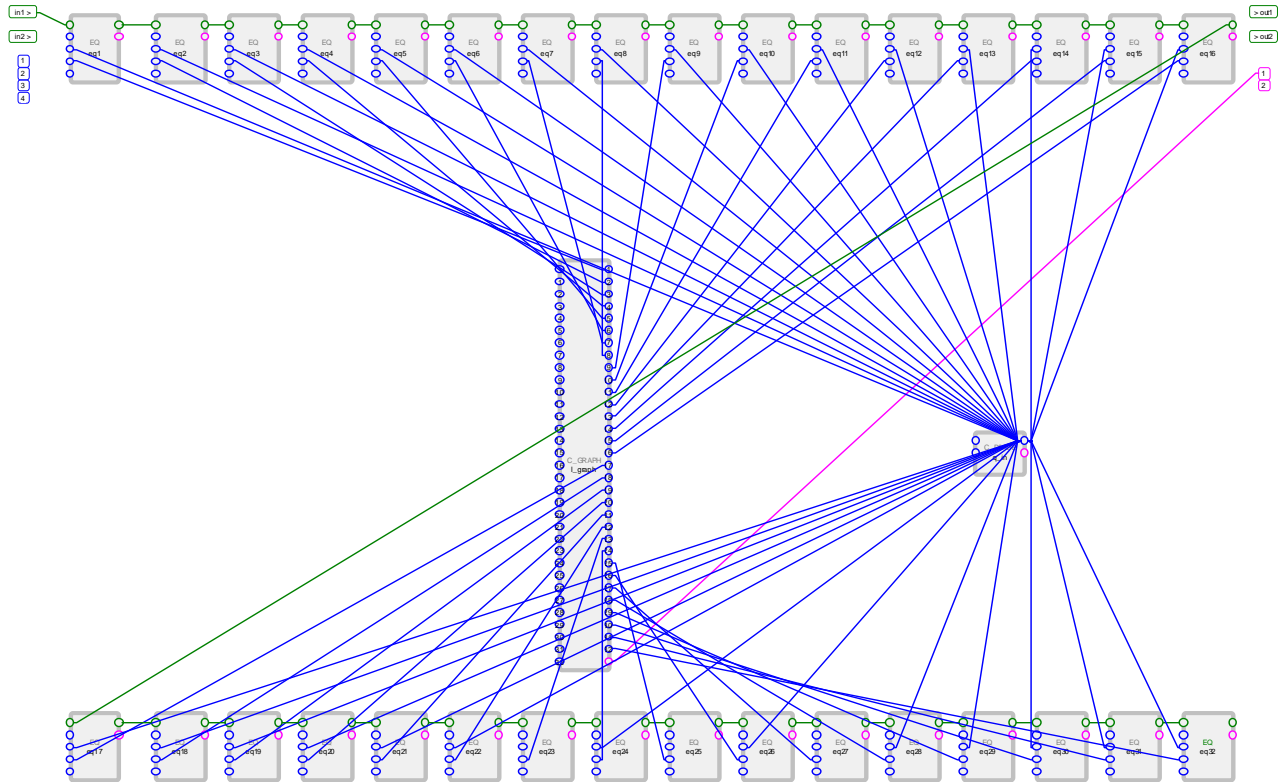


Eventide

the next step



Vsigfile™ User Manual

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About Vsigfile

Vsigfile™ is a PC-based editor designed to assist in creating [algorithms](#) for the Eventide® Orville™ and DSP7000 family of Ultra-Harmonizer® brand effects units. It also supports the DSP4000 family, but does not support either Eclipse™ or the H3000 series. This document refers to Vsigfile version 2.0 and above.

We at Eventide have done our best to make Vsigfile easy to use, but some knowledge is required to get the best from it. In particular, you need to have a clear idea of what he or she is trying to achieve, and some idea of how to go about it. It is recommended that beginners familiarize themselves with the large number of supplied Factory Presets and then first use Vsigfile to study them to see how they work, before trying to create algorithms from scratch.

Vsigfile can be [configured](#) to connect via MIDI, RS232 or EVE/NET™, to an UltraHarmonizer, or may be used stand-alone on the PC to gain an understanding of the functions of the machine and as an introduction to algorithm design. The following text refers to Orville as the connected unit, but this should be taken to refer to any of the above supported Eventide products.

The latest version of Vsigfile may be downloaded from the Eventide Web Site, <http://www.eventide.com/vsigfile/index.html>. The download consists of a number of files, all of which should be copied to the same directory (folder). It is recommended that this be a newly created directory and not be used for any other application.

Vsigfile runs under Windows® 95, 98, Me and XP, as well as NT4.0 and Windows 2000. It requires between 5 and 20 MB of free memory to run. It will NOT run on Windows 3.1 or 3.11, and, although some users have had success running it on a Macintosh under the Virtual PC emulator, Eventide is unable to offer support to those attempting to duplicate this feat.

This document assumes that the reader has basic familiarity with PCs using the Windows operating system, and has some (but not necessarily extensive) experience of using Windows applications.

In many places in the text, [hyperlinks](#) are used to direct the reader to either a deeper explanation of the referenced topic or to a relevant menu command or Web page. Click on the [hyperlink](#) to see this, and then use your browser or reader's *back* command to return to the original position. Note that the two hyperlinks in this paragraph are cosmetic only.

The creation of algorithms requires an understanding of the tools (read this manual), as well as some knowledge of the way the constituent parts (modules) relate. A full discussion of this subject is well beyond the scope of this document, but it is recommended that the beginner follow the [tutorial](#), and then study some of the large number of Factory Presets included with the Orville or DSP7x00.

Resources beyond the above include the Orville [PROGRAMMING MANUAL](#), and a worked example of an algorithm designed to simulate one of Eventide's earlier products, the Omnipressor®, which can be found at <http://www.eventide.com/vsigfile/omnipressor.htm>. The reader should be aware that these refer mainly to earlier versions of Vsigfile. They will be updated in due course.

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Algorithms

In Eventide parlance, an *algorithm* is a collection of signal processing and control functions used to create a particular sound treatment or effect. It will usually receive a signal at its input, change it in some user-defined way, and then produce the changed signal at its output. It will also typically have various controls to change the *parameters* of the effect. The result may be a reverb, a pitch shifter, an equalizer, some other effect, or, very often, many or all of the above.

Among members of the Orville and DSP4000 family an *algorithm* is interchangeably known as a *preset*. Be aware that on the Eclipse, algorithms and presets are not the same thing.

A *parameter* is a control value, often expressed as a number and usually accessible via the system display screen. The parameter controls some aspect of the effect, for example, delay time, pitch shift, reverb level, etc.

An Ultra-Harmonizer algorithm is made up of a number of *modules* (algorithm building blocks), connected together. These modules, and the connections between them, may be broadly divided into three areas:

- ***Signal*** - these process audio signals, as well as some high-speed control functions.
- ***Control*** - these are lower-speed functions, typically used to change modules' parameters, and are usually driven by knobs or other user interface elements.
- ***Misc*** or ***Userobjects*** - these are user interface features, and determine how the various controls are routed to the display screen.

Any given module may combine one or more of these areas, for example, a pitch shifter will have *signal* connections for its audio input and output, *control* connections to change its parameters (such as the amount of pitch shift) and may have a *userobject* to provide a general user interface.

Each *input* of a given type can only be connected to a single *output* of the same type. Any *output* can be connected to an unlimited number of *inputs* of the same type.

An *algorithm* is usually stored by Vsigfile as a *document* in a computer file, so these two words are also to some degree interchangeable.

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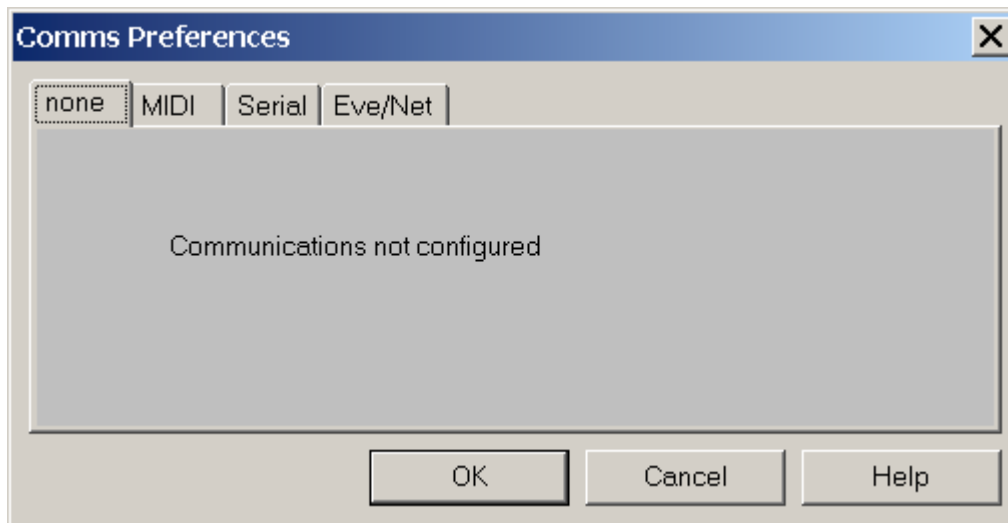
Getting Started

Assuming that the software has been copied or downloaded as directed, there are two issues that must be addressed:

- If Vsigfile is to be connected to an Ultra-Harmonizer, the means of communications must be configured. This will enable you to send and receive algorithms, and also to make parameter changes on the remote system, listen to the results, and then update Vsigfile's copy of the algorithm.
- A [modules database](#) is needed. This contains the information that tells Vsigfile what modules are available and how they are to be connected. If you are working with a connected Ultra-Harmonizer, once you have set up the communications, you should download a modules database from it. This will ensure that Vsigfile and your *remote system* march in step. If you are working standalone, you should select and download one of the databases on the [Eventide Web Site](#). If Vsigfile cannot find a database when it is first started, it will prompt you to download one and will not continue until this is done.

Setting Up Communications

If communications have not been configured, Vsigfile will prompt you to set them up when you first try to communicate with a remote system. At other times you can access the communications Dialog Box via **Comms Setup** on the [Preferences](#) menu.



To run standalone, select **none** as shown above. Otherwise select the option most suited to your purposes. Note that both [MIDI](#) and [Eve/Net](#) usually require extra hardware for operation. In most cases, [Serial](#) (RS232) will be the most suitable option - the COM: ports on most PCs are not overused and more can be easily added. If set at the highest baud rate the Eventide products currently support (115200), an RS232 connection will be more than three times as fast as MIDI. In addition, you may be using your computer's MIDI connection for other purposes.

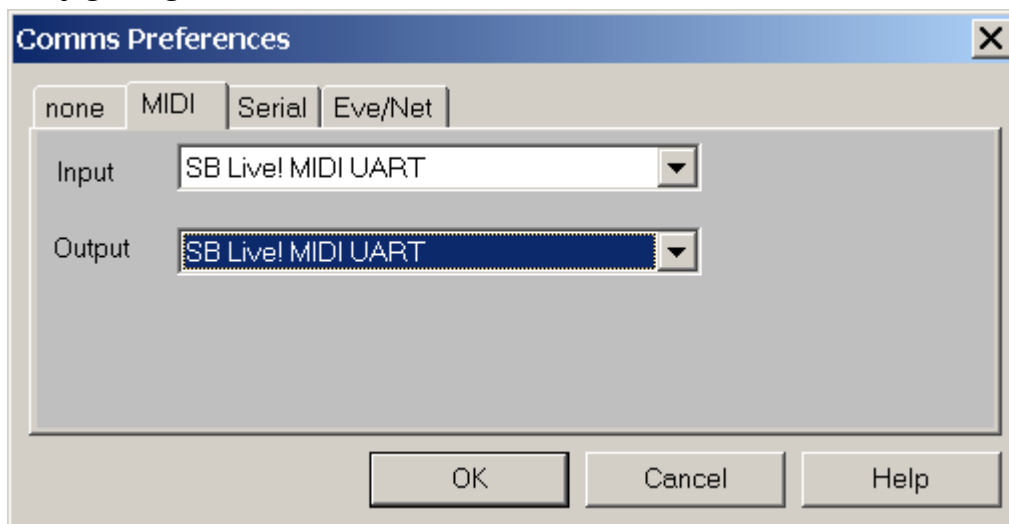
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When using remote communications, make sure that Orville's **MIDI/setup/system exclusive** is set to **on**, and that **device ID** on the same screen is set to **1**.

Please note that Eventide can offer little help in setting up PCs beyond that contained in this document - in the event of problems understanding or performing the following configuration, you should refer to your PC hardware and software suppliers or other advisors.

As previously mentioned, while it has been shown that Vsigfile can run under Virtual PC on a Mackintosh®, Eventide can offer little direct assistance towards the achievement of this goal. Mac users should study <http://www.eventide.com/vsigfile/vsigmac.htm> as a first step.

Configuring MIDI

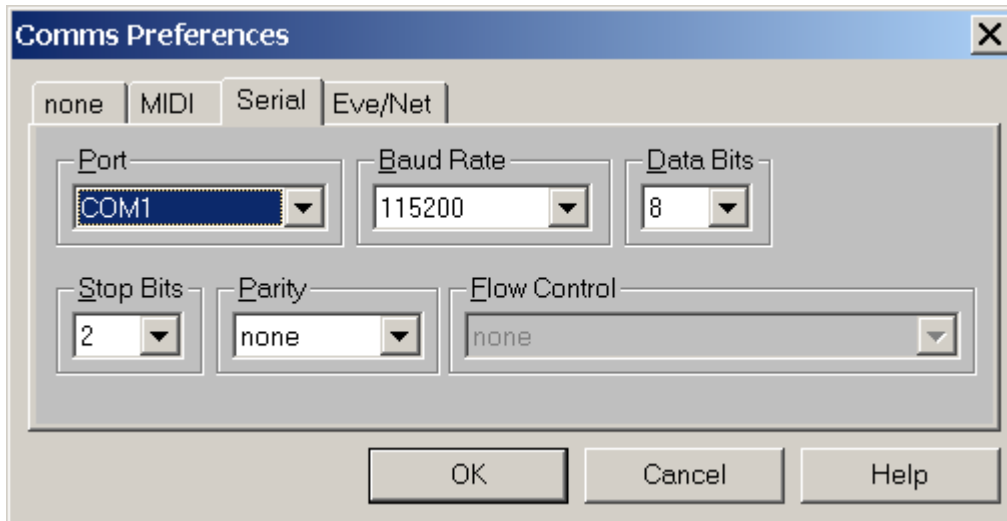


To configure Vsigfile to use MIDI, you only have to set up two parameters as shown above. Be sure that your selections actually connect to the outside world - many of the options (usually labelled 'synth' or similar) are purely internal. The exact options will depend upon your PC hardware and may require a plug-in Sound Card. The above are the settings for a SoundBlaster® Live! Card.

Then it is just a matter of connecting from your Sound Card's "MIDI out" connector to your Orville's "MIDI in" and vice-versa, using suitable 5-pin DIN cables.

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Configuring Serial



In order to configure Vsigfile to use serial communications, the above parameters must match those on your Orville's SETUP/MIDI screen.

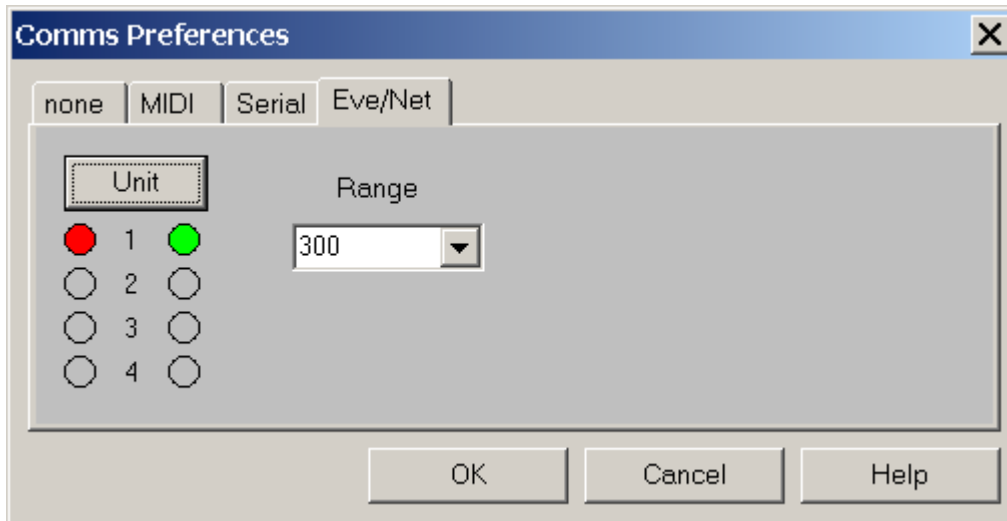
```
Ⓜ: BPM ResoChords serial setup
serial: enabled parity: none
baud rate: 115200
data bits: 8
stop bits: 2
<| service | midi | external | display |>
```

Some older or slower computers may not be able to operate successfully at 115200 baud - some laptops seem especially poor at serial communications. If you suspect this applies to your computer, as evidenced by garbled or missing characters, try a lower baud rate. Be sure to keep the Orville and the PC in step !

It is necessary to connect from the selected COM: port to your Orville using a suitable 9-pin cable. Note that this must be wired "pin 1 to pin 1," etc., and must **not** be either a "NULL modem" cable or a "cross-over" type designed for file transfer between two PCs.

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Configuring EVE/NET



If your PC does not have the special hardware and software needed to support Eve/Net, the above screen may be "grayed out" or otherwise inaccessible. It will also be necessary for your Orville to have an Eve/Net interface installed. Assuming that this is the case, to perform the configuration you need to connect the Eve/Net cable from the Orville to the PC's Eve/Net adaptor (or connect the PC adaptor to an existing Eve/Net system), set the **Range** setting to agree with Orville (**300** is the default and recommended value), and then select the Unit you wish to control. Like the Eve/Net remote, the green LEDs show the active connected units and the **Unit** button cycles through them, setting the red LED to show the selected unit.

On the Orville

- **mode** should be set to either **remote** or **local and remote**, normally the second.
- **send** should be set to **MIDI** or **keys & MIDI**, the second if you are using the Orville to control a second Orville.

```
Ⓜ: BasicRoom      Network Setup
unit: 1           send: MIDI
mode: local & remote  load holdoff: 2.0s
status: active     versions: 1.1,0.0
range: 300 ft
◀ EVE/NET ▶
```

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Loading the Module Database

The module database tells Vsigfile what modules it has to work with and what form they take. It is recommended that it be downloaded from your Orville, so as to ensure compatibility.

First make sure that any existing Vsigfile documents are closed. This is necessary because the new database may be incompatible with them.

Then select **Get Dbase** from the **MIDI** menu. On the Orville you should see a screen saying "Sending sigfile dbase ...". If you do not, check your [comms configuration](#) and connections as described above. If you see repeated "Program Loading" messages on the Orville screen, this is a sure sign that the RS232 baud rates are not set to the same value.

After a few minutes the transfer will complete and you will see the small dialog box below. Hit **OK**.



If this dialog does not appear at the same time as the Orville screen returns to normal, check or try the following:

- General comms configuration, as described above.
- Connections between the PC and the Orville, especially the "MIDI out" from Orville if MIDI is used.
- **System Exclusive** is set to **on** on Orville's **Setup/MIDI** screen.
- If using RS232, try a slower (lower numbered) baud rate, remembering to set the same value on both the PC and the Orville. Some older PCs, especially laptops, have trouble receiving the database, which involves transmission of a large amount of data at high speed.
- Set **sysex speed** to a lower number on Orville's **Setup/MIDI** screen. **10** is the fastest, so try a smaller value. This will put a pause between each piece of data as it is sent, giving the PC more time to handle it.
- If none of the above helps, try a different PC and/or cables.

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Using Vsigfile (Tutorial)

Vsigfile Operating Modes

Vsigfile has two main operating modes - *graphic* and *sigfile*. These are different representations of the same information. The two pictures below show the same algorithm, "Basic Room," in each of the two modes.

Sigfile Mode

```
HEADM "adc" 2 4 adder1-out adder2-out adder3-out adder4-out "BasicRoom" "" 2 vmenu-obj info-obj
TEXTBLOCK "info" 3 "Basic 4 out reverb. Diffusion out " "front. verb out front, rear or both." "Stereo in, quad out."
MENUPAGE "vmenu" "verb params" "verb" 14 rv-obj sw2-obj diff-obj size-obj rdcy-obj rsize-obj pdly-obj hv-obj lv-obj hf1-obj lf1-obj mdepth-obj
PERCENTKNOB "diff" "diff : %3.0f%%" "" 0 100 1 81
PERCENTKNOB "size" "dsize : %3.0f%%" "" 1 100 1 60
DIFFUSOR "dcl" 4 adc-in1 diff-out size-out 7 11 15 19 0.9 -0.9 0.9 -0.9
DIFFUSOR "dcr" 4 adc-in2 diff-out size-out 9 13 17 23 0.9 -0.9 0.9 -0.9
KNOB "rdcy" "rdecay: %4.1f sec" "" 0 1000 0.1 4
PERCENTKNOB "rsize" "rsize : %4.0f%%" "" 0 100 1 80
KNOB "pdly" "predly: %3.0f ms" "" 0 80 1 14
KNOB "lf1" "lofreq: %5.0f Hz" "" 0 1000 1 200
KNOB "hf1" "hifreq: %5.0f Hz" "" 1000 20000 1 5000
KNOB "lv" "lowcut: %5.1f dB" "" -20 0 0.1 -1
KNOB "hv" "hicut : %5.1f dB" "" -20 0 0.1 -4
KNOB "mdepth" "depth : %5.1f ms" "" 0 10 0.1 2
PERCENTKNOB "mrate" "rate: %4.0f%%" "" 0 100 1 10
PERCENTKNOB "mspan" "span: %4.0f%%" "" 0 100 1 80
REVERB_D "verb" 800 8 dcl-out dcr-out rdcy-out rsize-out pdly-out lf1-out hf1-out lv-out hv-out mdepth-out mrate-out mspan-out 0 47 53 5
KNOB "rv" "level : %4.0f dB" "" -100 0 1 -6
MIXER "mix3" 1 verb-left rv-out
MIXER "mix4" 1 verb-right rv-out
TEXTKNOB "sw2" "output: %s" "" 3 2 "front" "rear" "both"
OSWITCH "oswitch1" 3 mix3-out sw2-out
OSWITCH "oswitch2" 3 mix4-out sw2-out
ADDER "adder1" 3 dcl-out oswitch1-out1 oswitch1-out3
ADDER "adder2" 3 dcr-out oswitch2-out1 oswitch2-out3
ADDER "adder3" 2 oswitch1-out2 oswitch1-out3
ADDER "adder4" 2 oswitch2-out2 oswitch2-out3
TAIL "sdg"
```

This is *sigfile* mode. It will not make much sense on first viewing. For this reason, Eventide recommends that you start with *graphic* mode, as shown on the next page. In-depth coverage of *sigfile* mode is beyond the scope of this document.

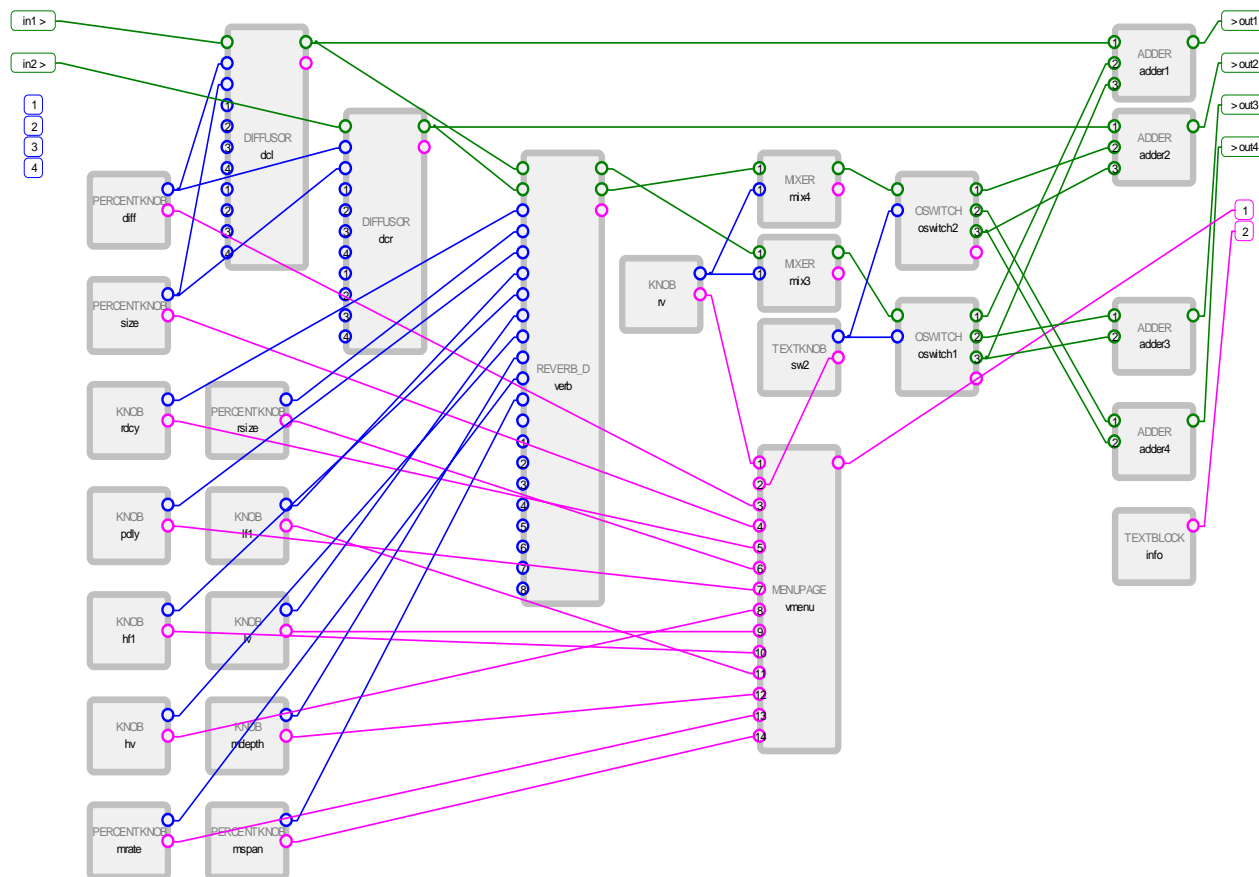
Sigfile mode has a number of advantages and is preferred by some expert Vsigfile users:

- The main advantage is that it packs a lot of information into a small space.
- It also allows the true [ordering](#) of the modules to be seen. This is important. More later.
- Each line represents a single module, with the name of the module type at the left. The remaining values are in the order given in the "Order:" section in the Modules Manual or Modules Info page.

To select either *sigfile* or *graphics* mode, use **View/as Sigfile** or **View/as Graphic** on the [View Menu](#).

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Graphic Mode



The picture above is much easier to understand, given some necessary information:

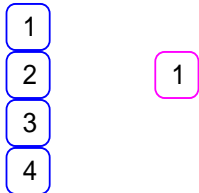
- It is made up of a number of modules (the gray blocks), with connections between them.
- Each module has its *inputs* on the left and its *outputs* on the right.
- The *inputs* to the whole algorithm are at the top left, and the *outputs* are on the top right.
- The green wires are *signal*. You can change any of these [colors](#) later.
- The blue wires are *control*.
- The purple wires are *userobjects*.

By studying the above, you can observe the following:

- The *signal* from the inputs each feed a *diffusor*, each of which feeds a *reverb_d*.
- The output is fed by a mix of the *diffusor* and *reverb_d* outputs, produced by the *adders* and *mixers* at the top right.
- A number of *knobs* on the bottom left supply *control* to the *diffusors* and *reverb*, and are in turn connected to a *menupage*.

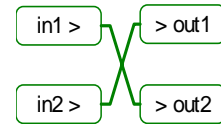
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My First Algorithm



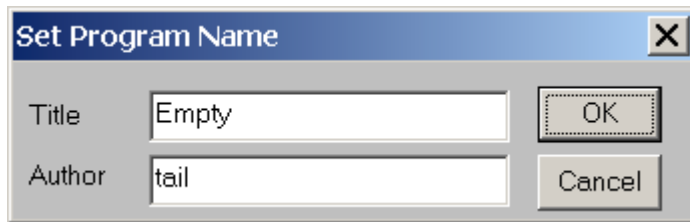
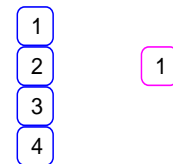
Select **File/New** (or hit the little blank page icon under the file menu). You should see the graphic shown at the left. If you see only text, you are probably in sigfile mode. Select [View/as Graphic](#) to change to graphics mode. This is a "Mute" algorithm - the outputs are not connected to anything, so no sound will pass through it. We can fix this.

Click on the **in1 >** block at the top left with the mouse left button. Its border will become heavier to show that you have selected it. Keeping the left button held down, move the mouse over towards the **> out2** block at the right. When the mouse is over it, its border will also become heavier, to show that you can connect to it. Release the mouse button. A green wire will appear between the two blocks - they are connected.



In the same way, connect the **in2 >** and **> out1** blocks. You have created a "cross-over" preset, which will reverse the channels of a stereo pair.

Set a new title for your algorithm by selecting **Edit/Set Title and Author**. The dialog box below will appear.



Enter a suitable title ("Cross-over" comes to mind) in the Title box, and your name in the Author box. Then hit OK.

Now if you are connected to an Orville, send your new algorithm to it by selecting **MIDI/send**. The yellow "busy" LED should light for about half a second, and then you should see the screen below:



Note that there are no soft key labels - this is because we have no *userobjects* connected. Also there are no visible *parameters* - this is a rather simple preset. Let's try a more complex one.

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My Second Algorithm

For this exercise we will build a simple preset with two delays and a stereo mixer. First, open another new (empty) preset. Close the first one by using **File/Close** or hitting the [X] button at its top right. Save it to a file first if you want to keep it. Then we need to add some modules. To open the **Add Module** dialog box, do one of the following:

- Select **Add Module** from the **Edit** menu.
- Click the mouse's **right button** on any module or blank space in the preset and select **Add Module**.
- Hold down the "Ctrl" key on the keyboard when either a module or nothing is selected and hit the "A" key.

Adding Modules



The **Add Module** dialog box allows you to select from the available *modules*. In addition, if you have saved anything to the **Library**, it will appear at the end of this list.

The *modules* are arranged in *groups* of similar or related functions. The initial dialog box, as shown on the left, shows the groups.

Now, click on the word **DELAY** with the left mouse button. It will open up to show the modules contained within.

Click on another group name and **DELAY** will close and the other group will open.

If you want a group to stay open while you look in another one, click on the [+] beside the name of the group. This will cause it to open and remain open. To close it, click on its name.



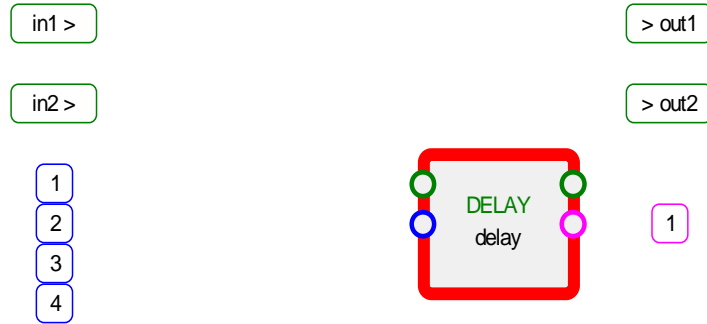
If you want the dialog box to be bigger so that you can see more, click on its bottom and note that the cursor changes to a doubled-headed "sizing" arrow. Now you can drag the bottom to change the size. It will remember its new size.

Similarly, you can move the box by clicking on its *title bar*. It will remember where you left it.

Now, open the **DELAY** group again and click on **DELAY** inside it, as shown at the left. Note that the **OK** and **Module Info** buttons are no longer grayed - you have now selected a module, so they have a function.

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Now, keeping the mouse button held down, move the mouse to the middle of the screen. A little yellow "bubble" labelled DELAY will follow the mouse to show you what you are doing. Release the mouse button. A module will appear at the point you released it. This is called "drag and drop."



The module has a red border - this shows that it is selected. When one or more modules are selected, you can click on them with the left mouse button and move them around. Try it !

This module will be set to default values - for our purposes we need to

change some of them. We will do this by using the [Specifier Display](#). Double click on the module with the left mouse button and the Specifier Display will appear (make sure not to click on the module name or an edit box will appear instead). Click and drag on the left and bottom edges of the Specifier Display to make it big enough to display all the information. It will not forget.

TYPE	DELAY	DESCRIPTION	MIN	MAX	VISIBLE	DEFAULT
opstart_name	delay	operator name			yes	
maxdelay	100	max delay	1	32500	yes	100
in			-1	1	yes	
out	out	signal	-32768	32767	yes	
delayamt	100		0	100	yes	100
obj	obj	userobj			yes	

DELAY Group: Delay

Audio Delay

This module implements a simple audio delay line. Any audio signal applied to the input appears at the output a specified amount of time later. The amount of delay is controllable via the delayamt control signal input. Note: changing the delay value while audio is present may cause clicks in the audio. If it is desired to change the delay time smoothly, use the moddelay module.

Specifier:
 maxdelay
 Specifies the maximum delay this module will use. Range: 1 to 65536 milliseconds.

Audio inputs:
 in
 audio input

Audio outputs:
 out
 audio output

Control inputs:
 delayamt
 Controls how much the audio will be delayed. Range: 0 to moddelay milliseconds.

External inputs:
 obj
 The control input if it is not connected to a control signal.

Output:
 DELAY module user moddelay in delayamt

The second column on the Specifier Display shows a number of the parameters of this module, not all of which will make sense at this time.

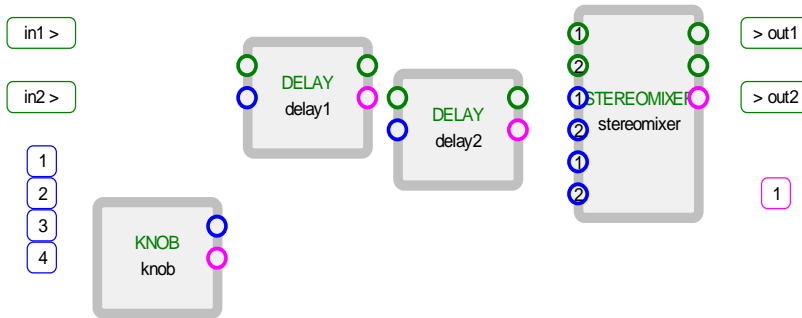
You can refer to the on-line Modules Manual by clicking the **Info** button, which will produce the screen on the left.

From the Specifier Display we can see that the *maxdelay* value is set to 100. Click on it (it will turn red and show a black border showing that it is selected). Then type in 5000 (660 for DSP4000 users). This tells it that it can have a delay up to 5000 milliseconds or 5 seconds.

Similarly, change the *opstart_name* from *delay* to *delay1*.

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Now, click on a blank section of the Vsig™ algorithm screen and the Specifier Display will go away. Click on the delay module and move it to the right. While holding down the Ctrl key on the PC keyboard, release the mouse button. This will cause a copy of the first module to be made at the position you released the mouse. Note that it is named *delay2*. It is easier to copy the first delay module rather than add a new one and then change its *maxdelay* value.

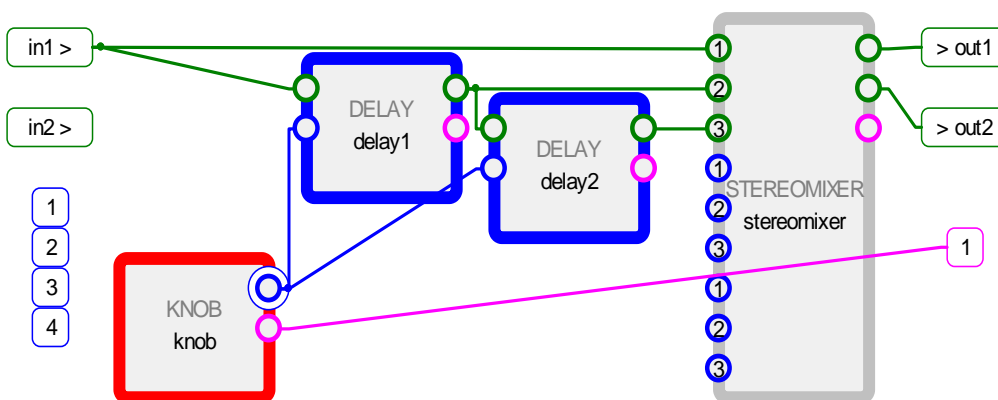


Now, bring up the Add Modules Dialog and drag over a STEREO MIXER from the MIXER *group* and position it to the right of the second delay, as shown at the left. From the INTERFACE *group* add a KNOB.

Make the following connections, allowing the yellow bubbles to show you the names of the connections:

- From *in1* to *stereomixer-in1*
- From *in1* to *delay1-in*
- From *delay1-out* to *delay2-in*
- From *delay1-out* to *stereomixer-in2*
- From *stereomixer-left* to *out*.
- From *stereomixer-right* to *out2*
- From *knob-ctrl out* to both *delay1-delayamt* and *delay2-delayamt*
- From *knob-userobject* to the square violet box [1] under the main outputs. Each of these (if more than one) corresponds to a *softkey* on the Orville. Whatever is connected to them may be selected by using the Orville *softkeys* in the normal way.

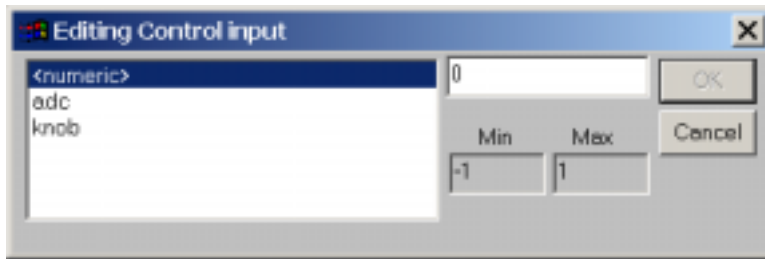
Click on *stereomixer-in2*. This is what is called a *repeating field*, in that you can have a variable number of them. A *repeating field* always has its number inside it. Click on the right mouse button and select **add repeating field**. This will add a third input (3). Connect this to *delay2-out*.



Note that as you click on a connection the module is selected, and any module connected to that connection is *highlighted* with a blue border.

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If you click on a module without clicking on a connection, all modules connected to it will be highlighted. This is helpful in large algorithms.



We now want to set values for the pan *control* inputs on the stereomixer. We could do this with the Specifier Display, but, instead, double click on *stereomixer-pan2* - this will bring up the dialog box to the left. Make sure *<numeric>* is highlighted as shown at

the left and enter "1" in the box currently showing "0." Confirm that this is between the Min and Max values. Hit OK.

Similarly, enter "-1" into *stereomixer-pan3*. The preset is now set up so that *in1* is panned to the center of the stereo image (*stereomixer-pan1* has its default value of 0), *delay1* is panned to the right, and *delay2* is panned to the left.

When you have done this, hold the cursor over it and look at the *status bar* at the bottom left of the screen and confirm that it shows the new values.

Right click on *stereomixer* and select **Module Info** if you want to find how these values control panning.

Note that only a control input may be set to a numeric value - other inputs must be either connected to something else or left unconnected.

There is one remaining thing to do - we have to configure the knob. Double click on the knob module to bring up the Specifier Display.

Info	TYPE	Knob	DESCRIPTION	MIN	MAX	VISIBLE	DEFAULT
	opstart_name	knob	operator name			yes	
	ctrl out	out	control	-32768	32767	yes	
	userobject	obj	userobj			yes	
	26-char	0	menu statement			yes	
	10-char	0	8 char name			yes	
	min	0	min value	-32768	32767	yes	0
	max	0	max value	-32768	32767	yes	0
	resolution	0		0	32767	yes	0
	default	0		0	0	yes	0

Make the following changes:

- Set *26-char* to "delay %4.1f mS". This will define the text that appears on the screen. If you are curious, see [Statement Formatting](#) to see what this means.
- Set *10-char* to "delay". This will give a name to the *softkey* for this knob.
- Set *min* to 0 if it has a different value.
- Set *max* to 5000 (660 for DSP4000). This is the maximum value the knob can be set to. For this preset, it should be the same as the delay *maxdelay* setting.

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- Set *resolution* to 100. This is the amount the knob will change for each "click" of the wheel.
- Set *default* to 1000 (500 for DSP4000). This is the amount it will be set at when the preset is first loaded.

Hit the *close* button [X] on the top right to close the Specifier Display. Now use **Edit/Set Title and Author** to give a suitable title and author's name (give yourself a credit).



If an Orville is connected, use **MIDI/Send** to transmit to the Orville. You should see something like this. If you play through it, you should hear the "live" or "dry" sound in the center of the stereo image, with a one-second delay in the right speaker, and a two-second delay in the left speaker. Set the knob to 50mS (enter 50 followed by ENT on the numeric keyboard, or change *knob-default* on Vsigfile and re-send it). You will then hear a pseudo-stereo effect with a light reverb.

We can make some small improvements to this preset:

- Add a second *knob* to control stereo width.
- Add a third *knob* to give some feedback on the first *delay*.
- Put the knobs on a *menupage* so that they are all together.

To do this, add the following modules and connect them as shown on the diagram on the next page: a MENUPAGE and two PERCENTKNOBS from the INTERFACE group, a C_MULTIPLY from the CONTROL_MATH group, and, lastly, a MIX from the MIXER group.

Then, make the following changes, noting that if the Specifier Window is visible, it will display whatever module you click on - you don't have to open and close it every time:

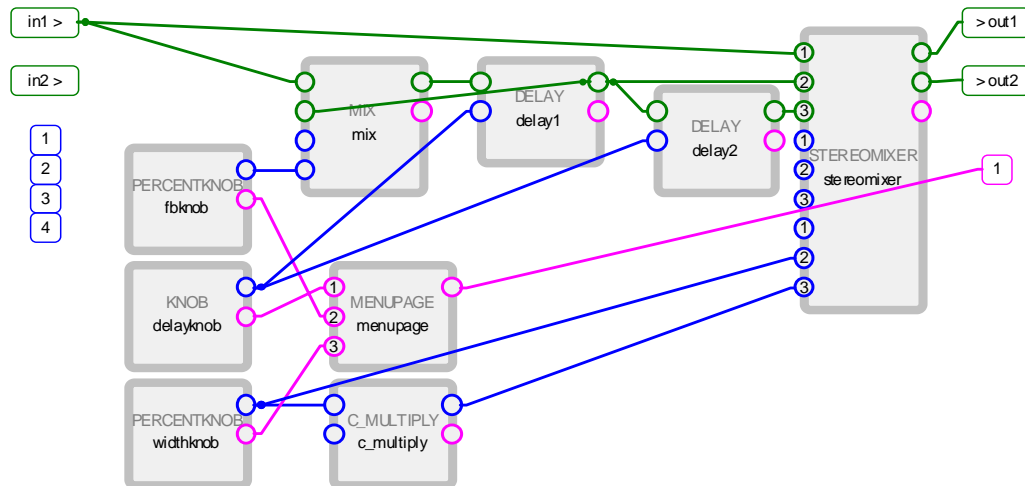
- Set *c_multiply-in2* to -1.
- Set *mix-amp1* to 1.
- Set *fbknob-20 char* to "feedback: %2.0f%%", *fbknob-max* to 100 and *fbknob-resolution* to 1. Note the double % at the end of *20 char*.
- Set *widthknob-20 char* to "width: %2.0f%%", *widthknob -max* to 100, *widthknob -resolution* to 1 and *widthknob-default* to 100.
- Set *menupage-obj_description* to "Main menu" and *menupage-obj_tag* to "Operate".

The image shows a window titled 'Vsigfile Specifier Display - menupage'. It contains a table with the following data:

Info	TYPE	MENUPAGE	DESCRIPTION	MIN	MAX	VISIBLE	DEFAULT
	opstart_name	menupage	operator name			yes	
	obj	obj	userobj			yes	
	obj_description	Main menu	description			yes	
	obj_tag	Operate	8 char name			yes	
	nsubuops	3	# entries	0	100	yes	0
	obj1	delayknob-obj				yes	
	obj2	fbknob-obj				yes	
	obj3	widthknob-obj				yes	

Here is the Specifier Display for *menupage* showing the above changes. Note the [+] and [-] buttons on *obj1* to *3*. These are there because these are *repeating fields* and the buttons allow you to add or remove them.

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The purpose of the *menupage* is to combine the three *knobs* on to one screen. Otherwise, we could connect them to the square *userobject* connections at the right (these are *repeating fields* as shown by the numbers inside them, so we could add more). This would then give us one *knob* per *softkey*, which would be fine in this preset, but inconvenient in a larger one.

The pan input for the first *stereomixer* channel is left at its default value (0). This puts the dry signal at stereo center. The range of *widthknob* (*min* to *max*) is from 0 to 1 (100%), which pans the first delay output from center (0) to right (1). The *c_multiply* multiplies this by -1, causing *stereomixer-pan3* to range from 0 to -1, panning the second delay output from center (0) to left (-1). This means that as the *widthknob* output varies from 0 to 100%, the delayed channels move from center to left and right, thus changing the stereo width of the output. Try setting *delay* at 20mS and *feedback* at 20% - this produces a simple stereo reverb with a variable image width.

If you don't wish to make the above changes and you are reading this as an Adobe® Acrobat document, there is another alternative - the text below is the *sigfile* representation of our preset. Select the Acrobat *text select tool* (T) and highlight the text below by clicking on its start and dragging the mouse to just after the last "Orville". Use **Edit/Copy** (or Ctrl+C) to copy this to the clipboard. Open a new document in Vsigfile and use **Edit/Paste** (or Ctrl+V) to paste it into the document. Then (if necessary) change to graphics mode and you will see it.

```
HEADM adc 2 2 stereomixer-left stereomixer-right Pandelay Empty 1 menupage-obj ;=25,25,100,0
KNOB delayknob "delay %4.1f mS" delay 0 5000 100 1000 ;=100,225,100,0
MIX mix adc-in1 delay1-out 1 fbknob-out ;=250,50,100,0
C_MULTIPPLY c_multiply widthknob-out -1 ;=275,325,100,0
DELAY delay1 5000 mix-out delayknob-out ;=400,50,100,0
DELAY delay2 5000 delay1-out delayknob-out ;=550,75,100,0
PERCENTKNOB widthknob "width: %2.0f%" 0 0 100 1 100 ;=100,325,100,0
PERCENTKNOB fbknob "feedback: %2.0f%" 0 0 100 1 0 ;=100,125,100,0
MENUPAGE menupage "Main menu" Operate 3 delayknob-obj fbknob-obj widthknob-obj ;=275,225,100,0
STEREOMIXER stereomixer 3 adc-in1 delay1-out delay2-out -3 -3 -3 0 widthknob-out c_multiply-out ;=675,25,100,0
TAIL Orville
```

If an Orville is connected, amuse yourself by experimenting with the *parameter* settings for a while. If you get a combination that you like, select **MIDI/Update Params** and any changes to the settings will be speedily copied back to Vsigfile.

That's enough playing for now - let's move on to a deeper understanding.

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Reference

Almost all of the following commands can be "undone" by use of the **Edit/Undo** menu command (Ctrl+Z). The **Edit/Undo** menu will show the previous command that will be undone by using the undo feature. Commands can be undone for as many as 100 previous actions.

Where a reference is made to "dragging" with the mouse, this means that the left mouse button should be held down while the mouse is moved. The [right mouse button](#) can be used to bring up a context-sensitive menu of useful commands.

Some commands are labeled as **ADVANCED** - the beginner should avoid these until he or she gains confidence. The functions of some of these commands are beyond the scope of this document.

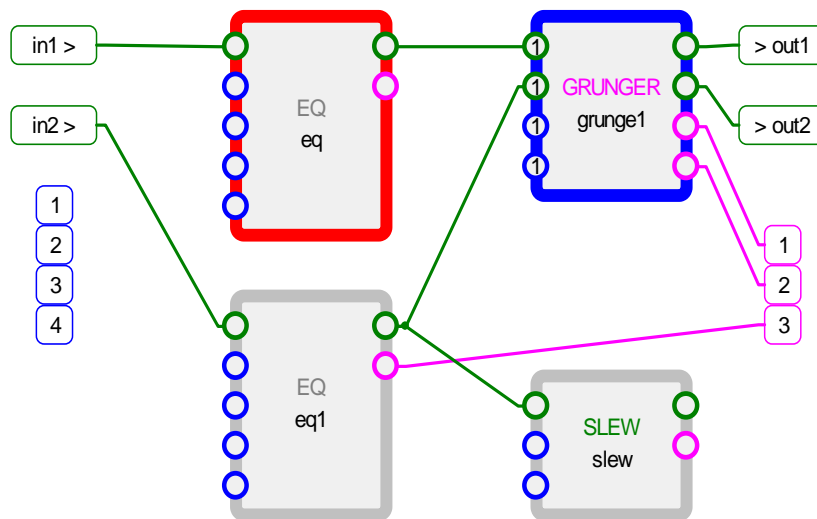
The Display in Sigfile mode

```
1  HEADM "adc" 2 2 mix-out mix-out "Empty" "Empty" 1 adc-nullobj
2  EQ "eq" adc-in1 1000 1 0 0
3  EQ "eq1" adc-in2 1000 1 0 0
4  NEW_SUPERMOD2 "new_supermod2" 1 eq-out -3 1 eq1-out -3
7  C_DIVIDE "c_divide" 0 0
8  C_AND "c_and" c_divide-out 0
9  MIX "mix" new_supermod2/M11-out new_supermod2/M12-out 0.5 0.5
10 TAIL "tail"
```

- This appears as a simple text display.
- The HEAD and TAIL modules are always present and are created when a new document is opened.
- Values in "double quotes" are text, while others are numeric or *inputs*.
- The first field on each line is the module NAME (note uppercase) or, more accurately, its *type*. An algorithm may contain multiple modules with the same NAME, as above.
- The second field on each line is the module *name* (note lowercase). This is the name for this *instance* of the module. No two modules in an algorithm may have the same name - Vsigfile will make sure of this.
- A module whose NAME is **red** is selected.
- A module whose NAME is **blue** is highlighted on account of being connected to a selected module.
- A module whose NAME is **green** has nothing connected to its outputs and is probably performing no function.
- **ADVANCED** A module whose NAME is **violet** is a [supermodule](#), a compound module that is itself comprised of other modules.
- An *input* whose text is **brown** is connected to an unknown *output*. This can only occur when loading a faulty sigfile and is displayed to indicate the faulty connection.
- All these colors can be changed to suit individual [preferences](#).
- The display can be [zoomed](#) larger or smaller, and the [font](#) can be changed.

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The Display in Graphics mode



- Each of the four blocks is a *module*.
- The round symbols on each *module's* border are *connectors*, some of which are shown connected to other connectors.
- The **green** oblongs at the top left are the inputs to the *algorithm*, those at the top right are the outputs.
- The **blue** numbered blocks on the left are auxiliary *control* inputs to the algorithm, which can be driven by the C_BRIDGE module.
- The **violet** numbered blocks on the right are *userobject outputs* from the algorithm. Each one of these corresponds to one of the *softkeys* on the Orville front panel.
- The capitalized text field in the center of each module is the NAME (note uppercase) or, more accurately, the module type. An algorithm can contain multiple modules with the same NAME, as shown above.
- The lower case text field on each module is the *name* (note lowercase) for that *instance* of the module. No two modules can have the same *name* - Vsigfile will make sure of this. This field can be edited by double clicking on it.
- A module whose NAME is **red** is *selected*.
- A module whose NAME is **blue** is *highlighted* on account of being connected to a selected module.
- A module whose NAME is **green** has nothing connected to its outputs and is probably performing no function.
- **ADVANCED** A module whose NAME is **violet** is a *supermodule*, a compound module that is itself comprised of other modules.
- All these colors can be changed to suit individual [preferences](#).
- The display can be [zoomed](#) larger or smaller, and the [font](#) can be changed.
- **ADVANCED** users can configure [bitmap](#) files to replace the normal module graphic.

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Using the Mouse in Sigfile mode

Selecting Fields

A field is any selectable word (or a number of words inside "double quotes") on the *sigfile* line. It can be selected by clicking on it. If the field is an *input* or an *output*, any modules connected to it will then be highlighted with their names drawn in **blue**. A text field will be displayed in double quotes, while a numeric will be displayed as is. Any field displayed in **light gray**, or the NAME of a module, cannot be directly edited.

Editing Fields and Connections

Double click on any editable field and an edit box will appear, allowing you to change it. If the field is an *input*, the box will contain the names of all appropriate *outputs*, from which you may select one.

Deleting Connections

In sigfile mode, a connection cannot be deleted - everything is always connected to something in order to provide a *place holder*. An unused connector is connected as follows:

- *Signal* - connected to <adc>-null, where <adc> is the name of the HEAD or HEADM module.
- *Userobject* - connected to <adc>-nullobj, where <adc> is the name of the HEAD or HEADM module.
- *Control* - connected to 0. Very old sigfiles (DSP4000 V1.0) may show unused control inputs connected to <adc>-zero.

Adding Repeating Fields

A repeating field may be added to a group by selecting another one in the same group and pressing **Ctrl+A**. The new one will be numbered one higher than the selected one, with the higher numbered fields renumbered accordingly.

Deleting Repeated Fields

A repeating field (and the connection to it) may be deleted by selecting it and hitting the **Del** key. The last remaining repeating field in a group may not be deleted.

Selecting Modules

A single module may be selected by clicking on its NAME (the leftmost field). The name will then be drawn in **red** and any modules connected to this selected module will have their names drawn in **blue**.

Selecting Multiple Modules

Multiple modules may be selected individually by holding down the **Ctrl** key before clicking on each, or, as a range, by clicking on the start of the range and then holding down the **Shift** key

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before clicking on the end of the range. All the modules including and between the two clicked modules will then be selected.

Individual selected modules may be removed from a multiple selection by clicking on them with the **Ctrl** key held down. Clicking on one of them without holding down the **Ctrl** key will deselect all the others.

Moving Modules

If one or more modules are selected, their positions in the sigfile may be changed by holding down the mouse button, and, without releasing the button, moving to another position in the sigfile before releasing the button. The insert point will be indicated by a horizontal line at the mouse position. This provides a way to [re-order](#) them.

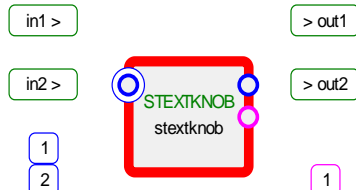
If multiple modules have been selected, it will be necessary to hold down the Shift key before clicking on one of them to move, to avoid deselecting the others.

Deleting Modules

The selected modules may be deleted by hitting the **Del** key. Note that the HEAD (HEADM) and TAIL modules may not be deleted.

Using the Mouse in graphics mode

Selecting Connectors



Connectors are the circles on either side of the module. They are color-coded - **green** is *signal*, **blue** is *control* and **violet** is *misc* (*userobject*). Click on one to select it. A larger circle will appear around it to show that it is selected. Any modules connected to the selected connector will then be highlighted with blue borders.

Deselect a selected connector by selecting another one, or by clicking on empty space.

Making Connections

Connections may be made in one of three ways:

- Double clicking on an *input* connector and selecting from the list of options.
- Clicking on a connector and then *dragging* the mouse (with the button held down) to another suitable connector. Suitable connectors will highlight as the mouse passes over them. Any *input* may only be connected to one *output*, but an *output* may feed any number of *inputs*.
- **ADVANCED** If a connector is selected with the mouse button held down and the **Shift** key is then held down, connectors of the *same* type will be highlighted if already connected. If the mouse is released, the following will occur:
 - For *inputs*, the connection will be made to the *output* currently connected to the *input* over which the mouse is released.

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- For *outputs*, the connection will be made to the *input* currently connected to the *output* over which the mouse is released. The current connection will be removed. If more than one *input* is connected to the *output*, a list will appear to enable selection of the desired *input*.

Deleting Connections

A connection may be deleted by selecting it and then hitting the **Del** key on the keyboard. But, note that this will delete all connections to an output and will also delete repeating fields (see below).

Adding Repeating Fields

A repeating field may be added to a group by selecting another one in the same group and pressing **Ctrl+A**. The new field will be numbered one higher than the selected one, while higher numbered fields in the same group will be renumbered.

Deleting Repeated Fields

A repeating field (and the connection to it) may be deleted by selecting it and hitting the **Del** key, causing higher numbered fields in the same group to be renumbered. The last remaining repeating field in a group may not be deleted.

Making Connections to Repeating Fields

A repeating field connector (one with a number inside it) may be connected in the same way as any other connector.

If a connection is made to a repeating field with the **Ctrl** key held down, an additional repeating field will be added and the connection made to it. It will be numbered one higher than the one over which the mouse was released, while higher numbered fields in the same group will be renumbered.

Selecting Modules

Left click on a module to select it. Click on another module or on empty space to deselect it.

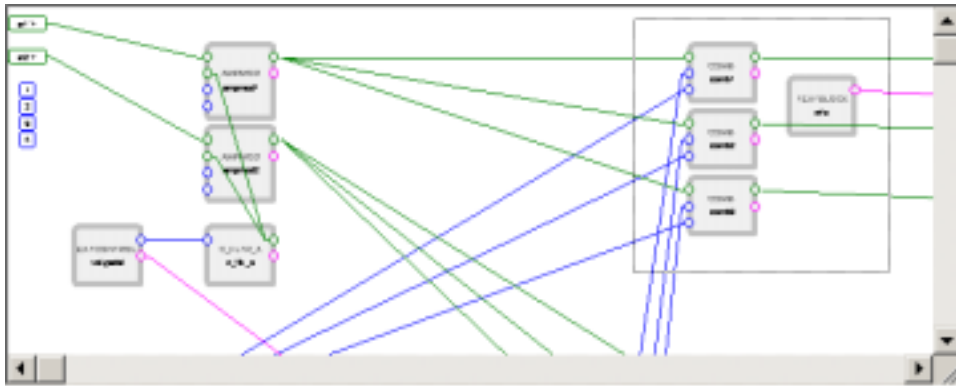
When a module is selected, its border will become **red** and any other modules connected to it will have **blue** borders.

Selecting Multiple Modules

Multiple modules may be selected in one of two ways:

- Select the first one and then hold down either the **Ctrl** or **Shift** key before clicking on the remainder.

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- "Marquee" selection - click on an empty area of screen at the top left of the modules to be selected, then drag the mouse to an area of empty screen at the bottom right of the modules to be selected and release it. All modules fully enclosed by the dotted rectangle created by this operation will then be selected.

Individual modules may be removed from a multiple selection by clicking on them with the **Ctrl** or **Shift** key held down. If multiple modules are selected, clicking on *one* of them will not change the selection.

Deleting Modules

The selected modules may be deleted by hitting the **Del** key.

Moving Modules

The selected modules may be moved by dragging them to a new position with the mouse.

Copying Modules

The selected modules may be copied by dragging them to a new position with the mouse and then holding down the **Ctrl** key before the mouse button is released. All internal connections will be preserved in the copy, and any connections from outside the copied module(s) to *inputs* inside will also be preserved. Connections from the copied modules to outside *inputs* will be lost (this is necessary because an input may only connect to one output at a time).

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Menu Commands

[File Menu](#) [Edit Menu](#) [View Menu](#) [Zoom Menu](#)
[MIDI Menu](#) [Preferences Menu](#) [Positioning Menu](#) [Supermod Menu](#)
[Tools Menu](#) [Window Menu](#) [Help Menu](#)

Menu commands are context-sensitive - those that are *grayed* are not appropriate for the current setting. This usually depends on the current state of the document or what, if anything, is selected. For example, in the File Menu below, the Save command is *grayed*, probably because no changes have been made since it was last saved or loaded, so saving again would make little sense.

The text of the right-hand side of the menu shows key sequences (known as *accelerator* keys) which perform the same function as the menu command.

The File Menu

File	Edit	View	Zoom	MIDI	Preferences	other menus
New					Ctrl+N	Opens a new (empty) document
Open...					Ctrl+O	Opens a document previously saved to disk
Close						Closes the current document. Will warn if changes made
Save					Ctrl+S	Saves the current document to disk.
Save As...						Saves the current document to disk under a new name
Send as mail						Sends the current document by e-mail (where supported)
Print...					Ctrl+P	Prints the current document. See Printing
Print Preview						Shows how the current document will look when printed
Print Setup...						Sets up the printer
1 C:\data\...\plague5.sif						This is a list of the most recently used files. Clicking on one of them will open it in Vsigfile
2 C:\data\...\VSIKFILE\my2nd.sif						
3 C:\data\...\my2nd_improved.sif						
4 C:\data\...\debug\untitled.sif						
5 C:\data\...\BPM ResoChords.sif						
6 C:\data\...\untitled.sif						
7 C:\data\...\midiplay.sif						
8 C:\data\...\debug\untitled.sig						
Exit						Closes Vsigfile. Will prompt if any documents have been changed and not saved.

Vsigfile supports two different file types. See [File Types used by Vsigfile](#) for more information.

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The Edit Menu

Edit	View	Zoom	MIDI	Preference	other menus
Undo				Ctrl+Z	Undo the last command as shown
Cut				Ctrl+X	Copy the selection to the clipboard then delete it
Copy				Ctrl+C	Copy the selection to the clipboard
Paste				Ctrl+V	Paste from the clipboard into the document
Select All					Select all modules
Select Highlights					Add all highlighted (blue border) modules to the current selection
Add Module				Ctrl+A	Add a new module
Delete Module				Del	Delete the current selected module(s)
Add Repeating Field				Ctrl+A	Add a repeating field to the group containing the selected field
Delete Repeating Field				Del	Delete the selected repeating field
re-Position					Re-position all the modules automatically
re-Order					Re-order all the modules automatically
Add Comment					Add a comment line to the document
Remove All Comments					Delete all comment lines from the document.
Module Specific..					This command varies according to the module selected.
Set Title and Author					Set the title and/or author for the current document.
Statement					Edit a knob's statement field

Undo

Undo the last command. The command to be undone will be displayed in the menu. Approximately the previous 100 commands can be undone.

Cut

[Copy](#) the selection to the clipboard then delete it from the document.

Copy

Copies the current selection to the clipboard from where it may be pasted back into Vsigfile or another application. Exactly what is copied will depend on the current selection:

- If a field is selected, its contents are copied as text.
- If one or more modules are selected, they are copied as a fragment of a sigfile. Note that if this is pasted into anything other than Vsigfile, it will lose those features not supported by [sigfiles](#).
- If nothing is selected, the entire document window is copied, at the current Zoom level, as an Enhanced Windows Metafile graphic, which may be inserted into a document produced by

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Word™ or other applications, giving a high-quality scalable picture. It will usually be necessary to use **Paste Special** on the target application to select the metafile for import. Note that some older applications cannot successfully import Enhanced Metafiles. The graphics mode diagrams in this document were all created by pasting in Enhanced Metafiles.

Paste

Paste the contents of the clipboard into the document. How this is interpreted depends upon the current selection:

- If a field is selected, the clipboard contents are copied to the field as text.
- If one or more modules is selected, the clipboard contents are copied to the document as a fragment of a sigfile, inserted immediately after the selected module.

It is possible to use a [Copy](#) followed by a Paste to duplicate modules - this will preserve internal connections between copied modules but will lose all external connections. It is recommended that [drag-and-drop](#) copying be used instead.

Select All

This command selects the entire algorithm, usually as a prelude to a [copy](#) operation.

Select Highlights

This command adds all the highlighted (blue border) modules to the current selection. This is useful to quickly select a module and everything connected to it, as a prelude for deletion or making a supermodule.

Add Module

Add one or more new modules to the current algorithm. See [Add Modules Dialog](#) for more information.

Delete Module

Delete the current selected module(s). This command can also be used to delete [comments](#).

Add Repeating Field

Add a [repeating field](#) to the group containing the selected field. The new field will be added immediately after the selected one, and higher numbered fields in the same group will be renumbered appropriately.

Delete Repeating Field

Delete the selected repeating field. Higher numbered fields in the same group will be renumbered appropriately.

Re-Position

Automatically repositions all the modules in graphics mode, with signal connections at the top and userobjects at the bottom. This may not always give optimum positioning, but is a real time-saver when starting from a text-only sigfile or a remote download.

Re-Order

Re-order all the modules automatically to reduce delays in the signal path. See [The importance of module order](#) for more information on ordering.

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Add comment

Add a comment line to the document immediately after the selected module. This can contain whatever information you desire.

Set Title and Author

Set the title and/or author's name for the current document.

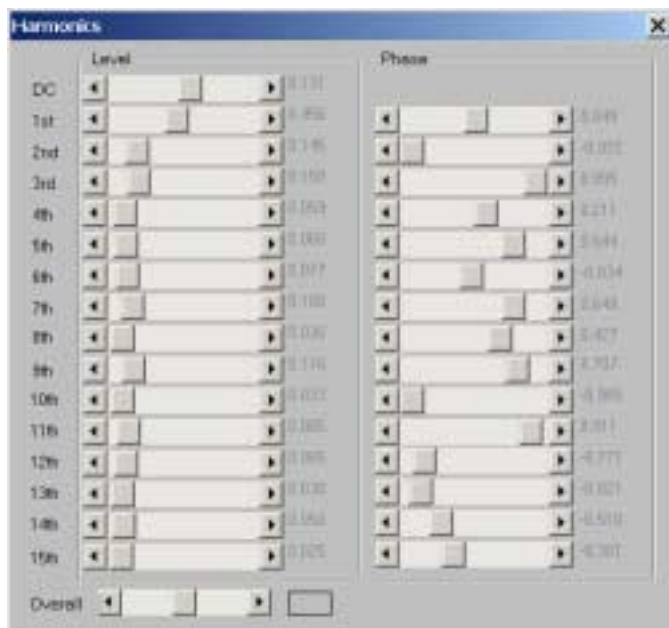
Statement

Edit a knob's [statement](#) field.

Module Specific

This is a place holder for commands that vary with the module selected. Currently these allow easier editing of TEXTBLOCK, WAVEFORM, CURVE and C_CURVE modules.

Below is the Harmonics window from the WAVEFORM editor.



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The View Menu

View	Zoom	MIDI	Pref	other menus
✓ Toolbar				Show Toolbar.
✓ Status Bar				Show Status Bar.
✓ as Sigfile				Show document in sigfile form.
as Graphic				Show document in graphics form.
✓ Show Audio				Show Audio (signal) connections/fields.
✓ Show Control				Show Control connections/fields.
✓ Show Misc				Show Misc (userobject) connections/fields.
✓ Show Unconnects				Show unconnected connectors/fields.
✓ Show All				Show all connectors/fields.
✓ Show Line Numbers				Show line numbers in sigfile mode.
Show All Fields				Show all connectors/fields of the current selected module, even if hidden.

Toolbar

Show or hide the Toolbar. This is the row of icons underneath the main menu.

Status Bar

Show or hide the Status Bar. This is the message bar at the bottom of the window.

As Sigfile

Show document in [sigfile](#) form.

As Graphic

Show document in [graphics](#) form.

Show Audio

Show or hide Audio (signal) connections and fields. This may be useful in making a dense algorithm more understandable.

Show Control

Show or hide Control connections and fields. This may be useful in making a dense algorithm more understandable.

Show Misc

Show or hide Misc (userobject) connections and fields. This may be useful in making a dense algorithm more understandable.

Show Unconnects

Show or hide unconnected connectors/fields. This command will also show or hide any modules with no visible connections in the current view mode.

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Show All

This command is a time-saver that will turn all the previous show modes ON.

Show Line Numbers

Show line numbers in sigfile mode. These are useful when interpreting error messages from a remote system. Note that:

- Comments are not numbered - they are not sent to the remote system.
- Supermodules will cause jumps in the visible numbered sequence.

Show All Fields/Show Field/Hide Field

If a module is currently selected, this command will show all its connectors and normally visible fields, even if hidden. It is intended as a time-saver, to remove the need to turn them all on individually. This command will be mainly used with [supermodules](#).

If a connector (field) is currently selected, this command will toggle its visibility, i.e., alternately hide it and then reveal it. Note that a hidden field can only be seen, and hence selected, when editing a supermodule.

The Zoom Menu

Zoom	MIDI	Preferences
In		Alt+
Out		Alt-
To Fit		
Show Selected		
Show Highlights		

[other menus](#)

Zoom in (make things bigger)

Zoom out (to see more)

Make the whole algorithm fill the page

Make the selected modules fill the page

Make the highlighted modules fill the page

In

Zoom in to make things bigger. In graphics mode, this command will double the size of a module, while in sigfile mode it is necessary to zoom in twice to double the size.

Out

Zoom out in order to see more of the algorithm at the same time.

To Fit

Change the zoom setting to make the whole algorithm fill the document window.

Show Selected

Change the zoom setting to make the selected modules fill the document window.

Show Highlights

Make the highlighted modules fill the document window, in order to see all the modules connected to the selected module.

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The MIDI Menu

MIDI	Preferences	Positioning	Superl	other menus
Get		Ctrl+Shift+G		Get an algorithm from a remote system to the current document.
Send		Ctrl+Shift+S		Send current algorithm to a remote system
Add MIDI Controller				Add a simulated MIDI Constant Controller
Update params				Update the algorithm parameters from a remote system.
Disconnect				Disconnect from the communication link.
<input checked="" type="checkbox"/> Auto Disconnect				Disconnect after 10 seconds inaction.
Add *remote*				Add a remote controller to the selected knob.
Get User Files				Get an archive of the User Files from the remote system
Get Setup				Get an archive of the Setup Data from the remote system
Send User Files				Send an archive of the User Files to the remote system
Send Setup				Send an archive of the Setup Data to the remote system

Note that the communications must be [configured](#) correctly for these commands to operate.

Get

Get an algorithm from a remote system to the current document. This will delete the contents of the current document.

Send

Send the current algorithm to the remote system. This will replace the loaded algorithm on the remote system if it is accepted. See also [Resources used by an Algorithm](#) for advice on what to do if it is not accepted.

Add MIDI Controller



Add a simulated MIDI Constant Controller. This allows you to exercise any remote control aspects of your preset. It is doubly useful when communicating over RS232 or Eve/Net, as it allows MIDI-type remote control without tying up the MIDI channel.

Update Params

This command allows you to update the algorithm parameters from a remote system. Typically, one would download a preset, and then 'tweak' the parameters by ear. Using this command means that the PC copy can be updated automatically, without having to enter the changes by hand. For obvious reasons, the algorithm on the remote system and on the PC must be identical (apart from parameter values) for this command to be useful - if they are not, an error will be reported.

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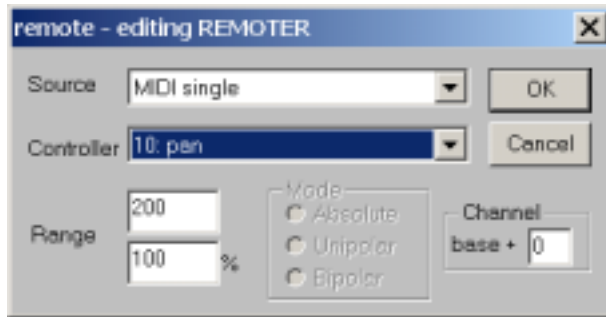
Disconnect

Disconnect from the communication link. This allows other applications to use it - for example, if you are using Vsigfile and also a PC-based MIDI sequencer, only one of them can use the PC's MIDI hardware at any one time. The next Vsigfile MIDI command will reconnect after a slight delay, assuming the communications channel is available.

Auto Disconnect

Automatically disconnects after 10 seconds without any communications activity.

Add Remote



Add a remote controller to the selected knob. This will add either an N_EXTCON or a REMOTER as appropriate, and then bring up a configuration dialog allowing you to set the source and parameters. Note that you can only add a remote to a knob, and the knob must be already connected to its destination, as well as having suitable maximum and minimum values established. This dialog can also be found by selecting the REMOTER or

N_EXTCON and then selecting Edit/edit REMOTER (N_EXTCON). It is unwise to attempt to set the parameters of these modules by hand.

Note that the "Mode" parameters on the dialog will only be available (not grayed) for Orville software greater than 2.750.

Get User Files

Get an archive of the User Files from the remote system. This can be used as a way to provide a remote backup, but see the warnings below.

Get Setup

Get an archive of the Setup Data from the remote system.

Send User Files

Send a saved archive of the User Files to the remote system.

WARNING: If the saved archive has been corrupted in some way, it will over-write the files in the remote system with corrupted data, probably causing them to be lost. This should only be done as a last resort.

Send Setup

Send a saved archive of the Setup Data to the remote system. See the warning above.

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The Preferences Menu

Preferences	Positioning
User Setup	
Comms	
Font	
High Samp Rates	
✓ Normal Samp Rates	

[other menus](#)

Allows you to [customize](#) a range of parameters, colors, etc.

Set up the [communications](#) device and parameters

Change the screen font for both sigfile and graphics modes

Select 96k sampling for certain rare modules [ADVANCED]

Select 48k sampling for certain rare modules [ADVANCED]

User Setup

Brings up the [User Setup](#) dialog, which allows you to customize a range of parameters and screen colors.

Comms Setup

Allows you to set up the [communications](#) device and parameters.

Font

Allows you to change the screen font for both *sigfile* and *graphics* modes.

High Samp Rates

Select 96k sampling for certain rare modules [ADVANCED]

Low Samp Rates

Select 48k sampling for certain rare modules [ADVANCED]

The Positioning Menu

Positioning	SuperMod	Tools
Align Top		
Align Left		
Space evenly horizontally		
Space evenly vertically		
Conform to grid		

[other menus](#)

Move the selected modules so their top edges line up with last selected

Move the selected modules so their left edges line up with last selected

Space the selected modules evenly horizontally in their current space

Space the selected modules evenly vertically in their current space

Move the selected modules to the nearest grid position

Align Top

Move the selected modules so their top edges line up with that of the last module selected.

Align Left

Move the selected modules so their left edges line up with that of the last module selected.

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Space Evenly Horizontally

Space the selected modules evenly in the horizontal direction. The leftmost and rightmost modules will remain in place, while the remaining modules will be spaced evenly between them. This command will space the modules according to the current [grid](#) setting.

Space Evenly Vertically

Similar to the above, but the modules are spaced vertically.

Conform to Grid

Move the selected modules to the nearest [grid](#) position. This usually only needs to be done if the grid has changed.

The Supermod Menu **ADVANCED**

SuperMod	Tools	Window	other menus
Create Supermodule			Create a supermodule from the selected modules
Break Apart			Break up a supermodule into its constituent modules
Create from File			Create a supermodule from a saved algorithm
Save to File			Save a supermodule to a file as an algorithm
Add to Library			Add a supermodule to the Library
Get from Library			Load a supermodule from the Library
Rename			Rename or add a comment or substitution strings to a supermodule
Edit			Edit a supermodule in a new window
Hide Internals			Hide all connectors that do not have external connections.
Make External			Make the selected connector an external entry point
Update Siblings			Update all supermodules in the file with the same name as the selected one
Update from Library			Update the selected supermodule from the Library

Create Supermodule

Create a [supermodule](#) from the selected modules. All *internal* (those not connected to a point outside the selected modules) connections will be hidden.

Break Apart

Break up a supermodule into its constituent modules. Any [substitution strings](#) will be translated. Note that the description (if any) and the definitions of any substitution strings will be lost.

Create from File

Create a supermodule from a saved algorithm.

Save to File

Save the current selected supermodule to a disk file as an algorithm.

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Add to Library

Add the current selected supermodule to the [Library](#). You can choose the Library group to which the module is to be added, and can create a new group, if desired.

Get from Library

Load a supermodule from the Library. This command is similar to [Add Modules](#), but only shows Library supermodules.

Rename

This command brings up the [Supermodule Rename Dialog](#), allowing you to rename or add a description or [substitution strings](#) to the current selected supermodule.

Edit

This command opens and expands the current selected supermodule in a new window, allowing it to be inspected or edited. Any changes can be saved when the window is closed. Supermodules within the edited one can themselves be edited, ad infinitum.

Hide Internals

Hide all connectors that do not have [external](#) connections.

Make External

Make the selected connector an [external](#) entry point.

Update Siblings

Update all supermodules in the current file with the same NAME as the selected one. This in effect replaces all other supermodules with the same NAME with the current one, while preserving the description, any [substitution strings](#) and [external](#) connections.

Update from Library

Update the selected supermodule from the [Library](#). This in effect replaces the selected supermodule with a copy of the one in the Library, while preserving all [substitution strings](#) and [external](#) connections. The description will be replaced with that from the Library version.

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The Bitmap Menu **ADVANCED**

Bitmaps	Tools	Window	H	other menus
Change Bitmap Size				Allows you to change the bitmap size
Set Connector Position				Reposition a connector to suit the bitmap
Edit Bitmap				Edit a bitmap using an external bitmap editor
Choose Bitmap				Attach a bitmap to the selected module type
Setup Bitmap				Set up the bitmap for the selected module
Delete Bitmap				Delete the bitmap for the selected module type

Change Bitmap Size

This command adds a *sizing rectangle* to the currently selected module, which allows you to change the size of the bitmap by dragging the sizing blocks at its corners or edges. The sizing rectangle will be removed if another module (or empty space) is clicked. If the bitmap has been set up to preserve its [aspect ratio](#), only the corner blocks will appear, and the width and height will change together.



The scaling can also be set numerically using the [The Bitmap Setup Dialog](#).

If a connector of the selected module is selected while the sizing rectangle is visible, it may be dragged to a different position on the graphic, while, if it is double clicked, the [Bitmap Connector Dialog](#) will appear, allowing the connector's position to be set to a numeric value.

Set Connector Position

Causes the [Bitmap Connector Dialog](#) to appear, allowing the selected connector's position to be set to a numeric value. It also allows the connector's circle to be hidden.

Edit Bitmap

Edit the bitmap associated with the selected module type using an external bitmap editor. The name and location of this editor can be set on the [Bitmap Setup Dialog](#).

Choose Bitmap

You are able to select a bitmap file from any of those available, which will then be copied to the [Bitmaps](#) folder and associated with all modules of the same NAME (type) as the selected one.

Setup Bitmap

Brings up the [Bitmap Setup Dialog](#) for the selected module.

Delete Bitmap

This command will delete the bitmap from the [Bitmaps](#) folder for the selected module type, causing it to use the normal Vsigfile graphic. Note that this command cannot be undone - once the file is deleted, it is gone.

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The Tools Menu

Tools	Window	Help
Remove C_CONSTANTs		
Convert N_EXTCON to REMOTER		
Remove All Comments		

[other menus](#)

Remove any C_CONSTANT modules from the algorithm

Replace N_EXTCON modules with REMOTER modules

Remove all comments from the algorithm

Remove C_CONSTANTs

A C_CONSTANT is a semi-obsolete module that can be used to send a constant value to a control input. This command removes any C_CONSTANT modules from the algorithm, and enters their constant value directly to the control input connected to the C_CONSTANT. The reason to do this is to reduce the algorithm size and loading time. In those cases where a C_CONSTANT is used as a 'binding post' to send the same value to a number of control inputs, it can be replaced with a C_TO_C module, which is not sent to the Orville.

Convert N_EXTCON to REMOTER

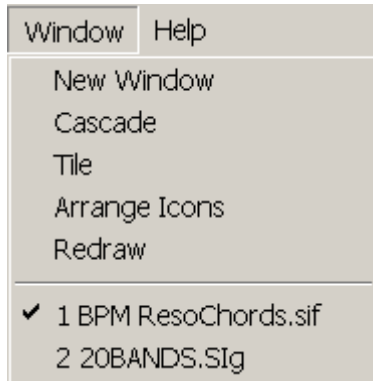
An N_EXTCON modules is used in the DSP4000 family to remote control a knob. For Orville, it should be replaced with a REMOTER module. This command will do this for you, preserving scale factors and source assignments.

Remove All Comments

This command will remove all comments from the algorithm in a single operation.

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The Window Menu



other menus

Create a new window (view) for the current document

Lay out all open windows into overlapping tiles

Lay out all open windows to fill the space without overlapping

No current function

Redraw the current document window

Change the current active document (ticked ✓) to another by clicking on its name. This is the same as clicking on the actual document window.

New Window

This command will create a new window (view) for the current document. It is useful for large algorithms where you wish to have access to different areas at the same time without needing to constantly scroll between them. The Zoom factor will be the same for each window, as this is stored in the algorithm.

Cascade

This command will lay out all open windows into overlapping tiles. This is mainly useful to tidy up the screen when many documents are open.

Tile

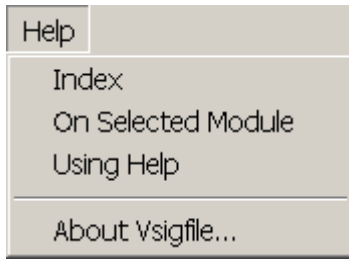
Lay out all open windows to fill the space without overlapping. This is mainly useful when it is desired to perform a side-by-side comparison of two documents.

Redraw

This command will redraw (refresh) the current document window, and is mainly useful in the event of graphics corruption.

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The Help Menu



other menus

The main table of contents for the Help System

The on-line Modules Manual page for the selected module

Information on using the Help System

Information on Vsigfile, particularly the Version Number currently running

Index

The main table of contents for the Help System

On Selected Module

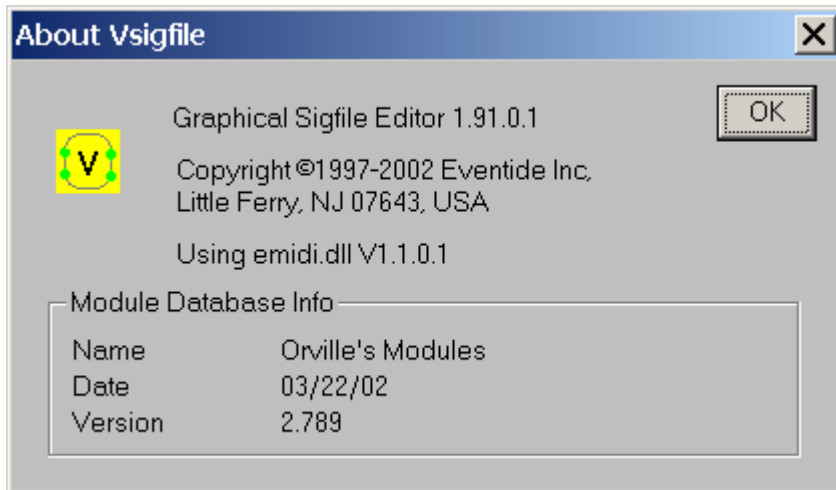
This brings up the on-line Modules Manual page for the selected module. One module at a time, please.

Using Help

Information on using the Help System

About Vsigfile

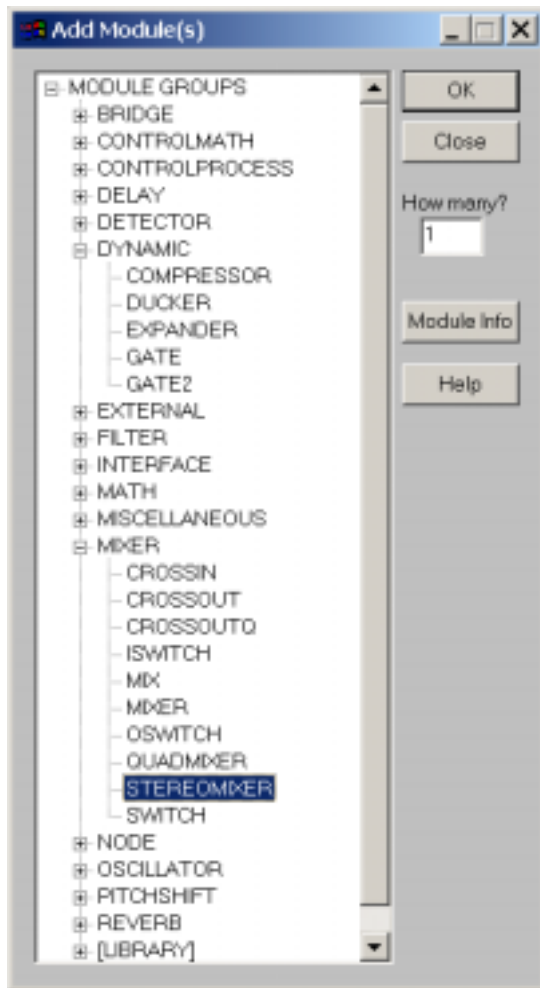
This gives information on Vsigfile, particularly the Version Number of the copy currently running, as well as the Version Number of some necessary DLLs. When running with Orville software later than 2.750, this will also give access to the Version Number of the Modules Database.



Please note that the Version Numbers above are simulated for the purpose of this document and do not necessarily refer to any valid versions of Eventide products.

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The Add Modules Dialog



The Add Module(s) Dialog may be reached via the following means:

- Select **Add Module** from the **Edit** menu.
- Click the mouse's **right button** on any module or blank space in the preset, and select **Add Module** from the context-sensitive menu.
- Hold down the "Ctrl" key on the keyboard when either a module or nothing is selected and then hit the "A" key.

The display is arranged in Module Groups in alphabetical order, with the Library and its groups (if any) at the bottom.

If a module has an associated [bitmap](#), this will be shown.

Any group may be opened by clicking on its name, at which point the last group opened in the same way will close.

A group can be opened and left open by clicking on the [+] to its right - this allows you to keep several groups open at the same time.

Clicking the name of an open group or clicking on the [-] button will close it.

Once a group is open, a module name can be highlighted as shown.

Once highlighted, one or more copies of the module can be added to the algorithm in one of the following ways:

- If double clicked, it will be added immediately after the *selected* module (if any) or just before the TAIL module. Note that the [order](#) of modules can affect the performance of the algorithm.
- If **OK** is pressed, the current highlighted module will be added as above and the dialog will close. Use **Close** to exit the dialog without adding a module.
- A single copy of the current highlighted module can be *dragged* over to the document window and released. In *sigfile* mode it will be placed in the algorithm at the cursor position, as shown by the underline. In *graphics* mode it will be placed at the position where the mouse is released, and ordered immediately after the closest module to the left of the drop position (if any) or, failing that, just before the TAIL.

The last module to be added will become *selected*.

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The Specifier Display

If a module is double clicked in *graphics* mode or its leftmost field (NAME) is double clicked in *sigfile* mode, the Specifier Display will appear. This allows convenient access to all the fields of the module, and is the only way some fields can be reached in *graphics* mode.

The Specifier Display will remain visible until the close [X] button at the top right is hit, or you click on empty space in the graphics window. It will always show the last module selected, so multiple modules may be edited without closing it.

The Specifier Display may be re-sized by clicking and dragging on its right or bottom edges. Scroll bars will appear if it is smaller than its contents.

The **Info** button may be used to access the on-line Modules manual page for the displayed module.

TYPE	STEREO MIXER	DESCRIPTION	MIN	MAX	VISIBLE	DEFAULT
opstart_name	stereomixer	operator name			yes	
ninputs	2	number inputs	2	50	yes	2
left	left	signal	-32768	32767	yes	
right	right	signal	-32768	32767	yes	
obj	obj	userobj			yes	
in1			-1	1	yes	
in2			-1	1	yes	
gain1	-3		-100	0	yes	-3
gain2	-3		-100	0	yes	-3
pan1	0		-1	1	yes	0
pan2	0		-1	1	yes	0

Fields shown in gray may not be edited. A field may be selected by clicking on it with the left mouse button, whereupon it will acquire a heavy border and, if it is editable, the text will become red, as shown above. The cursor arrow keys may be used to move the selected area.

- The first column (TYPE) shows the field name.
- The second column shows the field data, if any. If the field is an input, double clicking on it will bring up the usual Input Selection dialog, whereas if it is text or numeric, its data can be changed by selecting it and then typing in the new data. A number of vertically consecutive fields may be edited by selecting the first, typing in the new data, and then using the **Enter** key on the keyboard to select the next one.
- The small buttons in the second column are present because these are [repeating fields](#). The [+] button will add a new field immediately after it (if the maximum number has not been reached), while the [-] key will delete the corresponding field.
- The third column (DESCRIPTION) may show a description of the type or function of the field.
- The fourth and fifth columns (MIN, MAX) show the minimum and maximum values for the field.

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- The sixth column (VISIBLE) shows the *visibility* state for the field, and can be toggled by clicking on it. This is mainly useful for quickly changing the visibility of the fields of a [supermodule](#).
- The seventh column (DEFAULT) may show the default state for a field. This is the value that will be assumed if a new instance of this module is added to an algorithm.

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Printing

An algorithm may be printed in either sigfile or graphics mode, by using the [Print](#) command. The printer can be selected and configured by use of the [Setup Printer](#) command, or as part of the printing process.

Prior to printing, it is worth performing a [Print Preview](#) to see how the result will appear, as well as to avoid wasting time and paper.

Printing in Sigfile Mode

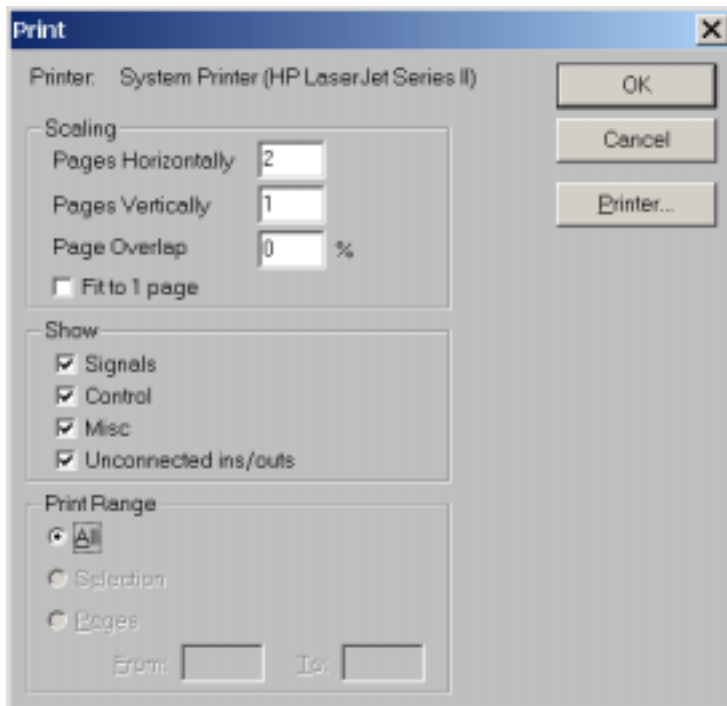
Printing in sigfile mode is much like any other Windows printing operation. The size of the text on the page is that determined by the document window (use [zoom](#) and [font](#) selection to change this), and any long lines that exceed the width of this window will be *wrapped* as they are printed.

A simple header and footer will be added showing the algorithm name, date, and page number. This cannot be customized - if you want any special print appearances, it is easy to [copy](#) and paste the entire sigfile into a Word Processor and obtain a wider range of output styles.

Printing in Graphics Mode

A graphic representation of an algorithm can be printed, using the number of pages desired. In addition, an overlap can be specified, making it easier to create a single large page from a number of printed pages. The algorithm will be printed in full color if this is supported by the printer, otherwise *signal*, *control*, and *userobject* connections are shown by different types of dotted lines. No header or footer is added, as this would make the creation of composite pages more difficult.

The dialog box below controls the appearance of the printed result:



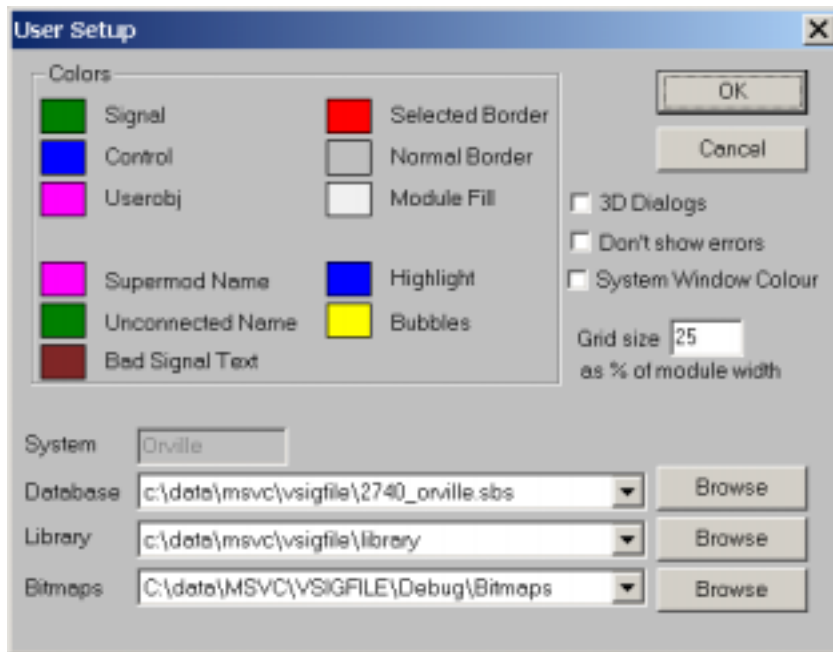
- You can define the number of horizontal and vertical pages the printed algorithm will occupy. As each number is changed, the other may change, depending on the shape of the algorithm graphic.
- The number of pages printed can be obtained from multiplying these two numbers together, i.e. 2 pages by 4 pages gives 8.
- If more than one page in either direction is selected, a page overlap may be entered, defined as a percentage of the page size.

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- By checking **Fit to One Page**, the printout may be confined to a single page, in which case the scaling will be such that the largest (horizontal or vertical) dimension of the graphic fits on the page.
- It is possible to control which types of connections and connectors are printed, in a similar form to the on-screen [view](#) menu.
- The selected printer is displayed at the top left - this can be changed or configured by use of the **Printer** button.

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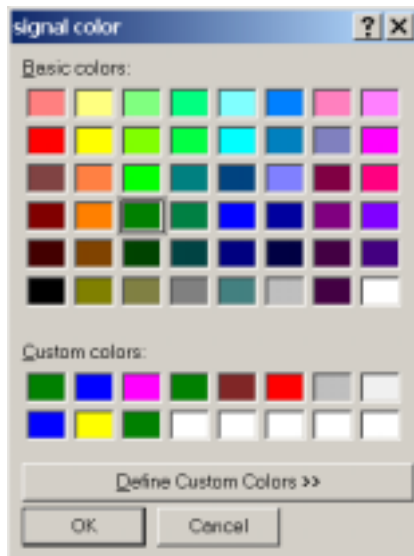
User Customization and Setup



The User Setup dialog, show above, can be reached by the [User Setup command](#). It allows a number of system parameters to be changed, as well as many of the on-screen colors. Changes to any of these values will be saved for future use. Note that some of them require Vsigfile to be restarted before they take effect. If any of these are changed, a warning will appear when **OK** is hit to exit the dialog.

The meanings of the above dialog fields are as follows:

Colors:



Clicking on one of the colored blocks will bring up a dialog box allowing you to change the color.

Signal: the color for signal connections and connectors.

Control: the color for control connections and connectors.

Userobj: the color for userobject connections and connectors.

Supermod Name: the color for a [supermodule's](#) NAME.

Unconnected Name: the color for the NAME of a module with no connections to its outputs.

Selected Border: the color for the border of a selected module in graphics mode or the NAME in sigfile mode.

Normal Border: the color for the border of an unselected module in graphics mode.

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Module fill: the color for the inside of a module in graphics mode.

Highlight: the color for the border of a highlighted module in graphics mode, or the NAME of the module in sigfile mode.

Bubbles: the color of the information bubbles (sometimes known as 'tool tips').

Other Options:

3D dialogs

Gives dialog boxes a "3D" look on some versions of Windows.

Don't show errors

Displays download errors on the Orville screen rather than on Vsigfile

System window color

Windows allows you to define the color of a window's background (right click on an empty part of the desk top, select **Properties** and then **Appearance** on the resulting dialog). Checking this box causes the Windows color to be used rather than the normal white.

Grid Size

Changes the spacing of the "snap grid" that modules are positioned on when moved. If this is large, modules will tend to "line up" automatically, while, if it is small, it will give more flexibility in positioning. It is expressed as a percentage of the width of a module.

System

This field is for information only, and shows which system (Orville, DSP4000, etc.) the current database applies to. For databases greater than 2.760, their version can be found on the [Help/About](#) Vsigfile screen.

Database

Displays and allows you to change the current database. Useful if you are working with more than one remote system or software version.

Library

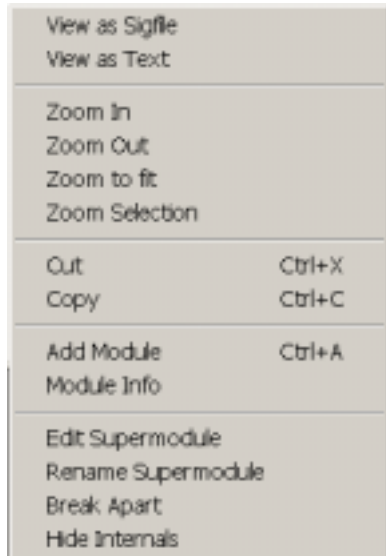
Displays and allows you to change the root folder (directory) for the current supermodule [Library](#).

Bitmaps

Displays and allows you to change the root folder (directory) for any [module bitmaps](#). Useful if you are working with different screen appearances.

Further Topics

Using the Right Mouse Button



Clicking with the right mouse button will bring up a context-sensitive menu that presents a number of useful commands. The commands that are displayed will depend upon the current screen mode and the selected module(s) or field.

As an illustration, the example menu to the left shows [supermodule](#) commands, because a supermodule was selected at the time the right button was clicked.

Right clicking will select a module, but right clicking on empty space will not deselect the current selection. This allows you to select a module and bring up the command menu with one click.

File Types Used by Vsigfile

Vsigfile supports two computer file types, differentiated by their *extensions* (the letters after and including the dot '.' in their file name):

- .SIG - this is a simple text format which can also be read by text editors and Word Processors. In appearance a .SIG file looks identical to the *sigfile* mode display. It is important to be aware that .SIG files do not support the following Vsigfile features which will be lost if an algorithm is saved in this format:

- *node* modules, i.e., A_TO_A, C_TO_C. These will be transparently removed.
- [supermodule](#) descriptions and [substitution string](#) definitions.

A .SIG file can be edited in a text editor, but this should only be done when strictly necessary, as it is easy to introduce errors that Vsigfile will not be able to correct, or, worse, produce a file that Vsigfile cannot read.

- .SIF - this is a binary format that can only be read and written by Vsigfile. It supports all Vsigfile's features.

[Bitmaps](#) are stored in the Bitmaps [folder](#) as .BMP files. These can be edited with a normal bitmap editor, such as Microsoft® Windows Paint. Each of these files may be accompanied with a file of the same name, but with the *extension* .TXT - this file contains customization information for the bitmap, such as its scaling and connector position. Manually deleting the .BMP file for a module will return it to the normal Vsigfile graphic when Vsigfile is next started, while deleting the .TXT file will return the bitmap to its default configuration.

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Using Module Bitmaps in Graphics Mode **ADVANCED**

Any module type may have a bitmapped graphic designed for it that will be displayed instead of the normal graphic. This must be a standard Windows .BMP file - other graphic formats are not supported. Normally, the bitmap should be cropped so that it has no empty border space.



This is an example using two images taken from the Eventide Web Site.

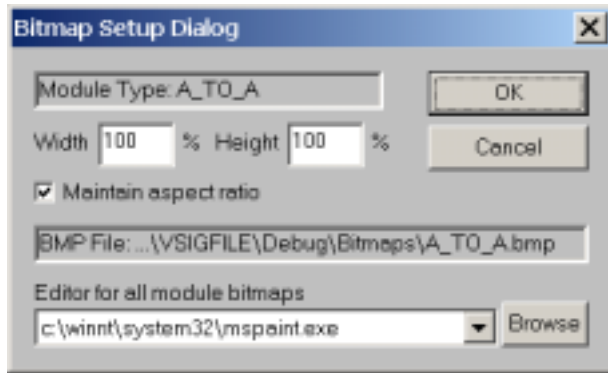
A bitmap can be associated with a module using the [Choose Bitmap](#) command. This will copy the selected file to the Bitmaps folder under the name <type>.bmp, where <type> is the module's NAME.

The images will be scaled so that the normal height of the image is the same as the height of the module it represents. This means that modules with repeating fields will increase in size and width as more fields are added.

The name and location of the Bitmaps folder can be [changed](#), allowing different sets of bitmaps to be used - select any folder with no bitmaps in it to return to normal graphics.

The use of many large bitmaps will increase Vsigfile's memory requirements and slow down screen drawing, but will not increase the size of sigfiles or affect download speed or algorithm performance.

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The Bitmap Setup Dialog

This may be summoned by selecting a bitmap module and using the [Setup Bitmap](#) command.

Bitmap Scaling(Width and Height)

Normally, the bitmap is automatically scaled so that its height is the same as the associated module. The width is scaled so as to preserve its [aspect ratio](#). This default scaling is considered to be 100%. The bitmap size can be changed from this value, either by entering numbers in this dialog, or graphically using the [Change Bitmap Size](#) command. Note that if **Maintain Aspect Ratio** is ticked, the Width and Height values will remain the same.

Maintain Aspect Ratio

The aspect ratio of a picture is the relationship between its height and width. When this box is checked, it means that this will not change, i.e., if the height is increased, the width will increase in proportion. It avoids the picture being 'stretched' or 'squashed' as its size changes. A line drawing or graphic will be more tolerant than a photograph to changes in its aspect ratio, making it easier to fit on the screen.

BMP File

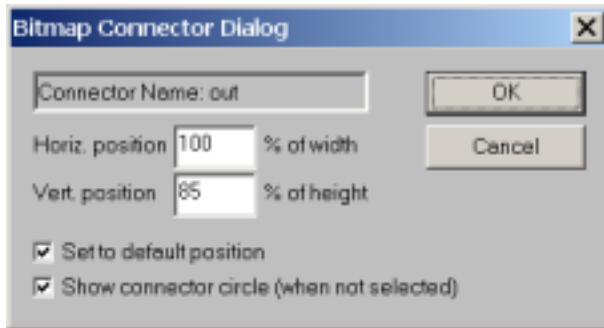
This is a reminder of the name and location of the bitmap file used for this module. The name of the file cannot be changed, and it is located in the Bitmaps [folder](#).

Editor for All Module Bitmaps

This allows the bitmap editor that is invoked by the [Edit Bitmap](#) command to be specified. The default is Microsoft Windows Paint, *mspaint.exe*. If this cannot be found in the normal position in your system, or if you wish to use a different editor, use **Browse** to locate it.

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The Bitmap Connector Dialog



This dialog is invoked by the [Set Connector Position](#) command, or by double clicking on a connector while the [Change Bitmap Size](#) sizing rectangle is visible.

The name of the selected connector is shown, as are its horizontal and vertical positions. These are expressed as a percentage of the bitmap's width and height respectively.

Set to Default Position

This box will be automatically checked when the horizontal and vertical positions are the same as if there was no bitmap, or if they had never been changed. If you manually check this box, the displayed positions will be set to these values.

Note that connectors at default positions will maintain the same absolute vertical positioning even if the bitmap size changes, while connectors whose positions have been changed (i.e. non-default) will always stay at the same place on the bitmap.

Show connector circle

If this box is checked, the normal connector circle will disappear. This may be desirable if the bitmap image already has suitable connection points. The circle will always be visible when the connector is selected.

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The Importance of Module Order

The order of the modules in the algorithm is important, as audio signals flow through the algorithm from start to finish (surprise!), and any reverse connections will incur a delay of a few samples. This delay will often be unnoticeable, but in the worst cases can be cumulative and may cause a *phasing* or "comb filter" effect. Be aware that, in a few algorithms, this delay **is** a key part of the sound, and changing the order can subtly change the quality of the effect.

In some cases, noticeably feedback loops, a reverse connection is unavoidable. However, the module(s) in the feedback loop will usually mask this delay by its very nature, so it is rarely an issue. The importance of ordering mainly lies in the creation of large algorithms, where reversed connections can have a noticeable effect.

The order of the modules in the algorithm is visible in *sigfile* mode, but, for obvious reasons, not in *graphics* mode. There is some value in dipping into *sigfile* mode to check the module ordering occasionally, even if one prefers working in *graphics* mode.

The ordering of the modules can be controlled when new modules are inserted, by knowing that a new module will be added immediately after any selected module in either mode. If no module is selected when new module is added, placing will be as follows:

- In *sigfile* mode, the module will be placed just before the TAIL module.
- In *graphics* mode, the module will be placed just after the closest module on the left-hand side of the cursor position in a *drag and drop* operation, or just before the TAIL otherwise.

With an understanding of the above, it becomes second nature to place modules in the desired order.

Note that the order of modules is mostly an issue for signal handling modules - poor ordering of control modules may slightly slow down their operation, but this is unlikely to be noticeable. In some complex control cases, however, the order of control modules does affect their function, in that changes in their outputs occur in the order in which they appear in the algorithm, so changes which are expected to occur at the same time may not do so, a situation known as a "race condition." The rule here is to avoid reverse connections, except in feedback loops, and, where possible, to avoid long forward connections.

Re-ordering an Algorithm

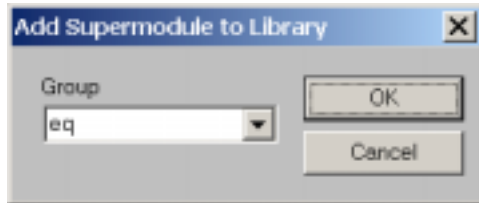
There are two ways to re-order the modules in an algorithm:

- Modules can be re-ordered automatically, by using the [Re-Order](#) command. This can be a time saver with a large algorithm, but will not always produce the optimum result.
- Modules can be re-ordered manually, by [clicking and dragging](#) them in *sigfile* mode.

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Making and Using a Library

The creation of a Library of [supermodules](#) can greatly enhance algorithm development, by allowing you to quickly build a new algorithm from tested and optimized blocks. Often a large algorithm can be created almost entirely from a few supermodules. Sensible use of [substitution strings](#) can customize the supermodules to suit the new application, and it is always possible to edit the supermodules (don't forget to [rename](#) them) if necessary.



Supermodules can be added to the Library using the [Add to Library](#) command, which allows the creation of Library Groups to further aid in their organization. You can select the group to which the supermodule is to be added from the drop-down list, or the name of a new group can be entered.

Supermodules from the Library can be added to an algorithm by use of the [Get from Library](#) command.

The Library itself is a normal Windows folder (called "Library"), normally located in the same directory as Vsigfile. It is possible to maintain multiple libraries and to select the active one from the [User Setup](#) dialog. Groups are sub-folders within the main Library folder, and the Library files are stored as *.sif* files within these folders. This means that the Library can be maintained by use of Windows Explorer® and other familiar tools.

Resources Used by an algorithm

An algorithm may use some or all of a number of types of resources. These vary from the size of the physical memory used to store the algorithm to the amount of DSP (digital signal processor) power needed to run it. Each type of resource is often subdivided, for example, the DSP power is divided into fast DSP power and slow DSP power, depending upon the speed of the memory in which the relevant DSP code runs.

For an algorithm to be able to load, all of its resource needs must be satisfied. Because Vsigfile presents no real limit to the size or complexity of an algorithm, it is possible to exceed the limits of one or more resources in the target system. Resource use is checked by the target system when the algorithm is [downloaded](#) to it, and any errors will be reported to you.

Because of the number of types of resources used and their interrelated nature, more detailed explanations of resource use are beyond the scope of this document and would only be meaningful to a small number of users. For the same reason, Vsigfile is not able to display a running total of resource usage.

If you encounter resource errors, the only answer is to remove some modules. Typically, the main resource issues are related to:

- the physical size of the algorithm. When the sigfile is downloaded, it is copied into memory and then translated into an internal binary representation. If it exceeds the maximum space in either operation, a "too big" error will result. This will usually show the line number at which the error occurred, so by enabling [line numbers](#) in *sigfile* view it is possible to see at what point the algorithm becomes "too big."

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To try to resolve the problem, first cut out any unused modules, then remove or reduce the size of TEXTBLOCKs or TEXTKNOBs, and, if this fails, optimize the algorithm to reduce the number of modules used. In general, the more fields a module has, the more space it occupies, with text fields using more space than numeric fields.

A saving can be made by using the built-in userobjects offered by many modules, rather than by adding knobs and menupages - this approach may have some cosmetic disadvantages.

- o the amount of DSP power used. This only affects those modules with *signal* (audio) inputs or outputs, as *control* and *userobject* functions do not use any DSP power. If the resource limit for DSP power is reached, the only answer is to cut out a number of DSP modules. Typically, large *reverbs* and *pitch shifters*, use more DSP power than *EQ*, *gain*, or *delay* functions, especially if many channels are enabled.

Statement Formatting

A *statement*, sometimes known as *20_char* or *26_char*, is a text string that determines how the setting or value of a *knob* or *monitor* is displayed on the Orville screen. It can be any text whatsoever (subject to being shorter than a module-dependent maximum length, typically 20 or 26 chars), as long as it contains a *variable field*, which is preceded by a percent sign '%'. In practice, the form is usually <name>: <variable field> <units>. Some examples:

"freq1: %4.2f Hz"

"gain: %2.0f dB"

"BAND: %1F"

"FEEDBACK: %2.0F %%"

"KEY: %-S"

The variable field starts with a '%' and ends in an 'f' or an 's', and is underlined in the examples above. You can experiment with these and others by using the **Statement Tester** dialog described below.

Note that the "feedback" example above has two percent signs at its end "%%". This is needed in order to *display* a percent sign and distinguish this from a *second* variable field (you are only allowed one).

This format will be familiar to students of the "C" programming language. In Vsigfile's world there are two main types of *variable field*:

Numeric:

These are used by those knobs or monitors that display a numeric value, typically KNOB, HFADER, VFADER, RFADER, SKNOB, or MONITOR. These end in 'f';

Text: These are used by those knobs or monitors that display a text value, typically TEXTKNOB, STTEXTKNOB or TMONITOR. These end in 's'.

It is important to use the correct *variable field* for the knob in use, otherwise problems ranging from un-displayed values to system crashes can result.

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Numeric Field Formats:

These have the form %[flags] [width] [,precision]f. Examples: "%2f", "%-3.3f", etc. The names in square brackets [] are optional and are described below. Note the trailing 'f' and the '.' in the *precision* field.

Flags:

One or more of '-', '0', ' ', '#', may appear following the percent sign. If present, these have the following meanings:

- The number will be left-aligned, otherwise it will be aligned to the right.
- + A plus '+' or minus '-' will always appear in front of the number, otherwise only minus signs will be displayed.
- blank* (' ') put an extra (place holder) blank in front of the number if it is positive, or a minus '-' if it is negative. This flag will be ignored if the '+' flag is present.
- # The displayed value will always contain a decimal point, otherwise the decimal point will only be shown if the *precision* value requires it.
- 0 Zeros will be added to the left of the number if it is less than *width* characters. This flag will be ignored if the '-' flag is present. If used, this flag should immediately precede the *width* field.

Width:

This is a number giving the minimum number of characters to be displayed, including any + or - signs and the decimal point. If this field is not present, a minimum width of 0 will be assumed.

If the *knob* value has fewer characters than the *width* value, blanks ' ' or zeros '0' will be added to the left or right, depending on the *flags* (see above).

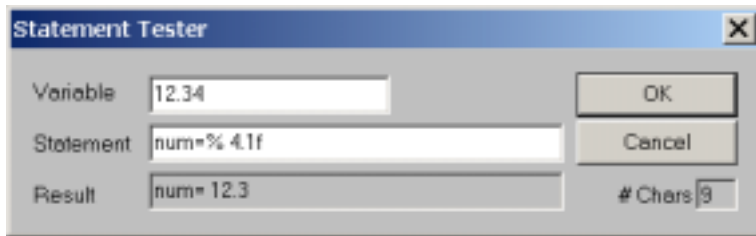
If the *knob* value has more characters than this value, they will be displayed - no characters will be lost.

This is perhaps the most important element of the *format specification*, in that it determines the width (number of characters) of the space in which the number appears, rather than just the number of digits. Careful choice of width and use of the flags makes it much easier to provide attractive screens with columns that line up.

Precision:

- o This is a number (preceded by a dot '.') giving the number of digits following the decimal point.
- o If the knob value has more digits after the decimal point than this value allows, they will be rounded to the specified number of digits.
- o If this field is either "." or ".0", no decimal point will appear.
- o If the *precision* field is not present, six digits will follow the decimal point.

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The [Statement](#) command summons the Statement Tester dialog, which is a useful way to demonstrate the functions of the above. It will also count the number of characters generated.

Text Field Formats:

These have the form `%[flags] [width]s`. Examples: `"%2s"`, `"%-10s"`, etc. The names in square brackets `[]` are optional and are described below. Note the trailing 's'.

Flags:

One or more of '-', '0', ' ', '#' may appear following the percent sign. If present, these have the following meanings:

- The text will be left-aligned, otherwise it will be aligned to the right.
- 0** Zeros will be added to the left of the text if it is less than *width* characters. If used, this flag should immediately precede the *width* field.

Width:

This is a number giving the minimum number of characters to be displayed. If this field is not present, a minimum width of 0 will be assumed.

If the *knob* value has fewer characters than the *width* value, blanks ' ' or zeros '0' will be added to the left or right, depending on the *flags* (see above).

If the *knob* value has more characters than this value, they will be displayed - no characters will be lost.

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Supermodules

A supermodule is a module which is itself made up from other modules, possibly including other supermodules. Supermodules have a number of uses:

- A complex algorithm can be made from a number of supermodules, hiding unnecessary detail and making it easier to build and maintain (and understand).
- An algorithm which has a number of repeated sections can usefully have the repeated sections created as supermodules and then copied. Changes to one supermodule can then be used to [update](#) the others, rather than having to make the changes multiple times. [Substitution strings](#) allow some customization of each instance of the supermodule.
- A [Library](#) of useful supermodules can be created, allowing new algorithms to be quickly made from tested and polished components. Changes to the Library module can be used to [update](#) algorithms using it.

Supermodules and their features can provide powerful and useful tools, but along with this power comes a degree of complexity - it is suggested that the beginner limit his or her study of supermodules until he or she gains confidence.

A supermodule is created by selecting the required modules, and then using the [Create Supermodule](#) command. All connections, connectors and fields of the component modules will then be hidden, except for those connected to points outside the supermodule. For this reason it is worth making the external connections to the modules that will comprise the supermodule first.



As part of the creation process, the ***Supermodule Rename Dialog*** will appear. It is necessary to enter a NAME for the new supermodule - this can not be the same as any other supermodule in the same document, or any supermodule in the Library. It is usually wise not to use any name that has already been used in another document, but, for obvious reasons, Vsigfile is unable to check for this.

At this time a description of the supermodule can be added, as well as any desired [substitution strings](#).

The above can be edited later, by use of the [Rename](#) command. Note that renaming a supermodule will cause any existing [bitmap](#) associations to be lost.

A supermodule can be converted back to its constituent modules by use of the [Break Apart](#) command.

Connections

A large supermodule may contain many connectors and connections, as well as numerous text fields. Because of this, it is desirable to be able to [hide](#) those whose visibility is not required. As a result, connections to the inputs and outputs of modules within supermodule can be one of three types:

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Internal

Internal connections are only visible when the supermodule is being edited, and are *hidden* at other times.

External

External connections are those visible from outside the supermodule to other modules within the algorithm. They may have been either [marked](#) as external, or have connections to points outside the supermodule (which automatically marks them as external).

Unhidden

Normally, the internal connections to a supermodule are hidden when it is created. They can [optionally](#) be made visible from outside it.

There is a subtle distinction between *unhidden* and *external* connectors which only applies to *nested* supermodules, i.e., those where a supermodule is contained within another supermodule:

- If the *containing* supermodule is edited, *unhidden* fields are essentially *external*, meaning they are *visible* and available for connection to other modules in the algorithm.
- If the *contained* supermodule is edited, an *unhidden* connector is NOT *external*, meaning it is *invisible* to modules in the algorithm outside the *containing* supermodule. It will, however, be visible to other modules in the *containing* supermodule.

The type of connection can be seen when editing a supermodule:



Substitution Strings

When an algorithm is comprised of multiple identical supermodules, it is usually necessary for them to have differences in the [statements](#) for their knobs, and often desirable that their constituent modules have different names.

For example, suppose we were to have a three-channel equalizer, with high, mid, and low bands. We might want their gain knobs to read "high: %2.0f dB", "mid: %2.0f dB", "low: %2.0f dB". If the supermodules were identical, they would all read the same and it would partly defeat the purpose of using supermodules were we to have to edit each one in turn.

The use of substitution strings provides a solution. Each supermodule may have up to four substitutions strings, each with its own *search key* and *replacement pattern*. The default search key is "^1". This means that if any text string in the supermodule contains "^1", this will be replaced by the replacement pattern when the algorithm is sent to the Orville.

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So, using the above example, we would create the knob statement to be " $^1: \%2.0f$ dB", and then assign the replacement patterns in each instance of the supermodule to be "high," "mid," and "low," respectively.

It is also possible to use substitution strings in module *names*, as shown in the graphic on the previous page. This means that the knob in the example could be visible from outside the supermodule as, say, "highknob," "midknob," and "lowknob," were we to give the knob a *name* of " 1 knob".

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Glossary

Audio (Signal) Inputs

Audio (signal) inputs are used to pass a single channel of high fidelity audio into a module. An audio input can be connected to one audio output or one *mod* output. Unconnected audio inputs are actually attached to a special *null* signal provided by Orville's program system. The *null* signal simulates a zero-voltage, noise-free audio source.

Audio (Signal) Outputs

Audio (signal) outputs are used to pass a single channel of high fidelity audio out of a module. An audio output may be connected to any number of audio inputs or *mod* inputs.

Control Inputs

Control inputs are parameter inputs into a module. They are used to pass values into a module. . The range of values a control input can be set to may be determined via [specifier](#), fixed internal programming, or even via another control input.

- The maximum value range for control signals is -32768 to +32767.
- The amount of resources used by a module does not change even as a control input value changes.
- Control inputs can only have a numerical value.
- A control input can be connected to only one control output.

Control Outputs

Control outputs send numerical values to other modules, if connected. A control output may be connected to any number of control inputs.

Mod signals

Mod signals are a special case of audio signals used for high-speed control or modulation. Although they are high performance modulation signals, they are not very good audio signals. An audio signal passed through a mod in/mod out module will lose fidelity.

Mod signals have no direct numerical value associated with them but are considered to be linear with a range of -1 to +1 or full negative to full positive.

Modules

A *module* is the smallest unit of an **Ultra-Harmonizer** preset. It will usually have one or more *inputs* and *outputs*, and may process *signals* and/or *control* information. It may also have a *userobject*, so that it can be operated directly from a *menu*.

Repeating Fields

A *repeating field* is an input, output, or text string which can occur more than once, the number of occurrences is usually defined by a [specifier](#). An example is a MIXER which may have a variable number of inputs, or a TEXTKNOB which can have a variable number of text strings. Repeating inputs or outputs can be identified by a number inside their connector circle.

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They are numbered in groups, starting at 1. For example, a four-input mixer might have repeating fields for the inputs labeled in1, in2, in3 and in4.

Specifiers

A specifier is a parameter that controls a module's behavior. A module may have several specifiers. The range of permitted values for a specifier is unchangeable. Specifiers have the following features:

- Specifiers are not directly visible in Vsigfile graphics mode or the patch editor display.
- Specifiers are efficient in terms of resources. (A module with a specifier for a parameter is smaller than a module with a control input for the parameter.)
- Specifiers can change the amount of resources that a module needs.
- Specifiers can change the number of audio, mod, and control inputs and outputs, or even the number of specifiers.
- Specifiers can be numerical, multiple choice, or text.

Supermodules

A [*supermodule*](#) is a module which is itself made up of other modules (possibly including other supermodules). The use of supermodules is a way of creating complex functions and then re-using them without being bothered by their tedious inner details.

Supermodules are also useful when a design requires the same functions on multiple channels - it is only necessary to get a single channel working satisfactorily, and then the channel can be converted to a supermodule and replicated easily.