



The Wersi Sound Factory Master Classes

Master Class 7 : October 2013 : The Matrix - Part 2 : Destination Components

Here is a reminder of the LFO/Matrix tab.

The LFO/Matrix screen

The Destination List
Pitch
Wave
Cutoff
Reso
Amp
Pan
[LFO3 Rate
Mod Env
LFO3 Depth]
The final three in brackets are not covered in this Master Class



This Destination column is the focus for this Master Class

This is the Matrix Table which will form the focus of our attention in these Master Classes.

This table refers to LFO3 to which we shall return much later. It can be ignored for now.

WAVE
Wave
Start/Sample
Page)

Last time (Master Class 6) we looked at and played with just using the MW (Modulation Wheel), a Uni-polar physical controller, to modulate/control the Pitch of a single Sample Layer in Sound Factory. Let's continue to use the MW as our Source and work down the Destination List, starting with the next option available: Wave.

This has been shortened from Wave Start. Just as before, when using Pitch as the Destination, this activates a path directly from the MW to the Wave Start parameter found on the Sample Page of Sound Factory [see Master Class 2].

The following values would activate this use of Wave as a Destination (known as a "patch routing"), using the MW as an unmodified Source:

Row No.	Source	Modifier	Modify	Destination	Depth
1	Mod Wheel	Off	0%	Wave	+100%

Bagpipe
example for
the
Destination
WAVE

Let's try using this. You will need to have set up your instrument by making sure that, in your selected Total Preset, the MW is active only for Selector 1. Once you have done that, load from the Quickload data base the sound Bag Pipe * (091-000-066) into Selector 1. Make sure that only this Selector is active.

Have a quick play across the upper keyboard to become familiar with the instrument's behaviour. As you will notice, there appear to be two separate parts to this sound: the 'drone' on the left and then the 'melody' part on the right of the keyboard. The left is fine, but the right hand part displays, when played, a musical 'turn' at the beginning of each note.

We are going to use the values in the table above to remove this 'turn' leaving the rest of the sound intact. You may remember we made a similar modification in Master Class 2 using the Wave Start function there. Now we are going to use the Matrix to make that modification.

Have a look at the Sample page of Sound Factory while this Bagpipe sound is loaded. There you will find that there is only one Layer available for editing: this makes things simpler to do. Go to the Sample Edit parameters and change the following:

Wave Start = 0% (previously +1%).

Velocity = 0% (previously +10%).

Random should already be at 0%.

This disables anything else that could affect the results of our experiment with Wave as a Matrix Destination. Now return to the LFO/Matrix page and in the first three rows disable the pre-programmed modulations by changing all the Destinations to Off. In the bottom row numbered six put in the values shown in the table on page 1.

Start playing some repeated notes with the right hand whilst moving the MW with the left hand. You will hear the 'turn' disappear at a certain point just leaving the rest of the waveform to loop continuously. So the MW is changing (modulating) the Wave Start position.

Because of the unique nature and function of Wave Start, the modulation is effective only at the time the note is played on the keyboard (key down trigger). Nothing will change if you move the MW after the note(s) are being held. Only when a new note is played will the current MW position be routed over to the parameter and influence the sound. (There is one other Destination parameter that shares this type of behaviour, but that's for a later date...)

So we can say that this particular Destination actually has two requirement conditions for it to work.

1. Whatever modulation Source is being used has a Depth value greater/less than 0%.
2. Whatever the modulation Source is outputting in the form of values the only value that matters is the one at the time of the key down trigger.

S&H
(Sample &
Hold)

This type of condition programming is what is called an S&H or Sample and Hold function. The Sample is the value taken at the time of the key triggering the sound which is then held (Hold) at this value until a new note or key is depressed. If the value of the modulation then is the same as before, there will be no change. If the value is different (change the MW position and therefore its output value), there will be a change in the Wave Start position and therefore in what we will hear from the instrument. In other words, in this Bagpipe example we can now control when the musical 'turn' is applied in an arrangement.

We've now covered one obvious use of Wave Start modulated by the Matrix. There are others. For example, try changing the Sample on the Sample Page and then move the MW while playing. Then try changing the control range on the Matrix Page (that means change the Depth value) to 50%. This will give you a greater resolution for finding new places to start the waveform from a key down.

See "Jeff's
Jazz Guitar"
Example on
page 5 for
the design of
this Jazz
Guitar sound

I produced a great Jazz Guitar by using the above method on a Harp Sample. Timpani can be made to sound as if played with a soft beater instead of the hard beater version found in the database. The Slap Bass can have its Slap removed to leave just the sustaining body part of the sound. You can remove the Key Click from organ samples by using the above method: it appears to turn the click on and off when using the MW. Each sample in the database will change somehow. You just need to take the time to listen to the differences when the MW is at a different value position.

CUTOFF
(Cutoff/Filter
-Map Page)

The next option in the Destination list is Cutoff with a function the same as Cutoff in the Filter table on the Filter-Map Page.

As you will have guessed, this will now route the MW to control (modulate) the Cutoff (Frequency) parameter on the Filter-Map Page. Normally when we load any sound into Sound Factory to be edited the Filter Cutoff is set either fully open or almost open. Because of this, using a positive value from the Matrix modulation appears to produce hardly any

changes to the sample layers that build the overall sound. Notice that the values below include a negative value assignment. This will, in a sense, reverse the direction that the Filter will be modulated in, thus closing the filter down the further forward the MW goes.

Here's the experiment to try. By using what has already been set up in the previous example, go to the Matrix Page and change Row 1 values to:

Row No.	Source	Modifier	Modify	Destination	Depth
1	Mod Wheel	Off	0%	Cutoff	-100%

Go back to the Sample Page and select any sample from any sample bank in your system. Move your MW towards the halfway point and you should notice some sort of filtering being applied to the sound. That should give you a feel for what is happening. The next experiment provides a deeper approach, being much more tailored to produce a specific sound result.

Open any spare Total Preset and load into Selector One the sound Pan Pipe 1 * (090-000-019). Then check to make sure that the MW is active for this Selector. When you have confirmed this go into Sound Factory/Expert Edit as there is some setting up to be done. Make sure that Layer One is selected for editing and mute Layers Two and Three as they will not be needed.

On the Sample Page, change the sample from Pan Flute to CD Theatre in the same Sample List (about halfway down). Change the following parameters to the values shown. All values not shown in these tables remain as their original values.

SAMPLE PAGE

Sample Edit	
Wave Start	0%
Velocity	0%

FILTER-MAP PAGE

Filter	
CutOff	44%
Resonance	0%
Velocity	0%
Key	80%

ENVELOPE PAGE

Envelope		Velocity to:	
Attack ms		Attack	0%
Decay		Volume	0%
Sustain	100%		
Fade			
Release ms			

LFO/MATRIX PAGE

Matrix					
Row No.	Source	Modifier	Modify	Destination	Depth
1				Off	
2				Off	
3				Off	
4	Mod Wheel	Off	0%	Cutoff	40%
5					
6					

Now we are ready to play with this. With the MW at its minimum/zero position, we get only a vocal/vox like sound. When the MW is moved towards its maximum/full position, the Filter is opened to let through the rest of the sound, in this case a string-like ensemble. In a later Class we shall learn how to change the behaviour of the MW from being able to send values (0 - 127) continuously to being a switch type controller which sends only two values, On and Off (0, 127). This has the effect of then acting like a Tab switch to change the registration of the particular Sample Layer.

RESO
(Resonance/
Filter-Map
Page)

The next option in the Destination list is Reso. This is short for Resonance with a function the same as Resonance in the Filter table on the Filter-Map Page.

Because Resonance can produce very loud frequencies in the audio spectrum when given large amounts of modulation, we need to be careful when assigning values in the Matrix to this Destination. Please be careful with this.

Still with the previous sound (CD Theatre), change the Matrix values in Row 4 to:

Matrix					
Row No.	Source	Modifier	Modify	Destination	Depth
4	Mod Wheel	Off	0%	Reso	95%

When moving the MW, the Resonance of the Filter is increased. The values above give a more vowel/nasal sound to this Sample. Try this Matrix modification with other Samples and Filter Cutoff settings. There are a few 'hidden gems' in the database but you'll need to find them. Make sure you follow the warning given to you in the last MC (MC 6, pages 3 and 4) as this will help protect your ears and speakers!

WARNING!
Control the
Expression
Pedal
carefully to
avoid very
high volume
levels being
generated
while
experimenting

AMP
(Volume/
Sample Page)

The next option in the Destination list is Amp (short for Amplitude) with a function the same as Volume on the Sample Page.

It just so happens that we can once again use the previous experiment to help understand this Matrix assignment. In Row 4 where we have been changing the data, put this in:

Matrix					
Row No.	Source	Modifier	Modify	Destination	Depth
4	Mod Wheel	Off	0%	Amp	-100%

Then go to the Sample Page and change the Volume dB to read -12.0dB. (This helps prevent overloads in the audio system.)

Once that's done, move the MW whilst playing. We have created a volume control. What's cool about this one is that by using this code/recipe in this and other Layers, we can have a specific 'mix' of volumes at one end of the MW's range, and a completely different mix at the other end. We don't need to touch the main volume controls for each Selector; it's all done with just one Controller, the Modulation Wheel.

PAN
(Panorama/
Sample Page)

The next option in the Destination list is Pan (short for Panorama) with a function the same as Panorama on the Sample Page.

Once again we can use the earlier experiment to explore this Destination. Let's change the Sample we are using now to Solo Trumpet which can be found in the same list as before, though this time the sample is located near the bottom of the list. Once you've done that, change the data in Row 4 of the 'Matrix Page' to:

Matrix					
Row No.	Source	Modifier	Modify	Destination	Depth
4	Mod Wheel	Off	0%	Pan	+100%

Playing this and using the MW in different positions will move the Sample's placement within the stereo field. With the above values, the Trumpet moves from the centre over to the right. (If it moves to the left with any external speakers connected, your connections are the wrong way round, so just swap the audio jacks coming out of the instrument to correct this).

If we wanted the Trumpet to go from the centre to the left we need to change the value sent by the modulation (Depth) from a positive to a negative value as shown below:

Matrix					
Row No.	Source	Modifier	Modify	Destination	Depth
4	Mod Wheel	Off	0%	Pan	-100%

Try this, and you'll hear that the Trumpet now moves to the left.

What do you have to do if you want the Trumpet to start either at the left or right and move to the opposite side?

Go into the Sample Page for the Layer in question, then in the Panorama window decide which side and placement the sound should occupy when the MW is in its normal minimum/zero position (I'll use R64 as an example). With the MW at zero the Trumpet is now on the far right of the stereo field. If you then move the MW to maximum, the Trumpet moves from right to left. If you want it the other way round, assign L64 as the normal position in Panorama on the Sample Page and use the positive version of the data as shown below:

Matrix					
Row No.	Source	Modifier	Modify	Destination	Depth
4	Mod Wheel	Off	0%	Pan	+100%

In case you hadn't realised it, you have been playing the Trumpet with the Filter Cutoff set to attenuate lots of the higher harmonics present in this sample, giving it a warmer sound. Try opening the Filter back to its maximum and listen to the difference. That's a little test for you of a procedure we've covered before!

The next three Destinations available in the Matrix list (LFO3 Rate, Mod Env and LFO3 Depth) do not refer to any of the other pages in Sound Factory like the parameters we've covered so far in our look at the Matrix. Instead, they link back directly into the Matrix itself. Because of this we need a lot more information before we can use these remaining Destinations effectively. They will be covered in a future Master Class.

Jeff's Jazz Guitar Example

Here is an implementation from Jeff Ormerod of Ian's suggestion for modifying a Harp sample to produce a Jazz Guitar. The principle will be to utilise the Modulation Wheel to control the Wave parameter such that with the Wheel rolled back we have the Harp sound and with the Wheel rolled forward we have the Jazz Guitar. Here's how it's done.

- 1) Load the Harp * sound (090-000-124) into Sound Factory and ensure that the Sample Tab page is selected. You will see that in addition to the Harp sample there are three other Layers on the samples list, namely two Pizzicato Strings samples and a Fact-Parametric EQ effect. The two Pizzicato Strings samples add extra attack to the sound, enhancing the initial 'pluck' of the instrument over the lower and higher octaves of the keyboard respectively. Since we also require this function in the Jazz Guitar sound we can retain both of these samples. The Fact-Parametric EQ effect is a factory supplied equaliser that applies appropriate treble and bass settings to fine tune the tonal quality of the overall Harp sound. This sample is non-editable and as such cannot be deleted. Fortunately, however, the settings it defines will not adversely affect the required tonal composition of our Jazz Guitar sound.
- 2) Select the Harp sample from the samples list and increase its Volume parameter to +5.1. This compensates for a reduction in volume when the Modulation Wheel is in its rolled forward position defining a more mellow sound.
- 3) Now select the LFO/Matrix Tab and locate the Mod Wheel entry in the Matrix Table as shown below.

Source	Modifier	Modify	Destination	Depth
Mod Wheel	LFO1	+100%	Pitch	+15%

Currently this command enables the Modulation Wheel to apply progressively more vibrato to the sound as it's rolled forward. This function is not appropriate for the Jazz Guitar so we can conveniently change this entry to control the Wave parameter. Modify the entry to specify the values shown below.

Source	Modifier	Modify	Destination	Depth
Mod Wheel	Off	+0.0%	Wave	+100%

We can now control the point at which the Harp waveform starts to play by adjusting the position of the Modulation Wheel.

- 4) Now select the Envelope Tab and locate the Release parameter. At the moment the value for the Harp sample is set appropriately for this instrument, but needs to be shorter for the Jazz Guitar. Reduce this value to 578 ms.
- 5) Finally on the initial Individual Sound Controls page locate the EQ parameter and increase its value to 100%. This Control varies the bass/treble ratio of the sound, so you can use this to emulate the tone control of the Jazz Guitar amplifier. In our example, a value of 100% adds more treble to the sound.
- 6) Save the sound as a new Sound Factory sound.

There is an audio download of this sound featuring a solo Jazz Guitar improvisation from the George Shearing classic, "Lullaby of Birdland" on the Sound Factory page of the WersiClub International website. But don't expect to hear the tune folks, this is jazz after all!!

This concludes Master Class 7, the Matrix - Part 2. In the next Master Class, in December 2013, we shall transfer our attention to the other two fields in the Matrix Table: Source and Modifier. There are currently 47 possible parameters usable in the Source field and 60 available parameters in the Modifier field. You can therefore expect it will take quite a time to complete this.

Next time, therefore, we shall just be making a start by firstly classifying the Source and Modifier parameters (31 of which are the same) into two basic groups:

Physical Controllers
Electronic Controllers

We hope you found this Master Class interesting and that you will join us again for Master Class 8 in December.

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