LIMITED WARRANTY

Opcode Systems, Inc. warrants the Studio 64X against defects in materials and workmanship for a period of one (1) year from the date of original retail purchase.

If you discover a defect, first write or call Opcode Systems, Inc. at (415) 856-3333 to obtain a Return Merchandise Authorization Number (no service will be performed on any product returned without prior authorization). If the product needs to be returned to Opcode, please attach your name, address, telephone number, a description of the problem, and a copy of the dated bill of sale as proof of purchase. Write the Return Merchandise Authorization (RMA) Number clearly on the outside of the package and all correspondence. Upon receiving the returned product, Opcode Systems, Inc. will then, at its option, repair, replace, or refund the purchase price of the product.

This warranty applies only to the Studio 64X; Opcode software is warranted separately.

This warranty does not apply if the product has been damaged by accident, abuse, misuse, or misapplication, or has been modified without the written permission of Opcode Systems, Inc.

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Studio 64X is a trademark of Opcode Systems, Inc. IBM is a registered trademark of International Business Machines Corporation. Windows is a trademark of Microsoft Corporation. Other product and brand names are trademarks or registered trademarks of their respective companies.

RADIO FREQUENCY INTERFERENCE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna of the affected radio or television.
- Increase the separation between the equipment and the affected receiver.
- Connect the equipment and the affected receiver to power outlets on separate circuits.
- Consult the dealer or an experienced radio/TV technician for help.

Modifications: Changes or modifications not expressly approved by Opcode Systems, Inc. could void the user's authority to operate the equipment, per FCC regulations.

Shielded Cables: Shielded cables must be used with this equipment to maintain compliance with FCC regulations.

<div align="center">

Declaration of Conformity

We, Opcode Systems, Inc.,
3950 Fabian Way, Suite 100
Palo Alto, CA 94303 USA
(415) 856-3333

declare under our sole responsibility that the product

Opcode Studio 64X

</div>

complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CSA RADIO FREQUENCY INTERFERENCE

This Class B digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

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$C \epsilon$

Declaration Of Conformity

We, Opcode Systems, Inc., of
3950 Fabian Way, Suite 100
Palo Alto, CA 94303 USA
declare under our sole responsibility that the product
Studio 64X, a MIDI Interface
for IBM PC compatible computers,
to which this declaration relates is in conformance with the
following
standards:
EN55022:1987
EN50082-1:1992
IEC 801-2:1984
IEC 801-3:1984
IEC 801-4:1988
following the provisions of the 89/336/EEC Directive.

</div>

Palo Alto, CA, 25-Oct-96
Place and date of issue   Authorized Signature

ACKNOWLEDGMENTS

Hardware Design and Studio 64X firmware by David Rowe.

OMS, Studio Patches Editor, and Studio 64X OMS Driver by Doug Wyatt.

Patchbay and Studio 64X Windows Driver by Paul Messick.

Quality Assurance by Mark LeBlanc, Jim Anderson, and Renan Sanchez.

Documentation by Greg Thomas.

Marketing by Butch Rovan.

TABLE OF CONTENTS

CHAPTER 1: Introduction

STUDIO 64X OVERVIEW

Thank you for purchasing Opcode's Studio 64X, a dual platform MIDI interface, patchbay, and SMPTE processor. The Studio 64X includes the following capabilities:

- Compatible with notebook, laptop, and desktop Macs or PCs;
- Serial port THRU connection (both MAC and PC) for easy access to serial devices;
- 4 x 6 MIDI interface with support for 64 channels;
- Read and write all SMPTE formats, also includes freewheeling and regeneration;
- Stand-alone MIDI patchbay—recall routings and filterings or even stripe SMPTE from front panel;
- 4 user programs accessible from front panel for MIDI routing and filtering;
- 4 preset programs accessible from front panel: PANIC, SMPTE, ALL, and TUNE;
- Front panel status LEDs for SMPTE and MIDI IN/OUT activity;
- Software, Mac and Windows, for on-screen editing of Studio 64X user programs;
- MME compatible driver for Windows 3.1, Windows 95, and Windows for Workgroups;
- OMS driver for Macs, including support for OMS Studio Patches.

What's Included in the Studio 64X Package

Your Opcode Studio 64X package includes:

- Studio 64X MIDI Interface
- DC power adapter
- PC serial cable, with cable adapter
- Macintosh serial cable
- PC floppy disk
- Macintosh floppy disks
- Getting Started Manual for easy setup
- Technical Support Information Sheet
- Registration card

System Requirements

To use the Studio 64X with a PC, you need:

- An IBM PC compatible with COM port;
- Windows 3.1, Windows for Workgroups, or Windows 95;
- MIDI instruments and cables.

To use the Studio 64X with a Macintosh, you need:

- A 68020 Macintosh or faster, or a Power Macintosh;
- System 7.0.1 or later;
- 4 MB of available RAM;
- MIDI instruments and cables.

STUDIO 64X DOCUMENTATION

This *Getting Started* booklet was written to give customers a general overview of the Studio 64X capabilities and to provide a "quick start" reference for easy configuration.

Online Help

In addition to the *Getting Started* booklet, an extensive **online help** file is included with your Studio 64X package. If you can't find some particular information in this document, please consult the online help file; it contains detailed operational information for the Studio 64X.

For PC users, the help file (64X.hlp) is installed when running the **Setup** program from the provided PC disk.

The Macintosh help file (Studio 64X.hlp) is installed by running the **install** program from the provided help disk.

Once installed, simply launch either help file by double-clicking.

Figure 1.1: Windows Online Help file

Figure 1.2: Macintosh Online Help file

Then use point-and-click links and keyword indexed searches to find information on:

- Hardware connection/configuration;
- Software Setup;

- Step-by-step tutorials;
- SMPTE sync;
- Troubleshooting.

OMS and Studio Patches Manual

Macintosh users must install and configure the Open Music System (OMS) to use the Studio 64X.

Printed manuals for both OMS and the Studio Patches Editor are included. Please read these manuals to take full advantage of the Studio 64X's Mac capabilities.

NOTE: OMS Studio Patches provides advanced MIDI processing capabilities when connecting the Studio 64X to a Macintosh.

CUSTOMER SUPPORT

### Registering your Studio 64X

Please complete and return your registration card right away. Doing so will enable us to deliver the best possible support to you; it also insures you'll receive important update/upgrade notices.

Contacting Opcode

Opcode provides a variety of phone, fax, and online support options. Consult your *Technical Support Information* sheet on how best to contact Opcode.

CHAPTER 2:   Front/Rear Panels
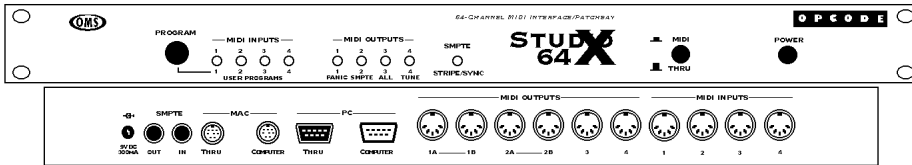
STUDIO 64X FRONT PANEL

Program Button

The PROGRAM button selects the current program. Press the button once and an LED flashes rapidly to indicate the currently selected program. Press the PROGRAM button repeatedly to advance to and select a particular program.

LEDs

- The red MIDI input LEDs flash when data is received. The red LEDs also indicate when a user program is selected.
- The green MIDI output LEDs flash when data is sent. The green LEDs also indicate when a preset program is selected.
- The yellow SMPTE LED serves three purposes. It blinks slowly when the Studio 64X is generating SMPTE; it flashes rapidly when receiving SMPTE; and when it glows steadily, it indicates the Studio 64X is turned on.

MIDI/Thru Switch

The MIDI/Thru switch specifies whether your computer is communicating with the Studio 64X or its "serial thru device." The switch must be set to MIDI for computer use.

Power ON/OFF Switch

The POWER switch turns on/off the Studio 64X. When powering up, all LEDs flash simultaneously four times. Make sure power is off before making any connections.

STUDIO 64X REAR PANEL

9V DC 300MA

The provided power adapter supplies power to the Studio 64X via this jack. The provided adapter has the following specifications:

- U.S. and Canada: 7.5vDC - 9vDC, 300mA, 5.5mm x 2.1mm center positive barrel plug.
- Europe: 7.5vDC, 300mA, 5.5mm x 2.1mm center positive barrel plug.

SMPTE IN/OUT

- The Studio 64X sends SMPTE timecode to this 1/4" unbalanced phone jack.
- The Studio 64X receives SMPTE time-code from this 1/4" unbalanced phone jack.

Mac Thru/Computer

- An additional Macintosh serial device connects to the Studio 64X's THRU port. For your computer to communicate with the thru device, set the front panel's MIDI/Thru switch to "Thru."
- The Mac COMPUTER port connects to the Mac's modem or printer port with the provided serial cable.

PC Thru/Computer

- An additional PC serial device connects to the Studio 64X's THRU port. For your computer to communicate with the thru device, set the front panel's MIDI/THRU switch to "Thru."
- The PC COMPUTER port connects to an IBM PC's COM port with the provided serial cable.

MIDI Outputs

The Studio 64X sends MIDI to any of four MIDI outputs. Each output port (identified by number, 1-4) represents a discrete set of 16 MIDI channels. Two MIDI OUTs (A and B) are provided for ports 1 and 2. Therefore, devices connected to ports 1A and 1B, for instance, receive the same MIDI information.

MIDI Inputs

The Studio 64X receives MIDI from any of four MIDI inputs. Each input port (identified by number, 1-4) represents a discrete set of 16 MIDI channels.

COMPUTER CONNECTION

The Studio 64X can be connected to either an IBM PC or Macintosh. What's more, the interface can even be connected to both types of computers at the same time.

However, when connecting to both a Mac and PC, the Studio 64X can communicate with only one computer at a time. Don't worry though; the Studio 64X's auto-sensing capability knows which computer to respond to.

MIDI CONNECTIONS

The Studio 64X is a multiport MIDI interface. This means that each of its four discrete input/output ports supports 16 MIDI channels, providing a total of 64 channels.

NOTE: Two MIDI OUTs (A and B) are provided for ports 1 and 2. Therefore, devices connected to ports 1A and 1B, for instance, receive the same MIDI information.

When to connect an instrument's MIDI IN and OUT jacks

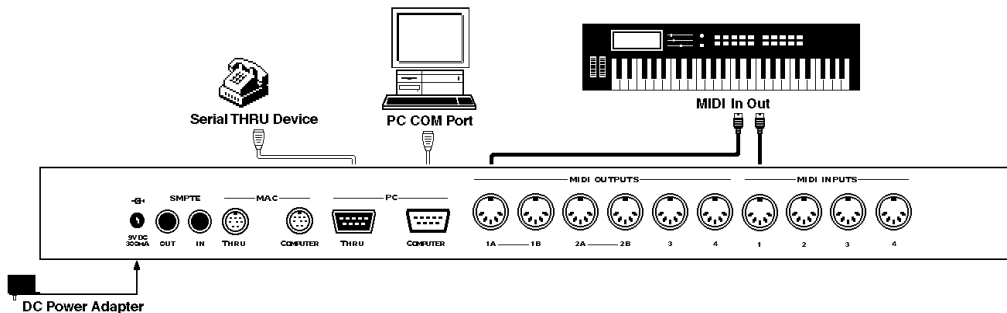When you need to send *and* receive MIDI (which may include performance data, system exclusive, or sync information) from an instrument, connect both of its MIDI jacks (OUT and IN) to the Studio 64X.

NOTE: When using both MIDI ports of an instrument, always connect to the same Studio 64X port number.

A common scenario necessitating this two-way communication is when using Editor/Librarian software.

CHAPTER 3:   Quick Start Guide for PC

Serial THRU Device   PC COM Port   MIDI In Out

MIDI OUTPUTS   MIDI INPUTS

SMPTE   MAC   PC

9V DC 300MA   OUT   IN   THRU   COMPUTER   THRU   COMPUTER   1A   1B   2A   2B   3   4   1   2   3   4

DC Power Adapter

PC CONFIGURATION

Connect Hardware

① **Turn off your computer, peripherals, and MIDI instruments.**

② **Plug one end of the provided serial cable into the PC COMPUTER port of your Studio 64X.**

③ **Plug the other end of the serial cable into your computer's COM port.**

Please make note of whether you are connecting to COM1 or COM2.

If your COM port has a 25-pin connector, use the provided PC cable adapter.

④ **If you have an extra serial device (and no available COM ports), connect it to the PC THRU port of the Studio 64X.**

Never plug your mouse in the PC THRU port of the Studio 64X.

⑤ **Using standard MIDI cables, connect the MIDI OUTs of your instruments to the MIDI INs of the Studio 64X; then connect the MIDI INs of your instruments to the MIDI OUTs of the Studio 64X.**

⑥ **Plug the small end of the provided power adapter into the Studio 64X's 9V DC 300MA jack; plug the other end into an AC power source.**

Make sure your power adapter is set to or compatible with the AC voltage in your area.

⑦ **Turn on your computer, peripherals, Studio 64X, and MIDI instruments—in that order.**

For best results, use a power strip to turn on/off all equipment simultaneously.

Run the Setup Program

To install the necessary PC software for the Studio 64X:

① **Insert the PC disk and double-click the Setup program.**

Setup.exe

② **Specify the install directory and click the Install button.**

If you have a previously installed driver, or if you're adding a second Studio 64X, make the necessary selections when prompted.

③ **When prompted, specify which COM port and IRQ you are using for the Studio 64X connection.**

Generally, COM1 and COM3 default to IRQ4, while COM2 and COM4 default to IRQ3.

④ **Once you've specified the COM port settings, click OK to install all necessary software.**

Files copied to your hard disk include the Studio 64X driver files, **64XDIAG** (diagnostics software), **64X.exe** (Patchbay program), and **64X.hlp** (online manual).

Additionally, the necessary changes are made to your System.ini file. A backup of your original system.ini file (renamed to "system.64x") is stored in your Windows directory.

⑤ **When prompted, restart Windows for changes to take effect.**

USING WINDOWS SOFTWARE

Once you've installed the Studio 64X driver, the following ports are available in Windows MIDI applications:

• **Studio64X In 1** - **In 4**: Receives MIDI from the specified input ports.

• **Studio64X Sync Port**: Receives MIDI Time Code, corresponding to received or generated SMPTE; also receives responses to sysex messages sent to it via the Control Port.

• **Studio64X Out 1** - **Out 4**: Sends MIDI to the specified output ports.

• **Studio64X Broadcast Port**: Sends MIDI to all output ports simultaneously.

• **Studio64X Control Port**: Sends system exclusive messages to the Studio 64X governing its operation. Most users will not use this port and should not select it.

It's important to grasp that these various input/output ports designate how MIDI is communicated between the Studio 64X and Windows applications.

When recording performance data, make sure you enable the **In** port to which your main keyboard controller is attached. When assigning MIDI tracks for playback, specify the correct **Out** port for the desired instrument. And if you intend to sync to SMPTE, you must select the **Sync Port**.

NOTE: If you are ever unsure of where MIDI is being sent or from where it is being received (or if you are receiving SMPTE timecode), just look at the LEDs on the front panel of the Studio 64X.

For details on selecting and assigning MIDI ports in Windows applications, consult your software manuals.

CHAPTER 4: Quick Start Guide for Mac
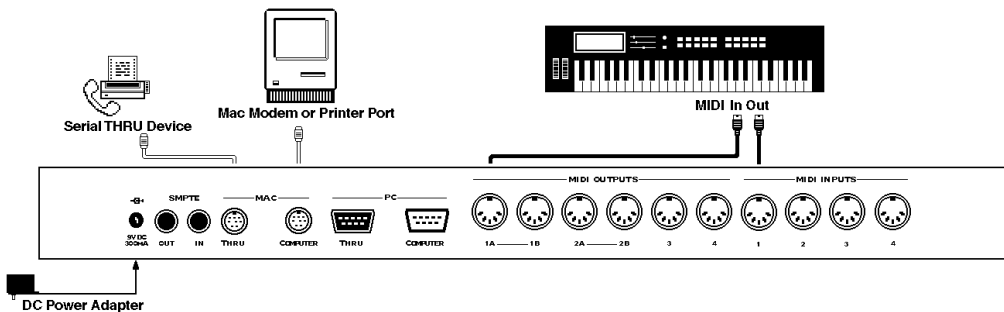
MACINTOSH CONFIGURATION

Connect Hardware

① **Turn off your computer, peripherals, and MIDI instruments.**

② **Plug one end of the provided serial cable into the MAC COMPUTER port of your Studio 64X.**

③ **Plug the other end of the serial cable into your computer's modem or printer port.**

④ **If you have an extra serial device (and no available ports), connect it to the MAC THRU port of the Studio 64X.**

⑤ **Using standard MIDI cables, connect the MIDI OUTs of your instruments to the MIDI INs of the Studio 64X; then connect the MIDI INs of your**

instruments to the MIDI OUTs of the Studio 64X.

⑥ **Plug the small end of the provided power adapter into the Studio 64X's 9V DC 300MA jack; plug the other end into an AC power source.**

Make sure your power adapter is set to or compatible with the AC voltage in your area.

⑦ **Turn on your computer, peripherals, Studio 64X, and MIDI instruments—in that order.**

For best results, use a power strip to turn on/off all equipment simultaneously.

Install and Configure OMS

① **Insert the OMS disk 1 and double-click Install OMS.**

   At the initial prompt, specify you are using a Studio 64X.

② **When reaching the main install screen, choose the Easy Install option and then click the Install button.**

③ **Insert each disk as prompted.**

④ **When completed, exit installer and Restart your Macintosh.**

⑤ **After restarting, launch the OMS Setup application and configure a "New Studio Setup."**

   Consult your OMS manual for help with Studio Setup configuration.

Once OMS is correctly configured, a **Studio 64X menu** appears in the OMS Setup application. Use this menu you to store and retrieve user programs, open the Program Edit and SMPTE windows, and check the unit's ROM version.

Install Studio 64X Help File

For detailed operational info on the Studio 64X, install its online help file. Insert the appropriate disk and run the **install** program.

OMS STUDIO PATCHES

"OMS Studio Patches" provides advanced MIDI processing capabilities for the Studio 64X (only implemented on the Macintosh). Studio patch documents, which are created in the **Studio Patches Editor** program, may contain complex merges, splits, layers, filters, transpositions, and more.

Unlike Studio 64X user programs, Studio Patches are only active when your computer is running an OMS-compatible application (or if OMS is set to "Run MIDI in the Background").

To learn more about OMS Studio Patches consult the printed manual.

USING OMS-COMPATIBLE APPLICATIONS

Once you have configured an OMS Studio Setup (a document referencing your MIDI studio), using OMS-compatible applications is quite easy. Any devices contained in your current Studio Setup are automatically available in your OMS applications, and you can even select them by name. If at some point you make changes in your Studio Setup, OMS applications are updated automatically.

If you wish to receive SMPTE timecode in an OMS application, the Studio 64X appears as a sync source.

If you have created a Studio Patches document, any of its "virtual instruments" and "virtual controllers" are also accessible from OMS applications.

Using Non-OMS Applications

The Studio 64X is compatible with non-OMS applications. When using such an application, the Studio 64X acts like a standard MIDI interface—thereby providing only 16 MIDI channels. In "standard interface" mode, the Studio 64X merges all MIDI inputs into the computer; additionally, transmitted MIDI is simultaneously sent to all four output ports.

IMPORTANT: To use non-OMS applications, the current Studio 64X user program must route MIDI to and from the computer.

CHAPTER 5:   Studio 64X Programs

USER PROGRAMS

The Studio 64X has four user programs that specify how the Studio 64X processes MIDI input and output, and how it stripes SMPTE. User programs are stored in nonvolatile (battery backed-up) memory and recalled from the front panel with the PROGRAM button.

IMPORTANT: When a user program is selected, its settings are always active—whether a MIDI software program is running, or even if the Studio 64X is not connected to a computer.

User programs can be edited on the PC or Macintosh with the provided software.

Default Factory Programs

The four *default* user programs shipped with the Studio 64X are as follows:

*   User Program 1: Sequencing, no routing;
*   User Program 2: Each IN routed to all OUTs except its corresponding OUT;
*   User Program 3: Each IN routed only to its corresponding OUT;
*   User Program 4: Same as Preset 3, ALL.

IMPORTANT: If at any time you'd like to restore the default factory programs, you can initialize the Studio 64X. See Initializing User Programs (pg. 11).

Preset Programs

In addition to four user programs, the Studio 64 has four *preset* programs. The preset programs provide the following special functions:

*   Preset 1, PANIC: Sends an "all notes off" command to each port.
*   Preset 2, SMPTE: Initiates striping (using the current user program's settings).
*   Preset 3, ALL: Routes all MIDI inputs to all outputs.
*   Preset 4, TUNE: Sends continuous "A440" note messages to all outputs.

EDITING USER PROGRAMS

Studio 64X user programs can be displayed, edited, and saved in either of the following environments:

*   On the PC, use the **Patchbay** program by launching **64X.exe**;
*   On the Mac, choose **Studio 64X**>**Edit Programs** in the OMS Setup program to open the **Program Edit Window**.

User programs route and merge MIDI by defining "connections," each of which may have its own set of filterings for MIDI messages and channels. The four user programs are saved in files called "program sets."

See the following page for a brief explanation of the Patchbay (PC) and Program Edit (Mac) Windows.
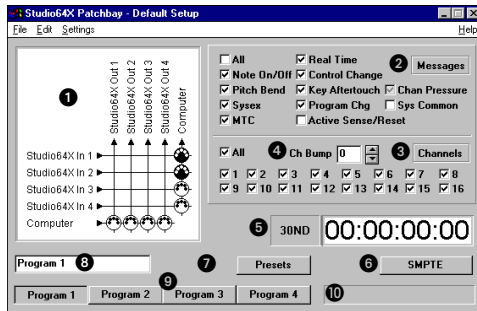
Figure 5.1: Patchbay Window for PC

❶ Connection Grid, defines *connections* between inputs (on left) and outputs (on top).

❷ Message Filtering, specifies which MIDI messages are routed for the selected connection(s).

❸ Channel Filtering, specifies which channels are routed for the selected connection(s).

❹ Channel Bump, shifts channel assignment for MIDI messages for the selected connection(s).

❺ SMPTE Monitor, displays scrolling SMPTE frames when receiving/generating timecode.

❻ SMPTE button, opens the SMPTE Window.

❼ Preset/User Programs Button, specifies whether the preset or user programs are displayed.

❽ Program Name field, renames the current program.

❾ Program Button, specifies the current program.

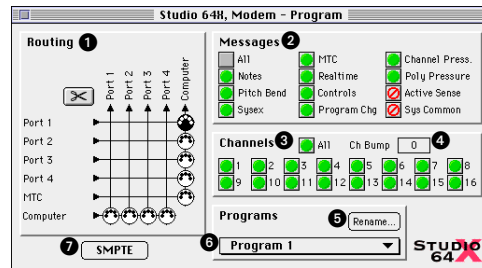**❿** Status Field, displays communication status between the Studio 64X and PC.

Figure 5.2: Program Edit Window for Macintosh

❶ Connection Grid, defines *connections* between inputs (on left) and outputs (on top).

❷ Message Filtering, specifies which MIDI messages are routed for the selected connection(s).

❸ Channel Filtering, specifies which channels are routed for the selected connection(s).

❹ Channel Bump, shifts channel assignment for MIDI messages for the selected connection(s).

❺ Rename Button, renames the current user program.

❻ Program Pop-up, specifies the current program.

❼ SMPTE Button, opens the SMPTE Window.

For more detailed information on creating and editing Studio 64X user programs (including settings in the SMPTE Window), please consult your online help file.

CHAPTER 6:   Front Panel Operation

SELECTING A PROGRAM

The PROGRAM button selects the current program. Press the button once and an LED flashes rapidly to indicate the currently selected program. Press the PROGRAM button repeatedly to advance to and select a particular program.

When either the TUNE or SMPTE presets are selected, pressing the PROGRAM button once will interrupt these routines and return to the previously selected user program.

After the PANIC preset is selected and the "all notes off" messages are sent to each port, the Studio 64X returns to the previously selected user program.

INITIALIZING USER PROGRAMS

The user programs for the Studio 64X are set to defaults at the factory. These user programs can be viewed and edited to accommodate your specific needs. For more information, see *Editing User Programs* (pg. 9).

If after making changes to the user programs you would like to return the Studio 64X to its default state, you can initialize the unit with the following procedure:

① **Turn off the Studio 64X.**

② **Press the PROGRAM button and hold it down while turning the unit back on—note that no LEDs are lit.**

③ **After several seconds, release the PROGRAM button**

   All LEDs flash four times, indicating the Studio 64X user programs have been initialized.

IMPORTANT: Initializing the Studio 64X is also recommended if, for some reason, the user programs have become corrupted.

STRIPING FROM THE FRONT PANEL

To begin generating SMPTE timecode, simply select the SMPTE program. Timecode is then automatically sent out the Studio 64X's SMPTE OUT jack; the SMPTE settings used are those contained in the previously selected user program. The default user programs are set to use a frame rate of "30 Non-Drop" with a SMPTE start time of 00:00:00:00.

NOTE: Striping with the SMPTE program always uses the current user program settings.

For more details on using SMPTE with the Studio 64X, see your online help file.

USING THE THRU DEVICE

If you would like your computer to communicate with your serial thru device, set the MIDI/Thru switch to the out position (Thru). Even when the Studio 64 is not communicating with your computer, it still operates as specified by the currently selected program.