BASS STATION

ANALOGUE MODELLING SYNTHESIZER PLUG-IN

USER MANUAL

novation
in music, anything is possible.

Editing sounds---

The BassStation's panel(s) can be edited much like the hardware BassStation's real panel - not *quite* as direct perhaps as reaching out and tweaking a knob but....

Simply move your mouse over the control you want to change. On the Mac, the cursor will change to a 'hand' and on a PC, the cursor will change to a 'cross-hair' symbol. The selected parameter and its value will be shown on the LCD:

CUTOFF
75
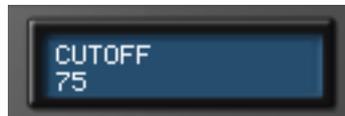
Click on the control and move the mouse up or down. As the control is moved, the value changes in the display. When a parameter has been modified, an asterisk appears in the LCD next the program number to indicate that the sound has been changed in some way:

MOOGBASS
*00

If you write the sound to memory, the asterisk disappears.

Switches can be enabled / disabled simply by clicking on them and sliding them to the required position. In the example below, it is clear that the RANGE is set to 8' and the WAVE is set to square.

16 8 4 2
RANGE WAVE

The LFO has a drop-down menu to select MIDI CLOCK SYNC.

LFO
OFF
SPEED   SYNC

Click and hold on these and make your selection by dragging down the drop down list and releasing the mouse on the value you want to set.

Note : If you have a mouse that is equipped with a wheel, you can use this to great effect with the panels. When the cursor is over a knob or slider, simply use the wheel to move it and set a value - no need to click... just place the cursor over the control and scroll the mouse wheel.

The mouse wheel can also be used with drop down menus as well... place the mouse over a drop down and scroll.

Using the compare function--

After making any changes to a sound it may be useful to compare it with the originally stored program. This can be achieved using the COMPARE function:

WRITE   CONFIRM   COMPARE

To illustrate this, select any program and tweak the panel controls - move the filter, change an oscillator's octave setting, whatever. Now click and hold down the COMPARE button. The sound you will hear will now be the originally stored program. Releasing the COMPARE button will switch to listening to the edited sound again. In this way, you can decide whether the changes you have made are worthwhile or should be abandoned

Writing a program--

If you make a change to a sound that you like, the chances are that you will want to keep it for use later on. Sounds may be saved in any memory location. However, it is recommended that the user locations (41-99) are used early on for saving new sound creations if only to prevent losing the original factory presets (but if you are confident enough to overwrite the factory presets with your own creations, feel free... it's up to you to decide!).

All the BassStation's 100 factory presets can be overwritten if desired. Once these factory presets are overwritten, they may only be retrieved by performing a factory restore.

To actually save the sound, click on the WRITE button below the LCD. The display will prompt you to select a memory location:

If you want to over-write the existing sound, simply click on CONFIRM - the sound will be written to the current location.

Note : The destination memory is always initially set to the currently selected program's number. Take care not to accidentally overwrite a treasured preset!

If you want to save the sound in a different location (thereby retaining the original sound in its original location), using the PROGRAM up/down buttons, select the destination memory and click on CONFIRM.

To cancel the WRITE operation, simply click on WRITE again.

Renaming programs---

It also possible to rename programs in the BassStation. This is particularly useful if you have created your own sounds. To rename a program, simply click on the LCD – you will see a contextual menu:
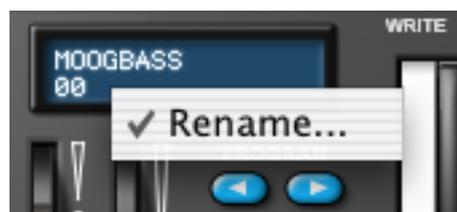
Click on this to pop-up a name field:

Type in a name and press RETURN when you're done.

Loading and saving banks--

Most sequencer hosts allow you to load and save banks of sounds. This is useful if you want to create your own library of sounds and you could, for example, create a set of, say, 'techno' sounds on your BassStation - these could be saved as a bank named "Techno". You might also create a series of 'vintage' synth emulations - again, these could be saved as a bank called "Vintage". Whatever... you can subsequently load all these sounds back into your BassStation at any time. In this way, you can build up your own private library of BassStation sounds. It's also likely that banks of sounds will appear on the Internet which can be downloaded and used with your BassStation.

You should consult your sequencer's documentation for details on loading and saving banks.

> Note : We have used the term 'bank' to describe a collection of sounds that can be loaded / saved on a plug-in. Different sequencers use different terminology for the same thing.

Notes about loading and saving---

There are generally three ways to load and save items within your sequencer and to confuse the issue, different sequencers either deal with this differently and/or use their own terminology for what is basically the same process!

At the top level, you can save your song. This will not only save the music you have recorded but it will also save the current settings of the BassStation (and any other plug-in(s) you may have running). When you subsequently load that song, the BassStation's sound(s) will also be recalled. Even if you have edited a sound, the edited version will be recalled when the song is opened again.

At the next level, you can save (or 'write') individual sounds to the BassStation's 'internal' memory. Thus, whenever you use the BassStation in any song, the sounds you have edited / created can be used in that song.

However, once you start building up lots of sounds of your own creation, you can save these as a bank (or 'preset' or 'setting' or whatever it is your sequencer calls them) and these can be loaded into the BassStation quite separately from the song. To illustrate this, you could be working on a song but can't find the right sound. You can load a different bank of sounds into the BassStation where you have access to 100 different sounds.

Some sequencers also allow you to save single sounds and these can subsequently be loaded into the BassStation at a later date.

Don't be confused by all of this, however - most of the time, you will simply insert instances of the BassStation into your song, select sounds as required (maybe even tweak them to suit the song) and then you'll just save the song's sequence file. When you load that song again, the instances of the BassStation will be recalled along with the sounds you selected / edited. The WRITE and SAVE / LOAD BANK (or whatever) options are more for building up a library of your own sounds.

Elements of a sound---

To gain an understanding of how a synthesizer generates sound, it is helpful to have an understanding of the components that make up a sound, be it musical or non-musical.

The only way that a sound may be detected is by air vibrating the eardrum in a regular, periodic manner. The brain interprets these vibrations (very accurately) into one of an infinite number of different types of sound.

Remarkably, any sound may be described by just three elements, and all sounds always have them. They are :

> * Volume
> * Pitch
> * Tone

What makes one sound different to another is the proportion of these three qualities initially present in the sound and how these three terms change throughout the duration of the sound.

With a musical synthesizer, we deliberately set out to have precise control over these three elements and, in particular, how they can be changed throughout the duration of the sound. These elements are often given different names: volume is sometimes referred to as amplitude and/or level, pitch as frequency and tone as timbre.

Pitch

Taking the example of air vibrating the ear drum, pitch is determined by how fast the vibrations are. For an adult human the lowest vibration perceived as sound is about twenty times a second, which the brain interprets as a low, bass type sound and the highest is many thousands of times a second which the brain interprets as a high pitched sound.

Wave A

Wave B

If the number of peaks in the two waveforms (vibrations) are counted, it will be seen that there are exactly twice as many peaks in Wave B as there are in Wave A. (Wave B is actually an octave higher in pitch than Wave A). It is the number of vibrations in a given period that determines the pitch of a sound. This is the reason that pitch is sometimes referred to as frequency. It is the frequency of the waveform peaks which are counted during a given period of time. Frequency is expressed in Hertz (abbreviated to Hz). For example:

20Hz   20 Hz or 20 cycles per second

440Hz   440Hz or 440 cycles per second. This is also known as 'concert A' or 'A-440' and is the pitch an orchestra tunes to. It is also the common tuning reference for many other instruments.

1kHz   1,000Hz or 1,000 cycles per second

10kHz   10,000Hz or 10,000 cycles per second

Tone

Musical sounds consist of several different related pitches occurring simultaneously. The loudest is referred to as the 'Fundamental' pitch and corresponds to the perceived note of the sound. Pitches related to the fundamental are called harmonics (sometimes also referred to as 'overtones') and these are multiples of the fundamental (i.e. x2, x3, x4, x5, x6..... etc.). The number of harmonics and their relative loudness to the fundamental determines the tone or 'Timbre' of the sound. Some waveforms contain both even and odd numbered harmonics (i.e. fundamental plus x2, x3, x4, x5... etc.), others contain only odd numbered harmonics (fundamental and x3, x5, x6, x7.... etc.). Some contain lots of harmonics (even and/or odd) whilst others only have a few.

Consider two instruments such as a clarinet and a trumpet playing exactly the same note at exactly the same volume. Even though the pitch and volume are identical, they sound completely different. This is because the trumpet is rich in even and odd harmonics whereas the clarinet only contains odd numbered harmonics. Consider also a flute - another very different tone. This is because a flute typically has very few harmonics. When a sound has a lot of harmonics, the sound will be bright; when a sound has very few harmonics, it will be mellow in tone.

However, tone is rarely static on most instruments and varies during the course of the note. Generally, sounds start off quite bright and, because higher harmonics have less energy, they tend to die away first followed by lower frequency harmonics - the result is that the sound gradually gets softer in tone throughout the note. Other instruments start off with few harmonics but higher harmonics build up throughout the course of a note so that the sound gets gradually brighter. Tonal changes are often linked with level changes - i.e. the harder you hit, pluck, scrape or blow something, not only is it louder but it is usually brighter in tone.

Volume

Volume, which is referred to as the amplitude or loudness of the sound, is determined by how large the vibrations are. Think of a guitar string - pluck it softly so that it hardly vibrates and the sound will be low in level. Pluck it hard, however, so that it moves a lot and the sound will be louder.

In the diagram above, the waveform on the right is quieter than the one on the left.

However, volume is not a static element of a sound as it tends to change throughout a note's duration. Consider the sound of a piano and, say, an oboe - the piano is initially very loud but dies away over time. The oboe, on the other hand, has a soft start but sustains during the course of the note (though not always). Other instruments' amplitude varies in different ways as well - some sounds start slowly (bowed instruments, for example) whilst other sounds ring on for a long time after the note has sounded (a gong, for example). The way in which a sound varies over time is known as the 'envelope' .

Putting it all together---

Having shown that just three elements make up any sound, these elements now have to be related to a musical synthesizer. It is logical that each element of the sound is handled by different sections on a music synthesiser.

OSCILLATORS generate the basic waveforms which provide the pitch of the sound along with its raw harmonic content (tone). This passes into a section called the FILTER which is responsible for further altering the tone of the oscillator's basic waveform. It does this by removing (filtering) certain undesired harmonics. Lastly, the filtered signal is fed into an AMPLIFIER which determines the final volume of the sound. The simplest synthesizer would look something like this:

| OSCILLATOR | → | FILTER | → | AMPLIFIER | → |

However, additional synthesizer sections; LFOs (low frequency oscillators) and ENVELOPES provide ways of altering the pitch, tone and volume of a sound by interacting with the oscillators, filter and amplifier. They introduce changes in the character of a sound that evolve throughout the duration of the sound. Because the LFOs and Envelopes' only purpose is to control (modulate) the other synthesizer sections, they are commonly known as 'modulators'. A more advanced synthesizer might look like this and the controllers are shown in red:
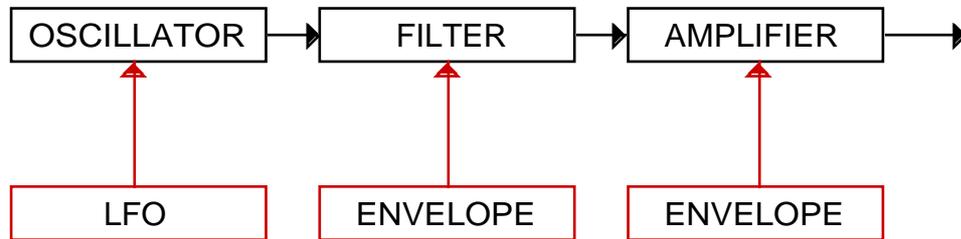
The oscillator generates the basic waveform but can be controlled (or modulated) from the LFO for effects such as vibrato, etc.. The oscillator's signal passes on to the filter where the basic waveform can be modified further and the filter's envelope can cause tonal changes to take place over time. Finally, the sound passes onto the amplifier where the sound's volume envelope can be shaped.

The BassStation's sound generating process is all based around these basic principles except that it has two oscillators which can be mixed and combined in any number of ways to provide a far greater palette of raw waveforms than a single oscillator could ever produce. The oscillators can also be detuned to create a denser sound (consider the sound of a single violin compared with a string ensemble where several violins are playing together but all slightly detuned from each other).

These oscillators are then mixed together in a mixer and the output of this mixer passes to the filter. The filter can be controlled by its own envelope but also by the LFO. The signal then passes through a final amplifier that can be shaped with its own envelope. Below is a *very* simplified block diagram of the BassStation:
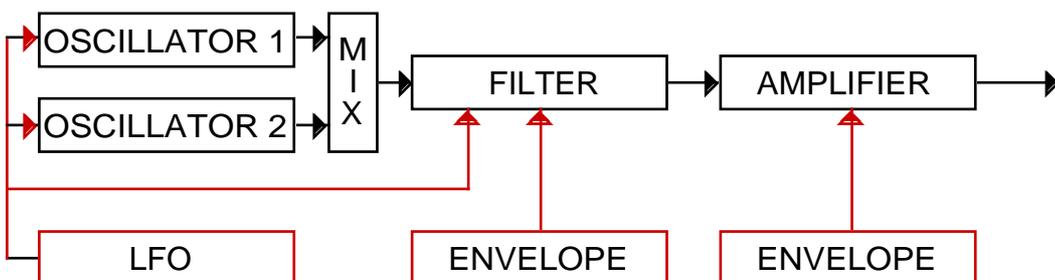
The various synthesizer sections will now be covered in more detail.

Oscillators--

The oscillator is really the heartbeat of the synthesizer. It generates an electronic wave (which creates the vibrations). This waveform is produced at a controllable musical pitch, initially determined by the note played on a keyboard or other MIDI controller. The initial distinctive tone or timbre of the waveform is actually determined by the wave's shape.

Many years ago, pioneers of musical synthesis discovered that just a few distinctive waves contained most of the useful harmonics for musical synthesis. The names of these waves reflect their actual shape when viewed on an instrument known as an oscilloscope. They are:

WAVEFORM   WAVESHAPE   HARMONIC STRUCTURE

Sawtooth wave

F 1 2 3 4 5 6 7 8 9 10 11

The sawtooth wave is probably the brightest sounding waveform of all and contains a wide range of odd and even numbered harmonics in equal proportion. It is good for a wide range of sounds including strings, brass and more.

Square wave

F 3 5 7 9 11
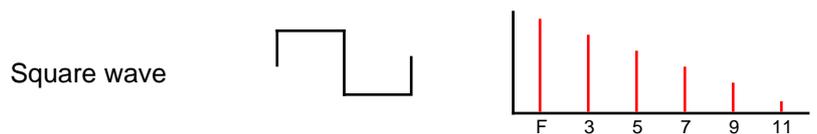
The square wave is a very bright but hollow sounding waveform, not unlike the tone of a clarinet. It consists of a wide range of odd numbered harmonics.

On many synths (the BassStation included), it is possible to vary the width of the square wave:

← →

The so-called 'pulse' waves at either extreme have a very different harmonic content to the square wave and sound 'thinner' and more 'nasal'. However, because the pulse width is totally variable, the harmonic content of each variation in between the extremes also differs. If the pulse width is controlled by something like an LFO, a very vibrant and animated sound can be created - this is called Pulse Width Modulation.

Another technique possible with the oscillators is that known as OSCILLATOR SYNC. This synchronises the outputs of two oscillators to create new waveforms.

Normally, when two oscillators are free running, they interact and the resulting waveform is an 'animated', constantly evolving sound:

Oscillator 1

Oscillator 2

Mixed waveform
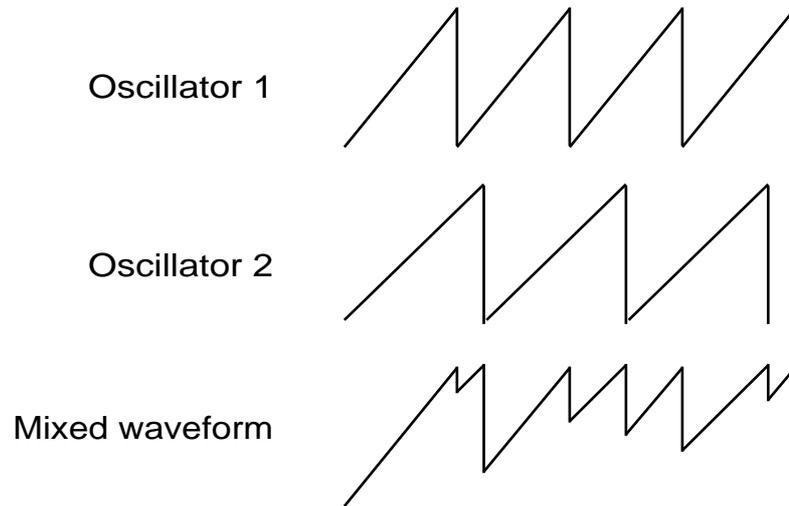
However, when two oscillators are synchronised, one oscillator's waveform is constantly being reset to the other:

Oscillator 1

Oscillator 2

Sync waveform
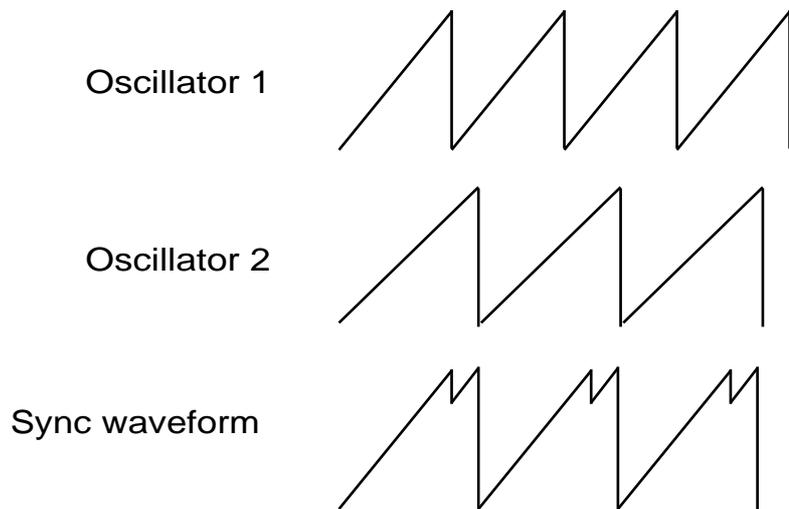
The result is a new waveshape with different harmonic components and the interval between the two oscillators (and the waveforms selected for both oscillators) determines the harmonic content of the final waveform. Some very interesting new waveforms can be made in this way and, used subtly, many digital sounding waveforms can be created.

However, by sweeping the frequency of the synchronised oscillator, many distinctive 'sync sweep' effects can be created that can sound like thick flanging - great for aggressive leadlines and distinctive bass sounds.

Mixer--

To extend the range of sounds that may be reproduced, a typical analogue synthesizer often has more than one oscillator. By using more than one oscillator when creating a sound, it possible to achieve very interesting harmonic mixes. It is also possible to slightly detune individual oscillators against each other which creates a very warm 'fat' sound. The BassStation has two independent oscillators which can be mixed and detuned.

For flexibility, a mixer section is usually included so that the level of each of the oscillators can be adjusted independently and mixed together to form a harmonically complex waveform.

Filter--

The BassStation is an *analogue subtractive* type of music synthesizer. Subtractive implies that part of the sound is subtracted or removed somewhere in the synthesis process.

The oscillators provide the raw waveforms many of which have plenty of harmonic content and it is the filter that subtracts unwanted harmonics in a controllable manner.

The filter in the BassStation is a Low Pass type. A cut-off point is chosen and any harmonics below that point are allowed to pass through unaffected and any above are filtered out. The setting of the FREQUENCY knob on the BassStation panel dictates the point below which harmonics are removed. This process of removing harmonics from the waveforms has the effect of changing the sounds character or timbre. When the FREQUENCY knob is set fully clockwise, the filter is set completely open and no harmonics are removed from the raw oscillator waveforms:
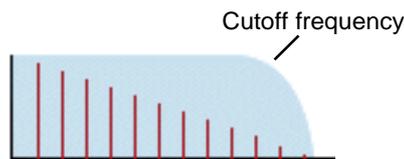
Cutoff frequency

Here, all the harmonics pass through and the sound is very bright. However, as the control is moved counter-clockwise, the cutoff frequency is reduced and the higher harmonics are removed:
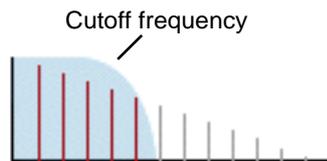
Cutoff frequency

In this example, all those harmonics within the shaded area pass through unaffected whilst those above the cutoff frequency are removed and won't be heard. With the cutoff set like this (i.e. about halfway), the sound will have mellower tone. As the cutoff moves down, so more and more upper harmonics will be removed.

In practice, there is a gradual reduction in the volume of the harmonics above the cut-off point. How quickly these harmonics are reduced in volume above the cut-off frequency is determined by the filter's slope. This slope is measured in 'volume units per octave'. Since Volume is measured in decibels, this slope is quoted in the number of decibels per octave (dB/Octave). Typical values are 12dB or 24dB per Octave. The higher the number, the faster the harmonics are cut and the more pronounced the filtering effect.

Cutoff frequency   Cutoff frequency

12dB/Octave   24dB/Octave
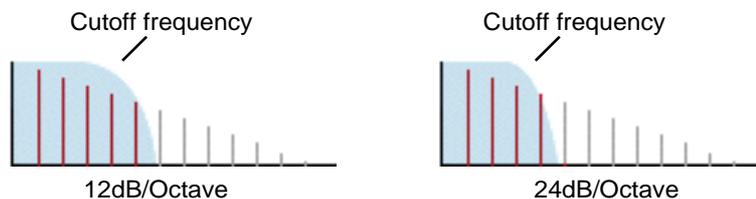
As you can see from the diagrams, the 12dB setting has a more gradual 'slope' than the 24dB setting which is steeper and even though the CUTOFF is the same in both examples, more upper harmonics are allowed to pass through with the 12dB setting than the 24dB setting. Some say that 12dB/Octave filters are 'fizzier' whilst the 24dB/Octave setting sounds 'punchier' and more like the original analogue synths. The BassStation offers both types of filter slopes to be selected.

A further important feature of the filter is the RESONANCE control. Frequencies at the cut-off point are increased in volume by this control:
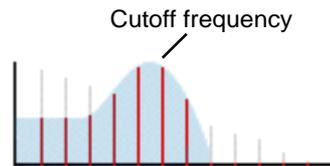
Cutoff frequency

As you can see, those harmonics around the cutoff frequency are actually boosted in level whilst all those outside the shaded area are removed. This is useful for emphasising certain harmonics of the sound and with increased resonance settings, sweeping the cutoff frequency up and down causes the filter sound to change from the normal 'waa' sound to a more distinctive 'weeow' as the individual harmonics are picked out and emphasised.

As the RESONANCE is increased, a whistling like quality will be introduced to the sound passing through the filter. When set to very high levels, RESONANCE actually causes the filter to self - oscillate whenever a signal is being passed through it. The resulting whistling tone being produced is actually a pure sine wave, the pitch of which depends on the setting of the FREQUENCY knob (the filter's cut-off point). This resonance-produced sine wave can actually be used for some sounds as an additional sound source if desired.

Amplifier and Filter Envelopes--

In earlier paragraphs, it was determined how the pitch and timbre of a sound is synthesised. This final part of the Synthesis Tutorial describes how the volume of sound is controlled. The volume throughout the duration of a sound created by a musical instrument often varies greatly according to the type of instrument.
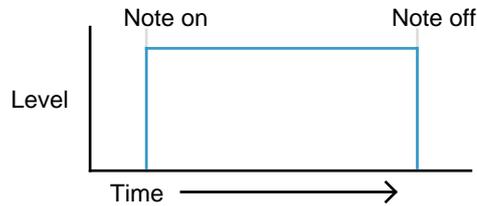
An organ sound (above) quickly attains full volume when a key on the keyboard is pressed. It stays at full volume until the key is released, at which point the volume level falls instantly to zero.
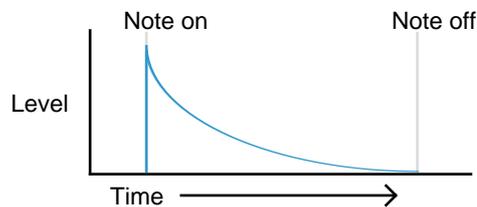
A piano quickly attains full volume when a key is pressed and gradually falls back down to zero after several seconds, even if a key is held.
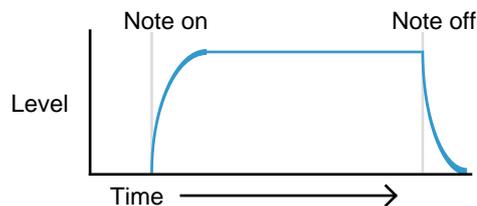
A string section emulation attains full volume gradually (i.e. it swells in gracefully with a slow attack) when a key is pressed. It remains at full volume while the key is held down, but once the key is released, the volume level gradually falls to zero.

On an analogue synthesizer, changes which occur throughout the duration of a note are controlled by a section known as an Envelope Generator.

> Note : On the BassStation, there are no controls in a section on the main panel which deal with the amplifier directly. The only way to hear and control an audio signal passing through the amplifier is to modulate it by using Amp Envelope controls.

The BassStation has two envelope generators - one controls overall amplitude, the other controls the filter (amongst other things).

Each envelope generator has four controls which are used to adjust the shape of the envelope.
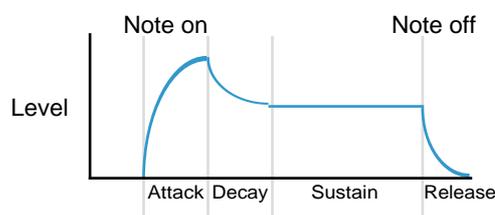
When controlling volume, these controls adjust the following phases of the envelope as shown in the illustration.

Attack time   Adjusts the time it takes when a key is pressed for the envelope to climb from zero to full volume. It can be used to create a sound with a slow fade in.

Decay time   Adjusts the time it takes for the envelope to decay from full volume to the level set by the Sustain control while a key is held down.

Sustain level   Sets the level that the envelope remains at while the key is held down, after the decay time has expired.

Note : It is important to realise that the SUSTAIN parameter is a **level** control, not one that sets time like the other envelope controls.

Release time   Adjusts the time it takes when key is released from the sustain level to zero. It can be used to create sounds that slowly fade away in volume after you have taken your finger(s) off the keyboard.

Low Frequency Oscillator (LFO)---

Like the Envelope Generators, the LFO section on a synthesizer is a 'modulator'. That is to say, instead of forming a part of the sound *generating* process, it is used instead to modify (modulate) other synthesizer sections. For example, altering the oscillator pitch or filter cutoff frequency.

Most musical instruments produce sounds that vary not just in volume but also in pitch and timbre. Sometimes this variation can be quite subtle, but still contributes greatly towards shaping the final sound.

Where an Envelope is used to control a one-off modulation event which occurs during the lifetime of a single note, LFOs modulate by using a cyclic repeating wave pattern. As discussed earlier, oscillators produce a constant waveform which can take the shape of a repeating sine wave, triangle wave etc. LFOs produce waveforms in a similar way, but at a frequency normally too low to produce an audible pitched vibration that the human ear can perceive.

The waveforms generated by the LFOs may be fed to other parts of the synthesizer to create the desired movements in the sound. A typical LFO will generate a variety of different control waveforms. These 'look' exactly the same as those we have seen with the audio oscillators except that, because their function is to modulate or control pitch, tone and amplitude, the effect they have is very different. The usual waveforms are:

WAVEFORM   WAVESHAPE

Triangle wave

The triangle wave will cause pitch to gradually rise and fall in accordance with its shape. The triangle wave is commonly used at a fairly fast speed (around 7Hz or a value of 75 on the BassStations LFO SPEED control) to create vibrato effects.

When applied to the filter cutoff frequency, it will cause the filter to gradually open (get brighter) and close (get softer). When the LFO speed is set quite fast, it can be used to emulate the 'tremolo' effect of instruments such as flute. With extreme settings, it can create distinctive 'bubbly' effects.

Sawtooth wave

The sawtooth wave will cause pitch to rise gradually and then drop suddenly. When applied to the filter, the filter will open gradually then close suddenly. It is often possible to 'invert' this waveshape (i.e. turn it upside down) so that pitch falls gradually then rises abruptly and the filter closes gradually and opens abruptly. Generally speaking, the sawtooth wave (and its inverted variation) is used for special effects.

Random wave

Most synths feature a random wave. When fed to the oscillators, this will cause random, repetitive jumps in pitch and when fed to a filter, will cause random, repetitive changes in tone. Its most clichéd use is for creating computer effects but has many other uses besides.

Another common parameter found on LFOs is a DELAY control. This causes the control waveform to fade in gradually after a note-on is received:
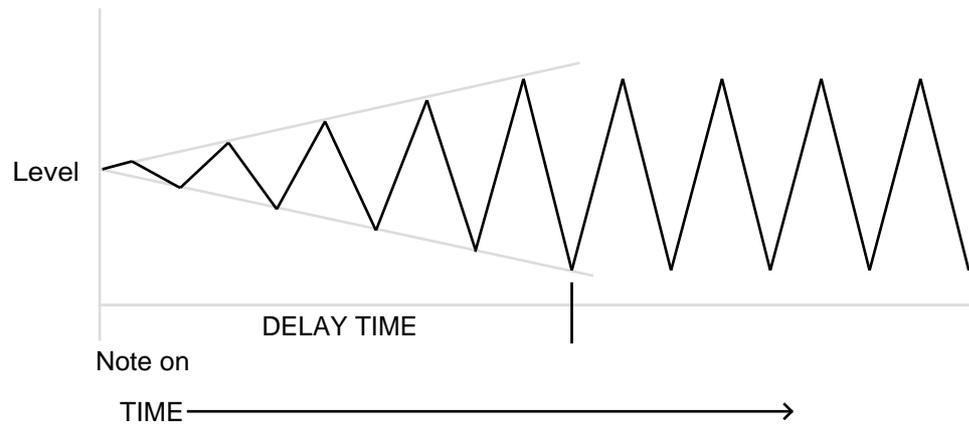
How is this useful? Well, with most instruments, vibrato is not always on - it tends to be gradually introduced during the course of a note. Think of a violinist or an opera singer - they start at a certain pitch and then gradually add vibrato. The LFO DELAY parameter allows us to simulate this (although it must be said that vibrato effects are more naturally controlled with a performance controller such as the modulation wheel).

Memories--

The first generation of synthesizers produced many years ago were large modular instruments where each part of the synthesizer was housed in separate units ('modules'). These modules could only be physically connected together by combinations of cables (known as patch leads or patch cords). A typical sound produced by this method would often involve connecting dozens of patch leads and every time a new sound was required, the leads would have to be physically disconnected and reconnected. The positions and connections of the controls would also have to be noted down on paper if there was to be any hope of creating that particular sound ever again!

However, it was discovered that nine times out of ten, a typical 'patch' (i.e. the collection of modules) followed the same signal path we have seen in this tutorial - i.e. oscillators into mixer into filter into output amplifier with each of these controlled by a few envelopes and LFOs. Thus, manufacturers started making 'hardwired' synthesisers where everything was connected together without the need for patch cords. This made them easier to use, less expensive and also portable. However, it was still not possible to store sounds and control settings had to be noted down in order to re-create any sound. In fact, some synthesists would take Polaroid photos of the panel(s) in an attempt to 'store' a sound's settings!

Around 1977, however, someone had the bright idea of digitizing the front panel controls (i.e. have their position monitored by simple digital circuitry) and use a simple processor to store their positions in battery backed-up memory. As a result, patch memories were born and became a standard feature on all synths and it was possible to recall sounds with a simple press of a button.

Originally, these programmable synths had only a limited number of memories (typically 40 or so) but as processors got better (and cheaper) and memory became cheaper and readily available, manufacturers were able to allow more and more sounds to be stored in memory.

Summary---

An analogue synthesizer can be broken down into five main sound generating or sound modifying (modulating) blocks.

1   Oscillators that generate waveforms at a certain pitches.

2   A Mixer that combines the outputs from the oscillators together.

3   A filter that removes certain harmonics and which changes the tone or timbre of the sound.

4   An amplifier that is controlled by an envelope generator that alters the volume of a sound over time when a note is played.

5   LFOs and envelopes that can be used to modulate and control any of the above.

6   The combination of all the above can be stored in memories for later recall.

Much of the enjoyment to be had with a synthesizer is with experimenting with the factory preset sounds and creating new ones. There is no substitute for 'hands on' experience. Experiments with altering knobs and buttons will eventually lead to a fuller understanding of how the various controls interact and alter and help create new sounds.

Conclusion---

Armed with the knowledge in this chapter, and an understanding of what is actually happening in the machine when tweaks to the knobs and buttons are made, the process of creating new and exciting sounds will become easy.

In the next chapter, we'll see how all this theory relates to the BassStation.

BassStation main panel---

The BassStation's MAIN panel is laid out like a conventional analogue synthesizer:

The design is based on the keyboard version of the BassStation and if you have any experience with that synthesizer, the BassStation will be immediately familiar to you.

The main panel houses all the main parameters associated with the creation and editing of a sound. The sections are logically laid out to be representative of the signal flow (i.e. oscillators into mixer into filter into amplifier). We will look at these in turn during this chapter.

Oscillators---

The oscillators generate pitched waveforms (as described in the Synthesis Tutorial chapter) .

The controls that determine the pitch and waveform of the oscillators and how they react to modulation are in this area.

OSC1 - MIX knob
This allows you to set the balance between the two oscillators. Fully counter-clockwise, you will hear only Oscillator 1. With the control set centrally, you will hear an equal mix of both oscillators and set fully clockwise, you will only hear Oscillator 2.

OSC 1 - WAVE switch
Use this switch to select between sawtooth and square/pulse.

OSC 2 - DETUNE knob
Sets the detune amount in cents for the Oscillator 2. If it is set fully clockwise, the oscillator's pitch will be 96 cents sharper than its basic pitch, fully anticlockwise and it will be 96 cents flat.

Slight detuning between each oscillator will enrich the sound by introducing a beating between the oscillators (in the same way a 12-string guitar sounds richer than a 6-string). Bass and lead sounds can be fattened up using a small amount of detune. Large amounts of detuning will lead to more extreme effects.

OSC 2 - SEMI knob
Raises or lowers the Oscillator 2's pitch in semitone increments up/down by a full octave. By setting the pitch of Oscillator 2 by differing amounts results in some musically pleasing intervals. Settings of 5 (a perfect 4th), 7 (a perfect 5th), 3 (minor 3rd), 4 (major 3rd), 8 (minor 6th) and 9 (major 6th) offer the best results.

OSC2 - RANGE switch
This allows you to set the basic octave for Oscillator 2. The range is referred in 'feet', a convention which comes from the length of organ pipes. An 8" setting is the same as Oscillator1.

OSC 2 - WAVE switch
Use this switch to select between sawtooth and square/pulse.

OSC 1 / 2 MODULATION
This section allows you apply modulation to the two oscillators. The controls are identical for both oscillators. they are:

ENV knob
Sets the amount of pitch sweep from Envelope 2. With the control set at the centre (value = 0), no pitch sweep is applied. Set clockwise, the pitch will rise through the envelope's attack phase and will then fall through the decay/release cycles. When turned counter-clockwise, the effect is inverted (turned upside down)... pitch will fall through the attack and rise through the decay/release).

LFO knob
Sets the amount of pitch sweep by the LFO. With the control set at the centre, no LFO modulation is applied. With the control set clockwise, you will hear 'positive' pitch sweeps. Set counter-clockwise, you will hear 'inverted' pitch sweeps. Consider modulation by the LFO's sawtooth wave:

With the LFO control set clockwise, the pitch will rise slowly and drop suddenly. Set counter-clockwise, the control signal is inverted (turned upside down):
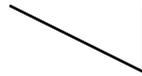
So, the pitch will fall slowly and then rise abruptly.

PULSE W knob
The function of the PULSE W knob is dependent on the selection made with the three position PWM switch to its right. With the MAN setting selected, the position of the PULSE W knob will manually control the pulse width of the square waveform (of course, the selected waveform for the oscillator must be square wave for this to happen).

With the PWM knob in the central position and with the square wave selected, the wave is a perfect square wave and gives the characteristic 'hollow' quality not unlike a clarinet. As the knob is adjusted clockwise or anticlockwise, the pulse width becomes narrower producing what is known as a Pulse Wave.

-63   0   64
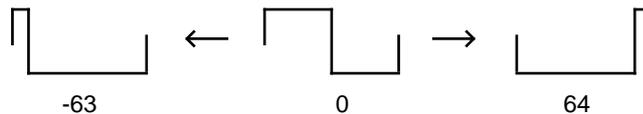
A pulse wave has a different complement of harmonics and sounds thinner and more 'nasal' and more like an oboe.

With LFO selected as the PWM source, the width of the pulse wave is modulated by an additional fixed speed triangle wave LFO dedicated to pulse width modulation (not to be confused with the main variable LFO on the front panel). The intensity of this modulation is determined by the PULSE W knob. With the PULSE W knob at the central position there is no effect. Turning clockwise or anticlockwise introduces the effect. Continuous variations in the width of a pulse waveform constantly changes the harmonic content which is pleasing to the ear, especially at lower pitches where all the associated harmonics fall within the audio range. This creates the classic PWM sound.

When modulated by the ENV2, pulse width is swept by Envelope 2. This is quite effective for creating clavinet and harpsichord sounds as well as dynamic sounds where the harmonic structure is changing throughout the course of a note. The effect is most apparent when using fairly long Attack and Decay times.

Filter--

The BassStation's filter is what is known as a 'Low Pass' type. This type of filter is musically the most useful for the majority of sounds, especially bass sounds at which the BassStation excels.

SLOPE switch

Controls how drastically the frequencies above the cutoff point are removed from the sound.

When the 12dB position is selected, the cutoff slope is gentle so higher harmonics are not attenuated (reduced in volume) as sharply as they are when the 24dB position is selected.
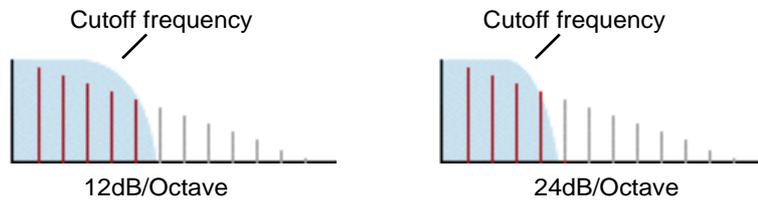
Note : The 12dB filter authentically emulates the Roland TB303 'Bassline' ™ synth. As such, it has a limited frequency response that only extends to around 4.5kHz.

Also, when the 12dB position is selected, there is no keyboard tracking. That is, the cutoff frequency is constant regardless of the pitch of the note. This allows the BassStation to emulate the Roland TB303 'Bassline'™ quite effectively. In the 24dB position, gentle keyboard track is applied.

FREQ knob

This controls the basic cutoff frequency of the filter. Set fully clockwise, the filter is wide open allowing all frequencies (harmonics) produced by the oscillators to pass through.
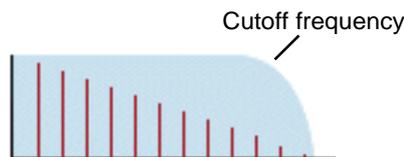
As the knob is turned anticlockwise, the filter closes, cutting out harmonics, starting with the highest, then increasingly lower ones until only the fundamental (or nothing at all is allowed to sound - fully anticlockwise).
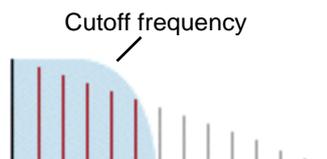
Note : If there is silence when the VOLUME knob is turned up, it is most likely that the filter is fully closed. Turn the FREQ knob clockwise to open the filter.

RES knob

This knob controls the resonance of the filter. The control will boost frequencies at the cutoff frequency.

Cutoff frequency
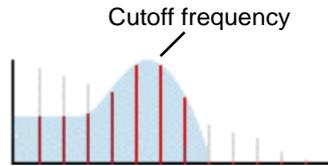
On some synthesizers, this control is known as Emphasis since it will emphasise certain frequencies. At the zero position (i.e. fully counter-clockwise) there is no effect. Turning clockwise slowly introduces the emphasis.

Set fully clockwise, the filter will begin to self-oscillate, producing a new pitched element (similar to feedback on an electric guitar).

Note : At least a small signal must be fed into the filter in order for the resonance to take effect. It is not possible for the filter to self - oscillate if no signal at all is fed into it.

If the BassStation produces a high pitched whistling sound, it is probably due to this knob is being adjusted too far clockwise. If this self-oscillating effect is not desired, keep the resonance control away from the extreme clockwise setting. Increasing the resonance is very good for bringing out modulation (movement or change) in the filter cutoff frequency, such as in Acid bass lines and other very edgy sounds.

LFO knob

Controls the amount of change to the filter cutoff (set by the FREQUENCY knob) by the LFO. In its central position there is no change to the filter cutoff frequency.

Adjusting the knob clockwise from centre will introduce an increasing amount of positive modulation - i.e. the filter will open and close at a rate set by the LFO's SPEED control.

Adjusting the knob anticlockwise from centre will introduce an increasing amount of negative modulation - i.e. the filter will close and open at a rate set by the LFO's SPEED control.

ENV 2 knob

Controls the amount of change to the filter cutoff (set by the FREQ knob) by ENVELOPE 2.

In its central position there is no change to the filter cutoff frequency.

In the 24dB/octave setting, adjusting the knob clockwise from centre will introduce an increasing amount of positive modulation - the cutoff will rise through the filter envelope's attack and will fall through Envelope 2's subsequent decay and release stages. Adjusting the knob anticlockwise from centre will introduce an increasing amount of negative modulation and Envelope 2's effect will appear to be 'upside down' (i.e. the attack stage of the Envelope 2 will force the cutoff frequency down and the decay/release stage will cause the cutoff to rise or 'open').

However, in the 12dB/Octave setting, the ENV control only has a positive effect. In other words, with ENV set fully counter-clockwise, there is slight envelope modulation and when set fully clockwise, there is full envelope modulation.

Amplifier and Filter Envelopes--

The BassStation's envelopes are used to shape a sound throughout its duration. ENVELOPE 1 determines the volume of the sound with respect to its duration.

ENVELOPE 2 can be used to control other sound elements of the synthesizer throughout the duration of the sound. It can control oscillator pulse width, filter frequency and oscillator pitch.

Using the controls associated with the two envelopes, you can 'shape' the sound:
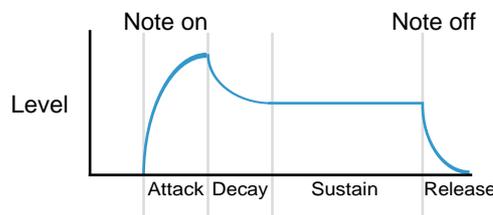
ATTACK knob

Sets how quickly the envelope rises to its maximum level when a note is struck. Fully anticlockwise and this rise time or slope is very fast increasing exponentially to twenty seconds when fully clockwise. To shorten attack times, turn this control towards zero and to lengthen attack times, turn this control towards maximum.

> Note : When the attack time is set to zero, the instantaneous rise time of the Envelope may produce audible 'clicks'. This is not a faulty condition and may be useful for the creation of certain sounds (for example, 'key clicks' on organ simulations). If this is undesirable, increase the Attack time until the clicks are inaudible.

DECAY knob

Sets how quickly the envelope falls to a sustain level after the maximum level has been reached. Set to zero, this time is very fast increasing exponentially to twenty seconds when set to maximum. To shorten decay times, move this control towards zero and to lengthen decay times move this control towards maximum.

SUSTAIN knob

Sets the level at which the envelope remains following the Decay phase, only while a key is being held on a controller keyboard (or there is a MIDI Note On command present). When set to zero, the envelope will decay to zero without being interrupted. As the control is moved towards maximum, the sustain level increases until, when at maximum, the sustain level is at its maximum level.

> Note: When SUSTAIN level is set to maximum, the DECAY control has no effect - with sustain at full, there's nothing to decay down to!

RELEASE knob

Sets how quickly the envelope falls from the sustain level to zero once the note has been released. When set to zero, this time is very fast (instantaneous to the ear) increasing exponentially to twenty seconds when set to maximum. To shorten release times, move this control towards zero and to lengthen release times, move this control towards maximum.

VEL knob
Sets the envelope's response to velocity. On Envelope 1, this affects how much amplitude will be affected by your playing technique and on Envelope 2, it will affect the amount of filter sweep by Envelope 2 but also anywhere else Envelope 2 is being used (i.e. oscillator pitch and/or pulsewidth).

When set fully counter-clockwise, the BassStation's velocity sensitivity is effectively disabled and it doesn't matter how hard you hit your keyboard, each note will be the same. Set fully clockwise, velocity sensitivity is at maximum - soft keystrokes will open the envelope less and hard keystrokes will open the envelope fully.

TRIG switch
This allows you to set various triggering options for the BassStation. The options are SINGLE, MULTI and AUTO.

Different monophonic synths over the years have used different triggering systems. Moog™ (and other) synths used single triggering. With this, the attack/decay of the envelopes is triggered with the first note but, if that first note is held and another note is played, the attack/decay is not re-triggered and only the pitch changes through the envelopes' sustain phase:
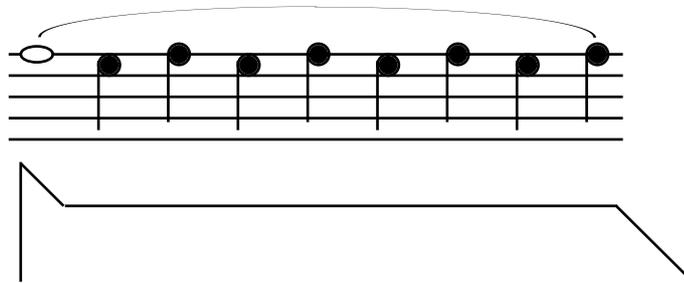
This triggering technique is actually closer to the way 'real' monophonic instruments are played. Consider the flute: the flautist doesn't (usually) re-blow for every single note - he/she blows the first note but then simply continues blowing as new notes are played. So, the first note has a distinct attack but the rest don't. Similarly other woodwind players, trumpeters, violinists and so on. The result is a more 'fluid' performance.

Of course, if every note *is* individually articulated, the attack/decay will be triggered for each note:
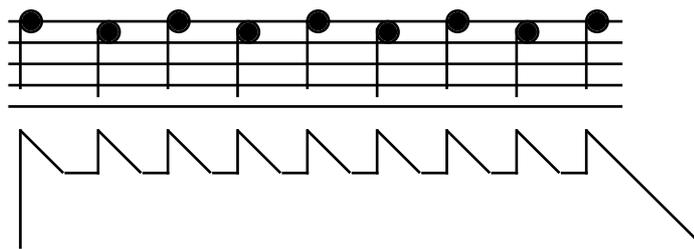
Other synths (ARP™ and others) used multiple triggering. With this, the attack/decay of the envelopes is triggered every note regardless:
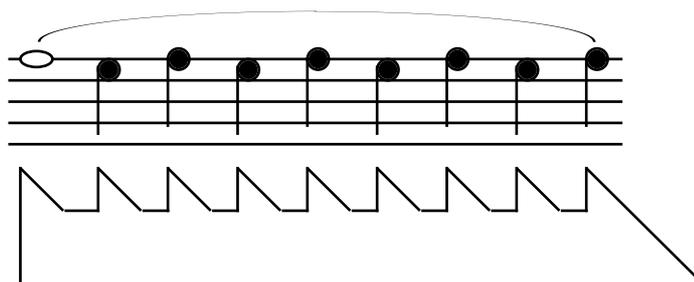
This option is useful if it is important that every note has a clear and distinct envelope articulation.

The BassStation allows you to choose either SINGLE or MULTI and you can decide which trigger method is best for the sound you are working with.

The BassStation also offers another triggering option - AUTO. With this selected, triggering is of the single triggering type but, if a note is played and held and another note is played, the pitch will slide up or down to the new note (at a rate determined by the PORTA control... see later).
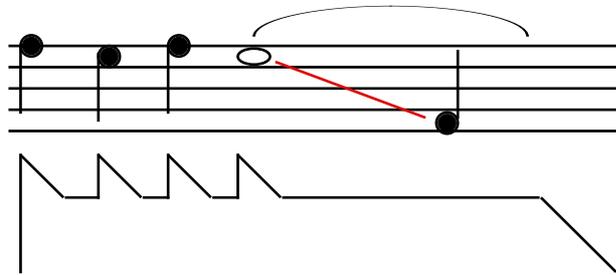
This is very useful for certain instrument emulations (fretless bass for example) but also for emulating the 'Slide' effect of Roland's TB303 'Bassline'™ synthesizer.

Low Frequency Oscillator (LFO)--

The BassStation's LFO produces regular electronic variations which are too low to be heard but can be used to modify or control various elements of the sound such as pitch (vibrato), pulse width or filter cutoff.

SPEED knob

Controls the speed of the low frequency oscillations. An LED below the knob indicates the speed. Faster speeds are set by turning the knob clockwise. These are suitable for vibrato and tremolo effects. Slower speeds are more appropriate for Pulse Width changes, slow filter sweeps or special effects.

DELAY knob

Controls how long after the note is struck the selected LFO begins to take effect. Fully anticlockwise and the selected LFO effect will begin immediately. Turning clockwise will cause the LFO effect to fade in. The time of the fade in is dependent on the knob position. This is used for delayed vibrato and other effects.

SHAPE switch

Selects the LFO's waveform shape.

RDN   Random. At a regular interval (governed by the SPEED knob), the level of the LFO jumps to a new random level and stays there until the next jump. This creates a rhythmic effect particularly if routed to the filter cutoff. Routing this to pitch gives a less musical result, but is useful for computer or machinery sound effects.

TRI   The triangle waveform gives the smoothest continuous change in level to the LFO. When routed to pitch, it introduces vibrato or a siren effect dependent of its speed setting. When routed to filter cutoff, a 'wow wow' effect results.

SAW   The sawtooth waveform generates a rising level which then jumps back up to zero level. Routed to the filter cutoff, it produces a rhythmic pulse effect. Routing it to pitch produces siren type sounds.

SYNC

The SYNC menu allows you synchronise the speed of the LFO to the sequencer's MIDI clock at a variety of sync rate intervals:

Menu Item	MIDI Clocks	Synchronised to	Menu Item	MIDI Clocks	Synchronised to
OFF	–	Manual rate	8th D	18	8th Dotted
32nd T	2	32nd Triplet	4th	24	4th
32nd	3	32nd	2nd T	32	2nd Triplet
16th T	4	16th Triplet	4th D	36	4th Dotted
16th	6	16th	2nd	48	2nd
8th T	8	8th Triplet	1bar T	64	1 Bar Triplet
16th D	9	16th Dotted	2nd D	72	2nd Dotted
8th	12	8th	1bar	96	1 Bar
4th T	16	4th Triplet			

When the SYNC menu is set to OFF, the speed of the LFO is controlled by the LFO's SPEED control and is totally free running independent of the sequencer's tempo.

However, when set to any of the SYNC divisions, the LFO will run at a rate determined by the sync division. For example, if the sync division is set to 16th, the LFO will output its control waveform at 16 cycles per bar (i.e. one cycle for every 16th note). If set to 1 BAR, there will be one LFO cycle per bar.

When sync'd to MIDI clock, the LFO's SPEED control is greyed out to show that it has no function:

Note : Many sequencers do not transmit MIDI Clock messages at all when they are stopped and so, when playing the BassStation when the sequencer is idle, if you play the BassStation, the LFO will have no effect.

Master section--

Although not labeled as such, this section on the far left of the panel houses certain 'master' controls that affect the BassStation overall.

VOLUME knob
This control adjusts the overall output volume on the main master audio outputs. This control can be useful for preventing distortion on your sequencer's mixer.

PORTA knob
Portamento (sometimes known as GLIDE) is an effect where notes will slide smoothly from one pitch to the next. Normally, when you play, notes change pitch instantly as you would expect. However, with portamento applied, the notes will slide from one to another at a rate determined by the PORTA control. This can be useful for simulating certain instruments such as fretless bass, trombone, etc., but is also a rich source of synth sounds and effects not least of which, of course, is an emulation of the famous Theremin.

With this control set to zero, when the keyboard is played, the pitches of notes change instantly from one pitch to another. Turning the portamento TIME control clockwise will increase the time taken for the pitch of the one note to reach the next note played.

Note : When AUTO is selected in the envelopes TRIG switch, this control sets the glide time when mono legato playing techniques are used.

TUNE knob
This tunes the BassStation +/-50 cents (+/- half a semitone) and can be used to bring the BassStation in tune with other instruments.

SYNC switch
This switches oscillator sync on between the two oscillators. With this enabled, a wider range of waveforms and sounds can be created not least of which is the distinctive 'tearing' sync sweep effect.

CREATING THE CLASSIC SYNC SWEEP EFECT.....

1   Switch OSC SYNC on
2   Set the RANGE of OSC2 to 4' or 2' (set SEMI as required)
3   Select the SQUARE wave on both oscillators
4   Set the MIX control fully clockwise
5   Turn ENV in the OSC2 MODULATION section to a positive (i.e. clockwise) position
     (make sure there is no modulation for OSC1)
6   Set ENV2 attack to 0, decay to 5, sustain to 0 and release to 0
7   Set FILTER FREQ to maximum (resonance to zero)

Play a note.

You should hear the distinctive 'tearing' sync sweep sound that is not unlike a thick flanging effect. Try experimenting with the following controls to alter the sound:

ENV2 DECAY / MIX / OSC2 ENV mod / OSC2 SEMI

Controller Section---

The controller section to the left of the keyboard contains a 'virtual' LCD, pitchbend and mod wheels and program and octave UP/DOWN keys.

LCD
This allows you to see the selected program name and its number.

However, when you move the cursor over any knobs and switches, after a short delay, the parameter name and its value is shown on the LCD:
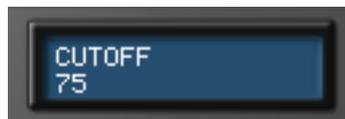
In this way, you can get a rough idea of control settings from looking at the knobs whilst the LCD shows the control's values as your mouse 'hovers' over the control. However, if you adjust the control, the value updates in the LCD allowing you to set precise values.

The LCD also shows other functions and sometimes prompts and other information under other circumstances. These are described and shown in the relevant sections of this manual.

PITCH CONTROLLER wheels
These replicate the pitchbend and mod wheels (or equivalent) controllers on your keyboard. However, it is possible to adjust them with your computer's mouse if you want. Please note, however, that any settings you might make with your mouse are overridden when your keyboard's actual pitchbend / modwheel (or equivalent) controllers are adjusted. The pitchbend and mod wheel graphics on the BassStation update in real-time as you manipulate your external keyboard's physical controllers[2].

PROGRAM UP / DOWN leys
These allow you to select programs sequentially, 'nudging' through them one by one. When you first try out your new purchase, this is a good way to familarise yourself with the sounds on offer.

NOTE : It is also possible to select sounds more directly using your computer keyboard's numeric keypad (more on this later in the section that describes the SETUP panel). You can also select programs remotely from an external keyboard using MIDI program change.

OCTAVE UP / DOWN keys
By clicking on these keys, you can transpose the whole sound up and down in octave increments.

---

2   Depending on the speed of your computer's CPU, there may be a lag (delay) between the actual movement of your external keyboard's controller and the BassStation's graphic's updating.

Program management--

Three buttons above the keyboard allow you to deal with saving programs. These are:

WRITE button

Allows you to write any sounds you edit or create to the BassStation's memory. Clicking on this will put a prompt in the LCD:

If you want to over-write the existing sound, simply click on CONFIRM - the sound will be written to the current location.

> Note : The destination memory is always initially set to the currently selected program's number.

If you want to save the sound in a different location (thereby retaining the original sound in its original location), using the PROGRAM up/down buttons, select the destination memory and click on CONFIRM.

To cancel the WRITE operation, simply click on WRITE again.

> Notes about editing programs
>
> When you select a sound, you can start editing it immediately simply by tweaking the controls and no special 'edit' mode is required. However, please note that if you do edit a sound, should you then select another, by default, the edits you made to the previous sound will be lost. However, it is possible to overcome this: In the SETUP page, there is a preference - AUTO WRITE - which, when enabled, will automatically write programs to memory if another program is selected. By default, this is off.
>
> With AUTO-WRITE enabled, selecting another sound will automatically write your edited version before the next sound is selected.

CONFIRM button

As described above, the CONFIRM button is used to confirm the act of writing a program to memory.

COMPARE button

Clicking *and holding* this button when editing a sound allows you to compare the original with your edited version.

MIDI Reception---

The BassStation has an indicator that shows incoming MIDI data. This flashes whenever a MIDI event is received.

If this LED does not flash when a note is played, there is a problem with MIDI reception.

The BassStation Keyboard---

The BassStation has its own 4-octave keyboard allowing it to be played without necessarily needing an external MIDI keyboard connected to your Mac/PC.

However, this keyboard is actually velocity sensitive!

By clicking on different areas of the keyboard, you can play a sound with differing velocity levels. Clicking on the front of the note (i.e. the bottom of the keyboard graphic), high velocity will be used; by clicking on towards the back of a note (i.e. towards the top of the keyboard graphic), low velocity will be used.
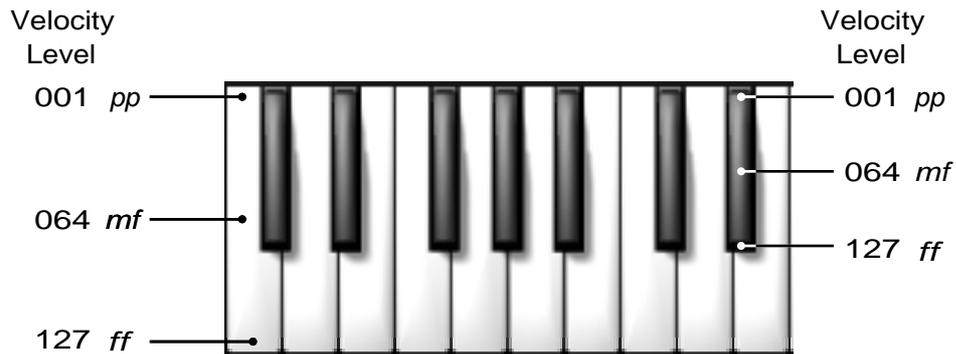
This is useful for checking (and / or creating / editing) sounds that use velocity when an external keyboard is not available for whatever reason.

The keyboard also has other unique 'performance' features.

If you press your computer keyboard's SHIFT key while holding down a note on the keyboard, moving your mouse left to right does pitch bend and moving it up/down does mod wheel. In this way, you can use your mouse as a kind of joystick for pitchbend and modulation.

Also, on the PC version only, holding down the CTRL key allows the first held note to remain down. This is very useful in many situations, For example, click on a note, press CTRL and now you're free to use the mouse to edit the panels. Another use might be click on a note and press CTRL - you can now click on another note to check, for example, portamento. No doubt you'll find your own uses for these unique features.

Conclusion---

That concludes our examination of the main panel. Armed with the knowledge you have (hopefully!) gained here and the Synthesis Tutorial, you should now be able to make meaningful edits to any of the preset sounds on offer (or even create your own sounds from scratch).

In the next section, we'll look at some of the lesser-used (but no less important) functions of the BassStation.

Setup Panel--

Pressing the SETUP button will show this panel:

Just over half the panel changes to show not only some lesser used sound creation parameters but some options and preferences that affect overall operation of the BassStation. It's in the SETUP pages as well where you can restore the factory presets and import / export sounds from / to either a keyboard BassStation or a BassStation Rack module.

These are described over the next few pages.

Modwheel / Pitch bend--

The FILTER control determines how much the mod wheel will open and close the filter's cutoff frequency.

The PITCH control determines how much the mod wheel will control the depth of LFO modulation (vibrato) to the two oscillators.

The PITCH BEND - RANGE control sets the range of pitch bend from the pitch bend wheel. The range is stepped in semi-tone increments (i.e. a value of '2' is equal to two semitones, hence 1 tone of pitchbend). The maximum range is 12 semitones (1 octave).

Aftertouch--

These controls allow you to set how much aftertouch will affect volume, filter cutoff and LFO modulation.

The ENV control determines how much aftertouch will affect overall volume.

The FILTER control determines how much aftertouch will open and close the filter's cutoff frequency.

The PITCH control determines how much aftertouch will control LFO modulation (vibrato).

Breath--

Much the same as the AFTERTOUCH controls described on the previous page, these controls determine how much breath control will affect volume, tone and LFO modulation.

The ENV control determines how much breath control will affect overall volume.

The FILTER control determines how much breath control will open and close the filter's cutoff frequency.

The PITCH control determines how much breath control will control LFO modulation (vibrato).

Note : The controls described above are stored as part of any sound that you edit/create and their settings are written to memory when the sound is saved.

Preferences--

The PREFERENCES switches allow you to set certain options that affect the way you work with the BassStation. They are:

POT CTRL switch
You can choose between two different types of controlling the knobs on the BassStation's panels. With LINEAR selected, moving the mouse vertically up or down will cause the knob to rotate. When ROTARY is selected, you should move the mouse round in a circle to rotate the knob.

AUTO WRITE switch
This option allows you to select whether loading external sounds into the BassStation will just be stored in memory or actually written to the BassStation's memory permanently.

When using your host sequencer's LOAD PRESET function (or BANK or SETTING or whatever the terminology is that is used by your sequencer), depending on the host, these will only be loaded into the BassStation's 'local' memory - to store them permanently, they need to be written to the BassStation's memory. This can be done manually, of course, but this preference allows you to set the BassStation so that whenever a preset/setting/whatever is loaded, it will automatically be written to the BassStation's memory.

You should consult your sequencer's documentation for details about loading presets/banks.

Another use for this is for automatically writing sounds to memory when you have edited a sound. Normally (i.e. AUTO WRITE : OFF), when you edit a sound, should you then select a different sound, unless you have specifically written the edited version to the BassStation's memory, your edits will be lost. With this preference enabled, should you select another sound when editing, the edited version will automatically be written before the new sound is selected.

This sounds ideal - when you select a new sound, any edits you might have made to the previous sound won't be lost forever. Except.....

You might have edited a sound but made a right hash of it and it sounds worse than the original you started off with. So you select another sound - with AUTO-WRITE enabled, your abortive edit will be written to memory thus overwriting the original sound!

So whilst it's very useful to be able to auto-save your edits, you can cause problems for yourself if you're not careful.

NUMPAD switch
This preference allows you to enable program selection using your computer keyboard's numeric keypad. With this enabled, programs can be selected by typing in a two digit number (00 - 99).

> Note : Some sequencers use the numeric keypad for play, stop, locating and other functions.
>
> Some sequencers allow you to re-assign these so that you can use the keypad for other purposes. Others, however, do not. If your sequencer doesn't allow you to re-assign the numeric keypad, you won't be able to select programs numerically from your keypad. You should switch NUMPAD off.

Memory---

With these buttons, you can perform certain memory management functions.

RESTORE
The RESTORE button allows you to restore the factory sounds originally supplied with the BassStation. To restore the factory sounds, simply click on RESTORE - you will receive a prompt asking if you want to restore just the currently selected program or all programs. Select as appropriate. You will receive a further prompt asking "Are you sure?" - click on CANCEL or OK as appropriate.

Note : The RESTORE process will completely replace the sounds you have in your BassStation and there is no 'undo' function - please proceed with caution if you have created and stored any of your own sounds as they will be lost if you proceed with the RESTORE function.

IMPORT / EXPORT
The BassStation allows you to import sounds from a keyboard or rack BassStation and export a MIDI file that can be used to dump your BassStation sounds into a keyboard or rack BassStation. The EXPORT function also allows you to back up your BassStation's internal sounds and/or build up your own personal library of BassStation sounds.

To export, click on EXPORT. You will receive a prompt where you can name the file and also select whether the file is compatible with the BassStation keyboard or the BassStation Rack. You can also navigate to where you want the file to be saved:
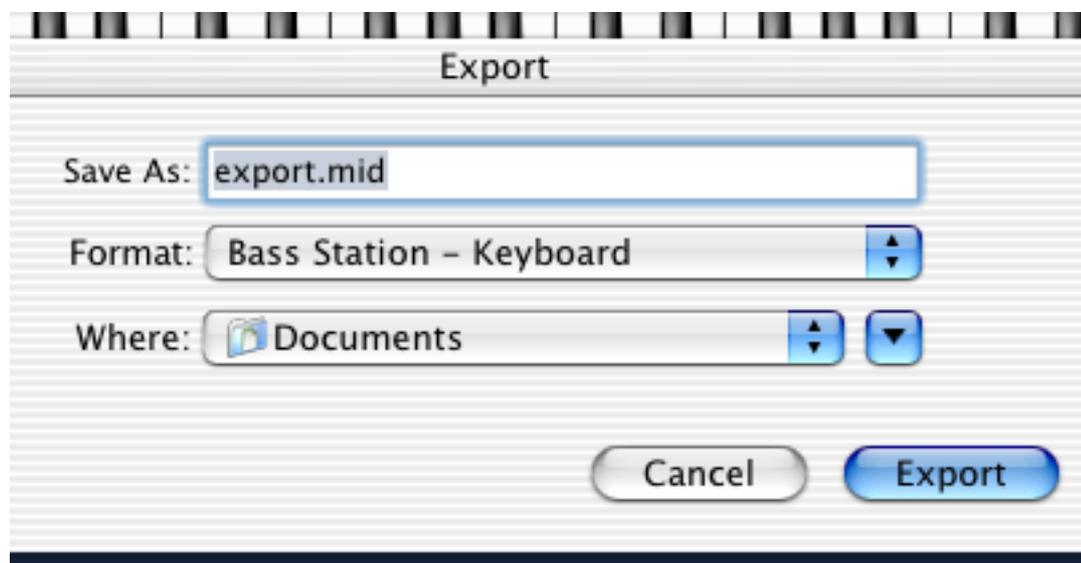
Select as appropriate and click on EXPORT. At the end of the process, you should have something like 'export.mid' or 'moodbass.mid' (or whatever) saved on your hard drive.

Repeat the process for the other programs.

To import a sound into the BassStation plug-in, first select the destination program you want to overwrite on the BassStation plug-in. Now click on IMPORT. This will pop-up a typical navigation window. Select the file you want to import and click on IMPORT. After a short while, the BassStation plug-in's 'virtual' LCD will inform you that the import completed successfully.

Please consult your hardware BassStation's manual for details on importing sounds.

Factory programs list--

Prog No.	Name	Prog No.	Name
0	Moog Bass	50	Single Osc Lead
1	Wow 1 Bass	51	Sync Up Lead
2	Jacko Bass	52	DnB Bass
3	Soft Bass	53	Porta Bass
4	Electric Bass	54	Sync Down Lead
5	Birdland Bass	55	Q Lead
6	Percussive Bass	56	Biaow Bass
7	Eow Bass	57	Interval Lead
8	Power Bass	58	Do Stay Lead
9	Freakpower Bass	59	Organic Lead
10	TB303 Autoglide Bass	60	Velo Bend Bass
11	Spit Sine Bass	61	Brassic Lead
12	TB303 Eow Bass	62	Log Bass
13	TB303 Square Bass	63	Popsicle Bass
14	Thud Bass	64	Ripping Lead
15	Ambient Bass	65	Gulp Bass
16	Trance 1	66	70s Funk Lead
17	Trance 2	67	Porta Lead1
18	Spit	68	Techno Bass
19	Rainman	69	Detuned Bass
20	Yazoo Lead	70	Click Sync Lead
21	Organ Bass	71	Squarobilly Lead
22	Clavy Lead	72	LFO Swept Bass
23	Puck Lead	73	Square Bass
24	Lfo Filter Fade Bass	74	Release Lead
25	Square Bass	75	Thin Pulse Bass
26	Wow 2 Bass	76	Knuckles Lead
27	Woweo Bass	77	Noughty Lead
28	hard Sync Lead	78	Sub Bass
29	Square Porta Lead	79	Takebreath Bass
30	Sync 0 Lead	80	Stairway Bass
31	Sync 1 Lead	81	Dr Who is it?
32	PT Power Lead	82	Cheapkey Bass
33	Love Don't'd Lead	83	Get Serious Bass
34	Duck Lead	84	Epic Bass Bass
35	Clav Lead	85	WowTalk Bass
36	Whistle Lead	86	Springit Bass
37	Yaz 2 Lead	87	Sussit Bass
38	Sync 3 Lead	88	Dirtysink Lead
39	Resonant Lead	89	Retro Bass
40	Early Bass	90	Weeow LeadBass
41	Fuzz Bass	91	Broken Race Car
42	Ripe Bass	92	Spinning Drunk
43	Aftertouch Lead	93	Simple Pulse
44	92 Lead	94	Inside Robot
45	Tinky Lead	95	Porta Lead2
46	Subtle Bass	96	Sweet Lead
47	Click Lead	97	Bounce Bass
48	Blitz Kid Lead	98	Bootit Bass
49	70s Funk Bass	99	Use it up Bass

All the factory programs can be overwritten with your own creations. If you need to get the original's back, use the RESTORE function described on the previous page (be sure to back your own sounds up first though!).

MIDI Controller Mapping--

CONTROLLER #	FUNCTION
1	Modwheel
2	Breath
5	Portamento
7	Master Volume
16	LFO speed
17	LFO delay
18	LFO sync rate
20	OSC1 env mod depth
21	OSC1 lfo mod depth
22	OSC1 PWM mod depth
23	OSC2 semitone tune
24	OSC2 fine tune
25	OSC2 env mod depth
26	OSC2 lfo mod depth
27	OSC2 PWM mod depth
28	OSC1/2 mixer level
35	Filter LFO mod depth
64	Sustain pedal
105	Filter cutoff frequency
106	Filter resonance
107	Filter env mod depth
108	Amp env attack
109	Amp env decay
110	Amp env sustain
111	Amp env release
112	Amp env velocity mod
114	Mod env attack
115	Mod env decay
116	Mod env sustain
117	Mod env release
118	Mod env velocity mod