Power “Arps”

By Brian Cowell

There are some amazing things that can be done with the YAMAHA EX-series synthesizers. Unfortunately, they are not either not documented, or not that obvious to users. In this tutorial, I hope to explain an aspect of the machine, which will open a large area of exploration that would have otherwise, been overlooked.

What we will discover is that the EX-series can do “one finger arpeggiator arrangements” along with powerful “wave-sequencing” possibilities”. Apart from these two things, there is further scope for actually creating giant “pads” by using this technique.

So without droning on to long about it, lets look at some of the key components that we will be using.

WAVE-EDIT mode

A little about WAVE-EDIT MODE.

The WAVE-EDIT MODE allows you to use a sample that you have loaded like the existing waves in ROM. In some ways, it more flexible then the existing ROM waves, as you can program them to your own requirements. Please refer to page 150 to 155 of your manual.

Here are some of the key components of WAVE-EDIT MODE that we will be looking at::

- COARSE/FINE= this allows the sample to be tuned.
- ZONE = sets where on the keyboard the sample will play.
- PAN = this places where in the stereo field the sample sounds
- Velocity = “L-Vel-H” sets the velocity in which the sample will trigger.

These are not all the parameters available in WAVE-EDIT MODE. There are a whole host of others which can affect the way the sample behaves, the ones I have listed are the ones we will be utilizing.

What you need to know on WAVE-EDIT MODE.

There are a couple of things that are not quite so obvious when using WAVE-EDIT MODE. While they are mentioned in the manual, the true possibilities of using them is not.

You can have 128 samples within a WAVE. Each of these samples used are referred to as a LAYER. (page 151 of the manual.)

What we are looking at here is the ability to program 128 samples within 1 WAVE ! None of the existing ROM WAVE’s have this !

There must be some form of limitation on this, and there is.

Say for instance, that we had a WAVE that had 128 LAYERs in it. They all cannot trigger at once. The limitation is that only 2 samples can trigger simultaneously. (page 151 of the manual.) The lowest LAYER numbers will trigger first.

This not a bad thing. In fact, it opens the door to a whole host of ideas.

Currently, with the existing ROM waveforms, they are only layered so 1 sample will trigger with each key. Imagine what could be done if you had 2 samples per key ! You could have 1 layer de-tuned to the other creating thick chorusing sounds, without having to use a CHORUS insert effect, or by using another element.

So, by looking at it with ROM waveforms, we can have a max of 4 sounds sounding per key.

But from WAVE-EDIT MODE, we can have 8 sounds per key !

Again, there must be limitation. There is, but its more a poor implementation by YAMAHA rather then a limitation.

You can program and use the ROM waveforms to create big and thick sounds when using WAVE-EDIT MODE, but you cannot SAVE the result. The minute you turn the machine off, they are lost !

So as it stands at the moment, you are limited to using samples you have loaded in.

Wave-sequncing using the EX.

The ablity to ZONE the velocity of each sample in WAVE-EDIT MODE opens up a reasonable amount of scope. We could, for instance, program each sample so it had its own velocity range. By doing this, we could use the arpeggiator (which had an appropriate arpeggio programmed in it), to step through each of the samples.

Did I hear somebody yell “Wave-sequencing” from the back of the room ?

That is exactly what the result is. If you had samples made up of different percussion/synth sounds, you have the ability to create a form of “wave-sequencing” on the EX-series with the limit of 128 waveforms to play with.

One-finger “power” arppegio’s using the EX.

The key thing I’ve wanted to get into this tutorial is to look at “power arps”. Since the EX series was introduced, many users have missed being able to have an arpeggio play many different notes by pressing one key.

Through the use of WAVE-EDIT MODE, we can setup a sound to play whatever we want. Unfortunately, we cannot use the ROM waveforms. But by using samples we now have the “power” to impress with 1 finger.

We know by using many samples in WAVE-EDIT MODE, we can get the arpeggiator to step through an actually play them when we want to. The key to the whole process is hiding in the COARSE parameter and how the velocity settings are set.

Using velocity to choose which sound to play.

By using descrete "velocity-switching" points, we can effectively get the arpeggiator to choose what sound to play. If every sound has a descrete "velocity zone" allocated to it, then we can actually tune each sample to a key we want played.

What this means, is that we can have 1 key playing many different notes on the keyboard. Overall, it allows you to have very powerful arppegiator patterns playing with the press of 1 note. The disadvantage of this technique is that it only works on RAM samples, and it makes un-musical arrangements if the arpeggiator is poorly programmed. Other stuff that make it a disadvantage is that you can not use the PLAY FX parameter on it, especially if it is adjusting the velocities.

But, the advantages out-weigh the disadvantages. Here is how you do it.

To cover the 12 notes in an octave, we need 12 velocity switching zones. If we need to jump up or down octaves, we can easily make use of the "Octave" setting in the arpeggiator. The "zoning" is what is crucial.

My personal method in setting this up is to make use of the ***higher*** velocity settings.

127 = C
126 = C#
125 = D
124 = D#
123 = E
122 = F
121 = F#
120 = G
119 = G#
118 = A
117 = A#
116 = B

As you can see, the "zoning" is very specific when it picks out a note. The velocity must equal this number in order to play. I've found this method to be the best, as it allows you the freedom of actually putting another sample in there and using it also. Remember that one key (WAVE) can play a maximum of two notes.

So for instance, you could have a synth sound hammering out different notes along with a throbbing bass drum!

Ideal samples to use.

The ideal sample to use would be one that has been sampled at the root key of "C". This is a matter of choice rather then being a rule. Though, tuning the sample and the velocity ranges can be more difficult. Thus, my reason for staying with a common root sample, is

that, arpeggio's I program using this method will be compatible with any other WAVE files I create.

Setting up in WAVE-EDIT mode.

When you have a sample in memory, the EX will let you use WAVE-EDIT mode. To get to it, you must press OSC and have the cursor under the BANK section. Change it from "PRE" to "RAM". At the bottom of the screen, "[WAVE-EDIT]" appears. Press the button underneath it (F3). You are now in WAVE-EDIT mode.

If you press the MIX (F7) button, you will see the area in which you can tune the sample for the zone What we are concerned with, is the "Coar" (Coarse) parameter.

If you press the ZONE (F8) button, you an see where the velocity zoning is . What we are specifically looking at is the "L – Vel – H" parameter. The velocity levels for low and high are under the respective columns.

To set up for the first note "C", we do not need to set anything in the MIX page. This is because the sample is our "root key". (Assuming your using a sample that is sampled at "C".)

What we do have to do, is make adjustments in the ZONE page. If you look at the numbers under the "L – Vel – H" parameter, you will see that they are 1 and 127 respectively. This is no good as the numbers are not discreetly unique to that *layer*. You need to change the 1 to 127. So you will have two numbers of 127. That is it for this *layer*.

Now you press the [ADD] (F3) button. The top right hand corner will now say " Layer = 2/ 2". This means we are now in the new *layer* which is the 2nd one.

Now we must make adjustments in the MIX page. Press the MIX button. Change the "Coar" parameter to +1. We now press the ZONE button and make the two numbers 126 and 126 under "L – Vel – H".

That is it for this LAYER…..we now press the [ADD] button again.

In the end, you will have to do this 12 times to set the whole thing up.

	Note		Layer	Coar	L – Vel – H
C	=	1/12	+0	127	127
C#	=	2/12	+1	126	126
D	=	3/12	+2	125	125
D#	=	4/12	+3	124	124
E	=	5/12	+4	123	123
F	=	6/12	+5	122	122
F#	=	7/12	+6	121	121
G	=	8/12	+7	120	120
G#	=	9/12	+8	119	119

A	=	10/12	+9	118	118
A#	=	11/12	+10	117	117
B	=	12/12	+11	116	116

After this has been completed, if you play the keyboard reasonably hard with velocity, you will hear the notes. You will notice that softer hits result in no sound. The WAVE is now ready for the appregiator!

Making the arpeggiator play the sounds.

If we refer back to the "Arp 1" tutorial, we know that every key represents a note on the keyboard. The "Keycodes" tell us what note exactly we have played on the keyboard. By using the "Keycodes", we can set an appropriate velocity setting that corresponds with it.

Key	Keycode	Velocity
C	1	127
C#	2	126
D	3	125
D#	4	124
E	5	123
F	6	122
F#	7	121
G	8	120
G#	9	119
A	10	118
A#	11	117
B	12	116

Of course, we still have to obey the rules that govern what is key playing. (The rule that involves the "Keycodes" – please see "arp tutorial 1".)

After you have played your tune into the arpeggiator, you can set out to change your "Keycodes" to that of "Keycode" no. 1. In the process, you change the velocity setting to that which equals the initial "Keycode". Take a look at the this example.

Example: This is the tune used from "arp tutorial 2".

```
001-01-000   3  +0   00-216 (    ) 72
001-01-240   3  +1   00-216 (    ) 72
001-02-000  10 +0   00-216 (    ) 72
001-02-240   8  +0   00-216 (    ) 72
001-03-000   8  +1   00-216 (    ) 72
001-03-240  10 +0   00-216 (    ) 72
001-04-000   7  +1   00-216 (    ) 72
001-04-240  10  +0   00-216 (    ) 72
```

Above is how it looks when it is played into the arpeggiator. Below, is the arpeggiator after it has been tweaked to play as a "power arp".

001-01-000 1 +0 00-216 ( ) 125
001-01-240 1 +1 00-216 ( ) 125
001-02-000 1 +0 00-216 ( ) 118
001-02-240 1 +0 00-216 ( ) 120
001-03-000 1 +1 00-216 ( ) 120
001-03-240 1 +0 00-216 ( ) 118
001-04-000 1 +1 00-216 ( ) 121
001-04-240 1 +0 00-216 ( ) 118

This arpeggio will now play back as originally played in, by using the “Wave-edit” mode technique.

The final word.

There are many uses for programming in this sense. By carefully choosing good waveforms, you can get the arpeggiator to come up with some wild “wave-sequences” reminiscent to those that would be heard in a KORG WAVESTATION.

Using all four elements and filtering, you could come up with “vector synthesis”. It does take a lot of work, but making sounds that are specific to your music is always worth pursuing. I’m sure that many of you will think of other methods in which to use this technique.

The final word from me on this, is try and put your drum/poly rhythms into the arpeggiator and use this technique. You will find that the EX arp that YAMAHA gave us, has quite a bit of power still up its sleeve !