Reference Manual

Revision 8

Fairlight Series III

Reference Manual

Software Revision 8

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Acknowledgements
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SPECIAL CAUTIONS

Please observe the following warnings to avoid possible permanent damage to your Series III

☐ Do not turn on the power without first checking the **MAINS SELECT** switches on the rear of the base. If the voltage supplied to the Series III differs from the voltage selected by these switches, serious and costly damage to the power supply **WILL** result.

☐ Hard disk drives are sensitive to vibration and shock. If the machine is dropped, permanent and costly damage may occur.

☐ Do not move the hard disk while spinning(any time the machine is turned ON) as gyroscopic forces can cause damge. Allow 30 seconds after switching OFF the Series III before moving.

☐ High temperature and humidity can cause the hard disk to malfunction temporarily. Ambient temperatures above 30 degrees Celsius, or humidity above 80% should be avoided. An air-conditioned envorinment will help to ensure reliable operation of the hard disk.

☐ Do not switch the computer OFF and immediately ON again. Wait at least thirty seconds before re-applying power. Failure to observe this can result in overheating due to the cooling fans not running.

☐ Do not remove or insert any modules (circuit boards) or connect or disconnect any cables (except external signal in/outs) woth power applied.

☐ Modules contain static-sensitive components. Remove, handle and ship only under static-free conditions.

Warranty void in case of damage resulting from failure to observe the above.

Chapter 1

Using this manual and Issuing Commands

Contents

Introduction

Welcome to the Series III Reference Manual. We assume you have already familiarised yourself with the Series III's general features and other important concepts outlined in the Introduction Manual and Tutorial Manual. As you will soon discover, most chapters in this Reference manual concentrate on specific groups of functions related to individual Series III display pages. Appendices cover secondary Series III functions and non-page related operations - OS9 commands, text editing and the like. These special 'Operating System' applications enhance system operation and provide a range of new Series III options for advanced Fairlight users.

The contents of this manual are designed to be read in any order. However, we recommend that you read Chapters 1, 2 and 3 first. These provide essential information on setting up the Series III , issuing commands and creating and saving sounds. For your convenience, chapters in this manual are set out in the same order as the Series III Command Summary.

This chapter introduces the general format of commands used on the Series III, and how these are described in this manual. The Introductory Manual explains many of the terms frequently used in this manual, so.... Please ensure you are familiar with these ideas before proceeding.

Series III Display Pages

Although Series III display pages appear on-screen as self-contained entities, many of their individual functions are closely related. For example, the Directory page works in conjunction with the System Configuration page to help you select and arrange Voices in memory.

To perform a specific function on the Series III you first need to know which page to call up. Here is a complete list of Series III pages:

Series III Page	Command	<ESC>Icon	Description
Large Timecode	**LTD**	<ESC><F1>	Displays Timecode input
System Configuration	**S C**	<ESC><F2>	Displays current state of the Series III's memory.
Real Time Effects	**FX**	<ESC><F3>	Adds effects such as vibrato and tremolo to sounds. Patches between sounds and MIDI devices. Maps Subvoices to the keyboard.
Function Edit	**F E**	<ESC><F4>	Edit Effects Page funtions.
Flanger	**F L**	<ESC><F5>	Adds flange and delay to selected Voices.
Wave Edit	**WE**	<ESC><F6>	Edits and re-structures the waveform of any sound resident in the Series III.

Sample	**SA**	<ESC><F7>	Samples sounds in stereo or mono.
Mix	**MX**	<ESC><F8>	Mixes or crossfades two waveforms together.
Fast Fourier Transform	**FFT**	<ESC><F9>	Analyses and recomputes sounds using harmonic and phase synthesis.
Realtime Sequencer	**RS**	<ESC><F10>	16-track real time sequencer.
CAPS Sequencer	**CAPS**	<ESC><F11>	Advanced music sequencer
Disk Recorder	**DR**	<ESC><F12>	Samples up to 8 mono tracks or 3 stereo tracks to hard disk.
Cue List Sequencer	**CL**	<ESC><F13>	Triggers sound effects to pre-determined SMPTE times.
Track Split	**TS**	<ESC><F14>	A multitrack recording data base.
Directory	**DIR**	<ESC><F15>	Displays and manipulates files on the Series III storage devices.

Issuing Commands

Commands are instructions issued to the Series III in three different forms; function key presses, icon selection (using the g-pen) and type-in commands . Pressing either the <SHIFT>, <CTRL> or <ESC> keys provides a new range of function keys, icons and command options for a particular page. The function key number corresponding to a particular icon is displayed on the left hand side of the icon.

When issuing typed commands, the <RETURN> key is always used to end the command. It is like telling the computer "That's what I want you do - now do it!" When using a Function key, however, this is not necssary. Pressing the Function key terminates a command.

Using the Graphics Pad

The graphics pad and pen are used for screen cursor control, icon selection and on-screen 'drawing'. Press the g-pen tip lightly on the pad to display the cursor. Now, moving the tip of the g-pen (whilst in contact with the pad) produces a corresponding movement of the screen cursor. For best results, the g-pen should maintain an angle 90 degrees to the pad at all times.

Once the cursor is in position, pressing the small button near the tip of the stylus has the same effect as issuing a command using function keys or typed commands. In this manual,

'hitting' the g-pen button is indicated by the [HIT] symbol. 'Tab' means move the cursor using either the g-pen or arrow keys.

When using the G-pen to [HIT] icons, the effect is identical to typing the Function key of the same number.

Command Syntax and Interpretation

Commands described in the Reference manual conform to a specific syntax - as demonstrated in the following sections.

In this manual, icons and function keys associated with type-in commands are displayed in the margin next to the typed command. Icons involving the <SHIFT> or <CTRL> keys are preceded by these symbols.

The field at the very top of every Series III display page is called the command line. If you have typed the command correctly, the Series III executes the command and your typing disappears. Character strings typed in on the command line are not interpreted by the Series III until you type one of the four termination keys:

<RETURN> or <ADD> or <SUB> or <SET>.

See 'Assigning Parameters to a Field' in this chapter for more information on the use of these keys.

If the syntax of a command is incorrect, an error message is printed on the line immediately below the command line - called the status line. In most cases, the command line cursor moves back through your typing to show where it thinks the error is.

Options may also be added to commands to modify their effect. These are listed with each command description. Function key and icon driven commands with type-in options usually require the optional information to be entered in prior to issuing the command.

Command Abbreviations

Most Series III commands may be abbreviated, provided there is no possibility for confusion with other commands. For example:

ZOOM requires one letter.

ZERO requires two letters.

In this manual, the abbreviation is displayed in **BOLD CAPITALS**; the remainder of the command is in SMALL CAPITALS.

The Copy command (Directory Page) is defined as:

<F7> **COPY** *newname* <RETURN>

newname The name of the new file to be copied from the currently tabbed (cursored) file.

{option} *oldname* The name of the file to be copied.
Default: currently tabbed filename.

So for example, if you want to copy a file on the Directory Page you can do it in two ways: The first is to type the Copy command and include both filenames (*oldname*) and (*newname*). Another way is to exclude the oldname and simply tab to the file you wish to copy.

If you just type CO <RETURN>, a message window appears

"Enter name of file for copy of oldname.VC:"

You type: *newname* <RETURN>

Message windows are general purpose prompts - in this case, the Series III is 'asking' for more information from you (the new file name) before proceeding with the command.

When using the function key or icon method, you must already be tabbed to a file name field. The Series III assumes that the tabbed filename is the file to be copied and asks for the new name of the file.

Some commands can only be issued via function key or icon selection. These symbols appear in the margin of this manual.

Ultimately, you decide which method best suits you when issuing commands - typed, function keys, icons or perhaps a combination of all three.

Upper or Lower Case Characters

The Series III makes no distinction between upper and lower case characters when issuing commands. However, the Series III distinguishes between cases when you are naming files.

The ALPHA LOCK key is used to toggle between default upper case and default lower case character modes.

In lower case mode, holding down <SHIFT> while striking character keys produces upper case letters. Toggle ALPHA LOCK once and you reverse this operation - i.e., upper case is the default, and lower case characters are produced using <SHIFT>.

Command Parameters

These are the variables associated with a particular command. They may specify file names, or provide additional information about individual files. When typed in, these parameters are separated from the actual command by a 'SPACE'. In this manual, command parameters are denoted by *italics*; e.g., Loading a Voice:

VOICELOAD *voicename* <RETURN>

voicename The parameter of the command. In this case, the name of the Voice file to be loaded from disk into memory.

So then, the typed instruction for loading a Voice requires typing the command **VL**, followed by a 'SPACE', followed by the name of the Voice to be loaded, and terminated with <RETURN>.

Global Commands

Global commands are those which can be issued from any page in the Series III System. Examples include all commands associated with Loading and Saving Instruments, Voices or Subvoices. See the Command Summary accompanying this manual for a complete list.

Spaces and Semicolons

Any number of spaces can be placed between commands and/or parameters. Also, multiple commands can be typed if they are separated by a semicolon. For example:

COPY *old.vc new.vc* ; **DELETE** *old.vc* <RETURN>

Screen Help

Some screen help is available on the Series III. To display a list of commands available for the current Page (including Global commands) type:

! <RETURN>

Use the <RETURN> key to step through the list. Press the Spcae Bar to move one page through this display. Once through the list, press any key to remove the 'Help' window. Type <CTRL- *Q*> to remove the window at any time.

Now let's suppose you are not sure of the exact syntax of a command, but you know the command name: Just type a question mark, then the name of the command:

? *command* <RETURN>

command The command to be queried.

For example, to query the Copy command on the Directory page, type:

? CO <RETURN>

The function key and associated command parameters are also displayed on-screen.

> **Note:** Help is not always available. On some pages, querying commands results in the following message:
>
> "DISPLAY PAGE MEMORY FULL (*)"

Queuing Commands

Because the Series III may take a certain amount of time to process input (e.g., when Loading or Saving), your typed-in characters are sometimes queued in a keyboard buffer.

If you wish, you can type instructions well ahead of the Series III, knowing it will catch up, eventually... If you make a mistake (for example, if you inadvertently press an 'arrow' key too many times for moving the cursor) you can discard the unprocessed character queue by holding down the <CTRL> key whilst striking the **P** key.

Assigning Parameters to a Field

A field is any area on the screen where Series III parameter information can be entered and displayed. On-screen, a field is indicated by an area of inverse video whenever the assignment cursor is positioned there (the bright bits become dark, and the dark bits become bright).

Data entered into a field may either be numeric or alphanumeric. For example, on the System Configuration page, you type in the name of the System file (saved from the currently loaded Voices) in the SYSTEM field:

SYSTEM: *name* <SET>

name The name of the System file to be saved.

Fields typically expect specific types of information; text fields for example, handle alphanumeric data, whereas strictly numeric fields expect only numbers. Parameter information entered into a field is terminated either with the <SUB> , <ADD> or <SET> key. Error messages displayed on the status line indicate incorrect entries.

> **Note:** Terminating a field entry with the <SET> key merely enters that value into the parameter field. This is not a command. When assigning values to numeric fields, the <SUB> and <ADD> keys can also be used to subtract or add the current value displayed on the command line to the currently tabbed field.

Defaults

Defaults are initial states set by the Series III. For example, the Series III defaults to the Directory Page on power-up. Where appropriate, all default values are indicated in this manual. For example;

To set Fine Tuning on the FX page:

Fine: *t* <SET>

t The amount of fine tuning to add or subtract.
Range: -255 to 255. Default: 0 (using <SET> key), 1 (using <ADD> or <SUB>)

Alphanumeric Keyboard

Assignment Cursors

On the alpha keyboard there are four 'arrow' keys; left, right, up and down. These move the cursor around the screen. Striking the <ESC> (escape) key immediately before using an 'arrow' key moves the cursor as far as possible in the direction indicated.

Home Key

The <HOME> key returns the cursor to the command line.

Delete Key

The <DEL> key deletes the character in the string immediately to the left of the cursor.

Control Keys

Control key commands may be used to edit strings of characters entered on the command line: Hold the <CTRL> key down and press the key letter indicated below:-

Table of Control Function Keys and their applications

Control Key	Function
A	AGAIN; restore previous command from cursor to end of line.
H	Move cursor to HEAD (left end) of typed line
T	Move cursor to TAIL (right end) of typed line
B	Move cursor BACK one character
F	Move the cursor FORWARD one character
D	DELETE one character forward
K	KILL (delete) to end of line
Z	ZAP (delete) whole line
I	Switch to INSERT mode
R	Switch to REPLACE (overwrite) mode
W	WORD; use before other <CTRL> B, F, D or <DELete> to act upon word

Command Line Edit Help

To display command line edit Help, type:

? <RETURN>

A window appears with a list of functions associated with the above keys. Use the <RETURN> key to step through the list. At the end of the list, press any key to remove the window.

Interrupt an Operation

Sometimes it may become necessary to halt an operation once a command has been issued. Most operations can be interrupted whilst still in progress. Type:

<CTRL- Q>

Caution: The Series III does not necessarily revert to its previous status (the state of the system immediately prior to issuing the interrupted command). For example, multiplying waveforms on the MIX Page may be interrupted half way through, thus leaving only part of the destination waveform mixed. Interrupting commands is most useful when a long operation (e.g., Streaming Tape Load/Save) is under way, and there is a change of plan.

Global Escape Key Sequences

The Escape key, situated just above the Control key, has a variety of special uses. It makes available a series of icons, on every page (globally), which can speed up operations.

The Page Menu

When you press the <esc> key once, you will see the icons at the bottom of the screen change to show a series of two- and three-letter words. These represent the display pages available in the Series III. To get to one of these Pages, press the Function Key associated with the Page, or [HIT] the corresponding icon.

For example, press the <esc> key, and under icon number 15 you will see the letters DIR. These refer to the Directory Page. Now by Pressing <F15>, the Directory Page will be accessed.

This key sequence is described in this manual as:

<esc><F15>

If you press <esc> by accident and wish to return to normal operation, press it again, and the Page Menu will disappear.

Do not hold the <esc> key down for any period of time, or the icons will continually change between their normal functions for the Display Page you are on, and the special <esc> functions.

Global Sync Control

The escape key can also be used to set the sync status and timecode generation of the system. If you press <esc> once, and then hold down the <SHIFT> key, a second menu of icons will appear. These select the sync status of the Series III. For example, under icon 2 you will see the letters SMP. These refer to SMPTE Timecode, and when pressed this icon will cause all of the Series III's sequencers (Disk Recorder, Cue List, RS and CAPS) to synchronise to SMPTE Timecode.

This key sequence, i.e. press <esc> once, hold down the <SHIFT> key and press <F2>, is referred to in this manual as:

<esc><SF2>

This operation will select timecode sync at whatever frame rate was previously in operation (25 frames per second by default). If you wish to select, say 30 frames per second, type:

30<esc><SF2>

Dropframe is selected by:

29<esc><SF2>

Similarly, icon 5 will select MIDI TimeCode, and icon 1 will select internal synchronisation, in which the Series III generates its own timing from an internal crystal. A summary table appears below.

The timecode generator in the Series III can be run at any time, using the <esc><SHIFT> menu to control it. For example, to start the generator, type:

<esc><SF8>

The starting time will be controlled by a field on the System Configuration Page, which is fully described in the Chapter of that name, but by default the starting time is zero. To Pause generation, type:

<esc><SF9>

and the same again to continue from where you paused. To go back to the start point, type:

<esc><SF8>

again, even if the Timecode is running.

The rest of this menu is concerned with MIDI clock advancement, which is covered under the Chapter on the RS Sequencer, and with Page Refresh. This function will redraw the current Page exactly as it was, and may be necessary after a particularly complicated key sequence involving the OS9 Shell (see Appendix A). To redraw the Page at any time, type:

<esc><SF15>

Key Sequence	Function
<esc><SF1>	Internal Synchronisation
<esc><SF2>	SMPTE Synchronisation
<esc><SF3>	MIDI Clock Synchronisation (with Song Pointer)
<esc><SF4>	EXTERNAL Synchronisation (proprietry pulse code)
<esc><SF5>	MIDI Timecode Synchronisation
<esc><SF7>	PLUS one clock (for MIDI clock Synchronisation)
<esc><SF8>	Start Timecode Generator
<esc><SF9>	Pause/Continue Timecode Generator
<esc><SF15>	Page Refresh

The Info Window

At the top right hand corner of the screen, there is a small window which can display a variety of different information, regardless of which Display Page you are looking at. For example, it can display the current Instrument, Voice and Subvoice, ot the current System, or the Timecode coming in, and so on.

It is also possible to tab into the Info Window and change parameters, particularly names. For example, you could rename a voice simply by [HIT]ting the voice name and assigning a new name to it (***newname*** <SET>). When tabbing into the Info Window, you cannot use the <arrow> keys. You must [HIT] one of the fields in the window with your G-pen. This is to prevent interruption of the normal tabbing behaviour of the Display Pages.

Here is a list of the available sub-windows:

Key Sequence	Function
<esc><CF1>	Time-of-day Clock
<esc><CF2>	Current System (allows renaming)
<esc><CF3>	Current instrument, voice and subvoice (allows renaming)
<esc><CF4>	MIDI Clock In and Out (Display only)
<esc><CF6>	Available Waveform Memory
<esc><CF8>	Start/Pause/Continue Timecode Generator
<esc><CF9>	Timecode In and Timecode Out (Display only)
<esc><CF14>	Audio Trigger Page (for drum replacement etc)
<esc><CF15>	Project, i.e. current open Directory (may be changed)

Cursor Control

The <esc> key can be used with the <arrow> keys to move the cursor to the limit of its possible travel in any one direction. For example, if you type:

<esc><down arrow>

the cursor will move as far downwards as it can in the downwards direction. (This may not always be the bottom of the screen, depending on the sub-windows of the particular Display Page.)

Instrument Selection

You may choose the next loaded Instrument using the <esc>, <ctrl> and arrow keys. Here is a summary of these commands:

<esc><ctrl-right arrow> - choose next loaded Instrument
<esc><ctrl-left arrow> - choose previous loaded Instrument
<esc><ctrl-down arrow> - choose next Group of loaded Instruments
<esc><ctrl-up arrow> - choose previous Group of loaded Instruments

A Group of Instruments consists of eight Instrument numbers, such as 1 to 8, or 9 to 16 etc. When you choose the next group using <esc><ctrl-down arrow>, the Series III will land on the first Instrument of that Group. When you choose the previous Group using <esc><ctrl-up arrow>, the Series III will land on the last Instrument of that Group.

* * *

Chapter 2

Setting up the Series III

Contents

Introduction

This chapter deals with routine maintenance and the connection of peripheral equipment (the Fairlight music keyboard, the alphanumeric keyboard and the VDU) to your Series III mainframe unit. Please ensure you are familiar with the following sections before powering-up your Series III.

> Note: For the Rack mounted version of the Series III, see the manual which accompanies it for details on its setting up.

Mains Voltage Selection

The Series III uses mains power supply of 100, 120, 220 or 240 Volts A.C. The correct supply input is set via the MAINS SELECT switches on the rear of the mainframe. These switches are factory set for local supply, and should not be altered without first consulting your distributor. Incorrect setting may cause serious damage.

The mains power cable attaches to the rear of the Series III. Always ensure that the mains power switch (the flat red switch located on the front of the Series III unit) is switched off *before* connecting the power cable.

Fuses

A 7.5 Amp fuse (for 120 Volt power supply) or a 3 Amp (for 240 Volt power supply) is located alongside the MAINS SELECT switch.

There are also several internal fuses that protect delicate circuitry within the Series III. If any of these should 'blow', not all the power indicator lights (on the rear of the Series III) will be illuminated.

Connect Peripheral Devices

Peripheral devices are connected to sockets on the rear panel of the Series III. Most devices use different types of connectors to avoid wrong connections.

Video Display Unit (VDU)

Connect the 5-pin DIN VDU socket to the 5-pin DIN socket on the base of the VDU. This connection supplies both power and signal to the VDU.

Fairlight Music Keyboard

The Fairlight music keyboard is connected to the Series III via a 9 p-s (male and female) D-mini connector cable. Connect the male (pin) end to the socket on the Series III marked KEYBOARD. Now, connect the other end to the connector on the keyboard marked TO SERIES III.

Also connect the 7 p-s Cannon-type cable between the KEYBOARD POWER (rear panel of the Series III) and the DC POWER sockets (rear panel of the music keyboard).

Immediately power is applied, the LED display (to the right of the Fairlight keyboard) should read "Series III". The current Voice will also be displayed here when you load sounds into the Series III.

Alphanumeric keyboard

Plug the 9-p alphanumeric keyboard cable into the D-mini socket marked ALPHA (on the rear panel of the music keyboard). If you do not wish to use the music keyboard, plug the alphanumeric keyboard cable into the D-mini socket marked KEYBOARD (on the rear panel of the Series III).

MFX Keyboard

Connect the 24pin Centronics cable from the output of the MFX panel marked TO SERIES III to the input of the Series III marked MFX. For more details on the operation and features of the MFX keyboard, see the "Fairlight MFX" manual.

Printer

Connect the 25-p printer cable to the D-type socket marked PRINTER 1 (on the rear panel of the Series III). You can connect a second printer to the PRINTER 2 socket. Set your (serial interface) printer for 9600 baud, 8 data bits, 1 stop bit, no parity.

Pedals

Connect your auxiliary performance controllers (pedals and footswitches) to the 5-s Cannon sockets marked PEDALS 1,2,3 (on the rear panel of the Music Keyboard). These devices can be obtained from your Fairlight distributor.

MIDI Input/Output on the Series III

You can directly connect up to three external MIDI keyboards/sequencers to the (5-pin DIN) MIDI IN Ports, located on the rear panel of the Series III.

You may also connect external devices to the four (5-pin DIN) MIDI OUT Ports.

Audio Connections

For the purposes of initial setting up and testing, the Series III can be monitored either via headphones, or by connecting an amplifier and speaker to the Mixed Output socket on the rear of the Series III.

> **CAUTION:** Do not short Pins 1 & 2 (to simulate unbalanced lines) as this can damage the sensitive output driving circuitry. To simulate unbalanced lines, connect ground to pin 1 and output to pin 3.

Line Outputs

The Series III also provides 16 (balanced) audio outputs marked LINE OUTPUTS. These are arranged in pairs on the rear panel for individual control of sounds, prior to mixing in the studio.

Mixed Output

A mono mix of all 16 channels is available at the MIXED OUTPUT socket at the rear of the Series III. Note: this output provides a composite mix of all 16 channels; whether 16 discrete signals are present or not. This can reduce overall signal-to-noise, hence the Mixed Output is recommended for monitoring ONLY.

Headphones

The Mixed Output and Metronome Output lines may be monitored via headphones connected to the HEADPHONE socket on the front of the Series III.

Starting up Procedures

Switch Power ON

The mains power switch is the flat red rocker switch located on the front of the Series III. On power-up, you should hear the sounds of the cooling fans and the hard disk drive rotating up to speed (this takes about 15 seconds).

Power Indicator Lights

On the rear panel there are 10 Power Indicator lights which should remain constantly lit while the Series III is running. These lights indicate that the internal circuitry is functioning correctly. If not all are illuminated, switch everything off and consult your distributor.

Digital Power Indicator Lights

These are found on the front panel of the Series III mainframe. The Digital Power Indicators should also remain constantly lit while the Series III is running. They indicate that the digital circuitry is being supplied with correct voltages (see Front Panel Diagram below).

Drive Access Indicators

The Series III has one Floppy Disk Drive, a Streaming Tape Drive and one Hard Disk Drive. Indicator LEDs on the front of each drive will begin flashing when any of these devices are accessed. See the chapter on 'Back Up Devices' for details on adding external hard disks and other external storage devices to the Series III.

VDU

The indicator light on the VDU unit should light up and remain on as long as the Series III is running. The VDU takes several seconds to warm up. The Directory Page should appear

once the Series III has finished loading its initial power-up programs. If the Directory does not appear, try adjusting the brightness control on the front panel of the VDU.

Loading a System

The Series III system loads its initial programs and sounds from the hard disk storage device. The VDU should display information about the system, beginning with the OS9 system version (which the Series III CMI system 'sits' on top):

FAIRLIGHT 0S9 LEVEL 2 - VERSION *number - date*

The current day, date and time is then quickly displayed followed by copyright information and finally ending with the Fairlight logo. The Directory Page will then be displayed once the CMI system has been completely loaded.

Restarting with Power ON

In the unlikely event of a system 'crash' or 'freeze', the Series III system can be re-booted using the RESTART switches on the front panel.

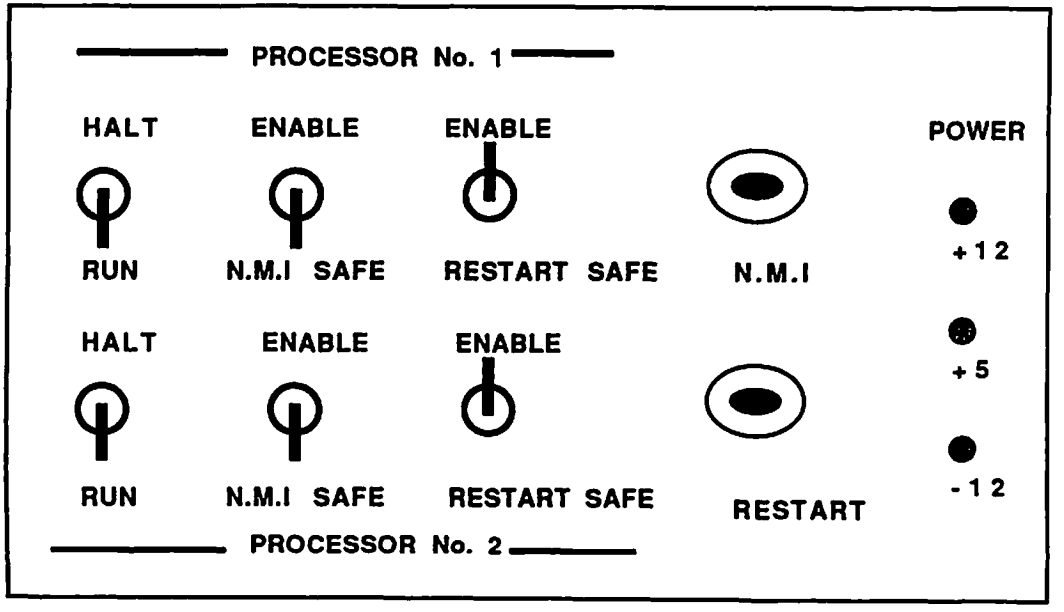


Diagram of the front panel of the Series III showing the RESTART/SAFE switches pointing to enable.

However, before resetting the Series III, please make a careful and complete note of the circumstances/operations which led to the 'crash'. By promptly submitting details of problems to your Fairlight distributor, we can start work on rectifying the problem. Your assistance in this matter would be greatly appreciated.

To restart a 'crashed' system; first switch BOTH switches labeled RESTART SAFE/ENABLE up to the ENABLE position. Now press the RESTART button. The VDU display should clear, while the system automatically re-boots from hard disk. Now return the restart switches to the RESTART SAFE position to avoid accidental restarting.

Routine Maintenance

Although the Series III does not require a great deal of maintenance, it is nonetheless a very complex and delicate instrument. Please make time to read the Special Cautions section to ensure you do not abuse your new Series III system.

The Streaming Tape heads should be cleaned from time to time. Clean the read/write/erase head assembly and the tape hole sensor openings with a clean, lintless cotton swab dampened with professional head cleaning solution (95% isopropyl alcohol). For best results, the following cleaning schedule should be used:

1. After the first complete pass of a new tape cartridge.

2. After every 2 hours of use, if using all new tape cartridges.

3. After every 8 hours of normal use.

Cleaning of Dust Filters

Two dust filters are used with the Series III. One dust filter is located in the front base of the Series III, the other is located under the internal disk drive. These filters must be cleaned regularly (at least once a month). Filters should be removed, brushed then washed until thoroughly clean.

> **IMPORTANT:** Clean dust filters regularly. This ensures effective operation of the cooling fans, and prevents serious damage to heat-sensitive components.

For the first couple of months check the filters for dust clogging ***every week.***

Cleaning the Graphics Pad

A build-up of grease and dust can affect Graphics pad operation; making the cursor appear 'jittery' on-screen. You can avoid this problem by regular cleaning of the g-pad and pen - using a small amount of soap on a moist cloth.

* * *

Chapter 3

Global Commands - Creating, Saving and Loading

Contents

Introduction

The following chapter deals with the file handling operations of the Series III - Loading, Saving, Playing, Resetting and Unloading. If you are not already familiar with the Series III's sound architecture (System, Instrument, Voice and Subvoice) please refer to the Introductory Manual.

Many of the commands discussed in this chapter are global commands; that is, they can be issued (with syntax unchanged) from any display page on the Series III. For example, with exactly the same command you can select a new current Instrument, Voice or Subvoice from any page.

Filenames

Anything created or saved must have a valid filename. Files must start with a letter between A and Z. Any combination of letters, numbers or '_' (underscore) characters up to a total of 15 characters is valid. Whenever a file is saved, the Series III adds a '.' (period) plus a two letter suffix to help you and it identify the file type later on.

For example, if you create and save a Voice called DRUM, it actually appears on disk as DRUM.VC. Therefore, never create a file containing a period in the name. In fact the Series III will complain if you try to save it.

Other Examples:

MY_WORK	Valid
2FORTEA	Invalid (starts with a number)
BIGBOY0123456789	Invalid (too many characters)
PROJECTY.X	Invalid (illegal character)
NewVoice	Valid

Creating

Creating a Voice

A new Voice can be created with the Voice Create command:

VOICECREATE *voicename* <RETURN>

voicename The name of the Voice to be created.

{option} A 'Buddy' the new Voice to the current Voice (they will always play together).

{option} S Create stereo Voice.

If the current Instrument does not contain a Voice - for example, if the Instrument has just been created, or a previously selected Voice has just been unloaded - the new Voice will be created in the current Instrument.

If the current Instrument already contains a Voice, the Voice Create command automatically creates a new Instrument with the same name as the new Voice. Also created within a new Voice is a single Subvoice containing default waveforms (sine, sawtooth, triangle, square).

> **Note:** The total number of Voices that can be created within any given Instrument is limited by the Nphony you assign to the Instrument. If you attempt to exceed this number - i.e., if you try to create more Voices than available channels, the following error message is displayed:
>
> "NO CHANNELS AVAILABLE"
> or
> "INSUFFICENT STEREO CHANNELS"
>
> if using stereo voices.

Creating a Subvoice

A new Subvoice can be created within the current Voice with the Subvoice Create command:

SUBVOICECREATE<RETURN>

{option} *name* Subvoice name.

If no current Voice exists (loaded or created) the following error message is displayed on some pages:

"No Voice"

Newly created Subvoices are assigned the next Subvoice number available for that Voice. For example, newly created Subvoice numbers are assigned numbers 1, 2, 3 ... up to a maximum of 63.

A newly created Subvoice becomes the current Subvoice. The default waveform is a composite of sine, sawtooth, triangle and square waves. A loop is created so you can play the keyboard and hear audio immediately

Stereo Subvoices are created if the Voice itself has been created as a stereo Voice.

> **Note:** Stereo Subvoices can not be created within a mono Voice. However you can Load the waveform from mono Subvoices into a stereo Voice , and vise-versa, with a special option (see below: Loading Subvoices).

Creating an Instrument

A 'null' Instrument can be created as a blank template for loading/unloading different Voices. You can also use 'null' Instruments for reassigning incoming and outgoing MIDI information on the System Configuration page.

To create an Instrument:

INSTRUMENTCREATE<RETURN>

{option} *instrumentname*	The name of the Instrument to be created.
{option} *n*	The number of Instruments to be created. Range: 1 to 40

If *instrumentname* is omitted from the command, the newly created Instrument takes the name of the first Voice created or loaded into it. New Instruments are assigned the lowest available Instrument number.

You may name this new Instrument on the SC Page, the FX Page, the Info Window, or as above. All these are described in the relevant chapters of this manual.

Creating a System

At any time, you can save the complete list of on-board Instruments, Voices and Subvoices, as well as the Sync status and your MIDI setup as part of a System. Whenever there is anything loaded, a System exists, but in order to save it for later recall, you must first give it a name. The name of this System can be assigned either on the System Configuration page, the Info Window (in the upper right hand corner of the screen) or saved as part of the System Save command.

To assign a System name on the System Configuration page, tab to the SYSTEM field at the top of the screen and type the name of the System you want to create:

SYSTEM: *systemname* <SET>

systemname The name of the System to be created.

To achieve the same thing in the Info Window, first access it by typing:

<esc><CF2>

Then <HIT> the field just below the word: SYSTEM, and assign a name to it as above.

Select Current Instrument

A Voice loaded into Series III memory from hard disk is loaded into an Instrument. An Instrument (which might 'contain' several Voices and Subvoices) is made current by specifying that Instrument's name or number as explained below.

To select a current Instrument by command from any Series III page:

INSTRUMENT *i* <RETURN>

i The number or name of the Instrument.
Range: 1 to 80

{option}V The number of the Voice within the Instrument.
Range: 1 to 16

{option}SV The number or name of the Subvoice within the Voice.
Range: 1 to 63

{option} * A wild card character can be used to represent unspecified characters in the Instrument name. The first matching Instrument in the System is selected as current.

Error messages are displayed if the numbers specified are not in the allowed range. For example, specifying an Instrument number greater than the number of already created Instruments.

Other Examples:

I 10	Select Instrument 10 as current.
I 2 3 4	Select Instrument 2, Voice3, Subvoice4 as current.
I B*	Select first Instrument starting with 'B'.
I BASS	Select Instrument called Bass.
I B* 1 4	Invalid (cannot have a Voice number after the wild card).

Select Current Voice

If you want to select a new Voice from within an Instrument already selected as current, use the select current Voice command:

VOICE *v* <RETURN>

v The number or name of the Voice.
Range: 1 to 16

{option} SV The number of the Subvoice.
Range: 1 to 63

{option} * A wild card character may be used to represent unspecified characters.

An error message is displayed if the number/s specified are not applicable to the current Instrument.

Examples:

V 1	Select Voice 1 as current.
V 1 2	Select Voice1, Subvoice2 as current.
V *GTR*	Select the first Voice with 'GTR' somewhere in the name as current.

Note: The above Voice select command is really only useful where an Instrument contains more then one Voice - which is comparatively rare.

Select Current Subvoice

To Select another Subvoice from within the current Voice:

SUBVOICE *sv* <RETURN>

S V	The number or name of the Subvoice. Range: 1 to 63
[option] *	A wild card character may be used to represent unspecified characters in the Subvoice name.

If you specify the subvoice name, the program will find the subvoice even if it is not in the current voice. If the name occurs more then once, the first instance will be found.

Saving

Whenever you Save a file, you are are transferring a copy of the file from temporary (volatile) memory within the Series III to more permanent (non-volatile) hard disk storage. Since the Series III attaches a file-type suffix to the end of a file for identification, (.VC for Voice, .SY for System and so on) you cannot save Voices with names containing a period - e.g., MY.DRUM.

Warning: If files are not saved, they cease to exist when the Series III is turned OFF. Make it a habit to regularly save work files. This can greatly minimise the catastrophic effects of momentary power failures, accidental erasures...

Saving Voices

The VoiceSave command may be used to save the current Voice to disk in two slightly different ways:-

Either as a complete Save - including all associated parameters and waveforms. Or Saving only what has been modified since the previous save.

To save the current Voice to disk:

VOICESAVE<RETURN>

{option}O Overwrite Voicefile (No Query).

{option}M Save modified parameters of the Voice and any Subvoice waveform changes.

If you are saving a newly created Voice, the VoiceSave command proceeds without query. If the Voice already exists on disk, the Series III inquires whether to overwrite this Voice with the current Voice - unless you use the O option.

Note: Subvoices can only be saved as a complete set; there is not an individual Subvoice Save command.

Saving Instruments

Use the Instrument Save command to save the current Instrument only (i.e., not including the Voices and Subvoices):

INSTRUMENTSAVE<RETURN>

The Instrument Load command reloads Instruments back into waveform memory.

Saving Systems

The current System - displayed in the SYSTEM name field on the System Configuration page - is saved to disk using the System Save command. Including the System filename with the command assigns a new name to the current System.

To save the current System:

SYSTEMSAVE<RETURN>

{option}*systemname* The name of the System to be saved.

This command is particularly useful since it saves your entire Series III setup. Only the names of Instruments and Voices are saved when using the System Save command. Modified Voice waveforms must be saved separately with the Voice Save command (if not already on disk).

Note: 40 Instruments can be saved to and loaded from a System file.

Loading

A file is loaded into memory using the Load command:

LOAD *filename* <RETURN>

filename The name of the Series III file to be loaded. Suffixes must be included.

The following Load commands enable you to specify just the names of files you wish to load. File suffixes can be omitted.

Loading Voices

To load a Voice:

VOICELOAD *voicename* <RETURN>

voicename The name of the Voice to be loaded. The currently loaded Voice is re-loaded if *voicename* is not specified (Useful if you experiment and want to resurrect the original version on disk).

{option} **I** Load a Voice into a newly created Instrument with the same name as the Voice to be loaded.

{option} **A** Add (buddy) a Voice to the existing Voice in the current Instrument.

Loading Subvoices

To load a Subvoice into the current Voice:

SUBVOICELOAD ***voicename subnum***<RETURN>

voicename The name of a specified Voice containing the Subvoice to be loaded. Default: current Subvoice is re-loaded.

Subnum The number of the Subvoice in the Voice to be loaded.

{option} **R** Create a new Subvoice, and load the mono Subvoice into the right side of a stereo Voice OR load the right side of a stereo Subvoice into the mono Voice.

{option} **L** Create a new Subvoice, and load the Subvoice into the left side of a stereo Voice.

{option} **S** Substitute the Subvoice to be loaded for the current Subvoice.

{option} **W** Load only the Subvoice waveform (this leaves the current Subvoice patchings and effects unchanged). To replace the waveform use the S and W options.

{option} **P** Load only the Subvoice patches, not the Subvoice waveform. To replace only the patches of current Subvoice, use the S and P options.

Examples:

Re-load current Subvoice from disk to memory.:

SVL<RETURN>

Load Subvoice 2 of DRUM.VC, substituting the waveform only of the current Subvoice:

SVL DRUM 2 SW<RETURN>

Previewing Subvoices

You may listen to the waveform of any subvoice on your hard disk(s) by typing:

PREVIEW ***voicename subnum***<RETURN>

This will work on any Series III display page. If you do not iclude the subvoice number, all the subvoices in the named file will play, one after the other.

Loading Instruments

To load an Instrument:

INSTRUMENTLOAD *filename* <RETURN>

filename The name of the Instrument to be loaded.

The Instrument name and an Nphony of 1 is assigned to the Instrument. Any Voices associated with the Instrument are also loaded - if they are stored on disk.

Load a System

To load a complete System file into memory:

SYSTEMLOAD *systemname* <RETURN>

systemname The name of the System as it appears on the Directory page (without the .SY suffix).

{option} **Q** Quick load: Create the Voices instead of loading them. Useful for quickly loading the Instrument names in the System, changing, then saving the System listing. Be careful NOT to save these Voices as they do not contain waveforms and will wipe any existing waveforms contained in the Voices.

{option} **Y** Overwrite query if Voice files are not found.

If the Voices included in the System cannot be found, the following error message is displayed:

"VOICE FILE NOT FOUND CONTINUE Y/N"

Answering no (N) to the query aborts the System load. Answering yes (Y) continues the load, and a 'null' Instrument with the name of the missing Voice is assigned within the System. The decision to either find the missing Voice, or re-save the System without this Voice name is left up to you.

Resetting

Resetting Voices, Subvoices and Systems has the effect of erasing them from memory and returning them to their default conditions. Make completely sure you have Saved any files you may later require before issuing a Reset command.

> **Note:** The difference between Resetting and Unloading. Unload totally removes something from memory. Resetting leaves the default settings intact.

Resetting a Subvoice

To erase the current Subvoice and reset it to its default waveforms:

SUBVOICERESET<RETURN>

Resetting a Voice

To erase the current Voice and reset it to its default single Subvoice waveforms:

VOICERESET<RETURN>

Resetting an Instrument

To erase the current Instrument and unload any Voices contained in the Instrument:

INSTRUMENTRESET<RETURN>

The current Instrument is reset to its default state with no Voices and an Nphony of 1.

Reset a System

To erase the currently loaded System from memory:

SYSTEMRESET<RETURN>

This is the default state upon first entering the Series III. All Instruments, Voices and Subvoices are unloaded.

> **Note:** A System Reset is performed before a new System is loaded.

Unloading

Unloading is the reverse of Creating. Unloading totally removes an Instrument, Voice or Subvoice from memory.

Unloading a Subvoice

SUBVOICEUNLOAD<RETURN>

This unloads only the current Subvoice of the current Voice. The closest, lower numbered Subvoice then becomes current.

Unloading a Voice

To unload the Voice from the current Instrument:

VOICEUNLOAD<RETURN>

Unloading an Instrument

To unload the current Instrument and any Voices contained in that Instrument:

INSTRUMENTUNLOAD<RETURN>

The closest, lower numbered Instrument becomes current.

Note: Instruments remaining in the System will not be renumbered.

* * *

Chapter 4

Directory (DIR) Page

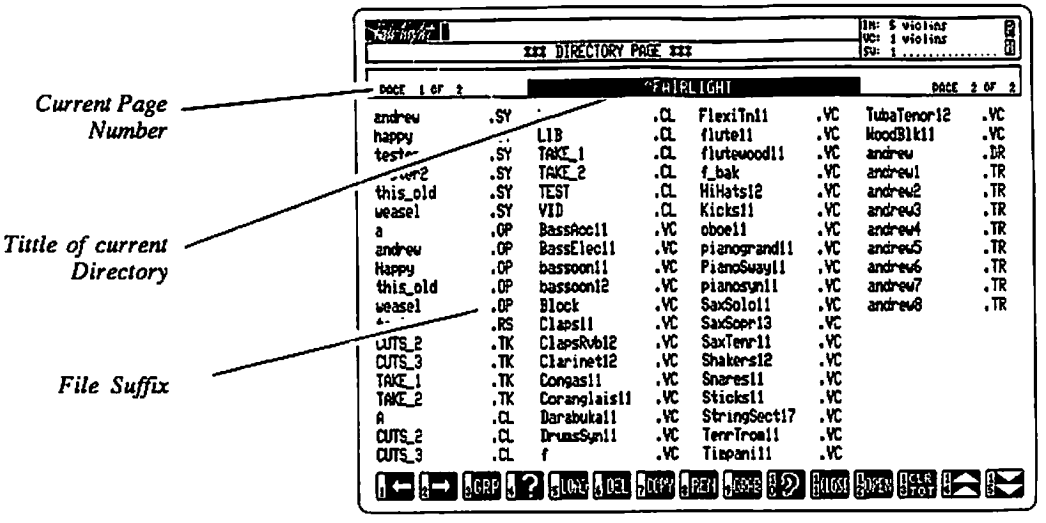
Contents

Introduction

The default page on the Series III is the Directory page. Here you can manipulate your hard disk files - copy, delete, rename, audition, query, load and mark. There are also facilities for handling large numbers of files to help you create System files, Streaming Tape files, mass deletions and copying.

To transfer to the Directory page from any other page, type:

<esc><F15> **DIR**ECTORY<RETURN>



The Default Directory Page

Series III Suffix Types

Series III files are displayed alphabetically on the Directory page and grouped according to suffix. File suffixes include:

SUFFIX	FILE
.CL	Cue List File
.DR	Disk Recorder File
.IN	Instrument File
.RS	Real Time Sequencer File
.SY	System Files
.TK	Cue List Take File
.TP	Streaming Tape File
.TR	Disk Recorder Track File
.TS	Track Split File
.VC	Voice File
.SX	System Exclusive File
.OP	CAPS File

Note: Not all file suffix types listed above are compatible with the current software release. Timecode Trigger files, for example, may only be saved and loaded from previous software (but Cue List can convert them to a new format.

Selecting a Directory

The current directory is displayed in the Directory Name field. This defaults to ^FAIRLIGHT upon entering the Directory page. The ^ symbol (called a caret) is an abbreviation for the */c0/cmifiles* pathlist. Thus, typing ^*mywork* is equivalent to typing */c0/cmifiles/mywork*. See the 'OS9 Commands' chapter (Appendix A) for more details.

To view a different directory, tab to the Directory Name field, type the new directory name in the command line (include its pathlist if necessary) then press the <SET> key.

For example, if there is a floppy disk in the drive, type:

/f0 <SET>

The contents of the floppy now appears as the current directory.

Note: a directory contained within a directory (on floppy, say) may also be displayed in the same manner:

/f0/mywork<SET>

To display more than one directory at a time, see Auxiliary Directories later in this chapter.

Moving Within the Directory Page

Two pages of files are displayed at the same time on the Directory page.

To move forward one page:

<F1> NEXT<RETURN>

To move back one page:

<F2> PREVIOUS<RETURN>

To move to the beginning of the Directory:

<SF1> BEGIN<RETURN>

To move to the end of the Directory:

<SF2> END<RETURN>

To select a specific directory page; tab to the Directory Page Number field (at the top of the screen), type the page number in the command line, then press <SET>.

Querying a File

The query command is used to display information about any file in the current directory - without actually loading the file. This saves considerable time if say, you only want to inspect the contents of Voice and System files.

To query a file on the Directory page:

<F4> QUERY<RETURN>

{option} *filename* The name of the file to be queried. (Can be in any directory if pathname and file suffix is included).
Default: Currently tabbed file.

Information contained within the query window includes filename, size, date created and the directory pathname of the queried file.

To remove the query window, toggle the query icon/function key, or issue the Query Off command:

<CF4> QUERYOFF<RETURN>

Use the same paging facilities for moving within the directory when the Query window is displayed.

File Size Accumulator

The total file size (in Kbytes) of all the files you have queried appears at the top right of the query window. It is useful to know the size of this File Size accumulator before loading files onto streaming tape, onto another disk, or to see if all the Voices in a System can fit into waveform memory. To clear the Total accumulator:

<F13> CLTOTAL<RETURN>

Query Voice files

A Voice file can be queried by command:

QUERYVOICE<RETURN>

{option} *filename* The name of the Voice file to be queried. Can be in any directory if pathname is included. No need for .VC suffix.
Default: Currently tabbed file.

When querying Voice files, the displayed information includes the number, size and name of Subvoices contained within the Voice.

WRAM

This field shows the sum of all the Subvoice waveforms (in bytes) which provides an indication of the amount of waveform memory that the Voice occupies when loaded.

Note: In the upper middle area of the window is the total voice size - which measures the amount of disk space actually allocated to the Voice file. Subvoice function parameters account for about 2.5 Kbyte per Subvoice. Voice parameters take up about 3Kbyte. Parameters are used on the FX page, so the WRAM figure is always slightly less than the total displayed in this field.

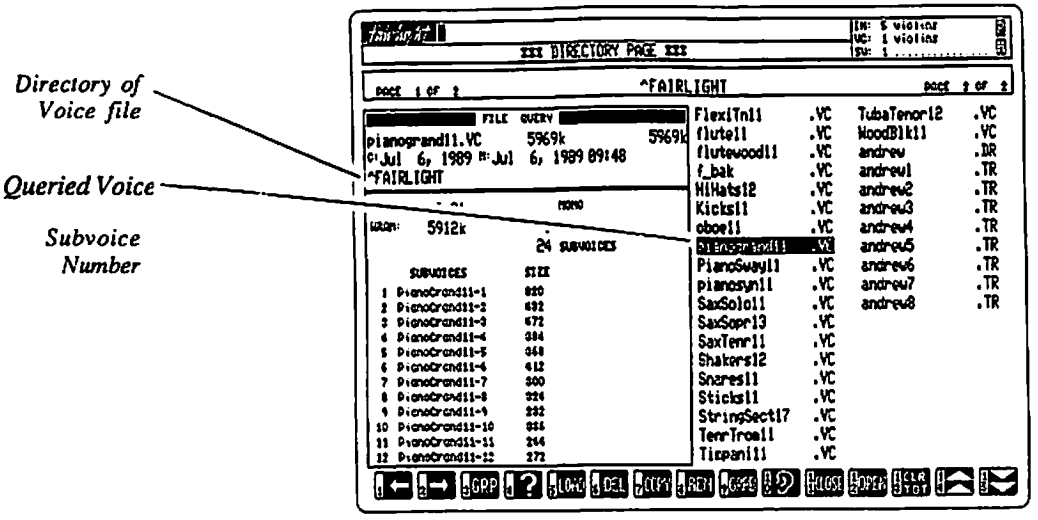
Version

The version number of the Voice. Voice file formats tend to evolve with each new version of Series III system software.

Note: Generally, new software is able to load old version Voices, Systems and Sequences. Old software sometimes cannot load files saved by new software.

Mono or Stereo

Informs whether the Voice is stereo or mono. Stereo Voices occupy at least two Voice channels when loaded.



Voice Query Window (with a Voice selected)

Voice Functions

The number of functions created on the FE Page for the Voice.

Subvoice Number, Name, Size

Subvoices are listed by number, name and waveform size - in groups of 14 Subvoices. If a Voice contains more then 14 Subvoices, use the Previous and Next page commands to display remaining Subvoices.

To display the previous Subvoice group:

<F14> PRPAGE<RETURN>

To display the next Subvoice group:

<F15> NEXTPAGE<RETURN>

With stereo Voices the size of the left waveform is displayed to the left of the size field, the right waveform is displayed on the right.

Query System File

A System file can be queried by tabbing to the System filename and using the file query commands as explained above. System files may also be queried by command:

QUERYSYSTEM *filename* <RETURN>

filename The name of the System file to be queried (.SY suffix not required).
Default: Currently tabbed system.

The following information is displayed whenever a System file is queried:

WRAM

The sum total of waveform memory used by all Voices in the System.

> **Note:** (as before) The total file size of a Voice exceeds its waveform size by a small amount. If the same Voice appears several times, its WRAM is only counted once - because WRAM is shared in memory.

Channels

The number of Voice channels used by the System.

Instruments

Instruments are listed according to Instrument number. Also displayed in the Instrument row - Nphony, the names of Voices contained and the Voice file sizes. A dashed line appears in the size column if the Voice is not found in the current directory.

Quick System Query

Use the Query Fast command to quickly scan the contents of a System (Instruments etc.). The fast query command does not involve WRAM size calculations:

<SF4> QUERYFAST<RETURN>

{option} *filename.SY* The System File name to be scanned (the .SY suffix must be included).
Default: The currently tabbed System file.

Note: This command cannot inform you if all the Voices listed are in the current directory, since it only lists Voicenames within the System file.

Query Disk Space

You can measure the amount of contiguous free disk space (in Kbytes) on any selected storage device from the Directory page. This is useful when using the Disk Recorder.

QUERY *device*@<RETURN>

device The name of the disk device to be queried; e.g., *fc0*

Voice Audition (preview)

On the Directory page you are able to listen to any sound stored on hard disk - without having to actually load the sound into waveform memory. When you audition the whole Voice, the individual Subvoices are auditioned in numerical order.

You can specify Subvoices using the Audition command:

<F10> **PREVIEW *Voicename*** <RETURN>

Voicename The name of the Voice containing the Subvoice.

{option} *Subvoicenumber* The number of the Subvoice.
Default: Currently tabbed Voice file.

You can also query the Voice file. To hear a specific Subvoice, [HIT] either the Subvoice number, name or size fields.

Subvoices are auditioned directly from disk. They are played back at the original sample rate without any FX page effects, looping or filtering.

Note: Sometimes a click may be heard at the end of a sound. This is where the loop takes effect when loaded into memory.

Loading Files

Most files - such as Voice (.VC) , System (.SY) or Realtime Sequence (.RS) files - can be loaded into memory using the Load command:

<F5> LOAD *filename* <RETURN>

filename The name of the file to be loaded into memory (include file suffix).
Default: Currently tabbed file name.

Some files - such as Track Split (.TS), or non CMI system files (e.g., your own text files) - cannot be loaded from the Directory page.

The following error message is displayed if you attempt to load these types of files:

"FILE TYPE UNSUITABLE FOR LOAD"

Load Voice with Instrument Create

The Load Voice with Instrument Create command automatically creates a new Instrument with the same name as the Voice you want to load. This enables you to load Voices without having to first Create an Instrument.

The Load Voice with Instrument Create command is:

<SF5> LOADINSTRUMENT<RETURN>

{option}*voice.VC* The name of the Voice file to be loaded (.VC suffix must be included). Default: Currently tabbed Voice file.

> **Note:** There are also global commands that perform all these Load functions. See 'Global Operations- Creating, Loading and Saving' chapter.

Copy Files

To copy files to the currently displayed directory - or to any specified directory within the Series III - use the Copy command. Files may be copied to provide a 'scratchpad' version of a sound - thus leaving you free to experiment, whilst keeping the original intact on disk.

The Copy file command is:

<F7> COPY *newname*<RETURN>

newname The new name of the copied file.

{option} *sourcename* The name of the file to be copied. Default: The currently tabbed filename.

The *sourcename* must contain the suffix which appears in the directory. The destination filename automatically inherits the suffix of the *sourcename*.

The pathname of the destination directory should also be specified when copying files to a different directory. If the pathname is not specified, the Series III assumes the file is to be copied into the current directory.

To use the Copy function key/icon; tab to a filename, then issue the Copy command. The Series III prompts for the new name of the copied file:

"Enter name of file for copy of *filename*"

filename is the name of the currently tabbed file. Type the new name of the file to be copied then <RETURN>.

Rename Files

The Renaming command is useful whenever you need to reorganise your files - say, to include more descriptive titles, or to avoid confusion with similar filenames.

The Rename command is:

<F8> **RENAME** *newname*<RETURN>

newname	The new name for the currently tabbed file.
{option} *oldname*	The name of the file to be renamed if not tabbed to a file Default: The currently tabbed file.

If both *oldname* and *newname* are specified, then *oldname* must be entered first after the Rename command.

Use <CLEAR><RETURN> to cancel the Copy or Rename command after a file name prompt - because the Series III interprets any string of characters typed in after the prompt as if it were a filename. The following message is displayed:

"Null file name."

and the Copy or Rename command is safely terminated.

Delete Files

The Delete command is used to erase files from the hard disk - to increase available disk space, for example.

Warning: A file cannot be retrieved once deleted - unless it had already been saved onto another medium such as Streaming Tape. The Delete command is:

<F6> **DELETE** *filename* <RETURN>

filename	The name of the file to be deleted. Default: Currently tabbed file.

Move Files

A file from a currently displayed directory can be removed and transferred to another directory within the same device:

<SF9> **MOVE** <RETURN>

{option} *filename*	Name of file to be moved (suffix must be included).
{option} *destination*	The name of the destination directory for file to be moved. Default: Currently tabbed file.

Grab File Name to Command Line

There is a filename 'capture' facility which allows you to incorporate any selected filename into a command. Tab to the filename, and use the Grab icon/function key to select the filename.

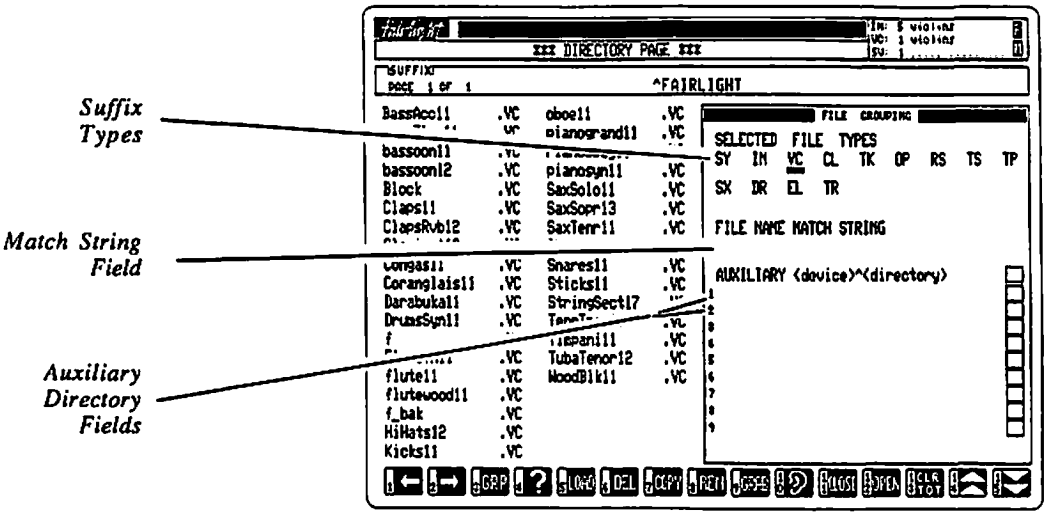
<F9> There is no alphanumeric command for the Grab facility.

Display Individual File Types

You can display a subset of files contained in the current directory display using the File Grouping window. Files can be selected according to suffix type, or using Match Strings (see Match String Characters (Wild Cards) below).

To display the File Grouping window:

<F3> GROUP<RETURN>



File Grouping Window

The File Grouping window contains a list of all standard Series III suffix types. [HIT] any type to display a list of files with that suffix.

For example, to display Voice files only, [HIT] the .VC suffix and all other files are cleared from the Directory display.

The file suffix is underlined to indicate that it has been selected. An icon marked SUFFIX also appears in the current Directory Name field above the page number. Different suffix files may be displayed at the same time.

To return to the main Directory display, [HIT] the SUFFIX icon, or re-[HIT] the suffix file/s you selected. To remove the File Grouping window, reissue the Group command as above, or [HIT] the bar at the top of the window.

Use the Type command to select file types by command:

TYPE *suffix* <RETURN>

suffix The two letter suffix name.

{option}ALL Display all file types. (This option is equivalent to [HIT]-ting the SUFFIX icon).

{option}+ Add a number of file groups e.g., ***TYP SY + VC*** <RETURN> displays Voice and System files only.

{option}- Subtract file groups e.g., ***TYP - VC*** <RETURN> removes .VC files from the current selection.

The Add and Subtract options can be used in any combination to include or exclude different types of files.

Match String Characters (Wild Cards)

The Match String facility enables you to search for a particular file or file group. This can be useful when specifying files for the File Grouping window (see above).

The Match String only searches for files in the currently displayed directories. For example; tab to the FILE NAME MATCH STRING field position, type in the filename you want to find, then <SET>. The search for the Match String begins as soon as you press <SET>. More then one search string can be specified in the Match String field at a time.

You can use wild cards to display groups of files with similar names.

The wild card characters are:

* Matches any number of characters from zero onward.
e.g., To show all Voices starting with Piano; **Piano*.VC**

: Matches exactly one character.
e.g., FR:D.VC matches FRED.VC, FRID.VC, FRXD.VC etc.

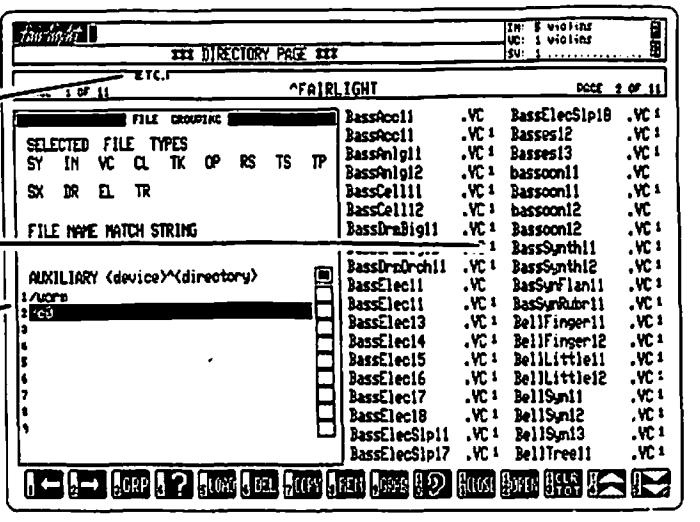
= Matches zero or one character
e.g., FR=D.VC matches FRD.VC as well as FRED.VC etc.

The MATCH icon appears above the Page number in the Directory Name field whenever the match string is being used. To turn the match facility OFF, [HIT] the MATCH icon or assign an empty character string to the FILE NAME MATCH STRING field.

Auxiliary Directories

The Series III provides a Main Directory, and as many as nine Auxiliary Directories to be displayed at once. This facility is available in the File Grouping window (see above). When using Auxiliary Directories, the directory assigned to the Directory Name field near the top of screen is called the Main Directory.

An Auxiliary Directory displays files other than those currently included in the Main Directory. Auxiliary Directories can be displayed by themselves or in combination - either with other Auxiliary Directories, or the Main Directory.



Example of Auxiliary Directories (with all Auxiliary Directories included in Directory display)

To add a directory to the Main Directory, tab to a cursor field immediately below the AUXILIARY <device>^<directory> screen position. Type the directory (include pathname) into the command line, then <SET>.

For example, to display the 'Fairlight' directory on a /c200 hard disk device, type:

/c200/cmifiles/fairlight <SET>

The Auxiliary Directory (or Directories) are now added to the Main Directory. Files are still grouped together according to suffix and listed in alphabetical order.

A number between 1 and 9 appears alongside files contained in an Auxiliary Directory. This is the Auxiliary Directory number - which is automatically assigned by the Series III when an auxiliary directory is first entered into the Group File window.

For example, files contained in the first Auxiliary Directory show the number 1 (following their suffixes). The second set of Auxiliary Directory files are assigned 2, and so on...

When a Voice Load command is issued, the Series III searches for the requested file in the Main Directory, then Auxiliary directory 1, 2 and so on.

The box to the right of each AUXILIARY <device>^<directory> field displays ON whenever an associated Auxiliary Directory is added to the Main Directory. An ETC icon also appears near the top of screen to signify that an external directory is being displayed along with the Main Directory.

To display the Main Directory only; either re-[HIT] the ON/OFF box or the ETC icon.

<SF3> There is no alphanumeric command equivalent for toggling between Aux and Main directories.

Displaying a Single Auxiliary Directory

Each Auxiliary Directory has an associated side-box. [HIT] one of these, and only that directory is displayed. An AUX icon is also displayed near the top of screen.

To return to the Main Directory only; either re-[HIT] the ON/OFF box, or the AUX icon.

Save Auxiliary Directory Set-Up

Your current Auxiliary directory set-up is saved whenever you leave the Directory page or QUIT the CMI system. This set-up will reappear when you re-boot the system for a new work session.

> **Note:** The Series III looks for any external hard disks used as source files for Auxiliary directories. If these devices have been removed since setting up the default directory display, the following error message is displayed:
>
> "Files Not Found"

Auxiliary directories should be closed before changing pages or Quitting the CMI system if external hard disks are <u>not</u> going to be used in the next work session.

Display and Load WORM Files

For Series III users with WORM drives:

A WORM directory can only be displayed on the Directory page as an Auxiliary Directory. To display a WORM directory, open the File Grouping window with GRP<RETURN> and tab to an Auxiliary Directory field. Type:

/WORM <SET> or **/W0**<SET>

If you have multiple WORM drives, their names may be added to the list of auxilliary directories: /W1, /W2 etc. WORM files can be loaded directly into waveform memory using the usual load commands on the Directory Page.

Note: You cannot load a System (.SY) directly from WORM. You have to exit to the OS9 Shell, FROMWORM the .SY file onto hard disk, re-enter the directory page and load it from there. The same thing applies for .TP files. A WORM file cannot be queried or auditioned since it is not on hard disk.

Mass File Operations

Individual files may be 'marked' for performing mass deletions and mass file copying. This is also a convenient method for creating System (.SY) and Streaming Tape (.TP) files.

Marking Files

Tab to a filename and either press the <ADD> key, or issue the Mark command:

MARK<RETURN>

A marked filename is indicated on the display by a highlighted first character.

Note: Files do not remain marked once you leave the Directory page.

To remove a mark from a file, tab to a filename and either press the <SUB> key, or issue the Unmark command:

UNMARK<RETURN>

To remove all marks from the directory, use the Killmarks command:

<CF10> KILLMARK<RETURN>

Making a System from Marked Files

You can create a System file by first marking a number of Voice files, then issuing the Make System command:

<CF5> SYSTEMMAKE<RETURN>

{option} *filename* The name of the System File to be created.

The new System contains all the marked Voice files, and assigns one channel and one Voice to each Instrument. If no files are marked, the Series III prompts whether you want to include all files within the current directory into the System file. Be careful - a maximum of 16 only can actually be loaded.

If *filename* is not specified (e.g., when using the function key/icon), the Series III prompts for the name of the System to be created.

Making a Streaming Tape from Marked Files

A Streaming Tape file can include any type of Series III files. These are used mainly for major backups of files contained on hard disk. For more details on .TP files see the chapter on 'Backup Devices'.

To make a streaming tape file, first mark the files you wish to include, then issue the Tape Make command:

<CF8> TAPEMAKE<RETURN>

{option} *filename* The name of the Streaming Tape file to be created.

If files are not marked, the Series III prompts whether you intend including all the files in the current directory. If *filename* is not specified in the Tape Make command, you are prompted for the name of Tape file to be created.

> **Note:** Use the file size accumulator (in the Voice file query) to ensure that files do not exceed the size of the Streaming Tape (60 Mb).

Mass Delete

Whole groups of marked files can be deleted from the hard disk via the Directory page:

<CF6> MASSDELETE<RETURN>

Warning: Be extremely careful with this command! Once files are deleted you cannot get them back again.

Mass Copy

You can also copy a whole group of marked files at once:

<CF7> MASSCOPY<RETURN>

This command is used for copying large numbers of files to different directories. The Series III asks for the destination directory (including its pathlist) before copying the marked files. Ensure there is sufficient space for hard disk destinations.

Mass Move

Use the Mass Move command to remove marked files from the current directory to another directory (within the current device only):

<CF9> MASSMOVE<RETURN>

{option} *directoryname* The name of the destination directory for marked files.

If a *directoryname* is not given, the Series III prompts for the pathname of the destination directory:

"Destination directory for mass move:"

Type the name of the destination directory, then press<RETURN>. If you wish to abort the Mass Move, use <CLEAR><RETURN> to produce a 'null' pathname.

Open Directories

There is a global command which enables you to open a directory from any page on the Series III. The current working directory is changed to the name of the directory specified.

The global Open Directory command is:

OPENDIR *directoryname* <RETURN>

directoryname The name of the directory to be opened.

This allows you to select any directory - without having to leave the page you are currently working on.

Open Subdirectory

Any subdirectory (contained within the current directory) displayed on the Directory page can be opened using the Open Directory command:

<F12> OPEN<RETURN>

{option}*dirname* The name of the subdirectory to be opened.
Default: The currently tabbed directory.

To close the current subdirectory, and return to the original directory containing the subdirectory:

<F11> CLOSE<RETURN>

Make a Subdirectory

A subdirectory can be created in the Directory page with the following command:

MAKEDIR *directoryname* <RETURN>

directoryname The name of the newly created directory (including the pathname).

The subdirectory is created in the current working directory if a pathname is not specified.

Example:

MD /c200 /MYWORK <RETURN>

Creates the directory *MYWORK* on external disk /c200.

> **Note:** You can only delete a directory which contains files by exiting to the OS9 Shell and using the TREDEL command (see Appendix A, 'OS9 Commands', for more details). If a directory does not contain files, it can be deleted from the Directory page as if it was a file.

* * *

Chapter 5

System Configuration (SC) Page

Contents

Introduction

On the System Configuration page you can see which Series III voices are loaded, which channels and router outputs they use, how much memory they occupy and many other things about them. It is your window on the state of the system, memory and MIDI setup. You can use the large number of tabbable fields to change names, channels, outputs, MIDI details, sync states and many other aspects of the System. Then you can save the Sytem, knowing that everything you see on this page will be re-created when you reload.

Eight subpages are used to display and alter all the information. Here is a brief description of each of them.

Subpage	Icon	Description
Instrument Lineup	<F1>	Displays the Voices, Instruments, MIDI outputs, memory usage, nphony, router outputs and tuning.
Channel Allocation	<F2>	Maps Voices to Channels.
MIDI Input	<F3>	Enables external MIDI devices to play Series III sounds.
MIDI Control Map	<F4>	Re-assigns incoming MIDI control data to different control numbers.
Keyboard Split	<F5>	Allocates Instruments to different parts of your MIDI keyboard.
Level Meters	<F6>	Displays the amplitude output of each channel card and router output.
SMPTE MIDI Sync	<F7>	Configures the Series III synchronisation
Router Assignment	<F8>	Routes voices and subvoices to polyphonic outputs

Table of Subpages Used in the System Configuration Page

To transfer to the System Configuration Page:

<esc><F2> SYSTEMCONFIG<RETURN>

Fields displayed on all the subpages include:

System

The SYSTEM field displays the current System name. This field may also be used to create a new System or to change the name of an existing System - you assign a new name to this field, then issue the System Save command. (see Chapter 3 'Creating, Saving and Loading'). When you save a System, you are saving every detail displayed on this Page.

Master Port

As in other MIDI systems, each instrument in the Series III environment responds on different MIDI channels, and a keyboard sending notes into the system must be set to transmit on the correct channel to play the Instrument you want to hear. To avoid this necessity, the system has a Master Port/Channel(s) which always plays the currently selected Instrument. To make use of this feature, you should ensure that the Master Port/Channel is adjusted to be the same as your main keyboard, and it is simplest if this only transmits on one channel.

The MASTER PORT field selects which MIDI Port, out of the four input Ports of the system, will contain the Master Channel. It defaults to Port D, which is hardwired to the Fairlight MIDI or MFX keyboard. When using a different keyboard as your Master, plug it into one of the three MIDI Input Ports; A, B or C located at the rear of the Series III, then select that input Port to be the Master Port.

Master Channel

The MASTER CHANNEL field displays the active MIDI channels of the Master Port. This field defaults to 1 since the Fairlight keyboards transmit only on MIDI channel 1. When using another keyboard set the Master Channel to match the one your keyboard is playing. Then each time you select an Instrument, you'll be able to play it on the keyboard.

Selecting Current Instrument

By Tabbing

As successive Instruments are created, each is assigned a number (between 1 and 40). An Instrument is made current by tabbing to that Instrument, or any of the fields associated with it.

By Command

You may also select the current Instrument by command - as described in 'Creating, Saving and Loading'. Or you may use the global Instrument select commands to move between Instruments:

<esc><Ctrl-right arrow>	for next Instrument
<esc><Ctrl-left arrow>	for previous Instrument

You may also use the global command to select a new group of 8 Instruments:

<esc><Ctrl-down arrow> for next group of 8 Instruments

<esc><Ctrl-up arrow> for previous group of 8 Instruments

Each time you select an Instrument by command, the system makes sure that it is displayed on the screen. If it was already displayed or partly displayed before you selected it, nothing happens, but if it was not visible at all, the screen scrolls to display the instrument you have selected.

Instrument Swap

The positions of any pair of Instruments on the page can be swapped globally (on any CMI display page) by typing:

INSTRUMENTSWAP *n1 n2*<RETURN>

n1 n2 The numbers of the instruments to be swapped.

In addition to the positions on the page, the Instruments will exchange their keyboard splits, MIDI inputs, and also the CAPS musical parts associated with them. This means that after an Instrument Swap, nothing in the sound will change, only the displayed positions of the instruments. This is useful for relocating two parts near to each other on the CAPS page for easy comparison.

If you simply wish to swap the positions of the Instruments, not the CAPS parts, MIDI inputs or keyboard splits, use the O (for only) option:

INSTRUMENTSWAP *n1 n2* O<RETURN>

n1 n2 The numbers of the instruments to be swapped.

After an instrument swap with the O option, the sound will change, because the voices played by the swapped instruments will move to each others' musical parts.

Display Options

Each subpage of the System Configuration Page is designed to show you something different about the state of the machine. As a result, each page shows you a different selection of the things that are loaded into the system. For example, when looking at the Channel Mapping subpage (accessed by typing <F2>) you are concerned with the channels occupied by each voice. Therefore the system shows you only the voices that are loaded.

There are times, however, when you may choose to display something other than the usual choice. And the Series III offers you the means to choose whatever you need.

Display Instruments

If you wish to see as many instruments as possible, you can display one instrument to a line by typing:

<F11> There is no alphanumeric command equivalent for displaying instruments only.

When in this mode, the first voice contained in the Instrument is displayed on the single line occupied by that instrument. This is true irrespective of the the subpage you are on.

Display Voices

To display as many voices as possible without external voices taking up space:

<F12> There is no alphanumeric command equivalent for displaying voices only.

When in this mode, an Instrument that does not contain any voices is not displayed at all, even if it is the current Instrument.

Display External Voices

If you wish to see as many external voices as possible, without the internal voices taking up space on the screen:

<F13> There is no alphanumeric command equivalent for displaying external voices only.

When in this mode, an Instrument that contains no external voices is not displayed at all, even if it is the current Instrument.

Display All

If you wish to display all of the voices and external voices in the system, you should turn off any of the icons listed above.

Lock Display

Sometimes you may wish to transfer to a different subpage without disturbing the layout of voices and instruments that you have been looking at. You may lock the display of the left side of the screen by typing:

<F10> There is no alphanumeric command equivalent for locking the display.

When in this mode, some irregular things may occur on the screen, particularly blank areas on the page. This is because the right side of the display is covering something that would normally be displayed on the left. If you wish to return to the default display for the subpage you are on, you should select that mode directly. Turning off the locked mode will not change the display at all.

Default Displays

Subpage	Display	Icon Highlighted
1. Instrument Lineup	All	none
2. Channel Allocation	Voices	<F12>
3. MIDI Input	Instruments	<F11>
4. MIDI Control Map	Irrelevant	any
5. Keyboard Split	Instruments	<F11>
6. Level Meters	Instruments	<F11>
7. SMPTE MIDI Sync	Irrelevant	any
8. Router Assignment	Voices	<F12>

Scrolling the Screen

Very often the total number of voices, instruments etc. is too large to fit on one screen. You can command the screen to scroll to the part you want to see in a number of ways.

To scroll the screen by one line forwards (to increasing instrument numbers), type:

]

To scroll the screen by one line backwards (to decreasing instrument numbers), type:

[

To scroll the screen by sixteen lines forward (to increasing instrument numbers), type:

<SHIFT-]>

To scroll the screen by sixteen lines backward (to decreasing instrument numbers), type:

<SHIFT-[>

Scrolling the screen using the square bracket keys, as described above, does not select a new current instrument, it simply displays a different part of the list of items. This means that after some scrolling, the current instrument may not be visible on the screen, and the cursor may be highlighting part of an instrument or voice that is not current. In this situation, changing a name or parameter by assigning a new one at the cursor position will not change the name of the instrument that is highlighted, but the one that is current (and may be offscreen). To prevent this, always make sure that the name or quantity you are changing is contained inside a dotted square. This is your indication that the item is the current item.

As described above in "Selecting Current Instrument", the screen will scroll if necessary to display any item you have selected as current by command. This is another way to control the scrolling action. The cursor problem mentioned in the previous paragraph is equally present when you use this method to scroll. You may avoid this in the way described.

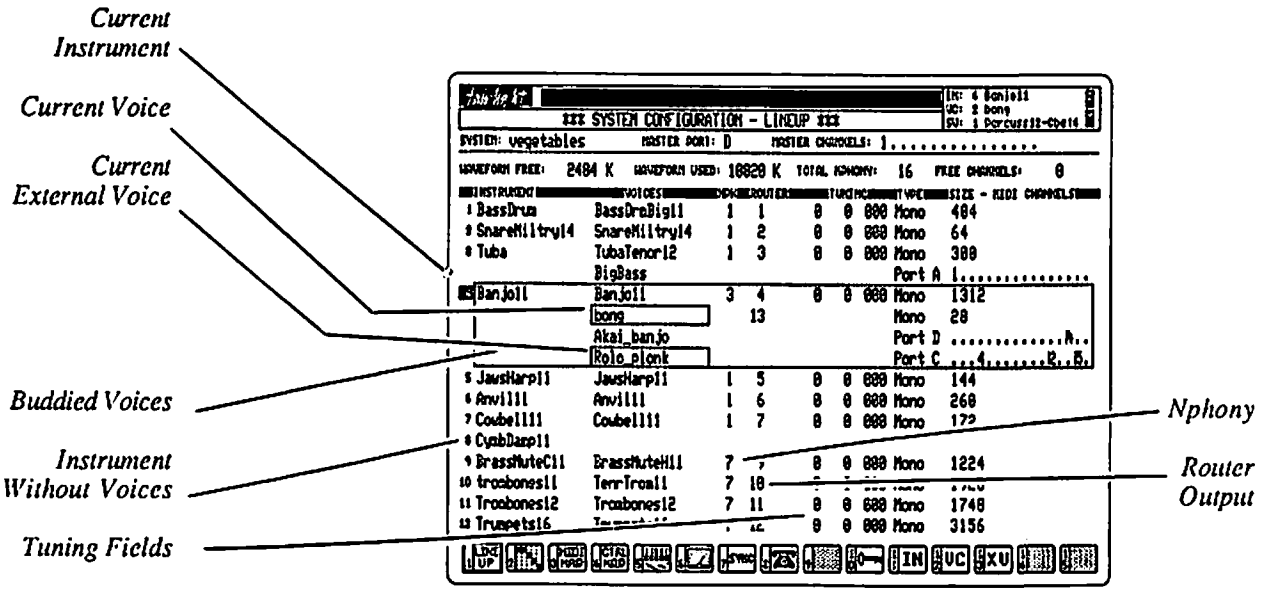
Instrument Lineup Subpage

<F1> There is no alphanumeric command equivalent for entering the Instrument Lineup subpage.

This is the default System Configuration subpage. Information displayed here includes Nphony (the number of channels allocated to the Instrument), tuning of the Instrument (Octave, Semitone and Fine Tuning), Router output, type (stereo, mono or MIDI) and size of waveform or MIDI output channel.

Instruments

Each Instrument may contain a number of internal voices "buddied" (or layered) together, and a number of external voices also buddied. All of these voices are displayed on the LineUp page by default, though you may decide to display only internal voices or only external voices (see above). An Instrument may contain no voices of either type, in which case it is displayed on a single line.



The Line Up subpage with a System loaded

The following fields are associated with each instrument:

Name

The name of each Instrument is written at the extreme left side of the page. This can be changed at any time by tabbing to the name and assigning a new one.

Nphony

Nphony means the number of channels assigned for the use of each voice in the instrument, and this is equivalent to the number of notes or sounds that can be played simultaneously by that instrument.

When an instrument contains two or more internal voices buddied together, the system tries to assign the same number of channels to each voice so that they can always play the same part, but this becomes impossible when there are insufficient channels available. In this case the channels are distributed as evenly as possible.

Tuning

The tuning here refers to the transposition, or offset, of the keyboard playing the Instrument. This means that only notes coming from a keyboard into the Instrument will be affected. Notes that come from one of the Series III's sequencers are not affected.

The fields refer, from left, to Octave, Semitone and Microtone (255 steps per semitone) tuning. Microtone tuning does not affect external voices which are sending notes to MIDI devices outside the sytem, so Instruments that contain only external voices do not have a microtone field.

Internal Voices

The Internal Voices (known simply as voices) in each Instrument are always displayed first. The following fields are associated with each voice:

Name

As with instruments, a voice name may be changed by tabbing to it and assigning a new one.

Router

Each voice is automatically given a router output when it is created or loaded. This will have no effect unless your system is equipped with a router to replace the standard mono mixing card supplied with earlier Series III's. If this new card has been installed, it will take all of the sounds produced by the voice in question, no matter which channels actually produced the sounds, and route them to a single polyphonic output. The router has up to 24 physical outputs, and that is the range of values available in the Router field. If your system has a router with fewer than 24 outputs, you should not assign numbers this high, though the only ill effect will be that you do not hear the sound. Systems using the original output channels (equipped with XLR outputs) can still use them in exactly the same way as before, though under dynamic voice allocation they have very limited application.

Stereo voices have two router fields so that you can separate the two sides. If you wish you may send both sides of your stereo voice to the same output.

Type

This field tells you whether the voice is mono or stereo. This cannot be changed by assignment. If you have a mono voice and you want it to be stereo, you must unload the mono voice and replace it with a stereo one. If you would like the same sound with the ability to pan it, you must load each subvoice of the mono voice into both sides of the subvoices of a new stereo voice. See Chapter 3, "Creating, Saving and Loading" for details.

Size

The size of the voice in kilobytes is given in this field. If the voice is stereo, the figure given is the sum of the left and right sides of the voice, in other words, it is an accurate picture of how much memory the voice occupies.

When considering the memory usage in megabytes, remember that a megabyte is 1024 kilobytes, so things are never quite as bad as they seem.

External (MIDI) Voices

External Voices play out to MIDI Output Ports and channels. The four MIDI sockets on the rear panel of the Series III (labeled MIDI OUT: A, B, C and D) correspond to the four MIDI Output Ports. An External Voice can be assigned to any of the 16 MIDI channels for each Port. Hence, the Series III can control up to 64 external MIDI devices in addition to its maximum of 16 internal voices.

To play a remote instrument from the Series III, connect a MIDI cable between the assigned MIDI Out Port and the MIDI In of the external device.

Create an External Voice

The External Voice Create command has the same status as the standard Voice Create command (see 'Creating Saving and Loading'). In other words, it creates a new Instrument with the same name as the External Voice if there is not already an Instrument created.

The command for creating an External Voice:

EXTERNALCREATE *voicename port channelnumber* <RETURN>

voicename	The name of the External Voice to be created.
port	The MIDI Output Port Range: A, B, C or D
channelnumber	The MIDI channel number. Range: 1 to 16
[option] A	Adds (buddies) the External Voice to the other voice(s) in the current Instrument (this means they will always play together).

For example:

XC DX7Bass A 4 A <RETURN>

buddies the external DX7 bass sound (on MIDI port A, MIDI channel 4) to the current Voice (internal or external). This means that, in addition to playing the notes on a Series III voice, they will be sent out of the MIDI Port selected, to play other devices. Of course "DX7Bass" is only a name and won't affect the way the Series III sends out MIDI data. Upon creation, the SIZE - MIDI CHANNELS field displays the MIDI channels of the External Voice (1 to 16) on the dotted line.]

External Voice Fields

External voices have no nphony field, since their polyphony is determined by the type of device plugged in at the other end of the MIDI cable. They also have no Router field, since they are not output fron the Series III. They do, however, have the following fields:

Name

You can change the name of an external voice by tabbing to it and assigning a new one.

Type

The Port addressed by the external voice is displayed in this field, indicating that it is an external voice. You may change it by tabbing to it and typing:

port<SET>

where *port* is the new MIDI Port for the external voice to come out.

MIDI Channels

These are displayed at the xtreme right of the page. Note that an external voice can address any number of the available channels on a single port.

To change the Channels targetted by the external voice, tab to the field containing the numbers of the current MIDI output channels. Now you may add to the channels already addressed by that external voice by typing:

n1 n2 .... <ADD>

where *n1 n2* ... are numbers of channels to be added.

In the same way, unwanted channels may be removed by typing:

n1 n2 .... <SUB>

where *n1 n2* ... are numbers of channels to be removed.

The channels addressed by an external voice may be completely replaced by typing:

n1 n2 ...<SET>

where *n1 n2* are the channels to replace the existing ones.

Unload an External Voice

The External Unload command deletes External Voices (but not the Instrument itself) from the current Instrument:

EXTERNALUNLOAD<RETURN>

The External voice unloaded will be the one displayed with a dotted square around its name.

The error message;

"External Voice not active"

appears if there is no External Voice in the current Instrument when you issue the XU command.

Redirect MIDI Input Channels (Rechannelise)

You can redirect any MIDI Input channels to any MIDI Output channels on the Series III. Assign the desired MIDI Input channel to an Instrument (see "MIDI Input Subpage"), then create an External voice in this Instrument with an appropriate MIDI Output channel. A 'null' Instrument (containing no other voices) can be created solely for this purpose.

Channel Mapping Subpage

<F2> There is no alphanumeric command equivalent for entering the Channel Allocation subpage.

This subpage allows you to map (connect) Series III Voices to Line Output Channels. A 16 by 16 square grid appears on the right hand side of the page. As each Voice is loaded into memory, a Channel (1 to 16) is automatically assigned to it. This will be the next available free channel if there are any. If not the voice will be assigned to a channel that is already being used. The channel will then be shared dynamically by the two (or more) voices.

You can intervene in this process by reassigning the channels to the voices as you wish.

Alter the Number of Channels (Nphony)

The Nphony of an instrument is the number of different notes or sounds an Instrument can play simultaneously. This depends on the number of channels allocated to it, which may be increased or decreased using the global Nphony command:

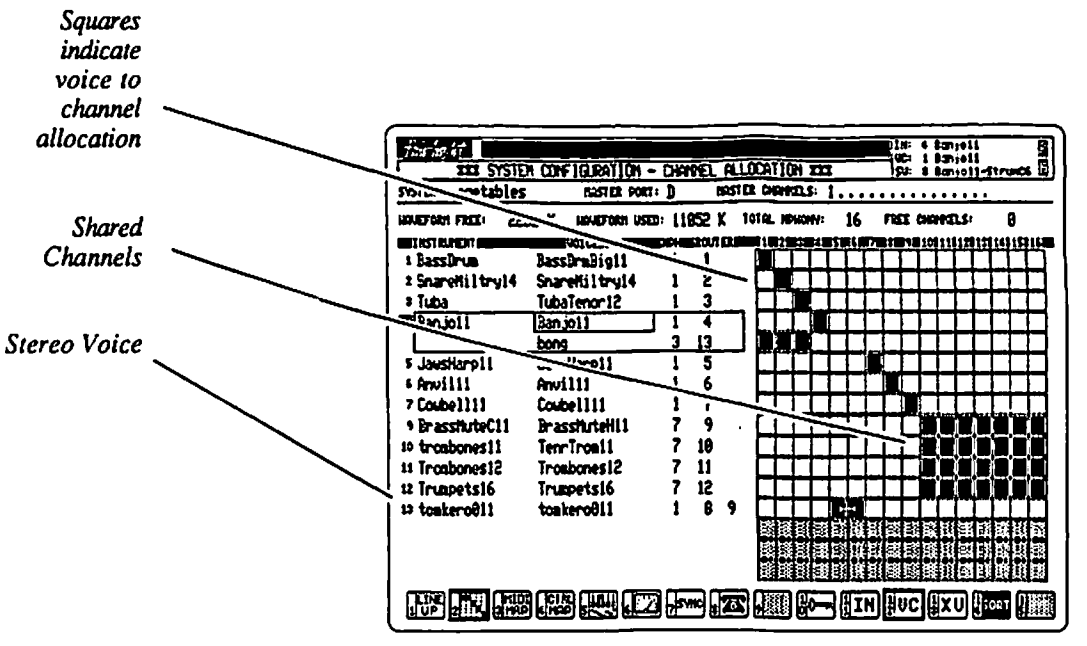
NPHONY *num* <RETURN>

num The number of channels allocated to the current Instrument.
Range: 1 to 16

Nphony can be changed with the G-pen also. To give an Instrument an extra channel, <HIT> the box marking the intersection between the Voice and any channel that is not already assigned to it. The box will be highlighted, indicating that the voice now has the use of that channel (not necessarily exclusive use!) To remove a channel from the voice, <HIT> the box representing a channel it currently uses. The light will go out, indicating that the voice no longer uses that channel.

In either case, the Nphony field next to the Instrument will change to show the total number of channels allocated to the voice. This is equal to the maximum number of notes the voice can play at once.

> Note: It is not possible to assign a channel to a mono voice if it is being used by a stereo voice, and vice versa. Similarly, channels being used to play Disk Recorder tracks are off limits to all voices.



The Voice to Channel Allocation Subpage

Dynamic Voice Allocation

As of software Revision 8, all Series III channels are dynamically assignable between voices. This means that the Voices "share" the channels. If, for example, a trumpet has the same three channels as a string section, you can play a three-note trumpet chord, followed immediately by a three-note string chord, with any other combination possible. The voices will "steal" channels from each other as they are needed.

The first rule is that a new note will use a silent channel if there is one available. If there are several silent channels, they will be used in rotation. The second rule is that the oldest note still held will be cut off if a channel is needed to start a new note, no matter which of the assigned voices needs the channel. "Held" in this case means that the key is still "down", whether being pushed down by a human hand or played by a sequencer. The release portion of the note, i.e. its decay after the key is released, has no effect on the note-stealing proceedure.

Dynamic voice allocation means that the total nphony of the loaded voices may exceed 16, and in fact may reach 256 if needed. Nevertheless, the machine can only produce 16 sounds at once, so any additional notes will be stolen from those already playing.

Since mono and stereo voices can never share the same channels, dynamic voice allocation divides the available channels into those used for mono voices and those used for stereo. Likewise, buddied voices cannot share the same channels. This is because they are always played at the same time, and would therefore be fighting for the same channels. The Series III will not allow you to contravene these two conditions.

Sort Channels

The Sort facility tries automatically to arrange Output channels in ascending order (1 to 16):

<F14> SORT<RETURN>

Instrument 1 is assigned to the lowest numbered channel, Instrument 2 to the next lowest and so on. This command is suitable only for sorting mono (not stereo) Instruments. When channels are shared amongst several voices, the Sort operation may be compromised.

Stereo Voice Mapping

The two Output channels mapped to a stereo Voice must be on the same channel card. This requirement is handled automatically when assigning Voices to channels. Channels are paired in ascending order on the Output channel cards when increasing or decreasing the Nphony of a stereo voice (1 and 2 on the first channel card, 3 and 4 on the second, and so on). Remember that channels cannot be shared between mono and stereo voices.

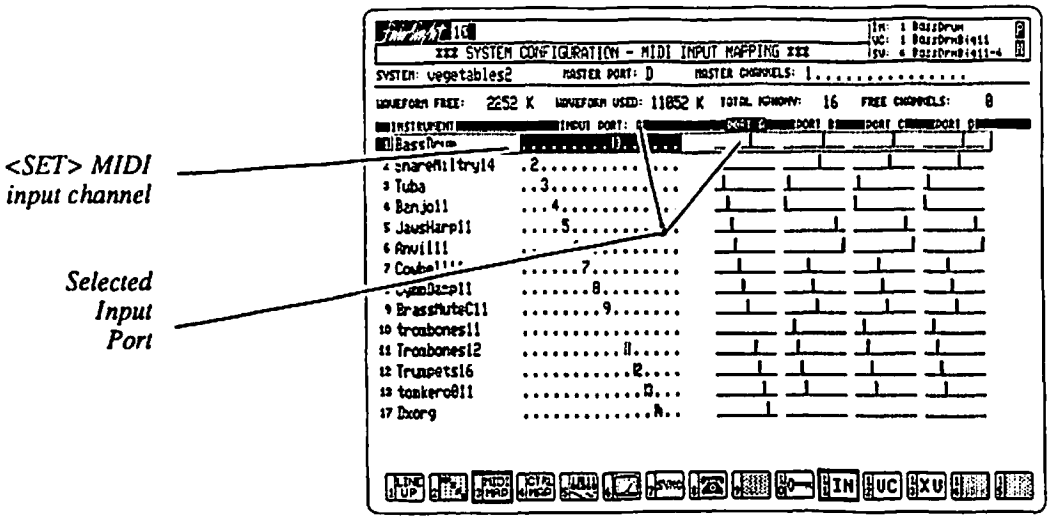
MIDI Input Subpage

<F3> There is no alphanumeric command for entering the MIDI Input subpage.

The Series III allows you to access any of its Instruments from a MIDI control source outside the system. You may do this with a keyboard, sequencer, drum machine or any other MIDI source.

When driving Series III instruments from an external MIDI source, each Instrument has a unique set of channels from each of the 4 ports. In other words a paricular MIDI channel / port combination can only drive one instrument.

The MIDI Input subpage is where you patch MIDI input channels to Series III Instruments.



MIDI Input Subpage showing how to reset the MIDI input of Instrument 1 to be received on channel 10 (port A).

Choosing MIDI Channel

To choose the MIDI Input Port whose channels you wish to patch, [HIT] the square containing the name of that Port, so that it becomes highlighted.

Alternatively, you may select a Port by command:

<SF1> SELECTPORTA<RETURN>

<SF2> SELECTPORTB<RETURN>

<SF3> SELECTPORTC<RETURN>

<SF4> SELECTPORTD<RETURN>

Assign MIDI Channels

To assign incoming MIDI channels to a particular Instrument; tab to the dotted line beside the Instrument you wish to change, then <SET> the MIDI channel number:

INSTRUMENT: *ch1 ch2* ... <SET>

ch1 ch2 ... The MIDI In channel numbers.
Range: 1 to 16.

To delete channel numbers from a specific Instrument, tab to the Instrument, type the channel number(s) you wish to delete then press <SUB>.

If you want to add another channel number, type the number then <ADD>. An incoming MIDI channel cannot address more than one Instrument so <ADD>ing a channel to an Instrument may "steal" it from another Instrument.

MIDI Control Map Subpage

<F4> There is no alphanumeric command for entering the MIDI Control Map subpage.

The MIDI Control Map subpage is used to re-assign incoming MIDI controls and switches to different numbers. You should read the Chapter on the FX page for details on how the the Series III uses MIDI controls and switches. The basic difference between controls and switches is that controls can have any value between 0 and 127, while switches can have only two values, ON (127) or OFF (zero). Most MIDI systems do not distinguish between controls and switches, referring to them all as controls. The Series III switches numbered 0 to 31 correspond to controls 64 to 95 in those systems.

Selecting a Port

Each MIDI Port can have a different set of control mappings. This is so that you can plug different controllers into the Ports and have them all behave sensibly. To select the Port whose inputs you would like to remap, [HIT] the Port selection icon in the upper right of the screen. Remember that the Series III keyboard plays into Port D.

Alternatively, you may select a Port by command:

<SF1> SELECTPORTA<RETURN>

<SF2> SELECTPORTB<RETURN>

<SF3> SELECTPORTC<RETURN>

<SF4> SELECTPORTD<RETURN>

Note: Only the mapping of the Master Port is saved with the system.

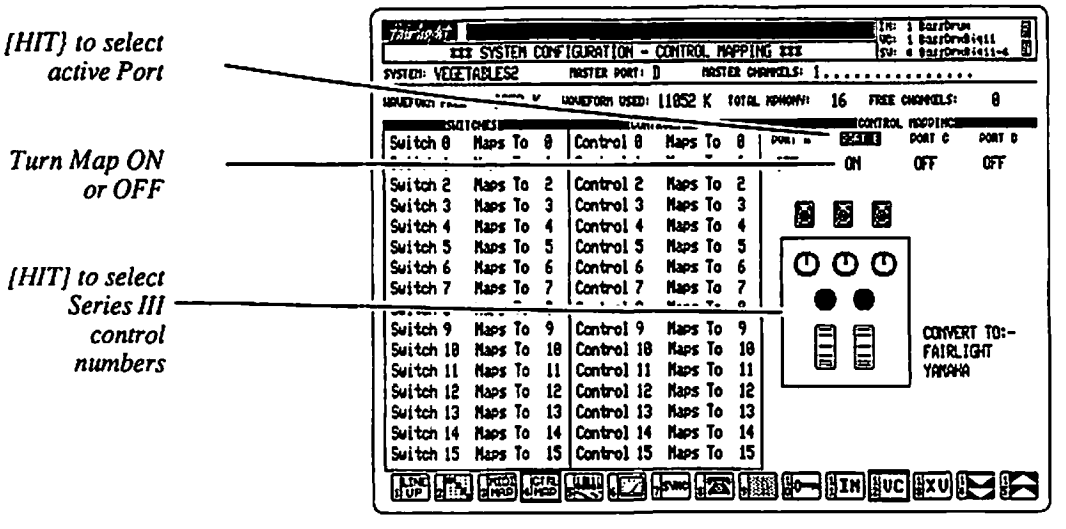
Remapping Control Numbers

This subpage displays two windows showing 16 Switches and 16 Controls plus a facsimile of the Series III keyboard controls. The numbers in the left hand column represent the MIDI control coming into the system, and the numbers in the right hand column represent the number taken by that control as it enters the system. To alter the correspondence, tab to the number in the right hand column and <SET> a new value. Controls can be set in the range 0 to 63 and switches from 0 to 31. You can also select control numbers by [HIT]ting the icons that resemble Series III physical controls and switches.

To cause any actual changes in the behaviour of the controls, you must switch the mapping ON. This is done by [HIT]ting the OFF sign beneath the Port selection box.

Example:

> If all your Series III Voices have (say) Vibrato depth mapped to Control 7 on the FX page, and your External synthesiser's modulation wheel is assigned as MIDI control 1, you can re-assign incoming MIDI control 1 to be Control 7 - to match the FX page. Of course, you could change all the control 7 values to control 1 on the FX page, but using the Control Map is quicker.



The MIDI Control Input Mapping Subpage

Scrolling the Display

The following icons/function keys scroll the control maps:

<F15> To scroll to the next 8 control and switch numbers.

<F14> To scroll to the previous 8 control and switch numbers.

Default Yamaha/Fairlight Configuration

Two default controller configurations are available on the MIDI Control subpage - Fairlight and Yamaha.

'Fairlight' maps incoming MIDI control numbers to the same range of Series III control numbers - that is, it does not change anything. 'Yamaha' maps incoming MIDI data to that of standard Yamaha MIDI switch and control configurations. To enable the Series III keyboard to send the "expected" controllers to Yamaha keyboards such as the DX7, <SET> the MIDI Input port to D, [HIT] Yamaha and turn the map ON. The Series III modulation wheel (for example) changes from C7 to C1.

Instrument to Keyboard Map Subpage

<F5> There is no alphanumeric command for entering the Instrument to Keyboard subpage.

The Instrument to Keyboard Map subpage enables multiple Instruments to be assigned across the music keyboard. Four independent keyboard maps are available which allow four different Instrument/keyboard splits. You can draw your own maps, and these are saved with the System file.

The four keyboard split maps have a default configuration of 2 Instruments; one above and one below Middle C. On the default keyboard split map, middle C is marked with a dot. Not all possible keys are shown on the screen, but you can scroll the view window:

<F14> Moves the keyboard to the right.

<F15> Moves the keyboard to the left.

Turning Keyboard Split On

To turn ON a particular keyboard split by command:

<SF10>	**SPLIT 1**<RETURN>	Display and turn on keyboard split 1.
<SF11>	**SPLIT 2**<RETURN>	Display and turn on keyboard split 2.
<SF12>	**SPLIT 3**<RETURN>	Display and turn on keyboard split 3.
<SF13>	**SPLIT 4**<RETURN>	Display and turn on keyboard split 4.

To turn all the Splits Off and return to normal keyboard operation, hit the icon of the enabled Split. Alternatively, type

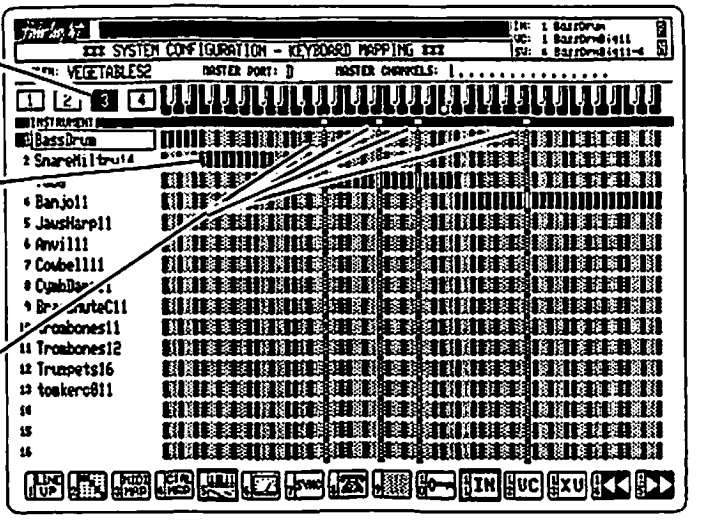
SP0<RETURN>

The **SPLIT** commands are global, that is ,they can be typed on any Display page in the system. The icons, on the other hand, are restricted to the SC Page.

[HIT] to select and deselect Split number

Use g-pen to map Instruments to keyboard.

Visual indication of played notes



Instrument to Keyboard Mapping Subpage showing allocation of keys to Instruments in Split3.

Editing a Keyboard Split

To alter a keyboard split, [HIT] the point on the map where the key number intersects with the Instrument name. This action is similar to assigning subvoices on the FX page. Any Instrument can be part of any split.

To help you locate the right keys, a visual indication of the key you are playing appears on the screen. This feature has two modes of operation:

a) If the cursor is on the name of a current Instrument, then only notes played on that Instrument will be shown on the screen actively.
b) If the cursor is in the HOME position, then all notes are shown, regardless of the Instrument played. This mode is most suitable for mapping splits.

The visual indication feature can be turned off by typing:

<SF8> There is no alphanumeric equivalent for turning off the visual indication.

By turning the Internal MIDI Routing to FX on the Sync Subpage (see later in this chapter) you can get visual indication of all notes played a Series III sequencer.

Level Meter Subpage

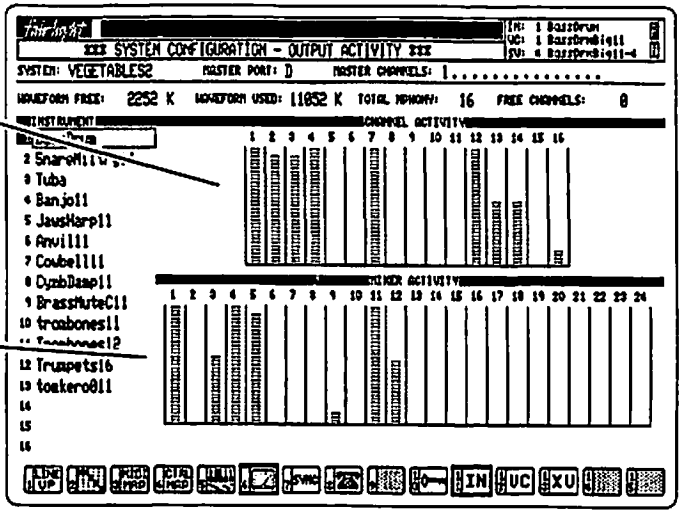
<F6> There is no alphanumeric command equivalent for entering the Level Meter subpage.

The Level Meter subpage is a convenient way of displaying the output of each channel and each router output of the Series III.

There are no fields or special commands associated with this subpage - it is intended for identifying the output associated with a particular sound, and for troubleshooting in the studio when no sound can be heard. Seeing output on the meters does not absolutely guarantee that there is audio at the physical outputs. For example, if the output amplifiers on an audio output card have failed, you will still get visual indication on the screen. But 99% of the time, if you see it, you can be sure it is there. To perform a 100% check on the existence of audio at the output, listen to the headphone socket, which is in series with the audio output cards.

Channel Meters

Output Meters

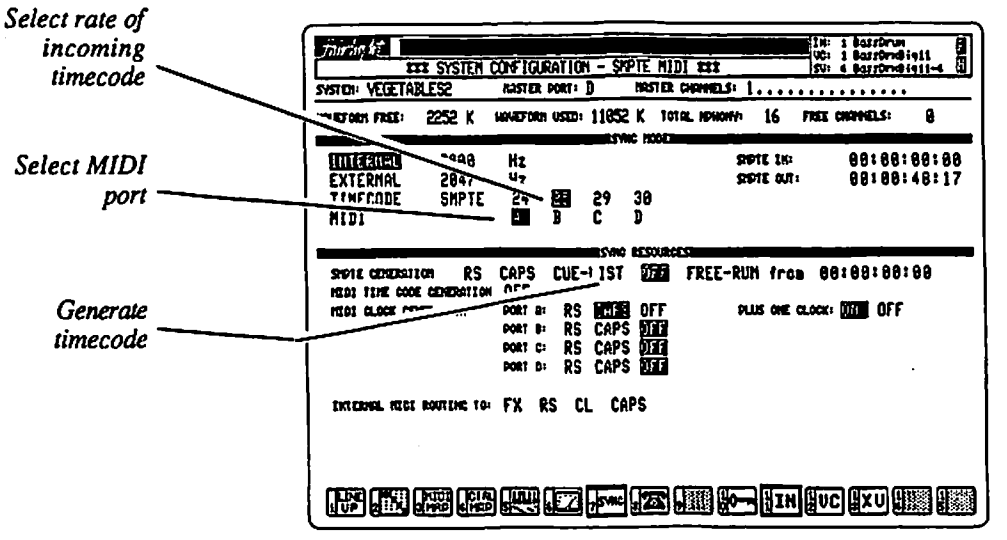


The Meters Subpage

SMPTE MIDI Sync Subpage

<F7> There is no alphanumeric command for entering the SMPTE MIDI Sync subpage.

This subpage is used to define the Series III's current synchronisation status, set SMPTE frame rate, generate SMPTE timecode, and other things to do with synchronisation. MIDI Time Code (MTC), MIDI Clock and Song Position, and Sync Tone are also supported.



The SMPTE MIDI Subpage

MIDI information from the CAPS, RS and Cue-list sequencers can also be re-routed to the Real time Effects page or to each other. This allows CAPS sequences to be recorded into Cue-list or RS sequences and vice-versa.

The SMPTE MIDI subpage is divided into 2 sections. The upper SYNC MODE section is used to alter the various sync modes available on the Series III. The lower half can be used to generate SMPTE or MTC (MIDI Time Code) via the Series III sequencing pages.

Sync Mode

The Series III, when playing sequences from the CAPS, RS or Cue List Pages, or when playing Disk Recordings, has a number of choices for defining the passage of time. These choices are described in detail below.

Alterations to the Series III synchronisation mode are reflected on all display pages. For example, if you change to Internal sync on the SMPTE MIDI Sync subpage, both the CAPS and Cue List pages display current sync as being Internal.

Five synchronisation modes can be selected on the SMPTE MIDI Sync subpage; Internal, External, SMPTE, MIDI and MTC. The global Sync command may be used from any page to alter the current sync status of the Series III.

Synchronisation command types are explained in more detail below. Any options can be entered into the command line before issuing function key/icon Sync commands{preoptions}, otherwise normal {options} are included with the command.

Internal Synchronisation

In Internal sync, the Series III generates its own timing from a built-in crystal. In this state it will not "slave" to any other machines, but it is capable of generating timing pulses for use by other machinery. These can be MIDI Clocks, SMPTE, MIDI Time Code or Sync tone.

The Sync Internal command also sets the frequency of the sync tone (output from the Click Out on the rear of the Series III):

<esc><SF1> SYNC INTERNAL<RETURN>

{preoption}*freq* The frequency of the sync tone generated.
Range: 100 to 2400 Hz
Default: 2000 Hz

For example, typing **2200<esc><SF1>** will set sync to internal and cause the sync tone frequency to 2200 Hz. The sync tone is generated whenever the RS or CAPS sequencer is playing. It is output from the CLICK OUT socket on the back of the machine. Its purpose is to be recorded on tape and used later to resync the sequencer to the recorded material (see EXTERNAL Synchronisation). Since the advent of SMPTE timecode and MIDI CLock, this form of synchronisation is seldom used.

For more details on Internal Synchronisation, see the 'Real Time Sequencer'.

External Synchronisation

External sync allows Series III sequencers to run at a rate determined by an external tone. Synchronisation is enabled via sync tone fed into the Click In socket on the rear of the Series III.

Typically, you record sync tone from Click Out to tape, then play that tone from tape back into the Click In socket. However, because SMPTE Sync is addressable (i.e. it "knows" where it is on the tape), this method should be used only with pre-MIDI sequencers that can only sync to tone.

To turn ON External synchronisation Mode and/or alter the sync frequency:

<esc><SF4> SYNC EXTERNAL<RETURN>

{preoption}*freq* The frequency of the external tone expected (in Hz).

The sync frequency of the external device is estimated and <SET> in the External field (see 'Real Time Sequencer' for more details on synchronising the Series III to an external sync tone).

SMPTE Synchronisation

This is the most useful way to synchronise; allowing triggering, chasing and locking to timecode. The TIMECODE field allows selection of either MTC or SMPTE time code. This field enables you to adjust for different frame-rates.

To turn ON SMPTE timecode Mode and/or alter the frame rate:

<esc><SF2> SYNC SMPTE<RETURN>

{preoption} *frame-rate* — The frame rate of the SMPTE code.
Range: 24, 25, 29 (DropFrame) or 30 Frames/second
Default: 25

To alter the Sync status using the g-pen, tab to the SMPTE field. The <ADD> or <SUB> keys are used to cycle through the SMPTE/MTC modes. The MTC modes choose from which Port the MIDI TIme Code will be read.

The SMPTE IN field (on the right hand side of the screen) displays the current incoming SMPTE timecode. For synchronisation to work properly, the frame rate you have set must match that of the incoming SMPTE.

MIDI Time Code

MIDI TIme Code (MTC) is almost identical to SMPTE timecode, except that it is transmitted on MIDI cables (mixed with other MIDI messages if required), and it is has a lower resolution (24 bits per frame versus 80). Using it is very similar to using SMPTE, except that MTC has the unique advantage that it can transmit numbers even when the "transport" is static. This allows the Series III to be "in sync" to a machine that is not yet moving, making lock-up time shorter, and allowing capture of edit points while stopped (see MFX and Cue List). MIDI Time Code is read in from one of the four MIDI In Ports on the Series III. The Port and frame-rate may be specified in the preoptions.

To turn MTC Mode ON and/or alter the MIDI receive Port and frame-rate:

<esc><SF5> SYNC MIDITIMECODE *port frame-rate* <RETURN>

{preoption} *port* — The Port receiving MTC
Range: A, B, C, D

{preoption} *frame-rate* — The equivalent SMPTE frame-rate.
Range: 24, 25, 29 or 30 Frames/second

Example: **A 30<esc><SF5>** sets Series III sync to MIDI Timecode at 30 frames per second, coming into MIDI Port A.

The TIMECODE field displays MTC and the MIDI receive Port. MTC received by the Series III is displayed in the SMPTE IN field.

MIDI Clock Sync

The MIDI field beneath the TIMECODE field selects MIDI clock input - useful for syncing the Series III. to the tempo of external sequencers. Time is measured in beats - not in absolute time. Song Pointers are also read and followed by the music sequencers.

To turn ON MIDI Clock Mode and/or change the MIDI In Port:

<esc><SF3> **SYNC MIDI** *port* <RETURN>

{preoption}*port* The MIDI Input Port receiving MIDI clocks.

> **Note:** Only the RS and CAPS sequencers respond to incoming MIDI clock data. The Cue-list and Disk Recorder pages ignore MIDI clock information, and therefore cannot run while this mode is selected.

Generating MIDI Clock and Song Pointer

Use the MIDI CLOCK GENERATION fields to output MIDI clock sync. This facility allows transmission of MIDI clock data when the CAPS or RS sequencers are playing. Song Pointers will be sent whenever Play is initiated, and appropriate PAUSE commands are also sent. These allow other sequencers or drum machines to synchronise properly with the Series III sequencers.

The Series III can generate MIDI Clock and Song Pointer while it is a slave to SMPTE or MIDI Timecode, or even MIDI Clock. So it can act as a sync switchboard for all of the devices in your studio.

Generating Timecode

Timecode can be generated in sync with CAPS, the RS sequencer, Cue-list sequencer, or independently.

FREE-RUN allows you to start generating SMPTE code from any start time - either as soon as you tab to the FREE-RUN field or a timecode generate command is issued (see below).

The start time of the generator is set by tabbing to the SMPTE time numbers at the end of the SMPTE GENERATION field - to the right of the word 'from'. <SET> the offset values in this field. Whenever the generator starts it will return to this start time.

To stripe tape with SMPTE timecode starting from the time specified on the Sync Display:

<esc><SF8> **TIMECODEGEN**<RETURN>

{preoption} **RS** Generate Timecode from the Real Time Sequencer
{preoption} **CAPS** Generate Timecode from the CAPS sequencer.
{preoption} **CL** Generate Timecode from the Cue-list Sequencer.

SMPTE time code is generated immediately Play Mode is engaged on the respective page. The starting code is equal to the Trigger Timecode on the RS Page, the Origin on the CAPS Page, or the location of the first event played on the Cue List Page.

To Pause or Continue SMPTE timecode generation:

<esc><SF9> TIMECODEGEN - or +<RETURN>

- \- Pause Timecode generation.
- \+ Continue Timecode generation.

Note: The Timecode can be made to continue from any numbers by using the Global Info Window. This can be accessed from any Series III display page by typing <esc><CF8>. Then, any Timecode can be entered in to the window, and the continue commadn will cause timecode to be generated from that number.

MIDI Re-routing

The Series III allows internal MIDI data to be re-directed to any of the three Series III sequencers (CAPS, RS and CL) for re-recording. Or, the MIDI data from any of these sequencers can be sent to the FX page so that the notes can be seen on the Subvoice to keyboard mapping display, or on the SC Page Keyboard Split subpage (this uses the FX option for Internal MIDI Routing).

Tab to the re-routing field:

INTERNAL MIDI ROUTING TO: CAPS FX RS CL

If either the CAPS, FX, CL or RS field is selected, then any MIDI data from the currently running sequencer will be directed to the selected destination.

For example, if you wish to record an RS sequence into Cue-list, then tab to the CL field. Any MIDI data played on RS can then be recorded as a Cue-list Takefile and then kept as an Event Module.

Plus One Clock

Due to the variation of synchronization standards, the Series III has a Plus one clock feature which will send an extra MIDI clock each time it starts up. Some sequencers and drum machines will work better in this mode. This facility can be implemented from the System Configuration SMPTE/MIDI subpage, or by the global Plus command:

To toggle the Plus One Clock between plus 1 or plus 0:

<esc><SF7> **PLUS 1 or PLUS 0**

To alter the Plus One status from the SMPTE/MIDI subpage:

Tab to the Plus One Clock field to turn the Plus One clock off (default ON).

Plus One clock ON will make the receiving sound module start playing from the first beat after the first song position pointer received.

Plus One clock OFF will make the receiving sound module start playing from the first song position pointer.

The Router Control Subpage

This subpage is where you choose router outputs for voices, and, if desired, for individual subvoices within the voice. A display at the top of the page allows you to confirm audio activity on the router outputs you have chosen.

Level Considerations

The Router has a maximum of 24 outputs, which can be used to split voices into different samples with separate outputs for processing in your console. Any number of voices or subvoices may be sent to any router output - but the headroom of the router channels is set to be at full level with eight full height samples playing through at once. In practice, even sixteen sounds at once are not likely to have an instantaneous level that exceeds this figure (unless they all start at the same time), but you should be careful to watch the number of inputs, and restrict it to eight for critical applications.

<F8> There is no alphanumeric equivalent for entering the Router Control subpage.

Voices

The voices loaded into your system are displayed at the left of the page, as are the router outputs currently assigned to them. To change the output of a voice, tab to the Router field of that voice and assign a new number. Doing this will reassign every subvoice in that voice to the output you have just chosen.

Subvoices

A list of the first 42 subvoices available in the voice is shown on the right side of the page. If you wish to access the remaining subvoices:

<F14> displays the 21 subvoices from 22 to 63

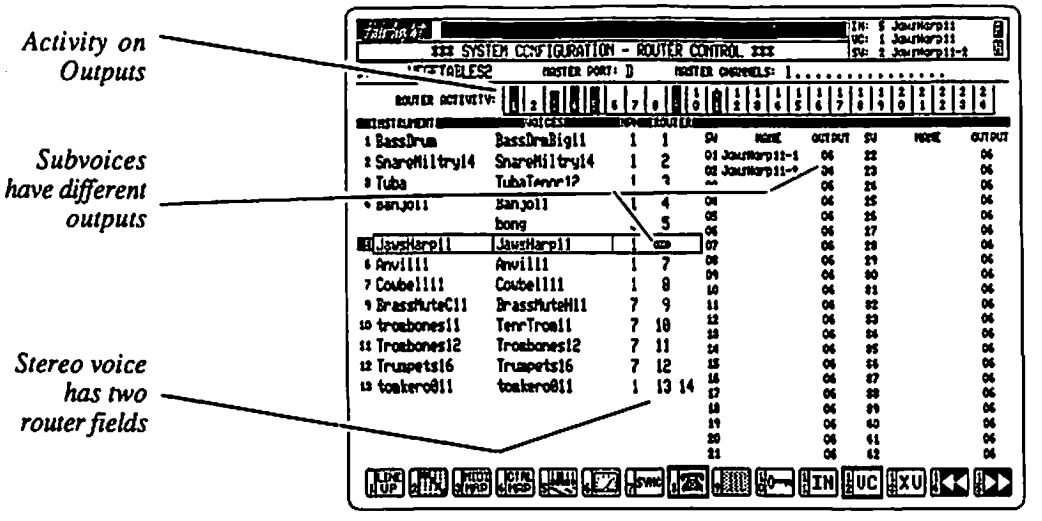
<F14> displays the 21 subvoices from 1 to 42

To change the output of a subvoice, tab to the Router field in that subvoice and assign a new number. When you have different outputs for the subvoices within one voice, the Router field for the voice displays a double infinity sign (∞∞). As described above, tabbing to a field containing this symbol and assigning a number will return all subvoices to the same output.

Subvoices can also be renamed on this subpage by tabbing to their name field and assigning a new name.

Stereo

When stereo voices are loaded, two Router outputs may be chosen so that you can separate the left and right sides of the audio. This is true in both the Router field, displayed on many of the SC Page subpages, and in the output fields for individual subvoices. If you wish to route both sides of the stereo to one router output, that is also possible.



The Router Control Subpage

Old System Configuration Page

Because the format of the SC Page has been changed for Revision 8 software, some users of the Series III may find it unfamiliar, and wish to use the Display to which they are accustomed. To do this, type:

OLDSYSTEMCONFIGURATION<RETURN>

It is possible to make the Old System Configuration Page your default SC Page by editing the file:

/k2/cmds/cmiuser8/cmi_pages

Under the section "main user pages" swap the second parts of the lines:

@pg 2 SC
@pg OSC

* * *

Chapter 6

Real Time Effects (FX) Page

Contents

Introduction

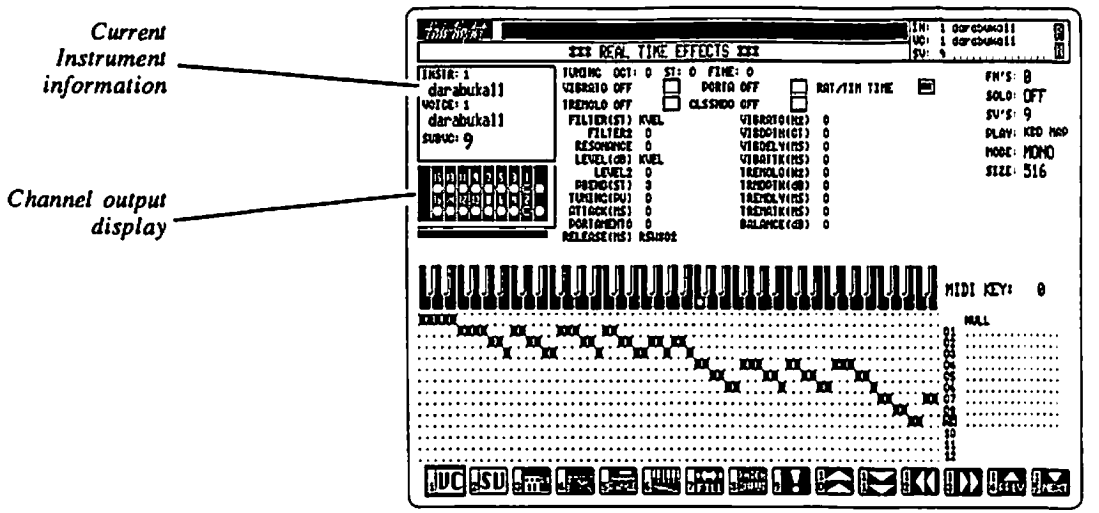
The Real Time Real Time Effects Page provides facilities for changing the character of individual Subvoices and Voices, and for mapping Subvoices on to the music keyboard. Subvoice effects include filter, output level, slur and alterations to amplitude envelope. Voice effects are applied equally to all Subvoices within a Voice and include tuning, tremolo, vibrato, filter, output level, portamento, glissando and stereo balance.
Most Effects (FX) page parameters may be controlled either via physical controller devices (modulation wheels, foot pedals) or according to other MIDI data (e.g. key velocity).

In the first part of this chapter each effect is examined in detail. The second part deals with patching various controllers to effects. The final section covers Subvoice to keyboard mapping.

To enter the Real Time Real Time Effects Page:

<esc><F3> **FX** <RETURN>

In the default FX page display; Voice effects are listed in the upper half of the screen. The Subvoice to keyboard map is displayed in the lower portion.



The default FX page (voice effects) with a Demo Voice loaded

To display Subvoice effects:

<F2> There is no alphanumeric equivalent for this command.

To display Voice effects:

<F1> There is no alphanumeric equivalent for this command.

Information Fields on the FX Page

A number of fields contained in the Voice and Subvoice display windows provide information about the current Voice and Subvoice. Some are not assignable fields.

Information fields include:

Current Instrument

The current Instrument, Voice and Subvoice number are all displayed in a box in the top corner of the FX page display. Use the Instrument select command (see 'Creating, Loading and Saving') to select a new Instrument or Voice. The Instrument and Voice name fields are assignable which allows you to change their names and save them under the new names.

Channel Output Display

The diagram immediately below the current Instrument box represents the Series III's 16 Channel Outputs. It shows which channels the current Instrument is using. This channel output plot can be changed only by increasing or decreasing the Nphony of the current Instrument, or using the Channel Allocation Subpage of the System Configuration Page.

Rate

This information field is found only on the Subvoice effects window - it shows the sample rate for the current Subvoice.

Mode

Mode tells if the current Voice is Stereo or Mono. Not assignable.

Subvoices

The SV'S field on the Voice window tells how many Subvoices are contained in the current Voice.

Size

This tells the size of the Voice currently in waveform memory. The amount is automatically updated whenever a Subvoice is added or deleted.

Current MIDI Note

The MIDI KEY field displays the MIDI numbers of notes played on the keyboard (or by a sequencer if Internal MIDI routing is directed to the FX Page [see SC Page - MIDI/SMPTE subpage]).

Remove Window Displays

Several optional windows (see below) can be displayed on the FX page:

The Function Graph window	Displays curves drawn on the Function Edit Page.
MIDI Selector window	Shows available MIDI controller numbers.
Keyboard Overview Map	Displays the total range of MIDI notes available.

Issuing the Kill Window command removes all the above windows from the FX page.

<SF7> There is no alphanumeric command equivalent for Removing Windows.

Signed Effects

An effect parameter responds to numbers it receives from a controller in one of two ways - signed or unsigned:

A signed effect responds to both negative and positive numbers, hence it may vary either up (positive) or down (negative) from a central point (zero). An unsigned effect responds only to zero and positive numbers.

The effects described below indicate whether each is signed or unsigned. Signed and unsigned effects are particularly important when applying function curves. See Function Curves in this chapter for more information.

Zero an Effect

The numerical input for any effect can be canceled by 0 <SET> in the required field. If the command line is empty you can just use the <SET> key. This does not mean the lowest possible value. For example, in the case of LEVEL, it means the loudest (0 dB)!

You can also use the Zero function key/icon:

<SF6> There is no command equivalent for Zeroing effects.

Voice Effects

Voice effects are displayed in the top half of the display screen upon first entering the FX page. The following section deals with Voice effect field assignments.

> **Note:** the 'Summary of Voice Effects' at the end of this section may be used as a quick reference guide when assigning controls to Voice effects.

Filter and Resonance

There is a lowpass output filter across each channel. The filter's behaviour is determined by two parameters; frequency and resonance.

Filter (ST): *n* <SET>

n The pitch (frequency) of filter cutoff, measured in semitones above the sampling frequency, divided by 128.
Range: 0 to 127 semitones above (useful range 0 to 72)
Default: 72 semitones which is exactly the sampling frequency, or the highest frequency that can be reproduced at the current sample rate.
Unsigned

By tracking the frequency of the Voice, the cut-off point of the filter is always a fixed number of semitones above the sound being played.

> **Note:** Filter 2 and Filter (ST) are additive.

Resonance is the second filter parameter. It increases the amplitude of the frequencies near the filter's cut-off point.

Resonance: *n* <SET>

n The degree of resonance.
Range: 0 to 255
Default: 0
Unsigned

Level

This is the amplitude of the Voice measured in decibels.

Level (dB):*n* <SET>

n Output of Voice
Range: -95 to 95 dB
Default: 0
Signed.

Note: Level 2 and Level (dB) perform the same function and are additive. This enables amplitude level to be patched to more than one controller (e.g. key velocity and a master pedal). The actual level played reaches its maximum when overall level is 0dB. Larger positive numbers may be used to offset negative numbers from other sources.

Pitch Bend

The Pbend parameter allows you to define the amount of pitch variation for the pitchbend wheel.

PBEND : *n* <SET>

n Range of pitch variation : -127 to +127 (semitones)
Signed.

For example, if you set PBEND to 3, the pitch rises a minor third or falls a minor third from the central zero position. You can patch Pbend to a controller to control the amount of pitch variation of the Pitch Bend wheel. The MIDI spec only provides 128 values for pitchbend. Therefore, if you try to spread these over too wide a range, you may hear "stepping" between pitches.

Note: The usable range is limited at the top by the maximum sample replay rate of the Series III. If you try to bend above that limit the pitch will drop by an octave.

Tuning

Tuning is measured in pitch units (1/256th of a semitone). This enables you to finely adjust the overall Voice tuning.

Tuning (PU):*n* <SET>

n Amount of tuning to be altered.
Range: -32768 to 32767 (± 127 semitones)
Default: 0
Signed.

Note: Constant Tuning fields, Octave, Semitone and Fine (at the top of the Voice effect window) and the controllable Tuning (PU) are additive. For example, to accomplish a sudden tuning change, patch Tuning (PU) to a switch and set the appropriate maximum and minimum values (see Ranges below).

Vibrato

Vibrato effects (continuous alterations of pitch at a regular rate for the duration of the sound) are produced according to 4 parameters:- Rate, Depth, Delay and Attack.

Vibrato Rate:

Vibrato (Hz): *n* <SET>

n The frequency of pitch variation.
Range: 0 to 2500 (1/100ths of a Hz).
Default: 0 Hz.
Unsigned.

Vibrato Depth:

Vibrato (CT): *n* <SET>

n The range of pitch variation.
Range: 0 to 3199 (1/100ths of a semitone or cents).
Default: 0 cents.
Unsigned.

Vibrato Delay:

Vibrato (MS) *n* <SET>

n The period between the beginning of the note and the start of Vibrato attack.
Range: 0 to 4095 (1/100ths of a second).
Default: 0
Unsigned.

Vibrato Attack:

Vibrato (MS): *n* <SET>

n The period over which Vibrato ramps from zero to full depth.
Range: 0 to 4095 (1/100ths of a second.).
Default: 0
Unsigned.

The vibrato switch (at the top of the screen) can be switched to ALWAYS ON, ALWAYS OFF, or patched to a switch to allow change during a performance. Vibrato effects will only be heard when this switch is ON. Default: OFF

Tremolo

Tremolo effects (cyclic variations in amplitude over time) are produced according to the same 4 parameters as vibrato:- Rate, Depth, Delay and Attack.

Tremolo Rate:

Tremolo (Hz): *n* <SET>

n The frequency of amplitude variation.
Range: 0 to 2500 (1/100ths of a Hz).
Default: 0 Hz.
Unsigned.

Tremolo Depth:

Tremdpth (dB): :*n* <SET>

n The range of amplitude variation.
Range: 0 to 1/100 of a dB.
Default: 0 dB/10
Unsigned.

Tremolo Delay:

Tremdly (MS): *n* <SET>

n The period between the beginning of the note and the start of Tremolo attack.
Range: 0 to 4095 (1/100ths of second)
Default: 0
Unsigned

Tremolo Attack:

Trematk (MS): *n* <SET>

n The period over which Tremolo develops.

Range: 0 to 4095 (1/100ths of a second)
Default: 0
Unsigned

The tremolo switch (at the top of the screen) can be switched to ALWAYS ON, ALWAYS OFF, or patched to a control switch to allow switching during a performance. Tremolo effects will only be heard when this switch is ON. Default: OFF

Attack

The Voice attack field affects the amplitude envelope attack parameter for all Subvoices in the Voice. To vary individual envelope parameters, see the Subvoice Effects.

ATTACK (MS) *n* <SET>

n The attack time.
Range: 0 to 4095 milliseconds.
Default: 0
Unsigned

Increasing *n* decreases the speed of attack.

Release

The release field affects the duration of a sound's decay - i.e. how long it takes to die away - after the key is released.

RELEASE (MS) *n* <SET>

n The release time.
Range: 0 to 4095 milliseconds.
Default: 0
Unsigned

Portamento and Glissando

Portamento provides continuous pitch glides between notes. This effect is more useful for monophonic Voices (Nphony of 1). The Portamento master switch (at the top of the screen) must be switched ON for Portamento effects.

PORTAMENTO *n* <SET>

n The rate of change between notes.
Range: 0 to 409
Default: 0
Unsigned

Switching the Glissando select switch to ON produces *gliss* effects (semitone-step progression between notes).

The number constant in the Portamento field determines either glide rate or glide time. The RAT/TIME field is used to switch between these two modes. Either tab to the RAT/TIM field then select rate or time, or click on the box to toggle between the two:

R<SET> for rate

The Portamento field determines the semitones/sec of glide. The higher the number, the faster the rate of glide.

T <SET> for time

Now the Portamento field determines the absolute time of the glide. The higher the number, the longer it takes to complete the glide.

> Note: A Portamento value of zero will "freeze' the pitch of all notes on the keyboard.

Balance

This effect is used to pan between left and right sides of a stereo Voice:

BALANCE(dB) *n* <SET>

n The degree of pan for a stereo Voice.
Range: -95dB to +94dB
Default: 0
Signed.

Balance can be patched to any control type, and permits sequenced panning for a variety of stereo effects.

Summary of Voice Effects

> Note: 'ALL' means all Control/Switch types can be patched to the effect. A number must be assigned to a constant field. See Patching Effects for a table of the types of controllers available.

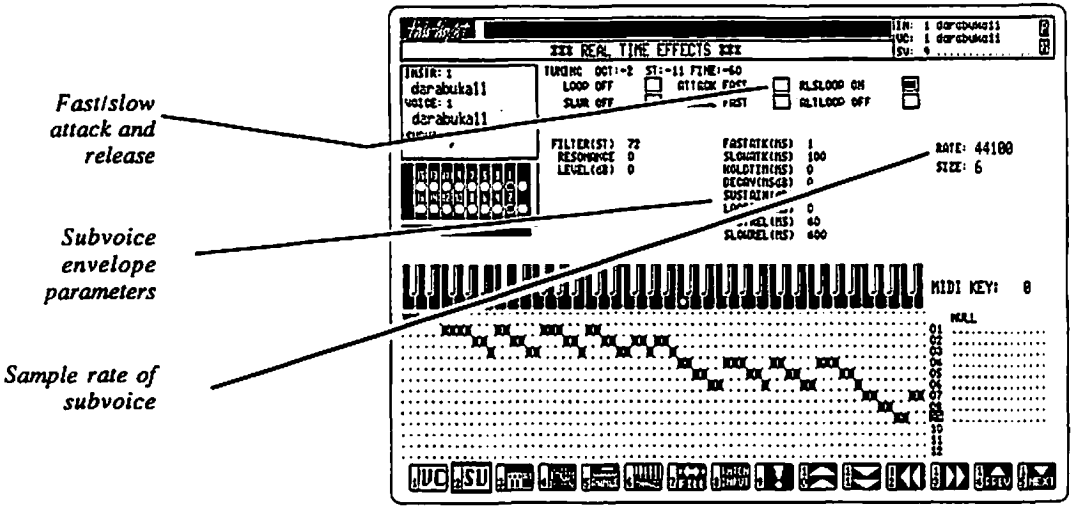
VOICE EFFECT	CONTROL TYPES
Filter (ST)	All
Filter 2	All
Resonance	All
Level (dB)	All
Level 2	All
Voice Attack (MS)	All
Voice Release (MS)	All
Tuning (PU)	All
Constant Tuning:	
Octave	Constant
Semitone	Constant
Fine	Constant

Vibrato:	
Select ON / OFF or Switch	
Rate (Hz)	All
Depth (CT)	All
Delay (MS)	All
Attack (MS)	All
Tremolo:	
Rate (Hz)	All
Depth (CT)	All
Delay (MS)	All
Attack (MS)	All
Pitch Bend (ST):	All (to control range of Pitch Bend)
Portamento:	
Select ON, OFF or Switch	
Glissando	ON, OFF or Switch
Constant Rate/Time	ON (Time), OFF (Rate) or Switch
Portamento control	All
Balance (dB):	
Stereo R/L balance	All

Subvoice Effects

Subvoice Effects only affect individual Subvoices. These effects include changes to the amplitude envelope of the Subvoice (Attack, Hold, Sustain and Decay), filter and output level, and loop control.

<F2> There is no alphanumeric command equivalent for selecting Subvoice Effects.



Subvoice Effects

Note: Effects common to Voice and Subvoice are additive (e.g. level, filter, resonance, attack, release, tuning). For example, if Voice level is set to -10 dB and Subvoice level to -20 dB, the resultant level is -30 dB. Remember, the sum of Voice and Subvoice effects cannot exceed the allowed working range - e.g. the combined effect of Subvoice Level, Voice Level and Sustain Level remains in the range: -95 dB to 0 dB.

Select Current Subvoice

To select a Subvoice as current with the g-pen [HIT] the desired Subvoice number on the Subvoice to keynumber map. Or type:

SV *n* <RETURN>

n The Subvoice number.

You can also use the Next or Previous Subvoice function key/icons:

<F14> Select the previous Subvoice.

<F15> Select the next Subvoice.

The Subvoice number is displayed in the current Instrument and Voice box.

Active Key Display

Whenever a key is played on the music keyboard, a vertical line appears on the display showing MIDI note/Subvoice assignment. This facility can be toggled ON or OFF:

The MIDI key display shows the MIDI number of the note pressed (Middle C = 60). This is useful when using the Tuning Field Calculator command.

<SF8> There is no command equivalent for toggling Active Key Display.

Attack Time

Attack time is the time between key depression and maximum amplitude. You can switch between FAST and SLOW attack times. The ATTACK field below the Fine Tuning field is used to select between Fast/Slow attack or patching to a MIDI switch.

Fast attack has a smaller range than Slow attack:

FASTATK (MS): *n* <SET>

n Rate of attack
Range:0 to 4095 ms
Unsigned

SLOWATK (MS): *n* <SET>

n Rate of attack
Range: 0 to 16383 ms
Unsigned

The higher the *n*, the more time it will take for that Subvoice to attack.

Hold Time

This is the time the SV will be held at maximum amplitude before the onset of decay.

HOLDTIM (MS): *n* <SET>

n Range: 0 to 32768 ms
Default: 0 ms
Unsigned

Decay

The rate at which the amplitude decays at the end of the Hold time:

DECAY (MSdB): *n* <SET>

n Range: -32768 to 32768 ms/10dB
Default: 0 ms/10 dB
Signed

Decay ceases when amplitude decay reaches the sustain level. Amplitude rises for positive values of *n*, and falls for negative *n*.

Sustain Level

This is the level at which the note is held after the decay period, and until the key is released. Sustain is measured from the maximum amount of level.

SUSTAIN (dB): *n* <SET>

n Range: -94 to 94 dB
Default: 0 dB
Signed

Release

Release is the amount of time it takes for the sound to decay completely after receiving a MIDI note off message. You can switch between FAST and SLOW release times. Fast Release has a smaller range than Slow Release.

FASTREL(MS) *n* <SET>

n Duration of decay after MIDI note off
Range:0 to 4095
Unsigned

SLOWREL(MS) *n* <SET>

n Duration of decay after MIDI note off
Range:0 to 16383
Unsigned

The Release switch below the Attack field is used to switch between FAST and SLOW release.

Subvoice Loop Fields

The following fields affect sound looping:

Loop Decay

Loop Decay is the rate at which the waveform decays after the beginning of the Loop. This effect can be switched ON or OFF when patched to a control switch:

LOOPDEC(MS): *n* <SET>

n Range : 0 to 32768 ms/10 dB
Default : 0 dB
Unsigned

Loop Decay begins at the time when the Subvoice enters its loop (if this is turned on). This effect is superimposed over the Attack Hold Decay Sustain Release (AHDSR) curve. The higher the number, the faster the amplitude decays.

Loop Select

The Loop field allows you to set the Subvoice Loop ON or OFF, or patched to a MIDI switch.

LOOP ON/OFF <SET> or [HIT] the box.

Default: ON

Release Loop

Release Loop determines which part of the waveform is played after key release.

RLSLOOP ON/OFF <SET> or [HIT] the box.

If Release Loop is ON, the sound continues to loop, during its release portion.

If Release Loop is OFF, the release portion finishes the loop it is on, then continues to the end of the waveform.

Alternating Loop Switch

The Series III provides two kinds of looping within a waveform.

Forwards Looping: The loop plays from Loop Start to Loop End then returns to Loop Start.

Alternating Looping: The loop plays from Loop Start to Loop End then reverses; (sometimes called Forwards/Backwards looping).

The type of looping is determined by the ALTLOOP switch on the Subvoice display:

ALTLOOP ON/OFF <SET>

OFF: Forwards Looping
ON: Alternating Looping
Default: OFF

Note: backwards/forwards looping can only be performed by a Series III equipped with Revision 2.0 or latyer Channel Cards. Look at the the label at the top of your channel cards to determine the Revision number. Any machine bought after August 1987 will certainly contain these late-revision cards.

Slur

When Slur is ON, notes which are played "over" each other, i.e. which steal a channel from a currently sounding note, will play smoothly without an attack phase - pitch and key velocity are the only parameters updated between subsequent notes. Playback of the waveform continues as if the second note had not occurred.

SLUR ON/OFF <SET> or [HIT] the box.

Default: OFF

For example:

Load any voice, and set Nphony to 2. Locate a Subvoice on the keyboard and turn Slur ON. Now play a series of notes without releasing any keys. You will hear that the third and subsequent notes have no attack portion. The second note does, because it is starting a quiet channel, not stealing one.

Summary of Subvoice Effects

Note: 'ALL' means all Control/Switch types can be patched to the effect. A number must be assigned to a constant field.

SUBVOICE EFFECT	CONTROL
Filter (st)	All
Resonance	All
Level (dB)	All
Slur Select	ON , OFF or Switch
Envelope:	
Attack Time Select	FAST , SLOW or Switch
Fast Attack Time	All
Slow Attack Time	All
Hold Time	All
Decay	All
Sustain Level	All
Loop Decay	All
Release Select	FAST , SLOW or Switch
Fast Release	All
Slow Release	All
Loop Select	ON , OFF or Switch
Release Loop Select	ON, OFF, or Switch

Patching Effects

A patch is the means by which an effect receives numerical information (values) from a controller. The Series III provides several different controller types that might be applied to an effect (see below: Table of Control Types). The number stream output from a controller may be further modified using a function curve (see the 'Function Editor' chapter).

Effects are patched via fields alongside each effect name. These fields might contain: controller numbers, function numbers or MIDI keyboard parameters (e.g. MIDI keynumber).

A variable control such as modulation wheel is used if you need to vary an effect over time.

A constant value may be all that is required for other effects:

For constant effects, tab to the effect name and set the degree of control (e.g. filter can be set to 72 semitones - rather than being varied by the modulation wheel or activated by MIDI switch).

Control Types

Here is a table of control types available for Voice and Subvoice effects.

Control Type	Explanation
Numerical Constant	A number is <SET> to the effect. This number can be increased or decreased using the <ADD> or <SUB> keys.
MIDI Switch	Used to switch an effect ON or OFF or toggle between two numerical values where appropriate (see Range).
MIDI Control	Can continuously vary the numerical values for the effect; e.g. modulation wheel.
Key Velocity	The keypress speed; or how hard the key is pressed.
Key Number	The MIDI keynumber pressed is used as the controller value. This gets higher as you move up the keyboard.
Key Pressure	An after-touch control for each MIDI key - also known as Polyphonic keypressure: Discrete pressure values are sent for each key.
Key Release	The speed of key release.
Channel Pressure	A common after-touch control for the entire MIDI keyboard - also known as Monophonic keypressure: Common pressure sensor for all keys.

MIDI Selector Window

The MIDI Selector window allows g-pad selection of almost all control types (key release is only available by alphanumeric assignment).

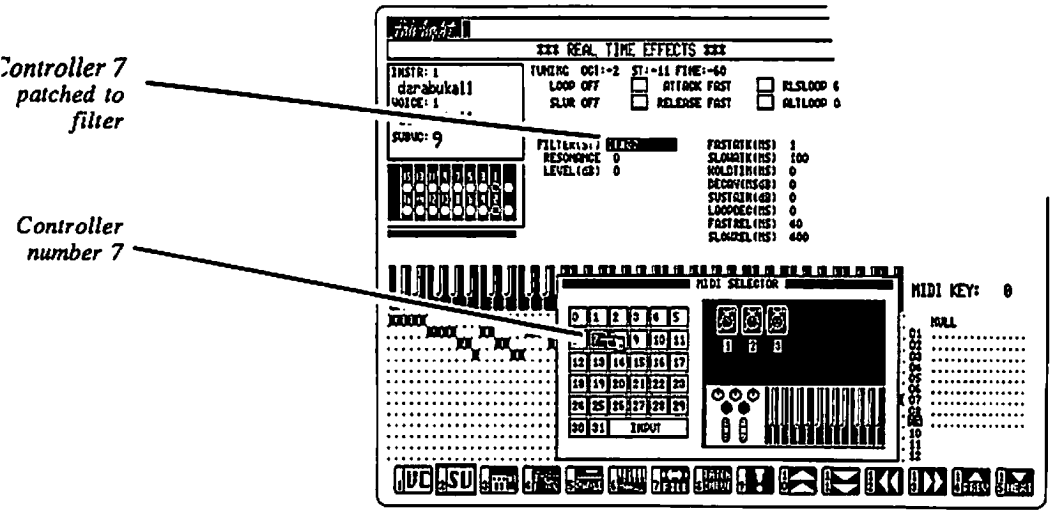
<F3> There is no alphanumeric command equivalent for displaying the MIDI Selector window.

The MIDI Selector window displays an array of small boxes each containing a number from 0 to 31, an INPUT square and a facsimile of the Series III keyboard showing the position of the Series III MIDI controls. The numbers refer to the controls that can be applied to the effect (see below).

Control Type	Keyboard Control number
Knob 1	CNTRL #0
Knob 2	CNTRL #1
Knob 3	CNTRL #2
Pedal 1 Control	CNTRL #3 / SWTCH #2
Pedal 2 Control	CNTRL #4 / SWTCH #3
Pedal 3 Control	CNTRL #5 / SWTCH #4
Wheel 1	Dedicated to Pitch Bend, (not available for patching)
Wheel 2	CNTRL #7
Switch 1	SWTCH #0
Switch 2	SWTCH #1

Example:

To assign MIDI controller 7 (Modulation wheel on the Series III keyboard) to a filter effect- Tab to Filter (ST), open the MIDI select window, [HIT] a control (CT) icon and [HIT] box number 7 in the MIDI window. The Filter (ST) field automatically displays CT#07 signifying that the modulation wheel is controlling the filter cutoff applied to the current Voice.



MIDI selector window with a patch between controller number 7 and Filter

The controls and switches on the Series III keyboard facsimile can also be [HIT] for patching effects to controls. The device [HIT] becomes the selected device type. If you

select a Series III control knob, all the numbers in the array relate to Controls, but if you [HIT] a switch, the numbers refer to Switches.

Cannon socket icons permit patching to external pedal controllers only (i.e. not switches). A [HIT] to any note on the keyboard facsimile patches MIDI keynumber to a selected effect.

> **Note:** Fairlight control/switch numbering is not the same as those used by other manufacturers. If using an external MIDI keyboard to control effects on the Fairlight, then the external control/switch numbers must either be translated into Fairlight controls and switches (found on the System Configuration MIDI Control subpage - or, use the external keyboard control/switch numbers on the FX page.

The various types of MIDI information which can be patched to an effect are contained in the Table below.

Table of MIDI Patches with corresponding Commands and Icons

<SHIFT> Icon	Control Type	Symbol Displayed	Assignment
No Icon	Time	TIME	**T**
<SF9>	Key Velocity	KVEL	**KV**
<SF10>	Key Pressure	KPRES	**KP**
<SF11>	Channel Pressure	CPRES	**CP**
<SF12>	MIDI Control	CT#00	**C** *n*
<SF13>	MIDI Switch	SH#00	**S** *n*
<SF14>	Key Release	KREL	**KR**

n The patch number selected. (0 is assigned if *n* not specified).

Patch Input: Automatic MIDI Patching

Control devices can also be patched to effects by tabbing to the effect and issuing the Make Patch icon/function command:

<F8> There is no alphanumeric command for displaying the Automatic MIDI Patch window.

A dialogue box appears on-screen, with the prompt:

"Move controller to make patch"

If a MIDI control device is now moved, that device is patched to the selected effect. This works equally well when using an external MIDI device as a MASTER keyboard. Press <SET> to escape Patch Input mode without moving a control.

To make patchings consistent with an external MIDI keyboard, see the MIDI Control subpage on the System Configuration page.

Function Curves

A function curve can be drawn on the Function Edit Page (FE) which allows you customised control over effects. The function curve receives data input from the controller device e.g a MOD wheel, and then sends out the new data as defined by the function curve. Up to 16 function curves can be drawn on the FE page.

The function graph number and controller number must be patched to an effect to allow control of the effect to take place. For example, to allow the filter to affect only the lower end of the music keyboard, simply allocate the Function Graph number and the controller number to the Filter field.

The function drawn on the FE page can be displayed on the FX page with the Function Display window:

<F4> There is no alphanumeric command for displaying the Function Display window.

A function cannot be drawn on this window. To re-draw the function, return to the Function Editor Page.

To assign a function curve to an effect; tab to the effect, then select a controller - e.g CT#7 mod wheel (either with the MIDI assignment window, or by direct assignment) then [HIT] the function number in the Function Display window. Both the controller number and the function number are displayed in the effect field.

For example, if you assign function 1, controlled by the Mod wheel, to Filter(ST):

FILTER(ST): *F01*(CT#7)

To patch the same function curve to an effect parameter by alphanumeric assignment, simply type function number and the controller number on the command line then <SET>:

FILTER(ST): *F1C7*<SET>

Or to assign key velocity and function curve two to filter:

FILTER(ST): *F2KV*<SET>

The function number and controller can be edited by repeating the above procedure with another controller or function number.

> **Note:** See the Chapter on the Function Editor for more details on drawing function curves.

A function can be created and allocated on the FX page but the shape of the curve can only be done on the FE page.

To create a function of the FX page:

<CF2> There is no alphanumeric command for creating a Function on the FX page.

A number will appear on the Function Display window. A new number from 1 to 16 will appear as each new function is created.

To select a function for allocation to an effect, either tab to the desired function number on the Function Display window, or use the Function select command:

FUNCTION *n*<RETURN>

n The number of the function to be allocated to an effect.

To delete the currently selected function from the Function Display window:

<CF2> There is no alphanumeric command for deleting a Function.

To display the function curve as signed or unsigned:

<CF1> There is no alphanumeric command for selecting signed or unsigned Functions.

Reversing a Patch

The sense of a controller to an effect can be reversed: So that, for example, hitting harder on the music keyboard (increasing the key velocity) reduces loudness (decreases the level).

<SF5> There is no alphanumeric command for Reversing the sense of a patch.

Range of Controls or Switches

The maximum and minimum control/switch values of a tabbed effect can be displayed by pressing the <SHIFT><DOWN> keys. A small window appears beneath the selected field showing the range for the effect. Values can be assigned to the maximum or minimum fields in this display. To move between these fields, the <ARROW> key must be used (not the g-pen).

Display the Control Range window by icon/function key for graphically adjusting values for that effect.

<F5> There is no alphanumeric command for displaying the Control Range window.

The Control Range window displays a scale showing the appropriate units for that controller. When using continuous controllers, the range determines the maximum and minimum points between which an effect can vary. For switches, the minimum range corresponds to OFF, the maximum corresponds to ON.

The solid bar above the scale shows the minimum and maximum controller values. Use the g-pen to alter the location and range of the bar.

Solo Subvoice

The Subvoice Solo facility mutes all Subvoices other than the one specified. This is useful for ensuring that only one Subvoice is recorded on a single track.

Example:

> Suppose you have a Voice containing three drum Subvoices. You give the Voice an Nphony of 3, and create a sequence with three parts assigned to the Voice. With solo OFF, the Subvoices appear cyclically at the Series III channel outputs - which makes it difficult to record on separate tracks. When a Subvoice is soloed, only that Subvoice is active, so the outputs can be mixed down to a single track.

To record individual Subvoices separately, use the Solo feature and three recording passes. Solo the first, mix the three Series III channel outputs onto one track, solo the second, mix the outputs on to another track, solo the third and mix the outputs on to a third track.

SOLO: *s* <SET>

s Any active subvoice number, or OFF (<SET> with *s* number in the command line).
Range: 1 to 63
Default: OFF

Tuning

Tuning an Instrument, Voice or Subvoice involves setting the Octave, Semitone and Fine Tuning. These fields are found at the top of both the Voice and Subvoice Real Time Effects Pages.

Octave tuning:

OCT: *o* <SET>

o The octave shift, relative to the original mapped sample pitch.
Range: -9 to +9 (octaves)
Default 0

Semitone Tuning:

ST: *s* <SET>

s The semitone shift, relative to the original mapped sample pitch.
Range: -11 to +11 (semitones)
Default: 0

Fine Tuning:

FINE *f* <SET>

f The fine-tune shift (measured in 1/256ths of a semitone) relative to the original sample pitch.
Range: -255 to +255
Default: 0

Tuning Subvoices

To individually fine-tune Subvoices, you can use an electronic tuner - as a fixed reference. Another way is to select a reference Subvoice. Use the Play Current Subvoice command for comparative tuning by assigning to the Octave, Semitone and Fine Tuning fields on the Subvoice effects display.

In order to get the sound to play at its sampled pitch from a particular key on your keyboard, use the global Tune Field Calculator command. The TFC command will show precisely how much you should alter Subvoice tuning. It calculates a fine-tune offset, the result of which is automatically placed on the command line ready for you to <SET> into the Fine Tuning field.

However, to calculate the offset, you need to know the sample rate of the current Subvoice. The RATE field on the Subvoice display can provide this information.

The Tune Field Calculator command is:

TUNEFIELDCALCULATOR *samprate key* <RETURN>

samprate The current sample rate expressed in kHz.

key The key name which the sound should be replayed at e.g. *a4*

(option) - for flat key name e.g *a-4*.
(option) + for sharp key name e.g *a+4*.
(option) # MIDI key number.e.g *#57*
(option) :A *freq* The tuning of A5. (This is only necessary if you do not use A440 tuning)

Examples of the Fine Tune Calculator;

TFC 44.1 a4 <RETURN>

This places the natural pitch of a sample made at 44.1 kHz on the A below middle C. The calculated tuning offset = 1988

TFC #35 48 :441 <RETURN>

This places the natural pitch of a sample made at 48kHz on to MIDI keynumber 35 (B2), where overall tuning of the keyboard is at A441 Hz.
The calculated tuning offset = 7985.

Starting and Stopping Channels

The Key Down command is the equivalent of sending a MIDI Note On (key 60) to all channels of the current Voice:

KEYDOWN<RETURN>

The Key Up command is the equivalent of sending a MIDI Note Off to all channels of the current Voice:

KEYUP<RETURN>

To stop all channels of the current Instrument:

STOP<RETURN>

Re-define Default Voice and Subvoice

Whenever you create a voice or subvoice, a default is loaded, containing neutral values for all patches. You can re-define the default FX page settings for Voices or Subvoices by saving the current set-up:

DEF V<RETURN>

The patches of the current Voice are saved; these become the default parameters for all new Voices.

DEF SV<RETURN>

The patches of the current Subvoice are saved; these become the default patches for all new Subvoices.

Mapping Subvoices to a Keyboard

As many as 63 different Subvoices can be mapped to specific MIDI key numbers on the Series III music keyboard. Thus, a single Voice can play a large range of independently sampled sounds.

On the Subvoice to keyboard map, a facsimile of the keyboard is displayed horizontally, with Subvoices listed down the right hand side of the display. Middle C key is indicated by a dot on the MIDI keyboard.

To map the current Subvoice to a key, [HIT] the point which intersects with the desired keynumber and Subvoice. A small square marks this point.

Mapping keys to the NULL position on the top row effectively mutes them.

Play Current or Mapped Subvoice

The Play Current/Map field on the Voice display is used to override the Subvoice to keyboard map:

M Returns to normal Subvoice to keyboard mapping.

Play Current/Map can also be changed using global commands:

To Play the current Subvoice:

PLAYCURRENT<RETURN>

To Play the mapped keyboard:

PLAYMAP<RETURN>

Filling Between Two Points

The Fill command allows you to quickly fill-in all points between two unique selections. [HIT] two points on the display, then issue the Fill command:

<F7> There is no alphanumeric command equivalent for the Fill command.

Scrolling the Map

The following Scroll icons allow the Subvoice to keyboard map to be scrolled up, down, left or right. The Scroll Reset icon returns the map to its default position.

<F9> Reset map to original position.

<F10> Scroll map up.

<F11> Scroll map down.

<F12> Scroll map left one octave.

<F13> Scroll map right one octave.

Use MIDI Keyboard to Map Subvoices

The current Subvoice can also be mapped onto the keyboard display using the master MIDI keyboard to choose the keys mapped to the current subvoice.

<SF7> There is no alphanumeric command for MIDI keyboard map assignment.

The current Subvoice will now be mapped to each key played.

> **Note:** Normal mapping operation resumes if MIDI information has not been received for several seconds.

Keyboard Map Overview

You can view all 63 Subvoices mapped across the entire MIDI pitch range (key numbers 0 to 127) with the Overview facility:

<F6> There is no alphanumeric command for displaying the Overview map.

> **Note:** The Overview map is for <u>viewing only</u> and cannot be used for altering Subvoice assignments.

Reorganizing Subvoices

Label Subvoices

Sound Effects or Subvoices can each be described by a 15-character label. Tab to the Subvoice name field, then <SET> the Subvoice name. This may also be done in the Info Window at the top right of the screen, which appears on every display page.

Swap Subvoice

The Subvoice Swap command exchanges the numbers of a pair of Subvoices within the current Voice:

SUBVOICESWAP *n1 n2*<RETURN>

n1 n2 The numbers of the Subvoices to be exchanged.

Leaving out one number exchanges the numbered subvoice with the current subvoice.

Exchanged Subvoices retain their original mapping and patching details.

Copy Subvoices

The Subvoice Copy command allows a Subvoice to be copied into a destination Subvoice. The Subvoice must already have been created using the Subvoice Create command.

SVCOPY *n1 n2* <RETURN>

n1 n2 Subvoice n1 is copied over subvoice n2
Range: 1 to 63

If only one number is specified, then the current subvoice is copied over the numbered subvoice.

* * *

Chapter 7

Function Edit (FE) Page

Contents

Introduction

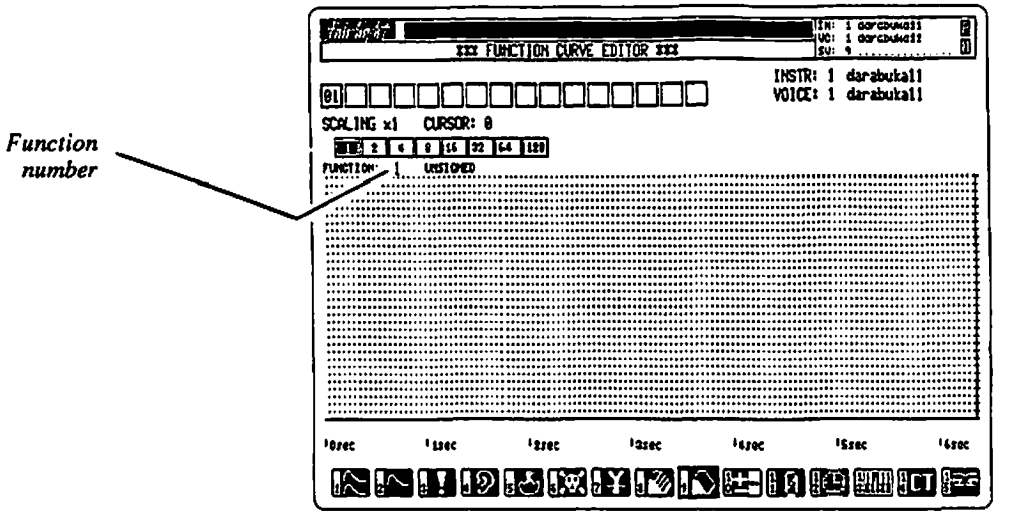
Many of the facilities found on the Function Edit page are closely related to those on the FX page. The Function Editor enables you to draw up to 16 separate function curves for customising Series III controller response characteristics. This allows you to fine-tune the way an effect can be used. The function curve number and the number of the controller must be patched to the effect parameter before the function will have any affect. See Function Curves in the FX page for details on patching Function Curves to effects.

The shape of the function curve (plotted on the Y axis) represents modifications made to Controller input numbers (represented on the X axis). For example; a function curve can be drawn that represent a specific panning rate between left and right sides of a stereo Voice.

Functions can be created and displayed in a variety of formats, and saved with the Voice.

To enter the Function Editor page:

<esc><F4> FUNCTIONEDITOR<RETURN>



Function Edit Page (set to time display).

Create and Delete Functions

A function must first be created - either on the FX page, or when you transfer to the FE page. If not already created, the following message is displayed:

"***FUNCTION REQUIRED***"

To create a function on the FE page:

<F5> There is no alphanumeric command for creating a function on the FE page.

Functions are created with the lowest available function number. This number is displayed in the function number box at the top of the Function Editor page. The function grid appears, ready for you to draw the function curve.

Select Function

If more then one function curve is created and saved with a voice, you can select a specific function by command:

FUNCTION *n* <RETURN>

n The number of the desired function.
Range: 1 to 16

This command is available on both the FE and FX pages.

Delete Function

The current function is deleted on the FE page using the Kill icon/function key:

<F6> There is no alphanumeric command for deleting a function on the FE page.

The Function Editor Cursor

The cursor is the vertical line in the centre of the graph. You can move the cursor to show the 'Y-axis' value of the curve at any cursor position. This value is displayed in the CURSOR field and always ranges from 0 to 127. Move the cursor using the <SHIFT> key in conjunction with the arrow keys:

<SHIFT><LEFT>: Moves the cursor left

<SHIFT><RIGHT>: Moves the cursor right.

If preceded by the <ESC> key, the cursor moves the maximum possible distance.

When using different Horizontal Scalings, the Y axis cursor value can also be moved by playing the keyboard or by moving a controller.

Toggle the Jill icon to stop the movement of the cursor at any time, this may be useful when using Horizontal scaling (see below):

<F15> There is no alphanumeric command for toggling cursor movement.

Drawing Modes for Function Curves

Functions can be drawn with the g-pen in two ways: By drawing the curve (Plot mode), or by selecting two points and having the Series III supply the connecting line (Join mode). Plot mode is the default mode.

To select Join mode:

<SF1> There is no alphanumeric command for selecting Join mode.

To select Plot mode:

<SF2> There is no alphanumeric command for selecting Plot mode.

Selecting Stepped or Smooth Display

For each function curve there, are 128 points on the Y axis, which can be displayed either in smooth or stepped mode. The display defaults to smoothed mode so the appearance is as continuous as possible. For discontinuous controls (e.g. keynumber) it may be more appropriate to display the function as stepped rather than smoothed (see Horizontal Scaling below).

To display the function as Stepped:

<F8> There is no alphanumeric command for selecting Stepped mode.

To display the function as Smooth:

<F9> There is no alphanumeric command for selecting Smooth mode.

Scaling Resolution

You can adjust screen resolution by increasing the scale of the display. [HIT] one of the 8 small numbered boxes to adjust scale:

1 | 2 | 4 | 8 |16 | 32 | 64 | 128

Each box (from the left) doubles display resolution; the higher the scaling, the finer the control of the curve within the 127 available steps.

If, for example, a curve reaches the maximum point (127 steps) on the 128 scale, this only represents 1 step on scale 1. Therefore, the larger the scaling number, the finer the curve can be drawn; however output is reduced in proportion to the scaling.

Horizontal Scaling

There are three types of Horizontal scaling displays available. This choice enables you to visualise the useful range of a control for a particular patch. For example, use the keyboard scale on the horizontal axis to change velocity over a range of MIDI key numbers. Different display modes on the X axis have absolutely no effect on numerical input.

To select one of the three horizontal axis display modes:

Icon	Horizontal Display Mode
<F12>	X-axis represents time (in seconds).
<F13>	X-axis represents keyboard scale. Play keyboard to move the cursor. This display format is useful for patching a function to KEYNUM on the FX page. The useful range of the function can quickly be seen on the keyboard facsimile.
<F14>	X - axis is scaled from 0 to 127, the MIDI control ranges. Move any controller to move the cursor.

Inverting a Function Curve

The Invert icon/function key inverts the shape of the drawn curve:

<F7> There is no alphanumeric command for Inverting the function curve.

Zeroing a Function Curve

The Zero icon/function key erases the current function curve:

<F11> There is no alphanumeric command for Zeroing a function curve.

Split Display Mode

Two function curves can be displayed at the same time for comparison.

To select dual function curves:

<F1> There is no alphanumeric command for selecting Dual Function Curves.

The upper display is the current function, and can still be edited. The lower display is the previous function (which cannot be edited). Although the actual display size for each graph is reduced, the X and Y axes still maintain the 128 X 128 quantization resolution, as before.

To exit split screen mode and return to single function curve:

<F2> There is no alphanumeric command for selecting Single Function Curve.

Signed and Unsigned Curves

As mentioned on the FX page, effects can be Signed or Unsigned. Unsigned effects use values 0 to 127 (maximum 128 quantized steps). Signed effects require both positive and negative values either side of zero. Because an effect itself cannot be changed from Signed to Unsigned, ensure that the appropriate curve is drawn for the intended type of effect (See 'Real Time Effects' chapter, for which effects are Signed or Unsigned).

Toggle the Sign/Unsigned icon/function key to change between Signed or Unsigned:

<F10> There is no alphanumeric command equivalent for toggling the Signed/Unsigned graph.

Signed/Unsigned mode is indicated next to Function number (below the Scaling Select field).

> **Note:** Choose between signed or unsigned mode before drawing your curves. Changing in midstream will have unpredictable effects.

Saving and Restoring the Edited Function

Functions are stored in channel card memory, and saved as part of the Voice when the Voice is saved (see Creating Saving and Loading for details and options for saving Voices). The Voice must be re-saved to disk to allow the patching and function curve to become part of the Voice.

Before taking effect, a function must be written to the channel card using the Ear icon/function key:

<F4> There is no alphanumeric command for writing a function curve to a channel card.

This enables you to hear the effect of the function on the current Subvoice.

Once written to the channel card, a function can be read back into the display using the Reset icon/function key:

<F3> There is no alphanumeric command for reading back a function from a channel card.

As soon as you draw a function curve, the Reset and Write icons flash on and off warning you that he function you see is not the one you will hear (until you write it to the channel card).

* * *

Chapter 8

Wave Edit (WE) Page

Contents

Introduction

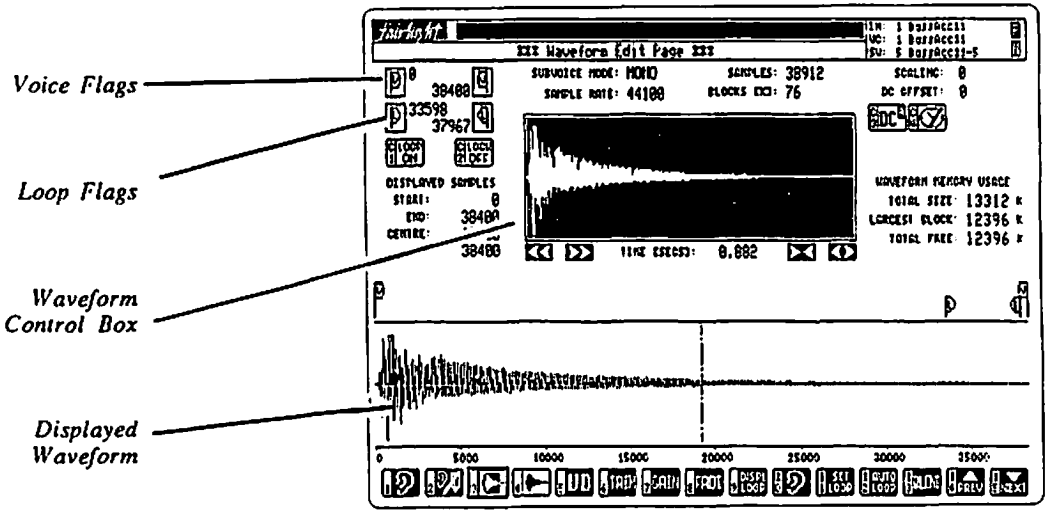
The WaveEdit Page provides facilities for editing the waveform of any sound in Series III WRAM. These facilities include pitch analysis, setting a loop, fading a waveform, adjusting waveform amplitude, cut and paste, inverting, rotating, and reversing a waveform.

These operations act on the currently selected Subvoice. For more details on loading Voices and choosing the current Instrument, Voice and Subvoice see the chapter on 'Creating, Saving and Loading'.

Waveforms are displayed in amplitude envelope format, showing how the level changes with time.

To transfer to the Wave Edit page:

<esc><F6> WAVEEDIT<RETURN>



The WaveEdit Page with a loaded Subvoice

The WaveEdit page is divided into two separate window displays. The smaller top display is the waveform Control Box. The lower one is called the Waveform Display or Large Window.

The Control Box is used to select the waveform in the Waveform Display. You can precisely control the extent of displayed waveform either by assigning parameters to the Displayed Samples fields or using the g-pen.

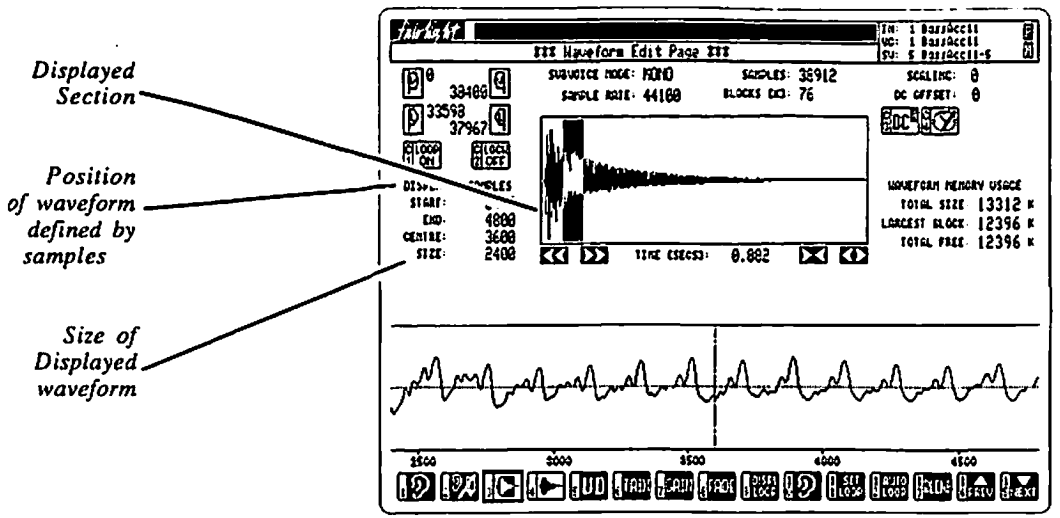
The Waveform Control Box

Any section of Subvoice waveform can be displayed in the Waveform Display window. The highlighted area in the Control Box determines the extent of waveform displayed in the Waveform Display. The Displayed Samples fields reflect any changes made in the Control Box.

[HIT] the exterior of the highlighted window area within the Control Box and then slide the G-pen to contract or expand the area of displayed waveform.

[HIT] the interior of this area to 'grab' the window and move it along the waveform.

These operations quickly become intuitive and can be used together for 'zooming' in and out.



The Wave Edit Page showing a section of a subvoice waveform as defined by the Waveform Control Box

Notice that the window area can be diminished by 'pressing' it against the edge of the Control Box.

In addition to direct g-pen control there are four command and icon controls located beneath the Control Box.

Zoom decreases the extent of the window area, thus increasing waveform resolution:

>< ZOOM<RETURN>

{option} M The amount by which resolution is increased.
Range: 1 to 50
Default: 1

Wide increases the extent of the window whilst decreasing waveform resolution:

<> WIDE<RETURN>

{option} M The factor by which the window is widened.
Range: 1 to 50
Default: 1

Left moves the window to the left without altering its extent:

<< LEFT<RETURN>

{option} M The amount of movement to the left.
Range: 1 to 50
Default: 1

Right moves the window to the right without altering its extent:

>> RIGHT<RETURN>

{option} M The amount of movement to the right.
Range: 1 to 50
Default: 1

Adjusting Waveform Display by Assignment

The Displayed Samples fields are used to accurately determine the size of the waveform in the Waveform Display window. Size can be measured either in samples (default) or time. Time display is useful for dialogue editing - where you need to know exactly how long a phrase is.

You can select sample/time calibration either by command or by toggling between the two:

<CF4> TIMEON<RETURN>

To turn off time calibration and return to sample calibration:

<CF4> TIMEOFF<RETURN>

Both modes adjust when the display is zoomed or changed in size by other methods.

> **Note:** the time referred to here is the time elapsed in the original sample. If you play this sample at a different pitch, the times will not be accurate.

Changes to the Displayed Samples fields are reflected in the Control Box:

START : *n* <SET>

n The start sample or time of the display window.

END : *n* <SET>

n The end sample or time of the display window.

CENTRE: *n* <SET>

n The sample number or time at the centre of the display window.

SIZE : *n* <SET>

n The size of the waveform display in samples or seconds.

All display sample fields are measured relative to the first sample in the Control Box. The first sample, however, depends on the current display format (see below). In Voice display format, sample 1 refers to the position of the Voice Start flag. In Waveform display format sample 1 is the beginning of the Subvoice waveform.

The Waveform Display Window

Voice Start and End

The Voice Start and End flags are used to define the beginning and end points of the waveform heard when activated by the keyboard. These flags face toward each other at the top of the WE display page.

To set the Start and End flags: [HIT] the relevant flag at the top of the page. It is then highlighted to indicate that you are in Voice flag setting mode. If you now [HIT] the Waveform Display window, the selected Voice flag is placed on-screen, and that flag selection canceled.

> Note: Although we are actually at the Subvoice level, for the sake of brevity these flags are called 'Voice' Start and End flags.

Lock Flag Setting

The Lock Flag facility allows you to keep a selected flag continually active - rather than having to re-select it each time:

<CF2> There is no alphanumeric command for toggling Flag Lock ON/OFF.

Set Voice to Waveform Display

The Voice Display command sets the Voice Start and End flags to the very beginning and end of the Waveform Display window:

<F5> VOICEDISPLAY<RETURN>

Display the Voice

To display the 'Voice' section of the waveform - as defined by the Voice Start and End flags:

<F3> DISPLAYVOICE<RETURN>

To display the complete waveform as sampled:

<F4> DISPLAYWAVEFORM<RETURN>

The Control Box will also be affected by the above two commands.

The Waveform Display can also be controlled by [HIT]-ting the waveform with the g-pen or mouse. A [HIT] to any point on the display window alters the position of the displayed waveform so that the [HIT] point now becomes the new vertical centre line. For example, if you [HIT] a waveform of (say) 2000 samples at the 500 sample point, the Waveform Display shows the waveform with the centre line at 500 - and 500 samples on either side (i.e 0 -500 and 500 -1000).

Audition the Displayed Waveform

You can hear all or part of the displayed waveform exactly as it was sampled. Use the Audition command to hear the waveform displayed in the Waveform Display window:

<F1> or **<F10>** AUDITION<RETURN>

The waveform is played directly from memory at the original sample rate - without filtering etc. by the FX page. It will always appear at output 1, or outputs 1 and 2 if stereo (also at the mixed output in both cases.)

> **Note:** auditioning is not possible if outputs 1 and 2 are being used by the disk recorder.

Graphic Pen Audition Mode

When the g-pen Audition mode is switched ON, sections of the displayed waveform can be heard using the g-pen. Drag the mouse or G-pen ,with botton depressed, across the Waveform Display to hear the portion you have covered. To toggle g-pen audition mode ON/OFF:

<F2> ROCK<RETURN>

The bar across the pen part of the icon is removed, and the Play icon <F1> changes to indicate that you are free to use one of the three play modes described below. These modes are cycled through using the <F1> function key/icon:

Icon	Audition Function
<F1>	Play scanned section at the original sample rate.
<F1>	Play a loop of the scanned section at original sample rate. This can be a loop of the whole waveform or just a few samples.
<F1>	Play scanned section at speed of the scan. The playback rate depends on how fast you scan the waveform.

Use <F2> again to toggle g-pen audition OFF, cancelling g-pen Audition mode.

> Note: Audition mode must be canceled to enable other functions to occur - e.g., Voice and Loop flag placement.

Display Auditioned Section

You can display the portion of the waveform just auditioned with the Display Audition command.:

<CF5> DISPLAYAUDITION<RETURN>

The length of waveform last scanned with the g-pen is displayed in the Waveform Display window.

Scaling the Display

The Scaling field controls the vertical resolution the Waveform Display window. This facility provides visual magnification *only*, (i.e., not audible) of the displayed section of waveform.

SCALING: *n* <SET>

n The amount of magnification required.
Range: 0 to 15
Default: 0

An increment of one doubles the vertical resolution. A scaling of 10 means that the waveform is magnified 1024 times.

> Note: Scaling is most useful for low amplitude waveforms.

Looping a Waveform

Many musical sounds have interesting attack characteristics which settle into a fairly cyclic waveform. It is often useful to set up a loop within the 'stable' portion of the waveform to extend the length of a note and to conserve waveform memory.

Setting the Loop

The beginning and end points of a loop are determined by the Loop Start and End flags. These are set by g-pen, or assignment to the fields next to the Loop Start and End flags at the top of the page.

When looped, a sound can be played in one of two ways- One is Forward looping where the waveform plays from the beginning of the waveform until the Loop End flag is reached then jumps to the loop start flag and continues looping repeatedly. The other form is Alternating Looping where the waveform is played in reverse once the Loop End flag is reached then played forward and alternates between these two modes. See the FX Page for details on selecting Forward or Alternating Looping.

When setting up a loop, you should ensure that the start and end points are dynamically matched - otherwise an audible click or sudden change in sound quality may be heard - due to amplitude or timbre changes between loop points. There are various facilities available on the WE page that can help you make smoother sounding joins - e.g., Blend, AutoLoop and 'Zero-crossing' methods.

The procedure for setting up loops is the same as for setting the Voice flags on the Waveform Display window (see above). You can also use the Lock ON/OFF facility to keep the selected flag active during placement.

Turn Loop ON/OFF

The loop can be toggled ON/OFF or (assigned to a MIDI switch on the FX Page).

<CF1> TURNLOOP<RETURN>

If Loop is OFF the Subvoice only plays between the Voice Start and Voice End flags.

Displaying the Loop

The looped section of the waveform can be displayed in the Waveform Display window:

<F9> DISPLAYLOOP<RETURN>

This command is useful for determining exactly where a loop occurs in the waveform.

Automatic Loop Setting

One method to ensure that Loop End-to-Start joins can be as smooth as possible involves the notion of 'Zero-crossing'. Zero-crossings are points on the waveform where the waveform crosses the 'line' representing zero amplitude. Looping between these points reduces the risk of introducing audible clicks at the loop join.

If consecutive samples cross the zero amplitude line from negative-to-positive, it is called a Positive zero-crossing. If samples cross from positive-to-negative, it is called a Negative zero-crossing.

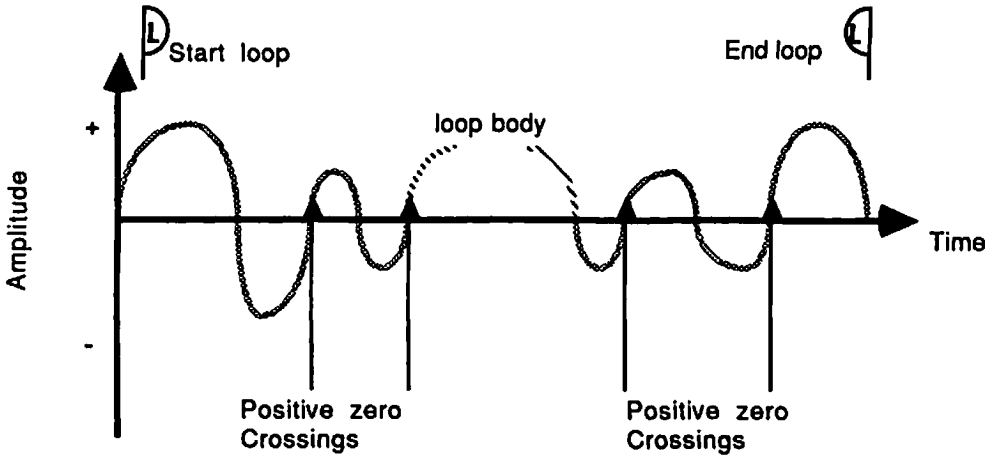


Diagram showing how automatic loop selects a group of positive zero crossings from the start and end of the loop to create a smooth join between these two points.

The Automatic and Semi-automatic looping operations considered below use Positive zero-crossings as loop Start and End points.

The Auto Loop command allows you create the largest possible loop within the lower display window by finding groups of zero crossings near both the loop Start and End points:

<F12> AUTO<RETURN>

You may find it easier to select loop points within an area not too small and with a relatively regular amplitude and timbre. If the selected area is too small, an error message appears.

Set Loop (Semi-Automatic Loop Setting)

The Semi-Automatic loop setting selects positive zero crossings as near as possible to the loop Start and End points. The end of the loop is the sample preceding the last positive zero crossing in the displayed area.

Use the Set Loop command to place a Semi-automatic loop on the displayed waveform:

<F11> SETLOOP<RETURN>

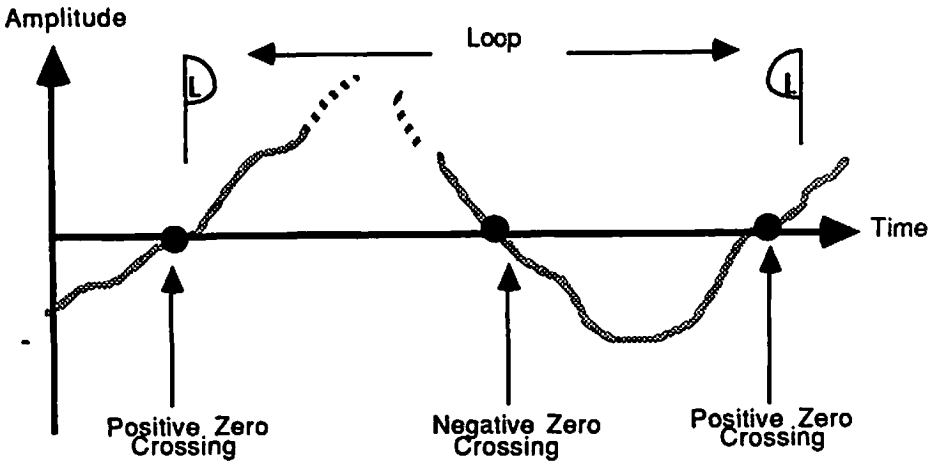


Diagram showing how single positive zero crossings are used in semi-automatic loop setting to help make a smooth loop.

Looping the Display

The displayed waveform can be looped using the display boundaries as the Loop Start and End points:

<CF10> LOOPDISPLAY<RETURN>

Note: The Loop Display command does not align to Zero-crossings.

Blending the Loop

Another way to smooth looping points is by using the Blend command.

> **Caution:** Blending permanently alters the waveform. This effect *may* be noticeable because the start of the loop is mixed in with the end of the loop, creating phase cancelling effects on the sound. This would not work for, say, a solo violin sound. Make sure you have saved a copy of the sample before blending it. Only use Blend if you cannot find a good loop any other way.

Issue the Blend command after you have created your loop:

<F13> BLEND RETURN>

{option} **L**	Length of loop to be blended in samples.
{option} ***n*** **%**	The percentage of the overall loop length to be blended. Default: 50% of the loop length.

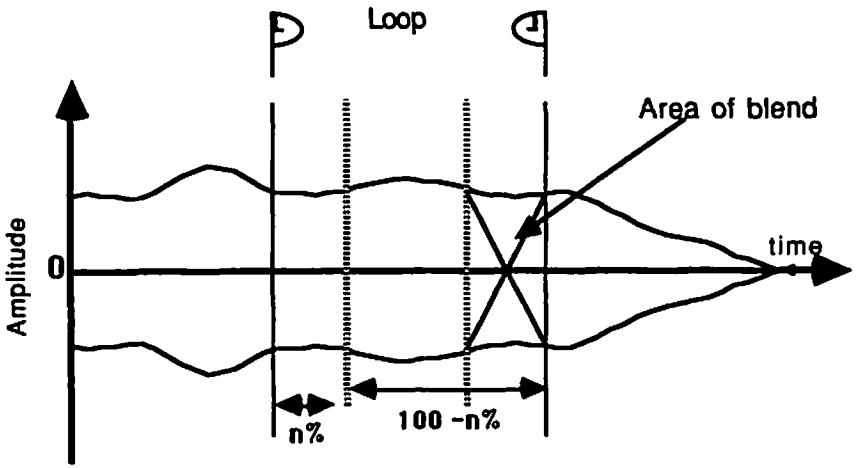
Examples:

BL Blend 50 per cent of loop into itself. Loop is half the original length.

BL 20% Blend 20 per cent of loop. Loop is 20 per cent shorter.

BL 1000 Blend 1000 samples of loop.

The Blend command blends the part of the waveform within the loop junctions together. As one half fades in, the other half fades out. This can be effective in removing clicks or other sound variations which make the loop obvious.



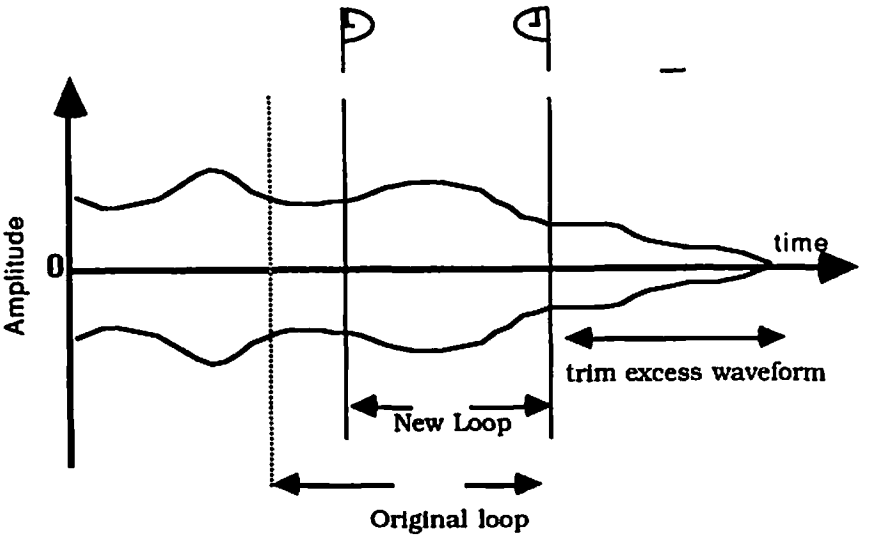
Entire Waveform before Blending

A new loop is created within the original loop as defined by the *n%* of the Blend option. The default 50% will split the original loop area in half. The smaller the percentage, the less area the blend command works within.

For example, in the diagram above, the area defined by *n%* will be blended into the area at the end of the original loop (marked as Area of blend).

The area defined as 100 -*n%* will be the area of the new blended loop. The Loop End flag will remain in the same place but the Loop Start flag will move to the point on the loop marked by 100 -*n%*.

It is suggested that the voice flag is brought up to just after the Loop End flag and the voice is re-trimmed after the Blend command.



After Blend command :- The new loop is created at a pointed dependent on the % option given.

Calculate Duration for Loop

The global Echo Delay Calculator determines the exact duration of any note or group of notes, at any tempo in most time signatures. This is useful for finding the length of a loop for a sound used in a specific piece of music.

The Echo Delay Calculator command is:

ECHODELAYCALC *count/note-value tempo* <RETURN>

count — The number of notes in the bar.can be fractional, e.g., 12.5
Default: 1

note-value — The note type in the bar
Default: quarter-notes

tempo — The tempo in beats per minute. May be fractional, e.g., 230.5
Default: 120

{option} T — A triplet value can be calculated by adding a *t* after the note-value. The result of the calculation (expressed in seconds and milliseconds) is displayed on the command line, ready to be inserted in any field required.

Example:

edc 4/8t 65.2 <RETURN>

Shows that four 8th note triplets (at 65.2 bpm) have a combined duration of:1.227 seconds

Note: You can use the EDC command for setting the echo time on external digital delay lines based on a sequence tempo. Also useful for adding delay repeats on the Flanger page.

Editing the Subvoice Waveform

All editing operations are performed on the Waveform Display window. Trim and Subvoice Expand utilise the Voice Start and End flags. Other editing commands - e.g., zeroing, amplitude alteration, cutting, copying, pasting, reversing, rotating, inverting - are performed on whatever part of the waveform is displayed in the Waveform Display window.

Note: You should always make a disk copy of the pre-edited waveform, since you might later want to change it back again. To regain the sound from disk after an unsuccessful edit, type SVL<RETURN>.

Trim Waveform

The Trim command erases the area of the waveform outside the Voice Start and End flags and is usually performed just after a sound has been sampled. Move the Voice Start and End flags to the appropriate positions. Type:

<F6> TRIM<RETURN>

A prompt appears asking if you want to trim the waveform.

You cannot retrieve the trimmed part of the waveform unless you have saved the original Subvoice to disk.

Zero Waveform

Zero sets all samples in the Waveform Display to zero amplitude. A query appears for confirmation:

<SF5> ZERO<RETURN>

{option} * Zeros entire Subvoice waveform.

You can not retrieve the Zeroed waveform unless you re-load the original Subvoice.

Insert Silence into Waveform

The Silence command without any options inserts 512 zero samples at the centre line of the Waveform Display. This is useful for inserting space to sampled dialogue etc.

SILENCE<RETURN>

{option}< Insert 1 Kbytes (512 samples) to start of the displayed waveform.
{option} > Insert 1 Kbytes (512 samples) to end of the displayed waveform.
{option} N Insert *n* 1kbyte blocks to position specified by direction arrows or default centre line.
{option} M If *n* is followed by an M then the units of *n* are milliseconds.
{option} S If *n* is followed by an S then the units of *n* are samples.

Examples:

SIL 1000M Insert 1 second of silence to centre of display.

SIL 100 S < Insert 100 samples to start of display of waveform.

SIL 10 > Insert 10 kbytes of silence to end of displayed waveform.

Expand Waveform

The Subvoice Expand command adds 'silent' samples to either the Voice Start flags or the Voice End flag.

SUBVOICEXPAND<RETURN>

{option} < Add 1 kbyte (512 samples) to the start of the Voice.
{option} > Add 1 kbytes (512 samples) at the Voice End.
{option} N Adds *n* 1kbyte blocks to position specified by direction arrows.
{option} M If *n* is followed by an M then the units of *n* are milliseconds.
{option} S If *n* is followed by an S then the units of *n* are samples.

The Subvoice Expand command with no options adds 1kbyte (or 512 samples) to the Voice End and then automatically trims the voice. This command is superseded by the Silence command.

Alter Waveform Amplitude

The Gain command allows you to increase or decrease the amplitude of the section bounded by the Waveform Display window:

<F7> GAIN<RETURN>

{option} G Gain expressed as a percentage of the displayed waveform.
For example; G200<RETURN> doubles the amplitude.
G50<RETURN> halves the amplitude.
Default: Maximum amplitude without clipping. Very useful!

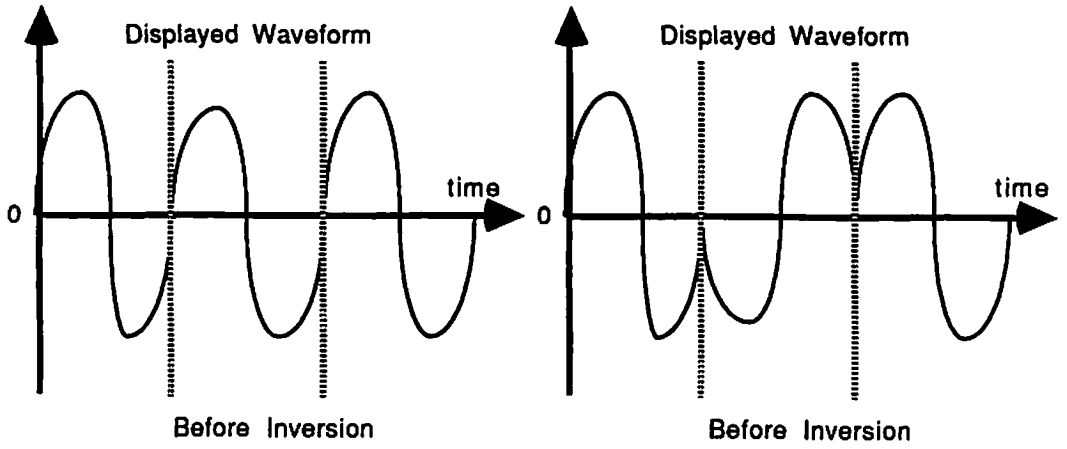
{option} * Gain the entire Subvoice.

Invert Waveform

The Invert command reflects the displayed waveform around the horizontal axis.

<SF9> INVERT<RETURN>

{option} * Invert the entire Subvoice.



Inverting the displayed waveform

Rotate Waveform

Sections of waveform can be rotated by a set number of Segments to the left or right. A segment is the grouping of samples based on the sample rate and pitch of the sound sampled. This defaults to 512 samples per segment for the default sample rate of 44.1kHz.

The Rotate command 'wraps around'; i.e., Segments shifted across boundaries re-appear at the opposite boundary. By setting Segment Length = 1 sample, a very fine control of rotation is possible. The RotateLeft command can also be used to change the phase of a waveform.

Rotate Right:

<SF11> ROTATERIGHT<RETURN>

{option} S The number of Segments to be rotated right.
Default: 1 segment.

{option}* Rotate the entire Subvoice to the right.

Rotate Left:

<SF10> ROTATELEFT<RETURN>

{option} S The number of Segments to be rotated left.
Default: 1 segment.

{option}* Rotate the entire Subvoice to the left .

Reverse Waveform

This command reverses the displayed section of waveform; the first sample becomes the last, the second becomes the second last and so on...

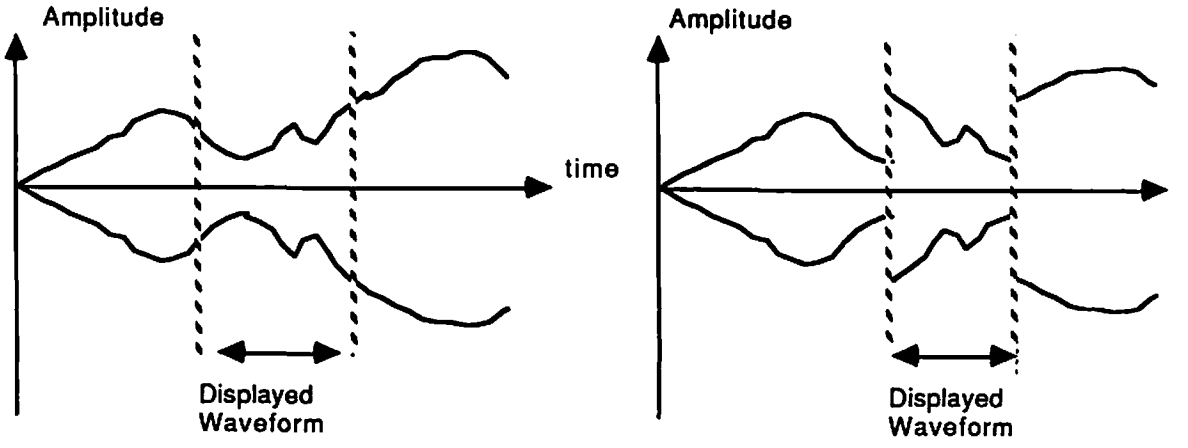


Diagram showing the effect of reversing the displayed waveform on the Subvoice

<SF8> REVERSE<RETURN>

{option} * Reverse the entire Subvoice.

Fade Waveform

The Fade command is applied from the beginning to the end of the displayed waveform. Used without options, the fade is exponential, i.e., rapid at first, then decreasing gradually.

The Fade command is:

<F8> FADE<RETURN>

{option} I Inverse exponential fade, slow at first but increasing in amplitude over time.

{option} L Linear fade, fading at a uniform rate.

{option} * Fade from the beginning of the display to the end of the Subvoice.

{option} *n* Fade factor determining the sharpness of the fade for the default exponential fade only.
Range:1 (gentle) to 100 (sharp)
Default: 2

> **Note:** You should always fade the end of non-looped sampled waveforms to eliminate abrupt endings. You can fade the start of a waveform by reversing before and after the fade. e.g.,
> **REV;F;REV<RETURN>**
> or **<SF8> <F8> <SF8>**

Cut, Copy and Paste

Copy Waveform

The WaveEdit page enables you to remove or copy sections of waveform into a memory buffer. This can then be pasted into the same or another waveform as many times as you like.

The contents of the buffer are erased when you leave the WaveEdit page. Its contents cannot be altered by any other action - except by cutting or copying a new section of waveform into it. Best results are achieved if you cut or copy near low amplitude points or Zero-crossings. The SetLoop command can assist by finding Zero-crossings.

> **Note:** Ensure that there is sufficient free waveform memory, as seen on the right hand side of the WE screen. For example, you cannot cut or copy 5 Mbytes of waveform memory into the buffer if there are only 4 Mbytes free.

Cut or Copy Waveform

The Cut command removes the displayed waveform from the Subvoice into the buffer.

<SF3> CUT<RETURN>

The Copy command does not remove the displayed waveform from the Subvoice:

<SF2> COPY<RETURN>

Paste Waveform

The default Paste command places the contents of the buffer at the centre line of the Waveform Display.

<SF4> PASTE<RETURN>

{option} < Paste to the start of the displayed waveform.
{option} > Paste to the end of the displayed waveform.
{option} *n* Paste *n* times.
Range: 1 to 100.

Example:
Paste the cut or copied waveform into the start of the Waveform Display 10 times:

PA < 10<RETURN>

Merge Two Segments of Waveform

The Merge command performs a linear crossfade between specified start and end Segments of the current Subvoice. Segments in between these segments are a combination of the start and end Segments. Segments are just groups of samples based on the sample rate and frequency of the sound. The segment length of the current Subvoice can be altered by assignment or by altering the pitch of the sound (see Sample Rate Convert and Pitch Adjustments below for more discussion on segments).

The Merge command is:

<SF7> MERGE<RETURN>

{option} S The Segment number at which the merge starts.
{option} E The Segment number at which the merge ends.

If start and end Segments are not specified, the first Segment of the displayed waveform merges to the end of the last Segment displayed. It is important to have an appropriate Segment length by using the Pitch command to ascertain Segment length, before issuing this command.

For example; To merge between Segments 20 and 40:

ME 20 40 <RETURN>

The waveform between Segments 20 and 40 is discarded and a linear crossfade is performed. The waveform changes smoothly between its shape at Segment 20 and its new shape at Segment 40.

> Note: the segment length is usually equal to one cycle of the waveform, whose length depends on the pitch. This is normally a very short piece of waveform, and creates a very repetitive mechanical sound when blended. If you increase the length of the segment to several cycles, the results may be more natural sounding.

Convert Sample Rate

Sample rate conversion is used whenever you want to change the inherent pitch of a waveform. If you add waveforms on the Mix page, you want them to be in tune with each other. The FFT page requires waveform Segments to be a power of 2 (32, 64, 128, 256 etc.) for analysis and resynthesis. Sample rate conversion is ***not*** used for general tuning/mapping of Subvoices. Use the tuning facilities on the FX page for this.

There are three ways of converting the original sample rate of a sound so that the original sample replays at a different pitch:

The first way is a simple transpose command- up or down by a number of octaves, semitones and cents (one hundredth of semitone).

The second way is the Sweep command and is based on using a ratio between the original pitch and the new pitch.

The last method is to use the Segment length of a sample.

Transpose Sample Rate

The Transpose command transposes the current Subvoice up or down by a specified musical interval. This command is useful when you want to add waveforms on the Mix page.

TRANSPOSE ***oct:semi.cents***<RETURN>

semi	The semitones to be transposed Range: +/- 1 to 11.999
oct	The octave up or down. This must appear before semitone specification, separated by a ':'
cents	Cents (1/100 of a semitone) to be transposed. This option must appear after the semitone/s specified, and separated by a "."
{option} -	Transpose down in pitch.

For example:

TRAN 1:7.10 <RETURN>

transposes the current pitch up an octave and a perfect fifth plus 10 cents.

TRAN -5<RETURN>

transposes down a perfect 4th.

The Sweep Command

The Sweep command converts the current sample rate to any interval ratio above or below the present pitch (see the Table of Interval Ratios below). It can also sweep between two pitches so that a continuous gradation of pitch is heard. The Sweep command operates on the displayed waveform, and Trims the Subvoice to this displayed waveform at the same time.

Enter the start ratio (of the current pitch) and the ratio of the end pitch to have the sound 'sweep' between two pitches:

SWEEP *r* <RETURN>

r The ratio of the current pitch.
Range: 0.1 to 10.0

{option} *end* The end ratio from the current pitch.
Range: 0.1 to 10.0

{option} *algorithm* The degree of resolution in the sound.
Range: 0 to 7 The higher the number, the greater the resolution and the better quality the result (will take longer with higher algorithm number however).
Default: 4

The start and end ratio numbers must be entered with a decimal point between the whole number and the fraction. Where the number is less then 1, a zero and a decimal point must be entered.

Examples:

Start an octave above the original pitch and slides down to the original pitch:

SWE 2 1 <RETURN>

Transpose the present sample rate to a minor third below present pitch:

SWE 0.841 <RETURN>

Note: The Sample Rate field will not be altered by the the Sweep command.

Table of Interval Ratios for the Tempered Scale

Interval name	No. of Semitones	Upward	Below
Unison	0	1	1
Semitone	1	1.059	0.944
Tone	2	1.122	0.891
Minor Third	3	1.189	0.841
Major Third	4	1.260	0.794
Fourth	5	1.335	0.750
Dim. Fifth	6	1.414	0.707
Perfect Fifth	7	1.498	0.667
Minor Sixth	8	1.587	0.630
Major Sixth	9	1.682	0.594
Minor Seventh	10	1.782	0.561
Major Seventh	11	1.883	0.531
Octave	12	2.000	0.5

The Sample Rate Convert Command

Many of the FFT page analysis and resynthesis functions work best on waveforms with Segment lengths which are powers of 2, e.g., 64, 128, 256, 512, 1024, 2048 or 4096. The Sample Rate Convert command can do this automatically.

Used with no arguments, this command takes the current segment length (as shown in the Segment field), and increases it to the nextt highest power of 2.

To get the correct Segment length into its field use the Pitch command (segment length often varies over the sample, so choose the part that sounds best to you, highlight it, and issue the pitch command:

PITCH<RETURN>

Then:

SAMPLERATECONVERT<RETURN>

A prompt shows the conversion factor and requests confirmation.

{option} *seglen* substitue your own value for segment length

{option} *newseglen* choose your own resultant segment length

Note: It is necessary to relocate loop start and end after a sample rate conversion.

Example:

Calculate Pitch and transpose new Segment length;

PI<RETURN>

SRC<RETURN>

This could have been achieved by typing SRC <RETURN>, since the argumants are the same as the defaults.

Pitch Adjustments

Pitch Justification

Sounds often vary in pitch over their entire duration, which can add colour and interest to a sound. Sometimes you may require there be no pitch variation within a portion of a sound - for example, in the area you want to loop. You may also want to correct a progressive alteration in pitch, (e.g., going flat).

The Pitch Justification algorithm may either stretch (by adding samples) or contract (by removing samples) each waveform Segment individually - for the whole waveform - in an attempt to make it conform to a specified Segment length.

JUSTIFY *seglen newseglen /var* <RETURN>

seglen — Segment length of original waveform

newseglen — Segment length of resultant waveform
Default: Next highest power of 2 from current Segment length

var — The limit of variation (tolerance) expressed as a percentage of Segment length for which each Segment is tested.
Range: 1 to 99 (%)
Default: 25 (%)

The above command converts each Segment of the current waveform within the specified variation (tolerance) to conform to the new Segment length - thus reducing pitch variation.

> **Note:** Since Pitch Justification works on matching zero crossings, sounds with complex rapidly changing harmonics (e.g., enharmonic percussive sounds, bells, etc.) may not have sufficient regularity for pitch justification to work properly. Therefore, always ensure you have made a copy of the sound before pitch justifying it.

Pitch Analysis

The Pitch Analysis algorithm finds an appropriate Segment length for the displayed waveform, and automatically adjusts the Segment length field accordingly. An automatic Pitch Analysis takes place after a sound has been sampled. On the WE page Pitch Analysis operates on the displayed section of the Current Subvoice.

Note: Since the instantaneous pitch of the Subvoice can vary considerably from start to finish, your selection of the displayed area is important in determining the result of the Pitch analysis. If a fundamental cycle corresponds to a single Segment of the sound, the Pitch, Segment length and Sampling frequency are related by the following formula:

Segment length = Sampling frequency/pitch in Hz.

The Pitch Analysis command is:

<SF6> PITCH<RETURN>

This may take several seconds, depending on the uniformity of the waveform displayed. Segment Length is changed automatically if a satisfactory result is found, otherwise error messages are displayed.

DC/AC Offset

When in default DC mode, the waveform is displayed *exactly* as it is in memory. There may be some DC in the waveform, which makes it sit slightly above or below the horizontal zero line. In AC mode, the Series III continuously re-calculates the net displacement of the waveform and centres the Waveform Display. The waveform in memory is not affected.

The DC Offset field shows the amount of DC compensation. To make this affect the waveform, use the DCShift command. After this the offset field returns to zero.

To activate DC Shift:

<CF6> DCSHIFT<RETURN>

{option} * Shift the entire waveform.

Toggle the DC/AC icon/function key to select DC Display mode, or use the DC command:

<CF3> DC<RETURN>

{option} * Shift the entire waveform.

To select AC Display:

<CF3> AC<RETURN>

Stereo Subvoices

Stereo Subvoices can be edited on either left or right side, or simultaneously on both sides. The side being edited is indicated by the Left/Right icon (stereo icons are only displayed with stereo Subvoices). Sometimes you want both sides linked, so that a command affects both sides at once (e.g., fade). Other times, you the sides unlinked so that they are separate entities (e.g., 'jet flying past' effect).

Changing Stereo Side

To select the left or right side for displaying, use the ToggleStereoSide command:

<S13> TOGGLESTEREOSIDE<RETURN>

Link/Unlink Stereo Voices

Stereo sides may be unlinked, so that editing affects only the displayed side.

To toggle linking ON/OFF:

<SF14> TOGGLESTEREOLINK<RETURN>

When sides are linked, a loop setting affects both side simultaneously. There is no guarantee, however, that the loop which works for the front side will work for the rear side. Similarly, other waveform manipulations are performed "blind" on the rear side when the sides are linked for editing.

Swap Stereo Sides

The left and right channels may be swapped so that left becomes right and right becomes left:

<SF15> SWAP<RETURN>

Middle/Side Stereo Conversion

Use the Middle/Side command to convert the middle/side stereo image to a normal left-right stereo image:

MIDDLESIDE<RETURN>

{option}*n* Percentage of middle in resulting left and right samples. This is an indication of the stereo "width".
Range 0 to 100%
Default 50%

For each channel in the stereo Voice, the ratio can be expressed in the following formula;

L = *n* * Middle + (100 - *n*)Side
R = *n* * Middle + (100 - *n*)Side

Selecting Subvoices

Use the next or previous commands to select a Subvoice within the current Voice.

To select the next Subvoice:

<F15> NEXTSUBVOICE<RETURN>

To select the previous Subvoice:

<F14> PRESUBVOICE<RETURN>

Use the Play Subvoice facility to play the current Subvoice on all keys of your MIDI keyboard:

PLAYCURRENT<RETURN>

To return to the Subvoice to keyboard mapping:

PLAYMAP<RETURN>

To toggle between Play Map and Play Current:

<SF12> CHANGEMAP<RETURN>

Previewing Subvoices

The Wave Edit page, like every page in the Series III, allows you to preview Subvoices from disk before loading them into waveform memory:

PREVIEW *voicename N* <RETURN>

voicename The name of the voice file.

N Subvoice number.
Range: 1 to 63

Channel one is used to output the auditioned sound (right side only if stereo). This does not affect any Instrument on that channel.

> Note: previewing from disk is not possible if outputs 1 and 2 are being used by the disk recorder.

* * *

Chapter 9

Sample (SA) Page

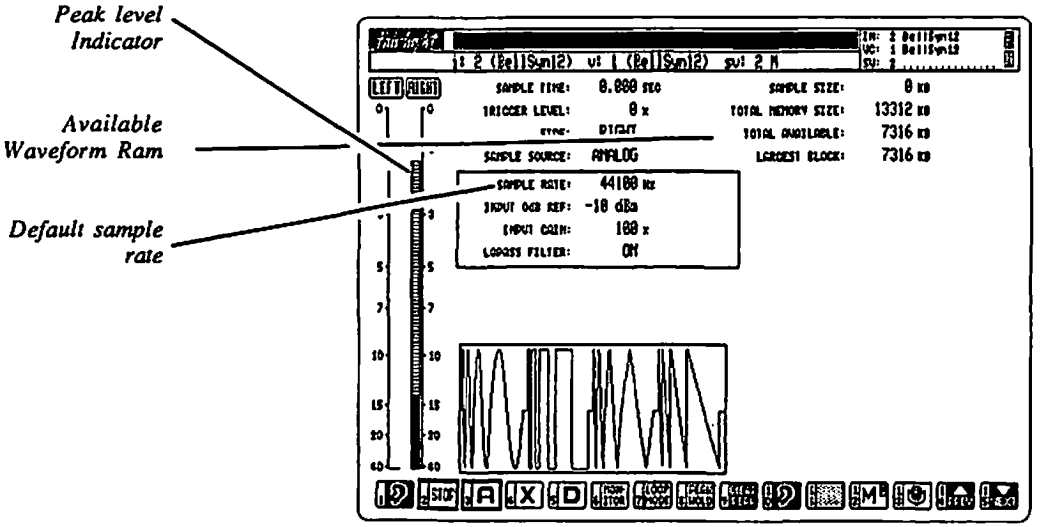
Contents

Introduction

Any sound can be sampled by recording a series of rapid, repeated readings of the analogue signal's amplitude. Using this method, electrical variations are converted into digital form via analogue-to-digital conversion. Thereafter, the sound is represented in waveform memory (or on disk) as a sequence of numbers. These numbers may then be re-converted to analogue signals in response to notes played on a MIDI keyboard or sequencer.

To transfer to the Sample Page:

<esc><F7> SAMPLE<RETURN>



Sample Page with a default mono waveform and incoming signal displayed on the Right channel.

The 16-bit (linear format) waveform memory of the Series III allows sounds to be sampled with a dynamic range of 96 dB. You can sample in either mono or stereo, with a maximum sample rate of 96kHz (maximum playback rate: 192 kHz). If you have purchased the new analogue/digital sampling card, you can sample direct from digital sources.

Sounds recorded at the default sample rate of 44.1 kHz (CD standard) allow approximately 11 seconds of sample-time per Mbyte of waveform memory - (in Mono).

Before you commence sampling, you need to create a Subvoice (see chapter on 'Creating, Saving and Loading'). A default waveform (comprised of sine, square, triangle and sawtooth waveforms) is displayed in the Sample display window. Alternatively, you can load an existing Subvoice which you might later choose to overwrite with your new sample.

The following message appears if a Voice is not present upon entering the Sample page:

"VOICE REQUIRED"

Connecting the Sound Source

Sound sources suitable for analogue sampling include - analogue or digital tape recorders, compact disc players, mixers or other (line-output level) devices. Microphone signals cannot be used unless pre-amplified.

The source signal is connected via the SAMPLING sockets at the rear of the Series III (See chapter on 'Setting Up the Series III'). The sample inputs are low impedance (600ohm) balanced with a maximum input of -10dbv (you choose +4dBm with the new sampling card CMI 347). Use the Right input for monophonic sampling.

If your Series III is equipped with an analogue/digital sampling card (CMI 346/347), the input marked "digital" is used to connect signals from AES/EBU standard digital devices. These include compact disc players and R-DAT machines.) This signal uses a single three-pin XLR connector for both sides of the stereo, which are multiplexed into a mono signal.

Creating clean sounding sound samples is very similar to making good tape recordings. Everything should be set up for best performance. Watch for hiss, crosstalk, earth loops, distortion, excess level, impedance matching or anything else that can degrade your sampled sound. Subsonic audio hums, for example, can become quite obvious when the sample is played back at a higher rate. Use a high pass filter to prevent this problem.

Sample Time

You must allocate some waveform memory before sampling can take place. Assign to either the Sample time field or the Waveform size field.

To set the sample time:

Sample time: *t* <SET>

t Duration of sound to be sampled in seconds (to three decimal places).

Note: This time will be rounded up to the next 4kbyte block size after the sample is done.

Waveform Size

To allocate waveform memory for the sample:

WAVEFORM SIZE: *k* <SET>

k The amount of memory to be allocated (in Kbytes).

Below the Sample rate field is the Largest block field which indicates (in Kbytes) how much waveform memory is available for sampling.

Sample Meters

Two vertical level meters are displayed on the Sample page marked L (left) and R (right). The Level Meters display the amplitude of the incoming analogue signal. When recording mono sounds from the right analog input, only the right meter will operate. The Level meters operate in two ways; one is by continuous level metering, the other by peak level metering.

Continuous level metering holds the highest point of the incoming signal for a short time.

Peak level metering maintains the highest point reached by the incoming signal until a higher level is reached. This is indicated by the grey hatched area of the level display.

To toggle Peak Level HOLD or Peak Level OFF:

<F8> There is no alphanumeric command for toggling Peak Level.

To reset the Peak Level indicator:

<F9> There is no alphanumeric command for clearing Peak Level indication.

The sample meters may be inverted (that white exchanged for black), which makes them easier to read at a distance:

<SF1> There is no alphanumeric command for inverting the sample meters.

Input Gain

The Input Gain field attenuates the input signal before Analogue to Digital conversion:

INPUT GAIN: *s* <SET>

s Percentage of incoming analogue signal.
Range: 0 to 100 (%) Default: 100%

For most situations, leave INPUT GAIN set at 100 per cent and control input signal via your mixing desk or device. If input gain is less than 10 per cent and you still get full scale indication, the signal is probably distorting before the Series III input stage.

Monitor Sample

The Hear It On command allows you to hear what the sample sounds like before and during the sampling process. The sample source signal is converted to digital, then re-converted to analogue and output through audio output channels 1 and 2 (1 only for mono sampling). Voices normally assigned to those channels are inoperative when on the Sample Page.

> **Note:** When using a sequencer, make sure you move any Voices assigned to these channels. Also, to avoid feedback ensure that these channels are not routed back to the sample inputs on your mixer while in monitoring mode.

To toggle between Hear It ON/OFF:

<F6> There is no alphanumeric command for toggle Hear It ON/OFF.

Sometimes the monitored sound may sound slightly different to the original - due to the effect of the anti-aliasing filters. But the monitored signal does sound exactly the same as the sampled sound which will result.

The Digital/Analogue Sampling Card

If your Series III is fitted with a digital/analogue sampling card, there are three different modes for sampling: digital, analogue, and crystal-locked analogue.

Digital Sampling

Digital sampling allows you to "read" audio that is already digitised, directly into the Series III. Each sample is transferred exactly as in the original, so there is no loss of quality whatsoever. To select digital sampling:

<F5> SAMPLE SOURCE: D<SET>

Repeat this procedure if you get an error message: "Cannot lock to digital signal"

Crystal-Locked Sampling

Crystal-locked sampling is a form of analogue to digital conversion employing a crystal inside the Series III to ensure the consistency of the sample rate. This in turn improves the clarity of the sample by eliminating distortion that would otherwise occur due to small variations in the sample rate. The crystals inside the Series III only support two sample rates: 44.1 kHz and 48kHz. If you wish to sample at either of these two rates, you are strongly advised to use crystal-locked sampling. To select crystal-locked sampling:

<F4> SAMPLE SOURCE: X<SET>

Analogue Sampling

Analogue sampling is a form of analogue to digital conversion that allows you to set the sample rate. You can select any rate between 5,000 and 96,000 Hz, in mono or in stereo. If you have no particular reason to select a rate other then 44.1 or 48 kHz, you will obtain better quality with Crystal-locked sampling, described above. To select analogue sampling:

<F3> SAMPLE SOURCE: A<SET>

Note: some sample cards will not reach the highest sampling frequencies, particularly on stereo samples. If you hear breakup in the monitored signal, or in the finished samples, lower the sample rate and try again.

Selecting Left or Right Input

The right side of the Sample Source field allows you to select which side of the stereo input you wish to sample. If your current voice is stereo, the field will indicate a Stereo source, and cannot be changed. But if you are sampling a mono voice, you may choose the left side by tabbing to this part of the Sample Source field and assigning to it. To select the left input:

SAMPLE SOURCE (right side): L<SET>

Set Sample Rate

Sample rate is the number of samples taken per second. According to the Nyquist theorem, the sample rate should always be greater than twice the maximum frequency you want to capture, contained within the original sound. An accurate representation of the sound is not possible if sample rate is set less than this, resulting in aliasing distortion - which imparts a grainy distortion to the sampled sound.

To avoid aliasing, the Series III uses a 22kHz low pass input filter. With a sample rate of 44.1kHz, for example, aliasing should not occur. On the other hand, with a sample rate of 10kHz, aliasing is almost certain to occur.

Generally, you need not alter the default Sample rate. One situation where reducing sampling rate might be useful is when you want to conserve waveform memory for a long-duration, low-frequency sound.

You might want to increase sample rate when trying to capture sounds with a very large number of high frequencies - e.g., cymbals.

To alter Sample rate:

SAMPLE RATE: *f* <SET>

f The frequency of the sample rate.

Range: 5000 Hz to 96000Hz
Default: 44100 Hz

Sample time is related to the sample rate and the number of samples:

Total duration (seconds) = Sample Rate (Hz) x Number of Samples.

> **Note:** some sample cards will not reach the highest sampling frequencies, particularly on stereo samples. If you hear breakup in the monitored signal, or in the finished samples, lower the sample rate and try again.

Filtered/Unfiltered Sampling

The LOPASS FILTER field is used to turn the anti-aliasing filter on or off. You can only toggle between filtered and unfiltered modes when using mono Subvoices. Stereo Subvoices are always sampled with filter ON

To turn the filter OFF:

LOPASS FILTER: *oFf*<SET>

To return to Mono Filtered Mode:

LOPASS FILTER: *oN*<SET>

Or use the <ADD> and <SUB> keys to select filter ON or OFF respectively.

When sampling the (analogue) output of a digital tape machine, it is suggested to remove the filter, since the source machine has already band-limited the audio signal when it was recorded.

> **Note:** At sample rates above 48kHz, the Low pass filter will be automatically turned OFF.

Trigger Level

Trigger level enables sampling to commence only once the incoming signal has reached a specified threshold level. Below this threshold, nothing happens. This facility can save you from having to eventually Trim the start of the sampled waveform. At the default level of 0, sampling starts immediately.

To set the sample trigger level:

Trigger Level: *t* <SET>

t The threshold level as a percentage of maximum level.
Range: 0 to 100 (%)
Default: 0 %

There is a finite period of time within which sampling can be triggered. If the threshold level is not reached in this time, the Series III terminates the sampling procedure with the message:

"Sample timeout"

> **Note:** Be careful with the trigger facility, as you can lose the start of waveforms having slow attacks. You can prevent this by setting low values such as 5%.

The Sample Command

The Series III allows sampling in two forms:

One is the 'single shot' method where sampling commences immediately upon issuing the Sample command, and stops when Sample time has terminated.

The other method is called Continuous Sampling. This permits you to sample continuously - until terminated by the <F2> STOP icon/function key. (see 'Stop Sampling' section).

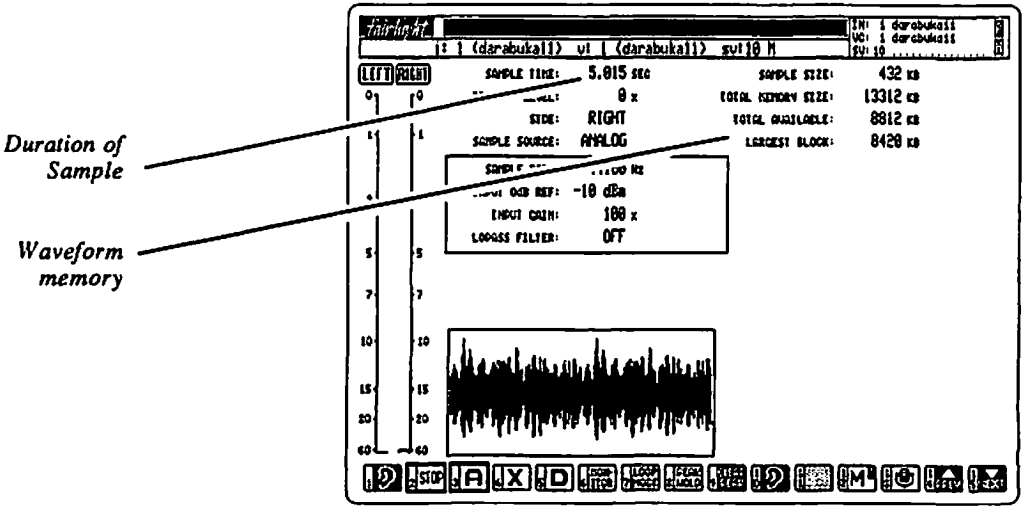
To toggle between 'single shot' and Continuous Sampling mode:

<F7> There is no alphanumeric command for toggling 'single shot' and Continuous Sampling

For example; suppose you set Sample time to 5 seconds and issue the Sample command. If after (say) 10 minutes you press <F2> to stop sampling, only the last 5 seconds of the previous 10 minutes is kept.

To start sampling in either single shot or Continuous mode:

<F13> SAMPLE<RETURN>



A completed sample of a mono waveform

The following message appears:

"Sample in Progress"

When sampling is complete, the newly sampled waveform envelope is displayed in the Sample display window.

Allow a few seconds for the waveform to be identified and displayed when using Continuous Sampling.

Stop Sampling

There are two ways to stop sampling; one way is to interrupt the Series III with the <CTRL-Q> command. This quits the sampling operation and resets to the default Subvoice. The problem with this method is that you lose your current sample; you also have to re-adjust the sample time and start all over.

Terminate Sampling

A more convenient way is to Terminate the sample:

This command allows you to keep whatever you had sampled before terminating. The Sample display window shows the resultant waveform up to the time of termination.

<F2> There is no alphanumeric command for Terminating the sample.

When terminating a sample, the sample time is reduced (subsequent Subvoices now have zero sample time).

Reset Sample Subvoice

Use the SubVoice Reset command to return to the default waveform setting:

<SF1> SUBVOICERESET<RETURN>

This command works closely with the Terminate command. For example, if the original Sample time was set at 10 seconds and you terminate the sample after only 4 seconds, the Sample time remains at 5 seconds. The SubVoice Reset command, however, deletes the current sample and returns to the default sample time of zero.

Play Back Sample

The following commands enable you to hear the completed sample.

Audition Subvoice from Memory

Use the Play command to play the current Subvoice directly from waveform memory:

<F1> or **<F10>** AUDITION<RETURN>

The <F1> and <F10> function key/icons perform exactly the same function; they allow you to hear the sample from waveform memory. Combined with the Next and Previous commands, you can use them for comparing Subvoices. The Subvoice is output through channel 1 (or channels 1 and 2 if stereo).

Play Current Subvoice

Use the Current/Map command to toggle between playing the sample across the keyboard, or allowing Subvoice to keyboard mapping.

To assign the current Subvoice across the music keyboard:

<F12> PLAYCURRENT <RETURN>

C appears after the Subvoice number in the status line, and PC in the Info window at the top right of the Page.

To recall the Subvoice to keyboard map:

<F12> PLAYMAP<RETURN>

M appears after the Subvoice number in the status line, and PM in the Info window at the top right of the Page.

Note: It is not possible to play a sample while on the Sample page, if it is using channel output 1 or 2. This is because the associated Channel Card is being used in the sampling process.

Select Next Subvoice

Use the Next and Previous function keys/icons to select a Subvoice from within the current Voice.

To select the Next Subvoice in the Voice:

<F15> There is no alphanumeric command for selecting the Next Subvoice.

To select the Previous Subvoice in the Voice:

<F14> There is no alphanumeric command for selecting the Previous Subvoice.

Stereo Sampling

When using stereo Subvoices, a Left and Right Level and Sample window is displayed. A Stereo Subvoice can only exist within a Stereo Voice (see 'Creating, Saving and Loading' chapter). The Sample command is the same for both mono and stereo sounds, except that you cannot sample in stereo at rates greater than 48kHz with the (older) CMI 337 sample card.

Swap Stereo Channels

The Swap command swaps the contents of the Left and Right channels:

<SF2> SWAP<RETURN>

Waveform Memory Fields

These three fields supply information on allocation and availability of waveform memory. You cannot assign to these fields. They are there to tell you how much memory is being used - an important consideration if you are sampling a complete song, for example.

Total Memory Size

This field shows the sum total of waveform memory. It can be altered only by fitting or removing Waveform memory cards.

Total Available

Shows waveform memory not presently allocated.

Largest Block

Shows the size of the largest free unallocated block of waveform available for sampling.

> Note: The Series III uses only contiguous free blocks of waveform memory (rather than 'scattered' blocks) for sampling. If necessary, Reset the System by typing 'SYR <RETURN>' and re-load Voices. This action compacts waveform memory - so that the Total Available equals the Largest Block.

* * *

Chapter 10

Fast Fourier Transform (FFT) Page

Contents

Introduction

The FFT Page employs a Fourier Transform algorithm which can analyse a waveform into the harmonics which make up its sound. It also contains a graphics drawing program by which you can redraw any displayed graph. There are several displays available on this page, which are listed below.

SEGMENT DISPLAY.

Waveform: A picture of your sample, viewed in sections called Frames. This display does not require an analysis before viewing, as no frequency information is involved. The waveform can be redrawn and the results heard immediately.

Amplitude: This is a spectrum analysis of the sound, viewed as amplitude versus harmonic number. An analysis is required before it can be viewed. The energy of each harmonic can be seen at different times (frames) during the progress of the sound, and any part of any frame may be redrawn. The results of this will be heard after resynthesis.

Phase: This is a picture of the phase variation of the sound versus harmonic number. It may be treated the same way as the Amplitude display above.

PROFILE DISPLAY.

Amplitude: Here we see the variation of each separate harmonic over sections of time (frames). We may choose to see and redraw any of the available harmonics, then resynthesise to hear the results.

Phase: This display shows the phase variation of each separate harmonic over successive frames. It may be treated the same way as the harmonic display above.

To transfer to the FFT Page:

<esc><F9> **FFT**<RETURN>

Load the Subvoice you want to alter with FFT (see chapter on 'Creating Saving and Loading').

> **Note:** Always ensure you maintain safety copies of the waveform before alteration, since FFT transformations are permanent.

Parameters Window

A number of parameters in the Parameters window must be set before starting the transform process.

To toggle the Parameters window ON/OFF:

<F1> **P**ARAMETER<RETURN>

Any changes made to fields in the Parameters window take effect only when the window is toggled OFF.

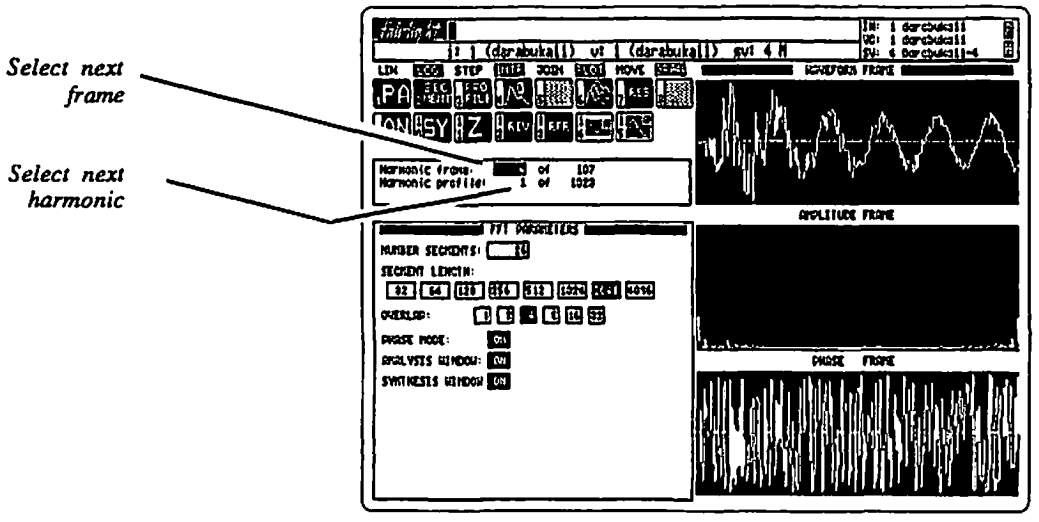
Note: The WE page Trim function is automatically performed on the waveform upon entering the FFT page. Therefore, moving the Voice flags on the WE page affects the waveform seen on the FFT page. Similarly, changes to the FFT Segment Length affects the waveform as seen on other pages.

Segment Length

A waveform Segment on the FFT page refers to a division of the waveform suitable for analysis and synthesis.

Sounds with a definable pitch exhibit regularly recurring waveforms. And, to achieve a more meaningful display, waveforms for pitched sounds are best when they have a Segment length equal to a power of two, i.e., 32, 64, 128, 256, 512, 1024, 2048.

Use the Pitch command on the WaveEdit page to find the Segment length of the waveform. You can then use the Sample Rate Convert command on the WaveEdit Page to modify the Segment length of existing waveforms to the nearest power of two (see the Waveform Edit chapter for more details on the SRC command).



The FFT Parameters Window with Segment display showing the phase and fourth Segment (frame) of an analysed subvoice waveform)

Number Segments

The NUMBER SEGMENTS display shows the total of FFT Segments in the waveform - Note that this number is always dependent on the value of the FFT Segment length. For example, if the current waveform has an FFT Segment length of 2048 samples and the (trimmed) waveform has 12288 samples (displayed on the WE page SAMPLES field) then the number of Segments is 6. This number is updated whenever new assignments are made to the Segment length.

Select the Segment length number (32 to 4096) with the g-pen.
Recommended value: 2048.

> **Note:** Increasing the Segment length reduces the number of FFT frames (see below) available for transform. However, you can compensate for this reduction in resolution by increasing the amount of frame-overlap.

Frame-Overlap

The waveform synthesis process also depends on the specified amount of frame-overlap.

Waveform synthesis is waveform analysis in reverse. Whenever synthesis is performed, the Series III divides the waveform into overlapping sections (of Segment length) called frames. The reconstructed waveform may be composed of many frames - which are then cross-faded over frame-boundaries to synthesise the waveform. The larger the frame-overlap, the 'smoother' sounding the result. However there is a trade off - the more frame-overlapping, the longer it takes to compute the new waveform.

The Overlap field shows the number of frame portions contained within each Segment (see diagram below).

Default: 4
Recommended: 4

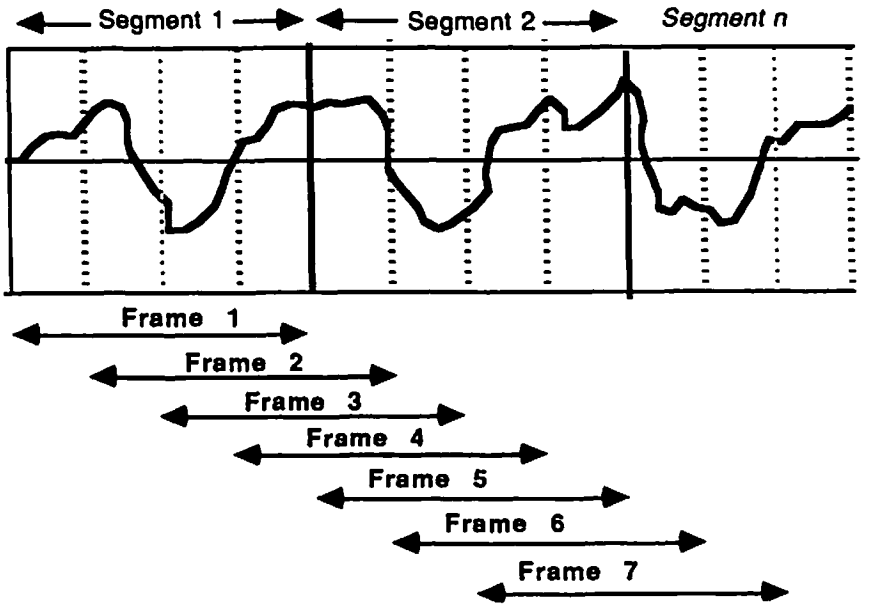


Diagram of how FFT frames relates to the original Segments of the waveform

The total number of frames for the waveform is displayed in the right hand column of the Harmonic frame field near the top of the page. This should be equal to the number of Segments (NUMBER SEGMENTS) multiplied by the amount of frame-overlap.

Phase Mode

When Phase Mode is ON, the FFT analysis of the waveform takes the phase angle of the original waveform into account. This allows you to re-edit waveform phase (see below; 'Editing Waveforms'). Note however, that editing the phase of a waveform usually results in little significant aural effect.

Default: ON
Recommended: ON

Analysis and Synthesis Windows

These two 'windows' are used in the Fourier analysis and synthesis calculations for reducing calculation errors. These should always be left ON except for special effects

Analysis of Waveform

A waveform needs to be analysed before any harmonic alterations can be performed.

The analysis command is:

<F9> ANALYSE<RETURN>

The FFT page automatically inserts an additional Segment at the beginning of the waveform to permit initial frame-overlap. The current frame being analysed is displayed on the status line until analysis is complete.

The results of the analysis depend on whether you are in Segment or Profile mode.

Segment Display

Segment is the default display mode. There are three Segment displays which show the waveform, the spectrum and the phase variation for each frame.

To select Segment display:

<F2> SEGMENTS<RETURN>

The actual frame displayed is determined by assignment to the left hand column in the Harmonic frame field.

Harmonic Frame: *framenumber* <SET>

framenumber Use the <ADD> and <SUB> keys to step through waveform frames.

To cycle through the WAVEFORM FRAME, AMPLITUDE (Spectrum) FRAME or PHASE FRAME displays for editing, use the following command.

<F15> There is no alphanumeric command for selecting between Waveform, Amplitude or Phase displays.

Profile Display

Profile displays are graphs of either the amplitude or phase of a given harmonic versus time for one frame. Over successive frame numbers, the Profile graph shows how the amplitude and phase for a specified harmonic varies throughout the duration of the sound.

To select Profile display:

<F3> **PR**OFILE<RETURN>

The actual harmonic displayed is determined by assignment to the left hand column in the Harmonic Profile field.

Harmonic Profile: *harmonicnumber* <SET>

harmonicnumber Use the <ADD> and <SUB> keys to step through the harmonics.

To toggle between these two displays for editing use the following command.

<F15> There is no alphanumeric command for toggling between Phase and Amplitude mode.

Redrawing Waveforms

Any waveform can be edited by re-drawing - whether or not it has been analysed. This is only available in Segment mode. However, analysis is necessary for adjusting harmonic amplitudes and/or phase graphs.

To edit any Segment or Profile display, toggle the Edit window ON:

<F4> **DRAW** <RETURN>

Select Curve to Edit

Curves can only be drawn or modified in the large edit window. You can edit using either the g-pen or by alphanumeric assignment using the 'marker', 'data', 'start' and 'length' fields - located around the border of the edit display (see table below).

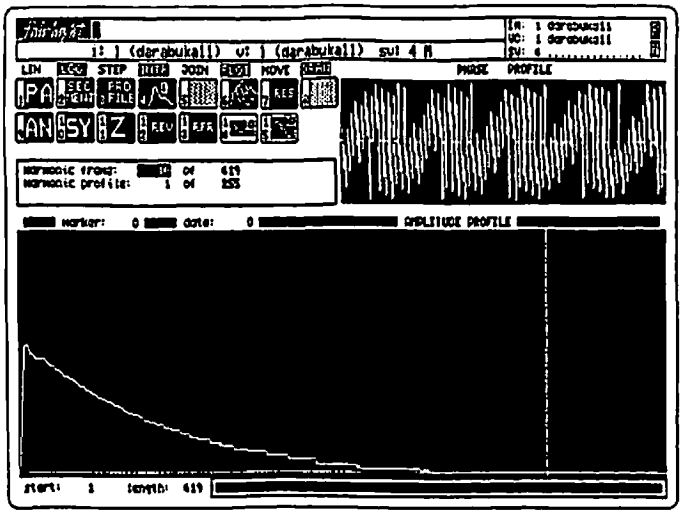
During editing, you can use the same command as above to cycle through the different graphic aspects of Segment (waveform/amplitude/phase) and Profile (amplitude/phase) modes.

<F15> There is no alphanumeric command for selecting between modes.

A currently selected graph has a header marker (solid bar) on either side of its name.

You can also compare different graphic displays by using the smaller ancillary display at the top right of the page.

<F14> There is no alphanumeric command for toggling between graphs.



The Edit window showing a harmonic number 10 from the Profile display being altered with the g-pen.

Table of parameter fields found on the Edit Display window.

Field	Description
start: <SET>	The start point, either a waveform position, (waveform Segment) harmonic number (harmonic amplitude), or Segment number (harmonic Profile).
marker: <SET>	The position in the display of the vertical cursor. This ranges from the first sample to last sample in Segment mode or first to last frame in Profile mode.
length: <SET>	Selects the beginning of the displayed waveform. Either the total number of Segments when in Segment mode or the total Harmonic frames when in Profile mode
data: <SET>	The maximum and minimum *Y* value of the displayed graph. Uses plus or minus indication from the zero line when in Segment mode (or phase in Profile mode).

To assign a value to a point on the graph, assign the desired *x* (horizontal) value to the 'marker' field, then assign the desired *y* (vertical) value to the 'data' field.

Note: The figure in the 'length' field does not change when toggling between Segment or Profile mode - unless the Edit window is quit and either the Profile or Segment display is re-selected.

Note: When modifying the time source of a harmonic in Profile mode - particularly if reducing its amplitude - you should remember to modify adjacent harmonics in a similar manner. If this is not done, the harmonic may be frequency shifted rather than reduced in amplitude.

Mode Menu

The mode menu appears above the icon bank at the top left of the screen. The options are selected either by [HIT]-ting the option name, using <SHIFT> function keys, or by using the following commands.

Table of Draw Modes and selection commands

Drawing Mode	Typed Command	Function Key
Linear: Display is incremented linearly i.e 1,2,3 etc.	LINEAR<RETURN>	<SF1>
Logarithmic: Display is incremented by logarithmic amounts.	LOG<RETURN>	<SF2>
Step: The display shows a horizontal step corresponding to the value at each of these points.	STEP<RETURN>	<SF3>
Interpolate: The curve is smoothly interpolated between these points.	INTERPOLATE<RETURN>	<SF4>
Join: The curve is joined between the point just plotted and the previous point plotted.	JOIN<RETURN>	<SF5>
Plot: No interpolation takes place and the new point is plotted without alteration to other points.	PLOT<RETURN>	<SF6>
Move: A [HIT] on the curve moves the marker to that point without plotting the point.	MOVE<RETURN>	<SF7>

Draw : DRAWMODE<RETURN> <SF8>
Normal drawing mode
after being in Move mode.

Display Scroll Control Bar

The scroll area appears at the base of the edit window. Inside this area is a highlighted scroll bar. The position of the scroll bar corresponds to the extent of waveform being viewed.

For example:
If the scroll bar fills only the first 1/3 of the scroll area, only the first 1/3 of the curve is in view in the display/edit window. Touching the scroll area with the g-pen activates the scroll bar and allows you to manipulate the position of the waveform for editing. If the g-pen cursor is moved out of the scroll area without a [HIT], the scroll bar does not change position.

If the g-pen cursor touches the scroll area outside the scroll bar, the bar extends to the g-pen cursor position leaving its other end fixed. Moving the g-pen cursor then moves only the mobile end of the bar.

If the g-pen cursor touches the interior of the scroll bar, the whole bar moves with the g-pen cursor. You can also use the 'start' and 'length' fields to position the scroll bar.

Zeroing a Segment or Profile

To zero the displayed curve:

<F11> ZERO<RETURN>

If not in edit mode, the zeroed curve is the one with the highlighted header.

Reset the Display

This resets the display to the original Segment start and length settings for the horizontal and depth axis.

<F7> There is no alphanumeric command for resetting the display.

Refresh the Display

This simply refreshes the screen display in the unlikely event of some garbled waveform is sent to the screen.

<F13> There is no alphanumeric command for refreshing the display.

Synthesis

Once the waveform has been analysed and altered using the edit facilities, the waveform can be re-synthesised. The Synthesis command re-synthesises the waveform, harmonic amplitude and the phase representation.

The Synthesis command is:

<F10> SYNTHESISE<RETURN>

3D Display

The 3D window displays a waveform either in Segment or Profile mode.

Segment mode is similar to the Waveform Edit 3D display; consecutive Segments (either waveform, amplitude or phase) are displayed behind one another.

Profile mode displays the harmonics of the total waveform behind one another. The current harmonic may then be edited on the Edit Display window.

By adjusting the parameters in the box above the 3D display, it is possible to view a selected range of harmonics or segments. The table below describes the available parameters.

To enter 3D display:

<F6> THREEDEE<RETURN>

Table of parameters available on 3D display

In Segment mode.

Field name	*Axis*	*Comment*
Harmonic Start:	Horizontal	Harmonic number (Freq. as a multiple of FFT fundamental frequency).
Frame Start:	Depth	Frame number (same as time).
length:	The upper length field controls the 3D depth. The lower length field controls time.	

In Profile mode:

Field name	*Axis*	*Comment*
Frame Start:	Horizontal	Harmonic number (same as time).
Data Start:	Depth	Shows the harmonics beginning from the number in this field.
Length:	The upper length field controls the 3D depth. The lower length field controls time.	

Scaling

The Scaling parameter can be used to increase the vertical resolution of the display by a factor of 2. Display clipping may occur if the factor is too large.

Aspect Ratio

The aspect ratio shows the number of pixels (dots) each subsequent or Profile element is displaced to the right (x) - for a corresponding upwards displacement (y).

An aspect of 0:3 gives a vertical display stack. An aspect of 3:3 gives an oblique angle display of about 45 degrees.

Stepping through the Profile display at a low resolution (say; less than 30 depth steps at a aspect ratio of 4:2) enables you to view major waveform 'peaks' and 'valleys'. These can sometimes become lost in the details of higher resolution displays.

Reverse Display

The Reverse command reverses the 3D display. Thus, any lines in the foreground will now appear at the rear of the 3D display.

The Reverse command is:

<F12> **REV**ERSE <RETURN>

The reversed display may not be exactly the reverse of the original 3D display. This is because the FFT page does not display every line in the current format when using a large display resolution. For example, the same harmonics may not be displayed when reversed, thus the landscape may not be an exact reversal of the original display. If the resolution is increased (i.e less harmonics displayed) then the reverse facility will display the same lines but in their reverse aspect.

* * *

Chapter 11

Flanger (FL) Page

Contents

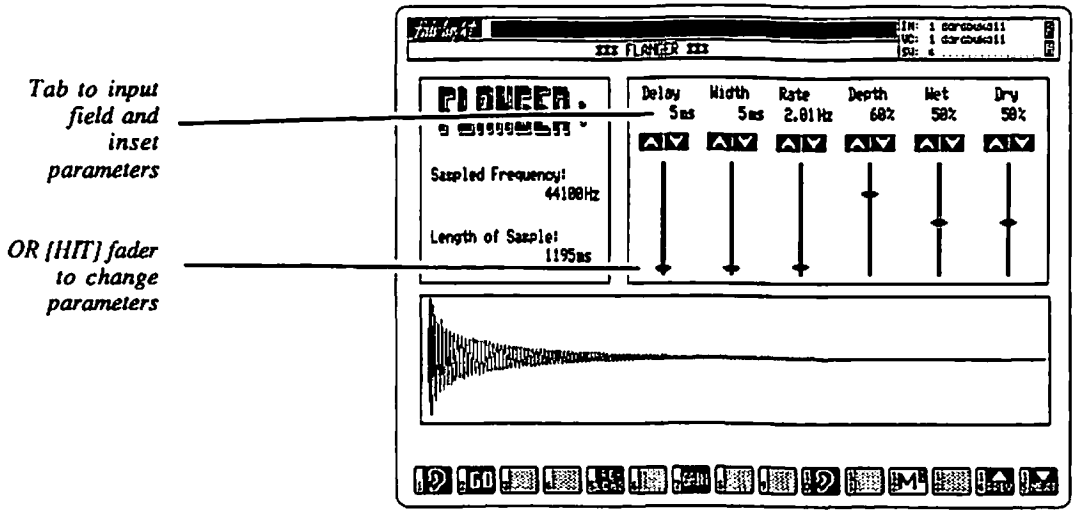
Introduction

The Flanger page enables you to add flange and/or delay effects to a mono or stereo Subvoice. Parameters (Delay, Width, Rate, Depth, etc.), are set using the fader and numerical fields. Issuing the GO command begins the calculations which will apply the effect to the Subvoice.

> **Note:** Flanging does <u>not</u> work in real time. The flanger takes the 'dry' waveform in the current Subvoice, creates a 'wet' flanged version of it, then mixes the two waveforms together into the current Subvoice. Since the Subvoice is permanently altered by operations performed on this page, always experiment with a working copy of the Subvoice.

To transfer to the Flanger page:

<esc><F5> FLANGER<RETURN>



The default Flange Page parameters

In the upper section of the display are the parameter controls; the lower section displays the waveform of the loaded Subvoice. The resultant flanged waveform is displayed here after issuing the GO command to apply the effect.

Select Subvoices

Subvoices can be selected from the current Voice using the Subvoice Select commands (see 'Creating, Saving and Loading' chapter).

To select the next Subvoice:

<F15> NEXTSUBVOICE <RETURN>

To select the previous Subvoice:

<F14> PREVIOUSVOX <RETURN>

The current Subvoice can be reloaded at any time with the Subvoice Load command:

<F5> SUBVOICELOAD<RETURN>

This is particularly useful when experimenting, since you can always quickly recall the original pre-flanged sound

Play the Current Subvoice

To play the current Subvoice across the whole keyboard range:

<F12> PLAYCURRENT<RETURN>

To play Subvoice to keyboard mapping:

<F12> PLAYMAP<RETURN>

Audition Current Subvoice

The current Subvoice can be played directly from waveform memory at its original sample rate:

<F1> or <F10> AUDITION<RETURN>

The <F1> and <F10> icon/function keys perform the same function.

Stereo Subvoices

If a stereo Subvoice is loaded, the Left/Right icon is displayed. You can select which side of a stereo Subvoice is to be flanged by toggling the L/R icon/function key:

<F13> There is no alphanumeric command for toggling Left/Right stereo sides.

Starting and Stopping the Flanger

Once flanger parameters have been set to desired levels (see below) you can issue the GO command:

<F2> GO<RETURN>

Various warning messages can appear if parameter restrictions are not met. These parameters are automatically adjusted to reasonable values before processing. As the waveform is processed, the number of samples remaining is displayed on the status line.

To abort the flanging process, type:

<CTRL-*Q*>

To continue, you need to re-load the Subvoice.

> **Note:** To flange both sides of a stereo voice, enter the following sequence:
> <F2> <F13> <F2>

Flanger Parameters

These parameters can be adjusted in three ways; either by numeric assignment, moving the faders with the g-pen, or by [HIT]-ting the increment/decrement arrows above each fader. Number fields respond to fader or arrow movement.

Delay

Delay is the average delay of the flanged waveform with respect to the original.

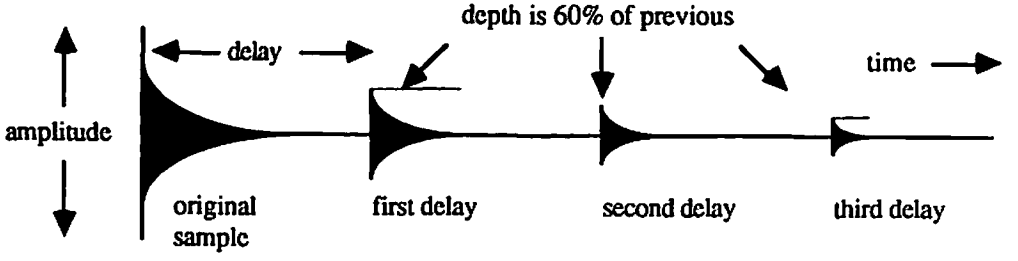


Diagram of how the flange delay process works if the depth is given as 60%

The range of delay is zero millisecond to ten seconds.

> **Note:** Delay time cannot exceed the Length of Sample (i.e., sample time).

Musical Delay Times

Adjust delay time to correspond with the duration of a note using the global Echo Delay Calculator. This facility may be used to determine the exact duration of any note (or group of notes) at any tempo, in any time signature.

The Echo Delay Calculator command is:

ECHODELAYCALC *count/note-value tempo* <RETURN>

count The number of notes in the bar.
Can be fractional, e.g 12.5
Default: 1

note-value The types of notes to be in the bar.
Default: quarter-notes

tempo The tempo of the piece of music.
May be fractional, e.g., 230.5

{option} *t* Calculate a triplet value - included after the note-value.

The output of the calculation is expressed in seconds and milliseconds. The result is displayed on the command line.

Examples:

edc 3/16 121 <RETURN>

This shows that three 16th notes (at a tempo of 121 beats per minute) have a combined duration of 0.372 seconds.

edc 4/8t 65.2 <RETURN>

This shows that four quaver-triplets (at 65.2 bpm) have a duration of 1.227 seconds.

Constant Delay

For a constant delay with no flanging, set Rate to zero.

> **Note:** When Rate is zero, Delay and Width are additive - so it is possible to have a delay longer than 10000 milliseconds. For example, to get a delay of 15000 milliseconds, set Delay to 10000 milliseconds and Width to 5000 milliseconds.

Width

Width is the amount of variation of the delayed waveforms in time. Width cannot exceed the Delay time.

Rate

Rate is the modulation speed between maximum and minimum delay - as defined by the Delay and Width settings.

Note: Delay modulation is linear (triangular wave-shape).

Depth

Depth (or Regeneration) determines the extent of recycling of the delayed waveform.

Depending on the Rate of modulation - if you increase the Depth you produce a deeper sounding flange. Depth may also be used for echo repeating effects - the number of repeats depends on the Length of Sample and Delay settings.

Negative values for Depth indicate inverted (i.e., out of phase) regeneration.

Wet

Wet controls the percentage of the flanged waveform in the resultant flanged waveform.

Dry

Dry controls the percentage of the original waveform in the resultant flanged waveform.

Typical workable parameter groups:

Delay->	1000 ms	Width-> 1000 ms	Rate-> 0.2Hz
Delay->	200 ms	Width-> 200 ms	Rate-> 1.0Hz
Delay->	10 ms	Width-> 10 ms	Rate-> 20.0Hz

Range of Flanger Parameters

Element	Maximum	Minimum
Delay:	10000 ms or the Length of Sample, whichever is smallest.	0ms
Width:	10000 milliseconds. Width cannot be greater than delay.	0ms
Rate:	99.99 Hz	0Hz
Depth:	+100% (default 60%)	-100%
Wet:	100% (default 50%)	0%
Dry:	100 % (default 50%)	0%

Gain Waveform

You can increase the gain (volume) of the waveform with the Gain command. This can be useful whenever waveforms are added together in such a way that the overall waveform amplitude diminishes (due to wave-cancellation effects).

The gain command is:

<F7> GAIN<RETURN>

Gain increases the amplitude of the waveform to the maximum output before clipping.

* * *

Chapter 12

Mix (MX) Page

Contents

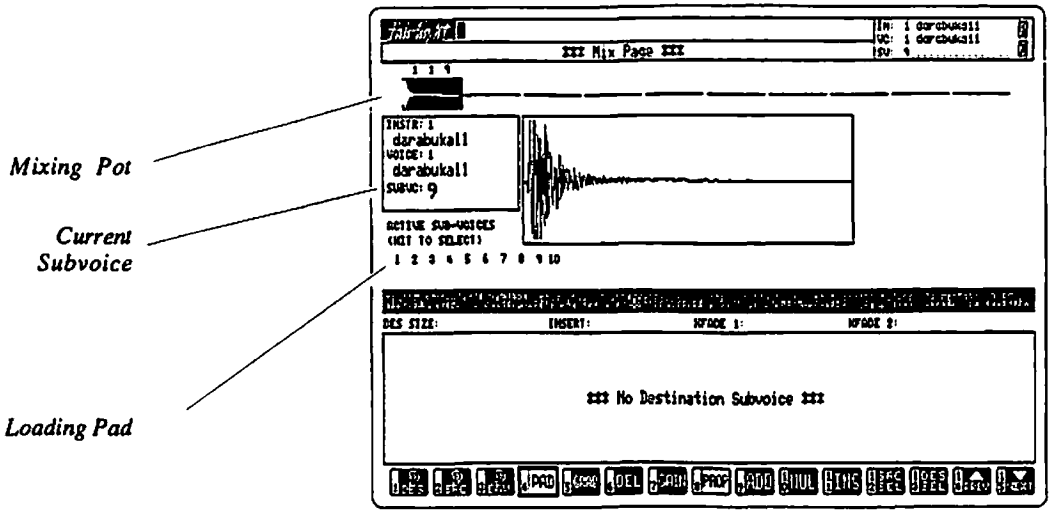
Introduction

The Mix page enables waveforms to be combined in various ways to create new sounds. Pre-mixed waveforms are called Source waveforms. The mixed result is called the Destination waveform. When you enter the Mix Page, it will display the current subvoice and a list of all of the other subvoices in the current voice of the current instrument. This list of available subvoices is called the "PAD", and it will change to show the subvoices of the current instrument when you select or load a new one.

To transfer to the Mix page:

<esc><F8> MIX <RETURN>

'Play Current' Subvoice mode is automatically enabled, whenever you enter the Mix page.



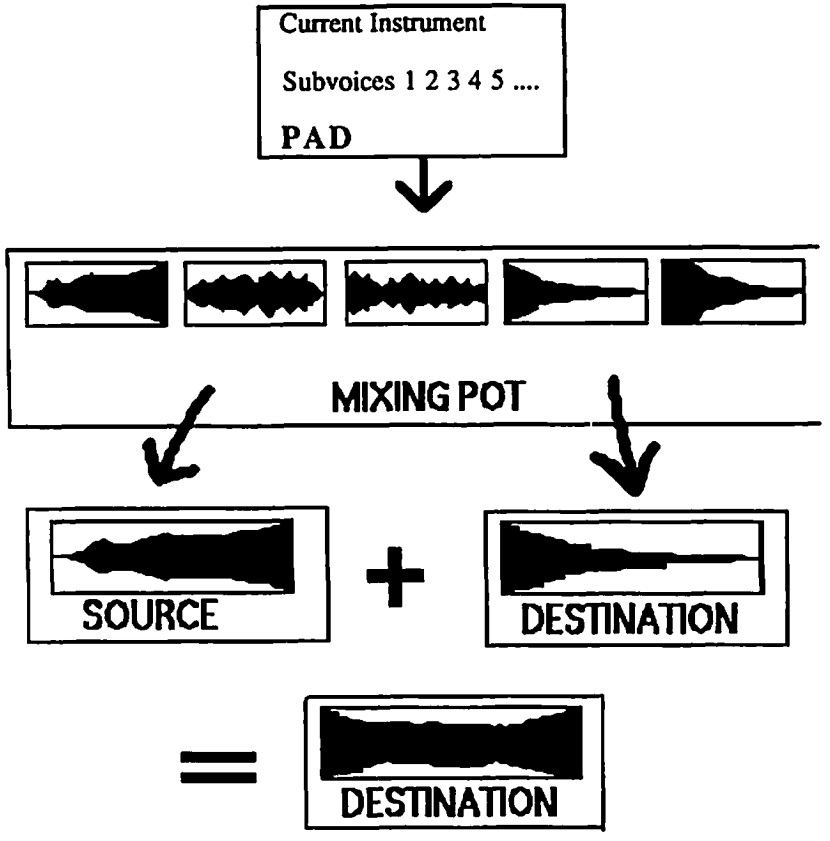
The default Mix Page with a Subvoice 9 from the Demo Voice in the Mixing Pot ready for selection as either the Source or Destination waveform.

From the PAD you may select subvoices (just the waveform part really) to mix together. Each time you make a selection, using the GRAB command, the selected subvoice is added to a memory store called the MIXING POT. This is a separate section of Waveform RAM, which holds all of the subvoices (from different instruments if required) that you wish to choose for mixing.

A further selection is then made. You choose a SOURCE subvoice and a DESTINATION subvoice, and then you mix them, which involves overwriting the destination subvoice. So the mixed sound is placed in the voice and instrument from which the destination subvoice was originally taken, replacing it.

Immediately upon entering the Mix page, you should first create a new Subvoice to contain the Destination Waveform. This avoids any destruction of an existing subvoice within the current voice.

To make this clearer, here is a diagram of the essential points:



Converting Waveforms to Equal Pitch

When mixing pitched waveforms, your source Subvoices should both have equal pitch. This ensures that the mixed waveform is also properly pitched. See the 'Wave Edit' chapter for more information on:- sample rate, segment length, pitch and the Justify and Sample Rate Convert commands.

Play Selected Waveform

Three types of waveforms can be selected as the current Subvoice for playing on the music keyboard; either the Source Waveform, the Destination Waveform, or the tabbed waveform in the Mixing Pot - called the Envelope Waveform.

These three types are selected with the following function key/icons.

Play the Destination Waveform on the music keyboard:

<SF1> PLAYDESTINATON<RETURN>

Play the Source Waveform on the music keyboard:

<SF2> PLAYSOURCE<RETURN>

Play the Envelope Waveform on the music keyboard:

<SF3> PLAYENVELOPE<RETURN>

Audition Displayed Waveforms

Any of the displayed waveforms can be played back at their original sample rate at any time.

To hear the Destination Waveform:

<F1> AUDITIONDES<RETURN>

To hear the Source Waveform:

<F2> AUDITIONSOURCE<RETURN>

To hear the tabbed waveform in the Mixing Pot:

<F3> AUDENVELOPE<RETURN>

Select Subvoice

You can also use the Next/Previous commands to select current Subvoice from the current Voice.

To select the next Subvoice as current:

<F15> NEXTSUBVOICE<RETURN>

To select the previous Subvoice as current:

<F14> PREVIOUSVOX <RETURN>

Setting up the Mixing Pot

The Mixing Pot can contain up to 10 Subvoice waveforms at a time - any of which can be selected as either the Source or Destination Waveform (see below; 'Select Source and Destination Waveform'). Any Subvoice waveform currently available within Series III waveform memory can be loaded into the Mixing Pot *via* the Loading Pad.

Display Loading Pad

The Loading Pad display incorporates:

> The information box containing the current Instrument, Voice and Subvoice number. A list of all active Subvoices in the current Voice. The waveform display of the current Subvoice - two if the Voice is stereo.

The Loading Pad may be replaced by the Source Waveform (SRC) display. To toggle between the Loading Pad and the Source Waveform:

<F4> **PAD**<RETURN>

Select and Delete Subvoices

The Grab command copies the waveform displayed in the Loading Pad into the leftmost available space in the Mixing Pot:

<F5> **GRAB**<RETURN>

The Mixing Pot displays the Instrument, Voice and Subvoice numbers above each mini-waveform display. The arrow keys and/or g-pen may be used to tab amongst them.

Use the Delete command to unload a tabbed Subvoice waveform from the Mixing Pot:

<F6> **DEL**ETE<RETURN>

Select Source or Destination Waveforms

The Source and Destination Waveforms can be selected only from those displayed in the Mixing Pot.

To select subvoice as the Source, tab to the waveform and issue the Source command:

<F12> SOURCE<RETURN>

The Source Waveform is highlighted in the Mixing Pot with an inverted *S*.

To select Destination, tab to the waveform and issue the Destination command:

<F13> DESTINATION<RETURN>

The Destination Waveform is highlighted in the Mixing Pot with an inverted *D*.

The selected Destination Waveform also appears in the large display below the Loading Pad/Source Waveform display area.

Display Source and Destination Waveforms

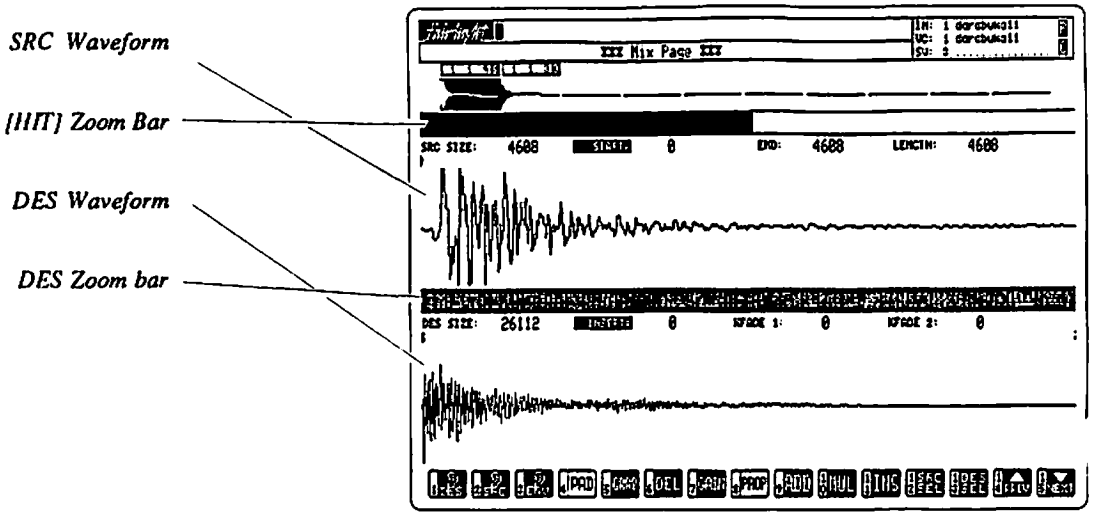
There are three distinct waveform display modes: Zoom mode, Proportional mode, and Normal mode.

In Zoom mode, the extent of the display of the Destination and Source waveforms can be manipulated by the range bar above each waveform. To toggle Zoom mode ON/OFF for the Source Waveform:

<CF12> SOURCEZOOM<RETURN>

To toggle Zoom mode ON/OFF for the Destination waveform:

<CF13> DESZOOM<RETURN>



The Mix Page showing a Source and Destination. The Source waveform is zoomed to display only half the waveform

A [HIT] outside the range bar causes the nearest end of the range bar to extend to the g-pen cursor. This end then moves as the g-pen cursor is moved.

A [HIT] within the range bar causes the whole bar to move as the g-pen cursor is moved. The Mix page remembers the zoomed position if you enter Proportional mode and return to the Zoomed display.

Proportional Mode

Proportional mode enables you to view the relative sizes of the Source and Destination Waveforms. The larger waveform is displayed at maximum width and the smaller waveform is displayed in proportion to the larger.

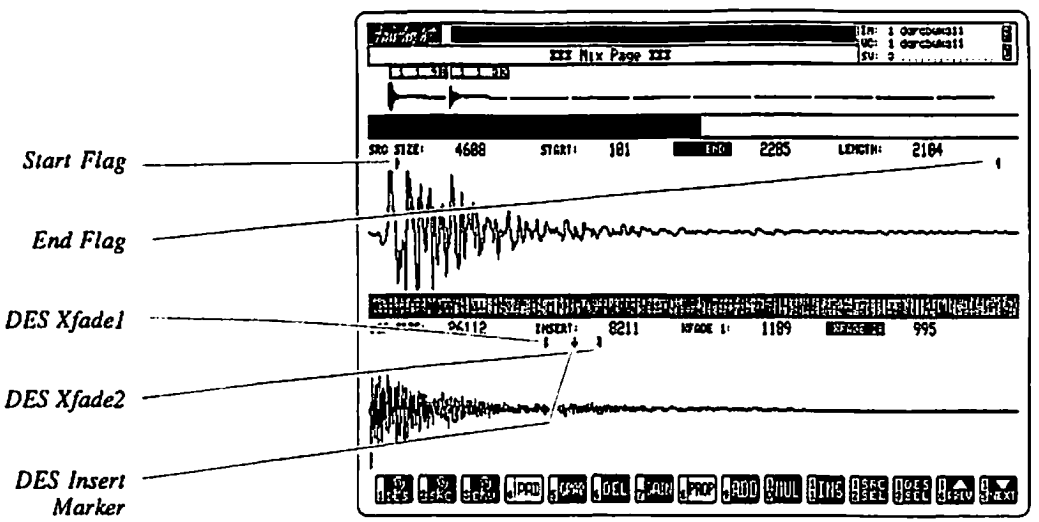
To toggle Proportional mode ON/OFF:

<F8> **PROP**ORTIONAL<RETURN>

Adjust Source Start and End Marks

Any part of the Source Waveform can be mixed into the Destination Waveform - determined by the Source waveform Start and End marks. These are indicated by arrow pointers positioned above the Source waveform. You can select the position of the Start and End makers using either the g-pen or by assigning to the START and END fields - located below the Source range bar.

The Start and End marks are bounded by Source Waveform limits - as displayed in the SRC SIZE field.



The Mix Page showing the SRC Start and End flags and the DES Insert, Xfade flags..

To adjust the Source Start and End by assignment:

Start: *startsample* <SET>

End: *endsample* <SET>

Length: *number-of-samples* <SET>

When using the g-pen, [HIT] either the Start or End field for selecting marker.

> **Note:** When setting these markers the End mark must always be greater than the Start mark - otherwise both markers are reset at the new value.

You may also use the Zoom facility described above to determine the precise Start and End points.

Adjust Destination Insert and Crossfade Marks

The point on the Destination Waveform where the Start of the Source Waveform is mixed in is determined by the Insert marker on the Destination Waveform. The fade-in/out period is determined by the distance between the *Xfade1* and *Xfade2* marks. The Xfade markers are only relevant for the Insert operation. These markers are indicated by arrow pointers above the destination waveform.

> **Note:** The "XFADE2" field (and marker) show the ***distance*** <u>from the end of the source</u> waveform at which the destination waveform fades back into the source waveform, not the position at which this takes place. See diagram below:

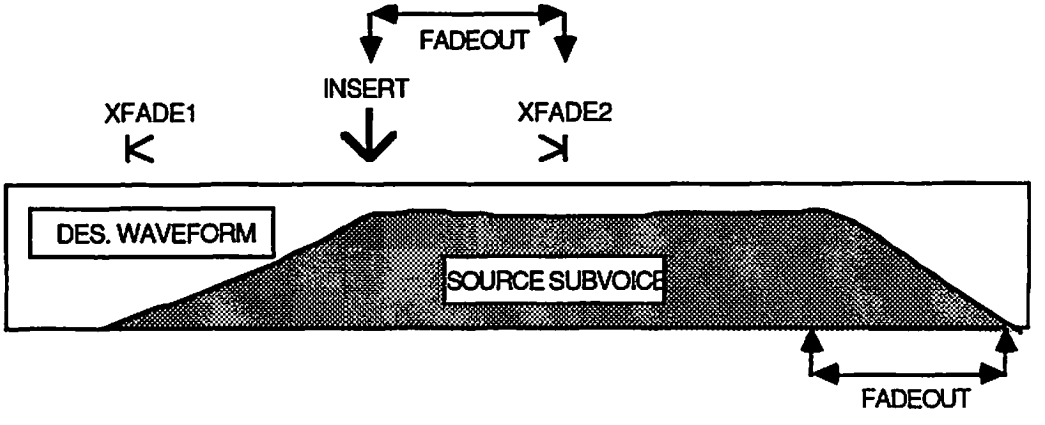


Diagram of how the Source waveform fades into the destination waveform beginning at the XFADE1 marker. It is completely inserted at the INSERT mark. The Source waveform will begin fading out at the distance determined by the XFADE marker.

The Insert and Crossfade marks are bounded by Destination Waveform limits - as displayed in the DES SIZE field.

> **Note:** The distance between the two crossfade marks must be less than the size of the Source section to be mixed in.

You can adjust by assignment:

Insert: *InsertSample* <SET>

Xfade 1: *Beginning-of-Xfade* <SET>

Xfade 2: *End-of-Xfade* <SET>

When using the g-pen, [HIT] either the *Xfade1* or *Xfade2* field for selecting marker.

Select Hard or Soft mode

You might want to use the 'zero crossing' method when placing Xfade markers. In Hard mode, the adjusted waveform pointers are used without modification in the mixed waveform. In Soft mode the waveform pointers are adjusted to the closest zero crossing to obtain a smoother join (see 'Wave Edit' chapter for more details on zero crossing).

To toggle between Hard and Soft modes:

<SF9> HARD/SOFT<RETURN>

> **Note:** The position of the waveform marks may alter after a mix operation when in Soft mode.

Cut Sample of the Source Waveform

In Cut mode, the mixed waveform ends at the last sample of the Source section. To toggle Cut mode ON/OFF:

<SF8> CUTEND<RETURN>

Create a Gain Curve

For both Adding and Insertion operations (see below), a gain curve is applied to the Source Waveform as it is mixed with the Destination Waveform. Each waveform in the Mixing Pot has its own gain curve, which is retained throughout the current session. The gain curve defaults to a constant 100 per cent, but it can be displayed and edited in the Gain Function window.

To toggle the Gain Function window ON/OFF:

<SF4> FUNCTION<RETURN>

The extent of the Gain Function represents the selected section of the Source waveform between the Start and End marks. As the Source waveform is mixed in, the value of the Source waveform is multiplied by the corresponding value of the Gain function.

To see this correspondence more clearly, display the Source waveform in Zoom mode. Adjust the range bar so that the Start marker is at the Start of the display and the End marker is at the end of the display.

To adjust the constant gain curve as a percentage of the total waveform, assign the per cent amount to the Gain field:

Gain: *level* <SET>

then issue the Level command:

<CF1> LEVEL<RETURN>

Edit the Gain Function

The Gain Function can also be edited directly by drawing with the g-pen.
You can also select preset curves:

Sine curve:

<CF2> SINE<RETURN>

Half Sine Curve:

<CF3> HALFSINE<RETURN>

Inverting Gain:

<CF4> INVERT<RETURN>

Add, Insert and Multiply Waveforms

Add Two Waveforms

An Addition operation takes the section of the Source between the Start and End marks, applies the Gain Function to it, then adds it to the Destination Waveform starting at the Insertion mark.

To perform waveform Addition:

<F9> ADD<RETURN>

With stereo Voices you get the "Adding Waveforms" messages for each side of the Voice.

Insert Between Two Waveforms

An Insert operation takes the Source section between the Start and End marks, applies the Gain Function to it, and inserts it into the Destination Waveform. The Source and Destination sections overlap at the fade-in and fade-out points.

The Destination Waveform expands by an amount equal to the size of the Source section less the two crossfade periods. A linear crossfade is performed between the overlapping Source and Destination waveforms within the two crossfade periods.
To perform waveform Insertion:

<F11> INSERT<RETURN>

Multiply Two Waveforms

To multiply the Destination section by the Source section starting at the Insertion mark:

<F10> MULTIPLY<RETURN>

Zero the Destination Waveform

This command resets all samples of the Destination Waveform to zero. The DES SIZE field is not altered by this operation.

<SF5> ZERO<RETURN>

Gain the Destination Waveform

This is equivalent to the Wave Edit page Gain command with no parameters:

<F7> GAIN<RETURN>

The amplitude of the Destination Waveform is adjusted to maximum without clipping.

Stereo Subvoices

If the Source and Destination waveforms are stereo Subvoices, the mix can be stereo unlinked, though usually the same mixing process is applied to both Left and Right waveforms. If the mix is performed Mono (i.e., unlinked) then either the Left or Right waveform of Source and Destination must be selected.

> **Note:** The Stereo icons are only displayed when a Stereo Voice is loaded into the Mix Page.

To toggle Linked/Unlinked modes:

<SF14> LINK<RETURN>

Select Left or Right Stereo

To toggle between Left/Right Source waveform:

<SF12> SRCSTEREO<RETURN>

To toggle between Left/Right Destination waveform:

<SF13> DESTSTEREO<RETURN>

* * *

Chapter 13

Track Split (TS) Page

Contents

Introduction

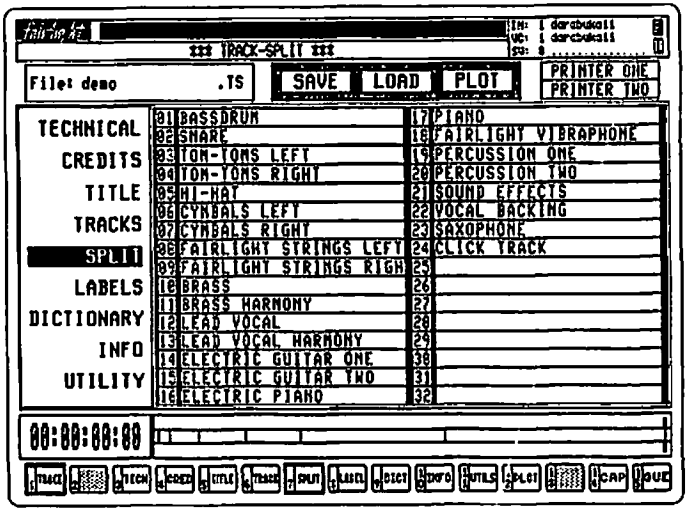
The Tracksplit page is a database for multitrack recording where a variety of session information, credits and so on, can be organised for display or printout. Sections of multitrack tape can be labeled according to SMPTE timecode and monitored during playback.

To transfer to the Tracksplit page, type:

<esc> <F14> TRACKSPLIT<RETURN>

If you are unfamiliar with the Tracksplit page, load the Tracksplit demonstration file - DEMO.TS:

L demo <RETURN>



Track Split Page with the Demo.ts file loaded and showing an example of the Split field contents

There are five main Tracksplit display windows: Technical, Credits, Title, Tracks and Labels. These are called up either by alphanumeric command or using the g-pen.

To display 16 lines of technical information (15 character heading, 36 character information):

<F3> TECHNICAL<RETURN>

To display 16 lines of credit information (15 character heading, 36 character information):

<F4> CREDITS <RETURN>

To display 2 title lines (15 character heading, 36 character information):

<F5> TITLES <RETURN>

To display the contents of 64 tracks (16 tracks at a time, 47 characters long):

<F6> TRACKS<RETURN>

Tracks can also be displayed in Split mode.

To display the contents of 64 tracks (32 tracks at a time, 22 characters long):

<F7> SPLIT<RETURN>

This display is the default window upon entering the Tracksplit page. Track descriptions longer than 22 characters are truncated.

To scroll through the Track or Split displays, cursor to a track number and re-select the number using either the <ADD>,<SUB> or<SET> keys.

Loading a Tracksplit file

Tracksplit files are displayed with a .TS suffix in the directory.

To load a .TS file:

LOAD *filename* <RETURN>

filename The name of the Tracksplit file.

You can create a standard setup file called Template.TS (see below) - which is automatically 'stamped' with the current date (displayed in the Info window) whenever re-created.

You can also load only the Dictionary information from a particular file.

Note: .TS files can only be loaded from the Tracksplit page.

Creating and Saving Tracksplit files

Tracksplit page windows are saved together as a single file. 'Slave' files can also be created, which contain current Tracksplit file information except Tracks data. Using Template and Slave files allows you to quickly edit track information within standard setups.

To create a new Tracksplit file, type a new name in the File field.

Creating a Slave file

To create a slave file from the current file:

SLAVE <RETURN>

You can also create slave files from within the Utilities window.

A slave file has the same name as the original, ending with *_slave* . The creation of the slave file is accompanied by the message:

"All tracks in this file have been reset".

Saving a Tracksplit file

The currently loaded Tracksplit file is saved using the name displayed in the Filename field:

<SF1> SAVE<RETURN>

{option} *filename* A new file name for saving the current TS file.

If the file already exists on disk, a query asks whether to overwrite. If the file does not exist, a query asks whether to create it. You can also save the current TS file using the SAVE icon at the top of the page.

Merging Tracksplit files

If you are using more than one tape machine, you may prefer to have separate track sheets for each reel of tape. The merge command allows you to load previously saved track information into the current file.

MERGE *filename start_track* <RETURN>

filename The name of the file to be loaded into the current file.
start_track The number of the first track of new file data

Example:

If ***tape1.TS*** is the currently loaded file with 24 tracks of data:

ME tape2 25 <RETURN>

merges track data from ***tape2.TS*** into ***tape1.TS*** starting at track 25.

Cue Labels

The Que command is used for inserting cues in the labels list at a particular SMPTE time - cue is triggered at the time the command is terminated by <RETURN>.

<F15> QUE<RETURN>

{option} *text* Text is inserted at the time of the cue.

Include a colon (delimiter) to enter the following options:
{option} **S** Sort the labels after insertion.
{option} **R** Round the label (up) to the nearest second.
{option} **!** Replace the label at the current cursor position.

This command requires Local-zero to be set at 00.00.00.00 and the correct SMPTE frame standard. For more details, see 'Info window'.

Note: Use the Sort command to place updated cue labels in order.

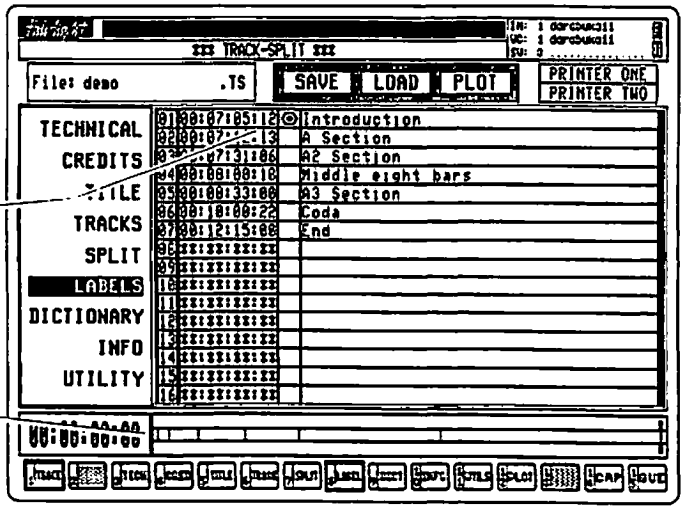
Example:
que Drum_break : s <RETURN>

SMPTE Event-Labels

The Labels window contains a list of up to 64 events arranged in order of SMPTE time:

<F8> LABLES<RETURN>

Labels can be scrolled in the same way as in the TRACKS window.



Screen Pointer

Label bar

Labels window showing the Demo.ts label contents.

Event-Label Trace

Events are monitored on the Tracksplit screen in two ways. A screen pointer traces labels vertically down the display when Trace mode is ON.

To switch Trace ON:

<F1> **TRACEON**<RETURN> or

T+ <RETURN>

To switch Trace OFF:

TRACEOFF<RETURN> or

T- <RETURN>

Label Bar

The vertical lines in the label bar at the bottom of the screen, give an indication of the events in the Labels window. Spacing is proportional to the SMPTE time between events.

The label selected at the start of this display is determined by the first field of the Utilities window:

Start label for Graphics trace: *labelnumber* <SET>

labelnumber The label number at the start of the display.

Label bar scaling is determined by the second field in the Utilities window:

Scaling for graphics trace: *scaling* <SET>

scaling Default: 100
Range 11 - 999

A Scaling of 11 represents a bar time span of one hour. A scaling of 999 plots events only within the first 40 seconds.

The label bar line corresponding to the currently tabbed event in the Labels window can be made to flash if the Flash field in the Utilities window is switched ON :

Flash current tab position: *Y/N* <SET>

Sort Labels

Use the Sort command to arrange labels in order of SMPTE time:

<SF3> **SORT**<RETURN>

You can also Sort using the g-pen field in the Utilities window.

Remove Labels

To remove labels from the current list:

<SF4> REMOVE *labelnumber* <RETURN>

labelnumber	The number of the label to be removed.
{option} *start - end*	Range of label numbers
{option} *!*	The currently tabbed label number
{option} :S	Sort remaining labels in SMPTE time

Examples:

Remove labels 20 to 30 inclusive:

REM 20-30 <RETURN>

Remove currently tabbed label and sort:

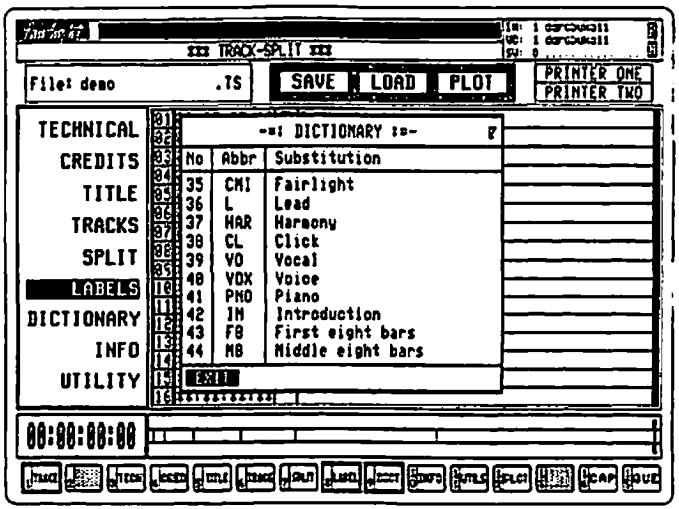
REM !:S <RETURN>

Remove labels 20 to current label and sort:

REM 20-!:S <RETURN>

The Dictionary Window

The Dictionary window helps minimise typing by enabling abbreviations to be entered in place of commonly used phrases such as 'Bass Drum'. This facility is enabled by switching the Dictionary Replacement field in the Utilities window to YES. The full dictionary phrase is automatically substituted whenever its associated abbreviation is assigned to one of the Tracksplit data fields.



The Dictionary window with examples of dictionary entries from Demo.ts.

To enter the Dictionary window:

<F9> DICTIONARY<RETURN>

To exit the Dictionary window:

DICTIONARYEXIT<RETURN>

The Dictionary contains a list of 99 numbered entries. Abbreviations may be up to 3 characters long. Expanded terms may be up to 25 characters long. Use the <ADD>, <SUB> or <SET> keys to select particular entries.

You can Save an updated dictionary into an existing file on disk (e.g., Template) using the Dictionary Save command:

DICTIONARYSAVE *filename* <RETURN>

An existing dictionary (e.g., on Template) may also be loaded into a currently displayed file.

To load an existing dictionary:

DICTIONARYLOAD *template* <RETURN>

Example;
DL template <RETURN>

No other data in the target file is modified when using Dictionary Save or Dictionary Load.

INFO Window

To enter the Info window:

<F10> INFO<RETURN>

To exit the INFO window:

INFOEXIT<RETURN>

Features on the Information window:

Field	Description
Date file created	This field is determined when the file is first created and cannot be assigned. It is saved and loaded as part of a file. However, whenever the Template file is loaded the field is automatically assigned the current date. This allows a Template file to be maintained with a standard dictionary and layout.
Date Last Saved	Is for information only - it cannot be assigned.
Current tape time	The SMPTE code read at the SMPTE input.

Local-zero	The time set in this field is subtracted from label times in the Labels window and affects label tracing. The first label becomes zero when Local-zero is set to this time.
Display offset	This field Displays the overall offset subtracted from incoming SMPTE time - useful for film work.
Frame standard	Options: 24,25,30 These cannot be assigned. Select with the <ADD>, <SUB> or <SET> keys: <ADD>: 24 <SUB>: 25 <SET>: 30
Label trace mode	Switch ON/OFF. Used when editing the Labels display, since Trace may scroll the display.

Re-set /Capture Local Zero

Use the Capture command to re-set Local-zero to incoming SMPTE time:

<F12> CAPTURE<RETURN>

Reset Local-zero to 00:00:00:00 using the zero command:

ZERO<RETURN>

Utilities Window

To enter the Utilities window:

<F11> UTILITIES <RETURN>

To exit the Utilities window:

UTILEXIT <RETURN>

Features found on the Utilities window:

Field	Explanation
Start label for graphics Trace	Adjust the SMPTE start on the label bar display at the bottom of the page.
Scaling for graphics trace	Adjust the height on the SMPTE label bar.
Flash current tab position	Use in Labels window to affect label bar display
Use dictionary replacement	Options: Y / N. Dictionary substitution is disabled by setting to NO.

Fold replacement strings to:	Determines whether upper or lower case letters are stored as substitutions: Options: **U** Upper case **L** Lower case **OF** Off
Sort label times into order	Sort command.
Create slave from this file	Slave command.

Printing or Plotting files

Tracksplit files can be printed using an Epson (type FX or MX) dot-matrix printer or compatible (e.g., Brother), or plotted using a Hewlett Packard HP7574A plotter.

The printer set-up should be:

9600 baud, 8 bit data, 1 stop bit, no parity, hardware handshake.

Attach the printer or plotter to one of the printer ports on the rear of the Series III. The printer setup is displayed in a window when you [HIT] the PLOT icon at the top of the page, or use the Plot command:

<F12> **PLOT**<RETURN>

To exit the printer setup window:

PEXIT<RETURN>

To start printing; [HIT] the START icon, or use the Start command:

<SF5> **START** *p* <RETURN>

p: The port number for printer output.
Default: Printer port 1.

The printer field at the top right of screen shows the port selected. The Series III can still be operated during printout.

> **Note:** If text is truncated when using an Epson MX or FX printer, limit the length of text lines.

To cancel printing, use the Abort command:

<SF6> **ABORT** *p*<RETURN>

p The number of the printer port to be turned off.

Four fields display information only and cannot be altered: First track, Last track, First label and Last label. The other fields determine output device parameters as described below:

Header	Options	
Printer Socket:	**1**	Printer Port 1
	2	Printer Port 2
Paper size:	**La**	Large (A3 paper or wide ribbon paper)
	S m	Small (A4 paper or narrow ribbon paper)
Device Type	**E**	Epson MX100-III or FX100-III
	H	Hewlett Packard
Line Velocity	Adjusts the speed of the pen when plotting lines. High speed on the Epson corresponds to draft quality and should not be used.	
	HI ->	high speed
	ME ->	medium speed
	LO ->	low speed
Text Pen #	For HP plotters only: Selects pen colour for text. Range: 1 to 7	
Line Pen #	For HP plotters only: Selects pen colour for lines. Range: 1 to 7	

Printer Cable

Printer and plotter cables are standard RS232. The essential connections are:

Series III	Printer or Plotter
25 p D mini (male)	25 p D mini (male)
Pin 1: Chassis ground	-> **Pin 1:** Chassis ground
Pin 2: Transmit (TX)	-> **Pin 3:** Receive (RX)
Pin 3: Receive (RX)	-> **Pin 2:** Transmit (TX)
Pin 5: Clear to Send (CTS)	-> **Pin 20:** Data Terminal Ready (DTR)
Pin 7: Signal Ground	-> **Pin 7:** Signal Ground
Pin 20: DTR	-> **Pin 5:** CTS

* * *

Chapter 14

Backing up Files

Contents

Introduction

This chapter deals with the transfer of stored files - between hard disk, floppy disk, streaming tape and optical WORM (Write Once, Read Many) drives. For more information on WORM drives, consult the Fairlight WORM Optical Disk manual.

Floppy Disk Saving and Recovering

The Series III uses an 8" 1Mbyte floppy disk drive for backing-up and retrieving small files - e.g., RS or Cue List files. You can also back-up Voice files onto a number of floppy disks when a larger format storage medium is not available.

There are two commands which enable you to do this:

You can completely Quit the Series III CMI system, and enter the OS9 Operating System, or 'Shell'. Using Quit, the CMI no longer runs 'in the background' - which means that OS9 operations work much faster:

QUIT <RETURN>

The VSAVE command appends (i.e., saves without erasing any existing data) a stored Series III Voice file onto floppy disk/s:

VOICE**SAVE** *filename* **/f0** <RETURN>

filename The name of the file to be appended (include suffix).

{option} **#32** Use maximum amount of memory to speed transfer operation.

The following message appears:-

```
Load destination disk 0
```

Place an OS9 formatted floppy disk in the drive.

Type 0 to indicate that it is the first disk. The hard disk and floppy lights should flicker to show that the transfer is under way. If the file does not fit onto the floppy disk, the following message appears:

```
Load destination disk 1
```

Replace disk 0 with a new formatted floppy disk, and type 1. Continue this procedure until the entire file is saved.

Recover a file from Floppy Disk

The Recover command retrieves files created by the VoiceSave command on floppy disk:

VOICERECOVER /f0/sourcefilename/*destfilename*<RETURN>

sourcefilename	The name of the source file on floppy disk.
destfilename	The name of the file to appear on hard disk. Include pathname in *destfilename*.
{option} -X	Detects any errors on the floppy disk file, and replaces them with zero values. This enables recovery of damaged disk files.
{option} -Y	Reads floppy disk file one Sector (256 bytes) at a time.
{option} #32	Use maximum amount of memory to speed operation.

The following message appears after the VoiceRecover command is given:

```
Load source disk 0:
```

The disk labeled *filename* 0 must be placed first in the floppy drive.

Press <RETURN> for the retrieval to begin. If the file includes a number of disks, you are prompted to load subsequent disks. Insert disks in the order of recording until the file is completely recovered.

Streaming Tape

The two main bulk-storage mediums used for backup on the Series III Tare streaming tape (use either DC400A or DC600A cartridges) and Optical WORM disk. Tape-streamer units can be installed onboard the Series III, or connected externally via the SCSI ports. (See below; 'External Disk Drives' for more information on connecting SCSI devices).

Like most other OS9 backup commands, streaming tape commands work considerably faster when you QUIT the Series III - rather than just temporarily exiting the system with the *$* <RETURN> command.

Bulk Storage of Files

The entire contents of a hard disk device (e.g., /c0) can be backed-up onto streaming tape with the Backup command. There is no facility for selecting individual files with this command (see below, 'Individual File Back-up').

Insert a cartridge in the tape streamer drive. Ensure the tape does not contain valuable information - as it will be erased by the back-up procedure.

When the tape streamer device is ready, type:

BACKUP *device* <RETURN>

device The name of the hard disk device to be backed-up, e.g., /c0

The name and size of the device to be backed-up is displayed with the prompt for overwriting the streaming tape. If you answer *N* at this point, back-up is aborted. If you answer *Y*, the tape is re-wound to the start, and the tape is erased.

Once tape erasure commences, the Series III does not respond to the interrupt command <CTRL-Q> until finished.

When back-up is under way, a dot appears for every 32 sectors copied to show you that files are being loaded.

Devices larger than 60 Mbytes require more than one streaming tape. The Back-up program instructs you to remove the full tape and insert a new one to continue.

Label all back-up disks and tapes clearly, and store in a cool, dark, dry environment. Streaming tapes should be spooled every few months for reliable operation. After that, the backup may be stopped between each file and the next. to do this hold down <CTRL> and Q, and wait for the backup to quit.

If you type BACKUP without the device name, a list of available options appears:-

- **-S** Silent mode. No printing to the screen (except query).
- **-Q** No query. Will overwrite TAPE without asking.
- **-C** Don't clear screen.
- **-N** TAPE NAME (user defined name for the streaming tape).
- **-P** Enable end of page pause.

Errors that may be reported during the back-up process include:

Disk error An unreadable Sector. This means that when the tape is restored, that Sector will contain '0's only - the original information is lost.

Tape error The tape is in an unusable condition and should be discarded.

Soft error A *soft error* is the term given to an area on the tape which did not receive all the data sent to it. This is detected by the error checking methods by the Series III. The Series III however, will work out which data was missing and replace the missing data. If more than 120 soft errors occurs (displayed as an *S* on the line of dots) the tape is probably worn and should be discarded.

Bulk Restoring of files

The following command allows you to restore files backed-up on streamer tape. The Restore command overwrites everything on the destination disk partition. Individual files can not be retrieved with this command.
When the streaming tape device is ready, type:

RESTORE *device* <RETURN>

device The name of the hard disk device where data from the streaming tape is to be restored. e.g., /c0

If you type RESTORE without the device name, a list of available options appears:

- -S Silent mode. No printing to the screen (except query).
- -Q No query. Will overwrite device without query.
- -C Don't clear screen.
- -P Enable end of page pause.

Error messages are the same as for the BACKUP command.

Individual File Back-up

Sometimes you may wish to back-up only a few files recently Saved to hard disk. You may also want to retrieve individual files from streaming tape. This is done using the TOTAPE and FROMTAPE commands.

Quit to OS9 if in the CMI system, and make sure the hard disk directory you wish to transfer files from is the current directory. You may have to use the change directory command **chd** <RETURN> (see Appendix A 'OS9 Commands' for more details).

The streaming tape must be blank, or one previously used with the TOTAPE command. If you try to use a tape previously formatted by the Backup command, the following message appears:

THIS IS NOT A LIBRARY TAPE.

You can use the TOTAPE command with the *-w* option to re-format the tape prior to copying files. Note that the erase option can not be halted once started.

The Totape command is:

TOTAPE *filename filename....filenameN* <RETURN>

filename The name of the file/s to be sent to steaming tape.

If no files are specified then a prompt appears asking for the filenames to be copied onto streaming tape. Enter the files to loaded, and terminate the last file with <RETURN>.

The names and total size of files to be loaded are displayed with a prompt that asks whether to erase the tape, or append files to those already there.

Note: Wildcards may be used to specify a group of files. See Using Match String Wildcards below.

Prompts can be avoided by including filenames and options in the TOTAPE command. To display TOTAPE options, type **TOTAPE -?** <RETURN>:

-A	Always append to what is on tape (Searches to last file on tape, then begins to copy files). Any attempts to re-copy an existing file to tape results in a query. You must then create a new name under which to store the file.
--W	Always wipe tape. (Erases the current tape before coping files without any more prompting).
-E	Extended directory listings (Lists the size in bytes of files to be loaded and any files which were not found in the current directory. These files have a Pathname not found error).
-S	Don't expand System files (only copy the .SY file, not the contents of the System). Normally, all files are are saved onto the streaming tape.
-T	Don't expand Tape files (only copy the .TP file, not the contents of the Tape). Normally, all files listed are saved onto the streaming tape.
-V	Don't view directories (will not display the list of files for saving).
-C	Don't clear screen (allows the current screen display to remain after the TOTAPE command has been given - useful for displaying filenames).
-P	Enable end of screen pause (pause once the screen is filled - then use <RETURN> to step through files or <DEL> to continue without screen pause).

For example;

TOTAPE *.vc -ac <RETURN>

Selects all Voice files stored on disk in the current directory, appends them to the streaming tape and does not clear the screen.

If any of the Voice files you have asked for are not found in the current disk directory, the following error message is displayed:

Error 216 - Path Name Not Found

and the operation is stopped immediately. To display the files not found, issue the TOTAPE command with the *-e* option.

At this point you should either find the missing file, create a file with the same name as the missing one, or re-Save the System or Tape file without the missing file.

Note: To re-save .SY files with the new file list listing, return to the CMI system- use the **SYL** *filename* command with the Q option. This will display the filenames in the **.SY** *filename* system without having to load the Voice files into waveform memory. Simply re-define the system to include the files to be loaded and then issue the SYS <RETURN> command to overwrite the old system *filename*.

Whenever files are appended onto streaming tape, the Series III displays the files encountered on the tape (with a period) while searching for the end of the tape.

Using Match String Wildcards

The Series III uses 3 wildcard symbols to locate specific filename types:

*	matches any string.
:	matches one character only. (e.g *tree:* will fine both *treed* and *trees*
=	matches nothing or one character (e.g. *tre=s* will find both *trees* and *tres*)

These can be used in any selection of file names through in both OS9 and the CMI system.

Individual File Retrieval

Files saved with the TOTAPE comamnd can be retrieved using the FROMTAPE command. This command transfers streaming tape files to disk - within the current directory.

FROMTAPE *filename filename....filenameN*<RETURN>

filename The name of the file/s to be loaded from the steaming tape.

If no files are specified a prompt appears asking for the filenames to be retrieved. Enter these, and terminate the last file with <RETURN>. Wild cards can also be used.

To display FROMTAPE options, type a **FROMTAPE-?** :

-S	Don't expand System files (only retrieve the .SY file, not the files listed).
-T	Don't expand Tape files (only retrieve the .TP file, not the files listed).
-C	Don't clear screen (allows the current screen display to remain after the TOTAPE command has been given - useful for displaying filenames).
-P	Enable end of screen pause (pause once the screen is filled - use <RETURN> to step through files or <DEL> to continue without screen pause).
-W	Always write file on tape (overwrites existing files on the hard disk).
-G	Match pattern for query (presents a query for every file specified with match string wild cards).

The Series III rewinds the tape and begins retrieval of selected files. A colon appears for every file found but not retrieved.

Soft Errors

If the Series III encounters difficulty reading from or writing to a length of tape, the drive will go back over that section and try again. If unsuccessful after several tries, the streaming operation will abort, and an error message will appear. If, however, the operation is ultimately successful, streaming will continue to the end.

At that point the computer will report a number of Soft Errors, that is, the number of times it had to go back and try again. These errors are not usually a source of problems. If, however a particular tape reports a large number, say 50 or more, you should take that as a sign that the tape is wearing out, and immediately back-up the data on to a new tape.

Directory of Library Files

A list of files saved onto streaming tape using the TOTAPE command may be displayed with the DIRTAPE command. This list can be saved, edited and printed (see 'OS9 Text Editor').

The command to display the contents of library streaming tape is:

DIRTAPE <RETURN>

{option} *filename* Creates a text file that can be edited and printed.

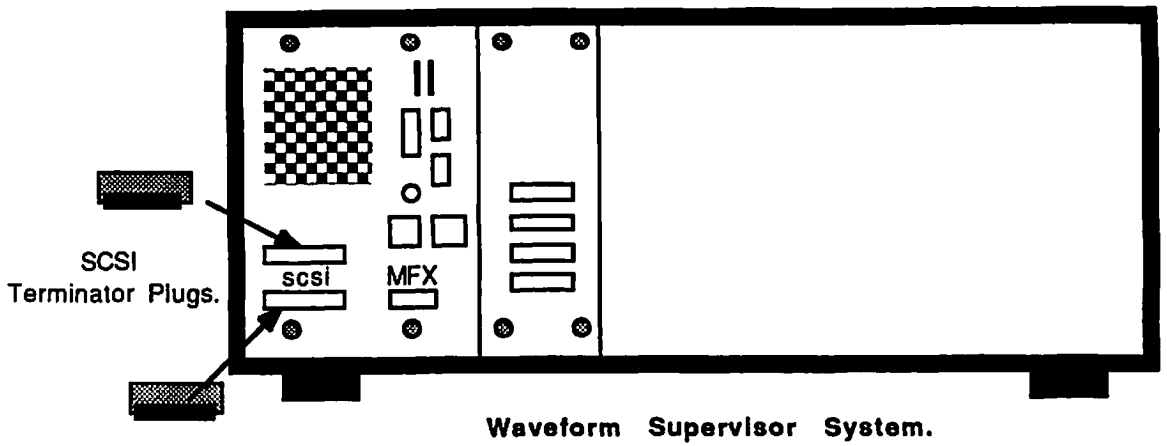
Maintenance of Streaming Tape Drive

As with any other tape mechanism, streaming tape performance can be degraded by poor maintenance. This may result in errors when transferring files.
Clean the read/write/erase head assembly and tape-hole sensor openings regularly, with a clean, lintless cotton swab dampened with proper head cleaning solution (95% isopropyl alcohol). Do this:

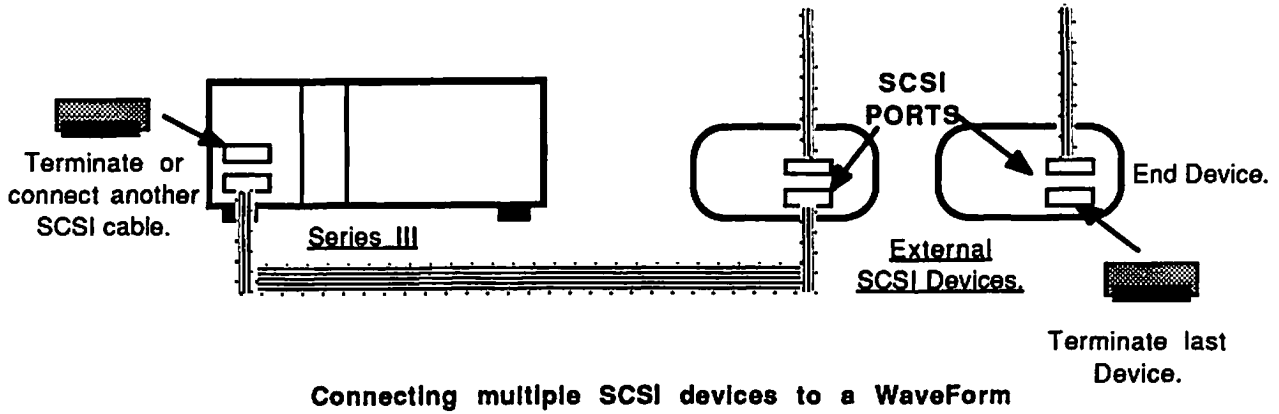
1. After the initial pass with a new tape cartridge.
2. After every 2 hours of actual use, if using all new cartridges.
3. After every 8 hours of normal use.

External Disk Drives

Fairlight supplies three types of external storage equipment: Tape Streamer, External Hard Disk and Optical WORM drives. All external units are connected via the SCSI (Small Computer System Interface) Port on the rear of the Series III; linked in daisy-chain formation and terminated (at both ends of the chain) by a Terminator Resistor Pack.



Waveform Supervisor System.
(SCSI Terminator Plug installed in each port.)



Connecting multiple SCSI devices to a WaveForm Supervisor system.

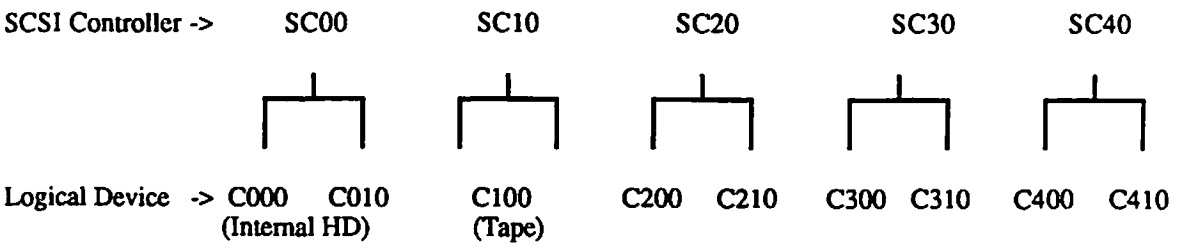
Naming SCSI Devices

Communication between the Series III and external equipment is governed by the SCSI controller-cards contained within each unit. Up to 5 SCSI controllers can be daisy-chained from either one of the SCSI Ports on the rear of the Series III.

> Note: Some external hard disk units contain a selector switch for selecting between drive device numbers (either 0 or 1). This switch enables access to two 'devices' (sharing the same built-in SCSI controller) within the one unit - though not simultaneously. These units must be turned off before you change the switch position.

In order to display a directory from an external unit, you need to know which SCSI controller and which 'logical device' you want to access on the SCSI buss. Each SCSI-connected unit can be addressed individually - each is given a unique name, specified by three digits:- the SCSI controller number, the 'logical device' number and the Partition number. The syntax for accessing external storage systems is described below:

Table of SCSI controller names and typical devices



To access only the SCSI controller:

/sc<*scsi_address*> <*logical_device_number*>

To access partitions governed by a SCSI controller:

/c<*scsi_address*> <*logical_device_number*><*partition_number*>

To access Partitions on the device:

/k<*scsi_address*> <*logical_device_number*><*partition_number*>

Angle brackets <> are only used here to distinguish between the three digits, and should not be typed.

> **Note:** For convenience, internal devices /c000, /k000, /k001 and /k002 can be abbreviated as:- /c0, /k0, /k1 and /k2, respectively.

Changing Directories on External Disk

External hard disk drive/s supplied by Fairlight are already formatted and may contain the standard Series III sound library. Files contained on an external device can be displayed either within OS9, or on the Directory page.

For example, when on the Directory page; to display the contents of the Fairlight sound library on the /C200 device - tab to the current directory name, and type:

/C200/cmifiles/fairlight
.The full pathlist for the Fairlight sound library can be abbreviated using the ^ (caret) symbol which means - /cmifiles/.

For example:

/C200^FAIRLIGHT<SET>

The directory now displays the files in the external hard disk sound library.

Hard Disk Maintenance

Because of their high precision engineering, hard disk drives are very sensitive to shock. Hard disks are particularly prone to damage while the disk is spinning, so the Series III should never be moved or bumped while operating.

The disk controller is equipped with a defect mapping system, which keeps track of any defective areas on the surface of the disk and prevents them from being written on. This map is pre-programmed onto the disk at the Fairlight factory.

After some time in operation additional defects may sometimes develop; in which case the defect mapping system needs updating. The hard disk is divided into 256-byte disk access areas called Sectors, and you should regularly verify that all available Sectors are in 100 percent working order. For peace of mind, do this about once a month.

Defective Sectors can be located using the SCHECK command:

SCHECK */dev*<RETURN>

/dev The device to be checked (e.g, /c0).

If Scheck reports any errors on your hard disk, note the files that have bad sectors and copy the files to either another directory or rename the files when copying.

Re-issue the SCHECK command with the following options:

{option} **-F** Fix disk as mush as possible.
{option} **-S** Treat soft errors as hard errors when fixing the disk.

Delete the files which were previously corrupted by bad sectors.

* * *

Chapter 15

Multi-track Disk Recorder

Contents

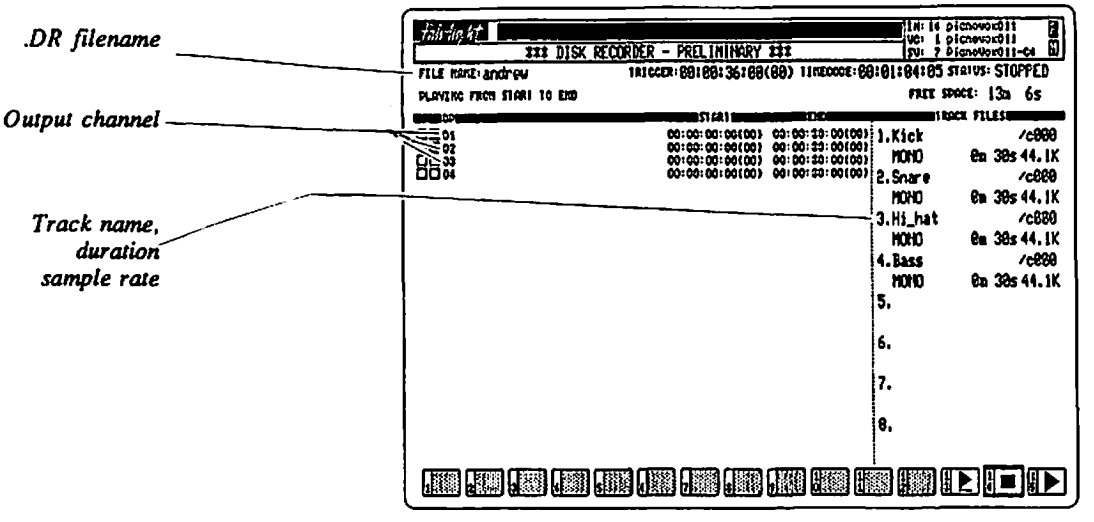
Introduction

With the multitrack Disk Recorder you can record up to 8 separate audio tracks directly on to hard disk. Each track has a start and end time and plays through the Series III channel Outputs. The total number of tracks you may play at once depends on your disk drive system, the sample-rate used and whether the tracks are mono or stereo.

To enter the multitrack Disk Recorder:

<esc><F1> DISKRECORDER<RETURN>

The screen is cleared, and the numbers 1 to 8 appear on the right-hand side which correspond to the eight possible recording tracks.



The Disk Recorder page with 4 tracks created

If you use Maxtor or Newbury Data (Type ST506) disk drives, you can only play either two mono tracks or one stereo track. The newer ESDI-type disk drive can read and write data much faster, so you are able to play more tracks. The table below provides an indication of how many mono or stereo tracks can be played back simultaneously at various sample rates on a Hitachi 380 Mbyte ESDI drive (but these figures may vary):

Number of tracks	Sample Rate
3 Stereo tracks	48Khz
4 Stereo tracks	44.1Khz
6 Stereo tracks	32Khz
6 Mono tracks	48Khz
8 Mono tracks	44.1Khz
8 Mono tracks	32Khz

The above figures may vary from drive to drive and with the temperature of the drive (cooler is better.)

Tracks are listed as files on the Series III Directory page with a .TR suffix - and are added into a .DR module. The .DR (Disk Recorder) module is used to list Track files in the same way a Series III System file 'contains' Instrument files.

Whenever a .DR file is loaded into Series III memory, its.TR files are loaded automatically. Tracks can be individually created, saved and loaded.

Channel Allocation

The Disk Recorder assigns each created track to a channel Output. The channel number is displayed in the OP field. The whole channel card is used to play tracks - as can be seen on the System Configuration (Channel Allocation) page. No card may have a Voice and a Track on it at the same time.

> **Note:** Because the clock on channel card 1 drives the Series III sample card (i.e controls the sample rate), it is important that you have a track on this channel which is the same sample rate as the track you wish to record. For example if the track on channel 1 was sampled at 48kHz then you will not be able to record a DR track at 32kHz.
>
> If you want to change the sample rate of the current DR file, then you must close the DR file, create a new DR file, allocate a new track with the new sample rate and then load the old tracks.
>
> **Note:** If you have any voices occupying channels 1 and 2 then they must be moved before recording on the DR page.

Create a Disk Recorder File

A Disk Recorder module is a file that contains a track listing and must be created before you can create or load a Track file. There are no waveforms contained within .DR files.

To create a .DR file:

NEW *filename* <RETURN>

filename The name of the Disk Recorder file to contain the track listings.

This command creates a DR file which is instantly saved to disk, and at all times stores the names of the loaded.TR files. The amount of free disk space is displayed in the FREE SPACE field in the top right hand corner of the display.

Create a Track File

To create a new track:

NEWTRACK *filename seconds* <RETURN>

filename	The name of the Track file.
seconds	The length of recording time in seconds. Range: 1 - 6000
{option} *sampleratek*	The sample rate for recording (the k must be included). Range: 32k, 44k, 48k (Default 44k)
{option} S	Stereo sampling (Default: Mono).
{option} *device*	The device name (if using and external hard disk). This option enables you to record a number of tracks on different hard disks. The Track file is only created on the external device if the same directory as the current directory exists on the selected device. For example, if your current directory is CMIFILES/FAIRLIGHT then CMIFILES/FAIRLIGHT must also be on the external device.

Displayed in the Track Files window is the Track file name, duration, sample-rate and whether it is mono or stereo. Track files are automatically assigned to a track when created or loaded.

Load a Disk Recorder File

To load an existing .DR file into memory:

LOAD *filename* <RETURN>

filename Name of the Disk Recorder module to be loaded.

This command automatically loads all Track files that were present the last time this .DR file was loaded.

The global command to load a .DR file from outside the DR page is:

DLOAD *filename* <RETURN>

Load Track Files

A .DR file is opened either by creating a new .DR file, or loading an existing one. If you attempt to load a Track file without a .DR file already open, the following error message is displayed:

```
Cant Create a Track File Without a DR File Open
```

To load a Track file into the currently opened DR file:

LOADTRACK *filename* <RETURN>

filename The name of the Track file to be loaded.

This command allows you to select Track files from different .DR files and load them into a new .DR file module. Track files are automatically assigned the next available track number and channel output when loaded.

Load Subvoice Files

Series III Subvoice files may be converted into Track files for loading into the currently opened .DR file:

VOICECONVERT *voicename SV*<RETURN>

voicename The name of the Voice file as displayed on the Directory Page (without suffix).
SV Subvoice number. Range 1-16.

The converted Voice file has the same status as a normal Track file. The sample-rate must be compatible with those used on the Disk Recorder page, i.e., 32kHz, 44.1kHz or 48kHz.

Record Tracks

The command to record a selected track:

<F13> RECORD <RETURN>

Note: See the Introduction of this chapter for limitations on sample rate and channel allocation before yoy begin recording.

The global command to record a track from outside the Disk Recorder page is:

DRECORD <RETURN>

Note: No recording will actually take place until you return to the DR Page.

Play Tracks

By assigning to the START and END time fields, any section of the track can be played.

The command to play all tracks:

<F15> PLAY <RETURN>

If START and END times are not specified,each track is played from beginning to end (see below, 'Set the Start and End Times'). The Play Status field (below the DR file name) tells you the section being played.

The global command to play a track from outside the Disk Recorder page is:

DPLAY <RETURN>

Stop Play/Record

To stop the Disk recorder playing or recording a track:

<F14> **STOP**<RETURN>

The global command to stop tracks playing from outside the Disk Recorder page is:

DSTOP<RETURN>

Set the Start and End Play Times

All time fields on the Disk Recorder are in SMPTE format time:

hr s:mi ns:sec:fr ames.subfr ames

The SMPTE frame rate is the same as set on the System Configuration (SMPTE MIDI Sync) page. Adjustments for the incoming SMPTE frame rate are made here. Or, you can use the global **SYNC** command:

<esc><SF2> **SYN SMP** *framerate*<RETURN>

framerate Select SMPTE frame rate format:- 24, 25, 29 or 30.

Start times can only exist within the set duration of the recorded track file as displayed in the Track Files information column, i.e from zero to maximum time. The length of play time can be reduced by increasing the START time or reducing the END time, but a track will not play if the START time is set later then the END time when the track was recorded.

For example:

If a track had a play time of 10 seconds, then the START time will display 00:00:00(00) and the END time will display 00:00:10:00(00). If the START time was set to 00:00:11:00(00) then the track will not play. See Trigger in this chapter for playing tracks at a specified time.

The START and END time displays on the DR page can be set separately (e.g., minutes only) or as a complete time field assignment (hours: minutes: seconds: frames. subframes).

To specify an individual SMPTE field, tab to the field, then <SET>.

To enter the complete SMPTE event time, tab to the start of the time field, type the SMPTE time - including the separating colons, or spaces - then <SET>.

Integers that exceed the range automatically increment to the next highest time unit.

For example:

To specify the START time of the current track as 3 minutes, 2 seconds and 21 subframes, tab to the hours field then type:

0:3:2:0:21<SET>

The IN display looks like;

00:03:02:00.21

Or, you could simply have tabbed to the minutes field and omitted the zero hours.

Remove Disk Recorder File

To close a .DR file use the Close command:

CLOSE <RETURN>

The .DR file and all associated .TR files are cleared from the DR page and saved to disk.

.DR and .TR files are also saved (but not cleared) as soon as they are created, loaded or changed.

The global command to close a DR file from outside the Disk Recorder page is:

DCLOSE <RETURN>

Remove Track Files

To remove individual track files without closing the whole DR file, use the Close Track command:

CLOSETRACK *n* <RETURN>

n The number of the track to be closed.
Range: 1 to 8

Note: Because recording uses more disk access time then playing, you may not be able to record a track while playing six others, though playing seven works. You can get around this by temporarily closing one of your tracks while you record another, then load it up again.

Synchronisation

The Disk Recorder can be synchronised to start at a precise time using either SMPTE or MIDI Time Code.

Incoming SMPTE time is displayed in the Timecode field at the top of the display. Connect the SMPTE source to the SMPTE IN XLR input on the rear of the Series III.

Trigger

The Trigger field determines when the disk recorder begins to play. This field can be specified as with the other SMPTE fields on this page.

TRIGGER: time <SET>

As soon as incoming SMPTE time (displayed in the Time Code field) corresponds with the Trigger time, the Disk Recorder begins playing. It will also chase timecode to any point within the duration of the Tracks.

> **Note:** DR will allow you to alter the Trigger time while playing, to give a slip feature across all tracks.

* * *

Appendix A

OS9 Commands

Contents

Introduction

The Series III CMI system actually exists within an operating system called OS9. Occasionally, you may need to enter OS9 to perform other functions not included in the CMI system - e.g., to install new system software on floppy disk, or to back-up and retrieve files to/from streaming tape, WORM disks and so on.

The OS9 operating system also provides various facilities for file manipulation (similar to those on the Directory page) e.g., file search, copying and renaming - and other features for creating, editing and printing ASCII text files.

Caution: Do not tamper unnecessarily with OS9 commands or system files unless you're completely sure you know what you are doing. OS9 is a very powerful but delicate system - and can be very unforgiving when abused.

Enter the OS9 Operating System

Two commands enable you to transfer to OS9 from 'inside' the CMI. The QUIT command is a permanent transfer - so, you have to re-boot (start again from scratch) to return to the CMI system.

QUIT <RETURN>

The screen clears, and the word 'Shell' appears followed by a prompt # - which shows that OS9 is ready for input. To re-boot the CMI:

CMI8<RETURN> or

<esc>

To temporarily transfer to OS9:

$ <RETURN>

This allows you to access the same functions as with the QUIT command and you can return to whatever you were doing. Whenever you temporarily jump out of the CMI system, the CMI continues to run in the background - which is why most OS9 operations take longer to perform.

To return to the CMI system from a temporary transfer, just press the <esc> key.

Running OS9 Commands from the CMI System

You can also issue OS9 commands without leaving the CMI system by prefacing the command with RUN:

RUN *command* <RETURN>

command An OS9 command in the Shell Commands directory.

Note: If the command creates output on the display (e.g., RUN DIR), it may print over some of the CMI page display. Use <ESC><SHIFT><F15> to refresh the body of the display. If the command and status lines are also over-printed, you can refresh the entire screen by temporarily exiting to the Shell, then returning with the <ESC> key.

Updating Your System

When a new CMI system is released, you will be given 3 floppy disks which contain the new system. First QUIT the CMI program, by typing:

QUIT<RETURN>

then put the disk called CMI-OS9-K0 in your floppy drive, and type:

PBACK /F0 /K0 -Q<RETURN>

Wait until the hash symbol (#) reappears at the left of the screen, replace the floppy disk with the one called CMI-USER-K1, and type:

PBACK /F0 /K1 -Q<RETURN>

Again wait until the hash symbol (#) reappears at the left of the screen, replace the floppy disk with the one called CMI-SYSTEM-K2, and type:

PBACK /F0 /K2 -Q<RETURN>

When this has finished, type:

WSCAT /K1>=/C0/CMI8FAST<RETURN>
<DEL>

The <DEL> key is pressed to prevent the WSCAT command from stopping at the bottom of the screen. WSCAT creates a "fast pages" file that will result in all of the page displays being loaded into waveform memory when the CMI program boots up, allowing very quick transfers between pages.

Data Storage Devices

A variety of storage devices can be used with the Series III. The internal hard disk is divided into several 'logical devices' or Partitions, containing root directories named /c0, /k0, /k1 and /k2. A root directory is that directory which contains all other directories or subdirectories on that Partition or device.

The /k0, /k1 and /k2 devices contain the same amount of memory as on a floppy disk (approx 1Mbyte) - a convenient size for transferring information to and from hard disk and floppy disk. The floppy disk device, named /f0, is used mainly for small file backup or installing software upgrades.

Other storage hardware includes Tape Streamer, External Hard Disk and Optical WORM drives (For more details; see chapters 'Setting Up the Series III' and 'Backing-Up Files').

The /c0 Device

The /c0 device is the largest Partition on the hard disk. It contains the /c0/cmifiles/fairlight directory, which contains all the CMI files you create and use.

The /k0 Device

The /k0 device contains the directories CMDS and SYS - which includes all the files used to boot and run the CMI system. The CMDS directory is accessed when you issue commands within OS9.

The /k1 Device

The /k1 device also contains a directory called CMDS with subdirectory CMIUSER8. These are concerned with the general operation and display of Series III pages.

The /k2 Device

The /k2 device also contains a CMDS directory and subdirectory CMISYS8 which also contains files for operation of the CMI system.

Determining Available Space on a Device

To measure the amount of free data space available on a device:

FREE */devicename* <RETURN>

/devicename The name of the device (e.g., /c0).

Defaults to the current root directory. The free command displays the capacity of the device in Sectors.

> Note: Each Sector contains 256 bytes (i.e., 1/4 of Kbyte) - so, divide by 4 to obtain the amount of free space in Kbytes. The 'Query Disk Space' facility on the Directory Page is expressed in Kbytes.

Erasing a Device

The DISKINIT command is used to erase a device such as floppy disk, or a hard disk Partition.

DISKINIT *device* <RETURN>

device The name of the device to be erased.

This command lists information about the device to be initialised, then prompts for confirmation. Reply *y* <RETURN>, and the device returns to its newly formatted state, i.e., containing no directories and files. Be very careful with this command when applied to hard disk.

If you wish to limit the amount of fragmentation that can occur on your hard disk, you can initialise it with a larger "cluster size". This will result in files being stored in larger blocks, and will ultimately prevent the slowing down of disk performance associated with badly fragmented drives. To do this type:

DISKINIT /C0 -c=16<RETURN>

This will create a minimum usable disk fragment of 16kbytes, as opposed to the default of 2 kbytes. Especially recommended for disk recording.

To erase a previously formatted floppy disk:

DISKINIT /f0 <RETURN>

> **Note:** DISKINIT can be used to recover the root directory (but not any of the original files) of a hard disk Partition whose root directory has been accidently erased by the TREDEL command.

Directories, Devices and Paths

The OS9 operating system uses a hierarchy of directories to contain Series III system files and user-created files. In order to specify a file, you need to know the device and directory address where it can be located by OS9. This is called the 'pathlist' or 'pathname' of the file. Each directory included in a pathlist must be separated by a slash (/); for example:

/devicename /dirname1 /dirname2.../dirnameN /filename

Directories form a branching tree structure: The root directory (device) can branch into a number of other directories - each of which can contain several other subdirectories, and/or files.

For example;

To delete the file *fred.vc* in the FAIRLIGHT directory, type the Delete command followed by the pathlist to the filename to be deleted:

DEL /c0 /cmifiles/fairlight/fred.vc <RETURN>

The Working Directory

The current directory in the CMI system is called the working directory in OS9. The default directory on the internal hard disk - which contains all your CMI files, sounds, sequences etc. - has a pathlist of:

/c0/cmifiles/fairlight

Another directory can be made the working directory - to allow you to access files without always having to specify a pathlist. If you omit the pathlist, OS9 assumes all files specified are in the working directory. If not found, an error message results; for example:

Error 216 - Path Name Not Found

Use the CHD command to make a directory the working directory:

CHANGEDIRECTORIES *pathname* <RETURN>

pathname The pathlist to the directory you want to become the working directory.

Changing directories is useful when you want to perform operations on a number of files in another directory.

For example;

Suppose the /c0/cmifiles/fairlight directory is not the current directory, and you want to change directories to delete a number of files there. Type:

CHD /c0/cmifiles/fairlight <RETURN>

Now, to delete fred.vc, type:

DEL fred.vc <RETURN>

A file in a directory at a 'lower level' than the current directory can be referred to by a partial pathlist containing just the names of the directories below the current level.

Files in levels directly 'above' the current directory can be addressed using periods:

One period refers to the current directory:

.

Two periods refer to the directory one level up:

. .

Three periods refer to the directory two levels up:

. . .

and so on.

Files not belonging to any of these categories must be specified by their full pathlist.

Determining the Working Directory

The Display Working Directory command, displays the name of the current working directory.

PRINTWORKINGDIRECTORY<RETURN>

Upon entering OS9 from the CMI system, the result of this command is:

/c0/CMIFILES/FAIRLIGHT

Changing the Executions Directory

When a command is specified in OS9, the operating system looks for the command in the Executions directory. This defaults to /k0/cmds. To change the Executions directory, type:

CHANGEEXECUTION *pathlist* <RETURN>

pathlist The pathlist of the new commands directory.

To check the contents of the Executions directory:

PRINTXECUTIONDIRECTORY<RETURN>

This may be useful if you want to store commands (for safe keeping) in a separate directory on another Partition or device.

Display Directory Contents

To display the contents of the current directory:

DIRECTORY<RETURN>

Upon entering OS9 from the CMI system, the DIR command lists the Fairlight directory - as displayed on the Series III Directory page. Any directory in the Series III can be displayed by adding its pathlist to the DIR command.

For example;

If /c0/cmifiles/fairlight is the working directory, and you want to display the /k0/cmds directory, type:

DIR /k0/cmds <RETURN>

Creating a Directory

The MAKDIR command creates a directory with the specified pathlist:

MAKEDIR *pathlist* <RETURN>

For example;

To create the directory *newsounds* in the /c0 device:

MAKDIR /c0/newsounds <RETURN>

Now, to enable *newsounds* to be the working directory:

CHD /c0/newsounds <RETURN>

The pathlist must be valid; i.e., all directories named in the path, other than the final directory (to be created) must already exist.

Note: This OS9 command is also available within the CMI system.

Deleting a Directory

The command to delete a directory and all the files contained within it is:

TREeDELete <RETURN>

TREDEL prompts for the pathname of the directory and any options. This allows for selective file and directory deletion.

Options to TREDEL:

F	query before deleting each file.
D	query before deleting each directory.
W	if file protected then delete anyway.
-W	if file protected then do not delete.
N	delete contents of directory only.
R	request new options for next level down.
/	specify options for next level.

For example;

If you are currently in the /c0 root directory, and you want to delete the newly created *newsounds* directory and all the files within it:

TREDEL<RETURN>

Path Name: *newsounds* <RETURN>

Options (enter "?" for help) : <RETURN>

Caution: Never use this command as a way to erase all files in a hard disk Partition - /c0, for example - since the root directory contained there will also cease to exist. If this happens, you must use the DISKINIT command to recover the Partition, then re-make the Partition name (e.g., MAKDIR /c0). If all else fails, consult your distributor.

Copying a Directory

The entire contents of a directory can be copied to another with the TRECPY command. Use this to copy the contents of a hard disk onto another. Quit the CMI system, and specify the maximum memory option for faster copying:

TREeCoPY <RETURN>

TRECPY prompts for the pathname of the source directory, the pathname of the destination directory, and any options.

Options to TRECPY:

F: query before copying each file.
D: query before copying each directory.
A: if directory exists then append.
-A: if directory exists then do not append.
W: if file exists then overwrite.
-W: if file exists then do not overwrite.
C: make lower case files and upper case directories.
M: use maximum memory for copy (60k).
R: request new options for next level down.
/: specify options for next level.

The TRECPY command lists files copied. When the screen is full, it pauses and waits for you to hit a key before continuing. Striking the <DEL> key causes the listing to continue - without further interruption. Striking the <RETURN> key advances the display (and command operation) by one line. Striking any other key advances by one page.

For example;

To copy the entire contents of device /c0 to the external hard disk device /c200:

TRECPY <RETURN>

After the Source Directory prompt, type:

/c0 <RETURN>

After the Destination Directory prompt, type:

/c200 <RETURN>

To display all options available with the TRECPY command, type a ? when prompted. Press the <DEL> key to prevent the command pausing when the screen fills.

For example:

To append files to the directory, and prevent any duplicate files on the /c200 device from being overwritten, and using a maximum of 60k memory, type:

WAM <RETURN> after the prompt, `Options ( "?" for help):`

File Management

The following commands allow you to Rename, Copy, Delete, and Move files from within the OS9 operating system (also available on the CMI Directory page). There are other commands which allow you to List, Dump, Compare and Search for files.

Renaming a File

To rename a file:

RENAME *filename newname* <RETURN>

filename The name of the file to be renamed. Include pathlist if not in the working directory.
newname The new name of the selected file.

For example;

To rename *Arthur.vc* in the FAIRLIGHT directory to *Martha.vc*, select FAIRLIGHT as the working directory, then type:

RENAME Arthur.vc Martha.vc <RETURN>

Copy a File

To copy a file:

COPY *filename copyname* <RETURN>

filename The name of the file to be copied. Include pathlist if not in the working directory.
copyname The copy-name of the file. Include pathlist to specify outside the working directory.

Deleting a File

To delete a file:

DEL *filename* <RETURN>

filename The name of the file to be deleted. Include pathlist if not in the working directory.

Move Files or Directories

The Move command is used to move both individual files to a new directory (rather than copy a file from one directory to another) or it can move complete directories into another directory:

MOVE *filename dirpath* <RETURN>

filename The name of the file/directory to be moved. Include pathlist if not in the working directory.
dirpath The pathlist of the destination directory.

The directories must be in the same device for the Move command to operate.

Listing a Text file

Files consisting of printable ASCII characters can be displayed on-screen, or sent to the printer:

LIST *filename* <RETURN>

If the file is not an ASCII text file, the screen will display 'garbage' characters.

Dumping a File

This command displays the contents of a file in hexadecimal and ASCII notation. Unprintable characters are displayed as a (.) period. It may be safely used to display the contents a file whose type you are not sure of (text, command, etc.). You can also use it to test whether a file contains any data at all.

DUMP *filename* <RETURN>

Printing a Text File

There are two ways to print an ASCII text file:

The LIST command can be used to print any text displayed on-screen. This requires a re-direction arrow (to printer Port 1 or 2).

For example;

To send a text file, called *mywritings* (located on the /c0 device), to printer Port 1:

LIST /c0/mywritings >/P1 <RETURN>

The *PP* command prints a specified text file, incorporating a certain amount of paragraph formatting (page no., date). This command can only output to printer Port 1:

PP *filename* <RETURN>

Any text displayed on the screen by a command can be 'piped' (re-directed) to the printer by following that command with ***!PP***. The *!* character is called a Pipe modifier - and is used to re-direct standard input and standard output (For more details, see section 'Running an OS9 Shell').

For example;

To re-direct a listing of the current directory to printer Port 1:

DIR !PP<RETURN>

PP command options:

-a	disable special assembler trap.
-e	disable even page eject.
-h	specify heading thus: -h=<heading>.
-j	eject one extra page so that listing can be removed.
-n	include line numbers.
-p	specify page length thus: -p=nnn (min=9, max=32767).
-o	specify output path thus: -o=<pathname>.
-v	overwrite if file exists.
-w	specify width thus: -w=nnn (min=40, max=136).

The equals sign (=) between option and parameter is optional.

Identifying a File

The IDENT command displays technical information on a specified file module currently stored in OS9 memory.

IDENT *modulename* <RETURN>

{option} **-X** Looks for the file in the commands directory.

This command may be used to identify the version of a particular CMI system file.

For example;

To establish the version of the wscat program file you now have in your CMI, type:

INDENT -/k0 /cmds/wscat<RETURN>

The header information printed out includes an item labelled 'Module CRC:' - which allows us to determine which wscat version you currently have installed.

Comparing Two Files

This command compares data stored within two files:

COMPARE *file1 file2* <RETURN>

file1 file2	The names of the two files to be compared. Include pathlist if the files are not in the working directory.
{option} #48	Use maximum amount of memory to speed operation.

If any data differences are encountered, the file place (offset), values and a summary of the number of bytes compared is displayed.

This command is useful for determining if two Voice files of the same name (in different directories) are actually the same sounds.

Search for a File

The Query File command is used to find files in a selected directory. You can search for a specific file in the working directory, or any directory specified by a pathlist. If a filename is not specified, all the files in the working directory are found:

QUERYFILE *filename* <RETURN>

{option} *-e*	Requests an expanded listing of the results of the search.
{option} *-u*	Distinguish between upper and lower case letters.
{option} *-d[l]*	Directory Tree search; Search the working directory first, then all subdirectories contained therein. *[l]* is the number of levels to limit search. If no number is included, a maximum of 9 levels is searched.

The output of the QF search command can 'pipe' into the OS9 *DO* command (see below).

For example;

To delete all files in the working directory beginning with the word *junk*:

QF junk* !DO DEL <RETURN>

Also, a group of files can be searched for - using Series III wild cards:-

*	match zero or more characters.
:	match exactly one character.
=	match nothing or one characters.

The DO Command

The DO command allows you to repeat the same operation on any number files:

DO *command* <RETURN>

command The command to be performed on selected files.

For example;

To delete a number of files in the current directory, type:

DO DEL <RETURN>

The > prompts appears. Enter the names of the file to be deleted, followed by a <RETURN>. The file is deleted and the > prompt re-appears. Press <RETURN> to terminate the DO function.

When used with the QF command, commands can be performed on any number of files contained within a directory.

For example;

To rename a number of files in a directory:

QF *bass.vc ! DO RENAME ~ new_~ <RETURN>

Note the use of the tilde (~) character. The selected Voice files ending with *bass* are found with the QF command and 'piped' to the DO command - which then takes these files and performs the Rename function, adding the word *new_* to the beginning of each.

Formatting Floppy Disks

The FORMAT command must be performed before any data can be written to a new disk. Most new hard disks are already formatted when purchased. Issuing the FORMAT command completely erases everything on the disk.

To format a floppy disk, place the disk in the drive and type:

FORMAT /F0<RETURN>

Options that may be included after /f0:-

diskname:	The new name for the floppy disk.
S/D	Density; single or double.
R	Ready.
P	No Physical Format.
V	No Verify.
N	No Printout.
Tnn	set Track to Track Skew.
Hnn	set Head to Head Skew.
1/2	number of sides.

For example:

FORMAT /f0 VRN <RETURN>

The VRN options tell OS9 that the device is ready to format, verify is not needed and that there be no printout to the screen.

If the disk is already formatted and you just want to scrub all files, type:

FORMAT /F0 VRNP <RETURN>

The **P** option tells OS9 that a 'physical' format is not necessary. Only the disk allocation map is re-written.

Running an OS9 Shell

The CMI System runs within an OS9 Shell - set up according to commands in the Startup text file in the /k0/sys directory.

The Shell is actually the command-interpreter program for OS9. It reads typed input from the alphanumeric keyboard (the standard input) and interprets these as commands. The Shell terminates when it has finished interpreting commands on the command line.

The list of parameters on a command line is called the *arglist* (argument list).

If the arglist is empty, the Shell starts by reading the first line of input from the alpha-keyboard. If arglist is provided - i.e., when Shell is called from another Program - the Shell interprets arglist as its first line of input.

If the arglist consists of built-in commands only, the Shell executes them in turn. Otherwise, Shell executes the non built-in command(s), then terminates.

Built-in Shell Commands

ex *name*	=	chain to program name.
chd *pathlist*	=	change working directory to pathlist.
chx *pathlist*	=	change execution directory to pathlist.
kill *proc* ID	=	send an abort signal to process identified, (proc ID).
setpr *proc* ID pri	=	change process priority proc ID's priority to pri.
w	=	wait for child process to terminate.
p	=	default; turns shell prompt and message on, (-p to turn off).
-t	=	(default) don't copy input lines to output, (t copy all input lines to output).
x	=	default; abort on error (-x don't abort on error).
* (comment)	=	text line (not processed).

Input/Output Re-direction Modifiers

Commands inherit input, output and error paths from the OS9 Shell. Re-direction notation may be used to alter the standard paths of a program. For example, you can re-direct the List output from the screen to printer Port 1.

Here is a list of Re-direction Modifiers:

< *filename*	=	re-direct standard input to come from pathlist of *filename*.
> *filename*	=	re-direct standard output to pathlist of *filename*.
>> *filename*	=	re-direct standard error to *filename*.
>>> *filename*	=	re-direct standard output and standard error to *filename*.

The *filename* is taken to be relative to the Shell's working directory.

Re-direction Modifiers must be immediately followed by a pathlist describing the file or device the I/O is to be re-directed to or from. They can be used before and/or after the program's parameters, but each modifier can only be used once.

Output Re-direction Modifiers can also be followed by additional optional parameters;

=	Causes *filename* to be overwritten.
+	Causes *filename* to be appended to.
%	Causes *filename* to be taken as relative to the execution directory, which is then created with execution attributes.

Combining Commands

More than one command can be executed sequentially or concurrently on a single Shell command line by separating commands by a ; (semi-colon). If an error occurs, subsequent commands on that line are not executed.

Concurrent Commands

Commands separated by the ampersand (&) character run concurrently. The number of programs run at the same time is not fixed.

Pipe Modifier

Commands separated by a ! character (pipe), are also run concurrently; the standard output of the command to the left of the ! is connected to the standard input of the command to the right. Various forms of pipe are:

cmd1 ! *cmd2*	cmd1 standard output	-->cmd2 standard input.
cmd1 !! *cmd2*	cmd1 standard error	-->cmd2 standard input.
cmd1 !!! cmd2	cmd1 standard output + cmd1 standard error	-->cmd2 standard input.
cmd1 !> cmd2	same as cmd1 !!! cmd2	

Keeping a Log File

The Series III permits you to keep a log of any notes or 'bugs' found on the system. The LOG command allows to you to log any comments in a file; either whilst in the OS9 operating system, or when using the CMI. Type;

LOG <RETURN>

The operating system then awaits input. A Log file is created in the /k0 device. Press the <ESC> key to exit.

The LOG command may also include text;

LOG text <RETURN>

This text is appended to the /k0/*log* file, and the command terminates immediately. Use the List command to display the contents of /k0/*log*.

Build A Text File

The BUILD command creates a text file from typed input.

To build a text file from standard input, type;

BUILD *filename* <RETURN>

This command creates a text file with the given name, then displays a '?' prompt to request input. Each line entered is written to the created file. Entering a line with only a carriage return terminates the command. The standard input of the BUILD file can be re-directed using the Shell re-direction commands.

Screen Dumps

A screen dump of any page within the Series III system can be made and then dumped to a laser printer using postscript format facilities (such as the Apple LaserWriter Plus). A serial XON/XOFF RS-232 cable must be connected from printer port 1 of the Series III to the RS232 input of the Apple LaserWriter. The Laser printer must be switched to 9600 baud rate.

The screen dump facility involves two commands; the first command is to make the screen dump file and the second is the actual output of the postscript screen dump to the printer.

Create Screen Dump File

The Create Screen Dump command makes a bit map copy of the screen which is saved into a default screen dump file on the /C0 device (if a pathname is not specified). It is advised to use *.px* suffix for all your screen dump files so they can be easily found on the Directory Page.

The Screen Dump command is issued from any page within the Series III with the help of the RUN command:

RUN SCRDUMP <RETURN>

(option) **-S=***n*	Wait *n* seconds before performing the screen dump Allows you to set up any information on the page before a copy of the screen is made.
(option) *pathname*	A directory and a filename of the screen dump. Defaults to ***/C0/default_px*** if a pathname is not given.

Example:

To create a screen dump file while in the Cue-list page and place it a directory called SCREEN on the /C0 device, type:

run scrdump /c0/screen/cue_list.px <RETURN>

Display Screen Dump

A screen dump file can be displayed on the screen before being printed with the following OS9 command procedure:

VFORK SCRFILL *filename*;**SLEEP**<RETURN>

filename The filename of the screen dump. Use a pathlist or change directories to specify the *filename*.

Note: The SLEEP command suspends the current OS9 process indefinitely. To "wake-up" the Series III, you must use the <CTRL-

Q> interrupt. A number of processor clock ticks can be specified after the SLEEP command so that it will wake up when this time has elapsed. SLEEP 100 gives about 7 seconds of suspended process time.

Use the QF command to display multiple screen dump files from the same directory:

QF *px ! do {vfork scrfill ~;sleep 80} <RETURN>

Print Screen Dump

The Post Script command is used to print the screen dump file and employs a number of options to help get the exact size and orientation of print.

The command to print the screen dump file:

PSDUMP *filename* **>/p1**<RETURN>

filename Name of source screendump file. This can be placed before or after the following options

{option}	**-P**	Print in A4 portrait mode (default: A4 landscape)
{option}	**-I**	Invert the image (default: background black)
{option}	**-B=*b***	Draw a border *b*cm wide around image (default: 0.6cm)
{option}	**-N=*n***	Produce *n* copies of the screen dump (default: 1)
{option}	**-L=*l***	Make left margin *l* cm (default: image centred on page)
{option}	**-T=*t***	Make top margin *t* cm (default: image centred on page)
{option}	**-X=*x***	Make width of screen dump image *x* cm (default: 12cm)
{option}	**-Y=*y***	Make height of screen dump image *y* cm (default: 9cm)

The B, L, T, X and Y options may all be fractional decimal numbers. You may not specify both the -x and -y options in the same command. If either -x or -y is given, then PSDUMP re-calculates the other to preserve the 3-to-4 aspect ratio of the screen page.

Note: Use the OS9 QF command to help print a number of screen dumps at a time. Note also that the Apple LaserWriter needs a few seconds between multiple prints to reset its buffer. An example of multiple printing of screen dump files is given below:

QF *px ! do {PSDUMP -p -i -b=0.2 -x=12 ~ >/p1;sleep 1200 }
<RETURN>

This will produce an inverted print with a length of 12 cm in the centre of a A4 page.

* * *

Appendix B

OS9 Text Editor

Contents

Introduction

The OS9 Editor is a functional word processor which allows you to create and edit text files on the Series III. These can be used to organise your own records, or to produce Command files - used for issuing a series of 'batch'-type commands in OS9.

The Editor is accessible from the OS9 operating system. Transfer temporarily to OS9:

$ <RETURN>

Press <ESC> to return to the CMI System.

To enter the Text Editor from OS9:

EDIT *filename* <RETURN>

filename The name of the file you wish to edit (include pathlist if not in the working directory).

If *filename* is not found in the working directory (or the directory specified by the pathlist), then the Editor creates a file called *filename*.

The Editor opens any type of file, so be sure that the file you specify is a text file - otherwise the screen may fill with 'garbage' characters.

If you want to edit an existing file and save the result under another name, the command is:

EDIT *sourcename destname* <RETURN>

sourcename The name of the file to be loaded.
destname The name of the file in which the edited result will be saved.

The Editor always creates a scratch file, called *etmp.xxx*, (where *xxx* is a number) which can appear in the directory. This file should be automatically deleted when you exit the Editor - and its purpose is to extend the memory available for the edit file. If the scratch file cannot be created for some reason, the Editor will not run. If you find an *etmp.xxx* file in the directory after you exit, you may delete it after you have done your edit but not before.

The line at the bottom of the Editor screen is called the status line. To correct mistakes, position the screen cursor to the right of the error and erase one character at a time by pressing the <DEL> key.

Most Editor commands are issued using either the <CTRL> or <ESC> keys, in conjunction with an alphanumeric key.

For example:
To move the cursor one word to the right:

<CTRL-F>

To insert the current time and date into text at the cursor position:

<ESC-@>

To abort an Editor command:

<CTRL-Q>

To control the position of the screen cursor, use the arrow keys:

<UP> moves the cursor up one line.
<DOWN> moves the cursor down one line.
<RIGHT> moves the cursor one character to the right.
<LEFT> moves the cursor one character to the left.

When you have finished editing, type:

<ESC-Z>

The message:

Overwrite existing file (Y/N) ?

appears at the bottom of the screen. Answer *Y* to save your edited file and return to OS9.

To quit the editor <u>without saving</u> the edited file, type:

<ESC-Q>

The message;

Abort edit (Y/N) ?

appears. Type *Y* to return to OS9.

Other functions of the editor allow deleting, un-deleting (recovering deleted characters), inserting characters, search-and-replace, copying and tabulation. Additional files, or a block of text (separate from the main file) can be built up and appended to the existing file at the cursor position. The Editor can also be placed in 'Learning' Mode - where it remembers sequences of keystrokes ('macros') that can be saved as a Command file for later recall.

The Status Line

Using Editor functions requires an understanding of the status line:

Mode:ILPXEK WG:S Wild:?:= ULF:+

Flag letters that can follow the word Mode are:

(for L,P,X and E; a dot appears if the feature is OFF)

I	=	Insert mode.
O	=	Overwrite mode.
L	=	Program Learning mode.
P	=	Program Run mode.
X	=	Execution mode for Command files.
E	=	<ESC>Lock mode.
K	=	Keyboard Input mode during Program or Command file execution (<ESC-%> or <ESC-&>).

The next three fields display information relevant to search operations:

WG: Word Grain size (S=small, M=medium, L=large). Refers to criteria the Editor uses to distinguish a word.

Wild: Wildcard characters used during search operations.

ULF: Indicates whether Upper and Lower case characters are distinguished when searching.

- \- Distinguished.
- \+ Not Distinguished.

The area to the right of these fields displays user queries and error messages.

Moving the Cursor

Many functions depend on the position of the cursor - which can be moved within text in a number of ways. Some functions also have alternative commands (see 'Text Editor Command Summary' - end of this chapter):

MOVE CURSOR	COMMAND
Character:	
Left:	<LEFT>
Right:	<RIGHT>
Display line:	
Down:	<ESC><SUB>
Up:	<ESC><ADD>
Word:	
Right:	<CTRL-F>
Left:	<CTRL-V>
Paragraph:	
End of current par:	<ESC><RIGHT>
Start of current par:	<ESC><LEFT>
Start of next par:	<DOWN>
Start of previous par:	<HOME>
End of previous par:	<UP>

Half Page (11 lines):

Down:	<SUB>
Up:	<ADD>

Entire Text:

Bottom:	<CTRL-B>
Top:	<CTRL-T>

Tabulation:

Right to next tabstop:	<TAB>
Left to next tabstop:	<SET>

Repeat-Count

Any command may be preceded by a repeat-count of the form:

<ESC-*number*>

number up to a 6 digit signed number; e.g., <ESC- **-456**>

The repeat-count applies only to the immediately following command, and can mean different things depending on the type of command which follows it. Some commands ignore it completely. Most of the time, a repeat-count causes the following command to be repeated the number of times specified. If the repeat-count is zero, the command is repeated indefinitely, until either the end of the file is reached, or you type:

<CTRL-Q>

For example;

To move the cursor 5 characters to the left.

<ESC-5><LEFT>

To add 10 'A's to the file: AAAAAAAAAA

<ESC>10A

In the following command descriptions, *repeat* refers to a repeat-count specified before a command. Also, *filename* defaults to the current filename - unless you specify *filename* (by inserting a block-marker, and typing *filename* prior to the command).

File Loading and Saving

To Load file into text at cursor position:

<ESC-A>

A query appears. Type *Y* to continue.

To Save file under *filename*, and remain in Editor.

<ESC-S>

Default: current filename. Query.

To Save file under *filename*, and exit Editor:

<ESC-Z>

Default: current filename. Query.

Change current filename to *filename*:

<ESC-F>

Inserting Text

The Editor can operate in Insert or Overwrite mode. Insert mode is the default mode for the Editor - indicated by the *I* in the Mode field, in the status line. Whenever you type a character in Insert mode, all text to the right of the cursor moves one position to the right.

Characters typed in Overwrite mode replace the character at the cursor position - which moves one position to the right. Overwrite mode (indicated by an *O* in the Mode field) is useful when you are typing text in columns.

To toggle between Insert and Overwrite modes:

<ESC-O>

Inserting Spaces

To Insert space ahead of cursor:

<ESC-SPACE>

To Insert spaces to next tabstop:

<CTRL-J>

To Insert carriage return behind cursor:

<RETURN>

Inserting Time and Date at Cursor

To Insert current time and date:

<ESC-@>

To Insert current filename preceded by block-marker:

<ESC-">

Inserting Block-Marker

Block-markers are used for Block functions and operations - e.g., Search-and-Replace. When a block-marker is specified before the cursor position, text is displayed in inverse video between these points in the file.

To Insert block-marker:

<CLEAR>

To Insert block-marker at start of *repeat* line previous:

<ESC-B>

Deleting Text

Text is deleted according to the current cursor position:

DELETE COMMAND
Character: Right: <CTRL-D> Left: <DEL>
Word: Right: <CTRL-E> Left: <CTRL-K>
Line: Right, to end of line: <CTRL-H> (If at end, then delete next line) Left, to start of line: <CTRL-A> (If at start, then delete previous line) Whole line: <CTRL-U>
Block: Left, from marker to cursor: <ESC-D> Left, from top of file to cursor: <ESC-(> (query) Right, from cursor to end of file: <ESC-)> (query) Entire file: <ESC-'> (query) Trim spaces from end of current line: <ESC>T>

Text deleted can be restored, one character at a time, immediately after deletion:

RESTORE	COMMAND
Restore character Right: (To follow a Left Deletion)	<CTRL-G>
Restore character Left: (To follow a Right Deletion)	<CTRL-W>

Search-and-Replace Character Strings

To specify a character search-string, Insert a block-marker in the text, then type:

<CTRL-L> *search-string*

The string is displayed in inverse video. You can then search backward or foreward from the cursor position.

To search forward:

<CTRL-S>

To search backward:

<CTRL-Z>

The cursor moves to the nearest occurrence of a matching search-string. The string is removed from where you typed it in the text, and becomes the current search string.

This string can be searched for again whenever you type <CTRL-S> or <CTRL-Z>. To change the search-string just Insert another block-marker, and type in a new string.

Upper/Lower Case Search

The ULF field on the status line defaults to+ - meaning that upper and lower case characters are treated as equivalent during searches. To distinguish between upper and lower case when searching, type:

<ESC-><ESC-COMMA>

The ULF field now displays -. To change back again, type:

<ESC+><ESC-COMMA>

Wild Characters in the Search String

The search string can contain wild characters. A wild character will be matched with a range of other characters in the search. Using wild characters enables you to search for members of a family of similar strings rather than for a specific string.

You can specify up to 3 different wild characters. By default, all 3 wild characters are disabled. Wild characters are displayed on the Status line in the **Wild:** field.

To select the wild characters, you insert a block-marker then the three desired wild characters in order. Then use close the search with the <ESC><COMMA> command. e.g to make a search for the three characters & , % and $:

<CTRL>L
&%$
<ESC><COMMA>

(Note that the above key sequence is displayed on 3 separate lines for clarity only. There are no <RETURN>s in the sequence.)

Wild card characters:

& will match any number of characters from zero onward. e.g. The search string *&cat* will match *cat* , *scat* , *tomcat* , *wildcat* etc.

% will match exactly one character. e.g. the search string *%cat* will match *scat* but not *cat* or *tomcat*. It will find and match the *mcat* part of the *tomcat* string. It will not match <RETURN>*cat*, i.e., *cat* at the beginning of a line, but will match <RETURN> *cat*, i.e. *cat* one character in.

**$** will match 0 or 1 characters. e.g. the search string *$cat* will match *cat* and *scat* but not *tomcat*. It also will find and match the *mcat* part of the *tomcat* string.

Replace Character String

To change a string to another string, you first use the search function to specify and find the string to be replaced. If you have specified the search string previously, you can move straight on to specifying the replacement string.

You type in the replacement string after a block-marker:

<CTRL>L *replacement string*

Then you type:

<CTRL>C

The replacement string is removed from the text where you typed it and remembered as the Current Replacement String. The Editor searches for the current search string, and replaces it with the current replacement string. If you specify a repeat count of repeat the Editor will automatically replace repeat instances of the search string with the replacement string. If no repeat count is specified, then the Editor displays the first match string it finds.
To the right of the Status line is displayed the message:

Change this (z/y/n/^y/^n)?

You then type one of the following (note that the caret ^ is used to indicate the <CTRL> key is to be pressed in conjunction with the specified key):

^*Y* Change this instance and all others until the end (in the case of right search) or start (in the case of left search) of the file is reached.

Y Change this instance and continue to next.

N Do not change this instance but continue to the next.

Z Change this instance then stop

^N Stop

Tabulation

The default tabstops are located at column 1 and every 5th column thereafter.

To set a tabstop at current column:

<ESC>I

Remove existing tabstops :

<ESC>I

Clear all tabstops:

<ESC>J

Set a tabstop at every *n*th column:

<ESC>*n* <ESC>J

Note: A repeat count of 1 or more results in setting tabstops, otherwise tabstops are removed.

Moving from Tabstop to Tabstop

These commands move the cursor without displacing the text. If there is no text to the right of the cursor, spaces are inserted between the cursor's starting position and its final position.

Move right to next tabstop:

<CTRL>I <TAB>

Move left to next tabstop:

<CTRL>Y <SET>

Inserting Spaces while Tabbing

These commands are used for moving text around relative to the tabstops you have specified.

Insert spaces to next tabstop:

<CTRL>J

The text to the right of the cursor moves with the cursor. The cursor moves to the next tabstop. Spaces are inserted between the cursor's start position and its final position over the tabstop.

Decimal tab:

<ESC>$

Suppose you wish to place a certain character in a word over the next tabstop. You place the cursor over the character and give the decimal tab command. The Editor then moves the cursor to the next tabstop, by inserting spaces at the beginning of the word in which the cursor rests.

The decimal tab has one little aberration. If you apply it to a word at the very beginning of a line, it does not move that word, but the last word on the previous line. This is because the previous word is separated from the word on the next line by a <RETURN> character only, and the Editor sees the last word, the <RETURN> and the word you wish to move as one whole word. To overcome this, put a space in front of the word you want to move.

One other eccentricity of the tabbing: If you tab past the last tab stop, the cursor moves to the 255th space in the line. You notice this particularly when you have removed all tabstops with the <ESC>*J* command. In this case tabbing always results in moving down 3 lines plus 3 characters. You can delete the spaces this adds to your file with <CTRL>*K* (delete word left).

Block Functions

The Editor has a block-buffer for use when manipulating blocks of text. After marking out a block of text, you can copy the block text to the block-buffer, or remove it from the text and place it in the block-buffer.

You can append the block-buffer to the text at the cursor position. You can save the contents of the block-buffer as a file, or append the contents of the block-buffer to an existing file.

Moving Text to the Buffer

To mark out a block of text, you insert a block-marker at the beginning of the block:

<CTRL>L or <CLEAR>

You then move the cursor to the end of the block. The block will be displayed in inverse as you do so. Then use one of the following commands.

Grab block and place in buffer:

<ESC>G

The marked block is removed from the text and placed in the Block Buffer.

Copy block into buffer:

<ESC>C

If repeat specified then duplicate in text repeat times.

Append block to buffer n times:

<ESC>*n* <ESC>N

n is a repeat count. The block is not deleted from the text.

Append block to buffer n times:

<ESC>*n*<ESC>E

Moving the Buffer to the Text

Place the cursor at the point in your text where you want the buffer contents to be inserted.

Restore block-buffer into file at cursor:

<ESC>R

Copying a Block of Text

To duplicate the part of the current paragraph to the left of the cursor, there is a single command:

Duplicate paragraph above:

<CTRL>R

For duplicating other blocks use a block-buffer command. To make a copy of a block just below it in the text, use <ESC>C. To make a copy of a block at some other point in the text, copy it into the block-buffer, move the cursor to where you want the copy, then restore the buffer to the text:

Mark block the blocked to be copied:

<CTRL>L

Then move cursor to end of block to be copied and issue the copy block command:

<ESC>C

Move cursor.to the position in the text where the copied text will be inserted:

<ESC>R

Move Text

To move a block of test, first mark the block:

CTRL>L

Then move cursor to end of block to be moved and issue the Grab text command:

<ESC>G

Move cursor to the position in the text where the grabbed text will be inserted:

<ESC>R

Saving a Block to a File

To save the buffer to a file, there are two command which require both filename by inserting a block-marker wherever you happen to be in the text and then typing the filename, then the command.

Save contents of buffer under filename:

<ESC>V

There is a query if this will overwrite an existing file.

Append buffer to filename:

<ESC>M

Removing Block Markers from Text

Block-markers are normally not left in the file. They are removed automatically after a Block Copy, Block Grab, Search, or File operation. However, if you do have a block-marker in your file, the text will be inverted between it and the cursor. It is a good idea to delete block-markers, as they may confuse programs and printers to which you send the file.

You can find the position of the block-marker by moving the cursor left until the inversion disappears. The block-marker is not visible in the display, but can be detected by this inverse video effect. When the cursor is at the right of the block-marker, delete the marker with the <DEL> key.

OS9 and the Text Editor

You can leave the Editor and return to OS9 temporarily or permanently, with or without saving your text first. You can execute some OS9 commands without leaving the Editor.

Temporarily exit the Editor:

<ESC>K

You enter an OS9 Shell, where you can execute all the OS9 commands such as listing directories, editing another text file, etc. Then to return to the Editor as you left it:

Return to Editor after temporary exit:

<ESC>

To execute OS9 commands from the Editor simply place a block-marker in the file; <CTRL>L. Then type an OS9 command line. This can consist of several instructions separated by semi-colons.

Then give the "Enter Shell" command:

<ESC>K

Change Data Directory from the Editor

Specify directory by inserting a block-marker and typing the directory pathlist, then:

<ESC>H

For example;

To change to a subdirectory called *newdirectory* in the /c0/CMIFILES directory:

<CTRL>L
/C0/cmifiles/newdirectory
<ESC>H

Change Word Grain Size

The word grain is the criteria the Editor uses to distinguish a word when deleting or moving the cursor or executing other word-oriented commands. There are three word grain sizes, small, medium and large. The word grain size is indicated on the status line. You change between them cyclically: Small -> Medium -> Large -> Small.

Small: Words are separated by a change from lower case to upper case characters or vice versa, a change from numeric to alphabetic characters or vice versa, and by the appearance of any non-alphanumeric character.

Medium: Words are separated by a change from numeric to alphabetic characters or vice versa, and by the appearance of any non-alphanumeric character.

Large: Words are separated by spaces or <RETURN>s only.

To cycle through the word grain size:

<ESC>W

Escape Lock Mode

The Escape lock mode is a feature useful when you want to enter a long sequence of escape commands. When in this mode, everything you type in is assumed to be preceded by <ESC>.

For example;

If you typed *12r* in escape lock mode will be interpreted as <ESC>12<ESC>r.

Enter ESC LOCK mode:
<ESC><ESC>

Query. Reply *Y* to enter.

Exit ESC LOCK mode:
<ESC>

Editor Programs and Command Files

The Editor has a program buffer, in which you can store a sequence of keystrokes. You can execute the programmed sequence, once or repeatedly. The Editor interprets the keystrokes and executes any commands as if they had been entered from the keyboard. You can save the program in a file, and then execute the file.

Abort program execution:

<CTRL>Q.

Enter Program Learning mode:

<ESC>P

An *L* will appear in the Mode field on the Status Line.

Type the keystrokes. When the sequence is complete, exit Program Learning Mode:

<ESC>P

The *L* disappears from the Status Line Mode field.

In addition to any of the Editor commands already listed, there are two specific to program mode:

Wait for next *n* characters from keyboard:

<ESC>*n* <ESC>%

Wait for next n characters from keyboard or from command file:

<ESC>*n* <ESC>&

If you specify a repeat count (*n*) of zero, the program will wait until you have typed either <ESC>& or <ESC>% before resuming execution.

Saving an Editor Program

After building up your program file in the program buffer, you specify a filename by inserting a block-marker and then giving the command:

Save program in filename:

<ESC>!

There is a query if this will overwrite an existing file. The program is saved in a default directory called EDITOR. If there is no EDITOR directory, an error message will be displayed. In this case, type:

<CTRL>L
MAKDIR *EDITOR*
<ESC>K

This will execute an OS9 command which makes a new directory called EDITOR. When this operation is complete, save your program file again.

Executing a Command File

In the following command descriptions, "display" means that after each run of the program the Editor display will be altered, and "blind" means that the program will run for the specified number of repeats before the display is altered. The "blind" options are faster but more potentially dangerous. Execute with care.

Execute program in buffer, display :

<ESC>X

Execute program in buffer, blind:

<ESC>Y

The difference between these two modes is only noticeable when you specify a repeat count.

In the following commands, you specify the filename by inserting a block-marker first then typing the filename. To execute a command file, you can first load it into the buffer then use the above commands.

Load command file filename into program buffer:

<ESC> #

Alternatively you can execute the command file directly, without affecting the current program in the buffer.

Execute command file filename, display:

<ESC> :

Execute command file filename, blind:

<ESC> *

For example;

To execute the file called *insertaddress* 9 times blind, type:

<CTRL>L
insertaddress
<ESC>9
<ESC>*

Text Editor Command Summary

Control Characters

Control characters are invoked by simultaneously holding down the <CTRL> key and the character key.

<CTRL>	Description
A	Delete to start of line. If at start of line, then Delete previous line.
B	Move to bottom of text.
C	Change current match-string to *change-string*. (Default: current string).
D	Delete next character.
E	Delete word right.
F	Move word right.
G	Restore character right.
H	Delete to end of line. If at end of line, delete next line.
I	Move right to next tabstop.
J	Insert spaces to next tabstop.
K	Delete word left.
L or <CLEAR>	Insert block-marker.
M or <RETURN>	Insert carriage return behind.
N or <ADD>	Move half page up.
O or <SUB>	Move half page down.
P	Kill keyboard queue (OS9 function).
Q	Abort current command (OS9 QUIT signal)
R	Duplicate line above.
S	Search right for *string* (Default: current search-string).
T	Move to top of file.
U	Delete whole line.

V .....: Move word left.

W .....: Restore character left.

X or <HOME> .....: Move to start of previous line.

Y or <SET> .....: Move left to next tabstop.

Z .....: Search left for *string* (default: current search-string).

\ or <UP ARROW> .....: Move to end of previous paragraph.

] or <DOWN ARROW> ....: Move to start of next paragraph.

^ or <RIGHT ARROW> ....: Move one character right.

_ or <LEFT ARROW> .....: Move one character left.

<DELETE> .....: Delete previous character.

Escape Codes Summary

Escape functions are invoked by pressing the <ESC> key, and then pressing the key associated with the function.

<ESC>	**Description**

<SPACE> .....: Insert space ahead.

! .....: Save program in file *filename* (no default) (query if overwrite).

" .....: Insert current filename into text preceded by block-marker.

.....: Load command file *filename* into program buffer (no default).

$ .....: Decimal tab.

% .....: Read next *repeatcount* characters from standard input.

& .....: Read next *repeatcount* characters from standard input or command file.

' .....: Delete whole file (query).

(.....: Delete from start of file to cursor (query).

) .....: Delete from cursor to end of file (query).

* .....: Execute command file *filename* blind (no default).

, or <CLEAR> .....: Set wild characters and upper or lower case fold switch for search.

. or <ADD> .....: Move up one display line.

/ or <SUB> .....: Move down one display line.

: .....: Execute command file *filename*.

; or <ESC> .....: Toggle <ESC>LOCK mode (query).

< or <UP ARROW> .....: Move to start of previous paragraph.

= or <DOWN ARROW> ....: Move to end of next paragraph.

> or <RIGHT ARROW> ...: Move to end of paragraph.

? or <LEFT ARROW> .....: Move to beginning of current paragraph.

@ .....: Insert current time/date at cursor. If overwrite set, overwrite remainder paragraph.

A .....: Load *filename* into text at cursor (default: current filename).

B .....: Insert block-marker at start of line *n* lines previous.

C .....: Copy *block* into block-buffer (no default). If *repeatcount*, duplicate *repeatcounts*.

D .....: Delete *block* (no default).

E .....: Append *block* to block-buffer *repeatcount* times (no default). Delete from text.

F .....: Change current filename to *filename* (no default).

G .....: Grab *block* and place in block-buffer (no default).

H .....: Change data directory to *filename* (no default).

I .....: Toggle tabstop at current column.

J .....: Clear tabs. If *repeatcount*, set tabstop at every *repeatcount* column.

K .....: Enter shell with *parameter* (default: no parameter).

L .....: Fold next character to lower case and advance.

M .....: Append contents of block-buffer to *filename* (no default).

N .....: Append *block* to block-buffer *repeatcount* times. Do not delete from text.

O .....: Toggle overwrite mode.

P .....: Start/end program mode.

Q .....: Abort edit (query).

R .....: Restore block-buffer into file at cursor.

S .....: Save file under *filename* (default: current filename) (query).

T .....: Trim spaces from end of line.

U .....: Fold next character to upper case and advance.

V .....: Save contents of block-buffer under *filename* (no default) (query of overwrite).

W .....: Change word grain (cyclic: small->medium->large->small).

X .....: Execute program, display after each complete run.

Y .....: Execute program, no display.

Z .....: Save file under *filename* and exit (default: current filename) (query).

* * *

Appendix C

Converting Series II Files

Contents

Introduction

The following commands deal with converting Series II files to Series III files. The conversion commands are accessible from the OS9 Operating System. Use the Quit command to transfer to the OS9 system:

QUIT <RETURN>

To return to the CMI system type:

CMI8 <RETURN>

or press the <ESC> key.

Ensure that the current working directory is the /C0/CMIFILES/FAIRLIGHT directory (see the chapter on OS9 commands to change directories).

The Series III filename suffixes .VC, .SQ and .RS, etc, must be included in your filename when using these commands.

If you mistype a command, the next time you try you may get an error message:

Error 218 - filename already exists

This is because one of the first functions of the conversion commands is to create a new Series III file with your specified filename. You must delete this dummy file first, before re-issuing the conversion command.

Directory of Series II Floppy Disk

The OS9 directory command cannot be used for looking at the directory of the Series II floppy disk which contains the files to be converted

Once you have entered OS9, place the Series II floppy disk in the Series III floppy disk drive. Use the Qdos directory command to display a Series II directory on the Series III:

QDOSDIR /f0 <RETURN>

A print out of the directory can be made by using the print commands found in Appendix A (OS9 Commands).

Converting a QDOS File to an OS9 File

The Series II used an operating system called QDOS, which had a file format different to that used by the Series III operating System, OS9. Text files and other files developed on the Series II must therefore be converted from QDOS to OS9 file format to be used on the Series III system.

Place the Series II disk in the Series III floppy drive, /f0, and type:

FROMQ *QDOSfilename*/**f0 oe** >=*OS9filename* <RETURN>

QDOSfilename The name of the Series II file as it appears when displayed with the QDOSDIR command, including any suffix. The */f0* must follow immediately after the filename, with no intervening spaces.

OS9filename The name of the output file to be created in the current data directory on the Series III.

Note: there cannot be a space between the filename and the word "/f0".

For example; To convert the Series II MCL source file TINKLE.SS to the series III, type:

FROMQ tinkle.ss/f0 eo >=newtinkle.ss <RETURN>

The reciprocal command, to convert an OS9 file to a QDOS file, is also provided:

TOQ *sourcepath destination* <RETURN>

sourcepath The original OS9 filename.
destination The pathname and new file name of the OS9 file.

For example;

TOQ fred.MC /f0/fred.PC <RETURN>

converts the Series III file *fred.MC* to QDOS format and places the result in *fred.PC* on the floppy disk drive */f0*.

Converting Real Time Sequences.

The Series III plays two types of sequences which can be transferred from the Series II. These are MIDI frames sequences .SQ and Page R sequences. The Page R sequences will be converted into Real Time (RS) sequence.

The Series II Page R sequence must be on a Series II data disk in the floppy Disk drive of the Series III. Use the R2R3 command to convert the files:

R2R3 /F0 *seqname.RS* >=*SIIIname.RS* <RETURN>

Converting Voice file

Insert the Series II data disk into the floppy disk drive. Ensure that you are in OS9, with the FAIRLIGHT directory selected. Use the Voice 2 to 3 command to convert voice files from Series II to Series III:

V23 /f0 *filename.VC* >*filename.VC* <RETURN>

* * *

Appendix D

Auxiliary Pages

Contents

Icon Editor

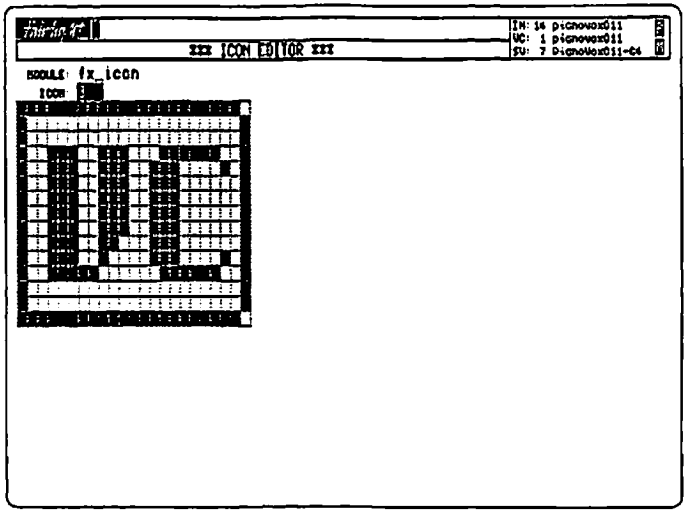
The Series III allows you to edit any icon within the CMI system. This gives you the chance to personalize the icons to your taste. The functions of the icons however, do not change by editing, only the display of the icon can be altered.

Icons reside in modules within the /K1/CMDS/CMIUSER7 directory. They have a *_icon* suffix after the system page they are used in. For example, ***fx_icon*** is the that contains the icons used on the FX page.

To edit an icon, first enter the Icon Edit page and then call up the module to be edited and then enter the icon number to edited.

To enter the Icon Edit page:

ICONEDIT<RETURN>



The Icon edit page with icon number 3 from the FX_ICON module.

Select Module

To select an icon module for editing, tab to the MODULE field and enter the name of the module:

MODULE: *module* <SET>

module The name of the icon module to be edited.

Select Icon Number

Each icon within the module has a unique number that must be selected. Tab to the ICON field:

ICON: *n* <SET>

n The number of the icon to be edited within the module.

You can step through the icon module using the <ADD> or <SUB> keys.

Select Display Size

The selected icon can be displayed in the large editing format or at the actual display size. To toggle between these two display formats:

<F1>

In the large edit format, the icon is displayed as an array of squares. Each square represents a pixel. Pixels are turned "on" or "off" with the g-pen. A pixel is turned on when it is lit and off when it is dark.

To turn a pixel "on", place the g-pen on a dark square and then [HIT]. To turn a pixel "off", hold down the <CTRL> key and [HIT] the pixil with the g-pen. A X appears when turning pixels off and a pencil appears when turning a pixel on.

Invert Icons

To invert the displayed icon, so the dark pixels become light and the light pixels become dark:

INVERT<RETURN> or

<F2>

Copy Icons

An icon from the current module can be copied into the current icon number:

COPY *n*<RETURN>

n The number of the icon to be copied.

Zero an Icon

All the pixels in the current icon number can be turned off with the Zero command:

ZERO<RETURN>

Save Icon Module

Once all the icons within the module have edited, the whole module can be saved to disk:

SAVE<RETURN>

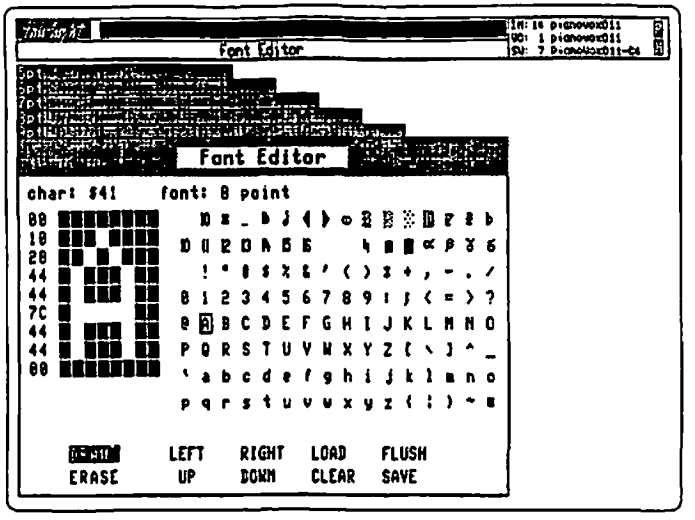
If the module is not saved, the icons will revert to their previous form the next time the CMI system is loaded.

Font Editor

The Series III Font Editor allows you to edit certain fonts used in the CMI system. Not all font sizes are available for editing.

To enter the Font Editor:

FONT<RETURN>



The default Font Edit page

Fonts are categorized according to point size (a point is 1/72 of an inch). The default display shows a series of windows with 5pt to 9pt in each left hand corner. Only windows 7, 8 and 9 can be edited.

The 5 font pages can be displayed by function key:

<F5>	Point size page 5
<F6>	Point size page 6
<F7>	Point size page 7
<F8>	Point size page 8
<F9>	Point size page 9

To return to the current edit display:

<F1>

To select a font to be edited, tab to the numeric field next to the font field:

font : 7 point

Use the <SET> key to insert the font size to be edited.

Select a Character

A character from a font can be selected by either tabbing to the character on the font display or selecting a character by hex number. To select a character by hexadecimal, tab to the Char field and enter a hex number 00 to 7F.

The selected icon will be ringed by a square in the character select display.

The character is edited in much the same way as editing icons. The character display is a 8x9 grid of squares which represent the screen pixels used by the character. Pixels can be turned "on" or "off" by g-pen or by hex number.

Draw Pixels

To turn a pixel off by g-pen make sure the character display is in DRAW mode. This is done by tabbing to the DRAW field below the character edit display. Move the g-pen to a square and [HIT].

To turn a pixel on, select ERASE from the fields below the character edit display. The character display will then have the reverse character display, i.e, lit characters on a dark background. Select a square with the g-pen then [HIT].

To turn pixels on or off by hex number, simply tab to the series of numbers on the left hand side of the character display grid. These hex numbers relate to the combinations of "on" or "off" pixels on that line. Select a hex number from 00 to 7F to turn pixels on or off.

Flush Font

The FLUSH field is used to send the edited font to the CMI system for display. Once a character has been edited, tab to the FLUSH field and the character will now be displayed on any page within the CMI system.

Load Font

The current font can be re-loaded from the CMI system. Tab to the LOAD field or use the Load Font command:

LOADFONT<RETURN>

This has the effect of re-setting the font if you make a mistake and wish to re-load the font.

Save Font

The current font can be saved to disk. Tab to the SAVE field or use the Save Font command:

SAVEFONT<RETURN>

The font will now be resident in the CMI system when the Series III is booted-up.

Shift Character

The current character can be shifted left, right, up or down from its present position in the character display grid.

Use the Shift command or tab to the LEFT, RIGHT, UP or DOWN field to move the character.

The Shift command is:

SHIFT *ch*<RETURN>

ch One of **L**, **R**, **U** or **D** for Left, Right, Up or Down respectively.

Clear Character

The current character can be cleared to all pixels "on" or all pixel "off" by tabbing to the CLEAR field or use the Clear command:

CLEAR<RETURN>

If you are in DRAW mode then clear will turn all pixels "on". If in ERASE mode then all pixels will be turned off.

Get Character

There are two commands available for moving characters within the current font.

The Get command is used to duplicate a selected character into the current character:

GET *n*<RETURN>

n The character number (in Hex) to be moved into the current character.

Put Character

The Put command will put the current character into a selected character in the current font.

PUT *n*<RETURN>

n The character number (in Hex) which the current character will be moved to.

List Text File

A textfile can be displayed in a selected font size on the Font page using the List command:

LIST *filename n* <RETURN>

filename The name of the text file to be displayed to screen.
n The font number which you wish the text file to be displayed in.

A text file must be used with the List command.

Large Time Code Display

A display of the incoming SMPTE timecode can be displayed from the Large Timecode Page:

<esc><F1> LARGETIMEDISPLAY<RETURN>

To display the SMPTE timecode in large format:

<F1> There is no alphanumeric command for displaying the large timecode format.

To display the Small timecode display:

<F2> There is no alphanumeric command for displaying the small timecode format.

The Audio Trigger Page

The Audio Trigger Page has been added to the Series III to allow samples to be played in direct response to a signal. It can be used for drum replacement and other purposes where a fast "double" is required. To get to the Audio Trigger Page:

<esc><CF14> ATP<RETURN>

The display appears in the top right corner of the screen, known as the Info Window. Here you will find two rows of fields which control the whole operation.

Before starting, plug the source for the trigger signals into the left and right sample inputs at the back of the Series III. (It is possible to trigger from two sources simultaneously.) If

signals arrive at the trigger inputs, you will see a highlighted flash at the left of the window.

It is a good idea to load up the voices that you wish to trigger before going to the Audio Trigger Page, because once it is on the screen, all other operations slow down to give this task precedence for minimum response time.

Instrument Field

The first field at the left of the window shows the Instrument numbers of the voices to be triggered, left sample on top, and right underneath. Assign the appropriate numbers in these fields.

Key Field

The key field allows you to choose which key number you wish to have played in response to the trigger. When it plays, it will be the same as if you pressed it yourself.

Decay Field

The Decay time is a measure of the time taken for the sensitivity of the triggering function to fall. This should be matched to the decay characteristics of the source signal to prevent several triggers from a single sound at the input.

Retrigger Level Field

The Retrigger level is the level at which a signal will override the decay characteristic. So if a new loud sound arrives at the input, the Audio Trigger Page can start its cycle again. You set the level at which this occurs.

Retrigger Time Field

Retrigger time is the minimum time before a retrigger can occur. This can also be used to prevent accidental retriggering.

General Comments

The speed of triggering is vital to its success. In order to get the best results, experiment with the level of input until the response is fastest. It may be necessary in some cases to record a click track on a spare track of tape with a predelay, in order to get satisfactory results.

The System Exclusive Page

The System Exclusive Page allows you to record System Exclusive messages from any MIDI device, store them on hard disk, edit them, and transmit them from any of the Series III's MIDI Ports.

To get to the Sys Ex Page, type:

SX<RETURN>

Loading

To load a Sys Ex message from your hard disk:

<F10> LOAD *filename*<RETURN>

filename the name of the file you wish to load

Creating a new Message

Before recording a Sys Ex message from an exrenal MIDI device, you must first create a file to put it in:

<F9> NEW *filename*<RETURN>

filename the name of the file

Recording a Sys Ex Message

To begin recording:

<F7> There is no alphanumeric equivalent for the record command

Once in record, the program looks for a System Exclusive message coming in any of the Series III MIDI Ports. It will be identified by the hexadecimal byte F0 at the beginning. The Series III then records all of the data coming in, until it sees the hex byte F7, which always concludes a Sys Ex message. Then the Message is displayed on the screen, and it is also saved to disk immeditaely under the filename you have created. You will be able to see the file on the Directory Page with an .SX suffix.

Transmitting a Loaded Sys Ex Message

Any message can be transmitted from any of the Series III's MIDI Ports. To transmit the message that is currently loaded (and therefore visible on the screen), you use the icons <F3> to <F6>, depending which port you wish to transmit the message.

<F3> Transmit from Port A

<F4> Transmit from Port B

<F5> Transmit from Port C

<F6> Transmit from Port D

Transmitting Messages from Hard Disk (Global)

You do not need to load a message in order to transmit it. Any System Exclusive on your hard disk may be transmitted by typing:

TRANSMITSYSTEMEXLUSIVE *filename Port*<RETURN>

filename	the name of the message you wish to transmit
Port	the MIDI Port from which you wish the message transmitted (default Port A)

You may issue this command from any Series III display page.

Editing a Message

A message that is loaded and displayed may be edited to change its effect on your synthesiser of other device. To edit any byte of the message, tab to the required byte and assign a new value to it, using the <ADD>, <SUB> and <SET> keys.

If your message is long enough to overflow into a second page of data, you may access the next page:

<F14> There is no alphanumeric equivalent for next page

You may also access the previous page of data, where there is one:

<F15> There is no alphanumeric equivalent for previous page

Entering a Comment

You may attch a comment to any Sys Ex message, which will be saved to disk along with the data. This may be useful for identifying the purpose of the message later. To open the comment box:

<F12> There is no alphanumeric equivalent for opening the comment box.

Once open you may enter a string of text, including spaces and punctuation, using the <SET> key to assign it.

To close the box:

<F12> There is no alphanumeric equivalent for closing the comment box.

* * *

Series III SPECIFICATIONS

AUDIO

Channel Outputs

Connector type:	Cannon XLR 3 pin (balanced) Pin 1 : Ground Pin 2 : Output Cold. Anti-phase output. Pin 3 : Output Hot. Output level +4dBm max. (higher with increased resonance)
Number of channels:	16 (maximum per mainframe)
Output level:	+4dBm
Output load:	600 ohms or greater

Click Input

Connector type:	Cannon XLR 3 pin
Pin 1:	Ground
Pin 2:	not connected
Pin 3:	Active
Level:	1 volt (min) to 20 volt (max) p-p
Frequency range:	200 Hz to 8KHz
Impedance:	10k ohms

Click Output

Connector type:	Cannon XLR 3 pin
Pin 1,2:	Ground
Pin 3:	Active
Output signal :	5 volt square clock

Clock or Drum-machine Controller Output (Electrical Specs only)

TTL open collector signals
Compatible with drum machines such as Roland

Pin 1 :	Run/Halt
Pin 2 :	Earth
Pin 3 :	Clock
Pin 4 :	Reset/Start
Pin 5 :	not connected

CMI Music Keyboard Pedals

Connector type:	Cannon 5 s:
Pin 1:	Ground
Pin 2:	On-Off: <1V = Off >4V=On
Pin 3:	-20V supply out
Pin 4:	+20V supply out
Pin 5:	Analog Input: -5V to +5V

Headphone Output

Connector type:	1/4" (6.25.mm) Stereo Phones
Amplifier:	Stereo 500mW
Signal:	from mixer output.

MIDI Inputs

Connector Type:	MIDI standard opto-coupler receivers. MIDI standard 5-pin DIN sockets:
Pin 1,2,3 :	not connected
Pin 4 :	MIDI +
Pin 5 :	MIDI -
Number of Inputs:	3 general purpose, 1 dedicated to music keyboard/MFX keyboard.

MIDI Outputs

MIDI standard open collector current loop drivers
MIDI standard 5-pin DIN sockets

Pin 1,3 :	not connected
Pin 2 :	Ground
Pin 4 :	MIDI +
Pin 5 :	MIDI -

Mixed Line Output

Connector type:	Cannon XLR 3 pin (balanced)
Output level:	+4dBm with one channel playing. Switchable to -20dB attenuation.
Output load:	600 ohms or greater

Multi-Sync Outputs (Electrical Specs only)

Four sync outputs, pins 1,3,4 and 5 of the DIN socket. TTL open collector signals

Power Requirements

Mains Voltage:	100-120 or 200-250 switch selectable
Mains Current:	2 amps @ 240V, 4 amps @ 120v
Mains Frequency:	50/60 Hz

Sampling Input - Analog (Optional)

Sample Rate:	4kHz to 96kHz channel locked or 32kHz, 44.1kHz or 48kHz crystal-locked, software selectable.
Number of Inputs:	2 (stereo)
Connector type:	Cannon XLR 3 pin
Input signal:	Balanced
Sensitivity:	+4dBm/-10dB software selectable
Signal to Noise Ratio:	Better than -90dB
Anti-ailaising filter:	11th order phase linear, 20kHz cutoff

Sampling Input - Digital(Standard)

Interface:	AES/EBU stereo digital serial interface
Connector Type:	Cannon 3pin balanced
Lock range:	30kHz to 50kHz

SMPTE Input

Connector type:	Cannon XLR 3 pin (balanced)
Level:	-20 to +10dBm
Speed:	24 fps to 30 fps
Impedance:	10k ohms

SMPTE Output

Connector type:	Cannon XLR 3 pin (balanced)
Output signal :	0dBm
Load Impedance:	600 ohms or greater

DIGITAL

Memory

1Mb CPU system RAM
16Kb Video RAM
512Kb Waveform Processor Private RAM
64K bytes program RAM on each channel card
128Kb General Interface Private RAM
2-32Mb Waveform RAM

Processors

Dual 6809 CPU
68000 Waveform Processor
(optional) 68020 Waveform Supervisor
68000 General Interface Processor
8 x 6809 Channel processors

DIMENSIONS

CPU Rack Mounted

Width 435 mm (Standard 19" rack compatible)
Depth 330 mm
Height 355 mm

I/O Rack

Width 435 mm (Standard 19" rack compatible)
Depth 230 mm
Height 355 mm

Standard Unit

Width 750 mm
Depth 480 mm
Height 365 mm
Weight 45 kilograms, depending on options.

DISK DRIVES

Floppy Disk

Mitsubishi M2896-63
8 inch double sided, single/double density
Soft sectored, 256 bytes per sector

Hard Disk

380 Mb per drive (unformatted) ESDI Winchester type SCSI bus compatible.

Optical Disk

800Mb WORM (Write-Once-Read-Many) SCSI bus compatible

GRAPHICS DISPLAY

Bit mapped VRAM 512 x 256 pixels
Composite video output
1 volt p-p nominal
75 ohms impedance

INPUT/OUTPUT

Serial RS232C, 9600 Baud plus MIDI

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C

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