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1. INTRODUCTION

Congratulations with your purchase of the MoonSound sound module. The sound quality of this module is very high and far better than the existing MSX sound extensions.

This manual only describes Moonblaster for Moonsound Wave.

Users who are familiar with MoonBlaster v1.4 are still advised to read the complete manual once. Although many things will be known to them, the improvements will become clear to them. This goes especially for the smaller improvements.

Have fun with the MoonSound and MoonBlaster!

2. GETTING STARTED

2.1 Hardware

To be able to use this program the following configuration is required as a minimum:

- MSX2 Computer with 128 KB RAM and 128 KB VRAM
- A MoonSound sound module
- A single sided FDD diskdrive (the program is supplied on double sided disks)

The program supports the following optional hardware:

- R800 processor
- MSX DOS 2.XX (Access of CD-ROM is possible)
- 256K mapper RAM

To use DOS 2 a 256K mapper is needed. This amount of RAM will also improve the speed of the program on several places and it will give you the possibility to use the program's RAMdisk. If you have a 7MHz upgrade you might want to try this for some extra speed.

Connecting the MoonSound is very easy. To obtain the stereo sound as meant with this program you will have to connect the MoonSound to an amplifier or a monitor with a separate sound input. On top of the MoonSound is a connector and the supplied cable cannot be connected the wrong way. Using a head-phone with a mini-jack connector is not advised, but it can be done since the output level from de MoonSound can be controlled (read more about this in chapter)

The sound output will be too loud and get very distorted if the output level is too high.

Notice that the sound *cannot* be heard *through* the MSX on a monitor or a TV.

2.2 Starting and installing the program

MBWAVE starts from MSX-DOS. At the DOS-prompt type MBWAVE to start the program. DOS 2 users need to make sure enough memory is available to start the program. In most cases it will be sufficient to decrease or remove an existing RAMdisk.

If DOS2 is used it is advised to copy the program files in a separate directory yourself. If this directory is added to the search path, the program will attempt to find the other files it needs in this same directory. DOS2 users will also note that only the RAM size of the primary mapper is displayed when loading. Only the primary mapper is used by MoonBlaster for maximum speed.

All other settings can be done in the program using the set-up menu. How to do this is described later in this manual.

3. THE MUSIC EDITOR

In every menu, submenu or input-event things can be cancelled with the [ESC] key. For every menu where settings are done, you can modify the current settings with the [CTRL] + cursor keys.

3.1 Patterns and positions

For composing music in MoonBlaster it is important to know that this program uses the pattern and position system. This system is widely used in other music programs on other computer systems and it has proven to have many advantages, for the composer as well as for the programmer who wants to use this music in his programs. Below is a brief explanation of this system.

3.1.1 What are patterns and positions?

The memory of the computer is divided into small pieces where music data is stored. These are called patterns. A complete song consists of a sequence of these patterns in an order chosen by the composer. These are the positions. Therefore it is also possible to play a pattern several times within one song, while it is stored in the computer's memory only once. This system can be compared to a CD-player. Let the tracks on the CD be the patterns and the order of these tracks the positions. When you want to listen to the fourth track, then to the first and then to the fourth again, on position 1 you set track (pattern) 4, on position 2 track (pattern) 1 and on position 3 track (pattern) 4.

This pattern/position system might sound a bit complicated at first, but in practice it is very convenient and it saves a lot of time and memory space. MoonBlaster v1.4 users need to be aware that next to the positions the numbering of patterns and steps also starts with 0!

3.1.2 Editing patterns and positions

Note: With the current pattern is meant: the pattern that is shown in the top right screen at that time. The current position is the position shown in the top right screen. When you change the current position, the current pattern changes automatically to the pattern on that position. This is not the case when you change the current pattern!

The patterns are numbered from 0 to 79. The positions go from 0 to 219. This means that a song can have a maximum length of 220 positions. During the music editing it is essential to be able to move through to the patterns and positions rapidly. With the [TAB] and the cursors left/right you can move by one through the positions; [TAB] and cursors up/down can be used to move 4 steps at the time. Moving through the patterns can be done too, without changing the current position. This is done with [CTRL] and the cursor keys. Again, left/right is used to move by one, and up/down to move 4 steps at the time. [CTRL] with the space bar is used to put the current pattern on the current position. [CTRL]-[A] adds the current pattern after the last position.

A pattern can also be inserted, this is done with [TAB]-[INS]. The current pattern will then be inserted on the current position (the 'last' position is then also increased by 1). Removing a pattern from a position sequence is done in a similar way, the [TAB] and [DEL] keys remove the pattern. The last position can be adjusted with [GRAPH] together with the cursor keys. This is used to set the song length.

3.1.3 Pattern/Position editor

Function key F6 will bring you to the pattern/position editor. This is a verbose list of the pattern order. Editing the pattern order is very easy here: move the cursor to a certain position here and with a hit of the space bar the pattern number can be modified. Inserting and deleting patterns is done with resp. the [INS] key and the [DEL] key. In this menu it is still possible to play the song (F1) or a pattern (F2) and to set the last position. This is similar to the way it is done in the music editor, with the [GRAPH] + cursor keys.

3.1.4 Loop Position

A song can play indefinitely when you set a loop position. This is the position where the song will loop after it has reached the last position. A loop position can be set with [CTRL]-[L]. After that the position can be altered with the cursor keys. Pressing [RETURN] will confirm the modification and [ESC] will cancel it. The music will end after the last position when 'OFF' is set as the loop position.

3.2 Playing music

3.2.1 Playing the song

First of all you can switch the output indicator, which will indicate when a note is being played, with the [CTRL]-[O] keys. In the command line in the lower screen is printed whether it is on or off.

The same goes for the settings scan. This is convenient if you are composing a song and you do not want to start playing from the start of the song. It is not impossible that for example an instrument change already took place earlier in the song before the pattern where you start playing. With the settings scan all changes and settings that are done in the song before the current pattern are checked and set. This can be switched on and off with the [CTRL]-[S] keys. When the settings scan is switched off, the song is started with the settings that are normally used at the beginning of the song. When it is switched on, MoonBlaster will scan the complete song after you press F1 or F2 to find setting changes. This is shown with the pattern/position numbers in the top right screen.

The [F1] key starts playing of the song. The song will start at the current position and end at the last position. The [F2] key will play the current pattern only, this is convenient during the composing of the song.

3.2.2 Stopping the song

The song can be stopped using the following keys: the space bar, the [ESC] and [STOP] key. The space bar and [ESC] have the same function, the music is stopped and the current position will be set to the current position before playing started. The [STOP] key is practical for debugging. When you hear a note that is out of tune, press the [STOP] key and the song will stop at the position that was being played.

3.3 Input and clearing of notes and effects

3.3.1 Input of music

The music notation that is used in MoonBlaster is according to the American way, so an A in octave 3 will be 'A 3', an A sharp in octave 3 'A#3'. MoonBlaster supports octaves 1 till 8. 'C5' is the 'central C'. A pattern is divided in 16 steps. The steps next to each other are played at the same time. Only one event can be put on a step per channel (for example a note).

More channels are available than shown on screen. With [SHIFT] + cursor keys the available channels can be scrolled onto the screen.

A note can be input in two different ways, MoonBlaster has two input systems. You can alternate these systems with the [CAPS] key. The [SHIFT] is a logical [SHIFT] here: In the first system a temporal switch to the second is made with [SHIFT] and vice versa.

With the first input system (CAPS off) notes have to be entered with several keys, these are the letters [A] till [G], for the right note (plus the [+] or [#] to increase a half note if desired) and the numbers [1] till [8], for the right octave. [ESC] cancels the input. When a note is entered, the [RETURN] key can be used to repeat the last input without having to re-enter it completely.

The second input system (CAPS on) turns the MSX keyboard into a music keyboard with two rows. Every row is an octave. These octaves can be set with [GRAPH] + cursors. The following keys are used in this system:

2		3		5	6	7		
Q	W	E	R	T	Y	U		(low octave)
	S	D		G	H	J		
Z	X	C	V	B	N	M		(high octave)

(With German keyboards the program adapts this to the swapped [Z] and [Y])

This means that you should press [Q] or [Z] for inputting a C. For a G# you press [6] or [H]. If you want to enter an event other than a note, CAPS must be switched off, or you can press [SHIFT].

During the input of notes it might be convenient to listen to what you just entered (note audition). This can be selected with [CTRL]-[K]. When it is switched on, every note will be played after it is entered. This simplifies noticing notes that are out of tune. You can of course always use [F1] and [F2] to do this.

A note can be (and sometimes must be) switched off. This is done with the [O] key. An 'OFF' event will be displayed in the pattern. If you want to play an A#5 and it should only last one step, move the cursor to channel 5 (the fifth column) and type an A#5, directly followed by an OFF event.

3.3.2 Special options

The special functions effect the tone in the desired way. With a number you have to enter several digits. Enter [RETURN] to end the input if you want to enter fewer digits than the maximum length.

Detune

The detune is an option that slightly increases or decreases the tone height of a channel (maximum of 3 frequency steps above or below normal). This can be used to give the song a 'full' effect. The detune is entered with the [T], followed by a [+] or [-] and a number between 0 and 3. In the pattern the detune command is displayed by the T, for example 'T+1'. The detune option in MoonBlaster always calculates from zero, so a detune is not added by the last detune (T+1, followed by T+3 will *not* be T+4). The detune will not take effect until a new note is played. The start detune settings are done with [F10].

Pitch bend

A pitch bend event bends a tone frequency smoothly up (+) or down (-). This is entered with [P] and a [+] or [-]. Next, you type a number between 0 and 9. This is the speed of the pitch bend, 1 is slow, 9 is fastest. Speed 0 will halt the pitch bend. Pitch bending also stops with a new note, OFF, or modulation event. A pitch bend is displayed with a P, for example 'P+3'. The overall speed of the pitch bend is also affected by the base frequency. (see chapter)

Modulation

Modulation is entered with the [M] key followed by a 1, 2 or 3. Modulation modulates the frequency of a tone. This will stop with a new note, OFF or pitch bend event. Modulation is displayed with the M, for example 'M 1'. The modulation wave to use is selected with the number after the M. These modulation waves can be edited with [CTRL] + [Y]. A menu appears where you can alter the current values with [CTRL] + cursors left/right. It is possible to make your own pitch bend here when you do not 'modulate' up and down, but only one way. It is highly recommended to use the hardware vibrato instead of the modulation (it is the same). The hardware vibrato is not affected by the base frequency and uses no processor time at all (only to start it that is).

Linking

The linking option plays a new note without triggering it. A smooth change is made from the last note to a new note. A link is entered with the [L] key. Next, you type a offset to which note the link should be done, this is from -9 to +9. This is entered with the [+] or [-] and the numeric keys. The offset is added to the current note and is given in half tones (this equals the difference in tone height on two keys from a piano, the black keys must also be counted). Examples:

From:	To:	Link command:
C 5	C#5	L+1
E 3	D 3	L-2
A#6	F 7	L+7

After a link a new link can be entered, this will be added to the last link.

Volume change

The volume of every channel can be set with the [V]. After pressing the [V] you can enter a value from 0 (weak) till 31 (loud). In the pattern a volume change is displayed with a V, for example 'V30'.

Waves

A maximum of 48 different waves can be selected with a start volume. These instruments are used to change the current instrument during the song. This is done with the [W] key. Next, you enter a value between 1 and 48. The values after the W correspond with the values in the list of selected waves. See chapter 5 for more information on Waves. In the pattern a wave change is displayed with a W, for example 'W 7'. Notice that with the instrument, the volume changes too!

Stereo settings

After the S option, entered with the [S] key, a value from -7 to + 7 can be entered. -7 plays the channel completely left, +7 plays completely on the right. An in between value sounds better of course. Also selectable with [F-8].

LFO Settings

The LFO settings can be used entering the [X] key and a value from 1 to 9. With this option you can alter the LFO speed, Vibrato dept and Tremolo dept of a wave currently playing on a channel. It works in the same way when if you were using a the modulation. The values of these LFO settings can be set as you like by using the LFO editor (CTRL-V).

Reverb on

The opl4 has a build in pseudo Reverb and this can be triggered by entering the [R] key. The 'Reverb' will start after an OFF command.

Reverb off

The pseudo Reverb can be set off by entering the [Q] key.

LFO

The LFO from any wave can be stopped with the LFO command and started again by using it again. You enter this by pressing the [Y] key.

3.3.3 Command options

The CMD channel, the last column of the pattern, controls some special functions described below.

Tempo change

With the [T] key the tempo of the song can be changes. Enter a value between 1 (slow) till 23 (fast) after the T. A tempo change is displayed in the pattern with TMP, for example 'TMP17'.

End of Pattern

This option can end a pattern before step 16. It is entered with the [E] key and displayed as an 'ENDOP'. Usually a pattern has 16 steps, but with an ENDOP on step 8 the pattern will end after playing step 8. This function is very practical for a 3/4 bar.

Transpose

It happens regularly that within a song the same part is played several times, but with a different tone height. This is done easily with the transpose option. A complete song is increased or decreased several half notes. The transpose is entered with the [R] key. Next, enter a value from -24 (2 octaves down) till +24 (two octaves up). The values are always used absolute, not relative to each other. A transpose is displayed with 'TR', for example 'TR+12'. Starts on the next step! With Waves it is not always desired that the channels are transposed. If, for example, you use a drum wave the transpose may result in completely different drum sounds! Therefore, all percussion sounds from the ROM will not transpose and it is user selectable for Own Waves.

Status bytes

Status bytes do not effect the song, but can be practical for programmers. When a statusbyte is set, the programmer who uses the MB music can read these bytes to wait for a specific moment within the song. This is entered with the [S] key followed by a value from 1 till 3. This is displayed as 'STAT', for example 'STAT1'. How to read these status bytes is described in the several replayers.

3.4 Edit options

For all functions described below, no block selection is expected.

Deleting steps, channels, patterns and song

When you want to clear a step because it contains something that should not be there, you can use the [DEL] key. This will clear the step with the cursor on it. A channel can be cleared with the [SHIFT]+[DEL] keys. The channel with the cursor on it will be cleared. A pattern is cleared with the [CTRL]+[DEL] keys. The current pattern will be cleared.

With the [F7] key the whole song is cleared. The program will ask a confirmation first before the song is cleared. The current settings can be kept if you want to. If you don't want this they will be set to the settings after MoonBlaster was started.

Copying patterns and channels

A number of patterns can be copied to another place in the song with the [CTRL]-[P] keys. Some questions will appear: which patterns should be copied, the destination pattern and how many patterns should be copied. So, if you want to copy patterns 4, 5 and 6 to 10,11 and 12 first use [CTRL]-[P] then answer: 4, 10 and 3 to the questions.

It is also possible to copy channels within the same pattern. You can enter how many steps the copied channels should be moved (echo-steps). This is done with the [CTRL]-[C] keys. Note that no block must be defined!

Exchanging two channels

With [CTRL]-[X] two channels can be exchanged. This is very ease: the program will ask the first channel, the second channel and it will exchange these channels.

Transposing channels

Channels can be transposed per half note or per octave. To transpose with a half note up use the [.] or [+] key and to transpose a half note down use the [,] or [-] key. To transpose per octave you can use [<] or [CTRL]-[+] up and [CTRL]-[-] down. The channel with the cursor on it will be transposed.

Switching channels off

The channels can be switched off to be able to hear one specific channel. Move the cursor to the channel you want to switch off and press [CTRL]-[W]. Above the channel the message 'OFF' will appear. Do the same to enable them again. Note that the CTRL-W settings are not saved, they are just for editing the song.

3.5 Blocks

Selecting and unselecting a block

You can select part of the song as a block and do several edit functions on the complete block contents. Set the start of the block (top left) with [CTRL]-[B], the end (down right) with [CTRL]-[E]. The block will be displayed in different colors than the rest of the song. You can unselect the block with [CTRL]-[D]. This does not clear the contents of the block, it just unselects the block. Note for MoonBlaster v1.4 users: Because of the extra flexibility of block markings the start of a block is not immediately marked when it is set. You will see the complete block marked when the end is set.

Clearing a block

The contents of a block will be cleared by placing the cursor within the block and pressing the [DEL] key. You will be asked to confirm the deletion, so if you press [DEL] by accident no harm is done.

Transposing

Just like the channels blocks can be transposed per half note or per octave. Move the cursor within the block and use [,] or [+] to increase a half note and [,] or [-] to decrease a half note. Transposing the block by an octave is done with [>] or [CTRL]-[+] and [<] or [CTRL]-[-].

Volume Transposing

It is also possible to transpose the volumes up & down in a block by use of the [key for up and the] key for down.

Copying a block

The selected block will be copied with [CTRL]-[C] to the current place of the cursor. When no block is selected, a channel will be copied instead of a block.

Exchanging a block

This option will only work when the block width is only one channel. The length is not important. Place the cursor on the destination channel and press [CTRL]-[X]. This will exchange the block channel with the cursor channel and vice versa. Note that the start settings (instruments, detune, etc.) are not exchanged. If desired, you can do this manually.

3.6 Other options

Entering a songname

The songname, in the top screen, can be modified with the [CTRL]-[N] keys. The cursor will appear in the top screen and the name can be entered. With [RETURN] the new name will be used, with [ESC] the operation will be cancelled and the old name is still used.

RAMdisk

The MoonBlaster ramdisk can contain exactly one song and can only be used within the program. The current song will be saved with [CTRL]-[R] or [INS]. The question will appear if you want to read from or write to the RAMdisk. It is also possible to swap the current song with the song on the RAMdisk. This enables you to edit two songs at the same time. The [S] will save the song, the [L] will load the song and the [W] swaps the two songs. With the [ESC] key you can cancel the operation. Note that the RAMdisk only works with a memory mapper of 256K!

Start settings of Stereo and Detune

The start settings are the settings that have effect at the start of the song. The stereo and detune settings can be set per channel. Use the [F9] and [F8] keys to set the stereo settings. The detune menu is used with the [F10] function key. You can set the desired detune per channel with [CTRL] and cursors left/right here.

Songinfo

With [CTRL]-[I] an info screen will appear. This screen shows a lot of information about the current song like the start settings, the wavekit, etc. When you press the space bar a settings scan will take place and the settings that are valid on that place in the song will be shown.

Set-up menu

In the set-up menu several settings can be changed as the user prefers them. They can be saved on disk. The settings will not be explained here, but they will be known after you read this complete manual. They will be saved on disk in the file MBWAVE.CFG.

Tempo

With [CTRL]-[T] the start tempo can be set. The tempo is between 1 (slow) and 22 (fast). In the table below the ‘number of crotchets per minute’ is assumed that you use a pattern per bar. A crotchet is then four steps.

The following values only show the values for a base frequency of 8 and 48 ,resp. 50 and 60 Hz. Other values can be calculated with a formula described in chapter

3.7 Base frequency.

Tempo:	Crotchets/min 50 Hz:	Steps/min 50 Hz:	Crotchets/min 60 Hz:	Steps/min 60 Hz:
1	31	125	38	150
2	33	130	39	157
3	34	136	41	164
4	36	143	43	171
5	38	150	45	180
6	39	158	47	189
7	42	167	50	200
8	44	176	53	211
9	47	188	56	225
10	50	200	60	240
11	54	214	64	257
12	58	231	69	277
13	63	250	75	300
14	68	273	82	327
15	75	300	90	360
16	83	333	100	400
17	94	375	113	450
18	107	429	129	514
19	125	500	150	600
20	150	600	180	720
21	188	750	225	900
22	250	1000	300	1200

3.7 Base frequency

In the most trackers on the MSX computer music timing was done by the VDP, this has a few disadvantages:

- The music timing is always in some way related to the interrupt frequency of the VDP (50 or 60 Hz). The only way the created different speeds is to skip an interrupt or more. (This is done by the tempo command of Moonblaster). This does not give a satisfying tempo setting.
- The music can not be played at the same speed on 50 or 60 Hz. This was solved by frequency speed equalizer, but this caused timing errors.

The solution for these problems is: Using the timer of the OPL4. This timer has an accuracy of 80.8 micro second and is in Moonblaster selectable from 1 until 133 , resp. 48Hz until 100Hz. In Moonblaster this value is called: Base frequency.

To calculate the interrupt frequency use the following equation.

$$s = (256 - \text{Base_freq.}) * 80.8^{10-6}$$

Interrupt frequency = 1/s

Example: Base frequency = 80
 $s = (256 - 80) * 80.8^{10-6}$
 Interrupt frequency = 1/0.0142208
 Interrupt frequency = 70.32Hz

The Tempo determines the division of the interrupt frequency.

Example: Tempo = 20
This means that every 5th interrupt a step is played:
(22 = every 3th int, 21 every 4th int, etc)
So if you have a interrupt frequency of 70.32hz and a tempo of 20
the step/min will be:
70.32
----- * 60 = 848 step/min
5

You can select between 2926 different tempos.

The maximum speed is 2012 Steps/min (tempo 22 , base freq. 133)

The minimum speed is 121 Steps/min (tempo 1 , base freq. 1)

3.7.1 Base frequency setting

The base frequency can be set in two different ways. It can be done by pressing CTRL-F or during song playing by means of the cursor keys.

Cursor Up - Increase base frequency

Cursor Down - Decrease base frequency

Cursor Left - restore base frequency.

Space Bar - stop song and set base frequency.

[ESC] and [STOP] - Stop song and restore base frequency.

You can select the base frequency during playing and press the space bar when you found the satisfying base frequency. This tempo editing during replaying is ideal for synchronising for example a drum loop with your song.

4. WAVE MENU

4.1 Waves, tones and samples

Before a description is given of all wave menu options the general concept of the wave principle is explained here. MoonBlaster knows three different types related to the PCM/wave channels: samples, tones and waves

A sample is a small piece of digitised sound as known on as well MSX (Turbo-R, PSG sampler) as on other computers (Amigo, Apple and PC). The only restriction MoonBlaster has is that the sample format should be 8 or 16 bit PCM data. This is also known as 'raw' samples.

But the OPL4 has the capability to add some effects to these samples. These effects can be set by adding some extra information to the sample. A sample with this extra information (header) is (in MoonBlaster) called a tone.

However, the disadvantage of a sample remains that this will sound best when it is played at approx. the same frequency as its sample frequency. To create an instrument that does sound well in a wide frequency range, several samples are desired. A Wave as MoonBlaster supports is a collection of tones with some extra information like the start note of a tone. Common formats like this Wave is also

known as a patch on other computers, but to avoid confusion with patches that remove program bugs we chose the name Wave.

Note that the drums are also input as a wave now. So they are handled the same as an instrument. The type of drum sound will depend on the note that is played. These drum waves can be made by yourself of course, but one wave is already available that contains all ROM and GM drum sounds. The tone order here is similar to the GM drums. Some extra sounds are added at the end of the wave. See Appendix B for an overview.

The explanation above may be a bit short, but after reading this chapter and some practice, everything should be clear. All these settings are done in the wave menu. Press <F3> to go to the wave menu.

4.2 Select Waves

With the first option from the wave menu you can select instruments (waves) with their start volumes for the song. You will see a table with numbers on the left of the screen. These are the numbers that should be typed after the 'W' in patterns. This table contains all the waves that will be saved in the song. You can move through this table with the cursor keys.

When you press space now, you will go to the wave list. This list contains all standard instruments MoonBlaster offers. These are the waves as they are stored in the Yamaha ROM. Some of the waves in these list are almost or even completely the same. Often an instrument is used separate and as a part (A or B) of an instrument. These waves are listed more than once to make it easier for the user to use the dual voices. The reason Yamaha did this is obvious: It saves a lot of memory. It would be impossible to put all GM instruments in the 2MB ROM if they did not do this. An other disadvantage is that the tone boundaries can be heard very clearly with some waves.

With [CTRL] + cursor left/right you can move through the wave list. The last columns of the wave list contain the 'Own Waves'. For more information on own waves, see section Edit Waves. When you have found the desired instrument, press space bar and you will return to the instrument table. With [ESC] you can leave the wave list without selecting an instrument. You can put an instrument on every line in a similar way. These selected instruments can be used for an instrument (wave) change, (see **¡Error! No se encuentra el origen de la referencia.**) or as start voices. The start volumes of these instrument (displayed

behind the instruments in the instrument table) can be modified with [CTRL] + cursor left (decrease volume) and cursor right (increase volume). With [CTRL] + cursors up/down the Level Direct can be switched on or off. This sets the moment where the volume is changed for a wave. When it is switched on, the volume changes immediately, when it is switched off, the volume changes with use of interpolation.

4.3 Set Start Waves

This option of the wave menu shows the channels with their instruments. The instruments with the channels are the instruments the song will start with. If for example on channel W 1 and W 2 instrument 1 is selected, and if instrument 1 is a violin with volume 13, the song will play a violin with volume 13 on channel 1 and 2, until this is changed with a V or W event to another volume or wave plus volume.

4.4 Edit Tones

Here you can modify the 64 available tones. Like mentioned earlier, a tone is a sample with some extra information about the effects with this sample. In the left part of the screen are the tones. You can select a tone here with the space bar and cursors. After a selection, the header information can be modified in the right screen.

We tried to bother the user as little as possible with the locations of the samples in the sample RAM. This only happens when you are out of sample memory or there is too much memory fragmentation. The sample addresses that can be set here will not alter the length of the sample in the sample RAM! It will set the part of the sample that is played of course. To shorten the length of a sample a separate sample editor must be used. Maybe we will make one ourselves in the future. Below is a brief explanation of the several possible settings:

Start address: Point within the sample where playing starts. It is not possible to change this.

End address: Point within the sample where playing will continue at the loop address.

Loop address: Point within the sample where playing will loop.

Sample type: Sample type: 8 or 16 bits. You cannot change this. This is set when a sample is loaded.

Freq. table: Frequency table to use when the sample is played. A choice can be made between 22050 Hz, 8363 Hz or 7875 Hz as a base frequency. The

frequency will be doubled for every higher octave. The first table is a common one for PC samples, the second is common for Amiga samples and the third is used for most Turbo-R samples.

Attack Rate: Sets the attack speed of the tone. Values 0 - 15

Decay Level: Level where the 1st Decay will change to the 2nd Decay. With decay level 0 only 1st decay will be used. Values 0 - 15.

1st Decay: Speed of the decrease in volume after the attack maximum was reached. Values 0 - 15.

2nd Decay: Speed of the decrease in volume after the Decay Level is reached. Values 0 -15.

Release Rate: Fading time of a tone. This is the speed the volume decreases after an OFF event. Values 0 - 15.

Vibrato: Sets the vibration of the tone. Values 0 - 7.

LFO speed: Sets the LFO speed. Values 0 - 7. This speed is used for vibrato and AM (Tremolo).

Rate correction: Values 0 - 15. This will set the speed off the attack, decay 1 ,decay 2 and release rate depending on the octave that there played on.

Amplitude modulation(Tremolo): Values 0 -15. Modulates the volume of the sound.

The end and loop address can be changed by 10 with [CTRL]+ cursors up and down. You can set the loop address to the end address and the end address to the start and sample end with the [SELECT] key. The tone name can be changed with the F6 key. Saving a tone on disk is done with F5. After the error message that there is not enough sample RAM left too much memory fragmentation (and on any other moment) F4 can be used. The program will now re-order all samples and place them sequentially in the sample RAM. All small empty memory pieces will be combined to a bigger part of available memory. You can use the DEL key to delete a tone.

4.5 Edit Waves

With this option from the wave menu you can create your Own Waves. In the left part of the screen all own waves are shown. On the right the structure of the selected Own Wave is displayed. You can set transpose for this wave on and off with [CTRL] + cursors. Clearing a wave is done with the [DEL] key.

As you can see an Own Wave usually contains several tones. Per tone you can set on what note should be switched to the tone. Next, you can also set the first note of a tone. This makes it possible to for example play a drum tone on note D#3

while the actual play frequency is a C4. An example of a wave structure is shown below:

START NOTE	TONE	FIRST NOTE
C 1	My Great Bass	C 4
C 3	My Other Great Bass	C 4

In this example at notes C1 - B2 the tone My Great Bass will be played and with noted C3 - B8 the tone My Other Great Bass is played. The first note is equal on both tones. This can be the result of the used sample frequency with the instruments. Low notes of instruments are often still sampled on high frequencies to keep a reasonable quality.

The explanation above probably sounds complicated at first, but it is not that complicated. It is a matter of experiments and practice, things will become clear after some time.

Own Waves can be named just like Own Voices with the F6 key and saved on disk with F5. Playing the waves is also done the same way.

5. DISK MENU

From the music editor, the wave menu and the voice menu you can enter the disk menu with F5. In the disk menu you can read files from or save files on disk. The options with the load and save choices will depend on the place in the program.

5.1 The main disk menu

Load file

The MoonBlaster files of the selected type that are on disk will be displayed. Move the bar to the desired file and press the space bar. The file will be loaded. With DOS2 subdirectories are displayed between brackets. When the bar is placed on a subdirectory and you press space this subdirectory will be entered. You can always change drives with the <SELECT> key. This, especially for harddisk owners, is very practical.

Save file

The MoonBlaster files of the selected type that are on disk will be displayed. If you want to overwrite an existing file, move the bar to the desired filename and press space. However, if you want to save with a new name, just type the desired name (max. 8 characters). An input bar will appear automatically. Press [RETURN] when done.

Show files

Shows all files of the selected type.

Delete file

With this option you can delete files from disk. This is especially convenient when a disk is full and you really need to save something.

Drive

At any moment in the disk menu when files are displayed, press <SELECT> to change the current drive.

Song

Songs can only be loaded or saved when you enter the disk menu from the music editor. Songs have the extension ‘.MWM’ on disk. Songs can be saved in edit or user mode. More information about this follows. It is also possible to load ‘old’ MoonBlaster v1.4 music (for MSX-AUDIO). The program will try to convert it as well as possible. For the conversion of the sample channel in MoonBlaster a separate menu appears to select the waves that will replace the samples. The difference between edit/user mode songs is explained later.

Wavekit

Wavekits have the extension ‘.MWK’ on disk. When you save a wavekit it is important to be aware that ALL valid tones and all waves up to the highest valid wave that is available at that moment will be saved. So it is wise to clear all unused tones waves first. This can decrease the wavekit size considerably. Wavekits can also be saved in a user or edit mode. Saving a wavekit in the raw mode will be the same as saving in the edit mode.

Tones

Tones, can be saved or loaded by selecting the concerning tone and go to the disk menu with <F5>. With tones it is important to make sure that enough sample RAM is available.

Samples

In the tone menu you can load raw/PCM samples. A selection between 8 and 16-bit, signed and unsigned is possible. If you are not sure whether the sample you are loading is signed or unsigned, just try it. You will hear which one is right and no harm is done. Not that 4 empty bytes are added when a sample is loaded. This is done to let the OPL4 loop on a silent part after it finished playing.

Edit/User mode

The MoonBlaster songs and wavekits can be saved in two different ways: the Edit or User mode. The User mode crunches the song as well as possible and will not save the unused patterns. This can be annoying when a song is not finished yet and a few patterns filled with music data are not used yet. So, songs that are not finished should be saved in the Edit mode.

Another difference is that in the edit mode all names of the used own-voices will be saved. With wavekits all names of waves and tones will be saved. In the user mode they will be lost.

On the average a music composer will only use the edit mode. He wants to save as much information as possible. At the time that songs will be used in own programs these should be saved in the user mode.

Next to the edit and user mode a third mode exists, this is the 'raw' mode. However, this mode is meant only for several conversion programs from and to MoonBlaster songs. These can be programmed faster and easier this way. With all other use, this mode is not advised.

5.2 File extensions

Below is an overview of the most important file extensions:

MWM - MoonBlaster Wave Music
MWK - Wavekit
MTN - Tone
MWV - Wave

6. USING SONGS IN YOUR OWN PROGRAMS

An replayer is available for MoonBlaster for MoonSound to enable you to use the music in your own programs. An assembly source will become available for ML programmers and a driver will become available for BASIC programmers. An explanation how to use them can be found with the replayer.

7. TIPS

Some pattern saving tips

If a bass is played and later in the song the same bassline is played but with a lead, the lead can be switched off at first by setting the volume very low. When the bass is played for the second time the volume must be set loud. This way the same music part is played, but with the lead.

Smooth frequency slide

The link option is very useful in combination with the pitch bend option. With the pitch bend the note is bent, after that the link will stop the pitch bend and play the right note. The right value of the pitch bend can be found with some experimenting. It may be convenient to switch the other channels off with CTRL-W. For example:

C 5

-

-

-

E 5

You can make the change from C5 to E5 smooth with:

C 5

-

-

P+3

L+4

Double speed

To make the tempo exactly twice as fast you need the following calculation: 25 minus the current tempo has a certain result. When the tempo should be twice as fast, you have to divide this value by 2 (2 times as slow is multiplying by 2). The result should be subtracted from 25. The result of this calculation is the new tempo. An example will make this more clear: Let the song tempo be 19. The tempo that is twice as fast is calculated with: $25 - 19 = 6$. $6 / 2 = 3$. $25 - 3 = 22$. So the new tempo should be 22.

Pitchbend and back

Say you want to pitch bend a note a bit higher and then go back to the old note without a triggering the note again. This can be done with L+0. Example:

C 6
P+3
L+0

Echo

You can create an echo effect by copying a certain channel to another channel with echo steps. Often two echo steps will give the best result. You can copy the channel with CTRL-C, see the description in chapter 3. Set the same instrument on the new channel, but decrease the volume somewhat. Especially with good stereo settings this sounds great!

‘Full’ sound

You can create a full sound by playing the same notes on two channels and do some detuning. For example in channel one and two the same melody with in channel one a T+0 and in channel two a T+1.

Saving type work

You can save yourself a lot of typing by using the block functions well. When you use the same bassline often in a song for example, but with another base tone, you can copy it as a block with CTRL-C, and next you can transpose the bassline to the desired bass tone with [,] and [.]

Number of bars per pattern

When you are composing a song it is the easiest way to use one pattern for every bar. Every step is 1/16th note then. However, if you want to use 32nd notes too you can should two patterns for one bar. For a 3/4 bar you can place an ENDOP on step 11 in the CMD channel.

Sample editor

Note that MoonBlaster is NOT meant as a sample editor. Just edit your sample in a real sample editor until they are perfect. Save them as Raw/PCM or WAV and load the samples in MoonBlaster. A converter to convert WAV to MTN is available.

A. KEY LIST

Key list

Music editor

[F1]	Play song from current position
[F2]	Play current pattern
[F3]	To wave menu
[F4]	To voice menu
[F5]	To disk menu
[F6]	Pattern/position editor
[F7]	Clear song + default settings
[F8]	Set wave-stereo
[F9]	Set FM-stereo
[F10]	Set detune
[CURSOR]	Move cursor
[TAB]+[CURSOR]	Change position
[CTRL]+[CURSOR]	Change pattern
[SHIFT]+[CURSOR]	Scroll channels
[HOME]	To start of song
[CAPS]	Switch edit-modes
[DEL]	Clear step or block
[SHIFT]+[DEL]	Clear channel
[CTRL]+[DEL]	Clear pattern
[TAB]+[DEL]	Remove pattern on position
[INS]	Ramdisk
[TAB]+[INS]	Inserting pattern on position
[ESC]	Cancel event-input
[RETURN]	Repeat last input
[+] or [.]	Increase channel or block a half note
[-] or [.]	Decrease channel or block a half note
[>] or [CTRL]+[+]	Increase channel or block an octave
[<] or [CTRL]+[-]	Decrease channel or block an octave
[[]] or [CTRL]+[[]]	Increase volume in a channel or block
[]] or [CTRL]+>[]]	Decrease volume in a channel or block

With multiple key input system:

[GRAPH]+[CURSOR] Set last position

With one key input system:

[GRAPH]+[CURSOR] Decrease/increase edit octaves

CTRL keys:

^A (Add position)	Add a position and with the current pattern
^B (Begin block)	Set begin of block
^C (Copy)	Copy channel or block
^D (Delete block)	Unselect block
^E (End block)	Set end of block
^F (Base Frequency)	Set the base frequency (interrupt frequency of the opl4.)
^I (song Info)	Displays song information
^J (Master Volume)	Set the master volume of the Opl4.
^K (note audition)	Switch note audition on/off
^L (Loop position)	Set loop position
^N (Name of song)	Enter the name of a song
^O (Output indicator)	Switch output indicator on/off
^P (Pattern copy)	Copy patterns
^Q (Quit)	Quit program
^R (Ramdisk)	Load/save on ramdisk (with >= 176K RAM available)
^S (Settings scan)	Switch settings scan on/off
^T (Tempo)	Set start tempo
^U (set-Up menu)	Set-up menu
^X (eXchange)	Exchange two channels
^V (LFO editor)	Edit LFO settings
^W (channel on/off)	Switch channel on or off
^Y (modulation wave)	Modulation Wave editor
^Z (hertz)	Change hertz frequency (50 or 60 Hz) Has no effect on the tempo of the music.

During songplay:

[ESC]	Stop song and restore base frequency.
[SPACE]	Stop song and set selected base frequency.
[STOP]	Stop song on current play position and restore base freq.
[Cursor Up]	Increase base frequency.
[Cursor Down]	Decrease base frequency.
[Cursor right]	Restore old base frequency.
[Cursor Left]	Fast forward.
[CTRL + Cursor up]	Increase master volume
[CTRL + Cursor Down]	Decrease master volume

Music input:

[L]	Link
[M]	Modulation
[O]	Off
[P]	Pitchbend
[S]	Stereo setting
[Q]	Reverb off
[R]	Reverb on
[T]	deTune
[V]	Volume
[W]	Wave change
[X]	LFO setting
[Y]	LFO toggle on/off

Command input:

[E]	End of pattern
[R]	tRanspose
[S]	Status bytes
[T]	Tempo change

Keys used in every other menu

[HOME]	back to default
[CTRL]-[CURSOR]	change settings
[SPACE]	select option
[ESC]	back to....

Select Waves / Edit Waves / Edit tones

[F1]	keyboard octave up
[F2]	keyboard octave down
[F3]	keyboard select
[F8]	Pseudo Reverb on/off
[F9]	Random panning on/off

Edit Tones

[DEL]	delete tone
[F4]	defragment sample memory
[F5]	disk menu
[F10]	Delete all tones
[SELECT]	to start or end of sample (for end and loop addresses)

Edit Waves

[DEL]	clear wave
[F4]	defragment sample memory
[F5]	disk menu
[F6]	enter wave name

Pattern/Position editor

[INS]	insert pattern in position sequence
[DEL]	remove pattern from position
[F1]	play song from current position
[F2]	play current pattern

B. GM PERCUSSION WAVE

An overview of the Wave with all GM percussion sounds is shown below.

Note	Sound	Note	Sound
B 3	Acoustic Bass Drum	D#6	Open Hi Conga
C 4	Bass Drum 1	E 6	Low Conga
C#4	Side Stick	F 6	High Timbale
D 4	Acoustic Snare	F#6	Low Timbale
D#4	Hand Clap	G 6	High Agogo
E 4	Electric Snare	G#6	Low Agogo
F 4	Low Floor Tom	A 6	Cabasa
F#4	Closed Hi Hat	A#6	Maracas
G 4	High Floor Tom	B 6	Short Whistle
G#4	Pedal Hi Hat	C 7	Long Whistle
A 4	Low Tom	C#7	Short Guiro
A#4	Open Hi Hat	D 7	Long Guiro
B 4	Low Mid Tom	D#7	Claves
C 5	Hi Mid Tom	E 7	Hi Wood Block
C#5	Crash Cymbal 1	F 7	Low Wood Block
D 5	High Tom	F#7	Mute Cuica
D#5	Ride Cymbal 1	G 7	Open Cuica
E 5	Chinese Cymbal	G#7	Mute Triangle
F 5	Ride Bell	A 7	Open Triangle
F#5	Tambourine	A#7	Bass Drum 2
G 5	Splash Cymbal	B 7	Snare Drum 2
G#5	Cowbell	C 8	Snare Drum 3
A 5	Crash Cymbal 2	C#8	TR808 Snare Drum
A#5	Vibraslap	D 8	Snare Drum 4
B 5	Ride Cymbal 2	D#8	Bass Drum 3
C 6	Hi bongo	E 8	Bass Drum 4
C#6	Low bongo	F 8	Scratch
D 6	Mute Hi Conga		