

Audio Sculpture

General informations

Genre	Music / Sound	Year	1990
Language	1990	Publisher	Expose Software
Controls	MIDI-Device / Mouse	Distributor	
Players	?	Developer	Synchron Assembly
Resolution		License	Commercial
Programmer(s)	Nestenius, Tore / Sjolen, Bengt	Country	United Kingdom
Graphic Artist(s)		Software language	English
Game Designer(s)		Documentation language	
Musician(s)		License	Commercial
Sfx		Serial	
Cover Artist(s)		ST Type	
MIDI		Version	
Protection		Number of Disks	

Musician guide to Audio Sculpture from Synchron Assembly

Published by Expose Software



AUDIO-SCULPTURE BY THE SYNCHRON ASSEMBLY

Developed at program copyright 1991.

Expose Software.

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MUSICIAN GUIDE TO AUDIO SCULPTURE FROM THE SYNCHRON ASSEMBLY EXPOSE SOFTWARE

Thank you on purchasing Audio Sculpture!

We did our best to make of this product a high quality software that we hope to give you all satisfaction.

If when using this program you happen to have any remarks, suggestions or critics to make then please contact us : we'll do anything humanly possible to get Audio Sculpture better and better...

The Authors

The Synchron Assembly

The Publishers

EXPOSE Software

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CHAPTER 1

Getting started

To load Audio Sculpture ensure that your computer is switched off, then insert disk A into drive a. When you switch your computer on the screen will flash white and become black. An introduction will soon appear on the screen presenting you Audio Sculpture. Pressing <SPACE> at this very moment will enter the main program. Otherwise the main program will be started

at the end of the introduction sequence. When the screen has faded from black to grey you will be able to see a Copyright message in the centre of the screen. After having pressed <RETURN>, <ESC> or the button at the bottom of the message you will enter the main menu of Audio Sculpture.



CHAPTER 2

*Being
the
master of
Audio
Sculpture*

As you all know the instrument is a very important tool for making music. A tune, for example, played with a saxophone is very different from the same tune played with an electric bass.

Therefore the ability

variety of different sounds is very important to the musician.

Due to the ST Sound Chip being very bad there was just one thing left for us to do: to write a music program using so called samples (what a sample actually is will be explained later). That program is Audio Sculpture. Audio Sculpture does not only give you the possibility to write music using samples, it has far more to offer. Yet it is easy to use. The program features multiple editing modes and gives you absolute control over your music. There are a vast amount of commands that modify the sound, each sample and the songs. You get all that just at the commands of your fingertips.

top play a wide

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*How to
communicate
with the
program*

Audio Sculpture is mouse controlled but most functions and even some more than the ones available for you using the mouse are possible to use through the

keyboard. As any other ST program, a function is activated by clicking on it with the mouse pointer and then pressing the left mouse button or for special purposes the right one. You can edit values by using the up and down gadgets to the right of the value. As you all know the up arrow will increase the value and the down arrow will decrease it. When pressing the left button the value will change one unit at a time (usually 1) while the right mouse button will change it faster. Both buttons at the same time will make the fastest change. String editing, for example, song name, sample name or the path of the disk functions, are edited by clicking on the string. A cursor will appear at the first position of the string. You can now move the cursor with the left and right arrow keys. Pressing any key on your keyboard will insert the letter or symbol. The characters on the right of it will be moved one step onwards.

<CONTROL> + <A> will move the cursor one word to the left, or in a directory to the next

\'. <CONTROL> + <F> will do the same but in the reverse direction.

<CONTROL> + <T> will delete the next word or character before the next '\'.

<CONTROL> together with the arrows will go to the left or the right end of the string.

<CONTROL> + <Y> will empty the entire line being edited at the moment.

<BACKSPACE> + <DELETE> will remove characters just like any word processor or text editor.

<ESC> or any mouse button will cancel editing and leave the string as it was.

<RETURN> will accept the new string.

When you are in a submenu of Audio Sculpture or for example in the copyright message at the beginning of the program you can either click in the box 'exit/ok' or in the box at the top left of the submenu, which is similar to the box at the very top left of the main screen, to return to the main screen. The alternative is to press **<ESC>** or **<RETURN>** but they do different things from time to time. The main rule is that **<ESC>**

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always exits. In the 'Are you sure?' box that you will get to know soon, pressing <ESC> means 'no' and <RETURN> 'yes'. When pressing <ESC> in the main screen you will enter the score edit screen. <ESC> again will toggle back to the main screen. This can also be done by pressing on the box, under the two boxes 'SONG NAME' and 'INSTR NAME'. When scrolling windows like directories or other lists you will find two arrows on the right edge of the window which are similar to the GEM windows. When pressing on the up or down gadgets with the left button the window will move one line in the desired direction while the right button will move the window an entire page.

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The music

At the very bottom of the main screen you will see a windowlike thing, called the Matrix Editor. This is the window through which you see and edit a pattern. A pattern consists of four tracks (as you can see there are also four similar small windows in the bottom window. Got it ?)

Each track can play one note/instrument at a time. The pattern is divided into 64 vertical steps. If you look at the inverted middle row which goes through all five windows you should be able to see a cursor. This cursor can be moved sideways by pressing the left or right arrow keys. It is always moved one position at a

time or together with <SHIFT> one track at a time. Pressing the up or down arrow keys will move the cursor up or down in the pattern. When pressing <SHIFT> too, the speed will increase to 4 steps at a time. Besides that any line in the window, or any horizontal position, may be clicked on with the left mouse button.

The

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cursor will immediately jump to this position. When moving up or down you may hold the mouse button down to obtain faster scrolling than what is available from using the keyboard.

When a pattern is played it is processed from the beginning downwards, spending exactly the same, and at any time controllable, time on for each step. The four tracks always use the same speed, which makes it easier for you to get the right timing and you can always understand, due to the position in the pattern on which a certain note is, the time on which the note is to be played.

Initially a line could look like this:

— 0000 — 0000 — 0000 — 0000

where: — 0000 is a single track.

As you can see the format for a note consists

of three characters and five figures. The characters will show you the value of the note to be activated at a

certain position or as in the above example ' ' for no note to be activated.

The five figures are to be written in hexadecimal which means that besides the usual 0 to 9 you will be able to use the letters A to F

indicating the decimal values 10 to 15:

C#3 01000

'C#3' means that a C raised one half-tone is to be played at this position in the third octave. The first two figures, '01' show the number of the instrument (here it's 1) used. This value can range from 01 to 1f meaning that you can use 31 instruments in the same composition. The last three figures are used to activate special effects and several sequencer commands which are all described later.

C	D	E	F	G	A	H
DO	RE	MI	FA	SOL	LA	SI

Fig 1 The Keyboard Map

(showing which key represents which note...)

To the left of the four windows is yet another window containing figures ranging from 00 to 63. These figures display the line in the pattern in which your cursor is.

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The sequencer

These patterns are put together in the sequencer which is represented by the four rows on the top right of the main screen. The sequencer consists of a list of pattern numbers showing in which order to play the pattern. This list can be maximum of 128 steps long. The uppermost row in the sequencer box, saying position, contains your current position in the list. The row under this displays which

pattern to be played at this position. You should use pattern numbers from 0 upwards (not in the reverse order) as all patterns are in a numerical order in the memory. The next row, 'LENGTH', displays the number of positions used in the list. When playing and the end is reached, that is when position 'LENGTH' is reached, Audio Sculpture will continue playing at the position set in the next row called 'RESTART'. The sequencer activity is controlled using the four icons in the box in the top left of the main screen. They are, in order from the left to right:

PLAY PLAY PATTERN RECORD STOP

The boxes right under the icon indicate the activity. 'PLAY' (or <RETURN>) : will start at the top of the current pattern/ position and

play through the sequencer list.

'PLAY PATTERN' (or the key immediately under <DELETE>) : will start at the current cursor position and play the pattern which you are currently editing over and over again. You can achieve the same with <HOME> or <F6> to <F9> with the difference that they first set the cursor position.

'RECORD' (or <CAPS LOCK>) : will, when the sequencer is stopped, play the pattern as 'PLAY PATTERN' but register every press on the keyboard or input on the midi port into track on which the cursor is. When recording is activated you may toggle between pattern recording (the same as 'PLAY PATTERN' but with record) and song recording (like 'PLAY'). If the 'PLAY' icon or <RETURN> is pressed during record or even 'RECORD' is pressed during

'PLAY' Audio Sculpture will change to song record which means that the song is played normally but with the recording function on. The 'PLAY PATTERN' icon switches back to the record pattern mode. If the record icon is clicked upon with the right mouse button or <CAPS LOCK> + <ALTERNATE> are pressed a synchronized recording will start. This means that the 'RECORD' indicator will start

flashing and Audio Sculpture will wait until you press a key on the keyboard or on a midi device. The program will then start the recording. 'STOP' (or <SPACE>) : all

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sequencer activity is stopped and all channels are shut down. <ALTERNATE> + <SPACE> will at any moment force all sound channels quiet.

Using the loudspeaker icons on top of each of the four tracks in the matrix editing window you can turn the sound 'on' or 'off' on each track. The arrow to the right of the loudspeaker itself indicates that the sound is on. <CTRL> + <1> for the leftmost channel through to <4> for the rightmost.

Command references

The five following icons, immediately to the right of the 'STOP' icon from the left to the right are: 'PREFERENCES' 'SAMPLE EDITOR' 'INSTRUMENT'

LIST 'TOOLS' 'DISK FUNCTIONS'
These functions will all be described in the following text.

a.preferences

Output With the gadgets on the right you can select the output device. The following are supported from which the bottom three only are available on the STE or the TT. YM2149 Mono Atari ST internal sound ST Replay ST Replay 8 bit output cartridge Printer The eight output pins on the printer port will

serve for the output. Connect a DA converter to these pins.

YM/Replay Stereo Two channels are sent to the internal sound chip and the two other to the Replay cartridge

YM/Printer Stereo Two channels are sent to the internal sound chip and the two other to the printer port. Replay/Printer Stereo Two channels each to the Replay cartridge and printer port. Stereo Playback Stereo Using the Stereo Playback cartridge from Microdeal.

MV16/Replay Pro Mono Using one of the two similar 12 bit cartridges: MV16 comes with the game BAT, or Replay Professional also from Microdeal.

STE/TT DMA Stereo Using the STE/TT's new soundchip, with full frequency control and oversampling.

STE 50KHZ Stereo Using STE/TT's new soundchip, with quantized frequency control which is that you cannot portamento smooth between two tones anymore. There is no oversampling.

16 BIT Mono This is a mode for anyone who feels an uncontrollable desire to modify his or her

STE. If the two unlatched 8 bit inputs of the 8 bit DAC in the STE are connected to a 16 bit DAC the output quality will be very good in this mode. The authors take no responsibility for whatever happens to your STE! Schematic drawings can be obtained from Synchron Assembly.

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Digital Effect Processor (Sounds quite good, doesn't it?) Clicking on the output mode in any of the three STE modes will enter the DEP menu in which you can set the registers of the internal effect processor of the STE. The items are: Main volume, treble, bass, left volume and right volume. Warning: Bass and treble should both be zero when using the internal YM2149 output mode on the STE or the TT because the the sound will distorted otherwise!

Input. Using the gadgets to the right you can select from which device the input is to be read. ST Replay
The ST-replay 8-bit cartridge
MasterSound

same for Amiga samples. Changing this to signed will enable you to load ST-Replay

The 8-bit MasterSound cartridge As the STOS Maestro cartridge is exactly the same as the ST-Replay Cartridge you can use the same option.

About This button will display the copyright message again showing the names of the two programmers.

Samples. By pressing the word signed or unsigned you select signed or unsigned samples. The default is unsigned which is the

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samples. This option has no effect on samples already in memory. It simply specifies whether or not the samples are

to be converted when loaded or when saving. Samples already loaded can be changed from signed to unsigned or the reverse by pressing <Alternate> and <F10>.

Velocity Control. Pressing the On/Off indicator to the right will swap the Velocity Control mode from on to off or the reverse. This will in most output modes increase the output frequency and therefore the output quality, but as it says, the velocity control (volume control) will be turned off meaning that echo effects and the mixing will not be heard. All instruments will be played with maximum volume.

b. sample editor CTRL+S

With this part of the program you can edit all the instruments and also make new ones.

Sound consists of pressure waves which travel through the air. A sample is produced by often testing for high or low pressure, or rather how high or low pressure is. When using

Audio Sculpture you are bound to 8-bit samples, which means that you have a value from zero to 256 showing the pressure. A typical sampling frequency is 10 kHz meaning 10 000 tests during a second. That is 10000 pressure values to be output in order. These long tables of pressure information describe a waveform which you are able to edit using the sample editor which is one of the most powerful parts of Audio Sculpture.

The editor is based on a 65535 bytes long sample buffer in which all the editing is performed. The immense window at the bottom of the sample editor screen is the window to this buffer. In this buffer you have two markers, visible in the window, which can be controlled using the left and right mouse buttons. Clicking in the window with the left button will set the left marker to that position. All editing is done in the area between these two markers. In the middle of

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the screen there is an oscilloscope, showing the input or output signal of the program. In the lower part of the screen is a large sample buffer window where all the editing is taking place. Below this window is the Loopmarker pointer. This pointer shows where the program will start looping. This pointer can be moved using the mouse. Above the window there are 4 numbers.

'L' & 'R' Shows the left and right markers' position in the sample buffer.

'LEN' Shows the length between the two marks.

'LOOP' Shows the position of the loopmarker relative to the left marker.

If you click on the 'L' icon with the left mousebutton the left marker will scan the sample leftwards and stop on the first zero encountered. The right button will do the same but scanning rightwards. The 'R' icon will do the same but towards the right marker. If you are short of memory, you can deactivate the sample-editor, by clicking on the sampleeditor icon with the right mousebutton. By deactivating it you will increase the available memory for the module with 64 kilobytes.

Description of the boxes in the upper left half of the screen.

Monitor (<CTRL> + <M>)

This function allows you to listen to the incoming sample on your sampling cartridge. The content in the samplebuffer is not altered

or changed.

Sample (<CTRL> + <S>)

With this function you will record the incoming sample and store it in the samplebuffer between the two marks. While recording the screen will turn red. If the Trigger option is ON, then the program will start sampling when the incoming signal is higher than a certain level defined beforehand by clicking with the left or the right mouse button: Left button is for the lower level threshold and the right button for the higher one. If you click on the sample button while sampling is on, the recording will start over again from the left marker.

Replay (<RETURN>)

This function will play the sample between the two marks in the samplebuffer. If you click on this button with the left mousebutton (or if you press <RETURN>) the program replays the sample and then stops at the end. If you click with the right mousebutton (<SHIFT> + <RETURN>), Audio Sculpture will loop the sample. Replaying the loop means that at the end of the sample, the program will continue at the position of the loopmarker. The loop function will only be activated when the loopmarker is on the left of the right marker.

'MONITOR', 'SAMPLE', 'REPLAY' and 'LISTEN' will all start some form of sample activity. The frequency for replaying a sample or sampling can be set using the two gadgets

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just on top of the oscillator window. Below the lowest frequencies on the keyboard, a 'C 1', you can see two higher frequencies not tuned to any precise note. These can be useful for getting a better quality sample without frequency shifting. The area between the markers can also be replayed by pressing any of the keys used for the keyboard in the rest of Audio Sculpture. Audio Sculpture automatically sets the correct frequency.

Reverse (<CTRL> + <R>), Delay
This function will reverse the sample between the marks when clicked upon with the left mousebutton. Using the right mousebutton will generate a delay effect on the sample between the marks. The delay time is the distance between the left mark and the loop mark. The number of times is specified in the delay effect option in the 'TOOLS' menu.

Norm (<CTRL> + <N>)
With this function you can increase or decrease the amplitude of the sample. With the left mouse button you will increase the volume to its maximum, optimizing the sample data. If you hold the right button you can change the volume by moving the mouse up and down. Releasing the button will change the area between the markers. Changing the volume beyond the range of the window (that is beyond the dynamics of the sample) will cut off all parts outside it and thereby result in distortion.

Listen (<CTRL> + <L>)

This function allows you to listen to a sample chosen in the 'INSTR' selector. This function does not affect the data in the samplebuffer.

Fetch (<CTRL> + <G>)

This alloww you to copy an instrument from your song to the sample buffer. With the left mousebutton you may make a copy which begins at the left marker and stops at the right marker filling the rest with zeroes in case the instrument was shorter than the right marker. With the right button you can stretch the instrument between the two marks and therefore detune it. The loopmarker below the samplebuffer is also updated.

Edit (<CTRL> + <E>), Accord

Clicking the left mousebutton allows you to draw or edit the waveform of a sample. When using the edit function, the sample in the buffer is magnified to its maximum and you can edit samples with the mouse. This function is useful if you want to erase a glitch in the sample. When you are in the edit mode you can pan the sample window by using the pan box. With the right button you will make an accord of the sample between the markers. When pressed, a window appears where you can enter up to 4 digits. Each digit represents how many halftones each tone should be raised when overlayed with the rest of the sample. A zero has no effect. Example: If '37' is entered in the accord window Audio

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Sculpture will overlay the sample between the markers with itself three halftones and seven halftones up on the keyboard. Playing the sample on a 'C 3' will then sound like playing the original sample on a 'C 3', a 'D#3' and a 'G 3' at the same time. The sample will have a lower volume after you have used this effect.

Trigg: 'ON/OFF' This icon will turn the trigger option on or off. A full description of this function is in the 'SAMPLE' text above.

Store (<CTRL> + <P>) This function will copy the sample between the marks into the module/sequencer to the selected sample position (1-31) defined in the 'INSTR' selector.

Filter (<CTRL> + <F>) This function will remove all high frequencies to decrease noise in the sample. When using the right mousebutton, the decrease is higher than when using the left button.

Stop (<SPACE>)

This icon will stop everything in the sample editor. The following functions are affected: 'REPLAY', 'SAMPLE' and 'MONITOR' Frequency Here you can select the frequency at which you want the sample to be played or sampled. Description of the boxes in the lower left side of the screen.

Blk (<CTRL> +) This icon will turn the block mode 'on/off'. When selected, the area between the two marks is highlighted and the distance between the two markers is locked. This means that if you try to move one of the marks, the other mark will move to. The block

mode can be turned off by either pressing the 'Blk' icon or the 'RESET' icon.

Zoom IN (<CTRL> + <I>) With this function you will zoom in on the sample between the

two marks to the size of the window.

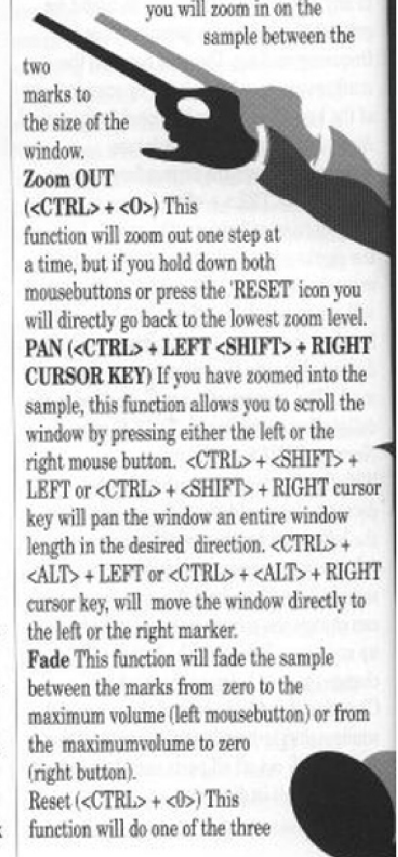
Zoom OUT

(<CTRL> + <O>) This function will zoom out one step at a time, but if you hold down both mousebuttons or press the 'RESET' icon you will directly go back to the lowest zoom level.

PAN (<CTRL> + LEFT <SHIFT> + RIGHT CURSOR KEY) If you have zoomed into the sample, this function allows you to scroll the window by pressing either the left or the right mouse button. <CTRL> + <SHIFT> + LEFT or <CTRL> + <SHIFT> + RIGHT cursor key will pan the window an entire window length in the desired direction. <CTRL> + <ALT> + LEFT or <CTRL> + <ALT> + RIGHT cursor key, will move the window directly to the left or the right marker.

Fade This function will fade the sample between the marks from zero to the maximum volume (left mousebutton) or from the maximum volume to zero (right button).

Reset (<CTRL> + <0>) This function will do one of the three



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things below corresponding to the current status : - Restore zoom level if zoom has been used

- Deselect a previously selected block
- Restore the marks to the left and right borders

Description of the boxes in the lower right side of the screen.

Copy,

Speechsyntheizer (<CTRL> + <C>) A block, earlier marked with the left mousebutton, will be copied to a new position determined by the marks. This function will only work if the block mode is on. If you click on this button with the right mousebutton, a window will appear where you can enter a message of your choice. When you are ready you press the return key and a sample of the message will be generated between the two marks.

Overlay, Multiplie (<CTRL> + <U>) This block function is used for mixing two samples. The blockmode must be selected for the function. The function is also used for making

'Echo' effects. This can be achieved by marking a block, moving the marks a few steps and

then selecting overlay. If you click with the right mousebutton the block and the sample between the markers will be multiplied

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instead of added as in the function above.

Insert (<INSERT>) This function is used to repeat the sample between the marks.

Clear (<DELETE>) This function will clear the sample between the two marks.

Exit (<ESC>) You can exit to Audio Sculpture's mainscreen by either clicking on the button or pressing the <ESC> key.

Sound synthesis (inside the sample editor)

There are two ways of generating sound in Audio Sculpture apart from sampling or drawing by hand. The first one is the most powerful and complex one of the two. It is called synthesis or possibly vectorsynthesis. This is a simulation of a synthesizer which generates sound using oscillators. At the top right of the Sample Editor screen are two words - 'BUF' and 'SYNTHESIS' of which the active one is green. 'BUF' means that the sample buffer is shown in the window at the bottom. 'SYNTHESIS' obviously in this case means that the synthesizer information will be shown in the window 'ENVELOPES'. The Synthesis option has EIGHT oscillators available to the user. They are defined through the value in 'OSC #' box. Each of them have an amplitude envelope - that is a graph showing how the value will change through time - and a pitch envelope. Each

envelope has 16 points which can be set in time (horizontally) and value (vertically). They also have an 'ON/OFF' indicator, immediately to the right of the 'OSC #' selector, showing if the oscillator will be used in the calculations or not. A value from 0 to 9 can be entered at the letter 'O' for Octave. Octaves from 4 upwards will be useful for making hearable sounds. Setting it to zero here will generate a sample where the frequency is far below to what the human ear can hear. The low frequencies are often intended for the use as modulators for other oscillators.

The Frequency Modulation submenu

Pressing the 'OSC #' text with the right mouse button will produce a window with the options 'TO OSC#' (to oscillator number...), which selects to which oscillator the amplitude of this oscillator is to be sent and used as a pitch offset. The 'MUTE' 'ON/OFF' selector which defines whether or not the amplitude generated by this oscillator is to be used in the actual sample. If mute is 'ON' the oscillator will be muted, quiet, but will still be useful as a modulation source for other oscillators. If mute is 'OFF' the oscillator will be a part of the generated sample.

The Vector Synthesis Settings submenu If you press the 'SYNTHESIS' box with the right key it will produce a window showing settings for the pitch envelope range, envelope duration and amplify. The pitch envelope

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range provides a scaling factor for the pitch envelope. The lower the value the less change in pitch is produced by the pitch envelope. The envelope duration controls the time duration during which the envelopes will last. Amplify is initially set to 'AUTO', which means that Audio Sculpture scans all the oscillators, finds the theoretical maximum amplitude of the sound and rescales the entire sample according to this value. This is not all when it comes down to generating artificial sound. You also have to select two waveforms for the each oscillator. The initial waveform is a sine wave. The reason why you have two waveforms per oscillator is that the oscillator starts with the first waveform and then fades it into the other, finishing off with only the other. The two boxes 'GW' and 'PW', meaning Get Waveform and Put Waveform, can be used for this. If you select a piece of a sample, painted or taken from another sample you can then press 'GW' with the left button to fetch the start waveform. The end waveform is selected with the right mouse button. The 'GW' function takes the area between the markers and stretches it into a 256 byte storage area. The closer it is to a 256 byte decimal or 100 byte hexadecimal, the more identic will it be to the original. Put wave does exactly the reverse, it takes the buffer and stretches it between the markers. For your convenience we have implemented three shortcuts. If you press <ALTERNATE> + <S> a sine wave will

be set on the start waveform of the current oscillator. Pressing <ALTERNATE> + <W> will produce a sawtooth waveform and <ALTERNATE> + <P> will produce a square wave. Together with the <SHIFT> key these shortcuts will set the end waveforms instead. A thing to be aware of before you start making your own sounds is that it will take a quite a while generating new sounds. Initially the sound generated will be a maximum of 2000 hexadecimal bytes long. That makes it useless to generate a 64Kbyte buffer. Therefore put the markers anywhere but still with a well chosen distance from the other to prevent useless calculations. Finally the most important thing is to know how to start the calculation of the sample. This is done by clicking on the Synthesis box again when it is already green. The 'SYNTHESIS' green indicator will disappear and when the sample is generated Audio Sculpture will switch to the 'BUF' selection. If you somehow fail, for example, if Audio Sculpture just changes from 'SYNTHESIS' to 'BUF' when you click on 'SYNTHESIS' the second time, you have probably forgotten to switch the switch on the right of the 'OSC #' text or you have switched on the 'MUTE' switch in the Frequency Modulation submenu. The second possibility to generate sound is the speech synthesizer about which I don't have much to say apart from that it is activated by clicking on the 'COPY' button with the right

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mouse button. It will convert a text according to some of the most common pronunciation rules into a sample and put this sample inside the markers. If the word you wrote does not sound the way you want it to then try inserting other characters or exchanging old ones until it sounds right. For example the word 'CYBER' will be pronounced more like 'CIBER' with a short 'I' sound in the beginning. The better pronunciation of 'CYBER' can be obtained by writing 'CIBER'. The speech synthesizer will use the start waveform from the 1st oscillator as its waveform. So that was the end of the sample editor!

c. Instrument list

This is an option for the already more sophisticated user. Therefore the first time you read this manual you could skip this part as it is not important for using the rest of the program. But if you are already familiar with the Amiga programs 'Preset Lists' then we advise you to read this anyway. The Instrument List is an easy way to organize your instruments and disks. It is a list containing a diskname and a filename for each instrument you put in the list. Loop parameters and velocity settings will also be in the list, meaning that the instrument will be absolutely ready to use when loaded, compared to when you normally load one you

have to set the loop parameters and the velocity if needed. The format of the instrument name in the list is: DISKNAME.FILENAME.

Add disk This will take all the files with the extension 'SPL' in the current instrument path and add them to the instrument list in memory.

Load - Ctrl This will load a previously saved instrument list or an Amiga preset list providing it has already been transferred to the ST

and changed from the name 'PLST' to 'ILST'. **Save** This will save the instrument list with the name 'ILST'.

Mask Clicking on this button you will be asked for one or more mask string which are strings containing the wildcards '*' and/or '?'. The question mark means that any single character could be present at this position. The star means that any sequence from one to more characters can be present at this position. The entries in the instrument list which coincide with your mask string will be marked and you will be asked for a new string. You can continue like this forever and when you press <RETURN> with on an empty string, no text, all the entries which are NOT marked will be deleted from the instrument list. This way you can sort and keep just some instruments which are of interest to you at the moment. Pressing <ESC> will remove the markings without deleting any entries.

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Volume name If you try to read or write to a disk without a name you will be requested to enter a new name here. We advise you to name your disks. It is very simple and will make the instrument list very useful. Clicking with the left mouse button on any entry in the window below will immediately try to load the instrument. It will first check if the disk is the right one and if it is not you will be presented a 'SKIP' 'RETRY' 'CANCEL' box displaying the name of the desired disk. 'SKIP' will try loading the instrument ignoring that it is not the right disk. 'RETRY' will check the diskname once again which can be quite useful if by any chance you have changed the disk. 'CANCEL' will cancel it. If the correct disk is in the drive or 'SKIP' has been pressed Audio Sculpture will search on the disk for the instrument. If it is found it will simply be loaded or else you will be confronted with the same 'SKIP' 'RETRY' 'CANCEL' box again but this time showing the name of the desired file. 'RETRY' will go back to the early stage of reading the disk name assuming that you had two disks with the same name and at this very moment have regained your consciousness to insert the correct disk. 'CANCEL' will still have nothing better to do but to cancel. 'SKIP' is useless in loading from the Instrument List. The same boxes will be shown when loading a song and the corresponding samples are to be loaded

automatically. In this case 'SKIP' will simply skip a sample and try loading the next. Clicking on an entry in the window with the right mouse button will generate a small editing window in which you can set the parameters for the specific instrument. <RETURN> will accept the edited instrument whereas <ESC> will leave it as it was. Insert This box will generate the window described above and you will be allowed to enter your own instrument with its parameters which then when <RETURN> is pressed will be added to the instrument list. <ESC> will ignore your changes worthless. Delete After having clicked on the delete button, which then turned green, you are supposed to click on an instrument which is no longer wanted. The right mouse button or the <ESC> key will cancel it.

d. Tools

In this menu you will find some very useful edit and block commands. The first five will, using the left mouse button, modify a track and with the right one modify a pattern. When using the keyboard, <SHIFT> and the corresponding key will modify a track while <ALTERNATE> and the key will modify a pattern. When modifying a track, it will be the one on which the cursor is.

Copy (or <F4> + <SHIFT> or

<ALTERNATE>) Copies the current track or

pattern into a buffer leaving the original untouched. There is one buffer for each track copy and one for each pattern so you can copy one track and one pattern at the same time.

Cut (or <F3> + <SHIFT> or <ALTERNATE>) Copies the current track or pattern into a buffer clearing the original. The same buffers as for copy are used.

Paste (or <F5> + <SHIFT> or <ALTERNATE>) Copies the track buffer or the pattern buffer to the current track or pattern deleting whatever was there before but leaving the buffer untouched, which

means that you can paste the same pattern or track several times.

Merge (or <CONTROL> + <F5> + <SHIFT> or <ALTERNATE>) This function will copy the track buffer or the pattern buffer to the current track or pattern but instead of overwriting the current track or pattern it will only copy the notes in the buffer which fit in the new track or pattern. It will mix two

tracks or patterns together where one track or pattern, the destination, has higher priority than the other, the buffer.

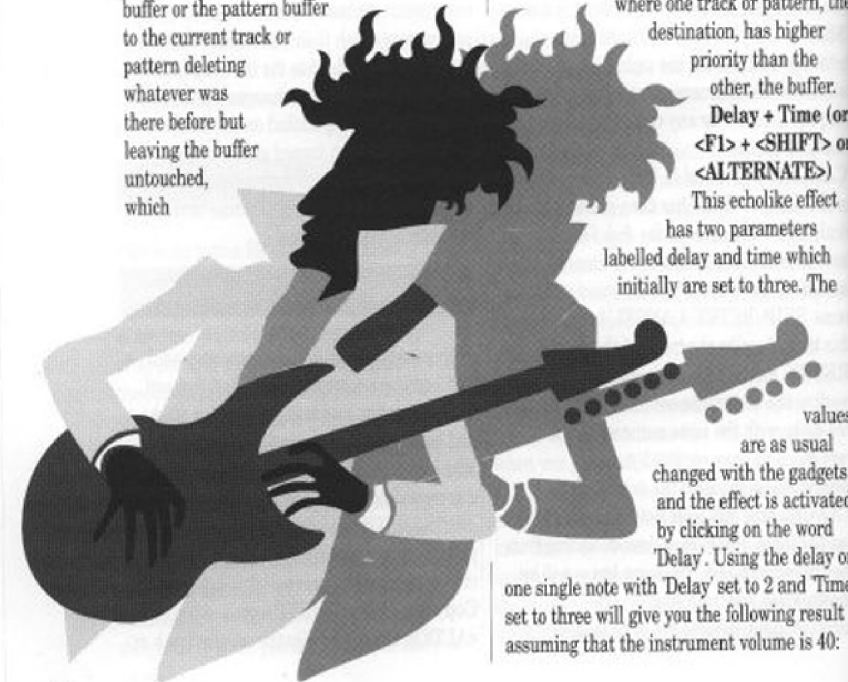
Delay + Time (or <F1> + <SHIFT> or <ALTERNATE>)

This echolike effect has two parameters labelled delay and time which initially are set to three. The

values are as usual changed with the gadgets and the effect is activated by clicking on the word 'Delay'. Using the delay on

one single note with 'Delay' set to 2 and 'Time' set to three will give you the following result assuming that the instrument volume is 40:

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00 --- 00000 01 C 3 01C40 This is the original note after which two (from 'Delay') notes 02 --- 00000 are inserted with a volume towards 0. The interval between 03 --- 00000 the notes is three (from 'Time'). The notes are inserted only 04 C 3 01C2B if the position is empty, meaning that no original notes will be 05 --- 00000 overwritten. 06 --- 00000 07 C 3 01C16 08 --- 00000 ...

The time can range from -63 to 63 decimal or FFC1 to 003F hexadecimal. Negative values means that the delay will raise in volume from 0 to the volume of the instrument delayed. With this function you can create very stunning effects especially when running the patterns at speed 6 or slower. Observe that this effect needs velocity control in Preferences to be turned on, or the sound will not be echolike but more like simply repeating notes in a certain manner.

Replace+with Clicking 'REPLACE' with the left mouse button will replace all notes using instrument number given in 'REPLACE' with the same note using the instrument number given in 'WITH'. The right mouse button will do the same but to the whole song, all patterns.

Transpose Following the so called word(!) 'Trnsp' is one 'T', two gadgets and one 'P' followed by two gadgets. 'T' stands for track. The gadgets immediately to the right of it will transpose the track one half note up or down. Example: C 2 01000 will be converted to: C#2

01000 when pressing the up arrow. The gadgets after the 'P' will transpose the pattern up or down. Shortcuts: <CONTROL> means Up arrow, without <CONTROL> means Down. <SHIFT> means modify track, <ALTERNATE> means modify pattern. Combinations of these should be used together with <TAB> to achieve a transposition from the keyboard.

Insert (or <INSERT>) This button will move the notes on, after the cursor position in the current track, downwards the number of positions given in the quantize box (the one to the right of the memory information...) inserting empty cells all the time.

Delete (or <DELETE>) This button will pull the notes on, after the cursor position in the current track, upwards the number of positions given in the quantize box inserting empty cells at the bottom of the track and deleting the quantize number of cells including the cursor position.

Clear All of the following will demand a verification of your wish before executing the command. Sample Song Samples All Ilist As you all understand these commands will clear a specific part of Audio Sculpture. The only thing needed to mention is that the 'All' box will only clear the song and all the samples but not the instrument list.

Reverse This box will, when pressed with the left mouse button, reverse the track on which the cursor is. The right mouse button will

CHAPTER 6

reverse an entire pattern. All of the above functions work with either an entire track or an entire pattern. It is often more convenient to have block functions modifying only a selected part of a track:

<Ctrl> Set start of block <Ctrl> <E> Set end of block <Ctrl> <M> Moves the marked block to the cursor position clearing the original <Ctrl> <C> Copies the marked block to the cursor position leaving the original as it was <Ctrl> <Q> Quantizes the track using the quantize counter and the module of the cursor position in the track and the quantize counter for input. <Ctrl> <Y> Clears the area between the markers. These functions will not copy the marked block to a buffer therefore any change inside the block after it is marked will also be in future copies and movements.

<Ctrl> <W> This function provides you with a method to rapidly fill an area with commands or a change of instruments - simply modify the five last characters on each row in a track. A window with two lines will be shown on the screen, the upper named mask and the lower named destiny. To the right of each line are 5 characters, initially question marks. clicking on the row of characters will allow you to edit the string. Allowed characters are 0 to 9, the letters A to F and the question mark. In the mask line a question mark means that all characters are allowed on that position. Other characters than question marks are compared to the corresponding position in the

block. Each line which are allowed in the mask will be modified according to the destiny. A question mark here means that the old character at this position will be kept. Any other character will be written into the track.

Example:
Mask ??C0?
Destiny ??201

Old Block: -> New Block:			
C#1 01C00	C#1 01201	Changed	
C 1 01C33	C 1 01C33		
--- 00000	--- 00000		
--- 0CC0F	--- 0C201	Changed	
D 1 01000	D 1 01000		

<Ctrl> <F1> This is a block repeat function which will repeat the area from the cursor position reaching the quantize positions forward through the track until the end of the track. The commands modifying a track or a single pattern can be used together with the <UNDO> key which will return the old pattern as it was before the command was executed. Pressing <UNDO> again will swap back to the old pattern.

The following keyboard commands can also be revealed in this part:

<HOME> or <F6> goto position 0 in the pattern

<F7> goto position 16 in the pattern

<F8> goto position 32 in the pattern

<F9> goto position 48 in the pattern

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When <SHIFT> is pressed together with the above keys the cursor jumps to the position and Audio Sculpture will start playing the pattern.

e. Disk functions

When you, dear Maestro, have composed a piece of music I guess you would be very happy to save it and to be able to reload it later as well as you would be happy to load already made songs from, for example, the Amiga or from the predecessors to this program. Therefore the Disk Functions menu exists. First we have to make clear what a song is in Audio Sculpture. It is a number of patterns and the order in which they are to be played, which is the sequencer information. It's also the name of the instruments used in the song, but not the actual instruments. When a song is loaded, Audio Sculpture will try to load the instruments used in the song. A "module" is a song which already includes the instruments, which means that all the data needed to replay the tune just as it was when you saved it is in that file. What is an instrument: It is a pure 8-bit sample without any further information connected to it. It could be saved from the ST-Replay program or any other sample editor as well as transferred from the Amiga, on which an enormous amount of samples exist. A tip is to use an Amiga program called Dos-2-Dos, which can

read and write ST disks, to transfer those samples.

Warning: When an unnamed disk is read by Audio Sculpture you will be asked for a new volume name for that disk. This is very important for Audio Sculpture to know when using Load Song or the so called Instrument List. Therefore we advise you to not just press <ESC> but instead enter a name for the disk. If not you will be questioned at every disk access which can be very frustrating. All those icons will then, when pressed, turn green and therefore you will easily be able to see which command you are just trying to activate which could be quite interesting to be aware of!

Loading To load a module click on the button marked 'L MODULE' (for "load module") with the left mouse button. Audio Sculpture will then switch the pathname to the path used for modules and read the current directory which will then be displayed in the area below. It is similar for songs and instruments. <Ctrl> and <L> is short for Load Song. <Ctrl> and <Z> is short for Load Module. <Ctrl> and <X> is short for Load Instrument

Saving To save a module or song you specify a name in the song name line in the middle of the screen. Then press 'S MODULE' (for "save module") using the right mouse button and the module will be saved. If you press 'S MODULE' using the left mouse button the directory will be loaded and if you click on a module name, the current module will be

CHAPTER 6

saved, overwriting this name, i.e. the old one. Be careful! If you have not yet accessed the disk and only inserted it into the drive you should, just to make sure, press 'S MODULE' or 'L MODULE' with the left mouse button to read the directory so that the operating system will definitely understand that you have changed disks - <Ctrl> and <R> for remount can also be pressed to reread the directory. It is similar for the song and for the instrument with only one difference which is that that when saving samples the filename will not be taken from the line 'SONG NAME' but naturally from the line 'INSTRUMENT NAME'. Songs will automatically have the extension SNG. Modules will automatically have the extension MOD. Instruments will automatically have the extension SPL.

Path and Volume Name Clicking on this line with the right mouse button will toggle between path and volume name information. Any one of them can be changed by clicking on the line with the left mouse button. There are three paths, one for songs, one for modules and one for instruments which lead to different drives and directories. The display will automatically switch to the correct directory when a load or a save command is clicked upon.

Using <CTRL> and <A> will increase the drive specification from, for example, 'A:*.MOD' to 'B:*.MOD'. Similarly the <CTRL> and the key immediately to the right

of the left <SHIFT> key will decrease the drive specification in the current path.

Delete File When clicking on this box, no new path will be displayed, but you can delete a file in the last path used.

Load buf This command will load a file into the area in between the markers in the sample editor. Preferably a sample of some kind.

Save buf This command will save the sample in the area between the markers in the sample editor with a name which you will be asked for in a cute box.

Pack Toggles the data compression option on or off for saving. Loading songs or modules will automatically unpack packed files. Note that only pattern data and sequencer data will be compressed. Unfortunately it is not efficient enough to try packing instrument data.

CHAPTER 7

Editing

Most midi sequencers do have some sort quantize function and so does

Audio Sculpture. The value without a name under the disk icon and to the right of the memory left indicators on the main screen is used in many ways. It used as a measure the amount of lines the cursor should jump down after every key press. It is used as a measure for the amount of lines the insert, delete and repeat function should insert, delete or repeat, as well as for the <Ctrl>+<Q>, block quantize command. When recording the quantization will be used for realtime quantizing the notes recorded. For example if quantize is set to four all notes recorded will be set at a position evenly divisible by four. If the recording has started on a position not easily divisible by four the offset between the last line evenly divisible by four and the current cursor position will be used as an offset for the quantization too. A quantize of 4 starts at position 5 meaning that notes can be put on position 1, 5, 9,.....

We have already briefly mentioned that there is a score editor in Audio Sculpture. Pressing <ESC> enters this editor. It is mainly intended to give you some kind of an understanding of the format used in the Matrix Editor but it is fully usable for writing music. The quantize value is used as the length of the note when inserting notes. At the top right of the window is a selector which

says INS for insert. This can be changed, using the left mouse button, to REP for replace, simply meaning that when INS is set new notes are inserted between the old ones, else new notes are overwrite the old ones leaving everything else as it was. Pressing the figures 1 to 4 at the top right of the window using the left mouse button turns the corresponding tracks on or off, the right button will jump to that channel. Also the up and down arrows are here used to change the track while the left and the right arrows move the cursor sidewise in the score. Pressing any note in the score edit window with the left mouse button will jump to that position. The right mouse button will jump to the position and play the note. Scrolling could be done by clicking on the left and right edges of the window. The small figures on top of the notes indicate which instrument is used by the note!

a. The numeric key pad

The numeric key pad allows you to choose sixteen programmable keys (and sixteen more with the <SHIFT> key). After having pressed any key on the keyboard your keyboard will suddenly turn into a midi device. You may press <CTRL> with any of the keys on the numeric key pad except for <> and <ENTER>. The instrument number and its pitch will then be saved for the key. When

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pressing that key again, you will activate the sound! Easy, isn't it? This is very useful for drums and things like that...

b. Channel flow

To the left of the text 'INSTR NAME' which is short for instrument name on the main screen is a small box with the letter 'F' in it. clicking on this box with the left mouse button will produce a window with a 4 x 4 matrix. Any of the cells in the matrix may be selected by clicking on them with the left button, the right button clears an entire row. This option will turn several monophonic channels into one polyphonic, it's simply a way of making the cursor jump to another channel at each note input. Each row represents an input source which are, in order from the top downwards

Keyboard Midi Trigger Matrix The numerical pad

Each column represents one of the four channels. Each selected cell in the matrix means that this channel will be used in the sequence for a certain input source. An empty row means that the cursor position will control where the next note input is to go to. This is the default. Example: If the keyboard row is like this (0 for off/1 for on): 1010 then the first note will be placed in track 1 (the leftmost), the second will meet its destiny in track 3 while the third note will end up in

track 1 again. This means that you will have the ability to play an accord directly on your keyboard! The effect is very nice when used with long samples. Pressing the 'F' box with the right mouse button will change from decimal notation to hexadecimal and the reverse.

c. Midi out

'Midi out' is the small box right below the 'F' for Channel flow and on the left of the word 'SONG NAME'. This button will enter yet another Audio Sculpture mode. Now everything will be sent on to Midi and you will have a four lines long list at the top right of the screen. This list is special for each

instrument.
Channel This is the midi channel on which the commands are sent for the current instrument.



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Program Number This is the number of the instrument which is to be used on the keyboard or the synthesizer
Tune This sets the base on midi for the three octaves on the ST keyboard and also which note is to be the base note **TuneFlg** This

selects whether or not the note number in Audio Sculpture is to be taken care off or only the tune value is to be sent.

d Midi in

Pressing the Midi out box with the right button will produce the 'Midi In' setup menu. Here you will be confronted with four values which you will have to set but are currently set to '-' meaning 'NO'!. There are four values, one for each track. When you select a value it will mean that this will be the midi channel from which midi is to be recieved for that certain track.

e. Tuning

The access to this next function is a bit strange: press the 't' in "Sculpture" in the copyright message at the top of the screen. This value may than be changed and when the value itself is clicked upon you will return to the main screen.

CHAPTER 8

The note commands

Do you recognize this here ?

D 2 01305

The third figure in the last part of the line is on the position where the commands should be. The two last figures are supposed to be parameters for the command or in the 'e' command a subcommand and the parameter to that command. The commands are in order:

0 Arpeggio Used for simulating accords. Sounds like shit with complex samples but OK with simple clock sounds. The parameter figures set how many halftones upwards each note in the accord will be from the base note.

1 Portamento up This command will slide the frequency upwards. The parameter sets the speed of the portamento.

2 Portamento down This command will slide the frequency downwards. The parameter sets the speed of the portamento.

3 Note portamento When this command is encountered in a track with a note on the left of it, the note will not be played but it will be used as a destination note for this function. The parameter defines the speed of the portamento and when the command is encountered without any note connected to it the portamento will be done towards and not past the destination note.

4 Vibrato Vibrato means, quite naturally that something will vibrate. This something in this case is the frequency of the current

note played. The first figure defines the speed of the vibrato and the second one the amplitude. The wave form(sine, sawtooth or square) is selected with a command described later.

5 Portamento Down + Volume Slide Down This command will continue the portamentoing with the last speed used and it will use the parameters for the volume slide just as the volume slide(command A) described later.

6 Vibrato + Volume Slide The last used vibratoing will remain and the two parameters will be used for the volume sliding described later.

7 Tremolo This will generate a vibrato effect but instead of the frequency vibrating the amplitude will vibrate. The parameters are exactly the same as the ones for vibrato.

8 Phasor effect Using two tracks with the same sample at the same time with the phasor effect on on one of them will generate stunning results in form of a phase delay and therefore an interference between the samples. If you use this repeatedly but change the phasor parameter you will get some sort of a phasor or flanger effect which is really groovy!!!

9 Play end part of a sample This will start playing the sample at a position in the sample specified by the parameter and multiplied by 256 decimal or 100 hexadecimal.

A Slide Volume The first parameter tells

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Audio Sculpture the speed with which it should slide upwards in the amplitude, the second one how fast it should slide downwards. This is useful for generating creeping raisings in amplitude, crescendos, and lowering the volume softly back. If you want to end a looped sample in a nice way this is the perfect way to do it.

b Break Pattern and jump to position

The next line processed will be the first line of the pattern at the position of the sequencer specified in the parameter. Not very useful but implemented for compatibility.

c Set volume Simply sets the amplitude of the sample. Lasts until a new set volume command or a new note is encountered in the track. This is useful for echoing and for making distinct low volume segments/very powerful segments in a piece of music.

d Break Pattern The next line processed will be the first line in the next pattern to be played in the song. Why would anyone want to end the pattern prematurely? It is very useful, indeed, to be able to play music in different speeds. Using a break at position 47 in each pattern will get you 48 positions long patterns which could result in some form of a 3/4 or 3/2 tempo.

e Extended command list which uses the first parameter figure as a second command. Description follows!

f Set sequencer speed Set the number of 50ths of a second the sequencer will spend on

each line in a pattern. The extended command list is just as the one in the protracker on the Amiga! Activated using the command 'E' and then selecting a sub command with the first parameter figure, leaving only one figure as a real parameter.

0 unused(filter on/off on the Amiga) **1 Fine Portamento up** Uses the last command figure as portamento speed

2 Fine Portamento Down Uses the last command figure as portamento speed

3 Set Glissando Control **4 Set Vibrato Waveform** **0 Sine** **1 Sawtooth** **2 Square** **5 Reserved** **6 Loop**

At the point this command is set with the parameter 0 a loop will be set. When Audio Sculpture finds a loop command with a parameter it uses the loop parameter for how many times to jump back to the marked start position inside the pattern. You cannot nest loops by using this command several times in a single track but you can have one loop on each track active at the same time! Very usefull for saving memory! **7 Tremolo**

Waveform **0 Sine** **1 Sawtooth** **2 Square** **8 Stop** Stop all sequencer activity **9 Retrigger Sample** This will perform like the Roll function of many drum machines. The parameter is used as a time measure. The sample will be started as normal but it will be restarted again and again after a number of 50ths of a second taken from the parameter. Useful for drum attacks and hihats out of rythm for example. a

CHAPTER 8

Fine Slide Volume up Uses the last command figure as sliding speed **b Fine Slide Volume down** Uses the last command figure as sliding speed **c Note cut** This command will cut the note, that is set the amplitude to 0, the parameter number of 50ths of a second after the start of the note as long as this time is shorter than the time spend on each line by the sequencer. The same thing could as well be achieved with the **C** command (SET VOLUME) with the parameter 00. **d Note delay** This will wait starting the sample an in the parameter specified amount of time in 50ths of a second. Using this command, you can in a very nice way generate strange and interesting rythms and also get a very high resolution in the pattern even when running the pattern at low speed, thereby saving memory. **e Pattern delay** This will wait at the current position inactive during the parameter multiplied with the speed 50ths of a second, that is the parameter number of positions in the pattern. Useful for saving memory. So for example if you want to set the amplitude of a sample at a certain point it could for example look like this:

G#3 04C30 Start Instrument 4 and sets amplitude to hexadecimal 30 or decimal 48 and plays a G# in the third octave. --- 00000 Does nothing but continues to play the sample activated at the previous position A#3 04C40 Starts instrument 4 and sets amplitude

to the maximum, that is 40 hexadecimal or 64 decimal. --- 00C20 Continues playing the sample but changes the volume immediately and in one crunch from 40 hexadecimal to 20 hexadecimal that is 32 decimal.

The set amplitude command works once and the state set by the command will remain till it is changed by another command. This is not the fact using most other commands, portamento for example has to be repeated to last longer(as it is a change in time.): **H 1 03104** An H is played in the first octave using instrument number 3 and the command number 1, that is portamento up, with speed 04. The command



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will during the processing of this line start portamenting the tone up but if the following lined looked like this: ---

00000 it would have stopped at the frequency it was there. --
- 00104 Instead we repeat the command and the portamento effect will continue.

It could be quite boring to write long lists of commands with parameters so therefore the <CTRL> + <W> command described in the 'TOOLS' section exists. You could also use the <CTRL> + <F1>, repeat command. If you write a command

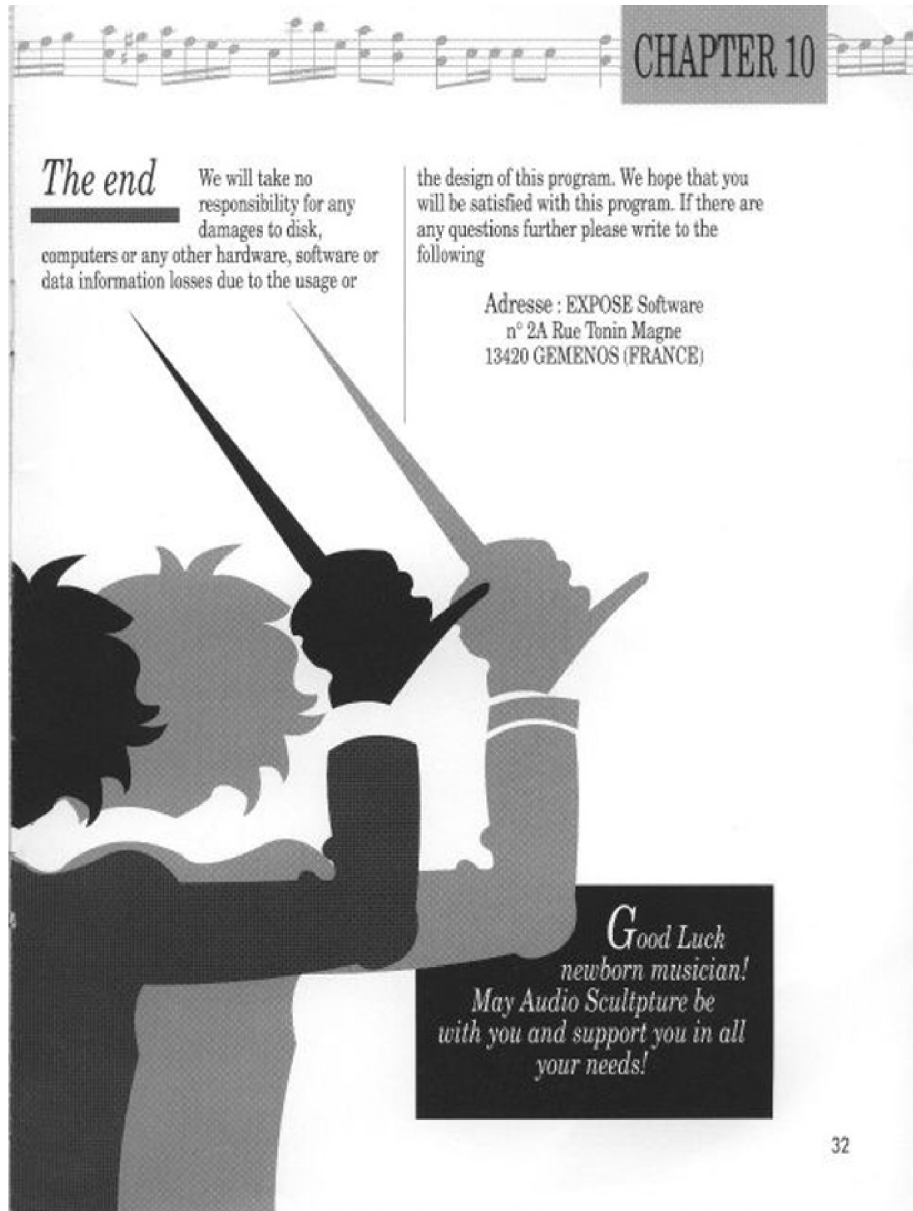
with the parameter zero most commands, that is the ones where a zero input will have no effect otherwise, means that the last used parameter with this command will be used!

CHAPTER 9

Replay routines

These routines are sent with the program for you to be able to include music made with Audio Sculpture in your own programs, demos, games and so on. On the disk there are sourcefiles for Devpac or other assemblers supporting conditional assembly, for GFA-Basic and for STOS Basic. The instruction for how to use the replay

routines is included in the sourcefiles. There are different versions of the sourcefile, one for absolute frequency control and one which is quantized to note steps which uses tables to set frequency. In the replay routines you may select volume control 'on' or 'off', frequency for the STE replay routines, or the YM-2149, as well as other output destinations. The replay routines are FAST if used in the right way : as fast as or faster than any opponents !



Audio Sculpture

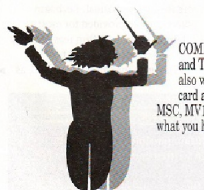
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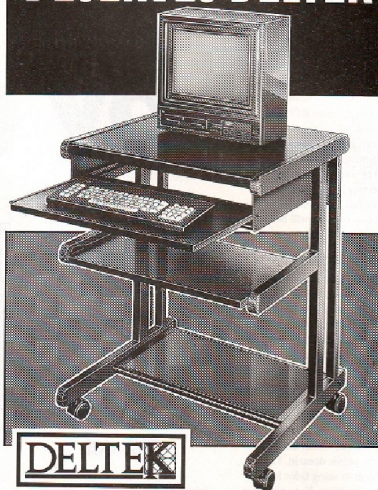
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