

CUBASE audio

USER MANUAL

BENUTZERHANDBUCH

MANUEL D'UTILISATION

MANUALE DELL'UTENTE

MANUAL DEL USUARIO

ANVÄNDARHANDBOK

JÄRJESTELMÄOPAS

BRUGERVEJLEDNING

BRUKERHÅNDBOK

GEBRUIKERSHANDLEIDING

Steinberg

Cubase Audio

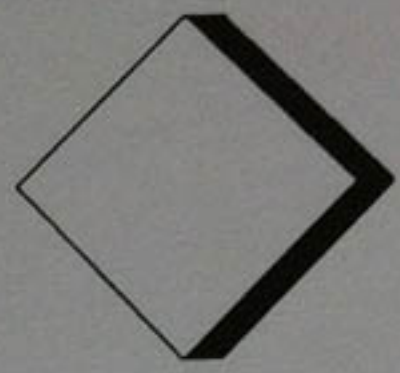
for Atari Falcon

Operation Manual

Steinberg

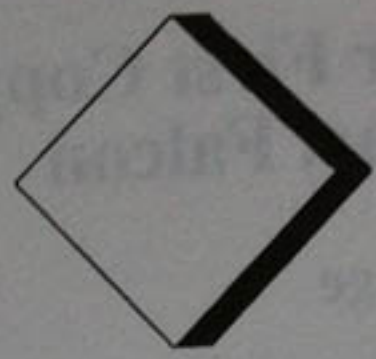
Operation Manual by Ernst Nathorst-Böös.

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Cubase Audio for Atari Falcon

Operation Manual Addendum for version 2.0



Important Information For All Users!

If This Is Your First Copy Of Cubase Audio For Atari Falcon

About This Package

This package contains a complete Cubase Audio for Atari Falcon. version 2.0, including a copy protection key, a full set of disks and a set of operation manuals. These are divided into a binder containing the Cubase Audio for Atari Falcon version 1.0 manual plus this Addendum covering the new features in version 2.0 plus a separate book that describes the newly integrated Cubase Score 2.0 features.

In the "Cubase Score for Atari" *book* you will find an installation chapter written for Cubase Score 2.0. Please ignore this chapter completely, it does not apply to Cubase Audio!

When you have become familiar with the basic MIDI and Audio recording procedures in the program, please come back to this document for description of the new audio features and refer to the separate book for description of the new score features.

Installation

How to install Cubase Audio Falcon 2.0 is described in Chapter 2 in the binder.

If you are updating from Version 1.0x of Cubase Audio for Atari Falcon

This package contains a full set of disks for Cubase Audio for Atari Falcon version 2.0 plus this Addendum covering the new features. Also included is a separate book that describes the newly integrated Cubase Score 2.0 features.

In the "Cubase Score for Atari" book you will find an installation chapter written for Cubase Score 2.0. Please ignore this chapter completely, it does not apply to Cubase Audio!

"Deinstalling" The Old Program

You need to be a wee bit careful when installing the new program. Read the following paragraphs before doing anything else.

Back Up Your Old Files

In case you make a mistake during installation and unintentionally delete any files you would like to keep, we advise you to start by making backups of all your old files.

If You Use Floppies

Put your old disks in a safe place. Perform the Installation as described in the main manual (in the binder). You may then wish to copy "DEF" files (see below), drum maps, mixer maps, etc. from the old disks to the new.

If You Use A Hard Disk

We recommend you to install your new version of Cubase Audio in a "fresh" empty directory. After that, copy files you have created or modified yourself, like "DEF" files (see below), drum maps, mixer maps, etc to your new Cubase directory. Finally, after verifying that the new version is installed properly and works as intended, delete the old program files.

About "Def" Files

When you install, you will get a new DEF.ALL default Song that Cubase loads automatically on startup. This might not be set up the way you want it. There are two ways to get around this. You either keep using your "old"

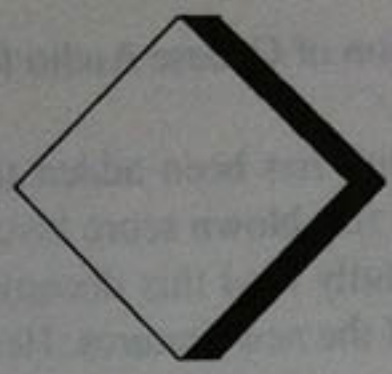
DEF.ALL or you manually customise the new one to make it identical to your old one. This last option may seem tedious but has the advantage that the new features in the update (which the old DEF.ALL file "knows nothing about") will be sensibly initialised on startup.

However, if you wish to keep your "old" DEF.ALL (or another DEF file), please proceed as follows:

- ❑ Locate your current Cubase folder.
- ❑ Find the DEF file(s) you wish to keep and make a backup of these to another directory or to floppy disks.
- ❑ Perform the Installation as described in Installation chapter in the binder.
- ❑ Copy your "old" DEF. files into the new Cubase directory, where they will replace the ones that came on the installation disks.

Installing The New Program

How to install Cubase Audio Falcon 2.0 is described in Chapter 2 in the binder included in this package.



New Features in Version 2.0

Welcome to this new version of Cubase Audio for Atari Falcon!

A lot of useful functionality has been added to the program, including 16 Track audio recording and full-blown score layout and printing facilities. We recommend that you carefully read this document and the additional Score book to get the most out of the new features. Here's a list of what's new:

- Recording and playback of 16 audio Tracks.
- Output bus support for FA-8.
- New Offline Functions.
- Selectable Sample Rates.
- 10 band Graphic Equalizer.
- Enhanced Audio Part Inspector.
- Arrange Window Monitor and Channel Mute/Solo.
- Arrange Window Level meters.
- Velocity response in Sample Tracks.
- Extended Score layout and printing facilities.
- Other changes and fixes.

16 Track Mode

Background

Cubase Audio for Falcon can now operate in two distinct modes: in 8 Track mode like the previous version, or in the new 16 Track mode. There are some important considerations you should be aware of to make the best of the new facilities.

Originally Cubase Audio for the Falcon was pushing the limits of technology by playing back 8 Tracks of 16 bit, 44.1 kHz audio direct from hard disk. But now we offer playback of 16 audio Tracks. How can this be possible?

The answer is simple. The files created in 16 Track mode are stored on the hard disk in compressed format. The reduction in size compared with the normal situation is 2:1. So in reality, the same amount of data is being retrieved from the hard disk for 16 Tracks as previously for 8 Tracks.

In this world you rarely get something for nothing. There are technical trade-offs to allow for 16 Tracks. The audio quality is slightly reduced in this mode. This reduction in quality doesn't manifest itself as in "reduced quality" *analog* systems (i.e. noise, reduced bandwidth etc), but rather in how the signal is distributed over the entire frequency range. The important thing is that even with compression, Cubase Audio plays back at full 16 bits at your chosen sampling rate, up to 48kHz.

So what does it sound like? We can clearly say that on most recorded material you will not hear any difference. A lot of work went into designing a data-reduction algorithm that shifts any perceived effects out of the most musically sensitive area.

So far we have only talked about the playback results of the 16 Track mode, and how the DSP chip in the Falcon is busy decompressing the files that are being played back. In fact, the DSP chip is so busy that there is not enough available processor time to compress the incoming audio being recorded. For this reason Cubase Audio for Falcon uses the main 68030 processor in the computer to compress the audio when *recording and monitoring*. This main processor is also responsible for the entire Cubase environment. When actually *recording or monitoring* in 16 Track mode you will therefore find the

mouse a little bit "jumpier" on screen and the graphics slower to update. Normally this is no problem as you are likely to be concentrating on playing the right notes, not checking the mouse efficiency.

Please note that this situation is specific to 16 Track mode while in *record* or *monitor* mode, not while *playing back*.

Also, only mono recording is allowed in 16 Track mode. This is because if two Tracks of audio had to be compressed as they were recorded, then the performance of the Cubase environment would be unacceptably slow. You may however play back stereo files recorded in "8 Track mode". This is done by converting them to "16 Track mode" files using the Offline functions described later in this text.

As stated above, in 16 Track mode the audio data is stored on the hard disk in a 2:1 compressed form. It is collected from the hard disk over SCSI in compressed format as required by the song. It is only decompressed at the very last stage in the system, by the DSP chip. This uses a considerable amount of DSP processing power, and as a result there is less remaining time for other processes. When using Cubase Audio in 16 Track mode, it is not therefore possible to use the internal effects available in 8 Track mode.

It also means, that it is not possible to play back a mixture of compressed and non-compressed files. It would simply take too much DSP processing time. Instead, you can use the new Offline facilities to convert non-compressed files to compressed files and back, so you are free to swap recordings back and forward between the two modes if you wish.

In 16 Track mode, all Tracks may be used as Hard Disk, RAM, or Sampler Tracks. Audio files used for this must then also be in compressed format.

The new DEF.ALL song that comes with this version contains a 16 Tracks Mixer map.

Compressed and Non-compressed Audio Files

If you have read the above, you know now that Cubase Audio can create/ play back one of two different types of audio file at a time, depending on the mode it is set to:

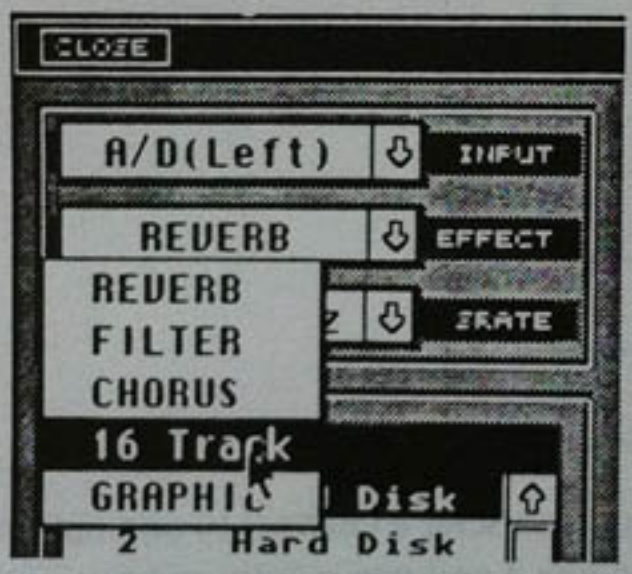
- 8 Track mode produces and plays back non-compressed AIFF files, only.
- 16 Track mode produces and plays back compressed AIFF files, only.

Mixing both file types in one Arrangement will lead to unexpected results and is something you should definitely avoid. You can use the conversion tools in the new Offline dialog box for easy two-way conversion. More details on page 12 in this addendum.

Activating/ Deactivating 16 Track Mode

To activate 16 Tracks mode, proceed as follows:

- Select "Hardware Setup..." from the Audio menu.
- In the Hardware Setup dialog box that appears, select "16 Track" from the Effects pop-up menu.



The effects pop-up in Hardware Setup.

To deactivate 16 Tracks mode proceed as follows:

- Select "Hardware Setup..." from the Audio menu.
- Select any of the available internal effects from the Effects pop-up menu.

The Monitor Window in 16 Track Mode

Phase Reverse Switches

In the Monitor window you can now find Phase Reverse switches. Click on one to invert the phase of the respective audio signal by 180 degrees.

16 Track Mode
A very "effective" layout is applied to the Monitor window in 16 Track mode, to allow for 16 audio channels on a regular Atari or VGA monitor.

8 Channel Output Busses and Auxiliary Sends

A stereo bus system has been implemented in Cubase Audio to support the FA8, Steinberg's 8 channel analog outputs interface. There are four stereo busses aptly named 1 to 4. All audio routed to the same bus will be "merged" (mixed, added). By routing audio to a bus you also send it to an output pair on the FA-8, as shown in the table below:

Bus	FA-8 Outputs
1	1 and 2
2	3 and 4
3	5 and 6
4	7 and 8

By using the available panning controls you can send a channel to one output only. If you for example route a channel to bus 3 and pan it fully right, it will appear on output 6 on the FA-8.



—— Panning set to "Full Right".

—— Channel set to output on Bus 3

In the example above, the output from the channel will appear on output 6 on the FA-8.

You will find bus selectors in various places in the program:

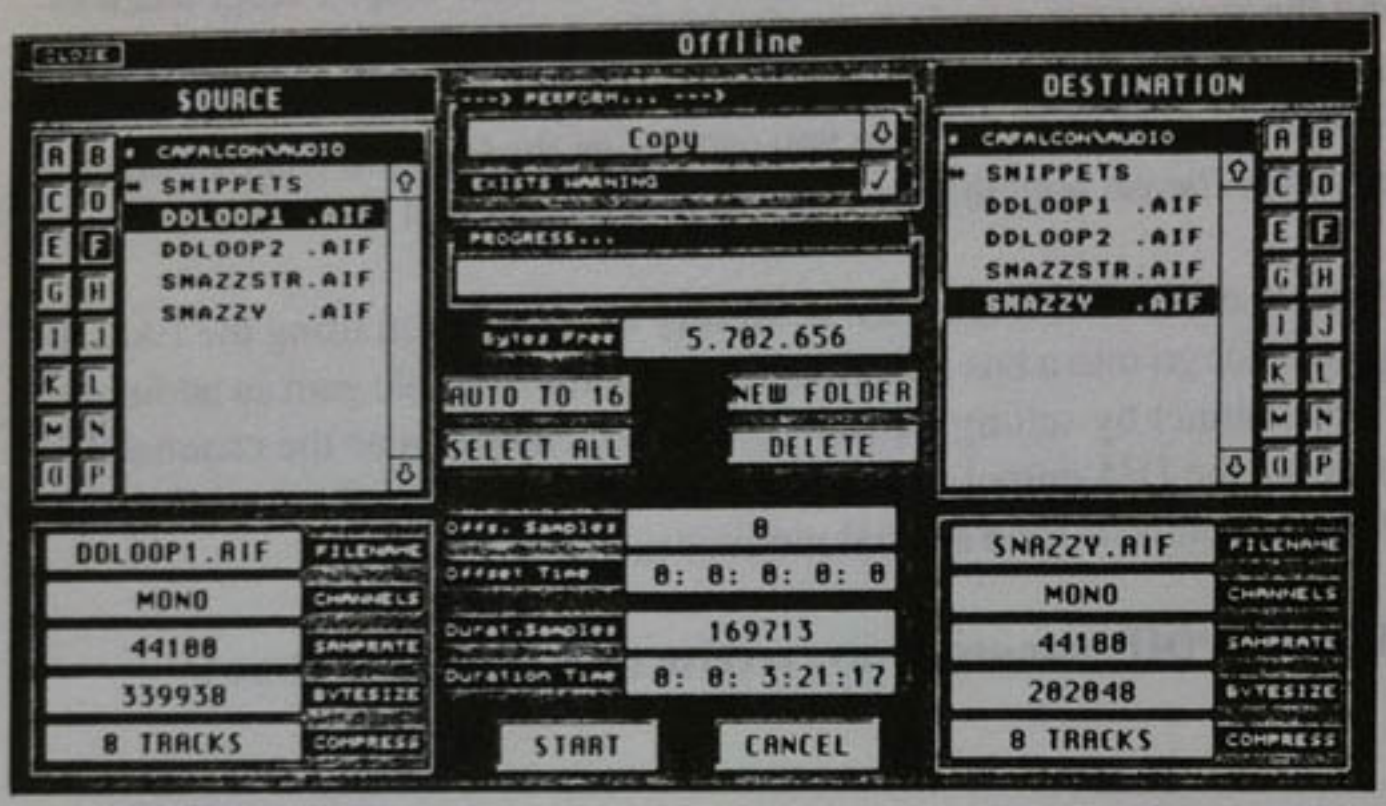
- For each channel in all Mixer maps.

- For the reverb output, each of the chorus delays outputs and the graphic eq input and output pair.
- For the 2 Auxiliary Sends that appear in all Mixer maps except when using the parametric equalizer or the 16 Track mixer. The Aux Sends have a bus select each and the signals are always pre-fader.
- In the Hardware setup where you can assign the Falcon's analog output to any bus. Please note that this also affects the internal speaker.

This system allows for maximum flexibility not only when using the FA8. As all signals that go into a bus are mixed, you can for example gain an additional 6 dB per channel by setting an Aux send to the same bus as the channel. Or, you may set the D/A output to bus 2, to use the Falcon's speaker and D/A outputs for real sends or for a special monitor mix, etc.

The FDI's S/PDIF outputs always receive their signal from bus 1.

The Offline Dialog Box



Overview

The item "Timestretch" on the Audio Menu has been replaced by "Offline..." in version 2.0 of Cubase Audio for Falcon.

Selecting this item opens a large dialog box. It is divided into three functional sections.

- In both the upper left and right corners of the dialog you will find a file selector. Use the left one to select source files (files to be processed) and the right file selector to specify the destination folder (where the processed files should appear). Details on how to operate them is found below.
- Between these two file selectors you will find an area labelled "Perform" with several function buttons, value fields, a pop-up menu, a check box, and a progress indicator bar.
- Below each of the file selectors, five fields display important information about the currently selected file.

You can apply a variety of data processing functions on source file(s) while copying them to the destination directory. Except for the "16 to 8 Track" conversion, all functions apply to "8 Track mode" (uncompressed) files, only.

To activate a function, proceed as follows:

- ❑ Select one or several source files.
- ❑ Set up a destination folder.
- ❑ Select the desired type of operation from the Perform pop-up menu.
- ❑ Click the Start button.

The destination file will get the same name as the source file. If a file with that name already exists in the destination folder, and the "Exists Warning" check box *is* ticked, an alert will appear, where you can change the destination file name.

If you decide to not change the name, or if the "Exists Warning" check box is *not* ticked, the file in the destination folder will be overwritten.

The File Selectors



For reasons of available screen space, the File selectors in the Offline dialog box differ somewhat from the normal Atari file selector.

- ❑ The selected drive is shown to the left of the file list. Click on one of the button to select another drive.

- ❑ The path is shown on the top line. To step out of the current folder, click on the Path.

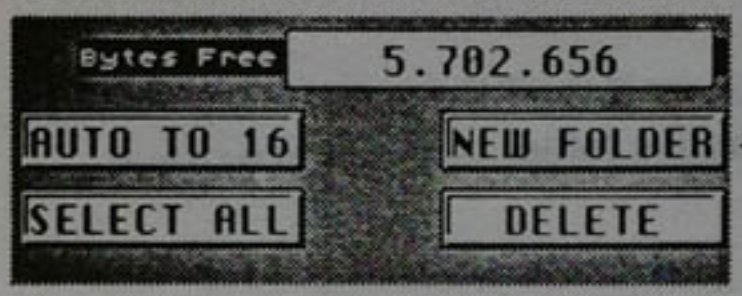
- ❑ To open a folder in the list, click on it.

- To select a file in the list, click on it. To select several files, hold down [Shift].

- The Information fields below each selector show the details of the currently selected (inverted) file.

Creating Folders

You can create a new folder in the destination directory by clicking on the New Folder button and typing a name in the dialog that shows up.

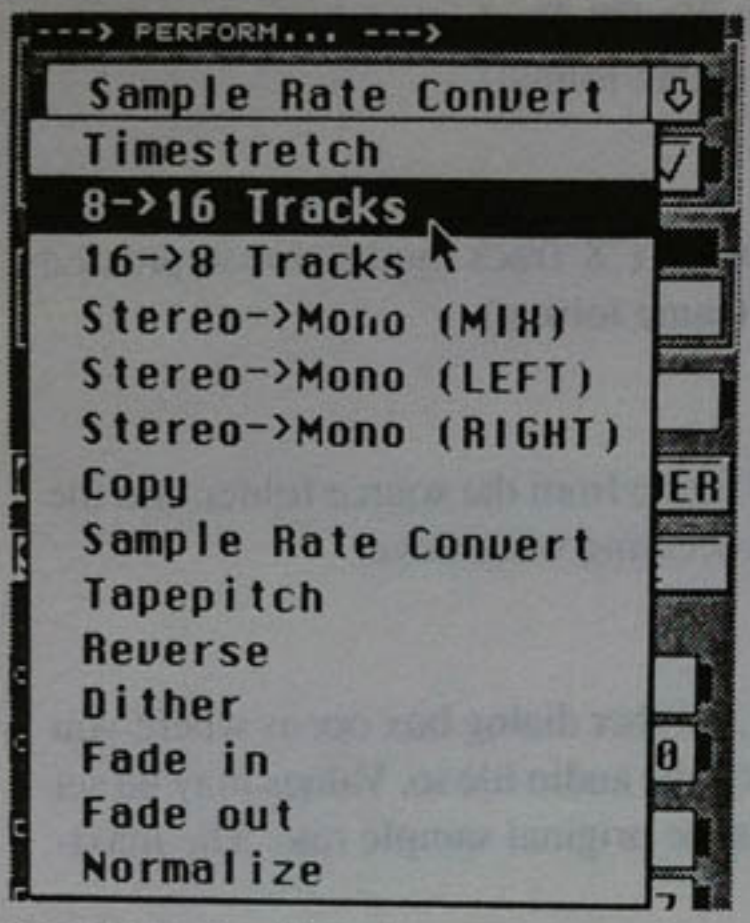


— The New Folder button

Renaming Files in the Destination File Selector

You may rename files for the Destination file selector. To do so, click on the file name in the information section below the destination file selector. Files in the source file selector can not be renamed.

The Perform Menu Functions



The following functions are currently available:

8 to 16 Track Conversion
This converts the selected file(s) from "8 Track mode" uncompressed format into "16 Track mode" compressed format. Both mono and stereo files are converted.

16 to 8 Track Conversion
This converts the selected file(s) from "16 Track mode" compressed format into "8 Track mode" uncompressed format. Both mono and stereo files are converted.

Timestretch
This is identical to previous versions of Cubase Audio for Falcon and you will find details about it in the Audio addendum to the main manual, Appendix 1.

Stereo to Mono (mix)
This converts both channels of a stereo file ("8 Track mode" uncompressed format) into a mixed mono file (same format).

Stereo to Mono (left)
This extracts the left channel of a stereo file ("8 Track mode" uncompressed format) and converts it into a mono file (same format).

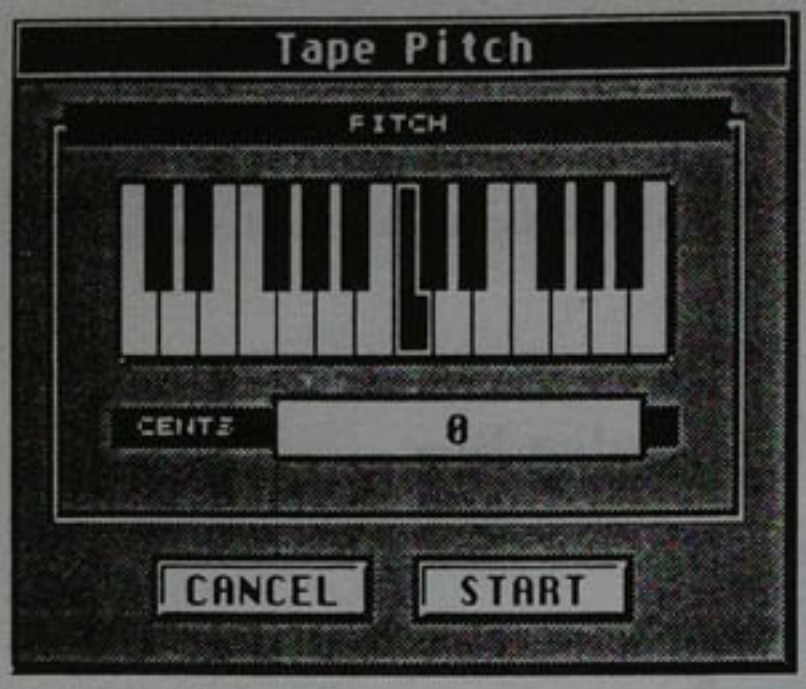
Stereo to Mono (right)
This extracts the right channel of a stereo file ("8 Track mode" uncompressed format) and converts it into a mono file (same format).

Copy
This function simply copies the selected file(s) from the source folder into the chosen destination folder without any processing whatsoever.

Sample Rate Conversion
When you activate this by pressing Start, another dialog box opens where you can set the sample rate you wish to convert the audio file to. Values may be set freely within a range from 0.5 to 2 times the original sample rate. The maximum possible setting is 48 kHz..

Tape Pitch
The effect of using Tape Pitch on an audio file is similar to that of slowing down (or speeding up) the tape speed on a tape recorder. The audio is pitched up or down and its length is changed. You can for example use this function to create re-pitched versions of files for use with sampler Tracks (to simulate a keyboard sampler). More information on Sampler Tracks in the Audio addendum to the main manual, Appendix 1.

When you activate Tape Pitch, by pressing Start, the following dialog box appears:



The Tape Pitch dialog.

The inverted middle C key serves as a fictitious reference point representing the current pitch. By clicking any of the other keys you set a transposition in semitones. Below this is a Cents field for fine tuning in percent steps.

Reverse
This creates a reverse copy of the audio - like when you turn a tape backwards.

Dither
This is a method which adds a slight amount of random noise to the signal to suppress significant level jumps in low level signals. Try this for example on sounds with long fade outs where you think the last, low-level portion of the sound is "grainy".

Fade In and Fade Out
When you select one of these two functions and press Start, a dialog box opens where you can set the Fade Time either as SMPTE time or as number of samples. Values you set here can not exceed the total file length.

Two types of fade are available: linear or logarithmic, where logarithmic is the generally more natural sounding. Click on the corresponding graph to select either. Please note that the logarithmic conversion needs significantly more calculation time.

Normalize
If a recording has too low a level, you can use this operation to bring it up to maximum output. Please note that any noise in the recording is amplified just as much as the rest of the signal. It is always better to re-record at a correct level, if you have the option.

The Buttons in the Offline Dialog Box



Auto to 16
This is a powerful function that converts all "8 Track mode" files it finds in the source folder to "16 Track mode" files. But there's a lot more to it. This is what happens when you press the button:

- Auto to 16 automatically creates a folder called "SIXTEEN" within the selected folder of the destination drive.
- It then looks up all 8 Track audio files in the source folder and calculates their current size and the disk space needed on the destination drive for the new files created. An alert box informs you if there is not enough space on the destination drive. The Sixteen folder will then automatically be erased.
- If there *is* enough space on the destination drive, a dialog box asks you if you want to convert all files in the source folder and apply the new files to the Pool. Applying the files to the Pool means that the Song will use the newly created files instead, after the conversion. Click Yes to start or No to abort.
- The Information fields below the source file selector and the Progress bar inform you about the details of the currently converted file and the duration of the conversion process.
- When all files have successfully been converted, an alert box informs you of this and reminds you to activate the 16 Track Mixer map.
- Finally, Cubase Audio is automatically being switched to "16 Track mode" in the Hardware Setup dialog box.

Select All
By clicking on this button or pressing [Control]-[A] on your Atari keyboard you select all audio files in the currently open folder in the source file selector. To deselect them again, simply click on one of them.

New Folder
This function applies to the destination drive, only.
Click on this button to create a new folder on the destination drive. A dialog box shows up where you can name the folder.

Delete
Deleting always applies to files and folders on the destination drive, only.

To delete files in the destination folder, select it/them (use [Shift] for multiple selections), then press the Delete button. Audio Files that are used in the currently open Song can not be deleted.

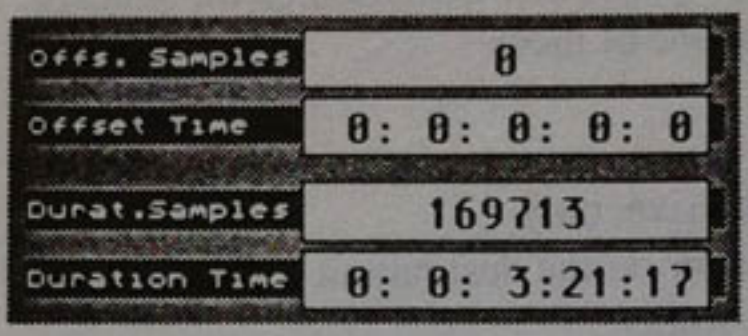
To delete a folder on the destination drive...

- ❑ Make sure it's empty by selecting it.
- ❑ Press the Delete button. An alert shows up saying "No Audio files found. Delete Folder ?". Click "Yes".
  Although the only file type shown in the Offline dialog box is AIFF (files with the extension "AIF") you can do this in good faith: if there is any other type of file left in your folder, the delete operation will automatically be aborted and an alert tells you that the folder could not be deleted.

Start
This is the button you use to start any function that you selected in the Perform pop-up menu.

Cancel
To abort a running process, keep clicking the Cancel button until the action stops. The resulting file will not be erased by this, it will just have as many samples as have been processed until you aborted the action.

Setting Offset and Duration

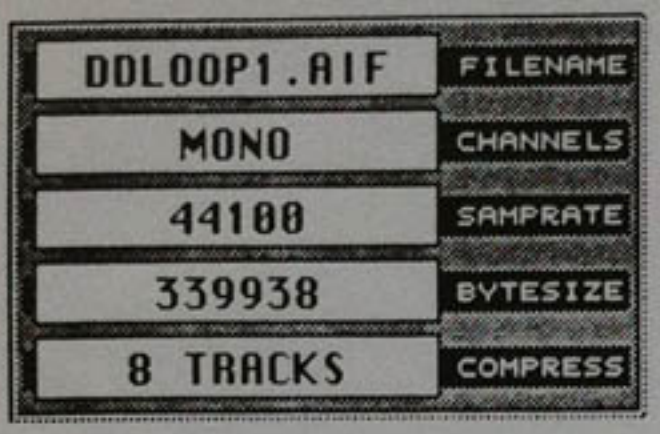


There are four fields in the lower middle part of the Offline dialog box that you can use to define which portions of an audio file you wish to process. This lets you select a dedicated section of the audio file to be transferred. If several files are selected in the source file selector, only the first selected file is affected. The Offset and Duration fields also inform you about the sample size and time duration of the currently selected source file.

Offset Samples / Offset Time
By changing the values in either of these two fields you "cut off" a number of samples or seconds from the start of the audio file before it is processed by one of the functions in the Perform pop-up menu. The "cut off" bit of the audio file is neither processed nor transferred to the destination drive.

Duration Samples/ Duration Time
By changing the values in either of these two fields you define the length of the audio to be processed by one of the functions in the Perform pop-up menu. Values you set here can of course not exceed the total length of the audio file.

The Information Fields



Information about the currently selected file are displayed below each of the two file selectors. This is what's shown:

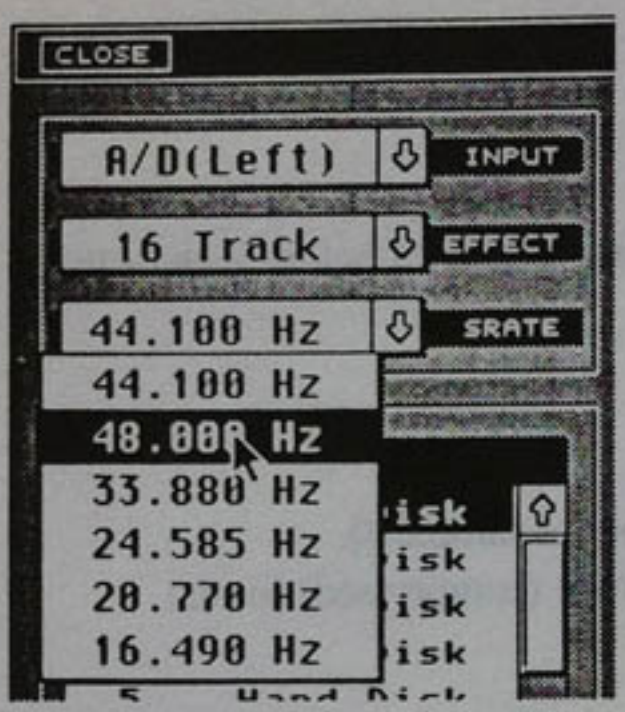
- The Name of the File.
- If it is in Mono or stereo.
- The Sample Rate.
- The size of the file in bytes (not the number of samples!).
- If it is in 8 Track (uncompressed) or 16 Track (compressed) format.

Pool – Pass to Offline

This useful new function has been added to the Function pop-up menu in the Pool window. You can use it to directly select an audio file or a Segment in the Pool and automatically open the Offline dialog box to process it with one of the available functions. You could e.g. select a Segment, select "Pass to Offline" and then use Copy or another function on the Perform pop-up menu in the Offline dialog to create a separate audio file from the Segment. When you select "Pass to Offline" in the Pool, Offset and Duration settings in the Offline dialog are automatically set to match the Segment's start and end points in the file.

The Hardware Setup Dialog Box

Sampling Rates



You may now choose from a list of Sampling Rates (16 to 48 kHz) in the Hardware Setup dialog box. Please note the following:

- 48.000 kHz can only be used if an FDI is connected and initialized.
- All Sampling Rates except for 44.1 kHz and 48 kHz are produced by the Falcon 030. These are non-standard Sample Rates, and they are *not compatible* with most standard equipment (DAT).

FDI Clocking



If you select FDI from the (audio) Input menu, the system is synchronized by the *external clock* from the FDI's S/PDIF input! Many users have stumbled across problems related to this issue.

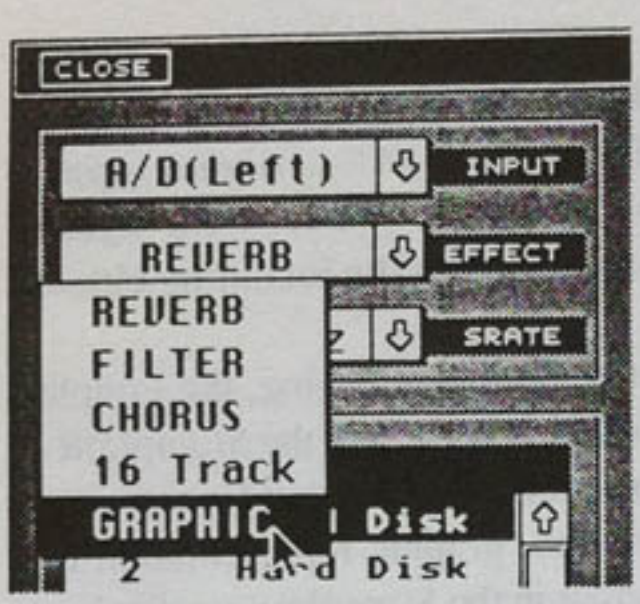
An S/PDIF signal does not only provide the digital audio, but also a *clock* at the speed of the current *sample rate*. If you set a DAT to digital input, and record, while Cubase Audio is set to FDI input, you create a *digital loop*, both Cubase and the DAT believe to be slaved to the incoming clock.

When the FDI is selected as audio input in the Hardware Dialog, the sample rate clock coming in via the S/PDIF input will be displayed in the S(ample)Rate field. If the measured sample rate does not match the one that Cubase Audio currently uses for all its calculations (tempo, graphic representation of audio, SMPTE times), *!* is added to the number in the S(ample)Rate display, to warn you.

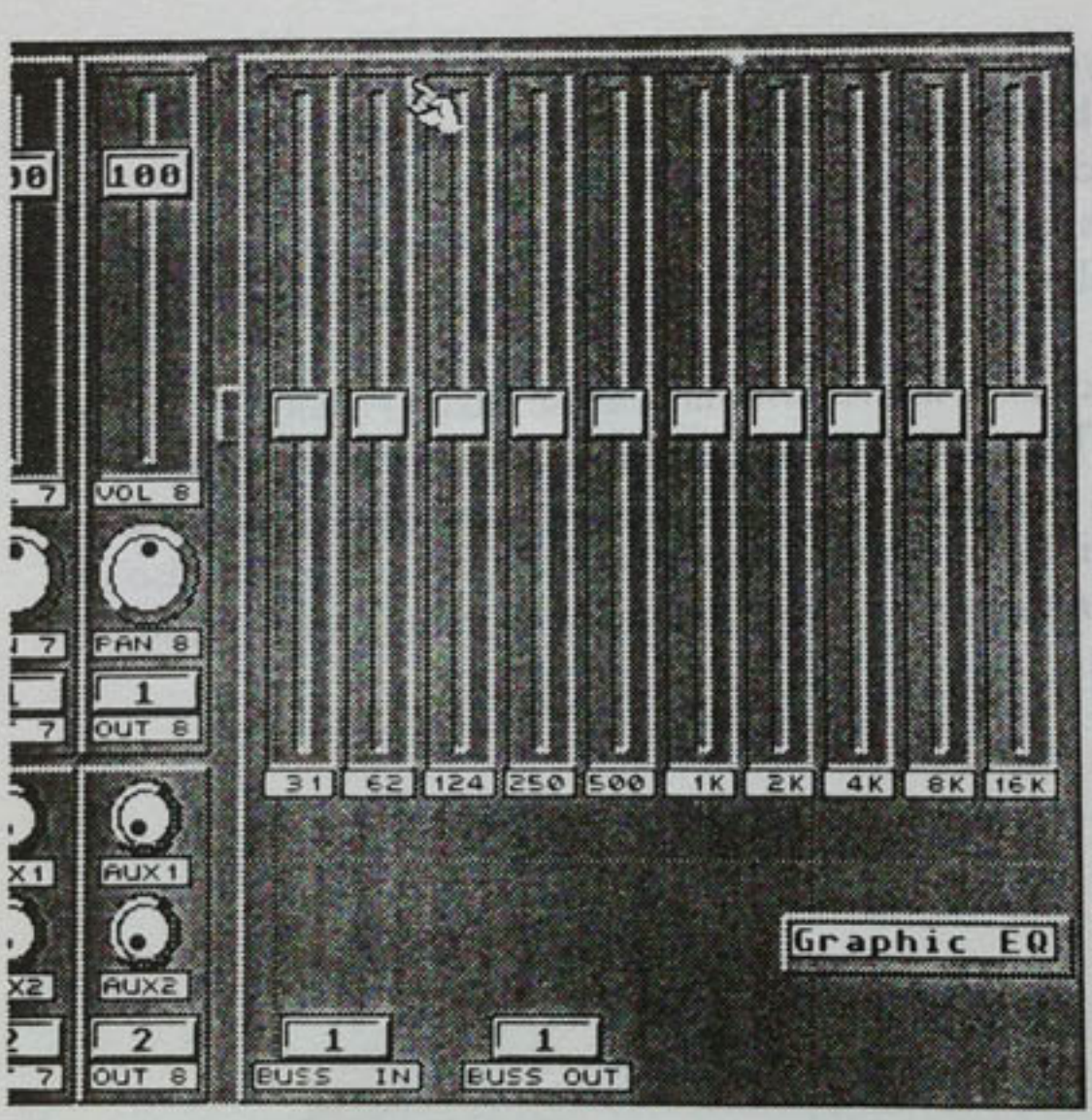
Please note that you may also work with the sample rates 22.050 kHz and 32.000 kHz, which are not listed in the menu. However, as these rates are not available from the internal sources (i.e., the Falcon and the FDI), this only works if the FDI is selected as audio input, and a clock with this sampling rate is fed to the digital inputs of the FDI (most commonly from a DAT player).

Sample rates higher than 48 kHz will run Cubase Audio Falcon's Audio Engine out of sync. This results in audio distortion, channel misalignment etc. If this occurs, select any other item on the (audio) Input pop-up menu in the Hardware Setup dialog to reset the Cubase audio system. You may also use "Reset Devices" on the main Options menu but be aware that this also performs a SCSI reset.

10 Band Graphic Equalizer



Selecting the Graphic Equalizer from the Hardware Setup dialog.

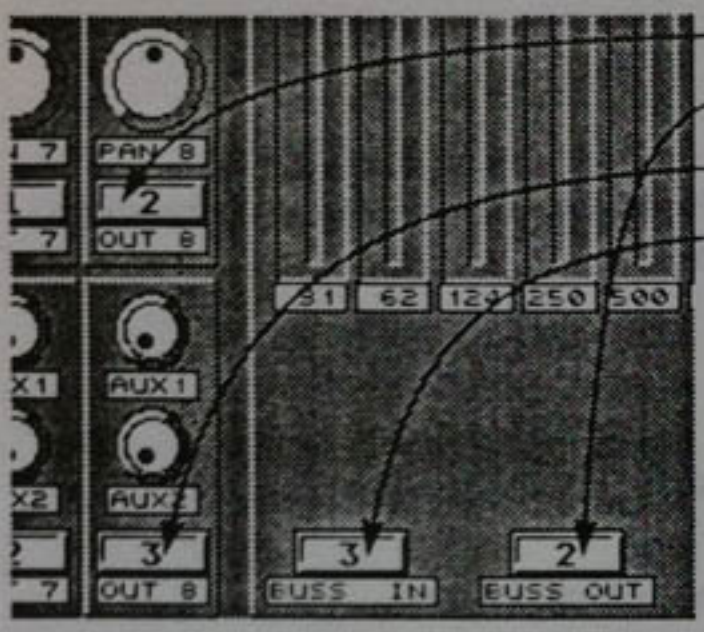


The controls for the Graphic Equalizer, in the Mixer window.

This new DSP module operates on the selected input and output stereo pairs. Note that the output bus of the equalizer contains the filtered signal only, which means that if all faders are in the middle position, there will be no signal

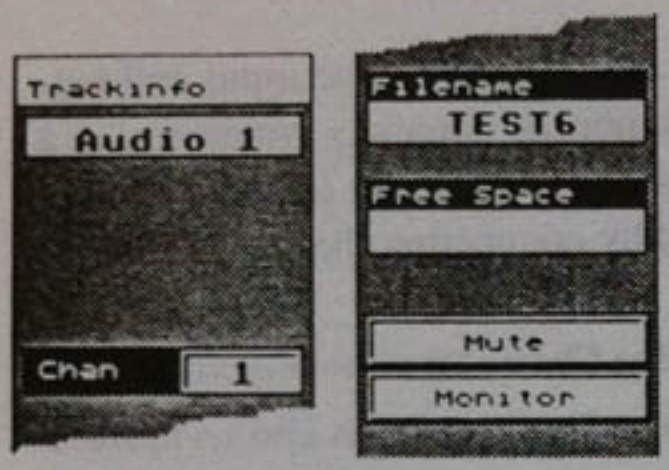
at all on this output bus. This is the way any equalizer works, but normally the input and the output are added together. In Cubase, you can route each one separately if you wish.

If you opt for the standard configuration of choosing the same input and output bus pair, everything will work as with a normal equalizer connected to a stereo output, but you could also try other things. You might for example adjust the amount of filtering for each channel by connecting the aux sends bus to the filter's input.



1. The Channel is set to play via Bus 2.
2. The Equalizer Out is also set to Bus 2.
3. The Auxilliary send is set to Bus 3...
4. ...and since the Input of the equalizer is set to the same bus, you can feed the equalizer from the aux send.

Audio Part Inspector



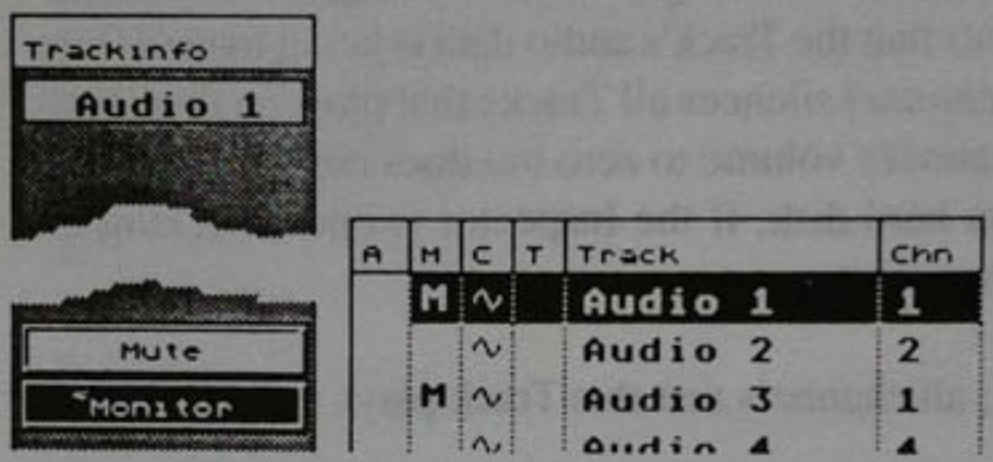
Additional functionality has been added to the Part Inspector. For audio Tracks, you may now (from top to bottom):

- Change the Track or Part Name.
- Change the Output channel.
- Create and name a new file for Recording (something you could previously only do from the Monitor window).
- Read the remaining record time on the selected drive
- Turn on Channel Mute – see below for details. (A rectangle appearing in the Mute column in the Track list indicates that an audio channel is muted).
- Turn monitoring on – again see below (An M in the Mute column in the Track list indicates that Monitoring is turned on).

Monitor, Channel Mute and Channel Solo

Monitor
You can now switch Monitoring on or off for an audio channel by holding down the [Alternate] key and clicking in the Mute column in the Arrange window. An "M" appears in the mute column for all Tracks playing via this channel.

This operation is the same as clicking the Monitor button in the Inspector or in the Monitor window.



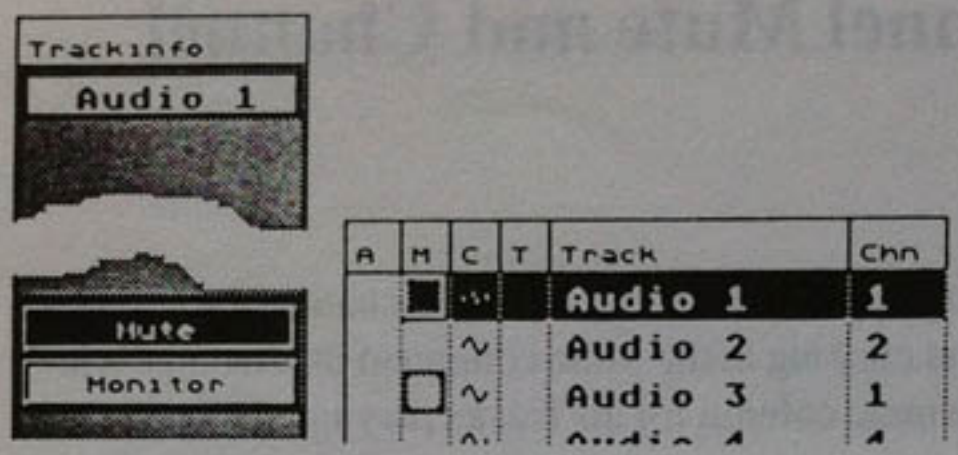
Activating Monitoring for one Track will set all Tracks playing via this audio channel to Monitor mode.

When monitoring is turned on for an audio channel it will pass on the incoming audio to the output instead of playing back what has already been recorded onto the Track. This is often the preferred mode during rehearsal and recording.

If the Track is set to "Any", channels 1+2 are always affected by the operation. But please keep in mind that you can not record or monitor in stereo in 16 Track mode.

Channel Mute
You can now mute an audio channel by holding down [Shift] and clicking in the Mute column (previously muting a channel was only possible from the Monitor window).

A rectangle appears in the mute column for all Tracks playing via this channel



Clicking the Mute button in the Inspector will "Channel Mute" all Tracks playing via that audio channel.

Please note that this is not the same as muting a Track! Muting *a Track* silences one Track only and prevents that the Track's audio data is being loaded from hard disk. Muting *an audio channel* silences all Tracks that play via this channel. It effectively sets the channel's volume to zero but does not prevent audio data from being loaded from hard disk. If the Inspector is open, clicking on the Mute button has the same effect.

If you mute an "Any" Track, all channels that this Track plays will be muted.

Channel Solo

If you click the Solo button on the Transport bar while holding the [Shift] key, the selected Track's audio channel is soloed (all audio channels but this one are Channel Muted).

This is much faster than a "normal" Solo, since the audio structure doesn't change, but keep in mind that audio channels which are Channel Muted will still read data from disk during playback.

If you have activated Solo this way, subsequent clicks in the mute column will only result in Channel mutes, even without pressing [Shift], until Channel Solo is exited again.

For consistency reasons, entering Channel Solo mode will remove all regular audio Track mutes.

Regular Track Soloing is also much faster in 2.0 than in previous versions.

Track List Level Meters (Audio Activity)



The Activity column now shows Track output level for audio Tracks. The intentions behind this were to make it easier for you to do all your work from the Arrange window. To make sure that everything works as expected, keep the following in mind:

- If a Track is set to "Any", there is no straightforward relationship between a certain audio Track and an audio channel. The same is true for multiple audio Tracks set to the same channel.
- If an "Any" Track only has one stereo lane, and no other Track has been assigned to the same channel, the meter shows the sum of the left and right channel.
- Everything should work as expected, if you use a "Multitrack approach", that is, if you *don't* use multiple Tracks assigned to the same channel, or several lanes on Tracks set to "Any". If you do...
- The meters will only indicate the level of the first channel (counted from channel 1) found on an "Any" Track, provided no "mono" Track was found with the same channel.
- If several Tracks use the same channel, only the first (from the top) is shown.

Other Changes and Fixes

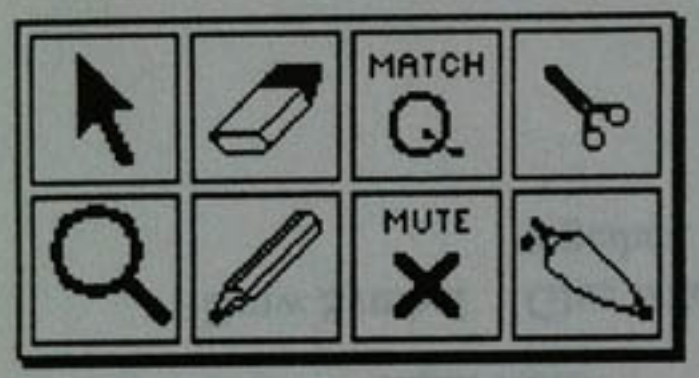
Several other changes and fixes, that are not immediately apparent, have been made to version 2.0.

- When you stop recording, the "want to keep" dialog box now appears much faster.
- There was a problem with MIDI data that got lost on the ATARI input, which has been solved.
- The SCSI Timeout especially during (long) recordings has also been fixed. This was actually a Falcon hardware problem but could fortunately be solved in software.
- There are two hidden features in the sampler section in the Hardware Set-up dialog box:
  If you click on a sample name, it will now be played back.
  If you click with the right mouse button, any Note Off for this Sample will be ignored. This is useful if you want to trigger drum samples via MIDI pads. Clicking again with the right mouse button enables Note Off again.

The Tool Boxes

The Arrange Window

Select and Move Parts
Match Quantize
Delete Parts
Split one Part in two



Scrub to hear the Events
Mute a Part
Change the length or start point of a Part
Glue (Join) Parts together

Key, List and Drum Edit

Select and Move Events
For Creating Controller "ramps"
Delete Events
Kick an Event forward



Scrub to hear the Events
Draw Events, change lengths of notes and draw and redraw controllers and velocity
Paint Events
Kick an Event back

Score Edit

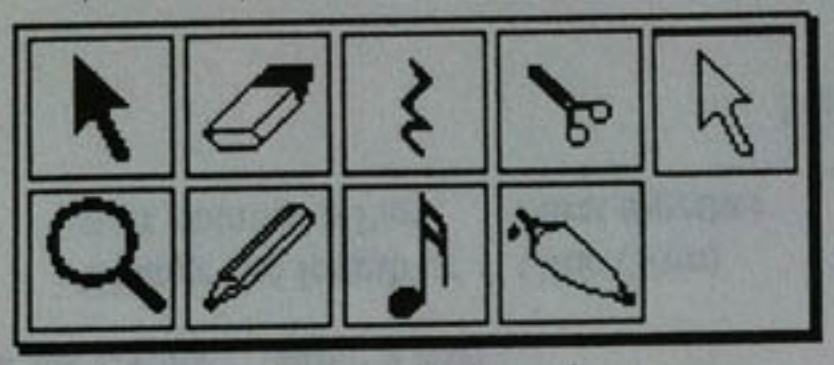
Select and Move Events

Insert Rests

Layout the Score

Delete Events

Split measures



Scrub to hear the Events

Input Note

Draw Symbol

Glue notes and measures together.

The MIDI Mixer

Play Object

Delete Events from Song Position and onwards

Create Object



Select, Move and Edit Object

Delete Events from from Song Position to beginning

Delete Events between Locators

Modifier Keys

The three so called modifier keys on the computer keyboard, [Shift], [Control] and [Alternate] are used separately and together to modify a number of operations.

Use [Shift]...

In general

- ❑ To extend selection of Parts, Events and Objects.
- ❑ To make the edited value change in larger steps.

In the Arrange Window

- ❑ To speed up Fast Forward and Rewind.
- ❑ With a double click in a free area to select all Parts on a Track.

In the Editors

- ❑ As a drag restriction when moving and duplicating events.
- ❑ With a double click in a free area in Drum Edit to select all notes for a Sound.

In the Mixer

- ❑ To reprogram snapshots.

Use [Alternate]...

In the Arrange Window

- ❑ With the Arrow Pointer to Duplicate a Track, by dragging it.
- ❑ With the Arrow Pointer to Duplicate Parts, by dragging them.
- ❑ With the Arrow tool to double click on an empty section of a Track and thereby select all Parts on the Track.
- ❑ With the Pen to Repeat Parts ([Control] creates Ghost copies).
- ❑ With the Scissors to Split one Part into many.
- ❑ With the Glue Tube to Join all consecutive Parts on the Track.
- ❑ With the Magnification Tool to Play the Part at the next bar.
- ❑ With the Eraser To delete all consecutive Parts on the Track.
- ❑ With Cut to move all consecutive Parts to fill up the gap.
- ❑ With Paste to *insert* the Pasted Part(s) on the Track.
- ❑ When you rename a Part, so that all Parts on the Track get the new name.
- ❑ When you set the Output of a Part, so that all Parts on the Track get that Output.
- ❑ When you drag a Group from the Group List to a Track so that it gets *inserted*.
- ❑ When you open an editor, so that the one you have open now doesn't close.

Use [Alternate]... (continued)

In the Editors

- When you drag events so that they get duplicated.
- With the Brush, to paint any pitch.
- When you use the Pencil or the line tool on controllers, so that you get new controller events.
- When you use the Pencil on notes, so that you only change the length of existing notes, instead of drawing new ones.
- With the arrow to move the Song Position to the point you clicked on.
- To make your text-change apply to all text in Score Edit.
- When you change the drum Map, to copy the change to all Sounds .
- When you you change values in Grid Edit, to copy the new value to all other or all other selected events.

In the Mixer

- To duplicate Objects when you drag them with the Arrow Tool.
- When you Play a Master Object and don't want the slaves to move with it.

In Other Places

- In the IPS, to make a setting apply to both synth A and B.
- When you load an Arrangement, so that it gets put in in the background.

Use [Control]...

In the Arrange Window

- ❑ With the Arrow Pointer to create Ghost Parts, by dragging.
- ❑ With the Pen to Repeat Parts and make Ghost Parts.
- ❑ To insert a Group on a Group Track in real time.

In the Editors

- ❑ In Score Edit to move notes outside the scale.
- ❑ In Score Edit to step input notes outside scale.
- ❑ In Score Edit to move a bar line without affecting measure spacing.
- ❑ In Score Edit to be able to drag a staff without affecting staff distance.

In the Mixer

- ❑ To be able to move objects without snapping to grid.

Use [Control] + [Alternate]...

- ❑ In the Arrange window to Merge Parts by dragging one on top of the other.
- ❑ To drag a Staff and set Staff distance in Score Edit.

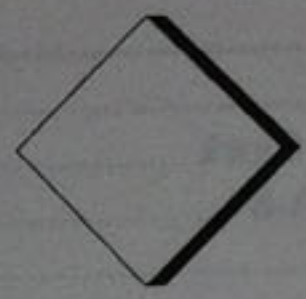


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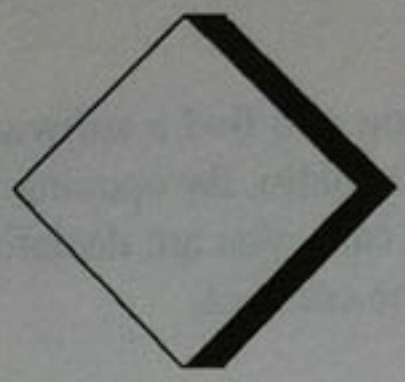
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Read This!

There are some pitfalls we want you to make sure to avoid, and some advice we want to give, before you start to work with Cubase Audio.

Software Licensing

At the back of this manual you will find a software licensing contract. Read this before you install Cubase Audio. By opening the sealed pack of disks or sending back the registration card, you are declaring yourself to be in agreement with the conditions in the contract.

Installation

Please follow the instructions in the Installation chapter meticulously or the program might not run properly.

Registration card

Send in the registration card! That's the only way for us to know that you exist. And we do want to know, believe us. If we receive the registration you will be informed of upgrades of the program. There may be other direct benefits as well, printed on the card.

Computer

This program runs on an Atari Falcon with at least four megabyte of RAM, but we definitely recommend you to get fourteen. You should use TOS 4.01 or later. Cubase can be made to autostart by selecting "Install Application" from the Desktop.

Falcon Computers manufactured before May 1993, may have a hardware problem that causes problems with audio recording. Please contact your dealer if in doubt.

Monitor

This program works with any monitor supported by the Falcon. However, you should put the screen in "2 colour" (black and white) mode, see the Installation chapter for more details.

Hard Disk and SCSI

To be able to record digital audio, you need to connect a SCSI hard disk to your computer.

Follow the SCSI instructions in the Installation chapter down to the last detail. Do not use your internal hard disk for recording audio!

Program Disk
The program comes on one HD floppy and a number of DD ones. None of them are copy protected. You might not need all the files on the disks, see page 2-2.

Backups
The first thing you do, make backups of the original disks that come with the package. You can copy them to other 3.5" floppies or to a hard disk. If you are not familiar with this procedure, consult your Atari Operation Manual. The disk is not copy protected and the copy will run if you have your Key (the plastic cartridge that comes with the program) inserted into the cartridge port.

MIDI Interface
You can use Cubase Audio with the built in Atari MIDI connector only. To expand on the number of MIDI Outputs (and thereby the number of MIDI Channels) and to achieve time code synchronisation, you can add the Steinberg SMP II to your system.

Cuabse Audio Falcon does not work with the Steinberg Midex and Midex+, due to the computer's limited processing power. However, the Midex and Midex+ *can* be used as a copy protection key expanders.

The Hardware Key
To be able to run the program you must have the Key inserted into the cartridge port of your computer or into a Midex or Midex+ MIDI/Time code interface. The key is the verification to that you have actually bought the program. If you loose it you have lost your program!

Never insert or remove the key with power turned on on the computer! Make sure you don't put the key in upside down!

Defragmentation
When you create many files on your SCSI hard disk (as you do with audio recording) it will eventually become *fragmented*. Generally, fragmentation is not a big problem with Cubase Audio Falcon, but if the disk gets *very* severely fragmented, audio playback may suffer (the program will report if it has problems with the hard disk). You will then have to run a so called *defragmentation* program. For recommendations on which defragmentation program to use, contact your Atari dealer.

Put the program files on the internal disk, and your audio and song files on the SCSI disk(s).

Saving

Program crashes are a well known fact in the computer industry, and a major crash will probably result in that the material resident in memory is lost forever. The only way to insure yourself against disasters is to save regularly while working or to use the Autosave function. You may run the program from a RAM-disk, but we can't *guarantee* full functionality. Save your work regularly to ordinary disks, since RAM-disks are erased at power-down or after a crash. Disks (even hard disks) can get damaged, so making backups of your files is a must!

The ST/STE/TT/Falcon's MIDI Thru and MIDI cables

The Atari ST/STe/TT/Falcons' MIDI Out port is non-standard. It uses pins 1 and 3 in the connector as a MIDI Thru port. Unfortunately some MIDI cable manufacturers shortcut these pins with the normal ones. This results in a hardware MIDI Thru function that can't be disabled. Make sure the MIDI cables you use are of the right kind!

Accessories

You can use Cubase with Accessory programs that follow the programming conventions for the Atari computers. But beware, not all Accessories follow the standard perfectly.

Steinberg can in no way guarantee the use of Cubase together with any certain Accessory or other type of utility program.

"Read Me" Files

There might be a file called "Read Me" on any of the disks that comes with the program. This is a text file which describes any changes or additions to the program that are not stated in the manual. Double click on this file. Select one of the two options in the dialog box, to either display the text on the screen or to print it out on a printer.

Note Off Controllers

Some Roland synthesizers send a MIDI message called All Notes Off as soon as you release all keys on the keyboard. This may lead to very confusing results when the same synth is used to play back music from more than one

Track. If you experience this problem you should filter out this message using the Controller filters in the MIDI Filter dialog box.

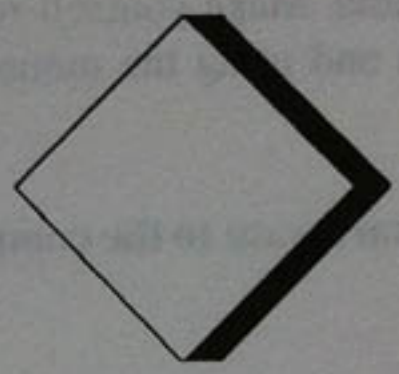
Running Status
There is a way to make MIDI transmission more compact, called Running Status. This was not a part of MIDI from the beginning so not all units can accept this data compression method. If you experience problems with a Korg DDD1 or DDD5, an Ensoniq Mirage, a Sequential Prophet T8 or a very old Yamaha DX7 you should make sure that you are not transmitting under Running Status from your computer. Check the setting in the MIDI Setup dialog box. It will be obvious if you have this problem since the instrument will hardly play back sequenced material at all.

SMP-24
Users of the Steinberg SMP-24 must have software version 1.6 or higher to make this unit work with Cubase. If you have an older software version, contact your dealer for an upgrade.

The Operation manual and Cubase Audio vs Cubase
This operation manual begins with a tutorial section showing you how to get started with MIDI recording in Cubase. After that follow descriptions of all aspects of the regular version of program, that is, the MIDI only version. The audio aspects of the program are described in a separate section of this manual, at the end.

The whole manual is designed so that you don't have to read all the text, only the sections that interest you. However, you should get familiar with all basic operations as they are described in this book. At the end you will find Indexes so that you can look up any function or feature that you need to know more about. In the back you also find a list of all computer keyboard commands.

Whenever the text in the manual refers to a key on the computer keyboard, the key's name is shown in brackets, like this: [Return].



Installation

If your computer isn't already set up as it should be, do so, following the instructions in the computer's Operation Manual. You should also verify that the computer works as it should. Make yourself reasonably familiar with operations like handling disks and using the mouse (clicking, selecting, double-clicking and dragging).

Before connecting any hardware to the computer, make sure power is off on all units.

Installing MIDI Interfaces

The Atari computers have MIDI built in, but you may want to add additional MIDI connectors and time code sync. For this purpose, Steinberg manufacture the SMP-II (rackmounted MIDI interface with time code sync). The Midex and Midex+ do not work with Cubase Audio Falcon, due to lack of computer processing power. They may still be used as protection key expanders however, allowing you to run several key protected programs at the same time.

How to install the various MIDI interfaces is described in the documentation that comes with the interface, but the general procedure is to connect the hardware and then activate a software driver. This last procedure is described on page 20 in this chapter.

Installing the Cubase Audio Clock

With Cubase Audio Falcon comes the Cubase Audio Clock (C.A.C.), which makes Cubase audio record with the standard CD sampling frequency of 44.1 kHz. This has to always be connected while recording and playing back.

- ❑ With power turned *off* on the computer, connect the Cubase Audio Clock to the DSP port on the back of the computer.

If you have the Steinberg FDI (see below) you do not need the Cubase Audio Clock!

Installing the FDI and the FA-8

Cubase Audio can record and play back audio without any additional "audio interfaces". However, adding a Steinberg FDI (Falcon Digital Interface) provides digital inputs and outputs for immaculate audio quality. Adding an FA-8 (Falcon Analog 8) provides the computer with eight separate analog outputs for external mixing of audio Tracks.

If you only have the FDI

- ❑ With power turned off on all equipment, connect the FDI to the Falcon's DSP port as described in the documentation included with the FDI.

- ❑ Install the FDI_INIT.PRG into your Auto folder as described in the FDI documentation.

- ❑ Copy the utility programs included with the FDI to your hard disk.

- ❑ There may be a version of Cubase Audio Falcon included on the disk. Ignore this since it is an older version than the one included in this package.

If you have the FDI and the FA-8

The FA-8 requires that you have the FDI, it can not be used without it.

- ❑ With power turned off on all equipment, connect the FDI and FA-8 to the computer as described in the documentation included with the FA-8.

- ❑ Copy the FDI_INIT.PRG and other FDI utility files to your hard disk as described above.

Installing a Printer

Exactly what cables and what settings to make of course varies completely with the type of printer you use, and may include such things as changing the printers so called "DIP switch settings". Please refer to the manuals that came with your computer and the printer. If in doubt, ask your dealer for help. On page 22 in this chapter you will find more information about compatible printers.

We recommend you to make sure the printer installation works as intended before trying to print a score. This will help you isolate the cause of any problems you may have.

Installing Hard Disks

The hard disks (you may use several!) for recording audio are connected to the Falcon's *SCSI* connector (SCSI is pronounced "scuzzy", and is short for Small Computer System Interface, a world standard for data storage computer peripherals).

Hard Disk Requirements

There are mainly two things to look for when shopping for a hard disk to use with Cubase Audio Falcon, size and speed.

The size of the hard disk is the limit to how many minutes of audio you may record. In mono, 5 MB of disk space is used up for each minute of continuous recording. In stereo, 10Mb is needed for one minute. If you for example have a 100Mb hard disk you will be able to record 20 minutes in mono and ten in stereo. This capacity is shared across all Tracks, so you may have 2 mono-minutes on one Track and 18 on another, and the 100 Mb disk would still suffice.

The speed factor determines how many Tracks the Falcon will be able to play back simultaneously, directly from the hard disk. There are (at least) two ways to measure speed, by *Average Access time* and by *True Average Data Transfer Rate*.

To get:	**... you need an Average Access Time of**	**... and a True Average Data Transfer Rate of:**
4/8* Tracks	at least 22 to 23 ms	at least 800kbit/second
6-8/12-16* Tracks	at least 12 to 15 ms	at least 1600kbit/second

* The first numb er refers to "8 Track mode" and the second to "16 Track mode".

Please note that the figures above are not to be taken as guarantees, only as guidelines, several additional factors have to be taken into account to get the full picture of a hard disk's performance. The best advice we can give is that you try before you buy.

The Internal Falcon Disk

It is not possible to record or play back audio directly from the Falcon's internal (IDE) hard disk. However, audio files intended for playback from RAM or via Cubase Audio's Sampler feature may be stored on (but not recorded onto) the internal drive and even floppy disks, since these files are loaded into RAM before they are played back.

Hard Disk Driver

Make sure the SHDRIVER.SYS you have is generated by the latest version of the "AHDI" software (this software comes with your Falcon). As of this writing, the current version number is 6.0, so you should have this or a higher version number. If in doubt, contact your dealer.

About SCSI

We don't mean to discourage you, but setting up a network of SCSI peripherals does contain some potential pitfalls. Entire books have been written on the subject, we will here only be able to guide you through the basics on SCSI ID's, termination, and configuration. After this follows a step by step guide for setting up your SCSI devices.

IDs

When you hook a number of SCSI Devices together, you connect them to the same "bus". This way they can all exchange data. You may have up to 8 devices connected on one SCSI bus, where the computer counts as one. To be able to distinguish between them you have to give each one (computer, hard disks, scanner, CD-ROM drive, etc) a unique ID number, a number between 0 and 7.

How to actually set the device ID is different for each vendor's device, and you have to read the manual that came with the unit to find out exactly how.

If all you want to do is to connect one SCSI Hard disk to the Falcon, you should simply set the hard disk's ID to zero.

If you have more than one device connected to your Falcon, you must number them from zero and upwards, without any "gaps". The reason for this is that the Atari computer checks for SCSI devices when you turn it on, and it starts by looking for ID 0 and then proceeds upwards. As soon as one ID is not found, it stops looking. If you for example have three devices set to IDs 0, 5 and 6, only the first one will be found.

As stated below, you will find a file called SHDRIVER.SYS on one of the floppies. This is a replacement for the standard Atari SCSI driver which allows you to use your Falcon with a wider range of SCSI devices than the original driver does.

SCSI Termination

A terminator is a bunch of resistors that either resides inside a SCSI device, or which is connected as a plug to one of its connectors. This is the law of SCSI termination:

Each end of your SCSI Chain, and *only* the ends of it, must be terminated.

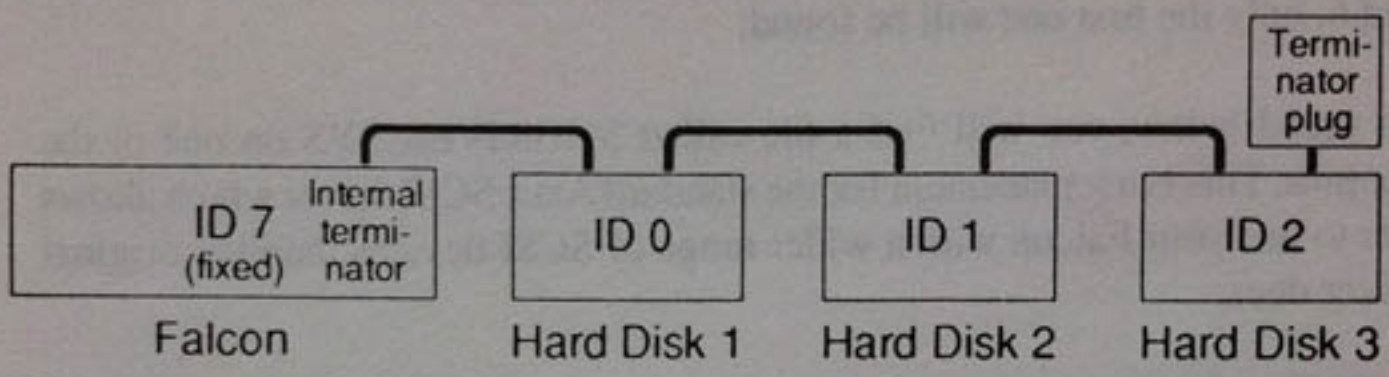
If you set things up any other way, with too many terminators, or a terminator missing, data transmission most probably won't work properly. In the worst case, one of your SCSI devices might get physically damaged.

Your computer should always be in one end of the SCSI chain of devices, and it is "internally terminated", which means you don't have to worry about it. On the other end of the chain you will have a hard disk or other SCSI peripheral, and you have to make sure this is terminated, either internally (see below), or that a SCSI Terminator plug is connected to the free SCSI connector on the back.

Some devices (some hard disks for example) come with *internal* termination (ask your dealer or consult the manual for information about your particular device). This means that if such a hard disk is the only device you plan to connect to your computer, you don't have to worry about adding terminator plugs. But, if you want to connect such a device into the middle of the chain, you have to have it opened it and the termination removed.

Opening the case of a hard disk will probably void the warranty. Contact your dealer if in doubt.

What makes this termination business hazardous is that a SCSI setup may seem to work even without proper termination; but, from time to time, randomly, important data such as the boot sector, root sector, or other directories on the disk may be irreparably damaged.



In the example above, the devices have the IDs set in ascending order. This is not necessary, but probably a good practise, simply to keep things clear. It doesn't matter which of the two connectors of a SCSI device you use for what connection, as they are connected in parallel.

Turn-on order

The third "SCSI rule" is easy to understand, but just as easy to forget:

Always switch on all Devices. First the peripherals and last the computer.

If some device is not turned on, you may loose data.

Cables

Last but not least, use high quality SCSI cables. The shorter they are, the better.

Summary

To sum things up: when you buy a hard disk (or other SCSI device) make sure you find out about how to set the ID, if the device is internally terminated, etc. Or even better, have the dealer help you set things up and make sure they work as intended.

Setting Up SCSI

- ❑ Make sure the power on all units is turned off.
- ❑ Connect all your SCSI Devices into a chain.
- ❑ Ensure proper termination, as described above.
- ❑ Assign unique IDs to all devices, starting at 0 with continuously higher numbers.
- ❑ Make sure once again that termination is inserted correctly and that all units are set to unique IDs (or you may lose data on the hard disks).
- ❑ Turn on power, first on the SCSI peripherals, and then on the computer, and wait until the Desktop appears.

Initialisation and Partitioning

Most hard disks come pre-formatted (you should get one that does!). However, you will still need to *initialize* and *partition* it yourself. Initialisation and partitioning software is included with the computer, and the procedures are described in the manual that came with your computer.

Using "Install Devices"

On the Atari computers, hard disks do not appear automatically on the Desktop the first time you turn on power. Select Install Devices from the Options menu. This should make symbols for your hard drive(s) appear. Then select "Save Desktop" from the same menu to make this configuration permanent. The manual that came with your computer describes this procedure in detail.

Before you proceed, make sure all hard disks operate as intended; that their symbols appear on the desktop, that you can write to them and read from them without problems, etc.

Connecting Audio To The Computer

Using the Falcon's Built-In Audio Connectors

On the back of the Falcon you will find two 3.5 mm audio contacts for stereo audio input and output. The input connector is labelled "Microphone" and the output labelled "Headphone".

- The Output provides headphone level, which can be lowered to some extent in the software (see page 4-3 in the audio addendum). You can connect this output to the line inputs of a mixer, or directly into a monitor system although the signal is pretty "hot". If you are using a hi-fi amplifier you should use the Tape or Auxiliary Inputs.

- The Input expects Microphone level signals, which means that it will work properly if you connect a microphone directly or if you connect the output of a guitar processor designed to be used with a guitar amplifier. If you need to feed line level signals to the input, you will run into problems, since the Input is much too sensitive for such signals. There are two ways around this: Either make a cable with built-in serial resistors (10 kΩ - 50 kΩ Ohm) or you can modify the Falcon hardware permanently. The latter option also allows you to improve the sound quality slightly and to install other connectors. More information is found in the Hardware specifics chapter.

The audio quality you will get when using the built-in audio connectors is not fully professional. To increase audio quality we recommend you use Steinberg FDI and optionally the Steinberg FA-8.

Using the FDI

The FDI accepts and produces digital audio signals in S/PDIF format via coaxial (RCA) and optical connectors. This requires you to have external A/D and D/A converters, either as separate units of for example as built into a DAT recorder.

Connect either pair of digital audio IN and OUT connectors on the FDI to your converters, as described in the documentation that came with the FDI.

Using the FA-8

If you use the FA-8 you will record via the digital inputs on the FDI and play back via the FA-8 and optionally also via the FDI. See the FA-8 documentation for more information.

Installing The MIDI Equipment

Depending on your setup, you may want to use other MIDI In and Outputs than the computer's own. Since this is an option, the following text refers to the built in MIDI connectors.

- ❑ Connect the MIDI Out of the keyboard (or other MIDI device) you plan to use for recording, to the MIDI In of the computer.

- ❑ Connect the MIDI Out of the computer to the MIDI In of the first instrument.

- ❑ Connect the MIDI Thru of that instrument to the MIDI In of the next. Continue to connect all units (maybe via MIDI Thru on each device) until they all have their MIDI In connected to the computer. If you plan to use more than three sound sources we recommend that you use a separate MIDI Thru box instead of the Thru jacks on each unit. If more than one instrument *doesn't have* a MIDI Thru, you will *have* to get a MIDI Thru box.

- ❑ Make all audio connections on the MIDI equipment, turn on the instruments and verify that they sound (if possible).

- ❑ Set each instrument to receive on a certain MIDI Channel. Or if you have multi-timbral instruments, set each Sound (Timbre, Part, Program, Patch) to receive on a certain MIDI Channel.

Installing the Copy Protection Key

- ❑ **Make sure that the computer's power is turned off!**

- ❑ Insert the Key, the plastic cartridge that comes with the program into the cartridge port of the computer. Make sure it is not upside down.

Installing the Program

Cubase Audio comes on two disks:

- The Program Disk contains the Cubase Audio program itself and some files (inside and out of folders) that go with it.
- The other disk contains additional files: Mixer Maps and Drum Maps, example files (for the IPS and other things) and printer drivers and fonts needed for printing.

None of the files or disks are copy-protected so you may use any means of copying that you find convenient.

You might not need all of these files, but it is very important to have the ones you use in the right folders.

Before you start copying the files to a hard disk, make yourself a backup copy of all original disks as they were when they came from the factory. You might need these at a later stage, for example when you buy additional hardware. Put the originals in a safe place and do the installation from the backups.

Copying Files onto a Hard Disk

Copying the right files from the floppies is a relatively painless procedure. If you wish, put everything in a folder or in the root directory, it doesn't matter. However, the relative positions between the files are very important, so when we say, "put this file at the same level as that file" they *must* both be visible at the same time in a folder or in the root directory.

If you have an internal disk in your computer, put the program and additional files on this.

However, all audio files intended for hard disk playback should always be put on the external (SCSI) disk, and it makes a good working habit to keep your Song files with your audio files.

Program Disk

File/Folder	Comment
CA_FALCN.PRG	The Cubase Audio program itself.
CUBASE.DAT (folder)	Must be found at the same "level" on the disk as the program file. Essential to running Cubase. Contains ".SYS" files and a number of font (".FNT") files.
MROS (folder)	Must be found at the same "level" on the disk as the program file. Contains the *M•ROS* itself and *drivers* for Devices you can use.
MODULES (folder)	Contains all modules included with the program. More details on page 16 in this chapter.
MIXERMAP (folder)	Contains special mixer maps for Audio Tracks.
DEF.ALL	Keep this on your working disk and at the same level as your Cubase Program file. It will give the default Song sensible settings. You can later alter this file or replace it with your own and thereby customize the program. See page 21 in this chapter..

Additional Files

File/Folder	Comment
IPS (folder)	Contains IPS examples.
MIXERMAP (folder)	Contains Mixermap examples.
DRUMSETS (folder)	Example Drum Maps.
SCORES (folder)	Example Scores.
PRINTERS (folder)	Contains files needed for printing. See page 22 in this chapter.
FONTS.SP (folder)	Standard *screen fonts* (the ones displayed in the program) and printer fonts for printing on *dot matrix printers*. See below for details.
GERAMONT (folder)	An additional "bonus" font, both screen and dot matrix files.
KEYSLOT.AC	This is an accessory which is needed if you have a MIDEX or MIDEX+ and use non-Steinberg programs with hardware keys for copy protection. More info in a README document.
SPOOLER.AC	This is an accessory that allows you to print scores while continuing to use Cubase.
FONTS.LS	Contains printer fonts for all types of printers, including lasers, see below.

Read Me Files

There might be a README text-file (or even a DOC Folder with README files in it) on the Program Disk that contains additional information and info about possible changes made to the program since this manual was written. Double click on it and select Show or Print from the dialog box that appears. If you select show you can at any time return to the desktop by pressing [Q]. This file is of course not needed to run Cubase.

Read the README file(s). They contain important information!

About Modules

The MODULES folder on the program disk contains all the modules that come free with the program. The files have the extension ".MOD".

You should keep the Modules that you will want to use in everyday work in the MODULES folder so that they can be loaded automatically when you start the program. If not all modules fit on the program disk, please note that they can always be loaded "manually" from any disk.

The following modules come with the program:

MIDIPROC.MOD	The MIDI Processor.
MIXER.MOD	The MIDI Mixer.
IPS.MOD	The Interactive Phrase Synthesizer.
SCORES.MOD	Score Editing and Printing.
SYSEX.MOD	System Exclusive editor. Only described in a READ_ME document.
ARPEGGIO.MOD	Arpeggiator. Only described in a READ_ME document.
FSEL.MOD	Alternative expanded File Selector. Only described in a READ_ME document.
GM_MENU.MOD	Adds General MIDI instrument names to the Inspector. Only described in a READ_ME document.

Additional modules can be purchased separately. Installation instructions for those comes with the Module. Currently available are:

- **Studio Module** – The Total Recall Studio Organizer. Manages the settings for all your synthesizers and other MIDI Devices.

- **StyleTrax** – The Accompaniment Tool. Make music in seconds with the Styles that are included, or create your own in minutes.

- **CueTrax** – The Graphic MasterTrack Editor. An essential tool for anyone making music for film or video.

Contact your dealer for more info!

About Font Files

Fonts are needed for two purposes:
1. To display characters on the screen. These fonts are called screen fonts.
2. To put characters on paper when printing. These fonts are called printer fonts.

The font files included support excellent quality output up to 300 dpi (dots per inch) and if a font with an even higher resolution is found in the FONTS folder as described below, and provided it can be utilized with the printer you have, it will automatically be used.

Installing Fonts – If you Have A Hard Disk

If you have a hard disk all the fonts included with Cubase should be copied to your CUBASE.DAT folder. If you purchase additional fonts (other type faces) copy these to the same folder.

Installing Fonts – If You Are Using Floppies

Two of the fonts are special Cubase designs needed to print symbols and chords. These are called CUBANT and CHORDS. In the CUBASE.DAT folder you will already find the files needed to display these on screen.

But, three additional type faces come with the program. One is called Dutch (Times comparable) and the file names for it contain the abbreviation "ATTR". The second is called Swiss (Helvetica comparable) and its name contains "ATSS". The third "bonus" font is found in a separate folder called GERAMONT.

In order for you to display these fonts on the screen, you need to have one or more font files of the "plain" type (for example ATTR10, 12, 18 and 24 *without* any EP, SP or LS additions) in the CUBASE.DAT folder. The CUBASE.-DAT folder on the Program Disk already contains a "ATTR10" file and you actually only need to keep the ATTR10/ATSS10 files there to be able to use both fonts. This will make text in other sizes than 10 point a bit jagged and ugly on screen, but then again it will save more memory for music (you will be able to record more notes) which is probably more important in most cases. Note that it is only on the screen the font will be displayed in a less pleasant way, when printing it will come out with full resolution.

When you print, the program will ask for the printer fonts (if not found in the CUBASE.DAT folder) If you don't have a hard disk, insert your copy of the Additional Files disk which includes a FONTS folder with all the printer fonts).

As mentioned above, you can buy additional standard GEM fonts (also called GDOS fonts) at your Atari dealer, and use them in the same way as the fonts provided free with Cubase.

Setting Colours

Handling audio and MIDI at the same time is a demanding task for the Atari Falcon 030. To relieve it from other burdens, set the display to "2 colours", that is, black and white mode or your audio will get distorted. How to do this is described in the manual that came with the computer. Use Save Desktop to make the setting permanent.

Launching Cubase

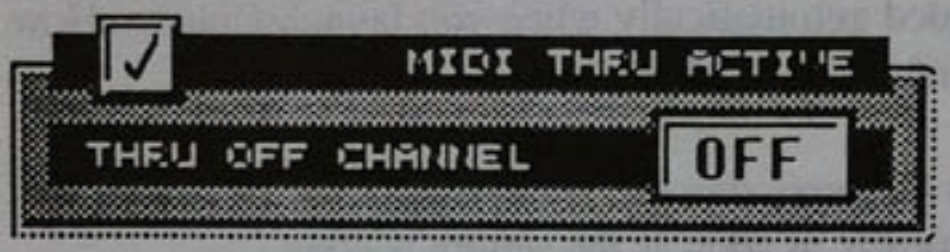
- ❑ Turn on the printer (if you have any).
- ❑ Turn on all peripherals, SCSI disks etc.
- ❑ Turn on the computer. The screen should come alive, showing the desktop. Open the folder where you have the Cubase Audio program.
- ❑ Locate the MROS folder, and double click on it to open it. In it you will find a number of files with the extension ".DR". These are the drivers for any external devices you want to use. The SMPFAXXX.DR (where "XXX" is a number) is for the SMP-24 and SMP-II interfaces and the MIDXFAL.DR is for the Midex and Midex+ (which can only be used as a key expander with the Cubase Audio Falcon). Other drivers are for tape recorders and Tape Tracks. You now have to activate these drivers. This is done by changing the extension in their name from ".DR" to ".DRV". Select the first file (click on it so that it turns black). Select "Show Info" from the File menu. When the dialog box appears, press "V" on the computer keyboard so that a "V" is added to the end of the name of the file. Click OK or press [Return] on the computer keyboard, and the dialog box closes. Continue in this way to activate the drivers you need (usually not more than one).
- ❑ Double click on the Cubase Audio program icon. The desktop should immediately disappear and after a while an Arrange window with the title DEF.ARR should be displayed.

Setting Thru

Before you go on, make sure that your MIDI Thru setting is correct (see the "MIDI Setup" section in the chapter "The Options menu").

- ❑ If you use a synth for recording, set this to *Local Off* if possible, and Cubase to *Thru On* (in the MIDI Setup Dialog box on the Options menu).

- ❑ If you use a separate MIDI device like a MIDI keyboard with no sounding capabilities, a guitar to MIDI converter with no built in synth or similar, Cubase should also be set to Thru On.
- ❑ If you use a synth or similar that can't be set to Local Off, the options are a little bit more complicated due to the nature of MIDI.



If you have your keyboard set to Local Off, or if you have a separate master keyboard, you should have MIDI Thru Active ticked and Thru Off Channel set to OFF.

- ❑ Play your MIDI keyboard or other device. Check the "I" box on the Transport Bar so that you are sure that Cubase receives MIDI data. If you have Thru activated, the "O" box just below it should indicate Output of data also.



The I and O symbols on the Transport Bar indicate MIDI In and Out activity.

- ❑ Select Save from the file menu. Click on the Song alternative in the dialog box that appears. In the file dialog, type in DEF on the file name line and click Save. This will make sure that the setting changes you have just made will be made permanent (for more info on the DEF.ALL Song, see the chapter The File Menu.).

Making Other Default Settings

You can personalize virtually all settings in Cubase, not only the MIDI Thru setting. When you launched Cubase this time, settings in the DEF.SET and DEF.ALL files where automatically loaded. By changing the settings and saving your own "DEF" files, you can have the program start with your settings each time. If you for example save a Song under the name DEF.ALL in your Cubase directory, *all* settings in that Song (including the music it contains) will be loaded the next time you launch Cubase. For more info, see the chapter "The File Menu".

Activating Modules

To be able to use the Score Editor, the Interactive Phrase Synthesizer etc, you have to activate the corresponding Module. You can activate Modules temporarily or set them to be loaded automatically when you launch Cubase. How to activate modules is described in the Modules chapter.

Which modules you set up for every day use is not part of the DEF file concept. This is stored automatically as soon as the setting is done.

Selecting A Printer Driver

Before you try to print, you should make sure you have the right Printer driver selected. There are two ways of selecting a Printer driver:

Using A Def.Prn File

If you know there is only one printer you will always use for all Songs, you can create a DEF.PRN file:

Make a copy of the correct printer driver (see below for info on how to choose a driver), rename the copy to DEF.PRN and put it on the same level on the disk as your Cubase program file.

Selecting a Printer File Specifically For A Song

If you select Printer Setup from the File menu, once the program is running, and click in the Printer section of this dialog, you are able to select a Printer driver file which will then be used for that Song only. This is described in more detail in the chapter "The Basics" in the Scoring appendix to this manual.

Which Printer Driver File Should I Choose?

One folder on the Additional Files disk is called PRINTERS. This contains files needed for printing on certain printers. You might be able to identify the printer you own by the name of the file. If not, check the tables below for more information.

Many printers *emulate* (imitate) the behaviour of other printers and therefore can use the driver for other printers. To find out exactly which emulation your printer uses, check its operation manual and then check the tables below.

About The Printer Driver File Names

- Printer drivers that have an "F" at the end of the name are faster than the ones without the F. However, they might not work on all printers. Try the faster driver first and switch to the other if you run into problems.
- Printer drivers that end with an "S" are for cut sheet printers.

9 pin dot matrix printers

Emulation	Driver to use:
Epson FX. (also called ESC/P)	EPSONFX.PRN or EPSONFXS.PRN
IBM Pro Printer	IBM-9PIN.PRN or IBM9PINS.PRN

24 pin dot matrix printers

Emulation	Driver to use:
Epson LQ. (also called ESC/P2)	EPSONLQ.PRN or EPSONLQS.PRN EPS_LQF
NEC P6	NECP6.PRN or NECP6S.PRN NECP6F.PRN NECPSFS.PRN
IBM X24 or X24E	IBM-X24_1.PRN, IBMX24S1.PRN, IBM-X24_2.PRN or IBMX24S2.PRN

Ink printers with 300 dpi resolution

Emulation	Driver to use:
HP Deskjet (also called PCL 3)	DESKJET.PRN
Epson FX (also called ESC/P)	EPSONFX.PRN or EPSONFXS.PRN
IBM Proprinter	IBM-9PIN.PRN or IBM9PINS.PRN

Ink printers with 360 dpi resolution

Emulation	Driver to use:
Epson LQ (also called ESC/P2)	EPSONLQ.PRN or EPSONLQS.PRN EPS_LQF.PRN EPS_LQFS.PRN
IBM X24 or X24E	IBM-X24_1.PRN, IBMX24S1.PRN, IBM-X24_2.PRN or IBMX24S2.PRN

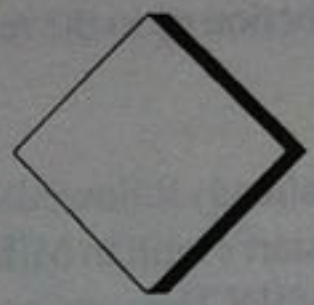
Laser printers

Emulation:	Driver to use:
HP Laser Jet (also called PCL2, PCL3, PCL4 or PCL5).	HPJET.PRN

For many laser printers it isn't necessary to manually activate the HP Laserjet emulation. They will automatically switch to the right mode when you select Print in Cubase.

You're Done!

This completes the Installation procedure. Please proceed to the next chapter to get acquainted with MIDI Recording.



Your First Recording

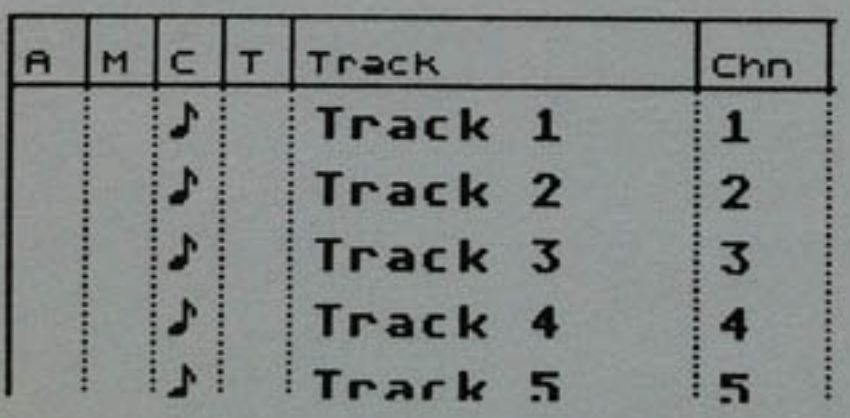
This chapter gives you a short introduction to how recording is done in an Arrange window in Cubase. This text does not give you all the details. If you run into problems, look each function up in the relevant chapter, or check the index.

This text assumes that you have already followed the steps in the "Installation" chapter, that you are using the Atari's built in MIDI connectors only, and that you have no problems with the MIDI Thru setting. You should have the DEF. ARR Arrangement that comes on the program disk displayed on the screen. This gets automatically loaded when you start the program. This text also assumes that you have one or more MIDI instruments, each set to one MIDI Channel, or that you have a multitimbral instrument (or several), with each sound set to one MIDI Channel.

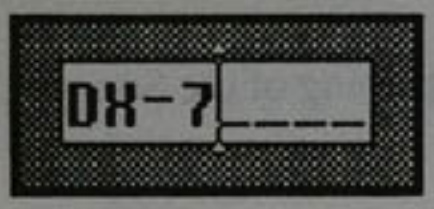
- ❑ Play your keyboard and check the I box on the transport bar. It should flicker to indicate that Cubase is receiving data. If you have Thru turned On (in the MIDI Setup dialog box), the O box flickers along, indicating outgoing data.



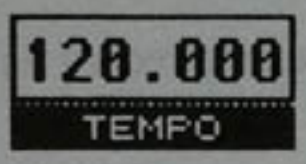
- ❑ On the left side of the screen you have the Track List. It now displays 16 Tracks set to send on MIDI Channel 1 to 16. Use the left (increase) and right (decrease) mouse button to set the first Track to the right MIDI Channel by changing the value in in the "Chn" column.



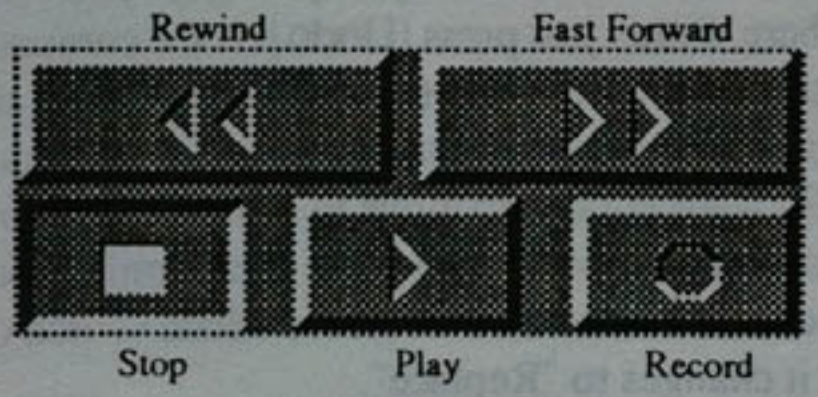
- Once you've got the setting right, double click in the "Instrument" column on that first Track. A small box opens up where you can enter a name for the sound or instrument you use. Do this and press [Return] when you are finished.



- If you want to change the tempo, locate the Tempo box on the Transport Bar, and change the value using the left and right mouse button.



- Click on Record or press [*] on the computer keyboard.



- After the two bar count-in, start playing for as long as you wish. When you are finished, click on the Stop button or press [0] on the numeric part of the computer keyboard. A black rectangle should be displayed on the first Track. This is a (selected) Part, a recording on a Track. A Part can be dragged around on the screen. If you hold down [Alternate] while dragging you are making copies (duplicating).

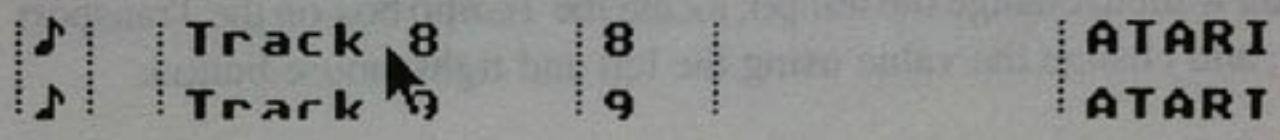


- Press [0] on the numeric part of the computer keyboard twice so that you return to the beginning of the Song.

- ❑ Click on Play or press [Enter] to play it back. If you wish, you can use Rewind or Fast Forward at any time to move back and forth without stopping first. If you decide to Stop first, you can use Fast Forward with the *right mouse button* to hear the music played back in a faster tempo (cueing).

- ❑ After playing back the Track, return to the beginning of the Song again.

- ❑ Select a new Track by clicking on it.



- ❑ Set it to the MIDI Channel for the next sound you wish to record with, and enter an Instrument name for that also.

- ❑ Record on the second Track just as with the first.

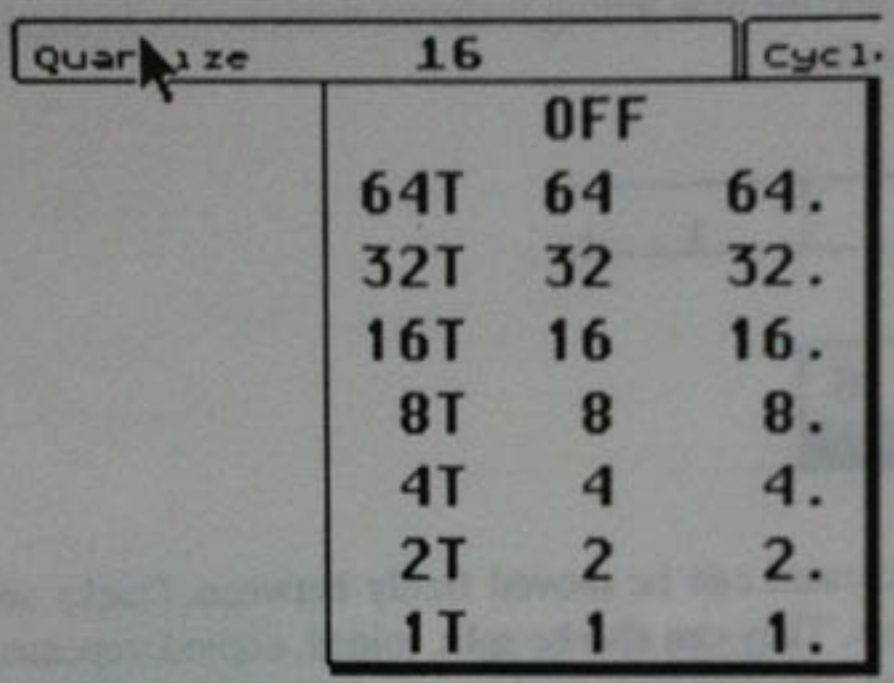
- ❑ If you make a mistake somewhere there are many ways to go, but we will only suggest two of them here. Either just press [Undo] on the computer keyboard to make the last recording undone (you can even "undo the undo" if you like). Or if you want to "repair" a section of your recording, use the Rewind and Fast Forward buttons to move to some point before that section. To tell Cubase that you want to Replace music rather than Overdub on the same Track, click once on the Record Mode switch on the Transport bar, so that it changes to "Replace".



- ❑ Play back the music. At any time, click on Record or press [*] to enter recording. Click again to exit record mode without stopping playback. Rewind again if you need to (in Play mode) and Punch in and out as many times as you wish.

- ❑ Click on the Record Mode switch once so that you put Cubase back in Overdub mode.

- If you want to Quantize a recording, (remember that you don't have to stop playback or even recording to do this) first set the right Quantize value. There is a box at the top of the screen labelled Quantize. If you press the mouse button inside that box, a menu falls down where you can select a Quantize value. This value is valid until you change it.



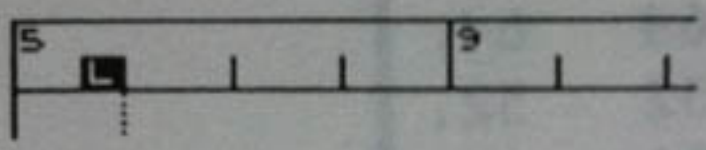
- Now select a Part by clicking on it. Then pull down the Functions menu and select Over Quantize or press [Q] on the computer keyboard. You can select several Parts to be Quantized at the same time if you hold down [Shift] while clicking on them.

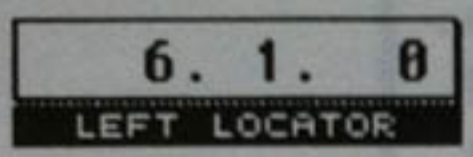
- Continue to record more Tracks. If you want to use an instrument or a sound that has been used before, press the left mouse button in the Instrument column, and select that instrument/sound from the menu that falls down. The Track is then automatically set to the right MIDI Channel.



- If you want to make a recorded Track send out an another MIDI Channel, just change the "Chn" value for that Track.

- If you want recording with a count-in (Precount) to start from some other point than the beginning, click in the Bar Display (above the Parts) at that position, using the left mouse button. What you do is to change the setting of the *Left Locator*, and the new setting is shown numerically in another box on the Transport Bar.





- The Parts that are created can be moved freely between Tracks and duplicated if you wish. They can also be split, joined, copied, repeated, lengthened shortened, grouped and much more. And all this while the music is playing! If you press the right mouse button somewhere in the Part Display, a Tool Box appears that you might want to experiment with. But you will learn more about this in the rest of the manual.

- If you want to delete one or more Parts, select them as with Quantizing and press [Delete] on the computer keyboard.

- When you are happy with your piece, pull down the file menu and select Save (no, you don't have to stop playback to Save). Click on "Arrangement" in the dialog box that comes up. Enter a name and save to disk as in most Atari programs.

- Select New from the File menu to get a new Arrangement window. This has no Tracks yet.

- Double-click anywhere in the Track column, and a new Track appears. You can create as many Tracks as you wish in this way.

- This time you don't have to create Instruments, they are already there when you press the left mouse button in the Instrument column. Select

an instrument for the first Track you wish to record on, and select that Track by clicking on its name.

- ❑ You are now ready to try the absolute fastest way of making up grooves or short sections of music you ever experienced—cycled recording in Cubase. This time you will record four bars, but the Cycle could be any length. Check the Left and Right Locator boxes on the Transport Bar, they should say 1.1.0 and 5.1.0. If they don't, press the function key [F1] on the computer keyboard.

- ❑ Click on Cycle on the Transport bar.



- ❑ Click on Record.

It is unnecessary to deactivate recording at any time during the following procedure. You can deactivate recording at any time by clicking on the Record button, if you want to, but you don't have to!

- ❑ Start playing after the two bar Precount. The music Cycles over the four bars and you can add as much as you want on each lap.

- ❑ When you so wish, select a new Track and record on that. Use the "Instrument" column to make each Track output to the right sound/ instrument. If you need to, make up more Tracks by double-clicking.

- ❑ You can Quantize, move Parts and duplicate as you wish and also select new instruments or MIDI Channels for each Track at any time.

- ❑ If you make a mistake, press [B] to delete the whole recording on that Track or [V] to just delete the last lap you played anything on. And if you come up with anything good, remember to save it to disk!

- ❑ When you have something you are almost satisfied with, double click on it. A new window opens with a piano keyboard at the left side and a Position Bar just like the one in the arrange window at the top. You will here see some or all of the notes you recorded, displayed as on a piano roll.

- ❑ If you wish, you can keep playback going in a Cycle. If you find the automatic scrolling disturbing, use the Options menu to turn "Follow Song" off (no tick).

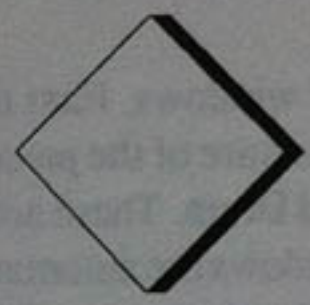
- ❑ If you want to hear the edited Part only during playback, activate "Ed Solo" on the Transport Bar.

- ❑ Use the scroll bars to locate some notes you want to work on. Press the right mouse button to bring up the Tool box. With the mouse button pressed, select a Tool. Use this Tool in the display, with the left mouse button. Here are some hints:

  The Arrow Pointer is for selecting and moving.
  The Pen is for drawing and lengthening/shortening.
  The Eraser is for deleting.
  The Kickers are for kicking notes around.

- ❑ When you are finished editing, click the "Keep" button on the window's title bar, to close the window and to make your edits "permanent".

Following this short description, you have of course barely scratched the surface of Cubase's power. But you have probably gotten a feel for how simple it is to use. Continue to experiment and try out functions as it suits you. Some things you will have to read in the manual about, and other things will be obvious from the start. But the way this program works, your intuition will always put you on the right track. Good Luck!



Overview of Cubase

The screen

Cubase is based on the use of windows. First there is the Arrange window. This shows you the overall structure of the piece. Then there are several Edit windows: Key, List, Score and Drum. These are used for editing music. Any changes done in one of the windows are automatically shown in all windows. This very powerful and flexible window handling makes an investment in a large screen monitor (eg Atari SM-194) for use with Cubase, worthwhile.

Regardless of which window you use, the Menu bar at the top of the screen shows all the menus used for selecting functions and commands. Some of these open up other windows or so called Dialog Boxes.

On the bottom of the screen you find the transport bar (which can be hidden). This holds all the tape recorder-like functions, the counters and a few buttons for special functions.

Timing resolution

The *recording* resolution of the program is 384 fractions (or ticks) per quarter note, which means 1536 ticks per bar in 4/4. This is sixteen times as good as MIDI clock, and a higher resolution wouldn't make sense at all, since MIDI still doesn't handle parallel data. With MIDI, a chord isn't really a chord, as you may know, it is a very, very tight arpeggio.

Here are some tick values at 384 tick per quarter note and their corresponding note values.

No of ticks	Note Value
384	One quarter note
192	One eighth note
96	One sixteenth note
64	One sixteenth note triplet
48	One thirty-second note
32	One thirty-second note triplet
24	One sixty-fourth note

Although recording is always done at full resolution, it can be lowered for playback. If you experience that the program doesn't perform as well as you expect (screen updates are slow for example), you may lower the playback resolution to 192 or 96, see page 21-28.

Real Time

Cubase is a true real-time program. It has sophisticated multitasking procedures that let you do almost anything (like loading from, and saving to disk) without interrupting the music.

Generally, don't turn off playback or recording just because you want to try a command or a function, just do it!

In some instances the notes sounding at the moment have to be cut off, but timing is never affected.

Undo

Cubase has extensive Undo functions for all important parts of the program, and Quantizing can be undone *at any time*, all the way down to recording resolution.

Structure

Parts

When you record MIDI you are creating a Part. This is the smallest element of music you work with (even though you can work on a section of a Part).

Tracks

Recording is done on one or more Tracks. You create as many Tracks as you need (up to 64), as you go along. Normally, you record on one Track at a time, but you can also record on several Tracks at the same time (Multi Recording). A Part isn't locked to a Track, you can move a Part from one Track to another.

Track classes

There are different types of Tracks, called track classes. In the basic version of Cubase you get:

MIDI tracks	For regular MIDI recording and editing.
Drum Tracks	For recording Drum Parts that you plan to edit in the Drum editor.
Group Tracks	For playing back Groups (see below).
Mix Tracks	For recording and editing MIDI Mixer Tracks.
Tape Tracks	For controlling tape recorders.

When you install additional so called *modules* other Track classes may appear.

Groups

A powerful feature of Parts is that they can be grouped. By grouping several Parts you can handle them as one entity. You might for instance group the trumpet, trombone and sax parts in the chorus, and call that group "Brass". This "Brass" Group can then be handled as if it was one single Part. You can also turn *all* different sections of your song (intro, verse...) into one Group each, and thereby easily rearrange your music.

Transport

Playback, recording and winding in itself is very tape recorder like. Playback starts from anywhere in the Arrangement, recording and overdubbing starts from anywhere or with automatic or manual punch-in and -out from any specified point.

Arrange Window

All the Parts created are put together into an arrangement in the Arrange window, which may contain up to 64 Tracks of mixed classes. You can have up to 16 Arrangements open at the same time (but only seven of them visible in windows). Actually, arrangements can be different versions of the same piece of music or completely different pieces or you can have different sections of one song in different Arrange windows, it's all up to your working style.

Song

All open Arrange windows can be saved as a Song. A Song is the largest entity you can work with. It is a set of Arrange windows, all the Groups that go with them, the Mixer maps, the Setup and the Drum Map. Your use of the Song feature depends on how you work. If you use several Arrange windows to make up sections of your music and handle these as Groups, you will use the Song as just that, a song. If you complete a piece of music in one Arrange window you can use one Cubase Song to handle a set of songs or maybe variations on one piece of music.

Setup

A special type of disk file called Setup allows you to store the program's settings as they are in a given moment.

Editors

The Editors are all different ways of looking at and editing your music.

- Key Edit allows you to look upon your music as it is played on a keyboard.
- Drum Edit is of course best suited for creating drum and percussion parts. It allows you to create Maps with setups for whatever drum machine, sampler or other drum sound source you use.

- Score Edit shows your music in standard notation and let's you add advanced formatting for printout.
- List Edit is a list of all "events" or musical happenings. It also has a graphic display.

These editors all have powerful commands for major changes and detailed fine tuning of notes and other MIDI events. Recording and playback can be done in any of them, and all communicate and instantly show changes made in any other window. All editing can be carried out while the music is playing.

- The MIDI Mixer is an editor of a sort, and allows you to control other aspects of your music, such as volume, panning and synth sounds, in a graphical manner.

- Logical Edit is a dialog box that allows you to make changes based on mathematical criteria.

On the Edit menu you will also find the Notepad, where you can make text notes about your Arrangement.

Modules

To save precious memory space in your computer, parts of the Program are broken down into modules. These can be loaded in to — and thrown out of — memory at will, and you can also configure the program to automatically load a selected set of modules when you launch the program. See page 22-1 for details.

These modules come with the program:
Score Edit
MIDI Mixer
Interactive Phrase Synthesizer
MIDI Processor

Other modules can be purchased separately.

Memory

The amount of memory in your computer stands in direct relation to how many notes you can record. The program runs on — and runs well on — 1 MegaByte of RAM, but in order for you to be able to use Score Edit to its fullest and to have several Modules loaded at the same time, you need more RAM; 2 or maybe even 4 Megabyte.

If you are running low of memory (too many events recorded) the program will alert you. Note that this can happen even during playback, since the program uses an advanced dynamic memory scheme to make the most out of the available RAM. If you want to check how much of your RAM you are currently using, select the About Cubase item form the Desk menu and look at the bar graph in the dialog box that appears.

Mouse and keyboard

Mousing around is done as in most Atari programs. You Click, Double-Click, Select, Drag and Shift-Click just as usual. Menus and file boxes are handled in a standard way. But there are a few things you should know.

Buttons and Value fields

Most buttons normally change between On (white text on black) and Off (black text on white) when you click on them. Other buttons change between two values.

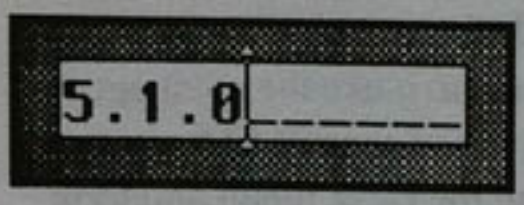
Value fields can sometimes be changed one numeral at a time. Which numeral depends on where you click in the field.

- The right mouse button increases the value and the left decreases it.
- If you hold down [Shift] while clicking, the value changes in larger steps (many times steps of ten).

- If you first press one mouse button and then while the value is scrolling, press the other, the values changes more rapidly.

- If you hold down [Control], you can drag the mouse up and down to change the value, as if the screen was a fader.

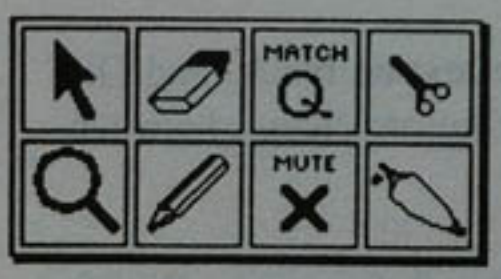
- Most value fields can also be double clicked upon. A small dialog box appears where you can type in the value. Finish by pressing [Return].



The Toolboxes

Inside the windows, the right mouse button can bring up a toolbox. If you keep holding the right button down, you can select one of the tools. You then use the selected tool to click with the left mouse button on an object to perform the action. An "object" in this sense refers to be a note or any other type of event in any editor, a Part in the Arrange window or an object in the MIDI Mixer window.

The different windows have different tool boxes:



The Arrangement tool box.



The Key, List and Drum Edit tool box. In Drum Edit, the Pen is replaced by a drum stick.



The Score Edit tool box.



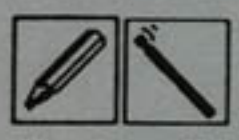
The MIDI Mixer tool box.

Below follows a brief description of some of the tools. Some of them appear in several windows.



The Arrow tool is used for selecting, moving and duplicating different types of objects. When something is selected it is shown in black.

A quick way to select the "arrow" tool (always in the upper left corner of the toolbox) is to just press the right mouse button once.



The Pencil is used for drawing in and lengthening/shortening objects and for scaling continuous data and velocity in some of the editors. The Drum Stick performs the same action in Drum Edit.



The Eraser is for deleting events and objects.



The Magnifying glass is for auditioning events by dragging over them.



The Scissors are for splitting Parts in two, in an Arrange window. It is also used in Score Edit.



The Glue tube is for glueing Parts together in an Arrange window. It is also used in Score Edit.



The Mute Tool is for muting Parts in an Arrange window.



The Match Quantize tool is for copying position and velocity values between Parts in an Arrange window.



The Compasses are for scaling velocity and continuous data in some of the editors.



The Paint Brush is for painting notes in the editors.



The Kickers are for moving notes in the editors.

Bees and Beach balls

These two items seem to go naturally together both in the real world and in Cubase. In Cubase they are both mouse pointer shapes that indicate that you have to wait for the program to finish whatever it's doing before it can receive input from you again.

Using the Keyboard

The keyboard is normally not used for typing. Instead it doubles up for the mouse by using different keys for different commands. A list of all keyboard commands is found on page 37-1. Users of other programs, even on other computers, will feel at home since Cubase uses all the standard key combinations for universal commands such as Save, Cut, Copy and Paste.

When the text says something like "press [Control]-[T]" this means that you should hold down the Control key on the Atari keyboard and press T once. when it says [F5] or any other figure, this refers to the function keys above the typewriter keyboard.

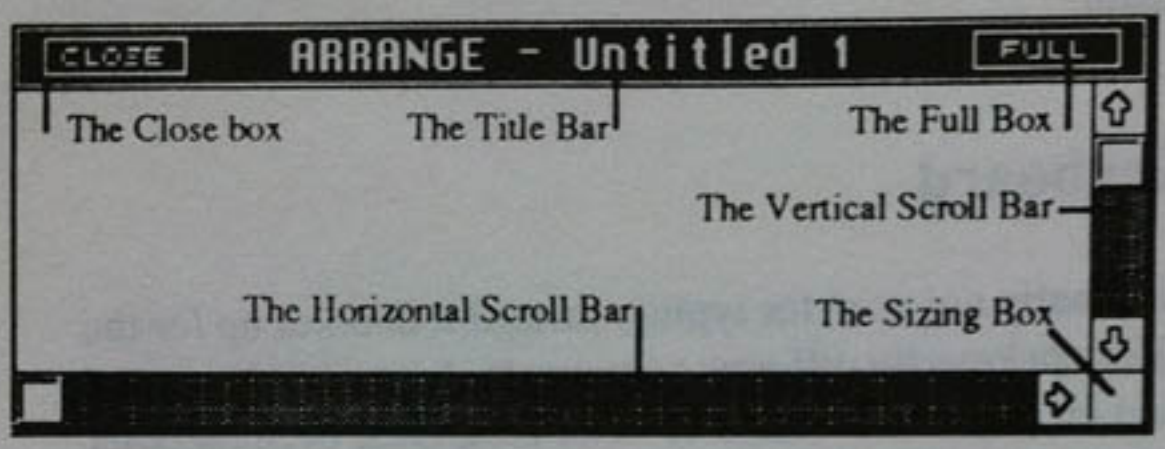
Naming things, like Parts and Tracks, is always done in the same way. By clicking or double-clicking on the item you want to rename, a small box opens up. Either use the [Backspace] key to delete one character at a time or use the [Esc] Key to delete all characters in one go. Then type in the new name. You can also use the left and right cursor keys ([←] and [→]) on the computer keyboard to move around inside the name and insert text. When you have it right, press [Return] or [Enter] to close the box.

Windows

It is in the windows that the action takes place. There are Arrange windows, Key Edit windows, Score Edit windows and so on. You can have several Arrange windows open at the same time and thereby work on several sections of a song or even several complete songs at the same time. You open saved pieces of music or create new Arrange windows by using the File menu. You then edit Parts of in the Arrange window (or create new music) by opening Edit windows.

The maximum number of open windows at any time is seven.

Cubase's windows are not standard Atari windows, although most techniques used for handling regular windows on the ST/STE/TT apply.



On the top is a black bar with some text or figures in the middle. This is the Title Bar. It can be used to move the window around on the screen. This is done by pressing and holding either mouse button with the pointer on the title bar. While holding the button down, move the mouse. An outline of the window is moved. When you release the mouse, the window is redrawn at the new location.

In the lower right corner is the Sizing Box. When you press and drag with the pointer in this box, you change the size of the window.

In the upper right corner is the Full Box. When you click once in this box the window changes to full size. When you click again it changes to the size last set with the sizing box. Each time you click, it switches between these two possibilities.

In the upper left corner you find either a Close box or a Keep and a Cancel box. When you click on either, the window closes. If you have the options of Keeping or Cancelling, this means that the changes you have made up to now have only been temporary, you may decide to Cancel all changes that have been made since you last opened the window, or to Keep them.



On the lower and right sides of the windows you may find scroll bars. They have two purposes: scrolling and changing magnification (zoom factor).

When you click the *left* mouse button on any of the *arrows*, the content of the window is moved one step in that direction (upwards, downwards and so forth). If you hold the mouse button down, the window scrolls continuously.

When you click or hold the *left* mouse button in the *grey area*, the window is scrolled in larger steps.

You can drag the white scroll box up and down in the scroll bar. If you do this with the left mouse button, the window is scrolled to the relative position of the scroll box, when you release the mouse.

If the whole scroll bar is white, this is an indication that there is nothing more to see in that direction. If for example the horizontal scroll bar in an Editor window is white, you can be sure that all the music that can be edited already fits into the window horizontally, there is no point in scrolling right or left.

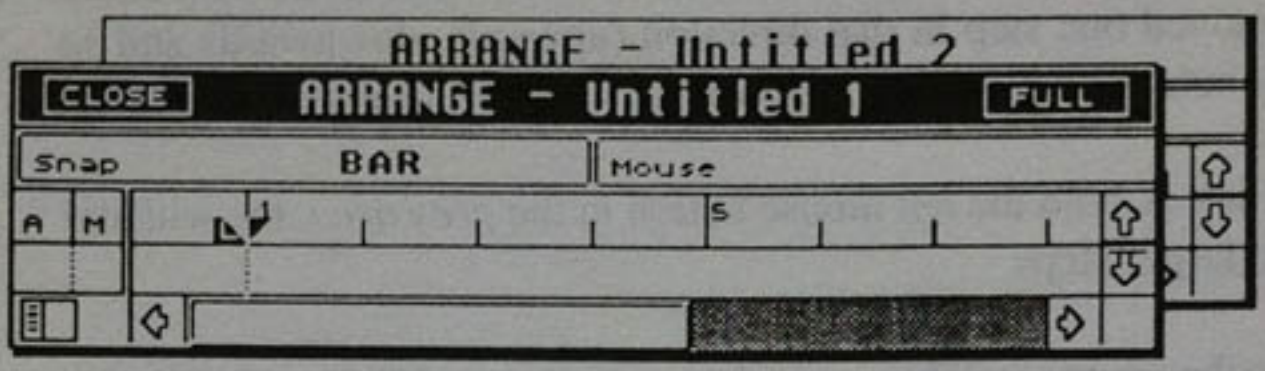
When you operate the scroll bar with the *right* mouse button, you change the magnification of the window instead of scrolling it. This way you can zoom in on fine details or zoom out to get a good overview of what is happening. You can magnify/reduce both horizontally and vertically. The right/upper arrow is used for magnification and the left/lower for reduction. You can click in the grey area and you can drag the white scroll box, but it doesn't move when you use the right mouse button to change the magnification.

You can change horizontal magnification by pressing [G] (zoom in) and [H] (zoom out) on the computer keyboard. In the same manner you change vertical magnification by pressing [Shift]-[G] and [Shift]-[H].

Not all windows have scroll bars.

You will often find yourself having several windows open at the same time. Maybe you will have one or a couple of Arrange windows open and one or more Editors.

The *active* window is the frontmost one. Only one window is active at at time and it is the only one with a black title bar. All other windows (the inactive ones) have white title bars.



An active and (behind it) an inactive Arrange window.

To make a window active, just click on any part of it. If you don't see it, just move or resize the windows that are on top of it.

Dialog boxes

When you select a function from a menu, sometimes a dialog box appears. This is also a window of a type, but it can't be resized. After you have input the necessary information using the mouse you close the dialog box by clicking on a button called Exit or OK, or by pressing |Return| on the computer keyboard. In most cases the |Esc| key doubles up for the Cancel button (if there is any) in the dialog boxes.

You can use the functions on the Transport Bar (and many of the computer keyboard commands for them) even when you have a dialog box open.

Pop-Up Menus

Throughout the program you will select values from *pop-up menus*. These differ a bit from the regular "menu bar menus". Pop-up menus may appear anywhere in a window or dialog box, and not all are on a menu bar (but some are). If you click briefly on then, the fall down and stay down until you have selected an item. If you instead press and hold the mouse button, they stay down until you release the mouse button. But, selecting is done identically from all menus, pop-up or regular.

Terminology

In this chapter we have defined some words that are used throughout this manual and in the program. Remember that key words always begin with a capital letter. "Part" is a special Cubase term, but "part" is just the word "part". Here's a recapitulation:

Parts The smallest elements of music. A bit like a Pattern in other programs.

Tracks Recording is always done on a Track. A Part is a section of music on a Track.

Track Class The type of Track.

Events The contents of a Part, i.e. MIDI (and other) messages recorded, like notes, controllers, after touch and so on.

Arrange The Arrange window has Tracks and contains Parts. A piece of music is organized in the Arrange window. This can be a complete piece or just a section like a verse or an intro.

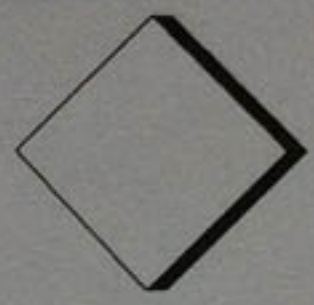
Groups You can group Parts in an Arrange window so that they can be handled as one entity. The set of Groups created are "shared" by all Arrange windows.

Group Part When you have created a Group you can use the whole Group as if it was one single Part. This type of Part is called a Group Part.

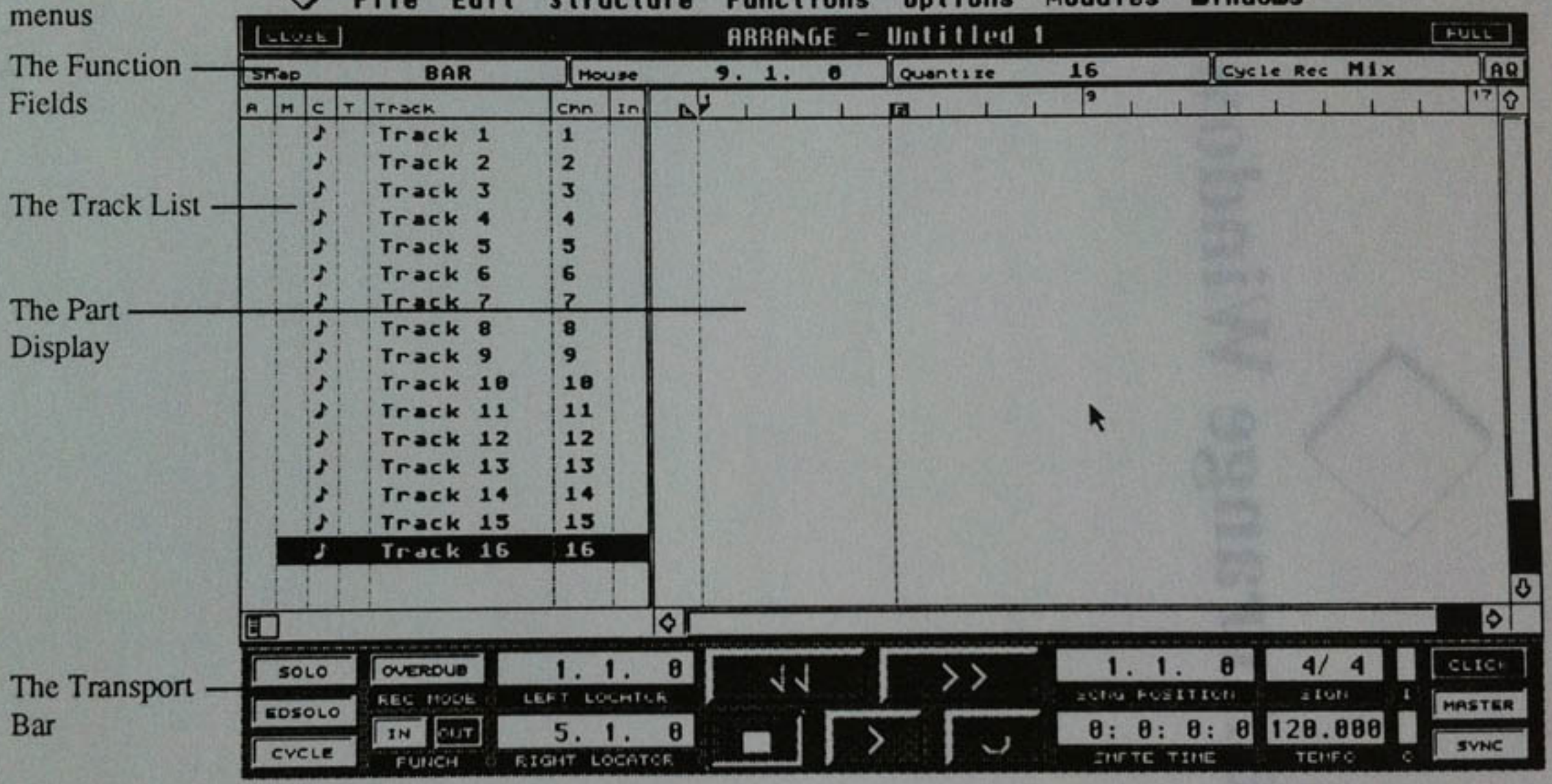
Song All open Arrange windows and all Groups can be saved together as a Song. In this manual a distinction is made between "song" and "Song" (with a capital "S"), where "song" is a regular piece of music and "Song" is a set of Arrange windows and Groups as described above.

Setup A file with all the program settings as you want to have them when you start working.

Module Some features in the program that can be loaded into and thrown out of memory at will.



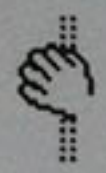
The Arrange Window


The Main menus
The Function Fields
The Track List
The Part Display
The Transport Bar
File Edit Structure Functions Options Modules Windows
ARRANGE - Untitled 1
Snap BAR
Mouse 9. 1. 0
Quantize 16
Cycle Rec Mix
A M C T Track Chn In
Track 1 1
Track 2 2
Track 3 3
Track 4 4
Track 5 5
Track 6 6
Track 7 7
Track 8 8
Track 9 9
Track 10 10
Track 11 11
Track 12 12
Track 13 13
Track 14 14
Track 15 15
Track 16 16
SOLO
EDSOLO
CYCLE
OVERDUB
REC MODE
IN OUT
PUNCH
1. 1. 0
LEFT LOCATOR
5. 1. 0
RIGHT LOCATOR
1. 1. 0
4/ 4
0: 0: 0: 0
120.000
TEMPO
CLICK
MASTER
SYNC

When you first start Cubase, an Arrange window with the name DEF (as in Default) is opened. It has a number of Tracks in it and some other "default settings".

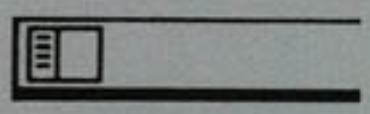
The title bar has the Close and Full boxes to the left and right respectively and in the middle you find the text "ARRANGE – DEF.ARR". The name (Def) will change when you save the Arrangement the first time.

The Arrange window is divided into two major parts, the Track list to the left and the Part Display to the right. There is a vertical double line drawn between them, and this line can be moved by dragging. When you move the pointer over the line the pointer changes into a hand, indicating that you can drag the border.



When you move the border all the way to the right you see all the columns in the Track List.

If you click on the white area just below the Track list, you hide/show an area called the Inspector.



Click on this icon below the Track list to open the Inspector.

Above both the Track List and the Part Display are a few fields for functions related to the Arrange window.

You can scroll the Part Display using the *left* mouse button on the scroll bars.

You can change the magnification by using the *right* mouse button on the scroll bars. You can also change horizontal magnification by pressing [G] (zoom in) and [H] (zoom out) on the computer keyboard. In the same manner you change vertical magnification by pressing [Shift]-[G] and [Shift]-[H].

You can have seven Arrange windows open at the same time. Either create new ones by selecting New from the File menu or open an existing using the Open command, also on the File menu. You also have the option of putting Arrangements up on the Windows menu when you close them (click KEEP in the dialog box). This means that the Arrangement is active as the others, but its window isn't displayed on the screen. You can have sixteen Arrangements active like this at the same time, but as said above, only seven of them displayed in windows.

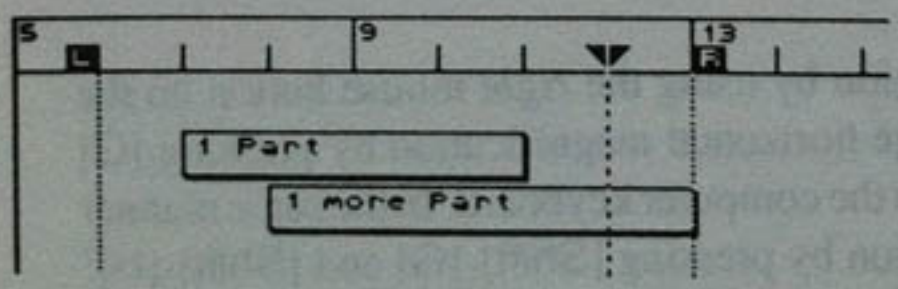
Having several Arrange windows open at the same time will let you try out variations on an Arrangement by using the Cut, Copy and Paste commands to move musical parts from one window to another. It will also allow you to make the most out of the Group feature.

Tracks

The Tracks are there for you to arrange your recordings in a structured way. A Track can be named. You can also make settings for the Track which affect all the Parts on it. These are done in the Track list and in the Inspector.

The Part Display

The central Part of the Arrange window is the Part Display. It shows your music as Parts. A Part is a recording you have made and maybe edited, shortened, lengthened, split in two or joined together with other Parts. A Part is shown as a rectangle, either with its name on it, or with small bars all over it representing the events in the Part.



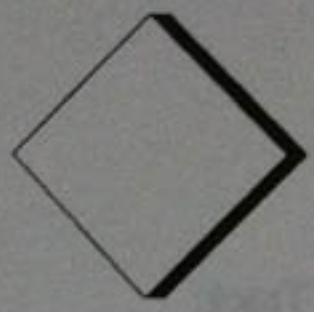
A section of the Part Display with two Parts, The Left and Right Locator and the Song Position Triangle.

The Position Bar

Above the actual Part Display you find the Position Bar. This shows you the positions in your song. The beginning of each bar is indicated by a vertical line, and some of the bars are numbered. The Song Position, the Left Locator and the Right Locator are all shown graphically in the Position Bar. This can also be displayed a SMPTE (time code) rather than bars. See page 8-4.

Crosshairs

If you tick "Use Crosshair Cursor" in the Preferences dialog box on the File menu, the pointer position will be indicated by a vertical and horizontal line when you drag Parts. The vertical line shows the position on the Position Bar, and the horizontal line shows you which Track you have the pointer on.



Tracks

Recording is always done on a Track. You can have up to sixty-four Tracks in each Arrange window and you can add and delete Tracks as needed.

Creating Tracks

There are three ways to create a Track:

- Double click in an empty (white) part of the Track List.
- Select Create Track from the Structure menu.
- Press [Control]-[T] on the computer keyboard.

New Tracks are always so called *MIDI Tracks*, that is they're intended for regular MIDI recording and playback.

The first Track you create gets the name Track 1. The Track is set to output on the Atari MIDI port and MIDI Channel 1.

More Tracks are created in the same way.

Track Classes

There are different types of Tracks, called *classes*. You select which type a Track is, by pressing the mouse button with the pointer over the "C" column for that Track. A menu appears where you can select one of the Track classes.

There are five basic types of tracks.

MIDI tracks	For regular MIDI recording and editing.
Drum Tracks	For recording Drum Parts that you plan to edit in the Drum editor.
Group Tracks	For playing back Groups.
Mix Tracks	For recording and editing MIDI Mixer Tracks.
Tape Tracks	For controlling tape recorders.

If you purchase an extension to Cubase or an expanded version, more Track Classes may appear on the menu.

Most of this manual is devoted to the MIDI tracks. The other classes are described in their respective relevant chapters.

In the rest of this manual, if nothing else is stated, an operation applies to all track classes.

If you have not recorded anything yet on a Track, you may at any time convert it to any class. But if there is something recorded on it you will not be able to select another class for the Track. The only exception is that MIDI Tracks can be converted to Drum Tracks and vice versa, at any time. **See page 27-10.**

Selecting Tracks

You select a Track by clicking on its name (in the TRACK column) or by stepping through the Tracks with the [↑] and [↓] keys on the computer keyboard. The selected Track is inverted (white on black) and is called the "active Track".

Moving Tracks

You can also rearrange the Tracks by dragging the names in the list. When you release the mouse button the Track is inserted in the list at the new position.

All the Parts on the Track are moved with the Track.

Duplicating Tracks

You may also make a copy of a Track and all Parts on it. This is done exactly as when moving a Track. The only difference is that you hold down [Alternate] on the computer keyboard while dragging.

Deleting Tracks

To delete a Track, first make sure that no Part is selected (inverted). This is to make sure that what you Delete will be a Track, not a Part. If you want to check this before you proceed, pull down the Edit menu. One of the items should say Delete Track (*not* Delete Parts). From this point there are several ways to go:

- Press [Backspace] on the computer keyboard.
- Press [Delete] on the computer keyboard.
- Use Delete Track on the Edit menu.

The Track columns

The Track columns shows names and settings for the Track. These can be changed directly. The headings are the same for all Tracks, but may have a slightly different meaning for different Track classes. Not all columns apply to all Track classes.

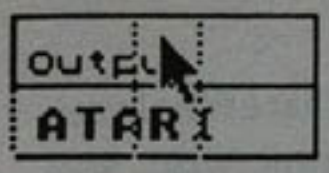
A	M	C	T	Track	Chn	Instrument	Output
				Hats	10	E3drums	ATARI
				Kit	10	E3drums	ATARI
				Bass	9	DX-7	ATARI
				VersePia	5	M1Piano	ATARI
				VersePad	4	M1String	ATARI
				G-24-3	3		
				Vol&Pan			MainMix

Rearranging the Track columns

You can arrange the vertical columns in any order you like, by simply dragging the headings to the left and right, respectively.

- Hold the mouse button over the heading of the column you want to move.
- Press the mouse button and drag the column to the new position and release the mouse button.

- If you drag to the left, the column will be inserted to the left of the column you "drop it on". If you drag to the right it will be inserted to the right of the column you "drop it on".



The Activity column can not be moved.

Below follows a brief description of each Column.

Activity

This has the heading "A". It shows if any MIDI is being sent out from the Track at the moment. The width of each bar represents velocity for notes.

The activity columns applies to MIDI Tracks, Drum Tracks, Group Tracks and Mix Tracks.

Mute

The Mute column is indicated by an "M". By clicking in this column, you defeat all output from the Track. This is described in detail on page 19-2.

Muting applies to MIDI Tracks, Drum Tracks, Group Tracks and Mix Tracks.

Class

This column is indicated by a "C" and is used to set a Track to a certain Class. See above for a thorough explanation.

Time Lock

This column is indicated by at "T". If you click in it, a small lock symbol will appear.

Events on Time Locked Tracks are fixed in time. This means that even if you change the tempo the events will stay at the same positions, time-wise. See page 17-2 for more information on Time Locked Tracks.

Track

The Track columns show the Track's name. To enter or change a name, double click in this field for the relevant Track. A box opens where you can edit the name as described on page 4-10.

Chn

- For MIDI Tracks and Drum Tracks this is the MIDI Channel.
- For Tape Tracks this is the Track of the tape recorder. See page 33-2 for more information on Tape Tracks.
- For Group Tracks and Mix Tracks this value does not apply and is therefore always left blank.

MIDI and Drum Track Channels
MIDI Channels are a system for directing the output of music and other data to certain instruments, to individual sounds in one instrument, MIDI equipped effect units and so on.

The MIDI Channel set in this column is the one the Track is sending out on. This means that if you select a Track which is set to MIDI Channel 4, all recording that is done on this Track will create Parts that are set to send out on MIDI Channel 4.

If you later move these Parts to another Track they will be set to send out on the MIDI Channel set for that Track. You can see the Track setting as something that is passed on to the Parts created on, or moved to, that Track. Moving Parts to new Tracks therefore automatically sets them to the right

MIDI Channel in most cases. But, you can also set the output Channel individually for each Part. More on Parts and Tracks is found on page 10-2.

Use the left and right mouse buttons to change the MIDI Channel. The values are "Any" and 1 to 16. 1 to 16 are regular MIDI Channels. For an explanation of the "Any" value, see page 10-3.

Output

The sixth column is the Output. If you press and hold the mouse over the Output name on a Track, a pop-up menu falls down listing the possibilities. Select the one you want. If you hold down [Alternate] while doing this, you set all the Parts on the Track to the same Output. The different options depend on the Track type.

MIDI and Drum Track Outputs

For these Track types the Output is the physical output on the computer where the data is sent out. If you don't have anything extra connected to your ST/STE/TT, the two possibilities are Atari and *M•ROS*.

An "extra Output" in this context is a *MIDI Out jack* on a *Device*. A Device is some equipment connected to your Atari, such as the Steinberg SMP-24 or MIDEX/MIDEX+. These units have several independent outputs. Each of these outputs can send on 16 MIDI channels which means that if you have one or several Devices connected to your computer, you can increase the number of effective MIDI Channels in your system up to over a hundred.

For instance, if you use a Steinberg MIDEX and you set a Track to Midex 3, all data coming from Parts recorded on that Track will be coming out on the third MIDI socket on the MIDEX.

These are the possibilities if you don't have any extra Devices connected to your Atari ST/STE/TT:
Atari: The regular MIDI Out connector on the computer.
MROS: This is not a physical output, but rather an invisible MIDI cord that runs inside and between all *M•ROS* programs. It is an advanced feature that lets you patch MIDI data from one place to another within one program or to another program.

If an item is grey, this means that there is software in the computer (a driver) for using that Output, but the Device is not properly connected or not turned on.

Mix Tracks
For Mix Tracks, the Output is the Mixer Map the recordings are played back "through". See page 30-3 for details.

Group Tracks
These have no specific output, since this is determined by each Part that is part of the Group.

Tape Tracks
These have no specific Output, the actual output is always the connected tape recorder.

Instrument

If you connect a synthesizer to a certain Output and decide to send to it on a certain MIDI Channel, you have defined an *Instrument*.

Instruments can be defined for MIDI Tracks and Drum Tracks.

For instance, say that you have a Roland D-110. You set it to play a Piano sound on MIDI Channel 3. The D-110 is connected to Midex Output number 2.

- ❑ Select a Track. Set the MIDI Channel to 3 and the Output to Midex 2.
- ❑ Double click in the Instrument column for that Track or press [Alternate]-[J] on the computer keyboard. A small dialog box opens up.
- ❑ Enter a name and press [Return] as with Track names and any other name. In our example, maybe "Pno110" would be appropriate.

You have now defined an instrument called "Pno110". If you set a Track (or Part) to that Instrument it will send its data to the Midex's output number 2" and it will send on MIDI Channel 3.

Some instruments are *multitimbral* (they can play several different sounds at the same time) so for them a name that includes the type of sound is probably best. Other instruments play only one sound at a time, which means that the model name is enough.

Take the time to create names for the instruments you use. It will be of great help later. If you create names for all the instruments (and sounds) you use, you can hide the Output and Channel columns in the Track list by moving them to the right and "pull the curtain" on them.

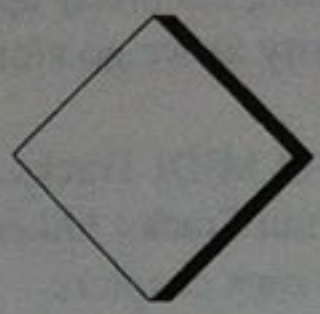
Once the names are created, they appear on a pop-up menu in the Instrument column. When you press either mouse button in the Instrument column for the Track you want to use, a pop-up menu falls down, listing all the instruments defined. If there are more than 16, the menu scrolls when you reach the bottom. Choose the one you want from the list.



The pop-up Instrument Menu pulled down from the Track List.

You can delete Instruments by double clicking on the *name* so that the name dialog box opens up Press [Esc] to clear the line and then [Return] and the Instrument is deleted.

Generally, in other parts of the program, where you see a field with an Instrument name, you can double click on it or press [Alternate]-[J] on the computer keyboard to change the name or to define new instruments in the same manner as above.



Basic Recording of MIDI Tracks

MIDI Recording is usually done in the Arrange window, but you can record in the Edit windows also. Recording is a pretty open ended business, and we will introduce levels of complexity as we go along.

This chapter explains recording of MIDI Tracks. Almost everything that is described here also applies to Drum Tracks. Other Track types are different. They are each described in their own chapters.

Before Recording

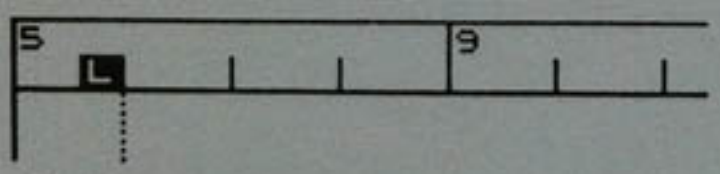
- ❑ Select which Track to start recording on and see to that it is set to the right Output and MIDI Channel.
- ❑ Check that your MIDI Thru setting in the MIDI Setup dialog box is correctly set, so that you hear what your playing (!), and don't get any funny doublings.
- ❑ Turn the click from the Atari speaker on or off by clicking on the Click button on the Transport Bar or by pressing [C] on the computer keyboard.

You may also want to change tempo and/or time signature. How this is done is described on page 8-2 and 20-2 respectively.

Recording from a specific point

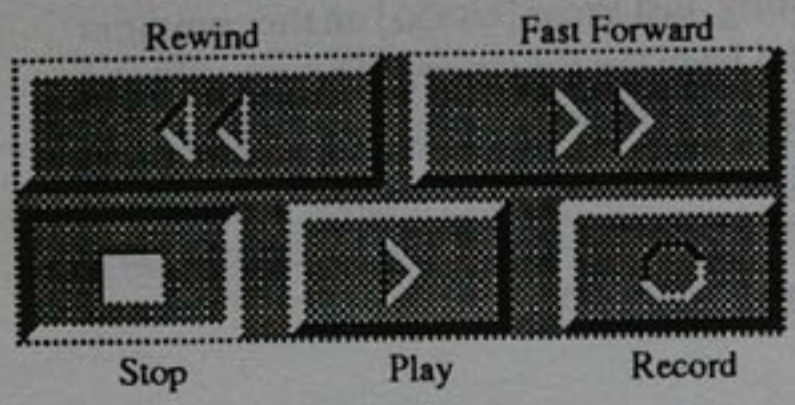
- ❑ If you want to record from the beginning, simply press [0] on the computer keyboard until the box "Song Position" says 1. 1. 0.

- ❑ If you want to record from another specific point in the piece you have to set that point with the Left Locator. Position the pointer in the Position Bar at the top of the Arrange window, and click with the left mouse button.



Click with the left mouse button to position the Left Locator.

Normally there is a two bar count-in (Precount) before recording starts, but this can be changed.



Click on the Record button or press [*] on the computer keyboard. The Record button gets "pushed in" immediately but the Play button doesn't react until after the Precount (count-in). Start playing for as long as you wish.

1. You can terminate recording without stopping playback by just clicking on the Record button again (or by pressing [*] again). You can also reactivate recording at any time in the same way. In this way you can punch in and out manually as many times as you wish. The Record button switches gets "pushed in and out" every time.

2. You can stop the music (and of course the recording) by clicking on the Stop button once or by pressing [0] or [spacebar] on the computer keyboard.

3. To *automatically* quit recording at a certain point you must use the Punch Out feature (see page 9-3).

When you have finished recording, the Part (or Parts) show up in the Part Display. A Part might be an empty box, it may contain the name of the Track or it might be filled with vertical bars representing the events in it.

Undoing a Recording

If you don't like your last MIDI recording, just Press [Undo] on the computer keyboard, or select the Undo command from the Edit menu. This restores the Arrange window to the state it was in just before this recording. If you undo again, you get the new recording back. This is a convenient way of comparing two versions of a "take". You can only undo your last action, so don't try any other changes to your music before you undo the recording.

Precount and Preroll

The length and Time Signature of the Precount (count-in) can be set in the Metronome dialog box which is reached from the Options menu. In this dialog box you can also set the Preroll to On or Off.

Precount

Cubase (almost) always records, even during the Precount.

If you play something in Record mode, Cubase records it, even during the Precount. This is perfect for adding notes on the upbeat of a bar. If you played during the Precount this is reflected in the Part created. It is extended to the left of the Left Locator. But there is one exception: Cubase can't record before 1.1.0 (the beginning of the whole Song). The Precount recording feature can be turned off in the Metronome dialog box.

Preroll

If you have the Preroll turned On, instead of having a silent Precount, the music jumps back in the Arrangement when you click on Record (it jumps as many bars as you have set the Precount to) and plays back from there. When it reaches the Left Locator it automatically activates recording (Punch In).

No recording takes place during the Preroll.

Recording with manual Punch In

You can also play back the music and activate recording when it suits you. You can replace what is already recorded on the Track by setting the Record mode to Replace, or you can add music "on top of" the existing by setting it to Overdub. A detailed description of this follows on page 7-6. If you want to start playback fr(:n the beginning, press 0 on the computer keyboard one or a few times until the Song Position box says "1. 1. 0".

Make sure the Punch Out button isn't active (inverted). If it is, click once on it.

Click once on the Play button or press [Enter] on the computer keyboard. The Play button on the screen gets "pushed in". The metronome starts (if the Click is activated). The "virtual tape" is now rolling from the point you started.

When you have reached the point where you want recording to begin, click on the Record button once or press [*] on the computer keyboard.

Notes that are sounding at the punch in point will not be cut off. They will play with their original length.

Watch out when punching in on a recording with pitch bend or controllers in it, (such as modulation wheel or sustain pedal), since this may lead to strange effects (hanging notes, constant vibrato and so on).

You can stop recording using any of the three methods described earlier.

You can also punch in and out automatically, see page 9-2.

Replace and Overdub



The Record Mode button switches between Overdub and Replace when you click on it.

Replace

If you made a mistake somewhere along the way, you may decide to redo the whole recording or a section of it. This is easily done.

Make sure the Record Mode switch is set to Replace (not Overdub). You can use the [D] key on the computer keyboard to switch between Overdub and Replace. Make a new recording in any way you like, from a specific point or with a manual punch in. Whatever was recorded before on the Track is erased from the point you activate recording to the point where you terminate it.

Stop recording as usual. The result may be a new Part, or your new recording may be partly incorporated into the existing Part. It all depends on where you entered and stopped recording. A full explanation of this follows later, on page 10-5.

Notes that are sounding at the moment you Punch In are not cut off, they play to their end as they did before you started this recording. This is due to the fact that Cubase gives each note a start position and a *length* (not a Note On and a Note Off as MIDI does).

Overdub

With the record mode switch set to Overdub, no music is overwritten or erased.

Any recording you do will be added to the existing recordings. As when Replacing, new Parts may be created.

Watch out when punching in on a recording with pitch bend or controllers in it, (such as modulation wheel or sustain pedal), since this may lead to strange effects (hanging notes, constant vibrato and so on).

Recording more Tracks

Just select the Track you want to record on and activate recording just as on the first Track. If you run out of Tracks, just create more by double clicking in the Track List, by using Create Tracks on the Structure menu, or by pressing [Control]-[T] on the computer keyboard. Set the new Track to the right class, by using the pop-up menu in the "C" column for the Track.

Switching Tracks While Recording

Yes folks, you can even switch Tracks while recording. There are no restrictions. Just select a new Track with the mouse or the [↑] and [↓] keys on the computer keyboard.

Recording Different Types of MIDI Messages

Cubase records anything that makes sense to record (to be precise it records everything but System Common and System Real Time messages). You can also prevent the Program from recording certain types of MIDI data by using the Record Filter in the MIDI Setup dialog box or the Input Transformer. There are a few facts about the recording of some types of messages that can be useful to know:

Notes

Note On and Note Off messages (which make up any note you play in MIDI) are recorded with the MIDI Channel intact. Normally you set the playback MIDI Channel in the Track List, and this setting overrides the channel stored with the notes (and other events). But, the original channel that the notes were coming in on *is* preserved. In fact, this goes for all MIDI messages that are

coming in on a certain Channel (all Channel Voice and Channel Mode messages). This can be used as a feature in combination with MIDI Channel "Any". If this sounds technical, a more thorough explanation is found on page 10-4.

Continuous messages
Pitch bend, After Touch and Controllers (like modulation and footswitches) can be recorded at the same time as notes, or afterwards (or even before). They can also be recorded on Tracks separate from the notes they belong to.

Say for instance that you record one or several bass Parts on Track 2. If you now set another Track, like Track 55, to the same Output and MIDI Channel as Track 2 you can make a *separate* recording of just pitch bends for the bass Parts. This means that you activate recording as usual and only move the pitch bend wheel during the take. As long as the two Tracks are set to the same Output and MIDI Channel number it will appear as if the two recordings were made at the same time.

But, just as Note On and Note Off commands have to match, you can run into problems with controllers that don't match up. If you for instance deactivate recording with the sustain pedal down, you have instructed the program to keep the notes hanging, since the release of the pedal is never recorded. The same applies if you leave the pitch bend wheel or the modulation wheel up (or any other MIDI controller for that matter), when you stop recording. During playback, Cubase may clean up Pitch Bend, Modulation and Damper pedal and Channel Pressure at the end of each Part, taking into account what happened in earlier Parts. But, the way Continuous MIDI messages behave is still something to be aware of. Remember that you also have the option of generating Continuous Controller messages from the MIDI Mixer window. This is in some instances more convenient than recording them from "the outside", especially when affecting mixer-like functions in your equipment, such as volume and panning.

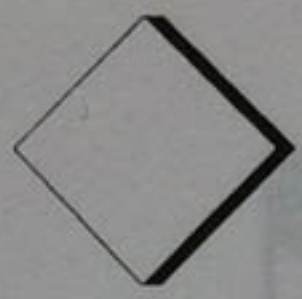
Program Change messages
The method above applies to Program Change messages also. Program Changes are used to switch between programs or presets on a synthesizer or an effect unit. Normally, when you switch from one Program to another on your keyboard (or whatever you use to record), a number corresponding to that Program is sent out via MIDI as a Program Change message. These can be recorded on the fly with the music, recorded afterwards on a separate

Track, or manually entered in one of the Edit windows. Furthermore, you can set a Part to send out a Program Change number at its beginning (see page 12-2).

System Exclusive

System Exclusive is a special type of MIDI message used to send things that only make sense to a unit of a certain make. Every major MIDI manufacturer has its own Sys Ex identity code. Sys Ex can be used to transmit a list of the numbers that make up the settings of one or more sounds in a synth. It can be used for transmitting sampled sounds via MIDI and for a number of other things. System Exclusive can be recorded just as any other messages and edited in List Edit.

However, if you plan to record "Sys Ex" parallel to your music (for example to reprogram a synth during the course of a song) try to minimize the size of the "packages" by only recording as much as is absolutely needed. That is, don't send out all 128 programs from your synth when you're only interested in number 33. Remember that you have the option of generating Sys Ex messages from "scratch" in the MIDI Mixer window. Also, please remember that there is nothing that prevents you from Cycled recording (described later) of Sys Ex data, although this can lead to serious confusion. In plain English: don't, if you're not absolutely sure of what you are doing.



The Transport Bar and Playback

Tempo, Time Signature, Click, Master and Sync



You can change the Tempo on the Transport Bar directly, using the left and right mouse button or by double clicking and entering the value directly. This is a temporary setting that is only valid if the Master Track is turned off (the Master button deactivated). This box also shows the current tempo on the Master Track (if it is activated) and incoming tempo if the sequencer is synchronized to another clock source, such as MIDI clock.

The first Time Signature in the Song can be changed directly by clicking directly on the numerator and denominator in the Time Signature field. By doing this you actually change the first Time Signature in the Master Track. The possible values range from 1/2 to 16/16. If you need Time Signature *changes* during the piece you have to open the Master Track.

The Master button is used to activate and deactivate the Master Track tempo changes.

The Time Signature changes on the Master Track are always active.

Click is used to turn the metronome on and off. This affects both the computer's "beep" and MIDI click if that is used.

Sync is used to turn synchronization to other equipment on and off.

More information on the Master Track, Tempi and Time Signatures is found on page 20-2 and on the Click and Sync options on page 21-20 and 21-23.

Play

You activate Play either by clicking on the Play button or by pressing [Enter] on the computer keyboard.

Playback always starts from the current position. This means that playback should be thought of as Continue Play. If you want playback to start from the beginning of the piece or from some other point you must either rewind or fast forward or enter a new Song Position.

Play can also (as a lot of other functions) be activated remotely via MIDI, using the Remote command on the Options menu.

Stop

You stop by clicking on the Stop button or by pressing [0] or [spacebar] on the computer keyboard. Once Cubase is stopped you have a couple of other options.

Clicking on the Stop button or pressing [0] or [spacebar] on the computer keyboard *a second time* moves the Song Position to the setting of the Left Locator. If the Left Locator for example is set to the beginning of bar three (3. 1. 0.), this is were you go. There is one exception to this: If you are already to the left of the Left Locator you go to the beginning of the Song (1. 1. 0.).

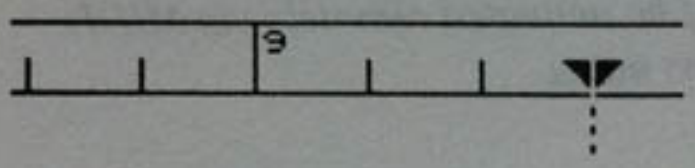
Clicking on the Stop button or pressing [0] or [spacebar] on the computer keyboard *a third time* always takes you to the beginning of the Song (1. 1. 0.).

Song Position

Your current Position in the song is indicated in three ways:

- The triangle on the Position Bar.
- The Song Position box on the Transport Bar.
- The time in the SMPTE Time box.

The Song Position Triangle

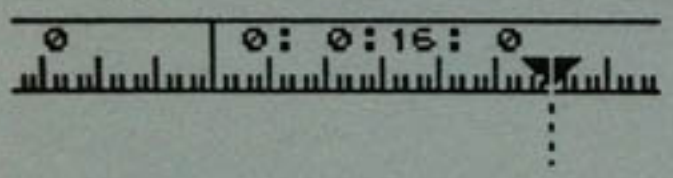


The triangle always indicates the current position. It might not, however, always be visible, depending on what part of the Arrangement is currently shown inside the window. For instance, if bar 1 to 17 is shown in the window and the current Song Position is 33.1.0 you won't see the triangle. You have to use the scroll bars to either move to that position or to reduce the magnification in order to make the Song Position visible on the Position bar.

However, if Follow Song on the Options menu is activated (ticked) the Arrange window will scroll with *playback*, so that you always see the Parts that are played back.

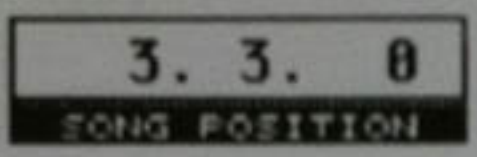
The bar lines show the beginning of each bar. The distance between them is adjusted after the Time Signature. If you start a song in 4/4 and somewhere change the Time Signature to 2/4 (using the Master Track) you will see that the bar lines are spaced twice as close after the Time Signature change.

You can also display the position as SMPTE times. Click once on the mouse box. The Position Bar changes to show the position in hours:minutes:seconds:frames, depending on the set tempo and SMPTE frame rate (see page 21-23). The Position Bar is divided into steps of seconds and smaller steps, some of them indicated by numbers. This technique applies in Key, Drum and List Edit as well.



This setting (positions as SMPTE or bar numbers) also affects which way the position of the mouse pointer is indicated in the Mouse Box above the Part Display, and a Part's Start and End position in the Part Info dialog box (explained later).

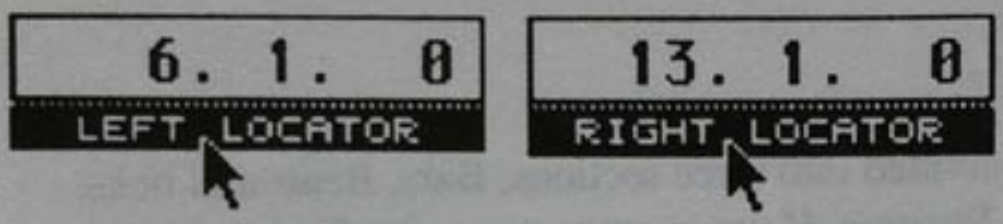
The Song Position box



The Song Position box is divided into three sections, Bars, Beats and ticks. These indicate the current Position. If you want to move the Song Position, for example because you want to start playback from a certain point, you have several options. The first two ways are of course to Rewind or Fast Forward (described in detail later). But, there are many ways:

- Double click once in the Position bar at the top of the Part Display, and the music immediately jumps to the new Song Position if Play is activated.
- Use the left and right mouse button to change the values in the Position box directly. By positioning the pointer on top of one of the numerals (the Bar, the Beat or the Fraction) you can change them individually. The right mouse button increases values, and the left decreases. One click moves you one "step", and if you hold down the button the values change continuously. This can of course be combined with [Shift] for drastic changes.
- Double click on the Song Position box or press [P] on the computer keyboard, and a small box appears. Here you enter the Bar, Beat and Fraction as numbers. Use any non-numeric character (like a period or a press on the spacebar) as divisions between the three steps. For instance, to enter the Position "3. 2. 64" you could type "3.2.64" or "3 2 64" (or actually even "003&2+064", the program is pretty forgiving). After you are finished, press [Return] and the box closes.
- If you only need to specify the bar, just enter that number and press [Return]. For example, typing just 5 and [Return] would give you "5. 1. 0" (the beginning of bar five). The same kind of shorthand applies if you want to enter the bar number and the beat and would like to omit the fraction. Typing 34.2 and [Return] gives you "34. 2. 0".

- If you want to move some specific amount forward or backwards from the current position, you can add or subtract a value from the current Song Position. Just enter the value preceded by a + or – sign. For instance, if you want to move four bars backwards from the current position enter -4 and press [Return].
- To set the Song Position to the same value as the setting of the Left or Right Locator, click on the black identification part with white text, below the Left/Right Locator box.



- Use the 1 and 2 keys on the numeric part (not the typewriter part) of the computer keyboard to move to the Left and Right Locator positions (see page 8-8).
- If you press [Clr Home] on the computer keyboard, the Song Position is instantly moved to the left side of the window.
- If you press [9] on the numeric part of the computer keyboard, you go to the last Position you Stopped at.

Changing the song Position in any way can very well be done while playing back the music. The music then jumps to the new Position as soon as the mouse button is released or [Return] is pressed. You can even change the Song Position while recording, but this terminates recording (not playback) before the music jumps to the new position.

Cue Points

If you hold down [Shift] and press any of the keys [3] to [8] on the numeric part of the computer keyboard the current Song Position is stored under that ([3] to [8]) key.

To move the Song Position to any of the stored cue points, just press the relevant key ([3] to [8]) on the numeric keypad on the computer keyboard.

These positions are actually SMPTE (time code) times. If you later change the tempo, jumping to a cue point will take you to a different bar position!

The SMPTE Time box



This shows the Song Position in hours:minutes:seconds:frames from the starting point (position 1. 1. 0).

What SMPTE times correspond to what Song Positions is calculated using the tempo changes on the Master Track (see page 20-2).

The Song Position can also be entered in absolute time using this box. Use the left and right mouse button to change the values, or double click and enter the time, just as with the Song Position box. If you for instance want to start playback of the music from the position 1 minute and 30 seconds, set the SMPTE Time box to "0: 1:30: 0" and click on the Play button.

If you want to, you can change this display so that the beginning of the song isn't shown as "0: 0: 0: 0", but any other value you decide. This is done using the Display Offset parameter described on page 21-25.

Rewind, Fast Forward and Cueing

You don't have to first stop the music to Rewind or Fast Forward.

To Rewind, click on the Rewind button or press [(] on the computer keyboard (left parentheses). Holding down the mouse button or the key lets you Rewind continuously.

To Fast Forward, click on the Fast Forward button with the left mouse button or press [)] on the computer keyboard (right parentheses). Holding down the mouse button lets you Fast Forward continuously.

If you want to speed up Rewind or Fast Forward, hold down [Shift] on the computer keyboard.

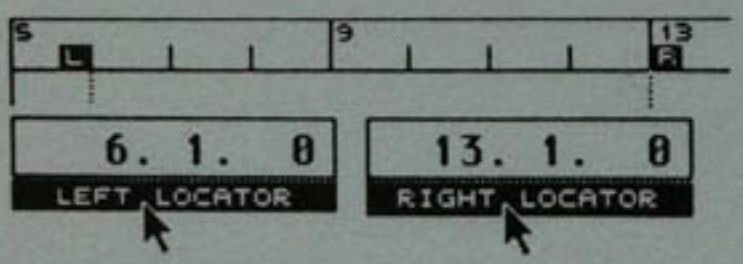
You may very well Rewind or Fast Forward while playing back the music. You can even do this while recording, but this terminates recording (not playback) before the music jumps to the new position.

Cueing

To Fast Forward and *hear the music* (cueing), first Stop Cubase. Then, click and hold the *right* mouse button over the Fast Forward button. To change the speed of the cueing, move the mouse to the left (slower) or to the right (faster). Pressing [Shift] works in this mode also.

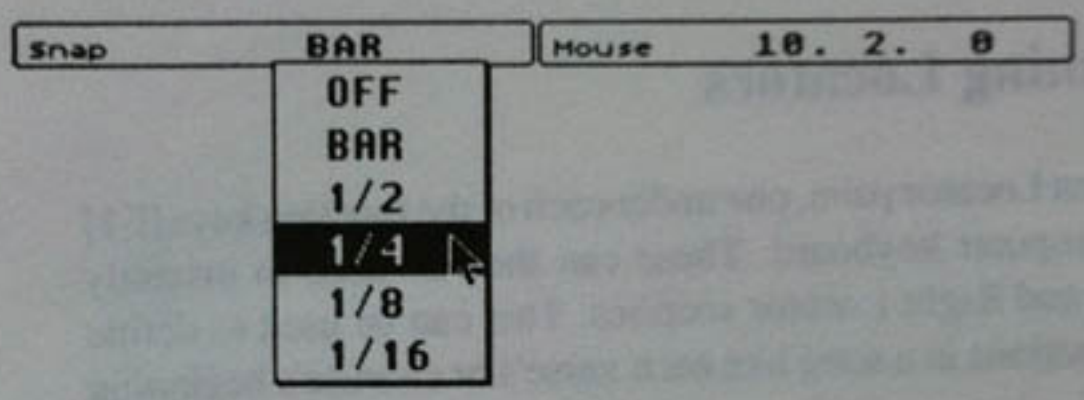
Left and Right Locators

The Locators are two markers, specifying two positions in the song used for recording, some editing and for the Cycle function. The Left and Right Locator appear on the Position Bar as two squares with the letters L and R in them. Their position is also shown in the Left Locator and the Right Locator boxes.



There are several ways to change the settings for the Left and Right Locator:

- Position the pointer in the Position Bar. If you click the left mouse button you set the Left Locator, and if you click the right mouse button you set the Right Locator. You are aided by two things in this procedure. Above the Track List you have a small box called Snap. If you press and hold any mouse button with the pointer positioned inside this box, a Pop-up menu appears. Selecting one of the values restricts the setting of the Locator Positions to that value, like a sort of quantizing. The possibilities are Off, Bar, 1/2, 1/4, 1/8 and 1/16 (notes). The second aid is the box beside Snap, called Mouse. When the mouse pointer is moved inside the Part Display, the mouse position in Bars/Beats/Ticks (or as SMPTE times if you click once on it) is shown in this box. If you want to get any closer than 32 ticks, you will have to use one of the methods below.



The Snap menu and the Mouse Box showing the mouse position as Bars/Beats/Ticks.

- Use the left and right mouse button to change the values in either of the value boxes directly. By positioning the pointer on top of one of the numerals (the Bar, the Beat or the Tick) you can change them individually. The right mouse button increases values, and the left decreases. One click moves you one "step", and if you hold down the button the values change continuously.
- Double click on either box or press [L] (for Left Locator) or [R] (for Right Locator) on the computer keyboard, and a small box appears. Here you enter the Bar, Beat and Tick as numbers. Use any non-numeric character (like a period or a press on the spacebar) as divisions between the three steps, just as with the Song Position box.
- If you hold down [Shift] and press [1] on the numeric part of the computer keyboard, the Left Locator is programmed with the current Song Position.

- If you hold down [Shift] and press [2] on the numeric part of the computer keyboard, the Right Locator is programmed with the current Song Position.
- If you select Parts in the Part Display and press [Alternate]-[P] on the computer keyboard the left Locator is set to the Start Point of the first Part and the Right Locator to the End Point of the last Part. In other words, the Locators are set to the beginning and end of the selected "block" of Parts.

You *can* set the Right Locator to a lower value than (to the left of) the Left Locator, but then you can't activate recording directly, you have to punch in at some point.

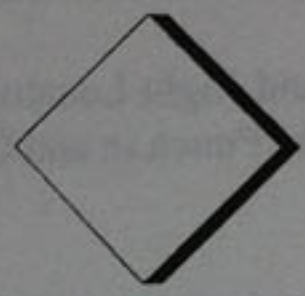
Changing the Locator values can be done while playing back the music, but not while recording.

Preprogramming Locators

You can also store ten Locator pairs, one under each of the function keys [F1] to [F10] on the computer keyboard. These can then be used to instantly reprogram the Left and Right Locator sections. This can be used to define certain often used sections in a song like each verse's or choruse's beginning and end.

Set the Left and Right Locator to the desired values using any method described earlier. Hold down [Shift] and press the desired Function key ([F1] to [F10]). The Left and Right Locator values are now stored under that key.

All you have to do to use a setting is to press the corresponding Function key once. The Left and Right Locator are then immediately set to the programmed positions.



Automatic Punch In and Out

Automatic Punch In is when you let Cubase automatically activate and deactivate recording. This is possible on MIDI, Drum and Tape Tracks.

As mentioned earlier, the Left and Right Locators are used for recording, especially in combination with the Punch In and Out buttons. This is how it works:

When you activate recording when the program is stopped (by clicking on the Record button or by pressing * on the computer keyboard) recording is started from the left Locator. This is a sort of instant punch in. But you can also just "roll the tape" (Play) and make Cubase punch in and out (activate and deactivate recording) wherever you want.

The Punch In point is always set with the Left Locator, and the Punch Out point with the Right Locator.

Recording with automatic Punch In

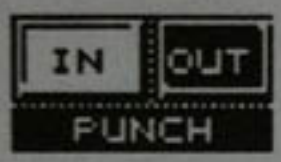


Punch In activated.

Activate the Punch In button by clicking on it or by pressing [I] on the computer keyboard, and Rewind the tape to some point before the Left Locator. Select a Track for recording and activate Play. When the "tape" reaches the position of the Left Locator, recording is activated on the selected Track. You can either manually terminate recording as usual or use Punch Out (see below) for automatic deactivation of recording.

MIDI notes that are sounding at the moment you Punch In are never cut off, they play to their end as they did before you started this recording. This is due to the fact that Cubase gives each note a start position and a *length* (not a Note On and a Note Off as MIDI does).

Recording with automatic Punch Out



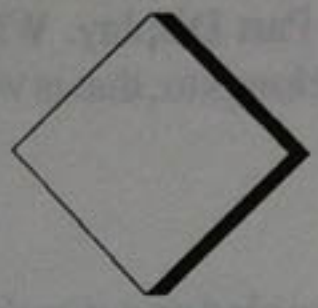
Punch Out activated.

Activate the Punch Out button by clicking on it or by pressing [O] on the computer keyboard. Select a Track and start recording (manually or with Punch In) at some point before the Right Locator. When the "tape" reaches the position of the Right Locator, recording is deactivated (the program switches to Playback). But, recording can manually be activated again at any point.

Automatic Punch In and Out

The two commands can of course be combined for a completely automated recording with the Left and Right Locators as Punch In and Out points.

Automatic punching doesn't differ from normal recording in any way. You can deactivate recording at any time and reactivate it again. You can switch Tracks and so on. The Record Mode switch (Overdub or Replace) works as usual.



Parts — What You Need To Know

So what is a Part, actually? It is a piece of your arrangement displayed as a box on a Track in an Arrange window. It has a Start- and an Endpoint which are defined by its place in the Part Display. What a Part actually contains differs with the Track Class it belongs to, that is which type of Track it resides on.

MIDI Parts
MIDI Parts hold MIDI data, recorded or put in their "manually" from one of the MIDI editors. These Parts also have a number of so called playback parameters, as we shall see.

Drum Parts
These are very much like MIDI Parts, the big difference being that they are routed via the Drum Map.

Mix Parts
Mix Parts contain Mixer events, which are not really MIDI events, but in the end generate MIDI events via the Mixer objects on the Mixer Map.

Group Parts
These contain other Parts. See page 18-2 for a detailed explanation.

Tape Tracks do not have Parts.

Parts' Structures

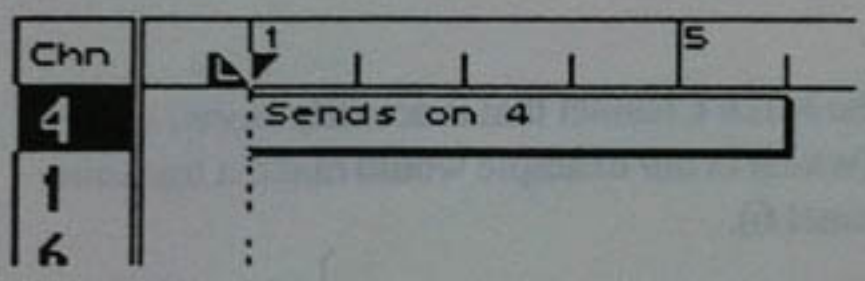
A Part actually has a pretty open structure. A Part can be moved, split in two, lengthened, merged with another Part or "glued" on to the end of another Part and much more. Furthermore, its contents can be changed in all and any respect.

The way notes are handled in MIDI and Drum Parts differs a bit from the way MIDI handles them. Cubase stores Note Ons, and the *note's length*. This means that a note can actually play past the end of a Part, it is not cut off at the end of the Part.

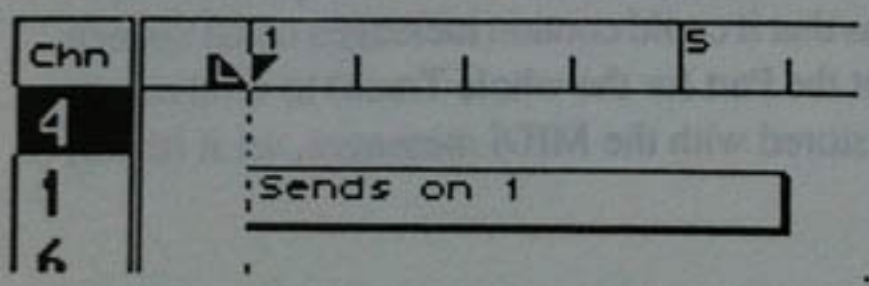
MIDI and Drum Parts and their relation to MIDI Channels and Outputs

The capability to transmit different parts of your music on different MIDI Channels is probably one of the most important features of a sequencer program, so we'll get to the bottom with that one first. Cubase relies heavily on the fact that you also can direct data to different Outputs.

- When you record on a Track, the MIDI/Drum Parts created are set to transmit to the same Output and on the same MIDI Channel as the Track is set to. An example: If you record on a Track set to output on MIDI Channel 3 on the regular MIDI Out, all Parts recorded on that Track will be set to output on that MIDI Out and on MIDI Channel 3.
- When you move a Part to another Track it takes on the Output and MIDI Channel setting of the Track it is moved to. That is, the Output and MIDI Channel are automatically changed when you move the Part to another Track.



The Part above is set to send on MIDI Channel 4. But when it is moved to the next Track (set to MIDI Channel 1) ...



.. its setting changes to that of the Track, so that it outputs on MIDI Channel 1 instead.

- You can change the Output and Channel for *one* specific MIDI/Drum Part by using the Inspector. More info on this is found on page 12-2.
- You can change the Output and MIDI Channel for *all* MIDI/Drum Parts

on a Track by changing these parameters for that Track in the Track list. Changes in the Track List are automatically transferred to all Parts currently on that Track.

A combination of a MIDI Channel and an Output can be defined as an Instrument, see page 6-8. Everything that is said above about Outputs and MIDI Channels can be handled directly through the Instrument definitions.

MIDI Channel "Any"

There is a seventeenth setting for the MIDI Channel value, called "Any". This is used to make a Part (or Track) send out on the original MIDI Channel, the MIDI Channel the sending instrument was set to when the Part(s) were recorded. An example: If you use a synth for recording, this may be set to send on MIDI Channel 6. When you record Parts, this value is stored with each single MIDI Channel message (note, program change, pitch bend or continuous controller) that is recorded. But, then you set the Part to send out on MIDI Channel 3. Now, the stored value of 6 is replaced with 3 when each message is played back.

If you want a Part to send on the MIDI Channel that is actually stored in the recording, you set it to "Any" (which in our example would make it transmit MIDI messages on MIDI Channel 6).

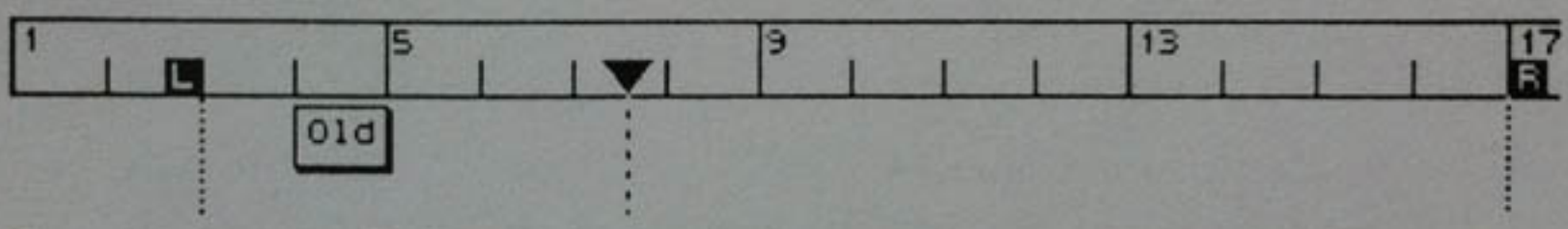
A Part recorded may contain MIDI messages on several MIDI Channels. MIDI may be recorded with a keyboard able to transmit on two MIDI Channels (each one on one side of a splitpoint) or data may come from another sequencer which means that it could contain messages on all sixteen MIDI Channels. So if you want the Part (or the whole Track) to send out on the MIDI Channel(s) actually stored with the MIDI messages, set it (them) to MIDI Channel "Any".

This feature is coupled with the possibility to change the stored MIDI Channel value for each MIDI message in the Edit windows. It is also coupled to the Mixdown and Remix features and the Polyphonic Voicing option in Score Edit.

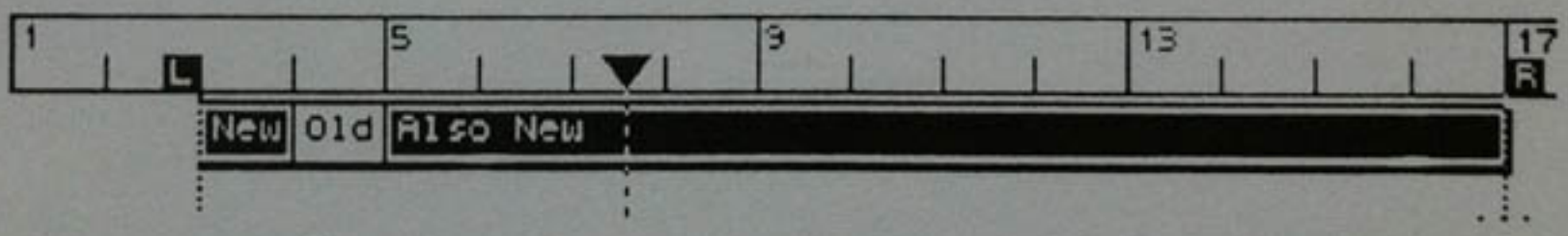
Recording Parts

When you record *on one MIDI or Drum Track* the following rules apply:

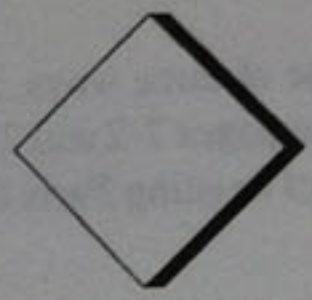
- Recording from one point to another creates a Part that spans between these two points (pretty obvious, huh?)
- Recording *again* between the same points or within the Start and End points of the existing Part creates no new Part. The music is either added to (Overdub mode) or replacing (Replace mode) the existing.
- Recording during the Precount (not before 1.1.0 and not in Cycle mode) extends the Part to the left.
- All other cases, like starting recording in an empty section of the Track, recording over Parts and recording out of existing Parts into empty areas of the Track only creates new Parts where there wasn't any before. The Overdub/Replace setting applies. An example might clarify this: You have an existing Part starting at 4.1.0 and ending at 5.1.0. You start the new recording in Overdub mode at 3.1.0 and end at 17.1.0. This creates a new Part starting at 3.1.0 and ending at 4.1.0. The old one between 4.1.0 and 5.1.0 is kept, but music gets added to it, and finally there is a new part created between 5.1.0 and 17.1.0.



Recording between 3.1.0 and 17.1.0 as in the example...



creates two new Parts.



Part Operations

Creating Parts

Parts are mainly created in one of three ways, by recording (this applies to MIDI and Drum Parts only, see pages 7-2 and 27-2), by direct creation of an empty Part or by duplication of existing Parts (see page 11-7).

Direct Creation of Parts

You can create empty Parts in three ways:

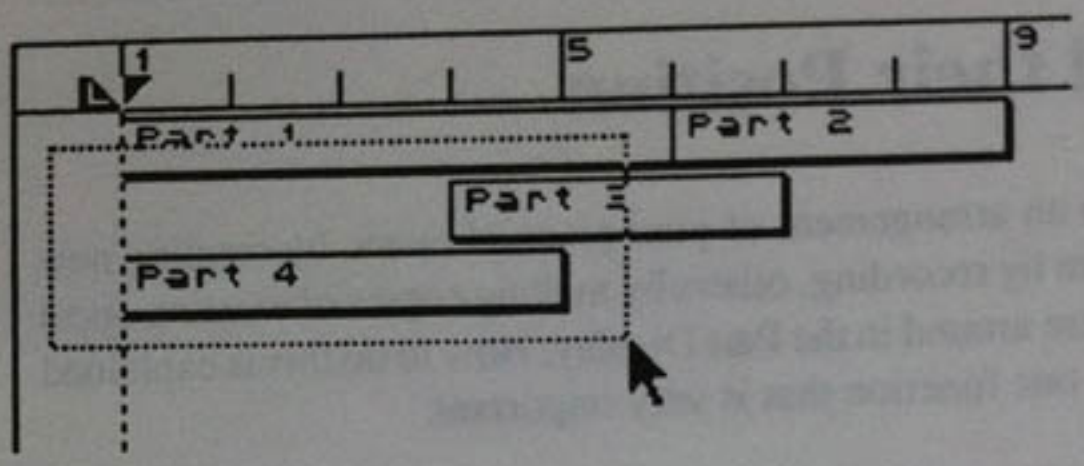
- By double clicking in any empty (white) area between the Left and Right Locator, in the Arrange window.
- By selecting Create Parts from the Structure menu.
- By pressing [Control]-[P] on the computer keyboard.
  (Group Parts are created differently, see page 18-2.)

The new Part winds up on the active Track and begins at the setting of the Left Locator and ends at the Right Locator. A Part created this way never replaces an existing Part, but may very well overlap one.

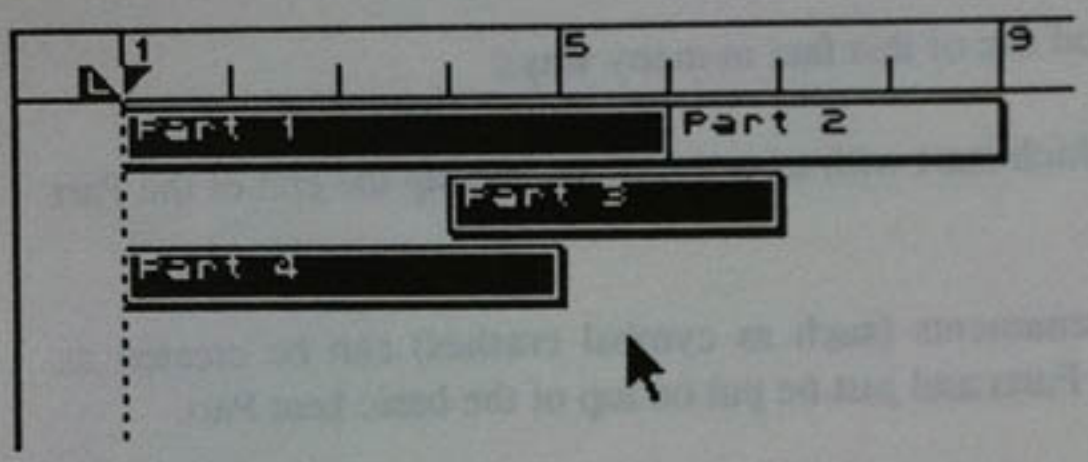
Selecting Parts

In the following operations you will do things that affect one or several Parts (like erasing, duplicating and so on). To do this you must first *select* the Part you want to be affected by the operation. This can be done in a few ways:

- To select one Part, click on it. Selected Parts are inverted (white on black).
- To select more Parts, hold down the [Shift] key and click on the Parts you want to select. You deselect Parts individually by clicking on them again (but don't let go of the [Shift] key until you're finished).
- To select several adjacent Parts at the same time you can enclose them in a rectangle by holding down the mouse button in some free (white) area in the Part Display. Drag the mouse to create a rectangle big enough to "touch" all the Parts you want to select. You don't have to perfectly enclose all the Parts, it's OK if the rectangle just covers some section of the Part. Release the mouse button, and the Parts are selected.



Making up a rectangle like this...



... selects these Parts.

- To deselect all Parts, click on some free space in the Part Display.
- You can select all Parts on a Track by holding down [Shift] and double-click anywhere in some free space on that Track.
- You can select all Parts in the Arrangement by using the Select All command from the Edit menu or by pressing [Control]-[A] on the computer keyboard.
- You can use the computer keyboard for selecting Parts. Use the [←] and [→] keys on the computer keyboard to step through the Parts on the Track, and combine this with the [Shift] key to select several Parts on the Track. You can also use the [↑] and [↓] keys to step to another Track.

Parts are always selected when they are first created.

Parts and their Position

You will make up an arrangement of your piece of music by creating new Parts (some of them by recording, others by making copies of existing ones) and by moving these around in the Part Display. How to do this is explained below but there is one function that is very important:

Parts on the same Track may very well overlap or be completely on top of one another.

You can make good use of this fact in many ways:

- MIDI Parts which start with an upbeat can overlap the end of the Part before.
- Small drum ornaments (such as cymbal crashes) can be created as separate drum Parts and just be put on top of the basic beat Part.
- Duplicated Parts (or Ghost Parts, see page 11-15) which are used to create delay effects, double sounds and so on, can be put on top of the Parts they are duplications of.

You will probably find yet other creative uses for this feature.

Part Info



This dialog box will be displayed if you select Info from the Edit menu or press [Control]-[I] on the computer keyboard. You must first select at least one Part. If several Parts are selected, the window will show the first one on the first Track. You can use the arrow keys to step around among the Parts as described above, and the Info window will change to reflect the new selection.

Start and End

The Start and End fields can be changed *for one Part* just as with the Locator Box or Song Positions. If you change the Start value, this is the same as moving the Part, see below. If you change the End value, this is the same as Sizing the Part with the Pencil, see page 11-11.

Event Filters

These filters prevent *output* of certain types of MIDI data from the Part. They of course affect recorded or directly input data (in an Edit window), but they also filter out Program Change and Volume values entered in the Inspector, see page 12-2.

To filter out one type of data, click on its name so that it is shown as white text on black.

Moving Parts

You may move Parts around in the Part Display as you like. You can select several Parts at the same time, and move them all. You can move them within the Track or to another Track.

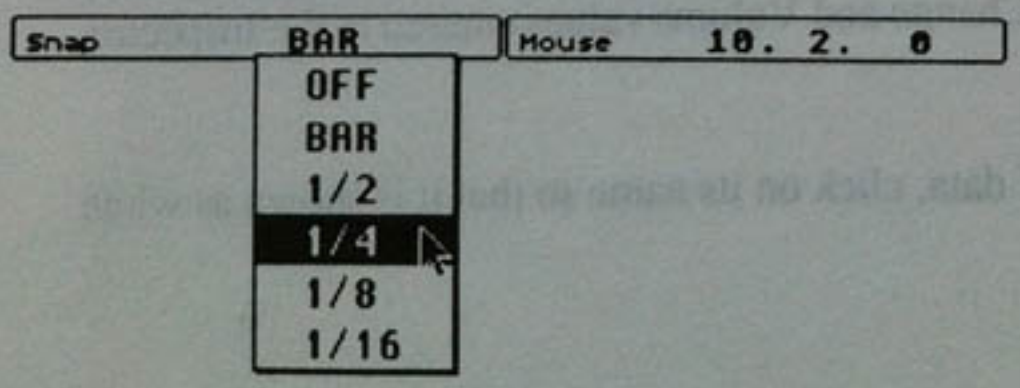
- If you release the mouse button below the last of the existing Tracks, a new Track of the same class is created. If it is a MIDI or Drum Track, it is set to the same Output and MIDI Channel (Instrument) as the Part. If it is a Mix Part it will be set to the same Output Map as the Part.

- If you move to the left or right sides of the Part Display, the window scrolls until you move the mouse back a bit. Of course, scrolling to the left only goes as far as the beginning of the song (1.1.0)

- When you are moving a Part, the Mouse box above the Part Display shows where the beginning of the Part is positioned. This aids you in moving it to the correct position. The box normally shows time in bars/beats/ticks, but if you click on it once it changes to display SMPTE time (hours/minutes/seconds/frames).

- If you have the Crosshair option turned on in the Preferences dialog box on the File menu, the start position and "Track position" will be displayed as a vertical and horizontal crosshair, during the drag.

- The Snap function (in the box above the Part display) acts as a sort of quantizing for your movement. If you press and hold the mouse button over the value shown to the right in this box, a Pop-up menu falls down. Select one of the values. The possibilities are Off, Bar, 1/2, 1/4, 1/8 and 1/16 (notes). Now when you release a Part its start point will automatically be moved to the closest position according to the value.



The Snap menu and the Mouse Box showing the mouse position as Bars/Beats/Ticks.

Duplicating Parts

There are two ways to directly duplicate a Part:

- Select the Part(s), hold down the [Alternate] key and drag it (them) to the new location.

- Select the Part(s), drag them as when moving, but while you drag, press the right mouse button too.

Remember that you must at least move the Part(s) one Snap value in either direction or to another Track to actually get a Duplicate.

Duplicate Parts take on the eventual MIDI Channel and Output (Instrument) settings of the Tracks they are put on, just as with a regular move.

Duplicating a Part to a nonexistent Track creates a new Track of the same class, just as when moving.

If you want to Duplicate all Parts on a Track, try the Duplicate Track function instead (hold down [Alternate] *and drag the Track name in the Track List).*

Merging Parts

If you hold down [Control] and [Alternate] and drag one Part and release it on top of another Part, a copy of the dragged Part is created which is merged into (added to) the new Part.

The dragged Part is not erased or even moved. A copy of its contents is made, and it is this that is merged into the other Part. If you set Record Mode to Overdub you get a regular merge, the dragged events are added to existing events in the destination Part. If you set it to Replace, the events in the dragged Part replace the events in the destination Part.

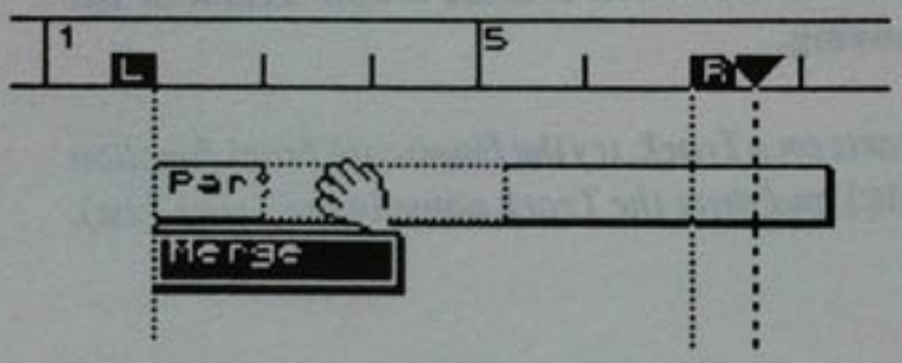
One way to use this is as a quick feature to add a few notes or other MIDI messages to a Part. If you have an extra cymbal crash or a snare fill

somewhere as a separate Part and wish to add this to the basic drum beat, then Merge is perfect.

This procedure is very much as if you had recorded in the Part. This means that the resulting Part keeps all its Parameters (Output MIDI Channel and so on). Explained in an other way: only the *events* in the dragged Part are copied to the destination Part.

Start and end points don't have to match at all. If the two Parts don't exactly overlap, new Parts are created. This follows the same rules as when creating Parts in other ways (see page 10-5). The Mouse indication and Snap value apply, as always when moving Parts.

An example: if you have two Parts on two Tracks both starting at 2. 1. 0 you can merge them with any offset you like. If you for instance drag one of them on top of the other (with the [Control] and [Alternate] keys down) and release it with the start point at 3. 1. 0, its events are offset one bar.



The lower Part is dragged (merged) into the upper Part with a one bar offset, as in the example.

You can only merge two Parts which belong to the same Track class. Group Parts can *not* be merged.

Deleting Parts

There are several ways to get rid of unwanted Parts.

- Select them and press [Backspace] on the computer keyboard.
- Select them and press [Delete] on the computer keyboard.
- Select them and use Delete Parts on the Edit menu.
- Hold down the *right* mouse button to bring up the Toolbox. Select the Eraser. With the *left* mouse button, click on the Parts you want to eradicate. When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.
- If you hold down [Alternate] and click on a Part with the Eraser Tool, this Part *and all the consecutive Parts* on the Track will be deleted.

Cutting, Copying and Pasting Parts

You can also use the standard commands, Cut, Copy and Paste to rearrange your Parts. These also have the keyboard equivalents [Control]-[X], [Control]-[C], and [Control]-[V] respectively.

Cutting, Copying and Pasting can also be used to move Parts from one Arrange window to another.

Cut

This command takes the selected Parts and removes them from the Arrange window they were in, and puts them in a temporary, non-visible location called the Clipboard.

Only one "cutting" (or "copying", see below) at a time can be stored on the Clipboard.

This means that if you first select two Parts and use Cut, and then select another Part and Cut that also, the two Parts that were on the Clipboard first, are lost forever, and the last Cut Part is now put on the Clipboard instead.

If you hold down [Alternate] and Cut a Part, all the consecutive Parts on the Track will moved so that the Cut doesn't create a "gap".

Copy

This command Copies the selected Parts and puts them on the Clipboard.

And again, only one "copying" (or "cutting") at a time can be stored on the Clipboard. There is only one Clipboard, shared by Cut and Copy.

Paste

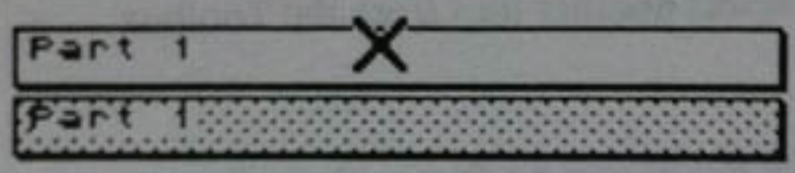
This command puts the Parts on the Clipboard back into the selected Arrange window, which might be the same window as they were Cut/Copied from, or another. These are the rules:

- The Parts are always Pasted in beginning at the current Song Position. Move the Position to where you want the beginning of the first Part. The Song Position is automatically moved to the beginning of the first selected Part when Cut or Copy is executed, making this Position a suggestion for Pasting.
- If you Paste in to the same Arrange window as the Parts came from, they are put in on the same Tracks as they originally were on.
- If you Paste in on another Arrange window, Parts are pasted in on Tracks set to the same Output and MIDI Channel, if possible. Otherwise, new Tracks are created.
- You can Paste the same contents from the Clipboard as many times as you like. Data is copied from the Clipboard, not moved from it.
- If you hold down [Alternate] and Paste, *all the consecutive Parts* on the Track will moved so that the new Parts are inserted into the existing "chain" of Parts on the Track.

Muting Parts

You can mute (silence) all output from a Part.

Hold down the *right* mouse button to bring up the Toolbox. Select the Mute Cross. To mute a Part, click on it with the left mouse button. To "unmute" a Part, just click on it again.



This picture shows the Mute cross over a regular Part, and below that a Part which is already muted.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

Changing the length of and Repeating a Part

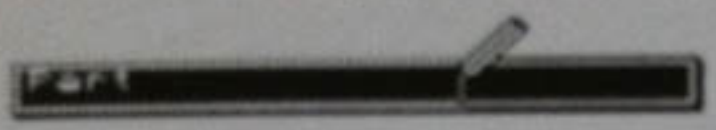
You can change the length of a Part using the Pencil icon in the Tool box.

Hold down the *right* mouse button to bring up the Toolbox. Select the Pencil.

- If you want to change the length of the Part, position the pointer close to the end point, and drag to the left (shorten) or to the right (lengthen).

- If you want to add to or mask out the beginning of the Part, position the pointer close to the beginning, and drag to the left (lengthen) or to the right(shorten). Lengthening a Part to the left does not move the events in it, it just sizes it as if recording had been activated earlier.

An outline of the Part shows the size while you are dragging. The Mouse box aids you in positioning the pointer so that you can set the length exactly as you want it. The Snap function also helps you to restrict your changes to some even note value (for more info on the Mouse and Snap boxes, see page 11-6).



This function can be undone as all others, but if you later lengthen the Part, the hidden events are lost.

When you are finished, press and let go of the *right* mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

Repeat
If you hold down [Alternate] while lengthening a Part with the Pencil tool, new Parts will be created, all "butt joined" to the Previous Part. If you for example have a one bar Part, hold down [Alternate] and lengthen it by three bars, then three new copies of that one bar Part will be inserted on the Track.

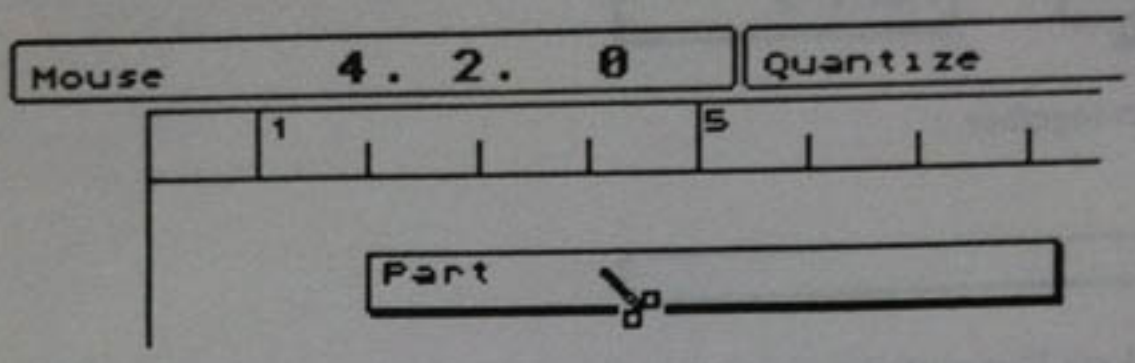
A similar option can be used to create Ghost Parts.

You can also Repeat using a dialog box, see page 16-6. This allows you to repeat several Parts at the same time.

Splitting a Part in Two

A Part can be split or cut apart using the Scissors tool in the Tool box. This creates two completely independent Parts. Hold down the *right* mouse button to bring up the Toolbox. Select the Scissors.

With the *left* mouse button, click on the Part you want to Split. The mouse box aids you in positioning the pointer so that you can split the Part in two, exactly where you want. The Snap function helps you in the same way as when using the pencil.



Splitting a Part in two at Position 4.2.0 (Snap set to 1/4).

If you hold down [Alternate] and Split the Part, it will be splitted up into many Parts, all with the length of the cut you indicated. If you for example have a six bar Part and cut it two bars in from its starting point with [Alternate] pressed, it will be cut into three two bar Parts.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

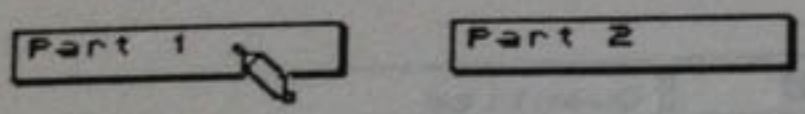
Joining Parts Together

Parts on a Track can also be joined. This turns two shorter Parts into one long Part. Hold down the *right* mouse button to bring up the Toolbox. Select the Join tool.

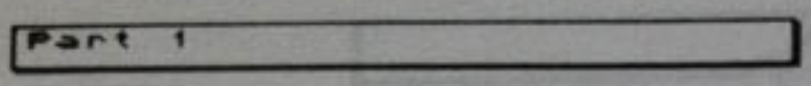
With the *left* mouse button, click on a Part. This Part will now be joined to the Part coming after it on the Track, regardless of if they overlap, if they are exactly adjacent or of they are spread apart.

If the Parts overlap, they are merged in the overlapping area. No events are lost.

If you click on a Part again with the Join tool active, the next Part on the Track will be appended. This goes on as long as there are any Parts left on the Track. When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.



Glueing two Parts together...



... gives you one long Part with the name of the first.

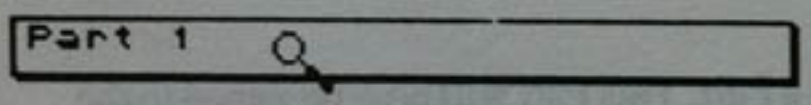
If you hold down [Alternate] while klicking on a Part with the Glue tool, all consecutive Parts on that Track will be glued to the Part you clicked on.

Scrubbing Parts

You can "listen" to the contents of a Part by using the magnifying glass icon.

Hold down the *right* mouse button to bring up the Toolbox. Select the magnifying glass.

With the *left* mouse button, click on the Part you want to hear. Drag the mouse to the left and to the right and over new parts to send out the data.



Both notes and other messages are sent out this way.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

Group Parts can't be scrubbed.

Triggering Parts

If you select the magnifying glass icon, as described above, you can start any Part during playback, by holding down [Alternate] and clicking on it. The Part plays back when Cubase reaches the beginning of the next bar, and plays to its end. This is a playback function only, allowing you to try out variations on an Arrangement.

Renaming Parts

If you hold down [Alternate] and double click on a Part, a small dialog box appears where you can change the name of the Part, as described on page 4-10.

If you hold down [Alternate] when hitting [Return], the new name is copied to all the Parts on the Track.

Ghost Parts

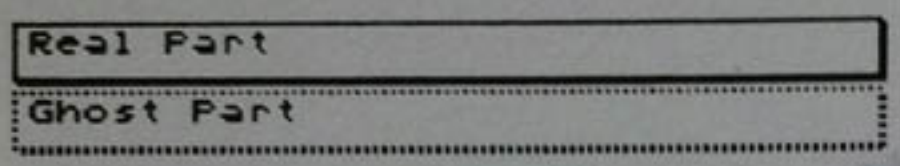
Often you will want to dub a certain Part, i.e. make several instruments (or sounds) play it. This is accomplished by using Ghost Parts. A Ghost Part is a linked copy of an existing Part. This means that even though the original and the copy share contents (notes and other MIDI data) they may play back on different MIDI Channels and Outputs and with different Playback Parameter settings (see page 12-2).

- To create one Ghost Part, do a copy, but instead of holding down the [Alternate] key, hold down [Control] and drag. The Ghost Part is shown with a dotted outline.

- If you hold down [Control] while lengthening a Part with the Pencil tool, a number of Ghost Parts will be created, all "butt joined" to the original Part. If you for example have a one bar Part and hold down [Control] and lengthen it by three bars, then three Ghost copies of that one bar Part will be inserted on the Track.

You can "Ghost" any type of Part, but for Group Parts, "real" and Ghost Parts are the same thing.

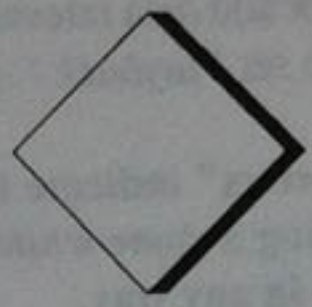
A Ghost Part can be moved as any other Part. It can also overlap existing Parts, just as any other Part.



If you edit the original *or* the Ghost Part in any of the Edit windows, the changes show up in both the original and the Ghost Part. But, the changes don't take effect for the other Parts until you exit the Edit window by clicking on Keep (see page 23-4).

If you alter the contents of a Ghost Part by recording over it, merging it with another Part or by splitting or joining, it is automatically converted to a regular copy.

Do not Edit (in an Edit window) several Ghost Parts at the same time that are made up from the same Real Part. It won't make the program crash or anything, it will just lead to confusing results.



The Inspector and the Playback Parameters

The MIDI and Drum Parts play back the data—i.e. notes, controllers and so on—that are put in them by recording or editing. But, you can also — during playback — change, filter out or add data relevant to each Part. This is done using the so called *Inspector* to set *Playback Parameters.*

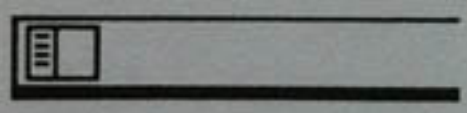
The name "Playback Parameters" indicate that the changes are done during playback. All processing is done *while* the Part is playing back, recorded data is not changed in any way.

This means that if you for instance transpose a Part down by two semitones, this is an arithmetic operation that is done on the data coming out from the Part while it is being played back. In this example, every note number is subtracted by 2.

For other Track classes than MIDI and Drum, the Inspector has less or at least other parameters, it all depends on the events on the Track.

Opening the Inspector

The Inspector is opened by clicking on the strip with the little Inspector Icon below the Track column. It can also be opened by pressing [Alternate]-[I].



An area to the left of the leftmost column in the Track list appears. In this you find a number of value fields, name fields and buttons. Exactly how many and which depends on the Part(s) that are selected.



What Parts will be affected?

You can direct the settings you do to one Part or all Parts on one Track, from inside the Inspector.

- If *one* Parts is selected, the Inspector will indicate this and any changes you do will affect this Part only.
- If no Parts are selected, the Inspector will show the settings for the active Track. The *existing* Parts on the Track doesn't necessarily have to have the settings of the Track. They might have been changed individually.
- Any new Parts on a Track will take on the current Playback Parameters.
- When you have one Track selected (no Parts) and change one parameter (like Velocity) you are changing this in all Parts on the Track. But, it is only that parameter (Velocity in the example) that is changed in the Parts, they keep their individual settings for all other parameters (like Length, Volume and so on).
- If several Parts are selected, and you change a value, a dialog box will ask you if you want to copy the value to all selected Parts.

You can step through the Tracks using the [↑] and [↓] keys on the computer keyboard, and you can step through the Parts on the active Track using [→] and [←].

The fields and the values

Many of the fields in the Inspector are value fields where the value can be increased with the right mouse button and decreased with the left. Or, you can double-click on them and enter the value in the dialog box that appears. Some fields activate pop-up menus when you press either mouse button with the pointer over the value. As all other changes, these can of course be done while the music is playing and even while recording.

Track/Part Name

The heading for this name field changes with your selection. If no Parts are selected, it shows the name of the Active Track. If Parts are selected it shows the name of the first of these. This field is always there, regardless of the Track class. It can be changed by clicking on it as usual. A little dialog box appears where you can edit the name.

Instrument

This is the Instrument (Output and Channel) that the Part is assigned to. If you press either mouse button in this field a pop-up menu falls down showing you a list of the existing instruments. Pick one. You can also create an Instrument name for the selected Output and MIDI Channel, by double-clicking on the Instrument field, just as in the Track List. For a more thorough explanation of Instruments, Outputs and Channels, see page 10-3.

Output

For MIDI Tracks, this is the physical Output port the Part is playing back on. For Mix Tracks it is the Mix map the Track uses. This is also a pop-up menu showing you a list of the existing Outputs. Select an Output from the menu.

This value may automatically be changed when you select a new Instrument in the Instrument field above.

Channel

For MIDI and Drum Tracks this is the MIDI Channel the Part is playing back on. This can be set to 1 to 16 or "Any". For an explanation of the values, see page 10-3.

This value may automatically be changed when you select a new Instrument in the Instrument field above.

For Tape Tracks the Channel is the tape recorder track, see page 33-2.

Bank

Bank Select messages are MIDI messages used to make a synth or other unit switch from one "program bank" to another. You can make a MIDI or Drum Track/Part send out a Bank Select number at its Start Point by setting this value to anything but Off. The range of the Bank Select numbers are 0 to 16384.

Cubase follows the MIDI standard for Bank Select. Users of some Roland products will have to shift this parameter in steps of 128 to get a new Bank. (128= Bank 1, 256 = Bank 2, 384 = Bank 3 etc)

The number is always sent out at the beginning of the Part, in Cycle mode also.

Make sure your instrument is set to receive Bank Select messages.

A Bank Select messages is sent out when you release the mouse. This makes it easy to "scroll" through the Banks of a receiving unit until you find the right one.

When a Bank Select message is sent, the Program Change message is sent out as well.

Program

Program Change messages are MIDI messages used to make a synth or other unit switch from one "program" (sometimes called preset, sound or timbre) to another. As with Bank select, you can make a MIDI or Drum Part send out a Program Change at its Start Point by setting this value to anything but Off. The range of the Program Change numbers are 0 to 127.

The number is always sent out at the beginning of the Part, in Cycle mode also.

Make sure your instrument is set to receive Program Change messages, and check that Program Change messages are not filtered out using the Output filters in Part Info.

What has been said above about Bank select messages being sent out while you change the value applies to Program Change as well.

The Playback Parameters are not the only way to send out a Program Change or Bank Select message. These can also be recorded just as any MIDI data, or entered in one of the Edit windows as a permanent event in the Part.

Volume

One of the MIDI controllers (number 7) is defined as a volume control. You can send out a volume value at the start point of a MIDI or Drum Part. This then changes the overall volume for instruments set to receive from that Output and on that MIDI Channel.

MIDI Volume is a function totally separate from MIDI note messages and their velocity values. Not all MIDI Instruments can receive MIDI Volume, check the instruments operation manual or MIDI Implementation Chart.

Also check that Controller messages are not filtered out using the Output filters (see below).

Normally, this value is sent out continuously while you change it. This can be used to set up a mix while the music is playing. Switch between Parts (and Tracks) and change the value for each until the desired mix is reached. But, if you hold down [Alternate] *while changing the value it is not sent out until the Part is played back next time.*

Transpose

This can be used to Transpose the notes coming out from a MIDI or Group Part by some amount. The range is –127 to +127 semitones, but remember that the total range of the MIDI note numbers are 127, and that not all instruments can play back notes over the whole range. For example, transposing a C, that is already two octaves below middle C, downwards by five octaves (60 semitones) makes no sense at all, and transposing it one octave down may or may not make sense, depending of the capacity of the instrument that is

playing it back.

Transposing Group Parts means transposing all music from the Parts in the Group (except Drum Parts).

Drum Parts have n' Transpose parameter.

Velocity

This value is used to change the dynamics of a MIDI or Drum Part. The value in this field is added to the velocity of each note message that is sent out from the Part. Positive values means that the resulting volume is raised and negative that it is lowered. The range is –127 to +127 and 0 is of course no change.

Not all instruments are responsive to velocity at all. And, remember that MIDI velocity is in fact an exponential function, and that not all instruments handle the velocity range identically. A certain value might lead to more drastic changes on one instrument than on another.

Delay

This is used to delay a MIDI or Drum Part relative to other Parts. The values represent 1 Tick (fraction of a beat). The range is –127 to +127. The negative values put the Part ahead of the other Parts. Use this feature to adjust the feel of a Part or Track or to compensate for "slow reactions" in a MIDI instrument.

Notes that wind up either before the beginning (1. 1. 0) or outside a set cycle, due to delay settings, are not played.

Length

This value adjusts the lengths of all notes in a Drum or MIDI part. The range is Off and 25% to 200%. 200% means that all notes get double the length of the recorded and 25% that they get a quarter of their actual length.

Compression

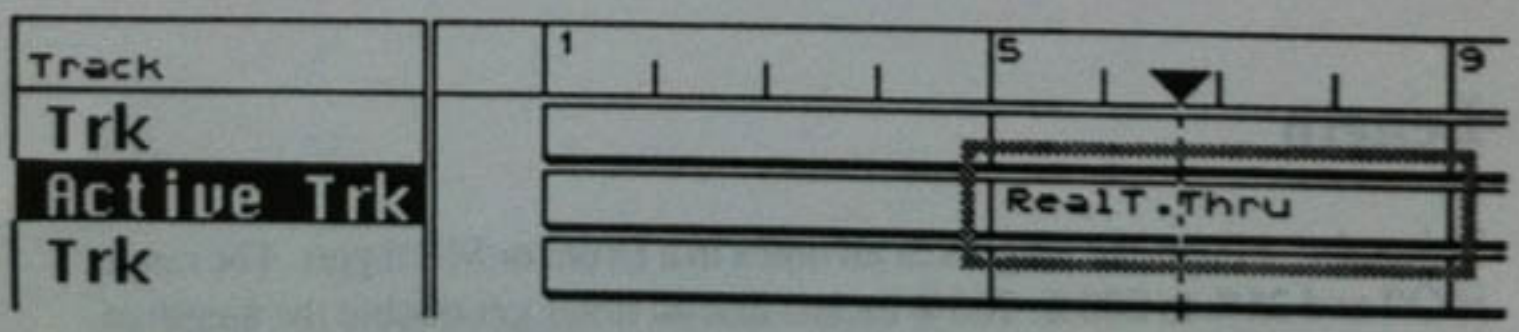
This parameter acts on MIDI and Drum Parts and works like a regular sound compressor/expander. It does this by adjusting velocity values (make sure that your sounds are velocity sensitive!) It can be set to Off and 25% to 200%. 25% means that all velocity values are divided by 4, and 200% that they are doubled. Remember that the maximum velocity is always 127 no matter how much you try to expand. Use this parameter in combination with Velocity to tailor dynamics.

Real-time Thru

In most recording situations, Cubase's Thru functions is used to "echo" incoming MIDI data via MIDI Out. If you use the Thru function, the MIDI-data that you send in to Cubase via MIDI In is modified in real-time by some of the Playback parameters. This means that if you for instance set a transposition value of 7 and play your keyboard, all notes coming out via the MIDI Out are transposed a perfect fifth upward.

This allows you to try out what effect a certain parameter setting will have on the music, before and when you record something. Since different Parts can have different settings you must select the right Track and check that the Song Position is somewhere within the Part that has the settings you want to try.

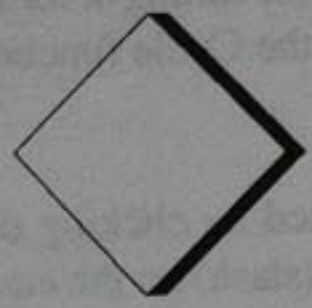
It doesn't matter which Part or Track you have visible in the Inspector box (you may have stepped through the Parts and Tracks with the arrow keys on the computer keyboard), it is only the Song Position and Active Track (MIDI or Drum Track) that determine which Part's settings should be used for the real-time modification.



The Part in the "cross" made up by the Active Track and the Song Position is used for real-time Thru-ing.

The parameters that are used for modification in real-time are: Transpose, Velocity and Compression.

You can also thru-put to up to four Instruments (Outputs and MIDI Channels), see page 21-4.



Cycle and Cycled Recording

You may want to repeat a certain section of your song over and over again, just for listening, for rearranging, for editing or for setting playback parameters for the Parts. This is done with the Cycle function. You can also record in Cycle mode.

Cycle is activated and deactivated by clicking on the Cycle button on the Transport Bar or by pressing [/] (slash) on the *numeric part* of the computer keyboard.

The cycle start and end is set with the Left and Right Locators.

If you manually punch in before the Left Locator in Cycle mode, the Cycle is automatically turned Off.

Cycle During Playback

You can do anything while in Cycle playback mode. You can select and edit, quantize, delete, move or create Parts and more. You can also change the Left and Right Locator positions to move the cycle, and turn off the Cycle at any time.

If you start playback before the cycle, the music plays until it reaches the Right Locator, and then cycles between the Left and Right Locator. This can for example be used for fade-outs at the end of a song.

If you change the Locator positions during the Cycle, this is readily accepted by the program. You can even use the Function keys to program new sets of Locator positions. If you switch to a new set of Left and Right Locator settings in the middle of the Cycle, the program will jump to this new Cycle when it reaches the Right Locator.

Other examples of cycled playback:

- Cycle a drum and bass section and adjust velocities, Quantizing and delays to fine tune the groove.
- Rehearse a part that you are about to record.
- Move different Parts out from, and into, the cycle to try out an arrangement.
- Restrict editing in one of the edit windows to a certain part of your music.
- Use the Function key possibility to jump between different sections of

the song, without using the Transport controls, and while playback is activated.

Cycled Recording

You can also record inside the cycle. Recording is activated just as usual, either directly from the position of the left Locator, manually by punching in somewhere inside (*not before*) the cycle, or by automatic punch in. Cycled recording first of all allows you to add notes or other MIDI messages on each lap, but there are three different modes to work in, each one with its distinct advantage. The following is a short list of what the possibilities are.

- ❑ You can switch Tracks at any time in Cycle Record mode, just as in normal recording. This makes recording short sections or setting up grooves very fast.

- ❑ If you make a mistake you can delete the whole recording or just the last "lap".

- ❑ You can activate and deactivate recording at any time, and as many times as you wish.

- ❑ You can turn off Cycle at any time, if you want to record past the Cycle.

- ❑ You can switch to an Edit window at any time and make changes there, just as in normal recording.

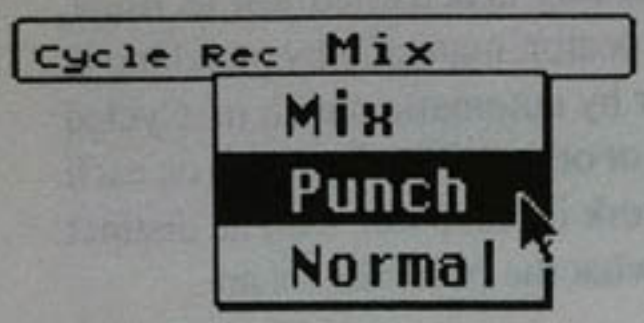
- ❑ You can Quantize just the last lap or have Quantizing happen automatically.

When you record in Cycle Mode, the Part created always gets the Left and Right Locator settings as Start and End Point (except when you record during the Precount).

If you manually punch in before the Left Locator in Cycle mode, the Cycle is automatically turned Off.

Cycled Recording Modes

On the upper right hand of the arrange window is a small box labelled Cycle Mode. This is used to select one of three "behaviours" when recording in Cycle Mode.



These modes apply to the recording done now, not what has previously been recorded on the Track (Punch, for example, doesn't delete any earlier recordings).

Mix
Mix mode allows you to add more music for each lap in the Cycle.

Punch
In this mode Cubase automatically punches in the moment you play anything on a lap. Use this to record a small section at a time. When you start playing in a cycle, your first note acts as an automatic punch in. If you for example have a cycle of eight bars and everything is perfect up until the the beginning of the sixth bar, you just have to wait until the music reaches this point, and start playing there. Everything that was previously recorded (during this recording) from the sixth bar to the end of the cycle is instantly erased and replaced with what you now play.

Normal
The name Normal mode refers to the way Cubase behaves during normal (as opposed to Cycled) recording.

First of all, earlier recordings (recordings made before you pressed Record this time) are kept in Overdub mode and erased in Replace mode, as always.

Now for how Cubase behaves in Normal mode during Cycled recording: Each time you enter a new lap, recording starts afresh if you play anything at

any time during the lap. This means that if you play something during a lap, everything you had recorded on an earlier lap is erased.

When you stop, the last complete recording (one complete lap) is kept.

But, erasing doesn't happen until the end of the Cycle. So if you stop before the end, this *last* recording is deleted (if you played any notes on this lap) and the previous one is kept instead.

This means that when you stop, the last complete recording (one complete lap) is kept.

In Normal Mode you only hear what you are actually playing, plus what might have been recorded before on the Track, if you are in Overdub mode of course. If you are in Replace mode you only hear what you are playing, since any earlier recordings are replaced. In other words: the music you are recording in one lap in Normal mode is not sent out on the next lap(s).

Cycled Recording Functions

These functions are found on a pop-up menu that appears when you press the mouse button with the pointer over the text "Cycle Mode" (in the top right corner of the Arrange window) *while recording*.

Key Erase
To erase all notes played with a certain key, or keys, (F#3, A0 or whatever) in the recording, first press the relevant keys. Then, select this item from the menu or hold down [K] on the computer keyboard.

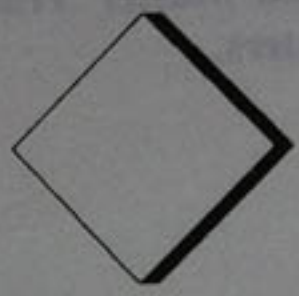
Delete SubTrack
If you make a mistake and don't wish to keep anything of what you've just recorded, select Delete Subtrack or press [B] on the computer keyboard, and the Part is cleared (but not deleted). Then you can instantly start inputting music again, without ever leaving Record mode.

Delete Last Version

If you just made a mistake on the last lap, select Delete Last Version or press [V] on the computer keyboard. This erases your last recording. It doesn't matter if you didn't play anything for several laps, the last lap *that you recorded anything on* is erased.

Quantize Last Version

This Over-Quantizes everything you played on the last lap, to the set Quantize value. Select Quantize Last Version or press [N] on the computer keyboard. And just as with Delete Last Version, it doesn't matter if Cubase has played back the Cycle several times since you last played anything, the last lap *you recorded anything on* is Quantized anyway.



The Edit Menu

This Chapter describes the Edit menu except for the items List, Drum, Key, Score, Mix, Logical and Master Track, which are important enough to get their own chapters.

Undo

You can undo your last action by selecting this item from the Edit menu or by pressing [Undo] on the computer keyboard. This is very helpful when something doesn't turn out as intended. Remember that it is only the *last* action that can be undone.

If something strange happens as a result of a command or a procedure, don't do anything to try to repair it before you try to Undo.

The menu item Undo also tells you what it is that will be undone at any given moment. If it e g says "Undo Delete", the last Deletion will be undone.

If you wish to "Undo the Undo", this is possible. The menu text changes to Redo after an Undo (for example "Redo Delete"). If this menu item is grey, nothing can be undone. The following is a list of Undo in different parts of the program.

Arrange window
Everything can be undone (even a recording) *except*:
Creating Tracks.
Creating Groups.
The automatic conversion of Ghost Parts to real Parts which happens as a result of some operations.

Edit windows
Everything can be undone (even a recording) *except* the following operations in Score Edit:
Enharmonic Shift.
Layout adjustments such as moving elements in Page Mode.
Changing the first key signature and clef for each Part.
The MIDI Meaning and Drum Map settings.
Insertion, editing or deletion of "layout" symbols.

MIDI Mixer Window
The following can be undone:
Delete Object.
Delete Events.

Plus that everything done since you entered an Edit window can be undone by Cancelling all changes (click Cancel on the window's title bar).

Cut

This command takes the selected object or objects, whatever they may be, and deletes them from the window and puts them in a temporary, invisible memory location called the Clipboard. The keyboard command for Cut is [Control]-[X]. If nothing is selected, this menu item is dimmed (grey).

You can Cut several objects at the same time and they are all put on the Clipboard, but only one set of objects can be put there at a time. As soon as you Cut again (or Copy), whatever was on the Clipboard is lost and replaced by the new Cut (or Copy).

The object(s) on the Clipboard can later be Pasted in. Cutting and Pasting is a way of moving objects. In the Arrange windows you Cut (and Copy) Parts (see page 11-9). In the Edit windows, you Cut (and Copy) notes and other MIDI events.

Copy

This command works as Cut, but it doesn't delete the objects, it just takes a copy of them and puts this on the Clipboard from where it later can be pasted in. The keyboard command for Copy is [Control]-[C]. If nothing is selected, this menu item is dimmed (grey).

The Clipboard rules apply as when Cutting, and there is only one Clipboard for Cut *or* Copied objects.

Copying and Pasting is a way of duplicating objects. Under the heading Cut above, you can see what can be Copied.

Paste

When you have put something on the Clipboard, by Cutting or Copying, you use the Paste command to put it back in. You can Paste the same object(s) as many times as you want from the Clipboard. The keyboard command for Paste is [Control]-[V]. If nothing is on the Clipboard, this menu item is dimmed (grey).

Objects are always Pasted in at the current Song Position.

You can Paste objects from one Arrange window in another and events from one Editor in another but you can't use it to move events or objects between different types of windows (which wouldn't make much sense to do either).

Delete

You can also Delete selected objects. This is pure eradication (but it can be Undone). There is also a special [Delete] key on the computer keyboard.

More info on Cutting, Copying, Pasting and Deleting is found on page 11-9 to 11-10 for the Arrange window and page 23-17 for the Edit windows.

Select All

This command just selects all items in the window (Parts in the Arrange window and events or objects in the Edit windows). It can be accessed from the computer keyboard by pressing [Control]-[A].

Edit, Drum, Score and List

These are used for opening the editors. See page 23-2 for more info.

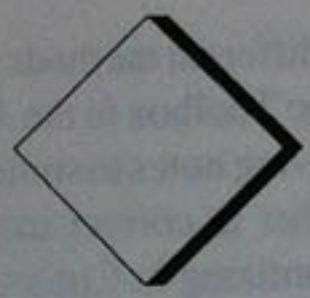
Info

This command opens up the Part Info window. Its computer keyboard equivalent is [Control]-[I]. More about this is found on page 11-5.

Note Pad

This utility allows you to make some text notes that are saved with the Arrangement. It is reached from the Edit menu or by pressing [Control]-[B] on the computer keyboard.

- Press [Return] when you reach the end of a line.
- Use [Backspace] to delete text.
- You can use the [←] and [→] arrows on the computer keyboard. to move through the text on one line, and the [↑] and [↓] arrows to step through the lines.
- Use the arrow buttons (<<< and >>>) below the text to move to the next/ previous page.
- Click Exit when you are ready.



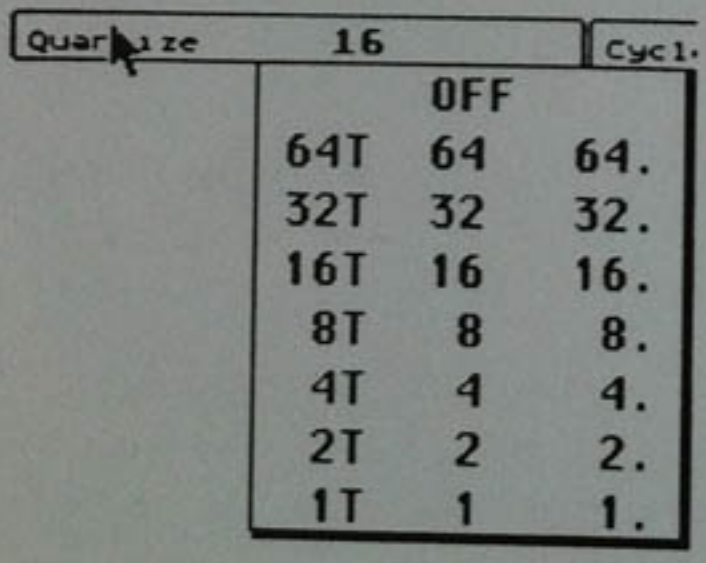
Quantizing and the Functions Menu

Quantizing

You can Quantize *notes* using different methods listed on the Functions menu or by using one of the tools in the Toolbox in the Arrange window. Quantizing is a means of automatically moving notes to some set value according to some method. This can be used either to correct imprecise playing or to create certain rhythmic feelings. Quantizing in Cubase is not just a way of tidying up, it is a creative feature.

Only notes are Quantized. Other events are left intact.

- If you Quantize from the Arrange window, all notes in all *selected* Parts are Quantized.
- If no Parts are selected, all Parts on the active Track are Quantized.
- If you Quantize from one of the Edit windows, all or some notes in the selected Part(s) are quantized.
- Quantizing is done according to the Quantize value set in the window you are working with.
  In the Arrange window, this is a Pop-up menu in the box Quantize at the top of the window. Press either mouse button in the box, and select a value.



In the Edit windows you will also find a box, labelled Quant. Use it to pull down an identical menu. These are the possibilities:

1. Quantizing is done to closest dotted whole note.
1 Quantizing is done to closest whole note.
1T Quantizing is done to closest whole note triplet.
2. Quantizing is done to closest dotted half note.
2 Quantizing is done to closest half note.
2T Quantizing is done to closest half note triplet.
4. Quantizing is done to closest dotted quarter note.
4 Quantizing is done to closest quarter note.
4T Quantizing is done to closest quarter note triplet.
8. Quantizing is done to closest dotted eighth note.
8 Quantizing is done to closest eighth note.

... and so on down to 64T (which of course is sixty-fourth note triplets).

You can also select new Quantize values from the computer keyboard. Use the keys [1] to [7] at the top of the typewriter keyboard to select the numeral, and the keys [T] and [.] to turn on and off the triplet and dotted options.

- Select the desired Quantize value, and then the type of Quantizing you want from the Functions menu (see the heading "The Different Types of Quantizing" on page 15-4), and the notes get quantized.

Undoing Quantize

Quantizing is not definite or irrevocable. You can *always* re-quantize to any value, or remove quantization, unless you specifically "freeze" your Quantize, see page 15-13.

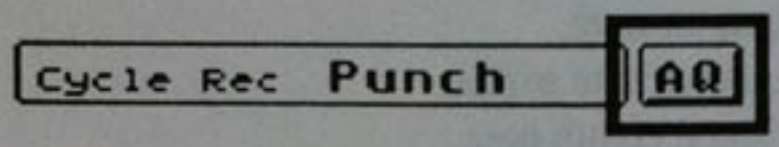
This means that notes quantized to eighths can later be quantized to sixteenths. The original (un-quantized) positions of the notes are used for determining how notes should be moved, except when using Iterative Quantize. You can also re-quantize just some notes in one of the editors.

To completely restore the recording to its original state, select Undo Quantize from the Functions menu or press [U] on the computer keyboard.

Automatic Quantize

This is a function that allows you to have everything automatically Quantized as you go along with your recording.

You will find the AQ button to the right of the Cycle Mode box at the top right part of the Arrange window. Click on it. When activated, it is black. You can also press [Z] on the computer keyboard to activate/deactivate.



When automatic Quantize is activated, Quantizing is done to the set Quantize value, according to the Over Quantize method. This Quantizing can be Undone as any other.

There is one thing to note. If you have this function activated in Cycle Mode, your recording gets Over Quantized at the end of each Cycle. Even if you select some other type of Quantizing (like Groove Quantize) during the Cycle, the music will be Over Quantized at the end of the Cycle. So, before you manually Quantize, turn this function off (which of course can be done without deactivating recording).

The different types of Quantizing

Over Quantize

This type of Quantize is the most plain musical one. It moves the notes to the closest Quantize value. But, it detects chords and if you consistently play behind of, or ahead of the beat, and uses this fact when finding notes to move. Over Quantize can be selected from the computer keyboard by pressing [Q].

Note On Quantize

The start of the note is moved to the closest Quantize value, but the length is kept intact. This is the "classic autocorrect", though not necessarily your best choice for normal Quantizing. Note On Quantize can be selected from the computer keyboard by pressing [W].

Iterative Quantize

This type moves the notes towards the selected Quantize value. An example: you can Iteratively Quantize a straight eighth note pattern more or less towards eight note triplets, to create a shuffle feeling. Selecting this type of Quantize several times moves the notes nearer the note value for each time. Iterative Quantize can be selected from the computer keyboard by pressing [E].

You can set parameters for the Iterative Quantize in the dialog box that pops up when you select Edit Quantize from the Functions menu. In the lower left half of this you find two settings called Strength and Don't Q. These can be set using the left and right mouse button as usual.

Strength
This is how much the notes should be moved towards the selected Quantize value. The higher the value the more the effect. 100% is the same as normal Quantizing to the selected value, and 0% will give you no effect.

Don't Q
This allows you to exclude certain notes from the Quantizing. This is how it works:

Iterative Quantize doesn't move notes that are already close to the Quantize value. And "Don't Q" is the parameter that decides what "close" means in this matter. It is the number of fractions (or ticks) between 0 and 192 (up to an eighth note) that a note can differ from the Quantize position without being moved.

A couple of examples:

Quantize value: 8
Don't Q: 48
Strength: Any
This only Quantizes note that fall longer than a thirty-second note from the eighth note.

Quantize value: 16
Don't Q: 96
Strength: Any
This is the same as quantizing no notes at all, since 96 ticks is the same as a 16th note.

Quantize value: 8T
Don't Q: 0
Strength: 10
Quantizing a Part towards triplets can be done in small steps. In this case all notes are moved towards eight note triplets in steps of 10%. Select Iterative Quantize several times and the notes move nearer for each time.

You can't always easily Undo this type of Quantize since it uses the last Quantize for determining how notes should be moved. If you wish to experiment, do this from inside a MIDI Editor, since this allows you to Cancel all changes.

Analytic Quantize

You should definitely try this type of Quantize on complex input (such as solos), when you have mixed straight notes and triplets in a Part, and when you have played glissandos.

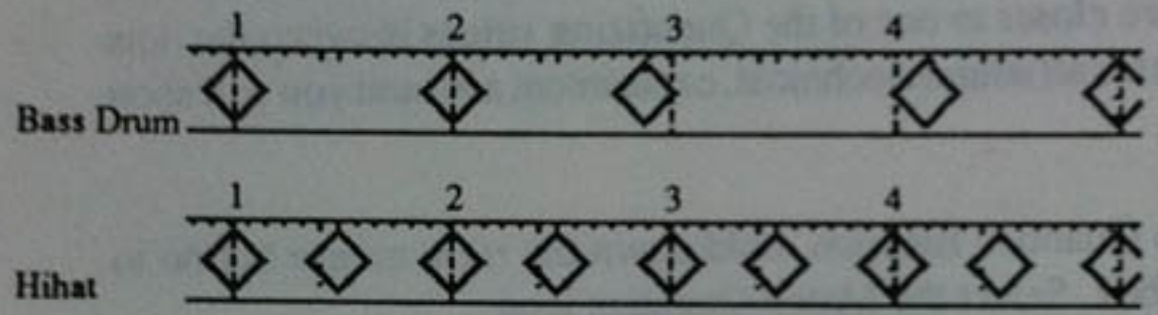
The Quantize value is used, but not rigourously. Set a Quantize value to give the program an "impression" of what type of phrase it is. When you then Quantize, Cubase analyses the music, detects timing errors and corrects them.

Match Quantize

This type of Quantizing allows you to match the feel and dynamics of one Part with the feel and dynamics of another. If you for instance have made up a great "live" hihat Part and wish to pass the timing of it on to a bass drum you should use Match Quantize.

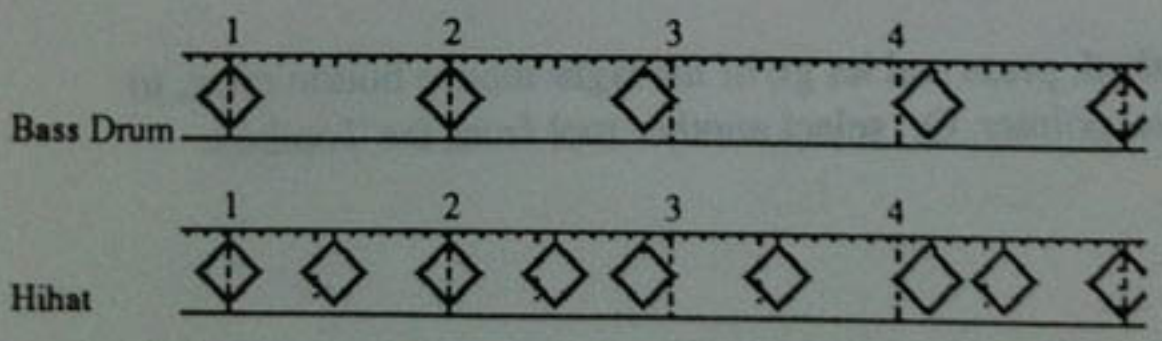
This type of Quantizing takes the positions and, if you so wish, the velocities of the notes in one Part and uses them for moving notes in another Part. But the set Quantize value is also of interest.

Say for instance that you have a bass drum playing on every beat (quarter) in a bar. The feel of this is to be passed on to a hihat playing eighths.

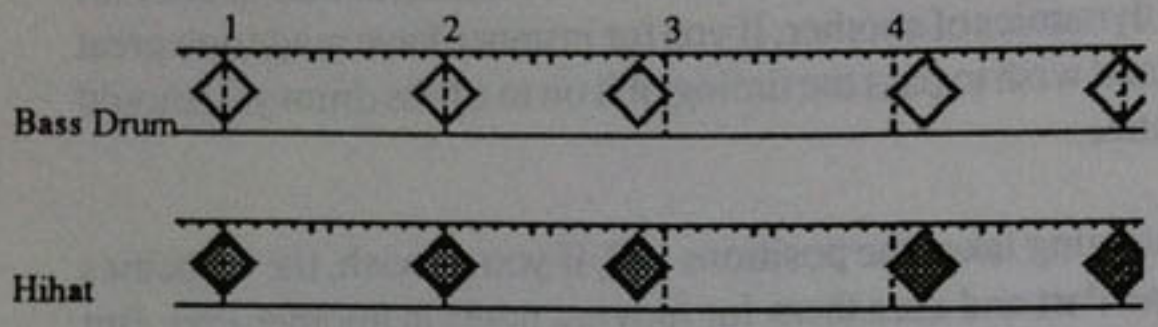


But, you don't want all notes in the hihat Part to be moved to the quarters of the bass drum, since this would not give you an eighth note hihat Pattern but a strange quarter note one. You only want every other hihat "note" to be affected.

So, you use the Quantize value to put a grid on the Match Quantize effect. If, in our example, Quantize was set to 8, the quarter notes in the hi-hat would be moved, but the eighth notes between them would "slip through", and not get Quantized.



If on the other hand it was set to 4, *all* hihat notes would be moved to the closest bass drum.



They grey notes indicate double hihats as in the example. Do not confuse this with grey notes in Drum Edit or Groove Edit.

The Quantize value is used to put a filter, or grid, on the Quantizing so that notes in the "affected Part" that are close to notes in the "feel Part" are moved, while notes that are closer to one of the Quantizing values between the dots are unaffected. If this all sounds technical, experiment a bit and you will soon get the hang of it.

To use the Match Quantize function, hold down the *right* mouse button to bring up the tool box. Select the Match Quantize icon.

With the *left* mouse button, drag the part that has the feel you want, so that it is positioned over the Part that you want to Quantize, and release the mouse button.

A dialog box pops up, asking you if you want to pass on the velocity values as well (Include Accents?). Click Yes or No.

If the "feel Part" is shorter than the "affected Part", the "feel Part's" contents is repeated so that the whole "affected Part" is Quantized by the operation.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

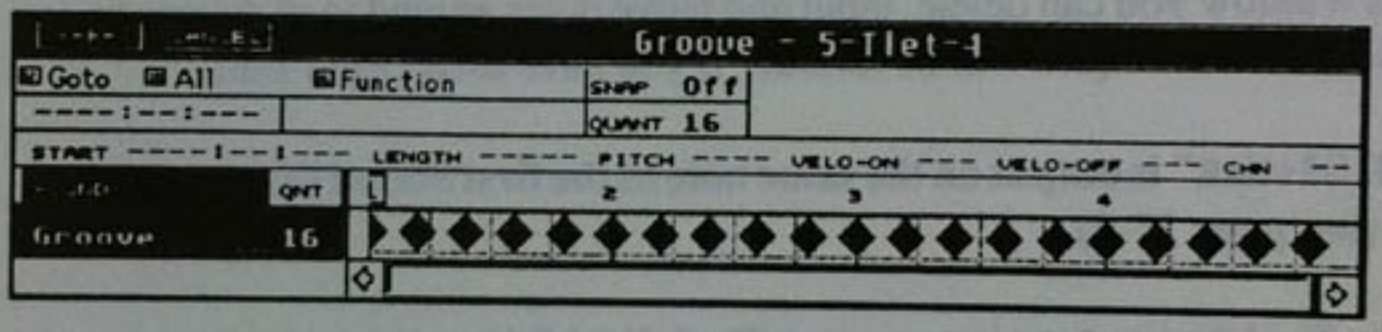
Groove Quantize

This type is not meant for correcting errors but for creating rhythmic feels. It allows you to set up your own "maps" for Quantizing.

Using the Groove Quantize Hierarchical Menu
When you select Groove Quantize, a list of the available Grooves appears where you can select one, to apply to your music. The items on the list change with the Groove Maps you currently have in your program. You can load sets of grooves from disk or make up your own, as described below. But you don't have to do this, there is a useful list of grooves on the menu to start with.

You can also press [J] on the computer keyboard to Quantize to the last selected Groove.

Groove is very similar to Match Quantize, the difference is that the notes are not moved according to another Part, but according to a Groove Map. A Groove Map is a bar filled with "dots" in a way that defines a rhythmic feel. One such Groove Map is displayed below.



When you use Groove Quantize, notes are moved to the closest "dot". But just as with Match Quantize, the Quantize value is used to put a grid on the Quantizing so that notes that are close to the "dot" are moved, while notes that are closer to one of the Quantizing values between the dots are unaffected. For a more thorough explanation, see Match Quantize.

There are a number of Groove-maps in a list under the menu item Edit Quantize. You can display and edit these by using the Edit option in the Groove section of the Edit Quantize dialog box. You can then save the whole set of maps to disk.

Editing, Saving and Loading Grooves

Making up useful Grooves takes some practice, don't despair if you don't get everything perfect the first time.

You select a Groove Map to work on from the Groove pop-up menu in the Edit Quantize dialog box. If want to try it out directly from this window, click Do It, and the Groove will be applied to the selected Parts/Notes as always when you Quantize.

You may change two things for the Groove Map directly from the Edit Quantize dialog box. The first is the name of the selected Groove (double click on the name) and the second is the Time Signature it uses.

The Groove Map is one bar long, in the Time Signature set. This means that if you set the Groove to 4/8 it will repeat itself twice in every bar of 4/4. You can use this fact with unusual time signatures to create really odd and interesting feels.

By clicking on the Edit button a new window appears, similar to Drum Edit. In this window you can delete, input and move notes around to make up the groove. The techniques will be familiar if you have used Drum Edit.

A "MIDI click" is output on the same note as the first Sound in the Drum Map (see page 27-2).

Use the Tool Box to draw in new notes (Pen), "kick" the existing ones around and to delete notes until you are satisfied with the feel of the Groove. Remember that the pointer has to be inside the grid for you to be able to call up the Tool box.

You can also use the Position value on the Note Info Line, but avoid pitch and other values. It is only the positions of the "dots" that are of interest for Groove.

When you are finished, click on Keep, and the Groove is saved to memory (but not permanently, see below). You can save the current set of groove maps to disk or load in a new set by clicking on either the Save or the Load buttons in the Edit Quantize dialog box. A standard file selector opens up where you can enter a name and decide where you want to save the grooves or which one you want to load. Grooves are given the suffix "GRV".

Freeze Quantize

As said above, you can Re-Quantize or Undo Quantize at any time. But you may want to make the current Quantizing permanent. To do this, select Freeze Quantize from the Functions menu.

An example: You want to create a perfect shuffle using Iterative Quantize, but the part you have is so sloppily played it doesn't give you the strict feeling you are after. This happens since the original recording (un-quantized) is used for determining how notes should be moved when you use Iterative Quantize the first time.

Now, first Quantize using one of the other types (Over- or Note On Quantize) to correct the playing. Then, select Freeze Quantize to make the current positioning permanent. And last, change the Quantize value and set the Iterative Quantize parameters and select Iterative Quantize from the Functions menu.

Other Functions

There are other types for automatic handling of MIDI events on the Function menu. The same rules as for Quantizing are used to decide what gets affected. That is, if you use any of these commands in the Arrange window, all events in all the selected Parts, or all Parts on a Track are affected, and if you select the function from one of the Edit windows, you can direct the operation to just some of the events. these Functions can be undone, as everything else.

Logical

This menu item allows you to use Logical Edit Presets (that you have made up or that come with the program) and apply them to the selected Parts/ Events.

Like all other editing these work either on the selected Parts/the active Track in the Arrange window, or on a restricted set of events in one of the editors.

Below follows a list of Presets in the DEF.ALL file that comes with the program. It is relatively easy to go into Logical Edit and change any of them should you wish.

Delete Notes
This simply deletes all notes, but leaves all other types of events.

DelShrtNotes
This Deletes all notes with a length shorter than 15 ticks (20 milliseconds at 120 bpm). This is for guitar and wind synthesizers which often send spurious short notes.

Random Notes
This makes all the notes get a random pitch within a two octave range and a random velocity between 90 and 127.

Fix Velocity
This sets all notes to velocity 100.

Random Velo
This leaves the pitch of all notes, but gives the a random velocity value between 90 and 110.

FadeOutVelo
This takes all the notes and creates a ramp of velocity for them starting at velocity 100, ending at 0. This is a "poor mans fade out" (it doesn't work very well on long notes, if that is a problem use MIDI Volume instead).

Push Forward
This moves all the events (not just notes) 4 ticks (5 milliseconds at 120 BPM) later in the song. Use this repeatedly if you need more.

Push Back
Same as above, but puts the events at an earlier position in the song.

Double Tempo
This recalculates the positions of all events to mimic a tempo change. Use this on one Part at a time, or the results will be confusing, since the beginning of the Part isn't moved.

Half Tempo
Same as above, but half the tempo. If you do not want to lose events, you have to resize the Part to at least double length before you try it.

Freeze Play Parameters

This transforms Playback Parameter settings that you have done in the Inspector (see page 12-2) into permanent changes in the Parts. This means that some MIDI messages in the Parts are altered and new ones may be inserted. It applies to the following:

Bank	Bank Select messages are put into the Part(s).
Program	Program Change messages are put into the Part(s).
Volume	Volume messages are put into the Part(s).
Transpose	The pitches of the notes are changed.
Velocity	The velocity of the notes is changed.
Delay	The notes are moved.
Length	The notes' lengths are altered.
Compression	The velocity of the notes is changed.

The Freeze Play Parameters setting also resets all the settings in the Inspector to their default values, so that the Arrangement plays back as it originally did.

This command, which can be reached from the keyboard by pressing [Alternate]-[F] is especially useful when you plan to export your music as a MIDI file (see page 36-6). To make up a MIDI file with all your Play parameter settings included, follow these steps.

- ❑ Save a copy of your Song or Arrangement.
- ❑ Load this copy back in, so that you don't work on the original.
- ❑ Select all Parts and apply "Freeze Play Parameters".
- ❑ Select Save from the File menu and save the music as a MIDI file.

Legato

This function corrects your legato playing. The Quantize value has no effect, but there is a Legato Overlap parameter in the Edit Quantize dialog box where you can set a number of ticks, positive or negative.

- If you set this to positive values, all notes will always overlap with *at least* the set number of ticks. This means that if two notes don't overlap enough or at all, before you select Legato from the Functions menu, they will be lengthened so that they overlap the set number of ticks. The last event will be lengthened to the end of the bar.

- If you set this to negative values, there will always be a gap between notes. This gap will be at least the number of ticks set in the Edit Quantize dialog box. Notes will be shortened if necessary to produce the gap. This is useful when you want to make sure that a line you recorded doesn't take up more than one voice on an instrument, for example a sampler with so called "fixed voice allocation".

Length size

This command Quantizes the length of notes without moving their start points. In other words, the length of all notes is changed to the closest Quantize value, but the start position of all notes is left intact.

Fixed Length

This sets all notes to the same length without moving their start points. They get the length of the Quantize value. If you set Quantize to 4 and select Fixed Length from the Functions menu, all selected notes become quarter notes. This function used in combination with Note On Quantize produces dead straight notes with identical lengths.

Delete Cont. Data

This command erases all continuous data such as Controllers (modulation, volume, breath controllers and so on), Pitch Bend and After Touch. Notes and Program Change messages are left intact.

The definition of Continuous might require some explanation. Even though some controllers are not used continuously—a sustain pedal might be pressed only every now and then, and a mode message could be sent out only once in a song—they are part of MIDI's family of continuous messages and therefore erased.

This command does not affect Mix Parts, even if the Objects send out Controller data, since parts contain Mixer events, not MIDI Controller events.

Delete Doubles

This command erases all double notes. These doubles mostly occur when you record in Cycle Mode (with or without Multi Record activated) and repeat for instance a snare drum on a second lap. Double notes could be hard to hear, but sometimes they sound like short delays or flanger effects. Or even just as one extra loud note.

Two notes are considered as double when they have the same note number (the same key) and have identical start points.

Reduce Cont. Data

Controller data, such as modulation or volume changes, are often recorded with a higher precision than is needed. The ear isn't as sensitive to changes in volume or changes in vibrato depth as it is to changes in pitch, so you can usually skip some of the controller data recorded.

The problem with too much Controller data being sent out has to do with MIDI's limitations. Only so much data can be sent down one MIDI cable at

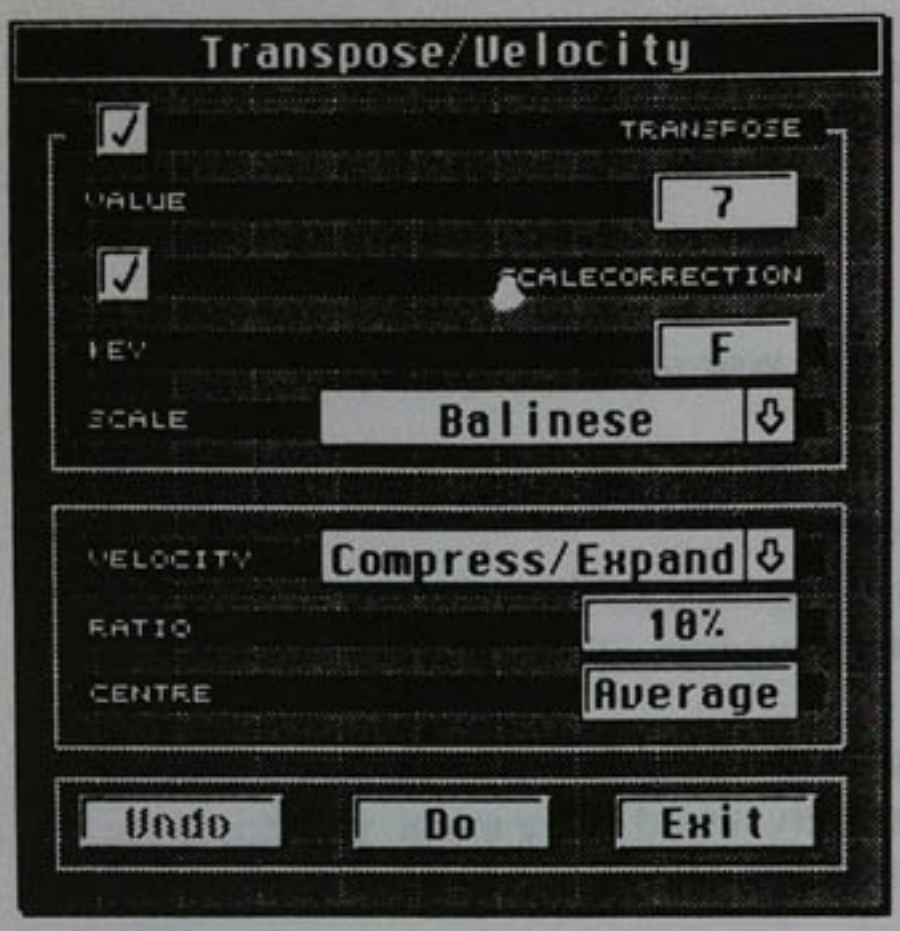
a time. Controller data take up a lot of "space" and if you feel that you have problems with timing due to hefty use of controllers, you could try this command.

Generally, Cubase isn't the problem itself, especially not when several Outputs are used, as with the MIDEX. Cubase has invisible routines for keeping the timing perfect in all instances. But, the receiving instrument might still have problems with handling large amounts of incoming MIDI data.

This command permanently reduces the amount of existing Controller data after a fixed method in the program.

This command does not affect Mix Parts, even if the Objects send out Controller data, since parts contain Mixer events, not MIDI Controller events.

Transpose/Velocity



This command opens up a dialog box allowing you to permanently Transpose notes and alter velocity values. This function operates on some selected Parts in an Arrange window or some selected notes in an Edit window (as all other functions). It differs from the Playback parameters with the same name, in that this is a permanent change to the actual note data.

- Use the left and right mouse button to set the values.
- Perform the Transposition/Velocity change by clicking the Do button.
- You can listen to the music without closing the Velocity/Transpose window, by using the Transport control keys on the numeric keypad of your keyboard. If you don't like what you get, click Undo to undo the last "Do" operation.
- When you are finished, click Exit. This closes the window.

Do not Transpose or "Scale Correct" Drum Tracks.

The Settings

Transpose
This on/off setting allows you to decide if the notes are going to get transposed at all, or not. Use the Off value when you only want to affect Velocity.

Semitones
The number of semitones you want your notes transposed. The Range is ±127.

Scale Correction, Key and Scale
When you turn Scale Correction on, all notes pitches are corrected to a scale. You use the pop-up and Value fields to select a Scale and a Key (signature).

Scale Correction always transposes downwards when it decides to change pitch, so a major is normally perfectly turned into a minor. Correcting the other way might give more unpredictable results.

Scale correction happens *after* Transposition, so that the Transposed notes are corrected to the set Key Signature.

Velocity
This includes a Number of different functions, acting on Note Velocity. No change of course means that Velocity won't be affected at all (use this when you only want to Transpose). The different options on the Velocity pop-up change the possibilities on the following two lines, as described below.

Compress/Expand
This menu choice takes two settings. The first is the Ratio which is the amount of compression/expansion in a range between -100% and 300%. The second is a Centre setting that can be set to Average or some velocity value you select yourself. The Average alternative makes the program calculate the average of the velocity values and use that number.

This works so that the velocities with exactly Centre value are not affected at all. On expansion (Ratios above 100%) velocities with lower values than Centre are lowered and velocities above are raised, thereby expanding the "distance" between low and high velocities without affecting all over average velocity.

On compression the reverse applies, velocities below Cent: : are raised and velocities above are lowered.

Add/Sub
This simply adds a fixed number (Amount) to the existing values, just as the Velocity field in the Inspector. This let's you change your music so that it seems like it was recorded with harder or softer key strikes.

Limit
This lets you make sure that no velocity values appear outside a given range. This function does not change velocity values that fall within the range set by the Lower and Upper values, but if any velocity value falls outside this range, it is lowered/raised to the Lower/Upper velocity.



The Structure Menu

This chapter describes the Structure menu, except for the last three items which are related to Groups and are described in the Group chapter.

Create Track

This command creates new Tracks. Its keyboard equivalent is [Control]-[T]. New Tracks are always MIDI Tracks, but you can change their class setting in the Track list. The first Track you create gets the name "Track 1" and the consecutive Tracks are numbered from there on. More about managing Tracks is found on page 6-2.

Global Cut

This command cuts out a piece of the "virtual tape" on all Tracks. The piece that is cut is the one inside the Locator Positions. For instance, setting Left Locator to 2. 1. 0 and Right Locator to 4. 1. 0 and selecting Global Cut removes bars two and three from the whole song.

In other words, Global Cut removes a section of the music on all Tracks. Any Parts that lie inside the Locator Positions are shortened (cut).

This is good for shortening a special section of your song or for rearranging, like turning a double chorus into a single.

Muted Tracks (see page 19-2) are excluded from the operation, i.e. they are not Cut, but the Master Track is affected like any other Track.

Global Insert

The opposite of Global Cut. A "piece of tape" is inserted between the Locator Positions. To insert four bars at the beginning of bar three, set the Left Locator to 3. 1. 0 and the Right Locator to 7. 1. 0.

When you use Global Insert, all Parts that started after the Left Locator Position are moved the selected amount of bars. Parts that have their start

point before the Left Locator and their end point after it, are lengthened the selected amount of bars, but of course contain no events in their lengthened sections.

As with Global Cut muted Tracks are excluded from the operation, but the Master Track is affected like any other Track.

Global Split

This works like the Split tool (the scissors) in the Toolbox, only it splits all Parts on all Tracks and at both the Left and Right Locator Positions.

Muted Tracks are excluded from the operation.

Copy Range

This command is used to copy a section of the Arrangement, on several Tracks, to some other position in the Arrangement. You set the Left and Right Locator to the beginning and end of the section you want to copy. Then you set the Song Position to the point where you want the copied section to wind up.

When you select Copy Range from the Structure menu, Cubase makes up one new Part for each Track, containing all the music between the Locators, and then puts (pastes in) these new Parts at the Song Position.

Muted Tracks are excluded from the operation.

Remix Track

With MIDI Parts
If you have one or several MIDI Parts containing events on several MIDI Channels, these Parts can be split up into new Parts, one for each MIDI Channel. To use this function to its full potential you should have come to grips with MIDI Channels in general, and especially Cubase's MIDI Channel setting "Any".

If you for example record with a split keyboard that sends on two MIDI Channels, or if you record music from one sequencer to another, you will have a mix of notes in the Part, with different MIDI Channel numbers as an integral part of them. If you set the Track they are on to MIDI Channel "Any", the events will be played back on the channels stored with them. But, you still can't edit them independently. Remix Track therefore allows you to split up a Track into new Parts on new Tracks so that events get separated according to the MIDI Channel they are on.

With Drum Parts
If you have Drum Parts, they can be split up per Sound in the Drum Editor. In other respects this works exactly as with MIDI Parts. The New Tracks that are created are also Drum Tracks, but with notes on only one Sound per Track. If you want some of the Drum Sounds back into composite Parts, you can always Merge the Parts (see page 11-7).

Performing the Remix
Select a Track to be Remixed. Set up the Left and Right Locators as boundaries for the split. All music between the Locators will be Remixed. Select Remix Track from the Structure menu. If possible, the Parts are put in on existing Tracks set to the same MIDI Channel and Output. Otherwise, as many new Tracks as are needed are created. New Parts with events on one MIDI Channel /one Sound each are created on those Tracks, between the Left and Right Locators. For MIDI Tracks, each track is set to the MIDI Channel the events in them are stored on.

Mix Down

Mixdown allows you to merge all Parts on some (or all) MIDI or Drum Tracks into one composite Part. To make use of all the information stored in that created Part you will probably use this feature in combination with MIDI Channel "Any". You need to know how MIDI actually handles the Channels to make full use of this feature.

Theory

Normally you set a Part or a Track to play back on a certain MIDI Channel. This means that it doesn't matter what MIDI Channel the recorded messages were coming in on, this is changed to some other value on playback anyway. But if you set a Part or a Track to MIDI Channel "Any" (see page 10-4) you make it output on the MIDI Channel(s) actually stored with the events in the Part(s).

When you Mixdown, the MIDI Channel that the Parts are set to will be stored as a permanent part of their MIDI data. That is, the MIDI Channel set for each Part replaces the MIDI Channel originally recorded. So, when you play back the Mixdown Part with the MIDI Channel set to "Any", you will actually get the same thing back as when you played back all the Tracks that are now merged into the Mixdown Part.

Furthermore, the Playback parameters are also passed on to the Mixdown Part. For example, a temporary transposition in one of the Parts will be a permanent one in the mixdown Part. The Output setting, on the other hand, is lost in the Mixdown, since one Part can output on one Output only.

Performing the Mixdown

The Left and Right Locator are used to determine the start and end points of the mixdown Part, so set these to the desired values.

Muted Tracks (see page 19-2) are excluded from the Mixdown. Drum Tracks are mixed down after the O-Note setting.

Once you have set the Locators and muted the Tracks you want, you just have to select a Track for the Mixdown Part. After that, select Mix Down from the Edit menu, and the Part will be created. It will get the name Mixdown.

Tracks that are included in the mixdown can be set to MIDI Channel "Any" themselves, so that their original MIDI Channels values will be preserved in the Mixdown Part.

Create Part

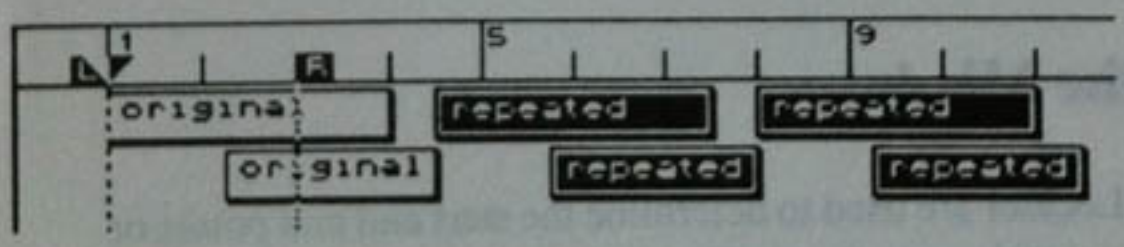
You can create an empty Part in three ways:

- By double clicking in an empty (white) area in the Part Display, between the Left and Right Locator.
- By selecting Create Part on the Structure menu.
- By pressing [Control]-[P] on the computer keyboard.

The created Part winds up *on the selected Track* and begins at the setting of the Left Locator and ends at the Right Locator. A Part created this way never replaces an existing Part, but may very well overlap one.

Repeat

This function simply repeats the Part(s) selected, and lines up the copies end to start after the original(s). The Parts selected are treated as one block, so the relative spacing between the created Parts is determined by the beginning of the first selected Part and the end of the last.



When you select this item from the Edit menu (or press [Control]-[K] on the computer keyboard) a dialog box gives you the option of deciding how many copies you want, and if the copies are to be Real Parts or Ghost Parts. Use the left and right mouse button to set the values, and click on OK or press

[Return] on the computer keyboard if you want to proceed, click Cancel or press [Esc] if you change your mind.

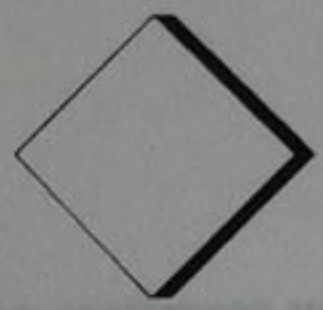
You can also repeat one Part using the Pencil Tool and the [Alternate] key, see page 11-11 and 11-15.

Cut Events

This command makes sure that all events in a Part end where the Part ends and no later. It only applies to events which have a length. With MIDI, this means notes only.

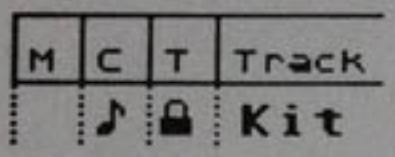
Cubase works differently from MIDI when it comes to handling notes. Where MIDI stores Note Ons and Note Offs, Cubase stores Note Ons and the notes' *lengths*. This means that even if you change the length of a Part by using the Pencil or Scissors Tool you may get notes that play past the end of the Part. This is a valuable feature, but you may not always want this to be the case. If you don't, you should use Cut Events on the Part(s).

Select the Part(s) that are to have their notes Cut, and select this command from the Structure menu.



Time Locked Tracks

If you click in the "T" column for a Track, a lock symbol will appear. This means that the Track is Time Locked.



For this to have any effect on your recordings, you must use the Master Track for your tempi. This means that the Master Button on the Transport bar must be activated, and tempo changes must be done in the Master Track window.

Events on Time Locked Tracks are fixed in time. This means that even if you change the tempo the events will stay at the same position, time-wise. An event that played back ten seconds in from the Song will still play back ten seconds in from the Song, even if the tempo is doubled.

Time locked Tracks can be used for example when you work with audio locked to film or video and mix the with music in one Arrange window. Time Locked Tracks can also be used to create music with multiple tempi.

After you have changed the tempo in the Master Track, the positions of events on time locked tracks are recalculated, so that they stay on the same time position. The Parts are also lengthened and shortened bar-wise, as needed to accommodate the events. The events' positions are also recalculated when you move the Part.

A Track can at any time be switched in and out of Time lock mode. But when you switch a Track out of time locked mode the events will of course stay at their current time position.

Recalculation

If you have a lot of Tempo changes and a lot of events in the Time locked Tracks, moving parts, inserting new tempi or changing existing ones, may lead to noticeable recalculation times.

When you edit tempi in the Master Track, Time Locked Tracks are not updated until you close the Master Track window.

Editing and Moving

When you move Parts around, or edit them in any other way in the Arrange window, all operations Snap to Bar positions, as set on the Snap menu. Therefore, when you operate on the Time Locked Tracks, it is probably best to set the Snap value to Off.

Remember that you can also click the Mouse box to make the Mouse position and the Bar Display switch to show time code values instead of bars and beats. The same applies in the MIDI editors.

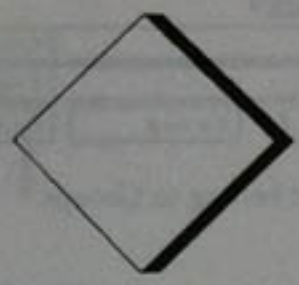
The Song Position can be always used as a converter between bar and time positions at the current tempo. If you for example know the time and need the bar position, input the bar beat and fraction in the Song Position box and read back the time value in the SMPTE Time box (and vice versa).

Creating Multiple Tempi

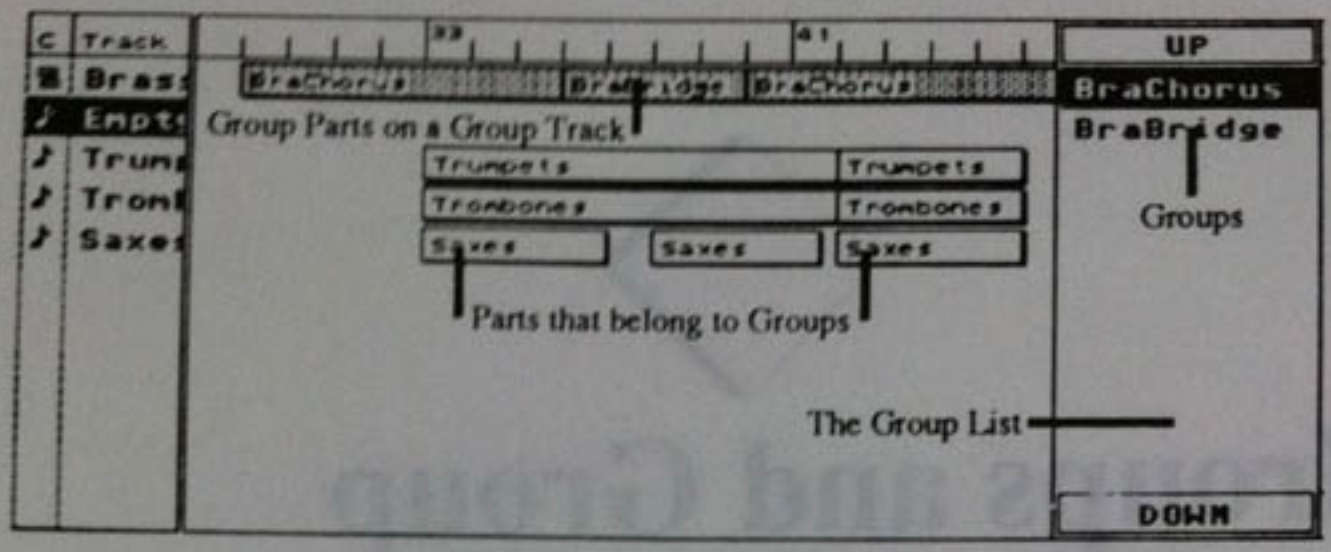
When scoring for film and video it is not unusual to need a piece fading over into the next which is played in another tempo. When you have the first piece finished, you can time lock the tracks it is on, and insert a tempo change where the new piece begins, even if this is before the end of the last. The previous piece will not be affected by the new tempo.

Things To Note

- When you time lock a Track with Ghost Parts, they are automatically converted into real Parts.
- Group Tracks and Tape Tracks can not be Time Locked.



Groups and Group Tracks



You can create Groups in the Arrange window. A Group is a collection of Parts (some or all Parts in an Arrange window) grouped together. A Group can be handled as if it was a Part of its own. It is played back from a Group Track. Groups can be used in many ways.

- Group all the brass parts in a chorus (trumpet, sax, trombone...) so that they can be handled as a section of the orchestra and easily be repeated in every chorus.
- Turn every section of a song (intro, verse, chorus) and so on, into a Group so that the song can be remodelled fast on a separate Group Track.
- Build up each Part of the song (intro, verse, chorus...) in one Arrange window *each*, and assemble the song on a Group Track in yet another Arrange window.

As you understand from the examples above, the Groups are global for the whole Song. A Group created in one Arrange window can easily be played back in another. All in all you can have 64 Groups, which are saved with the Song.

To create a new Group

You can create a Group by selecting the Parts you want and then use "Build Group" on the Structure menu. A dialog box appears where you can enter or edit a name as usual, and where you have the option of creating a new Group, replace an existing one or add a Part to a Group. Pressing [Return] on the computer keyboard is the same as selecting New.

Group Parts can not be put into other Groups.

If you want all Parts in an Arrange window to be put into the Group, use the Select All command on the Edit menu, or press [Control]-[A] on the computer keyboard.

New
To create a New Group, select the Parts you want to have in the Group. Select "Build Group" from the Structure menu (press [Control]-[U] on the computer keyboard). Enter a name for the Group (as usual) and click New or press [Return] on the computer keyboard.

Groups created are shown in the Group List on the right side of the Arrange window, see Hide Show/Groups later in this chapter.

The Parts keep their Playback Parameter settings within the Group. They also keep their relative starting points.

This means that all the Parts that are selected when you created the new Group are considered as one block of music. This block is made up of several Parts which all have a relation to each other, positionwize, and which all send out on their respective MIDI Channel, and Output, and which all can have different Playback Parameter settings.

A Part can be used in more than one Group.

A Part isn't muted or deleted or anything when it is used in a Group. Parts can both be used as parts of groups and as regular Parts at the same time. Therefore you might have to Mute the Tracks with the Parts that make up the Group. More on this later in this chapter.

Add
If you want to add one or more Parts to a certain Group, you must first select those Parts, in the Part Display, and also Select the right Group in the Group List. Then you can select "Build Group" from the Structure menu (or press [Control]-[U]) and click Add.

The Added Parts keep their relative position in relation to the existing Parts in the Group, and they also keep their internal relative starting points.

Which basically means that they wind up where you want them. Let's say that you have a Part that starts one bar later than the first Part in a Group. When you add that Part to the Group, it is put in so that it starts one bar later than the first Part in the Group. The only exception is if the Part starts *before* the Group, in which case it will be put in at the beginning of the Group.

Replace
You can also replace a Group completely with a new Group. This only affects the contents of the Group, not the Group Parts on the Group Track. It allows you to keep the structure of the Song (as it is on the Group Track, see later in this chapter) but to completely change the contents of for instance all verses, all bridges or whatever (the Groups). Select the Parts that are to make up the new Group. Select the Group in the Group List that is to be replaced. Select "Build Group" from the Structure menu and click Replace.

The Group List

On the right side of the Arrange window a special column appears with all the Groups visible, the Group List. This is a scrolling list, you can click on the arrows on the top and bottom if you have more Groups than can be shown in the column at one time.

This list is first displayed when you create the first Group. You can hide or show this list at any time with the command Hide/Show Groups on the Structure menu or by pressing [Control]-[J] on the computer keyboard. This list appears in all Arrange windows that you open during the session, since created Groups can be used in any Arrange window.

The Groups in the list are always sorted so that the Groups created in the selected Arrange window appear at the top of the list.

When you click on a Group in the List, all the Parts in the active Arrange window that are members of the Group get selected. This can be used as a quick way of selecting a number of Parts, for example for editing.

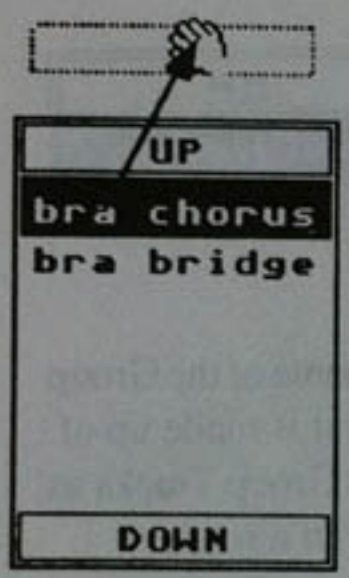
The Group List and all the Groups in it are part of what is called a Song. When you Save or Open a Song, all the Groups are saved/opened with it. On the other hand, when you save an Arrangement, only the Groups created in that Arrange window are saved.

Renaming a Group in the List

If you double-click on a Group in the Group List, a small dialog box appears where you can change the name, in the usual way.

Deleting a Group from the Group List

If you drag a Group past the top or bottom of the Group List the whole Group is deleted.



Deleting a Part that is in a Group

If you delete a Part from the Arrange window it is also deleted from the Group. And, if you undo this, it is put back.

Creating a Group Track

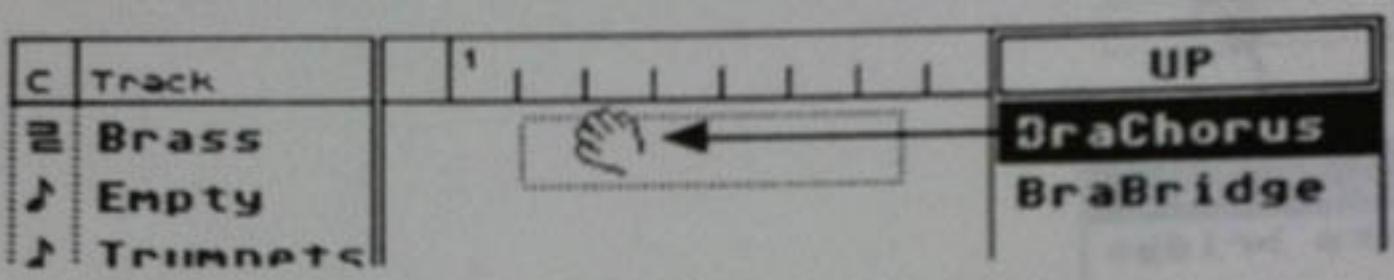
Before you can use the Group you have to create a Group Track. This is done by creating a regular Track and then change it to a Group track by using the Track Class pop-up in the Track list. Or, you can duplicate another Group Track (see page 6-3).

Group Tracks can't be set to a certain MIDI Channel, Instrument or Output, since this is independent for each Part in the Group.

Group Tracks only have one Playback Parameter in the Inspector, Transpose, which transposes all notes in MIDI Parts in the Group.

Using Groups on a Group Track

To use a Group, drag it from the Group List and put it somewhere on one of your Group Tracks, just as when moving a Part from one section of the Arrange window to another.



A Group appears on the Group Track as a grey box with the name of the Group in it. It is called a Group Part, and it is as long as the Parts it is made up of. You can drag the same Group up onto one or several of the Group Tracks as many times as you like, and place it on different Positions in a song.

If you hold down [Alternate] while dragging, the Group Part will be *inserted* on the Track instead. This means that all the Group Parts after it will be moved down the line to make room for the new Group Part.

Remember that the Group List is global for the whole Song, so you might very well use Groups created in one Arrange window in a second Arrange window, and even together with Groups created in a third (or fourth or fifth...) Arrange window. Just select the window (or create a new one) that you want to use the Group in, and drag the Group up to a Group Track as usual.

Also remember that a Part can be used as it is, even though you have put it into a Group. Therefore, you might have to Mute a Track (see page 19-2) if the Parts on it are used in a Group and the Group is played back at the same time as the Parts in it. Otherwise you will get double notes that might give you an increase in volume, reduced polyphony or strange flanger effects.

You can decide if Parts on muted Tracks should be muted when played back from the Group or not. This is done using the "Mute Parts In Group" flag in

the MIDI Setup dialog box, see page 21-14.

A Group Part has "living" links to all the Parts in it. If you delete it, it disappears in the Group, and if you change its Playback Parameters, this is also reflected in the Group. If you move it, however, this is not reflected in the Group.

Once they're on the Group Track, Group Parts are treated just as regular Parts. They *can* be:

- ❑ Moved.
- ❑ Selected in any way that regular Parts can.
- ❑ Duplicated (Hold down [Alternate]).
- ❑ Muted.
- ❑ Deleted in any way that Parts can.
- ❑ Sized using the pencil tool.

If you add Parts to a Group, so that this lengthens the Group, this is not shown in the Group Parts on the Group Tracks. However, it is possible to use the Pencil tool to "pull out" the added music from a Group Part.

You can also use any function, like Quantizing, directly on a Group Part, and this will Quantize all Parts in the Group.

Group Parts *can not* be:

- ❑ Recorded into.
- ❑ Merged with other Parts.
- ❑ Edited in any way (split, joined, or edited in the Edit windows).

Building the Group Track in Real Time

If you hold down [Control] and click on a Group in the Group List, it is inserted on the active Group Track, at the beginning of the next bar. Just as if you had dragged it there. This allows you to build the whole arrangement, or parts of it, on the fly, while the music is playing.

If you have already made up the basics of your arrangement and wish to experiment with adding Group Parts this way, create a separate Group Track for the Group Parts you are adding in real-time. This will give you a better overview of what is going on.

Unpacking a Group Part

You can also take a Group Part apart into its original components by using the Unpack Group command on the Structure menu. An example: you have repeated a verse several times during a piece of music by making a Group out of all the Parts that make up that verse. This Group has then been used several times on a Group Track. Now you find that you want to make some small changes to the first verse only. A convenient way to do this is to Unpack the Group Part on the Group Track that plays that first verse.

It is the *Group Parts* on the Group Track that can be Unpacked, not the Groups in the Group List.

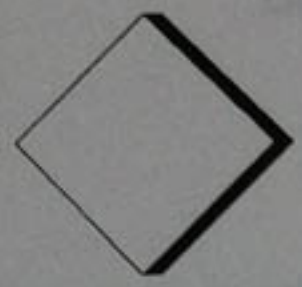
Select the Group Part on the Group Track that is to be Unpacked. Select Unpack Group from the Structure menu. One of two things happens:

- If the Group was created in the *same* Arrange window as it is used, Ghost Parts are created on the original Tracks at the same Positions as the Group Part.
- If the Group was created in *another* Arrange window, real Parts are created at the same Position as the Group Part. If possible, they are put in on existing Tracks set to the same MIDI Channel and Output. Otherwise, new Tracks are created as needed.

In both cases, the Group Part is of course removed from the Group Track.

Unpacking can also be undone using the Undo command.

The Group feature can be used to an extreme by making all different sections of a song (intro, verse, chorus...) into Groups to get an overall feeling of the structure of the song. Then you can Unpack all Groups and start making detailed changes. Just observe the difference between Ghost and Real Parts.

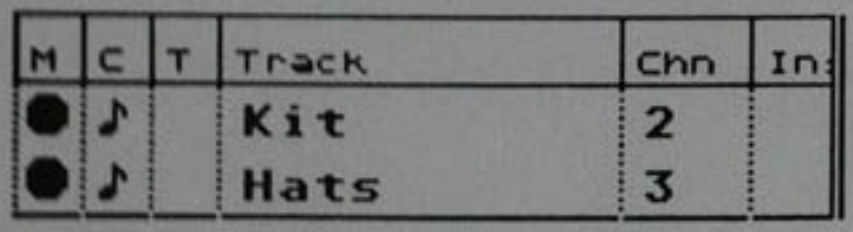


Mute and Solo

On a standard mixing console you can mute (silence) one channel. You can also mute all channels but one, which is called to "solo" that channel. There are equivalents to both in Cubase.

Mute

To silence a Track, click in the Mute column in the Track List. Muted Tracks are indicated by a black dot (●). Muting temporarily defeats all output from the Track. If any notes sound the moment you Mute the Track, these are allowed to play until their end (not muted).

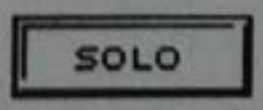


These two Tracks are muted.

You can mute as many Tracks as you want. By clicking again in the column, you unmute the Track.

You can also mute Parts individually using the Tool box mute icon.

Solo



When you click on this button, or press [S] on the computer keyboard, all Tracks except the selected one are muted so that you only hear the selected Track. You can unmute one or more Tracks while in Solo mode if you want to hear, for example, just how two or three tracks sound together. To deactivate Solo, click on the button or press [S] again.

Preprogramming Mutes

You can also store ten Mute settings, one under each of the function keys [F1] to [F10] on the computer keyboard. These can be used to instantly recall any combination of muted Tracks.

Mute the Tracks desired as described earlier, using either the Mute function or the Solo function. Hold down [Shift] and [Alternate] and press the desired Function key ([F1] to [F10]). The Mute setting is now stored under that key.

All you have to do to recall a setting is to hold down [Alternate] and press the corresponding Function key ([F1] to [F10]) once.

Recording Mutes and Solo

You can also record mutes in several ways: Either record a single Mute-click in the Track list, or a preprogrammed Mute on several Tracks (performed by pressing [F1] to [F10]), or you can even record the fact that you activated the Solo function. This allows you to have automated mutes happening at certain positions on playback, as an alternative to permanently deleting some music or other information on a Track.

- First you must activate the Recording of mutes by selecting the item "Record Tempo/Mutes" on the Options menu so that it is ticked. (this flag is also used for recording tempo changes, see page 21-8).

- Then you must select a MIDI Track for recording the mutes.

  Mute Events are recorded on MIDI Tracks!

- The Track you select shouldn't be the same Track as the music is on. We strongly recommend you to use a separate Track for your mutes, to avoid confusion. One single Track can be used to record events that mute any and all other Tracks.

- Now activate recording at some point. When you reach the point where you want the mute to happen, perform it by clicking in the Mute column

or by pressing one of the Function keys [F1] to [F10]) or activate the Solo function. Keep on muting and un-muting tracks for as long as you wish and terminate recording as usual.

There aren't really any restrictions to what you can do. Things can get quite involved if you indulge in complex mute setups. Observe the following:

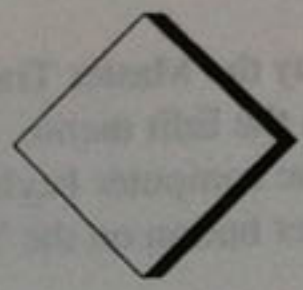
- Muting silences all output from a Track, notes, continuous controllers, MIDI Mixer data, System Exclusive, everything. Which includes the mute events themselves. So, if you use a Track to mute itself, by recording a mute and after that an un-mute, the un-mute will never happen since the Track is muted for all output (think about it and you'll understand). This is why you should always record mutes on a separate mute-Track, and never record any mutes for that Track.
- A mute Track may of course be muted by another Track, which leads to the same confusion as above.
- Notes that have started before the mute are not cut off by the mute itself. They always play to their end.
- Solo is just a special case of mute, where all Tracks but one are muted.
- The mute events that get recorded are of two types. Mute Events and Un-mute events. When one of these events is played back, the Track changes to the status of that event. This means that if the Track is already muted when a mute event is played back, nothing happens. This may sound obvious, but when you rewind or fast forward to some point, and start playback from there, this might confuse you. A Track that is "manually" muted is also un-muted by an Un-mute event.
- The Record switch (Overdub/Replace) applies, so that you can overwrite or add Mute and Un-mute events as you wish.
- Mutes are chased (see page 21-2) if the Chase Events flag is turned on, but only within one Part. Make sure to end your Mute recording with the Track in the right status (muted or un-muted).
- The mute events can be edited and moved in List Ed.. See page 28-6.
- If you want to mute a Track from the beginning, put your Mute Events one or two ticks before the first notes, so that you are sure the first note also gets muted.
- Do not rearrange the order of your Tracks after recording the mutes, or your mutes will affect the wrong Tracks...

Ed Solo



This button activates a special Solo function for the Edit windows. This is how it works: If you activate Ed Solo, you will only hear the Parts you are working on (the selected Parts) when you enter one of the Edit windows. All other Parts are muted. When you close the Edit window or select the Arrange window again you hear all Tracks again.

It doesn't matter if you had Muted the Track with the Part(s) to be edited. If you select Ed Solo you *will* hear those Parts in the Edit window.



The Master Track

The Master Track is a special 65th Track devoted to time signature and tempo changes.

There are three ways to *display* the Master Track and its entries:
- Select Master Track from the Edit menu.
- Press [Control]-[M] on the computer keyboard.
- Double click on the Master button on the Transport bar.

There are two ways to *activate* the tempo changes set up on the Master Track (make Cubase follow the tempo settings on it):
- Click on the Master button on the Transport Bar
- Press [M] on the computer keyboard.

Cubase always follows the *Time Signature* changes set up on the Master Track. By activating and deactivating the Master Track, you decide if Cubase is to follow the Master Track tempo setting or the direct tempo setting (on the Transport Bar).

The entries in the list

The Tempo and Time Signature settings are shown in a list which can be scrolled using the scroll bar or the [↑] and [↓] keys on the computer keyboard. There are always two entries at the top of the list, the Master Track is never empty. These two are the initial tempo and time signature, positioned at 1. 1. 0.

The four columns in the list display each entry's tempo related position, tempo/time signature value, and absolute (SMPTE) position. The only value that can be changed directly in the list is the tempo/time signature, which is edited using the left and right mouse button (and maybe the [Shift] key) or the keyboard, as usual. Tempi have both an integer value and a fraction that can be scrolled individually.

If you change the tempo value for an entry, this will of course change the SMPTE time for the following entries, and if you edit the time signature for an entry this will affect the following entries' measure position.

The Pop-up Functions menu

This is a pop-up menu in the Master Track dialog box, which holds a number of functions and settings for the Master Track.

Hide/Tempi and Time Signature

These two menu items allow you to Hide either all Tempi or all Time Signatures. When either is hidden, its menu item is ticked.

Inserting entries

To insert a new entry you must first decide at what position you want it inserted. Use the Song Position box or the SMPTE box in the Master Track dialog box (not on the Transport bar) to define a new position, using the left and right mouse button as usual. The SMPTE box to the right shows the absolute position at which the entry will be inserted.



The Master Track has its own Song and SMPTE Position boxes.

Now it is time to decide if you want a new tempo event or a time signature event, by selecting Insert Tempo or Insert Sign from the Functions pop-up menu. Time Signature events are always inserted at the start of a bar. Once the event is inserted, use the left and right mouse button or double click and type in the Tempo/Time Signature as usual.

If you have a lot of Tempo changes and a lot of events on Time locked Tracks, inserting new tempi or change existing ones, may lead to noticeable recalculation times.

If you're work involves matching musical sections to certain SMPTE cues, here is a tip:
To match a certain Position with a certain SMPTE time, first insert a dummy event, like for example a Time Signature entry with the same Time Signature value as the one before. This will (as all entries) get both a tempo and SMPTE Position in the list. If you now change tempi before this entry, the dummy entry is moved forward or backwards in time. You can adjust the tempi integer and fraction values until the dummy event gets exactly the SMPTE position value you desire.

Delete Events

To Delete events, click on them (you may use the [Shift] key to select several entries at the same time) and use Delete Selected on the pop-up menu or press [Delete] on the computer keyboard.

Copy Range

This command works very much like the Copy Range command in the Arrangement window. It copies all the Master Track entries between the Left and Right Locator and inserts them at the current Song Position, with a Snap to the closest bar.

The Overdub/Replace setting on the Transport bar applies, so that if you are in Overdub mode, the entries are added to the existing ones in the list, and if you are in Replace mode they replace the existing ones.

This means that if you copy a range that has *no entries* in it in Replace mode, this is the same as deleting entries in the section you are copying *to*. For instance, if the Left Locator is set to 1.1.0, the Right Locator to 5.1.0, the Position to 9.1.0 and Record Mode is set to Replace, then Copy section will delete all entries between 9.1.0 and 13.1.0.

Set up the Left and Right Locator and the Position (all on the Transport bar). Click on Copy Section and the copying is done.

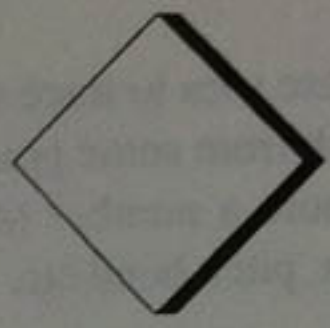
Clear Tempi

This button simply deletes all tempo entries from the list, except for the first.

Global Cut and Global Insert also affect the Master Track.

Closing the Master Track

By clicking the Exit button, the Master Track window is closed. It is still active though, as long as the Master button on the Transport Bar is black.



The Options Menu

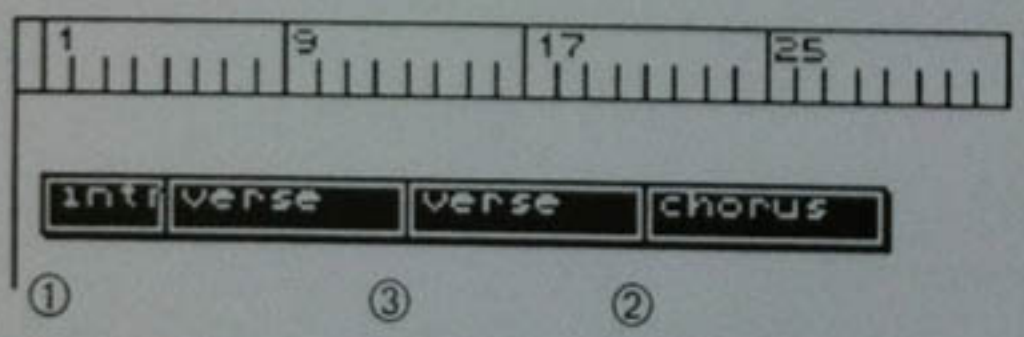
Chase Events

When this function is on Cubase tries to trace what has happened earlier in a song when you start playback from some point in the middle. It then uses the traced information to restore a number of things in your songs, like Program Changes, Controllers, pitch bend etc.

Theory

The theory behind this has to do with the way MIDI handles Continuous Controllers and other messages.

Say for instance that you had started a song by sending out a Program Change command to make a synth switch to a piano sound (①). In the beginning of the chorus you had another Program Change command to make the synth switch to a string sound (②). If you wouid rewind to some point between the beginning and the second Program Change (③), the synth would still play the string sound although you wish it would be piano. However, if you had Chase Events turned on, Cubase would have tracked the music back to the beginning (①) and would have found that first Program Change. It would then have sent this out when you rewinded to ③, so that the synth was set to the right Program.



In other words, when Chase Events is turned on (ticked, by selecting the item from the menu) Cubase checks the song from the beginning and tracks all changes that have occured since 1.1.0. It then sends out the last value for a number of parameters whenever you move to a new Position in any way (Rewind, Fast Forward, by using the Position box, via sync chase or whatever).

The effect of this is to restore the settings to their values at the point you are moving to.

Setting Up

When you select Chase Events from the menu, a list appears where you can use the top item (Active) to turn the whole function on (tick) and off (no tick). Below this is an on/off list for different types of MIDI data and other events.

Note On	Note On messages are chased, which means that notes that should be sounding at this position are turned on when you hit Play.
Controllers	Continuous Controllers are chased (see below).
Program Change	Program Change messages are chased.
Aftertouch	Channel Aftertouch is being chased.
Pitch Bend	Pitch Bend messages are being chased.
Sysex	All System Exclusive events of the current Part are sent out.
MIDI Mixer	All Mixer Events are chased.
RPN & NRPN	Registered and Non-registered Parameters (a special type of controller) are chased. The only currently registered Parameters are Master Tune and Pitch Bend Sensitivity (this chasing can be time consuming).

- As long as Parts aren't set to MIDI Channel "Any" on a Track, Program Changes are chased throughout the whole Song, regardless of how many Parts are on the Tracks. If the Part is set to "Any", only Controllers below 36 are chased.
- Inside a Part (played back from the Arrange window), Controllers, Pitch Bend, Program Change, Note Ons, Mute Events an Mixer Events are chased. Therefore, if you want to make sure events are always chased, make up one long Part for each Track (by glueing Parts together).

Multi Recording

Multi Recording allows you to record on several Tracks at the same time. By selecting Multi Recording from the Options menu you can activate and deactivate Multi Recording, and select one of a few different types.

Multi Recording Theory

If you have a MIDI unit (like a MIDI keyboard with splitpoints) that is able to transmit on several channels at the same time, or if you are a band, or for some other reason wish to record several MIDI instruments at the same time, you use Multi Recording. This allows you to record on up to four Tracks at the same time. It also allows you to use Tape Tracks to record on any combination of Tracks on your tape recorder.

Setting Up For MIDI Recording

The first thing to do is to activate Multi Recording and decide which kind you want. This is done by selecting Multi Record from the Options menu. A list appears where you can use the top item to activate (tick) or deactivate (no tick) Multi Recording. The lower part of this list is used to select one of three modes.

Merge
This is like recording without Multi Recording activated.

Channel Split
This splits the incoming MIDI messages according to the Channel they are coming in on. This is for those who have a MIDI instrument capable of sending on several MIDI Channels, like a keyboard with keyboard split, or a guitar synthesizer. Or alternatively, it can be used if several players are connected to a MIDI merge box and the output of the merge box is connected to the computer. If each player is set to send on a different MIDI Channel these can be directed to one Track each.

Input Split
This mode is useful when you have several MIDI units, each connected to one MIDI Input. It is mainly intended for recording several players, but it can also be used with one player that has for example several keyboards.

Layer
This function differs from the others a bit. Its main purpose is to Thru-put the incoming MIDI data to up to four different Outputs and MIDI Channels.

The Track columns

When Multi Recording is selected, A new Track column appears, labelled "R". This is used to select a Track for recording, and in some cases for selecting different options from a pop-up. It all depends on the Track Mode you have chosen:

Merge
In this mode you simply click in the Record column to activate any four Tracks. A small recording symbol appears. Click again to deactivate.
Recording only happens on the active Track, as in non-multi recording mode.

Channel Split
Recording is done on up to four Tracks simultaneously. A pop-up menu appears in the Record column with the following options:

Off: No recording takes place on the Track.
Chn 1, 5, 9 & 13: The track records data on MIDI Channel 1, 5, 9 and 13.
Chn 2, 6, 10 & 14: The track records data on MIDI Channel 2, 6, 10 and 14.
Chn 3, 7, 11 & 15: The track records data on MIDI Channel 3, 7, 11 and 15.
Chn 4, 8, 12 & 16: The track records data on MIDI Channel 4, 8, 12 and 16.

When you select either, a number (the first MIDI Channel) appears in the recording column.

Input Split
Recording is done on up to three Tracks simultaneously in the same way as with Channel Split, but each Track receives on one specific MIDI Input. The options on the Recording pop-up menu in the Track list are:

Off: No recording takes place on the Track.
In 1: The standard Atari Input.
In 2: Input 1 on a Steinberg Midex or SMP-24, Input E on a C-Lab Unitor.
In 3: Input 2 on a Steinberg Midex or SMP-24, Input F on a C-Lab Unitor.

When you select either, the "In" number appears in the column.

Layer
In this mode you simply click in the Record column to activate any four Tracks. A small recording symbol appears. Click again to deactivate. Activated Tracks will all record whatever data is coming in when you commence recording.

Incoming MIDI data is not separated to different Tracks in this mode. Instead it is recorded identically on all four Tracks. But, data is also *thru-put* via the Tracks to the Output and MIDI Channel of each Track (Instruments) you have selected. This allows you to hear and record something with up to four sound sources on different Outputs and MIDI Channels.

Recording MIDI in Multi Mode

... is done as usual, the only difference is that up to four Tracks are activated simultaneously and that you don't select a recording Track from the Track list (except for in Merge Mode). Recording can be done with or without Cycle activated. All the rules for what is possible to do during regular recording apply.

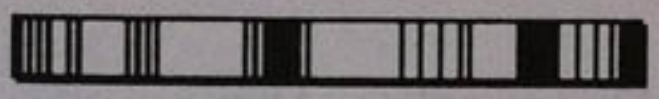
Any Cycle Mode (such as Mix or Punch) or Cycle Function (such as Key erase, Delete Last version and so on) that you select are applied to the Active Track only (the Track selected as in normal recording).

Tape Tracks

In Multi Record Mode, the Record column can be used to activate recording on any number of Tape Tracks. This means you can record on up to four MIDI Tracks and up to 24 Tape Tracks at the same time.

Part Appearance

This function allows you select what kind of information you want to be displayed in the Part boxes. When you select this item from the Options menu, you are able to choose between three alternatives: "empty boxes" (Show Frames), the Part's name displayed (Show Names) or to have an overview of the density of the events in the Parts (Show Events). Events are shown as vertical lines within the Part rectangle. Select either option by clicking on it.



A Part with the Events in it shown as vertical bars.

Group Parts never have events shown in them.

If you select Show Events you can also decide what type(s) of events to display by clicking on them in the list on the lower half of the dialog box. Hidden events are inverted (white text on black). Special refers to the special events described in the List Edit chapter.

This display filter has nothing to do with what is played back or any other function affecting your music. It is only there for making the graphics on the screen as useful as possible.

If you feel that you have problems, this option gives you a quick diagnosis. By selecting Pitch Bend, After Touch and so forth, you will be able to see what has been recorded and not and if there is a (too) large amount of e.g. Controller data recorded at some point in the music.

Parts muted with the Mute cross are always shown with names in them. One way to use this fact is to create a separate Track with "cross-muted" empty Parts that give a hint about the Songs structure through their names (Verse 1, Chorus 1 etc). The rest of the Parts can then be shown empty or with events in them, for a "cleaner" Part Display.

Follow Song

Normally, the Part Display in the Arrange window and the List, Key, Drum and Score windows "move" (or "scroll") with the Song when you play back, rewind, record and so on. You can turn this function on or off by selecting or deselecting (tick or no tick) Follow Song from the Options menu. You can also use [F] on the computer keyboard for this.

Recording Tempo/Mutes

This setting is used to activate tempo and Mute recordings. Mute recording is described on page 19-3.

Tempo Recording

It is possible to record changes in tempo. There are three major uses for this:

- Recording the actual tempo settings while the music is playing back.
- Setting out "markers" for tempo changes and then edit in the actual tempo values in the Master Track afterwards.
- Record tempo by tapping it, using Human Sync (see page 21-29).

When the "Record Tempo/Mutes" item is on (checked) on the Options menu, and Cubase is put into Record mode, it records any tempo changes and puts them in on the Master Track (this flag is also used for recording mutes, see chapter 19).

Make sure you don't overwrite (Replace) any regular recording when Cubase is put into Record mode. If you want to make real sure, select an empty Track.

- Tempo Recording works just as regular recording, using the Locators, with punch in and out at any time and so on, but...
- The Master Tracks is always in Replace mode, that is, the recording always replaces the existing tempo events.

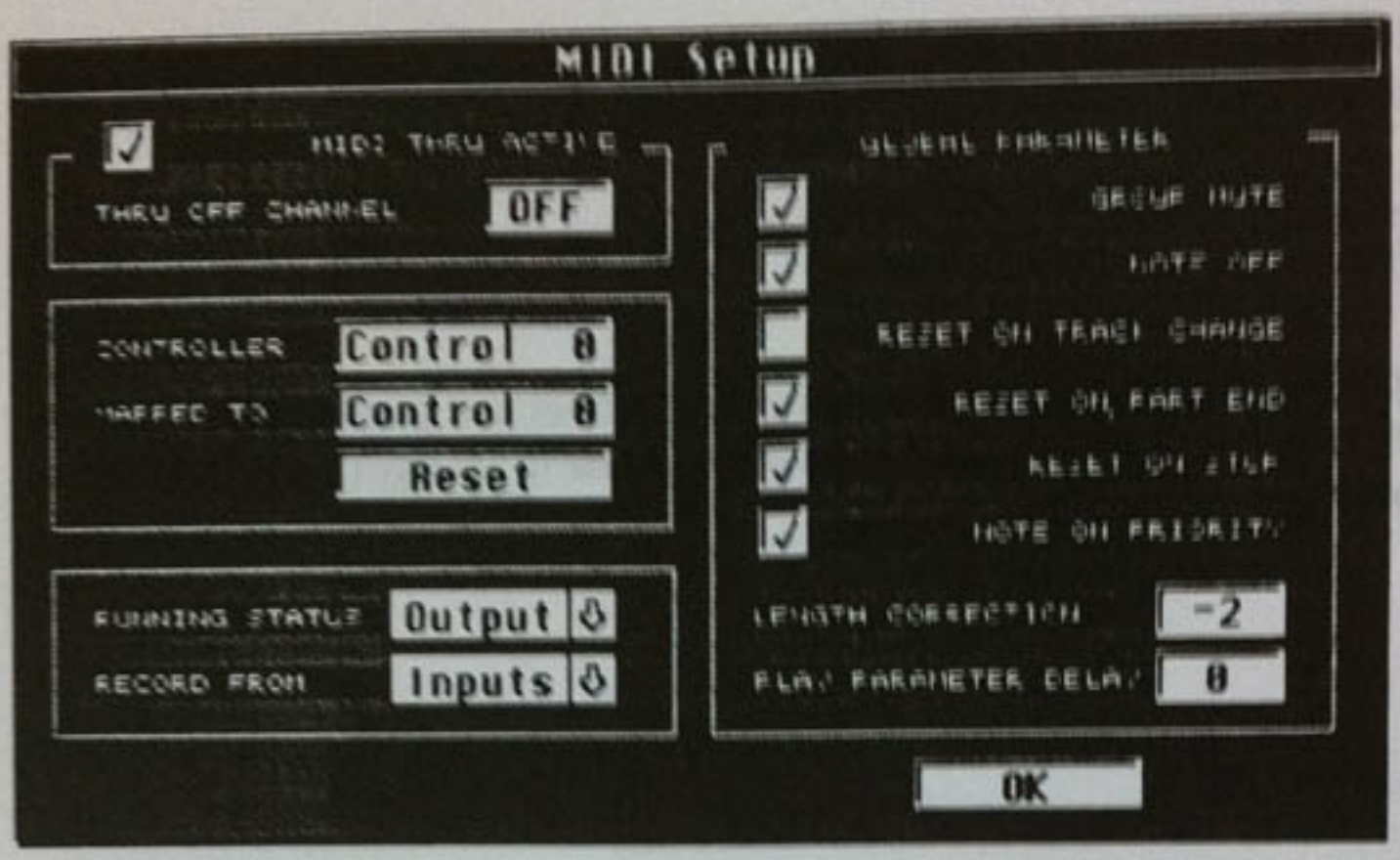
Once in Record mode, change the tempo value on the Transport bar. Each time you change it, the new setting is recorded.

Remember that it is only tempo *changes* that are recorded, you have to set an initial tempo directly in the Master Track.

Recorded tempo changes appear in the Master Track, where they can be edited as usual.

For the recorded tempi to have any effect on playback or future recordings you must of course switch Cubase to Master (press [M] on the computer keyboard).

MIDI Setup



This dialog box is used for setting up your main MIDI settings plus some other global parameters. Most of these are things that you probably will set up once and save with your Setup, so that they suit your MIDI system.

MIDI Thru Active

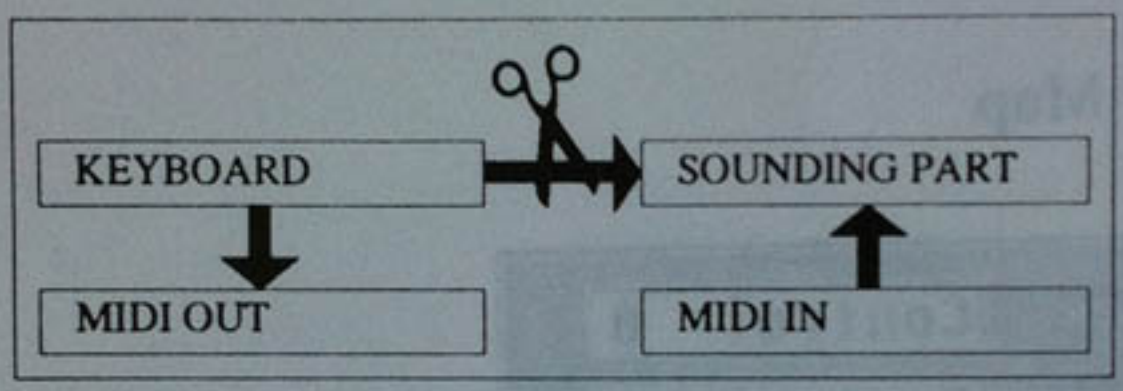
This is the major MIDI Thru function. By turning it on (ticked) or off (no tick) you decide if Cubase is to echo incoming MIDI data *at all*.

Let's say that you use a MIDI master keyboard for recording. This has no built in sound capabilities at all. You connect it to MIDI In on the computer. Then you connect a rack synth module to the MIDI Out. In order for you to hear what you are playing while rehearsing or recording, you must turn Thru on, so that all incoming MIDI data is immediately sent out again (echoed) via the computer's MIDI Out. This is **Thru On**.

On the other hand, let's say that you are recording with a digital piano with MIDI. You have connected the MIDI Out of the piano to the computer's MIDI in, so that data can be recorded, and you have connected the MIDI Out of the computer to the piano's MIDI In, so that you can play back your recording.

With the piano, you will hear every note you are playing, directly, regardless of your MIDI connections. So, you would want to turn the Thru function Off. If you decided to leave it on, each note would be played directly by the piano, but also sent out via MIDI to the computer, and there be echoed back to the piano again. This produces double notes, which might reduce polyphony, or just sound like some sort of flanger or phasing effect or as louder notes.

The best solution to the whole Thru problem is the Local Off function, which your recording keyboard may or may not have. This in effect turns your keyboard synth, sampler or similar into a separate keyboard and MIDI sound module by disconnecting the local communication between the keyboard and the sounding part of the instrument. With the instrument in Local Off mode you should have Thru turned on in Cubase at all times.



Local Off cuts off the internal communication between the keyboard and the sounding parts in a synth or other instrument, without affecting MIDI communication.

Thru Off Channel

Let's explain this function by yet another scenario. You have a digital piano *without* Local Off that you want to use for recording *and* playback, and a few MIDI rack synths for playback. Now, when you record a piano part, you want the Thru function to be turned off, so that you don't get any double notes (see MIDI Thru on the previous page). But when you are recording with any of the rack modules you want Thru to be turned on, so that you hear what you're playing with the right sound. It is a bit tedious to switch Thru on every time you are to record a piano part, and this is where Thru Off Channel comes in.

By turning Thru on, and setting the Thru Off Channel to the same MIDI Channel as your piano is receiving on, you will make Cubase echo data on all MIDI Channels *but* the one the piano receives on.

In other words, incoming MIDI data on the set Thru Off Channel, will not be echoed. Incoming data on all other MIDI Channels will (if Thru is set to On of course).

Use the left and right mouse button to set the Thru Off Channel values to 1 to 16, or, if you don't want to use the function, to Off.

Now you can use your piano for recording all Parts. The only problem is that you will either hear the piano directly even when you are recording other parts (if you have the volume on the piano turned up) or you won't hear the piano parts recorded when you record other parts (piano volume turned down).

Controller Map



This is a function that allows you to *remap* Controller numbers, which means to change one Controller number into another.

MIDI Defines a lot of things as Controllers: Modulation, Volume, Breath Control and so on, via a numbering system. Here's an example: Modulation is number 1, and Volume is number 7. Now say that you have a MIDI rack module that reacts to MIDI volume. You want to record some volume changes, but you don't have a specific device for it. But, you do have a keyboard with a Modulation wheel.

The Controller Map function allows you change the Modulation wheel Controller number (1) to Volume (7), so that the Modulation wheel is

recorded and echoed as if it was MIDI Volume.

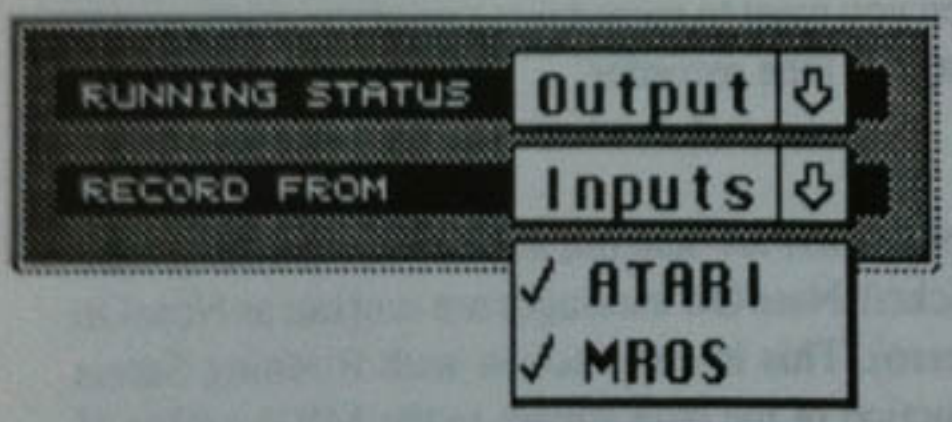
To set this function, use the left and right mouse button to display the Controller to be mapped in the field "Controller". Once the right Controller is shown, use the mouse to map it to some other Controller, by changing the value in the field "Mapped to". If you want to restore all Controllers so that no transformation takes place, just click once on the Reset button.

Running Status

There is a special data compression method that is part of the MIDI standard, called Running Status. Older units may not be able to handle this, so it can be turned off for any of the outputs. If you experience problems with a Korg DDD1 or DDD5, an Ensoniq Mirage, a Sequential Prophet T8 or a very old Yamaha DX7 you should make sure that you are not transmitting under Running Status from your computer. Each time you select an item from this local menu you turn Running Status On/Off (tick/no tick) for that Output.

The normal setting is all items ticked (Running Status On).

Record From–Inputs



It is not definite that Cubase receives its input from the Atari MIDI In. Input can come from a number of sources. It can come from any MIDI input on any connected Device, and it can come directly from *M•ROS*, the operating system behind Cubase. This last option means that data coming from another *M•ROS* program on the same computer. Also, the MIDI Processor and the Interactive Phrase Synthesizer in Cubase and Cubase's own Tracks can be set to output

via *M•ROS*.

So, the *M•ROS* alternative is an "invisible MIDI-chord" coming from some output in your system that is set to send out via *M•ROS*.

Pull down the Record From menu, and select the Inputs you want to be active. Several Inputs can be active at the same time. If an Input in the list is black, then it is physically connected and active. If it is grey this means that Cubase has found the software (the driver) for using the device which has the input, but it is for some reason not active (power turned off, not connected properly, or not connected at all). If an Input is black *and* ticked, it is selected as one of the recording Inputs. More information on drivers can be found on page 2-2.

Global Settings

Mute Parts In Group
Normally Parts in a Group are played back from the Group, even if the Track with the original Part is muted. However, when this functions is turned Off, they will not.

When this is set to off, you can use the Mute column of the Tracks that make up the Group as a way of bringing Parts in and out of playback from the Group Part. This is convenient when you want to record just one of the components of a Group Part on for example a tape recorder.

Note Off
When this option is ticked, Note Offs are sent out as just that, standard Note Off messages. If it is left unticked, Note Off messages are sent out as Note On messages with velocity 0 (zero). This in conjunction with Running Status (see above) makes for a reduction of the data stream in the MIDI cables. If it works, leave this flag unticked. If notes in one or more of your (old) instruments often "hang", tick this option.

Reset on Track Change
When this is activated, a Track change resets Pitch Bend, Modulation and Channel Pressure for that Track so that you aren't left with "stuck vibratos", or transposed notes due to "hanging Pitch Bends".

Reset on Part End
When this is activated and a Part ends, Pitch Bend, Modulation, Sustain Pedal and Channel Pressure are reset.

Reset on Stop
When this function is turned on, Cubase automatically resets Pitch Bend, Modulation and Channel Pressure for all tracks plus that it also sends out All Notes Off and Reset All Controllers when you Stop.

When any of the reset commands are turned on, it might reset things you don't want zeroed, like for instance modulation values recorded at the beginning of a song which are intended for a static effect throughout the piece. The way MIDI works makes a compromise necessary. For normal sequencer use, having Reset On Stop and Reset on Part End ticked should suffice.

Note On Priority
When this is checked, Note On messages are always given absolute priority over other MIDI messages. With this option ticked you can rest assured that your note recordings will be played back as intended no matter the amount of other MIDI messages that surrounds it.

Length Correction
This parameter makes sure there is always a short amount of time between a Note Off and a Note On on the same pitch and MIDI Channel. If you experience lost notes with a synthesizer when you send it notes with very short intervals, you should raise this value. The value is in ticks.

Play Parameter Delay
This is a parameter which allows you to (pre)delay the Play Parameters as set in the Inspector. Many synthesizers and similar units take some time to react to certain MIDI messages, especially Bank Select and Program Change. If you constantly experience that your synths "choke" when they receive the first note after for example a Program Change message from the Inspector, raise this value.

This does note apply to *recorded* Program Changes and other MIDI messages, only to the ones set in the Inspector. See page 12-2 for more info.

MIDI Filters

This dialog box allows you to prevent unwanted MIDI data from being recorded and "thrued".

Controller Filter

You may totally filter out four certain Continuous Controllers of your choice, regardless of what MIDI Channels they are coming in on.

This is an input filter only. It only acts on the MIDI Input(s), not the Output(s).

This means that it can be used to prevent some Controllers from being recorded, but if it already has been recorded at some earlier point, this Filter is not the way to stop the Controller from being played back. For playback filters, see page 11-5.

Four different Continuous Controllers can be filtered out. Use the left and right mouse button to step through the possibilities in the four fields (the possible values are identical in each field). The values start with No Cntrl, which is the same as no filtering, and then step up from Controller 0 to PolyModeOn (Controller 127).

Channel Filter

This option allows you to filter out *all* MIDI messages coming in on one or more specific MIDI Channels.

Just as the Controller Filters, this is an input filter only. It only acts on the MIDI Input(s), not the Output(s).

Click the mouse on the Channels you want/don't want recorded. White button means that the data will get recorded, and black button that it won't.

Thru Filter

MIDI data coming in to the program may or may not be "echoed" via one of the MIDI Outs. This is decided with the Thru function in the MIDI Setup dialog box. But, if you have the Thru function active you may still want to make sure that some certain *type(s)* of MIDI data are not echoed immediately via any MIDI Out.

The Thru Filter allows you to selectively prevent certain types of MIDI data to be echoed.

Click the mouse on the types you want/don't want recorded. Normal text (black on white) means that the data will be thru-put, and inverted (white on black) that it wont.

Record Filter

This is a way of preventing certain types of MIDI data to be recorded. For instance, you may want to turn off recording of System Exclusive data, since this takes up a lot of memory space and should only be recorded when necessary. Also, if you have a keyboard capable of sending After Touch (Pressure), but no sound module that accepts this type of MIDI information, it is useless to record it.

Use the mouse to set the Record Filter, just as with the Thru Filter.

Input Transformation

This function is used to selectively filter out and change data that is coming in to Cubase, before it is recorded. There are Input filters in the MIDI Filters dialog box, and Controller Mapping in the MIDI Setup dialog that perform similar functions, but Input Transformation is a more advanced function. Here are some of the things it allows you to do:

- Use four different filters/transforms at the same time.
- Make up split keyboard combinations for recording left and right hands separately.
- Turn a controller like a foot pedal into MIDI notes (for playing bass drum the right way)
- Filter out one specific type of MIDI data on one MIDI channel only.
- Turn Aftertouch into any Controller (and vice versa)
- Inverse velocity or pitch.
- etc...

And again: four of these things can be done at the same time.

The Filter and Processing sections work exactly as in Logical Edit in Easy mode (see page 29-3). The big difference is in that the Input transformer acts in real time on the incoming MIDI signals.

The buttons labelled 1-4 at the bottom of the window are used to decide which of the four transformers should be displayed in the window.

The tick boxes just below these are for turning each of these four transformers on (tick) and off (no tick).

If you want to reset any of the transformers to its initial setting (everything turned off), select it and click the Init button.

When you have set up the Filtering and Processing sections, you have to select one of two functions from the pop-up menu in the lower half of the dialog box, Filter (remove, delete) or Transform (change using Processing settings). If you select the Filter option, only the Filter settings are of any interest. If you select Transform, both the Filter and Processing settings apply, just as in Logical Edit.

Events are put through module 1 first, then number 2 etc. But, if a module "selects" events for filtering or processing, they will not reach the other modules at all.

It is very well possible to create transformations that lead to stuck notes! (Note Ons without Note Offs).

The following four Input Transformations come with the program. They are stored in the Setup and in the DEF.ALL file. They are all turned off initially, so you will have to open Input Transform and turn on the ones you plan to use.

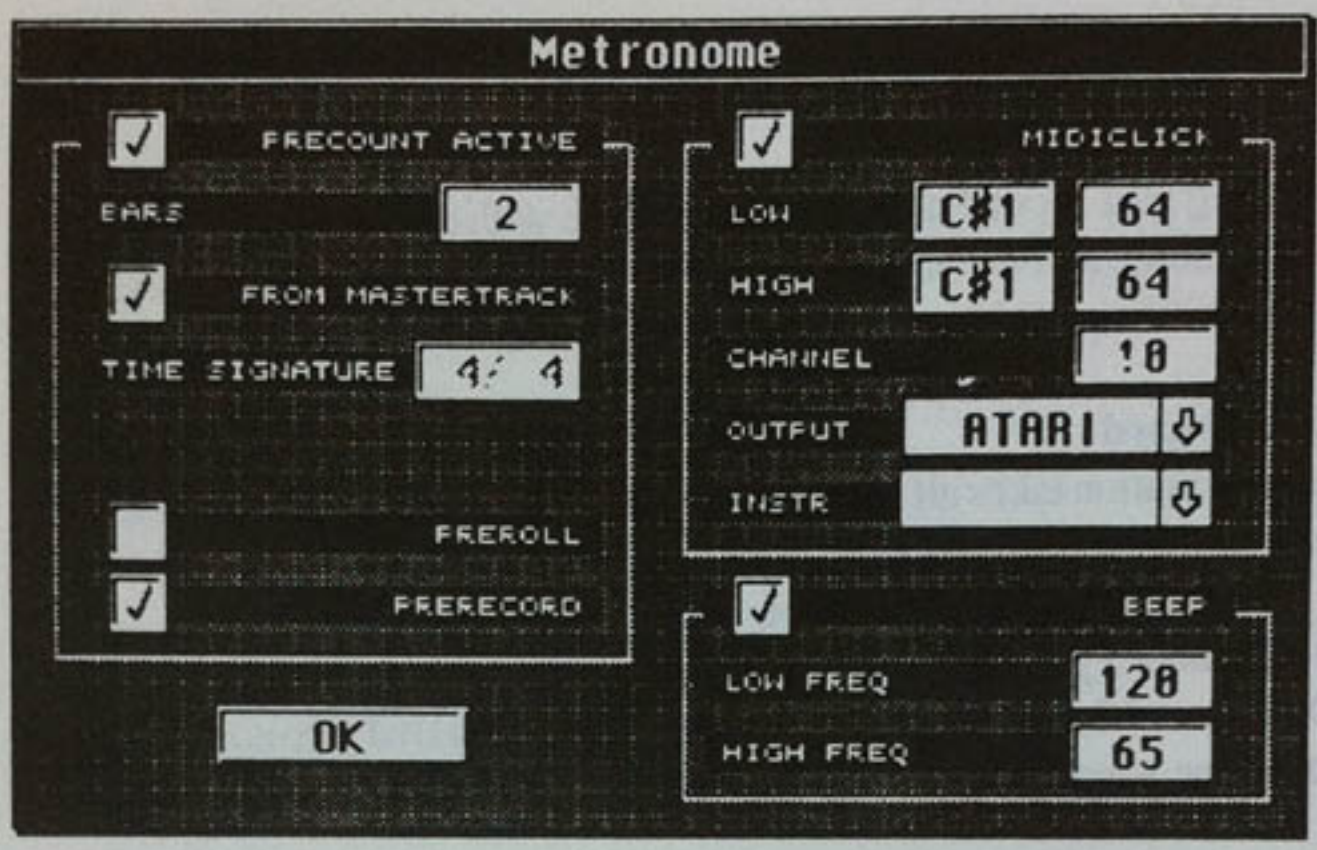
1. Split Keyboard
This Transformation takes all notes from C# and up, and adds 1 to their MIDI Channel. For this to have any effect you must set the Track to MIDI Channel "Any". If you do this and for example set a regular MIDI keyboard to send on MIDI Channel 3 you will get an output where all notes below C3 come out on MIDI Channel 3 and all notes above come out on MIDI Channel 4. Use this to play one sound with the left hand and another with the right hand.

2. Fix Velocity
This Transformation makes all notes have velocity 100, regardless of how you play. It is easy to change the output velocity value in the dialog box, should you wish.

3. Modulation Transformed into Aftertouch
This Transformation takes incoming Modulation wheel events and turns them into Aftertouch. Many rack synthesizers can receive Aftertouch, but not all keyboards send it. This allows you to use your "mod wheel" to send Aftertouch to a synth and their use it to control volume, filter or anything else the synth module is capable of doing via Aftertouch.

4. Invert keyboard
This Transformation turns your keyboard "upside down", "Joe Zawinul Arp 2600" style. Enjoy!

Metronome



Read about Precount and Preroll on page 7-4.

This dialog box can be reached from the Options menu or by double clicking on the Click button on the Transport bar. It is used for setting up everything that has to do with the click that acts as your metronome. This click can come from the computer's speaker, from your MIDI equipment, or both. The click follows the set time signature, with a special sound on each downbeat. A time signature of 6/8 for example will produce six clicks per bar, each on an eighth note.

You activate the metronome with the Click button on the Transport bar or by pressing [C] on the computer keyboard. When recording without a Preroll (see next page), you will hear the Click during the Precount (countdown) regardless of if you have turned the Click on or not on the Transport Bar. If you want a silent Precount, you will have to turn both the Beep and the MIDI Click off in the Metronome dialog box.

Precount

By ticking the "Precount Active" option you can turn the countdown used when recording On (tick) or Off (no tick). When this is set to Off, recording will begin as soon as you click on the Record button or press [*] on the computer keyboard.

By setting the "Bars" value you can decide how long you want the recording Precount to be.

If the option "From Master Track" is ticked the Precount follows the current time signature on the Master Track. If it is unticked you can use the Numerator and Denominator values to decide in what time signature and how often you will hear the clicks *during the Precount*.

Preroll

When Preroll is ticked, instead of having a normal Precount (where you can record if you wish) Cubase "rolls back" a number of bars when you activate recording. The number of bars is set in the "Bars" field above and is the same as with the Precount. No recording takes place during the Preroll, but after this Cubase automatically punches in.

Prerecord

This is used to turn the "recording during Precount" function on and off.

MIDI Click

The metronome can also be sent out as MIDI note commands to some suitable sound, like a bass drum or a sidestick sample from a drum machine or similar. Turn this function on (tick) or off (no tick) in the MIDI Click tick box.

The High parameters (Note and Vel) are used to set the note number and velocity values for the click on the downbeat of each bar, and the Low fields can be used to set the same values for all other clicks.

You can also set a MIDI Channel and an Output for the MIDI Click, or directly select an instrument, just as in the Track list.

Beep

This allows you to turn the beep from the computer's speaker on and off, (use the mouse to tick/untick the Beep option) and to set the sound.

High Frequency is the frequency on the downbeat of every bar, and Low Freq is the frequency of all other beeps. Use the left and right mouse button to set the values.

Synchronization

This dialog box is used for setting up everything that has to do with Cubase's sync to other units. You reach it from the Options menu, or by double clicking on the Sync button on the Transport bar. Once you have the settings in the dialog box right, you activate Sync as such by clicking on the Sync button on the Transport bar or by pressing [X] on the computer keyboard. When Sync is activated, Cubase will automatically start when it receives proper sync.

Syncing in itself is divided into two parts:

- SMPTE Sync. Cubase (or actually *M•ROS*) uses time code as an absolute reference for everything it does. This time code can come from a number of sources, from an internal generator, via MIDI as MTC (MIDI Time Code) or via a device such as the MIDEX+, SMP-24 or TimeLock.

- Tempo Sync. This governs Cubase's tempo. The Sync can come from an internal source, which means the tempo set on the Transport bar or the Master Track, it can come via MIDI as MIDI Clock, or it can come via a function called Human Sync.

These two types can be combined in a few ways:

SMPTE internal and tempo internal.
This is "normal" mode, not sync to any external source. This mode also uses the internal tempo setting(s), either on the Transport Bar (Master Off) or on the Master Track (Master On).

SMPTE internal and tempo via Human Sync
This allows you to tap the tempo without being synced to any external source.

SMPTE external and tempo internal
This is normal sync to an external time code source like the MIDEX+, or via MIDI Time Code. You can use the Master Track to set the tempo, or you can set the tempo directly on the Transport bar if you have the Master Track disabled.

SMPTE external and tempo via Human Sync
This allows you to tap the tempo while being synced to time code. This is mainly used to tap to make up a Master Track so that you can match Cubase's tempi to existing music on tape while being synced to time code.

Tempo MIDI Clock

If you have the tempo coming in via MIDI as MIDI clocks it really doesn't matter what kind of SMPTE sync you have, internal or external.

If you are using several *M•ROS* programs that should run in tempo-sync, you have to have the Master Track activated.

When syncing to external time code it could be a good habit to always use the Master Track. Either way, when Sync is activated, Cubase automatically chases to the correct Position.

When syncing to time code, and utilizing internal tempo, playback starts automatically when the program receives time code (see below). When syncing to MIDI Clock, Cubase automatically starts when it receives a Start or Continue message.

If no sync signal is coming in, you can activate Play as usual, even with Sync enabled and an external Sync source selected.

You have two pop-up menus for each of the main types of sync, SMPTE and Tempo. Below these sync menus you have menus for selecting where the sync is coming from.

SMPTE Sync

Internal

In this mode you use *M•ROS* internal time code. You are not synced to any external device. With the menu to the left you can select if you want to use the time code generated in the Atari, or some time code coming in via *M•ROS*

.

MTC

MIDI Time code is regular time code in a special format that allows it to be sent in a MIDI-cable. This may come in to Cubase from the Atari's MIDI port, via *M•ROS*, or from a connected Device.

Devices
A number of connected Devices may send time code to Cubase. Examples of such Devices are the Steinberg Smp-24, TimeLock and MIDEX+, C-Lab Unitor and Fostex tape recorders. If you have the right software (driver) for an output it will be found in the list.

Frames

This is used to set the format of the time code. The Options are 24, 25, 30 and 30DF (29.97) frames per second. This field might be changed automatically if a sync device senses some other incoming time code format.

Tempo

Internal
The tempi on the Master Track if this is activated or the tempo set on the Transport bar if it is not.

Human Sync
This mode allows you to tap notes that are used to set the tempo. Human Sync has its own dialog box, reached from the Options menu, and is explained in full on page 21-29.

MIDI Clock
This is sync to incoming MIDI Clock, Start, Stop, Continue and Song Position Pointer messages. This of course overrides any tempo settings made in Cubase. You can select via which input this is coming, by using the pop-up menu to the right.

Send Sync

You can also make Cubase output MIDI Time Code, MIDI Sync (MIDI clock, Start Stop and so on...) or both at the same time, via any combination of outputs, even while it is synced to any other format. You may for example make Cubase send out MIDI Clock when it is synced to MTC. Use the pop-up menus to set this to Off or to select an output for each of the two types of sync.

Songstart

This value is set using the left and right mouse button as usual. The values correspond to a time code setting of: hours:minutes:seconds:frames: subframes (80 bits). Cubase will use this "time" as a reference for Song Position 1. 1. 0 in all calculations. This means that you can make an Arrangement start at any time position (down to sub frame resolution). This is used for making a Song start at the right place when Cubase is synced to film or video, or to adjust the relative starting points between for example, material recorded on an audio tape recorder and Cubase.

Time Display Offset

Cubase normally displays the beginning of the Song (1.1.0 in bars/beats/ticks) as time code 0:0:0:0:0 regardless of how you have set the Song Start value. But, by adjusting Time Display Offset you can make Cubase *display* time code with any offset. The value you set here will be used as a SMPTE time for position 1.1.0, the beginning of the Song. This means that if you set this parameter to the same value as Song Start, all SMPTE displays in Cubase will show the same values as the actual incoming time code. Note that this parameter can also be set to negative values.

Bar Display Offset

On the same token as with Time Display Offset you can here set the number of the first Bar in the Song. This allows you to record before position 1.1.0, which is otherwise impossible.

Write SMPTE

This button starts the output of time code via the time code device selected on the SMPTE Sync pop-up menu (SMP-24, MIDEX+, Time Lock, Fostex MTC-1 or C-Lab Unitor). Time code is written starting at the set Songstart Time and with the frame rate selected on the Frame rate pop-up.

Get SMP-24 Song

Using Cubase you generally do not need the SMP-24 song since Cubase handles its song internally. The Get SMP-24 song-function has been added for those users who want to use the SMP-24's post-production features. If eg you have tapped in a song on the SMP or use a Pro-24 song that was synchronized via click-track or MIDI clock/MIDI notes and want to use that song structure then you can use this function to load it. The song data will replace data on the current Master Track.

For information about the SMP-24's post-production features please refer to its manual.

Convert 24 Song

If you have songs that were created in Steinberg's sequencer program "Pro-24", and load these into Cubase, they do not synchronize directly to tapes created with "Pro-24" and Steinberg SMP-24 or TimeLock. In order to achieve perfect sync you have to convert their tempi (the Master Track) to "Cubase format".

When you click on the "Convert 24 Song" button, another dialog box appears. Here you can select two of the SMP-24's modes, src 0 (TimeLock) or src 2 (SBX-80). Select either one and click "Do It". All tempi on the Master Track are automatically changed, so that the Song syncs perfectly to the "old" tapes.

PPQ's

This allows you to set the playback resolution of the program.

Cubase always give MIDI playback first priority. This means that whatever the workload of the computer, MIDI data is sent out when — and as — it should. However, when a lot of MIDI data is handled and an unusual amount of real-time processing is going on, the program might not feel as smooth to use as it normally does.

If you for example feel the graphics aren't updated as quickly as you like, you

could try lowering the resolution to 96 ticks per quarter note.

On the other hand, if you need extremely high playback resolution, you should use the highest possible playback setting, 384 ticks per quarter note (often called pulses per quarter note and hence abbreviated PPQ).

No matter what this setting is, data is always *recorded* at 384 PPQ and all editing conforms to this value.

Locktime

Using this field you can set how many frames of "correct" time code Cubase should receive before attempting to "lock up" (synchronize). If you have a tape recorder with a very short start-up time, you could try lowering this number to make lock-up faster than it already is.

Dropout Time

On a tape with time code (SMPTE), dropouts may occur. If a dropout is very long, Cubase may (temporarily) stop. In the Dropout field you can set how long a dropout (in frames) should be tolerated until Cubase decides that the tape isn't good enough to sync to. If you have a stable time code source, you may lower this number to make Cubase stop more swiftly after the tape recorder has been stopped.

Recognize Frame Change

If this is activated Cubase automatically detects frame rate changes in incoming Timecode.

OK

When you are finished with the settings, click on this button or press [Return].

Human Sync

Sequencers are normally locked to a predefined tempo, either set in the program or coming in via some type of sync. But, Cubase automatically synchronizes to the musician, even to chords and mixed music. You can use this feature to:

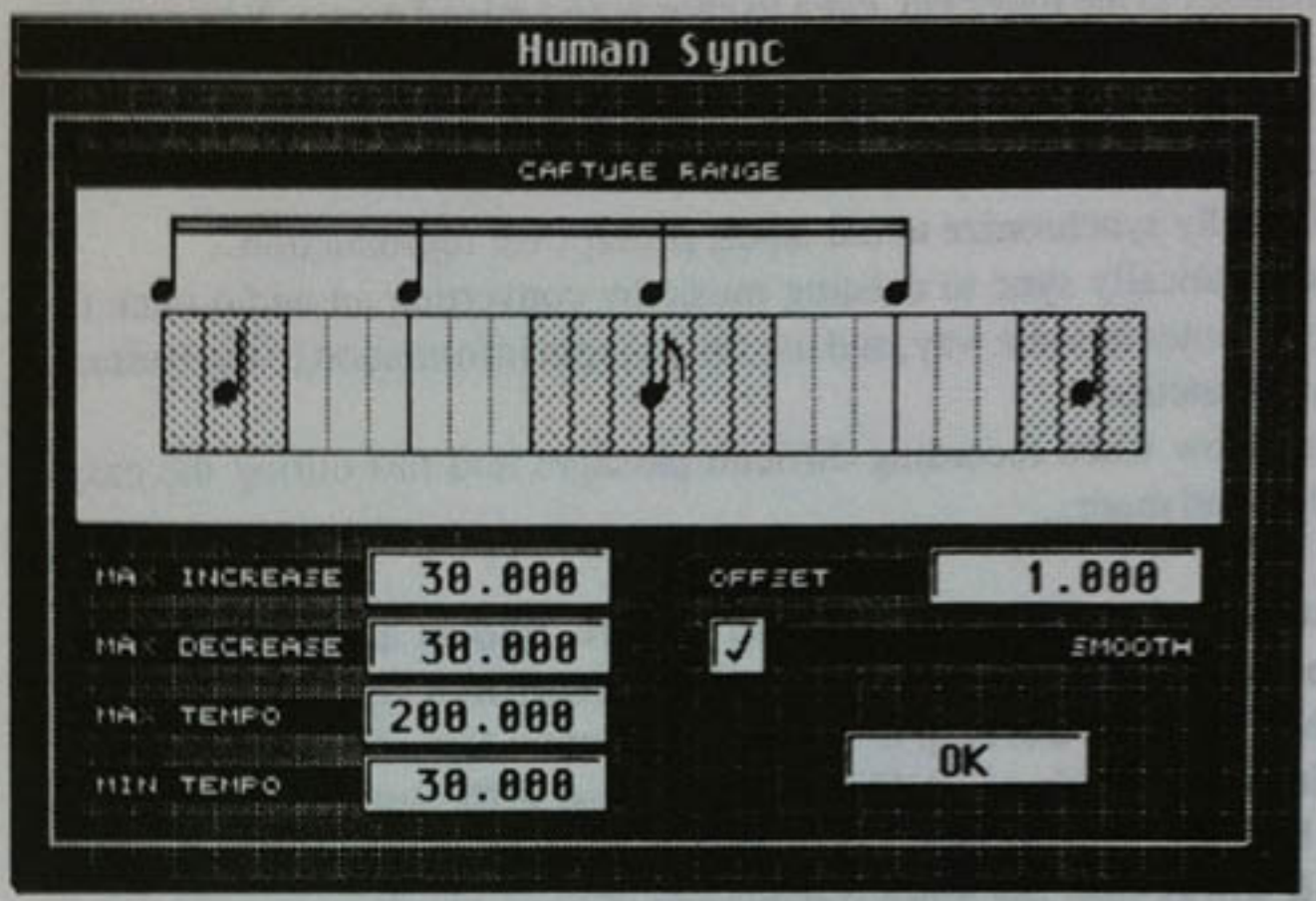
- Play along with your sequencer live, controlling the tempo with your playing.
- Manually synchronize to old tapes, perhaps for reproduction.
- Automatically sync to existing music by converting an audio click to MIDI notes in some way, and use this to input information to the Human Sync function.
- Play slow when recording difficult passages and fast during the easy ones, and more...

Human Sync is a genuinely musical feature, and as all such requires some practice. Don't start right off with sixteenth notes for input. But on the other hand, do not stop at setting up Human Sync for quarter note "tapping" for all times. Different tasks need different settings in the dialog box, and the more notes you allow Human Sync to recognize, the better it works (but the more it demands of your playing).

When you try Human Sync for the first time, try to play along to a rhythmically simple Song. If you start tapping the keyboard in Stop mode, the first four taps are taken as a count-in, and Cubase will start after that. Make sure the Master Track is turned off.

The Dialog box

When you select Human Sync, from the Options menu, a dialog box appears.



The upper half displays a graphic representation of *one quarter note*. This is used to tell Cubase something about what to expect of the incoming notes. The grey areas are the parts within the quarter note where incoming MIDI messages should be recognized, and the white parts are the areas where they should be ignored.

You can click and drag with the left mouse button to set a new grey area or to expand or shrink an existing one. The sides of each area has a thicker black line. You can also click with the right mouse button to completely erase an area.

First of all you must tell Cubase something about the frequency of the incoming MIDI notes, if it will be quarter notes only, eighth notes triplets or whatever. This is done by making up grey areas around the valid notes.

The leftmost section in the graphic is actually only for notes exactly on and after the quarter, and the area to the right of the last sixteenth is for what happens before the same quarter note. Since the whole window only displays

one quarter note, it sort of wraps around at the end. If input appears at the beginning of the quarter, this leads to a slow-down and vice versa. A note symbol in each area helps you to see what note value it belongs to.

The sizes of the grey areas around the notes are used to filter out invalid notes (when syncing to composite material). The larger the areas, the more drastic changes are allowed, but this also makes the program sensitive to erratic "taps". The smaller the area, the more correct Cubase will handle notes outside the intended range, but then it is also more confused about large tempo changes. Experiment!

The lower half shows a few parameters that can be set using the mouse buttons as usual.

Max Increase and Max Decrease
This is the maximum tempo increase/decrease allowed, shown in BPM (beats per minute). If you don't have drastic tempo changes, try to set these both as low as possible. If you, after trying the settings out, don't feel that Cubase "reacts" enough, increase the range.

Max and Min Tempo
These are the Maximum and Minimum tempi allowed, also shown in BPM. Remember that you may have to allow pretty high/low tempo settings momentarily, to "catch up", while tapping to existing music.

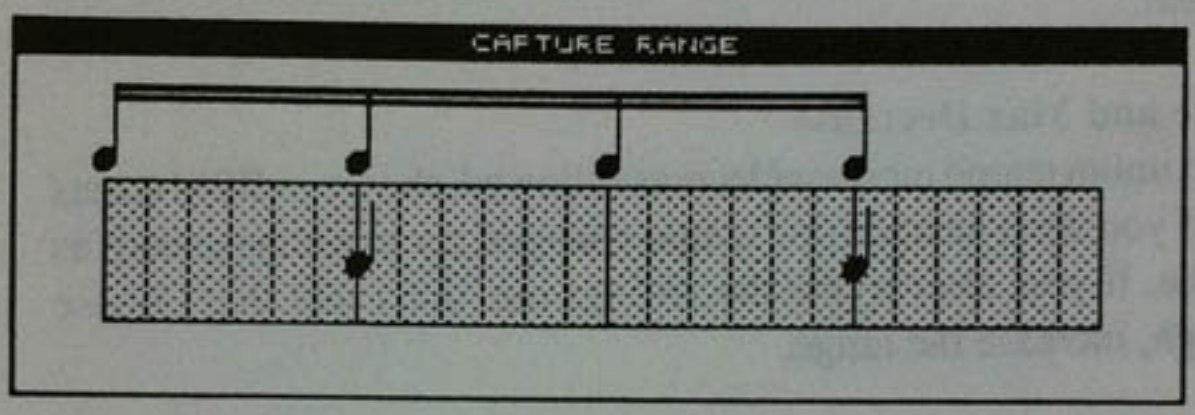
Offset
This is a setting (in BPM) which causes the tempo to actually be slower (negative values) or faster (positive values) than the tempo you tap. 1 has proven to be a normal value.

Smooth
If you active Smooth (tick), Cubase uses an average of the last tempo and the new tempo for each calculation.

Syncing to existing music on tape

Let's say that you have a piece of music on tape that you wish to sync to by playing quarter notes on a keyboard. The tape has time code on it as well as the music. Since you are tapping directly for the purpose you needn't worry much about taps outside the range. There is a two bar count in on the tape.

- ❑ Delete any range in the middle of the Human Sync graphic that has an eight or sixteenth note symbol in it.
- ❑ Drag up two quarter note areas as the picture below shows.



- ❑ Set the tempo parameters to some appropriate values (you may have to change these after a couple of tries).
- ❑ Set Offset to 1 and Smooth to off (no tick).
- ❑ Exit the Dialog box.
- ❑ Open the Synchronization dialog box on the Options menu and set SMPTE sync to your SMPTE device (SMP-24, TimeLock...) and Tempo sync to Human Clock. Exit this menu also.
- ❑ Activate Sync on the Transport Bar.
- ❑ See to that the Master Track is empty and that Master is turned Off on the Transport bar.
- ❑ Activate Tempo recording on the Options menu.
- ❑ Just for safety, select an empty Track (so that nothing is deleted by accident).
- ❑ Go into record mode and start the tape. Check that Cubase is receiving time code.
- ❑ Set up the SMPTE Offset and the initial tempo on the Master Track so that Cubase starts at the right point and in the right Tempo.
- ❑ When the music starts, tap quarter notes on the keyboard.
- ❑ Tap the whole Song. All the tapped tempi are now recorded on the Master

Track.

- ❑ Open the Synchronization dialog box on the Options menu and set tempo sync to Internal.
- ❑ Switch Master to On on the Transport bar.
- ❑ Rewind the tape and play back the music and Cubase syncs to the music on tape.

Remote Control

This dialog box lets you set up and "enable" the Remote Control function. Remote Control is used to activate functions in the program — like Start and Stop — via MIDI.

- ❑ First of all, to Enable/Disable Remote Control, click in the field at the bottom of the dialog box or press [Y] on the computer keyboard (this works even if the dialog box isn't visible).

- ❑ The next step is to set up which MIDI message is to activate each function. There is a list of functions that can be activated remotely, in the Remote dialog box. For each one there is a pop-up menu and a value field.

- ❑ The pop-up menu has three items on it, Note, Controller and Program (Change). Use this to select what type of MIDI message should activate the function.

- ❑ The value field is for setting *which* note, Controller or Program Change Number the function should react on.

If you use a note for activating a function, you will not be able to use this note to record music, unless you use the "Remote Key" option. This is activated by ticking the "Remote Key On" option in the dialog box and setting a up a certain key of your choice.

When Remote Key is activated you have to first hold down the "Remote key" and then press the key you have "connected" to a function in the program for anything to happen. To select another function, just press the relevant key. You don't have to release the "Remote Key" in between.

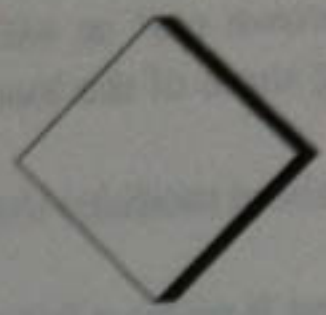
When Remote is enabled, the "Remote Key" can't be used to record music.

If you use a Controller as a remote, it will activate the function whenever a value above 0 comes in. This means that if you for example use a foot switch you'll activate the function each time you press the pedal. If you use a modulation wheel or slider, you will activate the function as soon as you move it.

Make sure that a certain MIDI message is not used for more than one function. If two messages are used for the same function, then only the first function (in the list) will be activated by that message.

Reset Devices

This command performs a Reset on Stop, plus that it resets all *M•ROS* Devices like the Midex/Midex+, SMP-24 and Time Lock. Should you encounter any problems with communication via the Devices, try this command.



The Modules Menu

Since primary memory (RAM) is limited, and one users needs differs from another, certain parts of the program are handled as so called "modules", files that can be loaded in and "thrown out" at will. The Modules menu is for handling this and for selecting some of the loaded modules directly.

There is one distinction made about modules that is important to understand:

Adding a module means putting it up on a list of available modules.

Activating a it means actually loading it into primary memory.

When activated, a module "steals space" that could otherwise be used to record data. If you run Cubase on one of the smaller ST's (for example with just one MegaByte of RAM) you may reserve more memory for music by only activating those modules you really need.

These modules come with the program:
Score Edit
MIDI Mixer
Interactive Phrase Synthesizer
MIDI Processor

Other modules can be purchased separately. Installing a Module may result in new Track Classes appearing on the Class menu in the Track list and new items appearing on the Modules menu.

Modules can't be activated when an editor window is open. When you are short of memory and activate a Module, a memory compaction takes place, which may last a few seconds or more.

Activating Modules

When you select the "Modules..." command you are presented with a window that displays the modules you currently have Added to the list of available modules (modules put into the CUBASE.DAT folder are automatically Added, see page 2-3). The fact that a module is in the list only means that the program has found it on the disk, it does not mean it is currently Active in the program.

There are three items in the list for each of the modules. They tell whether each module is Active, if it is set to Autoload, and (when it is activated), its Size.

Add/Remove

The Module files that you have put into your CUBASE.DAT folder will automatically appear in the list. If you wish to Add a module to the list you click on the Add button and locate the file using the File dialog box that appears. If you wish to Remove a file from the list, select it and click Remove.

The Adding and Removing is only a temporary setting. If you want to make sure a Module always appears in the list, put it into the CUBASE.DAT folder.

Adding and Removing does not mean the module can/can't be used in the program, you have to use Activate/Deactivate for this.

Activating

If you select a module in the list and click on the Activate button to the right of the list, this module is loaded into the program and hence activated. When the module is active you can find out how much of the internal memory this module uses up in the rightmost column of the list.

Make sure you have the right disk in the drive before activating.

Deactivating

By selecting a module and clicking the Deactivate button, the Module is "thrown" out and the memory previously used by it is free to use for your recordings.

Setting a module to Autoload

By selecting a module in the list and clicking Autoload, you tell the program to automatically load this module the next time you start the program. This setting is stored directly into the Module file which means this Module will always be automatically loaded into all Songs. The disk can not be write protected during this procedure.

Setting a Module to Autoload doesn't mean it is Activated *now*, it means it will be activated the *next time* you start the program. If you want to use it right away, activate it as well.

When you Add a file that is set to Autoload it is also Activated.

The Modules on the Menu

The lower half of the Modules menu displays those modules that have windows that are opened directly from this menu. (Score Edit for example is a module, but is opened from the Edit menu). If you try to select any of these items, or another module, when it isn't active, the program will let you load the module.

When you install new modules, new items may appear on the Modules menu.

MIDI Processor

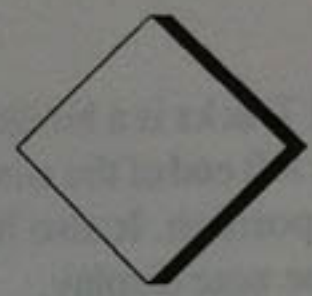
This is for opening the MIDI Processor window. It is described in chapter 31.

Phrase Synth

This brings up the Interactive Phrase Synthesizer (IPS) window, described in full in chapter 32.

Copy To Phrase

This is used to transform notes in a Part to a Phrase as used by the Interactive Phrase Synthesizer. This is described in detail in Chapter 32.



Using the Editors

Four editors for MIDI data come with the program. They are:

Key Edit
This graphical editor for MIDI Tracks is a bit like a piano roll display. It has a vertical piano keyboard at the left end of the window so that notes easily can be identified by their vertical position. It also has the possibility to handle non-note information below the note display.

Score Edit
This graphical editor shows your MIDI data (notes) as regular music notation. It also allows you to print out your score.

Drum Edit
This graphical editor is specially made for Drum Tracks. It lets you handle your drum sounds by name rather than by MIDI note number. It has a very special feature that allows you to redirect drum parts to new note numbers, MIDI Channels and Outputs *after recording*. Music is displayed graphically in a note display with each drum hit shown as a diamond. Non-note information can be entered and edited in a special display below the note display.

List Edit
This editor is a generic list editor for different types of data. You can use it to edit any type of Part. The display is divided into two parts: A list of all events and next to it a graphic section that shows each event as a horizontal bar. Events can be manipulated numerically in the list, or graphically in the display.

There is a fifth editor that operates on recorded MIDI data, called Logical Edit. But this differs from the others in that it works with changes based on mathematical and logical criteria. Logical Edit is described in its own chapter.

Opening a Graphic Editor

There are several ways to open a graphic editor:

- If you want to edit one Part, simply double click on it. The program selects the appropriate editor for you, depending on Track type.
- If you want to edit several parts of the same type, select them and double click on one of them. If the Tracks are of different types, only one editor will be opened.
- You can also select the Part(s) and use the Edit command on the Edit menu or press [Control]-[E] on the computer keyboard.

This is the editor you automatically get for each type of track:

Track type	*Editor opened*
MIDI Tracks	Key Edit, Score Edit or List Edit depending on your Preferences settings. See page 36-11.
Drum Tracks	Drum Edit.
Mixer Tracks	Mixer window.
Group Tracks	None.

- You can also use the Edit menu to select a specific editor for the selected Part(s). This allows you to, say, edit your Drum tracks in Score Edit or your MIDI Tracks in Drum Edit. Note that not all combinations of track type and editor type are possible.

You can edit several Parts on different Tracks simultaneously in the graphic editors. There are no restrictions. Just select the Parts you want to edit. If no Parts are selected when you use the Edit command, all Parts on the Active Track will be edited.

If there are no Parts on the section of the Track you want to edit, and you for example want to input some data directly into an Edit window, you must first create a Part by double clicking in an empty area between the Locators in the Arrange window or by using the Create Part command on the Structure menu.

Opening The List Editor

When you select List or press [Control]-[G] you get a list editor, mainly intended for precise editing of non-note data, but with a graphical section that makes it easy to use with any type of events.

List Edit allows you to edit any type of Track, except Group and Tape Tracks. It allows you to work on one Part or one whole Track (the latter if only a Track and no Part is selected).

Several Editors at Once

Normally you will want to use one Editor at a time for a Part or a selection of Parts. If you for example have Key Edit up on the screen and open List Edit from the Edit menu, Key Edit will disappear and be replaced by List Edit.

But, if you hold down [Alternate] on the computer keyboard when opening a second (or third, or fourth) Editor, *from the menu*, the other(s) are not closed, they remain on the screen and can be selected and resized as usual.

You can also switch back to the Arrange window and select other Part(s) and open the same type of Editor (or another type) for these by using the [Alternate] key.

Closing an Edit Window

Keeping the changes

Everything you do in an Edit window can be kept or cancelled (undone). There are two buttons on the left side of the Edit windows' menu bars called just that, Keep and Cancel.



If you click Keep, or press [Return] everything will be kept as it is at this point, and the Editor closes.

If you have several editors open at the same time for editing the same Part(s) you have to "Keep" in all of them to make the changes permanent.

Cancelling changes

If you click Cancel, or press [Esc] the Part(s) are restored to the state they were in before you opened the Edit window.

If you enter the Edit window while recording, and then click Cancel, the *whole* recording is deleted.

Editing done on a Ghost Part or a Real Part with Ghosts won't show up in the other Ghosts/the real Part until you Keep your changes. For instance, if you have a Real Part with a Ghost, and you edit the Ghost in an Edit window, the Real Part will not change while you are editing, but as soon as you Keep your changes, the Real Part changes so that the Ghost and the Real Part are identical again.

Undo

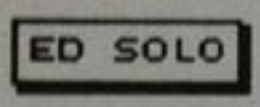
The Undo command ([Undo] on the computer keyboard) allows you to directly undo a number of things in the Edit windows.

In the MIDI editors, everything can be undone (even a recording) *except* the following operations in Score Edit:
Enharmonic Shift.
Layout adjustments such as moving elements in Page Mode.
Changing the first key signature and clef for each Part.
The MIDI Meaning and Drum Map settings.
Insertion, editing or deletion of "layout" symbols.

Don't forget, you can Undo *all* changes made since you opened the Editor (except some layout formatting in Score Edit), by pressing [Esc] on the computer keyboard.

Ed Solo

This function is reached from a button on the Transport bar. If it is activated, then only the edited Part(s) will be played back from the Edit windows. If Ed Solo is turned off, all unmuted Parts will be played back, even from the Edit windows.

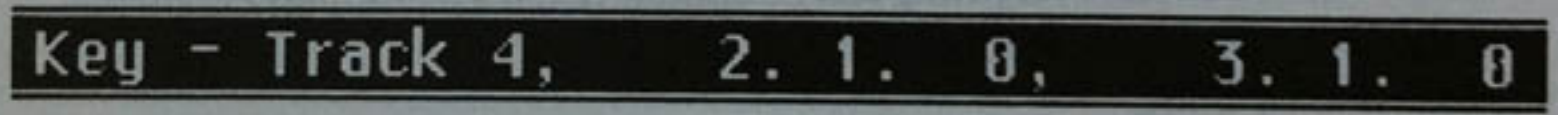


Window Handling

Edit windows can be opened, selected, closed, moved, resized, scrolled and so on while you are recording and during playback. You can do the actual editing at any time, even during recording. However, if you record inside an Editor and close it, recording is deactivated.

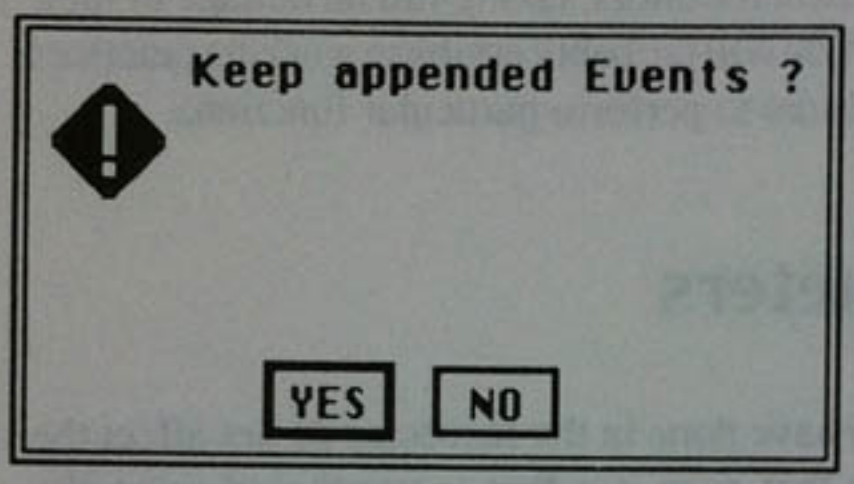
The windows and their scroll bars work as usual, and you may magnify the view in all editor windows (although Score Edit uses a pop-up menu for this). You may also choose to make the Edit windows scroll automatically when the music is running, by turning the "Follow Song" function on or off on the Options menu.

The window title for each editor shows some text that gives you a hint about what is edited (the name of the Part) and the start and end points for the edited section.



Recording, Playback and the Song Position

All recording, playback and other Transport Bar functions may be used while an Editor is active, simply observe the points mentioned under Window Handling and Closing an Editor, above. If you record past the end of the Part a dialog box asks you if you want to keep the events and extend the Part to the length of the recording.



When you open the editor it always displays the current Song Position, and if Follow Song is active you can use the normal ways of moving the Song Position (Rewind, Fast Forward and so on) to move to any point you desire, and the edit display follows.

If you press [Clr Home] on the computer keyboard, the Song Position is instantly moved to the left side of the window. For those editors with a Position bar, if you double click once on it, the Song Position is moved there.

And again, editing can be done during playback, or even while recording.

Communication between Open Editors

The Editors communicate in "real-time", so any changes made in one Editor will be displayed in any other that is editing the same Part. In addition to event edit information, the current selection of events and the various Loop settings are shared between editors editing the same Part. Other settings remain independent for each editor.

This makes it easy to switch between Editors, taking full advantage of their different styles of presentation. You will probably establish working practices whereby you utilise specific editors to perform particular functions.

Playback Parameters

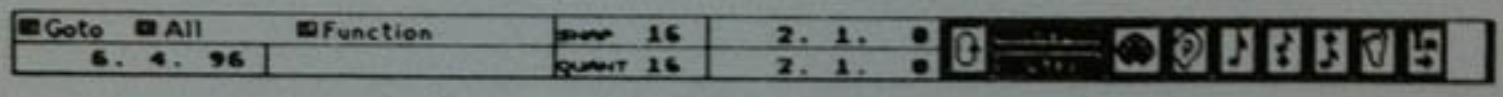
The Playback settings you may have done in the Inspector do not affect the Part when editing. This means that even if a Part is transposed using the Inspector, it will be shown at its original recorded pitch in the editor, even while it is playing back transposed.

If this is a problem, you may "freeze" the play parameters, see page 15-13.

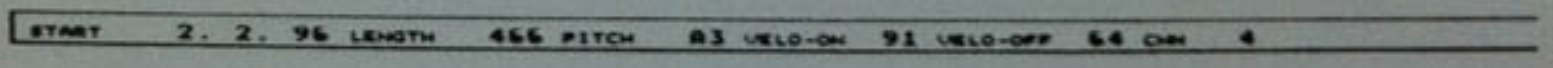
The Different Areas in an Editor

Status Bar

The Editors all have a Status Bar at the top with some controls on it.



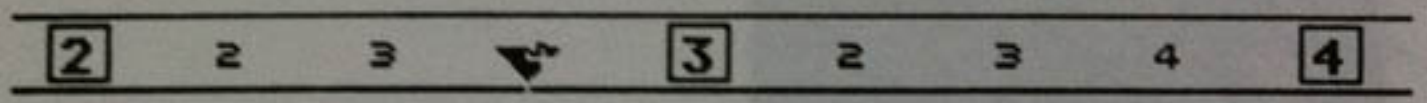
Most of them also have an info line below this, that can be turned on and off (see page 23-15).



Below this you have any number of areas for the data you are editing, the so

called *event displays*. In some cases, one or more of these can be hidden.

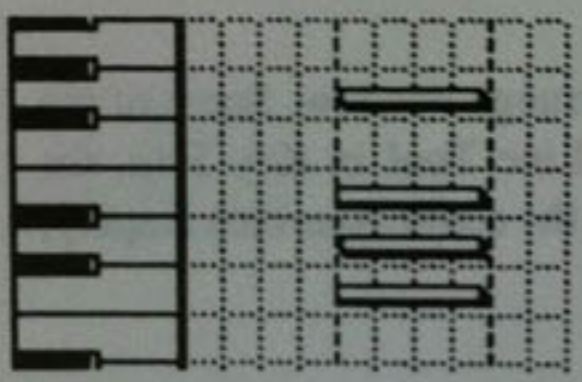
Some Editors have a Position Bar above the actual event display, very similar to the one in the Arrange display. If they do, the Song Position is shown graphically, just as in the Arrange window.



Event Displays and Events

The areas in the middle of the window that display your data are called *event displays*.

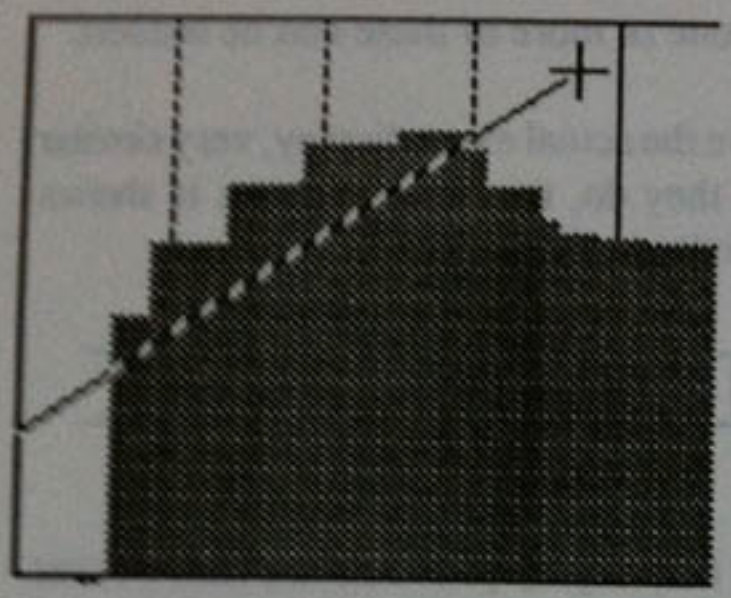
Most events are shown as boxes. One example is notes in Key and List edit, where the length of the box represents the length of the note.



A chord made up o four notes, as displayed in Key Edit.

These events can be moved around, lengthened etc, duplicated, cut, copied and pasted etc, all using the Toolbox in each editor.

There are also displays for so called continuous events, like for example pitch bend, which are shown as bar graphs. These are edited a little bit differently, you can for example use a line tool to change the height of a graph.



Rescaling Controller events in Key Edit.

The Toolboxes

Each editor has its own Toolbox, just as the Arrange window. Some of the Tools only apply to some of the areas. The Line Tool in Key Edit, for example, is only used to edit continuous data in the continuous data display, below the note display.



The Tool Box in Key Edit.

Mouse, Quantize and Snap

The Editors have their own Quantize settings, mouse position box and a so called Snap setting. You set the Quantize value by pulling down a pop-up menu in the Quan box, just as in the Arrange window (in Drum Edit, each "Sound" also has it's own Quantize setting).

There is a mouse box on the Function Bar showing the pointer's position, similar to the one in the Arrange window. It normally displays positions in

bars/beats/ticks, but if you click on it, two things happen: The Position bar changes to show a time scale, and in the mouse boxes positions are shown as Timecode (hours/minutes/seconds/frames...). The Position values on the Note Info Line and for the Loop start and end (see page 23-21) are also displayed in time code format. Click again on the mouse box to return to normal position indication.

There is also a Snap function. You can set it to a number of values. On the top you find single numbers from 2 to 7. These are ticks (the smallest position value). Below this you find larger Snaps as note's values, from 64th notes to whole notes, with the triplet and dotted options as on the Quantize menu.

The Snap value is used to restrict certain editing to even note values and to adjust the spacing of input events. It also "quantizes", or restricts what values can be shown in the mouse position box. The Quantize value is used for regular Quantizing operations, but also for determining lengths when you input notes. These two values (Snap and Quantize) can be changed at any time during any type of editing.

Goto	All	Function	SNAP 16
6. 4. 96			QUANT 16

The Mouse Box. Snap and Quant.

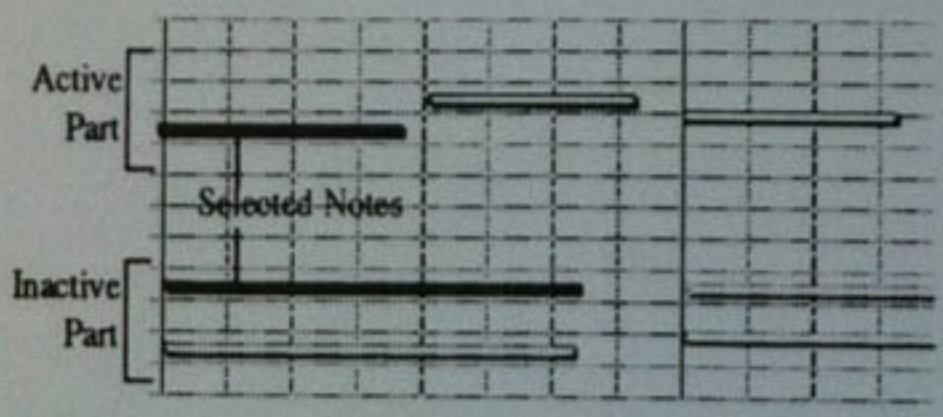
Continuous and Non-Continuous Events

The data you are editing is displayed as *events*. An Event may be a note, a pitch bend message, etc. In many displays (the note area in Key and Drum Edit for example), these events are shown as separate boxes. The other type of display, showing *continuous events*, is described separately, later in this chapter.

Several Parts can be edited at the same time in a graphic editor, but only one at a time is active. The active and inactive Parts are separated graphically. In Key and Drum Edit, notes belonging to an *active Part* are white (or black when they are selected, see below) and notes belonging to an *inactive Part* are dimmed (and grey when selected). In Score Edit, different Parts are put on different note systems.

MIDI input (as when you play your keyboard to input notes and painting and drawing of events, is always directed to the active Part. This is important when you record, use Step Input or make any other changes via MIDI. This means that you can direct your input to one Part or the other by making it active.

- ❑ To activate a Part, click on any event that belongs to that Part. You can also use the Next/Previous Part commands on the Goto menu, which is convenient if the Part is empty.



Active and Inactive Parts in Key Edit.

Selecting

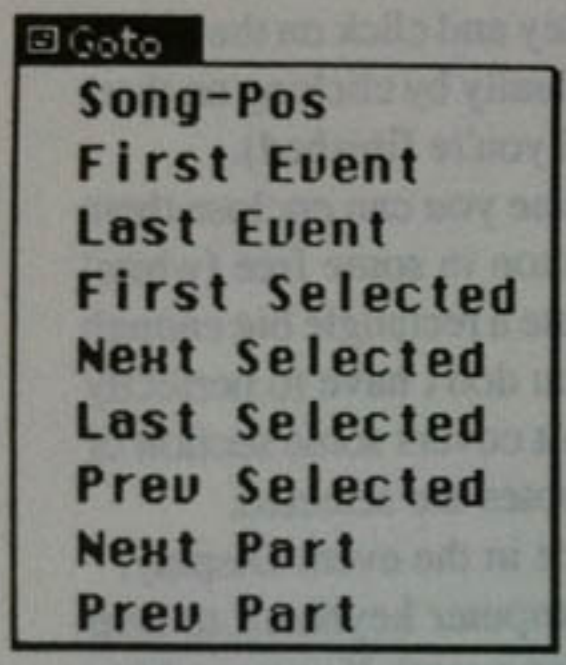
There are several ways to select events, similar to the way you select Parts in the Arrange window:

- To select one event, click on it. Selected events are inverted.
- To select more events, hold down the [Shift] key and click on the events you want to select. You deselect events individually by clicking on them again. (but don't let go of the [Shift] key until you're finished).
- To select several adjacent *notes* at the same time you can enclose them in a rectangle by holding down the mouse button in some free (white) area in the note Display. Drag the mouse to create a rectangle big enough to "touch" all the notes you want to select. You don't have to perfectly enclose all the notes, it's OK if the rectangle just covers some section of each one. Release the mouse button, and the notes are selected.
- To deselect all events, click on some free space in the event Display.
- You can use the [←] and [→] keys on the computer keyboard to step through the events *in the active Part* (first select an event). If you combine this with holding down the [Shift] key you can select several events from the keyboard (in List Edit, use [↑] and [↓] instead).
- You can select all events by using the Select All command on the Edit menu or by pressing [Control]-[A] on the computer keyboard.

Any type of editing you do (like moving, copying and so on) will affect all *selected* events, whether they are in active or inactive Parts.

Moving Around and the Goto Menu

You can move directly to certain useful positions by selecting from the Goto menu on the Function Bar. These options will scroll your view to show the events at the position chosen.



The Goto commands don't affect selection in any way. They only change the view as if the scroll bars where used.

Song Pos
Takes you to the Song Position.

First Event
Takes you to the first event in the active Part.

Last Event
Takes you to the last event in the active Part.

First Selected
Takes you to the first (earliest) of all the selected events.

Next Selected
Takes you to the second of all the selected events.

Last Selected
Takes you to the last of the selected events.

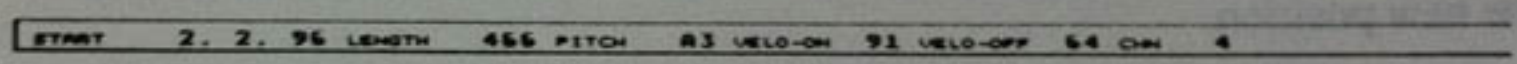
Prev Selected
Takes you to the last but one of all the selected events.

Next Part
Takes you to the beginning of the next Part. This might just lead to a vertical scroll if there are several Parts beginning at the same Position.

Prev Part
Takes you to the beginning of the previous Part. This might also just lead to a vertical scroll if there are several Parts beginning at the same Position.

The Info Line

It is possible to numerically change the values for one selected event in any graphical editor. This is done using the Info Line. You can hide/show the Info Line by clicking on the Info-button on the Functions Bar or by pressing [Alternate]-[I] on the computer keyboard.



If no event, or several events are selected, then the Info Line shows "- - - - - " for all values.

You can use the mouse and keyboard to change any value for the selected event.

Editing Notes on the Info Line

For MIDI notes, the parameters on the Info line are Position (click on any of the three numerals as usual), Length, Pitch, Note On Velocity (Velo-On), Note Off Velocity (Velo-Off) and MIDI Channel (Chn). Any Changes you do are shown graphically in the event display.

You can also use MIDI to change the pitch and velocity of notes as described on page 23-26.

The two velocity parameters might need an explanation. Note On Velocity

is the speed, or force, with which you press the key, and Note Off Velocity is the speed with which you release it. Not all keyboards are capable of sending out one or the other, but most can send at least the Note On type. And, not all instruments react to both types either. Check the relevant instrument's Operation Manual.

The MIDI Channel value is the original Channel number stored with the note. For this value to have any effect you must set the Track (or the Part) to MIDI Channel "Any". See page 10-4 for more info.

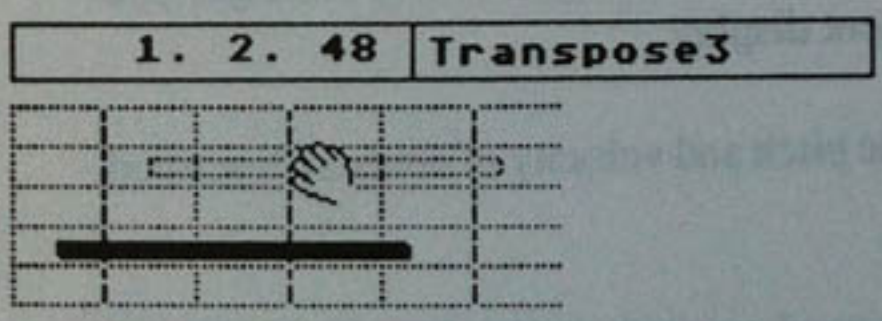
Moving Events

By Dragging

You may graphically move the selected Events. Just press and hold the mouse with the arrow pointer over one of the selected events, and move the mouse. When you release the mouse button, the whole block of events are moved to the new position.

- If you reach any of the sides of the window, it automatically scrolls.
- If you press [Shift] after you pressed the mouse button and keep it pressed while dragging, movement is restricted to one direction only, horizontally or vertically. You set the direction by *starting* to drag vertically or sideways.
- The Snap function acts so that the first event in the block is positioned on the closest value. This works as a sort of "move quantize."

The mouse box shows you where that first event will wind up when you release the button, and in the graphic editors for MIDI notes, the box beside it shows you how many semitones up or down all the events will be transposed.



The Mouse and Transpose values help you when moving notes.

By "Kicking"

If the editor has kicker tools, you can "Kick" an event one Snap value at a time, forward or backwards in time.



Select one of the Kickers and position the pointer over the event you want to move. It is *the tip* of the shoe you are Kicking with (mind you, this isn't soccer). Click once, and the event moves one Snap value in the selected direction.

Duplicating Events

You duplicate events by holding down the [Alternate] key while dragging. Everything else is as when moving.

Cutting, Copying and Pasting Events

You can also use the standard commands, Cut, Copy and Paste to rearrange notes and other events. These have the keyboard equivalents [Control]-[X], [Control]-[C], and [Control]-[V] respectively.

Cutting, Copying and Pasting is the way to move events from one Part to another. There is only one Clipboard for events, and it is shared between all the Edit windows, so that notes and other events can be moved from one Part to the next.

Cut
This command takes the selected events, removes them from the Edit window they were in, and puts them in a temporary, non-visible location called the Clipboard.

Only one "cutting" (or "copying" see below) at a time can be stored on the Clipboard.

This means that if you first select two notes and use Cut, and then select another note and Cut that also, the two notes that were on the Clipboard first are lost forever, and the last Cut note is now on the Clipboard instead.

Copy
This command takes copies of the selected events and puts them on the Clipboard.

And again, only one "copying" (or "cutting") at a time can be stored on the Clipboard. There is only one Clipboard, shared by Cut and Copy.

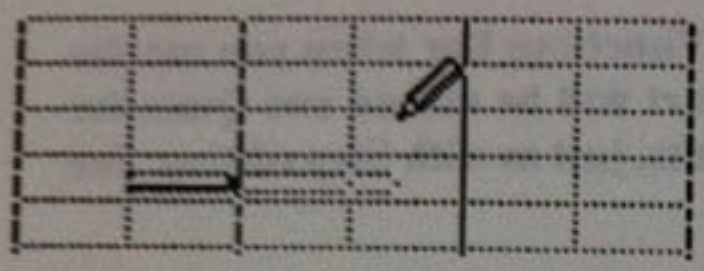
Paste
This command puts the events on the Clipboard back into the selected edit window, which might be the same window as they were Cut/Copied from, or another. These are the rules:

- The events are always put in as a block or group, beginning at the Song Position. The notes' pitches (and all other values for that matter) are kept intact.
- You can Cut and Copy from several Parts at the same time (active/inactive Parts) but you always Paste into the *active Part* (see each editor for an explanation of this term).
- You can Paste the same contents from the Clipboard as many times as you like. Data is copied from the Clipboard, not moved from it.

Creating New Events

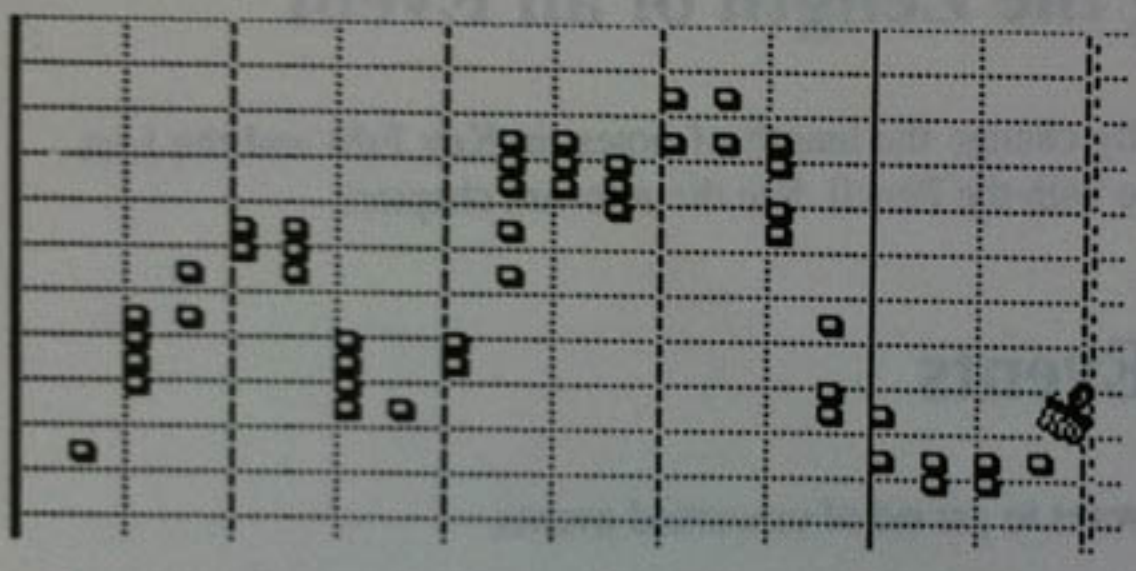
You can paint new events into the active Part using different tools in the Toolbox, depending on the editor you are using:

- If you use the pencil, a new event is input at the closest Snap Position, when you click. If the event is a MIDI note, and you click the mouse button once, the event gets a length set with the Quantize value. If you drag horizontally before you release the mouse button, you can change the length of the note. The Snap value works as a length Quantize. that is, the length will be an even multiple of the Snap value.



If you keep dragging after pressing the mouse button you change the note´s length..

- If you use the Paint Brush, you can move the pointer and "paint" in new notes by dragging. Normally, movement is restricted to horizontally only when you are dragging (all notes will have the same pitch), but if you hold down [Alternate] on the computer keyboard you will be able to move freely. The new notes are created at a spacing corresponding to the Snap value, and they all get the length of the Quantize value.



Painting notes with [Alternate] pressed.

- In Score Edit, you use the note and rest tools in a manner similar to the pencil, see page 25-14.

When you draw or paint notes, you can give them one of four fixed velocity values by holding down keys on the computer keyboard.

No key	Level 1	(Velocity 32)
[Shift]	Level 2	(Velocity 64)
[Control]	Level 3	(Velocity 96)
[Shift] + [Control]	Level 4	(Velocity 110)

The Note-Off velocity will always be 64 and the MIDI Channel will be that of the Part or Track, for all MIDI events.

If the Insert button is activated on the Functions Bar when you use the Pen or Brush, then all events in the Part will be moved one Quantize value forward when you input new events, just as with Step editing. See page 23-26.



The Insert button.

You can also create new events using the pop-up Functions menu, see page 23-24.

Changing the Length of an Event

You can graphically change the length of notes, in Key Edit and the List editor. This is done with the Pencil. See the relevant chapters.

Deleting Events

There are several ways to get rid of unwanted events.

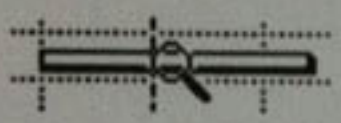
- Select them and press [Backspace] on the computer keyboard.
- Select them and press [Delete] on the computer keyboard.
- Select them and use Delete Events on the Edit menu.
- Select the Eraser from the Toolbox. Click on the events you want to eradicate. When you are finished, select the arrow pointer again, or any other tool from the Toolbox.

You can also conditionally delete events using the pop-up Function menus, see page 23-24.

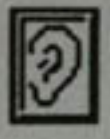
Monitoring events

Of course, you can have playback running while you are editing. And, you can also use the cue function in the Edit windows. But there are two more ways to listen to your music in the editors.

The Magnifying Glass
Select the Magnifying Glass from the Toolbox. When you click on a note using this tool, the note is played back. You can also hold the mouse button and drag the Magnifying Glass around over the notes.



The Ear
When you click on the Ear symbol on the Functions bar, events will be output automatically when you click on them, when you create them using the Pencil or Paint brush and when you make changes on the Info Line.



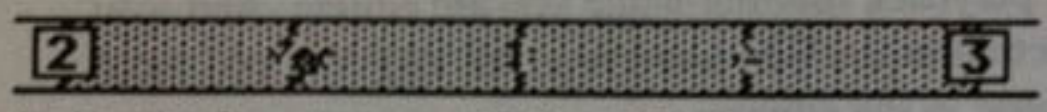
The Loop

In all four of the MIDI Editors you can set up a local Loop, which is a sort of "mini-cycle" for the Parts being edited. The Loop facility operates in addition to the Cycle, meaning you can Loop the Parts you are editing *while* Cycling Parts that are not being edited!

There are four ways to set the Loop:

- Use the left and right mouse button to directly set the values in the loop boundary boxes on the Functions Bar. The upper box is the start of the loop, and the lower is the end.
- Double click on the boxes and enter a value, just as with any position.
- Use [Alternate]-[L] and [Alternate]-[R] to open the Loop boundary boxes and enter the value.
- Drag directly on the Position Bar, in any direction.

Either way, the loop is shown in black on the Position Bar when it is on, and in grey when it is off.



An inactive Loop between 2.1.0 and 3.1.0.

You activate/deactivate the Loop by clicking on the Loop button or by pressing [Alternate]-[O].



The Loop Button.

When the Loop is active, the Part(s) in the Edit window loops almost independently of the rest of the music. We say "almost", because the Loop is still dependant on the Cycle. Every time the Cycle starts over again, so does the Loop.

The Loop is also used to direct editing to the events inside the Loop. See the next page.

Quantize and other Functions

You can use all of the options on the Functions menu in the editors. In addition you will find a pop-up Functions menu, offering some special commands. The *"select"* menu operates in conjunction with the *Functions* menu, so that only *a restricted set of notes and other events* are affected. This gives you very powerful control over the editing.

In the Edit windows, all Functions (both on the main menu bar and on the pop-up Functions menu) look at the "select" menu for deciding what events they should operate on.



The "select" menu is found between the pop-up menus "Goto" and "Function".

To direct the Functions, choose one of the options on the pop-up menu between the Goto and Functions menus:

All Events
All events, active or inactive, will be affected.

Looped Events
All events inside the Loop will be affected, whether the Loop is On or Off, and regardless of if the events come from active or inactive Parts.

Cycled Events
All events inside the Cycle will be affected, whether the Cycle is On or Off, and regardless of if the events come from active or inactive Parts.

Selected Events
All selected events, inactive or active, will be affected.

Looped Selected Ev.
Those events that are inside the Loop *and* selected will be affected.

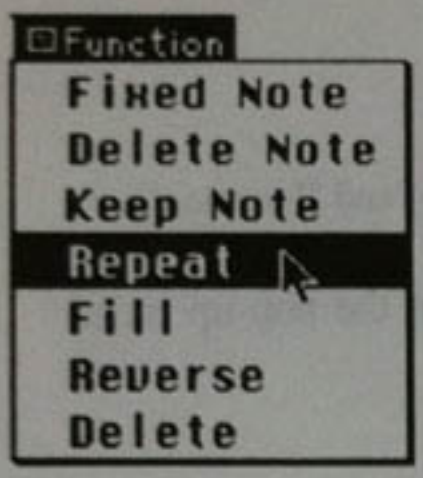
Cycled Selected Ev.
Those events that are inside the Cycle *and* selected will be affected.

Cubase tries to help you by automatically changing the selection from this menu when you select events, set the Loop and so on.

The main Functions menu is described in its own chapter, "Quantize and the Functions Menu".

The Pop-Up Functions Menu

This menu has some special commands on it. Again, only some events may be affected, depending on the "selection" menu (see prev. page).



Fixed Note
This gives all the notes affected the same note value as the selected note. All notes' positions, velocity and MIDI Channel values are left intact.

Make sure you only have one note selected when you use this function.

Delete Note
This deletes all notes with the same pitch as the selected note, but leaves all other notes. This means that if you select a C3 then all C3's will be deleted.

Make sure you only have one note selected.

Keep Note
This function is sort of the reverse of Delete Note. All notes that have the same pitch as the selected one are *kept*. All others are deleted.

Make sure you only have one note selected.

Repeat
This function is used to repeat a section of the Part until the end of the Part. You define the "repeat cycle" by setting the Loop or the Cycle. From there on there are two options:

- If the select menu is set to "Looped Selected Events" or "Cycled Selected Events", then the selected events inside the Loop/Cycle are repeated as

many times as it takes to fill the Part. The created events are added to the existing.

- If the select menu is set to just "Looped Events" or "Cycled Events", then all the events inside the Loop/Cycle are repeated and the created events *replace* the existing. The repeating goes on for as many times it takes to fill the Part.

Fill

This function only works when the "select" menu is set to "All Events", "Looped Events" or "Cycled Events". It then fills the whole Part/the Loop/ the Cycle with notes, with different default values depending on editor. In Key Edit they have a pitch corresponding to the centre of the window as it is scrolled at the moment. In Drum Edit they are put in on the selected Sound. In List Edit and Score Edit they are all C2 notes. The notes are spaced according to the Snap value and are all given a length corresponding to the Quantize value.

Reverse

This reverses the order of all events that are affected by the operation. Like when you turn a tape backwards.

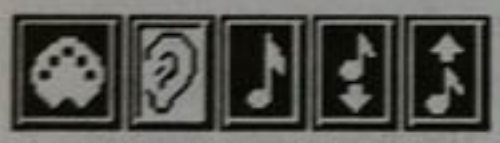
Delete

This deletes *all* events (notes, Pitch Bend, Controllers, the lot) that are set to be affected.

Editing Notes via MIDI

You can change MIDI notes' properties via MIDI. You can give them new pitches, new Key On Velocity, and new Key Off Velocity (in any combination) at the same time.

Click on the MIDI Connector symbol to activate MIDI Input. Decide what you want to change by clicking on any combination of the three symbols for note and velocity values.

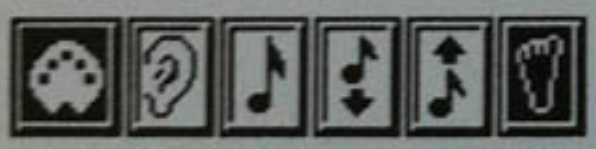


The MIDI In button, the Ear button and the three buttons for Pitch, Note On Velocity and Note Off Velocity.

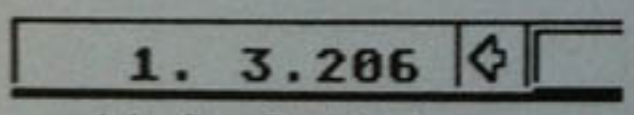
Select the first note you want to change. Play your keyboard (or other MIDI device) and the values for that note will change. Cubase automatically moves on to the next note in the active Part so that all you have to do to change its values is to play the keyboard again. You may activate a new Part or select a new note in the same Part at any time. A fast way to move back and forth among the notes to change their values is to use the [←] and [→] keys on the computer keyboard.

Step Programming

You can input notes in step time. Activate Step by clicking on the foot icon in the Functions Bar. The MIDI connector automatically gets activated to indicate that input is supposed to come via MIDI.



When you activate Step Input, the MIDI In connector is automatically turned on.



... and the Step Position box appears.

A Step Position box appears on the horizontal scroll bar. This shows you where note input will happen. You can change the Step Position directly in this field, and if you change the Song Position in any other way than through playback, the Step Position will be set to the same value. The Step Position is also shown in the note display as with the Song Position. Notes are put into the active Part, they will be spaced according to the Snap value, and will have the length of the Quantize value. You may of course change these values at any time during the input.

Play the keyboard and the first note/chord will be input at the Song Position. When you have released the last key, Cubase advances one step for you to input a new note/chord. You may use rewind, fast forward, or enter a new Song Position at any time to move input to that Position. You may also activate another Part at any time.

To move one step without entering any notes, press the [Tab] key on the computer keyboard.

The key velocities will be read and input with the notes.

The Insert Key

If you press [Insert] on the computer keyboard, a note is inserted at the same position as the currently selected note. It will take on the same default values as when you use Fill.

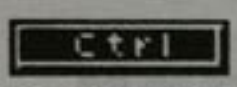
The In Button

If you activate the In button, all the notes after the current Position will be moved one step forward in time, each time you input new notes or press [Tab].

Continuous Data Editing

Some Edit windows (Key and Drum Edit) allow you to edit non-note events graphically, in a horizontal bar graph like area, called the continuous data display. This is a fast and powerful way to edit Velocity values, Program Change messages, Pitch Bend, After Touch, Continuous Controllers etc. For even more detailed (numeric) editing of non-note events and unusual controllers, use List Edit.

The continuous data display is turned on identically in Key and Drum Edit. You do this by clicking on the Ctrl button or by pressing [Alternate]-[C] on the computer keyboard.



The Control button...



... and some modulation wheel events in the continuous data display .

Selecting Event Type

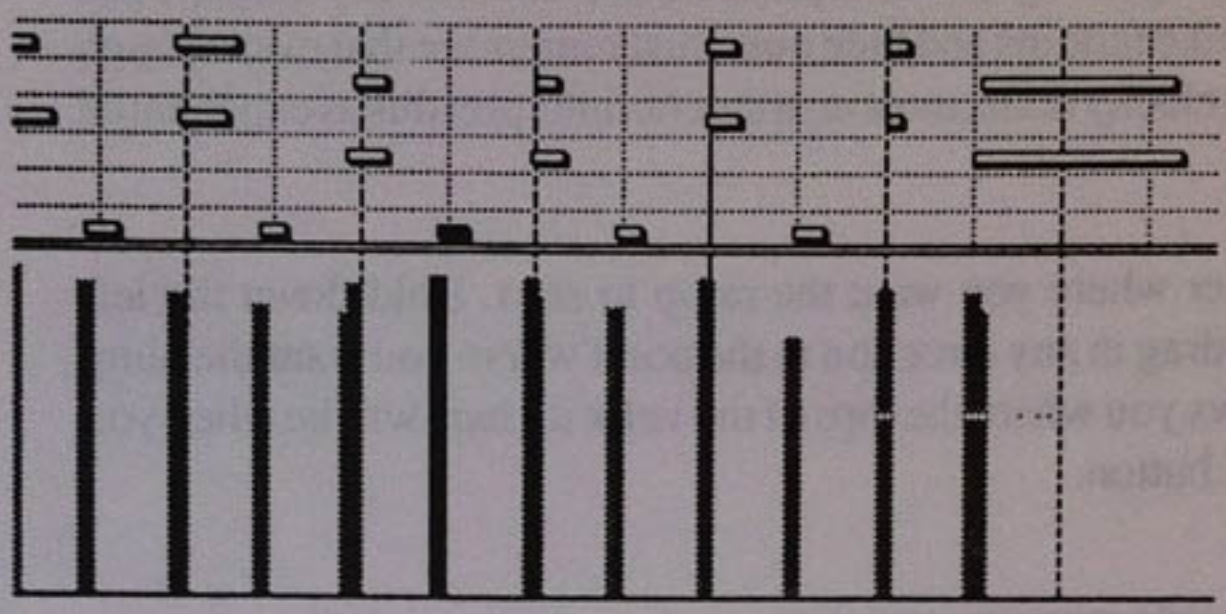
One display may be used to edit different types of events (one type at a time of course). You select event type in the editor. See each relevant chapter for details.

The Tool Box

When you are editing non-note data in the MIDI editors, only the arrow pointer, the eraser, the line tool, and the pencil have any function. Therefore, when you move into this area, the pointer changes into the arrow, if the tool selected doesn't apply.

Editing Velocity

Velocity values are shown in Key and Drum Edit as vertical bars below the start point of the note they belong to. Several velocity values may be placed on top of each other (in a chord for example).



Some notes with their corresponding velocity graphs. Observe the selected note.

If you do graphical editing of overlapping velocities (chords) you are editing the whole chord at the same time. To edit the velocity values of individual notes, use the Note Info line.

Using the Arrow pointer
If you click on a bar using the arrow pointer, this is the same as selecting the note(s) in the grid. So, this can be used to Cut, Copy, Keep, Delete notes and so on as usual. You can also drag a rectangle around velocity bars to select all notes from one point to another.

This is sometimes better than dragging a rectangle in the note grid, since that only selects notes within the vertical bounds of the rectangle.

Using the Pencil
You can draw in new velocity values by using the pencil. Either just click with the left mouse button on the bar to set a new value or drag vertically while holding down the left mouse button to change the value. You can also drag the pencil over several bars and thereby draw new velocity values for several notes in one drag. The Snap value applies, so you would generally make sure that the set Snap value is smaller than the distance between your notes/chords.

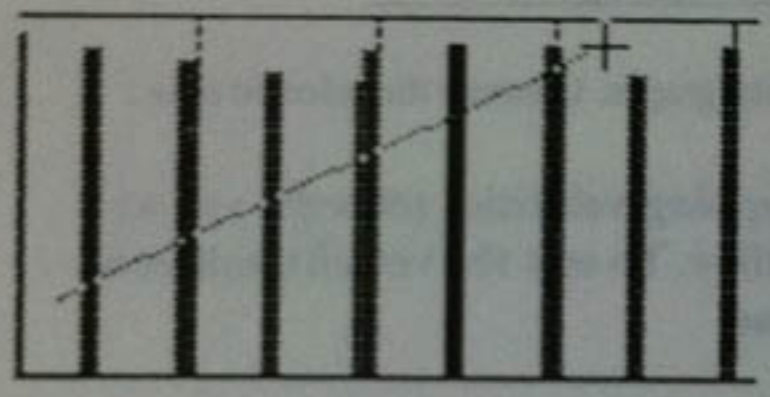
Otherwise, several notes/chords may be given the same velocity value when you drag.

The value box at the left side of the display shows you what values are drawn.

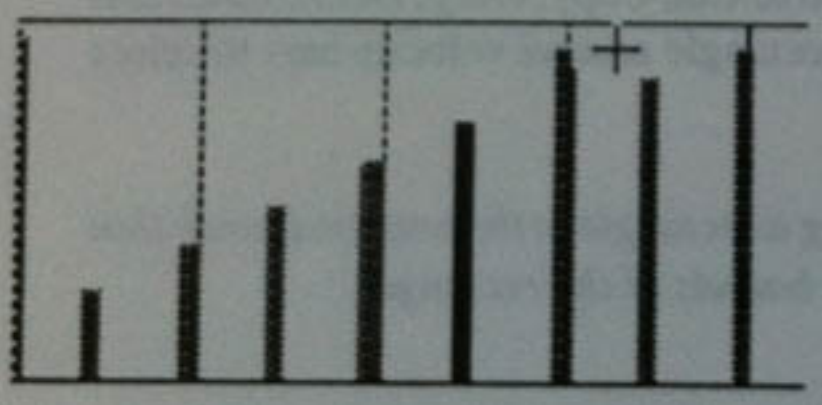
Using the Compasses

You can draw a ramp using the Compasses tools and thereby create even velocity changes, like fade ins and fade outs. Just remember that even though MIDI has a linear velocity scale, most instruments interpret this as exponential volume changes.

Position the pointer where you want the ramp to start. Hold down the left mouse button and drag in any direction to the point where you want the ramp to end. A line shows you where the tops of the velocity bars will be when you release the mouse button.



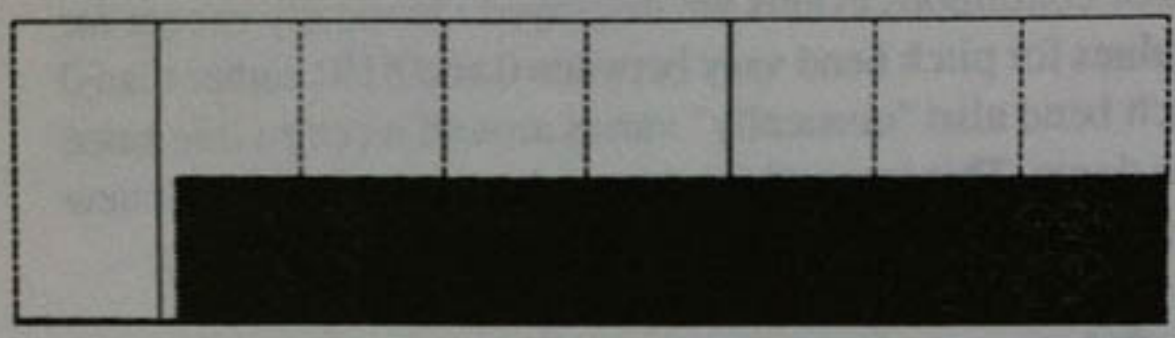
Drawing a line like this...



... creates a short fade-in.

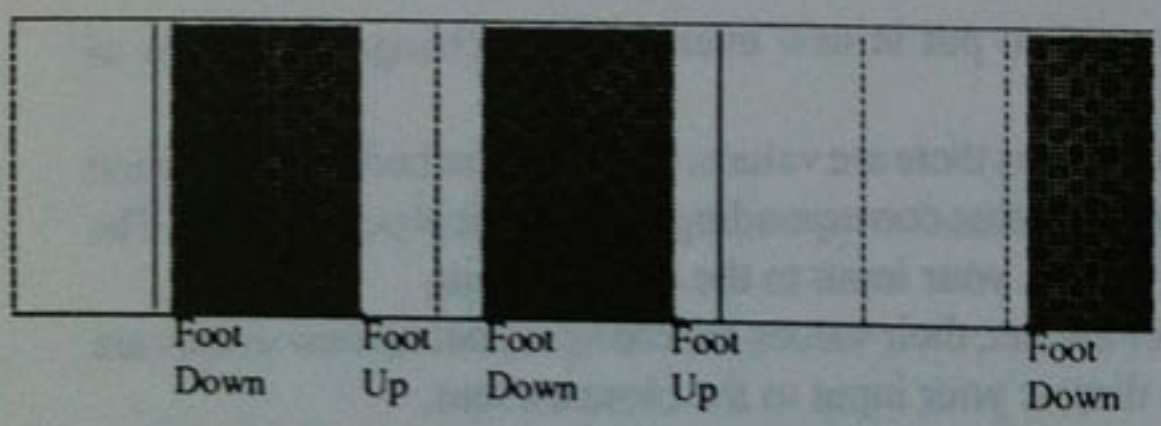
Editing Non-note Events

There is one very important thing to observe about non-note events. If you for example put in one single MIDI Modulation wheel event with a value of 63, it will be displayed like this:



The figure above might look like an "infinite" series of modulation events all with the value 63, but it is not, it is only one. It is a graph of instantly moving the modulation wheel to position 63 *and leaving it there.*

It is important to remember that drawing, or in any other way inputting, controllers makes them stay at the last set value for an infinite amount of time. Sustain pedal (damper) for instance, will vary between 0 and 127 every time you press or release the pedal, but stay at the last value as long as you don't move your foot on or off it. Draw in one "foot down" event, and the notes will sustain until a "foot up" event appears. All MIDI events can be thought of as a list, and it is this list that is showed horizontally in the continuous data display. Every time you see a jump from one value to another there is a new event in the list.



Cubase tries to clean up Controller changes that can lead to problems, especially when your music goes from one Part to another, but it can't correct everything. It is up to you to "zero" controllers when you want

them zeroed. Read the chapters about recording different types of events (page 7-7) and the Chase Events functions 21-2 and the MIDI Setup Global flags (21-13).

To edit some type of continuous data, open the editor, and if necessary, select the type of event to be displayed (see each editor for a description of how to do this). All types of continuous events are displayed identically except for pitch bend. The values for pitch bend vary between 0 and 8191 rather than 0 and 127. And, pitch bend also "musically" varies around a centre line since you can bend up or down. This means for instance that when you draw a new series of Pitch Bend values, they always start at centre value, not zero.

Using the Arrow Pointer

You can drag the pointer to make an enclosing rectangle and all events that you "touch" will get selected.

Once you have one or several events selected they can be deleted, Cut, Copied and so on as usual.

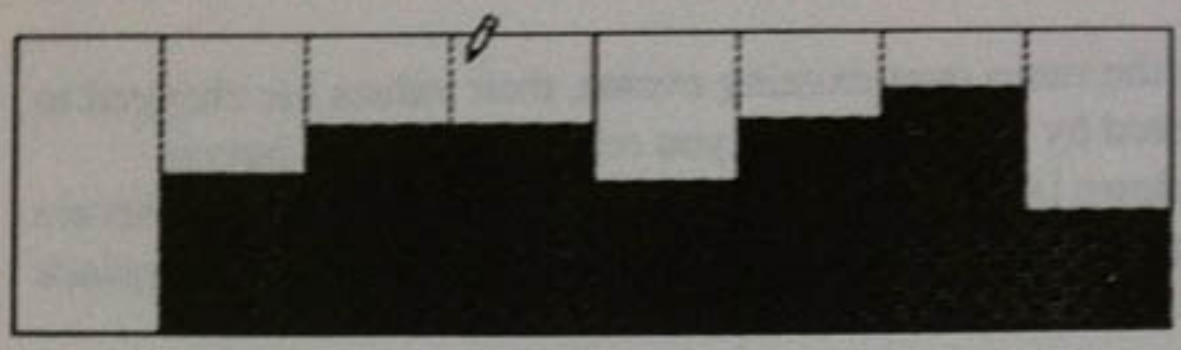
Cutting or deleting the events does not zero the values in the deleted area. It removes the events from "the list", which means that whatever event-value was before that, is valid up until the next existing event.

Pasting events puts them in, beginning at the current Song Position as always. The Pasted events are *inserted* at their relative positions in the "list", no events are deleted.

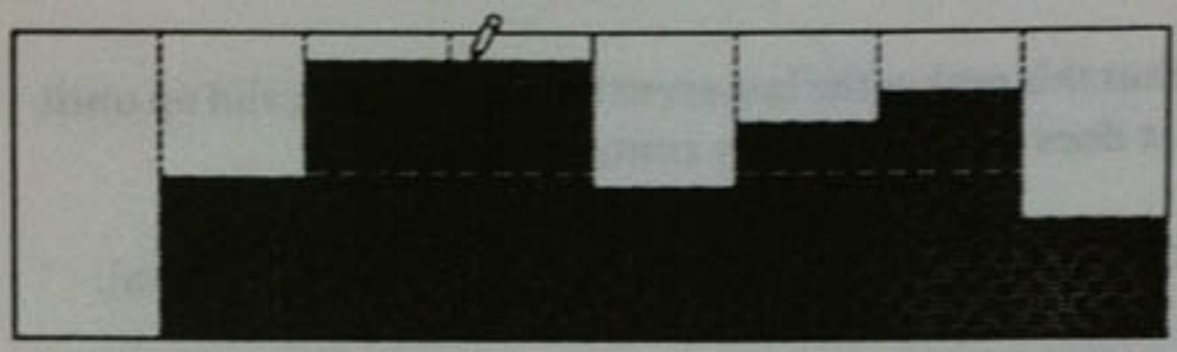
Using the Pencil

The pencil can be used to put in new events and to change the values of existing ones:

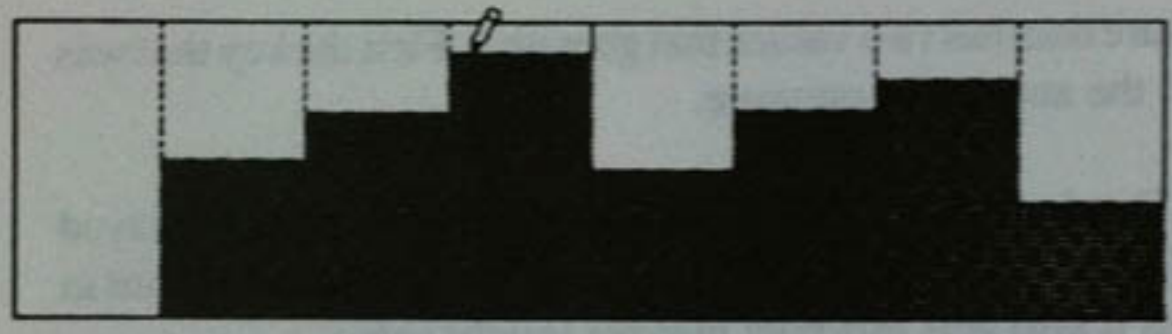
- If you click once where there are values, the last event before the position you click gets a new value corresponding to the vertical pen position. The Snap function directs your input to the closest event.
- If you *drag over* events, their values are changed, but no new events are inserted. Snap directs your input to the closest event.
- If you hold down [Alternate], new events are put in, *replacing* existing events, if there are any. All events are put in at the closest Snap value. Click once for one event, drag the pencil for many events. Use the Snap value to make sure that the density of the events isn't higher than it has to be.



If you click once with the pencil...



... the existing event gets a new value.



But if you had held [Alternate] down while clicking, a new event had been put in instead.

Using the Compasses

You can use the compasses to draw a ramp to change the values of existing events or put in new events.

Position the pointer where you want the ramp to start. Hold down the left mouse button and drag in any direction to the point where you want the ramp to end. A line gives you an indication of what the values will be.

- If you drag the ramp over existing events, their values are changed to those indicated by the ramp when you release the mouse button.
- If you hold down [Alternate] while making up the ramp, new events are input at a spacing determined by the Snap value. These events *replace* existing events.

Using the Eraser
The eraser deletes the event at the closest Snap position.

Please observe that this makes the last event before this one valid up until the next event. It does not "zero" any controller changes.

You can either click once to erase one event or to drag to delete several.

Poly Pressure

Polyphonic pressure data has two values that go with it. First the key that was pressed, and then the amount of pressure.

In the Controller Display, only the Poly Pressure data for the note displayed on the Info Line (select one note only!) is shown. When you draw or paint in Poly Pressure data it also gets this note number (pitch) value.

Similarities and Differences Between Editors

Even though the Edit windows all look pretty different, they have similar behaviours. On the top line of each you will find a number of functions, pop-up menus, value boxes and display boxes that work sim..arly or identically in all Edit windows.

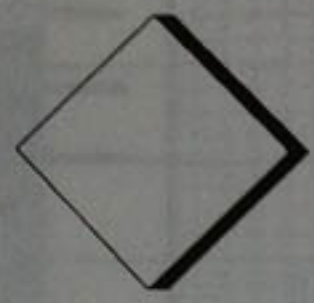
If you learn one Editor you will easily be able to master the others if you just understand the principle for each one. But, please take the time to read the whole text for each one, you will probably learn one or two useful tricks.

Here is a brief run-down of the differences and similarities between the editors. Don't expect to understand everything if you haven't tried the Editors

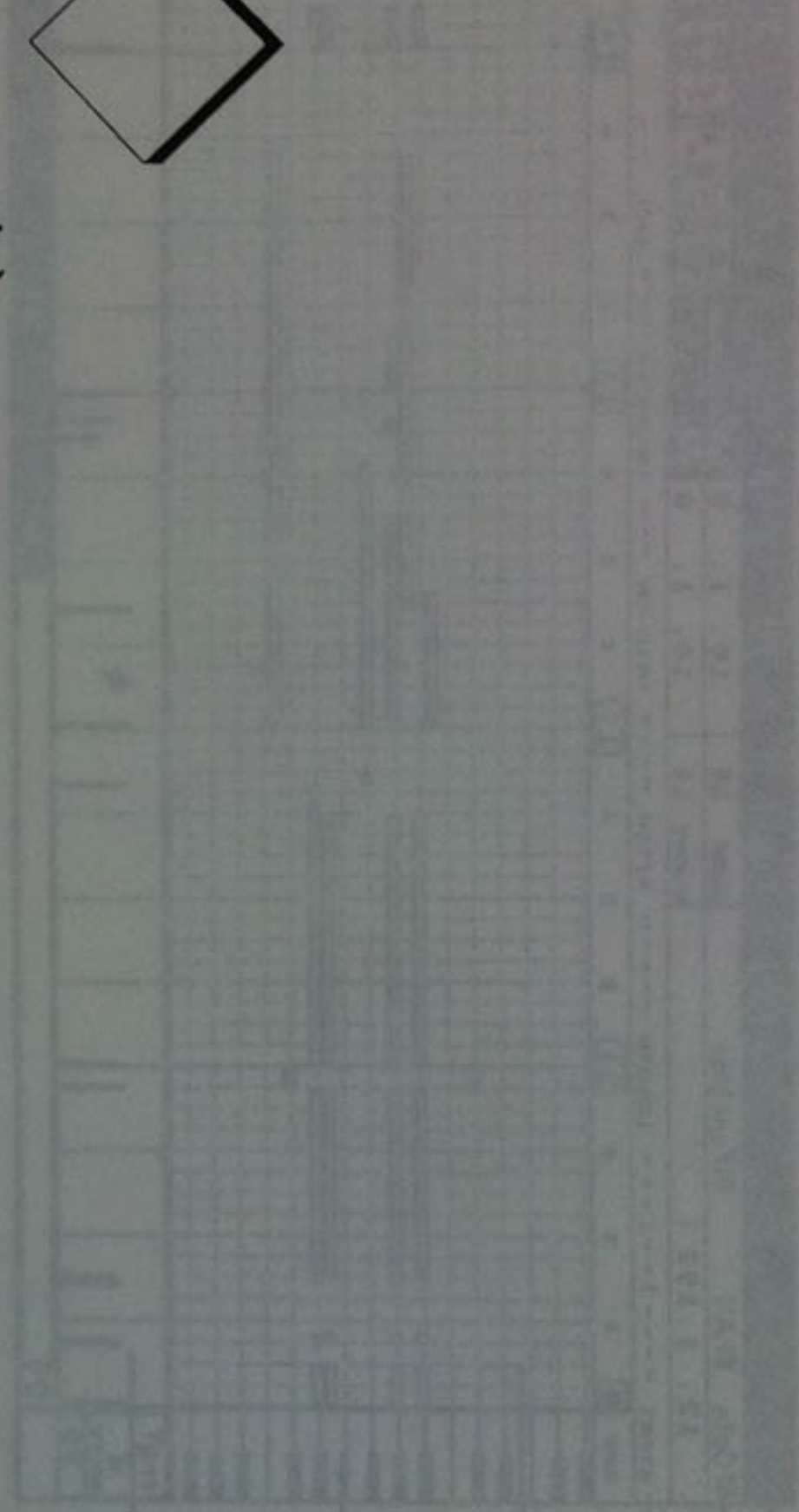
yet. Use this list for reference when you master one editor and want to try the next.

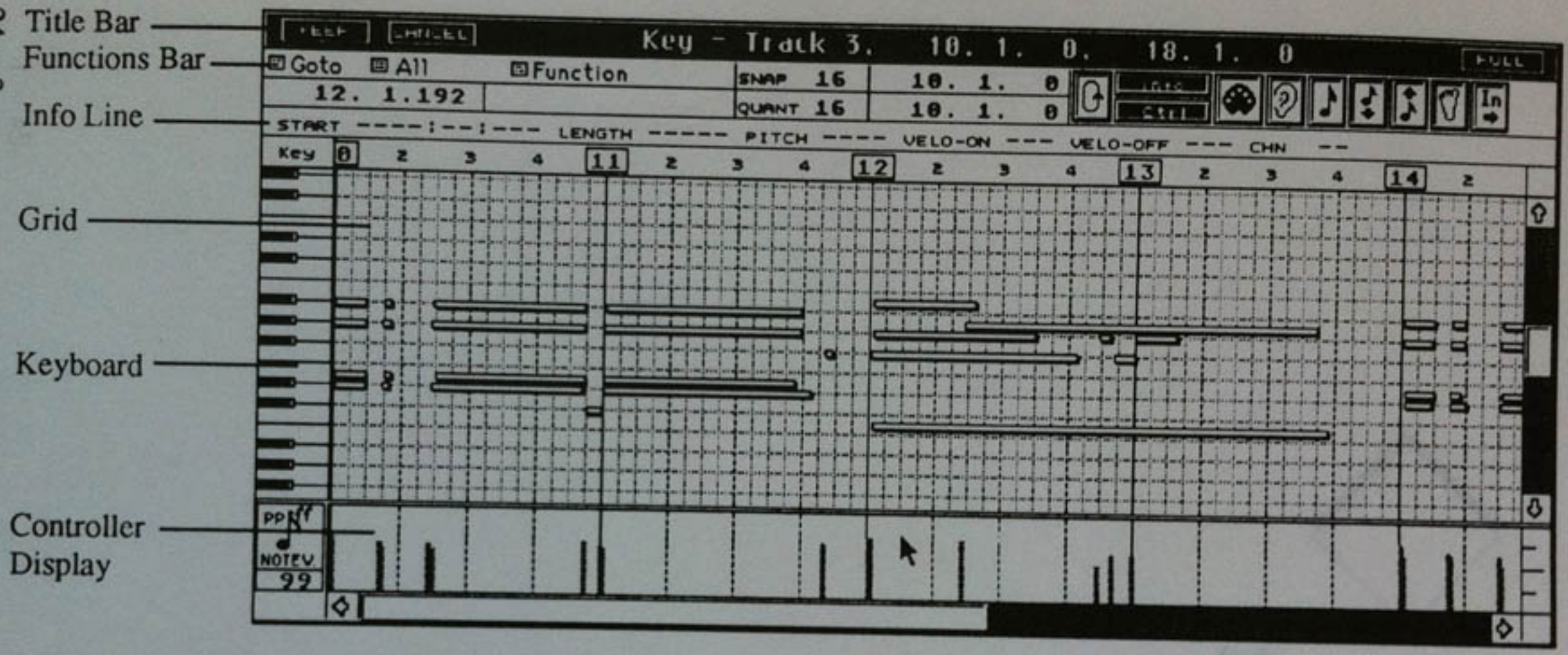
- Selecting, moving and duplicating events is very much alike in all Editors.
- Mouse, Quantize and Snap also work after the same principles for all, except for Drum Edit where each sound has its own Quantize (Qnt) and Length value.
- The pop-up Goto, "select" and Function menus work identically except for the default values for some functions and the fact that List also has a Mask and an "Ins" (Insert) menu on the Functions bar.
- The Note Info Line is identical in Key, Drum and Score Edit. List doesn't have one.
- The behaviour of the Loop is identical, although Score Edit has no Position Bar.
- Step edit and input via MIDI also work along the same lines wherever you are. Observe that MIDI input is also used to set up the map in Drum Edit.
- The Toolbox is very much alike in Key and Drum Edit. It is a bit different in List although it uses the same principles. Score uses its own Toolbox.
- Non-note editing is similar in Key and Drum Edit, and different in List Edit. Score Edit doesn't have non-note editing.

Remember that Key, Drum and Score Edit can be used to edit any combination of Parts from different Tracks should you so wish, and that List Edit can only be used for one single part on a Track or all Parts on one Track.



Key Edit




Title Bar
Functions Bar
Info Line
Grid
Keyboard
Controller Display
Key - Track 3. 10. 1. 0. 18. 1. 0
Goto
All
Function
12. 1.192
SNAP 16
QUANT 16
START ----:--:--- LENGTH ----- PITCH ---- VELO-ON --- VELO-OFF --- CHN --
Key
NOTEV
99

This editor is used for editing MIDI Tracks. When you double click on a Part on a MIDI Track you open Key Edit.

On the top of this window you find the Functions Bar that is similar in all Editors. Below this you *may* find the Event Info Line, if it is active (see page 23-15).

The central part is of course the note display with the notes. This displays the music in a piano roll fashion. You have a piano keyboard at the left end where the vertical mouse positi n is shown. All events are displayed as boxes relative to this keyboard. The length of a box represents the length of the event. The spacing of the grid in the note display changes with the editor Quantize setting so you can check off the Quantize value graphically directly in the event display.

The notes in the display can be moved, duplicated, cut, copied and pasted, lengthened and shortened by using the tools in the Toolbox. You can draw and paint in new events. You also have the main Functions menu and the local Functions menu at your disposal to perform swift and effective changes to your MIDI recordings. All these functions are described in general in the previous chapter. What follows is just explanations of things that are specific to Key Edit.

You have a Position Bar above the actual event display, very similar to the one in the Arrange display. The Song Position is shown graphically, just as in the Arrange window.

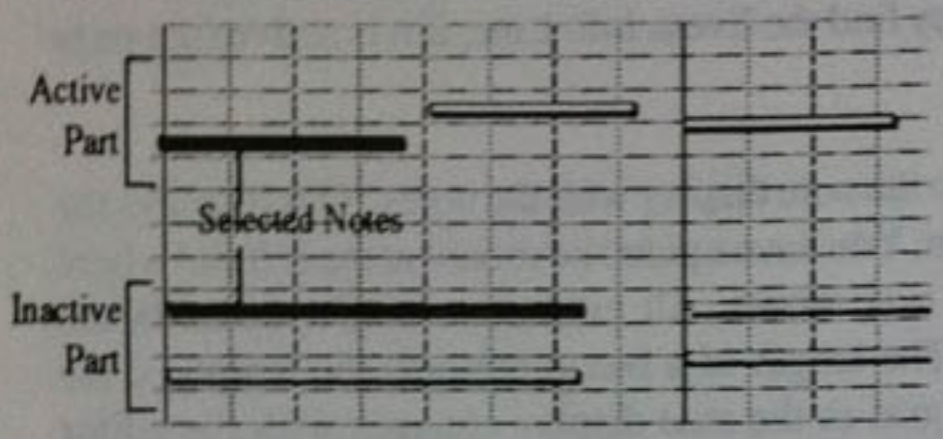
Below the event display you *may* see the continuous data display which shows all use of Velocity, Controllers, Pitch Bend and so on, graphically.

The Notes in the Display

Several Parts can be edited at the same time, but only one at a time is active. Notes belonging to an *active Part* are white (or black when they are selected, see below) and events belonging to an *inactive Part* are dimmed (and grey when selected).

- To activate a Part, click on any event that belongs to that Part. You can

also use the Next/Previous Part commands on the Goto menu, which is convenient if the Part is empty.



Changing the Length of a Note

You can change the length of an existing note using the Pencil icon. Hold down the *right* mouse button to bring up the Toolbox. Select the Pencil.

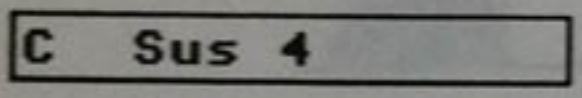
Position the pointer over the note you want to change, and drag to the left (shorten) or to the right (lengthen). An outline of the note shows the size while you are dragging. The Snap function helps you to restrict your changes to some even note value.

It might be hard to determine if you have the pointer over the note or not. To avoid painting in *new* notes, hold down [Alternate] on the computer keyboard. This restricts the use of the pencil to length-changes only. Also, remember that it is the tip of the pencil you are pointing with, and that you don't have to find the exact end of the note. Positioning the pointer over any part of it is OK.

When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

Chord display

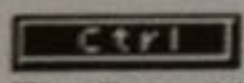
As you have probably seen by now, the keyboard display at the left side of the Key Edit window shows what keys are pressed at the moment. But the little box on the Functions Bar, beside the Mouse Position box, also shows the chords, both the ones you are playing, and the ones played back from the Edit window.



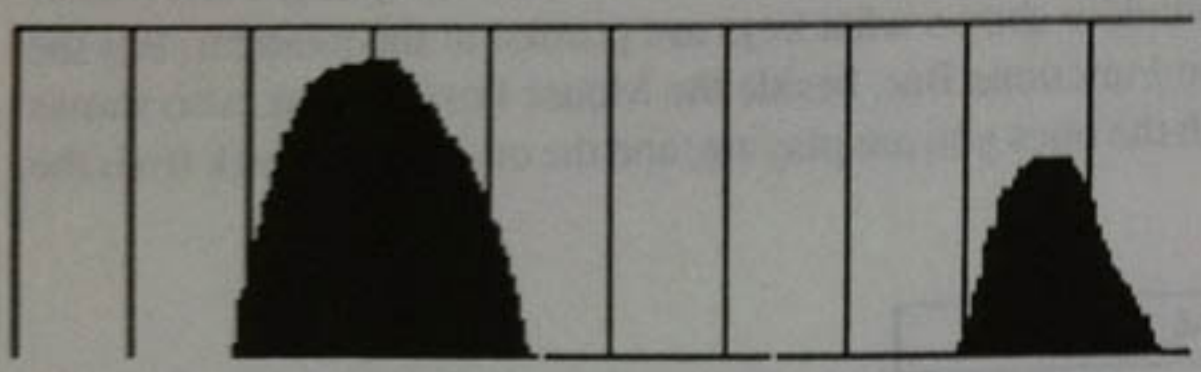
The Controller Display

Key Edit also allows you to edit non-note events like Velocity values, Program Change messages, Pitch Bend, After Touch and Continuous Controllers, graphically. The Controller Display is made up for fast and powerful editing, so only the most common Continuous Controllers are directly included. For even more detailed (numeric) editing of non-note events and unusual controllers, use List Edit.

You turn the Controller Display on and off by clicking on the Ctrl button or by pressing [Alternate]-[C] on the computer keyboard. When it is on, the lower part of the grid turns into the Controller Display. You may at any time drag the dividing line between the Controller Display and the note grid so that you use the window as effectively as possible. This does not change the range of values that are displayed, it scales the Controller Display. This means that you will always be able to see the full value (most often 127) of any event, it is the magnification that changes when you move the dividing line. This is obvious if you check the scaling lines on the right side which indicate 25%, 50% and 75% of the top value.



The Control button...



... and some modulation wheel events in the continuous data display .

There is a box on the left side below the event type icon that shows the vertical mouse position according to a scale corresponding to the value of the events (most often 0-127).

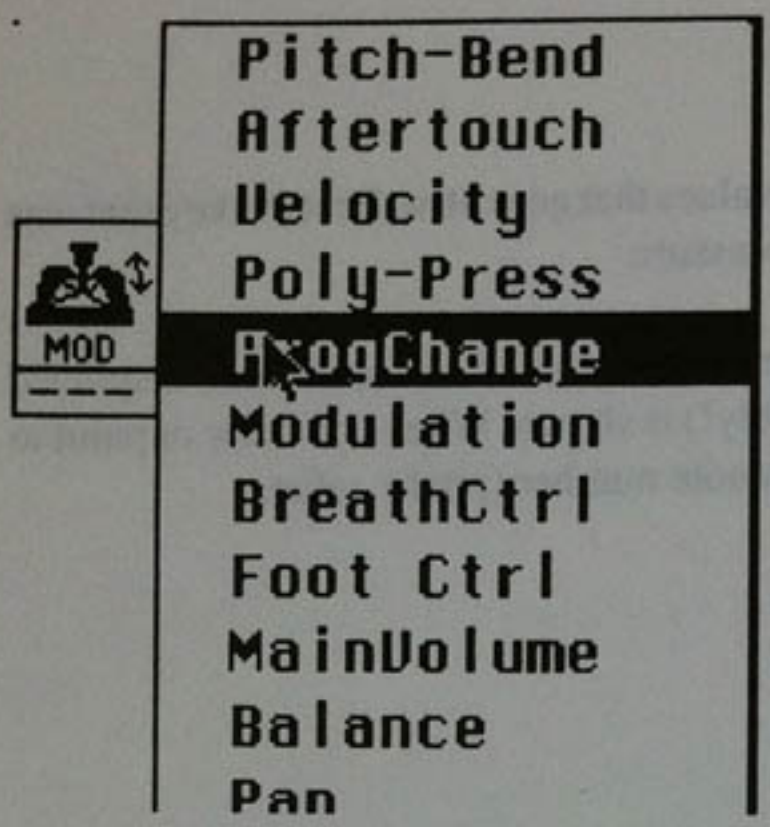


The event type icon and the value box just under it.

Only one Part a time (the active Part) is displayed and edited in the continuous controller display.

Selecting Event Type

To the left you have an icon indicating what type of event is currently shown (one at a time). To change this, press and hold down the left mouse button over the icon and a pop-up menu appears. Select the type of event you want to display.



Defining Your Own Controllers

For those of you who really want to get into Controller editing, there are three Controllers in the list that are not directly specified, the last three. You can set Controller numbers for these three yourself.

When you select "Unknown Control" you are always asked to specify a Controller number in a Dialog box. Use the left and right mouse button to scroll the list of numbers (click on the number) or to bring up a pop-up menu with all Controllers' names (click on the name), and select one. When you are finished, click Exit. Use this for temporary editing of some unusual Controller.

When you double click on the Event Type icon a dialog box opens up allowing you to select a Controller for each one of the last two items on the pop-up menu under the event type icon. Use the left and right mouse button to scroll the list of numbers (click on the number) or to bring up a pop-up menu with all Controllers' names (click on the name), and select one. When you are finished, click Exit. The selected Controllers appear at the bottom of the Event Type menu. Use these two for some Controllers you use often. Some synths allow you to specify an arbitrary Controller number to change certain functions via MIDI, and these two are perfect for this.

Poly Pressure

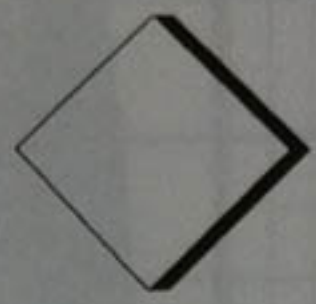
Polyphonic pressure data has two values that go with it. First the key that was pressed, and then the amount of pressure.

In the Controller Display, only the Poly Pressure data for the note displayed on the Info Line (select one note only!) is shown. When you draw or paint in Poly Pressure data it also gets this note number (pitch) .alue.

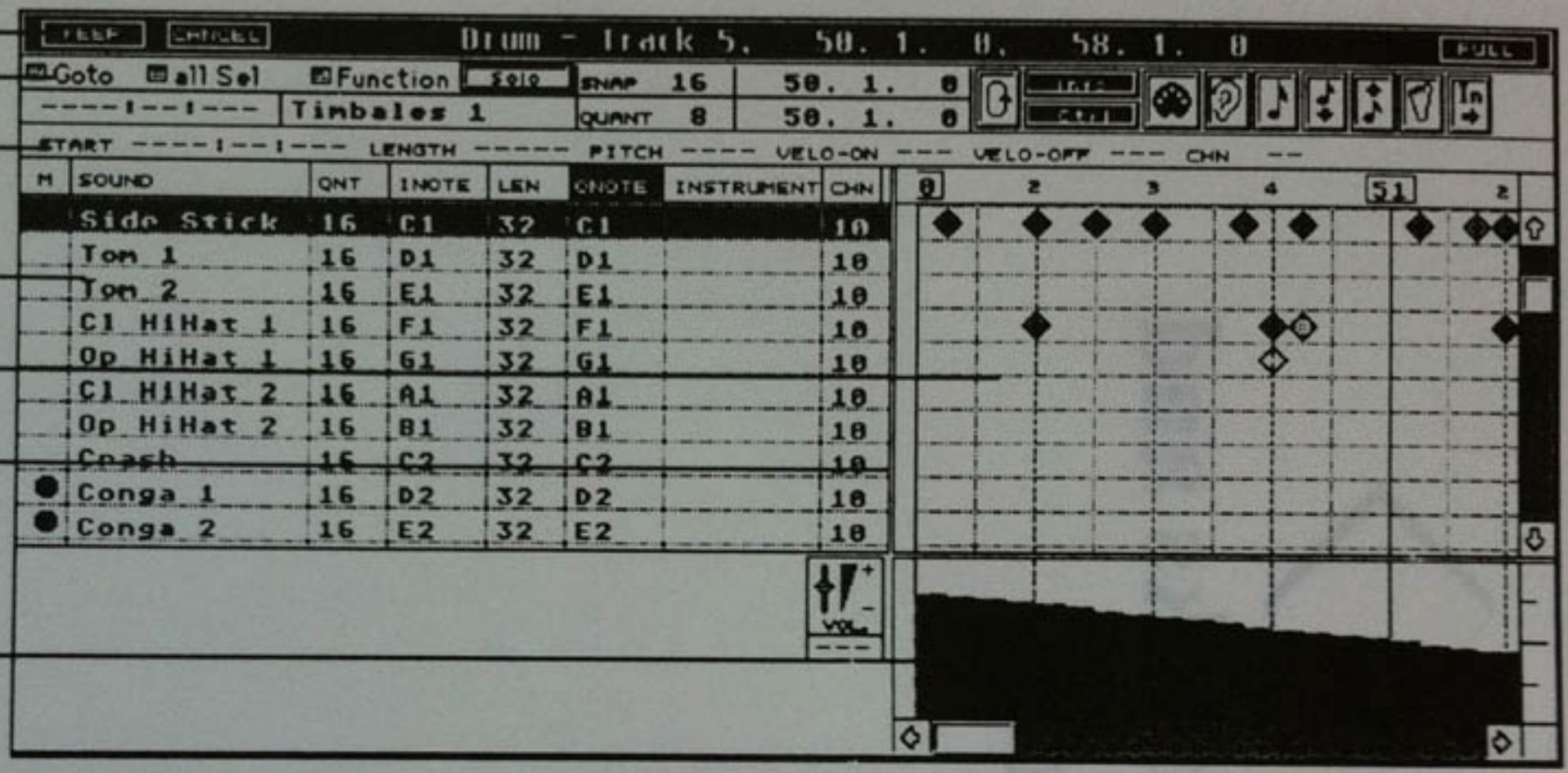
The Score Edit Chapter has been rewritten.

Please look up the new text in Chapter *III* in the separate Cubase Score Book

The Score Edit in Page Mode Chapter has been replaced by the separate Cubase Score Book



Drum Tracks and Drum Edit


Title Bar
Functions Bar
Info Line
Drum Map
Grid
Dividing Line Between Drum Map and Grid
Controller Display
Drum - Track 5. 50. 1. 0. 58. 1. 0
Goto
all Sel
Function
Solo
SNAP 16
QUANT 8
Timbales 1
START ----!--!--- LENGTH ----- PITCH ---- VELO-ON --- VELO-OFF --- CHN --
M SOUND QNT INOTE LEN QNOTE INSTRUMENT CHN
Side Stick 16 C1 32 C1 10
Tom 1 16 D1 32 D1 10
Tom 2 16 E1 32 E1 10
C1 HiHat 1 16 F1 32 F1 10
Op HiHat 1 16 G1 32 G1 10
C1 HiHat 2 16 A1 32 A1 10
Op HiHat 2 16 B1 32 B1 10
Crash 16 C2 32 C2 10
Conga 1 16 D2 32 D2 10
Conga 2 16 E2 32 E2 10

Drum Tracks and the Drum Map

MIDI identifies drum sounds by putting them on different keys. i.e. assigning them to different MIDI note numbers. That means that when you use a keyboard to record a drum part in a sequencer, you use one key for bass drum, one for snare and so on. Normally you are able to rearrange the drum sounds on the receiving instrument (drum machine, sampler or synth) so that you can make a sound react on any key number.

The Drum Map in Cubase allows you to make a list of up to 64 drum and percussion Sounds that you have access to, and define a number of things individually for each one of them, like what MIDI Channel they are on, what key (MIDI note number) they are set to react on, how they should be quantized and so on.

Drum Tracks can also be edited in Score Edit which has a special feature for selecting a note symbol for each Sound in the List. See page 26-31.

It may take some time to "tell" Cubase how your drum sounds are arranged (setting up the Drum Map), but it is worthwhile, since it gives you access to Drum Edit's tools, and allows you to handle the sounds by names, in a way that is easier to relate to than MIDI note numbers. You can also save Drum Maps to disk so that you can easily load a configuration that suits your current setup.

Only one Drum Map at a time is activated. All Parts in all open Arrangements use the same Drum Map.

SOUND	QNT	INOTE	LEN	CHN	LV1	LV2	LV3	LV4
Kick 1	16	C0	32	10	70	90	110	120
Kick 2	16	D0	32	10	70	90	110	120
Kick 3	16	E0	32	10	70	90	110	120
Snare 1	16	F0	32	10	70	90	110	120
Snare 2	16	G0	32	10	70	90	110	120
Snare 3	16	A0	32	10	70	90	110	120
Snare 4	16	B0	32	10	70	90	110	120

A section of the Drum Map when you are editing a MIDI Track...

SOUND	QNT	INOTE	LEN	ONOTE	INSTRUMENT	CHN	OUTPUT	LV1	LV2	LV3	LV4
Kick 1	16	C0	32	C0		10	ATARI	70	90	110	120
Kick 2	16	D0	32	D0		10	ATARI	70	90	110	120
Kick 3	16	E0	32	E0		10	ATARI	70	90	110	120
Snare 1	16	F0	32	F0		10	ATARI	70	90	110	120
Snare 2	16	G0	32	G0		10	ATARI	70	90	110	120
Snare 3	16	A0	32	A0		10	ATARI	70	90	110	120
Snare 4	16	B0	32	B0		10	ATARI	70	90	110	120

... and when you are editing a Drum Track.

How Drum Tracks work

It is common to use several sound sources to make up a complete drum kit. You may have recorded the drums at home with a drum machine, and decide to use a sampler or another drum machine (partly or completely) when you come to the studio. It is time consuming to remap sounds on a sampler or reprogram note numbers on a drum machine, so Drum Edit is made up to allow you to quickly set up the right combination of note numbers, MIDI Channels and Outputs for all the drum sounds, afterwards!

I-Notes and O-Notes

The most important thing to understand (and most complicated) with Drum Edit is the handling of notes and the Drum Map.

With Drum Tracks, all recording and playback is directed *via* the active Drum Map.

This is how the Drum Tracks works: For each Drum Sound in the Map you can set up an I-Note (Input Note). This is a certain key (MIDI Note number) used for playing (inputting) the drum sound, for example while recording. You can also set an O-Note (Output Note) used for playing back the Sound.

So you yourself define a note for input and another note for output. These can of course be set to the same note number should you so wish. When you later play back the Part, you may change either setting. Changing the O-note, Output or MIDI Channel will allow you to redirect everything recorded with that Sound to another sound source.

Let's say that you have recorded a bass drum Part on a Drum Track. You did this at home. If you later want to play back the bass drum sound using another instrument like a sampler in a studio, you probably have to see to that the bass drum is output to some other note number. All you have to do to achieve this is to locate the bass drum in your Drum Map, and change its O-Note to some other value.

Changing the I-note allows you to use another key (or drum pad or whatever) to record hits with that Sound.

Say that you have a rack synth with some drum sounds in it. They are spread over the keyboard range in a way that is inconvenient for your playing style. First set the O-notes in the Drum Map so that they match the actual notes that play back the sounds on your instrument. If the instrument plays back the bass drum on the C2 key, then set the O-Note for the bass drum Sound to just that, C2, so that the Sound plays the bass drum. Now you can rearrange the whole "drum kit" so that the fingering suits you just by setting the right I-notes.

This is how Cubase performs this trick: The Drum Map is a list of 64 drum or percussion definitions, called Sounds. When the Drum Map parameter is set to On, Cubase stores these Sounds internally from MIDI Note number 63 and down to 0. That is, the first Sound in the list is always stored as D#3, the second as D3, the third as C#3 and so on down to C-2. This is fixed and can't be changed.

When you play a key that corresponds to a set I-note, Cubase directs this incoming MIDI message to the corresponding Sound. If you have set the first instrument in the list to I-note F3, then all F3's will be directed to D#3.

Then, in order for you to hear anything, Cubase sends out the right O-Note. This should be set to the note number that plays back the drum sound on your instrument.

So, if you have set the first drum in the list to I-Note F3 and O-note G5, then

F3 is used to input the notes, D#3 to store them in Cubase and G5 to play them back. And again, it is only the middle value (D#3 in our example) that is actually stored with the recording, both the other two numbers can be changed at any time.

	I-Note	Stored Note	O-Note
Bass Drum	F3 ➠	D#3 ➠	G5

MIDI Channel and Output
There is a MIDI Channel and an Output setting for each Sound in the Drum Map. If you set the whole Part or Track to send on MIDI Channel "Any", you can here set the playback MIDI channel individually for each Sound. You can also select different Outputs for each Sound. The Output and MIDI Channel can of course be handled together as Instruments.

Using List Edit With Drum Tracks

If you have recorded a Part on a Drum Track, then all the notes will be placed somewhere in the range C-2 to D#3 (MIDI Note number 0 to 63) with the first Sound in the Drum Map at D#3. But, in the Comment column you will see the name of the Drum Sound for each note, which simplifies editing.

Setting Up the Drum Map

Only one Drum Map is used at a time, and all Parts and all Arrange windows use the same Map. You can Open and Save Maps at any time, you don't *have* to do that from inside Drum Edit (although it might feel more logical).

You can decide how much of the Drum Map you want to see by dragging the dividing line between the Map and the grid.

The Drum Map consists of 64 rows, one for each Sound. You can step through the sounds with the [↓] and [↑] keys on the computer keyboard. The Drum Map has a number of columns also. Use the mouse to change the values for

a field. Numbers can be changed using the left and right mouse button and [Shift] as usual, and names are also edited as always.

If you hold down [Alternate], you are changing this value for all the Sounds. Use this to set all sounds to the same Output, MIDI Channel and so on.

Some of the parameters (I-Note, O-Note and LV1 to LV4) can be set directly via MIDI: Drag the dividing line so that the column you want to change is displayed. Click once on the MIDI In icon (the MIDI connector symbol). Select the column you want to change by clicking either in one of the fields in the heading or in one of the fields for any of the Sounds. Select the Sound you want to change. Now play a note on your MIDI Input source (keyboard or whatever) and the value for the field is entered. Select another Sound (and another column if you so wish) and input the next value.

An example: to set all the I-Notes to the same keys as the drum sounds on your keyboard, do as follows:

- ❑ Click in the I-Note column once so that the text I-Note in the headings is inverted.
- ❑ Select the first Sound by clicking on it.

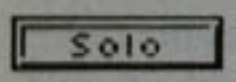
M	SOUND	QNT	INOTE	LEN
	BassDrum	16	C#1	32
	Snare	16	C#2	32

- ❑ Press the key on your keyboard that plays that first drum sound.
- ❑ Press [↓] on the computer keyboard to step to the next Sound.
- ❑ Repeat the last two steps to enter the I-Notes for all drums, and finish off by saving the Drum Map to disk.

If you have the Ear turned on, changes in the Drum Map are sent out via MIDI so that you for example can hear what drum sound will be played.

The Columns

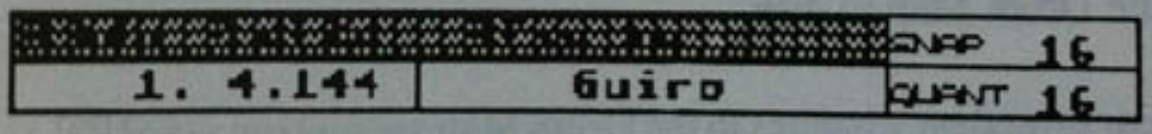
Mute and Solo
By clicking in this column, you can mute the Instrument. This is only a temporary setting, that can not be recorded and is *not* saved with the Drum Map. You can also Mute all Instruments *but* the one selected, by activating "Solo" on the local menu beside the local Functions menu, or by pressing [Alternate]-[S] on the computer keyboard.



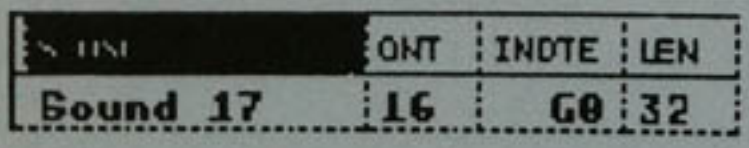
Sound
This is the name of the Sound. When you first enter Drum Edit with the DEF.ALL loaded that comes with the program all Sounds are named "Sound" and a number between 1 and 64. You click on the name or select a Sound and press [Alternate]-[N] on the computer keyboard to open a regular name box.

Qnt
This is a Quantize value set for each Sound that is used for individual Quantizing and for inserting and Step Inputting notes.

Len
When you input new notes using the Drum Stick or the Brush or via Step Editing the notes get this length value. The length may or may not be important since many drum sounds (especially on drum machines) play to their end regardless of how long notes you play. Note that this value is set in regular note values, while the Info Line shows the lengths in ticks.



The Mouse, Sound, Snap and Quant box are all on the Function bar...



... while Qnt and Len are set for each Sound.

I-Note
This is the Note used for inputting the Sound. The value can be set via MIDI.

O-Note
This is the note (the key number or MIDI Note number) that is used to play back the sound. This value can be set via MIDI.

Instrument
This is the instrument (Output and MIDI Channel) used for the Sound. It is used to make Sounds send on different Outputs and MIDI Channels.

Chn
This is the MIDI Channel for the whole Sound (all notes). It is a playback MIDI Channel just as the MIDI Channel setting for each Track or Part in the Arrange window.

For this to have any effect you must set the Track/Part to MIDI Channel "Any".

Output
This is the MIDI Output for the Sound.

LV1 to LV4
When you paint or draw in notes in the editor you can decide for one of four levels for each drum note, by holding down different combinations of keys on the computer keyboard while entering the notes. What these four levels are supposed to mean in MIDI velocity numbers is set using LV1 to LV4. This value can be set via MIDI.

This is not a playback function. The values are used when inputting notes, not while playing them back. The velocity set using LV1 to LV 4 will be a permanent part of each note. But velocity for the notes can of course be edited afterwards, as all other note values.

Editing MIDI Tracks in Drum Edit

You may also Edit regular MIDI Parts in Drum Edit, by selecting MIDI Parts (or just a Track) and selecting Drum Edit from the Edit menu or by pressing [Control]-[D] on the computer keyboard. When you do this, a simplified Drum Map is used where there is no O-note or Instrument setting. In this map the actual MIDI note numbers recorded are used to decide on which "lines" (Sounds) the notes should be displayed. If you have recorded your snare on the key D2 and there is a Sound set to I-note D2, all your Snare hits will be displayed on this line. When you use Drum Edit to edit MIDI Tracks, some of the columns work differently than with Drum Tracks:

I-Note
The I-Note is the note (the key, the MIDI Note number) used both to input, to display and to play back the sound.

Chn
This will be the Channel number for the notes you draw in or in any other way input directly in the editor. For this to have any effect you must set the Part to MIDI Channel "Any".

Changing the Drum Map
If you change the I-Note for a Sound, while editing, then the notes previously displayed on that line will of course disappear since the I-Note note number doesn't correspond to the notes any more. Conversely, all notes that are already in the Part and have the same note number as the I-Note will appear when a Sound's I-Note value corresponds to these notes'.

Converting between MIDI and Drum Tracks

If you change the class of a MIDI Track to Drum Track or vice versa a dialog box appears asking you if you wish to transform the Part(s) on the Track.

- If you convert a MIDI Track into a Drum Track, the conversion will look at the note numbers of the recorded parts and the I-note settings in the Drum Map and then "transpose" each note so that it appears on the right

Sound in the Drum Editor.

- If you convert a Drum Track into a MIDI Track, the conversion dialog box will ask you if you wish the transformation to take place after the I-note or O-note settings. This however, will make you loose the Output setting for each Sound.

Recording

To edit a Part in Drum Edit, you must either first record in an Arrange window or you must directly Create the Part, as with all Edit windows.

You should have the Drum Map set up correctly before you do any editing or recording of notes. Select (or create) a Drum Track and enter Drum Edit to make up the Map.

The Drum Edit Window's Parts

The window consists of two Parts, the Drum Map and the Note Display. You can decide for yourself how much of the window you want to devote to the Drum Map and how much to the Note Display, by dragging the dividing line to a Position that suits you, just as between the Track List and the Part Display in the Arrange window.



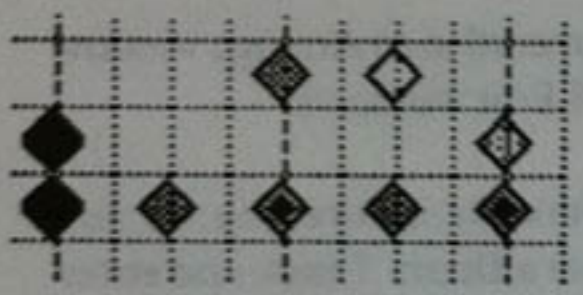
On the top of this window you find the Functions Bar that is similar in all Editors. Below this you *may* find the Note Info Line, if it is active (see page 23-15).

The central part is of course the Drum Map and the Note Display, and below this you again *may* see the Controller Display which shows all use of

Velocity, Controllers, Pitch Bend and so on, graphically.

The notes in the Display

Notes are shown as rhombs in the note grid. The "color" (grey scale) of each rhomb represents velocity. Several Parts can be edited at the same time, but only one at a time is active. Notes belonging to an inactive Part are dimmed.



Some notes with different velocity values.

The notes in the display can be moved, duplicated, cut, copied and pasted by using the tools in the Toolbox. you can shorten and lengthen them using the Info Line. You can draw and paint in new events. You also have the main Functions menu and the local Functions menu at your disposal to perform swift and effective changes to your MIDI recordings. All these functions are described in the "Using the Editors" chapter. What follows is just explanations of things that are specific to Drum Edit.

The Note Info Line in Drum Edit

If you are editing a Drum Track, the Note Info Line shows the actual note values (D#3 to C-2) that the notes represent, which might make changing this value confusing.

Changing a note's pitch on the Info line makes it disappear from the Sound it is on and might make it appear on another (if that Sound is set to a pitch corresponding to the note).

Selecting Notes

You can use all the normal ways of selecting notes in Drum Edit. But there is one additional way to do this.

- If you hold down [Shift] and double click in any free area in the notes display, all notes belonging to the Sound you double clicked on will get selected.

Creating and Deleting Notes

You can paint new notes into the active Part using one of the tools in the Toolbox. Hold down the *right* mouse button to bring up the Toolbox. Select the Drum Stick or the Paint Brush. Move the pointer to the position where you want to input a note. The mouse box shows the position in bars/beats/ticks or SMPTE (click on it). The name of the Sound you have the pointer positioned over, is shown in a box to the right of the mouse box.

If you use the Drum Stick, a new note is input at the closest Qnt position set for that Sound. The notes get a length corresponding to the set Len value for that Sound. If you want to delete a note, just click on it, using the Drum Stick.

If you have just deleted one note you can drag over other notes and delete these too as long as you don't release the mouse button.

If you use the Paint Brush, you can move the pointer and "paint" in new notes by dragging. Normally, movement is restricted to within the sound only, but if you hold down [Alternate] on the computer keyboard you will be able to move freely. The new notes are created at a spacing corresponding to the Sound's Qnt value, and they all get the length of the Len value set for each Sound.

You can also give the notes one of four velocity values by holding down keys on the computer keyboard while drawing and painting in notes. What these levels actually mean is set using the LV1 to LV4 parameters in the Drum Map. See page 27-6.

No key	Level 1
[Shift]	Level 2
[Control]	Level 3
[Shift] + [Control]	Level 4

If the In button is activated on the Functions Bar when you use the Drum Stick or Brush, then all the following notes in the Part will be moved one Qnt value forward when you input new notes, just as with step editing.

You can also create new notes using the pop-up Functions menu, see page 23-24.

Quantize and other Functions

Quantizing

Quantizing can be done either for all Sounds according to the Quantize value or for one Sound according to its Qnt value.

- If the "select" menu is set to Selected Events, Looped Selected Events or Cycled Selected Events, and *no events are actually selected*, then the *selected Sound* will be Quantized after the *Qnt* value.

- In all other instances, all events in *all Sounds that are set to be affected* will be Quantized after the *Quantize* value.

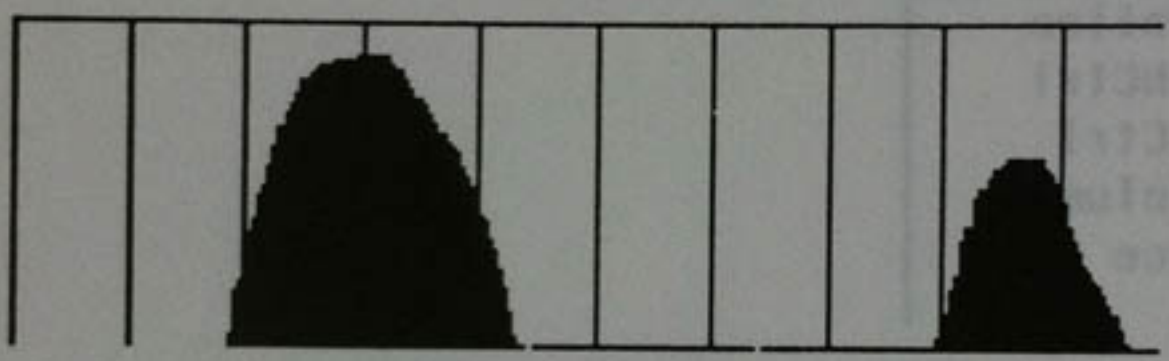
The rest of the main Functions menu is described in the chapter "Quantizing and the Functions menu".

The Controller Display

The Drum Edit window also allows you to graphically edit non-note events like Velocity values, Program Change messages, Pitch Bend, After Touch and Continuous Controllers. The Controller Display is made up for fast and powerful editing, so only the most common Continuous Controllers are directly included. For even more detailed (numeric) editing of non-note events and unusual controllers, use List Edit.



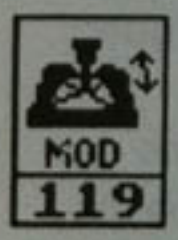
The Control button...



... and some modulation wheel events in the continuous data display .

Only one Sound (the selected sound) and one Part a time (the active Part) is displayed and edited. Drawn or painted non-note events get the same MIDI Channel value as the selected Sound is set to.

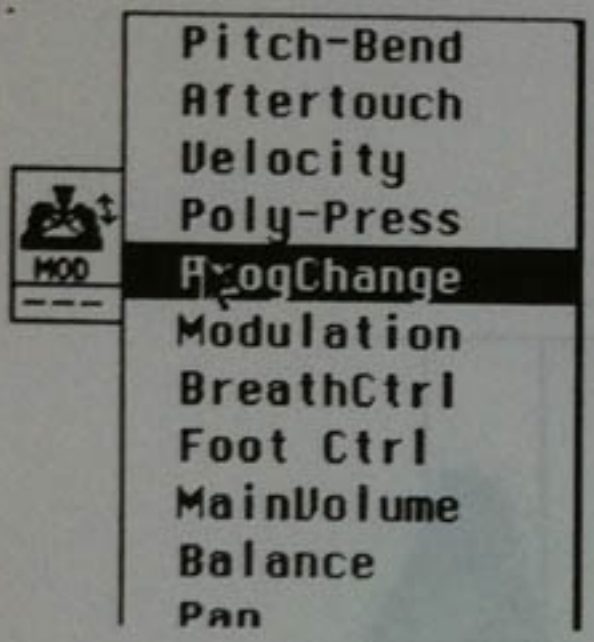
There is a box on the left side below the event type icon that shows the vertical mouse position according to a scale corresponding to the value of the events (most often 0-127).



The event type icon and the value box just under it.

Selecting Event Type

To the left you have an icon indicating what type of event is currently shown (one at a time). To change this, press and hold down the left mouse button over the icon and a pop-up menu appears. Select the type of event you want to display.



Defining Your Own Controllers

For those of you who really want to get into Controller editing, there are three Controllers in the list that are not directly specified, the last three. You can set a Controller number for these three yourself.

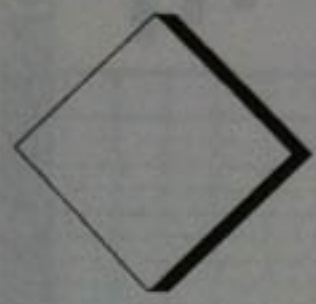
When you select "Unknown Control" you are always asked to specify a Controller number in a Dialog box. Use the left and right mouse button to scroll the list of numbers (click on the number) or to bring up a pop-up menu with all Controllers' names (click on the name), and select one. When you are finished, click Exit. Use this for temporary editing of some unusual Controller.

When you double click on the Event Type icon a dialog box opens up allowing you to select a Controller for each one of the last two items on the pop-up menu under the event type icon. Use the left and right mouse button to scroll the list of numbers (click on the number) or to bring up a pop-up menu with all Controllers' names (click on the name), and select one. When you are finished, click Exit. The selected Controllers appear at the bottom of the Event Type menu. Use these two for some Controllers you use often. Some synths allow you to specify an arbitrary Controller number to change certain functions via MIDI, and these two are perfect for this.

Poly Pressure

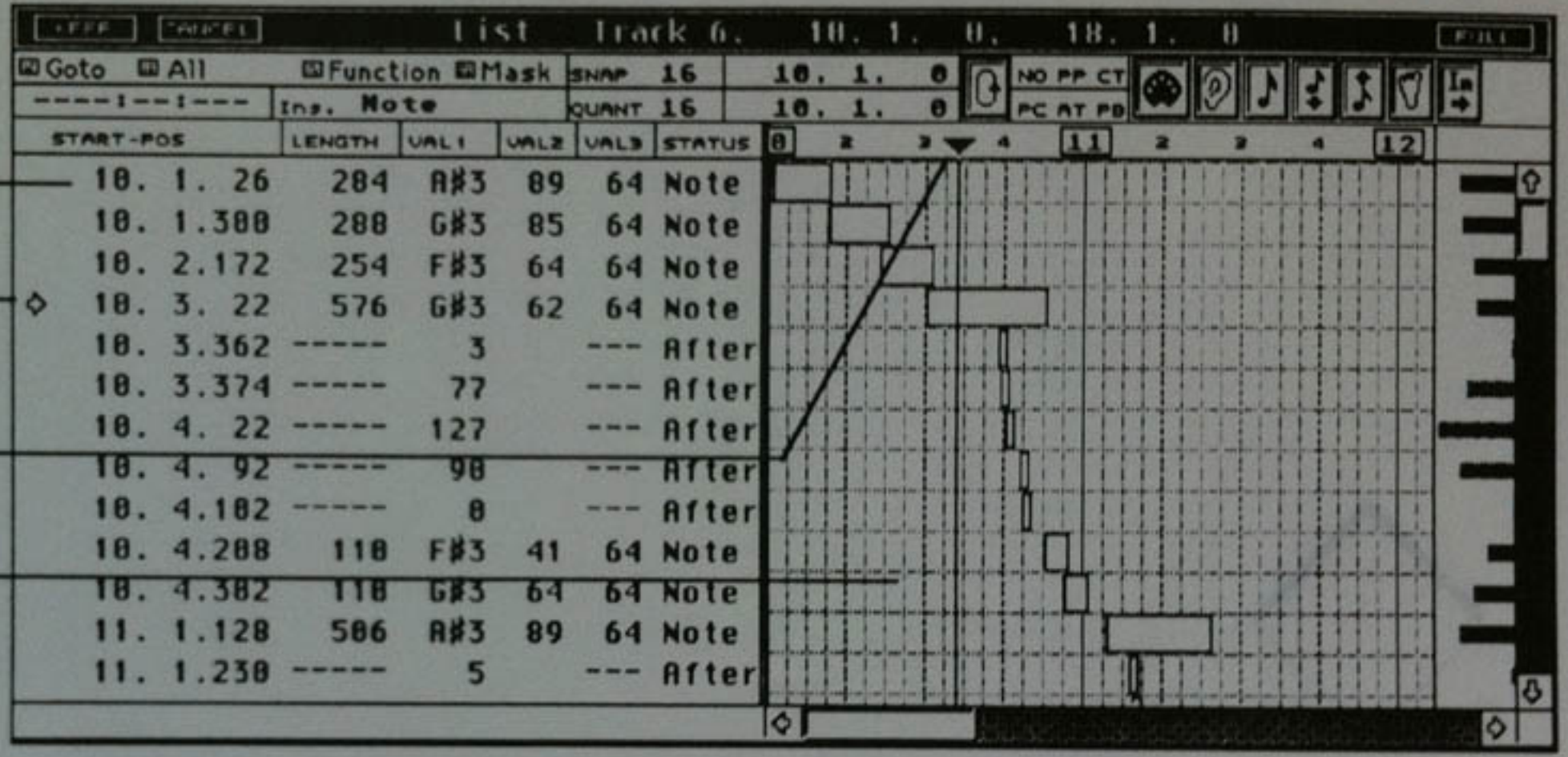
Polyphonic pressure data has two values that go with it. First the key that was pressed, and then the amount of pressure.

In the Controller Display, only the Poly Pressure data for the note displayed on the Info Line (select one note only!) is shown. When you draw or paint in Poly Pressure data it also gets this note number (pitch) value.



List Edit

Title Bar
Functions Bar
The List
The Song Position in the List
The Song Position in the Grid
Grid



This Editor can be used to Edit almost any type of Track. Exactly what types of events it lists therefore depends on the Track class you are editing. You select either one Part or no Parts (if you want to Edit the whole Track) and you open the editor by selecting List Edit from the Edit menu or by pressing [Control]-[G].

On the top of this window you find the Functions Bar which differs a bit from Key, Score and Drum Edit.

Below this are the list, the event display and the bar graph display. You can move the dividing lines between the three. This is done in the same way as moving the dividing line between the Track List and the Part Display in the Arrange window.

List Edit has three displays. The first is the actual list of events. The second is a graphical display for events. Each entry in the list is represented by a box in the display, and for notes, the length of the boxes correspond to the length of the note. The third Part is a display that shows notes' velocities and other event values as bars. You have a Position Bar above the event display. The Song Position is shown graphically in the event display, as a Triangle on the Position bar, and as an arrow in the list.

It might take some time to get used to "read" the grid if you haven't used a similar editor before. Horizontally the grid represents time in bars, and vertically it corresponds to the events in the list. A series of notes like a straight eight note hi-hat Pattern would therefore be represented as a diagonal line of boxes, and a chord is some number of boxes with their left sides aligned.

The event display can only be sized to accommodate a certain amount of bars, and since you don't know how long it is between the events, it is not sure that you at all times will see a box in the *event display*, for each event in the *list*. You might have to scroll the display horizontally.

The events in the display can be moved, duplicated, cut, copied and pasted, lengthened and shortened by using the tools in the Toolbox. You can draw and paint in new events. You also have the main Functions menu and the local Functions menu at your disposal to perform swift and effective changes to your MIDI recordings. These functions are described in "Using the Editors". What follows is just explanations of things that are specific to List Edit.

Positions as Timecode

When you use the Timecode display option (click on the mouse box), the first two columns change from showing an events Start Position and its length (notes only) to showing its Start Time and End Time. The positions for the Loop start and end are also displayed in this format. Click again to return to normal position indication.

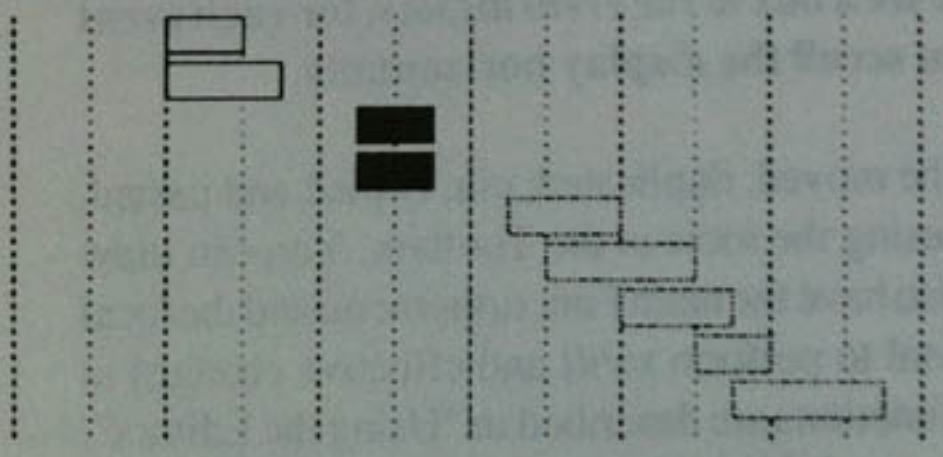
	START-POS	LENGTH	VAL1	VAL2	VAL3	STATUS
	1. 1. 0	84	E4	76	0	Note
	1. 1. 96	88	F4	76	0	Note
◇	1. 2. 0	66	E4	72	0	Note

	START-TIME	END-TIME	VAL1	VAL2	VAL3
	0: 0: 0: 0	0: 0: 0: 4	E4	76	0
	0: 0: 0: 4	0: 0: 0: 8	F4	76	0
◇	0: 0: 0: 9	0: 0: 0:12	E4	72	0

The Events in the Event Display

You either edit *one Part* at a Time or *one whole Track*. If a Part is selected when you enter List Edit, then this will be displayed. If no Part is selected, then the active Track will be edited. If you are editing the whole Track, then the Parts on that Track are divided into active (event boxes have solid outlines) and inactive (event boxes have dimmed, dotted outlines).

Only one Part at a time is active , and you activate a Part by selecting (see below) any event in it. You can also use the Next/Previous Part commands on the Goto menu for this, which is convenient if the Part is empty.



Active and Inactive events in the Grid. The black events are selected.

Selecting Events

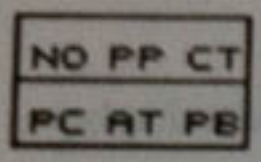
- To select one event, click on it, either in the list or in the event display. Selected events are inverted.
- To select more events, hold down the [Shift] key and click on the events *in the event display*. You deselect events individually by clicking on them again.
- To select several adjacent events at the same time you can enclose them in a rectangle by holding down the mouse button in some free (white) area in the grid. Drag the mouse to create a rectangle big enough to "touch" all the events you want to select. You don't have to perfectly enclose all the events, it's OK if the rectangle just covers some section of each one. Release the mouse button, and the events are selected.
- To deselect all events, click on some free space in the grid.
- You can select all events by using the Select All command on the Edit menu or by pressing [Control]-[A] on the computer keyboard.
- You can also use the [↑] and [↓] keys on the computer keyboard to step through the events. If you combine this with holding down the [Shift] key you can select several events from the keyboard.

Display Filters

You might not want to see all types of MIDI events in the list. If you are only interested in editing Program Change, then all other events are just in the way.

The Display Filters do not remove, mute or in any other way change the events. Any editing affects all events whether you use a Display Filter to hide them or not. The Display Filters should not be confused with Mask which has another purpose.

You have a small box with six two-letter abbreviations on the Functions bar. These are used to select which types of MIDI events are displayed in the grid and the list. If you click on them, they switch between upper- and lower-case letters. Upper-case means that the event type gets displayed, and lower-case that it doesn't. Click with the left mouse button to set up any combination.



NO Notes
PP Polyphonic Key Pressure (sometimes called Individual After Touch)
CT Control Change (Continuous Controllers and Controller Switches)
PC Program Change
AT After Touch (sometimes called Channel Pressure)
PB Pitch Bend

Other Events are always shown.

Editing different Track Classes

The values in the Columns can be edited using the left and right mouse button and the [Shift] key as usual.

The Position values (bar, beat and tick or SMPTE times) can be edited one numeral at a time. If you change an event's position so that it winds up after the next event or before the previous, in time, the list is instantly re-sorted. The events are always shown in time order, with the earliest at the top and the latest at the bottom. This may seem confusing at first, but in fact is quite logical. If you just keep the mouse button down, you are always changing the position of the last selected event.

Not all values can be changed for all types of events. Position values, notes' velocities and some other values can also be changed graphically, see page 28-13.

What the different columns are used for differs with the type of data you are editing, but all events always have a Start-Pos values (Start-Time when positions are displayed as SMPTE), which is the Position of the event.

Below follows a description of the columns that vary for the different types of events.

MIDI Tracks and Drum Tracks

All MIDI events have a Chn value, which is the MIDI Channel stored with the MIDI-events. For the Chn value to have any effect, the Part must be set to play back on MIDI Channel "Any" (see page 10-4).

Notes
These are the only events hich have a length/end position value. Val1 is the Pitch (the Note Number, C-2 to G8), Val2 is the Note On Velocity (sometimes called Attack Velocity) and Val3 is the Note Off Velocity (Release Velocity). Status is Note and this can't be changed.

Poly Pressure
This is the type of pressure that is individual for each key. Val1 is the Note Number, and is used to identify which key was pressed. Val2 is the amount of Pressure (0-127). Status is always Poly-Press and can't be changed.

Control Change
These are the Continuous Controllers. Val1 is the type of Controller, internally identified by MIDI as a number between 0 and 127. When you change this, the Status shows the name of the Controller for those that are standardized, and "Control xxx." (where xxx is the number) for all others. Val2 is the value for the Controller (the amount of Control Change), 0-127. You can scroll the Status field directly, which is the same as changing Val1.

Program Change
These are Program Change numbers, and they only have one value, Val1, which ranges from 0 to 127. Status is always Prog Change.

After Touch
This type of Pressure is sent globally for all keys pressed. This only has one value, Val1, which is the amount of pressure. Status is always Aftertouch.

Pitch Bend
Pitch bend takes on two values, both defining the pitch. The first (Val1) is for finer changes, and the second (Val2) for coarser. "0 64" is centre position of a pitch wheel, "0 0" is full negative swing and "127 127" full positive.

System Exclusive

A complete package of System Exclusive data is shown as one event. The status shows the manufacturers ID code, if it is known. The Val1 column is the MIDI Channel or Device number sometimes included in an event. If you set this to anything but 0, the event will use the MIDI Channel set for the Part, it will otherwise use the original Channel Number ("Any"). If you have problems with sending a dump out, try with this value set to 0.

The Comment column shows parts of the actual message in hexa-decimal code. If you click in this column, a dialog box opens up where you can edit the Sys Ex code (if it isn't too long). If you're not absolutely sure of what you are doing, you should probably avoid hexa-decimal editing of System Exclusive messages!

Score Events

Most of the Symbols in Score Edit appear in List Edit as "Special events" (see below), and so does information about grouping and hiding etc. The symbols are made up of coordinate events and symbol events which together make up the positioning and in some cases size, shape or contents of the object.

You can edit the coordinates of the "coord" objects which is the same as moving the elements around in Score Edit. This is a way to fine tune the positions, if needed.

You can *not* put in new Score events in List Edit or even edit any other than the "coord" events, but they can all be deleted.

Mixer Tracks

MIDI Mixer Events

This is an event generated in the MIDI Mixer window. It is not a MIDI event, it is a Special Event, see below. Val1 is the number of the "object" in the current MIDI Mixer Map and Val2 is the value for that object. Both these values can be edited. In the Comment column you will find the name of the object and its Instrument setting.

Available Events for All Track Classes

The messages described below are not really MIDI events, but rather internal Cubase types of events (we call *all* these internal events "Special events"). Therefore they have no MIDI Channel value.

Mute Events
These are Mute and Un-mute events as described in Chapter 19, Recording Mutes. Val1 is the number of the Track that the Event mutes, Val2 is the type of event (1=Mute, 0=Un-Mute) and the Comment columns shows you the name of the Track that the Event mutes. Be careful when adding, removing or editing these events (check the comments on page 19-4).

Stop Events
These events have no values at all. They just stop Cubase, as if you had clicked the Stop button yourself. This is good for example in a live situation. Insert a Stop Event at the end of a piece, and Cubase stops there. At this position you might have "chained" a second piece after this first, in the same Arrange window. This second piece could then be started just by pressing [Enter] on the computer keyboard. Or, you might switch to a another Arrange window and start playback from there.

Text Events
These are just events that allow you to enter a comment. Click in the Comments column, and a dialog box opens up where you can enter text. End by pressing [Return] and the dialog box closes.

Changing Values in the List

Editing in the list is done as with the Info line in other editors. But List Edit has one more option for editing the values in the list:

- If you have *only one event selected*, and hold down [Alternate] and change the values for it, the value you set will get copied to all other events of the same type.
- If you have *several events selected* and hold down [Alternate] and change the value for one of them, all the selected events of the same type will get the value of the changed event.

Moving Events

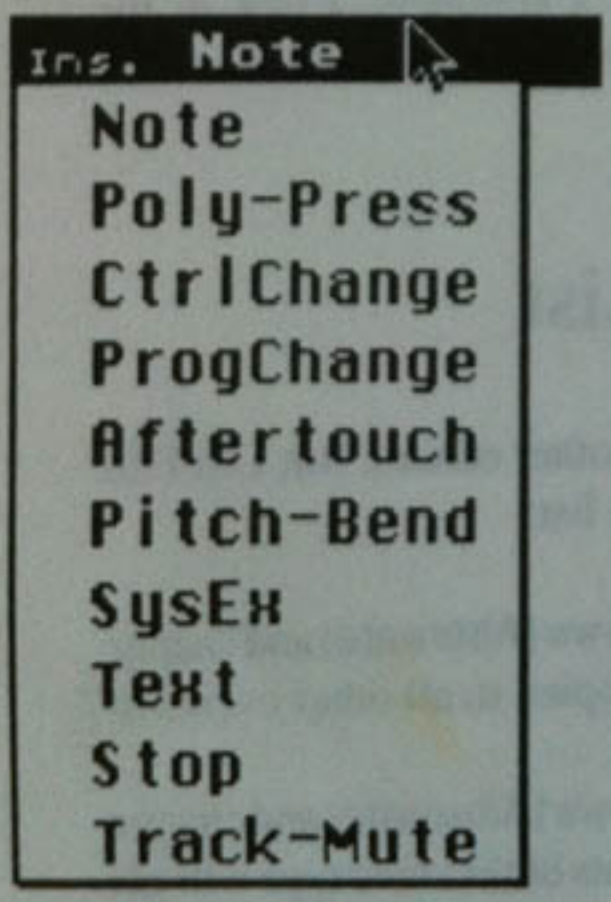
It is only the horizontal movement that matters when you drag events. If this sounds confusing, think about it for a while. The horizontal axis shows the events' positions in time, and the vertical axis also does in a way, in that the events always are sorted with the earliest at the top and the latest at the bottom.

Moving events to a new position means that the whole list probably has to be "re-sorted", but the program always tries to scroll the grid and the list so that as many of the moved events as possible are shown at their new position after the drag.

Creating New Events

You can paint new events into the active Part using one of the tools in the Toolbox.

Decide what type of event you want to put in by pulling down the Pop-up menu "Ins." on the Functions bar. Select one type. The text after "Ins." shows what type is currently selected. Exactly what events are possible to insert depends on the Track type. You can not input Score events.



The Insert menu when you edit MIDI or Drum Tracks and when you edit Mix Tracks.

Hold down the *right* mouse button to bring up the Toolbox. Select the Pencil or the Paint Brush. Move the pointer to the position where you want to input an event.

Inputting Notes

If you use the pencil, a new note is input at the closest Snap Position. If you just click the mouse button once, the note gets a length set with the Quantize value. If you drag horizontally before you release the mouse button, you can change the length of the note. The Snap value works as a length Quantize. That is, the length will be an even multiple of the Snap value.

If you use the Paint Brush, you can move the pointer and "paint" in new notes by dragging. The new notes are created at a spacing corresponding to the Snap value, and they all get the length of the Quantize value.

New notes always have the pitch C3. You can give the notes one of four Note On velocity values by holding down keys on the computer keyboard while drawing or painting in notes.

No key	Level 1	(Velocity 32)
[Shift]	Level 2	(Velocity 64)
[Control]	Level 3	(Velocity 96)
[Shift] + [Control]	Level 4	(Velocity 110)

The Note-Off velocity will always be 64 and the MIDI Channel will be that of the Part or Track.

You can also create new notes using the Functions menu, see page 23-24.

Inputting Other Events

For non-note events, it doesn't matter if you use the Brush or the Pencil since they don't have any length. New events are inserted at the closest Snap Position, and you can click once to input just one event or drag to input several events "in one drag".

Each type of event gets some preset default values and the MIDI Channel of the Part or Track, except for Special events, which have no MIDI Channel.

If In is activated on the Functions Bar when you use the Pencil or Brush, then all notes in the Part will be moved one Snap forward when you input new notes, just as with Step Input. See page 23-26.

Changing the Length of a Note

You can change the length of an existing note using the Pencil icon. Hold down the *right* mouse button to bring up the Toolbox. Select the Pencil.

Position the pointer over the note you want to change, and drag to the left (shorten) or to the right (lengthen). An outline of the note shows the size while you are dragging. The Snap function helps you to restrict your changes to some even note value.



When you are finished, press and let go of the right mouse button once, to bring back the arrow pointer. Or, select another tool from the Toolbox.

Changing Note Velocity

On the right side of the grid the notes' velocities are shown as black horizontal bars. You can change these values, graphically. When you move the pointer into this area it changes into the pencil automatically.



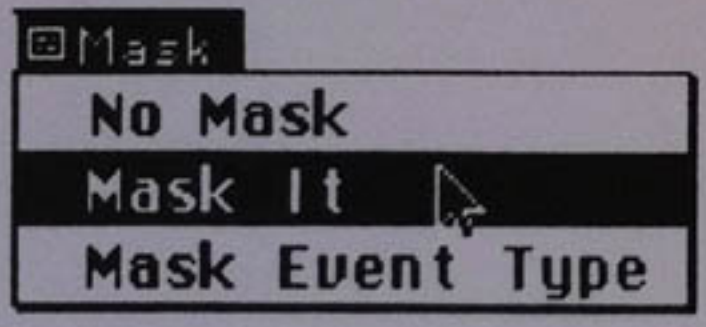
You can click on one bar and drag to change its height, or you can drag over as many notes as you like and "paint-change" the velocity values.

Changing other Events Graphically

The Val2 values are shown as grey horizontal bars for other events than notes. But not all can be changed, only Controllers, Pitch Bend, Poly-Pressure and MIDI Mixer Events. They can be changed using the Pencil in exactly the same way as with notes.

The Mask

You can decide to Mask Out certain events in List Edit. This goes beyond the Display filters in that Masking really hides events from any type of editing like Quantizing, Deleting, Fixed Note and so on.



The only things that are not affected by Mask are playback (all events are always played) and Select All.

Select an event in the list. Let's say that it is a note with the pitch F#4.

- If you pull down the Mask menu and select "Mask It", all events that are *not* notes with the pitch F#4 are *hidden*.
- If you pull down the Mask and select "Mask Event Type" all events that are *not notes* are hidden.

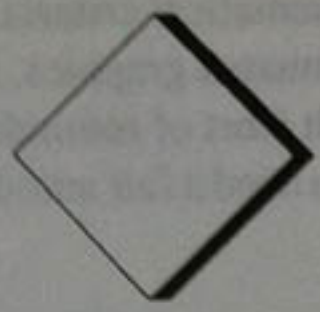
In other words: "Mask Event Type" picks out events of one type regardless of their values, e.g all Controllers, all notes, all Pitch Bend events and so on.

"Mask It" also looks at the values. For Notes and Poly Pressure, only events with the same note number (pitch) will be displayed, and for Controllers, only events with the same Controller number will be displayed. For other events "Mask It" and "Mask Event Type" are identical.

An example: You want to remove all Modulation controller events from a Part. Select one of the Modulation events. Use "Mask It" to hide all events except just the Modulation controllers. Set the "select" menu to All and use for example Delete Events on the Edit menu. All Controller values of type 1 (which means just Modulation) will be deleted from the Part. This is a bit like Logical Edit, but in many cases faster.

Quantize and other Functions

You can use all the Functions of the Functions menu in List Edit, but many of them, like quantizing, only work on notes. See page 23-22 for details.



Logical Edit

This editor differs from all the others. It allows you to make changes to your music based on logical or mathematical criteria, rather than musical. There is no dragging of events, no animated graphics, nothing like that. You enter numbers and out comes a result (sort of reminds you of computers, doesn't it?). To master Logical Edit you need a fair amount of knowledge about how MIDI messages are built up.

- If you enter Logical Edit from an Arrange window, it operates on the selected Parts, or, if no Parts are selected, all Parts on the active Track.
- If you enter Logical Edit from a MIDI Editor, it works on the Parts in that Editor and uses the setting in the "select" menu in the editor to decide exactly what events get affected. Just as when using any Function directly in an Editor.
- Logical Edit can be used on MIDI and Drum Tracks to edit MIDI data or on Mix Tracks to edit Mix data.

Before you enter Logical Edit from an Editor, check that the "select" menu shows the value you wish.

You enter Logical Edit by selecting it on the Edit menu or by pressing [Control]-[L] on the computer keyboard. The top row of the window displays text giving you a hint about what (Tracks, Parts) will be affected by the editing.

Using Presets

In the lower left corner is the Preset section of Logical Edit. By selecting a Preset from the pop-up menu and clicking Perform (to the right of the Preset section) the function is performed. A Preset includes all the settings in Logical Edit, that is, all the Filter settings all the Processing settings, the Quantize setting and the type of Logical editing selected from the pop-up menu below the Quantize value.

Presets that come with the program or that you make up can also be accessed from the Functions menu directly, without displaying the Logical Edit window. See page 15-11.

Making up your own Presets

If you make any settings of your own and wish to save those as a Preset you simply click the Store button. This operation overwrites the *current* Preset. If you don't want that, instead hold down [Alternate], select the Preset you wish to overwrite and click Store.

If you want to change the name for a Preset, double click on the Preset name (the pop-up) and enter a new name and hit [Return].

You always have ten Presets, and they are stored in the Setup or Song.

The Presets in the DEF.ALL Song.

When you install the program the first time, ten Presets will be included. These are described in detail under the heading Logical on page 15-11.

Easy/Expert

Logical Edit can be switched between two modes, Easy and Expert. The Expert mode has more possibilities than Easy, but is also harder to grasp. Most of the "normal" logical editing like deleting certain types of events etc, can be performed in Easy mode.

Init

The Init button returns all settings to "normal" default values.

Theory

The principle for Logical Edit is this: First you set up *Filters*. These are used to decide which MIDI messages will be affected and which will not. An example of a specified Filter could be "all notes that have a pitch of F#3 and

a velocity value that is larger than 37". Filters can be set up for all aspects of almost all types of MIDI messages.

After setting up Filters, you either perform a function like Quantizing or Deleting on the events that "pass through" the Filters, or you can set arithmetic *Processing*. An example of such Processing would be to "add 7 to all the notes' note number", which would be the same as transposing them all a perfect fifth.

In Expert mode further options are available. See page 29-15.

In the bottom right section is a pop-up menu where you select what type of editing to actually perform. Most of them, like Quantize and Delete, only need the Filters to perform their trick. But Transform and Insert also use the Processing settings.

The Quantize (QNT:) setting is for deciding what note value to Quantize to in Quantizing operations. The Perform button, finally, is used to actually Perform the Edit.

Setting up Filters

In Easy mode, there are four columns in the Filter area of the dialog box.

Event Type

The first column is called Event Type. This is for setting what type of Event the Filters should operate on, all, one specific or all but one specific. The options are all MIDI events if you edit a MIDI or Drum Track/Part. If you Edit a Mixer Track/Part, this can't be changed, it is always Mixer events you operate on.

The lower field in the Event column pulls down a pop-up menu used for deciding what *types* of events should be affected.

The upper field pulls down a menu with the possibilities All, Equal or Unequal. If this is set to All, the upper field is grey indicating that all types

of events will be affected. Selecting Equal allows you to direct the editing to just *one* type of event (like to notes only) and selecting Unequal directs editing to all types but the one selected (like to everything *but* Program Change).

For the next five columns, the top row of fields are pop-up menus used to set the Filter used with the two Value fields just below it. Both values are not used at all times, and non-used values are dimmed (grey). Here is an explanation of these menu's possibilities:

Value 1

The second column is the same as Val1 in the List Editor. The exact meaning of this value is different for each event type:

Notes
The Pitch or note number. The Value 1 fields show the pitch with small letters to the right of the number(like F#3, C2 and so on).

Poly Pressure
The key that was pressed, also easily found by looking at the small letters showing the pitch.

Control Change
The type of Controller, displayed as a number.

Program Change
The MIDI number of the Program. Observe that many MIDI units do not display the real Program Change number on the front panel.

After Touch
Simply the amount of pressure.

Pitch Bend
The "fine tune" of the bend.

Value 2

This is the same as Val2 in the List Editor. Here is a list of the meaning of this for each type of event:

Notes
The velocity of the note.

Poly Pressure
The amount of pressure for the note.

Control Change
The amount of Control Change.

Program Change
Program Change messages don't have a Value 2.

After Touch
After Touch messages don't have a Value 2.

Pitch Bend
The coarse amount of bend.

Channel

This is the MIDI Channel *stored* with the Event, not the one *set* for the Part.

Operators and values

For each of the values for an event you can select an Operator and values for it. The Operators are selected from the upper row of popup menus, and the values are set in the two lower fields. Not all Operators use both values. If a value isn't used it is dimmed (grey).

Ignore
This means that all events are affected regardless of the set values. Therefore, both the values below are dimmed.

Equal
Events that have a value equal to the set value are affected. This means that only one value is used, the lower field is therefore dimmed.

Unequal
Events that have a value that is not equal to the set value are affected. This also means that only one value is used, and the lower field is dimmed.

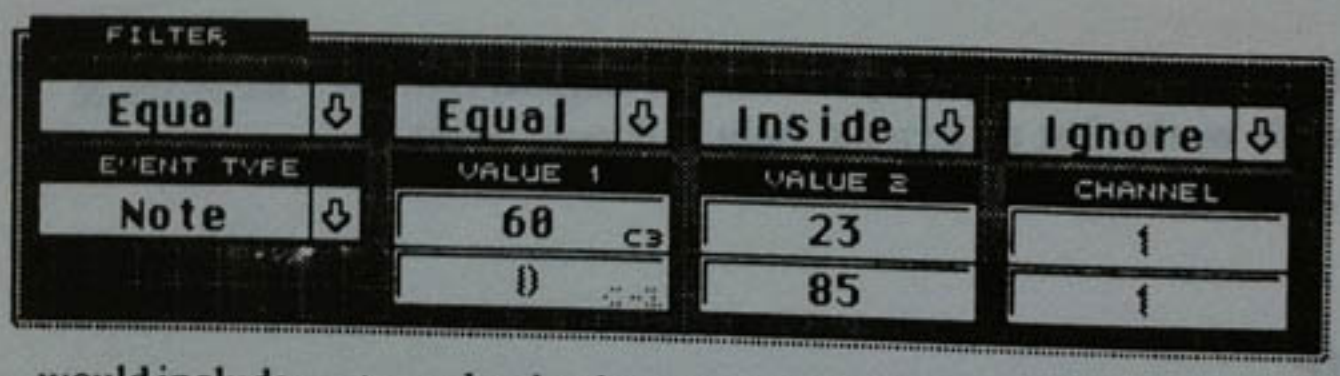
Higher
Events that have a value that is higher (*not* "equal to or higher") than the set value are affected. Only uses top field.

Lower
Events that have a value that is lower (*not* "equal to or lower") than the set value are affected. Only uses top field.

Inside
Events that have a value that falls inside the range formed by the two values are affected. You therefore need to set both fields.

Outside
Events that have a value that falls outside the range formed by the two values are affected. Uses both fields.

Example
This setting:



.. would include: notes only, that have a pitch of C3, a velocity value between 23 and 85, and are on any MIDI Channel.

Filter Functions

Just setting up the filters is enough for some very complex Logical Editing. The following operations can be be performed on the events that pass through the filters. You can make as many edits as you wish without leaving Logical Edit. Note that events that do not pass through the filters remain intact, they are not affected in any way by the operation.

Quantize

The notes that pass through the filters are Over-Quantized to the Quantize value set with the QNT: Pop-up menu.

Extract

This Function is only active if you selected Logical Edit from the Arrange window. It cuts the events that pass through the filters out of the Part, and then creates new Part(s) with the extracted events only. These new Part(s) are put on a new Track and have the same start and end points as the original(s).

Copy

This Function is only active if you selected Logical Edit from the Arrange window. It works just as Extract, only it doesn't cut the events from the Part(s), it copies them.

Delete

The notes that pass through the filters simply get deleted.

Select

This Function is only active if you selected Logical Edit from one of the other Edit windows: Key, Drum List or Score. It simply selects the events that passes through the filters for future processing directly in the editor, after you have exited Logical Edit.

Setting Up Processing

If you decide to Transform the events or Insert new events (see page 29-13) you must decide how the events that pass through the Filters should be recalculated. This is done setting an Operator and one or two Values for each column.

The Operators are found on pop-up menus in the Processing section of the dialog box.

The Values are displayed below each operator, and is set using the left and right mouse button as usual (except for Event type where the values are on a pop-up menu).

Event Type

For the Event type column you have two options on the upper menu, Keep and Fix. The first means the event type isn't changed at all, and the second means the event type is changed into another. If you select Fix you use the lower menu to decide what event type to transform the event into. The options are all the different MIDI types of events.

If you Edit Mix Tracks/Parts, this can't be changed, the created events are always Mixer events.

Value 1 and 2

The columns are the same as for the Filters. They consist of a pop-up menu with an operation and two value fields with values for the operation. Not all operations use both values, and some use none of them! You set the values as usual, using the left and right mouse or by double clicking. If you multiply or divide, the values consist of an integer with two decimals.

These are the Possible Operators for Value 1 and Value 2.

Keep
The value is not affected in any way. You don't set any number in the value fields.

Plus
A number is added to the existing. You use the upper value field to set how much should be added.

- Using this on notes in the Value 1 columns would mean transposing pitch upwards. Using it on Value 2 would mean increasing velocity.
- Using it on Value 1 for controllers would mean increasing the controller number (turning it into another controller), and using it on Value 2 would mean increasing the amount of that controller.
- Using Add for Value 1 on pitch bend would result in subtle pitch bend changes, when using it on Value 2 on pitch bend would mean more dramatic changes.
- Using Add for Value 1 on Program Change would mean increasing the program number. Program Change don't have a Value 2.
- Using Add on Value 1 for Aftertouch means increasing the amount of Aftertouch. After Touch doesn't have a Value 2.

The examples above can be applied to Minus, Multiply and Divide.

Minus
A number is subtracted from the existing. You use the upper value field to set how much should be subtracted.

Mul
The existing value is multiplied by a number. You use the upper value field to set how much it should be multiplied with. The result is always rounded to integers.

Div
The existing value is divided by a number. You use the upper value field to set how much it should be divided by. The result is always rounded to integers.

Fix
The existing values are simple replaced by a fixed value that you set in the upper value field.

Value 2/Value 1
This doesn't take any values at all. Let's first examine it for the Value 1 column, where the option is called Value 2.

When you select this, the existing Value 2 value in each event is copied to its Value 1. If you for example use this on notes, this would mean copying its velocity value to the note number. If you used it on controllers it means replacing the controller number with the controller value.

Using it on the Value 2 column (where the option is called Value 1) works the other way around. It copies the value from the Value 1 column to the Value 2 column for each event.

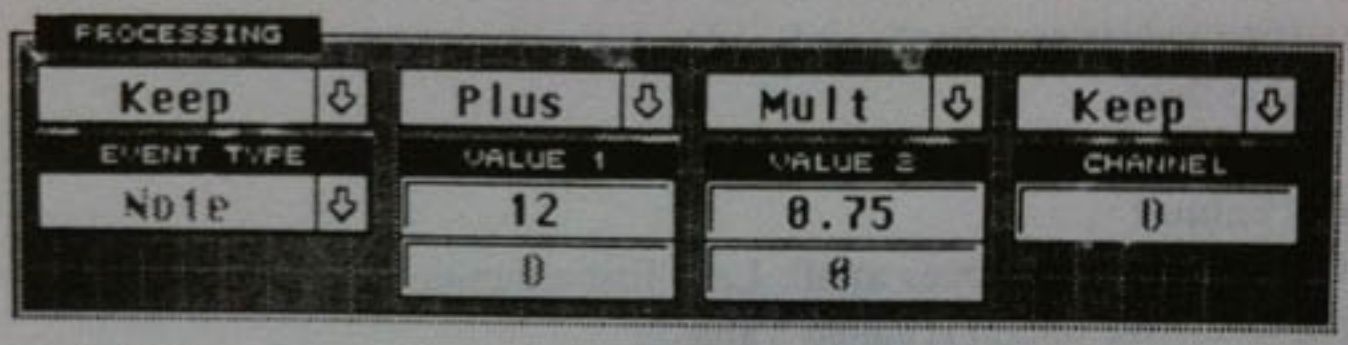
These functions comes to their best when you also change the event type. Then you can for instance turn a controller into After Touch and copy the amount of the controller (Value 2 column) to the amount of After Touch (Value 1 column).

Dynamic
This function is used to create a "ramp" from one value to an other, like for example a crescendo or a diminuendo (when used on the Value 2 column for notes). This function involves four things, the Start and End Value and the Start and End Point.

The Start and End *points* can't be changed from inside Logical Edit. If you entered Logical Edit from the Arrange window, they will be the start and end of the Part. If you entered it from one of the Editors they will be one of three things: the start and end of the Part, the left and right Locator values, or the Loop boundaries, all depending on how the "select" menu was set in the Editor.

Use the two value fields below to set the Start and End *value* , which means the initial values at the beginning of the range and the final values at the end of the range.

This Processing:



... would transpose all the notes that pass through the filters one octave up and compress their velocity values to 75% of the original.

Random
This replaces whatever values originally was in the event with a random number. The two values fields are used to set the lower/upper limit of the random numbers.

Channel

You can also process the MIDI Channel of the event. This only has four options, Keep (no change) Plus (increase channel number) Minus (decrease channel number) and fix (set the events to a certain channel).

For this to have any effect when you play back the Part, it must be set to MIDI Channel "Any".

Processing Functions

Once you have set the right Filters and the right Processing settings you can select one of two possibilities from the Functions pop-up below the QNT: value. After that you click Perform the perform the actual Processing. You can make as many edits as you wish without leaving Logical Edit. These are the Processing possibilities:

Transform

The notes that pass through the filters have their values Transformed (i.e. changed) according to the values set in Processing. This doesn't add any new events, it just changes the existing ones.

Insert

The events that pass through the filters get copied, transformed (see above) and then inserted among the existing events. This adds new events to the Part(s).

Undo

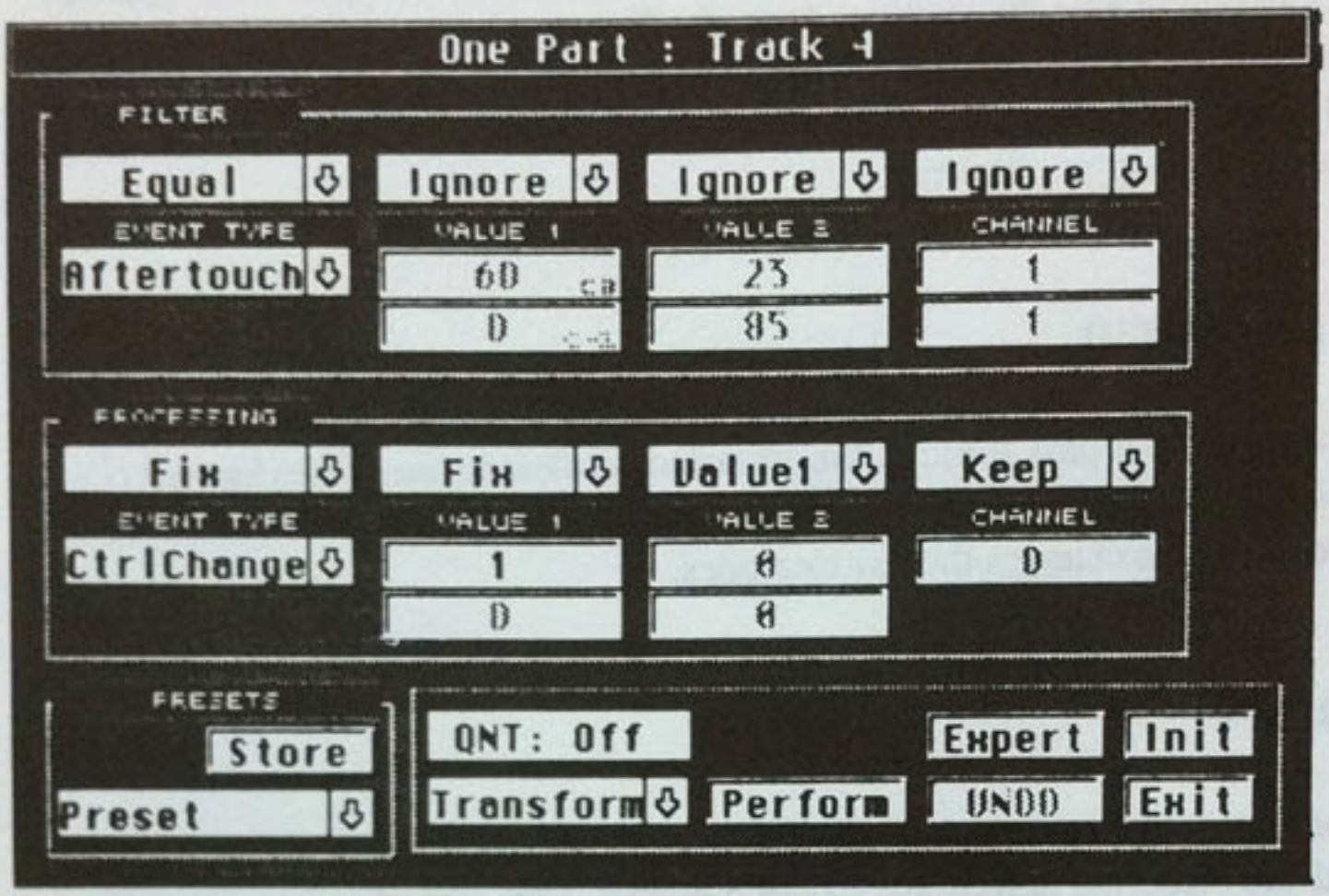
This function is only active if you selected Logical Edit from one of the Editors (Key, Drum, List or Score). It undoes the last function only.

Exit

If you click on this button press [Return] on the computer keyboard, Logical Edit closes.

Examples

Let us give two examples of the power of Logical Edit in Easy Mode.



This setting would allow you to change all After Touch Events into Modulation wheel events. This is useful if you have an older synth that may not receive After Touch. Click Perform to perform the Transformation.



This setting allows you to make up a bass drum part that exactly follows for example a bass part on the selected Track. The value in the Value 1 Processing field is the key you have the bass drum on. Since this example also uses Copy, it assumes that you entered Logical Edit from an Arrange window. Click Perform to create the new bass drum part.

You can also examine the Presets that in the DEF.ALL file that comes with the program. Their functionality is described on page 15-11.

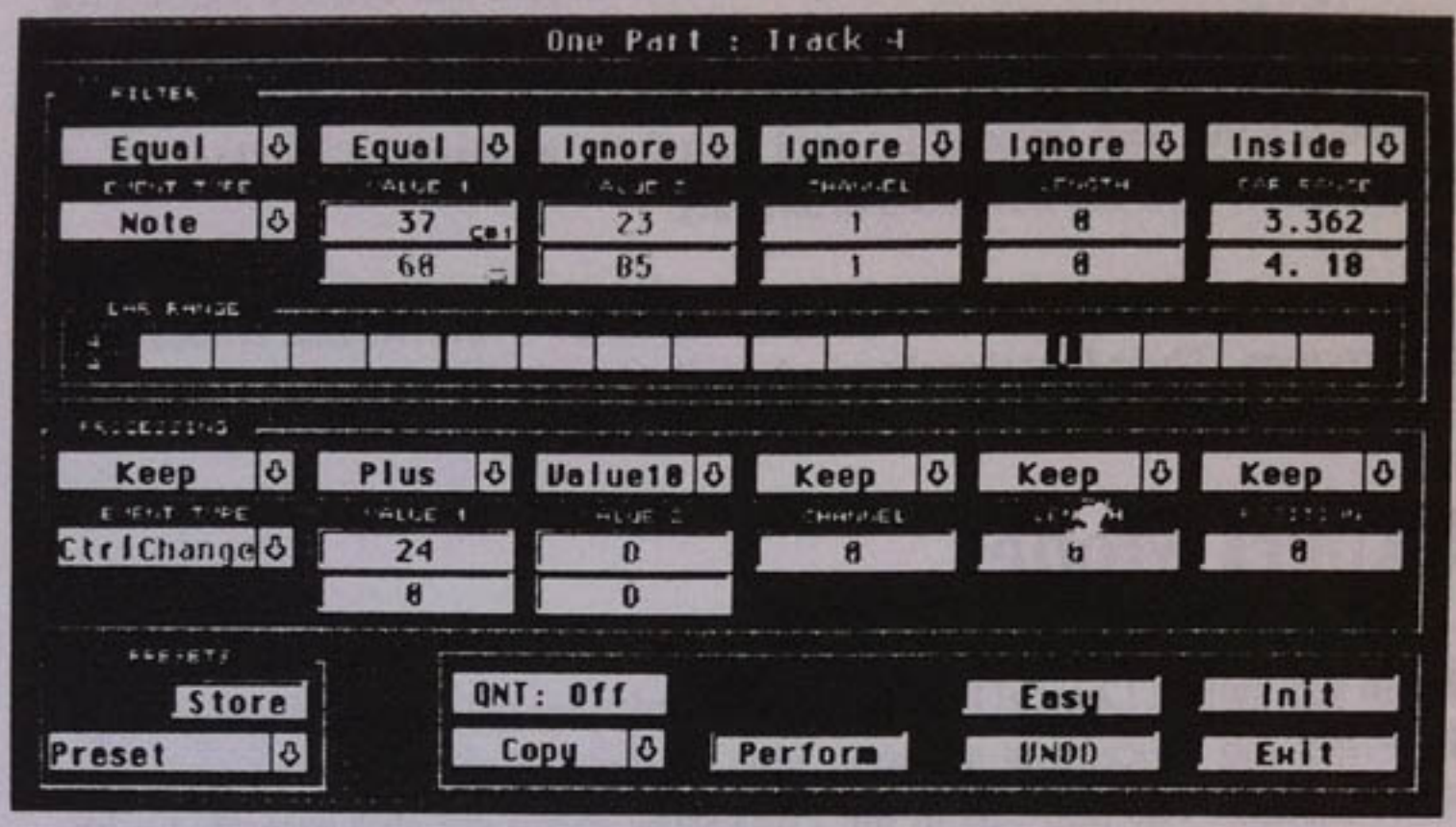
Expert Mode

When you switch Logical Edit to Expert Mode you get two more columns in the Filter and Processing sections, plus a graphic Bar Range setting in the Filter section. The pop-ups in the Processing menu are also extended with additional functions.

Filters

Length
This allows you to select notes depending on their length. This value is displayed in ticks.

Bar Range
This allows you to only include events at a certain position *within each Bar* in the editing. You can use the mouse to set the beat and tick value independently. Or, you can drag a range in the Bar Range graphic at the lower part of the whole dialog box. This is done in the same way as when you drag to set the Loop range in Key, Drum or List Edit.



Check out the settings above. If you have a snare drum playing on the key C#1, this setting will allow you to pin-point all snare drum beats that lie around the fourth quarter in each bar and transpose them up two octaves to C#3. This is useful if you want to double up the second snare drum in each bar in a basic rock beat, with some other sound. Since this example uses Copy, it assumes that you entered Logical Edit from an Arrange window. Click on Perform to make up a Part with the copied and transposed beats only.

Processing

In Expert Mode, the Operation pop-ups menu in the Processing section contain further possibilities. On the Value 1 menu you find:

Inverse
This inverts the values, so that the bigger it originally was the lower it comes out. If you for instance select controller values in Key or Drum Edit and Inverts them, you will find that it looks as if the graph has been turned upside down. An upwards scale becomes a downwards scale etc. This Operation needs no values.

ScaleMap
This works like Scale Correction in the Transpose/Velocity dialog box (see page 15-17. The upper value field is the Scale type, which is selected from

a pop-up and the second value is the Key Signature.

Flip
This flips the events around a set axis. For notes this will invert the scale, with any key as a "centre point". For velocity it will make high velocities low and low velocities high, with any value as a flip axis. It will have similar effect on controller values etc.

The Processing section also gets two new *columns* in Expert mode.

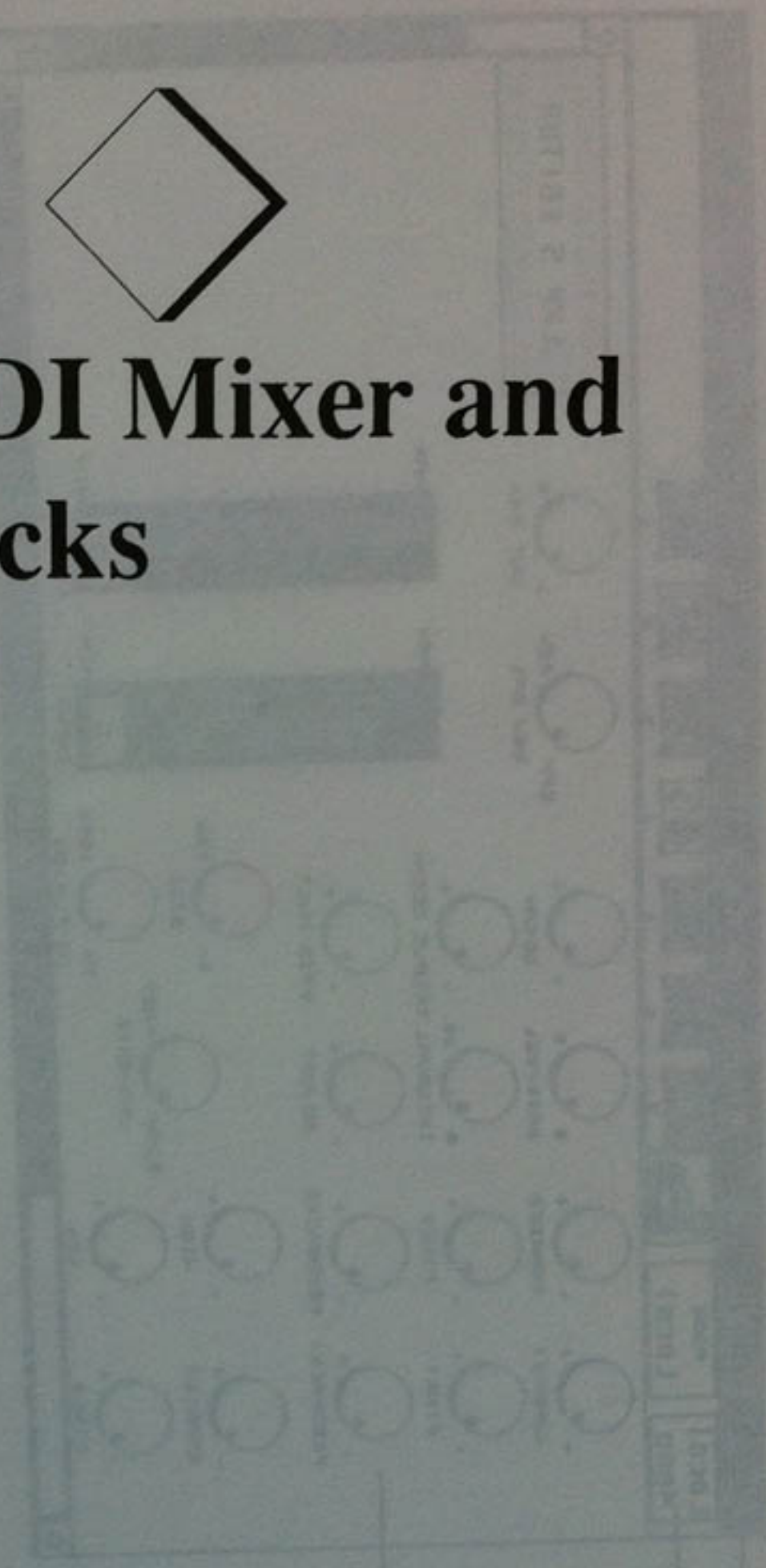
Length
By using processing on this value, you can manipulate notes' lengths. The Operations for it are Keep, Plus, Minus, Multiply, Divide, Fix.

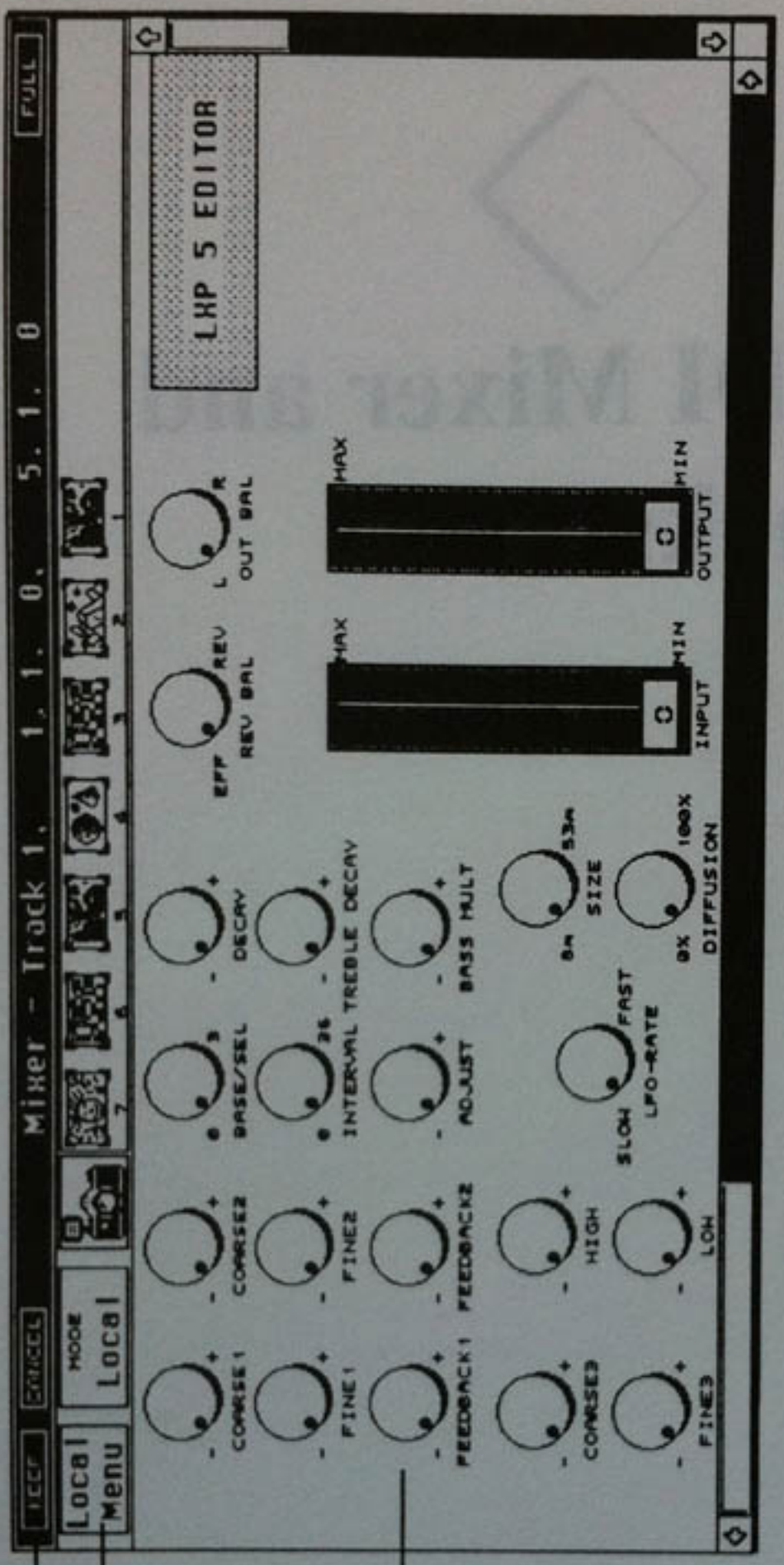
Position
Processing position will affect the events' position values so that you are able to move events and create events at new positions. The Operations for it are Keep, Plus, Minus, Multiply and Divide.

The integer (the number to the left of the decimal point) represents ticks (96 means 16th notes; refer to the list on page 4-2).

If you for example add to the Position value and use Insert, this will result in some sort of echo effect. If you multiply or divide the Positions, this will be the same as changing the tempo of the music in the Part. There are examples of this in the Logical Presets in the DEF.ALL that comes with the program.

The MIDI Mixer and Mix Tracks




Track 1. 1. 1. 0. 5. 1. 0
FULL
LHP 5 EDITOR
DECAY
REV BAL
OUT BAL
MAX
MIN
INPUT
OUTPUT
SIZE
DIFFUSION
Mixer - In
Local Menu
Local
Local
CORRSE1
CORRSE2
FINE1
FINE2
FEEDBACK1
FEEDBACK2
CORRSE3
HIGH
FINE3
LOW
BASE/SEL
INTERVAL
ADJUST
SLOW
FAST
LFO-RATE
Title bar
Local Menu, Mode and Snapshots
Mixer Map

Introduction

This chapter discusses various types of MIDI events. You won't need to know that much about MIDI to use the MIDI Mixer, but if you want to create your own MIDI Mixer Objects, you have to have at least a basic knowledge.

Cubase's MIDI Mixer window allows you to control MIDI-equipment for other functions than the regular "sequencing" ones. It works as a regular mixer for MIDI equipment (controlling volume, mute Pan etc), but it can also work as editor panels for various instruments effect devices etc.

Working in the MIDI Mixer window is a kind of editing. You therefore have to select a Part on a Mixer Track before you open up the MIDI Mixer.

The Mixer as such is a Module. This means you have to Activate it before you can use it. See page 22-2.

In a Mixer window you have so called Objects that resemble faders, knobs and buttons that send out MIDI. You can "play" these Objects and record your actions as a part of your Song. You can store static setups, like the initial volume mix for all instruments at the beginning of a song. Or, you can record dynamic real-time gradual changes like a fade-out, the opening up of a filter on a synthesizer or a smooth change in timbre on a reverb or similar unit. Once a certain static mix, or some dynamic changes, are recorded into a Part on a Mix Track, that Part can be handled like any other. Which means that you can cut, copy, split, merge, duplicate, move or whatever you need to do, to apply that certain "scene" to any part of your Song.

The events recorded from the MIDI Mixer window are actually not MIDI-events. They are Special events, like the Mute, Text and Stop events (see page 28-6). When these special events are *played back through the MIDI Mixer objects*, MIDI events are created and sent out to your equipment.

Recording MIDI Mixer events is not done by pressing the Record button as with regular recording. In fact you can't activate normal recording on Mix Tracks at all.

Mixer Tracks

The Mixer Tracks are only for recording Mixer data, created by the program itself. MIDI Mixer Tracks don't have a channel setting. MIDI-wise, they are always set to thru-put on the Atari MIDI Port and work as if they were set to MIDI Channel "Any".

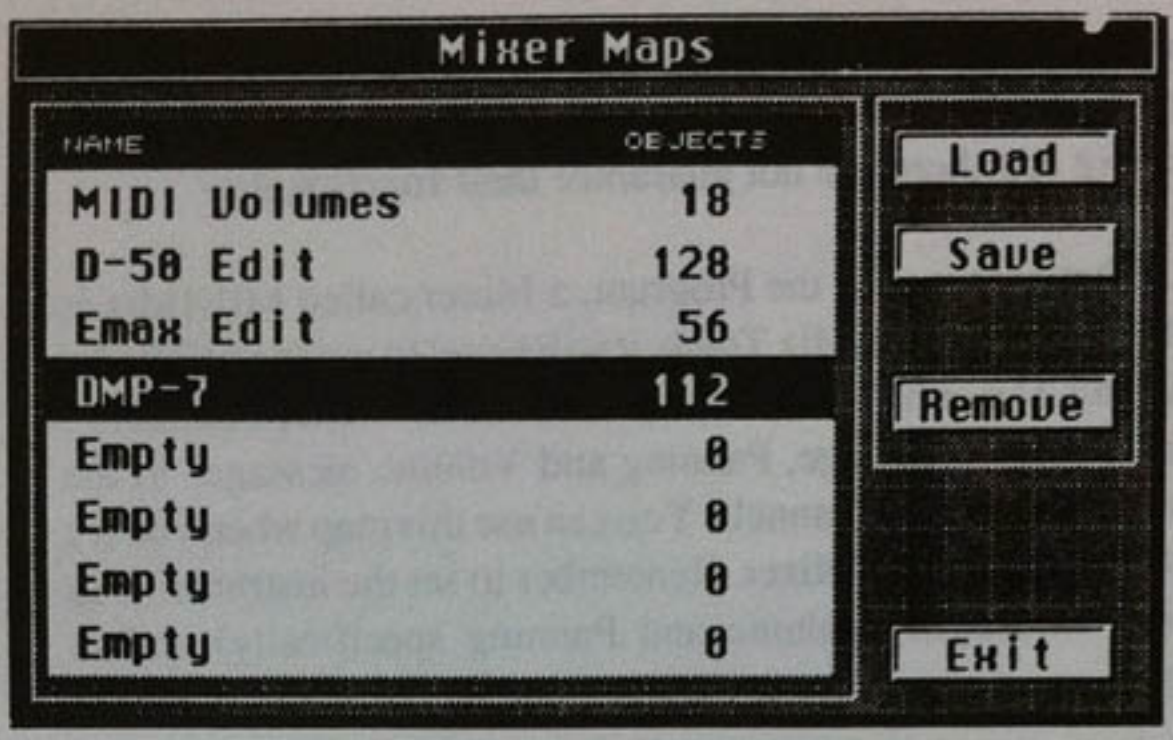
Selecting Maps

There are eight "slots" for Mixer Maps, which means you can have up to eight maps in memory at the same time. For each MIDI Track you select a slot, which means that this track will use the map selected for that slot. Several Tracks can use the same Map.

You use the Output column in the Track list to select a slot for the Track.

- In the DEF.ALL that comes with the program, the map in the first slot is called MIDIMix and contains a basic MIDI Mixer as described below.
- If you haven't yet set it up so that any maps are loaded, this pop-up menu will show "Untitled" for the first item and "Empty" for the rest. The "Untitled" map is an empty map with no Objects (faders, pots etc) on it.

If you select any of the "Empty" items, you are presented with a dialog box where you can Save, and Load Mixer maps from/to disk, give maps names, plus Remove loaded Maps from the list. This is called the Mixer Map dialog. This can also be reached from the Options menu, by selecting "Setup Mixermaps".



- If you want to create a new Map for one of the "Empty" slots, just select it in the Output column in the Track list, and click Exit when the Mixermap setup appears. To start making up Objects on that Map, create a Part on the Track and double click on it. You can later give the map a name and save it to disk. See below for details.

- If you want to Load a map from disk, open the Mixermap Setup, either by selecting an "empty" output in the Track list or by opening the dialog from the Options menu. Select one of the eight slots and click Load. Locate the map you want, using the regular file selector that appears. Click OK.

- If you want to give a Map a new name (not the file name), double click on the existing name and edit it. When you save the Map, the name will be saved with it.

- If you have created a new Mixer Map or changed it in any way, you can use the Save option in the Mixer Map Installation to save it to disk.

- When you have the slots filled as you want them, you simply use the Output column in the Track list to make any Mix Track use any map.

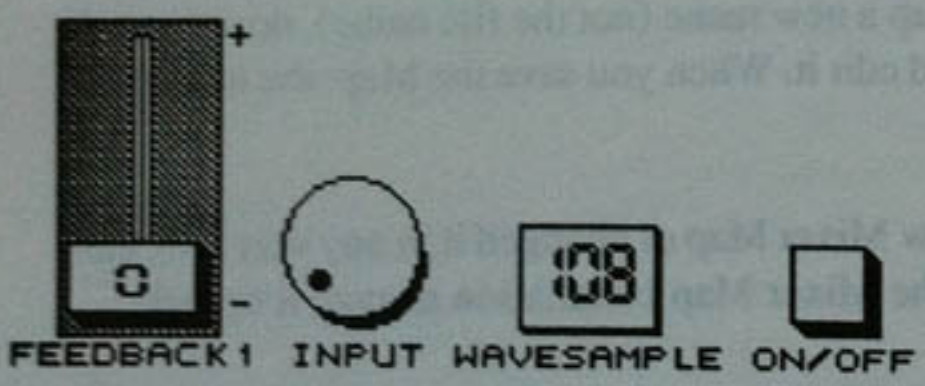
- All your current Mixer Maps are saved to disk with the Setup or the Song, see page 36-6.

Cubase comes with a number of ready-made maps located in the MIXERMAP folder on one of the additional disks. Some of these have been created by users, and Steinberg can therefore not guarantee their functionality.

In the DEF.ALL that comes with the Program, a Mixer called MIDIMix is included. When you first create a Mix Track, it will be set to use the MIDIMix map, by default. This Mixer has three objects each on 16 "MIDI Channels". The Objects send Program Change, Panning and Volume messages to the Atari port, on the sixteen MIDI Channels. You can use this map when you try out the different functions in the Mixer. Remember to set the instruments to react to controller messages (Volume and Panning specifically) and to Program Change.

Objects

The MIDI Mixer window works with *objects*. These objects are graphical representations of faders, pots, "steppable" numerical displays and switches. These objects send out the kind of MIDI-information you "program" them to do, from notes to System Exclusive events. Practically any kind of MIDI data can be generated from the MIDI Mixer window. You can also control the Objects via MIDI, so that you can use physical sliders or other devices that you have, that send MIDI.



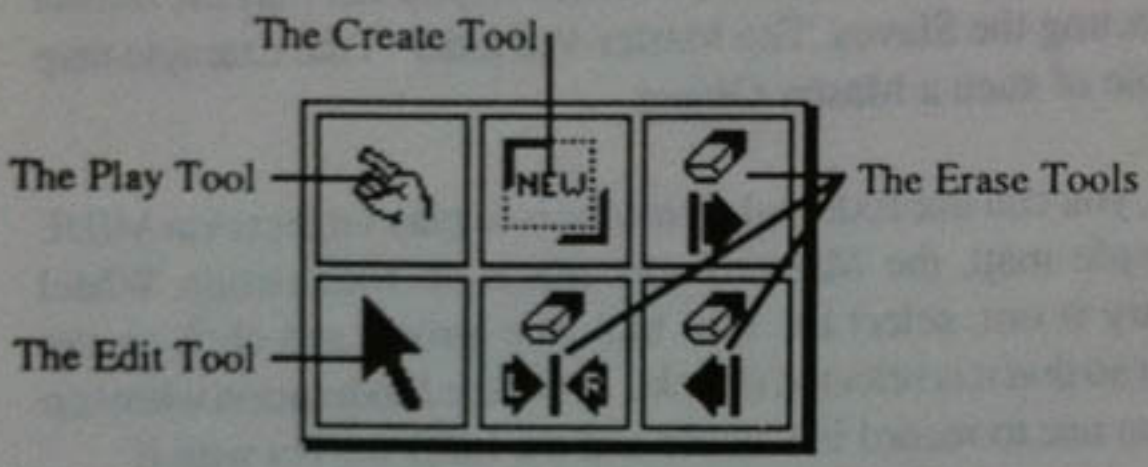
Object examples

There is also one type of Object that doesn't output any data at all, Text Objects, which simply display some text on the screen.

The maximum number of Objects (all types) in a MIDI Mixer is 128.

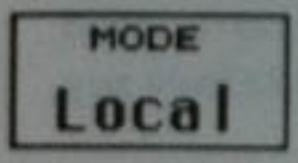
The Toolbox

The MIDI Mixer has a Toolbox that appears when you press the right mouse button, as in all the other windows. There are six tools. The Play Tool is for *Playing* the Objects, for example moving faders and pressing switches. The Create Tool is for creating new Objects and the Edit Tool is for editing existing objects. The remaining three tools are for erasing MIDI Mixer events in different ways.



Playing the Objects

If you want to make sure that you don't record any actions at this point, click on the "Mode" switch below the menu bar, until it says *Local* (not *Write* or *Replace*).



To actually Play an Object, select the Play Tool from the toolbox.

- If the Object is a fader, drag the handle up and down or sideways with the left mouse button. Or click directly somewhere on the fader, and the handle jumps there.

- If it is a dial, hold the tool over it, press the left mouse button and drag down/right to increase the value or up/left to decrease (see page 30-23).

- If it is an On/Off Switch you change the value by clicking on it with the left mouse button.

- If it is a display you in/decrease the value by pressing the left/right mouse button over the Object.

- You can also change the value of one *selected* Object with the [↑] or [↓] keys on the computer keyboard. Selecting is done either by clicking with the Edit Tool, or with the Play Tool and [Shift] pressed.

- If the Object is a Master (see page 30-26), Play it and the Slave Objects move with it. But if you hold down [Alternate], you can Play the Master without affecting the Slaves. The Master Vol fader in the example map is an example of such a Master Object.

- And finally, you can use External Controllers to play Objects via MIDI. In the example map, the Master Fader reacts on Modulation Wheel events. To try it out, select the Edit tool (the arrow) and click on the Master fader so that it is selected (black). Move the Modulation wheel on the synth you use to record in Cubase and the fader moves with it.

The External Controllers only work with the *selected* Objects. This makes it possible to use a limited number of external controllers effectively with a large number of Objects, by selecting and deselecting them as you go along.

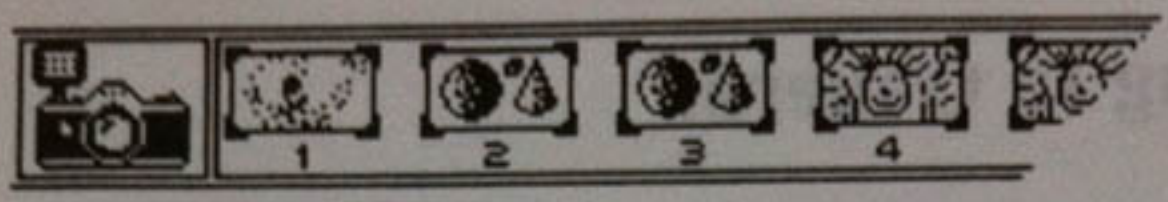
When you play the Objects, they send out messages to your equipment. You can try out Playing the objects while the music is playing, nothing is recorded in Local Mode. You can operate Cubase from the MIDI Mixer as from any Editor, the only difference is that you can't activate recording.

Snapshots

If you have set all the Objects to values that make up a static mix, you can save this mix as a *Snapshot*.

- If you want a Snapshot of all Objects, make sure that none of them are selected. If you want to take a Snapshot of just some Objects, select these.

- Click once on the camera icon and your new Snapshot appears beside it. Cubase selects an appropriate picture for each Snapshot for you!



- You can also recall the mix stored in a Snapshot. By clicking with the *left* mouse button on any of the Snapshot icons, the Objects are set to the values stored in the Snapshot. This allows you to recall a complete mix at any time.

This doesn't mean that the Snapshot is recorded as a permanent part of your music, see Recording a Snapshot, page 30-11.

- If you wish to *reprogram* a Snapshot, setup the Objects, hold down [Shift] and click on the Snapshot you want to replace, using the left mouse button. The new settings are now stored in that Snapshot.

- To delete a Snapshot, click with the right mouse button on one of the Snapshot icons, and then click Delete in the dialog box that comes up.

Naming Snapshots

If you double-click on a Snapshot, a dialog box opens up where you can enter a (short) name as usual.

Recording In General

Recording in the MIDI Mixer doesn't create Parts as other Track classes. No recording or editing takes place outside Parts on the Track. It is therefore in most cases a good idea to create a long Part (maybe even for the whole Song) for your MIDI Mixer events.

There are two main types of MIDI Mixer recording. The first is to record a static mix that for example sets up your instruments at the beginning of the Song. This can either be done by just putting the MIDI Mixer into Write mode and setting the Objects as you wish to have them while Cubase is stopped at a certain Position, or by recalling a Snapshot in Write mode. The second type is recording of dynamic changes. This is done by Playing the Objects while the music is playing. Either way, events are recorded that represent the Objects and their values at some point. Static mixes are recorded as one event per Object. Dynamic changes like fade-ins and fade-outs create many events per Object. Remember the following:

- **It is easy to create a large number of events from the MIDI Mixer. Cubase can handle the output, but it is not sure that MIDI can. System Exclusive messages are long MIDI messages, and if you only use one Output you might run into problems with MIDI delays. If something can be achieved with a Static mix, this is preferred to a Dynamic recording.**

- **If you don't want a true "fade", but rather a direct change in value, you should click somewhere on a fader to make the handle jump there (instead of dragging the handle there). This creates less events.**

- **Use the MIDI Mixer's Quantize value (on the Options menu, described later) to make sure that not more events are recorded than you actually need.**

- **Notes (usually) have timing priority over other events in Cubase, so for example a volume change should be put slightly before the note, not on the same tick.**

- **If you have System Exclusive messages in a Snapshot or static mix, record them slightly early, since many synthesizers need some time**

to process System Exclusive data.

- **If you have made a large Snapshot or static recording that sets up all your synthesizers at the beginning of a Song (remember that you can have up to 128 Objects!) record it in a one bar countdown, to avoid MIDI hiccups at the first downbeat of the Song.**

- **And, remember that you do not use the regular Record button for recording MIDI Mixer Events.**

Recording and Editing Static Mixes

By Playing the Objects

- Move to the Song Position where you want to insert a new mix. Make sure you stay within a Part!

- Make sure Cubase is stopped.

- Put the MIDI Mixer in "recording" mode by clicking on the *MODE* button below the menu bar until it says *Write*.

- Set the Objects to the desired values. Only the ones you actually use are recorded. You may move eg a fader up and down as much as you wish, it is only the last setting (the one you leave the Object at) that is recorded. This is stored as a Special MIDI Mixer Event at the current Song Position; one event is created for each Object you move.

- When you are finished, either switch back to Local Mode, or move somewhere else to Write another mix. When you play back the music, all the Objects will be updated at the correct position.

To make your Object recording play back, you have to have the MIDI Mixer in Write or Replace Mode.

By Recalling a Snapshot

You can also Write a complete Snapshot, which records one event for each Object. This can be done in two ways:

- Proceed as above, but instead of setting up the Objects, click on the Snapshot icon that recalls the right Snapshot.

- Put the MIDI Mixer in Write Mode. Start Playback. When the music reaches the right position, recall the Snapshot on the fly. You can recall as many Snapshots as you like during one "take", they will all be recorded at the right positions. Just remember to stay within the Part! Stop Playback when you are finished and switch back to Local Mode or keep recording as described above.

If you later re-program a Snapshot, this doesn't automatically change your recording in any way.

Replacing a Static Mix

In Replace Mode, Cubase records no new data, but replaces the values of existing MIDI Mixer Events. This is useful if you for instance have recorded a static mix at the beginning of a Song and decide that one of the volumes is too low, or for some other reason want to make changes to events already recorded. Replacing is best done while Cubase is stopped.

- Move to the same Position as, or some Position just after the event(s) that you want to replace.

- Set the MIDI Mixer to *Replace* Mode by clicking on the *MODE* button.

- Set the Object(s) to the new value(s), or recall a complete Snapshot. Cubase now tracks your recording backwards from the current Position. The first MIDI Mixer event found for each Object is replaced with the new values. If no event is found (within the Part) a new event is inserted at the beginning of the Part.

Recording and Editing Dynamic Changes

You can also record any Object-actions while the music is playing. This allows you to create dynamic changes in timbre, volume or anything else you can control via an Object.

- ❑ Put the MIDI Mixer in "recording" mode by clicking on the *MODE* button below the menu bar until it says *Write*.

- ❑ Start Cubase at any Position, in Cycle Mode if you wish. Play the Objects. Remember to stay within the Part.

- ❑ Stop Cubase when you are finished. Your actions are now recorded as MIDI Mixer Events. When you play back the music, the Objects will move as they did when you used them, and their MIDI messages are sent Out.

To make your Object recording play back, you have to have the MIDI Mixer in Write or Replace Mode.

Redoing a Dynamic Recording

If you're not satisfied with what you did, you may decide to redo the whole take. Use any of the methods described later to erase events for one or more Objects and redo the take.

Punching In on Dynamic Recordings

If you record the actions of an Object again, in Write mode, you can punch-in on each Object. This is how it works:

As long as you keep the mouse button pressed over one Object, the old events created with that Object are erased and new ones are put in if you for example Play the fader during the take. This means that you can easily replace eg one fader movement among many, by just redoing it. As soon as you release the mouse you have punched out.

Deleting MIDI Mixer Events

You have several Options here.

- You have three tools in the Tool Box for deleting all events *created by one Object*. These in turn delete:
  1. All events from the current Song Position to the end of the Part.
  2. All events from the beginning of the Part up to the current Song Position.
  3. All events in the Part inside the Locators.



Select the appropriate tool, and click on the Object that produced the events.

- You can pull down the Local menu and select "Delete Range". This Deletes all MIDI Mixer events (for *all* Objects) between the Left and Right Locator within the Part.
- You can Exit the MIDI Mixer window and either delete the whole Part or specific events from List Edit or Logical Edit.

Undo

In the MIDI Mixer window, you can Undo:

- Delete Object.
- Delete Events, either done with one of the delete Tools in the Toolbox or by selecting the command from the Local menu.

Options

On the Local menu to the left, just below the menu Bar you find one item called "Options". Selecting this Opens up a dialog box.

Quantize
Use this value to decide how precise your recording shall be. This value is in ticks and defines how often Objects are checked for changes, when Cubase is playing back, and the MIDI Mixer is in Write mode. Some changes, like pitch bend, have to be recorded with a small Quantize value to feel smooth. Others, like for example Panning, can be recorded with higher values to save memory and make editing easier.

Continuous Redraw
This is an On/Off function for the Object movements on the screen. If you have this set to On, any changes are always shown. If you set it to Off and move for example a fader, the other Objects will not be updated. This is convenient if you have a lot of movement going on on the screen, and wish to concentrate on writing events with one Object.

More about the MIDI Mixer Events and Objects

- The MIDI Mixer events are Special internal Events, not MIDI Events. They can be edited in List Edit as specified on page 28-6. But you can't go directly into List Edit from the MIDI Mixer, you have to "Keep" first.
- MIDI Mixer Events are chased within the Part if the Chase Events function is turned on on the Options menu (see page 21-2 for more info).
- You *can* change the settings for an Object, after you have recorded events with it, but it might give confusing results, so it is probably best avoided.
- MIDI Mixer events can be processed in Logical Edit. Special Events can be transformed into MIDI events, for further editing. But you have to go back to the Arrange window before you can select Logical Edit.

Keep and Cancel

These two buttons allow you to decide to save all changes made since you last entered the MIDI Mixer window (click Keep), or to cancel them (click Cancel). This cancels all recording of events, but changes to Objects and their parameters are not cancelled.

Creating and Editing Objects

Once you have entered a MIDI Mixer you can decide to create new objects, or manipulate existing ones.

Creating a MIDI Mixer Object

Select the Create Tool. Click once in a free area of the window to position the object (it can be moved later). A dialog box opens up where you can change a number of parameters for that specific object. These parameters are described later in the text. To Exit the dialog box and display the Object, click on OK or press [Return] on the computer keyboard. As an alternative to clicking, you can drag a rectangle to make up the size of the object at the same time as creating it.

Selecting Objects

- If you have the Edit Tool selected, all you have to do to select one Object is to click on it.
- If you are using the Play Tool or the Create Tool, you have to hold down [Shift] while selecting.

More Objects can be selected and de-selected by holding down the [Shift] key while clicking, or by using the Edit Tool or Play Tool to enclose them in a rectangle, just as when selecting Parts or Events (in for example Key Edit). If you have the Play Tool selected you have to hold down [Shift] while making up the rectangle.

Sizing an Object

When you select an Object using the Edit Tool or the Create Tool, a small handle appears at its lower right corner. Use this to change the size of the Object.

Moving an Object

To arrange all your Objects into a neat display, you need to move them around. This is done by selecting the Objects you want to move, and then dragging with the Edit or Create Tool positioned anywhere on one of the Objects (except on a sizing handle, of course).

Normally, movement is restricted to invisible gridlines, eight pixels apart (a pixel is the smallest black and white dot on the screen). This makes it easier to arrange Objects in neat rows and columns. But, if you hold down [Control], you can move to any position.

Duplicating an Object

If you hold down [Alternate] on the computer keyboard and drag an Object as when moving, you are creating a copy of the dragged object. When you release the mouse, the same dialog box opens up as when you create a new object.

Editing an Existing Object

There are two ways to do this:

- Select the Edit Tool or the Create Tool from the toolbox. Double click on the object.
- Select one object (if one isn't already selected) and press [Control]-[I] on the computer keyboard.

In either case, the same dialog box appears as when you create a new Object.

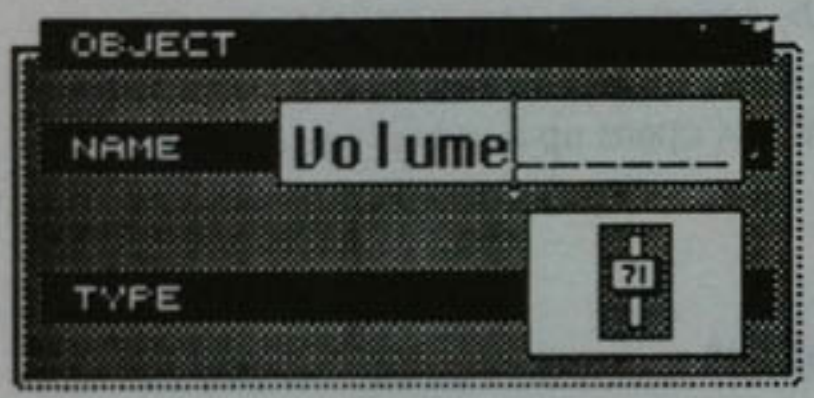
Deleting Objects

This is also done as in all other cases in Cubase. Select the Objects and press [Backspace] or [Delete], or select Delete Object from the Edit menu.

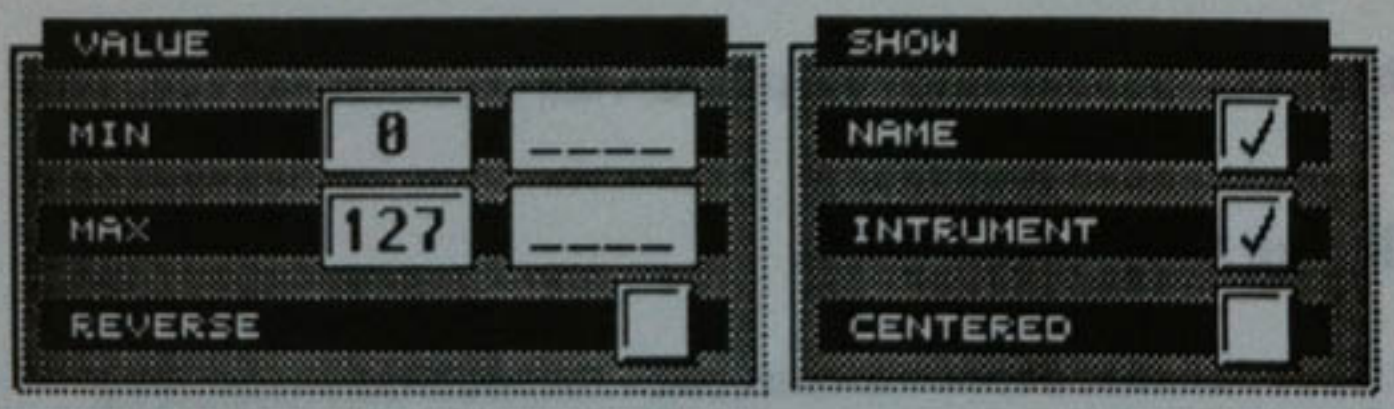
An example

Before we go into the details of the dialog box, let's create one fader that is used to output MIDI Volume.

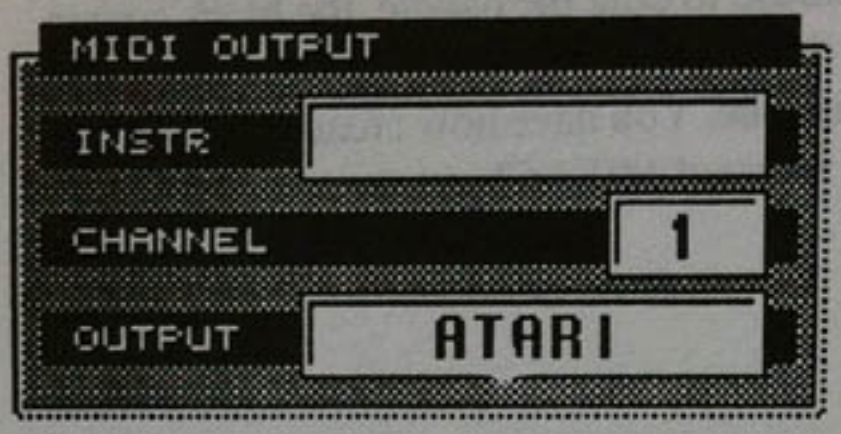
- ❑ Open up any MIDI Mixer map.
- ❑ If there are already Objects there, use the Select All command on the Edit menu, and press [Backspace] to remove them all.
- ❑ Select the Create Tool and click somewhere in the window.
- ❑ Click in the Name field at the top left of the dialog box that appears. Replace whatever text is there with the text "VOLUME".



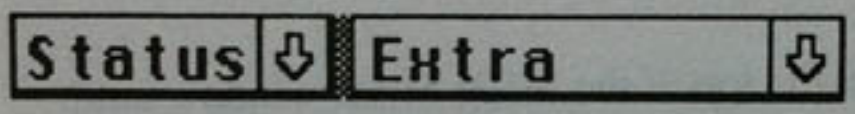
- ❑ Select the type of object by selecting on one of the graphical symbols on the "Type" pop-up, below. Choose the vertical fader, the top one, this time.
- ❑ Check that the Min and Max values are 0 and 127, that name and instrument are both shown (ticked).



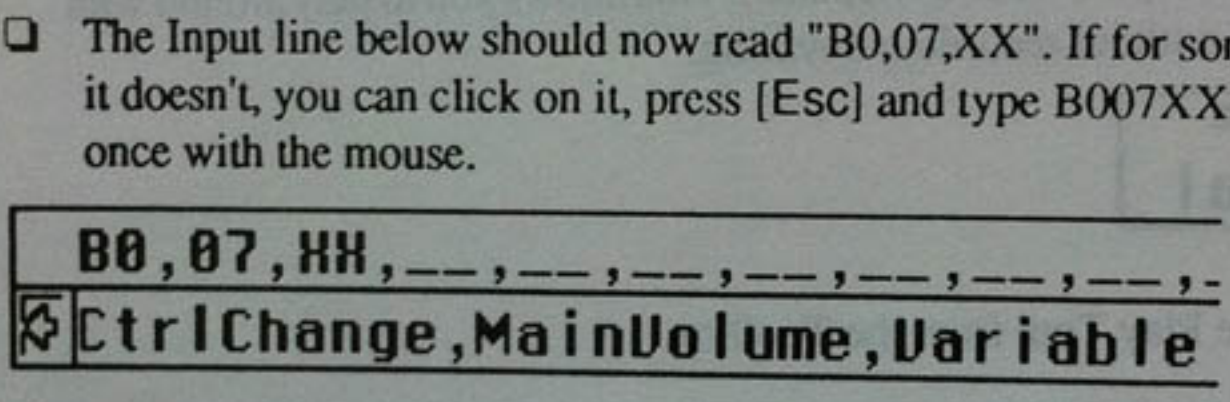
- In the MIDI Output section in the lower left corner of the dialog, select the same MIDI Channel and Output as for the Instrument you are playing.



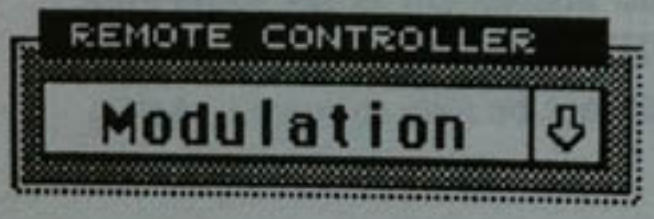
- It is time to define what MIDI data the fader will actually send. Use the Status pop-up in the middle section of the dialog box to select CtrlChange. From the pop-up menu beside it, select MainVolume.



- The Input line below should now read "B0,07,XX". If for some reason it doesn't, you can click on it, press [Esc] and type B007XX and click once with the mouse.



- A local menu pops up when you click on the field below the text REMOTE CONTROLLER. Select Modulation (1).

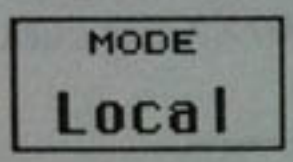


- Click OK or press [Return].

- The dialog box closes and a very short fader appears on the screen. Click on it to select it, and use the mouse to drag the handle, the black square at the lower right corner of the fader, downwards, so that the fader becomes as long as you want it to be. You have now created a fader that outputs MIDI Volume on the selected MIDI Channel.



- Click on the "Mode" button at the top of the MIDI Mixer window until it says *Local* (not Write or Replace). This allows you to play around with the fader without recording anything.



- Select the Play Tool from the Toolbox.

- Move the fader up and down by dragging its handle, while playing your instrument. The volume of the sound should change with the movement of the fader. If it doesn't, check that the instrument is set to receive Controllers (and especially number 7, MIDI Volume) on the right MIDI Channel. Also, some very old synths may not be able to react to MIDI Volume at all.



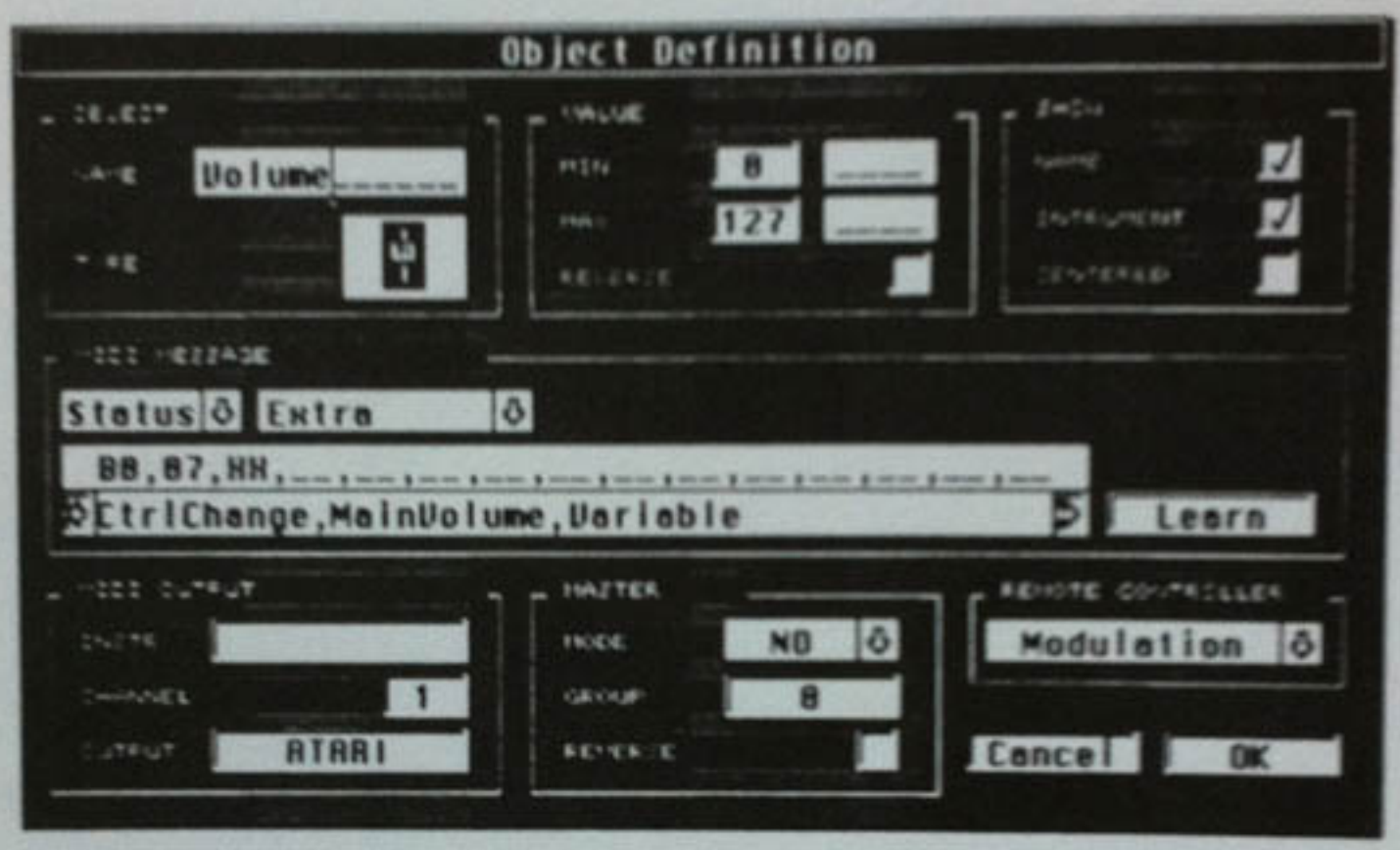
- Try moving the Modulation wheel or lever on the instrument you are playing (the Object has to be selected for this to work). This should also

make the fader handle move, since you have selected Modulation as an External Controller for the Object. You have now set up things so that the Modulation wheel now controls MIDI Volume on your synth, via the object you have created.

- Congratulations! If everything worked, you have made up your first Object, with a very useful function. Experiment by changing the values in the dialog box to see what else you can come up with.

The Object Dialog Box

Read as much as you wish of this text, and don't feel intimidated by its technical nature. If you don't wish to get into heavy MIDI-hacking, skip the details on the Input Line and the different types of messages and concentrate on the Status Byte and the menu beside it and the Learn function, since these features alone allow you to make an object without typing a single number!



There are quite a few parameters that you can set for each object, all found in this dialog box. Value fields are changed as usual, either using the left and right mouse button (maybe in combination with [Shift]) or by double clicking and entering the value from the computer keyboard. Text fields can be clicked on, and the text is edited as usual. There are also local menus and an Input Line and an Info Line in this dialog box.

Object parameters

The first row round of parameters affect the Object's looks and behaviours on the screen.

Name
This is simply the Object's name. You edit the name directly in this field. Twelve characters are maximum. For Text Objects this is the only information you need to input.

Object types
The five icons on the "Type" pop-up menu represent:

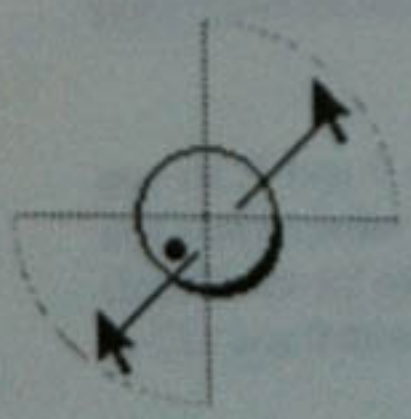
Vertical fader, a replica of a regular mixer fader. The current value is displayed in the "handle".



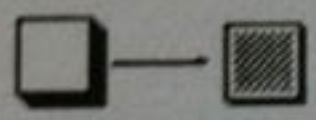
Horizontal fader, same as above but moving horizontally.



Dial, a knob that can be turned by first clicking on it and then moving the mouse down or to the right (or both) to increase the current value, or up/to the left to decrease it. This knob may also have a centre marking above it (see Show, next page).



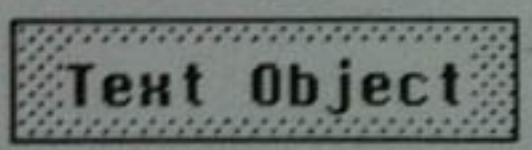
On/Off Switch. When you "press" this switch (click on it), the set maximum value is sent out (see below). When you "press" again, the minimum value is sent out.



Display. This is a replica of an LCD display that can also be used to send out values. Use the left and right mouse button to in/decreas the values.



Text
These Objects don't Output any data. Use them to create names, comments, borders and other things that make your MIDI Mixer Map simply look better. The only information in the dialog box that is valid for a Text Object is the name at the top.



Value Parameters

Min/Max
You can set a minimum and maximum value for the Object. The maximum range is 0 to 127. The minimum range is two adjacent numbers, for example 6 and 7 for all objects except Switches. For Switches you can set *the same min and max value*, which allows you to send out exactly the same message each time you click on the switch. Use this for Static Controller messages like Mode Changes or for specific System Exclusive messages that should always be the same.

Many other System Exclusive functions change between 0 and 1, so you could eg make up an On/Off Switch that sends out these values when you click on it. Another example: some Controller switches (like Sustain Pedal) should have 0 for off and 127 for on. Use a Switch for this with 0 and 127 as min and max settings.

If you wish you can also name the min and max values in the two small name-fields to the right of each value. These names are then shown beside the end positions for the faders and the dial.

Reverse
This parameter makes it possible to make an Object go "backwards", like for example a fader wi..i the highest value at the bottom, and the lowest at the top. For On/Off switches this parameter is used to decide which value should be sent out when the switch is pressed/not pressed.

Show Parameters

Name and Instrument
By clicking in the Name and Instrument field you can decide if the Object's name (as entered at the top of the dialog box) and Instrument setting (Output and MIDI Channel) should be displayed with the Object or not.

Justification
For Dials you can decide if you want the centre value indicated graphically above the knob. Some Controller messages, like Pan and Balance, are convenient to think of as having centre values (for example "no panning") and changes that go "up or down" (pan left, pan right) from that position. For those you should select Centred Justification.

MIDI Output Parameters

Instrument Channel and Output
Each Object can output to a different MIDI Channel and Output. And the combination of Channel and Output can of course be handled as an Instrument, as usual.

The Channel value does not apply to System Exclusive (Sys Ex) messages, since these are not sent on regular MIDI Channels.

Master Parameters

Mode
This setting is used with Grouped Objects, see page 30-26. Here you can make the Object you are editing the Master of the Group, by setting this value to anything but *No*.

Link means that the Slave Objects take on the same value as the Master.

Prop means that the slave Objects move as much as the Master, but each one keeping its relative distance to the Master.

Use the first option when you want to Link several functions, for example the panning of several sounds, and the second option when you for example want to use one fader to control the individual volumes of many sounds, as when using Groups on a regular mixing console. If you leave the Input line blank for a Master Object you have made it a dedicated Master Object that only controls other Objects.

Group
You can group several objects, so that they behave a bit like groups on a regular mixing console. You have one Master Object and as many Slave Objects as you like. Use this value field to enter a number. All Objects with the same Master Group number are considered to belong to the same Group. Number 0 is also a Group, so when you start with new objects they are all "members" of Group 0.

Reverse
If this is left unticked, the fader will move in the same direction as the Master. If you tick it, it will move in the opposite direction. If this Object is the Master this parameter has no effect.

Remote Controller

The Objects can be used directly on the screen, you can for instance use the mouse to operate a fader (we call that "Playing" the Object, to separate it from moving it, which is something else). But you can also control the Objects via MIDI. You may have one or more units in your setup that can transmit

Controller messages. This can be the data slider on your synth, a breath controller, a foot-pedal, a foot-switch, a modulation wheel or some unit specifically designed for sending out Continuous Controller events, such as the JL Cooper FaderMaster or Kawai MM-16. Some MIDI Keyboards like the Roland A-50 and A-80 and the Akai MX-76 also have several sliders and switches on them that can send out Controller messages.

Assigning for example the Modulation wheel on a synth as an External Controller for a fader, allows you to remotely control almost any parameter on a synth from that Modulation wheel, and record the changes in Cubase.

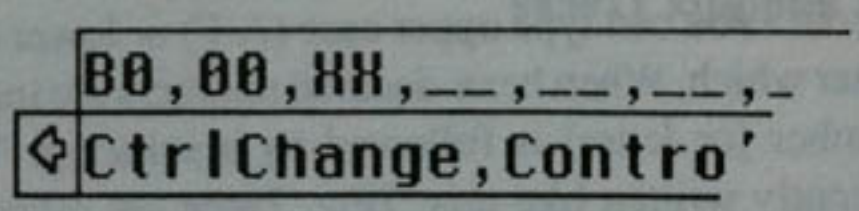
Select the Controller number you wish to use for external control of this object.

Observe that which MIDI Channel the Controller is coming in on is irrelevant. You therefore have to give each object different *Controller numbers*.

External Controllers only work on selected Objects, see page 30-7.

MIDI Message

The Input- and Info Lines and the Status Byte menu
This is the core of the object. You use these parameters to decide what MIDI messages the object should send out.



If you are a real MIDI-hacker you can just type in the message on the Input Line (the top line). Click once on the Input Line and use the [←], [→], [Esc] and [Backspace] keys as with all text. The commas are always there to separate the bytes so that the line is easier to read, you don't have to type them yourself. Once you click with the mouse on the Info Line, the text is interpreted and displayed there.

The decoded version of the message is shown on the Info Line with as much as possible interpreted into text that is fairly easy to understand. Numbers are always shown in regular decimal format on the Info Line (not in hexa-decimal as on the Input Line). This allows you to use the Input and Info Lines for automatic conversion from hexa-decimal to decimal.
If you are not used to typing hexa-decimal numbers (who is?), there are two local menus there to help you. One is called Status Byte, and on this menu you find a list of the possible status bytes, as described below. Select one and it appears on the line. Beside this is another menu. This helps you with filling out the rest of the "form". What you find on this menu depends on what kind of status byte you have selected or typed in, as described for each MIDI Message later in this text.

Text and Master Objects don't have to have a MIDI Message on the Input line at all.

General rules for the messages

All MIDI messages start with a status byte, a byte that tells what kind of message it is (notes, program change, Aftertouch/pressure and so on). After this follow one or more data bytes, the values, which represent for example "which key", "how much pressure" and so on.

Everything on the Input Line is in hexa-decimal format. This means that only numbers 0 to 9 and characters A to F (which means 10 to 15 in decimal notation) can be entered. You can type upper case (A-F) or lower case (a-f) letters, it doesn't matter which. When hexa-decimal numbers are indicated in this manual, the number (or letter) is followed by a subscript "16". 127 (decimal) is consequently written like this: $7F_{16}$. There are other ways of indicating hexa-decimal format also, (for example by a prefix $ or a suffix H or h) but the subscript format is used in the following text.

A table for conversion between Decimal, Hexa-Decimal and Binary formats is found on page 30-38. Different manufacturers use different formats (decimal, binary, hexa-decimal) in their documentation, so use this table to convert to hexa-decimal when you are copying messages from an operation manual or similar.

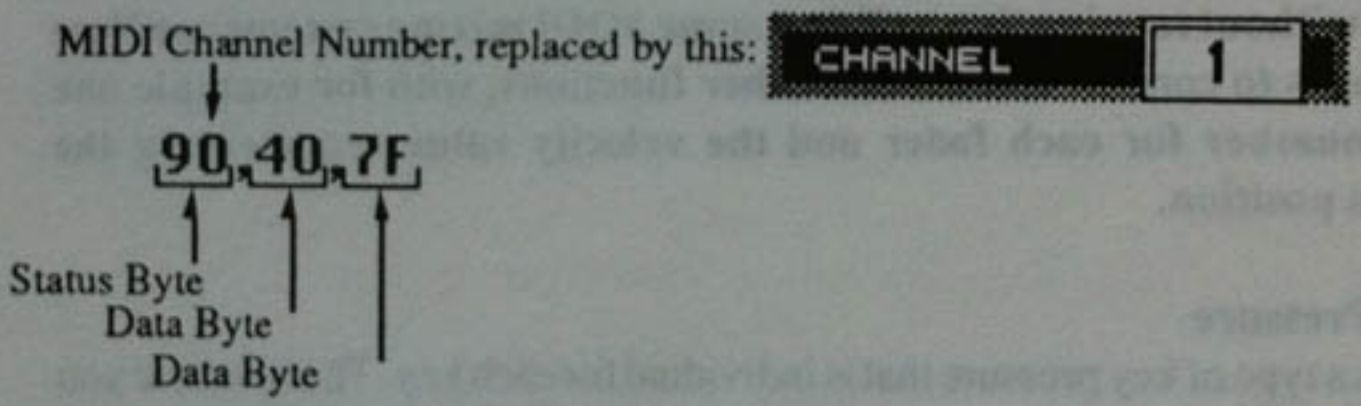
Each two characters between commas on the Input Line represent a byte, a number between 0 and 255. The idea by using hexa-decimal format is that it only takes two "digits" to represent all values between 0 and 255. The bytes on the Input Line form the MIDI message sent out. Somewhere in your message you **must** enter XX (or xx). This is the variable, the value that changes when you use the object. If the object for example is a fader, this will be the position of the fader, the value that changes when you Play it.

Let's say that you type in "90,3C,XX" and move the fader handle from position 8 to 9. This will make the fader send out $903C09_{16}$. The first two bytes are the ones you typed in, the third byte is the new position of the fader.

- All MIDI messages begin with a *status byte*, a code telling what type of message it is.

- After that comes one, two ore more *data bytes*. These are always between 00_{16} and $7F_{16}$ (0 to 127 decimal).

- Most MIDI messages contain a MIDI Channel number as a part of the Status byte. If the message on the Input Line is one of those, the Object will always send out its messages on the MIDI Channel selected at the at the top of the dialog box. Just as when you set a *playback* MIDI Channel for a Track in the Arrange window.



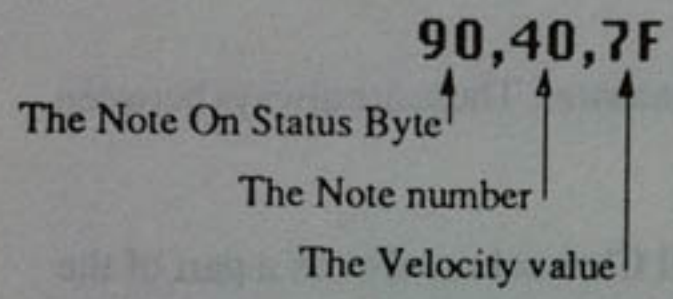
(Those of you who read fluent MIDI may know that the least significant four bits in the status byte is the channel number. However, it doesn't matter which number you enter here, it is always replaced by the channel number set at the top of the dialog box).

When you have typed or used the menus (or a combination of both techniques) to enter a message, you should click the mouse or press [Return] to let the program check for errors. Such errors could be: Other characters than the ones allowed, more than one status byte, no XX (variable) field, and so on. A dialog box will inform you so that you can correct the mistake.

Notes

Note On messages start with 90_{16}. Note Off messages start with 80_{16}. The Status Byte menu always enters Note On status (90_{16}).

After the status byte should follow a note number (which key) and a velocity number. These both range from 0 to 127 (00_{16} to $7F_{16}$) and you can replace either one with the variable XX.



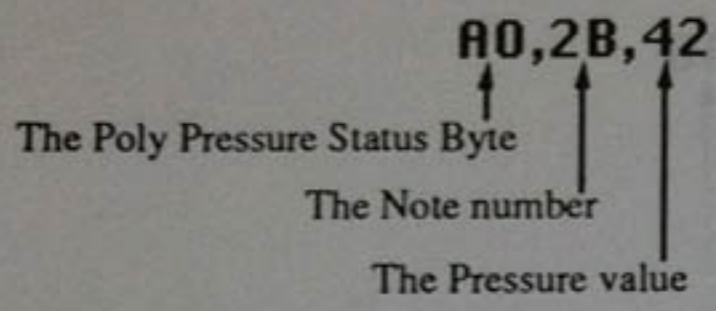
The menu beside the Status menu is not used for Notes.

Sending out streams of Note Ons from for example a fader to your synthesizers, may not be such a good idea, since this will turn on a lot of notes without turning them off. But some MIDI mixing systems use Note messages to control volume and other functions, with for example one note number for each fader and the velocity value representing the faders position.

Poly Pressure

This is a type of key pressure that is individual for each key. The first byte you get, when you select Poly-Press from the Status Byte menu, is $A0_{16}$.

After the status byte follows two data bytes, one that tells which key, and one that represents the amount of pressure. This can normally be used to control a number of parameters in a synthesizer, such as volume, vibrato or filter frequency. Use this instead of Channel Pressure (Aftertouch, see below) if you wish to have individual control of certain notes.



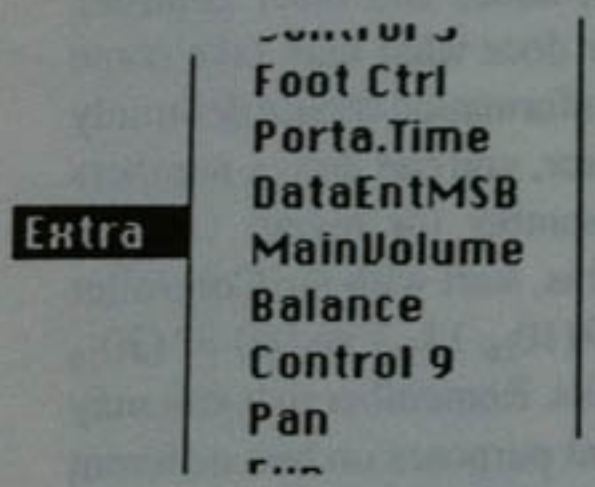
The menu beside the Status menu is not used for Poly Pressure.

Control Change

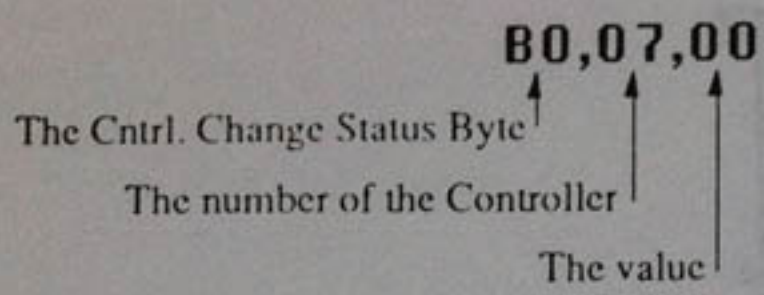
This is the most obvious purpose for the MIDI Mixer window. Controllers can be used for almost any function. You will find a general discussion on page 7-7 in this manual.

Controller messages start with $B0_{16}$ so this is what you get if you select CtrlChange from the Status Byte menu.

The second byte is the number of the Controller. If you have entered the status byte for Controllers, and pull down the menu beside the Status menu, a list of all Controllers (by their names) appears. Select the one you want.



The last byte in a Controller message is the value for the selected Controller, and this is probably where you will put your XXs, so that the Object can be used for adjusting the value of the Controller.



An example: Let's say that you want to create a volume mixer for four synths (or synth sounds on a multi-timbral unit) that receive on a MIDI Channel each, eg MIDI Channel 1 to 4. You don't know everything about the different types of Objects and how to use them yet, but anyway. First you create one Object that is set to send out on MIDI Channel 1 and that generates the MIDI message "B0,07,XX", as in the example on page 30-18. 07_{16} (the second byte) is Main (MIDI) Volume as you can see on the menu beside the Status menu, and XX is the variable field for the Object. To create the other three volume controls, all you have to do is to duplicate the Object three times and change the MIDI Channel number in each Objects dialog box. Simple, wasn't it?

Controllers can be used for almost any purpos, some of them are defined by the MIDI standard and others are not. Many synthesizers and effect units (like reverbs) can be programmed to react to controller messages, and MIDI-controlled mixer systems use them for faders, knobs and other controls. Figuring out exactly which Controller number does what may take some searching in the unit's operation manual, but the information should definitely be there. Often, on for example a signal processor, you can assign numbers to parameters yourself, like one Controller number for reverb volume, another for reverb decay, and so on. If you do this, start with the Controller numbers reserved for "user experimenting" 16-19 (10_{16}-13_{16}), and 80-83 (50_{16} to 53_{16}) to avoid number conflicts with other units. Remember that you may use the same Controller number for two different purposes on two different units as long as they receive on different MIDI Channels.

Registered and Non-Registered Parameter Numbers

The devoted MIDI fan can also use the Objects to send out so called Register Parameter numbers (RPNs) and Non-Registered Parameter Numbers (NRPNs). Proceed as follows:

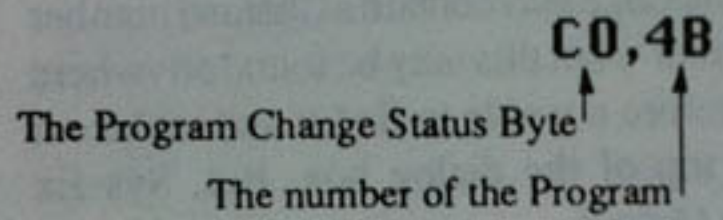
- ❑ To send a Registered Parameter number, input (in hex): B0,64,LSB,65,MSB,38,DLSB,06,DMSB.

The LSB and MSB should be replaced by numbers. They form the number of the Registered Parameter. You should also replace either the DLSB or the DMSB with the XXs and the other with a number, depending on how you want to change the value.

- To send a Non-Registered Parameter number, input:
  B0,62,LSB,63,MSB,38,DLSB,06,DMSB.
  The abbreviations should be replaced as with the registered parameters.

Program Change

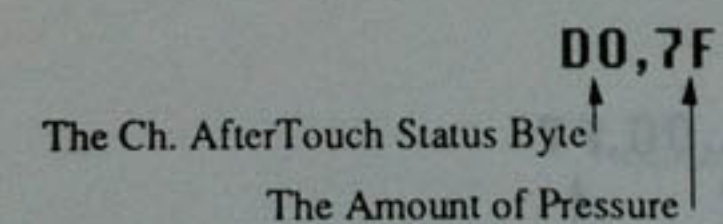
These messages are normally used to make an external unit switch to another Program (sometimes called Patch, Timbre, Set, Instrument, Combination or something else). They start with $C0_{16}$. Program Change messages only have one value (the Program Number), so after the status byte is where your XX's go.



Aftertouch

This is often called Channel Aftertouch or Channel Pressure. The first byte is $D0_{16}$.

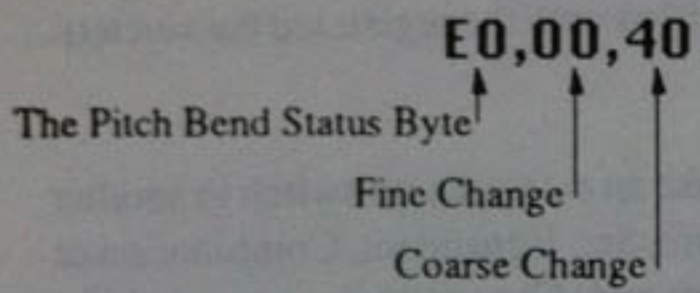
Channel Aftertouch affects all notes by the same amount and can often be used for functions like vibrato amount, volume, filter cutoff and so on.



Pitch Bend

If you have come this far in the text you probably knew what Pitch Bend was before you started reading! The status code should read $E0_{16}$ in the dialog box. The two values that come after this represent coarse and fine changes. The coarse value (the second data byte) represents the full swing of a pitch bend

wheel with 00_{16} as full negative, 40_{16} as middle (no pitch bend) and $7F_{16}$ as full positive swing. Within each of these steps you can fine tune the bend by setting the first data byte to anything between 00_{16} and $7F_{16}$. To create normal pitch bend you would probably change the second byte, which means that the line should look like this "E0,00,XX".

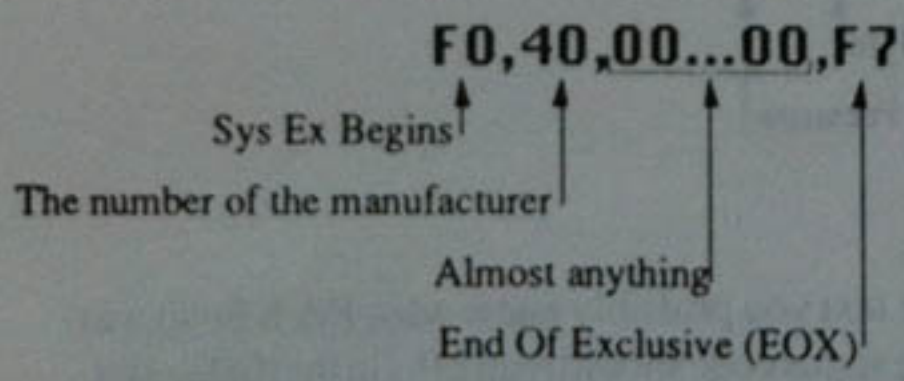


Sys Ex

System Exclusive messages are the only MIDI messages that don't follow any specific standard. A System Exclusive message *may* contain a Channel number (or a similar value called a "device number") but this may be found anywhere within the message and Cubase is therefore not able to find it and replace it with the Channel number set at the top of the dialog box. But, Sys Ex messages can of course be sent to any Output.

If it applies, you have to enter the right Channel number directly, somewhere into the message.

Sys Ex messages always start with $F0_{16}$, and after that comes a number which represents the manufacturer (Roland have 41_{16}, Yamaha 43_{16} and so on, but this *may* be more than one byte). After this comes (almost) anything that the manufacturer has decided makes sense for their products. The whole message always ends with a $F7_{16}$ (End Of Exclusive, EOX).



Sys Ex is mostly used for two things, sending out and receiving complete Programs (Patches, Timbres...) to and from a unit, and for changing individual

parameters. You probably could make a MIDI Mixer Object ask a synthesizer to give away a copy of all the settings in all Programs or something like that, but Satellite (the Accessory program that comes free with Cubase) is better suited for that. The System Exclusive messages you will send out from the MIDI Mixer window will probably be aimed at changing individual parameters.

It is hard to say how these messages should be built up, but here is a model of a general one: The whole thing starts with $F0_{16}$ (beginning of System Exclusive), followed by the manufacturers code. After this often comes a Device Number, which is almost the same as a MIDI Channel number. It is used if you have two units of the same model and wish to be able to address them individually. This number is often set with a parameter on the unit called "Global MIDI Channel" or "Device Number", "ID Number" or something like that. After this comes a number the manufacturer uses to identify the model (Ensoniq has one number for the EPS, one for the SQ-80, yet one for the VFX and so on).

What we have described up to now is often called the "System Exclusive header". After that comes a code telling that you want to access parameters, followed by a number telling exactly which parameter, and lastly a byte for the value of it (this is where your XX goes). And finally End of System Exclusive ($F7_{16}$). All in all a message of something between six and twenty bytes.

To make this work, you must set the receiving unit to receive System Exclusive messages and make sure that any "Global MIDI Channel", "Device Number" or "ID Number" is correct. Also save a copy of the programs in the unit before starting to experiment, since instruments have been known to misbehave when sent incorrectly formatted data.

Often information on how to build up System Exclusive messages is found in the back of the unit's operation manual (in fine print!). Otherwise, it can always be requested from the manufacturer. Either way, it is no light reading!

The menu beside the Status menu works in a pretty special way for the System Exclusive messages. Due to MIDI's nature, you can't send data bytes with values higher than 127 ($7F_{16}$). Many parameters on synthesizers vary between larger numbers than that (for example -99 to +99) so Cubase has a few tricks up its sleeve to make an object able to send the full range of values for that parameter although the objects max and min values are always 0 and 127.

Let's get technical:

No Function. The variable is not converted.
Lxp-Uni and Lxp-Bi. These two are for the Lexicon LXP-1. More information is found in the LXP-1 operation manual.
MIDI Byte -> 2 Nybbles. A byte formed as a MIDI byte (0 to 127 only) is converted into two nybbles (four-bit packages) each sent out in the MIDI format.
Full Byte -> 2 Nybbles. As above but the variable extrapolated to a full byte, ie a byte ranging from 0 to 255. This is then converted into two nybbles. The Ensoniq VFX uses this format.
14 Bit (Korg). The variable is extrapolated to a 14 bit "bi-polar" (allowing + and – settings) value for use with the Korg M- and T-series synthesizers.
7Bit+MSB. The variable is extrapolated to a full byte (0 to 255) and the most significant bit is sent out with the first byte, and the rest of the value is sent out with the second byte. Oberheim uses this format with eg the Matrix synthesizers.

If you plan to use any of the data formats described above (except No Function of course), put the Variable (XX) in where the section of the Sys Ex message that changes with the Object *begins*. Then enter 00 as the next byte to make room for the extrapolated data as explained above. Then select one of the described types of conversion of the variable from the menu beside the Status menu.

Std. Roland Checksum.
Most Roland synths need a checksum for each Sys Ex message. Selecting this item appends the checksum at the end of the message.

Learn

It is not all the time that you know exactly which controller number or note number you want an Object to send out. On for example a MIDI Controlled mixing console, each fader may send out a message that could either be a certain note number with different velocities or some Controller number with different values. In these cases, the Cubase Learn function will help you out. This method works with Notes, Controllers and System Exclusive messages. It can be applied to many situations.

- ❑ Check that the unit's MIDI Out is connected to Cubase.
- ❑ With the Object dialog box open, move the fader, play the key, turn the knob, or do whatever you need to do to input a couple of examples of the MIDI message you want the Object to send out.
- ❑ Click on Learn. On the input line you should now have a complete message, with the right Note number, Controller number, or a System Exclusive "string", with an XX inserted at the correct position.

The MIDI Channel is not "Learned", you have to set that yourself.

About "Learning" System Exclusive messages

- ❑ Only some synthesizers send *out* System Exclusive messages when you edit parameters on the front panel. If it does, this would then be the same message that you should send *in* to the unit to change that parameter via MIDI. This allows Cubase to automatically learn how such a message should be built up.
- ❑ The sending of Sys Ex messages from a unit can normally be turned on or off. Make sure it is turned on.
- ❑ To send out the right message you must select the parameter to be changed, and change its value a couple of times up and down.
- ❑ Do not confuse this with the Controller messages that are normally sent out just because you move the Data Entry knob or slider, or use the Up and Down or + and – keys on a unit (Controller number 6, 96 and 97).
- ❑ Click on Learn as described above. The decoded version on the Info Line should at least begin with Sys Ex, most likely followed by the manufacturers name.
- ❑ This method is not fool-proof since different manufacturers build up their messages differently and by their own rules, so only experimentation can tell if it works.

Getting Out Of the Dialog Box

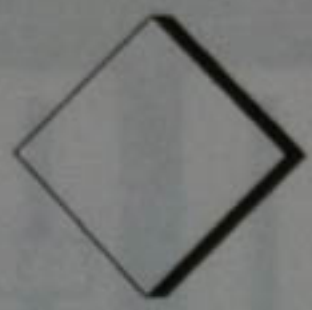
Once you're finished with all settings, click OK or press [Return] to exit the dialog box, and display the Object. You may at any time double-click with the Edit Tool on the Object again (or select it and press [Control]-[I]) and change its attributes.

The current set of Mixer Maps is saved with the Setup or the Song as described in Chapter 36.

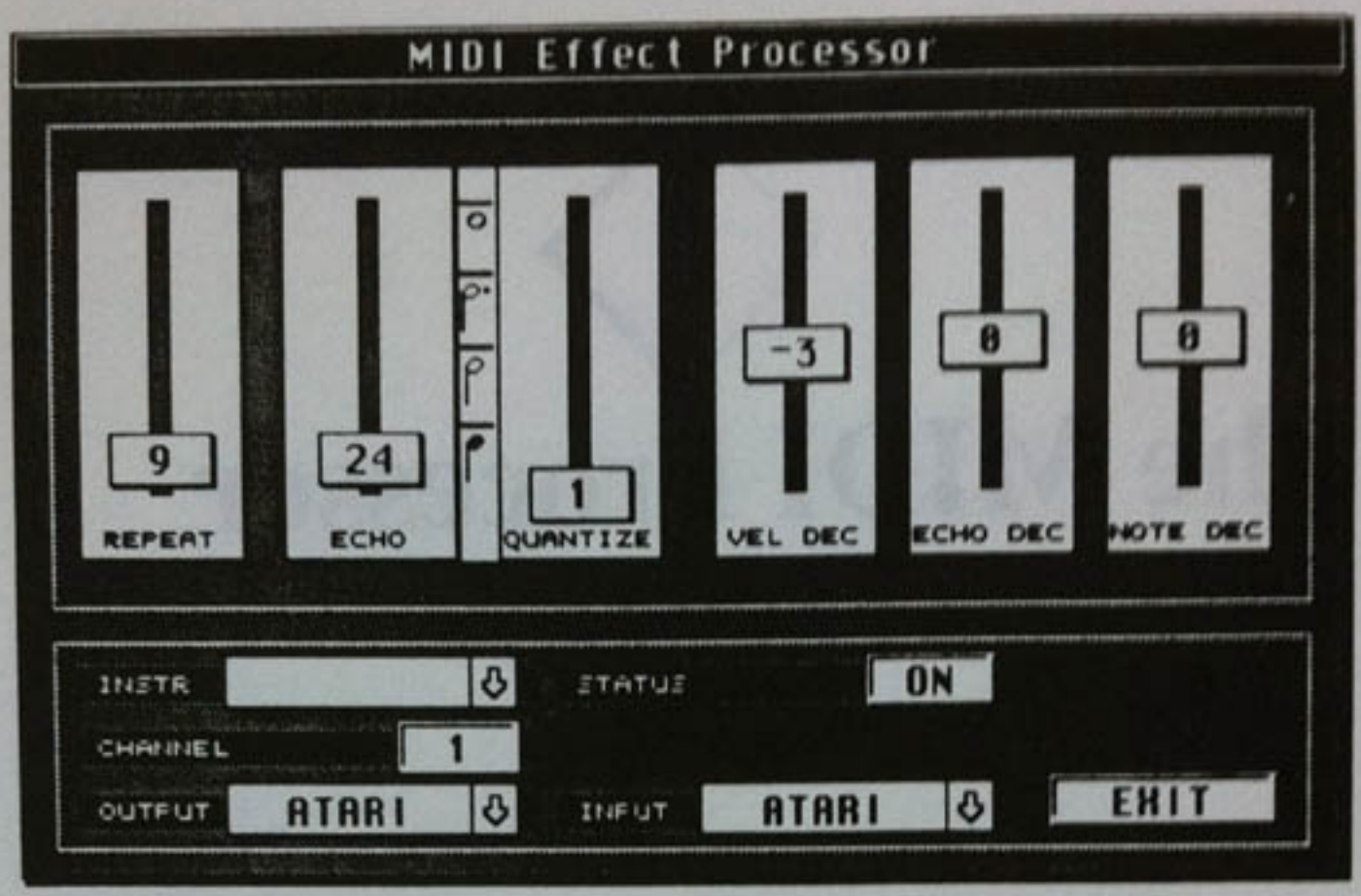
Conversion Table

$Decimal_{10}$	Hexa-$Decimal_{16}$	$Binary_2$	$Decimal_{10}$	Hexa-$Decimal_{16}$	$Binary_2$
0	0	0000 0000	35	23	0010 0011
1	1	0000 0001	36	24	0010 0100
2	2	0000 0010	37	25	0010 0101
3	3	0000 0011	38	26	0010 0110
4	4	0000 0100	39	27	0010 0111
5	5	0000 0101	40	28	0010 1000
6	6	0000 0110	41	29	0010 1001
7	7	0000 0111	42	2A	0010 1010
8	8	0000 1000	43	2B	0010 1011
9	9	0000 1001	44	2C	0010 1100
10	A	0000 1010	45	2D	0010 1101
11	B	0000 1011	46	2E	0010 1110
12	C	0000 1100	47	2F	0010 1111
13	D	0000 1101	48	30	0011 0000
14	E	0000 1110	49	31	0011 0001
15	F	0000 1111	50	32	0011 0010
16	10	0001 0000	51	33	0011 0011
17	11	0001 0001	52	34	0011 0100
18	12	0001 0010	53	35	0011 0101
19	13	0001 0011	54	36	0011 0110
20	14	0001 0100	55	37	0011 0111
21	15	0001 0101	56	38	0011 1000
22	16	0001 0110	57	39	0011 1001
23	17	0001 0111	58	3A	0011 1010
24	18	0001 1000	59	3B	0011 1011
25	19	0001 1001	60	3C	0011 1100
26	1A	0001 1010	61	3D	0011 1101
27	1B	0001 1011	62	3E	0011 1110
28	1C	0001 1100	63	3F	0011 1111
29	1D	0001 1101	64	40	0100 0000
30	1E	0001 1110	65	41	0100 0001
31	1F	0001 1111	66	42	0100 0010
32	20	0010 0000	67	43	0100 0011
33	21	0010 0001	68	44	0100 0100
34	22	0010 0010	69	45	0100 0101

$Decimal_{10}$	Hexa-$Decimal_{16}$	$Binary_2$	$Decimal_{10}$	Hexa-$Decimal_{16}$	$Binary_2$
70	46	0100 0110	105	69	0110 1001
71	47	0100 0111	106	6A	0110 1010
72	48	0100 1000	107	6B	0110 1011
73	49	0100 1001	108	6C	0110 1100
74	4A	0100 1010	109	6D	0110 1101
75	4B	0100 1011	110	6E	0110 1110
76	4C	0100 1100	111	6F	0110 1111
77	4D	0100 1101	112	70	0111 0000
78	4E	0100 1110	113	71	0111 0001
79	4F	0100 1111	114	72	0111 0010
80	50	0101 0000	115	73	0111 0011
81	51	0101 0001	116	74	0111 0100
82	52	0101 0010	117	75	0111 0101
83	53	0101 0011	118	76	0111 0110
84	54	0101 0100	119	77	0111 0111
85	55	0101 0101	120	78	0111 1000
86	56	0101 0110	121	79	0111 1001
87	57	0101 0111	122	7A	0111 1010
88	58	0101 1000	123	7B	0111 1011
89	59	0101 1001	124	7C	0111 1100
90	5A	0101 1010	125	7D	0111 1101
91	5B	0101 1011	126	7E	0111 1110
92	5C	0101 1100	127	7F	0111 1111
93	5D	0101 1101			
94	5E	0101 1110			
95	5F	0101 1111			
96	60	0110 0000			
97	61	0110 0001			
98	62	0110 0010			
99	63	0110 0011			
100	64	0110 0100			
101	65	0110 0101			
102	66	0110 0110			
103	67	0110 0111			
104	68	0110 1000			



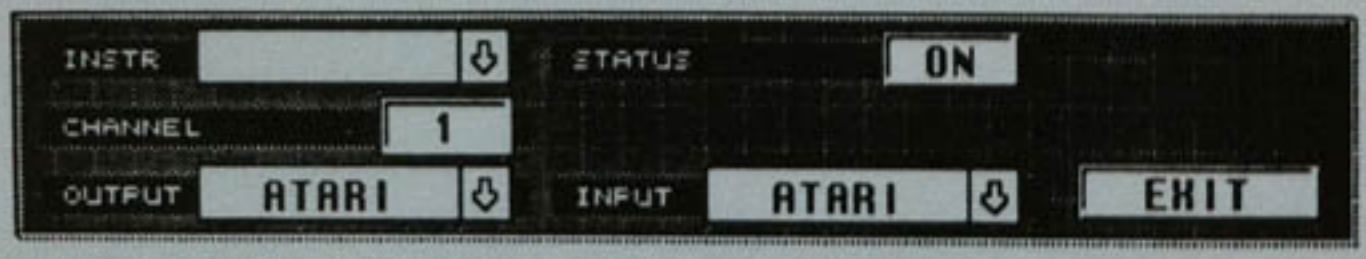
The MIDI Processor



This is Cubase's MIDI equivalent to a regular sound signal processor. It can produce echo, chorus and pitch-shifting type of effects, plus a lot of things you can't do with a normal signal processor.

Turn Remote Off when using the MIDI Processor, since it can accidentally create some Remote-key combinations.

If you're not familiar with this type of device, set the parameters in the lower field as in the picture below, where the Channel (Output MIDI Channel) number can be any MIDI Channel that you know produces some sound. Now play the keyboard and mess around with the sliders. For coarse value changes, drag the "handles". For step by step changes, click above or below each "handle". When you are ready, promise to come back and read the detailed explanation, there is a lot of power to be unleashed here.



This setting makes the MIDI Processor Output on MIDI Channel 1 on the Atari MIDI port.

The Ins and Outs

The MIDI Processor takes MIDI data coming in from somewhere, and generates new data according to the settings of the sliders. Input can come from any Input (including the ST/STE/TT's regular MIDI In). You select this with the Input pop-up menu at the lower half of the dialog box. The *M•ROS* value needs a special explanation.

M•ROS is the invisible MIDI cable that runs inside and between all *M•ROS* programs. As you may know, one or more Tracks can be set to output to *M•ROS*. This allows you to route MIDI data from one or more Tracks to the input of the MIDI Processor. Alternatively, *M•ROS* data can come from another program running on the computer.

So, to patch data from existing music on a Track to the MIDI Processor, set this Track to output to *M•ROS* and select *M•ROS* as Input for the MIDI Processor.

You can also select an Output for the MIDI Processor. Often this will be any of the physical Outputs, like the regular MIDI Out of the ST/STE/TT. But you can select *M•ROS* here also, thereby outputting data to some other program **or, to the recording input of Cubase!**

In the MIDI Setup dialog box, you can select where input for recording should come from. If you set this to *M•ROS*, and have the MIDI Processor's output also set to *M•ROS*, you will be able to record the output from the MIDI Processor on a Track.

You can also set which MIDI Channel the data should be coming out on (including "Any", see page 10-4) with the Channel parameter. And, Output and Channel can be set directly by selecting an Instrument.

Status

You turn the MIDI Processor On and Off by clicking on the Status button.

The MIDI Processor can be On even if the dialog box is closed.

The Sliders

You set the values for each slider by dragging the "handle" that shows the value or by clicking above or below each handle. Holding down the mouse button makes the value change continuously. The changes take effect

immediately and you can use this to "play" the MIDI Processor (and maybe record your playing).

Repeat is used to set up just how many echoes you want from each incoming note.

Echo is the initial time between delays in ticks (fractions). The note symbols beside the slider helps you set these values (the centre of the handle should be aligned to the line). Each unit on the slider corresponds to four ticks.

Quantize moves the repeated notes to the closest set value (1 unit = 4 ticks) The note values beside the slider apply here also.

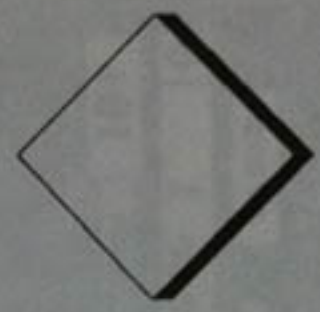
M.P. Units	No of ticks	Note Value
48	384	One quarter note
24	192	One eighth note
16	128	One eighth note triplet
12	96	One sixteenth note
8	64	One sixteenth note triplet
6	48	One thirty-second note
4	32	One thirty-second note triplet
3	24	One sixty-fourth note

Echo Dec allows you to add or subtract a number of ticks from the echo value for each repeat. This leads to echoes that arrive more and more (or less and less) often, like the sound of a bouncing ball.

Vel Dec allows you to add or subtract to the velocity values for each repeat so that the echo fades away or goes up in volume. Make sure your sound (or sound source) is velocity sensitive.

Note Dec allows you to construct arpeggios and harmonies by subtracting or adding some figure to the note value for each repeat.

When you are ready, close the dialog box by clicking Exit or by pressing [Return] on the computer keyboard. This does not turn off the MIDI Processor, it just hides the dialog box.



The Interactive Phrase Synthesizer

CLOSE

INTERACTIVE PHRASE SYNTHESIZER

FULL

Phrase Input

PHRASE 5.5.6 up

1. 0 | 1000 | 5

LENGTH NOTES NUMBERS

Interpreter

MODE Transp. Ret.

HOLD | LOOP | RETRIGGER | S

MIDI Input

SORT 5.5.6 up

THRU G8 TO G8

Modulator 1

Pitch:Density

OFF

LFO FREQ 101 AMPL 1000

16 MIN 16

Dynamics

OFF

LFO FREQ 101 ADD/SUB 15

Pitch

ON Hungarian 1 C

CORRECT TO SCALE IN KEY

OFF

LFO FREQ 101 DENS 1000 TRANSPOSE 15

Rhythm

LFO FREQ 101 COMPX LENGTH

101 Off Off

Modulator 2

Pitch:Density

OFF

LFO FREQ 101 AMPL 1000

16 MIN 16

Functions

Active Init

Output

OUT ATARI

PRG 16 CHN 5

Global

COMBI STORE

Phrase 1

THRU PROGRAM 101

IPS A IPS B

8.692 8. 8

The Phrase Synth window, which is opened from the Modules menu, contains all the controls for the Interactive Phrase Synthesizer (IPS), or actually for one of them at a time, because there are two IPS "synths", A and B. The IPS is not a sound synth, instead each one (A and B) allows you to model new *music* from existing, create one finger accompaniments, generate complicated arpeggios and more.

The IPS is a lot of things, as you will find out when using it. Let us just mention what it *isn't*! It is primarily *not* a random music generator, instead, it relies heavily on your real time input. In fact, you play it like an instrument. The IPS creates its magic out of *coincidence* rather than randomness, and that is a big difference.

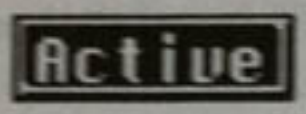
The IPS works in real-time (as everything else in Cubase), so you can use it for live playing. But you can also of course route its output to one or more Tracks so that it gets recorded as any other playing. Any parameter changes you do are immediately effective on output, so you you can "twist the knobs" during playback as when playing on an old-fashioned synthesizer.

Examples

Let us show you some of the features of the IPS by going through a couple of examples that are contained in an EXAMPLE.COM file that comes on one of your Cubase disks (*not* the program disk).

- Set your synths so that you have a piano sound on MIDI Channel 1, a bass sound (preferably synth type) on MIDI Channel 2 and some string or pad sound on the same MIDI Channel as the Active Track is sending out on. This last sound is just used to directly play the notes you are pressing on your keyboard (or whatever playing device you are using).
- If you haven't already done so, select Phrase Synth from the Modules menu.
- Insert the correct disk and press the mouse over the word Functions at the top right corner of the window, and a pop-up menu appears. From this, select Load Combi. A file box appears. Open the folder IPS and select EXAMPLE.COM and click on OK.

- ❑ Turn on the whole IPS by clicking on the Active button so that it turns black.



- ❑ Make sure you see the settings of IPS A, by clicking on the IPS A button so that it too turns black. Also make sure that the two On buttons beside the IPS A and IPS B buttons are active (black).



Example 1

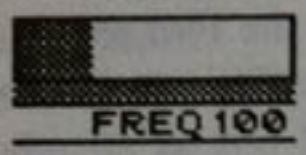
- ❑ Position the Pointer over the Pop-up menu below the word Combi in the Global module. Press the mouse and select "Example1" from the pop-up menu.
- ❑ Press one key on your keyboard. The string sound plays the note you press. The piano sound plays the short brass riff of the M1SOLO.ARR example that came with your Cubase program, over and over again. The interesting thing here is the bass part. It is actually also the brass riff, but the IPS modulates it so that it is turned into a new part, a part that is slightly different on each new lap! If you release the key and press a new one, the music will be transposed to the new key when the Phrase reaches the end of the lap.
- ❑ Turn off the music by stopping Cubase (using [0] or [spacebar]).

Example 2

- ❑ Select "Example2" from the Combi pop-up menu.
- ❑ Play a key, you will hear the same piano part, but without the bass.
- ❑ If you select the *Note Ramp Down* icon in the LFO box in the Pitch module, the order of the Pitches in the Phrase will change.



- By clicking on the Freq field in the Pitch module you can set new frequency values for the "pitch order" LFO, and thereby change the output. Values above 100 will make certain notes/chords repeat.



- You have now rearranged the order of the pitches in the original Phrase. To also rearrange the rhythm, select an LFO-type in the Rhythm module also. Experiment with different LFO types and Frequency values.
- If you want the original settings back, just select "Example2" from the Combi menu.
- Select different values in the Density field in the Pitch module. Any value below 1000 (actually 100.0%) will make the IPS skip some notes altogether.
- Switch off the Hold button on the Interpreter module. You can now play the Phrase momentarily by playing and releasing a key, but if you hold the key, the music will keep repeating (Loop is still On). If you hold one key, and press another, this *last* key will be used to instantly transpose the Phrase (since the sortmode is Last Note, see an explanation of this later in the text).
- Set the *right* key value in the Input Module to "C4". Now, keys below C4 are used to control the IPS and keys above C4 are just sent through (Thru is On), so that you can add a solo to the IPS music.

Example 3

- Select "Example3" from the Combi pop-up menu.
- Play a key, you will hear a Schumann piece. Adjust the tempo on the Transport bar if you like. Stop the music by stopping Cubase, whenever you wish.
- Select the *Note Ramp Down* LFO icon in the Pitch Module (see Example 1). The Freq setting of the Pitch LFO is 150% and this creates an interesting 3/4 feeling to the music by repeating some notes without actually changing the rhythm of the piece. The same goes if you set the Freq value to 75(%) but then the effect is achieved by skipping some pitches.
- Activate Scale correction by clicking on the CORRECT ON button in the Pitch Module. Now all notes are corrected to a blues scale in C, by transposing notes downwards to the closes note in that scale. Experiment by selecting different scale types from the pop-up menu and try different keys by setting the value in the box beside this.

The Window and the Modules

When you select Phrase Synth from the Modules menu the Phrase Synth window appears. This has a number of "synth" modules in it. The window can be moved and resized, and it has scroll bars and a Full box as all other windows. It displays one of the synths at a time, and you select which by clicking on the IPS A or IPS B button in the lower right part of the window or by pressing [Alternate]-[A]. You will see how all the settings change when you do this.



To the left you have three modules above each other, Phrase Input, MIDI Input and Interpreter. The *Phrase* is the raw material, the clay that the notes are modelled from. Phrases are created by copying a recording, or a Part of a recording, in an Arrange window or an Editor, into a Phrase location by selecting Copy to Phrase from the Modules menu.

You then model the Phrase by playing something, and this playing comes in via the *MIDI Input* module. How the Phrase and the MIDI Input interact is decided by the settings in the *Interpreter* module.

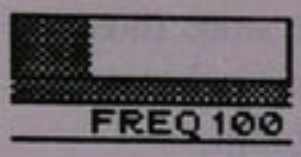
So, you have a Phrase and a MIDI Input which interact via the Interpreter, and new notes are created. The notes at the output of the Interpreter are split up into the three components that all music is made up of, *Rhythm*, *Pitch* and *Dynamics*. The thing about the IPS is that it is able to pick the music apart and handle these three entities separately, and this is reflected in the fact that they are represented by one module each on the screen. Each component may be exposed to more or less dramatic changes by settings made in each module.

The output from the Dynamics, Pitch and Rhythm modules are summed together and sent out via the *Output* module.

Many of the parameter settings can be changed automatically, on the fly, by the two *Modulators* (1 and 2) in the lower part of the window. And finally, you have a number of *Global* settings (like the Active button which turn both IPSes on and off) and above the Active and Init buttons a pop up *Functions* menu.

Editing Parameters

As in the rest of Cubase, you can use the mouse buttons to change any value in a value field or double click to enter it from the keyboard. But the IPS has some special fields whose values are indicated graphically like this:



Here you can click and drag directly in the graphics to set a value. You can also set the value as usual (using the mouse or keyboard) in the small value field shown below the graphics.

If you hold down [Alternate] you are changing the selected parameter in both IPS A and IPS B.

Active, Init and Global Controls

Active
This is the major On/Off button for the both "synths" (IPS A and B) and the keyboard shortcut for it is [Alternate]-[H]. The button is black with white text when the IPS is On. If you have created an endless loop of music (using the Hold and Loop buttons) you turn it off by clicking on Active twice (turn the IPS Off and On) or by stopping Cubase (using [0] or [spacebar]).
Remember that the IPS remains Active even if you close its window.

Init
By clicking the Init button you set both synths to some default settings, with almost all functions turned off. This is good if you want to start making up a Combi from scratch.

The Output and MIDI Channel settings are not changed by the Initiation.

Combi
You can select from one of 32 "programs" (held in RAM) from the pop-up Combi menu in the Global module. When you do this both IPS A and B are loaded with completely new settings. These "programs" are called *Combis*,

and sets of 32 Combis can be saved to and loaded from disk. You can also copy Combis between the 32 memory locations, by using the Functions menu. If you want to change the name of a Combi, double click on its current name in the global module.

Store
Whenever you have made any changes to a Combi, you can store those changes in the Combi by clicking on the Store button. This saves the changes to RAM, so that they are still there when you select another Combi.

You have to Store your settings before selecting another Combi, or the settings will be reset to the last stored version. The Store button does not save the settings to disk, you need to use the Functions menu for that.

Thru Program
This feature is described with the Thru function on page 32-11.

On, Off and Selecting A or B for Edit

Select A/B
Below the Global section you have two buttons called IPS A and B. The IPS is actually two completely independent "synths" and you use these buttons or press [Alternate]-[A] to select which one you want displayed in the window.

On
Beside *each* select button you have an On button, that is similar to Active in the Global Module above, but it turns each IPS (A and B) On/Off separately. You don't have to select "synth" A or B to turn it On/Off.

Activity Display
Above the On buttons you have two small rectangles which indicate output activity for each of the two "synths". If they blink, MIDI data is definitely being sent out from the IPS. If you still don't hear anything, you are sending on the wrong MIDI Channel, to the wrong Output or something.

Phrase Counters
Below the A/B select buttons are the two Phrase counters. In these you can see "where" in each Phrase you are.

Note that the Position is shown in bars and ticks, the quarter notes are omitted in this display. There is a list of what different tick values represent on page 4-2.

The Phrases

You can have up to 32 Phrases in the IPS at the same time. A Phrase can be any type of music, chords, lines or drums, short or long, with an upper limit of 1000 notes.

There are several ways to get Phrases into the IPS:

- ❑ You can copy the contents of *one* Part in an Arrange window into a Phrase.
- ❑ You can copy a set of notes from inside an editor.
- ❑ You can load and save Phrases to disk, using the Functions menu in the IPS.

You can not put a Phrase back into a Part in Cubase, so make sure you save a copy of the music as a Part file or on some Muted Track in your Arrangement. This allows you to later go back and modify the music used for the Phrase. The Phrases in the DEF.COM file (see page 2-7) are stored in a PHRASES.IPS file and as Parts in an Arrange window called PHRASES.ARR. Both these files are found in the IPS folder on one of the disks that come with Cubase.

Creating a Phrase

- ❑ If you have a Part that you want to use as a Phrase, select it in the Arrange window. The Part Info settings are not used by the IPS, so make eg any Transposition permanent if you need it.

The whole Part is used, even if some section of it was hidden using the Pen in the Toolbox. Use Cut Events to permanently delete the hidden notes, see page 16-7.

- ❑ If you have notes in an editor that you want to use as a Phrase, use the "select menu" in combination with selected notes, the Loop and the

Cycle to set up criteria that include some or all of the notes edited.

- Select Copy to Phrase from the Modules menu. A dialog box appears. In the middle of this you will find a pop-up menu containing the names of all the Phrases in the IPS at this moment.

- Select a Phrase from the menu that you think it is OK to replace with the Phrase you are now creating. The Phrase gets the name of the Part, but you can later rename it in the IPS window.

The notes in the Part/Editor are copied to the Phrase, not linked to it (as with Groups). Nothing happens to the Phrase if you change the Part later.

- Open the Phrase Synth window. The Phrase now appears on the pop-up menu in the Phrase Input Module. Select it if you want to use it right away.

- You can double click on the selected Phrase and change the name in the dialog box that appears.

In the Phrase Input Module you will find some information about the selected Phrase:
The Length field initially shows the total length of the Phrase as bars and ticks (just as the Phrase counters, see page 32-9). You can use this field to shorten the Phrase so that only a section of it is used. But this change is not destructive, you can always change the length back to the full Phrase or some value in between. If you change the Quantize (Q) or Compression (COMP) values in the Rhythm module, this field will also change.

The two fields beside this shows the number of notes and the "number of numbers" in the Phrase. These are only display values and you will find more information about what they really mean on page 32-11 and onwards.

Your music should in most cases be Quantized before it is copied into a Phrase. This is definitely true if the Phrase contains chords and if you plan to do any rhythmic modulation.

MIDI Input

This module is used for the notes that you actually *play* while using the IPS. They are combined with the Phrase in the Interpreter using different Sort and Play modes as described below. For now we will only describe the lower fields of the MIDI Input Module.

Thru
This button turns thru-put of your playing on and off. If it is turned off, your playing is used just to control the IPS. If it is turned on, your playing *is also* sent out as usual, via the Active Track. This means that thru-put is routed to the MIDI Channel of that Track, and also affected by the Real-time Thru settings, see page 12-8.
If the Key Ranges (see below) overlap on the keyboard, you must have Thru activated on both IPS A and B to get anything sent through in the overlapping zone. Notes outside the Keyrange(s) are always thru-put.

Key Range
You don't have to use the whole keyboard to control the IPS, you can use these two fields to set a range, so that keys outside that range are ignored. this can be used so that a section of the keyboard can be used for thru-put only, or so that IPS A is controlled from one key range and IPS B from another.

Thru Program
In the Global Module, you have an option of defining a Thru Program number. This is a Program change number that will be sent out via the Active Track each time it is changed or this Combi is selected. This can *not* be set individually for IPS A and B.

Interpreter and Play Modes

This is the most complicated part of the IPS to grasp. It reads the notes of the Phrase *and* the notes that you play (MIDI Input) and uses rules and algorithms to combine the two into new music at its output. Let us explain its function by yet an example.

- ❑ If you have followed the examples at the beginning of this chapter, just

select "Example4" from the Combi Menu in the Global module. This is a preset made up just for this example. If you haven't, follow the procedures there to load the EXAMPLES.COM file.

- ❑ Make sure that IPS A is selected, by clicking on the "IPS A"button in the Global section.

- ❑ Make sure that the IPS is turned On (Active button shown in inverse video).

You now have a Combi in the IPS which only uses Synth A (IPS B turned off). It is based on a simple one bar Phrase (1BarArpeg). MIDI Input can happen over the whole Key range, and thru-put is turned off. The Dynamics, Pitch and Rhythm modules do absolutely nothing, and output happens on the Atari MIDI port and MIDI Channel 1. You can change this if you wish to use another Output or Channel. Select a sharp, tonal sound.

When you press a key on the keyboard, the Phrase is played back. Use different keys to Transpose it. This Phrase begins with the note C4, so you hear the original Pitch of all notes when you press C4 (no transposition).

If you want playback to always go on until the End of the Phrase, activate the Hold button in the Interpreter module. If you want it to go on forever, activate the Loop button also. You can always stop the IPS by stopping Cubase. Note that when Hold is activated, transposing only happens at the end of the Phrase.

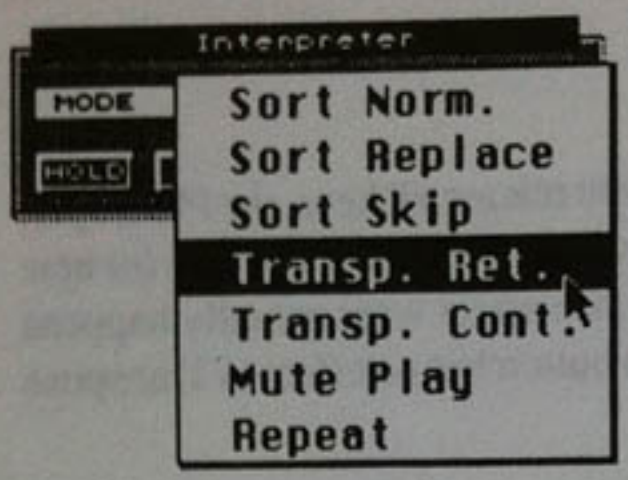
The Phrase is a straight eighth note pattern with these notes:

```
C4  F4  G4  C4  C5  C4  G4  F4
```

Or as it would have been displayed in Score Edit:



Now you can try out the different Play Modes in the Interpreter Module.



Transpose Retrig

This first of the two Transpose modes plays back the Phrase, beginning whenever you press a key. The key you press is simply used to transpose the Phrase. To try this out, press one key at a time, and the key will be used to decide how much the Phrase should be transposed.

If you want to get fancy, you can press several keys but *only one of them* will actually decide how Transposition will be done. Which one? Well, it might be the first key you pressed, the one with the lowest velocity, or the one with lowest pitch, etc, it all depends on the Sort Mode in the Input Module, but more on this later.

So hold down one key, and in the middle of the Phrase, press another one (without releasing the first). If the Sort Mode is the right one and Hold is Off, the Phrase is instantly transposed to the pitch of the new key.

In Transpose Retrig mode (as opposed to Transpose Continue, see below), the Phrase starts over when you release *all* keys and press a new one. What actually happens when you release keys and press new ones also depends on the Hold, Loop and Retrigger buttons as explained on page 32-18.

Since the Output of the Interpreter is basically just the Phrase as you played it, this mode comes to its best with Phrases that you modulate using the Rhythm, Pitch and Dynamics modules.

Transpose Continue

This is just as Transpose Retrig, but when you release all keys, the Phrase just stops and then it continues from that point when you press a new key (or new keys). Again, the Hold and Retrig buttons also affect what actually happens when you release and press keys. The Loop button has no effect in Transpose Continue mode.

Sort Normal

This might be complicated to understand, but hold on, you will soon get it.

This mode relies on the fact that the Phrase Input module always sorts the notes in the Phrase and gives them numbers. This list of numbers is stored and used with the three different Sort play modes (Sort Normal, Sort Replace and Sort Skip).

Sorting the Phrase

If you have ever seen a guitar book for beginners you might have noticed one way to write out an arpeggio. You first draw a picture of the chord as it appears on the fretboard and then write the number of the strings in the order they should be played, for example: 1, 4, 5, 6, 5, 4, 5, 6. The sort done in the Phrase Input module is similar:

In our example Phrase, the first *pitch* that the Phrase Input encounters when it reads the Phrase is C4, so this is given the number 1. After this comes the Pitch F4, so that would be 2 and the third pitch (G4) would be number 3. Then we have a C4 again so this is 1 again, then a C5 which is the fourth pitch found in the Phrase and therefore given number 4. In this way of notating our Phrase we would get:

```
1  2  3  1  4  1  3  2
```

Which is an adequate way of describing the Phrase, only that we don't know what Pitches or what rhythm (phrasing) to use. Do you understand the method? If you compare the notes and the numbers, you see that all C4s are number 1, all F4s are number 2 and so on, like this:

```
C4  F4  G4  C4  C5  C4  G4  F4
 1   2   3   1   4   1   3   2
```

And this is where the MIDI Input comes in:

In Sort Normal mode, the notes in the Phrase are *replaced* by the notes you play.

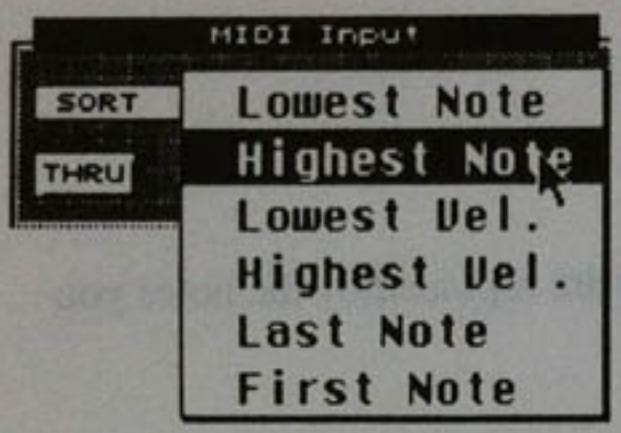
Sorting the MIDI Input
The Input notes are sorted, just as the notes in the Phrase. As the IPS is set now, they are sorted *from the lowest note up*, as you can see in the Input Module.

Try this: select Sort Normal from the pop-up menu in the Interpreter Module and press any four notes on the keyboard, and they will be played back in the order of the Phrase. You will recognize the order of the notes from the Phrase, but you will also hear that *you* decide the pitches with your playing.

If you wish, activate Hold and Loop, so that playback continues until you press [0] or [Spacebar] (note that when these two buttons are activated, you only get a new set of pitches at the end of the Phrase).

What the Interpreter does in Sort Normal mode
Sort Mode "Lowest Note" in the MIDI Input means that the notes you press at any given moment are numbered so that the one with the lowest pitch is given number 1, the next higher is given number 2 and so on.

Each pair of numbers in the two lists, the Phrase list and the MIDI Input list, are compared, and if they match, the note in the Phrase is played, but with the pitch from the MIDI Input. This means that if you press three keys only, there is no number 4 in the Input list, so no note is played when the Phrase encounters this number in the list.



You can now try out the different *sort modes in the MIDI ! ıput list* (Lowest Note, Highest Note, Lowest Veloc. and so on), we will explain them in detail later, but you will hopefully understand a little bit of what they do from their names.

Chords and Rhythm

In the example we used a rhythmically even Phrase to keep things clear, but this is of course not necessary (or maybe not even desirable). The Phrase can be any type of music, with any phrasing.

If you have quantized chords in the Phrase, it is not easy to say how the notes in each chord will be numbered, and this might make the Sort play modes unpredictable. But the Modulation functions in the Pitch, Rhythm and Dynamics modules (see later in this text) work on the whole chord at a time, so that the notes in the chord are not separated.

Sort replace

As you noted if you followed the example above, the "number of numbers" in the Phrase and the "number of numbers" in the Input have to match in Sort Normal mode, if you don't want rhythmic "holes" in the created arpeggio.

Sort Replace works differently from Sort Normal in that it tries to remedy this problem, by replacing any non-matched number in the Phrase with the first note (number 1) in the MIDI Input list. If sort mode is Lowest Note the first note is often the root note, so this many cases creates a harmonically pleasing arpeggio.

Sort Skip

This works as Sort Replace, but uses another method for avoiding "holes". If no matching number is found, this number in the Phrase is just skipped, and the IPS jumps to the next number in the Phrase and checks if there is an Input note matching that. The effect is similar to old arpeggios on synths, where the "rhythm" changed depending on how many keys you pressed.

Mute Play

This mode is different from the Sort and Transpose modes. The *Pitches* of the Phrase and the MIDI Input are compared and only Pitches that match are played. In other words, when the Phrase comes to a certain note, it plays the note if the same key is currently pressed (found in the MIDI Input buffer). If it doesn't find that Pitch, the note is not played (a pause). Here are two examples of the use for Mute Play:

- Drums. Make up a busy drum pattern as a Phrase, and use the IPS to bring the different instruments in and out at will, by just pressing the right keys.

- Dubbing. You might have a line that you want to augment, by dubbing certain notes with another sound. Make the line a Phrase and use Mute Play to decide which notes should be doubled by the second sound.

Repeat

This is simple, but effective. It just uses the rhythm (phrasing), of the Phrase to play all keys that are currently pressed. It can be used for things like bass lines or chords with a repeating rhythmic figure. Try using drums as a Phrase!

Hold, Loop and Retrig

Hold

When this function is activated, the Phrase always plays to its end even if you release the keys "mid-Phrase". There is one exception though: In Transpose Continue mode, the Phrase always stops immediately when you release the keys, even if Hold is turned on.

When Hold is activated, the Phrase will not Transpose or change in any other way (like when you use Repeat, Sort or Mute Play) until its end is reached. This is because when Hold is activated, the MIDI Input doesn't change until the end of the Phrase is reached.

You can also activate a temporary Hold, by pressing a Sustain (Hold) pedal attached to your MIDI Input.

Loop

This button only has any function when Hold is on and Retrig is off. When activated, the Phrase keeps repeating over and over, until you stop it by stopping Cubase or by turning the IPS off.

Since Looping only happens in Hold mode, the MIDI Input is only changed at the end/beginning of the Loop, so you can press (and release) the keys you want for the "next lap" at any time during the Phrase.

Looping doesn't work in Transpose Continue mode.

Retrig

When this function is activated, the Phrase always starts over from the beginning when any key is pressed, even if other keys are still down.

The MIDI Input Sort Modes

The notes that you play are put into a MIDI Input buffer, and *this is always sorted*, using one of the six sort Modes on the pop-menu in the MIDI Input module. The list is resorted each time you press or release a key.

The six sort modes are:

Lowest Note — The note with the *lowest* Pitch is the first one in the list, the note with the next higher pitch is the next one in the list and so on.

Highest Note — The note with the *highest* Pitch is the first one in the list, the note with the next lower pitch is the next and so on.

Lowest Velocity — The note with the *lowest* Velocity value is the first one in the list, the note with the next higher velocity is the next one in the list and so on.

Highest Velocity — The note with the *highest* Velocity is the first one in the list, the note with the next lower velocity is the next and so on.

First Note — The *first pressed* note is the lowest in the list, the one pressed after that is the next in the list and so on.

Last Note — The *last pressed* note is the lowest in the list, the one pressed before that is the next in the list and so on.

And again, this list is resorted each time you press or release a key, so if you for example have any of the other sort modes selected, you can change the list completelybyjustreleasingakeyandpressingitagain.

The Sort Modes and the Play Modes

Transpose Play modes

When you have one of the Transpose modes selected, it is obvious how the notes get transposed when you only have one key pressed. But what if you play a chord? Then the Sort Mode applies again. It is only the first note in the *list* that is used to decide how much the Phrase should be Transposed. And which note in the chord is first in the list? That depends on the sort mode. It might be the one with the lowest pitch (Lowest Note) the highest pitch (Highest Note) the lowest velocity (Lowest Veloc) and so on.

Sort Play Modes

When you use one of the Sort play modes, the interaction with the Input list is as described earlier, but here is a short recapitulation.

The Notes currently pressed (the MIDI Input notes) are sorted and numbered in a manner that depends on the sort mode selected. This list of numbers is then compared with the list of numbers in the Phrase Input, and the Interpreter decides accordingly which Pitches to play.

The "S" Switch

So far the explanation has assumed that the "S" switch in the Interpreter module has been turned off. This means that the Phrase is sorted the way it is played, time-wise, as you would expect. But if you click on the S switch in the Interpreter module so that it is activated, the Phrase is instead sorted after the Pitches, as with MIDI Input when it is set to Lowest Note. This is only useful in the Sort Play Modes, and mainly with drum and percussion Phrases.

Mute Play and Repeat

These Play modes don't use the MIDI Input Sort modes at all. They both just read the pitches of the currently pressed notes, as described above.

Rhythm, Pitch and Dynamics

General

The output of the Interpreter is split up into three parts, Rhythm, Pitch and Dynamics, and these three are treated independently in the three modules in the middle of the IPS window. What happens in these three modules doesn't really depend on the Interpreter and the MIDI Input settings at all, these Modules only act on the *output* of the Interpreter.

While experimenting with the Modules we suggest that you select "Example5" from the EXAMPLE.COM as described in the beginning of this chapter. This plays a section of a Bach prelude (although in a pretty stiff way). Only IPS A is turned on in this Combi, so make sure that it is selected for editing, by clicking on the "IPS A" button in the Global Module. We also suggest a piano sound and a tempo setting of around 80 to 90 BPM.

The Output from the IPS is MIDI Note messages. Each time a new note is to be output from the Output module, decisions are taken by the IPS as to what pitch it should be, what velocity, and what rhythmic distance it should have, compared to the last note played.

For each note these decisions have been taken independently for each of these three values for the note. This means that you might eg get a note with the Pitch of the first note in the Phrase, the velocity of the seventeenth note in the same Phrase and a rhythmic distance from the preceding note that is 66% of the time between the fourth and fifth note in the Phrase.

The LFOs

In each of the modules you can make settings that determine the output. The parameters vary, but all three modules have an LFO each, that works identically on each one. As you may know, an LFO is a slowly varying oscillator in a synthesizer, used to modulate (change) parameters like a note's pitch, volume or timbre.

The LFOs in the IPS work a little bit differently from regular synthesizer LFOs, and this difference is important to understand. The Pitch LFO for example doesn't vary Pitch directly, it is used to decide *in which order the Pitches in the Phrase should be output*. You might decide to eg output every

other pitch in the Phrase, forwards or backwards (from end to start), or you could start with the middle pitch and then alternate by going backwards and forwards among the pitches in the Phrase. You select a waveform, which decides the basic order of the notes, and a frequency which is used to set how fast the Phrase should be scanned. But more about this later.

The Pitch Module

In this module you have a number of parameters used for setting what should happen with the pitches that come in from the Interpreter.

The LFO

The LFO has two settings, Waveform and Frequency. Please note again that the LFO does not change the actual pitch of any note, it determines how the pitches are read from the Phrase. The LFO can't "invent" a pitch of its own, it only selects pitches that are already in the list.

LFO Modulation to Pitch only has any relevance in the Transpose and Sort Play Modes.

Frequency

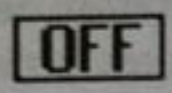
The Frequency parameter determines how fast the Phrase is read by the LFO. The frequency number is a percentage value of the Phrase's length, so 100 would mean that the Phrase LFO runs at the same "speed" as the Phrase.

Let's say that you have selected a Note Ramp Up waveform ([♩↗]), and Frequency 100. This would be the same as playing back the pitches just as they are in the phrase, because Note Ramp Up just reads the list from start to end, and Frequency 100 is the same as the Phrase's "normal speed". If you set Frequency to 50, and keep the Waveform set to Note Ramp Up, the LFO runs through the Phrase at double speed, so it can only pick up every other pitch value. If Frequency is set to 200 (max) the LFO will read out each pitch twice from the list (if you use Note Ramp Up). Other values create more unusual order of pitches, like 20 (%) and a Note Ramp Up waveform which would read out every fifth pitch.

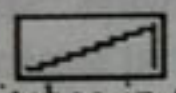
Please note that most waveforms start over again when the Phrase starts over. Short Phrases and low Frequency values might only give you the same one

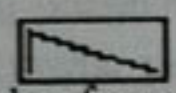
or two pitches over and over again.

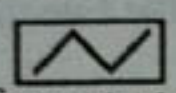
Waveforms

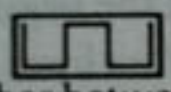
Off 

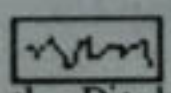
No Modulation at all.

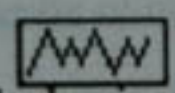
Ramp Up 
This scans the list of Pitches in the Phrase from start to End, just as with normal playback. The Frequency is of course important to determine which notes will be heard, see above.

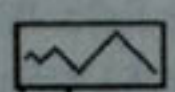
Ramp Down 
This reads the list of Pitches from back to front, otherwise same as Ramp Up.

Triangle 
This reads the list, first from start to end and then from end to start. Since one complete cycle therefore has to go through the whole Phrase twice, each half goes twice as fast as Ramp Up and Ramp down.

Square 
This normally just switches between two pitches, with high Frequency values maybe just one pitch and with low maybe more than two. It reads and holds the Pitch at the beginning of the Phrase, then it waits for the part of the Phrase set with the Frequency parameter, then it reads and holds the pitch at that position and so on. Therefore, this Waveform is most useful with low Frequency values and probably more appropriate for Rhythmic modulation and for Modulator 1 and 2, than for Pitch.

Random 
Random selection from the Pitches in the Phrase.

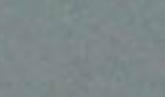
Mirror 
Starts by playing back the beginning of the Phrase, jumps to the End, moves backwards to the middle, then to the beginning and so on.

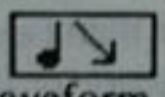
Pendulum 
Plays the middle note's pitch, goes one step forward in the Phrase, then jumps to the note before the middle one, then to the note after the second one played, then the one before the third and so on, like a pendulum that starts by hanging

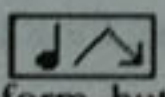
still in the middle, and then swings more and more towards the end and beginning of the Phrase.

All the Waveforms described above are "rhythm dependent", and may not exactly match up with the number of notes in the Phrase. That is, if you for example select Ramp Up and 50% speed, you will not get *exactly* every other note. These waveforms also always "start over" when the Phrase starts over. You will get the same (or at least similar) note orders in each loop of the Phrase.

Ramp Up Continuous FREQ
This is a Ramp Up as above, but this waveform differs in that it doesn't start over at the beginning of the Phrase. No matter what the frequency or the length of the Phrase is, this waveform keeps going at its own speed (unless the "Loop:LFO Reset" option is activated on the Functions menu).

Note Ramp Up 
This is the same as Ramp Up, but it works on the number of notes in the Phrase so that precise note orders are possible to achieve. It also differs from the normal Ramp Up in that it doesn't start over at the beginning of the Phrase, rather it works as the Ramp Up Continuous Waveform described above.

Note Ramp Down 
This is a Ramp Down Waveform, but it differs from the regular Ramp Down, just as the *Note* Ramp Up differs from the regular Ramp Up.

Note Triangle 
This is a Triangle Waveform, but it differs from the regular Triangle, just as the *Note* Ramp Up differs form the regular Ramp Up.

Transpose
This field allows you to set a fixed transposition to all notes.

Scale Correction
This function has three parameters, the On button for the whole function, the Scale select pop-up menu and the Key Signature field. When you turn Scale Correction On (click on the button so that it is black), select a scale and a key, all pitches coming out from the IPS are corrected to notes inside that scale. If you wonder what notes belong to a certain key in a certain scale, select Scale Info from the Functions menu and a list of the notes in the selected scale and

set Key Signature appears in a dialog box.

Scale correction always transposes downwards when it decides to change pitch, so a major is normally perfectly turned into a minor. Correcting the other way might give more unpredictable results.

Scale correction happens *after* Transposition, so that the Transposed notes are corrected to set Key Signature. Scale correction applies in all Play Modes.

Density
This parameter allows you to just skip some notes at the output. When we say skip we mean the whole note, not just that pitch. The value is set between 1 and 1000 but is actually a percentage value with one decimal. With even values you will note a repeating effect if you play the same Phrase back many times, so if this is undesirable select some prime (non-dividable) number.

This parameter works in all Play Modes, but only when the Pitch LFO is on (*not* set to Waveform Off).

Dynamics

This module allows you to alter the dynamics of the output, by working on the velocity values of each note.

LFO
This allows you modulate which velocity values are selected from the list, just as with Pitches.

These functions only have any relevance in the Transpose Play Modes, and they work on the Velocities recorded in the Phrase.

Add/Sub
This is a fixed value used to increase or decrease overall velocity values. The Range is from –127 to 127.

This function does not work in Mute Play mode.

Rhythm

These functions work on the phrasing. They apply in all Play Modes and always work on the rhythmic distances between the notes and chords in the Phrase.

LFO
This allows you to change the order of the phrasing around, just as with the Pitches. Please note again that this has nothing to do with the order of the Pitches you hear. For example, it is possible to generate interesting counterpoint by playing back the same Phrase from both IPSes, with the same Pitch order, but with different Rhythm modulation.

Len
With this parameter, which is a pop-up menu like the Len value in the drum Map, you can make all notes that come out from the IPS have identical lengths.

Q
This does not work as regular Quantizing. Instead it puts out all notes/chords at an even pace, with the spacing set using the Q value. In other words, all rhythmic phrasing and all pauses are lost.

Comp
When this is set to 100%, the IPS plays at the same tempo as the rest of Cubase. When you raise the value it goes faster, and when you lower it it goes slower. Compression is the last of the Rhythm functions, so Quantization happens before Compression.

Modulator 1 and 2

These two Modules at the lower part of the screen allow you to use an LFO to modulate (change) a number of parameters in the other Modules. It is just as if you yourself had changed the parameters, using the mouse while "playing" the IPS (which you of course can do). You have two Modulators, that are identical. We said earlier that the IPS primarily doesn't deal with randomness, but by using the Modulators you can make almost anything happen. For example, by Modulating Transposition and Rhythm Compression with a random waveform you're generating true random music.

First you use the pop-up menu to decide which parameter you want to modulate. Please note that there are more possibilities than fits on a regular SM-124 monitor, the menu scrolls when you reach the bottom. Also note that you can Modulate the Modulators, and thereby even change what is being Modulated. Then you select a waveform and a frequency just as with all other LFOs.

The Amplitude (Ampl., range 1 to 1000) and Minimum (Min, range 1 to 200) values might need a more detailed explanation. These two decide the range of values in the destination parameter, and take into account the range of the parameter being modulated. If you for instance modulate MIDI Channel (range 1 to 16), and wish to make sure that the MIDI Channel value never is lower than 2, you must take into account that that Min parameter has a range of 200, and therefore set it to 13 (c:a 200/16). If it should never be lower than 3 set it to 26, never lower than 4, set it to 40 and so on.
The same goes for the Ampl. parameter. An Ampl. setting of 500 (half the range) and a Min setting of 1 (lowest possible, would make it possible to have the MIDI Channel value vary between 1 and 8). If you raised the Min value it might be 2 to 9 or 3 to 10 and so on.

And finally you may decide to Quantize the output from the Modulators, so that the changes happen on some even rhythmic values. This is done by selecting a Q value in the Modulator Module you are working with.

You can see on the screen when a parameter is being modulated, the values change in the window also.

Output

Out
With this parameter you decide where output should go, to the regular Atari MIDI Out, to a MIDI output on a connected device or to M•ROS. This last option is for recording the Output of the IPS onto a Track in Cubase. Note that even this parameter is separate for the two IPS synths A and B. More about recording into Cubase on page 22c-31.

For logical reasons you can't route the Output of the IPS to the Input of the MIDI Processor (you can make the settings but nothing will happen). If you want to use the MIDI Processor on IPS material, record it on a Track and route that Track to the input of the MIDI Processor as described on page 16-29.

Chan
This is the MIDI Channel Output for the selected IPS synth (A or B). If the Out parameter is set to MROS, so that the output of the IPS goes via the Active Track in Cubase, this parameter is of no importance, unless you set the Track to output on MIDI Channel "Any".

Prg
You can make the IPS Output a certain Program Change number each time a new Combi is selected, and which number it should send is set using this parameter, which can also be set to OFF (no Program Change sent out from this Combi). If you want to disable the Output of Program Change numbers *altogether* you should deactivate (no tick) the "Send Prg Change" item on the Functions menu.

Functions

On the pop-up Functions menu, you find a number of Functions and some settings that are valid for all Combis in both IPS A and B.

Load and Save All Combis
This allows you to save and load all 32 Combis to disk. The files have the extension .COM. Saving and loading is done as with Arrangements, Setups or any other files in Cubase. A DEF.COM file is also loaded on startup if found on the same level on the disk as Cubase. See page 25-02 for more info. If you want something to start with, there is a DEF.COM file on one of your Cubase disks.

A ".COM" file contains all 32 Combis *and all Phrases*.

Load and Save Phrases
You may also save the Phrases separately from the Combis. The Phrases are actually stored in two Banks of 16, but on the pop-up Phrase menu you have a list of all 32, first the 16 of Bank A and then the 16 of Bank B.

When you select Save Phrase Bank from the functions menu, a dialog box appears where you enter or select a file name as usual. When you click Save or press [Return] a new dialog box asks you if it is the first 16 Phrases (Bank A) or the last 16 (Bank B) that you want to Save.

When you select Load Phrase Bank from the Functions menu and select a file and click Open, a similar dialog box asks you if you want the file to replace the first 16 Phrases (Bank A) or the last 16 (Bank B).

These two functions in combination with "Copy Phrase to" (see next page) makes it possible to rearrange Phrases in memory and on disk so that you can compile a Phrase Bank (or two) from existing Phrases.

Scale Info
This displays a dialog box that shows you which notes belong to the selected scale in the set Key Signature in the Pitch Module.

Send Prg.change
In the Output Module of the IPS you can set a Program Change number that is sent out each time that Combi is selected from the Combi menu in the Global Module. The Send Prg.Change switch on the Functions menu is used to enable (tick) or disable (no tick) this function altogether.

This function is not stored with the Combi (.COM) file, it is stored with the Setup, see page 25-7.

Ext. Prg.change
This allows you to select Combis via MIDI. If this is turned on, and the IPS receives a Program Change number on any MIDI Channel it switches to another Combi. Make sure your current Combi is Stored before you select another one via MIDI.

This function is not stored with the Combi (.COM) file, it is stored with the Setup, see page 25-7.

Copy Combi to
This allows you to Copy one Combi from one memory location to another, so that you can make variations on that Combi.

Select the Combi you want to copy, from the Combi menu in the Global Module. Then select Copy Combi To from the Functions menu, and a dialog box appears where you can select the Combi that you want to replace, from a pop-up menu. Click OK or press [Return] and the copying is done.

Delete Combi
This brings up a dialog box with two options. "Yes" deletes the selected Combi, and "No" aborts the operation.

Copy Phrase to
This is identical to "Copy Combi to", but it copies Phrases between the 32 memory locations.

Delete Phrase
This brings up a dialog box where you can delete the selected Phrase (Yes), or abort the operation (No).

Sync A/B
This allows you to "soft sync" the IPSes to each other. If this item is ticked, they will lock up rhythmically to each other after the first note. They will not necessarily start at the same time, you can decide the rhythmical offset between them, by starting them at different times (using two different key ranges for them).

Loop:LFO Reset
If this function is turned on (ticked) the LFOs always "start over" (begin their cycle as they do the first time a key is pressed) at the beginning of Loop of the Phrase, regardless of which LFO Waveform you have chosen.

Wait for Play
When this is activated, the IPS does not start until you start Cubase. This allows you to hard sync the IPS to some previously recorded music. To use this function, make sure it is ticked on the menu, press the keys you want to start with and then start playback of Cubase.

This feature is intended primarily for recording the output of the IPS into Cubase. If you forget to turn it off, you will not be able to use the IPS without starting Cubase!

Erase All
This simply erases all Phrases and all Combis in memory.

Recording into Cubase

You may want to record the IPS onto a Track (or several) in Cubase.

- First select MROS as an Output in the Output Module in the IPS. This is done separately for the two Synths IPS A and B. You may record both "synths" on one Track or use Multi Recording to Record them on one Track each.
- Now select MIDI setup from the Options menu, and make sure the MROS alternative is ticked on the "Record from" menu, so that the Output of the IPS gets recorded. You may or may not disable other recording Inputs. If you have Thru activated on the IPS, and your playing Input activated for recording, in the Record dialog box, you will record both your actual playing and the output of the IPS.

- When you select MROS as an output for the IPS and use MROS as a recording input for Cubase, you are routing the output of the IPS via Cubase's active Track. This means that output from the IPS will now effectively happen on the MIDI Channel of the Active Track, not on the Channel set in the IPSes output module, if the Track is not set to MIDI Channel "Any", of course.
- If you want to record the two IPS "synths" on one track each, select Multi Recording from the Options menu and enable Channel Split mode. Set the IPS A and B to output on the right MIDI channels, so that you route the output to the Tracks you want. If you for example select MIDI channel 1 for IPS A, it will be recorded on the Track set to 1 in the Record column of the Track List, and if you set IPS B to MIDI channel 2, it will be recorded on the Track set to 2 in the Record column.

- Temporarily close the IPS window. If you record on one Track only, select it and set it to output on the right MIDI Channel. If you set it to "Any", you make sure that the MIDI Channel setting in the IPS is valid. This is very important if you plan to change the MIDI Channel in the IPS during the recording, either manually or via Modulator 1 or 2.

- If you use Multi recording, drag the Players you plan to use to Tracks you want, and set each Track to the right MIDI channel. To avoid confusion it might be a good idea to set them all to MIDI Channel "Any" for reasons described above.

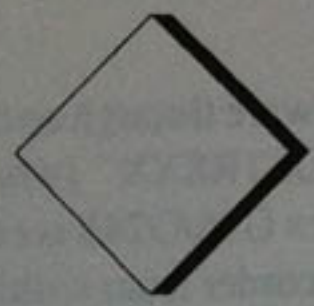
- ❑ If you wish, select Phrase Synth from the Modules menu again. Or, if the IPS is set up as it should be and activated, just proceed with recording.

- ❑ Start recording as usual in Cubase. When ready for it, play your keyboard (or whatever you use) to activate and "play" the IPS. Remember that it is possible to change any parameter at any time, even during recording. When you Stop Cubase, the IPS stops automatically.

In Cycle mode, often a lot of notes are put at the Cycle Start position, which in most cases isn't really what you want. However, recording in Cycle mode may make up beautiful textures, so you could always Quantize your recording and use Delete Doubles to erase any doubled notes, and of course continue editing in an editor. Or why not make your new recording a Phrase?

Some Tips and tricks

- ❑ Music that you make into a Phrase should in most cases be Quantized.
- ❑ When using Sort play modes, try out all three variations (Normal, Replace and Skip).
- ❑ When experimenting with a Phrase, activate Hold or press an attached hold pedal, release the keys and try out different settings in the Pitch, Rhythm and Dynamics Modules.
- ❑ If you use pitch-selection modulation via an LFO in the Pitch module, you may also modulate that LFOs frequency using Modulator 1 or 2. This will give you endless variations on the Phrase.
- ❑ Try making a drum part a Phrase, and use it with one of the Sort Play modes or Repeat.
- ❑ Record into Cubase, make the new Recording a Phrase and continue to work on it in the IPS.



Tape Tracks and Fostex Mixer Maps

Introduction

Cubase can control external hardware through so called *driver files*. The one for the Fostex R8 is called "FOST R8XX" (where the XXs is a version number) and the one for the Fostex G16/G24S is called "FOSR16XX". With these you can access your tape recorder from within Cubase and make MIDI and audio recording an integrated environment.

Cubase sends messages to the tape recorder which make it start, stop, activate recording on a certain track, rewind and so on. The tape recorder sends time code (also known as SMPTE, and in this case converted to MIDI Time Code via an interface on the tape recorder) to Cubase which it synchronizes to.

Installation

- ❑ Make sure you have the appropriate driver file in the MROS folder. See the chapter "Installation".
- ❑ With the Fostex R8 you need the MTC-1 installed and connected. The DIP Switches should be set as follows:

1-4 These should all be set to **0**, which means MIDI Channel 1, but is overridden by the next two switches anyway.

5 This should be set to **0** as well which means that R8 receives on all MIDI channels.

6 This one is important. It must be set to **0** so that the R8 is controlled by System Exclusive messages, *not* Note On commands.

7-8 The last two switches are for deciding the frame rate as in the table below. 25F is the most common format in Europe and 30 the most common in the USA.

24 Frames	Switch 7	**0**	Switch 8	**0**
25 Frames	Switch 7	**0**	Switch 8	**1**
30 Frames	Switch 7	**1**	Switch 8	**0**
30DF (Drop Frame)	Switch 7	**1**	Switch 8	**1**

With the G-16/G24S you need the 8330 card installed. The settings are accessed via *2nd Functions* on the tape recorder (see the 8330 Owner's

Manual). If you want to make sure you're starting from scratch with the settings, begin by resetting your G16/8330 by holding down Start and Stop on the tape recorder (not on the remote control) while turning on power. If you do this some parameters must be set again, which is described in the 8330 Owner's Manual, but here is a suggestion:

2nd Func. #	Name	Set to
09	External Frame Rate	As applies (**24, 25, 30 or 30DF**)
10	Internal Frame Rate	As applies (**24, 25, 30 or 30DF**)
27	No Tach Pulse Mode	**ON**
72	Generator Mode	**FREERUN**
73	Generator Frame Mode	As applies (**24, 25, 30 or 30DF**)

These are the settings imperative to use with Cubase:

2nd Func. #	Name	Set to
60	Serial In/Out select	**MIDI**
64	Address Free Mode	**ON**
65	Channel Voice Message	**OFF**

- ❑ You need an audio cable connected from the LTC IN/OUT connectors on the MTC-1/8330 to the OUTPUT and INPUTS of one track on the tape recorder, in order to read/write time code to the track. The highest track (8/16/24 respectively) is commonly used for this purpose.

- ❑ Connect the tape recorder to your computer, via MIDI. You need one cable from a MIDI OUT on your computer to the MIDI IN of the tape recorder and one from the MIDI OUT of your tape recorder to a MIDI IN on the computer.

- ❑ The Fostex interfaces do not "merge" MIDI signals, so if you want to be able to record into Cubase while syncing to tape, you need to somehow merge the MIDI OUT signal from your recording device (eg keyboard) with the MIDI OUT of the tape recorder's MIDI interface. Or, you could use a multiple port MIDI device such as the Steinberg Midex and use one MIDI IN for the tape recorder's MIDI interface and another for the recording device you use.

- ❑ If not already on, turn on the tape recorder, load a tape and launch Cubase.

The first thing you have to do to be able to synchronize is to "stripe the tape", which means to record LTC ("regular" time code) on one audio track on the tape recorder.

- Pull down the Options menu and select Synchronization. To select synchronization to the tape recorder you use, pull down the SMPTE Sync menu in this dialog box and select the name of your tape recorder. If you can't find the correct option on the menu, the driver hasn't been loaded for some reason.



- Use the "from" pop-up menu to the right of this to select the input to which you have connected the tape recorder.

- Select the correct frame rate (the one you set with the DIP switches or 2nd Functions) from the Frames pop-up menu. Put your tape recorder in Input Monitor Mode and click on the Write SMPTE Start button. Watch the meter on the tape recorder, the correct track should light up to indicate that it is receiving time code from the interface. On the R8/MTC-1, use the LEVEL adjustment on the tape recorder's interface so that the signal will be recorded at approximately 0 dB. Click on Write SMPTE Stop.

- If you want the time code you are about to record to start at something else than 0: 0: 0: 0: 0, adjust the "Write SMPTE From" value. You might for example start at exactly one hour (1: 0: 0: 0: 0).

- Activate recording on the tape recorder, let the tape roll for approx. 15 seconds seconds and click Start again. Now time code gets recorded. Let the tape roll until its end. Do not interrupt recording in the middle of the tape. When you're finished, click Stop SMPTE.

- Set the "Songstart" value a couple of seconds later than you started writing time code (for example to (1: 0: 5: 0: 0) so that the interface has a short "leader" to read the code before Cubase starts. This position on the tape will be the place where Cubase starts (the reference to Song Position 1. 1. 0).

- Close the dialog box, and rewind the tape to the beginning.

- Click on the SYNC button on the transport bar (or press [X]). Cubase is now expecting sync to come from an external source, in this case the tape recorder, since that was the option you selected from the "SMPTE Sync" menu.

- Press PLAY on the tape recorder. When the time code plays back, the meter on the Track should light up to indicate that the code actually got recorded. Stop the tape recorder.

- Now activate play from Cubase. The tape recorder should wind the tape to a position just before the Song Position in Cubase and go into Play. After a short while, Cubase should start, in sync. Try to Stop, Fast Forward and Rewind from Cubase and activate Play from different positions. The tape recorder should follow. Record something sequenced from Cubase onto an audio track and make sure that what you hear "live" from Cubase and taped on the tape recorder is in perfect sync from all positions.

This completes the installation. Just note the following:

- Make up a DEF.ALL Song or a DEF.SET setup, with all sync settings as they are now. This will make Cubase control the tape recorder right after startup.
- When you record the next song on the tape, advance the "Songstart" value to a position that corresponds to some position on the tape after this first song. By doing so you have shifted forward Cubase's Song Position 1. 1. 0 to that position. When you later save this second Song, this "Songstart" value is saved with it so that the tape recorder always will wind to the correct positions for this Song.
- Each time you start up your tape recorder, you have to activate play from its front panel for a couple of seconds before it will sync correctly. If you don't, it has no chance of "knowing" where to wind the first time, since it doesn't know what time code is recorded on the tape.

Using Tape Tracks

The tape transport of your tape recorder can always be controlled from Cubase's Transport bar, no matter which window is up on the screen, as long as SYNC is activated on the Transport bar. But you can also activate recording directly from Tape Tracks in Arrange window.

- Create a new Track and set its class to Tape.

- Use the Channel column to set the Cubase track of the tape recorder you wish to record on (1 to 8 for the R8, 1 to 16 for the G-16 and 1 to 24 for the G-24).

- If you wish, make up tape tracks for as many of your actual tape recorder tracks as you like. You can move the Tracks and create new Tracks at will, it is only the channel setting that decides which track on the tape recorder each Cubase Tape Track controls.

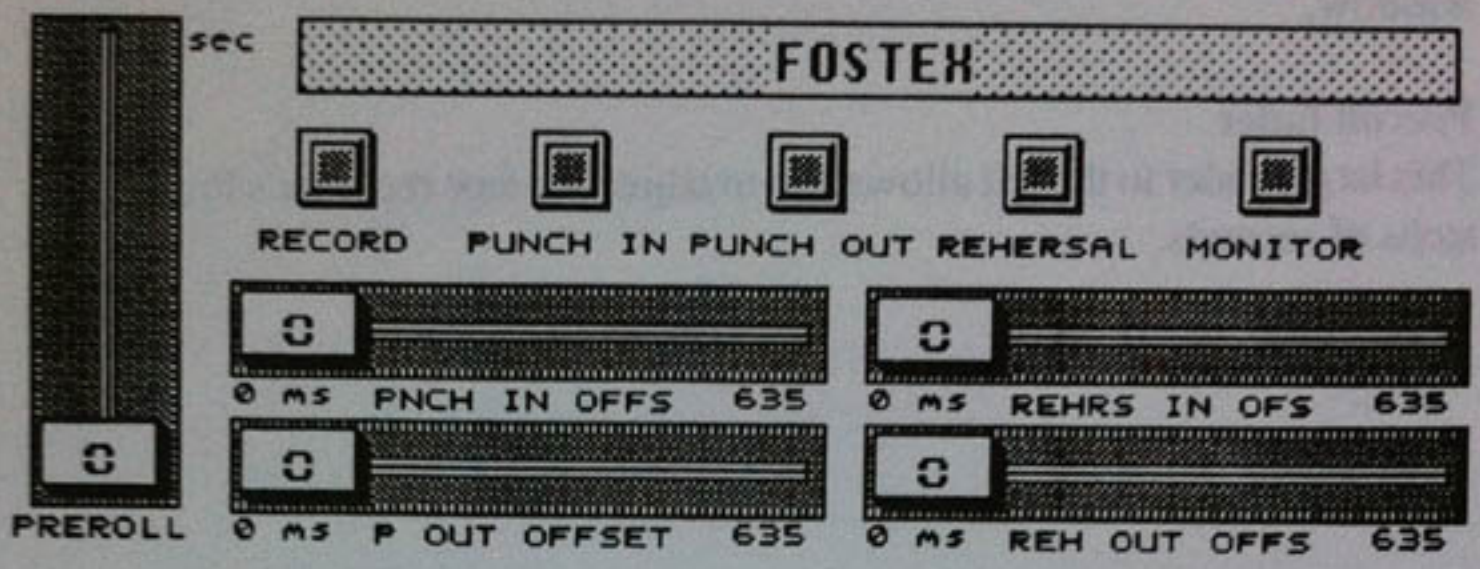
We strongly recommend you not to make up a Cubase Tape Track for the tape recorder track you have the time code (SMPTE) on, since recording over the time code can be disastrous. Retrieving a lost sync track is very hard. To avoid confusion, do not set two Tape Tracks to the same channel.

- In single recording mode, when you select a Cubase track, the corresponding tape recorder track is set to Record Ready mode. By just switching between these tracks you set the right track of the tape recorder to record ready mode.

- You can also use Multi Recording, to record on as many Tape Tracks as you like. When you activate the recording symbol in the "R" column, that track on the tape recorder is put into Record Ready mode.

- When you activate recording in Cubase, recording immediately starts on the track(s) on the tape recorder. This means that you can use all of Cubase's manual and automatic punch in and out options to control recording on up to four tracks at a time on the tape recorder.

Using the Mixer Maps



A Mixer Map called FOSTEX.MIX comes with your Cubase program. It is found in the MIXERMAP folder on one of the additional disks. For detailed information on how to use the Mixer window, see chapter 30.

The map gives access to functions which are not available from the Arrange window.

The functions in the maps should be self explanatory if you understand your tape recorder and the Mixer window as such. Here is just a brief run-down of what they do.

Record Control Buttons

Record simply duplicates the functions of the Tape Control. *Punch In* and *Punch Out* allows you to automatically activate/deactivate recording at Cubase's Left and Right Locator positions, respectively, just as when you use the Arrange window option. If *Rehearsal* is activated, the Tracks put in Record ready Mode will be switched in and out of input monitor at the Left and Right Locator respectively. *Monitor* switches all tracks to Input Monitor. Remember that by modifying the map you can use MIDI controllers to operate these controls.

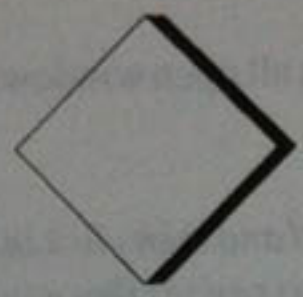
Offset Faders

If you want your tape recorder to activate functions before the positions they are actually specified to (for example punch out just before a downbeat), you use these controls. Their range is 0 to 635 milliseconds although the fader

handle shows 0 to 127.

These functions also affect punch ins and outs made from the Arrange window.

Preroll fader
This larger fader to the left allows you to adjust the tape recorder's Preroll in steps of seconds.



The Window menu

Tile Windows

This command resizes and aligns all open windows, whether they are Editors or Arrange windows.

One option is to use this command and then click in the Full box of the window you want to use at the moment. This resizes that window to full size. If you click again in the Full box (without resizing the window in between) it goes back to the tiled size. This can be a quick and handy way of switching between windows.

Tile Editors

This command resizes and aligns all open Editor windows. See Tile Windows above.

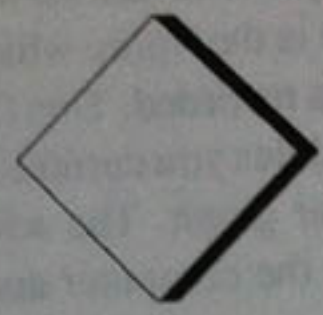
Hide/Show Transport

This allows you to switch between hiding and showing the whole Transport Bar. If you use the computer keyboard for activating Play, Stop, Record etc, you can use this option as a means of getting more screen area for your Arrangement and Editor windows.

Arrange Window List

Below Hide/Show Transport you will find a list of all open Arrange windows, plus those that have been closed with the Keep option (see page 36-10). When you select a window from this menu it will be made active (put in front of the other windows).

You can have up to 16 Arrangements "hanging" on this menu, but only seven windows (including editors) open at the same time on the screen.



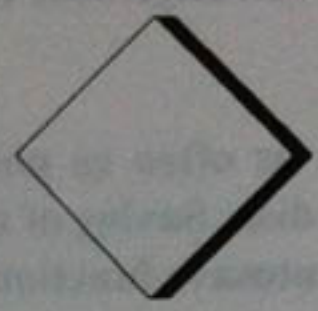
The Desk/Cubase Menu

This is the regular Desk menu, indicated by a Cubase symbol. The first item brings up a dialog box where you can see how much memory you have available, in two ways. The first is the figure which tells the total number of available events, when nothing is recorded. This figure varies both with your hardware and the number of modules you currently have loaded. The second way to check memory is the bar graph. The whole bar graph is the total amount of available memory in the computer and the grey area is the part you've already used up.

You can also see the version and the name of the programmers that created the program.

Press [Return] or click on the box to make it go away.

Below this first menu item you find the Accessories you have installed. Refer to the computer's Operation Manual for more information about Accessories.



The File menu

All File Operations can be done while the music is playing! This for example allows you to load one Arrangement while another is playing back.

Remember to save your work as often as possible, preferably on a separate disk, not the program disk. Saving of the current Song can be done automatically using the Autosave function, see page 36-11.

Saving to disk is permanent and can't be undone.

The DEF-files

When you first start Cubase it looks on the disk for "Def" files. If it finds any or all of them, they are automatically loaded. This allows you to configure all or some settings beforehand so that Cubase always comes up with settings that suit you.

You can at any time save your own "Def." files. Just save a whole Song, or an Arrangement, a Setup or a Drum Map under the name DEF. And you can of course have several startup disks with different sets of "Def." files for different jobs.

Def.Arr
This allows you to define everything that comes with the Arrangement, the Tracks and their MIDI Channels and Outputs and so on. It even allows you to save music (Parts) to be loaded at startup.

Def.Set
This includes a complete Setup as listed on page 36-8.

Def.Drm
This automatically loads a Drum Map with all settings for all columns.

Def.Com
This loads the Interactive Phrase synthesizer with Phrases and Combis.
Def.All
This automatically loads a complete Song consisting of one or several Arrange windows, a Setup and a Drum Map.

New

Selecting this item or pressing [Control]-[N] on the computer keyboard gives you a new Arrange window. This is given the name "Untitled" followed by a number. The name changes when you Save the first time. The maximum number of open windows, (both Arrange and Editors) at any time, is seven.

Open

This item brings up a small dialog box where you select what type of file you want to open. You can reach this dialog box by pressing [Control]-[O] on the computer keyboard also. A dialog box appears where you select which type of file to open. Click on the type or press [1] to to [7] to select a file type, from Song (1) to Setup (7).

The File dialog box that appears is standard Atari.

Song
This option opens up a complete Song, which consists of a number of Arrange windows with their Groups, a Setup and a Drum Map. Songs have the suffix "ALL".

Arrange
This opens up one arrange window complete with:

- The contents of the window, including Groups that were created from Parts in that window.
- The tempo setting on the Transport bar.
- The Master switch setting.
- The Solo switch setting.
- The SMPTE Offset.

Arrange windows have the suffix "ARR".

If you hold down [Alternate] while clicking on "Load Arrangement" the arrangement is loaded into the background (into an inactive window) without interrupting the existing music. This makes it easy to load new music, in eg a live situation.

Part
This loads a Part file which may contain one or more Parts. The Parts are put into the current Arrangement with the first Part starting at the position of the Left Locator. The following Parts keep their relative position (compared to the first Part) as it was when they were saved.

The Parts are loaded into the same Tracks as they originally were on. If not enough Tracks exist, new Tracks are created as needed. Part files have the suffix "PRT".

24 Song
This loads a Steinberg Pro-24 Song into a new Arrange window. The conversion between the old format and the new may take some time. Most of the information from the Pro-24 Song is kept, but a few things can not be transferred to Cubase format from Pro-24:

- Fixed Velocity values and Quantize values set in the Track Info box.
- The Quantize values set in Score Edit.
- Midi Mode/Note Off settings.
- Multi Out SMP-24 Assignments.
- MIDI Setup and MIDI Filter settings.
- Cue points for SMP-24/TimeLock.
- The 10 preprogrammed Mute settings (Alt+F1 to F10).
- Text Input.
- Drum Map 2 and 3.

If a Pro-24 Song was stored in Mode SEQ, Cubase tries to recreate the Pro-24 Arrangement using a Group Track. All Tracks that played in Sequence Mode are muted.

If you want a Pro-24 Song loaded into Cubase to synchronize to "old" 24 tapes you have to convert the Master Track so that the tempi are adjusted. See page 21-23.

MIDI File
MIDI files are a part of the MIDI standard used for transfering files between two sequencer programs. The standard only incorporates the contents of the files, not the physical format of the disk. This means that it isn't at all sure that you can take a disk from one computer brand and model and put it into anther and simply load the MIDI file. Direct transfer via disk only works if the two

computers are disk compatible. Otherwise you will need special hard- and/or software.

Cubase reads standard MIDI files in formats 0 and 1. Files saved in format 0 are loaded into Track 1. Files stored in format 1 are load into as many Tracks as is necessary starting at Track 1. New Tracks are created if needed. MIDI Files have the suffix "MID".

The only non-MIDI events that are recognized are Track names, Tempi and Time Signatures.

When you select "Open MIDI File" a dialog box asks you if you want to merge the music on disk with the current Arrangement.

- If you answer No, a new Arrangement is created, and the file is loaded starting at 1.1.0.

- If you answer Yes, the file is loaded into the current Arrangement, starting at the Left Locator Position. This allows you to load more music into the current Arrangement *while* the music is playing.

Drum Map
This loads a Drum Map from disk. It replaces the current Drum Map. Drum Maps have the suffix "DRM". Drum Maps don't have to be loaded from within the Drum Editor.

Set Up
This loads a Setup from Disk. What is contained in a Setup is described on page 36-8. Setups have the suffix "SET".

Save

Save your work as often as possible. Saving to disk is permanent and can't be undone. Saving of the Song can be done automatically using the Autosave function, see page 36-11.

This item brings up a small dialog box where you select what type of file you want to save. You can reach this dialog box by pressing [Control]-[S] on the computer keyboard. Click on the file type or press [1] to [8] as with Open.

You can't save in 24 Song format at all, and from an editor you can only save Drum Maps and Setups.

Saving Backups

When you save, and a file with the same name already exists, a dialog box alerts you (FILE EXISTS!) and gives you two options, to overwrite the existing file (Replace) and thereby create a new one with the same name, or to save a Backup instead (Backup).

If you chose to save a Backup, the file gets saved with the same name, except for the last letter in the extension, which is replaced by a "B". MYSONG.ALL creates a backup file called MYSONG.ALB, MYSET.SET becomes MYSET.SEB etc. This means that when you choose Backup you will have two versions of the file on disk: the Backup that you saved now and the original that you saved before.

When you later choose Backup again, the old backup file is deleted without warnings. Remember to always save as a Replace as well, before you Quit the program.

To open the backup, proceed as during normal loading, but in the file selector, change the last letter in the extension on the top line to a * (change "DRM" into "DR*", "ALL" into "AL*" etc) and click the arrow pointing up and left, at the top of the file list. This will make the list show all the files of the selected type (Songs, Drum Maps etc), both the originals and the backups.

You can then open the file as usual.

The "File Not Saved" Alert

When you save and a file with the same name already exists, a dialog box alerts you (FILE EXISTS!) and gives you two options as described above.

If you select the Replace option, the program checks the floppy disk inserted (if there is any) to see if there is room to save the new file after the old file is deleted. If there isn't, a Disk Full alert appears, allowing you to abort the whole operation. In this case, the file is not saved, but the last saved version is left intact.

Please note that only the floppy drive is checked during this operation. If there is space enough on the floppy, the program "wipes" the old file and creates a new one. Problems may occur in two cases:

- If you are saving to a hard disk and there is not room enough on it for the file.
- If you take out the floppy and put in another one during the operation.

In these cases a dialog box alerts you that the file has not been saved.

This also means that the old file with the same name has been deleted, so that you don't have any copies of the file on the disk *at all*, any more. Please use a new floppy to save the file.

Save options

Song

This saves the whole Song, which means a number of things that can be saved individually also:

- All Arrange windows and their Groups.
- The Setup.
- The Drum Map.

Arrange

This saves the active Arrange window. The window's title changes to the file name used when saving. With the Arrange window, all settings are saved that are not part of the Setup (see next page), plus all Groups that consist of Parts from that Arrange window. This for example means that the settings for all

Parts, and the Master Track is saved with the Arrangement.

Part
If one or several Parts are selected, these are all saved in one file, with their internal relative start positions kept. If no Parts are selected, then all Parts on the selected Track are saved.

Ghost Parts are saved as Real Parts. Group Parts are not saved.

MIDI File
Cubase normally saves MIDI files in format 1, but if only one Track exists a file of type 0 is created. Due to the way MIDI files are defined, all Parts on each Track have to be joined together into one long "Part".

- If you wish to make your Playback Parameter settings a part of the MIDI file (which you probably do), use the Freeze Play Parameters command, see page 15-13 for details.
- Muted Tracks are not saved.
- The only non-MIDI events that are saved are the time signatures and tempi on the Master Track and the Track names (names are saved as text).

Drum Map
This saves the current Drum Map, which means all the Sounds and all settings for each one of them.

Set Up
This saves a number of settings in the Program so that you can configure everything to your own liking. This is what is saved:

Arrange Window and Menus
- All the Instruments
- The tempo setting.
- Locator-Positions.
- All the On/Off buttons on the Transport bar.
- Follow Song On/Off.
- Chase Events On/Off.
- Reset on Stop
- All settings in the Part Appearance dialog box.
- All settings in the Metronome dialog box.

- ❑ All settings in the Synchronization Dialog box.
- ❑ All MIDI Processor settings.
- ❑ All Input Transformation settings.
- ❑ The Logical Edit presets.
- ❑ Multi Record Mode.
- ❑ Record Inputs.
- ❑ All Cycle-Modes (for the four "Players").
- ❑ Tempo Recording On/Off.
- ❑ All Human Sync parameters.
- ❑ All settings in the MIDI Setup dialog box.
- ❑ The 16 Grooves.
- ❑ The settings in the Preferences dialog box.
- ❑ Time Display and Bar Display Offsets.

Separate for each Editor

- ❑ Last Tool used.
- ❑ The Last chosen Controller in the Control Display.
- ❑ The User defined Controllers 1 and 2 and the last chosen Unknown Controller in the Control Display.
- ❑ Everything on the Functions bar.
- ❑ Window size and position.
- ❑ Magnification.
- ❑ The position of all dividing lines.
- ❑ The Display Filter setting (List Edit).
- ❑ The event type selected for insertion (List Edit).
- ❑ Some of the Setup and Printer Setup settings for Score printing.

The MIDI Mixer

- ❑ All MIDI Mixer maps.
- ❑ All Snapshots.

The Interactive Phrase Synthesizer

- ❑ Send Program Change.

Close

If you select Close when an Arrange window is active you have the option to Keep it, which means that the window closes, but the Arrangement is still there and can be reopened from the Windows menu.

Keeping does not mean that the Arrangement is saved to disk.

If you select Discard, the Arrangement is closed and erased from memory. It can't be opened again (if you didn't save it to disk first, of course). Cancel aborts the whole operation.

If you select Close from an Editor or the MIDI Mixer this is the same as clicking Keep.

Delete Files

This is a utility for deleting files on disk. It brings up a standard file selector where you can select the file to be deleted. The program then asks for a verification that you really want the file removed completely from the disk.

Deleted files can not be retrieved.

Format Disk

This allows you to format disks without leaving Cubase. A dialog box asks you if you have a single or double sided disk and if it is in drive A or B (if you have two drives, otherwise select A).

When you have clicked the right combination, click on "Start Format" to format the disk or click on Cancel ([Return] on the computer keyboard) if you change your mind.

Formatting a disk erases it completely!

Preferences

This item opens up a dialog box where you can select a number of options:

Auto Save Active
If you tick this option, the Song is saved automatically at a time interval set with the "Minutes" value field. The Song is saved under the name "Backup.All".

Mouse Speeder
This function is what is often called a Mouse Accelerator which makes the mouse move more when you move it faster. You activate it by ticking Mouse Speeder active. Threshold is the lowest speed at which this function is to be activated, and Speed is the amount of "acceleration".

Use crosshair cursor
When this option is ticked, the mouse position will be graphically indicated by a crosshair in the Arrange window when moving Parts. The crosshair consists of two lines, one extending vertically up on to the position bar and one line going horizontally into the Track list, so that you have a clear indication of your position.

Increase by left mouse
Most Atari programs use the right mouse button to increase values in values fields but some use the left. This option allows you to select the one you feel most comfortable with.

DClick Opens
Normally, when you double click on a MIDI Part you get Key Edit. But by using this pop-up menu you can have Score Edit or List Edit instead.

Printer Setup

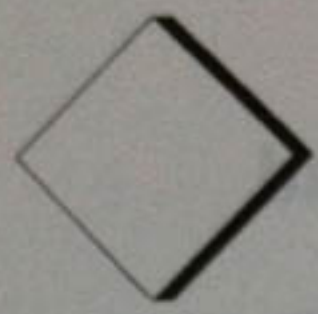
In this dialog box you define a number of things that have to do with printing: what type of printer you use, paper size, margins and so on. A detailed explanation is found on page 26-5.

Print

Use this dialog box to decide which pages to print, to set the speed/quality of the output (faster/better) and finally to activate the actual printing. More on page 26-33.

Quit

This allows you to quit the program gracefully. Its keyboard command is [Control]-[Q]. A dialog box will allow you to save before quitting.



Keyboard Commands

The following is a list of the computer keyboard equivalents for many of Cubase' functions.

Numeric Keypad

Transport Functions

[*]	Activate recording
[Enter]	Start/Continue
[0] or [Spacebar]	**1st time** – Stop **2nd time** – Go to Left Locator/Go to 1. 1. 0 **3rd time** – Goto 1. 1. 0
[(]	Rewind
[)]	Fast Forward
[1]	Go to Left Locator
[2]	Go to Right Locator
[Shift] + [1]	Store Song Position as Left Locator
[Shift] + [2]	Store Song Position as Right Locator
[3] to [8]	Go to Cue Point 3 to 8
[Shift] + [3] to [8]	Store Song Position as Cue Point 3 to 8
[9]	Go to last Stop Position
[/]	Cycle On/Off

Typewriter Keyboard

All windows

[Control]-[O]	Open (Use [1] to [7] to select file type)
[Control]-[S]	Save (Use [1] to [7] to select file type)
[Control]-[W]	Close active window
[Control]-[Q]	Quit
[G]	Zoom in horizontal
[H]	Zoom out horizontal
[Shift]-[G]	Zoom in vertical
[Shift]-[H].	Zoom out vertical
[Undo]	Undo
[Control]-[X]	Cut
[Control]-[C]	Copy
[Control]-[V]	Paste
[Delete]	Delete Selection
[Backspace]	Delete Selection
[Control]-[A]	Select All
[Control]-[G]	List Edit
[Control]-[D]	Drum Edit
[Control]-[E]	Open Relevant Editor for Track class
[Control]-[R]	Score Edit
[Control]-[F]	Mixer
[Control]-[L]	Logical Edit
[Control]-[B]	Notepad
[Z]	Auto Quantize On/Off
[Q]	Over-Quantize
[U]	Undo Quantize
[W]	Note On Q
[E]	Iterative Q
[Control]-[H]	Transpose/Velocity
[F]	Follow Song On/Off
[Y]	Remote On/Off

[F1] to [F10]	Recall Locator settings
[Shift] + [F1] to [F10]	Store Locator Settings
[Alternate]+[F1] to [F10]	Recall Mute Settings
[Alternate]+[Shift]+ [F1] to [F10]	Store Mute Settings
[P]	Set Position
[L]	Set Left Locator
[R]	Set Right Locator
[Alternate]-[P]	Set L and R Locator to Parts' Start & End
[D]	Overdub/Alternate Record Mode
[I]	Punch In On/Off
[O]	Punch Out On/Off
[C]	Click On/Off
[M]	Master Track On/Off
[S]	Solo On/Off
[A]	Ed Solo On/Off
[X]	Sync On/Off
[1]-[7]	Quantize value
[T]	Set Quantize value to triplets
[.]	Set Quantize value to dotted
[Alternate]-[N]	Change Instrument name
[V]	Delete last version
[B]	Delete SubTrack
[N]	Quantize last version
[K]	Key Erase
[Return]	Exit (in Dialog Boxes)
[Esc]	Cancel (in Dialog Boxes)

Arrange window

[Control]-[N]	New Arrange window
[Control]-[I]	Part Info
[Control]-[M]	Display Master Track
[Alternate]-[A]	Part Appearance
[Alternate]-[J]	Change Instrument Name
[Alternate]-[N]	Change Track Name
[Control]-[T]	New Track
[Control]-[P]	Create Part
[Control]-[K]	Repeat
[Control]-[J]	Show/Hide Groups
[Control]-[U]	Parts to Group
[Alternate]-[F]	Freeze Play Parameters
[→]	Select Next Part
[←]	Select Previous Part
[↑]	Go one Track up
[↓]	Go one Track down

The four arrows can be used in combination with the [Shift] key to select several Parts on a Track.

All Editor windows

[Return]	Keep
[Esc]	Cancel
[Insert]	Insert Event
[Tab]	Move one Snap in Step Edit
[Alternate]-[O]	Loop On/Off
[Alternate]-[L]	Input Left Loop boundary
[Alternate]-[R]	Input Right Loop boundary
[Alternate]-[I]	Info On/Off
[Alternate]-[C]	Ctrl On/Off

Key Edit only

[→]	Next Note
[←]	Previous Note

The arrows can be used in combination with the [Shift] key to select several notes.

List Edit only

[↑]	Previous Event
[↓]	Next event

The arrows can be used in combination with the [Shift] key to select several notes.

Drum Edit only

[→]	Next Note
[←]	Previous Note

The arrows can be used in combination with the [Shift] key to select several notes.

[↓]	Next Sound
[↑]	Previous Sound
[Alternate]-[S]	Solo
[Alternate]-[N]	Rename Sound

Score Edit only

[→]	Next Note
[←]	Previous Note

The arrows can be used in combination with the [Shift] key to select several notes.

[↓]	Next Staff
[↑]	Previous Staff

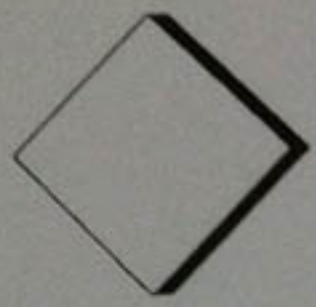
[Alternate]-[D]	Print
[Alternate]-[B]	Hide
[Alternate]-[E]	Enharmonic Shift
[Alternate]-[G]	Group
[Alternate]-[X]	Flip Stem
[Alternate]-[1]	To Voice 1
[Alternate]-[2]	To Voice 2
[Alternate]-[3]	To Voice 3
[Alternate]-[4]	To Voice 4

MIDI Mixer Window only

[↓]	Decrease Object Value
[↑]	Increase Object Value
[Control]-[I]	Open Object Dialog Box

Interactive Phrase Synthesizer

[Alternate]-[H]	Turn IPS On/Off (works from other windows)
[Alternate]-[A]	Switch between IPS A and B



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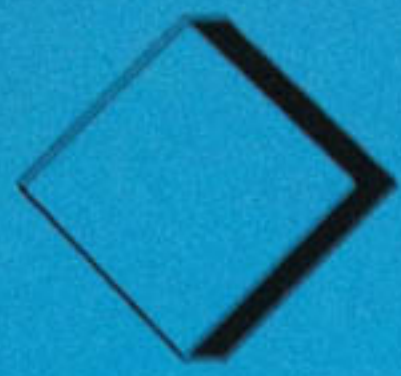


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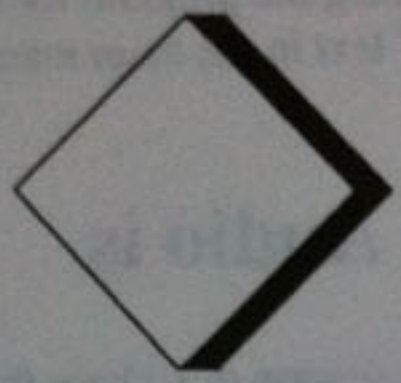
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Table Of Contents For Audio Addendum



Introduction

This text is an addendum to the regular Cubase manual. It assumes you are reasonably familiar with using the program for MIDI recording. It also draws on the "Using the Editors" text in the main manual.

What Cubase Audio is

Cubase Audio is a special version of Cubase that expands the program from being a MIDI recorder to also becoming an audio recorder. It allows you to record a virtually unlimited number of parallel audio "tracks". The actual number of simultaneous audio output channels is wholly dependent on the hardware being used. The total length of the recording is only limited by the storage capacity of your system, ie the size of your hard disk(s).

Don't think of Cubase Audio as a regular tape recorder, which normally restricts you to linear recording of parallel tracks. This program basically does everything with audio that it does with MIDI. In fact, the handling of audio is very similar to that of MIDI, allowing you to establish one working method for all of your recording and editing. You can even record MIDI and audio at the same time!

The number of audio channels in your recording and playback hardware puts a restriction on how many sounds can be played back *at the same time*. Because of Cubase Audio's flexible approach and non-destructive editing capabilities, the effective number of tracks may be much larger. Therefore, what may be called "tracks" in your recording system is referred to as "audio channels" or simply "channels" in Cubase Audio and this manual.

The Atari Falcon version of Cubase Audio has eight audio channels. These can be freely divided between three types of playback:

Hard disk Audio is collected from the hard disk continuously during playback, which allows for very long continuous recordings. You can use all eight audio channels for hard disk playback, but this requires a fast hard disk, see page 2-3.

RAM Audio is loaded into RAM memory in the computer, in advance, and played back from there. Using an audio channel for RAM playback relieves the hard disk from feeding that audio channel with data, which is an advantage. On the other hand, you have to

have RAM enough to hold all the audio files that this audio channel is supposed to play back. Effective use of RAM playback probably requires you to have 14 MB RAM (or more) in your computer. When you organise your Tracks, you should probably reserve RAM channels for Tracks that play short and repetitive stuff, such as drum loops, vocal snippets and short riffs.

Sampler The sampler option also plays back audio from RAM, but allows for real time performance of audio. You use your MIDI keyboard to "trigger" audio recordings and you may capture your performance onto a Track for further editing as *MIDI* data.

The only difference between Hard Disk and RAM audio channels is in where the audio files are stored. How to assign a channel to either option is described in the Audio Appendix 1, page 3.

Since the " Sampler" option is unique to the Falcon version of Cubase Audio, it is described in the Hardware Specifics chapter.

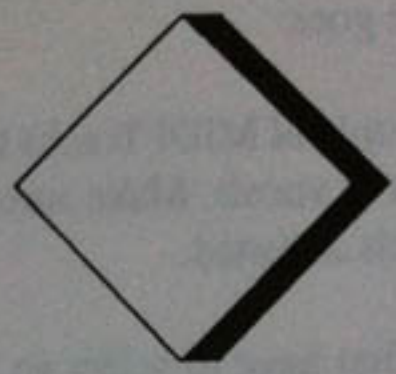
If you run out of RAM, the program will ask you if you want to compact the memory (defragment it). If that doesn't do the trick, you will then be unable to see the waveforms of the audio recordings on screen. However, they and any MIDI recordings you have will play back just fine.

Volume mixing is either done by drawing in the editor, just like drawing Volume controllers in Key Edit, or by using the MIDI Mixer (or both). A special Mixer Map included with the program allows you to control volume, panning and effects, to create total automated dynamic mixing of your digital audio.

Please remember...

Some of your systems' capabilities will depend on the hardware you are using, see the chapter Hardware Specifics, Appendix 1 in this Audio addendum to the manual. The audio quality, the synchronizing precision, and the speed of operation during certain processes is solely dependant on your recording hardware, not Cubase Audio.

It will be necessary to every now and then *defragment* the disk that holds your audio files. See Appendix 1, page 23 in this addendum to the manual.



Getting Started

This text assumes you are reasonably familiar with Cubase as a MIDI recorder. If not, check out the "Your First Recording" Chapter in the beginning of the main Cubase manual. Here goes:

- If you like, record a couple of MIDI Tracks to which you want to overdub some "real" instrument or vocals. Make sure you have all your equipment connected and the levels adjusted.

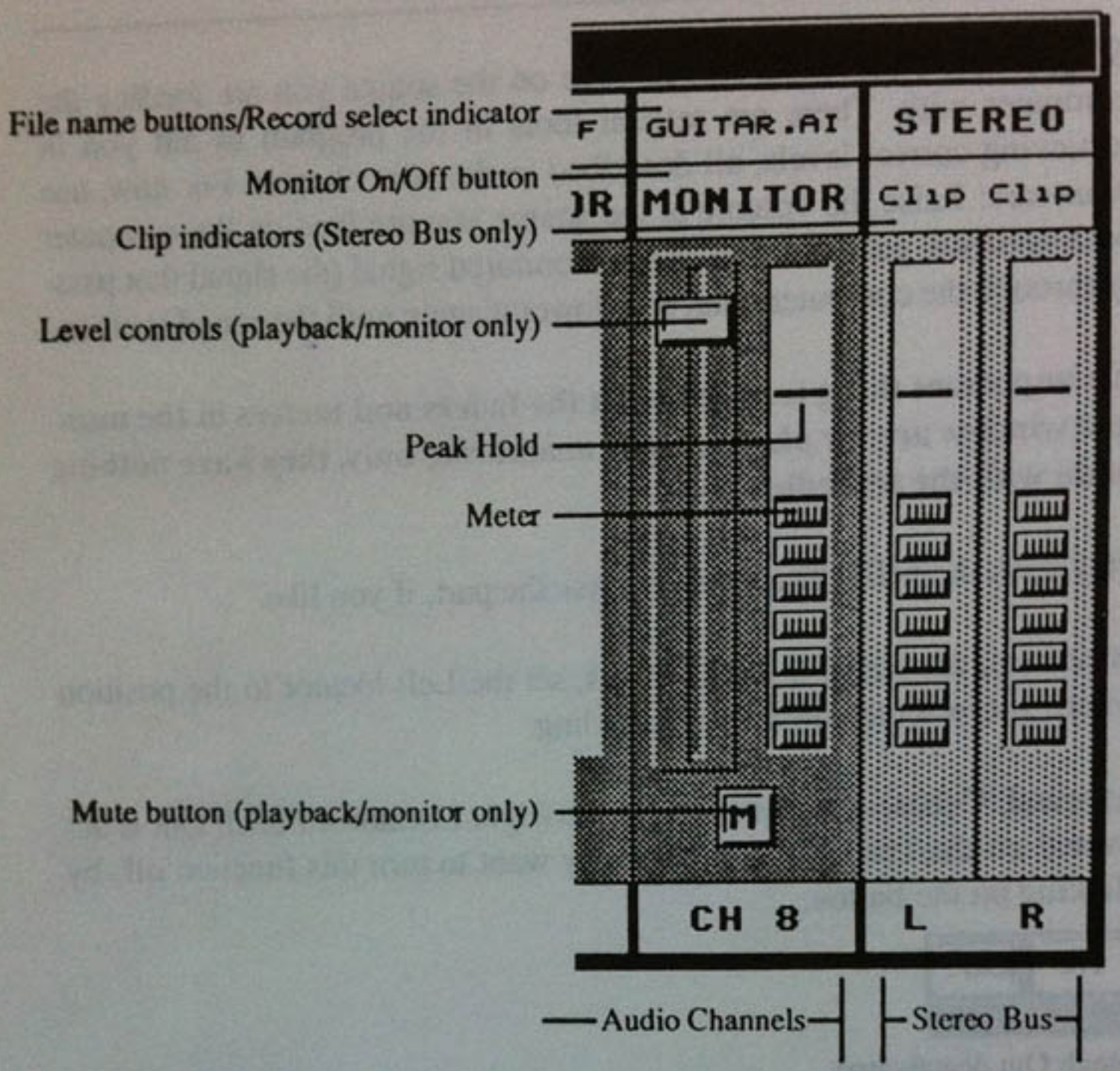
- To record audio, you first have to select an Audio Track. The DEF.ALL song that loads automatically when you start the program the first time contains a number of Audio Tracks which you might use. But you might want to make Audio Tracks yourself. This is done by creating a new Track, which will then be a MIDI Track. To make it an Audio Track, press the mouse button in the "C" column for the Track, and select "Audio Track" from the Track Class pop-up menu that appears.



- Set the Track to Channel 1. It will now record and play back from audio channel 1 in your recording hardware.

- The DEF.ALL Song is set up to record (mono) from the left channel input on your Falcon, so make sure the audio source feeds the left channel of the computer's audio in.

- Bring up the Monitors window, by selecting Monitors from the Audio menu.

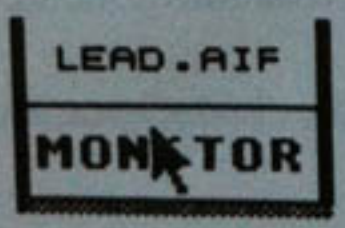


- Click on the leftmost Record Selector button, the one for audio channel 1.



- In the file dialog that appears, type in the name of the audio file you are about to create, and find a location for it. Click OK when ready (audio files have the extension "AIF").

- Turn on Monitoring for this audio channel if you like. This will make your audio source pass through the audio system and get monitored via the output.



- ❑ Set the recording level. This is done on the source you are feeding the computer with. There are several tools in the program to aid you in achieving correct levels, all described in the next chapter. For now, use your ears: Raise the volume at the source you are feeding the computer with until you get distortion on the monitored signal (the signal that passes through the computer), and then lower it again until the sound is clean.

  An important thing to note is that the faders and meters in the monitor window are for *playback* and *monitoring* only, they have nothing to do with the recording level.

- ❑ Play back the MIDI Tracks to rehearse the part, if you like.

- ❑ When you are happy with the levels, set the Left locator to the position where you want to commence recording.

- ❑ As usual, Cubase will punch out at the Right Locator if Punch Out is activated on the Transport Bar. You may want to turn this function off, by clicking on the button.

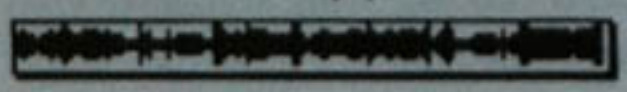


Punch Out deactivated.

- ❑ Activate recording as always, by clicking on the Record button or by pressing [*] on the computer keyboard.

- ❑ Record as much as you like, and then press Stop. A dialog box asks you if you wish to Keep the file, Rename it and Keep it or Delete it right away. Select Keep. You will now have to wait a few seconds while an image of the audio file gets calculated.

- ❑ When this is ready you should have a Part with a waveform in it.



If not, select Show Events from the Part Appearance nierarchical menu.

- ❑ Open the Monitor window and turn off monitoring on the channel you are recording, by clicking the Monitor button.

- Play back the Arrangement to listen to what you did.

- If you want to redo the recording completely, simply select Undo, or delete the Part (select it and press [Backspace]). If you hold down [Control] while pressing [Backspace], the audio file you recorded will also be permanently deleted from the hard disk.

- If you want to punch in on this recording, do so, just as with MIDI Tracks. You can punch in on the fly or use the Left and Right Locators to set up an automatic punch.

- When you alternate between recording and playing back a Track, don't forget to turn Monitoring on/off.

- You can also use Cycled recording with Audio Tracks. This doesn't work exactly as with MIDI, see page 4-9 in this Audio addendum to the manual.

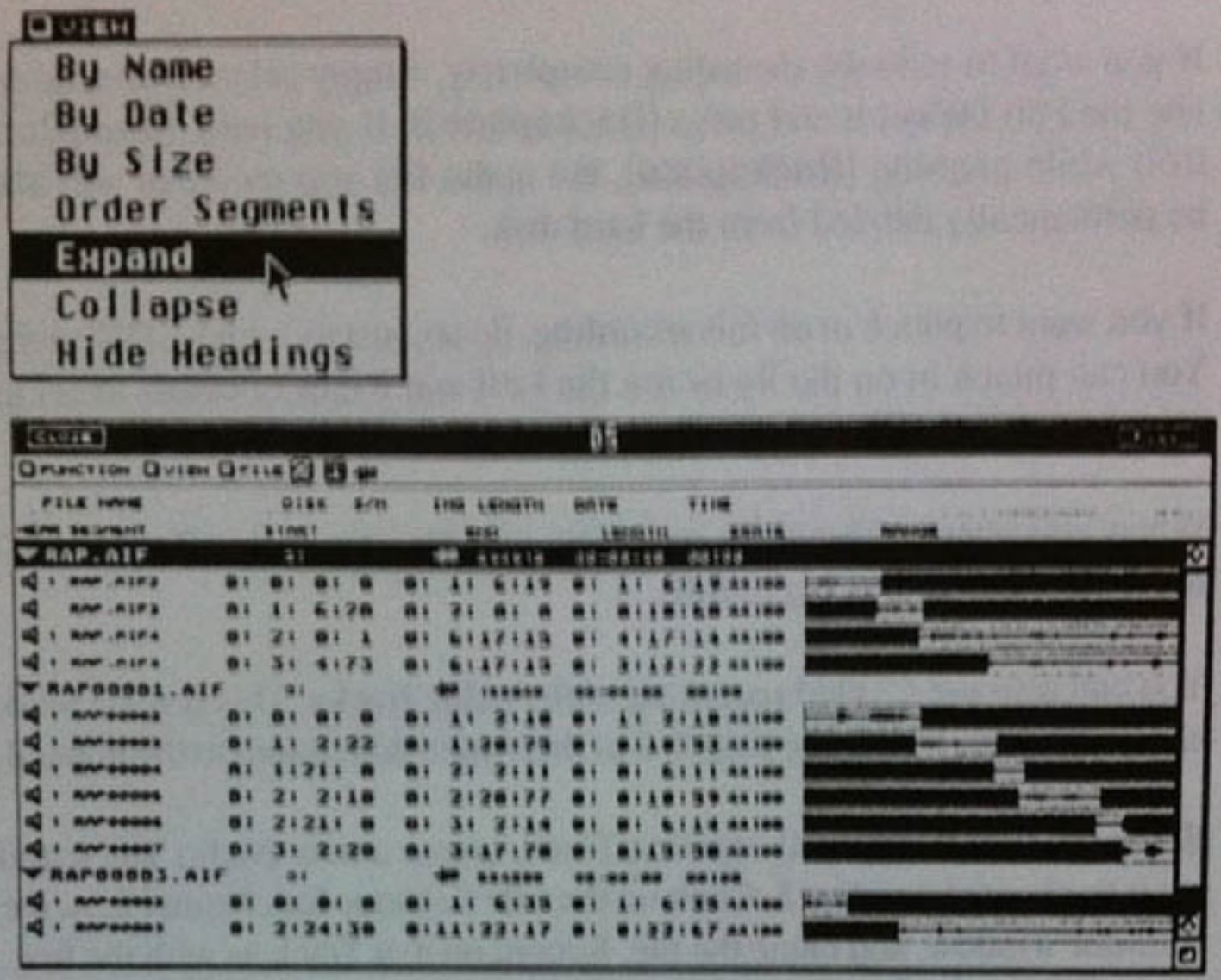
- When you are happy with the first Track, create a new Audio Track and set it to channel number 2. Click on the File Selector for channel 2, in the Monitor window, and name the file. Record on this Track as with the first. You will hear the first Track playing back while recording. If you want to adjust its playback level, use the controls in the Monitor window.

- If you have more audio channels, feel free to record more Tracks. In fact you can have many Tracks set to the same audio channel, for playback. But if two sounds "collide", only one of them will play back. Each audio channel can only play back one sound file at a time.

- If you wish you can use all of the regular Tools for MIDI Tracks on your audio Parts. Move them, duplicate, split them up, join them etc. The only thing to note is that when recording from anywhere but position 1.1.0, the Part will extend to the left of the actual punch in point (the Left Locator), to preserve the attack in the recording.

- Now it is time to examine what you actually did when you were recording. Select Pool from the Audio menu.

- Use the pop-up "View" menu in the Pool window to select "Expand".



What you see is a list of files and their Segments. The audio files are in bold text and the Segments are in plain.

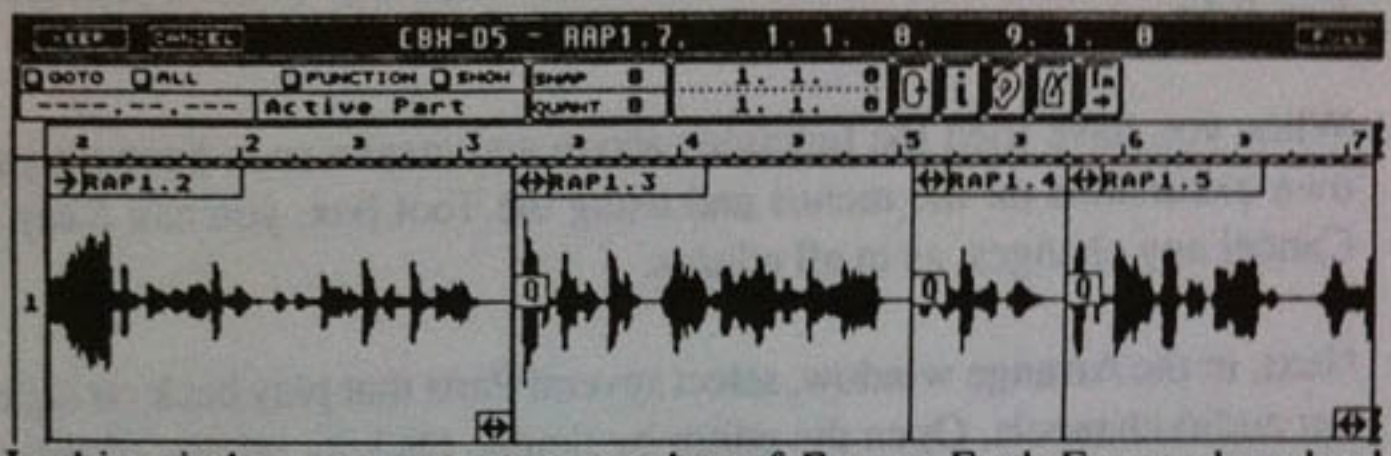
A File is an actual recording on disk. A Segment is a "cutout" from a file, a specification for a section of it. As you will note, one file can have a number of Segments, all playing back different sections of the file.

For each file there is at least one Segment, maybe more, depending on how much editing you have done.

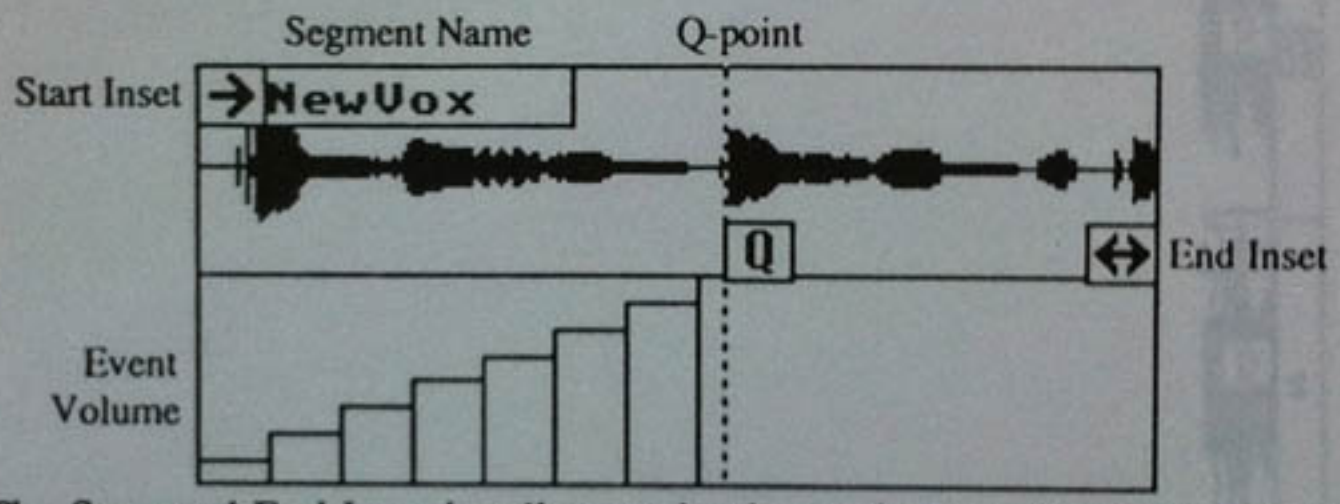
- You can display or hide headings for the file/segment columns. This is done by selecting Hide/Show Headings from the View pop-up menu at the top of the window. You can also turn waveform display on and off by clicking the Waveform icon at the top of the window.

- If you press the mouse over the speaker icon for a Segment it will be played back. There are a lot of other interesting things you can do with the Pool, like import audio files from other applications and perform editing on them, but we'll save that for later. Let's go into the editor.

- Click somewhere in the Arrange window so that it gets activated. Find a Part you'd like to inspect closer, and double click on it. The editor opens.



- In this window you can see a number of *Events*. Each Event plays back one Segment, and you can see the name of that Segment in the Event. This editor has a Toolbox as all others. You can pretty much do with an audio Event what you can do with a MIDI note, and more. You can also customize the display by using the View pop-up menu on the Status bar. This is what can be shown in an Event:



- The Start and End Inset handles can be dragged to mask out portions of the file. The Q-point can be dragged, and when you move or Quantize, it is to this point that the Event snaps. If you have the ear on the Functions bar activated when you drag any of the handles, you will hear where you put it when you release the mouse.

- When you move Events you may note that you can drag them vertically as well as horizontally (make the window bigger first). We call the horizontal strips separated by dotted lines, *lanes*. When you edit *one* Part, as now, it doesn't matter which lane you put an Event on.

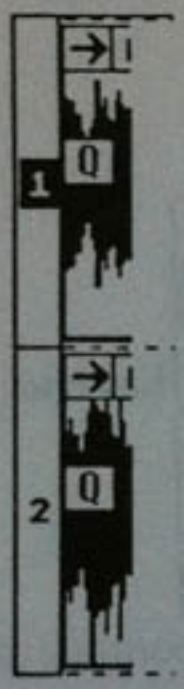
- If you have Volume turned on on the View pop-up, the bottom half of the event will show a volume curve for the event (if you put one in, otherwise

this area is left blank). You can draw volume just as with controllers in Key Edit.

- ❑ When you have tried the functions above and maybe even gone on your own excursions on the menus and using the Tool box, you can Keep or Cancel any changes, as in all editors.

- ❑ Next, in the Arrange window, select several Parts that play back on *different* audio channels. Open the editor by double clicking on any of the selected Parts.

- ❑ Turn on Lane Info on the Show pop-up in the editor. You will now see that each lane plays back on one audio channel.

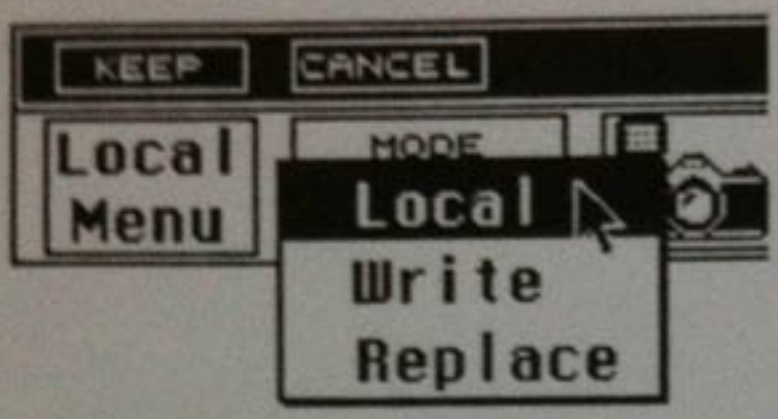


- ❑ By moving an Event to another lane, you move it to another audio channel, and in this case also to another Part.

- ❑ When you are finished, close the editor.

- ❑ Locate a Track called "Reverb". This contains one long Part. Double click on that Part. The Mixer window opens up and displays the Reverb Mix map (in the Hardware Specifics chapter you will learn how to apply other effects than reverb to the sound).

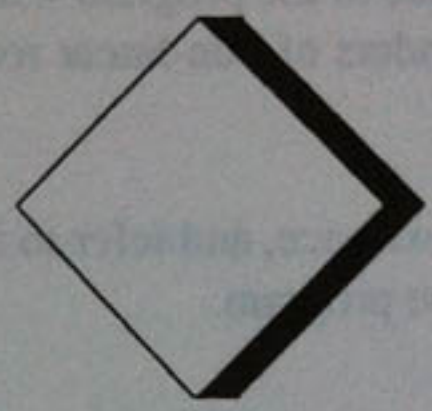
- ❑ Set the Mixer to Local mode so that you don't record anything at this point.



- Select the Play tool (the hand) from the toolbox, and play around with the Controls of this window. When you are done, close the Mixer.

- Save the Song if you wish to keep it. Make it a habit to put the Song in the same folder as your Audio, and Cubase will easily find it even if you restore it after a backup. And when you back up, don't forget to include the audio files...

This completes the guided tour of the audio part of Cubase Audio. Hopefully you will have gained some understanding about the structure of the program, and realised that with this program, recording audio doesn't differ much from recording MIDI. Please refer to the rest of the text for details on each function.



Overview

Handling audio in Cubase is very intuitive, but understanding something about the underlying structure of the program will get you a long way in making the most out of the wonders of non-linear recording and non-destructive editing.

Please read the following text once, and refer to it later when you go through the different processes in the program.

Channels

When we refer to *channels* (or rather *audio channels*), we mean the physical recording and playback channels of the hardware you use. One channel plays back one mono recording at a time. The number of channels in your hardware limits the number of recordings that can be played back *simultaneously*, much like the voices in a synthesizer limits the number of notes that can be played at one time.

Sound files

When you are recording something, you are creating a sound file. Each time you go into record mode, one (and always just one) new sound file per Track is created. It is this file that holds the actual recording. Delete the file and the sound is gone, forever.

Disk crashes are a well known fact in the computer industry, and the only verification against disasters is a meticulous backup scheme. After each session, always backup your data, including both the audio and the Song files.

The only instances when you will create new sound files — and thereby use up more disk space — is when you:

- Make new recordings.
- Import files from other disks.
- Use the Desktop to duplicate files.
- Use another software program to make up modified copies of any recording you may have.

Files are automatically created when you record. You don't need to specify file names and locations prior to recording except for the first recording for each audio channel.

You *can* use several files with the same name in one Song. However, if you want to put two files in the same folder, they must of course have different names.

Make it a habit to always put the audio files for a Song in the same folder as the Song. When you later load the Song, Cubase always first looks for the audio files in the folder where you put the Song document. That means that you can back up the whole folder and restore it to your hard disk later without the program having any problems with "lost" audio files.

If you *do* use the Desktop to move a sound file or rename it (you shouldn't!), the program will warn you next time you open that Song, and will let you find the files automatically or manually. See page 5-4 in this Audio addendum to the manual.

When you save your Song, the program remembers the "creation date" and "last changed" date for each sound file, so it knows if you "tampered" with the file since the last time you had the song open (you might for example have used it in another Song). If this is the case, you will probably need to update the *image* (the waveform picture used on screen) of that sound file. See page 5-5 in this addendum to the manual.

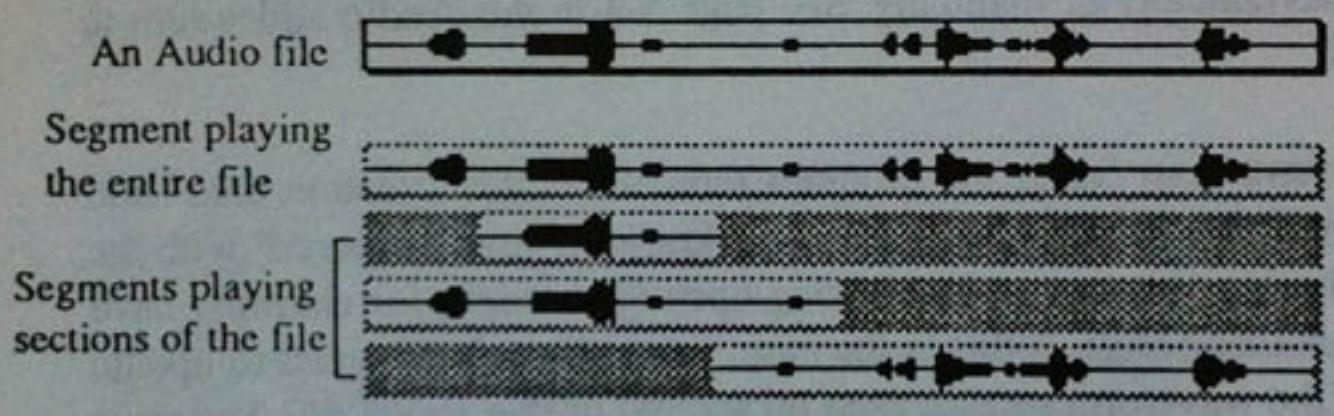
Waveform files

With each audio file ("AIF" file) goes a waveform file used to display the recording graphically on the screen (this file has the extension "WIF"). When you back up your audio files, you should include the Waveform files. However, if you loose a waveform file, this is no disaster, a new one can be created as described on page 5-10.

Segments

Most of the time you don't bother with sound files at all, since Cubase isn't restricted to playing complete recordings. Cubase plays back *Segments* of your recordings, which is a section of a sound file defined by a start offset, and a length.
Segments take up virtually no disk space, they only point to the sound files (that do take up a lot of disk space). Making up many Segments from few sound files is a disk space conservative way of working.

You can make up one or many Segments out of one sound file. These Segments can play the same section or different sections of the same sound file. You can use all these Segments in the same Song, and even play them back on different audio channels simultaneously, there are no restrictions.



A Segment is played back via a channel. You can have several Segments playing back via different channels, at the same time, although they all are Segments out of the same sound file. Complicated? Here's an example:

Let's say that you recorded a few bars of a drum beat. You make up one Segment that plays this recording. Then you make up another very small Segment from the same recording, a Segment that only contains a single snare hit.

Now you can play back the whole recording via one channel and use another channel to play the short Segment wherever you feel additional snare hits are needed. As long as these two Segments play back on different channels they will not cut each other off.

This is what is often referred to as *non-destructive editing*. You can use different portions of one sound file, even on different audio channels, without actually making any permanent changes to that file. Most editing procedures in

Cubase are non-destructive. And with those who aren't you are given the choice of creating a copy of the original file before proceeding.

Stereo files are played back by special stereo Events. These take up two channels.

Audio Events

When you record MIDI in Cubase, you record Events. By the same token, what you actually handle in Cubase's Audio editor, are audio Events. One Audio Event plays one Segment at a certain time.

The difference between the handling of Events and Segments may seem redundant, but it isn't. Some operations work on Segments and other work on Events.

One thing to note is that the position of the Event determines where the audio *starts* playing, but the Segments determine the *duration* of playback. Another example is that you might delete an *Event* in the Audio Editor, but the *Segment* is still there in the Audio Pool (see below), so that some other Event can play it back.

When you use the Audio editor, most of the handling of Events is identical to that of MIDI Events in other editors.

Summary

Let's repeat this:

- Your recording hardware has a number of *channels*. Each channel can play back one mono recording at a time.
- For each recording you make on a Track, one *sound file* is put on disk.
- To specify what part of the sound file should be played back, Cubase makes up *Segments*.
- In the Parts are *Events*, and it is Events you see in the Audio Editor as well. Each mono Event plays back one *Segment* via one *channel*. Stereo Events take up two channels.

Spend a few moments getting acquainted with this terminology, it will make it a lot easier to understand what's going on in the more complex operations you are able to perform on audio in Cubase.

Audio in the Arrange window

There are different types of Tracks in Cubase, one of them being Audio Tracks. For general handling of Track types, see the "Tracks" chapter in the main manual.

One Audio Part on an Audio Track can contain any number of Audio Events, in any order, parallel or after each other (the exact handling of an audio Part is described later in this manual).

This means you must not confuse Cubase's Audio Tracks with tape recorder Tracks. A Cubase Audio Track may contain any number of parallel recordings taking up any number of audio channels. Sometimes, though, it is convenient to handle a Cubase track as a tape recorder track. At other times this may be restricting, it's all up to you and what you are trying to achieve.

With Audio Tracks, there is no individual Channel setting per Part, as there is with MIDI Parts. All Parts on the Track will use the Channel setting in the Track list.

The Audio Editor

There is a special editor for audio. Like all other Cubase editors, it allows you to get a close-up of one or several Parts. The Audio Editor shows Events graphically, as boxes, and displays the actual audio waveform inside these boxes (if you so wish). You use the editor to assemble Events (that play Segments) into parts of music (or whatever noise you're recording!), by putting new Events in, copying, cutting, pasting, splitting, shortening and of course moving them around.

Again, one Part, that you edit in the editor, is not restricted to being like a Track on a traditional tape recorder, you can have many parallel Segments in

the editor. They are then displayed vertically above each other on so called *lanes*.

The Audio Pool

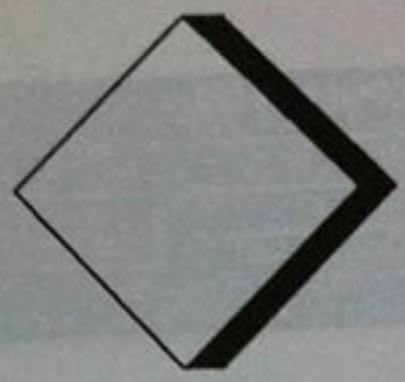
The Audio Pool is for managing your Sound Files and Segments, much like you use the Desktop to manage your folders and files.

The Audio Pool displays an overview of each of your recordings (Sound Files), and the Segments made up of each one. It allows you to import Sound files, make up new Segments, delete Segments, etc.

Getting the Sound into the Parts

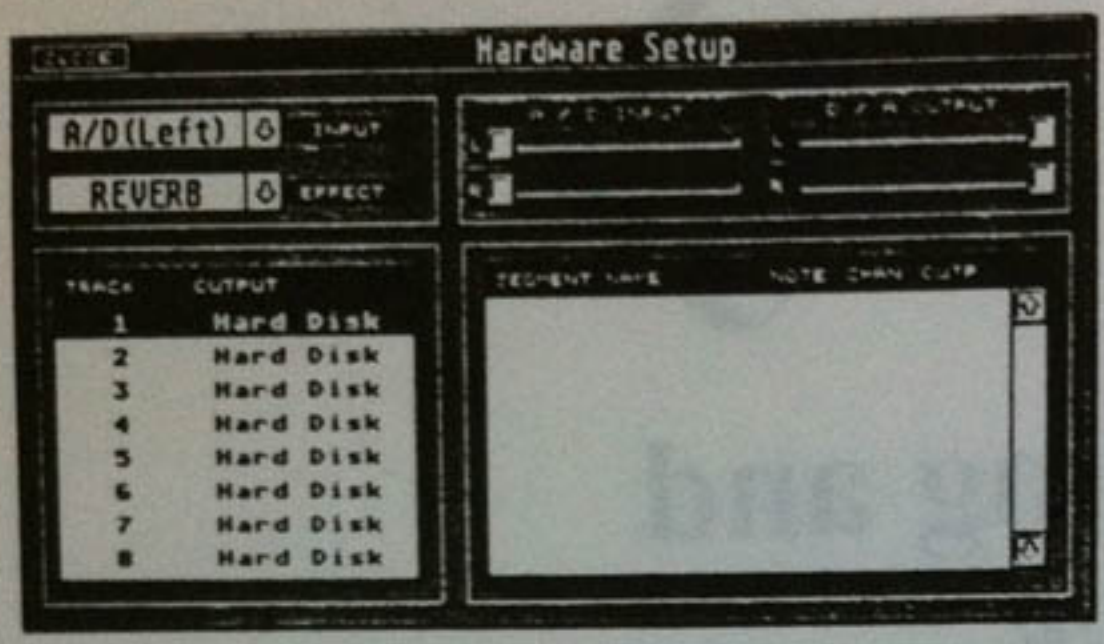
From the Arrange window you see your audio as Parts on Tracks, just as with MIDI. There are four ways to get the audio Events into a Part:

- By recording (from the Arrange window or from the editor, it doesn't matter).
- By dragging Segments from the Pool into the Arrange window.
- By dragging Segments from the Pool into the Editor.
- By using the Pencil Tool to import Audio into the editor.



Recording and Playback

Hardware Setup



The following settings in the Cubase Audio Falcon Hardware Setup dialog – reached from the Audio menu – are vital to recording (the Hardware Setup dialog is described in full in Appendix 1, page 10).

Recording Inputs

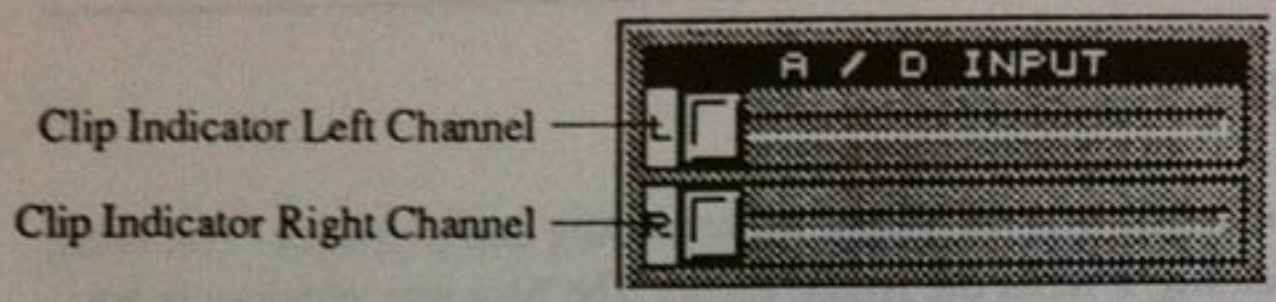
The "Inputs" pop-up menu at the top left is used to decide which input to record audio from, when you are recording a mono Track. "A/D (Left)" and "A/D (Right)" means the left and right audio inputs on the back of the Falcon. This is the setting you use for regular recording. "Mix (Left)" and "Mix (Right)" are reserved for permanent Mixdown, as described in Appendix 1, page 9 in this audio addendum. The external settings (Ext) are for future expansion.

A/D Input and clipping

That A/D Input fader is for controlling the overall audio input level. When you set it to "zero" (full left) the input is attenuated by 22.5 dB. Please observe that this does not mean you turn the input off completely, only that the input level is reduced. Details about this can be found in Appendix 1, page 10 in this audio addendum.

The inputs on the Falcon expect a (low level) microphone signal. Connecting line outputs (as from a mixer) will lead to distortion. See Appendix 1, page 10.

To the left of the fader you will also find a clip indicator, which lights up when the maximum signal level is exceeded. Please note that clipping will lead to very unpleasant disitortion and should defintely be avoided.



D/A Output

This is used to set the Output level at the Audio Out of the Falcon. Full level means that the output delivers a signal strong enough to drive a pair of headphones. When connecting the Falcon to an external mixer, you should lower the D/A output to minimum. Even this signal could possibly be too "hot" for your mixer, see Appendix 1, page 11 in this audio addendum.

Audio Channel List

The lower left section of the dialog box is used to set which of the eight audio channels should play from the Hard Disk(s), which should play from RAM and which should be used as "Sampler Channels". Initially, in the DEF. ALL song, all channels are set to "Hard Disk". Details about the other possibilities can be found in the Hardware Specifics chapter.

One Track Recording

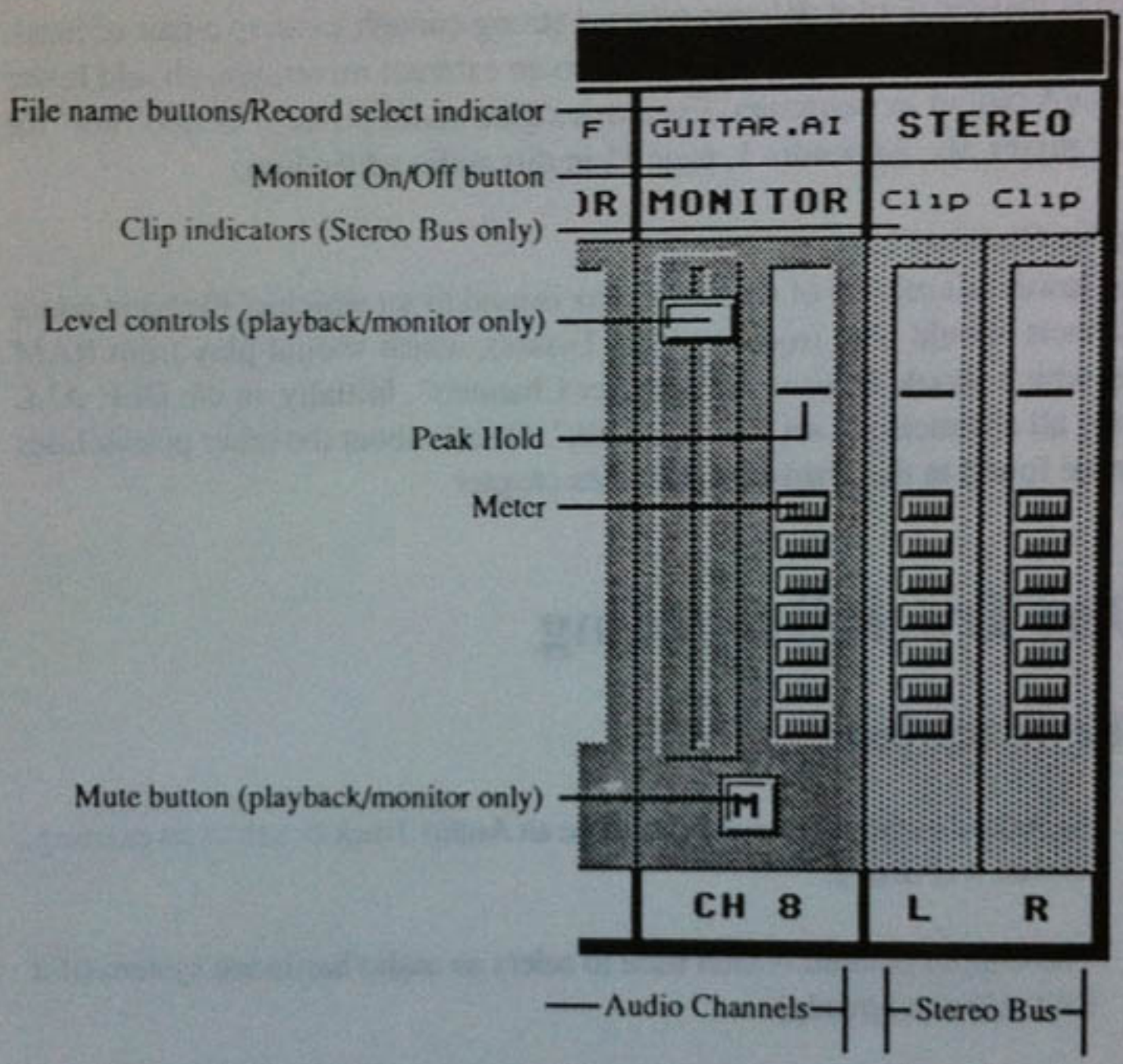
The Track list

- To record audio you must first create an Audio Track or select an existing, so that it is active.
- The Output column is then used to select an audio hardware system (if it isn't selected already).
- Finally you must set the Track's Channel (Chn) to the Audio Channel you plan to record on. You must also make sure you have the correct audio input selected in the Hardware setup dialog.

The "Any" channel setting is reserved for stereo recording (see page 4-9) and stereo and multitrack playback (see page 6-5).

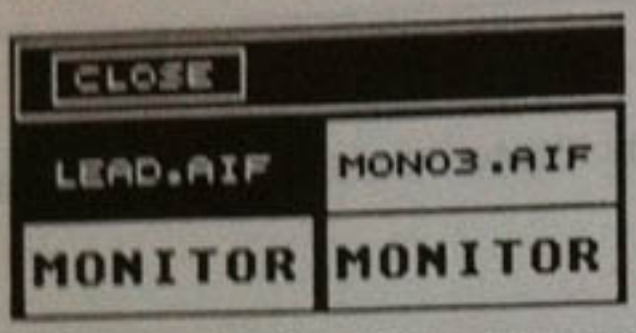
The Monitor Window

- The monitor window is used both for recording and playback. You bring it up by selecting it from the Audio menu. The Monitor Window is basically a minimal Mixer.



The File Name Buttons
The top row buttons have two purposes.

- The button that is black indicates record ready, that is, this input will be used for recording (you select input by selecting a track for recording and setting it to a specific audio channel, as described above).



In this example, "Lead" is put into record Ready.

- By clicking on the button you can decide where to put the audio file, and what name to give it. A standard file dialog box appears where you can type in a new name and select where you want the file located. This has to be done the first time you record on an audio channel. After that Cubase automatically creates new sound files for you, by replacing the last characters in the name with a number, each time you start a new recording.

  If you don't like the Automatic names or for some other reason want another one or a different location for the file, you can specify this prior to recording, just like the first time for the channel.

- If you have set a Track to Any, to record in stereo (see page 4-9 for details), you use the File Name button for Channel 1 to select a file. The File Name selector for Channel 2 will then be greyed out, indicating that both channels are used for the recording.

Monitor On/Off
When this button is activated sound, will be thru-put so that you hear the sound being recorded in your monitors. This will make the signal pass through both the A/D and D/A stages (analog to digital conversion and back) of your recording hardware, so that you can compare and listen out for any degradation in signal, due to improper levels.

The recording level is solely set at the source, or at the panel of your recording hardware. The fader in the Monitor window is only for controlling the Output level of the channel, not the recording level. The same goes for the Mute button in the Monitor window; it is only for playback.

If you have montoring turned on, and turn it off *during playback*, the Track will not be heard immediately. Please Stop and activate Play again.

Mute On/Off (M)

This allows you to mute the output for the respective audio channels. This is primarily intended for playback.

Meters

These always show the *Output* level from the Channel. The bars indicate the current level, and the thin black line is a "hold meter", which means it indicates the highest level that has come in since the meter was last reset. To reset a meter, simply click on it.
For more info on how to use the meters when recording, see below.

Output Volume

This controls the output level of the audio hardware. It affects playback only.

Stereo Bus

To the far right in the Monitor window you have two meters that show the output level from the stereo bus. Use this to check the output overhead. If you have many channels playing back at full volume, the output might get overloaded, which will lead to distortion. The two Clip indicators above the meters will indicate this. If you get output clipping, lower the channel volumes, either in the Monitor window or in the Mixer window (which is described later).

Setting Recording Levels

As described above, the recording level is primarily set at the source you are feeding the computer with, most probably a mixer. There are three ways to check the recording level:

Using Your Ears

When you monitor the signal through the computer, it passes through both the "Analog to Digital" and "Digital to Analog" stages. This means that you will be able to judge from the monitored output if the signal is recorded too hot (clipping occurs, whish leads to distortion) or if the signal is too weak (which gives you an unecessary amount of background noise).

Using the Hardware Setup Window

If you open the Hardware Setup window, you will be able to look at the Input clip indicators described above, to judge the level. While these might not be able to catch every single occurrence of clipping, the fact that they do light up

(even once) is an indication that you should lower the signal level at the source.

Using the Monitors Window
The channel meters in the Monitor window do *not* show recording level, they show output level. However, if you raise the channel fader in the Monitor window all the way up, and also open the Mixer window and make sure the channel is permanently set to full volume in this window too, the Monitor window Channel meter will in practice be possible to use for setting recording levels.

This last method will not work if the Montor and Mixer Volumes are not set to maximum level!

File Naming

As stated above you must create a file name for each new audio channel you want to record on. After that all subsequent files will be automatically named for you.

You can rename the files from the Pool window if you like, but don't rename them from the Desktop, or Cubase won't be able to find the files next time you load your Song. See page 5-4 and page 9-1 in this section of the manual for details.

Recording

The actual recording is done exactly as with MIDI, see the chapter "Basic recording of MIDI Tracks" in the main manual. Please just note the following points:

- Precount (an on/off setting in the Metronome dialog box) does not work with audio as with MIDI. If Precount is activated, a short portion of audio is recorded before your actual starting point. We definitely recommend you to leave this on. This is to ensure that any attack in the sound will be properly preserved. If you used the Locators for recording, you will note that the Part extends a little bit to the left of the Left Locator. Since Parts Snap to their relative starting point (the beginning of the Part

doesn't necessarily snap to a bar, beat or whatever) you can still move the Part around in the Arrangement and Snap will work as you expect it to.

The only exception to the Precount feature is that no Part obviously can start before the beginning of the Song (position 1.1.0).

- If you wish to redo the whole recording, use Undo, delete the Part or use the editor to delete the Events that have been created, then re-record. You can *permanently* delete the audio file at the same time by holding down [Control] (This only works when you use the [Backspace] key to delete, not the Eraser tool).

- You may record again on a Track, and this will mimic a regular overdub in replace mode, as on a tape recorder. The new Events you record will overlap earlier Events. But in fact, each earlier recording is still intact, it is just that it isn't played back where another recording overlaps it. The logic of this becomes apparent when you use the editor, see page 6-8 in this section of the manual.

- Each time you activate recording, one and exactly one new sound file is created per Track you record on.

- You can not punch out and then punch in again, during the same "play pass". You have to first stop Cubase.

- Switching Tracks while recording does not allow you to continue recording on the new track, it deactivates recording, but doesn't stop playback. You have to stop before recording again.

- The Overdub/Replace Rec switch on the Transport bar doesn't apply to audio. Overdub doesn't apply, since each audio channel can only play one "sound" at a time. And as stated above, recordings are never actually replaced, but new Events may overlap existing Events in the Parts, which will give you the same effect as with an overdub in replace mode.

- You may record from the Arrange window, the Audio Editor or any other editor, or while the Audio Pool is the topmost window, it doesn't matter. You may not record from the Arrange window when the Editor is open.

Mono/Stereo

Mono
When you select a plain number in the Channel column in the Track list, you are recording in mono on the Track. The Track Channel setting is used to select an Audio Channel, as described on page 4-3.

Stereo
When you set the Track to Channel "Any" you are recording in stereo. The recording will of course use both Audio Inputs 1 and 2, and will also use Audio Channel 1 and 2.

Both channels of a stereo recording are stored in a single file.

In the Monitor window you will be able see when the recording Track is set to "Any" for stereo recording, since the File Name for Channel 2 will be greyed out and the Monitor buttons for the two channels will be "linked".

To make a Stereo recording play back on any other audio channels than 1 and 2, you must move it to another lane in the Audio Editor, see page 6-9.

Cycled Recording

When you enter recording in Cycled mode, your existing tracks (MIDI and audio) Cycle as usual. However, your new audio recording only creates one long file per Track, not one file "per lap".

One Segment *with the length of the whole file* is then put in where you began recording, a bit as if Cycle had been turned off for that Track only. It is then a simple task to use the Arrange window features or — maybe even better — the Audio editor to "chop up" this Segment into shorter ones, each as long as the Cycle. These Segments can be "stacked" above each other, in the editor. What this means becomes obvious when you understand how Audio Edit works. Since only one Event at a time can be played back on one audio channel, you can use the editor to pick out the best take out of all the ones created during your Cycled recording.

The Cycle modes and functions have no relevance to Audio tracks.

Stopping Recording

When you stop, the program will ask you if you want to Keep the take you just made, keep it but Rename it first or Delete it completely. This function can be turned on using Confirm Record on the Audio menu. When turned off, files are always Kept.

If you keep the take, the program calculates a screen image for the file recorded. A dialog box informs you of the progress and disappears when it is finished. If you don't need these waveforms you can speed up all graphic operations in the program by unchecking Use Waveforms on the Audio menu.

There are a few error possibilities you should be aware of. Your storage media could possibly get filled up. Or, it could be too fragmented or for some other reason too slow to accept the data being recorded. The more channels you try to play back from one hard disk, the faster it has to be. A dialog box will inform you of what went wrong. The chapter "Hardware Specifics", Appendix 1, may contain additional information about potential pitfalls in each system.

Playing Back

You can immediately rewind and play back your new recording.
As stated earlier, the Arrangement doesn't play back sound files, it plays *Events* which are linked to *Segments* of a Sound File. If you think about this for a second you realise that this means that recording actually is a three stage rocket: First of all you have created a Sound File on your disk. Secondly the program has also created a Segment as long as your recording. Finally an Event that plays this Segment is inserted into the Part you recorded into.

If you don't hear a recording there may by several reasons:

- You didn't turn off monitoring for this audio channel (in the Monitor window)
- Check in the Part whether there is any audio. If Show Events is ticked in the Part Appearance pop-up on the Options menu, and there is just a straight horizontal line in the middle of the Part, you somehow didn't record anything, or just silence.

- Open the editor (double click on the Part) and check if there is an Event in there (use the "GoTo" menu to find the "First Event"). If there isn't, you somehow didn't activate recording.
- Check your channel settings on the Tracks (and in the Parts). If two Events play back on the same audio channel, you will only hear one of them.
- Check your volume settings, both in the Monitor window, in the Mixer window and on your mixer/amp.
- Check that the the Mixer Track you have activated (unmuted) corresponds to the Effect type you have chosen in the Hardware Setup dialog (this is all described in detail in Appendix 1, page 12), that the correct Mixermap is loaded and that its volume faders aren't turned down.

A Segment never spills over the end of a Part, as opposed to MIDI Parts where notes may be longer than the Part. This means your Parts are always at least as long as to the end of the last Segment (they can be longer too).

You can mute the Track if you wish, using the Mute column as with any Track type.

Time Locked Audio Tracks

You can Time Lock an Audio Track (see the chapter Time Locked Tracks in the main Cubase manual). This is very useful when you work with Cubase locked to time code coming for example from a video. You may use audio Tracks to for example record dialog or sound effects. If you keep these recordings on Time Locked Tracks, you can still work freely with tempo based material (music) on other Tracks, without losing "sync" with the audio.

The Monitor Window

You can also use the monitor window to mute an audio channel, and to change its playback volume, see page 4-4 in this section of the manual. For automated mixing, see page 6-22 and page 10-1.

Winding

Fast Forward and Rewind works as with MIDI, although it takes slightly longer for the Audio Tracks to catch up, when you eg rewind in the middle of playback.

Cueing doesn't play back Audio Tracks.

The Track Channel Setting

You may set a Track to play back on one specific audio channel or to "Any".

You can set two tracks to the same channel for playback if you wish. Remember that each physical audio channel in your system is monophonic and therefore only one recording can be played back by any channel at a given moment. See page 6-8 in this section of the manual.

If you set a Track to Any, it may play back on all the Audio channels of your recording system. What Events will play on which audio channels is decided by the way the Events are put on the *lanes* in the editor. See page 6-5 for details.

Multi Track Recording

You can only record on one Audio Track at a time. However, Multi Recording (on the Options menu) is still used, as a means of recording MIDI and Audio at the same time, as described below.

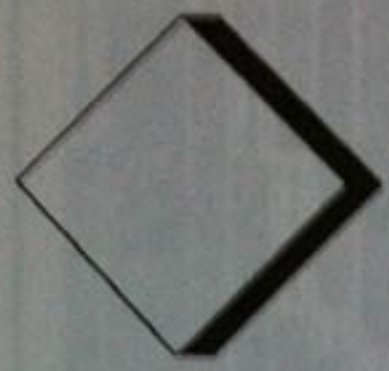
Recording MIDI And Audio At The Same Time

When multi Record is active, you may record MIDI and audio at the same time. MIDI/Drum Tracks operate just as they normally do in multi record, except that only three MIDI tracks may be record enabled rather than the four available in regular versions of Cubase.

Synchronization

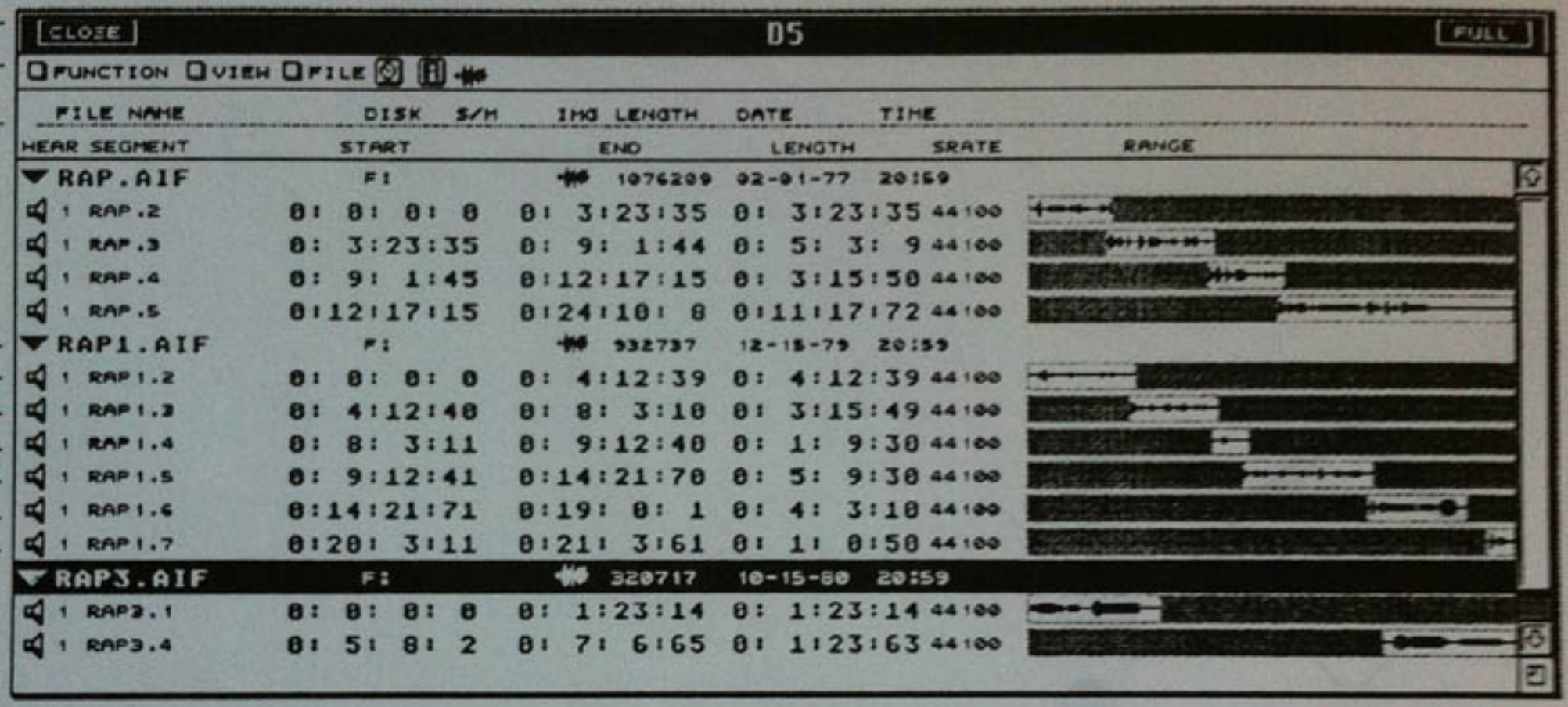
Synchronization brakes down into two points, Syncing Cubase and syncing the actual audio:

- With Cubase Audio, you should sync the computer to time code (SMPTE or MIDI Time Code), *not* MIDI Clock.
- Sync and Digital Audio is described in Appendix 1, page 20.



The Audio Pool

Title Bar
Functions Bar
Headings
A File
Segments of the File



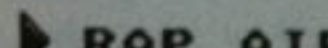
This window is opened by selecting Pool from the Audio menu. It displays a list of the Sound Files you are currently using and all their related Segments. The Pool can be seen as a management tool, helping you to maintain an overview of the audio portion of your production.

Headings

Above the list of Files and Segments you may find two lines of headings. The upper is for the Files columns and the lower for the Segment columns. You use the Hide/Show Headings item on the pop-up View menu to hide/display the headings.

Sound Files

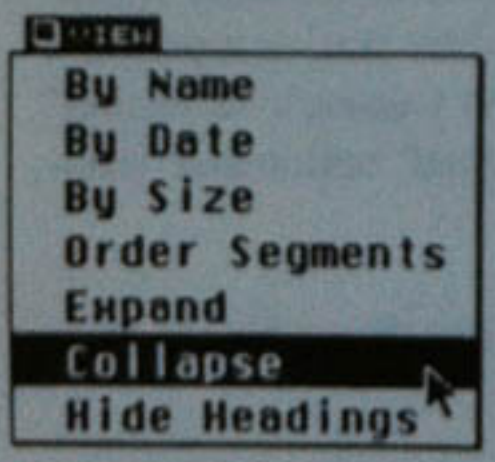
Each file is displayed in bold text, and is preceded by a triangle.



You may click on the triangle to hide/show a list of all the Segments that belong to the Sound file.



If you want to show all Segments for all files, select Expand from the pop-up View menu or click on a triangle while holding the [Alternate] key.
If you wish to see only the files, select Collapse from the View menu.



- You can change the name of the file. Double click on it or select the list entry and while holding [Alternate] hit [N], then enter text as usual. Hit [Return] or click outside when you are finished.

- There is a letter and a colon to the right of the sound file name, indicating which drive the file is on. If the file can't be found, three question marks are shown instead.

G:	This file is on the "G" drive.
???	This file can't be found.

  A file is considered missing if you moved it on the Desktop and ignored the missing files dialog when you Opened the Song or Arrangement. If you always keep your audio files in the same folder as the Song and never rename them from the Desktop, this will never happen.

  To locate a missing file, click on the question marks. A dialog appears asking you if you want to locate the file yourself (Manual) or have the program do it for you (Auto). Select either.

  If you select Auto, a dialog appears showing you how all your hard disk drives are searched for a file with the correct name. This might take some time.

  When you or the program has found a file, you click OK to use this file to replace the one missing in the Pool. If the name or "last modified" date is not identical to the missing one, the program will warn you but let you proceed.

  Please note that Cubase is quite strict about identifying the files you are using. Cubase retains information on the Name and Creation Date of every file saved in a song. If these values are changed by you, or a program you may be using, you will not be able to rely on Cubase's "auto-find" function. In this case you will have to use the "Manual" option and "override" the subsequent warnings.

- If the sound file is stereo, two intersecting circles are shown beside it.
  ⓒ Stereo is indicated by two circles.

- With each file goes a so called *image*, the picture of the waveform used on the screen in Cubase. This image is stored in a separate file with the same name as the audio file, but with the extension "WIF". When you record new files, image files are created automatically (see page 4-10 in this Audio addendum to the manual.) However, you don't *have* to use images at all, you might somehow lose the files or they might get "out of sync" with the audio, for example when using other programs to process an audio file. The program indicates the status of the image file for each audio file in the Pool:

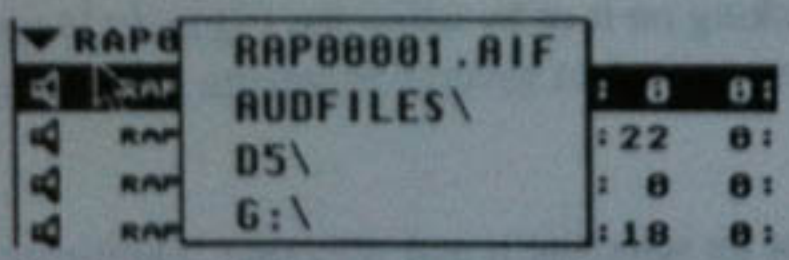
  The Image is OK.

  The Image might need updating.

  No Image can be found for this file.

  If you click on the icon or select "Make image" from the "Function" menu, a new image is calculated for the file. Whenever the program warns you about problems with the images, you can use this feature to remedy the problem.

- If you hold down [Control] and [Alternate] and click on the name of a file, a pop-up list appears showing where the file is located. The bottom item in the list is the drive the file is on, above that are all the folders and at the top you will find the name of the file.



- You can select a file by clicking on it or by using the [↑] and [↓] keys on the computer keyboard.

- You can audition any Segment by clicking on the speaker icon. Immediately next to the speaker icon is an indication of the number of times this Segment is actually used in your Song.

- You can delete the selected file from the Audio Pool (if it isn't used in the Song) by using the main Edit menu, or by hitting [Backspace].

Deleting the file does not mean it is deleted from disk, it simply removes it from the Pool.

- If you want to also delete the file from the disk, hold down [Control] while hitting [Backspace]. The program asks you if are sure you want to follow through. This operation can not be Undone!

- You can create a Segment for the file by selecting it and selecting "Duplicate" from the pop-up Function menu.

- You can use the "i" (info) icon at the top of the pool to display some information about the file. When Info is active (black) the size of the file (in samples) and the date and time it was created is displayed to the right of the tick mark.

Segments

When you click on the triangle beside the file name so that it points downwards, a list of all the Segments belonging to the file, appears.

- You can decide to display the waveform for the Segments or not, by clicking on the small waveform icon at the top of the window.

- You select the Segment by clicking on it or by using the [↑] and [↓] key on the computer keyboard. You can select several Segments by holding down [Shift].

- You can duplicate one Segment by selecting it and selecting "Duplicate" from the Function menu.

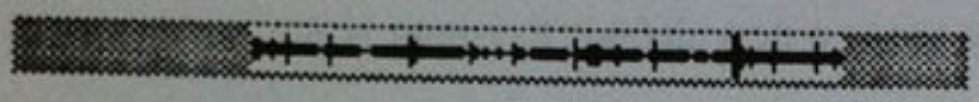
- You can delete the selected Segments not used in the Song by hitting [Backspace].

Any Segments used in a Part cannot be deleted from the Pool window, you have to first delete the Events that play the Segment. You can always tell how many times you refer to each Segment in your Song from the number next to the speaker icon.

- If you want to also delete the file that plays the Segment, from the disk, hold down [Control] while hitting [Backspace]. The program asks you if are sure you want to follow through.

- You can change the name of a Segment, just as with files (see above).

To the far right of each Segment is a bar-graph displaying where in the files this Segment is. This might contain an image of the waveform. You can turn this on/off by clicking the waveform icon at the top of the window. The total bar represents the total file (this always has the same length, regardless of the file's actual length) and the waveform area represents the Segment.



- You can audition any part of the Segment by holding the mouse down on it's image. Playback will commence from that point. This allows you to easily audition the latter parts of long recordings.

The Segment's *Start and End Insets* within the file can also be seen as numbers to the right of the file name. These figures can be displayed as time (in a time code like format) or as samples. You decide which by clicking on the clock/frame icon at the top of the window.

The Start and End Insets can be changed by double clicking on them and entering new values. Using this method you can do sample accurate editing of Segments, which is not possible to do in the editor. See page 6-7 in the main manual for how to enter time code values from the keyboard.

To the right of these two numbers is the length of the Segment (as calculated from the Start and End Insets) and its sample rate. These values are displayed for your information and cannot be changed.

Importing Audio files into the Pool

If you select Import Audio from the pop-up File menu you will be presented with a dialog box which allows you to import audio files into Cubase for use in your Song. The exact nature of this dialog is dependent on the hardware system you are using. Regardless, you use this dialog box to find sound files on your hard disk, and to select them.

For details of each system's Import dialog box, see Appendix "Hardware Specifics" in this Audio addendum to the manual.

You can import mono or stereo files. See the page 22 in the "Hardware Specifics" Appendix.

When you have selected a file, the dialog box goes away. A new file is visible in the Audio Pool window, and with it is a Segment, which has the same name as the file preceded by the text "New".

If you import the same file twice a new default Segment is assigned to the original file.

Dragging Segments into the Arrangement

You can easily drag a Segment from the Pool and release it directly onto an Audio Track (click on the *name* of the segment). This action automatically creates a Part with the same length as the Segment. You can use this as a quick method to import Segments into an Arrangement.

Dragging Segments into the Editor

Another method of inserting audio into your Arrangement is to drag a Segment to the Audio Editor. This action inserts an Event into one of the Parts being edited. The Event plays the Segment you dragged. Using this method you can put as many Segments as you require into a single Part. Below is a quick hint to how this is done, the details are found on page 6-16.

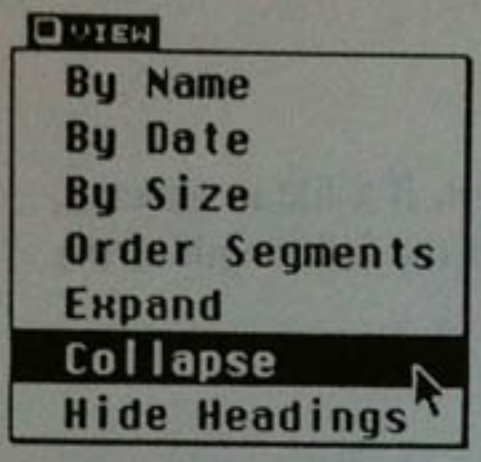
- Click on the name of a Segment and drag it to an open editor window (you must open the editor first!). The mouse position box in the editor informs of which position the Segment will be put on, and the Snap function helps you positioning it.

- If you are editing a Part set to channel "Any" or if you are editing several Parts, you have to find the right *lane* for the Segment (the horizontal strips divided by dotted lines are called *lanes*). Depending on which lane you

"drop it" on, it will be played back on a different audio channel and maybe it will be put into a different Part.

- Release the mouse when you have found the right Position.

The View Menu



- You can use the first three items on the View pop-up menu to decide in which order the Sound Files in the Pool should be displayed:

By Name Files are shown alphabetically.

By Date Files are shown chronologically after the time they were created, with the newest file on top.

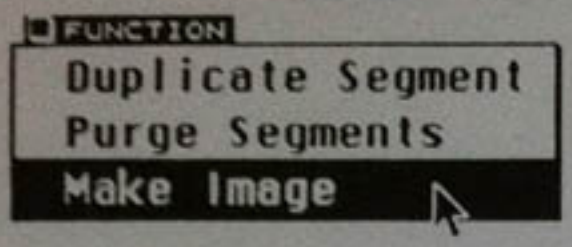
By Size Files are shown after size, with the largest one on top.

- You can use **Order Segments** to rearrange the order of the Segments so that they are shown in the order they appear in the file.

- If you want to show all Segments for all files, select **Expand** from the pop-up View menu. If you wish to see only the audio files, select **Collapse**.

- The **Hide/Show Headings** item does just that, hides/shows the headings at the top of the Pool window. The upper line of headings is for files, the lower for Segments.

The Function Menu



The Pool has three items on the Function menu.

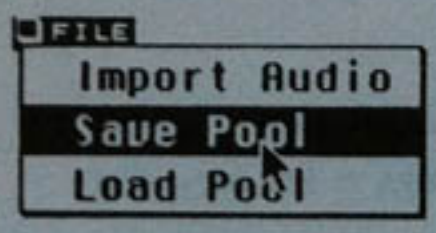
Duplicate
If a Segment is selected, this action creates a copy of it. If a file is selected, this action creates a new default Segment which plays the full length of the file.

Purge Segments
This allows you to delete all Segments that are not used in the Song. This does not delete any audio files, only Segments.

Make Image
This item recalculates the waveform image for the file. See page 3-3 for details.

Loading and Saving the Pool

Normally, the Pool is saved with the Song. However, by using the Load and Save Pool commands on the pop-up file menu, you can freely save Pools and load them into Songs.

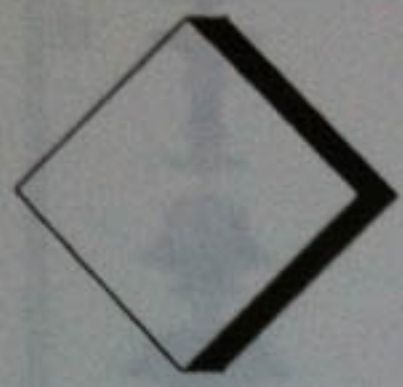


When you select Save Pool a dialog box asks you if you want to save all files and Segments, or just the selected ones. After this a standard dialog box appears where you can specify a name and a location.

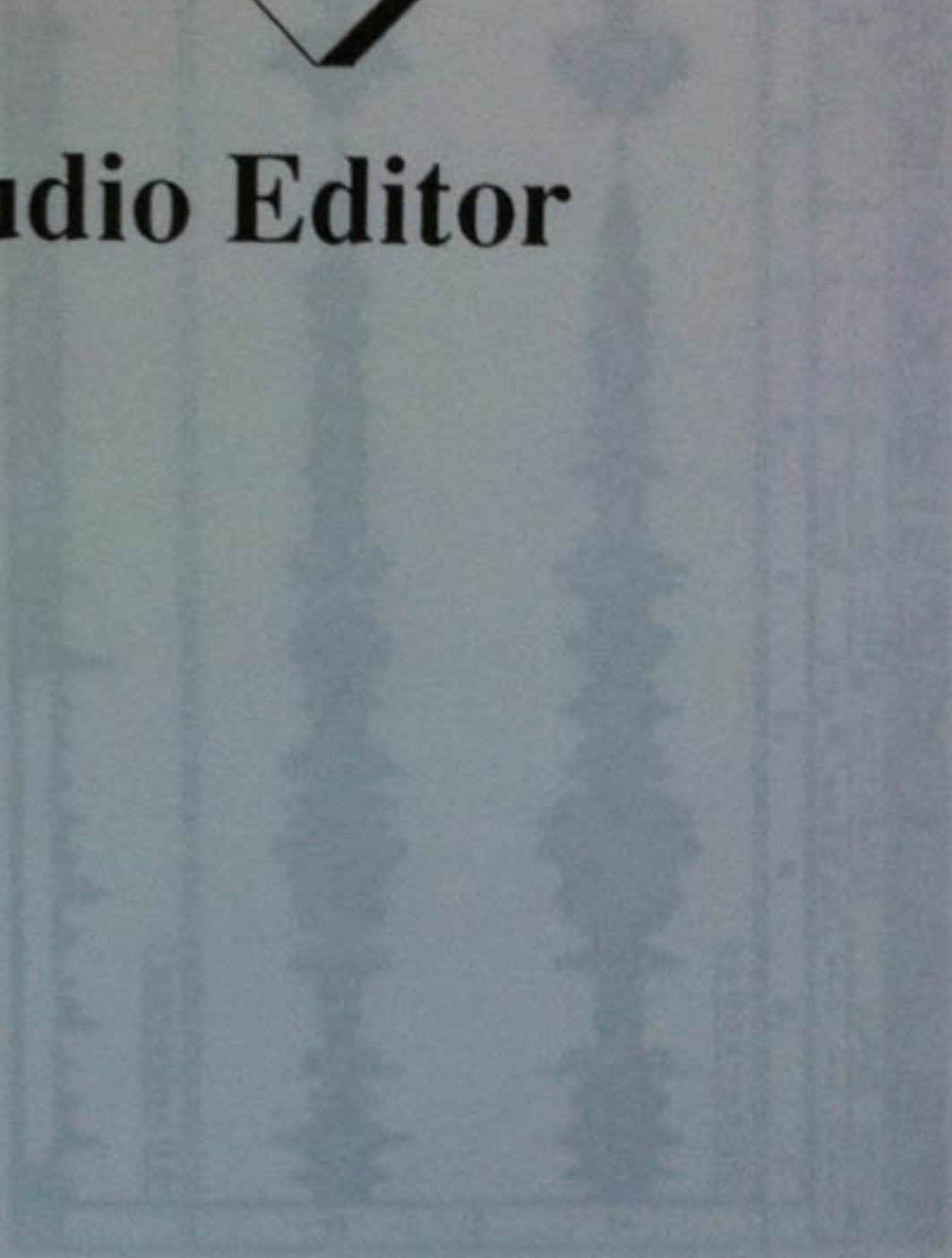
Pool files have the file extension "POL".

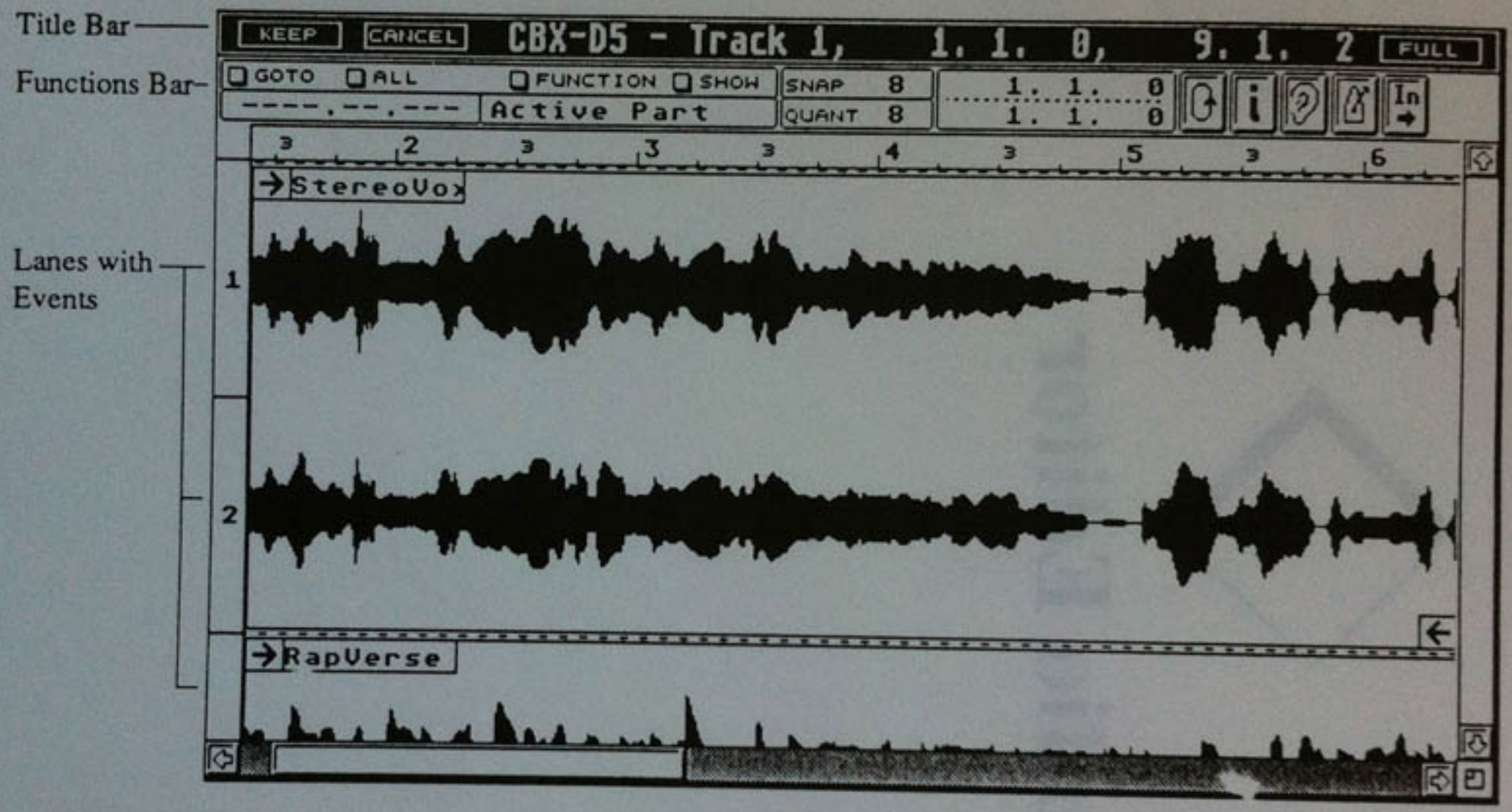
The audio files themselves are not saved in the pool, only a reference to them. You should probably not move any audio file(s) until next time you want to use the Pool. You should definitely not delete them!

If you load a Pool, the files in it are added to the current Pool.



The Audio Editor




Title Bar
Functions Bar
Lanes with Events
KEEP
CANCEL
CBX-D5 - Track 1, 1. 1. 0, 9. 1. 2
FULL
GOTO
ALL
FUNCTION
SHOW
SNAP 8
QUANT 8
Active Part
StereoVox
RapVerse
1
2

To enter the Audio Editor, select one or several Audio parts and double click on one of them. Alternatively you can select Parts or just activate an Audio Track, and select Edit from the Edit menu or press [Control]-[E] on the computer keyboard.

This chapter assumes you are reasonably familiar with the MIDI editors. It mainly lists the differences from these other editors. Please refer to the chapter "Edit Windows in General" in the main Cubase manual.

The Audio Editor displays Audio Events. These are boxes that may have the waveform displayed in them (if you don't want this, uncheck Show Waveforms from the pop-up Show menu.) It can also display a volume setting or curve for the event (check Volume on the Show menu). The length of a box represents the length of the Event. You have a Position Bar above the actual Event display, very similar to the one in the Arrange display. The Song Position is shown graphically, just as in the Arrange window.

You can only have one Audio Editor open at a time.

The Window's Parts

On the top of this window you find the Functions Bar that is similar in all Editors. Below this you *may* find the Event Info Line, if it is active (see below).

The central part of the window is of course the Event display with the Events. This is divided into a number of *audio lanes*, that bear some resemblance to tracks, but are not really the same thing. On *one* audio lane you have a number of audio Events that all play back *on the same channel* (see below).

There is a pop-up Show menu where you can select what will be shown on the lanes:



Waveforms
This turns the display of Waveforms on and off in the editor. Waveforms appear in the Segments if you have had "Use Waveforms" ticked when you did the recording and if you allowed the program to finish calculating images after each recording. If you for some reason don't get any waveform in an Event, you can calculate one in the Pool, see page 5-5 in this Audio addendum to the manual. These waveforms are only overview images of the actual audio. If you zoom in far enough, they will look a bit jagged.

Names
This turns the display of Segment names in the Events, on and off.

Handles
This allows you to decide if you want to see the Start, End and Q-point handles in the Events. See below.

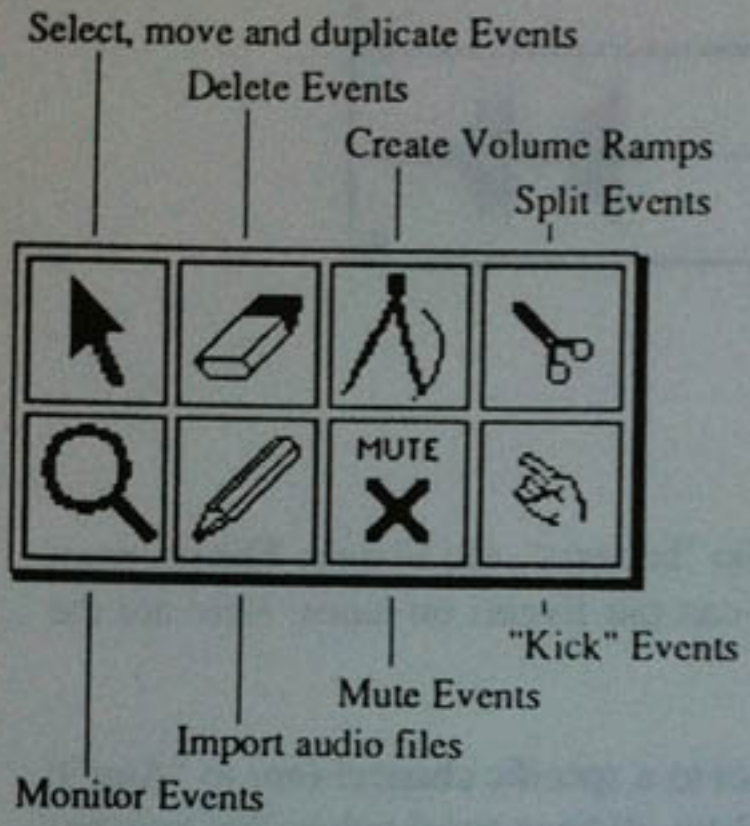
By Output
By selecting this item you sort your Events so that all Events that play back on the same audio channel are put on the same lane. See page 6-7 for details.

Lane Info
This invokes a display to the left of each lane, which shows what Audio channel the Events on the lane play back on.

Volume
If this is ticked, the lower half of each event displays volume that you might have put in using the Toolbox (just as with controllers in Key Edit).

The Toolbox

The Audio Editor has a Toolbox like all editors. Here's a quick run-down of its tools.

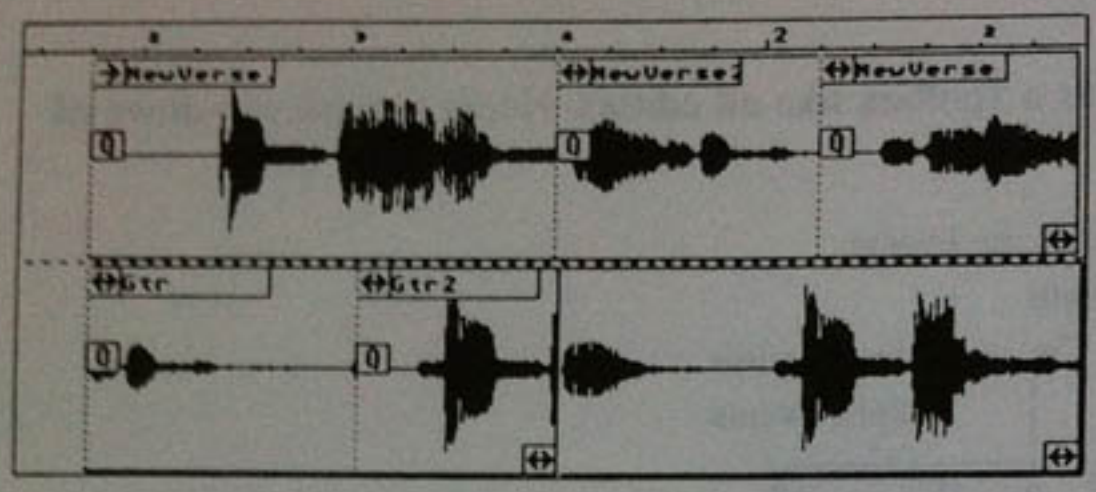


Events, Lanes, Parts and Channels

It is very important that you understand the relations between the items under this heading, so bear with us for a few minutes while we try to explain this to you:

You can have a virtually unlimited number of Audio Events in the editor, they do not take up more of your available memory than do MIDI Events.

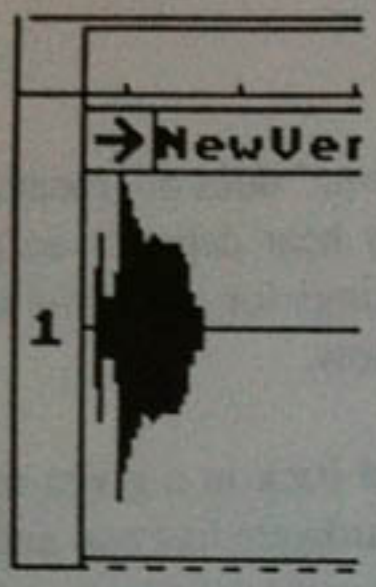
There are no restrictions on how the audio Events can be put in. They can be lined up sequentially, which means after each other, on one lane or on several lanes, they can be on top of each other, with start and end points overlapping, or any combination of all this.



What are the lanes?

The lanes are just "rails" for your audio "hangers", the Events. The program displays the Events on lanes and you can put Events on lanes. Here are the rules:

- When you edit one Track that is set to a specific channel (*not* to "Any"), you get a large number of lanes. These all have equal value. You may put Events on any lane in the editor, this doesn't affect playback in any way. This is only to simplify editing for you by allowing you the type of overview that suits you best. *Each time* you open one Track in the editor all the Events will be shown on the top lane. If you hold down [Shift] and drag an Event vertically to another lane, you may get a better overview of overlapping Events, without affecting playback.
- When you edit one Track set to channel "Any" you get *one lane for each available audio channel* in your system, counted from top to bottom. If you turn on Lane Info, you will see the audio channel of each lane to the left in the window.



This lane plays on audio channel 1.

With an "Any" Track, moving an Event from one lane to another means putting it on another audio channel. Always when you open a Track set to "Any" all Events that play back on the same audio channel are put on the same lane.

- When you edit several Tracks, they each get as many lanes as needed to display all their Events with a separate lane for each audio channel. The topmost Track comes first, and the others below. In this configuration, you can use the lanes to move Events between Parts and between audio channels, by dragging vertically. If you hold down [Shift], dragging will be vertically only.

Show By Output

Normally the lanes and therefore the Events on them are sorted vertically per audio channel and Track as stated above. If you want to put all the Events that use the same audio channel on the same lane (regardless of if they're on the same Track or not), for example to see how they compete about the audio channel (see below), simply turn on By Output on the pop-up Show menu in the editor.

Events and Audio Channels

The fact that you can see several Events at the same "time" does not mean all of them will play back. Which ones you will actually hear depends on the number of channels in your hardware, the channel settings for each lane and the channel settings for the Tracks in the Arrange window.

- The number of sounds that can possibly be played back in a given moment, is only restricted by your hardware. If the hardware has two audio channels, then that is your limit, if it has eight, up to eight sounds can play simultaneosuly, and so on.

- If one Track in the Arrange window is set to a certain playback channel, *all* audio on that Track will compete for *one single audio channel* in your hardware.

- If several Tracks in the Arrange window are set to the same channel, all audio on those Tracks will compete about one playback channel in your hardware.

- If the Track/Part is set to playback channel "Any", it is the lanes that determine which channel will be used. Each of the lanes plays back on one Audio channel. By putting different Events on different lanes you can have one Part playing back on many audio channels. The channel number for each lane is displayed if you turn on "Lane Info" from the pop-up Show menu.

In short, any Event that is in any way made to play back on a certain channel will always compete with all other audio Events about that channel. The "most recent Event" always wins and overlapped Events are always returned to if they last long enough.

What you see is what you hear — almost!

To find out about how channel defeating will work in any particular case, select all the Parts that contain "competing" audio and open them in the editor. To put all Events that play on the same channel on the same lane, select "Show By Output" from the Show menu.

The basic principle of the Audio editor is that you hear what you see (WYSIWYH, for all you acronym fans out there). An Event that is on the same lane as another will always have it's *start point* visible, and the waveforms you see on the lane are the ones you hear from that lane. If an Event finishes so that the end of an underlying long Event becomes visible, that revealed part will be heard again.

Even if two Events are on different lanes, but on the same channel (as set in the editor or the Arrange window) the same principle applies. An Event that starts will always be played until another "competing" event starts.

Stereo Events

You can record in stereo and you can import stereo files created by other programs.

The program will not allow you to put Stereo Events on Tracks set to anything other than channel "Any", since these have to be played back on two channels.

Stereo Events are twice the height of mono Events, that is they take up two lanes. By placing them on different lane combinations you can make them play back on the desired combination of channels.

When recording stereo events, they always appear on Channel 1 and 2, initially. For them to play back on any other channel pair, you need to use the Audio Editor to move them vertically to other lanes.

Stereo Events always play back on a channel combination starting at an odd number, channel 1/2 or 3/4, etc. Note that you will produce very strange results if you overlap Stereo and Mono Events. We very strongly recommend that you avoid doing this. There are no restrictions in Cubase preventing such circumstances, so you should take special care if you are using both Stereo and Mono Events in your Song.

Putting Audio into the Editor

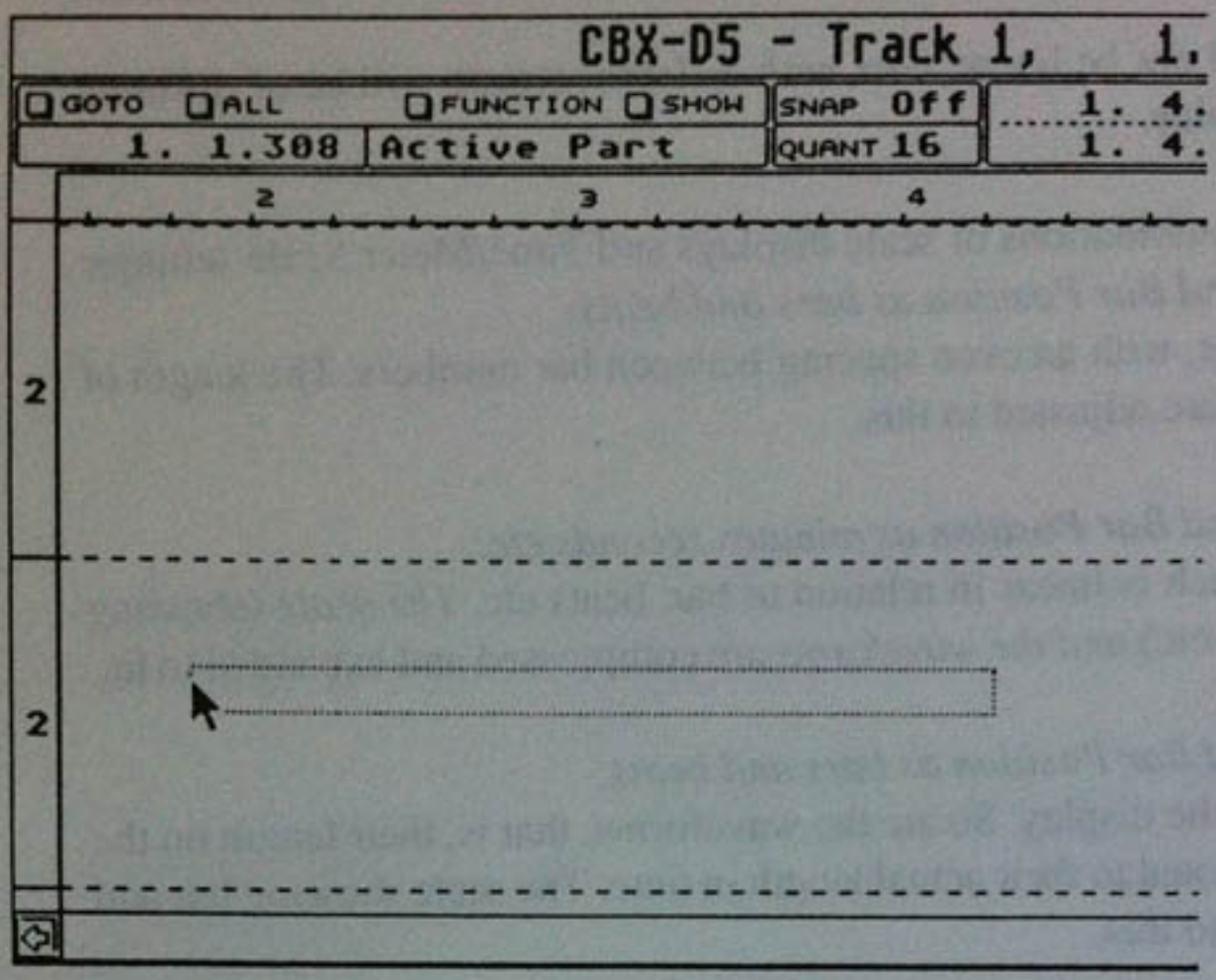
There are three ways of putting audio into the editor.

- The most obvious one is to record it, which is described on page 4-3 in this Audio addendum to the manual. Recording is done into the Track(s) selected for recording, or into the Part being edited.

- The second way is to use the Pencil Tool in the Audio Editor toolbox. Select this tool and click on any lane in the editor (just make sure you don't click on a volume graph, or you will change its value). The Import dialog box of your recording system will appear, allowing you to select an audio file to put into the editor. Do this and click OK. What actually happens is three things. A file gets selected, a Segment is made up, and an Event playing that Segment will be put in on one of the lanes.

- The third way is to drag a Segment from the Pool into the editor. Open the Pool by selecting it from the Audio menu (each installed recording system has its own Pool). Click on the name of a Segment (not a file!) and drag the outline from the Pool into the Audio editor. The length of the outline you are dragging has nothing to do with the length of the sound. To position the start of the Event you are putting in, use the mouse box which may show the position in bars and beats or as time code. The Snap setting aids you in this. When you have found the correct position, release the mouse button.

- If you are editing a Part set to channel "Any" or if you are editing several Parts, you have to find the right lane for the Segment, when you use the Pen or drag from the Pool. Depending on which lane you "drop it" or "draw it" on, it will be played back on a different audio channel or be put into a different Part. See above for the details on lanes, channels and Parts.



Dragging a Segment into the Audio Editor

Time/Meter Scale

By clicking on the Time/Meter Scale button on the Functions bar, you decide if you want to see bars or time as linear in the display.


Meter linear


Time linear

With *Meter* selected, the window always shows the bars linearly (as the Arrange window and the other editors always do). This means that two bars take up the same space on the screen, even if they have different tempi. In this mode, the images of the recordings (the waveforms), will be contracted or expanded. Their length in the display are dependant on tempo.

With *Time* selected, the length of your samples in the display will always be proportional to their actual length in time (minutes, seconds etc). On the other hand, if you have tempo changes and the Bar Position displays bars and beats,

the bar scale will not be linear, bars with different tempo will be of different length in the display.

There are four combinations of scale displays and Time/Meter Scale settings:
Scale to Meter and Bar Position as bars and beats:
The scale is linear, with an even spacing between bar numbers. The length of the audio events are adjusted to this.

Scale to Meter and Bar Position as minutes seconds etc:
The display as such is linear in relation to bar, beats etc. *The scale* (showing minutes, seconds etc) *and the waveforms* are compressed and expanded to fit.

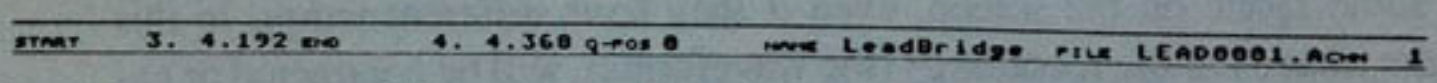
Scale to Time and Bar Position as bars and beats:
Time is linear in the display. So are the waveforms, that is, their length on the screen is proportional to their actual length in time. The scale showing bar and beats is adjusted to this.

Scale to Time and Bar Position as minutes seconds etc:
Time is linear in the display, so are the waveforms and the scale.

Remember that Snap and Quantize are always meter based (bars/beats...).

The Event Info Line

It is possible to numerically change the values for one *selected* Audio Event. This is done on the Event Info Line. You can hide/show the Event Info Line by clicking on the i-button on the Functions Bar or by pressing [Alternate]-[I] on the computer keyboard.



If no Event, or several Events are selected, then the Event Info Line shows "---" for all values.

You can use the mouse and keyboard to change any value for the selected Event except its audio channel. The parameters are Start Position (click on any of the three numerals as usual), End Inset, Q-point (see below) Segment name,

File name (for display only) and audio Channel (for display only). Any changes you do are shown graphically in the Event display.

Start and End Insets

Each Event has a Start and End Inset which represent the Segment start point in the audio file, and its length. Handles for adjusting these offsets are visible in the upper and the lower corners (respectively) of the Events if Show Handles is ticked on the pop-up view menu.

The Start and End Inset handles can be dragged to the left and right. Use this to mask out the sections of a file that you don't want to hear, or bring out sections that you do want to hear.

Changing the Start Inset is not the same as moving the Event. When you change the Start Inset you will here more or less of your recording, but at the same song positions. When you move an Event you will hear as much of your recording as before, but at another position in your song.

Note that the actual "active area" of the Handle spreads along the entire length of the Event, with half of the Handle's visible "height". This enables you to adjust the offset of any Event you can see by clicking on the Event's edge, whether or not the actual handle is visible at the time. The upper area is used for adjusting the Start offset of the Segment, the lower area is used for the End offset:



This is the Start Inset when the Event plays the sound file from its absolute beginning. There is no point in dragging a handle like this to the left.



This is the End Inset when the Event plays the sound file to its absolute end. There is no point in dragging a handle like this to the right.



This is either Inset when some audio has been masked out.

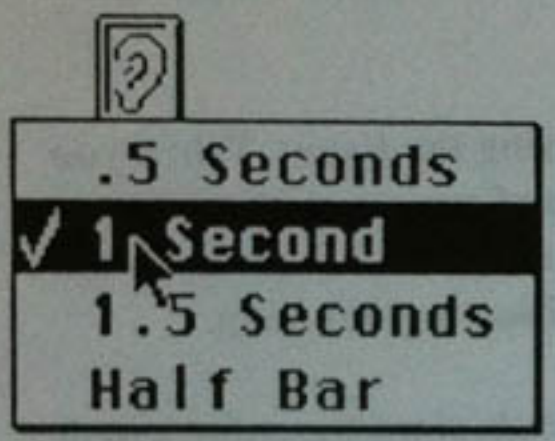
The End Inset can also be set numerically on the Event Info line.

These settings are always in ticks and *they do not Snap*. If you need sample accurate editing of Segments, use the Pool.

Monitoring settings

If you turn on the Ear icon, a short section of the Segment will play allowing you to monitor your edits. If you move the Start Inset you will hear a short section from the Start Inset and onwards. If you move the End Inset you will hear a short section up until the End Inset.

You can set the length of the played section by holding down [Control] and clicking on the Ear button. A pop-up appears listing a number of alternatives for playback time. Pick one.



Zero crossings

If the option "Snap To Zero" in the Audio menu is enabled, all offset adjustment will be followed by an automatic "search for a zero crossing". This option will always make the resulting Segment very slightly smaller than it was when you released the mouse button. If there is absolute silence, and therefore no zero crossings in the sample for some time, Cubase will ask whether it should continue the search. For more info on Zero Crossings, see page 8-2 in this Audio addendum to the manual.

Q-point

Each Event has a Q-point. This is used for snapping the Event to musical positions when you move or Quantize.

With audio, as opposed to MIDI, the beginning of an Event might not occur at a musical position at all. The Q-Point allows you to set a position in the Segment which is to be taken as it's "musically significant position". The first down-beat in the Segment for instance.

Then when you move or Quantize (even from the Arrange window), the downbeat will automatically align with, for example, the beginning of a bar.

The Q-Point also enables Cubase to handle its Prerecord function properly, allowing the Event to occur before the position it should be snapped to (the beat!). In this instance, the Q-Point is automatically placed at the Left Locator's position. If you punch in manually, off the beat, the Q-Point is put in at the closest beat.

The "Q" handle in an Event (only visible if "Handles" are ticked on the pop-up Show menu) can be dragged anywhere up to approx. 30 seconds into the Segment. It can also be set numerically on the Event Info line, where the position is displayed in ticks from the Start Inset.
Q-Points are also used significantly in the process of determining tempo automatically. See below.

Monitoring settings
If you turn on the Ear icon, a short section of the Segment, from the Q-point and onwards will play whenever you move the Q-point. The Events will play back at full volume.

You can adjust the playback time by holding down [Control] and clicking on the Ear button, see above.

Moving Events

By Dragging

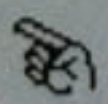
You may graphically move the selected Events in the editor. Just press and hold the mouse with the arrow pointer over one of the selected Events (not in the handles) and move the mouse. When you release the mouse button, the selected Events are moved to the new position.

- If you reach any of the sides of the window, it automatically scrolls.
- If you hold down [Shift] while dragging, moving is restricted to vertically or horizontally only (depending on in which direction you dragged first). This allows you to move the sound to another lane (and thereby maybe to another audio channel or Part) without affecting Start position.
- The Snap function acts so that the Q-point of the selected Event (or of the first Event in the block of selected ones) is positioned on the closest value. This works as a sort of "move quantize."
- Moving an Event to another lane may mean to move it to another audio channel or even another Part, see page 6-5 in this Audio addendum.

The mouse box shows you where the Q-point of the first selected and dragged Event will wind up when you release the button.

By "Kicking"

You can "Kick" an Event one Snap value at a time, forward or backwards in time. Select the hand from the Toolbox.



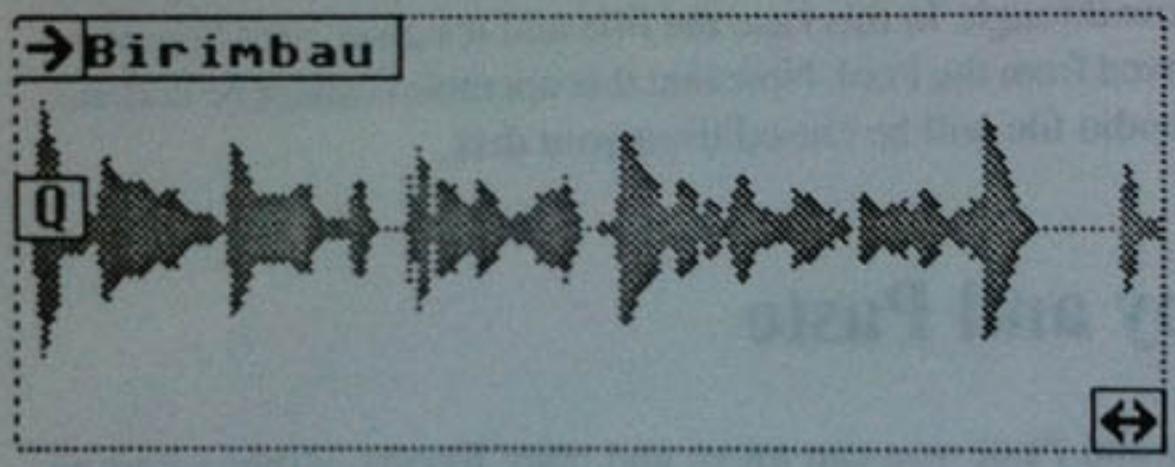
Position the pointer over the Event you want to move. If you click on the first half of an Event, the Event is moved one snap value later in the song. If you click on the later half it is moved to an earlier position in the song.

Duplicating Events

Real copies
By holding down [Alternate] and dragging an event you create a copy of it, just as with any event in Cubase. A new segment for this event is also created. Please make it into a habit to rename the Segment (by using the Info Line, clicking in the Name box of the Event, or by holding [Alternate] and hitting [N]) to avoid confusion in the Pool.

Two Events duplicated this way are totally separate, any changes you do in the editor or the pool will not affect the other Event/Segment.

Ghost copies
If you instead hold down [Control], you create a ghost copy, which is indicated by a dotted outline.



Now all Events that play this Segment are indicated by a dotted outline, the program doesn't differentiate between the "original" and the ghost, they are all considered ghost copies of each other.

These ghost Events are "semi separate" from each other. If you make any changes to the Segment in the Pool, this will affect all Ghost Events that play this Segment. If you make change to the Start and End Insets of one of the ghost Events in the editor, the Event will be turned into a real Event, and a new Segment will created for it.

If you specifically want to make Start and End Inset Changes that will affect all the Ghosts that play the same Segment, hold down the [Control] key while editing any of those Events.

Everything else about duplicating or creating ghosts is as when moving.

Deleting Events

There are several ways to get rid of unwanted Events.

- Select them and press [Backspace] on the computer keyboard.
- Select them and use Delete Events on the Edit menu.
- Select the Eraser from the Toolbox. Click on the Events you want to eradicate. When you are finished, select the arrow pointe again, or any other tool from the Toolbox.

Deleting an Event does not delete it's Segment from the Audio Pool.

- If you want to also delete the audio file from the disk, hold down [Control] while hitting [Backspace]. The program asks you if are sure you want to follow through. In this case the File and it's associated Segments will be removed from the Pool. Note that this operation cannot be undone, the deleted audio file will be erased from your disk.

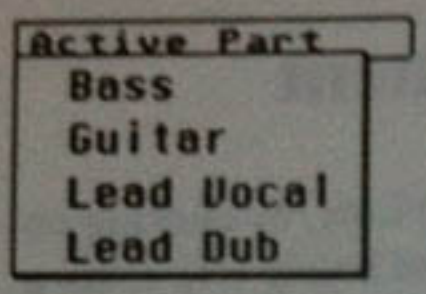
Cut, Copy and Paste

Using Cut, Copy and Paste you can move and copy Events within a Part or between Parts. See page 23-17 in the main manual for details on Cutting, Copying and Pasting which works exactly as with MIDI Events.

Pasting in a Cubase Editor always adds Events to the active Part. The currently Active Part is indicated in the Editor's window title and in the Lane Info fields, by a black rectangle.



To select which Part is active, when you edit several, either click directly in the Lane Info fields or use the Active Part pop-up on the Status bar:



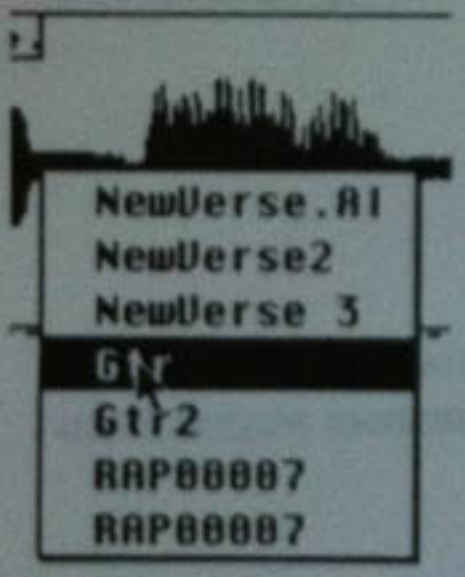
The Active Part pop-up on the Status Bar.

If possible, Events are always pasted in on a lane that plays back on the same channel the original Event played back on.

Making an Event Play Another Segment

With Any Type of Event

If you hold down [Control] and [Alternate] and click on an Event, a pop-up menu shows a list of all the available Segments in the audio file, with the one now used by the Event highlighted.



If you select another Segment from this list, the Event will play back this Segment instead.

Use this to make an already positioned Event play back another sound.

With Ghost Events only

If you select a Ghost Event or an Event that has ghosts and press [Control], [Shift] and [Alternate] you are able to select a new Segment from the list as above. This will switch *all* the ghost Events that are now in the editor to play that Segment.

Changing the name of a Segment

This can be done on the selected Segment from the Info Line, by clicking on the Name Box in an Event, or by holding [Alternate] and hitting [N]. Enter a new name as usual, and press [Return] when you are done.



Changing the Name of a File

In the same manner, you can rename a File, by clicking and typing in the new name.

Monitoring Events

Of course, you can have playback running while you are editing. And, you can also use the cue function in the Edit window. But there are more ways to listen to your music in Audio Edit.

The Magnifying Glass
Select the Magnifying Glass from the Toolbox. When you click on an Event using this tool, the Event is played back from that point as long as you hold the mouse button down. It is played at full volume.

You can also use the Ear icon to monitor your Inset and Q-point edits, see page 6-14 and page 6-15 in this Audio addendum to the manual.

Muting Events

Using the Mute Tool in the Toolbox you can mute an Event. This silences it until you unmute it again or until you close the Editor.



A muted Event.

Splitting Events

Using the scissors Tool in the Toolbox you can "chop up" your Events into smaller ones which creates Segments for each new Event. The Snap value applies to the Split.

If "Snap to Zero" is ticked on the main Audio menu, the split will happen at the first zero crossing after the point where you clicked (for an explanation of this term, see page 8-2 in this Audio addendum to the manual).

You can automatically delete the left or right resulting Event by holding [Alternate] or [Control] respectively when you Split the original Segment.

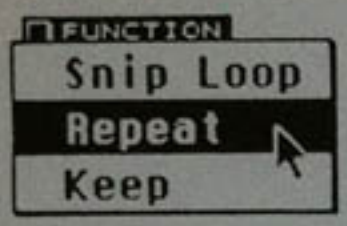
You can also use the Function menu to Split, see below.

Quantize and other Functions

You can easily Quantize audio Events, from the editor or from the Arrange window (for more info on audio in the Arrange window, see the chapter "Arrangement Editing" in this addendum to the manual).

Over Quantize is used exclusively for Audio Parts, it is the only quantize option available which has any relevance to Audio. This option moves the Events so that their Q-Points wind up at the closest Quantize value.

The Pop-Up Function menu

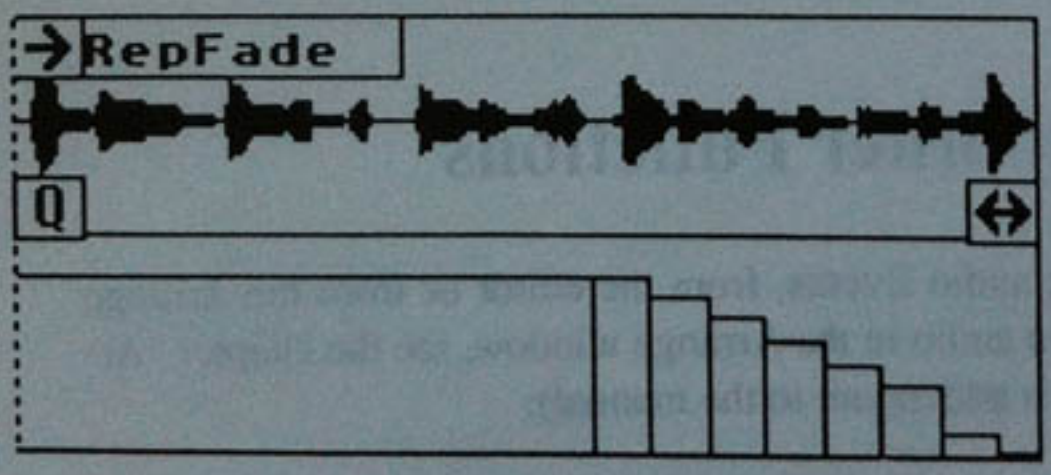


Snip Loop
This command splits all Events at the positions of the Left and Right Loop position, much as when you use the scissors.

Repeat
This works just like Repeat in the other Editors, allowing you to for example set up a Loop and then Repeating everything within it to the end of the Part.

Keep
This command also works just like Keep in the other editors. Snip Loop, Keep and Repeat can be used together to make up a repeating section of an arbitrary section of the audio in the editor.

Event Volume



If you tick Volume on the pop-up Show menu, the lower half of each event is used to display a volume curve individual to the event.

The relation between the volume you put in for an event and the volume control from the Mixer window and the Monitor window is described in detail in chapter 10 — Mixing — in this Audio addendum to the manual.

You put in new volume "events" and edit existing, just as in the Continuous data section of Key and Drum Edit. Exactly how this is done is described in the Editors in General chapter but here is a quick rundown:

- New Events are always put in at the closest Quantize value.
- If you use the pen, you edit the value of existing events.
- If you use the pen and hold down [Alternate] you put in new events.
- If you use the eraser tool, the volume "event" you clicked on gets deleted.
- If you use the line tool, you either "ramp" the existing events or put in new events (hold down [Alternate]).

Volume events can not be put in denser than with a 1/64th note triplet spacing (the Quantize menu will prevent you from selecting a higher value than this). Generally, don't make the curve denser than it has to be.

If two consecutive volume events have the same value, the later is deleted.

Match Tempo

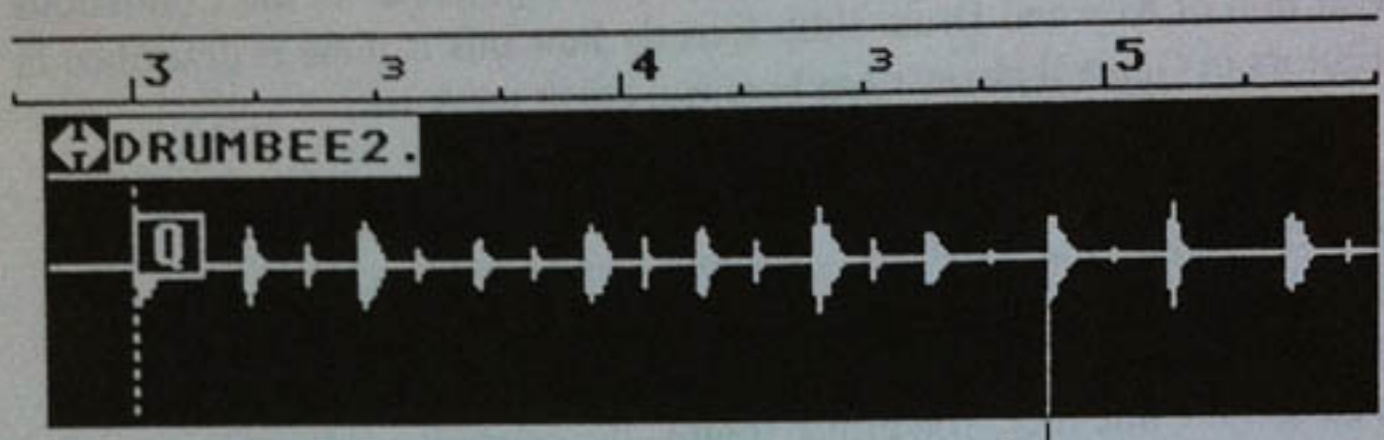
You can very easily match Cubase's tempo to some recorded audio material. This is done by dragging on the Position bar, stretching a given number of bars and beats to match the length of a section of audio. Do as follows:

- ❑ If you plan to use the Master Track, make sure it is activated and turned on.

- ❑ Go into the editor and find an Event that contains material at the tempo you require Cubase to match. Select that Event, using the mouse or cursor keys.

- ❑ Set the Q-point of that Event exactly to a point in the Segment where a bar begins or which represents a musically significant moment.

- ❑ Move the Event so that the Q-point is lined up with some sensible musical point in your song (for example the downbeat of a bar).

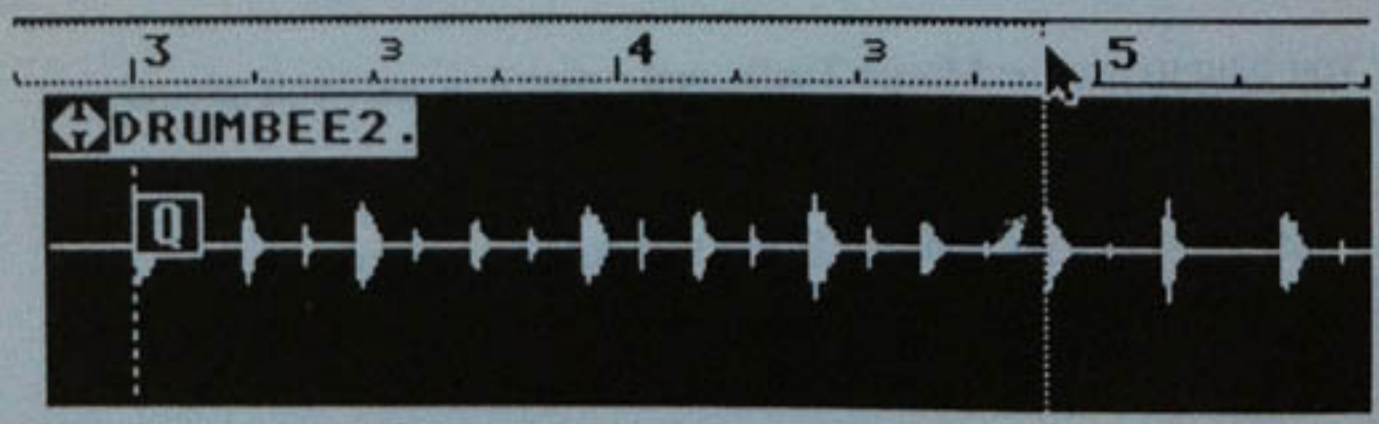


The Beginning of a measure in the recorded audio

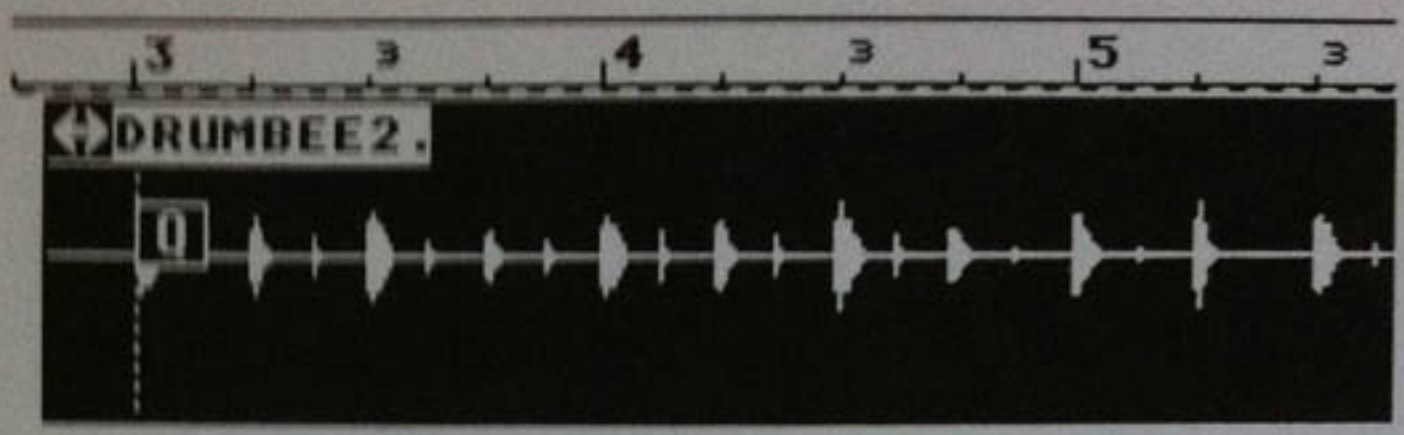
- ❑ Now it is time for the Magic: Hold down [Shift] and find a bar position on the bar scale, further on in the Song, that corresponds musically to the length of the audio section you are matching. (In the example above we have the Q-point of the event at 3.1.0. The event is 2 bars long, so we grabbed 5.1.0, see below.)

- ❑ A dotted box appears in the scale area, extending from that Event's Q-Point to the point where you clicked. You can stretch and shrink the box by dragging your mouse to the right and left.

- ❑ Drag the bar position you picked up so that it becomes aligned with the end of the section of audio you are matching.



- ❑ Release the mouse.



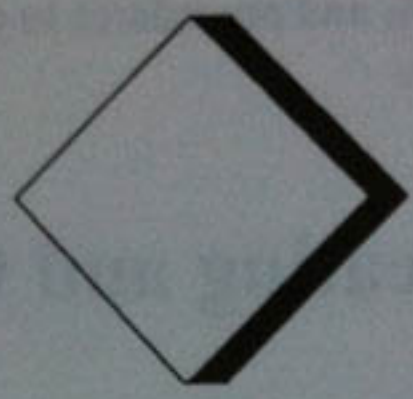
- If the Master Track was off, you now get a new tempo on the Transport bar which matches that of the section of audio you selected. If the Master Track was turned on, the most recent tempo change will be adjusted.

  If the Master Track is off, and no Event is selected, the range goes all the way back to the beginning of the Song.

  When the Master Track is on, then the range is determined by the either the most recent tempo change (by the selected Event's Q-Point) or the beginning of the Song, in that order.

- If you need to insert a tempo change into the Master Track, you can hold down [Shift] and [Alternate] and click on the Position Bar, and an Event will get inserted where you clicked. We recommend you to put in the tempo change slightly before the Q-point of the Event you are using to match tempo. Try putting it where the audio Event starts, since this is normally slightly before the Q-point.

You can very quickly and easily build tempo maps for entire songs in this manner. We recommend that you work very strictly from "left" to "right" when doing so, as earlier tempo adjustments will always displace later tempo values with respect to the recorded material.



Arrangement Editing

Handling Parts with audio is very much the same as handling Parts with MIDI.

You can use most of the tools and procedures to edit audio Parts. Please just observe the following points:

Moving, Duplicating and Creating Ghosts

There are two things to note about audio Events (in Parts):

- When you move Parts, the movement Snaps to the Snap value as usual. With Prerecording turned on in the Metronome dialog box, your recorded Parts will begin slightly before the position where you set recording to begin (see page 4-7 in this Audio addendum to the manual). Still, when you move a Part with Snap for example set to "Bar" the Part will *move* by exact Bars, so that its starting point relative to the downbeats, is kept as it originally was.
- Duplicating Parts creating Ghost Parts creates no new Segments, only new Events.

Using the Tools

Pen
Sizing the Part to make it shorter means masking out audio, so that the audio doesn't play longer than the Event. This is *not* the same as with MIDI notes.

Eraser
This works exactly as on MIDI Parts, but it does not delete the corresponding Segments or audio files.

Scissors
When you Split a Part in two you also split the Events at that position and thereby create new Segments. Otherwise, splitting works as with MIDI. If Snap to Zero is turned on on the Audio menu, the splitting of the audio will

occur at the closest zero crossing. See page 8-2 in this addendum to the manual for details.

Remember that you can split a Part into many if you hold down [Alternate]. This can be used for example with Cycled recording to make each Cycle "pass" into a separate Part.

Magnifying Glass
This plays the segment under the Cursor.

Glue Tube
This works exactly as on MIDI Parts.

Match Quantize
This does not work on Audio Parts.

Mute
This works exactly as on MIDI Parts.

Quantizing

The only Function on the Functions menu that applies to Audio Parts is Over Quantize. This moves the Events in the selected Parts, so that their Q-points line up with the selected Quantize value. See page 6-15 in this addendum to the manual.

Mixdown

This function mixes down audio *Events*, just as it does with MIDI notes. This means that it moves audio Events from several Tracks into one Track. It is not to be confused with mixing of audio.

If you record a number of Tracks from the Arrange window, you wind up with one mono recording per Track. Using Mixdown on the Structure menu allows you to pack all the Events on these Tracks into a Part on one Track. Then, setting this track to channel "Any" will make it play back as before the mixdown.

The benefit of this operation is that when you edit the mixdown Track all the audio channels are put above each other on one lane each. This simplifies editing of multi-track material a lot.

The Mixdown is mainly done as with MIDI Tracks, the big difference being that you select an audio Track as a destination, and thereby tell the program that it is audio you want Mixed down, not MIDI.

- Mute all the audio Tracks that you want excluded from the Mixdown.
- Select an (empty) Audio Track where you want the mixdown to appear.
- Set the Left and Right Locators to encompass the Part of the Arrangement you want to get mixed down.
- Select Mixdown from the Structure menu.
- Check the Part you get, by setting it to channel "Any", so that all Events in it play back on their original channels. When you play back the Mixdown Part, also make sure all the original Tracks are muted so that they don't steal audio channels.

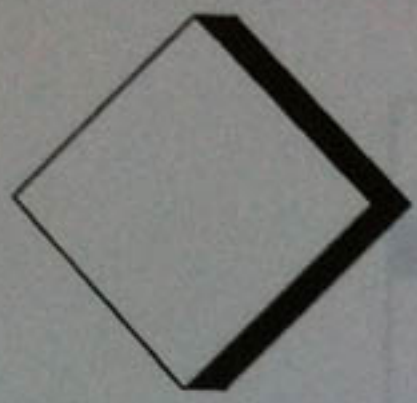
Remix

You may want to split up a Track set to "Any" and which contain Events on several channels, into one Track for each channel. This is done using Remix on the Structure menu. The procedure is very much as with MIDI Tracks, see page 14-4 in the main manual.

- Select an audio Track to be Remixed. Set up the Left and Right Locators as boundaries for the split. All music between the Locators will be Remixed. Select Remix Track from the Structure menu.
- As many new Tracks as are needed are created. New Parts with Events on one channel each are created on those Tracks, between the Left and Right Locators. Each track is set to the Channel the Events in it are stored on.

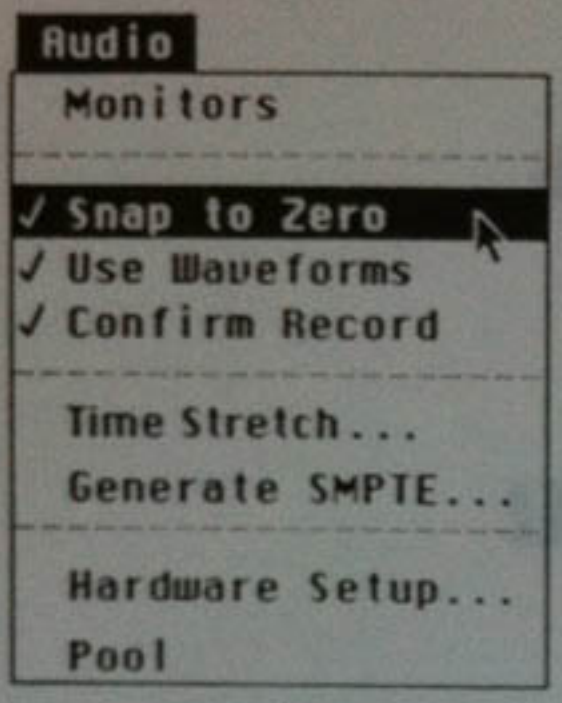
Groups

Audio Parts can not be put into Groups.



The Audio Menu

Most of the commands on this menu are covered in the relevant sections of this manual, but here is a quick run-down of the possibilities:



Monitors

Brings up the Monitor window. See page 4-4 in this Audio addendum to the manual for a detailed explanation.

Snap to Zero

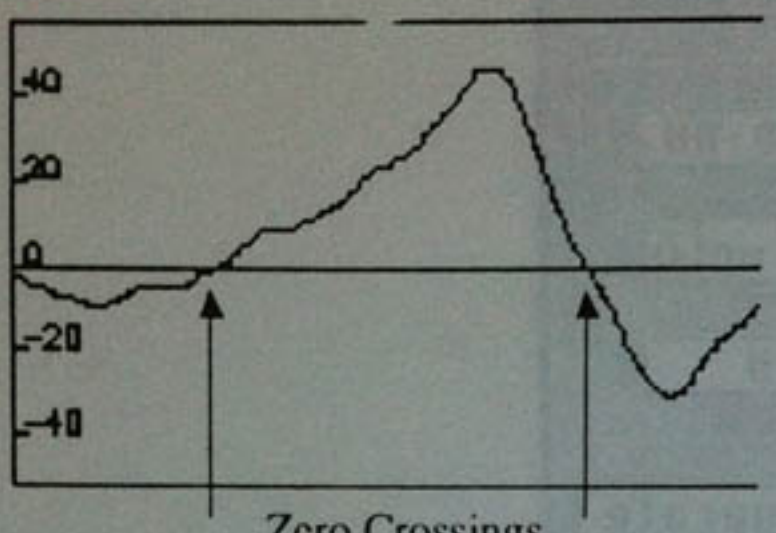
This affects the following operations:

- Changing Start and End Insets.
- Using the Scissors in the Audio Editor.
- Using Snip Loop.
- Splitting Parts in the Arrange window.

When Snap To Zero is ticked, the program automatically searches for the closest zero crossing and performs the operation at that point. If Cubase cannot find a Zero Crossing point in the recording quickly it will pause and ask if you wish it to continue the search.

What is a zero crossing?
An analog waveform is a voltage rising and falling around a centre axis. This axis is considered "zero" voltage or DC (direct current). Whenever the wave-

form crosses this centre axis you have a so called zero crossing. Editing a sound at zero crossings is a good way of avoiding clicks and pops in the edits. Such noise might otherwise appear due to abrupt changes in signal amplitude (level)



Zero Crossings

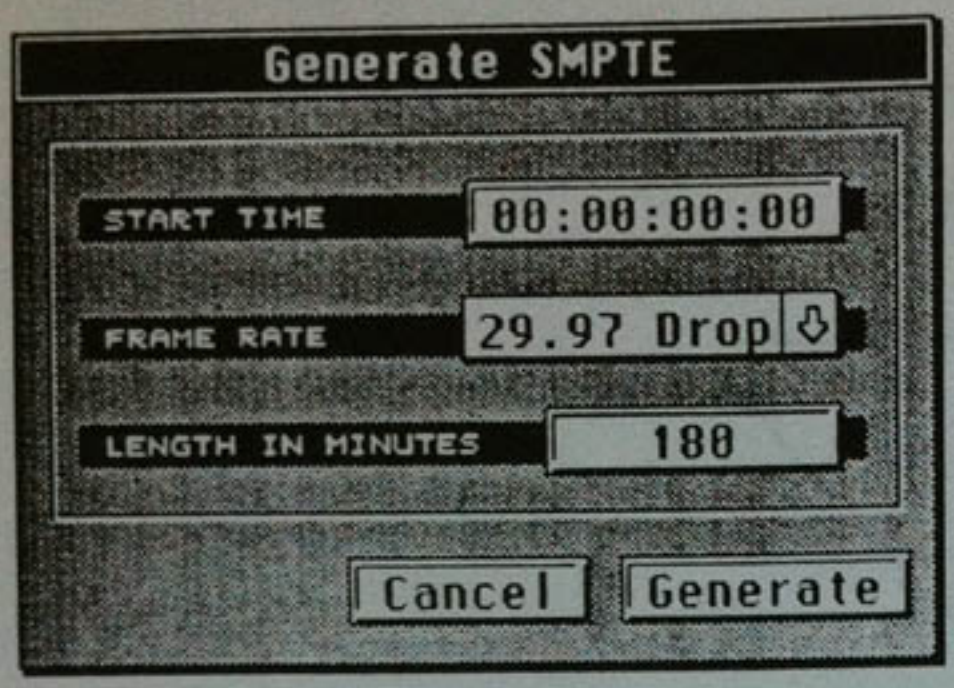
Use Waveforms

When this is ticked, waveforms will be created and used for each new recording. Having this unticked makes many operations slightly faster, but gives you less information about the recording. Even if you don't create waveforms when recording (Use Waveforms unticked) you can create waveforms for any recording afterwards. See the Audio Pool chapter.

Confirm Record

When this is on, you will be prompted to Keep, Keep and Rename, or to Delete each file after each recording pass. When it is off, files are automatically kept.

Generate SMPTE



This command allows you to use the audio output on the Falcon to generate perfectly stable time code (SMPTE) which can be recorded onto a track on a tape recorder for synchronizing purposes (also known as "striping the tape").

The code that gets created is exactly the equivalent of that from any LTC time code generator.

The main reason for using this feature instead of a regular device is that the synthesized code is perfectly stable and generated at the same sample rate as the one currently being used for the digital audio in your Song. Thereby you get a time code that is perfectly matched to your digital audio system, speed-wise. There is a thorough discussion on the problems of using different time code sources in Appendix 1, page 20 in this Audio addendum to the manual.

- ❑ Patch the audio output of the Falcon to the track on the tape recorder where you want to record the time code.
- ❑ Select a frame rate, a start time and a length in the dialog box.
- ❑ Start the tape recorder in record mode.
- ❑ Click Generate.

Hardware setup

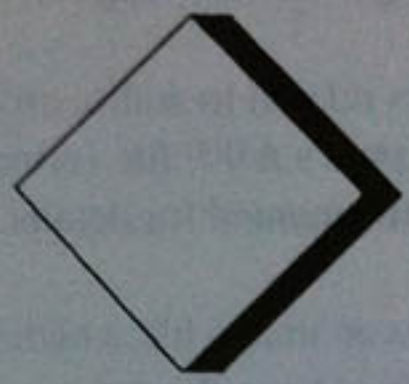
These item brings up different dialogs depending on the hardware system you use. See the Hardware Specifics Appendix.

Time Stretch

This is used to change the length of an audio recording without affecting its pitch. See page 1-18 for details.

Pool

This item brings up the Audio Pool, see chapter 5 in this addendum to the manual.



File Handling

The handling of files is almost identical to that of the MIDI only version of Cubase. There are a few things to note though:

- There are three file types related to audio, created by the program:
  The Audio files are in Apple's AIFF file format, see Appendix 1, page 22 in this Audio section of the manual for details. Audio files have the extension "AIF".
  With each audio file goes an image file which is used to display the waveform on screen. These files have the same name as the respective audio file, but with the extension "WIF".
  The Pool can be saved separately to disk (but this only includes the list of files and segments, not the audio files themselves), so that you can "move" Pools from one Song to another (see page 5-10). Pool files have the extension "POL".

- The Pool is saved as part of the Song and is common to all open Arrangements. We recommend you to always save complete Songs.

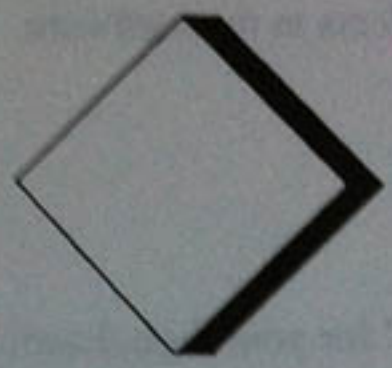
- The program always first looks for the audio files in the same folder as the Song is in. This means that if you back up a complete folder with a Song and all the audio files for it, you will never have any problems with "lost" audio files, even after you restore the backup.

- If you have moved or deleted any audio file since last time you saved a Song, an alert box will inform you. Opening songs with lost files will display an alert. See page 5-4 for info about finding "lost" files.

About Deleting Files

When Cubase prepares to record, it creates a file which covers the entire partition. If Cubase is terminated in any other way than by a regular "Quit" (you may have a power failure or other accident) you will be left with that large file preventing you to record or to even store anything else on that drive. You will then have to delete this file from the Desktop.

Also please note that the only way you should *ever* delete audio files is from the Pool or by using the [Control] key when deleting Parts or Audio Events as described on page 4-8 and page 6-18 in this audio addendum.



Mixing

Mixing brakes down into two major blocks: handling volume and controlling panning, EQ and digital effects in the hardware.

Volume

There are three "mixpoints" for your digital audio.
• Each Event has its own volume curve which you draw in, in the Audio Editor. This is what we call the Event Volume.
• You can use the Cubase Mixer to dynamically control the volume and panning of the audio channels in your hardware, see below.
• The Monitor window in Cubase Audio has playback volume controls that essentially double up for the Mixer volume.

If you compare the audio flow through Cubase Audio to that of a regular mixer you will find that the Event Volume is just like the channel volume, it is individual for each input (if you look upon the events as inputs to the mixer).
The Mixer and Monitor volumes on the other hand are more like the group volumes, that is, all events assigned to a certain audio channel (the equivalent of a group) are affected equally by these volume changes.

The Event Volume

How to draw in or change the volume curve in an event is described on page 6-22 in this Audio addendum to the manual. Event volume is perfect for fades in individual events or for compensation of abrupt level changes in the recorded material.

The program restricts the density of the volume changes to a maximum of 1/64 triplet notes, which should suffice even for the most demanding applications. We recommend you to not put in more volume events than is necessary for your application.

Event volume is effective during regular playback, but not when monitoring using the Speaker button or the Magnifying glass tool.

The Mixer Volume and Pan

The Mixer Maps in the DEF.ALL Song are used to control volume and pan plus whatever digital effects your hardware might support.

This is described in detail later in the next chapter.

The Monitor Window Controls

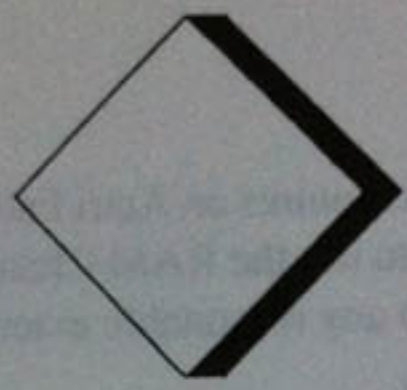
These controls can *not* be automated. They are mainly there for monitoring purposes during recording, and are described in detail on page 4-4.

Digital Effects

If your recording hardware has built in digital effects that can be automated, they will be controlled from the Cubase Mixer window plus in some cases from additional panel windows reached from the Audio menu.

The automation as such is performed as with any Mixer recording, see the main Cubase manual.

Exactly what can be done and the details of the Mixer maps and (optional) set-up dialogs is described in the next chapter, Hardware Specifics.



Appendix 1 – Hardware Specifics

Hardware

RAM

Cubase Audio for the Falcon requires an Atari Falcon 030 with at least 4 MB of RAM. For you to be able to use the RAM Channels (see later in this chapter) and Sampler Channels to any reasonable extent, you should probably get 14 MB (or more, if you can).

Hard Disks

The hard disk requirements are described in the Installation chapter. Exactly how many simultaneous Hard Disk Tracks you can squeeze out of a particular disk can only be judged by experimentation. When you have exceeded the limit, a dialog box saying "HD Too Slow" will appear and some audio will not play back correctly. Try transforming the Track with the least number of segments assigned to it, into a RAM Track if possible, or perform a permanent mixdown of a few Tracks (see below).

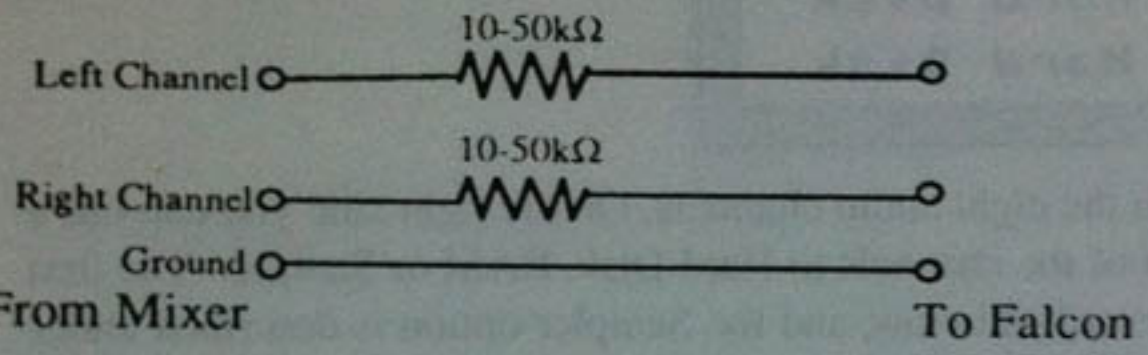
Automatic calibration
If the "HD Too Slow!" message crops up every now and then, even though you have provided yourself with a fast hard disk, you have probably got a hard disk model with "Automatic Recalibration". Such a disk automatically performs internal adjustments at (more or less) regular intervals, during which time it can't output data fast enough. If this feature can be turned off, please do so, but the most likely situation is that this hard disk is simply not suited for audio recording, which requires a non-interrupted performance.

Cubase Audio Clock

The only additional hardware needed (except the SCSI hard disk) is the Cubase Audio Clock that connects to the DSP port (see the Installation chapter). This circuit makes the Falcon record and playback audio at 44.1 kHz, the standard CD frequency, which is otherwise impossible.

Inputs and Outputs

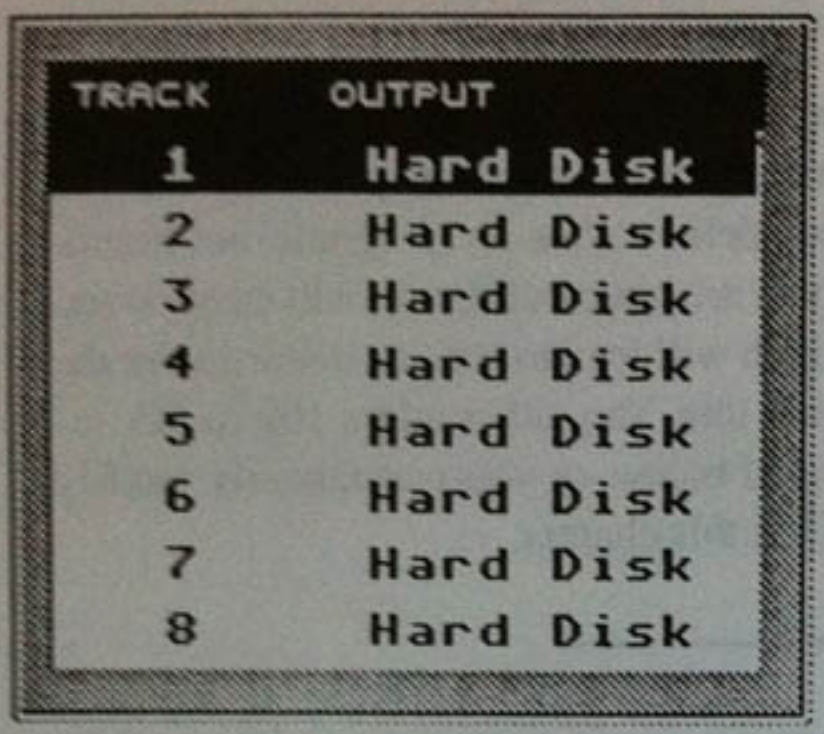
The Falcon Audio input (identified by a Microphone icon on the back of the computer) is built for connecting microphones. You will probably want to connect your *mixer* to this input, which delivers *line level* signals, not microphone level as the Falcon expects. If you are not careful, you will easily overload the audio input on the Falcon, which will lead to serious distortion in the recording. There are a two ways around this. You either add a 10k to 50k resistor to your cable, serially, as indicated below, or you permanently modify the computer, as described on page 23 in this chapter.



The Audio Out (the Headphone symbol on the back of the computer) carries all audio output from Cubase Audio. The signal from this output is matched for headphones, which again means it is actually too "hot" for connection to line level inputs of a regular mixer (do not connect it to microphone inputs!). To compensate for this, you may modify the Falcon's audio out, see page 23 in this chapter.

Hard Disk, RAM and Sampler Channels

One of the unique things about Cubase Audio for the Atari Falcon is the ability to choose between three ways of utilising the eight Audio Channels. This choice is made in the Hardware Setup dialog.



The list shows you the eight audio channels. On the right side you can use a pop-up to set each of the channels to Hard Disk, RAM or Sampler. The first two options are described below, and the Sampler option is described under the next heading, "Working with Sampler Channels".



Hard Disk
This is the "normal" setting, which means that the audio channel reads the files from the hard disk when playing them back.

RAM
This means that the audio files that this channel plays, are loaded into RAM. All audio files played back by a *RAM Channel* (an audio channel set to RAM in the Hardware Setup dialog), are automatically loaded into RAM whenever needed. This will happen for example when you open a Song with RAM Channels, when you switch a channel to play from RAM instead of from the hard disk or when you move an event to a RAM Channel in the audio editor.

When you record on a channel set to play from RAM, the file is recorded onto the hard disk, as usual, but after the recording, it is automatically loaded into RAM.

If the program is running out of RAM for audio files, it will ask you if you want to compact (reorganise) the memory to make room.

Audio files that you play back via RAM can be moved to the internal hard disk (or even a floppy!) if needed they don't *have to* reside on a SCSI disk (which audio files played back by Hard Disk Channels do).

Please remember that audio files take up a lot of memory, 5 MB for every minute in mono, and ten for stereo! Therefore, on a computer with only 4 MB of RAM, you will not be able to load long recordings into RAM, since the Cubase Audio program itself uses up the better part of the internal memory on a 4 MB machine.

Segments already loaded into RAM because they are played back by a RAM channel, can be used by a Sampler channel without using up any more memory. The inverse also applies, Sampler segments can be used by RAM Channels without using up more memory.

Working with Sampler Channels

You are able to reserve one or more channels as Sampler Channels, as described above. This lets you play the audio recordings in realtime, from your MIDI keyboard, and capture the performance for later playback.

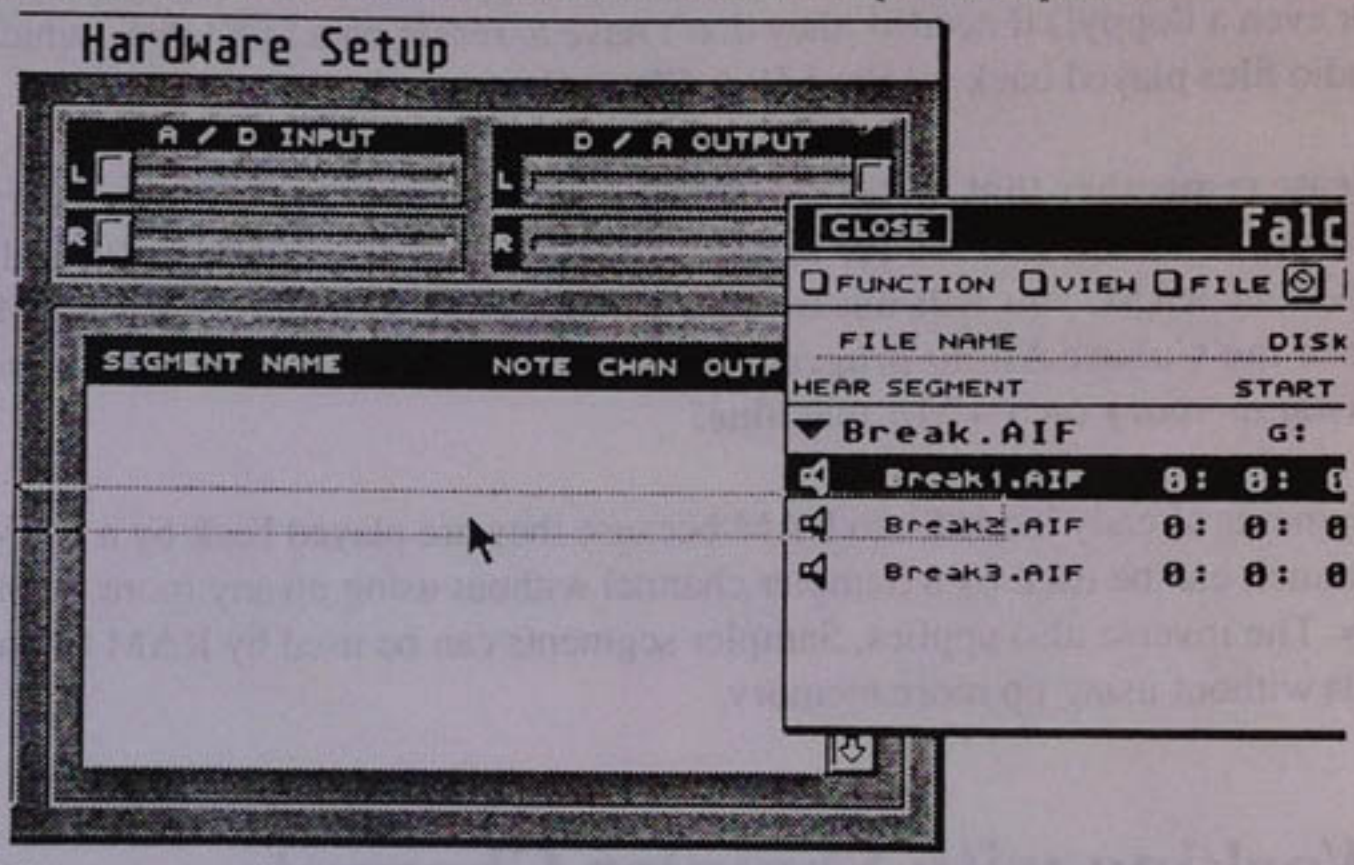
Sampler Channels play back from RAM, just as RAM Channels do, so the warning above about unning out of RAM applies to Sampler Channels, too.

Please note that audio can not be transposed as in a keyboard based sampler. Each audio channel can only play one audio segment at a time. If you try to play two, the second will cut the first one off.

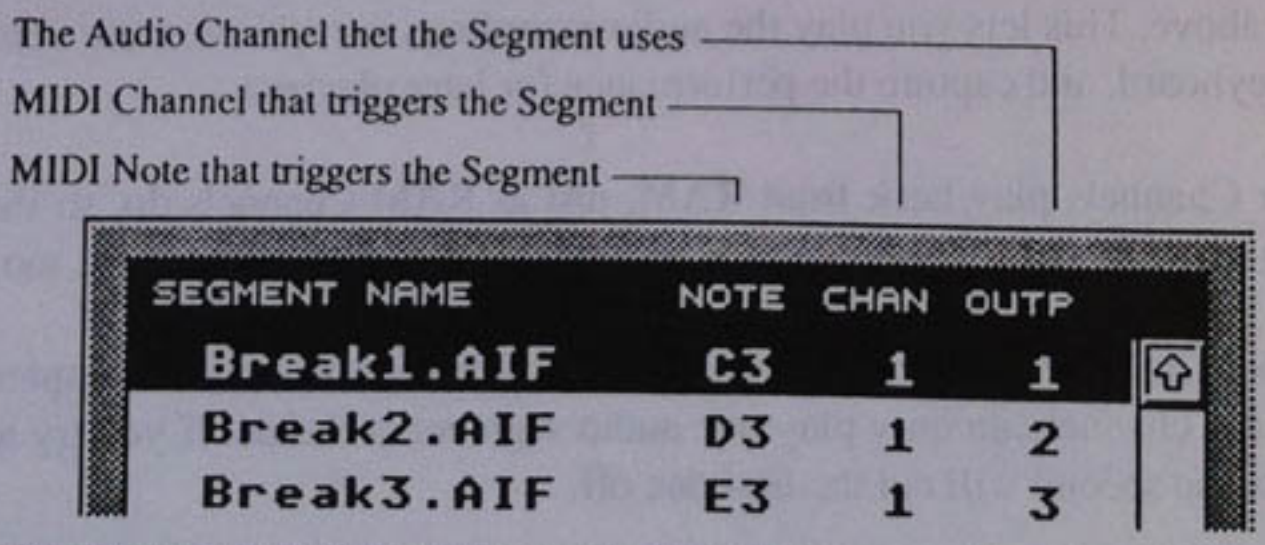
Sampler Channels can only be used for mono files!

Setting Up Sampler Channels

- In Hardware Setup, set one or more Audio channels that you are currently not using, to Sampler, as described above.
- You should now "install" the segments that you wish to play back via Sampler into the box to the right, the Sampler Setup box. This is done by dragging segments from the Pool onto the Sampler Setup box.



- The next step is to set each segment to one of the audio channels you reserved for Sampler playback (as described above). This is done by scrolling the value in the "OUTP" column.



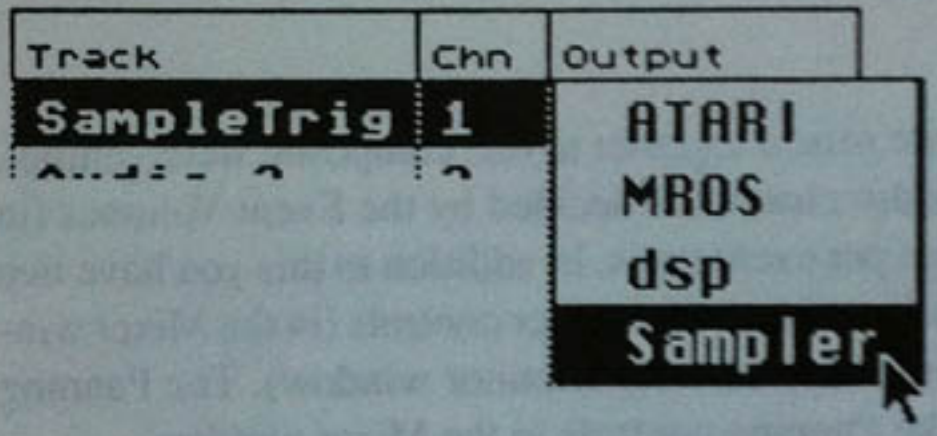
You may very well set two segments to the same audio channel, but you will not be able to play them both *at the same time*. The audio channels can only play one audio segment at a time.

- ❑ Now it's time to set each segment in the Sampler Setup box to a MIDI Channel. If you want to trigger them all from the same Track, you can leave them all set to the same MIDI Channel. If you wish to trigger different segments from different Tracks, you should organise them in groups set to different MIDI Channels.
- ❑ The final setting is the MIDI key you wish to use to trigger this segment (C3 is middle C on a five octave keyboard). This is done using the Note column.

Make sure that no two samples play back on the same audio channel *from the same MIDI key*, to avoid confusion.

Now you've set up which segments play on which audio channels and from which MIDI channels and keys. Close the Hardware Setup dialog box, so that you return to the Arrange window.

- ❑ Select or create a MIDI Track (not an Audio Track!).
- ❑ Set its Output to "Sampler".



- ❑ Set the Track's channel to the MIDI Channel you assigned in the Sampler Setup box.
- ❑ Play the keys you defined on the MIDI keyboard. This should play the corresponding audio Segments. A Segment will play for as long as you hold down the key (or until the Segment ends).
- ❑ If you wish, you can record on this Track as with any other. The Track will record MIDI notes, just as any MIDI Track. The only difference is that the MIDI events on this Track trigger audio, because the Track is routed to the special Output called Sampler.

If you have reserved more than one audio channel for playing samples, you can trigger several audio files simultaneously, one for each audio channel.

Signal flow

The Atari Falcon has one stereo input and one stereo output. Cubase Audio creates eight audio channels, that is, it makes the Falcon able to play back eight discrete mono audio files at the same time.

You have to understand the difference between Audio Inputs, Audio Channels and Audio Outputs.

Inputs and Channels

The fact that there are two Audio Inputs (one stereo input) means you can "only" record on two channels at a time. However, the inputs can be routed to different channels while recording. Just because you connect a sound source to Input 1 doesn't mean it gets recorded onto Channel 1. Selecting an Input is done in the Hardware Setup dialog. Deciding which audio channel it gets recorded on is done in the Track list in Cubase's Arrange window. See the Recording and Playback chapter.

Channels and Outputs

The eight Audio Channels are mixed together to one composite stereo output. The total Volume of each audio channel is decided by the Event Volumes (in the Audio Editor) on an event per event basis. In addition to this you have two direct controls over a channel's volume: the Mixer controls (in the Mixer window) and the Monitor Volume faders (in the Monitor window). The Panning of a channel is decided by the Panning controls in the Mixer window.

Stereo Recording

When you set a Track to Any, you will be recording in stereo. Stereo recording of course uses both the left and right inputs, but it also *always uses Channel 1 and 2*.

This means that if you want to play back some previously recorded audio while recording in stereo, you must make sure that this previous recording plays back on some other set of channels. Tracks set to play back on Channel 1 or 2 will not be heard while performing a stereo recording.

Permanent Mixdown

Cubase Audio for the Falcon allows you to make a permanent mixdown of *all eight* audio channels onto one mono or stereo Track. You can then mute the original Tracks and only use the mixdown Track. This frees up the previously used Tracks (or rather, the audio channels) for new recordings.

- ❑ Set up the Tracks you wish to Mix. Mute the Tracks you don't want included. Make sure the mix (including effects and dynamic volume and panning changes) is the one you want.
- ❑ Set up an empty Track and set it to record on any audio channel. If the Mix should be in stereo, this Track should be set to Any.
  You can *not* record on an audio channel that is already used for playing back from the hard disk. However, you *can* record onto an audio channel that is set up to play back from RAM or from the Sampler. Using this last option allows you to make a mixdown of all eight audio channels.
- ❑ Open Hardware setup. Pull down the Input pop-up and select Mix (Left) or Mix (Right). If you mix down to one Track (Mono) only the Left *or* Right channel will get recorded, depending on what you selected here. (check your panning!). If you mix down to an Any (stereo) Track, it doesn't matter which of the two you select.
- ❑ Select the destination Track for the Mixdown, set it up for recording in the Monitor window, and then perform the recording as you normally would. The output of the playback Tracks is routed to the input of the recording Track, just as if you yourself would have connected the Output of the Falcon to its own, except that since this happens in the digital domain, there is no signal degradation whatsoever!

Please note that the Mix does not get monitored during the recording.

When the recording is done, solo out the resultant Track and listen to it. If you are happy with it, turn off Solo and mute the now superfluous Tracks. You might of course delete them permanently, but if you keep them you can at any time unmute them and redo the mixdown, should you change your mind. Muted Tracks do not take up any audio channels. However, the audio files they play do take up hard disk space, so if you're running out of disk space, you could possible delete some of your "source" files after a mixdown.

There are other creative uses for Mixdown. You can for example create new audio files that are crossfades between two other files (use Event Volume), make an effect like reverb or chorus a permanent part of an audio file to free up the DSP power of the computer for new effects, create unusual stereo files, (using dynamic panning) etc.

The Hardware Setup Dialog

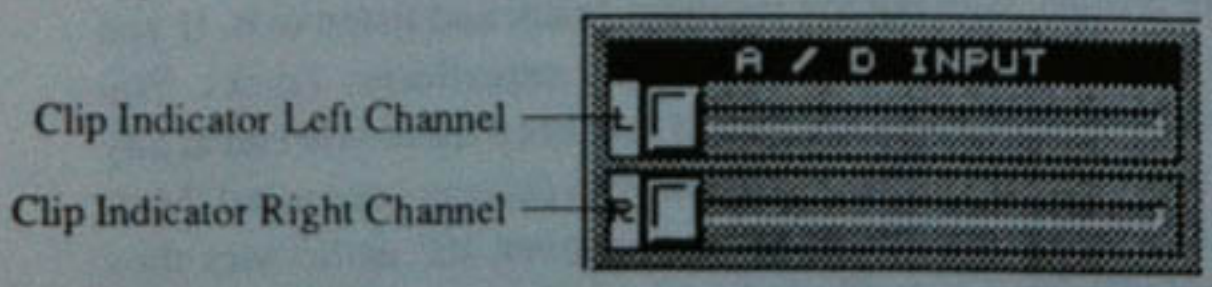
The Hardware Setup dialog is reached from the Audio menu. It is used for basic settings for the Falcon "audio engine" as follows. Some of these settings you will have done already at installation.

Input Select
This is to select from which input to record.

- A/D (Left) and A/D (Right) are the left and right channels of the audio input on the back of the Falcon. These are used for normal recording as described in the Playback and Recording chapter.
- Ext (Left) and Ext (Right) are for recording from an external audio interface.
- Mix (Left) and Mix (Right) are used for Permanent Mixdown only, as described above.

Effect Select
This pop-up is used to decide what type of effect the built in Digital Signal Processing chip in the Falcon should produce. It is described in detail on page 12 in this chapter.

A/D Input Levels and Clip Indicators



These faders are used for input attenuation of the audio inputs on the back of the Falcon. As described above, the Falcon expects microphone signals. By turning this fader all the way down, you may attenuate the input by 22.5 dB,

which is not enough to make the input accept line level signals without distortion.

Please note that this level adjustment is made in the analog domain, before A/D conversion. This means that the recording sound quality will be the same regardless of this setting.

Just to the left of the A/D Input level faders you will find two small clip indicators.

If you want to make sure you are not overloading the input, you can use these indicators which light up as soon as the input is clipping.

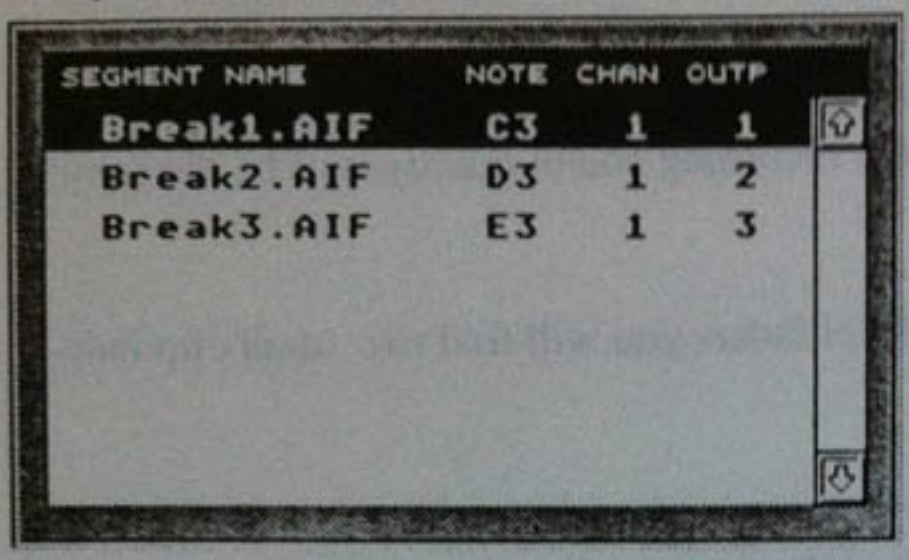
A/D Output Levels
These faders are used to attenuate the output from the audio out on the back of the Falcon. This signal is strong enough to drive headphones, but by turning the A/D Output fader all the way down, you attentuate the signal by 22.5 dB. As above, this happens in the analog domain, lowering the output does not compromise sound quality.

Audio Channel Setup



This is used to set the eight audio channels to play back audio from Hard Disk, from RAM or to make them act as Sampler Channels, as described on page 3 and page 5 in this chapter.

Sampler Setup



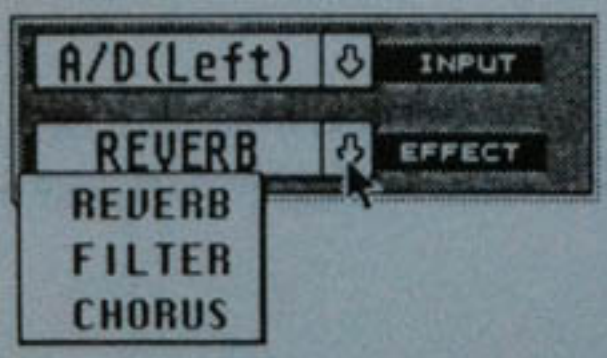
This is used with Sampler Channels as described on page 5 in this chapter.

The Mixers In General

As stated above, Cubase Audio Falcon has a built-in eight channel mixer. Depending on your settings, Cubase Audio can also make the Falcon produce Reverb, Chorus or parametric filtering.

With Cubase Audio come three Mixer Maps, located in the MIXERMAP folder on one of the Additional Files disks. They are also part of the DEF.ALL Song that comes with the program.

- ❑ Make sure you have the DEF.ALL Song loaded.
- ❑ Open the Hardware setup dialog. From the Effect pop-up, select Reverb, Chorus or Filter.

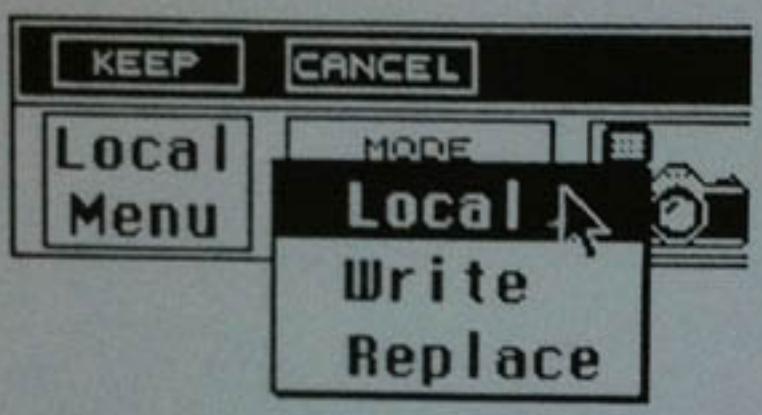


This makes Cubase load the Digital Signal Processing chip in the Falcon with the instructions necessary to perform this type of effect. Note that the Falcon is only capable of producing one of these effect types at a time.

- There are three Mixer Tracks named after the three effect types. Each one has a long empty Part on it. Double click on the Part on the Track that corresponds to the Effect type you select in Hardware Setup, and the Mixer opens.

It is a good practise to keep the Mixer Tracks that are assigned to the effects type you don't use, muted. This ensures that there will be no confusion during playback in Write mode.

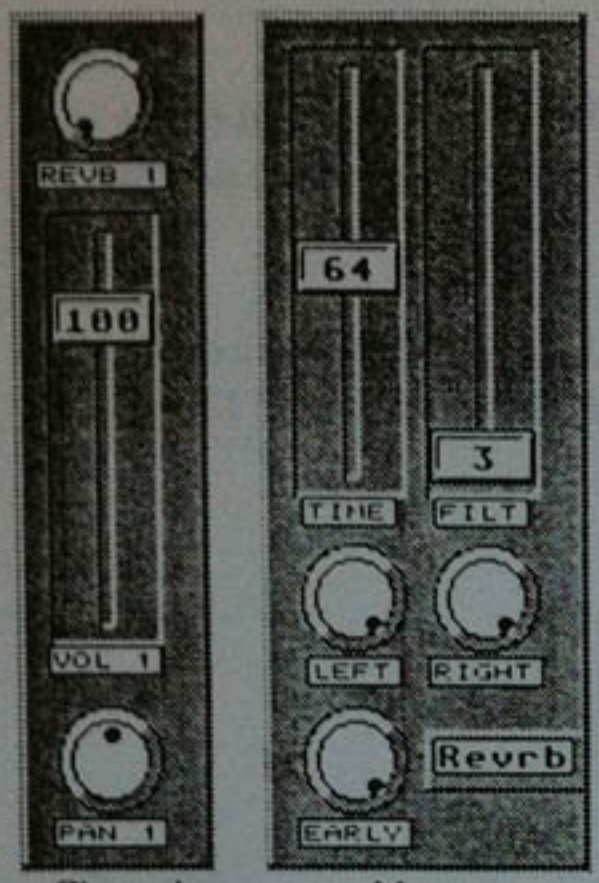
- Make sure the Mixer is in Local mode to begin with so that you don't accidentally record anything while acquainting yourself with the Mixer.



- Play back the music and play around with the controls. They are all described in detail below.

- Mix Automation is achieved using Write mode and/or Snapshots, as described in the Mixer chapter in the main manual.

The Reverb Mixer



Channel Controls

Master Controls

(1 of 8)

The Reverb Mixer consists of eight channel sections and one reverb control section.

The eight Channel sections are for controlling the eight audio Channels in Cubase Audio for the Falcon, regardless if they are used for Hard Disk or RAM playback or as Sampler Channels. The reverb section is for controlling the output of the reverb unit.

Channel Controls

Volume
The fader is of course for controlling the Output Volume of the Channel.

Panning
This pans the channel between the left/right outputs.

A typical situation would be when you use two channels to play back a stereo recording. Then you would set the Pan Controls of the two channels to full left and full right, respectively.

Reverb Send
The Send "pots" (above the Volume faders) are used to control the amount of reverb on each audio channel. The higher you set them, the more signal will be sent from this particular audio channel to the reverb.

The effect send is "post-fader", which means that the amount of effect send also depends on the Volume fader. For example, if the Volume fader is all the way down, no signal is sent to the reverb at all, regardless of the send setting.

Reverb Settings

This section allows you to control the return signal from the reverb.

Left and Right
This is used to control the return volume from the stereo outputs of the reverb.

Time, Filter and Early Reflections
These three controls are used to set the length of the reverb (Time), the amount of high frequency damping (Filt) and the amount of early reflections (Early).

The Chorus Mixer

If you have Chorus selected in the Hardware setup dialog and the Chorus Mixer map open, you can apply chorus effect to the eight audio channels. In fact, there are two independent delay units.

Channel Controls

The Volume and Panning Controls work just like on the Reverb Mixer (see above). The Del 1 and Del 2 controls allow you to set how much of this channel should be routed into each delay unit. The controls are post-fader, just as the Reverb Send controls in the Reverb mixer (see above).

Chorus Settings

As you can see, there are two identical chorus units. For each of them you have the following settings:

The "Delay" knob adjusts the main delay time that the Chorus is based on, and the "Width" is used to set how much that delay should vary when the Chorus "sweeps". The "Freq" (Frequency) knob is used to set the speed of the sweep. The "Feedb" (Feedback) control is used to feed the output of the chorus back to its input, for a more pronounced, flanger-like effect. And finally, the "Left" and "Right" knobs allow you to set how much of the Chorus effect should be blended into the final mix.

The Filter Mixer

If you have Filter selected in the Hardware setup dialog and have the Filter Mixer map open, you can apply filtering individually to the eight audio channels.

Channel Controls

The Volume and Panning Control work just like on the other mixers. Each channel also has the following Filter settings:

There are three EQs, labelled Hi, Mid and Low, which each operate in one part of the audio spectrum (as their names indicate). Each EQ has a Gain (amount), Frequency and a Q (bandwidth) setting.

Frequency ranges of the filters:
Hi: 1kHz to 13 kHz.
Mid: 80 Hz to 10 kHz.
Lo: 30 Hz to 1KHz.

Please note that heavy EQing increases the gain of the output from the Channel. This might lead to audible artifacts due to overload. This will be indicated by the clipping indicators in the Monitor window. If this prob-

lem occurs, reduce the Volume for that Channel (in the Mixer or Monitor window) until the sound is clean again.

More About Mixer Objects

Please remember that you can modify the Mixer Maps provided with the program.

The most obvious thing to do would be to assign External Controllers, in order to use MIDI hardware such as a fader panel to physically control the objects in real time during a mix.

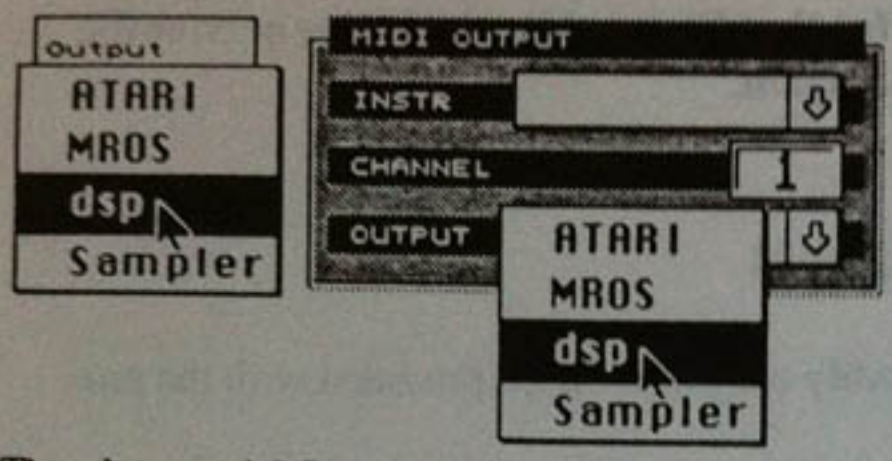
You might also want to add Master Objects which control the other faders in groups.

But there are other things you might want to do, too. You might for example change the graphic layout, rename objects or change the Min and Max values to restrict a value range. You might even create your own Mixer Objects to control the Falcon. If you open one of the Mixer Maps supplied with the program and double click on an object you will see precisely how it is built up. You can then create an identical object in your own custom Mixer Maps.

Additional MIDI Control

Those of you that belong to the adventurous type can create their own Mixer objects or record MIDI data directly into Parts to control the Falcon DSP hardware.

There is a special "virtual" MIDI port for the Falcon, called DSP, which you will find in the MIDI Output list. All data that want to send to the Falcon DSP hardware must be sent via this MIDI Output.



There's a special Output item called dsp. As you can see above it appears both in the Track list and in the Mixer Object dialog.

To find out what can be controlled, and how, open the Mixer maps. If you examine the setting for the Objects, you will find out which Controller numbers and MIDI Channels to use to control the Volume, Panning, Reverb, Chorus and Filters individually. Please remember that you can only have either Reverb, Chorus or Filter, and that you decide which by selecting from the Effect pop-up in the Hardware setup dialog.

Time Stretch

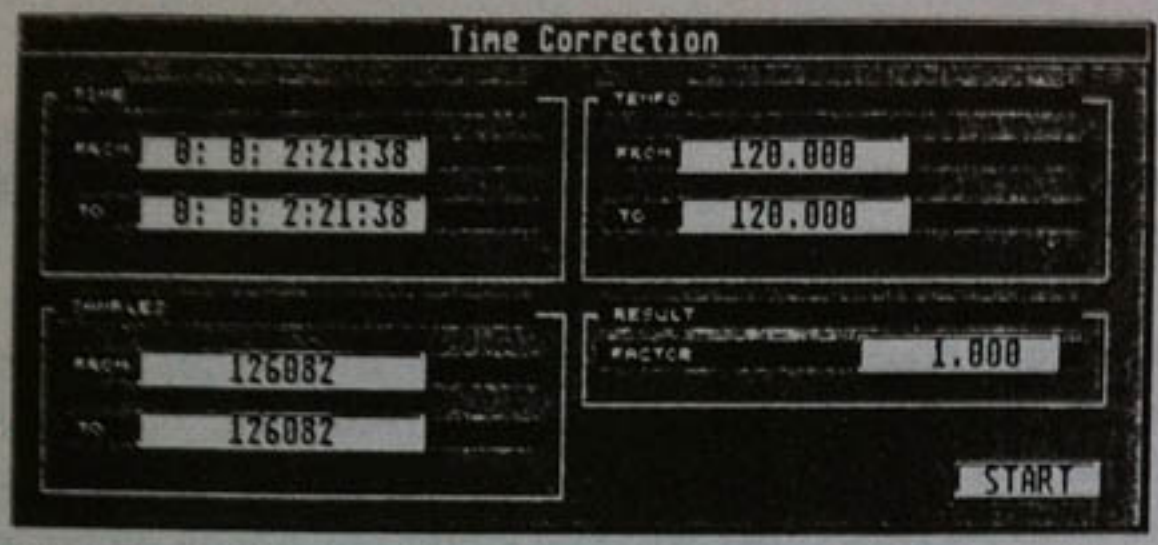
The Time Stretch item on the Audio menu is used to control an independent "off-line" time correction tool, included in Cubase Audio Falcon.

This tool works on audio files on the disk. It processes them (or rather a copy) with the help of the DSP chip in the Falcon so that the length of the recording changes without affecting pitch.

Time Stretch is a very complex type of digital signal processing. The quality of the result depends on the amount of stretch and the type of material you process. Generally, the less complex the material the better the result. For example, try to stretch individual instruments rather than an entire mix.

- When you select Time Stretch from the Audio menu, a regular file selector appears, allowing you to select any audio (AIF) file for processing.

- When you click OK, the Time Correction dialog appears.



- If you know the percentage factor you wish to stretch the file by, you may enter this number in the Factor field directly. For example, entering a factor of 1,050 will make the file 5% longer. Entering a factor of 0.970 will make it 3% shorter.

- If you don't know the factor, there are tools which help you set it. You may specify the length change in time code values (SMPTE), as a tempo change or as a change in number of samples.

- If you want to change the length of the file based on its time code length, check the Time fields. The From box contains the current length of the file (you can enter another value if you wish). Enter the desired length in the To field and the Factor gets updated accordingly.

- If you want to change the length of the file based on its tempo, check the Tempo fields. The From box initially contains Cubase's tempo. Change this if it isn't correct. Then enter the desired Tempo in the To field and the Factor gets updated.

- If you want to change the length of the file based on the number of samples it contains, simply enter the desired number of samples in the To field. The From field is already filled out for you (this can't be changed).

- When you are done with the settings, click Start. A file selector appears asking for a name and location for the file. Click OK and processing begins.

The processing time is approximately 2.5 times "real time", which means that if the original file is 10 seconds it will take approximately 25 seconds to create the processed file.

Please note that no waveform image file is created for the new audio file. You will have to do this "manually" after you have imported the new file into the Pool (see page 5-7).

If Cubase is in record ready mode, it will have created a temporary recording file which covers the entire partition you record on. This means that this partition will be full and you will not be able to store the processed file on it. To avoid this, either select an audio Track with no file assigned to it (no name in the Monitor window) or save the processed file on another disk or partition.

Synchronization

Synchronizing digital audio material with the "real world" raises many issues which are not immediately apparent when using MIDI only systems. This is a big subject, and we will only be able to touch upon it here.

When Cubase is playing *non-synchronized*, MIDI and audio are locked to the same clock in the computer, which means they are always in perfect sync.

Synchronizing Cubase vs Synchronizing actual audio
When you lock Cubase to time code, it will replace its internal "absolute time" clock with an external one – the time code. If the time code is slow, fast, or fluctuates in speed, this will affect Cubase's playback speed likewise – it should, that's the whole purpose of synchronization!

There are a number of situations where you will encounter time code that varies slightly in speed: when moving a project from one tape recorder to another, when using a tape for long periods of times so that it stretches and wears out, when striping tapes with different time code generators, etc.

In a system where Cubase only handles MIDI, these differences will be too small to be noticed. However, as soon as you bring digital audio into the picture, things get more complicated.

When Cubase asks the Falcon to play back an audio file it will only specify which file to start and *when*. Once the audio is playing, it is not being clocked

by Cubase, but rather by the Audio Clock inserted into the DSP port. This means that if Cubase's playback speed varies (because of varying incoming sync), or if it is not the same as when you recorded the audio file, MIDI and audio will drift out of sync.

Let's take an example of a situation where the SMPTE time code is running 0.001% fast when you play back a sound file, compared to when you recorded it. When set against a perfectly stable sound file, we find that this tiny error grows, within 16 bars, to become an audibly disturbing 27 tick positioning error (at 120 BPM). By 64 bars into the song we have a 100 tick error.

So, are there any solutions to this problem? Fortunately – yes!

First of all, if you plan to synchronize to tape at all, you should use Cubase's Generate SMPTE feature (see page 8-4) to produce the code. By doing so, you will eliminate the need for highly expensive 100.000% stable SMPTE generator devices. Most synchronizers are capable of generating MTC (MIDI Time Code) with a high degree of stability if they are driven by this"perfect" time code from tape.

Secondly, within a certain project, you should make sure you are *always* synchronized to tape when recording digital audio into the Falcon. That way, you will have the same basic timing reference throughout the entire project – the time code on the tape recorder (and remember — this code was originally created by the Falcon itself). You should also avoid moving the project between tape recorders.

And last, you should try to stick to moderately long segments. And what does "moderately long" mean, then? This of course depends on the stability of your tape recorder, but limiting yourself to segments up to a minute in length is a good starting point.

Please remember that if you run into problems, you can always use the scissors in the Audio Editor to split up a long segment into a number of smaller ones, and adjust the starting position of each one individually.

File Import/Export

All Cubase specific files (Song files, Arrangement files, Pools etc) are compatible between different versions of Cubase, even on different platforms (see Appendix 1 to the main Cubase manual). There are a few things to note specific to audio, though.

- Cubase Audio for the Atari Falcon creates and reads audio files in an Apple Computer standard file format called "AIFF". These files can contain 1, 2 (stereo) or 4 audio channels, in a so called interleaved format. Cubase only creates and reads 1 and 2 channel files.

- When playing back songs created by other versions of Cubase Audio that read "AIF" files (or that can convert them before reading), please observe the precautions you must take for proper synchronization, as per above. Please note that normally, Cubase is not responsible for the actual clocking of the digital audio. Therefore, playback speed of audio might differ slightly between systems, which might make the audio drift noticeably out of sync.

  Also note that the sample rates used by the two systems must correspond.

- There are other programs on the market that can read and process "AIFF" files (such as Steinberg Avalon). These programs can very well be used to process recordings made with Cubase Audio.

- With each "AIFF" file (which gets the extension "AIF" on the Atari) goes a "WIF" file which contains a graphic representation of the recording, to be used on screen. When you import files from other programs or when you use other programs to process Cubase Audio recordings, the graphic representations will no longer be "in sync" with the actual recording. You must then update the image, see page 5-10.

Maintaining the hard drive

Audio requires a lot of disk space and fast disks. In fact, recording one minute of audio in mono requires between 5 and 6 megabyte of disk space, depending on the sampling frequency.

The Installation chapter lists the requirements put on the SCSI hard disk in terms of speed and interleave.

After using Purge Segments in the Pool, it will be evident which files are no longer used in a Song (the files not used will have no Segments at all). This gives you a way of finding out which files can be deleted. But please remember that an audio file can be used in more than one song.

Deleting files should be done from the Pool or possibly from the Arrange window or the Editors (using [Control]-[Backspace]).

You should *not* delete audio files by using Delete files on the main File menu.

It is necessary to every now and then *defragment* the disk that holds your audio files. See page 1-3 in the main manual.

Falcon Hardware Modifications

To be able to record line level signals directly and to improve the sound quality of the Falcon's Audio Outputs, there are a few hardware modifications you can make to your Falcon computer, suggested by Atari themselves. Admittedly, the details below are sketchy, and if you are in any doubt whatsoever, contact your dealer or service centre.

Opening the casing of your Atari Falcon will void the warranty! Steinberg does not take any responsibility whatsoever regarding damages on your computer, due to improper handling or unexpected side effects of this modification.

To remove the bass boost on the output:

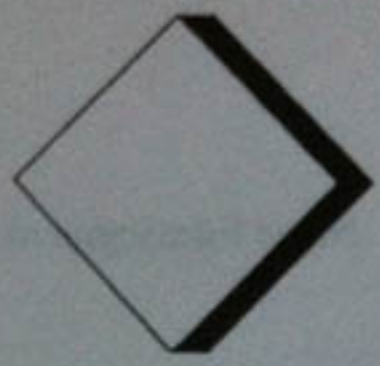
- ❑ Change C58 and C59 from 100PF to 1000PF.
- ❑ Change R123 and R130 from 10K to 15K.
- ❑ Change R59 and R68 from 100K to 4.7K.
- ❑ Change C95 and C90 from 0.033yF to 1K Resistor.

To reduce the speaker amplifier gain:

- ❑ Add a 10K Resistor between pin 2 of U21 (@R119) and AGND (@R111).

To reduce the Input Gain by 6dB:

- ❑ Remove R56, R57, R90, R92, C21, and C81.
- ❑ Change R66 and R87 from 100K to 47K.
- ❑ Add a 470pF NPO +/- 5% in parallel with R67.
- ❑ Add a 470pF NPO +/- 5% in parallel with R88.
- ❑ Add a 100pF NPO +/- 5% in parallel with R66.
- ❑ Add a 100pF NPO +/- 5% in parallel with R87.



Keyboard Commands

The following Keyboard commands are specific to the Audio part of Cubase Audio:

General

[Alternate]-[N]	Name File/Segment.

Arrange window

[Control]-[Backspace]	Delete Part *and* the Audio files it plays.

Pool

[Control]-[Backspace]	Delete Segment *and* the Audio files it plays.

Audio Edit

[Return]	Keep
[Esc]	Cancel
[Alternate]-[O]	Loop On/Off
[Alternate]-[L]	Input Left Loop boundary
[Alternate]-[R]	Input Right Loop boundary
[Alternate]-[I]	Info On/Off
[Control]-[Backspace]	Delete Event *and* the Audio files it plays
[←]	Previous Event
[→]	Next event

The arrows can be used in combination with the [Shift] key to select several events.