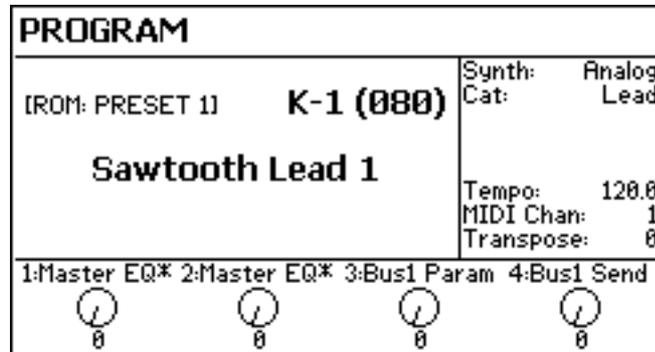


How to edit a VA synth program

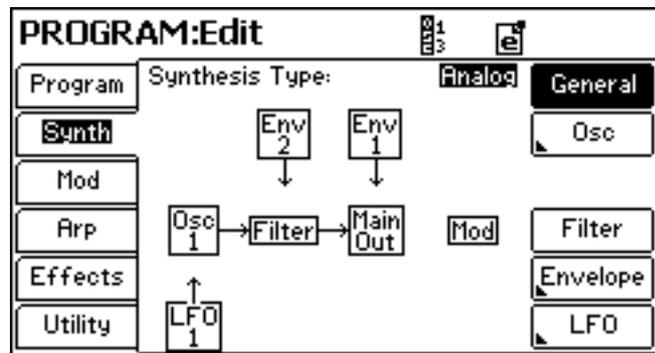
To edit a VA synth (analog) program, select one as appropriate in the usual way using the data wheel, the INC/DEC keys or a combination of the BANK keys and the A-P/1-8 keys.

For example, [ROM preset 1] K-1:



There are other examples in the ROM presets to choose from as the basis for your edit. Whichever you choose, press the EDIT key located around the data wheel.

To edit the synthesiser parameters, press the SYNTH soft key (highlighted on the left of the LCD in the screen shot shown below). You will see this screen:



You can now choose to edit the oscillator(s), filter, envelopes and LFO(s) using the soft keys down the right hand side of the LCD.

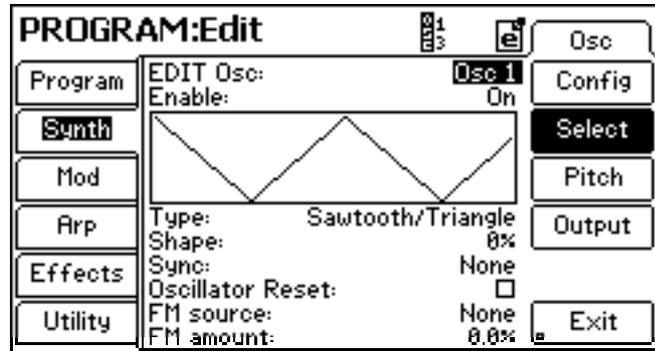
Other aspects of the program can be selected using the soft keys down the left of the LCD.

This 'How To' tutorial follows a sequential approach - i.e. oscillators then filters then envelopes then LFOs, mod matrix, effects. You can use the bookmarks in this PDF to skip directly to the section you want.

For detailed information about the principles employed in Fusion's VA synth, please refer to the in-depth analog synthesis tutorial that is also available for download hereabouts

How to change waveforms

To change the basic waveform, press OSC and, if necessary, SELECT:



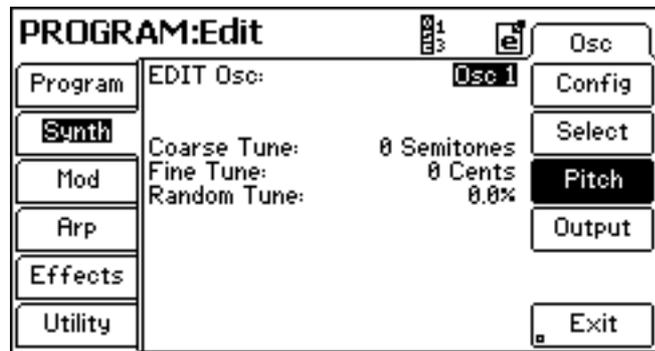
You can select the oscillator (up to three) in the EDIT OSC field (highlighted in the above screen shot).

To change the waveform, move the cursor to the TYPE field (below the waveform display) using the NEXT (or PREV) key by the data wheel and select from SAWTOOTH/TRIANGLE, PULSE/SQUARE, SINE and three types of noise. You can also select EXT IN for processing external audio inputs through Fusion's powerful synth engine.

Select other oscillators (they need to be switched on of course) and select the waveforms as required.

How to change oscillator pitch

Press PITCH. You will see this:



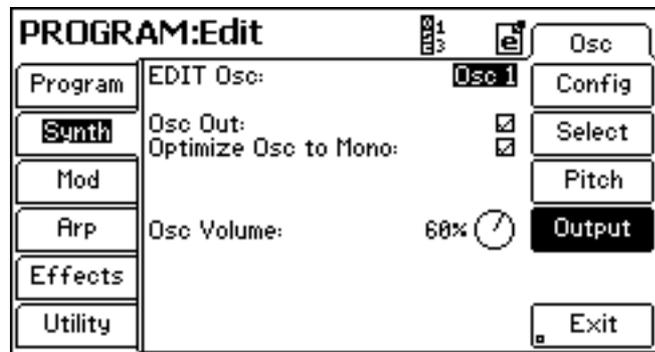
You can tune the oscillators in semitones or you can fine tune (detune) the oscillators against each other for a richer, more chorused/ensemble sound.

RANDOM TUNE makes each note you play have a slightly different tuning (like old analogue synths that had poor tuning stability!) and the degree of this is set using the percentage value.

At any time, press EXIT or SYNTH to return to the main menu.

How to balance / mix the oscillators

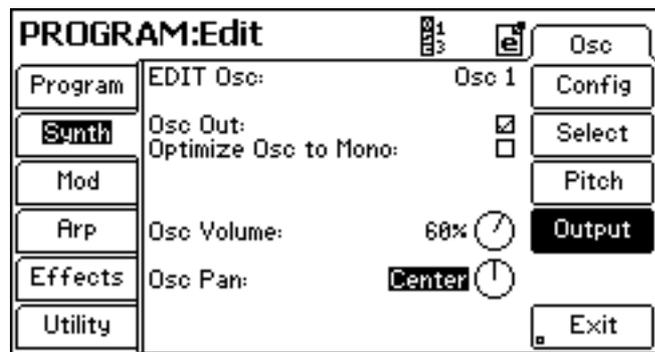
Press OUTPUT to see this screen:



Move the cursor to the OSC VOLUME field using the NEXT (or PREV) key by the data wheel and use the data wheel to set a value as appropriate.

Select the oscillator you wish to adjust using the EDIT OSC field (highlighted in the above screen shot)

When OPTIMIZE TO MONO is unchecked, an extra PAN parameter is shown:

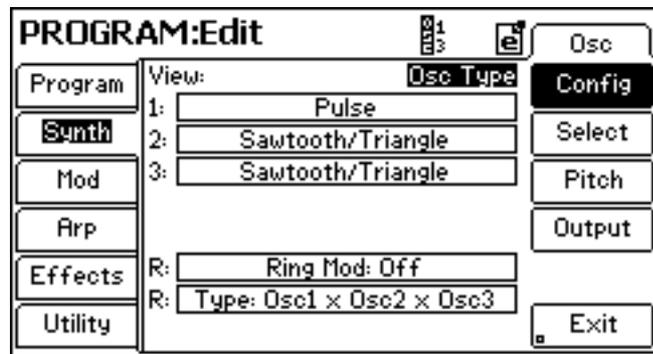


This allows to 'spread' the three oscillators across the stereo image for a wider sound (useful for ensemble sounds such as strings, pads, etc.).

At any time, press EXIT or SYNTH to return to the main menu.

How to quickly configure the VA synth's oscillators

A quick way of mixing, tuning, selecting waveforms, etc., can be done in the CONFIG page:



Using the VIEW parameter (top right and highlighted in the above screen shot) you can select:

- OSC ENABLE (i.e. oscillator on/off)
- OSC TYPE (shown - selects the waveform)
- OSC COARSE TUNE
- OSC FINE TUNE
- OSC RANDOM TUNE
- OSC VOLUME
- OSC PAN

Use the NEXT/PREV keys to navigate to the 1, 2 and 3 fields below and use the data wheel to change the selected value.

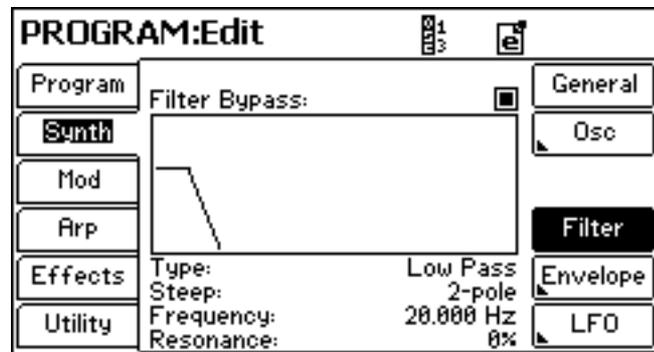
This page is useful as you can perform these functions relative to each oscillator without extensive page swapping.

Down the bottom of the page, you can see the VA synth's Ring Modulator which can be switched on or off and the source for it selected (OSC1 x OSC2, OSC2 x OSC3, OSC1 x OSC3 or OSC1 x OSC2 x OSC3),

At any time, press EXIT or SYNTH to return to the main menu.

How to change the filter

Press FILTER. You will see this page:



The filter can be totally bypassed if you want (sometimes useful!) but moving the cursor to TYPE allows you to select from a wide variety of different filter types:

LOW PASS
 HIGH PASS
 BAND PASS
 BAND STOP
 BAND BOOST
 RP LOWPASS (a modelled filter based on a famous '2600' synth classic)
 VOCAL FORMANT 1, 2 and 3

The STEEP parameter allows you to set 'slope' of the selected filter type. The steeper the slope, the more dramatic the filter effect (2- or 4-pole are the most commonly used filter types).

NOTE: On some of the filter types, this parameter is unavailable.

FREQUENCY sets the selected filter's cutoff frequency. You will see that the graphic updates as this parameter is altered. This is the most obvious control to head for as it has the most dramatic effect.

NOTE: You can also - and more easily - affect filter cutoff using the matrix of real-time controls on the front panel. Select the FILTER row and use Knob 1 to adjust filter cutoff in real-time.

RESONANCE emphasises the area around the cutoff frequency and your filter 'wow' effect will take on more of a 'weeeow' characteristic.

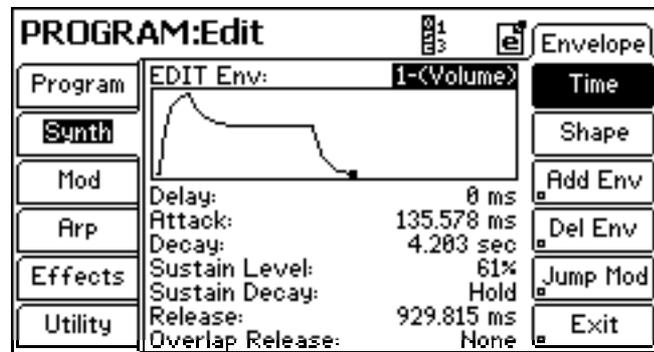
NOTE: You can also - and more easily - affect filter resonance using the matrix of real-time controls on the front panel. Select the FILTER row and use Knob 2 to adjust filter resonance in real-time.

Fusion's filter is the key to many of the analogue sounds created in the VA synth. There are no rules to its usage - be prepared to experiment!

At any time, press EXIT or SYNTH to return to the main menu.

How to change the envelope(s)

To access Fusion's envelope generators, press ENVELOPE. You will see this screen:



Here you can set the usual attack, decay, sustain and release parameters. By default, Env 1 and 2 are always present when a new program is created - Env 1 controls amplitude and Env 2 controls the filter although a Fusion VA synth program can actually contain up to eight envelopes. The envelope to be edited can be selected using the EDIT Env parameter (highlighted in the above screen shot).

Move the cursor to the appropriate fields to set attack, decay, sustain and release. The times are shown in seconds and levels shown in percentage.

All envelopes are identical.

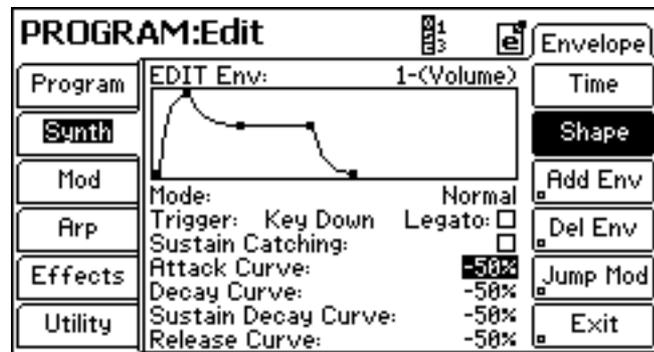
Extra envelopes can be added by pressing ADD ENV and these can be assigned to almost anything you want in the MOD matrix (more later). Unused or unwanted envelopes can also be deleted using DEL ENV.

Because the envelopes are routed to other modules by way of the MOD matrix, JUMP MOD takes you directly to the selected envelope's connection in the matrix where you can set modulation levels, etc., (and in the MOD matrix page, you can jump back to the selected envelope).

At any time, press EXIT or SYNTH to return to the main menu.

Changing the envelope 'curves'

Pressing SHAPE shows this screen:



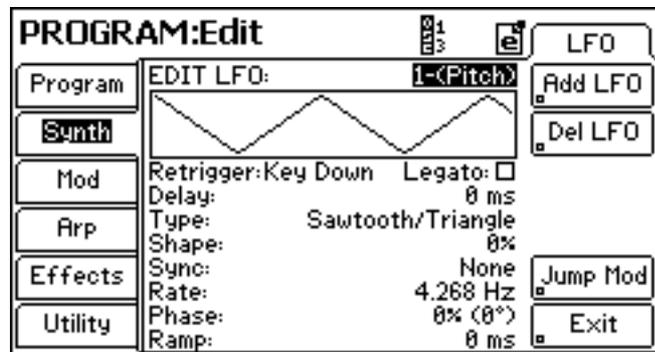
Such is the degree of control offered by Fusion, you can set the curve or 'shape' of the individual stages of each envelope generator. This allows precise control over a sound's articulation.

The graphic shows you the curve as the parameters are changed.

At any time, press EXIT or SYNTH to return to the main menu.

How to change the LFO(s)

Pressing LFO will show this page:



A Fusion VA synth program can contain up to six separate LFOs (although the norm is usually one or two - one for vibrato and maybe another for, say, filter sweep). The LFO you want to edit can be selected in the EDIT LFO field (shown highlighted in the above screen shot).

The most obvious parameters to change are TYPE (i.e. the LFO's waveform) and/or RATE.

NOTE 1: In the case of the TYPE parameter, you can also use the SHAPE parameter below it to change the 'shape' of the waveform. When SAWTOOTH/TRIANGLE is selected, the SHAPE control changes it continuously from triangle to sawtooth:



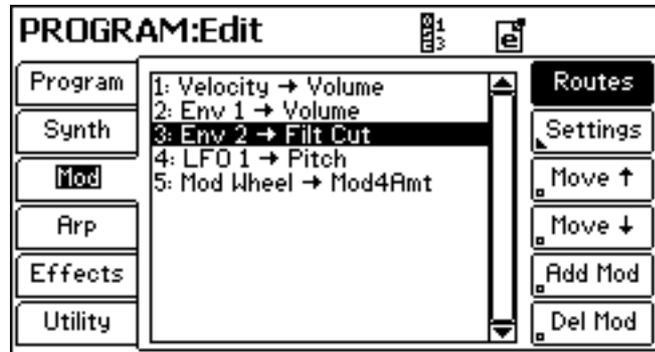
In the case of PULSE being selected, you can alter the width of the control waveform with the SHAPE control:



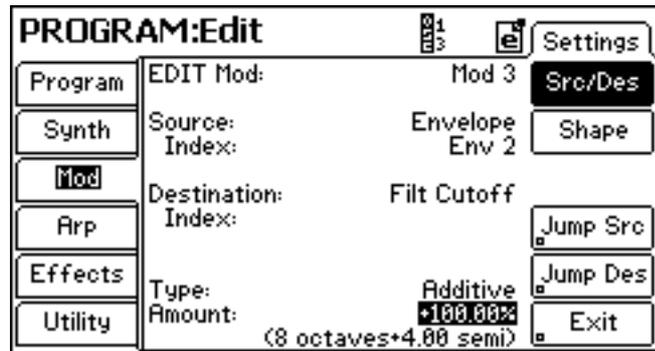
NOTE 2: In the case where SYNC is set to external MIDI clock, the RATE parameter is not available. Instead, you can change the 'division' (for example, 8ths, dotted 8ths, 16ths, dotted 16ths and many more) to synchronise the LFO to the tempo of your track. When SYNC is set to NONE (as shown above), you can use the RATE control to set the LFO rate as normal.

How to make changes to modulation

Fusion’s mod matrix is a powerful component in Fusion’s synthesis armoury and allows you to route almost any controller to almost any destination - pitch, timbre (tone), amplitude, panning and more. This is done in the MOD pages and pressing this will show something like this screen:



Here, you see a list of the mod assignments and you see the source and the destination for each one (for example, *Velocity -> Volume* or *Env 2 -> Filt Cut*). To make any changes to these, move the cursor to the modulation ‘connection’ you want to edit and press SETTINGS. You will see this screen:



Probably the first (and maybe only!) parameter to head for is the AMOUNT parameter down the bottom of the screen (as highlighted in the above screen shot). Use the data wheel to set a value (to hear your changes as you adjust the parameter, repeatedly play a note on the keyboard as you adjust the parameter).

You can, of course, change the connection’s source and/or assignment but for most ‘tweaks’, simple adjustment of the modulation amount is usually all that’s required.

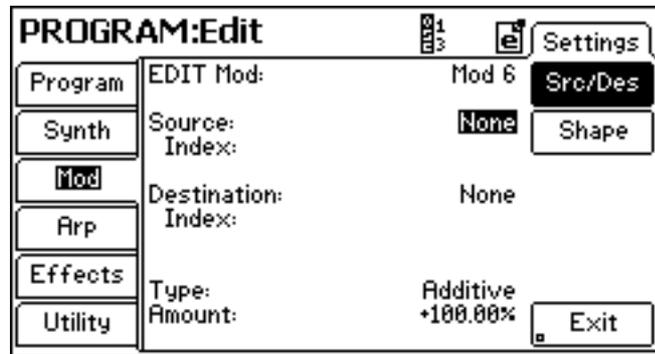
To select another modulation connection, either press EXIT to return to the ROUTES page or move to the EDIT MOD parameter at the top of the screen and select another using the data wheel or INC/DEC.

To ‘cancel’ a connection, either set its AMOUNT to 0.00% (press INC and DEC simultaneously) or, in the ROUTES page, press DEL MOD. The first of these two options is safest in case you maybe want to re-instate the mod without having to build the connection from scratch.

How to add a new mod route

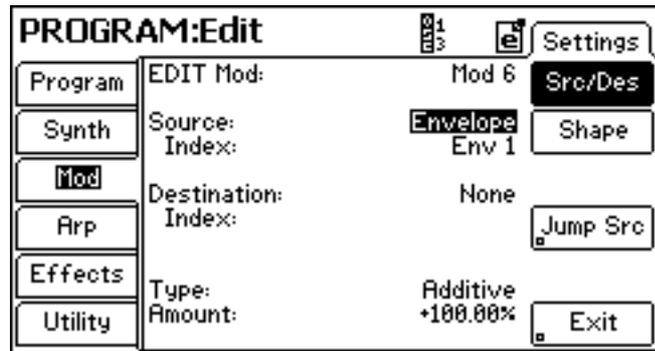
If you are feeling adventurous, you might want to add your own mod routing. It's actually not difficult. A silly example perhaps but let's say you want to route Envelope 1 to pitch to create an octave sweep for a special effect.....

In the ROUTES page, press ADD MOD. You will automatically be taken to this screen:

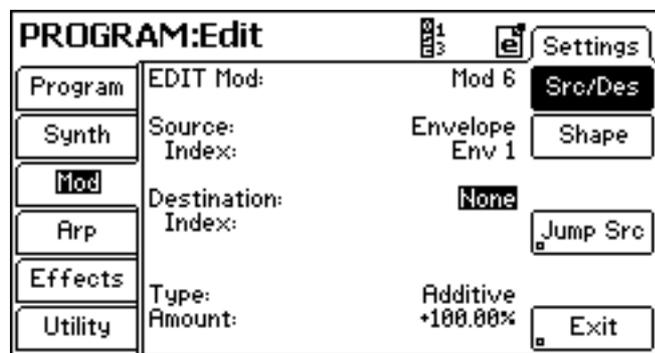


As you can see, no assignments are made.

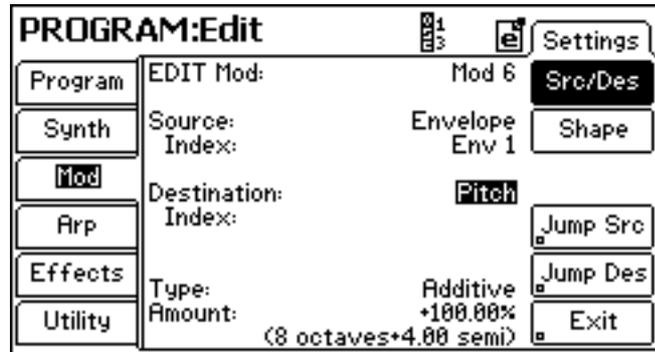
In the SOURCE field, use the INC key until ENVELOPE is shown:



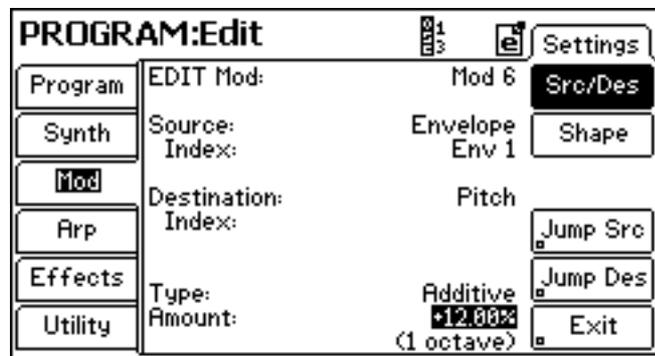
By default, ENV1 is selected in the index field so you don't have to change that. Now move the cursor to the DESTINATION field:



Using the INC key (or data wheel), select PITCH:



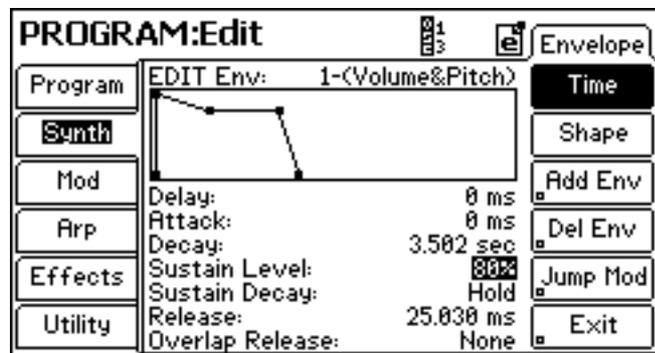
By default, the AMOUNT parameter is automatically set to 100.00% giving a whopping 8 octave+ sweep. Move the cursor to the AMOUNT field and set that to 12.00% (1 Octave):



Done! Ok - maybe not the most useful musical example but hopefully one where you can get a feel for assigning controllers to destinations and setting their modulation amounts.

NOTE: Although maybe not the best or most useful example to offer, it does provide a good opportunity to explain another very useful function of the MOD page(s).

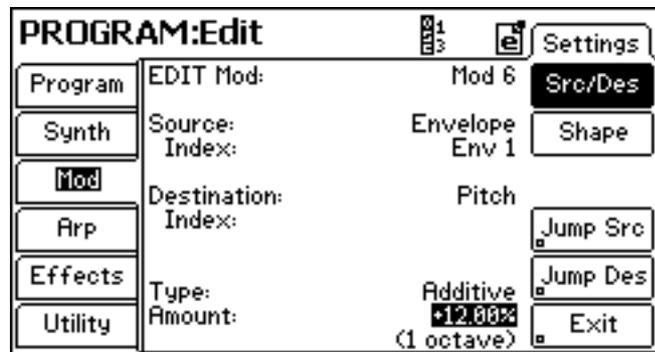
Now that you have assigned ENV1 to PITCH and set the mod amount, you might not like the 'shape' of the pitch sweep and so need to edit ENVELOPE 1's parameters. Of course, you can navigate your way back to the ENV1 page (press SYNTH and get to the envelope pages there) or, more quickly and easily, you can press JUMP SRC - you will be taken immediately to Envelope 1's page



You can adjust the envelope's parameters accordingly. However.....

You will note the JUMP MOD key on the right of the ENVELOPE page.

Pressing that will take you directly back to the MOD page:

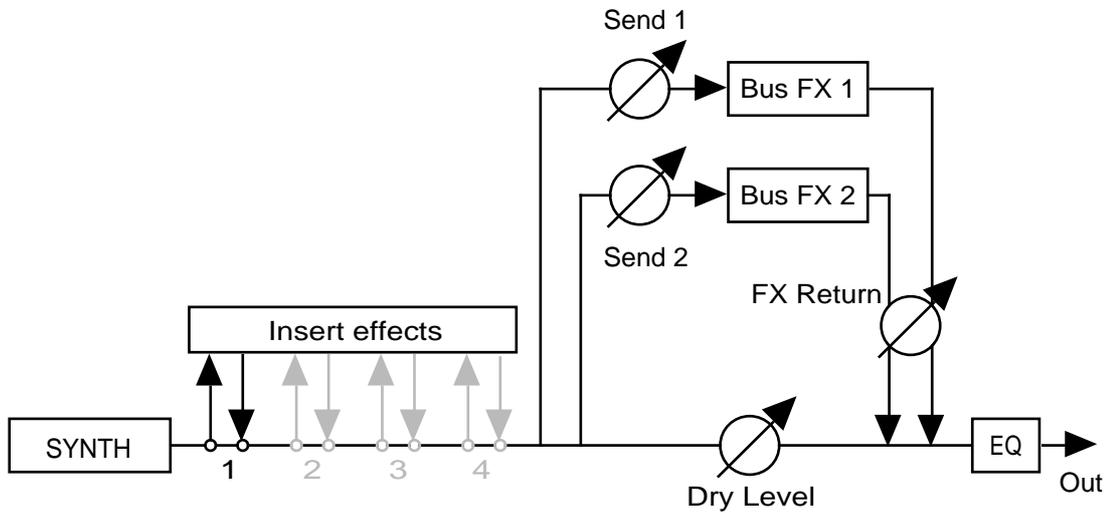


This way, you can 'toggle' between the two pages quickly and easily to set mod amounts and the source controller's parameters.

At any time, to return to the mod matrix's ROUTE page to select another route or add/delete a routing, press EXIT or MOD.

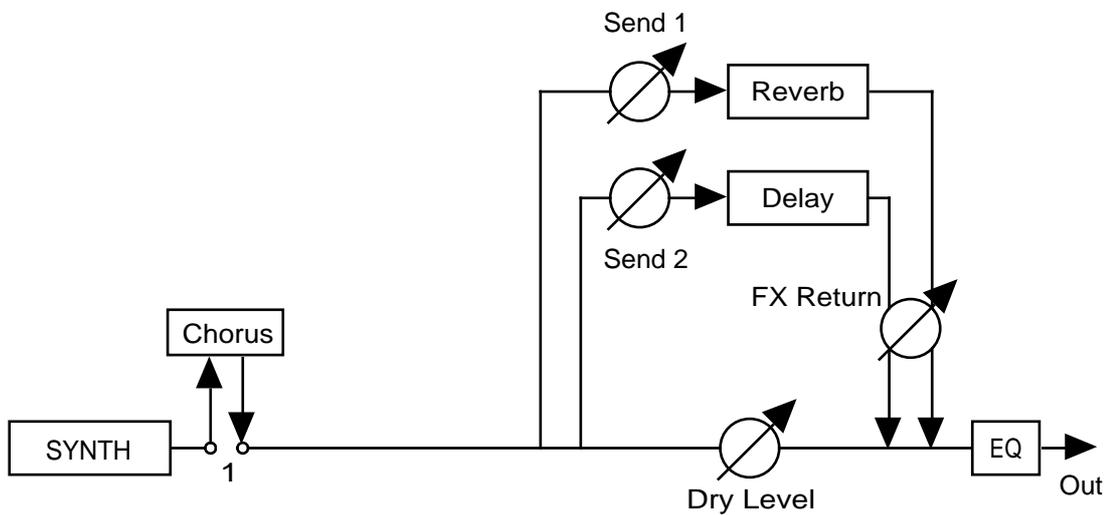
How to add / change effects

Fusion has two 'bus effects' and (up to) four 'insert effects' as shown below:



Simplified block diagram of Fusion's FX chain

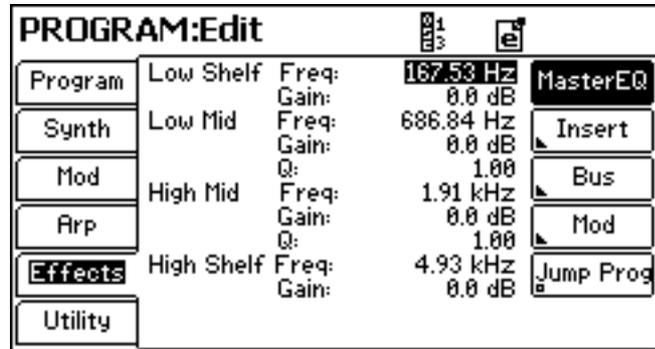
The output of the synth engine passes along to the physical outputs on the rear panel. On the way, the signal can pass through (up to) four insert effects. The signal also passes to the two bus effects through two variable send level controls. These effects are 'returned' to the main output path via an FX RETURN control and the whole lot then passes through a 4-band parametric equaliser before hitting the outputs. A typical effects configuration might be something like this:



One insert effect is used with a chorus and this is fed in variable amounts to reverb and delay (echo).

Master EQ

Press EFFECTS will show this screen:



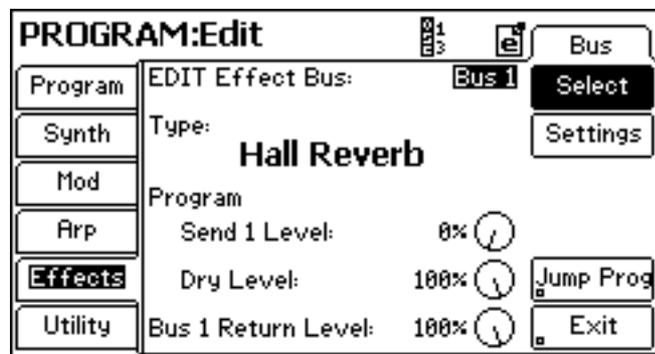
NOTE: If this screen isn't shown, press EFFECTS again.

This is the main EQ page where you can set the frequency and gain of four bands. You can use this to add more low frequency (bass) to a sound or to emphasize the higher frequencies. You can also boost or cut two mid frequencies.

TIP: To 'flatten' the EQ so that it has no effect, move the cursor to each GAIN parameter and press INC and DEC simultaneously to set each one to 0.0dB

Bus effects - selecting effects

To access the bus effect, press BUS. You will see this screen:



To select the bus you want to change, move the cursor to EDIT EFFECT BUS field (as shown above) and use the data wheel or INC/DEC key to select as required.

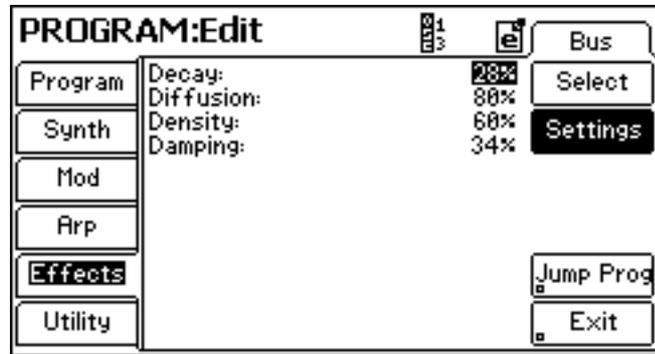
The easiest change you can make is to change the effects type - from Hall Reverb (as shown) to, say, Room Reverb, whatever.

The next easiest change to make is to move the cursor to the SEND LEVEL and adjust that so that the sound has more or less of the effect.

NOTE: Many of the presets sounds in Fusion use the assignable front panel knobs to set the effects levels which is a quicker and easier way to govern the amount of effects on the sound.

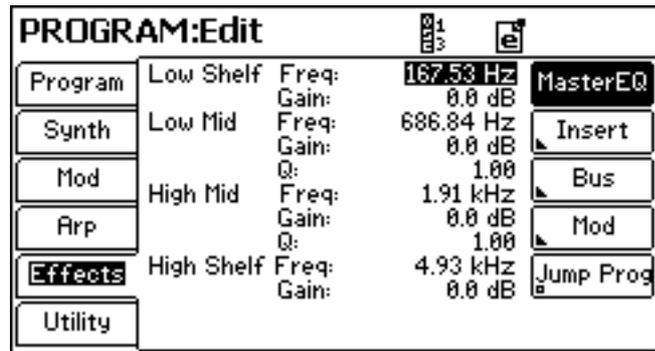
Bus effects - changing effects settings

If you are feeling more adventurous, you might like to actually change the settings of the selected effects type. This is achieved by pressing (not surprisingly!) SETTINGS. You will see something like this screen:



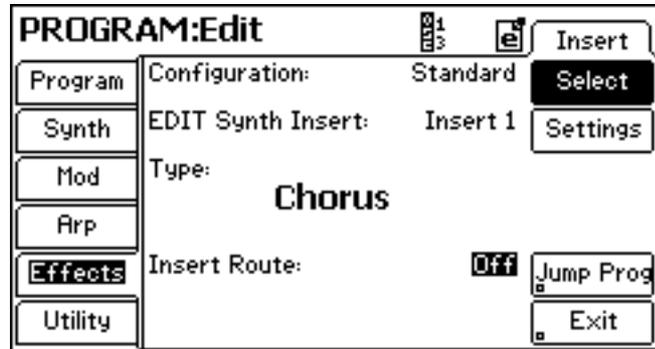
Each effect will have a different assortment of parameters depending on the selected effect.

To return to the bus effects screen, press SELECT. To return to the main effects screen (and the EQ), press EXIT:



Insert effects

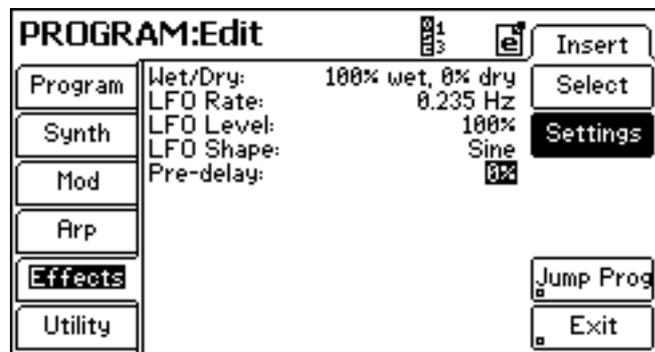
To access the insert effects, press INSERT. You will see something like this screen:



If the insert effect is not enabled (i.e. it is switched OFF in the INSERT ROUTE field as shown above), the first thing to do is, of course, switch it on. After that, the easiest change you can make is to select a different effect until you find something you like - with 57 different effects to choose from, you're not exactly short of choice!

Insert effects - changing effects settings

Once you find an effect you quite like, to modify its parameters, press SETTINGS. Depending on the selected effect, you will see something like this screen:



The parameters can be adjusted as you want.

Many of the insert effects have a WET/DRY parameter which governs the balance between the effected signal and the straight (or 'dry') signal so, for example, if you choose - say - a flanger effect but the effect is too pronounced, use the WET/DRY parameter to turn the flanger effect down in level. By default, the WET/DRY parameter in insert effects is set to 100% WET/0% DRY.

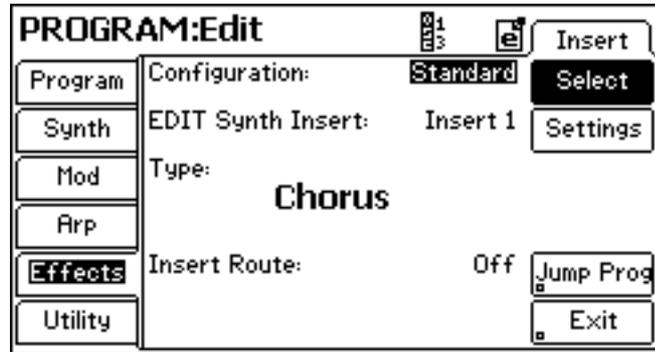
NOTE: Some insert effects such as the amp and cab simulators, EQs, compressors, tremolo, autopan, ring mod and slicer do not have this parameter.

To return to the bus effects screen, press SELECT. To return to the main effects screen (and the EQ), press EXIT.

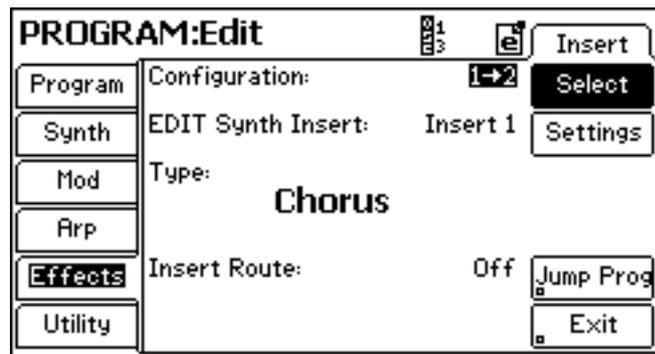
How to add more insert effects

More often than not, one insert effect is enough for most applications. However, there are occasions where more are required. For example, you might want a chain of compressor into an amp simulator into a speaker cabinet simulator into a flanger - four effects in other words. This is easily achieved.

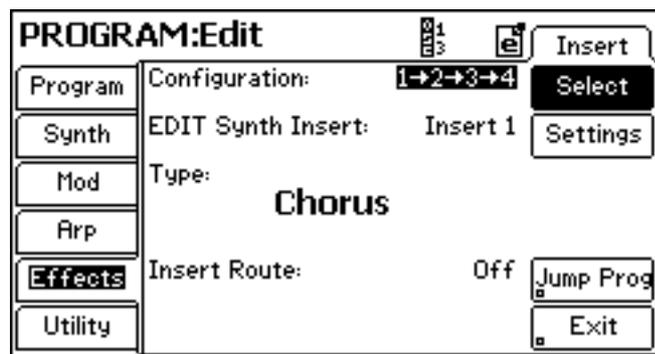
In the insert effect page, move the cursor to the CONFIGURATION field as shown below:



You may now select a different configuration using the data wheel and/or INC/DEC keys. For example, for two insert effects:



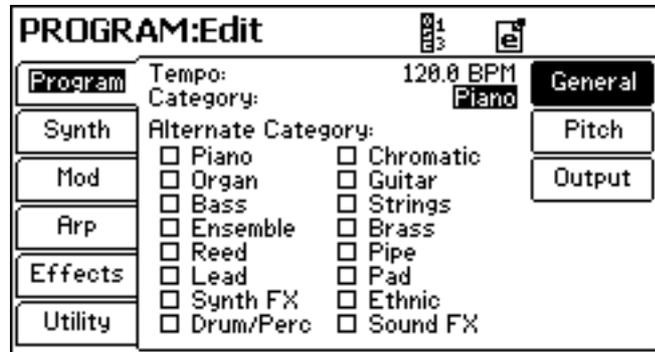
Or ultimately with four insert effects:



The insert effect to edit is selected in the EDIT INSERT EFFECT field and selected/edited as normal and as described on the previous page.

How to categorise your sound

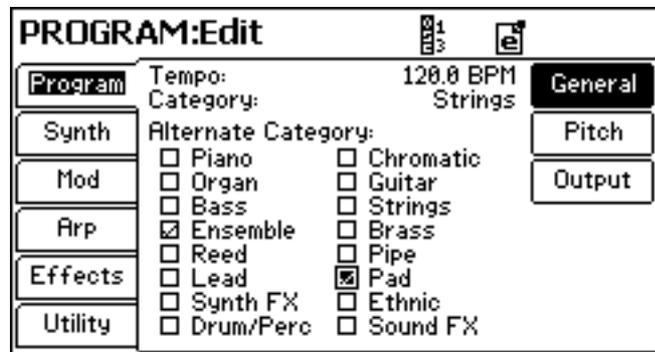
It is very useful to assign a 'category' to any sound you edit/create. This is so that if you choose to view/select sounds by category, your sound will be included in the list. This is easily done by pressing the PROGRAM soft key. You will see this screen:



Simply use the data wheel and/or INC/DEC keys to select an appropriate category for your sound.

How to set alternate categories

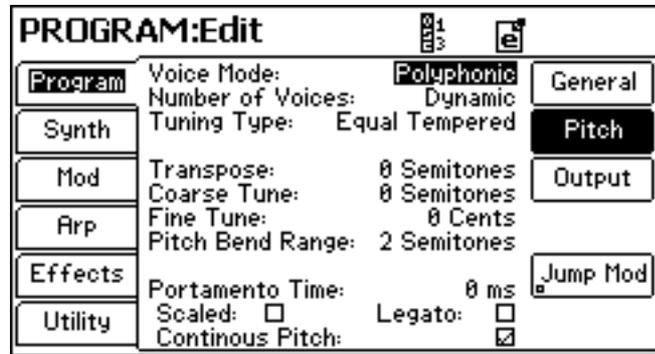
Sometimes, a sound can fall into several categories. For example, you might create a string-like sound that could also be an 'ensemble' sound and a 'pad' sound. Using the NEXT/PREV keys, you can move around the ALTERNATE CATEGORY check boxes and the INC/DEC keys to assign the sound to other categories:



When you view by category, the sound will appear in the STRINGS, ENSEMBLE and PAD category lists.

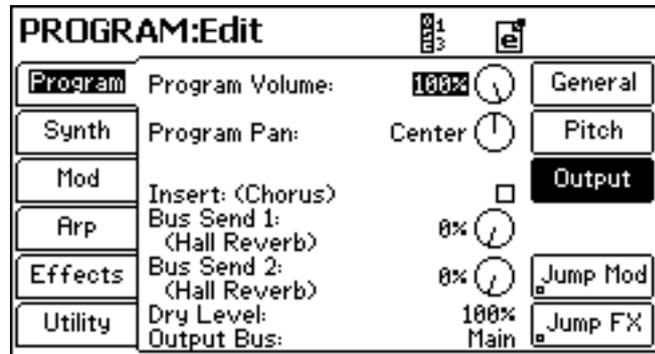
How to change program settings

There are many 'global' program settings that can be applied. The first of these is pitch and related parameters which are accessed by pressing the PROGRAM soft key and then PITCH. You will see this screen:



In this page, you can determine whether the sound is polyphonic or monophonic. The latter selection allows the emulation of older monophonic analog synths. You can also tune and transpose the sound in this page as well as set the program's pitch bend range, portamento (glide) parameters, etc..

Pressing the OUTPUT soft key will show this screen:



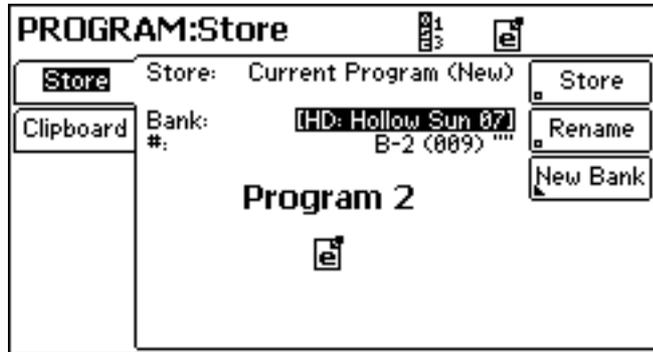
Here you can set the program's master output level (useful for ensuring that different programs have a consistent level as you flick between them) as well as its overall pan position in the stereo output.

This page also gives quick and easy access to FX level parameters and you can set bus effect send levels as well as enable/disable insert effects.

Storing your changes

The quickest way to store a sound is to press the STORE key (located by the data wheel) twice in succession - this will save your edited version to the same location as the original (i.e. it will overwrite the original).

However, if you want to store your edited version to a different location (thus retaining the original), press STORE once to see this screen:



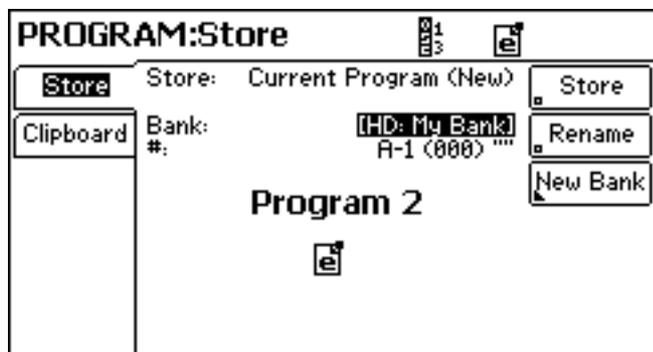
You can navigate to another existing bank to save the sound or, if you prefer, you can create a new bank to save the sound in.

Creating a new bank

To create a new bank, simply press NEW BANK - you will see this screen:

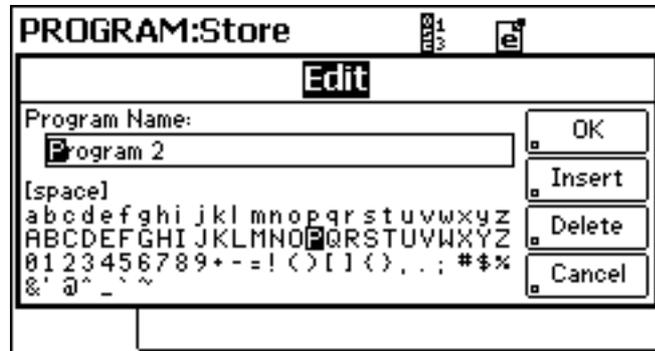


Press RENAME if you want to change the name of the bank to something of your choosing. Otherwise, press NEW BANK to create the bank - it will be shown as the destination bank:

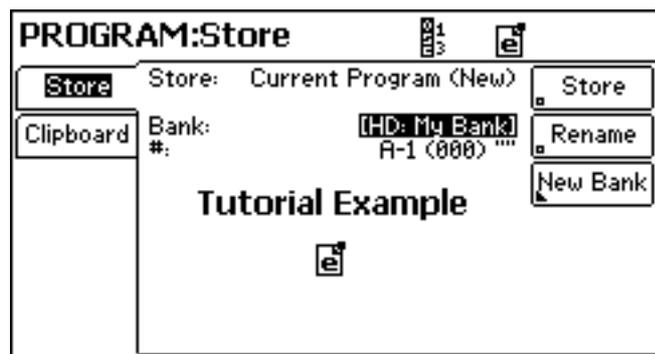


Naming / renaming a program

At this point, you might want to rename your sound to something more appropriate or more memorable to you. This is achieved by pressing RENAME. You will see this screen:



Use the NEXT/PREV keys to move around the name field and use the data wheel and/or INC/DEC keys to select the letter / number / character. When you have entered the name, press OK to see this screen:



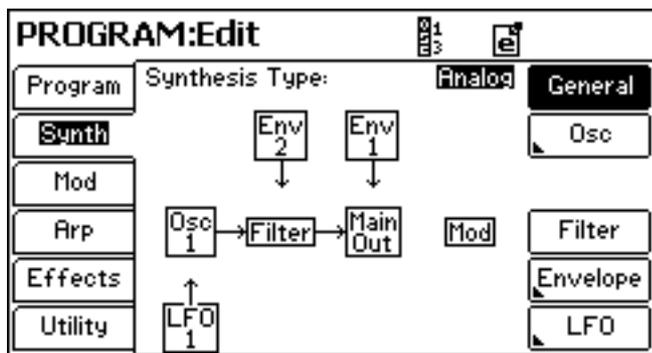
Assuming you are happy with the name and the destination, simply press STORE - your edited sound will be stored.

Creating a new program

To start from scratch and create your own program, press UTILITY to see this screen:



Press NEW PROG to create the new program. By default, the new program will be of the 'Analog' variety:



Use this tutorial to maybe guide you through creating your own sound from scratch.