Manual III
Reference Guide

Note: This document describes the state of the Synclavier® Digital Audio System as of October, 1994. Software updates issued since that time are not described in this manual but are documented elsewhere.

Synclavier Digital does not, at this time, offer any Synclavier® hardware or systems for sale. Please visit our website at www.synclavier.com to learn more about the rebirth of this remarkable instrument.

Synclavier Digital, February 2006

Synclavier Digital

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Chapter 1
Installation

Preparing Your System

Setting up your digital audio workstation involves two tasks—

- assembling the hardware components
- installing software on both the Macintosh and the system hard disk

This section describes the main hardware connections. The remaining sections explain the two types of software installation.

Main Connections

There are two main connections between the Macintosh and either the Synclavier or DTD—

- The Macintosh must have a MAC422 board installed. An RS-422 cable connects that board to the RS-422 or SYNCNET port of the Synclavier or DTD.
- An RS-232 cable connects the TERMINAL port of the Synclavier or DTD to either the Modem or Printer port on the back of the Macintosh.

Your Macintosh may contain a Hurdler board which provides additional serial ports. Do not use these ports for the RS-232 cable. It must be connected to the Modem or Printer serial port.

Installing EvE™ Keys

Synclavier Digital controls the usage of its Macintosh software applications with a hardware security key. Preventing unlawful duplication of software has many benefits for Synclavier Company customers. All of us will be assured that only licensed users can run new Synclavier Company features.

The software security system requires that you install a hardware EvE™ key on each Macintosh that will be running Release 2.7 or later software. If you already have EvE keys installed on your Macintosh computers, you do not need new ones. The keys themselves do not change for each software release.

If you have more than one workstation, each Macintosh must have a hardware EvE key installed.

To install an EvE key—

1. Turn off the Macintosh. It is extremely important that you power down the Macintosh whenever you install or remove the EvE hardware. You can damage your computer if you pull cables in and out with the power on.
2. Insert the EvE key anywhere along the Apple DeskTop Bus™ (ADB). Typically, the key is plugged into one side of the Macintosh keyboard or connected directly to one of the ADB connectors on the back of the Macintosh CPU.

3. Turn on the Macintosh. The EvE key will not interfere with the operation of your Macintosh and should remain attached at all times so it is not misplaced or lost.

Installing Macintosh Software

Software on the Macintosh can be separated into three groups—

- Apple System software is the operating system required for the Macintosh to function.
- Synclavier Company applications, such as TransferMation, EditView, and TermulatorX, provide the Macintosh interface to the Synclavier and DTD.
- Other software, such as word processing and graphics programs, allows you to use the Macintosh for functions unrelated to Synclavier Company applications.

Installer Program

Use the Installer program to automatically install Synclavier Digital applications and system files on the Macintosh.

All forms of virus protection must be turned OFF during the installation process.

You should have received three Macintosh disks from Synclavier Digital (Applications Disk 1 and 2 and a Configuration Disk). Insert Applications Disk 1 and double-click the Install icon. A dialog displays instructions for installing all Macintosh applications and system files. You can choose to install the entire set of applications or to select individual applications. You must also drag the Configuration file into Synclavier Digital System Folder.

For the best operation, all the applications should remain on the top level of the Macintosh hard disk.

Even though you can install all Synclavier Company applications, only those you purchase will function.

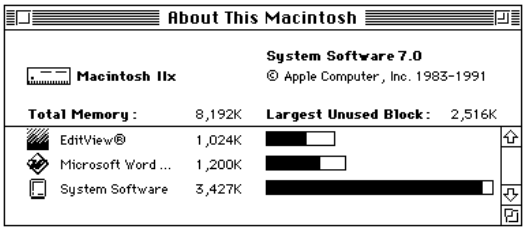
Installation Problems

If you have problems installing Macintosh software with Installer, try installing the software manually. See “Manually Installing Software.”

If the message “Software Configuration Error” appears when you try to launch an application, there is an installation problem with the software security system. Make sure your Synclavier Company System Folder (inside the Macintosh System Folder) contains the correct Configuration file, and check that your EvE key is installed correctly.

If you have double-checked your software installation and everything appears to be correct but you are still experiencing problems, call customer support for help.

Rebuilding the Desktop

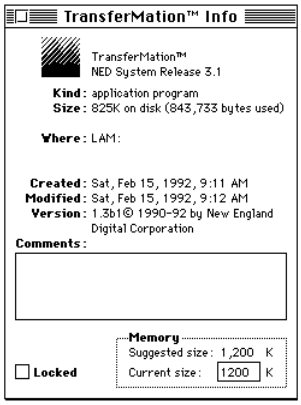


All Synclavier Company applications after Release 2.7 have the old logo as the application icon. If after installing the Macintosh software yours do not, try rebuilding the desktop.

1. Make sure that all older versions of the applications are removed from your Macintosh. These older versions can confuse the Apple desktop.
2. Select Restart from the Special menu and hold down both the Option and □ keys until your Macintosh boots up.
3. A dialog asks if you want to rebuild the Apple desktop. Click OK to continue. After a minute or so, the new icons should appear.

Memory Management

When an application (such as TransferMation) is loaded, a specific amount of computer memory is allocated for its operation. In most cases this is more than sufficient for operation. If you are working with a large sequence or many events, you may find your system slowing down or running out of memory. In some cases increasing the memory requirement enhances certain operational aspects of the application.



To check the memory allocation for an application, click once on the application icon and choose **Get Info** (□-I) from the File menu.

A "Suggested" memory size is given. However, you can increase this by typing a new number into "Current size." Try increasing the "Current size" by increments of 500 K. Restart the application and see if this makes a difference.

The amount you increase the application's memory allocation may depend on how much memory you have available. To check the total amount of memory available in your system, pull down the Apple menu and select the **About** command at the top of the list. The dialog shows the "Total Memory" available and how it is currently being allocated.

Manually Installing Software

Macintosh software should be installed automatically using Installer. If you need to manually install the software, follow the instructions below.

If you used Installer, the software has already been installed on your system and you do NOT need to perform the operations in this section.

You should have received three Macintosh disks (Applications Disks 1 & 2 and Configuration Disk).

1. Before copying any new software onto your system, remove all old Synclavier Company software from your Macintosh hard disk. This includes any old copies of the following programs:

   TermulatorX EditView
   TransferMation Autoconform MIDInet

2. Insert Applications Disk 1 into the Macintosh floppy drive and drag the following files into the System Folder, replacing any older versions if they exist.

   NED System Folder
   SYNCnet INIT
   EvE INIT

3. From Applications Disk 1 and 2, copy Synclavier Digital applications for which you have licenses to the top level of the Macintosh hard disk. These applications include all or some of the following:

   TermulatorX.sea Autoconform.sea
   TransferMation.sea MIDInet.sea

4. Each file is shipped in a compacted format. To expand each file to normal size, double-click its icon and specify the top level of your Macintosh hard disk when prompted for an installation location.
5. The Configuration Disk in contains a file called “Configuration” that is unique to your software site license. Insert the disk and drag this file into the “Synclavier Company System Folder” which you have already put into the Macintosh System Folder. Your software will not run without the Configuration file installed in the correct location.
6. Restart your Macintosh.

Sometimes a dialog indicates that the Configuration file on your Macintosh is newer than the one being installed. Just click Continue to ignore the message and replace the file. If you have more than one workstation, each Macintosh must have a copy of your Configuration file in Synclavier Digital System Folder.

Installing ABLE Software

Able software, which includes the Real-Time Program (RTP), is installed on your system hard disk. Before you install the Able software, you should decide whether you want to format your hard disk(s) to better utilize storage space. Formatting ERASES ALL FILES from the disk. Backup all your files before erasing.

System Disk Installation

The procedure for installing ABLE software onto your hard disk is straightforward. Once you begin, the installation program leads you through the process.

1. Insert the 5.25" Installation Disk into floppy drive 0.
2. Press the red LOAD button on floppy drive 0.

   A message asks you to confirm the type of hard disk (SCSI or IMI) that will be used as W0, your system hard disk.
3. Unless you have a non-standard configuration, type Y for Yes. Call your local Synclavier Company office/distributor if you are not sure how to answer this question.
4. A message asks whether you want to format your hard disk. Type Y for Yes or N for No.

Formatting erases all information on your hard disk. Do not answer Yes unless all your files have been backed up to floppy disks, tape or optical disk.

After formatting, a series of messages continues the installation process.

1. A list of questions asks which options are part of your system. After each question, type Y for Yes or N for No.
2. If your system has a profile file, a message asks whether you want it to be updated. Type Y for Yes or N for No. If your system does not already have a profile file, a new one is installed automatically.

The profile file starts the system in the RTP system. If no profile file exists, the system begins in the Monitor module whenever you press the LOAD button.

3. When you are prompted to insert disks into floppy drive 0, insert them in the exact order indicated.

   The appropriate RTP software, Utility programs and Music Printing software (if you have that option) are installed on the system hard disk.
4. A message asks whether you want to install the Synclavier setup timbres and sequences. Type Y for Yes or N for No.

   If you answer Yes, the setup timbres and sequences overwrite the Timbre Directory and the eight numbered sequence files in the top-level catalog of your W0 system hard disk.

TermulatorX Settings

After installing both the Macintosh and Able software, launch the TermulatorX application and check two settings on the Terminal menu at the top of the screen—

- Select the baud rate (9600, 19200, or 38400) that corresponds to the baud rate of your Synclavier or DTD.
- If the RS-232 cable connects the TERMINAL port of the Synclavier/DTD to the Printer port of the Macintosh, select Printer on the Terminal menu. If the cable is connected to the Modem port of the Macintosh, select Modem instead.

The baud rates of your Synclavier and DTD are set internally. The standard baud rate of 9600 is set by Synclavier Digital before shipping any new system.

Chapter 2
Real-Time Program

TermulatorX

TermulatorX is a Macintosh application that lets you access Synclavier Digital's Real-Time Program (RTP).

CAUTION - THIS DOCUMENTATION DESCRIBES THE TERMULATORX APPLICATION AS IT WAS RELEASED IN 1994. SEVERAL FEATURES HAVE BEEN ADDED TO TERMULATORX SINCE THAT TIME THAT ARE NOT DOCUMENTED HERE.

Accessing the RTP

TermulatorX is a Macintosh application that serves as a terminal emulation program. It communicates with Synclavier Digital hardware over an RS-232 cable, and provides a way for users to communicate with the RTP displays from the Macintosh.

When using TermulatorX, it is helpful to understand the program from two perspectives—

- It is a Macintosh application. TermulatorX is launched from the Finder and consumes Macintosh RAM when it is running. It has a menu bar where you can select display options such as how large the window should be on your screen.

- It is a window into the RTP displays. Once you click in the TermulatorX window, you are working in the RTP. The RTP displays will not necessarily behave as conventional Macintosh windows. The trackball will not always work as you would expect it to on a Macintosh. Standard commands such as ⇧ S will *not* save your current sound file, timbre or sequence.

TermulatorX Menus

The TermulatorX menus appear in the menu bar when TermulatorX is the current application.

FILE MENU

COMMAND	KEY	FUNCTION
Close VK Window	⌘-W	Closes the VK Panel display window.
Page Setup...		Set up the page size, orientation and other options for printing.
Print	⇧ P	Allows you to print the current display from the Macintosh. The printout is scaled to print to the margins of the chosen paper size.
Start Journaling		Allows capturing the output from the Synclavier® to a Macintosh Text File

Capture Printer Output		Not available with TermulatorX. With SynclavierX allows the capturing of laser printer output to a Macintosh text file which can then be sent to a post-script printer.
Quit	□-Q	Quits the TermulatorX program and returns you to the Finder.

EDIT MENU

COMMAND	KEY	FUNCTION
Undo	□Z	not available
Cut	□X	not available
Copy	□-C	Copies text from the current display to the Macintosh Clipboard. Graphics are not copied.
Paste	□V	Pastes the contents of the Macintosh Clipboard into most Macintosh applications.
Clear		not available

WINDOW MENU

COMMAND	KEY	FUNCTION
EditView		Starts the EditView application.
MIDInet		Starts the MIDInet application.
Autoconform		Start the Autoconform application.
TransferMation		Starts the TransferMation application.
Leave Window In Background		Prevents clicking in a window from bringing that window to the foreground.
Arrange VK Panel...	□A	Allows you to rearrange the VK Panel sections and store preset arrangements.
Panel Presets		Recalls VK Panel arrangements which have been set up and stored using the Arrange VK Panel command.
Preset 1	□1	
Preset 2	□2	
Preset 3	□3	
Preset 4	□4	
Preset 5	□5	
Preset 6	□6	
Colors		Choose colors for certain VK Panel display items.

Show VK Panel	□D	Toggles between the current RTP display and the VK Panel display.
Show/Hide Terminal Window	□D	Allows showing or hiding the terminal window

DISPLAY MENU

COMMAND	KEY	FUNCTION
Half Size	□H	Displays small TermulatorX window.
Mid Size	□M	Displays medium TermulatorX window.
Full Size	□F	Displays large TermulatorX window.
Extended		Currently implemented only in Music Printing F.5. Allows editing of graphics larger than the screen.
Show (Hide) Title & Scroll bars	□L	Adds (or deletes) scroll bars at the bottom and right.
White on Black (Black on White)		Exchanges background and foreground colors.
Align Window to Screen	□R	Aligns the window to the top left of the screen.

TERMINAL MENU

COMMAND	KEY	FUNCTION
PF1	F1	Moves from the RTP to the Reverse Compiler.
PF2	F2	Moves from the Music Printing module to the RTP.
PF3	F3	Moves from the RTP to the Music Printing module.
PF4	F4	Moves from the RTP to the Signal File Manager.
Pause (Resume)		Stops/resumes drawing or scrolling on screen.
Break		Moves to the Monitor module. The current RTP screen is replaced with a Ready> prompt.
Reset		Returns to either the Main or Welcome menu.
9600, 19200 or 38400 Baud		Shows the current baud rate. It should correspond to the baud rate of your Synclavier
Clear Holds	□T	Clears held buttons anywhere on the VK Panel.
Update Panels	□U	Updates all panels to display current information.
Search For Ports		Refreshes the list of USB serial ports that are available

HELP MENU

COMMAND	KEY	FUNCTION
Help...		Displays some key commands and instructions for starting the Synclavier or DTD system.
Quick Reference		not available

RTP Controls

This section describes methods that can be used on most RTP displays.

Buttons and Switches

There are many different types of buttons on the RTP displays. The individual buttons on each display are described in the following sections.

Take button

A special button, called a **Take** button, appears on many of the screens. In general it is used to grab a time and stuff it into an adjacent time field. When you press a Take button, it replaces the time currently in the field.

Some RTP displays contain switches which can be set to any of several options—

- Move the cursor onto the switch. Press and hold the large trackball button while you roll the trackball right or left to change the switch setting. Release the button to make the selection.
- Press and hold the or Option key while you click on the screen switch. When holding the key, each click selects the previous setting. When holding the Option key, each click selects the next setting.

Entering Text and Values

Some RTP displays contain information areas, called **fields**, that display values or text you can edit. To enter information, click the field, type the value or text and press Return.

You can increment values in a time field by selecting the desired segment (for example, the minutes segment in a SMPTE time field) and hold the or Option key while you click. The key increases segment numbers; the Option key decreases them.

In some displays, you can enter text or values without using the trackball.

1. Select the desired field.
2. Press the Tab key to enter the overstrike mode (any typed character replaces the one at the cursor, which advances to the next character).
3. Move to the text or value to be changed. Use the Tab key to move by words or numeric segment; use the arrow keys to move character by character. At the end of the field, the cursor wraps.
4. Type the desired text or value and press Return.

After you press the Tab key, you can move the cursor by pressing a : (colon) key to move to the next colon or a . (period) to move to the next decimal.

You can also use the Control key in conjunction with another key to access other text features—

Control-A	Toggles between insert and overstrike mode in a text field.
Control-D	In overstrike mode, moves the cursor one character to the right. In insert mode, erases one character to the right of the cursor.
Control-E	Deletes all characters to the right of the cursor.
Control-I or Tab	Advances the cursor to the next segment within the field.
Control-H	Moves the cursor one character to the left.
Control-L	Moves the cursor one character to the right.
Control-R	Cursor moves to the first character in the segment.
Control-X	Erases the entire entry and exits the edit mode.
Delete	In overstrike mode, moves the cursor one character to the left. In insert mode, erases the character to the left of the cursor.

Function Keys

The top of the terminal keyboard has 15 function keys (F1–F15). Their function varies depending on which software module is running.

F1	Moves from the RTP system or Music Printing to the Reverse Compiler.
F2	Moves to the RTP system.
F3	Moves from the RTP system to Music Printing.
F4	Moves to the Signal File Manager.
F5	Selects the Cue In time on the Cue Editor.
F6	Selects the Edit In time on the Cue Editor.
F7	Selects the Edit Out time on the Cue Editor.
F8	Selects the Cue Out time on the Cue Editor.
F9	Plays from the selected time on the Cue Editor.
F10	Stops cue playback on the Cue Editor. Toggles to continue playback.
F11	Plays to the selected time on the Cue Editor.
F12	Toggles between scan and scrub mode on the Cue Editor.
F15	Freezes and unfreezes a scrolling screen.

Main Menu

The **Main Menu** lists all the RTP displays and appears when you first start the RTP.

```
                                  Main Menu
Directories                                  Memory Recorder
   A. Timbre Directory                          S. Sequence Editor
   B. Sound File Directory                      G. Recorder Display
   C. Sequence Directory                        H. Multichannel Display
   D. Subcatalog Directory                      J. Midi Display
   M. Missing Sound Display                     K. Music Notation Display

Sound Design                                 Direct-To-Disk
   L. Sound File Editor                         O. Project Directory
   F. FM Timbre Display                         P. Track Display
   I. Patch Display                             Q. Audio Event Editor
   N. Name Keyboard Timbre

Sound Archival                               System Control
   R. Optical Disk Storage                      E. Extra System Commands

                                                <PF1>   Reverse Compiler
                                                <PF3>   Music Printing
                                                <PF4>   SFM
                                                <BREAK> Monitor
```

There are three ways to choose a display—

- type the letter preceding its name
- click the display name
- use the arrow keys to highlight a name, and press the Return key.

All navigation between RTP displays takes place by returning to the Main Menu and then selecting another display. To return to the Main Menu from any RTP display, press Enter on the Macintosh keyboard or click the Close box at the top right of all RTP displays.

close box

Timbre Directory

```
TIMBRE DIRECTORY
1. Use arrows to move cursor, <RETURN> to call up timbre, <ENTER> when done.
2. Select devices with 1,2,3,....   Poly Memory: [Avail]  [Free]    [Bin]
3. Devices:1 W0:  2 F0:                          [Shuffle] [Collect] [Erase]

        BANK 1        BANK 2        BANK 3        BANK 4
   1.   WORKSPACE     BBALL/SHOT  .46 TUMBA     .14 ELEC BASS1  .18
E  2.   LIVE DRUMS  .37 CROSS STICK .02 CONGA     .36 POPBASS1    .08
N  3.   ELECTRIC KIT .26 TOTOSAN    .38 QUINTO    .34 BASS W/POP  .26
T  4.   ELEC KIT #2 .27 MAMBO BELLS .22 TIMBALES  .42 STEINBERGER .37
R  5.   DRUM MACHINE .31 BONGO BELLS .18 SHEKERE   .07 SBASS W/POP .41
Y  6.   BDRUM/SNARE  .1 WOOD BLOCKS  .1 GANZA     .07 PHASED EBASS .18
   7.   RIDE CYMBAL1 .47 PERCUSSION  .33 TRIANGLE  .42 PHASED SBASS .37
   8.   RIDE CYMBAL2 .48 TABLA      .66 TAMBOURINE .49 ACOUSTIC BS 2.67

        BANK 5        BANK 6        BANK 7        BANK 8
   1.   PIANO     3.79 TRUMPET    .15 FLUTE     .21 LEAD HAMMOND (S)
E  2.   VIBES      .43 TPT SECTION1 .76 BRASS/SAXES 1.6 SPACE VOICES (S)
N  3.   GUITAR     1.3 TPT SECTION2 .57 BASS/VIBES  .8 RHODES      (S)
T  4.   12 ST GTR  2.3 TROMBONE1  .39 FLUTE/VIBES .69 SYNTH BASS  (S)
R  5.   RHYTHM GUITAR .1 TROMBONE2  .47 SAX/GUITAR 2.29 SOLO VIOLIN (S)
Y  6.   STEEL DRUMS .72 BRASS SECTION .6 GUITAR/CLAR 2.25 BIG BELL    (S)
   7.   STRINGS   1.68 CLARINET   .95 SDRUMS/VIBES 1.2 BOO BAMS    (S)
   8.   CELLI      1.7 SAXOPHONE  .99 HARP GLISS  .48 SINE WAVE   (S)
```

The Timbre Directory displays the timbre file on the current device. If the desired timbre is in a timbre file on another device, type the number preceding the device name.

```
Select devices with 1,2,3,....
Devices:1 W0:  2 F0:
```

If the desired timbre is in a different subcatalog, go to the Subcatalog Directory and choose another subcatalog. Return to the Timbre Directory to display the timbre file in that subcatalog.

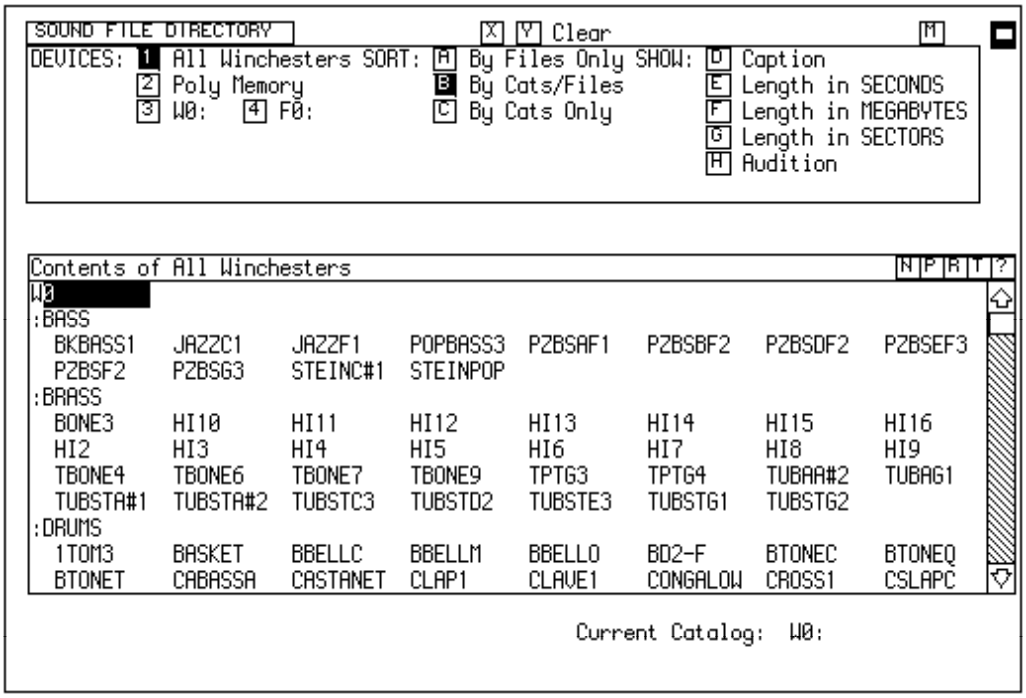
To recall a timbre, select it with the arrow keys and press Return, or click the desired timbre name. The sound files associated with the timbre are loaded into poly RAM.

Click a Poly Memory buttons at the top of the display to perform the following functions—

```
Poly Memory: [Avail]  [Free]    [Bin]
             [Shuffle] [Collect] [Erase]
```

Avail	Display the total amount of poly RAM (in megabytes).
Free	Display the amount of poly RAM currently unused.
Bin	Shows the number of poly bins in the system.
Shuffle	Rearranges files in poly RAM so that all files are adjacent and all empty sectors are collected into a group.
Collect	Erases from poly RAM all sound files not part of the current timbre or sequence.
Erase	Erases all sound files from poly RAM.

Sound File Directory



The Sound File Directory displays sound files stored on the system hard disks, floppy or optical disks, or sound files currently in poly RAM. The display lists the storage devices in your system.

DEVICES: 1 All Winchesters
2 Poly Memory
3 W0: 4 F0:

Click a numbered button to display sound files stored on the selected device—

All Winchesters	Lists catalogs and sound files stored on all hard disks.
Optical Disk	Lists sound files stored on the current optical volume.
Poly RAM	Lists sound files currently in poly RAM.
W0 or W1	Lists catalogs and sound files stored on an individual hard disk.
F0	Lists catalogs and sound files stored on the floppy disk currently in the superfloppy drive.

When an optical disk is the selected device, you can sort the list by categories and/or sound files—

SORT: A By Files Only	Displays sound file names only.
B By Cats/Files	Display categories and sound Files.
C By Cats Only	Displays categories only.

Click the appropriate button to display the caption and/or length of each sound file, or to audition selected sound files—

SHOW: D Caption	Displays each sound file caption.
E Length in SECONDS	Displays the length of each sound file, the sampling rat in kHz, and whether the sound is stereo or mono (S/M).
F Length in MEGABYTES	
G Length in SECTORS	
H Audition	Plays the selected sound file when it is recalled into poly RAM.

To select a sound file, press the arrow keys until the sound file name highlights, or just click the desired sound file name. To recall the selected sound file, press Return. If the Audition option is on, the sound file plays as it is loaded into poly RAM.

The following buttons appear at the top of the display—

Click X or Y to store the location of a selected sound file. Clicking the button again automatically scrolls to that location in the list. Click Clear and the X or Y button to erase its information.

M — Toggles between showing and hiding the list of devices and options at the top of the window. Hiding the options displays more sound files.

Click a button at the top of the sound file list to perform the following functions—

N — Displays the amount of memory available in each poly bin, and lets you specify a preferred bin.

P — Prints the displayed list of sound files, subcatalogs and categories. A dialog lets you specify a title for the printout. Click [PRINT] in the dialog to begin printing. To stop printing, click anywhere.

R — Displays the amount of available poly RAM, and lets you shuffle, collect or erase poly RAM.

T — Automatically scrolls to place the selected sound file at the top of the displayed list.

? — Displays a dialog to search for a sound file or any string of characters in the list. In the dialog, type the desired characters after “Enter Search ID” and click [SEARCH]. To continue a search, press / (the back slash key next to the Shift key). To stop searching, click anywhere.

Sequence Directory

```
SEQUENCE DIRECTORY
1. Use arrows to move cursor. Press <RETURN> to recall sequence.
2. Press <ENTER> when done with this screen.
3. Select devices with 1,2,3,....
4. Devices-->1 W0:  2 F0:

   <SEQ #1> 12STRING BACH-JOY BIGBAND  BONELOOP BOXPOLKA COMPARSA EVTST1
   FUNK     HBDAY3   JSBFUGUE MITSU    NANINGO  RELATIVE TABLA    TINTAL
```

Use the Sequence Directory to recall a sequence stored on a hard disk or floppy disk. The directory lists the storage devices in your system and the sequences on the current device. On startup, the directory lists the sequences in the top-level catalog of the system hard disk.

The eight numbered sequences correspond to the numbered buttons on panel 4 of the Synclavier keyboard.

To recall a sequence, select it with the arrow keys and press Return, or click the desired sequence name.

If the desired sequence is on another device, type the number preceding the device name.

```
Select devices with 1,2,3,....
Devices:1 W0:  2 F0:
```

To recall a sequence from another subcatalog, select a different subcatalog before opening the Sequence Directory.

Subcatalog Directory

```
SUBCATALOG DIRECTORY

1.  Use this screen to enter a different Subcatalog.
2.  Move cursor over name of desired Subcatalog using arrow keys.
3.  Press <RETURN> to enter that Subcatalog.
4.  Or simply enter a valid treename for desired catalog.
5.  Press <ENTER> when done with this screen.

F0:      W0:      -XPL     .INDEX   .SYSTEM  BASS     BRASS    DRUMS
DXRHODES GEORGE   GUITAR   HORTA    LEE      MISCSNDS PIANO    POPHORN
SOUNDS   STRINGS  SYSDOC   TOPLEVEL TPLEVEL1 VIBES    VOX      WINDS
```

The Subcatalog Directory shows the devices in your system. It also lists the subcatalogs of the current device or catalog, indicated at the bottom of the display. Use the Subcatalog Directory to change the current subcatalog without using the Monitor.

To enter a different device or catalog, select the device with the arrow keys and press Return, or click the desired device or catalog name.

If you select a device, the subcatalogs in the top-level catalog are listed. Selecting a catalog is analogous to opening a Macintosh folder. Subcatalogs within the selected catalog are listed in the directory.

Your selection becomes the current catalog for all RTP displays. For example, if you use the Subcatalog Directory to make F0:DRUMS the current catalog, and then use the Sequence Display to save a sequence, the sequence is stored inF0:DRUMS, the current catalog.

Missing Sound File Directory

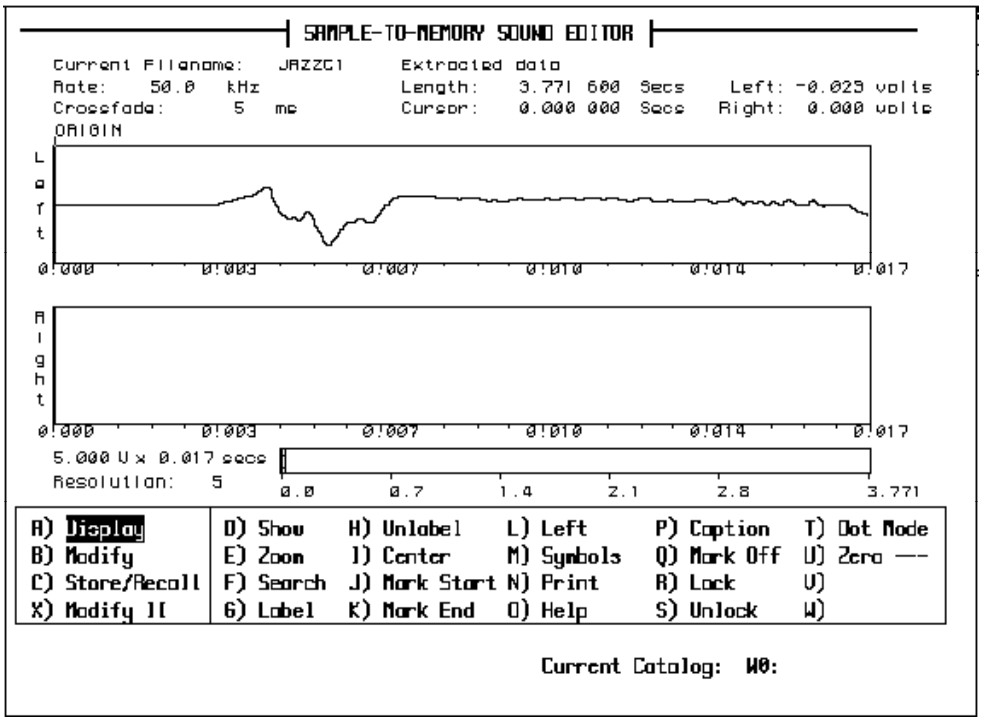
```
MISSING SOUND FILE DISPLAY
1. Sound Files used in the current Sequence or Keyboard Timbre which are
   missing from Polyphonic Sampling Memory are identified below.
2. Insert diskettes containing some or all of these files into Drive F0:
   and press <RETURN> to load them into Polyphonic Sampling Memory.
3. Press <ENTER> when done with this screen.       -->

XTK2A-40 XTK2A-41 CRAMB-41 TUBAC2   TUBAF2   TUBAE3   TUBAA3   HAHA
SCREAM1
```

When you recall a sequence requiring sound files not currently available on the storage device, the message DATA/SOUND FILE IS MISSING appears in the display window of the Synclavier keyboard.

Use the Missing Sound File Directory to list and recall those sound files. If the missing sound files are stored on a floppy or optical disk, insert the disk into the appropriate rive and press Return. The sound files from that disk are loaded into poly RAM and their names disappear from the list. Repeat the process for other sound files you want to retrieve.

Sound File Editor



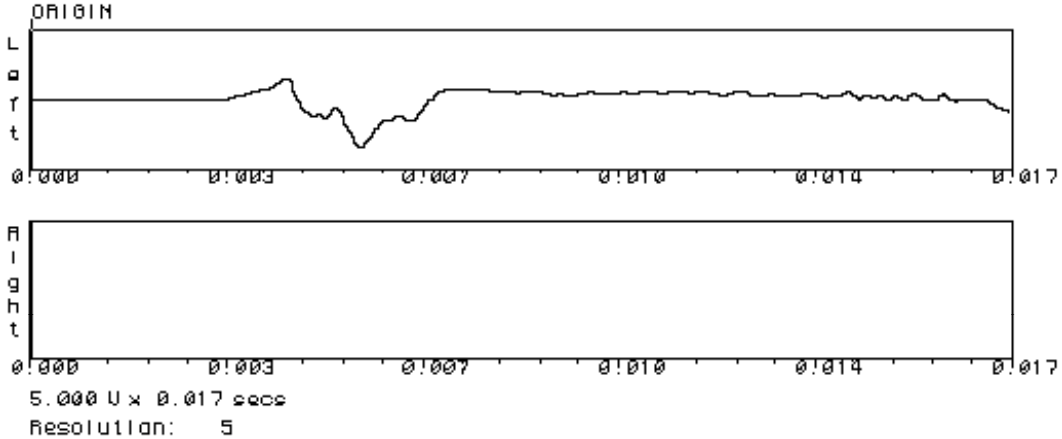
Displaying a Sound File

Use the Sound File Editor to display, modify and store sound files. The top of the display lists information about the current sound file—

```
Current Filename:   JAZZC1      Extracted data
Rate:    50.0   kHz             Length:    3.771 600  Secs    Left: -0.023 volts
Crossfade:       5   ms         Cursor:    0.000 000  Secs   Right:  0.000 volts
```

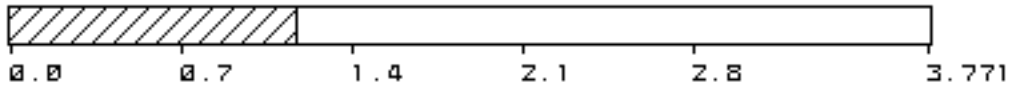
Current Filename	Name of the current sound file.
Rate	Sampling rate, in kHz, used when the sound file was recorded.
Crossfade	Default crossfade length, used for splicing portions of sound files during editing.
Length	Duration of the current sound file, to the nearest microsecond.
Cursor	Time associated with the current cursor location.
Left	Amplitude of the sound file's left channel at the current cursor location.
Right	Amplitude of the sound file's right channel at the current cursor location.

Two display windows contain waveforms representing the left and right channels of a stereo sound file. Mono sound files appear in the top display window. The cursor is a vertical line that moves when you either press the arrow keys or click in one of the display windows.



The vertical axes indicate voltage; the horizontal axes show time in seconds.

The bar below the left and right waveforms represents the entire length of the sound file. The shaded portion represents the part of the sound file currently displayed. Dragging the shaded portion changes the horizontal scale of the waveforms.



Four symbols automatically appear in the display windows, which also show the sound file offset and any other labels you define.

ORIGIN	Beginning of the sound file.
END	End time of the sound file.
#	Mark start time; the point at which playback begins.
$	Mark end time; the point at which playback ends.

The bottom of the Sound File Editor contains four menus. Click a menu name (or type its letter) to see a list of related commands. The commands in each menu are described on the next few pages.

Display Menu Commands

Show	Displays a dialog in which you specify a time, label or symbol. When you press Return, the cursor moves to the specified location in the sound file.
Zoom	Adjusts the horizontal and vertical scales of the display windows.
Search	Displays a dialog in which you specify an amplitude between 0 and 5 volts. When you press Return, the cursor moves to the next occurrence of the specified voltage, regardless of polarity.
Label	Assigns a user-defined label to the current cursor location.
Unable	Removes a specified label from the sound file. If you press Return without typing a label name in the dialog, the label at the current cursor location is removed.
Center	Redraws the sound file waveform so that the current cursor position is centered in the display window.
Mark Start	Assigns the mark start symbol (#) to the current cursor location. When you play the sound file, playback begins at the mark start point.
Mark End	Assigns the mark end symbol ($) to the current cursor location. When you play the sound file, playback ends at the mark end point.
Left	Redraws the sound file waveform so that the current cursor position is at the left of the display window.
Symbols	Displays a list of the symbols defined for the current sound file. Click a symbol in the list and press Return to move the cursor to the specified location in the sound file.
Print	Prints a copy of the Sound File Editor.
Caption	Displays a dialog for defining a sound file caption (up to 256 characters).
Mark Off	Assigns the OFFSET label to the current cursor location. The offset is useful for backtiming events in a sequence.
Lock	Allows comparison of two mono sound files, one in each display window, provided they have the same sampling rate. Only the sound file in the top window can be played or edited.
Unlock	Removes the mono sound file from the bottom display window.
Dot Mode	Shows one dot for each sample or group of samples, depending on the resolution.
Zero—	Displays a horizontal line representing 0 volts.

Modify Menu Commands

Reverse	Reverses the sound file so it plays backwards.
Cut	Removes a portion of the sound file and places it in the edit buffer.
Paste	Inserts up to 999 copies of either the edit buffer or a stored sound file into the current sound file at the current cursor location.
Extract	Creates a new sound file containing only the samples between specified points of the current sound file.
Delete	Removes a portion of the sound file without affecting the edit buffer. The remaining portions of the sound file are spliced together.
Exchange	Interchanges the left and right channels of a stereo sound file.
Combine	Creates a new stereo sound file by combining a stored mono sound file with the current mono sound file.
Ext Mono	Creates a new mono sound file from either channel of the current stereo sound file.
Crossfade	Defines the default crossfade time (0-65.535 sec) used for splicing portions of sound files.
Copy	Copies a portion of the sound file to the edit buffer.
Fill	Replaces a portion of the current sound file with a copy of either the edit buffer or a stored sound file.
Loop	Defines a crossfade loop to repeat a specified portion of the sound file during playback.
Volume	Increases or decreases the sound file volume by the specified factor. Scale factors between 0 and 1 reduce the volume; factors between 1 and 30 increase the volume.
Normalize	Scales the sound file's volume so that its highest signal level is 5 volts.
Modulate	??
Rev Loop	Defines a reverse loop to play a specified portion of the sound file forward and backward repeatedly.
Mix	Digitally mixes a stored sound file with the current found file, provided both have the same sampling rate. A dialog lets you specify the volume ratio of the two sound files.
Undo	??
Invert	Inverts the phase of the current sound file. Each positive voltage becomes negative, and vice versa.
DC Trim	Removes a DC component from the sound file.

When using the Cut, Copy, Delete, Extract or Fill command, you can use the Mark Start (#) and Mark End ($) points to specify a portion of the sound file.

One other editing command is available on the Modify II menu—

TSM	Time scale modification displays a dialog for compressing or expanding the length of the current sound file. Choose from three algorithms, and

specify either the desire sound file length or a ratio of compression or expansion.

Store/Recall Commands

Save	Stores the current sound file in the current catalog. A dialog lets you assign a sound file name.
Unsave	Deletes a specified sound file from the current catalog of the system hard disk.
Rename	Displays a dialog for changing the name of the current sound file.
Recall	Loads a stored sound file into poly RAM.
Collect	Erases from poly RAM all sound files not part of the current timbre or sequence.
Record	Records a sound into poly RAM. A dialog indicates the amount of available recording time, and lets you set the mode, trigger, sampling rate, gain and threshold level for recording.
Max Time	Rearranges sound files in poly RAM so that all files are adjacent and all empty sectors are collected into a group. If your system has more than one poly bin, sound files are moved out of bin 1 to maximize the amount of available recording time.

FM Timbre Display

The FM Timbre Display is actually five displays. To select one, click its name in the list at the bottom of the display.

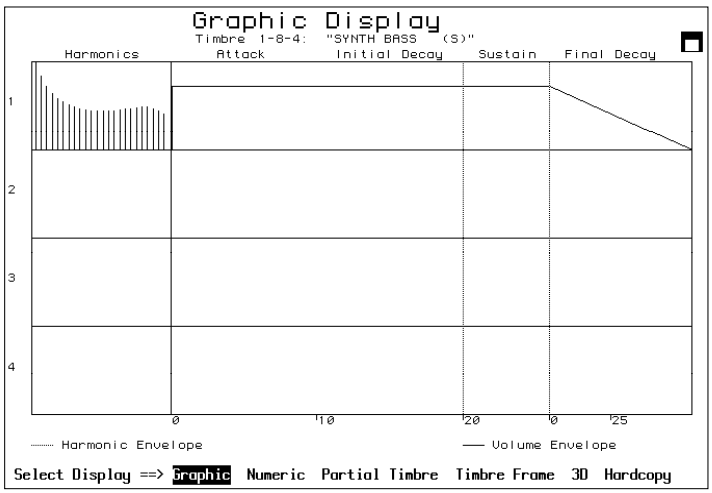
Select Display ==> Graphic Numeric Partial Timbre Timbre Frame 3D Hardcopy

The name of the current timbre appears at the top of each display, along with the bank and entry numbers that indicate where the timbre is stored.

Timbre 1-8-4: "SYNTH BASS (S)"

Graphic Display

The Graphic Display illustrates four partial timbres in an FM timbre. The first columns shows the relative volume of each harmonic. The rest of the display represents the volume envelope (solid lines) and harmonic envelope (dotted lines) for each partial.



Numeric Timbre Display

The Numeric Timbre Display provides the same information as the Graphic Display, but in numeric form.

partial timbre 1

partial timbre 2

partial timbre 3

partial timbre 4

```
                              NUMERIC TIMBRE DISPLAY
Press arrow key to move cursor and enter value. Press <ENTER> for Main Menu.
Select Display ==> Graphic  Numeric  Partial Timbre  Timbre Frame  3D  Hardcopy
                    Timbre:   1-5-1:  "PIANO       3.79"

   Delay Attck  IDec  FDec  Peak Sust    1st 12 Harmonic Coefficients
1. V     0     0     0   192 100.0 100.0
   H     0     0     0     0     0     0

2. V
   H

3. V
   H

4. V
   H

   Partial                Vibrato                Stereo
   Tuning Volume FM Rat Chorus Wave Rate  Depth MDep  Attk IQB Wave Rate Dep Pan
1.   440.0| 65.7| 0.000| 1.000|Sin | 0.00| 0.00| 0.00|   0|    |  0 |0.00|  0|  0
2.        |    |      |      |    |    |    |    |    |    |    |    |   |
3.        |    |      |      |    |    |    |    |    |    |    |    |   |
4.        |    |      |      |    |    |    |    |    |    |    |    |   |
```

The Numeric Timbre Display lists five sets of values for each partial timbre. To change any value, select and type a new value.

```
┌ Delay Attck  IDec  FDec  Peak Sust ┐
```

The delay, attack, initial decay and final decay times, as well as the peak and sustain volumes are listed for both the volume envelope (V) and the harmonic envelope (H).

```
┌ 1st 12 Harmonic Coefficients ┐
```

Coefficients indicate the volume for each of the first twelve harmonics.

```
┌──────── Partial ────────┐
Tuning Volume FM Rat Chorus
```

The bottom of the display lists the values for partial tuning, volume and chorus, as well as the FM ratio.

```
┌──────── Vibrato ────────┐
Wave Rate  Depth MDep  Attk IQB
```

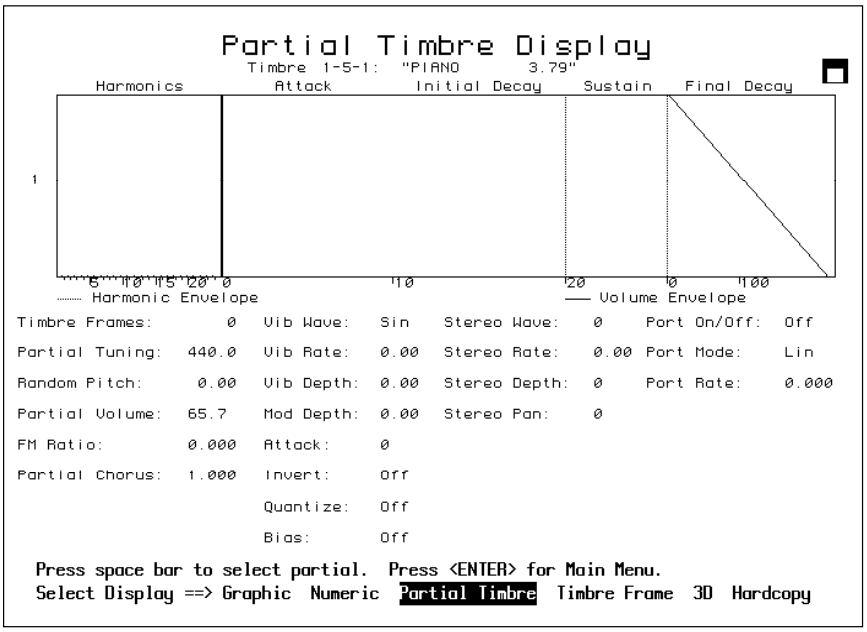
Vibrato information includes the wave type, rate, depth, and attack. MDep indicates the depth of the modulator wave. IQB indicates the vibrato invert, quantize and bias functions.

```
┌── Stereo ──┐
Wave Rate Dep Pan
```

Stereo values indicate the wave, rate, depth, and pan parameters used for automatic panning.

Partial Timbre Display

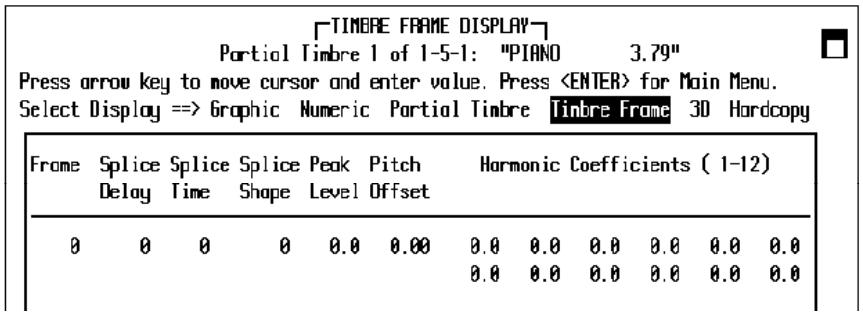
The Partial Timbre Display provides both graphic and numeric information for one partial timbre at a time. Press the Spacebar to display information about the next partial timbre. Values cannot be changed on the screen. I you change a value using the buttons an control knob on the Synclavier keyboard, the new value appears on the screen.



Timbre Frame Display

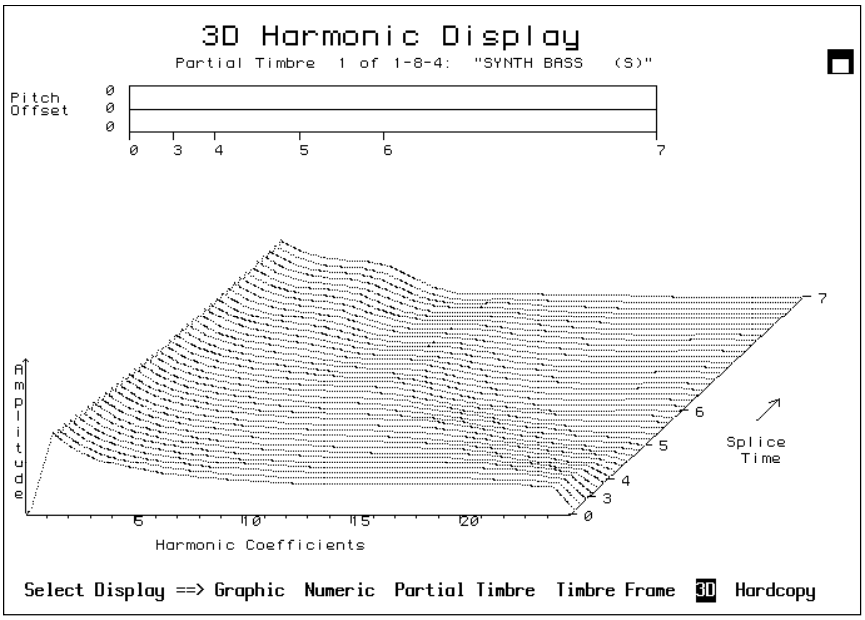
The Timbre Frame Display lists values for each timbre frame of a partial timbre. Press the Spacebar to display the timbre frames of the next partial timbre. Use the arrow keys to scroll through the list of timbre frames. To change any value, select it and type a value.

The display lists the splice delay, time, and shape, as well as the peak volume an pitch offset for each timbre frame of the selected partial timbre. Coefficients indicate the volume for the first twelve harmonics of each timbre frame.



3D Harmonic Display

The 3D Harmonic Display illustrates how the timbre frames of a partial timbre change over time. Press the Spacebar to display the timbre frames of the next partial timbre.



Each waveform represents the relative volumes of the 24 harmonics in the timbre frames. All waveforms are separated by a constant amount of time, and timbre frames are shown in proportion to their duration. Thus, several short timbre frames may be represented by one waveform, while a longer timbre frame may be represented by several waveforms.

The graph at the top of the display indicates the pitch offset of each timbre frame. The horizontal axis lists the timbre frame numbers. The vertical scale is determined by the timbre frame with the largest pitch offset.

Patch Display

```
┌──────────────────────┤ SOUND FILE "PATCH" DISPLAY ├──────────────────────┐
│  1.  Use this screen to create Patch Lists. Press ? for more instructions.
│  2.  Move cursor using arrow keys. Enter new values.
│  3.  Select Partial Timbre from button panel or by pressing space bar.
│  4.  Press  <CTRL-C>  to view directory of Sound Files in Current Catalog.
│             <CTRL-E>  to enter a different Subcatalog.
│             <RETURN>  to view Keyboard Display.
│             <ENTER>   when done with this screen.
└──────────────────────────────────────────────────────────────────────────
  Keyboard Timbre:  1-8-2:  "POPBASS3"
  Current Catalog:  W0:
──────────────────────────────────────────────────────────────────────────
Partial # 1:                        Memory Left:  5.8 Megabytes
    File      Start  End  Volume  Transpose  Tuning  Total Length Loop Length
1.  POPBASS3  C0     C7   100.0               0.00   0.000 000    0.000 000
```

Patch List

Use the Patch Display to create a patch list by assigning sound files to regions of the Synclavier keyboard. You can create a keyboard patch for each partial timbre. The display indicates the current timbre and catalog, and the selected partial timbre. Press the Spacebar to select the next partial timbre.

```
Keyboard Timbre:  1-8-2:  "POPBASS3"
Current Catalog:  W0:
──────────────────────────────────────────────────────────────────────────
Partial # 1:                        Memory Left:  5.8 Megabytes
```

"Memory Left" indicates the amount of poly RAM available for sound files.

The patch list below shows the keyboard assignments for each sound file in the partial timbre. To change any parameter, select it and type a new value.

File	Sound file name.
Start	Lowest note of assigned keyboard region.
End	Highest note of assigned keyboard region.
Volume	Playback volume of the sound file, expressed as a percentage.
Transpose	Key to which the original pitch is assigned; if nothing is listed, the original pitch is assigned to A3.
Tuning	Tuning factor (-48 to +48 semitones) assigned to the sound file.
Total Length	Play length of the sound file,, to the nearest microsecond.
Loop Length	Play length of the keyboard loop, to the nearest microsecond.

You must use the arrow keys instead of the trackball to select items on the Patch Display.

The following key commands are available when the Patch Display is shown—

Control-P	Prints the patch list.
Control-C	Displays a directory of sound files in the current catalog.
Control-E	Lets you select a different subcatalog.
Return	Toggles to the Keyboard Display.
Enter	Exits to the Main Menu.

Keyboard Display

The Keyboard Display lists the sound file assigned to every note on the Synclavier keyboard, for one partial timbre at a time.

```
                          KEYBOARD DISPLAY
   1.  Select Partial Timbre from button panel or by typing 1,2,3, or 4.
   2.  Press  <RETURN>  to return to Sound File "PATCH" Display.
   3.  Press  <ENTER>   to return to Main Menu.  --->

Timbre:  1-1-1:  "NEWF1018"                Selected Partial:  #1
                                           "PATCH" Display
                          OCTAVE
PITCH   C0 - B0   C1 - B1   C2 - B2   C3 - B3   C4 - B4   C5 - B5   C6 - B6

  C  :
  C# :
  D  :
  D# :
  E  :
  F  :
  F# :
  G  :
  G# :
  A  :
  A# :
  B  :
```

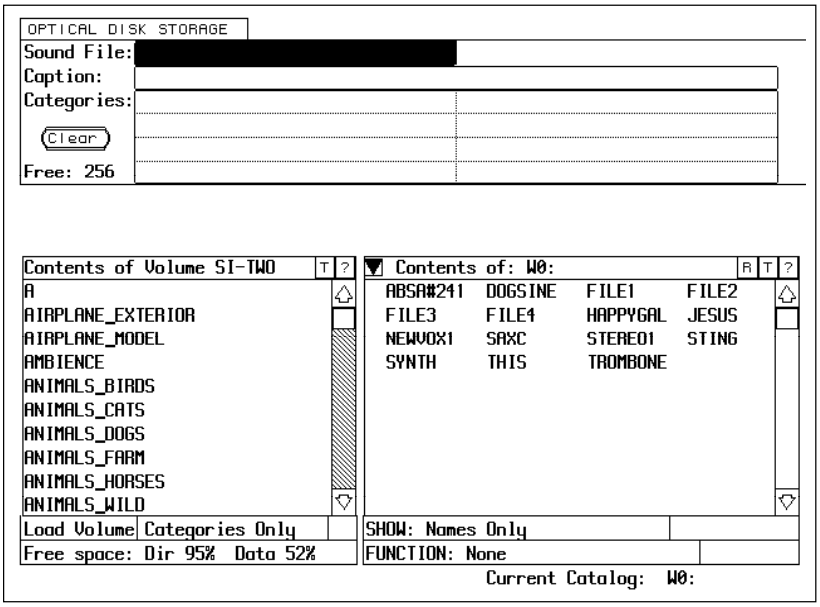
The display indicates the current timbre and the selected partial timbre. To select a different partial timbre, type the appropriate number (1, 2, 3, or 4).

The following key commands are available when the Keyboard Display is shown—

Return	Toggles to the Patch Display.
Enter	Exits to the Main Menu.

Optical Disk Storage Display

Use the Optical Disk Display to format and load optical disk volumes, and to store and recall sound files. You can use the Oplist Utility to print a list of the sound files.



Load Volume Loads the index file into memory.

Free space: Dir 95% Data 52% The numbers after "Free Space" indicate the available space in the directory (Dir) and sound file storage area (Data) of the current volume.

Displaying Sound Files

The contents of the current optical disk are listed at the bottom left of the display. The contents of the current device or catalog appear at the bottom right. Two switches determine what information appears—

Categories Only

Categories Only lists only categories on the optical disk.
Files Only lists only sound files on the optical disk.
Categories & Files lists both categories and sound files.

The Show switch applies to all sound files listed on both the left and right of the display.

SHOW: Names Only

Names Only displays on the sound file names.
Names, Captions also displays the sound file captions.
Names, Lengths, Captions also displays the length (seconds, sectors, or megabytes) of each sound file.

The Function switch indicates the result of clicking a sound file name in the list.

FUNCTION: Recall Files

None just selects the sound file.
Recall Files loads the sound file into poly RAM.
Recall & Audition Files loads and plays the sound file.

The following buttons appear at the top of the sound file lists—

R	Displays a dialog for shuffling, collecting or erasing poly RAM.
T	Automatically scrolls to place the selected sound file at the top of the list.
?	Displays a dialog to search for a sound file or any string of characters in the list. To stop searching, click anywhere.
▼	Selects a device or subcatalog so that all its sound files can be copied to the optical disk.

Storing Sound Files

To copy sound files to the optical disk, you select the sound file or catalog names at the bottom right. Depending on the selection, the following buttons appear at the top of the display—

Store/Replace	Copies the selected sound file from the current catalog to the optical disk, and updates the index file on the hard disk.
Store Catalog	Displays a dialog for copying all or some of the sound files from a catalog to the optical disk. The button appears only when a device or subcatalog is selected.
Source	Assign the caption and category information at the top of the display to the sound file selected in the bottom right list. The sound file is updated but is not copied to the optical.
Clear	Removes the list of categories from the top of the display.

For each sound file, the total number of characters in the caption and categories is limited to 256. The number after "Free" indicates how many characters remain before exceeding the limit.

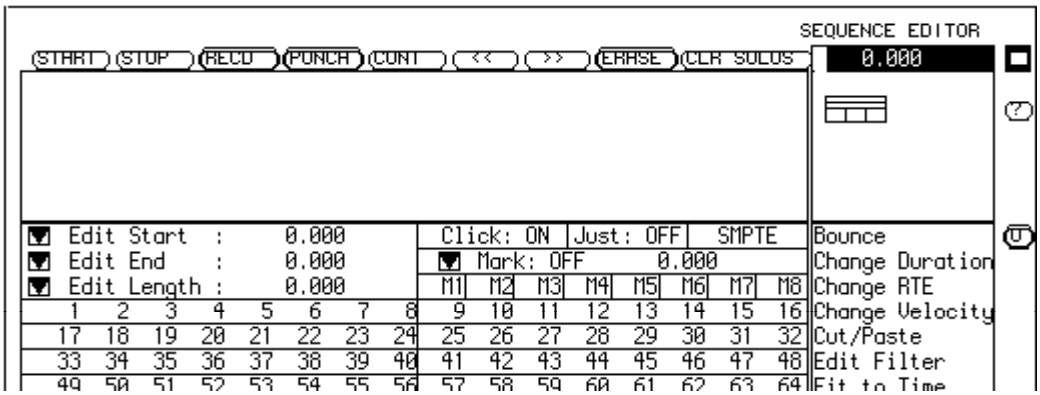
Recalling Sound Files

To copy sound files from the optical disk, you select the sound file or category names at the bottom left. Depending on the selection, the following buttons appear at the top of the display—

Cpy	Copies the selected sound file from the optical disk to the catalog specified in the Sound File/Category field.
Copy Category	Displays a dialog for copying all or some of the sound files from an optical disk category to the current catalog or a new subcatalog within the current catalog.
Info	Displays the number of sound files and sectors in the current category, and the number of available sectors in the current catalog. The button appears only when copying a category.

Sequence Editor

Use the Sequence Editor to play, record, edit and save sequences.



Motion Control and Record Buttons

Click one of these buttons to perform the following functions—

START — Plays the sequence from the beginning or the mark point.

STOP — Stops playback.

RECD — Adds recorded notes to a track.

PUNCH — Records over existing notes on a track.

CONT — Continues playback from the current time.

<< — Reverse. Click to rewind the sequence at twice normal speed; double-click (or triple-click) for eight (or 32) times normal speed.

>> — Fast forward. Click to play at twice normal speed; double-click (or triple-click) for 8 (or 32) times normal speed.

ERASE — When no tracks are selected, double-clicking erases the entire current sequence. If any tracks are selected, double-clicking erases only those tracks.

CLR SOLOS — Clear all track solos.

Closes the Sequence Editor and opens the Recorder Display.

The Info button highlights the track number of each track containing notes. Click a track number to display its timbre and the number of notes recorded. Click the ? button again to turn off the Info function.

The Undo button reverses any editing command, provided no other functions have been performed, the Settings dialog Undo option is ON, and the available space in the top level of the current device is at least twice the size of the current sequence.

Sequence Tracks

1	2	3	4
17	18	19	20
33	34	35	36
49	50	51	52

The bottom of the display lists sequence track numbers. Click a number to select an individual track. Drag from one number to another to solo a group of tracks. Soloed tracks are highlighted. The largest track number in the group blinks, indicating that the track is selected for recording.

Edit Times

```
Edit Start   :   0.000
Edit End     :   0.000
Edit Length  :   0.000
```

Some edit commands allow you to change a selected region of the sequence. In order to define this region, you set **edit times** using Edit Start, Edit End and Edit Length, which define the parameters of the region you want to edit.

Synchronization

Click: ON	Just: OFF	SMPTE

Turn click rate on/off.

Turn justify on/off. When justify is on, the computer automatically positions the notes you play exactly on the nearest click or selected subdivision of the click.

The current time format is displayed.

```
Mark: OFF        0.000
```

Click the Mark take button and the time is entered into the Mark point time field.

Drag a time from another time field or from a memory button to the mark time.

Type a value into the Mark point time field.

Step the Mark switch to TRK and click a display track number. The time of the first note recorded on the selected track is entered in the Mark point time field.

Memory Buttons

M1	M2	M3	M4	M5	M6	M7	M8

Stores times which are dragged to one of the buttons. Times can be dragged from a memory button to a time field, such as Edit Start or Mark.

Commands

Clicking any of these commands presents a dialog near the top of the display—

Bounce	Copy or move all notes from one track to another. Bounced notes are merged with existing notes on the destination track.
Change Duration	Set note durations to a specific value, scale them to a percentage of the current values, or gradually lengthen or reduce values throughout the selected region. If the Edit Filter is on, editing affects only the notes defined by the filter.
Change RTE	Set values for real-time effects parameters such as pedals, mod wheel, breath controller, pitch bend and ribbon.
Change Velocity	Set not volumes to a specific value, scale them to a percentage of the current values, or gradually lengthen or reduce values throughout the selected region. If the Edit Filter is on, editing affects only the notes defined by the filter.
Cut/Paste	Duplicate and/or move sections of one or more sequence tracks. You can insert, merge or replace notes from a file or the Clipboard. If the Edit Filter is on, editing affects only the notes defined by the filter.
Edit Filter	Define the pitches, durations and real-time effects that can be affected by changing duration or velocity, or by cutting, justifying or transposing. For example, to increase the volume of only soft notes, set the Edit Filter so that the Change Velocity command affects only notes with velocity values below a certain level.
Fit To Time	Expand or compress any region of the sequence to fit a designated length of time. Note durations can be scaled or remain unchanged.
Justify	Align notes to the nearest subdivision of a beat. If the Edit Filter is on, editing affects only the notes defined by the filter.
MIDI Mapping	Route incoming MIDI channels to Synclavier tracks.
Settings	Define the play speed, number of beats per measure, click rate, synchronization mode, SMPTE mode and offset. Toggle the click, Undo and SMPTE resync functions on and off. Check for sound drop-out.
Sequence Files	Store, replace and delete sequences.
SKT	Copy the timbre from a sequence track to the Synclavier keyboard. The timbre becomes the current timbre.
SMT	Place the current timbre or a stored timbre onto a sequence track.
Track Volume	Set the volume of a track to a specific level or scale the volume to a percentage of the current level.
Transpose	Change the pitch of all notes within a region by a specified interval. If the Edit Filter is on, editing affects only the notes defined by the filter.
Unwrap Loops	Remove an independent loop from a track, and repeatedly copy the notes from the loop for a specified length of time.

Recorder Display

The Recorder Display is used for adding, deleting and editing events in the sequence. Each sequence track can contain either notes or cues, but not both.

```
MEMORY RECORDER COMPARATIVE TRACK DISPLAY

1.  Enter Track numbers from top-most row to display desired Tracks.
2.  Press  <DELETE>  from top-most row to remove Track from display.
3.  Move cursor with arrow keys, and enter values to change notes.
4.  Use <TAB> key to view/change mode selections.
5.  Press H to Print Screen. Press  <ENTER>  to return to Main Menu.

        Track 1                    Track 2                    Track 3
       "TONE-1"                  "FBEEP005"                  "XYL01"
  Seconds      Duration     Seconds      Duration     Seconds      Duration

271.200  ModW     0.0      271.200  ModW     0.0      271.200  R3     0.168
271.200  R3       5.000    271.200  G4       0.338
```

Displaying the Sequence

The Recorder Display shows up numeric values for events on up to three tracks of the current sequence. To display a track, click any column heading, type the desired track number and press Return. To display the track currently selected for recording, select a column heading and type # (Shift-3). And "R" appears in the heading, and the information in that column changes whenever a different track is selected for recording. To remove a track from the display, click its heading and press the Delete key.

For each note on a track, the start time (in seconds), pitch name and duration are displayed. All accidentals are represented as sharps (#). Octave numbers are relative to middle C (C3). If the track contains cues, a Q appears instead of each pitch name.

You can use the arrow keys to scroll the sequence. Type the following commands to play the sequence—

Ctrl-P start
Ctrl-E stop
Ctrl-C continue (playback begins at the cursor, not the song pointer, location)
Ctrl-R rewind
Ctrl-F fast forward

If you accidentally press Ctrl-S for start or stop, press Ctrl-Q to unfreeze the screen.

The **song pointer** (*) appears next to the notes as the sequence plays. There is one song pointer for each track. When the sequence stops, the largest note played indicates the true position of the song pointer. Scrolling the sequence does not affect the song pointer.

Options

Use the following options to set up and edit note values. To change an option, move the cursor to it and press the Spacebar

```
Show Times in   : SMPTE    Show Sound File Offsets: NO   UNDO Enabled: NO
Dur/End/Name/Vel: DURATION Show Real-Time  Effects: NO   Note Ripple : OFF
```

Show times in	Set time format to Beats, Measure, SMPTE, Feet:Frames, Seconds.
Dur/End/Name/Vel	Display the duration, end time, name, or velocity of each note.
Show Sound File Offsets	Display only.
Show Real-Time Effects	Display real-time effects information.
Note Ripple	When ON, editing an event affects subsequent events on the track. When OFF, subsequent events remain unchanged. Choose VER to verify each ripple edit.

Editing Notes

You can edit the sequence note by note using the following commands.

```
              MEMORY RECORDER COMPARATIVE TRACK DISPLAY
 Change Selections:  <SPACE>   Insert Note: -      Ped1  Ped2  ModW  Mi000
 Review Instructions: <TAB>    Append Note: +      RibF  Brth  Ptch  Sust
 Add Independent Loop:  ~      Append EFX : *      PrC#2 MiPgm SysEx
```

General editing

- To enter a value, use the arrow keys to move the cursor to the field, type a new value and press Return.
- Type CTRL-U to undo an operation.
- To add a note, place the cursor in the first or second column where you want the note added. Click Apend Note or type + (plus) or -(minus). The new note has the same characteristics as the note the cursor is on, or in the case of a blank note, it has the characteristics of the corresponding note in the adjacent track.
- To delete a note, move the cursor to the note and press the Delete key.

- To edit a pitch, move the cursor to the second column and type a new pitch name and octave number.
- To edit End and Duration values, display the values by toggling a switch and then enter a new value.
- When you edit a Start value, the edit affects that note only unless the Note Ripple function is on.
- Select a region to edit by typing a [(left square bracket) at the first note in the region and a] (right square bracket) on the line following the last note to be selected. To unselect a region, type the left and then the right bracket keys while the cursor is on the same note.
- All notes playing a sound file with an offset are marked with a caret (^). The offset time is displayed in the first column. Since the offset of one note may occur after the start to the following, the times may not be in order. The offset time may change if you change the pitch of the sound.
- To add an independent loop, move the cursor to the first or second column of the starting note of the loop. Type a tilde (~) to add an independent loop 4 beats long. Move the cursor to the last note of the loop and enter a new end time, if desired. If the sequence has played past the end of the loop, the loop start and end times cannot be edited. To edit, restart the sequence from the beginning or rewind until you are in the first performance of the loop.

RTE editing

- Add an RTE record by moving the cursor to the note with a starting time nearest the point where you want the RTE. Click Append EFX or type an asterisk (*) to add an RTE having the same start time as the selected note. If there is no RTE earlier on the track, ModW (mod wheel) is added. If there is an earlier RTE, its name and value appear.
- To delete an RTE by moving the cursor to it and press the Delete key.
- To edit an RTE, move the cursor to the middle column of the RTE record and type one of the controller abbreviations shown at the top of the display. Move to the third column and type a value from 0-100%.

MIDI editing

- MIDI program change and system exclusive messages are added and edited as RTE records. When adding a MIDI message, set the start time to least 100 milliseconds before the first note using the message. System exclusive messages include an identifier in the third column expressed in either decimal or hexadecimal units. To toggle these modes, click the Dur/End/Name/Vel switch and move the cursor to the right column of the system exclusive message. Press the spacebar to toggle.

Multichannel Display

```
     Instrument Name  Left Right Poly        MULTICHANNEL ROUTING DISPLAY
KBD  POPBASS3                  1
 1   Cross Stick               1            1.  Move cursor with arrow keys
 2   Accordion     2v          1            2.  Assign new track numbers
 3   Kick                      1                and routings
 4   SirenWhistle  2v          1            3.  Press space bar to
 5   BIG BELL     (S)          1                increment values
 6   IRONP001                  1            4.  M/C Outputs: 0   Poly Bins: 1
 7   CLAP1                     1                DTD Outputs: 0
 8   HAHA                      1
 9   CRASH CYMS   2.3          1        21
10   TUBA FULL    2.4          1        22
11   CLARINET     .95          1        23
12   SCREAM1                   1        24
13   HAHA                      1        25
14                             1        26
15                             1        27
16                             1        28
17   TROMBONE2    .47          1        29
18   TROMBONE2    .47          1        30
19                             1        31
20                             1        32

                                   Current Catalog:  W0:
```

If your hardware includes the Multichannel Distributor, you can use the Multichannel Display to route sequence tracks, DTD tracks, and the Synclavier keyboard timbre to the multichannel outputs.

The display shows routing assignments for the keyboard timbre (KBD) and 32 tracks at a time, separated into four groups (1-8; 9-16; 17-24; and so on). Track numbers beginning with "L" indicate DTD tracks. To display other tracks, select any group and type the desired track number.

Numbers near the top right of the display indicate how many multichannel (M/C) outputs, DTD outputs and poly bins are in your system.

```
M/C Outputs: 0   Poly Bins: 1
DTD Outputs: 0
```

Routing Sequence Tracks

By default, each sequence track is routed to the output channel with the same number (for example track 3 is routed to output 3). Left and right outputs are routed to the same output. If you have a Synclavier keyboard, the keyboard timbre is routed to output 1.

To change a routing, move the cursor to the column labeled **Left** or **Right** and type a new number, or press the Spacebar until the desired output number appears.

For each sequence track, the Poly column indicates the poly bin assigned to the track's timbre. To assign the sound files associated with a track timbre to a different poly bin, type a new number in the Poly column. Store the sequence to save the new poly bin assignments.

Changing a poly bin assignment does not change the bin location of sound files that are already in poly RAM. You must store and then recall the sequence to load the sound files into the assigned poly bins.

Tracks that use stereo effects must be routed to separate outputs which must then be panned left and right at the console. You can use the Synclavier keyboard to route a stereo track—

1. Hold down the TRACK ROUTING button on panel 2 while you press a numbered button on panel 3 to select the track to be routed.
2 Release both buttons and turn the control knob to route the left signal to an output. (The right signal is temporarily routed to the same output). P
3. Press and hold the TRACK ROUTING button again and turn the control knob to route the right signal to a different output.

Routing DTD Tracks

Direct-to-Disk (DTD) tracks are listed as L1-L16, depending on the configuration of your system. An asterisk (*) appears next to DTD output numbers. If no routing has been assigned, the default routing is shown. Once an output has been assigned, any track previously assigned to the selected output now appears with no output assigned to it. Left and right outputs always appear with the same number.

Sequence tracks containing cues also appear with an asterisk (*) on either side of the output number to indicate that these are DTD outputs. In the default setting, no routing assignment appears, and each cue in the cuelist is routed through the output of the track(s) from which it originated.

MIDI Routing Display

```
     Instrument Name  Out Chan Pres        MIDI ROUTING DISPLAY
KBD  POPBASS3         ■
 1   Cross Stick
 2   Accordion     2v                 1.  Move cursor with arrow keys
 3   Kick                             2.  Assign new track numbers
 4   SirenWhistle  2v                     and routings
 5   BIG BELL     (S)                 3.  Press space bar to
 6   IRONP001                             increment values
 7   CLAP1                            4.  Available Outputs: 4
 8   HAHA                   Sync In:OFF   Out:OFF Inputs:ALL Echo:ON
 9   CRASH CYMS   2.3
10   TUBA FULL    2.4          21
11   CLARINET     .95          22
12   SCREAM1                   23
13   HAHA                      24
14                             25
15                             26
16                             27
17   TROMBONE2    .47          28
18   TROMBONE2    .47          29
19                             30
20                             31
                               32
                       Current Catalog:  W0:
```

Use the MIDI Routing Display to route sequence tracks and the Synclavier keyboard timbre to MIDI outputs.

The display shows MIDI routing information for the keyboard timbre (KBD) and 32 tracks at a time, separated into four groups (1-8;9-16;17-24; and so on). To display other tracks, select a group and type the desired track number.

Routing Tracks

To route a sequence track or the keyboard timbre, type the desired MIDI output number in the **Out** column and the appropriate channel number in the **Chan** column. If you want to send pressure messages, move the cursor to the **Pres** column and press the Spacebar to select INDV (individual pressure) or CHAN (channel pressure).

If the "Echo" option is on, the output assigned to the keyboard timbre becomes a MIDI THRU port which echoes messages received at the MIDI IN port.

Options

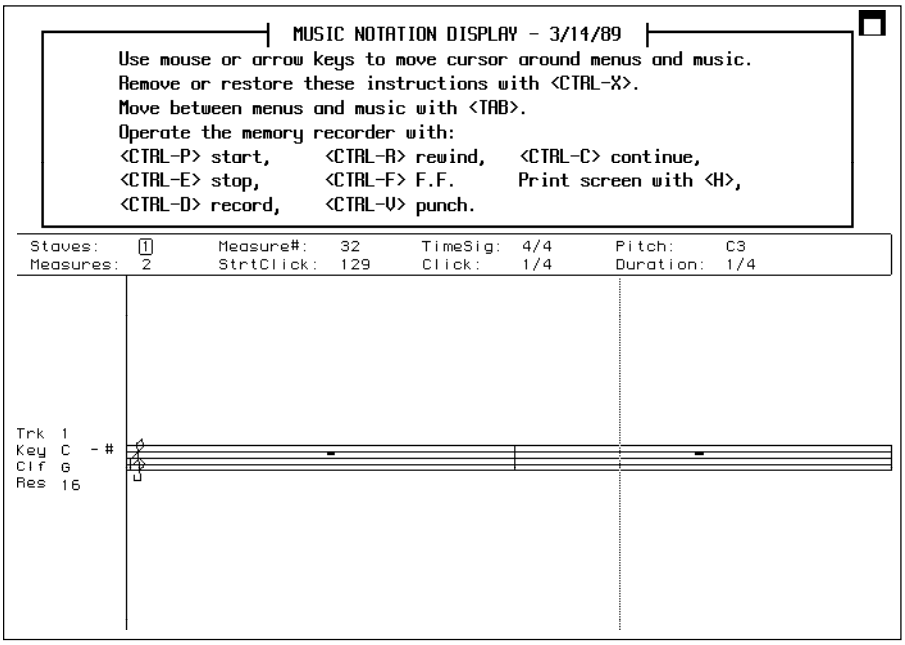
Four options are available near the top right of the display. To set an option, move the cursor to it and press the Spacebar.

```
Sync In:OFF   Out:OFF Inputs:ALL Echo:ON
```

Sync In	Toggles MIDI input synchronization on and off. Regardless of the number of MIDI modules installed, only the first MIDI IN or MIDI AUX ports can be used to sync input.
Out	Assigns a MIDI OUT port for sending MIDI synchronization signals. MIDI synchronization is transmitted on all channels of the selected port.
Inputs	Indicates whether the Synclavier responds to messages from one channel or all 16 channels of the MIDI IN port.
Echo	When OFF, the Synclavier keyboard can be routed to a MIDI OUT port. When ON, the keyboard port becomes a MIDI THRU port. MIDI messages received at the MIDI IN port are echoed at the port assigned to the keyboard.

The DTD derives its sampling rates from synchronization signals. MIDI synchronization signals are not accurate enough to guarantee reliable sampling rates. There fore, do not use MIDI synchronization when recording or playing back on the DTD.

Music Notation Display

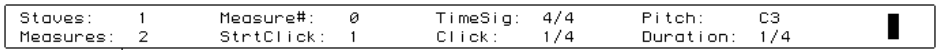


The Music Notation Display shows up to eight tracks of the current sequence in standard music notation. You can add, delete or change any note in the sequence.

Do not use this display while performing critical timing functions, such as transfer of sequences to tape or transfer to and from MIDI sequencers. Timing errors may result.

Displaying a Sequence

In the middle of the display is an area for entering sequence parameters. To change any parameter, move the cursor to it and type the appropriate entry.



Staves	The number of staves to be shown at one time. When more than three staves are displayed, the instruction area disappears. Press Ctrl-X to toggle the instructions on and off.
Measures	The number of measure shown on each staff.
Measure #	The number of the first measure displayed.
StrtClick	The click number corresponding to the first measure displayed.
TimSig	Time signature.
Click	The click value used to record the sequence. Use standard notation, such as 1/4 for a quarter note.
Pitch	The pitch of the last note entered.
Duration	The duration of the last note entered.

You can display any sequence track on any stave, and set its key signature, clef and resolution.

```
Trk  1
Key  C - #
Clf  G
Res  16
```

Trk — The number of the sequence track displayed.

Key — The key signature. Pressing the spacebar steps through the cycle of fifths. Minor key signatures are designated by their relative majors. If you are in a sharp key and want all accidentals to appear as flats, move the cursor to the # following the signature and type F for flats. If you are in a flat key and want the accidentals to appear as sharps, move the cursor to F and type #.

Clf — The clef for the track. Type the appropriate letter or press the Spacebar to step through the available clefs.

G	treble	A	alto
T	tenor	F	bass
P	percussion, full staff	S	percussion, single line
H	high treble with octave marking		

Res — The resolution determines the smallest note value displayed and the increment by which the cursor moves. If the resolution is 16, the smallest displayed note is a 1/16 note. Smaller notes (such as 1/32) are displayed as 1/16 notes. The resolution affects only the display, not the actual duration of notes. Use finer resolutions to detect if notes are slightly before or after the beat.

The **song pointer** is a dotted vertical line that indicates the notes being played. The song pointer marks the current click, or the point at which the sequence starts playing if you press Ctrl-C. When you play, the notation drawn on the screen sometimes falls behind the audio output. When you stop the sequence, the screen and the song pointer catch up.

Motion Controls

Use the following commands to control the sequencer—

Control-P	Plays the sequence from the beginning or the mark point.
Control-E	Stops playback.
Control-C	Continues playback.
Control-R	Rewinds the sequence.
Control-F	Plays the sequence at fast forward speed.
Control-D	Records notes without erasing any existing notes.
Control-V	Records over existing notes on a track.

Adding and Deleting Notes

Press the Tab key to move the cursor to and from the music notation area. In the notation area, the cursor becomes a vertical line with two cross bars called range indicators. The range indicators enclose the octave where notes can be edited. When the cursor is on a note, crosshairs identify that note.

Move the cursor by pressing the arrow keys or by clicking. To display more pages, press the arrow keys until the cursor moves past the right or left side of the display. Move between the menu area and the notation display by pressing Tab or clicking. To move the cursor forward a selected note value, press R.

To add a note, place the cursor at the correct measure and beat. If necessary use the arrow keys to move the range indicators to the correct octave. Type the appropriate characters to enter the duration and pitch—

	Character	Result	
Duration	1 2 4 8 6 3	whole half quarter eighth sixteenth thirty-second	A dot after the number produces the dotted note value.
Accidental	Q S Z	sharp natural flat	Accidentals are necessary only for notes outside the key signature. Type the accidental before entering the pitch.
Pitch	A-G Shift A-G R	Adds a single note; the cursor advances Adds one note of a chord; the cursor does not advance Adds a rest	

Enter the last note of a chord without pressing the Shift key, so the cursor advances to the next note.

To add a note that is longer than a dotted whole note, type a Duration in the display parameter area. Enter a fraction whose numerator is at least 1.5 times the denominator. For example, enter 10/4 to create a note whose duration is equal to ten quarter notes or 2.5 whole notes.

The cursor range is limited to four lines above the staff and two below. To enter a note above (or below) that limit, click the area directly above (or below) the cursor before entering the duration and pitch. You can also move an existing note up or down, or enter a specific pitch in the display parameter area.

You can press the Shift key while you enter the highest (or lowest) note permitted by the cursor. If you then delete the note, the cursor remains centered at that position, allowing you to enter an even higher (or lower) note.

To delete a note, place the cursor on the note and press Delete. If the deleted note is a single note, a rest of equal value takes its place. If the note was part of a chord, the cursor moves to the next lower note in the chord. You can also delete a note by holding the Option key and clicking on the note.

Editing Notes

To edit individual notes, select the note and type one of the following keys.

Edit	Key	Result
Pitch changes	P	Raise the pitch of a note up a half-step.
	;	Raise the pitch of a note down a half-step.
Duration changes	]	Lengthens a note by a value equal to the resolution. Subsequent notes are not moved. The lengthened note can overlap or form a chord with the following note.
	{	Shorten the note by a value equal to the resolution. Rests are added following the note. If you shorten a note to a time value smaller than the resolution, the note appears to have the time value determined by resolution but actually has a duration of zero.
Position changes	}	Moves the note forward in increments equal to the resolution.
	{	Move the note backward in increments equal to the resolution.
Justification	J	Justify the note to the precise starting time displayed.

There are special rules concerning displaying and editing tuplets. If a sequence contains tupelos, you can display either the tuplets or the sequence correctly, but not both at the same time.

To display tuplets correctly, set the resolution to the number of tuplet notes that would appear in one whole note. For example, to display triplets correctly in 4/4 time, set the resolution to 12.

When a tuplet is displayed correctly, it can be edited using the commands listed in the chart above. When you finish editing tuplets, you will probably want to reset the resolution to its original setting; the tuplet will appear incorrectly, but it will play correctly in the sequence.

Project Directory

```
PROJECT DIRECTORY
Press <ENTER> to return to Main Menu.  Use arrow keys to move cursor.
Enter values or toggle with space bar.  Press <CTRL> and letter for command.

        Total Recording Time (50 kHz):  21:19   Tracks Available:

        Project Title        Start    End  Rate  Avail   Used  Status   Mod
 1. New Indy Demo              :00   1:09  50.0   1:09   1:09  Locked   Yes
 2. Burger King               1:09   2:10  50.0   1:01   1:01  Unlocked No
 3. I'll Be There             2:10   8:01  44.1   6:38   6:38  Unlocked No
 4. DON'T ERASE               8:01  14:18  50.0   6:17   6:17  Unlocked No
 5. MAYBE YOU                14:40  21:00  44.1   7:11   6:16  Unlocked No
 6.                            :00    :00  50.0    :00         (Empty)
 7.                            :00    :00  50.0    :00         (Empty)
 8.                            :00    :00  50.0    :00         (Empty)
 9.                            :00    :00  50.0    :00         (Empty)
10.                            :00    :00  50.0    :00         (Empty)
                   Click here to see most recent message
 <CTRL>: ^A Backup Proj   ^D Backup All   ^O Home       ^U Unlock   ^X Eject
         ^B Load/Add Proj ^E Load/Add All ^R Verify     ^V Lock     ^Y Abort
         ^C Erase Proj    ^F Erase All    ^T Verify All ^W Lock All ^Z New
          Show Proj Info   Skip Forward    Skip Back
```

T

The Project Directory lists the projects currently on the DTD. Information above the list of projects indicates the total disk time (minutes:seconds) available for all projects (assuming a sample rate of 50 kHz) and the number of DTD tracks in your system. The numbers change if you reconfigure the system for more recording time or for more tracks.

```
Total Recording Time (50 kHz):  21:19   Tracks Available: 16
```

Project Information

The following columns provide information about each project—

Start	The time at which the project begins on the DTD tracks.
End	The time at which the project ends on the DTD tracks.
Rate	Sampling rate used for recording audio in the project.
Avail	The total DTD track time reserved for the project.
Used	The amount of DTD track time already used for recording.
Status	Indicates whether the project is locked. If so, the project cannot be edited or erased.
Mod	Indicates whether the project has been modified by recording.

Commands

The bottom of the display lists available commands. Click a command to initiate it, or press and hold the Control key while you type the appropriate letter.

Backup Proj	Copies the selected project from the DTD tracks to backup tapes.
Load/Add Proj	Copies a single project from backup tapes to the DTD tracks.
Erase Proj	Erases the selected project from the DTD tracks.
Backup All	Copies all projects from the DTD tracks to backup tape.
Load/Add All	Copies all projects from the current backup tapes to the DTD tracks.
Erase All	Erases all projects from the DTD tracks. In the dialog, type one of the following to reconfigure the DTD tracks. erase — track configuration remains unchanged. erase1 — configures one track per drive (doubles recording time on odd-numbered tracks; even-numbered tracks are unavailable). erase4 — configures four tracks per drive (doubles the number of tracks, with half as much recording time per track; recording is limited to sampling rates of 50 kHz or less); available only if you purchased the track expansion option.
Home	Rewinds the backup tapes to the beginning.
Verify	After using the Home and/or Skip commands, Verify checks that the next track or project on the tape was backed up accurately.
Verify All	After using the Home command, Verify All checks that all tracks or projects were backed up accurately.
Unlock	Allows recording in the selected project.
Lock	Prevents erasing and recording in the selected project.
Lock All	Locks all projects currently on the DTD tracks.
Eject	Ejects tape cartridges from Patriot drives only. To eject a WangDAT tape, press the Eject button on the drive.
Abort	Interrupts all except the current DTD function.
New	Creates a new project.
Show Proj Info	Displays the name, time and sampling rate of the next project on the backup tapes.
Skip Forward	Winds the tapes forward to the beginning of the next project.
Skip Back	Winds the tapes backward to the beginning of the previous project.

The DTD produces status messages when it performs certain functions (such as turning on the DTD disk drives). To display the most recent message, click the line above the list of commands.

Click here to see most recent message

Track Display

```
RECORD   START | STOP | CONT | REW | FORWD      TRACK DISPLAY   Seconds 460.613   OFF | IN | OUT | BOUNCE
                                                                                    Digital Xfer:  DSP IN
 Proj:  DON'T ERASE                                          Start:   8:01  End:   14:18
 Crossfade:   5 ms   *READY*     Rate:  50.0 kHz   Avail:   6:17 Used:   6:17
                          TRACKS                                          OUTPUTS
 Butn No.  Track Title      Status  Mode    Used  Input dB Out  No.  Vol   Pan DDT
 (25)  1.  CELLO            Safe    Cue PB  6:17 STM 1A  0   1   1. 100.0   0
 (26)  2.  BLIND MAN        Safe    Cue PB  4:06 STM 1A  0   2   2. 100.0   0
 (27)  3.  TRAIN            Safe    Cue PB   :53 STM 1A  0   3   3. 100.0   0
 (28)  4.  LUCIEN           *READY* Cue PB  1:10 STM 1A  0   4   4. 100.0   0
 (29)  5.  PROJECTOR        Safe    Cue PB  1:42 STM 1A  0   5   5. 100.0   0
 (30)  6.                   Safe    Repro    :00 STM     0   6   6. 100.0   0
 (31)  7.                   Safe    Repro    :00 STM     0   7   7. 100.0   0
 (32)  8.                   Safe    Repro    :00 STM     0   8   8. 100.0   0
       9.                   Safe    Repro    :00 STM     0   9   9. 100.0   0
      10.                   Safe    Repro    :00 STM     0  10  10. 100.0   0
      11.                   Safe    Repro    :00 STM     0  11  11. 100.0   0
      12.                   Safe    Repro    :00 STM     0  12  12. 100.0   0
      13.                   Safe    Repro    :00 STM     0  13  13. 100.0   0
      14.                   Safe    Repro    :00 STM     0  14  14. 100.0   0
      15.                   Safe    Repro    :00 STM     0  15  15. 100.0   0
      16.                   Safe    Repro    :00 STM     0  16  16. 100.0   0
 ^A Backup Track   ^C Erase Track    ^U UnLock    ^W All Repro    ^Y All Auto
 ^B Load Track     ^D Enter Fade     ^V Lock      ^X All Input    ^Z All Safe
                                                 Current Catalog:  W0:
```

The Track Display lists the DTD tracks in the current project. The following information appears near the top of the display.

Project Information

```
 Proj:  I'll Be There                                        Start:   8:01  End:   14:18
 Crossfade:   5 ms   *READY*     Rate:  50.0 kHz   Avail:   6:17 Used:   6:17
```

Proj	The name of the current project.
Crossfade	The crossfade time for punch in recording.
Start	The time at which the project begins on the DTD tracks.
End	The time at which the project ends on the DTD tracks.
Rate	Sampling rate used for recording audio in the project.
Avail	the total DTD track time reserved for the project.
Used	The amount of DTD track time already used for recording.

DTD Tracks and Outputs

```
┌──────────────────────────────────── TRACKS ────────────────────────────────┐ ┌── OUTPUTS ──┐
 Butn No. Track Title      Status  Mode    Used  Input dB Out No.  Vol  Pan DDT
```

Columns in the display provide information about each DTD track—

Butn	Indicates which TRACK SELECT buttons (on panel 3 of the Synclavier keyboard) correspond to the DTD tracks. To select a different bank of eight buttons, click the Butn column and press the Spacebar.
No	DTD track number
Track Title	User-defined track name.
Status	
Safe	Prevents recording on a track.
Ready	The track is ready for recording.
Mode	
Repro	Track playback mode.
Input	Recording mode.
Auto	Alternates between Repro (during playback) and Input (during recording or when stopped).
CuePB	Playback mode for cues placed in a sequence.
Used	The amount of time already used for recording on the DTD tracks.
Input	
STM	Input signal is derived from sampled live audio via analog-to-digital converter of the STM module on channels 1A through 4D.
DIG	Signal is transferred from a digital source to the DTD via the UDIO module on channel 1 or 2.
TRK	Bounces one DT track to another.
OUT	Bounces events on a sequence track (outputs 1-16) to a DTD track.
dB	Gain setting for track input. Enter a value between -3 and +28 dB; 0 dB is unity gain.
Out	Routes the track to a specified DTD output.

Information about each DTD output is also listed—

No	Output number.
Volume	Playback volume of the track. Enter a value between 0 and 100%.
Pan	Placement of the track in the stereo pan. -50 places the signal on the left output; 0 places it in the middle; +50 places it on the right output.
DDT	Routes the track to the specified digital output of the UDIO module.

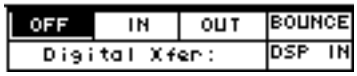
Motion Controls

The top of the display includes motion control buttons, a time format selector and buttons for managing the mark point.

RECORD	Begins recording on readied DTD tracks.
START	Plays from the beginning of the sequence. If the mark button is on, playback begins at the mark point.
STOP	Stops playback.
CONT	Continues playback from the current sequence location.
REW	If the sequencer is stopped, click REW to rewind it. If the sequencer is playing, each click reduces the playback speed by half.
FORWD	Each click doubles the playback speed.
	Click a segment to set the time format to Seconds, Beats, Measures:Beats, SMPTE, Feet:Frames or Minutes:Seconds.
Take button	Click to define the mark point.
	Toggles the mark point on and off.

Digital I/O

The following digital I/O buttons are available at the top of the display—



DIGITAL XFER	Displays a dialog for selecting the digital format and output sync signal.
OFF	Turns off all digital I/O functions.
IN	Turns on digital input from the UDIO module to the DTD. You must set the appropriate track input and recording parameters.
OUT	Turns on digital output from the DTD. You must et the appropriate track output parameters.
BOUNCE	Bounces either a DTD track or a sequence track onto another DTD track. You must set the appropriate source and destination track parameters.

Commands

The bottom of the display lists available commands. Click a command to initiate it, or press and hold the Control key while you type the appropriate letter.

Backup Track	Copies the selected DTD track to a backup tape.
Load Track	Copies a track from backup tape of the DTD.
Erase Track	Erases the selected DTD track.
Enter Fade	Sets the crossfade time for punch in recording (0-99ms)
Unlock	Unlocks the selected DTD track and sets its status to Safe.
Lock	Prevents erasing and recording on the selected DTD track.
All Repro	Sets all tracks to Repro mode.
All Input	Sets all tracks to Input mode.
All Auto	Sets all tracks to Auto mode.
All Safe	Sets all Tracks to Safe status.

Audio Event Editor

The Audio Event Editor contains several panels. Each is organized around a particular function, such as recording, editing or synchronization.

Selection Panel

PROJECTS	CUE EDIT	CUE TRIM	CUE DIR	MOTION	EVENTS	RECORD	SYNC
CUE STOR	OPT XFER			CJ	USER 2	MH'	MH

The Selection panel always appears at the top of the screen. To open other panels, click the appropriate boxes in the Selection panel. To close a panel, click its box again.

Box	Panel	Function
PROJECTS	Project Manager	Allocate disk space, manage projects and tracks, assign inputs and outputs.
CUE EDIT	Cue Editor	Create, edit, play back and place cues.
CUE TRIM	Cue Trimmer	Create, play back and edit cues and fades.
CUE DIR	Cue Directory	List, recall and place cues.
MOTION	Motion Control	Recall, play back and store sequences.
EVENTS	Event List Editor	Build and edit sequences.
RECORD	Record Control	Record audio and create cues.
SYNC	Synchronization	Select synchronization formats.
CUE STOR	Cue Store/Recall	Back up cues.
OPTXFER	Optical Transfer	Display, audition and place sounds stored on optical disks.

You can program the User Buttons to display groups of panels. Open the desired panels and click the small black box in one of the User buttons. In the dialog that appears, type a label for the button and click [STORE]. Whenever you click that User button, the selected panels are displayed.

Click one of these buttons to determine what time is shown in the Selection panel—

SMPTE	Displays incoming time code.
SEQUENCE	The time display shows the current sequence time.
D-TO-D	Displays the current Direct-to-Disk track time.

To use incoming time code for triggering audio from the DTD tracks, click the SMPTE ON button. Click OFF when you finish synchronizing with incoming time code. Click SET OFFSET to define the SMPTE time at which you want your sequence to start.

SMPTE:	ON	OFF	SET OFFSET

Buttons below the time display control digital I/O functions—

Digital Xfer	OFF	IN	OUT	BOUNCE	DSP IN

DIGITAL XFER — Displays a dialog for selecting the digital format and output sync signal.

OFF — Turns off al digital I/O functions.

IN — Turns on digital input from the UDIO module to the DTD. You must set the appropriate track input and recording parameters.

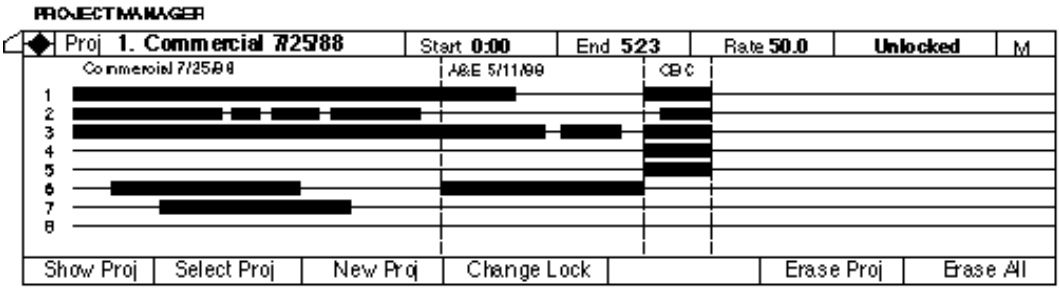
OUT — Turns on digital output from the DTD. You must set the appropriate track output parameters.

BOUNCE — Bounces either a DTD track or a sequence track onto another DTD track. You must set the appropriate source and destination track parameters.

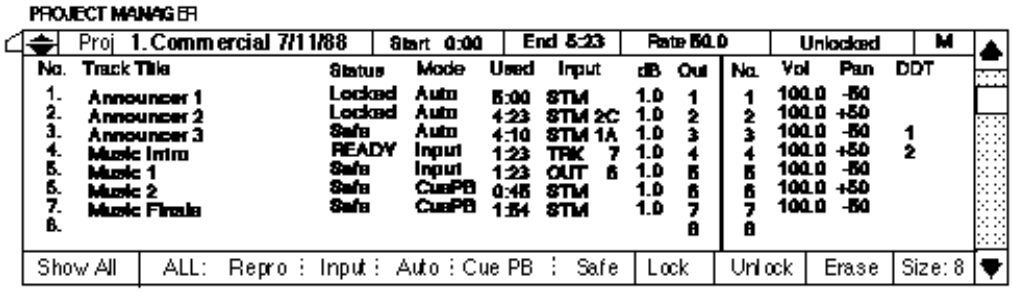
You can save and recall default values for some items on the Project Manager, Record Control and Synchronization panels. Click WRITE to save defaults, and READ to recall them.

Defaults:	READ	WRITE

Project Manager



Unlike the other panels, the Project Manager has two display modes. **Show All** mode displays information for all projects available on the DTD. Horizontal bars represent audio recorded on the DTD tracks. **Show Project** mode displays track parameters and routing information for the current project only. Click the Show Proj or Show All button to toggle between modes.



Information about the current project is shown at the top of the panel—

Proj	The name of the current project. To select a different project click the scroll arrows or type a number after Proj and press Return.
Start	The time on all DTD tracks at which a project begins, normally at the beginning of the tracks or just after the end of the previous project. Time is displayed as minutes:seconds, based on a sampling rate of 50 kHz.
End	The time on all DTD tracks at which a project ends. Time is displayed as minutes:seconds, based on a 50 kHz sampling rate.
Rate	The sampling rate for recording and playback. Set it to any number from 1 to 100 kHz; 50 kHz is the default.
Unlocked/Locked	Unlocked projects are available for recording. Locked projects can be played back, but no recorded or erased.
M	When project has been modified, M is highlighted.

Buttons at the bottom of the Show Project panel perform project management functions—

Show Proj	Displays only one project in the Project Manager panel.
Select Proj	Displays a dialog for selecting the current project.
New Proj	Creates a new project on the DTD tracks. You assign the project name, star and end times, and sampling rate.
Change Lock	Displays a dialog for locking or unlocking selected projects.
Erase Proj	Displays a dialog for erasing a selected project. You must set the Start and End times of the project to zero.
Erase All	Displays a dialog for erasing all projects.

Buttons at the bottom of the Show All panel perform project management functions—

Show All	Displays all projects in the Project Manager panel.
All	Sets all tracks to the same mode or status (Repro, Input, Auto, CuePB or Safe)
Lock/Unlock	Displays a dialog for locking (or unlocking) a track.
Erase	Displays a dialog for erasing a track.
Size	Determines the number of tracks displayed in the Project Manager.

In Show Project mode, columns provide information about each DTD track—

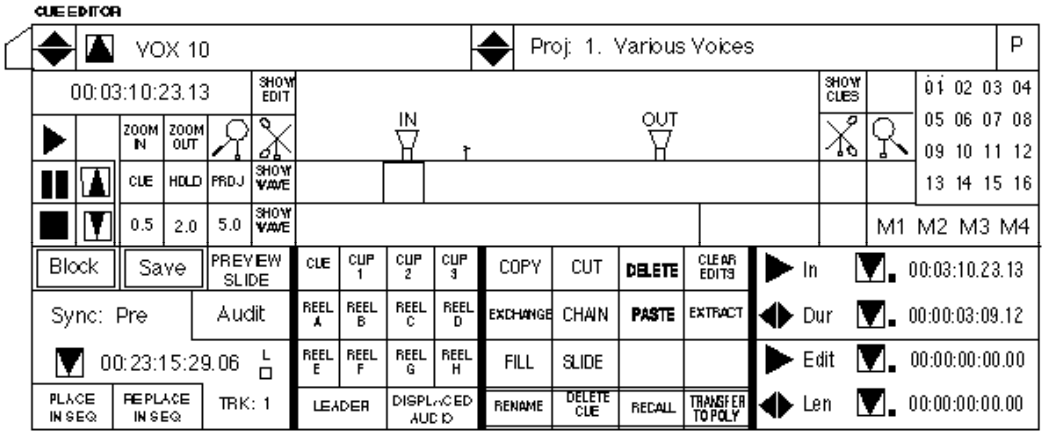
No		DTD track number
Track Title		User-defined track name
Status		
	Safe	Prevents recording on a track.
	Ready	The track is ready for recording.
Mode		
	Repro	Track playback mode.
	Input	Recording mode.
	Auto	Alternates between Repro (during playback) and Input (during recording or when stopped).
	CuePB	Playback mode for cues placed in a sequence.
Used		Indicates the amount of time (minutes:seconds) used for recording on the DTD track. This information is set automatically.
Inputs	STM	Input signal is derived from sampled live audio via analog-to-digital converter of the STM module on channels 1A through 4D.
	DIG	Signal is transferred from a digital source to the DTD via the UDIO module on channel 1 or 2.
	TRK	Bounces one DTD track to another.
	OUT	Bounces events on a sequence track (outputs 1-16) to a DTD track.
	dB	Gain setting for track input. Enter a value between -3 and +28 dB: 0 dB is unity gain.
	Out	Routes the track to the specified DTD output.

Information about each DTD output is also listed—

No	Output number
Volume	Playback volume of the track. Enter a value between 0 and 100%.
Pan	Placement of the track in a stereo pan. -50 places the signal on the left output; 0 places it in the middle; +50 places it on the right.
DDT	Routes the track to the specified digital output of the UDIO module.

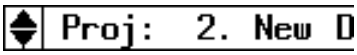
Cue Editor

Use the Cue Editor to edit cues on the DTD, and audition and place them into the current sequence.

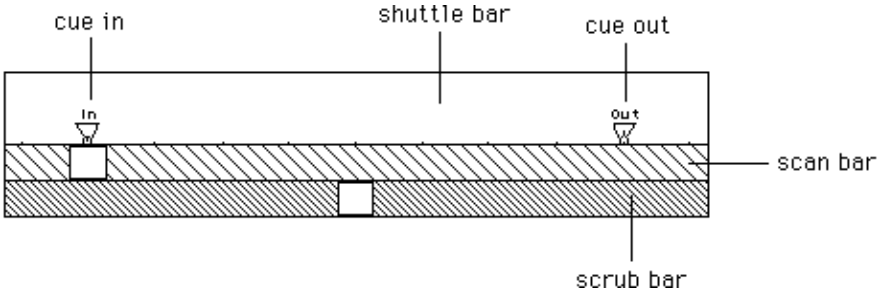


The top of the panel shows the names of the current cue and current project. Use the corresponding scroll arrows to select a different cue or project.

Cue

Project 

The shuttle bar shows the IN and OUT points of the current cue. Click in the shuttle bar to play back the cue. Then scan bar, directly below the shuttle bar, is for playing the cue and locating edit points. The scrub bar is used for finer playback and edit location.



Buttons in the Cue Editor control a variety of functions—

Play from scan box.

Stop

Pause/Continue

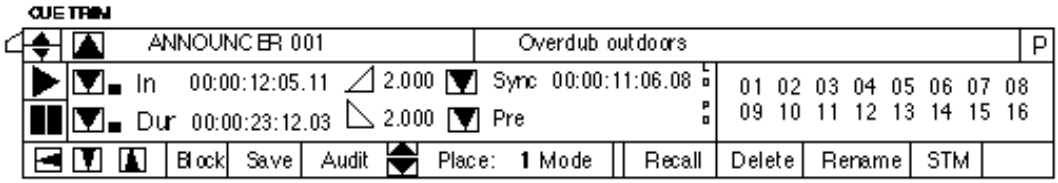
High speed play. Each click doubles speed.

Slow speed play. Each click cuts speed by half.

Zoom In	Show less time in the shuttle bar.
Zoom Out	Show more time in the shuttle bar.
	Define the area of the cue you want to look at.
	Place right and left edit points.
Cue	Bring the current cue to the shuttle bar.
Hold	Freeze shuttle bar location and recall a different cue to the shuttle bar.
Proj	Brings all cues on a selected track to the shuttle bar.
Show Cues	Display the cue name on the shuttle bar.
Show Wave	Display the cue as a waveform.
0.5 | 2.0 | 5.0	Sets the number of seconds on the scrub bar.
Block	Breaks a single cue into two or more smaller ones.
Save	Save the cue.
P	When protect is on, cannot save the cue under the same name.
Sync	Set preroll and postroll time.
Audit	Audition cue.
Place in Seq	Place cue in the sequence.
Replace in Seq	Replace cue in the sequence.
Cue	Stores and recalls the current cue.
Clip	Cue storage area.
Reel	Cue storage area.
Leader	Stores the equivalent of blank tape.
Copy	Copies edit or entire cue to selected CLIP or REEL button.
Cut	Removes edit from cue and places it into selected CLIP or REEL button.
Delete	Removes edit from cue.
Clear edits	Click once to clear a selected CUE, CLIP or REEL button. Click twice to bring the entire track to the shuttle bar. (In and Out points are placed on either end of the project.)
Exchange	Swaps cue or edit on shuttle bar with contents of selected CLIP or REEL button.
Chain	Splices contents of selected CUE, CLIP or REEL button to end of cue.
Paste	Inserts contents of selected CLIP, REEL or LEADER button into edit start point. Edit flags appear at start and end of pasted material.
Extract	Makes the edit the current cue on shuttle bar.

Fill	Replaces edit with contents of selected CLIP or REEL button. If fill material is shorter than edit length, loops material to fill entire edit.
Slide	Places an edit in a different location without changing the duration.
Rename	Renames and saves the current cue. *The original version of the cue is overwritten. Be careful how you use this command.*
Delete cue	Deletes selected cue from Librarian.
Recall	Recalls a cue from any project.
Transfer to poly	Places current cue onto keyboard as first partial timbre of the keyboard timbre.
▶ In	Play from In to Out.
◆ Dur	Play Out (Dur). Display Out time or Duration between In and Out. Click right arrow to begin play at current play marker and continue until manual stop. Click left arrow to backup playback 2 seconds with each click.
▶ Edit	Play edit from IN time or take new IN time.
◆ Len	Play Out (Len). Display Out time or Length of edit. Click right arrow to begin play at current play marker and continue until manual stop. Click left arrow to backup playback 2 seconds with each click.
▼	Take the current time into the time field. Undo button.
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16	The track(s) on which a cue is recorded.
M1 M2 M3 M4	Time memory buttons.

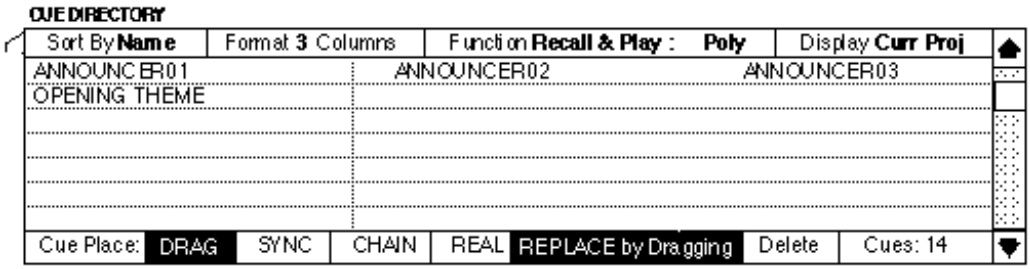
Cue Trim Panel



Like the Cue Editor the Cue Trim panel has motion controls for cue playback, as well as button for blocking, saving, auditioning, placing, recalling, deleting, and renaming cue. For more information, see Cue Editor above.

To change the volume envelope of a cue, type the desired number of seconds in the Fade In ◿ or Fade Out ◺ field. Cue envelope changes are performed only at the analog outputs; they are not available when using the digital bounce or UDIO features.

Cue Directory



The Cue Directory lists all cues in the current project or in all projects. The number at the bottom right indicates how many cues are displayed. Use the buttons at the top of the panel to customize the display—

Sort By	Displays cues by name, sequence time or sync time.
Format	Displays 1, 3, 5 or 8 columns in the panel.
Function	Indicates whether clicking a cue name recalls and plays the cue, only recalls it, only plays it, or transfers the cue to poly RAM.
Poly/Mono	Plays back cues simultaneously or one at a time.
Display	Displays cues from all projects or from only the current project.

Click one of these buttons to places cues into the current sequence—

DRAG	Appears only if the Event List Editor is displayed. When selected, cues can be dragged from the Cue Directory to the Event List Editor.
SYNC	Displays a dialog for placing a cue by its sync time.
CHAIN	Displays a dialog for placing multiple cues into the sequence.
REAL	Places a cue in real time, provided the sequence is playing.

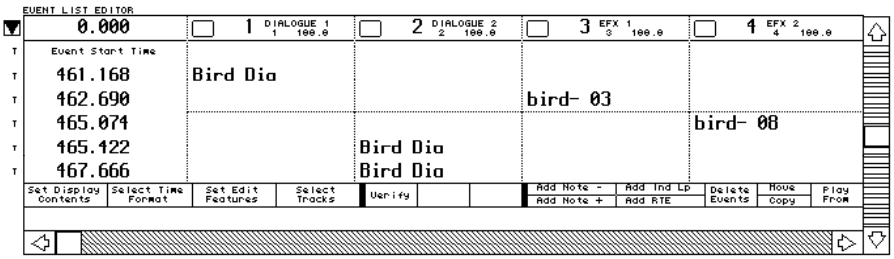
Motion Control Panel

Use the Sequencer Motion Control panel to recall, play back and store sequences. The current sequence appears in the NAME field. The scroll arrows let you access other sequences.

START	Plays from the beginning of the sequence. If the LOCATOR ON/OFF button is on, playback begins at the selected locator point.
STOP	Stops playback.
CONT	Continues playback from the current sequence location.
REW	If the sequencer is stopped, click REW to “rewind” it. If the sequencer is playing, each click reduces the playback speed by half.
FORWD	Each click doubles the playback speed.
MIDI RECRD	Records input from a MIDI device onto the selected sequence tracks.
MIDI PUNCH	Records input from a MIDI device, replacing anything previously recorded on the sequence tracks.
MIDI LOCATE	Sends a MIDI song pointer which relocates the sequencer to the specified locator point without playing the sequence.
TRACK	Shows the number of the track you are recording on.
DELETE	Displays a dialog for removing the saved version of the sequence listed in the NAME field. Cue definitions are not deleted.
RENAME	Permanently removes the saved version of a sequence, and stores the current sequence in its place.
STORE	Save the current sequence on the hard disk or floppy disk specified in the NAME field.
RECALL	Recalls the sequence specified in the NAME field. The recalled sequence becomes the current sequence.
P	Protects the current sequence from accidental erasure or alteration. When the protect button is lit, the sequence can be edited but not stored, deleted or renamed.

You can define up to 20 locator points in the current sequence. Enter the desired time in the time field, click the LOCATOR STORE button, and click a number at the bottom left of the panel. Each locator point can have a caption, which appears next to the time field.

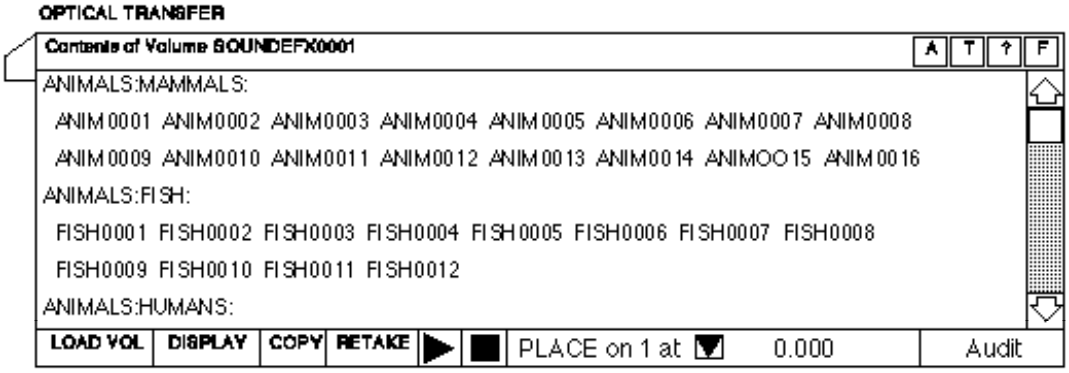
Event List Editor



The Event List Editor displays all events (notes and cues) on each track in the current sequence. The far left column lists the time at which each event is triggered. Click a button near the bottom of the panel to perform the following functions—

Set Display Contents	Displays a dialog for specifying the number of tracks and rows shown in the panel. You can display event names, RTEs, loops, pitch names, MIDI note numbers, event durations, end times, velocity and captions.
Select Time Format	Specifies whether time is displayed in Seconds, Minutes:Seconds, Beats, Measure:Beats, SMPTE or Feet:Frames.
Set Edit Features	Displays editing and printing options. You can turn ripple editing on or off, show or hide column headings, turn automatic scrolling on or off, display event end times or offset times.
Select Tracks	Displays buttons for erasing or bouncing events, or for clearing all solos. Two lists of numbers represent sequence tracks and DTD tracks. Click a number to solo a track.
Verify	If ripple editing is on, a dialog asks for confirmation of each edit. click the Verify button to complete the edit.
Add Note-	Inserts a duplicate event before the selected event.
Add Note+	Inserts a duplicate event after the selected event.
Add Ind Loop	Adds in independent loop to a notelist. The loop begins at the selected event and is two measures long.
Add RTE	Inserts real-time effects, MIDI program change messages or MIDI system exclusive messages before the selected event.
Delete Events	Removes selected events from the sequence.
Move	Drag events from one location to another in the list.
Copy	Duplicate and drag events from one location to another.
Play From	Plays the sequence beginning at the selected event. If you click and hold Play From, playback stops when you release.

Optical Transfer Panel



Use the Optical Transfer panel to record sounds from an optical disk on the DTD, and to store DTD cues on an optical disk.

A	Auditions sounds without recording on the DTD.
T	Scrolls to the to of the list of sound files.
?	Displays a dialog for searching the list of sound files.
F	Separates the panel into two parts for storing DTD cues on an optical disk. Select a cue name at the top right of the split panel, enter a caption and categories, and click the STORE CUE button.
LOAD VOL	Loads the index files of the volume currently in the optical drive.
DISPLAY	Presents a dialog for indicating the number of rows in the panel, and what is displayed (captions and/or seconds, categories and/or sound files).
COPY	Displays a dialog for copying the selected sound from the optical disk to the DTD. You can specify DTD track number(s) and the cue name.
RETAKE	Re-records the previous cue. Plays the cue most recently copied to the DTD. And Stops cue playback.
PLACE	Places the most recently copied cue into the current sequence at the specified time and track.
Audit	Auditions the cue in the sequence before placing it.

Record Control Panel

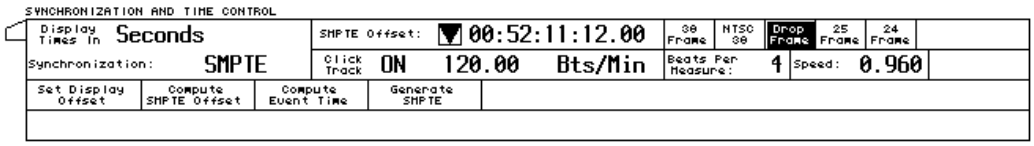
```
RECORD CONTROL
READY   Mode Allocate   Trk Start      0.000
RECORD  Trig Manual     Trk Stop     691.200
STOP    Rec  Single     Tracks  01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
  Cue: Take 01                    Retake | Audition | Crfade:  5
```

Use the Record Control panel to record audio on the DTD. Continuous recording records DTD tracks in sync with each other, like multitrack tape recorder. Cue recording lets you record multiple takes, one after another, that can be assembled into an edit decision list. The Mode and Trig settings determine the type of recording—

Mode	Trigger	Type of Recording
Punch In	Manual	Continuous recording, triggered manually.
Punch In	Sequencer	continuous recording, triggered automatically by preset sequence start and stop times.
Allocate	Manual	Cue recording, triggered manually.
Allocate	Sequencer	Cue recording, triggered automatically by preset sequence start and stop times.
Allocate	PolyXfer	Copies the current sound file from the Sound File Editor to the DTD.
Allocate	TSM	Records a compressed or expanded copy of a cue.
Cue Lock	Manual	Replaces a cue with a new recording, triggered manually.
Cue Lock	Sequencer	Replaces a cue with a new recording, triggered automatically by preset sequence start and stop times.
Cue Lock	PolyXfer	Replaces a cue with a copy of the current sound file.

Times displayed in the time fields depend on the Mode and Trigger settings. Clicking a numbered track button arms the corresponding DTD track. The Cue field displays the name of the next recorded cue. In Allocate mode, clicking the Retake button erases the most recent take from the DTD. With Punch In mode, you can specify a time (0-65.5 msec) in the Crfade field to crossfade one part of a continuous recording into another.

Synchronization Panel



Use the Synchronization and Time Control panel to set synchronization parameters. Display time as SMPTE, Beats, Measures:Beats, Seconds, Minutes:Seconds or Feet:Frames. You can specify a SMPTE offset (the SMPTE time at which the sequence starts) and frame rate.

The panel includes the following buttons—

Set Display Offset	Presents a dialog for displaying a time other than the time entering the system; similar to setting a mark point on a tape machine and zeroing the tape counter at that point.
Compute SMPTE Offset	Presents a dialog for automatically calculating the SMPTE offset required to trigger the current sequence.
Compute Event Time	Displays a dialog for automatically converting one time format to another.
Generate SMPTE	Sends out a SMPTE signal that can be recorded on tape.

Cue Store/Recall Panel

Use the Cue Store/Recall panel t back up cue definitions—track location, duration and editing information—in a data file on your system hard disk. Type the desired filename after File, and click [DTD-To-File].

The [File-To-DTD] option recalls cue definitions stored in a data file. The recalled cues are added to the list of cues in the current project. If both the project and data file contain the same cue name, the cue definition from the data file is used.

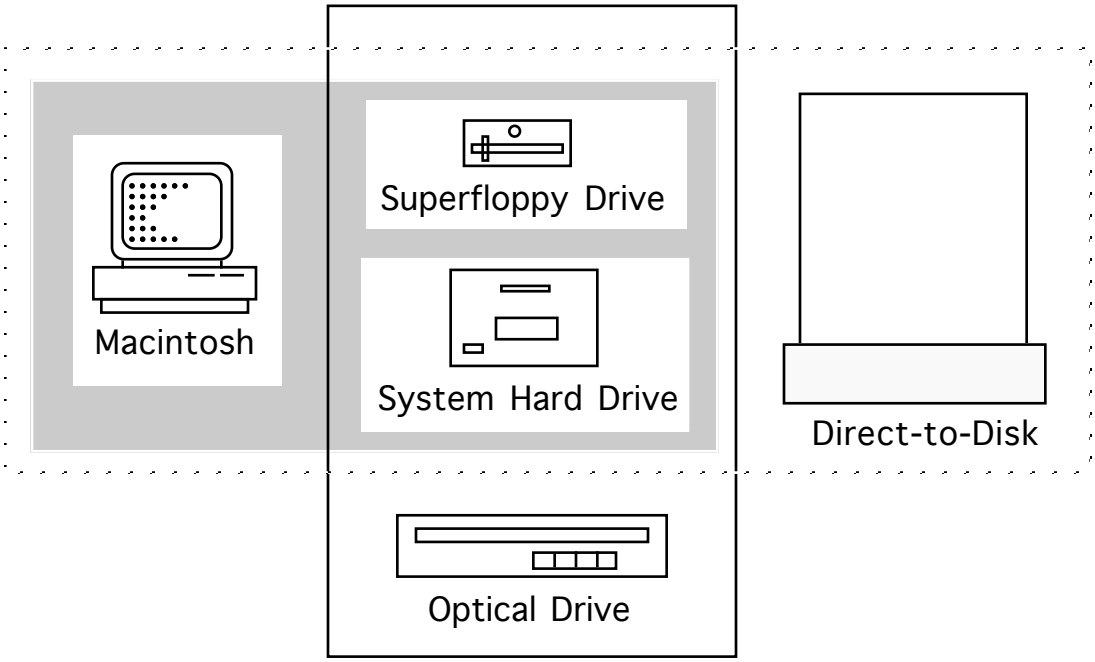
Chapter 3
Storage Systems

Introduction

There are three major storage areas possible in your system—

- the Macintosh
- the system storage devices
- the Direct-to-Disk

All Synclavier Company systems contain the Macintosh and two of the system storage devices (superfloppy and system hard drive). Some systems have a third system storage device (optical drive) and/or the Direct-to-Disk.



Macintosh Storage System

The Macintosh has both a floppy drive and an internal hard drive. The floppy drive uses 3.5" floppy disks that can be purchased at any computer store. All Synclavier Company Macintosh applications, such as EditView, are shipped on this type of floppy disk.

The internal hard disk stores the Macintosh system software. Synclavier Company applications, such as TermulatorX and EditView, must be installed on the Macintosh hard disk. Macintosh sequence and data files are commonly stored on the hard disk.

Direct-to-Disk Storage System

The Direct-to-Disk has both hard drives and tape drives. The hard dries are used for recording and stored source audio, project information and cue data. The tape drives are used for backing up audio and cues stored on the DTD hard disks.

RTP Storage System

The rest of this chapter describes the three types of storage options available for all Synclavier Company systems—

- hard drives
- superfloppy drives
- optical drives

The minimum requirement for a system is on superfloppy drive and one system hard drive. Additional floppy dries, hard drives and optical drives can be purchased to increase the capacity and flexibility of the storage options on your system.

To refer to each storage area, the RTP uses a short **device name** which is usually the first letter of the device plus a number (zero for the main drive, and one for the auxiliary drive). The following storage options are possible—

Type	Device Name	Storage Options and Uses
superfloppy drive	F0	*Capacity*: 1.2 megabytes per floppy disk. Removable media. *Uses*: The disk labeled "Bootload" loaded in this drive starts the system. Additional floppy disks can be used to store small sound files, timbre files and sequence files.
auxiliary superfloppy drive	F1	An additional superfloppy drive available for backing up audio, timbre, and sequence files.
system hard drive	W0	*Capacity*: varies, but normally about 600 megabytes. Non-removable media. *Uses*: Synclavier Digital system software is located here. This drive is also used to store audio, timbre and sequence files.
auxiliary hard drive	W1	An additional hard drive for storing sound, timbre and sequence files.
optical drive	O0	*Capacity*: either 480 megabytes (magneto) or 1000 megabytes (WORM) per side. Removable media. *Uses*: Storage and archiving of audio data.

Storage Device Capacity

The capacity of computer storage devices is measured in terms of how many **bytes** of information can be stored. A byte contains eight **bits** (binary digits), which are the smallest storage unit available in a computer. A bit can contain one of two values—zero or one. All other capacity measurements are multiples of these basic building blocks, as the following chart illustrates.

bits	bytes	kilobytes	megabytes	gigabytes	terabytes
8	1				
	1024	1			
		1024	1		
			1024	1	
				1024	1

When comparing different types of storage devices, there are several important things to consider—

Capacity — How much data can the device contain, usually expressed in megabytes. A measurement which is often used to compare different devices is the "cost per megabyte"—the total cost of the media divided by how many megabytes it can hold.

Portability — Some devices, such as floppy disks, are referred to as removable devices because the media can be removed from the drive and transported easily to another location. Other devices, such as hard dries, are enclosed and the media cannot be removed.

Speed — How fast data can be written to and read from the device. hard drives are very fast, but are not removable. Floppy drives are generally the slowest and smallest capacity storage device, but floppy disks are very convenient for quickly moving information between systems.

Your storage needs will depend on your particular usage of the system. If you commonly travel between different studios, removable media sucha as floppy disks and optical volumes will be important to you. If you do all your work on one system, you may want to invest in more hard dries.

How Much Is a Megabyte?

Synclavier Digital directory system keeps track of the length of all fils in terms of **sectors**. A sector is equivalent to 512 bytes, so there are 2048 sectors per megabyte. To determine how many megabytes a large file contains, you can use the following formula—

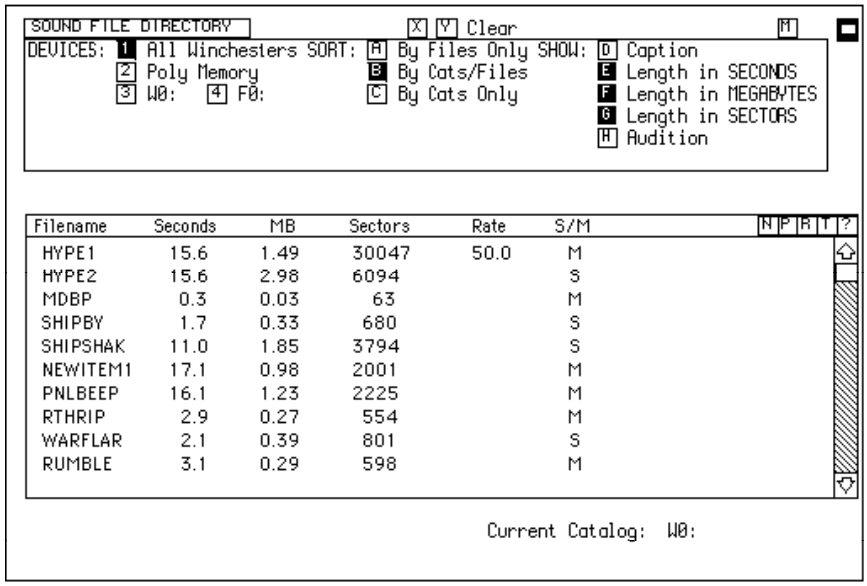
megabytes = sectors ÷ 2048

For example, a superfloppy disk can hold 2400 sectors. Since 2400 divided by 2048 is approximately 1.17, a superfloppy can hold about 1.2 megabytes of data.

Many displays in the system indicate the lengths of sound file, usually represented in two ways—

- how much time it takes to play the sound (such as 2.5 seconds)
- how much storage space the sound file requires (such as 448 sectors)

In many situations you will need to convert the length of a sound file from one representation to another. For example, you might now that a sound takes four seconds to play, but want to know how much space is required to store it on a floppy disk. In all cases, you need to know the sample rate of the file (expressed in samples per second) and whether it is a stereo or mono files. All of this information can be displayed on the Sound File Directory—



Use the following formulas to convert between sectors, megabytes and seconds. For stereo sound files, insert a 2 fo the stereo variable. For mono sound files, the stereo variable is equal to 1, and therefore has no effect. Sample rates are displayed as kHz in the Sound File Directory; therefore, multiply each rate by 1000 in the formulas.

sectors = (seconds X sample rate X stereo) ÷ 256

megabytes = ((seconds X sample rate X stereo) ÷ 256) ÷ 2048

seconds = ((sectors X 256) ÷ sample rate) ÷ stereo

seconds = ((megabytes X 256 X 2048) ÷ sample rate) ÷ stereo

Example 1: The stereo sound file SHIPSHAK takes 11.0 seconds to play. To calculate the number of megabytes required to store the file—

((11.0 X 44000 X2) ÷ 256) ÷ 2048 = 1.85 megabytes

Example 2: The mono sound file PNLBEEP uses 2523 sectors of disk space. To calculate the number of seconds required to play the sound—

((2523 X 256) ÷ 40000) ? 1 = 16.1 seconds

Because the folumlas yield approximate values, you should "round up" each result if you want to guarantee enough storage space.

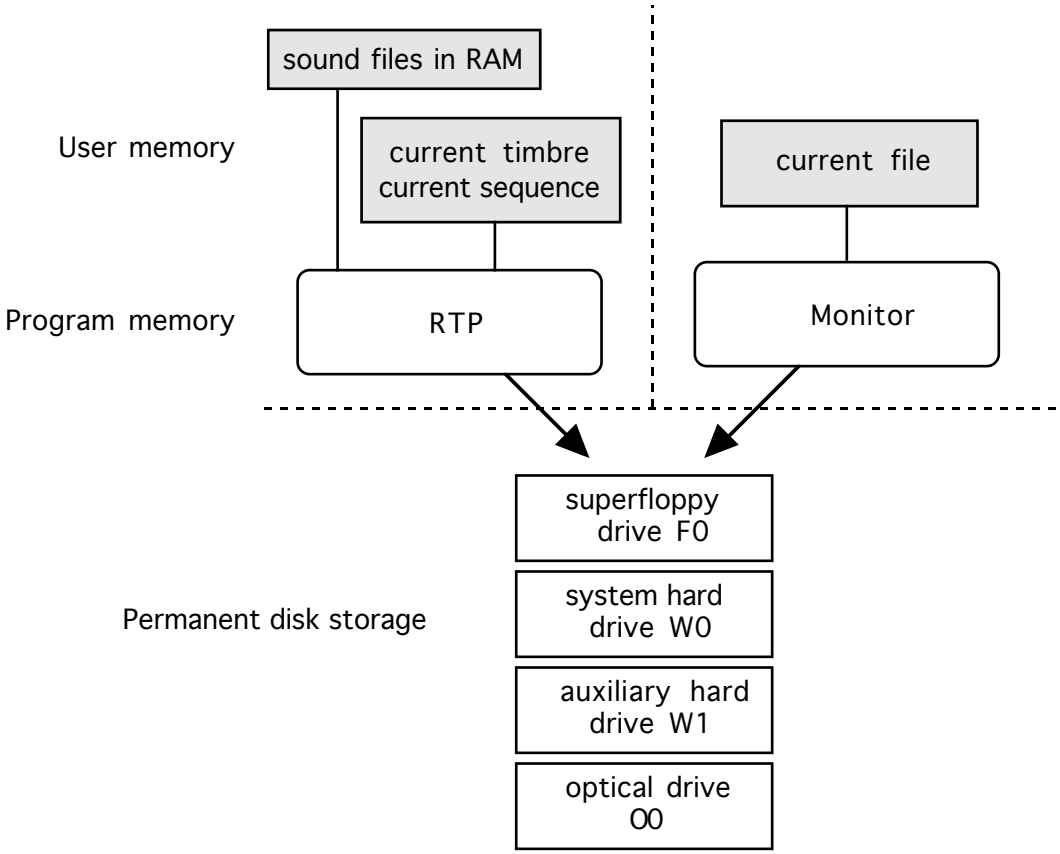
Saving and Organizing Files

Two software modules are commonly used when storing and managing data—the RTP and the Monitor. While working in the RTP you need to save copies of your work to disk as you create and edit sequences, timbre and sound files. The current sequence, current timbre, and any sound file in poly RAM exist only in computer memory until you save them to disk. All computer memory containing user information is erased when the computer is powered down.

The Monitor program is used to organize the files on your storage system after you have finished one project and before you begin the next. You can back up files from the hard disk to floppy disks, delete files you no longer need, create subcatalogs for the new material you just created, or prepare to archive large groups of sound files to optical disk.

The following habits are strongly recommended—

- save copies of your work often while using the RTP, and then
- after each session or job, back up and organize your work using a combination of the RTP and the Monitor.



The Monitor

The Monitor is a software module that provides direct access to your storage system and to all Synclavier Digital utility programs. The Monitor and the RTP are the software modules that are used most frequently.

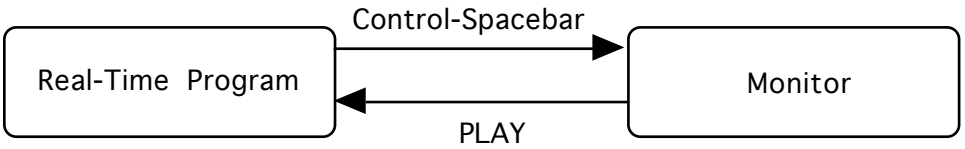
Remember to save your current sequence and current timbre before leaving the RTP to enter the Monitor.

To leave the RTP and enter the Monitor, go to the Main Menu and press Control-Spacebar on the Macintosh keyboard. The Monitor's “Ready>” prompt appears in the TermulatorX window. At the Ready prompt, you can enter any Monitor command or initiate a utility program such as Formcopy or Shuffle.

To enter a Monitor command—

1. Type the command after the Ready prompt.
2. Press the Return key. The command is executed only when you press Return.

To return to the RTP, type the Monitor command `play` and press Return.



When you leave the RTP to enter the Monitor, your current sequence and current timbre are erased. The sound files in poly RAM remain intact, however, until you actively erase poly RAM or power down the system.

For more information on the Monitor, see the chapter “System and Utility Software.”

File Management

Each Synclavier Company system has at least one system hard drive, and many also have an auxiliary hard drive for storing user data. This section descirbes how to manage the files on these storage devices.

General Organization

The following chart shows the location and characteristics of some of the files on your storage devices. Synclavier Digital system software and the optical index files must be located on the system hard disk (W0). All other files and user data can be located on either W0 or W1, or on superfloppy disks.

	Location	Characteristics
System files	W0	RTP, files in the .SYSTEM subcatalog, other files beginning with . (a period)
Optical index files	W0	Files in the .INDEX subcatalog
Sound files	W0, W1, F0	Files of type SOUND
Timbre files	W0, W1, F0	Files named .NEWDATA
Sequence files	W0, W1, F0	Any files of type SYNC, or files named .SQxDATA

Basic Terms

Synclavier Digital computer uses a hierarchical file system which allows you to group information together in discrete areas. You can create nested storage areas on your hard disks and floppies by using subcatalogs, special file types that allow other files to be stored inside them. Subcatalogs are similar to folders on the Macintosh computer..

The following list will help you understand some basic terms—

file — A collection of information stored on disk. Different types of files contain different data. For instance, audio material is stored in files of type “sound,” but documents are stored in files of type “text.”

disk — A magnetic medium, such as a floppy or hard disk, used for storing files.

directory — A reserved area on the disk containing a list of all the files in a particular storage area and where they are located.

catalog — Any storage area that has its own directory. Each storage device is considered to be a catalog (W0, W1, F0) , as is each subcatalog.

subcatalog — A type of file which allows other files to be stored inside of it. Subcatalogs can be nested up to 10 levels deep.

current catalog — The catalog selected as the default for saving and recalling files. You can change the current catalog at any time from either the Monitor or the RTP.

current file — In the Monitor, only one file can be present in memory at any time. You can recall a file into memory and then move it to a new location.

Catalog Organization

Each catalog has a directory that contains information about the files stored there. Included in the directory is the name and type of each file, where the file begins on the disk (sector number) and how many sectors of disk space are required to store it.

To view the directory of your current catalog, type the command catalog all at the Monitor's Ready prompt and press the Return key.

After the directory, the remainder of the space in a catalog is used to store file data. The system uses the directory to manage the storage area, keeping track of where file data is located and where there is space available in the catalog for storing additional files.

Data for each file must be stored in contiguous disk space. It is possible to have enough total sectors free to store a new file, but the available space is fragmented within the catalog. Use the Shuffle Utility to rearrange the files in a catalog and consolidate all the free space at the end.

Directories

There is a maximum number of files that can be stored in each directory. There are two sizes of directories in the system—

Directory Size	Maximum Number of Files	Type of Catalog
small directory	32 files	superfloppy disks, and subcatalogs of type SUBC
large directory	128 files	hard disks, and subcatalogs of type LSUBC

The directory sizes on hard disks and floppy disks are fixed and cannot be changed. When you create subcatalogs, however, you can specify either a small or large directory for each one.

The basic catalog command has many variations that can be used to view directories. You can sort the directory by file name or size, or save the catalog listing into a text file that can be printed. (See the chapter “System and Utility Software” for a complete list of catalog commands.

When a directory is too large to fit on the screen, the filenames scroll by until all the files have been displayed. To stop scrolling, press Control-S. To resume scrolling, press Control-Q.

File Types and Names

Catalogs can contain a variety of files of different types. Most of these file types cannot be viewed and edited directly with the Monitor, but are accessed through the RTP. For example, you cannot view the contents of a sequence file with the Monitor, but you can use the RTP to recall, play, edit and save the sequence to disk again. The sequence file is listed in the directory, however, and you can use the Monitor to move the file to a different disk location or make a copy of it under a new name.

The types of files are as follows—

file type	examples
sound	sampled sound files
data	timbre files, also some system data files
sync	sequence files
index	optical disk index files, located in the .INDEX subcatalog
text	documents, or files created with the SCRIPT music language
exec	software programs, such as the Monitor or the shuffle Utility
subc	subcatalogs with a small directory (can store up to 32 files)
lsubc	subcatalogs with a large directory (can store up to 128 files)

With a catalog, each files must have a unique name. A valid filename has up to eight consecutive characters, including letters, digits and some symbol characters. File names cannot contain spaces or any of the following characters—

`? ! : ; , / \ < > + = % & * | @`

Creating Subcatalogs

The highest level catalog of each storage device is called the **top level**. Each hard disk and floppy disk has a top level. The top level of W0 is the default current catalog when you first turn on the system.

A customized storage system is created by dividing these large catalogs into smaller storage areas, or **subcatalogs**. Each subcatalog can contain a manageable number of files as well as other subcatalogs. Subcatalogs can be used to separate the files on your system by projects, by clients, by system operators, or by any combination of these groupings.

The Monitor command `create` is used to make a subcatalog—

`create` <subcatalog name>,<`large` or `small`><sectors>

The comma (,) following the subcatalog name and the spaces are essential parts of this syntax. If you do not specify “large” or “small,” a small directory is assigned for a subcatalog of 1000 sectors or less and a large directory is assigned for a subcatalog of more than 1000 sectors. If you do not specify the size, a default size of 399 sectors is assigned.

For example, to store cello sound files in a subcatalog you might enter—

```
create cellocat, small 2398
```

When you press Return, a subcatalog file of 2398 sectors is reserved on your hard disk with the name "cellocat." An additional sector is added for a small subcatalog directory, bringing the total size of the subcatalog to 2399 sectors (exactly the size that will fit onto a superfloppy disk).

The system automatically adds one sector to the total size for small directories, and four sectors for large directories. You cannot change the directory size of a subcatalog once you have created it, except by creating a new subcatalog, copying the file contents into it, and deleting the old subcatalog.

To change the total sector size allocated for a subcatalog, use the Resize Utility. Or, if you know the desired catalog size, use the Monitor `resize` command—

`resize` <subcatalog name><+n, -n, or n>

or just type `resize` to bring up a screen where you can select from different options.

Treenames

The location of a file or catalog within the storage device hierarchy is specified with it **treename**. A treename identifies the location of a file by its filename, the name of the subcatalog in which it is stored and the name of the device on which the subcatalog is located. All elements of the treename are separated by a colon (:).

The order of names in a treename is—

<device name>:<subcatalog name(s)>:<filename>

The colon following the device name and each subcatalog name is essential. There must be no spaces between colons and names. The top level of the current device can be designated by a leading colon. You can designate the current file by leaving a trailing colon at the end.

The device name (and the leading colon) can be omitted from the treename if you are only working within one device. Likewise, you can omit the subcatalog name from the treename if you are only working in the current subcatalog. The following are examples of treenames.

`trumpet`	file or subcatalog "trumpet" stored in current catalog
`horns:trumpet`	fil or subcatalog "trumpet" stored in subcatalog "horns" located in current catalog
`:trumpet`	file or subcatalog "trumpet" stored in top-level catalog of current device
`:horns:trumpet`	fil or ssubcatalog "trumpet" stored in subcatalog "horns" located in top-level catalog of current drive
`F0:trumpet`	fil or ssubcatalog "trumpet" located on the superfloppy disk in the F0 drive

The Current Catalog

The current catalog is the catalog currently selected as the default for saving and recalling files. Whenever you save a file without specifying a treename, the file is stored in the current catalog.

You can use the Monitor `enter` command to change the current catalog—

`enter`<treename>

If you want to verify the name of the current catalog, use the Monitor `show catalog` command.

The Current File

There are many files of all types stored on your hard disk, but only one can be the current file at any given time. When you make a file the current file, you are making a copy of it in memory so that you can change it in some way or move it to a new location. The original file remains saved on the disk until you actively delete or replace it.

To recall a disk file and make it the current file, use the Monitor `old` command—
`old`<filename or treename>
Specifying only a filename recalls the file from the current catalog. Use a treename if you want to recall a file located within another catalog or another device.

The name of the current file is the same as the name of the file stored on disk. You can use the Monitor `name` command to display the name of the current file on the screen.

If you use any of the Monitor `catalog` commands without specifying a filename, the Monitor uses the name of the current file as the default.

Use caution with commands that write files to disks (such as **unsave** or **replace** described earlier in this chapter) until you are comfortable with how the Monitor uses default information.

Recalling and Saving Files

The current file is a copy of a disk file that you have recalled into memory using the `old` command.

Use the `save` commands to store a copy of the current file on disk—
`save` <filename or treename>
Omitting the filename or treename stores the file using all the default values. The current file is saved with its current name in the current catalog. By adding a filename to the command the current file is saved under that specified name; if you add a treename the current file is saved to another catalog location or device.

For example, you could use these commands to recall a file from a superfloppy disk and save it to your hard disk (W0)—

`enter F0:`	Makes F0 the current catalog.
`old highhat`	Recalls the file "highhat" as the current file.
`enter W0:`	Makes W0 the current catalog.
`save`	Saves the file "highhat" to the current catalog (W0)

The same result could be obtained without changing your current catalog at all by typing these two commands:

`old F0:highhat`	Recalls the file "highhat" from F0, making it the current file.
`save W0:`	Saves the file "highhat" to the top level catalog of W0.

If you wanted to save the file under a new name—

`old F0:highhat`	Recalls the file "highhat" from F0, making it the current file.
`save W0:drum2`	Saves the file as "drum2" in the top level catalog of W0.

Summary of Monitor Commands

The following chart summarizes the Monitor commands used most often. Any Monitor command can be shortened to its first three letters, and many abbreviations can also be used. For example, the following commands are equivalent—

`catalog all`	`cal a`
`create cellocat, small 2398`	`cre cellocat, s 2398`
`show catalog`	`sho cat`
`drename highhat drum2`	`dre highhat drum2`

Most of these commands can be used by themselves to work with the current file and in the current catalog. The addition of a specific filename or treename causes the command to operate on files or catalog elsewhere on the system.

`old`<filename>	Copies the specified disk file into memory, making it the current file
`save`	Saves the current file to disk.
`save`<filename>	Saves the current file to disk under the specified name.
`unsave`	Deletes the disk version of the current file from the disk
`unsave`<filename>	Deletes specified disk file from the disk
`replace`	Saves the current file to disk, replacing the disk version with the same name as the current file.
`replace`<filename>	Saves the current file to disk, replacing the specified disk file.

`rename`<filename>	Changes the name of the current file to the specified filename.
`drename`<filename><newname>	Changes the name of a disk file from <filename> to <newname>; does not affect the current file.
`name`	Displays the name and file type of the current file.
`enter`<treename>	Changes the current catalog.
`show catalog`	Displays the name of the current device and catalog.
`catalog all`	Displays the directory of the current catalog.
`catalog all of` <treename>	Displays the directory of the specified catalog.
`catalog all sort name`	Displays the directory of the current catalog, sorted by filename.

For more information on the Monitor, see the chapter "System and Utility Software."

Backing Up Project Data

It is very important to make extra copies of your data files and back up your work frequently. Computer hardware does fail and sometimes needs to be replaced. In such situations, some or all of your data may be lost. It is also easy to write over use files by mistake, or to forget the name of the current catalog or current file when you are working on a project.

Please back up your work regularly. Before you save, think about what file you are saving, what it is named, and where you are saving it.

When you are finished with a project, use the Monitor to reorganize your storage space and back up your work. There are many ways to back up your work, but they all fall into two general categories—

- Saving copies of files in another catalog or under a different name prevents losing a file by accidentally wiring over it, and allows you to quickly retrieve earlier versions of a file.

- Saving copies of files on another storage device prevents file loss in the case of a device or hardware failure. For instance, if a hard drive fails, it does not matter how many copies of your latest sequence file you have saved in different catalogs. Unless you have a copy of it on another device, such as a floppy disk, your data could be lost.

Saving regularly is a good idea. When you finish a major project, take the time to make sure all files associated with that project are backed up to other storage devices.

Copying Data Files

There are several ways to make copies of your sound files, timbre files, and sequence files. There are other files that you might want to back up regularly, such as your optical index files or any text files that you create with the Screen Editor.

The following chart summarizes the types of files you might want to back up and the recommended backup locations—

File Type	Work Location	Backup Locations
sound files	poly RAM	hard drive, optical drive
sound files	hard drive	optical drive, superfloppy, another hard drive
timbre files sequence files optical index files text files	hard drive	superfloppy, another hard drive

There are two ways to copy files onto superfloppy disks or to other locations on any hard drive (W0 to W1, for instance)—

- For individual files, you can use Monitor commands such as old and save to move files to different locations. The Monitor is also very useful for making copies of files and saving them under different names.

- For groups of files, or for files that are too large to be called into memory with the Monitor old command, use the Formcopy Utility. Formcopy is most useful when you have large amounts of data to move, or when you also need to format superfloppies as you copy data to them.

Timbre Files

A particular type of data file is used to store timbres. The data file must be name .NEWDATA, and therefore there can be only one active copy in any catalog or subcatalog. When you recall a timbre, the RTP loads the timbre information from the .NEWDATA file in the current catalog. Likewise, when you save timbres, you are writing to the .NEWDATA file in the current catalog.

There is a copy of a .NEWDATA file on the **Master Timbre/Sequence Storage Disk** , one of the floppies you received from Synclavier Digital. To creat a new timbre file, simply copy this .NEWDATA file to any catalog or subcatalog on your system.

If there is no .NEWDATA file in your current catalog, the RTP will read and write data from the .NEWDATA file at the top level of your current device. This is important to remember because you could accidently overwrite timbre data in the top level if there is no timbre file in your current catalog.

The current catalog is displayed at the bottom of most RTP screens, including the Timbre Directory. You can change the current catalog at any time by using the Subcatalog Directory.

Each .NEWDATA file has space reserved for 64 timbres arranged in eight banks of eight timbres each. These banks and timbres are accessed with the BANK and ENTRY buttons on panel 4 of the Synclavier keyboard, or by selecting a timbre from the Timbre Directory. If you are storing large, complicated timbres (especially resynthesized timbres), it is possible that there will not be enough room to store a complete set of eight timbres per bank.

Sequence Files

When you save a sequence to disk, you are actually saving not information, the timbre definition for each track, and other information such as real-time effects data. A short sequence can require a lot of disk space if it uses many complicated timbres or real-time effects; a long sequence could require very little disk space if it only uses a few timbres.

There are two ways to save a sequence when using the RTP—

- Assign a name to the sequence when you save it. A file of type "sync" with the specified name is saved in the current catalog. The file is exactly the length required to save all the necessary sequence information to disk.

- Use one of eight numbered sequence files, provided by the system as a general workspace and for quickly saving versions of a sequence in progress. As with the .NEWDATA timbre files, you can have only one copy of each numbered sequence file in any catalog; the file versions located in the current catalog are the ones accessed by the RTP by default.

Each of the empty sequence files corresponds to a button on panel 4 of the Synclavier keyboard, and is listed in the Sequence Directory—

filename	*button*	*sequence directory*	*size in sectors*	*storage space*
.sq0data	1	<seq #1>	500	32,000 notes and space for editing
.sq1data	2	<seq #2>	500	32,000 notes and space for editing
.sq2data	3	<seq #3>	250	16,000 notes and space for editing
.sq3data	4	<seq #4>	250	16,000 notes and space for editing
.sq4data	5	<seq #5>	125	8,000 notes and space for editing
.sq5data	6	<seq #6>	125	8,000 notes and space for editing
.sq6data	7	<seq #7>	125	8,000 notes and space for editing
.sq7data	8	<seq #8>	125	8,000 notes and space for editing

If the current catalog does not contain any .SQxDATA files, the RTP will read and write data from the .SQxDATA files at the top level of your current device. This is important to remember because you could accidentally overwrite sequence data stored at the top level if there are no numbered sequence files in your current catalog.

The Master/Timbre Sequence Storage Disk contains eight SQxDATA files. To create a new set of numbered sequence files, simply copy these SQxDATA files to any catalog or subcatalog on your system.

When the Sequence File Is Too Small—

Unlike named sequence files, the .SQxDATA files are created on the disk with a certain sector size allocated to them. The size of the numbered sequence file is not dynamically increased if you attempt to save a sequence that is too large for the assigned space. In such a situation, an error message indicates that there is not enough room on disk to save the sequence.

If you are unable to save your sequence using the Synclavier keyboard, use EditView to save your sequence under a specific name.

You can also use the following set of Monitor commands to create a new .SQxDATA file of any size in the current catalog—

```
new .sq0data
set type sync
save, [size in sectors]
```

Managing Timbres and Sequences

As stated earlier, the RTP defaults to the top level of your current device when accessing timbre files and numbered sequence files, if none are located in the current catalog. Because of this convention, it is recommended that you use the top-level timbre and .SQxDATA sequence files as general work spaces and save your important projects in subcatalogs.

A subcatalog can be used to store one .NEWDATA file for timbres, eight numbered .SQxDATA files, and named versions of sequence files all relating to one project. You can also save sound files and other files relating to the project in this subcatalog. When you are working in the RTP, defining that subcatalog as the current catalog will ensure that you are saving data files in the correct location.

Using subcatalogs in this way simplifies backup because you have all the data relating to a project in one place. While you are working on the project, the subcatalog should be large enough to accommodate new files as you save them. Then when you are ready to back up your project—

1. Use the Shuffle Utility to compact the data in the subcatalog.
2. Use the Resize command to shrink it to the smallest size possible.
3. Copy the entire subcatalog to superfloppy disks or another hard disk location to back up all the timbre and sequence information for your project in one place.

When you back up timbre and sequence files, you should also back up any sound files that are requried to play thte timbres or sequences.

Superfloppy Disks

Every system has at least one 5.25" superfloppy drive. Blank floppy disks used in this drive can be purchased at any computer store (make sure you get double-sided, high-density floppies). You also received several 5.25" floppy disks from Synclavier Digital. They contain Synclavier Digital system software and various utility and diagnostic programs. The “bootload” floppy disk is for starting up your system.

Formating

Before you can use a new floppy disk or a disk previously used in another type of computer, it must be formatted using the Formcopy Utility. Formatting writes to the entire disk and checks for bad sectors. If any bad sectors are found, do not use that floppy for data storage. You should also use Formcopy to format any old floppies that you want to reuse.

Make sure that you have backed up all files ostored n the disk before reformatting. Formatting erases all files on the disk.

Backing Up

Superfloppy disks are normally used for backing up files that already exist on your system hard drive, such as sound files, timbre files or sequence files. Because the disks are small and removable, you can create portable libraries of sound and sequences. Each superfloppy can contain 2400 sectors, or about 1.2 megabytes of data.

You can use the Formcopy Utility to copy a single, large file from a hard fisk to many superfloppies. When the first floppy is full, the program prompts for more floppies until the entire file has been copied. Once a file has been backed up this way, it cannot be recalled directly from one of the floppy disks. You must use the Formcopy Utility to reconstruct the file on the hard disk by inserting the floppies in the correct order.

Protecting the Disks

To protect a superfloppy disk from accidental erasure, use the adhesive tab included with the disk. When the tab is covering the small notch on the side of the floppy, you can read files from the disk but cannot write new information to it.

Please observe the following precautions—

- Handle disks by the plastic casing only.
- Do not touch or scratch the disk surface inside the casing.
- Keep disks away from magnetic fields.
- Use only a felt tip pen to write on labels.
- Avoid compressing or stacking disks.
- Store disks at 50-122° F (10-50° C) and 20-80% relative humidity.
- Store disks in protective cases or boxes, expecially when transporting.

Hard Disks

Up to eight hard disks can be placed on the system chained together to form a single storage capacity of one gigabyte. Two hard disks can be connected directly to the Winchester 0 and Winchester 1 connectors on the control unit. Additional hard disks can be "daisy-chained" to each of these.

Configuration

Your hard disks are set up and configured at Synclavier Digital before you receive your system. You may have to reconfigure if you add hard disks to your system.

If you have hard disks attached to the W1 port, you may have to reconfigure after installing new software with the Winchester Installation program. When you configure a SCSI hard disk, you need only specify that it is a SCSI disk; the computer automatically determines its size and capacity.

Each hard disk in your system has an address that is displayed when you run the Configur Utility. To change any of the numbers, move the cursor to the desired number and press the Spacebar. If your system is different from the default configuration, you have to change these numbers.

```
Storage Devices:              D T L
     W0: (1)    5", SCSI     0,5,0
```

- The first number is the address of the D24 card to which the Winchester is attached (0–3).
- The second number is the target number of the SCSI controller attached to the drive. Target numbers 2–5 are reserved for Winchesters.
- The third number is the logical unit number, or lun, (0–1). Currently, the lun is always set to zero.

The correct address values are written on the SCSI hard disk case, near the connectors. Up to four SCSI hard disks can be attached to each W0 or W1 port.

Formatting

Never reformat a hard disk unless directed to do so by an Support Service Representative. Formatting erases all files on the disk.

Before reformatting a hard disk, back up everything you do not want to lose. **Reformatting erases everything**. Use the Formcopy Utility. Make sure that you only select the hard disk you want to format and erase. (See the chapter System and Utility Software.)

Optical Disks

The optical disk storage system features non-magnetic, removable media storage of large amounts of sound data. Both sound files and DTD cues can be archived to optical disks, where they can be cross-referenced and indexed for quick retrieval.

A master index of the sounds on all your optical volumes is maintained on your Macintosh hard drive, which allows you to search your entire library at any time. To actually recall a sound, however, you must first insert the media containing that sound into the drive.

Comparing Drives

Synclavier Digital supports two types of optical drives—the Tahiti® magneto optical drive and the LaserDrive® 1200 optical drive.

	Tahiti	LaserDrive
General description	Random access, removable media	Random access, removable media
Write method	Magneto optics, media erasable	WORM (write once, read many), media cannot be erased
Media size	5.25 inches	12 inches
Capacity	1 gigabyte per disk, approximately 480 megabytes per side	2 gigabytes per disk, approximately 1000 megabytes per side
Speed loading into poly RAM	2 megabytes takes about 4.5 seconds	2 megabytes takes about 13 seconds
Write protection available	Yes	No

Although Synclavier Digital supports both types of drives, only one optical drive can be attached to a system at any one time.

Configuration

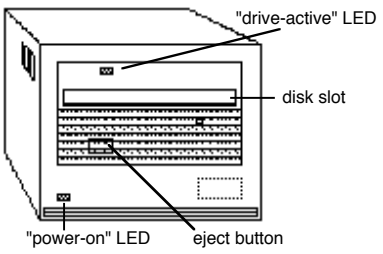
Before using any optical disk drive, be sure it is included in the device configuration for your system. Use the Configur Utility to configure your system. The device name for the Tahiti optical drive is O0: (Oh-zero), but the type is 12 inch Optical.

Answering *yes* to the optical disk question during the system software installation process automatically sets this configuration for you.

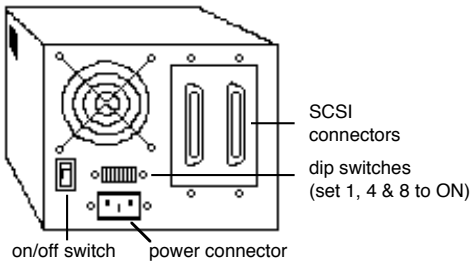
The Tahiti Magneto Optical Drive

The power switch for the Tahiti drive is on the back of the enclosure. Insert a magneto optical disk, either side up, with the arrow pointing toward the drive. Push it firmly into the drive. To remove a disk, press and hold the Eject button.

Front panel



Back panel



Invisible laser radiation is present inside the drive assembly. Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. Observe the following precautions.

- Never remove any circuit board from the drive.
- Do not use the drive without a chassis or enclosure.

If the Tahiti drive does not operate properly, do not try to fix it yourself. The drive does not require user maintenance. Please call your distributor, dealer, technical support representative, or Maxoptix Applications Engineering for service information.

Preparing the Media

The Tahiti drive uses 5.25" magneto optical disks. Before you can use a new magneto optical disk, it must be formated using the Formcopy Utility. Formating writes to teh entire disk and check for bad sectors. You also need to format a magneto optical disk if you want to erase and reuse it. To initiate a format, select the Format mode and set the device to O0: (optical zero).

Formating completely erases the optical media. Be careful that you do not accidentally initiate formating.

Two type of formating are required for a brand new magneto optical disk—

- A **SCSI initialization** is needed only once in the lifetime of the disk. The process takes about 40 minutes per 1 megabyte side.
- Synclavier Digital format is needed the first time a disk is used and then again whenever it is erased. The process takes about 25 minutes per side.

Formcopy Utility automatically applies whatever formating is necessary, either both formats in sequence or just the latter one.

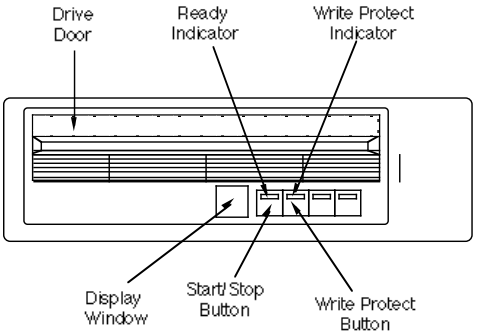
Magneto optical media is available in two types—1024 bytes per sector and 512 bytes per sector. Synclavier Digital system requires 1024 bytes per sector. An error message appears if you try to u se the other type by mistake.

You can protect a magneto optical disk from accidental erasure by using a paper clip or pen tip to push the button on the lower left of the cartridge to the locked position.

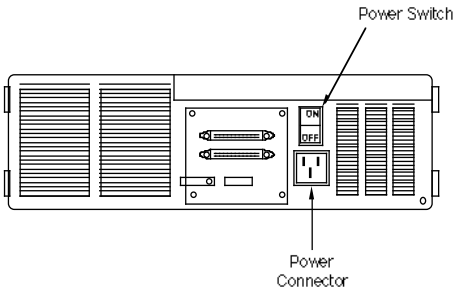
The LaserDrive Optical Disk Drive

The power switch for the LaserDrive is on the back panel. On the front of the drive, press the door handle down firmly to insert a WORM optical disk. The letter of the side you want to read should be on the left (the sides are labeled A and B). Close the drive door and press the START/STOP button. When the light stops blinking, the drive is ready.

Front panel



Back panel



If this is the first start after power up, a series of diagnostic tests runs before the Ready Indicator begins to blink.

To remove a disk, press the START/STOP button. When the light stops blinking, firmly press down on the door handle to open the drive and pull out the cartridge.

WORM Disks

The LaserDrive uses 12" WORM (write once, read many) disks. Unlike magneto disks, a new WORM disk is ready to use right away. WORM disks do not require formating, and because they are write-once media, they cannot be erased.

There are two ways to write-protect WORM disks. When a disk is protected, you can read sound files from it, but you cannot write new sound files to it.

- To protect an individual disk, lay it flat so the side you want to protect faces up. Rotate the write protector in the corner until the arrow points to “write-protect.” When you insert a protected disk in the drive, the WRITE-PROTECT button lights.

- To protect all disks inserted into the drive, press the drive's WRITE-PROTECT button. As long as the button is lit, no sound files can be written to any volume in the drive.

Optical Disk Care

Unlike Winchester hard disks, magneto WORM optical disks are not enclosed in an airtight case. Dust will accumulate on the disk during normal usage, and can cause read and write errors. Therefore, we recommend that you check your optical disks once a month and carefully clean them, if necessary.

The cleaning procedure requires instruction, a special fluid, and lint-free cloths. Synclavier Digital provides a special cleaning kit for magneto optical disks. This fluid can be obtained through Synclavier Digital Support Services.

It is very important to follow the cleaning procedure recommended by the manufacturer. Please call your service representative for detailed instructions.

Naming an Optical Disk Volume

Each side of an optical disk is is treated as if it were a separate disk, called a **volume**. Before you can use an optical disk, each volume must have a unique name.

1. Insert the optical disk into the drive. Make sure you have inserted the correct disk and side.
2. Go to the Optical Disk Display. After a few seconds, a dialog should appear.
3. In the dialog, enter a name (up to 8 characters) after **Volume Name**.

A volume nsme cannot be changed once it is written to the disk. Before proceeding, make sure the volume name you entered is unique.

4. Enter the current date and time.
5. Select the **Caption** field and enter a caption (up to 45 characters) for the volume.
6. Click the **Format** button to write the volume name and caption to the optical disk. An index file, having the same name as the volume name, is created automatically in the **.index** subcatalog of the system hard disk.

Index Files

The top level of your system hard disk has a subcatalog called **.index** which contains an index file for each optical volume you use with your system. An index file included a sorted list of all the sounds and categories that are present on the volume, as well as the first 62 characters of each sound file caption. The RTP uses these index files to quickly search and display the contents of each optical volume.

Synclavier Digital **Index Files** folder on the Macintosh contains an index file for each of the volume listed by the Librarian's Index button. The Librarian creates optical index files on the Macintosh based on information in the .index subcatalog on the system hard disk.

If you insert a volume that was created on another system, you must use the Optical Disk Display to create an index file on your system. An RTP dialog informs you that the index file (on the system hard disk) is not up-to-date. Click [UPDATE] in the dialog to update the index files on the system hard disk. Then select **Import New Volume** from the Librarian Local Menu to create the Macintosh index file.

If you store new sound files or edit information on a volume, the index file on the system hard disk is updated automatically. However, you must also update the index file on the Macintosh by selecting one of these commands from the Librarian—

Update	Updates the Macintosh index file for the volume currently displayed in the Librarian.
Update All Volumes	Updates the Macintosh index files for all volumes.

If you have problems with a particular optical volume, you can recreated the index file on the system hard disk. To do this, remove the index file from the .index subcatalog and then load the volume again.

If you are having problems with the Librarian and suspect that the index files are corrupted or out-of-date, remove Synclavier Digital Index Files folder from your Macintosh and then select the Update All Volumes command to recreate the index files.

Mounting a Volume

Mounting or loading a volume puts it online for storing, viewing and auditioning sounds. To mount a volume, first insert the disk into the drive. If the disk is inserted before you start the software, the volume will be mounted automatically.

If you change disks during a session, use one of two methodsto put the volume online—

- In the Librarian, select **Mount Optical** from the Local Menu. This mounts the current volume inserted in the drive. When you pull down the Index button, any online volume appears with a headphone icon next to it.
- In the Optical Disk Display, click the **Load Volume** button. If the current volume is out-of-date or different from that in memory, a message prompts you to update the index. Generally, you should go ahead and do this.

Categories and Captions

When you store a sound file to optical disk, you assign it to one or more **categories**. For example, sound file JET00001 could be assigned to the category—

AIRPLANE:JET00001

A category can also contain one or more levels of **subcategories**—

AIRPLANE:LARGE:JET00003

Cross-reference files by placing them in more than one category. For example, if you have assigned the file RAIN0001 to the category RIN, WATER:RIN and WEATHER:RAIN, you can locate the file by listing the sound files in any of the three categories Although the file appears in all three categories, the sound file data for the file is stored only once on the optical disk.

The space reserved with each sound file for storing both the caption and categories is limited to 256 characters. Thus, the more categories to which you assign a single sound file, the shorter its caption can be. Or, the longer the sound file caption, the fewer categories to which the sound file can be assigned.

Viewing Sound Files

Use either the Librarian or the Optical Disk Display.to list the sounds on a volume—

- In the Librarian, click and hold the **Index** button and select the desired device from the popup menu. The Librarian is the only place you can view online *and* offline optical disks. After you select one or all volumes, the categories are displayed on the left and sound files are listed on the right. Click individual categories to list their sound files. Use the **Find** field to search for specific files.

- The Optical Disk Display lists sound files on the current volume. You can set the switch near the bottom of the display to list categories and/or filenames.

Optical Archives

Unlike hard drives and floppy disks, the optical drive was designed to be an archival device. You should only save sound files to an optical volume when you have finished editing and are sure that you want to keep the sound files as they are. Although you can delete, rename, recategorize or replace files on optical volumes, you do not regain any of the space that was used for the previous version of the file. Hence you lose valuable storage space every time you make a change to a file after it has been archived.

You should try to limit chagnes to optical volumes for another reason. The optical software is optimized to provide quick access to huge amounts of sound data, but it does not expect to find many file changes on the volume. Therefore, access time to optical volumes which have had many changes can sometimes be degraded.

It is all right to add new files and fill up your optical volumes—this is the usage for which the software was deisnged. But it is a good idea to think before you archive and chose your categories carefully, so that you do not have to make many changes later.

To maximize your storage capacity and maintain system performance, only delete, rename, recategorize or replace files on optical volumes when absolutely necessary.

You do not regain storage space when you modify files on either LaserDrive WORM or Tahiti magneto volumes. With the Tahiti magneto, however, you can use the Formcopy Utility to completely erase the volume and use it again.

Archiving Sound Files

Use the Optical Disk Display to store sound files from a hard disk or poly RAM to the current optical volume. The sound files being copied are called **source files**. The bottom right of the display lists source files; the bottom left lists categories and sound files already on the current volume.

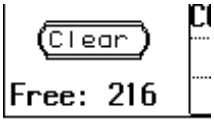
To store a sound file—

1. Select the desired subcatalog near the bottom right of the display.
2. Set the display and function switches to the desired settings.
3. Scroll to locate the desired sound file, or click the Find button to search for a name in the list. In the search dialog, type any part of the sound file name, caption, or other information you want to locate. click [SEARCH] to begin. To continue the search, click the Find button again. Click anywhere to abort the search.
4. Click the sound file name, or move the cursor to it with the arrow keys and press Return.
5. At the top of the display, you can enter a new caption and assign the source file to one or more categories.
6. If the selected sound file is not yet stored on the current volume, a **Store** button appears at the top of the display. If the sound file is already stored on the current volume, the button is labeled **Replace**. Clicking either button copies the source file to the optical disk.

Assigning a Caption and Category

The current sound file caption appears at the top of the Optical Disk Display. You can type a new caption into the **Caption** field. When the sound is stored to optical disk, the new caption will be stored with it.

The current category assignments also appear in the information panel. Enter a new category by typing into an empty category field. To remove a category from the list of assigned categories, select the category and press the Spacebar. Remove all categories by clicking the **Clear** button.



For each sound file on an optical disk, the total number of characters in its caption and categories is limited to 256. The number of characters available for the selected source file is listed next to **Free** under the Clear button.

If the current volume contains a large number of sound files, the index updating process can take a considerable amount of time. You can save some time by storing any new captions and/or categories with the source file on the hard disk or floppy disk first, and then storing the entire subcatalog, as described in the next heading. Clicking the **Source** button updates the caption and categories of the source file on the hard disk or floppy disk, without affecting the optical disk or index file.

Review caption and category assignments carefully before storing. Although you can make changes on the optical disk, you lose valuable storage space each time you store.

Archiving a Subcatalog

Storing an entire subcatalog to an optical disk involves a number of options. First, use one of these methods to select the subcatalog—

- Type a treename into the Sound File field at the top of the Optical Disk Display. The specified subcatalog becomes the current catalog.

  or

- Select the desired subcatalog near the bottom right of the display. The specified subcatalog does not become the current catalog.

You can store sound files with their original captions and categories or with the caption and categories displayed at the top of the display. Click the **Store Catalog** button and set the options described below. Click [STORE] in the dialog when you are ready to store or update files on the optical disk.

Storing Options

Files stored on the current optical disk are **existing files**. Files that have never been stored on the current optical disk are **new files**. When storing a subcatalog to optical disk, you can pick and choose files based on the options explained below.

Settings	Caption	Category
SCREEN	All sound files in the subcatalog are assigned the caption shown at the top of the display.	All sound files in the subcatalog are assigned the categories shown at the top of the display.
SOUND FILES	Each sound file retains the caption currently stored with the sound file on the hard disk or floppy disk.	Each sound file retains the categories currently stored with the sound file on the hard disk or floppy disk.

Files that are already stored on the current volume are **existing files**. Files that have never been stored on the current volume are **new files**. Set the following options to indicate which sound files are copied to the optical disk—

Setting	New Files	Existing Files
NONE	None of the sound files are new. This is set automatically and cannot be changed.	All sound files are new. This is set automatically and cannot be changed.
REPLACE	(not applicable)	Replaces name, caption, category and sound data for existing sound files. Replaces existing sound file with a new version.
SKIP	All new files are skipped. Updates existing files and does not store any new files.	All existing sound files are skipped. Stores only new files and does not alter any existing files on optical disk.
STORE	All new files are stored to optical disk.	(not applicable)
UPDATE	(not applicable)	Stores only name, caption and category information for existing files. The actual sound file data remains unchanged.
VERIFY	Verification dialog appears for each new file, allowing you to store some new files and not others.	Verification dialog appears for each existing file, allowing you to update or replace some existing files and not others.

In the Verification dialog, you can edit the name of a sound file before storing it on the optical disk. You can also cancel the storing process by clicking ABORT in the dialog.

Copying Optical Disk Files

To copy individual sound files from the current optical volume to a catalog on any device in your system—

1. Select the desired catalog near the bottom right of the Optical Disk Display.
2. Select the sound file(s) to copy.
3. Click the **Cpy** button.
4. In the dialog that appears, click [COPY] to copy the file. If the sound file already exists in the catalog, click [REPLACE] to replace it with the sound file from the optical disk.

Copying Categories

You can copy an entire category of sound files from the current volume to the current catalog on the hard disk—

1. The categories on the current volume are listed at the bottom left of the Optical Disk Display. Drag the desired category name to the **Sound File** field at the top of the display.
2. If desired, click the **Info** button to display information about the selected category and the current catalog. You must click [CANCEL] in the dialog before continuing.
3. Click the **Copy Category** button. In the dialog that appears, indicate whether you want to copy, replace, skip or verify new files and existing files. New files are sound files that are not stored in the current catalog. Existing files are already stored in the current catalog.
4. Click [COPY] in the dialog to copy the specified files to the current catalog on the hard disk.

In the **Info** dialog, the total number of Sound Files and Entries cannot exceed 128, and the Total Sectors cannot exceed the Available Sectors. If you exceed these limits and continue copying, only files for which there is room will be copied.

Alternately, you can create a new subcatalog automatically. After you click the **Copy Category** button, as explained above, toggle the switch labeled "Put sound files in" to NEW SUBCAT. Name the subcatalog and set the options for new and existing files. When you click [COPY] in the dialog, a new large subcatalog is created as the current catalog. The size of the new subcatalog is equal to the size of the optical disk category, and can contain up to 128 entries in the directory.

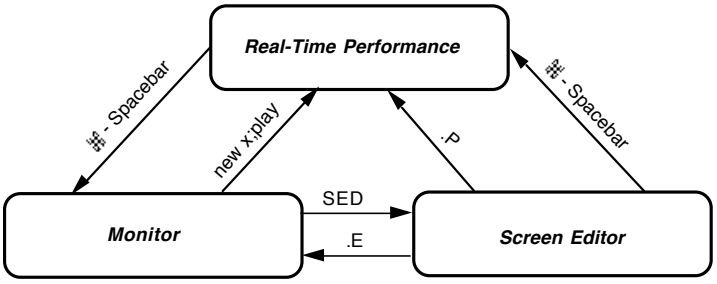
You can use the Shuffle Utility to increase the Largest Available Space in the current catalog.

Chapter 4
System and Utility Software

Monitor and Screen Editor

This chapter summarizes all Monitor and Screen Editor commands. For more detailed information, consult the special manual *Monitor and Screen Editor*.

You can move between the RTP system, the Monitor and the Screen Editor using the following commands.



Operating the Monitor

When the Ready prompt (Ready>) appears, the Monitor is active and ready for a command. The format for entering many Monitor commands is—

command <filename or treename>

Press the Return key to execute the command. You can abbreviate a command by typing just its first three letters. You can list multiple commands, separated by a ; (semicolon). For example—

old trumpet; **sav** F0:

recalls the file named "trumpet" and stores a copy of it on the superfloppy disk in drive F0.

Monitor Commands

TYPED COMMANDS	**.[A-Z]**	Recalls the command assigned to the selected letter, executes it and adds it to the command history file.
	.newdata	Name of a timbre file.
	.profile	The computer executes the profile file whenever the LOAD button on the floppy drive is pressed. Normally the profile file sets the software version and directs the computer to enter the RTP system immediately.
	.sq[n]data	Name and number of a sequence file.
	.system	Subcatalog file containing system software.
	,[A-Z]	Recalls for editing the command assigned to the selected letter.
	*	Add comments to a command file.
	caption	Enter the Caption Utility.
	catalog	Displays a short directory of the current catalog.

catalog of	Displays a short directory of the catalog specified.
catalog all	Displays a complete directory of the current catalog.
catalog all of	Displays a complete directory of the catalog specified.
catalog file	A short directory of the current catalog replaces the current file. The default name of this file is -cat.
catalog file all of	A complete directory of the catalog specified replaces the current file. The default name of this file is -cat.
catalog length	Displays a directory including file size and origin.
catalog snames	Displays a short directory of the current catalog in alphabetical order.
catalog all snames	Displays a complete directory of the current catalog in alphabetical order.
directory	Same as **catalog all snames** above.
catalog slength	Displays a short directory in order of length.
catalog stype	Displays a short directory in order of type (text, exec, data, etc.).
catalog sorigin	Displays a short directory in order of origin.
configur	Enter the Configur Utility.
do	Execute the commands in the command file.
drename	Change the name of a stored file.
enter	Make any catalog the current catalog.
formcopy	Enter the Formcopy Utility.
new	Create a new file.
old	Recall a stored file.
pause	Tell the command file to wait until you have pressed any key.
play	???
ready	Monitor prompt. Waiting for a command.
recall	Make a numbered sequence file current.
rename	Give the current file a new name.
replace	Replace the stored file with the current file.
run	???
save	Store a file to a subcatalog.
sed	Enter the Screen Editor.
set echo off	Do not view the commands in the command file as they are executed.
set echo on	View commands in the command file as they are executed.
set path	Tell the Monitor where to look for system software.
set prompt	Change the prompt to other text.
set rtp	Change the RTP system version.
set type	Set the file type.

show macros	Displays a list of macros defined from the Screen Editor.
show path	View the current system software path.
show prompt	View the current prompt.
show rtp	View the name of the current default RTP system.
show version	View the current configuration.
store	Save a numbered sequence file to a subcatalog.
tapecat	Enter the Tapecat Utility.
unsave	Erase a stored file.
write	Add text to a command file that appear as messages.

KEY COMMANDS

Ctrl-/	Search back for the last command containing the string.
Ctrl-A	Toggles between insert and overstrike mode. Also use the Delete key to return to insert mode.
Ctrl-D	Deletes one character to the right in insert mode, character at cursor in overstrike.
Ctrl-E	Deletes the remainder of a command to the right of the cursor.
Ctrl-G	Replaces all occurences of a string in the current command.
Ctrl-H	Moves cursor left one character.
Ctrl-I	Moves cursor forward to next word.
Ctrl-L	Moves cursor right one character.
Ctrl-P	Adds a semicolon and a single key macro command to the current command at the cursor.
Ctrl-R	Repeat last command.
Ctrl-W{1-Z]	Adds a semicolon and recalls command [A-Z] to current command at the cursor.
Ctrl-X	Deletes entire command line.
Ctrl-Y	Replaces the cirst occurence of a string in the current command. A dialog allows you to enter the desired original and replacement strings.

Operating the Screen Editor

The Screen Editor is a text editing tool. You enter the Screen Editor from the Monitor by entering the command **sed**. If there is a current text file in the Monitor, the file is displayed. If there is no current file, type the name of the file you want to edit, or press Return twice to open a new blank unnamed current file.

The **command column** is the vertical column of letter on the left side of the screen. The **text area** is the entire area to the right of the command column. It can display up to 22 lines of text. Use the cursor to enter the text area. The **query line** at the bottom of the display shows error and other messages. The **status line** below the query line displays current file information and editing mode.

Some Screen Editor commands can only be entered from the command column, some from the text area, and some from either location. Certain commands require you to enter information at the query line or to press terminal keys.

There are two editing modes. In the **append mode** (default mode) each typed character is inserted at the cursor. In the **overstrike mode** each typed character replaces the character at the cursor. To toggle between these modes, press Ctrl-A. The **adjust mode** (Ctrl-U) is a special editing mode for entering repetitive text quickly. To repeat text, type the text and then press an arrow key to duplicate it on the lines above or below.

You can assign frequently used commands to a single keystroke using the **macros** file. Use the following command format—

[character] space = space [command]

You can move the cursor to any position on the screen by pressing the following keys.

key	result
right arrow	move cursor right one character
left arrow	move cursor left one character
up arrow	move cursor up one line
down arrow	move cursor down one line
diagonal arrow	move cursor to command command
tab	move cursor to right one word
A-V	move cursor to line specified
[Ln]<return>	move cursor to line number specified
$	move cursor to last line of file

Summary of Commands

TYPED COMMANDS

.b	Move cursor to bottom of screen.
.c	Move cursor to center of screen.
.d	Delete a block of text. Text is temporarily saved in the safety buffer.
.e	Leave the Screen Editor and return to the Monitor. The current file remains unchanged.
.g	Global search and replace.
.m	Move marked text to new file.
.n	Create a new file.
.o	Recall a stored file.
.p	Make a script composition the current sequence and plays.
.r	Store the current file to disk.
.s	Display the first line of each buffer. (Return to the file display by pressing any key.)
.t	Move cursor to the top of the screen.

.u	Unsave a file.
.w	Copy marked text to new file.
.y	Selective search and replace.
.z	Change the current catalog.
.+	Insert the designated file after the current line.
!	Clear all buffers.
?	View the current catalog directory.
+	Insert a line after the current line.
-	Insert a line before the current line.
;	Restore deleted text. Cannot restore a single character or part of a line.
/	Search forward in the file.
****	Search backward in the file.
`	Search moves to the next appearance of the string.
.	Press twice to mark the beginning and end line of a block of text. Press four time to unmark the block of text. (First two periods unmark all but current line; second two periods unmarks current line.)
,	Copy marked text from one location to another.
=c	Turn search case matching off and on.
[	Place text into first buffer.
]	Copy text from first buffer.
<	Place text into second buffer.
>	Copy text from second buffer.
{	Place text into third buffer.
}	Copy text from third buffer.
&	Add marked text to the end of the buffer indicated.
#	Add marked text to the beginning of the buffer indicated.

KEY COMMANDS

Ctrl-A	Toggle between append and insert modes.
Ctrl-E	Erase all text to the right of the cursor.
Ctrl-U	Enter adjust mode.
Delete	Delete individual characters. Erase an entire line by pressing the Delete key while the cursor is in the command line

Printing

Any text file can be printed from the Monitor using the print command.

1. Recall the desired file by entering the command—

   old<filename or treename>

2. If you want the file printed without line numbers, enter the command—

   desequence

3. If you want to preview the first twenty-two lines of the file on the screen, enter the command—

   list

4. To print, enter the command—

   print

   or if you want to print selected lines—

   print [ln-ln]

To print a catalog directory, first create a file containing that directory and then print the file using the command cat f (and any other catalog modifier). Use the **save** command to store the file on disk. Use the print procedure described above to print the file.

If you want to print letters or more complex documents created or edited with the Screen Editor, use the Hform formatting program.

Utility Programs

The System Utilities Disk, one of the floppy disks you received from Synclavier Digital, contains a variety of programs. Some utilities, such as Formcopy, Resize, and Shuffle are used quite often. Others are used only if you are developing XPL programs, or if a problem occurs and you need to recover data or repair an optical directory.

Five of the utility programs (Configur, Formcopy, Resize, Shuffle, and Oprepair) are copied automatically onto your system hard disk during software installation. To initiate any of these programs, type its name at the Monitor's Ready prompt and press Return.

To initiate any other utility program, recall it from the System Utilities Disk and then use the Monitor **run** command. Save any utility programs that you use frequently to your system hard drive so that they are easily accessible.

Utility	Purpose
Caption	View, update and assign sound file captions.
Compare	Locate differences between two files of the same type.
Configur	Define the hardware configuration for system software.
Find	Search the files for characters in a string.
Formcopy	Format and copy files.
Listing	Display or print out files from any attached storage device.
Oplist	Display or print a list of files and categories on an optical disk.
Oprepair	Repair files after an optical disk write error.
Recover	Restore undamaged sectors of a defective floppy or Winchester disk.
Resize	Make a subcatalog larger or smaller
Shuffle	Rearrange files and subcatalogs to eliminate empty sectors.
Tapecat	Make changes to the catalog of files stored on a cartridge tape.

Formcopy Utility

Formcopy has two basic uses—

- Formatting storage device media
- Copying groups of files between storage devices

This program has many important uses for the system, but you should be careful when using it. Valuable data can be lost very quickly by initiating a format or copying files in the wrong direction by mistake.

Formcopy does not always warn you when you are about to erase large amounts of data. Use caution and double-check your settings before initiating a format or copy operation.

Formatting prepares certain types of media for storage of data. Formcopy can be used to format superfloppies, hard drives, magneto opticals, and Kennedy tapes.

When you format a piece of media, all data previously stored there (if any) is completely erased. You will need to format pieces of media such as floppy disks and magneto optical disks when you purchase them new. You can also use the format process to verify that older pieces of media are still usable and have not become damaged over time.

The following list summarizes what types of media require formatting and when you would most likely need to perform a format—

Media Type	When to Format
superfloppy disks	• before using brand new floppy disks • to verify that older floppies are still usable • if you receive data errors (beeping) when you try to recall or save files to a particular floppy disk
hard disks	• before using brand new hard disks • if you experience data reliability problems or errors (beeping) when using the hard disk
magneto optical disks	• before using brand new magneto optical media • if you want to completely erase the media so you can reuse it for saving sound files

When you format a hard disk device (W0 or W1), all hard disks that are part of that device are formatted. For example, if you have three hard disks chained together as your W0 device, all three of the disks are formatted by Formcopy.

If Formcopy informs you of an error or tells you that a piece of media is defective, do not use that media in the system or try to store any data to it. Contact your customer service representative for instructions on how to deal with the specific situation.

Formcopy can obliterate valued information very quickly. Double-check what you are doing before initiating nay sort of format operation.

Formcopy has several modes that are used to copy files to and from storage devices on the system. You can copy a single file, a series of selected files, or an entire catalog from one location to another.

To specify each Formcopy option, move the cursor to it and press the Spacebar until the desired setting appears. When you finish setting the source and destination, and the copy or format mode, press Return. The program prompts you to double-check your settings, then type OK and press Return again to initiate the desired operation.

Mode

Copy	Copies files from source to destination.
Move	Moves the files from source to destination, erasing the files from the source.

Format and copy	Formats the destination disk, then copies files from source to destination.
Format and move	Formats the destination disk, then moves files from source to destination.
Format	Formats the destination disk.

Source and destination

Source and destination options include some storage device attached to your system (W0:, W1:, F0:, etc.) and any subcatalog (CC—current catalog or AC—alternate catalog). Use the commands on the left of the screen to help you set up the catalogs you want.

The magneto optical device (O0) appears as a destination device only when the Format option is selected. Formcopy only formats the optical media. You must use the RTP to read or write sound files from or to an optical media.

Use the commands onl the left of the screen to help set up the source and destination catalogs you want—

Type "S" or "D" at any time to view a directory of the source or destination as the option is currently set on the Formcopy screen.

Type "A" and then a subcatalog treename to set that subcatalog among the source and destination options (AC). Note that AC might not appear as an option until you use the Spacebar to cycle through the selections again.

Type "I" to interchange source and destination options.

The device name T0 (tape zero) refers to the Kennedy tape drive, a device that is no longer available, but may be present in some older systems.

Select

If you set the Select option to "Yes," you can select which of the files in the source catalog you want copied. After you press Return to initiate the copy operation, a list of files appears. Use the arrow keys to move the cursor to each file you want to copy and press the Spacebar. Ther vertical bar changes to an arrow symbol when you select a file for copying—

unselected	selected for copying
|Song 1	>Song 1

You can also deselect files by moving to the file and pressing the Spacebar again; the arrow symbol changes back to a vertical bar and the file will not be copied.

Alphabetic

If you set the Alphabetic option to "Yes," source files will be copied to the destination in alphabetical order.

Erase

If you set the Erase option to "Yes," the destination disk or catalog will be erased before copying or moving files.

To quickly erase all files from a device or catalog, select that device to be the destination and set the Select and Erase options to "Yes." Then do not select any files for copying. The destination will be erased.

Configuration Utility

Configur Utility identifies the hardware configuration of your system so the software functions properly. System software is configured at Synclavier Digital for the particular set of hardware in your system. Whenever you upgrade your system, use Configur to reconfigure your software. For example, if you add a Winchester or an optical disk, reconfigure the system software so that the new device appears on the directories and displays.

Before using Configur, make sure you are in the top-level catalog of your W0: drive. To start Configur, enter the Monitor and type CONFIGUR, and then press Return.

Set configuration options by moving the cursor to the option and pressing Spacebar until the name of the hardware item or value desired appears. When you are finished, press Return. If the options are set correctly, type OK and then press Return again to initiate the reconfiguration.

Incorrect settings can make the system inoperable.

Terminal and Printer

If you have changed your terminal or printer, step through the options until the designation for your new equipment appears.

System and Current Device

The system device must be set to the device where your system software is stored. The current device is usually set to the same device as the system device.

Interfaces & Options:

Select “Yes” or “No” or a specific entry for each item listed.

Storage Devices:

Step through each storage device and select the appropriate entry.

Shuffle Utility

Shuffle Utility consolidates space on the Winchester disks by packing files and subcatalogs together so that all empty sectors are collected into a group. You can also rearrange the files so that specified files are collected into adjacent areas. Tape drives and optical disks cannot be shuffled.

To start Shuffle, enter the Monitor and type **shuffle**, and then press Return. Set Shuffle options by moving the cursor to the option and pressing Spacebar until the name of the desired option appears. When you are finished, press Return. If the options are set correctly, type OK and then press Return again to initiate the shuffle.

Storage Devices:

Select the Winchester disk that you want to shuffle.

Collect Mode: Yes or No

"Yes" allows you to specify which files to store contiguously. After you press Return, a screen appears from which you can select files. Move the cursor to each file in the order you want them to appear and press the spacebar.

unselected	selected for contiguous storage
|Song 1	>Song 1

You can review the order in which the files will be collected by pressing "R." the marked files are collected first in the order selected; then the remaining files are shuffled.

Resize Utility

Resize Utility makes the subcatalog larger for additional files or smaller to save disk space. You may be able to decrease the size of a subcatalog by a larger amount if it is first shuffled using the Shuffle Utility.

To start Resize, enter the Monitor and type **resize**, and then press Return. Type the name of the subcatalog you want to resize and press Return.

The screen displays the maximum increase or decrease (insectors) possible. Enter either the amount of increase or decrease or a new actual size. Use a plus sign (+) to indicate an increase. Use a minus sign (-) to indicate a decrease. If you want to indicate the actual size, just type the number of sectors.

When you finish, press Return. If the options are set correctly, type OK and then press Return again to initiate the shuffle.

Increase or Decrease Subcatalog Size:

Without moving:	the maximum increase or decrease possible without moving the files.
By moving:	the maximum increase or decrease possible if the files are rearranged.

If you know the catalog name and the amount of increase or decrease, you can resize the catalog from the Monitor without using the Resize Utility—

resize <subcatalog name> <+n, -n, or n>

Find Utility

Use the Find Utility to search for text files in the current catalog and all its subcatalogs. The search pattern can be a single character or a string of characters. It can include one or both of two "wild card" symbols—

- A question mark (?) in a search pattern stands for a single character. For example the search pattern "File ??" locates a group of related files such as FileAB, File TI, File JL.
- An asterisk (*) in a search pattern stands for a string of characters. For example, the search pattern "*" locates all text enclosed in quotation marks.

If the search pattern you want to locate contains either an asterisk (*) or a question mark (?), precede the asterisk or question mark with a slash (/) to mark it as a character in the search pattern rather than a wild card. For example, if you want to locate the string:

A*B use the search pattern A/*B

To start Find, enter the Monitor and type **find**, and then press Return. Type the search pattern, including any wild card characters, and press Return. All text files in the current catalog and all subcatalogs are searched.

At any time during the search you can press the Spacebar to see the file and line currently being search, or Control-Spacebar to stop the search.

If the Find Utility is installed in the top-level catalog of your system device, you can search for patterns in specificed files in your current catalog from the Monitor using the following syntax:

find <pattern> **-f** <filenames>

If no filenames are specified, all files are searched.

You can tailor your search in a number of ways.

1. Run the Find utility and press Return with*out* entering a search pattern.
2. A dialog appears asking if you need instructions. Type Y for yes or N for no.

   If you type Y, instructions for using the wildcard characters appear, plus a dialog requesting a search pattern.

   If you type N, only the dialog requesting the search pattern appears.
3. Type the search pattern, including any wild card characters, and press Return.
4. A new dialog asks you to specify desired options. Press ? and then Return to view the search and display options.
5. Select an option by typing the character that precedes it. Select more than one option by typing the appropriate characters without any spaces between them. Press Return.
6. A dialog requests the names of the files to search. Type the selected filenames separated by spaces. (Filenames can include wildcards.) Or type * to search all files in the current catalog. Press Return to begin the search.

Caption Utility

Caption Utility lets you view and update subcatalogs of sound file captions.

The eight-character sound file name carries a limited amount of information about the sound file—an abbreviation of the instrument and the pitch at which it was recorded, for example. Each sound file also has a caption, which describes the sound file further.

Sound file captions are listed in a Winchester text file. Often this file has the name "**-caption**," although you can assign it a filename. If you edit captions from the RTP, this file is updated automatically. If you are editing subcatalogs of sound file captions, you must use the Monitor and Screen Editor to view and update captions.

1. Enter the Monitor and type the name of the subcatalog to view.
2. Type CAPTION, and press Return.
3. Type **Y** to create and view a caption file.
4. Press Return to automatically create a caption file with the filename "**-caption**". You can also enter a specific filename or treename of the caption file to be created.

   The sound files and their captions are listed.

You can add up to 128 characters to a caption using the Screen Editor. After the captions have been edited, you must return to the Monitor to update the caption file.

1. Enter the Monitor and type the subcatalog whose captions are to be updated.
2. Enter the Screen Editor and edit the captions.
3. Enter the Monitor and type CAPTION, and press Return.
4. Type **N**.
5. Type **Y** to update the sound file captions.
6. Enter the filename or treename you used when creating the caption file.

Tapecat Utility

Tapecat Utility is for managing files stored on a Kennedy tape drive, a device no longer sold. Use the Tapecat Utility to—

- print the tape directory
- print all directory information
- alphabetize the directory
- unsave or rename a file on the tape

Never switch the power on or off while a tape is in the drive. Data on the tape may be destroyed.

To use the Tapecat Utility—

1. Load the tape cartridge into the tape drive.
2. In the Monitor and type **TAPECAT**, and press Return.

   A display of commands appears from which you can choose. Typing the first three letters of any command is sufficient to enter it.
3. Type **LOAD** to load into memory the catalog directory of the tape in the drive.
4. Type any other command as desired.

   If you enter the SORT, UNSAVE or RENAME command, you must enter the UPDATE command to update the catalog directory on the tape.
5. When you are done, type **QUIT** to return to the Monitor.

You can only copy files and subcatalogs to and from tape using the Formcopy Utility. Synclavier Company recommends using the Scotch Brand DC300XL data cartridge from 3M for the Kennedy tape drive. This cartridge hold approximately 15 megabytes of data.

Once files and subcatalogs have been stored on a tape, you should write protect it so that data is not lost. To protect a tape, turn the screw in the corner of the tape so that the arrow points to SAFE. When you want to copy more files onto the tape, turn the arrow so that it points away from SAFE.

Optical Disk Listing Utility

The Oplist Utility allows you to display and print out a variety of information about the files and categories on an optical disk volume. You can list only filenames, or filenames and categories, along with the file length in seconds and megabytes, the caption and a stereo and mono designation.

This information is stored in the .INDEX subcatalog on your Winchester. Each optical volume that has been previously loaded has an index file inside .INDEX. If you want to list the contents of an optical disk that has never been loaded into the system, you must first go to the Optical Disk Display (R-page) and update the index of the current volume. This creates an index file for this volume and stores it in .INDEX.

In the Monitor, type **oplist** and press Return. Enter the name of the index file assigned to the volume. Type Yes or No to set each of the following options—

Display File List:	"Yes" creates a list filenames only.
Display Category List:	"Yes" creates a list of categories and filenames.
Display all file information:	"Yes" creates a list containing all file information, including file length in seconds and megabytes, the caption and a stereo and mono designation.o
Send output to printer:	"Yes" sends a copy of the designated list to the printer. Be sure your printer is ready. "No" displays the list on the screen only.

You can halt the listing procedure at any time by pressing Control-Spacebar. If you diplay the list on the screen, you can stop and start scrolling by pressing the F15.

Listing Utility

Listing Utility displays or prints out files from any attached storage device. In the Monitor type LISTING, and press Return. Set each option by moving the cursor to the desired option and either pressing the Spacebar or typing to make an entry. When you are ready to display or view, press Return.

Storage Devices:	Select the storage device containing the files you want to display or print out.
Printer:	Select any printer, or select the terminal if you want the files printed out on the screen.
File Select:	"No" prints all files on the specified storage device in the order they appear. "Yes" allows you to select the files to be displayed or printed from a directory of the current catalog. After you press Return, a screen appears from which you can select files. Move the cursor to each file in the order you want them listed and press the spacebar. You can review the order in which the files will be listed by pressing **R**. Change the order by deselecting and selecting files as needed. Unselected files are preceded by a bar (|); selected files are preceded by an arrow (>).

Print Index Page:	"Yes" prints an index of files, including the page where each file begins and its length in words. The index also includs each Procedure, Insert, When, Library and Module statement, along with its page and line numbers.
Number of Copies:	Type the number of copies desired.
Page Length:	Type the number of lines you want on a page. Be sure to remain within the physical limits of the paper or printer in use.
Page Width:	Type the number of columns per page. Be sure to remain within the physical limits of the paper or printer in use.

Optical Disk Repair Utility

Optical Disk Repair Utility repairs files after an optical disk write error, which sometimes appears after you save or delete files on an optical disk—

Unable to write directory entry

If this message appears, you can use the Optical Disk Repair Utility to move the directory information to a new area of the disk. Running the Optical Disk Repair Utility decreases the amount of space available on the disk.

If you have to repair disks often, your drive may have an alignment problem. Please contact your N.E.D. Customer Service representative.

Run the Optical Disk Repair Utility only on disks that produce the above error message.

1. Insert the disk you want to repair into the optical disk drive and press the START/STOP button.
2. Enter the Monitor and type OPREPAIR, and press Return.

   The following message appears:

   Do you wish to repair this optical disk cartridge [Y(es) or N(o)]?
3. Type **Y** to begin the repair process, or type **N** to return to the Monitor without repairing the disk.

   If you wish to repair the disk, messages appear on the screen to indicate the status of the repair process. When the process is complete, the Ready prompt appears.

   If the disk cannot be repaired, an error message appears. Please copy the exact text of the message and contact your customer service representative.

Use a repaired optical disk only with Release O or updated Release N (revision date 6/21/88) or later software. Any other software will not recognize the repairs, and therefore will only be able to access files written before the disk was repaired.

Compare Utility

Compare Utility locates differences between two text files (script compositions or other text files) or data files (sound files, sequences, timbres).

In the Monitor, type **compare**, and press Return. Enter the first filename (or treename) and press Return (or press Return immediately if you want the first file to be the current file). Enter the second filename. Both files must be of the same file type. Continue to press Return to see the differences.When all the differences have been displayed, you are returned to the Monitor.

You can compare the current file to its stored version on disk by entering no filenames for either the first or the second file.

If the Compare Utility is in the top-level catalog of the Winchester, you can compare two files from the Monitor using the following syntax:

compare <filename 1> <filename 2>

Recover Utility

Recover Utility restores undamaged parts of defective sectors of a Winchester disk. When sectors of a floppy or Winchester disk are defective, you cannot recall any file stored on these sectors. The Recover program allows you to recover the undamaged parts of such a file. Text files are the easiest to reconstruct, but in certain cases it is possible to recover other types of files.

1. Enter the Monitor and type RECOVER, and press Return.
2. Type OK and press Return to continue.
3. Type the device name (without the colon) where the damaged file is located, and press Return.
4. Type the name of the file to recover, and press Return.

   As much of the file as can be recovered is written into the current catalog on the Winchester disk, or if the current catalog is on a floppy disk, into the top level catalog. When the recovery is complete, you are returned to the Monitor.

Printing

Each system includes two types of printer ports—one on the Macintosh and another on the Synclavier or DTD control unit.

Macintosh Printer Port

To use the Macintosh printer port for printing, the Macintosh modem port must be used for communicating with the Synclavier or DTD. Make sure the RS-232 cable connects the Macintosh modem port to the Synclavier or DTD TERMINAL port. In the TermulatorX menu bar, check the Terminal menu to make sure Modem (not Printer) is selected. Connect a Macintosh-compatible printer to the printer port on the back of the Macintosh.

You can stop printing at any time by clicking the trackball button.

Selecting the File menu **Copy** command (□-C) copies text from the current RTP display to the Macintosh Clipboard. Then you can use a word processing program to paste, edit and print the text.

You can also print the list of sounds shown in TransferMation's Librarian. Select the File menu **Save As Text** command to save the current list in a Macintosh text file. Then use a word processing program to open and print the text file.

Journaling

Journaling is a feature that captures text from the screen and saves it in a text file. For example, if journaling is on while you are running the Oplist Utility, the list of sound files on the selected optical disk is saved in a text file. Once the text is captured, you can use a word processing program to edit and/or print the text on a printer connected to the Macintosh printer port.

To turn on journaling, press ⇧ **Option-right del** (the Del key is above the arrow keys on the Macintosh keyboard). A dialog box asks you to name the Macintosh file you want to create. Output from the Monitor screen is then recorded into the file.

To turn off journaling, press ⇧ Option-right del again. The screen output is no longer recorded to the Macintosh file. To add more captured text to the same file, turn on jouurnaling again.

While journaling is turned on, you can also close the current file and open another. When you press ⇧ **Option-end**, the current file closes and a dialog asks for the name of the new file.

Synclavier/DTD Printer Port

You can print a copy of any RTP screen by using one of the commands listed below while in that display.

Display	Print Command
Sequence Directory Missing Sound File Display Patch Display (keyboard) Multichannel Display MIDI Display Extra System Commands	type P
Subcatalog Directory Patch Display (main screen) Project Directory DTD Track Display	press Control-P
Recorder Display Music Notation Display	type H
Sound File Editor (Display menu)	type N
FM Timbre Displays	move cursor to Hardcopy and press Return
Sound File Directory	click the P button
AEE Event List Editor panel	click “Set Edit Features” and then select “Print Page” or “Print All” from the dialog

To use the Music Printing Option, connect a graphics printer such as a postscript laser printer to the Synclavier PRINTER port.

You can use the Oplist Utility to print the list of sounds stored on an optical disk. You can use the Listing Utility to print the contents of files stored on other devices in your system.

You can also print any text file from the Monitor software module. In the Monitor, use the `old` command to recall the desired text file. At the Ready prompt, type `print` to print the entire file, or print [ln-ln] to print only selected lines.

If you want to print letters or more complex documents created or edited with the Screen Editor software module, use the Hform formatting program.

Diagnostic Programs

There may be times when you are unable to load your system using your regular Winchester bootload disk. This may be due to failure of the bootload disk or a problem with one of the hardware components in your system. Before you call customer service, read this section carefully.

Diagnostic Disks

Two floppy disks contain programs that can be used to help diagnose hardware problems in your system. Both disks have self-contained system software so that you can use either disk to load your system.

System Diagnostic Disk
Audio System Diagnostic Disk

Most of the diagnostic tests are designed to be run under the supervision of the customer service. Many system problems can be solved by running specific tests and reporting the results back to Synclavier Digital. A customer service technician may be able to walk you through the appropriate troubleshooting steps.

Since you may be using a diagnostic disk when your system is not working properly, you should make a copy of it and use the copy, not the original, to load the system.

Running a Diagnostic Test

Put the System Diagnostic Disk in the floppy dirve and press the LOAD button. The Diagnostic Display appears from which you can select specific tests. Synclavier diagnostic tests are listed. DTD diagnostic tests are accessed from DTDMENU.

To select a test, move the cursor to the appropriate test name and press Return. Or type the letter that precedes the name.

Diagnostic Tests

CONFIGUR	Configures the diagnostic disk to match the hardware in your system.
EXTMEM	Tests external memory, both M128K and M512K Dynamic RAM boards.
FLOPTEST	Tests the floppy drive and interface card.
GRAPHTST	Tests graphics printing.
KEYBOARD	Tests functions of the Velocity/Pressure keyboard.
LOGGER	Tests Synclavier system functions.
MAINMEM	Tests 60K or 63K of the main memory.

MEMBURN	Tests main memory.
METERTST	Tests DTD meter bridge display. Accessed only from DTD Menu.
MIDIST	Tests MIDI system.
MULTICHN	Tests Multichannel Distributor.
PRINTEST	Tests printer and printer interface card.
PSXMBT	Tests poly memory.
SMPTETST	Tests SMPTE board.
STARTUP	Tests storage capability of SCSI devices used with DTD. Accessed only from DTD Menu.

Audio System Diagnostics

Put the Audio System Diagnostic Disk in the floppy dirve and press the LOAD button. Enter the Timbre Directory. The Audio Testing Timbre Directory appears. Timbres stored in banks 1-4 are for testing the FM synthesizer voices. Timbres in bank 5 are for testing the polyphonic sampling voices.

For specific procedures on running these tests, call customer service.

Chapter 5
External Synchronization

Time Code

External synchronization locks the Synclavier and DTD to a timing signal produced by another machine. The external machine is the "master" and its time base determines the playback speed and location of the "slave" Synclavier or DTD.

The most reliable sychronization signal is SMPTE time code, a digitally encoded audio sync signal that keeps track of elapsed time using a 24-hour clock. SMPTE (Society of Motion Picture and Television Engineers) time code allows you to locate any point in a video picture, and play back a sequence or record in "sync" from that point.

Time Code Signal

SMPTE time code is expressed in terms of an eight-digit number (hours : minutes : seconds : frames). Each frame is further divided into 80 equal bits. This time code number serves as a point of reference for locating a particular event in time. User bits within the time code signal are reserved for information such as reel numbers, location codes, take IDs or dates. The Synclavier and DTD acknowledge user bits, but they do not use them.

The time code signal is usually recorded on a separate audio track of the video tape. This is called longitudinal time code (LTC), which can be read only when the video tape is in motion.

When you store a sequence the selected SMPTE mode and offset are stored with it. If you recall a sequence containing SMPTE information and change the mode or offset, you must store the sequence again in order to save the new SMPTE information.

VITC

Unlike longitudinal time code, VITC (Vertical Interval Time Code) is recorded within the video signal on tape. LTC and VITC contain the same address and user information, but VITC can be read at slow and still-frame speeds.

The Synclavier and DTD can accurately track the output of VITC readers, shaft encoders, tach-to-time code converters and other devices which can receive a signal and convert it to longitudinal time code.

Time code enters the SMPTE IN jack on the Synclavier or DTD control unit. When still-framing, the same frame address is repeatedly sent to the system in order to accurately read the time code.

Time Code Formats

The Synclavier and DTD support five time code formats. Each format can be recorded on audio or video media. Elapsed time is measured in frames per second (fps).

- Non-drop (30 fps). American black-and-white video uses a frame rate of 30 fps. The SMPTE frames column counts 30 frames, after which the seconds column advances and the frames column returns to zero.
- Drop-frame. American color video uses a frame rate of approximately 29.97 fps. To compensate for the .03 fps (108 frames or 3.6 seconds per hour) less than the black-and-white signal, the frames column counts 30 fps and then compensates for the additional frames by dropping frames in a regular pattern. The other columns advance in the same manner as Non-drop SMPTE.
- 30-frame NTSC. CMX lists which contain both drop-frame and non-drop frame source material can be conformed using the NTSC format.
- 25-frame (25 fps). European video uses a frame rate of 25 fps. The SMPTE frames column counts 25 frames before advancing the seconds column and returning to zero.
- 24-frame (24 fps). The film industry uses a frame rate of 24 fps. The SMPTE frames column counts 24 frames before advancing the seconds column and returning to zero.

Receiving Time Code

Time code enters the system through the SMPTE IN jack on the Synclavier or DTD control unit. If SMPTE is on, pressing START or RECORD does not automatically start the sequence. Instead, the sequence waits for the incoming time code to trigger playback.

If the incoming time code starts before the start of the sequence, the sequence waits for the SMPTE offset time before beginning. If the incoming time code starts after the start of the sequence, the sequence automatically advances to the correct time. Whenever the time code is stopped, fast forwarded or rewound, the sequence is automatically synchronized to the correct frame. If the tape containing time code has been wound a long distance, there may be some lag time before the sequencer catches up. The system can read time code signals at rates as slow as approximately one frame per second.

When triggering audio from the DTD tracks with incoming time code, the sync mode must be set to SMPTE. Once the parameters are set, all incoming time code is read in the selected format. If the system receives a signal that does not match the mode selected, an error message appears.

There are several ways to turn on SMPTE synchronization—

- In TransferMation, selecte the Settings menu **Synchronization...** command. In the dialog that appears, select SMPTE and choose the appropriate time code format.
- In the Sequence Editor, selecting **Settings** from the command list. In the dialog, set the Sync Mode switch to "SMPTE" and select the appropriate time code format.
- In the Audio Event Editor, display the Synchronization panel. Set the Synchronization switch to SMPTE and select the appropriate time code format. you can also click ON or OFF above the large time display in the AEE Selection panel.
- On panel 2 of the Synclavier keyboard, press and hold the SMPTE MODE button while you press EXT SYNC MODE to toggle SMPTE off and on. The display window shows the offset time and SMPTE mode.

Except for START and RECORD, all motion control buttons are inactive when the system is synchronized to time code. The MARK button is also inactive, although mark points remain in memory. When you finish synchronizing, remember to turn off SMPTE or the audio recorded on the DTD will wait for incoming time code.

When a time code signal is lost temporarily, the Synclavier calculates a speed from the last signals received and continues or "coasts" until valid time code signals are again received. To specify the length of time that the Synclavier will coast, select the Settings command on the Sequence Editor (the "S" page), and type a number (from zero to 5000 ms) in the "Coast Msec" field. After a loss of time code signal, the Synclavier may be slightly off from the time code. If you turn on the "SMPTE Resync" switch in the Settings dialog, the Synclavier resynchronizes, which may cause a slight interruption in the sequence. If "SMPTE Resync" is off, the Synclavier continues slightly off while preserving the integrity of the sequence.

SMPTE Offset

When synchronizing sound to picture, you may have many sequences each starting at a different picture time. The **SMPTE offset** is the SMPTE time at which the sequence begins. If the sequence begins at 00:00:00:00, then there is no SMPTE offset. The SMPTE offset time is saved with the sequence.

To assure precise synchronization of the first click of the sequence, there should be at least one second of preroll time code before the start time used for playback.

You can set the SMPTE offset from several places—

- From the AEE Synchronization panel, enter an offset time into the SMPTE OFFSET field, or use the Take button to take a time while the sequence is playing.
- In the AEE Selection panel, click the SET SMPTE button and type or take the SMPTE offset time; click DONE to enter the time.
- On panel 2 of the Synclavier button panel, press and hold the SMPTE MODE button while you press EXT SYNC MODE. The display shows the SMPTE offset and current SMPTE mode. Turn the control knob to increase time by frame bits. Turn the control knob while pressing the SMPTE MODE button to increase time by whole seconds.

You can sync any sequence time to any SMPTE time and automatically calculate the new SMPTE offset required to trigger the sequence. This feature is useful for such things as backtiming.

1. Click the COMPUTE SMPTE OFFSET button on the AEE Synchronization panel.
2. Select the DISPLAY TIME IN format. The SEQUENCE TIME field will change to the selected time format.
3. Type or take into the SEQUENCE TIME field the time you want to sync to.
4. Type or take into the SYNCS TO SMPTE TIME field the SMPTE time to which the sequence time is synced.
5. Click the COMPUTE SMPTE OFFSET button in the dialog to compute the new SMPTE offset time. The new SMPTE offset appears at the top of the panel.
6. When you are finished, click DONE in the dialog.

Display Offset

The **display offset** converts each time code address to a different time when it is displayed. This is similar to setting a mark point on a tape machine and then zeroing the tape counter at this point.

You define a display offset by locating a time in the sequence and assigning it a different time. The offset is the difference between the actual time and the assigned time. All other displayed times automatically change to reflect the offset.

The display offset can also be used to set a relationship between Feet:Frames and SMPTE by setting the point at which you want a Feet:Frames location to display a particular time code address.

Set the display offset from the AEE Synchronization panel.

1. Click the SET DISLAY OFFSET button.
2. Select the DISPLAY TIME IN format. The DISPLAYS field below in the dialog box changes to either SMPTE or Feet:Frames depending on the selection you make.
3. Type or take the current SMPTE time into the SMPTE TIME field.
4. Enter the time you want displayed into the DISPLAYS time field.

   The SMPTE OFFSET button reflects the amount of the display offset. The button lights when a SMPTE display offset is turned on. It does not light or show a box when there is a footage offset.
5. If you want to change the film format or frame rate, click the button next to the DISPLAYS time field that corresponds to the rate and format in which the time should be displayed.

The display offset is not calculated only if you enter a number into both the SMPTE TIME field and the DISPLAYS field.

The display offset is saved with the sequence. When you recall the sequence, the display offset is recalled automatically.

You can view time code with or without the display offset included by clicking the SMPTE OFFSET button on the AEE Synchronization panel. If the button is boxed, a display offset is set. If the button is not boxed, no display offset is set. If the button is highlighted, the display offset is turned on and the times include the amount of the display offset.

The display offset feature affects times shown in the RTP displays only. It does not alter times displayed in any TransferMation window.

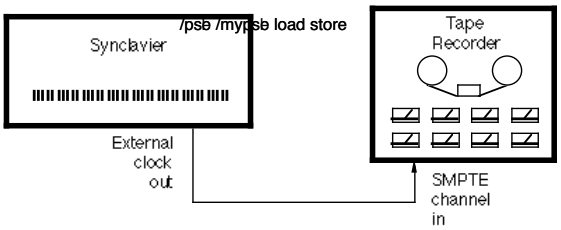
Computing Times

Given a time, you can compute its equivalent in any of the available time formats. For example, if you know the SMPTE time at which a cue occurs, you can calculate the equivalent start time in Measures:Beats, or vice versa. This function does not affect any other time field. It is used only as a calculator on the AEE Synchronization panel.

Click the COMPUTE EVENT TIME button at the bottom of the panel. Type or take the time that you want to find the equivalent for into the first time field. Toggle the second time field to a different time format. The equivalent times in the selected formats are shown. You can enter a time into either time field and its equivalent is calculated in the opposite field. When you are finished, click DONE.

Generating SMPTE Time Code

To record time code on tape, connect the EXTERNAL CLOCK OUT jack on the control unit to the time code input channel on the tape recorder. On video tape, record the time code signal on the address track. On audio tape, record on an edge track (highest or lowest track number) if possible. Try to leave a blank track between the time code track and other recorded tracks to avoid crosstalk. Avoid recording percussive signals on tracks adjacent to the time code track; crosstalk from the percussion signals may affect the time code signal.



There are two places from which you can generate a time code signal for recording—

- From the AEE Synchronization panel, click the **Generate SMPTE** button to turn the function off and on. Pressing any Macintosh key or clicking also turns it off.

- On panel 2 of the Synclavier keyboard, hold down the SMPTE MODE button while pressing START. Press the STOP button to stop.

Striping a Tape

To strip a tape (record time code onto tape) select the desired time code format and offset time. Place the tape recorder in the input or record mode (metering the input level). Begin generating SMPTE using one of the two methods described above. The SMPTE time code generator starts and time code is displayed. Except for the STOP button, all motion controls and other functions are inactive while the generator is running.

Set the record level on the tape recorder. On professional tape decks, a signal level of -10 dBvu is recommended when synchronizing at normal speeds. On semi-pro machines (narrower track formats such as half-inch or quarter-inch eight-track) a -3 dBvu level is recommended. If you anticipate playback at very slow speeds (for video spotting, for example), a higher signal level may be necessary to provide a better margin of error.

Stop generating SMPTE and start the tape recorder. Once the tape is running smoothly, start generating SMPTE as before. The SMPTE signal is now being recorded onto the tape. Continue recording the signal for a period of time equal to or greater than the duration of the sequence you want to synchronize. When you have recorded enough SMPTE signal, turn off the SMPTE generator and stop the tape recorder.

Some screen savers send a character to the Macintosh when the trackball moves. This stops the time code generator if it was started from the AEE Synchronization panel.

Recording and Playing Back with Time Code

Once the SMPTE parameters are set, you can synchronize the current sequence or DTD tracks to time code entering the system through the SMPTE IN jack.

Make sure SMPTE is activated and the correct SMPTE mode, offset time and display times have been set. If the time code signal is recorded on video or tape, select the **repro** or **play** mode on the video or tape recorder. Adjust the output level of the SMPTE track to equal or exceed the level at which it was recorded.

If you are recording a DTD track, set the track recording parameters andthe Mode and Trigger settings. This can be done from the AEE Record panel or the TransferMation Record panel. Begin recording and then start the SMPTE source. Recording starts and stops depending on the type of recording you have selected.

If you are recording a sequence, select a timbre for recording, and start the sequencer recording. Start the tape. When the incoming code matches the offset time, the sequencer begins recording.

You cannot place overall loops on the sequence, since overall looping is incompatible with SMPTE. Use independent loops on individual tracks instead.

When you play back a sequence while the SMPTE option is turned on, playback does not begin until the proper time code is received through the SMPTE IN jack.

MIDI Synchronization

MIDI clock signals can be used to synchronize the Synclavier sequencer to another sequencer. Either one can be the master sequencer; the other is the slave. When you start the slave sequencer, it waits for an external sync signal. When you start the master sequencer, it sends the sync signal.

Song Pointer

Unlike SMPTE time code, the MIDI clock has no absolute time values within the signal. However, you can use the MIDI song pointer to mark a locate point in a sequence. The Synclavier can send and receive a MIDI song pointer message.

Receiving MIDI Sync

MIDI clock signals can be received by either the MIDI IN or MIDI AUX port of the standard MIDI module in your system. If you system has more than one MIDI module, only the first module has active IN and AUX ports.

If your system incluces the MIDInet© option, MIDI clock signals can be received by andy MIDInet input specified in the MIDInet window.

There are several ways to turn on MIDI synchronization—

- In TransferMation, select the Settings menu **Synchronization...** command. In the dialog that appears, select MIDInet, MIDI In or MIDI Aux.
- In the Sequence Editor, select **Settings** from the command list. In the dialog, set the Sync Mode switch to MIDI In or MIDI Aux.
- In the Audio Event Editor Synchronization panel, set the Synchronization switch to MIDI In or MIDI Aux.
- On panel 2 of the Synclavier keyboard, repeatedly press EXT SYNC MODE until the display window shows Internal Sync. Then hold down the EXT SYNC MODE button while you repeatedly press the MIDI button on panel 5 to set the mode to MIDI In or MIDI Aux.

The DTD derives its sampling rates from the synchronization signal. Because the MIDI clock is not accurate enough to guarantee reliable sampling rates, MIDI clock signals are not recommended when synchronizing the DTD.

Synchronizing to Audio Tape

You can synchronize a sequence, cue list or DTD project to an external source using external synchronization modes other than SMPTE.

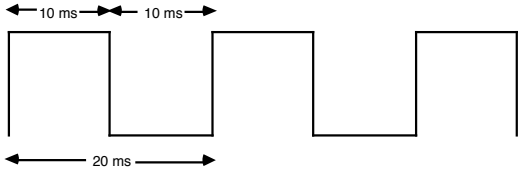
The 50Hz and Beat Sync Modes

The sequencer is normally set to the internal synchronization mode. Two modes are available for synchronizing the current sequence to audio tape.

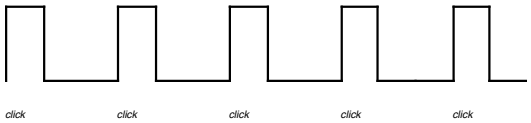
- The 50 Hz mode synchronizes the sequence to a series of pulses at a frequency of 50 pulses per second. Each pulse is 10 milliseconds wide.
- The beat sync mode synchronizes the sequence to a pulse with a frequency determined by the current click rate and click rate multiplier settings. Each pulse is 15 milliseconds wide.

You can generate either of these signals for recording into the sync track of a multitrack tape recorder. You can then feed the taped signal back into the Synclavier and record a sequence synchronized to the tape recorder.

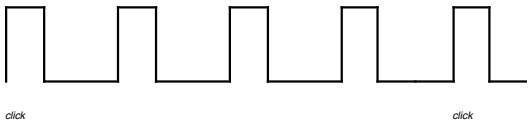
50 Hz signal with 10 ms duty cycle



beat sync signal, click rate multiplier=1



beat sync signal, click rate multiplier=4



FSK Encoding

The selected pulse (beat sync or 50 Hz) is automatically generated at the EXTERNAL CLOCK OUT jack on the Synclavier or DTD control unit whenever START is pressed. The outgoing signal, DC voltage switched on and off, must be fed through an FSK (frequency shift key) encoder which converts it to a signal that can be recorded on tape. FSK signals recorded on tape can then be decoded to produce reliable sync pulses that can be sent to the EXTERNAL CLOCK IN jack on the Synclavier or DTD control unit.

The pulse signals received through the EXTERNAL CLOCK IN jack trigger the current sequence—

- When a 50 Hz signal is received, the sequence moves forward at a steady rate. While using 50 Hz synchronization, you can make changes in the speed, click rate and click rate multiplier settings just as you would when the sync mode is set to internal sync.
- Beat sync mode requires one pulse per quarter note. If your sync source produces multiple pulses per quarter note, use a pulse divider to reduce the rate to one pulse per quarter note. When a beat sync pulse is received, the sequence advances one click or click rate division, depending on the click rate and click rate multiplier settings. The speed setting determines the rate at which the sequence advances between clicks.

When using the beat sync mode, the rate of the beat sync pulse should match the click rate of the sequence being synchronized. If it does not, each incoming pulse may trigger several notes simultaneously, or none at all.

There are several ways to turn on the external synchronization modes—

- In TransferMation, select the Settings menu **Synchronization...** command. In the dialog that appears, select "Beat" or "Ext 50 Hz."
- In the Sequence Editor, select **Settings** from the command list. In the dialog, set the Sync Mode switch to "Beat" or "Ext 50 Hz."
- In the Audio Event Editor, display the Synchronization panel. Set the Synchronization switch to "Beat" or "Ext 50 Hz."
- On panel 2 of the Synclavier keyboard, press the EXT SYNC MODE button until it lights (for 50 Hz mode) or blinks (for beat sync mode). When the button is off, the sequencer is set to internal synchronization.

Synchronization Overview

When you synchronize the system to tape, you need tape machines capable of recording and playing tracks independently. Three-head machines must have a sync mode which allows the use of the record head as a play head.

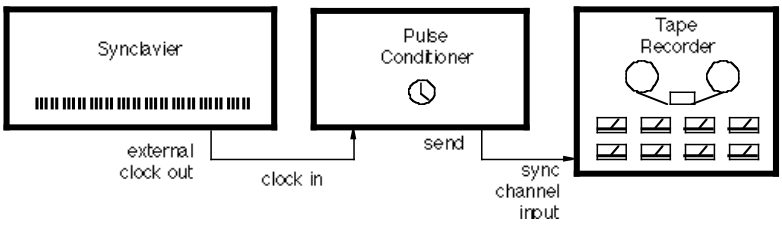
Synchronizing the Synclavier to audio recorded on tape can be done from either the Sequence Editor or, if you have a Synclavier keyboard, the keyboard control panel. Each step of the procedure outlined below is discussed in detail further on.

1. Select the 50 Hz or beat sync synchronization mode by pressing EXT SYNC MODE once or twice.
2. Connect the EXTERNAL SYNC OUT jack through a pulse conditioner to the sync input channel of the tape recorder.
3. Record a sync track on tape that is as long as the sequence you want to synchronize.
4. Feed the sync channel output of the tape recorder into the EXTERNAL CLOCK IN jack on the Synclavier.

continued next page

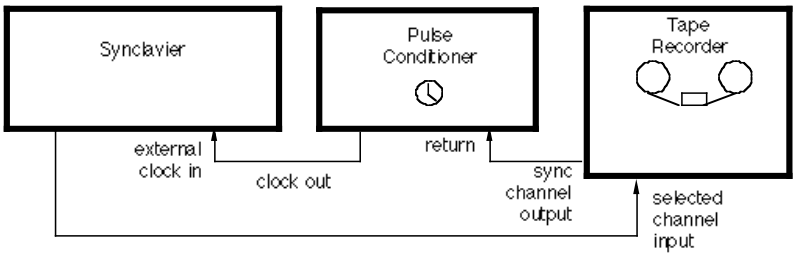
5. Press RECORD. The sequencer waits for the incoming sync signal.
6. Start the tape recorder. As soon as the signal is received at the EXTERNAL CLOCK IN, the digital metronome begins and you can start recording. When the external signal stops, the sequence stops.

The following shows how to set up for recording a sync track on tape—



- Synclavier EXTERNAL CLOCK OUTto the pulse conditioner CLOCK IN.
- Pulse conditoner SEND to TAPE INPUT of the sync track channel.
- Set the tape recorder sync track channel to record mode.

The following shows how to record Synclavier tracks synchonized to tape—



- Synclavier audio output(s) to tape recorder selected channel input(s). If the selected timbre is a stereo timbre you will need two tracks to record the stereo information.
- Tape recorder sync track output to FSK decoder input.
- FSK decoder clock output to Synclavier EXTERNAL CLOCK IN.

Recording a Signal to Tape

Set up the tape recorder or other pulse conditioner and the Synclavier as described on the previous page. To listen to the playback, send the sync pulse to the EXTERNAL CLOCK IN jack. Press the EXT SYNC MODE button once to select the 50 Hz mode and twice to select the beat sync mode, and then press START on the control panel. If you are recording a 50 Hz signal, the signal is sent from the EXTERNAL CLOCK OUT jack. If you are recording a beat sync pulse, the beat sync pulses with a frequency equal to the click rate of the sequence (or the click rate times the click rate multiplier, if used) are sent from the EXTERNAL CLOCK OUT jack. The signal is sent through the pulse conditioner to the sync channel input on the tape recorder.

Set the recording level on the tape recorder low enough so that the signal does not bleed onto other tracks (usually -5 to -10 dBvu). Press STOP, and start the tape in the record mode. Let the tape get up to speed, allow the low FSK tone to record for 5 seconds, and then press START on the control panel. The 50 Hz or beat sync pulse is recorded on the tape as long as the sequencer is running. Continue recording until sufficient signal is recorded for the entire sequence to be synchronized, and the press STOP on the control panel.

Playing Back a Sequence Synchronized to Tape

Connect the recorded sync track output through the FSK decoder to the EXTERNAL CLOCK IN jack on the control unit. Place the sync track's channel in the **sync** mode when recording on tape or the **play** mode for final playback and mixing, and press START on the control panel and play the tape. Adjust the FSK decoder for adequate input trigger level. The sequence begins playing when the sync track reaches the encoded sync signal (50 Hz or beat sync).

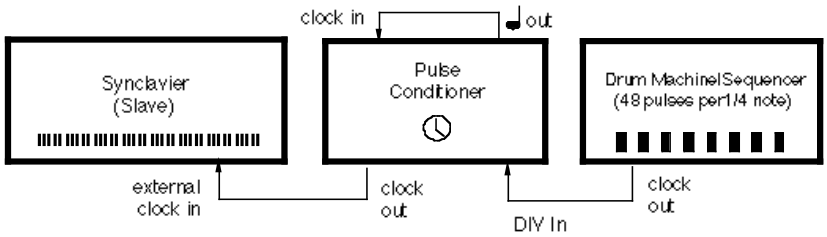
Recording Synclavier Tracks to Tape

1. Place the tape recorder in **sync** mode and the selected **input** track(s) in the input mode. Make sure the tape is rewound to a point prior to the beginning of the low FSK tone.
2. Select the internal sync mode (unlit) with the EXT SYNC MODE button.
3. Solo the track to be recorded, press START on the control panel and set the recording level(s) on the tape recorder.
4. Press STOP on the control panel.
5. Press the EXT SYNC MODE button once or twice to select the appropriate external sync mode (50 Hz or beat sync).
6. Start recording on the selected channel. Watch the VU meter of the sync track. When the low FSK tone begins, press start on the control panel.
7. When the sequence is finished playing, stop the tape recorder and press STOP on the control panel.

Synchronizing to High Speed Clock Signals

Many sequencers and drum machines generate a high speed clock signal. This signal is usually a multiple of the click rate and is defined in pulses per quarter note. Common time bases are 12, 24, 48 or 96 pulses per quarter note beat. When synchronized to the Synclavier, such systems must be set up as the master system. The sync signal from the system must be divided using a pulse divider.

To play or record a sequence synchronized to a drum machine or sequencer place the Synclavier in the beat sync mode by pressing EXT SYNC MODE button twice to make it blink. Press START, and then start the drum machine or sequencer. Each beat of the sequence in the drum machine or sequencer triggers a beat in the sequencer.

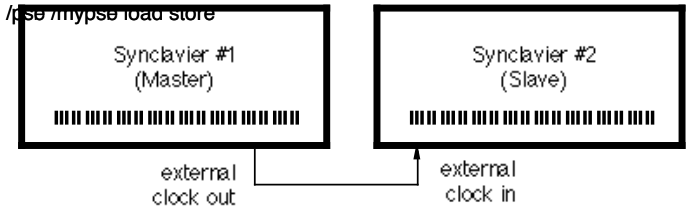


- Drum machine or sequencer time base output to the pulser divider input.
- Pulse divider output to the Synclavier EXTERNAL CLOCK IN.

Synchronizing Two Sequencer Systems

Select the appropriate 50 Hz sync mode on both the slave system and the master system. Start the slave system and then start the master system. When you start the slave system, it waits for an external signal. When you start the master system, it emits a sync signal through its clock output. The systems play in synchronization.

When one of the two systems is a Synclavier, new tracks may be recorded in the sequencer while the systems are synchronized. The new tracks are automatically synchronized to the original sequence.



- The Synclavier #1 clock output is sent to the System #2 clock input.

Drum Replacement

You can replace or augment a recording of an acoustic percussion instrument with any of the timbres of the Synclavier using the technique of drum replacement. Use the buttons on the **Synclavier keyboard panels**.

External Trigger

Before initiating the drum replacement procedure, you must select the external trigger mode by pressing and holding EXT SYNC MODE button while you press START. To turn external trigger off, press and hold the EXT SYNC MODE button while you press STOP.

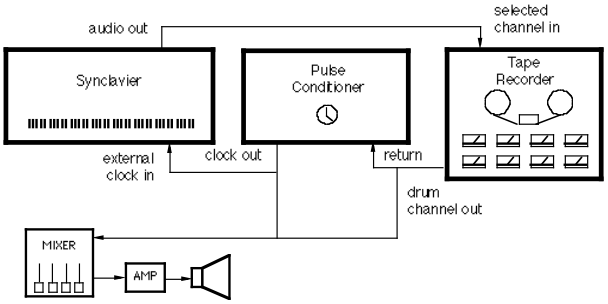
The external trigger mode is one of four modes of the EXTERNAL CLOCK IN jack. In order for the drum replacement technique to work, all of the other modes must be turned off. If you **have not** been using the external synchronization, external click or external repeat modes, then the single step above is sufficient to turn on the external trigger.

If you **have** used any of these other modes or are not sure, you must turn them off. First make sure the EXT SYNC MODE button is unlit. Then press the CLICK RATE button, and if the display window shows EXTERNAL CLICK, press the EXT SYNC MODE button. Now press the RATE button, and if the display window shows EXTERNAL REPEAT, press the EXT SYNC MODE button. All other modes are now turned off.

Replacing a Taped Drum Sound

Use the drum replacement technique to replace a live drum recorded on tape with a Synclavier timbre.

1. Record the live drum onto one track of a multitrack tape recorder.
2. Feed the signal of the drum track through a pulse conditioner into the EXTERNAL CLOCK IN jack of the Synclavier control unit, and adjust the pulse conditioner.
3. Select the external trigger sync mode.
4. Select the desired Synclavier timbre and play a note on the Synclavier keyboard.
5. Play back the drum track of the tape recorder. Each pulse of the drum retriggers the note played on the Synclavier, replacing the rhythmic pattern of the tape drum sounds with the Synclavier timbre.

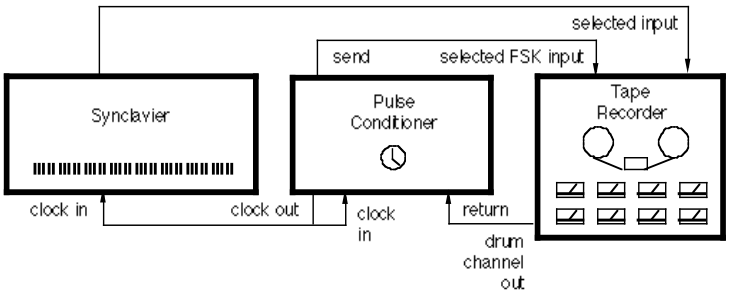


- Taped percussion track output to pulse conditioner RETURN.
- Pulse conditoiner CLOCK OUT to sound system audio input (for verification of audio-to-pluse conversion).
- Taped percussion track output to sound system audio input (for comparison with pulse verify conversion).
- Synclavier audio output to selected track of tape recorder.

Recording a Percussion Sound

You can record the converted percussion sound directly to tape by connecting the audio output of the Synclavier to the selected input channel of the tape recorder. You can simultaneously record FSK encoded percussion pulses on the tape recorder. To do this, add the connections shown below.

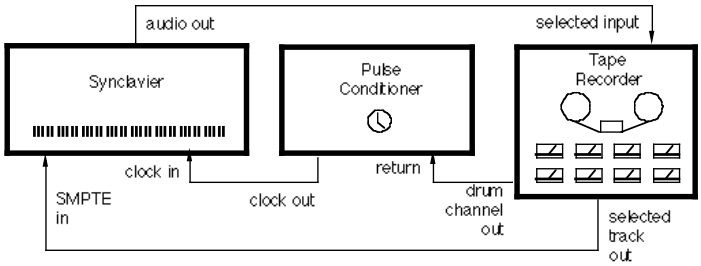
Tape playback should be in the sync mode (monitoring the record head) so that the attacks are recorded in sync with the rest of the tracks.



- Using a Y-connector or patch bay tie ine, send the pulse conditioner CLOCK OUT to both the Synclavier EXTERNAL CLOCK IN and the pulse conditioner CLOCK IN.
- Connect pulse conditioner SEND to the selected tape track input.

You can also record the drum track with the Synclavier timbre directly into the sequencer. If you do this, use SMPTE synchronization so that the new drum track precisely matches other music recorded on tape.

Set up the Synclavier, the pulse conditioner and the tape recorder as shown below. Select the appropriate SMPTE mode and enter the desired offset time. Feed the SMPTE signal to the SMPTE IN jack on the Synclavier. Rewind the tape and place all taped tracks in the **repro** mode (monitoring the play head). Now press the RECORD button and start the tape in the playback mode.



- Connect Synclavier audio out to selected channel in of tape recorder.
- Connect tape SMPTE OUT to Synclavier SMPTE IN.
- Connect drum channel output to pulse conditioner RETURN.
- Connect pulse conditioner CLOCK OUTto Synclavier EXTERNAL CLOCK IN.

External Click Tracks

You can use a sync pulse or percussive signal from an external source to control the click while recording on the Synclavier.

You cannot use the external sync mode if you have activated the tempo/meter mapping feature of the sequencer.

External Click

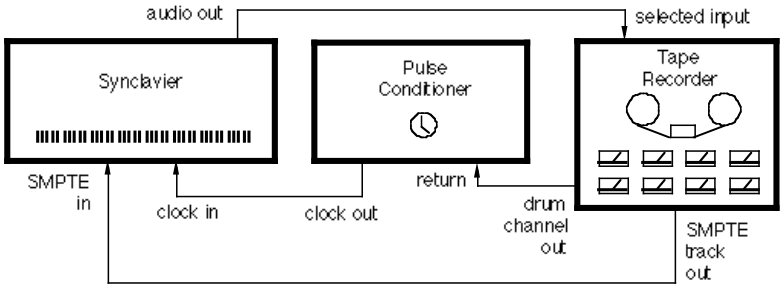
Before using an external signal for a click track, you must select the external click mode. To turn it of and on, press the CLICK RATE button while you press EXT SYNC MODE. (Make sure the external synchronization function is turned off before you turn external click on.)

You can also select the external click mode from the Sequence Editor. Click **Settings** in the Sequence Editor command panel and step the Beats/Min swtich until Ext Click is displayed. To turn external click off, step the switch to another selection.

Recording an External Click Track

You can record any of the previously described external clicks onto a sequencer track. You can also justify a recording to a click of variable tempos.

1. Set up the Synclavier, pulse conditioner and multitrack recorder as shown below.
2. Select the appropriate SMPTE mode and enter a SMPTE offset time.
3. Press and hold EXT SYNC MODE button while you press START to select the external trigger mode.
4. Select a Synclavier timbre for the click track and play a single note on the keyboard.
5. Select a track and start recording in the sequencer.
6. Start the sources for the SMPTE signal and the external click to record the click into the sequencer.

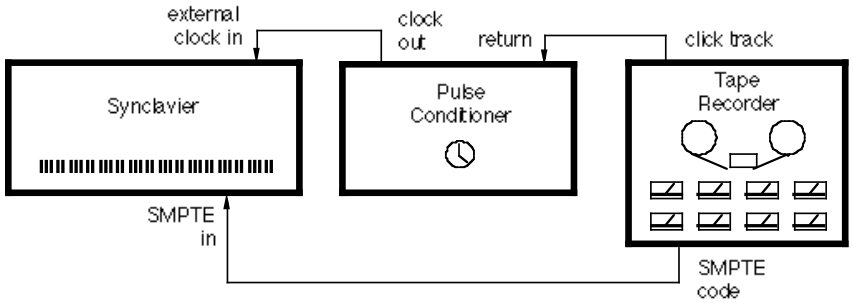


Recording a Sequence to an External Click

You can record a sequence into the sequencer using the signals from SMPTE-driven metronome, a drum machine or a live drum sound recorded on tape as the click track.

1. Feed the signal of the external click track through a pulse conditioner into the EXTERNAL CLOCK IN jack on the Synclavier control unit and adjust the pulse conditioner.
2. Select the external click sync mode.
3. Select the appropriate SMPTE mode and offset time.
4. Feed the SMPTE signal into the SMPTE IN jack on the Synclavier control unit.
5. Start the sources of the external click track and SMPTE.
6. Record the sequence in the justified mode.

You could also record the external click onto a track in the sequencer and then use that track as a click track to synchronize additional tracks recorded into the sequencer.



Turning Off the Digital Metronome

If you want to record a sequence using a click that has been recorded onto a click track, you must turn off the internal digital metronome. This can be done from the Synclavier keyboard button panel or the Sequence Editor.

From the button panel, press and hold the CLICK RATE button and the appropriate TRACK SELECT button. Press and hold the TRACK VOLUME button while you press the same TRACK SELECT button. Then use the control knob to set the track volume to zero.

From the Sequence Editor, select the Settings command and set ON to OFF. Step BEATS/MIN to Click Trk and step the track number to the desired track.

When you start recording or playing back, the Synclavier emits a click for every note recorded on the selected track. The click numbers in the lower half of the display window follow the click track. The sound originally recorded is not heard.

External Repeat and Arpeggiate

You can control repeating notes and/or arpeggiating chord with external signals.

External Repeat Mode

Before performing or recording with the repeat and arpeggiate functions controlled by an external signal, you must select the external repeat mode. Press and hold the RATE button while you press EXT SYNC MODE to turn the external repeat mode off and on.

The external repeat mode is one of four modes of the EXTERNAL CLOCK IN jack. In order for this technique to work, two of the other modes must be turned off. If you **have not** been using external synchronization or the external click modes, then the single step explained above is sufficient. If you **have** used either of these modes or are not sure, make sure that the external sync and the external click modes are turned off.

Performing or Recording to Tape

1. Feed the external signal through a pulse conditioner into the EXTERNAL CLOCK IN jack of the Synclavier control unit.
2. If the signal is a live drum recorded on tape, adjust the pulse conditioner as explained in the section "Drum Replacement."
3. Select the external repeat sync mode.
4. Press REPEAT or ARPEGGIATE or both, as desired.
5. Play on the keyboard. Each incoming pulse triggers the next note when the repeat function is turned on; each pulse triggers the next note of the chord when the arpeggiate function is turned on.

Using the External Repeat with the Sequencer

The external repeat function can be used with the sequencer provided SMPTE synchronization is also used. You need a SMPTE metronome or some other source of SMPTE and trigger pulses that are synchronized.

Feed the trigger pulse into the EXTERNAL CLOCK IN jack and the SMPTE time code into the SMPTE IN jack. Record into the sequencer using SMPTE. Feed the repeat/arpeggiate pulses into the Synclavier during playback as well as record.

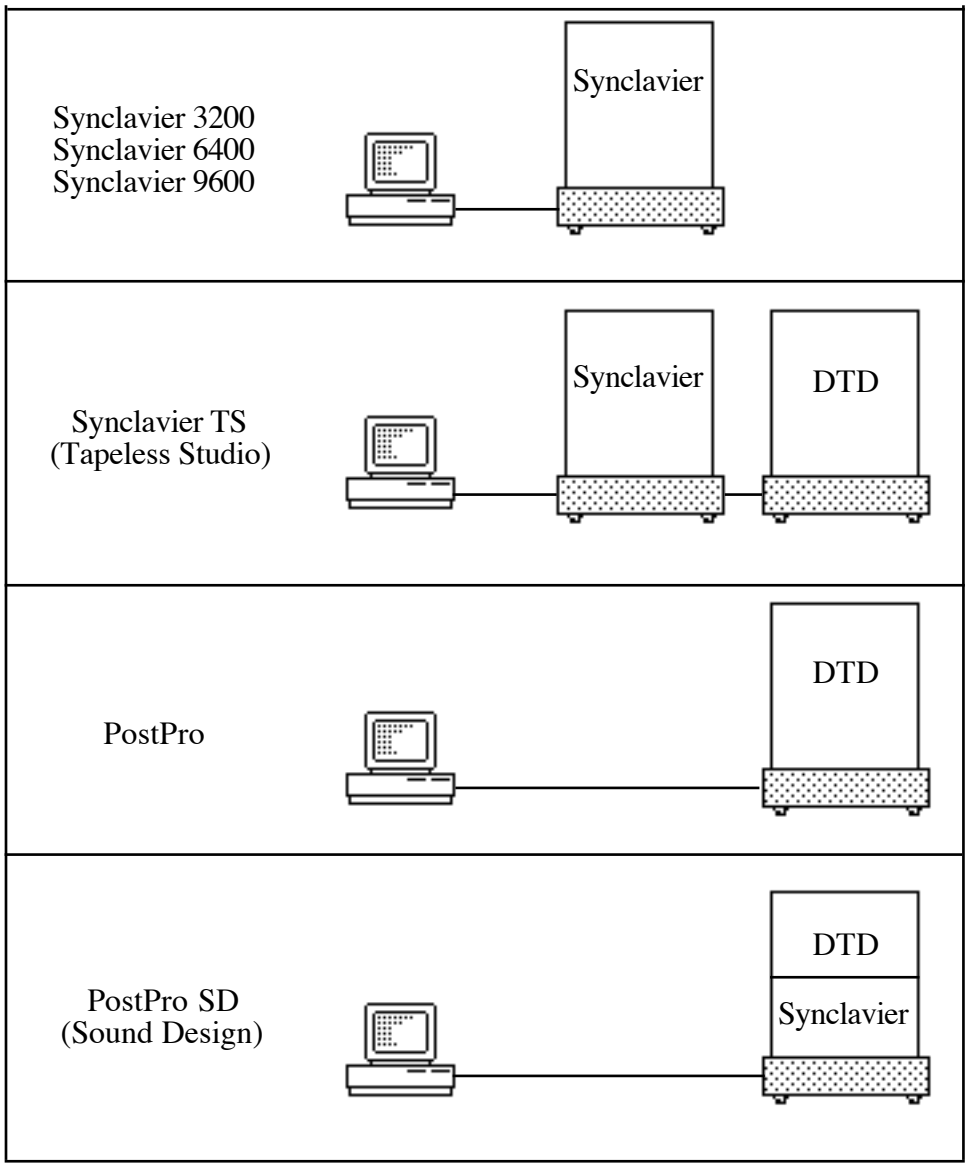
Chapter 6
Hardware Specifications

System Overview

Synclavier Digital sells systems in a variety of hardware configurations. Although these systems can differ greatly in capability and size, they have some general things in common.

System Configurations

All Synclavier Company systems have a Macintosh computer, which is attached to a Synclavier computer, a Direct-to-Disk (DTD) computer, or a combination of both. The diagram below shows the hardware layout of the most common configurations.



System Maintenance

Every Synclavier Company System has been designed to withstand the rigors of continual use, both on the road and in professional studio envionments. As with all sophisticated electronic equipment, however, proper care must be taken in the installation, shipping and handling of your system.

Maintenance and Service

Synclavier Company holds periodic training programs for studio operators and technical personnel. However, before performing routine maintenance or undertaking any repair, all customers are strongly advised to contact an authorized Synclavier Company Support Services representative. A complete list of our worldwide sales, service and training offices is in the back of the manual.

Never attempt to open the system with the power on. Major operating problems may be created by careless disassembly and reassembly of the unit. Synclavier Company technicians are trained to troubleshoot system problems quickly and efficiently. If you experience a problem, call your nearest Synclavier Company Support Service.

When you request a service visit, be sure you back up all vital media prior to the arrival of the service personnel. If you wait until the service personnel arrive to begin backup, you will be billed for Time and Materials plus Waiting Time.

Shipping and Handling

Always consult with Synclavier Digital Shipping Department (603/448-5870) before shipping any hardware. Proper care in packing is essential for all systems. Any unit supplied with a flight case must always be transported in the flight case. Studio units with doors should always be transported with the front (power on/off) side facing down. Units housed in wooden or ATS case enclosures should always be transported with the front (power on/off) side facing up. Units housed in wood must be properly wrapped in padding. Be sure that adequate personnel are available to pack and unpack the unit.

The unit must be shipped by air freight or “air ride” trucks equipped to handle precision electronics equipment. Never transport the unit via a commercial freight forwarder.

The hard disk drives included in your system are extremely sensitive. Rough treatment can result in severe damage to the units, platters and heads as well as unrecoverable loss of your valuable data. Never remove a hard disk unit from the special protective case it is shipped in. We strongly advise that you back up all essential data to floppy or data cartridge before moving any hard disk.

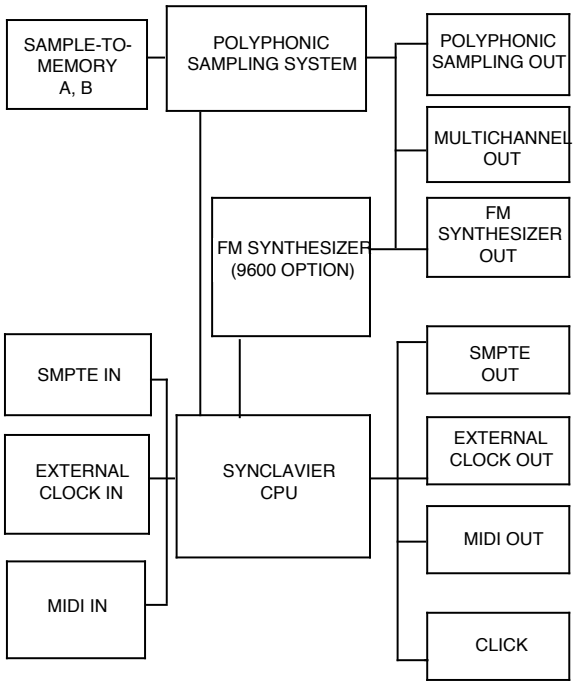
Synclavier Technical Data

The Synclavier control unit contains Synclavier Digital ABLE computer. In addition to the signal processor, the unit contains memory boards for storing information and voice cards for playing back sounds.

The unit has connectors for the keyboard, hard disks and floppy drives, the terminal and a printer. Other connectors are used for polyphonic sampling, FM synthesis and synchronization.

Depending on the configuration of your system, the control unit also may include the Sample-to-Memory (STM) module, MIDI and SMPTE interfaces, the Multichannel Distributor.

Synclavier Signal Flow Chart



Cooling and Ventilation

To assure proper ventilation, the front vents must be unobstructed. The air exhaust fans on the back of the unit must be clear and at least six inches from the wall. Exhaust air should be vented away from the unit and not allowed to recycle through the front vents.

Operating temperature	42–75° F
Storage temperature	32–110° F
Operating humidity	20–80%, non-condensing
Storage humidity	8–80%, non-condensing

Power Requirements

	Synclavier 9600	**Synclavier 6400 or 3200**
Circuit	120-volt, single-phase, 60 Hz, independent isolated ground branch circuit fused at 30 amps	120-volt, single-phase, 60 Hz, independent isolated ground branch circuit fused at 15 amps
Plug	30-amp, 120-volt twist lock of the National Electrical Manufacturer's Association L5-30 code male style	15-amp, 120-volt code male style
Power consumption	2160 watts	785 watts
BTU output	13000 BTU/hr	5000 BTU/hr

Audio Input Specifications

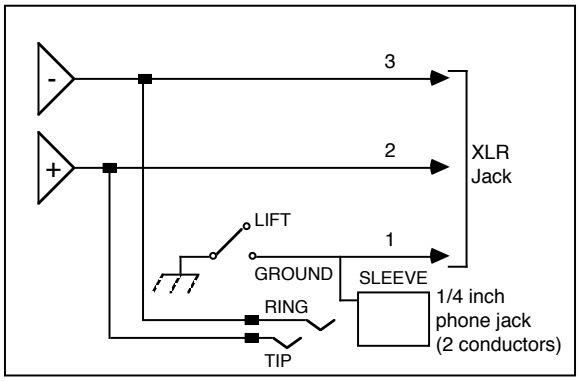
	Synclavier 9600, 6400, 3200
A/D inputs	16 bits/channel, linear quantization
Impedance	200 kΩ balanced 100 kΩ unbalanced 20 Hz to 20 kHz
Gain	Programmable, -3 to +28 dB in 1 dB steps ± -0.05 dB accuracy @ 1 kHz
Sampling rate	Programmable, 1 to 100 kHz in 0.1 kHz steps
Frequency response	+0.5 dB, -1.0 dB, 20 Hz to 20 kHz
THD	< 0.02% at +4 dBm, 20 to 20 Khz @ 50 kHz
IMD	not specified
Signal-to-noise ratio	94 dB minimum, gain =0 dB, 20 Hz to 20 kHz
Crosstalk	< -90 dB minimum, channel to channel

Audio Output Specifications

	Polyphonic sampling composite outputs	FM composite outputs	Multichannel Distributor outputs
Connector	Electronically balanced XLR or 3-conductor 1/4" phone	Electronically balanced XLR	Electronically balanced XLR
Impedance	100 Ω balanced 50 Ω unbalanced 20 Hz to 20 kHz	660Ω balanced 330Ω unbalanced 20 Hz to 20 kHz	100 Ω balanced 50 Ω unbalanced 20 Hz to 20 kHz
Level, balanced	+4 dBm nominal +19 dBm maximum		-9.5 dBm nominal, 600Ω -16 dBm balanced, no load -15.5 dBm unbalanced, 600Ω -19 dBm unbalanced, no load
Frequency response	+0.5 dB, -1.0 dB, 20 Hz to 20 kHz		
Gain	-1 dB for 1 voice peak amplitude +3 dB per every doubling of voices		-26.5 dB

Ground lift switch wiring

XLR Pin 1 connected to chassis ground when switch is up. Pin 1 of interconnecting audio cables not connected to connector housing.



Synchronization Specifications

	SMPTE In	External Clock In	MIDI
Type	Balanced transformer coupled	TTL	MIDI clock or song position pointer
Impedance	10 kΩ	4 kΩ	standard MIDI
Level	-32 dBm minimum -10 dBm nominal	3 volt minimum for ON state	standard MIDI

	SMPTE Out or External Clock Out	Click out
Type	TTL	Balanced 10 ms pulse
Impedance	1 kΩ	100 Ω balanced 50 Ω unbalanced
Level	0–5 v	pin 2 to ground: 0–3.5 v pin 3 to ground: 0–7.5 v pin 2 to pin 3: 0–7.25 v

Keyboard Back Panel Output Specifications

	Gate	Trigger	CV	Ribbon	Headphone, Front or Back panel
Level	+10 v	+10 v, 10 ms pulse	+1 to 5 v, 1 per octave	0 to 4.6 vDC	+3.5 dBm
Impedance	100 Ω	100 Ω	100 Ω	800 Ω pressed 10 kΩ unpressed	250Ω

	Pedal1, Pedal2
Controller range	0Ω–1 MΩ = 0–100%

Connectors

Audio input	SAMPLE-TO-MEMORY A,B	Input channels for recording audio signals
Audio output	FM SYNTHESIZER OUT	Composite output for all polyphonic sampling voices (9600)
	POLYPHONIC SAMPLING OUT	Composite output for all polyphonic sampling voices
	HEADPHONE OUT	Composite FM and sampling output for headphone (9600)
	MULTICHANNEL 1–16	Outputs for right and left channels of individual sequencer tracks
Timing	EXTERNAL CLOCK IN	Input for audio sync signals
	EXTERNAL CLOCK OUT	Output for audio sync signals; SMPTE time code generator for Synclavier 9600
	SMPTE IN	Input for SMPTE time code
	SMPTE OUT	SMPTE time code generator for Synclavier 6400 or 3200
	CLICK	Output for digital metronome
MIDI	MIDI IN	Input for MIDI events
	MIDI OUT	Output for MIDI events
	MIDI THRU	Output for MIDI events for module in MIDI chain.
	MIDI AUX	Input for MIDI sync signals
Peripherals	TERMINAL	RS-232
	PRINTER	Printer connector
	MODEM	Modem connector
	RS422	Connectors for RS422 board, MIDInet and/or DESC

Peripherals

Keyboard footswitches

Footswitches can be purchased from local music stores. They should provide both Normally Open and Normally Closed momentary contacts. For correct operation, connect the Normally Open contacts to any of the footswtich inputs on the back panel of the Synclavier keyboard.

Hold
Repeat
Portamento
Punch In/Out
Sustain
Arpeggiate
Phrase
(Mute is not currently used)

All footswtiches are normally open; close to activate.

Real-time effects controllers

A battery powered (9-volt) Morley SLVO footpedal is shipped with all Synclavier keyboards. Connect its 1/4-inch phone jack (labeled "Instrument") to either the **Pedal1** or **Pedal2** input on the back panel of the Synclavier keyboard.

The footpedal "Volume" know sets the volume level for the lowest (heel down) pedal position. The "Travel" knob adjusts how much pedal travel is required to reach maximum volume.

The controller range for both pedal inputs is 0Ω–1 MΩ = 0–100%.

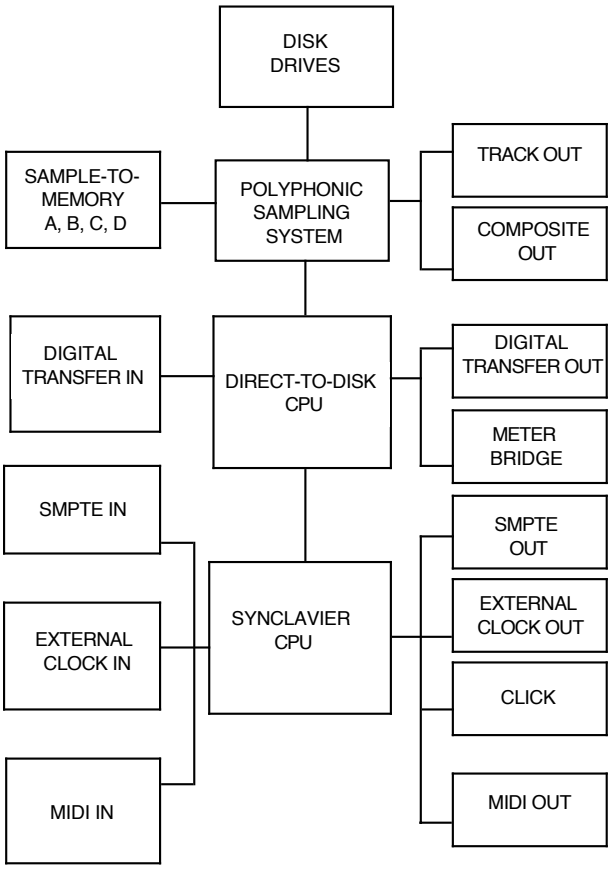
A Yamaha BC-1 or its electrical equivalent can be connected to the **Breath Controller** input on the back panel of the Synclavier keyboard.

Direct-to-Disk Technical Data

The Direct-to-Disk (DTD) control unit has its own Synclavier Company ABLE computer. In addition to the signal processor, the unit contains Sample-to-Memory modules for analog input, hard disk drives for storing information, and digital-to-analog converters for playing back sounds. The meter bridge indicates the recording mode and signal level for each DTD track.

Depending on the configuration of your system, the control unit also may include MIDI and SMPTE interfaces, UDI and MIDInet modules, and connectors for the terminal and a printer.

DTD Signal Flow Chart



Cooling and Ventilation

To assure proper ventilation, the front vents must be unobstructed. The air exhaust fans on the back of the unit must be clear and at least six inches from the wall. Exhaust air should be vented away from the unit and not allowed to recycle through the front vents.

Operating temperature	42–75° F (5-24° C)
Storage temperature	32–110° F (0-43° C
Operating humidity	20–80%, non-condensing

Storage humidity	8–80%, non-condensing

Power requirements

	Direct-to-Disk, PostPro	PostPro SD
Circuit	120-volt, single-phase, 60-Hz independent isolated ground branch circuit fused at 20 amps	120-volt single-phase 60-Hz independent isolated ground branch circuit fused at 15 amps.
Plug	15-amp	15-amp
Power consumption	1380 watts	1020 watts
BTU output	6500 BTU/hr	6500 BTU/hr

Audio Input Specifications

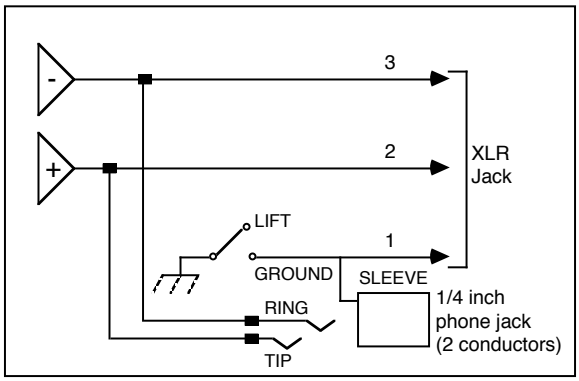
	PostPro SD, PostPro, Direct-to-Disk
A/D inputs	16 bits/channel, linear quantization
Impedance	200 kΩ balanced 100 kΩ unbalanced 20 Hz to 20 kHz
Gain	Programmable, -3 to +28 dB in 1 dB steps ± -0.05 dB accuracy at 1 kHz
Sampling rate	Programmable, 1 to 100 kHz in 0.1 kHz steps
Frequency response	+0.5 dB, -1.0 dB, 20 Hz to 20 kHz
THD	< 0.02% at +4 dBm, 20 to 20 Khz @ 50 kHz
IMD	not specified
S/N ratio	94 dB below full scale level of +19 dBm, 20 Hz to 20 kHz
Crosstalk	< -80 dB minimum, 20 Hz to 20 kHz

Audio Output Specifications

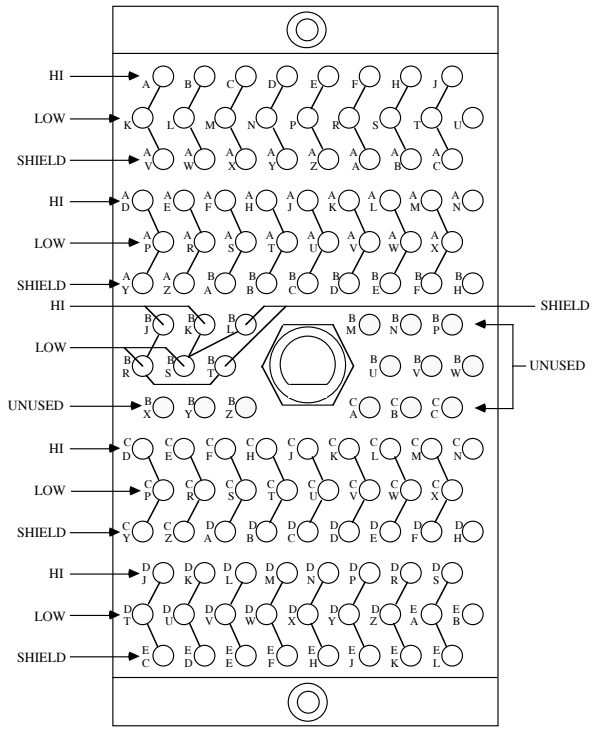
	DTD direct track outputs	DTD composite outputs
D/As	Electronically balanced stereo composite ELCO 8016 120-pin	Electronically balanced stereo XLR or 3-conductor 1/4" phone
Impedance	100 Ω balanced 50 Ω unbalanced 20 Hz to 20 kHz	100 Ω balanced 50 Ω unbalanced 20 Hz to 20 kHz
Level, balanced	+4 dBm nominal +19 dBm maximum	+4 dBm nominal +19 dBm maximum
Frequency response	+0.5 dB, -1.0 dB, 20 Hz to 20 kHz	+0.5 dB, -1.0 dB, 20 Hz to 20 kHz
Gain	0 dB	0 dB

Ground lift switch wiring

XLR Pin 1 connected to chassis ground when switch is up. Pin 1 of interconnecting audio cables not connected to connector housing.



ELCO 8016 120-pin connector



DTD Track Outputs	----------Left----------			----------Right----------		
	High	Low	Shield	High	Low	Shield
Track 1	A	K	V	CD	CP	CY
Track 2	B	L	W	CE	CR	CZ
Track 3	C	M	X	CF	CS	DA
Track 4	D	N	Y	CH	CT	DB
Track 5	E	P	Z	CJ	CU	DC
Track 6	F	R	AA	C	CV	DD
Track 7	H	S	AB	CL	CW	DE
Track 8	J	T	AC	CM	CX	DF
Track 9	AD	AP	AY	DJ	DT	EC
Track 10	AE	AR	AZ	DK	DU	ED
Track 11	AF	AS	BA	DL	DV	EE
Track 12	AH	AT	BB	DM	DW	EF
Track 13	AJ	AU	BC	DN	DX	EH
Track 14	AK	AV	BD	DP	DY	EJ
Track 15	AL	AW	BE	DR	DZ	EK
Track 16	AM	AX	BF	DS	EA	EL
Composite	BJ	BR	BT	BK	BS	BL

Multichannel Outputs	----------Left----------		
	High	Low	Shield
output 1	A	K	V
output 2	B	L	W
output 3	C	M	X
output 4	D	N	Y
output 5	E	P	Z
output 6	F	R	AA
output 7	H	S	AB
output 8	J	T	AC
output 9	AD	AP	AY
output 10	AE	AR	AZ
output 11	AF	AS	BA
output 12	AH	AT	BB
output 13	AJ	AU	BC
output 14	AK	AV	BD
output 15	AL	AW	BE
output 16	AM	AX	BF
output 17	CD	CP	CY
output 18	CE	CR	CZ
output 19	CF	CS	DA
output 20	CH	CT	DB
output 21	CJ	CU	DC
output 22	CK	CV	DD
output 23	CL	CW	DE
output 24	CM	CX	DF
output 25	DJ	DT	EC
output 26	DK	DU	ED
output 27	DL	DV	EE
output 28	DM	DW	EF
output 29	DN	DX	EH
output 30	DP	DY	EJ
output 31	DR	DZ	EK
output 32	DS	EA	EL

Synchronization Specifications

	SMPTE In	**External Clock In**
Type	Balanced transformer coupled	TTL
Impedance	10 kΩ	4 kΩ
Level	-32 dBm minimum -10 dBm nominal	3 volt minimum for ON state

	SMPTE Out	**External Clock Out**	**Click out**
Type	TTL	TTL	Balanced 10 ms pulse
Impedance	1 kΩ	1 kΩ	100 Ω balanced 50 Ω unbalanced
Level	0–5 volt	0–5 volt	pin 2 to ground: 0–3.5 v pin 3 to ground: 0–7.5 v pin 2 to pin 3: 0–7.25 v

Connectors

Audio input	
SAMPLE-TO-MEMORY A,B,C,D	Input channels for recording audio signals
Audio output	
TRACK OUT	Direct output of all DTD tracks
COMPOSITE OUT	Composite output of all DTD tracks
MULTICHANNEL 1–16	Outputs for right and left channels of sequencer tracks (PostPro SD only)
Sync I/O	
EXTERNAL CLOCK IN	Input for audio sync signals
EXTERNAL CLOCK OUT	Output for audio sync signals
SMPTE IN	Input for SMPTE time code
SMPTE OUT	SMPTE time code generator
MIDI	
MIDI IN	Input for MIDI events
MIDI OUT 1-8	Output for MIDI events
MIDI THRU	Output for MIDI events for module in MIDI chain
MIDI AUX	Input for MIDI sync signals

Peripherals	
TERMINAL	Macintosh connector
PRINTER	Printer connector
MODEM	Modem connector
RS422	Connectors for RS422 board, MIDInet and/or DESC
DISPLAY	Connector for meter bridge

Time Expansion	1	Connects additional drive to tracks 1–2 (tracks 1–4 if running with track expansion) to double recording time.
	2	Connects additional drive to tracks 3–4 (tracks 5–8 if running with track expansion) to double recording time.
	3	Connects additional drive to tracks 5–6 (tracks 9–12 if running with track expansion) to double recording time.
	4	Connects additional drive to tracks 7–8 (tracks 13–16 if running with track expansion) to double recording time.
SCSI	IN OUT Dignostic	Input for external SCSI drive Output for external SCSI drive Connector for diagnostic terminal

Any DTD can have up to four STM input modules installed with the input channels numbered as follows:

	Input channels			
STM module	1	2	3	4
1	1A	1B	1C	1D
2	2A	2B	2C	2D
3	3A	3B	3C	3D
4	4A	4B	4C	4D

Meter Bridge

The meter bridge has individual LED viewmeters for each DTD track. Below each view meter, the track number lights whenever the track is available. The following colors indicate track status.

color	**track status**
green	input mode
yellow	repro mode
red	record mode

When the track is in Auto mode, the track number switches from green (when stopped) to yellow (when playing back).

Color-coded words add track status information.

color	word	track status
green	INPUT	input assigned
yellow	READY	track set to ready
red	RECORD	track set to record

UDIO Technical Data

With the Universal Digital I/O (UDIO) hardware installed, you can transfer digital audio between the DTD and another digital device without leaving the digital domain and while retaining the original recorded quality.

You can transfer one or two tracks of audio at a time between the DTD and another digital device using any ProDigi, SDIF, AES/EBU or S/PDIF format. The two available digital channels, DIG 1 and DIG 2, are channels left and right, respectively. Tracks can be routed to or from either of the digital channels.

Connecting the UDIO module

Before performing a digital transfer, your digital device should be properly connected for sending or receiving audio. The UDIO module contains an input for a composite (house) sync signal, inputs and outputs for digital devices using a ProDigi, SDIF, AES/EBU or S/PDIF format, and lights labeled Data and Word clock. The Data light is on whenever the signal on either channel is greater than -30 dB. Its brightness roughly indicates the strength of the signal. The Word clock light cycles on and off every 32,768 samples whenever the module is active.

Use the connectors labeled SDIF2 DIGITAL I/O for SDIF two-track format only. Use the connectors labeled PRODIGI for SDIF multitrack format and any ProDigi format.

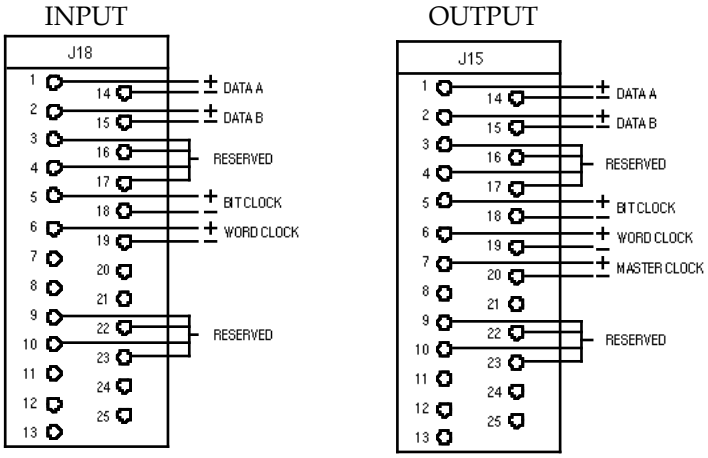
Composite Sync Source

Frame rate	30, 29.97, 25 Hz
NTSC standard levels	1-4v peak-to-peak positive polarity
Input frequency	Must be accurate to within ± 100 PPM
Input termination	Unterminated; user must provide 75 Ω termination

ProDigi Two-Track Format

Input clocking	slave to source, ±150 ppm
Output clocking	
internal crystal oscillator	±25 ppm
composite sync	±150 ppm
SDIF word sync	±150 ppm
AES/EBU input signal	±150 ppm
ProDigi two-track/multitrack word clock	±150 ppm
Input connector type	25-pin dsub male
Output connector type	25-pin dsub female
Number of tracks	2
Sampling rates	32, 44.1, 48, 88.2 or 96 kHz
Sample size	16 bit
Cable	twisted pair (100 Ω)
Maximum cable length	20 feet
Level	TTl open collector (100 Ω)
Signal format	ProdDigi 2-channel dub

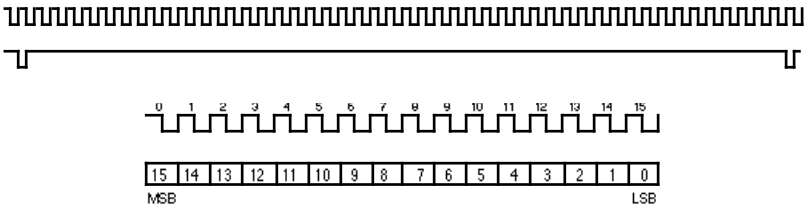
connector pin assignments



master clock
word clock

bit clock

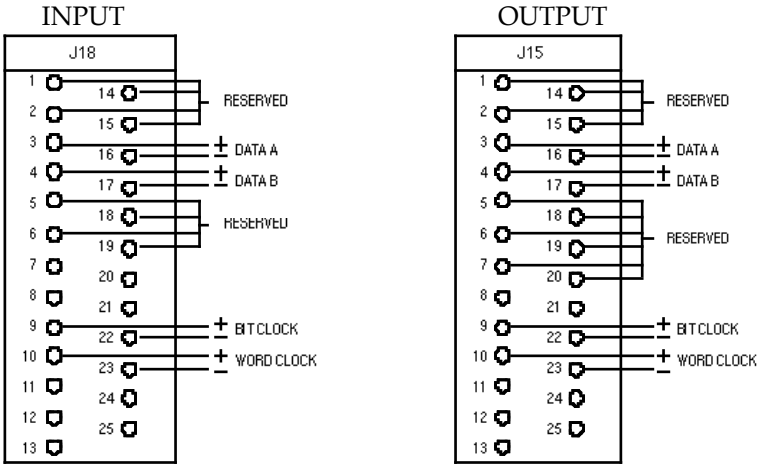
data A or B



ProDigi Multitrack Format

Input clocking	slave to source, ±150 ppm
Output clocking	
internal crystal oscillator	±25 ppm
composite sync	±150 ppm
SDIF word sync	±150 ppm
AES/EBU input signal	±150 ppm
ProDigi word clock	±150 ppm
Input connector type	25-pin dsub male
Output connector type	25-pin dsub female
Number of tracks	2
Sampling rates	32, 44.1, 48, 88.2 or 96 kHz
Sample size	16 bit
Cable	twisted pair (100 Ω)
Maximum cable length	50 feet
Level	RS422 (100 Ω)
Signal format	ProdDgi multichannel dub

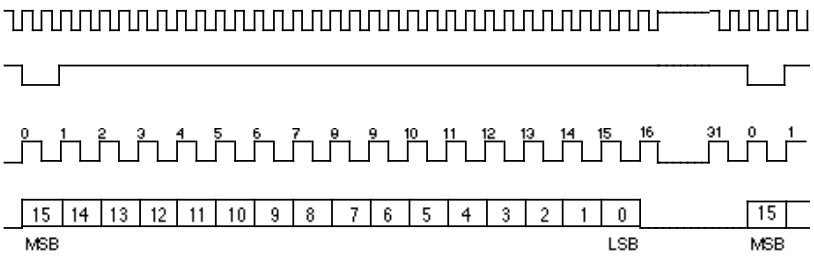
connector pin assignments



master clock
word clock

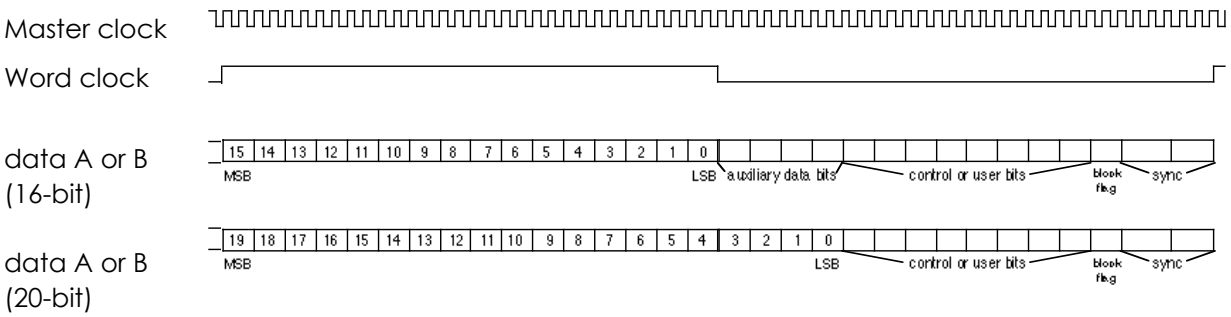
bit clock

data A or B



SDIF Two-Track Format

Input clocking	slave to source, ±150 ppm
Output clocking	
internal crystal oscillator	±25 ppm
composite sync	±150 ppm
SDIF word sync	±150 ppm
AES/EBU input signal	±150 ppm
ProDigi word clock	±150 ppm
Word sync	BNC-R
Number of tracks	2
Sampling rates	32, 44.1, 48, 88.2 or 96 kHz
Sample size	16 or 20 bit
Connector type	BNC-R
Cable	COAX (75 Ω)
Maximum cable length	50 feet
Level	TTL (75 Ω)
Signal format	SDIF2

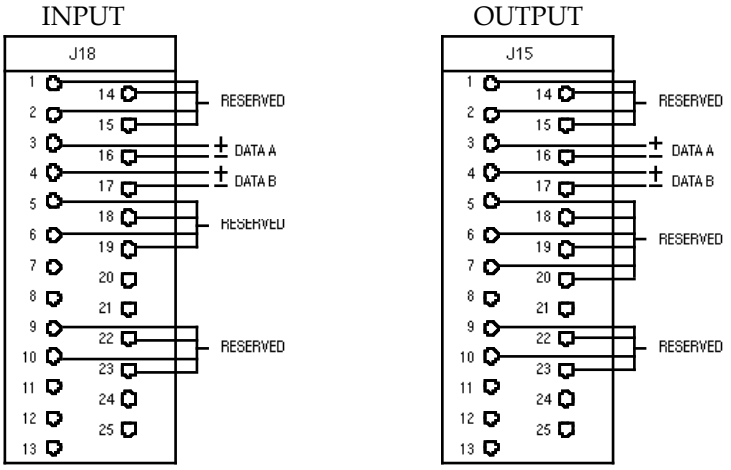


When using the SDIF format to transfer out from the DTD, Emphasis bits and Dubbing Prohibition bits are set to zero to indicate that emphasis is not used and that dubbing is possible. When transferring in to the DTD, the Emphasis and Dubbing Prohibition bits are ignored.

SDIF Multitrack Format

Input clocking	slave to source, ±150 ppm
Output clocking	
internal crystal oscillator	±25 ppm
composite sync	±150 ppm
SDIF word sync	±150 ppm
AES/EBU input signal	±150 ppm
ProDigi word clock	±150 ppm
Word sync	BNC-R; TTL (75 Ω) coax
Input connector type	25-pin dsub male
Output connector type	25-pin dsub female
Number of tracks	2
Sampling rates	32, 44.1, 48, 88.2 or 96 kHz
Sample size	16 or 20 bit
Cable	twisted pair (100 Ω)
Maximum cable length	50 feet
Level	RS422 (100 Ω)
Signal format	SDIF2

connector pin assignments

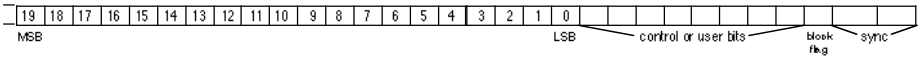


master clock

word clock

data A or B (16-bit)

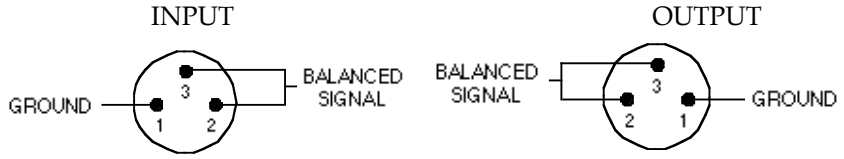
data A or B (20-bit)



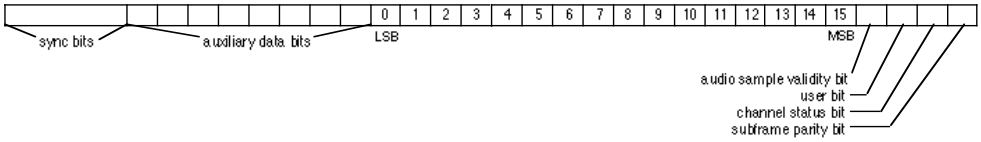
AES/EBU Format

Input clocking	slave to source, ±150 ppm
Output clocking	
internal crystal oscillator	±25 ppm
composite sync	±150 ppm
SDIF word sync	±150 ppm
AES/EBU input signal	±150 ppm
ProDigi word clock	±150 ppm
Input connector type	3-pin xlr female
Output connector type	3-pin xlr male
Number of tracks	2
Sampling rates	32, 44.1, 48, 88.2 or 96 kHz
Sample size	16–24 bit
Cable	twisted pair (100 Ω)
Maximum cable length	50 feet
Level	RS422 (100 Ω)
Signal format	AES/EBU

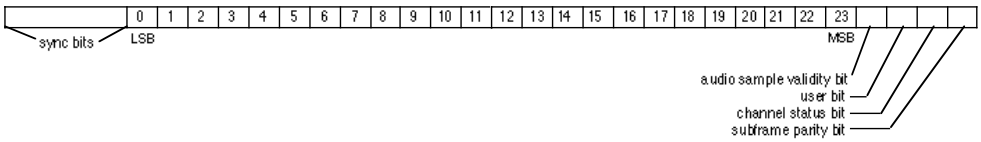
connector pin assignments



16-bit



24-bit



When using the AES/EBU format to transfer out from the DTD, User Data bits are set to zero. Validity bits are set to zero to indicate that the Audio Data bits are valid. The settings for Channel Status Data bits are shown in the chart on the next page. Status byte 23 is the CRCC byte.

When transferring in to the DTD, only Audio Data bits are used. All Channel Status Data, User Data and Validity bits are ignored by the DTD.

AES/EBU channel status data bits

Status Bit Number	Status Byte 0		Status Byte 1		Status Bytes 2 – 22
	Bit Value	indicates	Bit Value	indicates	
7	Z*	sampling frequency	0	reserved but undefined	0
6	Y*		0		0
5	X*	0: sampling rate locked 1: sampling rate unlocked	0		0
4	0	no emphasis with manual override enabled	0		0
3	0		0	channel mode not indicated	0
2	0		0		0
1	0	normal audio mode	0		0
0	1	professional use	0		0

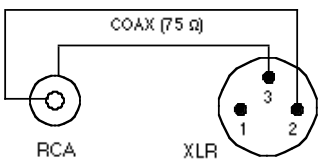
*Note: When sampling rate is 48 kHz, Z=1 Y=0 X=0
When sampling rate is 44.1 kHz, Z=0 Y=1 X=0
When sampling rate is 32 kHz, Z=1 Y=1 X=0
For any other sampling rate, Z=0 Y=0 X=1

S/PDIF Format

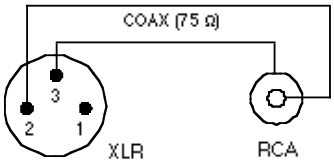
Input clocking	slave to source ±150 ppm
Output clocking	
internal crystal oscillator	±25 ppm
composite sync	±150 ppm
SDIF word sync	±150 ppm
AES/EBU input signal	±150 ppm
ProDigi word clock	±150 ppm
Input connector type	RCA phone plug adapted to 3-pin xlr female
Output connector type	RCA phone plug adapted to 3-pin xlr male
Number of tracks	2
Sampling rates	32, 44.1, 48, 88.2 or 96 kHz
Sample size	16–24 bit
Cable	COAX (75 Ω)
Maximum cable length	20 feet
Level	RS422 compatible with single-ended 100 mV
Signal format	S/PDIF

connector pin assignments

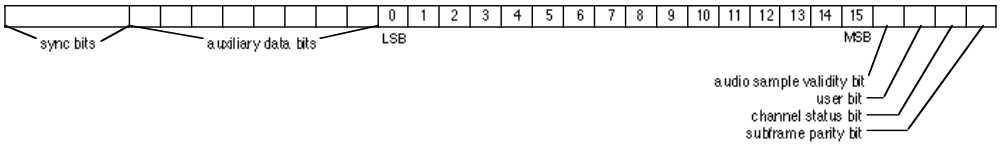
INPUT



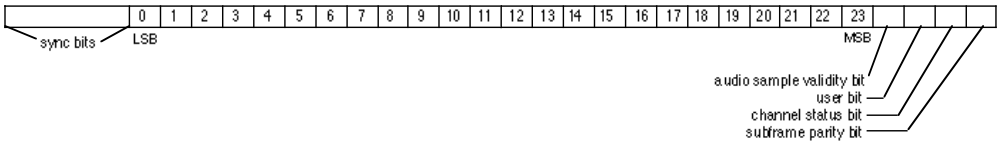
OUTPUT



16-bit



24-bit



When using the S/PDIF format to transfer out from the DTD, User Data bits are set to zero. Validity bits are set to zero to indicate that the Audio Data bits are valid. The settings for Channel Status Data bits are shown in the chart below.

When transferring in to the DTD, only Audio Data bits are used. All Channel Status Data, User Data and Validity bits are ignored by the DTD.

AES/EBU channel status data bits

Status Bit Number	Status Byte 0		Status Byte 1		Status Bytes 2 – 23
	Bit Value	indicates	Bit Value	indicates	
7	0	sampling frequency not indicated	0	reserved but undefined	0
6	0		0		0
5	0	sampling rate locked	0		0
4	0	no emphasis	0		0
3	0		0	channel mode not indicated	0
2	1	copy ok	0		0
1	0	normal audio mode	0	general category	0
0	0	consumer use	0		0

Chapter 7
Appendix

Glossary

A/B Roll. The use of alternating scenes, recorded on separate source tapes, to perform dissolves, wipes or other types of video transitions.

Academy Leader. Film leader that features countdown numbers to aid in cuing the film prior to use.

ADC unit (or A-D). See also DAC unit. Analog-to-digital converter. A device that transforms a continuously variable (analog) signal to discrete binary bits that can be manipulated by the computer.

Additive Synthesis. The process of creating a sound or timbre by adding harmonics to a sine wave.

Algorithm. A series of computer operations which perform a specific task.

Amplitude Modulation. Periodic change in the volume of a sound with the effect of a tremolo or repeated emphasis of the same sound.

Analog Recording. A form of magnetic recording where the recorded waveform signal maintains the shape of the original waveform signal.

Analysis. Computer measurement of a sampled sound waveform so that it can be produced synthetically or resynthesized.

Append Mode. Screen Editor editing mode. Each typed character is inserted at the cursor.

ASCII. American Standard Code for Information Interchange. A seven-bit-plus parity code established by ANSI to achieve compatibility between data services.

Assembly Track. EditView tracks used for placing audio events during the assembly of an Output Track.

ATR. Audiotape recorder.

Attack. The beginning of a sound.

Audio Event. Any cue, note or RAM sound placed in a sequence or EDL.

Audio Post-Production. See Audio Sweetening.

Audio Sweetening. The process of mixing sound effects, music and announcer audio tracks with the audio track of the edited master tape.

Auto-assembly. The process of assembling an edited videotape from an edit decision list on a computerized editing system.

Auto-mix. Controlling and recording changes in track playback volume.

Backing Up. Saving copies of a file or sequence to a disk as you work. You also back up files and sequences to floppy disk or tape for safe keeping in another location.

Backtiming. Synchronizing the end time or some mid point of an event to a sequence.

Bandwidth. the range of frequencies available for signalling; the difference expressed in Hertz between the highest and lowest frequencies of a band.

Bank. A division of a timbre file containing up to eight timbres. Each timbre file can have up to eight banks of timbres. Also a row of eight buttons on the keyboard control panel.

Baud. A unit for measuring the rate of digital data transmission.

Bit. Binary Digit. The smallest unit of information in a binary system: a 1 or 0 condition.

Blocking. Dividing recorded material into cues.

Boot. To activate the software that runs the system.

Bounce. Copying or moving tracks or partial timbres.

BPS. Bits Per Second. Unit of data transmission rate.

Breath Controller. An optional expression input controller which enables a player to control sound parameters with breath pressure through a mouthpiece device.

Buffer. A temporary storage area.

Bus. A data path shared by many devices with one or more conductors for transmitting signals, data or power.

Button. See also Memory Button and Take Button. A keyboard control panel button or a graphic button on the terminal screen used to select and control the system.

Byte. A binary element string functioning as a unit. Eight-bit bytes are most most.

Caption. A descriptive phrase stored with a sound file or cue.

Catalog. A separate storage area where files and subcatalogs are stored.

Catalog Directory. A list of files and subcatalogs contained in a catalog or subcatalog. The catalog directory is accessed with the catalog commands in the Monitor or the Subcatalog Directory in the Real-Time Performance system.

Category. A descriptive term identifying related optical disk files. A category can contain one or more subcategories.

Central Processing Unit (CPU). The primary functional unit of the computer system which controls the execution of program commands. Located in the signal processing unit.

Chain. Adding a selected section of recorded material one or more times to the end of the same or another section.

Character. Letter, numerical, punctuation or any other symbol contained in a message.

Checkerboard. A nonsequential method of assembly where the edits are performed by reel.

Chorus. The addition of a duplicate sound, sometimes at a different pitch, to a single partial or the whole timbre.

CIM. See Clock Interface Module.

Click. See also Speed and Tempo. A digital metronome used for tempo and rhythm reference during recording. The click outputs from the click track jack on the control unit whenever the Memory Recorder is in operation. The rate is programmed by the CLICK RATE button and knob on the keyboard control panel.

Clicking. Pressing the large trackball button when the trackball cursor is on a terminal display item.

Clock. Timing signals used in synchronous transmission.

Clock Interface Module (CIM-1). An N.E.D. device that translates audio signals, clock pulses or FSK-encoded audio into clock pulses or FSK signals. It also divides clock pulses received at one jack and sends a smaller number of pulses to each of several divider outputs.

Clock Pulse. See TTL logic pulse.

Column. A vertical division of the terminal screen. The space for one vertical row of characters or numbers.

Command. Directions given to the computer either by typing a specific word or series of characters and pressing the Return key or by selecting an item from a list of commands.

Command Column. Vertical column of letters on the left side of the Screen Editor Display in which commands are typed.

Compiler. See also reverse compiler. A program that translates computer data from one format to another. The Synclavier compiler changes music written in the Script language into a format that can be played, modified and stored by the Memory Recorder.

Compression The process of reducing the dynamic range of the audio signal.

Conditioning. The addition of equipment to a leased voice-grade channel, enabling the channel to meet specifications for transmission.

Configure. The process of setting up the system software to recognize the existence and exact nature of all the hardware components.

Contiguous Disk Space. An unbroken area of storage space on a storage device. Files stored contiguously can be accessed quickly. All files must be stored this way.

Control Interface. See also Interface. A device through which a computer can be given instructions. Synclavier interfaces include the keyboard unit, the guitar and the graphics terminal.

Control Knob. A round knob at the left of the keyboard used to change values relating to all Synclavier operations.

Controller. See Expression Input Controller.

Converter. See ADC unit and DAC unit.

CPU. Central Processing Unit. The primary functional unit of the computer system which controls the execution of program commands. Located in the signal processing unit.

Crossfade. Fading one audio event, timbre frame or sequence out while another fades in so that there is a gradual change.

Crosstalk. The unwanted transmission of a signal between adjacent channels.

Cue. A section of a recording identified by in and out points on one or more Direct-to-Disk tracks.

Cuelist. A list on the Recorder Display or the Event List Editor panel showing the starting time, pitch and duration of each cue in a sequence.

Current Catalog. The top-level catalog or subcatalog currently in use. The computer assumes you are referring to this catalog whenever you recall or store a file, unless you tell it otherwise.

Current File. A file that temporarily exists in computer memory. The timbre on the keyboard, the sequence in the Memory Recorder or the sound file you are editing in the Sound Editor is the current file. Whenever you recall a new file into memory, it replaces the previous file and becomes the current file.

Cursor. A crosshair, rectangle or other symbol on the terminal screen indicating where an action will take place or which item will be selected.

Cursor Key Block. Block of terminal keys containing cursor keys and command keys immediately to the right of the main keys.

DAC Unit. See also ADC unit. A digital-to-analog converter that converts the digital data of a sound wave into analog form so that it can be heard.

Data. Any text, sound, measurements, information, graphics or other material the computer or any of its programs can receive, process, use, store, recall or transmit.

Decay. A selected amount of time for change between events in a harmonic or volume envelope. Initial decay is the time for change between the peak volume level of the

attack and the volume selected for the sustain portion of the envelope. Final decay is the time between key release at the sustain volume level and zero volume at the end of the envelope.

Default. A setting for a variable that is established whenever the system is turned on or restarted.

Delay. A selected amount of time between key depression and the start of a sound or one of its components.

Delete. See Erase.

Device. A hardware component of the computer system. There are input, signal processing, memory, output and storage devices. The term is most often used in reference to storage devices such as Winchesters, floppy drives, tape drives and optical disk drives.

Device Name. The name the computer recognizes as referring to a specific storage device. If you have one Winchester, its device name is W0: (W-zero); W1: is the second Winchester. The first floppy drive is F0: (F-zero); F1: is the second floppy drive; the optical disk is O0: (oh - zero). The colon (:) is part of the device name.

Diagnostic Programs. Programs used for preliminary diagnosis when some part of the system hardware appears to be malfunctioning. These programs are found on the system diagnostics disk.

Digital Transfer. Transferring audio between a digital tape recorder and the Direct-to-Disk system.

Dip Switches. Switches for opening and closing leads between two devices.

Direct-to-Disk (DTD). Synclavier proprietary technology allowing digital sound recording directly to a Winchester hard disk.

Directory. See also Catalog Directory. One of several display screens accessed from the Welcome Menu or Main Menu in the Real-Time Performance system, such as the Timbre Directory, Sound File Directory, Sequence Directory, Project Directory and Subcatalog Directory.

Disk. A computer storage medium. Either a removable disk, a hard disk built into a disk drive or an optical disk in a cartridge.

Disk Drive. A computer data storage component such as a Winchester or floppy disk drive.

Display. See also Screen. Information presented on the terminal screen.

Display Offset. A value used to adjust the time code display to a different number than that entering the system.

Display Window. The digital display on the left of the Synclavier keyboard control panel which shows information about keyboard operations.

Downloading. the process of sending configuration parameters, operating software or related data from a central source to remote stations.

Drag. Using the trackball to select or move on the terminal screen

Drive. A component of the system used for storage of data, such as a Winchester, floppy drive or tape drive.

Drop-Frame. A SMPTE time code format that counts 30fps and then drops frames in a regular pattern to compensate for the American color video frame rate of 29.97 fps.

DTD. See Direct-to-Disk.

Dub. Copy.

Dynamic Envelope. A partial timbre setting that allows the selected partial timbre to sound or not sound, depending on the expression input to which it is patched. For example, a partial timbre patched to velocity may have its dynamic envelope set so that it sounds only when a key is pressed very rapidly.

Dynamic Range. The range between the softest and the loudest levels a source can produce without distortion.

Edit. To write, change or rearrange material on the terminal screen.

Edit Decision List (EDL). A list of edited audio and video events from different sources synchronized to a master film or video tape.

Emulation. The imitation of a computer system, performed by a combination of hardware and software, that allows programs to run between incompatible systems.

Enter. To give the computer directions or information by selecting an item on the terminal screen or by typing information on the terminal keyboard and then pressing Return. Also, to set up a device or subcatalog as the current device or subcatalog by selecting it from the Subcatalog Directory (in the Real-Time Performance module) or by typing the enter command (in the Monitor module).

Entry. A timbre in one of the banks of a timbre file. Each timbre file has up to eight banks of timbres, and each bank has as many as eight timbre entries.

Equalization The balancing of various frequencies of a sound through attenuating or boosting specific frequencies.

Erase. To remove data from memory or from disk storage. When a file in disk storage is erased, its name is removed from the directory and the space it occupied is marked so that another file may be stored there.

Error Message. A printed message appearing in the keyboard display window or on the terminal screen indicating that the latest instructions to the computer have not been performed. A list of error messages, the circumstances under which they occur and possible solutions is in the Reference Guide.

Event. Each audio event (cue, note, RAM.) placed in a sequence.

Event List. An Event List Editor display showing the starting time, pitch and duration of each note or cue in a sequence.

Exit Box. A small box located in the upper right corner of the terminal screen. You click the exit box to leave a display.

Expression Input Controller. A user interface controlling the parameters of a sound during performance or recording. Examples are keyboard velocity and pressure, mod wheel, ribbon controller, pedals and breath controller.

External Synchronization. Synchronization of the Synclavier to other sequencers, tape, film or video.

Fade A gradual increase or decrease in sound from the beginning or end of an audio event.

FCC. Federal Communications Commission.

Field. An area on a display where a value or text can be entered. It usually has an identifying label.

File. Any block of information the computer can process. A filename and disk location are recorded in the directory of the catalog where a file is stored.

Filename. The name for a file designated by the user. A filename can be up to eight characters long and can include letters, numbers and symbols. It cannot contain a space or any of the following characters: ? ! : ; , / \ < > + = % & * | @

File Type. An identifier that defines the internal structure of a file, such as timbre file, sequence file, sound file, text file or executable file.

Floppy Disk. A removable flexible disk used as a storage medium in a floppy disk drive.

Floppy Disk Drive. An external storage device which stores data on floppy disks.

Foley. The process of recreating sound effects in sync with a video playback. Background sounds added to heighten realism (eg., footsteps, voices).

Format. To initialize or prepare a computer disk to receive data in the form required by a particular computer. The utility program Formcopy is used to format disks for the Synclavier.

FPS. Frames Per Second.

Frames. See also TimbreFrames. The individual pictures that make up the visual part of film or video. Frame rates are expressed in frames per second (fps).

Frequency Modulation. Additional harmonic components produced when a sound wave (carrier wave) interacts with a second sound wave (modulating wave).

FSK Signal. Frequency Shift Keying. A frequency modulation technique in which one frequencey represents a mark and a second, a space.

Function Keys. Pre-programmed keys located at the top of the terminal keyboard which activate a command when pressed.

Generation The number of times material has been re-recorded.

Fundamental Frequency. See Harmonics.

Hardcopy. A computer file or sequence printed on paper.

Hard Disk Drive. Self-contained external storage device attached to the signal processing unit.

Hardware. The physical components of a computer system; for example, the signal processing unit, terminal, keyboard unit, disk drives and disks.

Harmonic Envelope. A series of times and values controlling the addition of frequency modulation to a partial timbre. Delay, attack duration, peak volume, initial decay duration, sustain volume and final decay duration of the modulating wave can all be controlled.

Harmonics. Also called overtones or harmonic coefficients. A series of related tones produced whenever a single note sounds. The number, strength and relationship of these tones define the waveform of a sound. The first harmonic is the fundamental frequency.

Hertz (Hz). A measure of frequency or bandwidth. The same as cycles per second.

Input. Instructions, information or control data made available to a computer.

Interface. See also Control Interface. A device that allows exchange of data between different computer components or between computer and human being.

I/O. Input/output equipment used to send information or data signals to and from a computer.

Jogging. (See also Scrubbing) The process of moving forward or backward though a list.

Justification. Adjusting the starting times of notes to the correct value. Notes of a sequence played at the keyboard slightly ahead of or behind the beat can be justified to place them exactly on the nearest beat or selected subdivision of the beat.

Keyboard. See also Velocity/Pressure Keyboard. In Synclavier documentation, keyboard always refers to the musical keyboard.

Keyboard Control Panel. The area above the Synclavier keyboard which contains five button panels, a display window and a control knob for controlling the system.

Keyboard Control Voltage. A difference in voltage produced by successive keyboard keys which can be used to control timbre parameters. Higher notes produce greater voltage.

Keyboard Envelope. A timbre control function that allows the placing of a partial timbre on a particular section of the keyboard. You can place different partial timbres on overlapping or separate sections of the keyboard.

Keyboard Patch. A group of sound files on a single partial timbre, each one sounding on a discrete region of the keyboard.

Keyboard Polyphony. The number of notes that can sound simultaneously when you play on the Synclavier keyboard. This number is limited by the number of voices in your system. Each partial timbre requires one or two voices for each note played.

Keypad. The set of number keys on the right side of the terminal keyboard.

Kilohertz (kHz). On thousand cycles per second.

Layback. Transferring the finished audio track back to the master videotape.

Layering. Combining up to four different sounds or partial timbres to make a complex timbre.

Leader. Blank sound.

LED. Light Emitting Diode. A semiconductor light source that emits visible light or invisible infrared radiation.

Line. A horizontal division of the terminal screen. The space for one line of text across the screen.

List. To display a file or program on the terminal screen while in the Monitor module.

Load. To transfer a program or file from disk storage to computer memory. Also means to boot, or turn on, the system.

Log. A list of scenes and takes, prepared either during or after production, in preparation for editing.

Longitudinal Time Code. A type of SMPTE time code that is recorded on the audio track of a videotape.

Looping. Continuous repetition of a section of a sound file or sequence. Sound files are given loops so that a continuous sound can be produced. Rhythm parts of a sequence are often looped to provide the sounds required.

Macro. A series of commands and/or data executed or inserted by pressing appropriate keys.

Mark. The process of entering and saving time code numbers while the sequence is stopped or running.

Master/Slave. An editing process in which one or more controllers (the slaves) are set to imitate the actions of another controller (the master).

Memory. Areas in the computer where information can be inserted and stored temporarily. When the computer is turned off, all data stored in memory is lost.

Memory Buttons. Small boxes located on some terminal displays and labeled M1, M2, etc. which store time values for later use.

Menu. A list of software commands or functions on the computer screen from which the desired item is selected.

Meter Bridge. Remotely operated signal display with a peak program meter (PPM) for each track displayed.

MIDI (Musical Instrument Digital Interface). Hardware and software standards used throughout the electronic music industry so that many different kinds of electronic instruments can be controlled from a single MIDI keyboard or sequencer.

Mod Wheel. A wheel-shaped expression input controller at the left of the Synclavier keyboard. It is used to control any of the parameters of a sound during performance or recording.

Mode. A set of functions identified by a single heading which affect the display or operation of the system.

Modem. A device used to convert serial digital data from a transmitting terminal to a signal for transmission over a telephone channel, or to reconvert the transmitted signal to serial digital data for acceptance by a receiving terminal.

Modulation. Modifying some characteristics of a wave form.

Monitor. Software module with facilities for creating, storing, organizing, copying and recalling files. A variety of useful utilities for software setup, disk formatting, search, file recovery and system trouble-shooting can be run from the Monitor. Also, another name for a speaker.

Monophonic. Having one voice only. A monophonic timbre can be played only one note at a time. Chords are not possible, and a second note will sound only when the first note is released.

Motion Controls. Controls which operate the sequencer, such as start, stop, rewind, fast forward and continue.

Multichannel Distributor. Optional hardware and software linking the Synclavier to a standard multitrack mixing console. Each track of the Memory Recorder can be routed to an independent output channel.

Music Printing. Optional software which prints music recorded on the Memory Recorder in standard music notation.

Non-Drop Frame. See also Drop-Frame. The SMPTE time code format for American black-and-white video that counts 30 fps.

Notelist. A list on the Recorder Display or the Event List Editor panel showing the starting time, pitch and duration of each note in a sequence.

Noteline. One entry in a notelist.

NTSC. National Television Standards Committee, the group that established the color TV transmission system used in the U.S.

Offline. Unavailable to the computer. Edit decision lists are made on low-cost offline editing machines.

Online. Available to the computer. Final editing using source audio to produce a finsihed product.

Optical Disk. A removable permanent, non-magnetic storage medium for storing up to two gigabytes of sound files.

Optical Drive. An external storage device which reads and writes to an optical disk.

Output. Sound, visual signals or digital signals produced by the computer. Sound output is produced by sampling voices or synthesizer voices. Visual signals may be terminal displays, lighted buttons on the keyboard control panel or material sent to a printer. Digital signals are sent directly to another computer component such as a storage device.

Output Track. Editview tracks on which audio events are placed for output.

Overdubbing. Recording additional tracks of a sequence or recording additional notes on the the same track.

Overstrike Mode. Screen Editor editing mode. Each typed character replaces the character at the cursor location.

Overtones. See Harmonics.

Overwrite. To store a file or sequence over another one of the same name. Data in the original file is destroyed.

PAL. Phase Alternating Line. A color TV standard used in many countries.

Partial Timbre. One of the four layers of a Synclavier timbre.

Patch. See also Keyboard Patch. To assign an expression input controller to a particular timbre parameter for real-time control.

Pitch Wheel. A wheel-shaped controller at the left of the Synclavier keyboard used to bend the pitch of a keyboard timbre.

Poly Transfer (PolyXfer). Transferring a sound to the keyboard.

Polyphonic. Having more than one voice. The number of sampled sounds that can be played simultaneously is determined by the number of polyphonic sampling voices in the system; the number of FM synthesis sounds that can be played simultaneously is determined by the number of FM voices in the system.

Polyphonic Sampling Memory (poly memory). RAM reserved as a temporary storage area for sound files.

Poly RAM. (see Polyphonic Sampling Memory)

Post-Production. The editing process.

Preroll. The process of rewinding videotapes to a predetermined cue point, so that tapes are up to spped when they reach the edit point.

Preview. To rehearse an edit without actually recording it.

Program Change. A MIDI message that transmits timbre change information anywhere in a sequence.

Project. A set of PostPro tracks, separate from sequencer tracks, containing music, dialog or sound effects which can be edited and placed in a sequence.

Project Tracks. See also Project. A set of tracks associated with the PostPro.

Protocol A formal set of conventions governing the formatting and timing of message exchange between communicating systems.

Pulldown Frame. A duplicate frame created when transferring material from film to videotape.

Query Line. The line at the bottom of the Screen Editor Display that shows error messages and requests for information concerning the current file.

RAM. Random Access Memory. Read-write volatile memory. Data stored is lost if power is turned off.

Real-Time Effects (RTE). See also Expression Input Controller. Expression variables of the keyboard timbre and the means of controlling them.

Real-Time Performance (RTP). The software module used to create sounds, perform, record, edit and synchronize music, dialog or sound effects. An older version of NED software.

Realtime. Actual clock time in which events occur.

Recall. Retrieving a previously recorded event or sequence.

Reel. A button on the Audio Event Editor's Cue Editor panel where edited cues can be temporarily stored.

Resynthesis. The process by which a digital analysis of a sampled sound is used to create a synthesized sound that matches the analysis.

Reverse Compiler. A program that changes sounds recorded on the Memory Recorder or entered on the Music Notation Display to a format that can be edited with the Screen Editor.

RGB. The primary color Red, Green and Blue.

Ribbon Controller. A black felt strip located just above the Synclavier keyboard used for expression input. It can be used to control any of the parameters of a sound during performance or recording.

Ripple. The process of adjusting times when an edit adds or deletes length.

ROM. Read-Only Memory. Nonvolatile memory for permanent data storage.

RS-232. Interface between xxxxx

RS-422. Interface between xxx.

RTP. See Real-Time Performance.

Sample-to-Disk. Optional Synclavier hardware and software used to sample sounds and record them directly to disk.

Sample-to-Memory. Optional Synclavier hardware and software used to sample sounds and edit them in computer memory.

Sampling. The process of recording measurements of a sound wave a number of times (usually 40,000 or more) per second. Once recorded, these measurements can be used by the computer to reproduce the original sound. The sound can also be modified by digitally processing the measurements and by changing the sampling rate.

Save. To store a file or sequence in a disk storage area.

Scientific XPL. The computer language used for Synclavier programs.

Screen. The terminal display area.

Screen Editor. A Synclavier software module used for text editing.

Script. A computer language for writing music on the Synclavier.

Scroll Bar. A bar on the terminal screen with a movable scroll box somewhere along its length and arrows at either end. It is used to move backward and forward through a list, sound, sequence or file.

Scrubbing. The process of moving the trackball back and forth across an audio event or the sequence to hear audio.

SCSI. Small Computer Systems Interface. A general purpose parallel interface for connecting one or more computers and/or peripherals.

Sector. A division of the storage area on a device or in memory. A sector is equal to 256 sixteen-bit words.

Selecting. Choosing a track to be heard, recorded, edited or erased.

Sequence. See also Sequencer and EDL. A series of audio events—musical notes, MIDI data, sound effects, Foley effects or dialog— which can be triggered by the sequencer at a precise moment in time. Additional kinds of information including timbres and real-time effects are part of the sequence.

Sequencer. A recording and playback device for digital sound. The Sound itself is not recorded, only note on and off times, timbre definitions and various values controlling parameters and effects.

Signal Processing. The manipulation of signals or data sent to the computer by a control interface. Some signals act directly on the data in computer memory, others trigger action by the processing programs. Processed information is then routed to the appropriate output or storage device.

SMPTE. Society of Motion Picture and Television Engineers.

SMPTE Offset. The SMPTE time at which a sequence is triggered.

SMPTE Time Code. A frame numbering system divided into hours, minutes, seconds, frames bits (e.g., 02:23:12:01.44) developed by SMPTE that assigns a number to each frame of video.

Software. Computer programs.

Soloing. Choosing particular tracks or partial timbres to be heard.

Song Pointer. Information that tells a sequencer or other device where to begin playing. The sequencer auto-locates and begins to play from that point when you press START or CONTINUE.

Sound File. A digital version of a recorded sound stored in computer memory or on disk.

Speed. See also Click and Tempo. The rate at which a sequence proceeds, controlled by the speed button. The basic tempo of a sequence is set with the click rate. Also, when a tape is up to speed, it means there has been enough preroll time to establish a stable speed.

Startup Disk. The computer disk that contains the operating system files needs to run the program.

Status Line. A line at the bottom of the terminal screen showing information about the file being edited, the mode or current working procedures and instructions or error messages.

Step Editing. Editing note by note. The Synclavier can be set to advance one beat or one subdivision of the beat at a time to allow editing of each note.

Store. See Save.

String. A group of one or more characters, numerals or symbols manipulated together by the computer.

Stripe. the process of recording SMPTE time code on tape.

Subcatalog. A separate area of storage space in a device or in another subcatalog that contains its own file directory. The name of a subcatalog can contain up to eight characters.

Switch. A terminal display item used to turn on or off a mode or function, or to step through a series of options.

Synchronization. See also External Synchronization. Timing mechanism for playback and recording. Indicates synchronization between picture and sound.

Syntax. The format of terminal commands.

Synthesis. See Additive Synthesis.

Synthesizer. A computer-operated device which can produce and combine waveforms to create different sounds. The Synclavier keyboard unit includes a synthesizer operated by the harmonic control buttons on the keyboard control panel.

Take. An individual audio event that is part of a project.

Take Button. A small triangle in a box or a "T" associated with a field on the terminal screen. Take buttons are clicked to record the current play time or other time value.

Tape Cartridge. A removable storage medium for use with an external tape drive to provide backup for a hard disk.

Tempo. See also Click and Speed. The basic rate at which a sequence proceeds, measured in beats per minute or milliseconds between beats.

Text File. See ASCII.

Timbre. See also Partial Timbre. A combination of up to four layers of synthesized or sampled sounds. A timbre is stored in a timbre file on any of the Synclavier storage devices and can be recalled to the keyboard for performance or recording.

Timbre Frames. A series of segments of a synthesized partial timbre, each of which can have different harmonics, delay time, volume, pitch and splice characteristics. As the series of frames is played one after the other, a sound with a changing waveform is created.

Time Code. An electronic indexing method used for editing and timing events.

Time Scale Modification (TSM). Compressing or expanding the length of a cue or sound file without changing its pitch.

Toggle. To move back and forth between two functions or values of a terminal display switch.

Tone. A constant audio signal recorded as a reference point at the start of a tape.

Top-level Catalog. The main storage area of each storage device containing files and subcatalogs. This is the catalog accessed when you first load your system or enter another device.

Track. (See also Output Track and Assembly Track) A separate data storage area used to record a series of sounds. It is similar in function to a track on a tape recorder. Also a channel.

Trackball. A hand-operated controller which allows you to point to an object on the terminal screen and perform an operation.

TransferMation. Macintosh software application containing the Transport, Patch Bay, and Librarian windows.

Transpose. To change the pitch of a sound or sequence. On the Synclavier, a sequence can be transposed without changing its speed.

Treename. A file address in the system. The treename begins with the device name, followed by the name of the subcatalog in which the file is located, followed by the filename, all separated by colons.

Trim. The process of adjusting edit points.

TTL Logic Pulse. A periodic burst of direct current of a specific voltage and duration used to synchronize recording components.

Tuning. The overall pitch level or the relationship between notes of the scale.

Tuplet. The notation of an irregular number of note values per beat or subdivision. Triplets or quintuplets in common time are examples of tuplets.

UHF. Ultra high frequency TV signals.

Unbalanced Line. A transmission line in which the magnitudes of the voltages on the two conductors are not equal in respect to the ground.

Unsave. See Erase.

Utility Programs. Programs used to set up the system software, format disks, copy files and subcatalogs, search files, recover damaged files and diagnose system problems.

VCR. Videocassette recorder.

Velocity/Pressure Keyboard. A keyboard unit that senses the velocity with which you strike a key and the after-touch pressure you apply. The values sensed can be used to control a variety of expression parameters such as attack, volume or vibrato.

Vertical Integrated Time Code (VITC). Time code that is inserted in the vertical blanking interval.

VHF. Very high frequency TV signals.

Vibrato. A periodic variation in pitch.

Video. The visual portion of a program.

Videocassette. A plastic shell containing two reels and a length of videotape.

Videotape. Magnetic tape used for recording video and audio signals.

VK Panel. Screen representation of the velocity sensitive keyboard button panels. Buttons can be pressed to activate actions, just as on the actual keyboard.

VO. Voice over. Narration in which the speaker is not seen.

Voices. Sound generator units which sound the timbres you design or sample. One note sounded on the keyboard requires at least one voice to sound. Depending on the complexity of the timbre used, a note may require up to sixteen voices. The number of notes that can sound simultaneously depends on the number of FM and polyphonic sampling voices in your system.

Volume Envelope. A series of times and values controlling the volume of a partial timbre over time. Delay, attack duration, peak volume, initial decay duration, sustain volume and final decay duration can all be controlled to give the timbre a particular character as it begins, sustains and ends.

VTR. Videotape recorder.

VU Meter. Volume unit meter. An instrument used to measure audio levels.

Winchester. See Hard Disk.

Write. See also Save. To store a file or sequence in a disk storage area.