that it's part of a 2-cable connection. The network shown in Figure 14-5 produces three Studio 5 Studio Setup icons as shown in Figure 14-6. You may change the name of any Studio 5 as discussed in "Renaming Studio 5's" in Chapter 4.

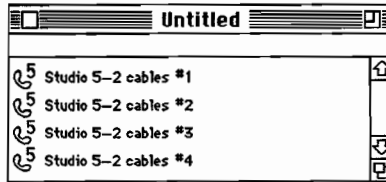


Figure 14-6: Studio Setup Document for Figure 14-5

If you have three Studio 5's in a 2-cable network, MIDI data distribution occurs as follows:

- The Studio 5 that's connected directly to the Modem port will communicate exclusively over the Modem port.
- The Studio 5 that's connected directly to the Printer port will communicate exclusively over the Printer port.
- The middle Studio 5 sends all of its internally generated data (timecode, Studio 5 footswitches, Studio 5 foot controller and Audio In note events) to the "B" port connection and all other MIDI data to the "A" port.

If you have two Studio 5's in a 2-cable network, then each Studio 5 communicates exclusively with the Macintosh port to which it is directly connected.

Two Networks

Your final networking option is to split your Studio 5's between both Macintosh serial ports as shown in Figure 14-7. You can put up to three Studio 5's on either network. Using two networks gives you complete control over which MIDI data goes to which Macintosh serial port.

You must use two networks if you have more than four Studio 5's connected to a Macintosh.

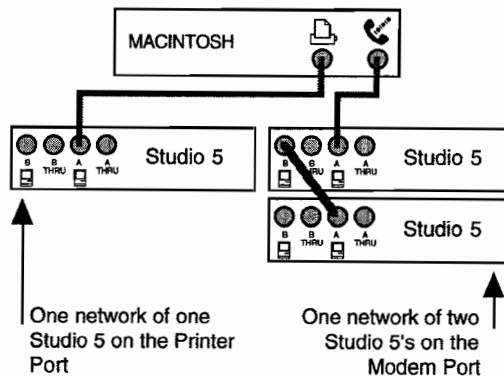


Figure 14-7: Two Studio 5 Networks

Each Studio 5 has its own icon in the Studio Setup document. The icon contains the name of the serial port and the number of the Studio 5. The connection shown in Figure 14-7 produces three Studio 5 Studio Setup icons as shown in Figure 14-8. You may change the name of any Studio 5 as discussed in "Renaming Studio 5's" in Chapter 4.

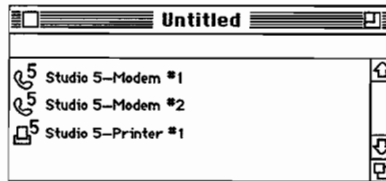


Figure 14-8: Studio Setup Document for Figure 14-7

THE STUDIO 5 MENU WITH NETWORKS

Any time the current Studio Setup document contains more than one Studio 5, you'll see a listing of them at the bottom of the **Studio 5** menu.

To select (check) a Studio 5, simply pull down the menu and release the mouse over the desired Studio 5.

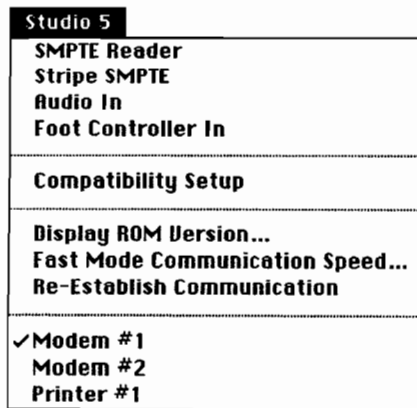


Figure 14-9: Multiple Studio 5's in the Studio 5 menu

The following sections discuss how each **Studio 5** menu item behaves when more than one Studio 5 is present in a Studio Setup document.

In general, you must select a Studio 5 before choosing a **Studio 5** menu command. If you select a different Studio 5 while a **Studio 5** menu window is already open, subsequent menu selections apply to the new Studio 5 selection. Windows that are already open continue to work with the Studio 5 that was selected when they were opened.

SMPTE Reader

The SMPTE Reader displays the timecode received at the SMPTE IN jack of the selected Studio 5. If you're using multiple Studio 5's, you must select a Studio 5 *before* opening the SMPTE Reader window.

Stripe SMPTE Windows

The Stripe SMPTE window works with the selected Studio 5. If you're using multiple Studio 5's, you must select a Studio 5 *before* opening the Stripe SMPTE window.

Audio In

This toggles the Audio In feature ON or OFF for the selected Studio 5.

Foot Controller In

This enables or disables the Foot Controller for the selected Studio 5.

Compatibility Setup

This command opens a Compatibility Setup window which recognizes *all* Studio 5's in the setup document. If you're using multiple Studio 5's, it doesn't matter which Studio 5 is selected when you open the Compatibility Setup window.

NOTE: *If you use two Studio 5's to emulate four MIDI Time Pieces, you should use both Macintosh serial ports. This gives you access to 17 MTP cables on each port.*

Display ROM Version...

This command displays the ROM Version of the selected Studio 5.

Fast Mode Communication Speed

This command dictates communication speeds between the *Macintosh* and any Studio 5's that are connected directly to it. Communication between Studio 5's in a network is always at a speed of 8 x MIDI.

Re-Establish Communication

This command re-establishes communication with all Studio 5's regardless of which is selected.

SIMPLE NETWORK EXAMPLE: TWO STUDIO 5's

You can network two Studio 5's to a single Macintosh using any of the methods discussed previously.

One Network/One Cable Example

Figure 14-10 shows a single network of two Studio 5's. The Macintosh modem port connects to the first Studio 5's "A" port. That Studio 5's "B" port connects to the second Studio 5's "A" port.

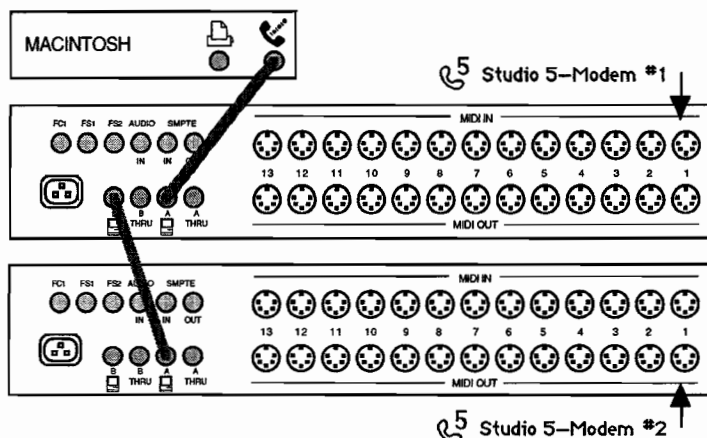


Figure 14-10: One Network of Two Studio 5's

- Choose **New Studio Setup** from the **File** menu and search the Macintosh Modem port. Your new Studio Setup document contains an icon for each Studio 5 in your network (see Figure 14-11).

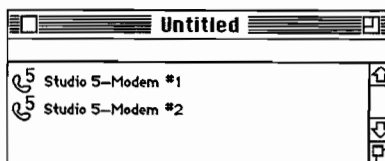


Figure 14-11: Studio Setup for Network of Figure 14-10

- Add devices to your Studio Setup document and connect them to Studio 5 icons to reflect the current conditions in your studio.

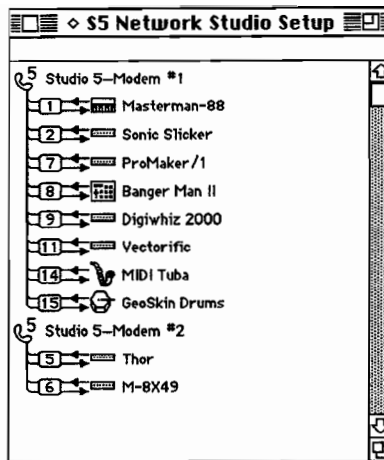


Figure 14-12: Sample Studio Setup Document

One Network/Two Cable Example

You could add an additional cable between the second Studio 5's "B" port and the Macintosh Printer port (as shown in Figure 14-13).

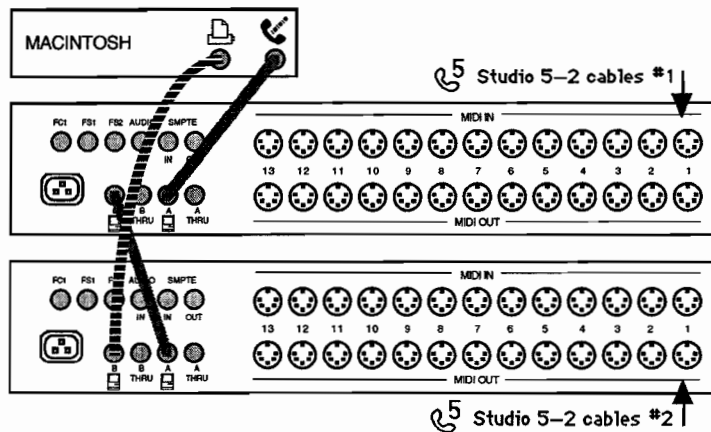


Figure 14-13: One 2-cable Network of Two Studio 5's

Connecting the Macintosh Printer port to the second Studio 5 increases MIDI throughput capabilities by balancing the MIDI data load between the two Macintosh serial ports. Studio 5 #1 communicates with the Modem port. Studio 5 #2 communicates with the Printer port.

Two Network Example

Figure 14-14 illustrates another possible way to connect two Studio 5's to the Macintosh. In this connection, all communication with the top Studio 5 is handled by the Printer port, and all communication with the bottom Studio 5 is handled by the Modem port.

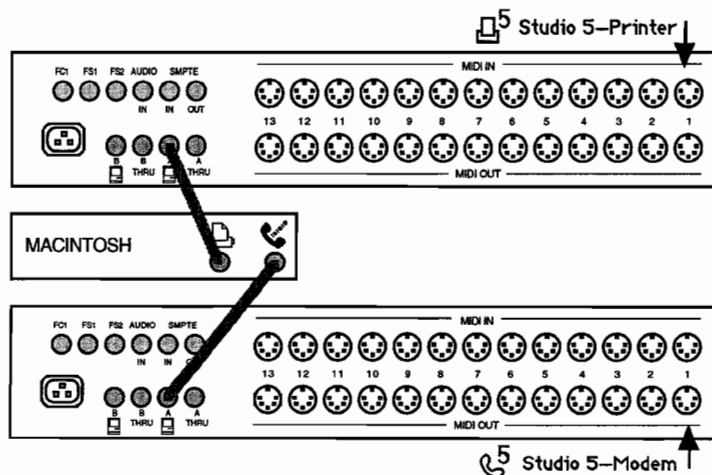


Figure 14-14: Two Networks of One Studio 5 Each

Which Setup is Best?

The only real advantage of the one network/one cable setup is that it leaves you a free Macintosh serial port.

The advantages and disadvantages of the other two methods are more subtle. Each Studio 5 can communicate directly with the computer without having to go thru the other Studio 5. However, if you are using an OMS patch and want to route data from a device on one Studio 5 to a device on the other Studio 5, the one network/two cable setup is more efficient because data can travel directly between the two Studio 5's. In the two network setup, data must go from one Studio 5 to the Macintosh and then to the other Studio 5. In addition, the Macintosh will only know that it must thru the data from one serial port to another when OMS is active (i.e. either when you are in OMS only mode, or when an OMS application is running). This means you cannot use this type of patch with a two network setup without the Macintosh being present. With a one cable two cable setup, the routing will work even if the Macintosh is not present.

15 Menus

THE FILE MENU

File	
New Studio Setup	
New Patch Document	⌘N
Open...	⌘O
Open Current Studio Setup	⌘U
Open Current Patch Document	⌘Y
Close	⌘W
Save	⌘S
Save As...	
Save and Make Current	⌘M
Page Setup...	
Print...	
Quit	⌘Q

Figure 15-1: File Menu

This menu is very similar to the regular OMS Setup menu (as discussed in the OMS manual) and its functions can be found in that manual. Two new menu items are added when using OMS with the Studio 5, and some items behave differently depending on whether a Studio Setup or a patch document window is active.

New Patch Document ⌘N

Choose this command to open a new, untitled patch document. You can create and save 128 patches and any number of Virtual Controllers, Virtual Instruments and Program Change Sources.

Open Current Patch Document ⌘Y

Choose this command to open the current patch document. See Chapter 5 for information about current patch documents.

Print

If a Studio Setup document is active, choosing this command will print the active Studio Setup document.

If a patch document window is open, (or any related windows such as Patch, Sequence, or Module editing windows) choosing the Print command will print the active patch document.

Other File Menu Differences

Other menu items such as Close, Save, Make Current, etc. apply to the active window. Therefore, if a Studio Setup window is active, these items will perform as discussed in the OMS manual. If a patch document window is active, these items will perform similar operations on the patch document.

THE EDIT MENU

Edit	
Undo	⌘Z
Cut	⌘H
Copy	⌘C
Paste	⌘V
Clear	⌘B
Show Clipboard	
OMS MIDI Setup...	
All Notes Off (Panic)	!
Preferences...	

Figure 15-2: Edit Menu

This menu is the same as the Edit menu discussed in the OMS manual. If a patch document (or related window) is active, these commands will be performed on selected items within that window instead of within the Studio Setup document.

THE STUDIO MENU

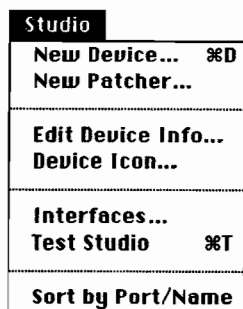


Figure 15-3: Studio Menu

This menu is identical to the Studio menu discussed in the OMS manual. It affects only the Studio Setup document and is grayed out if a patch document (or related window) is active.

THE PATCH MENU

This menu becomes available when an OMS patch document (or related window) is active. It is grayed out when another window is active.

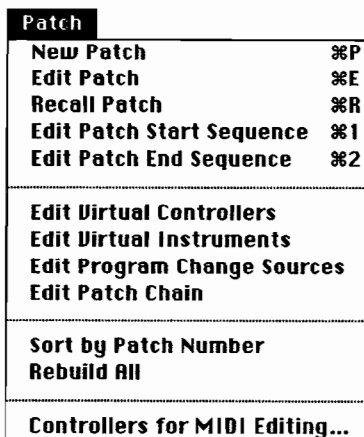


Figure 15-4: Patch Menu

New Patch ⌘P

Choose **New Patch** to add a new empty patch to the patch document. Each patch document can hold up to 128 patches.

Edit Patch ⌘E

Choose **Edit Patch** to open a patch editing window. This is the same as double-clicking a patch selector dot in the patch document window.

Recall Patch ⌘R

Choosing **Recall Patch** is the same as clicking in a patch's diamond column. It makes the selected patch the current patch. After choosing **Recall Patch**, you will see a diamond next to the patch number. The patch is now active and its number is displayed on the front of the Studio 5.

Edit Patch Start Sequence ⌘1

Choose this item to open a Patch Start Sequence edit window. For information on editing and using Start Sequences, see Chapter 10.

Edit Patch End Sequence ⌘2

Choose this item to open a Patch End Sequence edit window. For information on editing and using End Sequences, see Chapter 10.

Edit Virtual Controllers

Choose **Edit Virtual Controllers** to open the active patch document's Virtual Controller editing window. Choosing this menu item is the same as clicking the **Virtual Controllers** button in the patch document window. Virtual Controller editing is discussed in Chapter 7.

Edit Virtual Instruments

Choose **Edit Virtual Instruments** to open the active patch document's Virtual Instruments editing window. Choosing this menu item is the same as clicking the **Virtual Instruments** button in the patch document window. Virtual Instrument editing is discussed in Chapter 7.

Edit Program Change Sources

Choose **Edit Program Change Sources** to open the active patch document's Program Change Source editing window. Choosing this menu item is the same as clicking the **Program Change Sources** button in the patch document window. Program Change Sources editing is discussed in Chapter 8.

Edit Patch Chain

Choose **Edit Patch Chain** to open the active patch document's Patch Chain edit window. Choosing this menu item is the same as clicking the Patch Chain button in the patch document window. Patch Chains are discussed in Chapter 9.

Sort by Patch Number

Select the **Sort by Patch Number** option to view your patch document in numerical order. When the option has a check mark to its left, patches will *always* be displayed in numerical order. When the option is unchecked, patches can be in *any* order.

Rebuild All

Choose this command to rebuild all your patches and resend them to the Studio 5. You will need to use **Rebuild All** only if your patches, virtual controllers, virtual instruments or program change sources aren't working, and the device menus in the appropriate window's don't contain italicized choices. This situation is most likely to occur if you switch between two very similar Studio Setups (for example, one with your Studio 5 on the modem port, and another with the same devices, but with the Studio 5 on the printer port).

Controllers for MIDI Editing...

Choose **Controllers for MIDI Editing** to produce a dialog containing a list of all devices defined in your current Studio Setup document. In the dialog, click (highlight) those devices you wish to use for MIDI entry of patch edit parameters.

***NOTE:** If you don't plan to use a MIDI controller to edit patches, it's best to disable all controllers. That way you can't accidentally edit a module by playing your MIDI controller.*

THE STUDIO 5 MENU

The Studio 5 menu appears in the OMS Setup+Patches application whenever a Studio 5 driver is installed and the current Studio Setup document contains one or more Studio 5's.

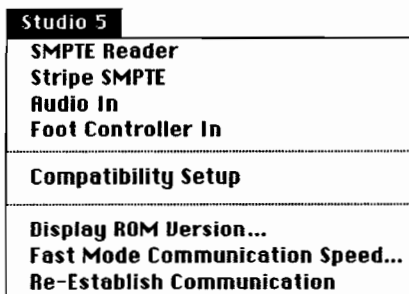


Figure 15-5: Studio 5 Menu

SMPTE Reader

This window reads the SMPTE timecode signal at the Studio 5's SMPTE In jack. See Chapter 13 for a detailed description of the SMPTE Reader window.

Stripe SMPTE

Use this window to define SMPTE attributes and to stripe tape with SMPTE timecode. It also determines the MIDI format (MTC, DTL, DLTe) used by the Macintosh. Chapter 13 discusses the Stripe SMPTE window in detail.

Audio In

This enables the Studio 5's audio-to-MIDI conversion feature. Select this option to enable it (checked). Select it again to disable it (unchecked). You can use **Audio In** to sync Vision (or Studio Vision) to an external audio signal. Audio In status is saved in the Studio 5's internal memory. See Appendix A for a short Audio In tutorial.

Foot Controller In

This enables the Studio 5's continuous foot controller (FC1). Select this option to enable the foot controller (checked). Select it again to disable the foot controller (unchecked). Its status is saved in the Studio 5's internal memory.

Compatibility Setup

This opens a configuration window in which the Studio 5 can be set to emulate either a standard 2 port MIDI interface or a MIDI Time Piece. See Chapter 12 for details on using this window.

Display ROM Version...

This will display the version numbers of your Studio 5's internal ROMs. You should know your ROM versions if you call Opcode Technical Support about your Studio 5. Registered users will be notified of ROM updates.

Fast Mode Communication Speed...

Choose **Fast Mode Communication Speed** to open a dialog for setting fast mode communication speeds between the Studio 5 and the Macintosh. Chapter 4 discussed the Fast Mode Communication Speed dialog in detail.

Re-Establish Communication

On rare occasions, the Studio 5 may lose contact with the Macintosh. This can be caused by a lost MIDI message (due to AppleTalk being on, for example) or a software error within the Mac or Studio 5. You won't need to use this command unless you see an alert message on the Macintosh telling you that you need to re-establish communication.

***NOTE:** You can also re-establish communication from within an OMS compatible application other than OMS Setup+Patches (such as Vision, Studio Vision, Galaxy) by choosing **OMS MIDI Setup** and clicking **OK**. This way, you don't have to launch OMS Setup+Patches just to re-establish communication with the Studio 5.*

PART FOUR:

Appendices

Using Audio In with Vision—Appendix A

Troubleshooting—Appendix B

Specifications—Appendix C

Appendix A: Using Audio In with Vision

This appendix discusses creating a tempo track in Vision or Studio Vision (versions 1.1 or later) using the Studio 5's Audio In feature.

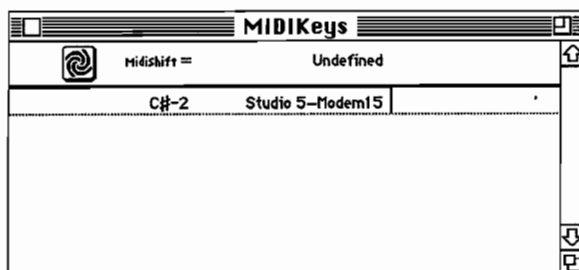
Suppose that you have a live band recorded on two tracks of a 4-track tape, and that you'd like to supplement the recording with some sequenced virtual tracks. Follow this step-be-step procedure for using the Studio 5 Audio In feature with Vision.

- Make certain you have two blank tape tracks. You'll need one for an audio click track and one for SMPTE time code.
- Record a click track onto a blank tape track.

A rim shot or similarly percussive sound works well. You'll want to include a one or two bar count-off before the song begins. The best way to do this is to turn the tape backward (so when you play the tape, you hear the music backwards), and record the click track this way. When the end of the song is reached, record an additional two bars. When the tape is played in the forward direction, you'll have two bars of clicks before the music begins. The click level should be between -2dB and +2dB.

- Record a SMPTE stripe on the remaining track, making sure it begins a few seconds before the click track you just recorded.
- Make sure that **Audio In** is checked in the OMS Setup+Pathces **Studio 5** menu.
- Record enable the TEMPO track of an empty sequence. Click on the tempo number itself, so it is selected.
- Set the record mode to "Wait for Note".
- Set the sync mode to "Internal".
- Play the beginning of the song. Use the Macintosh's "single quote" (') tap tempo key to tap along with the song to establish a rough tempo. This will preset the sequence to about the right tempo.
- Make sure MIDIKeys are enabled in Vision's **Setups** menu.
- Make sure the Studio 5 is enabled in Vision's **Enable Input Device** dialog box.
- Open the MIDIKeys window and choose "Add Line" from its Mogrify menu. Click the left side of the new line, and play a rim shot or similarly percussive sound into the Studio 5's Audio In jack. The Studio 5 will respond with a note (C#-1 or C#-2 on Channel 15 of the Printer Port, depending on the Middle C setting in the preferences menu selection).

- Click the right side of the new line, and type the single quote key ('). Your MIDIKey is now set up as shown below.



- Verify that the tempo track is still record-enabled.
- Start the tape and listen to the countoff go by.
- Play a MIDI note on the down beat of the first bar of your song. This will initiate recording of the tempo track. The actual note will not be recorded.
- Let the song play through until the end.
- Stop recording in Vision. Then stop the tape.

In the List Editing window of the tempo track you will see one tempo change event for every beat. This is the tempo Vision has extracted from the click. It is, however, one beat later than it should be: each event is at the time it was recorded (indicating the tempo of the past beat), but needs to be moved to the beginning of the beat (so the beat will play at the right tempo). To correct this, you will have to shift all the tempos one beat earlier.

- Set the start time in the upper left corner of the tempo track's List Editing window to 1 1 0, and the end time to one beat later.
- Choose Delete Time from the Mogrify menu. If there was an event at 1 1 0, it will be deleted. Now the tempo track should correctly describe the tempos of the click signal on the tape.
- Find the SMPTE time of the down beat of bar one and set the Start Time (off-set).

If you don't know the SMPTE time of the down beat, then set the sync mode to "Time Code", and turn off the Studio 5's Audio In feature in the **Studio 5** menu. Play the tape and watch the SMPTE numbers on Vision's counter display. Set the sequence's Offset to a SMPTE number five to ten seconds before the approximate down beat of bar one. Then, select an empty track, rewind the tape, click on Record, and start the tape. Listen to the countoff and record a note on the down beat of the first bar. Open the List window for that track, and look at the absolute SMPTE time of the note you recorded. Use this time as the actual Offset for the sequence.

You may have to adjust the 80ths of a frame of the Offset to make it exact—especially if there is no specified offset from the previous recording session.

Once you have a SMPTE Offset and the tempo "map" in the tempo track of a sequence, you can record and play Vision's MIDI tracks in sync with the music on tape. You can copy the tempo track and Offset to other sequences if you wish to record several MIDI versions for that tape recording.

Appendix B: Troubleshooting

STUDIO 5 DISPLAY PROBLEMS

Studio 5 displays a zero

No patch is currently selected. Either the Studio 5 is new, it has been reset, or you have just deleted the current patch. As new patches are defined in the OMS Setup+Patches application, they will be sent to the Studio 5. Opening the current patch document will send patch data to the Studio 5 automatically. Patch #0 is a “do nothing” patch.

If this doesn't work, your battery may be low. Contact Opcode for servicing.

Studio 5 displays a number followed by a dash

When the Studio 5 encounters an error condition, it will display an error message. Error messages are recognized by a minus sign preceded by a number. The following is a list of Studio 5 error messages:

- 1 not enough memory in Studio 5 to complete a command
- 2 memory management error
- 3 memory management error
- 4 a command parameter was out of range
- 5 a command size was out of range
- 6 internal processor error
- 7 already executing another command
- 8 a Studio 5 serial port is busy
- 9 memory management error
- 10 Studio 5 received an undefined command
- 12 memory test failed (memory not valid)
- 13 power on failure

COMMUNICATION PROBLEMS

Macintosh loses communication with Studio 5

Choose the **Re-Establish Communication** command from the **Studio 5** menu or, within any OMS-compatible application, choose **OMS MIDI Setup** and click **OK**.

If that doesn't work, turn off the Studio 5. Hold in both inc/dec buttons while turning the Studio 5 back on. This resets the Studio 5 and empties its patch memory.

If the Studio 5 was turned off and then on while OMS was running, the Mac will not communicate with the Studio 5 again until...

- a) you open the **OMS MIDI Setup** dialog and click **OK** or **Cancel**, or
- b) you choose **Re-Establish Communication** from the Studio 5 menu

You receive an Overrun Error Message on the Macintosh

This message indicates that some information may have been lost by the Macintosh serial port. Too much data is being transmitted too quickly to the Macintosh. Try thinning the MIDI data stream being sent to the Mac. Refer to "Studio 5 Loses Sync" in the "Sync Problems" section for various ways to thin the MIDI data stream.

If thinning the data stream either doesn't help or isn't possible, you will need to set a slower Studio 5->Macintosh communication speed. Lower the speed in single step increments until the problem disappears (See Chapter 4).

PERIPHERAL PROBLEMS

Images on the Macintosh screen appear distorted

The Studio 5 should be located at least 2 feet away from your computer monitor.

Unresponsive modems, initialized printers, etc.

If the problem peripheral is connected directly to the Macintosh's serial port, you should choose **OMS MIDI Setup** from the **Edit** menu, uncheck that port's check box, and click **OK**.

If the problem peripheral is connected to the Studio 5, make sure the front panel **THRU** switch is set to the **THRU** position.

SYNC PROBLEMS

Studio 5 will not stripe tape

Make sure the power cord is firmly inserted into its connector, the power switch is on, and that the SMPTE/Power indicator light is lit.

Check all cables between your computer and the Studio 5, and between the Studio 5 and your tape deck.

Check the input level to your tape deck. Set levels as discussed in the “Guide To Setting SMPTE Levels” section in Chapter 13.

Studio 5 loses sync

Make sure that the heads on your tape deck are clean and that you are using a quality tape in good condition. Old or worn tape contains dropouts that may cause the Studio 5 to lose sync.

If you are syncing to tape, and your sequencer keeps starting and stopping erratically, you are probably losing sync. One possibility is that your SMPTE source is not good. This can be because you have a bad tape or possibly a bad connection from your tape machine to the Studio 5's SMPTE in jack. This is easy to verify; if the Studio 5's SMPTE indicator light does not start blinking regularly when you try to sync, the Studio 5 is not getting a correct signal. Check your cables and make sure that the recorded SMPTE level is sufficient (see Chapter 13 for a guide to SMPTE recording levels). If the tape was recorded with too high a SMPTE level, then it will have to be re-stripped. If SMPTE was recorded at too low a level, you will need to boost the signal using a preamp or mixer between your tape deck and the Studio 5 SMPTE IN.

If the Studio 5 SMPTE indicator light blinks regularly, then a bad SMPTE signal is not the problem. You may have too much data going from the Studio 5 into the Mac. Some instruments output constant active sensing or MIDI clock messages. MIDI clock messages especially can be a problem, because they are sent more often than active sensing. Or, you could have a device sending MIDI Time Code. You don't need this if you're trying to sync your sequencer to the Studio 5's MIDI Time Code. In general, if you tell a real time application (such as a sequencer) to play, and then send it too much data, it will start to lose some of the data. If it loses timecode data, it will lose sync.

See if any MIDI devices attached to the Studio 5 are transmitting data to the Studio 5 (make sure none of them are playing). Look at the red Studio 5 MIDI In LEDs. If any are lit or flashing, you know those devices are constantly sending some kind of data. You can verify if this is the cause of sync loss by turning off or disconnecting the MIDI In cables (from the instrument into the Studio 5) and seeing if the sync problem goes away. If it does, you have a couple of choices:

- If you can stop the device from sending this data in the first place, do it. Unfortunately, most devices will not let you do this. Typically, the devices that send MIDI clocks have built in sequencers; some of them only send MIDI clocks when their sequencer is actually playing. Others send MIDI clock messages when they are in their "sequencer" mode, and active sensing (which is far less intrusive) when they are not. If you cannot stop the device from sending MIDI clocks, you can set its sequencer to the slowest possible tempo—this results in a slower MIDI clock transmission rate. You can see the tempo change on the Studio 5's MIDI In LED for that device; it will blink slowly at slow tempos, and very rapidly at fast tempos.
- You can slow down the Studio 5->Macintosh communication speed. Decreasing the communication speed will give the Macintosh more time to "see" the incoming MIDI data, and will help if the Macintosh is busy with a lot of output as well as input.
- If you're using only one serial cable between the Macintosh and the Studio 5, try using two. OMS applications, such as Vision and Studio Vision, will send only data generated from within the Studio 5 out the Studio 5's "B" port. This includes timecode, Studio 5 footswitch and foot controller data, as well as Audio In note events. All other data coming from MIDI devices connected to the Studio 5 will be sent out the Studio 5's "A" port. If you are running a non-OMS application, select **Compatibility Setup** from the **Studio 5** menu, then select either **Standard Interface In** or **MIDI Time Piece In**. Make sure that sync and *only* sync is sent out the Studio 5's "B" port (the **Auto** button will also do this).
- If you are running Vision or Studio Vision, select **Enable Input Devices** from the **Setups** menu. Only enable those input devices that you wish Vision to listen to. If you have 15 devices, but you only play one or two of them when you record, disable all other inputs.
- You can design Virtual Controllers to filter out MIDI clock messages, active sensing, or any other offensive data. You can then use these Virtual Controllers instead of the actual devices. In Vision or Studio Vision, select **Enable Input Devices** from the **Setups** menu, then enable the Virtual Controllers and disable the actual devices on which they are based. For non-OMS applications, select **Compatibility Setup** from the **Studio 5** menu, select either **Standard Interface In** or **MIDI Time Piece In** views, and then replace the unfiltered devices with their corresponding Virtual Controllers.

Studio 5 will not sync to tape

Make sure the power cord is firmly inserted into its connector, the power switch is on, and that the SMPTE/Power indicator light is lit.

Check all the cables between your computer and the Studio 5, and between the Studio 5 and your tape deck.

Verify that the SMPTE/Power indicator light blinks when it is receiving timecode from the tape deck. If not, you may have a bad cable or connection between the Studio 5 and your tape deck. Also, your SMPTE level may be recorded too low. If so, you may need to use a preamp or mixer to boost the SMPTE level before sending it to the Studio 5. See Chapter 13 for proper SMPTE record levels.

Choose **SMPTE Reader** from the **Studio 5** menu, then start the tape. If it displays timecode correctly, the problem is with your application setup, not the Studio 5.

Sequencer gradually slows down rather than stopping when synced to a tape that has stopped

Jam Sync mode is on. To turn off Jam Sync mode, choose **Stripe SMPTE** from the **Studio 5** menu, open the **Level** pop-up menu and choose **Off**. See Chapter 13 for more information.

Audio In feature doesn't function

Make sure the power cord is firmly inserted into its connector, the power switch is on, and that the SMPTE/Power indicator light is lit.

Check the cable between your audio input source and your Studio 5, and verify that **Audio In** is checked in the **Studio 5** menu.

Make sure your software knows how to interpret the Studio 5's Audio In feature.

MIDI PROBLEMS

More than one instrument sounds on a MIDI channel

You may be using an OMS patch that contains a splitter routed to more than one device on the same MIDI channel, or...

You may be using an OMS patch that references a Virtual Instrument containing a splitter routed to more than one device on the same MIDI channel, or...

If you're playing into a sequencer, you should use an empty OMS patch—the MIDI Thru instrument is usually controlled by your sequencer (see Part 2: OMS Patches), or...

If you're playing into a sequencer, it's possible that you've enabled both a virtual controller and the "actual" controller as input devices. If you're in Vision, choose **Enable Input Devices** from Vision's **Setups** menu and make sure you only have one MIDI input device enabled for the MIDI port used by your MIDI controller, or...

In compatibility mode, you may have "auto" enabled MIDI ins and outs, thus causing some devices (particularly those defined as multi-timbral) to sound on the same channel as other multi-timbral devices. There are only 16 channels available per port in a standard interface emulation mode.

Incorrect system exclusive data sent to Virtual Instruments

You can't send system exclusive data to a virtual instrument consisting of two or more MIDI channels from the same device, or the sysex data will be sent incorrectly (If you think about the situation, you wouldn't want to do this, anyway).

Difficulty receiving large system exclusive data dumps

Reduce the Studio 5->Macintosh communication speed if you're having difficulty receiving large System Exclusive data dumps. Reduce the speed in small increments until the data is received properly, or...

If you're using Compatibility mode, make sure that the Compatibility Setup Speed is set to 1MHz.

This problem is unlikely to occur unless you have disabled the reporting of overrun errors since lost data is reported as an overrun error.

Sound Designer II will not communicate with some samplers

The Studio 5 does not work with Sound Designer II and samplers (such as E-mu's and the Prophet 2000) that communicate using non-MIDI transfer rates. To use Sound Designer II with these samplers, you must use a standard MIDI interface. Either:

1. Connect a standard MIDI interface to an unused Macintosh serial port, or...
2. Connect a standard MIDI interface to one of the Studio 5's THRU ports, then use the front panel THRU switch whenever you need to send data between Sound Designer II and a non-standard sampler.

MIDI data stream clogging

If you're using Vision 1.3 or later, choose **Enable Input Devices** from the **Setups** menu and deselect any device which is not recording into the sequencer. Vision will ignore the data from these devices, and more processing power will be available for SMPTE sync or dense MIDI data handling chores.

Refer to "Studio 5 Loses Sync" in the previous section for more ways to thin the MIDI data stream.

OMS PATCH PROBLEMS

A MIDI Source or Destination module contains a question mark

Question marks indicate undefined modules. Click anywhere to the right of the question mark to open a pop-up menu of MIDI devices as defined in your current Studio Setup document. See Part 2 for more details.

One or more MIDI Devices do not appear in the MIDI source pop-up menu

The MIDI device is being used elsewhere within the same patch as a MIDI source.

Patches don't work—MIDI source or destinations are italicized

You probably have a patch document that was created with a Studio Setup document other than the one that is now current. Either make the other Studio Setup document current, make another patch document current, or re-select any italicized MIDI Source or Destination modules in the current patch and save it. See Chapter 6 for more information.

Patches don't work—MIDI source or destinations are NOT italicized

Choose **Rebuild All** from the **Patch** menu.

MISCELLANEOUS PROBLEMS

Foot Controller doesn't function

Check that the foot controller is connected to the proper connector (FC1), and that **Foot Controller In** is checked in the **Studio 5** menu.

Macintosh crashes when running the Installer

If you experience a crash when running the installer and are using the Virex INIT for virus protection, open the Control Panel and select Virex's panel. From the pop-up menu, select **File Diagnosing Options**. Deselect **Diagnose Files when Opened** and **Check for HyperCard Virus**. Run the Installer again, and the Macintosh should not crash. If problems persist, completely remove any Virus checking INITs from your System folder (Extensions folder for System 7), restart your Macintosh, and run the Installer again.



Appendix C: Specifications

GENERAL

Processors

68HC000 @ 16MHz

68B03 @ 8MHz

Internal Memory

64k x 8 battery backed-up SRAM
(expandable to 256K)

Power Supply

120VAC, 60Hz @ 280mA, or
240VAC, 50Hz @ 180mA

External Dimensions (W x H x D)

44.45 x 8.64 x 28.02 cm
(17.5" x 3.4" x 11.03")
2 Rack Spaces (2U spaces)

Weight

2.99 kg

Operating Temperature

0°C to 50°C (32°F to 122°F)

CONNECTORS

15 MIDI Ins

15 MIDI Outs

1 SMPTE In

Type: Stereo Phone Jack
Input Impedance: 500k Ω

1 SMPTE Out

Type: Stereo Phone Jack
Output Impedance: <5 Ω

1 Audio In

Type: Stereo Phone Jack
Input Impedance: 1k Ω

2 Footswitch Ins

Type: Mono Phone Jack
Input Impedance: 10k Ω

1 Foot Controller In

Type: Mono Phone Jack
Input Impedance: 100k Ω

2 RS-422 Serial Computer Ports

2 RS-422 Peripheral "Thru" Ports

DISPLAY

3-digit LED Display (0-127)

SWITCHES

2 Patch Increment/Decrement
switches

2 Peripheral "Thru" switches

1 Power on/off switch

*Specifications and appearance subject to change
without notice.

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