CUBASIS AV

for Windows

User Guide

Steinberg

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Introduction

Welcome!

Welcome to the Cubasis AV on-line documentation!

Please use one of the methods described below to quickly find the desired information:

- **Use the Table of Contents provided by the Adobe Acrobat Reader program.**
- **Use the Adobe Acrobat Reader Search function.**
- **Click on a cross-reference (green text) to jump to the respective topic.**

It is possible to print out this document or parts of it.

Additional Information on how to use the Adobe Acrobat Reader program can be found in its on-line Help.

● Before you start using the program, you should follow the instructions in the separate Installation document.

How you can reach us

You can find us at the World Wide Web, at the following address:

- **www.steinberg.net.**

Here you can find the following sections (among others):

- The Service Web contains support information, answers the frequently asked questions etc.
- You can send email to our support personnel from the web pages.
- On the Web site you will find the latest update of your program and demo version of other Steinberg products, for instant download.
- The web User Area lets Cubasis AV users world wide communicate and exchange information.
- The Web pages also have sections for Education and Multimedia users.

2

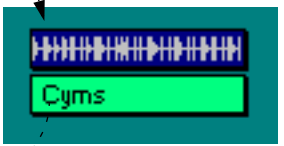
Basic Methods

Why you should read this Chapter

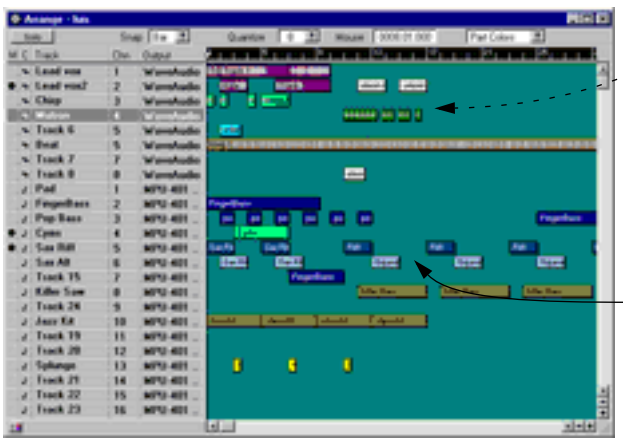
In this chapter, none of the actual features of Cubasis AV are described. Instead, the chapter contains information about the general methods you need to employ when using Cubasis AV, plus some useful terminology. These methods are the same in every part of the program, whether you are making a basic recording, or using Cubasis AV at its most advanced level. To make your work with Cubasis AV as effective as possible, please take some time to read this chapter.

Cubasis AV Building Blocks

When you record audio or MIDI, your recorded sounds or MIDI signals are packed into “containers” called **Parts**.



Parts reside on **Tracks**. The Parts and Tracks make up an **Arrangement.**



An Arrangement with 24 Tracks.

You can work on a number of Arrangements simultaneously. Together they form a **Song**.

Toolboxes

What are the Tools?

When you are working with Cubasis AV, you need different tools in different situations. You may for example want to move or copy Parts using the Arrow tool, or delete Parts using an Eraser tool. There are a lot of other tools as well.

Some examples of tools

What are the Toolboxes?

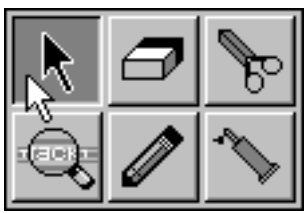
The various tools you may need in a certain situation are gathered in a Toolbox. This is essentially a “box” containing an icon for each tool. Each of the main windows in Cubasis AV has its own Toolbox, containing its associated tools. All the main tools are described in the chapters “Arrangement Editing” and “The MIDI Editors - General Information”.

Three different Toolboxes (Arrange window, Key/List Edit and Score Edit).

Selecting a Tool from a Toolbox

1. **Press the right mouse button.**
   Make sure the pointer is not positioned over a numerical value field, as this will instead increase the value (see page 24).

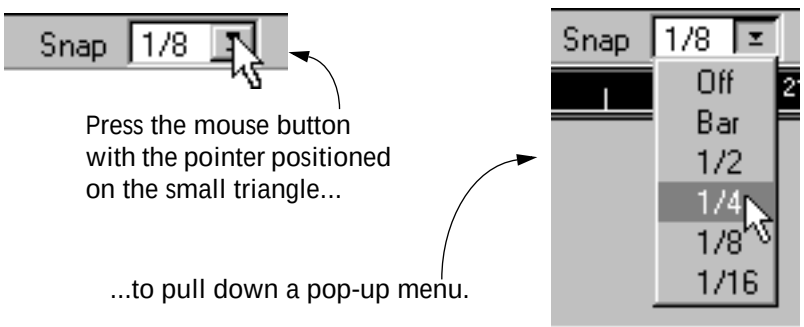
2. **The Toolbox appears.**



3. **Move the pointer to the tool you want to select, and release the mouse button.**
   The Toolbox disappears and the pointer takes on the shape of the selected tool.

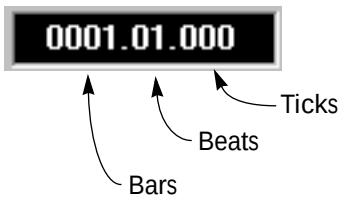
Pop-Up Menus

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 be located anywhere in a window, and are not on a menu bar. But selecting is done similarly from both pop-up and regular menus.



About Positions

Cubasis AV works with a resolution of 384 fractions (or ticks) per quarter note. You will often work with position values in the Arrange window. Positions in Cubasis AV are displayed as Bars, Beats (quarter notes) and Ticks.



The first Beat of the first Bar, in other words the beginning of the Song.

The lengths of notes are shown as ticks. In the table below, some note values are displayed as ticks:

Note Value	Number of Ticks
Whole note	1536
Half note	768
Quarter note	384
Dotted eighth note	288
Eighth note	192
Eighth note triplet	128
Dotted sixteenth note	144
Sixteenth note	96
Sixteenth note triplet	64

Setting Values

There are three basic kinds of values displayed in Cubasis AV:

- Meter Positions
- Note Pitches
- “Other” values

As explained above, positions and lengths are displayed as Meter Positions. Other values, such as tempo, velocity etc, are displayed as a number, sometimes with decimals. Some values may be negative.

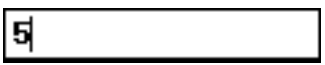
Changing a value by typing

You can double click on a value field. The value is highlighted, and you can type in a new value and press [Return]. You can use the numeric key pad as well as the normal keyboard in most cases.

If you are editing a value that is “segmented”, such as a Song Position or a decimal number, you can use spaces, dots, commas or any character that is not a number, to separate the numerals. However, you don’t have to type in all the numerals. If you just type in a single number, you will change the largest numeral in the segmented value, and all the lesser numerals will be set to their lowest values.

Double clicking on this value (Song Position)...

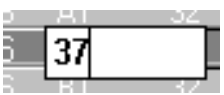
...brings up a value box with a cursor.



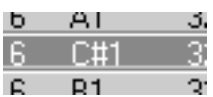
If you type a single value and press |Return|...

...the lesser numerals get their lowest values automatically.

If you are editing a pitch (note number), there are two ways of typing it: as a *note name* (a letter followed by a number and maybe a #-sign) or as a *MIDI note number* (a number from 0 to 127, where 0 is the lowest note).



You may enter a MIDI note number, for example 37...



...but Cubasis AV will display the name of the note (in this example C#1).

Changing a value by using the Mouse

You can use the mouse to either change a value by single steps or continuously scroll it up or down.

Method 1

1. **Position the pointer over the value you want to change.**

2. **Click with the left or right mouse button**
   The left button decreases the value, the right button increases it. For each click the value changes one step.

3. **Continue clicking until you have reached the desired value.**

- **If you hold down [Shift] while clicking, the value will change in larger steps (often steps of ten).**

Method 2

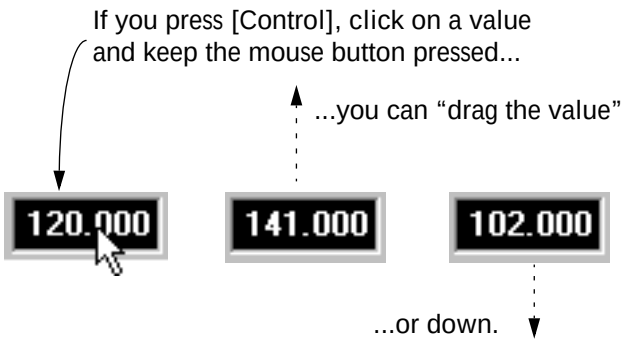
1. **Press and hold one of the mouse buttons with the pointer over the value.**
   The value will scroll up or down depending on which button you press (the left button decreases the value and the right button increases it).

2. **Release the button when you have reached the desired value.**

- **If you hold down [Shift] while using the mouse, the value will scroll in larger steps (often steps of ten).**

Changing a value by dragging

If you hold down the [Control] key on the computer keyboard, you can click on a value and drag the mouse up or down with the button pressed. The whole screen will then act like an invisible scroll bar or fader, which you can use to change the value.



About changing “segmented” values

If you are using the mouse to change a “segmented” value such as a position or a decimal number, you can change any one of the “segments” individually. In a position value for example, you can change the bar, beat and tick values independently, just by positioning the pointer at the right numeral.

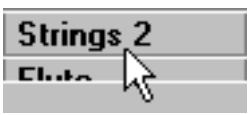
Clicking on the “Beats” value...

...will change this value only.

Naming

You can give names to Tracks, Parts and other items in Cubasis AV. To edit a name just double click on it. The text gets highlighted and you can type in the changes you want to make. You can use the arrow and [Backspace] keys, just as in any text-editing program.

Double clicking on the name...



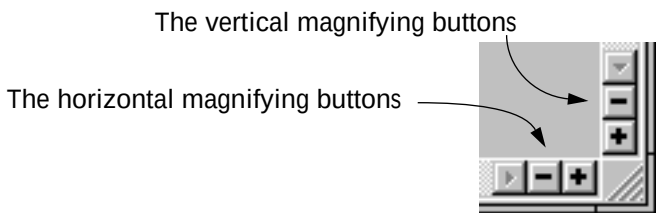
...highlights it and makes it ready to edit.

Window Techniques

Cubasis AV is a Windows program, which means standard “Windows procedures” apply. You may move, resize, scroll and close windows using standard procedures. But there are also a couple of special features:

Changing the Magnification

In the Arrange window, and most of the editors, a plus and a minus sign appear on each scroll-bar. Click on the plus sign to increase magnification. The minus sign will decrease magnification.



The plus and minus sign on the left/right scroll bar change the horizontal magnification. The signs on the up/down scroll bar change the vertical magnification. If you click on a plus or minus sign and keep the mouse button pressed, the magnification factor will change continuously, allowing you to zoom in or out.

You can also change the magnification from the computer keyboard, using the following keys:

[G]	Decrease horizontal magnification.
[H]	Increase horizontal magnification.
[Shift]-[G]	Decrease vertical magnification.
[Shift]-[H]	Increase vertical magnification.

Dividers

Some of the windows in Cubasis AV are divided into two sections. The “borders” between the sections are called Dividers. If you position the pointer on a Divider, the pointer takes on the shape of a hand. If you then click on the Divider and drag it in the direction of one of the sections, you will shrink that section and enlarge the other.

Dragging the Divider in the Arrange Window.

The Transport Bar

This is a special window that, among other things, contains the transport controls: Play, Stop, Record, Rewind and Fast Forward. These work much like the controls on a tape recorder. Read more about the Transport Bar in the chapter “Playback, Tempo and the Transport Bar”.

The Transport Bar differs from standard windows. It doesn’t have a title bar (the area at the top, used for dragging a window around on the screen). Instead you use the “handles”, at each side of the window, to move the Transport Bar. Also, the Transport Bar will never be obscured by other Cubasis AV windows, but always stays on top.

Dialog Boxes

When you select a function from a menu, sometimes a dialog box appears. This is a type of window for making various settings, etc. After you have input the necessary information using the mouse and/or keyboard you close the dialog box by clicking on a button called “OK”, “Do It!” or something similar, or by pressing [Return] on the computer keyboard.

Even when you have a dialog box open you can still use the numeric key pad for the functions on the Transport Bar (Start, Stop and so on).

Using the Computer Keyboard

When you are working with Cubasis AV, the computer keyboard has several different uses:

Transport Controls

The Transport functions (such as Play, Stop, Record and so on) can all be managed from the computer keyboard. The keyboard commands for these functions are located on the numeric key pad, to the right of the main computer keyboard. See page 109 in this book.

Keyboard Shortcuts

Many of the items on Cubasis AV menus have a computer keyboard equivalent - a “shortcut”. These keyboard shortcuts generally use keys on the “typewriter” part of the computer keyboard.

How Keyboard Commands are displayed in this Manual

The following list shows how the “special” keys on the computer keyboard are displayed in this manual.

In this manual:	On some keyboards:
[Shift]	
[Alternate]	Alt
[Alt Gr]	(should not be confused with Alternate)
[Control]	Ctrl
[Tab]	
[Return]	
[Backspace]	

When the text says something like “press [Control]-[T]” this means that you should hold down the control key on the computer keyboard and press T once.

Cutting, Copying and Pasting

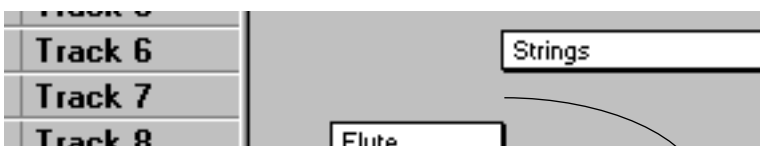
You can use the standard commands, Cut, Copy and Paste, to rearrange Parts, notes and other Events. These commands can be found on the Edit menu, and have the keyboard equivalents [Control]-[X], [Control]-[C] and [Control]-[V] respectively. Cutting, Copying and Pasting is the main way of moving and duplicating notes between different Parts or between the different Arrangements in a Song.

Cutting

The Cut command takes the selected Parts or Events, removes them from where they were and puts them in a temporary, non-visible location called the Clipboard.

Selecting a Part and Cutting it...

...removes it from where it was...



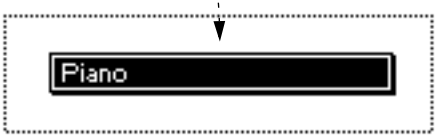
...and puts it on the Clipboard.

Copying

The Copy command takes the selected Parts or Events, copies them and puts the copy on the Clipboard. The difference between Cut and Copy is that nothing is removed when using Copy.

Selecting a Part and Copying it...

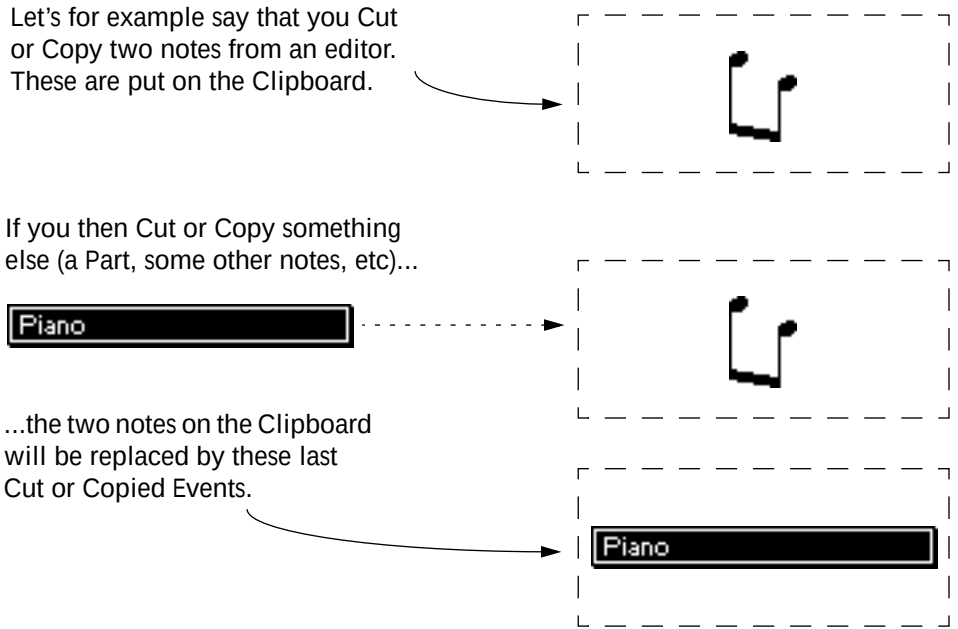
...makes a duplicate of the Part and puts the duplicate on the Clipboard.



The original Part is left where it was.

- Only the last Cut or Copied item(s) are stored in the Clipboard. There is only one Clipboard, shared by Cut and Copy.

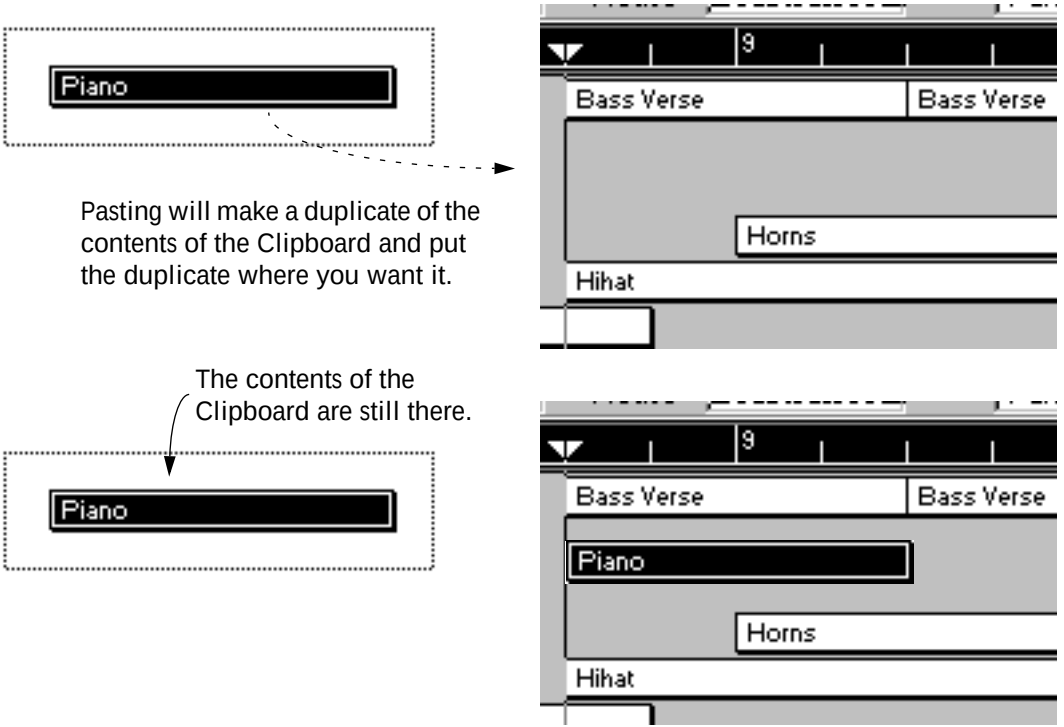
This means that anything already on the Clipboard will be replaced if you Cut or Copy again.



Pasting

The Paste command puts the contents of the Clipboard back into the selected window, which can be the same window as they were Cut or Copied from or another. These are the rules:

- **If the Clipboard contains *Events* Cut/Copied from an *editor*, you can only Paste them into an editor (the one they came from or another one). You can't Paste editor Events into the Arrange Window.**
- **If the Clipboard contains *Parts* Cut/Copied from the *Arrange* window, you can only Paste them into the Arrange window.**
- **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.**

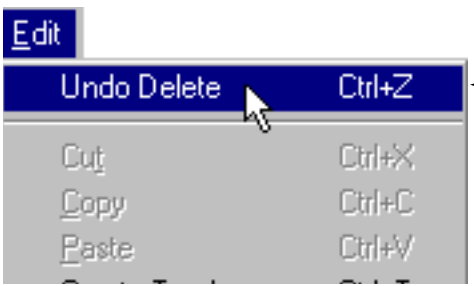


- Cutting, Copying and Pasting is the way to move Events from one Part to another. There is only one Clipboard for Events, and it is shared between all the editors, so that notes and other Events can be moved from one Part to the next.

Undo

Cubasis AV has a wide-ranging Undo function. This means that if you regret your last action, you can Undo it. This is very helpful when something doesn't turn out as intended. Remember that it is only the *last* action that can be undone.

You Undo an action by selecting "Undo" from the Edit Menu, or by pressing [Control]-[Z] on the computer keyboard.



Often the menu item Undo tells you what will be undone at any given moment. In this case, "Undo Delete" means 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 the menu item is grey, nothing can be undone.

Real Time

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

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

- In general, don’t turn off playback or recording just because you want to try a command or a function, just do it!

3

Recording Audio

Selecting a sound source for recording

Before starting to record audio, you must decide what type of sound source you want to record. There are (usually) two basic options:

- **Recording a sound source connected to the audio inputs of the audio card.**
  This could be a microphone, a mixer or any electrical musical instrument.

- **Recording audio from an internal CD-player.**
  You may for example want to record loops and sounds from a Sample CD.

To "tell" the computer which type of sound source you want to record, proceed like this:

1. **Switch to the desktop/Program Manager.**

2. **Locate and launch the mixer software included with the audio card.**
   Possibly, you may have to launch the Explorer/File Manager to do this.

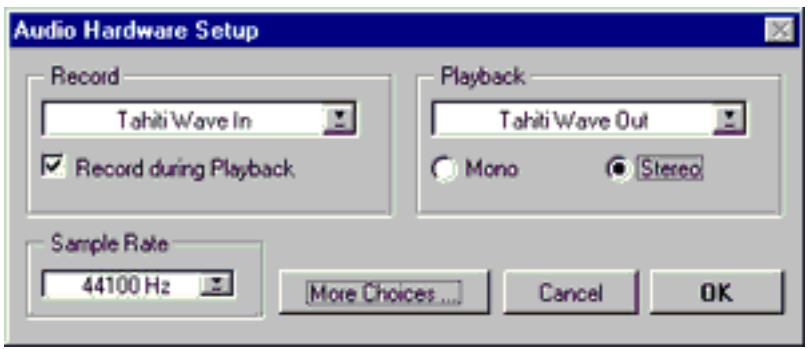
3. **Use the settings in the mixer program to select an input source.**
   There may be several options, such as line and microphone inputs, internal CD-player and possibly digital inputs. Refer to the audio card documentation for more information.

4. **Quit the mixer program and return to Cubasis AV.**

Choosing a Sample Rate

Before you start recording the first audio file in a Song, you have set the sample rate:

1. **Open the "Hardware Setup" dialog (on the Audio menu).**



2. **Select a Sample Rate.**
   See page 430 for details about sample rates. Some cards might only support the 11025, 22050 *or* 44100 alternative. See the card's documentation for details.

- This setting is done once and for all for the whole Song. You can not make some recordings at one sample rate and others at some other sample rate.

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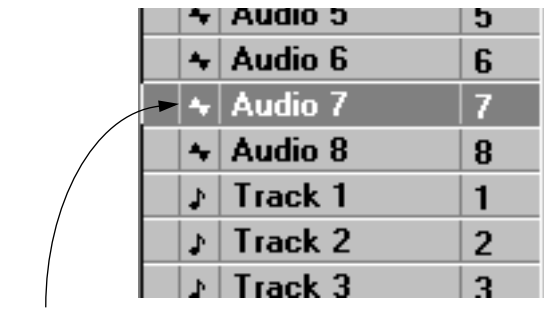
3. Close the dialog by clicking OK.

The settings are automatically saved together with the program.

Preparing a Track

1. Select an Audio Track by clicking on its name field in the list.



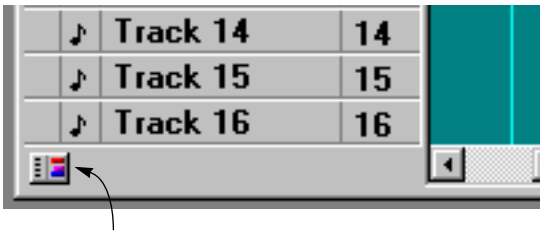
Audio Tracks are indicated by this symbol.

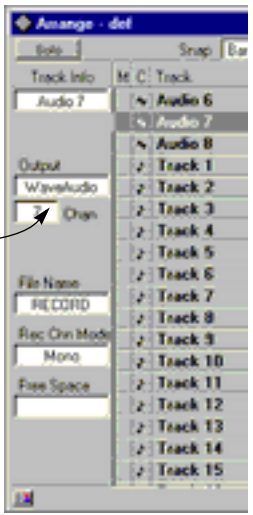
- **If you don’t have any empty Audio Tracks in your Arrangement, you need to create one, for example by using the Create Track item on the Edit menu.**
  To make sure the Track is an Audio Track, position the pointer in the “C” column for the Track, click the mouse to pull down the pop-up menu and select “Audio Track”.

2. **Set the Track's channel (Chn) to the audio channel you plan to record on (1 to 8).**
   If this is the first Audio Track you record on, select 1. For more information on channels, see page 80.

3. **Double click on the Track name, type in a new name for the Track and press [Return].**

4. Open the Inspector.
This is done by clicking on the Inspector icon below the Track list.





5. Decide whether you want to make a mono or a stereo recording, by clicking on the Mono/Stereo button under the heading Rec Chn Mode.
If you select Mono, the signal from the left input channel will be recorded.

6. Click on the Filename button.

7. **In the standard file dialog box that appears, select where you want the file located and type in a name. Click OK.**
   The Filename button turns darker to indicate this audio channel and file are now ready for recording.

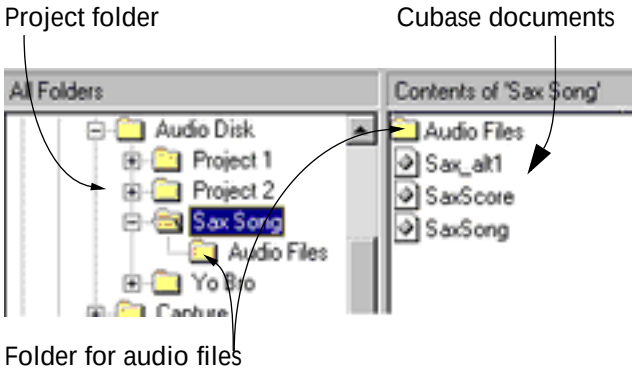
An Audio file set up for recording.

- If you attempt to record on a Track for which you don't have selected a file name and location, Cubasis AV will ask for this information, before allowing you to record.

Where is the best place to put my Files?

- If you have the choice, we recommend that you put your audio files on a separate hard disk. You can also store your Cubasis AV documents (like Song and Arrangement files) on this hard disk, together with the audio files, since this simplifies archiving and backing up. We recommend that you reserve your startup hard disk for applications, system files etc.

- We recommend that you make one folder for each project. In this folder you can put your Cubasis AV documents and other documents related to the project. We have also found it convenient to create an “Audio” folder *inside* the Project folder for the actual audio files.



The “Free Space” indication

The Free Space indication in the Inspector shows you the longest recording you can make with the available disk space. Please note that the Rec Chn Mode setting (Mono/Stereo) affects this value.

- For the Free Space value to be shown for a Track, a Record File must have been selected, as described on page 48.

About Monitoring

Cubasis AV in itself does not handle monitoring, that is it has no controls for how the audio passes *through* the card (since many cards are different in this respect).

However, with some audio cards, the accessory application(s) that come with the card will allow you to turn on and off Monitoring. If your card has this ability, we recommend you to activate monitoring, since it will (among other things) facilitate setting recording levels.

Using Monitoring to check levels

If monitoring is activated, the audio signal will pass through the card's "analog to digital" and "digital to analog" convertors. You can then simply check the recording levels by listening to the output of the card. To obtain an optimal recording level, raise the level of the input signal until you hear distortion, and then lower the input level a bit.

About Digital Recording and Levels

Digital recording (as in Cubasis AV) is different from analog recording when it comes to recording levels. Whereas with analog recording it is often perfectly acceptable to let the "needle hit the red" (record at levels actually higher than the system can reproduce accurately), this is *not* true when it comes to digital recording.

The term used here is *headroom*. The headroom is the difference in level between the signal you record and the maximum level the system can handle. When the level of the signal increases, the headroom diminishes towards 0 dB (decibels).

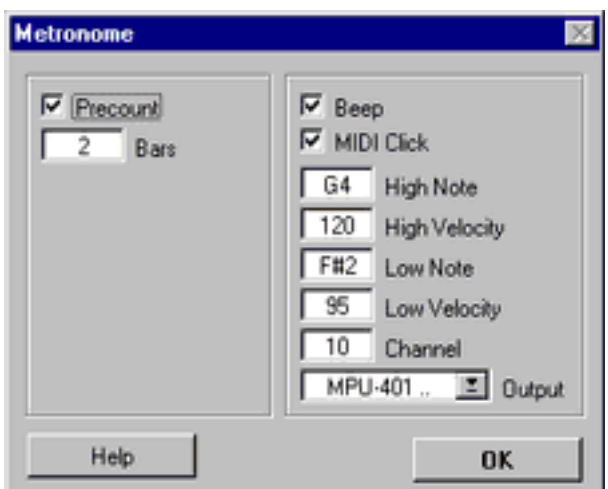
When the signal is stronger than the system can handle - when you exceed the available "headroom" - in a digital recording system, *hard clipping* occurs, which results in clearly audible and very unpleasant distortion.

To avoid this, you should always give yourself an extra bit of headroom in your recordings in Cubasis AV.

Setting up the Metronome Click and selecting a tempo

When you record audio, you don't have to use a metronome, or even any specific tempo. However, it is often practical to select a correct tempo before starting to record, since this will let you add MIDI music easily later on. To help you keep time when recording, you use the Metronome Click function. First, you need to set it up:

1. **Pull down the Options menu and select "Metronome...".**
   The Metronome dialog opens.

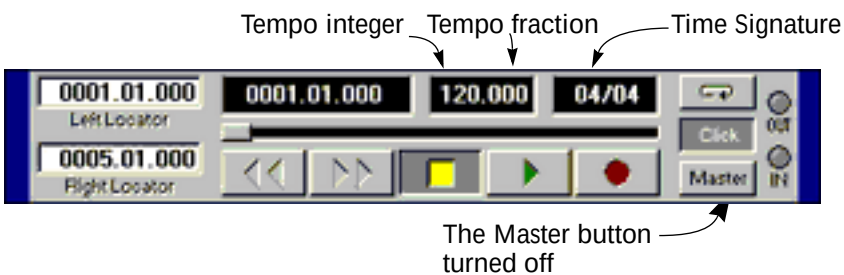


2. **Make sure that “Precount” and “Beep” are activated.**
   When “Precount” is activated, the metronome will give you a “count in” before you start recording. You can select the length of the count in, by entering a value in the “Bars” field below.

3. **Click OK.**
   Now you need to set a suitable time signature and tempo for your music:

4. **Make sure the Master button on the Transport Bar is *not* activated.**
   How to use the Mastertrack and the Master button is described in the chapter “The Master Track”.

5. **Set a Time Signature of your choice on the Transport Bar.**
   You can change each of the two Time Signature values separately to get Time Signatures from 1/2 to 16/16.



6. **Activate the Click button on the Transport Bar and click on the Play button.**
   You will hear a metronome click sound.

7. **Adjust the Tempo on the Transport Bar, until it feels right.**
   The Tempo setting is divided into integer (“coarse”) and fraction (“fine”) values. We suggest you start with the integer part and use the fraction value only for fine-tuning.

Recording from a specific point

Now that you're all set, it is time to actually record!

1. **Set up the Left Locator to where you want the recording to start and the Right Locator to where you want it to end.**
   The Locators are markers, visible as two lines stretching over the Arrangement and with an "L" and an "R" flag in the ruler.

   You move the Locators by clicking with the left or right mouse button in the ruler, or by changing the Locator values on the Transport bar (for other ways of setting the Locator positions, see page 118).

- If you are not sure how long you want the recording to be, or prefer to deactivate recording manually, set the Right Locator to a very large value so that you will not intentionally reach it while recording.

---

2. **Make sure that the Cycle button (the top button to the right on the Transport Bar) is deactivated.**

3. **Click the Record button.**

4. **After the count-in, start performing.**

5. **When you are done, press Stop.**
   The program will now calculate an image file so that a waveform can be displayed. Depending on the length of your recording, this may take a few seconds, during which a dialog box shows the progress of the calculation. When finished, a Part will appear on the Track:

A Part on a Track.

6. **Click Stop again to return to the beginning of the recording, and click Play to listen to your performance.**

Redoing the Recording

There are three ways you can redo a recording that you are not satisfied with:

Recording again over the existing Part

If you simply record again on the Track, you will get a new Part which overlaps the previous. The Track will play back fine, but you will be wasting hard disk space with unused recordings.

Using Undo

If you press Undo after Recording, the Part you just created will disappear and you can record again. However, the audio file still resides on the hard disk and there is a *segment* for it in the Pool (see page 84 for more about audio files and segments). You can always delete unused segments later, so this is nothing to worry about.

Deleting the Part

The final option is to manually delete the Part and then record again on the Track.

- **If you delete the Part with the Eraser (or by selecting it and clicking [Backspace]), it disappears, but the segment and the audio file are not deleted (just as when you use Undo, see above).**

- **If you select the Part, hold down [Control] and press [Backspace], a dialog appears, asking you if you also want to delete the audio file. To do this, click OK.**
  This is the method to choose if you are sure you permanently want to delete the recording.

Recording more on the same Track

To record more on the same Track, proceed as follows:

1. **Move the Left Locator to the next position where you want to start recording.**
   This can be at a “free” area on the Track, or at some place where something is already recorded, as described below.

2. **Move the Right Locator to where you want the recording to stop.**

3. **Activate recording just as you did the first time on the Track.**
   A new file is automatically created for you, as described below.

● Please note that the same audio channel can play back a mono file on one section of the Track and a stereo file on another.

About overlap

When you record again, where something has already been recorded on the Track, you will get a new Part which overlaps the previous one(s). When you play back, only the Parts that you can *see* are played back. Let's say the Track contains a long Part, and a shorter Part is recorded "on top of" and in the middle of the longer one. When the Track is played back, you will hear the first Part (the longer one) up until the start of the shorter Part. The short Part will then be played until its end and then you will hear the end of the longer Part.

During the "riff" Part, the "guitar" Part is silenced.

About File Names

As described on page 48 in this chapter, you have to specify a file name before you start recording on a Track. This is done by clicking on the Filename box in the Inspector, and using the file dialog that appears.
You can also change the names of files, *after* recording. This should be done from the Pool, as described on page 216.

- Do not change the names of audio files from “outside” Cubasis AV, for reasons described on page 216.

Recording the Next Track - Overdubbing

Recording the next Track is done just as with the first. Just select another Track, name it and record as described on page 56. When you activate recording, you will hear the previously recorded Tracks together with the performance you are currently recording.

- Not all audio cards support simultaneous audio playback and recording (also known as “full duplex”)! If your card does *not* support full duplex, this means that as soon as you enter record mode, you will not hear your previously recorded audio Tracks.
  If your card *does* support full duplex, you should make sure this function is activated in Cubasis AV’s Hardware Setup dialog, as described on page 429.

Some additional recording rules

In Cubasis AV, the following guidelines apply when recording audio:

- **Cubasis AV always punches out automatically at the Right Locator.**
  This means, that if you are recording and the Song Position passes the Right Locator, recording is automatically deactivated.

- **Recording always starts from the Left Locator.**
  This means you cannot punch in manually (activate recording “on the fly” from play mode.

- **If you switch Tracks when recording audio, recording is disabled but playback continues.**
  To be able to record on another Track you have to stop playback.

4

Recording MIDI

Preparations

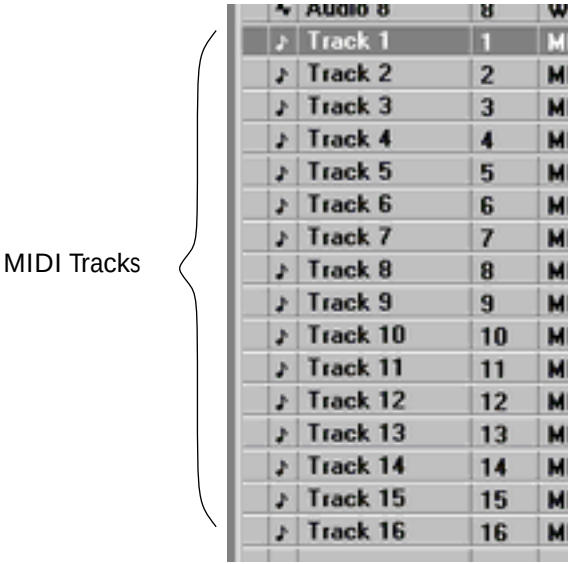
Activate MIDI Thru!

Cubasis AV is best used with MIDI Thru activated and the connected MIDI sound source in Local Off-mode. Therefore:

- Make sure that MIDI Thru is activated on the Options menu.

Selecting a MIDI Track for recording

The Tracks with the note symbol in the “C” column, are used for recording MIDI. You can have up to 64 MIDI Tracks in Cubasis AV. Each Track has its own MIDI Channel (1 - 16, indicated by the number in the “Chn” column). If you have a MIDI sound source that can play different sounds for different MIDI channels (usually called a “multitimbral” sound source), you can control up to 16 different MIDI sounds at once, one for each MIDI channel.



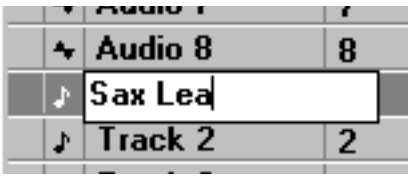
First, you need to select a Track to record on:

1. **In the Track list in the Arrange window, click on the name of one of the Tracks.**

- **If you don't have any empty MIDI Tracks in your Arrangement, you need to create one, for example by using the Create Track item on the Edit menu.**
  To make sure the Track is a MIDI Track, position the mouse in the "C" column for the Track, pull down the pop-up menu and select "MIDI Track".

At this stage, you can name the Track if you want to. It is often very practical to use a Track name that corresponds to the music or the sound you want to record on the Track:

2. Double click on the Track name in the list.
A name box opens.



3. Type in the desired name of the Track and press [Return].

4. Set a MIDI channel for the Track in the “Chn” column.

● In General MIDI, channel 10 is always used for drums!

Selecting a sound for the Recording

If you use a typical multitimbral MIDI sound source, it can receive MIDI signals on 16 different MIDI channels. For each channel, you can select a sound (“Programs”, “Presets”, “Patches”, “Tones”, “Voices” or whatever they might be called).

There are three ways to select a sound for the Track’s MIDI channel:

Using the Instrument’s front panel

Normally you can select sounds – for each MIDI Channel – directly from the front panel on the instrument. If you choose this method, please refer to the instrument’s operation manual for details.

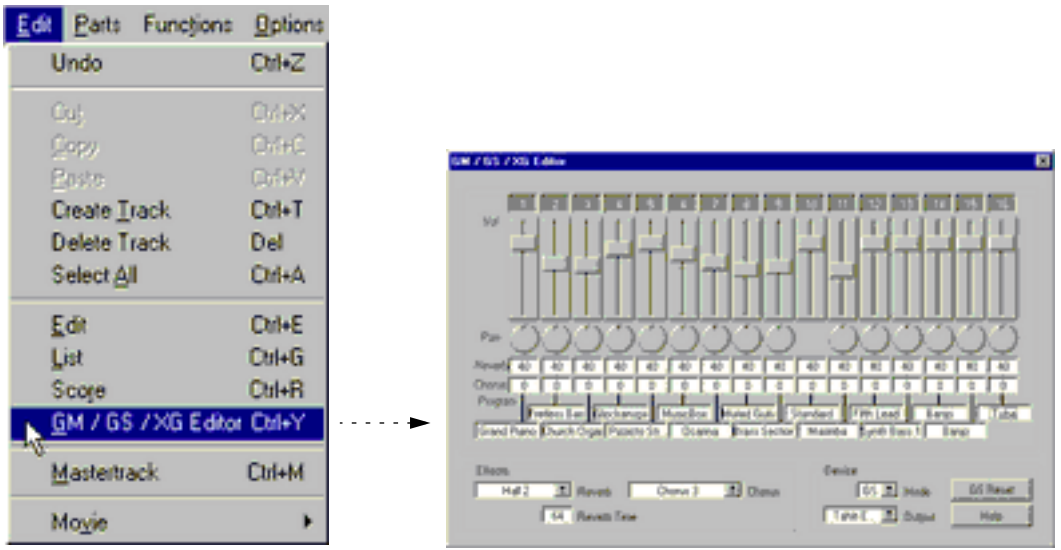
Using the GM/GS/XG Editor

This method is suitable if your instrument is compatible with any of the standards GM (General MIDI), GS or XG.

- You may need to activate your instrument’s GM/GS/XG mode for the settings below to work. Refer to page 381 and the instrument’s operation manual for instructions on how to do this.

To select a sound, proceed as follows:

1. **Pull down the Edit menu and select “GM/GS/XG Editor”.**



A window with 16 sections of controls, on for each MIDI Channel, appears.

2. **Locate the Device section in the lower left corner of the window.**

3. **Use the Mode pop-up to select GM, GS or XG Mode.**
   Select the mode that is appropriate for your instrument.

4. **Pull down the Output pop-up and select the MIDI Output port your instrument is connected to.**

5. **Locate the channel section corresponding to the MIDI Channel you have chosen.**

6. **Press the mouse button with the pointer over the “Program” box at the bottom of the channel section.**

7. **Use the hierarchical menus to select a sound.**
   The pop-up menu consists of 16 submenus, each containing 8 GM instruments. Selecting one of them will send out the appropriate MIDI Program Change message to your MIDI sound source.

- **You can also use the GM/GS/XG Editor to set levels, panning and various other parameters for each MIDI channel.**
  This is described on page 379.

Using the Inspector

You can also select sounds directly in Cubasis AV's Arrange window.

● Your instrument must be set up to receive MIDI "Program Change" messages for this to work. Refer to the instrument's operation manual for instructions on how to do this.

---

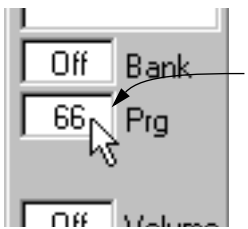
1. **Click on the Inspector icon, below the Track list.**
   The Inspector appears.

2. **Click in some empty part of the Part Display (the area to the right of the Track list).**
   This is to make sure no Part is selected.

3. **Click on the Track name to make sure the Track is selected.**
   The top text in the Inspector now says "Trackinfo" and below this, the name of your Track is displayed. This is your verification that the Inspector actually shows the settings for the right Track (the selected one).

4. **If GM, GS or XG Mode is activated in the GM/GS/XG Editor, you can click on the "Prg" field to pull down a hierarchical program menu, similar to the one in the GM/GS/XG Editor.**
   For this to work, your instrument needs to be General MIDI-compatible and possibly set to its GM/GS/XG Mode.

5. **If you use a non-GM sound source (and "Off" is selected in the Mode pop-up in the GM/GS/XG Editor), you can instead enter a Program Change number in the Prg value field.**
   In MIDI, Programs are always numbered continuously, and in Cubasis AV they are numbered from 1 upwards. Your instrument might use some other numbering scheme, so you might need to experiment a bit before you get the right sound.



- If you are using a soundcard with a built-in synthesizer that supports SoundFonts, such as the Creative Labs AWE series, you could also use the Patch pop-up menu to select sounds (see page 158).

Click

Recording into a sequencer is done in time with a metronome click. So, to make sure you hear the metronome, check that the Click button is activated. If it isn't, click on it.

Click activated on the Transport bar.

This activates a click directly from the computer, and/or a MIDI metronome, depending on the settings in the Metronome dialog.

Tempo and Time Signature

To set a Tempo and Time Signature for your recording, proceed as follows:

1. **Make sure the Master button on the Transport Bar is turned off.**
   You need to activate the Master (Track) if you want tempo changes in your song. Otherwise it is best turned off. See page 110.

2. **Set a Tempo and a Time Signature of your choice in the Tempo/Time Signature box on the Transport Bar.**

Recording from a specific point

1. **Set up the Left Locator to where you want the recording to start and the Right Locator to where you want it to end.**
   Make sure the Cycle button is deactivated.

Cycle deactivated on the transport bar.

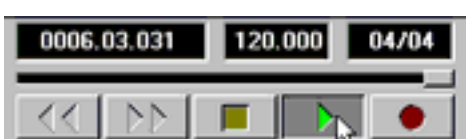
2. **Click on the Record button or press [*] on the numeric key pad.**

3. **After the count-in, start playing your MIDI instrument.**

4. **When you are done, click the Stop button.**
   A Part appears on the Track.

5. **Click Stop again to return to the beginning of the recording, and click Play to listen to what your performance.**

   Now all you have to do to hear what you recorded, is to click the Play button, or press [Enter] on the numeric key pad.



Redoing the Recording

If you aren't satisfied with the recording, you can try either of the two following methods:

Using Undo

If you haven't made any changes to the Arrangement since you recorded, you can simply Undo the recording by selecting Undo from the Edit menu. Remember you can only Undo your last action.

Deleting a Part

You can delete a recording (a Part) by clicking on it and selecting Delete from the Edit menu or pressing [Backspace].

Recording more on the same Track

If you wish to record more on the same Track, proceed as follows:

1. **Set up the Left Locator to where you want the new recording to start and the Right Locator to where you want it to end.**

- You can't activate recording if the Locators are positioned in "reverse order".

---

2. **Activate Recording by clicking on the Record button or pressing [*] on the numerical keypad.**

   You will hear a count-in just as you did the first time, and then recording starts from the Left Locator position.

   When you have finished recording, you will probably get a new Part, after the first one.

The second Part appears after the first.

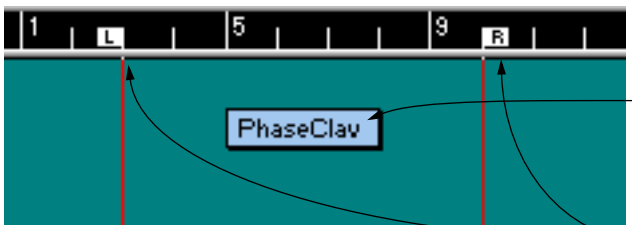
You may also start recording from Play mode (“Punch In”), see page 78.

How Parts appear when you record

When you record, the following rules apply:

- **Recording from one point to another creates a Part that spans these two points.**
- **Recording again on the same Track, between the same points or within the Start and End points of the existing Part creates *no* new Part.** The music is added to the existing.

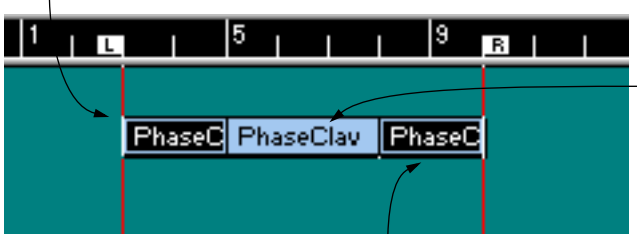
- **In other cases (like starting recording in an empty section of the Track, recording over Parts and recording out of existing Parts into empty areas of the Track), new Parts are only created where there weren't any before.** An example might clarify this:



You have an existing Part starting at 5.1.0 and ending at 8.1.0.

You start the new recording at 3.1.0 and end at 10.1.0.

This creates a new Part starting at 3.1.0 and ending at 5.1.0...



...the old one between 5.1.0 and 8.1.0 is kept, but music gets added to it...

...and finally there is a new Part created between 8.1.0 and 10.1.0.

Recording the next Track

To record on the next Track, proceed as follows:

1. **Select the next Track by clicking on its name field.**

2. **Select a sound for this recording, just as with the first.**
   Again, this can be done either on the front panel of the instrument or from the Inspector - it all depends on your instruments and which method you prefer.

3. **Set the Left Locator to the position where you want the recording to begin, and the Right Locator to the position where you want it to automatically end.**

4. **Activate Recording, wait for the count-in and start performing.**
   Now, if you have everything set up OK, you should hear your first Track while you record the second.

Activating Recording from Play mode - Punch In and Out

As with Audio Tracks, you can Punch In and Out on your MIDI recordings, following these rules:

- **Punch In is done manually, by activating recording anytime during playback.**
- **Punch Out is either done manually, by deactivating recording without pressing the Stop button, or automatically, when the Song Position passes the Right Locator.**

About punching in on long notes

When you activate recording in Cubasis AV, already recorded notes are never cut off, they will play to their end just as they did before you started this recording.

About punching in on Controller or Pitch Bend data

Watch out when punching in on recordings with Pitch Bend or Controller data (modulation wheel, sustain pedal, volume etc), since this may lead to strange effects (sustained notes, constant vibrato etc).

5

How Cubasis AV handles audio and MIDI

Why you should read this Chapter

This chapter contains some details and background theory about how Cubasis AV handles audio and MIDI, as well as some terminology used throughout this manual and in the program. Please take the time to read this, as it will aid you in using the program in the most effective way (when working with audio, you should also read the chapter “Optimizing Audio Performance” for best results).

Audio Channels vs Tracks

Many audio recording systems do not make a difference between audio channels and Tracks, which is the way a regular tape recorder works: one channel - one Track. Cubasis AV however, has a much more flexible approach to handling audio, as we shall see. This is important to note, especially if you have previously been working with a system where Tracks and Channels are one and the same thing.

Audio Channels

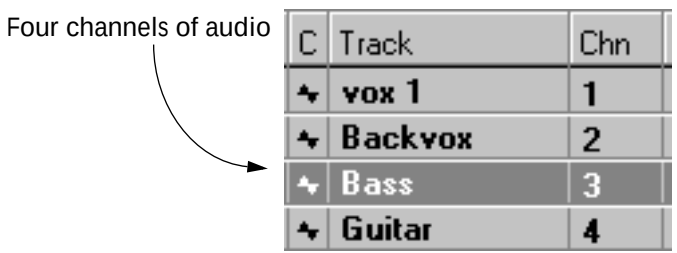
An audio channel plays back one audio recording at a time.

In Cubasis AV, the number of audio channels you have access to is limited by your computer’s processing power, the amount of free RAM and the speed of the hard disk (see page 418). However, the maximum is 8 stereo channels.

The number of audio channels puts a limit to how many audio recordings can be played back at the same time. For example, in a four channel system, you could play back:

- One lead vocal recording (one channel), plus
- One backing vocal recording (one channel), plus
- One mono bass recording (one channel), plus
- One mono guitar recording (one channel)...

...all at the same time.



Mono/Stereo

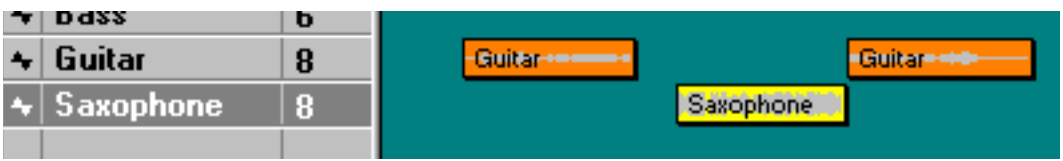
In Cubasis AV, an audio channel can play back either mono or stereo files, it doesn't matter which. The same Track can play back a mono file in one section of the Song and a stereo file in another. In essence, this means the audio channels are all stereo.

Tracks

An Arrangement can contain up to 64 Tracks. In the “Chn” column, you set an Audio Track to play back on a certain audio channel, just like you set MIDI Channel for a MIDI Track.

Setting Two Tracks to the same Audio Channel

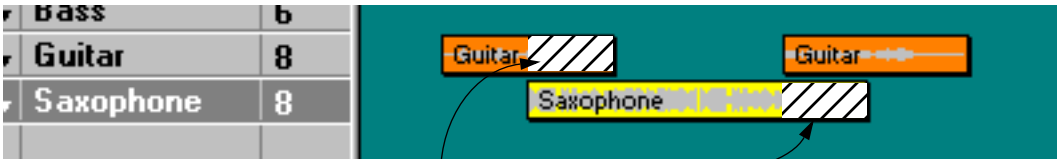
You can set things up so that two Tracks use the same audio channel. This is not a problem as long as there is no audio happening at the same time, on the two Tracks. For example like this:



Here, the Guitar Track plays through the verses and the saxophone Track plays in the chorus. Since the Parts don’t overlap, both Tracks can have access to the same audio channel during playback.

However, if there is any overlap between the two – if, for example, the saxophone starts playing in the middle of the guitar, the two Tracks will compete for the single audio channel, and only one of them can use it at the same moment. In this case, the “latest” recording will always “steal” the audio channel, as described in the illustration on the next page.

The guitar will play until the sax Part starts.
Then the sax will be heard instead.



These sections will not be heard!

Audio Files

When you record, your audio card digitizes the audio signal coming from the microphone (or other sources) and stores the digital data as files on your hard disk.

One File per Channel

One file is always created for each single recording and each audio channel you record on.

File Format

The audio files created by Cubasis AV are Wave files (WAV), the most common audio file format for the PC. It is also possible to import and export audio files in AIFF format.

Since practically all Windows audio processing programs read and write Wave or AIFF files, this allows you to process your Cubasis AV files in other programs, and import files that have been created elsewhere, into Cubasis AV. See page 233 for information about importing and exporting files.

Audio Files are big

Audio files are comparatively large, compared to Cubasis AV Song files, MIDI files, or for example, word processor files. For each minute of recording at 44.1 kHz mono, you will use up 5 MBytes of hard disk storage per mono audio channel. This means that to record continuously on four channels for three minutes, you will need 60 Mbyte of free hard disk space (5MByte * 4 channels * 3 minutes = 60MByte).

Take good care of your Audio Files!

This can not be repeated too many times: Back up your files! Hard disk crashes are a well known fact in the computer industry, and the only way to insure yourself against any disasters is to maintain a meticulous back-up scheme. If you work professionally, we suggest you invest in an removable disk based, DAT based or other back-up system and that you keep multiple copies of all files.

Audio Segments and Events - Non-Destructive Editing

Cubasis AV is a random access based, non-destructive audio recording system – and even if that sounds like gibberish, you should be happy about it, as you will soon find out.

Non-destructive editing

Let's say you have recorded a couple of minutes of guitar. During the first verse, there happens to be a brilliant section that you would like to use again in all the other verses. As you may know, this is possible using the "Copy and Paste" techniques employed in most computer programs.

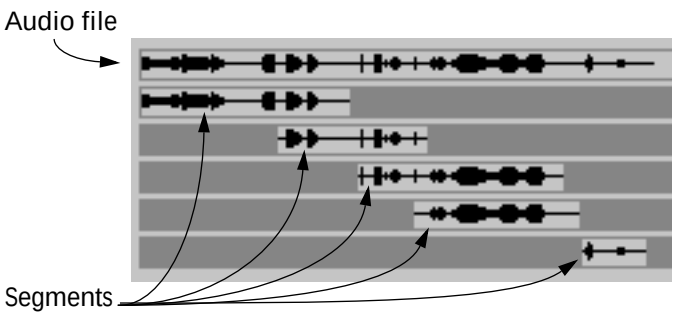
However, reusing material over and over again, normally wastes computer memory and/or hard disk space. With Cubasis AV it doesn't!

If you "cut out" a section of audio, and paste it in, over and over again in the song, you are simply instructing the program to use the same portion of the audio file in many places, without actually copying the file. This is made possible via Cubasis AV's use of *segments*.

Segments

A segment is a specification for a section of an audio file. The segment contains information about where in the audio file to start playing and where to stop. It might be that the segment plays the entire file, or it could also be that it just plays a couple of seconds somewhere in the middle of the file.

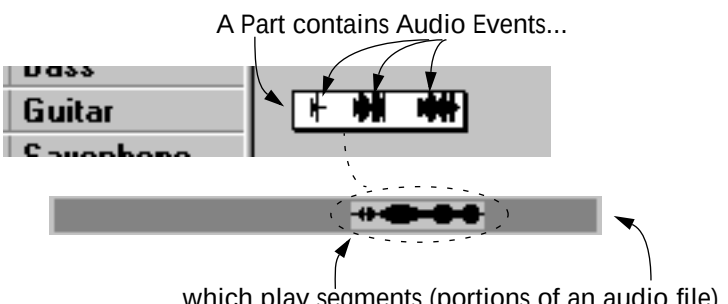
You can create as many segments as you like, from the same file, as the example below shows.



Audio Events

To actually play back a segment in your Song, you need to place an *Audio Event* in the Song. Each Audio Event plays a certain segment.
Audio Events and segments are of course automatically created as you record, but you can also manually create events and segments when you are editing or assembling recorded material.

In many cases, you will not “feel” any difference between handling Audio Events and segments, but there is one. For example, an Audio Event specifies where to start playing some audio, but the segment specifies the duration of playback. Also, you might delete Audio Events and still have access to the segment it played, so that some other Audio Event can play back the same segment in another part of the song. When there is an important difference between these two, this manual will tell you.



MIDI Inputs

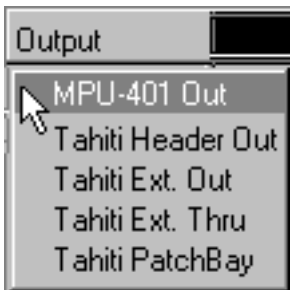
Cubasis AV records from all active MIDI Inputs at the same time. In essence, this means you don’t have to care about selecting or activating MIDI Inputs. However, if you have multiple interfaces and want to deactivate an input for some reason, you could do this by quitting Cubasis AV, launching the application “setupmme” in your Cubasis AV folder and setting the Input to “Inactive”.

MIDI Outputs

Each MIDI Track has a MIDI Output setting. This routes the data on the Track to a physical MIDI Output on one of your MIDI Interfaces.

Standard Interfaces

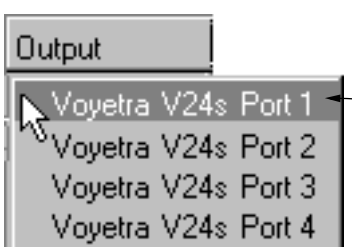
Standard interfaces are identified in Cubasis AV by the names provided by their respective drivers.



Select one of the ports on the Output pop-up menu to make the Track transmit data to that interface.

Multi-port Interfaces

If you have a multi-port interface, each of its MIDI Out connectors appears as a MIDI Output in the Output list. Setting a Track to a certain Output routes all the MIDI Data on that Track to that specific MIDI Out connector on the interface.

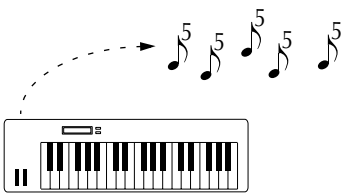


In this case, the Track will transmit all its data to MIDI Output number 1 on a Voyetra multi-port interface.

How Cubasis AV records MIDI Channel data

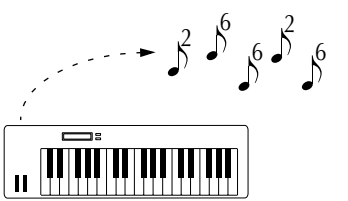
Each MIDI Event that Cubasis AV records has a MIDI Channel number.

If for example you set your MIDI keyboard to transmit on MIDI Channel 5, all the notes, Pitch Bend data, program change or whatever you transmit from it, will have the MIDI Channel number 5.



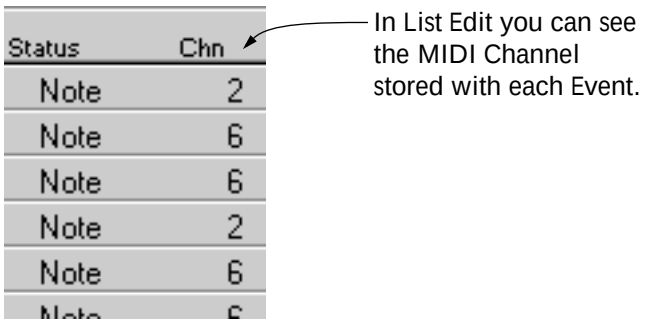
This keyboard transmits on MIDI Channel 5.

Some MIDI devices can transmit on more than one MIDI Channel. In this case the MIDI input data coming in to Cubasis AV will contain mixed channel numbers.



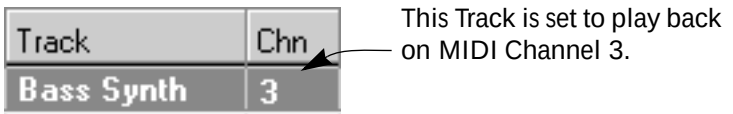
This keyboard transmits on two MIDI Channels, – 2 and 6. It may for example transmit each channel from one side of a split point.

Cubasis AV stores the MIDI Channel with the Event. If for example you look in List Edit (which you will learn about later in this manual), you can see the MIDI Channel for each Event that has been recorded.

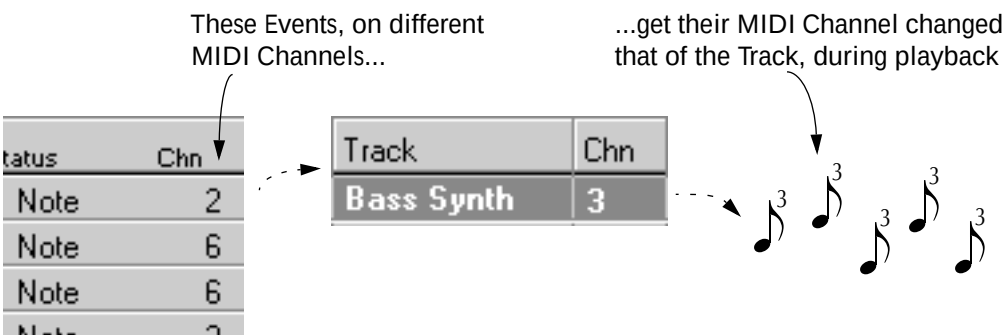


Rechannelizing – The MIDI Channel setting for the Track

When you play back a recording, you want it to be routed to a certain sound in one of your synthesizers. Let's say you have a synthesizer that plays a bass sound on MIDI Channel 3. To route a Track to that sound you set it to MIDI Channel 3.



What now happens is that when you hit play Cubasis AV plays back all the data on the Track, but when doing so it *replaces the MIDI Channel number stored in the Events with that of the Track* – in this example, MIDI Channel 3!



This replacement is done as part of the playback procedure, that is it does not affect the recording permanently. If you check the data on the Track in List edit (as mentioned above) all the Events still have their MIDI channel intact.

This is what we refer to as *rechannelizing* – changing the MIDI Channel of the Events on playback.

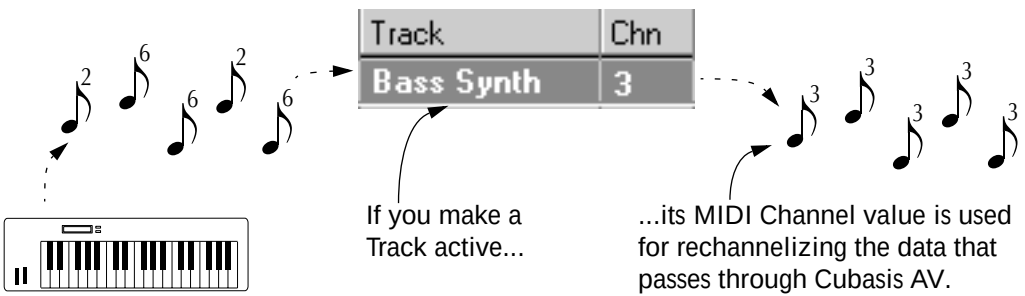
Rechannelizing is very convenient because it lets you forget what MIDI Channel number your keyboard is set to transmit on. Instead, to route a Track to a certain sound, you simply set the MIDI Channel number in the Track list in Cubasis AV.

And, if you decide you want to route the Track to another synthesizer, later, the only thing you have to do is to change the MIDI Channel setting for the Track.

Rechannelizing also works on Thru-put!

The text above only described what happens on playback. But in fact, Rechannelizing happens on the data that passes *Thru* Cubasis AV.

If you click on a Track to activate it, its MIDI Channel setting is used for rechannelizing the data that passes through the program. This automatically routes your playing to the correct MIDI Channel when you are recording, or rehearsing for a recording you are about to make.



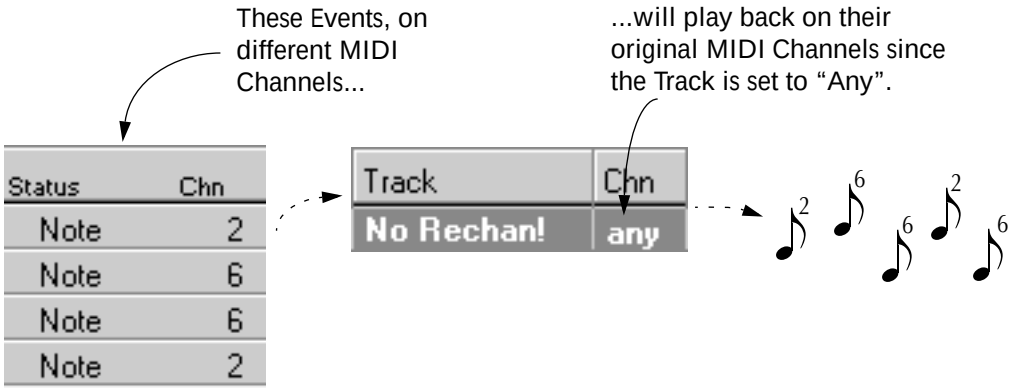
Turning off Rechannelization – MIDI Channel “Any”

There’s one situation where you might not want rechannelizing and that’s when you have a Track that contains Events on multiple MIDI Channels. You might for example have:

- Recorded with a keyboard that can be “split” so that it transmits on two MIDI Channels.
- A guitar synthesizer where each string can transmit on a different MIDI Channel.
- Recorded the output of another MIDI sequencer onto a Track in Cubasis AV.
- Imported a MIDI File of Type 0, which by definition contains only one Track, possibly with Events on several MIDI Channels.

In each of these situations you might want to have the Track transmit on all its MIDI Channels – the MIDI Channels actually stored with each Event, as described above. This would allow you to set up several sounds and play them all from one Track.

To do this, set the Track to MIDI Channel “Any” (the “lowest” value).



Summary

To summarize: When a Track is set to MIDI Channel “Any”, rechannelizing is turned off, and the Events will be transmitted on their original MIDI Channels instead.

6

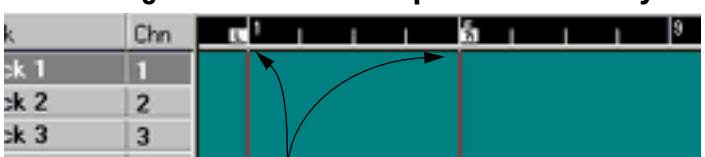
Cycled Playback and Recording

What can I do with the Cycle?

Cubasis AV can play back and record in a Cycle – a loop. You decide where the Cycle starts and ends by setting the Left and Right Locators. When Cycle is active you can repeatedly listen to a section of the Arrangement, and record, adding more on each lap etc. Cycled playback is also convenient when making adjustments in the Monitor mixer or GM/GS/XG Editor.

Setting up the Cycle

1. **Set the Left Locator to the position where you want the Cycle to begin.**
2. **Set the Right Locator to the position where you want the Cycle to end.**



The Left and Right Locator.

3. **Click on the Cycle button so that it gets activated, or press [/] on the numeric key pad.**

The Cycle button.

Playing back the Cycle

When you play back with Cycle activated, the section between the Locators gets repeated indefinitely.

You can use any or all of the functions while the program is playing back. This fact allows you to use Cycled playback for a number of things, many of which you will learn about later in this manual:

- Rehearse a part before recording.
- Try different settings in the Monitor mixer or GM/GS/XG Editor.
- Mute Tracks to try out variations on an Arrangement.
- Make adjustments in the Inspector, apply Quantize etc.
- Make adjustments to the sounds in your instruments or try out a Track with another sound.
- etc., etc.

Recording in Cycle Mode

Cycle Recording works differently for MIDI Tracks and Audio Tracks. The text below describes the procedure and results of MIDI Cycle Recording; Audio Cycle Recording is described on page 103.

With MIDI Tracks

When you record in Cycle mode on a MIDI Track, you can add new notes to the Part for each Cycle "lap". You may for example use it when recording a drum pattern - record the kick drum on the first lap, the snare on the next and so on.

1. **Set up the Cycle and activate the Cycle button.**
2. **Set up a Track to record on.**
3. **Click the Record button.**
4. **After the count-in, start playing.**
5. **Keep playing on each lap of the Cycle until you are done.**
   The new notes are added to the existing ones.

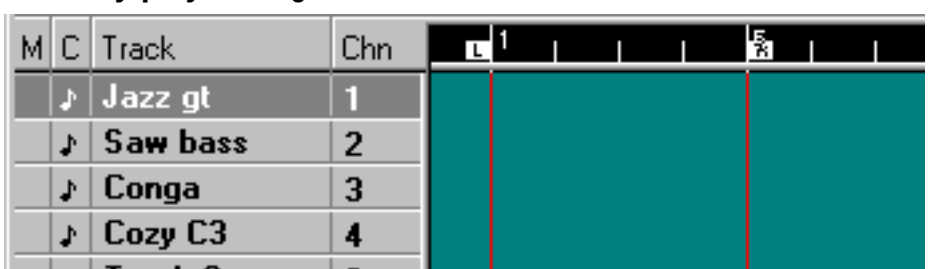
- If you punch out manually by clicking the Record button after each recorded lap, you can listen to the latest recording, and use the Undo command to delete it if you are not satisfied. Then, simply punch in again and try again on the next lap.

6. **Stop Cubasis AV or punch out manually by clicking on the Record button again.**

Switching MIDI Tracks while recording

You can record on more than one Track while in the Cycle (this only works with MIDI Tracks):

1. **Set up a few Tracks on which to record. Also set up the instrument(s) so that they play the right sounds on these MIDI Channels.**



A few Tracks set up for recording a four bar groove.

2. **Enter recording in Cycle mode.**
   Record on the first Track.

3. **Without stopping, select a new Track in the Track list or use the [↑] and [↓] keys to step through the Tracks.**
   Selecting a new Track automatically routes your playing to the new sound.

4. **Record on this second Track as with the first.**

5. **Keep recording on different Tracks until you are finished.**

6. **Stop Cubasis AV or punch out manually.**

With Audio Tracks

When you record in Cycle mode on an Audio Track, the new music is not simply added to the old. Instead you will get a separate "take" for each recorded lap, and can decide afterwards which one to use. Let's say that you want to record an instrumental solo passage or a lead vocal:

1. **Set up the Cycle and activate the Cycle button.**

2. **Set up a Track to record on.**

3. **Click the Record button.**

4. **After the count-in, start performing.**
   For each lap, try a new take, until you are satisfied.

5. **Stop recording.**
   You will find that all your audio "takes" are lined up as one long Audio Event in one long Part, as if Cycle had been turned off for that Track only. Now you need to cut up this long Part into several smaller Parts, one for each take:

6. **Select the Scissors tool from the toolbox, hold down [Alt] and click on the recorded Part, at the position of the Right Locator.**
   The Part will be split into several Parts, each one as long as the Cycle and containing one take.

7. **Listen to each of the Parts and decide which one to keep.**
   To make this easy, a good idea is to create new Audio Tracks (so you have one for each take), and position all the Parts between the Left and Right locator, but on different Tracks. Then click in the "M" column to Mute all the Audio Tracks except one - the one with the take you want to listen to. You could also use the Solo function to quickly switch between Tracks with different takes (see the chapter "Mute and Solo").

8. **Move the selected Part into place, on the right Track, between the Left and Right Locator.**

9. Select the other Parts and press [Backspace] to erase them.
This will not remove anything from your hard disk, only the Parts from the Arrange window. If later you want to permanently remove the unused takes from your hard disk, you need to use the “Erase Unused” command in the Pool, as described on page 228.

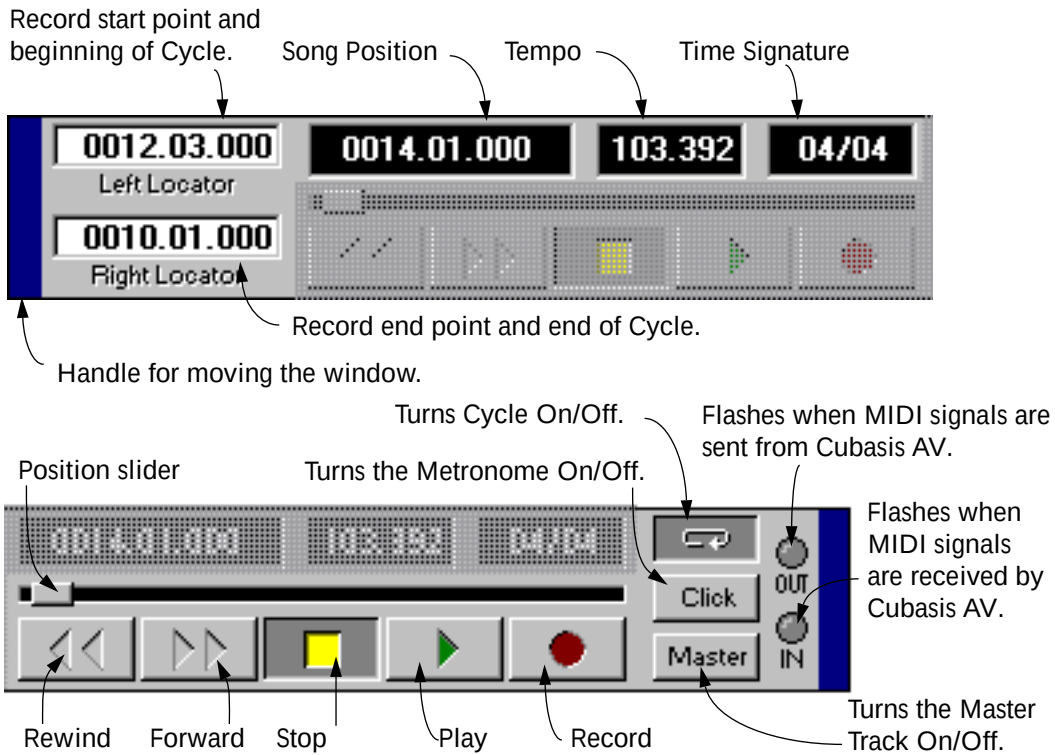
- As long as you don’t delete the unused takes permanently, they will be available as segments in the Pool. This means that you can drag them into the Arrangement and use them later if you wish. See page 235.

7

Playback, Tempo and the Transport Bar

The Transport Bar

Below, you will find a brief description of each control on the Transport Bar:



Hiding and showing the Transport Bar

To hide the Transport Bar, either select “Hide Transport” on the Windows menu or press [F12] on the computer keyboard. To bring it back, select “Show Transport” from the Windows menu or press [F12] again.

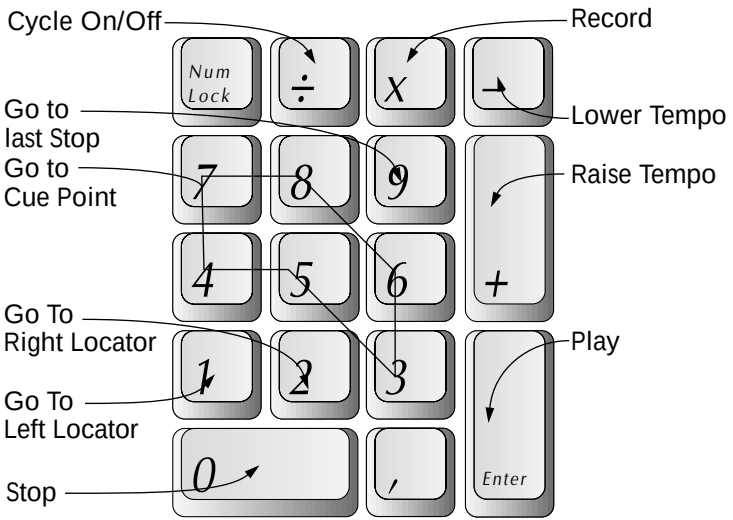
When the Transport Bar is hidden, you can still access all its functions via the computer keyboard. See below for a list of Transport Bar commands.

Moving the Transport Bar

You can put the Transport Bar anywhere you want it, by dragging the handles. It will always stay on top of the other Cubasis AV windows.

The Numeric Key Pad

The numeric part of the computer keyboard is used for many Transport Bar operations. Some of these are described in more detail later in this chapter.



In addtion to this, the Page Up and Page Down keys function as Fast Forward and Rewind and the Space bar also functions as Stop button.

Basic Tempo and Time Signature Handling

Transport Bar and Master Track Tempo

There are actually two sources for the tempo in Cubasis AV:

- When the song uses a steady tempo throughout, you don't need to use the Mastertrack and can have the Master button on the Transport Bar turned off and simply set the right tempo directly on the Transport Bar. The tempo can be adjusted at any time, even while playing back.
- When the song contains tempo changes, you need to use the Master Track, (which is Cubasis AV's tempo Track and more!). For those tempo changes to actually "happen" on playback, the Master button on the Transport Bar must be activated. This is all discussed in the chapter "The Master Track".

The Tempo setting on the Transport Bar is used.

The Tempi set on the Master Track are used.

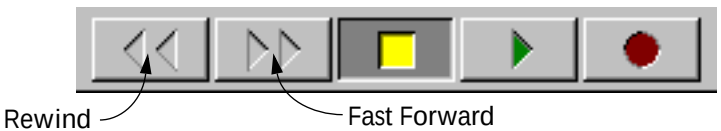
Setting the Transport Bar Tempo

The tempo on the Transport Bar is adjusted like any other value (see page 22 in this book). The value is in BPM (Beats Per Minute). The integer and fraction part can be adjusted separately, if necessary.

Setting the Song and Time Position

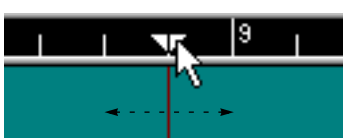
Using Fast Forward and Rewind

The Song Position can of course be moved using Fast Forward or Rewind. If you hold down [Shift] while clicking the button, Rewind/Fast Forward is much faster.



By moving the Song Position in the Ruler

You can drag the Song Position Pointer directly in the ruler simply by pointing at the triangle, pressing the mouse and dragging left or right.

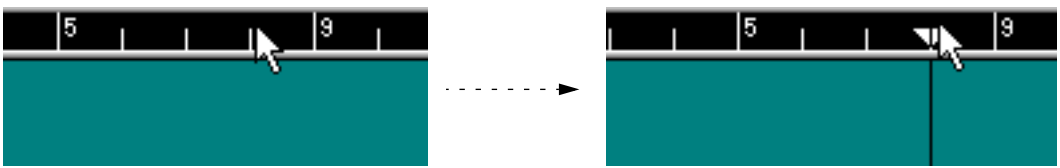


Dragging the Song Position.

By double clicking in the Ruler

If you double click somewhere in the ruler, the Song Position Pointer is moved there.

Double click in the ruler... ...to move the Song Position Pointer.



By using the Position slider

The position slider is located on the Transport Bar. You can drag the handle or click directly somewhere on the line to move the handle there.

The range of the slider is relative to the length of your song. This means that if you drag the slider all the way to the right, the Song Position will be moved to the end of the last Part.

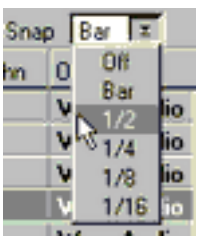
Dragging the position slider.

About the Snap Value

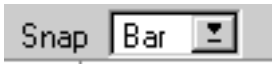
When you change the Song Position in the ruler or by using the position slider, the Snap value helps you find exact positions quickly. It does this by limiting the possible points for positioning to Bar, half note, quarter note, etc. Snap can also be set to Off; then all movements are unrestricted.

The Snap value is set with the Snap pop-up at the top of the Arrange window.

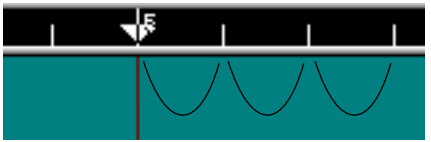
Value	Description
Off	Any position can be used.
Bar	Movement is restricted to exact bar lines.
1/4 to 1/16	Movement is restricted to the selected note value.



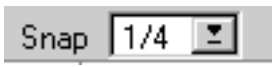
The Snap pop-up.



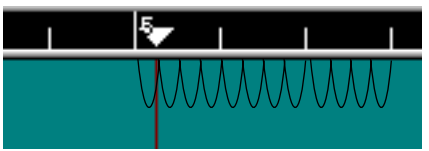
If Snap is set to Bar...



...the Song Position can only be dragged to exact bar lines.



If Snap is set for example to 1/4...



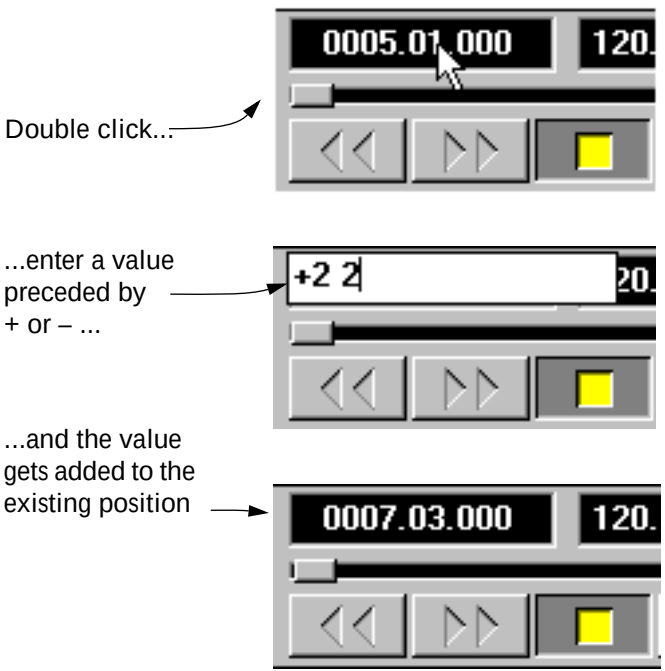
...the Song Position can be put on any quarter note position.

Changing Position values on the Transport Bar

You can adjust the Position values on the Transport Bar as described in the chapter “Basic Methods”. The Song pointer is moved accordingly.

Making relative Position changes

If you double click on either position value and enter a new one, preceded by a “+” or “–” character, the song position is changed accordingly.



Returning to the beginning of the Song

If the Song is stopped and you click the Stop button again (or press [0] on the numeric key pad), the following happens:

- The Song Position is moved to the Left Locator.
- If the Song Position is already at the Left Locator or to the left of it, the Song Position is moved to the beginning of the Song.

This means that you can always click twice on the Stop button to return to the beginning of the Song.

Going to the left side of the window

If you press the [Home] key on the computer keyboard, the Song Position Pointer is moved to the left side of the window.

Going to the last Stop Position

If you press [9] on the numeric key pad, the Song Position moves to the place you last stopped at.

Moving to the Locators

- If you press [1] on the numeric key pad, the Song Position is moved to the Left Locator.
- If you press [2] on the numeric key pad, it is moved to the Right Locator.

Using Cue Points

Cue points are used to quickly locate to any position. If for example you often find yourself jumping to the beginning of the first chorus, set up that position as a cue point.

Programming Cue Points

1. **Set the Song Position to where you want the Cue Point to be located.**

2. **Hold down the [Shift] key and press any of the keys [3] to [8] on the numeric key pad.**
   The key is now programmed with that position.

Locating to Cue Points

If you press any of the keys [3] to [8] on the numeric key pad, the Song Position is moved to the position programmed for that key.

Cueing

Cueing is when you fast forward through the music while playing it. You might have done this on a multi-track tape recorder. The big difference with Cueing in Cubasis AV is that the music is played back with normal pitch.

● Cueing only works with MIDI Tracks; Audio Tracks are silenced during Cueing.

1. **Hold down the [Control] key.**

2. **Click and hold down the mouse button with the pointer over the Fast Forward button.**

- **To change the speed of cueing, drag the mouse left/right.**

Locators

As described in the previous chapters, the Left and Right Locator are crucial for recording, setting up a cycle, etc. There are several ways of setting the Locator positions:

Setting the Locators by clicking in the Ruler

1. **Set the Snap value.**
   The Snap value restricts the positions to which you can move the Locator, as with the Song position, see page 114.

The Snap pop-up.

2. **Click somewhere in the ruler with the left mouse button, to move Left Locator.**
   The Locator appears at that position. To move the Right locator, click with the right mouse button.

Setting the Locators on the Transport Bar

You can also adjust the Left and Right Locator position by changing the numerical values in the Locator boxes on the Transport Bar.

Making relative Position changes

Just as with positions (see page 116 in this book) you can double click and enter a new value, preceded by a “+” or “–” character. When you hit [Return] the Locator is moved relative to its current position.

8

Managing Tracks

What can I do with Tracks?

The Track is one of the most basic concepts in Cubasis AV. Every time you record something in Cubasis AV, the recorded material is placed on a Track. You can have up to 64 Tracks in each Arrange window, and you can easily move or copy material between Tracks, as long as they are of the same type (MIDI or Audio).

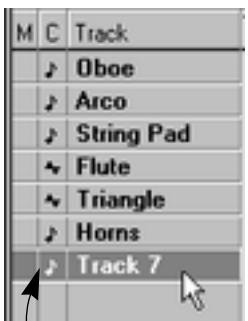
When you are working with audio, different Tracks can be set to play back on different audio channels, which is essential if you want several audio files to be played back simultaneously (as described in the chapter “How Cubasis AV handles audio and MIDI”). In MIDI recording, the most obvious reason for putting the recorded material on different Tracks is perhaps that you want to have your music played back by different “instruments” - or maybe rather by different sounds on a MIDI sound module or keyboard. But there are also many other advantages of working with multiple Tracks.

Creating Tracks

Create a new Track when you want to add another “layer” to your recording. You might for example want to add another audio or MIDI recording, or make room for an alternative version of a part in your music. There are several ways to create a new Track:

- **By double clicking in the Track List.**

Double clicking in an empty part of the Track List...



...creates a new Track.

- **By selecting Create Track on the Edit Menu.**
- **By pressing [Control]-[T] on the computer keyboard.**

● The maximum number of Tracks in an Arrangement is 64.

Properties of the new Track

Track Type

There are two types of Tracks, Audio Tracks and MIDI Tracks. If you create a Track using any of the above methods, it will get the type of the Track that was previously selected. If you start with an empty Arrange window, the first Track you create will be a MIDI Track. You can easily switch type for any Track as long as it doesn't contain any Parts (see page 126).

Track Name

If you start with an empty Arrange Window (with no Tracks), and create a new Track, it gets the name "Track 1". Next time you create a New Track, this gets the name "Track 2" and so on. You can rename a Track at any time (see Naming Tracks, below).

Audio/MIDI Channel

When you create a Track, it will be set to a channel "one higher" than the previously selected Track, with the reservation that the highest audio channel is 8 and the highest MIDI channel is 16. If you start with an empty Arrange window, the first Track you create will be set to Audio/MIDI channel 1.

Naming Tracks

You can rename a Track simply by double clicking on its current name in the Track List, and typing in a new name.

Selecting Track Class

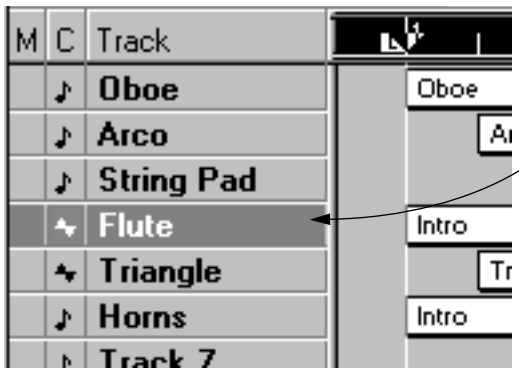
There are two different types of Tracks, called Track Classes: Audio and MIDI Tracks. If a Track contains no Parts, you can select Track Class in the following way:

1. **Press the mouse button with the pointer in the “C” column for a Track.**

2. **Select “MIDI Track” or “Audio Track” from the pop-up menu that appears.**

Selecting Tracks

If you want to record on a Track, change settings for it or perform an operation that affects a whole Track, the Track itself has to be selected so that Cubasis AV “understands” which Track you wish to direct the action to.



By clicking

1. **Click in the name field of the Track you want to select.**

2. **The Track gets inverted (white on black).**
   The Track you have selected is called the “active Track” or the “selected Track”.

By using the keyboard

You may also “move” the selection up or down in the Track List by using the [↑] and [↓] keys on the computer keyboard. This will select the Track above/below the currently selected.

If you press the [↑] key...

...the Track above in the Track List gets selected.

Finally, you may also press [Alt Gr]-[T] on the computer keyboard, and type in the number of the Track you want to select (counted from the top of the Track List).

Changing the order of the Tracks

You can rearrange the Tracks in the list like this:

1. Press the mouse button with the pointer on the Track you want to move. The pointer takes on the shape of a hand.

2. Drag the Track with the mouse button pressed. A dotted outline shows you where the Track will be placed.

3. When you release the mouse button, the Track is moved to its new position.

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

Duplicating Tracks

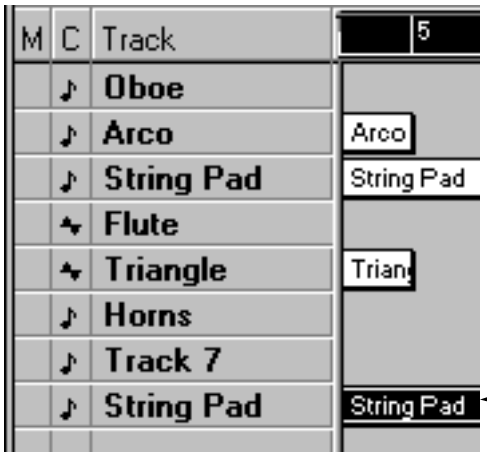
You may make a copy of a Track and all Parts on it.

1. **Position the pointer on the name of the Track in the Track List.**

2. **Hold down [Alternate] on the computer keyboard and press the mouse button.**

3. **Drag the outline of the Track to an empty field in the Track List.**

4. Release the mouse button.



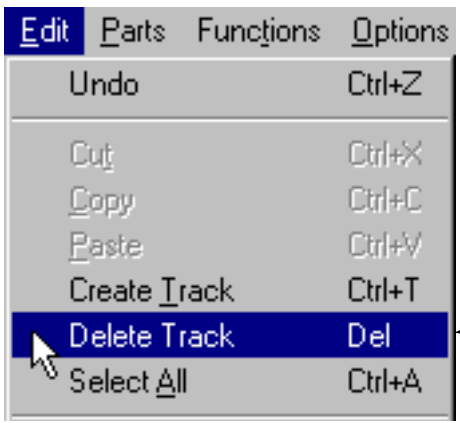
A duplicate of the selected Track is created and placed, complete with Parts, at the bottom of the Track List.

● You can not duplicate empty Tracks.

Deleting Tracks

You may delete a Track and all Parts on it.

1. **Make sure that no Part is selected (inverted).**
   This is to make sure that what you Delete will be a Track, not a Part.



Check that this menu item says "Delete Track", not Delete Parts.

2. **Press [Backspace] on the computer keyboard or select Delete on the Edit menu.**

- If you change your mind, you can undo the Delete Track operation with the Undo option on the Edit menu, or by pressing [Control]-[Z] on the computer keyboard.

9

The Track Columns and the Inspector

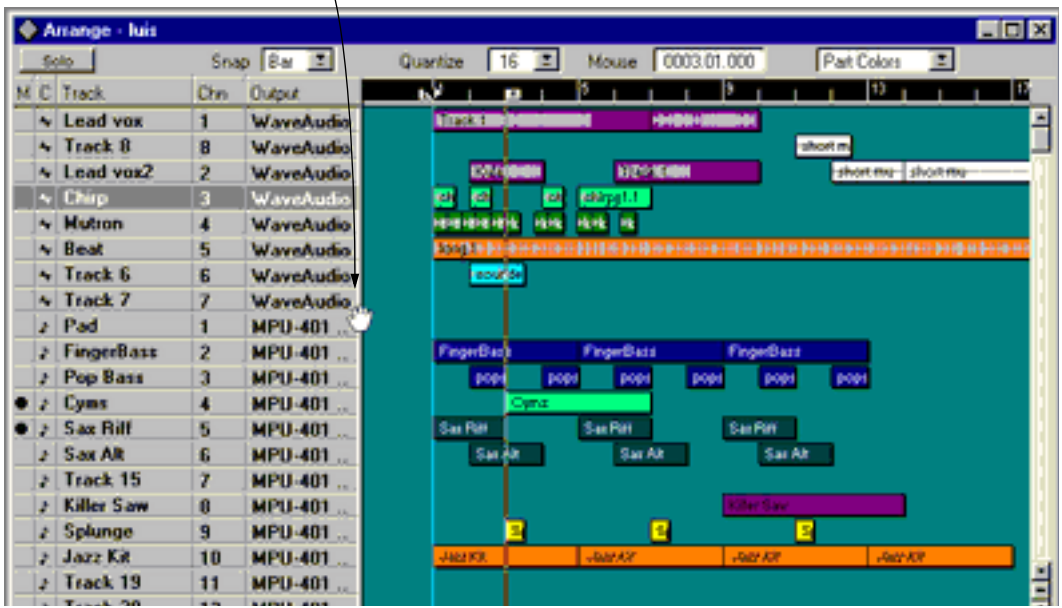
The Track Columns

The Track columns show names and settings for the Tracks. Some of these settings can be changed directly.

Getting the Track Columns to appear

The Arrange Window is divided into two parts, the Track columns to the left and the Part display to the right. To get all of the Track columns to appear, press the mouse button with the pointer positioned above the Divider (the border between the two parts of the Arrange Window) and drag it as far to the right as possible. You should now be able to see all of the Track columns.

The Divider, dragged as far right as possible.



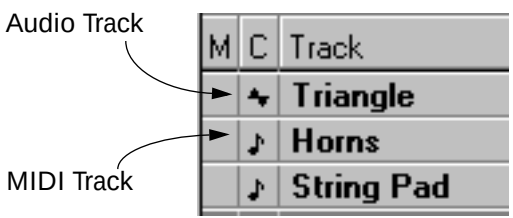
Changing the order of the Track Columns

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

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”.

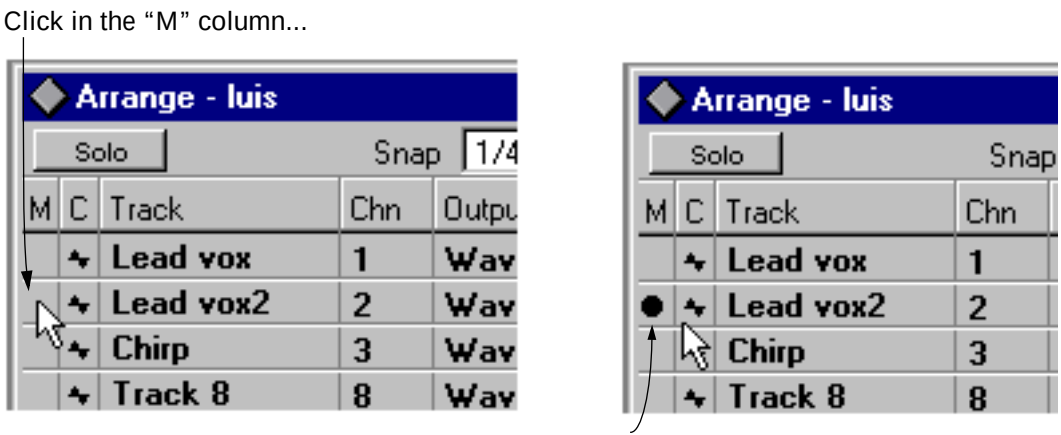
The Class Column

This column (labelled “C”) is used to select Track Class (MIDI or Audio Track - see page 126). The Class for each Track is indicated by a symbol in the C column:



The Mute Column

The Mute column is indicated by an “M”. By clicking in this column, you temporarily “silence” the Track. A black dot is displayed in the column. To make the Track sound again, you just click in the Mute column again. This is described in detail in the chapter “Mute and Solo”.



The Track Column

This column shows the Track's name. To enter or change a name, double click in this field for the relevant Track.

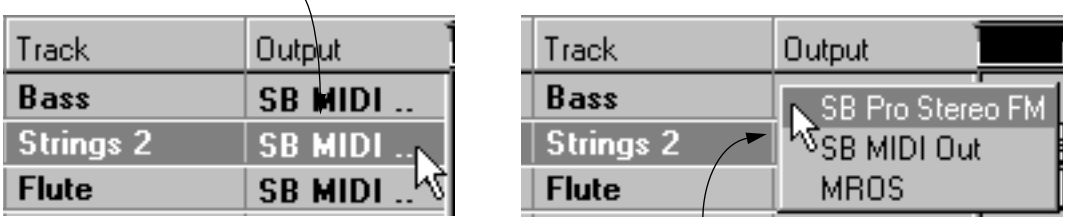
The Chn Column

The Chn column shows the Audio/MIDI Channel for each Track. You may change the channel of a Track at any time. For a full explanation of Audio/MIDI Channels and the effect of changing them, see the chapter “How Cubasis AV handles audio and MIDI”.

The Output Column

For MIDI Tracks, the Output column shows which physical MIDI Output each Track uses (see the chapter “How Cubasis AV handles audio and MIDI”). For Audio Tracks, this column will always show the word “WaveAudio”.

To change Output for a Track, position the pointer in its Output column, press the mouse button...



...and select the MIDI Output you want from the pop-up menu that appears.

- **If you hold down [Control] while you change the Output value, all Tracks will get the selected Output value.**

Using the Inspector

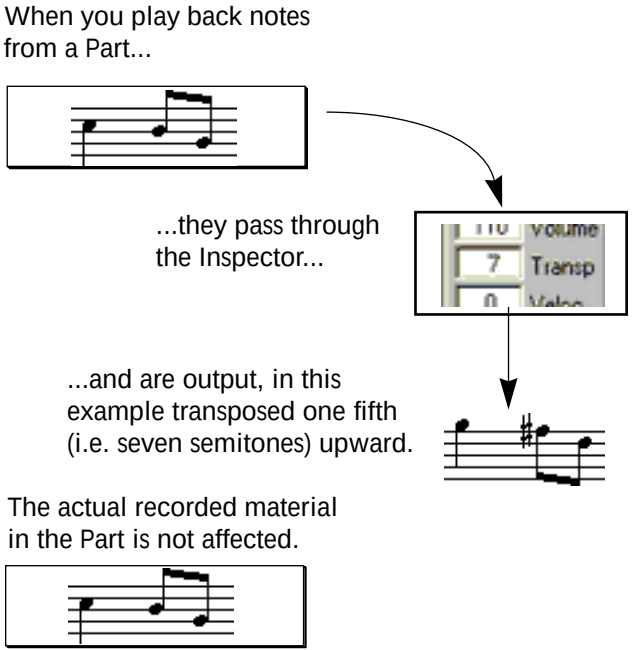
- The information in this section is mostly relevant to MIDI Tracks/Parts only. For Audio Tracks, the Inspector is mainly used to set up the Tracks for recording, as described on page 46.

What is the Inspector?

The Inspector is a part of the Arrange Window. It contains a number of value- and name fields where you can change settings and properties of a Track, or individual Parts on a Track.

There is one important thing to remember before you start working with the Inspector:

- The settings you make in the Inspector will only affect the material *during playback*. You don't actually change the recorded data itself.

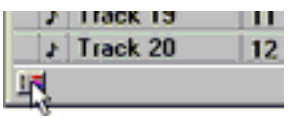


This also means that Inspector settings, such as transposition, are not shown when you edit a Part. To make these settings permanent you need to use the Freeze Play Parameter item on the Functions menu, as described on page 149.

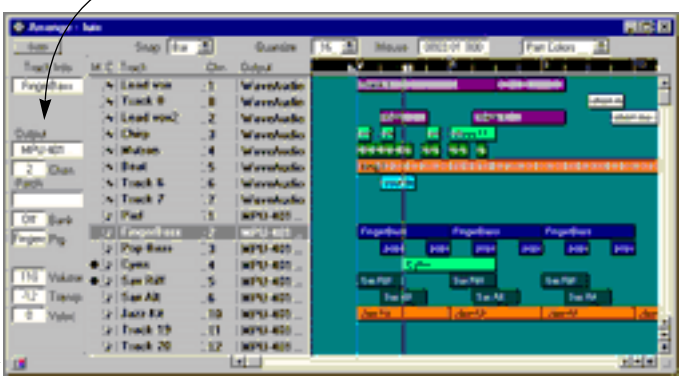
Getting the Inspector to appear

You open the Inspector by clicking on the strip with the little Inspector Icon below the Track column, or by pressing [Alt Gr]-[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. These are described in the following pages.

Click on the Inspector Icon...



...to open the Inspector.



To close the Inspector, click on the Inspector Icon again.

Changing values in the Inspector

By changing values in the Inspector, you make changes to your Parts and Tracks. Some fields are duplicates of settings in the Track columns or the GM/GS/XG Editor, while others can be found only in the Inspector. To get a basic concept of how to use the Inspector, follow the steps below:

1. **Open the Inspector.**

2. **Select a MIDI Track on which you have recorded some music.**

3. **Check that no Parts are selected.**
   The heading of the Inspector should read “Trackinfo” - otherwise, just click on an empty area in the Part Display.

4. **Start playback.**

5. **While the music is playing, try changing the “Transpose” and “Volume” values in the Inspector.**
   The transposition and volume of the played back music will change accordingly.

Making Real-time changes with the Inspector

When you change the value of a parameter in the Inspector, the new value is immediately sent out to the MIDI Output. This will affect not only the sound source assigned to the selected Track, but all MIDI devices connected to the same Output as the Track, and set to receive on the same MIDI Channel.

You may use this feature for setting appropriate values (e.g. volume, velocity etc.) while the music is playing.

What is affected by the Inspector?

This depends on what is selected in the Arrange window. The following possibilities exist:

When a Track, but not a Part, is selected:

When no Parts are selected, the Inspector has the heading “Trackinfo”. The parameter values affect the selected Track, and all the recorded material (the Parts) on it.

The Inspector opened for the Track “Bass”.

When One MIDI Part is selected:

The Inspector has the heading “Partinfo”. The parameter values affect the selected Part only.

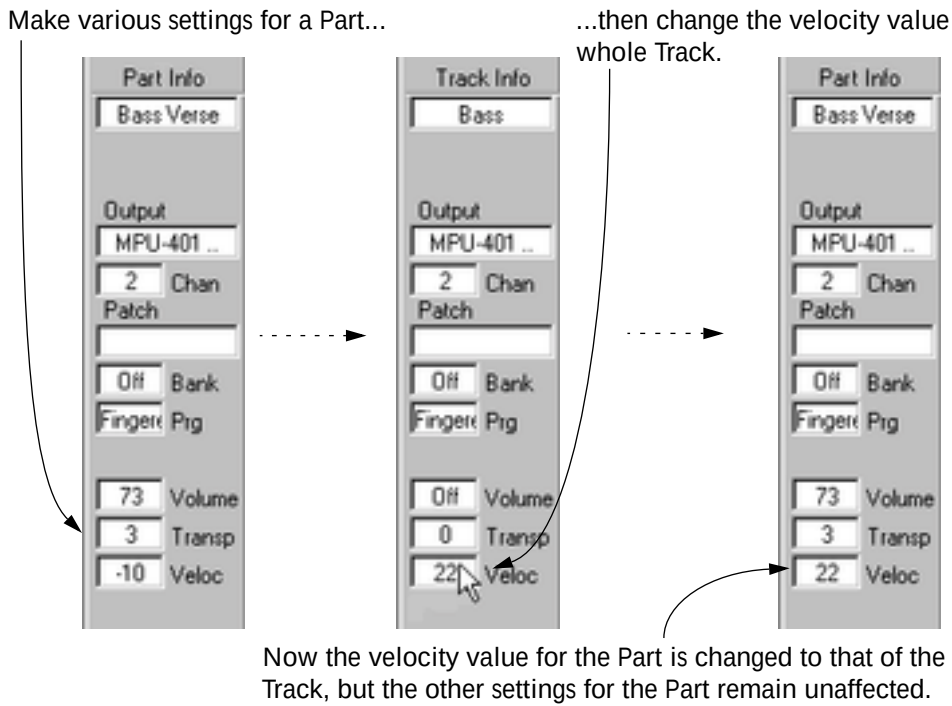
The Inspector opened for the Part ”Bass Verse”.

When Two or more MIDI Parts are selected

The Inspector has the heading “Partinfo”, and shows the parameter values for one of the selected Parts. If you change a parameter the changes will be applied to all selected Parts.

How MIDI Part and Track settings relate

As you have seen, you may change parameter values both for the whole MIDI Track and for individual Parts on the Track. It is the latest change that “counts”. If for example you change the velocity value of a single Part and then set another velocity value for the whole Track, the Part will also get this latest velocity value. Other parameter settings for the Part will remain unaffected.



The Fields and Values in the Inspector

The Inspector contains names, numerical values and pop-up menus. All these settings can be changed using any combination of mouse and keyboard, as usual. Like all other changes, these can of course be done while the music is playing and even while recording.

Audio Parts/Tracks

Parameter	Explanation
Track/Part Name	If a Track is selected, this shows the Track's name. If a Part is selected, this displays the name of the Part.
Output	Always "WaveAudio".
Channel	The audio channel the Track uses, as described on page 80.
Filename	This is the name of the file you are currently recording into. See page 48.
Rec Chn Mode	Use this button to determine whether the next recording on the Track should be in Mono or Stereo, as described on page 46.
Free Space	This shows you how much recording time you have left on your hard disk.

MIDI Parts/Tracks

Parameter	Explanation
Track/Part Name	The name of the selected Track or Part.
Output	The physical Output port for the selected Track or Part.
Chn	The MIDI Channel associated with the Track.
Patch	If you are using a soundcard with a built-in synthesizer that supports SoundFonts (such as the Creative Labs AWE series) you can use this field to select sounds for the synthesizer (see page 158).
Bank	Lets you associate a MIDI Bank Select message with a Track or a Part, to make an instrument switch "program bank" (see page 157).
Prg	Lets you associate a MIDI Program Change message with a Track or a Part, to make a connected instrument switch from one sound to another. If GM, GS or XG Mode is activated in the GM/GS/XG Editor, clicking this field will open a hierarchical pop-up menu, where you can select a GM instrument by name.
Volume	A volume value for a Track or a Part. This setting is sent out as a MIDI Volume message.
Transp	Lets you transpose the notes in a Part or a Track.
Veloc	The value in this field is added to the velocity of the notes played back.

Using Freeze Play Parameters

As mentioned above, the Inspector settings (or “Play Parameters”) does not change the MIDI Events themselves, but works rather like a “filter”, affecting the music on playback. However, sometimes you may want to make these settings permanent, i.e. convert them to “real” MIDI Events in the Part. You might for example want to transpose a Part and then edit the transposed notes in a MIDI editor. For this, you need to use the Freeze Play Parameters item on the Functions menu:

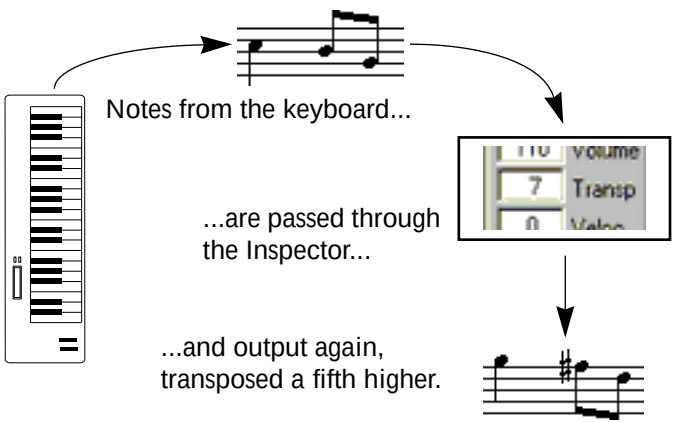
1. **Select the Part(s) with Inspector settings you want to make permanent.**
   If no Parts are selected, all Parts on the active Track will be affected.

2. **Pull down the Functions menu and select “Freeze Play Parameters”.**
   Bank Select, Program Change and Volume settings in the Inspector will be converted to MIDI Events and inserted at the beginning of the Part(s). All notes in the Part(s) will be modified according to the Transpose and Velocity settings in the Inspector, and the Inspector settings will be reset.

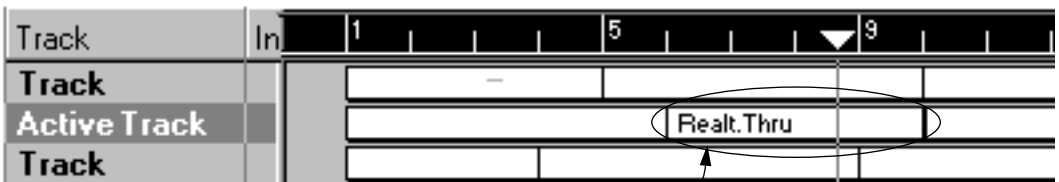
- When you export a MIDI file, all Inspector settings are automatically included in the file, with no need to perform Freeze Play Parameters.

Real-time Thru

In most MIDI recording situations, the Thru function in Cubasis AV is used to “echo” incoming MIDI data via MIDI Out. If you use the Thru function, the MIDI data that Cubasis AV receives 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 (semitones) and play your keyboard, all notes coming out via the MIDI Out are transposed a perfect fifth higher.



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.



The settings for the Part in the “cross” made up by the Active Track and the Song Position are used for real-time “Thruing”.

- It doesn’t matter which Part or Track you have visible in Part Info (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 which determines which Part’s settings should be used for the real-time modification.

The real-time parameters used for modification are Transpose and Velocity.

10

Program Change and MIDI Volume

Why you should read this Chapter

When you arrange in Cubasis AV you will find yourself spending some time selecting Programs and setting Volumes for each instrument. This will be significantly easier if you understand exactly how and where Program Change and Volume can be inserted and the advantage that the different methods have.

- This chapter is not relevant if you only work with audio.

Program Change

Program Change messages are used to switch between sounds in your instruments. By inserting Program Change messages for all MIDI Channels, at the *beginning* of the Song, the instruments will automatically play with the correct sounds when you open and play the Song (if you haven't "re-programmed" your instruments since you played the Song last).

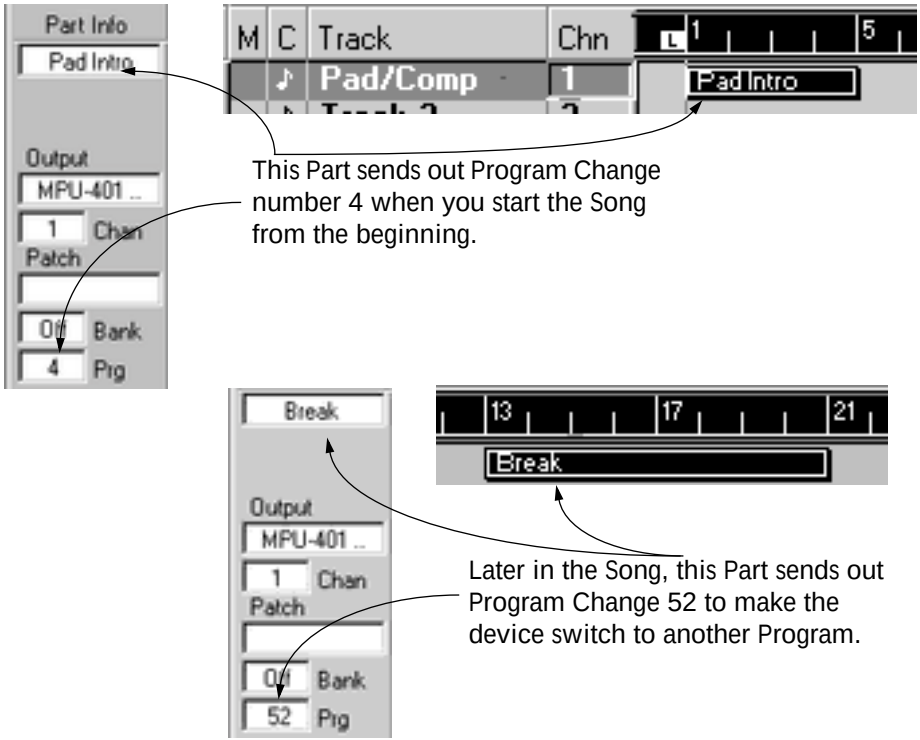
By inserting Program Change messages *somewhere in "the middle"* of a Song, you can use one MIDI Channel for playing several different sounds throughout the Song. This allows you to use "limited MIDI resources" as effectively as possible.

Entering Program Change in the Inspector

You can enter Program Change messages in the Inspector, either for the whole Track or for one Part at a time. If you're not sure how this is done, refer to the chapter "The Track Columns and the Inspector".

- **If you enter a Program Change for *the Track*, this Program Change will be sent out at the beginning of *every* Part on that Track.**
  This might not always be desirable, since some devices shut off their sound momentarily when they receive a Program Change message.

- **If you enter a Program Change message for *a certain Part*, this is only sent out where *that specific Part* starts.**
  For instance you can enter one Program for the first Part on the Track and then another for a Part later in the Song, where you want the device to switch to another Program (see the example on the next page).



- As described in the the chapter “The Track Columns and the Inspector”, the Prg field in the Inspector will show a GM Program name instead of a number, if GM, GS or XG Mode are activated in the GM/GS/XG Editor.

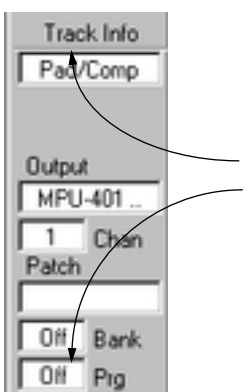
Resetting Program Change

If for example you Copy and Paste or duplicate Parts a lot, Program Change messages might also get copied or moved, ending up in positions where you don't want them. The quickest way to get around this might be to start over from scratch:

1. **Make sure no Part is selected.**

2. **Select the Track for which you want to "reset" Program Change.**

3. **Use the Inspector to set the Program Change to "Off".**
   Even if the box already says "Off", adjust the value up and then down again to make sure all Parts are set to "Off".



Make sure that the Inspector says "Trackinfo" at the top. Then, if you set Program Change to Off, this setting is "copied" to all Parts on the Track.

4. **Now select each Part for which you want a Program Change message, and enter it in the Inspector.**

About Bank Select

With Program Change messages, you are able to select between 128 different programs in your MIDI device. However, many MIDI instruments contain a larger number of program locations. To make these available from within Cubasis AV, you need to use Bank Select messages, a system in which the programs in a MIDI instrument are divided into Banks, each Bank containing 128 programs. If your instruments supports MIDI Bank Select, you can use the Bank field in the Inspector to select a Bank, and then the Prg field to select a program in this Bank.

- Technically, a Bank Select message is actually a combination of two MIDI Controller messages (Controller 0 and 32). However, not all manufacturers follow the MIDI Standard in this aspect; some instruments use Controller 0 messages as a replacement for standard Bank Select messages. If this is the case with your instruments, you need to multiply the value in the Bank field with 128 to select program Banks. Refer to the documentation for your MIDI equipment for more information.

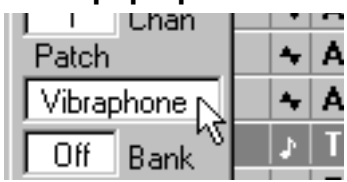
Selecting SoundFont Banks and Patches

If you are using a soundcard that supports SoundFonts, such as the Creative Labs AWE series, Cubasis AV offers a special feature to make it easier to select sounds for the card's built-in synthesizer:

1. **Make sure the card's built-in wavetable synthesizer is selected on the Output pop-up menu.**

2. **Pull down the Bank pop-up menu and select a SoundFont Bank.**
   The Banks are displayed with names instead of numbers.

3. **Instead of using the Program Change (Prg) pop-up menu, pull down the Patch pop-up menu.**



   A list is displayed, containing all the SoundFont names for the sounds in the selected Bank.

4. **Select a Patch from the pop-up menu.**

- Cubasis AV automatically detects an installed SoundFonts compatible soundcard and makes the SoundFonts Patch pop-up menu available, provided that the proper software is installed. This is usually done automatically when installing the card. If in doubt consult the documentation for the card.

Recording or Entering Program Change in the Editors

You can record Program Change messages if you have equipment that can transmit them. This is done as with any other MIDI recording in Cubasis AV, simply enter Record mode and transmit the message (probably by selecting a new Program on the front panel of your instrument).

You can also enter Program Change messages “by hand” in List Edit. Entering Program Change messages in List Edit allows you to put them anywhere you want them, even in the middle of a Part. It also allows you to perform editing functions on them.

Which should I choose - Inspector Settings or “Real” Events?

Well of course, it’s up to you. The only advice we’d like to give is not to mix the two methods unless you are absolutely sure of what you’re doing. For more help in your decision, please check the table below:

Method	Advantages	Disadvantages
Inspector	• Can be viewed and changed in real time from the Arrangement, while the music is playing.	• Always positioned at beginning of a Part.
Recording or entering in List Edit	• Can be entered anywhere in a Part. • Can be edited using all the available edit tools. • Finding the right Program number might be easier by recording a button on the synth front panel than by typing in a number.	• Can’t be changed or displayed from the Arrange window.

Program Change Numbering

Program Change numbers range from 1 to 128 in MIDI. Some instruments use other types of numbering; some count from 0 to 127 and others have the numbers divided into Banks (A 1 to 32, B 1 to 32 etc.). To find the right number to enter in for example the Inspector, consult the device's operation manual or simply experiment until you get it right!

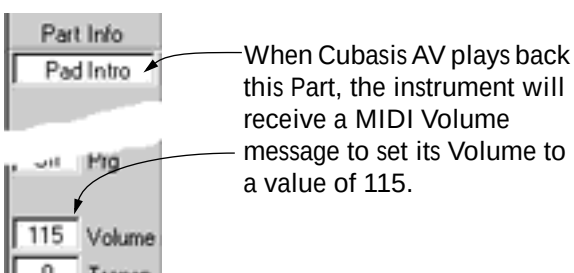
MIDI Volume

MIDI Volume is a MIDI Controller message, Controller 7 to be exact. When a device receives MIDI Volume messages it is supposed to adjust its volume for that MIDI Channel, just as if you had changed it directly from the front panel.

- Some very old synthesizers might not be able to “read” MIDI Volume!

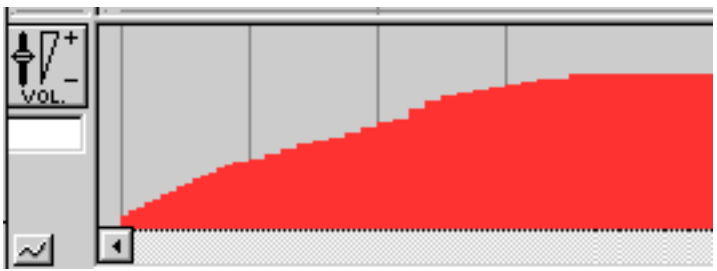
Entering Volume in the Inspector

Just as with Program Change messages you can enter MIDI Volume messages in the Inspector for individual Parts, for example to get a basic mix at the beginning and to introduce volume changes at different positions in the Song.



Entering Volume in an Editor

You can enter single MIDI Volume messages in the List editor. But it is often more useful to use the Controller Display in Key Edit. This allows you to “paint” volume curves, to easily create fade ins and fade outs etc.



A Fade in, drawn in Key Edit.

Which should I choose - Inspector Settings or “Real” Events?

Again – it’s your choice, but the table might give some advice:

Method	Advantages	Disadvantages
Inspector	• Visible directly from the Arrange window. • Can be changed in real time from the Arrangement, while the music is playing.	• Can only be used for “direct changes” not for fades. • Always appear at the beginning of the Part.
Recording or entering into an editor	• Can be entered anywhere in a Part. • You can draw in smooth curves in Key Edit. • Can be recorded from external equipment such as a foot pedal or slider. • Can be edited using all the available edit tools.	• Not visible from the Arrange window. • Can’t be changed from the Arrange window.

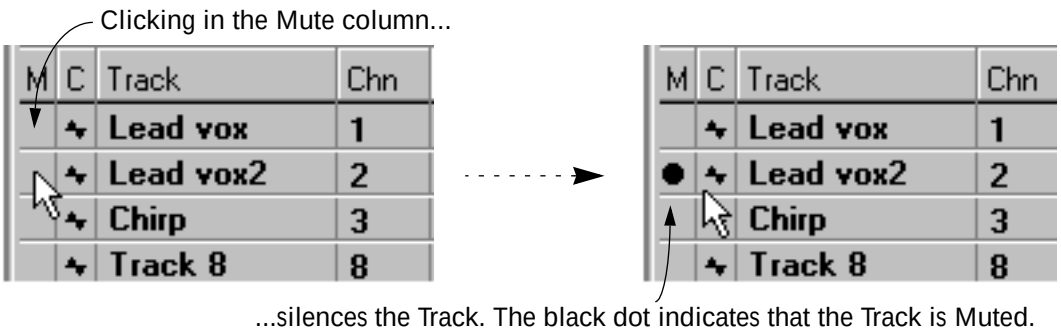
11

Mute and Solo

What is Muting?

Using the Mute function you can silence some of the music without actually deleting it. This is useful in many situations; you may for example want to try out different variations of an Arrangement by muting some parts of the music, or listen only to the rhythm section of a song etc.

Muting a Track

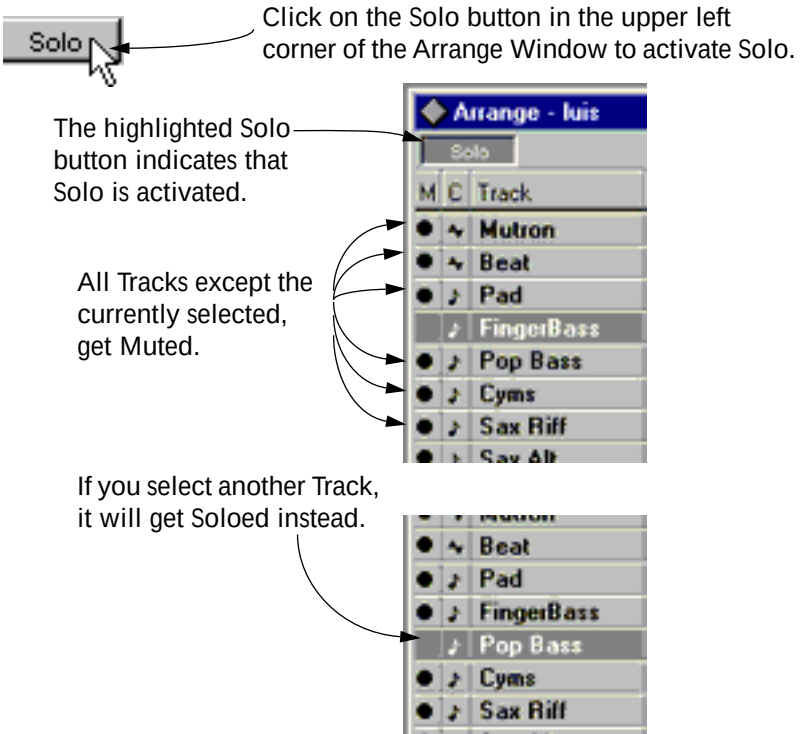


To “unmute” a Track, simply click on the black dot.

- If any notes are sounding at the moment you Mute a Track, they are allowed to play until their end.

What is Solo?

The Solo function works as an “inverted” Mute - that is, if you Solo a Track, all other Tracks get Muted. This is useful if you want to listen closely to the contents of a Track, and don’t want any other music to interfere. Solo a Track like this:



Instead of clicking on the Solo button, you can press [S] on the computer keyboard. 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.

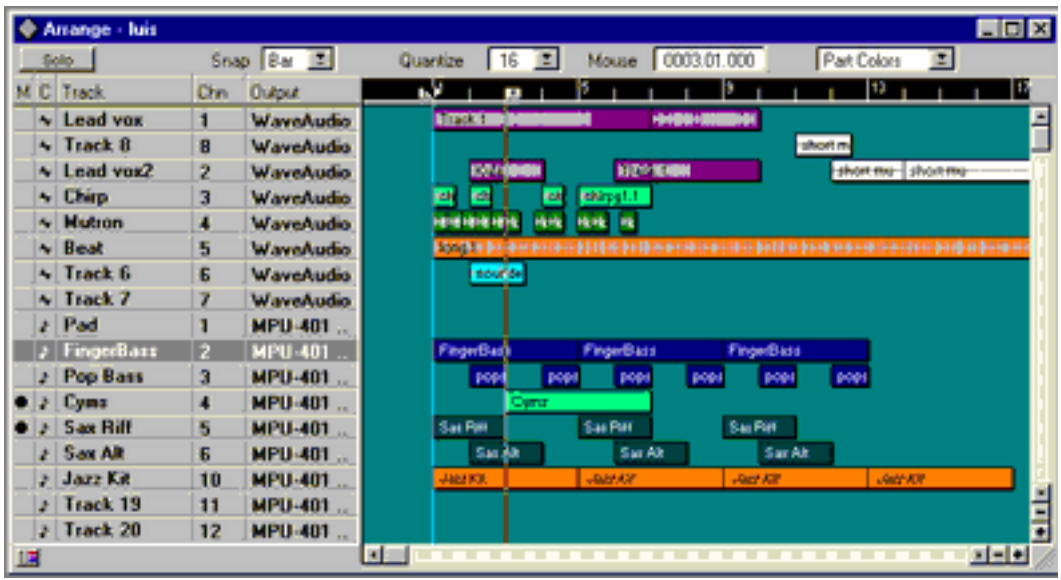
To deactivate Solo, click on the Solo button (or press [S]) again. All Tracks will return to the Mute status they had before Solo was activated.

12

Arrangement Editing

About Parts and Arranging

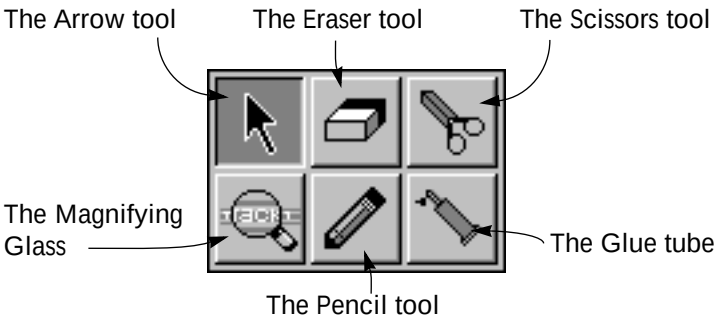
As you have already seen, a Cubasis AV Arrangement is roughly structured in two “levels”: Several *Tracks*, each containing a number of *Parts* . This chapter is about Arrangement editing - in other words, re-arranging Parts. This is done in the right part of the Arrange Window, the area called the Part Display.



The Arrange Window with the Part Display on the right side.

About the Tools

When manipulating the Parts, you will make use of the various tools in the Toolbox.



- **To display the Toolbox and select a tool, click the right mouse button.** The pointer takes on the appearance of the selected tool when moved into the Part Display.

The tools are all described later in this chapter, in the contexts in which they are used.

About Overlapping Parts

Parts on the same Track might overlap or be completely on top of one another. However, there is a big difference between the two types of Tracks:

- **On Audio Tracks, only the Parts that you can *see* are played back.**
  This means that if two Parts overlap, the section that is obscured will be silent.

- **On MIDI Tracks, all sections of all Parts will be played back, no matter if they are visible or not.**
  You can make good use of this feature in many ways:

- Parts which start with an upbeat can overlap the end of the previous Part.
- Small drum ornaments (such as cymbal crashes) can be created as separate Parts and just be put on top of the basic beat Part.
- Duplicate Parts which are used to create delay effects, double sounds and so on, can be put on top of the original Parts.

Creating Parts

Parts are created automatically when you record, but there are situations when you may want to create empty MIDI Parts and “fill them” with Events in one of the editors. This is essential if you want to create music using Step Recording (see page 350). Parts can be created using the following methods:

- **By selecting Create Part on the Parts menu or by pressing [Command][Control]-[P] on the computer keyboard.**
  This will create an empty Part on the selected Track, between the Left and Right Locator.

- **By double clicking with the Arrow tool between the Left and Right Locator.**
  This will create an empty Part between the Locators on the Track you clicked on.

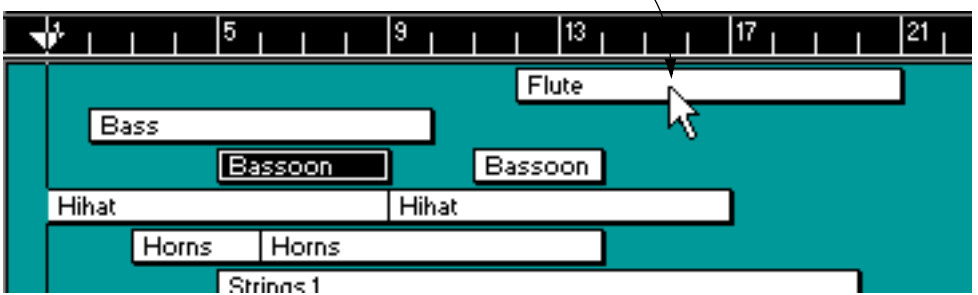
- **By drawing an outline in the Part display with the Pencil tool.**
  This will create an empty Part with the size and position of the drawn outline. Remember that the Snap value applies as usual.

Selecting Parts

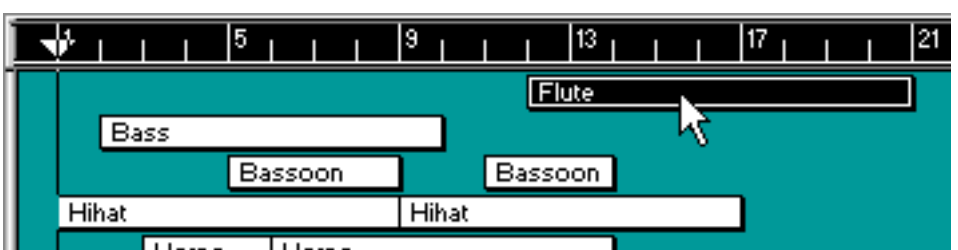
You have to select a Part in order to move, delete or in any way manipulate it. Selecting a Part can be done in several different ways:

By clicking

Clicking on a Part with the Arrow tool...

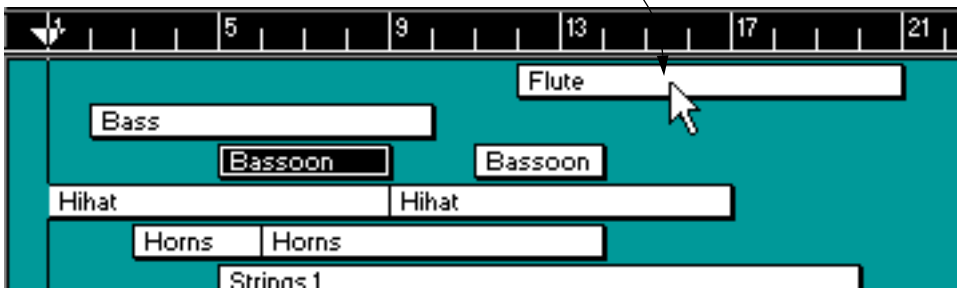


...selects it and deselects all other selected Parts.

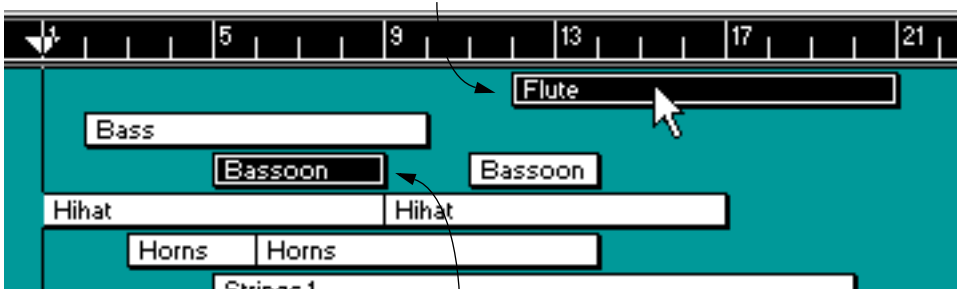


By shift-clicking

Clicking on a Part while holding down [Shift]...



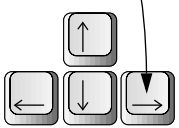
...selects the Part.

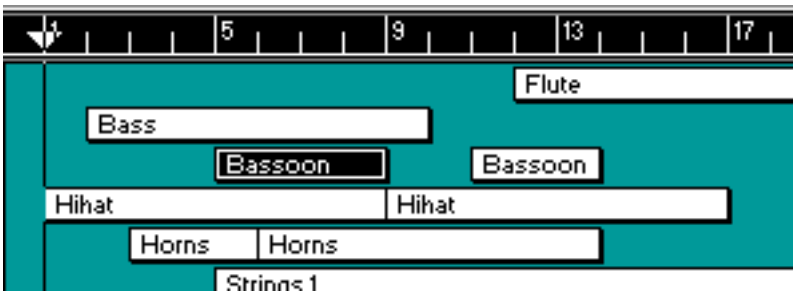


The previously selected Part(s) remain selected.

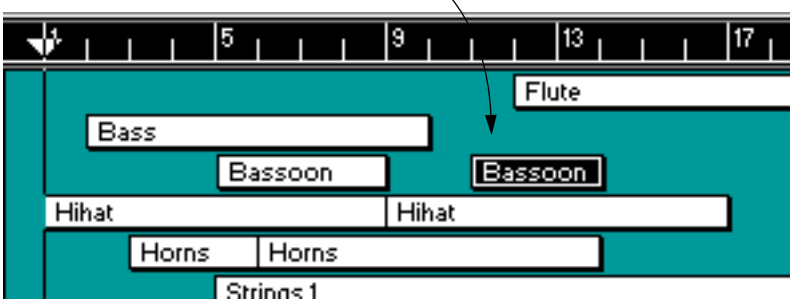
By using the computer keyboard

Pressing the right arrow key on the computer keyboard...





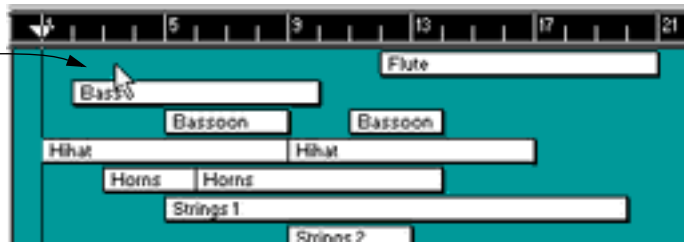
...selects the next Part on the same Track.



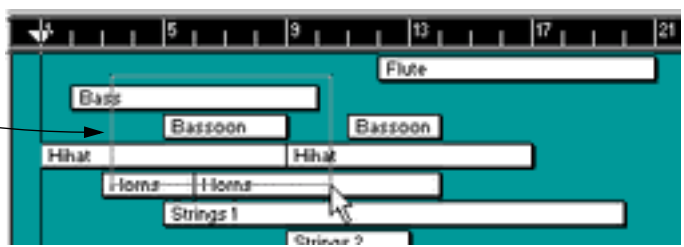
- **If you hold down the [Shift] key, the previous Parts will remain selected.**

By enclosing them in a rectangle

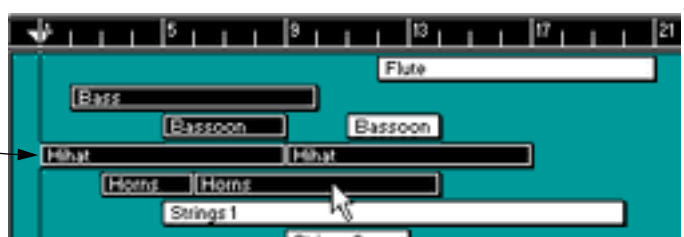
Press the mouse button with the pointer somewhere in an empty part of the Part Display...



...and drag the mouse with the button pressed. A dotted outline of a rectangle is shown.



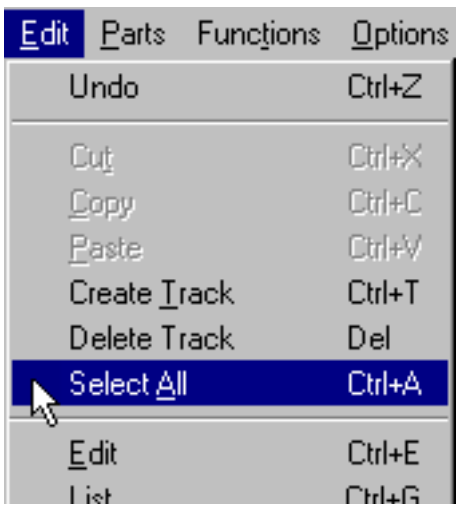
When you release the mouse button, all Parts that were enclosed or “touched” by the rectangle, become selected.



If you hold down [Shift] when you start to drag, you don’t have to have the pointer in an empty area, you can start with the pointer positioned over a Part.

Selecting all Parts

On the Edit menu you will find an item called “Select All”. This item selects all Parts in the Arrangement.



- You can also select all Parts by pressing [Control]-[A] on the computer keyboard.

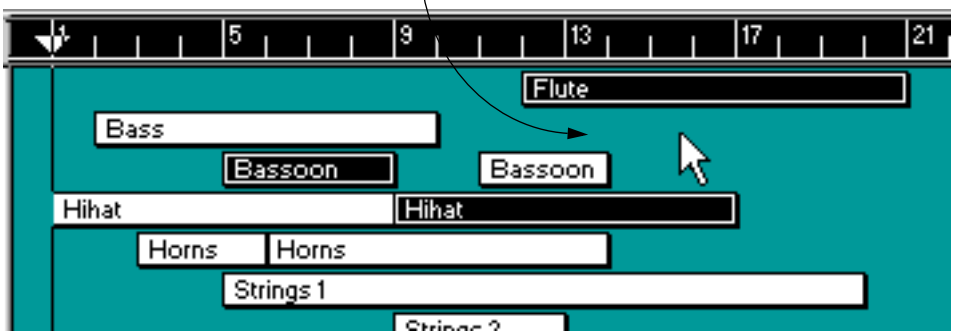
Selecting all Parts on one Track only

If you hold down [Shift] on the computer keyboard and double click on a Part, all Parts on that Track get selected.

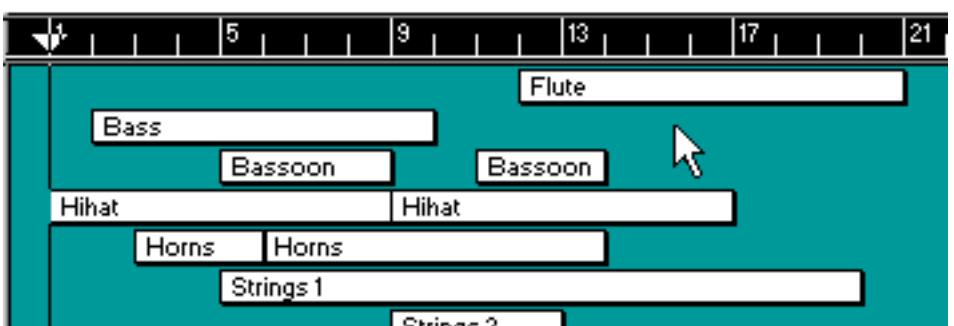
Deselecting Parts

There are two principal ways to deselect already selected Parts:

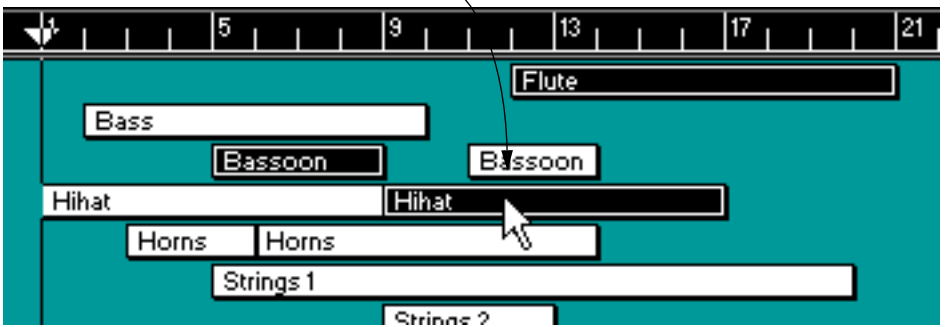
1. If you click in some empty area in the Part Display...



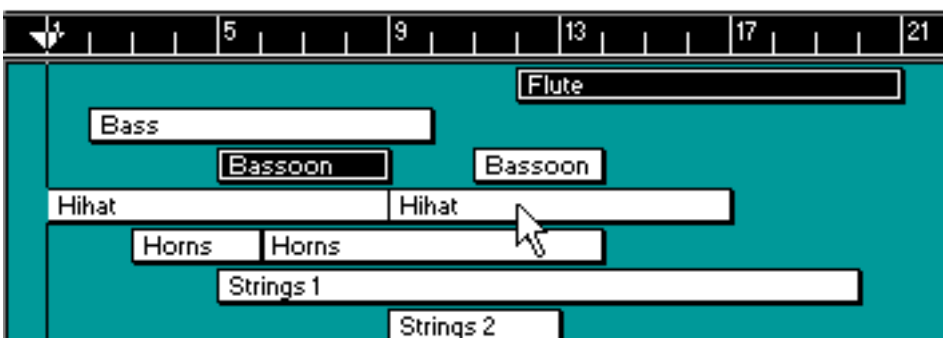
...all selected Parts get deselected.



2. If you instead hold down [Shift] and click on a Part...



...the Part gets deselected, but the other selected Parts remain selected.



Manipulating Parts

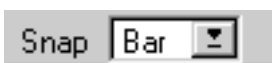
About the Snap value

When you are moving, duplicating or changing the length of Parts, the result of your actions depends on the Snap value.

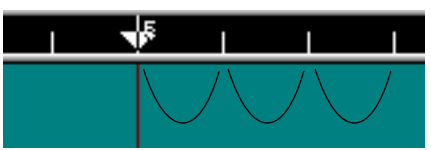
Pulling down the Snap pop-up menu.

This value determines the smallest distance you can move a Part. The table and figure below explains it more clearly:

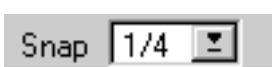
Value	Description
Off	Any position can be used.
Bar	Movement is restricted to exact bar lines.
1/2 to 1/16	Movement is restricted to the selected note value.



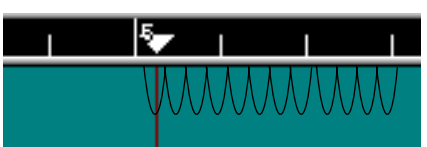
If Snap is set to Bar...



...the Song Position can only be dragged to exact bar lines.



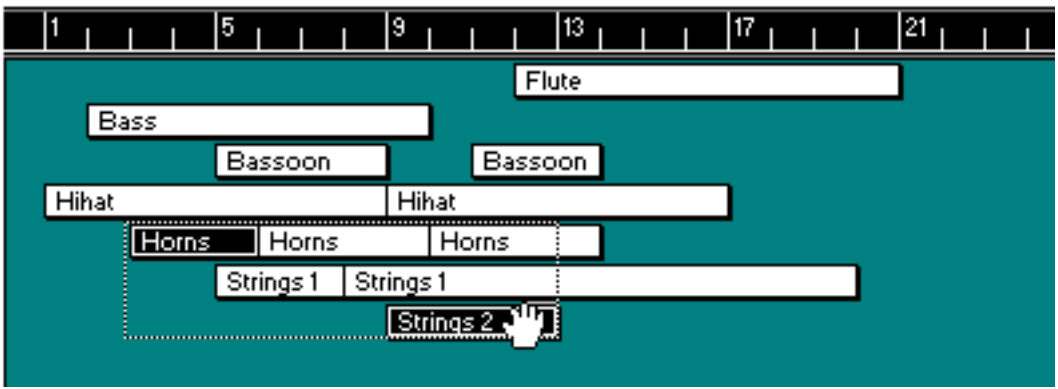
If Snap is set for example to 1/4...



...the Song Position can be put on any quarter note position.

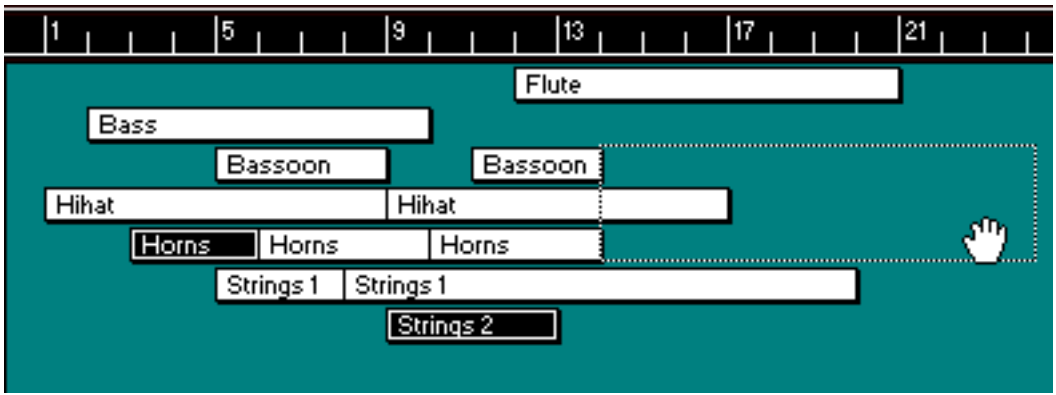
Moving Parts

You can move one or more Parts to a new position on any Track of the same type. Remember that the Snap value determines where you can place the Parts.

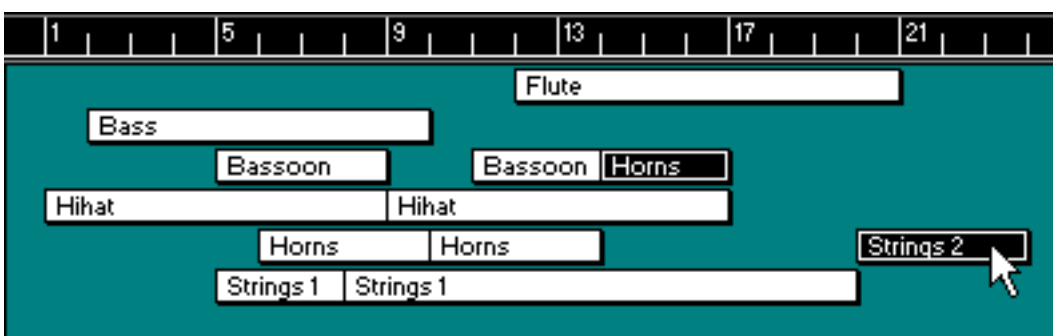


Press the mouse button with the Arrow pointer over the selected Parts you want to move. The pointer takes on the shape of a hand.

Drag the Parts to their new position...



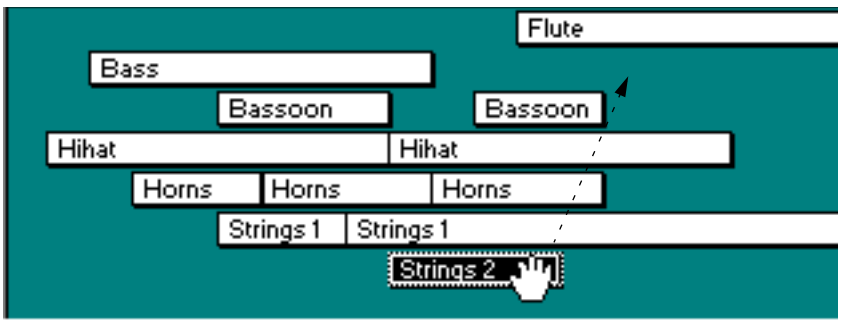
...and release the mouse button. The Parts are moved.
Note that the relative distances between the moved Parts are kept intact.



Duplicating Parts

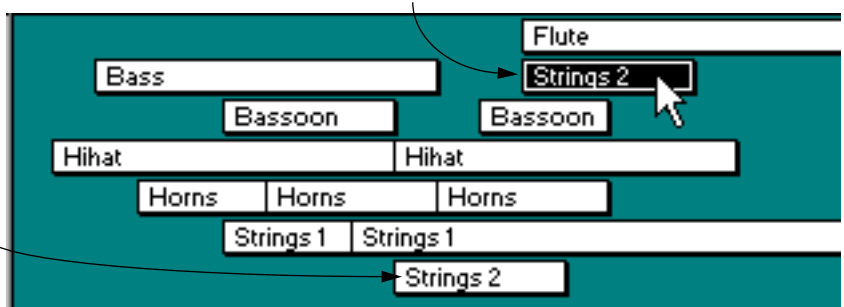
To duplicate Parts, hold down the [Alt] key on the computer keyboard and proceed exactly as when moving. You may move the duplicate to any position on any Track of the same type.

When you hold down [Alt] and drag a Part to a new position...



...a duplicate of the Part, complete with contents, is placed at the new position.

The original Part is not affected.



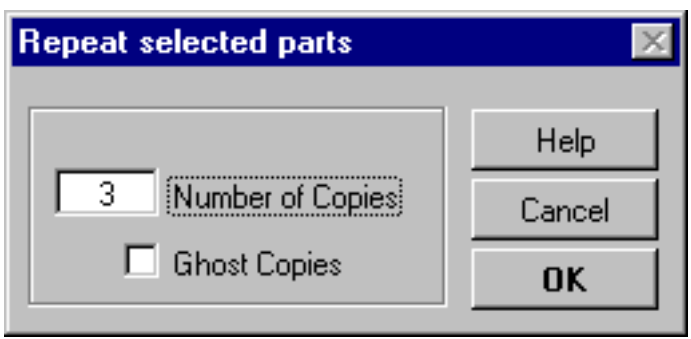
Another way of moving or duplicating Parts is to use Cut/Copy and Paste. These functions are described on page 35.

Repeating Parts

You can repeat one or several Parts, on the same or different Tracks, using the Repeat function on the Parts menu:

1. **Select the Part(s) you want to repeat.**

2. **Select the “Repeat...“ item on the Parts menu...**
   ...or press [Control]-[K] on the computer keyboard.



3. **Enter the desired number of copies in the dialog box that appears.**
   If you activate the “Ghost copies” checkbox, the copies will be Ghost Parts. Ghost Parts are described on page 196 in this chapter.

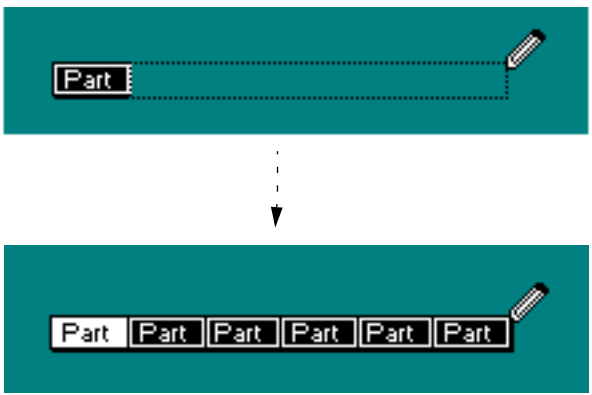
4. Click “Do It”.

The selected Part(s) are repeated, and the copies are lined up “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.

Original Parts. Copies.

Repeating Parts with the Pencil tool

If you hold down [Alt] while lengthening a Part with the Pencil tool, new Parts will be created, all lined up end-to-start after the Previous Part. The new Parts will be copies of the original, including all Events and playback parameters.



The outline shown when you drag the Pencil can be thought of as a “frame”, that becomes filled with as many copies of the original Part as possible.

Merging Parts

Merging one Part with another adds the contents of the first Part to the second. Of course, the two Parts have to be of the same type, i.e. both MIDI Parts or both Audio Parts. It is done like this:

1. **Hold down the [Control] and [Alt] keys on the computer keyboard.**

2. **Drag the first Part and release it on top of the other Part.**
   As when moving a Part, the result of this depends on the Snap Setting. The start and end points of the two Parts don't have to match at all.

- The dragged Part is not erased or even moved. A copy of its contents is made, and it is this copy that is merged into the other Part.

Changing the Length of a Part

If you have an excessively long Audio or MIDI Part, you can easily shorten it using the Pencil tool.

- For Audio Parts, this will only create a new shorter Segment, without destroying any actual audio data. For MIDI Parts, however, shortening a Part will erase any MIDI data in the section that is removed.

1. **Select the Pencil tool from the Toolbar.**

2. **Pull down the Snap pop-up menu and select an appropriate Snap value.**
See page 181.

3. **Click anywhere in the Part and keep the mouse button pressed.**
A dotted frame appears, indicating the size of the Part.

4. **Drag the Pencil to the left or right, and release the mouse button.**
The Part is resized. You may use this method to make the Part longer as well, but this is not very useful, since there will be nothing in the lengthened section!

- If you make a MIDI Part shorter with the Pencil tool, some notes may continue to sound after the end of the Part. To make these notes end when the Part ends, select the Part, pull down the Parts menu and select Cut Notes.

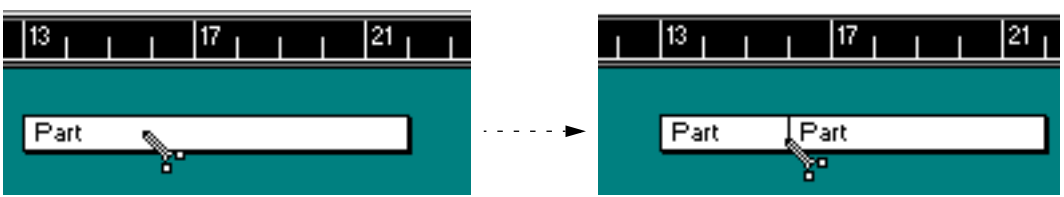
Splitting a Part

To split a Part into two, you use the Scissors tool:

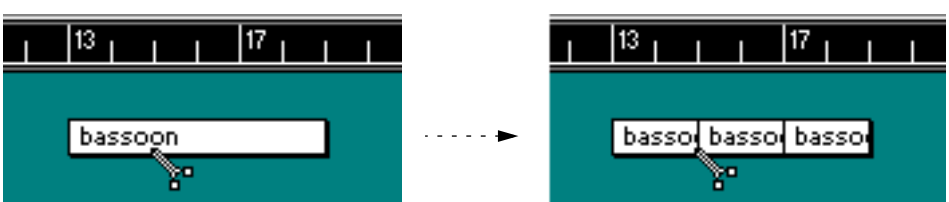
1. **Select the Scissors tool from the Toolbar.**

2. **Pull down the Snap pop-up menu and select an appropriate Snap value.**
   See page 181.

3. **Click in the Part where you want to split it.**
   You will get two Parts, with the same name as the original Part:



- **If you hold down [Alt] and click on a Part with the Scissors tool, the Part is split into several sections.**
  The length of the sections is determined by where you click in the Part:

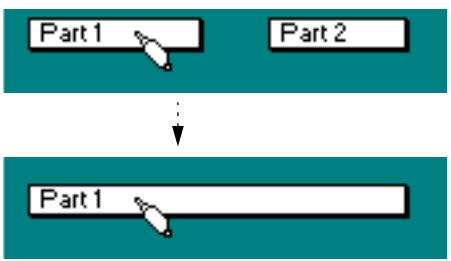


Joining Parts

You can use the Glue Tube tool to join Parts together into one:

1. **Select the Glue Tube tool.**

2. **Click on a Part.**
   The Part is “glued together” with the next Part on the Track. The resulting, longer Part will have the name of the first Part. It is OK if there is a gap between the two Parts.



Before and after glueing two Parts together.

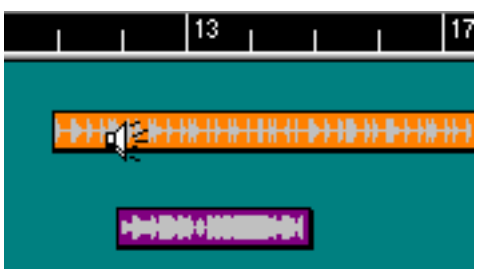
- **If you hold down [Alt] and use the Glue Tube tool, the Part you click on, and all following Parts on the Track, will be joined into one larger Part.** The resulting Part will have the name of the Part you click on.

Scrubbing

With the Magnifying Glass tool, you can perform what is known as “Scrubbing”. This means that you can listen to the contents of each Part separately in Stop mode:

1. **Select the Magnifying Glass.**
   From there on, the procedure differs for Audio Parts and MIDI Parts:

2. **To monitor the contents of an Audio Part, click anywhere in the Part.**
   You will hear the contents of the Part played back, from the point where you clicked, for as long as you keep the mouse button pressed (or until the end of the Part).



When you press the mouse button, the pointer takes on the shape of a speaker.

3. **To monitor the contents of a MIDI Part, drag the pointer forwards or backwards over the Part.**
   Notes and other MIDI Events will be played back according to how fast you drag the pointer.

Renaming Parts

A Part can have a name consisting of up to 10 characters. When you create a Part by recording, it will get the name of the Track it resides on. There are two ways to change the name of a Part:

- **Select the Part, open the Inspector and double click on the name field.**
  Type in a new name and press [Return].

- **You can also hold down [Alt] on the computer keyboard and click on the Part.**
  A small name value box opens, where you can type in a new name. For MIDI Parts, the name is shown inside the actual box in the Part display.

Deleting Parts

There are several ways to delete a Part:

- **Click on it with the Eraser tool.**
- **Select it and press [Backspace] on the computer keyboard.**
- **Select it, pull down the Edit menu and select “Delete Parts”.**

A note on deleting Audio Parts

Deleting an Audio Part with any of the above mentioned methods does not remove the actual audio file from the hard disk, or even from the list in the Pool. To actually delete the audio file from the hard disk, proceed as follows:

1. **Select the Part.**
   If the audio file is used in several Parts in the Arrangement, you need to select all these Parts.

2. **Hold down [Control] on the computer keyboard and press [Backspace].**
   A dialog appears, asking if you really want to delete the Audio file.

3. **Click "Yes".**
   The Audio file is removed from your hard disk.

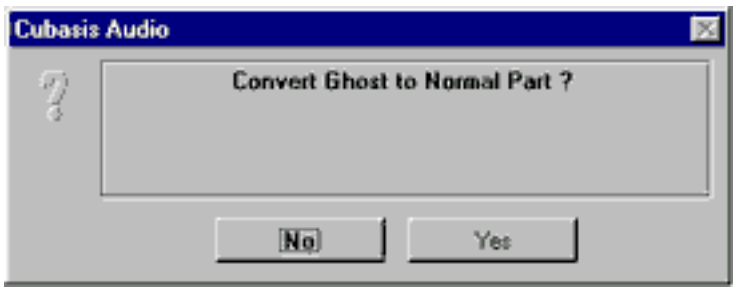
● Keep in mind that a single audio file may be used by several Cubasis AV Songs! Make absolutely sure the audio file isn't used in any other Song, before you delete it.

Ghost Parts

A Ghost Part is a linked copy of an existing Part. For Audio Parts, this simply means that the Ghosts and the original Part all contain the same segments (see page 86). This can be practical if you have a lot of copied Parts in your Arrangement, since it reduces the number of segments in the Pool (see page 207), making the audio management easier.

When it comes to MIDI Parts, there are even bigger benefits of working with Ghost copies: Let's say you have recorded a four bar drum pattern, that you want to repeat through your Song. By using the Repeat function (described on page 186) and activating the "Ghost Copies" checkbox, you make a large number of Ghost Parts, lined up after the original. If you later want to change or add something in the drum pattern, you only have to edit the original Part - your changes will automatically be reflected in all Ghost copies.

On the other hand, you may want to change one of the Ghost Parts only - for example to create a fill or variation. After making your changes in one of the MIDI Editors, you will get the following alert (upon closing the editor):



- **If you click “Yes” the edited Ghost Part will be converted to a normal Part.**
  The other Ghost Parts will not be affected by the editing.

- **If you click “No”, your changes will be inserted into all of the copies, just as if you were editing the original Part.**
  The Part will remain a Ghost Part.

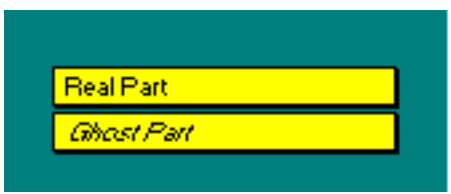
Creating a Ghost Part

You can create Ghost Parts either by using the Repeat function (see page 186) or by using the following method:

1. **Hold down the [Control] key.**

2. **Drag the Part you want to copy to a new position.**

3. **Release the mouse button.**
   The Ghost Part appears, shown with the Part name in italics.



Creating several Ghost Parts

1. **Hold down the [Control] key.**

2. **Lengthen the Part with the Pencil tool.**
   A number of Ghost Parts will be created, all lined up end-to-start after the original Part (the number of Ghost Parts is determined by the length of the "frame" you draw with the Pencil, that is, the outline shown when you drag the Pencil becomes "filled" with as many ghost copies of the original Part as possible).

More about Ghost Parts

- A Ghost Part can be moved like any other Part.
- It can also overlap existing Parts, just like any other Part.
- 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 MIDI 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 when you close the editor.

Working with several Arrangements

You can work with more than one Arrangement within a Song, should you so want. The different Arrangements could for example contain different versions of your music, or be used as “workbenches” for pieces that you later put together into one final Arrangement, etc.

Opening a New Arrangement

There are two ways to open a new Arrangement:

- **Pull down the File menu and select “New”.**

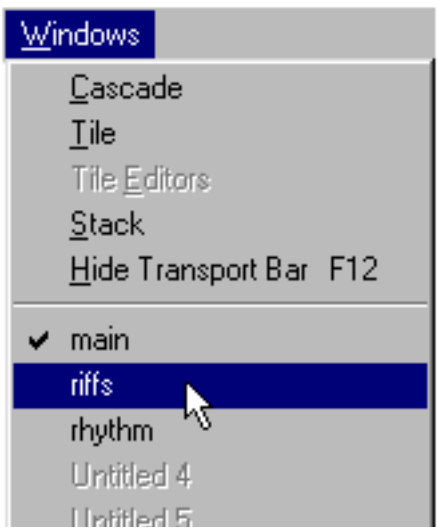
  or

- **Press [Control]-[N] on the computer keyboard.**

  The new, empty Arrangement opens in a window of its own.

Selecting an Arrangement

Clicking on the Arrange button on the Transport Bar brings the most recently active Arrange window to front. To select another Arrangement, click on its window, or if it is obscured, pull down the Windows menu and select it from the Arrangement list.



Copying Parts between Arrangements

If you want to move or copy Parts from one Arrangement to another, you use the standard Windows Cut, Copy and Paste commands on the Edit menu. This example describes how to copy a group of Audio and MIDI Parts to a new, empty Arrangement:

1. **Select the Parts to be copied.**

2. **Pull down the Edit menu and select Copy, or press [Control]-[C] on the computer keyboard.**
   If you want to move the Parts instead of copying, you should use the Cut command ([Control]-[X]) instead.

3. **Click on the other Arrange window, so that it comes to front.**

4. **Move the Song Position pointer to where you want the first of the copied Parts to begin.**
   All other Parts will keep their distances in relation to the first Part.

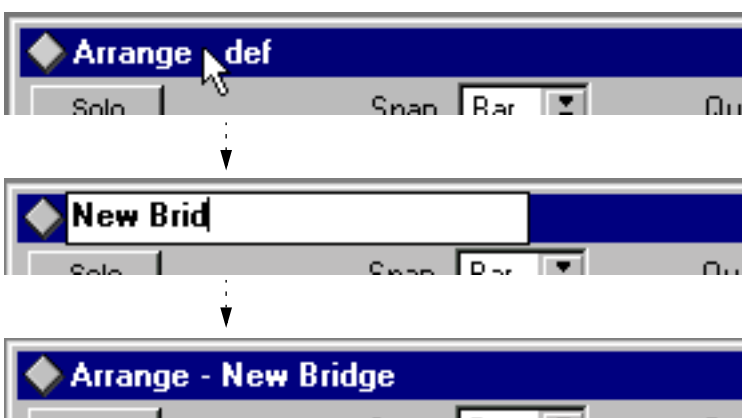
5. **Pull down the Edit menu and select Paste, or press [Control]-[V].**
   The Copied/Cut Parts are pasted into the new Arrangement, on their original Tracks, starting at the Song Position.

Making a copy of a complete Arrangement

Sometimes you may want to make a duplicate of your whole Arrangement, for example if you want to have several versions to experiment with. Then, the easiest way is simply to save the Arrangement (using the “Save As...” item on the File menu) and open it again in new Arrange windows, as many times as you want. Refer to the page 403 for more information about these commands.

Naming the Arrangement

You can give names to each of your Arrangements by clicking with the right mouse button in the left part of the Arrange window’s Title bar, and typing in a new name.



Renaming an Arrangement.

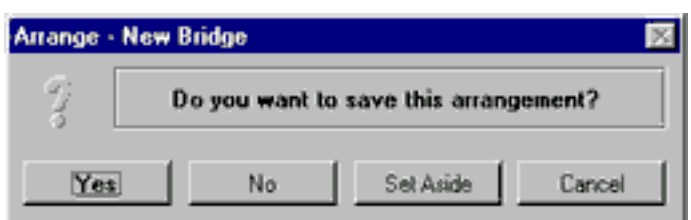
If you choose to save an Arrangement to disk as a separate file, then the name you give it while saving will be used as the Arrangement's title next time you load it.

Closing an Arrangement

You can close an Arrangement, if you don't want to keep it or if you just want it to get out of the way:

1. **Make sure the window is active (selected).**

2. **Click on the window's Close Box, select "Close" from the File menu or press [Control]-[W].**
   A dialog appears:



3. Select one of the options in the dialog.

The four options have the following functions:

Don't Save	Closes the Arrangement without saving it.
Save	Opens a file dialog where you can save the Arrangement for later use. After saving, the Arrangement is closed.
Cancel	Cancels the operation, i.e. the Arrangement is not closed.
Set Aside	The window is closed, but the Arrangement is kept ,"hidden" in the Song. To open a Set Aside Arrangement, pull down the Windows menu and select it from the Arrangement list there.

13

The Audio Pool

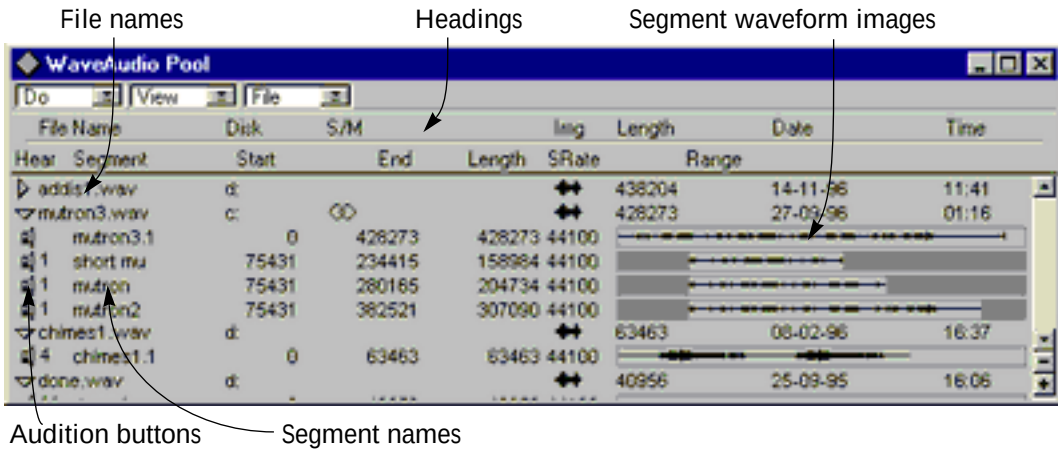
Introduction

Just as you use the Explorer or File Manager to manage your files and folders, you use the Pool to manage your audio segments and files.

Opening the Pool Window

The Pool is opened by selecting “Pool” from the Audio menu or pressing [Control]-[F].

Overview of the Window



The Pool lists all the audio files in the Song. Please note that this means it shows the files for *all* Arrangements that belong to the Song.

- For an explanation of audio files and segments, see page 84.

Customizing the Display

Showing and Hiding Segments

For one File

- **To display/hide the segments belonging to one file, click on the triangle preceding the file.**

For all Files

- **To Show all segments for all files, select Expand from the pop-up View menu.**
- **To Hide all segments for all files, select Collapse from the same menu.**
- **To toggle between showing and hiding all segments for all files, hold down [Alt] and click on one of the triangles preceding the files.**

Hiding Headings

If you don't need the Headings at the top of the window you can hide them using the "Hide/Show Headings" item on the pop-up View menu.

Selecting what is shown

If you don’t need all the information fields for the files and segments, you can deactivate these by clicking the “i” icon at the top of the window. Among other things this allows you to get a more detailed overview of the waveforms.

Zooming and setting Sizes of the Waveforms

If you change the width of the window, the waveforms are scaled accordingly. That is, the bigger you make the window the more detailed view of the waveform you will have.

By clicking the Plus/Minus buttons you can set the vertical size of the lines, to get a better overview of the waveforms.

Setting File and Segment Order

File Order

On the View menu, you can determine in which order the files should be displayed:

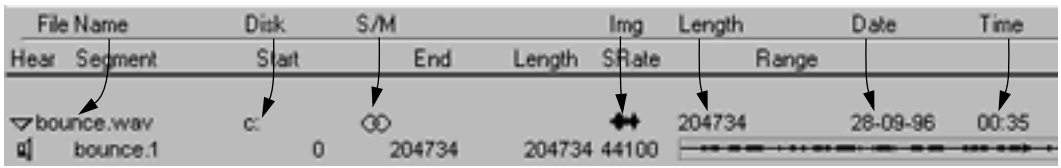
Option	Description
By Name	Files are shown alphabetically.
By Date	Files are shown ordered according to the time they were created, with the newest file on top.
By Size	Files are shown in size order, with the largest one on top.

Segment Order

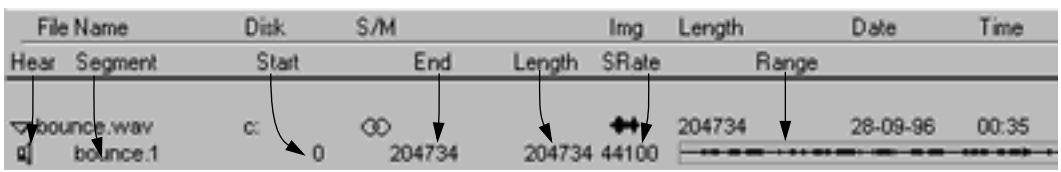
By selecting “Order Segments” from the pop-up View menu, you rearrange the segments so that they are shown in the order they appear in the file.

The Headings and Columns

For each file/segment you have a number of information and setting fields. The names for these are displayed in two rows of headings at the top of the window.



The file headings and their corresponding fields in the Pool window.



The segment headings and their corresponding fields.

Below follows a brief description of each entry in the headers. Many of these are used in various operations described later in this chapter.

File Heading	Explanation
File Name	The name of the file, on disk.
Disk	The Disk the file resides on. If the file can't be found, three question marks are shown instead (see page 221). Clicking on the letter in this column lets you replace an audio file as described on page 219.
S/M	Indicates if the file is mono or stereo. If the audio file is stereo, two intersecting circles are shown.
Img	This shows you the status of the waveform image for the file (see page 223).
Length	This shows the size of the file in bytes.
Date and Time	This shows the date and time the file was created.

Segment Heading	Explanation
Hear	To play the segment, click in this column (on the speaker symbol) and hold down the mouse button.
Segment (name)	The name of the segment.
Start	The segment's Start Inset in the file, displayed in samples. You can change this value by double clicking and typing in another value.
End	The segment's End Inset in the file. Can be changed like the Start value.
Length	The length of the segment, i.e. the number of samples between the Start and End Insets.
SRate	The Sample Rate of the file. Cannot be changed.
Range	A graphical overview of the segment in the file.

Finding Out how a Segment is used in the Song

One segment can be used in more than one place in a Song. There are a number of situations where you will want to find out where a segment is used, for example:

- So that you can tell that a segment isn't used anywhere and possibly delete it.
- If you want to know if a segment is used in more than one place, so that you can decide how editing the segment affects the Song.

Number of Times the Segment is used

Next to the speaker icon for each segment, you will see a number telling how many times in the Song this segment is used. A segment without numbers is not used anywhere.

File Operations

Renaming a File

To rename a file, proceed as follows:

1. **Double click on the existing name.**

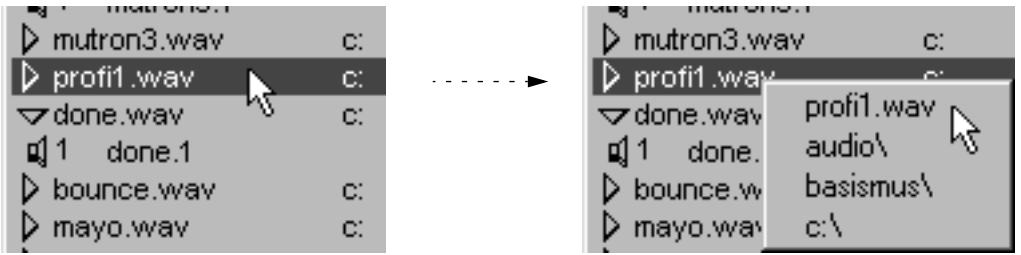
2. **Enter a new name or edit the existing one.**

3. **Click outside the box or press [Return].**

- Renaming a file this way is much preferred to renaming it from the Explorer or File Manager. This way, Cubasis AV “knows” about the change and will not lose track of the file the next time you open the Song. See page 221 for details about lost files.

Locating a File on the Hard Disk

To find out where on the hard disk a certain file is located, hold down [Control] and [Alt] and click on the file. A pop-up showing you the file location appears.



Deleting Files

Removing from Pool

If you want to remove one or more files from the Pool without actually deleting them from the hard disk, proceed as follows:

1. **Select the file(s).**
   Selecting more than one is done just as with any other object in Cubasis AV, by clicking in combination with the [Shift] key.

2. **Press [Backspace].**

- **If you try to delete a file that is used by one or more Parts, the program will ask you if you also want to delete those Parts.**
  Cancelling this operation means that neither the file nor the Parts are deleted.

Removing from the Pool and deleting from Hard Disk

If you want to remove the file from the Pool and also delete the file permanently from the hard disk, proceed as follows:

1. **Select the files.**

2. **Hold down [Control] and press [Backspace].**
   A dialog box asks you if you are sure you want to continue. Remember that this operation cannot be undone!

Creating a Segment

You can create a “default” segment for the file, that is one that plays the entire file.

1. **Select the file.**

2. **Select Duplicate Segment from the Do pop-up menu or press [Alt Gr]-[D].**
   The new segment can be edited to play any part of the file (see page 227).

Replacing a File in the Pool

There are situations when you may want to replace an audio file in the Pool with another, but keep all segments that are in use. As an example, consider the following situation:

You have used an external Wave Editor (see the chapter "Using an External Wave Editor") to perform some editing on an audio file. To be on the safe side, you save the edited audio file under another name than the original. When you return to Cubasis AV, you will want to be able to replace the original file, so that all segments reference to the new, edited audio file instead, and preferably be able to switch back if you change your mind. Proceed as follows:

1. **Click on the letter in the Disk column for the file.**
   A dialog appears, asking if you want to "Re-find" the file. Click "Yes".

2. **In the file dialog that appears, select the audio file that should replace the existing file in the Pool.**
   In our example above, this would be the edited version of the audio file.

3. **Another dialog will ask you if you are sure. Click "Sure".**
   The audio file in the Pool is now replaced with the one you selected in the file dialog. The segments keep their names and, if possible, their start and end inset positions. If you later want to switch back to the original file, just repeat the operation.

- Please note that the replacing audio file must be of the same length as the original file, for the segment start and end insets to be relevant! If you perform any editing that involves changing the length of the file (such as time stretch, truncating, etc.), this method does not work, since you will have to create new segments.

Handling “Missing Files”

When you open a Song, you may get a warning that one or more files are “missing”. If you click Ignore, the Song will open anyway, without the missing files. In the Pool you can check which files are considered missing. This is indicated by three question marks under the heading “Disk” (instead of the usual drive letter).

A file is considered missing under one of the following conditions:

- The file has been moved to another folder or renamed in the Explorer/File Manager since the last time you changed the Song
  and
  you ignored the Missing files dialog when you opened the Song.
- You have used the Explorer/File Manager to move, rename or change properties such as date for the file since you started the program this time.

Locating a missing file

1. **Click on the question marks.**
2. **In the dialog that appears, decide if you want the program to try the find the file for you (Auto) or if you want to do it yourself (Manual).**

Auto

If you choose Auto, the program scans all your hard disks for a file with the proper name and creation date.

If Auto doesn't work

Please note that Cubasis AV is quite strict about identifying the files you use. Cubasis AV 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 Cubasis AV's "auto-find" function. In this case you will have to use the "Manual" option and "over-ride" the subsequent warnings.

Manual

If you choose Manual, the program will display a file dialog allowing you to locate the file manually.

When you have found the file, click OK to replace the missing file in the Pool. If the name or date is not identical to the missing one, the program will warn you but let you proceed. The next time during this session that the program attempts to search for a missing file, it will first look at the position of the last found file.

Creating Wave Images and Keeping them up to date

With each audio file goes an image, a picture of the waveform for display in the Pool and Arrange window. Wave images are created after you have completed recording (in a process that may take a few seconds) and stored in a separate file with the same name as the audio file, but with the extension “WIF”.

If for example you perform some external editing to the audio file, it may get “out of sync” with its corresponding wave image. In the same way, if you accidently delete or move a “WIF” file, the wave image will be missing for the corresponding audio file. The three states of the wave image are indicated by the waveform icon for each file in the Pool like this:

Icon:	Description:
	The image is OK.
	The image might need updating (“out of sync”).
	The file has no image.

Updating the Wave Image

To update the wave image for one file, click on its icon or select “Make Image” from the Do pop-up menu.

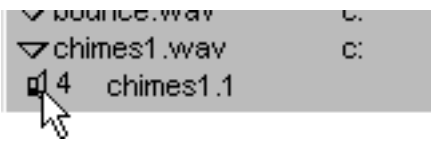
Segment Operations

The Pool allows you to create new segments, slightly or drastically different from those you already have in your Song, and drag and drop these in the Arrange window.

Auditioning a Segment

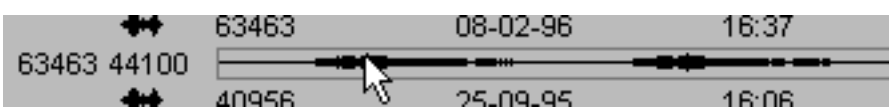
From the Beginning

To audition a segment from its beginning, press and hold the mouse button with the pointer over the speaker icon to the left of the segment name.



From any Position

To start playback from any position in the segment, click with the mouse pointer in the waveform to the right. Playback will start from the position you click on.



Renaming a Segment

To rename a segment, proceed as follows:

1. **Double click on the existing name or select the segment and press [Alt Gr]-[N].**

2. **Enter a new name or edit the existing one.**

3. **Click outside the box or press [Return].**

Duplicating Segments

To create a copy of a segment, proceed as follows:

1. **Select the segment by clicking on it.**

2. **Select Duplicate Segment from the Do pop-up menu or press [Alt Gr]-[D].**
   The new segment appears in the Pool.

Deleting segments

● Deleting a segment never destroys any actual audio data.

Deleting one or several segments from the Pool

1. **Select the segment(s).**
   Selecting more than one segment is done just as with any other object in Cubasis AV, by clicking in combination with the [Shift] key.

2. **Press [Backspace].**

- **If you try to delete a segment that is used by one or more Parts, the program will ask you if you also want to delete those Parts.**
  Cancelling this operation means that neither the segments nor the Parts are deleted.

  You can tell how many times a segment is used in a Song by checking the number next to the speaker icon.

Deleting all Segments not used in the Song (Purge)

To automatically delete all segments that are currently not used in the Song, select Purge Segments from the Do pop-up menu. This is a quick way to “clean up” the Pool, making it easier to get a good overview.

Changing Start and End Insets

You can change the Start and End points of the segment, by double clicking and typing in new values. This allows you to change what part of the audio file the segment plays. One use for this is to remove unwanted silence at the beginning or end of a recording.

- Please note that this change will affect all places in the song where this segment is used. If this is not what you want, make a duplicate of the segment first, and make the changes to this. Then drag the changed segment into the Arrange window and place it wherever you want it.

Deleting Unused Portions of Audio Files (Erase Unused)

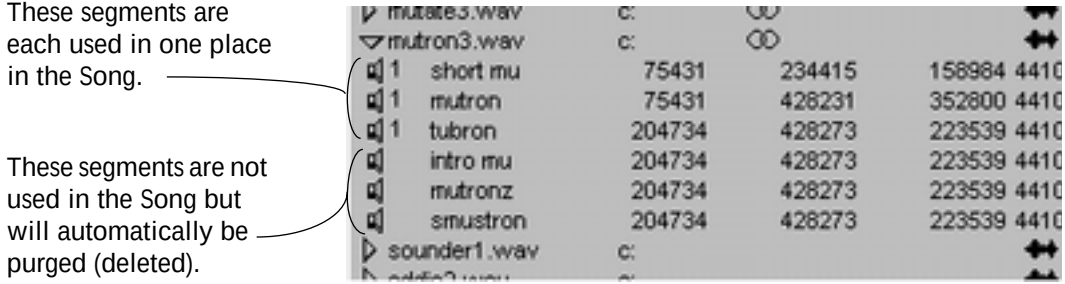
"Erase Unused" allows you to "trim" down your Audio files so that they only contain the sections actually referenced by that file's segment. This helps you maintain as much free space on the hard disk(s) as possible.

The idea behind this is that hard disk space is most often precious, and recorded silence (for example) takes up as much hard disk space as recorded "noise". When you adjust Start and End Points in segments to "hide" the sections of audio you don't want to hear, you are still using up valuable disk space for those unheard bits. To "fix" this, use Erase Unused.

Which Parts of the Files are considered Unused?

Unused portions of a file are the sections not played back by any segment in the *Pool*.

This means that even if the segment isn't used anywhere in the Song (which you can tell by looking at the speaker icon beside the segment – unused segments have no number) the section of the file that the segment plays *is* considered to be in use. To avoid keeping a lot of unnecessary audio sections, the program therefore automatically performs a "Purge Segments" (see page 226 in this chapter) before the actual "Erase Unused" operation.



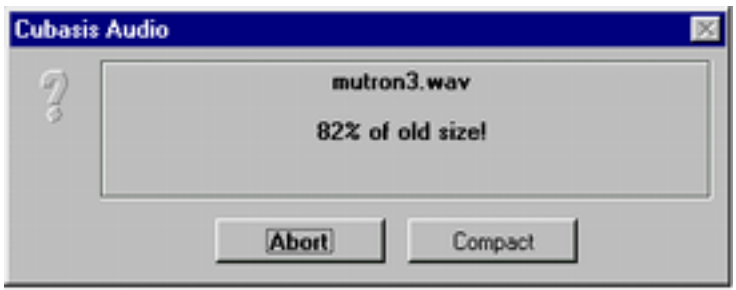
Applying Erase Unused

● Erase Unused changes the contents of one selected audio file. If you use the file in another Song, or if you want to be able to go back to the original recording, make sure you have a copy of the file before you begin!

1. Select either the file or one of its segments.
This command works on *one sound file at a time*. For this function to work, two criteria have to be fulfilled:

- The audio file must be used by at least one Event somewhere in the Song.
- There must be some section of the audio file that isn't used by any Segment (otherwise there's nothing to erase, right?).

2. **Select the “Erase Unused” command from the pop-up menu.**
   A dialog box will display how much of the original audio file will be kept, and ask you if you want to go on.



3. **Click Compact.**
   First the unused Segments are deleted. Then the unused sections of the file are deleted and the remaining parts “joined together” with only a short section of silence in between. The segments are adjusted accordingly.

Erasing all Unused Audio in a Song

To permanently erase all unused Audio in a Song, simply select all files in the Pool and select Erase Unused.

Processing Files and Segments

The Pool contains two audio processing functions: Normalize and Reverse. There are two different ways of processing audio files and segments:

- **If you simply select a file or a segment and select one of the processing functions, a new file will be created and added to the Pool, together with a segment for it.**
  To use the processed audio in the Song, you need to drag the segment into the Arrange window, as described on page 235.

- **If instead you select a file (not a segment), hold down [Alt] and select a processing function, the original file is removed from the Pool and replaced with a new, processed file.**
  All segments that played the original audio file, will now play sections of the processed file. If later you want to use the original file in your Song, you have to import it again (see page 233).

● Beware, you can not Undo this operation! All Segments playing a section of the file will be affected by the processing!

Normalize

This lets you increase the level of a recording that was made at too low a level: The program scans the file to find the maximum amplitude. Then, the level of the entire recording is raised until the maximum amplitude matches 0 dB (the highest level possible without digital distortion).

- Please note that the level of any background noise is raised just as much as the rest of the signal. If you have the option to re-record the file with correct level settings, this is in many cases a better option than using Normalize.

Reverse

This turns a recording backwards, just as when you turn a tape on a reel-to-reel recorder backwards.

Importing Audio Files into the Pool

From the Pool you can import files created by other programs, or files you have created in another Cubasis AV Song.

File Formats

Files in the following formats can be imported:

- Wave (.WAV) or AIFF (.AIF).
- Mono or Stereo.
- The sample rate set for the Song.
- 16 bit resolution (uncompressed).

A regular file dialog is used to select audio files to import.

Exporting Files and Segments

You can export segments from the Pool as individual files, for use in other applications:

1. **Select the segment you wish to export.**

2. **Select “Export Audio File” from the File pop-up menu.**
   A file dialog appears.

3. **Use the pop-up in the lower left corner of the file dialog to select a format for the file to be created.**
   You can choose between Wave files (extension .WAV) and AIFF files (extension .AIF).

4. **Use the file dialog to find a location and name for the file.**

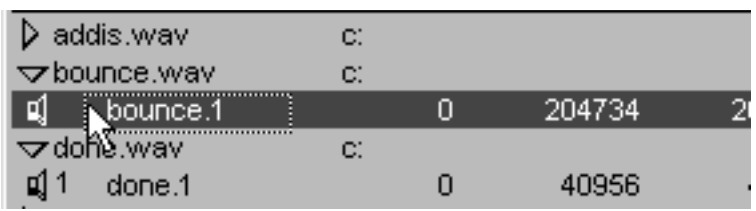
5. **Click Save.**

Dragging Segments into the Arrange Window

To move segments into the Arrangement, Cubasis AV uses drag and drop techniques:

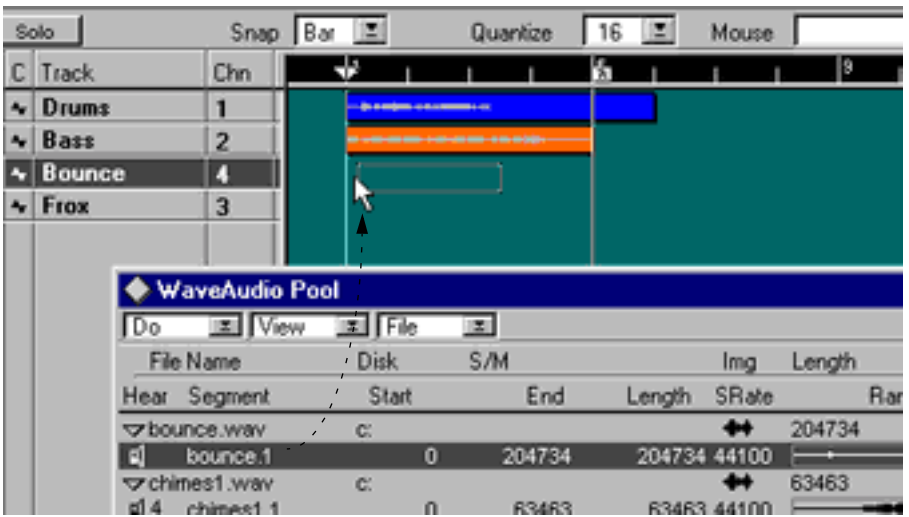
1. **Arrange the windows so that as much as possible of the Part Display in the Arrange window is visible, when you have the Pool window active.**

2. **Position the mouse button over the name of the segment and press the mouse button.**



A dotted rectangle appears around the name of the segment.

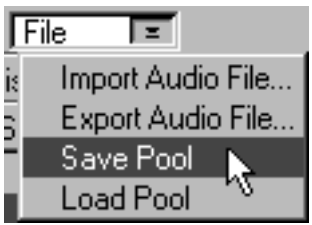
3. **Drag the segment out of the Pool window and release it on an Audio Track in the Arrange window.**
   The Snap value applies as usual.



4. **A new Part is created, playing the segment you dragged.**

Saving and Loading the Pool

The Pool is automatically 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.



Saving

1. **Select Save Pool from the File Pop-up menu.**
2. **In the dialog box that appears, specify if you want to save all files and segments, or just the selected ones.**
3. **In the standard dialog box that appears, specify a name and a location for the file.**

- The audio files themselves are not saved in the Pool file, 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!

Loading

A Pool file is opened (loaded) just like any other file. When you load a Pool file, the files in it are *added* to the current Pool.

14

Importing and Exporting Audio

Importing Audio

You can import audio into the Song, from the Arrangement or from the Pool. Use the former when you want to position the file on a Track directly, and the latter when you plan to edit the file before using it in an Arrangement.

File Specifications

The files that you import must meet the following specifications:

- The file must be in AIFF (Audio Interchange File Format) or Wave (.WAV) format.
- It can be in Mono or Stereo.
- The sample rate must be the same as the one set for the Song (or the file will not play back correctly).
- The file must have 16 bit resolution and be uncompressed.

Naturally, the files created by Cubasis AV fit into these specifications.

Importing into the Arrangement

The Import Audio File item on the File menu imports a file into the Arrangement as follows:

1. **Select the Track where you want the audio file to appear.**

2. **Set the Left Locator at the point where you want the file to start.**

3. **Select Import Audio File from the File menu.**
   A file dialog appears.

4. **Locate the file, select it and click OK.**
   The following now happens:

- The audio file is added to the Pool.
- A segment is created, that plays the entire audio file.
- A Part, playing the segment, is created and positioned on the selected Audio Track, starting at the Left Locator position.

Into the Pool

This is described on page 233.

Exporting Audio

Exporting from the Arrangement

It might happen that you want to turn the whole or parts of an Arrangement into a single audio file. This is handy if you are running out of audio Tracks and want to "merge" for example a number of vocal overdubs into one recording, instead of keeping each overdub on a separate Track.

Performing the Audio Mixdown

1. **Set up the Tracks to play as intended.**

   Please note the following:

- Muted Tracks will not be included in the Mix.
- Make sure the levels are set correctly so that no clipping occurs and that the overall volume is not *too* low. Use the Audio Mixer to check the levels.
- The Volume settings in the Monitor window will be used.
- If you create a stereo file (see below), the panning in the Monitor window will be used.

2. **Set up the Left and Right Locator as desired.**
   Only the section between the Left and Right Locator will be included in the new audio file.

3. **Create an empty Audio Track, where you want the mixdown to wind up, and make sure it is selected.**

4. **If the Mix Audio will be in stereo, set the “Rec Chn Mode” parameter in the Inspector for the Track to “Stereo”.**

5. **Select Mixdown from the Audio menu.**
   A dialog box asks you for a new file name and location.

   A new audio file is created and added to the Pool together with a segment that plays the whole file. In the Arrange window, a new Part appears between the Locators on the selected Audio Track, containing the new segment.

Exporting from the Pool

This is described on page 234.

15

Using an External Wave Editor

What is a Wave Editor?

In this context, the word Wave editor indicates any program that allows you to perform editing on your audio *files*. This may include cutting and pasting real audio data, applying DSP (Digital Signal Processing) functions, etc. In other words, it provides more direct control over the audio files than the Audio editor does. Two examples of Wave editors are Steinberg's WaveLab and WaveLab Lite, both powerful audio editing and processing tools.

Cubasis AV allows you to open a Wave Editor of your choice from inside the Pool or the Arrange window, process an audio file and return to Cubasis AV, without any hassle.

Precautions

In contrast to working inside Cubasis AV, e.g. changing a segment's start and end insets in the Pool, a Wave editor makes permanent changes to your audio *files*, (sometimes called "destructive editing"). When you for example Paste in the Wave editor, this alters the file on disk directly, rather than just adding new segments or Events.

Many Wave Editors allow you to Undo your last action. However, it may be safest to use the Export Audio File item on the File pop-up menu in the Pool to make a backup of your audio file before editing it in an external Wave editor.

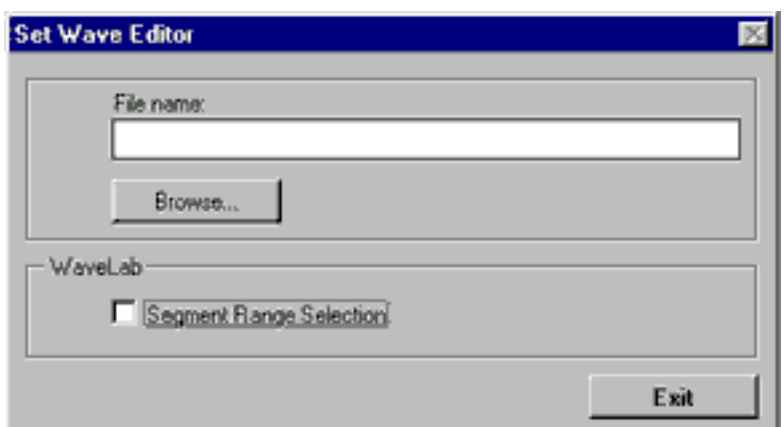
Setting which Wave Editor to use

You may use any Windows program as Wave editor, provided it meets the following criterium:

- **The program must be able to launch and open a ".WAV"-file for editing, by receiving a DOS command line with the path and name of the file as argument.**
  If you are uncertain whether your programs meet this criterium or not, follow the instructions below and try it.

To select which program to use for Wave editor, proceed like this:

1. **Pull down the Audio menu and select "Set Wave Editor...".**
   A dialog opens.



2. **Click on the Browse button.**
   A regular file dialog opens. Find and select the Wave editor file you want to use, and click OK.

   The path and name of the selected Wave editor file is displayed in the dialog, together with its program icon.

3. **If you are using Steinberg WaveLab or WaveLab Lite as Wave editor, and want to make use of the segment start and end insets when editing the audio file, activate “Segment Range Selection”.**
   See below.

4. **Click Exit.**

Editing in the selected Wave Editor

Once you have selected a Wave editor using the procedure on the previous page, you can access it from the Arrange window.

● Remember that any processing you perform on this audio file will be reflected in all its segments throughout the Song. If you don't want this, use the Export Audio File command in the Pool to create a copy of the audio file to edit instead.

---

1. Double click on an Audio Part in the Arrange window.
This automatically opens the audio file in the set Wave editor.

● If you are using WaveLab Lite or WaveLab, and you have activated the option "Segment Range Selection" in the Set Wave Editor dialog, the segment range in the audio file will be *selected* when you open it in the editor. Furthermore, if you are using WaveLab (the full-featured version), *Markers* will be inserted in the audio file, at the start and end inset positions.

---

2. Perform whatever processing you want.
This may include shortening or lengthening the file, applying DSP effects, etc. See the documentation for the Wave editor in question for more details. Steinberg WaveLab and WaveLab Lite also include extensive on-line help.

3. **Save the audio file and close it.**
   Nothing stops you from keeping the Wave editor running, just remember to close the audio file.

4. **Return to Cubasis AV.**
   If you have applied any processing to the audio file, an alert box will appear, telling you that the file contents have been changed, and the Pool and Arrange windows will be updated to reflect the changes.

- **If you have shortened the audio file in the Wave editor, the length of its segments in Cubasis AV will automatically be adjusted if needed (since a segment cannot be longer than its audio file).**
- **If you have lengthened the audio file, the length and start point of its segments will not be affected.**
- **If you created a copy of the audio file before editing it, and then performed editing to the audio file that didn't change its length (e.g. dynamic or spectral editing), you can switch between the original and the edited file without having to adjust or make new segments.**
  See page 219.

16

The MIDI Editors - General Information

What can I do with the MIDI Editors?

When you record MIDI data, you fill Parts with notes and other MIDI “Events”. But you don’t really get to see and manipulate those Events individually from the Arrange window. In the MIDI editors you do!

Different types of Events and where to find them

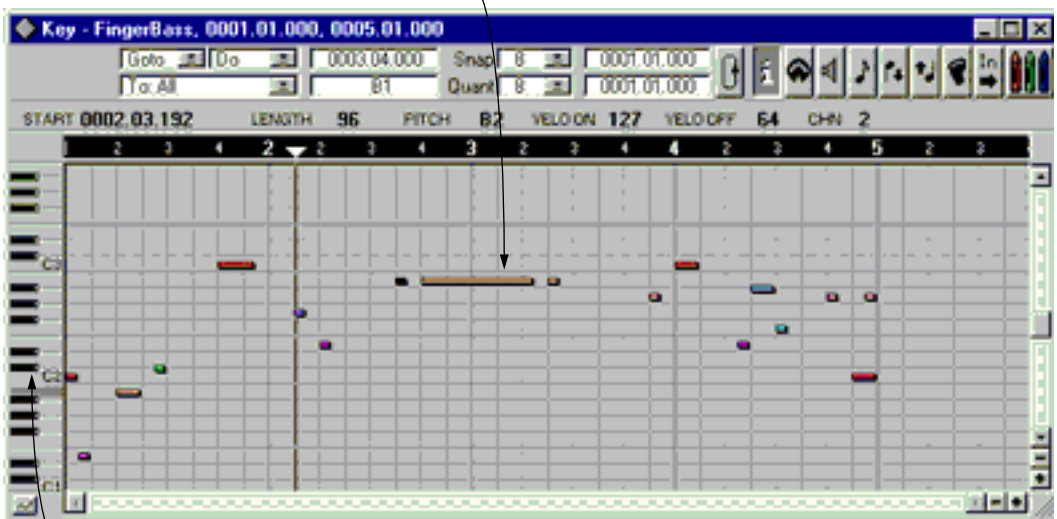
Below we’ll list the different types of MIDI data that Cubasis AV can record, and how and where they are displayed for editing:

Notes (Note On and Off messages)

Notes are displayed in all MIDI editors. Let’s look at a simple melody line and how it is shown in the different editors:

In Key Edit

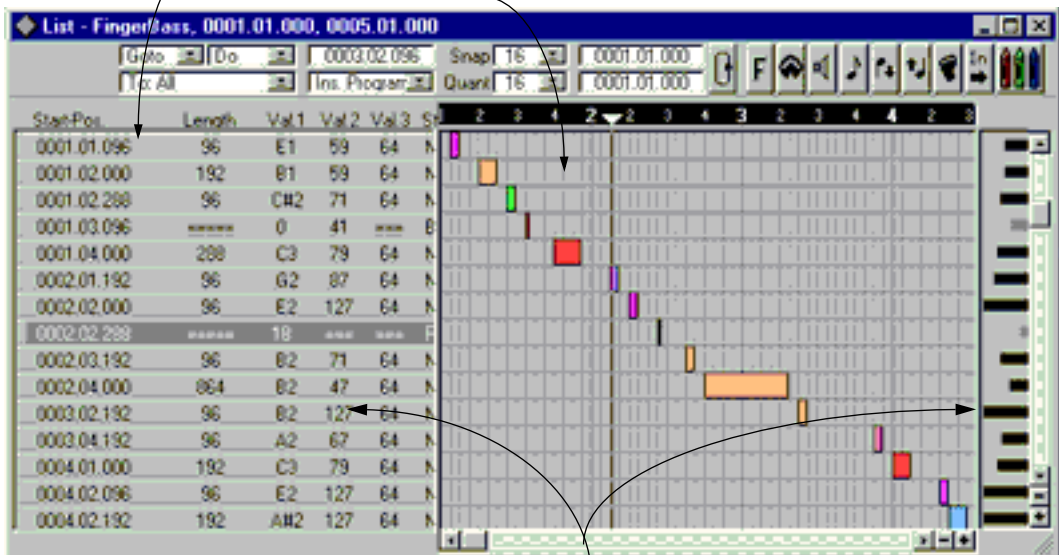
The notes are shown as boxes, with higher notes higher up in the grid. The note length is indicated by the width of the rectangle.



The piano keyboard to the left is there to make it easy to find the right pitch when inputting or editing notes.

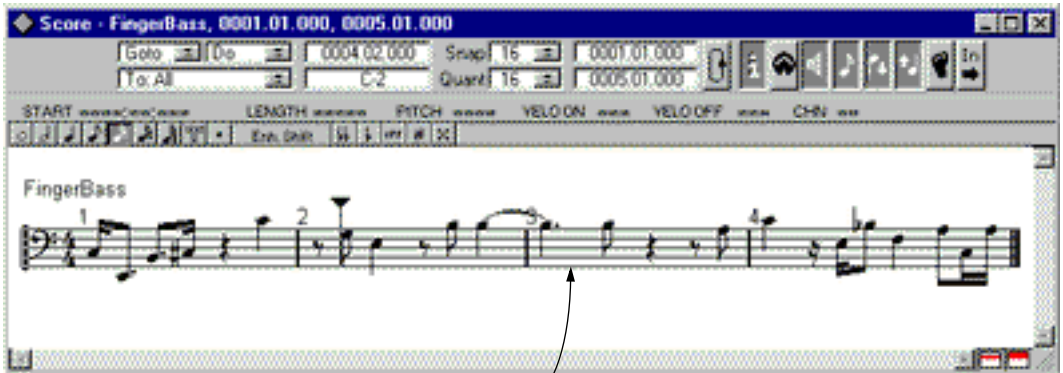
In List Edit

The notes are shown both in the list to the left, and in the graphic display to the right.



The black bar graphs are for graphically displaying and editing MIDI “Value 2” in every Event. In the case of notes, “Value 2” is the velocity value.

In Score Edit



In Score Edit, notes are displayed and edited just as notes on a printed score.

Continuous Events

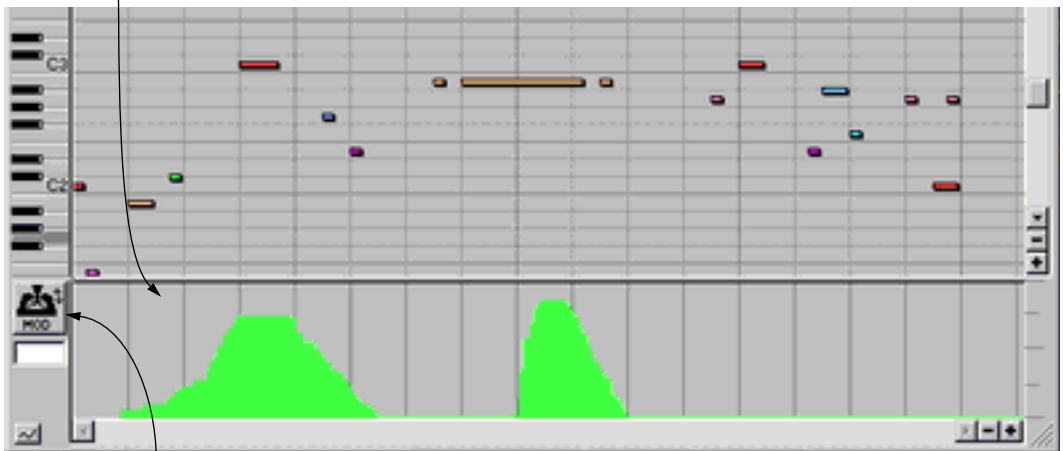
In MIDI, various types of MIDI messages are used to transfer continuous changes. To be exact, these types are:

- Aftertouch (Channel Pressure).
- Pitch Bend.
- Controllers, like sustain pedal, MIDI Volume, Modulation wheel etc.

To be really exact (not to say pedantic!) some of these are not really continuous. Sustain Pedal for example can only be down (On) or up (Off). However, the MIDI specification groups all these messages as Continuous messages, and so does Cubasis AV.

Continuous messages are shown and edited in Key Edit and List Edit:

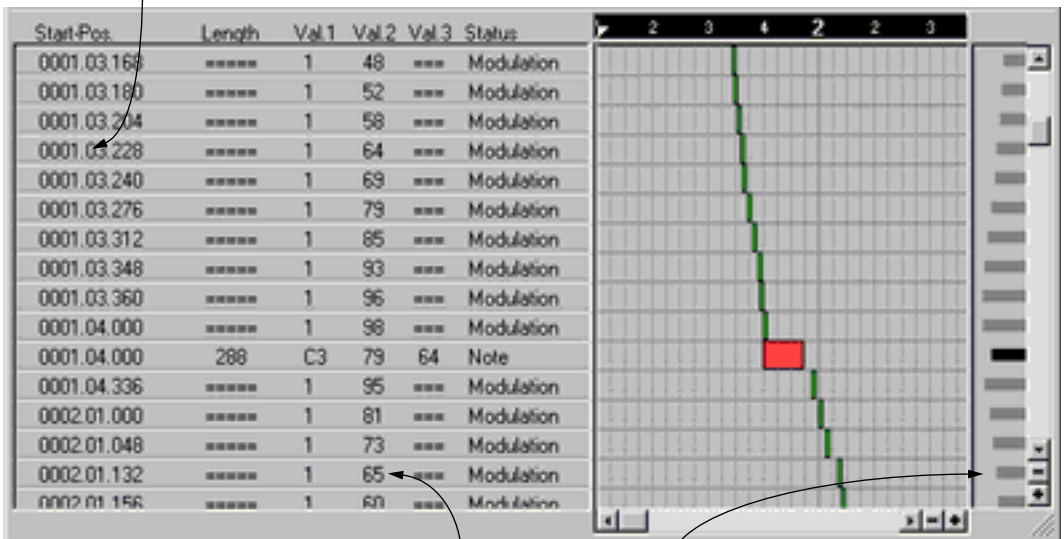
In Key Edit, the area beneath the Divider is the Controller Display.



Clicking on this icon brings up a pop-up menu, allowing you to select which type of continuous data should be shown. In this case, modulation wheel Events are displayed.

The “mountains” of continuous data in the Key Edit window above are in reality a large number of single Events. This becomes clear when looking at the same data in the List Edit Window on the next page:

The modulation Events are listed in their playback order.



Value 2 for each Event is shown in the list and in the bar display.
The grey color indicates non-note Events.

- Please note that only the most common Continuous Controller Events are shown in Key Edit. These are Aftertouch (Channel Pressure), Pitch Bend, Modulation, Main Volume, Pan and Velocity. To display, create or edit other types of Continuous Events, use List Edit.

Program Change messages

A Program Change message is a MIDI Event, telling a connected MIDI device to switch to another Program (e.g. a sound in a synthesizer, a setting in a reverb device, etc). You can record Program Change messages into Cubasis AV like any other Event. If you want to edit (or create new) Program Change messages, it can be done in List Edit. See the chapter “List Edit”.

System Exclusive messages

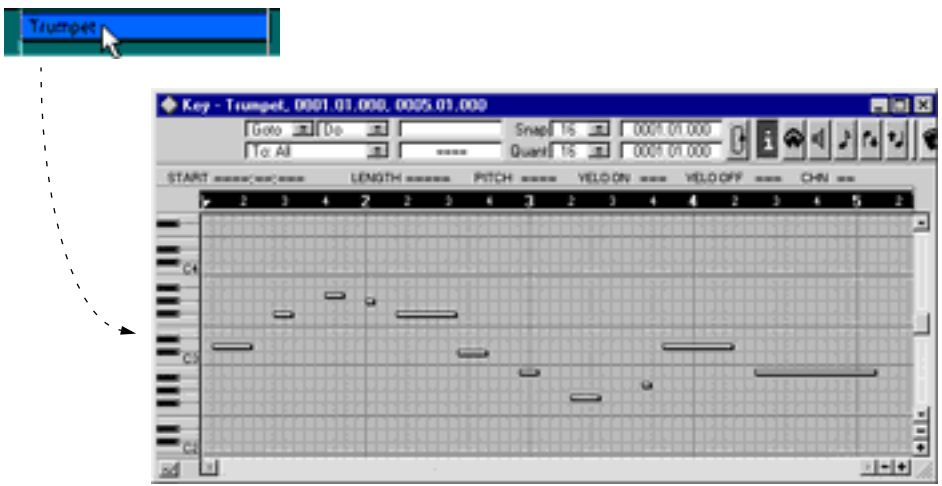
System Exclusive messages are a special kind of MIDI Event, intended for detailed control of the parameters of a MIDI device. Since all devices have different parameters, each major manufacturer of MIDI devices has a special ID code that is included in the System Exclusive message.

Cubasis AV can record and play back System Exclusive messages, but they can not be edited or created from scratch.

Opening An Editor

By double clicking on one Part

1. **If you only want to open one Part into an editor, simply double click on it.**



Selecting the default MIDI editor

Which editor opens when you double click on a Part, depends on the “Double Click Opens” setting:

1. **Pull down the Options menu and position the pointer on the Double Click Opens item.**
   A submenu appears.

2. **Select one of the three items on the submenu.**
   You can choose between Key, Score and List Edit.

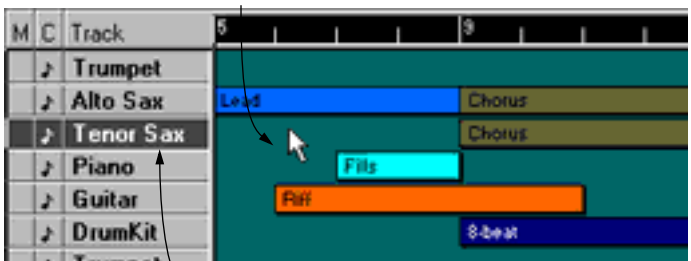
3. **Save your Song.**

   If you want this setting to be valid for all new Songs, you should set up your “Autoload” song for this. See the chapter “Customizing Cubasis AV”.

Editing a complete Track

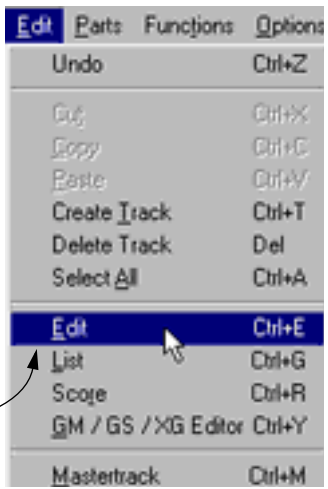
You can edit all Parts on a Track at the same time:

1. Make sure no Parts are selected, by clicking somewhere in the background area of the Arrange Window.



2. Select the Track you want to Edit.

3. Select the preferred editor from the Edit menu or use the keyboard equivalents.



Editing more than one Part

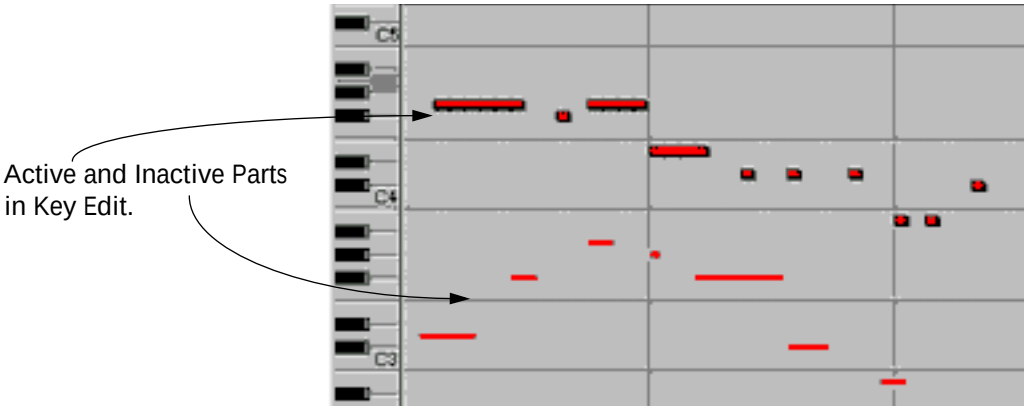
You can edit any selection of Parts, even Parts on different Tracks at the same time. The only restriction is this:

- List Edit can only be used to edit Parts that are all on the same Track.

1. **Select the Parts you want to Edit.**

2. **Select the preferred editor from the Edit menu or use the keyboard equivalents.**
   The editor opens, showing the selected Parts at the same time. However, only one at a time is active. The active and inactive Parts are separated graphically:

- In Key Edit, notes belonging to an *active Part* are bright-colored (black when they are selected), while notes belonging to an *inactive Part* are dimmed and thinner than the notes of the active Parts.



3. **To activate a Part within an editor, click on any Event belonging to that Part.**
   You can also use the Next/Previous Part commands on the Goto pop-up menu, which is convenient if the Part is empty.

If you haven't recorded any Part yet

You might want to open the editor to input notes from scratch, without recording anything first. In this case you have to create a Part, using any of the methods described on page 173.

About Recording and Playback

Basically, anything you can do in the Arrange window that relates to playback and recording, can also be done in the editors.

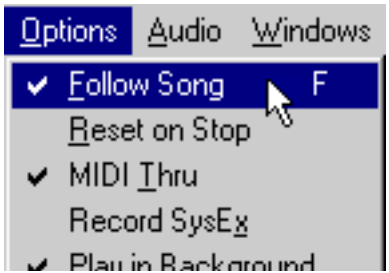
Realtime

Like everything else in Cubasis AV, editing can happen in realtime. This means that you can edit while the music is playing or actually even while you are recording!

Step Recording

If you prefer not to record your music in real time, you may use the Step Recording function to input music one note at a time. This is explained in the chapter “Step Recording”.

Follow Song



If Follow Song on the Options menu is turned on, the Edit window will scroll automatically during playback, so that the current Song Position is always visible.

- **You may also press [F] on the computer keyboard to turn Follow Song on and off.**

Cycle

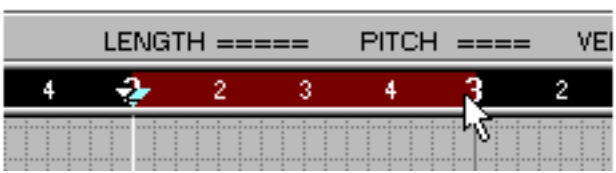
If the Cycle button on the Transport Bar is activated, a certain section of your arrangement will be repeated over and over as described in the chapter “Cycled Playback and Recording”. This is very handy for editing where you can fine-tune a recording and instantly hear the result without having to Rewind and Play to get to the right section.

The Loop Function

In all 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!

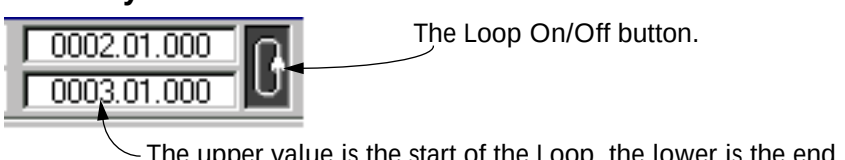
There are three ways to set the Loop:

- **Drag the mouse on the Position Bar to draw the Loop area.**



This does not work in Score Edit, since it has no Position Bar.

- **Use the mouse and/or computer keyboard to set the values in the Loop boundary boxes on the Status Bar.**



- **Use [Alt Gr]-[L] and [Alt Gr]-[R] to open the Loop boundary boxes and enter the values.**

Either way, the current Loop is shown in black on the Position Bar when it is on, and in grey when it is off.

Turning the Loop on or off

- **Turn the Loop on/off by clicking on its button or by pressing [Alt Gr]-[O].** For this to work, you have to define the Loop first, as explained above.

  When the Loop is active, the Parts within the Loop in the Edit window loop almost independently of the rest of the music. We say “almost”, because the Loop is still dependent 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 page 273 in this chapter.

Playback Parameters

The Playback settings you may have done in the Inspector are not visible when you edit the Part. This means that if a Part is transposed using the Inspector, it will be shown at its original recorded pitch in the editor, even though you will hear it playing back transposed.

- **If this is a problem, you may “freeze” the play parameters.** This function transforms the settings in the Inspector (e.g. a transposition) to “real” MIDI data (in the case of transposition, changed pitches for each note), visible and editable in the editors.

Moving around and the Goto pop-up menu

You can move directly to certain useful positions in an editor by selecting from the Goto menu on the Function Bar. These options will scroll your view to show the Events at the chosen position.

Song Position	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 of all the selected Events.
Next Selected	Takes you to the next selected Event.
Last Selected	Takes you to the last of the selected Events.
Prev Selected	Takes you to the selected Event before the one currently in view.
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. Again, this might just lead to a vertical scroll.

- The Goto commands don't affect selection in any way. They only change the view as if the scroll bars were used.

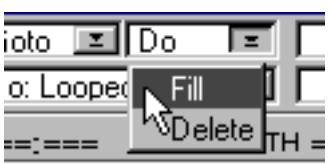
Creating Events in the Editors

This is mainly done with various tools from the Toolboxes:

- **The Pencil tool is used to “draw” notes and other Events in Key and List Edit (see page 287 and page 315).**
- **The Paint Brush tool is used to “paint” series of notes in Key and List Edit (see page 289 and page 315).**
- **The Note and Rest tools are used in Score Edit, to create notes and rests respectively (see page 336).**

Creating notes with the Fill function

All the editors have a pop-up menu named “Do”. The contents of this pop-up menu varies with the different editors, but all include a function called “Fill”.



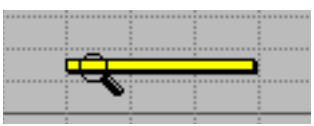
This function only works when the To menu is set to “All Events”, “Looped Events” or “Cycled Events” (see page 273). It then fills the whole Part/the Loop/the Cycle with notes that have the same pitch. The notes are spaced according to the Snap value and are all given a length corresponding to the Quantize value.

Monitoring Events in the Editors

As already mentioned, you can have playback running while you are editing. And, you can also use the cue function (see page 119) in the Edit windows. But there are two more ways to listen to your music in the editors:

The Magnifying Glass

The Magnifying Glass tool is common to all MIDI editors. When you click on an Event using this tool, the Event is played back. You can also hold the mouse button and drag the Magnifying Glass around over the Events.



The Speaker

When you click on the speaker symbol on the Status 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.

Selecting Events in the Editors

Selecting Events in the editors is done just like selecting Parts in the Arrange window, described on page 174. You can:

- **Click on an Event to select it (and deselect all others).**
- **Hold [Shift] and click on an Event to select it, adding to any previous selection.**
- **Select several Events by enclosing them in a rectangle using the Arrow tool.**
- **Press [Control]-[A] to select all Events in the editor.**
  This is the same as using the Select All item on the Edit menu.
- **Use the [←] and [→] keys to select the previous/next Event in the Active Part.**
  If you hold down [Shift] and use the arrow keys, the next/previous Event will be selected, without deselecting already selected Events.

Selecting Events from different Parts

You can select Events from both an active and an inactive Part:

1. **Select the Events you want in the active Part, using any method described above.**

2. **Hold down [Shift].**

3. **Select one Event from an inactive Part by clicking on it.**
   This Part now becomes active.

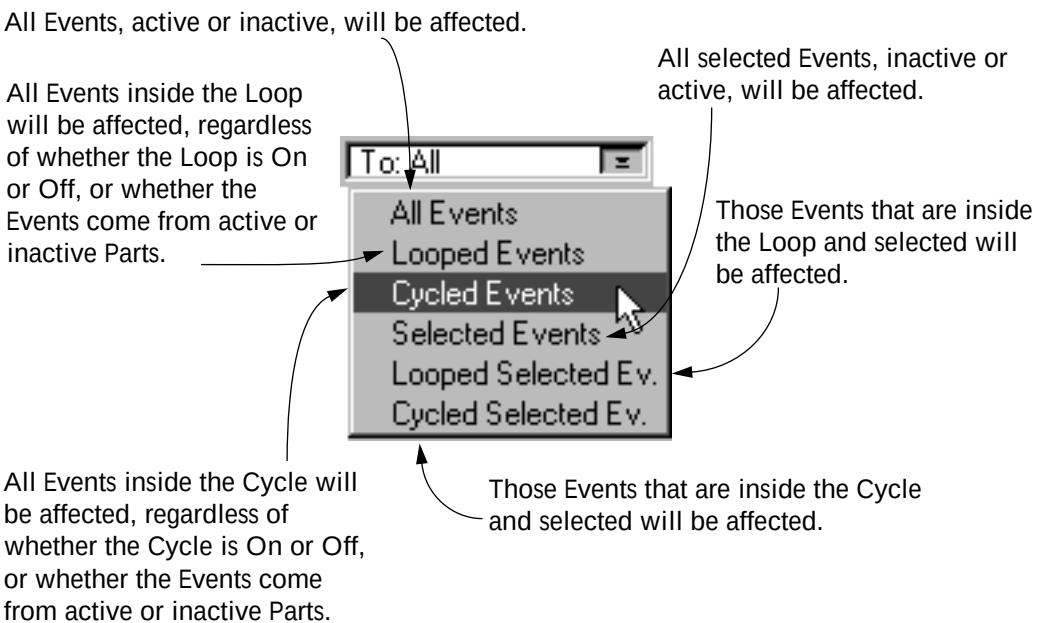
4. **While keeping [Shift] pressed, use any method to select more Events from the now active Part.**
   As long as you keep [Shift] pressed, you can switch active Parts and select from as many as you like.

- 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.
  (Note, however, that the setting on the To pop-up menu may further restrict which Events are affected, see below).

- When you record, use Step Input or make any other changes via MIDI, it is always the active Part that is affected.

The To Pop-up

All the editors have a pop-up menu called “To”. This is used together with the Loop and Cycle functions to collectively choose a group of Events to be affected by your editing.



About Editing

This is done differently in every editor, using the various tools in the Toolboxes. Refer to each editor's chapter for detailed information about how to use the different tools.

Quantize and Snap Values in the Editors

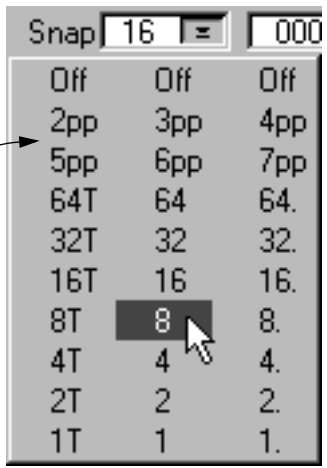
The Quantize and Snap values work exactly as in the Arrange Window (see page 181). However, there are a couple of things worth pointing out:

- **Each editor has separate settings for Quantize and Snap values.**
  This means that the settings you make in the Key Edit window will not automatically be transferred to for example Score Edit. This is practical, due to the different work methods you will employ in the different editors.

- **The Quantize value also determines the length of input notes.**
  If for example you have the Quantize value set to 8, the notes you create will automatically become 1/8-notes.

- **The Snap value also defines the spacing between input notes.**
  This applies when you use the paint brush or the Fill command from the Do pop-up. With a Snap value of 4 and a Quantize value of 16, you will get sixteenth notes, positioned on the beats (quarter-note positions).

- **The Snap pop-ups in the editors contain more options than the one in the Arrange Window.**
  This is because, unlike when moving Parts, you may need small or uneven Snap values in the editors. The following Snap values are available:



The values 2 - 7 pp are values in ticks, allowing high precision editing and moving.

The values ranging from 64 to 1 are regular note values. Triplets (T) and dotted (.) note values can be selected.

Editing Notes via MIDI

You can change the properties of notes via MIDI. This can be a handy and fast way to get for example the right velocity value, since you will hear the result even as you edit:

1. **Select the note you want to edit.**

2. **Click on the MIDI Connector symbol on the Status Bar.**

The symbol should be “lit”. This enables editing via MIDI.

3. **Use the Note buttons on the Status Bar to decide what properties will be changed by the MIDI input.**
You can enable editing of Pitch, Note On- and/or Note Off-velocity.

With this setting, the edited notes will get the Pitch and Velo-off values of the notes input via MIDI, but the Velo-on values will be kept as they are.

4. **Play a note on your MIDI instrument.**
   The note selected in the editor will take on the properties of the played note, according to the setting made in step 3.

   The next note in the active Part automatically gets selected. A series of notes can therefore quickly be edited.

- **If you want another try, select the note again (easiest by pressing the [←] key on the computer keyboard) and again play a note on your MIDI Instrument.**

The Info Line

At the top of the Key and Score editors, you have the Info Line.The Info Line shows the values for one selected note. The values can be edited, just as in the List in List Edit:

1. **To show/hide the Info Line, click on the i-button on the Status Bar or press [Alt Gr]-[I] on the computer keyboard.**

When the “i” button is lit, the Info Line is shown.

2. **Select a single Event.**
   Its values are shown on the Info Line.

   If no Event or several Events are selected, the Info Line shows “– – –” for all values.

3. **Change the desired values using regular value editing.**
   As always, you can use the mouse or type in values from the computer keyboard.

Info Line Parameters

The following parameters can be changed on the Info Line:

Parameter	Remark
Start	Changing this value is the same as moving the note.
Length	In ticks.
Pitch	Changing this value transposes the note.
Velo On	The Note On velocity; the speed with which you press a key on a MIDI keyboard.
Velo Off	The Note Off velocity; the speed with which you release a key on a MIDI keyboard.
Chn	The “original” MIDI Channel associated with the note (see page 91).

- Not all MIDI Instruments send and/or read velocity (especially true with Note Off velocity). Check your instrument’s operation manual if you are unsure.

Cutting, Copying and Pasting

You can use the Cut, Copy and Paste commands to move Events between editors or to duplicate a series of Events.

- **Cut or Copied Events are Pasted in starting at the Song Position. The Events will keep their relative positions, pitch and other properties. See page 39.**

Deleting Events

To delete Events:

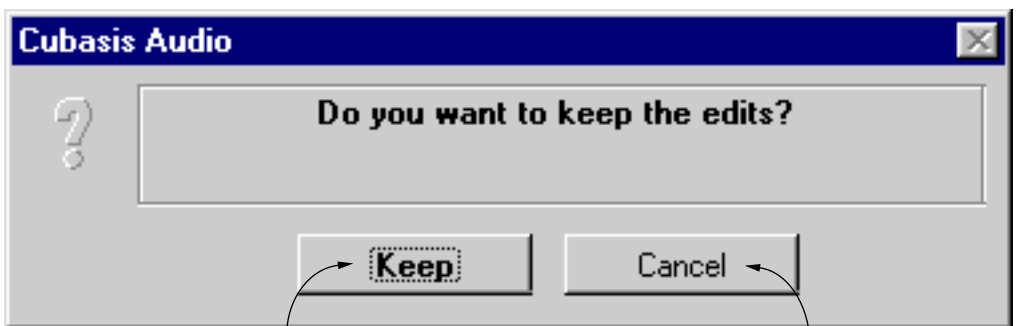
- **Click with the Eraser tool on the Events you want to delete, or...**
- **Select the Event(s) you want to delete and press [Backspace], or...**
- **Select the Event(s) and select Delete from the Edit menu.**

Closing the Editor

There are two ways of closing the editor, “Cancelling” and “Keeping”.

Cancelling

If you press [Esc] (escape) on the computer keyboard or select “Cancel” from the Edit window’s Control Menu (reached by clicking on the Control Menu button to the left on the window’s title bar), a dialog box allows you to change your mind:



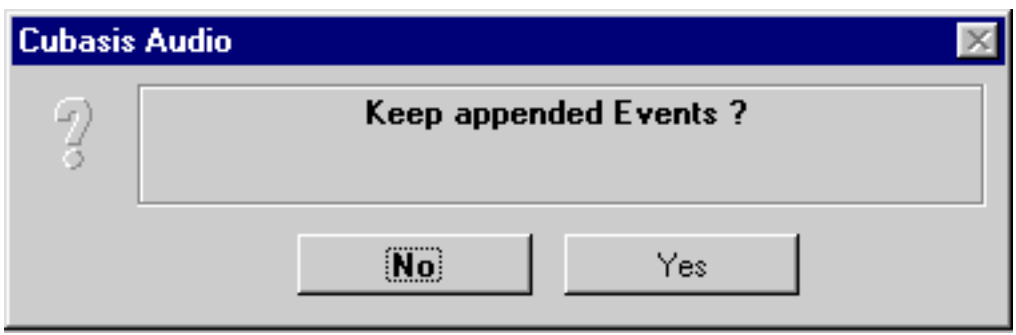
Cancelling can be thought of as a super-undo. It allows you to try out a series of changes to a recorded piece of music and then easily revert to its original state.

Keeping

If you close the editor by selecting “Keep” from the Control Menu or by pressing [Return], the window closes and all the editing you have done is kept.

The “Keep Appended Events?” Dialog

If you close the editor and a dialog appears asking you if you want to “Keep appended Events”, this is because you have added Events outside the Part(s) being edited.



- If you click “Yes”, the Part will be extended to encompass the added Events.
- If you click “No”, the Events outside the Part will be discarded.

Which Editor should you use?

This of course depends on your individual way of working. However, the following suggestions may help you find your way:

Use Key Edit when...

- You want to get a quick overview of the Events.
- You want to edit several Parts at the same time.
- You're editing Pitch Bend, Aftertouch, Main Volume, Modulation, Pan or Velocity values.

Use List Edit when...

- You need to perform detailed editing of single Events.
- You're editing other kinds of Continuous Controllers than those available in Key Edit.

Use Score Edit when...

- You are used to reading and writing scores.
- You are preparing your music for printing.

● Key and Score Edit can be used to edit any combination of Parts from different Tracks. List Edit can only be used for Parts on one Track at a time.

17

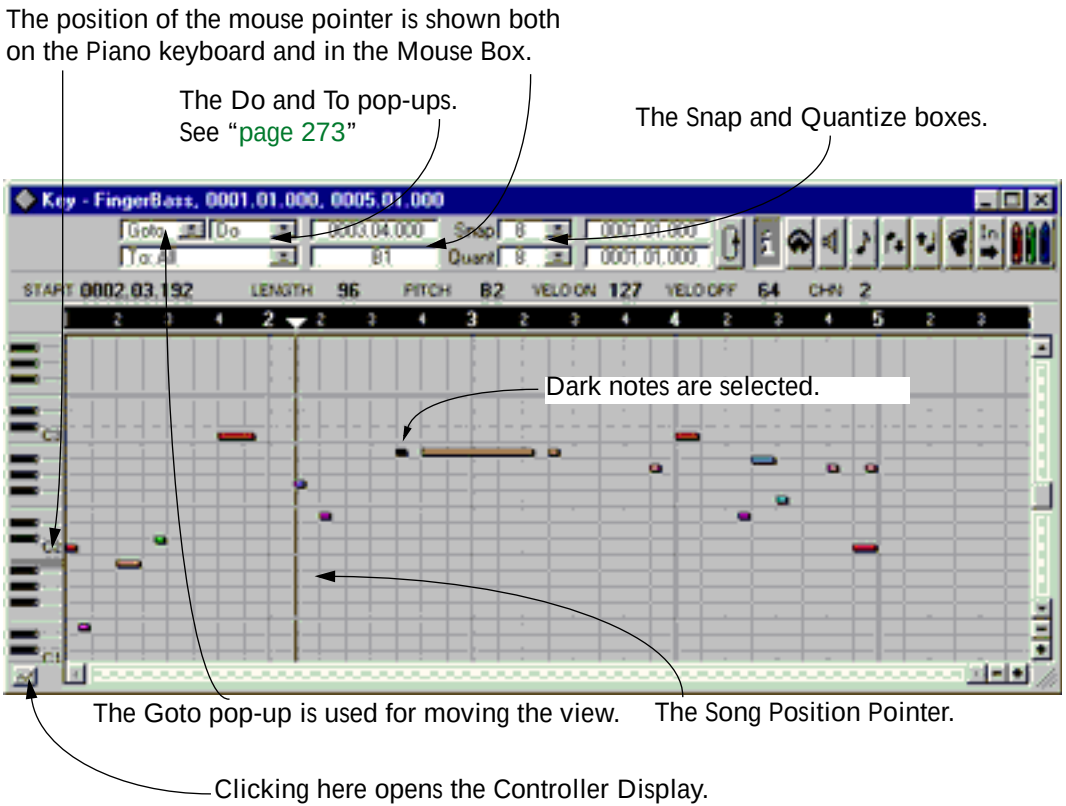
Key Edit

Overview

Key Edit displays notes as boxes with higher notes higher up in the display, and the width of the boxes corresponding to the note lengths. The piano keyboard to the left is there to make it easy to find the right pitch when inputting or editing notes.

Key Edit also lets you display and edit Continuous Controllers (such as Pitch Bend, Modulation, Aftertouch, etc.) in a graphic Controller Display, as described on page 298.

Below you will find a description of some of Key Edit's main features:

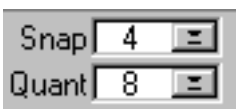


Entering Notes

Using the Pencil tool

1. **Set the Snap value to the smallest position at which you want to enter a note.**

2. **Set the length of the note to be entered by changing the Quantize value.**

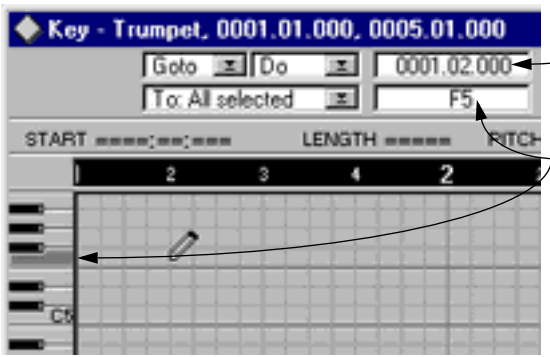


For example, if you want to enter eighth notes at quarter note positions, set the Quantize value to “8” and Snap to “4”.

3. **Select the Pencil tool from the Toolbox, and move the pointer onto the note display.**

4. Aim at the correct position.

The piano keyboard to the left and the two fields on the Status Bar will help you by showing the pitch and position.

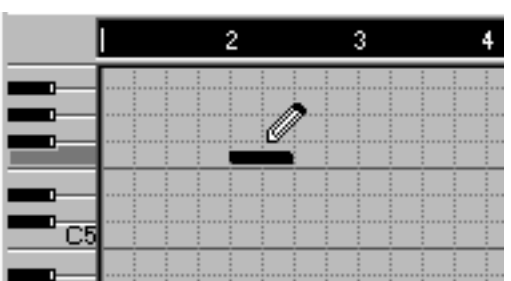


The position of the note.

The pitch of the note.

5. Click once with the mouse.

The note appears.



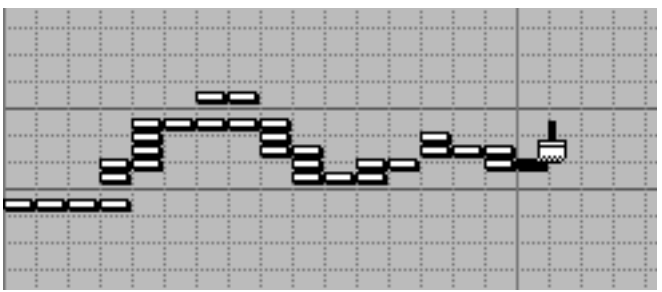
Using the Paint Brush tool

Use the Paint Brush to ‘paint’ in several new notes at a time:

1. **Select the Paint Brush tool.**

2. **Position the pointer where you want the first note to be.**

3. **Press the mouse button and drag the pointer.**



Notes are created according to the following rules:

- The notes are created at a spacing defined by the Snap value.
- The notes get the length of the Quantize value.
- Movement is restricted to a horizontal direction only when you are dragging (that is, all notes will have the same pitch).
  If you want to paint “freehand”, with no restrictions in pitch, hold down [Alt] when you are using the Paint Brush.

The Insert Button

The Insert button

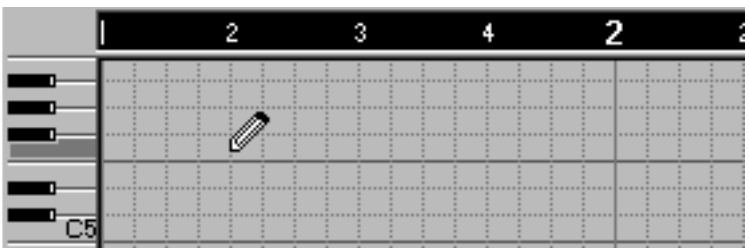
If the Insert button is activated on the Status Bar,when you use the Pen or Brush to insert new events, all Events in the Part (after the insert position) will be moved one Quantize value later. This works just like with Step Input (see the chapter “Step Recording”).

- You can also create new Events using the Fill function on the pop-up Do menu, see page 269.

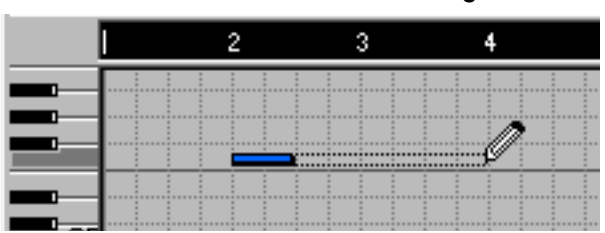
Setting the length while drawing

You can easily set note lengths to something else other than the quantize value, while entering them. The *Snap value* still applies so you can only set the Length to even multiples of this value.

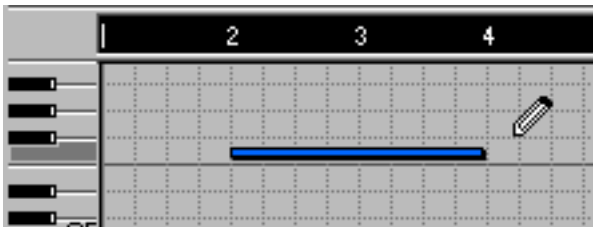
1. **Aim with the Pencil at the correct position and pitch.**



2. **Press the mouse button and drag to the right with the button pressed.**



3. **Release the mouse button. The Event is adjusted to the closest Snap value.**



Determining the note's velocity

The Notes you enter have a high velocity normally. In Key and List Edit you can change it by holding down modifier keys while clicking. Use the following modifier keys:

Velocity	Modifier key
High (127)	None
Medium - high (96)	[Shift]
Medium (64)	[Control]
Low (32)	[Shift]+[Control]

Manipulating Notes

Selecting Notes

This is done with the Arrow tool, just like selecting Parts in the Arrange window:

- Click on a note to select it.
- Hold down [Shift] and click to select several notes.
- “Draw” a rectangle around several notes to select them.

You may also use the left and right arrow keys on the computer keyboard to select the previous or next Event in the editor.

- **If you select a single note, its values will be shown on the Info Line.** You can use the Info Line for detailed editing of single notes, as described on page 278.

Moving Notes

1. **Select the Arrow tool.**

2. **Set the Snap value.**
   If you want to be able to move the note(s) to exact quarter note positions only, set Snap to 4. If you want to move them to exact eighth note positions, set Snap to 8, etc. This works just like when moving Parts in the Arrange Window (see page 181).

3. **Select the note(s) you want to move.**

4. **Position the pointer over one of the selected notes and press the mouse button.**
   The pointer takes on the shape of a hand.

- **If you hold down [Shift], movement is restricted to either vertical or horizontal.**
  Use this if you only want to transpose the notes, or move them without transposing.

5. **Drag the note(s) to the new position and release the mouse button.**
   A dotted outline of the note(s) is shown while you drag.

Duplicating Notes

1. **Select the Arrow tool.**

2. **Set the Snap value as for moving notes (see the previous page).**

3. **Select the note(s) you want to duplicate.**

4. **Hold down [Alternate] on the computer keyboard.**

5. **Position the pointer over one of the selected notes and press the mouse button.**
   The pointer takes on the shape of a hand.

- **If you hold down [Shift], movement is restricted to either vertical or horizontal.**
  Use this if you want move the duplicated notes in one direction only.

6. **Drag the note(s) to the new position and release the mouse button.**
   A duplicate set of notes is created and positioned where you drag them.

Resizing Notes with the Pencil tool

You can change the size of notes that you have drawn or recorded, using the Pencil tool:

1. **Set the Snap value.**
   What you do when you resize a note, is to move the end position of that note. You can only resize in multiples of the set Snap value. That means, if Snap is set to 8, you can move the end-position of a note to 1/8, 1/4, 3/8, etc.

2. **Press the mouse button with the Pencil pointer inside the note you want to resize.**

- It might be hard to determine whether you have the pointer inside a note or not. To avoid painting in new Events, hold down [Alt] on the computer keyboard. This disables creation of new Events.

---

3. **Drag the pointer to set the note to the desired length, and release the mouse button.**
   The note gets resized, taking the set Snap value into account.

Deleting Notes

To delete notes, you can use one of the following three methods:

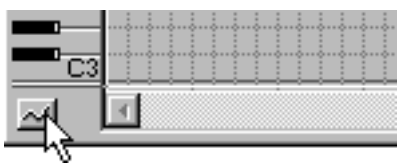
- **Select the Eraser tool and click on the notes you want to delete, or...**
- **Select the note(s) you want to delete and press [Backspace], or...**
- **Select the note(s) you want to delete and select Delete from the Edit menu.**

The Controller Display

This is the area in Key Edit that is used for graphically displaying and editing Velocity and Continuous Controllers.

Opening the Controller Display

- **Open the Controller Display by clicking on the Controller button below the piano keyboard to the left.**
  To close the Controller Display, click on the button again.

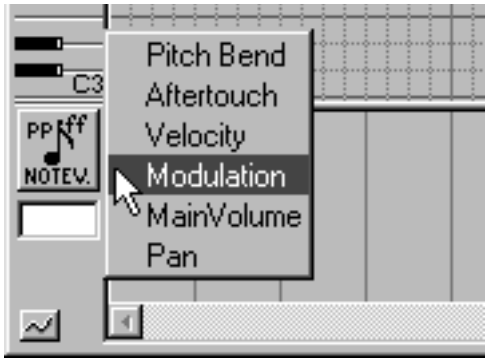


Determining which Controller to display

The Controller Display can show several types of continuous MIDI data, but only one at a time, of course. You decide which one yourself:

1. **Open the Controller Display as described above.**

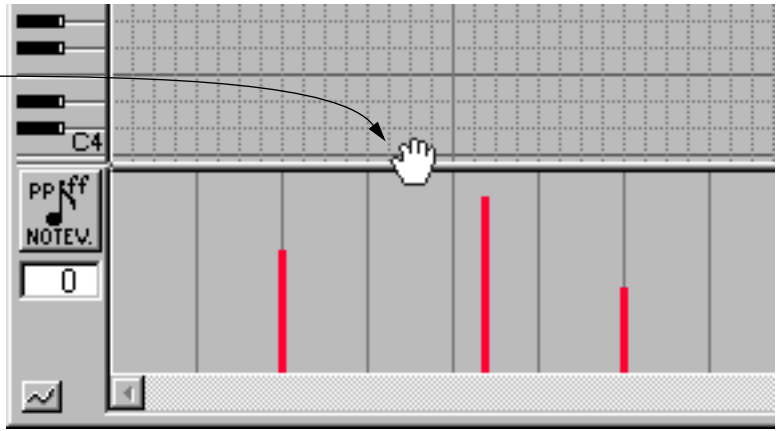
2. **Position the pointer over the Controller icon and press the mouse button.**



3. Select a Controller type from the pop-up menu that appears.
The numeric value below the icon shows the number of the displayed Controller.

Changing the size of the Controller Display

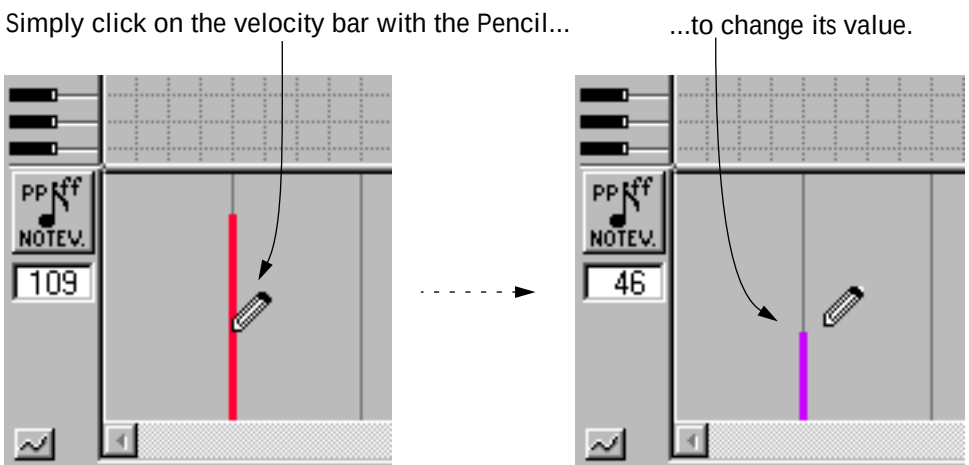
Drag the Divider up or down to enlarge or shrink the Controller Display.



Editing Velocity

The velocity values are shown as bars, with higher bars representing higher velocity values. Since a velocity value is no Event in itself, but rather a property of a note, you cannot create, move or delete velocity values in the Controller display. However, if you move or delete a note in the Event Display, its corresponding velocity bar is moved or deleted as well.

Using the Pencil



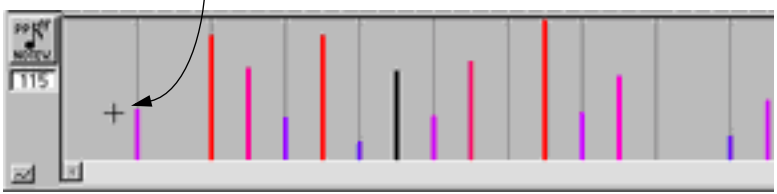
To change a series of values, drag over them.

Using the Line Tool

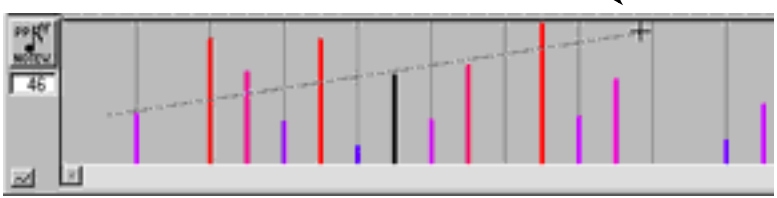
To create a ramp of values, for example a fade-in or fade-out, proceed as follows:

1. Select the Line tool.

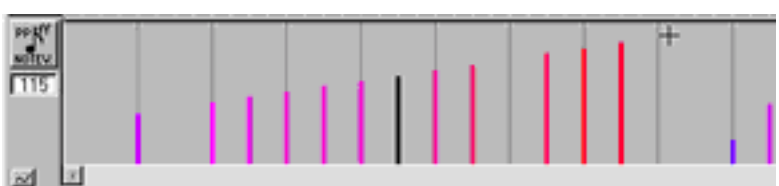
2. Position the pointer and press the mouse button.



3. “Draw” the outline of the ramp with the mouse button pressed.

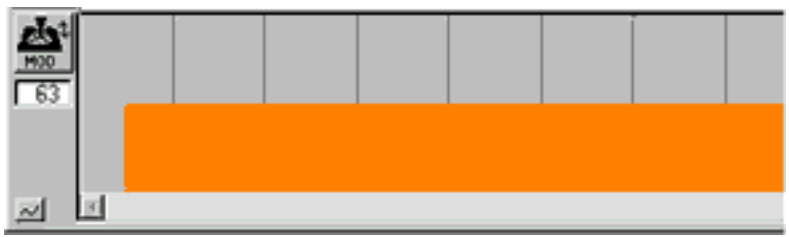


4. Release the mouse button. The velocity values are changed.



Creating Non-note Events

These include Aftertouch (Channel Pressure), Pitch Bend, Modulation, Volume and Pan. There is one very important thing to observe about non-note Events. If for example you put in one single MIDI Modulation wheel Event with a value of 63, this will be displayed like this:



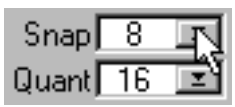
The figure above might look like an “infinite” series of modulation Events all with the value 63, but it is not, it is only one. It is a graph of instantly moving the modulation wheel to position 63 *and leaving it there*.

It is important to remember that if you draw, or in any other way input Controllers, this makes them stay at the last set value for an infinite amount of time (or until you change it the next 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.

To create a non-note Event, proceed like this:

1. **Select what type of data you want to add.**
   Use the Controller pop-up, as described on page 298.

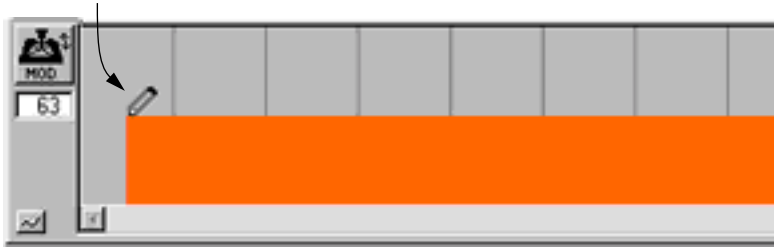
2. **Set up the Snap value to decide what “density” you want for the Events.**



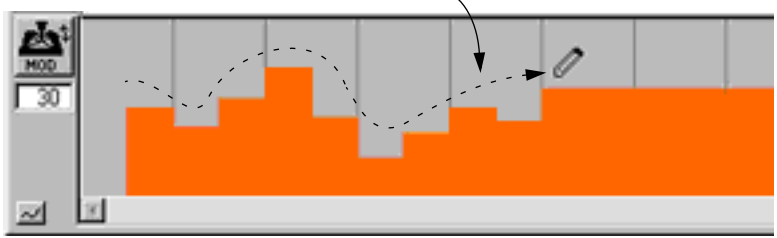
   If you for example want to input one Event every eighth note, set the Snap value to “8”.

3. **Hold down the [Alt] key.**
   From here on there are basically three ways to go, as shown in the picture on the next page:

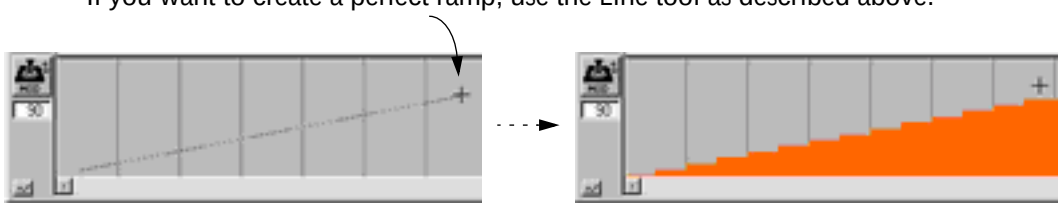
If you want to enter just one Event, click once with the Pencil.



If you want to “paint a curve”, drag the Pencil (with the mouse button pressed).



If you want to create a perfect ramp, use the Line tool as described above.



4. Release the [Alt] key.

- All values range between 0 and 127, except Pitch Bend, which has a value range from -8192 to +8191. For Pitch Bend, value 0 is equivalent to no Pitch Bend (the Pitch Bend wheel/lever in center position).

Selecting Non-note Events

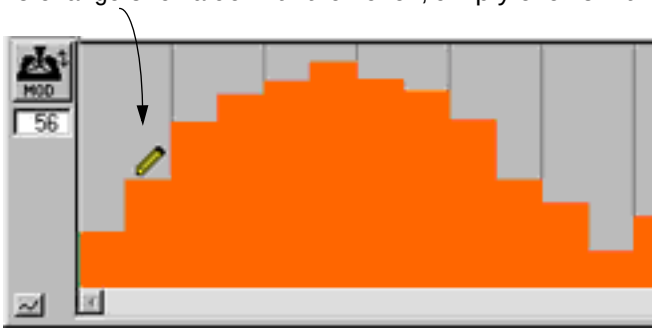
This is done somewhat differently from selecting notes: You can't click on an Event to select it, rather you have to enclose it in a frame, using the Arrow tool. Note that it is the *start* of the Event that has to be enclosed:

Click with the Arrow tool to select Events in the Controller Display. To select several Events, you may hold down the [Shift] key on the computer keyboard and click, or enclose the Events in a frame, just like when selecting notes.

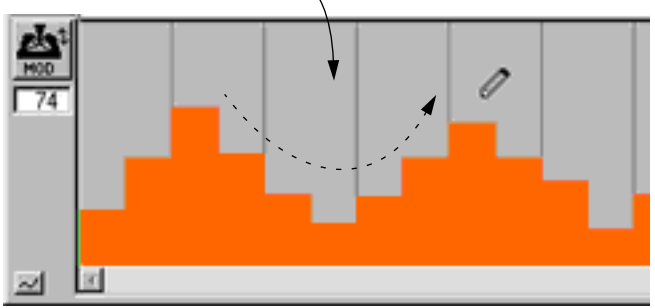
Editing Non-note Events

With the Pencil

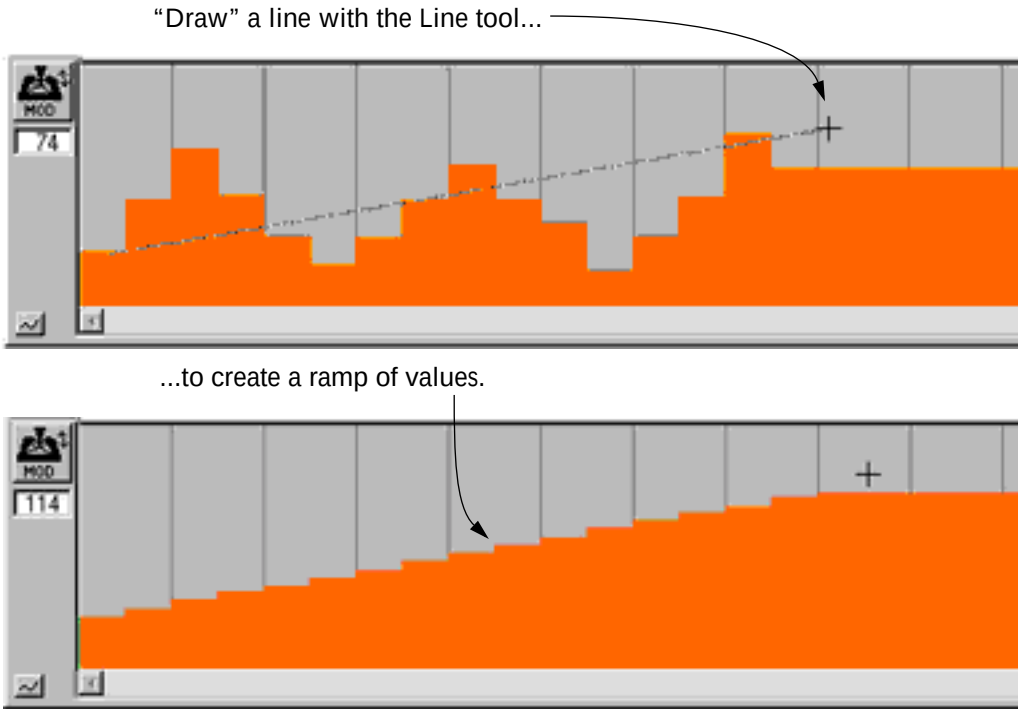
To change one value with the Pencil, simply click on it.



To change a series of values, drag over them.



With the Line Tool



Deleting Non-note Events

You delete an Event in the Controller Display just like you delete notes:

- **Click on the Event with the Eraser tool.**
- **Select the Event and press [Backspace].**

  or

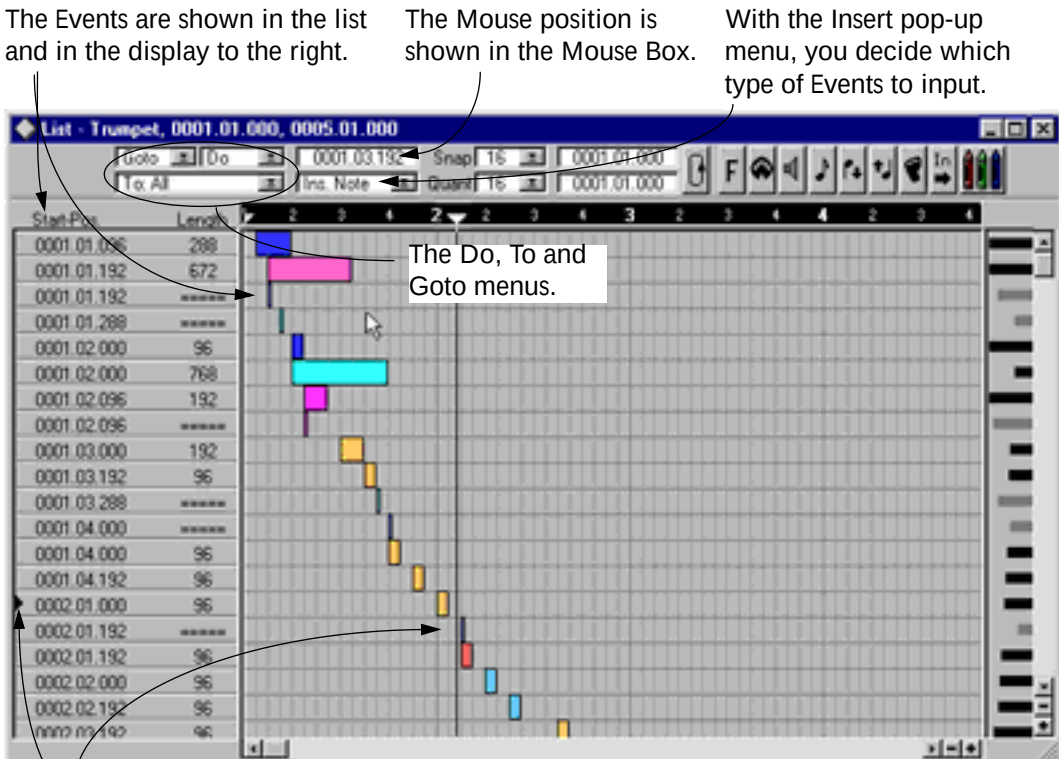
- **Select the Event and select Delete from the Edit menu.**

18

List Edit

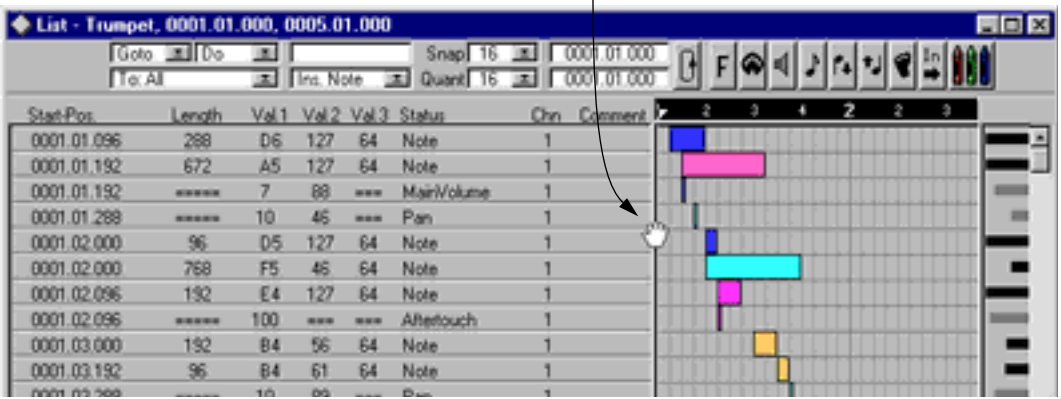
Overview

Below you will find a description of some of List Edit's main features:



The Columns in the List

To make all columns appear, drag the Divider as far right as possible.



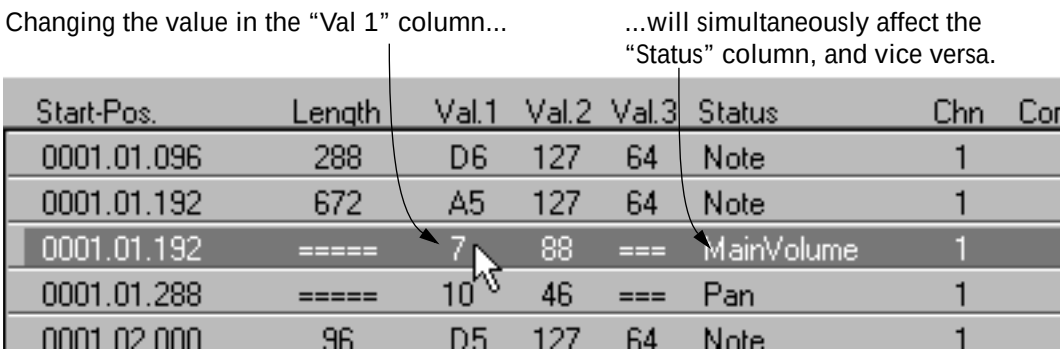
In List Edit, you can view and edit several types of Events. Common to the various Event types are the Start Position, Length and Chn parameters. As you expected, these show where an Event starts, its length in ticks and its MIDI Channel value, respectively. The table on the next page shows the List columns and the parameters for the normal Event types (the rows):

	Val 1	Val 2	Val 3
Notes	Pitch	Note On velocity	Note Off velocity
Poly Pressure	Note Number	Pressure Amount	Not used
Control Change	Controller Type	Change Amount	Not used
Program Change	Program Number	Not used	Not used
Aftertouch	Pressure Amount	Not used	Not used
Pitch Bend	Bend value (fine)	Bend value (coarse)	Not used

There is also a column named Status. For all Event types except Control Change (see below), this is just an explanatory value that can't be changed, e.g. "Note" for Note Events etc.

Transforming Controller Events

If you change Value 1 for a Control Change Event, you actually change the Controller from one type to another. To simplify this, the name of the Controller type is shown in the “Status” column in the List. You can change the value either in the “Val 1” column or the “Status” column.



Creating Events

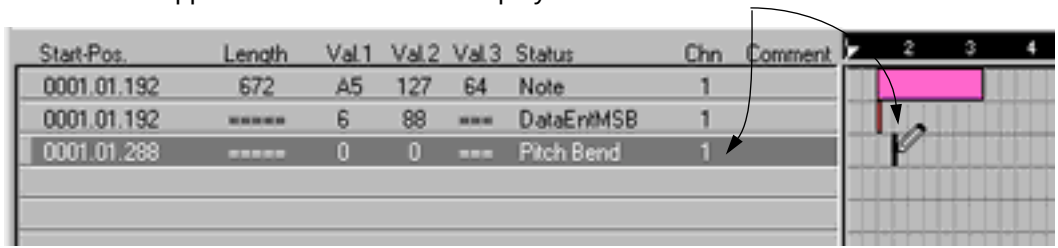
1. **Use the Insert pop-up menu to decide what type of Event to Insert.**

2. **Set the Snap value to the smallest position at which you want to enter a note.**

3. **If you are entering notes, set their length with the Quantize value.**

From here there are three ways to go:

- **Select the Pencil or the Paint Brush and draw the Event in the Event display.**
  The Event appears both in the Event Display and in the List.



- **Activate Step Input by clicking on the foot symbol on the Status Bar.**
  Step programming is described in “Step Recording”.

- **Create notes using the Fill function on the Do pop-up menu, see page 269.**

If you are inputting notes, they will have...

- the pitch C3.
- a Note On velocity of 127.
- a Note-Off velocity of 64.
- the MIDI Channel value of the Part.

If you are using Step Input, the notes will have other properties, as described in the chapter “Step Recording”.

Editing in the List

The positions and values of Events can be edited in the List, using the regular procedures. There are some things to note:

- **If you hold down the [Alt] key on the computer keyboard when you change a value, all Events of the same Event type will be set to the same value.** This means for example that all Control Change Events will be affected.
- **If you change an Event's Start Position, the List will be resorted.** The Events are always shown in the order they are played back, with the earliest Event at the top and the latest at the bottom.

Editing in the Event Display

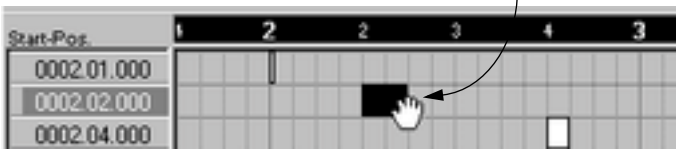
Moving Events

You can use the Arrow tool to move Events in the Event Display, much like in Key Edit. However, there is one big difference. This is how you should look at the horizontal and vertical positions:

- **The horizontal position of an Event in the Event Display is directly related to the Event's Start Position in the Song (just as in Key Edit).**
- **The vertical position of an Event is just related to the order of the Events, as in the List. It has no *direct* relation to time.**

An example:

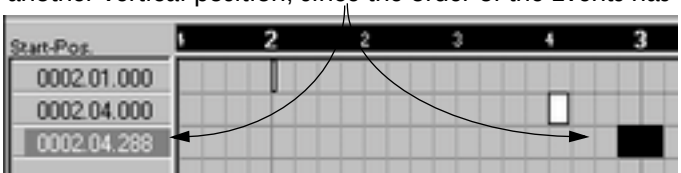
Let's say we have three Events, positioned at 2.1.0, 2.2.0 and 2.4.0. If you move the middle Event a bit to the right...



...it will still keep the exact same vertical position, since its position is still after the first Event but before the third.

But if you move the Event further to the right, past the third Event...

...the Event suddenly appears on another vertical position, since the order of the Events has been changed.

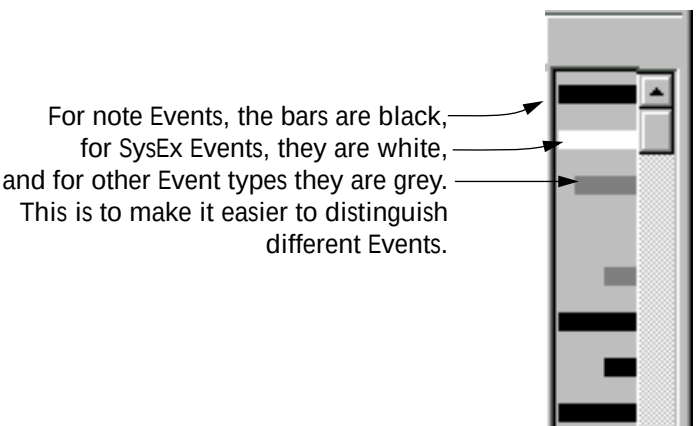


Changing the Lengths of Notes

You can click inside a Note Event and drag it to the desired length, using the Pencil tool. The new length is shown in the Length column in the List.

Editing in the “Value 2” Display

The graphical display to the right shows Value 2 for the Events in the List (where applicable) as horizontal bars. You may use this to change values, create ramps etc.



As you can see in the tables on page 312 in this chapter, the Event types that use Value 2 are Notes, Poly Pressure, Control Change and Pitch Bend Events. Perhaps the most common use for the display is to edit Value 2 for Note Events, that is, the Note On velocity value.

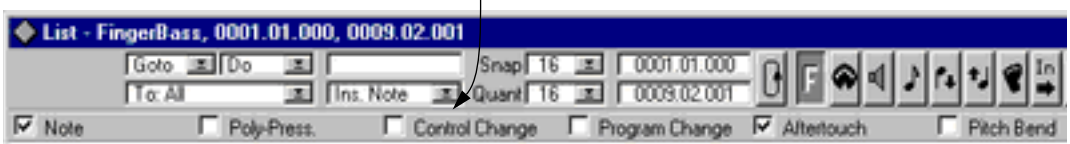
- **You do not have to select the Pencil tool to change the bars in the “Value 2” display; the pointer automatically changes to the Pencil when you move it into the display.**

Hiding Events

You might not want to see all types of Events in the list. If you for example are only interested in editing Program Change, then all other Events are just in the way. Use the Display Filters to determine which Event types should be shown:

1. Click on the “F”-button on the Status Bar.

This opens a line with checkboxes for the different Event Types.



2. Check the checkboxes for the Event Types you want to Hide.

These types disappear from the List.

- The Display Filters do not remove, mute or in any other way change the Events. Editing may affect both visible Events and Events hidden with the Display Filters.

- “Special” Events, such as SysEx or Text, cannot be hidden.

19

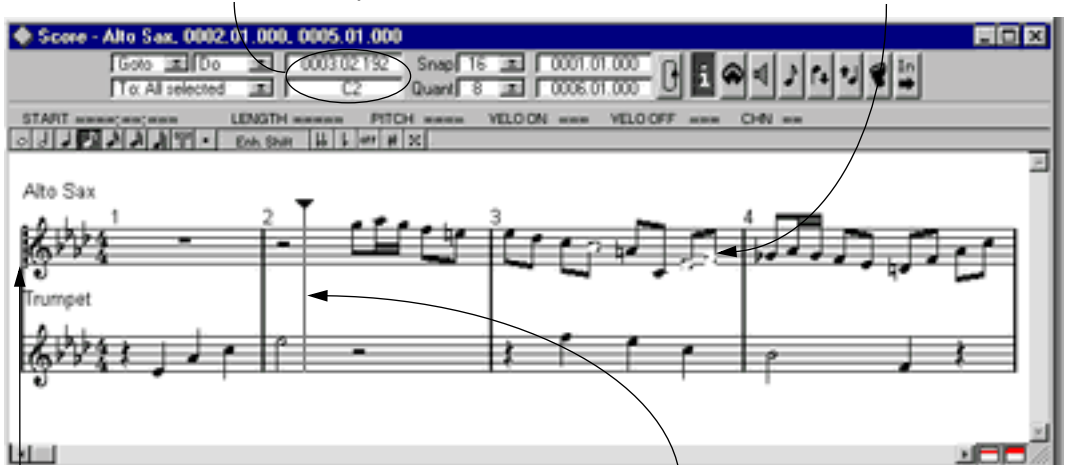
Score Edit

Overview

Score Edit displays your music as regular notation. Below you will find a description of some of Score Edit's main features:

The mouse position is shown both in the mouse box and as a note name in the box below. When you move a note, the lower box shows the amount of transposition in semitones.

The "inverted" notes are selected.



If you are editing Parts on several Tracks at the same time, the striped double bar line at the beginning of the score indicates the Active Track.

The Song Position Pointer.

- **If you are editing one Track, as much of it as possible is shown on several staves - one above the other - just as with a score on paper.**

- **If you edit Parts on several Tracks, they are put on a grand staff (multiple staves, tied together by bar lines).**
- **The number of measures across the screen of course depends on how many notes there are in each measure.**
- **The last measure in the Part is indicated by a double bar line.**

Getting the Score displayed correctly

Time Signature

Score Edit always uses the Time Signatures specified in the Master Track.

Staff Settings

When you open Score Edit for a Part recorded in real-time, the score may not look as legible as you would first expect. The Score editor can ignore the minor time variances in performance and make a neater score almost instantly. To achieve this, there are a number of settings in a *Staff Settings* dialog box that determine how the program displays the music.

There are two ways to open the Staff Settings dialog:

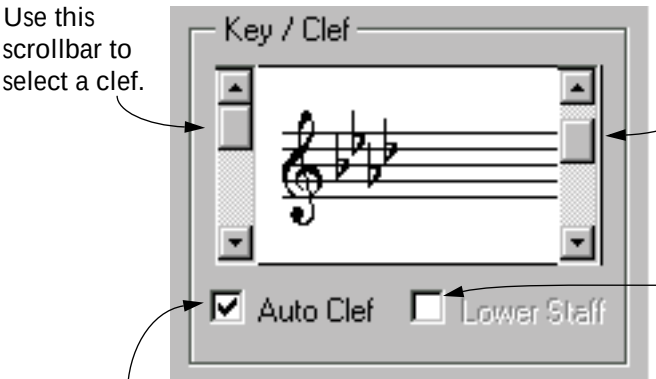
- **Double click in the white area to the left of the staff.**
- **Activate a staff by clicking on the first bar line on any of the staves in the window. Then select “Staff Settings” from the Do pop-up menu.**

The Staff Settings dialog appears:

- The settings you do in this dialog box are independent for each Staff (Track), but common for a piano staff you create with Split Staff Mode.

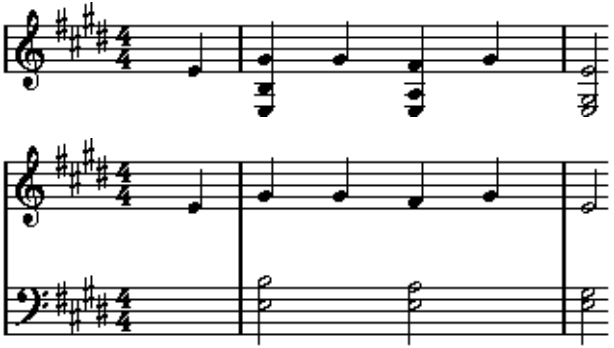
Key and Clef

The correct Key and Clef are set using the two scroll bars in the Key & Clef section.



Splitpoint

When this is ticked, the Part is split on the screen into a bass and treble clef, as in a piano score. You use the value field to set the note where you want the split to occur. Notes above the split note will appear on the upper staff, and notes below the split note will appear on the lower staff.



Before and after setting a split at C3.

Display Quantize

Since the actual timing of recorded notes often varies slightly from the desired notation, the program can be told to "allow" such variations, and still display notes as if they were played perfectly in time. This is done using the Quantize section of the Staff Settings dialog.

- These are only display values used for the graphics in the Score Editor. They do not affect the actual recording in any way.

Here is a description of the functions:

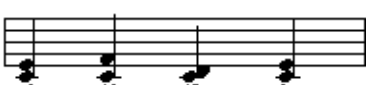
Parameter	Description
Notes	The smallest note value to be displayed. Set this to the smallest significant note value used in your music. If for example you set this to eighth notes, no note values smaller than eighth notes will be displayed. If you set it to a triplet value, the program expects all notes on this staff to be triplets. This setting is partly overridden by Auto Quantize (see below).
Rests	The smallest rest value to be displayed, as with the "Notes" setting described above.

Parameter	Description
Auto Quantize	Generally, if your music contains mixed triplets and straight notes, try activating this function by selecting “Position” from the pop-up menu. Otherwise leave it off. Auto Quantize uses involved methods to make your score look as legible as possible while allowing you to mix straight notes with tuplets (triplets) in a Part. But, Auto Quantize also uses the (display) Quantize value. If it can't find an appropriate note value for a certain note or group of notes, it will use the set Quantize value to display it. If the part is imprecisely played and/or complex, Auto Quantize may have a problem “figuring out” exactly what you “mean”.

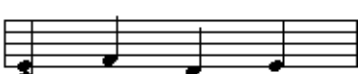
Switches

These provide additional options for how the score should be displayed:

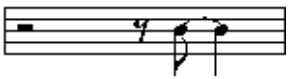
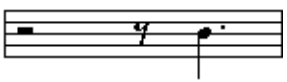
Parameter	Description
Clean Lengths	When this is activated, notes that are considered to be chords will be shown with identical lengths. This is done by showing the longer notes as shorter than they are. When Clean Lengths is turned on, notes with very short overlaps are also cut off; a bit as with No Overlap (see below), but with a more subtle effect.
No Overlap	When this is activated one note will never be shown as overlapping another, lengthwise. This allows long and short notes starting at the same point to be displayed without ties; the long notes are cut off in the display. This will make the music more legible.



An example measure with No Overlap deactivated...



...and with No Overlap activated.

Parameter	Description
Syncopation	When this function is on (ticked) syncopated notes are shown in a more legible way.  This is a dotted quarter at the end of a bar when Syncopation is Off...  ... and when it is On.
Shuffle	Activate this function when you have played a shuffle beat and want it displayed as straight notes (not triplets). This is very common in jazz notation.
Flat Beams	When this is ticked, the beams over the notes will be flat (as opposed to slanted).
No Beams	When this is ticked, there will be no beams whatsoever in the Part. This is good for example for vocal scoring.
Track Name	When this is activated, the name of the Track is shown at the beginning of the Staff.

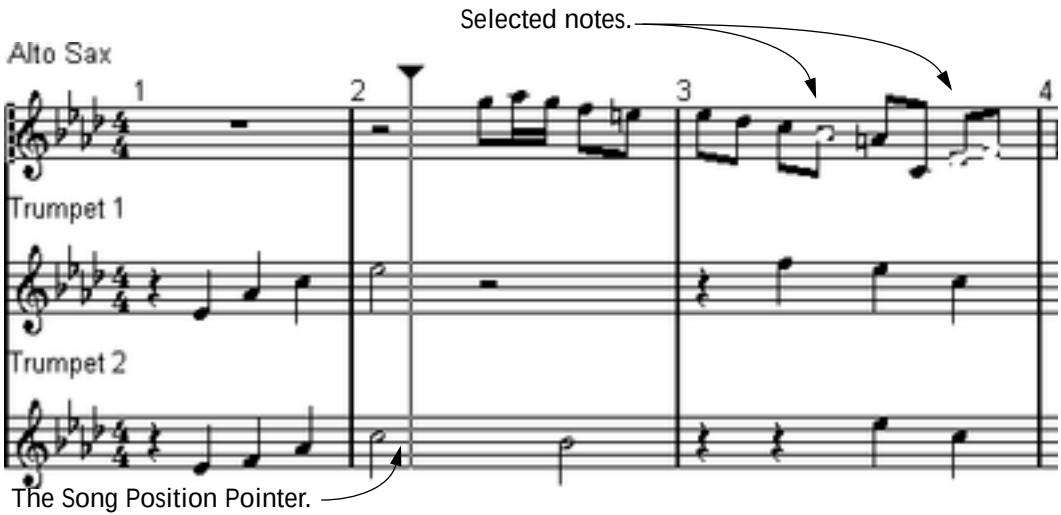
Closing the Dialog

- **When you have finished with the settings, close the dialog by clicking the OK button.**
  This applies the settings to the active Staff/Track.

● Remember that the Staff settings are done independently for each Track.

Editing several Tracks

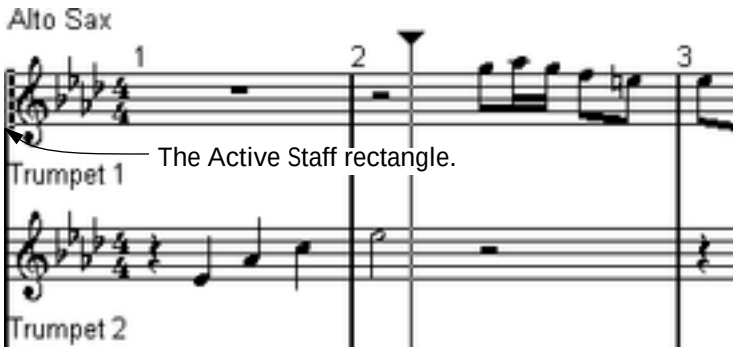
You may edit several Tracks simultaneously in Score Edit. The Tracks are shown as multiple staves, tied together by bar lines and placed in the order they appear in the Track List.



- **If you need to rearrange the staves: close the editor, go back into the Arrange window, drag the Tracks to the order you want them, and open Score Edit again.**

The Active Staff

Just as in the other editors, all MIDI input (as when recording from your instrument) is directed to one of the Tracks, here called the Active Staff. The Active Staff is indicated by a black rectangle in the left part of the first visible bar.



To make another Staff active:

- **Click anywhere in the Staff you want to activate.**

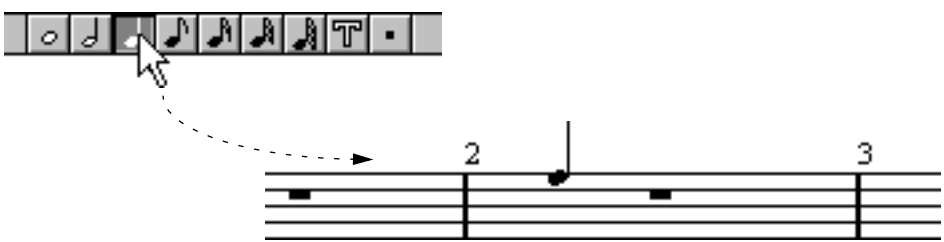
  or

- **Step to the Staff you want to activate, using the [↑] and [↓] keys on the computer keyboard.**

Creating Notes and Rests

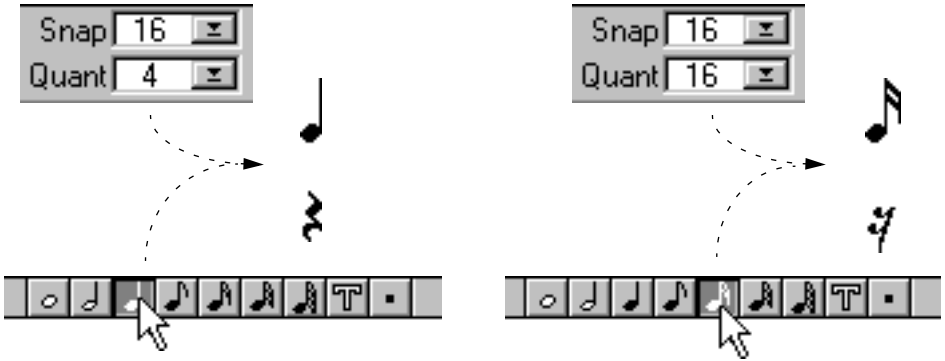
When you input music “by hand” in Score Edit, you can use the Note and Rest tools. The length of the note or rest to be input, is determined by the Quantize value. However, the easiest way to input notes and rests, is to use the note symbols in the Toolbar:

- **To input a note, first click on the desired note value in the Toolbar (the Note tool is automatically selected), then click in the staff where you want the note.**
  If you want to insert a triplet or dotted note, click on the “T” or “·” button when you select the note value.



- **To input a rest, first select the Rest tool, then proceed as when inputting notes.**
  There is one big difference between inputting notes and rests:

● Rests are always inserted (as if Insert was activated) into the music.



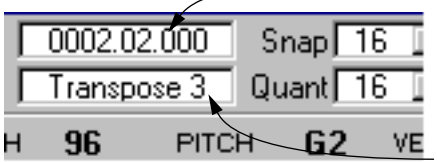
When you change Quantize value, or click on a note button on the Toolbar, the shapes of the Note and Rest tools are changed.

Manipulating Notes

There are a few special features for manipulating notes:

Moving and Transposing Notes

- **Use the two mouse boxes to determine where to place notes.**



The upper box shows the position of the moved note (as bars, beats and ticks).

The lower box shows the pitch when inputting notes, and the transposition value when moving notes.

When you move several notes, the upper mouse box shows the position of the note you clicked on when starting to drag.

- **If you hold down [Control] and transpose a note, it will only be transposed within the set key.**
If, for example, the key is C major (set in the Staff Settings dialog), you will only transpose to notes belonging to the C major scale.

- **Holding down [Shift] restricts movement to either up/down or left/right.**
If for example you want to transpose a note, select it, hold down [Shift] and move it vertically. This way, the note is not accidentally moved to another position in the bar.

Changing the Length of Notes

You may use the Note tool to change the lengths of notes in the score:

1. **Select the Note tool.**

2. **Click on the desired note value button on the Toolbar.**

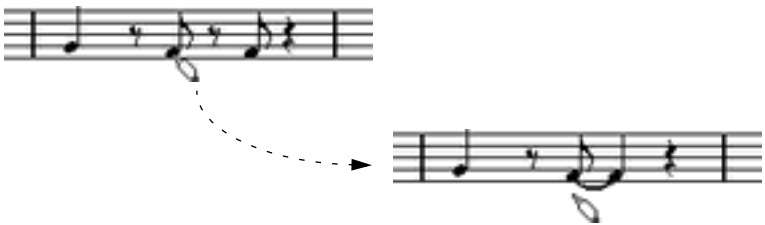
3. **Hold down [Alternate] on the computer keyboard and click on the note you want to change.**
   The note gets the selected note value.

● Please remember that the Display Quantize settings in the Staff Settings dialog affect how notes are displayed. If the above procedure doesn't give the expected result, check the Display Quantize settings.

Joining Notes

The Glue Tube tool allows you to join two or more notes of the same pitch.

- **Click on a note with the Glue Tube tool.**



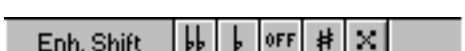
The note is joined to the next note with the same pitch.

Enharmonic Shift

The buttons on the right part of the toolbar are used to shift the display of selected notes so that for example an F# (F sharp) is instead shown as a Gb (G flat) and vice versa:

1. **Use the arrow tool to select the note(s) you want to affect.**

2. **Click on one of the buttons to display the selected note(s) a certain way.**



The middle button resets the notes to the original display. The other four options are double flats, flats, sharps and double sharps.

Flip Stems

By selecting this item from the pop-up Do menu or by pressing [Alt Gr]-[X] on the computer keyboard, you change the stem direction of the selected note(s).

Deleting Notes and Rests

This is done with the Eraser tool, the [Backspace] key or the Delete item on the Do pop-up menu, as in the other editors.

- **Deleting a note is the same as replacing it with a rest.**
  No other notes are affected, although some notes may be displayed differently, due to the Display Quantize settings (see page 329).

- **Deleting a rest will cause all the following notes and rests to move to the left, to fill up the "empty space".**
  Let's say you have a quarter note rest on the first beat of a bar, followed by two quarter notes, on the second and third beats. If you delete the quarter note rest, the two notes will be moved to the left, ending up on the first and second beat of the bar.
  In other words: deleting rests is really only a way of moving notes.

Adding Text

Cubasis AV lets you enter text anywhere in the Score. This can be used for lyrics, comments or performance instructions. Proceed like this:

1. **Select the “Text” Tool.**

2. **Click anywhere in the score.**
   A text input line dialog box appears.

3. **Enter the text and press [Return] when you are ready.**
   The font, style and size of the text depends on the settings in the Text Settings dialog, reached from the Do pop-up menu.

Changing the Font and Size

If you wish to change the font and size for some text you already put in, proceed as follows:

1. **Select the text by clicking on it with the Arrow tool.**
   You may select several lines of text in the Staff, by holding down [Shift] and clicking on them.

2. **Select "Text settings..." from the Do pop-up menu.**

3. **Use the Font pop-up, the size setting and the style options in the dialog box that appears.**
   The fonts you find on the menu depend on what fonts you have installed in your computer.

4. Click “Change Selected or “Change All” to “direct” the font size and style selection to one or more text objects.

The font and size settings you just made will also apply to all the text you input from now on (until you change the settings, of course).

Editing text

To edit text, double click on it with the Arrow tool and enter new information on the input line, just as when you put in the text the first time.

● On your font menu you will also find the *Cubase* font. This is not intended for text, but for the non-text symbols used in the score.

Cutting and Pasting Text

Using the keyboard short-cuts (not the menus) you can Cut and Paste text. Select a “block” of text by clicking on it with the arrow tool, press [Control]-[X] or [Control]-[C] to Cut or Copy. Click for a new insertion point, and press [Control]-[V] to Paste.

Moving and Duplicating Text

Text “blocks” can be moved freely within the “page”, one at a time or together, just drag it/them to the new location.

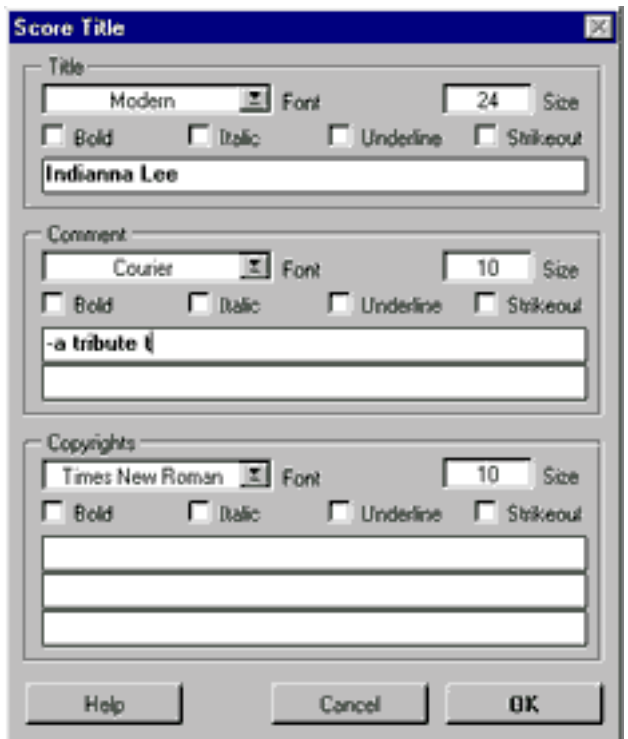
If you hold down [Alt] when you drag you are making copies instead of just moving.

Deleting Text

Text “objects” are deleted just like notes, rests or other objects.

Title, Comment and Copyright

There are three standard text elements on the first page of your score, which you may enter in the dialog box that comes up when you select “Score Title...” from the Do pop-up menu.



1. **Enter Title, Comments and Copyright notes in the respective text areas.**
   "Title" is the title of the Score. It is printed at the top of the first page, and is always centred.
   "Comment" is positioned just below the Title.
   "Copyright" is positioned at the right side of the first page, just above the first system.

2. **Use the pop-up menus and check boxes to select font, size and attributes for the three text elements.**

3. **Click OK.**

● None of these elements are visible on-screen but will be printed out.

Printing

To print your score, proceed as follows:

1. **Make settings for the Text, Title, Comment and Copyright elements, as described on the previous pages.**

2. **Pull down the File menu and select Print & Page Setup.**
   A dialog with printer settings opens.

3. **Select the preferred printer, paper size, orientation, etc.**

4. **If you need to, change the margins by setting the Left, Right, Top and Bottom settings.**
   Please note that each printer has a minimum margin. To automatically set the values to this, click the Default Values button.

5. **Click OK to close the dialog.**
   The “Print” item should now be available on the File menu. If it is greyed out, you have not made the correct printer settings in the Print & Page Setup dialog - repeat step 6 to 8 above.

6. Select Print from the File menu or press [Command]-[P].

A dialog box appears. The options in the dialog depend on the type of printer you use (explained in your Windows documentation). Normally you should be able to specify a number of copies to be printed, print all pages or just a specified range, etc.

7. Click OK.

A dialog will inform you of the progress of the printout. You can cancel printing at any time by clicking the Cancel button.

● Note that printing is only available from Score Edit!

20

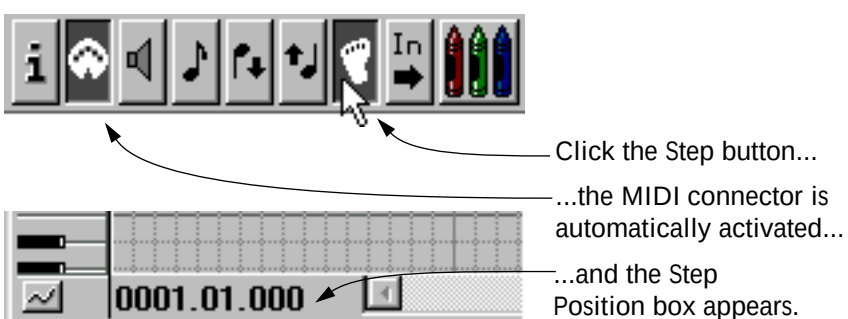
Step Recording

Introduction

Step Input is when you enter notes one at a time (or one chord at a time). This is useful when you know the part you want to record but are not able to play it exactly as you want it.

Preparations

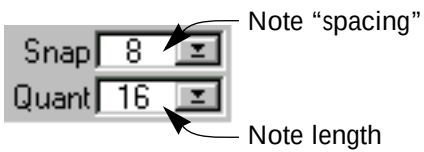
1. **Create an empty Part, as a container for the notes you are about to Step Record.**
   You can of course also use an exisiting Part.
2. **Open the Part in a MIDI editor of your choice.**
   The pictures below show Key Edit, but it doesn't matter which you select.
3. **Click on the Step button.**
   This automatically activates the MIDI In icon and the Step Position box.



Determining Note Lengths and Positions

- **To set the length of the notes you are about to input, adjust the editor's Quantize value.**
  If for example you set this to "16" all notes you input will be sixteenth notes.

- **To set the "spacing" between the notes and chords, adjust the editor's Snap value.**
  If you set this to "8" all notes will appear on eighth note positions.



Setting the Position for the first note

To set the position where you want the first note to appear, adjust the regular Song Position (for example on the Transport Bar) and the Step Position is automatically set to the same value.

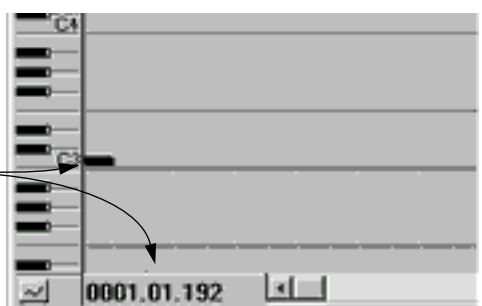
Selecting a Track for input

If you are editing several Tracks at the same time, you must decide which Track to enter notes into by making a Part/Track active. This is just as when recording from an editor, see page 262.

Entering notes and chords

1. **Play one key or a chord.**
   If you just played one key it appears as soon as you release it. If you play a chord it appears when you release the last key. In either case, the velocity you played is recorded with the note.
   No matter how long you hold down the key, the note will get the length set in the Quantize box.

When you release the key, the note appears and the Step Position box advances one step.



2. **Enter the note(s) for the next position.**

Adding Rests

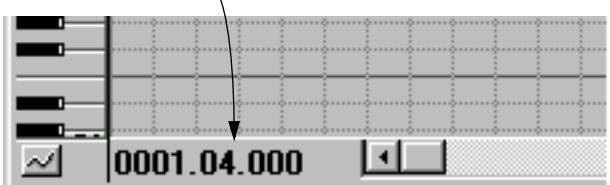
To move one step without entering any notes, press the [Tab] key on the computer keyboard.

Changing note values and positions as you go along

- **If you want to enter notes of another length, simply change the Quantize value at any point.**
- **If you want to input notes with a different "spacing" simply adjust the Snap value.**
- **If you want to move to a completely new position, change the Song Position or use Fast Forward or Rewind.**

If you change the Song Position...

...the Step Position is set to the same value.

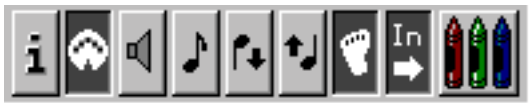


If you make a mistake

If for example you entered a note with the wrong pitch or made a mistake when playing a chord, press [Backspace]. This deletes the last note/chord you entered, and moves the Step Position one step backwards. You can press this key repeatedly to “delete backwards”.

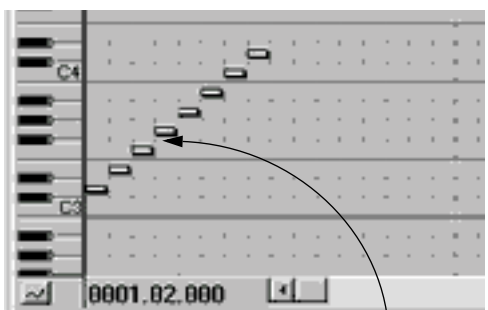
You can also use the tools and menu for editing (deleting, moving etc.).

Using the Insert button

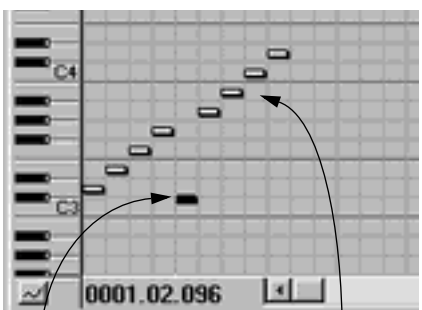


The Insert button.

If the Insert button on the Status Bar is activated, the notes are inserted rather than added. That is, any existing notes are moved to a later position to make room for the new notes.



With Insert on, and the Step Position here...



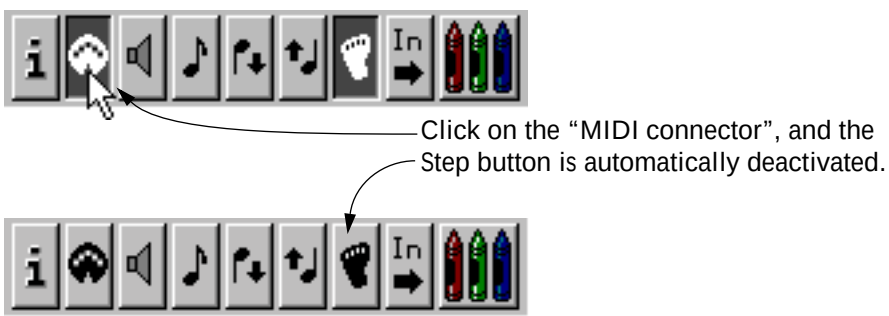
...the new note is inserted, and the following notes are “pushed forward”.

Playing back

You can activate playback at any time and from any position, to hear what you have done. Please note, though, that moving the Song Position also moves the Step Position.

When you are finished

When you have entered all the notes you want, don't forget to deactivate step mode by clicking on the MIDI In button.



21

Quantizing and Using Functions

How Functions are applied

● The procedures in this chapter are relevant for MIDI Tracks only.

By using the items on the Functions menu you can perform various operations on notes and other MIDI data. The most important of these functions is called Quantization, and will be explained in detail in this chapter. However, before explaining how the functions work, it is important to know exactly what is affected by a function:

In the Arrange window

- **Functions will apply to *all selected Parts*.**
- **If there are no selected Parts, the function will apply to *all Parts* on the *active Track*.**

In the MIDI Editors

- **Which Events are affected depends on the selection and the setting on the To pop-up menu (see page 273).**

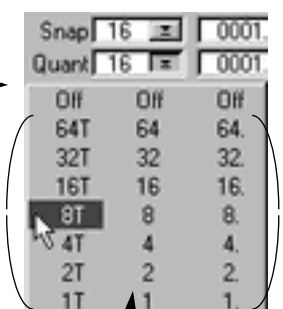
Quantizing

What is Quantizing?

Quantizing is a function that automatically moves recorded notes, positioning them on exact note values. If you record a series of eighth notes, for example, some of them may end up slightly “off” the exact eighth note positions. Quantizing the notes with the Quantize value set to eighth notes, will move the “misplaced” notes to exact positions.

The Quantize value concept may need some explanation. By setting this value, on the pop-up menu on the Status Bar, you select the exact positions the notes should be moved to when you quantize. These are the options:

If you select OFF, no quantizing will be done.



This column is for selecting a triplet Quantize value. The available values range from 1T (whole note triplet) to 64T (1/64 note triplet).

This column is for selecting a dotted Quantize value. The available values range from 1. (dotted whole note) to 64. (dotted 1/64 note).

The middle column is for selecting “normal” Quantize values. The available values range from 1 (whole note) to 64 (64th-note).

In this example a Quantize value of eighth note triplets is selected.

Selecting Over Quantize

In Cubasis AV, the Quantize function is called “Over Quantize”. This is a very musical version of the standard “auto correct” quantize. It will move notes to the closest quantize value, without changing the length of the notes.

To Quantize your music, proceed as follows:

1. **Select the Part(s) (Arrange window) or notes (MIDI Editors) that you want to Quantize.**
   If you have no Parts selected in the Arrange window, all Parts on the selected Track will be affected.

2. **Pull down the Functions menu and select Over Quantize or press [Q] on the computer keyboard.**
   The selected notes are quantized according to the selected Quantize Value.

Undoing Quantize

- Quantizing in Cubasis AV is not done “once and forever”! You can always re-quantize to any value, even to Off, and even after saving to disk!

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.

To completely restore quantized notes to their original positions, use the Undo Quantize function on the Functions menu. This can be applied to any selection of Parts or notes, just as all Functions (see page 359).

Other Functions

The Functions menu is not only used for quantizing, it contains a couple of other functions as well. The same rules as for Quantizing are used to decide what gets affected.

Delete Doubles

This command erases all double notes, which may occur when you record with Cycle activated. 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).

Notes are considered to be doubled when they have the same note number (pitch) and have identical start points.

Delete Cont. Data

This command erases all continuous data such as Modulation, Pitch Bend, etc. Notes and Program Change Events are left unaffected.

Freeze Play Parameters

Use this function when you need to make play parameters in the Inspector permanent, or in other words, convert them to real Events, as described on page 149.

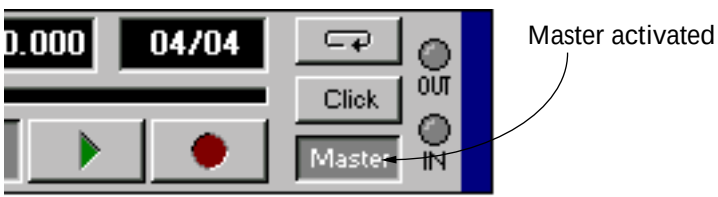
22

The Master Track

Using the Master Track

The Master Track is a special Track that contains time signature and tempo events only. Use this Track when you want to incorporate time signature and tempo *changes* in your music. If your Song does not contain any time signature or tempo changes, it is easier to set the tempo on the Transport Bar, as described in the chapter “Playback, Tempo and the Transport Bar”.

- **To make Cubasis AV follow the tempo settings on the Master Track, click on the Master button on the Transport Bar so that it is activated.**



You may also press [M] on the computer keyboard to activate/deactivate the Master Track.

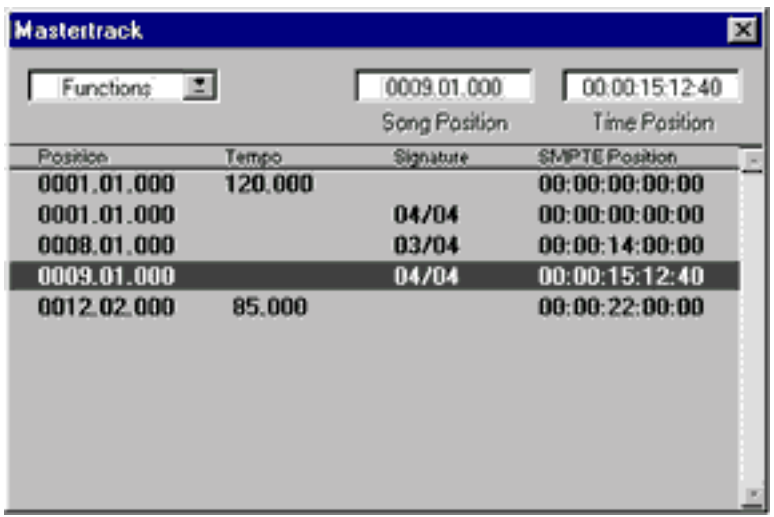
- Cubasis AV always follows the *Time Signature* changes set up on the Master Track. By activating/deactivating the Master Track, you decide if Cubasis AV is to follow the Master Track *tempo* settings or the tempo on the Transport Bar.

- Please note that changing the tempo in Cubasis AV will not change the tempo within any recorded audio! The Master Track tempo only affects *when* each Audio Part starts, not the actual contents of the Part.

The Master Track Editor

There are two ways to *display* the Master Track and its entries:

- **Select Master Track from the Edit menu.**
- **Press [Control]-[M] on the computer keyboard.**



The four columns in the list display each entry's position (in two different ways, see below), and its tempo or time signature value.

The Tempo and Time Signature entries 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.

About the Time Position value

The fourth column in the list shows the time position for each entry. This is displayed in the format hours:minutes:seconds:frames:subframes, where there are 25 frames to each second and 80 subframes to each frame (the common European time code format). This is useful when for example you are working with sounds and music for movies (see the chapter "Movies").

Remember that the time position for an entry will change when you change any previous tempo value. For example, an entry on the first beat of bar 15 (position 15:01:000) will have the time position 00:00:28:00:00 in tempo 120. If you lower the initial tempo in the Mastertrack to 105, the entry will have the time position 00:00:32:00:00, since it "takes longer" to get to bar 15 at this lower tempo.

Editing Events in the List

You change the Tempo and Time Signature values directly in the list, using the normal value editing procedures. Please note:

- **You cannot change the position of the Events in the list.**
  Instead of moving an Event, use Cut and Paste, as described on page 370.

Inserting Tempo or Time Signature Events

To insert new Events into the list, you use the Functions pop-up menu in the top left corner of the editor:

1. **Use the Song Position value box in the top right corner to set the position where you want to insert the Event.**

2. **Pull down the Functions pop-up menu and select “Insert Tempo” or “Insert Signature”.**
   The new Event is added to the list. Time Signature Events are always positioned at the start of a bar.

3. **Edit the Event to give it the desired value, as described above.**

Deleting Events

1. **Click on the Event you want to delete, to select it.**

- **If you want to select a range of Events, click on the first Event, hold down [Shift] on the computer keyboard and click on the last Event.**
  All Events in between are selected.

- **If you want to select several Events, but not all in between, hold down [Control] and click on the Events.**
  Only the Events you click on are selected.

2. **Pull down the Functions pop-up and select Delete Selection, or press [Delete] on the computer keyboard.**
   The Event is removed from the Master Track.

Cut, Copy and Paste

You can use the Cut, Copy and Paste commands on the Edit menu (and their keyboard equivalents) on the Master Track Entries.

1. **Select one or more events and Cut or Copy them.**

2. **Set a new Position value using the Song Position value field.**

3. **Select Paste.**
   The entries will get pasted in, beginning at the position set in the value field.

- **A Pasted entry will not replace an existing Entry at the same Position.**
- **A Time Signature entry can only be pasted in at the downbeat of a bar.**

Other Functions

On the Functions pop-up menu in the top left corner, there are some other functions for the Master Track:

Hide/Show 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 changes from “Hide” to “Show”.

Clear Tempi

This function simply deletes all tempo entries but the first from the list.

Copy Range

This function is practical if you have a certain section of tempo and/or time signature changes in your Song and want to copy this section to another position. Proceed as follows:

1. **In the Arrange window, set up the Left and Right Locator to encompass the section you want to copy.**

2. **Move the Song Position pointer to where you want to copy the section.**

3. **Press [Control]-[M] to open the Mastertrack editor.**

4. **Pull down the Functions pop-up and select Copy Range.**
   The entries within the range will be copied and the copies pasted into the Mastertrack, starting at the Song Position you set in step 2 above.

Undo

Any deletion, copying or creation of events in the Master Track can be undone by selecting Undo from the Edit menu or by pressing [Control]-[Z] on the computer keyboard. Value changes cannot be undone.

Closing the Master Track Editor

Close the editor window by clicking its close box or pressing [Return] on the computer keyboard.

23

Mixing

Introduction

This chapter describes the general procedures of adjusting levels, pan etc., for both audio and MIDI Tracks. This is done in two different windows in Cubasis AV, the Audio Mixer and the GM/GS/XG Editor.

About the differences between the two Mixers

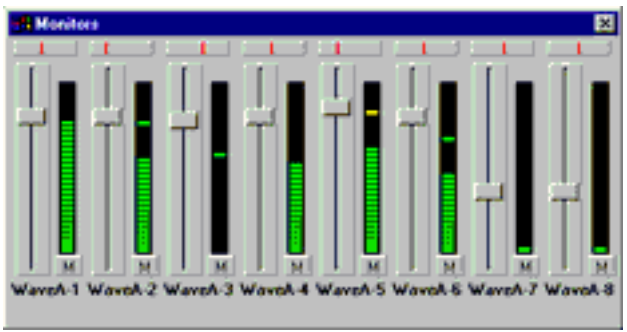
It is important to understand the difference between the two Mixers:

- **The Monitor window (the audio mixer) affects the actual audio playback.** For example, the volume faders in will really attenuate or boost the volume of the audio, and the pan controls will determine where in the stereo image (left - middle - right) the sound appears when you play it back.
  This also means you have to be careful when raising the channel volumes - it's fully possible to cause distortion by setting to high levels. If this happens, simply lower the faders until the distortion disappears.
- **The GM/GS/XG Editor (the MIDI mixer) sends out MIDI messages to the connected MIDI sound source.**
  For examples, the volume faders in the MIDI Mixer send MIDI Volume messages (Controller 7) on each channel, and the pan controls send MIDI Pan messages (Controller 10).

● For this to work properly, your MIDI sound source must be able and set to receive the appropriate MIDI signals. Most modern MIDI instruments are, but if you're in doubt, consult your instrument's documentation.

Opening the Mixers

- **Open the Audio Monitor Mixer by pulling down the Audio menu and selecting “Monitors”.**



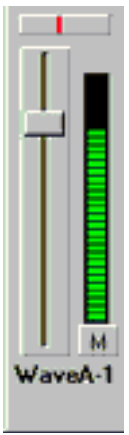
- **Open the GM/GS/XG Editor by selecting “GM/GS/XG Editor” on the Edit menu, or by pressing [Control]-[Y] on the computer keyboard.**

Performing the Mix

To mix, simply play back the music and adjust the controls in each window to your liking.

The Monitor Mixer Controls

Below follows descriptions of the controls in the Monitor window:



Control:	Description:
Channel Faders	These work just like volume faders on a normal mixer. Just click and drag the fader handles to set the playback level for each channel. • If you click directly anywhere on the fader, the fader handle is immediately set to where you click. • If you hold down [Alt] and drag a fader, all faders in the Monitor Mixer will be moved accordingly. Use this as a quick way to lower the total volume, if you get distortion due to high levels.
Pan Controls	These govern where the sound of each channel is positioned in the stereo image. To change the panning for a channel, drag the red line left or right, or click directly in the pan control box (the pan line is immediately moved to where you click).
Meters	These show the playback level of each channel. If the red segments at the top of the meter graph light up, you should lower the level of the channel, to avoid distortion.
Mute buttons	Clicking these buttons temporarily silences the corresponding audio channels.

The GM/GS/XG Editor

If you have a MIDI instrument that supports any of the standards GM (General MIDI), GS (Roland's extension of GM) or XG (Yamaha's extension of GM), this window allows you to "mix" the sound of your MIDI instrument, by sending MIDI messages to the instrument. These messages include volume, pan, program change and effect settings (GS/XG only).

- If your instrument does not support any of the standards mentioned, you may still be able to use some of the functions in the editor, such as volume and pan. Refer to the instrument's documentation and to the MIDI message column in the table below.

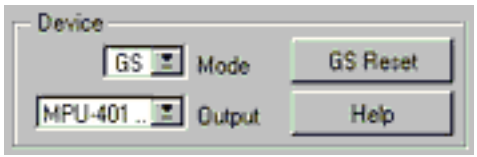
The Mixer section

This is the main section of the window, where you perform the actual mixing. The following table lists the controls available for each channel:

Control:	Description:	MIDI message:
Volume fader	Drag the fader to change the volume of the corresponding MIDI channel.	Controller #7
Pan	Defines the panning (position in the stereo image) for the corresponding MIDI channel. The Drum channel (channel 10) has no panning control.	Controller #10

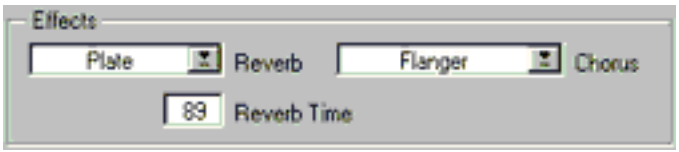
Control:	Description:	MIDI message:
Reverb level	Although this is not a part of the GM specifications, many GM instruments (and all GS/XG instruments) have a built-in reverb that can be controlled via the standard MIDI controller number for reverb (#91). If this is available in your instrument, use this value field to set the amount of reverb for the channel.	Controller #91
Chorus level	Like the Channel Reverb controls, this parameter is not a part of the GM specification. However, some GM instruments (and all GS/XG units) have a built-in chorus (sometimes flanger or delay) that can be controlled via the standard MIDI controller number for chorus depth (#93). If this is available in your instrument, use this value field to set the amount of chorus for the channel.	Controller #93
Program name	This item opens a hierarchical pop-up menu with the 128 GM sounds divided into instrument type groups on sub-menus. To select a sound, pull down the pop-up, move the pointer to one of the instrument groups and select the sound from the sub-menu that appears.	Program Change
Mute switch (GS/XG only)	In GS/XG Mode (see below), the channel number fields above the faders can be used as Channel Mute buttons. You can mute/unmute each channel individually by clicking on the respective button.	Manufacturer SysEx

The Device section



Control:	Description:
Mode	You can use the editor in GM *or* Roland GS *or* Yamaha XG mode. To switch between modes, click on the Mode pop-up and select the desired mode.
Output	Use this pop-up menu to select the Output to which your GM/GS/XG instrument is connected (otherwise the editor wouldn't know where to send the changes you make).
On/Off/Reset button	This button has different names and functionalities depending on which Mode is selected: In GM mode, this button is used to switch your instrument in and out of General MIDI mode. Click on the button to send the command that is *currently shown,* to your instrument. In GS/XG mode, this button is labelled "GS/XG Reset". Clicking it resets all controls in the window, as well as any connected GS/XG instrument, to their default values.

The Effects section (GS/XG only)



The third section is not shown at all in GM mode. It contains the following global settings for the reverb and chorus effects that are included in all GS/XG instruments:

Control:	Description:
Reverb pop-up	Lets you select one of eight reverb types. The available reverb types are different in GS and XG instruments. In XG mode, selecting “No Effect” allows you to easily turn off the reverb completely.
Reverb time	Lets you change the overall reverb time.
Chorus pop-up	Lets you select one of eight chorus- and related effect types. The available effect types are different in GS and XG instruments. In XG mode, selecting “No Effect” allows you to easily turn off the effect completely.

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Synchronization

Background

You can set up synchronization between Cubasis and other equipment, so that the two devices play together and at the same tempo. This is done by receiving or transmitting something called MIDI Clock. MIDI Clock is a very fast metronome transmitted in a MIDI cable.

- **If one device is set to *transmit* MIDI Clock, via its MIDI Out, it will transmit this "metronome" at the specified tempo when you activate playback on the device.**
- **If a device is set to *receive* MIDI Clock, it will ignore its own tempo setting and instead play at the tempo specified by the incoming MIDI Clock.**

Cubasis can do both of these things, at the same time if you wish.

Synchronizing Cubasis to other equipment

In this case, Cubasis AV will ignore its own tempo setting, and adjust its playback to the other device.

1. **Connect the MIDI Out of the other device to a MIDI In on the computer.**

2. **Set up the other device to *transmit* MIDI Clock.**

3. **Open Cubasis' Synchronization dialog box.**
   This is reached from the Options menu.

4. **Check the box titled "Receive MIDI Clock" and select the correct MIDI Input from the "Input" pop-up.**

5. **Close the dialog.**

6. **Activate playback on the other device.**
   Cubasis will start automatically and play at the same tempo as the other device.

- **If you wind the other device to a certain position, and activate its playback function, Cubasis will automatically start from the correct position.**

Synchronizing other equipment to Cubasis

In this case, the other devices will adjust their playback and tempo to Cubasis AV.

1. **Connect one of the MIDI Outputs on your computer to a MIDI In on the other device.**

2. **Set up the other device to receive MIDI Clock via this MIDI In.**

3. **Open Cubasis Synchronization dialog box.**

4. **Check the box titled “Send MIDI Clock” and select the correct MIDI Output from the “Output” pop-up.**

5. **Close the dialog.**

6. **Set the desired tempo in Cubasis and click the Play button.**
   The other device should start automatically.

- **If you wind Cubasis to a certain position, and hit Play, the other device should automatically start from the correct position.**

25

Movies

What is Video for Windows?

Video for Windows (AVI) is an extension to Windows that allows you to play back movies in a window on your computer.

Cubasis AV supports Video for Windows, which means that you can have video playing on your screen, synchronized with Cubasis AV’s playback.

Do I need to install Video for Windows?

If you run Windows 3.1 and 3.11, you need to install the Video for Windows DLL, before you can play back video from your computer at all. Please contact your computer dealer for more information. If you are running Windows 95/98, video support is built in.

Opening a Movie

1. **Select Open Movie from the File menu.**
   A standard file dialog appears.

2. **Locate and select the movie file (extension ".AVI") and click OK.**
   The movie appears in a new window.

- **If you want a certain movie to be opened automatically when you launch Cubasis AV, you can copy it to your Cubasis AV directory and name it "DEF.AVI".**

Playing back the movie

1. **Pull down the Options menu, select Movie and from the submenu that appears, select “Options...”.**
   The AVI Monitor Options dialog appears.

2. **Make sure that the On Line option is activated.**

3. **Click Exit to close the dialog.**

4. **Activate playback in Cubasis AV.**
   The movie plays back in sync. If for some reason you don’t want the movie to play when you play back MIDI and audio, open the Options dialog again and deactivate On Line.

- The audio in the movie is not played back when you play it from within Cubasis AV.

About Positioning

The positions of Cubasis AV and the movie are completely linked. This means that when you Fast Forward, Rewind, Locate etc., the movie will be positioned accordingly.

Setting Offset

If you don't want the movie to start at the first bar of the Cubasis AV Song, you can define an Offset value:

1. **Pull down the Options menu, select Movie and from the submenu that appears, select "Options...".**
   The Options dialog appears again.

2. **Use the Offset value field to set the desired time at which you want the movie playback to begin.**
   The value is in time code format (hours:minutes:seconds:1/25ths of seconds). If you for example set this to "00:01:00:00", the movie will start one minute in, from the beginning of the Song.

Other Options

There are a a few additional options on the Movie sub-menu on the Edit menu:

- **Hide/Show Title Bar.**
  This hides/shows the movie window's title bar.

- **Hide/Show Movie.**
  This hides the movie window without closing the file. To show the movie, select this item again.

Closing the Movie

You close the Movie by pulling down the File menu and selecting Close Movie. This item is greyed out when no Movie is open.

26

Customizing Cubasis AV

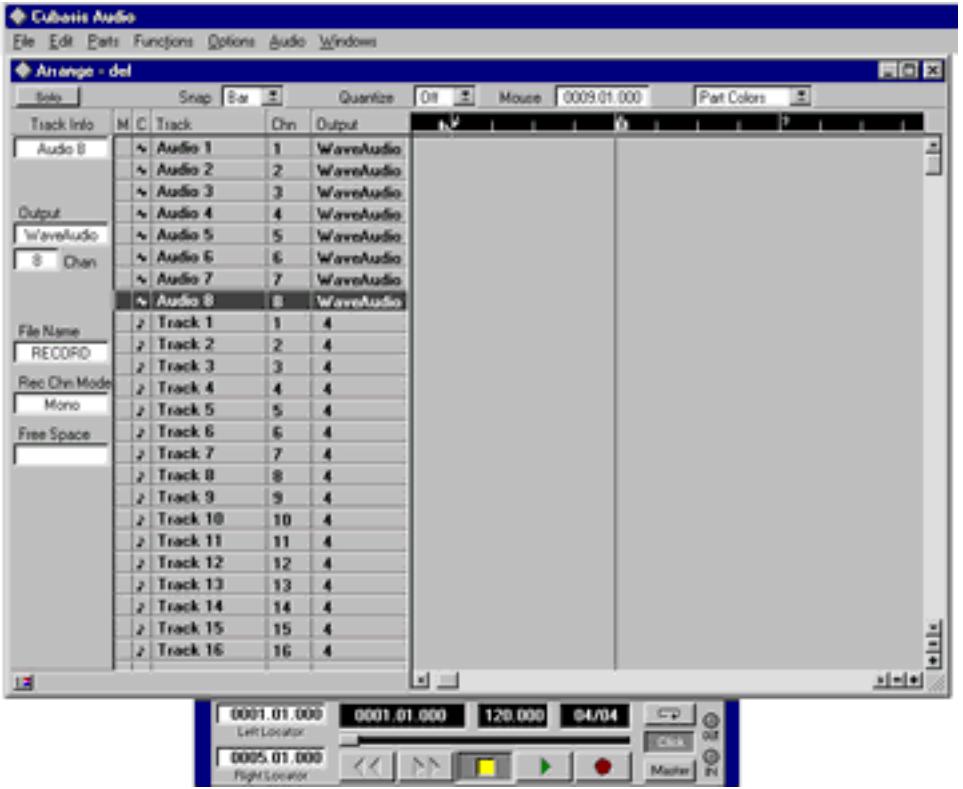
Why Customize?

When you use Cubasis AV the first time, all settings in the program have “factory values”. Depending on your working style, what we have chosen might suit you perfectly or not at all. By customizing Cubasis AV, you are able to make it “your program” and you will streamline your work considerably.

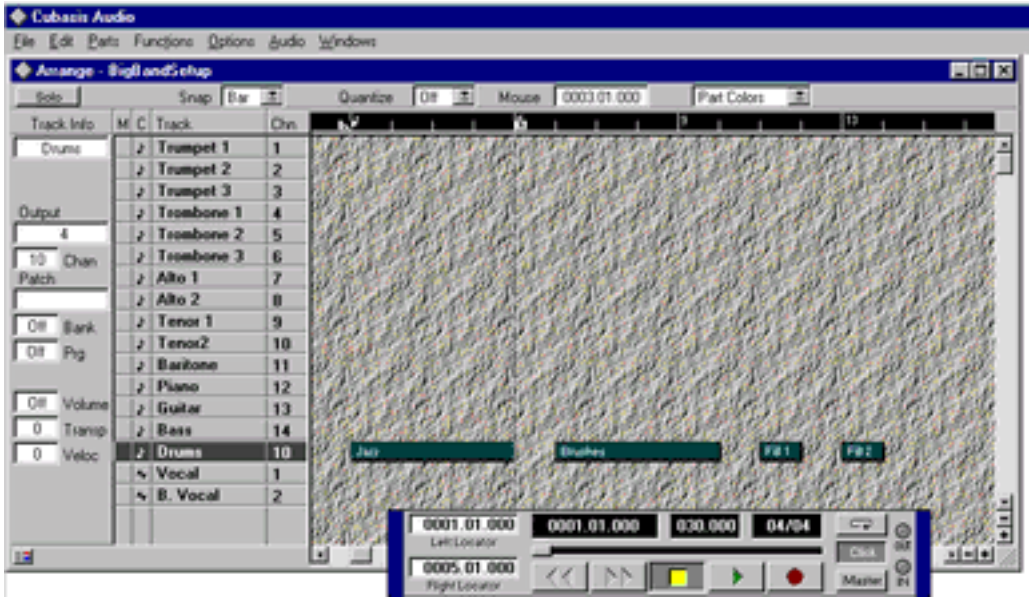
Customizing actually only involves two steps:

1. **Setting up the program exactly as you want it to be each time you start up.**

2. **Saving those settings in a default Song file (“Def.All”; hereafter referred to as the “startup song”).**



Before customizing...


Cubasis Audio
File Edit Parts Functions Options Audio Windows
Arrange - BigBandSetup
Solo
Snap Bar
Quantize Off
Mouse 0003.01.000
Part Colors
Track Info
Drums
Output
4
10 Chan
Patch
Off Bank
Off Prg
Off Volume
0 Transp
0 Veloc
M C Track Chn
Trumpet 1 1
Trumpet 2 2
Trumpet 3 3
Trombone 1 4
Trombone 2 5
Trombone 3 6
Alto 1 7
Alto 2 8
Tenor 1 9
Tenor2 10
Baritone 11
Piano 12
Guitar 13
Bass 14
Drums 10
Vocal 1
B. Vocal 2
Jazz
Brushes
Fill 1
Fill 2
0001.01.000
Left Locator
0005.01.000
Right Locator
0001.01.000
030.000
04/04
Click
Master

... and after.

Examples of things to customize

Below follows a brief list of candidates for customizing. You might not understand what all the functions below are for and what they do. Either look them up in the rest of this manual or leave them out for now.

Window Settings

You can change the size of the windows, move dividers and set the magnification, to tailor the windows to your needs. Saving this in the startup song will make the program appear as you want it.

Tracks

You can create and name Tracks, set them to different Track classes, etc. For example if you know you always want a Drum Track that plays on MIDI Channel 10, simply create it!

You can also rearrange Track columns as you like.

Parts

You can even have Parts in your startup Song. These could for example contain libraries of often used drum patterns or riffs. Or, they could contain System Exclusive dumps of settings that load your instruments with certain sounds. Put the Parts on muted Tracks and drag them onto other Tracks when you need them.

Transport Bar settings

You might for example prefer to record in Cycle Mode, or you might always want Click activated. If you do, simply set this up on the Transport Bar.

Editor settings

If you prefer certain settings in the editors, for loops, quantizing etc, set them up and save them with the startup song.

Preferences

On the Options menu, there are several items, like Double Click opens and Follow Song, which you may prefer to have set in a certain way.

Metronome

Do you want a click at all? Do you want it via the computer speaker or via MIDI? How long do you want the count-in to be? All this is set in the “Metronome” dialog box, reached from the Options menu.

Sync

Most often you will synchronize to the same external equipment – for example the tape recorder in your studio. By setting up the Synchronization dialog as you want it and saving this with the startup Song, Cubasis AV will automatically synchronize as soon as you hit play on the tape recorder.

Saving the Startup Song

Once you have set up the Song, perform the following steps (details about file saving can be found in the next chapter).

1. **Pull down the File menu and select “Save As...”.**

2. **From the File Format pop-up, select “Songs (*.ALL)”.**

3. **Make sure you save in the same directory as your Cubasis AV program.**

4. **In the File Name field, type in the name “Def.All”.**

5. **Click OK.**
   Now the next time you launch the program, the Song you just saved will automatically be loaded.

Starting from other Song documents –Templates

The only thing that is special about the Def.All Song, compared to other Songs is that it loads automatically on startup if found in the same directory as the program.You can in fact use any Song document for customizing on startup. This is convenient if you do different types of work and want different “templates” for each.

1. **Set up the Song as you want it.**

2. **Save it under any name in any directory on your hard disk.**

3. **When you want to use a “template” song, simply double click on the document icon in the File Manager, or create an icon in the Program Manager/Start Menu and launch from this (see your Windows documentation).**
   Cubasis AV launches and the Song is loaded automatically.

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File Handling

Saving

Which should I choose - Song or Arrangement?

When you save your music in Cubasis AV, there are three document formats you can use for saving your music: Song, Arrangement or MIDI File. You should only choose MIDI Files if you want your music (MIDI only - no audio) to be playable in other sequencers. If you want to save your music for further use in Cubasis AV, you should use either the Song or the Arrangement format:

Song

When you save a Song, the following is saved:

- All the Arrangements.
- All settings in dialogs, on the Transport Bar, etc.
- All Audio Parts and segments, and references to their respective audio files.
- The Pool.
- The settings in the Mixer windows.

Arrangement

When you save an Arrangement, the following is saved:

- All the things you see in one Arrange window; the Tracks, the Parts, the Inspector settings etc.

The audio files, however, are stored in the Pool, and the Pool is not part of the Arrangement. This means that if you only save an Arrangement, there will be no audio files for them to reference to! Therefore:

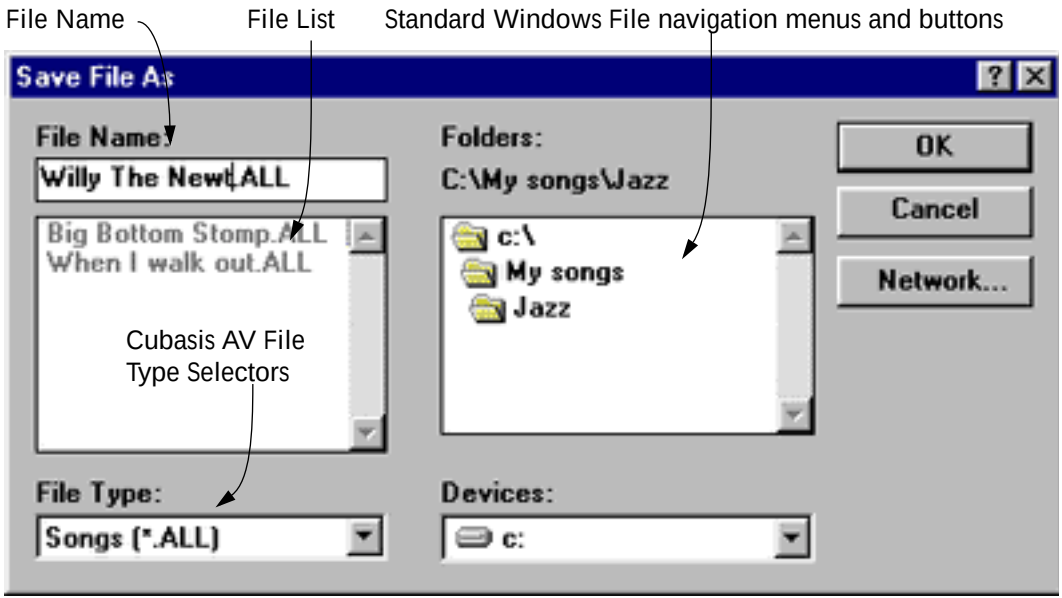
● When doing audio work with Cubasis AV we recommend that you always save complete Songs!

This table shows the advantages and disadvantages of the two formats:

File Format	Advantages	Disadvantages
Arrangement	• Takes up little disk space. • Does not contain "unnecessary" settings if all you want to save is MIDI music. • Opening an Arrangement does not affect settings in dialog boxes and on menus, which, in some situations, is an advantage. • A saved Arrangement can be opened and incorporated into any other Song.	• Does not contain any references to audio. • Does not contain a complete "snapshot" of the program's "state".
Song	• Contains references to all audio information and data. • Contains more than one Arrangement. • Saves all the settings on all menus, in all dialog boxes etc.	• Takes up more disk space than the Arrangement file format, even if you only have one Arrangement in the Song.

Performing the Save

1. **Pull down the File Menu and select “Save As...”**
   The file dialog appears.



2. **Use the standard controls to find the location on your hard disk where you want to save the file.**

3. **Use the file type pop-up to select a format, Song or Arrangement.**

4. Type in a name for the file.

5. Click the OK button.

Using “Save”

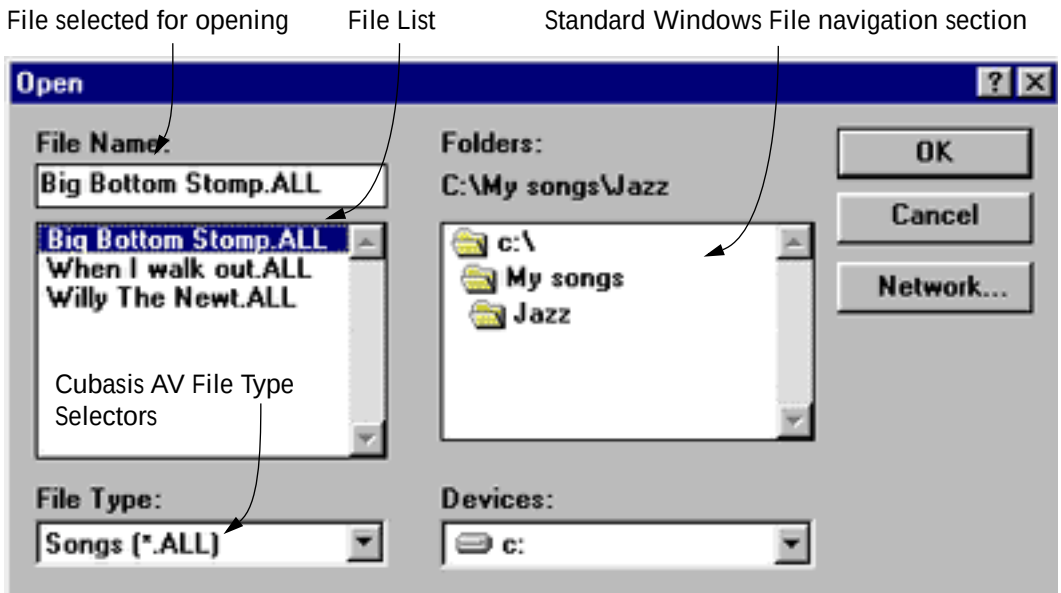
On the File menu you will find a menu item called “Save”.

- If you have already saved your Song once (using “Save As...”) this menu command will save your Song without asking for a file name and location. The file you save now will simply overwrite the earlier version.
- If you have not yet saved your Song, selecting “Save” is the same as selecting “Save As...”.

The “Save” command can also be executed by pressing [Control]-[S] on the computer keyboard.

Opening

1. **Select Open... from the File menu.**
   The Open dialog appears.



2. **Use the pop-up to select which type of file you want to open, Song or Arrangement.**

3. **Use the standard controls to display the correct folder on your hard disk.**

4. **Click on the file in the file list.**
   The list will only show documents of the selected type.

5. **Click Open.**

About opening Songs

If the file is a Song, you will be prompted with a reminder that the Song you open will appear *instead* of the Song you have on screen now. If this is not what you want, Cancel and Save the existing Song first.

About opening Arrangements

If the file is an Arrangement, it will appear as a new window on screen, in addition to any Arrange windows already open.

Opening Songs made by other Steinberg programs

Cubasis AV can open Song files made in other Steinberg sequencer programs such as Cubase and Cubasis. However, there are some restrictions:

- **If the Song contains more than 64 Tracks, the excess Tracks are removed.**
- **In more advanced Steinberg programs, there are additional settings and parameters, which are ignored when opening the file in Cubasis AV.**

Exporting an Arrangement as a MIDI File

You might want to export an Arrangement as a Standard MIDI File, so that it can be loaded into other computer programs or hardware sequencers, for example.

- A Standard MIDI File contains MIDI data only - no audio. Any audio in your Arrangement will automatically be excluded from the created MIDI file.

1. **Mute all the MIDI Tracks you don't want included in the MIDI File.**

2. **Pull down the File menu and select "Export MIDI File".**
   A file dialog appears.

3. **Select a name and location for the file.**

4. **Click Save.**

- Cubasis AV normally saves MIDI files in format 1. However, if you Export a MIDI File with only one Track unmuted, a MIDI File of type 0 is created.

Importing a MIDI File

You can import Standard MIDI files into Cubasis AV, either into the currently selected Arrangement or into a new Arrangement of its own:

1. **If you want to include the MIDI file in an existing Arrangement, select this Arrangement and move the Left Locator to where you want the MIDI file to start.**

2. **Pull down the File menu and select “Import MIDI File”.**
   A dialog box appears, asking if you want the file to appear in a new Arrange window or if you want to merge the MIDI File into the current Arrangement.

3. **Select one of the options.**
   The MIDI file is imported. The data is automatically split up into shorter segments (Parts) to make it easier to edit the music in the Arrange window.

About Audio Files

Audio File Formats

All audio files created by Cubasis AV are Wave (.WAV) files with 16 bit resolution.

However, using the Import Audio command in the Pool, you can load audio files in AIFF format. When you do this, the program expects the imported file to match the sample rate setting in the Song. If the audio has another sample rate, it will not play back normally.

Backing Up

Needless to say, it is essential that you back up your audio data regularly, preferably on to another device.

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Optimizing Audio Performance

About Audio Cards

Which cards will work?

Cubasis AV works with any audio card that meets the following demands:

- Capable of 16-bit wave file recording and playback.
- Comes with a Windows driver.

Sample rates

Cubasis AV can record and play back at five sampling rates, 11025Hz (11kHz), 22050Hz (22kHz), 32000Hz (32kHz), 44100Hz (44.1kHz) and 48000Hz (48kHz).

The choice of sample rate is made in the Hardware Setup dialog as described on page 430. Most audio cards support 11, 22 and 44.1kHz. Many cards do not support 48kHz and some don’t support 32kHz.

Audio Quality

The audio quality you get from your recordings (the amount of distortion, the amount of background noise etc.) is solely dependant on your audio card and your other audio equipment, not on Cubasis AV.

Number of Audio Channels

The number of audio channels does not depend on the audio card at all (except for the “single mode DMA warning” earlier in this chapter). More on this later in this chapter.

Timing

Cubasis AV uses a part of Windows called Windows Multimedia System. When you activate playback or recording, Cubasis AV “asks” Windows Multimedia System to in turn “ask” the audio card to start playback/recording.

How long this actually takes depends on a few factors, but the most important is the card and its driver. If one particular card is slower than another there will be a longer delay between Cubasis AV’s playback command and the moment the audio actually starts playing back.

To compensate for this, there are two Offset settings in the Hardware Setup dialog, one for recording and one for playback. See page 431.

Stereo/Mono

All 16-bit audio cards can record and play back in stereo or mono.

- In Cubasis AV you can decide before each recording which it should be, stereo or mono. This is done in the Inspector as described on page 48 in this manual.
- Playback can also be switched to stereo/mono, as described on page 430.

Simultaneous Recording and Playback (“Full Duplex”)

On a regular multi track recorder you often perform something called overdubbing. This is when you listen to one Track and at the same time record on another.

You can of course overdub in Cubasis AV, but there are a few things you have to be aware of.

For a PC audio card to allow simultaneous recording and playback, the card must support something called *Full Duplex*. Many PC audio cards do *not* have the ability to record and play back at the same time. This means that as soon as you enter record mode, you will *not* hear your previously recorded audio Tracks. This is not a limitation of Cubasis AV, but of the cards themselves.

If your card *does* have the ability to record and play back at the same time, you should activate this function in Cubasis AV’s Hardware Setup dialog, see page 429.

It is of course a great benefit to have this ability, since it allows you to match your current performance to the previous audio recordings, for example when adding vocal harmonies, one by one.

Some cards, like the Roland RAP-10, have the ability to use one channel for playback and the other for recording, which means that you *can* record and play back audio at the same time, but only if playback is limited to mono in the Hardware Setup dialog.

Computer Performance and Audio Channels

The number of audio channels you can get from your system depends on a number of factors. These factors are all related to the amount of data that has to be transferred within the system. When you record, data is collected by the audio card and transferred via the computer's processor to the hard disk. When you play back, this process is reversed. On the way there are a number of bottlenecks to pass, which we will try to outline on the following pages. Please also refer to the Read Me files in your Cubasis AV directory which may contain late information on how to optimize your system.

How do I know how many channels I can get?

There are two ways to do this:

- **Use the included "Performance Tester" program, to test your computer's performance. See page 435 in this chapter.**
- **Record and play back channel by channel, until Cubasis AV informs you that there is not enough capacity to play back all the Tracks at the same time.**

Computer architecture and processor speed

In all audio operations, the computer's processor is involved, which means that the processor speed will limit the amount of audio that can be handled at any given moment.

Memory access

During playback, data is read from the hard disk and output via the audio card. During this process the data has to pass via the computer's internal memory (RAM). It is very hard to determine exactly how fast any computer is in this respect, but a "256 kByte 2nd level cache" will improve performance considerably.

Hard disk caching and access

If you are using Windows 3.1, we recommend that you use SmartDrive (or similar) to increase the hard disk performance.

If you are using Windows for Workgroups (Windows 3.11), we strongly recommend that you activate "32-bit file access" if your system supports it.

If you are using Windows 95, there are two settings you can adjust to improve the performance for audio recording: Read-ahead Optimization and File Caching.

Windows 95/98 Read-ahead Optimization

When disk Read-ahead Optimization is turned on, Windows 95/98 will read data from disk in bigger chunks than the application (Cubasis AV) actually requests. For many hardware configurations, this will increase the performance. However, for some systems, raising the Read-ahead memory amount might instead have a negative effect on performance. Therefore, we suggest that you experiment to find the setting that bests suits your system. Proceed as follows:

1. **Click the Start button on the Taskbar.**

2. **From the menu that appears, select "Settings" and then "Control Panel".**

3. **In the Control Panel, double click on "System".**

4. **Click the "Performance" tab at the top.**

5. **Click the "File system..." button.**

6. **Move the slider to another position.**
   You can select 0kB (None), 16kB, 32kB or 64kB (Full).

7. **Click OK and OK again in the next window that appears.**

8. **Close the Control Panel.**

9. **Start the Steinberg Performance Tester program and check its results.**
   Alternatively you can launch Cubasis AV and check whether it performs "more smoothly" than before.

10. **Repeat this operation until you find the best setting for your computer configuration.**

Windows 95/98 File Caching

Windows 95/98 has a built-in file caching mechanism. This mechanism implements a very sophisticated way to improve disk performance for certain applications. Contrary to Smartdrive for Windows3.x, the File System Cache of Windows 95/98 does not have a fixed size. Instead it can grow within the physical memory when the demand on disk data access is high. For Multimedia and hard disk access intensive applications this becomes a problem.

When the File System Cache increases its size, application and data memory will be paged out into the swap file by the virtual memory system.This leads to additional disk accesses, which will cause the audio recording and playback performance to suffer. To avoid this performance degradation, you should set a maximum size for the Dynamic File System Cache.

Microsoft did not provide a user interface for the file system cache.You have to manually edit the SYSTEM.INI file. Please perform the following steps:

1. **Click the Start button on the Taskbar.**

2. **From the menu that appears, select "Programs", then "Accessories" and finally "Notepad".**

3. **From within the Notepad, select "Open..." from the "File" menu.**

4. **For the file type select the option "All files". Locate and select the SYSTEM.INI file in the Windows directory and click the "Open" button.**

5. **In the SYSTEM.INI file, search for a line which consists of [vcache] (the word "vcache" in square brackets).**

6. **Add a new line after the [vcache] line. Type "MaxFileCache=2048" on that line.**
   If you have a computer with only 8 MByte of RAM you should type "MaxFileCache=512" instead.

7. **Select "Save" from the "File" menu.**

8. **Click the Start button on the Taskbar.**

9. **Select "Exit" and choose "Restart Windows".**

10. **Click OK.**
    Windows 95/98 restarts and the new settings take effect.

Disk Controller Card

The controller card for the hard disk is the next possible bottleneck:

- If you have an IDE or E-IDE drive, preferably use an “Enhanced IDE” (E-IDE) controller card.
- We recommend that you use a controller card connected to your computer's PCI bus, VESA local bus or EISA, rather than to the ISA bus. A PCI or VESA card can transfer data considerably faster than an ISA card.

Hard Disk Speed

The speed of the hard disk is probably the biggest limiting factor.

One unit of measure for a hard disk’s speed is the Average Access Time. This should be as low as possible, and the more Tracks you plan to record on the drive, the lower it has be. For eight stereo Tracks, you need an Average Access Time of 20ms or less.

Many manufacturers do not specify the Average Access Time. You will then have to check out a number of other parameters:

- Average Seek Time. This should be as low as possible.
  For eight stereo channels at 44.1 kHz, you need an Average Seek Time of 9ms or less.

- Rotation Speed. Sometimes indicated as Rotation Latency. The Rotation *Speed* should be as high as possible, which in turn makes the Rotation *Latency* as small as possible.
  For eight stereo Tracks you need a Rotation Speed of 5400rps or above, which equals a Rotation Latency of 5.6 ms or less.
- Sustained Data Transfer Rate. This should be as high as possible.
  For eight stereo Tracks you need at least 5Megabytes/second.

SCSI or E-IDE?

- In general, SCSI disks are better suited for hard disk recording than IDE drives, for various technical reasons. However, a fast E-IDE drive is better than a slow SCSI one.
- If you decide not to use SCSI, try to get an “Enhanced IDE” (E-IDE) drive rather than a regular IDE one.
- If you use a SCSI or E-IDE drive, make sure it has a built in cache of at least 256 kByte, preferably 512 kByte.

Other hard disk considerations

- Make sure the hard disk does not have automatic “thermal recalibration”. Or, at least use a hard disk that only performs thermal recalibration when the hard disk is not in operation. Some manufacturers sell special “A/V” (Audio/Video) drives, claimed to be specifically suitable for hard disk recording. This usually means (among other things) that the drive doesn't have automatic thermal recalibration.
- Try to get as large a disk as you can. We recommend 1 GigaByte and up. You will get 1 minute of mono audio for each 5 MByte on the hard disk, per Track, at 44.1kHz sample rate. This means that if you for example record two stereo Tracks, you will use up 20 MByte per minute.
- We recommend that you save your audio files together with your Song documents on a separate drive, leaving the main drive of your computer to hold Windows, program files and the like.

Using the Stereo/Mono and Sample Rate settings to gain more channels

If your computer system limits the number of channels, you should try recording with a lower sample rate and/or mono recording.

This will considerably reduce the amount of data that needs to be transferred from the hard disk to the audio card. A 44100Hz stereo recording creates four times as much data as 22050Hz mono!

An example

A setup consisting of...

- a Pentium 100 with a 256kB 2nd level cache and 24 MBytes of RAM...
- a VESA or PCI local bus E-IDE or SCSI hard disk interface with a data transfer speed of 10 MBytes/second or more...
- an E-IDE or SCSI hard disk with an average seek time of 9ms or better, 512k onboard cache, 5400/7200 RPM rotation speed, 5MBytes/second minimum sustained data transfer rate (or better)...

...should be able to provide eight *stereo* channels at 44.1KHz sample rate.

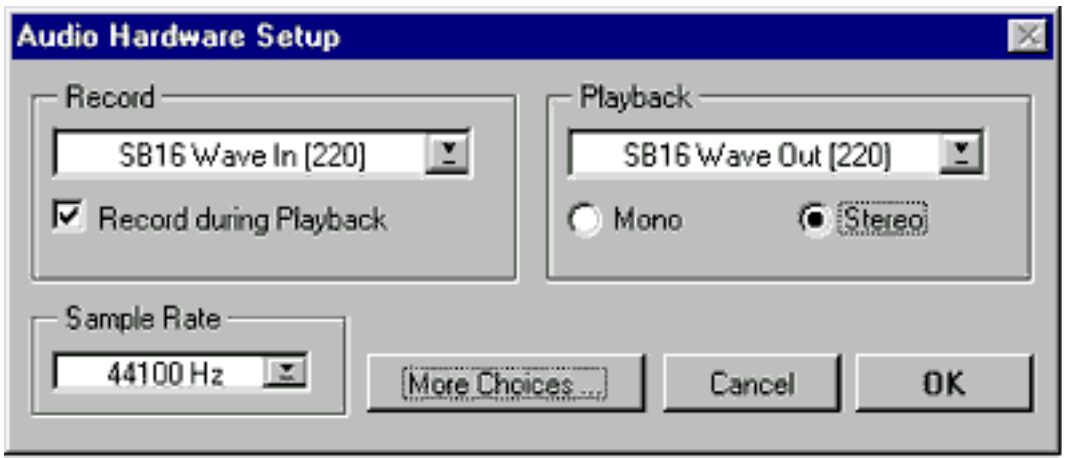
A setup consisting of...

- a 486DX 100MHz, CPU with a 256kB 2nd level cache and 16MBytes of RAM...
- a VESA or PCI local bus E-IDE or SCSI hard disk interface with a data transfer speed of 5 MBytes/second or more...
- an E-IDE or SCSI hard disk with an average seek time of 10ms or better, 512k onboard cache, 5400 RPM rotation speed, 3MBytes/second minimum sustained data transfer rate (or better)...

...should be able to provide eight *mono* channels at 44.1KHz sample rate.

The Hardware Setup Dialog

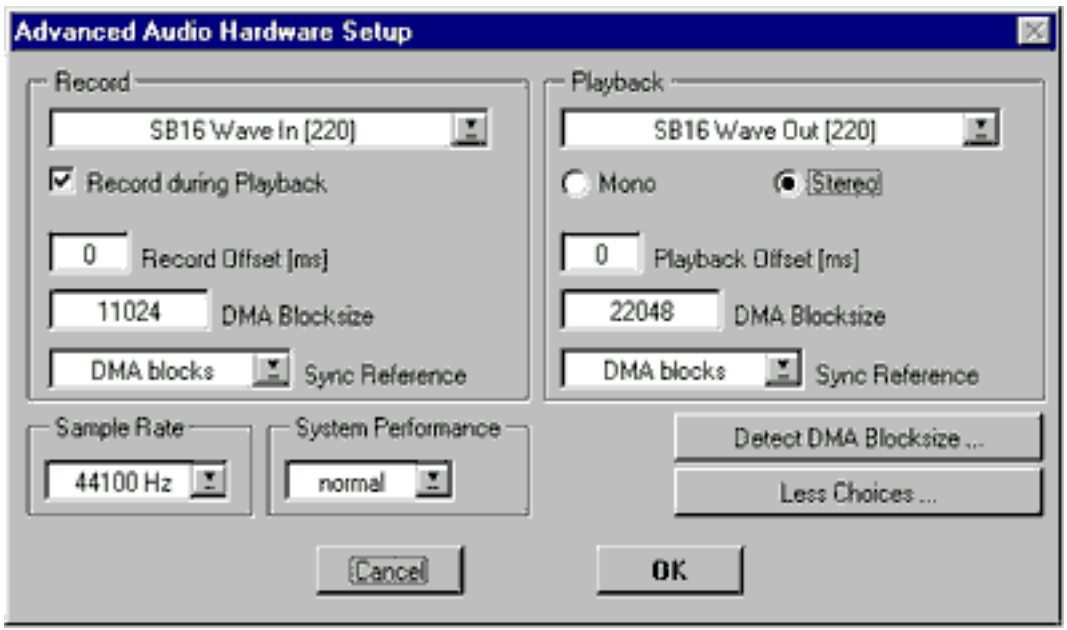
Introduction



This dialog is opened from the Audio menu and is used for a number of overall settings for audio recording and playback.

More/Less Choices

This dialog actually appears in two guises. To switch between these, use the More Choices/Less Choices buttons. All settings that appear in the Less Choices mode also appear in the More Choices mode.



The Hardware Setup dialog after clicking the More Choices... button

Card Selection

There are two pop-ups in the upper part of the dialog. These allow you to select an audio card to use, should you have more than one.

We recommend that you use the same card for recording and playback. You *can* use two different cards, but you should be aware that the two cards will play back at fractionally different Sample Rates, and the playback speed and pitch will not match the actual recording speed and pitch.

Playback during Recording

When this switch is activated, Cubasis AV will play back audio Tracks while recording new ones. It is of course a great benefit to have this ability, since it allows you to hear previously recorded audio Tracks when recording overdubs.

However, not all audio cards support this feature. Only activate this switch if:

- You know you have a card that supports this feature.
- You use two separate cards for recording and playback.

Playback in Mono/Stereo

- **When Stereo is activated, stereo recordings will play back in stereo and mono recordings can be positioned in the stereo image with the Pan control in the Monitor window.**
- **When Mono is activated, only the left channel audio output on your card will be used for playback. When you play back stereo recordings in this mode, you will only hear the left channel.**

  The main reason for using mono is if you have a card that supports Playback during Recording, but only when mono is used. See page 416.

Sample Rate

This setting determines the audio quality of your recordings. The higher the value, the better the quality, but when you raise the value, each recording also uses up more disk space and computer processing power.

Changing the Sample Rate

You should not change the Sample Rate setting if you already have files in the Pool (which you will have if you have made any audio recordings at all in this Song).

If you try to do this, a dialog box will appear informing you that if you proceed, the files you have already recorded will play back at the wrong speed. Recordings you make *after* the change will play back normally.

Record and Playback Offsets

If you find that your audio recordings play back late in relation to your MIDI card, you probably have an audio card with a slow response time.

To compensate for this you can adjust the Record and Playback Offsets.

- **When you raise the Playback Offset value, the audio *playback* will be ahead of (earlier than) the MIDI playback.**
- **When you adjust the Record Offset value, and start recording, the audio will be *recorded* ahead of the MIDI, in the same manner as with Playback Offset.**

The delay for most audio cards is in the range of 0 to 20 milliseconds. Normally you would adjust the Playback value only. However, if very large adjustments are needed, you might try with a combination of Record and Playback Offsets.

Sync Reference

This setting is used to switch between two methods of “synchronizing” the MIDI playback to the audio. Which one to choose depends on your system.

Normally, the recording and playback sections should be set to the same value.

Sample Position

This is the preferred setting if your card supports it. In this mode the number of samples played are reported from the card to Cubasis AV and this number is used for synchronizing the MIDI playback. This is equivalent to synchronizing to a sample accurate external clock.

Unfortunately, not all audio cards support this method. When you select it, Cubasis AV will check if your particular card and driver does. If not, a warning is issued and the DMA Blocksize option (see below) is selected instead.

DMA Blocks

In this mode, the reference between audio and MIDI is determined by the size of the data blocks being transferred by Direct Memory Access (DMA) to the audio card during recording and playback (yes, this is a heavy technical explanation, but this is a very technical issue!).

For this mode to work properly, the DMA Blocksize setting must be in accordance with the real blocksize used in the system. See below.

- If the card does not support the “Sample Position” method, and the “Detect DMA Blocksize” function (see below) doesn’t work, you unfortunately have an audio card not suitable for this application. With such a card we cannot guarantee synchronization between the MIDI and audio material.

DMA Blocksize and Detect DMA Blocksize

The DMA Blocksize settings are only of any relevance if “DMA Blocks” is selected as Sync reference. If you use “Sample Position” it doesn’t matter at all how these fields are set.

Normally you do not set the DMA Blocksize yourself. Instead, click the Detect DMA Blocksize, and let Cubase Audio detect it and set it for you.

System Performance

This parameter is used to set a balance between the following two things:

- The time it takes for the program to react to volume and pan changes in the Monitor window.
- The number of playback channels.

Setting:	Description:
High	Changes in the Monitor window (Volume and Pan) will take effect quickly. On the other hand, if you do not have a very fast computer, you may encounter problems with playing back many audio Tracks in this mode (the “System too slow...” message appears).
Medium	This is an intermediate balance between volume and pan updates on one hand and audio playback on the other.
Normal	In this mode, most of the system resources are devoted to audio playback. This is the safest mode for playing back as many audio Tracks as possible.

Using the Performance Tester Program

Included with Cubasis AV you will find a small application called “Performance Tester” (PFMCHKDA.EXE) that runs “benchmarks tests” on your computer system and informs you of how many audio channels it can provide. Please check the ReadMe file included, for information on how to use this application.

Maintaining the Hard Disk

Defragment!

Always make sure your hard disk is defragmented. Fragmentation affects the performance of any hard disk severely.
A defragmentation utility is included with later versions of DOS and Windows 95. See your computer manuals for details.

Delete Unused Files!

Audio files require a lot of disk space. If you don't delete unused files, your hard disk will soon fill up.

When you use 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.

Back Up!

It can't be said too often. Disk crashes are a well known phenomenon. Without a regular backup scheme you risk to lose valuable recordings!

Multitasking

Cubasis AV of course supports Windows multitasking. However, note that audio playback may be temporarily interrupted if you switch between programs or keep the mouse button down for a long time. We recommend that you don't switch between programs while playing back audio.

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Keyboard Commands

What This Chapter Contains

The following is a list of the keyboard short-cuts for many of Cubasis AV's functions.

Numeric Keypad

Key Command	Function:
[*]	Activate recording
[Enter]	Start/Continue
[0] or [spacebar]	1st time – Stop 2nd time – Go to Left Locator/ 1. 1. 0 3rd time – Go to 1. 1. 0
[+]	Increase Tempo
[–]	Decrease Tempo
[1]	Go to Left Locator
[2]	Go to Right Locator
[9]	Go to last Stop Position

Key Command	Function:
[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
[/]	Cycle On/Off

Typewriter Keyboard

The various key commands are grouped after their contexts, to make it easier to find what you're looking for:

File Handling and General Procedures

Key Command	Function:
[Control]-[O]	Open
[Control]-[S]	Save
[Control]-[Z]	Undo
[Control]-[X]	Cut
[Control]-[C]	Copy
[Control]-[V]	Paste
[Control]-[Q]	Quit

Window Handling

Key Command	Function:
[Control]-[N]	New Arrange window
[Control]-[W]	Close active window
[Return]	Close box or “click button with heavy border” in Dialog Boxes
[Esc]	Close and Cancel in Dialog Boxes
[Control]-[E]	Open Key Edit window
[Control]-[G]	Open List Edit window
[Control]-[R]	Open Score Edit window
[Control]-[F]	
[G]	Decrease horizontal magnification
[H]	Increase horizontal magnification
[Shift]-[G]	Decrease vertical magnification
[Shift]-[H]	Increase vertical magnification

Transport Bar functions

Key Command	Function:
Page Up	Forward
Page Down	Rewind
[P]	Set Position
[L]	Set Left Locator
[R]	Set Right Locator
[C]	Click On/Off
[M]	Master Track On/Off
[S]	Solo On/Off
[F]	Follow Song On/Off

Arrange Window Selection and Editing

Key Command	Function:
[Control]-[A]	Select All Parts
[→]	Select Next Part
[←]	Select Previous Part
[↑]	Go one Track up
[↓]	Go one Track down
[Backspace]	Delete Selection
[Control]-[Backspace]	Permanently delete the audio file(s) in the selected Parts from the hard disk.
[Q]	Over-Quantize
[U]	Undo Quantize
[1]-[7]	Set Quantize value
[T]	Set Quantize value to triplets
[.]	Set Quantize value to dotted

Key Command	Function:
[Alt Gr]-[I]	Open/Close Inspector
[Control]-[M]	Display Master Track
[Control]-[T]	Create Track
[Alt Gr]-[N]	Rename Track
[Control]-[P]	Create Part
[Control]-[K]	Repeat Part(s)
[Alt Gr]-[F]	Freeze Play Parameters

Pool functions

Key Command	Function:
[Alt Gr]-[D]	Duplicate Segment
[Alt Gr]-[N]	Rename Segment
[Control]-[Backspace]	Permanently delete the selected audio file from the hard disk.

All MIDI Editor windows

Key Command	Function:
[Return]	Keep (Close editor, keeping changes)
[Esc]	Cancel (Close editor, discarding changes)
[Insert]	Insert Event
[Tab]	Move one Snap in Step Edit
[[Control]-[A]	Select All Notes/Events
[Alt Gr]-[O]	Loop On/Off
[Alt Gr]-[L]	Input Left Loop boundary
[Alt Gr]-[R]	Input Right Loop boundary
[Alt Gr]-[I]	Info On/Off

Key Edit only

Key Command	Function:
[Alternate]	Restrict Pen to length changes only
[→]	Next Note
[←]	Previous Note

List Edit only

Key Command	Function:
[↑]	Previous Event
[↓]	Next Event

Score Edit only

Key Command	Function:
[→]	Next Note
[←]	Previous Note
[↓]	Next Staff
[↑]	Previous Staff
[Alt Gr]-[X]	Flip Stems
[Control]-[P]	Print Score

- **In all MIDI Editors, the arrow keys can be used in combination with the [Shift] key to select several notes.**

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